

**NOTICE OF PUBLIC MEETING**



**MAY 25, 2021 AT 12:00 P.M.**

**11 CHAPEL LANE, SUITE B  
NEW BOSTON, TX 75570**

Persons wishing to attend the TexAmericas Center Board of Directors Meeting by telephone can call 1-866-778-5424 and enter the Participant Code of 5090805. Board meeting agenda and materials can be found at the [www.texamericascenter.com](http://www.texamericascenter.com) website.

The Board of Directors of TexAmericas Center will meet to conduct business at the above time and location via conference call.

**AGENDA**

1. Reflection.
2. Call to Order.
3. Roll Call of Directors.
4. Public Comment Period for Non-Agenda Items. Comments are limited to five minutes.
5. Public Comment Period for Agenda Items. Comments are limited to five minutes.
6. Hear and discuss reports from the standing Committees of TexAmericas Center. Committees that met since the last board meeting are:
  - a. Infrastructure/Real Estate/Marketing/Business Development
  - b. Nominating
  - c. Executive
7. Consent Agenda:
  - a. Approve Minutes of Board Meeting from April 27, 2021
  - b. Approve Check Book Register and Deposit Summary from April 23, 2021 – May 19, 2021.
  - c. Approve Board Calendar July 2021-July 2022.
8. Report regarding regional water.

9. Consider and take action to **appoint William Scott Norton to the Advisory Committee for Riverbend Water Resources District.**
10. Consider and take action upon **Resolution #20210525-01 approving a Qualified Sites Program for Brazos Site upon the TexAmericas Center East Campus.**
11. Consider and take action upon **Resolution #20210525-02 approving a Qualified Sites Program for Duke East Site upon the TexAmericas Center East Campus.**
12. Consider and take action upon **Resolution #20210525-03 authorizing the Executive Director/CEO to execute a new industrial lease agreement with Cherokee Nation Red Wing, L.L.C. for production space at 154 Service Street, New Boston, TX 75570, upon the TexAmericas Center Central Campus.**
13. Consider and take action upon **Resolution #20210525-04 authorizing the Executive Director/CEO to execute an amendment number one with Woodfield, Inc. to add 1.1 acres for truck/trailer parking at the south parking lot of 125 Austin Street, Hooks, TX 75561, upon the TexAmericas Center East Campus.**
14. Consider and take action upon **Resolution #20210525-05 authorizing the Executive Director/CEO to execute Amendment No. 3 with CJ Tex-Corp L.L.C. for the license agreement to use designated property upon the TexAmericas Center East Campus.**
15. Consider and take action upon **Resolution #20210525-06 authorizing the filing of the Land Use and Site Design Policy as Property Restrictions in the Real Property Records of Bowie County, Texas.**
16. Consider and take action upon **Resolution #20210525-07 authorizing TAC East Holdings Company No. 1 to sell and convey property to Expansion Industries, LLC; authorizing the grant of road easements to Expansion Industries, LLC; and authorizing change of name of Titus Street to Freedom Way.**
17. Consider and take action upon **Resolution #20210525-08 approving a standard Third Party Logistics Services and Warehouse Space Lease Agreement Form.**
18. Hear Nomination of Officers of the Board of Directors from Nominating Committee.
19. Staff Reports:
  - a. Executive Director/CEO Report
  - b. Executive Vice President/CEDO Report
  - c. Executive Vice President/COO Report
  - d. Vice President of Logistics Report
  - e. Vice President of Finance Report
20. Adjourn to Executive Session pursuant to the following Sections:
  - a. Section 551.071 of the Texas Government Code; Consultation with attorney regarding legal issues relating to pending or contemplated litigation.
  - b. Section 551.072 of the Texas Government Code; Deliberation of the purchase, exchange, lease, or value of real property.
  - c. Section 551.074 of the Texas Government Code; Personnel Matters.

d. Section 551.087 of the Texas Government Code; Deliberation regarding Economic Development Negotiations.

21. Reconvene in Open Session.

22. Adjournment.



## **Infrastructure, Real Estate, Marketing and Business Development**

*Oversight, review and recommendations relating to all infrastructure needs of the properties of the organization and shall also oversee all real estate marketing activities, facilities master planning and personal property disposal.*

### **MINUTES**

107 Chapel Lane, New Boston, TX 75570

May 4, 2021

12:00 P.M.

The Infrastructure, Real Estate, Marketing and Business Development Committee of TexAmericas Center Board of Directors met to conduct business on the date and time listed above via conference call.

#### **Committee Members, Staff and Others in Attendance by roll call were:**

Fred Norton	Jimmy Howell	Ron Collins	Scott Norton
Marla Byrd	Eric Voyles	Jeff Whitten	John Sesler
David Williams			
MTG Engineers			

#### **Committee Members Absent by roll call were:**

Marc Reiter	Steve Mayo
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1. Ron Collins called the meeting to order at 12:06 p.m.
2. Considered and approved the minutes from February 9, 2021 Infrastructure/Real Estate, Marketing and Business Development Committee meeting. A motion was made by Fred Norton and seconded by Jimmy Howell. The motion carried unanimously by voice vote.
3. Eric Voyles provided an update regarding Building Occupancy Rates as follows:
  - a. TAC-East 483,491sf of 973,243sf ~49.68%
  - b. TAC-Central 501,855sf of 601Ksf ~ 83.41%
  - c. TAC-West 17,842sf of 260Ksf ~6.88%
4. Eric Voyles provide an update regarding Available Move-In Ready Buildings as follows:
  - a. TAC-East
    - i. Area U Buildings – Storage Only; No Utilities; 14 buildings, 11,500sf each
    - ii. Area V Bunkers - 22 bunkers remaining, mix of ~1,100sf and ~1,600sf
    - iii. Area D
      - 555 Elm Circle:
        - a. ~ 90 days of rehab needed
        - b. Financing Approved
        - c. 3PL Approved



- Array Technologies = 177,200sf
    - a. Pending vacancy
  - b. TAC-Central
    - i. 135 Miller Street – 15,754sf – Industrial; 3PL Approved
    - ii. 150 Service – 12,490sf – Industrial
    - iii. 154 Service – 19,228sf – Industrial
    - iv. 245 Ammo – 15,850sf – Industrial –
    - v. 228 Texas, Suite B, C & D – 7,237sf - Office
    - vi. 11B Chapel Lane, Suite B – 1,390sf – Office
      - Currently being used by TAC for BOD meeting room
    - vii. 116 Technology Circle – ~24,000sf – Office – ~ 90 days of rehab needed
    - viii. 342 Texas – 4,800sf – Office
  - c. TAC-West – Total Square feet available
    - i. Area A Bunkers – Total Square feet available - 141,114sf
    - ii. Area C Bunkers– Total Square feet available – 100,564sf
5. Jeff Whitten provided an update regarding Existing Product Improvement Plans as follows:
- a. New Projects
    - i. 116 A-E Demo and Rebuild
    - ii. Area U Infrastructure Planning – No Update
      - 14 buildings vacant each 11,500sf; 161,000sf
      - Approximately \$1,700,000 to extend all utilities; can be phased by row
      - Estimated investment:
        - a. Per building = \$75,000
        - b. Aggregate all 14 - \$1,050,000
      - Annual Revenue potential
        - a. 161,000sf x \$3.50psf = \$563,500
        - b. 161,000sf x \$5.00psf = \$805,000
    - iii. Area V Investments
      - Electronic Gate
    - iv. Telecommunication Infrastructure
      - Connectivity Study
        - a. TAC property well positioned for hyperscale, corporate, or similar data center applications
        - b. TAC property less suited for retail and wholesale data center applications
        - c. Second phase of study to begin in May 2021, will focus on regional investments needed to improve attractiveness for both types of applications
      - Wireless Back-up System - No Update
    - v. Planning Utility Corridors
      - Crockett Site on South Ellis - No Update
      - South Lamar to Area U
  - b. Existing Project Status Update:
    - i. Utility Corridor Oak Street – TAC East
      - Natural Gas to Area A
    - ii. Rehabilitation of 555 Elm Circle (Area D) & C-1 – Have bids for doors and finish-out and holding at this time.
    - iii. Retrofit of Area D Buildings
      - Current Construction Projects

- a. Roof Punch List Items
  - iv. 175 Arkansas – Rowe Casa Organics
    - Developing Scope of Work for 5,000sf expansion onto existing pad
    - Evaluating window replacement
  - v. 125 Austin Street
    - Extending fiber
    - Adding new dispatch office area
    - Removing janitor closet and building in coffee bar
    - Reflooring and painting walls
    - Improving the hardstand area to improve entrance and exits
    - Evaluating painting exterior of building
  - vi. 245 Ammunition Drive
    - Need to replace drywall, ceiling grid, insulation and other items in the north three offices.
    - Evaluating rebuild of and replacement of HVAC in bathrooms.
6. Jeff Whitten provided an updated on the Spec Building progress as follows:
- a. Building walls set up the week of 4-26-2021
    - i. [Insert Construction cam link](#)
  - b. Delivery date – August 2021
  - c. Financing complete
  - d. Referrals Welcome
7. Jeff Whitten provided a Property Maintenance Report as follows:
- a. General Mowing & Cleaning – seasonal decline in mowing activities, cleaning continues
  - b. Building Inventory Assessment - Complete
8. Jeff Whitten provided an update regarding Planning Activity as follows:
- a. Status update: Wetlands – Consultant working on current USACOE comments
  - b. Texas A&M Planning Partnership – No Update
  - c. EDA Public Works Grant - Received
    - i. Rail Infrastructure – JDW to elaborate
9. Jeff Whitten gave a presentation regarding Qualified Sites. A motion was made by Jimmy Howell and seconded by Fred Norton to present the Brazos and Duke East Qualified Sites from draft form to final form to the full Board for approval. The motion carried unanimously by voice vote.
- a. Brazos
  - b. Duke East
  - c. STAR Site
10. Scott Norton and Eric Voyles provided an updated regarding Organizational Development Activity as follows:
- a. Access to Capital – Future Capital Projects Funding – Scott Norton
  - b. Incentives
    - i. PILOT Modifications to TAC Existing Leases
    - ii. Freeport Tax Exemption - All Jurisdictions
    - iii. Add Leary to All Incentives as Needed
  - c. Marketing Activities
    - i. Spec Building Micro-Website – <https://tacspebuilding.com/>
    - ii. TexAmericas Center Property Brochure

- iii. [TAC Overview Video](#)
- iv. Research On Investment – Lead Generation
- v. Social Media
- vi. Chartwell Agency (Select coverage)
  - [RCRA Permit Removal Press Release](#)
  - [Utilizing 3PL...needs](#)
  - [TAC Responds...](#)
  - [... How TexAmericas Coped...](#)
  - [TexAmericas Center Top Ranked Industrial Park...](#)
  - [Diamond in the Industrial Rough...](#)
- d. Regional Economic Development – No report
- e. Training & Conferences
  - i. In office webinars on various topics
  - ii. Leadership Texarkana – Strategic Doing
- f. Strategic Doing – No report

11. Jeff Whitten discussed there were no new Proposed TAC Ordinances.

12. There was no Executive Session; therefore, the meeting remained in Open Session.

13. In other business, Eric Voyles discussed some Prospect Activity to include G Line, Area F and a LOI with an option to purchase.

14. With no other business to discuss, a motion was made by Jimmy Howell and seconded by Fred Norton to adjourn the meeting at 12:50 p.m. The motion carried unanimously by voice vote.



## **Nominating Committee Meeting**

*Oversees nominating and recommending persons to serve as Officers of the Board to the Full Board of Directors*

### **MINUTES**

**Wednesday, May 12, 2021**

**12:30 p.m.**

The Nominating Committee of TexAmericas Center Board of Directors met to conduct business at 11 Chapel Lane, Suite B, New Boston, TX 75570.

1. Denis Washington called the meeting to order at 12:46 p.m.
2. **Directors and Staff in Attendance were:**

Denis Washington	Jim Roberts	Justin Powell	Ben King
Scott Norton	Marla Byrd		

**Directors Absent:**  
Ron Collins
3. Considered and took action to approve the Minutes from the June 5, 2020 Nominating Committee Meeting. A motion was made by Justin Powell and seconded by Jim Roberts. The motion carried unanimously by voice vote.
4. Denis Washington led a discussion regarding recommendations/nominations for Executive Officers for 2021-2022 to the Board of Directors. A motion was made by Ben King and seconded by Jim Roberts to recommend to the Board the Executive Officers for 2021-2022 to be as follows:  
Chairman – Jim Roberts  
Vice Chairman – Ben King  
Secretary – Justin Powell  
Treasurer – Denis Washington  
The motion carried unanimously by voice vote.
5. There was no Executive Session; therefore, the meeting remained in open session.

6. With no other business to discuss, a motion was made by Ben King and seconded by Justin Powell to adjourn the meeting at 1:04 p.m. The motion carried unanimously by voice vote.



## EXECUTIVE COMMITTEE MEETING MINUTES

**11 CHAPEL LANE, SUITE B  
NEW BOSTON, TX 75570**

**MAY 18, 2021  
12:00 P.M.**

The Executive Committee of TexAmericas Center Board of Directors met to conduct business on the date and time listed above.

1. Jim Roberts called the meeting to order at 12:09 p.m.
2. **Directors and Staff in Attendance were:**

Jim Roberts	Denis Washington	Ben King	Gabe Tarr
Scott Norton	Wes Jordan	Marla Byrd	
3. Considered and approved the Minutes from March 18, 2021 Committee Meeting. A motion was made by Ben King and seconded by Gabe Tarr. The motion carried unanimously by voice vote.
4. Scott Norton led a discussion on status of the SPEC Building. With weather delays from all of the rain and week of snow, the new delivery date is now August 20, 2021. Original delivery date was July 13, 2021.
5. Scott Norton led a discussion of Legislative Request for the 87<sup>th</sup> Texas Legislative Session. SB 479/BH 1414 was sent to Governor Abbott on 5/4/21 and was signed into law on 5/15/21. Effective immediately. Still tracking Chapter 313 agreements.
6. Scott Norton led a discussion regarding renaming the road currently called Titus to Freedom Way. Received a request from a party with whom we are in negotiations to purchase land to change the name of a road from Titus to Freedom Way. The consensus was to allow a name change once all closing documents are signed and sale of land is funded and process completed on all of the land, including G-ponds. A motion was made by Gabe Tarr and seconded by Denis Washington to recommend to the full Board a road currently called Titus to Freedom Way once all closing documents are signed and sale of land is funded and process completed on all of the land, including G-ponds. The motion carried unanimously by voice vote.
7. Scott Norton led a discussed to review and recommend the July 2021-July 2022 Board Calendar to the Full Board for approval. Discussed changing the Executive Committee Meetings to the second Wednesday of each month at 12:30 for final copy to be presented to the board. A motion was made by Ben King and seconded by Gabe Tarr to recommend the July 2021 –July 2022 with this change to the full Board. The motion carried unanimously by voice vote.
8. A motion was made by Ben King and seconded by Denis Washington to adjourn to Executive Session at 12:36 p.m. pursuant to the following Sections. The motion carried unanimously by voice vote.

- a. Section 551.071 of the Texas Government Code; Consultation with Attorney
  - b. Section 551.072 of the Texas Government Code; Deliberation of the purchase, exchange, lease, or value of real property
  - c. Section 551.074 of the Texas Government Code; Personnel Matters
  - d. Section 551.087 of the Texas Government Code; Deliberation regarding Economic Development Negotiations
9. A motion was made by Ben King and seconded by Denis Washington to reconvene to Open Session at 1:26 p.m. The motion carried unanimously by voice vote.
10. With no other business to discuss, a motion was made by Denis Washington and seconded by Ben King to adjourn the meeting at 1:28 p.m. The motion carried unanimously by voice vote.



## MINUTES

The Board of Directors of TexAmericas Center met to conduct business at 11 Chapel Lane, Suite B, New Boston, TX 75570 via conference call on April 27, 2021.

1. The Reflection was led by Scott Norton.
2. Jim Roberts, Chairman of the Board called the meeting to order at 12:06 p.m., certifying the meeting was properly posted, being held in accordance with the Texas Open Meetings Act and that a quorum was present.

3. **Directors in Attendance by roll call were:**

Jimmy Howell	Marc Reiter	Jim Roberts	Steve Mayo
Tim Ketchum	Kevin Avery	Steven Seals	Ben King
Justin Powell	Fred Norton	Fred Meisenheimer	

**Directors Absent by roll call were:**

Craig McDuffie	Ron Collins	Gabe Tarr	Denis Washington
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**Staff and Others in Attendance by roll call were:**

Scott Norton	Marla Byrd	Jeff Whitten	Eric Voyles
John Moran	John Sesler	Holly Sleek	Wes Jordan Jordan Law Firm
Mason Andres Thomas & Thomas, PLLC	Cody Tilley Thomas & Thomas, PLLC	Maddie Warren Thomas & Thomas, PLLC	

4. Jim Roberts called for Public Comments for Non-Agenda Items. Comments are limited to five minutes. None noted.
5. Jim Roberts called for Public Comments for Agenda Items. Comments are limited to five minutes. None noted.
6. Jim Roberts called for reports from the standing Committees of TexAmericas Center. Committees that met since the last board meeting were:
  - a. Investment/FinanceThere were no additional comments noted in addition to the minutes provided in the board packet.



7. A motion was made by Jimmy Howell and seconded by Ben King to approve the items listed under the Consent Agenda. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote. Those items were:
  - a. Approved Minutes of Board Meeting from March 23, 2021
  - b. Approved Check Book Register and Deposit Summary from March 19, 2021 – April 22, 2021.
8. Scott Norton provided a brief report regarding regional water.
9. Mason Andres with Thomas & Thomas, PLLC presented the FY2020 Auditor's Report. Considered and took action upon **Resolution #20210427-01 accepting the Fiscal Year 2020 Auditor's Report**. A motion was made by Ben King and seconded by Jimmy Howell. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
10. Considered and took action upon **Resolution #20210427-02 approving the TexAmericas Center Investment Policy**. A motion was made by Jimmy Howell and seconded by Ben King. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
11. Considered and took action upon **Resolution #20210427-03 approving the Revised Hunting License Agreement with Kingwood Forestry Services, Inc., for Hunting Services**. A motion was made by Ben King and seconded by Jimmy Howell. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
12. Considered and took action upon **Resolution #20210427-04** authorizing the Executive Director/CEO **to execute a new lease agreement with Runnin' WJ Ranch for hardstand space at 200 Denton Street, Unit B, Hooks, TX 75561, upon TexAmericas Center-East Campus**. A motion was made by Jimmy Howell and seconded by Ben King. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
13. Considered and took action upon **Resolution #20210427-05** authorizing the Executive Director/CEO **to execute a license agreement for use of the baseball/softball field near the old main gate to the former Lone Star Army Ammunition Plant to the Mudcats**. A motion was made by Ben King and seconded by Jimmy Howell. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
14. Considered and took action upon **Resolution #20210427-06** authorizing the Executive Director/CEO **to execute a fourth modification and extension with Bristol General Contractors, LLC for trailer space at 180 Arkansas Avenue, Lot C, and laydown yard at 171 Arkansas Avenue, New Boston, TX 75570**. A motion was made by Ben King and seconded by Jimmy Howell. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
15. Considered and took action upon **Resolution #20210427-07** authorizing the Executive Director/CEO **to execute Addendum Number One to the Pipeline Development Agreement and A Right of Way and Easement for the Development of a Natural Gas Pipeline System along Oak Street upon the TAC East Campus by Navitas Utility Texas, LLC and Navitas Utility Corporation**. A motion was made by Jimmy Howell and seconded by Ben King. Jim Roberts called for votes by

roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.

16. Considered and took action upon **Resolution #20210427-08** authorizing the Executive Director/CEO to execute a **Professional Services Agreement with Pacheco Koch Consulting Engineers, Inc. for professional engineering services for FY21**. A motion was made by Ben King and seconded by Jimmy Howell. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
17. Considered and took action upon **Resolution #20210427-09** authorizing the Executive Director/CEO to execute a **Professional Services Agreement with Lockwood, Andrews & Newnam, Inc. for professional engineering services for FY21**. A motion was made by Ben King and seconded by Jimmy Howell. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
18. Considered and took action upon **Resolution #20210427-10** authorizing the Executive Director/CEO to execute a **Professional Services Agreement with Halff Associates, Inc. for professional engineering services for FY21**. A motion was made by Ben King and seconded by Jimmy Howell. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.
19. Staff Reports:
  - a. Scott Norton provided the Executive Director/CEO Report. Specifically noting Change Order #9, the newest change order for the Spec Building. This change order is to relocate the water connection for the building as it was determined the original location was not a good location. This change order added \$7,599 to the project and was approved by the Executive Committee. The Owners Allowance balance is now \$200,460.00.
  - b. Eric Voyles provided the Executive Vice President/CEDO Report.
  - c. Jeff Whitten provided the Executive Vice President/COO Report.
  - d. John Sesler provided the Vice President of Logistics Report.
  - e. John Moran provided the Vice President of Finance Report.
20. There was no Executive Sessions; therefore, the meeting remained in Open Session.

With no other business to discuss, a motion was made by Ben King and seconded by Jimmy Howell to adjourn the meeting at 1:07 p.m. Jim Roberts called for votes by roll call by each director in attendance. Each director voted yes. The motion carried unanimously by voice vote.

**The above and foregoing minutes of the TexAmericas Center Board of Directors meeting, April 27, 2021 were read and approved on May 25, 2021.**

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**Denis Washington, Secretary**

**TexAmericas Center**  
**Check Register**  
**April 23, 2021 - May 19, 2021**

Type	Date	Num	Name	Memo	Deposits	Payments
Check	04/27/2021	EFT	Regions	Credit Card		941.37
Check	04/28/2021	EFT	Regions	Credit Card		292.72
Check	04/28/2021	EFT	Wright Express	Fuel		550.71
Check	04/28/2021	EFT	Regions	Credit Card		767.80
Bill Pmt -Check	04/28/2021	18589	American United Life Insurance Company	Insurance		1,134.29
Bill Pmt -Check	04/28/2021	18590	Bowie County	Insurance		13,105.76
Bill Pmt -Check	04/28/2021	18591	Cintas Corp #197	Uniforms		35.00
Bill Pmt -Check	04/28/2021	18592	Colonial Life	Insurance		326.78
Bill Pmt -Check	04/28/2021	18593	Cooper Cleaning Service, LLC	Janitorial		1,200.00
Bill Pmt -Check	04/28/2021	18594	Express Employment Professionals	Temp Labor		1,038.80
Bill Pmt -Check	04/28/2021	18595	France Publications, Inc.	Advertising		1,700.00
Bill Pmt -Check	04/28/2021	18596	Hightech Signs	Advertising		156.25
Bill Pmt -Check	04/28/2021	18597	Hooks Tire Service	Vehicle Maintenance		10.00
Bill Pmt -Check	04/28/2021	18598	Jordan Law Firm, L.L.P.	Legal Services		393.75
Bill Pmt -Check	04/28/2021	18599	Julie's Deli	April Board Meeting		624.74
Bill Pmt -Check	04/28/2021	18600	MW Builders	Duke West I Spec Building		450,243.00
Bill Pmt -Check	04/28/2021	18601	OilCo Distributing LLC	Fuel		225.51
Bill Pmt -Check	04/28/2021	18602	Point Trade Services, Inc	Consulting		100.00
Bill Pmt -Check	04/28/2021	18603	Randy's Smokehouse BBQ	Project Braven Luncheon		225.00
Bill Pmt -Check	04/28/2021	18604	Tatum Excavating Company, Inc.	BLDG 125 Improvements		1,723.00
Bill Pmt -Check	04/28/2021	18605	Texarkana Chamber of Commerce	Dues and Memberships		1,000.00
Bill Pmt -Check	04/28/2021	18606	Texarkana Concrete Construction	BLDG 125 Improvements		4,458.00
Bill Pmt -Check	04/28/2021	18607	Texarkana Tractor	Equipment Maintenance		58.82
Bill Pmt -Check	04/28/2021	18608	Vinson & Elkins, LLP	Legal Services		7,098.75
Liability Check	04/29/2021	EFT	Texas Workforce Commission	Payroll Liability		1,855.74
Deposit	04/30/2021			Deposit	3,450.76	
Liability Check	05/05/2021	E-pay	United States Treasury	Payroll Liability		11,776.26
Liability Check	05/06/2021		QuickBooks Payroll Service	Payroll		27,002.35
Bill Pmt -Check	05/06/2021	18609	AEP SWEPCO	Utilities		1,654.20
Bill Pmt -Check	05/06/2021	18610	C & D Mechanical, LLC	Emergency Repairs		125.00
Bill Pmt -Check	05/06/2021	18611	Chartwell Agency	Marketing		5,750.00
Bill Pmt -Check	05/06/2021	18612	Cintas Corp #197	Uniforms		35.00
Bill Pmt -Check	05/06/2021	18613	Federal Express	Shipping		28.20
Bill Pmt -Check	05/06/2021	18614	France Publications, Inc.	Advertising		155.00
Bill Pmt -Check	05/06/2021	18615	McWilliams & Associates	Consulting		3,333.33
Bill Pmt -Check	05/06/2021	18616	Mountain Valley of Texarkana, Inc	Supplies		105.00
Bill Pmt -Check	05/06/2021	18617	OilCo Distributing LLC	Fuel		239.90
Bill Pmt -Check	05/06/2021	18618	Riverbend Water Resources District	Utilities		120.00
Bill Pmt -Check	05/06/2021	18619	Tex-21	Dues and Memberships		5,000.00
Bill Pmt -Check	05/06/2021	18620	Thomas & Thomas PLLC	Auditing		8,000.00
Bill Pmt -Check	05/06/2021	18621	Waste Management	Waste Management		869.56
Bill Pmt -Check	05/06/2021	18622	Datacast, Inc.	Computer		1,602.87
Bill Pmt -Check	05/07/2021	18623	AEP SWEPCO	Utilities		24.78
Deposit	05/07/2021			Deposit	2,456.25	
Deposit	05/10/2021			Deposit	14,360.15	
Bill Pmt -Check	05/11/2021	18624	Airgas USA, LLC	Supplies		40.60
Bill Pmt -Check	05/11/2021	18625	Ameritas	Insurance		641.28
Bill Pmt -Check	05/11/2021	18626	Chartwell Agency	Marketing		4,000.00
Bill Pmt -Check	05/11/2021	18627	Conterra Networks	Telephone & Internet		1,501.72
Bill Pmt -Check	05/11/2021	18628	Madison Services, Inc.	Mowing		5,333.64

**TexAmericas Center**  
**Check Register**  
**April 23, 2021 - May 19, 2021**

Bill Pmt -Check	05/11/2021	18629	MW Builders	Duke West I Spec Building	<b>489,346.90</b>
Bill Pmt -Check	05/11/2021	18630	Verizon	Telephone	<b>466.75</b>
Bill Pmt -Check	05/11/2021	18632	Xerox Corp	Copier	<b>490.84</b>
Bill Pmt -Check	05/11/2021	18633	Whitten, Jeff	Tuition Reimbursement	<b>2,492.90</b>
Liability Check	05/11/2021	EFT	InWest Retirement Solutions	Retirement	<b>5,964.49</b>
Check	05/18/2021	EFT	Regions	Credit Card	<b>1,155.06</b>
Bill Pmt -Check	05/19/2021	18634	Boston Hardware & Lumber	Supplies	<b>63.37</b>
Bill Pmt -Check	05/19/2021	18635	Bowie County	Insurance	<b>13,105.76</b>
Bill Pmt -Check	05/19/2021	18636	Bumper to Bumper	Equipment Maintenance	<b>91.07</b>
Bill Pmt -Check	05/19/2021	18637	Business Communications Systems, Inc.	Telephone	<b>79.00</b>
Bill Pmt -Check	05/19/2021	18638	Cintas Corp #197	Uniforms	<b>85.20</b>
Bill Pmt -Check	05/19/2021	18639	CoStar Realty Information, Inc.	Marketing	<b>502.20</b>
Bill Pmt -Check	05/19/2021	18640	Defense Finance and Accounting Services	Utilities	<b>174.95</b>
Bill Pmt -Check	05/19/2021	18641	Federal Express	Shipping	<b>15.00</b>
Bill Pmt -Check	05/19/2021	18642	France Publications, Inc.	Advertising	<b>2,150.00</b>
Bill Pmt -Check	05/19/2021	18643	Guaranty Bank & Trust	Interest Payment	<b>10,448.47</b>
Bill Pmt -Check	05/19/2021	18644	Julie's Deli	Executive Committee Meeting	<b>332.70</b>
Bill Pmt -Check	05/19/2021	18645	MTG Engineers & Surveyors	Consulting	<b>7,423.05</b>
Bill Pmt -Check	05/19/2021	18646	OilCo Distributing LLC	Fuel	<b>249.90</b>
Bill Pmt -Check	05/19/2021	18647	Pop A Lock	Re-key BLDG 125 Austin	<b>505.00</b>
Bill Pmt -Check	05/19/2021	18648	R.B.T. Construction	Roof Repairs Area D Warehouses	<b>1,105.00</b>
Bill Pmt -Check	05/19/2021	18649	Sesler, John	Per Diem	<b>137.50</b>
Bill Pmt -Check	05/19/2021	18650	Texarkana Gazette	Advertising	<b>26.40</b>
Bill Pmt -Check	05/19/2021	18651	TMR Generators	Generator Maintenance	<b>330.00</b>
Bill Pmt -Check	05/19/2021	18652	Valley View Consulting, LLC	Consulting	<b>1,250.00</b>



**July 2021 – July 2022**  
**Board Calendar**

**July 2021**

5 - TAC Offices Closed for 4<sup>th</sup> of July  
27- Regular Board Meeting 12:00 P.M.

**August**

3 - Infrastructure/Real Estate Meeting 12:00 P.M.  
4 - Environmental Meeting 12:30 P.M.  
11 - Executive Meeting 12:30 P.M.  
24 - Regular Board Meeting 12:00 P.M.

- FY21 Budget Amendments
- FY22 Budget Workshop

**September**

6 - TAC Offices Closed for Labor Day  
8 - Executive Committee Meeting 12:30 P.M.  
23 - Investment/Finance Conf. Call 9:00 A.M.

- Review Budgets
- Review Investment Policy
- Review 3<sup>rd</sup> Quarter Financials

28 - Regular Board Meeting 12:00 P.M.

- Approve FY21 Budget Amendments
- Approve FY22 Budget
- Approve 3<sup>rd</sup> Quarter Financials
- Personnel Review
- Renewal of Contracts/PSA's
- Investment Policy Review

**October**

11 - TAC Offices Closed for Columbus Day  
26 - Regular Board Meeting 12:00 P.M.

**November**

2 -Infrastructure/Real Estate Meeting 12:00 P.M.  
3 - Environmental Meeting 12:30 P.M.  
10 - Executive Meeting 12:30 P.M.  
11 -TAC Offices Closed for Veteran's Day  
18 - Investment/Finance Conf. Call 9:00 A.M.

- Review 4<sup>th</sup> Quarter Financials

25 – 26 TAC Offices Closed for Thanksgiving  
30 - Regular Board Meeting 12:00 P.M.

- Approve FY 2021 Year End Financials

**December**

4 - TAC Annual Dinner Party  
14 - Regular Board Meeting 12:00 P.M.(if needed)  
23-24 - TAC Offices Closed for Christmas  
31 - TAC Offices Closed for New Year's Day

**January 2022**

17 - TAC Offices Closed for MLK Day  
25 - Regular Board Meeting 12:00 P.M.

**February**

1 - Infrastructure/Real Estate Meeting 12:00 P.M.  
2 - Environmental Meeting 12:30 P.M.  
9 - Executive Meeting 12:30 P.M.  
17 - Investment/Finance Conf. Call 9:00 A.M.

- Review 1<sup>st</sup> Quarter Financials

21 - TAC Office Closed For Presidents Day  
22 - Regular Board Meeting 12:00 P.M.

- Approve 1<sup>st</sup> Quarter Financials

**March**

17 – Investment/Finance Conf. Call 9:00 A.M.  
22 - Regular Board Meeting 12:00 P.M.

**April**

6 - Environmental Meeting 12:30 P.M.  
15-TAC Offices Closed for Good Friday  
21 - Investment/Finance Conf. Call 9:00 A.M.

- Review FY20 Audit

26 - Regular Board Meeting 12:00 P.M.

**May**

3 - Infrastructure/Real Estate Meeting 12:00 P.M.  
11 - Executive Meeting 12:30 P.M.  
19 - Investment/Finance Conf. Call 9:00 A.M.

- Review 2<sup>nd</sup> Quarter Financials

24 - Regular Board Meeting 12:00 P.M.

- Approve 2<sup>nd</sup> Quarter Financials

30 – TAC Offices Closed for Memorial Day

**June**

28 - Regular Board Meeting 12:00 P.M.

- Swearing in of New Directors
- Election of Officers
- Committee Assignments

**July**

4 - TAC Offices Closed for 4<sup>th</sup> of July  
26 - Regular Board Meeting 12:00 P.M.



**RESOLUTION NO. 20210525-01**

**A RESOLUTION APPROVING A QUALIFIED SITES PROGRAM FOR BRAZOS SITE UPON  
TEXAMERICAS CENTER EAST CAMPUS**

**WHEREAS**, TexAmericas Center is a political subdivision of the State of Texas with the powers and authorities specified in Chapter 3503 of the Special District Local Laws Code of the State of Texas; and

**WHEREAS**, on August 25, 2020 the Board of Directors approved a Qualified Sites Program by Resolution 20200825-02 for the purpose of recognizing the commercial and industrial sites with characteristics and infrastructure in place that make the sites Shovel-Ready for development; and

**WHEREAS**, the goal of the Qualified Sites Program is to help developers, real estate professionals, both public and private utility companies and state partners understand and utilize the criteria outlined in this program, to recognize TAC as a nationally recognized industrial park with an inventory of attractive, pre-qualified, speculative sites ready for immediate development by end-users and for these groups to refer prospects to TAC for their business endeavors to take advantage of the location attributes; and

**WHEREAS**, staff has completed the Qualified Sites Program analysis of the Brazos Site, the site meets the program criteria and the data in this report is current as of today and will be updated as information changes, such as increased utility capacity, roadway changes, changes in community information, etc.; and

**WHEREAS**, this will serve as a template for future TAC Qualified Sites.

**NOW, THEREFORE, BE IT RESOLVED** by the Board of Directors of TexAmericas Center the attached hereto as Exhibit "A" is approved and shall be implemented as of this date.

**PASSED and APPROVED this 25<sup>th</sup> day of May, 2021.**

---

**Jim Roberts, Chairman of the Board**

**ATTEST:**

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**Denis Washington, Secretary**

Attached: Exhibit "A" – Qualified Sites Program BRAZOS SITE



**TexAmericas**  
**CENTER**<sup>®</sup>  
**Texarkana USA**

**Build | Lease | Manage | Sell | Incentives | Logistics**

**QUALIFIED SITES PROGRAM**  
**BRAZOS SITE**

TexAmericas Center – Texarkana MSA – Hooks, Texas

**Qualified Site:**

A Certified Site is a commercial or industrial site where the majority of the information (infrastructure, encumbrances, attributes, availabilities, etc.) needed for a development to go to construction has been obtained, organized, prepared and endorsed by an objective third-party assuring a higher level of accuracy of site conditions therefore reducing the unknowns and increasing the speed to development.

A **Qualified Site**, endorsed by TexAmericas Center, is a commercial or industrial tract of land that has undergone the same level of scrutiny as a site certified by an objective third party but has been prepared in-house by a qualified professional.

**Jeff Whitten, P.E.**

Jeff.Whitten@TexAmericasCenter.com  
903.223.9841 - O 903.278.1821 - M

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# 1 ABOUT TEXAMERICAS CENTER

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TexAmericas Center is one of the largest mixed-use industrial parks in the Americas and has recently been recognized as the 8<sup>th</sup> ranked industrial park in the nation by *Business Facilities*. TexAmericas Center is a State of Texas-sanctioned Local Redevelopment Authority. This unique organizational structure allows to act like a hybrid of an economic development organization and an industrial real estate development & management company. These characteristics allow it to offer tenants custom real estate solutions and unparalleled speed-to-market.

With the operating capabilities of a municipality and control of its own land use (zoning) regulations and permitting, TexAmericas Center eliminates much of the red tape inherent in traditional real estate processes. Depending on the size and complexity of a development, the plan review and approval may be completed in less than five (5) business days giving businesses a shorter timeline to become operational than may exist in other complexes or municipalities. In addition to permitting expediency and custom real estate solutions, TexAmericas Center offers unique value-added services including: third party logistics, transload activities, on-site rail service, incentive management and build-to-suit and/or build-out-to-suit services.

## 1.1 MISSION

TexAmericas Center's mission is to bring quality jobs to the greater Texarkana area and diversify the tax base through property redevelopment. The TexAmericas Center Board of Directors has mandated that staff **create 12,000 jobs on the property**. To fulfill this mission, TexAmericas Center redevelops and manages **12,000 acres and 3.5 million square feet** of former military property in centrally located Northeast Texas. TexAmericas Center is currently home to **33 manufacturing and commercial businesses**. TexAmericas Center and its Partners in Development have invested over **\$40 million** in on-site infrastructure upgrades & environmental remediation and are committed to continue investing in our tenants, future tenants, and community.

## 1.2 LAND USE

TexAmericas Center is located outside of any city municipal boundaries and therefore controls its own land use (zoning) regulations and has designated its property for **light and heavy industrial uses**. All land and buildings are governed by TexAmericas Center planning, permitting, and approval processes, which are administered by an on-staff Professional Engineer. Guidelines covering development of the property, including but not limited to, Drainage Guidelines, Land Use Guidelines and Covenants, Codes & Restrictions are available from TexAmericas Center, most being easily accessible on our website, [www.TexAmericasCenter.com](http://www.TexAmericasCenter.com) and more specifically at <https://texamericascenter.com/public-information/development-use-guidelines/>.

### 1.3 CONTACT INFORMATION

Additional information about TexAmericas Center and the contents of this report may be obtained through the following:

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### 1.4 QUALIFIED SITES PROGRAM PURPOSE

The purpose of the TexAmericas Center (TAC) **Qualified Sites Program (QSP)** is to recognize the commercial and industrial sites with known development characteristics and available infrastructure in place that allow for the designation of the property as a **Qualified Site** meaning that the site is **Shovel-Ready** for vertical development.

When a site is designated as a **Qualified Site**, it has undergone a rigorous level of scrutiny to confirm that the site is **adjacent to utilities** typically needed for commercial and/or industrial operations, that site characteristics are **conducive to business activities**, that any **encumbrances** that might impact the property are known and that **key approvals**, documentation, regulations and assessments required for commercial or industrial uses are known and in place.

By having shovel-ready sites available, TAC will be able to better accommodate the needs and desires of prospective businesses. Companies that have immediate space and/or time requirements will have access to a greater amount of information potentially decreasing the chances of risks or constraints that could delay or derail a project.

In addition to designating sites as a Qualified Site, the qualification process will also help TAC identify gaps in information and attributes of its property and develop gap closure recommendations that will increase the inventory of **Qualified Sites**. The QSP

will also help elevate recognition of existing sites that may not be perceived as meeting the needs of business prospects that approach TAC for appropriate locations.

The goal of the QSP is to help developers, real estate professionals, both public and private utility companies and state partners understand and utilize the criteria outlined in this program, to recognize TAC as a nationally recognized industrial park with an inventory of attractive, pre-qualified, speculative sites ready for immediate development by end-users and for these groups to refer prospects to TAC for their business endeavors to take advantage of the location attributes.

Positioning a business prospect on a Qualified Site offers the company the ability to perform at a high standard. The coordination of these efforts may result in the ability of portions of TAC to be branded for a specific application or **Targeted Industry**. Project objectives include:

- Winning more projects;
- Filling identified market gaps;
- Establishing an expectation of high standards for development;
- Creating a high-quality product, a Qualified Site, that does not currently exist in the market;
- Creating an inventory of qualified speculative sites ready for immediate development prior to a prospect's inquiry

It is important to recognize that a principal goal of the program is to identify market gaps in TAC's portfolio of sites. Identifying the deficiencies in information or the availability of infrastructure will help TAC focus its efforts and attention on gaining this insight and prioritizing the extension of infrastructure to underserved properties. In addition, the recognition of sites that have been previously not perceived as having qualifying attributes will be recognized as a Qualified Site and marketed as such.

Creating an inventory of Qualified, Shovel-Ready Sites, defined as being ready for vertical development before a prospect conducts a site visit will help TAC convert more leads to announcements thus creating jobs, causing more investment and creating more quality commercial and industrial jobs in the region.

TAC reserves the right to amend or terminate the requirements of the QSP at any time.

## 2 THE BRAZOS SITE

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### 2.1 PROPERTY ATTRIBUTES

The property that makes up the TexAmericas Center East campus transferred from the United States of America to Red River Redevelopment Authority (later renamed TexAmericas Center) by Deed Without Warranty on September 1, 2010, and recorded

in Volume 5898, Page 1 of the Real Property Records of Bowie County, Texas. A copy of this document is available from TexAmericas Center, most being easily accessible on our website, [www.TexAmericasCenter.com](http://www.TexAmericasCenter.com).

The 250-acre Brazos Site is a greenfield development site situated on the TexAmericas Center East Campus (TAC East). The site is at the southeast corner of the intersection of Cass Street and Oak Street and is positioned to be the prominent development site near the entry into TAC East. This property is a wooded buffer area separating a former industrial tract from adjacent roadways and other land uses. Vicinity Maps (Figures A-1 to A-5) of TexAmericas Center as well as a Boundary Survey (Figure A-6) of the Brazos Site may be found in Appendix A.

## 2.2 PROPERTY TERRAIN

The Brazos Site slopes from the southwest to the northeast at approximately 1%. A Topographical Exhibit (Figure A-7) of the property can be found in Appendix A.

The site is wooded with a mixture of a variety of species of Pine trees and Oak trees. The site is accessible by vehicle to its boundary on the north and west property lines and by all-terrain vehicle/4WD from its eastern boundary. Additional information regarding the adjacent roads may be found in Section 5.1.1 of this document.

## 2.3 FLOOD PLAIN

Based on the National Flood Insurance Program Flood Insurance Rate Map for Bowie County Community Panel No. 48037C0310D with an effective date of October 19, 2010, the site is situated in Zone X. This area is defined as '**Areas determined to be outside of the 0.2% annual chance (500-year) floodplain**'. A copy of the firmette (Figure A-8) of the site is included in Appendix A.

## 2.4 GEOLOGICAL INFORMATION

Historical information in the form of a Soil Survey of Bowie County, Texas and on-the-ground investigation of the property are available to give an insight into the soil conditions on the Brazos Site.

### 2.4.1 Soil Survey of Bowie County, Texas

Based on the *Soil Survey of Bowie County, Texas* prepared by the United States Department of Agriculture Soil Conservation Service in cooperation with the Texas Agriculture Experiment Station, the soils located across the property are classified as being a Sawyer Silty Loam (characterized by a layer of silt loam for approximately six-inches (6") and varied colored clay loams below) and Wrightsville-Rodessa complex (a classification where the Wrightsville silt loam and Rodessa loam are so intermingled that they could not be shown separately and characterized by a surface layer of silt loam over a clay loam). Excerpts from the Soil Survey are included in Appendix B.

### 2.4.2 Preliminary Geotechnical Investigation

A *Preliminary Geotechnical Investigation* of the soils for portion of TAC East was prepared by E TTL Engineers & Consultants, Inc. in July 2013. Several bores were performed on the Brazos Site and the results were included in the investigation. A copy of the boring logs that were taken from the Brazos Site and excerpts from the investigation are included in Appendix C.

## 3 GOVERNMENTAL JURISDICTION

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### 3.1 BOWIE COUNTY, TEXAS

TAC resides inside unincorporated Bowie County, Texas which is governed by a five-member commissioners' court. Four commissioners are voted on by the residents of their respective precincts in the county and presided over by a county judge elected by the residents of Bowie County.

### 3.2 TEXAMERICAS CENTER (TAC)

TAC is governed by a fifteen-member Board of Directors comprised of individuals appointed by the mayors of the municipalities throughout Bowie County, Texas. The Board of Directors sets policy and leaves the daily operations to staff. The Board of Directors is the final decision maker on all matters related to TAC business, with exception of taxation as TexAmericas Center does not have the right to levy taxes.

All TAC property is **deed restricted to commercial and industrial activity** which makes it suitable and designated for heavy and light industrial construction and operations. TAC controls its own land use (zoning) and has designated TAC property primarily for **Light and Heavy Industrial** uses. The Brazos Site is located in a **Heavy Industrial District (HI)** based on the Land Use Map adopted by the TexAmericas Center Board of Directors on September 25, 2018. A copy of the Land Use Map (Figure A-9) is included in Appendix A. The Land Use Guidelines will be discussed in sections to follow.

Other than the deed restrictions to the property from the deed and title transfer, there are no additional encumbrances, easements, liens or other rights on the property.

TAC has developed ordinances that affect site development of the property. These ordinances are intended to promote the health, safety, moral and general welfare of TAC. A list of these ordinances include:

- Codes, Covenants & Restrictions (CCR's);
- Drainage Guidelines;
- Land Use & Site Design Guidelines;
- Paving Guidelines;
- Road Signage, Striping & Lighting Guidelines;
- Sign Guidelines.

A copy of these are easily accessible on our website, [www.TexAmericasCenter.com](http://www.TexAmericasCenter.com) and more specifically at <https://texamericascenter.com/public-information/development-use-guidelines/>.

### 3.3 FIRE PROTECTION

Fire Protection for the property will come from the Hooks Volunteer Fire Department. **The ISO rating for the Hooks Volunteer Fire Department, at the Brazos Site, is a 6.** A Mutual Aid, Interlocal Agreement exists between the cities of Hooks & New Boston, Texas and Red River Army Depot (RRAD) to provide emergency response services. **The ISO rating for RRAD's Fire and Emergency Services is a 2.**

### 3.4 POLICE PROTECTION

Police Protection will be provided by the Bowie County Sheriff's Department. Similar Mutual Aid agreements exist within the adjacent cities for these services also.

## 4 ENVIRONMENTAL & CULTURAL IMPACTS

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Located amid the Piney Woods, the Texarkana region offers a rare and wonderful bounty of lakes, green space and forestry where hardwoods grow nearly as quickly as softwoods. The region offers picturesque, relaxing and meaningful settings in which to retreat, relax and recharge. An impressive collection of federal, state and local recreational assets are waiting to be explored within a 90-minute drive.

### 4.1 ENVIRONMENTAL ASSESSMENT

A **Final Phase I and Limited Phase II Environmental Site Assessment** for TexAmericas East Tract (Former Lone Star Army Ammunition Plant) in Texarkana, Texas was prepared by Science Applications International Corporation (SAIC) in May 2013. The findings of the report are that... 'based on the results of the report, a more extensive Phase II Environmental Site Assessment is not recommended at this time'. A copy of the report may be obtained at the office of TexAmericas Center.

### 4.2 WETLANDS

A wetland delineation for a portion of TAC East, including the limits of the Brazos Site, has been prepared. The findings of the investigation and the Jurisdictional Determination provided by the United States of America Corps of Engineers (USACOE) indicates **the Brazos Site is free of Jurisdictional Wetlands.** A copy of the Jurisdictional Determination is found in Appendix D.



### 4.3 ENDANGERED/THREATENED SPECIES

Texas Parks & Wildlife Department Annotated County Lists of Rare Species, updated March 5, 2021, is included in Appendix E. This is a county-wide list of the species.

In 2000, a planning level survey (PLS) was conducted for vegetative communities and fauna, including an assessment of the potential presence of quality habitat for threatened and endangered species (TES) (Tetra Tech 2002b). The alligator snapping turtle (*Macrolemys temminckii*), a state-listed threatened species, was the only Threatened and Endangered Species (TES) observed at the installations during the Planning Level Survey (PLS). There were no federal-listed threatened or endangered species on the property.

### 4.4 ARCHAEOLOGICAL/HISTORICAL DESIGNATIONS

Based on the Phase II Archaeological Investigations at Red River Army Depot and Lone Star Army Ammunition Plant, Bowie County, Texas Final Report dated February 2012 prepared for the US Army Corps of Engineers (Mobile District) by Earth Science, Inc., there are no locations on the Brazos site that are determined to be of Archaeological or Historical Significance. A map of locations from the report showing these Brazos Site and the locations of areas of Historical Significance is included in Appendix F.

### 4.5 AIR ATTAINMENT STATUS

Based on information provided by the Texas Commission on Environmental Quality and the United States Environmental Protection Agency, Bowie County, Texas appears within acceptable air quality levels according to the National Ambient Air Quality Standards.

## 5 TRANSPORTATION ASSETS

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TAC is positioned to give you access to the greatest domestic market share while still operating in the top-ranked State of Texas. This is because TAC is situated in the Texarkana MSA, **one of the lowest aggregate mile locations in Texas to the geographic and population centers of the US**. This gives tenants at TAC a **500-mile reach of 53.8 million consumers**, which is **10 million more than the Dallas 500-mile reach**. This access comes at a fraction of the transportation costs due to our strategic, central location and robust infrastructure.

### 5.1 ROAD INFRASTRUCTURE

TAC has excellent interstate access with plans for additional improvements to ease speed of delivery for businesses. **Interstate Highway 30 (I-30)** is the closest interstate to the Brazos Site at a distance of **less than 1 mile**. I-30 has **six interchanges** and multiple entry points to TAC on the 15-mile stretch that runs parallel to and less than 1-mile from its north property boundary. TexAmericas Center is **two hours east of Dallas** and **two**

**hours southwest of Little Rock.** Construction is currently underway in Texarkana to widen I-30 to six lanes.

### 5.1.1 Key Connections

Key connections of TAC road transportation system:

- **Interstate Highway 30** connects to I-20, I-35 & I-45 and more U.S. & State Highways to the west to the DFW Metroplex, and east to Little Rock, connecting with I-40 to Oklahoma City, Memphis, Nashville and the eastern seaboard of the United States.
- **Interstate Highway 69/369** (I-69/I-369) connects Canada and the Northeast United States to Houston and the Texas/Mexico border with multiple connections to additional interstate, U.S. & State Highways along the route. I-69 is currently under construction in various stages along its route.
- **U.S. Highway 59** (HWY 59) connects Texarkana to Houston and all Texas ports along the Gulf of Mexico with connections to I-20, Interstate Highway 10 (I-10) and numerous U.S. & State Highways along the route. The existing roadbed of HWY 59 is the proposed route for I-69/I-369 corridor.
- **Interstate Highway 49** (I-49) connects Texarkana to New Orleans with connections to I-10 and I-20 along this route to the south, and Fort Smith and Kansas City to the north with connections to I-40 & I-44 with multiple connections to additional U.S. & State Highways along the entire route. Plans are in progress to complete the construction of the portion of I-49 between Texarkana and Fort Smith.
- **U.S. Highway 71** (HWY 71) connects Texarkana to Fort Smith, Arkansas and I-40.
- **U.S. Highway 67** (HWY 67) connects Dallas to St. Louis through Texarkana with multiple connections to additional interstate, U.S. & State Highways along the route.
- **U.S. Highway 82** (HWY 82) runs immediately adjacent to the north property line of all TexAmericas Center property and connects North and West Texas, to the Atlantic Ocean, and to Los Angeles via I-10 with multiple connections to additional interstate, U.S. & State Highways along the route.

### 5.1.2 Brazos Site Road Adjacency

The Brazos Site is situated at the southeast corner of the intersection of Cass Street and Oak Street on the TAC East campus.

- Cass Street is the main entry into TAC East in downtown Hooks, Texas. Leaving the TAC East campus heading north and crossing HWY 82, Cass Street becomes F.M. 560 through Hooks, Texas. Continuing north on F.M. 560 for approximately half a mile, F.M. 560 intersects I-30. This intersection is a primary exit from I-30 providing access to TAC East. Cass Street is a primary north/south corridor through TAC East and is immediately adjacent to the west boundary of the Brazos Site. Cass Street is currently a two-lane road with a 150' wide right-of-way. Future improvements to Cass Street will add capacity by increasing the pavement width making this a four-lane thoroughfare.

- Oak Street is a primary east/west corridor through TAC East. Oak Street intersects Cass Street approximately a third of a mile south of HWY 82 and is immediately adjacent to the north boundary of the Brazos Site. Oak Street is currently a two-lane road with a 150' wide right-of-way. Future improvements to Oak Street will add capacity by increasing the pavement width making this a four-lane thoroughfare.

Both Oak Street and Cass Street are Private Roads, owned and maintained by TexAmericas Center. Both roads have asphalt surfaces and are designated truck routes through TAC East with an 80,000-pound capacity.

- Collin Street is a secondary north/south corridor connecting Oak Street to Cypress Street (a primary east/west corridor through the TAC East campus approximately 3/4-mile south of the Brazos Site) and runs within the limits of the Brazos Site near its eastern boundary. Collin Street has a 75' wide right-of-way and is currently unimproved. Collin Street can be abandoned in the event that a prospect elects to utilize the full limits of the Brazos Site for development. Future improvements to Collin Street, if needed, will be to re-surface or re-build the two-lane road meeting current paving criteria.

Exhibits located in Appendix A show the roads adjacent to TexAmericas Center and to the Brazos Site.

## 5.2 RAIL AND INTERMODAL INFRASTRUCTURE

### 5.2.1 Area Rail Operators

Texarkana is a major east/west and north/south rail center, with over 125 trains passing through the community per day. The Union Pacific (UP – a Class I Operator), Kansas City Southern (KCS – a Class I Operator), Texas Northeastern (TNER – a Short Line Operator), and Lone Star Rail Car Service (LSRCS – a privately owned Operator on the TAC East Campus) serve TexAmericas Center and the Texarkana market.

### 5.2.2 Area Intermodal Facilities

The Texarkana/TexAmericas Center market is well-served by inland ports or intermodal facilities. The nearest intermodal operations can be found in:

- **Dallas/Fort Worth, TX** (BNSF, KCS-NS, and UP)
- **Houston, TX** (BNSF and UP)
- **Kansas City, MO-KS** (BNSF, CP, NS, and UP)
- **Memphis, AR-TN** (BNSF, CN, CSX, NS and UP)
- **New Orleans, LA** (CN, NS and UP)
- **St. Louis MO-IL** (BNSF, CN, CSX, NS and UP)
- **San Antonio, TX** (UP)
- **Shreveport/Minden, LA** (KCS-NS)

### 5.2.3 Brazos Site Rail Adjacency

The TNER collects cars in the UP & KCS yards in Texarkana and delivers to TAC via a UP owned line running immediately south of HWY 82 and along the north boundary line of TAC East. The TNER delivers these cars to the siding located at the northwest corner of TAC East. At this point, LSRCs connects and spots the cars in a 350-car classification yard along the west boundary of TAC East or maneuvers the cars to locations on TAC East at other storage locations or for spotting as needed for tenant activities.

### 5.2.4 TAC Rail System

TAC owns approximately 36-miles of rail on TAC East. A siding currently runs along the west boundary of the Brazos Site. Additional switches can be added along this line, if needed, for rail served activities within the Brazos Site.

The rail on the TAC East campus is predominantly 85# rail. Several crossings adjacent to the Brazos Site have been upgraded recently and the rail at these locations has been upgraded to 115# rail. TAC has received grant funds and is currently working on improvements to several existing crossings and turnouts with the intentions of upgrading the rail through these facilities to 115# rail and performing other maintenance upgrades to better accommodate 286,000# loads.

### 5.2.5 TAC Transload Facility

A designated transload location is currently operating at TAC East and is located on the acreage immediately north of the Brazos Site on Oak Street. A twelve-car spot is designated and an operator contracts with businesses independently for loading and unloading activities. A variety of commodities can be handled in this facility. TAC will provide contact information for operator if requested.

## 5.3 AIR INFRASTRUCTURE

TexAmericas Center is a 25-minute drive from **Texarkana Regional Airport (TXK)**, with three daily round trip flights to **Dallas/Fort Worth International Airport (DFW)**. DFW is America Airlines' largest hub and is the third busiest airport in the world, with **over 900 flights daily** from over 23 airlines with service to **218 non-stop destinations**, both international and domestic. DFW is a 30-minute flight from Texarkana.

Other airports within an approximate two-hour drive from TAC East include:

- **Shreveport Regional Airport (SHV)** – approximately 75 minutes, 5 non-stop, direct flights
  - Commercial air operations are provided by Allegiant, American, Delta, GLO, and United.
  - Major Destinations include: Dallas/Fort Worth, Las Vegas, Atlanta, Chicago, Denver, Charlotte, and Houston
- **Little Rock Municipal Airport (Clinton National Airport)(LIT)** – approximately 2 hours, 13 non-stop, direct flights
  - Commercial air operations are provided by Allegiant, American, Delta, Southwest, GLO, and United.

- Major Destinations include: Las Vegas, New Orleans, Phoenix, Dallas, Houston, Atlanta, Orlando, Charlotte, Detroit, St. Louis, Denver, and Chicago.
- **Dallas Love Field (DAL)** – approximately 2 hours, 58 non-stop, direct flights
  - Southwest HQ hub
  - Major Destinations include: Chicago, Washington DC, Los Angeles, New York, Atlanta, and Las Vegas

## 5.4 WATERWAYS AND PORT FACILITIES

TexAmericas Center is **within a five-hour drive of 10 of the 20 busiest ports in the USA**. The **Port of Caddo-Bossier** is approximately 100 miles away in Northwest Louisiana, the closest port to Texarkana and commercially navigable via the Red River. The Red River connects to the Mississippi River, the coastal waterway system, and the central US waterway system. The **Port of Little Rock** is approximately 160 miles northeast of TexAmericas Center on the Arkansas River, while the **Port of Houston** lies 295 miles south on the Gulf of Mexico.

# 6 UTILITIES

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TexAmericas Center is well-served by industrial-grade utilities with excess capacity situated immediately adjacent to the Brazos Site. Below is a brief summary of all utilities. More information can be provided upon request.

## 6.1 WATER SOURCE INFORMATION

TexAmericas Center's water provider is **Riverbend Water Resource District (RWRD)**, which currently contracts with **Texarkana Water Utilities (TWU)** for provision of water to TexAmericas Center property. The water sources are two large reservoirs, Millwood Lake in Arkansas, and Lake Wright Patman in Texas.

TWU's current water plant has a design **capacity of 36 MGD**. The average daily use is 16 MGD, leaving an **excess capacity of 20 MGD**. A **30" transmission line** connects Texarkana to New Boston, Texas. This line can deliver over **4 MGD** to Riverbend's water system on TexAmericas Center's property. RWRD pumps currently pull **1.7 MGD** of water from the line, leaving **2.3 MGD of excess capacity** in the transmission line.

### 6.1.1 Water (potable) Main Adjacency

A 16-inch main is situated on the south side of Oak Street immediately adjacent to the north boundary line of the Brazos Site.

A Water Availability Map (Figure G-1) is located in Appendix G.

### **6.1.2 Water (non-potable) Main Adjacency**

Riverbend Water Resources District will also be the provider of non-potable water on TAC East after the completion of the new regional water treatment plant.

### **6.1.3 Water System Expansion**

RWRD recently announced a **\$200 million investment** in a new, **30 MGD regional water system** that will be located on TexAmericas Center property. This state-of-the-art water system will eliminate reliance on TWU, while allowing businesses locating to TexAmericas Center to expand without concerns surrounding water treatment needs and availability. **Raw water** will also be available on both the Central and East campuses. Long term growth planning calls for full plant expansion up to **90 MGD**.

### **6.1.4 Contact Information**

Riverbend Water Resources District (RWRD)  
Kyle Dooley, P.E.  
Executive Director/Chief Executive Officer  
228 Texas Avenue, Suite A  
New Boston, Texas 75570  
903.831.0091  
[riverbend@rwrdd.org](mailto:riverbend@rwrdd.org)  
[www.rwrdd.org](http://www.rwrdd.org)

## **6.2 SANITARY SEWER**

Riverbend Water Resources District is also the provider of sanitary sewer collection and treatment on TAC East.

### **6.2.1 Sanitary Sewer Main Adjacency**

An 18-inch, SDR 26, sanitary sewer is situated along the north side of Oak Street immediately adjacent to the Brazos site. The main slopes from the west to the east along the north property line with the manhole near the northwest corner of the site having a flowline of approximately 369 and the manhole near the northeast corner of the Brazos Site having a flowline of approximately 363.

A Sanitary Sewer Availability Map (Figure G-2) is located in Appendix G.

### **6.2.2 Treatment Facility**

The wastewater plant servicing the TAC footprint has an average daily discharge limitation of 1.5 MGD with a daily maximum discharge limitation of 3.0 MGD. Based on the TCEQ permit for the facility, utilizing the daily maximum discharge limitations (3.0 MGD), the daily maximum biological oxygen demand is 250 lbs/day and the daily maximum total suspended solids is 500 lbs/day. The pH has an operating requirement range from greater than 6.0 to less than 9.0 with minimum monitoring requirements of one sample per day.

RWRD is in negotiations with RRAD to establish a public pretreatment facility for non-food industrial uses which will be at a yet determined site located on TAC East.

### 6.2.3 Treatment Facility Expandability

The existing wastewater plant serving the TAC footprint is built in a modular fashion with two (2) modules having a 750,000 GPD capacity. The facility is currently constructed with the necessary piping in place to accommodate an additional 750,000 GPD module increasing the treatment capacity to approximately 2.25 MGD.

### 6.2.4 Contact Information

Riverbend Water Resources District (RWRD)  
Kyle Dooley, P.E.  
Executive Director/Chief Executive Officer  
228 Texas Avenue, Suite A  
New Boston, Texas 75570  
903.831.0091  
[riverbend@rwrdd.org](mailto:riverbend@rwrdd.org)  
[www.rwrdd.org](http://www.rwrdd.org)

## 6.3 ELECTRICITY

### 6.3.1 Source Information

TexAmericas Center is served electricity by **AEP/SWEPCO**, one of the lowest cost electricity providers in the USA, with **rates typically 80% of the US average**. Currently **3-Phase, 12kv distribution lines** and **four substations** serve TexAmericas Center property. Each substation is connected to a **69kv transmission line** and has design capacity of **20MW**, with existing excess capacity of approximately **10MW** of power per substation. An additional **138kv line** and **two 345kv lines** are near and adjacent to TexAmericas Center, making dual feeds/connections and upgrading the substations to provide **up to 350MW** possible.

### 6.3.2 Substation Locations

Four substations are on or adjacent to TexAmericas center and provide service to the property. TAC East is served by a substation on Bowie Parkway on its east boundary.

One of the adjacent substations is situated approximately one quarter mile north of TAC East with a distribution line along the north right-of-way line of HWY 82. A connection may be made to this distribution line and extended south into TAC East for the purpose of providing a dual service connection to the property.

Conversations with AEP have led to the ability for the placement of an additional substation in TAC East if needed to support prospects activities. One location under consideration is in the vicinity of the intersection of Cass Street and Oak Street near the northwest corner of the Brazos Site.

### 6.3.3 Electrical Service Adjacency

A 12-kv overhead distribution line is situated on the north side of Oak Street immediately adjacent to the north boundary line of Oak Street.

An Electricity Availability Map (Figure G-3) is located in Appendix G.

### 6.3.4 Contact Information

AEP/SWEPCO (AEP)  
John R. Jones  
Customer Account Manager  
428 Travis  
Shreveport, LA 71101  
903.728.5490  
[jrjones@aep.com](mailto:jrjones@aep.com)  
[www.aep.com](http://www.aep.com)

## 6.4 NATURAL GAS

### 6.4.1 Source Information

**Navitas Utility Corporation** is the gas supplier to TAC East, which contracts through **Enable**. The Enable Interstate transmission pipeline that connects Texas to Arkansas runs adjacent to TexAmericas Center, north of the HWY 82 right-of-way. This Interstate pipeline is a **10-inch, 220 psi** high pressure natural gas line.

A **6-inch lateral at 220 psi** from the Enable transmission line connects to Navitas' distribution system on TAC East. The existing meter can be upgraded for additional capacity as demand increases. The natural gas line onto TAC East consists of **dual 4-inch gas lines** that deliver **130 MCF per hour** and is expandable to **at least 170 MCF per hour**.

### 6.4.2 Natural Gas Main Adjacency

A pair of 4-inch gas lines is set to be installed in Summer 2021 on the south side of Oak Street immediately adjacent to the north boundary line of the Brazos Tract. These lines will be capable of delivering approximately 130 MCF/hour with the ability to expand to 170 MCF/hour.

A Gas Availability Map (Figure G-4) is located in Appendix G.

### 6.4.3 System Expandability

The Enable Interstate transmission pipeline can be upgraded substantially to at least **10,000 MCF per hour**. An upgrade like this would include a dedicated pipeline, likely a 12-inch high pressure (input 900 psi) steel line. Cost for this upgrade is \$300,000 per mile (2020 estimate), plus \$1,000,000 for interstate pipeline system improvements, and \$1,000,000 of contingency. This cost includes:

- Development
- Engineering
- Securing ROW
- Procurement
- Installation



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- Commission
  - Restoration
  - Clean up

#### **6.4.4 Contact Information**

Navitas Utility Corporation  
Thomas Hartline  
Executive Director/Chief Executive Officer  
3186 D Airway Avenue  
Costa Mesa, CA 92626  
714.424.4094  
[thartline@navitasutility.com](mailto:thartline@navitasutility.com)  
[www.navitasutility.com](http://www.navitasutility.com)

### **6.5 HIGH SPEED FIBER**

#### **6.5.1 Source Information**

**Conterra Networks (Conterra)** provides data center-quality internet service to TexAmericas Center and has extended a **144-strand fiber line** onto or adjacent to all TexAmericas Center campuses. Conterra offers high bandwidth at competitive rates with **100+ gigabyte upload and download speeds** available.

#### **6.5.2 High Speed Fiber Adjacency**

Conterra installed a 144-strand fiber line on the north side of Oak Street immediately adjacent to the north boundary line of the Brazos Tract.

A Fiber Availability Map (Figure G-5) is located in Appendix G.

#### **6.5.3 Contact Information**

Conterra Networks  
Stephanie Green  
Area Sales Manager  
903.908.3052  
[sgreen@conterra.com](mailto:sgreen@conterra.com)  
[www.Conterra.com](http://www.Conterra.com)

#### **6.5.4 Fiber Assessment Study – TAC Property**

**CBRE – Network Advisory Services** recently performed a Level 2 IT Assessment on TexAmericas Center property. On a scale of 1-5, with 5 being very feasible and 1 being infeasible, **TexAmericas Center ranked a 4** to support hyperscale, corporate, and similar data center applications. The next phase of the study will provide recommendations for upgrades to a 5 rating. The results of both of these assessments can be made available if requested/as completed.

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## 7 INCENTIVES

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Governments consider using public funds on a case-by-case basis to help incentivize proposed private economic development projects to strengthen a community's economic viability. Incentives can take a variety of forms such as tax breaks, construction of supporting infrastructure, workforce development programming and other forms of assistance. Jurisdictions may use these incentives to pursue economic goals such as tax base diversification, job creation, or business retention and expansion.

Incentive and business assistance offerings are typically based on the expected, realistic capital investment and job creation projections. A sample of available incentives are below; all can be used as an inducement to secure investment in our region's economy.

### 7.1 Special Zones

Locating to one of TAC's three campuses offers several incentive options on the federal, state and local levels. All incentives are competitive and based on established criteria. Available incentives include property purchase price abatement, property tax abatement, favorable lease/purchase arrangements, employee recruitment & training assistance, infrastructure grants and favorable financing. Area partners have a successful history of obtaining financial assistance for qualified projects from both state and federal sources; however, delivery of proposed grants is not guaranteed. Independent applications must be filed, and an established review and award process is followed. Seven of TAC's distinct incentives include:

#### 7.1.1 Defense Economic Readjustment Zone

As TAC is comprised solely of land formerly operated as a military installation, companies which locate to the TAC footprint become eligible for the Defense Economic Readjustment Zone Program. This program is a tool for business recruitment and job creation in adversely impacted military communities, such as TexAmericas Center. It is designed to aid Texas communities, businesses, and workers impacted by the closure or realignment of military installations and provides local and state regulatory and tax incentives to encourage businesses to locate or expand in these areas.

#### 7.1.2 U.S. Foreign Trade Zone #258

TexAmericas Center manages Foreign Trade Zone #258, a geographic area where goods may be landed, stored, handled, manufactured or reconfigured then re-exported under specific customs regulations, generally not subject to customs duties. Areas designated as Foreign Trade Zones (FTZ) are generally organized around major transportation hubs and areas with many advantages for trade. An FTZ is a defined, physical area within the United States that, for customs entry purposes is treated as if it is outside U.S. borders. Companies may use FTZs for both storage/distribution activities or, after specific authorization by the U.S. FTZ Board, for production.

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TAC will engage our consultant, Point Trade Services Inc., to estimate cost savings of operating in FTZ #258 upon request.

Foreign Trade Zones give companies multiple benefits that ultimately streamline operations and impact the bottom line. Some of these benefits include:

- CBP duty and federal excise tax, if applicable, are paid when the merchandise is transferred from the zone for consumption.
- While in the zone, merchandise is not subject to U.S. duty or excise tax. Certain tangible personal property is generally exempt from state and local ad valorem taxes.
- Goods may be exported from the zone free of duty and excise tax.
- CBP security requirements provide protection against theft.
- Merchandise may remain in a zone indefinitely, whether or not subject to duty.
- The rate of duty and tax on the merchandise admitted to a zone may change as a result of operations conducted within the zone. Therefore, the zone user who plans to enter the merchandise for consumption to CBP territory may normally elect to pay either the duty rate applicable on the foreign material placed in the zone or the duty rate applicable on the finished article transferred from the zone whichever is most advantageous.
- Merchandise imported under bond may be admitted to an FTZ for the purpose of satisfying a legal requirement of exporting the merchandise. For instance, merchandise may be admitted into a zone to satisfy any exportation requirement of the Tariff Act of 1930, or any other exportation requirement.

### **7.1.3 HUBZone**

TexAmericas Center is located within a federal HUBZone which offers advantages for federal contracts. A US HUBZone helps small businesses gain preferential consideration with government contracts by limiting some contracts just to HUBZones and giving HUBZone businesses a 10% price evaluation preference in full and open contract negotiations. By law, three percent of all dollars awarded for federal prime contracts are required to go to HUBZone-certified small business concerns. The local Small Business Development Center will assist in preparing company applications for being recognized as HUBZone eligible.

The SBA provides a higher surety bond for HUBZone companies. There is typically a subcontractor participation goal for many large business contracts. HUBZone requirements generally apply to U.S. Government purchases in excess of \$3,000.

The Small Business Association regulates and implements the HUBZone Program by doing the following:

- Determining which businesses are eligible to receive HUBZone contracts
- Maintaining a list of qualified HUBZone small businesses that federal agencies can use to locate vendors
- Adjudicates protests of eligibility to receive HUBZone contracts

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- Reports to Congress on the program's impact on employment and investment in HUBZone areas.

To qualify for the program, a business must meet the following criteria:

- It must be a small business by SBA standards (<https://www.sba.gov/federal-contracting/contracting-guide/size-standards>)
- Its principal office must be located in a HUBZone, which includes military facilities closed by the Base Realignment and Closure Act, such as TAC
- At least 35% of its employees must reside in a HUBZone

#### **7.1.4 New Market Tax Credits**

TexAmericas Center is designated as an economically distressed community making businesses located on our footprint eligible for New Market Tax Credits (NMTC). The NMTC program attracts capital to eligible communities by providing private investors with a federal tax credit for investments made in businesses or economic development projects located in distressed communities, such as TAC.

Investors in NMTC receive a tax credit equal to 39 percent of the total Qualified Equity Investment made in a Community Development Entity. The credit is realized over a seven-year period: five percent annually for the first three years and six percent in years four through seven.

#### **7.1.5 U.S. Opportunity Zone**

A US Opportunity Zone is an economically distressed community where new investments, under certain conditions, may be eligible for preferential tax treatment to spur economic development in those areas. Qualified Opportunity Zones retain their designation for 10 years.

First, investors can defer tax on any prior gains until December 31, 2026 or such date in which an investment is sold or exchanged, whichever comes first, as long as the gain is reinvested in a Qualified Opportunity Fund.

Second, if the investor holds the investment in the Opportunity Fund for at least ten years, the investor would be eligible for an increase in basis equal to the fair market value of the investment on the date that the investment is sold or exchanged. Investors can defer certain taxes if they invest in an Opportunity Zone within six months of realizing the gain.

Investments in Opportunity Zones realize the following benefits for investment periods of at least:

- Five years with a 10% increase in tax basis
- Seven years with a 15% increase in tax basis

Ten years with an exemption from additional gains beyond what was previously deferred

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### **7.1.6 Texas Enterprise Zone**

The Texas Enterprise Zone Program is a state sales and use tax refund program designed to encourage private investment and job creation in economically distressed areas of the state of Texas.

Depending upon capital investment, Texas will refund up to \$7,500 for each allocated permanent or retained job.

- For projects with a capital investment below \$150 million, qualified businesses may receive up to \$1.25 million in state sales and use tax refunds (\$2,500 per job with a maximum of 500 jobs created).
- For projects with a capital investment between \$150 million and \$250 million, qualified businesses may receive up to \$2.5 million in state sales and use tax refunds (\$5,000 per job with a maximum of 500 jobs created).
- For projects with a capital investment of \$250 million or more, qualified businesses may receive up to \$3.75 million in state sales and use tax refunds (\$7,500 per job for no less than 500 jobs created).

### **7.1.7 Texas Reinvestment Zone**

Designating a specific geographic area as a Texas Enterprise Zone also makes it a Texas Reinvestment Zone, and potentially eligible for tax increment financing, tax abatement and limitations on appraised value. A local property tax exemption may be granted for real and tangible personal property located in the reinvestment zone that was acquired from the federal government by lease or deed. In addition, property in a reinvestment zone is eligible for:

- A tax refund based on the capital investment in the project
- An exemption from state regulation and suspension from local regulation
- Preference for loans from the state
- Refunds and credits on state excise, use, sales and franchise taxes
- Refunds on local sales and use taxes
- The reduction or elimination of local fees.
- Incentives tied to increasing jobs, wages or investment

### **7.1.8 Pace Program**

The Texas Property Assessed Clean Energy (PACE) program provides low-cost, long-term financing for water and energy efficiency upgrades to commercial and industrial properties. PACE improvements add value to the property and reduce utility bills with the upgrades typically paying for themselves with positive cash flow over time. In 2013, the Legislature passed Senate Bill 385 (83R) allowing municipalities and counties to work with commercial lenders and property owners to pursue improvements using property

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assessments as a secure repayment mechanism. Eligible upgrades are financed over time through a voluntary property tax assessment attached to the property. Under a PACE arrangement, private property owners evaluate measures that achieve energy savings and obtain financing, repaid as an assessment on the building. The assessment mechanism allows access to low-cost, long-term capital to finance improvements to the property. By eliminating upfront costs, extending financing and simplifying the transfer of repayment obligations to new owners upon sale, PACE overcomes challenges that have hindered building energy efficiency and related projects.

## **7.2 RECRUITMENT AND TRAINING**

### **7.2.1 Skills Development Fund**

The Texas state-funded Skills Development Fund is an innovative program providing local customized training opportunities for Texas businesses and workers to increase skill levels and wages of the Texas workforce. Training providers can use grant funds for curriculum development, training materials, instructor certifications and training equipment additions or upgrades. The employer and local community colleges will partner to develop a training plan for the Skills Development project and submit the application jointly.

The Texas Workforce Commission and local Workforce Board will assist to ensure the application requirements are completed. Grants are provided to help companies and labor unions form partnerships with local community colleges and technical schools to provide custom job training. However, the benefit may vary depending on the proposal.

If the grant is awarded, the Texas Workforce Commission funding will be provided to the community college to administer the training program for the employer. Total grant amounts vary depending on the number of employees participating in the program. No money is spent or received by the company.

The Skills Development Fund is only available to Texas employers and will pay up to \$1,800 for each new employee and \$900 for each incumbent employee participating in the training. Grants are generally capped at \$500,000 but exceptions can be approved, and additional funds requested.

### **7.2.2 On-the-Job Training (OJT) Contracts**

On-the-Job Training (OJT) Contracts are available to an employer who hires an eligible Texas resident. OJT Contracts pay up to 50% of an eligible employee's wages during their training period. OJT Contracts are subject to availability and approval of Texas Workforce Solutions.

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### **7.2.3 Come Home to Texarkana Program**

The Texarkana region would be delighted to help you and your employees call Texarkana home. Institutions like the Texarkana Chamber of Commerce, the Greater Texarkana Young Professionals (GTYP), Leadership Texarkana, MainStreet Texarkana, Texarkana College, local school districts and others will help key employees discover Texarkana and acclimate to their new surroundings. We will use all our relocation tools to help you and your employees succeed at your new home in Texarkana.

## **7.3 TAX ABATEMENT PROGRAMS**

### **7.3.1 Goods in Transit Tax Abatement**

This law exempts goods, principally inventory, that are stored under a contract of bailment by a public warehouse operator at a public warehouse facility, and that is in no way owned or controlled by the owner of the goods. This is provided such property is moved to another location inside or outside Texas within 175 days after the goods were acquired in Texas or imported into Texas. The movement requirement could be satisfied by simply moving the goods to another warehouse across the street.

Certain specific types of goods are presently excluded from this exemption: oil, natural gas, petroleum products, aircraft, dealer's motor vehicle inventory, dealer's vessel and outboard motor inventory, dealer's heavy equipment inventory, or retail manufactured housing inventory. Some owners of goods that presently store them in owned facilities may move their goods into a public warehouse in order to obtain the tax exemption. Having inventory located in Texas on the lien date (January 1) that is not being manufactured, modified, assembled, or processed and is pre-committed to an out-of-state customer, most likely qualifies a business for a 100% property tax exemption. In some cases, it is possible to qualify part of your inventory for an interstate/foreign commerce exemption and a Freeport Exemption on the remainder, depending on the flow of goods and qualifying thresholds. Furthermore, as this is a statutory exemption, it applies to all taxing jurisdictions, including county, city, school, and special districts.

### **7.3.2 Freeport Tax Exemption**

The Freeport Exemption is a constitutional amendment that exempts certain goods, which the government has dubbed Freeport goods, from property taxes. If a business has inventory in the state of Texas for a short period of time (175 days or less) before transporting it out of state, it may be eligible to claim a business personal property tax exemption on that inventory. Savings will be based on the percentage of tangible property goods that your business moved out of Texas within the 175-day window during the previous year.

The following conditions must also be met:

- Freeport property includes goods, merchandise, ores, and certain aircraft and aircraft parts.

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- The inventory must fall under the categories of finished goods, supplies, raw materials or work in process of being assembled, repaired, maintained, stored, processed or fabricated. The exemption does not apply to oil, natural gas, or liquid or gaseous materials that are immediate derivatives of the oil refining or natural gas.
  - The Freeport goods that are eligible for this exemption must be transported out of Texas within 175 days of the date that they are acquired, manufactured or brought into the state.
  - Goods, known as goods-in-transit that meet the Freeport property requirements may be sold in-state instead of being shipped out of state. However, the property still must meet all the Freeport property requirements, and be transported out of Texas within 175 days after it was first acquired in or imported into the state.

### **7.3.3 312 Tax Abatement**

Chapter 312 of the Texas Tax Code permits local taxing units to enter into agreements with property owners providing for the abatement of ad valorem property taxes, provided that the property owner makes specified improvements or repairs to the property. The code, also known as the Property Redevelopment and Tax Abatement Act, allows the governing bodies of cities, counties and special districts to exempt all or part of the taxable value of new investments for a period not to exceed 10 years. To be eligible for an abatement, a project must be a new facility or an expansion or modernization of an existing one. Abatement agreements are required to include certain provisions. They must specify the improvements to be made to the property and provide access for city or county employees to verify that the agreements are followed. The agreements must require payment of taxes if a property owner fails to comply with the abatement terms. In addition, annual certificates of compliance must be filed with the applicable taxing units to ensure accountability and visibility for the public.

### **7.3.4 313 Tax Abatement**

An appraised value limitation is an agreement between a taxpayer and a Texas school district in which the taxpayer proposes to build or install property and create jobs meeting certain requirements in exchange for a ten-year limitation on the taxpayer's property value for school district maintenance and operations tax (M&O) purposes. For ten years, school M&O property taxes are not levied on the value in excess of the limitation amount. Limitation amounts are established by statute and vary by school district. Unlike abatements based on a percentage of the property value, the structure of the program benefits primarily large projects, such as petrochemical, energy, or manufacturing sectors. .

Companies seeking a limitation submit an abatement application to the school district in which the project may be located. The school district forwards the application to the Texas Comptroller for evaluation. The school district may not grant final approval of the



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abatement without Comptroller analysis and approval. For the 10 years of the tax benefit period, reduced local school district revenues are substantially replaced with state funds through the state public school finance system.

### **7.3.5 381 Tax Abatement**

Chapter 381 of the Local Government Code allows counties to provide incentives encouraging developers to build in their jurisdictions. A county may administer and develop a program to make loans and grants of public money to promote state or local economic development and to stimulate, encourage and develop business location and commercial activity in the county. Specifically, it provides for offering loans and grants of city funds or services at little or no cost to promote all types of business development including industrial, commercial and retail projects. Each agreement can be uniquely tailored to address the specific needs of both the local government entity and the business prospect.

### **7.3.6 Texas Research and Development Tax Credit**

Taxpayers in Texas can claim the R&D Tax Credit to offset a portion of their franchise tax or use it towards a sales and use tax exemption on the purchase or lease of depreciable tangible personal property used in qualified research in Texas. Some highlights of the Texas R&D Tax Credit include:

- Qualified Research Expenses (QREs) must be for research conducted within Texas.
- The credit amount is 5% of the excess amount of qualified research expenses in the current period over the base amount (50% of the average of the previous three years).
- The allowable Franchise Tax Credit in any one period, including carryforward amounts, cannot exceed 50% of the franchise tax due for the period.
- Unused credits can be carried forward for up to 20 years.

### **7.3.7 Pollution Control Equipment Incentive**

Property used wholly or partly to prevent, monitor, control or reduce pollution is considered "pollution control property" and is at least partly exempt from ad valorem (property) tax for the life of the asset. To obtain the exemption, the property owner must apply to the Texas Commission on Environmental Quality. The applicant can submit in three different tiers, or levels, of applications for a use and benefit determination.

### **7.3.8 Franchise Tax Exemption and Deduction for Business HQ Relocation**

Companies may deduct from apportioned margin relocation costs incurred in relocating their main office or other principal place of business to Texas from another state provided the company (1) did not do business in Texas before the relocation and (2) is not a member of an affiliated group engaged in a unitary business, another member of which is already doing business in Texas.

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Deductible relocation costs include (1) costs of relocating computers and peripherals, other business supplies, furniture and inventory; and (2) any other costs related to the relocation that are allowable deductions for federal income tax purposes. The deduction must be taken on the company's initial franchise tax filing.

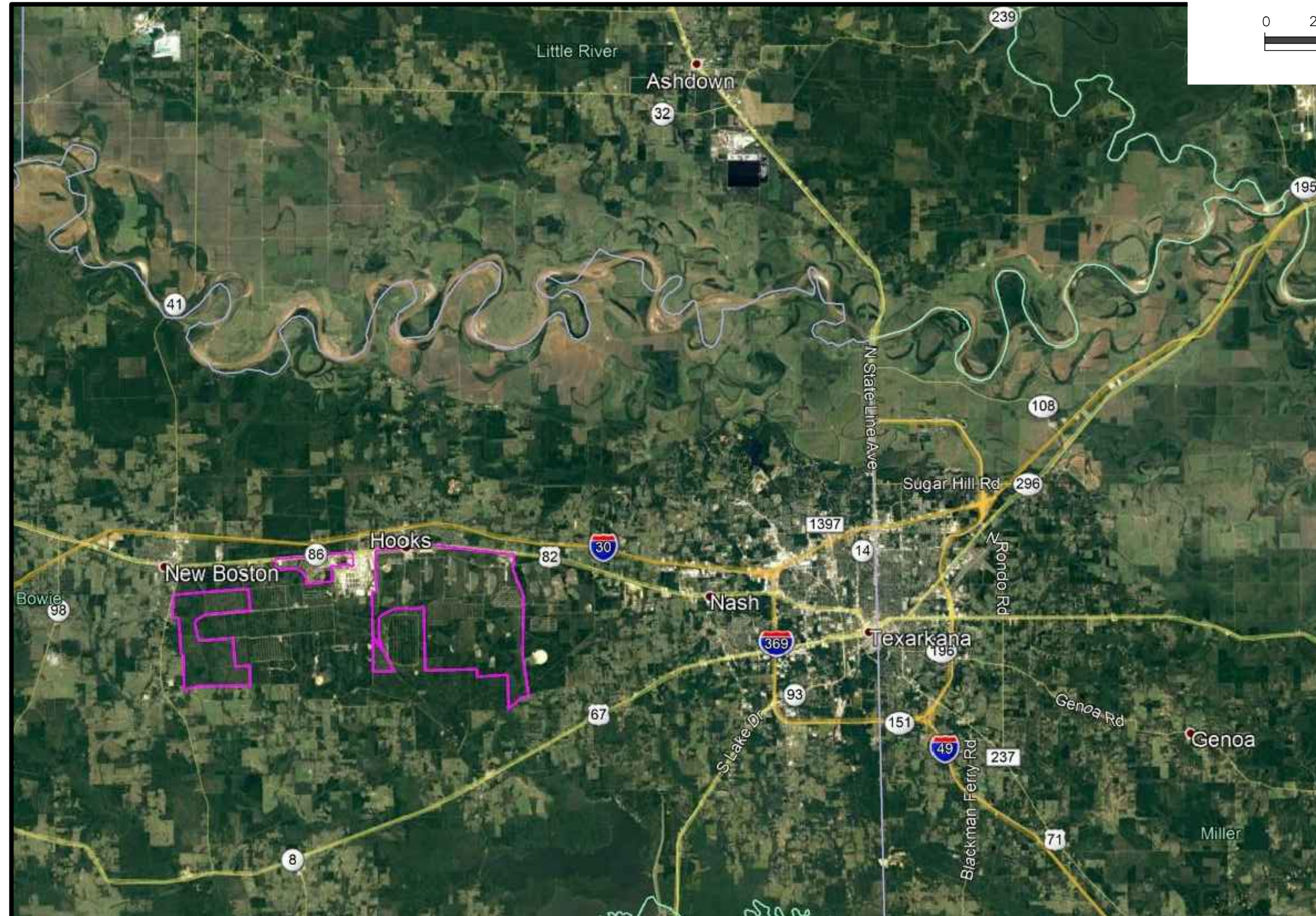
# APPENDIX A







FIGURE A-2



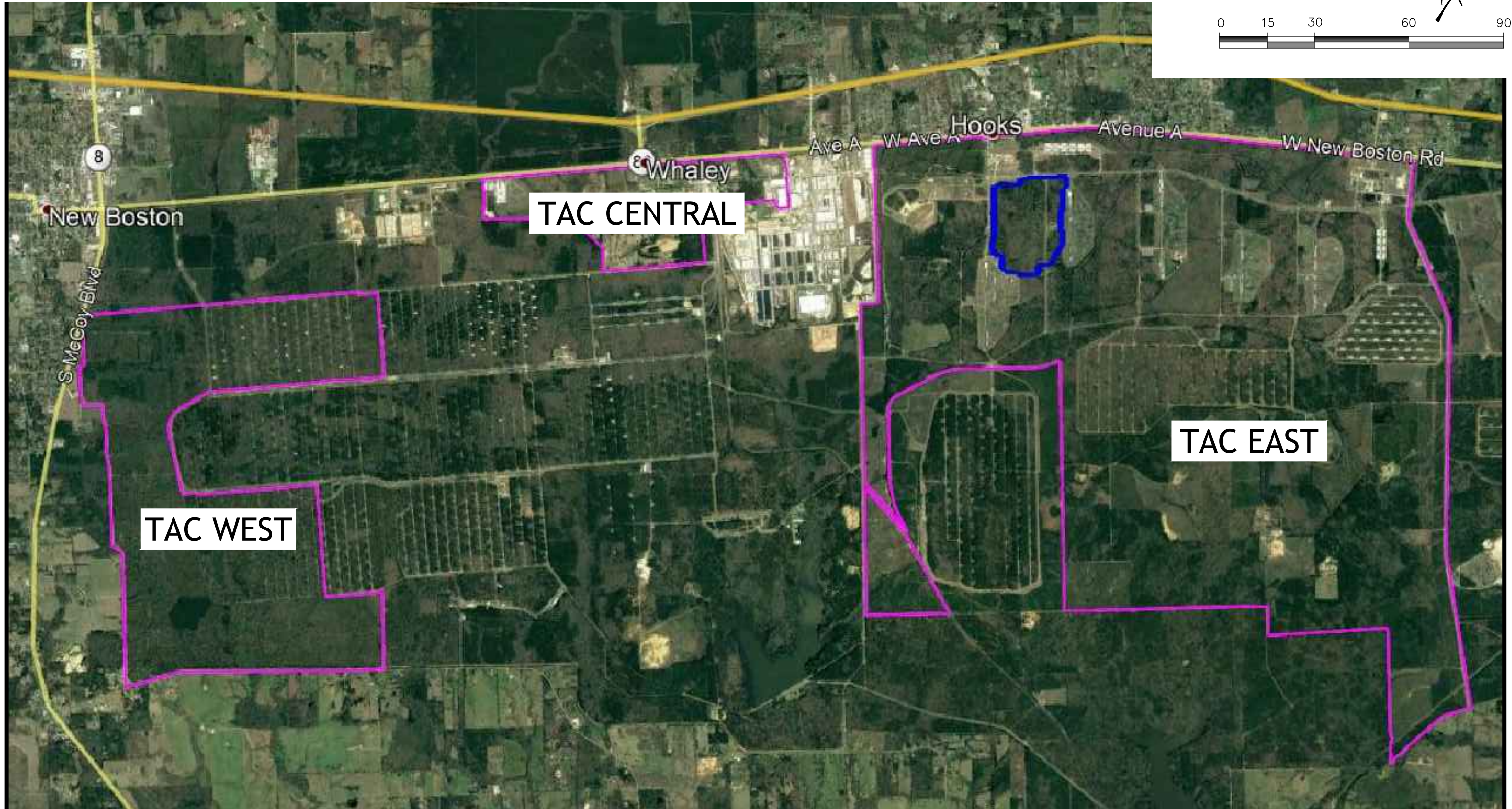
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REGIONAL LOCATOR MAP  
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FIGURE A-3



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TEXAMERICAS CENTER - CAMPUS MAP

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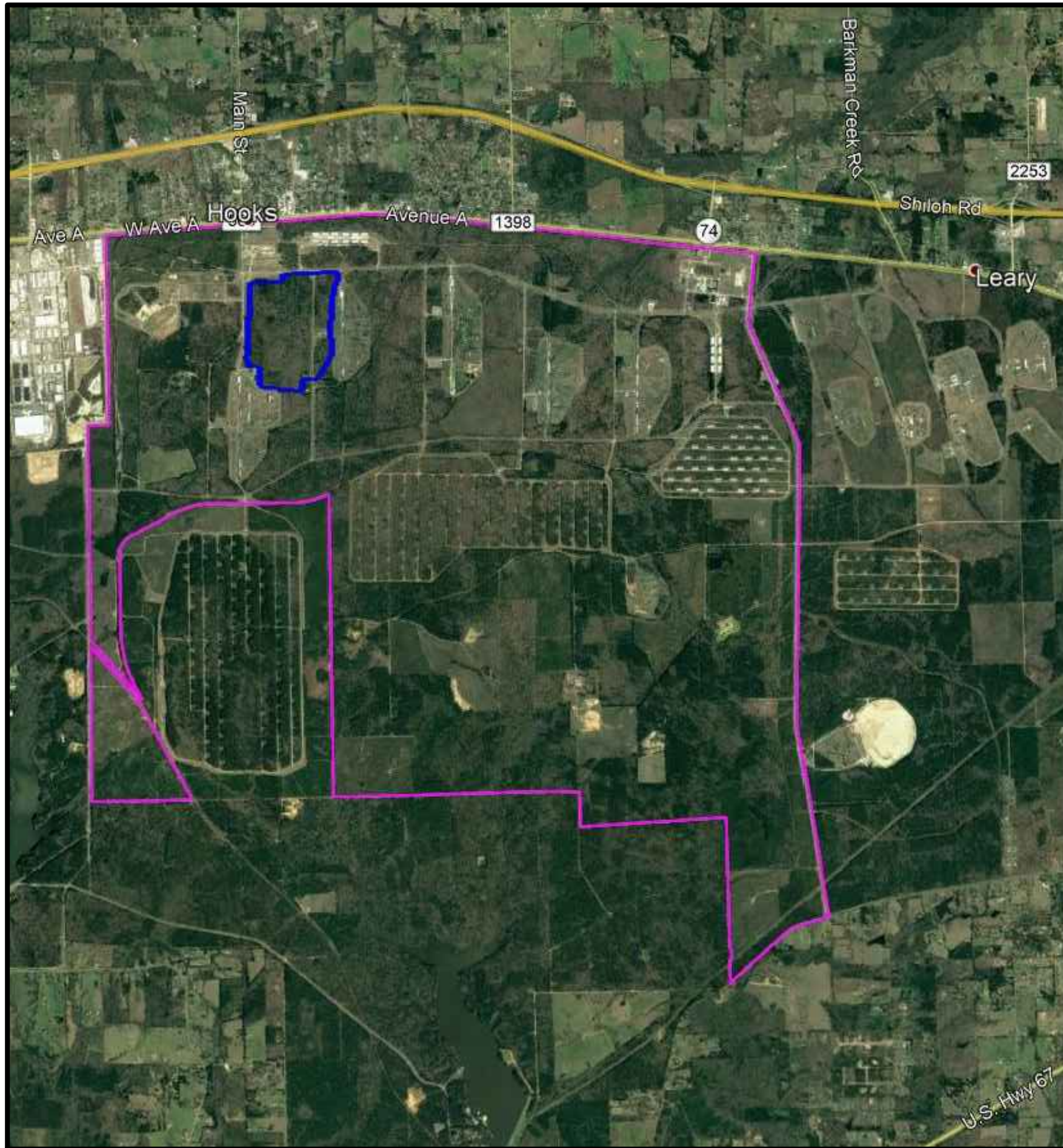
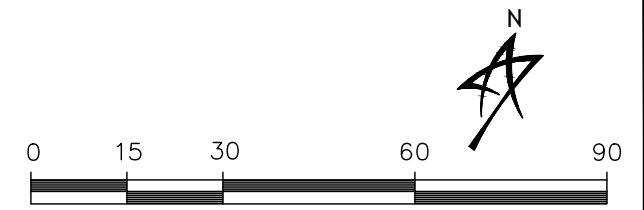


FIGURE A-4



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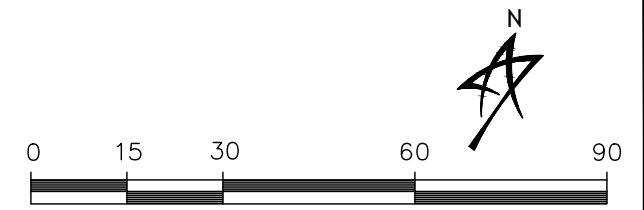


TEXAMERICAS CENTER - EAST CAMPUS  
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FIGURE A-5



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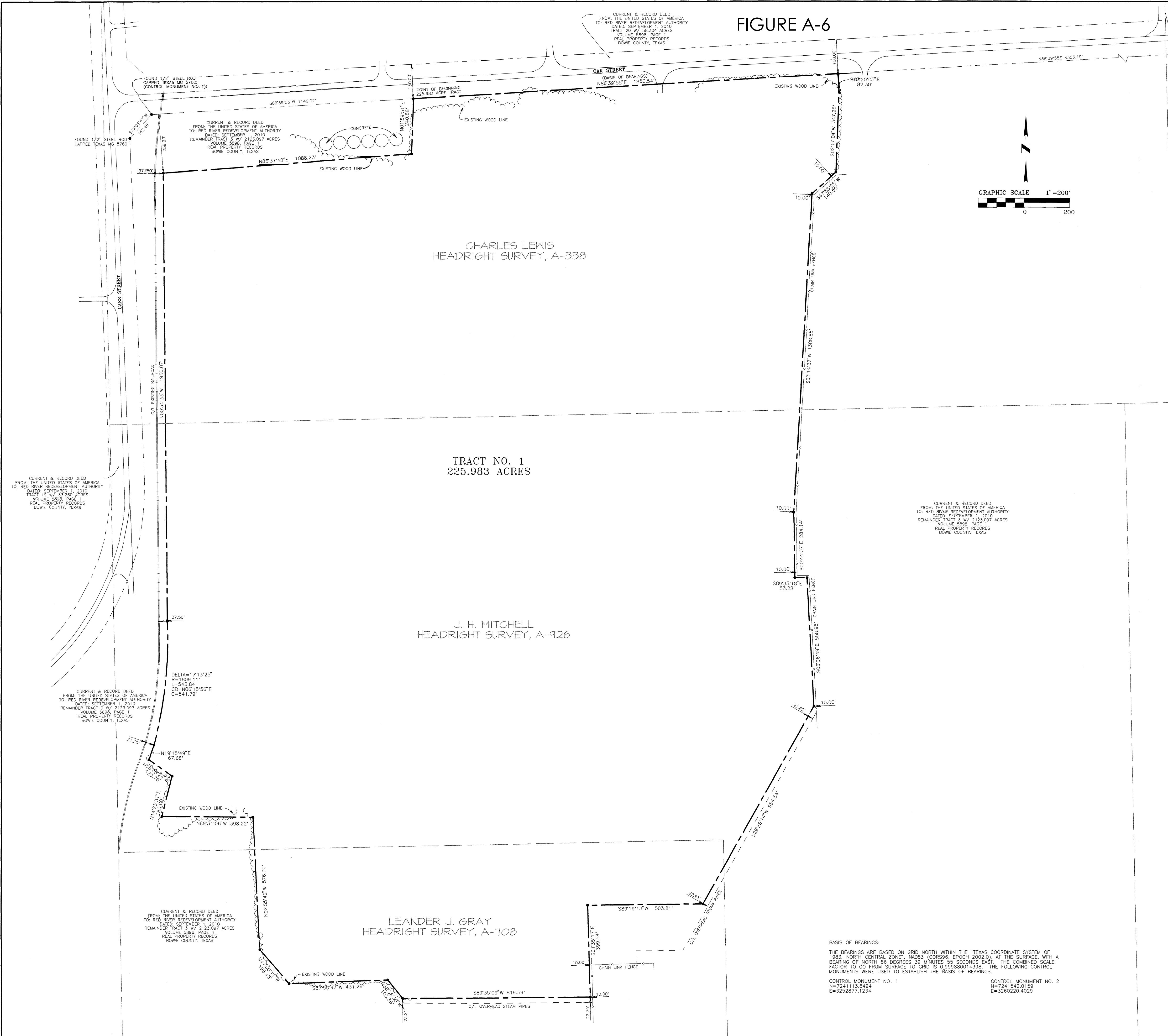


BRAZOS TRACT - TAC EAST CAMPUS  
**TexAmericas Center**



FIGURE A-6

FIGURE A-6



Property Description  
 Tract No. 1  
 225.983 Acres  
 Bowie County, Texas

All that certain lot, tract or parcel of land lying and situated in the Charles Lewis Headright Survey, Abstract 338, the J. H. Mitchell Headright Survey, Abstract 926 and the Leander J. Gray Headright Survey, Abstract 708, Bowie County, Texas, being a part of that certain tract of land described as Tract 3 with 2123.097 acres in the deed from the United States of America to Red River Redevelopment Authority, now known as TexAmericas Center, dated September 1, 2010, recorded in Volume 5898, Page 1 of the Real Property Records of Bowie County, Texas, and being more particularly described by metes and bounds as follows:

BEGINNING at a 1/2 inch steel rod set for a corner, capped MTG 101011-00, lying in the North line of the said 2123.097 acre tract and the South line of that certain tract of land described as Tract 20, with 58.304 acres in the said Volume 5898, Page 1, said corner bears South 86 degrees 39 minutes 55 seconds West a distance of 1146.02 feet to a 1/2 inch steel rod set for a corner (control monument), capped TEXAS MG 5760, and South 42 degrees 04 minutes 57 seconds West a distance of 142.46 feet to a 1/2 inch steel rod set for a corner, capped TEXAS MG 5760, the Northwest corner of the said 2123.097 acres tract;

THENCE North 86 degrees 39 minutes 55 seconds East (basis of bearings) a distance of 1856.54 feet along the North line of the said 2123.097 acre tract and the South line of the said 58.304 acre tract to a 1/2 inch steel rod set for a corner capped MTG 101011-00, said corner bears North 86 degrees 39 minutes 55 seconds East a distance of 4353.19 feet to a 1/2 inch steel rod set for a corner (control monument), capped TEXAS MG 5760;

THENCE South 03 degrees 20 minutes 05 seconds East a distance of 82.30 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE South 02 degrees 17 minutes 04 seconds West a distance of 347.25 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE South 47 degrees 55 minutes 25 seconds West a distance of 140.55 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE South 03 degrees 14 minutes 37 seconds West a distance of 1388.88 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00 at an angle point;

THENCE South 00 degrees 44 minutes 07 seconds East a distance of 284.14 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

THENCE South 89 degrees 35 minutes 18 seconds East a distance of 53.28 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

THENCE South 03 degrees 06 minutes 49 seconds East a distance of 558.95 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE South 29 degrees 26 minutes 14 seconds West a distance of 984.54 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE South 89 degrees 19 minutes 13 seconds West a distance of 503.81 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

THENCE South 01 degrees 35 minutes 17 seconds East a distance of 399.54 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

THENCE South 89 degrees 35 minutes 09 seconds West a distance of 819.59 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE North 38 degrees 36 minutes 30 seconds West a distance of 103.36 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE South 87 degrees 55 minutes 47 seconds West a distance of 431.26 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE North 41 degrees 00 minutes 11 seconds West a distance of 195.45 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE North 02 degrees 55 minutes 42 seconds West a distance of 576.00 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

THENCE North 89 degrees 31 minutes 06 seconds East a distance of 398.22 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

THENCE North 14 degrees 23 minutes 31 seconds East a distance of 180.80 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at an angle point;

THENCE North 55 degrees 05 minutes 24 seconds West a distance of 123.76 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00 at an angle point;

THENCE North 19 degrees 15 minutes 49 seconds East a distance of 67.68 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at the beginning of a circular curve to the left;

THENCE in a Northeasterly direction along the arc of the said circular curve a distance of 543.84 feet with a delta angle of 17 degrees 13 minutes 25 seconds, a radius of 1809.11 feet, a chord bearing of North 06 degrees 15 minutes 56 seconds East, and a chord distance of 541.79 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, at the end of the said circular curve;

THENCE North 00 degrees 34 minutes 33 seconds West a distance of 1950.07 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

THENCE North 85 degrees 37 minutes 48 seconds East a distance of 1088.23 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

THENCE North 01 degrees 59 minutes 51 seconds East a distance of 240.88 feet to the point of beginning and containing 225.983 acres of land at the time of this survey;

The bearings are based on Texas Coordinate System of 1983, North Central Zone, NAD83, with a bearing of North 86 degrees 39 minutes 55 seconds East.

This description is based on the survey and plat made by Jeffrey A. Wood, Registered Professional Land Surveyor No. 6220, on April 19, 2013, and revised on April 24, 2013.

**SURVEYOR CERTIFICATE:**

THIS IS TO CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND UNDER MY SUPERVISION ON APRIL 8, 2013, THAT THIS PLAT (MAP OR DRAWING) SUBSTANTIALLY COMPLIES WITH THE CURRENT PROFESSIONAL AND TECHNICAL STANDARDS OF THE TEXAS BOARD OF PROFESSIONAL LAND SURVEYING, AND REPRESENTS THE FACTS FOUND AT THE TIME OF THE SURVEY, THERE ARE NO VISIBLE IMPROVEMENTS EXCEPT AS SHOWN ON THE SURVEY PLAT.

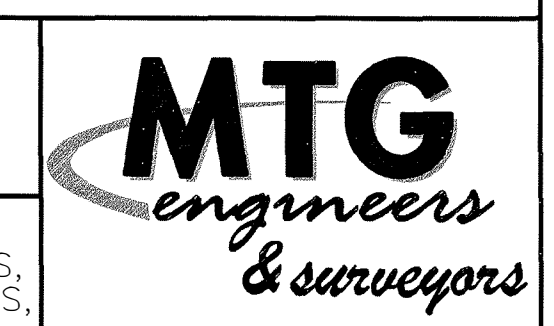
THIS PLAT IS FOR THE INTENDED USE OF TEXAMERICAS CENTER AS RELATES TO OWNERSHIP OR TRANSFER OF OWNERSHIP. THIS SURVEY IS NOT ASSIGNABLE OR TRANSFERABLE. MAY NOT BE REISSUED WITHOUT RE-SURVEY AND MAY BE VOID/INVALID SUBJECT TO CHANGES IN GOVERNANCE OR INTERPRETATIONS ISSUED BY THE TEXAS BOARD OF PROFESSIONAL LAND SURVEYING, AND MAY NOT BE COPIED OR PROVIDED TO OTHER PARTIES WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE UNDERSIGNED.

*Jeffrey A. Wood*  
 JEFFREY A. WOOD  
 REGISTERED PROFESSIONAL LAND SURVEYOR  
 NO. 6220, STATE OF TEXAS  
 FIRM CERTIFICATE NO. 101011-00  
 DATE: APRIL 19, 2013  
 REVISED: APRIL 24, 2013



NOTES:  
 1) ALL MONUMENTS ARE SET 1/2 INCH STEEL RODS CAPPED MTG 101011-00, UNLESS OTHERWISE NOTED.  
 2) ALL BEARINGS & DISTANCES ARE SHOWN AS MEASURED.

<b>BOUNDARY SURVEY</b>	
<b>TRACT NO. 1</b>	
<b>225.983 ACRES</b>	
SITUATED IN THE CHARLES LEWIS HRS, A-338, THE J. H. MITCHELL HRS, A-926 AND THE LEANDER J. GRAY HRS, A-708, BOWIE COUNTY, TEXAS	
Date	Revision/Description
4/24/13	REVISED PROPERTY DESCRIPTION DATE
Drawn By	Checked By
T.B.K.	J.A.W.
Project No.	Dwg. Date
0910	4/20/13
File No.	Sheet No.
	2 of 7



5830 SUMMERHILL RD., P.O. BOX 3786  
 TEXARKANA, TEXAS 75501  
 P 903.836.8593 | F 903.852.4700  
 www.mtgengineers.com

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**BASIS OF BEARINGS:**  
 THE BEARINGS ARE BASED ON GRID NORTH WITHIN THE "TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE", NAD83 (COORD. EPOCH 2002.0), AT THE SURFACE, WITH A BEARING OF NORTH 86 DEGREES 39 MINUTES 55 SECONDS EAST. THE COMBINED SCALE FACTOR TO GO FROM SURFACE TO GRID IS 0.999999014358. THE FOLLOWING CONTROL MONUMENTS WERE USED TO ESTABLISH THE BASIS OF BEARINGS.

CONTROL MONUMENT NO. 1  
 N=7241113.8494  
 E=3262877.1234

CONTROL MONUMENT NO. 2  
 N=7241542.0159  
 E=3260220.4029

X:\2013 Projects\138113 TAC East Non-Permit Private\02 Surveying\Field Data\Tract No. 1\Tract No. 1.prg  
 Wed Apr 24, 2013 3:46PM

FIGURE A-7



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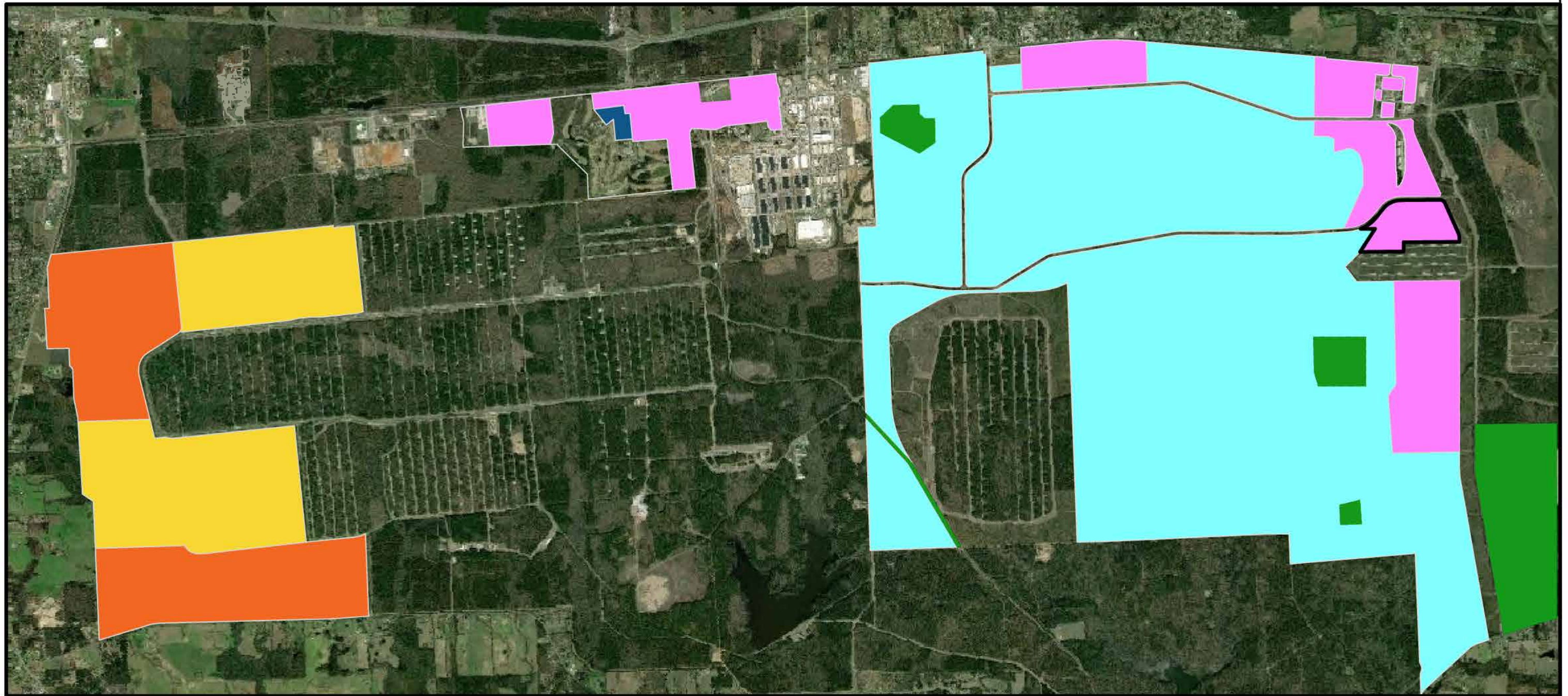
TOPOGRAPHICAL  
 EXHIBIT  
 BRAZOS SITE  
 TEXAMERICAS CENTER  
 EAST CAMPUS  
 HOOKS, TEXAS

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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FIGURE A-9



- TECHNOLOGY DISTRICT 1 (T1)
- TECHNOLOGY DISTRICT 2 (T2)
- RESIDENTIAL DISTRICT (R)
- LIGHT INDUSTRIAL DISTRICT (LI)
- HEAVY INDUSTRIAL DISTRICT (HI)
- U.S. ARMY PROPERTY

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ADOPTED 09.25.2018

LAND USE MAP

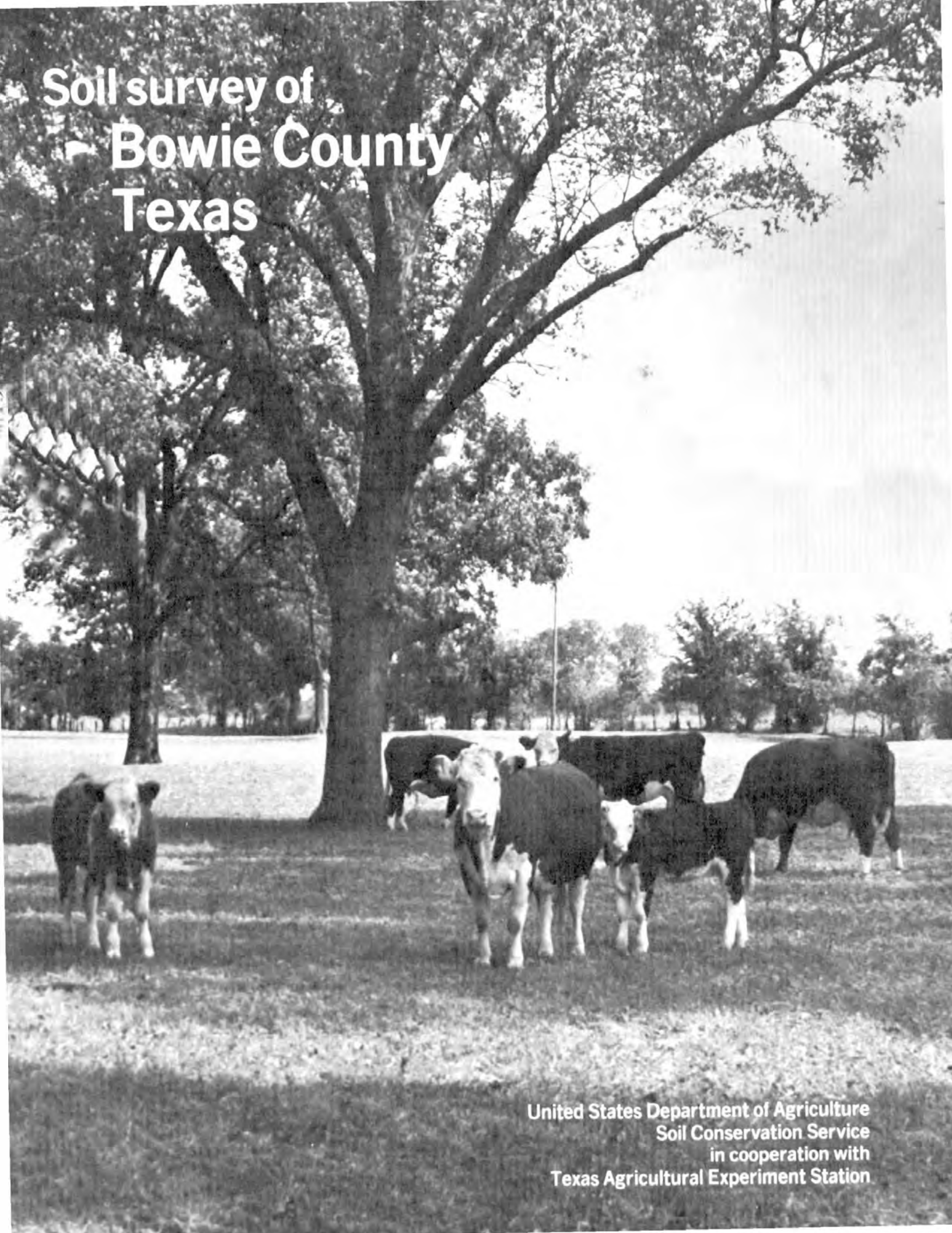
TexAmericas Center

SHEET NO:

LUM

# APPENDIX B





**Soil survey of  
Bowie County  
Texas**

**United States Department of Agriculture  
Soil Conservation Service  
in cooperation with  
Texas Agricultural Experiment Station**

production. Bahiagrass, bermudagrass, crimson clover, and arrowleaf clover are the main plants.

These soils are moderately well suited to loblolly pine, shortleaf pine, and eastern redcedar. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases yields.

This soil is poorly suited to crops. Droughtiness, the erosion hazard, the high gravel content, and low fertility are the main limiting features. However, the addition of lime and fertilizers will increase production. Terraces and diversions help control soil washing. Crop residue left on the soil surface helps to maintain organic matter content.

This soil is well suited to most urban development. Small stones or gravel are limitations for shallow excavations. In some areas, slope is a limitation for small commercial buildings.

This soil is well suited to recreational development except for playgrounds, which are limited by slope and small stones or gravel.

This soil is in capability subclass IIIe; woodland group 4f.

**34—Saffell-Urban land complex, 3 to 8 percent slopes.** This deep, gently sloping and sloping complex is on forested convex upland terraces. Slopes average about 5 percent. Areas are long and narrow. They average about 75 acres. This complex is about 45 percent Saffell soils, about 35 percent Urban land, and about 20 percent other soils. Areas of these soils and Urban land are so intermingled that they could not be shown separately at the scale selected for mapping.

Typically, the Saffell soil has a slightly acid gravelly sandy loam surface layer about 14 inches thick. It is brown in the upper part and yellowish red in the lower part. The subsoil to a depth of 80 inches or more is red, very strongly acid gravelly sandy clay loam.

Cuts for leveling purposes have removed the gravelly sandy loam surface layer and exposed the more clayey subsoil in some places. The Saffell soils are well drained and moderately permeable. The available water capacity is low. The erosion hazard is moderate.

Urban land is occupied mostly by commercial establishments and their paved parking lots. In places there are single-unit dwellings, streets, driveways, sidewalks, and patios.

Information on the use of these areas for urban development is contained in the sections on engineering and recreation.

This complex is not assigned to a capability subclass or woodland group.

**35—Sardis silt loam, frequently flooded.** This nearly level soil is on flood plains along the major creeks and drainageways. Slopes are less than 1 percent. Soil areas are long and narrow and parallel to streams. They range from 50 to several hundred acres and average about 200 acres.

Typically, the surface layer is brown silt loam about 9 inches thick. The subsoil extends to a depth of 62 inches or more. In the upper 41 inches, it is silt loam that is yellowish brown in the upper part and brown in the lower part. The lower part of the subsoil is pale brown fine sandy loam. Typically, this soil is neutral in the upper part and grades to very strongly acid in the lower part.

This soil is somewhat poorly drained. It floods briefly two to four times a year. A water table is 1 to 3 feet below the surface during winter and spring. Runoff is slow, and permeability is moderate. The available water capacity is high. The rooting zone is deep, and roots, water, and air move easily through the soil. The erosion hazard is slight.

Included with this soil in mapping are small areas of Amy and Thenas soils. The included soils make up less than 30 percent of any mapped area.

This Sardis soil is used mainly for woodland and pasture.

This soil is moderately well suited to pasture. The main forage plants are bermudagrass, fescue, bahiagrass, crimson clover, and arrowleaf clover. Frequent flooding and wetness limit yields to some extent. Proper grazing and the addition of lime and fertilizers increase yields.

This soil is well suited to trees such as loblolly pine, yellow-poplar, water oak, and sweetgum. Proper woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber production.

This soil is not recommended for cultivation because of frequent flooding.

This soil is poorly suited to urban and recreational development because of the hazard of flooding.

This soil is in capability subclass Vw; woodland group 1w.

**36—Sawyer silt loam, 0 to 3 percent slopes.** This nearly level and gently sloping soil is on uplands. Areas are broad and irregular in shape. They range from 20 to 500 acres and average about 100 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 80 inches or more. It is yellowish brown silty clay loam in the upper 9 inches, yellowish brown clay loam that has grayish and reddish mottles in the next 11 inches, and mottled gray, red, and strong brown clay in the lower part. Typically, this soil is slightly acid in the upper part and grades to very strongly acid in the lower part.

This soil is moderately well drained. Runoff and permeability are slow. Available water capacity is high. The rooting zone is deep, but the clayey texture in the lower part slows the movement of roots, water, and air. The erosion hazard is moderate.

Included with this soil in mapping are a few areas of Adaton and Eylau soils. Some areas have small mounds. Included soils make up 10 to 20 percent of the area.

These Sawyer soils are used mostly for pasture. A few areas are used for woodland and crops.



This soil is well suited to pasture plants such as bermudagrass, dallisgrass, bahiagrass, ryegrass, arrowleaf clover, and crimson clover. Proper grazing and the addition of lime and fertilizers increase production.

This soil is well suited to trees such as loblolly and slash pine. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and control of fire, increases timber production (fig. 9).

This soil is moderately well suited to crops. The main crops are soybeans, grain sorghum, corn, and small

grains. Low fertility and the erosion hazard are the main limiting features. Terraces and diversions decrease the amount of soil washing. Crop residue left on the soil surface increases infiltration and maintains organic matter content. Lime and fertilizers increase yields.

This soil is poorly suited to most urban development. High shrink-swell and high clay content are the main limiting features. Low strength is also a limitation for roads and streets.

This soil is well suited to recreational developments



*Figure 9.*—Mixed pine and hardwood forest on Sawyer silt loam, 0 to 3 percent slopes.



such as picnic areas and paths and trails. It is moderately well suited to camp areas and playgrounds. Slow permeability and slope are limitations.

This soil is in capability subclass IIe; woodland group 2w.

**37—Sawyer-Urban land complex, 0 to 3 percent slopes.** This nearly level and gently sloping soil is on upland interstream divides. Slopes average about 2 percent. Most areas are broad and irregular in shape. They range from 20 to several hundred acres and average about 50 acres.

This complex is about 60 percent Sawyer soils, 30 percent Urban land, and 10 percent other soils. Areas of these soils and Urban land are so intermingled that they could not be shown separately at the scale selected for mapping.

Typically, the Sawyer soil has a surface layer of dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 80 inches or more. It is yellowish brown silty clay loam that has grayish and reddish mottles in the upper 26 inches. Below this is gray, red, and strong brown, very strongly acid clay. The upper layers of most of the soil have been altered by cutting and filling.

Sawyer soils are moderately well drained. Runoff is slow, and permeability is slow. Available water capacity is high. The rooting zone is deep, but the clayey texture in the lower part slows the movement of water, air, and plant roots. The erosion hazard is moderate.

Structures on Urban land are mostly commercial buildings, streets, parking lots, and residences.

Included with this complex in mapping are small areas of Eylau and Ruston soils. The included soils make up about 10 percent of each mapped area.

The main soil characteristics that affect construction are high shrink-swell and wetness. Low strength limits use for streets and roads. Information about the use of these soils for urban development is contained in the sections on engineering and recreation.

This complex is not assigned to a capability subclass or woodland group.

**38—Severn very fine sandy loam.** This nearly level soil is on flood plains that rarely flood. Soil areas are long and narrow and parallel the river. They range from 100 to over 1,000 acres and average about 300 acres.

Typically, this soil has a surface layer of reddish brown very fine sandy loam about 8 inches thick. The next layer, to a depth of about 42 inches, is yellowish red very fine sandy loam. Below this to a depth of 65 inches or more is reddish brown, moderately alkaline silty clay loam stratified with other textures. Typically, this soil is moderately alkaline throughout.

This soil is well drained. It is rarely flooded. Runoff is slow, and permeability is moderately rapid. Available

water capacity is high. The rooting zone is deep, and roots, water, and air move easily through the soil. The erosion hazard is slight.

Included with this soil in mapping are small areas of Severn silty clay loam and Kiomatia soils. Also included are areas of a soil that has a thin clayey horizon on the surface and stratified sandy horizons below. These soils make up less than about 20 percent of the mapped acreage.

Most of this Severn soil is used for crops.

This soil is well suited to pasture. Bermudagrass, white clover, and alfalfa are common pasture and hay plants. Proper grazing and fertilization increase production.

This soil is well suited to trees such as eastern cottonwood, black walnut, pecan, and sweetgum. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber production.

This soil is well suited to soybeans, grain sorghum, cotton, and corn. Crop residue left on the soil surface helps to maintain organic matter content. Fertilizers increase yields.

This soil is moderately well suited to urban development. Limitations are flooding and low strength. Low strength is particularly a limitation for roads and streets.

This soil is well suited to recreational development.

This soil is in capability class I; woodland group 2o.

**39—Severn silty clay loam.** This nearly level soil is on flood plains that rarely flood. Areas are circular or long and narrow. They range from 10 to 100 acres and average about 50 acres.

Typically, the surface layer is dark reddish brown silty clay loam about 8 inches thick. The underlying material extends to a depth of 72 inches or more. It is silt loam that is reddish brown in the upper part, yellowish red in the middle part, and reddish brown in the lower part. This soil is typically calcareous throughout.

This soil is well drained. Runoff is slow, and permeability is moderately rapid. Available water capacity is high. The rooting zone is deep, and roots, water, and air move easily through the soil. The erosion hazard is slight.

Included with this soil in mapping are small areas of Billyhaw clay, Severn very fine sandy loam, and Redlake clay. Included soils make up less than 20 percent of any mapped area.

Most of this Severn soil is used for crops. Minor acreages are in pasture and woodland.

This soil is well suited to pasture. Bermudagrass, white clover, and alfalfa, are the main pasture plants. Proper grazing and the addition of fertilizers increase production.

This soil is well suited to trees such as eastern

This Woodtell soil is used for pasture and woodland.

This soil is moderately well suited to pasture. The main forage crops are bermudagrass, bahiagrass, crimson clover, and arrowleaf clover. Proper grazing and the addition of lime and fertilizers can increase yields.

This soil is moderately well suited to trees such as loblolly pine and shortleaf pine. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber production.

This soil is not recommended for cultivation because of slope and the hazard of erosion.

This soil is poorly suited to urban development. The main limitations are the high shrink-swell, high clay content, and low strength. Low strength is a limitation for local roads and streets.

This soil is well suited to recreational development such as paths and trails. It is moderately well suited to picnic areas. Limitations for camp areas and playgrounds are very slow permeability and slope.

This soil is in capability subclass VIe; woodland group 4c.

**47—Woodtell gravelly sandy loam, 3 to 8 percent slopes.** This gently sloping soil is on narrow convex ridges. Slopes average about 5 percent. Soil areas are oblong. They range from 5 to about 25 acres and average about 15 acres.

Typically, this soil has a surface layer of brownish gravelly sandy loam about 12 inches thick. The subsoil extends to a depth of 44 inches. It is red clay in the upper part and red clay loam in the lower part. Gray mottles are throughout. The underlying material to a depth of 70 inches or more is red sandy clay loam. This soil is typically strongly acid in the upper part and very strongly acid in the lower part.

This soil is moderately well drained. Runoff is medium, and permeability is very slow. Available water capacity is medium. The rooting zone is deep, but the clayey subsoil slows the movement of roots, water, and air. The erosion hazard is moderate.

Included with this soil in mapping are small areas of soils like the Woodtell soil that has loamy subsoil and small areas of the gravelly Saffell soils. The included soils make up less than 15 percent of the mapped acreage.

This Woodtell soil is used for pasture and woodland. The surface layer has been removed from much of this soil for gravel.

This soil is moderately well suited to pasture. Bermudagrass, bahiagrass, crimson clover, and arrowleaf clover are the main forage plants. Proper grazing, the addition of lime, and heavy applications of fertilizers can increase yields.

This soil is moderately well suited to loblolly and slash pine. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber yields.

This soil is poorly suited to crops. Crops can grow successfully, however, with intensive management that includes erosion control, proper management of crop residue, and recommended applications of lime and fertilizers. The main crops are corn and soybeans.

This soil is poorly suited to urban development. The main limitation is the high shrink-swell, and low strength is a limitation for roads and streets.

This soil is well suited to recreational development such as paths and trails. Very slow permeability and slope are limitations for camp areas, picnic areas, and playgrounds.

This soil is in capability subclass IVe; woodland group 4c.

**48—Wrightsville-Rodessa complex.** This nearly level complex is on broad, upland terraces. Slopes average less than 1 percent. Soil areas are irregular in shape. They range from 10 to over 1,000 acres and average about 300 acres.

This complex is characterized by broad flats of Wrightsville silt loam and circular mounds of Rodessa loam in a random pattern. The mounds of Rodessa soil are so small and the soil pattern is so intricate that the soils could not be shown separately at the scale selected for mapping. The mounds are 2 to 3 feet high, 60 to 120 feet in diameter, and 100 to 200 feet apart.

This complex is about 75 percent Wrightsville soils, 15 percent Rodessa soils, and 10 percent other soils.

Typically, the Wrightsville soil has a surface layer of brown, strongly acid silt loam about 4 inches thick. The next layer, which extends to a depth of 16 inches, is light brownish gray, very strongly acid silt loam. The subsoil to a depth of 80 inches or more is light brownish gray, very strongly acid clay that has strong brown mottles and vertical streaks of uncoated sand and silt.

Wrightsville soils are poorly drained. A water table is at or near the soil surface during the winter and spring. Water stands on the surface for 2 or 3 weeks during the cool season. Runoff is slow, and permeability is very slow. The available water capacity is high. The rooting zone is deep, but the excess water and clayey subsoil restrict the movement of air and plant roots. The erosion hazard is slight.

Typically, the Rodessa soil has a surface layer of brownish loam about 14 inches thick. The subsoil extends to a depth of 70 inches or more. It is yellowish brown loam to a depth of 26 inches. Below this to a depth of about 42 inches, it is clay loam that is yellowish brown in the upper part and pale brown in the lower part. It has common tongues and streaks of uncoated sand and silt and has reddish, brownish, and grayish mottles. The lower part of the subsoil is mottled gray and red clay.

Rodessa soils are somewhat poorly drained. A water table is 2 to 3 feet below the surface during the cool season. Runoff is slow, and permeability is very slow. Available water capacity is high. The rooting zone is deep. The erosion hazard is slight.

Included with this complex in mapping are small spots of Adaton, Ashford, and Sawyer soils. Included soils make up less than 10 percent of the mapped acreage.

Most areas of Wrightsville-Rodessa complex are used for woodland and wildlife habitat. A few areas are used for rice and soybeans and for pasture.

These soils are moderately well suited to pasture plants such as bahiagrass, dallisgrass, and tall fescue. Crimson clover and arrowleaf clover will grow on the Rodessa part of the complex. A drainage system will remove excess water and provide a better environment for pasture plants. Proper grazing and complete fertilizers can increase forage yields.

These soils are moderately well suited to loblolly pine, water oak, willow oak, and sweetgum. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber yields.

The soils in this complex, are moderately well suited to crops such as soybeans and rice (fig. 11). Wetness, very slow permeability, low fertility, and droughtiness are the main limiting features. A drainage system is needed to remove excess water. Crop residue left on the soil surface improves infiltration and helps to maintain organic matter content. The addition of lime and a complete fertilizer can increase yields.

These soils are poorly suited to urban development. The main limitations are wetness, low strength, and high shrink-swell characteristics. Low strength limits use for roads and streets.

These soil are poorly suited to most recreational developments because of very slow permeability. However, they are well suited to paths and trails.

This complex is in capability subclass IIIw; woodland group 3w.



*Figure 11.*—Combining rice on Wrightsville-Rodessa complex.



hard, very friable; many fine roots; about 40 percent by volume of siliceous pebbles up to 3 inches in diameter; medium acid; gradual smooth boundary.

**B21t**—14 to 45 inches; red (2.5YR 4/6) very gravelly sandy clay loam; weak medium and fine subangular blocky structure; hard, very friable; few fine roots; few patchy clay films on faces of peds; about 50 percent by volume of siliceous pebbles up to 3 inches in diameter; very strongly acid; gradual smooth boundary.

**B22t**—45 to 80 inches; red (2.5YR 4/6) gravelly sandy clay loam; weak medium and fine subangular blocky structure; hard, very friable; few fine roots; few patchy clay films on faces of peds; about 20 percent by volume of siliceous pebbles up to 3 inches in diameter; very strongly acid.

The thickness of the solum exceeds 60 inches. Reaction is strongly acid or very strongly acid except in surface layers that have been limed.

The A1 horizon is 3 to 6 inches thick. It is brown or dark grayish brown. Pebbles make up 10 to 30 percent of the horizon. The A2 horizon is 2 to 8 inches thick. It is brown, yellowish red, or reddish yellow. Pebbles make up 30 to 50 percent of the horizon. The B2t horizon is red or yellowish red. Pebbles make up 35 to 65 percent of the upper part of the horizon and 20 to 65 percent of the lower part.

These soils are taxadjuncts to the Saffell series. They have a thicker solum than is defined as the range for the Saffell soils, and they do not have a decrease in clay content of more than 20 percent from their maximum within a depth of 60 inches. However, management, use, and behavior are similar to those of the Saffell series.

### **Sardis series**

The soils of the Sardis series are deep, somewhat poorly drained, and loamy. They formed in loamy alluvial sediments high in silt on flood plains. Slopes are less than 1 percent.

A typical pedon of Sardis silt loam, frequently flooded, in pasture; from the intersection of U.S. Highway 82 and U.S. Highway 259 west of De Kalb, 1.75 miles south on U.S. Highway 259, and 50 feet west of road:

**A1**—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; slightly hard, very friable; many fine roots; neutral; gradual smooth boundary.

**B21**—9 to 16 inches; yellowish brown (10YR 5/4) silt loam; few fine faint grayish brown mottles; moderate medium subangular blocky structure; slightly hard, very friable; few fine roots; strongly acid; gradual smooth boundary.

**B22**—16 to 50 inches; brown (10YR 5/3) silt loam; few fine distinct yellowish brown and common medium faint grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; slightly hard,

very friable; very strongly acid; gradual smooth boundary.

**B3**—50 to 62 inches; pale brown (10YR 6/3) fine sandy loam; many medium distinct yellowish brown (10YR 5/6) and few fine faint light brownish gray mottles; weak medium subangular blocky structure; slightly hard, very friable; very strongly acid; clear smooth boundary.

The solum thickness ranges from 40 to 70 inches. The 10- to 40-inch control section ranges from 20 to 35 percent clay and is less than 15 percent coarser than very fine sand.

The A horizon is 6 to 10 inches thick. It is brown or dark grayish brown. Reaction ranges from neutral to medium acid. The B2 horizon is brown, dark brown, or yellowish brown with few to many mottles in shades of gray and brown. It is silt loam, silty clay loam, or loam. Reaction ranges from medium acid to very strongly acid. The B3 horizon is light brownish gray, pale brown, or gray. It is silty clay loam, silt loam, fine sandy loam, or clay loam. Reaction ranges from medium acid to very strongly acid.

### **Sawyer series**

The soils of the Sawyer series are deep, moderately well drained, and loamy. They formed in loamy and clayey sediments on uplands. Slopes range from 0 to 3 percent.

A typical pedon of Sawyer silt loam, 0 to 3 percent slopes, in pasture; from the intersection of Texas Highway 98 and U.S. Highway 82 west of New Boston, 1 mile west on U.S. Highway 82, south on county road 0.9 mile, and 50 feet east of road:

**A1**—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium and fine granular structure; hard, friable; many fine roots; slightly acid; gradual smooth boundary.

**B21t**—6 to 15 inches; yellowish brown (10YR 5/6) silty clay loam; few fine faint light brownish gray mottles; weak coarse subangular blocky structure parting to moderate medium and fine subangular blocky; hard, friable; few fine roots; few patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

**B22t**—15 to 26 inches; yellowish brown (10YR 5/6) clay loam; many prominent coarse red (2.5YR 4/6) and many fine faint light brownish gray mottles; moderate medium subangular blocky structure; hard, friable; few patchy clay films on faces of peds; 5 percent by volume light gray (10YR 7/2) uncoated sand and silt; very strongly acid; gradual smooth boundary.

**B23t&A2**—26 to 38 inches; mottled yellowish brown (10YR 5/6) and red (2.5YR 4/6) clay; moderate medium and fine subangular blocky structure; hard, firm; few patchy clay films on faces of peds; 20

percent by volume light gray (10YR 7/2) uncoated sand and silt between peds; very strongly acid; gradual smooth boundary.

B24t—38 to 61 inches; gray (10YR 5/1) clay; few coarse distinct strong brown (7.5YR 5/8) and many coarse prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; extremely hard, very firm; continuous clay films on faces of peds; about 5 percent by volume uncoated sand and silt on faces of peds; very strongly acid; gradual smooth boundary.

B25t—61 to 80 inches; mottled gray (10YR 5/1) and red (2.5YR 4/6) clay; few fine distinct strong brown mottles; weak medium subangular blocky structure; extremely hard, very firm; continuous clay films on faces of peds; about 10 percent by volume uncoated sand and silt in streaks and pockets; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches.

The A horizon is 4 to 10 inches thick. It is dark grayish brown, brown, pale brown, or grayish brown. Reaction is slightly acid or medium acid. In some pedons there is an A2 horizon that is brown, grayish brown, or pale brown and is 3 to 5 inches thick. In some pedons there is a B1 horizon that is thin yellowish brown. The B21t horizon is yellowish brown or strong brown. In some pedons this horizon has a few grayish mottles. It is silt loam, silty clay loam, or clay loam. Reaction is strongly acid or very strongly acid. The B22t horizon is yellowish brown with common or many grayish brown, light brownish gray, light gray, or gray mottles and few or common yellowish red or red mottles. This horizon is silt loam, silty clay loam, or clay loam. Reaction is strongly acid or very strongly acid. The depth to the clayey Bt horizon is 24 to 40 inches. The lower part of the Bt horizon is mottled gray, red, and brown. Each of these colors is dominant in places. Texture is clay or silty clay. Pockets, streaks, and tongues of lighter colored clean sand and silt make up 5 to 25 percent of the lower part of the Bt horizon.

### Severn series

The soils of the Severn series are deep, well drained, and loamy. They formed in loamy alluvium high in silt on flood plains. Slopes range from 0 to 1 percent.

A typical pedon of Severn very fine sandy loam, in cropland; 200 feet west of the south end of the Red River bridge on U.S. Highway 259:

Ap—0 to 8 inches; reddish brown (5YR 4/4) very fine sandy loam; weak subangular blocky and granular structure; slightly hard, friable; many fine roots; few worm casts; calcareous; moderately alkaline; gradual smooth boundary.

C1—8 to 42 inches; yellowish red (5YR 4/6) very fine sandy loam; massive; slightly hard, friable; few fine

strata of loam and loamy fine sand; calcareous; moderately alkaline; abrupt smooth boundary.

C2—42 to 65 inches; reddish brown (5YR 4/4) silty clay loam; massive; slightly hard, firm; few fine strata of loam and loamy fine sand; calcareous; moderately alkaline.

The A horizon is 6 to 15 inches thick. It is dark brown, dark reddish brown, or reddish brown. The A horizon is very fine sandy loam or silty clay loam. Reaction is moderately alkaline or mildly alkaline. Some pedons are noncalcareous in the upper 10 inches. The C horizon is yellowish red, reddish brown, or light reddish brown. It is very fine sandy loam, silty clay loam, or silt loam. The C horizon contains thin strata of coarser and finer textured materials.

### Smithdale series

The soils of the Smithdale series are deep, well drained, and loamy. They formed in loamy sediments on uplands. Slopes range from 8 to 12 percent.

A typical pedon of Smithdale fine sandy loam, 8 to 12 percent slopes, in pasture; from the intersection of Farm Road 2735 and U.S. Highway 82 in De Kalb, 8.25 miles north on Farm Road 2735, 1.2 miles east on county road, 0.25 mile south on county road; and 150 feet east of road:

A1—0 to 6 inches; dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; slightly hard, very friable; few fine roots; slightly acid; clear smooth boundary.

A2—6 to 15 inches; yellowish red (5YR 5/6) fine sandy loam; weak fine subangular blocky structure; slightly hard, very friable; few fine roots; medium acid; gradual smooth boundary.

B21t—15 to 25 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; hard, friable; few fine roots; many pores and horizontal channels 1/8 inch in diameter; many patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B22t—25 to 42 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; hard, friable; many patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23t—42 to 80 inches; red (2.5YR 4/6) sandy clay loam; moderate coarse prismatic structure parting to moderate medium and fine subangular blocky; hard, friable; many patchy clay films on faces of peds; tongues of uncoated sand about 1 inch wide make up 15 to 20 percent; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction in all horizons is strongly acid or very strongly acid in unlimed soil.

The A1 horizon is 4 to 10 inches thick. It is brown, dark brown, dark grayish brown, or dark yellowish brown.

ranges from neutral to moderately alkaline. The IIB horizon is calcareous or noncalcareous and has few to many calcium carbonate concretions.

These soils are taxadjuncts to the Perry series because they are deeper to the IIB horizon than is typical for the Perry series. Use, management, and behavior are similar to those of the Perry soils.

### Redlake series

The soils of the Redlake series are deep, moderately well drained, and clayey. They formed in clayey alluvium on flood plains. Slopes are less than 1 percent.

A typical pedon of Redlake clay, in cropland; from the intersection of Interstate Highway 30 and Farm Road 992 in New Boston, 13.5 miles north on Farm Road 992, 3 miles north and west on private road, and 50 feet east:

A1—0 to 5 inches; dark reddish brown (2.5YR 3/4) clay; weak coarse granular and subangular blocky structure; extremely hard, very firm; common fine roots; few worm casts; calcareous; moderately alkaline; clear smooth boundary.

B21—5 to 35 inches; dark red (2.5YR 3/6) clay; weak coarse subangular blocky structure; extremely hard, very firm; few fine roots; few worm casts; calcareous; moderately alkaline; clear smooth boundary.

B22—35 to 56 inches; red (2.5YR 4/6) clay; weak coarse subangular blocky structure; extremely hard, very firm; calcareous; moderately alkaline; abrupt smooth boundary.

IIC—56 to 72 inches; red (2.5YR 5/6) silt loam; massive; slightly hard, friable; few thin strata of silty clay loam; calcareous; moderately alkaline.

The thickness of the solum ranges from 30 to 60 inches. All horizons are mildly alkaline or moderately alkaline. Some pedons are noncalcareous in the upper 10 inches, but all are calcareous below a depth of 10 inches. These soils crack when dry.

The A horizon is 5 to 10 inches thick. It is dark reddish brown or dusky red. The B horizon is red, dark red, or dark reddish brown. Texture is clay or silty clay. The IIC horizon is silt loam, clay loam, or silty clay loam and is stratified in some pedons.

### Rodessa series

The soils of the Rodessa series are deep, somewhat poorly drained, and loamy. They formed in clayey sediments on uplands. They are on mounds in the Wrightsville-Rodessa complex. Slopes range from 0 to 1 percent.

A typical pedon of Rodessa loam in the Wrightsville-Rodessa complex, in woodland; from the intersection of Farm Road 561 and U.S. Highway 259 south of De Kalb, 0.1 mile south on U.S. Highway 259, 1.8 miles west on county road, 1.5 miles south, and 25 feet west:

A11—0 to 8 inches; brown (10YR 4/3) loam; moderate medium granular structure; slightly hard, very friable; many fine roots; slightly acid; clear smooth boundary.

A12—8 to 14 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; slightly hard, very friable; few fine roots; medium acid; gradual smooth boundary.

B1—14 to 26 inches; yellowish brown (10YR 5/6) loam; moderate fine subangular blocky structure; hard, very friable; many worm casts; many patchy clay films on faces of peds; few black concretions; strongly acid; gradual smooth boundary.

B21t&A'2—26 to 34 inches; yellowish brown (10YR 5/8) clay loam; few fine distinct red mottles; moderate fine subangular blocky structure; hard, firm; white (10YR 8/2) uncoated silt and sand on surfaces of peds and in streaks and tongues make up 25 percent of the horizon; very strongly acid; gradual smooth boundary.

B22t&A'2—34 to 42 inches; pale brown (10YR 6/3) clay loam; many coarse distinct strong brown (7.5YR 5/6), many coarse prominent red (2.5YR 4/6), and few medium faint light brownish gray (10YR 6/2) mottles; moderate fine subangular blocky structure; hard, firm; white (10YR 8/2) tongues and streaks of uncoated silt and sand make up about 15 percent of the horizon; very strongly acid; gradual smooth boundary.

B23t—42 to 70 inches; gray (10YR 5/1) clay; few coarse faint strong brown (7.5YR 5/6) and many coarse distinct red (2.5YR 4/6) mottles; weak medium subangular blocky structure; very hard, very firm; few streaks of uncoated sand and silt; very strongly acid.

The thickness of the solum ranges from 60 to more than 100 inches.

The A horizon is 16 to 22 inches thick. It is brown, dark yellowish brown, yellowish brown, light yellowish brown, or pale brown. The A horizon is loam or fine sandy loam. Reaction ranges from slightly acid to very strongly acid. The B1 horizon is 6 to 12 inches thick. It is light yellowish brown, yellowish brown, or very pale brown. It is loam or fine sandy loam. Reaction ranges from medium acid to very strongly acid. The B2t&A'2 horizons are clay loam or loam. The B2t part is yellowish brown, pale brown, strong brown, or light brownish gray. The A'2 part is white or light gray and makes up 10 to 60 percent of the horizon. Reaction of the B2t&A'2 horizon is strongly acid or very strongly acid. The lower part of the B2t horizon is gray, dark gray, or light brownish gray. This horizon is clay or silty clay. Reaction ranges from medium acid to very strongly acid.

### Roebuck series

The soils of the Roebuck series are deep, somewhat poorly drained, and clayey. They formed in clayey alluvium on flood plains. Slopes are less than 1 percent.



## Wrightsville series

The soils of the Wrightsville series are deep, poorly drained, and loamy. They formed in clayey sediments on uplands. Slopes range from 0 to 1 percent.

A typical pedon of Wrightsville silt loam in the Wrightsville-Rodessa complex, in woodland; from the intersection of Farm Road 561 and U.S. Highway 259 south of De Kalb, 0.1 mile south on U.S. Highway 259, 1.8 miles west on county road, 1.5 miles south, 50 feet west of road:

- A1—0 to 4 inches; brown (10YR 5/3) silt loam; weak fine granular structure; hard, friable; many fine roots and bits of organic material; strongly acid; clear smooth boundary.
- A2g—4 to 16 inches; light brownish gray (10YR 6/2) silt loam; common fine faint strong brown mottles; weak medium subangular blocky structure; extremely hard, friable; few fine roots; very strongly acid; gradual irregular boundary.
- B21tg&A'2g—16 to 28 inches; light brownish gray (2.5Y 6/2) clay loam; few fine faint strong brown mottles; weak medium subangular blocky structure; extremely hard, very firm; about 20 percent of volume tongues of light brownish gray (10YR 6/2) uncoated sand and silt; very strongly acid; gradual smooth boundary.
- B22tg—28 to 55 inches; light brownish gray (2.5Y 6/2) clay; few fine faint strong brown mottles; weak medium subangular blocky structure; extremely hard, very firm; streaks and coatings on peds of light

brownish gray (10YR 6/2) silt loam; very strongly acid; gradual smooth boundary.

B23tg—55 to 66 inches; light brownish gray (2.5Y 6/2) clay; many medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; extremely hard, very firm; continuous clay films on faces of peds; few slickensides; few black specks and streaks; streaks and coatings on peds of light brownish gray (10YR 6/2) silt loam; very strongly acid; gradual smooth boundary.

B24tg—66 to 80 inches; light brownish gray (2.5Y 6/2) clay; few fine faint strong brown mottles; weak subangular blocky structure; extremely hard, very firm; continuous clay films on faces of peds; few slickensides and pressure faces; streaks of light brownish gray (10YR 6/2) silt loam; strongly acid.

The thickness of the solum ranges from 65 to 80 inches. Reaction is strongly acid or very strongly acid except in places where the soil has been limed.

The A1 horizon is 2 to 5 inches thick. It is grayish brown, brown, or dark grayish brown. In some pedons this horizon has a few faint yellowish brown or strong brown mottles. The A2 horizon is 9 to 18 inches thick. It is light brownish gray or light gray. The A2 horizon is silt loam or silty clay loam. Tongues of this horizon extend deep into the B2tg horizon. The B2tg horizon is gray or light brownish gray. Mottles of strong brown and yellowish brown range from few to many. The B2tg horizon is clay or silty clay with tongues and streaks of lighter colored uncoated silt, silt loam, or very fine sandy loam. In a few pedons, there are black streaks, specks, and concretions in the B2tg horizon.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
32: # Sacul-----  Urban land.	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
33----- Saffell	Severe: small stones.	Slight-----	Slight-----	Moderate: slope.	Slight.
34: # Saffell-----  Urban land.	Severe: small stones.	Slight-----	Slight-----	Moderate: slope.	Slight.
35----- Sardis	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, low strength.
36----- Sawyer	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.
37: # Sawyer-----  Urban land.	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.
38, 39----- Severn	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, low strength.
40----- Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
41----- Texark	Severe: floods, too clayey, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, low strength, wetness.
42----- Thenas	Moderate: floods, wetness.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
43: # Udorthents					
44----- Vesey	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.
45----- Woodtell	Severe: wetness, too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
46----- Woodtell	Severe: wetness, too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.

See footnote at end of table.



TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
47----- Woodtell	Severe: wetness, too clayey.	Severe: shrink-swell.	Severe: shrink-swell. wetness.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
48:*\br/>Wrightsville-----	Severe: wetness, too clayey.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, low strength, shrink-swell.
Rodessa-----	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
32:*											
Sacul-----	0-10	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	10-55	Clay, silty clay	CH, MH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	55-65	Silty clay loam, silt loam, clay loam.	CL, CH, ML, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
Urban land.											
33:*											
Saffell-----	0-14	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	14-80	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
Urban land.											
34:*											
Saffell-----	0-14	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	14-80	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
Urban land.											
35:*											
Sardis-----	0-9	Silt loam-----	ML, CL-ML, CL	A-4	0	100	100	80-100	75-95	<30	NP-10
	9-50	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20
	50-62	Loam, silt loam, sandy loam.	ML, SM, CL, SC	A-4, A-2	0	100	95-100	60-95	35-75	<30	NP-10
Urban land.											
36:*											
Sawyer-----	0-6	Silt loam-----	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	6-26	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	26-80	Silty clay, clay	CH, CL, MH	A-7	0	100	95-100	90-100	80-90	45-60	20-35
Urban land.											
37:*											
Sawyer-----	0-6	Silt loam-----	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	6-32	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	32-80	Silty clay, clay	CH, CL, MH	A-7	0	100	95-100	90-100	80-90	45-60	20-35
Urban land.											
38:*											
Severn-----	0-8	Very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	94-100	65-97	22-31	3-12
	8-65	Stratified silt loam to loamy very fine sand.	ML, CL-ML	A-4	0	100	100	94-100	65-97	<28	NP-7

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
35----- Sardis	Fair: wetness, low strength.	Poor: excess fines.	Poor: excess fines.	Good.
36----- Sawyer	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
37: # Sawyer-----	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Urban land.				
38, 39----- Severn	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
40----- Smithdale	Good-----	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
41----- Texark	Poor: shrink-swell, low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
42----- Thenas	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
43. # Udorthents				
44----- Vesey	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
45, 46, 47----- Woodtell	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
48: # Wrightsville-----	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Rodessa-----	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
48: # Wrightsville-----	0-16	Silt loam-----	ML, CL, CL-ML	A-4	0	100	95-100	90-100	75-100	<31	NP-10
	16-55	Silty clay, clay, silty clay loam.	CH, CL, MH	A-7	0	100	100	95-100	90-100	41-65	22-40
	55-80	Silty clay loam, silty clay, clay.	CL, CH, MH	A-7, A-6	0	100	95-100	95-100	90-100	35-65	16-40
Rodessa-----	0-26	Loam-----	ML, CL-ML, CL	A-4	0	100	100	80-95	55-75	15-25	3-8
	26-70	Clay, clay loam.	CH, CL	A-7-6	0	100	100	90-100	75-95	45-65	25-40

\* See description of the map unit for composition and behavior characteristics of the map unit.

# APPENDIX C



# ETTL Engineers & Consultants Inc.

GEOTECHNICAL \* MATERIALS \* ENVIRONMENTAL \* DRILLING \* LANDFILLS

July 31, 2013

William V. Cork  
TexAmericas Center  
107 Chapel Lane  
New Boston, Texas 75570

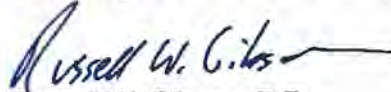
SUBJECT: TexAmericas Center – East Parcels 1, 2, 3, 6, 7, 8 & 9  
Hooks, Texas  
Preliminary Geotechnical Investigation  
ETTL Job No. G3972-136


Dear Mr.Cork:

Submitted herein is the report summarizing the results of a preliminary geotechnical investigation conducted at the site of the above referenced project.

If you have any questions concerning this report, or if we can be of further assistance during construction, please contact us. We are available to perform any construction materials testing and inspection services that you may require. Thank you for the opportunity to be of service.

Sincerely,  
ETTL Engineers & Consultants Inc.

  
Russell W. Gibson, P.E.  
Project Manager

  
C. Brandon Quinn, P.E., P.G.  
Vice President  
Manager of Engineering Services



ETTL  
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F-3208  
July 31, 2013



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**Preliminary Geotechnical Investigation  
TexAmericas Center – East Parcels 1, 2, 3, 6, 7, 8 & 9  
Hooks, Texas**

Submitted to

TexAmericas Center  
New Boston, Texas

Prepared by

ETTL Engineers & Consultants Inc.  
Tyler, Texas

July 2013

## EXECUTIVE SUMMARY

This Executive Summary is provided as a brief synopsis of the specific recommendations and design criteria provided in the attached report. It is not intended as a substitute for a thorough reading of the report in its entirety.

### Project Description

The project consists of a preliminary geotechnical investigation for parcels 1, 2, 3, 6, 7, 8 & 9 at bore locations staked by representatives of TexAmericas. **This investigation is very preliminary and not to be used for any final design.**

### Site Description

The project site is currently partially developed with large areas heavily forested. According to USGS topography, the elevation varies from approximately 325 to 425. The elevation decreases generally from west to east with drainage ways running south to north at two to three locations.

### Depth & Number of Borings

Location	Borings	Depth
Parcel 1 – 223.5 Acres	B-1, B-2, B-3, B-4, B-5	2-20' & 3-10'
Parcel 2 – 136.9 Acres	B-10, B-11, B-12, B-13	2-20' & 2-10'
Parcel 3 – 198.8 Acres	B-6, B-7, B-8, B-9	2-20' & 2-10'
Parcel 6 – 83.5 Acres	B-14, B-15, B-16, B-17	2-20' & 2-10'
Parcel 7 – 2.0 Acres	B-18	1-20'
Parcel 8 – 8.1 Acres	B-19, B-20	1-20' & 1-10'
Parcel 9 – 36.2 Acres	B-21, B-22	2-20'

### Soils Encountered

The soils encountered in Parcel 1 generally consisted of loose to medium dense silty sands (SM), silty clayey sands (SC-SM) and silts (ML) overlying interlayered medium stiff to hard lean clays (CL) and fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from non-plastic to 42.

The soils in Parcel 2 consisted of surficial loose silts (ML) and clayey sands (SC) overlying soft to medium stiff lean clays (CL) followed by medium stiff to hard fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from non-plastic to 61.

In Parcel 3, the soils encountered generally consisted of interlayered soft to very stiff lean clays (CL) and fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from 13 to 35.

The soils in Parcel 6 consisted of interlayered medium stiff to hard lean clays (CL) and fat clays (CH). Very loose to loose silt (ML) and clayey sand (SC) was found at the surface in Boring B-17. Atterberg Plasticity Indices of the tested soils ranged from 16 to 51.

The soils encountered in Parcel 7 consisted of stiff to very stiff fat clays (CH). Atterberg Plasticity Index of the tested soils was 42.

In Parcel 8, the soils encountered consisted of very soft to medium stiff interlayered lean clays (CL) and fat clays (CH) and very loose silt (ML) overlying medium stiff to very stiff fat clay (CH). Atterberg Plasticity Indices of the tested soils ranged from 15 to 44.





The soils encountered in Parcel 9 consisted of medium stiff to hard fat clays (CH). The Atterberg Plasticity Indices of the tested soils ranged from 43 to 61.

**Groundwater Depth**

No seepage was noted during drilling operations and all borings were dry and open upon completion. The phreatic surface is predicted to be at some depth deeper than 20 feet.

**Recommended Foundation Type**

- Shallow spread footings*
- Shallow spread footings/ stiffened slab option*
- Drilled piers*

**Allowable Gross Bearing Pressure**

*Spread Footings*  
Depth listed is below finished subgrade or adjacent exterior grade whichever is deeper.

Parcel	Native Soils		Select Fill	
	Isolated Footings	Strip Footings	Isolated Footings	Strip Footings
Parcel 1	800 psf @ 2 ft.	600 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 2 ft.
Parcel 2	1000 psf @ 2 ft.	1000 psf @ 2 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 3	1000 psf @ 2 ft.	1000 psf @ 2 ft.	1000 psf @ 2 ft.	1000 psf @ 2 ft.
Parcel 6	1000 psf @ 2 ft.	500 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 7	3000 psf @ 2 ft.	2500 psf @ 1.5 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 8	800 psf @ 2 ft.	800 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 2 ft.
Parcel 9	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.

*Drilled Piers*

Bearing capacity for underreamed piers bearing at the indicated depth below existing grade.

Location	End Bearing Capacity	Depth
Parcel 1	6000 psf	18
Parcel 2	6000 psf	13
Parcel 3	6000 psf	18
Parcel 6	6000 psf	13
Parcel 7	6000 psf	13
Parcel 8	6000 psf	13
Parcel 9	6000 psf	13

**Floor System**

- Flat Slab on prepared subgrade
- Stiffened slab on grade - monolithically placed with *shallow footings*
- Structurally suspended floor - used with *drilled piers* only

**Building Subgrade Preparation**

The following *minimum* overexcavation is suggested for the specific option chosen. Limits of overexcavation should extend beyond building and footing lines a distance of 5'. Options are listed in order of increasing risk of damage due to soil movement.



- *Drilled piers with suspended slab* - Grade void space beneath floor to drain.
- *Drilled piers with grade beams and floor slab on prepared subgrade* - Native expansive clay soils are to be removed and replaced with select fill. Overexcavation to the depths below existing grade shown in the table below in order to reduce Potential Vertical Rise (PVR) to 1.0" or less.
- *Shallow spread footings with monolithic flat slab* - Overexcavate to the depths below existing grade shown in the table below in order to reduce the PVR to 1 inch or less.
- *Shallow spread footings with monolithic stiffened slab placed on grade* – None required.

For options where the slab is to be placed on grade, scarify the exposed subgrade, adjust the moisture content, and recompact. Place select fill to finished slab subgrade.

Location	Undercut Depth (ft.)
Parcel 1	3 – 6
Parcel 2	6 – 8
Parcel 3	1 – 3
Parcel 6	6.5 – 7.5
Parcel 7	6
Parcel 8	4 – 7
Parcel 9	7 – 8

### Pavement

Cut to proposed subgrade elevation as required and proof roll prior to compaction or treatment. Soft and/or unstable areas should be cut out and replaced with select fill. Scarify exposed subgrade to a depth of 8 inches, adjust the moisture content to optimum -1% to optimum +3% and recompact. If highly plastic soil (PI > 20) is encountered at finished subgrade, it should be cut out to a depth of 18 inches and replaced with select fill. Lime treatment of the subgrade is an alternative to removing and replacing soil.

Type	Base/Surface Thickness		Subgrade Preparation
Flexible HMAC	2" Surface (Type D)	6" Crushed Stone Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" HMAC Surface (Type D)	3" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	5" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill



<b>Table 2 – Pavement Options – Medium Duty</b>			
<b>Type</b>	<b>Base/Surface Thickness</b>		<b>Subgrade Preparation</b>
Flexible HMAC	3" Surface (Type C or D)	8" Crushed Stone Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" Surface (Type C or D)	4" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	6" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill

<b>Table 3 – Pavement Options – Heavy Duty</b>			
<b>Type</b>	<b>Base/Surface Thickness</b>		<b>Subgrade Preparation</b>
Flexible HMAC	2" Surface (Type C or D)	7" Crushed Stone Base & 2.5" HMAC Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" Surface (Type C or D)	5.5" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	7" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill

**Notes:**

1) Tensar Triax Geogrid placed on subgrade may be substituted for lime treatment of subgrade. Lime treatment or replacement with select fill only needed where expansive clay is encountered within 12" of finished subgrade as determined by a representative of this firm.

2) Increase HMAC thickness by 1" in lieu of lime treated subgrade

3) Increase concrete thickness by 0.5" in lieu of lime treated subgrade.

**Construction Considerations**

The surficial soils in several areas may become unstable when wet necessitating remediation or removal and replacement to facilitate construction.



## 1.0 INTRODUCTION

This study was performed at the request and authorization to proceed granted by Nate Hahm with TexAmericas Center of New Boston, Texas in accordance with our proposal dated June 6, 2013. Field operations were conducted June 24 – 26, 2013.

The purpose of this preliminary investigation was to define and evaluate the general subsurface conditions in the area south of US 82 and west of Red River Army Depot near Hooks, Texas. Specifically, the study was planned to determine the following:

- Subsurface stratigraphy within the limits of exploratory borings;
- Classification, strength, expansive properties, and compressibility characteristics of the foundation soils;
- Suitable foundation types and allowable loading; and,
- Construction related problems that may be anticipated by the investigation.

To determine this information a variety of tests were performed on the soil samples. The scope of testing for this report comprised Standard Penetration, Atterberg liquid and plastic limits, Percentage of Fines Passing the No. 200 sieve, Natural Moisture Content, Unconfined Compressive Strength and One-Dimensional Swell. These tests were conducted to classify the soil strata according to a widely used engineering classification system; identify, and provide quantitative data for active (expansive) soils; define strength characteristics relating to allowable bearing values; predict immediate settlement; and assess construction workability of the soils.

The conclusions and recommendations that follow are based on limited information regarding site grading. The boring locations were selected by the client and staked with their assistance. (ETTL did not confirm by survey that the locations indicated on the attached Plan of Borings accurately reflect the location on the ground). This information should be verified prior to design. *Should any portion of it prove incorrect, this firm should be notified in order to assess the need for revisions to this report.*

## 2.0 PROJECT DESCRIPTION

The project consists of a preliminary geotechnical investigation for parcels 1, 2, 3, 6, 7, 8 & 9 at bore locations staked by representatives of TexAmericas. **This investigation is very preliminary and not to be used for any final design.**

## 3.0 SITE DESCRIPTION

The project site is currently partially developed with large areas heavily forested. According to USGS topography, the elevation varies from approximately 325 to 425. The elevation decreases generally from west to east with drainage ways running south to north at two to three locations.

## 4.0 SOIL STRATIGRAPHY AND PROPERTIES

### 4.1 Site Geology

The Midway Group undivided outcrops at the subject site. The Midway Group is composed of the Wills Point and the Kincaid Formations in Bowie County. The Wills Point Formation is primarily clay. The upper portion of the formation is composed of silt and lignite with some calcareous siltstone



concretions. A thin bed of limestone is located near the middle of the formation and is glauconitic near the base of the formation. The maximum thickness of the Wills Point Formation is approximately 450 feet. The Kincaid Formation is predominately clay with some glauconite and selenite and slightly calcareous. The formation is in part silty and sandy and is locally phosphatic near the base. The maximum thickness of the Kincaid Formation is approximately 150 feet.

#### 4.2 Soil Stratigraphy

The soils encountered in **Parcel 1** generally consisted of loose to medium dense silty sands (SM), silty clayey sands (SC-SM) and silts (ML) overlying interlayered medium stiff to hard lean clays (CL) and fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from non-plastic to 42.

The soils in **Parcel 2** consisted of surficial loose silts (ML) and clayey sands (SC) overlying soft to medium stiff lean clays (CL) followed by medium stiff to hard fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from non-plastic to 61.

In **Parcel 3**, the soils encountered generally consisted of interlayered soft to very stiff lean clays (CL) and fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from 13 to 35.

The soils in **Parcel 6** consisted of interlayered medium stiff to hard lean clays (CL) and fat clays (CH). Very loose to loose silt (ML) and clayey sand (SC) was found at the surface in Boring B-17. Atterberg Plasticity Indices of the tested soils ranged from 16 to 51.

The soils encountered in **Parcel 7** consisted of stiff to very stiff fat clays (CH). Atterberg Plasticity Index of the tested soils was 42.

In **Parcel 8**, the soils encountered consisted of very soft to medium stiff interlayered lean clays (CL) and fat clays (CH) and very loose silt (ML) overlying medium stiff to very stiff fat clay (CH). Atterberg Plasticity Indices of the tested soils ranged from 15 to 44.

The soils encountered in **Parcel 9** consisted of medium stiff to hard fat clays (CH). The Atterberg Plasticity Indices of the tested soils ranged from 43 to 61.

#### 4.3 Seismic Design Parameters

Based on the 2012 International Building Code section 1613 *Earthquake Loads – Site Ground Motion*, the seismic site class definition should be taken as **Class D**. This classification is based on an average of the blow counts obtained for all borings in this study. This site classification should be confirmed for future projects based specifically on the project site.

A seismic impact zone is an area with a 10 percent or greater probability that the maximum horizontal acceleration in rock, expressed as a percentage of the earth's gravitational pull, will exceed 0.10g in 50 years. Seismic impact maps that represent a 2 percent probability of exceedance in 50 years for 0.2 and 1 second Spectral Response Acceleration can be found in the IBC code. Based on the maps and the site coefficients determined for the appropriate site class, parameters as listed below are recommended by the IBC Code:

Site Coefficients:

$$F_a = 1.6$$

$$F_v = 2.4$$

Mapped Acceleration Parameters:

$$S_s = 0.140 \text{ g}$$

$$S_1 = 0.077 \text{ g}$$





Maximum Earthquake Spectral Response Acceleration Parameters:  $S_{MS} = 0.223 \text{ g}$   
 $S_{M1} = 0.185 \text{ g}$

Design Spectral Response Acceleration Parameters:  $S_{DS} = 0.149 \text{ g}$   
 $S_{D1} = 0.123 \text{ g}$

#### 4.4 Behavior of Expansive Soils

Expansive soils such as were found at this site, swell when they absorb moisture and shrink as they dry. Structures placed on these soils move up and down with such volume changes of the soil. When expansive soils are covered by an impermeable surface such as a building slab or pavement, seasonal moisture fluctuation at the interior of the covered area tends to be reduced or eliminated due to the lack of exposure to natural wetting and drying conditions (i.e., wind, rain, sun, vegetative, etc.). At the edges of the structure, however, the near surface soils are still subject to seasonal drying and wetting. Where continuously irrigated areas abut a building, the risk of severe shrinkage due to seasonal evaporative drying effects is low, but excess moisture could lead to significant swelling (especially if native clays are dry at the start of construction). Where areas immediately adjacent to the structure are paved both the risk of swelling due to excess moisture and shrinkage due to moisture loss are reduced significantly. A deeper bearing elevation will also reduce the anticipated vertical movements.

Moisture content of the significantly expansive soils we tested varied from dry to moist. Potential for swelling is considered to be moderate to high under conditions at the time of drilling. Potential for shrinkage is also predicted to be moderate to high. As the moisture content of the soil changes from what it was in our samples, the potential for swelling and shrinkage will change accordingly.

One method for quantifying the potential for subgrade movement at any given location is to calculate the Potential Vertical Rise (PVR) (Tex 124 E Modified). This calculation takes into account the inter-relationship between depth, PI, and fluctuations in soil moisture. The maximum potential movement of the existing subgrade, PVR, due to normal climatological fluctuations in soil moisture content is summarized in Table 4.1 (based on assumed dry conditions and an estimated annual seasonal moisture fluctuation zone of approximately 10 feet). Swell testing indicates a potential heave from 1 inch to as much as 7 inches at current moisture contents.

Location	PVR (inches)
Parcel 1	1 – 2.75
Parcel 2	3 – 4
Parcel 3	1 – 2.2
Parcel 6	1 – 3.4
Parcel 7	3
Parcel 8	1.75 – 2.2
Parcel 9	4.8 – 5.5

#### 5.0 GROUNDWATER OBSERVATIONS

No seepage was noted during drilling operations and all borings were dry and open upon completion. The phreatic surface is predicted to be at some depth deeper than 20 feet.

It should be noted, however, that seasonal groundwater conditions might vary throughout the year depending upon prevailing climatic conditions. This magnitude of variance will be largely dependent



upon the duration and intensity of precipitation, surface drainage characteristics of the surrounding area, and significant changes in site topography.

## **6.0 FOUNDATION DESIGN RECOMMENDATIONS**

The proposed use is unknown at this time. Given the preliminary nature of this study and the variability of the soils encountered, options for both a shallow foundation system as well as deep foundations are provided below.

Where drilled pier foundations are used, a structurally suspended slab is recommended in order to isolate the structure from subgrade movements.

A system consisting of shallow footings incorporated in a stiffened slab, which is placed on native subgrade or select fill may also be used, but is much less tolerant of significant subgrade volume changes than a structure, which is suspended above the ground (i.e. the risk of structure distress is significantly higher for a ground supported structure). In addition, a stiffened slab on native ground is subject to tilt due to uneven wetting or drying of subgrade soils. Unless the entire structure is surrounded by an impermeable barrier or pavement, uneven wetting due to continuous irrigation on one side of the structure could result in significant heave on that side, tilting the structure. Likewise, uneven drying due to lack of irrigation can also result in tilting.

Some conditions that may affect foundation performance are difficult to account for in standard foundation design procedures. These include vegetative influence (e.g. tree root zones as noted above), unusual climatological conditions, uncontrolled water sources such as plumbing and sprinkler system leaks, and poor drainage conditions. Such sources of moisture change could cause large shrink/swell movements of the expansive clay that will remain beneath the building and lead to significant distress. If it is desired to virtually eliminate the risk of damage from vertical movement due to these conditions, an option incorporating drilled piers with a suspended slab is recommended.

Recommendations and pertinent design parameters for both shallow foundation and deep foundation systems are presented below. With ground supported foundation/floor systems it is *essential* that measures be taken to assure subgrade moisture stability (see section **10.3 Site Design**) in order to enhance the chances of satisfactory structure performance. Proper site design that prevents water from soaking into the subgrade soils around the building is essential to reduce the potential for excessive movement caused by saturation of foundation soils.

### **6.1 Shallow Spread Footings**

Footings should be designed to bear in firm undisturbed native soil or properly compacted select fill. Isolated footings should have a minimum width of 2 feet and strip footings should be at least 12 inches wide. Footings should be proportioned for the allowable gross bearing pressures summarized in **Table 6.1**, below. The footings should bear at the indicated depths below finished slab subgrade or adjacent exterior grade, whichever is deeper. These allowable pressures incorporate a safety factor relative to shear failure of the soil of about 3 and may be increased up to 33% for intermittent loads such as wind. Predicted total settlement for footing widths less than 6 feet is approximately 1 inch or less (total) and 0.5 inch (differential). Detailed testing for the prediction of long-term settlement due to load for these footings is beyond the scope of this investigation.



Table 6.1 – Gross Allowable Bearing Pressures				
Parcel	Native Soils		Select Fill	
	Isolated Footings	Strip Footings	Isolated Footings	Strip Footings
Parcel 1	800 psf @ 2 ft.	600 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 2 ft.
Parcel 2	1000 psf @ 2 ft.	1000 psf @ 2 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 3	1000 psf @ 2 ft.	1000 psf @ 2 ft.	1000 psf @ 2 ft.	1000 psf @ 2 ft.
Parcel 6	1000 psf @ 2 ft.	500 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 7	3000 psf @ 2 ft.	2500 psf @ 1.5 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 8	800 psf @ 2 ft.	800 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 2 ft.
Parcel 9	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.

### 6.2 Post-Tensioned Slab Design

The information provided below is based on analysis of our field and laboratory test results as well as design procedures given in the Design and Construction of Post-Tensioned Slab-on-Ground - Post-Tensioning Institute Third Edition with 2008 Supplement. We make no warrantee as to the adequacy or applicability of the design procedures given in this manual. These design criteria attempt to account for soil movement due to *normally anticipated climatological fluctuations* and may not entirely accommodate vegetative effects and other unusual situations (noted above). In addition, should the shape factor (SF) of the building slab or foundation exceed 24 as defined by the 2008 manual, PTI recommends limiting the maximum differential movements to 2.0 inches for center lift and 1.0 inch for edge lift. Should the anticipated movements exceed these values, geotechnical approaches should be considered to reduce these predicted movements. Possible methods include, but are not limited to, water injection, lime or chemical injection, removal and replacement with low expansive soil materials or perimeter barriers. Please contact E TTL should evaluation of these methods be necessary. Listed below are parameters for either the post-construction (TMI between -15 and 15) or post-equilibrium case (TMI < -15 or > 15), as recommended by the manual. For the post-construction case, soil moisture fluctuates from very wet to very dry. The post-equilibrium case represents moisture fluctuation from existing to either very wet or very dry.

Table 6.2 – Post Tensioned Slab Design Parameters					
Thorthwaite Moisture Index (TMI) = 45					
Parcel	Weighted Plasticity Index	Edge Moisture Variation Distance, $e_m$		Maximum Differential Soil Movement, $y_m$	
		Center lift (in)	Edge lift (in)	Center lift (in)	Edge Lift (in)
Parcel 1	24	9.0	5.1	0.9	0.1
Parcel 2	39	8.5	5.1	1.3	0.2
Parcel 3	22	8.7	5.1	0.7	0.1
Parcel 6	30	8.7	5.1	0.9	0.1
Parcel 7	42	9.0	5.1	1.6	0.2
Parcel 8	26	8.7	5.1	1.3	0.2
Parcel 9	57	8.0	5.1	2.5	0.4

### 6.3 Drilled Piers

This foundation system consists of drilled and reinforced concrete piers supporting the entire structure that is suspended above the ground when native clay is not removed from beneath the building.

Drilled piers should be founded in undisturbed native soil and should be proportioned using the gross allowable end bearing pressures summarized in **Table 6.3**, below. The depth indicated is below





existing grade. This value may be increased by 33% when considering intermittent loads such as wind or seismic. Shafts should be underreamed to anchor against uplift from expanding soils. Settlement (due to imposed load only) for piers with a sustained full design load is predicted to be 0.5% to 1% of pier tip diameter. The minimum side slope of underreams should be 60 degrees and the maximum ratio of bell to pier diameter should be 3:1.

The foundation units should contain a minimum amount of reinforcement to resist tensile forces caused by soil heave. An adhesive stress of 1,500 psf applied over the portion of the top 10 feet of the pier perimeter *in contact with unprocessed, native expansive clay* should be used to design the pier for uplift due to expanding soils. A minimum pier size of 18 inches is recommended to facilitate proper concrete placement. Further guidelines for the construction of drilled piers are provided in section **10.0 GENERAL CONSTRUCTION CONSIDERATIONS**. Since moisture migration to the base of a drilled shaft (usually along the shaft perimeter surface) could lead to heave, it is especially important that these construction guidelines be followed in order to reduce the risk of such shaft movement.

<b>Location</b>	<b>End Bearing Capacity</b>	<b>Depth (ft.)</b>
Parcel 1	6000 psf	18
Parcel 2	6000 psf	13
Parcel 3	6000 psf	18
Parcel 6	6000 psf	13
Parcel 7	6000 psf	13
Parcel 8	6000 psf	13
Parcel 9	6000 psf	13

### 6.3.1 Uplift Resistance of Belled Shafts

For cases where the top of the bell is at least  $2.5 \cdot d_b$  below the ground surface, ultimate uplift resistance of a belled shaft,  $Q_u$  (kips) may be determined by:

$$Q_u = 7.07 \cdot c \cdot (d_b^2 - d_s^2)$$

Where:

- $c$  = cohesion (ksf) (avg in the zone from the base of the bell to  $2 \cdot d_b$  above the base)
- $d_s$  = diameter of shaft (ft)
- $d_b$  = diameter of bell (ft)

For cases where the top of the bell is shallower than  $2.5 \cdot d_b$  below the ground surface, the ultimate capacity may be assumed to vary linearly from 0 at the ground surface to  $Q_u$  as determined above at  $2.5 \cdot d_b$ .

The ultimate uplift resistance as determined above should be divided by a safety factor (say 2 to 3) and the resultant allowable uplift resistance should be compared to the design uplift load (minus the shaft weight if it is not otherwise accounted for) to verify that the allowable resistance is equal to or greater than the design load (i.e. the uplift load applied at the top of the shaft).

The above procedure is only intended to predict uplift capacity based on the characteristics of the soil surrounding the pier. The designer must verify that the shaft reinforcing (for prevention of detachment of the bell from the shaft) and the thickness of the bell (for prevention of shearing off of the edge of the bell) are also adequate to safely carry the uplift load.



## 7.0 FLOOR SYSTEMS

The floor system for use with a shallow footing option consists of a flat slab on prepared subgrade or a stiffened slab on grade as detailed above. For the drilled pier system, a structurally suspended floor is preferred. However, a flat slab on grade system can be used provided that most of the surficial expansive clays are removed and replaced with select fill. As noted above, this sort of floor is subject to damage from unusual moisture changing conditions.

A flat slab on a prepared subgrade can be considered where the risk of localized differential movements of approximately 1" is acceptable (1" is what is predicted due to normal climatological factors only, not other possible moisture sources). However, overexcavation to remove some of the expansive clay creates a "bathtub" beneath the structure that can have the potential to collect surface drainage (or moisture from other sources such as plumbing leaks) at its base. This water will soak into the deeper, dry clays over time possibly resulting in excessive heave. The pavement surrounding the buildings (where it actually abuts the building and the joint is maintained in a sealed condition), however, will help to maintain a stable moisture content beneath the building by virtually preventing moisture gain or loss from surface drainage, thus lowering the risk of severe movements. The risk of distress due to shrink/swell movement of the native subgrade (caused by normal climatological moisture fluctuation only) prepared as specified below is considered relatively low. That is, shrink/swell movements of the clay that will remain beneath the building, should they occur, are predicted to be small (1") and, thus, resulting distress is predicted to be relatively low.

Some conditions that may affect floor system performance are difficult to account for in standard design procedures. These include vegetative influence (prior, or subsequent to, construction), unusual climatological conditions, uncontrolled water sources such as plumbing and sprinkler system leaks, and poor drainage conditions. If it is desired to virtually eliminate the risk of damage from vertical movement due to these conditions, an option incorporating drilled piers with a suspended slab is recommended.

### 7.1 Flat Slab

This floor system consists of a cast-in-place concrete, unstiffened, flat slab on prepared subgrade (according to Section **8.0 BUILDING SUBGRADE PREPARATION**, below) that is either isolated from, or monolithic with footings and grade beams. Provision should be made to account for the fact that a heavily loaded foundation element, which is monolithic with an unloaded slab, may result in significant stress in the transition zone between the unloaded slab and the foundation element. Reinforcing in the slab is used primarily to control shrinkage.

Where a slab is to be placed on grade, we recommend that the subgrade be prepared to reduce the PVR to 1 inch or less. Removal of some of the expansive clay from the zone where the soil moisture tends to fluctuate seasonally is predicted to reduce the potential swelling movement due to normal climatological fluctuation of moisture content of the clay that remains in that zone to less than 1 inch (See **BUILDING SUBGRADE PREPARATION** section 8.0, below).

Where some or all of the native clay remains beneath a ground supported floor system, it is *essential* that measures be taken to assure subgrade moisture stability (see **Site Design** section 10.3) in order to enhance the chances of satisfactory structure performance. Provision should be made to account for the possibility of significant differential movement between the main structure and driveways, sidewalks, and any other structure, which are not placed on subgrade prepared as for the building. Proper site design that prevents water from soaking into the subgrade soils around the building and appurtenances (i.e. provides for rapid runoff away from them) is *essential* to reduce the potential for



excessive movement caused by saturation of foundation soils and should help limit differential movement between soil supported elements and the main building.

## **7.2 Structurally Suspended Slab**

The most positive means of eliminating the effects of vertical subgrade movements on the structure is to structurally suspend the entire floor system (including grade beams) as well as all other non-load bearing elements between drilled piers and above the ground. This may be accomplished via the use of void forms upon which a structurally reinforced concrete slab is placed, or may take the form of a structurally framed floor system above a crawl space. Where a "skirt" encloses a crawl space it should be supported on a concrete grade beam that is designed to span between drilled piers and is isolated from the ground with 10" thick void boxes. Any appurtenances attached to the structure such as stairs or decks should also be suspended above a void space and supported on piers. Soil retainers at the edges of voids are recommended to prevent soil from migrating into the void space.

The void space created beneath the floor system should be sealed so that it does not collect surface drainage. Where there is a crawl space created beneath the floor system the floor of the crawl space should be graded so that it does not collect surface drainage. The base of the space should be higher than the surrounding ground to reduce the chances that water will collect in it. Where this is not possible, grading of the space to a drain is recommended. Planting beds adjacent to the structure should be contained in leak proof boxes or a horizontal moisture barrier should be used in conjunction with them in order to protect the building subgrade from water infiltration (from sources such as sprinkler systems). Backfill adjacent to the structure should be properly compacted native clay soil sloped away from the structure at a 5% slope (minimum) to help limit surface infiltration.



<b>Table 7.1 – Comparison of Foundation Options</b>		
<b>Foundation Option</b>	<b>Advantages</b>	<b>Disadvantages</b>
Drilled Piers (with structurally suspended slab)	Isolated from potential expansive clay movements  Minimal subgrade preparation	Expensive.
Drilled Piers (with a monolithic or isolated flat slab on overexcavated subgrade)	Potentially lower cost  Risk of damage to pier supported elements very low.	Requires some overexcavation to remove a significant portion of expansive clay.  Slab and slab supported elements subject to damage from subgrade movement due to soil moisture change (Risk of significant damage is low and is primarily related to unusual water sources such as plumbing leaks and surface water infiltration)
Shallow spread footings (with a monolithic or isolated flat slab)	Ease of installation  Potentially lower cost.	Requires some overexcavation to remove a significant portion of expansive clay.  Structure, slab and slab supported elements subject to damage from subgrade movement due to soil moisture change (Risk of significant damage is low and is primarily related to unusual water sources such as plumbing leaks and surface water infiltration)
Stiffened Slab (monolithic with shallow footings)	Ease of installation  Lower risk of foundation distress than flat slab for identical subgrade preparation  Minimal subgrade preparation	Potentially more expensive than spread footings with a flat slab  Subject to damage and/or tilt from subgrade movement due to unusual and/or uneven wetting or drying conditions

## 8.0 BUILDING SUBGRADE PREPARATION

In order to validate the design assumptions given above regarding allowable foundation loads, and, in order to provide a serviceable floor system (within the limitations stated above), it is imperative that the subgrade of the building be properly prepared. Special subgrade preparation (other than grading for drainage beneath and around the building) is not required for the suspended slab option. The following procedures are recommended as a minimum:

- Remove any surficial vegetation, wood chips and topsoil. Where trees are removed (or have been removed in the last year) from the slab area, the entire root zone should be cut out and



replaced with select fill. Root zones tend to be comprised of highly desiccated soil, which, if left in place, are prone to significant swelling later on, resulting in heaving of the slab. Verify that all stump holes are backfilled with properly compacted select fill.

- The following *minimum* overexcavation is required for the specific option chosen. Limits of overexcavation should extend beyond building and/or footing lines a distance of 5'. Options are listed in order of increasing risk of damage due to foundation movement.
  - *Drilled piers with suspended slab* - Grade void space beneath floor to drain.
  - *Drilled piers with grade beams and floor slab on prepared subgrade* - Native expansive clay soils are to be removed and replaced with select fill. Overexcavate to the depths below existing grade shown in **Table 8.1** below in order to reduce the PVR to 1 inch or less.
  - *Shallow spread footings with monolithic flat slab* - Overexcavate to the depths below existing grade shown in **Table 8.1** below in order to reduce the PVR to 1 inch or less.
  - *Shallow spread footings with monolithic stiffened slab placed on grade* – None required
- Scarify the exposed subgrade to a depth of 8 inches, adjust the moisture content to, and maintain it within a range of optimum to optimum +3% and recompact to a minimum density of 95% of the maximum density defined by ASTM D 698 (Standard Proctor). *Maintain specified moisture content until subgrade is covered with fill or slab.*
- Place select fill to finished slab subgrade. Specifications for the placement of select fill are covered in section **10.4 Select Fill**.

A durable moisture barrier should be provided between the concrete building slab and the underlying soil subgrade. An intact membrane installation with lapped and sealed joints and which is repaired if damaged during construction will help to inhibit moisture migration from the subgrade through the slab.

<b>Table 8.1 – Recommended Undercut Depth</b>	
<b>Location</b>	<b>Depth (ft.)</b>
Parcel 1	3 – 6
Parcel 2	6 – 8
Parcel 3	1 – 3
Parcel 6	6.5 – 7.5
Parcel 7	6
Parcel 8	4 – 7
Parcel 9	7 – 8

## **9.0 PAVEMENT RECOMMENDATIONS**

General recommendations for the design of *minimal* pavement structures are provided herein for your information. A more detailed pavement analysis would require additional laboratory tests on bulk samples of the materials to be used in pavement construction and is beyond the scope of this





investigation. A summary of proposed designs is provided in **Table 9.1**, **Table 9.2** and **Table 9.3** below.

### **9.1 Pavement Subgrade Preparation**

As a minimum, strip the native subgrade to remove topsoil and other deleterious materials. Cut to the proposed subgrade elevation as required. After all cutting to finished subgrade has been performed, the exposed soils should be examined and tested by a representative of E TTL to detect areas of expansive clay or other unsuitable soil conditions that need to be cut out and replaced. Tree root zones often contain highly desiccated, highly plastic soil that eventually results in heaving after a period of rewetting. The only way to limit this potential is to remove these zones and replace them with select fill. The heaving effect can be reduced with good pavement drainage and maintenance. If this is not feasible, then future additional pavement maintenance will probably be necessary. Verify that all stump holes as well as areas disturbed by demolition activity, if any, are cut out and backfilled with properly compacted select fill. Positive surface drainage should be provided at all times during construction (especially in low areas) to maintain pavement subgrade in a dry and stable condition.

#### **9.1.1 Unsuitable Subgrade Soil**

Where the exposed subgrade is found to consist of soil with a  $PI > 20$ , cut out the plastic clay to an elevation equal to finished subgrade minus 12", or deeper if necessary to expose stable ground (as determined by proof rolling as specified below). Scarify the exposed soil to a depth of 8", adjust the moisture content to within a range of optimum to optimum +3% and recompact to a minimum density of 95% of ASTM D698 (standard proctor). Lime treatment, in accordance with section **9.1.3 Lime Treated Subgrade**, is an alternative to removal and replacement.

#### **9.1.2 Suitable Subgrade Soil**

Where exposed native soil consists of a soil with a  $PI < 20$ , it should be proof rolled in accordance with TxDOT Item 216 (with the exception of roller size). The use of a fully loaded dump truck is recommended. Areas, which prove unstable should be cut out and replaced as directed by a representative of this firm. Scarify the exposed soil to a depth of 8", adjust the moisture content to within a range of optimum to optimum +3% and recompact to a minimum density of 95% of ASTM D698 (standard proctor).

#### **9.1.3 Lime Treated Subgrade**

In areas where the subgrade soils consist of expansive clays ( $PI > 20$ ), lime treatment is recommended. Lime treatment of subgrade should be in accordance with Item 260, "Lime Treatment for Materials Used as Subgrade (Road Mixed)," Texas Department of Transportation *Standard Specifications for Construction of Highways, Streets and Bridges*, 2004 Edition with the following exceptions:

- Under article 260.4 (4), "Application," the rate of lime to be applied can be estimated as 40 pounds per square yard worked into the top 8 inches of finished subgrade. *The actual amount of lime to be used should be based on tests of lime soil mixtures conducted prior to treatment.* Quicklime, if used, must be hydrated before mixing into the soil.
- The modified subgrade should be compacted under article 260.4 (6) (b), "Density Control," except that it shall be compacted to 95% of Standard Proctor Density (ASTM D698) *at a moisture content well above optimum* to allow for the drying action of the lime.
- Curing procedures should be strictly followed. Traffic on the treated subgrade should be kept to a minimum during curing.



- Prior to use by significant traffic, the treated subgrade should be covered with base, concrete or some temporary wearing surface to avoid degradation.

#### 9.1.3.1 Alternatives to Lime Treatment

For the flexible pavement option (only) placing a geogrid (Tensar TX 140, no substitute) on the native subgrade prior to placing base material will serve as a substitute for lime treated subgrade. For the full depth HMAC section, lime treatment of the subgrade may be omitted if the thickness of pavement surface specified is increased by 1". For the rigid pavement option (concrete) increase the recommended thickness by 0.5" where lime treatment is omitted.

#### 9.1.4 Fill Construction

Fill to be placed which is below an elevation of finished subgrade minus 18" may consist of any soil and should be compacted to a minimum density of 95% ASTM D698 (standard proctor) at a moisture content within the range of optimum to optimum + 3%. The top 18" of finished subgrade should consist of a select material with the following properties: a PI  $\leq 15$ , a liquid limit  $\leq 35$  and a percentage passing the #200 sieve  $< 40\%$ .

#### 9.1.5 Stability of Finished Subgrade

The stability of the finished subgrade should be verified by proof rolling (as specified above) prior to placing base material or surfacing. Unstable areas will need to be cut out and reworked.

### 9.2 Light-Duty Pavements

#### 9.2.1 Flexible Pavement

The minimum pavement section (and a section commonly used) for light-duty driveways and parking areas consists of 6 inches of crushed stone base with 2 inches of hot mix asphaltic concrete (HMAC). Crushed stone base should comply with Type A, Grade 2, Item 247 of the *Texas Department of Transportation (TxDOT) 2004 Standard Specifications for Construction of Highways, Streets and Bridges*. Compaction of the stone base should be to a minimum of 95 percent of ASTM D 1557 (modified proctor) maximum density at optimum moisture  $\pm 3$  percent. Asphaltic concrete surfacing should comply with the requirements of Type D, Item 340 of the TxDOT Specifications and should be compacted to a density of 92 to 94 percent of maximum theoretical density.

#### 9.2.2 Full Depth Asphalt

The **minimum** full depth asphalt pavement section consists of 3 inches of hot mixed asphaltic concrete binder course (Type B) with 2 inches of hot mixed asphaltic concrete surfacing (Type D). Asphaltic concrete surfacing should comply with the requirements of Type D, Item 340 of the TxDOT Specifications and the asphaltic concrete binder should comply with the requirements of Type B, Item 340. All HMAC should be compacted to a density of 92 to 94 percent of maximum theoretical density.

#### 9.2.3 Rigid Pavement

The performance of concrete pavement is dependent on many factors including weight and frequency of traffic, subgrade conditions, concrete quality (which itself is dependent on a host of factors), joint type and layout, jointing procedures, and numerous construction practices. A detailed discussion of all of these items is beyond the scope of this report. By way of general guidance, the following recommendations are offered:

- Minimum concrete compressive strength of 3,500 psi at 28 days placed with a water/cement ratio of 0.45 or less. The mix should contain 4% - 6% entrained air for durability.



- Minimum pavement thickness of 5 inches.
- Sawcut or preformed control joints at maximum spacing of 12 feet each way. Layout of joints should form basically square panels. Timing of the cutting of joints is critical to their performance and generally should be within 4 - 18 hours of concrete placement. *Sealing of joints and cracks and maintenance of the seal are critical for satisfactory performance.*
- Adequate site drainage to prevent ponding on or near the pavement.
- Cure concrete via use of liquid membrane curing compound.
- Concrete quality should be controlled and jointing properly executed. Minimum reinforcement should consist of 6 x 6 No. 6 welded wire fabric or No. 3 at 18 inches each way and should not be continuous through control joints.
- All edges of pavement should be thickened to 9 inches (transitioning back to 5 inches over a minimum distance of 3 feet).
- Allow a minimum of 7 days curing time before permitting traffic on the pavement.

The reader is referred to the American Concrete Institute Publication No. ACI 330R, *Guide for Design and Construction of Concrete Parking Lots* for more detailed information.

### **9.3 Medium-Duty Pavements**

#### **9.3.1 Flexible Pavement**

For areas that will be subject to trash or delivery truck parking and traffic, the minimum recommended flexible pavement section consists of 8 inches of crushed stone base and 3 inches of asphaltic concrete surfacing. The 3 inches of surfacing may be composed of fine-graded surface course (Type D) or coarse-graded surface course (Type C). Paving materials should be specified as discussed previously.

#### **9.3.2 Full Depth Asphalt**

For a medium-duty full depth asphalt section, the minimum recommended section is 6 inches of HMAC paving consisting of 2 inches wearing surfacing (Type D) over 4 inches of asphaltic binder (Type B). Paving materials should be specified as discussed previously.

#### **9.3.3 Rigid Pavement**

Recommendations for medium-duty concrete paving are the same as for light duty except that 6 inches of portland cement concrete should be considered the minimum pavement section and the edges should be thickened to 9 inches.

### **9.4 Heavy-Duty Pavements**

#### **9.4.1 Flexible pavement**

For areas that will be subject to heavy truck parking and traffic, the *minimum recommended* flexible pavement section consists of 7 inches of crushed stone base and 4.5 inches of asphaltic concrete surfacing. The 4.5 inches of surfacing may be composed of 2 inches of fine-graded surface course (Type D) wearing surfacing overlying 2.5 inches of coarse-graded surface course (Type C). Paving materials should be specified as discussed previously.





### 9.4.2 Full Depth Asphalt

For a heavy duty full depth asphalt section, the minimum recommended section is 7.5 inches of HMAC paving consisting of 2 inches of hot mixed asphaltic concrete surfacing (Type C or D) over 5.5 inches of asphaltic concrete base course (Type A or B). Paving materials should be specified as discussed previously.

### 9.4.3 Rigid pavement

Recommendations for heavy-duty concrete paving are the same as for light duty except that 7 inches of Portland cement concrete should be the minimum pavement section and the edges should be thickened to 9 inches.

Table 9.1 – Pavement Options – Light Duty			
Type	Base/Surface Thickness		Subgrade Preparation
Flexible HMAC	2" Surface (Type D)	6" Crushed Stone Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" HMAC Surface (Type D)	3" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	5" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill

Table 9.2 – Pavement Options – Medium Duty			
Type	Base/Surface Thickness		Subgrade Preparation
Flexible HMAC	3" Surface (Type C or D)	8" Crushed Stone Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" Surface (Type C or D)	4" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	6" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill



Table 9.3 – Pavement Options – Heavy Duty			
Type	Base/Surface Thickness		Subgrade Preparation
Flexible HMAC	2" Surface (Type C or D)	7" Crushed Stone Base & 2.5" HMAC Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" Surface (Type C or D)	5.5" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	7" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill

**Notes:**

- 1) Tensor Triax Geogrid placed on subgrade may be substituted for lime treatment of subgrade. Lime treatment or replacement with select fill only needed where expansive clay is encountered within 12" of finished subgrade as determined by a representative of this firm.
- 2) Increase HMAC thickness by 1" in lieu of lime treated subgrade
- 3) Increase concrete thickness by 0.5" in lieu of lime treated subgrade

## 10.0 GENERAL CONSTRUCTION CONSIDERATIONS

The surficial soils in several areas may become unstable when wet necessitating remediation or removal and replacement to facilitate construction.

### 10.1 Shallow Footings

All footing excavations should be inspected by qualified personnel to insure that subgrade is composed of firm, undisturbed native soil or properly compacted select fill as recommended in this report. Water and/or loose material in footing excavations should be removed prior to final shaping of the footing excavation and placement of concrete.

### 10.2 Drilled Piers

Personnel familiar with the installation of drilled foundations should monitor construction of all foundation units. As a minimum, a representative of this firm should be present before and during construction in order to verify the founding stratum and to insure that the base of excavation is firm and undisturbed. Free water and/or loose material at the base of excavations should be removed prior to placement of concrete.

Groundwater observations indicate that shaft tip depth will not be below the water table and that dry method of construction should be feasible. Temporary casing and/or slurry drilling procedures could be required however. In any case, it is recommended that contract documents provide alternates with or without casing and dry or slurry displacement construction procedures.

Concrete should be designed to be highly workable (slump of 7 inches to 9 inches) and should be placed at each drilled pier location as soon as possible after the completion of drilling. Also, to insure proper construction of the drilled piers at this site, close coordination between the drilling and concreting operations is considered to be of primary importance. In no case should a shaft remain open overnight.

*Construction documents must specify that all piers should be constructed in accordance with ACI 336.1 "Standard Specification for the Construction of Drilled Piers," latest edition. Only contractors familiar with and competent in the employment of these methods should be considered for the work.*



*The actual capacity of the completed drilled pier is directly related to the degree of conformance to correct construction procedures.*

### **10.3 Site Design**

The following recommendations are derived from years of experience with structures founded on expansive soils and are considered essential to satisfactory structure performance, especially where the floor slab is to be placed on grade:

- Sidewalks should be sloped away from buildings and should not be tied to the structures. The joint between the sidewalk and the foundation should be sealed. Sidewalks should not impound water adjacent to the structure. Potential heave of native ground adjacent to the structure needs to be taken into consideration when constructing the walk so as to avoid a sidewalk which impounds water adjacent to the structure.
- The ground surface around the building as well as paved areas should be sloped away from the building on all sides so that water will drain away from the structure. A minimum slope of 5% is recommended for the area 10 feet wide immediately adjacent to the structure. Drainage swales should have a minimum longitudinal slope of 2%. Roof drainage should be conveyed by an appropriate means for a distance of at least 15 feet from the building before it is allowed to drain into the subgrade. Water should not be allowed to pond near the building after the floor system has been placed.
- Trees should not be closer than their mature height to the structure and shrubbery should not be planted adjacent to the building unless they can be contained in watertight planter boxes and irrigation water can be prevented from seeping into the subgrade around the building. A horizontal moisture barrier (e.g. Mirafi 1212 reinforced polyethylene permanently sealed to the foundation edge at the ground line and sloped away from the building) and placed beneath planting beds is an alternative to planter boxes provided it is maintained in a watertight condition (i.e., joints sealed and punctures repaired). Planting bed edging should not impound water. A root barrier around the entire structure perimeter will provide some added assurance against desiccation of the soil due to roots growing beneath the structure. Periodic root pruning may be required to limit drying of soils beneath foundations due to vegetation. *Over irrigation adjacent to the structure can cause an increase in subsurface moisture contents that could lead to heaving.*
- To help limit surface water infiltration beneath the structure, backfill in the area 10 feet wide adjacent to the structure should be native lean or fat clay soil compacted to a minimum density of 95% of ASTM D 698 (Standard Proctor) at a moisture content of optimum or above. This zone should be at least 2 feet thick. This backfill is not necessary where pavement abuts the structure and the joint is sealed.
- Backfill for utility line ditches should be carefully controlled and should consist of a relatively impermeable material (clayey sand or lean clay), especially in the area beneath and immediately outside of the structure. Old utility lines should be removed from beneath the structure. Fill in new or old utility trenches should be placed to the same specifications as select fill. The top 6 inches under paving should be compacted to a density equal to that specified for the pavement subgrade.
- Utility connections to the building should be flexible to allow for anticipated soil movements that will be different than the anticipated movement of the structure to which they are connected (e.g. where a suspended slab is used).



#### 10.4 Select Fill

Select fill shall consist of homogeneous soils (i.e. not sand with clay lumps) free of organic matter and rocks larger than 6 inches in diameter and possessing an Atterberg PI of 8 to 18, with a liquid limit of 40 or less. Atterberg limits testing of the fill at a rate of 1 test per 500 cubic yards of fill (and as visual changes occur) placed is recommended to verify that fill specifications are met. The material should be placed in the following manner:

- Prepare the subgrade in accordance with the recommendations discussed in a previous section of this report entitled **BUILDING SUBGRADE PREPARATION**. Sites that slope more than about 15% should be benched with 5-foot wide benches prior to placing fill.
- Place subsequent lifts of select fill in thin, loose layers not exceeding nine inches in thickness to the desired rough grade and compact to a minimum of 95% of the maximum density defined by ASTM D 698. Maintain moisture within a range of optimum -1% to optimum +3%. Where the total fill depth exceeds 6 feet beneath any portion of a structure, all fill should be compacted to a minimum of 100% of the maximum density defined by ASTM D 698.
- Conduct in-place field density tests at a rate of one test per 3,000 square feet for every lift with a minimum of 2 tests per lift. **Density testing is essential to assure that the soil, which supports the structure, is properly placed.**
- Prevent excessive loss of moisture during construction.
- For select fill placed above the existing groundline, extend the lateral limits of the fill at least 5 feet beyond the perimeter of the building area, transitioning back to the existing groundline on a 3:1(horizontal/vertical) slope.

#### 11.0 LIMITATIONS

Geotechnical design work is characterized by the presence of a calculated risk that soil and groundwater conditions may not have been fully revealed by the exploratory borings. This risk derives from the practical necessity of basing interpretations and design conclusions on a limited sampling of the subsoil stratigraphy at the project site. The number of borings and spacing is chosen in such a manner as to decrease the possibility of undiscovered anomalies, while considering the nature of loading, size and cost of the project. The recommendations given in this report are based upon the conditions that existed at the boring locations at the time they were drilled. The term "existing groundline" or "existing subgrade" refers to the ground elevations and soil conditions at the time of our field operations.

It is conceivable that soil conditions throughout the site may vary from those observed in the exploratory borings. If such discontinuities do exist, they may not become evident until construction begins or possibly much later. Consequently, careful observations by the geotechnical engineer must be made of the construction as it progresses to help detect significant and obvious deviations of actual conditions throughout the project area from those inferred from the exploratory borings. Should any conditions at variance with those noted in this report be encountered during construction, this office should be notified immediately so that further investigations and supplemental recommendations can be made.



Construction plans and specifications should be submitted to E TTL for review prior to issuance for construction to help verify that the recommendations of this report have been correctly understood and implemented.

This company is not responsible for the conclusions, opinions, or recommendations made by others based on the contents of this report. The recommendations made in this report are applicable only to the proposed scope of work as defined in **SECTION 2.0 PROJECT DESCRIPTION** and may not be used for any other work without the express written consent of E TTL Engineers. The purpose of this study is only as stated elsewhere herein and is not intended to comply with the requirements of 30 TAC 330 Subchapter T regarding testing to determine the presence of a landfill. Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. No warranties are either expressed or implied.







# Design Maps Detailed Report

2012 International Building Code (33.4526°N, 94.26929°W)

Site Class D – “Stiff Soil”, Risk Category I/II/III

## Section 1613.3.1 – Mapped acceleration parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain  $S_s$ ) and 1.3 (to obtain  $S_1$ ). Maps in the 2012 International Building Code are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 1613.3.3.

From **Figure 1613.3.1(1)**<sup>[1]</sup>

$$S_s = 0.140 \text{ g}$$

From **Figure 1613.3.1(2)**<sup>[2]</sup>

$$S_1 = 0.077 \text{ g}$$

## Section 1613.3.2 – Site class definitions

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Section 1613.

2010 ASCE-7 Standard – Table 20.3-1  
SITE CLASS DEFINITIONS

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
Any profile with more than 10 ft of soil having the characteristics: <ul style="list-style-type: none"> <li>• Plasticity index <math>PI &gt; 20</math>,</li> <li>• Moisture content <math>w \geq 40\%</math>, and</li> <li>• Undrained shear strength <math>\bar{s}_u &lt; 500</math> psf</li> </ul>			
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

$$\text{For SI: } 1\text{ft/s} = 0.3048 \text{ m/s } 1\text{lb/ft}^2 = 0.0479 \text{ kN/m}^2$$

**Section 1613.3.3 — Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters**

TABLE 1613.3.3(1)  
VALUES OF SITE COEFFICIENT  $F_s$

Site Class	Mapped Spectral Response Acceleration at Short Period				
	$S_s \leq 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of  $S_s$ .

**For Site Class = D and  $S_s = 0.140$  g,  $F_s = 1.600$**

TABLE 1613.3.3(2)  
VALUES OF SITE COEFFICIENT  $F_1$

Site Class	Mapped Spectral Response Acceleration at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of  $S_1$ .

**For Site Class = D and  $S_1 = 0.077$  g,  $F_1 = 2.400$**

**Equation (16-37):**

$$S_{H5} = F_b S_b = 1.600 \times 0.140 = 0.223 \text{ g}$$

---

**Equation (16-38):**

$$S_{M1} = F_v S_1 = 2.400 \times 0.077 = 0.185 \text{ g}$$

---

#### Section 1613.3.4 — Design spectral response acceleration parameters

**Equation (16-39):**

$$S_{D5} = \frac{2}{3} S_{H5} = \frac{2}{3} \times 0.223 = 0.149 \text{ g}$$

---

**Equation (16-40):**

$$S_{M1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.185 = 0.123 \text{ g}$$

---

## Section 1613.3.5 – Determination of seismic design category

TABLE 1613.3.5(1)

SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD (0.2 second) RESPONSE ACCELERATION

VALUE OF $S_{Ds}$	RISK CATEGORY		
	I or II	III	IV
$S_{Ds} < 0.167g$	A	A	A
$0.167g \leq S_{Ds} < 0.33g$	B	B	C
$0.33g \leq S_{Ds} < 0.50g$	C	C	D
$0.50g \leq S_{Ds}$	D	D	D

For Risk Category = I and  $S_{Ds} = 0.149g$ , Seismic Design Category = A

TABLE 1613.3.5(2)

SEISMIC DESIGN CATEGORY BASED ON 1-SECOND PERIOD RESPONSE ACCELERATION

VALUE OF $S_{D1}$	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and  $S_{D1} = 0.123g$ , Seismic Design Category = B

Note: When  $S_1$  is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

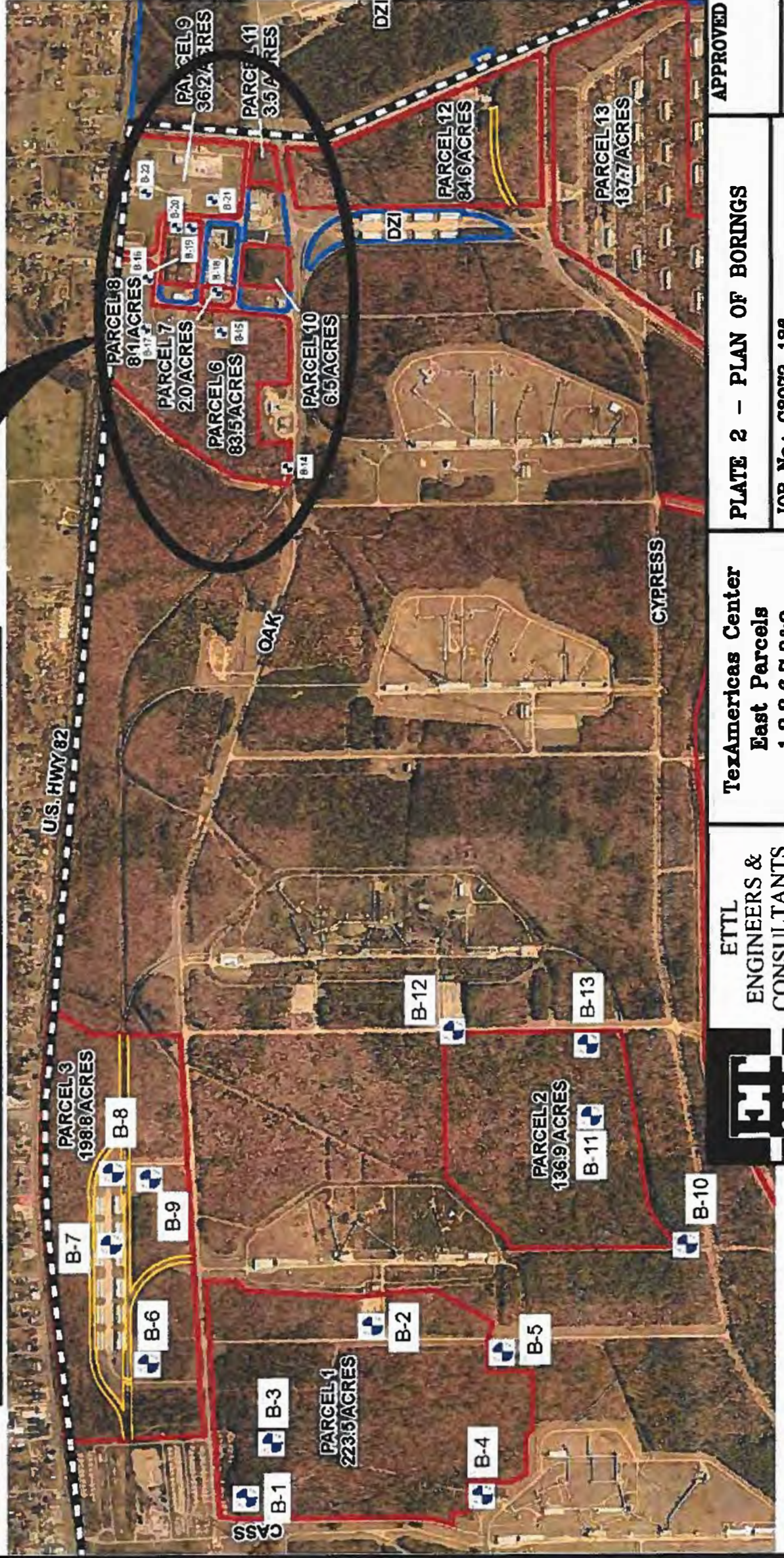
Seismic Design Category  $\equiv$  "the more severe design category in accordance with Table 1613.3.5(1) or 1613.3.5(2)" = B

Note: See Section 1613.3.5.1 for alternative approaches to calculating Seismic Design Category.

### References

1. Figure 1613.3.1(1): [http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(1\).pdf](http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(1).pdf)
2. Figure 1613.3.1(2): [http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(2\).pdf](http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(2).pdf)





**ETTL**  
**ENGINEERS & CONSULTANTS**  
MAIN OFFICE  
1717 East South  
York, PA 17402  
(717) 325-4421

**TexAmericas Center**  
**East Parcels**  
**1,2,3,6,7,8&9**  
**Hooks, Texas**

**PLATE 2 - PLAN OF BORINGS**

**JOB No.: G3972-138**

**DATE: July 2013**

**SCALE: N.T.S.**

**APPROVED BY:**

**DRAWN BY:**  
RWG







**ETTL  
ENGINEERS &  
CONSULTANTS**

MAIN OFFICE  
1717 East Erwin  
Tyler, Texas 75702  
(903) 595-4421

**MATERIAL DESCRIPTION**

±1' SILT WITH GRAVEL (ML) tan  
SILTY CLAYEY SAND (SC-SM) medium  
dense; tan  
LEAN CLAY WITH SAND (CL) medium  
stiff; red and gray

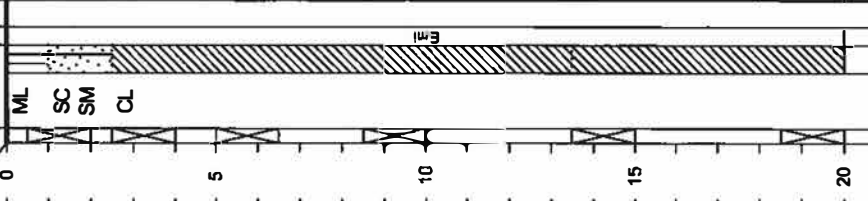
--very stiff

LEAN CLAY (CL) stiff; tan and gray

--very stiff

Bottom of Boring @ 20'

USC	WATER LEVEL
ML	GEOLOGIC UNIT
SC	
SM	
CL	



**LOG OF BORING B-1**

PROJECT: TexAmericas Center - East Parcels DRILL RIG: Truck Rig  
Preliminary Investigation  
New Boston, TX

PROJECT NO.: G3972-136

BORING TYPE: Flight Auger

DATE: 6/24/13

SURFACE ELEVATION

ATTERBERG LIMITS (%) SIEVE ANALYSIS SWELL TEST

FIELD STRENGTH DATA	BLOW COUNT	DRY DENSITY (pcf)	COMPRESSION STRENGTH (tsf)	COMPRESSION STRENGTH (tsf)	MOISTURE CONTENT (%)	Natural Moisture Content and Atterberg Limits		LIQUID LIMIT (PL)	PLASTICITY INDEX (PI)	MINUS #200 SIEVE (%)	PLUS #40 SIEVE (%)	PLUS #4 SIEVE (%)	DRY DENSITY (pcf)	FREE SWELL (%)	ZERO SWELL PRESSURE (psf)	MOISTURE CONTENT (%)
						Plastic Limit	Liquid Limit									
N=11	1	1.0	1.0	1.0	6	20	20	20	13	39	39	17				
N=7	2	1.0	1.0	1.0	17	42	42	17	25	74	74	0				
N=16	3	1.0	1.0	1.0												
N=20	4	1.0	1.0	1.0												
N=12		1.0	1.0	1.0												
N=24		1.0	1.0	1.0												

Notes:

Key to Abbreviations:

- N - SPT Data (Blow/Ft)
- P - Pocket Penetrometer (tsf)
- T - Tonvane (tsf)
- L - Lab Vane Shear (tsf)

Est.  Measured:  Perched:

Dry and open upon completion.

Water Level  
Water Observations:

GPS Coordinates: N33.46064°, W94.28807°

Driller: J. Lewis

Logger: J. Lewis



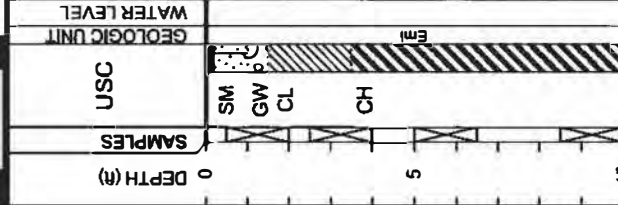
**ETTL  
ENGINEERS &  
CONSULTANTS**

MAIN OFFICE  
1717 East Erwin  
Tyler, Texas 75702  
(903) 585-4421

**MATERIAL DESCRIPTION**

2" ASPHALT  
SILTY SAND WITH GRAVEL (SM) red  
WELL GRADED GRAVEL  
LEAN CLAY (CL) medium stiff; gray  
FAT CLAY (CH) stiff; tan and gray

Bottom of Boring @ 10'



Water Level  
Water Observations:  
Elev. Measured: Perched:

Dry and open upon completion.

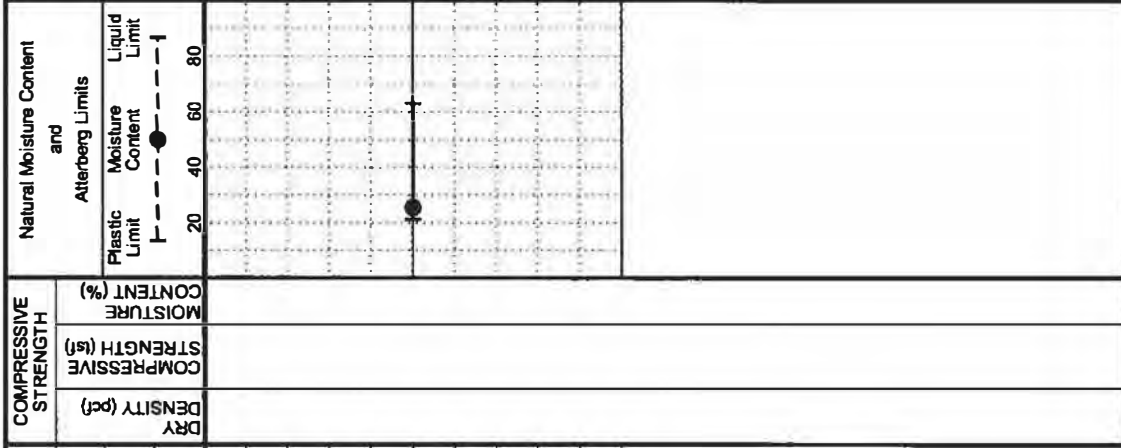
**LOG OF BORING B-2**

PROJECT: TexAmericas Center - East Parcels DRILL RIG: Truck Rig  
Preliminary Investigation  
New Boston, TX  
PROJECT NO.: G3972-136 BORING TYPE: Flight Auger

DATE  
6/24/13

**SURFACE ELEVATION**

ATTERBERG LIMITS (%)	SIEVE ANALYSIS	SWELL TEST	SURFACE ELEVATION						
			PLASTIC LIMIT	LIQUID LIMIT	PLASTICITY INDEX	DRY DENSITY (pcf)			
25	PLUS #200 SIEVE (%) MINUS #40 SIEVE (%) PLUS #4 SIEVE (%)	FREE SWELL (%) ZERO SWELL PRESSURE (psf) MOISTURE CONTENT (%)	25	63	21	42	92	1	0



FIELD STRENGTH DATA	BLOW COUNT	DRY DENSITY (pcf)	COMPRESSION STRENGTH (tsf)	COMPRESSION STRENGTH (tsf)	MOISTURE CONTENT (%)	Natural Moisture Content and Atterberg Limits	
						Plastic Limit	Liquid Limit
N=5	Qu (tsf) 1, 2, 3, 4 PPR (tsf) 1.0, 2.0, 3.0, 4.0 Tonvane (tsf) 1.0, 2.0, 3.0, 4.0						
N=7							
N=9							
N=14							

Key to Abbreviations:  
N - SPT Data (Blows/Ft)  
P - Pocket Penetrometer (tsf)  
T - Tonvane (tsf)  
L - Lab Vane Shear (tsf)

Noise  
GPS Coordinates  
N33.45604°, W94.28106°  
Driller: J. Lewis  
Logger: J. Lewis



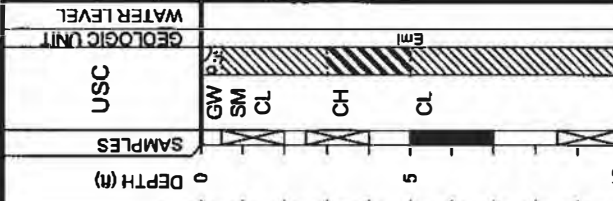
**ETTL  
ENGINEERS &  
CONSULTANTS**

MAIN OFFICE  
1717 East Erwin  
Tyler, Texas 75702  
(903) 595-4421

**MATERIAL DESCRIPTION**

4" WELL GRADED GRAVEL (GW)  
45" SILTY SAND (SM) tan  
SANDY LEAN CLAY (CL) stiff, gray and tan  
FAT CLAY (CH) very stiff, red and gray  
SANDY LEAN CLAY (CL) very stiff, tan and gray  
--stiff

Bottom of Boring @ 10'



**LOG OF BORING B-3**

PROJECT: TexAmericas Center - East Parcels DRILL RIG: Truck Rig  
Preliminary Investigation  
New Boston, TX  
PROJECT NO.: G3972-136 BORING TYPE: Flight Auger

DATE  
6/26/13

**SURFACE ELEVATION**

ATTERBERG LIMITS(%) SIEVE ANALYSIS SWELL TEST

FIELD STRENGTH DATA	BLOW COUNT	COMPRESSIONIVE STRENGTH (tsf)	DRY DENSITY (pcf)	COMPRESSIONIVE STRENGTH (tsf)	MOISTURE CONTENT (%)	Natural Moisture Content and Atterberg Limits		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX	MINUS #200 SIEVE (%)	PLUS #40 SIEVE (%)	PLUS #4 SIEVE (%)	DRY DENSITY (pcf)	FREE SWELL (%)	ZERO SWELL PRESSURE (psf)	MOISTURE CONTENT (%)
						Plastic Limit	Liquid Limit										
N=13	1.0	2.0	3.0	4.0	15	26	14	12	12	68	6	2					
N=13	1.0	2.0	3.0	4.0	16	38	17	21	69	10	3						
P=3.5 P=3.0	1.0	2.0	3.0	4.0													
N=12	1.0	2.0	3.0	4.0													

Key to Abbreviations:  
N - SPT Data (Blow/Ft)  
P - Pocket Penetrometer (tsf)  
T - Torvane (tsf)  
L - Lab Vane Shear (tsf)

Notes:  
GPS Coordinates  
N33.46009°, W94.28519°  
Driller  
J. Lewis  
Logger  
J. Lewis

Water Level  
Water Observations:  
Est. Measured:  Perched   
Dry and open upon completion.



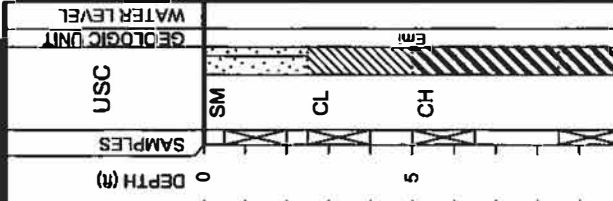
**ETTL  
ENGINEERS &  
CONSULTANTS**

MAIN OFFICE  
1717 East Erwin  
Tyler, Texas 75702  
(903) 595-4421

**MATERIAL DESCRIPTION**

**SILTY SAND(SM)** loose; brown  
**LEAN CLAY WITH SAND(CL)** stiff; tan and gray  
**FAT CLAY(CH)** very stiff; tan and gray  
**FAT CLAY WITH GRAVEL(CH)** very stiff; tan and gray

Bottom of Boring @ 10'



**DATE**  
6/24/13

**SURFACE ELEVATION**

**PROJECT:** TexAmericas Center - East Parcels  
Preliminary Investigation  
New Boston, TX  
**PROJECT NO.:** G3972-136

**DRILL RIG:** Truck Rig

**BORING TYPE:** Flight Auger

FIELD STRENGTH DATA	BLOW COUNT ● 20 40 60 80 ▲ Qu (tsf) 1 2 3 4 ■ PPR (tsf) 1.0 2.0 3.0 4.0 ◆ Torvane (tsf) 1.0 2.0 3.0 4.0	DRY DENSITY (pcf)	COMPRESSION STRENGTH (tsf)	COMPRESSION STRENGTH (tsf)	MOISTURE CONTENT (%)	Natural Moisture Content and Atterberg Limits		LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MINUS #200 SIEVE (%)	PLUS #40 SIEVE (%)	PLUS #4 SIEVE (%)	DRY DENSITY (pcf)	FREE SWELL (%)	ZERO SWELL PRESSURE (psf)	MOISTURE CONTENT (%)
						Plastic Limit	Liquid Limit										
N=6																	
N=13																	
N=24																	
N=26																	

**Water Level**  
Water Observations: Dry and open upon completion.

**Notes:**

Key to Abbreviations:  
N - SPT Data (Blows/Ft)  
P - Pocket Penetrometer (tsf)  
T - Torvane (tsf)  
L - Lab Vane Shear (tsf)

GPS Coordinates: N33.45281°, W94.28785°  
Differ: J. Lewis  
Logger: J. Lewis





**ETTL**  
**ENGINEERS &**  
**CONSULTANTS**

MAIN OFFICE  
1717 East Erwin  
Tyler, Texas 75702  
(903) 595-4421

**MATERIAL DESCRIPTION**

CLAYEY SAND WITH GRAVEL (SC) red  
SILTY SAND (SM) loose, brown

SANDY SILT (ML) loose, tan and gray

LEAN CLAY WITH SAND (CL) very stiff;  
tan

FAT CLAY WITH SAND (CH) very stiff;  
tan and gray

-hard

Bottom of Boring @ 20'

DEPTH (ft)	SAMPLES	USC	GEOLOGIC UNIT	WATER LEVEL
0				
5		SC		
		SM		
		ML		
		CL		
		CH		
20				

Water Level  
Water Observations:

Est.  Measured  Perched   
Dry and open upon completion.

**LOG OF BORING B-5**

PROJECT: TexAmericas Center - East Parcels DRILL RIG: Truck Rig  
Preliminary Investigation  
New Boston, TX

PROJECT NO.: G3972-136

BORING TYPE: Flight Auger

DATE 6/24/13

SURFACE ELEVATION

ATTERBERG LIMITS (%) SIEVE ANALYSIS SWELL TEST

FIELD STRENGTH DATA	BLOW COUNT	DRY DENSITY (pcf)	COMPRESSION STRENGTH (tsf)	COMPRESSION STRENGTH (tsf)	MOISTURE CONTENT (%)	Natural Moisture Content and Atterberg Limits		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX	MINUS #200 SIEVE (%)	PLUS #40 SIEVE (%)	PLUS #4 SIEVE (%)	DRY DENSITY (pcf)	FREE SWELL (%)	ZERO SWELL PRESSURE (psf)	MOISTURE CONTENT (%)
						Plastic Limit	Liquid Limit										
N=4	1	1.0	1.0	1.0	15	20	20	44	18	NP	62	9	5				
N=9	2	2.0	2.0	2.0	15	20	20	44	18	NP	80	1	0				
N=26	3	3.0	3.0	3.0	15	20	20	44	18	NP	80	1	0				
N=27	4	4.0	4.0	4.0	15	20	20	44	18	NP	80	1	0				
N=23	1	1.0	1.0	1.0	15	20	20	44	18	NP	62	9	5				
N=34	2	2.0	2.0	2.0	15	20	20	44	18	NP	80	1	0				

Notes:

Key to Abbreviations:

- N - SPT Data (Blows/Ft)
- P - Pocket Penetrometer (tsf)
- T - Torvane (tsf)
- L - Lab Vane Shear (tsf)

GPS Coordinates  
N33.45186°, W94.28194°

Printer  
J. Lewis

Logger  
J. Lewis

# APPENDIX D



**DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
2488 EAST 81<sup>ST</sup> STREET  
TULSA, OKLAHOMA 74137-4290**

November 4, 2020

Regulatory Office

Mr. Jeff Whitten  
TexAmericas Center  
107 Chapel Lane  
New Boston, TX 75570

Dear Mr. Whitten:

Please reference your correspondence concerning the TexAmericas Center commercial development jurisdictional determination request. The proposed project is located at Latitude 33.4566, Longitude -94.2835, Bowie County, Texas. We have reviewed the submitted data relative to Section 404 of the Clean Water Act (CWA).

We have examined the property (depicted in red) and concluded that the referenced site contains three non-jurisdictional ephemeral streams (depicted in pink) and five non-jurisdictional forested wetlands (depicted in yellow) on the enclosed map. At the northwest corner of the review area one of the ephemeral streams transitions into intermittent flow regime, which results in the unnamed tributary becoming jurisdictional (depicted in blue). Therefore, your proposal may be subject to regulation pursuant to Section 404 of the CWA, and a Department of the Army (DA) permit would be required within the intermittent unnamed tributary.

Should your method of construction necessitate such a discharge into an aquatic area or tributary, we suggest that you resubmit that portion of your project so that we may determine whether an individual DA permit will be required. Although Section 404 of the CWA authorization is not required, this does not preclude the possibility that a real estate interest or other Federal, State, or local permits may be required.

This final determination constitutes an approved JD subject to the optional Corps Administrative Appeal Process. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed is a copy of the "Notification of Administrative Appeal Options and Process and Request for Appeal (RFA)" form. If you request to appeal this determination you must submit a completed RFA form to the Southwestern Division Office at the following address:

Mr. Elliott Carman  
Appeals Review Officer  
U.S. Army Corps of Engineers  
1100 Commerce Street, Suite 831  
Dallas, TX 75242 1317  
Tel: 469 487 7061  
Fax: 469-487-7199

In order for a RFA form to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the RFA form. Should you decide to submit a RFA form, it must be received at the above address by January 2, 2021. It is not necessary to submit a RFA form to the Division Office if you do not object to the determination in this letter.

We believe this determination to be an accurate assessment of the presence of jurisdictional wetlands and other waters on the site which are subject to Section 404 of the CWA. This is a final determination of federal jurisdiction on the property pursuant to Section 404 of the CWA. This determination is valid for 5 years from the date of this letter unless new information warrants revision of the determination before the expiration date.

This delineation has been conducted to identify the limits of the Corps CWA jurisdiction for the particular site identified in this request. This delineation may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

If you desire to complete a "Customer Service Survey" on your experience with the Corps Regulatory Program, visit [http://corpsmapu.usace.army.mil/cm\\_apex/f?p=regulatory\\_survey](http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey) on the internet at your convenience and submit your comments.

This case has been assigned Identification No. SWT-2020-00322. Please refer to this number during any future correspondence. If you have any questions, please contact Mr. Bryan Noblitt at 918-669-4904.

Sincerely,

For:

Andrew R. Commer  
Chief, Regulatory Office

Enclosures





**U.S. ARMY CORPS OF ENGINEERS  
REGULATORY PROGRAM  
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)  
NAVIGABLE WATERS PROTECTION RULE**

**I. ADMINISTRATIVE INFORMATION**

Completion Date of Approved Jurisdictional Determination (AJD): 11/4/2020  
 ORM Number: SWT-2020-322  
 Associated JDs: N/A  
 Review Area Location<sup>1</sup>: State/Territory: Texas City: New Boston County/Parish/Borough: Bowie  
 Center Coordinates of Review Area: Latitude 33.4575 Longitude -94.2708

**II. FINDINGS**

**A. Summary:** Check all that apply. At least one box from the following list MUST be selected. Complete the corresponding sections/tables and summarize data sources.

- The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
- There are “navigable waters of the United States” within Rivers and Harbors Act jurisdiction within the review area (complete table in Section II.B).
- There are “waters of the United States” within Clean Water Act jurisdiction within the review area (complete appropriate tables in Section II.C).
- There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in Section II.D).

**B. Rivers and Harbors Act of 1899 Section 10 (§ 10)<sup>2</sup>**

§ 10 Name	§ 10 Size	§ 10 Criteria	Rationale for § 10 Determination
N/A.	N/A.	N/A.	N/A.

**C. Clean Water Act Section 404**

Territorial Seas and Traditional Navigable Waters ((a)(1) waters): <sup>3</sup>			
(a)(1) Name	(a)(1) Size	(a)(1) Criteria	Rationale for (a)(1) Determination
N/A.	N/A.	N/A.	N/A.

Tributaries ((a)(2) waters):			
(a)(2) Name	(a)(2) Size	(a)(2) Criteria	Rationale for (a)(2) Determination
SWT-2020-0322-09 (INT1)	500 linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	This intermittent tributary is located within the northwest corner of the review area. This evaluation includes two site visits, a jurisdictional delineation, review of aerial imagery, USGS topographic mapping, and soil data. The stream channel is depicted on the USGS Topographic map as a “blue line” unnamed tributary to Panther Creek, which flows into Barkman Creek, and then into the McKinney Bayou, and finally in the Red River. There is the presence of a visible bed and bank in aerial imagery and confirmed at the site visit, the

<sup>1</sup> Map(s)/figure(s) are attached to the AJD provided to the requestor.

<sup>2</sup> If the navigable water is not subject to the ebb and flow of the tide or included on the District’s list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.

<sup>3</sup> A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD Form.



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Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
				<p>average channel width was 5 feet. The stream was modified and straightened from previous development, however, bank erosion and sediment sorting processes are visible within this reach. At the site visit (October 23, 2020), this feature was observed following a minor rain event, however, no flows resulted due to the limited rainfall. The drainage area for this feature is approximately 450 acres. Bowie County rainfall averages 51 inches a year. Based on the Antecedent Precipitation Tool (APT) report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing continuously during certain times of the year and more than in direct response to precipitation. This flow regime meets the definition of intermittent flow as defined in 33 CFR Part 328.3(a)(2).</p>

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):				
(a)(3) Name	(a)(3) Size		(a)(3) Criteria	Rationale for (a)(3) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

Adjacent wetlands ((a)(4) waters):				
(a)(4) Name	(a)(4) Size		(a)(4) Criteria	Rationale for (a)(4) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

**D. Excluded Waters or Features**



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Excluded waters ((b)(1) – (b)(12)): <sup>4</sup>				
Exclusion Name	Exclusion Size		Exclusion <sup>5</sup>	Rationale for Exclusion Determination
SWT-2020-0322-01 (EPH1)	5800	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	The stream channel is depicted on the USGS Topographic map as a blue line stream. There is the presence of a visible bed and bank in aerial and confirmed at the site visit, the average channel width was 3 feet. The stream was modified, straightened, and contained within a ditch like channel, which has erosional processes visible, and herbaceous vegetation is visible within the channel at its headwater. During the site visit (July 22, 2020), this feature was observed during a minor rain event with minimal flow visible. The drainage area for this feature is approximately 450 acres due to the previous development associated with the ammunition plant. Bowie County rainfall averages 51 inches a year. Based on the Antecedent Precipitation Tool (APT) report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. This feature is surrounded by wetland habitat within the review area. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).
SWT-2020-0322-02 (EPH2)	570	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	The stream channel is depicted on the USGS Topographic map as a blue line stream. This feature was the headwater of the originally mapped channel for this drainage area, before the stream was modified into the current straightened ditch. The feature is not identifiable in review of aerial imagery, however, based on the delineation report, this feature is grass lined and has an average channel width of 2 feet. The drainage area for this feature is approximately 17 acres. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation.

<sup>4</sup> Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.

<sup>5</sup> Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.



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Excluded waters ((b)(1) – (b)(12)): <sup>4</sup>				
Exclusion Name	Exclusion Size		Exclusion <sup>5</sup>	Rationale for Exclusion Determination
SWT-2020-0322-03 (EPH3)	2030	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	The stream channel is not depicted on the USGS Topographic map as a blue line stream. There is no presence of a visible natural channel in aerial imagery, aside from a visible culvert for a railway crossing on the most upper extent of the stream reach. The drainage area for this feature is approximately 25 acres. This feature has been mapped through a forested wetland. The delineation report shows the channel full of water, however, the field work was conducted during the spring rain season, which is wetter than normal based on the APT report. The channel is relatively straight and consistent with channelization. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation.
SWT-2020-0322-04 (PFO1)	120	acre(s)	(b)(1) Non-adjacent wetland.	This wetland was mapped in the jurisdictional delineation report, however, it is not depicted on any resource maps as a wetland habitat. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that a smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was eight data points taken within this specific feature supporting the inclusion of this feature as a forested wetland. This wetland is adjacent to the ephemeral stream (EPH1) within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
SWT-2020-0322-05 (PFO2)	14	acre(s)	(b)(1) Non-adjacent wetland.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows no wetland habitat occurs within the footprint of this depicted wetland. There was no data point taken within this specific feature, the inclusion of this feature was likely based on a landscape comparative analysis based on the results of other data points in similar forested habitat in the review area. This wetland is adjacent to the ephemeral



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Excluded waters ((b)(1) – (b)(12)): <sup>4</sup>			
Exclusion Name	Exclusion Size	Exclusion <sup>5</sup>	Rationale for Exclusion Determination
			stream (EPH1) within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
SWT-2020-0322-06 (PF03)	19	acre(s)	(b)(1) Non-adjacent wetland.  This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows this area as a forested wetland within the footprint of this feature. There was four data points taken within this specific feature supporting the inclusion of this feature as a forested wetland. This wetland is not adjacent to any stream channel within this review area, which result in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
SWT-2020-0322-07 (PFO4)	13	acre(s)	(b)(1) Non-adjacent wetland.  This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows this area as a forested wetland within the footprint of this feature. There was no data point taken within this specific feature, the inclusion of this feature was likely based on a landscape comparative analysis based on the results of other data points in similar forested habitat in the review area. This wetland is not adjacent to any stream channel within this review area, which result in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
SWT-2020-0322-08 (PFO5)	13	acre(s)	(b)(1) Non-adjacent wetland.  This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows this area as a forested wetland within the footprint of this feature. There was six data points taken within this specific feature supporting the inclusion of this feature as a forested wetland. This wetland is not adjacent to any stream channel within this review area, which result in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.





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Excluded waters ((b)(1) – (b)(12)): <sup>4</sup>				
Exclusion Name	Exclusion Size		Exclusion <sup>5</sup>	Rationale for Exclusion Determination
SWT-2020-0322-10 (PFO6)	7	acre(s)	(b)(1) Non-adjacent wetland.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map does not depict this area as a potential wetland. There was two data points taken within this specific feature supporting the inclusion of this feature as a forested wetland. This wetland is adjacent to ephemeral stream (EPH1) within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
SWT-2020-0322-11 (PFO7)	2.5	acre(s)	(b)(1) Non-adjacent wetland.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map does not depict this area as a potential wetland. There was two data points taken within this specific feature supporting the inclusion of this feature as a forested wetland. This wetland is adjacent to ephemeral stream (EPH1) within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
SWT-2020-0322-12 (EPH4)	1600	linear feet	(b)(5) Ditch that is not an (a)(1) or (a)(2) water, and those portions of a ditch constructed in an (a)(4) water that do not satisfy the conditions of (c)(1).	The stream channel is not depicted on the USGS Topographic map as a blue line stream. There is the presence of a visible natural channel in aerial imagery. The drainage area for this feature is approximately 16 acres. This feature is apparently constructed as a ditch adjacent to a railroad. The channel is straight and consistent with channelization. Based on the information included in this evaluation, this ditch has been determined to have surface water flowing/pooling only in direct response to precipitation.

**III. SUPPORTING INFORMATION**

**A. Select/enter all resources** that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.

Information submitted by, or on behalf of, the applicant/consultant: [Revised TexAmericas AJD Report, Dated October 22, 2020](#)

This information is sufficient for purposes of this AJD.

Rationale: [N/A](#)

Data sheets prepared by the Corps: [Title\(s\) and/or date\(s\)](#).



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- Photographs: **Aerial and Other:** Google Earth Aerial Imagery, Dated March 2019, and Site Photos July 22, 2020 and October 23,2020
- Corps site visit(s) conducted on: July 22, 2020, and October 23, 2020
- Previous Jurisdictional Determinations (AJDs or PJDs): ORM Number(s) and date(s).
- Antecedent Precipitation Tool: provide detailed discussion in Section III.B.
- USDA NRCS Soil Survey: Title(s) and/or date(s).
- USFWS NWI maps: ORM Data accessed September 28, 2020
- USGS topographic maps: ORM Data accessed September 28, 2020

**Other data sources used to aid in this determination:**

Data Source (select)	Name and/or date and other relevant information
USGS Sources	N/A.
USDA Sources	N/A.
NOAA Sources	N/A.
USACE Sources	N/A.
State/Local/Tribal Sources	N/A.
Other Sources	N/A.

**B. Typical year assessment(s):** The APT tool was ran for April 21, 2020, which corresponds with the delineation report. The results of this report concluded that the site conditions are wetter than normal with a value of 16. The graph depicts conditions for approximately 9 months of the year, and the 30 year rolling average. Based on the comparison of the average rainfall in 2020 compared to the typical year average, the site is likely to have received higher than average rainfall this year, which would result in site conditions that are wetter than normal. The graph shows that the site likely had recent rain events in close proximity, which would support that the streams exhibit ephemeral flow based on minimal observed flowing water during the site visit. Following a site visit on October 23, 2020, a second APT report was ran, which resulted in a value of 12 indicating normal rainfall conditions. However, upon review of the last 3 months, the rainfall is well above average and site conditions would reflect that. These reports both indicate wetter than normal rain conditions throughout much of the year. Based on the analysis of these reports, the site would be wetter than typical years and the mapped aquatic features within the delineation may appear more prominent than during typical year.

**C. Additional comments to support AJD:** This evaluation was based on two site visits, a jurisdictional delineation report, aerial imagery, various resource maps, and rainfall data. This site has experienced extensive grading and drainage modification associated with the review area being part of the historic Red River Army Depot. The four ephemeral features and the seven forested wetlands have been determined above to meet the definitions as non-jurisdictional (excluded) waters. The intermittent unnamed tributary identified within the review area meets the requirements of an (a)(2) water, thus it is jurisdictional.



# SWT-2020-322

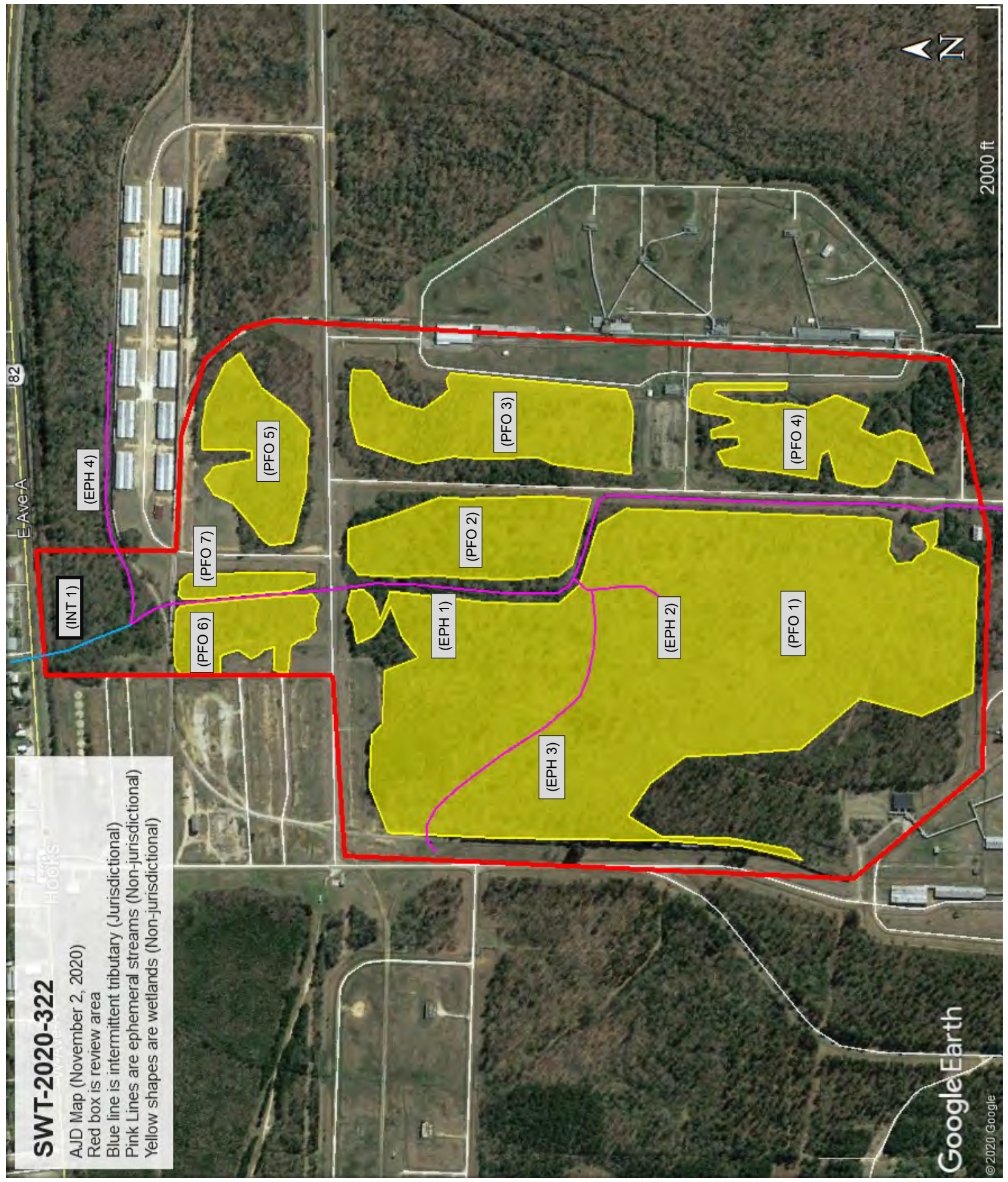
AJD Map (November 2, 2020)

Red box is review area

Blue line is intermittent tributary (Jurisdictional)

Pink Lines are ephemeral streams (Non-jurisdictional)

Yellow shapes are wetlands (Non-jurisdictional)



# APPENDIX E

Last Update: 3/5/2021

## BOWIE COUNTY

### AMPHIBIANS

**southern crawfish frog** *Lithobates areolatus areolatus*

Terrestrial and aquatic: The terrestrial habitat is primarily grassland and can vary from pasture to intact prairie; it can also include small prairies in the middle of large forested areas. Aquatic habitat is any body of water but preferred habitat is ephemeral wetlands.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G4T4 State Rank: S3

**Strecker's chorus frog** *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S3

### BIRDS

**Bachman's sparrow** *Peucaea aestivalis*

Open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub

Federal Status: State Status: T SGCN: Y  
Endemic: N Global Rank: G3 State Rank: S1B

**bald eagle** *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S3B,S3N

**Franklin's gull** *Leucophaeus pipixcan*

This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S2N

**interior least tern** *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: DL: Delisted State Status: E SGCN: Y  
Endemic: N Global Rank: G4T3Q State Rank: S1B

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## BOWIE COUNTY

### BIRDS

#### piping plover

*Charadrius melodus*

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT

State Status: T

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S2N

#### swallow-tailed kite

*Elanoides forficatus*

Lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S2B

#### white-faced ibis

*Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S4B

#### wood stork

*Mycteria americana*

Prefers to nest in large tracts of baldcypress (*Taxodium distichum*) or red mangrove (*Rhizophora mangle*); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G4

State Rank: SHB,S2N

### FISH

#### blackside darter

*Percina maculata*

Restricted to the Red River Basin in the northeast part of the state although specimens have been taken in the lower Trinity and San Jacinto rivers; Often found in clear, gravelly streams.

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S1

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## BOWIE COUNTY

### FISH

**blackspot shiner**

*Notropis atrocaudalis*

Occurs from the lower Brazos River to the Sabine River drainage; Red River drainage. Small to moderate size tributary streams in runs and pools over all types of substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**chub shiner**

*Notropis potteri*

Brazos, Colorado, San Jacinto, and Trinity river basins. Flowing water with silt or sand substrate

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S2

**goldeye**

*Hiodon alosoides*

Restricted to the Red River basin; adults in quiet turbid water of medium to large lowland rivers, small lakes, marshes and muddy shallows connected to them.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

**ironcolor shiner**

*Notropis chalybaeus*

Found only in northeastern streams from the Sabine to the Red River with the exception of an isolated population found in the San Marcos River headwaters. Found primarily in acidic, tannin-stained, non-turbid, sluggish Coastal Plain streams and rivers of low to moderate gradient. Occurs in aggregation, often at the upstream ends of pools, with a moderate to sluggish current and sand, mud, silt or detritus substrates. Usually associated with aquatic vegetation.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**orangebelly darter**

*Etheostoma radiosum*

Streams, creeks, and small to moderate-sized rivers in the Red River basin. Riffle areas of gravel-bottoms streams with moderate to high currents.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**paddlefish**

*Polyodon spathula*

Species occurred in every major river drainage from the Trinity Basin eastward, but its numbers and range had been substantially reduced by the 1950's; recently reintroduced into Big Cypress drainage upstream of Caddo Lake. Prefers large, free-flowing rivers but will frequent impoundments with access to spawning sites.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**Red River shiner**

*Notropis bairdi*

Red River basin; typically found in turbid waters of broad, shallow channels of main stream, over bottom mostly of silt and shifting sand.

Federal Status:	State Status:	SGCN: Y
-----------------	---------------	---------

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## BOWIE COUNTY

### FISH

Endemic: N                                      Global Rank: G4                                      State Rank: S3

**shovelnose sturgeon**                                      *Scaphirhynchus platyrhynchus*

Found only in the Red River below Denison Dam (Lake Texoma). Evidence of the presence of this species in the lower Pecos River, during prehistoric times, strongly suggests that it likely occurred in many Texas rivers. Inhabits flowing water over sandy bottoms or near rocky points or bars.

Federal Status: SAT                                      State Status: T                                      SGCN: Y  
Endemic: N                                      Global Rank: G4                                      State Rank: S2

**silver chub**                                      *Macrhybopsis storeriana*

Red River and Brazos River basins. Mainly restricted to large, often silty rivers. Ranges over gravel to silt substrates but found more commonly over silt or mud bottom.

Federal Status:                                      State Status:                                      SGCN: Y  
Endemic: N                                      Global Rank: G5                                      State Rank: S3

**silverband shiner**                                      *Notropis shumardi*

In Texas, found from Red River to Lavaca River; Main channel with moderate to swift current velocities and moderate to deep depths; associated with turbid water over silt, sand, and gravel.

Federal Status:                                      State Status:                                      SGCN: Y  
Endemic: N                                      Global Rank: G5                                      State Rank: S4

**taillight shiner**                                      *Notropis maculatus*

Restricted to the Sulphur and Cypress drainages in northeast Texas; Quiet, usually vegetated oxbow lakes, ponds, or backwaters.

Federal Status:                                      State Status:                                      SGCN: Y  
Endemic: N                                      Global Rank: G5                                      State Rank: S1

**western creek chubsucker**                                      *Erimyzon claviformis*

Eastern Texas streams from the Red River to the San Jacinto drainage. Habitat includes silt-, sand-, and gravel-bottomed pools of clear headwaters, creeks, and small rivers; often near vegetation; occasionally in lakes. Spawning occurs in river mouths or pools, riffles, lake outlets, or upstream creeks. Prefers headwaters, but seldom occurs in springs.

Federal Status:                                      State Status: T                                      SGCN: Y  
Endemic: N                                      Global Rank: G5                                      State Rank: S2S3

### INSECTS

**American bumblebee**                                      *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:                                      State Status:                                      SGCN: Y  
Endemic:                                      Global Rank: G3G4                                      State Rank: SNR

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## BOWIE COUNTY

### MAMMALS

#### big brown bat

*Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

#### black bear

*Ursus americanus*

Generalist. Historically found throughout Texas. In Chisos, prefers higher elevations where pinyon-oaks predominate; also occasionally sighted in desert scrub of Trans-Pecos (Black Gap Wildlife Management Area) and Edwards Plateau in juniper-oak habitat. For ssp. luteolus, bottomland hardwoods, floodplain forests, upland hardwoods with mixed pine; marsh. Bottomland hardwoods and large tracts of inaccessible forested areas.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

#### eastern spotted skunk

*Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S3

#### long-tailed weasel

*Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

#### mountain lion

*Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

#### southeastern myotis bat

*Myotis austroriparius*

Caves are rare in Texas portion of range; buildings, hollow trees are probably important. Historically, lowland pine and hardwood forests with large hollow trees; associated with ecological communities near water. Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

#### swamp rabbit

*Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

#### DISCLAIMER

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## BOWIE COUNTY

### MAMMALS

**tricolored bat**

*Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G2G3

State Rank: S3S4

**woodland vole**

*Microtus pinetorum*

Include grassy marshes, swamp edges, old-field/pine woodland ecotones, tallgrass fields; generally sandy soils.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S3

### REPTILES

**alligator snapping turtle**

*Macrochelys temminckii*

Aquatic: Perennial water bodies; rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near running water; sometimes enters brackish coastal waters. Females emerge to lay eggs close to the waters edge.

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S2

**eastern box turtle**

*Terrapene carolina*

Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S3

**slender glass lizard**

*Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S3

**Texas horned lizard**

*Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G4G5

State Rank: S3

#### DISCLAIMER

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## BOWIE COUNTY

### REPTILES

**timber (canebrake) rattlesnake**      *Crotalus horridus*

Terrestrial: Swamps, floodplains, upland pine and deciduous woodland, riparian zones, abandoned farmland. Limestone bluffs, sandy soil or black clay. Prefers dense ground cover, i.e. grapevines, palmetto.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

### PLANTS

**Arkansas meadow-rue**      *Thalictrum arkansanum*

Mostly deciduous forests on alluvial terraces and upper drainages of hardwood slope forests at contacts with calcareous prairies; flowering March-April, withering by midsummer

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2Q	State Rank: S2

**Arkansas oak**      *Quercus arkansana*

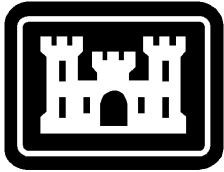
At the Cass County location, it occurs with *Quercus stellata*, *Q. marilandica* and *Q. incana* in a young pine plantation on deep sandy soils; Perennial; Flowering spring

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S1

#### DISCLAIMER

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# APPENDIX F



**US Army Corps  
of Engineers®**

Mobile District

---

**PHASE II ARCHAEOLOGICAL INVESTIGATIONS  
AT RED RIVER ARMY DEPOT AND LONE STAR  
ARMY AMMUNITION PLANT, BOWIE COUNTY,  
TEXAS**

Final Report

February 2012

EARTH SEARCH, INC.  
P.O. Box 770336  
New Orleans, LA 70177-0336

---

Prepared for

U.S. Army Corps of Engineers  
Mobile District  
P.O. Box 2288  
Mobile, AL 36628-0001







# APPENDIX G



FIGURE G-1



- BRAZOS SITE BOUNDARY
- EXISTING WATER MAINS

107 CHAPEL LANE  
 NEW BOSTON, TEXAS 75570  
 903.223.9841  
 www.TexAmericasCenter.com



**WATER SYSTEM  
 EXHIBIT  
 BRAZOS SITE  
 TEXAMERICAS CENTER  
 EAST CAMPUS  
 HOOKS, TEXAS**

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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FIGURE G-2



- BRAZOS SITE BOUNDARY
- EXISTING 18-INCH SANITARY SEWER MAIN

107 CHAPEL LANE  
 NEW BOSTON, TEXAS 75570  
 903.223.9841  
 www.TexAmericasCenter.com



**SANITARY SEWER  
 SYSTEM EXHIBIT  
 BRAZOS SITE  
 TEXAMERICAS CENTER  
 EAST CAMPUS  
 HOOKS, TEXAS**

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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FIGURE G-3



- BRAZOS SITE BOUNDARY
- EXISTING 3-PHASE POWER

107 CHAPEL LANE  
NEW BOSTON, TEXAS 75570  
903.223.9841  
www.TexAmericasCenter.com



ELECTRICAL SYSTEM  
EXHIBIT  
BRAZOS SITE  
TEXAMERICAS CENTER  
EAST CAMPUS  
HOOKS, TEXAS

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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FIGURE G-4



- BRAZOS SITE BOUNDARY
- - - EXISTING 2-4" NATURAL GAS LINES (50 PSI) - COMPLETED SUMMER 2021

107 CHAPEL LANE  
 NEW BOSTON, TEXAS 75570  
 903.223.9841  
 www.TexAmericasCenter.com



**NATURAL GAS SYSTEM  
 EXHIBIT  
 BRAZOS SITE  
 TEXAMERICAS CENTER  
 EAST CAMPUS  
 HOOKS, TEXAS**

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
------------	-------------	------------------	--------	--------



FIGURE G-5



- BRAZOS SITE BOUNDARY
- EXISTING 144-STRAND FIBER

107 CHAPEL LANE  
 NEW BOSTON, TEXAS 75570  
 903.223.9841  
 www.TexAmericasCenter.com



**FIBER SYSTEM  
 EXHIBIT  
 BRAZOS SITE  
 TEXAMERICAS CENTER  
 EAST CAMPUS  
 HOOKS, TEXAS**

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
------------	-------------	------------------	--------	--------



**RESOLUTION NO. 20210525-02**

**A RESOLUTION APPROVING A QUALIFIED SITES PROGRAM FOR DUKE EAST UPON  
TEXAMERICAS CENTER EAST CAMPUS**

**WHEREAS**, TexAmericas Center is a political subdivision of the State of Texas with the powers and authorities specified in Chapter 3503 of the Special District Local Laws Code of the State of Texas; and

**WHEREAS, on August 25, 2020** the Board of Directors approved a Qualified Sites Program for the purpose of recognizing the commercial and industrial sites with characteristics and infrastructure in place that make the sites Shovel-Ready for development; and

**WHEREAS**, the goal of the Qualified Sites Program is to help developers, real estate professionals, both public and private utility companies and state partners understand and utilize the criteria outlined in this program, to recognize TAC as a nationally recognized industrial park with an inventory of attractive, pre-qualified, speculative sites ready for immediate development by end-users and for these groups to refer prospects to TAC for their business endeavors to take advantage of the location attributes; and

**WHEREAS**, staff has completed the Qualified Sites Program analysis of the Duke East Site, the site meets the program criteria and the data in this report is current as of today and will be updated as information changes, such as increased utility capacity, roadway changes, changes in community information, etc.; and

**WHEREAS**, this will serve as a template for future TAC Qualified Sites.

**NOW, THEREFORE, BE IT RESOLVED** by the Board of Directors of TexAmericas Center the attached hereto as Exhibit "A" is approved and shall be implemented as of this date.

**PASSED and APPROVED this 25<sup>th</sup> day of May, 2021.**

---

**Jim Roberts, Chairman of the Board**

**ATTEST:**

---

**Denis Washington, Secretary**

Attached: Exhibit "A" – Qualified Sites Program for DUKE EAST



# TexAmericas CENTER<sup>®</sup> Texarkana USA

Build | Lease | Manage | Sell | Incentives | Logistics

## QUALIFIED SITES PROGRAM DUKE EAST SITE

TexAmericas Center – Texarkana MSA – Hooks, Texas

### Qualified Site:

A Certified Site is a commercial or industrial site where the majority of the information (infrastructure, encumbrances, attributes, availabilities, etc.) needed for a development to go to construction has been obtained, organized, prepared and endorsed by an objective third-party assuring a higher level of accuracy of site conditions therefore reducing the unknowns and increasing the speed to development.

A **Qualified Site**, endorsed by TexAmericas Center, is a commercial or industrial tract of land that has undergone the same level of scrutiny as a site certified by an objective third party but has been prepared in-house by a qualified professional.

**Jeff Whitten, P.E.**

Jeff.Whitten@TexAmericasCenter.com  
903.223.9841 - O 903.278.1821 - M

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# 1 ABOUT TEXAMERICAS CENTER

---

TexAmericas Center is one of the largest mixed-use industrial parks in the Americas and has recently been recognized as the 8<sup>th</sup> ranked industrial park in the nation by *Business Facilities*. TexAmericas Center is a State of Texas-sanctioned Local Redevelopment Authority. This unique organizational structure allows to act like a hybrid of an economic development organization and an industrial real estate development & management company. These characteristics allow it to offer tenants custom real estate solutions and unparalleled speed-to-market.

With the operating capabilities of a municipality and control of its own land use (zoning) regulations and permitting, TexAmericas Center eliminates much of the red tape inherent in traditional real estate processes. Depending on the size and complexity of a development, the plan review and approval may be completed in less than five (5) business days giving businesses a shorter timeline to become operational than may exist in other complexes or municipalities. In addition to permitting expediency and custom real estate solutions, TexAmericas Center offers unique value-added services including: third party logistics, transload activities, on-site rail service, incentive management and build-to-suit and/or build-out-to-suit services.

## 1.1 MISSION

TexAmericas Center's mission is to bring quality jobs to the greater Texarkana area and diversify the tax base through property redevelopment. The TexAmericas Center Board of Directors has mandated that staff **create 12,000 jobs on the property**. To fulfill this mission, TexAmericas Center redevelops and manages **12,000 acres and 3.5 million square feet** of former military property in centrally located Northeast Texas. TexAmericas Center is currently home to **33 manufacturing and commercial businesses**. TexAmericas Center and its Partners in Development have invested over **\$40 million** in on-site infrastructure upgrades & environmental remediation and are committed to continue investing in our tenants, future tenants, and community.

## 1.2 LAND USE

TexAmericas Center is located outside of any city municipal boundaries and therefore controls its own land use (zoning) regulations and has designated its property for **light and heavy industrial uses**. All land and buildings are governed by TexAmericas Center planning, permitting, and approval processes, which are administered by an on-staff Professional Engineer. Guidelines covering development of the property, including but not limited to, Drainage Guidelines, Land Use Guidelines and Covenants, Codes & Restrictions are available from TexAmericas Center, most being easily accessible on our website, [www.TexAmericasCenter.com](http://www.TexAmericasCenter.com) and more specifically at <https://texamericascenter.com/public-information/development-use-guidelines/>.

### 1.3 CONTACT INFORMATION

Additional information about TexAmericas Center and the contents of this report may be obtained through the following:

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TexAmericas Center  
107 Chapel Lane  
New Boston, Texas 75570  
Office:903.223.9841

### 1.4 QUALIFIED SITES PROGRAM PURPOSE

The purpose of the TexAmericas Center (TAC) **Qualified Sites Program (QSP)** is to recognize the commercial and industrial sites with known development characteristics and available infrastructure in place that allow for the designation of the property as a **Qualified Site** meaning that the site is **Shovel-Ready** for vertical development.

When a site is designated as a **Qualified Site**, it has undergone a rigorous level of scrutiny to confirm that the site is **adjacent to utilities** typically needed for commercial and/or industrial operations, that site characteristics are **conducive to business activities**, that any **encumbrances** that might impact the property are known and that **key approvals**, documentation, regulations and assessments required for commercial or industrial uses are known and in place.

By having shovel-ready sites available, TAC will be able to better accommodate the needs and desires of prospective businesses. Companies that have immediate space and/or time requirements will have access to a greater amount of information potentially decreasing the chances of risks or constraints that could delay or derail a project.

In addition to designating sites as a Qualified Site, the qualification process will also help TAC identify gaps in information and attributes of its property and develop gap

closure recommendations that will increase the inventory of Qualified Sites. The QSP will also help elevate recognition of sites that do exist but may not be perceived as meeting the site needs of business prospects that approach TAC for appropriate locations.

The goal of the QSP is to help developers, real estate professionals, both public and private utility companies and state partners understand and utilize the criteria outlined in this program, to recognize TAC as a nationally recognized industrial park with an inventory of attractive, pre-qualified, speculative sites ready for immediate development by end-users and for these groups to refer prospects to TAC for their business endeavors to take advantage of the location attributes.

Positioning a business prospect on a Qualified Site offers the company the ability to perform at a high standard. The coordination of these efforts may result in the ability of portions of TAC to be branded for a specific application or **Targeted Industry**. Project objectives include:

- Winning more projects;
- Filling identified market gaps;
- Establishing an expectation of high standards for development;
- Creating a high-quality product, a Qualified Site, that does not currently exist in the market;
- Creating an inventory of qualified speculative sites ready for immediate development prior to a prospect's inquiry

It is important to recognize that a principal goal of the program is to identify market gaps in TAC's portfolio of sites. Identifying the deficiencies in information or the availability of infrastructure will help TAC focus its efforts and attention on gaining this insight and prioritizing the extension of infrastructure to underserved properties. In addition, the recognition of sites that have been previously not perceived as having qualifying attributes will be recognized as a Qualified Site and marketed as such.

Creating an inventory of Qualified, Shovel-Ready Sites, defined as being ready for vertical development before a prospect conducts a site visit will help TAC convert more leads to announcements thus creating jobs, causing more investment and creating more quality commercial and industrial businesses in the region.

TAC reserves the right to amend or terminate the requirements of the QSP at any time.

## 2 THE DUKE EAST SITE

---

### 2.1 PROPERTY ATTRIBUTES

The property that makes up the TexAmericas Center East campus transferred from the United States of America to Red River Redevelopment Authority (later renamed

TexAmericas Center) by Deed Without Warranty on September 1, 2010, and recorded in Volume 5898, Page 1 of the Real Property Records of Bowie County, Texas. A copy of this document is available from TexAmericas Center, most being easily accessible on our website, [www.TexAmericasCenter.com](http://www.TexAmericasCenter.com).

The 22-acre Duke East Site is a greenfield development site situated on the TexAmericas Center East Campus (TAC East). The site is at the northwest corner of the intersection of Cass Street and the east end of Elm Circle. This property is a wooded buffer area separating a former warehouse and storage tract from adjacent roadways and other land uses. Vicinity Maps (Figures A-1 to A-5) of TexAmericas Center as well as a Boundary Survey of a tract of land that the Duke East Site is a part of (Figure A-6) of may be found in Appendix A.

## 2.2 PROPERTY TERRAIN

The Duke East Site slopes generally from west to east and north to south to the southeast corner of the tract. The site is bounded by swales/ditches that parallel Oak Street, Elm Circle and the existing rail line adjacent to the site. These ditches carry runoff generally to the outfall near the southeast corner of the Duke East Site. A Topographical Exhibit (Figure A-7) of the property can be found in Appendix A.

The site is wooded with a mixture of a variety of species of Pine trees and Oak trees. The site is accessible by vehicle to its boundary on the north and east property lines. Additional information regarding the adjacent roads may be found in Section 5.1.1 of this document.

## 2.3 FLOOD PLAIN

Based on the National Flood Insurance Program Flood Insurance Rate Map for Bowie County Community Panel No. 48037C0310D with an effective date of October 19, 2010, the site is situated in Zone X. This area is defined as '**Areas determined to be outside of the 0.2% annual chance (500-year) floodplain**'. A copy of the firmette (Figure A-8) of the site is included in Appendix A.

## 2.4 GEOLOGICAL INFORMATION

Historical information in the form of a Soil Survey of Bowie County, Texas and on-the-ground investigation of the property are available to give an insight into the soil conditions on the Duke East Site.

### 2.4.1 Soil Survey of Bowie County, Texas

Based on the *Soil Survey of Bowie County, Texas* prepared by the United States Department of Agriculture Soil Conservation Service in cooperation with the Texas Agriculture Experiment Station, the soils located across the property are classified as being a Sawyer Silty Loam (characterized by a layer of silt loam for approximately six-inches (6") and varied colored clay loams below) and Wrightsville-Rodessa complex (a classification where the Wrightsville silt loam and Rodessa loam are so intermingled that



they could not be shown separately and characterized by a surface layer of silt loam over a clay loam). Excerpts from the Soil Survey are included in Appendix B.

#### 2.4.2 Preliminary Geotechnical Investigation

A *Preliminary Geotechnical Investigation* of the soils for portion of TAC East was prepared by ETL Engineers & Consultants, Inc. in July 2013. A bore was performed at the northeast corner of the Duke East Site. An additional bore was performed immediately north of the Duke East tract. A copy of the boring logs and excerpts from the investigation are included in Appendix C.

## 3 GOVERNMENTAL JURISDICTION

---

### 3.1 BOWIE COUNTY, TEXAS

TAC resides inside unincorporated Bowie County, Texas which is governed by a five-member commissioners' court. Four commissioners are voted on by the residents of their respective precincts in the county and presided over by a county judge elected by the residents of Bowie County.

### 3.2 TEXAMERICAS CENTER (TAC)

TAC is governed by a fifteen-member Board of Directors comprised of individuals appointed by the mayors of the municipalities throughout Bowie County, Texas. The Board of Directors sets policy and leaves the daily operations to staff. The Board of Directors is the final decision maker on all matters related to TAC business, with exception of taxation as TexAmericas Center does not have the right to levy taxes.

All TAC property is **deed restricted to commercial and industrial activity** which makes it suitable and designated for heavy and light industrial construction and operations. TAC controls its own land use (zoning) and has designated the sites for **Light and Heavy Industrial** uses. The Duke East Site is located in a **Heavy Industrial District (HI)** based on the Land Use Map adopted by the TexAmericas Center Board of Directors on September 25, 2018. A copy of the Land Use Map (Figure A-9) is included in Appendix A. The Land Use Guidelines will be discussed in sections to follow.

Other than the deed restrictions to the property from the deed and title transfer, there are no additional encumbrances, easements, liens or other rights on the property.

TAC has developed ordinances that affect site development of the property. These ordinances are intended to promote the health, safety, moral and general welfare of TAC. A list of these ordinances include:

- Codes, Covenants & Restrictions (CCR's);
- Drainage Guidelines;
- Land Use & Site Design Guidelines;
- Paving Guidelines;
- Road Signage, Striping & Lighting Guidelines;

- Sign Guidelines.

A copy of these are easily accessible on our website, [www.TexAmericasCenter.com](http://www.TexAmericasCenter.com) and more specifically at <https://texamericascenter.com/public-information/development-use-guidelines/>.

### 3.3 FIRE PROTECTION

Fire Protection for the property will come from the Hooks Volunteer Fire Department. **The ISO rating for the Hooks Volunteer Fire Department, at the Duke East Site, is a 6.** A Mutual Aid, Interlocal Agreement exists between the cities of Hooks & New Boston, Texas and Red River Army Depot (RRAD) to provide emergency response services. **The ISO rating for RRAD's Fire and Emergency Services is a 2.**

### 3.4 POLICE PROTECTION

Police Protection will be provided by the Bowie County Sheriff's Department. Similar Mutual Aid agreements exist within the adjacent cities for these services also.

## 4 ENVIRONMENTAL & CULTURAL IMPACTS

---

Located amid the Piney Woods, the Texarkana region offers a rare and wonderful bounty of lakes, green space and forestry where hardwoods grow nearly as quickly as softwoods. The region offers picturesque, relaxing and meaningful settings in which to retreat, relax and recharge. An impressive collection of federal, state and local recreational assets are waiting to be explored within a 90-minute drive.

### 4.1 ENVIRONMENTAL ASSESSMENT

A **Final Phase I and Limited Phase II Environmental Site Assessment** for TexAmericas East Tract (Former Lone Star Army Ammunition Plant) in Texarkana, Texas was prepared by Science Applications International Corporation (SAIC) in May 2013. The findings of the report are that...**'based on the results of the report, a more extensive Phase II Environmental Site Assessment is not recommended at this time'**. A copy of the report may be obtained at the office of TexAmericas Center.

### 4.2 WETLANDS

A wetland delineation for a portion of TAC East, including the limits of the Duke East Site, has been prepared and has been submitted to the United States Corps of Engineers for a Jurisdictional Determination to be made. A copy of the Preliminary findings of the consultant are enclosed in Appendix D. The findings in this report are that there are no jurisdictional wetlands within the limits of the Duke East Site. This report will be updated to include the Jurisdictional Determination as finalized and approved by the USACOE.

A copy of the Preliminary Jurisdictional Determination prepared by Cardno is found in Appendix D.

### **4.3 ENDANGERED/THREATENED SPECIES**

Texas Parks & Wildlife Department Annotated County Lists of Rare Species, updated March 5, 2021, is included in Appendix E. This is a county-wide list of the species.

In 2000, a planning level survey (PLS) was conducted for vegetative communities and fauna, including an assessment of the potential presence of quality habitat for threatened and endangered species (TES) (Tetra Tech 2002b). The alligator snapping turtle (*Macroclemys temminckii*), a state-listed threatened species, was the only Threatened and Endangered Species (TES) observed at the installations during the Planning Level Survey (PLS). There were no federal-listed threatened or endangered species on the property.

### **4.4 ARCHAEOLOGICAL/HISTORICAL DESIGNATIONS**

Based on the Phase II Archaeological Investigations at Red River Army Depot and Lone Star Army Ammunition Plant, Bowie County, Texas Final Report dated February 2012 prepared for the US Army Corps of Engineers (Mobile District) by Earth Science, Inc., there are no locations on the Duke East site that are determined to be of Archaeological or Historical Significance. A map of locations from the report showing these Duke East Site and the locations of areas of Historical Significance is included in Appendix F.

### **4.5 AIR ATTAINMENT STATUS**

Based on information provided by the Texas Commission on Environmental Quality and the United States Environmental Protection Agency, Bowie County, Texas appears within acceptable air quality levels according to the National Ambient Air Quality Standards.

## **5 TRANSPORTATION ASSETS**

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TAC is positioned to give you access to the greatest domestic market share while still operating in the top-ranked State of Texas. This is because TAC is situated in the Texarkana MSA, **one of the lowest aggregate mile locations in Texas to the geographic and population centers of the US**. This gives tenants at TAC a **500-mile reach of 53.8 million consumers**, which is **10 million more than the Dallas 500-mile reach**. This access comes at a fraction of the transportation costs due to our strategic, central location and robust infrastructure.

## 5.1 ROAD INFRASTRUCTURE

TAC has excellent interstate access with plans for additional improvements to ease speed of delivery for businesses. **Interstate Highway 30** (I-30) is the closest interstate to the Duke East Site at a distance of **less than 1 mile**. I-30 has **six interchanges** and multiple entry points to TAC on the 15-mile stretch that runs parallel to and less than 1-mile from its north property boundary. TexAmericas Center is **two hours east of Dallas** and **two hours southwest of Little Rock**. Construction is currently underway in Texarkana to widen I-30 to six lanes.

### 5.1.1 Key Connections

Key connections of our road transportation system are:

- **Interstate Highway 30** connects to I-20, I-35 & I-45 and more U.S. & State Highways to the west to the DFW Metroplex, and east to Little Rock, connecting with I-40 to Oklahoma City, Memphis, Nashville and the eastern seaboard of the United States.
- **Interstate Highway 69/369** (I-69/I-369) connects Canada and the Northeast United States to Houston and the Texas/Mexico border with multiple connections to additional interstate, U.S. & State Highways along the route. I-69 is currently under construction in various stages along its route.
- **U.S. Highway 59** (HWY 59) connects Texarkana to Houston and all Texas ports along the Gulf of Mexico with connections to I-20, Interstate Highway 10 (I-10) and numerous U.S. & State Highways along the route. The existing roadbed of HWY 59 is the proposed route for I-69/I-369 corridor.
- **Interstate Highway 49** (I-49) connects Texarkana to New Orleans with connections to I-10 and I-20 along this route to the south, and Fort Smith and Kansas City to the north with connections to I-40 & I-44 with multiple connections to additional U.S. & State Highways along the entire route. Plans are in progress to complete the construction of the portion of I-49 between Texarkana and Fort Smith.
- **U.S. Highway 71** (HWY 71) connects Texarkana to Fort Smith, Arkansas and I-40.
- **U.S. Highway 67** (HWY 67) connects Dallas to St. Louis through Texarkana with multiple connections to additional interstate, U.S. & State Highways along the route.
- **U.S. Highway 82** (HWY 82) runs immediately adjacent to the north property line of all TexAmericas Center property and connects North and West Texas, to the Atlantic Ocean, and to Los Angeles via I-10 with multiple connections to additional interstate, U.S. & State Highways along the route.

### 5.1.2 Duke East Site Road Adjacency

The Duke East Site is situated at the northwest corner of the intersection of Oak Street and the west end of Elm Circle on the TAC East campus.

- Oak Street is a primary east/west corridor through TAC East. Oak Street intersects Cass Street approximately a third of a mile south of HWY 82 and is immediately

adjacent to the south boundary of the Duke East Site. Oak Street is currently a two-lane road with a 150' wide right-of-way. Future improvements to Oak Street will add capacity by increasing the pavement width making this a four-lane thoroughfare.

- Elm Circle is a secondary corridor that serves a cluster of small warehouse buildings north of the Duke East Site. Elm Circle is a two-lane road with a 75' wide right-of-way. Future improvements to Elm Circle will re-build the two-lane road meeting current paving criteria.

Both Oak Street and Elm Circle are Private Roads, owned and maintained by TexAmericas Center. Both roads have asphalt surfaces and are designated truck routes through TAC East with an 80,000-pound capacity.

Exhibits located in Appendix A show the roads adjacent to TexAmericas Center and to the Duke East Site.

## **5.2 RAIL AND INTERMODAL INFRASTRUCTURE**

### **5.2.1 Area Rail Operators**

Texarkana is a major east/west and north/south rail center, with over 125 trains passing through the community per day. The Union Pacific (UP – a Class I Operator), Kansas City Southern (KCS – a Class I Operator), Texas Northeastern (TNER – a Short Line Operator), and Lone Star Rail Car Service (LSRCS – a privately owned Operator on the TAC East Campus) serve TexAmericas Center and the Texarkana market.

### **5.2.2 Area Intermodal Facilities**

The Texarkana/TexAmericas Center market is well-served by inland ports or intermodal facilities. The nearest intermodal operations can be found in:

- **Dallas/Fort Worth, TX** (BNSF, KCS-NS, and UP)
- **Houston, TX** (BNSF and UP)
- **Kansas City, MO-KS** (BNSF, CP, NS, and UP)
- **Memphis, AR-TN** (BNSF, CN, CSX, NS and UP)
- **New Orleans, LA** (CN, NS and UP)
- **St. Louis MO-IL** (BNSF, CN, CSX, NS and UP)
- **San Antonio, TX** (UP)
- **Shreveport/Minden, LA** (KCS-NS)

### **5.2.3 TAC Rail Service**

The TNER collects cars in the UP & KCS yards in Texarkana and delivers to TAC via a UP owned line running immediately south of HWY 82 and along the north boundary line of TAC East. The TNER delivers these cars to the siding located at the northwest corner of TAC East. At this point, LSRCS connects and spots the cars in a 350-car classification yard along the west boundary of TAC East or maneuvers the cars to locations on TAC East at other storage locations or for spotting as needed for tenant activities.



#### 5.2.4 TAC Rail System

TAC owns approximately 36-miles of rail on TAC East. The rail on the TAC East campus is predominantly 85# rail. Several crossings have been upgraded recently and the rail at these locations has been upgraded to 115# rail. TAC has received grant funds and is currently working on improvements to several existing crossings and turnouts with the intentions of upgrading the rail through these facilities to 115# rail and performing other maintenance upgrades to better accommodate 286,000# loads.

#### 5.2.5 TAC Transload Facility

A designated transload location is currently operating at TAC East and is located on acreage approximately one half mile west of the Duke East Site on Oak Street. A twelve-car spot is designated and an operator contracts with businesses independently for loading and unloading activities. A variety of commodities can be handled in this facility. TAC will provide contact information for operator if requested.

#### 5.2.6 Duke East Rail Adjacency

A portion of the TAC Rail System utilized to deliver railcars to the eastern parts of TAC East, called the 'East/West Main' currently runs along the north boundary of the Duke East Site. Additional switches can be added along this line, if needed, for rail served activities within the Duke East Site. Figure A-10 in Appendix A shows three different alignments for extending rail into the site. Each of these sites could potentially allow for the placement of at least one rail-served building on the site.

### 5.3 AIR INFRASTRUCTURE

TexAmericas Center is a 25-minute drive from **Texarkana Regional Airport (TXK)**, with three daily round trip flights to **Dallas/Fort Worth International Airport (DFW)**. DFW is America Airlines' largest hub and is the third busiest airport in the world, with **over 900 flights daily** from over 23 airlines with service to **218 non-stop destinations**, both international and domestic. DFW is a 30-minute flight or a 2.5-hour drive from Texarkana.

Other airports within a two-hour drive include:

- **Shreveport Regional Airport (SHV)** – approximately 75 minutes, 5 non-stop, direct flights
  - Commercial air operations are provided by Allegiant, American, Delta, GLO, and United.
  - Major Destinations include: Dallas/Fort Worth, Las Vegas, Atlanta, Chicago, Denver, Charlotte, and Houston
- **Little Rock Municipal Airport (Clinton National Airport)(LIT)** – approximately 2 hours, 13 non-stop, direct flights
  - Commercial air operations are provided by Allegiant, American, Delta, Southwest, GLO, and United.
  - Major Destinations include: Las Vegas, New Orleans, Phoenix, Dallas, Houston, Atlanta, Orlando, Charlotte, Detroit, St. Louis, Denver, and Chicago.

- **Dallas Love Field (DAL)** – approximately 2 hours, 58 non-stop, direct flights
  - Southwest HQ hub
  - Major Destinations include: Chicago, Washington DC, Los Angeles, New York, Atlanta, and Las Vegas

## 5.4 WATERWAYS AND PORT FACILITIES

TexAmericas Center is approximately 100 miles from the Port of Caddo-Bossier in Northwest Louisiana, the closest port to Texarkana and commercially navigable via the Red River. The Red River connects to the Mississippi River, the coastal waterway system, and the central US waterway system. The Port of Little Rock is approximately 160 miles northeast of TexAmericas Center, while the Port of Houston lies approximately 295 miles south.

# 6 UTILITIES

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TexAmericas Center is well-served by industrial-grade utilities with excess capacity situated immediately adjacent to the Duke East Site. Below is a brief summary of all utilities. More information can be provided upon request.

## 6.1 WATER SOURCE INFORMATION

TexAmericas Center's water provider is **Riverbend Water Resource District (RWRD)**, which currently contracts with **Texarkana Water Utilities (TWU)** for provision of water to TexAmericas Center property. The water sources are two large reservoirs, Millwood Lake in Arkansas, and Lake Wright Patman in Texas.

TWU's current water plant has a design **capacity of 36 MGD**. The average daily use is 16 MGD, leaving an **excess capacity of 20 MGD**. A **30" transmission line** connects Texarkana to New Boston, Texas. This line can deliver over **4 MGD** to Riverbend's water system on TexAmericas Center's property. RWRD pumps currently pull **1.7 MGD** of water from the line, leaving **2.3 MGD of excess capacity** in the transmission line.

### 6.1.1 Water (potable) Main Adjacency

A 16-inch main is situated on the south side of Oak Street immediately adjacent to the south boundary line of the Duke East Site. Additionally, a 10-inch main runs along the west side of Elm Circle immediately adjacent to the east boundary line of the Duke East Site. The main turns west and continues west immediately adjacent to the north boundary of the site.

A Water Availability Map (Figure G-1) is located in Appendix G.

### 6.1.2 Water (non-potable) Main Adjacency

Riverbend Water Resources District will also be the provider of non-potable water on TAC East after the completion of the new regional water treatment plant.

### **6.1.3 Water System Expansion**

RWRD recently announced a **\$200 million investment** in a new, **30 MGD regional water system** that will be located on TexAmericas Center property. This state-of-the-art water system will eliminate reliance on TWU, while allowing businesses locating to TexAmericas Center to expand without concerns surrounding water treatment needs and availability. **Raw water** will also be available on both the Central and East campuses. Long term growth planning calls for full plant expansion up to **90 MGD**.

### **6.1.4 Contact Information**

Riverbend Water Resources District (RWRD)  
Kyle Dooley, P.E.  
Executive Director/Chief Executive Officer  
228 Texas Avenue, Suite A  
New Boston, Texas 75570  
903.831.0091  
[riverbend@rwrdd.org](mailto:riverbend@rwrdd.org)  
[www.rwrdd.org](http://www.rwrdd.org)

## **6.2 SANITARY SEWER**

Riverbend Water Resources District is also the provider of sanitary sewer collection and treatment on TAC East.

### **6.2.1 Sanitary Sewer Main Adjacency**

An 18-inch, SDR 26, sanitary sewer is situated along the north side of Oak Street immediately adjacent to the south boundary of the Duke East site. The main slopes from the west to the east along the south property line. Additionally, an 8-inch, SDR-26 sanitary sewer runs on the east side of Elm Circle immediately adjacent to the east boundary of the Duke East Site. The main turns west and continues along the north line of the site.

A Sanitary Sewer Availability Map (Figure G-2) is located in Appendix G.

### **6.2.2 Treatment Facility**

The wastewater plant servicing the TAC footprint has an average daily discharge limitation of 1.5 MGD with a daily maximum discharge limitation of 3.0 MGD. Based on the TCEQ permit for the facility, utilizing the daily maximum discharge limitations (3.0 MGD), the daily maximum biological oxygen demand is 250 lbs/day and the daily maximum total suspended solids is 500 lbs/day. The pH has an operating requirement range from greater than 6.0 to less than 9.0 with minimum monitoring requirements of one sample per day.

RWRD is in negotiations with RRAD to establish a public pretreatment facility for non-food industrial uses which will be at a yet determined site located on TAC East.

### 6.2.3 Treatment Facility Expandability

The existing wastewater plant serving the TAC footprint is built in a modular fashion with two (2) modules having a 750,000 GPD capacity. The facility is currently constructed with the necessary piping in place to accommodate an additional 750,000 GPD module increasing the treatment capacity to approximately 2.25 MGD.

### 6.2.4 Contact Information

Riverbend Water Resources District (RWRD)  
Kyle Dooley, P.E.  
Executive Director/Chief Executive Officer  
228 Texas Avenue, Suite A  
New Boston, Texas 75570  
903.831.0091  
[riverbend@rwrdd.org](mailto:riverbend@rwrdd.org)  
[www.rwrdd.org](http://www.rwrdd.org)

## 6.3 ELECTRICITY

### 6.3.1 Source Information

TexAmericas Center is served electricity by **AEP/SWEPCO**, one of the lowest cost electricity providers in the USA, with **rates typically 80% of the US average**. Currently **3-Phase, 12kv distribution lines** and **four substations** serve TexAmericas Center property. Each substation is connected to a **69kv transmission line** and has design capacity of **20MW**, with existing excess capacity of approximately **10MW** of power per substation. An additional **138kv line** and **two 345kv lines** are near and adjacent to TexAmericas Center, making dual feeds/connections and upgrading the substations to provide **up to 350MW** possible.

### 6.3.2 Substation Locations

Four substations are on or adjacent to TexAmericas center and provide service to the property. TAC East is served by a substation on Bowie Parkway on its east boundary.

One of the adjacent substations is situated approximately one quarter mile north of TAC East with a distribution line along the north right-of-way line of HWY 82. A connection may be made to this distribution line and extended south into TAC East for the purpose of providing a dual service connection to the property.

Conversations with AEP have led to the ability for the placement of an additional substation in TAC East if needed to support prospects activities. One location under consideration is in the vicinity of the intersection of Cass Street and Oak Street approximately one mile west of the Duke East Site on Oak Street.

### 6.3.3 Electrical Service Adjacency

A 12-kv overhead distribution line is situated on the north side of Oak Street immediately adjacent to the south boundary line of Oak Street. Additionally, an overhead single phase line runs along a portion of the north boundary line of the Duke East Site.

An Electricity Availability Map (Figure G-3) is located in Appendix G.

#### **6.3.4 Contact Information**

AEP/SWEPCO (AEP)  
John R. Jones  
Customer Account Manager  
428 Travis  
Shreveport, LA 71101  
903.728.5490  
[jrjones@aep.com](mailto:jrjones@aep.com)  
[www.aep.com](http://www.aep.com)

### **6.4 NATURAL GAS**

#### **6.4.1 Source Information**

**Navitas Utility Corporation** is the gas supplier to TAC East, which contracts through **Enable**. The Enable Interstate transmission pipeline that connects Texas to Arkansas runs adjacent to TexAmericas Center, north of the HWY 82 right-of-way. This Interstate pipeline is a **10-inch, 220 psi** high pressure natural gas line.

A **6-inch lateral** at **220 psi** from the Enable transmission line connects to Navitas' distribution system on TAC East. The existing meter can be upgraded for additional capacity as demand increases. The natural gas line onto TAC East consists of **dual 4-inch gas lines** that deliver **130 MCF per hour** and is expandable to **at least 170 MCF per hour**.

#### **6.4.2 Natural Gas Main Adjacency**

A pair of 4-inch gas lines is set to be installed in Summer 2021 on the south side of Oak Street immediately adjacent to the south boundary line of the Duke East Site. These lines will be capable of delivering approximately 130 MCF/hour with the ability to expand to 170 MCF/hour

#### **6.4.3 Gas System Expandability**

The Enable Interstate transmission pipeline can be upgraded substantially to at least **10,000 MCF per hour**. An upgrade like this would include a dedicated pipeline, likely a 12-inch high pressure (input 900 psi) steel line. Cost for this upgrade is \$300,000 per mile (2020 estimate), plus \$1,000,000 for interstate pipeline system improvements, and \$1,000,000 of contingency. This cost includes:

- Development
- Engineering
- Securing ROW
- Procurement
- Installation
- Commission
- Restoration



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- Clean up

A Gas Availability Map (Figure G-4) is located in Appendix G.

#### **6.4.4 Contact Information**

Navitas Utility Corporation  
Thomas Hartline  
Executive Director/Chief Executive Officer  
3186 D Airway Avenue  
Costa Mesa, CA 92626  
714.424.4094  
[thartline@navitasutility.com](mailto:thartline@navitasutility.com)  
[www.navitasutility.com](http://www.navitasutility.com)

### **6.5 HIGH SPEED FIBER**

#### **6.5.1 Source Information**

**Conterra Networks (Conterra)** provides data center-quality internet service to TexAmericas Center and has extended a **144-strand fiber line** onto or adjacent to all TexAmericas Center campuses. Conterra offers high bandwidth at competitive rates with **100+ gigabyte upload and download speeds** available.

#### **6.5.2 High Speed Fiber Adjacency**

Conterra installed a 144-strand fiber line on the north side of Oak Street immediately adjacent to the south boundary line of the Duke East Tract.

A Fiber Availability Map (Figure G-5) is located in Appendix G.

#### **6.5.3 Contact Information**

Conterra Networks  
Stephanie Green  
Area Sales Manager  
903.908.3052  
[sgreen@conterra.com](mailto:sgreen@conterra.com)  
[www.Conterra.com](http://www.Conterra.com)

#### **6.5.4 Fiber assessment Study – TAC Property**

**CBRE – Network Advisory Services** recently performed a Level 2 IT Assessment on TexAmericas Center property. On a scale of 1-5, with 5 being very feasible and 1 being infeasible, **TexAmericas Center ranked a 4** to support hyperscale, corporate, and similar data center applications. The next phase of the study will provide recommendations for upgrades to a 5 rating. The results of both of these assessments can be made available if requested/as completed.

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## 7 INCENTIVES

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Governments consider using public funds on a case-by-case basis to help incentivize proposed private economic development projects to strengthen a community's economic viability. Incentives can take a variety of forms such as tax breaks, construction of supporting infrastructure, workforce development programming and other forms of assistance. Jurisdictions may use these incentives to pursue economic goals such as tax base diversification, job creation, or business retention and expansion.

Incentive and business assistance offerings are typically based on the expected, realistic capital investment and job creation projections. A sample of available incentives are below; all can be used as an inducement to secure investment in our region's economy.

### 7.1 Special Zones

Locating to one of TAC's three campuses offers several incentive options on the federal, state and local levels. All incentives are competitive and based on established criteria. Available incentives include property purchase price abatement, property tax abatement, favorable lease/purchase arrangements, employee recruitment & training assistance, infrastructure grants and favorable financing. Area partners have a successful history of obtaining financial assistance for qualified projects from both state and federal sources; however, delivery of proposed grants is not guaranteed. Independent applications must be filed, and an established review and award process is followed. Seven of TAC's distinct incentives include:

#### 7.1.1 Defense Economic Readjustment Zone

As TAC is comprised solely of land formerly operated as a military installation, companies which locate to the TAC footprint become eligible for the Defense Economic Readjustment Zone Program. This program is a tool for business recruitment and job creation in adversely impacted military communities, such as TexAmericas Center. It is designed to aid Texas communities, businesses, and workers impacted by the closure or realignment of military installations and provides local and state regulatory and tax incentives to encourage businesses to locate or expand in these areas.

#### 7.1.2 U.S. Foreign Trade Zone #258

TexAmericas Center manages Foreign Trade Zone #258, a geographic area where goods may be landed, stored, handled, manufactured or reconfigured then re-exported under specific customs regulations, generally not subject to customs duties. Areas designated as Foreign Trade Zones (FTZ) are generally organized around major transportation hubs and areas with many advantages for trade. An FTZ is a defined, physical area within the United States that, for customs entry purposes is treated as if it is outside U.S. borders. Companies may use FTZs for both storage/distribution activities or, after specific authorization by the U.S. FTZ Board, for production.

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TAC will engage our consultant, Point Trade Services Inc., to estimate cost savings of operating in FTZ #258 upon request.

Foreign Trade Zones give companies multiple benefits that ultimately streamline operations and impact the bottom line. Some of these benefits include:

- CBP duty and federal excise tax, if applicable, are paid when the merchandise is transferred from the zone for consumption.
- While in the zone, merchandise is not subject to U.S. duty or excise tax. Certain tangible personal property is generally exempt from state and local ad valorem taxes.
- Goods may be exported from the zone free of duty and excise tax.
- CBP security requirements provide protection against theft.
- Merchandise may remain in a zone indefinitely, whether or not subject to duty.
- The rate of duty and tax on the merchandise admitted to a zone may change as a result of operations conducted within the zone. Therefore, the zone user who plans to enter the merchandise for consumption to CBP territory may normally elect to pay either the duty rate applicable on the foreign material placed in the zone or the duty rate applicable on the finished article transferred from the zone whichever is most advantageous.
- Merchandise imported under bond may be admitted to an FTZ for the purpose of satisfying a legal requirement of exporting the merchandise. For instance, merchandise may be admitted into a zone to satisfy any exportation requirement of the Tariff Act of 1930, or any other exportation requirement.

### **7.1.3 HUBZone**

TexAmericas Center is located within a federal HUBZone which offers advantages for federal contracts. A US HUBZone helps small businesses gain preferential consideration with government contracts by limiting some contracts just to HUBZones and giving HUBZone businesses a 10% price evaluation preference in full and open contract negotiations. By law, three percent of all dollars awarded for federal prime contracts are required to go to HUBZone-certified small business concerns. The local Small Business Development Center will assist in preparing company applications for being recognized as HUBZone eligible.

The SBA provides a higher surety bond for HUBZone companies. There is typically a subcontractor participation goal for many large business contracts. HUBZone requirements generally apply to U.S. Government purchases in excess of \$3,000.

The Small Business Association regulates and implements the HUBZone Program by doing the following:

- Determining which businesses are eligible to receive HUBZone contracts
- Maintaining a list of qualified HUBZone small businesses that federal agencies can use to locate vendors
- Adjudicates protests of eligibility to receive HUBZone contracts

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- Reports to Congress on the program's impact on employment and investment in HUBZone areas.

To qualify for the program, a business must meet the following criteria:

- It must be a small business by SBA standards (<https://www.sba.gov/federal-contracting/contracting-guide/size-standards>)
- Its principal office must be located in a HUBZone, which includes military facilities closed by the Base Realignment and Closure Act, such as TAC
- At least 35% of its employees must reside in a HUBZone

#### **7.1.4 New Market Tax Credits**

TexAmericas Center is designated as an economically distressed community making businesses located on our footprint eligible for New Market Tax Credits (NMTC). The NMTC program attracts capital to eligible communities by providing private investors with a federal tax credit for investments made in businesses or economic development projects located in distressed communities, such as TAC.

Investors in NMTC receive a tax credit equal to 39 percent of the total Qualified Equity Investment made in a Community Development Entity. The credit is realized over a seven-year period: five percent annually for the first three years and six percent in years four through seven.

#### **7.1.5 U.S. Opportunity Zone**

A US Opportunity Zone is an economically distressed community where new investments, under certain conditions, may be eligible for preferential tax treatment to spur economic development in those areas. Qualified Opportunity Zones retain their designation for 10 years.

First, investors can defer tax on any prior gains until December 31, 2026 or such date in which an investment is sold or exchanged, whichever comes first, as long as the gain is reinvested in a Qualified Opportunity Fund.

Second, if the investor holds the investment in the Opportunity Fund for at least ten years, the investor would be eligible for an increase in basis equal to the fair market value of the investment on the date that the investment is sold or exchanged. Investors can defer certain taxes if they invest in an Opportunity Zone within six months of realizing the gain.

Investments in Opportunity Zones realize the following benefits for investment periods of at least:

- Five years with a 10% increase in tax basis
- Seven years with a 15% increase in tax basis

Ten years with an exemption from additional gains beyond what was previously deferred

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### **7.1.6 Texas Enterprise Zone**

The Texas Enterprise Zone Program is a state sales and use tax refund program designed to encourage private investment and job creation in economically distressed areas of the state of Texas.

Depending upon capital investment, Texas will refund up to \$7,500 for each allocated permanent or retained job.

- For projects with a capital investment below \$150 million, qualified businesses may receive up to \$1.25 million in state sales and use tax refunds (\$2,500 per job with a maximum of 500 jobs created).
- For projects with a capital investment between \$150 million and \$250 million, qualified businesses may receive up to \$2.5 million in state sales and use tax refunds (\$5,000 per job with a maximum of 500 jobs created).
- For projects with a capital investment of \$250 million or more, qualified businesses may receive up to \$3.75 million in state sales and use tax refunds (\$7,500 per job for no less than 500 jobs created).

### **7.1.7 Texas Reinvestment Zone**

Designating a specific geographic area as a Texas Enterprise Zone also makes it a Texas Reinvestment Zone, and potentially eligible for tax increment financing, tax abatement and limitations on appraised value. A local property tax exemption may be granted for real and tangible personal property located in the reinvestment zone that was acquired from the federal government by lease or deed. In addition, property in a reinvestment zone is eligible for:

- A tax refund based on the capital investment in the project
- An exemption from state regulation and suspension from local regulation
- Preference for loans from the state
- Refunds and credits on state excise, use, sales and franchise taxes
- Refunds on local sales and use taxes
- The reduction or elimination of local fees.
- Incentives tied to increasing jobs, wages or investment

### **7.1.8 Pace Program**

The Texas Property Assessed Clean Energy (PACE) program provides low-cost, long-term financing for water and energy efficiency upgrades to commercial and industrial properties. PACE improvements add value to the property and reduce utility bills with the upgrades typically paying for themselves with positive cash flow over time. In 2013, the Legislature passed Senate Bill 385 (83R) allowing municipalities and counties to work with commercial lenders and property owners to pursue improvements using property



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assessments as a secure repayment mechanism. Eligible upgrades are financed over time through a voluntary property tax assessment attached to the property. Under a PACE arrangement, private property owners evaluate measures that achieve energy savings and obtain financing, repaid as an assessment on the building. The assessment mechanism allows access to low-cost, long-term capital to finance improvements to the property. By eliminating upfront costs, extending financing and simplifying the transfer of repayment obligations to new owners upon sale, PACE overcomes challenges that have hindered building energy efficiency and related projects.

## **7.2 RECRUITMENT AND TRAINING**

### **7.2.1 Skills Development Fund**

The Texas state-funded Skills Development Fund is an innovative program providing local customized training opportunities for Texas businesses and workers to increase skill levels and wages of the Texas workforce. Training providers can use grant funds for curriculum development, training materials, instructor certifications and training equipment additions or upgrades. The employer and local community colleges will partner to develop a training plan for the Skills Development project and submit the application jointly.

The Texas Workforce Commission and local Workforce Board will assist to ensure the application requirements are completed. Grants are provided to help companies and labor unions form partnerships with local community colleges and technical schools to provide custom job training. However, the benefit may vary depending on the proposal.

If the grant is awarded, the Texas Workforce Commission funding will be provided to the community college to administer the training program for the employer. Total grant amounts vary depending on the number of employees participating in the program. No money is spent or received by the company.

The Skills Development Fund is only available to Texas employers and will pay up to \$1,800 for each new employee and \$900 for each incumbent employee participating in the training. Grants are generally capped at \$500,000 but exceptions can be approved, and additional funds requested.

### **7.2.2 On-the-Job Training (OJT) Contracts**

On-the-Job Training (OJT) Contracts are available to an employer who hires an eligible Texas resident. OJT Contracts pay up to 50% of an eligible employee's wages during their training period. OJT Contracts are subject to availability and approval of Texas Workforce Solutions.

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### **7.2.3 Come Home to Texarkana Program**

The Texarkana region would be delighted to help you and your employees call Texarkana home. Institutions like the Texarkana Chamber of Commerce, the Greater Texarkana Young Professionals (GTYP), Leadership Texarkana, MainStreet Texarkana, Texarkana College, local school districts and others will help key employees discover Texarkana and acclimate to their new surroundings. We will use all our relocation tools to help you and your employees succeed at your new home in Texarkana.

## **7.3 TAX ABATEMENT PROGRAMS**

### **7.3.1 Goods in Transit Tax Abatement**

This law exempts goods, principally inventory, that are stored under a contract of bailment by a public warehouse operator at a public warehouse facility, and that is in no way owned or controlled by the owner of the goods. This is provided such property is moved to another location inside or outside Texas within 175 days after the goods were acquired in Texas or imported into Texas. The movement requirement could be satisfied by simply moving the goods to another warehouse across the street.

Certain specific types of goods are presently excluded from this exemption: oil, natural gas, petroleum products, aircraft, dealer's motor vehicle inventory, dealer's vessel and outboard motor inventory, dealer's heavy equipment inventory, or retail manufactured housing inventory. Some owners of goods that presently store them in owned facilities may move their goods into a public warehouse in order to obtain the tax exemption. Having inventory located in Texas on the lien date (January 1) that is not being manufactured, modified, assembled, or processed and is pre-committed to an out-of-state customer, most likely qualifies a business for a 100% property tax exemption. In some cases, it is possible to qualify part of your inventory for an interstate/foreign commerce exemption and a Freeport Exemption on the remainder, depending on the flow of goods and qualifying thresholds. Furthermore, as this is a statutory exemption, it applies to all taxing jurisdictions, including county, city, school, and special districts.

### **7.3.2 Freeport Tax Exemption**

The Freeport Exemption is a constitutional amendment that exempts certain goods, which the government has dubbed Freeport goods, from property taxes. If a business has inventory in the state of Texas for a short period of time (175 days or less) before transporting it out of state, it may be eligible to claim a business personal property tax exemption on that inventory. Savings will be based on the percentage of tangible property goods that your business moved out of Texas within the 175-day window during the previous year.

The following conditions must also be met:

- Freeport property includes goods, merchandise, ores, and certain aircraft and aircraft parts.

- 
- The inventory must fall under the categories of finished goods, supplies, raw materials or work in process of being assembled, repaired, maintained, stored, processed or fabricated. The exemption does not apply to oil, natural gas, or liquid or gaseous materials that are immediate derivatives of the oil refining or natural gas.
  - The Freeport goods that are eligible for this exemption must be transported out of Texas within 175 days of the date that they are acquired, manufactured or brought into the state.
  - Goods, known as goods-in-transit that meet the Freeport property requirements may be sold in-state instead of being shipped out of state. However, the property still must meet all the Freeport property requirements, and be transported out of Texas within 175 days after it was first acquired in or imported into the state.

### **7.3.3 312 Tax Abatement**

Chapter 312 of the Texas Tax Code permits local taxing units to enter into agreements with property owners providing for the abatement of ad valorem property taxes, provided that the property owner makes specified improvements or repairs to the property. The code, also known as the Property Redevelopment and Tax Abatement Act, allows the governing bodies of cities, counties and special districts to exempt all or part of the taxable value of new investments for a period not to exceed 10 years. To be eligible for an abatement, a project must be a new facility or an expansion or modernization of an existing one. Abatement agreements are required to include certain provisions. They must specify the improvements to be made to the property and provide access for city or county employees to verify that the agreements are followed. The agreements must require payment of taxes if a property owner fails to comply with the abatement terms. In addition, annual certificates of compliance must be filed with the applicable taxing units to ensure accountability and visibility for the public.

### **7.3.4 313 Tax Abatement**

An appraised value limitation is an agreement between a taxpayer and a Texas school district in which the taxpayer proposes to build or install property and create jobs meeting certain requirements in exchange for a ten-year limitation on the taxpayer's property value for school district maintenance and operations tax (M&O) purposes. For ten years, school M&O property taxes are not levied on the value in excess of the limitation amount. Limitation amounts are established by statute and vary by school district. Unlike abatements based on a percentage of the property value, the structure of the program benefits primarily large projects, such as petrochemical, energy, or manufacturing sectors. .

Companies seeking a limitation submit an abatement application to the school district in which the project may be located. The school district forwards the application to the Texas Comptroller for evaluation. The school district may not grant final approval of the

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abatement without Comptroller analysis and approval. For the 10 years of the tax benefit period, reduced local school district revenues are substantially replaced with state funds through the state public school finance system.

### **7.3.5 381 Tax Abatement**

Chapter 381 of the Local Government Code allows counties to provide incentives encouraging developers to build in their jurisdictions. A county may administer and develop a program to make loans and grants of public money to promote state or local economic development and to stimulate, encourage and develop business location and commercial activity in the county. Specifically, it provides for offering loans and grants of city funds or services at little or no cost to promote all types of business development including industrial, commercial and retail projects. Each agreement can be uniquely tailored to address the specific needs of both the local government entity and the business prospect.

### **7.3.6 Texas Research and Development Tax Credit**

Taxpayers in Texas can claim the R&D Tax Credit to offset a portion of their franchise tax or use it towards a sales and use tax exemption on the purchase or lease of depreciable tangible personal property used in qualified research in Texas. Some highlights of the Texas R&D Tax Credit include:

- Qualified Research Expenses (QREs) must be for research conducted within Texas.
- The credit amount is 5% of the excess amount of qualified research expenses in the current period over the base amount (50% of the average of the previous three years).
- The allowable Franchise Tax Credit in any one period, including carryforward amounts, cannot exceed 50% of the franchise tax due for the period.
- Unused credits can be carried forward for up to 20 years.

### **7.3.7 Pollution Control Equipment Incentive**

Property used wholly or partly to prevent, monitor, control or reduce pollution is considered "pollution control property" and is at least partly exempt from ad valorem (property) tax for the life of the asset. To obtain the exemption, the property owner must apply to the Texas Commission on Environmental Quality. The applicant can submit in three different tiers, or levels, of applications for a use and benefit determination.

### **7.3.8 Franchise Tax Exemption and Deduction for Business HQ Relocation**

Companies may deduct from apportioned margin relocation costs incurred in relocating their main office or other principal place of business to Texas from another state provided the company (1) did not do business in Texas before the relocation and (2) is not a member of an affiliated group engaged in a unitary business, another member of which is already doing business in Texas.

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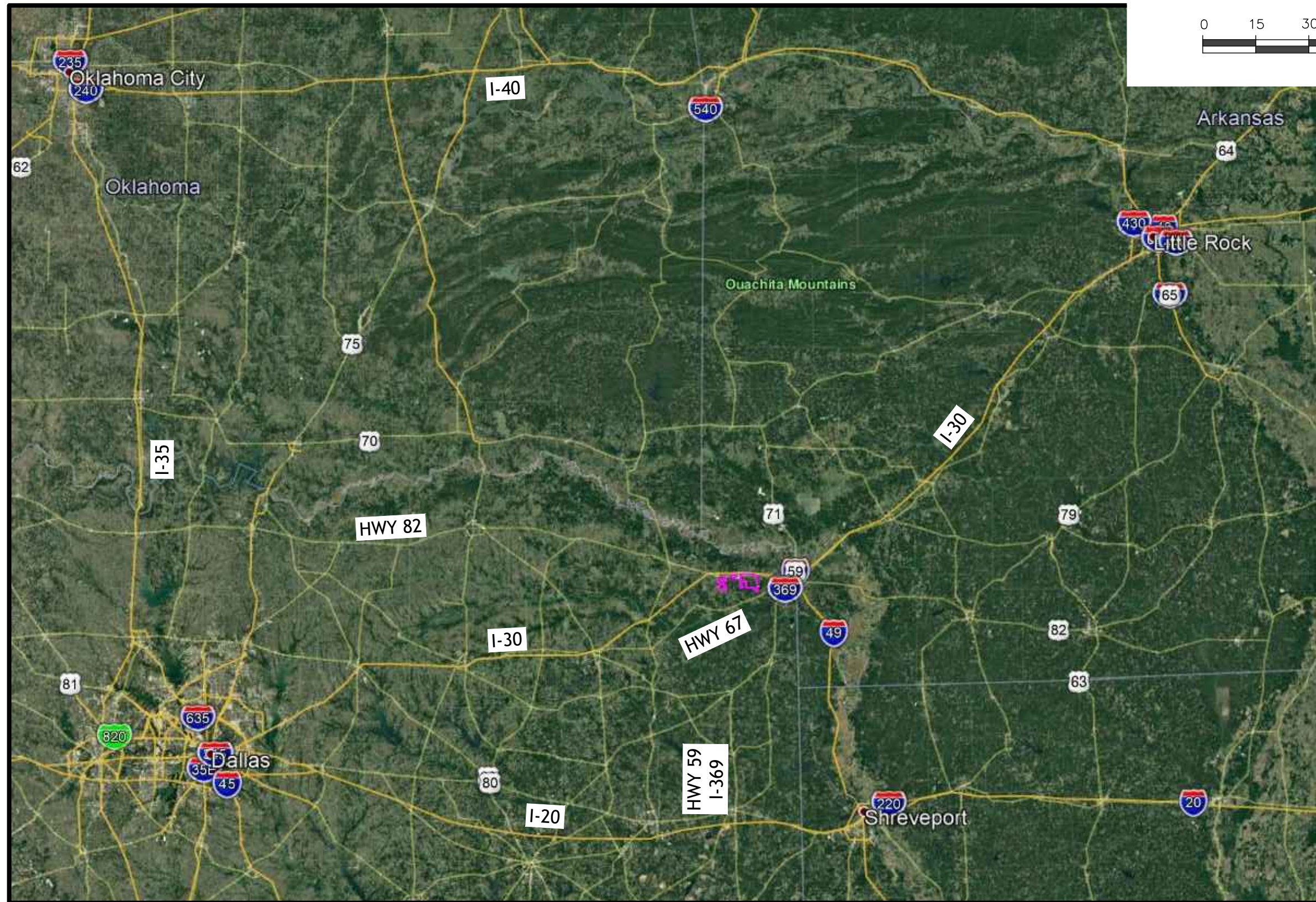
Deductible relocation costs include (1) costs of relocating computers and peripherals, other business supplies, furniture and inventory; and (2) any other costs related to the relocation that are allowable deductions for federal income tax purposes. The deduction must be taken on the company's initial franchise tax filing.



# APPENDIX A



FIGURE A-1



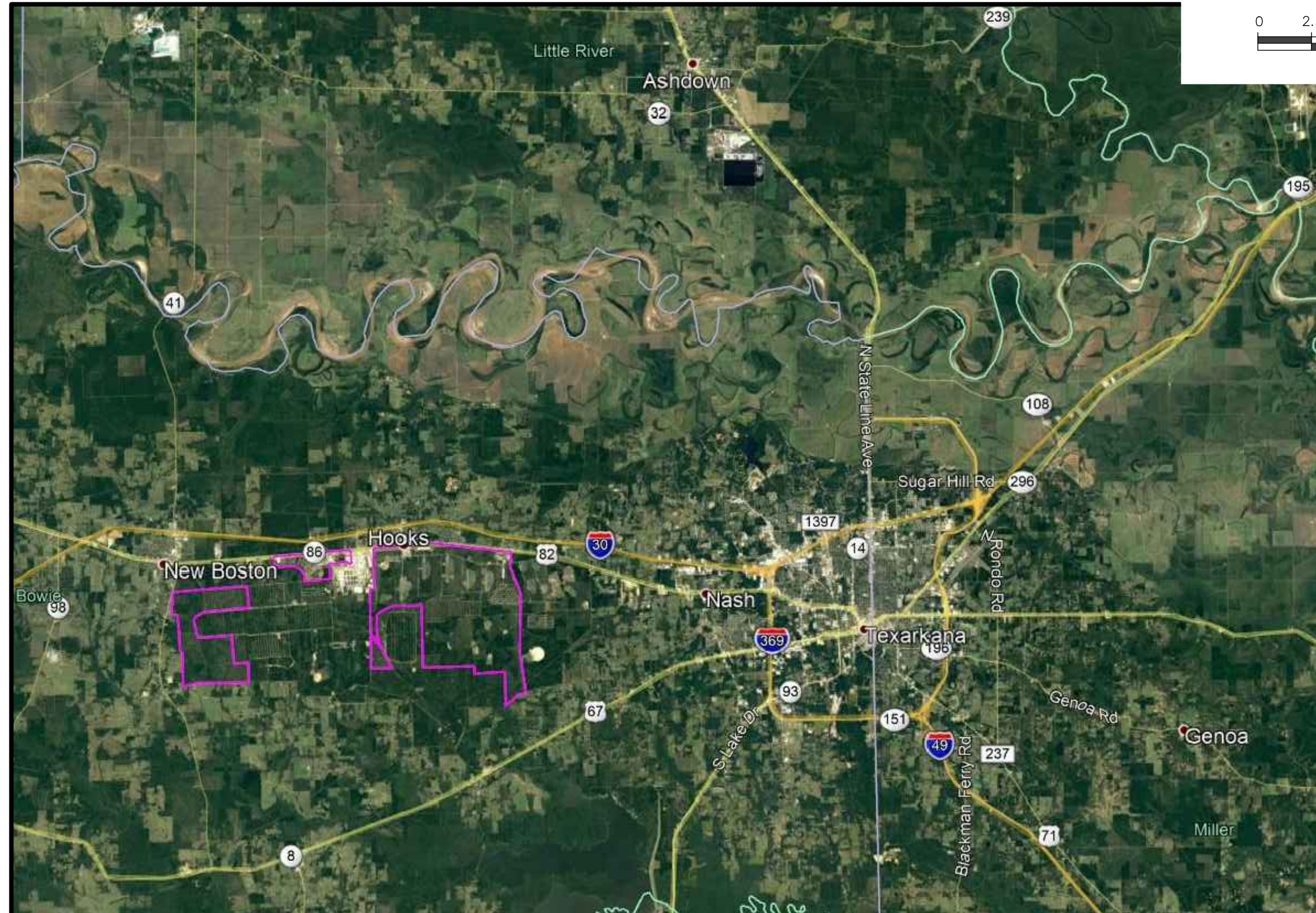
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AREA LOCATOR MAP  
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FIGURE A-2



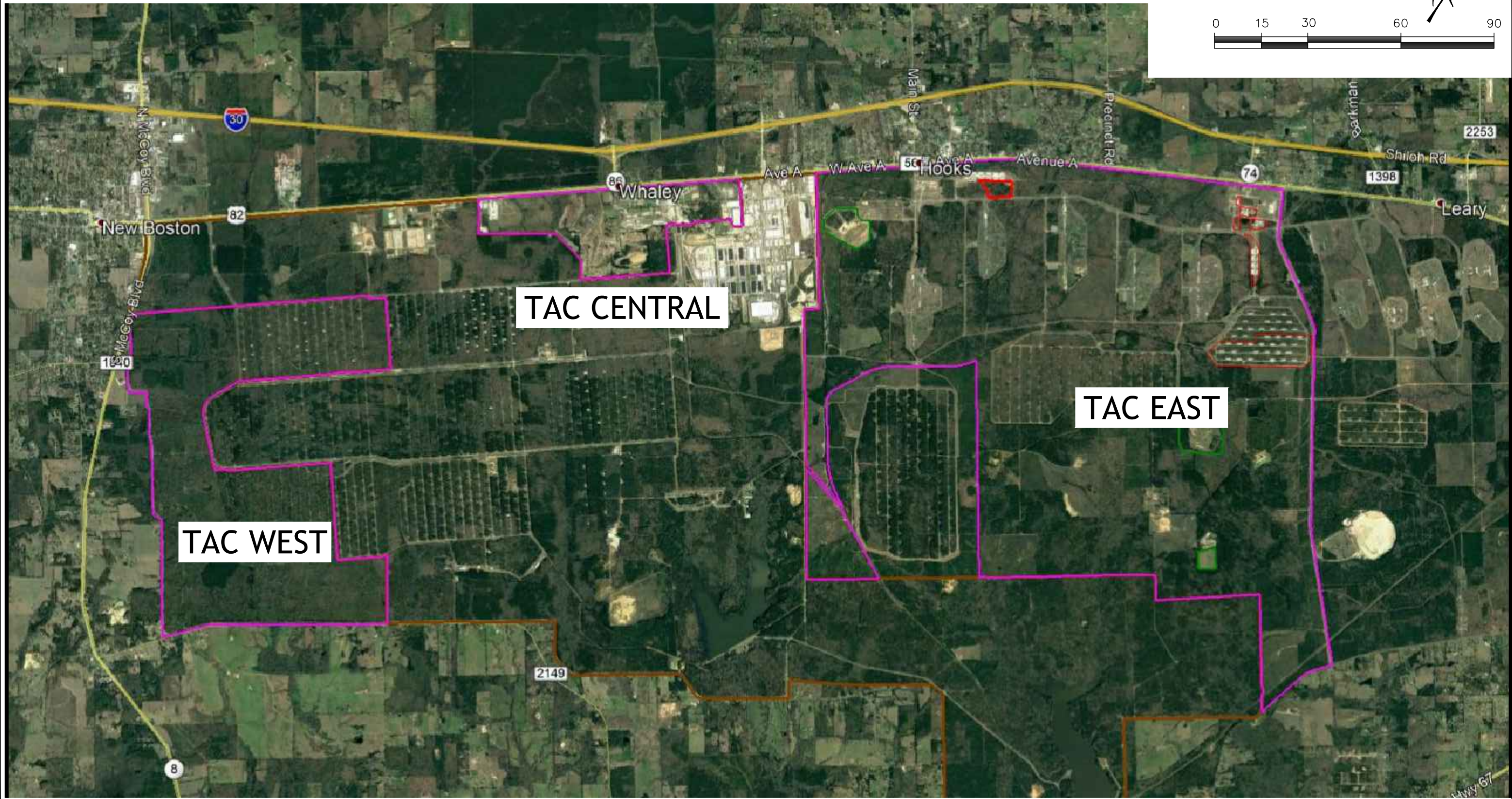
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REGIONAL LOCATOR MAP  
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FIGURE A-3



TAC WEST

TAC CENTRAL

TAC EAST

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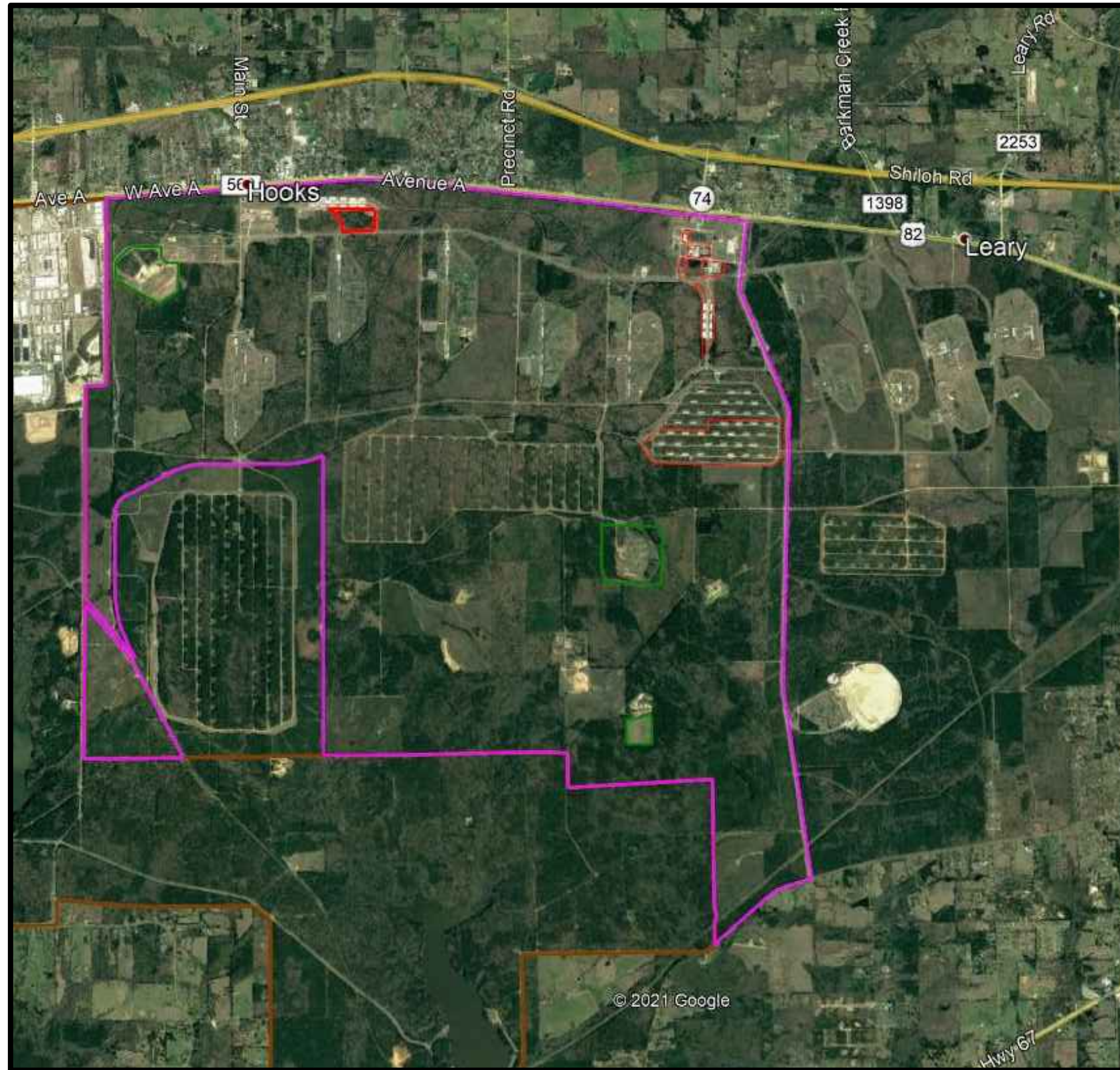
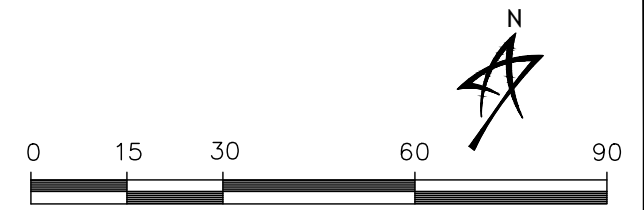


TEXAMERICAS CENTER - CAMPUS MAP

TexAmericas Center



FIGURE A-4



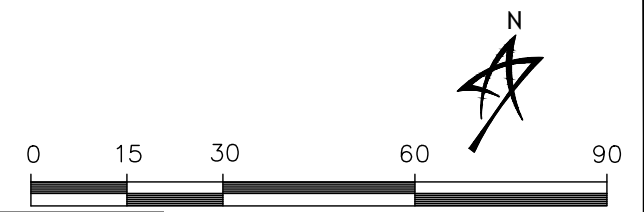
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TEXAMERICAS CENTER - EAST CAMPUS  
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FIGURE A-5



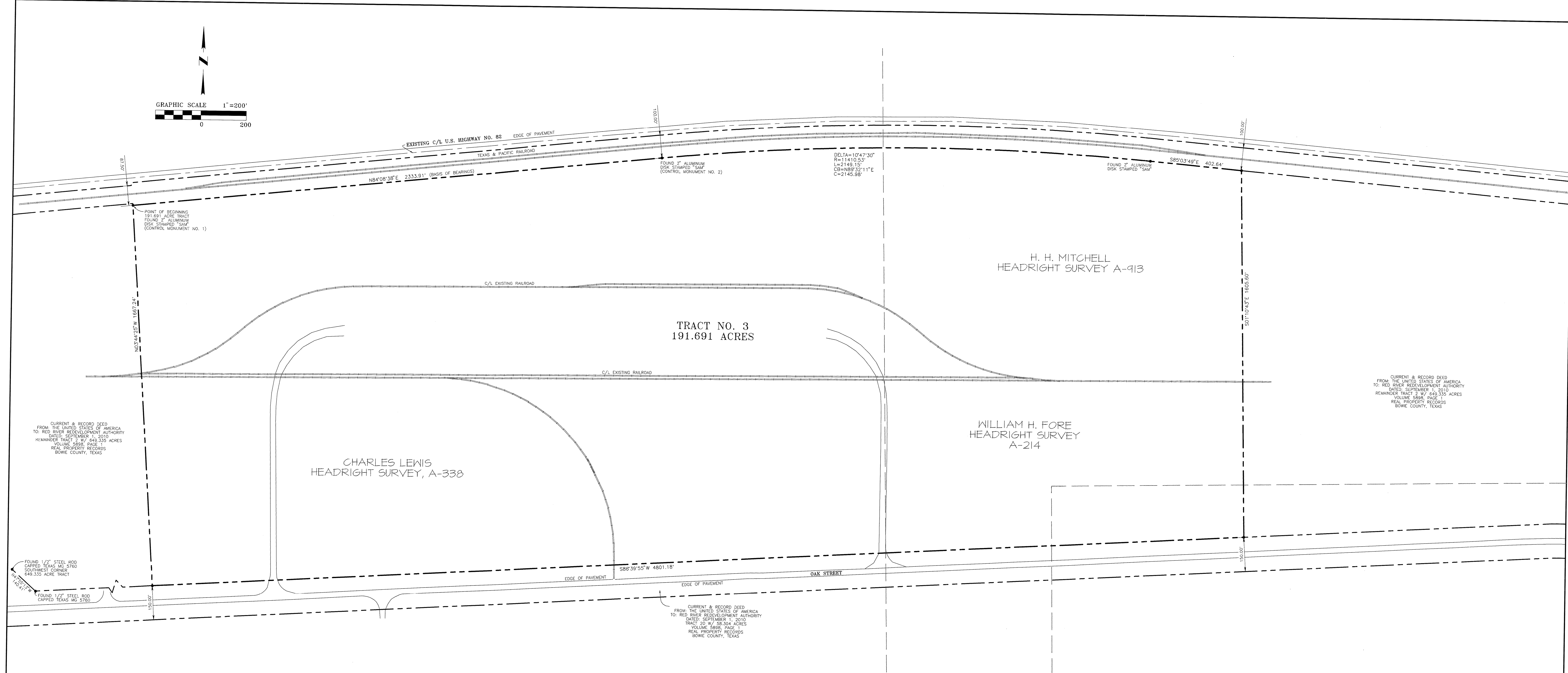
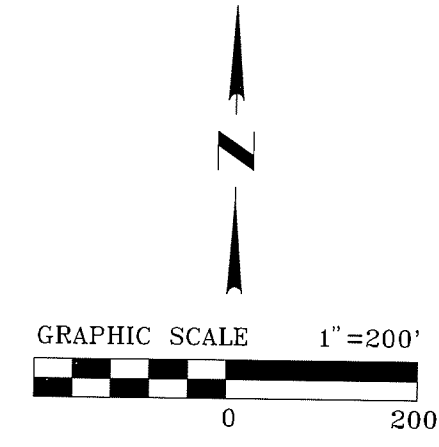
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DUKE EAST TRACT - TAC EAST CAMPUS  
**TexAmericas Center**







CURRENT & RECORD DEED FROM THE UNITED STATES OF AMERICA TO RED RIVER REDEVELOPMENT AUTHORITY DATED SEPTEMBER 1, 2010 REMAINDER TRACT 2 W/ 649.335 ACRES VOLUME 5898 PAGE 1 REAL PROPERTY RECORDS BOWIE COUNTY, TEXAS

CURRENT & RECORD DEED FROM THE UNITED STATES OF AMERICA TO RED RIVER REDEVELOPMENT AUTHORITY DATED SEPTEMBER 1, 2010 REMAINDER TRACT 2 W/ 649.335 ACRES VOLUME 5898 PAGE 1 REAL PROPERTY RECORDS BOWIE COUNTY, TEXAS

CHARLES LEWIS HEADRIGHT SURVEY, A-338

TRACT NO. 3  
191.691 ACRES

H. H. MITCHELL HEADRIGHT SURVEY A-913

WILLIAM H. FORE HEADRIGHT SURVEY A-214

**Property Description**  
Tract No. 3  
191.691 Acres  
Bowie County, Texas

All that certain lot, tract or parcel of land lying and situated in the Charles Lewis Headright Survey, Abstract 338, the H. H. Mitchell Headright Survey, Abstract 913 and the William H. Fore Headright Survey, Abstract 214, Bowie County, Texas, being a part of that certain tract of land described as Tract 2 with 649.335 acres in the deed from the United States of America to Red River Redevelopment Authority, now known as TexAmericas Center, dated September 1, 2010, recorded in Volume 5898, Page 1 of the Real Property Records of Bowie County, Texas, and being more particularly described by metes and bounds as follows:

**BEGINNING** at a 2 inch aluminum disk found for a corner (control monument), stamped SAM, on inside ell corner of the said 649.335 acre tract and an outside ell corner in the South right-of-way line of the Texas and Pacific Railway Company Railroad;

**THENCE** North 84 degrees 08 minutes 38 seconds East (basis of bearings) along the North line of the said 649.335 acre tract and the South right-of-way line of the said Railroad, a distance of 2333.91 feet to a 2 inch aluminum disk found for a corner (control monument), stamped SAM, at the beginning of a circular curve to the right;

**THENCE** in a Northeasterly direction along the arc of the circular curve a distance of 2149.15 feet, with a delta angle of 10 degrees 47 minutes 30 seconds, a radius of 11410.53 feet, a chord bearing of North 89 degrees 32 minutes 11 seconds East, and a chord distance of 2145.98 feet to a 2 inch disk found for a corner, stamped SAM;

**THENCE** South 85 degrees 03 minutes 49 seconds East along the North line of the said 649.335 acre tract and the South right-of-way line of the said Railroad, a distance of 402.64 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00;

**THENCE** South 01 degrees 10 minutes 43 seconds East a distance of 1605.60 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, lying in the South line of the said 649.335 acre tract and the North line of that certain tract of land described as Tract 20 with 58.304 acres in the said Volume 5898, Page 1;

**THENCE** South 86 degrees 39 minutes 55 seconds West along the North line of the said 58.304 acre tract, a distance of 4801.18 feet to a 1/2 inch steel rod set for a corner, capped MTG 101011-00, said corner bears South 86 degrees 39 minutes 55 seconds West a distance of 1215.45 feet to a 1/2 inch steel rod found for a corner, capped TEXAS MC 5760, and North 47 degrees 55 minutes 13 seconds West a distance of 140.41 feet to a 1/2 inch steel rod found for a corner, capped TEXAS MC 5760, the Southwest corner of the said 649.335 acre tract;

**THENCE** North 03 degrees 44 minutes 25 seconds West a distance of 1667.24 feet to the point of beginning and containing 191.691 acres of land at the time of this survey.

The bearings are based on Texas Coordinate System of 1983, North Central Zone, NAD83, with a bearing of North 84 degrees 08 minutes 38 seconds East.

This description is based on the survey and plat made by Jeffrey A. Wood, Registered Professional Land Surveyor No. 6220, on April 19, 2013.

**SURVEYOR CERTIFICATE:**

THIS IS TO CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND UNDER MY SUPERVISION ON APRIL 19, 2013, THAT THIS PLAT (MAP OR DRAWING) SUBSTANTIALLY COMPLES WITH THE CURRENT PROFESSIONAL AND TECHNICAL STANDARDS OF THE TEXAS BOARD OF PROFESSIONAL LAND SURVEYING AND REPRESENTS THE FACTS FOUND AT THE TIME OF THE SURVEY, THERE ARE NO VISIBLE IMPROVEMENTS EXCEPT AS SHOWN ON THE SURVEY PLAT.

THIS PLAT IS FOR THE INTENDED USE OF TEXAMERICAS CENTER AS RELATES TO OWNERSHIP OR TRANSFER OF OWNERSHIP. THIS SURVEY IS NOT ASSIGNABLE OR TRANSFERABLE. MAY NOT BE REISSUED WITHOUT RE-SURVEY AND MAY BE VOID/INVALID SUBJECT TO CHANGES IN GOVERNANCE OR INTERPRETATIONS ISSUED BY THE TEXAS BOARD OF PROFESSIONAL LAND SURVEYING, AND MAY NOT BE COPIED OR PROVIDED TO OTHER PARTIES WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE UNDERSIGNED.

*Jeffrey A. Wood*  
JEFFREY A. WOOD  
REGISTERED PROFESSIONAL LAND SURVEYOR  
NO. 6220, STATE OF TEXAS  
FIRM CERTIFICATE NO. 101011-00  
DATE: APRIL 19, 2013



**BASIS OF BEARINGS:**

THE BEARINGS ARE BASED ON GRID NORTH WITHIN THE "TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE, NAD83 (CONUSS9, EPOCH 2002.0), AT THE SURFACE, WITH A BEARING OF NORTH 84 DEGREES 08 MINUTES 38 SECONDS EAST. THE COMBINED SCALE FACTOR TO GO FROM SURFACE TO GRID IS 0.99998014508. THE FOLLOWING CONTROL MONUMENTS WERE USED TO ESTABLISH THE BASIS OF BEARINGS:

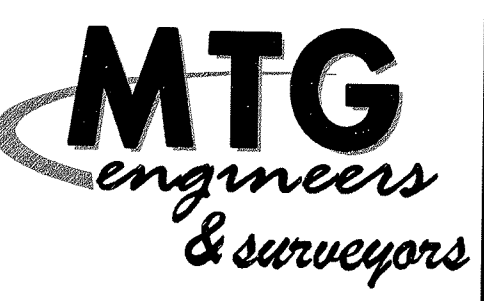
CONTROL MONUMENT NO. 1  
N=7242998.3926  
E=3252976.1897

CONTROL MONUMENT NO. 2  
N=7243236.5244  
E=3252976.9161

**NOTE:**  
1. ALL MONUMENTS ARE SET 1/2 INCH STEEL RODS CAPPED MTG 101011-00, UNLESS OTHERWISE NOTED.  
2. ALL BEARINGS AND DISTANCES ARE SHOWN AS MEASURED.

**BOUNDARY SURVEY**  
**TRACT NO. 3**  
**191.691 ACRES**

SITUATED IN THE CHARLES LEWIS HRS, A-338, THE H. H. MITCHELL HRS, A-913 AND THE WILLIAM H. FORE HRS, A-214, BOWIE COUNTY, TEXAS

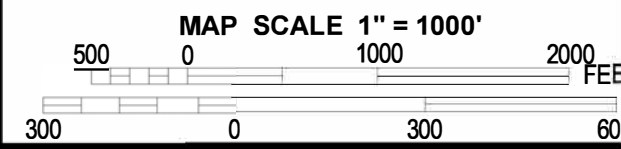


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Date	Revision/Description			File No.	Sheet No.
Drawn By	Checked By	Project No.	Dwg. Date	File No.	Sheet No.
T.B.V.	J.A.W.	19810	4/2013		4 of 7

X:\2013 Projects\191.691 Tract No. 3\Drawings\191.691 Tract No. 3.dwg  
 4/19/13 10:10 AM  
 TAC East Non-Permit Parcels\02 Surveying\Field Data\Tract No. 3\Tract No. 3.dwg

FIGURE A-8



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0310D

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**BOWIE COUNTY,**  
**TEXAS**  
**AND INCORPORATED AREAS**

**PANEL 310 OF 600**  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOWIE COUNTY	481194	0310	D
HOOKS, CITY OF	480056	0310	D

Notice to User: The Map Number shown below should be used when placing map orders, the Community Number shown above should be used on insurance applications for the subject community

**MAP NUMBER**  
**48037C0310D**

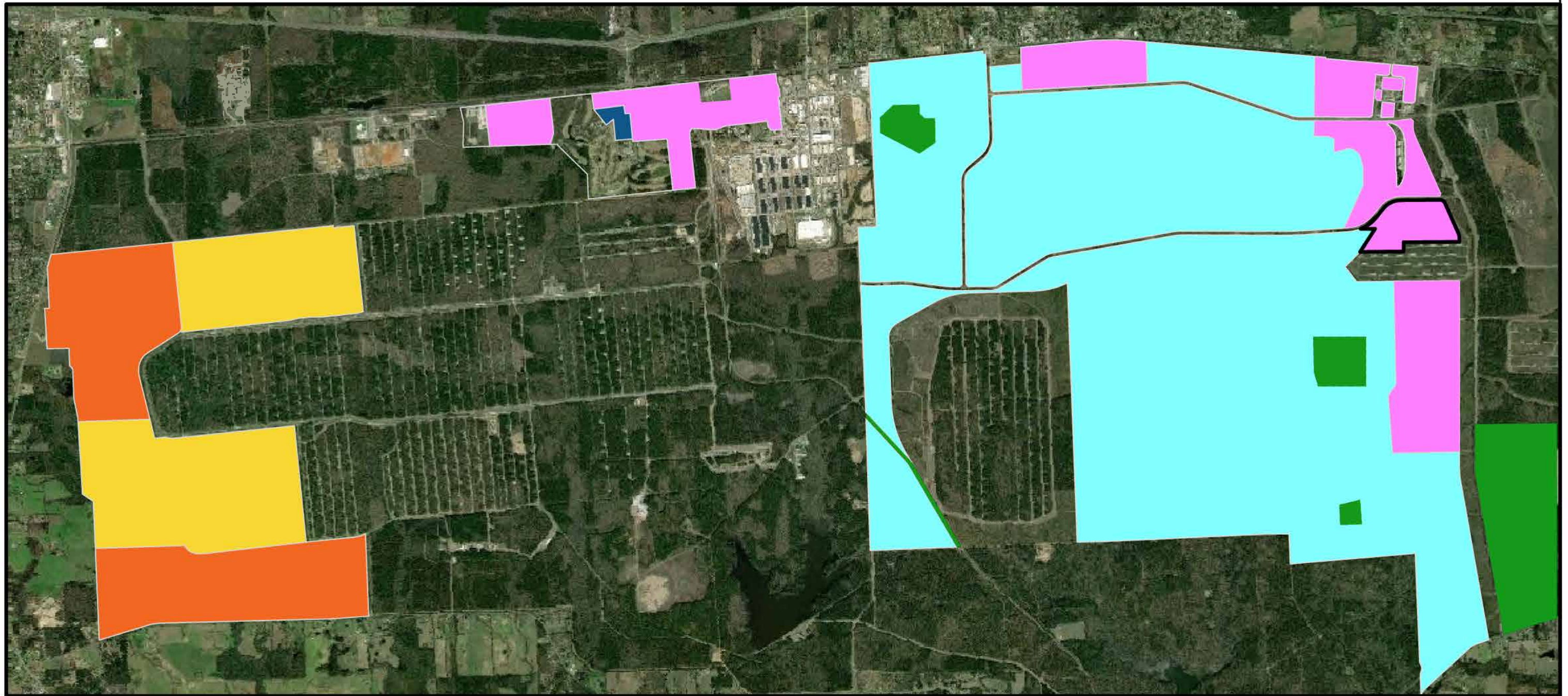
**EFFECTIVE DATE**  
**OCTOBER 19, 2010**

Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at <https://msc.fema.gov>.



FIGURE A-9



- TECHNOLOGY DISTRICT 1 (T1)
- TECHNOLOGY DISTRICT 2 (T2)
- RESIDENTIAL DISTRICT (R)
- LIGHT INDUSTRIAL DISTRICT (LI)
- HEAVY INDUSTRIAL DISTRICT (HI)
- U.S. ARMY PROPERTY

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ADOPTED 09.25.2018

LAND USE MAP

TexAmericas Center

SHEET NO:

LUM



FIGURE A-10



ELM CIRCLE EAST

OAK STREET

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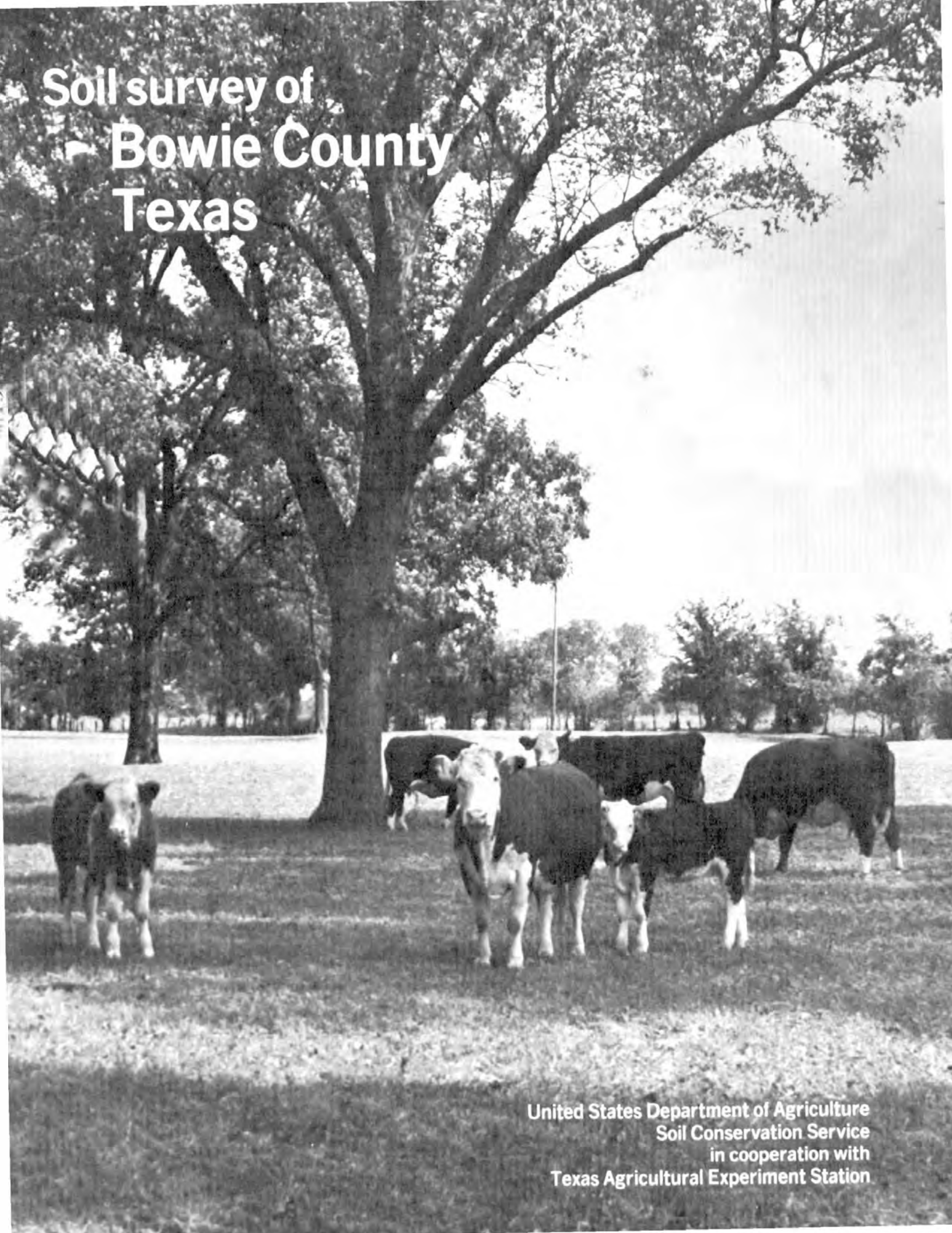


DUKE EAST TRACT - RAIL SERVICE OPTIONS

**TexAmericas Center**

# APPENDIX B





**Soil survey of  
Bowie County  
Texas**

**United States Department of Agriculture  
Soil Conservation Service  
in cooperation with  
Texas Agricultural Experiment Station**

production. Bahiagrass, bermudagrass, crimson clover, and arrowleaf clover are the main plants.

These soils are moderately well suited to loblolly pine, shortleaf pine, and eastern redcedar. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases yields.

This soil is poorly suited to crops. Droughtiness, the erosion hazard, the high gravel content, and low fertility are the main limiting features. However, the addition of lime and fertilizers will increase production. Terraces and diversions help control soil washing. Crop residue left on the soil surface helps to maintain organic matter content.

This soil is well suited to most urban development. Small stones or gravel are limitations for shallow excavations. In some areas, slope is a limitation for small commercial buildings.

This soil is well suited to recreational development except for playgrounds, which are limited by slope and small stones or gravel.

This soil is in capability subclass IIIe; woodland group 4f.

**34—Saffell-Urban land complex, 3 to 8 percent slopes.** This deep, gently sloping and sloping complex is on forested convex upland terraces. Slopes average about 5 percent. Areas are long and narrow. They average about 75 acres. This complex is about 45 percent Saffell soils, about 35 percent Urban land, and about 20 percent other soils. Areas of these soils and Urban land are so intermingled that they could not be shown separately at the scale selected for mapping.

Typically, the Saffell soil has a slightly acid gravelly sandy loam surface layer about 14 inches thick. It is brown in the upper part and yellowish red in the lower part. The subsoil to a depth of 80 inches or more is red, very strongly acid gravelly sandy clay loam.

Cuts for leveling purposes have removed the gravelly sandy loam surface layer and exposed the more clayey subsoil in some places. The Saffell soils are well drained and moderately permeable. The available water capacity is low. The erosion hazard is moderate.

Urban land is occupied mostly by commercial establishments and their paved parking lots. In places there are single-unit dwellings, streets, driveways, sidewalks, and patios.

Information on the use of these areas for urban development is contained in the sections on engineering and recreation.

This complex is not assigned to a capability subclass or woodland group.

**35—Sardis silt loam, frequently flooded.** This nearly level soil is on flood plains along the major creeks and drainageways. Slopes are less than 1 percent. Soil areas are long and narrow and parallel to streams. They range from 50 to several hundred acres and average about 200 acres.

Typically, the surface layer is brown silt loam about 9 inches thick. The subsoil extends to a depth of 62 inches or more. In the upper 41 inches, it is silt loam that is yellowish brown in the upper part and brown in the lower part. The lower part of the subsoil is pale brown fine sandy loam. Typically, this soil is neutral in the upper part and grades to very strongly acid in the lower part.

This soil is somewhat poorly drained. It floods briefly two to four times a year. A water table is 1 to 3 feet below the surface during winter and spring. Runoff is slow, and permeability is moderate. The available water capacity is high. The rooting zone is deep, and roots, water, and air move easily through the soil. The erosion hazard is slight.

Included with this soil in mapping are small areas of Amy and Thenas soils. The included soils make up less than 30 percent of any mapped area.

This Sardis soil is used mainly for woodland and pasture.

This soil is moderately well suited to pasture. The main forage plants are bermudagrass, fescue, bahiagrass, crimson clover, and arrowleaf clover. Frequent flooding and wetness limit yields to some extent. Proper grazing and the addition of lime and fertilizers increase yields.

This soil is well suited to trees such as loblolly pine, yellow-poplar, water oak, and sweetgum. Proper woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber production.

This soil is not recommended for cultivation because of frequent flooding.

This soil is poorly suited to urban and recreational development because of the hazard of flooding.

This soil is in capability subclass Vw; woodland group 1w.

**36—Sawyer silt loam, 0 to 3 percent slopes.** This nearly level and gently sloping soil is on uplands. Areas are broad and irregular in shape. They range from 20 to 500 acres and average about 100 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 80 inches or more. It is yellowish brown silty clay loam in the upper 9 inches, yellowish brown clay loam that has grayish and reddish mottles in the next 11 inches, and mottled gray, red, and strong brown clay in the lower part. Typically, this soil is slightly acid in the upper part and grades to very strongly acid in the lower part.

This soil is moderately well drained. Runoff and permeability are slow. Available water capacity is high. The rooting zone is deep, but the clayey texture in the lower part slows the movement of roots, water, and air. The erosion hazard is moderate.

Included with this soil in mapping are a few areas of Adaton and Eylau soils. Some areas have small mounds. Included soils make up 10 to 20 percent of the area.

These Sawyer soils are used mostly for pasture. A few areas are used for woodland and crops.



This soil is well suited to pasture plants such as bermudagrass, dallisgrass, bahiagrass, ryegrass, arrowleaf clover, and crimson clover. Proper grazing and the addition of lime and fertilizers increase production.

This soil is well suited to trees such as loblolly and slash pine. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and control of fire, increases timber production (fig. 9).

This soil is moderately well suited to crops. The main crops are soybeans, grain sorghum, corn, and small

grains. Low fertility and the erosion hazard are the main limiting features. Terraces and diversions decrease the amount of soil washing. Crop residue left on the soil surface increases infiltration and maintains organic matter content. Lime and fertilizers increase yields.

This soil is poorly suited to most urban development. High shrink-swell and high clay content are the main limiting features. Low strength is also a limitation for roads and streets.

This soil is well suited to recreational developments



*Figure 9.*—Mixed pine and hardwood forest on Sawyer silt loam, 0 to 3 percent slopes.

such as picnic areas and paths and trails. It is moderately well suited to camp areas and playgrounds. Slow permeability and slope are limitations.

This soil is in capability subclass IIe; woodland group 2w.

**37—Sawyer-Urban land complex, 0 to 3 percent slopes.** This nearly level and gently sloping soil is on upland interstream divides. Slopes average about 2 percent. Most areas are broad and irregular in shape. They range from 20 to several hundred acres and average about 50 acres.

This complex is about 60 percent Sawyer soils, 30 percent Urban land, and 10 percent other soils. Areas of these soils and Urban land are so intermingled that they could not be shown separately at the scale selected for mapping.

Typically, the Sawyer soil has a surface layer of dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 80 inches or more. It is yellowish brown silty clay loam that has grayish and reddish mottles in the upper 26 inches. Below this is gray, red, and strong brown, very strongly acid clay. The upper layers of most of the soil have been altered by cutting and filling.

Sawyer soils are moderately well drained. Runoff is slow, and permeability is slow. Available water capacity is high. The rooting zone is deep, but the clayey texture in the lower part slows the movement of water, air, and plant roots. The erosion hazard is moderate.

Structures on Urban land are mostly commercial buildings, streets, parking lots, and residences.

Included with this complex in mapping are small areas of Eylau and Ruston soils. The included soils make up about 10 percent of each mapped area.

The main soil characteristics that affect construction are high shrink-swell and wetness. Low strength limits use for streets and roads. Information about the use of these soils for urban development is contained in the sections on engineering and recreation.

This complex is not assigned to a capability subclass or woodland group.

**38—Severn very fine sandy loam.** This nearly level soil is on flood plains that rarely flood. Soil areas are long and narrow and parallel the river. They range from 100 to over 1,000 acres and average about 300 acres.

Typically, this soil has a surface layer of reddish brown very fine sandy loam about 8 inches thick. The next layer, to a depth of about 42 inches, is yellowish red very fine sandy loam. Below this to a depth of 65 inches or more is reddish brown, moderately alkaline silty clay loam stratified with other textures. Typically, this soil is moderately alkaline throughout.

This soil is well drained. It is rarely flooded. Runoff is slow, and permeability is moderately rapid. Available

water capacity is high. The rooting zone is deep, and roots, water, and air move easily through the soil. The erosion hazard is slight.

Included with this soil in mapping are small areas of Severn silty clay loam and Kiomatia soils. Also included are areas of a soil that has a thin clayey horizon on the surface and stratified sandy horizons below. These soils make up less than about 20 percent of the mapped acreage.

Most of this Severn soil is used for crops.

This soil is well suited to pasture. Bermudagrass, white clover, and alfalfa are common pasture and hay plants. Proper grazing and fertilization increase production.

This soil is well suited to trees such as eastern cottonwood, black walnut, pecan, and sweetgum. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber production.

This soil is well suited to soybeans, grain sorghum, cotton, and corn. Crop residue left on the soil surface helps to maintain organic matter content. Fertilizers increase yields.

This soil is moderately well suited to urban development. Limitations are flooding and low strength. Low strength is particularly a limitation for roads and streets.

This soil is well suited to recreational development.

This soil is in capability class I; woodland group 2o.

**39—Severn silty clay loam.** This nearly level soil is on flood plains that rarely flood. Areas are circular or long and narrow. They range from 10 to 100 acres and average about 50 acres.

Typically, the surface layer is dark reddish brown silty clay loam about 8 inches thick. The underlying material extends to a depth of 72 inches or more. It is silt loam that is reddish brown in the upper part, yellowish red in the middle part, and reddish brown in the lower part. This soil is typically calcareous throughout.

This soil is well drained. Runoff is slow, and permeability is moderately rapid. Available water capacity is high. The rooting zone is deep, and roots, water, and air move easily through the soil. The erosion hazard is slight.

Included with this soil in mapping are small areas of Billyhaw clay, Severn very fine sandy loam, and Redlake clay. Included soils make up less than 20 percent of any mapped area.

Most of this Severn soil is used for crops. Minor acreages are in pasture and woodland.

This soil is well suited to pasture. Bermudagrass, white clover, and alfalfa, are the main pasture plants. Proper grazing and the addition of fertilizers increase production.

This soil is well suited to trees such as eastern



This Woodtell soil is used for pasture and woodland.

This soil is moderately well suited to pasture. The main forage crops are bermudagrass, bahiagrass, crimson clover, and arrowleaf clover. Proper grazing and the addition of lime and fertilizers can increase yields.

This soil is moderately well suited to trees such as loblolly pine and shortleaf pine. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber production.

This soil is not recommended for cultivation because of slope and the hazard of erosion.

This soil is poorly suited to urban development. The main limitations are the high shrink-swell, high clay content, and low strength. Low strength is a limitation for local roads and streets.

This soil is well suited to recreational development such as paths and trails. It is moderately well suited to picnic areas. Limitations for camp areas and playgrounds are very slow permeability and slope.

This soil is in capability subclass VIe; woodland group 4c.

**47—Woodtell gravelly sandy loam, 3 to 8 percent slopes.** This gently sloping soil is on narrow convex ridges. Slopes average about 5 percent. Soil areas are oblong. They range from 5 to about 25 acres and average about 15 acres.

Typically, this soil has a surface layer of brownish gravelly sandy loam about 12 inches thick. The subsoil extends to a depth of 44 inches. It is red clay in the upper part and red clay loam in the lower part. Gray mottles are throughout. The underlying material to a depth of 70 inches or more is red sandy clay loam. This soil is typically strongly acid in the upper part and very strongly acid in the lower part.

This soil is moderately well drained. Runoff is medium, and permeability is very slow. Available water capacity is medium. The rooting zone is deep, but the clayey subsoil slows the movement of roots, water, and air. The erosion hazard is moderate.

Included with this soil in mapping are small areas of soils like the Woodtell soil that has loamy subsoil and small areas of the gravelly Saffell soils. The included soils make up less than 15 percent of the mapped acreage.

This Woodtell soil is used for pasture and woodland. The surface layer has been removed from much of this soil for gravel.

This soil is moderately well suited to pasture. Bermudagrass, bahiagrass, crimson clover, and arrowleaf clover are the main forage plants. Proper grazing, the addition of lime, and heavy applications of fertilizers can increase yields.

This soil is moderately well suited to loblolly and slash pine. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber yields.

This soil is poorly suited to crops. Crops can grow successfully, however, with intensive management that includes erosion control, proper management of crop residue, and recommended applications of lime and fertilizers. The main crops are corn and soybeans.

This soil is poorly suited to urban development. The main limitation is the high shrink-swell, and low strength is a limitation for roads and streets.

This soil is well suited to recreational development such as paths and trails. Very slow permeability and slope are limitations for camp areas, picnic areas, and playgrounds.

This soil is in capability subclass IVe; woodland group 4c.

**48—Wrightsville-Rodessa complex.** This nearly level complex is on broad, upland terraces. Slopes average less than 1 percent. Soil areas are irregular in shape. They range from 10 to over 1,000 acres and average about 300 acres.

This complex is characterized by broad flats of Wrightsville silt loam and circular mounds of Rodessa loam in a random pattern. The mounds of Rodessa soil are so small and the soil pattern is so intricate that the soils could not be shown separately at the scale selected for mapping. The mounds are 2 to 3 feet high, 60 to 120 feet in diameter, and 100 to 200 feet apart.

This complex is about 75 percent Wrightsville soils, 15 percent Rodessa soils, and 10 percent other soils.

Typically, the Wrightsville soil has a surface layer of brown, strongly acid silt loam about 4 inches thick. The next layer, which extends to a depth of 16 inches, is light brownish gray, very strongly acid silt loam. The subsoil to a depth of 80 inches or more is light brownish gray, very strongly acid clay that has strong brown mottles and vertical streaks of uncoated sand and silt.

Wrightsville soils are poorly drained. A water table is at or near the soil surface during the winter and spring. Water stands on the surface for 2 or 3 weeks during the cool season. Runoff is slow, and permeability is very slow. The available water capacity is high. The rooting zone is deep, but the excess water and clayey subsoil restrict the movement of air and plant roots. The erosion hazard is slight.

Typically, the Rodessa soil has a surface layer of brownish loam about 14 inches thick. The subsoil extends to a depth of 70 inches or more. It is yellowish brown loam to a depth of 26 inches. Below this to a depth of about 42 inches, it is clay loam that is yellowish brown in the upper part and pale brown in the lower part. It has common tongues and streaks of uncoated sand and silt and has reddish, brownish, and grayish mottles. The lower part of the subsoil is mottled gray and red clay.

Rodessa soils are somewhat poorly drained. A water table is 2 to 3 feet below the surface during the cool season. Runoff is slow, and permeability is very slow. Available water capacity is high. The rooting zone is deep. The erosion hazard is slight.

Included with this complex in mapping are small spots of Adaton, Ashford, and Sawyer soils. Included soils make up less than 10 percent of the mapped acreage.

Most areas of Wrightsville-Rodessa complex are used for woodland and wildlife habitat. A few areas are used for rice and soybeans and for pasture.

These soils are moderately well suited to pasture plants such as bahiagrass, dallisgrass, and tall fescue. Crimson clover and arrowleaf clover will grow on the Rodessa part of the complex. A drainage system will remove excess water and provide a better environment for pasture plants. Proper grazing and complete fertilizers can increase forage yields.

These soils are moderately well suited to loblolly pine, water oak, willow oak, and sweetgum. Woodland management, such as selective cutting, removal of undesirable trees and shrubs, and protection from fire, increases timber yields.

The soils in this complex, are moderately well suited to crops such as soybeans and rice (fig. 11). Wetness, very slow permeability, low fertility, and droughtiness are the main limiting features. A drainage system is needed to remove excess water. Crop residue left on the soil surface improves infiltration and helps to maintain organic matter content. The addition of lime and a complete fertilizer can increase yields.

These soils are poorly suited to urban development. The main limitations are wetness, low strength, and high shrink-swell characteristics. Low strength limits use for roads and streets.

These soil are poorly suited to most recreational developments because of very slow permeability. However, they are well suited to paths and trails.

This complex is in capability subclass IIIw; woodland group 3w.



*Figure 11.*—Combining rice on Wrightsville-Rodessa complex.



- hard, very friable; many fine roots; about 40 percent by volume of siliceous pebbles up to 3 inches in diameter; medium acid; gradual smooth boundary.
- B21t—14 to 45 inches; red (2.5YR 4/6) very gravelly sandy clay loam; weak medium and fine subangular blocky structure; hard, very friable; few fine roots; few patchy clay films on faces of peds; about 50 percent by volume of siliceous pebbles up to 3 inches in diameter; very strongly acid; gradual smooth boundary.
- B22t—45 to 80 inches; red (2.5YR 4/6) gravelly sandy clay loam; weak medium and fine subangular blocky structure; hard, very friable; few fine roots; few patchy clay films on faces of peds; about 20 percent by volume of siliceous pebbles up to 3 inches in diameter; very strongly acid.

The thickness of the solum exceeds 60 inches. Reaction is strongly acid or very strongly acid except in surface layers that have been limed.

The A1 horizon is 3 to 6 inches thick. It is brown or dark grayish brown. Pebbles make up 10 to 30 percent of the horizon. The A2 horizon is 2 to 8 inches thick. It is brown, yellowish red, or reddish yellow. Pebbles make up 30 to 50 percent of the horizon. The B2t horizon is red or yellowish red. Pebbles make up 35 to 65 percent of the upper part of the horizon and 20 to 65 percent of the lower part.

These soils are taxadjuncts to the Saffell series. They have a thicker solum than is defined as the range for the Saffell soils, and they do not have a decrease in clay content of more than 20 percent from their maximum within a depth of 60 inches. However, management, use, and behavior are similar to those of the Saffell series.

### Sardis series

The soils of the Sardis series are deep, somewhat poorly drained, and loamy. They formed in loamy alluvial sediments high in silt on flood plains. Slopes are less than 1 percent.

A typical pedon of Sardis silt loam, frequently flooded, in pasture; from the intersection of U.S. Highway 82 and U.S. Highway 259 west of De Kalb, 1.75 miles south on U.S. Highway 259, and 50 feet west of road:

- A1—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; slightly hard, very friable; many fine roots; neutral; gradual smooth boundary.
- B21—9 to 16 inches; yellowish brown (10YR 5/4) silt loam; few fine faint grayish brown mottles; moderate medium subangular blocky structure; slightly hard, very friable; few fine roots; strongly acid; gradual smooth boundary.
- B22—16 to 50 inches; brown (10YR 5/3) silt loam; few fine distinct yellowish brown and common medium faint grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; slightly hard,

very friable; very strongly acid; gradual smooth boundary.

- B3—50 to 62 inches; pale brown (10YR 6/3) fine sandy loam; many medium distinct yellowish brown (10YR 5/6) and few fine faint light brownish gray mottles; weak medium subangular blocky structure; slightly hard, very friable; very strongly acid; clear smooth boundary.

The solum thickness ranges from 40 to 70 inches. The 10- to 40-inch control section ranges from 20 to 35 percent clay and is less than 15 percent coarser than very fine sand.

The A horizon is 6 to 10 inches thick. It is brown or dark grayish brown. Reaction ranges from neutral to medium acid. The B2 horizon is brown, dark brown, or yellowish brown with few to many mottles in shades of gray and brown. It is silt loam, silty clay loam, or loam. Reaction ranges from medium acid to very strongly acid. The B3 horizon is light brownish gray, pale brown, or gray. It is silty clay loam, silt loam, fine sandy loam, or clay loam. Reaction ranges from medium acid to very strongly acid.

### Sawyer series

The soils of the Sawyer series are deep, moderately well drained, and loamy. They formed in loamy and clayey sediments on uplands. Slopes range from 0 to 3 percent.

A typical pedon of Sawyer silt loam, 0 to 3 percent slopes, in pasture; from the intersection of Texas Highway 98 and U.S. Highway 82 west of New Boston, 1 mile west on U.S. Highway 82, south on county road 0.9 mile, and 50 feet east of road:

- A1—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium and fine granular structure; hard, friable; many fine roots; slightly acid; gradual smooth boundary.
- B21t—6 to 15 inches; yellowish brown (10YR 5/6) silty clay loam; few fine faint light brownish gray mottles; weak coarse subangular blocky structure parting to moderate medium and fine subangular blocky; hard, friable; few fine roots; few patchy clay films on faces of peds; strongly acid; gradual smooth boundary.
- B22t—15 to 26 inches; yellowish brown (10YR 5/6) clay loam; many prominent coarse red (2.5YR 4/6) and many fine faint light brownish gray mottles; moderate medium subangular blocky structure; hard, friable; few patchy clay films on faces of peds; 5 percent by volume light gray (10YR 7/2) uncoated sand and silt; very strongly acid; gradual smooth boundary.
- B23t&A2—26 to 38 inches; mottled yellowish brown (10YR 5/6) and red (2.5YR 4/6) clay; moderate medium and fine subangular blocky structure; hard, firm; few patchy clay films on faces of peds; 20

percent by volume light gray (10YR 7/2) uncoated sand and silt between peds; very strongly acid; gradual smooth boundary.

B24t—38 to 61 inches; gray (10YR 5/1) clay; few coarse distinct strong brown (7.5YR 5/8) and many coarse prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; extremely hard, very firm; continuous clay films on faces of peds; about 5 percent by volume uncoated sand and silt on faces of peds; very strongly acid; gradual smooth boundary.

B25t—61 to 80 inches; mottled gray (10YR 5/1) and red (2.5YR 4/6) clay; few fine distinct strong brown mottles; weak medium subangular blocky structure; extremely hard, very firm; continuous clay films on faces of peds; about 10 percent by volume uncoated sand and silt in streaks and pockets; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches.

The A horizon is 4 to 10 inches thick. It is dark grayish brown, brown, pale brown, or grayish brown. Reaction is slightly acid or medium acid. In some pedons there is an A2 horizon that is brown, grayish brown, or pale brown and is 3 to 5 inches thick. In some pedons there is a B1 horizon that is thin yellowish brown. The B21t horizon is yellowish brown or strong brown. In some pedons this horizon has a few grayish mottles. It is silt loam, silty clay loam, or clay loam. Reaction is strongly acid or very strongly acid. The B22t horizon is yellowish brown with common or many grayish brown, light brownish gray, light gray, or gray mottles and few or common yellowish red or red mottles. This horizon is silt loam, silty clay loam, or clay loam. Reaction is strongly acid or very strongly acid. The depth to the clayey Bt horizon is 24 to 40 inches. The lower part of the Bt horizon is mottled gray, red, and brown. Each of these colors is dominant in places. Texture is clay or silty clay. Pockets, streaks, and tongues of lighter colored clean sand and silt make up 5 to 25 percent of the lower part of the Bt horizon.

### Severn series

The soils of the Severn series are deep, well drained, and loamy. They formed in loamy alluvium high in silt on flood plains. Slopes range from 0 to 1 percent.

A typical pedon of Severn very fine sandy loam, in cropland; 200 feet west of the south end of the Red River bridge on U.S. Highway 259:

Ap—0 to 8 inches; reddish brown (5YR 4/4) very fine sandy loam; weak subangular blocky and granular structure; slightly hard, friable; many fine roots; few worm casts; calcareous; moderately alkaline; gradual smooth boundary.

C1—8 to 42 inches; yellowish red (5YR 4/6) very fine sandy loam; massive; slightly hard, friable; few fine

strata of loam and loamy fine sand; calcareous; moderately alkaline; abrupt smooth boundary.

C2—42 to 65 inches; reddish brown (5YR 4/4) silty clay loam; massive; slightly hard, firm; few fine strata of loam and loamy fine sand; calcareous; moderately alkaline.

The A horizon is 6 to 15 inches thick. It is dark brown, dark reddish brown, or reddish brown. The A horizon is very fine sandy loam or silty clay loam. Reaction is moderately alkaline or mildly alkaline. Some pedons are noncalcareous in the upper 10 inches. The C horizon is yellowish red, reddish brown, or light reddish brown. It is very fine sandy loam, silty clay loam, or silt loam. The C horizon contains thin strata of coarser and finer textured materials.

### Smithdale series

The soils of the Smithdale series are deep, well drained, and loamy. They formed in loamy sediments on uplands. Slopes range from 8 to 12 percent.

A typical pedon of Smithdale fine sandy loam, 8 to 12 percent slopes, in pasture; from the intersection of Farm Road 2735 and U.S. Highway 82 in De Kalb, 8.25 miles north on Farm Road 2735, 1.2 miles east on county road, 0.25 mile south on county road; and 150 feet east of road:

A1—0 to 6 inches; dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; slightly hard, very friable; few fine roots; slightly acid; clear smooth boundary.

A2—6 to 15 inches; yellowish red (5YR 5/6) fine sandy loam; weak fine subangular blocky structure; slightly hard, very friable; few fine roots; medium acid; gradual smooth boundary.

B21t—15 to 25 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; hard, friable; few fine roots; many pores and horizontal channels 1/8 inch in diameter; many patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B22t—25 to 42 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; hard, friable; many patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23t—42 to 80 inches; red (2.5YR 4/6) sandy clay loam; moderate coarse prismatic structure parting to moderate medium and fine subangular blocky; hard, friable; many patchy clay films on faces of peds; tongues of uncoated sand about 1 inch wide make up 15 to 20 percent; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction in all horizons is strongly acid or very strongly acid in unlimed soil.

The A1 horizon is 4 to 10 inches thick. It is brown, dark brown, dark grayish brown, or dark yellowish brown.

ranges from neutral to moderately alkaline. The IIB horizon is calcareous or noncalcareous and has few to many calcium carbonate concretions.

These soils are taxadjuncts to the Perry series because they are deeper to the IIB horizon than is typical for the Perry series. Use, management, and behavior are similar to those of the Perry soils.

### Redlake series

The soils of the Redlake series are deep, moderately well drained, and clayey. They formed in clayey alluvium on flood plains. Slopes are less than 1 percent.

A typical pedon of Redlake clay, in cropland; from the intersection of Interstate Highway 30 and Farm Road 992 in New Boston, 13.5 miles north on Farm Road 992, 3 miles north and west on private road, and 50 feet east:

A1—0 to 5 inches; dark reddish brown (2.5YR 3/4) clay; weak coarse granular and subangular blocky structure; extremely hard, very firm; common fine roots; few worm casts; calcareous; moderately alkaline; clear smooth boundary.

B21—5 to 35 inches; dark red (2.5YR 3/6) clay; weak coarse subangular blocky structure; extremely hard, very firm; few fine roots; few worm casts; calcareous; moderately alkaline; clear smooth boundary.

B22—35 to 56 inches; red (2.5YR 4/6) clay; weak coarse subangular blocky structure; extremely hard, very firm; calcareous; moderately alkaline; abrupt smooth boundary.

IIC—56 to 72 inches; red (2.5YR 5/6) silt loam; massive; slightly hard, friable; few thin strata of silty clay loam; calcareous; moderately alkaline.

The thickness of the solum ranges from 30 to 60 inches. All horizons are mildly alkaline or moderately alkaline. Some pedons are noncalcareous in the upper 10 inches, but all are calcareous below a depth of 10 inches. These soils crack when dry.

The A horizon is 5 to 10 inches thick. It is dark reddish brown or dusky red. The B horizon is red, dark red, or dark reddish brown. Texture is clay or silty clay. The IIC horizon is silt loam, clay loam, or silty clay loam and is stratified in some pedons.

### Rodessa series

The soils of the Rodessa series are deep, somewhat poorly drained, and loamy. They formed in clayey sediments on uplands. They are on mounds in the Wrightsville-Rodessa complex. Slopes range from 0 to 1 percent.

A typical pedon of Rodessa loam in the Wrightsville-Rodessa complex, in woodland; from the intersection of Farm Road 561 and U.S. Highway 259 south of De Kalb, 0.1 mile south on U.S. Highway 259, 1.8 miles west on county road, 1.5 miles south, and 25 feet west:

A11—0 to 8 inches; brown (10YR 4/3) loam; moderate medium granular structure; slightly hard, very friable; many fine roots; slightly acid; clear smooth boundary.

A12—8 to 14 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; slightly hard, very friable; few fine roots; medium acid; gradual smooth boundary.

B1—14 to 26 inches; yellowish brown (10YR 5/6) loam; moderate fine subangular blocky structure; hard, very friable; many worm casts; many patchy clay films on faces of peds; few black concretions; strongly acid; gradual smooth boundary.

B21t&A'2—26 to 34 inches; yellowish brown (10YR 5/8) clay loam; few fine distinct red mottles; moderate fine subangular blocky structure; hard, firm; white (10YR 8/2) uncoated silt and sand on surfaces of peds and in streaks and tongues make up 25 percent of the horizon; very strongly acid; gradual smooth boundary.

B22t&A'2—34 to 42 inches; pale brown (10YR 6/3) clay loam; many coarse distinct strong brown (7.5YR 5/6), many coarse prominent red (2.5YR 4/6), and few medium faint light brownish gray (10YR 6/2) mottles; moderate fine subangular blocky structure; hard, firm; white (10YR 8/2) tongues and streaks of uncoated silt and sand make up about 15 percent of the horizon; very strongly acid; gradual smooth boundary.

B23t—42 to 70 inches; gray (10YR 5/1) clay; few coarse faint strong brown (7.5YR 5/6) and many coarse distinct red (2.5YR 4/6) mottles; weak medium subangular blocky structure; very hard, very firm; few streaks of uncoated sand and silt; very strongly acid.

The thickness of the solum ranges from 60 to more than 100 inches.

The A horizon is 16 to 22 inches thick. It is brown, dark yellowish brown, yellowish brown, light yellowish brown, or pale brown. The A horizon is loam or fine sandy loam. Reaction ranges from slightly acid to very strongly acid. The B1 horizon is 6 to 12 inches thick. It is light yellowish brown, yellowish brown, or very pale brown. It is loam or fine sandy loam. Reaction ranges from medium acid to very strongly acid. The B2t&A'2 horizons are clay loam or loam. The B2t part is yellowish brown, pale brown, strong brown, or light brownish gray. The A'2 part is white or light gray and makes up 10 to 60 percent of the horizon. Reaction of the B2t&A'2 horizon is strongly acid or very strongly acid. The lower part of the B2t horizon is gray, dark gray, or light brownish gray. This horizon is clay or silty clay. Reaction ranges from medium acid to very strongly acid.

### Roebuck series

The soils of the Roebuck series are deep, somewhat poorly drained, and clayey. They formed in clayey alluvium on flood plains. Slopes are less than 1 percent.



## Wrightsville series

The soils of the Wrightsville series are deep, poorly drained, and loamy. They formed in clayey sediments on uplands. Slopes range from 0 to 1 percent.

A typical pedon of Wrightsville silt loam in the Wrightsville-Rodessa complex, in woodland; from the intersection of Farm Road 561 and U.S. Highway 259 south of De Kalb, 0.1 mile south on U.S. Highway 259, 1.8 miles west on county road, 1.5 miles south, 50 feet west of road:

- A1—0 to 4 inches; brown (10YR 5/3) silt loam; weak fine granular structure; hard, friable; many fine roots and bits of organic material; strongly acid; clear smooth boundary.
- A2g—4 to 16 inches; light brownish gray (10YR 6/2) silt loam; common fine faint strong brown mottles; weak medium subangular blocky structure; extremely hard, friable; few fine roots; very strongly acid; gradual irregular boundary.
- B21tg&A'2g—16 to 28 inches; light brownish gray (2.5Y 6/2) clay loam; few fine faint strong brown mottles; weak medium subangular blocky structure; extremely hard, very firm; about 20 percent of volume tongues of light brownish gray (10YR 6/2) uncoated sand and silt; very strongly acid; gradual smooth boundary.
- B22tg—28 to 55 inches; light brownish gray (2.5Y 6/2) clay; few fine faint strong brown mottles; weak medium subangular blocky structure; extremely hard, very firm; streaks and coatings on peds of light

brownish gray (10YR 6/2) silt loam; very strongly acid; gradual smooth boundary.

B23tg—55 to 66 inches; light brownish gray (2.5Y 6/2) clay; many medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; extremely hard, very firm; continuous clay films on faces of peds; few slickensides; few black specks and streaks; streaks and coatings on peds of light brownish gray (10YR 6/2) silt loam; very strongly acid; gradual smooth boundary.

B24tg—66 to 80 inches; light brownish gray (2.5Y 6/2) clay; few fine faint strong brown mottles; weak subangular blocky structure; extremely hard, very firm; continuous clay films on faces of peds; few slickensides and pressure faces; streaks of light brownish gray (10YR 6/2) silt loam; strongly acid.

The thickness of the solum ranges from 65 to 80 inches. Reaction is strongly acid or very strongly acid except in places where the soil has been limed.

The A1 horizon is 2 to 5 inches thick. It is grayish brown, brown, or dark grayish brown. In some pedons this horizon has a few faint yellowish brown or strong brown mottles. The A2 horizon is 9 to 18 inches thick. It is light brownish gray or light gray. The A2 horizon is silt loam or silty clay loam. Tongues of this horizon extend deep into the B2tg horizon. The B2tg horizon is gray or light brownish gray. Mottles of strong brown and yellowish brown range from few to many. The B2tg horizon is clay or silty clay with tongues and streaks of lighter colored uncoated silt, silt loam, or very fine sandy loam. In a few pedons, there are black streaks, specks, and concretions in the B2tg horizon.



TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
32: # Sacul-----  Urban land.	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
33----- Saffell	Severe: small stones.	Slight-----	Slight-----	Moderate: slope.	Slight.
34: # Saffell-----  Urban land.	Severe: small stones.	Slight-----	Slight-----	Moderate: slope.	Slight.
35----- Sardis	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, low strength.
36----- Sawyer	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.
37: # Sawyer-----  Urban land.	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.
38, 39----- Severn	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, low strength.
40----- Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
41----- Texark	Severe: floods, too clayey, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, low strength, wetness.
42----- Thenas	Moderate: floods, wetness.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
43: # Udorthents					
44----- Vesey	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.
45----- Woodtell	Severe: wetness, too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
46----- Woodtell	Severe: wetness, too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
47----- Woodtell	Severe: wetness, too clayey.	Severe: shrink-swell.	Severe: shrink-swell. wetness.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
48: * Wrightsville-----	Severe: wetness, too clayey.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, low strength, shrink-swell.
Rodessa-----	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
32:*											
Sacul-----	0-10	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	10-55	Clay, silty clay	CH, MH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	55-65	Silty clay loam, silt loam, clay loam.	CL, CH, ML, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
Urban land.											
33:*											
Saffell-----	0-14	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	14-80	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
Urban land.											
34:*											
Saffell-----	0-14	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	14-80	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
Urban land.											
35:*											
Sardis-----	0-9	Silt loam-----	ML, CL-ML, CL	A-4	0	100	100	80-100	75-95	<30	NP-10
	9-50	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20
	50-62	Loam, silt loam, sandy loam.	ML, SM, CL, SC	A-4, A-2	0	100	95-100	60-95	35-75	<30	NP-10
Urban land.											
36:*											
Sawyer-----	0-6	Silt loam-----	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	6-26	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	26-80	Silty clay, clay	CH, CL, MH	A-7	0	100	95-100	90-100	80-90	45-60	20-35
Urban land.											
37:*											
Sawyer-----	0-6	Silt loam-----	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	6-32	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	32-80	Silty clay, clay	CH, CL, MH	A-7	0	100	95-100	90-100	80-90	45-60	20-35
Urban land.											
38:*											
Severn-----	0-8	Very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	94-100	65-97	22-31	3-12
	8-65	Stratified silt loam to loamy very fine sand.	ML, CL-ML	A-4	0	100	100	94-100	65-97	<28	NP-7

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
35----- Sardis	Fair: wetness, low strength.	Poor: excess fines.	Poor: excess fines.	Good.
36----- Sawyer	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
37: * Sawyer-----	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Urban land.				
38, 39----- Severn	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
40----- Smithdale	Good-----	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
41----- Texark	Poor: shrink-swell, low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
42----- Thenas	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
43. * Udorthents				
44----- Vesey	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
45, 46, 47----- Woodtell	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
48: * Wrightsville-----	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Rodessa-----	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.

\* See description of the map unit for composition and behavior characteristics of the map unit.



TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
48: # Wrightsville-----	0-16	Silt loam-----	ML, CL, CL-ML	A-4	0	100	95-100	90-100	75-100	<31	NP-10
	16-55	Silty clay, clay, silty clay loam.	CH, CL, MH	A-7	0	100	100	95-100	90-100	41-65	22-40
	55-80	Silty clay loam, silty clay, clay.	CL, CH, MH	A-7, A-6	0	100	95-100	95-100	90-100	35-65	16-40
Rodessa-----	0-26	Loam-----	ML, CL-ML, CL	A-4	0	100	100	80-95	55-75	15-25	3-8
	26-70	Clay, clay loam.	CH, CL	A-7-6	0	100	100	90-100	75-95	45-65	25-40

\* See description of the map unit for composition and behavior characteristics of the map unit.

# APPENDIX C



# ETTL Engineers & Consultants Inc.

GEOTECHNICAL \* MATERIALS \* ENVIRONMENTAL \* DRILLING \* LANDFILLS

July 31, 2013

William V. Cork  
TexAmericas Center  
107 Chapel Lane  
New Boston, Texas 75570

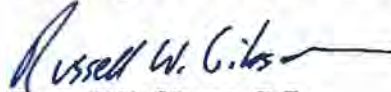
SUBJECT: TexAmericas Center – East Parcels 1, 2, 3, 6, 7, 8 & 9  
Hooks, Texas  
Preliminary Geotechnical Investigation  
ETTL Job No. G3972-136


Dear Mr.Cork:

Submitted herein is the report summarizing the results of a preliminary geotechnical investigation conducted at the site of the above referenced project.

If you have any questions concerning this report, or if we can be of further assistance during construction, please contact us. We are available to perform any construction materials testing and inspection services that you may require. Thank you for the opportunity to be of service.

Sincerely,  
ETTL Engineers & Consultants Inc.

  
Russell W. Gibson, P.E.  
Project Manager

  
C. Brandon Quinn, P.E., P.G.  
Vice President  
Manager of Engineering Services



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July 31, 2013



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**Preliminary Geotechnical Investigation  
TexAmericas Center – East Parcels 1, 2, 3, 6, 7, 8 & 9  
Hooks, Texas**

Submitted to

TexAmericas Center  
New Boston, Texas

Prepared by

ETTL Engineers & Consultants Inc.  
Tyler, Texas

July 2013



## EXECUTIVE SUMMARY

This Executive Summary is provided as a brief synopsis of the specific recommendations and design criteria provided in the attached report. It is not intended as a substitute for a thorough reading of the report in its entirety.

### Project Description

The project consists of a preliminary geotechnical investigation for parcels 1, 2, 3, 6, 7, 8 & 9 at bore locations staked by representatives of TexAmericas. **This investigation is very preliminary and not to be used for any final design.**

### Site Description

The project site is currently partially developed with large areas heavily forested. According to USGS topography, the elevation varies from approximately 325 to 425. The elevation decreases generally from west to east with drainage ways running south to north at two to three locations.

### Depth & Number of Borings

Location	Borings	Depth
Parcel 1 – 223.5 Acres	B-1, B-2, B-3, B-4, B-5	2-20' & 3-10'
Parcel 2 – 136.9 Acres	B-10, B-11, B-12, B-13	2-20' & 2-10'
Parcel 3 – 198.8 Acres	B-6, B-7, B-8, B-9	2-20' & 2-10'
Parcel 6 – 83.5 Acres	B-14, B-15, B-16, B-17	2-20' & 2-10'
Parcel 7 – 2.0 Acres	B-18	1-20'
Parcel 8 – 8.1 Acres	B-19, B-20	1-20' & 1-10'
Parcel 9 – 36.2 Acres	B-21, B-22	2-20'

### Soils Encountered

The soils encountered in Parcel 1 generally consisted of loose to medium dense silty sands (SM), silty clayey sands (SC-SM) and silts (ML) overlying interlayered medium stiff to hard lean clays (CL) and fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from non-plastic to 42.

The soils in Parcel 2 consisted of surficial loose silts (ML) and clayey sands (SC) overlying soft to medium stiff lean clays (CL) followed by medium stiff to hard fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from non-plastic to 61.

In Parcel 3, the soils encountered generally consisted of interlayered soft to very stiff lean clays (CL) and fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from 13 to 35.

The soils in Parcel 6 consisted of interlayered medium stiff to hard lean clays (CL) and fat clays (CH). Very loose to loose silt (ML) and clayey sand (SC) was found at the surface in Boring B-17. Atterberg Plasticity Indices of the tested soils ranged from 16 to 51.

The soils encountered in Parcel 7 consisted of stiff to very stiff fat clays (CH). Atterberg Plasticity Index of the tested soils was 42.

In Parcel 8, the soils encountered consisted of very soft to medium stiff interlayered lean clays (CL) and fat clays (CH) and very loose silt (ML) overlying medium stiff to very stiff fat clay (CH). Atterberg Plasticity Indices of the tested soils ranged from 15 to 44.



The soils encountered in Parcel 9 consisted of medium stiff to hard fat clays (CH). The Atterberg Plasticity Indices of the tested soils ranged from 43 to 61.

**Groundwater Depth**

No seepage was noted during drilling operations and all borings were dry and open upon completion. The phreatic surface is predicted to be at some depth deeper than 20 feet.

**Recommended Foundation Type**

- Shallow spread footings*
- Shallow spread footings/ stiffened slab option*
- Drilled piers*

**Allowable Gross Bearing Pressure**

*Spread Footings*  
Depth listed is below finished subgrade or adjacent exterior grade whichever is deeper.

Parcel	Native Soils		Select Fill	
	Isolated Footings	Strip Footings	Isolated Footings	Strip Footings
Parcel 1	800 psf @ 2 ft.	600 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 2 ft.
Parcel 2	1000 psf @ 2 ft.	1000 psf @ 2 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 3	1000 psf @ 2 ft.	1000 psf @ 2 ft.	1000 psf @ 2 ft.	1000 psf @ 2 ft.
Parcel 6	1000 psf @ 2 ft.	500 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 7	3000 psf @ 2 ft.	2500 psf @ 1.5 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 8	800 psf @ 2 ft.	800 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 2 ft.
Parcel 9	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.

*Drilled Piers*

Bearing capacity for underreamed piers bearing at the indicated depth below existing grade.

Location	End Bearing Capacity	Depth
Parcel 1	6000 psf	18
Parcel 2	6000 psf	13
Parcel 3	6000 psf	18
Parcel 6	6000 psf	13
Parcel 7	6000 psf	13
Parcel 8	6000 psf	13
Parcel 9	6000 psf	13

**Floor System**

- Flat Slab on prepared subgrade
- Stiffened slab on grade - monolithically placed with *shallow footings*
- Structurally suspended floor - used with *drilled piers* only

**Building Subgrade Preparation**

The following *minimum* overexcavation is suggested for the specific option chosen. Limits of overexcavation should extend beyond building and footing lines a distance of 5'. Options are listed in order of increasing risk of damage due to soil movement.



- *Drilled piers with suspended slab* - Grade void space beneath floor to drain.
- *Drilled piers with grade beams and floor slab on prepared subgrade* - Native expansive clay soils are to be removed and replaced with select fill. Overexcavation to the depths below existing grade shown in the table below in order to reduce Potential Vertical Rise (PVR) to 1.0" or less.
- *Shallow spread footings with monolithic flat slab* - Overexcavate to the depths below existing grade shown in the table below in order to reduce the PVR to 1 inch or less.
- *Shallow spread footings with monolithic stiffened slab placed on grade* – None required.

For options where the slab is to be placed on grade, scarify the exposed subgrade, adjust the moisture content, and recompact. Place select fill to finished slab subgrade.

Location	Undercut Depth (ft.)
Parcel 1	3 – 6
Parcel 2	6 – 8
Parcel 3	1 – 3
Parcel 6	6.5 – 7.5
Parcel 7	6
Parcel 8	4 – 7
Parcel 9	7 – 8

### Pavement

Cut to proposed subgrade elevation as required and proof roll prior to compaction or treatment. Soft and/or unstable areas should be cut out and replaced with select fill. Scarify exposed subgrade to a depth of 8 inches, adjust the moisture content to optimum -1% to optimum +3% and recompact. If highly plastic soil (PI > 20) is encountered at finished subgrade, it should be cut out to a depth of 18 inches and replaced with select fill. Lime treatment of the subgrade is an alternative to removing and replacing soil.

Type	Base/Surface Thickness		Subgrade Preparation
Flexible HMAC	2" Surface (Type D)	6" Crushed Stone Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" HMAC Surface (Type D)	3" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	5" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill



<b>Table 2 – Pavement Options – Medium Duty</b>			
<b>Type</b>	<b>Base/Surface Thickness</b>		<b>Subgrade Preparation</b>
Flexible HMAC	3" Surface (Type C or D)	8" Crushed Stone Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" Surface (Type C or D)	4" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	6" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill

<b>Table 3 – Pavement Options – Heavy Duty</b>			
<b>Type</b>	<b>Base/Surface Thickness</b>		<b>Subgrade Preparation</b>
Flexible HMAC	2" Surface (Type C or D)	7" Crushed Stone Base & 2.5" HMAC Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" Surface (Type C or D)	5.5" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	7" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill

**Notes:**

1) Tensar Triax Geogrid placed on subgrade may be substituted for lime treatment of subgrade. Lime treatment or replacement with select fill only needed where expansive clay is encountered within 12" of finished subgrade as determined by a representative of this firm.

2) Increase HMAC thickness by 1" in lieu of lime treated subgrade

3) Increase concrete thickness by 0.5" in lieu of lime treated subgrade.

**Construction Considerations**

The surficial soils in several areas may become unstable when wet necessitating remediation or removal and replacement to facilitate construction.





## 1.0 INTRODUCTION

This study was performed at the request and authorization to proceed granted by Nate Hahm with TexAmericas Center of New Boston, Texas in accordance with our proposal dated June 6, 2013. Field operations were conducted June 24 – 26, 2013.

The purpose of this preliminary investigation was to define and evaluate the general subsurface conditions in the area south of US 82 and west of Red River Army Depot near Hooks, Texas. Specifically, the study was planned to determine the following:

- Subsurface stratigraphy within the limits of exploratory borings;
- Classification, strength, expansive properties, and compressibility characteristics of the foundation soils;
- Suitable foundation types and allowable loading; and,
- Construction related problems that may be anticipated by the investigation.

To determine this information a variety of tests were performed on the soil samples. The scope of testing for this report comprised Standard Penetration, Atterberg liquid and plastic limits, Percentage of Fines Passing the No. 200 sieve, Natural Moisture Content, Unconfined Compressive Strength and One-Dimensional Swell. These tests were conducted to classify the soil strata according to a widely used engineering classification system; identify, and provide quantitative data for active (expansive) soils; define strength characteristics relating to allowable bearing values; predict immediate settlement; and assess construction workability of the soils.

The conclusions and recommendations that follow are based on limited information regarding site grading. The boring locations were selected by the client and staked with their assistance. (ETTL did not confirm by survey that the locations indicated on the attached Plan of Borings accurately reflect the location on the ground). This information should be verified prior to design. *Should any portion of it prove incorrect, this firm should be notified in order to assess the need for revisions to this report.*

## 2.0 PROJECT DESCRIPTION

The project consists of a preliminary geotechnical investigation for parcels 1, 2, 3, 6, 7, 8 & 9 at bore locations staked by representatives of TexAmericas. **This investigation is very preliminary and not to be used for any final design.**

## 3.0 SITE DESCRIPTION

The project site is currently partially developed with large areas heavily forested. According to USGS topography, the elevation varies from approximately 325 to 425. The elevation decreases generally from west to east with drainage ways running south to north at two to three locations.

## 4.0 SOIL STRATIGRAPHY AND PROPERTIES

### 4.1 Site Geology

The Midway Group undivided outcrops at the subject site. The Midway Group is composed of the Wills Point and the Kincaid Formations in Bowie County. The Wills Point Formation is primarily clay. The upper portion of the formation is composed of silt and lignite with some calcareous siltstone



concretions. A thin bed of limestone is located near the middle of the formation and is glauconitic near the base of the formation. The maximum thickness of the Wills Point Formation is approximately 450 feet. The Kincaid Formation is predominately clay with some glauconite and selenite and slightly calcareous. The formation is in part silty and sandy and is locally phosphatic near the base. The maximum thickness of the Kincaid Formation is approximately 150 feet.

#### 4.2 Soil Stratigraphy

The soils encountered in **Parcel 1** generally consisted of loose to medium dense silty sands (SM), silty clayey sands (SC-SM) and silts (ML) overlying interlayered medium stiff to hard lean clays (CL) and fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from non-plastic to 42.

The soils in **Parcel 2** consisted of surficial loose silts (ML) and clayey sands (SC) overlying soft to medium stiff lean clays (CL) followed by medium stiff to hard fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from non-plastic to 61.

In **Parcel 3**, the soils encountered generally consisted of interlayered soft to very stiff lean clays (CL) and fat clays (CH). Atterberg Plasticity Indices of the tested soils ranged from 13 to 35.

The soils in **Parcel 6** consisted of interlayered medium stiff to hard lean clays (CL) and fat clays (CH). Very loose to loose silt (ML) and clayey sand (SC) was found at the surface in Boring B-17. Atterberg Plasticity Indices of the tested soils ranged from 16 to 51.

The soils encountered in **Parcel 7** consisted of stiff to very stiff fat clays (CH). Atterberg Plasticity Index of the tested soils was 42.

In **Parcel 8**, the soils encountered consisted of very soft to medium stiff interlayered lean clays (CL) and fat clays (CH) and very loose silt (ML) overlying medium stiff to very stiff fat clay (CH). Atterberg Plasticity Indices of the tested soils ranged from 15 to 44.

The soils encountered in **Parcel 9** consisted of medium stiff to hard fat clays (CH). The Atterberg Plasticity Indices of the tested soils ranged from 43 to 61.

#### 4.3 Seismic Design Parameters

Based on the 2012 International Building Code section 1613 *Earthquake Loads – Site Ground Motion*, the seismic site class definition should be taken as **Class D**. This classification is based on an average of the blow counts obtained for all borings in this study. This site classification should be confirmed for future projects based specifically on the project site.

A seismic impact zone is an area with a 10 percent or greater probability that the maximum horizontal acceleration in rock, expressed as a percentage of the earth's gravitational pull, will exceed 0.10g in 50 years. Seismic impact maps that represent a 2 percent probability of exceedance in 50 years for 0.2 and 1 second Spectral Response Acceleration can be found in the IBC code. Based on the maps and the site coefficients determined for the appropriate site class, parameters as listed below are recommended by the IBC Code:

Site Coefficients:

$$F_a = 1.6$$

$$F_v = 2.4$$

Mapped Acceleration Parameters:

$$S_s = 0.140 \text{ g}$$

$$S_1 = 0.077 \text{ g}$$



Maximum Earthquake Spectral Response Acceleration Parameters:  $S_{MS} = 0.223 \text{ g}$   
 $S_{M1} = 0.185 \text{ g}$

Design Spectral Response Acceleration Parameters:  $S_{DS} = 0.149 \text{ g}$   
 $S_{D1} = 0.123 \text{ g}$

#### 4.4 Behavior of Expansive Soils

Expansive soils such as were found at this site, swell when they absorb moisture and shrink as they dry. Structures placed on these soils move up and down with such volume changes of the soil. When expansive soils are covered by an impermeable surface such as a building slab or pavement, seasonal moisture fluctuation at the interior of the covered area tends to be reduced or eliminated due to the lack of exposure to natural wetting and drying conditions (i.e., wind, rain, sun, vegetative, etc.). At the edges of the structure, however, the near surface soils are still subject to seasonal drying and wetting. Where continuously irrigated areas abut a building, the risk of severe shrinkage due to seasonal evaporative drying effects is low, but excess moisture could lead to significant swelling (especially if native clays are dry at the start of construction). Where areas immediately adjacent to the structure are paved both the risk of swelling due to excess moisture and shrinkage due to moisture loss are reduced significantly. A deeper bearing elevation will also reduce the anticipated vertical movements.

Moisture content of the significantly expansive soils we tested varied from dry to moist. Potential for swelling is considered to be moderate to high under conditions at the time of drilling. Potential for shrinkage is also predicted to be moderate to high. As the moisture content of the soil changes from what it was in our samples, the potential for swelling and shrinkage will change accordingly.

One method for quantifying the potential for subgrade movement at any given location is to calculate the Potential Vertical Rise (PVR) (Tex 124 E Modified). This calculation takes into account the inter-relationship between depth, PI, and fluctuations in soil moisture. The maximum potential movement of the existing subgrade, PVR, due to normal climatological fluctuations in soil moisture content is summarized in Table 4.1 (based on assumed dry conditions and an estimated annual seasonal moisture fluctuation zone of approximately 10 feet). Swell testing indicates a potential heave from 1 inch to as much as 7 inches at current moisture contents.

Table 4.1 - PVR Predictions	
Location	PVR (inches)
Parcel 1	1 – 2.75
Parcel 2	3 – 4
Parcel 3	1 – 2.2
Parcel 6	1 – 3.4
Parcel 7	3
Parcel 8	1.75 – 2.2
Parcel 9	4.8 – 5.5

#### 5.0 GROUNDWATER OBSERVATIONS

No seepage was noted during drilling operations and all borings were dry and open upon completion. The phreatic surface is predicted to be at some depth deeper than 20 feet.

It should be noted, however, that seasonal groundwater conditions might vary throughout the year depending upon prevailing climatic conditions. This magnitude of variance will be largely dependent



upon the duration and intensity of precipitation, surface drainage characteristics of the surrounding area, and significant changes in site topography.

## **6.0 FOUNDATION DESIGN RECOMMENDATIONS**

The proposed use is unknown at this time. Given the preliminary nature of this study and the variability of the soils encountered, options for both a shallow foundation system as well as deep foundations are provided below.

Where drilled pier foundations are used, a structurally suspended slab is recommended in order to isolate the structure from subgrade movements.

A system consisting of shallow footings incorporated in a stiffened slab, which is placed on native subgrade or select fill may also be used, but is much less tolerant of significant subgrade volume changes than a structure, which is suspended above the ground (i.e. the risk of structure distress is significantly higher for a ground supported structure). In addition, a stiffened slab on native ground is subject to tilt due to uneven wetting or drying of subgrade soils. Unless the entire structure is surrounded by an impermeable barrier or pavement, uneven wetting due to continuous irrigation on one side of the structure could result in significant heave on that side, tilting the structure. Likewise, uneven drying due to lack of irrigation can also result in tilting.

Some conditions that may affect foundation performance are difficult to account for in standard foundation design procedures. These include vegetative influence (e.g. tree root zones as noted above), unusual climatological conditions, uncontrolled water sources such as plumbing and sprinkler system leaks, and poor drainage conditions. Such sources of moisture change could cause large shrink/swell movements of the expansive clay that will remain beneath the building and lead to significant distress. If it is desired to virtually eliminate the risk of damage from vertical movement due to these conditions, an option incorporating drilled piers with a suspended slab is recommended.

Recommendations and pertinent design parameters for both shallow foundation and deep foundation systems are presented below. With ground supported foundation/floor systems it is *essential* that measures be taken to assure subgrade moisture stability (see section **10.3 Site Design**) in order to enhance the chances of satisfactory structure performance. Proper site design that prevents water from soaking into the subgrade soils around the building is essential to reduce the potential for excessive movement caused by saturation of foundation soils.

### **6.1 Shallow Spread Footings**

Footings should be designed to bear in firm undisturbed native soil or properly compacted select fill. Isolated footings should have a minimum width of 2 feet and strip footings should be at least 12 inches wide. Footings should be proportioned for the allowable gross bearing pressures summarized in **Table 6.1**, below. The footings should bear at the indicated depths below finished slab subgrade or adjacent exterior grade, whichever is deeper. These allowable pressures incorporate a safety factor relative to shear failure of the soil of about 3 and may be increased up to 33% for intermittent loads such as wind. Predicted total settlement for footing widths less than 6 feet is approximately 1 inch or less (total) and 0.5 inch (differential). Detailed testing for the prediction of long-term settlement due to load for these footings is beyond the scope of this investigation.





Table 6.1 – Gross Allowable Bearing Pressures				
Parcel	Native Soils		Select Fill	
	Isolated Footings	Strip Footings	Isolated Footings	Strip Footings
Parcel 1	800 psf @ 2 ft.	600 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 2 ft.
Parcel 2	1000 psf @ 2 ft.	1000 psf @ 2 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 3	1000 psf @ 2 ft.	1000 psf @ 2 ft.	1000 psf @ 2 ft.	1000 psf @ 2 ft.
Parcel 6	1000 psf @ 2 ft.	500 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 7	3000 psf @ 2 ft.	2500 psf @ 1.5 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.
Parcel 8	800 psf @ 2 ft.	800 psf @ 2 ft.	2000 psf @ 2 ft.	2000 psf @ 2 ft.
Parcel 9	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.	2500 psf @ 2 ft.	2000 psf @ 1.5 ft.

### 6.2 Post-Tensioned Slab Design

The information provided below is based on analysis of our field and laboratory test results as well as design procedures given in the Design and Construction of Post-Tensioned Slab-on-Ground - Post-Tensioning Institute Third Edition with 2008 Supplement. We make no warrantee as to the adequacy or applicability of the design procedures given in this manual. These design criteria attempt to account for soil movement due to *normally anticipated climatological fluctuations* and may not entirely accommodate vegetative effects and other unusual situations (noted above). In addition, should the shape factor (SF) of the building slab or foundation exceed 24 as defined by the 2008 manual, PTI recommends limiting the maximum differential movements to 2.0 inches for center lift and 1.0 inch for edge lift. Should the anticipated movements exceed these values, geotechnical approaches should be considered to reduce these predicted movements. Possible methods include, but are not limited to, water injection, lime or chemical injection, removal and replacement with low expansive soil materials or perimeter barriers. Please contact E TTL should evaluation of these methods be necessary. Listed below are parameters for either the post-construction (TMI between -15 and 15) or post-equilibrium case (TMI < -15 or > 15), as recommended by the manual. For the post-construction case, soil moisture fluctuates from very wet to very dry. The post-equilibrium case represents moisture fluctuation from existing to either very wet or very dry.

Table 6.2 – Post Tensioned Slab Design Parameters					
Thorthwaite Moisture Index (TMI) = 45					
Parcel	Weighted Plasticity Index	Edge Moisture Variation Distance, $e_m$		Maximum Differential Soil Movement, $y_m$	
		Center lift (in)	Edge lift (in)	Center lift (in)	Edge Lift (in)
Parcel 1	24	9.0	5.1	0.9	0.1
Parcel 2	39	8.5	5.1	1.3	0.2
Parcel 3	22	8.7	5.1	0.7	0.1
Parcel 6	30	8.7	5.1	0.9	0.1
Parcel 7	42	9.0	5.1	1.6	0.2
Parcel 8	26	8.7	5.1	1.3	0.2
Parcel 9	57	8.0	5.1	2.5	0.4

### 6.3 Drilled Piers

This foundation system consists of drilled and reinforced concrete piers supporting the entire structure that is suspended above the ground when native clay is not removed from beneath the building.

Drilled piers should be founded in undisturbed native soil and should be proportioned using the gross allowable end bearing pressures summarized in **Table 6.3**, below. The depth indicated is below



existing grade. This value may be increased by 33% when considering intermittent loads such as wind or seismic. Shafts should be underreamed to anchor against uplift from expanding soils. Settlement (due to imposed load only) for piers with a sustained full design load is predicted to be 0.5% to 1% of pier tip diameter. The minimum side slope of underreams should be 60 degrees and the maximum ratio of bell to pier diameter should be 3:1.

The foundation units should contain a minimum amount of reinforcement to resist tensile forces caused by soil heave. An adhesive stress of 1,500 psf applied over the portion of the top 10 feet of the pier perimeter *in contact with unprocessed, native expansive clay* should be used to design the pier for uplift due to expanding soils. A minimum pier size of 18 inches is recommended to facilitate proper concrete placement. Further guidelines for the construction of drilled piers are provided in section **10.0 GENERAL CONSTRUCTION CONSIDERATIONS**. Since moisture migration to the base of a drilled shaft (usually along the shaft perimeter surface) could lead to heave, it is especially important that these construction guidelines be followed in order to reduce the risk of such shaft movement.

<b>Location</b>	<b>End Bearing Capacity</b>	<b>Depth (ft.)</b>
Parcel 1	6000 psf	18
Parcel 2	6000 psf	13
Parcel 3	6000 psf	18
Parcel 6	6000 psf	13
Parcel 7	6000 psf	13
Parcel 8	6000 psf	13
Parcel 9	6000 psf	13

### 6.3.1 Uplift Resistance of Belled Shafts

For cases where the top of the bell is at least  $2.5*d_b$  below the ground surface, ultimate uplift resistance of a belled shaft,  $Q_u$  (kips) may be determined by:

$$Q_u = 7.07 * c * (d_b^2 - d_s^2)$$

Where:

- c = cohesion (ksf) (avg in the zone from the base of the bell to  $2*d_b$  above the base)
- $d_s$  = diameter of shaft (ft)
- $d_b$  = diameter of bell (ft)

For cases where the top of the bell is shallower than  $2.5*d_b$  below the ground surface, the ultimate capacity may be assumed to vary linearly from 0 at the ground surface to  $Q_u$  as determined above at  $2.5*d_b$ .

The ultimate uplift resistance as determined above should be divided by a safety factor (say 2 to 3) and the resultant allowable uplift resistance should be compared to the design uplift load (minus the shaft weight if it is not otherwise accounted for) to verify that the allowable resistance is equal to or greater than the design load (i.e. the uplift load applied at the top of the shaft).

The above procedure is only intended to predict uplift capacity based on the characteristics of the soil surrounding the pier. The designer must verify that the shaft reinforcing (for prevention of detachment of the bell from the shaft) and the thickness of the bell (for prevention of shearing off of the edge of the bell) are also adequate to safely carry the uplift load.



## 7.0 FLOOR SYSTEMS

The floor system for use with a shallow footing option consists of a flat slab on prepared subgrade or a stiffened slab on grade as detailed above. For the drilled pier system, a structurally suspended floor is preferred. However, a flat slab on grade system can be used provided that most of the surficial expansive clays are removed and replaced with select fill. As noted above, this sort of floor is subject to damage from unusual moisture changing conditions.

A flat slab on a prepared subgrade can be considered where the risk of localized differential movements of approximately 1" is acceptable (1" is what is predicted due to normal climatological factors only, not other possible moisture sources). However, overexcavation to remove some of the expansive clay creates a "bathtub" beneath the structure that can have the potential to collect surface drainage (or moisture from other sources such as plumbing leaks) at its base. This water will soak into the deeper, dry clays over time possibly resulting in excessive heave. The pavement surrounding the buildings (where it actually abuts the building and the joint is maintained in a sealed condition), however, will help to maintain a stable moisture content beneath the building by virtually preventing moisture gain or loss from surface drainage, thus lowering the risk of severe movements. The risk of distress due to shrink/swell movement of the native subgrade (caused by normal climatological moisture fluctuation only) prepared as specified below is considered relatively low. That is, shrink/swell movements of the clay that will remain beneath the building, should they occur, are predicted to be small (1") and, thus, resulting distress is predicted to be relatively low.

Some conditions that may affect floor system performance are difficult to account for in standard design procedures. These include vegetative influence (prior, or subsequent to, construction), unusual climatological conditions, uncontrolled water sources such as plumbing and sprinkler system leaks, and poor drainage conditions. If it is desired to virtually eliminate the risk of damage from vertical movement due to these conditions, an option incorporating drilled piers with a suspended slab is recommended.

### 7.1 Flat Slab

This floor system consists of a cast-in-place concrete, unstiffened, flat slab on prepared subgrade (according to Section **8.0 BUILDING SUBGRADE PREPARATION**, below) that is either isolated from, or monolithic with footings and grade beams. Provision should be made to account for the fact that a heavily loaded foundation element, which is monolithic with an unloaded slab, may result in significant stress in the transition zone between the unloaded slab and the foundation element. Reinforcing in the slab is used primarily to control shrinkage.

Where a slab is to be placed on grade, we recommend that the subgrade be prepared to reduce the PVR to 1 inch or less. Removal of some of the expansive clay from the zone where the soil moisture tends to fluctuate seasonally is predicted to reduce the potential swelling movement due to normal climatological fluctuation of moisture content of the clay that remains in that zone to less than 1 inch (See **BUILDING SUBGRADE PREPARATION** section 8.0, below).

Where some or all of the native clay remains beneath a ground supported floor system, it is *essential* that measures be taken to assure subgrade moisture stability (see **Site Design** section 10.3) in order to enhance the chances of satisfactory structure performance. Provision should be made to account for the possibility of significant differential movement between the main structure and driveways, sidewalks, and any other structure, which are not placed on subgrade prepared as for the building. Proper site design that prevents water from soaking into the subgrade soils around the building and appurtenances (i.e. provides for rapid runoff away from them) is *essential* to reduce the potential for



excessive movement caused by saturation of foundation soils and should help limit differential movement between soil supported elements and the main building.

## **7.2 Structurally Suspended Slab**

The most positive means of eliminating the effects of vertical subgrade movements on the structure is to structurally suspend the entire floor system (including grade beams) as well as all other non-load bearing elements between drilled piers and above the ground. This may be accomplished via the use of void forms upon which a structurally reinforced concrete slab is placed, or may take the form of a structurally framed floor system above a crawl space. Where a "skirt" encloses a crawl space it should be supported on a concrete grade beam that is designed to span between drilled piers and is isolated from the ground with 10" thick void boxes. Any appurtenances attached to the structure such as stairs or decks should also be suspended above a void space and supported on piers. Soil retainers at the edges of voids are recommended to prevent soil from migrating into the void space.

The void space created beneath the floor system should be sealed so that it does not collect surface drainage. Where there is a crawl space created beneath the floor system the floor of the crawl space should be graded so that it does not collect surface drainage. The base of the space should be higher than the surrounding ground to reduce the chances that water will collect in it. Where this is not possible, grading of the space to a drain is recommended. Planting beds adjacent to the structure should be contained in leak proof boxes or a horizontal moisture barrier should be used in conjunction with them in order to protect the building subgrade from water infiltration (from sources such as sprinkler systems). Backfill adjacent to the structure should be properly compacted native clay soil sloped away from the structure at a 5% slope (minimum) to help limit surface infiltration.





<b>Table 7.1 – Comparison of Foundation Options</b>		
<b>Foundation Option</b>	<b>Advantages</b>	<b>Disadvantages</b>
Drilled Piers (with structurally suspended slab)	Isolated from potential expansive clay movements  Minimal subgrade preparation	Expensive.
Drilled Piers (with a monolithic or isolated flat slab on overexcavated subgrade)	Potentially lower cost  Risk of damage to pier supported elements very low.	Requires some overexcavation to remove a significant portion of expansive clay.  Slab and slab supported elements subject to damage from subgrade movement due to soil moisture change (Risk of significant damage is low and is primarily related to unusual water sources such as plumbing leaks and surface water infiltration)
Shallow spread footings (with a monolithic or isolated flat slab)	Ease of installation  Potentially lower cost.	Requires some overexcavation to remove a significant portion of expansive clay.  Structure, slab and slab supported elements subject to damage from subgrade movement due to soil moisture change (Risk of significant damage is low and is primarily related to unusual water sources such as plumbing leaks and surface water infiltration)
Stiffened Slab (monolithic with shallow footings)	Ease of installation  Lower risk of foundation distress than flat slab for identical subgrade preparation  Minimal subgrade preparation	Potentially more expensive than spread footings with a flat slab  Subject to damage and/or tilt from subgrade movement due to unusual and/or uneven wetting or drying conditions

## 8.0 BUILDING SUBGRADE PREPARATION

In order to validate the design assumptions given above regarding allowable foundation loads, and, in order to provide a serviceable floor system (within the limitations stated above), it is imperative that the subgrade of the building be properly prepared. Special subgrade preparation (other than grading for drainage beneath and around the building) is not required for the suspended slab option. The following procedures are recommended as a minimum:

- Remove any surficial vegetation, wood chips and topsoil. Where trees are removed (or have been removed in the last year) from the slab area, the entire root zone should be cut out and



replaced with select fill. Root zones tend to be comprised of highly desiccated soil, which, if left in place, are prone to significant swelling later on, resulting in heaving of the slab. Verify that all stump holes are backfilled with properly compacted select fill.

- The following *minimum* overexcavation is required for the specific option chosen. Limits of overexcavation should extend beyond building and/or footing lines a distance of 5'. Options are listed in order of increasing risk of damage due to foundation movement.
  - *Drilled piers with suspended slab* - Grade void space beneath floor to drain.
  - *Drilled piers with grade beams and floor slab on prepared subgrade* - Native expansive clay soils are to be removed and replaced with select fill. Overexcavate to the depths below existing grade shown in **Table 8.1** below in order to reduce the PVR to 1 inch or less.
  - *Shallow spread footings with monolithic flat slab* - Overexcavate to the depths below existing grade shown in **Table 8.1** below in order to reduce the PVR to 1 inch or less.
  - *Shallow spread footings with monolithic stiffened slab placed on grade* – None required
- Scarify the exposed subgrade to a depth of 8 inches, adjust the moisture content to, and maintain it within a range of optimum to optimum +3% and recompact to a minimum density of 95% of the maximum density defined by ASTM D 698 (Standard Proctor). *Maintain specified moisture content until subgrade is covered with fill or slab.*
- Place select fill to finished slab subgrade. Specifications for the placement of select fill are covered in section **10.4 Select Fill**.

A durable moisture barrier should be provided between the concrete building slab and the underlying soil subgrade. An intact membrane installation with lapped and sealed joints and which is repaired if damaged during construction will help to inhibit moisture migration from the subgrade through the slab.

<b>Table 8.1 – Recommended Undercut Depth</b>	
<b>Location</b>	<b>Depth (ft.)</b>
Parcel 1	3 – 6
Parcel 2	6 – 8
Parcel 3	1 – 3
Parcel 6	6.5 – 7.5
Parcel 7	6
Parcel 8	4 – 7
Parcel 9	7 – 8

## **9.0 PAVEMENT RECOMMENDATIONS**

General recommendations for the design of *minimal* pavement structures are provided herein for your information. A more detailed pavement analysis would require additional laboratory tests on bulk samples of the materials to be used in pavement construction and is beyond the scope of this



investigation. A summary of proposed designs is provided in **Table 9.1**, **Table 9.2** and **Table 9.3** below.

### **9.1 Pavement Subgrade Preparation**

As a minimum, strip the native subgrade to remove topsoil and other deleterious materials. Cut to the proposed subgrade elevation as required. After all cutting to finished subgrade has been performed, the exposed soils should be examined and tested by a representative of E TTL to detect areas of expansive clay or other unsuitable soil conditions that need to be cut out and replaced. Tree root zones often contain highly desiccated, highly plastic soil that eventually results in heaving after a period of rewetting. The only way to limit this potential is to remove these zones and replace them with select fill. The heaving effect can be reduced with good pavement drainage and maintenance. If this is not feasible, then future additional pavement maintenance will probably be necessary. Verify that all stump holes as well as areas disturbed by demolition activity, if any, are cut out and backfilled with properly compacted select fill. Positive surface drainage should be provided at all times during construction (especially in low areas) to maintain pavement subgrade in a dry and stable condition.

#### **9.1.1 Unsuitable Subgrade Soil**

Where the exposed subgrade is found to consist of soil with a  $PI > 20$ , cut out the plastic clay to an elevation equal to finished subgrade minus 12", or deeper if necessary to expose stable ground (as determined by proof rolling as specified below). Scarify the exposed soil to a depth of 8", adjust the moisture content to within a range of optimum to optimum +3% and recompact to a minimum density of 95% of ASTM D698 (standard proctor). Lime treatment, in accordance with section **9.1.3 Lime Treated Subgrade**, is an alternative to removal and replacement.

#### **9.1.2 Suitable Subgrade Soil**

Where exposed native soil consists of a soil with a  $PI < 20$ , it should be proof rolled in accordance with TxDOT Item 216 (with the exception of roller size). The use of a fully loaded dump truck is recommended. Areas, which prove unstable should be cut out and replaced as directed by a representative of this firm. Scarify the exposed soil to a depth of 8", adjust the moisture content to within a range of optimum to optimum +3% and recompact to a minimum density of 95% of ASTM D698 (standard proctor).

#### **9.1.3 Lime Treated Subgrade**

In areas where the subgrade soils consist of expansive clays ( $PI > 20$ ), lime treatment is recommended. Lime treatment of subgrade should be in accordance with Item 260, "Lime Treatment for Materials Used as Subgrade (Road Mixed)," Texas Department of Transportation *Standard Specifications for Construction of Highways, Streets and Bridges*, 2004 Edition with the following exceptions:

- Under article 260.4 (4), "Application," the rate of lime to be applied can be estimated as 40 pounds per square yard worked into the top 8 inches of finished subgrade. *The actual amount of lime to be used should be based on tests of lime soil mixtures conducted prior to treatment.* Quicklime, if used, must be hydrated before mixing into the soil.
- The modified subgrade should be compacted under article 260.4 (6) (b), "Density Control," except that it shall be compacted to 95% of Standard Proctor Density (ASTM D698) *at a moisture content well above optimum* to allow for the drying action of the lime.
- Curing procedures should be strictly followed. Traffic on the treated subgrade should be kept to a minimum during curing.



- Prior to use by significant traffic, the treated subgrade should be covered with base, concrete or some temporary wearing surface to avoid degradation.

#### 9.1.3.1 Alternatives to Lime Treatment

For the flexible pavement option (only) placing a geogrid (Tensar TX 140, no substitute) on the native subgrade prior to placing base material will serve as a substitute for lime treated subgrade. For the full depth HMAC section, lime treatment of the subgrade may be omitted if the thickness of pavement surface specified is increased by 1". For the rigid pavement option (concrete) increase the recommended thickness by 0.5" where lime treatment is omitted.

#### 9.1.4 Fill Construction

Fill to be placed which is below an elevation of finished subgrade minus 18" may consist of any soil and should be compacted to a minimum density of 95% ASTM D698 (standard proctor) at a moisture content within the range of optimum to optimum + 3%. The top 18" of finished subgrade should consist of a select material with the following properties: a PI  $\leq$ 15, a liquid limit  $\leq$ 35 and a percentage passing the #200 sieve <40%.

#### 9.1.5 Stability of Finished Subgrade

The stability of the finished subgrade should be verified by proof rolling (as specified above) prior to placing base material or surfacing. Unstable areas will need to be cut out and reworked.

### 9.2 Light-Duty Pavements

#### 9.2.1 Flexible Pavement

The minimum pavement section (and a section commonly used) for light-duty driveways and parking areas consists of 6 inches of crushed stone base with 2 inches of hot mix asphaltic concrete (HMAC). Crushed stone base should comply with Type A, Grade 2, Item 247 of the *Texas Department of Transportation (TxDOT) 2004 Standard Specifications for Construction of Highways, Streets and Bridges*. Compaction of the stone base should be to a minimum of 95 percent of ASTM D 1557 (modified proctor) maximum density at optimum moisture  $\pm$ 3 percent. Asphaltic concrete surfacing should comply with the requirements of Type D, Item 340 of the TxDOT Specifications and should be compacted to a density of 92 to 94 percent of maximum theoretical density.

#### 9.2.2 Full Depth Asphalt

The **minimum** full depth asphalt pavement section consists of 3 inches of hot mixed asphaltic concrete binder course (Type B) with 2 inches of hot mixed asphaltic concrete surfacing (Type D). Asphaltic concrete surfacing should comply with the requirements of Type D, Item 340 of the TxDOT Specifications and the asphaltic concrete binder should comply with the requirements of Type B, Item 340. All HMAC should be compacted to a density of 92 to 94 percent of maximum theoretical density.

#### 9.2.3 Rigid Pavement

The performance of concrete pavement is dependent on many factors including weight and frequency of traffic, subgrade conditions, concrete quality (which itself is dependent on a host of factors), joint type and layout, jointing procedures, and numerous construction practices. A detailed discussion of all of these items is beyond the scope of this report. By way of general guidance, the following recommendations are offered:

- Minimum concrete compressive strength of 3,500 psi at 28 days placed with a water/cement ratio of 0.45 or less. The mix should contain 4% - 6% entrained air for durability.





- Minimum pavement thickness of 5 inches.
- Sawcut or preformed control joints at maximum spacing of 12 feet each way. Layout of joints should form basically square panels. Timing of the cutting of joints is critical to their performance and generally should be within 4 - 18 hours of concrete placement. *Sealing of joints and cracks and maintenance of the seal are critical for satisfactory performance.*
- Adequate site drainage to prevent ponding on or near the pavement.
- Cure concrete via use of liquid membrane curing compound.
- Concrete quality should be controlled and jointing properly executed. Minimum reinforcement should consist of 6 x 6 No. 6 welded wire fabric or No. 3 at 18 inches each way and should not be continuous through control joints.
- All edges of pavement should be thickened to 9 inches (transitioning back to 5 inches over a minimum distance of 3 feet).
- Allow a minimum of 7 days curing time before permitting traffic on the pavement.

The reader is referred to the American Concrete Institute Publication No. ACI 330R, *Guide for Design and Construction of Concrete Parking Lots* for more detailed information.

### **9.3 Medium-Duty Pavements**

#### **9.3.1 Flexible Pavement**

For areas that will be subject to trash or delivery truck parking and traffic, the minimum recommended flexible pavement section consists of 8 inches of crushed stone base and 3 inches of asphaltic concrete surfacing. The 3 inches of surfacing may be composed of fine-graded surface course (Type D) or coarse-graded surface course (Type C). Paving materials should be specified as discussed previously.

#### **9.3.2 Full Depth Asphalt**

For a medium-duty full depth asphalt section, the minimum recommended section is 6 inches of HMAC paving consisting of 2 inches wearing surfacing (Type D) over 4 inches of asphaltic binder (Type B). Paving materials should be specified as discussed previously.

#### **9.3.3 Rigid Pavement**

Recommendations for medium-duty concrete paving are the same as for light duty except that 6 inches of portland cement concrete should be considered the minimum pavement section and the edges should be thickened to 9 inches.

### **9.4 Heavy-Duty Pavements**

#### **9.4.1 Flexible pavement**

For areas that will be subject to heavy truck parking and traffic, the *minimum recommended* flexible pavement section consists of 7 inches of crushed stone base and 4.5 inches of asphaltic concrete surfacing. The 4.5 inches of surfacing may be composed of 2 inches of fine-graded surface course (Type D) wearing surfacing overlaying 2.5 inches of coarse-graded surface course (Type C). Paving materials should be specified as discussed previously.



### 9.4.2 Full Depth Asphalt

For a heavy duty full depth asphalt section, the minimum recommended section is 7.5 inches of HMAC paving consisting of 2 inches of hot mixed asphaltic concrete surfacing (Type C or D) over 5.5 inches of asphaltic concrete base course (Type A or B). Paving materials should be specified as discussed previously.

### 9.4.3 Rigid pavement

Recommendations for heavy-duty concrete paving are the same as for light duty except that 7 inches of Portland cement concrete should be the minimum pavement section and the edges should be thickened to 9 inches.

Table 9.1 – Pavement Options – Light Duty			
Type	Base/Surface Thickness		Subgrade Preparation
Flexible HMAC	2" Surface (Type D)	6" Crushed Stone Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" HMAC Surface (Type D)	3" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	5" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill

Table 9.2 – Pavement Options – Medium Duty			
Type	Base/Surface Thickness		Subgrade Preparation
Flexible HMAC	3" Surface (Type C or D)	8" Crushed Stone Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" Surface (Type C or D)	4" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	6" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill



Table 9.3 – Pavement Options – Heavy Duty			
Type	Base/Surface Thickness		Subgrade Preparation
Flexible HMAC	2" Surface (Type C or D)	7" Crushed Stone Base & 2.5" HMAC Base	6" Lime Treated <sup>1</sup> or 18" Select Fill
Full Depth HMAC	2" Surface (Type C or D)	5.5" HMAC Base (Type A or B)	6" Lime Treated <sup>2</sup> or 18" Select Fill
Concrete	7" <sup>3</sup>	No Base Required	6" Lime Treated <sup>3</sup> or 18" Select Fill

**Notes:**

- 1) Tensar Triax Geogrid placed on subgrade may be substituted for lime treatment of subgrade. Lime treatment or replacement with select fill only needed where expansive clay is encountered within 12" of finished subgrade as determined by a representative of this firm.
- 2) Increase HMAC thickness by 1" in lieu of lime treated subgrade
- 3) Increase concrete thickness by 0.5" in lieu of lime treated subgrade

## 10.0 GENERAL CONSTRUCTION CONSIDERATIONS

The surficial soils in several areas may become unstable when wet necessitating remediation or removal and replacement to facilitate construction.

### 10.1 Shallow Footings

All footing excavations should be inspected by qualified personnel to insure that subgrade is composed of firm, undisturbed native soil or properly compacted select fill as recommended in this report. Water and/or loose material in footing excavations should be removed prior to final shaping of the footing excavation and placement of concrete.

### 10.2 Drilled Piers

Personnel familiar with the installation of drilled foundations should monitor construction of all foundation units. As a minimum, a representative of this firm should be present before and during construction in order to verify the founding stratum and to insure that the base of excavation is firm and undisturbed. Free water and/or loose material at the base of excavations should be removed prior to placement of concrete.

Groundwater observations indicate that shaft tip depth will not be below the water table and that dry method of construction should be feasible. Temporary casing and/or slurry drilling procedures could be required however. In any case, it is recommended that contract documents provide alternates with or without casing and dry or slurry displacement construction procedures.

Concrete should be designed to be highly workable (slump of 7 inches to 9 inches) and should be placed at each drilled pier location as soon as possible after the completion of drilling. Also, to insure proper construction of the drilled piers at this site, close coordination between the drilling and concreting operations is considered to be of primary importance. In no case should a shaft remain open overnight.

*Construction documents must specify that all piers should be constructed in accordance with ACI 336.1 "Standard Specification for the Construction of Drilled Piers," latest edition. Only contractors familiar with and competent in the employment of these methods should be considered for the work.*



*The actual capacity of the completed drilled pier is directly related to the degree of conformance to correct construction procedures.*

### **10.3 Site Design**

The following recommendations are derived from years of experience with structures founded on expansive soils and are considered essential to satisfactory structure performance, especially where the floor slab is to be placed on grade:

- Sidewalks should be sloped away from buildings and should not be tied to the structures. The joint between the sidewalk and the foundation should be sealed. Sidewalks should not impound water adjacent to the structure. Potential heave of native ground adjacent to the structure needs to be taken into consideration when constructing the walk so as to avoid a sidewalk which impounds water adjacent to the structure.
- The ground surface around the building as well as paved areas should be sloped away from the building on all sides so that water will drain away from the structure. A minimum slope of 5% is recommended for the area 10 feet wide immediately adjacent to the structure. Drainage swales should have a minimum longitudinal slope of 2%. Roof drainage should be conveyed by an appropriate means for a distance of at least 15 feet from the building before it is allowed to drain into the subgrade. Water should not be allowed to pond near the building after the floor system has been placed.
- Trees should not be closer than their mature height to the structure and shrubbery should not be planted adjacent to the building unless they can be contained in watertight planter boxes and irrigation water can be prevented from seeping into the subgrade around the building. A horizontal moisture barrier (e.g. Mirafi 1212 reinforced polyethylene permanently sealed to the foundation edge at the ground line and sloped away from the building) and placed beneath planting beds is an alternative to planter boxes provided it is maintained in a watertight condition (i.e., joints sealed and punctures repaired). Planting bed edging should not impound water. A root barrier around the entire structure perimeter will provide some added assurance against desiccation of the soil due to roots growing beneath the structure. Periodic root pruning may be required to limit drying of soils beneath foundations due to vegetation. *Over irrigation adjacent to the structure can cause an increase in subsurface moisture contents that could lead to heaving.*
- To help limit surface water infiltration beneath the structure, backfill in the area 10 feet wide adjacent to the structure should be native lean or fat clay soil compacted to a minimum density of 95% of ASTM D 698 (Standard Proctor) at a moisture content of optimum or above. This zone should be at least 2 feet thick. This backfill is not necessary where pavement abuts the structure and the joint is sealed.
- Backfill for utility line ditches should be carefully controlled and should consist of a relatively impermeable material (clayey sand or lean clay), especially in the area beneath and immediately outside of the structure. Old utility lines should be removed from beneath the structure. Fill in new or old utility trenches should be placed to the same specifications as select fill. The top 6 inches under paving should be compacted to a density equal to that specified for the pavement subgrade.
- Utility connections to the building should be flexible to allow for anticipated soil movements that will be different than the anticipated movement of the structure to which they are connected (e.g. where a suspended slab is used).





#### 10.4 Select Fill

Select fill shall consist of homogeneous soils (i.e. not sand with clay lumps) free of organic matter and rocks larger than 6 inches in diameter and possessing an Atterberg PI of 8 to 18, with a liquid limit of 40 or less. Atterberg limits testing of the fill at a rate of 1 test per 500 cubic yards of fill (and as visual changes occur) placed is recommended to verify that fill specifications are met. The material should be placed in the following manner:

- Prepare the subgrade in accordance with the recommendations discussed in a previous section of this report entitled **BUILDING SUBGRADE PREPARATION**. Sites that slope more than about 15% should be benched with 5-foot wide benches prior to placing fill.
- Place subsequent lifts of select fill in thin, loose layers not exceeding nine inches in thickness to the desired rough grade and compact to a minimum of 95% of the maximum density defined by ASTM D 698. Maintain moisture within a range of optimum -1% to optimum +3%. Where the total fill depth exceeds 6 feet beneath any portion of a structure, all fill should be compacted to a minimum of 100% of the maximum density defined by ASTM D 698.
- Conduct in-place field density tests at a rate of one test per 3,000 square feet for every lift with a minimum of 2 tests per lift. **Density testing is essential to assure that the soil, which supports the structure, is properly placed.**
- Prevent excessive loss of moisture during construction.
- For select fill placed above the existing groundline, extend the lateral limits of the fill at least 5 feet beyond the perimeter of the building area, transitioning back to the existing groundline on a 3:1(horizontal/vertical) slope.

#### 11.0 LIMITATIONS

Geotechnical design work is characterized by the presence of a calculated risk that soil and groundwater conditions may not have been fully revealed by the exploratory borings. This risk derives from the practical necessity of basing interpretations and design conclusions on a limited sampling of the subsoil stratigraphy at the project site. The number of borings and spacing is chosen in such a manner as to decrease the possibility of undiscovered anomalies, while considering the nature of loading, size and cost of the project. The recommendations given in this report are based upon the conditions that existed at the boring locations at the time they were drilled. The term "existing groundline" or "existing subgrade" refers to the ground elevations and soil conditions at the time of our field operations.

It is conceivable that soil conditions throughout the site may vary from those observed in the exploratory borings. If such discontinuities do exist, they may not become evident until construction begins or possibly much later. Consequently, careful observations by the geotechnical engineer must be made of the construction as it progresses to help detect significant and obvious deviations of actual conditions throughout the project area from those inferred from the exploratory borings. Should any conditions at variance with those noted in this report be encountered during construction, this office should be notified immediately so that further investigations and supplemental recommendations can be made.



Construction plans and specifications should be submitted to E TTL for review prior to issuance for construction to help verify that the recommendations of this report have been correctly understood and implemented.

This company is not responsible for the conclusions, opinions, or recommendations made by others based on the contents of this report. The recommendations made in this report are applicable only to the proposed scope of work as defined in **SECTION 2.0 PROJECT DESCRIPTION** and may not be used for any other work without the express written consent of E TTL Engineers. The purpose of this study is only as stated elsewhere herein and is not intended to comply with the requirements of 30 TAC 330 Subchapter T regarding testing to determine the presence of a landfill. Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. No warranties are either expressed or implied.





# Design Maps Detailed Report

2012 International Building Code (33.4526°N, 94.26929°W)

Site Class D – “Stiff Soil”, Risk Category I/II/III

## Section 1613.3.1 – Mapped acceleration parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain  $S_s$ ) and 1.3 (to obtain  $S_1$ ). Maps in the 2012 International Building Code are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 1613.3.3.

From **Figure 1613.3.1(1)**<sup>[1]</sup>

$$S_s = 0.140 \text{ g}$$

From **Figure 1613.3.1(2)**<sup>[2]</sup>

$$S_1 = 0.077 \text{ g}$$

## Section 1613.3.2 – Site class definitions

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Section 1613.

2010 ASCE-7 Standard – Table 20.3-1  
SITE CLASS DEFINITIONS

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
Any profile with more than 10 ft of soil having the characteristics: <ul style="list-style-type: none"> <li>• Plasticity index <math>PI &gt; 20</math>,</li> <li>• Moisture content <math>w \geq 40\%</math>, and</li> <li>• Undrained shear strength <math>\bar{s}_u &lt; 500</math> psf</li> </ul>			
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

$$\text{For SI: } 1\text{ft/s} = 0.3048 \text{ m/s } 1\text{lb/ft}^2 = 0.0479 \text{ kN/m}^2$$

**Section 1613.3.3 — Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters**

TABLE 1613.3.3(1)  
VALUES OF SITE COEFFICIENT  $F_s$

Site Class	Mapped Spectral Response Acceleration at Short Period				
	$S_s \leq 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of  $S_s$ .

**For Site Class = D and  $S_s = 0.140$  g,  $F_s = 1.600$**

TABLE 1613.3.3(2)  
VALUES OF SITE COEFFICIENT  $F_1$

Site Class	Mapped Spectral Response Acceleration at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of  $S_1$ .

**For Site Class = D and  $S_1 = 0.077$  g,  $F_1 = 2.400$**



**Equation (16-37):**

$$S_{M5} = F_b S_b = 1.600 \times 0.140 = 0.223 \text{ g}$$

---

**Equation (16-38):**

$$S_{M1} = F_v S_v = 2.400 \times 0.077 = 0.185 \text{ g}$$

---

#### Section 1613.3.4 — Design spectral response acceleration parameters

**Equation (16-39):**

$$S_{D5} = \frac{2}{3} S_{M5} = \frac{2}{3} \times 0.223 = 0.149 \text{ g}$$

---

**Equation (16-40):**

$$S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.185 = 0.123 \text{ g}$$

---

## Section 1613.3.5 – Determination of seismic design category

TABLE 1613.3.5(1)

SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD (0.2 second) RESPONSE ACCELERATION

VALUE OF $S_{Ds}$	RISK CATEGORY		
	I or II	III	IV
$S_{Ds} < 0.167g$	A	A	A
$0.167g \leq S_{Ds} < 0.33g$	B	B	C
$0.33g \leq S_{Ds} < 0.50g$	C	C	D
$0.50g \leq S_{Ds}$	D	D	D

For Risk Category = I and  $S_{Ds} = 0.149g$ , Seismic Design Category = A

TABLE 1613.3.5(2)

SEISMIC DESIGN CATEGORY BASED ON 1-SECOND PERIOD RESPONSE ACCELERATION

VALUE OF $S_{D1}$	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and  $S_{D1} = 0.123g$ , Seismic Design Category = B

Note: When  $S_1$  is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

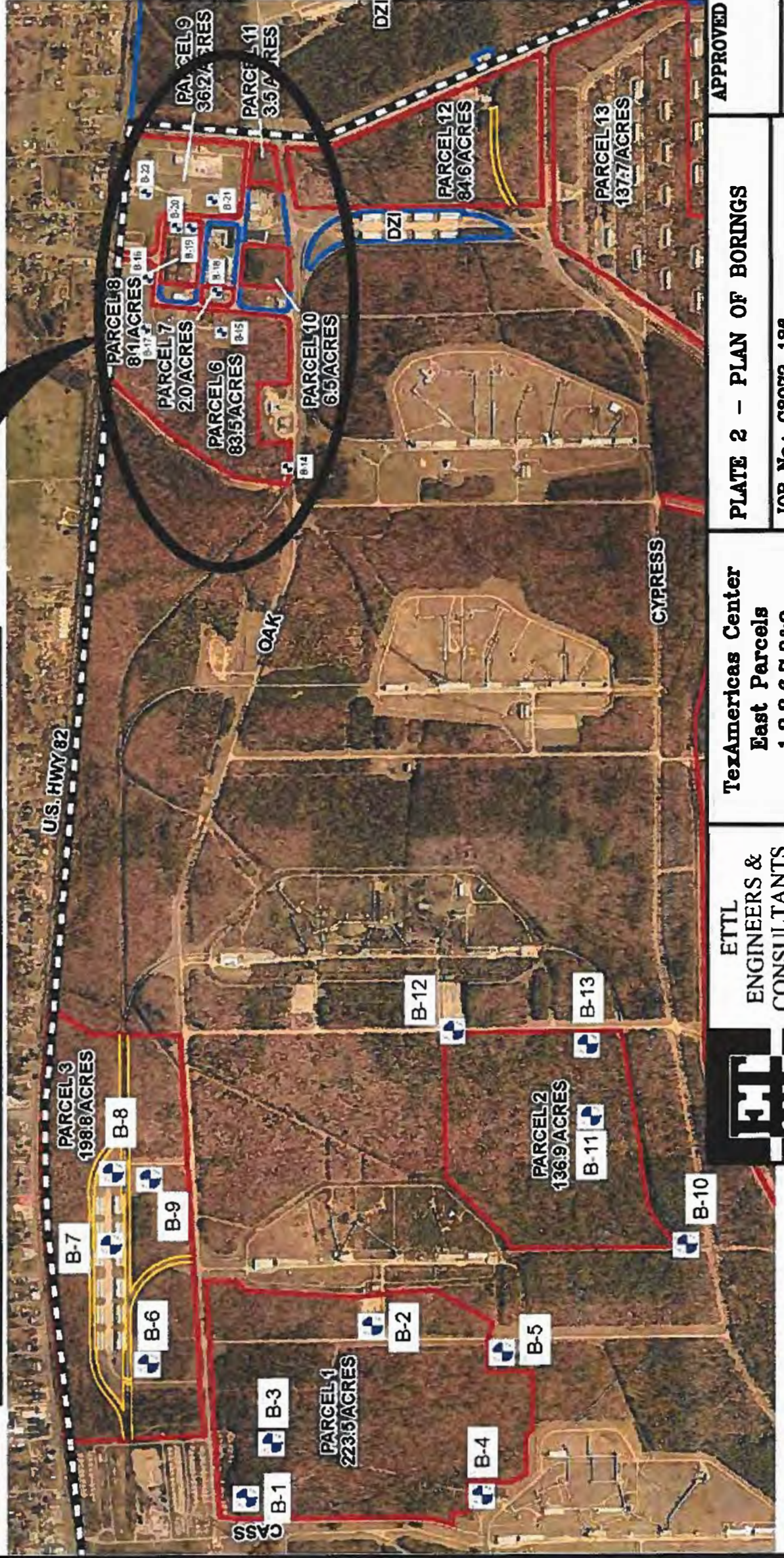
Seismic Design Category  $\equiv$  "the more severe design category in accordance with Table 1613.3.5(1) or 1613.3.5(2)" = B


Note: See Section 1613.3.5.1 for alternative approaches to calculating Seismic Design Category.

### References

1. Figure 1613.3.1(1): [http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(1\).pdf](http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(1).pdf)
2. Figure 1613.3.1(2): [http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(2\).pdf](http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(2).pdf)





 <p><b>ETTL</b> ENGINEERS &amp; CONSULTANTS</p> <p><small>MAIN OFFICE 1717 East South York, PA 17402 (717) 325-4421</small></p>	<p><b>TexAmericas Center</b> East Parcels 1,2,3,6,7,8&amp;9 Hooks, Texas</p>	<p><b>PLATE 2 - PLAN OF BORINGS</b></p>	<p><b>APPROVED BY:</b></p>
	<p><b>DATE: July 2013</b></p>	<p><b>JOB No.: G3972-138</b></p>	<p><b>DRAWN BY:</b> RWG</p>
		<p><b>SCALE: N.T.S.</b></p>	





**ETTL  
ENGINEERS &  
CONSULTANTS**

MAIN OFFICE  
1717 East Erwin  
Tyler, Texas 75702  
(903) 595-4421

**MATERIAL DESCRIPTION**

LEAN CLAY WITH SAND (CL) very stiff;  
tan and gray

--medium stiff

--soft

FAT CLAY (CH) very stiff; gray and tan

Bottom of Boring @ 10'

USC	CL	CH	
SAMPLES			
DEPTH (ft)	0	5	10
WATER LEVEL			
GEOLOGIC UNIT			

**LOG OF BORING B-9**

PROJECT: TexAmericas Center - East Parcels DRILL RIG: Truck Rig  
Preliminary Investigation  
New Boston, TX  
PROJECT NO.: G3972-136 BORING TYPE: Flight Auger

DATE: 6/25/13

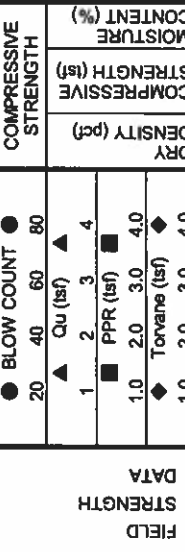
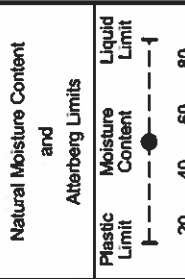
**SURFACE ELEVATION**

ATTERBERG LIMITS(%)

SIEVE ANALYSIS

SWELL TEST

LIQUID LIMIT	TL	27	14	13						
PLASTIC LIMIT	PL	14	13							
PLASTICITY INDEX	PI									
MINUS #200 SIEVE (%)		76								
PLUS #40 SIEVE (%)		4								
PLUS #4 SIEVE (%)		1								
DRY DENSITY (pcf)										
FREE SWELL (%)										
ZERO SWELL PRESSURE (psf)										
MOISTURE CONTENT (%)		11								



FIELD STRENGTH DATA	N=17	N=7	N=2	N=16
DRY DENSITY (pcf)				
COMPRESSIVE STRENGTH (tsf)				
COMPRESSIVE STRENGTH (tsf)				
MOISTURE CONTENT (%)				

Water Level  
Water Observations:  
Est. Measured:  Perched:   
Dry and open upon completion.

Key to Abbreviations:  
N - SPT Data (Blows/Ft)  
P - Pocket Penetrometer (tsf)  
T - Torvane (tsf)  
L - Lab Vane Shear (tsf)

Notes:

GPS Coordinates: N33.46331°, W94.27476°

Dyer: J. Lewis

Logger: J. Lewis





# APPENDIX D



**U.S. ARMY CORPS OF ENGINEERS  
REGULATORY PROGRAM  
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)  
NAVIGABLE WATERS PROTECTION RULE**

**I. ADMINISTRATIVE INFORMATION**

Completion Date of Approved Jurisdictional Determination (AJD): 1/4/2021

ORM Number: (e.g. HQS-2020-00001-MSW).

Associated JDs: N/A

Review Area Location<sup>1</sup>: State/Territory: Texas City: New Boston County/Parish/Borough: Bowie

Center Coordinates of Review Area: Latitude 33.460530 Longitude -94.277423

**II. FINDINGS**

**A. Summary:** Check all that apply. At least one box from the following list MUST be selected. Complete the corresponding sections/tables and summarize data sources.

- The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
- There are “navigable waters of the United States” within Rivers and Harbors Act jurisdiction within the review area (complete table in Section II.B).
- There are “waters of the United States” within Clean Water Act jurisdiction within the review area (complete appropriate tables in Section II.C).
- There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in Section II.D).

**B. Rivers and Harbors Act of 1899 Section 10 (§ 10)<sup>2</sup>**

§ 10 Name	§ 10 Size	§ 10 Criteria	Rationale for § 10 Determination
N/A.	N/A.	N/A.	N/A.

**C. Clean Water Act Section 404**

Territorial Seas and Traditional Navigable Waters ((a)(1) waters): <sup>3</sup>			
(a)(1) Name	(a)(1) Size	(a)(1) Criteria	Rationale for (a)(1) Determination
N/A.	N/A.	N/A.	N/A.

Tributaries ((a)(2) waters):			
(a)(2) Name	(a)(2) Size	(a)(2) Criteria	Rationale for (a)(2) Determination
S-1	4,758.41 linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Based on the Antecedent Precipitation Tool (APT) report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface

<sup>1</sup> Map(s)/figure(s) are attached to the AJD provided to the requestor.

<sup>2</sup> If the navigable water is not subject to the ebb and flow of the tide or included on the District’s list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.

<sup>3</sup> A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD Form.



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water flowing continuously during certain times of the year and more than in direct response to precipitation. This flow regime meets the definition of intermittent flow as defined in 33 CFR Part 328.3(a)(2).

S-7	847.88	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing continuously during certain times of the year and more than in direct response to precipitation. This flow regime meets the definition of intermittent flow as defined in 33 CFR Part 328.3(a)(2).
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S-14	7043.35	linear feet	(a)(2) Intermittent tributary contributes surface water flow directly or indirectly to an (a)(1) water in a typical year.	The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing continuously during certain times of the year and more than in direct response to precipitation. This flow regime meets the definition of intermittent flow as defined in 33 CFR Part 328.3(a)(2).
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Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):				
(a)(3) Name	(a)(3) Size	(a)(3) Criteria	Rationale for (a)(3) Determination	
N/A.	N/A.	N/A.	N/A.	N/A.

Adjacent wetlands ((a)(4) waters):				
(a)(4) Name	(a)(4) Size	(a)(4) Criteria	Rationale for (a)(4) Determination	
Wet-A-1	6.05 acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain.	





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			<p>The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland.</p>
Wet-A-15	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	<p>Wetland abuts intermittent S-1</p> <p>This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland.</p>
	5.95		
Wet-B-1	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	<p>Wetland abuts intermittent S-14</p> <p>This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There were 2 datapoints collected within this specific feature supporting its designation as a PSS wetland. This wetland is adjacent to the S-1 intermittent stream within the review area, which results in the wetland meeting the A(4) abutting wetland definition. Thus this wetland is considered an adjacent wetland.</p>
	8.58		
Wet-B-19	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	<p>This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling</p>
	32.74		



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Wet-B-20	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	<p>method, which shows data points taken throughout the mapped review area. There were 4 datapoints collected within this specific feature supporting its designation as a PFO wetland. This wetland is adjacent to the S-14 intermittent stream within the review area, which results in the wetland meeting the A(4) abutting wetland definition. Thus this wetland is considered an adjacent wetland.</p> <p>This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. a. There was 1 datapoint collected within this specific feature supporting its designation as a PSS wetland. This wetland is adjacent to the S-14 intermittent stream within the review area, which results in the wetland meeting the A(4) abutting wetland definition. Thus this wetland is considered an adjacent wetland.</p>
	0.29		
Wet-B-21	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	<p>This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that larger wetland habitat occurs across the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is adjacent to the S-14 intermittent stream within the review area, which results in the wetland meeting the A(4) abutting wetland definition. Thus this wetland is considered an adjacent wetland.</p>
	0.88		



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Wet-B-22	0.19	acre(s)	(a)(4) Wetland abuts an (a)(1)-(a)(3) water.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is adjacent to the S-14 intermittent stream within the review area, which results in the wetland meeting the A(4) abutting wetland definition. Thus this wetland is considered an adjacent wetland.
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**D. Excluded Waters or Features**

Excluded waters ((b)(1) – (b)(12)): <sup>4</sup>				
Exclusion Name	Exclusion Size		Exclusion <sup>5</sup>	Rationale for Exclusion Determination
S-1	633	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated.
S-2	543.97	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	The stream channel is not depicted on the USGS Topographic map as a blue line stream; however, a visible channel was observed on aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions,

<sup>4</sup> Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.

<sup>5</sup> Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.



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S-3	92.56	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	<p>which was when the site was delineate. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).</p> <p>The stream channel is not depicted on the USGS Topographic map as a blue line stream; however, a visible channel was observed on aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).</p>
S-4	107.65	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	<p>The stream channel is not depicted on the USGS Topographic map as a blue line stream; however, a visible channel was observed on aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).</p>
S-5	116.25	linear feet	(b)(3) Ephemeral feature, including an ephemeral	<p>The stream channel is not depicted on the USGS Topographic map as a blue line stream; however, a visible channel was observed on</p>





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			stream, swale, gully, rill, or pool.	aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).
S-8	292.89	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	The stream channel is not depicted on the USGS Topographic map as a blue line stream, and a visible channel was not observed in aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).
S-9	268.05	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	The stream channel is not depicted on the USGS Topographic map as a blue line stream, and a visible channel was not observed in aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation,



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S-10	5216.0 4	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	<p>this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).</p> <p>The stream channel is not depicted on the USGS Topographic map as a blue line stream; however, a visible channel was observed on aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).</p>
S-13	355.54	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	<p>The stream channel is not depicted on the USGS Topographic map as a blue line stream; however, a visible channel was observed on aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).</p>
S-15	1696.7 8	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	<p>The stream channel is not depicted on the USGS Topographic map as a blue line stream; however, a visible channel was observed on aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line</p>



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S-16	888.93	linear feet	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	<p>stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).</p> <p>The stream channel is not depicted on the USGS Topographic map as a blue line stream; however, a visible channel was observed on aerial imagery. The stream channel is depicted on the USGS Topographic map as a blue line stream, and a visible channel was observed in aerial imagery. Bowie County rainfall averages 51 inches a year. Based on the APT report, the site has been exhibiting wetter than normal precipitation conditions, the graph for the spring months depicts wetter than average conditions, which was when the site was delineated. Based on the information included in this evaluation, this stream has been determined to have surface water flowing/pooling only in direct response to precipitation. This flow regime meets the definition of ephemeral flow as defined in 33 CFR Part 328.3(c)(3).</p>
Wet-A-2	1.11	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	<p>This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There were 3 datapoints collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this</p>



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wetland is considered a non-adjacent wetland.

Wet-A-3	2.54	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that larger wetland habitat occurs across the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is adjacent to the S-5 ephemeral stream within the review area, which results in the wetland not meeting the A(4) abutting wetland definition. Thus this wetland is not considered an adjacent wetland.
Wet-A-4	0.33	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that larger wetland habitat occurs across the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint datapoints collected within this specific feature supporting its designation as a PEM wetland. This wetland is adjacent to the S-5 ephemeral stream within the review area, which results in the wetland not meeting the A(4) abutting wetland definition. Thus this wetland is not considered an adjacent wetland.
Wet-A-5	19.54	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a





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			(a)(1) water in a typical year.	random sampling method, which shows data points taken throughout the mapped review area. There were 2 datapoints collected within this specific feature supporting its designation as a PFO wetland. This wetland is adjacent to the ephemeral portion of the S-1 stream within the review area, which results in the wetland not meeting the A(4) abutting wetland definition. Thus this wetland is not considered an adjacent wetland.
Wet-A-6	4.25	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There were 3 datapoints collected within this specific feature supporting its designation as a PFO wetland. This wetland is adjacent to the ephemeral portion of the S-1 stream within the review area, which results in the wetland not meeting the A(4) abutting wetland definition. Thus this wetland is not considered an adjacent wetland.
Wet-A-7	12.98	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There were 5 datapoints collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.



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Wet-A-8	16.92	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There were 2 datapoints collected within this specific feature supporting its designation as a PFO wetland. This wetland is adjacent to the S-6 ephemeral stream within the review area, which results in the wetland not meeting the A(4) abutting wetland definition. Thus this wetland is not considered an adjacent wetland.
Wet-A-9	0.15	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-A-10	0.53	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that larger wetland habitat occurs across the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this



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specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.

Wet-A-17	7.49	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that larger wetland habitat occurs across the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There were 6 datapoints collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-A-18	1.27	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that larger wetland habitat occurs across the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-A-19	0.49	acre(s)	(b)(1) Lake/pond or impoundment	This ponded area was mapped in the jurisdictional delineation report. Based on review



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that does not contribute surface water flow directly or indirectly to an (a)(1) water and is not inundated by flooding from an (a)(1)-(a)(3) water in a typical year.

of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted ponded area. This ponded area is not adjacent to any stream channel within this review area, which results this ponded area not meeting the A(4) abutting definition. Thus this ponded area is considered non-adjacent.

Wet-A-20	0.14	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-A-21	0.04	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PEM wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.





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Wet-A-22	0.98	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PEM wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-2	19.69	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There were 3 datapoints collected within this specific feature supporting its designation as a PSS wetland. This wetland is adjacent to the ephemeral portion of the S-1 stream within the review area, which results in the wetland not meeting the A(4) abutting wetland definition. Thus this wetland is not considered an adjacent wetland.
Wet-B-3	0.35	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a



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			(a)(1) water in a typical year.	random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-4	0.07	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PEM wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-5	1.43	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PEM wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-6	0.86	acre(s)	(b)(1) Surface water channel	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS



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			<p>that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.</p>	<p>Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PEM wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.</p>
Wet-B-17	1.85	acre(s)	<p>(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.</p>	<p>This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is adjacent to the S-13 ephemeral stream within the review area, which results in the wetland not meeting the A(4) abutting wetland definition. Thus this wetland is not considered an adjacent wetland.</p>
Wet-B-18	0.15	acre(s)	<p>(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.</p>	<p>This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PEM wetland. This wetland is adjacent to the S-6 ephemeral stream within the review area, which results in the wetland not meeting the A(4) abutting</p>



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wetland definition. Thus this wetland is not considered an adjacent wetland.

Wet-B-23	0.65	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that larger wetland habitat occurs across the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-24	19.24	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-25	1.37	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling





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			(a)(1) water in a typical year.	method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PEM wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-26	4.88	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that smaller wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-27	0.38	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PEM wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.



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Wet-B-28	5.43	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped forested area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There were 2 datapoints collected within this specific feature supporting its designation as a PFO wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-29	0.74	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PSS wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
Wet-B-30	2.4	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken



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throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PSS wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.

Wet-B-31	2.02	acre(s)	(b)(1) Surface water channel that does not contribute surface water flow directly or indirectly to an (a)(1) water in a typical year.	This wetland was mapped in the jurisdictional delineation report. Based on review of USGS Topographic map, this feature is depicted as an undeveloped area on relatively flat terrain. The NWI map shows that no wetland habitat occurs within the footprint of this depicted wetland. The delineation approach was a random sampling method, which shows data points taken throughout the mapped review area. There was 1 datapoint collected within this specific feature supporting its designation as a PSS wetland. This wetland is not adjacent to any stream channel within this review area, which results in this wetland not meeting the A(4) abutting wetland definition. Thus this wetland is considered a non-adjacent wetland.
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**III. SUPPORTING INFORMATION**

**A. Select/enter all resources** that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.

- Information submitted by, or on behalf of, the applicant/consultant: [Cardno](#)  
This information [is](#) sufficient for purposes of this AJD.  
Rationale: [Intermittent stream with abutting wetlands. Ephemeral drainages and wetlands with no direct surface hydrology from creek to wetland; or due to adjacency to ephemeral water.](#)
- Data sheets prepared by the Corps: [Staff](#)
- Photographs: [Other: Staff Photographs March 2020](#)
- Corps site visit(s) conducted on: [July 22, 2020 \(adjacent features\)](#)
- Previous Jurisdictional Determinations (AJDs or PJDs): [SWT-2020-00322](#)
- Antecedent Precipitation Tool: [provide detailed discussion in Section III.B.](#)
- USDA NRCS Soil Survey: [Staff Soil Survey April, 2020](#)
- USFWS NWI maps: [Staff April 2020](#)
- USGS topographic maps: [Staff April 2020](#)



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**Other data sources used to aid in this determination:**

Data Source (select)	Name and/or date and other relevant information
USGS Sources	N/A.
USDA Sources	N/A.
NOAA Sources	N/A.
USACE Sources	N/A.
State/Local/Tribal Sources	N/A.
Other Sources	N/A.

**B. Typical year assessment(s):** N/A

**C. Additional comments to support AJD:** N/A





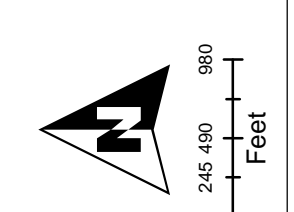
**Cardno**  
Shaping the Future

TexAmericas Center  
Wetland Delineation  
Bowtie County, Texas

**Wetlands and Waterbodies**

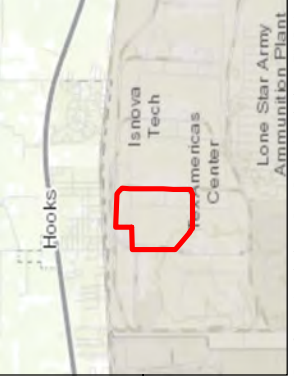
Date: October 2020  
Project No: E320201501  
Appendix: **C-0**

Data Source: BaseMap; Bing Maps Aerial (2020)



**Delineated Wetlands**

- Levee
- Survey Area
- Streams
  - Ephemeral
  - Intermittent
- PEM
- PFO
- PSS
- PUB









TexAmericas Center  
Wetland Delineation  
Bowlie County, Texas

**Wetlands and Waterbodies**

Date: April 2020    Project No: E320201501    Appendix: C-0



0 130 260 520  
Feet

**Delineated Wetlands**

- Survey Area
- Levee
- PEM
- PFO
- PSS
- PUB

**Datapoints**

- Upland
- Wetland

**Streams**

- Ephemeral
- Intermittent



# APPENDIX E

Last Update: 3/5/2021

## BOWIE COUNTY

### AMPHIBIANS

**southern crawfish frog** *Lithobates areolatus areolatus*

Terrestrial and aquatic: The terrestrial habitat is primarily grassland and can vary from pasture to intact prairie; it can also include small prairies in the middle of large forested areas. Aquatic habitat is any body of water but preferred habitat is ephemeral wetlands.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G4T4 State Rank: S3

**Strecker's chorus frog** *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S3

### BIRDS

**Bachman's sparrow** *Peucaea aestivalis*

Open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub

Federal Status: State Status: T SGCN: Y  
Endemic: N Global Rank: G3 State Rank: S1B

**bald eagle** *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S3B,S3N

**Franklin's gull** *Leucophaeus pipixcan*

This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S2N

**interior least tern** *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: DL: Delisted State Status: E SGCN: Y  
Endemic: N Global Rank: G4T3Q State Rank: S1B

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## BOWIE COUNTY

### BIRDS

#### piping plover

*Charadrius melodus*

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT

State Status: T

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S2N

#### swallow-tailed kite

*Elanoides forficatus*

Lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S2B

#### white-faced ibis

*Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S4B

#### wood stork

*Mycteria americana*

Prefers to nest in large tracts of baldcypress (*Taxodium distichum*) or red mangrove (*Rhizophora mangle*); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G4

State Rank: SHB,S2N

### FISH

#### blackside darter

*Percina maculata*

Restricted to the Red River Basin in the northeast part of the state although specimens have been taken in the lower Trinity and San Jacinto rivers; Often found in clear, gravelly streams.

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S1

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## BOWIE COUNTY

### FISH

**blackspot shiner**

*Notropis atrocaudalis*

Occurs from the lower Brazos River to the Sabine River drainage; Red River drainage. Small to moderate size tributary streams in runs and pools over all types of substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**chub shiner**

*Notropis potteri*

Brazos, Colorado, San Jacinto, and Trinity river basins. Flowing water with silt or sand substrate

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S2

**goldeye**

*Hiodon alosoides*

Restricted to the Red River basin; adults in quiet turbid water of medium to large lowland rivers, small lakes, marshes and muddy shallows connected to them.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

**ironcolor shiner**

*Notropis chalybaeus*

Found only in northeastern streams from the Sabine to the Red River with the exception of an isolated population found in the San Marcos River headwaters. Found primarily in acidic, tannin-stained, non-turbid, sluggish Coastal Plain streams and rivers of low to moderate gradient. Occurs in aggregation, often at the upstream ends of pools, with a moderate to sluggish current and sand, mud, silt or detritus substrates. Usually associated with aquatic vegetation.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**orangebelly darter**

*Etheostoma radiosum*

Streams, creeks, and small to moderate-sized rivers in the Red River basin. Riffle areas of gravel-bottoms streams with moderate to high currents.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**paddlefish**

*Polyodon spathula*

Species occurred in every major river drainage from the Trinity Basin eastward, but its numbers and range had been substantially reduced by the 1950's; recently reintroduced into Big Cypress drainage upstream of Caddo Lake. Prefers large, free-flowing rivers but will frequent impoundments with access to spawning sites.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**Red River shiner**

*Notropis bairdi*

Red River basin; typically found in turbid waters of broad, shallow channels of main stream, over bottom mostly of silt and shifting sand.

Federal Status:	State Status:	SGCN: Y
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## BOWIE COUNTY

### FISH

Endemic: N                                      Global Rank: G4                                      State Rank: S3

**shovelnose sturgeon**                                      *Scaphirhynchus platyrhynchus*

Found only in the Red River below Denison Dam (Lake Texoma). Evidence of the presence of this species in the lower Pecos River, during prehistoric times, strongly suggests that it likely occurred in many Texas rivers. Inhabits flowing water over sandy bottoms or near rocky points or bars.

Federal Status: SAT                                      State Status: T                                      SGCN: Y  
Endemic: N                                      Global Rank: G4                                      State Rank: S2

**silver chub**                                      *Macrhybopsis storeriana*

Red River and Brazos River basins. Mainly restricted to large, often silty rivers. Ranges over gravel to silt substrates but found more commonly over silt or mud bottom.

Federal Status:                                      State Status:                                      SGCN: Y  
Endemic: N                                      Global Rank: G5                                      State Rank: S3

**silverband shiner**                                      *Notropis shumardi*

In Texas, found from Red River to Lavaca River; Main channel with moderate to swift current velocities and moderate to deep depths; associated with turbid water over silt, sand, and gravel.

Federal Status:                                      State Status:                                      SGCN: Y  
Endemic: N                                      Global Rank: G5                                      State Rank: S4

**taillight shiner**                                      *Notropis maculatus*

Restricted to the Sulphur and Cypress drainages in northeast Texas; Quiet, usually vegetated oxbow lakes, ponds, or backwaters.

Federal Status:                                      State Status:                                      SGCN: Y  
Endemic: N                                      Global Rank: G5                                      State Rank: S1

**western creek chubsucker**                                      *Erimyzon claviformis*

Eastern Texas streams from the Red River to the San Jacinto drainage. Habitat includes silt-, sand-, and gravel-bottomed pools of clear headwaters, creeks, and small rivers; often near vegetation; occasionally in lakes. Spawning occurs in river mouths or pools, riffles, lake outlets, or upstream creeks. Prefers headwaters, but seldom occurs in springs.

Federal Status:                                      State Status: T                                      SGCN: Y  
Endemic: N                                      Global Rank: G5                                      State Rank: S2S3

### INSECTS

**American bumblebee**                                      *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:                                      State Status:                                      SGCN: Y  
Endemic:                                      Global Rank: G3G4                                      State Rank: SNR

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## BOWIE COUNTY

### MAMMALS

#### big brown bat

*Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

#### black bear

*Ursus americanus*

Generalist. Historically found throughout Texas. In Chisos, prefers higher elevations where pinyon-oaks predominate; also occasionally sighted in desert scrub of Trans-Pecos (Black Gap Wildlife Management Area) and Edwards Plateau in juniper-oak habitat. For ssp. luteolus, bottomland hardwoods, floodplain forests, upland hardwoods with mixed pine; marsh. Bottomland hardwoods and large tracts of inaccessible forested areas.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

#### eastern spotted skunk

*Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S3

#### long-tailed weasel

*Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

#### mountain lion

*Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

#### southeastern myotis bat

*Myotis austroriparius*

Caves are rare in Texas portion of range; buildings, hollow trees are probably important. Historically, lowland pine and hardwood forests with large hollow trees; associated with ecological communities near water. Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

#### swamp rabbit

*Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

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## BOWIE COUNTY

### MAMMALS

#### tricolored bat

*Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G2G3

State Rank: S3S4

#### woodland vole

*Microtus pinetorum*

Include grassy marshes, swamp edges, old-field/pine woodland ecotones, tallgrass fields; generally sandy soils.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S3

### REPTILES

#### alligator snapping turtle

*Macrochelys temminckii*

Aquatic: Perennial water bodies; rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near running water; sometimes enters brackish coastal waters. Females emerge to lay eggs close to the waters edge.

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S2

#### eastern box turtle

*Terrapene carolina*

Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S3

#### slender glass lizard

*Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S3

#### Texas horned lizard

*Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G4G5

State Rank: S3

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## BOWIE COUNTY

### REPTILES

**timber (canebrake) rattlesnake**      *Crotalus horridus*

Terrestrial: Swamps, floodplains, upland pine and deciduous woodland, riparian zones, abandoned farmland. Limestone bluffs, sandy soil or black clay. Prefers dense ground cover, i.e. grapevines, palmetto.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

### PLANTS

**Arkansas meadow-rue**      *Thalictrum arkansanum*

Mostly deciduous forests on alluvial terraces and upper drainages of hardwood slope forests at contacts with calcareous prairies; flowering March-April, withering by midsummer

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2Q	State Rank: S2

**Arkansas oak**      *Quercus arkansana*

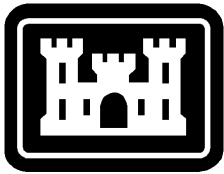
At the Cass County location, it occurs with *Quercus stellata*, *Q. marilandica* and *Q. incana* in a young pine plantation on deep sandy soils; Perennial; Flowering spring

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S1

#### DISCLAIMER

*The information on this web application is provided "as is" without warranty as to the currentness, completeness, or accuracy of any specific data. The data provided are for planning, assessment, and informational purposes. Refer to the Frequently Asked Questions (FAQs) on the application website for further information.*

# APPENDIX F



**US Army Corps  
of Engineers®**

Mobile District

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**PHASE II ARCHAEOLOGICAL INVESTIGATIONS  
AT RED RIVER ARMY DEPOT AND LONE STAR  
ARMY AMMUNITION PLANT, BOWIE COUNTY,  
TEXAS**

Final Report

February 2012

EARTH SEARCH, INC.  
P.O. Box 770336  
New Orleans, LA 70177-0336

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Prepared for

U.S. Army Corps of Engineers  
Mobile District  
P.O. Box 2288  
Mobile, AL 36628-0001







# APPENDIX G

FIGURE G-1



- DUKE EAST SITE BOUNDARY
- EXISTING WATER MAINS (SIZED AS NOTED)

107 CHAPEL LANE  
NEW BOSTON, TEXAS 75570  
903.223.9841  
www.TexAmericasCenter.com





WATER EXHIBIT  
DUKE EAST SITE  
TEXAMERICAS CENTER  
EAST CAMPUS  
HOOKS, TEXAS

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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FIGURE G-2



-  DUKE EAST SITE BOUNDARY
-  EXISTING SANITARY SEWER MAINS (SIZED AS NOTED)

107 CHAPEL LANE  
NEW BOSTON, TEXAS 75570  
903.223.9841  
www.TexAmericasCenter.com



**SANITARY SEWER  
SYSTEM EXHIBIT  
DUKE EAST SITE  
TEXAMERICAS CENTER  
EAST CAMPUS  
HOOKS, TEXAS**

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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FIGURE G-3



— DUKE EAST SITE BOUNDARY  
— EXISTING 3-PHASE POWER

107 CHAPEL LANE  
NEW BOSTON, TEXAS 75570  
903.223.9841  
www.TexAmericasCenter.com



ELECTRICAL SYSTEM  
EXHIBIT  
DUKE EAST SITE  
TEXAMERICAS CENTER  
EAST CAMPUS  
HOOKS, TEXAS

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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FIGURE G-4



- DUKE EAST SITE BOUNDARY
- EXISTING 2-4" NATURAL GAS LINES (50 PSI) - COMPLETED SUMMER 2021

107 CHAPEL LANE  
NEW BOSTON, TEXAS 75570  
903.223.9841  
www.TexAmericasCenter.com



# GAS EXHIBIT DUKE EAST SITE TEXAMERICAS CENTER EAST CAMPUS HOOKS, TEXAS

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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FIGURE G-5



- DUKE EAST SITE BOUNDARY
- EXISTING 144-STRAND FIBER

107 CHAPEL LANE  
NEW BOSTON, TEXAS 75570  
903.223.9841  
www.TexAmericasCenter.com



FIBER SYSTEM EXHIBIT  
DUKE EAST SITE  
TEXAMERICAS CENTER  
EAST CAMPUS  
HOOKS, TEXAS

DRAWN: JDW	DESIGN: JDW	DATE: 05/18/2021	SCALE:	WCE #:
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**RESOLUTION NO. 20210525-03**

**RESOLUTION AUTHORIZING THE EXECUTIVE DIRECTOR/CEO TO EXECUTE A NEW INDUSTRIAL LEASE AGREEMENT FOR PRODUCTION SPACE AT 154 SERVICE STREET, NEW BOSTON, TX 75570 TO CHEROKEE NATION RED WING, L.L.C.**

**WHEREAS**, TexAmericas Center is a political subdivision of the State of Texas with the powers and authorities specified in Chapter 3503 of the Special District Local Laws Code of the State of Texas; and

**WHEREAS**, Cherokee Nation Red Wing, L.L.C. contacted TexAmericas Center to seek a new lease arrangement for production space at 154 Service Street, New Boston, TX 75570; and

**WHEREAS**, the parties have come to the attached terms of agreement for said lease.

**NOW, THEREFORE, BE IT RESOLVED**, by the Board of Directors of TexAmericas Center that the Executive Director/CEO shall be and he is hereby authorized to execute the attached lease agreement in substantially the same form attached hereto; and

**BE IT FURTHER RESOLVED**, by the Board of Directors of TexAmericas Center that the Center appreciates the collaborative effort of Cherokee Nation Red Wing, L.L.C. to negotiate this lease as well as to locate its business operations, create jobs and contribute to the tax base in Bowie County, Texas

**PASSED AND APPROVED THIS 25<sup>th</sup> day of May, 2021.**

---

**Jim Roberts, Chairman of the Board**

**ATTEST:**

---

**Denis Washington, Secretary**

Attached: New Lease Agreement





**RESOLUTION NO. 20210525-04**

**RESOLUTION AUTHORIZING THE EXECUTIVE DIRECTOR/CEO TO EXECUTE A LEASE AMENDMENT NUMBER ONE TO ADD 1.1 ACRES OF TRAILER/TRUCK PARKING AT THE SOUTH LOT OF 125 AUSTIN STREET, HOOKS, TX 75561 TO WOODFIELD, INC.**

**WHEREAS**, TexAmericas Center is a political subdivision of the State of Texas with the powers and authorities specified in Chapter 3503 of the Special District Local Laws Code of the State of Texas; and

**WHEREAS**, Woodfield, Inc. contacted TexAmericas Center to seek a lease amendment number one to add 1.1 acres of trailer/truck parking at the south lot of 125 Austin Street, Hooks, TX 75561; and

**WHEREAS**, the parties have come to the attached terms of agreement for said lease.

**NOW, THEREFORE, BE IT RESOLVED**, by the Board of Directors of TexAmericas Center that the Executive Director/CEO shall be and he is hereby authorized to execute the attached lease; and

**BE IT FURTHER RESOLVED**, by the Board of Directors of TexAmericas Center that the Center appreciates the collaborative effort of Woodfield, Inc. to negotiate this lease as well as to locate its business operations, create jobs and contribute to the tax base in Bowie County, Texas.

**PASSED AND APPROVED THIS 25<sup>th</sup> day of May, 2021.**

---

**Jim Roberts, Chairman of the Board**

**ATTEST:**

---

**Denis Washington, Secretary**

Attached: Lease Agreement



**RESOLUTION NO. 20210525-05**

**RESOLUTION AUTHORIZING THE EXECUTIVE DIRECTOR/CEO TO EXECUTE AMENDMENT NO. 3 OF THE LICENSE AGREEMENT TO USE DESIGNATED PROPERTY ON THE TAC-EAST CAMPUS TO CJ TEX-CORP L.L.C.**

**WHEREAS**, TexAmericas Center is a political subdivision of the State of Texas with the powers and authorities specified in Chapter 3503 of the Special District Local Laws Code of the State of Texas; and

**WHEREAS**, CJ Tex-Corp L.L.C. contacted TexAmericas Center to seek a third amendment of the License Agreement to Use Designated Property on the TAC-East Campus; and

**WHEREAS**, the parties have come to the attached terms of agreement for said amendment of License Agreement.

**NOW, THEREFORE, BE IT RESOLVED**, by the Board of Directors of TexAmericas Center that the Executive Director/CEO shall be and he is hereby authorized to execute the attached third amendment of License Agreement to Use Designated Property; and

**BE IT FURTHER RESOLVED**, by the Board of Directors of TexAmericas Center that the Center appreciates the collaborative effort of CJ Tex-Corp L.L.C. to negotiate this third amendment of License Agreement to Use Designated Property on the TAC-East Campus as well as to continue its business operations, preserve existing jobs and contribute to the tax base in Bowie County, Texas.

**PASSED AND APPROVED THIS 25<sup>th</sup> day of May, 2021.**

---

**Jim Roberts, Chairman of the Board**

**ATTEST:**

---

**Denis Washington, Secretary**

Attached: Amendment No. 3 - License Agreement to Use Designated Property



**RESOLUTION NO. 20210525-06**

**A RESOLUTION AUTHORIZING THE FILING OF THE LAND USE & SITE DESIGN POLICY AS  
PROPERTY RESTRICTIONS IN THE REAL PROPERTY RECORDS OF BOWIE COUNTY, TEXAS**

**WHEREAS**, TexAmericas Center is a political subdivision of the State of Texas with the powers and authorities specified in Chapter 3503 of the Special District Local Laws Code of the State of Texas; and

**WHEREAS**, on or about September 25, 2018, the Board of Directors of TexAmericas Center adopted and imposed upon its property known as the TexAmericas Center-East Campus, the TexAmericas-Central Campus, and the TexAmericas Center-West Campus, a Land Use and Site Design Policy; and

**WHEREAS**, the Board of Directors finds that it is in the best interest of TexAmericas Center to authorize the recording of the Land Use and Site Design Policy in the Real Property Records of Bowie County, Texas, to ensure that the terms of the Land Use and Site Design Policy are enforceable against property now owned by TexAmericas Center to be binding upon future purchasers of the property; and

**NOW, THEREFORE, BE IT RESOLVED** that the Land Use and Site Design Policy of TexAmericas Center shall be recorded in the Real Property Records of Bowie County, Texas prior to the sale of any property; and

**BE IT FURTHER RESOLVED**, that Scott Norton, Executive Director/CEO shall be and he is authorized to execute any and all documents necessary to file and record the Land Use and Site Design Policy in the Real Property Records of Bowie County, Texas.

**PASSED AND APPROVED this 25th day of May, 2021.**

---

**Jim Roberts, Chairman of the Board**

**ATTEST:**

---

**Denis Washington, Secretary**

# LAND USE & SITE DESIGN POLICY

## Sec. 1. - Introduction

- (a) *Short title.* This chapter shall be known and may be cited as "The TexAmericas Center Land Use & Site Design Policy." This chapter may also be cited as the "TexAmericas Land Use Policy", "TAC Land Use Policy", "Land Use Policy", "TexAmericas Center Site Design Policy", "TAC Site Design Policy", "Site Design Policy" or the "Site Design Requirements".
- (b) *The TexAmericas Center Land Use Map adopted.* The official land use map is hereby adopted and incorporated herein.
- (c) *Minimum standards.* The requirements of these regulations are minimum permissible standards; and it is expected that developers and the respective decision-making authority will normally strive for quality developments which will exceed these minimum requirements.

## Sec. 2. - Purpose.

The land uses and regulations as herein established have been made for the purpose of promoting the health, safety, morals and general welfare of TexAmericas Center (TAC). They have been designed to regulate and restrict the height, number of stories and size of buildings and other structures; the percentage of the lot that may be occupied; the size of the yards and other open spaces; the location and use of buildings, structures and land for business and other purposes; to regulate the construction, alteration, reconstruction or razing of buildings and other structures; to place requirements on the level of noise generated on property and land uses; to secure safety from fire, panic and other dangers; to provide adequate light, air and prevent the overcrowding of land; to facilitate the adequate provision of transportation, water, sanitary sewer, stormwater drainage and other public and private infrastructure; and with a view of conserving the value of buildings and encouraging the most appropriate use of land throughout TAC.

## Sec. 3. - Definitions

- (a) Words used in the present tense include the future, words in the singular number include the plural number and words in the plural number include the singular number; the term "building" includes the term "structure;" the term "lot" includes the terms "plot" or "tract;" the term "shall" is mandatory and not discretionary.
- (b) The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

*Accessory use* means a use subordinate to and incidental to the primary use of the main building or to the primary use of the premises.

*Alley* means a public space or thoroughfare which affords only secondary means of access to property abutting thereon.

*Apartment* means a room, or suite of rooms, in a multifamily dwelling or apartment house arranged, designed or occupied as a place of residence by a single-family, individual or group of individuals.

*Apartment house* means any building or portion thereof, which is designed, built, rented, leased or let to be occupied as three or more dwelling units or apartments or which is occupied as a home or place of residence by three or more families living in independent dwelling units.

*Architect* means a person holding a certificate of registration to practice architecture in the State of Texas.

*Area of the lot* means the net area of the lot and shall not include portions of streets and alleys.

*Authority* Means TexAmericas Center



*Basement* means a building story which is partly underground, but having at least one-half of its height above the average level of the adjoining ground. A basement shall be counted as a story in computing building height.

*Block* means an area enclosed by streets and occupied by or intended for buildings; or if said word is used as a term of measurement, it shall mean the distance along a side of a street between the nearest two streets which intersect said street on said side.

*Board or Board of Directors or BOD* means the appointed governing/decision-making body of TexAmericas Center.

*Brewery, Microbrewery, distillery, microdistillery or winery* means an establishment for the manufacture, blending, fermentation, processing, packaging and sale of alcoholic beverages (such as beer, ale, wine or spirits) that takes place wholly inside a building.

*Building* means any structure built for the support, shelter and enclosure of persons, animals, chattels or movable property of any kind. When subdivided in a manner sufficient to prevent the spread of fire, each portion so subdivided may be deemed a separate building.

*Building ends* means those sides of a building having the least dimension as compared to the front or rear of a building. As used herein for the building spacing regulations for a multiple-family dwelling, the term "building end" shall be interpreted as being the most narrow side of a building regardless of whether it fronts upon a street, faces the rear of the lot or is adjacent to the side lot line or another building.

*Building line* means a line parallel to the property line at a specified distance therefrom making the minimum distance from the street line that a building may be erected.

*Cellar* means a building story with more than one-half its height below the average level of the adjoining ground. A cellar shall not be counted as a story in computing building height.

*Central preparation facility/commissary* means a facility that is an approved and permitted retail food establishment at which food is prepared, stored, and wrapped; and the mobile food unit is supplied with fresh water and ice; and emptied of waste water into a proper waste disposal system; and cleaned, including washing, rinsing, and sanitizing of those food-contact surfaces or items not capable of being immersed in the mobile food unit utensil-washing sink. Use of a private residence as a central preparation facility is prohibited.

*Certificate of Occupancy* means an official certificate issued by TAC through the enforcing official which indicates conformance with or approved conditional waiver from the land use regulations and authorizes legal use of the premises for which it is issued.

*Clinic* means a group of offices for one or more physicians, surgeons or dentists to treat sick or injured out-patients who do not remain overnight.

*Court* means an open, unoccupied space, bounded on more than two sides by the walls of a building. An inner court is a court entirely surrounded by the exterior walls of a building. An outer court is a court having one side open to a street, alley, yard or other permanent space.

*Coverage* means the percent of a lot or tract covered by the roof or first floor of a building. Roof eaves to the extent of three feet from the walls of a building shall be excluded from coverage computations.

*District* means a section of TAC for which the regulations governing the area, height or use of the land and buildings are uniform.

*Director or Executive Director* means the Executive Director of TexAmericas Center.

*Dwelling, multiple-family*, means any building or portion thereof, which is designed, built, rented, leased or let to be occupied as three or more dwelling units or apartments or which is occupied as a home or residence of three or more families.

*Dwelling, one-family*, means a detached building having accommodations for and occupied by not more than one family, or by one family and not more than three boarders and lodgers.

*Dwelling, two-family*, means a detached building having separate accommodations for and occupied by not more than two families, or by two families and not more than three boarders and lodgers.

*Dwelling unit* means a building, or portion of a building, which is arranged, occupied or intended to be occupied as living quarters and includes facilities for food preparation and sleeping.

*Engineer or Professional Engineer* means a person holding a license to practice engineering in the State of Texas.

*Executive Director*. See *Director*

*Family* means any number of individuals living together as a single housekeeping unit, in which not more than three individuals are unrelated by blood, marriage or adoption.

*Floor area* means the total square feet of floor space within the outside dimensions of a building, including each floor level, but excluding cellars, carports or garages.

*Floor area ratio (FAR)* means the ratio between the total square feet of floor area in a structure and the total square feet of land in the lot or tract on which the structure is located.

*Food truck court* means an area designed to accommodate two or more mobile food units and offering food and/or beverages for sale to the public as the primary use of the property; functioning as a single business.

*Height* means the vertical distance of a building measured from the average established grade at the street line or from the average natural front yard ground level, whichever is higher, to:

- (1) The highest point of the roofs surface if a flat surface;
- (2) To the deck line of mansard roofs; or
- (3) To the mean height level between eaves and ridge for hip and gable roofs and, in any event, excluding chimneys, cooling towers, elevator bulkheads, penthouses, tanks, water towers, radio towers, ornamental cupolas, domes or spires and parapet walls not exceeding ten feet in height.

If the street grade has not been officially established, the average front yard grade shall be used for a base level.

*Legal height* means the maximum height of a building.

*Lot* means land occupied or to be occupied by a building and its accessory buildings, and including such open spaces as are required under this chapter and having its principal frontage upon a public street or officially approved place.

*Lot coverage* means the percentage of the total area of a lot occupied by the base (first story or floor) of buildings located on the lot or the area determined as the maximum cross-sectional area of a building.

*Lot depth* means the mean distance between the front and rear lot lines.

*Lot lines* means the lines bounding a lot, as defined herein.

*Lot of record* means a lot which is part of a subdivision, the plat of which has been recorded in the office of the county clerk of the county or a parcel of land, the deed for which it is recorded in the office of the county clerk of the county prior to the adoption of the ordinance from which this chapter is derived.

*Lot width* means the width of a lot at the front building line.

*Main building* means the building, or buildings, on a lot which are occupied by the primary use.

*Nonconforming use* means a building, structure or use of land lawfully occupied at the time of the effective date of the ordinance from which this chapter is derived or amendments thereto, and which does not conform to the use regulations of the district in which it is situated.

*Occupancy* means the use or intended use of the land or buildings by proprietors or tenants.

*Open space* means the area included in any side, rear or front yard or any unoccupied space on the lot that is open and unobstructed to the sky, except for the ordinary projections of cornices, eaves, porches and plant material.

*Parking space* means an enclosed or unenclosed paved surface area of not less than 180 square feet, usually measuring nine feet (9') by twenty feet (20') or ten feet (10') by eighteen feet (18'), connected to a paved private driveway aisle or access apron which, in turn, connects to a publicly maintained street or paved public alley. A paved surface on private property is further defined as being concrete, hot mix asphaltic concrete, cold mix limestone rock asphalt, or one or more courses of asphalt oil and rock aggregate on a flexible base, except any gravel or stone parking space and connecting driveway that was in existence prior to the adoption of the ordinance from which this chapter is derived is exempt. If an alley or a portion of an alley is to be paved, it shall be paved with concrete or hot mix asphaltic concrete in accordance with TAC's minimum paving standards. All required off-street parking spaces shall be clearly marked with paint or some other permanent pavement marking material.

*Private garage* means an accessory building housing vehicles owned and used by occupants of the main building; if occupied by vehicles of others, it is a storage space.

*Residence* means the same as a dwelling; also defined as the same when used with district or area of residential regulations.

*Sign* means any structure, device or contrivance, electric or non-electric, upon which any poster, bill, bulletin, printing, lettering, painting, device or other advertising of any kind whatsoever is used, placed, posted, tacked, nailed, pasted or otherwise fastened, affixed or displayed on premises.

*Story* means the height between the successive floors of a building or from the top floor to the roof. The standard height for a story is eleven feet, six inches (11'-6").

*Street* means any thoroughfare or public driveway, other than an alley, and more than thirty feet (30') in width, which has been dedicated or deeded to the public for public use.

*Street line* means a dividing line between a lot, tract or parcel of land and a contiguous street use; the right-of-way or property line.

*Structural alterations* means any change in the supporting member of a building, such as a bearing wall, column, beam or girder.

*Structure.* See *Building*.

*TAC* means TexAmericas Center

*Thoroughfare.* See *Street*.

*Yard* means an open space other than a court, on the lot in which a building is situated and which is not obstructed from a point forty inches (40") above the general ground level of the graded lot to the sky, except as provided for roof overhang and similar special architectural features and plant material.

*Yard, front,* means an open, unoccupied space on a lot facing a street extending across the front of a lot between the side lot lines and from the main building to the front lot or street line with the minimum horizontal distance between the street line and the main building line as specified for the district in which it is located.

*Yard, rear,* means an open, unoccupied space, except for accessory buildings as herein permitted, extending across the rear of a lot from one side lot line to the other side lot line and having a depth between the building and the rear lot line as specified in the district in which the lot is situated.

*Yard, side,* means an open, unoccupied space or spaces on one side or two sides of a main building and on the same lot with the building, situated between the building and a side line of the lot and extending through from the front yard to the rear yard. Any lot line, not the rear line or a front line, shall be deemed a side line.

*Variance* means an adjustment in the application of the specific regulations of this chapter to a particular parcel of property which, because of special conditions or circumstances peculiar to the particular

parcel, is necessary to prevent the property from being deprived of rights and privileges enjoyed by other parcels in the same vicinity and zoning district.

*Land Use Map* means the official certified map upon which the boundaries of the various land use districts are drawn and which is an integral part of this chapter.

#### **Sec. 4 - Land Use Districts established**

TAC is hereby divided into seven (7) land use districts. The use, height and area regulations as set out herein are uniform throughout each district. The districts established herein shall be known as:

Abbreviated Designation	Land Use District Name
T1	Technology District 1
T2	Technology District 2
R	Residential District
NS	Neighborhood Service District
C	Commercial District
LI	Light Industrial District
HI	Heavy Industrial District

#### **Sec. 5 - Land Use Map.**

- (a) The boundaries of the land use districts set out herein are delineated upon the land use map of TAC, said map being a part of this chapter as fully as if the same were set forth herein in detail.
- (b) A copy of the TexAmericas Land Use Map bearing the signature of the Executive Director of TexAmericas Center shall be available at the TexAmericas Center offices and kept up to date by posting all subsequent changes and amendments for use in issuing building permits, certificates of compliance and occupancy and enforcing this chapter.

#### **Sec. 6 - Land Use District Boundaries.**

- (a) The district boundary lines shown on the land use maps are usually along streets, alleys, property lines or extensions thereof. Where uncertainty exists as to the boundaries of districts as shown on the official land use map, the following rules shall apply:
  - (1) Boundaries indicated as approximately following the centerlines of streets, highways or alleys shall be construed to follow the centerlines of such streets.
  - (2) Boundaries indicated as approximately following platted lot lines shall be construed as following such lot lines.
  - (3) Boundaries indicated as approximately following TAC boundary limits shall be construed as following TAC boundary limits.
  - (4) Boundaries indicated as following railroad lines shall be construed to be the centerline of the right-of-way or if no centerline is established, the boundary shall be interpreted to be midway between the right-of-way lines of such railroad.
  - (5) Boundaries indicated as following shore lines or centerlines of streams shall be construed to follow such shore lines and in the event of change in the shore line shall be construed as moving



with the actual shore line; boundaries indicated as approximately following the centerlines of streams, drainageways or draws shall be construed to follow such centerlines.

- (6) Boundaries indicated as parallel to or extensions of features indicated in subsection (a)(1) through (5) of this section shall be so construed. Distances not specifically indicated on the original land use maps shall be determined by the scale of the map.
  - (7) Whenever any street, alley, thoroughfare or other public way is vacated by official action of the Board or whenever such area is franchised for building purposes and the land use district line is not simultaneously adjusted, the land use district line adjoining each side of such street, alley or other public way shall be automatically extended to the centerline of such vacated street, alley or way and all area so involved shall then and henceforth be subject to all regulations of the extended districts.
- (b) Where physical features on the ground are at variance with information shown on the official land use district map or when there arises a questions as to how or whether a use is allowed on a parcel of property and such question cannot be resolved by the application of the provisions of subsections (a)(1) through (7) of this section, the property shall be considered as classified LI Light Industrial District temporarily in the same manner as provided for newly acquired territory and the issuance of a building permit and the determination of permanent land use shall be in accordance with the provisions provided in section 7 for temporarily classified areas.

#### **Sec. 7 - Amendments to this chapter or to Land Use Map.**

- (a) The Board may, by the adoption of an ordinance or Resolution, amend, supplement or change the regulations or text of this article or the classification or boundary of a land use district. Any property owner may petition the Board for a change or amendment in the classification or boundary of the owner's property or for a change or amendment in the regulations or text of this article.
- (b) The Director shall hold a public hearing on any change or amendment prior to making its report and recommendation to the Board. The Director shall submit its report and recommendation on any changes or amendments to the Board before the Board can take any action of those changes or amendments. When a change or amendment relates to a classification or boundary of a land use district, written notice of such public hearing of the Director shall be sent to all owners of real property lying within 200 feet of the property on which the change is requested. Such notice shall be given to each owner as shown on the last approved county tax roll by depositing the notice, properly addressed and postage paid, in the post office not less than ten days before the date of the public hearing. TAC shall post a sign on the property to be reclassified as further public notification. When a change or amendment relates to the regulations or text of this article not affecting specific property, notice of the public hearing before the Board shall be given not less than ten days before the hearing by publication in a newspaper of general circulation in the county, without the necessity of notifying property owners by mail. Such notice shall state the date, time and place of the public hearing and the nature of the subject to be considered.
- (c) The Board shall hold a public hearing on any amendment or change to the regulations or text of this article or any amendment or change to the classification or boundary of a land use district. Notice of such public hearing shall be given by publication of the date, time and place of such hearing and the nature of the subject to be considered in a newspaper of general circulation in the county not less than 15 days before the hearing.
- (d) A majority vote of the Board shall be required to adopt an ordinance approving any amendment or change, except that a three-fourths vote of the Board shall be required when either:
  - (1) The Director has recommended for denial of an amendment or change; or

- (2) A written protest against an amendment or change has been filed which is signed by the owners of 20 percent or more of the area included in such change or signed by the owners of 20 percent or more of the area within 200 feet of such change. In order to be considered, the petition must be received by the Director before the meeting at which the item is to be heard.
  
- (e) In the event an amendment or change affecting the classification or boundary of a land use district, for which application has been made, is not approved, no person shall file a subsequent request for an amendment on the same lot or tract for a period of one year from the date of such action, except that a subsequent request can be submitted at any time if such request is to a more restrictive land use classification than was not approved or if the request was denied without prejudice by the Board.
  
- (f) A person requesting an amendment or change of the regulations or text of this article or the classification or boundary of a land use district shall provide a nonrefundable filing fee in an amount as established by the Board from time to time and on file in TAC's office or website.

## **Sec. 8 - Temporary Classification of Annexed Territory**

- (a) All territory hereafter acquired by TAC shall be temporarily classified as the land use district classification specified in the Resolution authorizing acquisition of said territory, or shall be temporarily classified as being in the Light Industrial District (LI). Permanent classification of the newly acquired property should be accomplished within one year after annexation. The procedure for establishing a permanent land use classification of annexed territory shall conform to the procedure established in Section 9.
- (b) In an area temporarily classified as Light Industrial District (LI):
  - (1) No person shall erect, construct or add to any building or structure or cause the same to be done in any newly acquired territory by TAC without first applying for and obtaining a building permit and a certificate of occupancy therefor from TAC as may be required herein.
  - (2) No permit for the construction of a building or use of land shall be issued by TAC other than to permit the construction of a building or use permitted in the Light Industrial District (LI), unless and until, such territory has been reclassified to some other land use district as provided in Section 9, except that a building permit may be issued in accordance with the provisions of subsection (b)(3) of this section.
  - (3) An application for a permit for any use other than that specifically permitted in the Light Industrial District (LI) may be made to TAC, and to the Executive Director for consideration and recommendation to the Board. The Executive Director shall take into consideration the appropriate land use for the area. The Board, after receiving and reviewing the recommendations of the Executive Director may, by majority vote, authorize the issuance of a building permit or certificate of occupancy or may disapprove the application.

## **Sec. 9 - Classification of New and Unlisted Uses.**

It is recognized that new types of land uses will develop and forms of land use not anticipated may seek to locate in TAC. In order to provide for such changes and contingencies, a determination as to the appropriate classification of any new or unlisted form of land use shall be made by the Operations Department. Any applicant that is in disagreement with the decision of the Operations Department shall have the right to appeal such decision in writing to the Executive Director. The Executive Director shall, within ten (10) days of the request, make a ruling on the decision. Any person who is in disagreement with the decision of the Executive Director, shall within ten (10) days of that decision, file an appeal with the Board of Directors. The appeal should state what areas, in the opinion of the person adversely affected, the decision of the Executive Director disagrees with provisions or the intent of this chapter. It shall be the duty of the Board to hear any such appeal within a reasonable amount of time, which shall not exceed 75 days.

## **Sec. 10 - Use Regulation in Districts.**

Land and buildings in each of the classified districts may be used for any of the listed uses, but no land shall hereafter be used and no building or structure shall hereafter be erected, altered, converted, used or occupied which is arranged, designed or used for other than those uses specified for the district in which it is located as set forth by the schedule of uses.

**Sec. 11 - Specific use permits.**

The Board, after public hearing and proper notice to all parties affected and after recommendations by the Executive Director, may authorize the issuance of specific use permits for the uses indicated by "S" in the use schedule in Section 12. The Executive Director, in considering and determining its recommendations to the Board on any request for a specific use permit, may require from the applicant, plans, information, operating data and expert evaluation concerning the location and function and characteristics of any building or use proposed. The Board may, in the interest of the public welfare and to ensure compliance with this article, establish conditions of operation, location, arrangement and construction of any use for which a permit is authorized. In authorizing the location of any of the uses listed as specific use permits, the Board may impose such development standards and safeguards as the conditions and locations indicate important to the welfare and protection of adjacent property from excessive noise, vibration, dust, dirt, smoke, fumes, gas, odor, explosion, glare, offensive view or other undesirable or hazardous conditions.

**Sec. 12 - Legend for Interpreting Schedule of Use**

(a) The following legend may be used in interpreting the schedule of use:

	Designates use permitted in district indicated.
	Designates use prohibited in district indicated.
S	Indicates use may be approved as specific use permit. (See Section 10.)

(b) Permitted Use Schedule

Types of Uses	Technology District 1 (T1)	Technology District 2 (T2)	Residential District (R)	Neighborhood Services (NS)	Commercial (C)	Light Industrial (LI)	Heavy Industrial (HI)
<b>Residential Uses</b>							
One-family dwelling detached							
One-family dwelling attached							
Two-family dwelling							
Multiple-family dwelling							



Accessory building (residential)							
Accessory building (non-residential)							
Accessory building (farm)							
Stable (private)							
Caretakers quarters			S				
Swimming pool (private)							
<b>Utility &amp; Service Uses</b>							
Electrical substation			S				
Electrical energy generating plant	S	S					
Electrical transmission line							
Fire station (without housing)							
Gas line and regulating station							
Local utility line							
Public building, shop or yard of local, state or federal agency	S	S	S	S	S	S	S
Radio, television or microwave towers	S	S	S	S	S	S	S
Radio or television transmitting station	S	S	S	S	S	S	S
Sewage pumping station							
Sewage treatment plant	S	S					
Trash transfer station							
Telephone business office							
Telephone exchange, switching relay or transmitting station							
Utility shops or storage yards or buildings (private)							
Elevated water storage				S	S		
Water pumping station				S	S		
Off-street parking incidental to main use							
Water treatment plant	S	S					
<b>Recreational &amp; Entertainment Uses</b>							
Amusement commercial (outdoor)	S	S		S	S	S	S

Amusement commercial (indoor)	S	S		S	S	S	S
Drag strip or commercial racing		S			S	S	S
Go cart track		S		S	S	S	S
Park or playground (public)	S	S	S	S	S		
Playfield or stadium (public)	S	S	S	S	S	S	S
Pistol and rifle range (indoor)		S				S	S
Riding club		S					
Rodeo grounds		S					
Theater or playhouse in building	S	S		S	S		
Zoo (public)		S					
Zoo (commercial)		S					
<b>Educational, Institutional &amp; Special Uses</b>							
Arboretum		S					
Cemetery or mausoleum	S	S	S	S	S	S	S
College or university							
Institution for alcoholic, narcotic or psychiatric patients				S	S		
Fairgrounds or Exhibition area		S		S	S		
Community center (public)	S	S	S	S	S	S	S
Kindergarten, nursery, private school or day care				S	S		
Neighborhood health center							
School, business	S	S		S	S	S	S
School, commercial trade	S	S		S	S	S	S
Conference or training seminar center	S	S		S	S	S	S
Union hall and related semi-public office	S	S		S	S	S	S
<b>Transportation Related Uses</b>							
Airport or landing field	S	S				S	S
Bus station or terminal				S	S		
Hauling or storage company				S	S	S	S
Heliport	S	S		S	S	S	S
Motor freight terminal		S					
Railroad freight terminal							
Railroad yard or roundhouse							

Parking lot, truck	S				S		
<b>Automobile &amp; Related Uses</b>							
Auto glass or seat cover shop							
Auto laundry/car wash							
Auto parts and accessory sales (indoor)							
Auto parts and accessory sales (outdoor display)							
Auto painting or body rebuilding shop							
Automobile repair garage (including transmissions)							
Minor vehicle and repair shop							
Auto storage						S	
Gasoline or fuel service station							
Self-serve sale of gasoline and/or diesel fuel							
Steam cleaning of vehicles or machinery						S	S
Tire retreading or capping							S
Wrecking or scrap salvage yard							S
<b>Retail and Related Service Uses</b>							
Antique shop							
Bakery shop (retail)							
Bank or savings and loan office							
Barber or beauty shop							
Book store							
Camera shop							
Cleaning plant, commercial							
Cleaning shop or laundry							
Cleaning or laundry self-service shop							
Clinic, medical or dental							
Department store or discount store							
Drug store or pharmacy							
Florist shop							
Food and beverage sales store							

Food truck court					S	S	S
Furniture or appliance store							
Garden shop and plant sales							
Handcraft and art objects, sales							
Hardware store or hobby shop							
Laboratory, medical or dental						S	S
Medical appliances, fitting, sales or rental							
Mini-warehouses				S	S	S	
Mortuary							
Offices, general business or professional							
Optical shop or laboratory							
Pawn shop							
Pet shop, small animals, birds and fish							
Real estate model homes							
Repair of appliances, TV, radio and similar equipment							
Restaurant							
Retail store							
Studio, decorator & display of art objects							
Studio, health reducing or similar service							
Studio, photographer, artist, music, drama or dance							
Tool rental (in structure)						S	S
Tool rental (outdoor)						S	S
Travel bureau or consultant							
Variety store or other retail outlet store							
Veterinarian, office only (no animal hospital)							
<b>Sign &amp; Identification Uses</b>							
Real estate sign							
Construction sign							
Promotional sign							
Institutional sign							



Apartment name sign							
Advertising sign (off-premises or billboard)					S	S	
Advertising sign (on-premises)				S	S		
Changeable electronic variable message sign (CEVMS)(Off-Premises or billboard)					S	S	
Changeable electronic variable message sign (CEVMS) (on-premises)				S	S		
<b>Agricultural Uses</b>							
Farm or ranch (non-residential)							
Livestock auction							
Hatchery, poultry							
Animal pound (public or private)		S					
Animal clinic, hospital, or kennel (no outside pens)				S	S		
Animal clinic, hospital, or kennel (outside pens)							
Animal feeding lot		S					
Greenhouse or plant nursery (commercial)							
<b>Commercial Uses</b>							
Bakery wholesale							
Boat sales and repair							
Brewery, distillery or winery							
Building material sales						S	S
Cabinet and upholstery shop						S	S
Central preparation facility/commissary						S	S
Cleaning, dyeing or laundry plant							
Clothing or similar light manufacturing processes							S
Contractor storage or equipment yard					S	S	S
Heavy machinery sales, rental, or repair					S	S	S
Light manufacturing or Assembly processes							S

Laboratory manufacturing							
Laboratory, scientific or research							
Lithographic or print shop							S
Maintenance and repair service for buildings						S	
Milk depot, dairy or ice cream plant							
Microbrewery, microdistillery, or winery							
Open storage of furniture, appliances or machinery, etc.							
Paint shop, commercial							
Petroleum products, storage and wholesale							
Plumbing shop						S	
Quick print copy shop							
Storage warehouse							
Welding or machine shop							
Wholesale storage or sales facilities					S		
<b>Natural Resources Storage &amp; Extraction Uses</b>							
Caliche pit and caliche storage area						S	S
Petroleum collecting and storage facilities		S				S	S
Petroleum or gas well		S				S	S
Sand or gravel extraction or storage	S	S				S	S
Top soil, earth or stone extraction or storage	S	S				S	S
<b>Special Industrial Processes</b>							
Asphalt or concrete batching plant, permanent							
Asphalt or concrete batching plant, temporary							
Brick kiln or tile plant							
Cement or hydrated lime plant							
Dump or sanitary fill area							
Open salvage yard for vehicles,						S	S

machinery, etc.							
Meat packing plant		S				S	S
Smelter or refinery							
<b>General Manufacturing &amp; Industrial Uses</b>							
Light manufacturing or industrial use							
Heavy manufacturing or industrial use							

**Sec. 13 - Lot regulations.**

Except as hereinafter provided, no building or structure or part thereof shall be erected, altered or converted for any use permitted in the district in which it is located, unless it is in conformity with all the minimum regulations herein specified for lot area, lot width, lot depth, lot coverage and front, side and rear yards. In the event that Federal and/or State regulations for the use or operations on the TAC differ from these requirements, the more restrictive shall apply.

**Sec. 14 - Lot area.**

The minimum lot area for the various districts shall be in accordance with the following schedule except that a lot having less area than herein required, which was an official lot prior to the adoption of this Land Use Policy may be used and no existing lot existing at the time of this Land Use Policy shall be reduced in area below the minimum requirements set forth herein.

- (1) In the following land use districts, the minimum lot area for each building or structure shall be in accordance with the following schedule:

Types of Uses	Technology District 1 (T-1)	Technology District 2 (T-2)	Residential District	Neighborhood Service	Commercial	Light Industrial	Heavy Industrial
	One-Family Dwelling Detached			half acre			

Two-Family Dwelling			half acre				
Townhouses and Single-Family Dwelling Attached			2500 sf				
Multiple-Family Dwelling one to three stories			2000 sf				
Multiple-Family Dwelling over three stories			2000 sf				

(2) Minimum required lot area in square feet for each primary building or structure. Note: Indicates area in sq. ft.

**Sec. 15 - Minimum Setbacks.**

All Lots shall comply with the minimum setbacks as outlined which are determined by intended land use and proximity to streets:

(a) Neighborhood Services:

- (1) Front yard - All lots with street frontage shall have a minimum setback of 20' from the right-of-way/property line;
- (2) Side yard - A minimum setback of 20' shall be required from side property lines except that a side setback shall be required such that buildings in adjacent properties shall be no closer than 40' with such area being permanently unobstructed for fire access purposes
- (3) Rear yard - A minimum setback of 10' shall be required from rear property lines except for rail access purposes and except that a rear setback shall be required such that buildings on adjacent properties shall be no closer than 20', with such area being permanently unobstructed for fire access purposes.

(b) Commercial:

- (1) Front yard - All lots with street frontage shall have a minimum setback of 20' from the right-of-way/property line;
- (2) Side yard - A minimum setback of 20'shall be required from side property lines except that a side setback shall be required such that buildings in adjacent properties shall be



no closer than 40' with such area being permanently unobstructed for fire access purposes

- (3) Rear yard - A minimum setback of 10' shall be required from rear property lines except for rail access purposes and except that a rear setback shall be required such that buildings on adjacent properties shall be no closer than 20' with such area being permanently unobstructed for fire access purposes.
- (c) Technology & Industrial: All lots with street frontage shall have a minimum setback of 50' from the right-of-way/property line, the first 20' will be used for utility easements and the next 30' will be a vegetative buffer zone. TAC is to retain an easement in this vegetative buffer zone in order to place a pedestrian trail through the setback area. The sides and back shall have a minimum setback of 10' and be left in a natural vegetative state. TAC intends for the Owner to create/maintain a vegetative buffer between the primary road and the improvement. This buffer can be the existing vegetative indigenous growth or a landscaped setback/buffer with shade and ornamental trees.
- (d) Residential:
- (1) Front Yard – All lots with street frontage shall have a minimum setback of 25' feet from the right-of-way/property line;
  - (2) Side Yard – A minimum setback of 10% of the lot width, not to exceed 10', shall be required from side property lines except that buildings in adjacent properties shall be no closer than 20' with such area being permanently unobstructed for fire access purposes;
  - (3) Rear Yard - The main residential building may not be constructed nearer than ten feet to the rear property line. Any nonresidential uses permitted in residential districts shall not be constructed nearer than ten feet to the rear property line. A detached accessory building shall have a rear yard of not less than three feet from the rear property line. A garage or carport entered from an alley shall have a rear yard of not less than 15'.
- (e) Special Setback Regulations:
- (1) No building shall hereinafter be located, erected, or altered to have setbacks less than required by this section. Owner may, at its sole discretion, seek a variance to these requirements.
  - (2) The setbacks shall be measured from the property line to the face of the building, covered porch, covered terrace or attached accessory building. Stairs, uncovered porches, eaves and roof extensions may project into the required front yard for a distance not to exceed four feet.
  - (3) Where a building line has been established by a subdivision plat or other ordinance which requires a front yard setback greater or lesser than required by this section, the required front yard shall comply with the building line established by such plat or ordinance.

- (4) Where lots have double frontage, running through from one street to another, a required front yard shall be provided on both streets, unless a building line has been established along only one frontage by a subdivision plat or by another ordinance.
- (5) Where buildings exceed three stories in height, the front and/or rear yard shall be increased one foot for each two feet the building exceeds three stories but no front yard need exceed 75'.
- (6) Every part of a required side yard shall be open and unobstructed by any building except for accessory buildings, as permitted herein, and the ordinary projections of window sills, belt courses, cornices and other architectural features projecting not to exceed 12" into the required side yard, and a roof eave or canopy projecting not to exceed 24" into the required side yard.
- (7) Multiple-family dwellings shall provide a minimum side yard of 15' between any building wall containing openings for windows, light and air and any side lot line except that any such building face or wall not exceeding 35' in length may provide a minimum side yard of ten feet. Where a building wall contains no openings for windows, light or air, a minimum side yard of ten feet shall be provided between such wall and the side lot line
- (8) On a corner lot, a side yard adjacent to a street for a one-family dwelling, a two family dwelling, a townhouse or multiple-family dwelling not exceeding three stories in height shall not be less than 25' and no balcony or porch or any portion of the building may extend into such required side yard, except that a roof may overhang such side yard not to exceed four feet.

**Sec. 16 - Lot coverage.**

The maximum percentage of any lot area which may hereafter be covered by all buildings shall not exceed the following:

- (1) Forty percent in the T2, R and NS districts.
- (2) Fifty percent in the T1, C, LI and HI districts.

**Sec. 17. - Height regulations.**

- (a) No building or structure shall be located, erected or altered so as to exceed the height limit hereinafter specified for the district in which the building is located.

Land Use Districts:	The Maximum Height of Buildings and Structures Shall be:
Technology District 1 (T1)	Three stories, except as noted in Section 18
Technology District 2 (T2)	Three stories, except as noted in Section 18
Residential District (R)	Two and one-half stories except as noted in Section 18
Neighborhood Service District (NS)	Two stories except as noted in Section 18
Commercial District (C)	To any legal height not prohibited by other laws or ordinances

Light Industrial District (LI)	To any legal height not prohibited by other laws or ordinances
Heavy Industrial District (HI)	To any legal height not prohibited by other laws or ordinances

(b)

<b>Sign Heights in Business Districts **</b>	
Technology District 1 (T1)	Sign height: Maximum size is six feet height and eight feet length. Type: Monument, planter or low-profile signage
Technology District 2 (T2)	Sign height: Maximum size is six feet height and eight feet length. Type: Monument, planter or low-profile signage
Neighborhood Service District (NS)	Sign height limited to 35 feet measured from the grade level of the closest adjacent roadway, Maximum size 48 square feet
Commercial District (C)	Sign height limited to 35 feet measured from the grade level of the closest adjacent roadway, Maximum size 48 square feet
Light Industrial District (LI)	Sign height: Maximum size is six feet height and eight feet length. Type: Monument, planter or low-profile signage
Heavy Industrial District (HI)	Sign height: Maximum size is six feet height and eight feet length. Type: Monument, planter or low-profile signage

\*\* For each development of ten acres or less, a maximum of two signs shall be permitted. Developers with frontage on two or more streets may have signs on any two street frontages. Development with frontage on one street may have two signs where street frontage exceeds 500 feet. Development of more than ten acres may have a maximum of three signs. Owner may seek a variance to these height restrictions.

**Sec. 18 - Special height regulations.**

In the districts where the height of the buildings is restricted to two or three stories, cooling towers, roof gables, chimneys and vent stacks may extend for an additional height not to exceed 40 feet above the average grade line of the building. Water tanks and institutional buildings may be erected to exceed three stories in height in residential areas restricted to two or three stories in height, provided that one additional foot shall be added to the width and depth of side and rear yards for each foot that such structures exceed three stories in height.

**Sec. 19 - Floor area ratio.**

Except as hereinafter provided, no building or structure shall be erected, added to or altered to exceed the maximum floor area ratio standards in the various districts as set forth herein.

In the following districts, the maximum floor area ratio (FAR) for any building or structure shall be as follows:

Land Use District	Maximum Floor Area Ratio
T1, T2, R, NS, C	4:1
LI & HI	2:1

Note: Structure used for off-street parking of vehicles shall not be computed as area subject to floor area ratio standards.

**Sec. 20 – Construction of Improvements**

No improvements shall be erected, placed, altered, maintained, or permitted to remain on any lot by an Owner or Occupant until final plans and specifications shall have been submitted to and approved in writing by the Operations Department of TAC.

- (a) Construction Plans - A set of Detailed Development Plans for the improvements should be submitted with the authorization of the Owner, Occupant or both and include the following items:
  - (1) A Site Plan of the lot or tract showing important development features of the property including, but not limited to, the boundary of the property; applicable setbacks, easements or reservations on the property; location of existing and proposed parking and paving improvements meeting the access and parking needs of the site; location of proposed site signage; location of existing and proposed buildings and structures and any other improvements necessary (at the request of TAC or informational purposes provided by the Owner or Occupant) to convey the development plan for the property.
  - (2) A Grading & Drainage Plan for the property identifying existing and proposed grades and contours across the property as required to adequately define existing site topography and finished grades; the size and location of existing and proposed drainage structures on and adjacent to the property; plans for stormwater conveyance systems (channels, box culverts, storm sewer, etc...); A Drainage Area Map that will define stormwater discharges and drainage requirements for the property; location of the 100-year flood plain on the property; other considerations necessary (at the request of TAC or informational items provided by the Owner or Occupant) to ensure proper and adequate conveyance of stormwater associated with the development;



- (3) A Storm Water Pollution Prevention Plan satisfying the Construction, Industrial or other requirements of the Texas Commission on Environmental Quality (TCEQ). Owner or Occupant will provide copies of all TCEQ submittals to TAC.
  - (4) Water & Wastewater Plans will need to be provided to Riverbend Water Resources District (RWRD) for its review and consideration.
  - (5) A Landscape Plan showing location and type of landscape improvements proposed for the site. If utilized, sprinkler and irrigation plans shall be included.
  - (6) Complete Building Plans for any structure or building proposed for construction including, but not limited to, Floor Plans; Foundation & Structural Plans; Building Elevations; Mechanical, Electrical and Plumbing Plans and other plans necessary (at the request of TAC or informational items provided by the Owner or Occupant) to ensure the improvements meet current building code requirements.
  - (7) TAC may request additional items for review to ensure that the improvements do not present health, safety and welfare concerns to the property
- (b) Plan Review Process – Owner or Occupant shall submit two (2) sets of printed plans and one electronic copy in a PDF format to TAC for review. TAC shall review and either approve or disapprove all or parts of the Plans submitted. TAC will complete its review and either approve or disapprove all or parts of the plans within thirty (30) calendar days from the day the plans are submitted. If, after receiving the plans for review, TAC determines that the size or complexity of the project will require additional time beyond the normal thirty calendar days, TAC shall advise the Owner or Occupant of the additional time for plan review. TAC may grant approval subject to specific conditions. If revisions to the plans are requested by TAC, the Owner or Occupant will have the opportunity to incorporate changes required by TAC and deliver revised plans for approval. No improvement shall be constructed, erected, placed, altered, maintained or permitted until the plans have been finally approved in writing by TAC.
  - (c) Changes to Approved Plans - An Owner or Occupant shall secure the written approval of TAC for any material change or revision in approved plans. Minor changes require a minor amount of time to review. Major changes may require more time to review. TAC reserves the right to recover costs associated with reviewing proposed material changes made by the Owner or their agent.
  - (d) Variances - Written requests for variances shall be submitted detailing the particular standard from which a variance is sought and submitted to TAC for consideration.
  - (e) Proceeding with Work - Upon receipt of approval from TAC, the Owner, or Occupant, or both, shall, as soon as practicable, satisfy any and all conditions of such approval and shall diligently proceed with the commencement and completion of all approved excavation, construction, refinishing, rehabilitation, and alterations.
  - (f) Completion of Work – Construction of improvement shall be completed expediently and without interruption within one (1) year of TAC approval of the plans and specifications, or as outlined and agreed to in the Work Schedule submitted as part of the Design & Development Plans TAC, at its sole discretion, upon written request made and received

- prior to the construction project time table being deemed delayed, may extend the time within which work must be completed.
- (g) Liability - TAC shall not be liable for any damage, loss, or prejudice suffered or claimed by any person on account of:
    - (1) The approval or disapproval of any plans, drawings, and specifications, whether or not in any way defective;
    - (2) The construction of any improvement, or performance of any work, whether or not pursuant to approved plans, drawings, and specifications; or
    - (3) The development of any lot within the TAC.
  - (h) Construction without Approval - Any improvement erected, placed, or maintained upon any lot, or any new use commenced upon any lot, other than in accordance with TAC approval, shall be deemed to have been undertaken in violation of this ordinance, and upon written notice from TAC, any such improvement or use shall cease and be removed or altered so as to conform to this ordinance. Should such removal, alteration or use not be accomplished within thirty (30) days after the date of such notice, then the party in violation of this Land Use Policy shall be subject to the enforcement procedures.
  - (i) Construction to Begin or Repurchase - Owner or Occupant must begin approved construction within eighteen (18) months of purchase or lease of property. If Owner or Occupant does not begin approved construction within the specified eighteen (18) month period, TAC has the right to repurchase property from Owner or Occupant at the original price paid to the seller for said lot, or TAC may at its sole discretion, renegotiate with Owner or Occupant for an extended construction period. UNDER NO CIRCUMSTANCES, WITHOUT SPECIFIC WRITTEN CONSENT FROM DECLARANT, MAY OWNER OR OCCUPANT SELL SAID UNIMPROVED PROPERTY TO A THIRD PARTY WITHOUT PRIOR APPROVAL OF TAC. This option must be exercised within sixty (60) days after the expiration of the eighteen (18) month period.
  - (j) Use of Temporary Structures - No temporary structure, or nonpermanent outbuilding shall ever be placed, erected or allowed to remain on any portion of the property without prior written authorization of TAC (other than during construction), and no edifice shall be occupied in any manner prior to its completion.

## **Sec. 21 - Variance Process**

TAC may, from time to time, permit an Owner to construct, erect or install improvements which may differ from TAC's Lot or Site Design Requirements. Written requests for variances shall be submitted detailing the particular standard from which a variance is sought and submitted to TAC for consideration. A determination as to the request shall be made by the Operations Department. Any applicant that is in disagreement with the decision of the Operations Department shall have the right to appeal such decision in writing to the Executive Director. The Executive Director shall, within ten (10) days of the request, make a ruling on the decision. Any person who is in disagreement with the decision of the Executive Director, shall within ten (10) days of that decision, file an appeal with the Board of Directors. The appeal should state what areas, in the opinion of the person adversely affected, the decision of the Executive Director disagrees with provisions or the intent of this chapter. It shall be the duty of the Board to hear any such appeal within a reasonable amount of time.

- (a) TAC shall have the right to require additional information, supporting data and/or plans and specifications in form and substance satisfactory to TAC as a condition of consideration of any request for a variance.
- (b) TAC shall not be liable to any Owner or Occupant for any claims, causes of action or damages arising out of the granting or denial of any requested variance.
- (c) By acceptance of any deed to any Parcel, the Owner expressly waives any such claims, demands, or causes of action arising from the granting or denial of any request variance.
- (d) Each request for a variance shall be reviewed separately and apart from other such requests.
- (e) The granting of a variance to any Owner shall not constitute a waiver of TAC's right to strictly enforce the CCR's and development standards contained herein against any other Owner.

#### **Sec. 22 – Fence & wall regulations**

In any residential district or along the common boundary between any residential or nonresidential district where a wall fence or screening separation is erected, the standards for height and design in this article shall be observed.

#### **Sec. 23 - Height of fence or wall.**

- (a) Any fence or wall erected on the property line and located to the rear of the minimum required front yard line as determined by the provisions of Section 15 shall not exceed eight feet in height above the adjacent grade.
- (b) No fence, screen, wall or other visual barrier shall be so located or placed so that it obstructs the vision of a motor vehicle driver approaching any street, alley or drive intersection. At all street intersections clear vision shall be maintained across the lot for a distance of 15 feet back from the property corner along both streets.

#### **Sec. 24 - Screening walls or visual barriers and open storage.**

No open storage of commodities, materials or equipment for sale or display shall be permitted in any T1, T2, R or HI district. All commodities and materials offered for sale and displayed in the open in the NS, C or LI district shall be located back of the minimum required front yard setback line. In the LI district, no open storage operation shall be permitted, except as an accessory use and all such open storage operations shall be located behind the building setback line and screened with a fence or visual barrier as herein prescribed.

#### **Sec. 25 - Reserved.**

#### **Sec. 26 - Creation of building site.**

No permit for the construction of buildings or improvements upon any tract shall be issued until a building site, building tract or building lot has been created by compliance with one of the conditions in Sections 27, 28 or 29.

#### **Sec. 27. - Lots or tract part of plat record.**

The lot or tract is part of a plat of record, properly approved by the Bowie County Commissioner's Court and filed in the plat records of the county.

## **Sec. 28 - Site plan.**

The site, plot or tract is identified on a Site Plan, included in the Design and Development Plans and officially approved by the Operations Department, which provides all utility and drainage provisions, alleys, streets and other public improvements necessary to meet the normal requirements for platting, including the designation of building areas and such easements, alleys and streets have been required and properly dedicated and the necessary public improvements provided.

## **Sec. 29 - Existing lot or tract.**

The plot, tract or lot faces a dedicated street and was separately owned prior to the effective date of the ordinance from which this article is derived or prior to annexation by TAC, whichever is applicable, in which event a building permit for only one main building may be issued on each such original separately owned parcel without first complying with Section 27 or Section 28.

## **Sec. 30 - Vehicle parking regulations.**

No building or structure shall be erected in the district in which it is located, unless there shall be provided on the lot or tract of land on which the building or structure is located, on an immediately contiguous lot or tract of land or within 150 feet of the lot or tract of land on which the building or structure is located, vehicle parking for the uses specified in the designated districts. Any established use which was lawfully existing at the effective date of the ordinance from which this article is derived and which in the interim has not been enlarged or converted to any other use need not provide parking as specified in this article. No existing vehicle parking shall be reduced below the minimum number of spaces specified in this article without approval of the Executive Director.

## **Sec. 31 – Off-Street Parking schedule.**

The following parking space schedule for nonresidential uses is applicable to all districts:

- (1) Bank, savings and loan or financial establishment—One space for each 600 similar square feet of floor area.
- (2) Clinics or doctors' offices—One space for each 300 square feet of floor area.
- (3) Manufacturing, processing or repairing—One space for each two employees or one space for each 1,000 square feet of floor area, whichever is greater.
- (4) Offices—One space for each 300 square feet of floor area.
- (5) Recreational, private or commercial area or building—One space for each four persons to be normally accommodated in the establishment.
- (6) Retail or personal service—One space for each 200 square feet of floor area.
- (7) Furniture stores and appliance stores general area—One space for each 400 square feet of floor area.
- (8) Storage or warehousing—One space for each two employees or one space for each 1,000 square feet of floor area, whichever is greater.
- (9) Meeting rooms and public assembly—One space for each three places of seats.
- (10) Residential Dwelling Unit – a minimum of two parking spaces for each residential dwelling unit.



**Sec. 32 - Special off-street parking regulations.**

- (a) In computing the parking requirements for any building or development, the total parking requirements shall be the sum of the specific parking space requirements for each class of use included in the building for development.
- (b) In the R, C or a NS districts, no parking space, garage or carport or other automobile storage space or structure shall be used for the storage of any truck, truck trailer or van except a panel or pickup truck not exceeding 1½ tons capacity.
- (c) Floor area of structure devoted to off-street parking of vehicles shall be excluded in computing the off-street parking requirements of any use.

**Sec. 33 - Parking requirements for new or unlisted uses.**

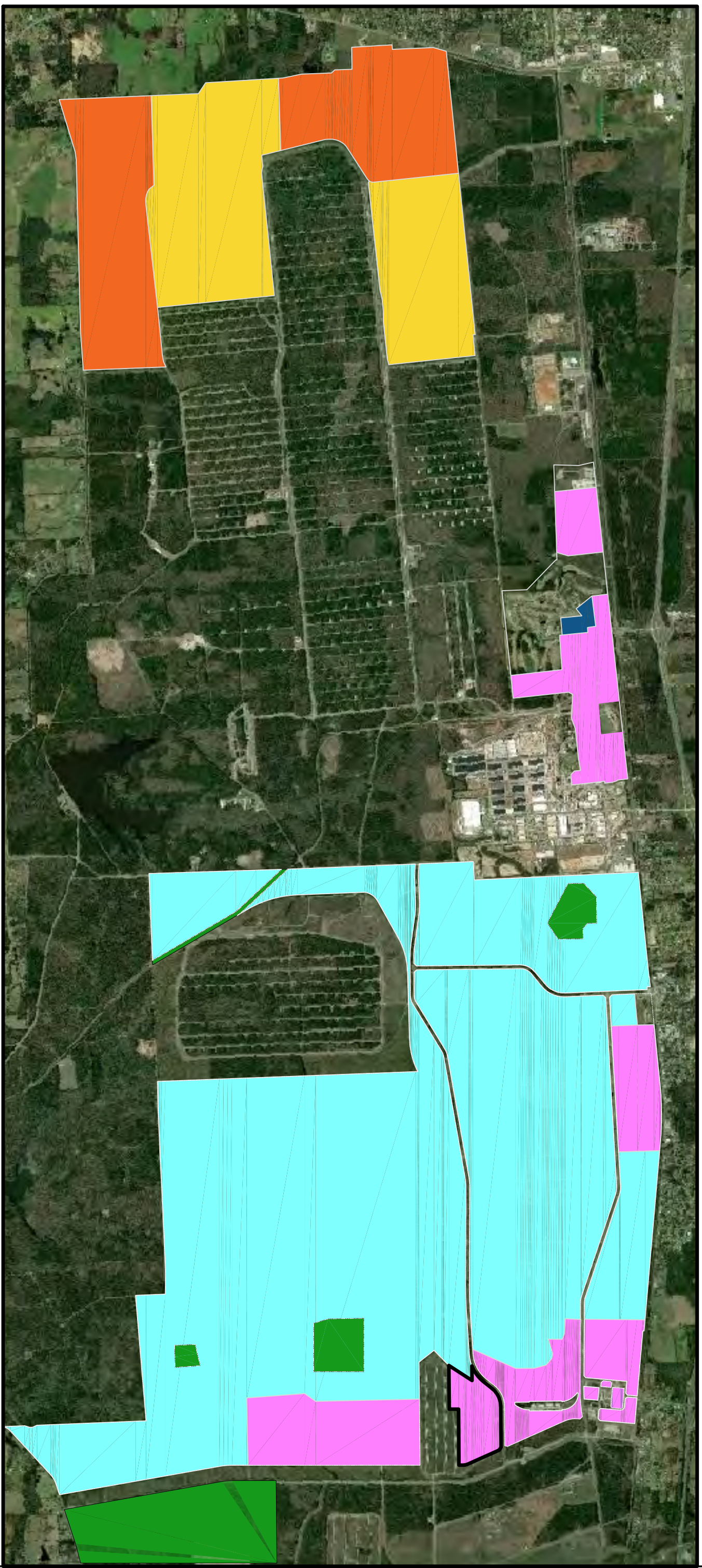
- (a) Where questions arise concerning the minimum off-street parking requirement for any use not specifically listed, the requirements may be interpreted as those of a similar use.
- (b) Where a determination of the minimum parking requirements cannot be readily ascertained for new or unlisted uses according to subsection (a) of this section or where uncertainty exists, the minimum off-street parking requirements shall be established by the same process as provided in Section 9 for classifying new and unlisted uses.




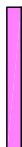


**Sec. 34 - Off-street loading regulations.**

All retail, commercial, industrial and service structures shall provide and maintain off-street facilities for receiving and loading merchandise, supplies and materials within a building or on the lot or tract. Such off-street loading space may be adjacent to a public alley or private drive or may consist of a truck berth within the structure. Such off-street loading space or truck berth shall consist of a minimum area of ten feet (10') by forty five feet (45') and such spaces or berths shall be provided in accordance with the following schedule:


Square feet of Gross Floor Area in Structure	Minimum Required Spaces or Berths
0 to 5,000	None
5,001 to 15,000	1
15,001 to 40,000	2
40,001 to 65,000	3
65,001 to 100,000	4
Each additional 50,000	1 additional





-  TECHNOLOGY DISTRICT 1 (T1)
-  TECHNOLOGY DISTRICT 2 (T2)
-  RESIDENTIAL DISTRICT (R)
-  LIGHT INDUSTRIAL DISTRICT (LI)
-  HEAVY INDUSTRIAL DISTRICT (HI)
-  U.S. ARMY PROPERTY

ADOPTED 09.25.2018

107 CHAPEL LANE NEW BOSTON, TEXAS 75570 903.223.9841 www.TexAmericasCenter.com		LAND USE MAP	SHEET NO:
		TexAmericas Center	LUM





## **RESOLUTION NO. 20210525-07**

### **A RESOLUTION AUTHORIZING TAC EAST HOLDINGS COMPANY NO. 1 TO SELL AND CONVEY PROPERTY TO EXPANSION INDUSTRIES, LLC; AUTHORIZING THE GRANT OF ROAD EASEMENTS TO EXPANSION INDUSTRIES, LLC; AND AUTHORIZING CHANGE OF NAME OF TITUS STREET TO FREEDOM WAY**

**WHEREAS**, TexAmericas Center is a political subdivision of the State of Texas with the powers and authorities specified in Chapter 3503 of the Special District Local Laws Code of the State of Texas; and

**WHEREAS**, TAC East Holdings Company No. 1, the non-profit title holding corporation for TexAmericas Center, has entered into a written Industrial Lease with Option to Purchase with Expansion Industries, LLC regarding property known as the "G-Line" including the property known as the "G-Ponds" for a purchase price of approximately \$2,077,070.00; and

**WHEREAS**, access to the property being purchased will be over and across certain roads owned and maintained by TexAmericas Center; and

**WHEREAS**, the purchaser of the property, Expansion Industries, LLC, has requested that the name of Titus Street be changed to Freedom Way, which proposed name has been approved by the Ark-Tex Council of Governments as available for use;

**NOW, THEREFORE, BE IT RESOLVED** as follows:

1. That the sale by TAC East Holdings Company No. 1 to Expansion Industries, LLC of the property described in Exhibit "A" attached hereto shall be and it is hereby approved; and
2. That simultaneous with the closing of the sale of the property by TAC East Holdings Company No. 1 to Expansion Industries, LLC, TexAmericas Center grant to Expansion Industries, LLC a non-exclusive easement for access to and from the property described in Exhibit "A" over and across the roads known as Cass, Oak, Lamar, Titus and Cypress, upon the TAC East property; and



3. That upon the closing of the complete and final sale by TAC East Holdings Company No. 1 to Expansion Industries, LLC of the property described as Tract 2 in Exhibit "A", TexAmericas Center shall apply to the Ark-Tex Council of Governments for the approval of the change in name of Titus Street to be Freedom Way; and
4. That Scott Norton, Executive Director/CEO of TexAmericas Center shall be and he is hereby authorized to execute any and all documents necessary to facilitate the sale of the property, the granting of the road easements, and the change of name from Titus Street to Freedom Way.

**PASSED AND APPROVED this 25th day of May, 2021.**

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**Jim Roberts, Chairman of the Board**

**ATTEST:**

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**Denis Washington, Secretary**

**ATTACHMENT: EXHIBIT "A" 165.540 ACRES TRACT 1 - 4.736 ACRES TRACT 2 LEGAL DESCRIPTIONS**

## EXHIBIT "A"

### TRACT 1

All that certain lot, tract or parcel of land lying and situated in the William H. Fore Headright Survey, Abstract 214, Bowie County, Texas and the Mary Burnside's Headright Survey, Abstract 49, Bowie County, Texas, being a portion of that certain tract of land described as 210.970 acres in the deed from TexAmericas Center to TAC East Holdings Company No. 1, dated May 22, 2018, recorded in Document No. 2018-00005386 of the Real Property Records of Bowie County, Texas, and being more particularly described by metes and bounds as follows:

COMMENCING at a 1/2 inch steel rod (control monument), capped MTG 101011-00, found for a corner, being an angle point in the West line of the said 210.970 acre tract, and an angle point in the East line of the Titus Street parcel, being an easement for ingress and egress, as described in the deed from TexAmericas Center to TAC East Holdings Company No. 1, dated April 25, 2017, recorded in Document No. 2017-4829 of the Real Property Records of Bowie County, Texas;

THENCE South 00 degrees 33 minutes 32 seconds East a distance of 820.98 feet along the West line of the said 210.970 acre tract, and the East line of the said Titus Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, being the POINT OF BEGINNING for the herein described tract;

THENCE North 89 degrees 51 minutes 59 seconds East a distance of 729.81 feet across the said 210.970 acre tract to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner in the West line of a railroad;

THENCE South 00 degrees 28 minutes 58 seconds East a distance of 389.42 feet across the said 210.970 acre tract, and the West line of the said railroad to a point for a corner in a fence line, at an angle point;

THENCE North 73 degrees 13 minutes 07 seconds East a distance of 65.17 feet across the said 210.970 acre tract, across the said railroad, and along the said fence to a point for a corner in the East line of the said railroad;

THENCE North 00 degrees 25 minutes 31 seconds West a distance of 370.75 feet across the said 210.970 acre tract to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, at an angle point;

THENCE South 89 degrees 30 minutes 14 seconds East a distance of 1453.40 feet across and through the said 210.970 acre tract to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, lying in the East line of the said 210.970 acre tract, and the West line of the Lamar Street

parcel, being an easement for ingress and egress, as described in the deed from TexAmericas Center to TAC Holdings Company No. 1 dated May 22, 2018, recorded in Document No. 2018-00005386 of the Real Property Records of Bowie County, Texas;

THENCE South 00 degrees 29 minutes 46 seconds West a distance of 101.27 feet along the East line of the said 210.970 acre tract, and the West line of the said Lamar Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, at an angle point;

THENCE South 01 degrees 19 minutes 49 seconds East a distance of 982.73 feet along the East line of the said 210.970 acre tract, and the West line of the said Lamar Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, at an angle point;

THENCE South 02 degrees 30 minutes 55 seconds East a distance of 1676.77 feet along the East line of the said 210.970 acre tract, and the West line of the said Lamar Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, at an angle point;

THENCE South 18 degrees 24 minutes 33 seconds West a distance of 47.58 feet along the East line of the said 210.970 acre tract, and the West line of the said Lamar Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, found for a corner, being the Southeast corner of the said 210.970 acre tract, the Southwest corner of the said Lamar Street parcel, the North line of that certain tract described as Tract 10 – Proposed 5th Street, now known as Cypress Street, w/81.718 acres in the deed from United States of America to Red River Redevelopment Authority, now known as TexAmericas Center, dated September 1, 2010, recorded in Volume 5898, Page 1 of the Real Property Records of Bowie County, Texas, and the beginning of a circular curve to the right;

THENCE in a Southwesterly direction along the said circular curve, a distance of 1113.11 feet, with delta angle of 46 degrees 59 minutes 04 seconds, a radius of 1357.39 feet, a chord bearing of South 62 degrees 35 minutes 35 seconds West, and a chord distance of 1082.18 feet to a 1/2 inch steel rod found for a corner at the end of the said curve, lying in the South line of the said 210.970 acre tract, and the North line of the said Tract 10;

THENCE South 86 degrees 05 minutes 07 seconds West a distance of 509.53 feet along the South line of the said 210.970 acre tract, and the North line of the said Tract 10 to a 1/2 inch steel rod found for a corner, at an angle point;

THENCE South 86 degrees 06 minutes 19 seconds West a distance of 776.49 feet along the South line of the said 210.970 acre tract, and the North line of the said Tract 10 to a 1/2 inch steel rod, capped MTG 101011-00, found for a corner, being the Southwest corner of the said 210.970 acre tract, and the Southeast corner of the said Titus Street parcel;

THENCE North 47 degrees 16 minutes 42 seconds West a distance of 68.68 feet along the West line of the said 210.970 acre tract, and the East line of the said Titus Street parcel to a 1/2 inch steel rod (control monument), capped MTG 101011-00, found for a corner, at an angle point;

THENCE North 00 degrees 33 minutes 32 seconds West (basis of bearings) a distance of 2917.13 feet along the West line of the said 210.970 acre tract, and the East line of the said Titus Street parcel to a point for a corner in a fence line;

THENCE generally along the said fence line, and the West line of the said 210.970 acre tract the following bearings and distances:

THENCE South 49 degrees 26 minutes 04 seconds East a distance of 198.15 feet to a point for a corner, at an angle point;

THENCE North 88 degrees 47 minutes 11 seconds East a distance of 224.51 feet to a point for a corner, at an angle point;

THENCE North 35 degrees 48 minutes 40 seconds East a distance of 278.05 feet to a point for a corner, at an angle point;

THENCE North 26 degrees 46 minutes 09 seconds West a distance of 265.91 feet to a point for a corner, at an angle point;

THENCE South 89 degrees 52 minutes 01 seconds West a distance of 326.87 feet to a point for a corner, at an angle point;

THENCE South 39 degrees 55 minutes 10 seconds West a distance of 145.33 feet to a point for a corner in the East line of the said Titus Street parcel;

THENCE North 00 degrees 33 minutes 32 seconds West a distance of 210.28 feet along the West line of the said 210.970 acre tract, and the East line of the said Titus Street Parcel to the point of beginning and containing 165.540 acres of land, at the time of this survey.

## **TRACT 2**

Willam H. Fore Headright Survey, Abstract 214, Bowie County, Texas and the Mary Burnsidess Headright Survey, Abstract 49, Bowie County, Texas, being a portion of that certain tract of land described as Tract 3 – between proposed 4th and 5th street parcel with 2123.097 acres in the deed from the United States of America to Red River Redevelopment Authority, now known as TexAmericas Center, dated September 1, 2010, recorded in Volume 5898, Page 1 of the Real Property Records of Bowie County, Texas, and all of that certain tract of land described as 4.72 acres in the Disposal Site Deed, dated July 15, 1982, recorded in Volume 688, Page 811 of the Deed Records of Bowie County, Texas, and being more particularly described by metes and bounds as follows:

COMMENCING at a 1/2 inch steel rod (control monument), capped MTG 101011-00, found for a corner, being an angle point in the West line of the said 210.970 acre tract, and an angle point



in the East line of the Titus Street parcel, being an easement for ingress and egress, as described in the deed from TexAmericas Center to TAC East Holdings Company No. 1, dated April 25, 2017, recorded in Document No. 2017-4829 of the Real Property Records of Bowie County, Texas;

THENCE South 00 degrees 33 minutes 32 seconds East (basis of bearings) a distance of 1028.46 feet along the West line of the said 210.970 acre tract, and the East line of the said Titus Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, being the POINT OF BEGINNING for the herein described tract;

THENCE South 00 degrees 33 minutes 32 seconds East a distance of 2.80 feet West line of the said 210.970 acre tract, and the East line of the said Titus Street parcel to a point for a corner in a fence line;

THENCE generally along the said fence line, and the West line of the said 210.970 acre tract the following bearings and distances:

THENCE North 39 degrees 55 minutes 10 seconds East a distance of 145.33 feet to a point for a corner, at an angle point;

THENCE North 89 degrees 52 minutes 01 seconds East a distance of 326.87 feet to a point for a corner, at an angle point;

THENCE South 26 degrees 46 minutes 09 seconds East a distance of 265.91 feet to a point for a corner, at an angle point;

THENCE South 35 degrees 48 minutes 40 seconds West a distance of 278.05 feet to a point for a corner, at an angle point;

THENCE South 88 degrees 47 minutes 11 seconds West a distance of 224.51 feet to a point for a corner, at an angle point;

THENCE North 49 degrees 26 minutes 04 seconds West a distance of 198.15 feet to a point for a corner in the East line of the said Titus Street parcel, said corner bears South 00 degrees 33 minutes 32 seconds East a distance of 2917.13 feet to a 1/2 inch steel rod (control monument), capped MTG 101011-00, found for a corner, at an angle point in the West line of the said 210.970 acre tract and the East line of the said Titus Street parcel;

THENCE South 00 degrees 33 minutes 32 seconds East a distance of 2.66 feet along the West line of the said 210.970 acre tract, and the East line of the said Titus Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, said corner bears South 00 degrees 33 minutes 32 seconds East a distance of 2914.47 feet to a 1/2 inch steel rod (control monument), capped MTG 101011-00, found for a corner;

THENCE North 49 degrees 26 minutes 04 seconds West a distance of 19.79 feet across the said Titus Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, at an angle point;

THENCE North 00 degrees 43 minutes 24 seconds West a distance of 200.82 feet across the said Titus Street parcel to a 1/2 inch steel rod, capped MTG 101011-00, set for a corner, at an angle point;

THENCE North 39 degrees 50 minutes 45 seconds East a distance of 23.89 feet across and through the said Titus Street parcel to the point of beginning, and containing 4.736 acres of land at the time of this survey.

BEING SUBJECT TO that certain nonexclusive easement for ingress and egress described as Titus Street with 7.480 acres in the deed from TexAmericas Center to TAC East Holdings Company No. 1, dated April 25, 2017, recorded in Document No. 2017-4829 of the Real Property Records of Bowie County, Texas.



## RESOLUTION NO. 20210521-08

### A RESOLUTION APPROVING A STANDARD THIRD PARTY LOGISTICS SERVICES AND WAREHOUSE SPACE LEASE AGREEMENT FORM

**WHEREAS**, TexAmericas Center is a political subdivision of the State of Texas with the powers and authorities specified in Chapter 3503 of the Special District Local Laws Code of the State of Texas; and

**WHEREAS**, TexAmericas Center has put into effect the prior resolutions of the Board of Directors authorizing the creation of a Third Party Logistics Services Program; and

**WHEREAS**, it is necessary that TexAmericas Center have a written agreement regarding the lease of warehouse space and provision of Third Party Logistics Services to present to potential customers for said services; and

**WHEREAS**, the staff at TexAmericas Center has developed a Third Party Logistics Services and Warehouse Space Lease Agreement Plan for use in the Logistics Services Program, a copy of which is attached hereto as Exhibit "A";

**NOW, THEREFORE, BE IT RESOLVED** by the Board of Directors of TexAmericas Center as follows:

1. The Third Party Logistics Services and Warehouse Space Lease Agreement Form attached hereto as Exhibit "A" shall be and it is hereby approved for use in the Logistics Services Program;
2. The staff of TexAmericas Center shall be and it is hereby authorized to modify the form as needed provided that it substantially complies with the terms as set forth in the document; and
3. That Scott Norton, Executive Director and CEO of TexAmericas Center, shall be and he is hereby authorized to negotiate the terms of said Lease Agreement with prospective clients and to execute any and all documents necessary to put into effect the Third Party Logistics Services Program using the form in substantially the form as set forth in Exhibit "A".

**PASSED AND APPROVED this 25th day of May, 2021.**

\_\_\_\_\_  
Jim Roberts, Chairman of the Board

**ATTEST:**

\_\_\_\_\_  
Denis Washington, Secretary

**ATTACHMENT: THIRD PARTY LOGISTICS SERVICES AND WAREHOUSE SPACE LEASE AGREEMENT PLAN**

**THIRD PARTY LOGISTICS SERVICES  
AND  
WAREHOUSE SPACE LEASE AGREEMENT**

This Third Party Logistics Services and Warehouse Space Lease Agreement (this "Lease") is entered into by and between TexAmericas Center, a political subdivision of the State of Texas ("Lessor"), and \_\_\_\_\_ ("Lessee").

1. **Premises.** Lessor leases to Lessee, and Lessee leases from Lessor, approximately \_\_\_\_\_ square feet of space (the "Premises") in the warehouse located \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ (the "Building"). A depiction of the Premises is shown on Exhibit A attached hereto. Lessor also grants Lessee the nonexclusive use of the common areas serving the Building (the "Common Areas") for purposes of accessing the Premises.

2. **Services.** Lessor shall provide to Lessee logistical support services described as follows:

- \_\_\_\_\_ Unloading at the dock and positioning Lessor's goods and/or equipment;
- \_\_\_\_\_ repositioning Lessee's goods and/or equipment and loading same at the dock;
- \_\_\_\_\_ No logistical services other than storage will be provided; and/or ;
- \_\_\_\_\_ other: (describe) \_\_\_\_\_

3. **Term.** The term of this Lease will commence on \_\_\_\_\_ (the "Commencement Date") and will continue thereafter for a term of \_\_\_\_\_ months (the "Term"). Either Lessor or Lessee may terminate this Lease upon thirty (30) days' prior written notice to the other party. Lessee may extend the Term for an additional Term by giving Lessor sixty (60) days Notice in writing.

4. **Rent.** Monthly rent shall be \$ \_\_\_\_\_ ("Rent"), payable in advance, on the Commencement Date and on the first (1<sup>st</sup>) day of each month thereafter. Rent shall be payable without prior notice or demand, without offset or deduction and without relief from valuation or appraisal laws at the address of Lessor set forth below. In the event that any Rent is not received by Lessor with five (5) days of the date set forth for payment, Lessee shall pay to Lessor (i) a late fee equal to five percent (5%) of the delinquent Rent (the "Late Fee") and (ii) interest on such delinquent Rent at a rate equal to the lessor of the National Prime Rate of Interest as published in the Wall State Journal plus five percent (5%) or the highest rate allowed by law from the date that such delinquent Rent was due through the date that such delinquent Rent is actually received by Lessor. Rent shall be prorated for any part of the Term that is a partial month.



**5. Payment for Services.** Payment for logistical services provided by Lessor shall be imposed based upon Lessor's Logistical Services Rates as posted upon Lessor's website; provided, however, Lessor and Lessee may negotiate and agree to other rates by written agreement.

**6. Lessee's Insurance.** Lessee, at its sole cost and expense, shall secure and maintain throughout the Term (a) commercial general liability insurance, insuring both Lessor and Lessee against death and personal injuries to one or more persons and damage to property occurring on the Premises or Common Areas or in connection with Lessee's use and occupancy of the Premises in an amount equal to not less than Two Million and 00/100 DOLLARS (\$2,000,000) combined single limit per occurrence, (b) fire, casualty and extended coverage insurance covering all equipment and personal property of Lessee on or about the Premises, insuring both Lessor and Lessee, for full insurable value thereof on a replacement cost basis, and (c) worker's compensation insurance required by law. Prior to the Commencement Date, Lessee shall furnish to Lessor a certificate of insurance evidencing such coverage with Lessor named as an additional insured, which certificate shall contain a provision to the effect that such coverage may not be canceled, materially changed or not renewed with at least thirty (30) days' prior written notice to Lessor. Lessee acknowledges Lessor is not responsible for carrying insurance covering Lessee's property.

**7. Waiver of Subrogation.** Each party hereby waives any and every claim which arises or may arise in its favor and against the other party hereto during the Term for any and all loss or damage to any of its property located within or upon or constituting a part of the Premises, which loss or damage is covered, or is required to be covered, by the terms of this Lease, by valid and collectible fire and extended coverage insurance policies, and if and to the extent reimbursement is made, even if such loss or damage shall be brought about by default or negligence of the other party or by its employees, agents, servants or any persons claiming under them.

**8. Permitted Use; Alterations.** Lessee will use the Premises solely for the storage of Lessee's personal property and for no other purpose. Lessee shall not commit waste on the Premises. No alterations, additions or improvements shall be made to the Premises, and no equipment or fixtures shall be installed in the Premises, without Lessor's prior written consent. Use of the Premises shall be subject to rules and regulations adapted by Lessor from time to time.

**9. Hazardous Substances.** Lessee shall keep the Premises, the Building and the Common Areas free from contamination by or from any hazardous substances or hazardous waste (as such terms are defined or used in applicable state or federal law or in the regulations issued thereunder, including, but not limited to, the federal Comprehensive Environmental Response, Compensation and Liability Act (collectively, "Hazardous Substances").

**10. Compliance With Laws.** Lessee shall comply with all requirements of duly constituted public authorities, and with the terms of any federal, state or local law, statute, regulation, code ordinance or order applicable to Lessee or to Lessee's use of the Premises, the Building and the Common Areas, and Lessee shall indemnify, defend and save Lessor

harmless from any and all penalties, fines, costs or other damages, including without limitation, attorney's fees, resulting from its failure to do so. Lessee shall not carry on any unlawful business in or about the Premises, and shall not carry on any business or activity which would endanger the Premises or any portion thereof from fire or cause a forfeiture of any fire insurance that Lessor has or may have on the Building.

**11. Compliance With Building Rules.** Lessee shall comply with all the building rules established by Lessor. Lessee or their employees cannot block or place any items in egress paths including exit doors. Lessee and their employees cannot leave any property in any area except their leased space. Lessee or their employees must remove their trash from the building and put in the trash containers outside. Lessee and their employees must keep their leased area clean. Vehicles in the parking lot are for daytime parking only and cannot be left over night in the parking lot. Vehicles left over night are subject to towing at the owners expense. Any violation of the rules shall constitute a default by Lessee under this Lease and be subject to immediate termination of the Lessee's lease.

**12. Liability.** Neither Lessor nor its board members, officers, managers, members or employees shall be liable for any injury to any person while on the Premises, the Building or the Common Areas or for damage to property while located on the Premises, the Building or the Common Areas, whether owned by Lessor, Lessee or third parties, whether caused by or resulting from any act, omission or negligence of Lessor or any of its respective agents, servants, or employees, or by fire, or by any other casualty or condition existing on or resulting to the Premises, the Building or the Common Areas during the Term (except for acts caused by the willful misconduct of Lessor or Lessor's agents or employees), nor shall Lessor nor its board members, officers, managers, members or employees be liable in any claim for damages by reason of inconvenience or interruption to the business of Lessee, irrespective of the cause therefor (except for acts caused by willful misconduct of Lessor or Lessor's agents or employees). Lessee shall maintain all of the insurance policies and coverages referred to in the Lease against any loss or liability on account of any such claim. Lessee shall indemnify, defend and save Lessor harmless from any and all losses, liabilities, damages or costs, including, without limitation, attorney's fees, resulting from the acts or omissions of Lessee or its agents or employees.

**13. Assignment.** Lessee may not assign or transfer this Lease, or sublet the Premises, without Lessor's prior written consent, which may be withheld by Lessor in its sole discretion.

**14. Surrender; Holdover.** On expiration or early termination of this Lease, Lessee shall surrender the Premises broom clean and free of all debris and in the same condition as at the Commencement Date, subject only to reasonable wear from ordinary use. Lessee shall remove all of its personal property, and shall remove any alterations or improvements made by Lessee if required by Lessor, and Lessee shall repair all damage resulting from such removal. Failure to remove shall be an abandonment of the property, and Lessor may remove or dispose of it in any manner without liability, and recover the cost of removal and other damages from Lessee. If Lessee fails to vacate the Premises when required, including failure to remove all its personal property, Lessor may elect to either: (i) continue to treat Lessee as a tenant from month to month, subject to the provisions of this Lease, except that Rent shall

be twice the Rent being charged when the Lease term expired; or (ii) eject Lessee from the Premises (using self-help or otherwise) and recover damages caused by wrongful holdover.

**15. AS-IS.** The Premises are leased to Lessee AS IS and in the condition now existing, with no alterations or other work to be performed by Lessor. Lessee has inspected the Premises and is satisfied with the size, location and condition of the Premises. Lessee acknowledges that Lessor does not warrant any security alarm system or other security for the Premises.

**16. Right of Entry.** Lessor shall have the right to enter the Premises at any time to confirm Lessee's compliance with this Lease and make any necessary repairs, and in the event of an emergency.

**17. Complete Agreement.** This Lease constitutes the entire agreement of the parties and supersedes all prior written and oral agreements and representations and there are no implied covenants or other agreements between the parties except as expressly set forth in this Lease.

**18. Default and Remedies.** Any of the following shall constitute a default by Lessee under this Lease (time of performance being of the essence of this Lease): (i) Lessee's failure to pay rent within five (5) days after written notice from Lessor; provided, however, that Lessor shall not be required to give such written notice more than twice in any 12-month period, (ii) Lessee's failure to comply with any other provision of this Lease within fifteen (15) days following written notice from Lessor specifying the noncompliance, (iii) Lessee's insolvency, assignment for the benefit of its creditors, commencement of proceedings under any provision of any bankruptcy or insolvency law, or the appointment of a receiver for Lessee's properties, or (iv) Lessee's vacation or abandonment of the Premises without the written consent of Lessor. Upon any default, Lessor shall have the right to the following remedies, which are intended to be cumulative and in addition to any other remedies provided under applicable law or under this Lease: (a) Lessor may at its option terminate this Lease, without prejudice to its right to damages for Lessee's breach, (b) with or without termination, Lessor may enter and retake possession of the Premises by any means (including self- help) and may use or relet the Premises without accepting a surrender or waiving the right to damages, (c) Lessor may recover all damages caused by Lessee's default, including but not limited to an amount equal to delinquent Rent and future Rent lost because of the default.

**19. Attorney Fees.** If Lessor incurs attorney fees because of a default by Lessee, Lessee shall pay all such fees whether or not litigation is filed. In any litigation arising out of this Lease, including any bankruptcy proceeding, Lessor shall be entitled to recover attorney fees and expert witness fees and statutory costs incurred in arbitration, trial and on any appeal or petition for review.

**20. Applicable Law.** This Lease shall be construed and interpreted under the laws of Texas. Venue for all litigation relating to this agreement shall be in the District Court of Bowie County, Texas.

**21.** This Lease Agreement is made subject to, and Tenant agrees to be bound by those

certain exceptions, limitations, covenants, conditions and reservations made by and in favor of the United States of America, acting by and through the Secretary of the Army in that certain Deed Without Warranty dated the 20<sup>th</sup> day of May, 1999, and recorded in Volume 3072, Page 237 of the Real Property Records of Bowie County, Texas.

**22. Governmental Immunity.**By execution of this Agreement, TexAmericas Center does not waive its governmental immunity except to the extent it is contractually liable for damages for failure to perform its responsibilities under this Agreement. This limited waiver of governmental immunity shall not extend to, or for the benefit of, any person or entity other than Lessee.

**23. Limitation of Lessor's Liability.** Notwithstanding anything to the contrary contained herein, no personal or individual liability of any kind or character whatsoever shall now or at any time hereafter attach to Lessor or its property other than the Building for the payment of any amount payable under this Lease. The exclusive remedy of Tenant for the failure of Lessor to perform any of its obligations under this Lease shall be to proceed against the interest of Landlord in and to the Building.

**LESSEE:**

\_\_\_\_\_

By: \_\_\_\_\_

Date: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Mobile: \_\_\_\_\_

Email: \_\_\_\_\_

**LESSOR:**

TEXAMERCIAS CENTER

By: \_\_\_\_\_  
Scott Norton, Executive Director/CEO

Date: \_\_\_\_\_

Address: 107 Chapel Lane  
New Boston, Texas 75570

Tel.: 903-223-9841

**EXHIBIT "A"**  
**Building Floor Plan**  
**Bldg. # \_\_\_\_\_**

The Premises are outlined in Red.