The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated 12-09-2019, and executed by FHWA and TxDOT.

Archeological Background Study

**Project Name:** US 377 from BU 377 H (South) to 3000' North of FM 167 in Hood County

**Highway:** US 377

**District(s):** Fort Worth

**County(s):** Hood

**CSJ Number(s):** 00080-04-081 / 0080-03-049 / 0080-04-094/ 0080-03-060

**Author and Affiliation:** Kirsten M. Atwood, Ph.D., Raba Kistner, Inc.

**Report Completion Date:** October 6, 2022
Table of Contents

Introduction .................................................................................................................................... 3
Area of Potential Effects .................................................................................................................. 3
Information Source Checklist ......................................................................................................... 4
Analysis of Project Setting .............................................................................................................. 5
Conclusions .................................................................................................................................... 8
Recommendations .......................................................................................................................... 11
References Cited ............................................................................................................................... 13
Attachments ................................................................................................................................... 14
APPENDIX A: ................................................................................................................................. 23
Introduction

This project may require compliance both with Section 106 of the National Historic Preservation Act and with the Texas Antiquities Code. The purpose of this document is to identify risks for archeological historic properties within the project’s area of potential effects (APE). The document also considers whether any cemeteries may extend into the APE, requiring compliance with the state Health and Safety Code.

The following sections list the results of review of readily-available information for the APE’s setting and adjacent areas. The report also evaluates adjacent areas (a buffer zone; see Recommendations Section for definition of the buffer zone). The buffer zone is evaluated in case a subsequent design change expands the APE. This report concludes with separate recommendations regarding project effects and the need for additional work within shallow deposits less than three feet in depth and within Holocene-age deposits of three feet or greater depth, if such deep deposits are present.

This background study is (check one):

☒ the initial study for this project
☐ a continuation of previous investigations due to design changes or other reasons

Identify previous investigation(s):

Area of Potential Effects

The APE is defined to encompass the limits of the existing right of way; proposed, new project right of way; permanent and temporary easements; and any project-specific locations and utility relocations designated by TxDOT. Note: the APE encompasses the entirety of the project area, regardless of the extent of prior archeological investigations, the particular locations subject to proposed field investigations, or the portion of a project added through a design change. If impacts are not known, worst-case impacts are assumed in defining the APE.

The Texas Department of Transportation (TxDOT) Fort Worth District is proposing improvements to United States Highway (US) 377 from Holmes Drive to 3,000 feet north of Farm to Market Road (FM) 167 (Fall Creek Highway), a distance of approximately 9 miles, and State Highway (SH) 144 from Autumn Ridge Road to FM 51 (Paluxy Road), a distance of approximately 0.4 miles, in the city of Granbury, Hood County, Texas. The proposed project would require 26 acres of new ROW and 3.4 acres of permanent drainage easements. The typical depth of impacts is approximately 3 feet (0.9 meters [m]) and the maximum depth of impacts is expected to be 30 feet (9.1 m) below present ground surface. The APE for the proposed project encompasses approximately 279 acres.

See Attachment 1 for a map of the APE, which is based on the project information attached as Attachment 2.
Information Source Checklist

(check each source of information that was consulted by the professional archeologist in preparing this background study—the number and type of sources are at the professional archeologist’s discretion)

☑ Labelled USGS 7.5’ topographic quadrangle project location map (or equivalent if a 7.5’ quadrangle is unavailable) is attached and includes an inset map that depicts the county within Texas where the project occurs. (Attachment 1)

☑ Predictive Archeological Liability Map (PALM) is attached if available (consult TxDOT’s Environmental Compliance Toolkit). (Attachment 3)

☐ Geologic Atlas of Texas map is attached (PALM may be substituted for the GAT map, if it’s available.)

☐ Soils map is attached (PALM may be substituted for the soils map, if it’s available).

☑ FEMA flood hazard map is attached. (Attachment 4)

☑ National Wetlands Inventory map is attached. (Attachment 5)

☑ Texas Archeological Sites Atlas map is attached, depicting any sites within one kilometer of the APE or additional APE. (Attachment 6)

☐ Historic topographic map is attached.

☐ Historic soils map is attached.

☐ Historic road map is attached.

☐ As-built plans for roadway are attached.

☑ Other map of historic information is attached.

Specify Map: Recommended survey areas map and Schematics (Attachment 7 and Appendix A)

☐ Aerial images are attached.

☐ Project area photographs are attached.
Analysis of Project Setting

- Previously-Identified Archeological Sites

☐ No archeological sites have been identified within the APE or within 150 feet of the APE

☒ Archeological sites have been identified within the APE or within 150 feet of the APE

No archaeological sites are mapped within the APE (see Attachment 6). The nearest archaeological site is site 41HD11, which is located approximately 250 feet (76 m) west of the APE on the east bank of the Brazos River. Site 41HD11 was first recorded in 1953 as a 2 to 3 acre prehistoric open campsite with projectile points, a chopper, a mano, and scrapers. The site boundaries were not recorded. The site was revisited in 2015. No cultural material was found, and the site was assessed as destroyed. Site 41HD11 was determined to be ineligible for the National Register of Historic Places (NRHP) in 2015 (THC 2022).

Seven additional archaeological sites are recorded within 0.62 mile (1 kilometres [km]) of the APE. These include six prehistoric sites and one twentieth century farmstead. None have been determined to be eligible for the NRHP (THC 2022)

Table 1. Archaeological Sites within 1 km (0.62 mile) of the Area of Potential Effects.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Location</th>
<th>Site Type</th>
<th>NRHP Eligibility Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>41HD911</td>
<td>East bank of Brazos River near East Pearl Street</td>
<td>Open campsite</td>
<td>Ineligible (2015)</td>
</tr>
<tr>
<td>41HD16</td>
<td>Woodcreek Court</td>
<td>Lithic scatter</td>
<td>No Determination</td>
</tr>
<tr>
<td>41HD38</td>
<td>Former west bank of Brazos River west of Waterpoint Court West</td>
<td>Lithic scatter</td>
<td>No Determination</td>
</tr>
<tr>
<td>41HD52</td>
<td>East bank of Brazos River south of Rockview Drive</td>
<td>Lithic chipping station</td>
<td>No Determination</td>
</tr>
<tr>
<td>41HD53</td>
<td>East bank of Brazos River west of Granview Drive</td>
<td>Lithic chipping station</td>
<td>No Determination</td>
</tr>
<tr>
<td>41HD54</td>
<td>East bank of Brazos River south of Rockview Drive</td>
<td>Lithic chipping station and probable habitation site</td>
<td>No Determination</td>
</tr>
<tr>
<td>41HD94</td>
<td>East bank of Brazos River near Chanel Drive</td>
<td>Lithic scatter</td>
<td>No Determination</td>
</tr>
<tr>
<td>41HD96</td>
<td>South of Old Granbury Road and east of Business Boulevard</td>
<td>20th century farmstead</td>
<td>Ineligible (2021)</td>
</tr>
</tbody>
</table>
• Previously-Identified Cemeteries

☐ No known cemetery sites occur within the APE or within 150 feet of the APE.

☐ Cemeteries occur within the APE or within 150 feet of the APE.

No cemeteries are recorded within or within 150 feet of the APE. The nearest recorded cemetery is a vicinity cemetery named Bond or Lost Grove Cemetery (HD-C046). It is believed to be located approximately 0.5 mile (0.8 km) north of the APE (THC 2022). See Attachment 6 for cemetery location.

• Holocene-Age Deposits

☐ No Holocene-age deposits occur within or adjacent to the APE.

☒ Holocene-age deposits occur within or adjacent to the APE.

The underlying geology of the APE is mapped as Glen Rose Formation (Kgr), Quarternary deposits, undivided (Qu), Fluviatile terrace deposits (Qt), and Paluxy Formation (Kpa). Glen Rose Formation is composed of Cretaceous limestone, as well as some clay, marl, and sand. Quarternary deposits are Holocene and Pleistocene-aged deposits of colluvium with some alluvium and alluvial fan deposits. Fluviatile terrace deposits are Pleistocene-aged deposits of gravel, sand, silt, and clay. Paluxy Formation is formed from Cretaceous-age deposits of sandstone, mudstone, and limestone (United States Geological Survey 2022).

Consultation of the 1987 Geological Atlas of Texas, Dallas Sheet (Bureau of Economic Geology 1987) indicates that Holocene-aged deposits (Qal and Qu) within the APE are present immediately south of the Brazos River and in certain areas west of it. As shown in TxDOT’s PALM (see Attachment 3), some soil deposits have a strong potential to contain deep cultural deposits.

• Historically-Reliable Water Sources

☐ No historically-reliable water sources occur within 500 feet of the APE.

☒ Historically-reliable water sources occur within 500 feet of the APE, or this question can’t be answered confidently.

A review of both the Granbury (3297-234) and Action (3297-243), Texas. USGS 7.5-minute topographic quadrangle maps shows that there are multiple water sources mapped either intersecting or within 500 feet (152 m) of the APE. The Brazos River intersects and is paralleled by a portion of the APE. Furthermore, Lambert Branch, one of its unnamed intermittent tributaries, several unnamed tributaries contributing to Rucker Creek, Lick
Branch and one of its intermittent tributaries, and an unnamed tributary contributing to the Brazos River intersect the APE. See Attachments 1, 4 and 5 for locations of water sources.

- **Wetlands and Frequently-Flooded Areas**
  - ☑️ The APE and adjacent areas contain wetlands or frequently-flooded areas.
  - ☐ The APE and adjacent areas do not contain wetlands or frequently-flooded areas, or this question cannot be answered confidently.

  Areas adjacent to Lambert Branch and its tributary, the Brazos River and its tributary, and a tributary of Rucker Creek may be subject to flooding (see Attachment 4). One freshwater emergent wetland is mapped south of the APE east of the Brazos River (see Attachment 5) (United States Fish and Wildlife Service 2022).

- **Preferred Landforms for Occupation**
  - ☐ The Atlas map or other information shows that the APE does not contain landforms on which human settlement or occupation typically occurred.
  - ☑️ The Atlas map or other information shows that the APE does contain landforms on which human settlement or occupation typically occurred, or this issue was not resolved with the available information.

  The APE is situated in a location with abundant access to fresh water and generally gently rolling topography. Reference to the Atlas (THC 2022) indicated that seven prehistoric archaeological sites and one historic archaeological site are recorded within 0.62 mile (1 km) of the APE, indicating that it is in an area amenable to human settlement or occupation. See Attachment 6 for locations of these sites.

- **Prior Disturbances**

  Settings that are favorable for human occupation have been subject to the following previous disturbances *(check all that apply)*.

  - ☑️ Previous road construction and maintenance.
  - ☑️ Installations of utilities.
  - ☑️ Modern land use practices like plowing, grade modifications, brush clearing, and tree removal,
  - ☑️ Industrial, commercial, urban and/or suburban development
  - ☐ Erosion and scouring by natural causes.
☐ Other (identify)

☐ NO PRIOR DISTURBANCES OR UNKNOWN (do not check any foregoing disturbances)

- **Previous Archeological Surveys**

  ☒ The majority of the settings with high potential for archeological sites within or adjacent to the APE have been previously surveyed.

  □ The majority of the settings with high potential for archeological sites within or adjacent to the APE have not been previously surveyed.

  A linear survey directs through and near much of the area with high potential for archaeological sites. However, its date and methods of survey are not identified on the *Atlas* (THC 2022), so its negative findings cannot be assessed as reliable. See *Attachment 6* for locations of archaeological surveys.

- **Conclusions**

  - **Results of Previous Investigations**

    ☐ Previous surveys have covered a sufficient proportion of the APE or adjacent areas to conclude that the APE and adjacent areas are unlikely to contain archeological sites or cemeteries.

    ☒ Previous surveys have not covered a sufficient proportion of the APE or adjacent areas to draw inferences regarding the presence of archeological sites and cemeteries, or previous surveys show that archeological sites and/or cemeteries are present within the APE.

  - **APE Integrity (Prehistoric Sites)**

    The APE contains no deposits with sufficient integrity that prehistoric archeological sites would have the potential to address important questions. Any such sites would lack integrity of *(check all that apply):*

    ☐ Location

    ☐ Design

    ☐ Materials

    ☐ Association

    ☐ Other *(identify)*
THE APE HAS THE POTENTIAL TO PRESERVE SITES WITH SUFFICIENT INTEGRITY TO QUALIFY THOSE SITES FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES (if true, do not check any of the forgoing aspects of integrity)

- **APE Integrity (Historic-Age Sites)**

  The APE contains no deposits with sufficient integrity that historic-age archeological sites would have the potential to address important questions. Any such sites would lack integrity of (check all that apply):

  - ☒ Location
  - ☐ Design
  - ☐ Materials
  - ☐ Association
  - ☐ Other (identify)

  Due to road construction, significant intact historical deposits are unlikely to be located within the APE.

  THE APE HAS THE POTENTIAL TO PRESERVE SITES WITH SUFFICIENT INTEGRITY TO QUALIFY THOSE SITES FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES (if true, do not check any of the forgoing aspects of integrity)

- **Results of Historic Map Research (Historic Age Sites)**

  ☐ Historic map research shows that historic-era archeological deposits are not likely to occur within or adjacent to the APE

  ☑ Historic map research shows that historic-era archeological deposits could occur within or adjacent to the APE; this research was inconclusive; or this research was not completed because it was not necessary to reach justifiable conclusions.

  A review of available historic topographic maps and aerial photographs was conducted to determine the history of land use and development of the APE. The earliest available topographic maps date to 1889 and depict Granbury north of the Brazos River. Portions of the APE are shown to be developed with roads. The Fort Worth and Rio Grande Railroad is depicted. Much of the APE adjacent to the Brazos River and Lambert Branch is depicted as undeveloped. The 1923 and 1961 topographic maps depict much of the APE developed with roads, and indicate several potential historical structures. The 1987 topographic map is the first map to depict US 377 in its approximate current configuration, including road development adjacent to the Brazos River and Lambert Branch.
The earliest available historical photograph of the APE dates to 1981. It shows that much of the APE was developed with roads by this time. US 377 is shown in its approximate current location, but is shown to be narrower than its current configuration. Development within and adjacent to the APE is shown to increase with time.

Atlas indicates one Official Texas Historical Marker (OTHM) within the APE, and two OTHM and one National Register Property (NR Property) within 200 feet (61 m) of the APE (THC 2022). The OTHM within the APE is anticipated to be moved as a result of the project. The marker is Marker No. 6256, located approximately 653 feet (205 m) west of Fall Creek Highway. It serves to indicate that the 1860 grave of Elizabeth Crocket is located three miles to the south. The first non-intersecting OTHM is Marker No. 1711, located approximately 32 feet (10 m) south of the APE at 2109 West U.S. Hwy 377. It marks the location of the late 1800s First Christian Church of Granbury. The second non-intersecting marker is additionally associated with a NR Property, the Wright-Henderson-Duncan House. The marker is Marker No. 5913, located approximately 150 feet (46 m) west of the APE. The 1873 limestone house served as the home of three Hood County sheriffs. It is located at 703 Spring Street, approximately 125 feet (38 m) west of the APE. No ROW or easements are required from the property.

Due to road construction, significant intact historical deposits are unlikely to be located within the APE.

- **Results of Map Research (Cemeteries)**
  - Map research shows that cemeteries are not likely to occur within or adjacent to the APE.
  - Map research shows that cemeteries could occur within or adjacent to the APE, or this research was inconclusive.

- **Results of Landform Study**
  - The APE and adjacent areas occur in a setting that was not conducive to human occupation and activity
  - The APE and adjacent areas occur in a setting that was conducive to human occupation and activity; research on this issue was inconclusive; or this research was not completed
  - Because it was not necessary to reach justifiable conclusions.
Recommendations

- **Shallow Deposits**

  Evaluate the potential for shallow deposits (Holocene-age deposits less than three-feet in depth) within the APE to contain archeological historic properties and cemeteries. Make appropriate recommendations regarding the need for further work, including the need for shovel test pits, auger probes, or other methods for evaluating shallow deposits.

  The PALM predicts that the APE has a highly variable potential to contain shallow deposits of cultural deposits. The APE is scored as having a negligible, low, moderate, and high potential to contain shallow cultural deposits. Much of the APE has been strongly impacted by road installation and urban development, likely disturbing any shallow cultural deposits within these areas. However, the APE south of US 377 between Paluxy Road and South Morgan Street appears to be relatively undisturbed based on aerial photographs and topographic maps. This portion of the Project Area is scored as a 1 (low archaeological potential), 4 (moderate shallow potential, low deep potential), and a 5 (moderate shallow and moderate deep potential) on the PALM. As such, RKI recommends that this portion of the APE be subject to intensive pedestrian survey with shovel testing. See Attachment 3 for the PALM map and Attachment 7 for the recommended areas of survey.

- **Deep Deposits**

  Evaluation of deep deposits (Holocene-age deposits of three feet or greater depth) may or may not be necessary, depending on the nature of the sediments within the APE and the depth of proposed impacts. If Holocene-age deposits extend to three feet or more within the APE and would be impacted by the project, make appropriate recommendations regarding the need for further work. If no deep, Holocene-age deposits occur within the APE note that they are absent and indicate that no additional work is needed. If the deep Holocene deposits are present but the project either would not affect them or they have been too extensively disturbed to hold intact archeological deposits, provide an appropriate justification that no additional work is needed.

  The PALM and Bureau of Economic Geology (1987) indicate that Holocene-age deposits within the APE are most likely located south of and west of the Brazos River. As the APE has been strongly impacted by previous road and ditch installation, as well as urban development, RKI recommends that only relatively undisturbed areas estimated to have a high probability of containing deep cultural deposits on the PALM be investigated for these deposits. These areas are scored as 3 and 9 on the PALM. As such, RKI recommends that a section of the APE at Lambert Branch, as well as a section of the APE at one of the Lambert Branch tributaries east of Pirate Drive, where road improvements will be accompanied by drainage improvements, be investigated for deep cultural resources. Additionally, RKI recommends that the relatively undisturbed approximately 0.48 mile of the APE east of the Brazos River be investigated for deep cultural deposits. To further ensure that any cultural resources within the APE have been documented and assessed in regards to their cultural significance, RKI further recommends that a section of the APE at an unnamed intermittent tributary of Rucker Creek west of Corporate Drive be investigated for deeply buried cultural deposits. Drainage improvements are scheduled to be conducted in this area. This Rucker
Creek tributary section of the Project Area is scored as a 9 on the PALM map, indicating a high potential for deeply and shallowly buried cultural deposits.

Investigations should take place via mechanical backhoe. See Attachment 3 for the PALM map and Attachment 7 for the recommended areas of survey.

- **Recommendations Summary (select only one check box)**
  - ☐ No further study needed
  - ☐ Survey of entire APE
  - ☒ Variable, see attached figure

- **Results Valid Within**
  
  *The purpose of considering adjacent areas is to define, when possible, a buffer zone around the APE to which findings of no effect and recommendations for no further work can be extended. No additional investigation should be necessary if a subsequent design change expands the APE into the buffer zone. In some cases, however, no buffer zone may be reasonably defined for the project or portions of the project as expansion of the APE may warrant survey. In such cases, check the middle box and indicate that the results are valid within zero feet of the APE.*

  - ☐ 50 feet of APE
  - ☒ 0 feet of APE
  - ☐ Variable, see attached figure

- **The Definition and Evaluation of this Horizontal Buffer Zone is Based on One or More of the Following Considerations**

  ☒ The integrity of the areas within and adjacent to the setting is affected by prior development.

  ☒ Previous investigations show that archaeological materials are unlikely to exist in this area.

  ☒ Adjacent areas have potential to preserve archaeological sites with good integrity.

  ☐ Other (specify)

Findings of no effect to archaeological historic properties and/or State Antiquities Landmarks and recommendations for no further work apply to all areas within the horizontal buffer zone, as specified in the previous section. Any design change within this study area would not require further action or review beyond those actions recommended in this study. Design changes that either extend beyond the buffer zone or result in potential impacts deeper than the impacts considered in this report would require additional review. Note that no buffer zone may be defined for some projects, based on local conditions.
References Cited

Bureau of Economic Geology
1987  *Geologic Atlas of Texas, Dallas Sheet*. First printed 1954. V.E. Barnes, Project Director. University of Texas at Austin

Historicaerials.com

Natural Resources Conservation Service (NRCS)

Texas Historical Commission (THC)

United States Fish and Wildlife Service

United States Geological Survey (USGS)
Attachments

Attachment 1 – APE depicted on the *Granbury and Action, Texas* USGS 7.5-minute topographic quadrangle maps.

Attachment 2 – Project information from ECOS.

Attachment 3 – Predictive Archeological Liability Map of the APE.

Attachment 4 – FEMA flood hazard zones associated with the APE.

Attachment 5 – National Wetlands Inventory Map of the APE.

Attachment 6 – Cultural resources and previous investigations within a 1-kilometer (0.62-mile) radius of the APE.

Attachment 7 – Recommended survey areas within the APE.
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RESTRICTED SITE LOCATION INFORMATION - FIGURES REMOVED
Attachment 7 – Recommended survey areas within the APE.
APPENDIX A:

Schematics
This report was written on behalf of the Texas Department of Transportation by:

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