Biological Evaluation Form

Main CSJ: 0314-07-046

Date of Evaluation: May 23, 2016

☐ *Project has no Federal nexus.*

Proposed Letting Date: October 2016

☐ *Project not assigned to TxDOT under the NEPA Assignment MOU*

District(s): Fort Worth

County(ies): Parker

Roadway Name: Interstate Highway (IH) 20 at Center Point Road

Limits From: 0.55 Mile West of East Bankhead Highway

Limits To: Lakeshore Drive

Project Description: Interchange improvements between Center Point Road and East Bankhead Drive with IH-20 and adding frontage roads.

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 December 16, 2014, and executed by FHWA and TxDOT.

Endangered Species Act (ESA)

No — Is the action area of the proposed project within the range and in suitable habitat of federally protected species?

Date that the IPaC system was accessed: May 13, 2016

Resources consulted or activities conducted to make effect determination (if applicable):

- ☒ TPWD County List
- ☐ USFWS Critical Habitat Maps
- ☐ Species Expert Consulted
- ☒ Aerial Photography
- ☐ Coastal Areas Maps
- ☒ Site Visit
- ☒ Topographic Map
- ☐ Species Study Conducted
- ☐ Karst Zone Maps
- ☒ Ecological Mapping System of Texas (EMST)
- ☒ Natural Diversity Database (NDD)

Other:

Migratory Bird Treaty Act (MBTA)

Yes — Is there potential for nesting birds to be present in the project action area during construction?

No — Were active nests identified during the site survey?

Yes — Will BMPs will be incorporated to protect migratory bird nests?

Bald and Golden Eagle Protection Act (BGEPA)

No — Does the proposed project have the potential to impact Bald or Golden Eagles?

Comments:

No suitable habitat is present in the project area.

Fish and Wildlife Coordination Act (FWCA)

Yes — Does the project have impacts on one or more Waters of the U.S. or wetlands?

Yes — Is the project covered by a Nationwide Permit?

No — Is the project covered by an Individual Permit from the USACE?

Comments:

Field investigations of the project area on April 29 and May 2, 2014 and January 23, 2015 revealed that within the project limits, there are no wetlands and five water bodies (Streams 1 through 5) subject to U.S. Army Corps of Engineers' (USACE) jurisdiction under Section 404 of the Clean Water Act (CWA). These streams would be considered special habitat features. The Table below presents a summary of water body and related project data.

Streams within the Proposed Project Area

Stream 1: (Underwood Branch) 6 ft. wide OHWM, Intermittent Stream with 0.03 acre of permanent impact due to Culvert Extension
Stream 2: 1 ft. wide OHWM, Ephemeral Stream with no permanent (temporary only) impact due to Erosion Control
Stream 3: 1.5 ft. wide OHWM, Intermittent Stream with less than 0.01 acre of permanent impact due to Culvert Extension
Stream 4: 2 ft. wide OHWM, Intermittent Stream with less than 0.01 acre of permanent impact due to Culvert Extension
Stream 5: (Willow Creek) 12 ft. wide OHWM, Intermittent Stream - minor permanent impacts (0.03 acre) to protect structure (bridged)

Construction activities within the OHWM of the streams to be impacted would include small amounts of excavation and channel scraping for the placement of culvert extensions and fill within the streams would consist of the concrete culvert extensions. Impacts to the streams would be minimized by limiting construction to only the area required to properly construct the culvert extensions. The stream impacts would be permitted under USACE's Nationwide Permit 14 with no PCN. Due to the wide separation of these areas, each was considered a single and complete project with the impacts of each falling under the criteria of NWP 14 with no PCN required.

Executive Order 13112 on Invasive Species

Yes — Would the project be in compliance with EO 13112?

Comments:

During construction, efforts would be taken to avoid and minimize disturbance of vegetation and soils. All areas disturbed during construction would be revegetated according to TxDOT specifications as soon as it becomes practicable. In accordance with EO 13112 on Invasive Species, the Executive Memorandum on Beneficial Landscaping, and the 1999 FHWA guidance on invasive species, only non-invasive species would be planted within the ROW. Permanent soil erosion control features would be constructed as soon as feasible during the early stages of construction through proper sodding and/or seeding techniques. Disturbed areas would be restored and stabilized as soon as the construction schedule permits and temporary sodding would be considered where large areas of disturbed ground would be left bare for a considerable length of time. In accordance with EO 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping, sodding or seeding and replanting with TxDOT approved seeding specifications that are in compliance with EO 13112 would be done where possible. Moreover, abutting turf grasses within the ROW are expected to re-establish throughout the project area. Soil disturbance would be minimized to ensure that invasive species would not establish in the ROW.

Executive Memorandum on Beneficial Landscaping

Yes — Would landscaping be included in the proposed projects?

Describe landscaping activities:

Disturbed areas would be restored and stabilized as soon as the construction schedule permits and temporary sodding would be considered where large areas of disturbed ground would be left bare for a considerable length of time. In accordance with E.O. 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping, seeding with TxDOT approved seeding specifications that, to the extent practicable, is in compliance with E.O. 13112 would be done where possible. Moreover, abutting turf grasses within the ROW are expected to re-establish throughout the project length. Soil disturbance would be minimized to reduce the potential that invasive species would establish in the ROW. There would be no ornamental plantings allowed in the landscaping of the project.

Yes — Would the proposed project be in compliance with the Executive Memorandum on Beneficial Landscaping?

Farmland Protection Policy Act (FPPA)

Yes — Would the project require new ROW or permanent easements (do not include temporary easements)?

No — Is the project located in a "non-urbanized area" that contain areas mapped as prime, unique, statewide important or locally important farmland by the NRCS Web Soil Survey or Census Bureau?

Date that the Web Soil Survey was accessed: May 13, 2016

General Comments

Area is in urban development. Almost the entire area is indicated on the future land use plans of Weatherford and Hudson Oaks as a mix of urban land uses. Therefore, the project area was considered exempt from FPPA.

TPWD Analysis Section

Texas Parks and Wildlife Coordination Conditions

1. No — Is the project limited to a maintenance activity exempt from coordination?

   http://txdot.gov/inside-txdot/division/environmental/maintenance-program.html

2. No — Has the project previously completed coordination with TPWD?

Tier I Site Assessment

MOU Triggers

1. Yes — Is the project within range of a state threatened or endangered species or SGCN and suitable habitat is present?

*Explanation:

Suitable habitat was identified for eleven state-listed or rare species: western burrowing owl (*Athene cunicularia hypugaea*), plains spotted skunk (*Spilogale putorius interrupta*), Texas garter snake (*Thamnophis sirtalis annectens*), timber rattlesnake (*Crotalus horridus*), Comanche Peak prairie-clover (*Dalea reverchonii*), Glen Rose yucca (*Yucca necopina)* Hall's prairie clover (*Dalea hallii*), Mohlenbrock's sedge (*Cyperus grayoides*), Osage Plains false foxglove (*Agalinis densiflora*), Quayle's butterweed (*Senecio quaylei*), and Reverchon's scurfpea (*Pediomelum reverchonii*). The western burrowing owl, plains spotted skunk, Texas garter snake, Comanche Peak prairie-clover, Glen Rose yucca, Hall's prairie clover, Mohlenbrock's sedge, Osage Plains false foxglove, Quayle's butterweed, and Reverchon's scurfpea are considered state species of concern, and the timber rattlesnake is a state threatened species. The ROW was surveyed on May 21, 2015 and May 16, 2016 and no listed species were observed.

Date TPWD County List Accessed: May 13, 2016

Date that the NDD was accessed: May 16, 2016

What agency performed the NDD search? TPWD

1.1 Yes — Does the BMP PA eliminate the requirement to coordinate for all species?

*Explanation:

With implementation of Programmatic Agreement BMPs in the project, there are no species with suitable habitat in the project area for which coordination is required.

2. No — NDD and TCAP review indicates adverse impacts to remnant vegetation?

Comments:

3. No — Does the project require a NWP with PCN or IP by USACE?

Comments:

The project would qualify for authorization under NWP 14 without a PCN.

4. Yes — Does the project include more than 200 linear feet of stream channel for each single and complete crossing of one or more of the following that is not already channelized or otherwise maintained:

   No — Channel realignment; or

   Yes — Stream bed or stream bank excavation, scraping, clearing, or other permanent disturbance.

*Explanation:

Approximately 200 feet of culverts added to Stream 1 (Underwood Branch).

5. No — Does the project contain known isolated wetlands outside the TxDOT ROW that will be directly impacted by the project?

Comments:

6. Yes — Would the project impact at least 0.10 acre of riparian vegetation?

*Explanation:

The proposed project would permanently impact approximately 0.97 acre of riparian habitat in the existing ROW, 0.21 acre in the new ROW, 0.04 acre in the existing easement, and less than 0.02 in the new easement based upon field verified habitat types for a total of 1.24 acre of riparian habitat permanently impacted. Total temporary impacts of riparian habitat within ROW and easements (existing and new) would be approximately 2.24 acre.

7. Yes — Does project disturb a habitat type in an area equal to or greater than the area of disturbance indicated in the Threshold Table Programmatic Agreement?

*Explanation:

Approximately 6.29 acres of riparian habitat would be included in the ROW (existing and new). The new ROW and easements would permanently impact approximately 1.24 acre of riparian habitat through paving or other modification. Approximately 1.68 acre of FEMA classified floodplain would be within the new ROW and easement, and 1.48 acre of floodplain would be paved. Impacts to the field verified MOU Type floodplain would total 0.12 acre. These data have been field verified for the mapped types.

*Attach associated file of EMST output (Mapper Report or other Excel File which includes MOU Type, Ecosystem Name, Common/Vegetation Type Name) in ECOS

Excel File Name:

land_cover_revisions_20160523 and Habitat_Type_Discrepancy_Data (Excel spreadsheets). These show discrepancies between mapped types and field verified types.

7.1 Yes — Is there a discrepancy between actual habitat(s) and EMST mapped habitat(s)?

*Explanation:

The EMST shows predominantly urban habitats; however, field data indicate native vegetation is present throughout the project area. In addition, due to the limitations of the scale that the Texas Ecological Classification System Cover Types are mapped (30 meter resolution), they do not lend well to roadway projects that are mapped in much finer detail. To incorporate this data, aerial imagery was used to facilitate the land cover delineations in addition to field verifications. These classifications were then assigned to the nearest, relevant cover type for a more accurate eco system classification. Disturbed areas such as maintained ROW or maintained grassland were identified separately rather than lumping them into urban, or savannah categories. These categories were reserved for areas that more accurately reflected the typical cover type characteristics expected of the stated classifications. Since residential areas were presented in the analysis, this category was subsequently added. We conducted a field survey on December 9, 2015 to determine the extent of these discrepancies.

Attach file showing discrepancy between actual and EMST mapped habitat(s).
File Name:

Habitat type discrepancy data (Excel spread sheet)

Is TPWD Coordination Required?

Yes

☐ Early Coordination

☒ Administrated Coordination - Must be conducted through ENV-NRM

BMPs Implemented or EPICs included (as necessary):

Bird BMPs: Not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season. Avoiding the removal of unoccupied, inactive nests, as practicable. Preventing the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. Not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.

Plains Spotted Skunk BMP: Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens.

Reptile BMPs: Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered. Due to increased activity (mating) of reptiles, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged. When designing roads with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small mammals to get out of roadways.

Vegetation BMPs: Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable. Wherever practicable, impacted vegetation should be replaced with in-kind on-site replacement/ restoration of native vegetation. To minimize adverse effects, activities should be planned to preserve mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation have high value to wildlife as food and cover. It is strongly recommended that trees greater than 12 inches in dbh that are removed be replaced. TPWD's experience indicates that for ecologically effective replacement, a ration of three trees for every one (3:1) lost should be provided to the extent practicable either on-site or off-site. Trees less than 12 inches dbh should be replaced at a 1:1 ratio. Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species. When trees are planted, a maintenance plan that ensures at least an 85 percent survival rate after three years should be developed for the replacement trees. The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used. The use of seed mix that contains from only locally adapted native species is recommended Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds.

TxDOT Contact Information

Name: Elisa Garcia

Phone Number: 817.370.6718

E-mail: Elisa.Garcia@txdot.gov

Findings

Endangered Species Act (ESA)

No suitable habitat was observed for any federally listed species. Therefore, there would be no effect on federally listed species. However, measures to avoid harm to any threatened and endangered species would be taken should they be observed during construction of the proposed project. Coordination with the USFWS would not be required. The USFWS IPaC website was accessed on May 13, 2016.

Essential Fish Habitat (EFH)

Essential fish habitat is defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Tidally influenced waters do not occur within the project action area. Coordination with National Marine Fisheries Service (NMFS) is not required.

Coastal Barrier Resources Act (CBRA)

This project is not located within a designated CBRA map unit. Coordination with the U.S. Fish and Wildlife Service (USFWS) is not required.

Marine Mammal Protection Act (MMPA)

Marine mammals are protected under the Marine Mammal Protection Act (MMPA). The Texas coast provides suitable habitat and is within range of several marine mammals including the West Indian Manatee (*Trichechus manatus*), and bottlenose dolphin (*Tursiops truncatus*).

The project area does not contain suitable habitat for marine mammals. Coordination with NMFS is not required.

Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations.

A site survey did not identify active nests within the project action area. TxDOT will take all appropriate actions to prevent the take of migratory birds, their active nests, eggs, or young by the use of proper phasing of the project or other appropriate actions.

A MBTA appropriate EPIC will be included in the project file.

Bald and Golden Eagle Protection Act (BGEPA)

The proposed project does not have the potential to impact Bald or Golden Eagles.

Fish and Wildlife Coordination Act (FWCA)

The Fish and Wildlife Coordination Act (FWCA) of 1958 requires that federal agencies obtain comments from USFWS and TPWD. This coordination is required whenever a project involves impounding, diverting, or deepening a stream channel or other body of water.

The proposed project is authorized under a Section 404 of the Clean Water Act Nationwide Permit; therefore, no coordination under FWCA would be required.

Executive Order 13112 on Invasive Species (EO 13112)

Re-vegetation of disturbed areas would be in compliance with the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants will be used to the extent practicable in landscaping and re-vegetation.

Executive Memorandum on Beneficial Landscaping

Landscaping would be a part of the proposed project activities. Re-vegetation of disturbed areas would be in compliance with the Executive Memorandum on Beneficial Landscaping (26Apr94). Regionally native and non-invasive plants will be used to the extent practicable in landscaping and re-vegetation.

Disturbed areas would be restored and stabilized as soon as the construction schedule permits and temporary sodding would be considered where large areas of disturbed ground would be left bare for a considerable length of time. In accordance with E.O. 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping, seeding with TxDOT approved seeding specifications that, to the extent practicable, is in compliance with E.O. 13112 would be done where possible. Moreover, abutting turf grasses within the ROW are expected to re-establish throughout the project length. Soil disturbance would be minimized to reduce the potential that invasive species would establish in the ROW. There would be no ornamental plantings allowed in the landscaping of the project.

Farmland Protection Policy Act (FPPA)

Coordination with the National Resources Conservation Service (NRCS) for FPPA would not be required because the project is not located in areas mapped as prime, unique, statewide or locally important nor is it located in an "urbanized area" identified by the NRCS Web Soil Survey or Census Bureau.

Signatures:

No Was this form completed by TxDOT environmental staff?

Prepared By: Dan Gise, Freese and Nichols, Inc. Title: Environmental Scientist

Dan Gise Digitally signed by Dan Gise Date: 2016.05.31 06:48:20 -05'00' Date: May 31, 2016

Signature

TxDOT Reviewer: Title:

Date:

Signature

Suggested Attachments

Aerial Map (with delineated project boundaries)

USFWS T&E List

TPWD T&E List

Species Impact Table

NDD EOID List and Tracked Managed Areas (Required for TPWD Coordination)

NOAA EFH Mapper Printout

USFWS CBRA Mapper Printout

EMST Project MOU Summary Table (Required for TPWD Coordination)

TPWD SGCN List

FPPA Documentation

NRCS Web Soil Survey Map

Census Bureau Urbanized Area Map

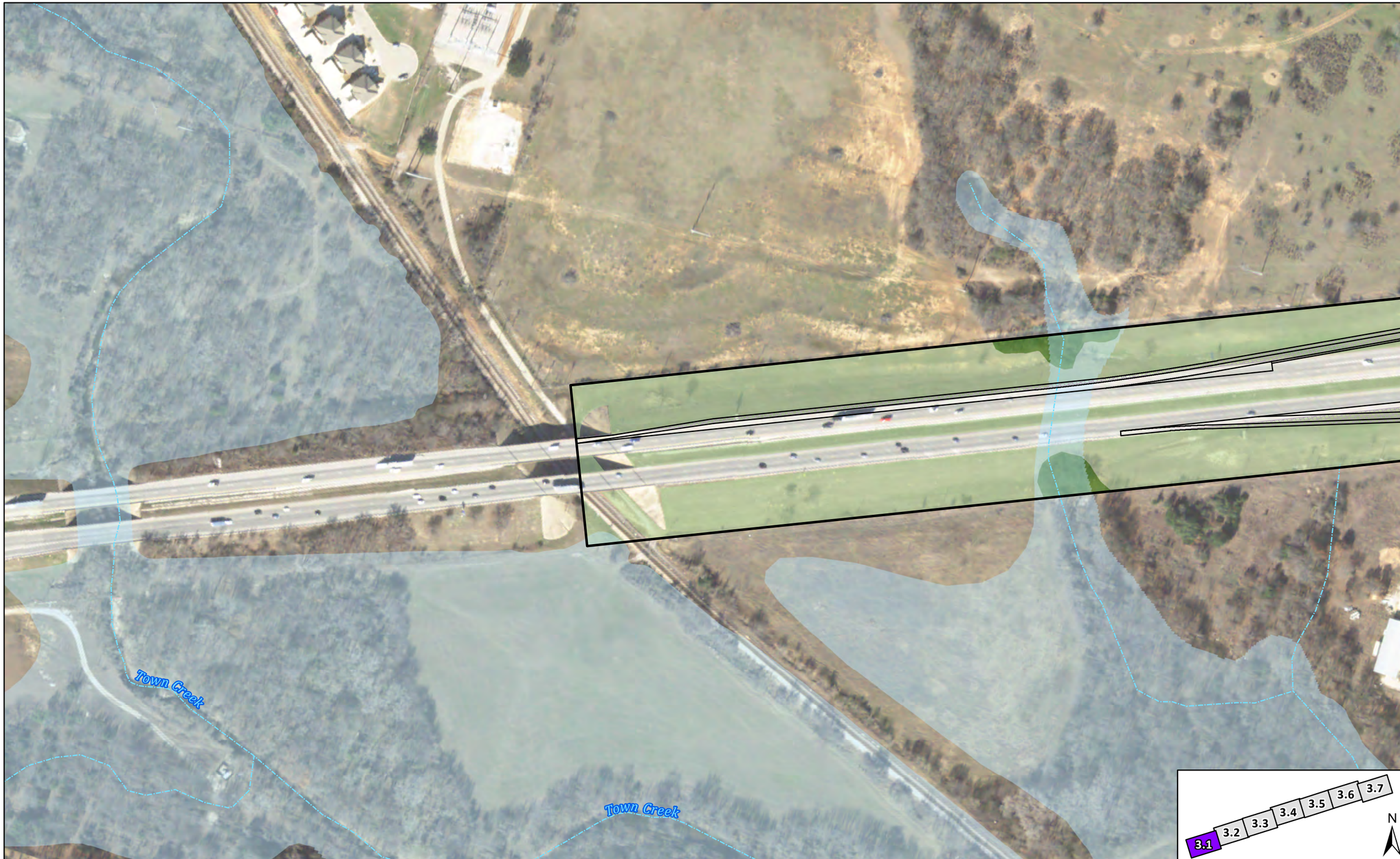
Landscaping Plans

Photos (Required for TPWD Coordination)

Previous TPWD Coordination Documentation (if applicable)

The following table shows the revision history for this guidance document.

Revision History	
Effective Date Month, Year	Reason for and Description of Change
May 2014	Version 1 released.
August 2015	Version 2 released. Revised the overall appearance to be more consistent with a form. Upgraded the District and County selection fields for increased simplicity. Included the NEPA Assignment MOU language for projects that are assigned to TxDOT under the NEPA Assignment MOU. Revised the Endangered Species Act to distinguish between take/no take and affect based on the project having or not having a federal nexus. Updated the Farmland Protection Policy Act questions to be more consistent with the applicable regulations.



FN PROJECT NO.	PRK12278
DATE CREATED	5/19/2016
DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	C-3 Cover Type MB 20160517
PREPARED BY	SS3

PARKER CO.
IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

Stream Crossing (SC #)
Streams
100 Year Floodplain
Revisions to cover types after field verification

Existing ROW
Proposed ROW
Existing Easement
Proposed Permanent Easement
Proposed Temporary Easement

Proposed Edge of Pavement
New Proposed Pavement
Blackland Prairie: Disturbance or Tame Grassland
Central Texas: Floodplain Hardwood Forest
Central Texas: Riparian Hardwood Forest

Commercial
Crosstimbers: Post Oak Woodland
Crosstimbers: Savanna Grassland
Edwards Plateau: Oak/Hardwood Motte and Woodland
Edwards Plateau: Savanna Grassland

Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

0 100 200 400 Feet
1 inch equals 200 feet

C-3.1

FIGURE

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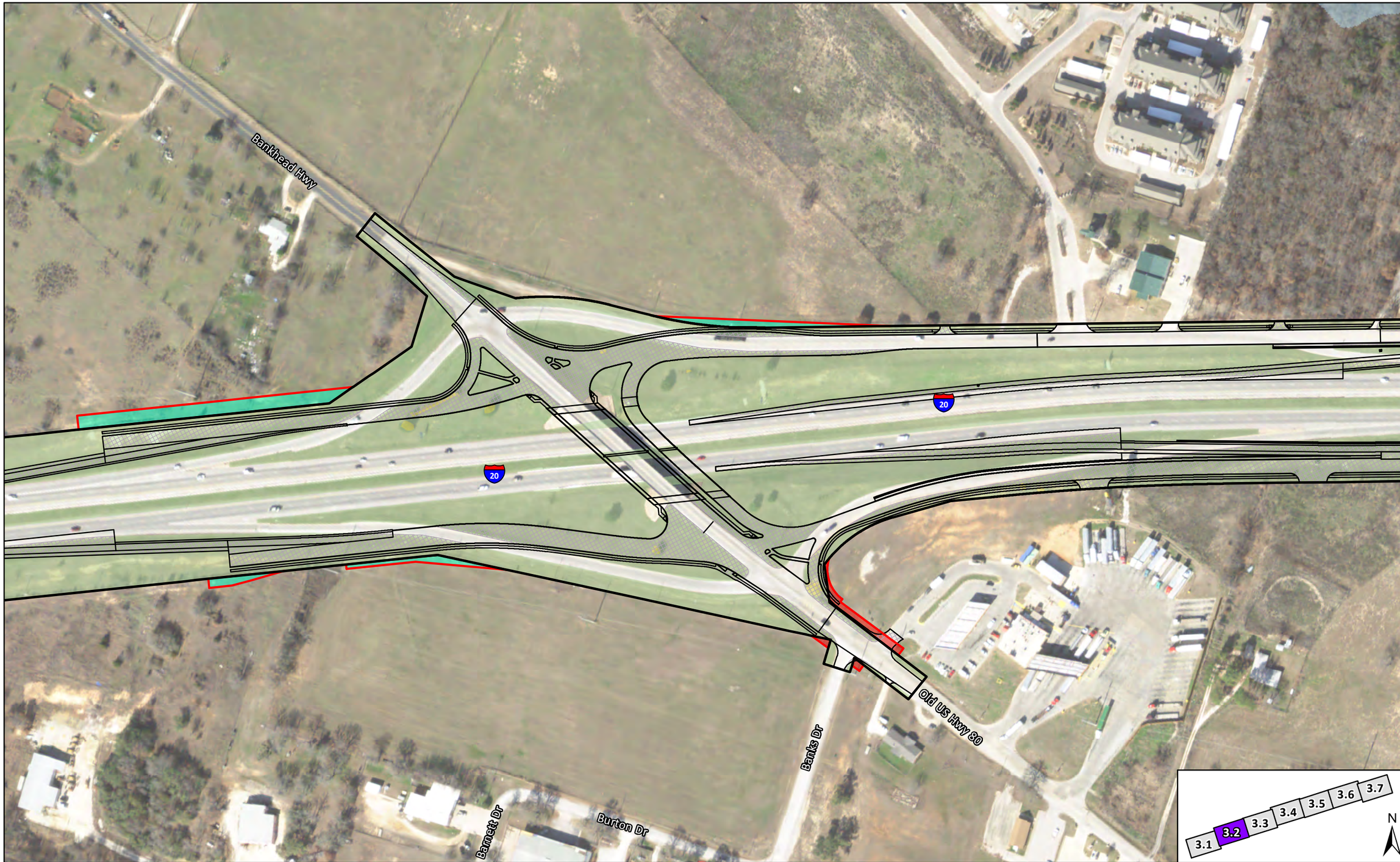

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PARKER CO.

Cover Type Mapbook

Stream Crossing (SC #)
Streams
100 Year Floodplain
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Existing ROW
Proposed ROW
Existing Easement
Proposed Permanent Easement
Proposed Temporary Easement

Proposed Edge of Pavement
New Proposed Pavement
Blackland Prairie: Disturbance or Tame Grassland
Central Texas: Floodplain Hardwood Forest
Central Texas: Riparian Hardwood Forest

Commercial
Crosstimbers: Post Oak Woodland
Crosstimbers: Savanna Grassland
Edwards Plateau: Oak/Hardwood Motte and Woodland
Edwards Plateau: Savanna Grassland

Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

0 100 200 400 Feet

1 inch equals 200 feet

C-3.2

FIGURE

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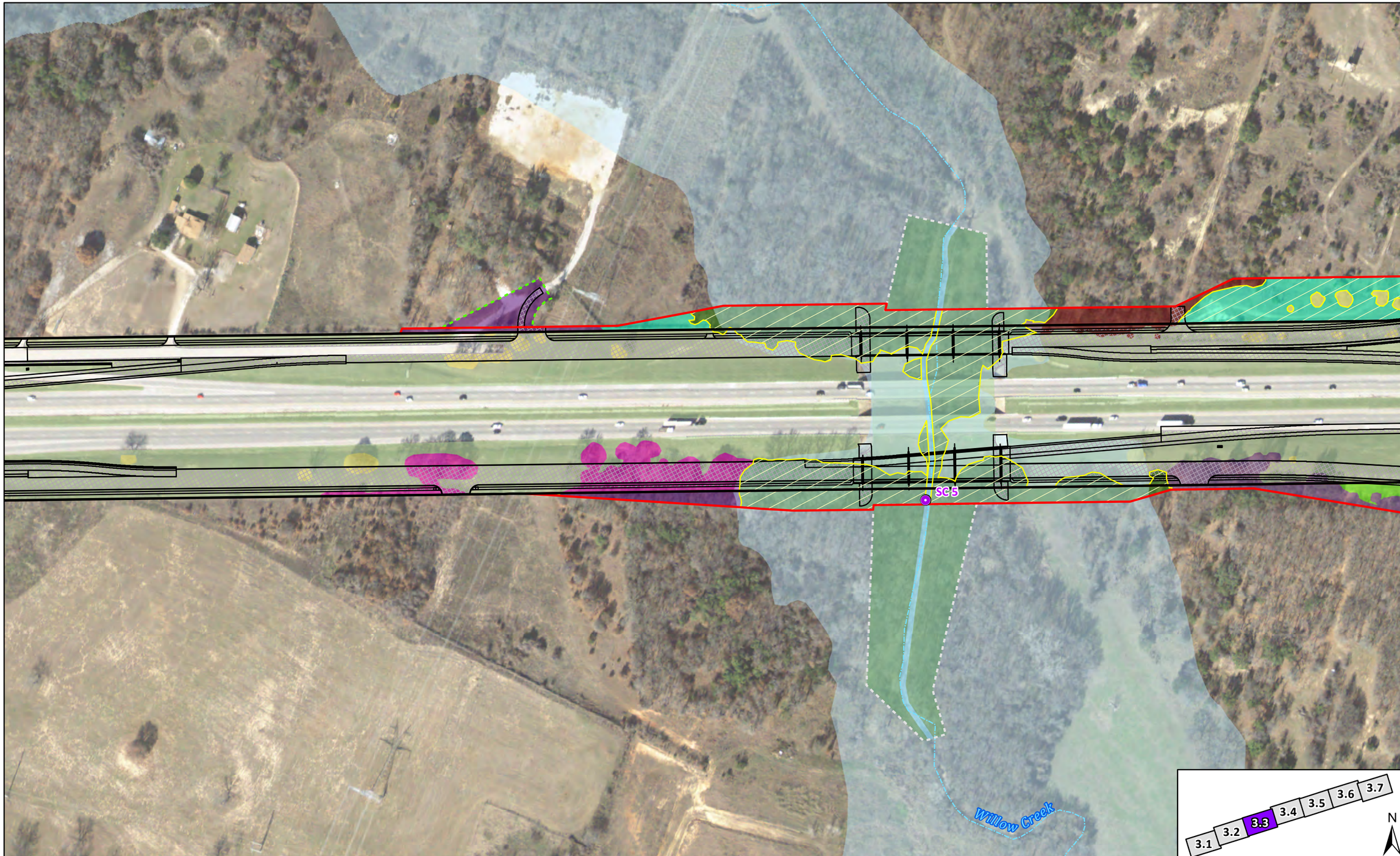

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PARKER CO.

Cover Type Mapbook

- Stream Crossing (SC #)
- Streams
- 100 Year Floodplain
- Revisions to cover types after field verification
- Existing ROW
- Proposed ROW
- Existing Easement
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- Proposed Edge of Pavement
- New Proposed Pavement
- Blackland Prairie: Disturbance or Tame Grassland
- Central Texas: Floodplain Hardwood Forest
- Central Texas: Riparian Hardwood Forest
- Commercial
- Crosstimbers: Post Oak Woodland
- Crosstimbers: Savanna Grassland
- Edwards Plateau: Oak/Hardwood Motte and Woodland
- Edwards Plateau: Savanna Grassland
- Maintained Grassland
- Maintained ROW/IT
- Native Invasive: Deciduous Woodland
- Residential
- Stream

1:2,400

0 100 200 400 Feet

1 inch equals 200 feet

C-3.3

FIGURE

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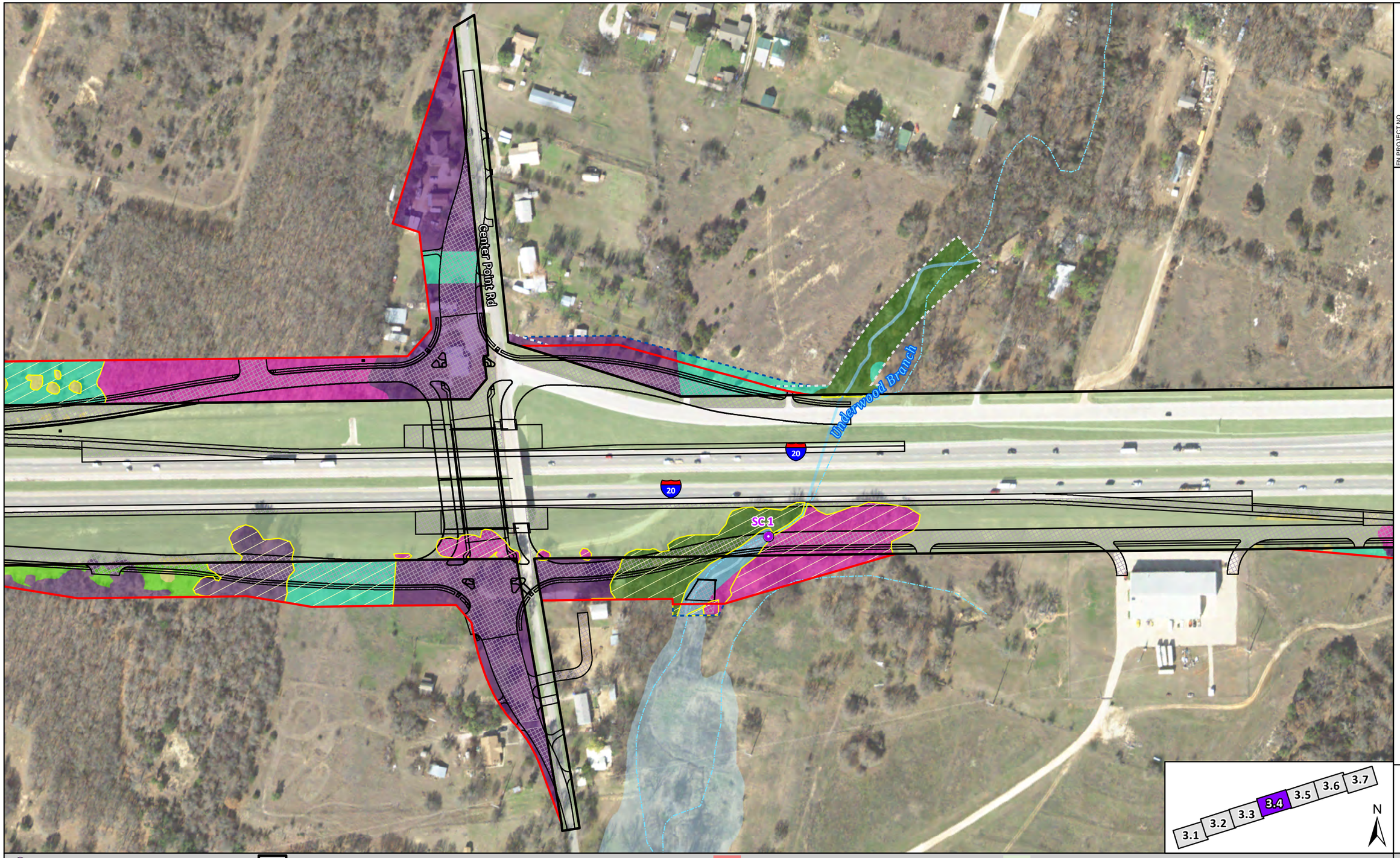

Stream Crossing (SC #)
Streams
100 Year Floodplain
Revisions to cover types after field verification
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Proposed ROW
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Edwards Plateau: Savanna Grassland
Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

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1 inch equals 200 feet

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PARKER CO.
IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

C-3.4

FIGURE

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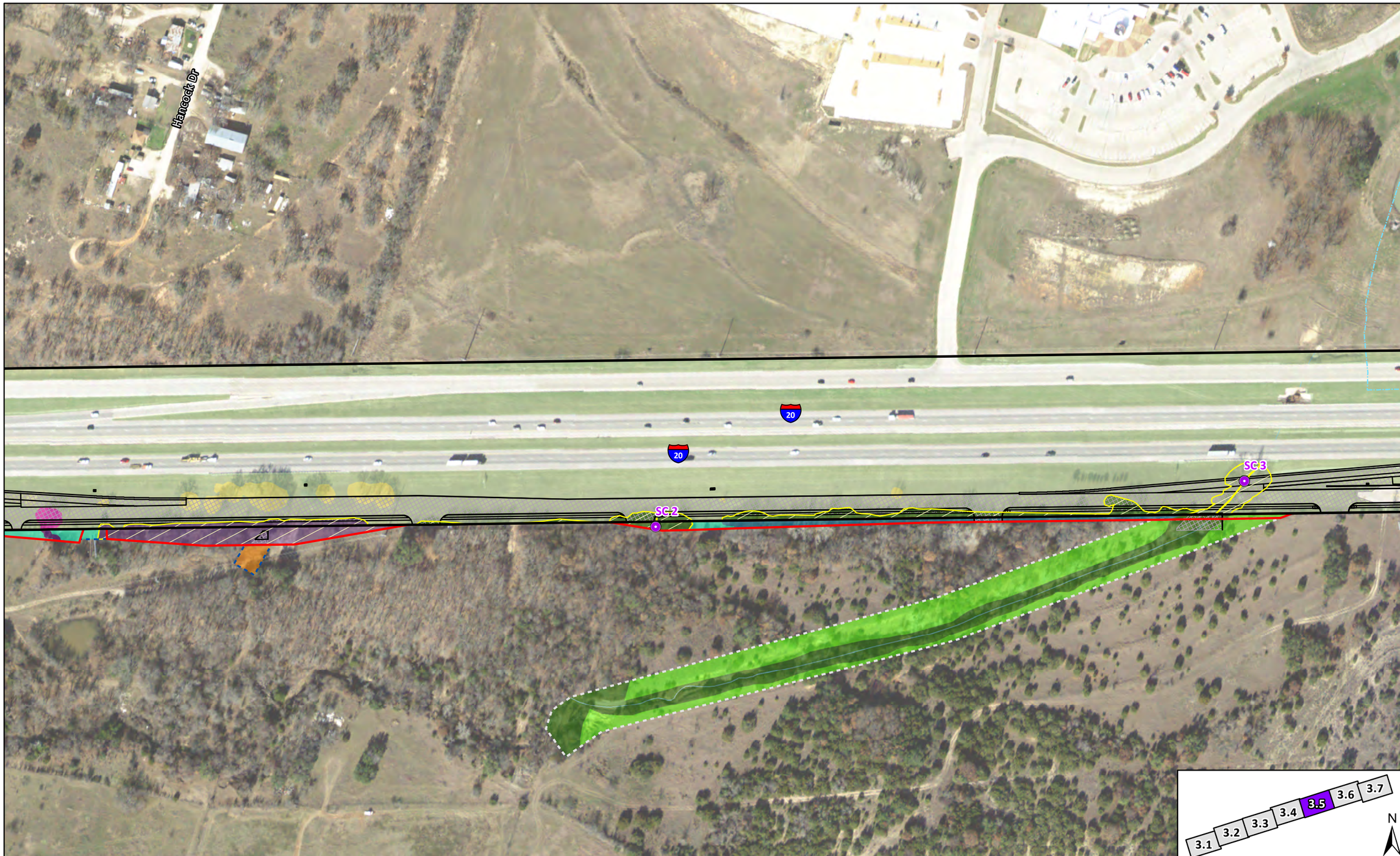

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IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

Stream Crossing (SC #)
Streams
100 Year Floodplain
Revisions to cover types after field verification

Existing ROW
Proposed ROW
Existing Easement
Proposed Permanent Easement
Proposed Temporary Easement

Proposed Edge of Pavement
New Proposed Pavement
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Crosstimbers: Post Oak Woodland
Crosstimbers: Savanna Grassland
Edwards Plateau: Oak/Hardwood Motte and Woodland
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Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

0 100 200 400 Feet
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C-3.5

FIGURE

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Cover Type Mapbook

Stream Crossing (SC #)
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100 Year Floodplain
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Proposed ROW
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Proposed Permanent Easement
Proposed Temporary Easement

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Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

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C-3.6

FIGURE

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PARKER CO.

IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

- Stream Crossing (SC #)
- Streams
- 100 Year Floodplain
- Revisions to cover types after field verification
- Existing ROW
- Proposed ROW
- Existing Easement
- Proposed Permanent Easement
- Proposed Temporary Easement
- Proposed Edge of Pavement
- New Proposed Pavement
- Blackland Prairie: Disturbance or Tame Grassland
- Central Texas: Floodplain Hardwood Forest
- Central Texas: Riparian Hardwood Forest
- Commercial
- Crosstimbers: Post Oak Woodland
- Crosstimbers: Savanna Grassland
- Edwards Plateau: Oak/Hardwood Motte and Woodland
- Edwards Plateau: Savanna Grassland
- Maintained Grassland
- Maintained ROW/IT
- Native Invasive: Deciduous Woodland
- Residential
- Stream

1:2,400

0 100 200 400 Feet

1 inch equals 200 feet

C-3.7

FIGURE

Path: H:\ENVIRONMENTAL\FINAL_EXHIBITS\Revised_20160517\BEF\C-3_ROUND2\C-3_Cover_Type_MB_20160517.mxd

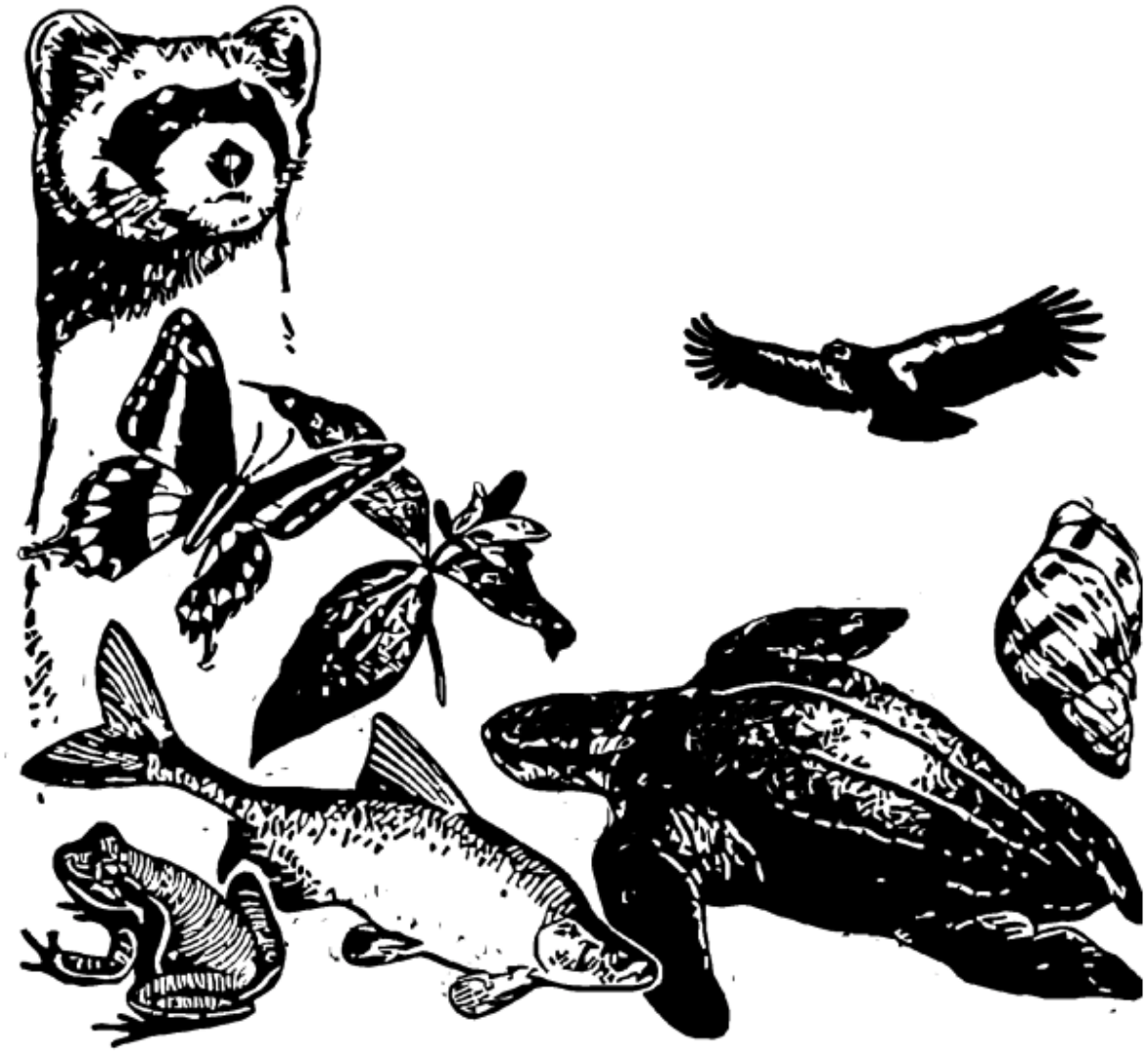
U.S. Fish & Wildlife Service

IH 20 at Center Point

IPaC Trust Resources Report

Generated May 13, 2016 11:25 AM MDT, IPaC v3.0.7

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

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U.S. Fish & Wildlife Service

IPaC Trust Resources Report

NAME

IH 20 at Center Point

LOCATION

Parker County, Texas

IPAC LINK

https://ecos.fws.gov/ipac/project/JHXCT-IVGLF-HL3BF-HXA2Y-EGQQTI

U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Arlington Ecological Services Field Office
2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247
(817) 277-1100

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Black-capped Vireo Vireo atricapilla

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B07T

Least Tern Sterna antillarum

Endangered

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind Energy Projects

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B07N

Piping Plover Charadrius melodus

Threatened

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind Energy Projects

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B079

Red Knot Calidris canutus rufa

Threatened

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind Energy Projects

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DM

Whooping Crane Grus americana

Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B003

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

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1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Bell's Vireo Vireo bellii — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JX

Burrowing Owl Athene cunicularia — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Chestnut-collared Longspur Calcarius ornatus — Bird of conservation concern
Season: Wintering

Dickcissel Spiza americana — Bird of conservation concern
Season: Breeding

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Golden Eagle Aquila chrysaetos — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DV

Harris's Sparrow Zonotrichia querula — Bird of conservation concern
Season: Wintering

Hudsonian Godwit Limosa haemastica — Bird of conservation concern
Season: Migrating

Lark Bunting Calamospiza melanocorys — Bird of conservation concern
Season: Wintering

Le Conte's Sparrow Ammodramus leconteii — Bird of conservation concern
Season: Wintering

Least Bittern Ixobrychus exilis
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B092

Little Blue Heron Egretta caerulea — Bird of conservation concern
Season: Breeding

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Mccown's Longspur Calcarius mccownii — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HB

Mississippi Kite Ictinia mississippiensis — Bird of conservation concern
Season: Breeding

Orchard Oriole Icterus spurius — Bird of conservation concern
Season: Breeding

Painted Bunting Passerina ciris — Bird of conservation concern
Season: Breeding

Prothonotary Warbler Protonotaria citrea — Bird of conservation concern
Season: Breeding

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern
Year-round

Rufous-crowned Sparrow Aimophila ruficeps — Bird of conservation concern
Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0MX

Rusty Blackbird Euphagus carolinus — Bird of conservation concern
Season: Wintering

Scissor-tailed Flycatcher Tyrannus forficatus — Bird of conservation concern
Season: Breeding

Short-eared Owl Asio flammeus — Bird of conservation concern

Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Sprague's Pipit Anthus spragueii — Bird of conservation concern

Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GD

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands in this location

U.S. Fish & Wildlife Service

Search ECOS

ECOS Environmental Conservation Online System

Conserving the Nature of America

ECOS / Species Reports / Species By County Report

Species By County Report

The following report contains Species that are known to or are believed to occur in this county. Species with range unrefined past the state level are now excluded from this report. If you are looking for the Section 7 range (for Section 7 Consultations), please visit the IPaC application.

County: Parker, Texas

CSV

Need to contact a FWS field office about a species? Follow this link to find your local FWS Office.

Group	Name	Population	Status	Lead Office	Recovery Plan	Recovery Plan Action Status	Rec Plan Stag
Birds	Whooping crane (*Grus americana*)	except where EXPN	Endangered	Assistant Regional Director-Ecological Services	Whooping Crane Recovery Plan, Final Third Revision	Implementation Progress	Fina Revi 3
Birds	Bald eagle (*Haliaeetus leucocephalus*)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Chesapeake Bay Bald Eagle Recovery Plan	Implementation Progress	Fina Revi 1
Birds	Bald eagle (*Haliaeetus leucocephalus*)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Southwestern Bald Eagle Recovery Plan	Implementation Progress	Fina
Birds	Bald eagle (*Haliaeetus leucocephalus*)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Northern States Bald Eagle Recovery Plan	Implementation Progress	Fina

Group	Name	Population	Status	Lead Office	Recovery Plan	Recovery Plan Action Status	Rec Plan Stag
Birds	Bald eagle (*Haliaeetus leucocephalus*)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Southeastern States Bald Eagle Recovery Plan	Implementation Progress	Fina Revi 1
Birds	Bald eagle (*Haliaeetus leucocephalus*)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Recovery Plan for the Pacific Bald Eagle	Implementation Progress	Fina
Birds	Piping Plover (*Charadrius melodus*)	except Great Lakes watershed	Threatened	Office of the Regional Director	Piping Plover Atlantic Coast Population Revised Recovery Plan	Implementation Progress	Fina Revi 1
Birds	Piping Plover (*Charadrius melodus*)	except Great Lakes watershed	Threatened	Office of the Regional Director	Volume I: Draft Revised Recovery Plan for the Northern Great Plains Piping Plover (Charadrius melodus)	Recovery efforts in progress, but no implementation information yet to display.	Draft Revi 1
Birds	Black-capped Vireo (*Vireo atricapilla*)	Entire	Endangered	Arlington Ecological Services Field Office	Black-capped Vireo (Vireo atricapillus) Recovery Plan	Implementation Progress	Fina
Birds	Red knot (*Calidris canutus rufa*)		Threatened	New Jersey Ecological Services Field Office			

PARKER COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	*Falco peregrinus anatum*	DL	T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon	*Falco peregrinus tundrius*	DL	

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Bald Eagle	*Haliaeetus leucocephalus*	DL	T

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

Golden-cheeked Warbler	*Setophaga chrysoparia*	LE	E

juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer

Interior Least Tern	*Sterna antillarum athalassos*	LE	E

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

Mountain Plover	*Charadrius montanus*		

breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Peregrine Falcon	*Falco peregrinus*	DL	T

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Sprague's Pipit	*Anthus spragueii*	C	

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

PARKER COUNTY

BIRDS

		Federal Status	State Status
Western Burrowing Owl	*Athene cunicularia hypugaea*		

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Whooping Crane	*Grus americana*	LE	E

potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties

FISHES

		Federal Status	State Status
Sharpnose shiner	*Notropis oxyrhynchus*	LE	

endemic to Brazos River drainage; also, apparently introduced into adjacent Colorado River drainage; large turbid river, with bottom a combination of sand, gravel, and clay-mud

Smalleye shiner	*Notropis buccula*	LE	

endemic to upper Brazos River system and its tributaries (Clear Fork and Bosque); apparently introduced into adjacent Colorado River drainage; medium to large prairie streams with sandy substrate and turbid to clear warm water; presumably eats small aquatic invertebrates

MAMMALS

		Federal Status	State Status
Gray wolf	*Canis lupus*	LE	E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Plains spotted skunk	*Spilogale putorius interrupta*		

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Red wolf	*Canis rufus*	LE	E

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

MOLLUSKS

		Federal Status	State Status
Texas fawnsfoot	*Truncilla macrodon*	C	T

little known; possibly rivers and larger streams, and intolerant of impoundment; flowing rice irrigation canals, possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows; Brazos and Colorado River basins

PARKER COUNTY

REPTILES

		Federal Status	State Status
Brazos water snake	*Nerodia harteri*		T

upper Brazos River drainage; riffle specialist, in shallow water with rocky bottom and on rocky portions of banks

Texas garter snake *Thamnophis sirtalis annectens*

wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August

Texas horned lizard	*Phrynosoma cornutum*		T

open, arid and semi-arid regions with sparse vegetation, including grass, 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; breeds March-September

Timber rattlesnake	*Crotalus horridus*		T

swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto

PLANTS

		Federal Status	State Status
Comanche Peak prairie-clover	*Dalea reverchonii*		

Texas endemic; shallow, calcareous clay to sandy clay soils over limestone in grasslands or openings in post oak woodlands, often among sparse vegetation in barren, exposed sites, most known sites are underlain by Goodland Limestone, most known sites are on roadway right-of-ways; flowering April-June, one account for October

Glen Rose yucca *Yucca necopina*

Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June

Hall's prairie clover *Dalea hallii*

GLOBAL RANK: G3; In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

Mohlenbrock's sedge *Cyperus grayioides*

GLOBAL RANK: G3; Deep sand and sandy loam in dry, almost barren openings in upland longleaf pine savannas, mixed pine-oak forests, and post oak woodlands; Occurs primarily in deep, periodically disturbed sandy soils in open areas maintained by factors such as wind, erosion, or fire. This species does not occur in shaded areas or in areas of high competition with other herbaceous species. Habitats include remnant sand prairies, sandy fields, sand "blow outs", sandhill woodlands, pine barrens, and open barrens in which the slope is sufficient to produce sand erosion. May also occur in areas where the soils have been disturbed by logging or road construction; Perennial

Osage Plains false foxglove *Agalinis densiflora*

GLOBAL RANK: G3; Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct

PARKER COUNTY

PLANTS

Federal Status State Status

Quayle's butterweed *Senecio quaylei*

GLOBAL RANK: G1; Known only from the type location in Parker County, where it occured in a weedy roadside ditch; Annual; Flowering spring

Reverchon's curfpea *Pediomelum reverchonii*

GLOBAL RANK: G3; Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; Perennial; Flowering Jun-Sept; Fruiting June-July

Topeka purple-coneflower *Echinacea atrorubens*

GLOBAL RANK: G3; Occurring mostly in tallgrass prairie of the southern Great Plains, in blackland prairies but also in a variety of other sites like limestone hillsides; Perennial; Flowering Jan-June; Fruiting Jan-May

Summary of State and Federally Listed Threatened, Endangered, and Rare Species.

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Pertinent Project Information
Birds						
American Peregrine Falcon *Falco peregrinus anatum*	DL	T	year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	Potential migrant through area. No habitat present in project area.	No impact	No tall cliff eyries located within project area.
Arctic Peregrine Falcon *Falco peregrinus tundrius*	DL	—	migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	Potential migrant through area.	No impact	No lake shores, coastlines, or barrier islands located within project area.
Bald Eagle *Haliaeetus leucocephalus*	DL	T	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	No habitat present in project area.	No impact	No nests, cliffs, or large water bodies located within project area.
Golden-cheeked Warbler *Dendroica chrysoparia*	---	E	juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer	No habitat present in project area.	No impact	No juniper-oak woodlands located within project area.
Interior Least Tern *Sterna anitllarum athalassos*	LE	E	subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also known 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	No habitat present in project area.	No effect	No sand or gravel bars within braided streams located within project area.
Mountain Plover *Charadrius montanus*	---	---	Nests on high plains or shortgrass prairie, on ground in shallow depressions	No habitat present in project area.	No impact	No shortgrass prairie in project area.
Peregrine Falcon *Falco peregrinus*	DL	T	both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.	No habitat present in project area.	No impact	No tall cliff eyries, lake shores, coastlines, or barrier islands located within project area.

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Pertinent Project Information
Sprague's Pipit *Anthus spragueii*	C	—	only in Texas during migration and winter, mid-September to early April; short to medium distance, diurnal migrant' strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges	No habitat present in project area	No impact	No native upland prairie located within project area.
Western Burrowing Owl *Anthene cunicularia hypugaea*	—	—	open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows	Habitat present in project area.	May impact	Areas of open grassland located within project area.
Whooping Crane *Grus americana*	LE	E	potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio Counties	Potential migrant through the area. No habitat present in project area.	No effect	No stopover habitat present within project area.
Fishes						
Sharpnose shiner *Notropis oxyrhynchus*	PE	—	endemic to Brazos River drainage; also, apparently introduced into adjacent Colorado River drainage; large turbid river, with bottom a combination of sand, gravel, and clay-mud	No habitat present in project area.	No impact	No large turbid rivers located within project area.
Smalleye shiner *Notropis buccula*	PE	—	endemic to upper Brazos River system and its tributaries (Clear Fork and Bosque); apparently introduced into adjacent Colorado River drainage; medium to large prairie streams with sandy substrate and turbid to clear warm water; presumably eats small aquatic invertebrates	No habitat present in project area.	No impact	Project area not located within Brazos or Colorado River drainages.
Mammals						
Gray wolf *Canis lupus*	LE	E	extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands	Habitat present in project area.	No effect	Species has been extirpated in Texas.
Plains spotted skunk *Spilogale putorius interrupta*	—	—	catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie	Habitat present in project area.	May impact	Project area contains habitat due to wide range of preferred habitat types.
Red wolf *Canis rufus*	LE	E	extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	Habitat present in project area.	No effect	Species has been extirpated in Texas.
Mollusks						
Texas fawnsfoot *Truncilla macrodon*	C	T	little known; possibly rivers and larger streams, and intolerant of impoundment; flowing rice irrigation canals, possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows; Brazos and Colorado River basins	No habitat present in project area.	No impact	Streams located within project area do not provide an adequate water source. Project area not within Brazos or Colorado River drainages.
Reptiles						
Brazos water snake *Nerodia harteri*	—	T	upper Brazos River drainage; in shallow water with rocky bottom and on rocky portions of banks	No habitat present in project area.	No impact	Streams located within project area do not have rocky bottoms or banks. Project area not within Brazos River drainage.

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Pertinent Project Information
Texas garter snake *Thamnophis sirtalis annectens*	—	—	wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August	Habitat present in project area.	May impact	Wet or moist microhabitats present within project area.
Texas horned lizard *Phrynosoma cornutum*	—	T	open, arid and semi-arid regions with sparse vegetation, including grass, 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; breeds March-September	No habitat present in project area.	No impact	No open, arid or semi-arid habitat with sparse vegetation located within project area.
Timber/Canebrake rattlesnake *Crotalus horridus*	—	T	swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto	Habitat present in project area.	May impact	Some habitat types such as upland woodlands, riparian zones, or abandoned farmland located within project area.
Plants						
Comanche Peak prairie- clover *Dalea reverchonii*	—	—	Texas endemic; shallow, calcareous clay to sandy clay soils over limestone in grasslands or openings in post oak woodlands, often among sparse vegetation in barren, exposed sites, most known sites are underlain by Goodland Limestone, most known sites are on roadway right-of-ways; flowering April-June, one account for October	ROW habitat present in project area.	May impact	Project area contains ROW habitat with calcareous soils. Closest known population is 2.2 miles away from project area. Species not observed within project area
Glen Rose yucca *Yucca necopina*	—	—	Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April - June	ROW habitat present in project area.	May impact	No *Yucca* species observed within project area.
Hall's prairie clover *Dalea hallii*	—	—	In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept	Habitat present in project area.	May impact	Project area contains ROW habitat with calcareous soils.
Mohlenbrock's sedge *Cyperus grayoides*	—	—	Deep sand and sandy loam in dry, almost barren openings in upland longleaf pine savannas, mixed pine-oak forest, and post oak woodlands; Occurs primarily in deep, periodically disturbed sandy soils in open areas maintained by factors such as wind, erosion, or fire. This species does not occur in shaded areas or in areas of high competition with other herbaceous species. Habitats included remnant sand prairies, sandy fields, sand "blow outs", sandhill woodlands, pine barrens, and open barrens in which the slope is sufficient to produce sand erosion. May also occur in areas where the soils have been disturbed by logging or road construction; Perennial	Habitat present in project area.	May impact	Areas of sandy soils present in project area.
Osage Plains false foxglove *Agalinis densiflora*	—	—	Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct	Habitat present in project area.	May impact	Project area contains ROW habitat with calcareous soils.
Quayle's butterweed *Senecio quaylei*	—	—	Known only from the type location in Parker County, where it occurred in a weedy roadside ditch; Annual; flowering spring	Habitat present in project area.	May impact	Due to restricted occurrence, could be present, but not likely to be in project area.
Reverchon's curfpea *Pediomelum reverchonii*	—	—	Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; perennial; flowering Jun Sept; Fruiting June-July	Habitat present in project area.	May impact	Project area contains ROW habitat with calcareous soils.

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Pertinent Project Information
Topeka purple coneflower *Echinacea atrorubens*	—	—	Occurring mostly in tallgrass prairie of the southern Great Plains, in blackland prairies but also in a variety of other sites like limestone hillsides; Perennial; Flowering Jan-June; Fruiting Jan-May	No habitat present in project area.	No impact	No tallgrass prairies, blackland prairies, or limestone hillsides present in project area.

LE, LT - Federally Listed Endangered/Threatened
C - Federal Candidate for Listing
DL- Federally Delisted
DM- Federally Delisted, Monitoring First 5 Years
PT - Federally Proposed Threatened
PE – Federally Proposed Endangered

E, T - State Listed Endangered/Threatened
" — " – Rare or Species of Concern, but no regulatory listing status
*Data Sources: U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department (Checked 2-28-12) and site visit/survey of project area.

Source: Texas Parks and Wildlife, January 22, 2014 and U. S. Fish and Wildlife Service, January 21, 2014

Best Management Practices- Programmatic Agreement

Species	BMP	BMP Details
Western Burrowing Owl *Anthene cunicularia hypugaea*	Bird BMPs	• Not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season. • Avoiding the removal of unoccupied, inactive nests, as practicable. • Preventing the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. • Not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit. Need for coordination eliminated due to implementation of BMPs
Plains spotted skunk *Spilogale putoria interrupta*	Plains Spotted Skunk BMP	• Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens. Need for coordination eliminated due to implementation of BMPs
Timber/Canebrake rattlesnake *Crotalus horridus* Texas garter snake *Thamnophis sirtalis annectens*	Reptile BMPs	• Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered • Due to increased activity (mating) of reptiles, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged. • When designing roads with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small mammals to get out of roadways. Need for coordination eliminated due to implementation of BMPs
Comanche Peak Prairie Clover *Dalea reverchonii* Hall's prairie clover *Dalea hallii* Glen Rose yucca *Yucca necopina* Mohlenbrock's sedge *Cyperus grayioides* Osage Plains false foxglove *Agalinis densiflora* Quayle's butterweed *Senecio quaylei* Reverchon's scurfpea *Pediomelum reverchonii*	Vegetation BMPs	• Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable. Wherever practicable, impacted vegetation should be replaced with in-kind on-site replacement/restoration of native vegetation. • To minimize adverse effects, activities should be planned to preserve mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation have high value to wildlife as food and cover. • It is strongly recommended that trees greater than 12 inches in dbh that are removed be replaced. TPWD's experience indicates that for ecologically effective replacement, a ration of three trees for every one (3:1) lost should be provided to the extent practicable either on-site or off-site. Trees less than 12 inches dbh should be replaced at a 1:1 ratio. • Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species. • When trees are planted, a maintenance plan that ensures at least an 85 percent survival rate after three years should be developed for the replacement trees. • The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used. • The use of seed mix that contains from only locally adapted native species is recommended Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds. Coordination not required.

Ben Hagood

To: Sabrina Joplin
Subject: RE: NDD Request for IH-20 at Center Point Road Interchange Project

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From: Texas Natural Diversity Database [mailto:TexasNatural.DiversityDatabase@tpwd.texas.gov]
Sent: Monday, May 16, 2016 1:43 PM
To: Sabrina Joplin <Sabrina.Joplin@freese.com>
Subject: RE: NDD Request for IH-20 at Center Point Road Interchange Project

Sabrina –

The Texas Natural Diversity Database (TXNDD) staff provides the following information in response to your request for data. Please read this entire message for important information regarding your request, additional data sources, and project review.

Data

The TXNDD includes federal and state listed and tracked Threatened, Endangered, and Rare species. Please note that **areas where Element Occurrence (EO) data are absent should not be interpreted as an absence of Threatened, Endangered, and Rare species.** *Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Data from the TXNDD do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features within your project area. These data cannot substitute for an on-site evaluation by qualified biologists.*

Attached documents

The attached .zip file contains several documents that will guide you in appropriate use, restrictions, and interpretation of TXNDD data as well as a reporting form for submitting data to the TXNDD. The .zip file also includes additional supplemental documents. Below is a list of the files in the attached folder:

Shapefile (*eo_[last name of requestor]_yyyymmdd.zip*) of the Threatened, Endangered and Rare species Element Occurrences made from information the TXNDD presently has available for the requested quad(s) (or within the requested county, by requested species when applicable).

EO Report (*eoreport_[last name of requestor]_yyyymmdd.pdf*) of the EOs in the shapefile mentioned above. The **EO Report** includes more detailed information about each EO than what is contained in the attribute table of the shapefile. Link the information in the shapefile to the information in the **EO Report** by *EO ID*. Note that if the number of records in your request area is large, this report may not be included; however, if, in this circumstance, you would like more detailed information about a particular EO, species, or smaller geographic area, you may request those data.

EO List (*eolist_[last name of requestor]_yyyymmdd.pdf*) for those requests made by USGS 7.5 minute quadrangles. The **EO List** is a list of species for which we have records in the database in the USGS 7.5 minute quadrangles *surrounding* your request area The **EO List** is to inform you of federal and state listed and tracked Threatened, Endangered, and Rare species in the area. Note that the EO list is not included in county requests.

County List FAQ (*County_lists_FAQ_20150415.pdf*) produced by the Wildlife Habitat Assessment Program.

TXNDD Information document (*txndd_information.docx*) that includes a background of the TXNDD, a description of past and current spatial methodology employed, and an explanation of interpretation of the data. Global and subnational (state) conservation ranks are also explained in this document as are the shapefile attributes and EO report sections.

TXNDD Reporting Form (txndd_reporting_form.doc) for reporting observations of tracked elements to the Texas Natural Diversity Database. To submit data, fill out this form and send it to TexasNatural.DiversityDatabase@tpwd.texas.gov. Note that you can also submit data in the form of an Excel spreadsheet or written report.

Project Review, Rare Species County Lists, Project Planning, and BMPs

This email cannot substitute for an environmental review of your project by TPWD. For information on project review and to access the county lists of protected species and species of greatest conservation need with potential to occur in the county, please visit the Wildlife Habitat Assessment (WHAB) website at http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/habitat_assessment/. The WHAB website includes several resources to consider while planning your project to minimize impacts to fish and wildlife resources, including information /guidelines on Wind Energy projects, Transmission Line projects, Communication Towers, and Karst Zones (Travis, Williamson, and Bexar Counties).

Ecologically Significant Stream Segments

If your information request area contains known ecologically significant stream segments, the data can be obtained at http://tpwd.texas.gov/landwater/water/conservation/water_resources/water_quantity/sigsegs/index.phtml

Critical Habitat

If your information request area contains federally designated critical habitat, the data can be obtained at http://ecos.fws.gov/crithab/.

TPWD Managed Areas

We are no longer providing Managed Area shapefiles and associated Managed Area Reports. To obtain shapefiles for Wildlife Management Areas and State Park Boundaries, please visit the Texas Parks and Wildlife Department GIS Data Download page (https://tpwd.texas.gov/gis/data/).

Thank-you,

Stephanie L. Shelton Certified Wildlife Biologist®
Stephanie.Shelton@tpwd.texas.gov
512-389-8723

Texas Natural Diversity Database
http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/txndd/
Texas Parks and Wildlife Department

"To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations."

From: Sabrina Joplin [mailto:Sabrina.Joplin@freese.com]
Sent: Friday, May 13, 2016 12:33 PM
To: Texas Natural Diversity Database <TexasNatural.DiversityDatabase@tpwd.texas.gov>
Subject: NDD Request for IH-20 at Center Point Road Interchange Project

TPWD Wildlife Division,

Good afternoon. I'm working on a transportation project in Parker County and need to request the latest TX NDD information for the following quads: Lake Weatherford, Annetta, and Weatherford South.

Thanks in advance for your assistance.

Sincerely,

Sabrina Santos Joplin, GISP
GIS Analyst IV

Freese and Nichols, Inc.
10431 Morado Circle,
Bldg. 5, Suite 300
Austin, TX 78759
p (512) 617-3188
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www.freese.com

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MEMORANDUM

FREESE AND NICHOLS

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4055 International Plaza, Suite 200 • Fort Worth, Texas 76109 • 817-735-7300 • fax 817-735-7492 www.freese.com

TO: Dan Gise

CC: File: PRK12278/2.30

FROM: Karl Hoffman

SUBJECT: Comanche Peak Prairie Clover Survey – Spring 2015

DATE: May 29, 2015

PROJECT: PRK12278

Qualified Freese and Nichols, Inc. (FNI) biologists conducted a pedestrian survey of the Interstate Highway 20 (IH-20) at Centerpoint Road project area in Parker County, Texas (Figure 1) on May 21, 2015 with the purpose of identifying Comanche Peak Prairie Clover (*Dalea reverchonii*) plants within the project area, if present. The survey was conducted at the request of the Texas Department of Transportation (TxDOT) as part of the Categorical Exclusion (CE) process for the proposed IH-20 service road modification project. The project area extends approximately 3.4 miles from Lakeshore Drive west to the Missouri Pacific Railroad crossing within the IH-20 right-of-way (ROW).

D. reverchonii is listed without State or Federal Status in the Texas Parks and Wildlife Department's (TPWD's) *Annotated County Lists of Rare Species* for Parker County. The species listing describes potential habitat and blooming season as "shallow, calcareous clay to sandy clay soils over limestone in grasslands or openings in post oak woodlands, often among sparse vegetation in barren, exposed sites, most known sites are underlain by Goodland Limestone, most known sites are on roadway right-of-ways; flowering April-June…". The Annotated List of Rare Plants also lists Glen Rose yucca (*Yucca necopina*) with no State or Federal status for Parker County.

The majority of the vegetated project area consists of mowed and maintained highway ROW (Photo 1) with a combination of turf grasses such as Bermudagrass (*Cynodon dactylon*), non-native grasses such as Japanese Brome (*Bromus japonicus*), various other grasses, and scattered trees in some locations (Photo 2). Numerous wildflowers were observed during the survey, including wild dill (*Perideridia americana*), Mexican hat (*Ratibida columnifera*), Indian paintbrush (*Castilleja* spp.), Indian blanket(*Gaillardia pulchella*), yarrow (*Achillea millefolium*), plains coreopsis (*Coreopsis tinctoria*), sensitive briar (*Mimosa nuttallii*), Engelmann's daisy (*Engelmannia peristenia*), Texas bullnettle (*Cnidoscolus texanus*), sneezeweed (*Helenium* spp.), prairie verbena (*Glandularia bipinnatifida*), meadow pink (*Sabatia campestris*), Texas vervain (*Verbena halei*), Texas star (*Sabatia campestris*), evening primrose (*Oenothera* spp.), snake herb (*Dyschoriste linearis*), silverleaf nightshade (*Solanum elaeagnifolium*), lemon bee balm

(*Monarda citriodora*), vetch (*Vicia villosa*), horsemint (*M. punctata*), Antelope horns milkweed (*Asclepias asperula*), black-eyed–susans (*Rudbeckia* spp.), *Penstemon* spp., and pale-leaf yucca (*Y. pallida*).

Most barren areas within the project area were observed to have red sandy soils typical of the Western Cross Timbers (Photo 3). A few barren areas had exposed calcareous soils, including the location of pale-leaf yucca (Photo 4). No *Dalea* species or Glen Rose yucca plants were observed during the survey.

Map

1:18,000

0 1,500 3,000 Feet

1 inch equals 1,500 feet

N W E S

1

FIGURE

FN PROJECT NO. PRK12278

DATE CREATED 5/29/2015

DATUM & COORDINATE SYSTEM NAD83 State Plane (feet) Texas North Central

FILE NAME Photo_Locations_11x17

PREPARED BY HHM

PARKER COUNTY

IH-20 at Centerpoint Road

Comanche Peak Prairie Clover Survey Photo Locations

FREESE AND NICHOLS
4055 International Plaza Suite 200
Fort Worth, Texas 76109-4895
(817) 735-7300

Path: H:\ENVIRONMENTAL\WORKING\Photo_Locations_11x17.mxd

Photos

Photo 1. Typical (east) view of the IH-20 ROW and eastbound service road within the project area.

Photo 2. Scattered trees in the IH-20 ROW within the project area.

Photo 3. Red sandy soils, typical of the Western Cross Timbers, within the IH-20 ROW project area.

Photo 4. Exposed calcareous soil and pale-leaf yuccas within the IH-20 ROW project area.

MEMORANDUM

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TO: Dan Gise

CC: File: PRK12278/2.30

FROM: Ben Hagood

SUBJECT: Rare Plant Survey – May 2016

DATE: May 16, 2016

PROJECT: PRK12278

A qualified Freese and Nichols, Inc. (FNI) biologist conducted a pedestrian survey of the Interstate Highway 20 (IH-20) at Centerpoint Road project area in Parker County, Texas (Figure 1) on May 16, 2016 with the purpose of identifying, if present, plant species listed by the Texas Parks and Wildlife Department (TPWD) *Annotated County List of Rare Species* for Parker County. The listed rare plants included the Comanche Peak Prairie Clover (*Dalea reverchonii*), Hall's prairie clover (*Dalea hallii*), Glen Rose yucca (*Yucca necopina*), Mohlenbrock's sedge (*Cyperus grayioides*), Osage Plains false foxglove (*Agalinis densiflora*), Quayle's butterweed (*Senecio quaylei*), Reverchon's scurfpea (*Pediomelum reverchonii*), and the Topeka purple-coneflower (*Echinacea atrorubens*). None of these plants have State or Federal threatened or endangered status for Parker County.

The survey was conducted at the request of the Texas Department of Transportation (TxDOT) as part of the Categorical Exclusion (CE) process for the proposed IH-20 service road modification project. The project area extends approximately 3.4 miles from Lakeshore Drive west to the Missouri Pacific Railroad crossing within the IH-20 right-of-way (ROW).

The majority of the vegetated project area consists of mowed and maintained highway ROW. Observed species included Japanese brome (*Bromus japonicus*), Texas wintergrass (*Nassella leucotricha*), wild oat (*Avena fatua*), perennial ryegrass (*Lolium perenne*), wild dill (*Perideridia americana*), Mexican hat (*Ratibida columnifera*), Indian paintbrush (*Castilleja* spp.), Indian blanket (*Gaillardia pulchella*), plains coreopsis (*Coreopsis tinctoria*), sneezeweed (*Helenium* spp.), prairie verbena (*Glandularia bipinnatifida*), meadow pink (*Sabatia campestris*), Texas vervain (*Verbena halei*), Texas star (*Sabatia campestris*), evening primrose (*Oenothera* spp.), snake herb (*Dyschoriste linearis*), silverleaf nightshade (*Solanum elaeagnifolium*), lemon bee balm (*Monarda citriodora*), horsemint (*M. punctata*), vetch (*Vicia villosa*), Antelope horns milkweed (*Asclepias asperula*), and blue-eyed grass (*Sisyrinchium* sp.).

No listed rare plant species were observed.

CROSS TIMBERS SPECIES OF GREATEST CONSERVATION NEED

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place
		Federal	State	Global	State	
MAMMALS						
Conepatus leuconotus	Hog-nosed skunk			G5	S4	Shrubland, Savanna/Open Woodland, Barren/Sparse Vegetation,
Dipodomys elator	Texas kangaroo rat		T	G1G2	S2	Shrubland, Agricultural
Lutra canadensis	River otter			G5	S4	Riparian
Mustela frenata	Long-tailed weasel			G5	S5	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland
Myotis velifer	Cave myotis			G5	S4	Caves/Karst,
Neovison vison	Mink			G5	S4	Riparian, Riverine, Lacustrine, Freshwater Wetland
Puma concolor	Mountain lion			G5	S2	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland, Riparian
Spilogale putorius	Eastern spotted skunk			G4T	S4	Savanna/Open Woodland, Grassland
Sylvilagus aquaticus	Swamp rabbit			G5	S5	Riparian, Freshwater Wetland
Tadarida brasiliensis	Brazilian free-tailed bat			G5	S5	Cave/Karst, Artificial Refugia
Taxidea taxus	American badger			G5	S5	Grassland, Desert scrub, Woodland, Savanna/Open Woodland, Forest
BIRDS						
Anas acuta	Northern Pintail			G5	S3B,S5N	Lacustrine, freshwater wetland, saltwater wetland, coastal, marine
Colinus virginianus	Northern Bobwhite			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland
Tympanuchus cupido	Greater Prairie-Chicken (Interior)			G4	S1B	Grassland
Meleagris gallopavo	Wild Turkey			G5	S5B	Shrubland, Savanna/Open Woodland, Forest, Riparian, Agricultural
Egretta thula	Snowy Egret			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic
Egretta caerulea	Little Blue Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic
Butorides virescens	Green Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Cultural Aquatic
Ictinia mississippiensis	Mississippi Kite			G5	S4B	Woodland, Forest, Riparian, Developed:Urban/Suburban/Rural
Haliaeetus leucocephalus	Bald Eagle			G5	S3B,S3N	Riparian, Lacustrine, Freshwater Wetland, Saltwater Wetland
Circus cyaneus	Northern Harrier			G5	S2B,S3N	Grassland, Shrubland
Buteo lineatus	Red-shouldered Hawk			G5	S4B	Woodland, Forest, Riparian, Freshwater Wetland
Buteo swainsoni	Swainson's Hawk			G5	S4B	Desert Scrub, Grassland, Shrubland
Pluvialis dominica	American Golden-Plover			G5	S3	Grassland, Freshwater Wetland, Agricultural
Sternula antillarum	Least Tern	LE*	E*	G4	S3B	Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Marine, Developed: Industrial
Athene cunicularia	Burrowing Owl			G4	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed
Asio flammeus	Short-eared Owl			G5	S4N	Grassland, Shrubland, Agricultural
Caprimulgus carolinensis	Chuck-will's-widow			G5	S3S4B	Woodland, Forest, Riparian
Melanerpes erythrocephalus	Red-headed Woodpecker			G5	S3B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
Tyrannus forficatus	Scissor-tailed Flycatcher			G5	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed
Lanius ludovicianus	Loggerhead Shrike			G4	S4B	Desert Scrub, Grassland, Shrubland, Savanna/Open Woodland, Agricultural, Developed
Vireo bellii	Bell's Vireo			G5	S3B	Desert scrub, Shrubland, Riparian
Vireo atricapilla	Black-capped Vireo	LE	E	G3	S2B	Shrubland
Poecile carolinensis	Carolina Chickadee			G5	S5B	Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
Anthus spragueii	Sprague's Pipit	C		G4	S3N	Barren/Sparse Vegetation, Grassland, Shrubland, Agricultural
*Dendroica chrysoparia**	Golden-cheeked Warbler	LE	E	G2	S2B	Woodland
Aimophila cassinii	Cassin's Sparrow			G5	S4B	Grassland, Shrubland
Aimophila ruficeps	Rufous-crowned Sparrow			G5	S4B	Grassland
Spizella pusilla	Field Sparrow			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland
Ammodramus savannarum	Grasshopper Sparrow			G5	S3B	Grassland, Agricultural
Chondestes grammacus	Lark Sparrow			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland
Ammodramus leconteii	Le Conte's Sparrow					Grassland
Zonotrichia querula	Harris's Sparrow			G5	S4	Shrubland, Agricultural
Calcarius mccownii	McCown's Longspur			G4	S4	Grassland, Agricultural
Piranga rubra	Summer Tanager			G5	S5B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
Passerina ciris	Painted Bunting			G5	S4B	Shrubland, Agricultural
Spiza americana	Dickcissel			G5	S4B	Grassland, Agricultural
Sturnella magna	Eastern Meadowlark			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland
Icterus spurius	Orchard Oriole			G5	S4B	Shrubland, Savanna/Open Woodland, Woodland, Riparian

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place
		Federal	State	Global	State	
REPTILES AND AMPHIBIANS						
Anaxyrus (Bufo) woodhousii	Woodhouse's toad			G5	SU	woodland, forest, freshwater wetland
Apalone mutica	smooth softshell turtle					riparian, riverine, lacustrine, freshwater wetland
Cheylydra serpentina	Common snapping turtle					riparina, riverine
Crotalus atrox	Western diamondback rattlesnake				S4	barren/sparse vegetation, desert scrub, grassland, shrubland, savanna, woodland, caves/karst
Crotalus horridus	Timber (Canebrake) Rattlesnake		T	G4	S4	woodland, forest, riparian
Eurycea chisolmensis	Salado Springs salamander	C		G1	S1	freshwater wetland (springs)
Eurycea naufragia	Georgetown Salamander	C		G1	S1	caves and karst, freshwater wetland (springs)
Graptemys versa	Texas map turtle			G4	SU	riparian, riverine
Heterodon nasicus	Western hognosed snake					desert scrub, grassland, shrubland
Macrochelys temminckii	alligator snapping turtle		T	G3G4	S3	riparian, riverine, cultural aquatic
Nerodia harteri	Brazos Water Snake		T		S1	riparian, riverine, cultural aquatic
Phrynosoma cornutum	Texas horned lizard		T	G4G5	S4	desert scrub, grassland, savanna
Pseudacris streckeri	Strecker's Chorus Frog			G5	S3	grassland, savanna, woodland, riparian, cultural aquatic, freshwater wetland
Sistrurus catenatus	massasauga					grassland, barren/sparse vegetation, shrubland, coastal,
Terrapene ornata	Ornate box turtle			G5	S3	grassland, barren/sparse vegetation, deset scrub, savanna, woodland
Thamnophis sirtalis annectans	Texas Garter Snake (Eastern/Texas/ New Mexico)			G5	S2	riparian, around lacustrine and cultural aquatic sites
Trachemys scripta	Red-eared slider					riparian, riverine, lacustrine, freshwater wetland, cultural aquatic
FRESHWATER FISHES						
Anguilla rostrata	American eel			G4	S5	streams and reservoirs in drainages connected to marine environments
Cycleptus elongatus	Blue sucker		T	G3G4	S3	large, deep rivers, and deeper zones of lakes
Hiodon alosoides	Goldeye					large lakes; backwaters
Ictalurus lupus	Headwater catfish			G3	S2	clear streams and rivers with moderate gradients, deep spring runs
Macryhbopsis storeriana	Silver chub					over silt or mud, turbid water with very soft sand/silt substrate
Micropterus treculii	Guadalupe bass			G3	S3	small lentic environments; commonly taken in flowing water
Notropis bairdi	Red River shiner					streambeds with widely fluctuating flows subject to high summer temperatures, high rates of evaporation,
Notropis oxyrhynchus	Sharpnose shiner	C		G3	S3	Moderate current velocities and depths, sand bottom
Notropis potteri	Chub shiner		T	G4	S3	turbid, flowing water with silt or sand substrate; tolerant of high salinities
Polyodon spathula	Paddlefish		T	G4	S3	rivers, sluggish pools, backwaters, bayous, and oxbows with abundant zooplankton; large reservoirs if
INVERTEBRATES						
Amblycorypha uhleri	A katydid			G2G3*	S2?*	Savanna/Open Woodland
Arethaea ambulator	A katydid			G2G3*	S2?*	Savanna/Open Woodland
Bombus pensylvanicus	American bumblebee			GU	SU*	Grassland, Savanna/Open Woodland
Pleurobema riddellii	Louisiana pigtoe		T	G1G2	S1	Riverine
Pogonomyrmex comanche	Comanche harvester ant			G2G3*	S2*	Barren/Sparse Vegetation
Potamilus amphichaenus	Texas heelsplitter		T	G1G2	S1	Riverine
Quadrula aurea	Golden orb		T	G1	S2*	Riverine
Quadrula houstonensis	Smooth pimpleback		T	G2	S1S2*	Riverine
Quadrula mitchelli	False Spike		T	GH	SH	Riverine
Taeniopteryx starki	Texas willowfly			G1	S1	Riparian, Riverine
Truncilla macrodon	Texas fawnsfoot		T	G2Q	S1*	Riverine
PLANTS						
Agalinis auriculata	earleaf false foxglove			G3	SH	Savanna/Open Woodland; Grrassland
Agalinis densiflora	Osage Plains false foxglove			G3	S2	Savanna/Open Woodland - Outcrops
Argythamnia aphoroides	Hill Country wild-mercury			G2G3	S2S3	Savanna/Open Woodland
Carex edwardsiana	canyon sedge			G3G4S3S4	S3S4	Woodland (slopes above Riparian)
Carex shinnersii	Shinner's sedge			G3?	S2	Grassland
Clematis texensis	scarlet leather-flower			G3G4	S3S4	Woodland
Croton alabamensis var. texensis	Texabama croton			G3T2	S2	Woodland
Cuscuta exaltata	tree dodder			G3	S3	Woodland
Dalea reverchonii	Comanche Peak prairie-clover			G2	S2	Savanna/Open Woodland; Grassland
Echinacea atrorubens	Topeka purple-coneflower			G3	S3	Savanna/Open Woodland
Festuca versuta	Texas fescue			G3	S3	Woodland

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place
		Federal	State	Global	State	
Gaura triangulata	prairie butterfly-weed			G3G4	S3	Grassland
Hexalectris nitida	Glass Mountains coral-root			G3	S3	Woodland
Ipomoea shumardiana	Shumard's morning glory			G2G3	S1	Savanna/Open Woodland
Liatris glandulosa	glandular gay-feather			G3	S3	Savanna/Open Woodland
Oenothera coryi	Cory's Evening-primrose			G3	S3	Savanna/Open Woodland
Pediomelum cyphocalyx	turnip-root scurfpea			G3G4	S3S4	Grassland
Pediomelum reverchonii	Reverchon's curfpea			G3	S3	Grassland
Physaria engelmannii	Engelmann's bladderpod			G3	S3	Savanna/Open Woodland
Prunus minutiflora	Texas almond			G3G4	S3S4	Savanna/Open Woodland
Schoenoplectus hallii	Hall's baby bulrush			G2G3	S1	Freshwater Wetland (ponds)
Senecio quaylei	Quayle's butterweed			G1Q	S1	Savanna/Open Woodland
Styrax platanifolius subsp. platanifolius	sycamore-leaf snowbell			G3T3	S3	Woodland
Valerianella stenocarpa	bigflower cornsalad			G3	S3	Savanna/Open Woodland
Yucca necopina	Glen Rose yucca			G1G2	S1S2	Savanna/Open Woodland

Photo 1. East view of typical, maintained ROW toward existing Center Point Road bridge.

Photo 2. East view of eastbound IH-20 frontage road and ROW toward East Bankhead Drive bridge.

Photo 3. Northeast (upstream) view of existing Underwood Branch (Stream 1) culvert.

Photo 4. Southwest (downstream) view of Stream 2 headwaters.

Photo 5. Northeast (upstream) view of existing Stream 3 culvert along eastbound IH-20.

Photo 6. Northeast (upstream) view of existing Stream 4 culvert.

Photo 7. Southwest view of typical fencerow vegetation along eastbound IH-20 ROW boundary.

Photo 8. North view of upland post oak forest in proposed ROW expansion along westbound IH-20.

Photo 9. South view Underwood Branch and typical riparian forest within existing ROW.

Photo 10. West view of bottomland hardwood forest in proposed ROW expansion near Willow Creek.

Photo 11. Southwest view of scattered post oaks within existing ROW near eastbound IH-20.

Photo 12. West view of typical existing ROW from just west of the Center Point Road bridge.

TOTAL PROJECT AREA

ROW	FIELD VERIFIED CLASSIFICATION	ACRES	TOTAL ACRES
Existing ROW	Central Texas: Floodplain Hardwood Forest	0.05	156.33
Existing ROW	Central Texas: Riparian Hardwood Forest	4.08	
Existing ROW	Crosstimbers: Post Oak Woodland	1.86	
Existing ROW	Crosstimbers: Savanna Grassland	<0.01	
Existing ROW	Edwards Plateau: Oak/Hardwood Motte and Woodland	0.79	
Existing ROW	Existing Pavement	59.85	
Existing ROW	Maintained Grassland	88.45	
Existing ROW	Maintained ROW/IT	0.94	
Existing ROW	Native Invasive: Deciduous Woodland	0.12	
Existing ROW	Residential	<0.01	
Existing ROW	Stream 1	0.06	
Existing ROW	Stream 2	<0.01	
Existing ROW	Stream 3	0.01	
Existing ROW	Stream 4	0.02	
Existing ROW	Stream 5	0.10	
Proposed ROW	Central Texas: Floodplain Hardwood Forest	0.41	13.74
Proposed ROW	Central Texas: Riparian Hardwood Forest	1.98	
Proposed ROW	Commercial	0.11	
Proposed ROW	Crosstimbers: Post Oak Woodland	1.75	
Proposed ROW	Crosstimbers: Savanna Grassland	2.86	
Proposed ROW	Edwards Plateau: Oak/Hardwood Motte and Woodland	1.27	
Proposed ROW	Edwards Plateau: Savanna Grassland	0.37	
Proposed ROW	Maintained Grassland	<0.01	
Proposed ROW	Maintained ROW/IT	0.12	
Proposed ROW	Native Invasive: Deciduous Woodland	0.31	
Proposed ROW	Residential	4.52	
Proposed ROW	Stream 1	0.02	
Proposed ROW	Stream 2	<0.01	
Proposed ROW	Stream 3	<0.01	
Proposed ROW	Stream 5	0.02	
Existing Easement	Central Texas: Riparian Hardwood Forest	4.57	6.94
Existing Easement	Crosstimbers: Savanna Grassland	0.05	
Existing Easement	Edwards Plateau: Savanna Grassland	1.96	
Existing Easement	Existing Pavement	<0.01	
Existing Easement	Residential	0.03	
Existing Easement	Stream 1	0.07	
Existing Easement	Stream 3	0.05	
Existing Easement	Stream 5	0.20	
Proposed Permanent Easement	Blackland Prairie: Disturbance or Tame Grassland	0.07	0.42
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	0.03	
Proposed Permanent Easement	Central Texas: Riparian Hardwood Forest	0.01	
Proposed Permanent Easement	Crosstimbers: Post Oak Woodland	0.02	
Proposed Permanent Easement	Crosstimbers: Savanna Grassland	0.13	
Proposed Permanent Easement	Edwards Plateau: Oak/Hardwood Motte and Woodland	0.01	
Proposed Permanent Easement	Residential	0.14	
Proposed Permanent Easement	Stream 1	<0.01	
Proposed Temporary Easement	Residential	0.27	0.27
		177.69	177.69

Riparian Habitat in ROW (existing and new)	6.29

PERMANENT IMPACTS BY LAND COVER

ROW	FIELD VERIFIED CLASSIFICATION	MOU TYPE	ACRES	TOTAL ACRES by ROW/EASEMENT
Existing Easement	Edwards Plateau: Savanna Grassland	Edwards Plateau Savannah, Woodland, and Shrubland	0.01	0.05
Existing Easement	Central Texas: Riparian Hardwood Forest	Riparian	0.04	
Existing Easement	Stream 3	Riparian	<0.01	
Existing ROW	Crosstimbers: Post Oak Woodland	Crosstimbers woodland and Forest	0.94	24.02
Existing ROW	Edwards Plateau: Oak/Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	0.28	
Existing ROW	Central Texas: Floodplain Hardwood Forest	Floodplain	0.04	
Existing ROW	Crosstimbers: Savanna Grassland	N/A	<0.01	
Existing ROW	Maintained Grassland	N/A	21.24	
Existing ROW	Maintained ROW/IT	N/A	0.49	
Existing ROW	Native Invasive: Deciduous Woodland	N/A	0.04	
Existing ROW	Residential	N/A	<0.01	
Existing ROW	Central Texas: Riparian Hardwood Forest	Riparian	0.96	
Existing ROW	Stream 1	Riparian	0.01	
Existing ROW	Stream 3	Riparian	<0.01	
Existing ROW	Stream 4	Riparian	<0.01	
Proposed Permanent Easement	Crosstimbers: Post Oak Woodland	Crosstimbers woodland and Forest	0.01	0.03
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Floodplain	0.02	
Proposed Permanent Easement	Central Texas: Riparian Hardwood Forest	Riparian	<0.01	
Proposed Permanent Easement	Stream 1	Riparian	<0.01	
Proposed ROW	Crosstimbers: Post Oak Woodland	Crosstimbers woodland and Forest	0.50	4.02
Proposed ROW	Edwards Plateau: Oak/Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	0.20	
Proposed ROW	Edwards Plateau: Savanna Grassland	Edwards Plateau Savannah, Woodland, and Shrubland	0.10	
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Floodplain	0.07	
Proposed ROW	Commercial	N/A	0.02	
Proposed ROW	Crosstimbers: Savanna Grassland	N/A	0.56	
Proposed ROW	Maintained Grassland	N/A	<0.01	
Proposed ROW	Maintained ROW/IT	N/A	0.01	
Proposed ROW	Native Invasive: Deciduous Woodland	N/A	0.02	
Proposed ROW	Residential	N/A	2.33	
Proposed ROW	Central Texas: Riparian Hardwood Forest	Riparian	0.20	
Proposed ROW	Stream 1	Riparian	0.01	
Proposed ROW	Stream 3	Riparian	<0.01	
Proposed Temporary Easement	Residential	N/A	0.03	0.03
TOTAL PERMANENT IMPACTS BY LAND COVER			**28.15**	

TOTAL PERMANENT IMPACTS BY MOU TYPE	
Riparian	1.24
Edwards Plateau Savannah, Woodland, and Shrubland	0.59
Floodplain	0.12
Crosstimbers woodland and Forest	1.46

TOTAL ACRES OF NEW ROW & PERMANENT EASEMENT WITHIN FEMA 100-YEAR FLOODPLAIN	
Proposed Permanent Easement	0.03
Proposed ROW	1.65
Total Area	**1.68**
Area of 100-Year Floodplain to be Paved	1.48

TEMPORARY IMPACTS BY LAND COVER

ROW	FIELD VERIFIED CLASSIFICATION	MOU TYPE	ACRES	TOTAL ACRES by ROW/EASEMENT
Existing Easement	Central Texas: Riparian Hardwood Forest	Riparian	<0.01	0.00
Existing Easement	Crosstimbers: Savanna Grassland	N/A	<0.01	
Existing ROW	Central Texas: Floodplain Hardwood Forest	Floodplain	0.01	16.90
Existing ROW	Central Texas: Riparian Hardwood Forest	Riparian	0.40	
Existing ROW	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	0.45	
Existing ROW	Crosstimbers: Savanna Grassland	N/A	<0.01	
Existing ROW	Edwards Plateau: Oak/Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	0.20	
Existing ROW	Maintained Grassland	N/A	15.75	
Existing ROW	Maintained ROW/IT	N/A	0.05	
Existing ROW	Native Invasive: Deciduous Woodland	N/A	0.02	
Existing ROW	Residential	N/A	<0.01	
Existing ROW	Stream 1	Riparian	0.02	
Existing ROW	Stream 3	Riparian	<0.01	
Existing ROW	Stream 4	Riparian	<0.01	
Proposed Permanent Easement	Blackland Prairie: Disturbance or Tame Grassland	Disturbed Prairie	0.07	0.38
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Floodplain	0.01	
Proposed Permanent Easement	Central Texas: Riparian Hardwood Forest	Riparian	0.01	
Proposed Permanent Easement	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	0.01	
Proposed Permanent Easement	Crosstimbers: Savanna Grassland	N/A	0.13	
Proposed Permanent Easement	Edwards Plateau: Oak/Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	0.01	
Proposed Permanent Easement	Residential	N/A	0.14	
Proposed Permanent Easement	Stream 1	Riparian	<0.01	
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Floodplain	0.34	9.69
Proposed ROW	Central Texas: Riparian Hardwood Forest	Riparian	1.78	
Proposed ROW	Commercial	N/A	0.08	
Proposed ROW	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	1.25	
Proposed ROW	Crosstimbers: Savanna Grassland	N/A	2.30	
Proposed ROW	Edwards Plateau: Oak/Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	1.07	
Proposed ROW	Edwards Plateau: Savanna Grassland	Edwards Plateau Savannah, Woodland, and Shrubland	0.27	
Proposed ROW	Maintained Grassland	N/A	<0.01	
Proposed ROW	Maintained ROW/IT	N/A	0.11	
Proposed ROW	Native Invasive: Deciduous Woodland	N/A	0.29	
Proposed ROW	Residential	N/A	2.17	
Proposed ROW	Stream 1	Riparian	0.01	
Proposed ROW	Stream 2	Riparian	<0.01	
Proposed ROW	Stream 5	Riparian	0.02	
Proposed Temporary Easement	Residential	N/A	0.23	0.23
TOTAL TEMPORARY IMPACTS BY LAND COVER				27.21

TOTAL TEMPORARY IMPACTS BY MOU TYPE	
Riparian	2.24
Edwards Plateau Savannah, Woodland, and Shrubland	1.55
Floodplain	4.15
Crosstimbers Woodland and Forest	1.71
Disturbed Prairie	0.07

RAW EMST IN PROJECT AREA

ROW	CommonName	ACRES
Existing Easement	Central Texas: Floodplain Hardwood Forest	3.71
Existing Easement	Central Texas: Riparian Hardwood Forest	0.34
Existing Easement	Crosstimbers: Sandyland Oak Woodland	<0.01
Existing Easement	Crosstimbers: Savanna Grassland	0.03
Existing Easement	Edwards Plateau: Oak / Hardwood Motte and Woodland	1.86
Existing Easement	Edwards Plateau: Savanna Grassland	0.84
Existing Easement	Urban Low Intensity	0.15
Existing ROW	Blackland Prairie: Disturbance or Tame Grassland	0.78
Existing ROW	Central Texas: Floodplain Hardwood Forest	4.19
Existing ROW	Central Texas: Riparian Hardwood Forest	0.85
Existing ROW	Central Texas: Riparian Herbaceous Vegetation	<0.01
Existing ROW	Crosstimbers: Post Oak Woodland	3.60
Existing ROW	Crosstimbers: Sandyland Oak Woodland	0.06
Existing ROW	Crosstimbers: Savanna Grassland	6.77
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	1.16
Existing ROW	Edwards Plateau: Savanna Grassland	2.15
Existing ROW	Native Invasive: Deciduous Woodland	0.42
Existing ROW	Native Invasive: Mesquite Shrubland	0.65
Existing ROW	Urban High Intensity	6.68
Existing ROW	Urban Low Intensity	129.01
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	0.06
Proposed Permanent Easement	Crosstimbers: Savanna Grassland	0.20
Proposed Permanent Easement	Urban Low Intensity	0.15
Proposed ROW	Blackland Prairie: Disturbance or Tame Grassland	0.82
Proposed ROW	Central Texas: Floodplain Hardwood Forest	2.44
Proposed ROW	Central Texas: Riparian Hardwood Forest	0.08
Proposed ROW	Central Texas: Riparian Herbaceous Vegetation	<0.01
Proposed ROW	Crosstimbers: Post Oak Woodland	1.85
Proposed ROW	Crosstimbers: Savanna Grassland	0.63
Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	0.85
Proposed ROW	Edwards Plateau: Savanna Grassland	0.01
Proposed ROW	Native Invasive: Deciduous Woodland	0.63
Proposed ROW	Native Invasive: Mesquite Shrubland	1.46
Proposed ROW	Urban Low Intensity	4.97
Proposed Temporary Easement	Crosstimbers: Post Oak Woodland	0.27
		177.69

RAW EMST IN PROJECT AREA WITH FIELD VERIFIED COMPARISON

ROW	RAW EMST Classification : CommonName (FROM)	FIELD VERIFIED CLASSIFICATION (TO)	ACRES
Existing Easement	Central Texas: Floodplain Hardwood Forest	Central Texas: Riparian Hardwood Forest	3.41
Existing Easement	Central Texas: Floodplain Hardwood Forest	Crosstimbers: Savanna Grassland	0.03
Existing Easement	Central Texas: Floodplain Hardwood Forest	Edwards Plateau: Savanna Grassland	0.01
Existing Easement	Central Texas: Floodplain Hardwood Forest	Stream 1	0.07
Existing Easement	Central Texas: Floodplain Hardwood Forest	Stream 3	<0.01
Existing Easement	Central Texas: Floodplain Hardwood Forest	Stream 5	0.20
Existing Easement	Central Texas: Riparian Hardwood Forest	Central Texas: Riparian Hardwood Forest	0.12
Existing Easement	Central Texas: Riparian Hardwood Forest	Edwards Plateau: Savanna Grassland	0.22
Existing Easement	Central Texas: Riparian Hardwood Forest	Stream 3	<0.01
Existing Easement	Crosstimbers: Sandyland Oak Woodland	Central Texas: Riparian Hardwood Forest	<0.01
Existing Easement	Crosstimbers: Savanna Grassland	Crosstimbers: Savanna Grassland	<0.01
Existing Easement	Crosstimbers: Savanna Grassland	Residential	0.03
Existing Easement	Edwards Plateau: Oak / Hardwood Motte and Woodland	Central Texas: Riparian Hardwood Forest	0.66
Existing Easement	Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau: Savanna Grassland	1.18
Existing Easement	Edwards Plateau: Oak / Hardwood Motte and Woodland	Stream 3	0.03
Existing Easement	Edwards Plateau: Savanna Grassland	Central Texas: Riparian Hardwood Forest	0.37
Existing Easement	Edwards Plateau: Savanna Grassland	Edwards Plateau: Savanna Grassland	0.45
Existing Easement	Edwards Plateau: Savanna Grassland	Stream 3	0.02
Existing Easement	Urban Low Intensity	Central Texas: Riparian Hardwood Forest	0.01
Existing Easement	Urban Low Intensity	Crosstimbers: Savanna Grassland	0.03
Existing Easement	Urban Low Intensity	Edwards Plateau: Savanna Grassland	0.11
Existing Easement	Urban Low Intensity	Existing Pavement	<0.01
Existing ROW	Blackland Prairie: Disturbance or Tame Grassland	Maintained Grassland	0.71
Existing ROW	Blackland Prairie: Disturbance or Tame Grassland	Maintained ROW/IT	0.05
Existing ROW	Blackland Prairie: Disturbance or Tame Grassland	Native Invasive: Deciduous Woodland	0.03
Existing ROW	Central Texas: Floodplain Hardwood Forest	Central Texas: Floodplain Hardwood Forest	0.05
Existing ROW	Central Texas: Floodplain Hardwood Forest	Central Texas: Riparian Hardwood Forest	2.21
Existing ROW	Central Texas: Floodplain Hardwood Forest	Crosstimbers: Post Oak Woodland	0.58
Existing ROW	Central Texas: Floodplain Hardwood Forest	Edwards Plateau: Oak/Hardwood Motte and Woodland	<0.01
Existing ROW	Central Texas: Floodplain Hardwood Forest	Existing Pavement	0.18
Existing ROW	Central Texas: Floodplain Hardwood Forest	Maintained Grassland	1.02
Existing ROW	Central Texas: Floodplain Hardwood Forest	Maintained ROW/IT	0.05
Existing ROW	Central Texas: Floodplain Hardwood Forest	Native Invasive: Deciduous Woodland	<0.01
Existing ROW	Central Texas: Floodplain Hardwood Forest	Stream 1	0.02
Existing ROW	Central Texas: Floodplain Hardwood Forest	Stream 5	0.07
Existing ROW	Central Texas: Riparian Hardwood Forest	Central Texas: Riparian Hardwood Forest	0.35
Existing ROW	Central Texas: Riparian Hardwood Forest	Existing Pavement	0.03
Existing ROW	Central Texas: Riparian Hardwood Forest	Maintained Grassland	0.46
Existing ROW	Central Texas: Riparian Hardwood Forest	Stream 3	0.01
Existing ROW	Central Texas: Riparian Hardwood Forest	Stream 4	<0.01
Existing ROW	Central Texas: Riparian Herbaceous Vegetation	Crosstimbers: Post Oak Woodland	<0.01
Existing ROW	Central Texas: Riparian Herbaceous Vegetation	Crosstimbers: Savanna Grassland	<0.01
Existing ROW	Central Texas: Riparian Herbaceous Vegetation	Maintained Grassland	<0.01
Existing ROW	Crosstimbers: Post Oak Woodland	Central Texas: Riparian Hardwood Forest	0.10
Existing ROW	Crosstimbers: Post Oak Woodland	Crosstimbers: Post Oak Woodland	0.17
Existing ROW	Crosstimbers: Post Oak Woodland	Existing Pavement	0.98
Existing ROW	Crosstimbers: Post Oak Woodland	Maintained Grassland	2.24
Existing ROW	Crosstimbers: Post Oak Woodland	Maintained ROW/IT	0.11
Existing ROW	Crosstimbers: Sandyland Oak Woodland	Existing Pavement	0.01
Existing ROW	Crosstimbers: Sandyland Oak Woodland	Maintained Grassland	0.06
Existing ROW	Crosstimbers: Savanna Grassland	Central Texas: Riparian Hardwood Forest	0.03
Existing ROW	Crosstimbers: Savanna Grassland	Crosstimbers: Post Oak Woodland	0.08
Existing ROW	Crosstimbers: Savanna Grassland	Crosstimbers: Savanna Grassland	<0.01
Existing ROW	Crosstimbers: Savanna Grassland	Existing Pavement	1.60
Existing ROW	Crosstimbers: Savanna Grassland	Maintained Grassland	5.06
Existing ROW	Crosstimbers: Savanna Grassland	Maintained ROW/IT	0.01
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Central Texas: Riparian Hardwood Forest	0.36
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Crosstimbers: Post Oak Woodland	<0.01
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Crosstimbers: Savanna Grassland	<0.01
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau: Oak/Hardwood Motte and Woodland	0.44
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Existing Pavement	0.02
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Maintained Grassland	0.32
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Stream 4	0.01

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Existing ROW	Edwards Plateau: Savanna Grassland	Existing Pavement	1.10
Existing ROW	Edwards Plateau: Savanna Grassland	Maintained Grassland	1.05
Existing ROW	Native Invasive: Deciduous Woodland	Central Texas: Riparian Hardwood Forest	0.07
Existing ROW	Native Invasive: Deciduous Woodland	Maintained Grassland	0.24
Existing ROW	Native Invasive: Deciduous Woodland	Maintained ROW/IT	0.01
Existing ROW	Native Invasive: Deciduous Woodland	Native Invasive: Deciduous Woodland	0.09
Existing ROW	Native Invasive: Mesquite Shrubland	Edwards Plateau: Oak/Hardwood Motte and Woodland	<0.01
Existing ROW	Native Invasive: Mesquite Shrubland	Existing Pavement	0.07
Existing ROW	Native Invasive: Mesquite Shrubland	Maintained Grassland	0.58
Existing ROW	Urban High Intensity	Existing Pavement	3.44
Existing ROW	Urban High Intensity	Maintained Grassland	3.24
Existing ROW	Urban High Intensity	Stream 4	<0.01
Existing ROW	Urban Low Intensity	Central Texas: Riparian Hardwood Forest	0.95
Existing ROW	Urban Low Intensity	Crosstimbers: Post Oak Woodland	1.03
Existing ROW	Urban Low Intensity	Crosstimbers: Savanna Grassland	<0.01
Existing ROW	Urban Low Intensity	Edwards Plateau: Oak/Hardwood Motte and Woodland	0.35
Existing ROW	Urban Low Intensity	Existing Pavement	52.41
Existing ROW	Urban Low Intensity	Maintained Grassland	73.47
Existing ROW	Urban Low Intensity	Maintained ROW/IT	0.71
Existing ROW	Urban Low Intensity	Native Invasive: Deciduous Woodland	<0.01
Existing ROW	Urban Low Intensity	Residential	<0.01
Existing ROW	Urban Low Intensity	Stream 1	0.04
Existing ROW	Urban Low Intensity	Stream 2	<0.01
Existing ROW	Urban Low Intensity	Stream 3	<0.01
Existing ROW	Urban Low Intensity	Stream 4	<0.01
Existing ROW	Urban Low Intensity	Stream 5	0.03
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Blackland Prairie: Disturbance or Tame Grassland	<0.01
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Central Texas: Floodplain Hardwood Forest	0.03
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Central Texas: Riparian Hardwood Forest	0.01
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Crosstimbers: Post Oak Woodland	0.02
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Crosstimbers: Savanna Grassland	<0.01
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Stream 1	<0.01
Proposed Permanent Easement	Crosstimbers: Savanna Grassland	Crosstimbers: Savanna Grassland	0.10
Proposed Permanent Easement	Crosstimbers: Savanna Grassland	Residential	0.10
Proposed Permanent Easement	Urban Low Intensity	Blackland Prairie: Disturbance or Tame Grassland	0.07
Proposed Permanent Easement	Urban Low Intensity	Crosstimbers: Post Oak Woodland	0.01
Proposed Permanent Easement	Urban Low Intensity	Crosstimbers: Savanna Grassland	0.03
Proposed Permanent Easement	Urban Low Intensity	Edwards Plateau: Oak/Hardwood Motte and Woodland	0.01
Proposed Permanent Easement	Urban Low Intensity	Residential	0.04
Proposed ROW	Blackland Prairie: Disturbance or Tame Grassland	Crosstimbers: Savanna Grassland	0.73
Proposed ROW	Blackland Prairie: Disturbance or Tame Grassland	Maintained ROW/IT	0.05
Proposed ROW	Blackland Prairie: Disturbance or Tame Grassland	Native Invasive: Deciduous Woodland	0.04
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Central Texas: Floodplain Hardwood Forest	0.12
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Central Texas: Riparian Hardwood Forest	1.76
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Crosstimbers: Post Oak Woodland	0.37
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Crosstimbers: Savanna Grassland	0.02
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Edwards Plateau: Oak/Hardwood Motte and Woodland	<0.01
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Native Invasive: Deciduous Woodland	0.01
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Residential	0.11
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Stream 1	0.02
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Stream 5	0.02
Proposed ROW	Central Texas: Riparian Hardwood Forest	Central Texas: Floodplain Hardwood Forest	0.04
Proposed ROW	Central Texas: Riparian Hardwood Forest	Central Texas: Riparian Hardwood Forest	0.03
Proposed ROW	Central Texas: Riparian Hardwood Forest	Edwards Plateau: Savanna Grassland	0.01
Proposed ROW	Central Texas: Riparian Hardwood Forest	Stream 3	<0.01
Proposed ROW	Central Texas: Riparian Herbaceous Vegetation	Crosstimbers: Post Oak Woodland	<0.01
Proposed ROW	Central Texas: Riparian Herbaceous Vegetation	Crosstimbers: Savanna Grassland	<0.01
Proposed ROW	Crosstimbers: Post Oak Woodland	Central Texas: Riparian Hardwood Forest	0.06
Proposed ROW	Crosstimbers: Post Oak Woodland	Crosstimbers: Post Oak Woodland	1.17
Proposed ROW	Crosstimbers: Post Oak Woodland	Crosstimbers: Savanna Grassland	0.10
Proposed ROW	Crosstimbers: Post Oak Woodland	Existing Pavement	<0.01
Proposed ROW	Crosstimbers: Post Oak Woodland	Maintained Grassland	<0.01
Proposed ROW	Crosstimbers: Post Oak Woodland	Residential	0.52
Proposed ROW	Crosstimbers: Savanna Grassland	Central Texas: Riparian Hardwood Forest	<0.01
Proposed ROW	Crosstimbers: Savanna Grassland	Commercial	0.01
Proposed ROW	Crosstimbers: Savanna Grassland	Crosstimbers: Savanna Grassland	0.51
Proposed ROW	Crosstimbers: Savanna Grassland	Maintained Grassland	<0.01
Proposed ROW	Crosstimbers: Savanna Grassland	Maintained ROW/IT	<0.01
Proposed ROW	Crosstimbers: Savanna Grassland	Residential	0.11

...continued from page above

Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Central Texas: Riparian Hardwood Forest	<0.01
Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Crosstimbers: Post Oak Woodland	0.15
Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Crosstimbers: Savanna Grassland	0.04
Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau: Oak/Hardwood Motte and Woodland	0.51
Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau: Savanna Grassland	0.04
Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Residential	0.11
Proposed ROW	Edwards Plateau: Savanna Grassland	Edwards Plateau: Savanna Grassland	0.01
Proposed ROW	Native Invasive: Deciduous Woodland	Central Texas: Riparian Hardwood Forest	0.05
Proposed ROW	Native Invasive: Deciduous Woodland	Crosstimbers: Savanna Grassland	0.27
Proposed ROW	Native Invasive: Deciduous Woodland	Maintained ROW/IT	0.05
Proposed ROW	Native Invasive: Deciduous Woodland	Native Invasive: Deciduous Woodland	0.26
Proposed ROW	Native Invasive: Mesquite Shrubland	Crosstimbers: Savanna Grassland	0.29
Proposed ROW	Native Invasive: Mesquite Shrubland	Edwards Plateau: Oak/Hardwood Motte and Woodland	0.03
Proposed ROW	Native Invasive: Mesquite Shrubland	Maintained Grassland	<0.01
Proposed ROW	Native Invasive: Mesquite Shrubland	Residential	1.14
Proposed ROW	Urban Low Intensity	Central Texas: Floodplain Hardwood Forest	0.24
Proposed ROW	Urban Low Intensity	Central Texas: Riparian Hardwood Forest	0.07
Proposed ROW	Urban Low Intensity	Commercial	0.10
Proposed ROW	Urban Low Intensity	Crosstimbers: Post Oak Woodland	0.06
Proposed ROW	Urban Low Intensity	Crosstimbers: Savanna Grassland	0.91
Proposed ROW	Urban Low Intensity	Edwards Plateau: Oak/Hardwood Motte and Woodland	0.73
Proposed ROW	Urban Low Intensity	Edwards Plateau: Savanna Grassland	0.30
Proposed ROW	Urban Low Intensity	Existing Pavement	<0.01
Proposed ROW	Urban Low Intensity	Maintained Grassland	<0.01
Proposed ROW	Urban Low Intensity	Maintained ROW/IT	0.02
Proposed ROW	Urban Low Intensity	Residential	2.53
Proposed ROW	Urban Low Intensity	Stream 1	0.01
Proposed ROW	Urban Low Intensity	Stream 2	<0.01
Proposed Temporary Easement	Crosstimbers: Post Oak Woodland	Residential	0.27
			177.69

RAW EMST PERMANENT IMPACTS CLIP

ROW	RAW EMST CLASSIFICATION	MOU BASED OFF EMST CLASSIFICATION	ACRES
Existing Easement	Central Texas: Riparian Hardwood Forest	Riparian	0.05
Existing ROW	Blackland Prairie: Disturbance or Tame Grassland	Disturbed Prairie	0.64
Existing ROW	Central Texas: Floodplain Hardwood Forest	Floodplain	1.14
Existing ROW	Central Texas: Riparian Hardwood Forest	Riparian	0.25
Existing ROW	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	0.60
Existing ROW	Crosstimbers: Savanna Grassland	N/A	0.97
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	0.23
Existing ROW	Edwards Plateau: Savanna Grassland	Edwards Plateau Savannah, Woodland, and Shrubland	0.11
Existing ROW	Native Invasive: Deciduous Woodland	N/A	0.28
Existing ROW	Native Invasive: Mesquite Shrubland	N/A	0.10
Existing ROW	Urban Low Intensity	N/A	19.69
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Floodplain	0.03
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Floodplain	0.30
Proposed ROW	Central Texas: Riparian Hardwood Forest	Riparian	0.02
Proposed ROW	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	0.65
Proposed ROW	Crosstimbers: Savanna Grassland	N/A	0.11
Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	0.23
Proposed ROW	Native Invasive: Deciduous Woodland	N/A	0.04
Proposed ROW	Native Invasive: Mesquite Shrubland	N/A	0.56
Proposed ROW	Urban Low Intensity	N/A	2.12
Proposed Temporary Easement	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	0.03
			28.15

RAW EMST TEMPORARY IMPACT CLIP

ROW	RAW EMST CLASSIFICATION	MOU BASED OFF EMST CLASSIFICATION	ACRES
Existing Easement	Central Texas: Riparian Hardwood Forest	Riparian	<0.01
Existing Easement	Urban Low Intensity	N/A	<0.01
Existing ROW	Blackland Prairie: Disturbance or Tame Grassland	Disturbed Prairie	0.07
Existing ROW	Central Texas: Floodplain Hardwood Forest	Floodplain	0.79
Existing ROW	Central Texas: Riparian Hardwood Forest	Riparian	0.07
Existing ROW	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	0.47
Existing ROW	Crosstimbers: Savanna Grassland	N/A	0.84
Existing ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	0.33
Existing ROW	Edwards Plateau: Savanna Grassland	Edwards Plateau Savannah, Woodland, and Shrubland	0.02
Existing ROW	Native Invasive: Deciduous Woodland	N/A	0.05
Existing ROW	Native Invasive: Mesquite Shrubland	N/A	0.03
Existing ROW	Urban Low Intensity	N/A	14.24
Proposed Permanent Easement	Central Texas: Floodplain Hardwood Forest	Floodplain	0.03
Proposed Permanent Easement	Crosstimbers: Savanna Grassland	N/A	0.20
Proposed Permanent Easement	Urban Low Intensity	N/A	0.15
Proposed ROW	Blackland Prairie: Disturbance or Tame Grassland	Disturbed Prairie	0.82
Proposed ROW	Central Texas: Floodplain Hardwood Forest	Floodplain	2.14
Proposed ROW	Central Texas: Riparian Hardwood Forest	Riparian	0.07
Proposed ROW	Central Texas: Riparian Herbaceous Vegetation	Riparian	<0.01
Proposed ROW	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	1.20
Proposed ROW	Crosstimbers: Savanna Grassland	N/A	0.53
Proposed ROW	Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau Savannah, Woodland, and Shrubland	0.62
Proposed ROW	Edwards Plateau: Savanna Grassland	Edwards Plateau Savannah, Woodland, and Shrubland	0.01
Proposed ROW	Native Invasive: Deciduous Woodland	N/A	0.59
Proposed ROW	Native Invasive: Mesquite Shrubland	N/A	0.90
Proposed ROW	Urban Low Intensity	N/A	2.82
Proposed Temporary Easement	Crosstimbers: Post Oak Woodland	Crosstimbers Woodland and Forest	0.23
			27.20

United States Department of Agriculture

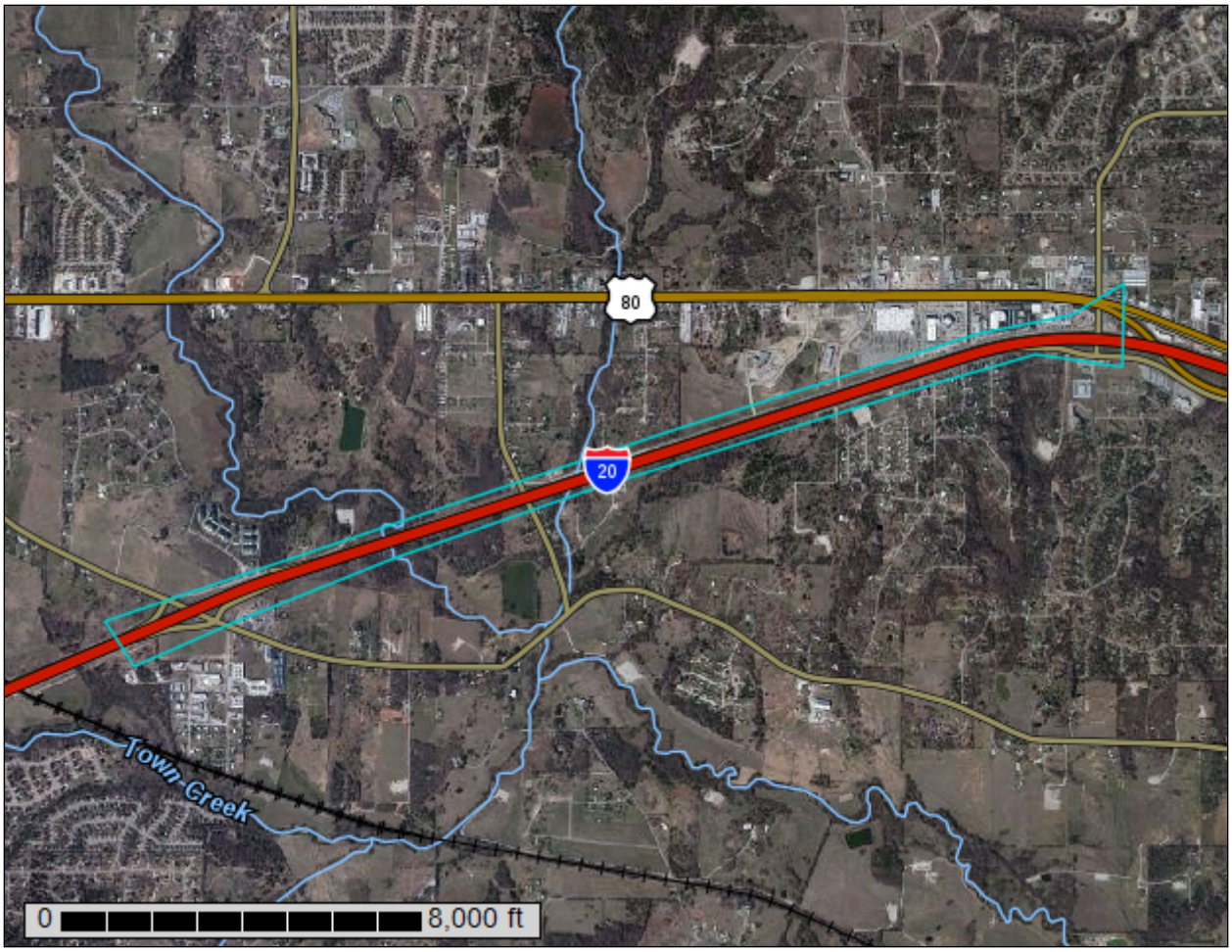
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Parker County, Texas



May 13, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

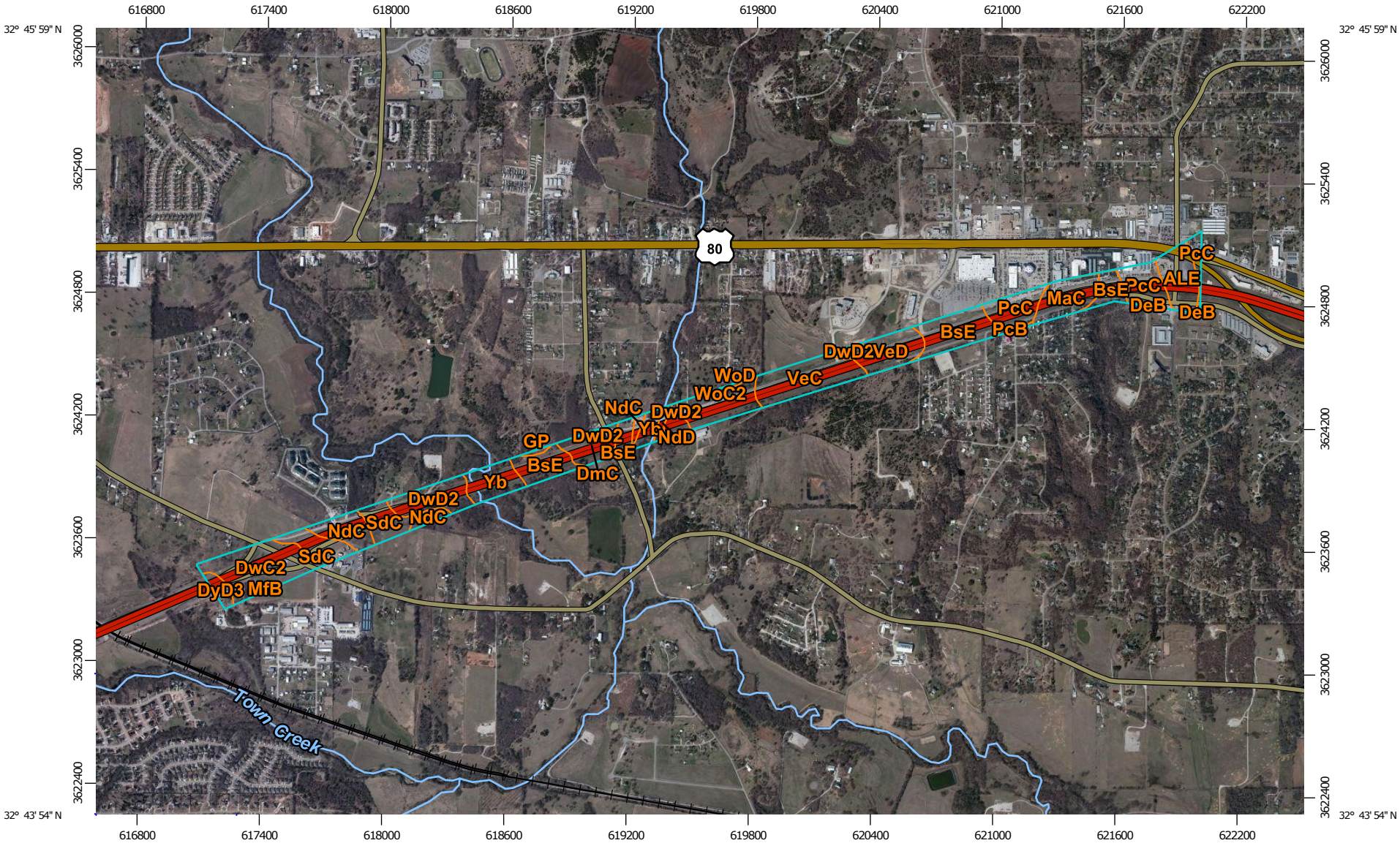
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:27,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 400 800 1600 2400

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Parker County, Texas
Survey Area Data: Version 13, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 18, 2010—Mar 1, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Parker County, Texas (TX367)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
ALE	Aledo-Bolar association, 1 to 8 percent slopes	12.3	5.5%
BsE	Brackett and Maloterre soils, 3 to 12 percent slopes	29.7	13.2%
DeB	Denton clay, 1 to 3 percent slopes	0.4	0.2%
DmC	Duffau and Weatherford soils, 1 to 5 percent slopes	9.1	4.0%
DwC2	Duffau and Weatherford soils, 2 to 5 percent slopes, moderately eroded	24.2	10.7%
DwD2	Duffau and Weatherford soils, 5 to 8 percent slopes, moderately eroded	20.1	8.9%
DyD3	Weatherford-Duffau complex, 2 to 8 percent slopes, severely eroded	3.1	1.4%
GP	Gravel pits	0.6	0.3%
MaC	Maloterre soils, 2 to 5 percent slopes	12.1	5.4%
MfB	May fine sandy loam, 1 to 3 percent slopes	0.7	0.3%
NdC	Nimrod fine sand, 1 to 5 percent slopes	12.6	5.6%
NdD	Nimrod fine sand, 5 to 8 percent slopes	1.7	0.7%
PcB	Purves clay, 1 to 3 percent slopes	0.7	0.3%
PcC	Purves clay, 3 to 5 percent slopes	22.4	10.0%
SdC	Selden loamy fine sand, 1 to 5 percent slopes	15.9	7.1%
VeC	Venus loam, 3 to 5 percent slopes	19.3	8.6%
VeD	Venus clay loam, 5 to 8 percent slopes	12.3	5.5%
WoC2	Windthorst fine sandy loam, 1 to 5 percent slopes, eroded	14.1	6.3%
WoD	Windthorst fine sandy loam, 5 to 8 percent slopes	0.2	0.1%
Yb	Santo and Bunyan soils, 0 to 1 percent slopes, frequently flooded	13.6	6.1%
Totals for Area of Interest		**224.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly

indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Parker County, Texas

ALE—Aledo-Bolar association, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tc39
Elevation: 500 to 1,400 feet
Mean annual precipitation: 30 to 38 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 220 to 245 days
Farmland classification: Not prime farmland

Map Unit Composition

Aledo and similar soils: 50 percent
Bolar and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aledo

Setting

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from limestone

Typical profile

A - 0 to 4 inches: gravelly clay loam
Bk - 4 to 16 inches: extremely gravelly clay loam
R - 16 to 80 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent
Percent of area covered with surface fragments: 1.0 percent
Depth to restrictive feature: 9 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 80 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: Shallow 30-38" PZ (R085XY185TX)

Description of Bolar

Setting

Landform: Structural benches on ridges
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from limestone

Typical profile

A - 0 to 13 inches: clay loam
Bk1 - 13 to 22 inches: clay loam
Bk2 - 22 to 28 inches: gravelly clay loam
R - 28 to 80 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 80 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Minor Components

Brackett

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Adobe 30-38" PZ (R085XY176TX)

Rock outcrop

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex

Venus

Percent of map unit: 3 percent

Landform: Ridges
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Purves

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Shallow Clay 30-38" PZ (R085XY563TX)

BsE—Brackett and Maloterre soils, 3 to 12 percent slopes

Map Unit Setting

National map unit symbol: f3qm
Elevation: 700 to 1,350 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 210 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Brackett and similar soils: 50 percent
Maloterre and similar soils: 22 percent
Minor components: 28 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brackett

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from limestone

Typical profile

A - 0 to 4 inches: clay loam
Bk - 4 to 14 inches: loam
Cr - 14 to 80 inches: bedrock

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 80 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Adobe 30-38" PZ (R085XY176TX)

Description of Maloterre

Setting
Landform: Ridges
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from limestone

Typical profile
A - 0 to 8 inches: gravelly clay loam
R - 8 to 10 inches: bedrock

Properties and qualities
Slope: 3 to 12 percent
Depth to restrictive feature: 3 to 10 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 80 percent
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Very Shallow 30-38" PZ (R085XY189TX)

Minor Components

Unnamed
Percent of map unit: 28 percent
Landform: Ridges

DeB—Denton clay, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tc45
Elevation: 400 to 1,900 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 64 to 67 degrees F
Frost-free period: 220 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Denton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Denton

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey slope alluvium and/or residuum over calcareous residuum weathered from limestone

Typical profile

Ap - 0 to 13 inches: clay
Bw - 13 to 19 inches: silty clay
2Bk - 19 to 36 inches: silt loam
2CBk - 36 to 52 inches: silt loam
2R - 52 to 80 inches: bedrock

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 80 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Minor Components

Bolar

Percent of map unit: 8 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Krum

Percent of map unit: 5 percent
Landform: Draws
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Venus

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

DmC—Duffau and Weatherford soils, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: f3qw
Elevation: 700 to 1,340 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 194 to 251 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Duffau and similar soils: 50 percent
Weatherford and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Duffau

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from limestone and shale

Typical profile

A - 0 to 9 inches: loamy fine sand
Bt - 9 to 75 inches: sandy clay loam
C - 75 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Loamy Sand 29-33" PZ (R084BY171TX)

Description of Weatherford

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical profile

A - 0 to 10 inches: loamy fine sand
Bt1 - 10 to 30 inches: sandy clay loam
Bt2 - 30 to 46 inches: sandy clay loam
C - 46 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Loamy Sand 29-33" PZ (R084BY171TX)

Minor Components

Unnamed

Percent of map unit: 15 percent
Landform: Plains

DwC2—Duffau and Weatherford soils, 2 to 5 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: f3qx
Elevation: 700 to 1,340 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 194 to 251 days
Farmland classification: Not prime farmland

Map Unit Composition

Duffau, eroded, and similar soils: 50 percent
Weatherford, eroded, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Duffau, Eroded

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from limestone and shale

Typical profile

A - 0 to 6 inches: fine sandy loam
Bt - 6 to 60 inches: sandy clay loam
C - 60 to 80 inches: sandy clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Description of Weatherford, Eroded

Setting
Landform: Ridges
Landform position (two-dimensional): Shoulder
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical profile
A - 0 to 6 inches: fine sandy loam
Bt1 - 6 to 28 inches: sandy clay loam
Bt2 - 28 to 44 inches: sandy clay loam
C - 44 to 80 inches: fine sandy loam

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Minor Components

Unnamed
Percent of map unit: 15 percent
Landform: Plains

DwD2—Duffau and Weatherford soils, 5 to 8 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: f3qy
Elevation: 700 to 1,340 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 194 to 251 days
Farmland classification: Not prime farmland

Map Unit Composition

Duffau, eroded, and similar soils: 51 percent
Weatherford, eroded, and similar soils: 22 percent
Minor components: 27 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Duffau, Eroded

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from limestone and shale

Typical profile

A - 0 to 6 inches: fine sandy loam
Bt - 6 to 68 inches: sandy clay loam
C - 68 to 80 inches: fine sandy loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Description of Weatherford, Eroded

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical profile

A - 0 to 10 inches: fine sandy loam
Bt1 - 10 to 28 inches: sandy clay loam
Bt2 - 28 to 45 inches: sandy clay loam
C - 45 to 80 inches: fine sandy loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Minor Components

Unnamed

Percent of map unit: 27 percent
Landform: Plains

DyD3—Weatherford-Duffau complex, 2 to 8 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2sz2v
Elevation: 700 to 1,550 feet
Mean annual precipitation: 32 to 38 inches
Mean annual air temperature: 62 to 66 degrees F
Frost-free period: 210 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Weatherford, severely eroded, and similar soils: 45 percent
Duffau, severely eroded, and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weatherford, Severely Eroded

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical profile

A - 0 to 3 inches: very fine sandy loam
Bt - 3 to 47 inches: sandy clay loam
Cr - 47 to 80 inches: bedrock

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Description of Duffau, Severely Eroded

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Sandy and/or loamy residuum weathered from sandstone and/or claystone

Typical profile

A - 0 to 4 inches: very fine sandy loam
Bt - 4 to 66 inches: sandy clay loam
BC - 66 to 80 inches: sandy clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Minor Components

Windthorst

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Gullied land

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave

Keeter

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Selden

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Loamy Sand 29-33" PZ (R084BY171TX)

GP—Gravel pits

Map Unit Setting

National map unit symbol: p5c2
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 64 to 68 degrees F
Frost-free period: 210 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits, gravel: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

MaC—Maloterre soils, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: f3rf
Elevation: 800 to 1,350 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 220 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Maloterre and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maloterre

Setting

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from limestone

Typical profile

A - 0 to 7 inches: gravelly clay loam
R - 7 to 10 inches: bedrock

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: 3 to 10 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 80 percent
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Very Shallow 30-38" PZ (R085XY189TX)

Minor Components

Unnamed
Percent of map unit: 10 percent
Landform: Ridges

MfB—May fine sandy loam, 1 to 3 percent slopes

Map Unit Setting
National map unit symbol: f3rg
Elevation: 700 to 1,350 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 194 to 251 days
Farmland classification: All areas are prime farmland

Map Unit Composition
May and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of May

Setting
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile
A - 0 to 12 inches: fine sandy loam
Bt - 12 to 40 inches: sandy clay loam
2Bt - 40 to 80 inches: clay loam

Properties and qualities
Slope: 1 to 3 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Minor Components

Unnamed
Percent of map unit: 10 percent
Landform: Ridges

NdC—Nimrod fine sand, 1 to 5 percent slopes

Map Unit Setting
National map unit symbol: f3rh
Elevation: 700 to 1,350 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 210 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Nimrod and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nimrod

Setting
Landform: Paleoterraces
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile
A1 - 0 to 8 inches: fine sand
A2 - 8 to 28 inches: fine sand
Bt - 28 to 45 inches: sandy clay loam
BC - 45 to 80 inches: sandy clay

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Sandy 29-33" PZ (R084BY172TX)

Minor Components

Unnamed

Percent of map unit: 10 percent
Landform: Ridges

NdD—Nimrod fine sand, 5 to 8 percent slopes

Map Unit Setting

National map unit symbol: f3rj
Elevation: 700 to 1,350 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 210 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Nimrod and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nimrod

Setting

Landform: Paleoterraces
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

A1 - 0 to 6 inches: fine sand

A2 - 6 to 30 inches: fine sand
Bt - 30 to 65 inches: sandy clay loam
BC - 65 to 80 inches: loamy fine sand

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Sandy 29-33" PZ (R084BY172TX)

Minor Components

Unnamed

Percent of map unit: 10 percent
Landform: Ridges

PcB—Purves clay, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tc2v
Elevation: 400 to 1,800 feet
Mean annual precipitation: 30 to 38 inches
Mean annual air temperature: 63 to 67 degrees F
Frost-free period: 210 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Purves and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purves

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Convex

Parent material: Clayey residuum weathered from limestone

Typical profile

A - 0 to 8 inches: clay
Bk1 - 8 to 12 inches: clay
Bk2 - 12 to 14 inches: extremely gravelly clay
R - 14 to 40 inches: bedrock

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 50 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: D
Ecological site: Shallow 30-38" PZ (R085XY185TX)

Minor Components

Aledo

Percent of map unit: 4 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Shallow 30-38" PZ (R085XY185TX)

Bolar

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Crawford

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Deep Redland 30-38" PZ (R085XY180TX)

Dugout

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Shallow 30-38" PZ (R085XY185TX)

PcC—Purves clay, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2tc2w
Elevation: 400 to 1,800 feet
Mean annual precipitation: 30 to 43 inches
Mean annual air temperature: 63 to 67 degrees F
Frost-free period: 210 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Purves and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purves

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey residuum weathered from limestone

Typical profile

A - 0 to 7 inches: clay
Bk1 - 7 to 12 inches: clay
Bk2 - 12 to 17 inches: very gravelly clay
R - 17 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum in profile: 50 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: D
Ecological site: Shallow 30-38" PZ (R085XY185TX)

Minor Components

Bolar

Percent of map unit: 4 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Krum

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Dugout

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Shallow 30-38" PZ (R085XY185TX)

Aledo

Percent of map unit: 1 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Shallow 30-38" PZ (R085XY185TX)

SdC—Selden loamy fine sand, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: f3rt
Elevation: 700 to 1,100 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 230 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Selden and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Selden

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex, concave
Parent material: Loamy alluvium

Typical profile

A - 0 to 18 inches: loamy fine sand
Bt - 18 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy Sand 29-33" PZ (R084BY171TX)

Minor Components

Unnamed

Percent of map unit: 10 percent
Landform: Ridges

VeC—Venus loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2tc4f
Elevation: 600 to 1,500 feet
Mean annual precipitation: 29 to 38 inches
Mean annual air temperature: 64 to 66 degrees F
Frost-free period: 220 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Venus and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Venus

Setting

Landform: Ridges, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy slope alluvium

Typical profile

Ap - 0 to 14 inches: loam
Bk - 14 to 50 inches: loam
BCk - 50 to 80 inches: fine sandy loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 60 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Minor Components

Aledo

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Shallow 30-38" PZ (R085XY185TX)

Denton

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Krum

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

VeD—Venus clay loam, 5 to 8 percent slopes

Map Unit Setting

National map unit symbol: f3s6
Elevation: 700 to 800 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 51 to 76 degrees F
Frost-free period: 220 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Venus and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Venus

Setting

Landform: Ridges
Landform position (two-dimensional): Footslope
Down-slope shape: Linear

Across-slope shape: Concave
Parent material: Loamy slope alluvium

Typical profile

A - 0 to 16 inches: clay loam
Bk - 16 to 45 inches: clay loam
BCk - 45 to 80 inches: clay loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Clay Loam 30-38" PZ (R085XY179TX)

Minor Components

Unnamed

Percent of map unit: 10 percent
Landform: Ridges

WoC2—Windthorst fine sandy loam, 1 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2tc3s
Elevation: 650 to 1,250 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 62 to 66 degrees F
Frost-free period: 210 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Windthorst, eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windthorst, Eroded

Setting

Landform: Ridges

Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or clayey residuum weathered from sandstone and shale

Typical profile

A - 0 to 3 inches: fine sandy loam
Bt1 - 3 to 28 inches: sandy clay
Bt2 - 28 to 42 inches: sandy clay
C - 42 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Minor Components

Duffau

Percent of map unit: 8 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Loamy Sand 29-33" PZ (R084BY171TX)

Keeter

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Chaney

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Footslope, backslope

Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Loamy Sand 29-33" PZ (R084BY171TX)

WoD—Windthorst fine sandy loam, 5 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tc3v
Elevation: 650 to 1,250 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 62 to 66 degrees F
Frost-free period: 210 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Windthorst and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windthorst

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and/or clayey residuum weathered from sandstone and shale

Typical profile

A - 0 to 7 inches: fine sandy loam
Bt1 - 7 to 31 inches: clay
Bt2 - 31 to 56 inches: clay
C - 56 to 80 inches: sandy clay loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Minor Components

Duffau

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Loamy Sand 29-33" PZ (R084BY171TX)

Keeter

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Sandy Loam 29-33" PZ (R084BY174TX)

Yb—Santo and Bunyan soils, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: f3sh
Elevation: 730 to 1,150 feet
Mean annual precipitation: 16 to 40 inches
Mean annual air temperature: 51 to 77 degrees F
Frost-free period: 194 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Santo and similar soils: 38 percent
Bunyan and similar soils: 23 percent
Minor components: 39 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Santo

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

A - 0 to 8 inches: fine sandy loam
C1 - 8 to 12 inches: loamy fine sand
C2 - 12 to 30 inches: fine sandy loam
C3 - 30 to 44 inches: loamy fine sand
C4 - 44 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A
Ecological site: Loamy Bottomland 29-33" PZ (R084BY170TX)

Description of Bunyan

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 6 inches: fine sandy loam
C1 - 6 to 15 inches: sandy clay loam
C2 - 15 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B
Ecological site: Loamy Bottomland 29-33" PZ (R084BY170TX)

Minor Components

Unnamed

Percent of map unit: 34 percent
Landform: Flood plains

Unnamed, hydric

Percent of map unit: 5 percent
Landform: Depressions on flood plains
Down-slope shape: Concave
Across-slope shape: Concave

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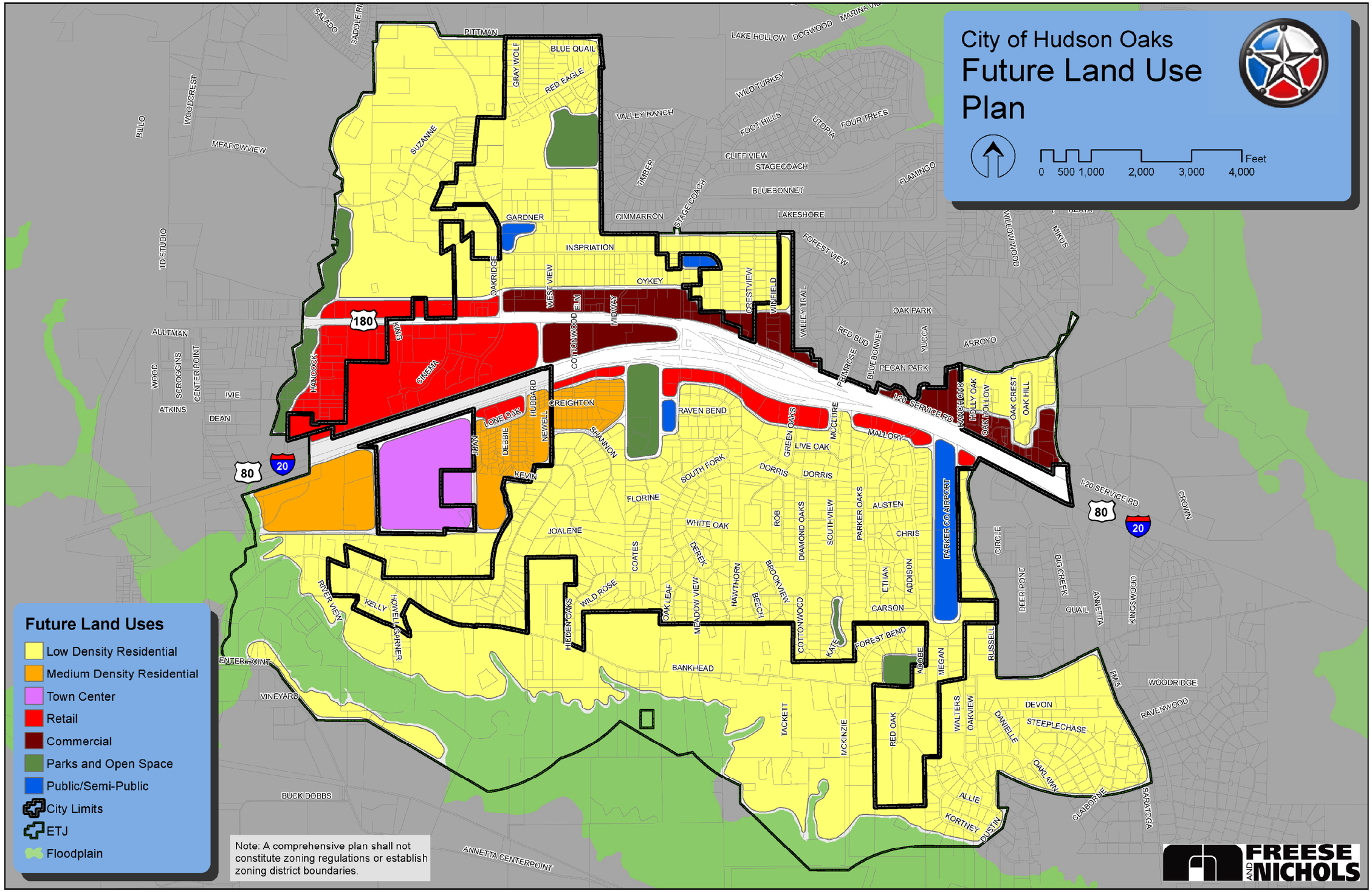

FN PROJECT NO.	PRK12278
DATE CREATED	5/20/2016
DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	B-1 FLU Hudson Oaks
PREPARED BY	SSJ

PARKER CO.
IH 20 AT CENTERPOINT ROAD

Hudson Oaks Future Land Use Map

N W E S

B-1

APPENDIX

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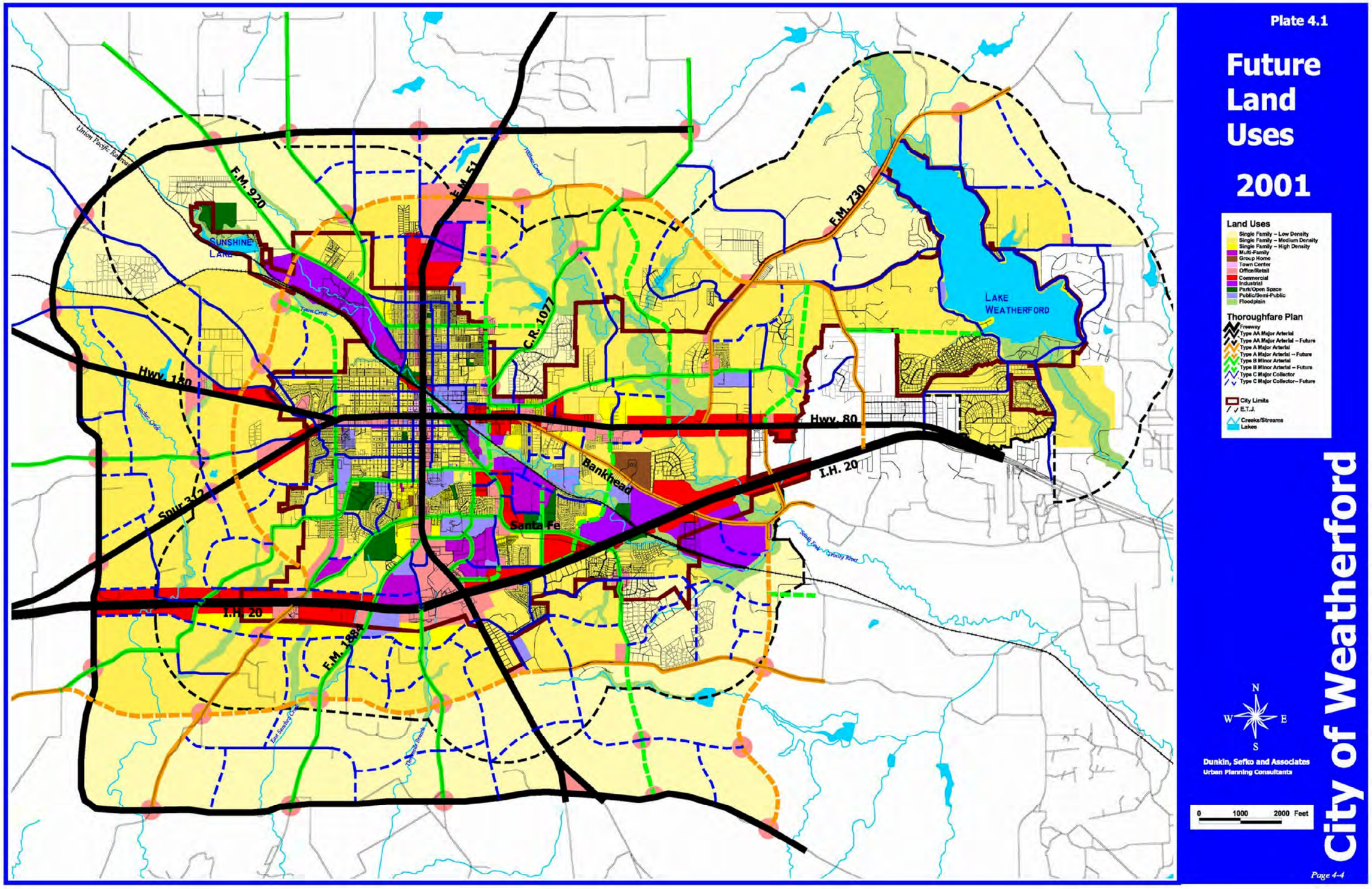


FN PROJECT NO.	PRK12278
DATE CREATED	5/20/2016
DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	B-2_FLU_Weatherford
PREPARED BY	SS1

PARKER CO.
IH 20 AT CENTERPOINT ROAD

Weatherford Future Land Use Map

N
W E
S

B-2

APPENDIX

Path: H:\ENVIRONMENTAL\FINAL_EXHIBITS\Revised_20160517\B-2_FLU_Weatherford.mxd

Summary Table of Impacts to Potentially Jurisdictional Waters of the U.S.

Project Name: IH 20 at Center Point **CSJ:** 0314-07-051, 052, 046 **County:** Parker **District:** Fort Worth **Date Completed:** June 2, 2016

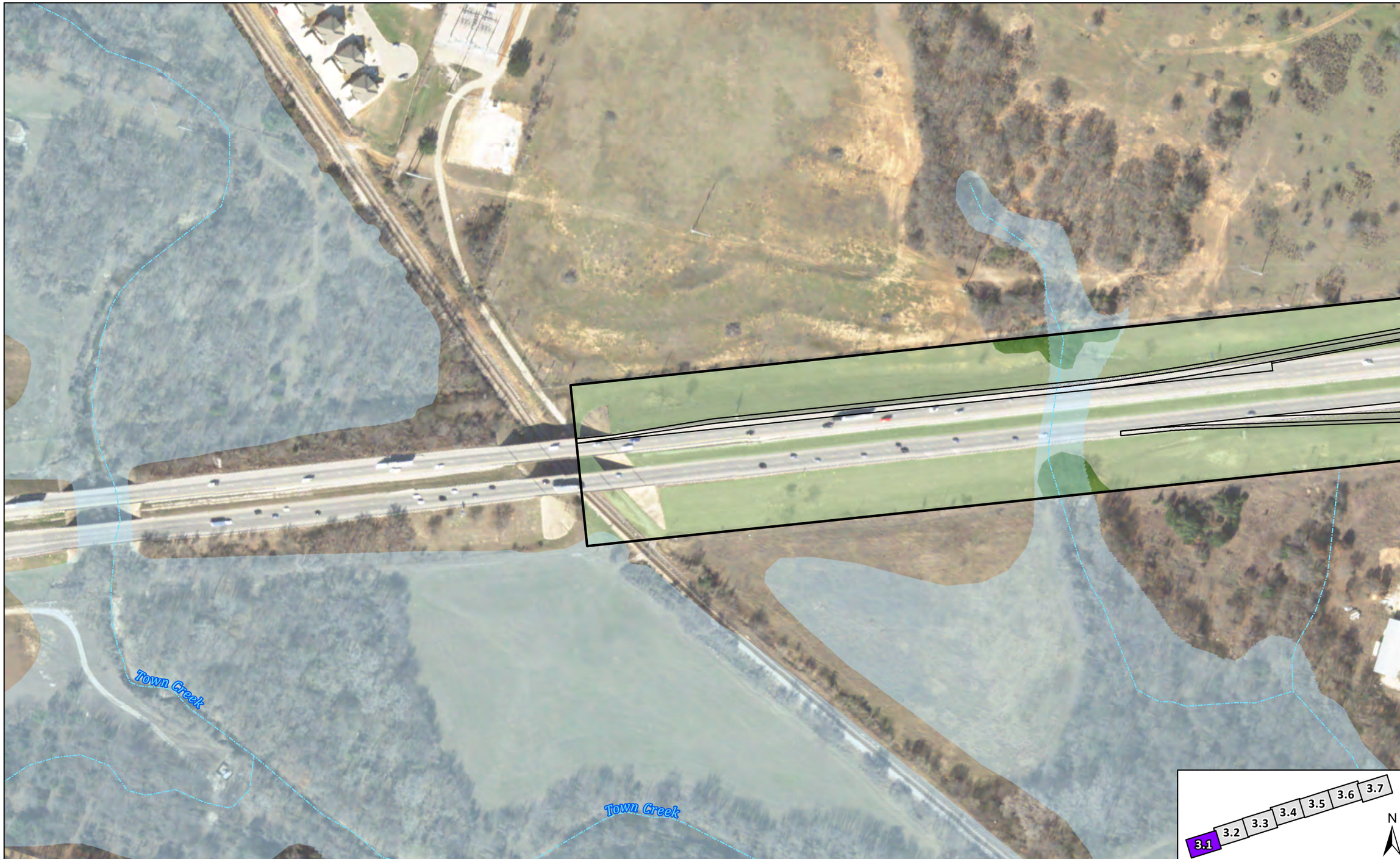
Please include, as an attachment, all supporting documentation that was used to populate the information in the table.

Waterbody ID[1]	Location Description *(Ex: Lat. and Long.; Intersection, Station Number; etc.)*	Resource Type[2]	Linear Feet in Project Area	Acres in Project Area	Permanent Fill		Temporary Fill		Permit Type	Pre-Construction Notification	
					Linear Feet	Acres	Linear Feet	Acres		Required	If Yes, Reason[3]
Underwood Branch (Stream 1)	2500+70	IS	1090.2	0.15	189.4	0.03	0.0	0.0	Nationwide Permit 14	No	
Stream 2	2525+00	ES	25.7	>0.01	0.0	0.0	17.9	>0.01	Nationwide Permit 14	No	
Stream 3	2539+00	IS	1907.3	0.07	14.6	>0.01	0.0	0.0	Nationwide Permit 14	No	
Stream 4	2578+20	IS	410.2	0.02	59.4	>0.01	0.0	0.0	Nationwide Permit 14	No	
Willow Creek (Stream 5)	2474+00	IS	1143.2	0.31	204.4	0.03	0.0	0.0	Nationwide Permit 14	No	

[1] Waterbody ID may be the name of a feature or an assigned label such as "W-1" for a wetland.
[2] Resource Types: NFW – Non-forested wetland, FW – Forested wetland, PS – Perennial Stream, IS – Intermittent Stream, ES – Ephemeral Stream, I – Impoundment
[3] Reasons for PCN requirement:
A – The loss of waters of the U.S. exceeds 1/10 acre
B – There is a discharge in a special aquatic site (e.g., wetlands)
C – Potential endangered species
D – Potential historic properties
E – Discharge into pitcher plant bog or bald cypress-tupelo swamp
F – Discharge into the area of Caddo Lake within Texas that is designated as a "Wetland of International Importance" under the Ramsar Convention
G – Required by Louisiana Regional Conditions
H – Other

Row Labels	Sum of TOTAL LENGTH	OHWM Width	Total/Impact (Y/N)	Perm/Temp	Acres	Notes
UNDERWOOD BRANCH (1)	1090.2	6	Total		0.1502	
E-ROW	439.7		N			
Ex-Easement	461.1		N			
Perm-Easement	25.4		Y	Perm	0.0035	
P-ROW	164.1		Y	Perm	0.0226	
Total Perm	189.4		Y	Perm	0.0261	sum of above
Stream 2	25.7	1	Total		0.0006	
E-ROW	7.8		N			
P-ROW	17.9		Y	Temp	0.0004	
Stream 3	1907.3	1.5	Total		0.0657	
E-ROW	419.4		N			
Ex-Easement	1473.3		N			
P-ROW	14.6		Y	Perm	0.0005	
Stream 4	410.2	2	Total		0.0188	
E-ROW	350.8		N			
E-ROW	59.4		Y	Perm	0.0027	
WILLOW CREEK (5)	1143.2	12	Total		0.3149	
E-ROW	356.8		N			
Ex-Easement	713.8		N			
P-ROW	72.6		NA			
All ROW*	204.4		Y	Perm	0.0282	
Grand Total	**4576.6**					

*Assumes some bank armoring would be done under NWP 14 within the new and existing ROW to protect new structures.
Assumes 3 feet of riprap below the OHWM on each bank for a distance of 204.4 feet



FN PROJECT NO.	PRK12278
DATE CREATED	5/19/2016
DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	C-3 Cover Type MB 20160517
PREPARED BY	SS3

PARKER CO.
IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

Stream Crossing (SC #)
Streams
100 Year Floodplain
Revisions to cover types after field verification

Existing ROW
Proposed ROW
Existing Easement
Proposed Permanent Easement
Proposed Temporary Easement

Proposed Edge of Pavement
New Proposed Pavement
Blackland Prairie: Disturbance or Tame Grassland
Central Texas: Floodplain Hardwood Forest
Central Texas: Riparian Hardwood Forest

Commercial
Crosstimbers: Post Oak Woodland
Crosstimbers: Savanna Grassland
Edwards Plateau: Oak/Hardwood Motte and Woodland
Edwards Plateau: Savanna Grassland

Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

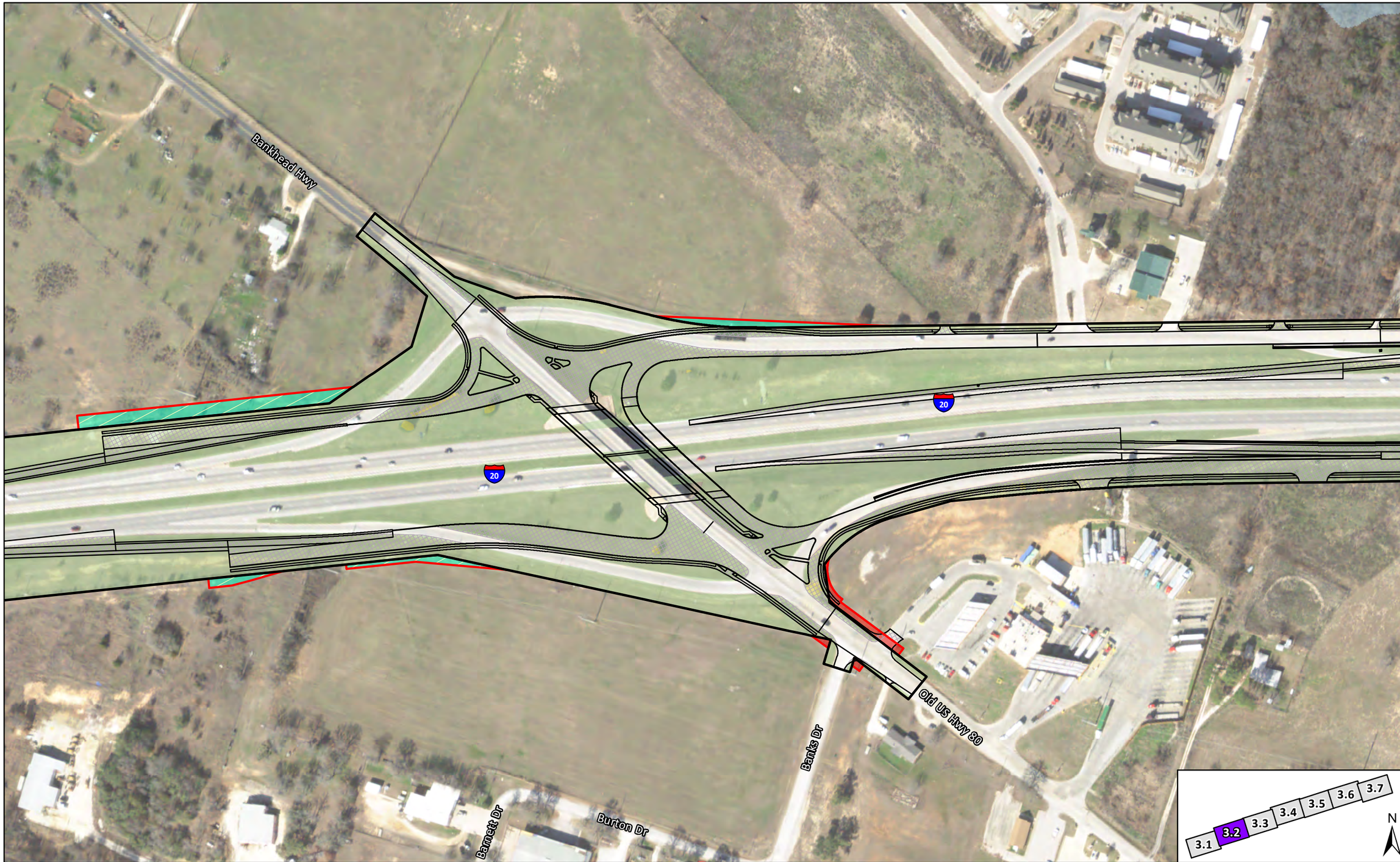
1:2,400

0 100 200 400
Feet
1 inch equals 200 feet

C-3.1

FIGURE

Path: H:\ENVIRONMENTAL\FINAL_EXHIBITS\Revised_20160517\C-3_Cover_Type_MB_20160517.mxd



FN PROJECT NO.	PRK12278
DATE CREATED	5/19/2016
DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	C-3 Cover Type MB 20160517
PREPARED BY	SS3

IH 20 AT CENTERPOINT ROAD

PARKER CO.

Cover Type Mapbook

Stream Crossing (SC #)
Streams
100 Year Floodplain
Revisions to cover types after field verification

Existing ROW
Proposed ROW
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Crosstimbers: Savanna Grassland
Edwards Plateau: Oak/Hardwood Motte and Woodland
Edwards Plateau: Savanna Grassland

Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

0 100 200 400 Feet
1 inch equals 200 feet

C-3.2

FIGURE

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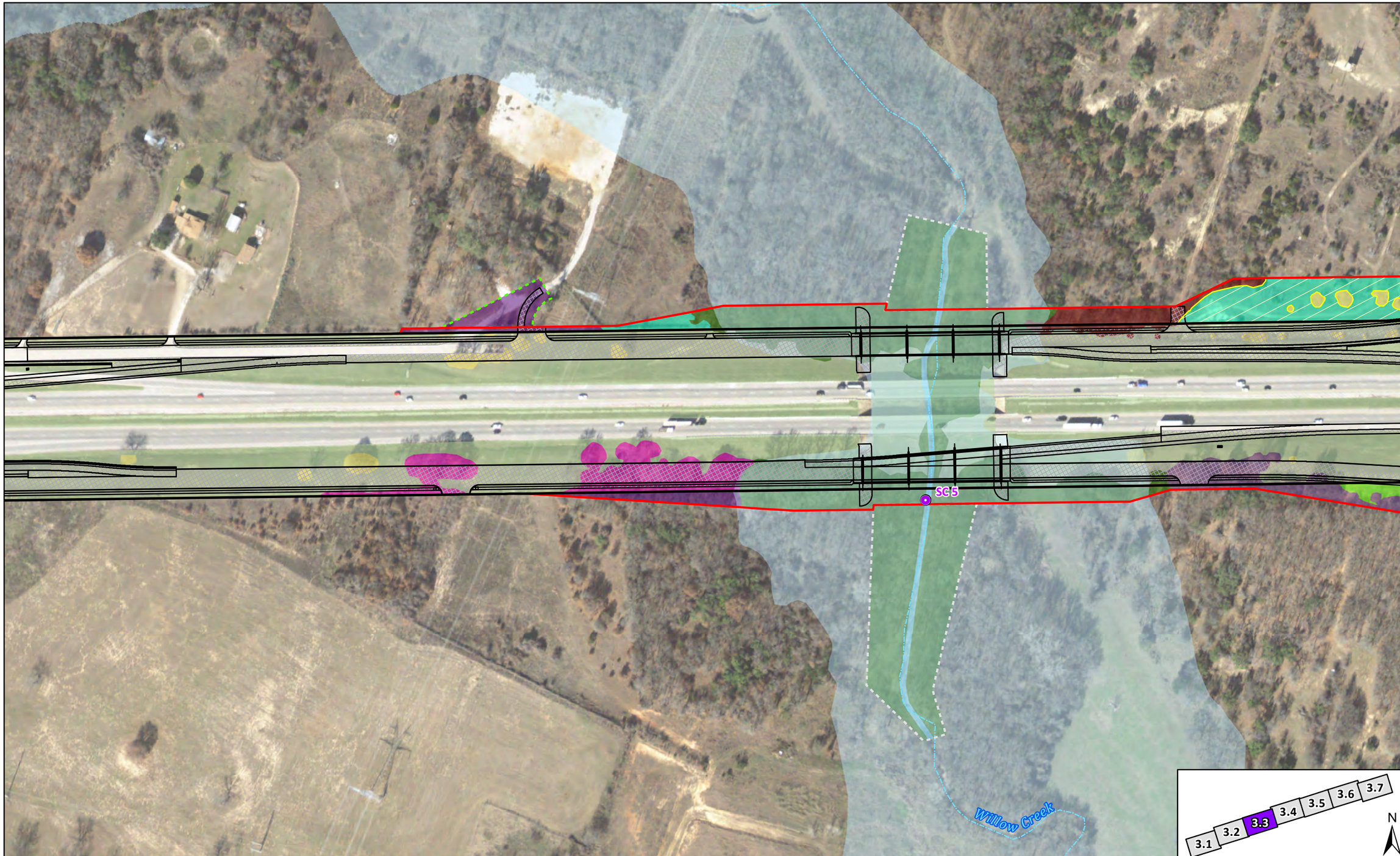

FN PROJECT NO.	PRK12278
DATE CREATED	5/19/2016
DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	C-3 Cover Type MB 20160517
PREPARED BY	SS3

IH 20 AT CENTERPOINT ROAD

PARKER CO.

Cover Type Mapbook

- Stream Crossing (SC #)
- Streams
- 100 Year Floodplain
- Revisions to cover types after field verification
- Existing ROW
- Proposed ROW
- Existing Easement
- Proposed Permanent Easement
- Proposed Temporary Easement
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- New Proposed Pavement
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- Commercial
- Crosstimbers: Post Oak Woodland
- Crosstimbers: Savanna Grassland
- Edwards Plateau: Oak/Hardwood Motte and Woodland
- Edwards Plateau: Savanna Grassland
- Maintained Grassland
- Maintained ROW/IT
- Native Invasive: Deciduous Woodland
- Residential
- Stream

1:2,400

0 100 200 400 Feet

1 inch equals 200 feet

C-3.3

FIGURE

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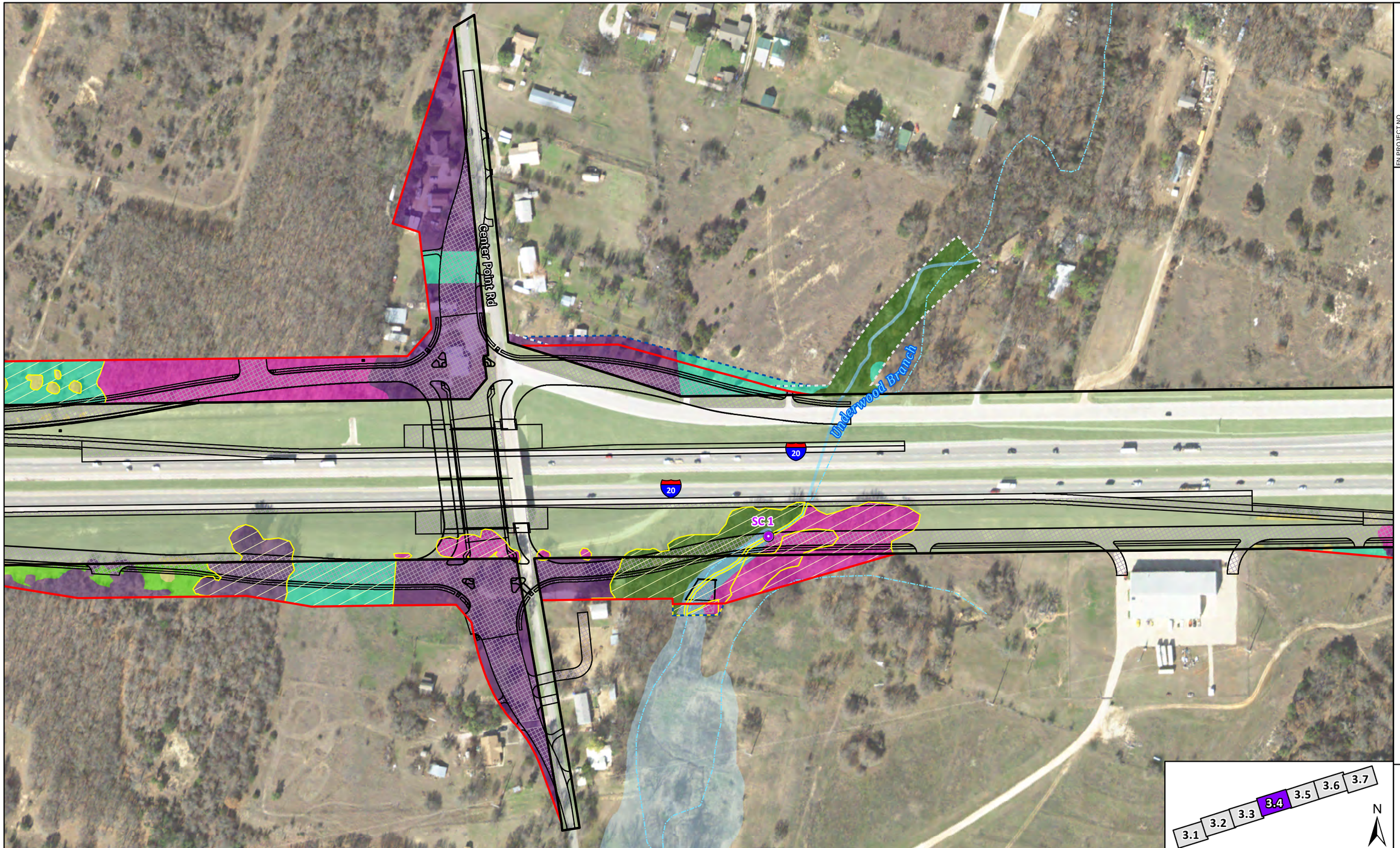

FN PROJECT NO.	PRK12278
DATE CREATED	5/19/2016
DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	C-3_Cover_Type_MB_20160517
PREPARED BY	SS3

PARKER CO.

IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

Stream Crossing (SC #)
Streams
100 Year Floodplain
Revisions to cover types after field verification

Existing ROW
Proposed ROW
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Crosstimbers: Savanna Grassland
Edwards Plateau: Oak/Hardwood Motte and Woodland
Edwards Plateau: Savanna Grassland

Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

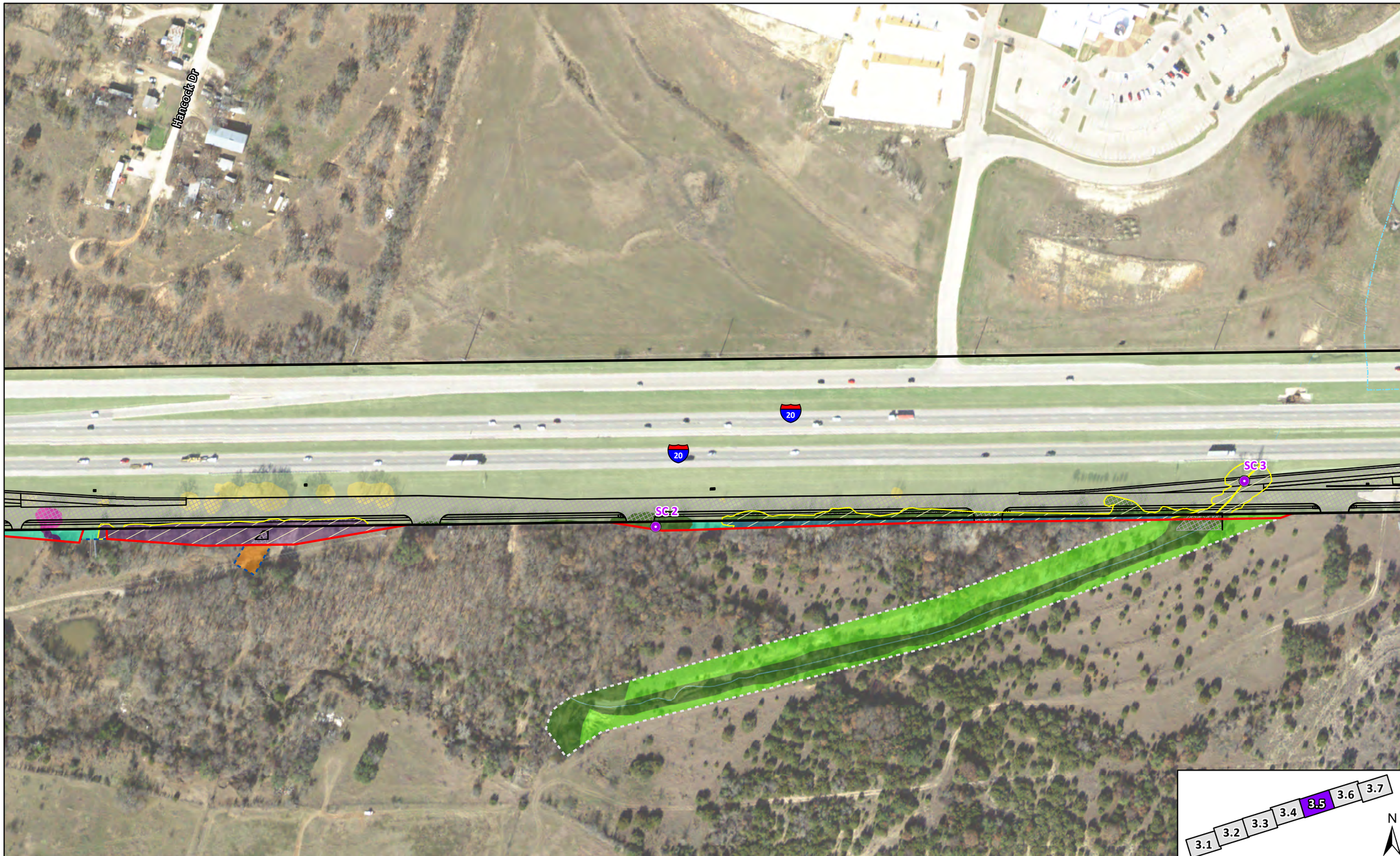
0 100 200 400 Feet

1 inch equals 200 feet

C-3.4

FIGURE

Path: H:\ENVIRONMENTAL\FINAL_EXHIBITS\Revised_20160517\C-3_Cover_Type_MB_20160517.mxd



FN PROJECT NO.	PRK12278
DATE CREATED	5/19/2016
DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	C-3 Cover Type MB 20160517
PREPARED BY	SSJ

PARKER CO.

IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

Stream Crossing (SC #)
Streams
100 Year Floodplain
Revisions to cover types after field verification

Existing ROW
Proposed ROW
Existing Easement
Proposed Permanent Easement
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Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

0 100 200 400 Feet

1 inch equals 200 feet

C-3.5

FIGURE

Path: H:\ENVIRONMENTAL\FINAL_EXHIBITS\Revised_20160517\C-3_Cover_Type_MB_20160517.mxd

FN PROJECT NO.	PRK12278
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FILE NAME	C-3 Cover Type MB 20160517
PREPARED BY	SSJ

PARKER CO.
IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

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Streams
100 Year Floodplain
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Maintained Grassland
Maintained ROW/IT
Native Invasive: Deciduous Woodland
Residential
Stream

1:2,400

0 100 200 400 Feet
1 inch equals 200 feet

C-3.6

FIGURE

Path: H:\ENVIRONMENTAL\FINAL_EXHIBITS\Revised_20160517\C-3_Cover_Type_MB_20160517.mxd

FN PROJECT NO.	PRK12278
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DATUM & COORDINATE SYSTEM	NAD83 State Plane (feet) Texas North Central
FILE NAME	C-3 Cover Type MB 20160517
PREPARED BY	SS3

PARKER CO.

IH 20 AT CENTERPOINT ROAD

Cover Type Mapbook

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Maintained ROW/IT
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Residential
Stream

1:2,400

0 100 200 400 Feet

1 inch equals 200 feet

C-3.7

FIGURE

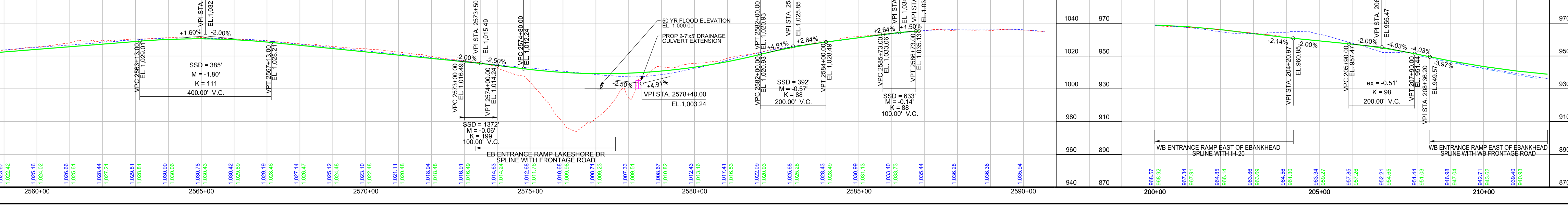
Path: H:\ENVIRONMENTAL\FINAL_EXHIBITS\Revised_20160517\C-3_Cover_Type_MB_20160517.mxd

EXISTING IH-20 PGL (IH-20)

DESIGN SPEED: 65 MPH

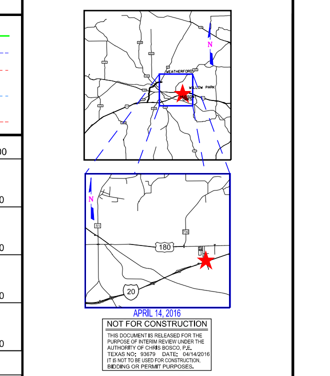
IH-20 EASTBOUND FRONTAGE ROAD (EBFR)

DESIGN SPEED: 40 MPH



WESTBOUND ENTRANCE RAMP EAST OF BANKHEAD HIGHWAY (WB-ENT-EBANK)

DESIGN SPEED: 45 MPH



APRIL 14, 2016

NOT FOR CONSTRUCTION

FORT WORTH DISTRICT

BRIAN R. BARTH, P.E. - DISTRICT ENGINEER

DAVID NEELEY, P.E. - AREA ENGINEER

Elisa Garcia

From: Sue Reilly <Sue.Reilly@tpwd.texas.gov>
Sent: Friday, June 17, 2016 5:24 PM
To: Elisa Garcia
Subject: RE: 0314-07-046, 51, 52

Elisa,

Thank you for the response. I do not have any further comments on the project.

Thank you for submitting the following project for early coordination: Interchange improvements and addition of frontage roads between Center Point Road and East Bankhead Drive on IH-20 near Weatherford (CSJ 0314-07-046, -051, -052). TPWD appreciates TxDOT's commitment to implement the practices listed below as well as in the Biological Evaluation Form submitted on May 31, 2016. Based on a review of the documentation, the avoidance and mitigation efforts described, and provided that project plans do not change, TPWD considers coordination to be complete. However, please note it is the responsibility of the project proponent to comply with all federal, state, and local laws that protect plants, fish, and wildlife.

Thank you,

Sue Reilly
Transportation Assessment Liaison
TPWD Wildlife Division
512-389-8021

From: Elisa Garcia [mailto:Elisa.Garcia@txdot.gov]
Sent: Friday, June 17, 2016 1:47 PM
To: Sue Reilly
Subject: RE: 0314-07-046, 51, 52

Hi Sue,

Please see responses in red below.

From: Sue Reilly [mailto:Sue.Reilly@tpwd.texas.gov]
Sent: Thursday, June 09, 2016 10:54 AM
To: Elisa Garcia
Subject: FW: 0314-07-046, 51, 52

Elisa,

I just have a couple of questions about streams.

There is a photo labeled Photo 6 that shows a perched culvert at Crossing 4. Perched culverts prevent aquatic life from moving upstream and maintaining their range within a waterway. One of the General Conditions for the Nationwide Permit 14 is that aquatic life movement be allowed. Will the perched culvert be repaired to maintain aquatic life

movement? It looks like there was erosion downstream from the paved surface in the stream. Maintaining natural stream bottom through culverts can prevent this type of erosion, e.g. using bottomless culverts or bridges. If paving is necessary, there should be some sort of transition to the natural stream bottom that minimizes erosion.

The perched culvert will be repaired. There will be a transition, most likely riprap, between the paved surface and the natural bottom of the stream. A bottomless culvert was deemed to be impractical due to the velocities of water that could periodically pass through this area.

It also looks like there are just really long drainage easements for some of the streams in this area. I just want to confirm that work is limited to the areas in the Biological Evaluation Form.

The long drainage easements are existing TxDOT easements. Within the easements, the amount of work in the streams would be confined to very small areas and would not extend the length of the easements (See attached).

I would suggest including an EPIC instructing contractors not to drive in streams, to minimize impacts to streams and the vegetation surrounding the streams, and to place PSLs away from streams and in previously disturbed areas.

An EPIC will be included in the project plans to state: Contractors are not to drive equipment in streams without protected crossings (culverts and riprap). All materials are to be removed from streams in entirety following construction. All project specific locations (PSLs) will be located in uplands not less than 50 feet from streams. BMPs will be placed down gradient from PSLs to protect streams. PSLs will be placed in previously disturbed areas where practicable.

I appreciate that Fort Worth District performed a survey for plants, thank you for planning and performing the survey during the appropriate season.

Thank you,

Sue Reilly
Transportation Assessment Liaison
TPWD Wildlife Division
512-389-8021

From: WHAB_TxDOT
Sent: Tuesday, May 31, 2016 2:48 PM
To: Elisa Garcia; WHAB_TxDOT
Cc: Sue Reilly
Subject: RE: 0314-07-046, 51, 52

Good afternoon,

The TPWD Wildlife Habitat Assessment Program has received your request for Early Coordination and has assigned it project ID #36640. The Habitat Assessment Biologist who will complete your project review is copied on this email.

Thank you,

Gloria Garza
Administrative Assistant
Texas Parks and Wildlife Dept
Wildlife Division - Habitat Assessment Program
4200 Smith School Rd
Austin, TX 78744

Office: (512) 389-4571
Fax: (512) 389-4599

gloria.garza@tpwd.texas.gov

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---

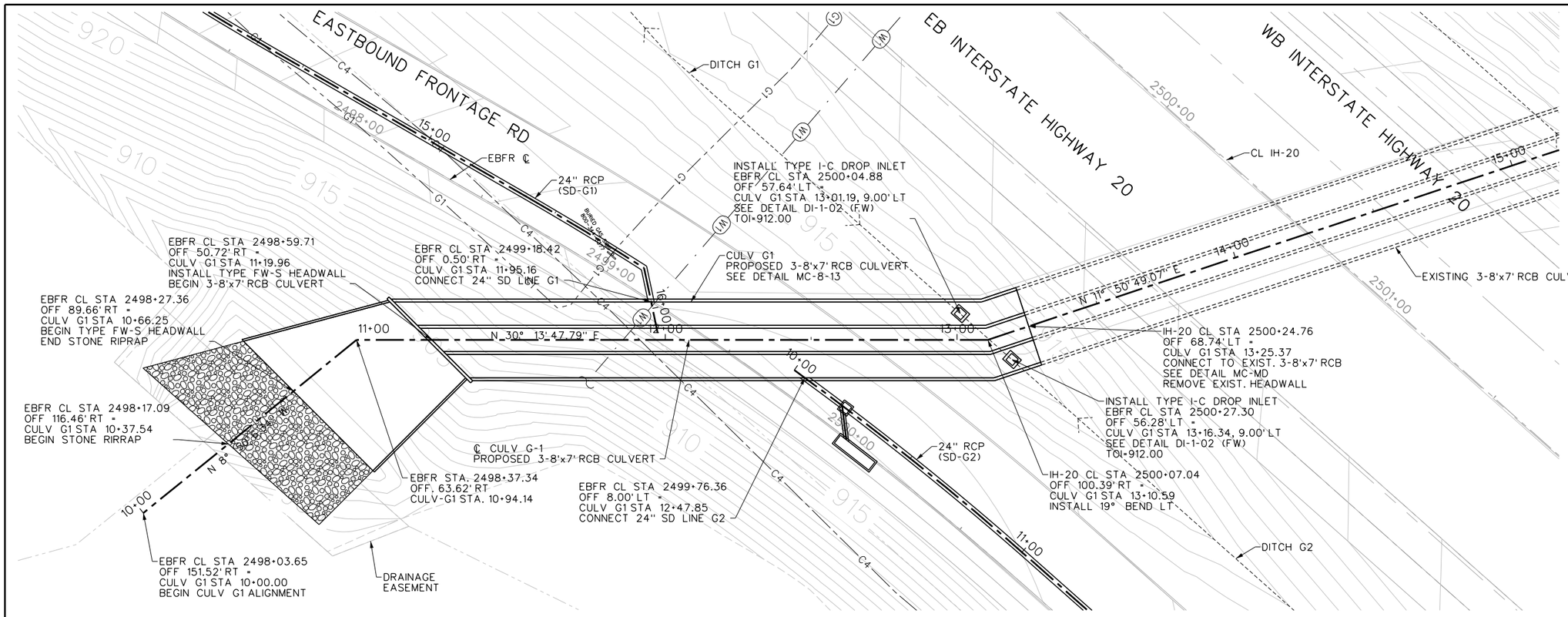
From: Elisa Garcia [mailto:Elisa.Garcia@txdot.gov]
Sent: Tuesday, May 31, 2016 2:22 PM
To: WHAB_TxDOT <WHAB_TxDOT@tpwd.texas.gov>
Subject: 0314-07-046, 51, 52

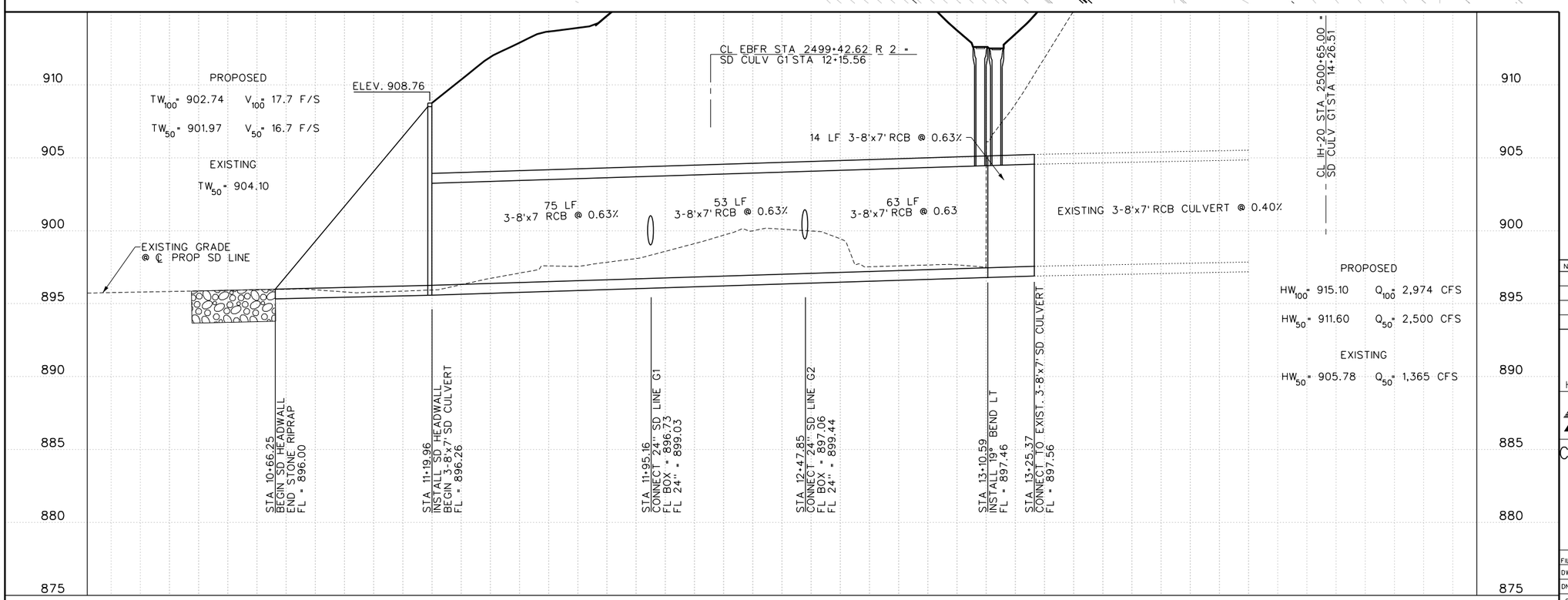
Hello,

Attached is the Biological Evaluation Form for TWPD early coordination review. Although there is no established timeline for review, we respectfully request a quick review to be able to meet our current letting schedule. Thank you and if there is anything else needed for you to complete your review, please let me know as soon as possible. THANKS

Elisa Garcia
Environmental Specialist
TxDOT
2501 SW Loop 820
Fort Worth, TX 76133
T|817.370.6718
F|817.370.6759
Elisa.Garcia@txdot.gov

Click It or Ticket
TxDOT





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THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF MITCH AITON, P.E. TEXAS NO. 118857 DATE: SEPT. 2015 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.

NO.	ISSUES	BY	DATE

FREESE AND NICHOLS
4055 International Plaza, Suite
Fort Worth, TX 76109-4895
Phone - (817) 735-7300
Fax - (817) 735-7491
Web - www.freese.com

HL-93 LOADING

Texas Department of Transportation
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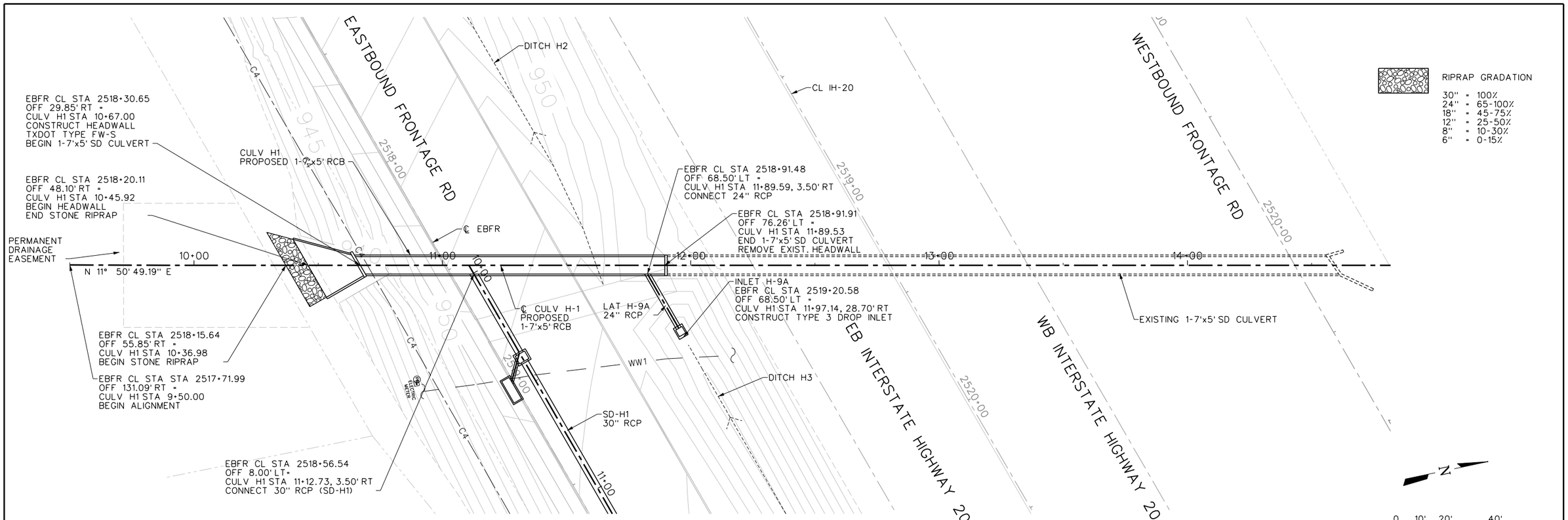
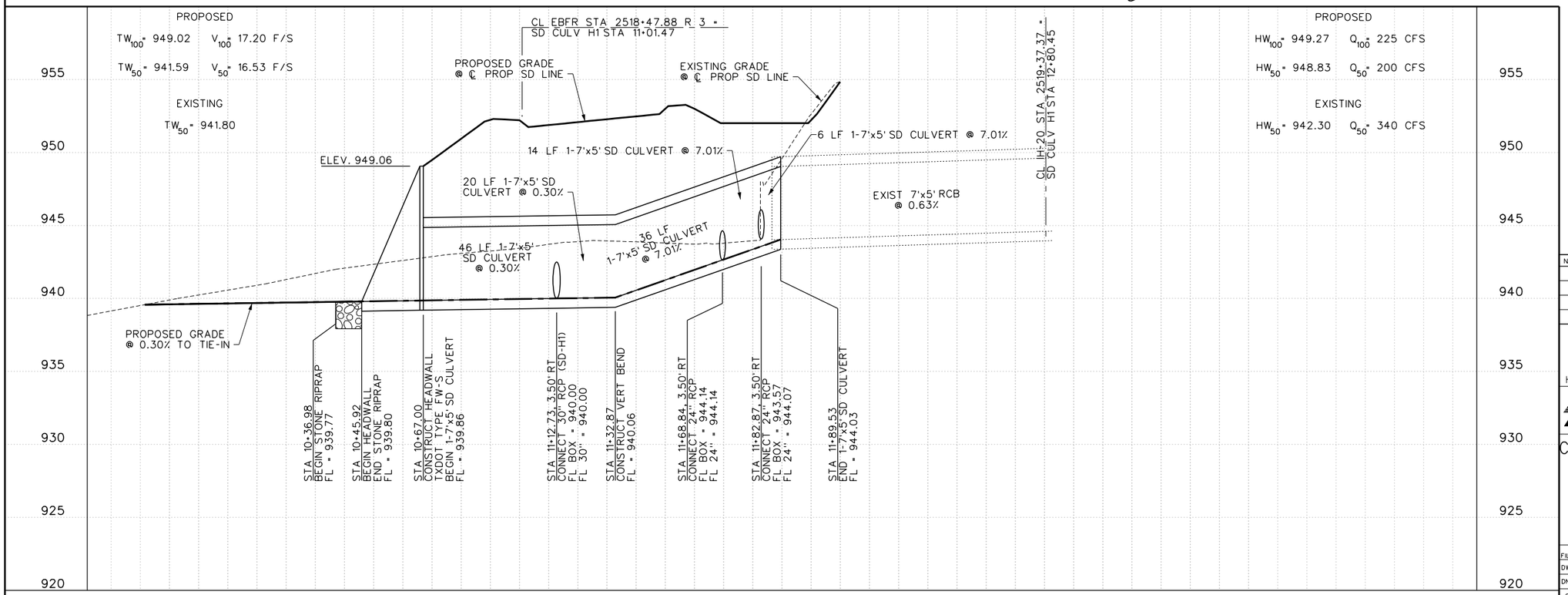
CENTER POINT ROAD INTERCHANGE DRAINAGE PLAN AND PROFILE CULVERT G1

FILE:			cv-trt-pp-culv-G1.sht			
DW: SS	CK: MA	FEDERAL AID PROJECT NO.				HIGHWAY
DN:	CK: CB					IH-20
CONT	SECT	JOB	FED. RD. DIV.NO.	DIST	COUNTY	SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER	248

MicroStation V8 (w=8235DFiceFort Worth,
#ACCUM$ N:\Drawings\cv-trt-pp-culv-G1.sht
Level(s): 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
Plot Scale=0.0833 - 1" = 10'
Date: Jun. 09, 2016 - 03:46:18 PM Project:Freese and Nichols, Inc.
User: 02235FileNaN\Drawings\cv-trt-pp-culv-G1.sht Date: Jun. 09, 2016 - 03:46:18 PM User: 02235FileNaN\Drawings\cv-trt-pp-culv-G1.sht





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NO.	ISSUES	BY	DATE

FREESE AND NICHOLS
4055 International Plaza, Suite
Fort Worth, TX 76109-4895
Phone - (817) 735-7300
Fax - (817) 735-7491
Web - www.freese.com

HL-93 LOADING

Texas Department of Transportation
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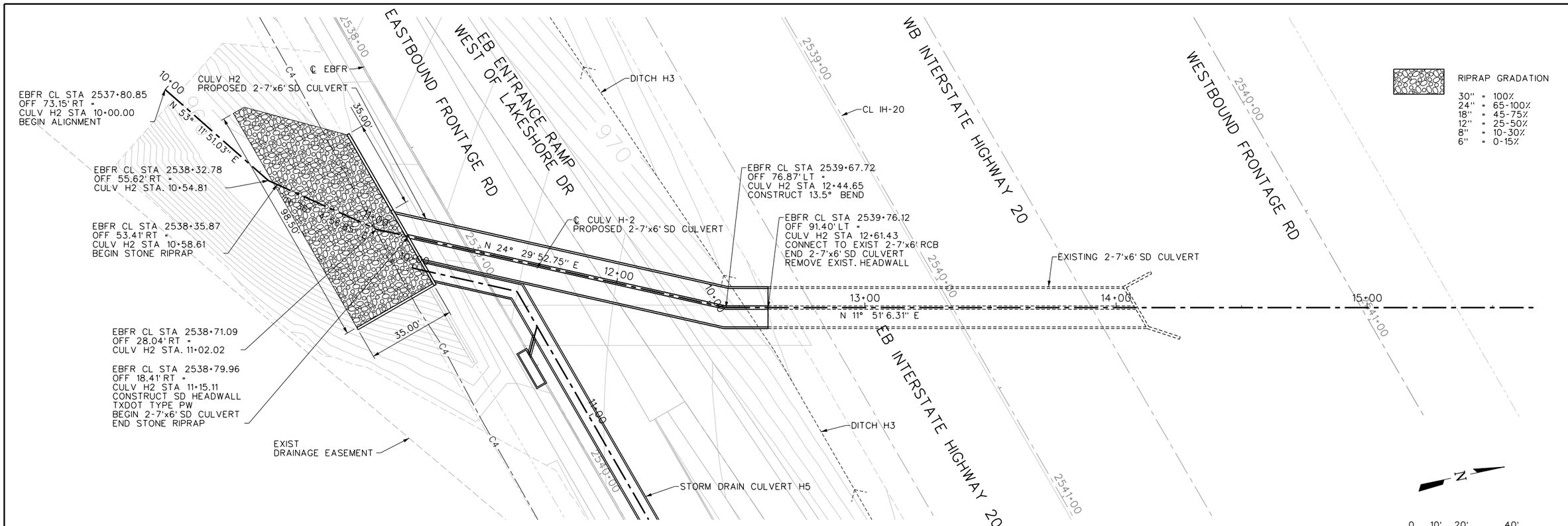
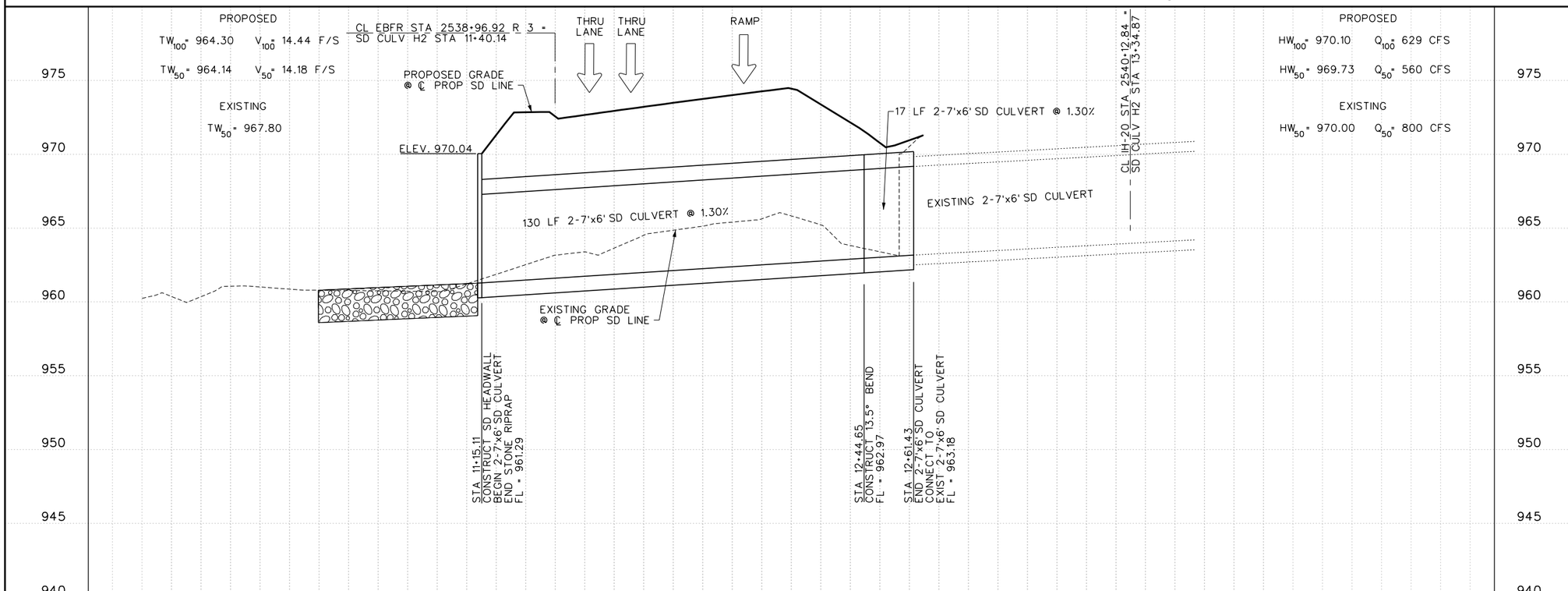
CENTER POINT ROAD INTERCHANGE
DRAINAGE PLAN AND PROFILE
CULVERT H1

FILE:								cv-trt-pp-culv-H1.sht
DW: SS	CK: MA	FEDERAL AID PROJECT NO.						HIGHWAY
DN:	CK: CB							IH-20
CONT	SECT	JOB		FED. RD. DIV.NO.	DIST	COUNTY		SHEET NO.
0314	07	052, ETC.		6	FTW	PARKER		249

MicroStation V8 (w=22350)FreeseFort Worth.
User: 22235FileNaNi\Drawings\cv-trt-pp-culv-H1.sht Date: Jun. 09, 2016 - 03:46:19 PM





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4055 International Plaza, Suite
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Fax - (817) 735-7491
Web - www.freese.com

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CENTER POINT ROAD INTERCHANGE
DRAINAGE PLAN AND PROFILE
CULVERT H2

FILE: cv-trt-pp-culv-H2.sht

DW: SS	CK: MA	FEDERAL AID PROJECT NO.	HIGHWAY
DN:	CK: CB		IH-20

CONT	SECT	JOB	FED. RD. DIV.NO.	DIST	COUNTY	SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER	250

MicroStation V8 (w=8223SOfficeFort Worth
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Date: Jun.09,2016 - 03:46:28 PM
Project=Freese and Nichols, Inc.
User: 02235FileNet
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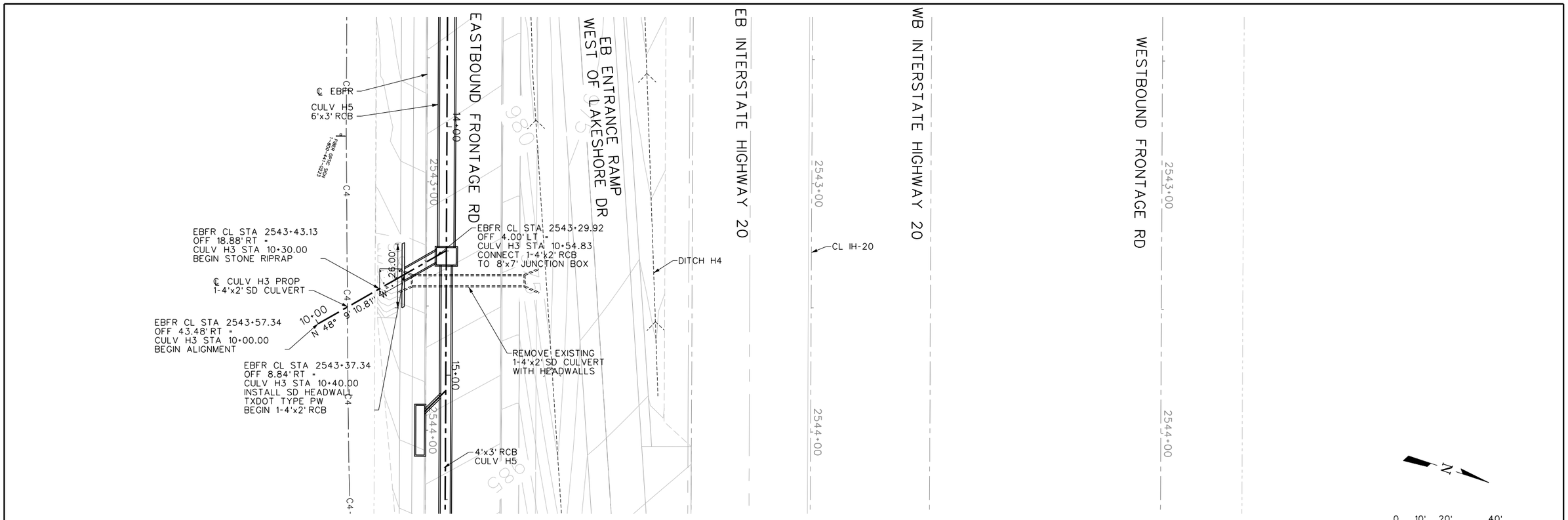

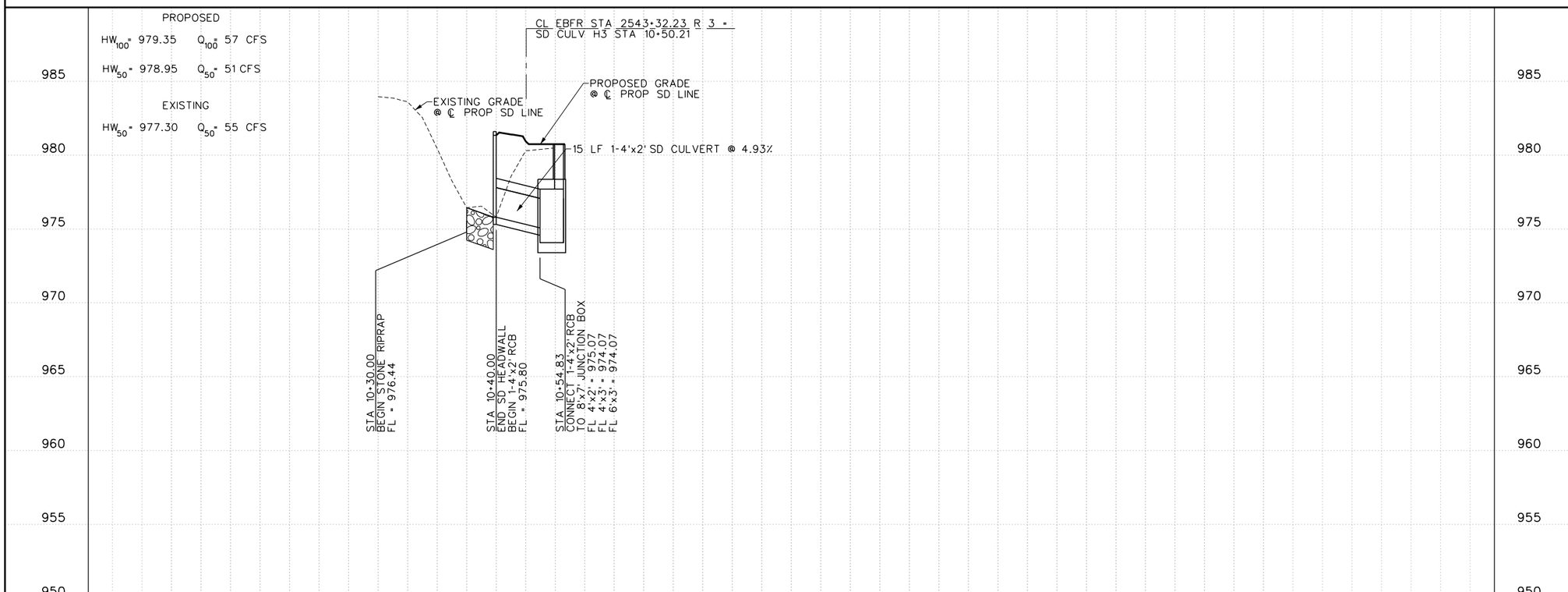

0 10' 20' 40'
HORIZONTAL SCALE
0 2' 4' 8'
VERTICAL SCALE

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CENTER POINT ROAD INTERCHANGE DRAINAGE PLAN AND PROFILE CULVERT H3

FILE: cv-trt-pp-culv-H3.sht

DW: SS	CK: MA	FEDERAL AID PROJECT NO.	HIGHWAY
DN:	CK: CB		IH-20

CONT	SECT	JOB	FED. RD. DIV.NO.	DIST	COUNTY	SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER	251

MicroStation V8 (Jun#223)OfficeFort Worth
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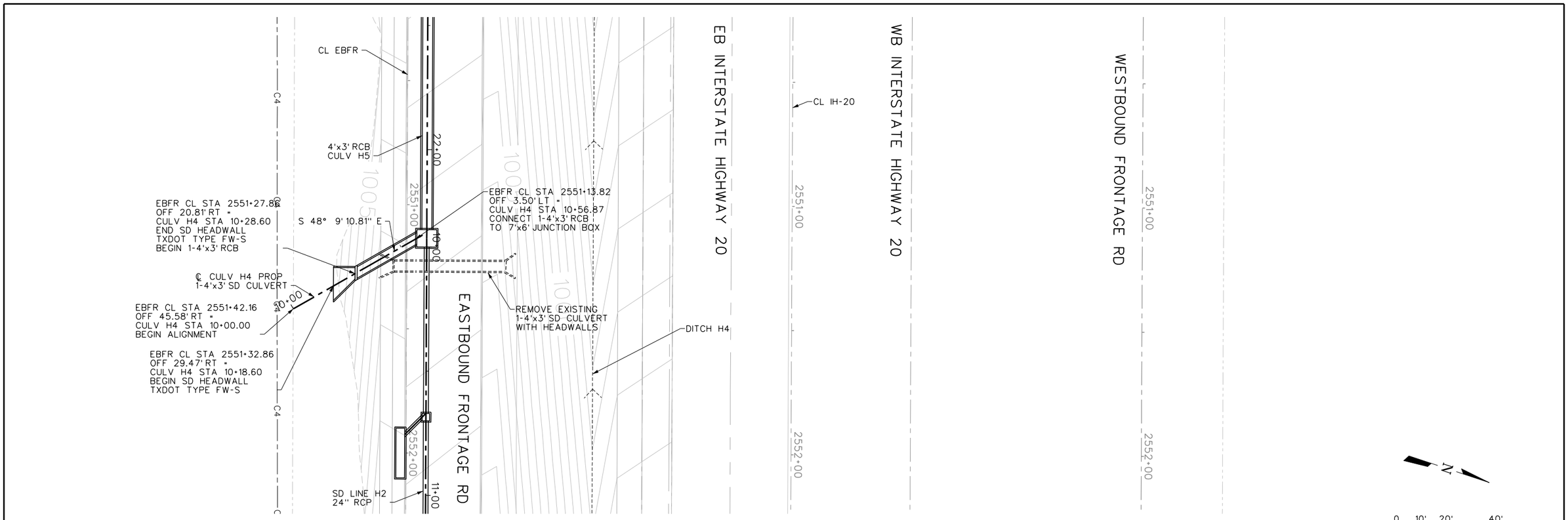
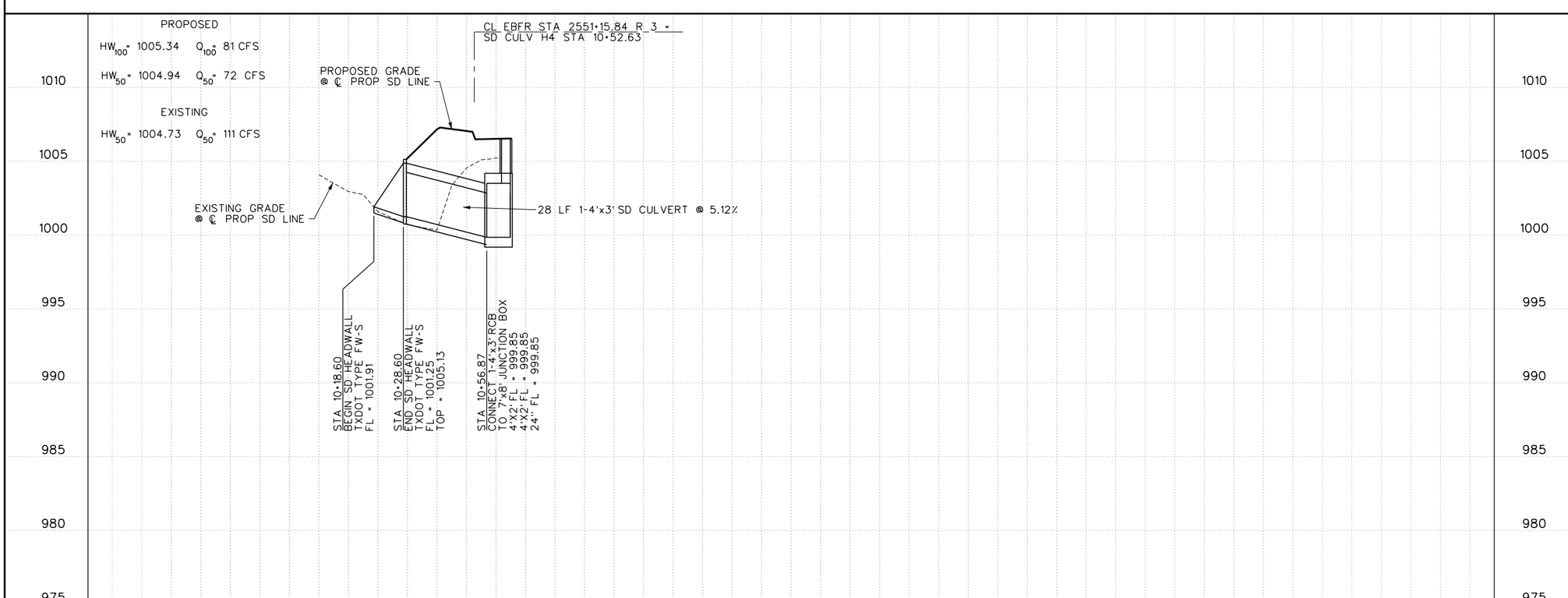
Level:All;All;-Xrefs;-Grids;-Dimensions;-Hatch
Plot Scale:0.0000 - 1.0 Project:Freese and Nichols,Inc.
Date:Jun.09,2016 - 03:46:21 PM
User: 02235FileNt\Drawings\cv-trt-pp-culv-H3.sht Date: Jun. 09, 2016 - 03:46:21 PM User: 02235FileNt\if\Drawings\cv-trt-pp-culv-H3.sht





0 10' 20' 40'
HORIZONTAL SCALE
0 2' 4' 8'
VERTICAL SCALE

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CENTER POINT ROAD INTERCHANGE
DRAINAGE PLAN AND PROFILE
CULVERT H4

FILE: cv-trt-pp-culv-H4.sht

DW: SS	CK: MA	FEDERAL AID PROJECT NO.	HIGHWAY
DN:	CK: CB		IH-20

CONT	SECT	JOB	FED. RD. DIV.NO.	DIST	COUNTY	SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER	252

MicroStation V8 (ww@22350Office\Fort Worth
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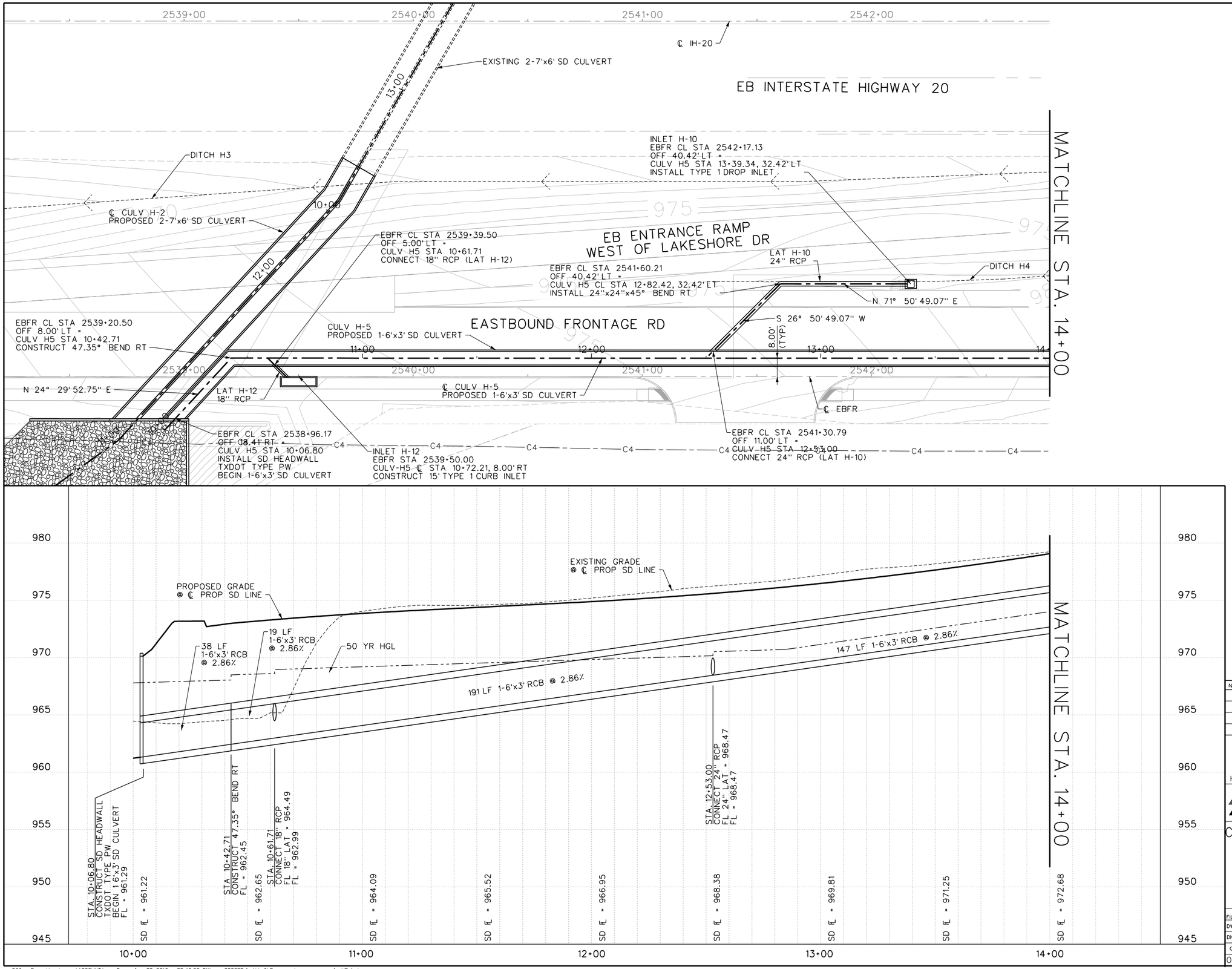

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CENTER POINT ROAD INTERCHANGE
DRAINAGE PLAN AND PROFILE
CULVERT H5
BEGIN TO STA. 14+00

1 OF 4

FILE: cv-trt-pp-culv-H5-1.sht

DW: SS	CK: MA	FEDERAL AID PROJECT NO.				HIGHWAY
DN:	CK: CB					IH-20
CONT	SECT	JOB	FED. RD. DIV. NO.	DIST	COUNTY	SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER	253

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Date:Jun.09,2016 - 03:46:23 PM
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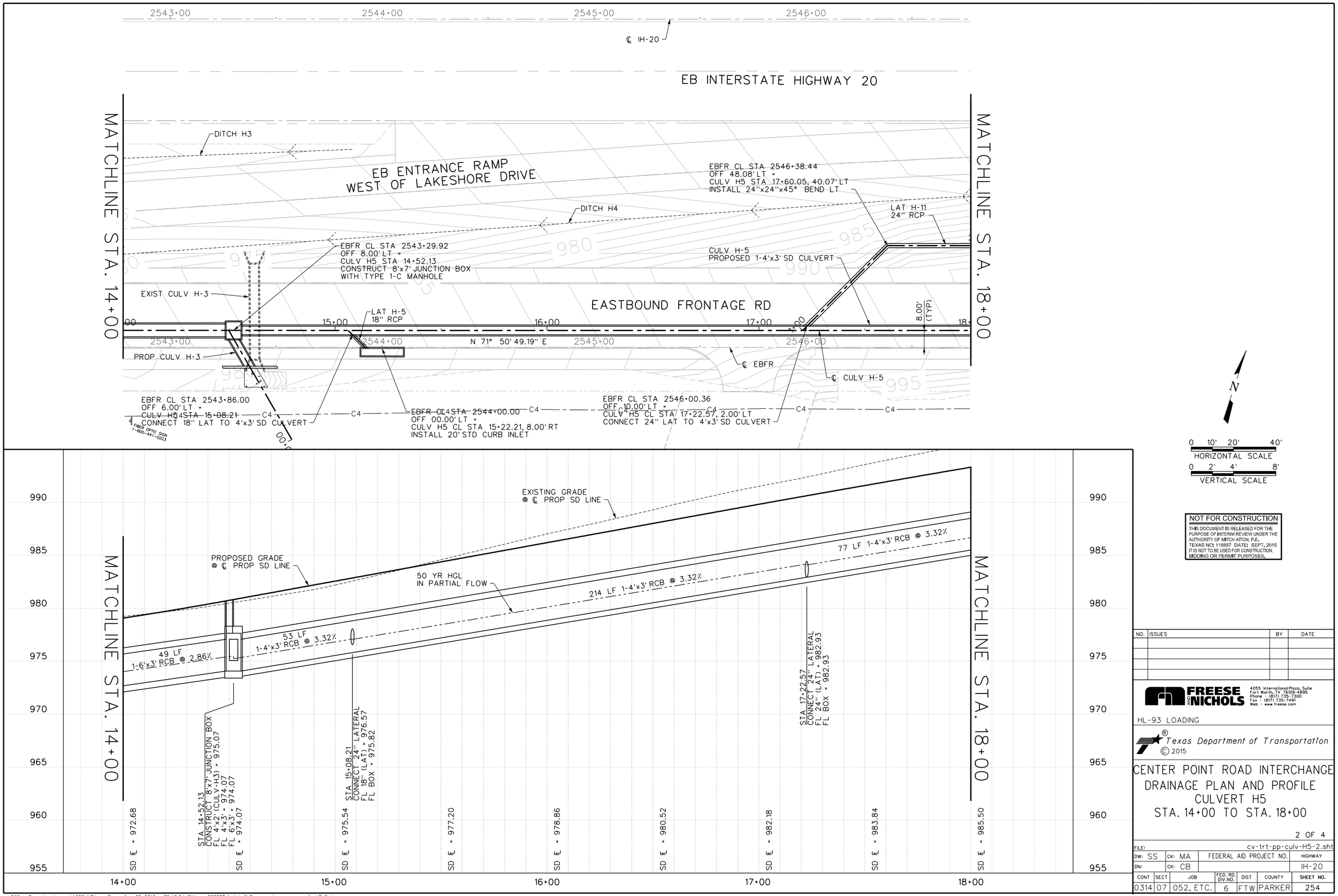

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DRAINAGE PLAN AND PROFILE
CULVERT H5
STA. 14+00 TO STA. 18+00

2 OF 4

FILE: cv-trt-pp-culv-H5-2.sht

DW: SS	CK: MA	FEDERAL AID PROJECT NO.	HIGHWAY
DN:	CK: CB		IH-20

CONT	SECT	JOB	FED. RD. DIV. NO.	DIST	COUNTY	SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER	254

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Date: Jun. 09, 2016 - 03:46:24 PM

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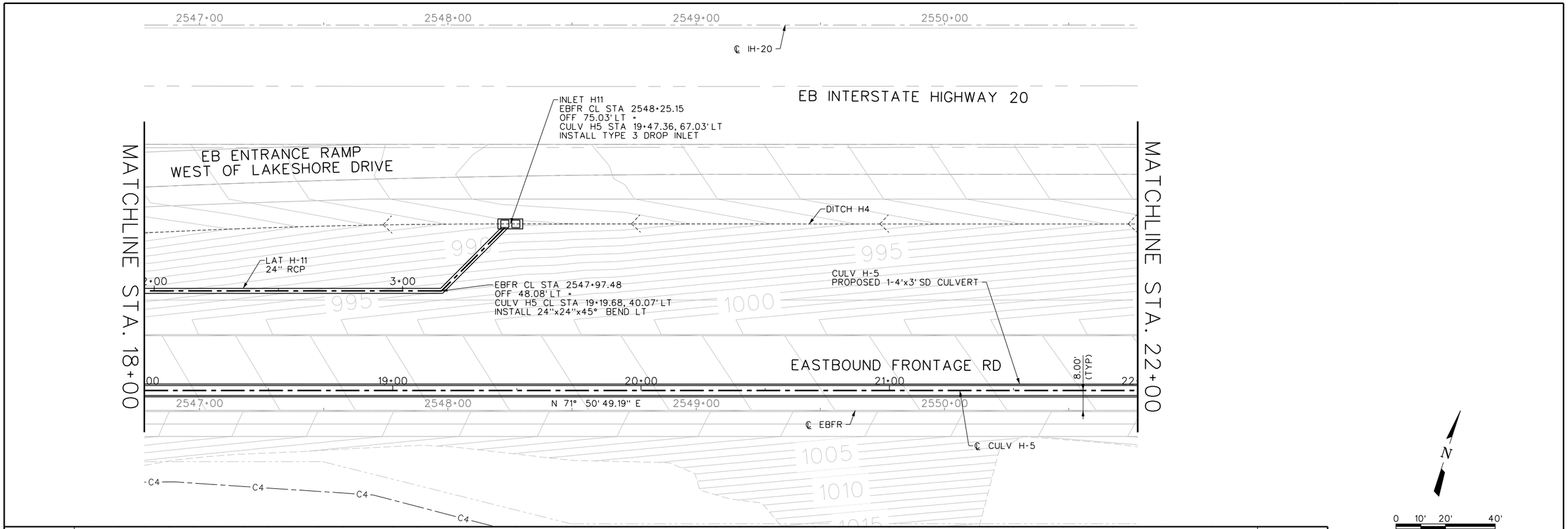

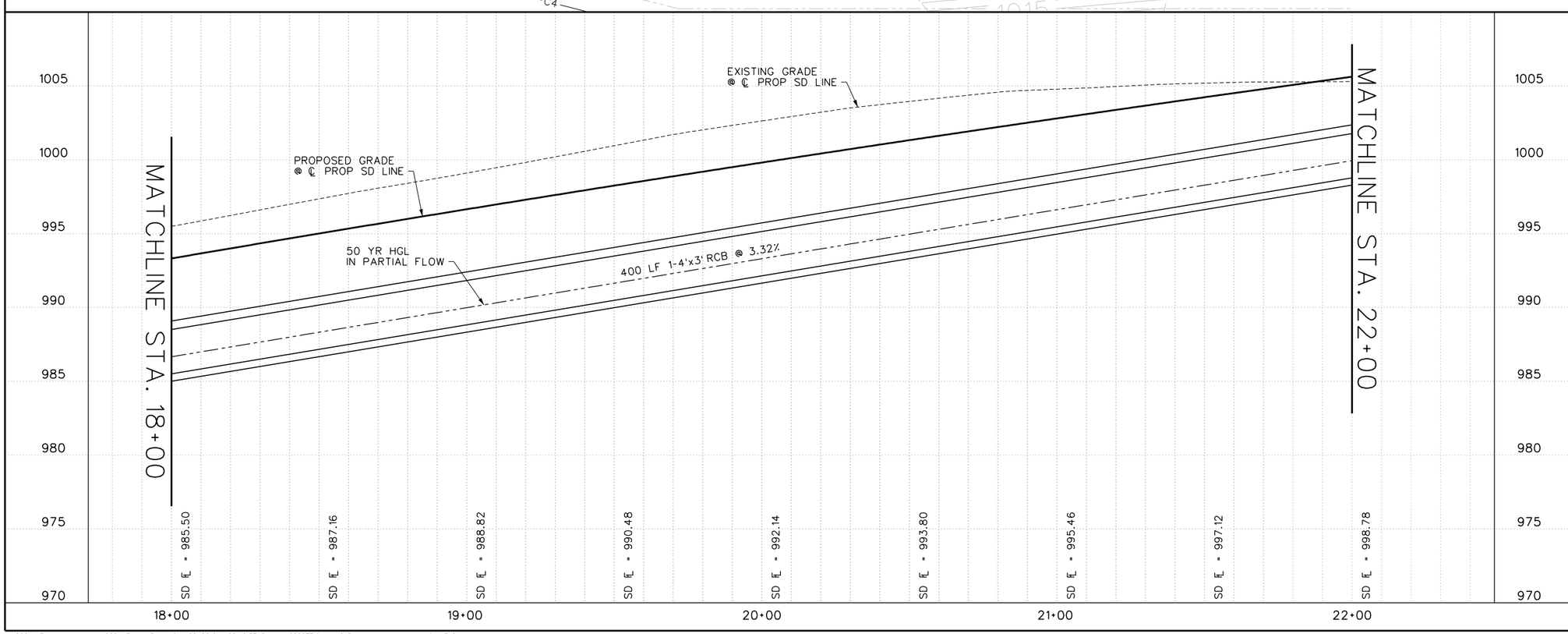

N

0 10' 20' 40'
HORIZONTAL SCALE

0 2' 4' 8'
VERTICAL SCALE

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DRAINAGE PLAN AND PROFILE
CULVERT H5
STA. 18+00 TO STA. 22+00

3 OF 4

FILE: cv-trt-pp-culv-H5-3.sht

DW: SS	CK: MA	FEDERAL AID PROJECT NO.	HIGHWAY
DN:	CK: CB		IH-20

CONT	SECT	JOB	FED. RD. DIV.NO.	DIST	COUNTY	SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER	255

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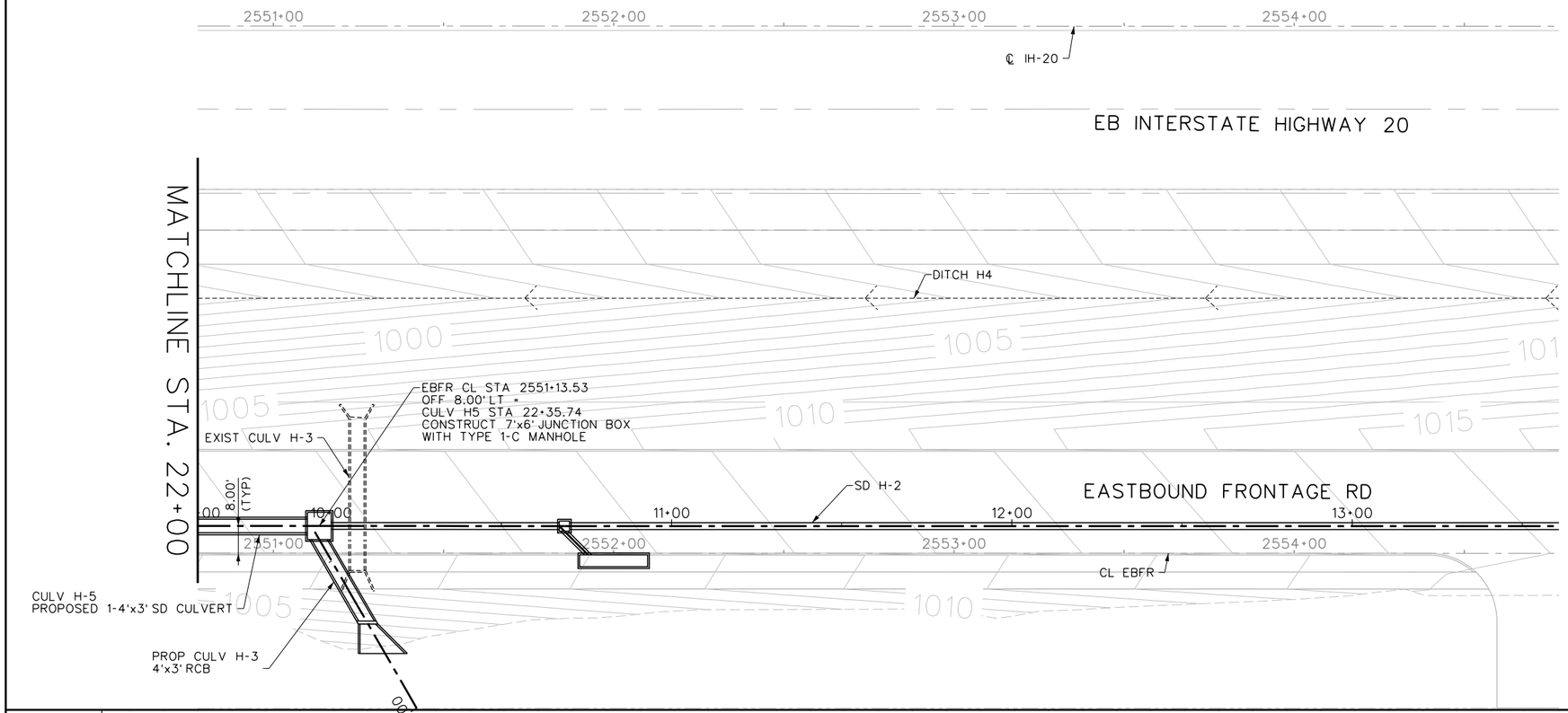

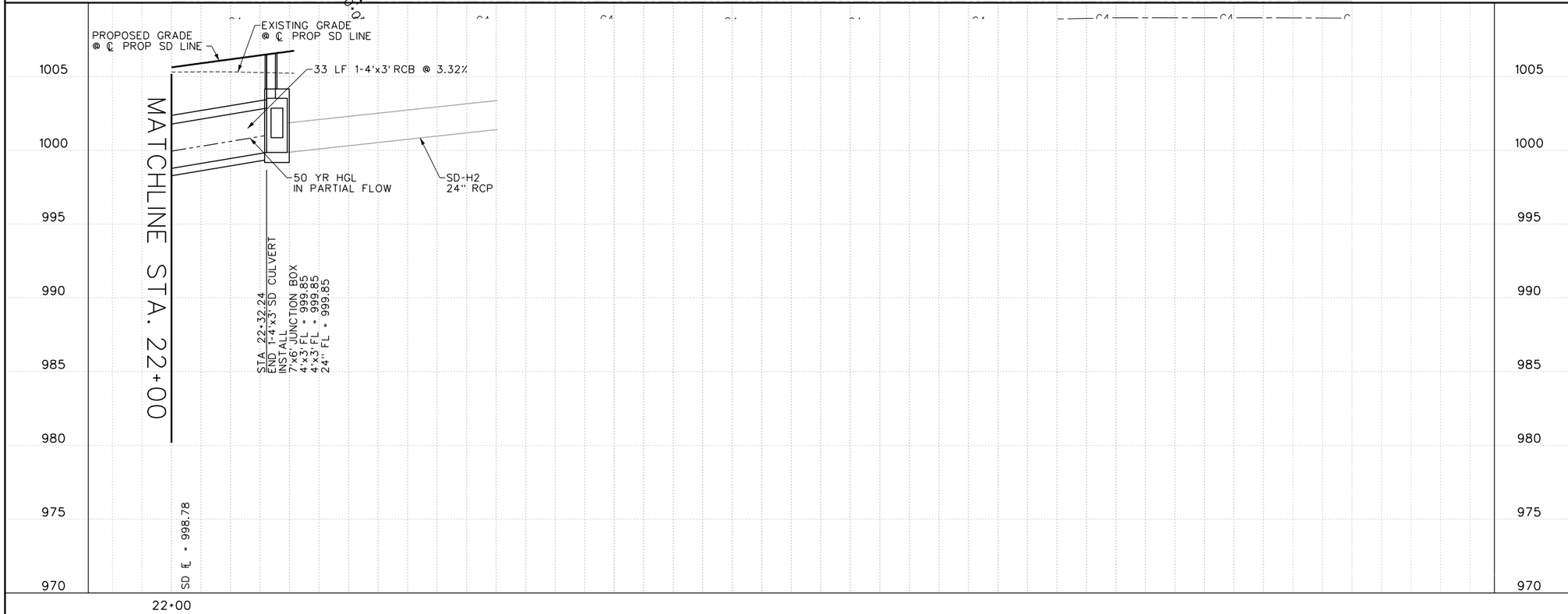

N

0 10' 20' 40'
HORIZONTAL SCALE

0 2' 4' 8'
VERTICAL SCALE

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DRAINAGE PLAN AND PROFILE
CULVERT H5
STA. 22+00 TO END

4 OF 4

FILE: cv-trt-pp-culv-H5-4.sht

DW: SS	CK: MA	FEDERAL AID PROJECT NO.	HIGHWAY
DN:	CK: CB		IH-20

CONT	SECT	JOB	FED. RD. DIV. NO.	DIST	COUNTY	SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER	256

MicroStation V8 Use#22350fficeFort Worth
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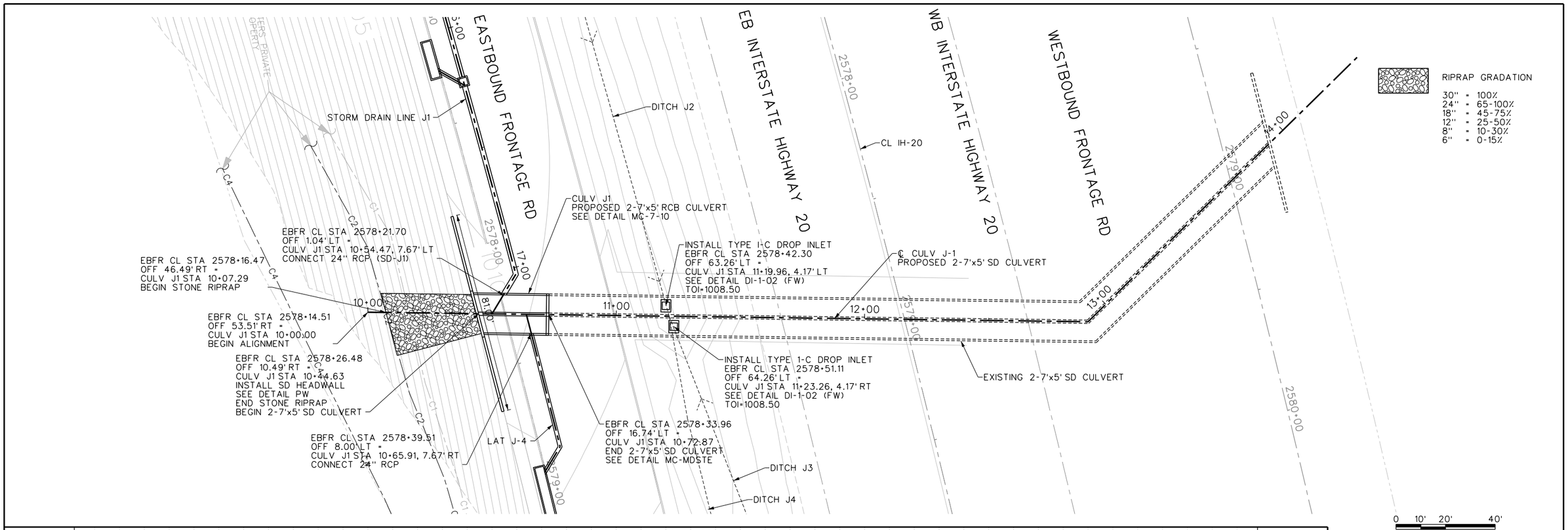
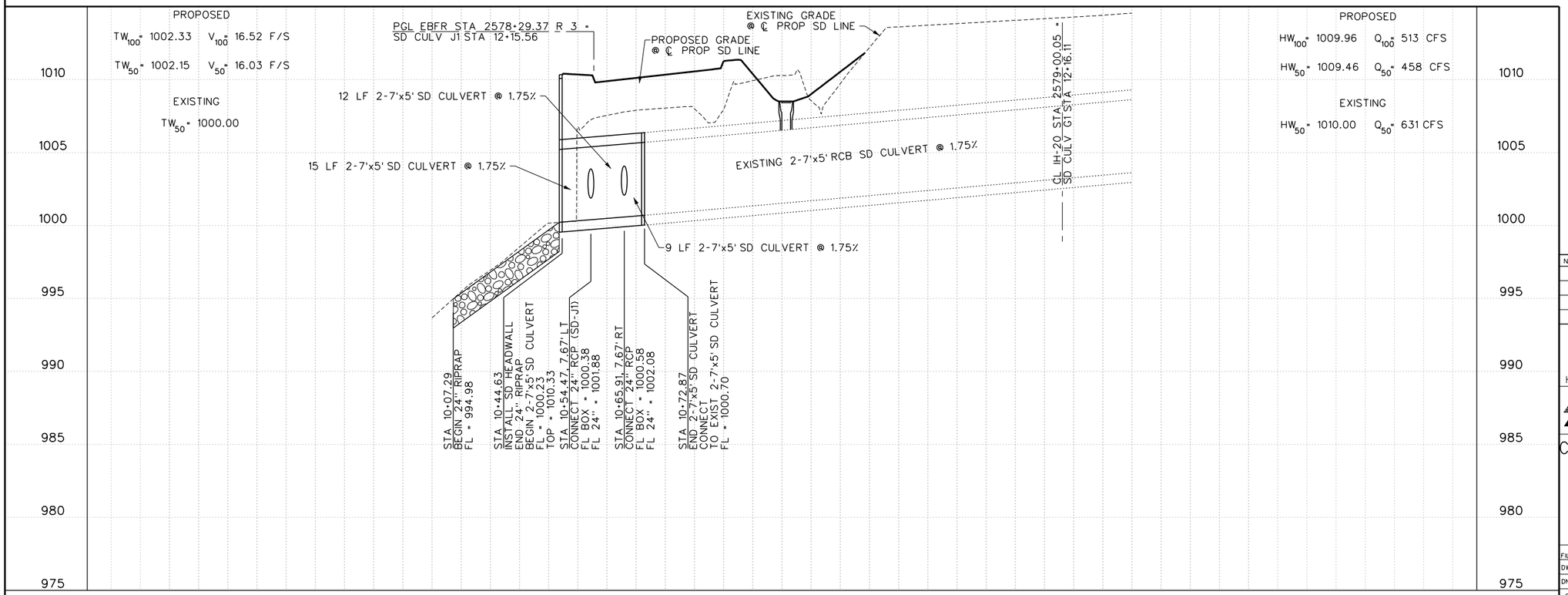
Date: Jun. 09, 2016 - 03:46:26 PM





0 10' 20' 40'
HORIZONTAL SCALE
0 2' 4' 8'
VERTICAL SCALE

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CENTER POINT ROAD INTERCHANGE DRAINAGE PLAN AND PROFILE CULVERT J1

FILE:							cv-trt-pp-culv-J1.sht
DW: SS	CK: MA	FEDERAL AID PROJECT NO.					HIGHWAY
DN:	CK: CB						IH-20
CONT	SECT	JOB	FED. RD. DIV.NO.	DIST	COUNTY		SHEET NO.
0314	07	052, ETC.	6	FTW	PARKER		257

MicroStation V8 (w=8235DFiceFort Worth,
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Level:(All); Color:(By Level); Pen:(By Level)
Plot Scale:0.0000 - 1.0000 Project:Freese and Nichols, Inc.
Date:Jun.09,2016 - 03:46:27 PM
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