00000170

LOCHNER

December 12, 2012

Mr. Kelly Blackburn
Bowie County Commissioner Precinct 3
850 Front Street
DeKalb, TX 75559

SUBJECT: **Department of the Army Permit Application**
U.S. Route 82 Reconstruction Project
Bowie County, Texas
USACE Identification No. SWT-2012-292; TxDOT CSJ 0046-04-057

Dear Mr. Blackburn:

Enclosed, please find the Department of the Army, Section 404 permit application packet for the U.S. Route 82 Reconstruction Project. This permit is required for the installation of structures on the future roadway crossings of Red Bayou, Austin Chapel Branch, and Peters Branch. Please note that the following items require your signature:

U.S. Army Corps of Engineers, Department of the Army Permit Application Form 4345

- Page 1, Block 11
- Page 3, Block 27

Once you have signed where indicated, please forward the packet to Mr. Jamie Hyslop at the address found on the application cover letter. If you have any questions or need assistance, please do not hesitate to contact me at (800) 748-8276 or via email at abartlett@hwlochner.com.

Sincerely,

LOCHNER

Alex Bartlett
Environmental Scientist

Enclosures:
Department of the Army Permit Application and Supporting Documentation

00000617D

LOCHNER

December 12, 2012

Mr. Jamie R. Hyslop
U.S. Army Corps of Engineers, Tulsa District
Regulatory Office – CESWT-RO
1645 South 101st East Ave.
Tulsa, OK 74128

SUBJECT: **Department of the Army Permit Application**
U.S. Route 82 Reconstruction Project
Bowie County, Texas
USACE Identification No. SWT-2012-292; TxDOT CSJ 0046-04-057

Dear Mr. Hyslop:

Enclosed, please find the Application for a Department of the Army Permit and supporting documentation for the proposed improvements to U.S. Route 82 in Bowie County, Texas. The project consists of the construction of new concrete pavement from FM 1840 in De Kalb to SH 98 near New Boston, all within Bowie County, Texas. The future typical width of pavement will be 50 feet to allow for a passing lane section comprised of two twelve-foot lanes in the passing lane direction, and one ten-foot shoulder in the opposite direction. An existing 3-8'x7' reinforced concrete box culvert (RCB) at the US-82 crossing of Red Bayou will be extended and the future roadway embankment at this location will impact a forested wetland known as Wetland Complex 3 (WC 3).

As requested in your letter dated May 16, 2012 and subsequent correspondence, we have completed functional assessments of the affected waterbodies using the Texas Rapid Assessment Method (TxRAM). In addition, a Draft Compensatory Mitigation Plan has been developed to address how the applicant proposes to offset project-related impacts to jurisdictional waters. For your review and consideration, we have enclosed the TxRAM scoring sheets and the Draft Compensatory Mitigation Plan in this submittal.

We are requesting your review of the furnished materials and Department of the Army authorization pursuant to Section 404 of the Clean Water Act. If you have questions or need any additional information, please contact me at (816) 363-2696.

Sincerely,

LOCHNER

Alex Bartlett
Environmental Scientist

Enclosures:
Department of the Army Permit Application - ENG Form 4345
TxRAM Data and Scoring Sheets
Draft Compensatory Mitigation Plan

HW Lochner, Inc.
903 E. 104th Street, Suite 800 • Kansas City, MO 64131 • Phone: 816.363.2696 • www.hwlochner.com

Department of the Army Permit Application
ENG Form 4345

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Kelly Middle - Last - Blackburn	First - Alex Middle - Last - Bartlett
Company - Bowie County Commissioner Precinct 3	Company - H.W. Lochner, Inc
E-mail Address - commblackburn@windstream.net	E-mail Address - abartlett@hwlochner.com
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 850 Front Street	Address- 903 East 104th Street, Ste. 800
City - DeKalb State - TX Zip - 75559 Country - US	City - Kansas City State - MO Zip - 64131 Country - US
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business (903) 667-5116 c. Fax (903) 667-4164	a. Residence b. Business (816) 363-2696 c. Fax (816) 363-0027

STATEMENT OF AUTHORIZATION

11. I hereby authorize, H.W. Lochner, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Original Signed By Kelly Blackburn on December 13, 2012 — SIGNATURE OF APPLICANT

DATE JBG

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

U.S. Route 82 Reconstruction Project

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Red Bayou, Austin Chapel Branch, Peters Branch	Address US-82 from FM 1840 to SH-98
15. LOCATION OF PROJECT Latitude: °N 33.479385 Longitude: °W -94.492145	City - Bowie County State- TX Zip- 75559

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Multiple Municipality DeKalb, Malta, and New Boston

Section - N/A Township - N/A Range - N/A

17. DIRECTIONS TO THE SITE

Travel west on U.S. Route 82 from New Boston approximately three miles to SH-98. Project area begins at SH-98 and extends approximately 8.4 miles west-northwest to SH-1840.

18. Nature of Activity (Description of project, include all features)

Construction of new concrete pavement from FM 1840 in De Kalb to SH 98 near New Boston. The typical width of pavement will be 50 feet to allow for a passing lane section comprised of two twelve-foot lanes in the passing lane direction, and one ten-foot shoulder in the opposite direction. An existing 3-8'x7' reinforced concrete box culvert (RCB) at the US-82 crossing of Red Bayou will be extended.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The project's purpose and need is to improve the safety of US-82 by constructing a passing lane in various locations along the 8.4-mile project area corridor.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Roadway and culvert improvements necessitate discharge of fill material to Red Bayou and an abutting wetland (WC 3).

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
RCB totalling 82CY	Soil fill totalling 148CY	

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 0.09 acre of wetlands and 0.03 acre (50 linear feet) of perennial stream impacted

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

The culvert extension and associated embankment at the US-82 crossing of Red Bayou is governed by clear zone requirements for safety. The proposed structure cannot be made any shorter; doing so would violate safety needs and would not be a viable option. Impacts to the abutting wetland (WC 3) have also been minimized to the extent practicable. The applicant proposes compensatory mitigation through the purchase of credits from the Brooks Creek Mitigation Bank, located in Bowie County, Texas. Refer to attached mitigation plan.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
TxDOT	PCE	0046-04-057	August 2012	September 2012	

* Would include but is not restricted to zoning, building, and flood plain permits

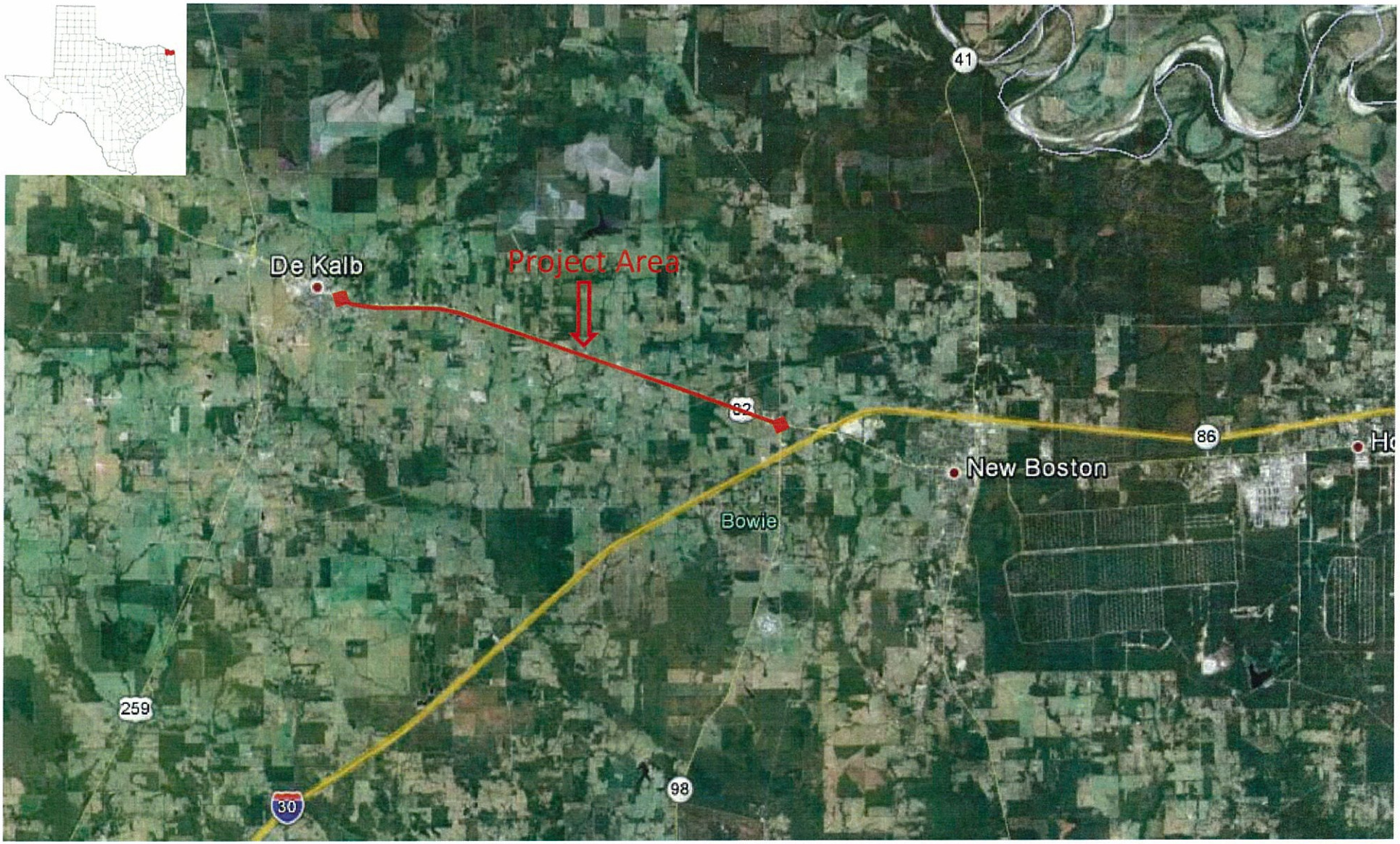
27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Original Signed by Kelly Blackburn on December 13, 2012 JBG
SIGNATURE OF APPLICANT DATE

SIGNATURE OF AGENT 12/12/12
DATE

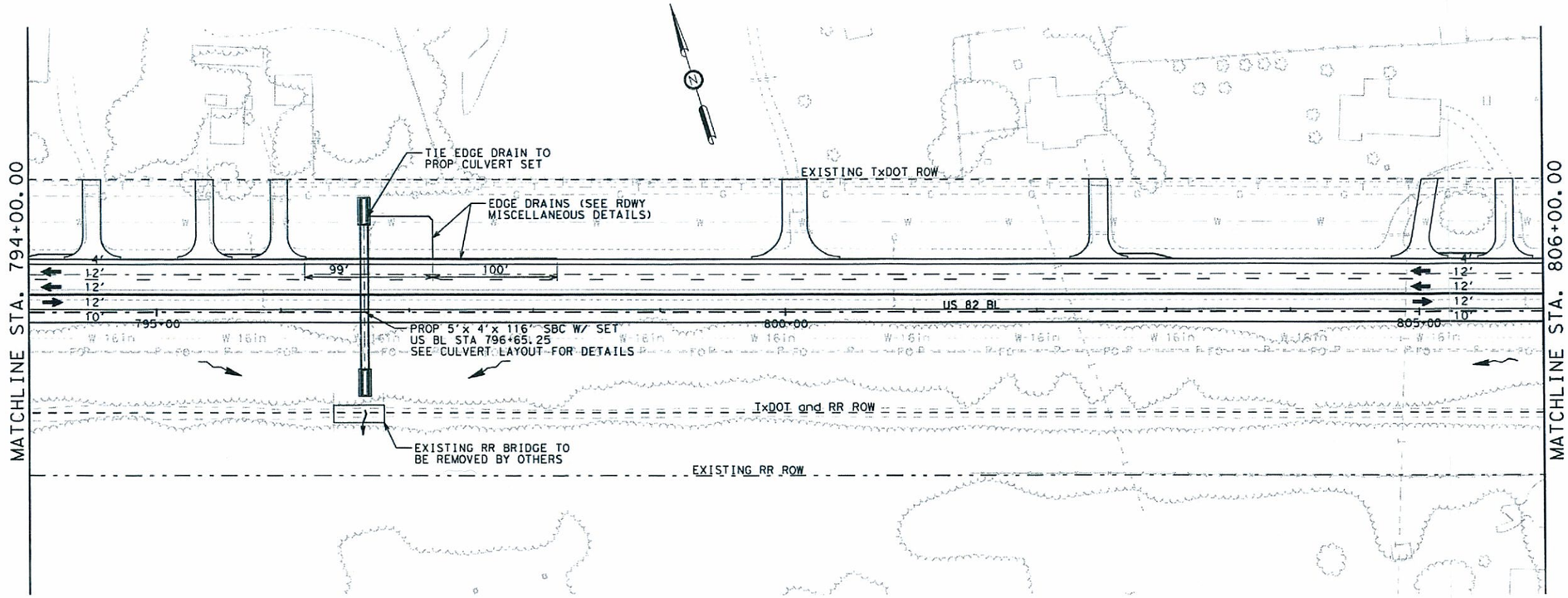
The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

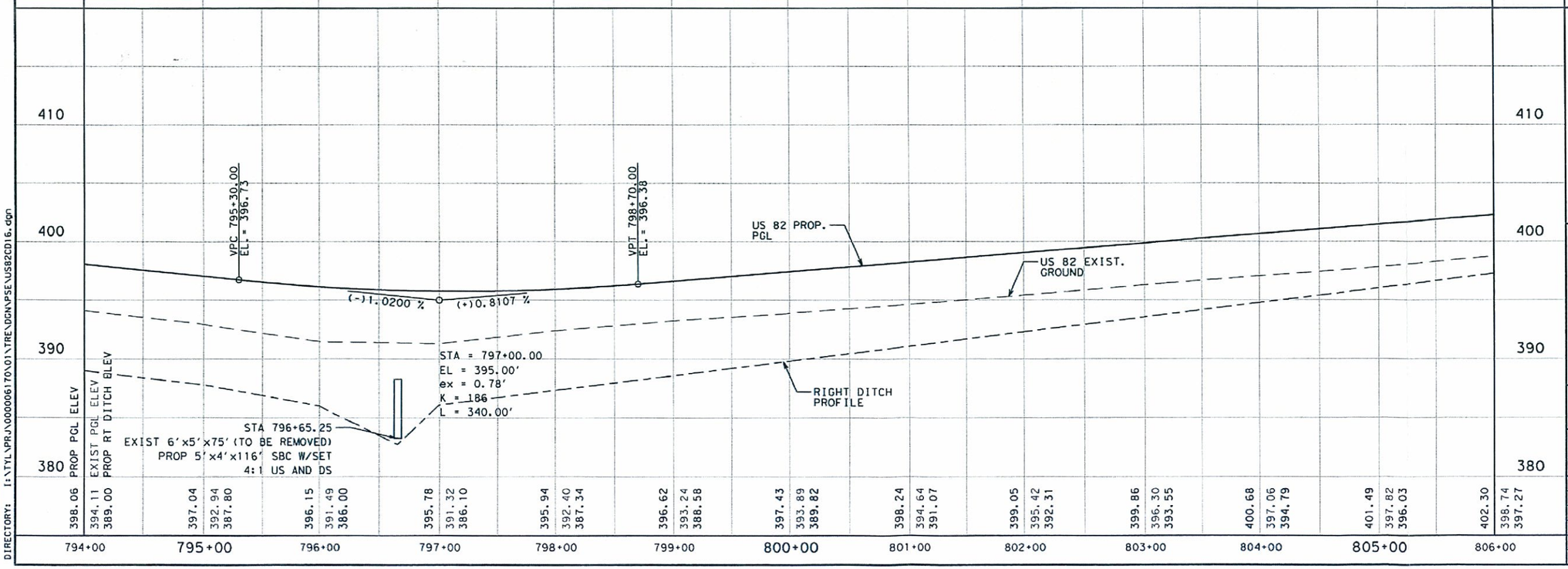


Vicinity Map
U.S. Route 82 Reconstruction Project
FM 1840 to SH 98 – Bowie County, TX
Source: Google Earth Date: October 2011

NOTES:
1) SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INTERSECTION DETAILS.



EST.	SHEET TOTALS FINAL	UNIT	DESCRIPTION
		CY	EXCAVATION (RDWY)
		CY	EMBANKMENT



STATE OF TEXAS
JOHN B. GOODWIN
63174
REGISTERED
PROFESSIONAL ENGINEER
12/7/2012

PLAN PROFILE US 82

STA 794+00 to STA 806+00

SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 10'

SHEET 16 OF 39

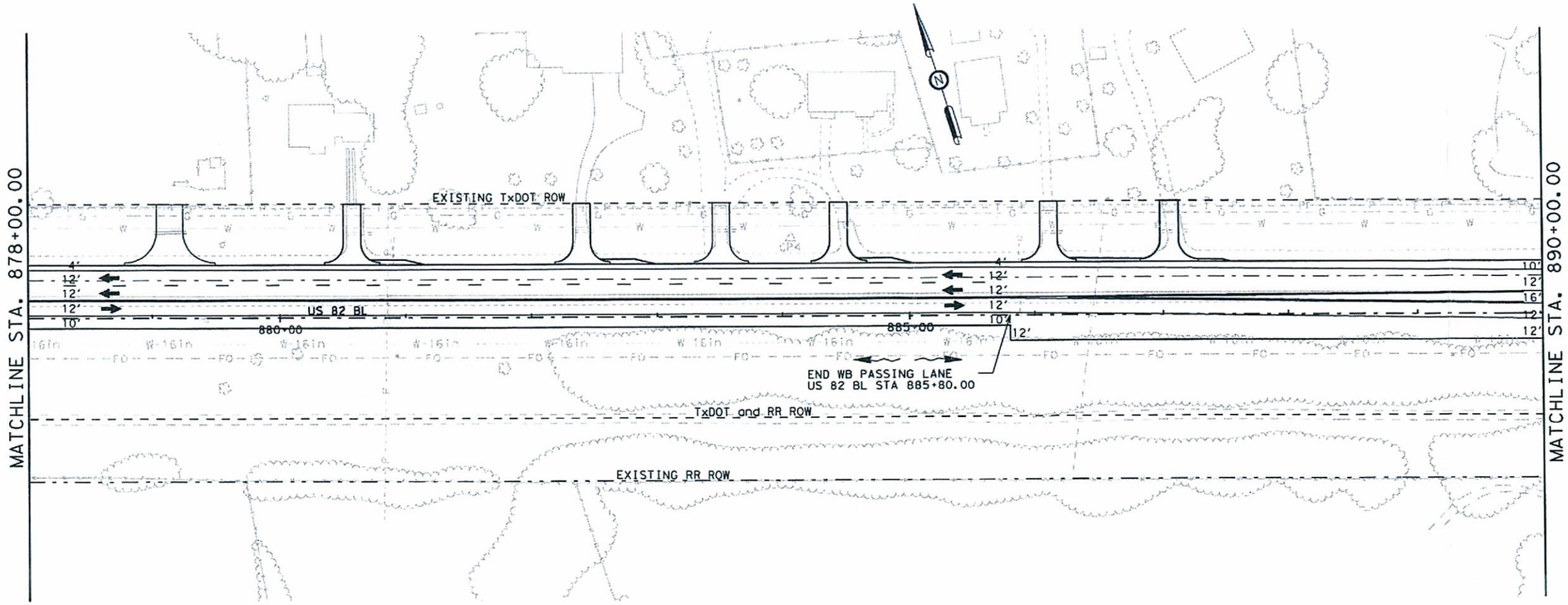
Texas Department of Transportation
© 2012

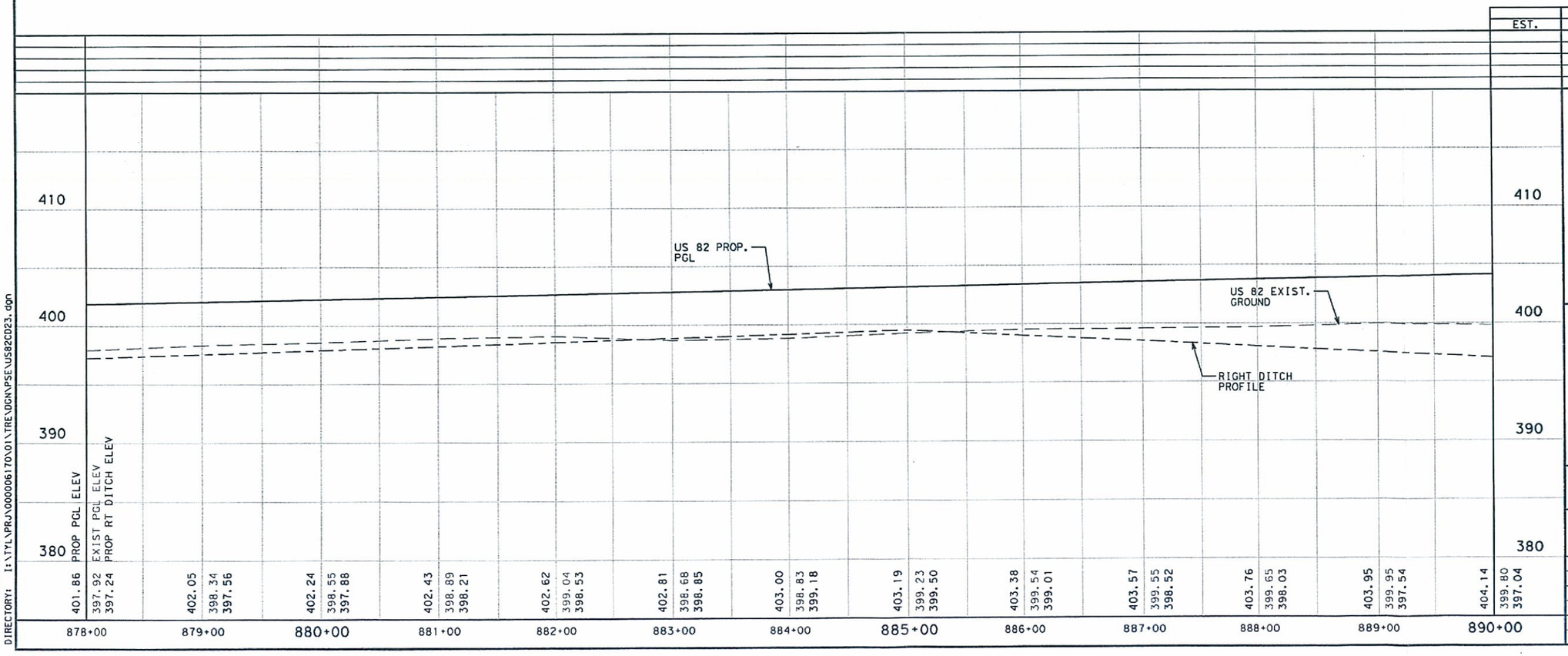
LOCHNER | 1828 ESE Loop 323 | Suite 202 Tyler, Texas 75701 TBPE Firm Reg. No. 10488

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	PTF 2013 (400)	127
STATE	DIST.	COUNTY
TEXAS	ATL	BOWIE
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: US82CD16.dgn
DATE: 12/7/2012 TIME: 5:11:41 PM
DIRECTORY: I:\TYL\PRJ\0000061701\01\TRE\DGN\PSE\US82CD16.dgn

NOTES:
1) SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INTERSECTION DETAILS.





EST.	SHEET TOTALS FINAL	UNIT	DESCRIPTION
		CY	EXCAVATION (RDWY)
		CY	EMBANKMENT

STATE OF TEXAS
JOHN B. GOODWIN
63174
REGISTERED PROFESSIONAL ENGINEER
12/7/2012

PLAN PROFILE US 82

STA 878+00 to STA 890+00

SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 10'

SHEET 23 OF 39

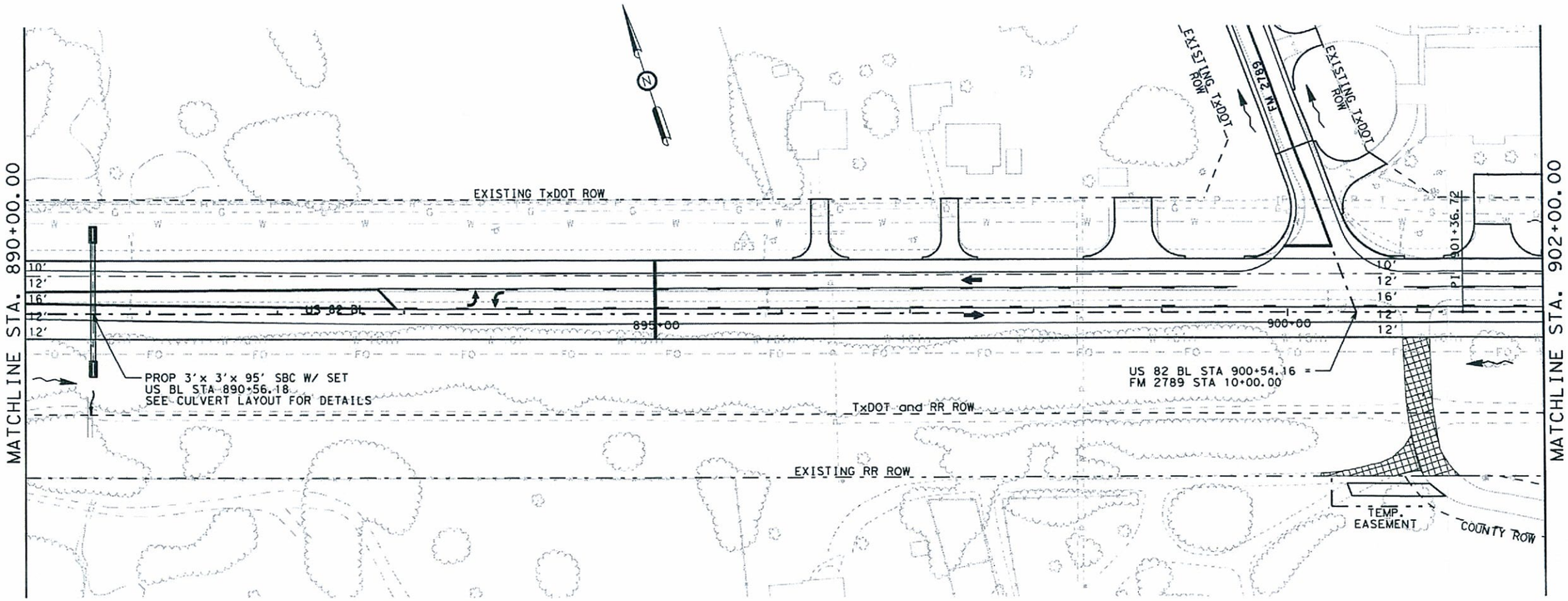
Texas Department of Transportation

LOCHNER | 1828 ESE Loop 323 | Suite 202 Tyler, Texas 75701 TBPE Firm Reg. No. 10488

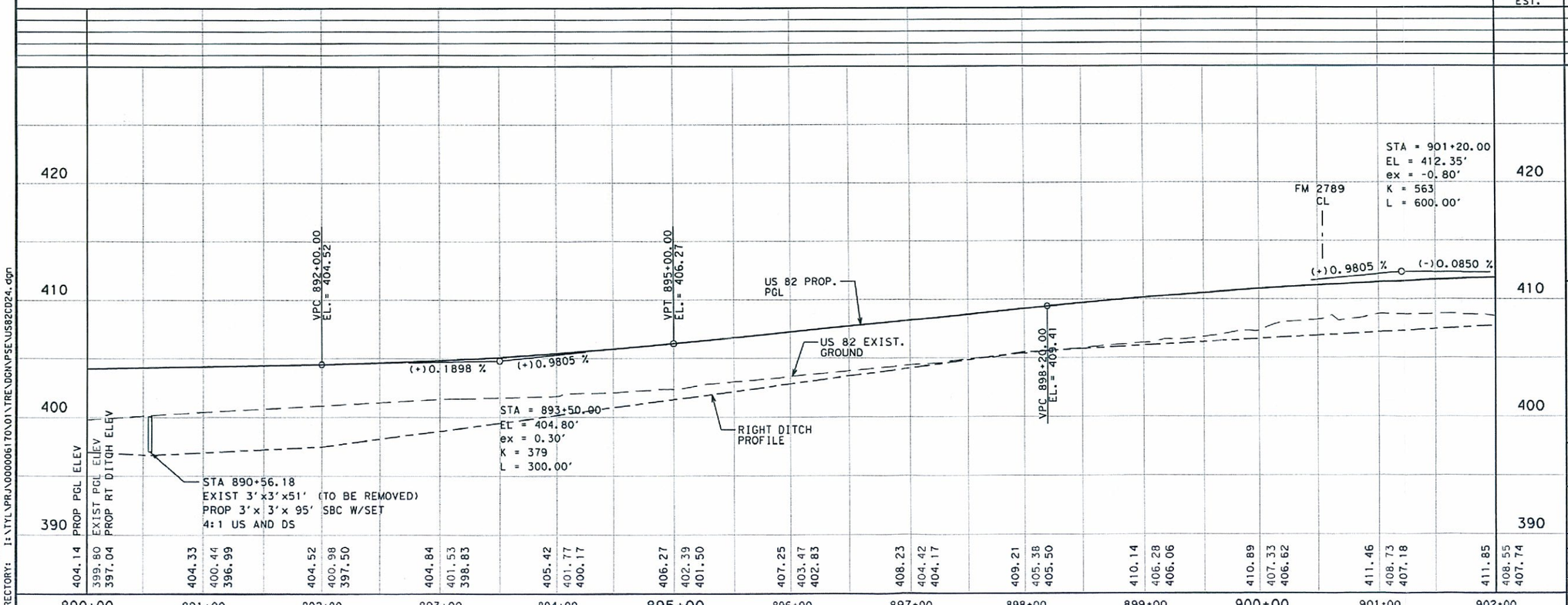
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	PTF 2013 (400)		194
STATE	DIST.	COUNTY	
TEXAS	ATL	BOWIE	
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: US82CD23.dgn
DATE: 12/7/2012 TIME: 5:11:51 PM
DIRECTORY: I:\TYL\PRJ\0000061701\01\TRE\DGN\PSE\US82CD23.dgn

NOTES:
1) SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INTERSECTION DETAILS.



EST.	SHEET TOTALS FINAL	UNIT	DESCRIPTION
		CY	EXCAVATION (RDWY)
		CY	EMBANKMENT



PLAN PROFILE US 82

STA 890+00 to STA 902+00

SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 10'

SHEET 24 OF 39

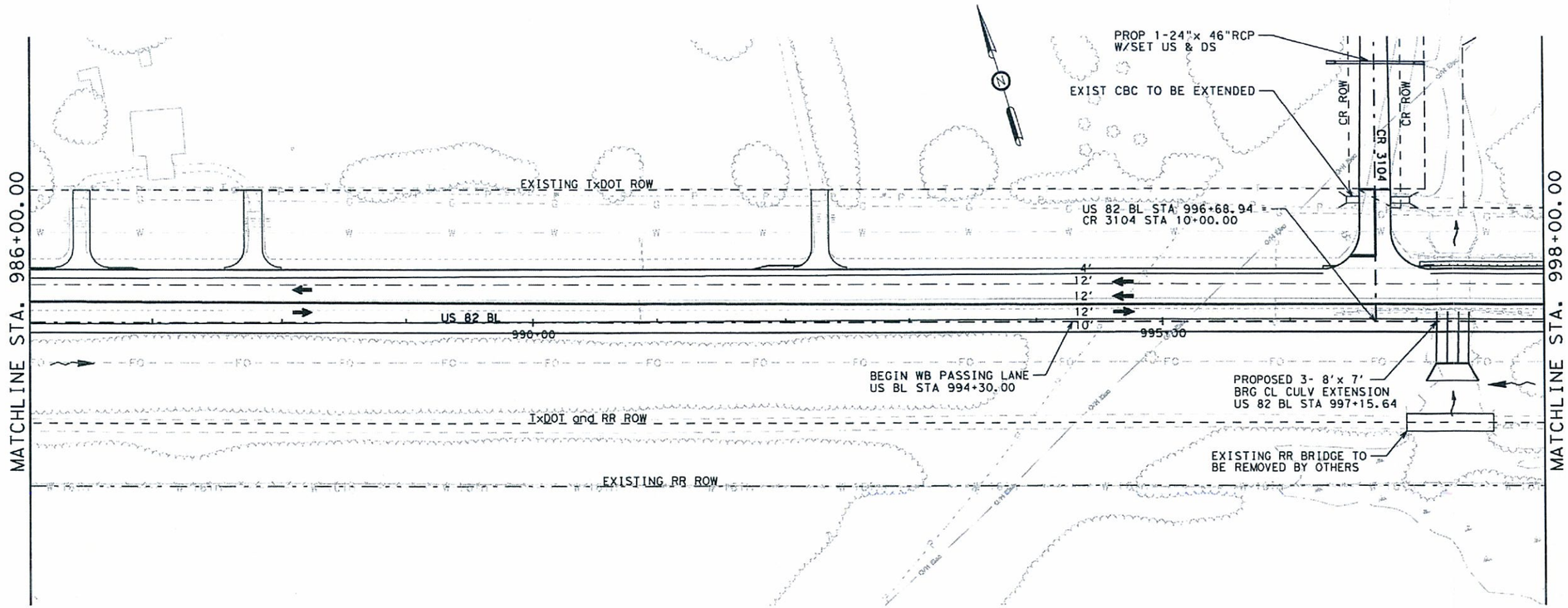
Texas Department of Transportation ©2012

LOCHNER | 1828 ESE Loop 323 | Suite 202 Tyler, Texas 75701 TBPE Firm Reg. No. 10488

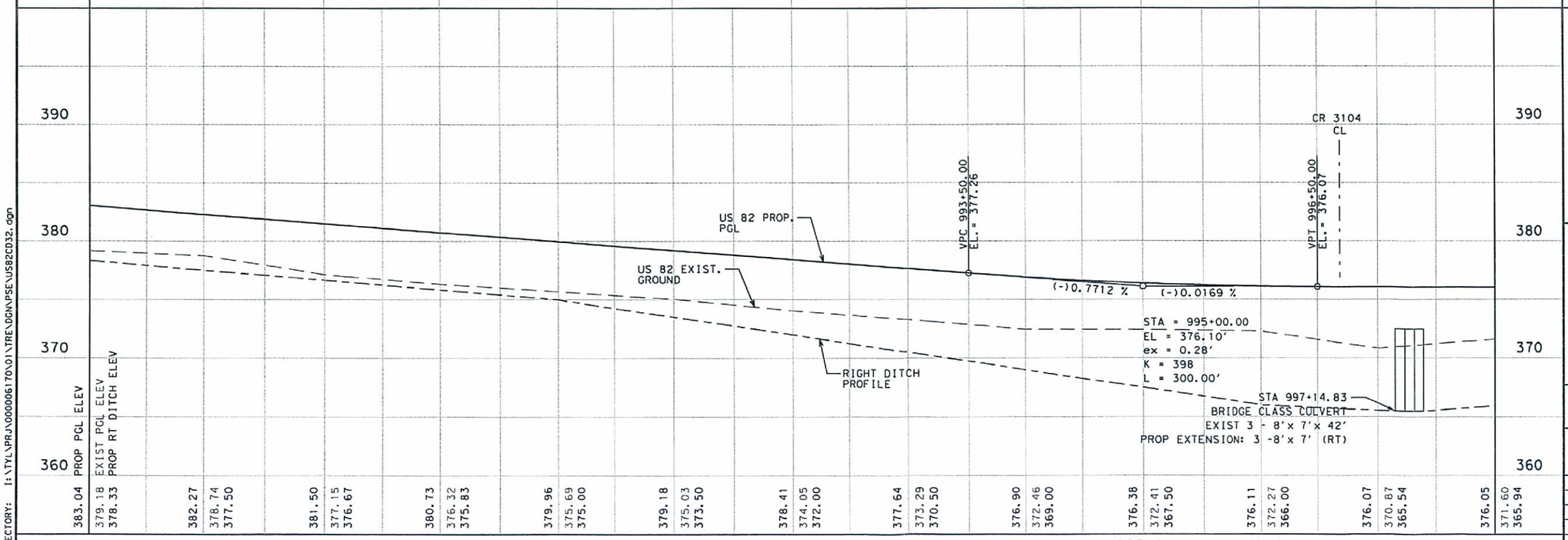
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	PTF 2013 (400)		195
STATE	DIST.	COUNTY	
TEXAS	ATL	BOWIE	
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: US82CD24.dgn
DATE: 12/7/2012 TIME: 5:11:53 PM
DIRECTORY: I:\TYL\PRJ\0000061700\01\TRE\DGN\PSE\US82CD24.dgn

NOTES:
1) SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INTERSECTION DETAILS.



EST.	SHEET TOTALS FINAL	UNIT	DESCRIPTION
		CY	EXCAVATION (RDWY)
		CY	EMBANKMENT



STATE OF TEXAS
JOHN B. GOODWIN
63174
REGISTERED PROFESSIONAL ENGINEER
12/7/2012

PLAN PROFILE US 82

STA 986+00 to STA 998+00

SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 10'

SHEET 32 OF 39

Texas Department of Transportation

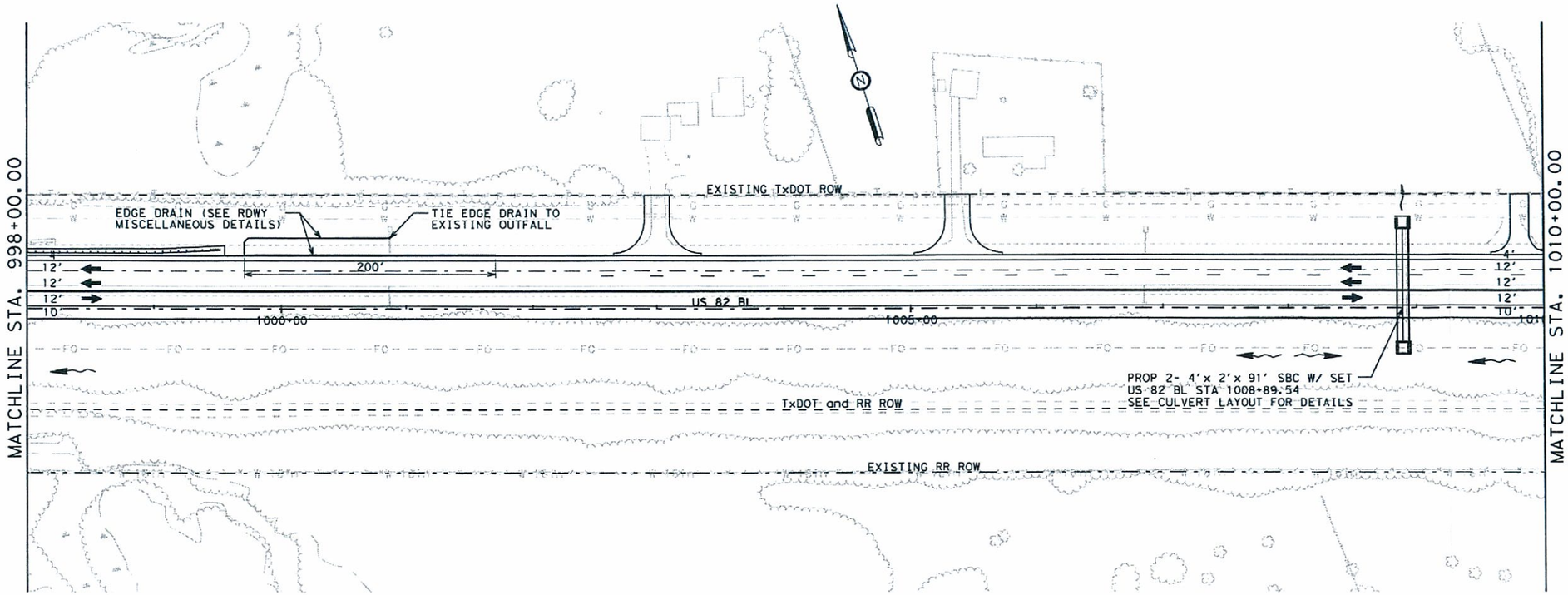
LOCHNER | 1828 ESE Loop 323 | Suite 202 Tyler, Texas 75701 TBPE Firm Reg. No. 10488

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	PTF 2013 (400)	203

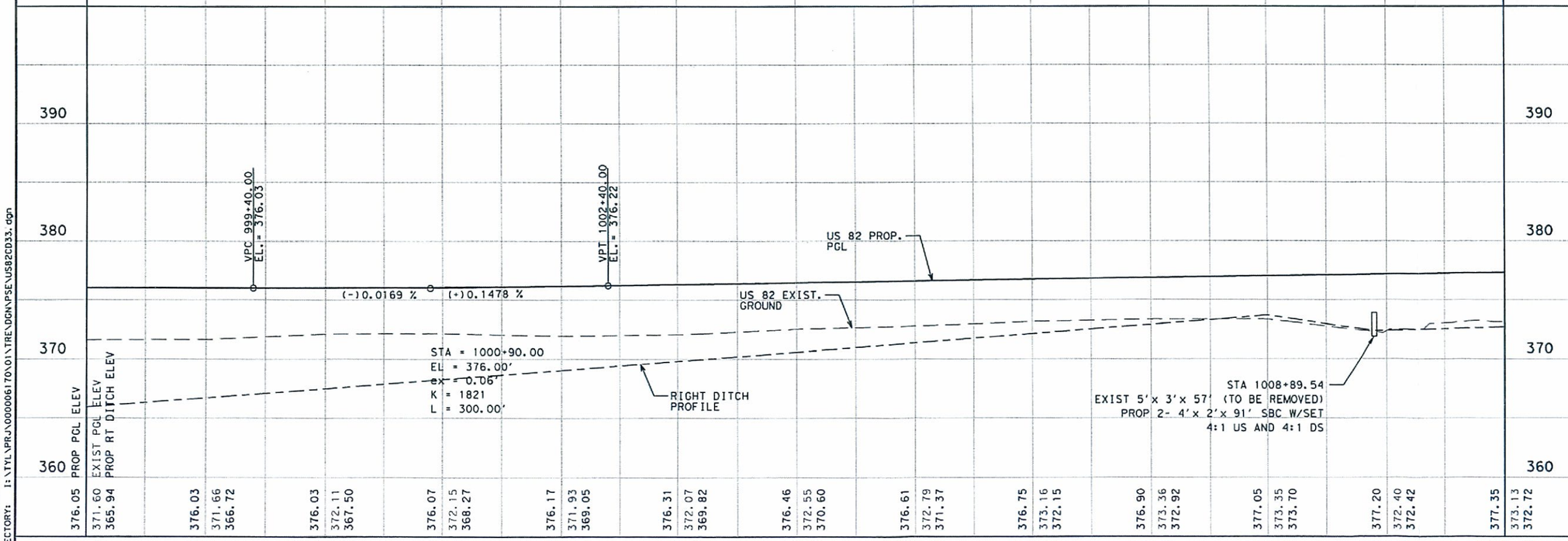
STATE	DIST.	COUNTY	
TEXAS	ATL	BOWIE	
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: US82CD32.dgn
DATE: 12/7/2012 TIME: 5:12:04 PM
DIRECTORY: I:\TYL\PRJ\0000061700\01\TRE\DGN\PSE\US82CD32.dgn

NOTES:
1) SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INTERSECTION DETAILS.



EST.	SHEET TOTALS FINAL	UNIT	DESCRIPTION
		CY	EXCAVATION (RDWY)
		CY	EMBANKMENT



PLAN PROFILE
US 82

STA 998+00 to STA 1010+00

SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 10'

SHEET 33 OF 39

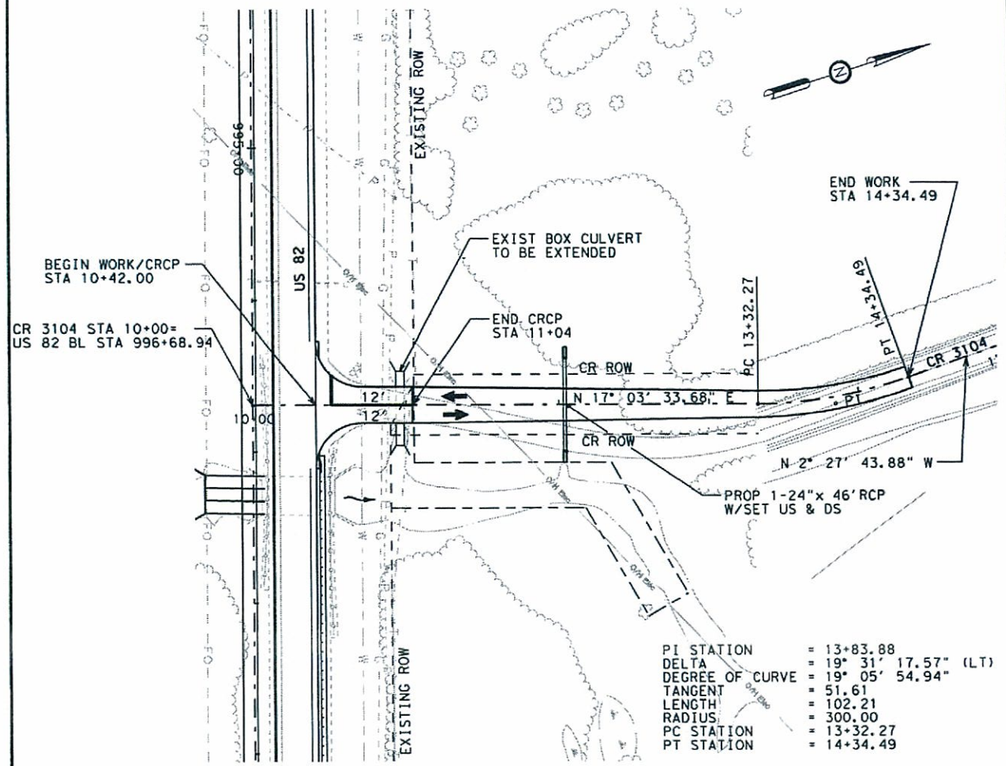
Texas Department of Transportation
© 2012

LOCHNER
1828 ESE Loop 323 | Suite 202
Tyler, Texas 75701
TBPE Firm Reg. No. 10488

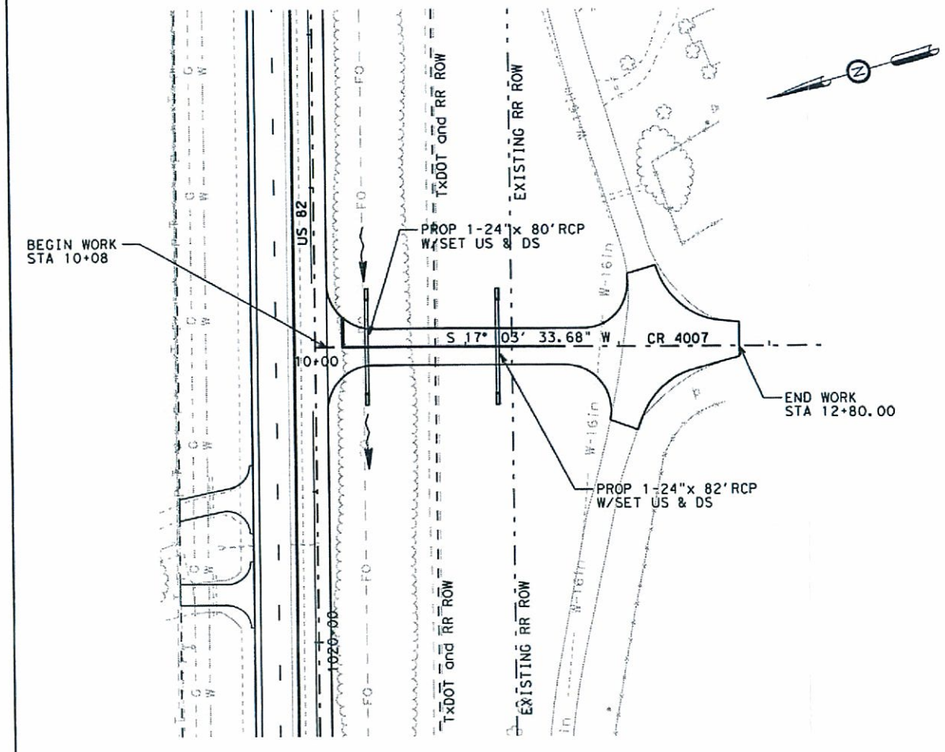
FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	PTF 2013 (400)	204
STATE	DIST.	COUNTY
TEXAS	ATL	BOWIE
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: US82CD33.dgn
DATE: 12/7/2012 TIME: 5:12:06 PM
DIRECTORY: I:\TYL\PRJ\0000061701\01\TRE\DGN\PSE\US82CD33.dgn

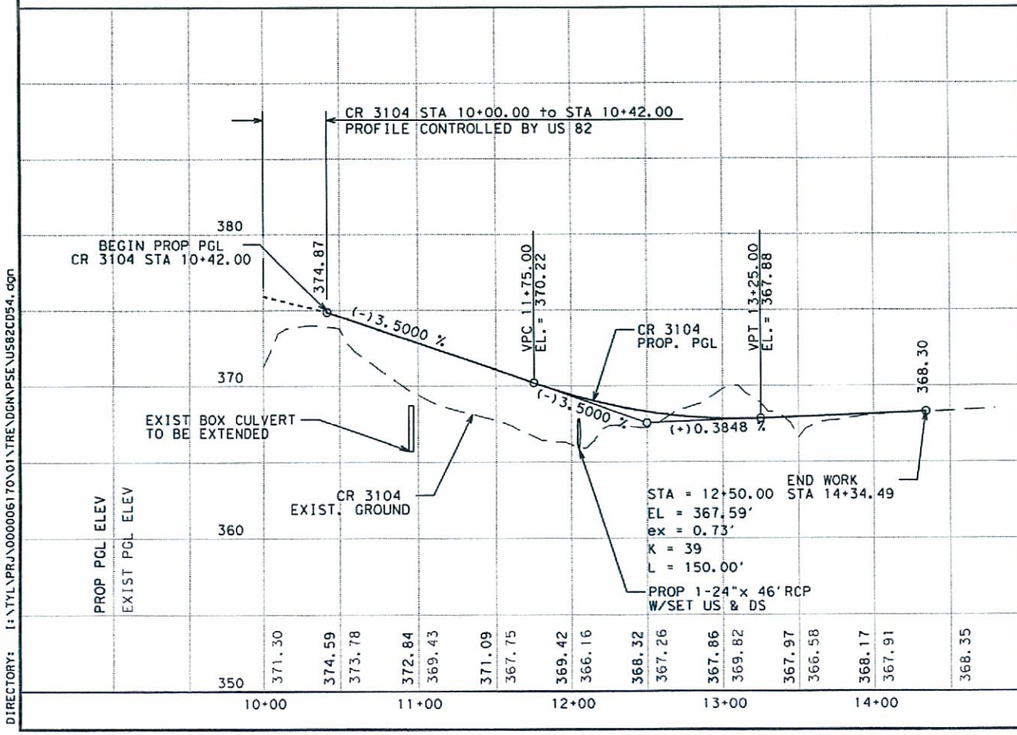
CR 3104

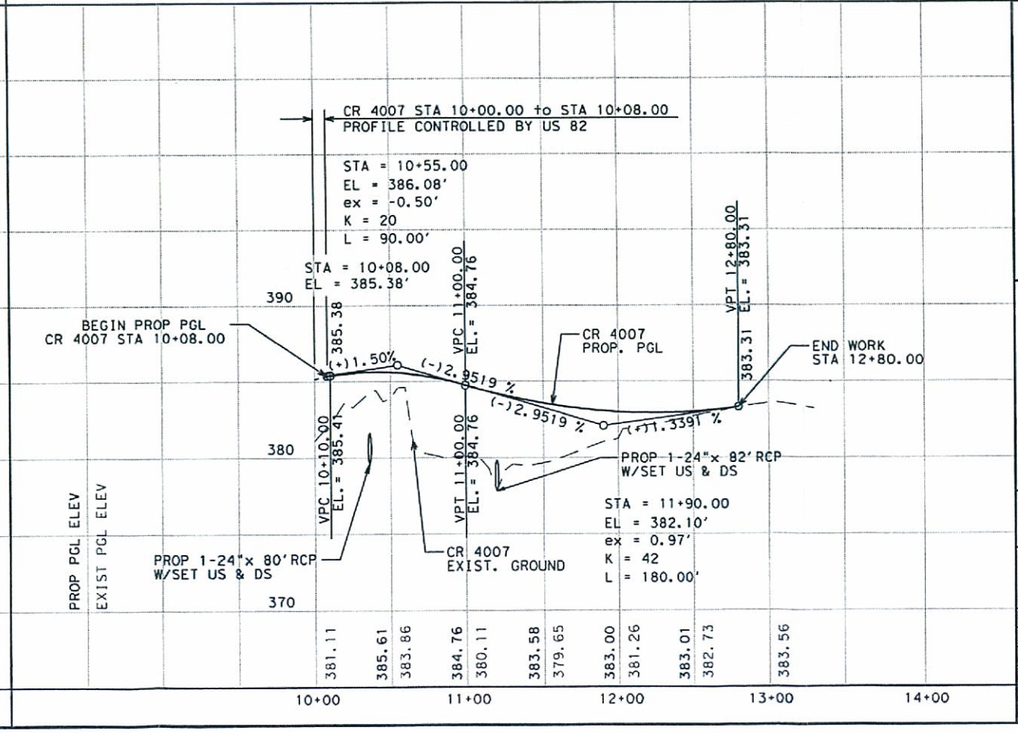


CR 4007



NOTES:
1) SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INTERSECTION DETAILS.





PLAN PROFILE ACCESS ROADS

CR 3104 & CR 4007

SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 10'

SHEET 10 OF 11

Texas Department of Transportation
© 2012

LOCHNER | 1828 ESE Loop 323 | Suite 202 Tyler, Texas 75701 TBPE Firm Reg. No. 10488

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	PTF 2013 (400)		224
STATE	DIST.	COUNTY	
TEXAS	ATL	BOWIE	
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: US82CD54.dgn
DATE: 12/7/2012 TIME: 5:13:04 PM
DIRECTORY: I:\TYL\PRJ\0000061701\01\TRE\DGN\PSE\US82CD54.dgn

STATION	DRAINAGE AREA		RUN-OFF COMPUTATION								CULVERT PARAMETERS									REMARKS
	NO.	ACRES	C	TIME OF CONCEN.	I_{25}	DESIGN DISCHARGE (Q)		I_{100}	CHECK DISCHARGE (Q)		SIZE AND LENGTH	S	K_e	HW_{25}	TW_{25}	V_{25}	HW_{100}	TW_{100}	V_{100}	
				MIN.	IN/HR	FREQ	CFS	IN/HR	FREQ	CFS		FT/FT		FT	FT	fps	ELEV	FT	fps	
628+61.53	A-1	8.72	0.50	43.88	4.04	25	15.83	4.97	100	19.47	1 - 24" x 81' R.C.P.	0.0357	0.70	404.69	399.84	12.55	405.36	399.94	13.12	
642+27.91	A-2	49.62	0.35	42.55	4.12	25	71.56	5.07	100	88.04	1 - 3'x3' x 90' R.B.C.	0.0047	0.70	397.75	395.42	9.16	398.98	395.57	9.78	
693+23.24	A-3	8.78	0.35	76.44	2.81	25	8.65	3.46	100	10.64	1-18"x88' R.C.P.	0.0199	0.70	402.93	399.72	9.18	403.56	399.83	9.58	
701+15.06	A-4	14.88	0.35	39.89	4.29	25	22.36	5.28	100	27.51	2-18"x114' R.C.P.	0.0139	0.70	401.43	397.88	8.47	402.44	398.1	8.65	
719+93.72	A-5	3.02	0.35	26.33	5.49	25	5.81	6.76	100	7.15	1-18"x112' R.C.P.	0.0144	0.70	402.40	399.94	3.29	402.68	400.03	4.05	
734+56.00	A-6	45.08	0.35	25.62	5.58	25	62.16	6.87	100	76.46	3-24"x85' R.C.P.	0.0075	0.70	399.76	397.23	7.72	400.23	397.64	8.11	
742+62.93	A-7	9.79	0.35	45.70	3.94	25	16.02	4.85	100	19.71	2-18"x82' R.C.P.	0.0035	0.70	401.78	401.01	4.53	402.31	401.01	5.58	
764+21.60	A-8	17.84	0.35	42.88	4.1	25	25.6	5.04	100	31.5	1 - 24"x85' R.C.P.	0.0061	0.70	403.26	400.64	8.15	404.70	400.64	10.03	
796+65.24	A-9	159.16	0.35	70.00	2.99	25	166.3	3.67	100	204.54	1 - 5'x4'x116 R.B.C.	0.0099	0.70	390.11	384.99	13.19	391.79	385.38	13.85	
816+44.10	A-10	1.00	0.35	15.20	7.35	25	2.572	9.07	100	3.174	1-18"x92' R.C.P.	0.0035	0.70	400.46	399.78	3.83	400.58	399.86	4.09	
830+86.05	A-11	2.44	0.35	21.47	6.15	25	5.25	7.58	100	6.47	1-18"x90' R.C.P.	0.0099	0.70	400.42	398.85	6.34	400.66	398.94	6.71	
839+51.18	A-12	12.07	0.35	49.83	3.73	25	15.75	4.59	100	19.38	1-24"x82' R.C.P.	0.0152	0.70	401.46	398.64	9.42	402.12	398.78	9.92	
857+73.26	A-13	44.78	0.35	50.18	3.71	25	58.18	4.57	100	71.57	1 - 4'x2'x102' R.B.C.	0.0224	0.70	394.4	389.14	12.95	395.7	389.3	13.66	
890+56.18	A-14	32.55	0.35	36.91	4.50	25	51.26	5.54	100	63.07	1-3'x3'x95' R.B.C.	0.0035	0.70	400.87	399.21	8.19	401.42	399.65	7.01	
905+07.00	A-15	27.00	0.35	39.26	4.33	25	40.94	5.33	100	50.37	1-3'x2'x112' R.B.C.	0.0070	0.70	410.38	407.46	8.72	411.52	407.73	9.13	
936+64.49	A-16	4.54	0.35	18.80	6.60	25	10.49	8.14	100	12.93	1-24"x114' R.C.P.	0.0043	0.70	405.14	403.83	5.55	405.39	404.01	6.01	
970+99.91	A-17	2.60	0.35	16.73	7.01	25	6.38	8.64	100	7.87	1-24"x80' R.C.P.	0.0128	0.70	390.19	388.43	7.14	390.36	388.51	7.47	
1008+89.54	A-19	85.25	0.35	62.22	3.23	25	96.31	3.97	100	118.45	2-4'x2'x91' R.B.C.	0.0284	0.70	375.3	370.19	13.35	376.18	370.31	14.02	
1050+33.20	A-20	3.31	0.35	18.51	6.66	25	7.71	8.21	100	9.51	1-18"x87' R.C.P.	0.0133	0.70	397.49	395.22	7.73	398.00	395.34	8.05	
1063+18.28	A-21	2.60	0.35	41.64	4.18	25	3.80	5.14	100	4.68	1-18"x110' R.C.P.	0.0035	0.70	396.89	396.09	4.34	397.05	396.2	4.66	
FM 1840 - 12+70.11	PC#19	18.86	0.35	45.10	3.97	25	26.22	4.90	100	32.36	2-24"x60' R.C.P.	0.0203	0.70	399.25	396.65	9.66	399.71	396.76	10.17	
FM 3378 - 11+26.41	PC#18	1.74	0.68	29.39	5.16	25	6.14	6.35	100	7.56	1-18"x73' R.C.P.	0.0035	0.70	395.01	394.24	5.16	395.25	394.62	4.28	
SH 98 - 10+67.57	PC#17	0.62	0.35	33.64	4.76	25	1.03	5.86	100	1.27	1-18"x225' R.C.P.	0.0079	0.70	396.61	394.36	3.68	396.61	394.40	3.92	
SH 98 - 11+17.75	PC#20	1.02	0.35	39.16	3.99	25	1.55	5.34	100	1.906	1-18"x94' R.C.P.	0.0051	0.70	395.52	394.76	3.29	395.61	394.81	3.50	

12/3/2012

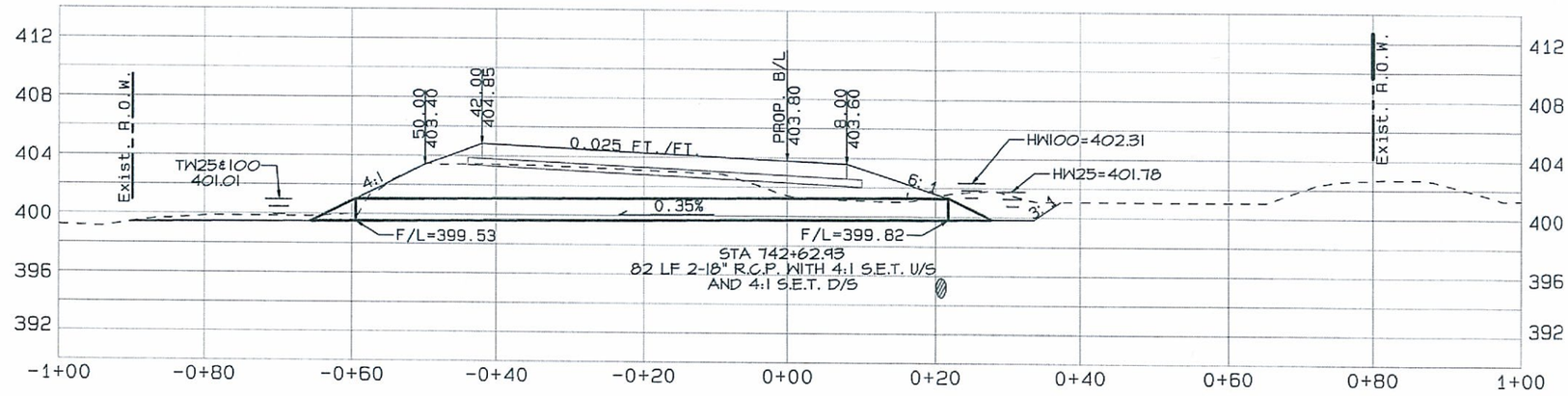
CULVERT SUMMARY

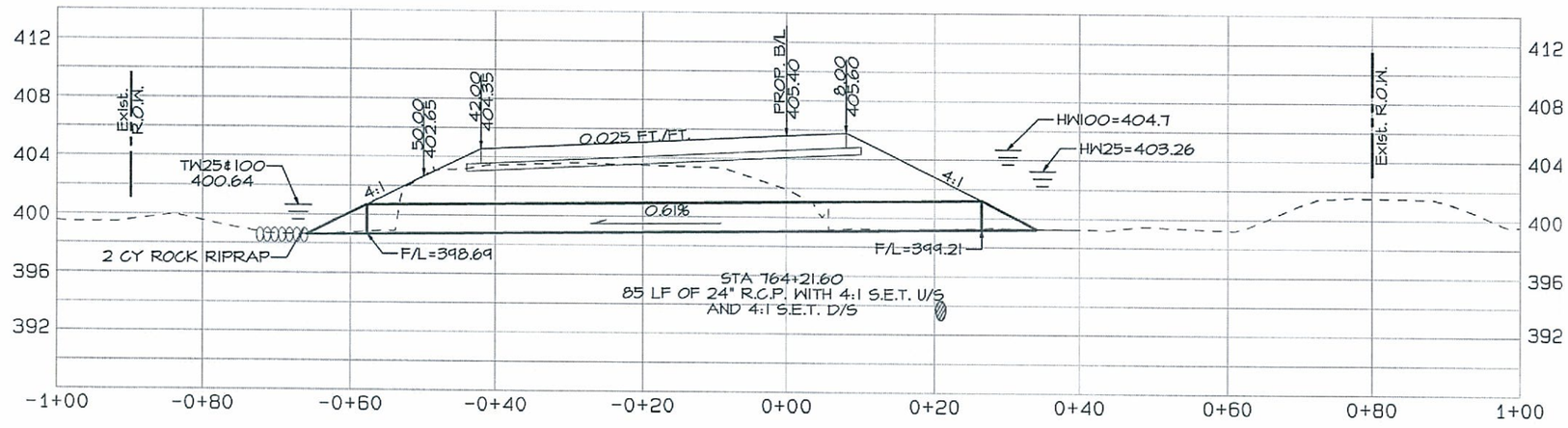
Texas Department of Transportation
© 2012

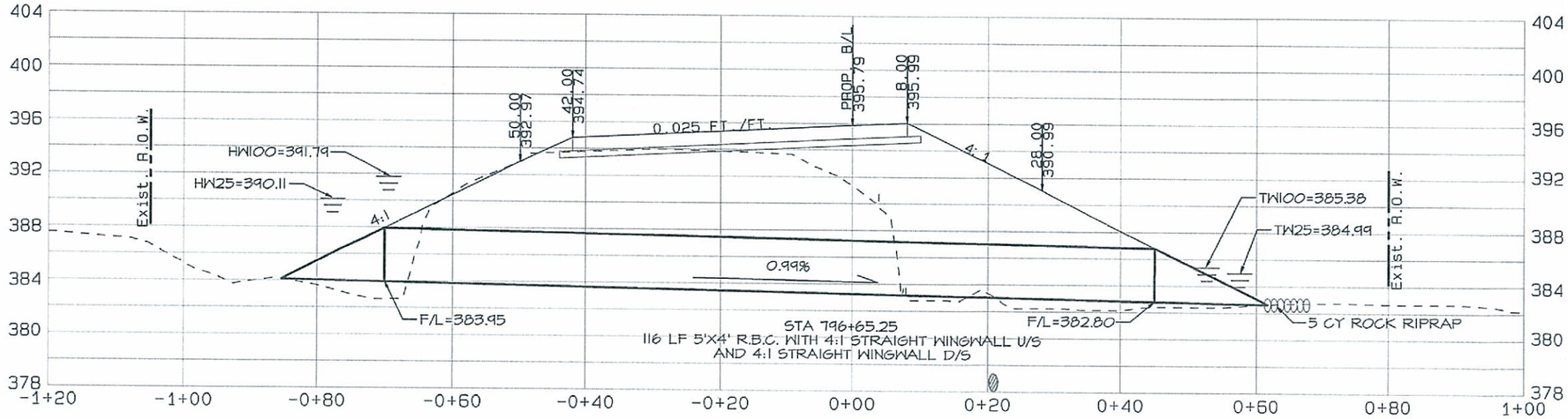
MTG engineers & surveyors
5430 SUMMERHILL RD.| P.O. BOX 3186
TEXARKANA TEXAS 75501
P 903.838.8533 | F 903.832.4100
www.mtgengineers.com
©MTG 2012 TBPE NO. 354

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	PTF 2013(400)		322
STATE	DIST.	COUNTY	
TEXAS	ATL	BOWIE	
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: $FILESS
DATE: 3 Dec 2012 TIME: 11:07AM
PROJECT DIRECTORY: X:\2011 Projects\116035 US 82 PTF_Bowie County\PS&E\FINAL_PS&E\CULVERT LAYOUTS.pro







STATE OF TEXAS
DAVID A. WILLIAMS
66437
REGISTERED
PROFESSIONAL ENGINEER

12/3/2012

HORIZONTAL SCALE - 1"=20'
VERTICAL SCALE - 1"=10'

NOTE: TAILWATER ELEVATIONS ARE GIVEN AT NORMAL DEPTH

CULVERT LAYOUTS

PAGE 3 OF 8

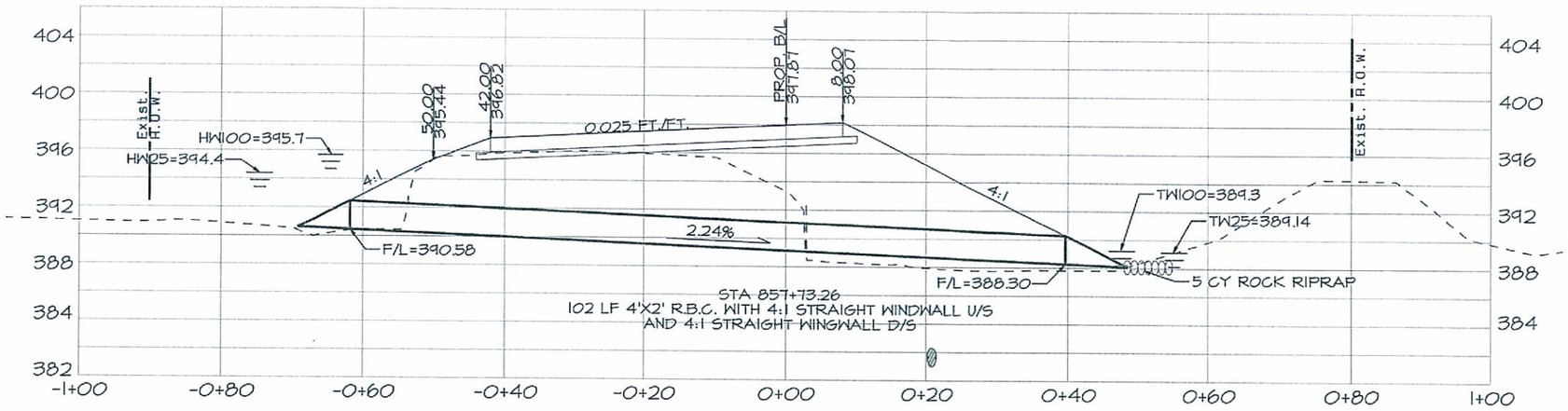
Texas Department of Transportation

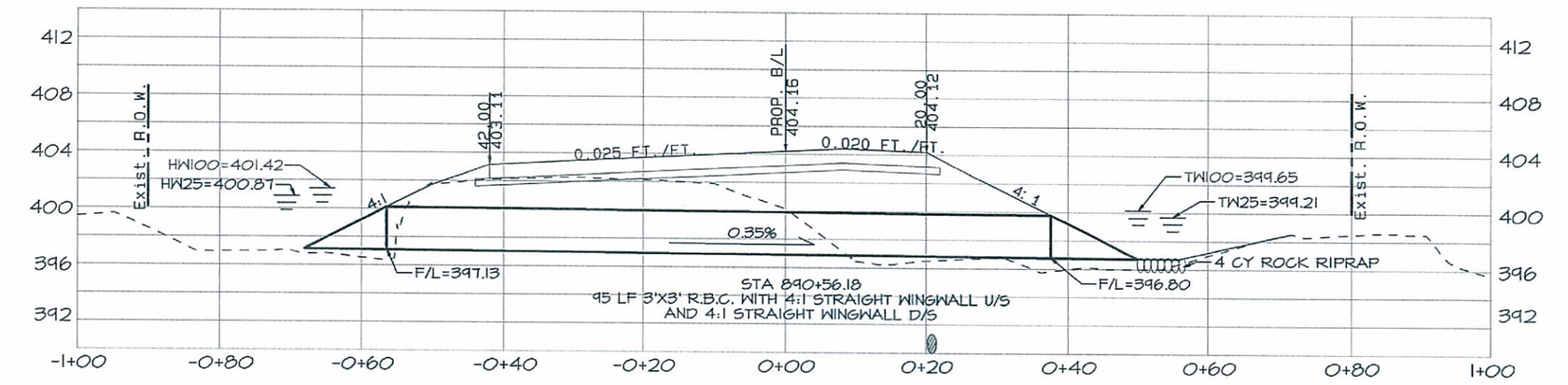
MTG engineers & surveyors
5430 SUMMERHILL RD. P.O. BOX 3186
TEXARKANA TEXAS 75501
P 903.838.8533 F 903.832.4700
www.mtgengineers.com

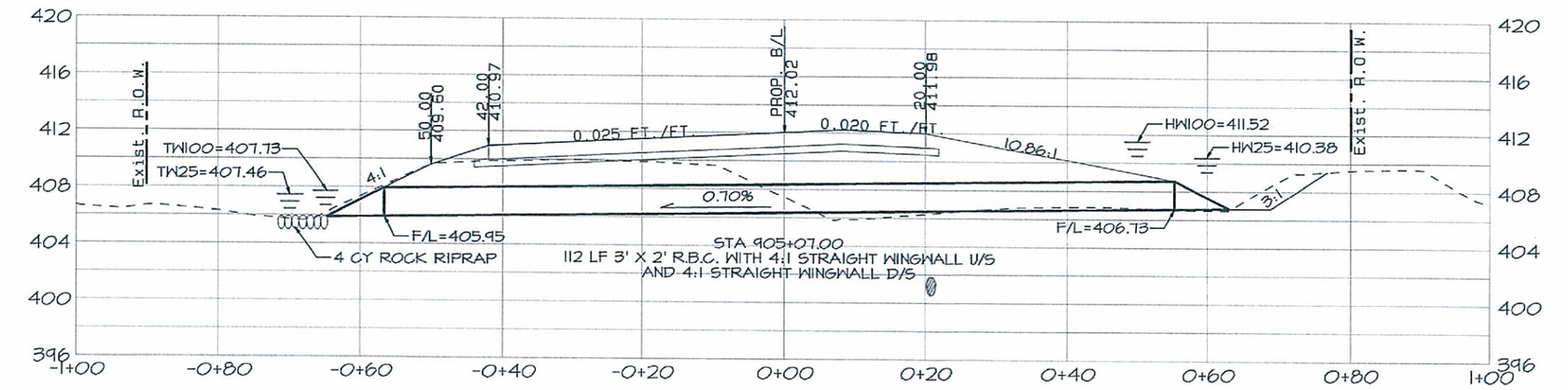
TBPE NO. 354

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	PTF 2013 (400)		325
STATE	DIST.	COUNTY	
TEXAS	ATL	BOWIE	
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: $FILESS
DATE: 3 Dec 2012 TIME: 11:07AM
PROJECT DIRECTORY: X:\2011 Projects\116035 US 82 PTF_Bowie County\PSGE\FINAL_PSGE\CULVERT LAYOUTS.prg







FILE: $FILESS
DATE: 3 Dec 2012 TIME: 11:07AM
PROJECT DIRECTORY: X:\2011 Projects\116035 US 82 PTF Bowie County\PS&E\FINAL_PS&E\CULVERT LAYOUTS.prc

STATE OF TEXAS
DAVID A. WILLIAMS
66437
REGISTERED PROFESSIONAL ENGINEER

12/3/2012

HORIZONTAL SCALE - 1"=20'
VERTICAL SCALE - 1"=10'

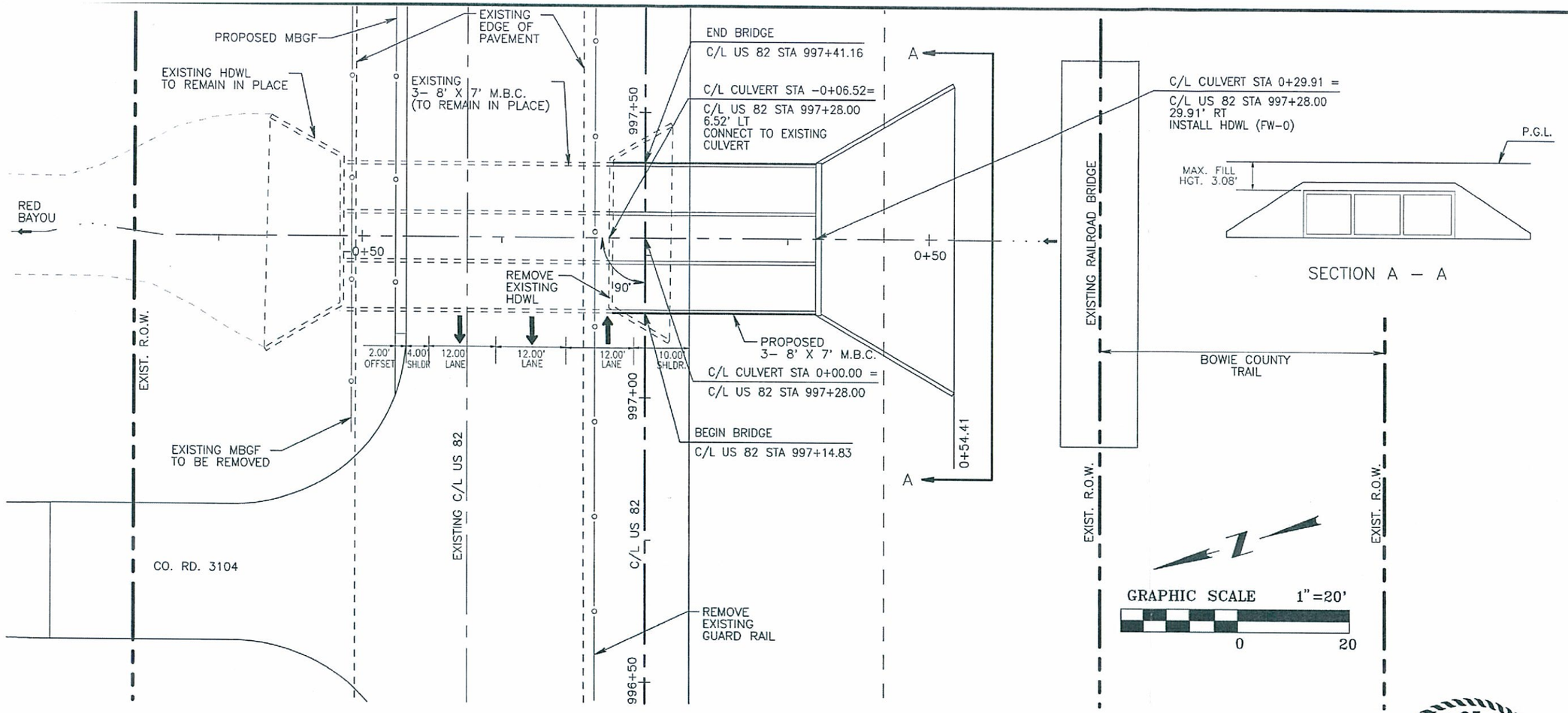
NOTE: TAILWATER ELEVATIONS ARE GIVEN AT NORMAL DEPTH

CULVERT LAYOUTS

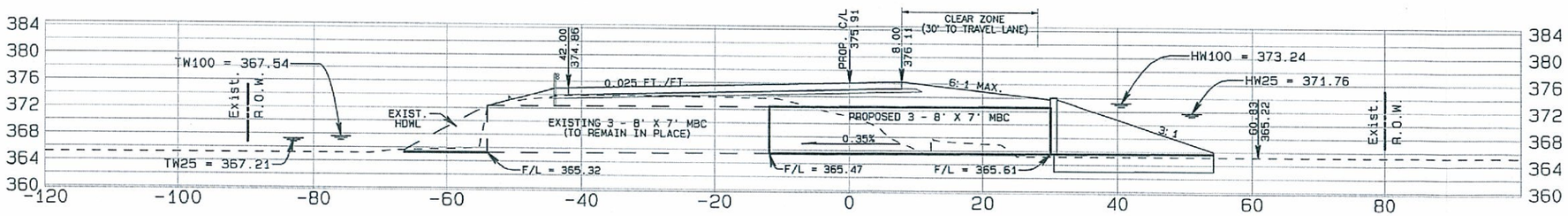
PAGE 5 OF 8

MTG engineers & surveyors
5430 SUMMERHILL RD. | P.O. BOX 3186
TEXARKANA TEXAS 75501
P 903.838.8559 | F 903.832.4700
www.mtgengineers.com

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	PTF 2013(400)		327
STATE	DIST.	COUNTY	
TEXAS	ATL	BOWIE	
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82



PLAN VIEW



STA 997+28.00
EXISTING 3 – 8' X 7' X 42' TO BE EXTENDED
3 – 8' X 7' R.B.C.X 42.0' (MC-8-13) WITH
3:1 FLARED WINGWALL U/S

PROFILE VIEW
HORIZONTAL SCALE – 1"=20'
VERTICAL SCALE – 1"=20'

STATE OF TEXAS
DAVID A. WILLIAMS
66437
REGISTERED PROFESSIONAL ENGINEER
12/3/2012

NBI NO. 190190004604028

BRIDGE LAYOUT
RED BAYOU
(US 82)

STA 997+14.83 TO STA 997+41.16

Texas Department of Transportation
©2012

MTG engineers & surveyors
5430 SUMMERHILL RD. P.O. BOX 3786
TEXARKANA TEXAS 75501
P 903.838.8593 | F 903.832.4100
www.mtgengineers.com
©MTG 2012 TBPE NO. 354

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	PTF 2013(400)		344
STATE	DIST.	COUNTY	
TEXAS	ATL	BOWIE	
CONT.	SECT.	JOB	HIGHWAY NO.
0046	04	057	US 82

FILE: $FILE$$
DATE: 3 Dec 2012 TIME: 11:42AM
PROJECT DIRECTORY: X:\2011 Projects\16035 US 82 PTF_Bowie County\PS&E\FINAL_PS&E\RED BAYOU BRIDGE LAYOUT.pro

TxRAM Data and Scoring Sheets

Version 1.0 - Final Draft

TXRAM STREAM DATA SHEET

Project/Site Name/No.: US-82 Reconstruction Project Type: ☒ Fill/Impact (☒ Linear ☐ Non-linear) ☐ Mitigation/Conservation

Stream ID/Name: Red Bayou SAR No.: 1 Size (LF): 170 Date: 11/26/12 Evaluator(s): A.L.Bartlett

Stream Type: Intermittent Ecoregion: 1: South Central Plains Delineation Performed: ☒ Previously ☐ Currently

8-Digit HUC: 11140106 Watershed Condition (developed, pasture, etc.): Forested Watershed Size: _____

Aerial Photo Date and Source: TX Orthoimagery Program/Google Earth 2008 Site Photos: 02/23/12 Representative: ☒ Yes ☐ No

Stressor(s): _____ Are normal climatic/hydrologic conditions present? ☐ Yes ☒ No (If no, explain in Notes)

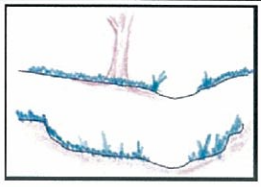
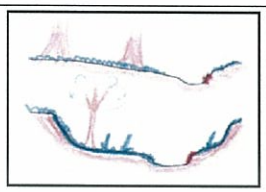
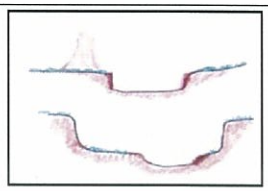
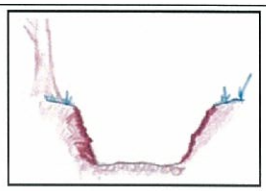
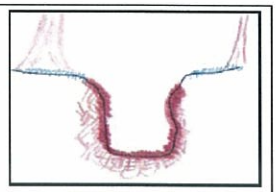
Stream Characteristics

Stream Width (Feet)		*Stream Height/Depth (Feet)*	
Avg. Bank to Bank:	35	Avg. Banks:	3
Avg. Waters Edge:	15	Avg. Water:	1
Avg. OHWM:	30	Avg. OHWM:	2

Notes: 2.5" rainfall within past 5 days

CHANNEL CONDITION

Floodplain Connectivity

				
Very little incision and access to the original floodplain or fully developed wide bankfull benches.	Slight incision and likely having regular (i.e., at least once a year) access to bankfull benches or newly developed floodplains along majority of the reach.	Moderate incision and presence of near vertical/ undercut banks; irregular (i.e., greater than 2 year return interval) access to floodplain or possible access to floodplain or bankfull benches at isolated areas.	Overwidened or incised channel and likely to widen further; majority of both banks near vertical/undercut; unlikely/rarely having access to floodplain or bankfull benches.	Deeply incised channel or channelized flow; severe incision with flow contained within the banks; majority of banks vertical/undercut.
5	4	3	2	1

Score: 4

Bank Condition

Left Bank Active Erosion: 10 % Right Bank Active Erosion: 10 % Average: 10

Bank Protection/Stabilization: ☒ Natural ☐ Artificial: _____

Score: 4

Sediment Deposition

☐ Less than 20% of the bottom covered by excessive sediment deposition; bars with established vegetation (5)

☒ 20–40% of the bottom covered by excessive sediment deposition; some established bars with indicators of recently deposited sediments (4)

☐ 40–60% of the bottom covered by excessive sediment deposition; moderate deposition on old bars and creating new bars; moderate sediment deposits at in-stream structures; OR obstructed view of the channel bottom and a lack of other depositional features (3)

☐ 60–80% of the bottom covered by excessive sediment deposition; newly created bars prevalent; heavy sediment deposits at in-stream structures (2)

☐ Greater than 80% of the bottom covered by excessive sediment deposition resulting in aggrading channel (1)

Score: 4

RIPARIAN BUFFER CONDITION

Riparian Buffer - See Table 22 to determine appropriate buffer distance. Confirm in office review.

Identify each buffer type and score according to canopy cover, vegetation community, and land use (see section 3.3.2.1.3).

Left Bank

Buffer Distance: 185'

Buffer Type	*Canopy Cover*	*Vegetation Community*	*Land Use*	*Score*	*Percentage of Area*	*Subtotal*
1. Forest	75	Native	Low	5	25	1.25
2. Maintained ROW	0	Mix	High	1	20	0.20
3. Lawn	0	Mix	Inten	0	25	0
4. Highway/Road	0	None	Inten	0	30	0
5.						

Score: 1.45

Right Bank

Buffer Type	*Canopy Cover*	*Vegetation Community*	*Land Use*	*Score*	*Percentage of Area*	*Subtotal*
1. Forest	75	Native	Low	5	25	1.25
2. Maintained ROW	0	Mix	High	1	25	0.25
3. Lawn	0	Mix	Inten	0	25	0
4. Highway	0	None	Inten	0	25	0
5.						

Score: 1.50

IN-STREAM CONDITION

Substrate Composition (estimate percentages)

Boulder:	Gravel: 25	Fines (silt, clay, muck): 60	Artificial:
Cobble:	Sand: 15	Bedrock:	Other:

Score: 3

In-stream Habitat (check all habitat types that are present)

Habitat Type	*T1*	*T2*	*T3*	*T4*	*T5*	*T6*	*T7*	*T8*	*T9*	*T10*	*T11*	*T12*	*T13*
Undercut Banks													
Overhanging Vegetation	✓												
Rootmats													
Rootwads	✓												
Woody/Leafy Debris	✓	✓	✓										
Boulders/Cobbles													
Aquatic Macrophytes			✓										
Riffle/Pool Sequence													
Artificial Habitat Enhancement													
Other													
Total No. Present	3	1	2										

Average: 2 **Score:** 2

HYDROLOGIC CONDITION

Flow Regime

- ☐ Noticeable surface flow present (4)
- ☒ Continual pool of water but lacking noticeable flow (3)
- ☐ Isolated pools and interstitial (subsurface) flow (2)
- ☐ Isolated pools and no evidence of surface or interstitial flow (1)
- ☐ Dry channel and no observable pools or interstitial flow (0)

Score: 3

Channel Flow Status

- ☒ Water covering greater than 75% of the channel bottom width; less than 25% of channel substrate is exposed (4)
- ☐ Water covering 50–75% of the channel bottom width; 25–50% of channel substrate is exposed (3)
- ☐ Water covering 25–50% of the channel bottom width; 50–75% of channel substrate is exposed (2)
- ☐ Water present but covering less than 25% of the channel bottom width; greater than 75% of channel substrate is exposed (1)
- ☐ No water present in the channel; 100% of channel substrate exposed (0)

Score: 4

Version 1.0 - Final Draft

TXRAM STREAM FINAL SCORING SHEET

Project/Site Name/No.: US-82 Reconstruction Project Type: ☒ Fill/Impact (☒ Linear ☐ Non-linear) ☐ Mitigation/Conservation

Stream ID/Name: Red Bayou SAR No.: 1 Size (LF): 170 Date: 11/26/12 Evaluator(s): A.L.Bartlett

Stream Type: Intermittent Ecoregion: 1: South Central Plains Delineation Performed: ☒ Previously ☐ Currently

8-Digit HUC: 11140106 Watershed Condition (developed, pasture, etc.): Forested Watershed Size: _____

Aerial Photo Date and Source: TX Orthoimagery Program/Google Earth 2008 Site Photos: 02/23/12 Representative: ☐ Yes ☐ No

Stressor(s): _____ Are normal climatic/hydrologic conditions present? ☐ Yes ☒ No (If no, explain in Notes)

Notes: 2.5" rainfall within past 5 days

Stream Characteristics

Stream Width (Feet)		*Stream Height/Depth (Feet)*	
Avg. Bank to Bank:	35	Avg. Banks:	3
Avg. Waters Edge:	15	Avg. Water:	1
Avg. OHWM:	30	Avg. OHWM:	2

Scoring Table

Core Element	***Metric***	***Metric Score***	***Core Element Score Calculation***	***Core Element Score***
Channel condition	Floodplain connectivity	4	Sum of metric scores / 15 x 25	20
	Bank condition	4		
	Sediment deposition	4		
Riparian buffer condition	Riparian buffer (left bank)	1.45	Sum of bank scores / 10 x 25	7.4
	Riparian buffer (right bank)	1.50		
In-stream condition	Substrate composition	3	Sum of metric scores / 10 x 25	12.5
	In-stream habitat	2		
Hydrologic condition	Flow regime	3	Sum of metric scores / 8 x 25	21.9
	Channel flow status	4		
			Sum of core element scores = overall TXRAM stream score	61.8
Additional points for limited habitats = overall TXRAM stream score x 0.025 for each bank (right/left) if: L R ☐ ☐ Dominated by native trees greater than 24-inch diameter at breast height ☐ ☐ Dominated by hard mast (i.e., acorns and nuts) producing native species in the tree strata				
			Sum of overall TXRAM stream score and additional points = **total overall TXRAM stream score**	61.8

Representative Site Photograph:

Red Bayou, viewed to northwest from south side of US-82 crossing.

TXRAM WETLAND DATA SHEET

Project/Site Name/No.: US-82 Reconstruction Project Type: ☒ Fill/Impact (☒ Linear ☐ Non-linear) ☐ Mitigation/Conservation

Wetland ID/Name: WC 3 WAA No.: 1 Size: 0.21ac Date: 11/26/12 Evaluator(s): A.L.Bartlett

Wetland Type: Riverine Ecoregion: 1: South Central Plains Delineation Performed: ☒ Previously ☐ Currently

Aerial Photo Date and Source: TX Orthoimagery Program/Google Earth 2008 Site Photos: 02/23/12 Representative: ☐ Yes ☐ No

Notes: 2.5" rainfall within past 5 days

LANDSCAPE

Connectivity – Confirm in office review. See figures in section 2.3.1.1 for examples.

Notes on any barriers or alterations that prevent connectivity: _____

Aquatic resources within 1,000 feet of WAA to which wetland connects (including number for other considerations): _____ **Score:** 4

Buffer – Evaluate to 500 feet from WAA boundary. Confirm in office review. See figures in section 2.3.1.2 for examples.

Buffer Type/Description	*Score (See Narratives)*	*Percentage*	*Subtotal*
1. Forest	4	50%	1.25
2. Non-native grass/maintained ROW	1	50%	0.20
3.			0
4.			0
5.			

Score: 4

HYDROLOGY

Water Source – Degree of natural or unnatural/artificial influence. Confirm in office review for watershed.

Natural: ☐ Precipitation ☐ Groundwater ☒ Overbank flow/stream discharge ☒ Overland flow ☐ Beaver activity ☐ Other: _____

Unnatural/Manipulated: ☐ Impoundment ☐ Outfall ☐ Irrigation/pumping ☒ Other artificial influence or control: Roadway drainage

Watershed: ☐ Development ☐ Irrigated agriculture ☐ Wastewater treatment plant ☐ Impoundment ☐ Other: _____

Degree of artificial influence/control: ☐ Complete ☒ High ☐ Low ☐ None

Wetland created/restored/enhanced: ☒ Sustainable/replicates natural ☐ Controlled **Score:** 4

Hydroperiod – Variability and recent alteration of the duration, frequency, and magnitude of inundation/saturation.

Evaluate the hydroperiod including natural variation: Low variability

Direct evidence of alteration: Natural: ☐ Log-jam ☐ Channel migration ☐ Other: _____

Human: ☐ Diversions ☒ Ditches ☐ Levees ☐ Impoundments ☐ Other: Poor cross drainage from US-82 & Railway

Riverine only: ☐ Recent channel in-stability/dis-equilibrium (☐ Degradation or ☐ Aggradation)

Indirect evidence of alteration: ☐ Wetland plant stress: _____ ☐ Plant morphology: _____

☐ Upland species encroachment: _____ ☐ Plant Community: _____ ☐ Soil: _____

Change/Alteration of hydroperiod: ☐ None ☐ Due to natural events ☒ Human influences (☐ Slight or ☐ High)

Degree hydroperiod of wetland created/restored/enhanced replicates natural patterns: _____

Lacustrine fringe on human impoundment: ☐ High variability ☐ Low variability ☐ Recent changes to hydroperiod **Score:** 1.45

Hydrologic Flow – Movement of water to or from surrounding area and openness to water moving through the WAA.

Flow: ☐ Inlets: _____ ☐ Outlets: _____ ☒ Signs of water movement to or from WAA: Red Bayou

Restrictions: ☐ Levee ☐ Berm/dam ☐ Diversion ☒ Other: Abandoned railway to south, US-82 to north

High flowthrough: ☒ Floodplain ☐ Drift deposits ☐ Drainage patterns ☐ Sediment deposits ☐ Other: _____

Low flowthrough: ☐ High landscape position ☐ Stagnant water ☐ Closed contours ☐ Other: _____ **Score:** 1.50

SOILS

Organic Matter – Use data and indicators from wetland determination data form(s) based on applicable regional supplement.

☐ High (organic soil or indicator A1, A2, A3)

☐ Moderate (indicator A9, S1, F1 in AW or A9, S1, S2, F1 in GP or A6, A7, A9, S7, F13 in AGCP)

☒ Low (indicated by thin organic or organic-mineral layer) ☐ None observable in surface layer as described herein **Score:** 3

Sedimentation – Deposition of excess sediment due to human actions. Confirm in office review for landscape.

Landscape with stress that could lead to excess sedimentation? ☐ Yes ☒ No Landscape position: ☐ High ☒ Low

Magnitude of recent runoff/flooding events: ☐ High ☒ Low Percent of WAA with excess sediment deposition: 0

☐ Sand deposits: _____% of area, _____ average thickness ☐ Silt/Clay deposits: _____% of area, _____ average thickness

Lacustrine fringe only: ☐ Upper end of impoundment ☐ Degrades wetland ☐ Contributes to wetland processes **Score:** 2

Soil Modification – Physical changes by human activities. Confirm in office review for past.

Type (Check those applicable and circle R for recent or P for past): ☐ Farming R/P ☐ Logging R/P ☐ Mining R/P ☐ Filling R/P

☐ Grading R/P ☐ Dredging R/P ☐ Off-road vehicles R/P ☐ Other R/P: _____

Percent of WAA with recent soil modification: 0 % Degree of modification: ☐ High ☐ Low

Indicators of past modification: ☐ High bulk density ☐ Low organic matter ☐ Lack of soil structure ☐ Lack of horizons ☐ Hardpan

☐ Dramatic change in texture/color ☐ Heterogeneous mixture ☐ Other: _____

Indicators of recovery: ☐ Organic matter ☐ Structure ☐ Horizons ☐ Mottling ☐ Hydric soil ☐ Other: _____

Percent of WAA with past modification: 0 % Recovery: ☐ Complete ☐ High ☐ Moderate ☐ Low ☐ None **Score:** 3

PHYSICAL STRUCTURE

Topographic Complexity – See figures in section 2.3.4.1. Record % micro-topography and % WAA for each elevation gradient.

Elevation gradients (EG): 0 Evidence: ☐ Plant assemblages ☐ Level of saturation/inundation ☐ Path of water flow ☐ Slope

Micro-topography: 0 % of WAA (By EG: _____)

Types: ☐ Depressions ☐ Pools ☐ Burrows ☐ Swales ☐ Wind-thrown tree holes ☐ Mounds ☐ Gilgai ☐ Islands

☐ Variable shorelines ☐ Partially buried debris ☐ Debris jams ☐ Plant hummocks/roots ☐ Other: _____ **Score:** 4

Edge Complexity – Confirm in office review. See figure in section 2.3.4.2 to evaluate wetland-to-upland boundary.

Variability: ☐ High ☐ Moderate ☐ Low ☒ None Edge (feet) to Area (square feet) ratio: .04 **Score:** 1

Physical Habitat Richness – See definitions and table in section 2.3.4.3 for habitat types applicable to each wetland type.

Label of habitat types qualifying as present in WAA: C, K, M Total: 3 **Score:** 1

BIOTIC STRUCTURE

Plant Strata – Use applicable wetland delineation regional supplement and data from determination data form(s).

Number of plant strata: ☐ ≥ 4 ☐ 3 ☒ 2 ☐ 1 ☐ 0 **Score:** 2

Species Richness – Use data from determination data form(s) to count species with 5% or more relative cover in a stratum.

Number of species across all strata and determination data forms (not counting a species more than once): 5 **Score:** 1

Non-Native/Invasive Infestation – Use data from determination data form(s). See tables in section 2.3.5.3 for examples.

Average total relative cover of non-native/invasive species across all strata and determination data forms: 0 % **Score:** 4

Interspersion – Confirm in office review. Use figure in section 2.3.5.4 to determine the degree of interspersion of plant zones.

Degree of horizontal/plan view interspersion: ☐ High ☐ Moderate ☐ Low ☒ None **Score:** 1

Strata Overlap – Use strata defined in plant strata metric using applicable regional supplement. See figures in section 2.3.5.5.

High overlap (≥ 3 strata overlapping): _____% of WAA Moderate overlap (2 strata overlapping): 100 % of WAA

Herbaceous species/dense litter overlap (only in portion where there are no other strata overlapping): 0 % of WAA

Total percentage of WAA with some form of overlap (if more than one present): 100 % of WAA **Score:** 3

Herbaceous Cover – Estimate for entire WAA.

Total cover of emergent and submergent plants: ☐ > 75% ☐ 51–75% ☐ 26–50% ☒ ≤ 25% **Score:** 1

Vegetation Alterations – Unnatural (human-caused) stressors. Confirm in office review for past.

Type (Check those applicable and circle R for recent or P for past): ☐ Disking R/P ☐ Mowing/shredding R/P ☐ Logging R/P

☐ Cutting R/P ☐ Trampling R/P ☐ Herbicide treatment R/P ☐ Herbivory R/P ☐ Disease R/P ☐ Chemical spill R/P

☐ Pollution R/P ☐ Feral hog rooting R/P ☐ Woody debris removal R/P ☐ Other R/P: _____

Percent of WAA with recent vegetation alteration: 0 % Severity of alteration: ☐ High ☐ Low

Percent of WAA with past vegetation alteration: 0 % Degree of recovery: ☐ Complete ☐ High ☐ Moderate ☐ Low

☐ Alteration to improve wetland (degree of natural community recovery): _____ **Score:** 4

TXRAM WETLAND FINAL SCORING SHEET

Project/Site Name/No.: US-82 Reconstruction Project Type: ☒ Fill/Impact (☒ Linear ☐ Non-linear) ☐ Mitigation/Conservation

Wetland ID/Name: WC 3 WAA No.: 1 Size: 0.21ac Date: 11/26/12 Evaluator(s): A.L.Bartlett

Wetland Type: Riverine Ecoregion: 1: South Central Plains Delineation Performed: ☒ Previously ☐ Currently

Aerial Photo Date and Source: TX Orthoimagery Program/Google Earth 2008 Site Photos: 02/23/12 Representative: ☐ Yes ☐ No

Notes: 2.5" rainfall within past 5 days

Core Element	*Metric*	*Metric Score*	*Core Element Score Calculation*	*Core Element Score*
Landscape	Connectivity	1	Sum of metric scores / 8 x 20	8.8
	Buffer	2.5		
Hydrology	Water source	2	Sum of metric scores / 12 x 20	11.7
	Hydroperiod	2		
	Hydrologic flow	3		
Soils	Organic matter	2	Sum of metric scores / 12 x 20	16.7
	Sedimentation	4		
	Soil modification	4		
Physical Structure	Topographic complexity	1	Sum of metric scores / 12 x 20	5
	Edge complexity	1		
	Physical habitat richness	1		
Biotic Structure	Plant strata	2	Sum of metric scores / 28 x 20	16
	Species richness	1		
	Non-native/invasive infestation	4		
	Interspersion	1		
	Strata overlap	3		
	Herbaceous cover	1		
	Vegetation alterations	4		

Sum of core element scores = overall TXRAM wetland score	61.8
Additional points for unique resources = overall TXRAM wetland score x 0.10 if: ☐ Area of Caddo Lake designated a "Wetland of International Importance" under the Ramsar Convention ☐ Bald cypress – water tupelo swamp ☐ Pitcher plant bog ☐ Spring	
Additional points for limited habitats = overall TXRAM wetland score x 0.05 if: ☐ Dominated by native trees greater than 24-inch diameter at breast height ☐ Dominated by hard mast (i.e., acorns and nuts) producing native species in the tree strata	
Sum of overall TXRAM wetland score and additional points = **total overall TXRAM wetland score**	58.2

Representative Site Photograph:

Red Bayou, viewed to northwest from south side of US-82 crossing.

Draft Compensatory Mitigation Plan

Draft Compensatory Mitigation Plan

Avoidance and Minimization

Through design of the proposed project, TxDOT and Bowie County have avoided and minimized impacts to waters of the U.S. to the extent practicable. Unavoidable and permanent impacts will occur to the following waterbodies:

Red Bayou

Fill impacts resulting from culvert extension at Red Bayou were minimized by designing the structure to the minimum lengths necessary to support the required structural roadway fill for the new road. The structure extension is governed by clear zone requirements for safety and shortening the structure any further would violate safety needs. Alternative headwall designs for the structure would require additional work within the channel to accommodate channel transitions and scour protection; alternate headwall designs were deemed undesirable. Total impacts to Red Bayou resulting from the proposed project will be 50 linear feet (0.03 acre).

Wetland Complex 3 (WC 3)

Fill impacts to WC 3 are proposed to provide an acceptable side slope on US-82 to avoid overturning of vehicles inadvertently leaving the pavement. The roadway embankment must also be constructed in a manner allowing recoverable areas for vehicles to come to a rest. The proposed roadway embankment on a 4:1 slope, which is the steepest slope allowed for the conditions of the US-82 roadway. Impacts to WC 3 have been minimized to the extent practicable while also maintaining side slope and roadside safety design. Total impacts to WC 3 resulting from the project will be 0.09 acre.

Potential water quality impacts as a result of construction will be minimized with the implementation of a Storm Water Pollution Prevention Plan, as required under Texas Commission on Environmental Quality's (TCEQ) National Pollutant Discharge Elimination System (NPDES) permitting program.

Table 1 summarizes impacts to the waters of the U.S. within the project area.

Table 1: Stream and Wetland Impact Summary for NW Loop 363

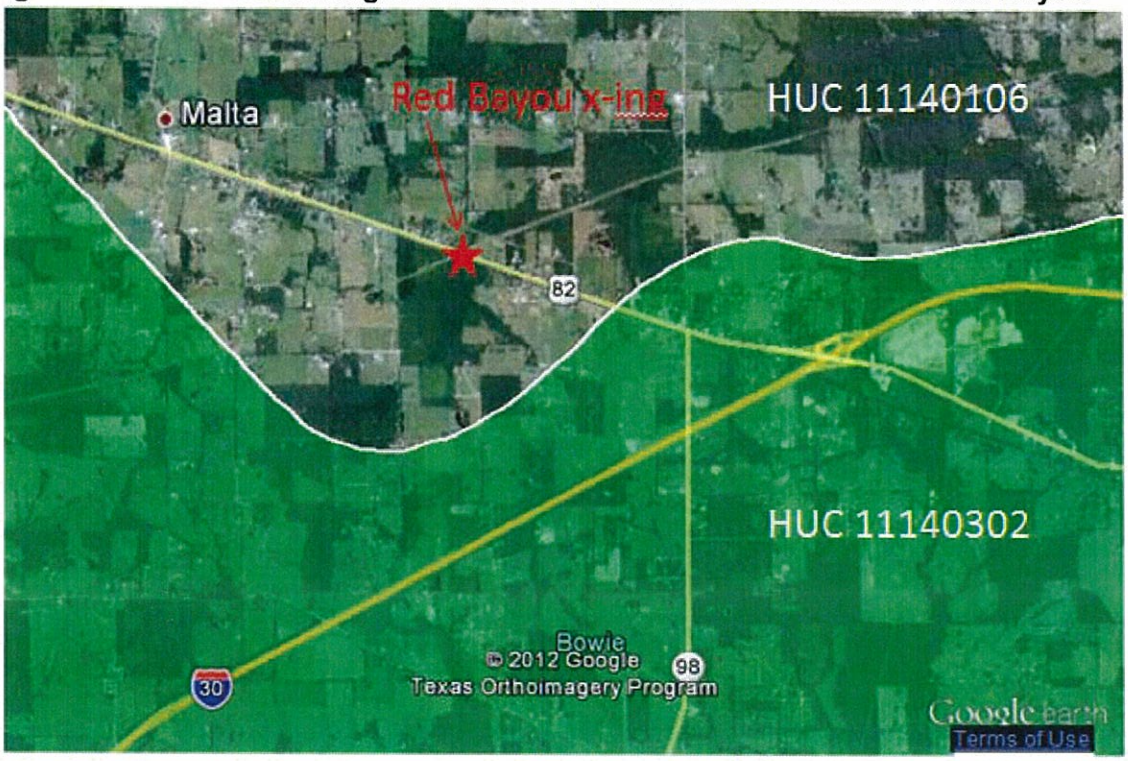
Waterbody ID	Aquatic Classification	Proposed Structure	Linear Feet of Impact	Acres of Impact
Red Bayou	Perennial Stream	3-8'x7'x110' RCB[1]	50	0.03
WC 3	PFO1A Wetland	Roadway Embankment	N/A	0.09
Totals	--	--	**50**	**0.12 (0.09 wetlands)**

Notes: [1] Reinforced Concrete Box Culvert (RCB)

Compensatory Mitigation for Waters of the U.S.

Portions of the US-82 Reconstruction corridor fall within the primary service area (HUC 11140302) of the Brooks Creek Mitigation Bank (also located in Bowie County). Although the headwaters of Red Bayou originate within HUC 11140302, project-related impacts to Red Bayou and WC3 occur within the neighboring HUC to the north (11140106), which is not included in the geographic service area of the Brooks Creek Mitigation Bank. **Figure 1** illustrates the Brooks Creek service area, HUCs 11140302 and 11140106, and the location of the US-82 crossing of Red Bayou and WC 3.

Figure 1: Brooks Creek Mitigation Bank Service Area and Location of Red Bayou



Brooks Creek Mitigation Bank Primary Service Area Shaded in Green

Review of the Brooks Creek Mitigation Banking Instrument (MBI) indicates that the use of the bank to compensate for impacts beyond its service area will be considered by the U.S. Army Corps of Engineers (USACE) after coordination with the Interagency Review Team (IRT), or other permitting agency, and on a case-by-case basis. In addition, while the USACE indicates that the Brooks Creek Mitigation Bank provides only wetland credits, review of the MBI suggests that out-of-kind mitigation is also allowed on a case-by-case basis.

No other mitigation banks are located within the vicinity of the US-82 Reconstruction project area. To compensate for unavoidable impacts to 0.09 acre of wetlands and 0.03 acre (50 linear feet) of stream channel, Bowie County and the Texas Department of Transportation (TxDOT) are proposing the following mitigation (Table 2) based on the

ratios and calculations provided in the Brooks Creek Mitigation Bank *Final Mitigation Banking Instrument*'s alternative assessment procedure. A surrogate Functional Capacity Unit (FCU) of 0.7 for medium quality wetlands was applied based on the findings of the Texas Rapid Assessment Method (TxRAM) functional assessment completed for Red Bayou and WC 3. Furthermore, a 1.0 multiplier was applied due to the close proximity of the project area to the Bank's primary service area.

Table 2: Proposed Compensation

Waterbody	Proposed Impact	Proposed Compensation Brooks Creek Mitigation Bank
Red Bayou	0.03 acre (50 linear feet), permanent impact	0.12 acre X 0.7 FCU X 1.0[a] = 0.084 Physical FCU 0.12 acre X 0.7 FCU X 1.0 = 0.084 Biological FCU 0.12 acre X 0.7 FCU X 1.0 = 0.084 Chemical FCU
Wetland Complex 3 (WC 3)	0.09 acre, permanent impact	
Total	**0.12 acre**	**0.3[b] FCU**

Notes: [a] Primary Service Area multiplier of 1.0; [b]Total FCU of 0.252 rounded to nearest tenth.

In summary, the applicant proposes the purchase of 0.3 FCU from the Brooks Creek Mitigation Bank to offset unavoidable impacts to Red Bayou and WC 3.