Total Project Cost Estimate

Job No. 1904-1040A, Townsen Park-N-Ride Multimodal Connector for Harris County Precinct 4

Item No.	Description	Spec No.	Unit of Measure	Estimated Quantity		Unit Price		Total Price
I.	**CONSTRUCTION COST ESTIMATE**							
A	**SITE PREPARATION / EARTHWORK**							
1	Project Sign 1	0100	EA	1	x	$2,200.00	=	2,200.00
2	Remove Old Concrete (Slope Paving)	0104	SY	305	x	$15.00	=	4,575.00
3	Roadway Excavation (Includes 3" Stripping)	0110	CY	2,000	x	$15.00	=	30,000.00
						Subtotal of Item A		**$ 36,775.00**
B	**PAVING**							
4	Hydrated Lime (Dry Powder) for Stabilization (3% by Dry Weight)	0221	TON	40	x	$175.00	=	7,000.00
5	Fly Ash for Stabilization (7% by Dry Weight)	0223	TON	94	x	$90.00	=	8,460.00
6	Lime-Fly Ash Stabilized Subgrade, 2 Manipulations at 6" Depth	0223	SY	5,342	x	$5.00	=	26,710.00
7	Reinforced Concrete Pavement - 6" Depth	0360	SY	4,095	x	$65.00	=	266,175.00
8	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM) (0644-2002)	TxDOT	EA	2	x	$433.00	=	866.00
9	IN SM RD SN SUP&AM TY10BWG(1)SA(T) (0644-2004)	TxDOT	EA	4	x	$507.00	=	2,028.00
10	REFL PAV MRK TY I (W) 12"(SLD)(100MIL) (0666-2042)	TxDOT	LF	64	x	$2.50	=	160.00
11	Collapsible Bollards	SP 2086	EA	2	x	$750.00	=	1,500.00
						Subtotal of Item B		**$ 312,899.00**
C	**DRAINAGE**							
12	RC PIPE (CL III)(24 IN)	0460	LF	225	x	$65.00	=	14,625.00
13	CMP (GAL STL 24 IN)	0461	LF	20	x	$50.00	=	1,000.00
14	SET (TY II)(24 IN)(RCP)(6:1)(P)	0463	EA	3	x	$1,700.00	=	5,100.00
15	Standard Type "E" Inlet	0472	EA	2	x	$2,500.00	=	5,000.00
16	Riprap (6" thick) (02378)	HCFCD	SY	34	x	$60.00	=	2,016.00
						Subtotal of Item C		**$ 27,741.00**
D	**STRUCTURE**							
17	Prefabricated Bridge		SF	1,463	x	$155.00	=	226,765.00
18	Concrete Slab Bridge		SF	3,276	x	$45.00	=	147,420.00
19	RETAINING WALL (CONC BLOCK) (0423-2006)	TxDOT	SF	4,305	x	$50.00	=	215,250.00
20	Structural Concrete, Retaining Walls	0421	CY	70.0	x	$2,000.00	=	140,000.00
21	Pedestrian Railing	0450	LF	1,740.0	x	$85.00	=	147,900.00
22	Reinforced Concrete Slope Paving (5") (03310)	HCFCD	SY	100	x	$62.00	=	6,200.00
						Subtotal of Item D		**$ 883,535.00**
E	**STORM WATER POLLUTION PREVENTION PLAN**							
23	Hydro-Mulch Seeding (for Erosion Control and Stabilization)	0165	ACRE	0.8	x	$2,000.00	=	1,500.00
24	TPDES General Permit No. TXR 150000, Notice of Intent (NOI) Application Fees (Contractor's NOI Fee & Harris County's NOI Fee, Each Fee shall be a set price of $325)	0700	EA	2	x	$325.00	=	650.00
25	Reinforced Filter Fabric Barrier	0713	LF	3,000	x	$5.00	=	15,000.00
26	Stabilized Construction Access (Type 1-Rock; 60% of unit cost for furnish and installation and 40% of unit cost for removal)	0724	SY	333	x	$1.00	=	333.00
27	Concrete Truck Washout Structures (60% of unit cost for furnish and installation and 40% of unit cost for removal)	0730	LS	1	x	$1,000.00	=	1,000.00
28	Rock Filter Dams (Type 2; 60% of unit cost for furnish and installation and 40% of unit cost for removal)	0750	LF	200	x	$10.00	=	2,000.00

Total Project Cost Estimate

Job No. 1904-1040A, Townsen Park-N-Ride Multimodal Connector for Harris County Precinct 4

29	SWPPP Inspection and Maintenance (Min. Bid - $800 Required)	0751	MO	3	x	$800.00	=	2,400.00	
30	Mulch and Tackifier	SP8251	ACRE	0.30	x	$20,000.00	=	6,000.00	
						Subtotal of Item E		**$**	**28,883.00**
F	**EXTRA WORK ITEMS**								
31	Clearing and Grubbing (at the direction of the County)	0102	STA	50	x	$100.00	=	5,000.00	
32	Borrow (at the direction of the County)	0130	CY	579	x	$1.00	=	579.00	
33	Cement Stabilized Sand, FOB Plant (MATERIAL ONLY) (at the direction of the County)	0433	TON	216	x	$10.00	=	2,160.00	
34	Riprap (6" thick) (02378)	HCFCD	SY	45	x	$60.00	=	2,700.00	
35	Riprap - Gradation No. 1 (18" thick)	0493	SY	25	x	$50.00	=	1,250.00	
36	Contractor to set up and provide for inspection by TDLR	0530	EA	1	x	$1,000.00	=	1,000.00	
37	Tree Removal (Dia ≤ 12")	SP102	EA	2	x	$200.00	=	400.00	
38	Tree Removal (Dia > 12")	SP102	EA	2	x	$400.00	=	800.00	
39	Tree Stump only removal (Dia ≤ 12")	SP102	EA	2	x	$200.00	=	400.00	
40	Tree Stump only removal (Dia > 12")	SP102	EA	2	x	$400.00	=	800.00	
41	Lighting		TOTAL	1	x	$200,000.00		200,000.00	
						Subtotal of Item F		**$**	**215,089.00**
						Subtotal Construction Cost		**$**	**1,504,922.00**
						20% Contingency		**$**	**300,984.40**
						TOTAL CONSTRUCTION COST		**$**	**1,805,906.40**

II. ENGINEERING COST ESTIMATE

A	**ENGINEERING**								
1	HC curve basic fee		LS	1	x	$137,000.00	=	137,000.00	
2	Surveying		LS	1	x	$25,000.00	=	25,000.00	
3	Geotechnical		LS	1	x	$40,000.00	=	40,000.00	
4	H&H import analysis		LS	1	x	$15,000.00	=	15,000.00	
5	Environmental		LS	1	x	$21,000.00	=	21,000.00	
6	Construction phase services		LS	1	x	$24,000.00	=	24,000.00	
7	TxDOT Administration Services (15%)		LS	1	x	$270,885.96		270,885.96	
						Subtotal of Item A		**$**	**532,885.96**
						Subtotal Engineering Cost		**$**	**532,885.96**
						20% Contingency		**$**	**106,577.19**
						TOTAL ENGINEERING COST		**$**	**639,463.15**

III. ACQUISITION COST ESTIMATE

A	**ACQUISITION**								
1	Skymark Development Acquisition		SF	20,500	x	$5.00	=	102,500.00	
						Subtotal of Item A		**$**	**102,500.00**
						Subtotal Acquisition Cost		**$**	**102,500.00**
						20% Contingency		**$**	**20,500.00**
						TOTAL ACQUISITION COST		**$**	**123,000.00**
						TOTAL PROJECT COST (Construction, Engineering, & Acquisition)		**$**	**2,568,369.55**

HARRIS COUNTY PUBLIC INFRASTRUCTURE DEPARTMENT
ARCHITECTURE AND ENGINEERING DIVISION

TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR

FROM TOWNSEN PARK-N-RIDE TO US 59 HISTORICAL PEDESTRIAN BRIDGE (APPROX 0.7 MILES)

UPIN NO. 14104MF0AV01

TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY AT 713-207-2222

NOTICE:

For your safety, you are required by Texas Law to call 811 at least 48 hours before you dig so that underground line can be marked. This Verification does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

Date

CenterPoint Energy/Natural Gas Facilities Verification ONLY.
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification.) (Gas service lines are not shown.)
Signature Valid for six months.

Date

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities - not to be used for conflict verification.)
Signature Valid for six months.

SHEET INDEX:

EL FRANCO LEE
COMMISSIONER PRECINCT 1

JACK MORMAN
COMMISSIONER PRECINCT 2

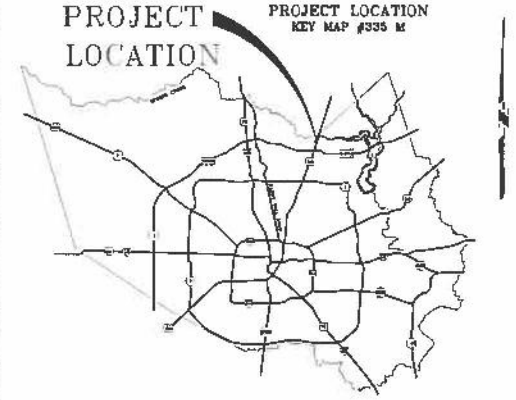
BARBARA J. SCHOTT
COUNTY AUDITOR

ED EMMETT
COUNTY JUDGE

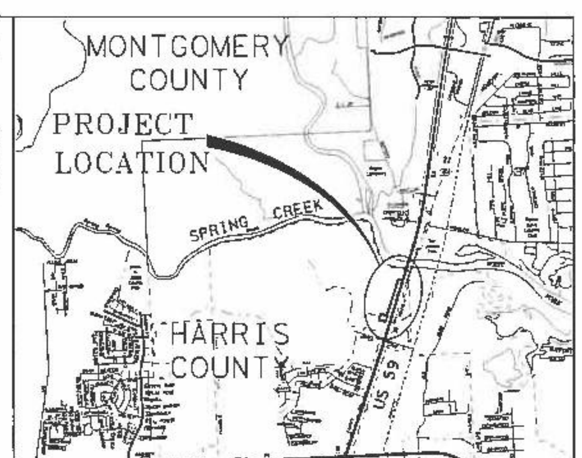
STEVE RADACK
COMMISSIONER PRECINCT 3

R. JACK CAGLE
COMMISSIONER PRECINCT 4

ARTHUR L. STOREY, JR., P.E.
COUNTY ENGINEER



VICINITY MAP
N.T.S.



HARRIS COUNTY 1836 TEXAS

JULY 2014
PRECINCT 4
Harris County, Texas

TEXAS DEPARTMENT OF LICENSING NUMBER
EABPRJ#

PRELIMINARY SUBMITTAL

THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

CHUN-HOI WONG, P.E.
TEXAS P.E. #87943

ISSUED ON:
Jul. 21, 2014

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

APPROVED: ____________________
HCPID—Permit Group

SPRING CREEK GREENWAY PHASE 4A JOB NO. 1904-1040A

1. PAVING

I. DESIGN THICKNESS OF PAVING 6" CONCRETE
II. STABILIZED SUBGRADE TO A DEPTH OF 6" LIME/FLYASH TREATED
III. DESIGN STRENGTH OF CONCRETE 3,500 PSI psi
IV. TYPE AND PLACEMENT OF STEEL: GR. 60

DRIVEWAYS

I. NUMBER OF DRIVEWAY APPROACHES PROPOSED:
II. HARRIS COUNTY STANDARD DRIVEWAY DETAIL APPEARS ON SHEET

FIRE APPARATUS ACCESS ROAD

☐ REQUIRED AND SHOWN ON SHEET(S)
☐ NOT REQUIRED DUE TO

CURBING

I. ISLANDS AND MEDIANS REQUIRE STANDARD 6" CURBING
II. ☐ STANDARD 6" CURBING PROPOSED
☐ 4" x 12" CURBING PROPOSED EXCEPT AT MEDIANS AND ISLANDS

TRAFFIC CONSIDERATIONS

I. MEDIAN CUTS
☐ NO MEDIAN CUT OR RELOCATION IS PROPOSED
☐ MEDIAN MODIFICATIONS ARE SHOWN ON SHEET

II. LEFT / RIGHT TURN LANE
☐ NO LEFT / RIGHT TURN LANE IS PROPOSED
☐ LEFT / RIGHT TURN LANE IS SHOWN ON SHEET

III. TRAFFIC CONTROL PLAN
☐ NO WORK IN THE RIGHT OF WAY IS PROPOSED THAT WOULD INTERFERE WITH TRAFFIC FLOW
☐ TRAFFIC CONTROL SHOWN ON SHEET

IV. TRAFFIC SIGNAL
☐ NO TRAFFIC SIGNAL IS EXISTING / PROPOSED
☐ EXISTING TRAFFIC SIGNAL DEVICES (T.C. BOXES AND LOOPS) SHOWN ON SHEET
☐ PROPOSED TRAFFIC SIGNAL (BY OTHERS)

V. TRAFFIC IMPACT ANALYSIS
☐ NO TRAFFIC IMPACT ANALYSIS IS REQUIRED
☐ TRAFFIC IMPACT ANALYSIS HAS BEEN APPROVED ON DATE:

2. RESIDENTIAL / SUBDIVISION DRAINAGE

I. DRAINAGE SYSTEM TYPE
☐ STORM SEWER
☐ ROADSIDE DITCH

II. DESIGN METHOD USED
☐ CITY OF HOUSTON FREQUENCY
☐ OTHER

III. DRAINAGE SYSTEM OUTFALL
☐ TO DETENTION POND
☐ DETENTION POND MAINTAINED BY
☐ TO HCFCD DRAINAGE DITCH UNIT NO
☐ TO HARRIS COUNTY ROADSIDE DITCH
ROAD NAME:
☐ STATIC W.S.E. @ OUTFALL IS
☐ PROPOSED STORM SEWER IS SUBMERGED

IV. STORM SEWER OUTFALL
CAPACITY ALLOCATED TO TRACT FROM O. A. MAP: (CFS)
FROM DRAINAGE AREA MAP DATED:
PREPARED BY:
ACTUAL OUTFALL RATE: (CFS)

V. DRAINAGE SYSTEM FLOW RATE
FLOW PRIOR TO DETENTION: cfs
FLOW AFTER DETENTION (IF REQUIRED): cfs

3. COMMERCIAL / OTHER SITE DRAINAGE

I. PROPOSED DRAINAGE AREA
☐ NEW DEVELOPMENT AREA:
☐ RE-DEVELOPMENT AREA (AMOUNT INCREASED IMPERVIOUS AREA):

II. DETENTION VOLUME
NEW AREA x * = ACRE FEET
DETENTION REQUIRED
*☐ .55
*☐ .65
*☐ 1.00
*☐ OTHER
PROPOSED VOLUME = ACRE FEET

III. OUTFALL
OUTFALL TO ☐ H.C. ROADSIDE DITCH
☐ EXISTING H.C. STORM SEWER
☒ OTHER VARIOUS HCFCD CHANNELS
ROADSIDE DITCH OUTFALL
ALLOWABLE OUTFALL RATE 0.0027 x LF Frontage = (CFS)
PROPOSED OUTFALL RATE
☐ STORM SEWER OUTFALL
CAPACITY ALLOCATED TO TRACT FROM O. A. MAP (CFS)
FROM DRAINAGE AREA MAP DATED:
PREPARED BY:
ACTUAL OUTFALL RATE: (CFS)

IV. PUMPED DETENTION FACILITIES
VOLUME THAT GRAVITY FLOWS: ACRE FEET
VOLUME THAT IS PUMPED: ACRE FEET
ENTRANCE VELOCITY INTO ROADSIDE DITCH OR STORM SEWER
PUMP SPECIFICATIONS AND OPERATING PLAN APPEAR ON SHEET

V. FLOW RESTRICTOR SIZE
OUTFALL PIPE SIZE:
RESTRICTOR PIPE SIZE:

4. WATER AND WASTEWATER

I. TYPE OF SERVICE PROPOSED
☐ MUNICIPALITY:
☐ MUNICIPAL UTILITY DISTRICT:
☐ OTHER DISTRICT:
☐ PRIVATE WATER AND WASTEWATER SYSTEMS
☐ PRIVATE WATER SYSTEM AND INDIVIDUAL OSSF
☐ INDIVIDUAL WATER WELL AND OSSF
☐ OTHER:
H.C. WASTE WATER PERMIT/REQUEST NO.

II. PROOF OF CAPACITY
☐ LETTER FROM DISTRICT AUTHORIZING SERVICE AND CONNECTION
☐ TCEQ APPROVAL FOR WATER SYSTEM AND PERMIT FOR WASTEWATER SYSTEM.
☐ OSSF SUBDIVISION PLANNING REPORT

III. AMOUNT OF FLOW
☐ RESIDENTIAL: LOTS OR UNITS
☐ COMMERCIAL: AVERAGE DAILY FLOW
☐ OTHER:

NOTES:
I. COMPLETE FOR ALL PROJECTS
II. COMPLETE FOR ALL PROJECTS
III. COMPLETE ONLY IF TCEQ DISCHARGE PERMIT IS PROPOSED

5. DESCRIPTION OF PROPERTY

I. LEGAL DESCRIPTION
A. ACREAGE: HARRIS COUNTY OWNERSHIP

B. ☐ SUBDIVISION:
☐ SURVEY & ABSTRACT:

C. ADJACENT ROADS:

II. PLATTING
A. SUBDIVISION PLAT
☐ PROPOSED PLAT / REPLAT
☐ RECORDED PLAT / REPLAT
PLAT NAME:
PLAT NUMBER
☐ NO PLAT REQUIRED

B. STREETS PROPOSED
☐ PUBLIC
☐ PRIVATE
☐ PUBLIC & PRIVATE
☒ NONE

III. JURISDICTIONS
*☐ CITY OF HOUSTON
☒ CITY OF HUMBLE
*☐ ETJ, CITY OF HOUSTON
☐ ETJ, CITY OF
☐ NO ETJ

IV. HCAD ACCOUNT NOS. (ALL)
041-051-002-0001
041-051-002-0013

V. UNOBSTRUCTED VISIBILITY EASEMENT (U.V.E.)
☐ REQUIRED AND SHOWN ON SHEET(S)
☒ NOT REQUIRED

KEY MAP® page(s)

*CPC 101 FORM MAY BE REQUIRED

6. STORM WATER QUALITY

I. CONSTRUCTION PROTECTIVE MEASURES.
☒ SWPPP SITE PLAN AND DETAILS ON SHEET(S) XX

II. APPLICABILITY FOR PERMANENT FEATURES.
☐ EXEMPT NEW DEVELOPMENT OF LESS THAN 5 ACRE PARCEL.
☐ EXEMPT REDEVELOPMENT OF A 5 ACRE OR LARGER PARCEL WHERE TOTAL IMPERVIOUS SURFACE (EXISTING PLUS PROPOSED) IS LESS THAN 1 ACRE.
☐ EXEMPT "GRAND FATHERED" BY AN EXISTING STORM SEWER LINE.
☐ STORM WATER QUALITY PERMIT REQUIREMENT FOR THIS PROJECT IS COVERED BY **
☒ "STORM WATER QUALITY MANAGEMENT PLAN" INCLUDED. SWQMP SITE PLAN ON SHEET(S) XX

III. PERMANENT STORM WATER QUALITY FEATURES.
☐ VEGETATIVE CONTROLS USED: (FILTER STRIP, GRASSY SWALE, URBAN FORESTRY) DETAILS AND CALCULATIONS APPEAR ON SHEET(S)
☐ POND STRUCTURE USED (WET, DRY, WETLANDS) DETAILS AND CALCULATIONS APPEAR ON SHEET(S)
☐ HYDRODYNAMIC TYPE SEPARATOR MODEL:
☐ OTHER(S):

NOTES:
I * IS REQUIRED ON ALL PROJECTS. III IF NOT EXEMPT OR "GRANDFATHERED"
** INCLUDE PROJECT TITLE, HARRIS COUNTY PROJECT NUMBER, AND SWQ PERMIT NUMBER, OR THE NAME OF THE PERMITTING AUTHORITY IF OTHER THAN HARRIS COUNTY

☒ IN LIEU OF A SWQ FEATURE, THE REQUIREMENT WILL CONSIST OF SWQ EDUCATIONAL SIGNAGE AND TRASH RECEPTACLES PLACED THROUGHOUT THE LENGTH OF THE TRAIL LAYOUT AND DETAILS ON "OVERALL LAYOUT" SHEET.

7. FLOOD CONTROL DISTRICT CRITERIA

I. DETENTION SUMMARY

STORMWATER DETENTION BASIN ROUTING TABLE

DETENTION BASIN DRAINAGE AREA = ACRES MAX BASIN DRAIN TIME (100-YR EVENT) = HOURS

RAINFALL EVENT PROBABILITY	PRE-DEVELOPED PEAK RUNOFF (CFS)	POST-DEVELOPED PEAK RUNOFF (CFS)	DETENTION BASIN PEAK OUTFLOW (CFS)	MAXIMUM WATER SURFACE ELEVATION	PEAK STORAGE VOLUME (AC-FT)	STORAGE RATE (AC-FT PER AC)
10% EXCEEDANCE (10-YEAR)						
1% EXCEEDANCE (100-YEAR)						

ADDITIONAL CRITERIA FOR PUMPED DETENTION BASINS:
VOLUME OF PUMPED 1% EXCEEDANCE STORAGE VOLUME = AC-FT = % OF TOTAL VOLUME
MAXIMUM DESIGN OUTFLOW VELOCITY INTO HCFCD CHANNEL = FT/SEC.
DRAIN TIME FOR BASIN = HOURS BASED ON HEAD CONDITIONS.

STORMWATER DRAINAGE DESIGN REPORT

REPORT TITLE
REPORT DATE ENGINEERING FIRM
DATE OF ACKNOWLEDGEMENT BY HCFCD OR FLOODPLAIN ADMINISTRATOR HCFCD PROJECT #

STORMWATER DETENTION FOR THE PROPOSED WORK CONTAINED IN THESE PLANS IS PROVIDED BY OTHER PLANS
PLAN TITLE
ENGINEERING FIRM DATE SIGNED BY HCFCD HCFCD PROJECT #

II. HCFCD STANDARD NOTES: SEE SHEET OF THESE PLANS

III. HCFCD STANDARD DETAILS: SEE SHEET XX-XX OF THESE PLANS

IV. REFER TO PLAN SHEETS N/A FOR EXISTING AND PROPOSED RIGHT OF WAY DELINEATION AND COMPLETE RECORDING INFORMATION TO INCLUDE CLERK'S FILE NUMBERS, TYPE OF ESTATE (e.g., DRAINAGE EASEMENT, FEE STRIP, ETC.) AND GRANTEE (e.g. COH, HCFCD, PUBLIC, TXDOT, ETC.)

NOTES:
I. COMPLETE ONLY IF HCFCD OR HARRIS COUNTY IS REQUIRING DETENTION.
II. COMPLETE ONLY IF PROJECT HAS WITHIN IT OR IS IMMEDIATELY ADJACENT TO AN EXISTING OR PROPOSED HCFCD MAINTAINED CHANNEL OR DETENTION BASIN.
III. COMPLETE ONLY IF PROJECT INCLUDES NEW OUTFALL, BACKSLOPE INTERCEPTOR OR OTHER RELATED WORK WITHIN AN EXISTING OR PROPOSED HCFCD MAINTAINED CHANNEL OR DETENTION BASIN
IV. COMPLETE ONLY IF PROJECT HAS WITHIN OR IMMEDIATELY ADJACENT TO IT AN EXISTING OR PROPOSED PUBLIC DRAINAGE CHANNEL OR DETENTION BASIN.

8. FLOOD PLAIN STATUS

I. GENERAL INFORMATION
FIRM PANEL(S) FOR PROPERTY 48201C0295M
FIRM PANEL(S) DATE: JUNE 09, 2014
STATUS OF PROPERTY ON MAP
☐ ENTIRELY LOCATED IN UNSHADED ZONE "X"
☐ LOCATED PARTIALLY IN ANY "A" ZONE OR SHADED ZONE "X", DELINEATE FLOODPLAIN BOUNDARY ON CONSTRUCTION DRAWINGS (DRAINAGE LAYOUT PG. NO.) (BASE FLOOD LEVEL)
☒ LOCATED ENTIRELY IN ANY "A" ZONE OR SHADED ZONE "X", (INDICATE BASE FLOOD LEVEL 66)
☐ LOCATED IN THE 10-YEAR FLOODPLAIN
☐ LOCATED IN CYPRESS CREEK LOMR 08-06-2369P (INDICATE BASE FLOOD LEVEL)
☐ SITE REMOVED FROM FLOODPLAIN BY LOMA OR LOMR-F CASE NO.
☒ OTHER

ELEVATION INFORMATION
BENCHMARK USED
☒ HARRIS COUNTY FLOODPLAIN REFERENCE MARK
☐ HARRIS-GALVESTON COASTAL SUBSIDENCE DISTRICT BENCHMARK (FOR COASTAL AREAS)
DESCRIPTION OF BENCHMARK INCLUDING ELEVATION, DATUM AND YEAR OF ADJUSTMENT (2001 ADJ.)
HARRIS COUNTY REFERENCE MARK NUMBER 100010
BRASS DISK STAMPED "100010" SET IN CONCRETE AT THE DEAD END OF KENSWICK IN JESSE JONES PARK. TO REACH MONUMENT FROM THE INTERSECTION OF US 59 AND FM 1960, EAST ALONG FM 1960, 1.7 MILES TO KENSWICK, NORTH ALONG KENSWICK TO DEAD END IN JESSE JONES PARK AND BENCHMARK ON THE LEFT. KEYMAP: 335J ELEVATION: 58.07' (NAVD88)

II. FLOOD PLAIN DETERMINATION BASED ON GROUND ELEVATION
☐ PROPERTY LIES ENTIRELY ABOVE THE BASE FLOOD LEVEL AND IN SHADED ZONE "X"
☒ PROPERTY LIES PARTIALLY OR ENTIRELY BELOW THE BASE FLOOD LEVEL

III. FLOODPLAIN STORAGE SUMMARY (APPLIES ONLY TO PORTION OF LAND LOCATED WITHIN FLOODPLAIN AS DELINEATED BY FIRM PANEL)
A. TOTAL VOLUME OF MATERIAL PROPOSED TO BE PLACED WITHIN THE FIRM DELINEATED FLOODPLAIN (FILL, BASE, CONCRETE, ASPHALT, ETC.): i.e., BELOW ELEVATION 66 (2001 ADJ.) XX CUBIC YARDS
B. TOTAL VOLUME OF MATERIAL PROPOSED TO BE REMOVED FROM THE FIRM DELINEATED FLOODPLAIN: i.e., BELOW ELEVATION 66 (2001 ADJ.) XX CUBIC YARDS
C. FILL AREA IN FLOODPLAIN IS SHOWN ON SHEET N/A

NOTES:
I. COMPLETE FOR ALL PROJECTS
II. COMPLETE ONLY IF PROJECT IS ADJACENT TO 100-YEAR FLOOD PLAIN

IV. ☐ LOMR REQUIRED ☐ CLOMR REQUIRED

VERIFIED BY:

FOR PROJECTS LOCATED IN ANY FLOODPLAIN
[illegible]

9. WORK IN HCFCD RIGHT-OF-WAY

I. TYPE OF WORK TO BE PERFORMED IN CHANNEL
☐ OUTFALL
☐ UTILITY CROSSING
☐ ROADWAY BRIDGE / CULVERT CROSSING
☐ FILL ACTIVITY
☐ REHABILITATION OF CHANNEL
☐ MAINTENANCE
☐ TEMPORARY CROSSING
☐ OTHER

II. PERMIT
☐ US ARMY CORPS ENGINEERS NATIONWIDE PERMIT NUMBER(S)
☐ US ARMY CORPS OF ENGINEERS INDIVIDUAL PERMITS
☐ OTHER
☐ NO PERMITS REQUIRED
EXPLAIN:

III. REFERENCE / BASIS OF DETERMINATION
☐ ENVIRONMENTAL CONSULTANT REPORT
BY
REPORT TITLE
REPORT DATE
☐ OTHER

NOTES:
I. - III. REQUIRED ON PROJECTS WITH WORK IN A HCFCD CHANNEL.
PLEASE REFERENCE SECTION 17 OF THE FLOOD CONTROL DISTRICT POLICY, CRITERIA, AND PROCEDURE MANUAL FOR MORE INFORMATION.

10. PERMITS REQUIRED

TOTAL ESTIMATED SITE CONSTRUCTION COST, (EXCLUDING ENCLOSED BUILDINGS/STRUCTURES)

☐ STORM WATER QUALITY
☐ PHASE II PERMIT CLASS I
☐ PHASE II PERMIT CLASS II ☐ CRITICAL FACILITY
☐ DRIVEWAY WITH CULVERT CURB AND GUTTER
☐ SEPTIC (EXISTING) ☐ SEPTIC (PROPOSED)
☐ NOTICE OF DETENTION REQUIRED
☐ FILL AFFIDAVIT REQUIRED
☐ BUILDING PERMITS (NO. OF BUILDINGS =)
☐ SUBDIVISION INFRASTRUCTURE PHASE II (NO. OF LOTS =)

NOTES:

WORK IN HARRIS COUNTY R.O.W.

☐ UTILITY
☒ CONSTRUCTION
☒ OTHER HIKE AND BIKE TRAIL

11 CURB RAMPS / SIDEWALK

CURB RAMPS PROPOSED ☐ YES ☒ NO
SIDEWALKS PROPOSED ☐ YES ☒ NO
A. HOME BUILDER ☐ YES
B. DEVELOPER ☐ YES
C. H.O.A. ☐ YES
D. OTHERS

12 LANDSCAPING

☐ REQUIRED AND SHOWN ON SHEET(S)
☒ NOT REQUIRED

NOTES:
A PERMIT IS REQUIRED FOR EACH SCOPE OF WORK ON SITE.
A NOTIFICATION IS REQUIRED FOR EACH SCOPE OF WORK IN HC OR HCFCD ROW.
REFER TO www.eng.hctx.net/permits FOR EACH SCOPE OF WORK IN HC OR IN HCFCD ROW.

HCPID SIGNATURE BLOCK

PROJECT NAME:
TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR
ADDRESS: PRECINCT #4

WAS ACCEPTED BY THE FOLLOWING GROUPS FOR THE PURPOSES LISTED BELOW:

ENGINEERING DIVISION

BY INTERPOSE NO OBJECTION DATE
BY AS TO PAVING AND/OR DRAINAGE ONLY DATE
BY AS TO LOCATION OF ITEMS IN COUNTY RIGHT OF WAY DATE
BY AS TO STORM WATER QUALITY DATE

ADDITIONAL COMMENTS:

HARRIS COUNTY FLOOD CONTROL DISTRICT

INTERPOSE NO OBJECTION
BY DATE
FOR ITEMS LOCATED OUTSIDE OF HCFCD RIGHT-OF-WAY
APPROVED:
BY DATE
FOR ITEMS LOCATED WITHIN EXISTING HCFCD RIGHT-OF-WAY
APPROVED:
BY DATE
FOR ITEMS LOCATED WITHIN PROPOSED HCFCD RIGHT-OF-WAY

ADDITIONAL COMMENTS:

THE PROJECT WAS REVIEWED, HOWEVER, THIS DOES NOT MEAN THE ENTIRE PROJECT, INCLUDING ALL SUPPORTING DATA AND CALCULATIONS HAVE BEEN COMPLETELY CHECKED AND VERIFIED. THESE DRAWINGS ARE SIGNED, DATED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS, WHICH THEREFORE CONVEYS THE ENGINEER'S RESPONSIBILITY AND ACCOUNTABILITY. THIS DOES NOT RELIEVE ANY PARTY FROM COMPLYING WITH APPROPRIATE FEDERAL, STATE AND LOCAL ENVIRONMENTAL RULES, LAWS, AND REGULATIONS AND ANY OTHER LEGALLY ADOPTED REGULATION OR ORDINANCE RELATED TO LAND DEVELOPMENT. IF THE CITY SIGNATURES ARE REQUIRED BY ORDINANCE, COUNTY PERMITS WILL NOT BE ISSUED UNTIL SUCH SIGNATURES ARE OBTAINED. THESE SIGNATURES ARE VALID FOR A MAXIMUM OF TWO YEARS.

ENGINEER'S CERTIFICATION

I, , A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THE INFORMATION PRESENTED ON THIS SHEET IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND THAT I AM NOT VIOLATING ANY PROVISION OF THE CURRENT TEXAS ENGINEERING PRACTICE ACT AND RULES CONCERNING THE PRACTICE OF ENGINEERING AND PROFESSIONAL ENGINEERING LICENSURE.

ANY VIOLATIONS WILL BE FORWARDED TO THE HARRIS COUNTY DISTRICT ATTORNEY'S OFFICE FOR PROSECUTION.

THE COMPLETED PROJECT CONSISTS OF DRAWING SHEETS THRU .

SIGNATURE DATE

SEAL

THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.
CHUN-HOI WONG, P.E.
TEXAS P.E. #97343
ISSUED ON: JUL. 21, 2014

REVISIONS

DATE	SHEET NO.	DESCRIPTION	P.E. INITIAL	H.C. APPROVED DATE

HARRIS COUNTY
PUBLIC INFRASTRUCTURE DEPARTMENT
EXPRESS REVIEW SHEET

VERSION 12.1 May 26, 2011

PROJECT NO. XXXXXXX

GENERAL

1. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.

2. THE CONTRACTOR SHALL NOTIFY THE HARRIS COUNTY PUBLIC INFRASTRUCTURE DEPARTMENT - CONSTRUCTION PROGRAMS DIVISION AT LEAST 24-HOURS PRIOR TO CONSTRUCTION. NOTIFICATION IS TO BE BY FAX AT 713-755-4177 OR BY EMAIL TO PROJECT ENGINEER AND CHIEF INSPECTOR. EMAIL ADDRESSES CAN BE OBTAINED BY CALLING 713-755-5199.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SECURITY TO PROTECT THE PROJECT SITE, CONTRACTOR PROPERTY, EQUIPMENT, AND WORK.

4. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING STREETS OF CONSTRUCTION DIRT AND DEBRIS AT CLOSE OF EACH WORK DAY.

5. THE CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF THE JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.

6. THE CONTRACTOR STAGING AREA SHALL BE DETERMINED BY THE CONTRACTOR WITH CONCURRENCE BY THE ENGINEER PRIOR TO CONSTRUCTION.

7. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO BLOCKING DRIVEWAYS OR ENTERING UTILITY EASEMENTS.

8. INGRESS AND EGRESS SHALL BE PROVIDED FOR TRAFFIC DURING CONSTRUCTION.

9. THE CONTRACTOR SHALL REMOVE AND REPLACE OR RECONSTRUCT EXISTING FENCES, POSTS, PLANTERS, TRASH CONTAINERS, CULVERTS, ETC PER THE CONTRACT AS NECESSARY TO COMPLETE CONSTRUCTION. ANY ITEMS DAMAGED DURING CONSTRUCTION BY THE CONTRACTOR SHALL BE REPLACED WITH EQUAL OR BETTER AT NO EXTRA PAY. TREES, BUSHES, SHRUBBERY AND OTHER DAMAGED PLANTINGS MARKED TO REMAIN ARE TO BE REPLACED WITHIN 72 HOURS OF REMOVAL AND TO BE WATERED IN THOROUGHLY. NO SEPARATE PAY.

10. ANY MAIL BOXES REQUIRING REMOVAL SHALL BE RELOCATED SO THAT MAIL SERVICE IS NOT INTERRUPTED.

11. PAVED SURFACES, PAVEMENT MARKERS AND MARKINGS SHALL BE PROTECTED FROM DAMAGE BY TRACKED EQUIPMENT.

12. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PUBLIC LAND SURVEYOR FOR THE ORIGINAL PROPERTY OWNER AT NO SEPARATE PAY.

13. CONSTRUCTION STAKING WILL BE PROVIDED BY THE CONTRACTOR. TWO COPIES OF STAKING NOTES TO BE PROVIDED TO THE ENGINEER PRIOR TO CONSTRUCTION.

14. THE COUNTY OR THE COUNTY'S SURVEYOR SHALL PROVIDE A BENCHMARK OR TEMPORARY BENCHMARK AND SURVEY CONTROLS.

15. THE CONTRACTOR SHALL MAINTAIN UPDATED REDLINED RECORD DRAWINGS ON SITE FOR INSPECTION BY THE ENGINEER.

16. MOWING, MAINTENANCE, AND CLEAN-UP OF THE PROJECT SHALL MEET THE REQUIREMENT OF SPECIFICATION ITEM 560 (NO SEPARATE PAY). MOWING, MAINTENANCE, AND CLEAN-UP IS REQUIRED FOR THE PROJECT LIMITS AND DURATION, REGARDLESS OF THE CONTRACTOR'S SCOPE OF ACTIVITIES WITHIN THE PROJECT LIMITS.

17. THE REMOVAL OF ANY ABANDONED UTILITIES REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL AND NO SEPARATE PAYMENT SHALL BE MADE.

18. IT IS THE CONTRACTOR'S RESPONSIBILITY TO STOCKPILE NECESSARY MATERIAL ON-SITE OR SECURED OFF-SITE AT NO ADDITIONAL EXPENSE TO HARRIS COUNTY. ALL STORM SEWER, ROADWAY, AND CHANNEL EXCAVATION, IF SUITABLE, NEEDS TO BE USED BEFORE BORROW IS BROUGHT ON-SITE.

19. MANHOLES, JUNCTION BOXES, INLETS, AND RISERS ARE TO BE PRE-CAST OR CAST IN PLACE.

20. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES AND HAVE THEIR UNDERGROUND AND AERIAL SYSTEMS LOCATED.

21. PROPOSED DRIVEWAY, SIDEWALK, CURB, GUTTER LINE AND/OR GRADE SHALL MATCH EXISTING STREET. CURB RAMPS SHALL BE CONSTRUCTED SO THAT EXISTING ROADWAY DRAINAGE IS NOT IMPEDED AND WATER DOES NOT POND FOR MORE THAN TWENTY-FOUR (24) HOURS.

22. THERE EXISTS THE POSSIBILITY THAT OTHER PRIVATE UTILITIES SUCH AS SPRINKLERS, DECORATIVE LIGHTING, ETC. MAY BE PRESENT AND CONFLICT WITH THE PROPOSED CONSTRUCTION. IN ADDITION, THERE MAY BE LANDSCAPING OR DECORATIVE FEATURES THAT MAY NEED TO BE RELOCATED TO PERFORM THE WORK. THE CONTRACTOR SHALL NOTIFY HARRIS COUNTY REGARDING ANY CONFLICT WITH THESE FACILITIES.

23. ALL WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE LOCAL REQUIREMENTS.

24. CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY, TEXAS FOR CONSTRUCTION WITHIN HIKE AND BIKE TRAIL RIGHT-OF-WAY AT HIS OWN EXPENSE.

25. THE CONTRACTOR'S OFFICIAL NOTIFICATION OF COMMENCEMENT OF ON-SITE WORK SHALL BE ISSUED TO THE COUNTY BY ONE OF THE METHODS DESCRIBED BELOW. CONTRACTOR SHALL SEND A FAX TO (713) 755-4177 A MINIMUM OF 24-HOURS PRIOR TO COMMENCING ON-SITE WORK. OTHERWISE, THE CONTRACTOR SHOULD CALL (713) 755-7070 IN ORDER TO OBTAIN THE EMAIL ADDRESSES OF BOTH THE PROJECT ENGINEER AND CHIEF INSPECTOR, AND SEND AN EMAIL TO HARRIS COUNTY NOTIFYING THEM A MINIMUM OF 24-HOURS PRIOR TO COMMENCING ON-SITE WORK.

26. COORDINATES FOR THIS PROJECT ARE GRID.

27. CONTRACTOR TO COORDINATE WITH HARRIS COUNTY PRECINCT 4 PERSONNEL ON LOCATION OF WETLANDS. HARRIS COUNTY PRECINCT 4 PERSONNEL WILL STAKE AND INSTALL ORANGE PROTECTIVE FENCE AROUND WETLANDS BEFORE START OF ANY CONSTRUCTION. CONTRACTOR WILL MAKE SURE TO STAY CLEAR OF THIS AREA.

28. THE LOCATION AND DATE INITIATED OF CONSTRUCTION SUPPORT ACTIVITIES INCLUDING MATERIALS, WASTE, BORROW, FILL, AND EQUIPMENT STORAGE AREA WILL BE SHOWN ON THE PLAN SHEETS ONCE ESTABLISHED BY CONTRACTOR. THESE SITES WILL BE INCLUDED IN THE INSPECTION REPORT.

29. THE LOCATION(S) OF VEHICLE WASH AREAS INCLUDING CONCRETE WASHOUTS WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.

30. THE FOLLOWING RECORDS WILL BE MAINTAINED BY THE CONTRACTOR AND WILL BE MADE READILY AVAILABLE UPON REQUEST TO PARTIES LISTED IN PART III.D.1 OF THE TPDES GENERAL PERMIT TXR150000.
   I. DATES WHEN MAJOR GRADING OCCUR
   II. ALL DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, AND
   III. THE DATES WHEN STABILIZATION (BOTH TEMPORARY AND/OR PERMANENT) MEASURE ARE INITIATED.

TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR)

1. THIS PROJECT REQUIRES THAT THE SIDEWALKS, CROSSWALKS, AND RAMPS BE IN CONFORMANCE WITH THE CURRENT ADA REQUIREMENTS. THE CONTRACTOR IS REQUIRED TO MAKE THEMSELVES FAMILIAR WITH THE CURRENT TEXAS ACCESSIBILITY STANDARDS (TAS), AS OUTLINED BY THE TDLR. THE CURRENT STANDARDS ARE AVAILABLE AT HTTP://WWW.LICENSE.STATE.TX.US/AB/ABTAS.HTM.

2. THESE DRAWINGS SHOW TYPICAL INSTALLATIONS AND GUIDELINES FOR CONSTRUCTION OF PEDESTRIAN FACILITIES AND HAVE BEEN SUBMITTED TO THE TDLR FOR REVIEW AND HAVE BEEN APPROVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE REQUIRED TDLR INSPECTION OF THE COMPLETED PEDESTRIAN FACILITIES FOLLOWING CONSTRUCTION, INCLUDING ANY FEES. INSPECTION AND ACCEPTANCE BY THE TDLR OR THEIR REPRESENTATIVE IS REQUIRED AS PART OF THIS PROJECT.

3. CERTAIN LOCATIONS MAY REQUIRE MODIFICATIONS AND DRAWINGS TO ACCOMMODATE SITE SPECIFIC CONDITIONS. DRAWINGS WILL BE PREPARED FOR THESE AREAS AS NEEDED AND SUBMITTED TO THE TDLR FOR REVIEW. FOLLOWING CONSTRUCTION, THE CONTRACTOR SHALL ARRANGE FOR INSPECTION BY THE TDLR, AS DESCRIBED ABOVE.
4. CONTRACTOR TO COORDINATE, ARRANGE, AND PAY FOR THE INSPECTION (AND IF REQUIRED THE RE-INSPECTION) FOR ALL WORK INCURRED IN THIS PROJECT.

SITE PREPARATION AND EARTHWORK

1. STRIP THE VEGETATION AND ORGANIC TOPSOILS TO A DEPTH OF AT LEAST 3 INCHES AND TO A DEPTH AS NECESSARY TO OBTAIN THE DESIRED FINISH GRADE, WITHIN THE LIMITS OF PROPOSED TRAIL PAVEMENT. STRIPPED VOLUME MAY BE USED FOR EARTHWORK GRADING OUTSIDE THE LIMITS OF BERM AND NOT WITHIN THE PROPOSED TRAIL PAVEMENT.

2. WITHIN THE LIMITS OF THE PROPOSED CONSTRUCTION, THE SUBGRADE SHALL BE BROUGHT TO LINES AND GRADES AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH SPECIFICATIONS. ALL FINISHED GRADES SHALL VARY UNIFORMLY BETWEEN FINISHED ELEVATIONS SHOWN ON PLANS.

3. CONTRACTOR SHALL COMPACT FILL USED TO BACKFILL STRUCTURES AND SINKHOLES. BACKFILL SHALL BE DONE IN LAYERS NO MORE THAN 8-INCH LIFTS.

4. CONTRACTOR SHALL PROOFROLL THE EXCAVATED AREA WITHIN THE LIMITS OF THE PROPOSED WORK FOR ANY REMAINING HOLES, SOFT SPOTS, AND WEAK SOILS WHICH SHALL BE EXCAVATED AND BACKFILLED WITH SELECT FILL MATERIAL AND COMPACTED TO 95 PERCENT (95%) OF THE STANDARD PROCTOR DENSITY. SELECT FILL MATERIAL SHALL HAVE A PLASTICITY INDEX RANGING FROM 12 TO 20, AND SHALL HAVE A MOISTURE CONTENT RANGING FROM OPTIMUM TO PLUS 3 PERCENT (+3%) ABOVE OPTIMUM (NO SEPARATE PAY).

ACCESSIBLE ROUTE FOR PEDESTRIAN FACILITIES

1. THIS PROJECT WAS DESIGNED USING CRITERIA IN "GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES" CHAPTER 5 DESIGN OF SHARED USE PATHS PUBLISHED 2012, 4TH EDITION BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.
2. SLOPE. CROSS-SLOPE OF AN ACCESSIBLE ROUTE MUST NOT EXCEED 1:50 (2%). ANY PART OF AN ACCESSIBLE ROUTE WITH A SLOPE GREATER THAN 1:20 (5%) SHALL BE CONSIDERED A RAMP. FOR PROJECTS IN THE PUBLIC RIGHT-OF-WAY, WHERE THE ADJACENT ROADWAY HAS A RUNNING SLOPE OF 5% OR GREATER, THE PEDESTRIAN ROUTE SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY. IF A RAMP HAS A RISE GREATER THAN 6 IN. OR A HORIZONTAL PROJECTION GREATER THAN 72 IN., THEN IT SHALL HAVE HANDRAILS ON BOTH SIDES. THE ONLY EXCEPTION IS AT CURB RAMPS. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS.
3. WIDTH. THE PROPOSED TRAIL WIDTH SHALL BE 12 FT. MINIMUM.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE MINIMUM DIMENSIONS, SLOPES, AND CROSS SLOPES HAVE BEEN MET WHILE IN THE PRESENCE OF THE HARRIS COUNTY INSPECTOR. HARRIS COUNTY RESERVES THE RIGHT TO INSPECT AND DETERMINE WHETHER THE WORK HAS MET THESE REQUIREMENTS.
5. THE CONTRACTOR SHALL PROVIDE AN ELECTRONIC LEVEL, (E.G. MD SMART-TOOLS 4-FOOT ELECTRONIC LEVEL MANUFACTURED BY MACLENBURG-DUNCAN OR EQUAL), AND DEMONSTRATE TO THE HARRIS COUNTY INSPECTOR THE SLOPES AND CROSS SLOPES OF THE PROPOSED WORK.
6. SHOULD THE CONTRACTOR DETERMINE THAT THE PROPOSED WORK CANNOT MEET THESE REQUIREMENTS, THEY SHALL NOTIFY HARRIS COUNTY IN WRITING. MODIFICATIONS SHALL BE MADE AS DIRECTED BY THE ENGINEER INCLUDING THE ISSUANCE OF DRAWINGS, IF REQUIRED.
7. HARRIS COUNTY WILL INSPECT THE WORK PRIOR TO FINAL ACCEPTANCE. SHOULD ANY DEFICIENCIES BE DETERMINED, THE CONTRACTOR SHALL REMOVE AND REPLACE THE DEFICIENT AREAS AT NO COST TO HARRIS COUNTY.
8. AFTER AUTHORIZATION AND NOTIFICATION BY HARRIS COUNTY, THE CONTRACTOR SHALL SCHEDULE AN INSPECTION BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR). SHOULD THE INSPECTION REVEAL THAT THE WORK DOES NOT MEET ADA REQUIREMENTS, THE CONTRACTOR SHALL REPLACE DEFICIENT AREAS AS DIRECTED BY HARRIS COUNTY, AT NO COST TO HARRIS COUNTY.
9. ALL CONCRETE SURFACES SHALL RECEIVE A LIGHT BROOM FINISH UNLESS NOTED OTHERWISE IN THE PLANS.

STORM WATER QUALITY:

1. SWQMP: THIS PROJECT REQUIRES A STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) BECAUSE THE PROJECT MEETS THE DEFINITION OF NEW DEVELOPMENT OR SIGNIFICANT REDEVELOPMENT UNDER THE HARRIS COUNTY REGULATIONS. THE SWQMP CONTROLS SHALL BE CONSTRUCTED BY THE CONTRACTOR, THEN MAINTAINED BY THE COUNTY UPON COMPLETION OF THE PROJECT. REFER TO THE FOLLOWING DETAILS ON THE OVERALL LAYOUT AND TYPICAL SECTION: "NO LITTERING SIGN DETAIL" AND "TRASH RECEPTACLE DETAIL".

2. SWPPP: THIS PROJECT DISTURBS 7 ACRES; THEREFORE COVERAGE IS REQUIRED UNDER THE TPDES GENERAL PERMIT TXR150000 FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION, INSPECTION, AND MAINTENANCE OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS. THE COSTS TO IMPLEMENT, INSPECT, AND MAINTAIN THE SWPPP SHALL BE CONSIDERED INCIDENTAL TO THE SWPPP BID ITEMS.

3. SINCE THIS PROJECT DISTURBS GREATER THAN 5 ACRES, A NOTICE OF INTENT (NOI) IS REQUIRED TO BE SUBMITTED TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) AT LEAST 7 DAYS PRIOR TO THE START OF ANY EARTH DISTURBING ACTIVITIES. THIS PROJECT SHALL HAVE TWO NOIS, ONE WITH THE CONTRACTOR'S SIGNATURE AND ONE WITH HARRIS COUNTY'S SIGNATURE. EACH NOI IS SUBJECT TO A $325 APPLICATION FEE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BOTH NOI APPLICATION FEES. THE CONTRACTOR HAS THE OPTION TO SUBMIT THE CONTRACTOR'S NOI FORM AND FEE ELECTRONICALLY TO THE TCEQ (IF SUBMITTED ELECTRONICALLY, THEN THE CONTRACTOR SHALL PROVIDE COPIES OF THE ELECTRONIC SUBMITTAL TO HARRIS COUNTY AT THE PRECONSTRUCTION MEETING). THE CONTRACTOR SHALL PROVIDE A CHECK IN THE AMOUNT OF $325 FOR HARRIS COUNTY'S NOI APPLICATION FEE MADE PAYABLE TO TCEQ AT THE PRECONSTRUCTION MEETING. AFTER THE PRECONSTRUCTION MEETING, HARRIS COUNTY SHALL MAIL THE CERTIFIED NOI(S), CHECK(S), AND THE PAYMENT SUBMITTAL FORM(S) TO THE TCEQ. HARRIS COUNTY SHALL ALSO SUBMIT COPIES OF BOTH SIGNED NOIS TO THE LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM OPERATOR (MS4) AT LEAST 7 DAYS PRIOR TO THE START OF ANY EARTH DISTURBING ACTIVITIES.

4. COPIES OF THE CONTACTOR'S AND HARRIS COUNTY'S NOI AND CONSTRUCTION SITE NOTICE (CSN) SHALL BE POSTED AT THE SITE BY THE CONTRACTOR. THE CONTRACTOR SHALL LAMINATE AND POST THE TWO NOIS, TWO CSNS AND ANY "SECONDARY OPERATOR" CSNS ON THE PROJECT SITE AT A LOCATION WITH EASY ACCESS TO THE PUBLIC FOR CLEAR VIEWING AND AS APPROVED BY THE ENGINEER. THE COST OF LAMINATION AND POSTING OF THE NOIS & CSNS SHALL BE CONSIDERED INCIDENTAL TO THE SWPPP BID ITEMS.

5. UPON COMPLETION OF CONSTRUCTION ACTIVITIES AND FINAL STABILIZATION OF THE SITE, AS DEFINED BY THE TPDES GENERAL PERMIT, A NOTICE OF TERMINATION (NOT) IS REQUIRED TO BE SUBMITTED TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ). THIS PROJECT SHALL HAVE TWO NOTS, ONE WITH THE CONTRACTOR'S SIGNATURE AND ONE WITH HARRIS COUNTY'S SIGNATURE. WHEN DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL PROVIDE TO HARRIS COUNTY A SIGNED COPY OF THE CONTRACTOR'S NOTICE OF TERMINATION (NOT). HARRIS COUNTY SHALL SUBMIT TO THE TCEQ THE CONTRACTOR'S AND HARRIS COUNTY'S SIGNED NOTS. HARRIS COUNTY SHALL ALSO SUBMIT COPIES OF BOTH SIGNED NOTS TO THE LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM OPERATOR.

6. A RAIN GAUGE SHALL BE KEPT ON THE PROJECT SITE OR WITHIN THE IMMEDIATE PROJECT VICINITY. RECORDS OF RAINFALL EVENTS SHALL BE KEPT BY THE CONTRACTOR TO ASSIST WITH DETERMINING IF AN SWPPP SITE INSPECTION IS REQUIRED. THE COSTS FOR THE RAIN GAUGE SHALL BE CONSIDERED INCIDENTAL TO THE SWPPP BID ITEMS.

7. THE SWPPP, INSPECTION & MAINTENANCE REPORTS, CERTIFICATIONS, RAINFALL RECORDS, MAJOR GRADING DATE RECORDS AND TEMPORARY AND PERMANENT STABILIZATION DATE RECORDS SHALL BE KEPT CURRENT BY THE CONTRACTOR AND IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. COPIES OF THE ALL SWPPP RECORDS SHALL BE KEPT ON-SITE, IF FEASIBLE, UNTIL THE NOTICE OF TERMINATIONS HAS BEEN SUBMITTED TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY. THE SWPPP RECORDS SHALL BE MADE READILY AVAILABLE TO REGULATORY AUTHORITIES UPON AN ON-SITE INSPECTION. THE CONTRACTOR SHALL DELIVER COPIES OF ALL SWPPP RECORDS TO HARRIS COUNTY AS DIRECTED BY THE ENGINEER.

STANDARD HCFCD NOTES FOR CONSTRUCTION DRAWINGS

1. NOTIFY THE HARRIS COUNTY FLOOD CONTROL DISTRICT, PROPERTY MANAGEMENT DEPARTMENT IN WRITING AT LEAST 48 HOURS PRIOR TO
2. ENGINEER SHALL SUBMIT CERTIFICATION LETTER AND RECORD DRAWINGS TO THE HARRIS COUNTY FLOOD CONTROL DISTRICT, PROPERTY
3. PROTECT, MAINTAIN, AND RESTORE EXISTING BACKSLOPE DRAINAGE SYSTEMS.
4. BACKSLOPE SWALE AND INTERCEPTOR STRUCTURE ELEVATIONS AND LOCATIONS SHOWN ON PLANS ARE APPROXIMATE. FINAL ELEVATIONS
5. ESTABLISH TURF GRASS ON ALL DISTURBED AREAS WITHIN THE CHANNEL OR DETENTION RIGHT-OF-WAY, EXCEPT THE CHANNEL BOTTOM AND
6. BACKFILL IN ACCORDANCE WITH HARRIS COUNTY FLOOD CONTROL DISTRICT STANDARD SPECIFICATION, SECTION 02315 - EXCAVATING AND
7. EXCAVATE CHANNEL FLOWLINE TO DESIGN ELEVATION AS SHOWN ON PLANS AND DOWNSTREAM, AS NECESSARY, TO ENSURE NO WATER IN
8. MAINTAIN FLOW IN CHANNEL DURING CONSTRUCTION AND RESTORE CHANNEL TO ORIGINAL CONDITION.
9. REMOVE ALL EXCAVATED MATERIAL FROM THE HARRIS COUNTY FLOOD CONTROL DISTRICT OR DRAINAGE RIGHT-OF-WAY. NO FILL IS TO BE
10. OBTAIN AND COMPLY WITH ALL APPLICABLE CITY, COUNTY, STATE, AND FEDERAL PERMITS AND APPROVALS, WITH ASSISTANCE FROM

UTILITIES

GENERAL NOTES FOR SIGN RELOCATION AND UTILITY ADJUSTMENT:
1. UTILITY ADJUSTMENT WILL BE PERFORMED AS REQUIRED AND AS DIRECTED BY THE ENGINEER.
2. TELEPHONE SOUTHWESTERN BELL TELEPHONE AND/OR GENERAL TELEPHONE AND ELECTRONICS
(A). THE LOCATION OF SOUTHWESTERN BELL TELEPHONE CO. UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.
(B). UNDERGROUND TELEPHONE AND TELEVISION CABLE EXISTS THROUGHOUT THE PROPOSED PROJECT AREA. CONTRACTOR TO CONTACT "DIG-TEST" AT 1-800-344-8377 AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO BEGINNING ANY CONSTRUCTION FOR LOCATION AND MARKING OF UNDERGROUND CABLE.
(C). CONTACT SOUTHWESTERN BELL TELEPHONE COMPANY AT 1-800- 843-4345 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. OTHER:
(A). UNDERGROUND PIPELINES ARE SHOWN ACCORDING TO BEST AVAILABLE INFORMATION. CONTRACTOR TO PROCEED WITH CAUTION DURING EXCAVATION. CONTRACTOR TO COORDINATE WITH PIPELINE OWNER IN CASE OF CONFLICTS OR QUESTIONS.
(B). CONTRACTOR SHALL VERIFY LOCATION OF UNDERGROUND UTILITIES AND CONTACT THE HOUSTON AREA UTILITY COORDINATING COMMITTEE FORTY-EIGHT (48) HOURS BEFORE BEGINNING WORK AT 800-245-4545 OR (713) 223-4567.
(C). ALL EXISTING UNDERGROUND UTILITIES ARE NOT GUARANTEED TO BE COMPLETE OR DEFINITE. THE APPROXIMATE LOCATIONS OF KNOWN EXISTING UTILITIES ARE SHOWN. CONTRACTOR SHALL DETERMINE THE EXACT SIZE AND HORIZONTAL AND VERTICAL LOCATIONS IN THE FIELD PRIOR TO COMMENCING WORK.
(D). ANY PERMANENT RELOCATION OF AN EXISTING UTILITY NOT SHOWN ON THE DRAWINGS SHALL BE APPROVED BY THE ENGINEER PRIOR TO RELOCATION AND SHALL CONFORM TO THE APPLICABLE STANDARDS OF GOVERNING AUTHORITIES.
(E). CONTRACTOR SHALL PROTECT EXISTING UNDERGROUND FACILITIES DURING INSTALLATION OF PROPOSED WORK.

CAUTION: UNDERGROUND GAS UTILITIES

Locations of CenterPoint Energy main lines (to include CenterPoint Energy, Intrastate Pipeline, LLC. where applicable) are shown in an approximate location only. Service lines are usually not shown. Our signature on these plans only indicates that our facilities are shown in approximate location. It does not imply that a conflict analysis has been made. The contractor shall contact the Utility Coordinating Committee at (713) 223-4567 or 1-800-669-8344 a minimum of 48 hours prior to construction to have main and service lines field located.

* When CenterPoint Energy pipe line markings are not visible, call (713) 967-8037 (7:00 a.m. to 4:30 p.m.) for status of line location request before excavation begins.

* When excavating within eighteen inches (18") of the indicated location of CenterPoint Energy facilities, all excavation must be accomplished using non-mechanized excavation procedures.

* When CenterPoint Energy facilities are exposed, sufficient support must be provided to the facilities to prevent excessive stress on the piping.

The contractor is fully responsible for any damages caused by his failure to exactly locate and preserve these underground facilities.

WARNING: OVERHEAD ELECTRICAL LINES

Overhead lines may exist on the property. The location of overhead lines has not been shown on these drawings as the lines are clearly visible, but you should locate them prior to beginning any construction. Texas law, Section 752, Health & Safety Code forbids activities that occur in close proximity to high voltage lines, specifically:

* Any activity where person or things may come within six(6) feet of live overhead high voltage lines; and

* Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of live overhead high voltage lines.

Parties responsible for the work, including contractors, are legally responsible for the safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or removed call CenterPoint Energy at (713) 207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE or EASEMENT PROPERTY

No approval to use, cross or occupy CenterPoint fee or easement property is given. If you need to use CenterPoint property, please contact our Surveying & Right of Way Division at (713) 207-6248 or (713) 207-5769.

UTILITY AND PIPELINE CONTACTS

Mr. Jim Paul
Centerpoint Energy
Attn: Business Process
PO BOX 2883
Houston, Texas 77251-2883
Telephone: 713-207-4622
Email: jim.paul@centerpointenergy.com

Ms. Susan D. Sager
Senior Right of Way Agent
Centerpoint Energy
Telephone: 713-207-6350
Email: susan.sager@centerpointenergy.com

Ms. Margaret Blackwell
Comcast Cable
7033 Airport Blvd
Houston, Texas 77061
Telephone: 713-341-8676
Email: margaret_blackwell@cable.comcast.com

Suddenlink Communications, Inc. Contact:
Melton Prestwood, Construction Planner / Coordinator
Phone: 936-672-5739
Fax: 866-935-1576
Email: Melton.Prestwood@suddenlink.com

TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY AT 713-207-2222

NOTICE:

For your safety, you are required by Texas Law to call at least 48 hours before you dig so that underground lines can be marked. This verification does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

Date

CenterPoint Energy-Natural Gas Facilities Verification ONLY.
(This signature verifies that you have shown our Natural Gas lines correctly - not to be used for conflict verification.) (Gas service lines are not shown.)
Signature valid for six months.

Date

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities - not to be used for conflict verification.)
Signature valid for six months.

NO.	REVISIONS	DATE	NAME

HARRIS COUNTY
PUBLIC INFRASTRUCTURE DEPARTMENT
ARCHITECTURE & ENGINEERING DIVISION

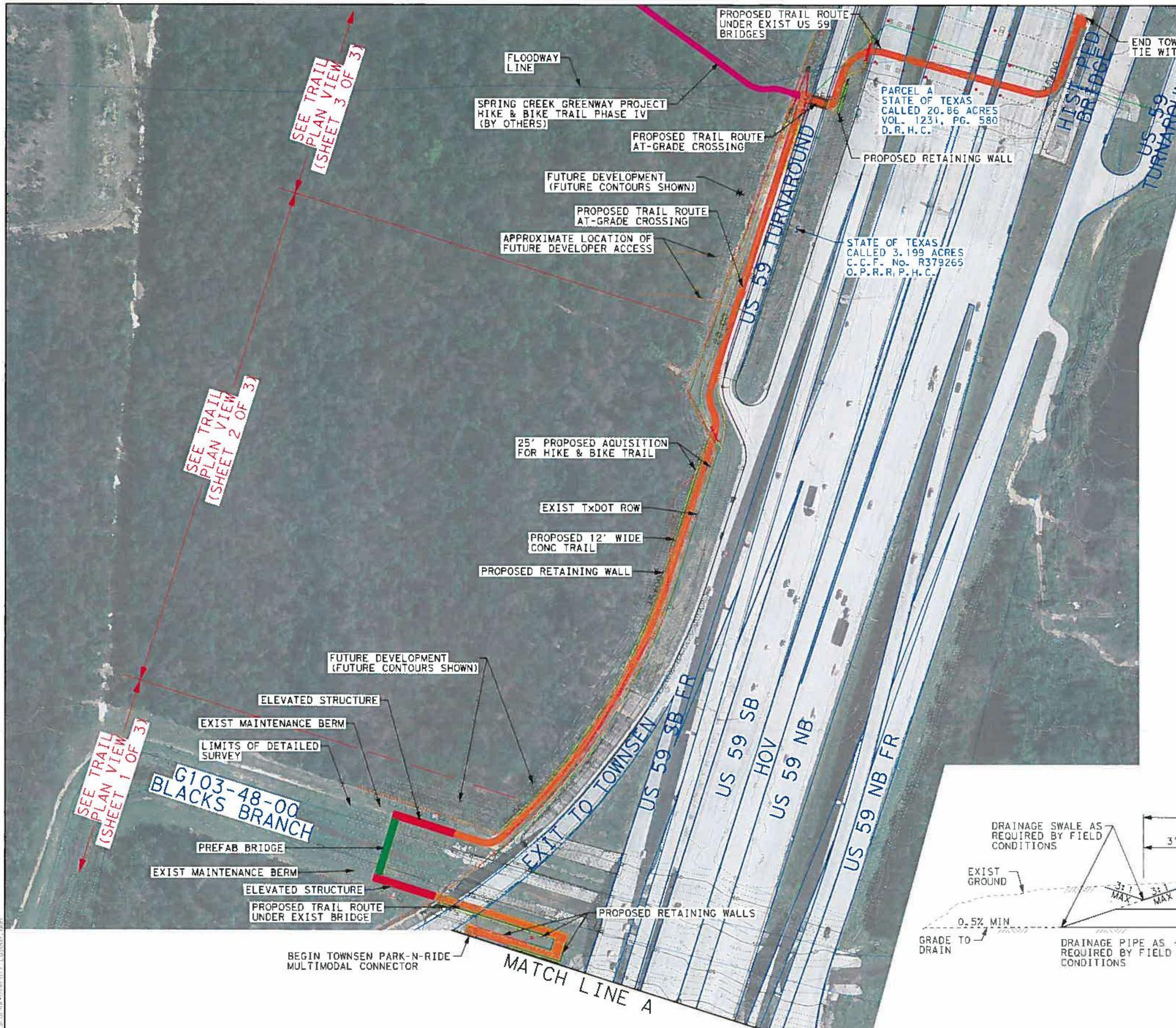
LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

CHUN-HOI WONG, P.E.
TEXAS P.E. #87943

ISSUED ON:
JUL. 21, 2014

PROJECT TITLE:	TOWNSEN PARK-N-RIDE	
DRAWN BY: RH	MULTIMODAL CONNECTOR	
CK'D BY: WW	SHEET DESCRIPTION: GENERAL NOTES	
SCALE: NTS		SHEET NO
DATE: JUL 2014	APPROVED BY.	3 / 11



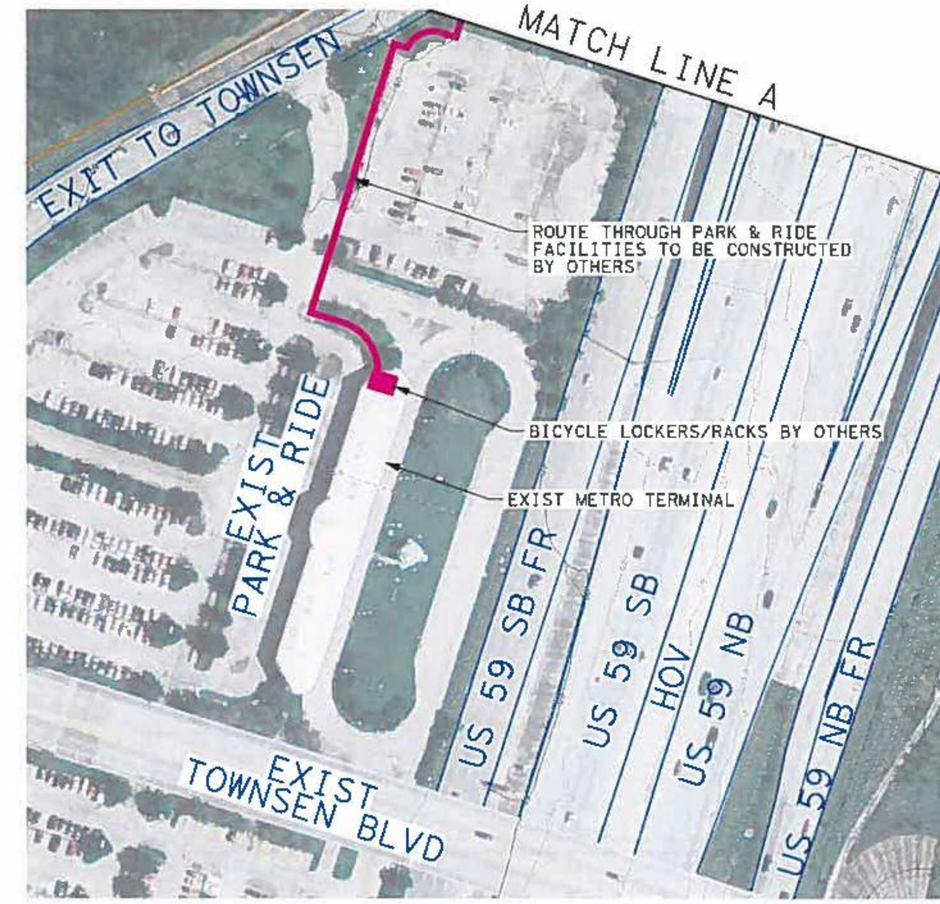
PROPOSED TRAIL ROUTE UNDER EXIST US 59 BRIDGES
END TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR TIE WITH EXIST RAMP TO HISTORICAL PEDESTRIAN BRIDGE
FLOODWAY LINE
SPRING CREEK GREENWAY PROJECT HIKE & BIKE TRAIL PHASE IV (BY OTHERS)
PARCEL A STATE OF TEXAS CALLED 20.86 ACRES VOL. 1231, PG. 580 D.R.H.C.
HIST PED BRIDGE
US 59 TURNAROUND
SEE TRAIL PLAN VIEW (SHEET 3 OF 3)
PROPOSED TRAIL ROUTE AT-GRADE CROSSING
PROPOSED RETAINING WALL
FUTURE DEVELOPMENT (FUTURE CONTOURS SHOWN)
PROPOSED TRAIL ROUTE AT-GRADE CROSSING
APPROXIMATE LOCATION OF FUTURE DEVELOPER ACCESS
STATE OF TEXAS CALLED 3.199 ACRES C.C.F. No. R379265 O.P.R.R.P.H.C.
US 59 TURNAROUND
SEE TRAIL PLAN VIEW (SHEET 2 OF 3)
25' PROPOSED AQUISITION FOR HIKE & BIKE TRAIL
EXIST TxDOT ROW
PROPOSED 12' WIDE CONC TRAIL
PROPOSED RETAINING WALL
FUTURE DEVELOPMENT (FUTURE CONTOURS SHOWN)
ELEVATED STRUCTURE
EXIST MAINTENANCE BERM
LIMITS OF DETAILED SURVEY
SEE TRAIL PLAN VIEW (SHEET 1 OF 3)
G103-48-00 BLACKS BRANCH
PREFAB BRIDGE
EXIST MAINTENANCE BERM
ELEVATED STRUCTURE
PROPOSED TRAIL ROUTE UNDER EXIST BRIDGE
PROPOSED RETAINING WALLS
BEGIN TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR
EXIT TO TOWNSEN
US 59 SB FR
US 59 SB
HOV
US 59 NB
US 59 NB FR
MATCH LINE A

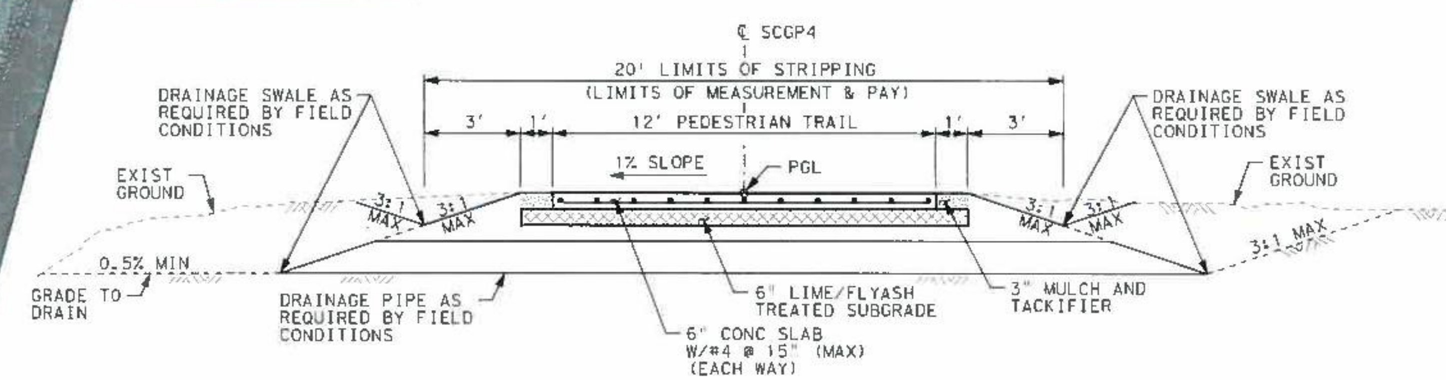
LEGEND:

- AT-GRADE TRAIL
- ELEVATED STRUCTURE
- PREFAB BRIDGE
- TRAIL BY OTHERS

N

0 100 200





℄ SCGP4
20' LIMITS OF STRIPPING (LIMITS OF MEASUREMENT & PAY)
3'
1'
12' PEDESTRIAN TRAIL
1'
3'
DRAINAGE SWALE AS REQUIRED BY FIELD CONDITIONS
DRAINAGE SWALE AS REQUIRED BY FIELD CONDITIONS
EXIST GROUND
EXIST GROUND
1% SLOPE
PGL
3:1 MAX
3:1 MAX
3:1 MAX
3:1 MAX
3:1 MAX
0.5% MIN
GRADE TO DRAIN
DRAINAGE PIPE AS REQUIRED BY FIELD CONDITIONS
6" LIME/FLYASH TREATED SUBGRADE
3" MULCH AND TACKIFIER
6" CONC SLAB W/#4 @ 15" (MAX) (EACH WAY)

12' CONC TRAIL TYPICAL SECTION
(LOOKING UP-STATION TYP)
NTS

NO.	REVISIONS	DATE	NAME

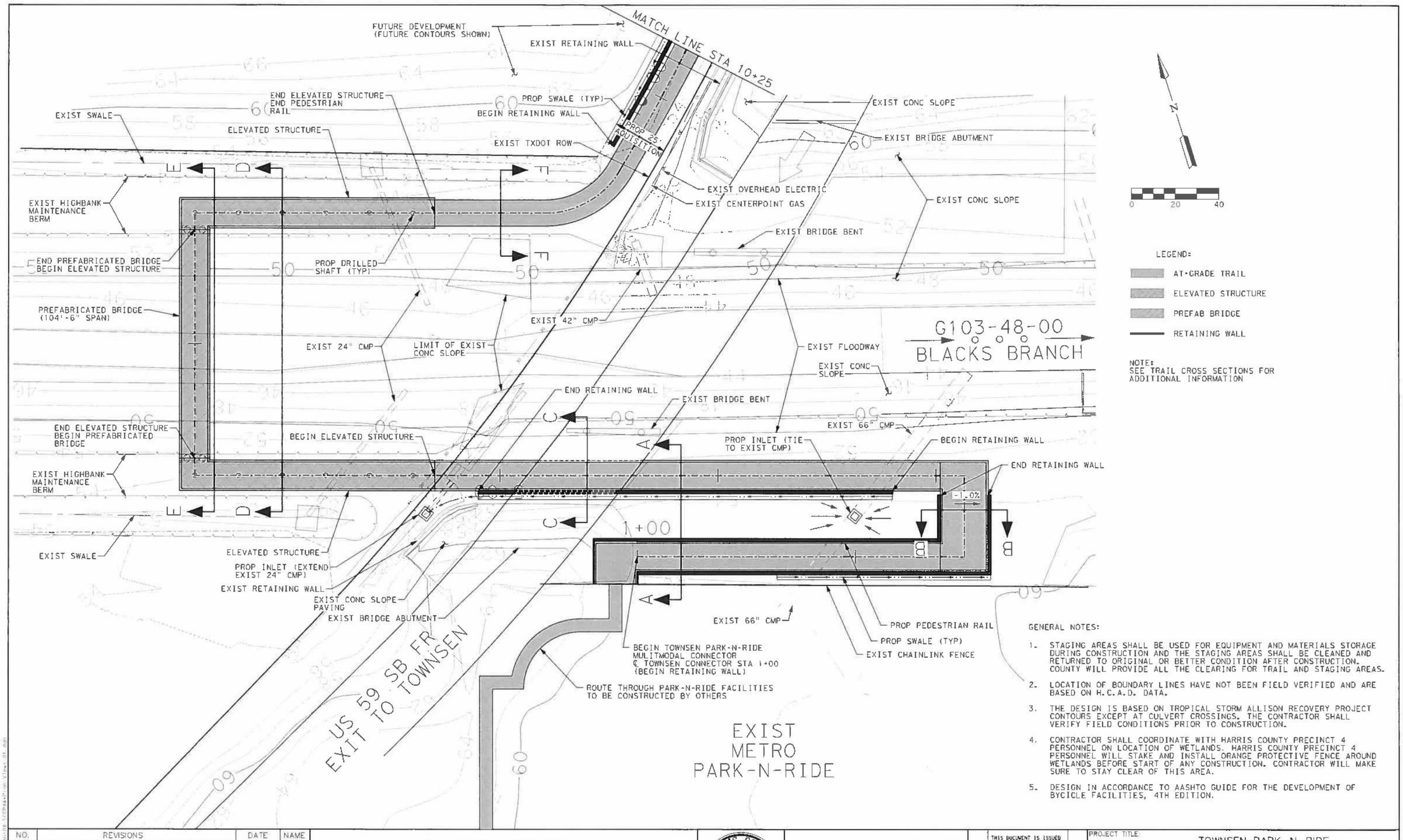
HARRIS COUNTY
PUBLIC INFRASTRUCTURE DEPARTMENT
ARCHITECTURE & ENGINEERING DIVISION

HARRIS COUNTY TEXAS 1836

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN-F-1386

THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.
CHUN-HOI WONG, P.E.
TEXAS P.E. #87943
ISSUED ON: JUL. 21, 2014

PROJECT TITLE:	TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR
DRAWN BY: RH	
CK'D BY: WW	SHEET DESCRIPTION: OVERALL LAYOUT AND TRAIL TYPICAL SECTION
SCALE: 1"=100'	
DATE: JUL 2014	APPROVED BY:
SHEET NO:	4 / 11



GENERAL NOTES:

1. STAGING AREAS SHALL BE USED FOR EQUIPMENT AND MATERIALS STORAGE DURING CONSTRUCTION AND THE STAGING AREAS SHALL BE CLEANED AND RETURNED TO ORIGINAL OR BETTER CONDITION AFTER CONSTRUCTION. COUNTY WILL PROVIDE ALL THE CLEARING FOR TRAIL AND STAGING AREAS.
2. LOCATION OF BOUNDARY LINES HAVE NOT BEEN FIELD VERIFIED AND ARE BASED ON H.C.A.D. DATA.
3. THE DESIGN IS BASED ON TROPICAL STORM ALLISON RECOVERY PROJECT CONTOURS EXCEPT AT CULVERT CROSSINGS. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL COORDINATE WITH HARRIS COUNTY PRECINCT 4 PERSONNEL ON LOCATION OF WETLANDS. HARRIS COUNTY PRECINCT 4 PERSONNEL WILL STAKE AND INSTALL ORANGE PROTECTIVE FENCE AROUND WETLANDS BEFORE START OF ANY CONSTRUCTION. CONTRACTOR WILL MAKE SURE TO STAY CLEAR OF THIS AREA.
5. DESIGN IN ACCORDANCE TO AASHTO GUIDE FOR THE DEVELOPMENT OF BYCICLE FACILITIES, 4TH EDITION.

NO.	REVISIONS	DATE	NAME

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FRN-F-1386

PROJECT TITLE:	TOWNSEN PARK-N-RIDE
DRAWN BY: RH	MULTIMODAL CONNECTOR
CK'D BY: WW	SHEET DESCRIPTION: TRAIL PLAN VIEW
SCALE: 1"=20'	(SHEET 1 OF 3)
DATE: JUL 2014	APPROVED BY:

SHEET NO: 5 / 11

LEGEND:

AT-GRADE TRAIL

RETAINING WALL

NOTE:
SEE TRAIL CROSS SECTIONS FOR ADDITIONAL INFORMATION

0 30 60

MATCH LINE STA 10+25

PROP 25' AQUISITION

EXIST TxDOT ROW

11+00

FUTURE DEVELOPMENT (FUTURE CONTOURS SHOWN)

EXIST CONC LINED INLET

US 59 SB FR EXIT TO TOWNSEN

EXIST CONC SLOPE PAVING

EXIST OVERHEAD ELECTRIC

EXIST CENTERPOINT GAS

LIMIT OF EXIST CONC SLOPE

15+00

RETAINING WALL

℄ TOWNSEN CONNECTOR

EXIST ROADWAY EMBANKMENT

EXIST OVERHEAD ELECTRIC

EXIST CENTERPOINT GAS

EXIST TXDOT ROW

FUTURE DEVELOPMENT (FUTURE CONTOURS SHOWN)

PROP SWALE (TYP)

PROP 24" RCP

END PROP 25' AQUISITION

END RETAINING WALL

EXIST ℄ ROADSIDE DITCH

US 59 TURNAROUND

REGRADE EXIST ROADSIDE DITCH

MATCHLINE STA 19+80

US 59 SBFR

US 59 SBML EXIT RAMP

US 59 SBML ENTRANCE RAMP

US 59 SBML

HOV

US 59 NBML

GENERAL NOTES:

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CHUN-HOI WONG, P.E.
TEXAS P.E. #87543

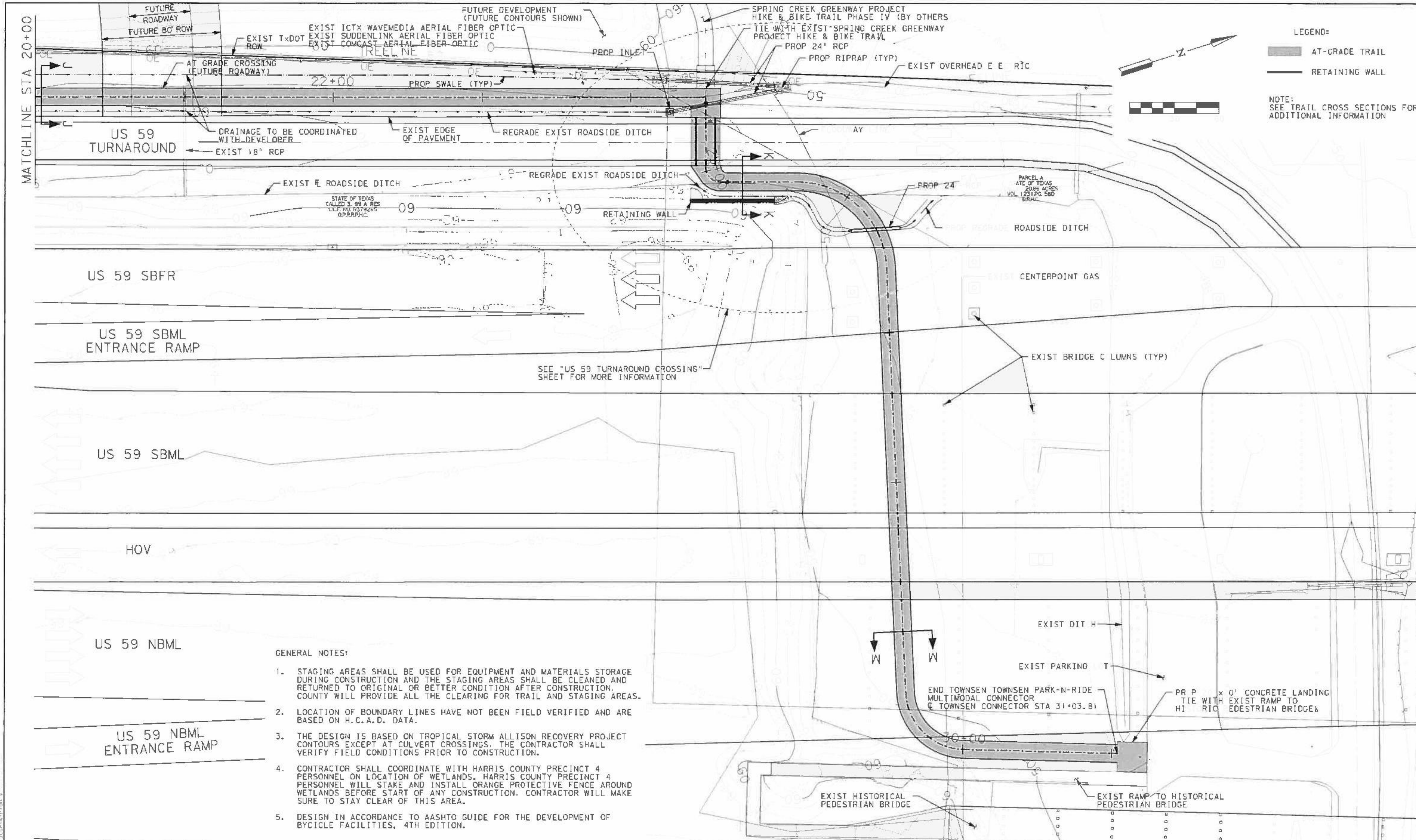
ISSUED ON:
JUL. 21, 2014

PROJECT TITLE: TOWNSEN PARK-N-RIDE
MULTIMODAL CONNECTOR

DRAWN BY: RH
CK'D BY: WW
SCALE: 1"=30'
DATE: JUL 2014
APPROVED BY:

SHEET DESCRIPTION: TRAIL PLAN VIEW (SHEET 2 OF 3)

SHEET NO 6 / 11



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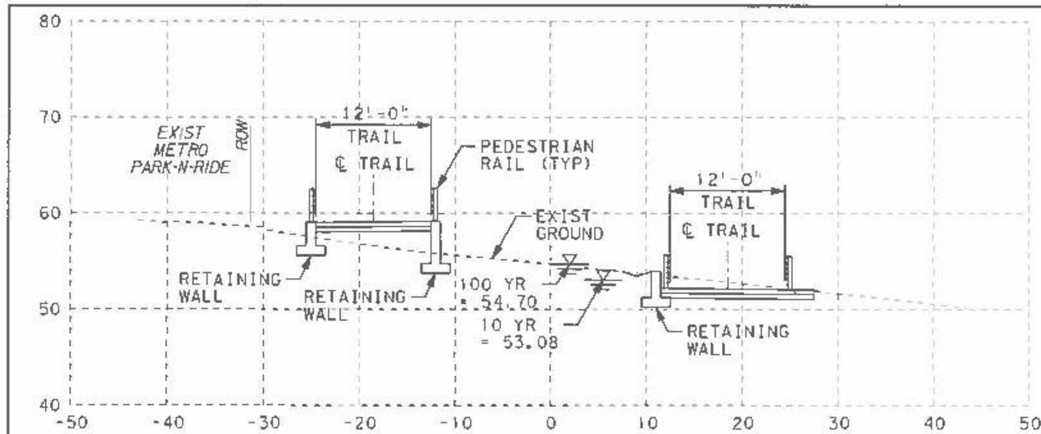
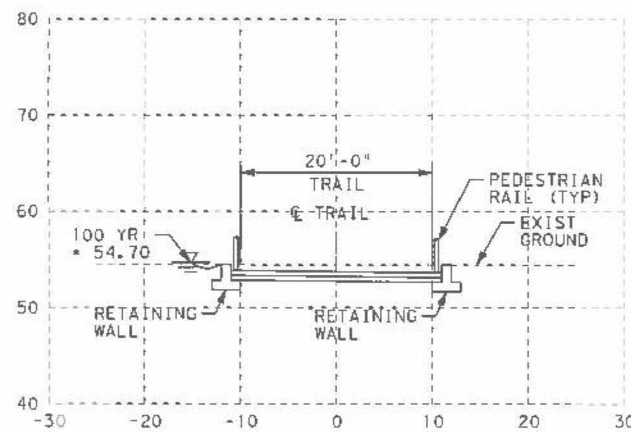
CHUN-HOI WONG, P.E.
TEXAS P.E. #87943
ISSUED ON: JUL. 21, 2014

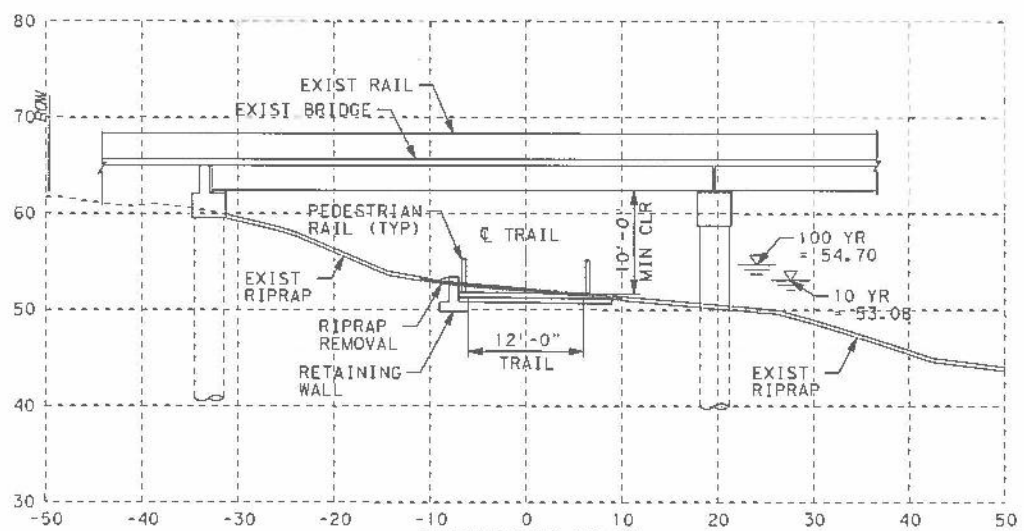
PROJECT TITLE: TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR
DRAWN BY: RH
CK'D BY: WW
SHEET DESCRIPTION: TRAIL PLAN VIEW (SHEET 3 OF 3)
SCALE: 1"=30'
DATE: JUL 2014
APPROVED BY:
SHEET NO: 7 / 11



STA 1+20.00 SECTION A-A STA 4+20.00



SECTION B-B (STA 2+70.00)



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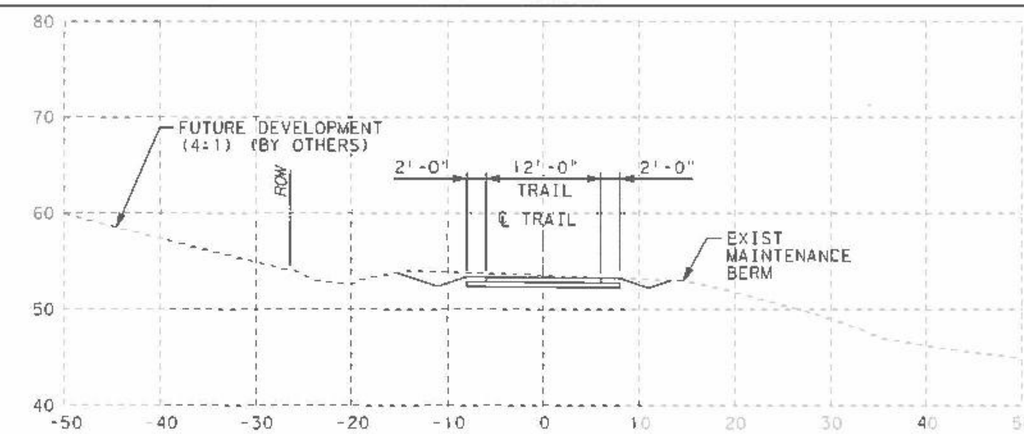
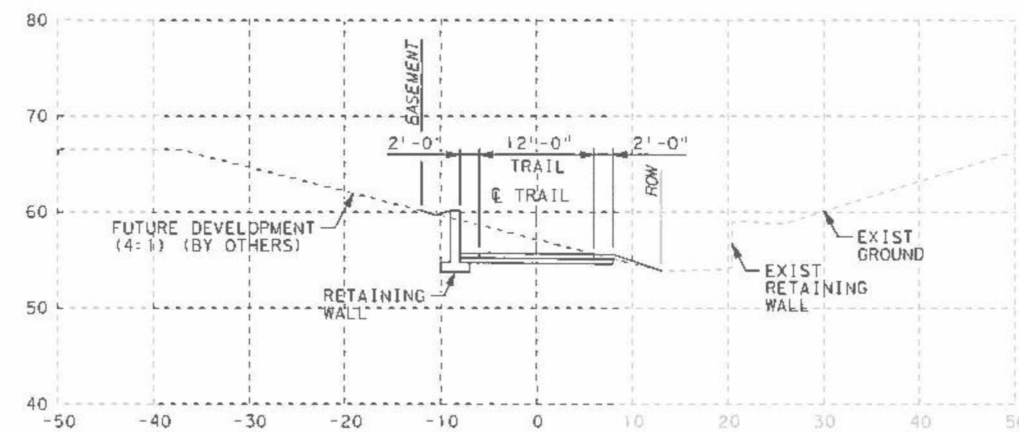
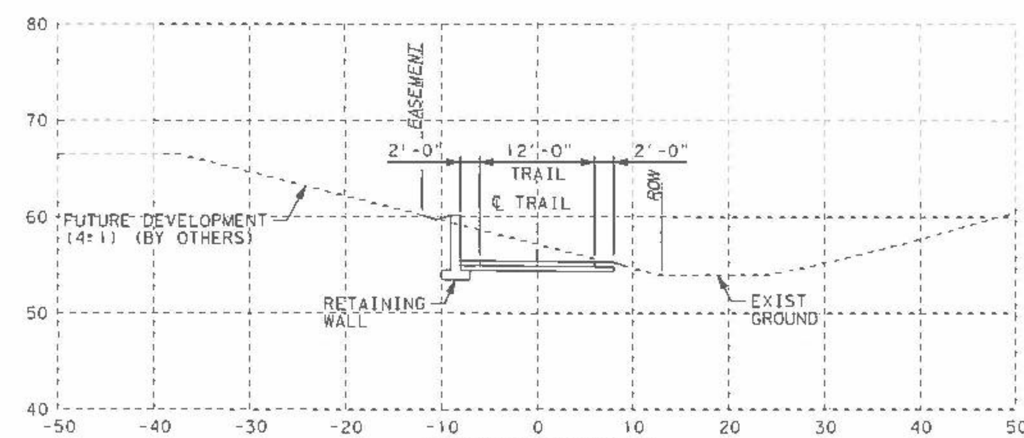


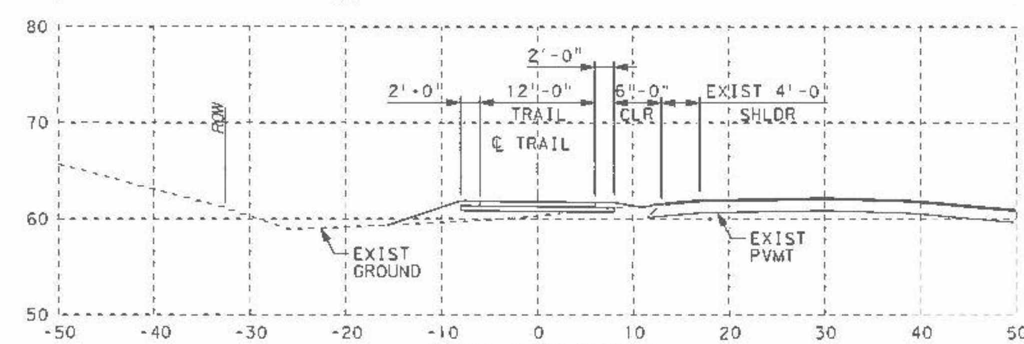
SECTION F-F (STA 9+00.00)



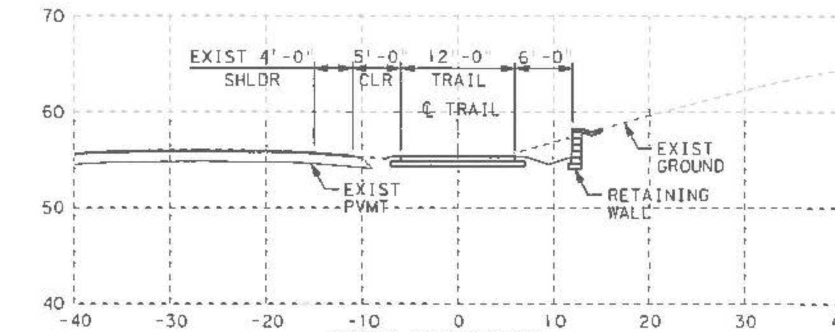
SECTION G-G (STA 11+00.00)



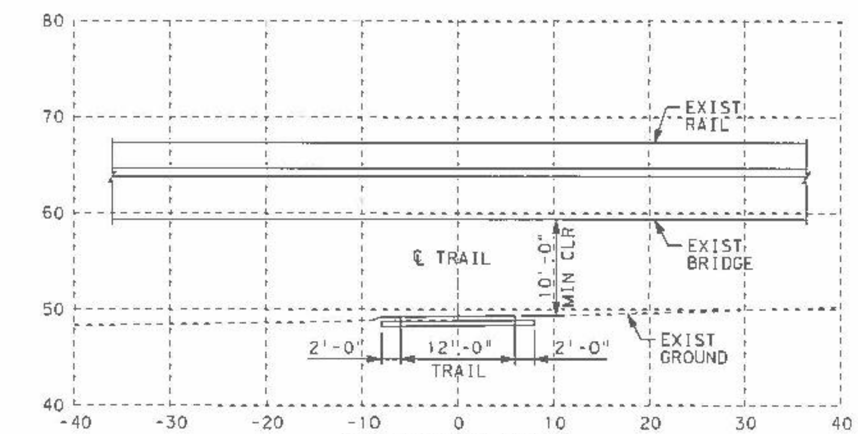
SECTION H-H (STA 15+00.00)



SECTION J-J (STA 20+00.00)



SECTION K-K (STA 25+30)



SECTION M-M (STA 29+00.00)

NO.	REVISIONS	DATE	NAME

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PUBLIC INFRASTRUCTURE DEPARTMENT
ARCHITECTURE & ENGINEERING DIVISION

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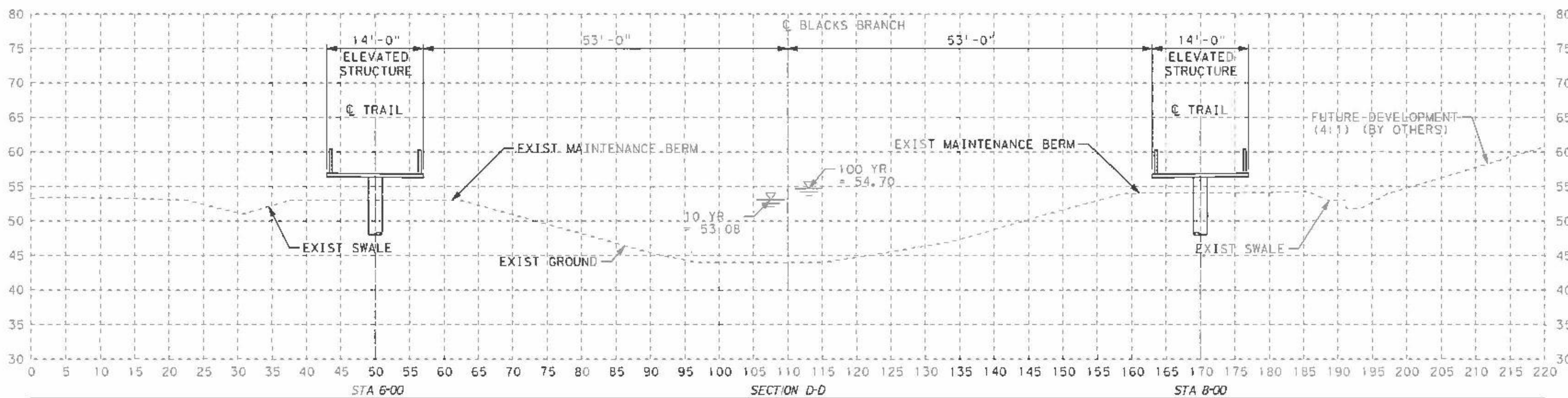
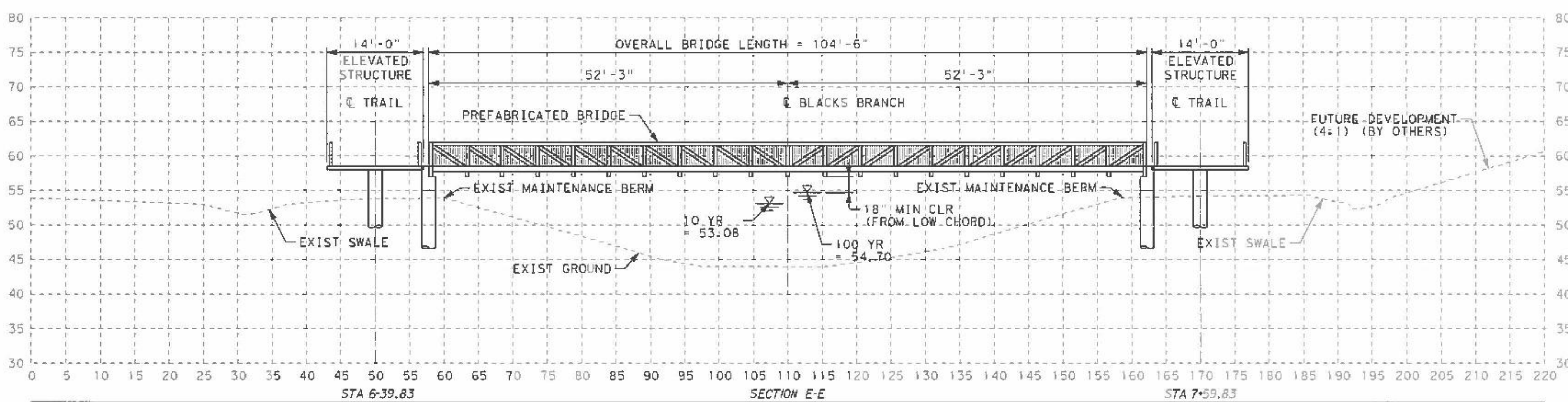
CHUN-HOI WONG, P.E.
TEXAS P.E. #87943
ISSUED ON: JUL. 21, 2014

PROJECT TITLE:	TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR	
DRAWN BY: RH		
CK'D BY: WW	SHEET DESCRIPTION: TRAIL CROSS SECTIONS (SHEET 1 OF 2)	
SCALE: 1"=10'		SHEET NO
DATE: JUL 2014	APPROVED BY:	8 / 11





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DRAWN BY: RH
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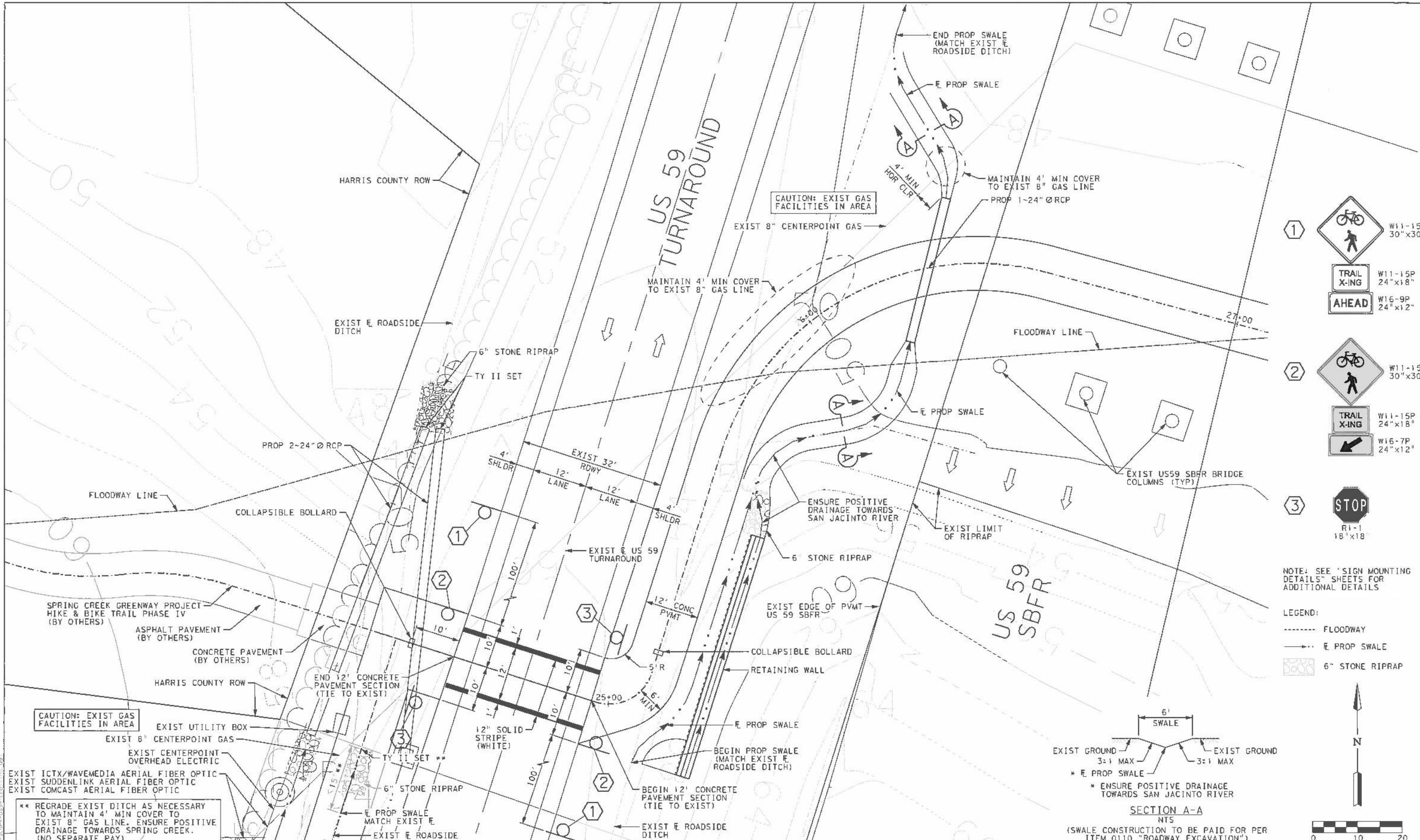
SHEET DESCRIPTION: TRAIL CROSS SECTIONS (SHEET 2 OF 2)
SCALE: 1"=10'
DATE: JUL 2014
APPROVED BY:
SHEET NO. 9 / 11



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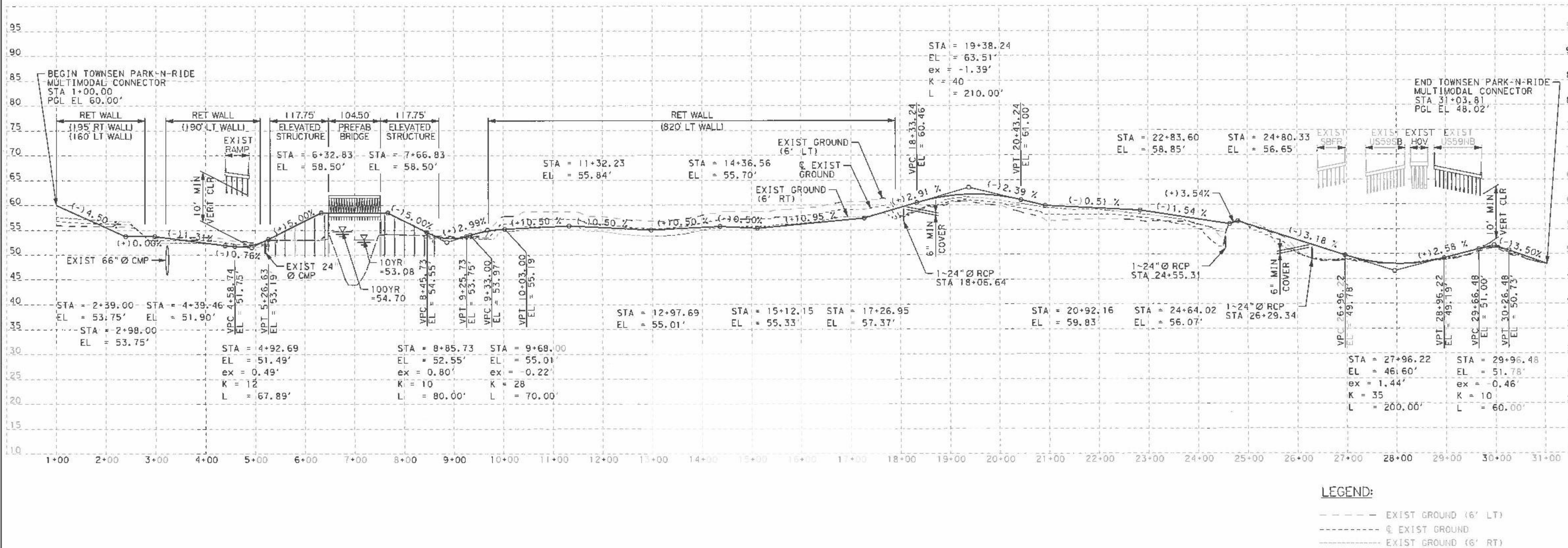
TEXAS P.E. #87943
ISSUED ON: JUL. 21, 2014

PROJECT TITLE: TOWNSEN PARK-N-RIDE
MULTIMODAL CONNECTOR
DRAWN BY: RH
CK'D BY: WW
SHEET DESCRIPTION: US 59 TURNAROUND CROSSING
SCALE: 1"=10'
DATE: JUL 2014
APPROVED BY:
SHEET NO 10 / 11



NO.	REVISIONS	DATE	NAME

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ISSUED ON: JUL. 21, 2014

PROJECT TITLE	TOWNSEN PARK-N-RIDE
DRAWN BY: RH	MULTIMODAL CONNECTOR
CK'D BY: WW	SHEET DESCRIPTION: TRAIL PROFILE
SCALE: 1"=10'V 1"=100'H	
DATE: JUL 2014	APPROVED BY
SHEET NO.	11 / 11

16.a

HARRIS COUNTY

Public Infrastructure Department
Architecture & Engineering Division

1001 Preston, 7th Floor
Houston, Texas 77002
(713) 755-5370

December 5, 2014

Vote of the Court:

	Yes	No	Abstain
Judge Emmett	☑	☐	☐
Comm. Lee	☐	☐	☐
Comm. Morman	☐	☐	☐
Comm. Radack	☐	☐	☐
Comm. Cagle	☐	☐	☐

Honorable County Judge
& Commissioners

Attention: Commissioner R. Jack Cagle

SUBJECT: Recommendation by the Director of Architecture and Engineering that Commissioners' Court Authorize the Submission of an Application to the Houston-Galveston Area Council for Construction Funding for the Townsen Park & Ride Multi-Modal Connector, Precinct 4

Dear Court Members:

The Architecture and Engineering Division respectfully requests that Commissioners' Court authorize submission of a grant application to the Houston-Galveston Area Council for potential inclusion of funding in the Transportation Improvement Program (TIP) in the amount of $1,444,725.12 for the construction of a Townsen Park & Ride Multi-Modal Connector. The purpose of the TIP program is to distribute federal funding to selected transportation projects of regional priority.

If funds are awarded, Precinct 4 would be required to commit $1,123,700.00 for related expenses as follows:

Engineering Cost:	$ 639,500.00
ROW Acquisition Cost:	$ 123,000.00
20% Local Matching Funds:	$ 361,200.00
Total:	$1,123,700.00

Your favorable consideration of the above request is sincerely appreciated.

Sincerely,

John Blount, P.E.
Director, Architecture & Engineering

JS- orig letter + order + copy backup
JB/BN/vht
Attachments

Presented to Commissioners' Court

DEC 16 2014

APPROVE cm

Recorded Vol._____ Page____

cc: Commissioner R. Jack Cagle, Pct. 4
Cheryl Guenther, Pct. 4
Pamela Rocchi, Pct. 4
Dennis Johnston, Pct. 4
Bill Lee, Pct. 4
Cindy Mayfield, Pct. 4
Arthur L. Storey, Jr., HCPID
Janice Maaskant, HCPID JMM
Mark Ables, HCPID
Reid Mrsny, HCPID
Loyd Smith, HCPID
Ron Jenson, HCPID
Nora Martinez, HCPID
Central File

Aud. copy

Eng. copy letter + cc order + orig backup

Budget (Pam) copy

j:\agenda.bid processing\lcourt\2014\budget mgmt agenda - 12-16-14 hgac grant - towsen.doc

2m. copy

finance - copy

Grant

HARRIS COUNTY, TEXAS

Office of Budget Management 1310 Prairie, Suite 530 Houston, Texas 77002 (713) 755-3301

Grants Coordination Section - Conveyance Form Application [X] Award [ ]

Department Name / Number	DUNs	Grant Title
PUBLIC INFRASTRUCTURE - 030	072206378	Townsen Park & Ride Multi-Modal Connector '15

Funding Source: U.S. Department of Transportation CFDA#		**Grant Agency:** Houston-Galveston Area Council	
Program Year:	1 st	**Program Ending:**	
Grant Begin Date:	06/01/2015	**Grant End Date:**	12/31/2017
Grant Org. Key:		**If applicable, Prior Year Org. Key:**	N/A

Grant Description:

Funded by the U.S. Department of Transportation via the Texas Department of Transportation via the Houston-Galveston Area Council, the Transportation Improvement Program provides grant funding for roadway, transit, bicycle and pedestrian, livable centers, and air quality projects.

	Total Budget	Grant Funded	County Funded
Salary & Benefits	$0.00	$0.00	$0.00
Non-Labor	$2,568,425.12	$1,444,725.12	$1,123,700.00
Sub Tot. Incremental Cost	**$2,568,425.12**	**$1,444,725.12**	**$1,123,700.00**
Indirect Cost	$0.00	$0.00	$0.00
TOTALS	**$2,568,425.12**	**$1,444,725.12**	**$1,123,700.00**

Full Time Equivalent Positions 0.00

% of Positions Paid by Grant 0.00 %

Date Guidelines are Available

Grant Submittal Deadline Date 01/12/2015

Grant Discussion:

The Public Infrastructure Department, in coordination with Precinct 4, is applying for grant funding of $1,444,725.12 under H-GAC's 2015 Transportation Improvement Program. Grant funds would be used for the construction of a multi-modal hike and bike trail that connects the Townsen Park and Ride bus terminal with the Spring Creek Greenway trail system in northeast Harris County. Precinct 4 would provide a match of $1,123,700, consisting of $361,200 for the required 20% match plus an additional $762,500 in discretionary funds for engineering and right of way acquisitions. Note: This grant would be administered by TxDOT, and the County would not actually receive any grant funds.

County Funded Cost Projection

Year	Required	Discretionary
2016	180,600.00	381,250.00
2017	180,600.00	381,250.00
2018	-	-
2019	-	-
2020	-	-

Completed by : Brian Schmitz Schmitz, Brian **Date :** 12/9/14

Reviewed by: **Date :** 12/9/14

ORDER

STATE OF TEXAS

COUNTY OF HARRIS

On this, the 16th day of December, 2014, the Commissioners' Court of Harris County, Texas, sitting as the governing body of Harris County, upon motion of Commissioner Cagle, seconded by Commissioner Morman, duly put and unanimously carried,

IT IS ORDERED that County Judge Ed Emmett or his designee be hereby authorized to approve, and on behalf of Harris County, Texas, to apply for, the following grant from the U.S. Department of Transportation via the Texas Department of Transportation via the Houston-Galveston Area Council:

TOWNSEN PARK & RIDE MULTI-MODAL CONNECTOR '15 – PUBLIC INFRASTRUCTURE DEPARTMENT

Grant Funds:	$1,444,725.12
Cash Match:	$1,123,700.00
Estimated Grant Period:	June 1, 2015 – December 31, 2017

Vote of the Court:

	Yes	No	Abstain
Judge Emmett	☑	☐	☐
Comm. Lee	☑	☐	☐
Comm. Morman	☑	☐	☐
Comm. Radack	☑	☐	☐
Comm. Cagle	☑	☐	☐

Presented to Commissioners' Court

DEC 16 2014

APPROVE clm

Recorded Vol.____ Page____

First Name
Dennis

Last Name
Johnston

Title
Parks Director

Primary Phone Number
(281)353-8100

Email Address
djohnston@hcp4.net

Project Title
Towsen Park-N-Ride Multimodal Connector

Project Sponsor
Harris County - Precinct 4

Has the project been submitted in a prior call?	
X	No
	Yes

Is the application requesting a minimum of $150,000?	
	No
X	Yes

Is this a joint application?	
X	No
	Yes

Does the proposed project scope qualify for use of a categorical exclusion (CE) and no unusual circumstances exist which would require additional environmental investigation?	
	No
X	Yes

Is the proposed project exempt from transportation conformity or regional emissions analysis?	
	No
X	Yes

Preliminary Questions

Project Narrative

Describe the primary problems to be addressed by the project (Project Need):
The US 59 to I-45 corridor is undergoing a tremendous surge in development due to the influx of employees associated with new development by energy companies such as Exxon-Mobil and Southwest. Construction of these huge company complexes is nearing completion. They are located right next to the Spring Creek Greenway Trail system and will be linked in the near future by the proposed Townsen Park-n-Ride Multi-Model Connection to the Metropolitan Transit Authority of Harris County, Texas (METRO) bus terminal at Townsen Park-N-Ride. It is important to establish linkage to an alternative transporation mode such as Park-n Ride bus terminals and existing anchor parks along exisitng greenwaytrail systems. Traffic Congestion occurs within the project area and with future growth, the congestion will increase providing a need for other forms of transportation and connectivity within the area.

Describe the primary outcomes to be achieved by the project (Project Purpose):
The proposed Townsen Park-n-Ride Multi-Model Connector will provide a critical link to public transportation, Ride-Share parking, the regional Spring Creek Greenway Trail project, the regional Cypress Creek Greenway Trail project, and over 100-miles of hike and bike trails located throughout the master planned community of Kingwood. Furthermore, residents living along the greenway in subdivisions from US 59 to I-45 will immediately benefit from the prospect of alternative transportation to the bus terminals at the Park-n-Ride as well as existing anchor parks along the developed greenway. The Townsen Park-n-Ride Multi-Model Connection takes the existing trails to another level creating a regional transportation hub and an alternative mode of transportation to METRO buses and downtown destinations for thousands of residents. Approximately 22,000 residents live within 5 miles of the Townsen facility as measured along the greenway trails. About 15,000 of these residents are 60-years of age or younger and would have the opportunity to utilize an alternate mode of transportation. Also health conscience residents of the region would have access to enjoy the Spring Creek Greenway experience and visit the Historic 1931 Bevil Jarrel Memorial Bridge using the METRO transportation network.

Describe the proposed improvement (Facility/Limits/Description):
The project is a proposed multimodal connector hike/bike trail that connects the Townsen Park-n-Ride with the regional Spring Creek Greenway trail system in northeast Harris County, Texas. The limits of the project are from the Townsen Park-n-Ride to the historic US 59 Bevil Jarrel Memorial Bridge. The project is approximately 0.7 miles in length and will affect 0.77 acres of land. The project area is located adjacent to the US 59 southbound frontage road, approximately 0.4 miles south of the San Jacinto River and 0.2 miles north of Townsen Boulevard. The 12' wide concrete trail will be routed mostly within TxDOT right-of-way (ROW) and includes a clear-span pedestrian bridge over a drainage ditch and under an existing frontage road bridge allowing pedestrians and cyclists to safely travel to their destination.

Describe any alternatives to the proposed improvement which have been considered or will be evaluated:
A no-build alternative was analyzed but was shown to not alleviate the mobility issues that will occur in the area. It was deemed that a no-build alternative would cause an environmental impact to the area. An alternate route was also analyzed, however utilities and ROW obstacles showed the alternative to be not cost effective.

Please describe any opportunities for staged construction of the project:
There is a possibility for staged construction but due to the length, it would be most productive to complete the project as a whole.

Project Development/Readiness

Has a scoping meeting been conducted with TxDOT or FTA?	
	No
X	Yes (Please attach a completed scoping checklist or meeting summary)

What level of environmental documentation is required for the proposed project?	
X	Categorical Exclusion (CE)
	Environmental Assessment (EA)
	Environmental Impact Statement (EIS)

Will any permits from the Army Corps of Engineers, US Coast Guard, railroad, etc. be required before the project can be constructed?	
X	No
	Yes - Please describe the permits needed and the timeline anticipated to acquire them:

Please provide an estimated completion date for the 30% Design/PS&E milestone:

Preliminary Questions

30% design is already completed

Will additional property, or interest in property (easement), be required to implement the project?	
	No
X	Yes
1 parcel (20,500 sf)	How many parcels or portions thereof remain to be acquired?
July 1, 2015	Please provide an estimated date for the completion of property acquisition necessary for construction activities to begin:

Has a utility evaluation been completed for the project?	
	No
X	Yes

Please describe the process for utility adjustments/relocations (entity responsible, financial responsibility, etc.):
Harris County Public Infrastructure Department (HCPID), through its engineering consultant, will be responsible for the utility coordination throughout the project with the assistance of TxDOT. HCPID will also be financially responsible for the cost of utility relocation. Minimal utilities are anticipated to be impacted in the project area. Preliminary on-the-ground surveys have been conducted for the 30% plans.

Preliminary Questions

Will the project improve or significantly affect infrastructure owned or operated by another agency?	
	No
X	Yes - Please describe the affect and supply evidence of support from the affected agency:
The project will improve the traffic flow and use of the Townsen Park-n-Ride for METRO. METRO is involved with and actively supports the project. METRO has plans to improve the Townsen Park-n-Ride due to the multimodal connector that is being proposed.	

Please describe previous and upcoming public involvement activities related to the proposed project:
Local landowners were identified and informed of the project intention. The process involving the acquisition of ROW from a property owner has already commenced. The property owner stated that he is supportive of the project and will comply with the need to acquire some of his property. Meetings with the City of Humble and METRO have also occurred and all involved with the project are supportive and receptive.

Please provide any additional project development/readiness information relevant to the proposed project:
The 30% design is complete along with several environmental documents to speed up environmental clearance for the project. Cultural Resources, Natural Resources, and Environmental Constraints have already been completed for the project.

Map/Location

Please provide a clear and concise GIS coverage or PDF map of the proposed project (*.mpk ESRI Map Package file preferred):
Attachment

Benefit /Cost Methodology – Ped/Bike

H-GAC to conduct analysis based on the GIS/map project location and project scope information provided
See preliminary questions tab.

Planning Factors - Ped/Bike

Design Standards

Does proposed facility meet or exceed AASHTO design guidelines for pedestrian and/or bicycle facilities?	
	No
X	Yes - Please explain:
AASHTO design guidelines for pedestrian and/or bicycle facillites were used for the design.	

Connectivity

15 pts - Does proppsed facility provide safe and convenient routes across barriers, such as freeways, railroads, and waterways or does proposed facility close a gap in the existing bicycle network that align with a regional bikeway shown on the Regional Bikeway Concept Map? Please identify location of barriers on map/GIS provided above.	
	No
X	Yes - Please explain:
The multimodal connector crosses under US 59 and over Blacks Branch and the San Jacinto River to connect the Townsen Park-n-Ride with the regional Spring Creek Greenway trail system and Kingwood. Thls alignment avoids high volume traffic routes and spans the Black's Branch waterway providing a safe and convenient route for pedestrians and bicyclists to cross under US 59 to gain access to the trail system.	

15 pts - Does proposed facility directly connect to existing pedestrian and bicycle facilities? Please identify location of connections on map/GIS provided above.	
	No
X	Yes - Please explain:
The proposed multimodal connector will connect the METRO Townsen Park-n-Ride planned biking facilities with the regional Spring Creek Greenway trail system and other surrounding pedestrian and bicycle facilities.	

15 pts - Does proposed facility provide or demonstrate the potential for a transit connection: Please identify location of connections on map/GIS provided above.	
	No
	3 pts - Project demonstrates potential for future transit connection - Please explain:
	5 pts - Project is thin 0.26-0.50 mi of a transit connection - Please explain:
	10 pts - Project is within 0.25 mi of a transit connection - Please explain:
X	15 pts - Project provides a direct link to a transit connection - Please explain:
The proposed project directly connects to the Townsen Park-n-Ride facility operated by METRO.	

10 pts - Does proposed facility provide connections to regional destinations? Please identify location of connections on map/GIS provided above.	
	No
	10 pts - Provides a connection to or within activity centers*?
X	7 pts - Located outside of an activity center, but directly connects to one or more points of interest? - Please explain:

The project connects to regional points of interest such as the Historic 1931 Bevil Jarrel Memorial Bridge, Townsen Park-n-Ride, the regional Spring Creek Greenway trail system, and access to the Deerbrook Mall and surrounding commercial developments.
** Density thresholds for different types of activity centers are defined within the Livable Centers Benefits Calculator, which is available online at http://www.h-gac.com/community/livablecenters/tools.aspx. Project area is considered within a ½-mile radius of the project location.*

Pilot Projects

	5 pts - Is the proposed facility a pilot or first-time facility (no other facility of this type exists within a jurisdiction or with a 5 mile radius of proposed facility) ?
	No
X	Yes - Please explain:
The proposed multimodal connector is the first in Harris County Precinct 4 to connect a Park-n-Ride with an existing trail system.	

Safety

	15 pts - Does proposed facility: ***Note: - Project will be awarded:*** ***15 points if three or more of the aforementioned characteristics are met.*** ***10 points if two of these characteristics are met.*** ***5 points if one of these characteristics is met.***
X	Provide pedestrian and/or bicycle facilities along a major corridor that are separated from vehicular traffic by a barrier or provides dedicated bicycle facilities along a low volume, low-speed roadway that parallels a major corridor (within 1/2 mile)?
	Provide a new or improved pedestrian and/or bicycle connection to a school?
X	Provide exceptional accommodations for pedestrians and or bicyclists at intersections, mid block crossings or locations where there have been two or more documented collisions between pedestrian/bicyclists and motor vehicles over the past five years?
X	Correct existing pedestrian and bicycle facilities that do not comply with current ADA?
Because of this project, METRO will provide Bicycle facilities at the Townsen park-n-ride facility that will comply with ADA thus correcting non-existing bicycle facilities	

Existing Plans/Studies

	10 pts - Is proposed facility identified within and H-GAC Special Districts Study, an H-GAC Livable Centers Study or a comparable multi-jurisdictional or local plan study?
X	No
	Yes - Please explain:
The project is outside of these aforementioned areas.	

Funding Leverage

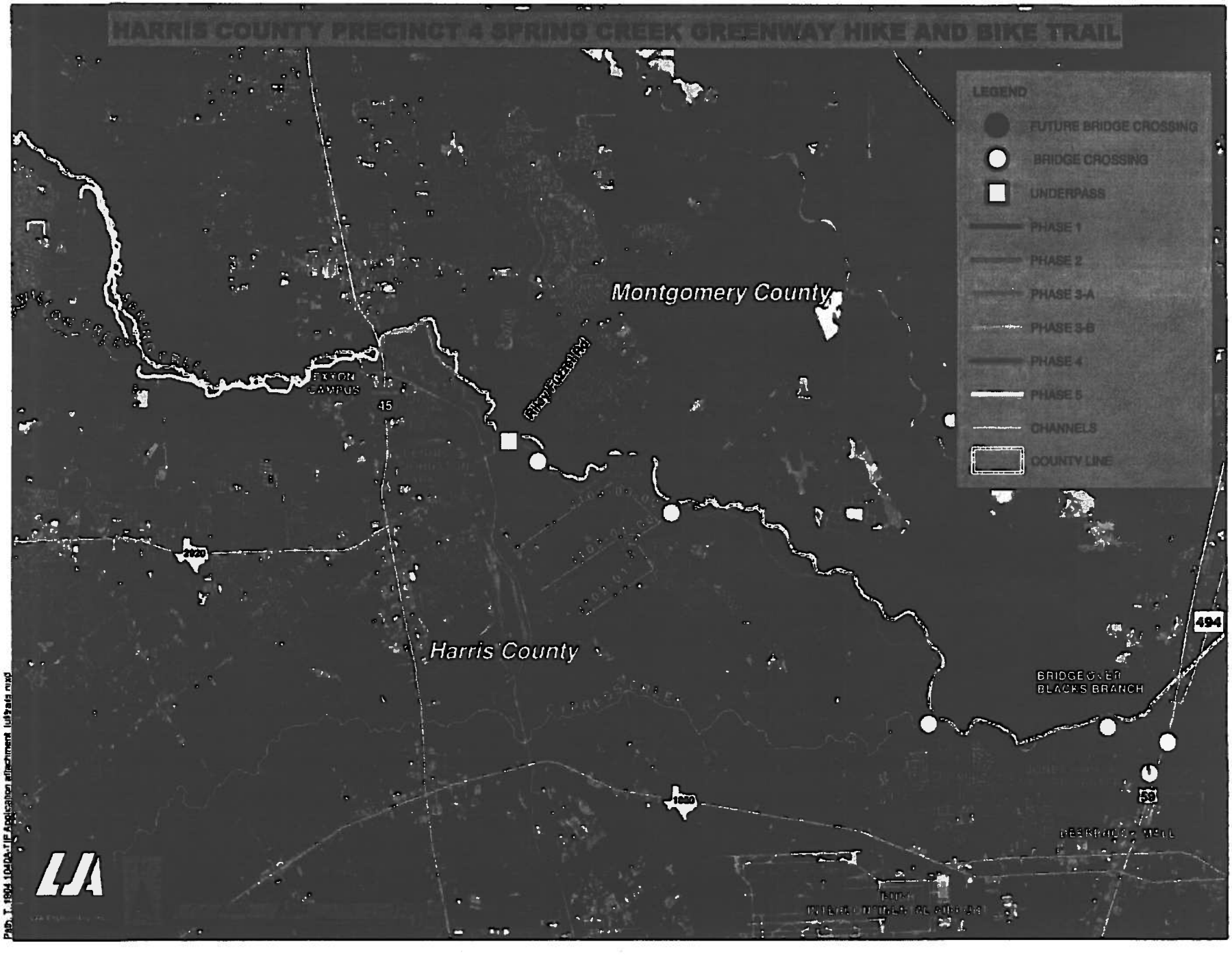
	5 pts - Proposed facility leverages additional funding:
	Neither
	Sponsor has committed to provide more than 20% of local match
	Leverages funding through partnerships to meet or exceed the 20% match

X	Both
Harris County alone plans to provide more than 20% of local match and METRO also will provide funding for their portion of the project.	

Underserved Population Access

10 pts - Is all or part of the proposed facility located within a Census Tract that has a higher proportion of the following populations than the regional average; H-GAC to conduct analysis based on the GIS/map project location provided above **Note - Project will be awarded:** **3 points if one of the aforementioned indicators is above the regional average** **7 points if two of the aforementioned indicators is above the regional average** **10 points if three of the aforementioned indicators is above the regional average**	
	Minority populations
	Low income households
	Senior populations (over age 65)
	Limited Educational attainment
	Zero automobile ownership
	Female head of household
	Limited English proficiency


TOWNSEN PARK-N-RIDE TIP APPLICATION
LEGEND
BUS STOPS
PARK-N-RIDE
BRIDGE CROSSING
SCHOOLS
PROJECT ALIGNMENT
PROJECTED TRAIL
RAILROAD
CHANNELS
494
59
LOOP 494
HAMBLEN RD
PROJECT ALIGNMENT
W TOWNSEN BLVD
TOWNSEN PARK-N-RIDE
E TOWNSEN BLVD
59
1960
LJA


HARRIS COUNTY PRECINCT 4 SPRING CREEK GREENWAY HIKE AND BIKE TRAIL
LEGEND
FUTURE BRIDGE CROSSING
BRIDGE CROSSING
UNDERPASS
PHASE 1
PHASE 2
PHASE 3-A
PHASE 3-B
PHASE 4
PHASE 5
CHANNELS
COUNTY LINE
Montgomery County
Harris County
EXXON CAMPUS
45
2920
494
59
1960
BRIDGEWATER BLACKS BRANCH

Memorandum

To: Wilson Wong, P.E.

From: Chad Johnson, P.E., CFM

Date: July 2, 2014

Re: Townsen Park and Ride Pedestrian Bridge
LJA Job No. 1904-1040A

As requested we have performed a preliminary analysis to determine the feasibility of the construction of a pedestrian bridge over Black's Branch (HCFCD Unit Number G103-48-00) near Townsen Blvd. and US 59 in northeast Harris County, Texas.

Our preliminary analysis was based on the preliminary schematics you provided us for the proposed trail and bridge. The analysis was performed based on the models available through the Harris County Flood Control District (HCFCD) Map and Model Management System (M3).

For the analysis, we added three cross sections to the model in order to more accurately model the proposed bridge. The cross sections were modified to reflect the proposed trail and bridge, and the proposed bridge was added to the model based on the preliminary schematics.

Based on our analysis, the bridge and trail as presented in the preliminary schematics can be constructed without any adverse impacts on water surface elevations on Black Branch for all events up to and including the one-percent exceedance probability event as shown in the following tables.

Table 1- Comparison of Water Surface Elevations						
	10% Exceedance Probability Event			1% Exceedance Probability Event		
RAS Station	Existing Condition	Proposed Condition	Diff	Existing Condition	Proposed Condition	Diff
6682.849	54.76	54.76	0	56.23	56.22	-0.01
6615.872	54.81	54.81	0	56.17	56.17	0
5915.559	53.79	53.79	0	55.47	55.46	-0.01
5798.855	53.67	53.67	0	55.2	55.2	0
5448.7	53.48	53.48	0	54.97	54.97	0
5344.35	53.42	53.42	0	54.91	54.9	-0.01
5326.81	Ped. Bridge					
5282.18	53.39	53.39	0	54.87	54.86	-0.01
5233.642	53.08	53.07	0.01	54.7	54.63	-0.07
5170.231	52.91	52.91	0	54.39	54.39	0

Table 2 - Comparison of Energy Grade Elevation						
	10% Exceedance Probability Event			1% Exceedance Probability Event		
RAS Station	Existing Condition	Proposed Condition	Diff	Existing Condition	Proposed Condition	Diff
6682.849	55.23	55.23	0	56.34	56.34	0
6615.872	54.98	54.98	0	56.29	56.29	0
5915.559	54.1	54.1	0	55.71	55.71	0
5798.855	53.94	53.94	0	55.57	55.57	0
5448.7	53.64	53.64	0	55.21	55.2	-0.01
5344.35	53.58	53.58	0	55.12	55.12	0
5326.81	Ped. Bridge					
5282.18	53.54	53.54	0	55.08	55.07	-0.01
5233.642	53.48	53.47	0.01	55.02	55.01	-0.01
5170.231	53.34	53.34	0	54.88	54.88	0

As shown in the tables, there are no increases in water surface elevation or Energy Grade with the proposed construction. This analysis only addressed the proposed trail and bridge and did not consider any other possible development in the area.

Intensive Cultural Resources Survey of the Townsen Park-N-Ride Multimodal Connector Harris County, Texas

Prepared for

LJA Engineering and Surveying, Inc.

Prepared by

SWCA Environmental Consultants

SWCA Project No. 29327

June 11, 2014

INTENSIVE CULTURAL RESOURCES SURVEY OF THE TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR, HARRIS COUNTY, TEXAS

Prepared for

LJA Engineering and Surveying, Inc.
2929 Briarpark Drive, Suite 600
Houston, Texas 77042
Attn: Omar Escabar
713-953-5076

Prepared by

Kevin J. Pintz and Rebecca Mehok

Rebecca Mehok
Principal Investigator

SWCA Environmental Consultants
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Houston, Texas 77040
www.swca.com

SWCA Project No. 29327

June 11, 2014

ABSTRACT

The following report describes an intensive cultural resources survey of portions of the proposed Townsen Park-N-Ride Multimodal Connector Hike/Bike Trail on behalf of LJA Engineering and Surveying, Inc. and Harris County Public Infrastructure Department (HCPID). The project area is located in northeast Harris County, Texas and will be approximately 2,805 feet in length and will affect 0.77 acres of land. The project area is located adjacent to the Highway 59 southbound feeder road, approximately 0.4 miles south of the San Jacinto River and 0.2 miles north of Townsen Boulevard. Current project plans call for the construction of a hike and bike trail connecting the existing Townsen Park-N-Ride with recreational trails in the area.

The investigation included an archaeological background literature and records review and an intensive pedestrian survey with shovel testing. Archaeological investigations were performed as part of the sponsor's compliance with application requirements for a U.S. Army Corps of Engineers (USACE) Galveston District, Section 404 permit in accordance with 33 Code of Federal Regulations (CFR) Part 325, Appendix C (Processing Department of Army Permits: Procedures for the Protection of Historic Properties; Final Rule 1990; with current Interim Guidance Document dated April 25, 2005). Work was also completed in compliance of the Antiquities Code of Texas (Antiquities Permit No. 6894) and Section 106 of the National Historic Preservation Act (NHPA), as amended, and with guidelines set forth by the Texas Historical Commission (THC)/Texas State Historic Preservation Office (SHPO).

A background literature review revealed that the project area had not been previously surveyed for cultural resources. There have been eight cultural resource surveys conducted within 1 mile of the project area; none of these intersect with the project area. The background research indicates that there are six previously recorded archaeological sites within 1 mile of the project area; none of these are located within or adjacent to the proposed alignment. The project area does intersect with the Bevil Jarrell State Highway 35 Bridge, which is listed on the National Register of Historic Places. The proposed trail will intersect with the existing concrete ramps and will not alter the design of the bridge.

Prior to field investigations, SWCA developed and submitted a Texas Antiquities Permit application and associated scope of work to the THC for review and approval (Texas Antiquities Permit No. 6894). Following the approval, SWCA conducted investigations over portions of the project area that extend outside of the existing Texas Department of Transportation (TxDOT) right-of-way. Investigations included a systematic walk-over survey and subsurface shovel testing.

During the field investigation, an archaeologist examined approximately 825 feet of the proposed trail that was located outside of the cleared and maintained TxDOT right-of-way. SWCA excavated three shovel tests within the project area; none were positive for cultural material. The project area showed signs of disturbance due to its location adjacent to the Highway 59 feeder road and associated concrete retaining walls and culverts, an existing transmission line, and a modified creek. The project will intersect with the existing ramps associated with the NHRP listed State Highway 35 bridge, but it will not alter the design or function of the bridge.

In accordance with the Antiquities Code of Texas, Section 106 of the NHPA, as amended, (36 CFR 800.4), and 33 CFR Part 325, Appendix C, SWCA has made a reasonable and good faith effort to identify archaeological historic properties within the project area. Based on the results of these investigations, it is SWCA’s opinion the proposed action would have no adverse effect (per 36 CFR 800.5[b]) on any properties listed or otherwise eligible for listing in the NRHP.

CONTENTS

APPENDICES

FIGURES

TABLES

MANAGEMENT SUMMARY

Project Title. Intensive Cultural Resources Survey of the Townsen Park-N-Ride Multimodal Connector, Harris County, Texas.

SWCA Project Number. 29327

Project Description. HCPID proposes to construct a hike/bike trail that will connect to existing trails in the area.

Location. The project is located adjacent to Highway 59 southbound feeder road, approximately 0.4 miles south of the San Jacinto River and 0.2 miles north of Townsen Boulevard.

Number of Miles Surveyed. Approximately 2,805 miles (0.77 acres) of land was examined. Approximately 825 feet of this length fell outside of the TxDOT ROW and was subjected to intensive pedestrian survey and shovel testing.

Principal Investigator. Rebecca Mehok

Purpose of Work. The construction of the proposed hike/bike trail will connect the existing Townsen Park-N-Ride facility with recreational trails in the area.

Number of Sites. No new sites identified and there are no previously recorded sites located within the project alignment.

Eligibility. No archaeological sites identified in the project area. The project will connect to existing ramps associated with the NRHP listed State Highway 35 Bridge. The design or function of the bridge will not be affected by the current work.

Curation. No artifacts were encountered; therefore, nothing will be curated.

Comments. In accordance with the Antiquities Code of Texas, Section 106 of the NHPA, as amended, (36 CFR 800.4), and 33 CFR Part 325, Appendix C, SWCA has made a reasonable and good faith effort to identify archaeological historic properties within the project area. Based on the results of these investigations, it is SWCA's opinion the proposed action would have no adverse effect (per 36 CFR 800.5[b]) on any properties listed or otherwise eligible for listing in the NRHP.

INTRODUCTION

The following report describes an intensive archaeological survey of the proposed Townsen Park-N-Ride Multimodal Connector located in northeast Harris County, Texas. The proposed project alignment encompasses approximately 2,805 feet (0.77 acres) of linear trail. The project corridor is adjacent to the Highway 59 southbound feeder road, approximately 0.4 miles south of the San Jacinto River, and 0.2 miles north of Townsen Boulevard. (Figure 1). Current project plans call for the construction of a hike/bike trail connecting the existing Townsen Park-N-Ride with several recreational trails in the area.

Based on a review of the project area soils, geology, recorded archaeological sites, and the results of previously conducted surveys in the area, SWCA conducted an intensive archaeological survey, including a pedestrian survey augmented by shovel testing across portions of the project alignment located outside of the previously cleared and maintained TxDOT right-of-way. The goal of the work was to determine if any previously undocumented archaeological sites are located within the project area. All work was done in accordance with the standards and guidelines of the Texas Antiquities Code (TAC), and in accordance with 33 Code of Federal Regulations (CFR) Part 325, Appendix C and the National Historic Preservation Act (NHPA), as the project will require authorization under Section 404 of the Clean Water Act (CWA). The overall approach will ensure that all project related impacts are investigated thoroughly for their potential to affect cultural resources present within the project area.

Project Description

HCPID proposes to construct a hike and bike trail connecting the existing Townsen Park-N-Ride with several existing recreational trails in the area. The project area is located just adjacent to the Highway 59 southbound feeder road, approximately 0.4 miles south of the San Jacinto River, and 0.2 miles north of Townsen Boulevard.

Land in the project vicinity consists of a mix of undeveloped, residential, and commercial properties. The current 2,805-foot-long project area contains some undeveloped land, but is adjacent to the existing maintained TxDOT right-of-way (ROW). The trail will connect to the existing ramps associated with the State Highway 35 Bridge, run under the bridge to the west, and then turn south to run along the Highway 59 feeder road. The trail will then continue south across an existing channelized bayou to intersect with the Townsen Park-N-Ride facility. In order to construct the proposed trail the depth of excavations would be limited to 12 to 18 inches of soil disturbance in areas that are not already covered in concrete.

ENVIRONMENTAL SETTING

Geology

The geology project area is mapped as Holocene or Late Pleistocene-age Deweyville Formation (Qd). The Deweyville Formation is composed of sand, silt, clay, and gravel (Barnes 1992). This formation includes point bar, natural levee, and sand dune deposits. There may be some areas where the remnants of meanders are present (Barnes 1992).

Soils

Soils within the project area include Kamen clay, Ozan loam, and Voss sand. The Kamen series consists of very deep, poorly drained, very slowly permeable soils on flood plains (NRCS 2014). The Ozan series

consists of deep, poorly drained, slowly permeable soils formed in loamy alluvium (NRCS 2014). Voss sand is formed from very deep, sandy sediments (NRCS 2014).

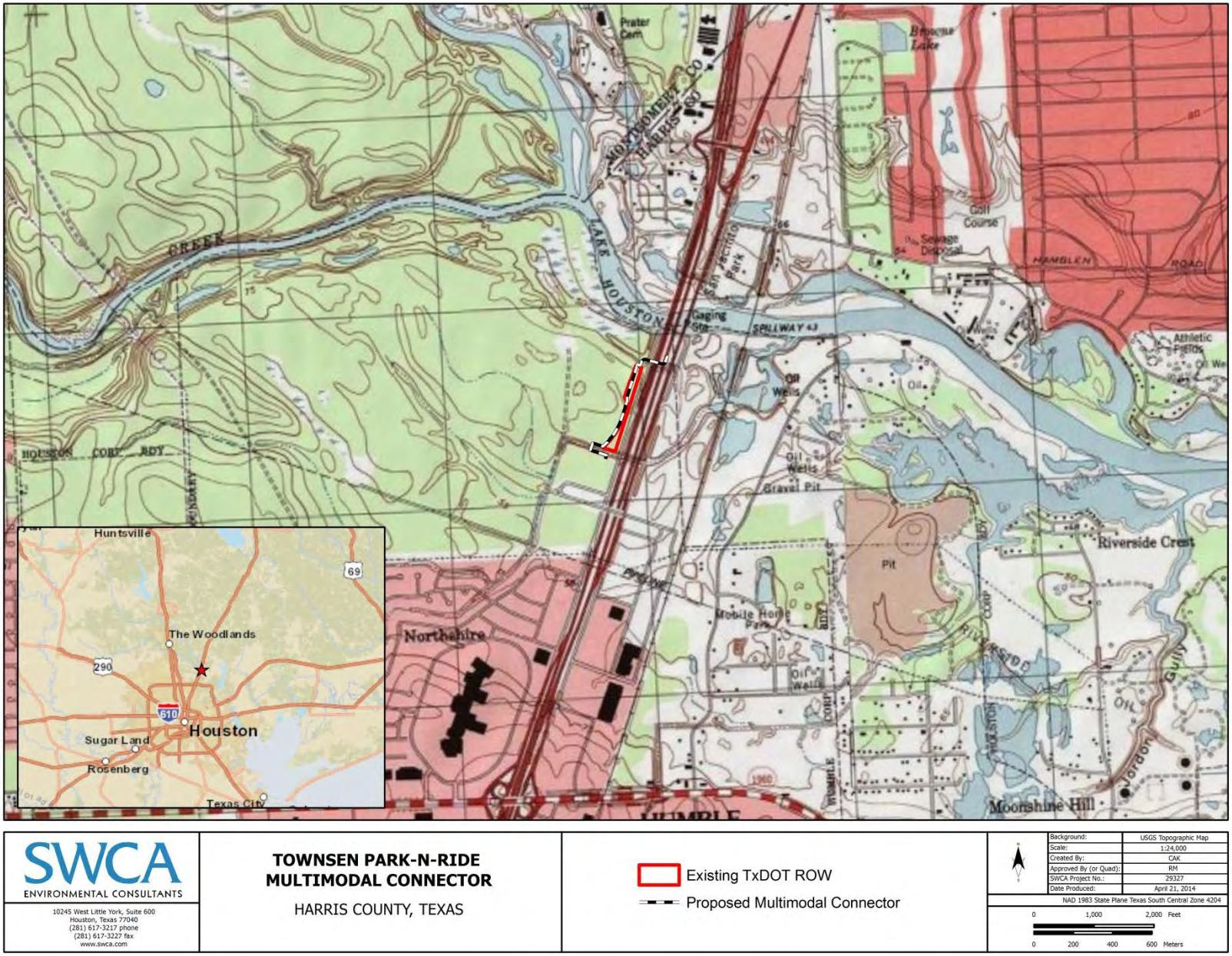

Figure 1. Project location map.

Houston PALM

According to Abbott's 2001 Houston-PALM, a guide to archaeological potential related to geomorphology in the Harris County area, the project area is mapped within Map Units 3 and 3a. Both Map Units recommend no surface survey, but deep testing is recommended if deep impacts are anticipated (Abbott 2001).

Vegetation

SWCA biologists identified four vegetation communities within or adjacent to the proposed project area; herbaceous upland, scrub-shrub upland, palustrine emergent (PEM) wetland, and palustrine forested (PFO) wetland (SWCA 2014). Species identified at each data point were recorded in the data sheets along with aerial coverage and wetland indicator status. Examples of common species identified within each vegetation community are provided in the following discussion.

The herbaceous upland community occurs throughout the existing ROW in the project area. The dominant herbaceous species within the herbaceous upland community are perennial ryegrass, cereal rye (*Secale cereale*), Carolina geranium (*Geranium carolinianum*), garden vetch (*Vicia sativa*), and tuberous vervain (*Verbena rigida*) (SWCA 2014).

The scrub-shrub upland community occurs outside of the existing ROW in the project area. The tree and sapling/shrub layer is dominated by yaupon (*Ilex vomitoria*), sweetgum (*Liquidambar styraciflua*), American beautyberry (*Callicarpa americana*), and redbay (*Persea borbonia*). The herbaceous layer was dominated by redbay and sassafras (*Sassafras albidum*). A vine layer of muscadine (*Vitis rotundifolia*) was also observed (SWCA 2014).

The PEM wetland occurred within the proposed corridor. The PEM was comprised of an herbaceous layer dominated by alligator weed (*Alternanthera philoxeroides*), perennial ryegrass (*Lolium perenne*), pennywort (*Hydrocotyle verticillata*), common rush (*Juncus effusus*), Pennsylvania smartweed (*Polygonum pennsylvanicum*), black medic (*Medicago lupulina*), and reversed clover (*Trifolium resupinatum*) (SWCA 2014).

The PFO wetland occurred adjacent to, but outside of the ROW for the proposed project. The PFO was comprised of a tree and sapling shrub layer dominated by bald cypress (*Taxodium distichum*). An herbaceous layer was dominated by lizard's tail (*Saururus cernuus*), Cherokee sedge (*Carex cherokeensis*), and giant ragweed (*Ambrosia trifida*). A vine layer of muscadine (*Vitis rotundifolia*) and peppervine (*Ampelopsis arborea*) was also observed (SWCA 2014).

METHODS

Background Review

The background review consisted of a cultural resource and environmental literature review of the project area. An SWCA archaeologist reviewed the corresponding U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps on the *Texas Archaeological Sites Atlas* (TASA) online database for any previously recorded surveys and historic or prehistoric sites located in or near the project area. Site files, relevant maps, National Register of Historic Places (NRHP), and State Antiquities Landmark (SAL) listings were examined. These sources provided information on the nature and location of previously conducted archaeological surveys and previously recorded cultural resource sites. The Texas Historic

Sites Overlay, aerial photographs, Bureau of Economic Geology Maps, and the NRCS Web Soil Survey, were also examined for historical and environmental information related to the project area.

Field Methods

Prior to field investigations, SWCA developed and presented a scope of work to the THC for review and approval. The methodology described in the scope of work included an intensive survey of the portions of the project alignment that extend outside of the existing TxDOT ROW. The cultural resources survey was sufficient in intensity to determine the nature, extent, and if possible, significance of any cultural resources located within the project area.

The general survey consisted of an archaeologist walking the project area while examining the ground surface, documenting modifications and disturbances, and utilizing shovel tests and cutbank exposures to test for subsurface archaeological deposits and assess the geomorphic setting of the area.

During the survey, the SWCA archaeologist examined the ground surface and eroded profiles for cultural resources. Shovel testing was the general method of subsurface explorations utilized during the survey. The utilization of shovel tests was keyed to the level of disturbance within the area and the nature of the soils, geology, and topography. Shovel tests were approximately 30 cm in diameter and excavated in 20-cm arbitrary levels to culturally sterile deposits. The matrix was screened through ¼-inch mesh. The location of each shovel test was plotted using a global positioning system (GPS) receiver, and each test was recorded on appropriate project field forms.

Excavations were conducted to the depth of project impacts and in compliance with THC standards. The survey was of sufficient intensity to determine the nature, extent, and significance of any cultural resources located within the investigated project area. No deep testing was undertaken as it is anticipated that project impacts will be limited to 12 to 18 inches in depth. The survey met all THC minimum archaeological survey standards for such projects with any exceptions thoroughly documented.

RESULTS

Background Review

The background review revealed that the proposed project alignment has not been previously surveyed for cultural resources; however, eight cultural resource investigations had been conducted within a 1 mile radius of the project alignment. These included five area surveys and three linear surveys (Table 1) (TASA 2014). The cultural resource surveys were conducted for infrastructure development through various agencies. It is also suspected that the existing Highway 59 ROW and associated feeder roads have been surveyed for cultural resources. A report of these investigations was not available for review.

Table 1. Previous cultural resource surveys within 1 mile of the project area.

Distance to Project Area	TAP #	Year	Description	Sponsoring Agency	Additional Information
0.26 mi	1711	1996	Linear Survey	Unknown	Townsen Blvd West ROW
Adjacent	6469	2014	Linear Survey	HCP4-PD	Spring Creek Greenway Phase IV
0.21 mi	None	2003	Area Survey	USACE	Townsen Plaza Shopping Center
0.53 mi	None	1993	Linear Survey	FHWA	No additional information provided
0.28 mi	None	2001	Area Survey	USACE	Super Target Center
0.28 mi	None	2001	Area Survey	USACE	Super Target Center Borrow Pits
0.83 mi	None	1990	Area survey	COE-VD	No additional information provided

0.56 mi	4765	2005	Area survey	FHA	No additional information provided

The background review also revealed that there are six archaeological sites located within 1 mile of the project area (TASA 2014). These are listed in Table 2. None of these sites are located within the proposed project alignment, and therefore will not be impacted.

Table 2. Previously recorded sites within 1 mile of the project alignment.

Type	Site No	Distance to Project Area	Date	Description	NRHP Eligibility
Site	41HR412	w/in 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Undetermined
Site	41HR413	w/in 1 mile	Undefined Historic	Surface Historic Scatter	Not Eligible
Site	41HR1146	w/in 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Undetermined
Site	41HR1147	w/in 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Undetermined
Site	41HR1148	w/in 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Undetermined
Site	41HR1149	w/in 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Not Eligible

The Bevil Jarrell State Highway 35 Bridge, located north of the project area, meets Natural Register Criterion C in the area of engineering at the state level of significance. The current project will tie into existing ramps associated with this bridge, but will not alter the design or function of the bridge.

Field Investigations

On June 2, 2014, an SWCA archaeologist investigated portions of the proposed Townsen Park-N-Ride Multimodal Connector project alignment. The level of investigation was keyed to the topographic setting as well as the level of disturbance identified within the project area. Overall, the project area appeared to have been substantially altered as a result of the construction of Highway 59, the feeder roads, and the associated concrete retaining walls and culverts. There is also an existing transmission line and a channelized bayou located within the project area.

Subsurface investigations were concentrated in the areas of the alignment that were located outside of the existing, maintained TxDOT ROW. A total of three shovel tests were excavated; none were positive for cultural material (Figure 2). As described in the vegetation section, the project area was covered in a combination of scrubby trees and secondary growth. Ground surface visibility was limited throughout the project area (Figures 3 through 6).

Shovel test profiles were variable throughout surveyed alignment; likely the result of previous construction events including the creation of Highway 59 and the associated structural improvements. A typical shovel test contained two strata in profile. Stratum I extended from ground surface to 23 cmbs and consisted of a light brownish gray (10YR 6/2) sand. Stratum II extended from 23 cmbs to 100 cmbs and consisted of a very pale brown (10YR 7/3) coarse sand terminating due to depth.

The very northern end of the project area intersects with the existing pedestrian ramps associated with NRHP listed Bevil Jarrell State Highway 35 bridge. The bridge was listed on the NRHP in 1996 as part of the Historic Bridges of Texas (1866 to 1945) initiative. The bridge consists of two 200-foot-long truss spans and 30 concrete approach spans. It was originally constructed in 1930 and 1931 and was in use until the new Highway 59 bridge was constructed from 1997 to 1999; this was associated with the larger expansion of the Highway 59 in northern Harris County. The bridge has seen some limited repairs, but it maintains integrity of location, setting, feeling and association (TASA 2014; Figures 7 and 8). The current project plans would not alter the design or function of the bridge. The proposed trail would provide greater visitor access to the bridge; however, this traffic will be limited to pedestrian and non-vehicular traffic.

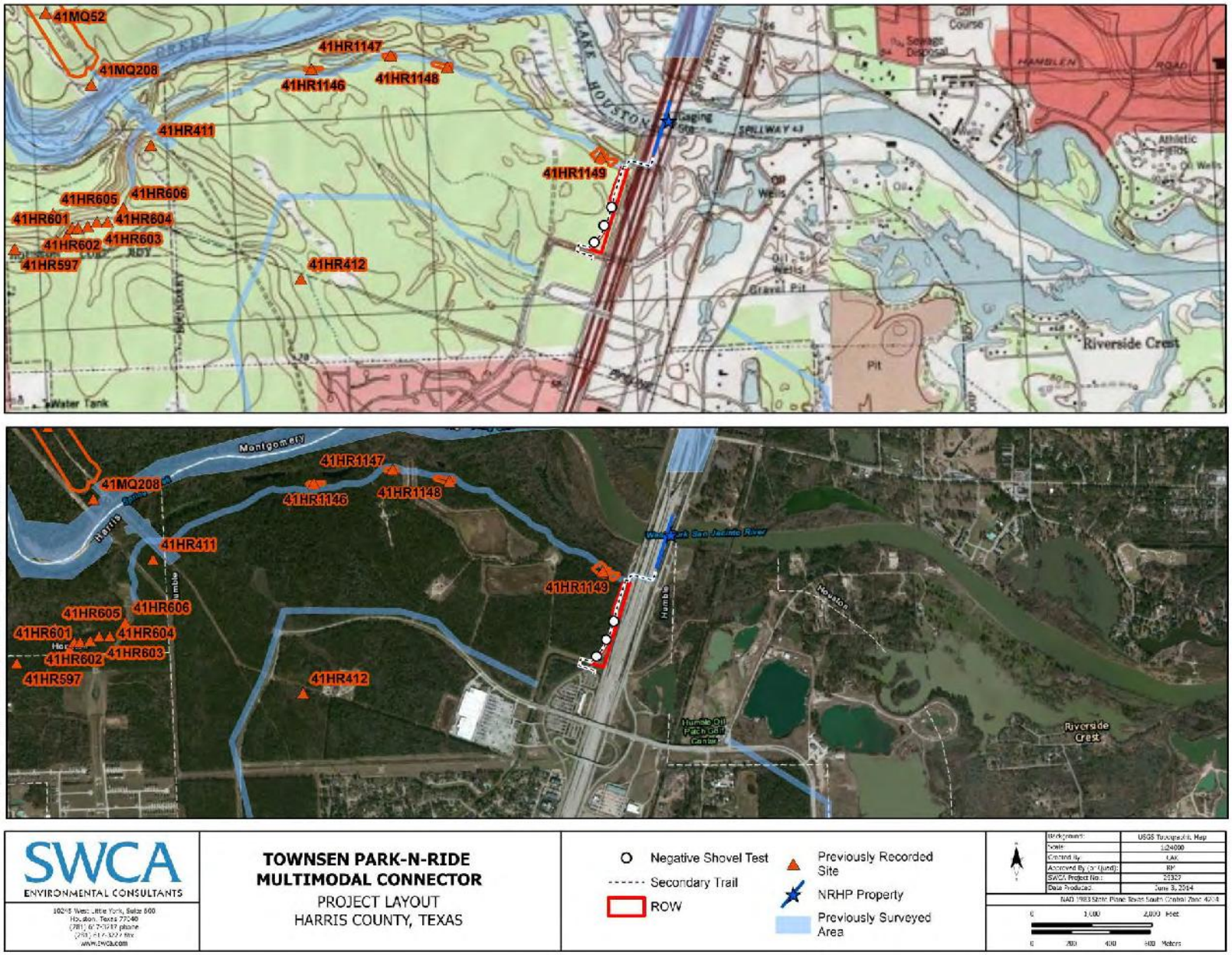

Figure 2. Project layout map.

Figure 3. Overview of project alignment from midpoint, view south.

Figure 4. Overview of project alignment from end of survey, view north.

Figure 5. Highway 59, feeder road, and associated improvements to drainage, view east.

Figure 6. Overview of improved drainage (channelized bayou), view west

Figure 7. Existing concrete ramps, Bevil Jarrell State Highway 35 bridge, facing north.

Figure 8. Overview of Bevil Jarrell State Highway 35 bridge, facing north.

SUMMARY AND RECOMMENDATIONS

On behalf of HCPID, SWCA conducted an intensive archaeological survey for the proposed Townsen Park-N-Ride Multimodal Connector hike and bike trail in Harris County, Texas. SWCA's investigations were performed in compliance with the Antiquities Code of Texas (Antiquities Permit No. 6894) and Section 106 of the NHPA, and included a background review and an intensive pedestrian survey with shovel testing to systematically identify, record, and determine the significance of any cultural resources located within the project area.

Overall, the project area exhibited extensive ground disturbance due to the construction of Highway 59 and its associated features, a transmission line, and a channelized bayou. No new cultural resources or evidence of cultural features were identified within the project area.

The project will connect to the existing ramps associated with the Bevil Jarrell State Highway 35 Bridge, which is listed on the NRHP. The design or function of the bridge will not be altered by the current project.

In accordance with the Antiquities Code of Texas, Section 106 of the NHPA, as amended, (36 CFR 800.4), and 33 CFR Part 325, Appendix C, SWCA has made a reasonable and good faith effort to identify archaeological historic properties within the project area. Based on the results of these investigations, it is SWCA's opinion the proposed action would have no adverse effect (per 36 CFR 800.5[b]) on any properties listed or otherwise eligible for listing in the NRHP.

REFERENCES

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2001 *Houston Area GeoArcheology: A Framework for Archaeological Investigation, Interpretation, and Cultural Resource Management in the Houston Highway District*. Texas Department of Transportation, Environmental Affairs Division, Archeological Studies Program Report 27. Austin.

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2014 Official Soil Series Descriptions. Natural Resources Conservation Service, U.S. Department of Agriculture. Available at: http://soils.usda.gov/technical/classification/osd/index.html Accessed June 02, 2014.

SWCA Environmental Consultants

2014 *Natural and Cultural Resources Assessment for the Townsen Park-N-Ride Multimodal Connector, Harris County, Texas.* Produced for Harris County Public Infrastructure Department.

APPENDIX A

Shovel Test Log

Segment	Temporary Site #	Shovel Test #	Level	Depth (cmbs)	Negative or Positive	Munsell	Soil Texture Description	Reason for Termination	Comments
Segment 1		KP1	1	0-23	N	10YR6/2	Sand		Flat floodplain in hardwood forest with dense secondary growth, Adjacent to Highway 59 feeder road and transmission corridor
Segment 1		KP1	2	23-100	N	10YR7/3	Sand	Depth	
Segment 1		KP2	1	0-15	N	10YR5/2	Sandy loam		Flat floodplain in hardwood forest with dense secondary growth, Adjacent to Highway 59 feeder road and transmission corridor
Segment 1		KP2	2	15-35	N	10YR6/2	Sandy loam		
Segment 1		KP2	3	35-50	N	10YR4/2 mottled with 10YR5/1	Sandy clay with Iron Oxide inclusions	Compact soil	
Segment 1		KP3	1	0-35	N	10YR4/2	Sandy loam		Flat floodplain edge of hardwood forest with dense secondary growth, adjacent to Highway 59 feeder road, transmission corridor and concrete retaining wall. Approaching improved drainage
Segment 1		KP3	2	35-80	N	10YR6/3 mottled with 10YR6/4	Sand with slight Iron oxide inclusions	Compact soil	

Natural and Cultural Resources Assessment for the Townsen Park-n-Ride Multimodal Connector Harris County, Texas

Prepared for

LJA Engineering, Inc.

Prepared by

SWCA Environmental Consultants

SWCA Project No. 029327

May 2014

NATURAL AND CULTURAL RESOURCES ASSESSMENT FOR THE TOWNSEN PARK-N-RIDE MULTIMODAL CONNECTOR, HARRIS COUNTY, TEXAS

Prepared for

LJA Engineering, Inc.
2929 Briarpark Drive, Suite 600
Houston, Texas 77042
Attn: Mr. Omar Escobar

On behalf of

Harris County Public Infrastructure Department
1001 Preston, 5th Floor
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May 2014

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APPENDICES

FIGURES

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1. INTRODUCTION

On behalf of Harris County Public Infrastructure Department (HCPID), SWCA Environmental Consultants (SWCA) was contracted by LJA Engineering, Inc. to conduct a natural and cultural resources assessment for the proposed Townsen Park-n-Ride Multimodal Connector hike/bike trail located in northeast Harris County, Texas. The purpose of this assessment was to gather available information on natural and cultural resources that may be present within the project area and to assess the potential for the presence of wetlands, endangered species, and significant cultural resources and their effect on the project. The goal is to provide information for project planning and development, as well as forecasting potential future work that may be required to acquire and satisfy regulatory compliance.

This review does not serve as a project clearance letter for the above-referenced project, but rather, provides a professional opinion as to whether construction of the project would impact natural or cultural resources present within the project area.

2. DEFINITION OF STUDY AREA

The proposed project is situated adjacent to the Interstate Highway (IH) 69/U.S. Highway (US) 59 southbound feeder road, approximately 0.4 mile south of the San Jacinto River and 0.2 mile north of Townsen Boulevard in northeast Harris County, Texas (Figure 1). HCPID plans to construct a 12-foot-wide hike and bike trail that will be restricted to pedestrian and bicycle traffic. The project will be approximately 2,805 feet in length and will affect approximately 0.77 acre of land with work confined mainly to the existing, maintained Texas Department of Transportation (TxDOT) right-of-way (ROW). The depth of impacts would be limited to 12 to 18 inches below ground surface.

3. REGULATORY FRAMEWORK

Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged or fill material into non-tidal waters of the United States, including wetlands. The U.S. Army Corps of Engineers (USACE) administers the Section 404 program and grants authorizations to discharge fill material into waters of the United States through Individual, Nationwide, or General Permits. Certain activities thought to have a minimal effect on aquatic resources can be authorized by the most project-applicable of 52 available Nationwide Permits (NWPs).

The USACE NWP Program allows certain construction activities within regulated waters of the United States, including wetlands, provided that certain specific general conditions are followed. Under NWP General Condition No. 18 (a):

> ***…no activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as designated under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which 'may affect' a listed species or critical habitat, unless [ESA] Section 7 consultation addressing the effects of the proposed activity has been completed.***

Additionally, NWP General Condition 20 (a) states that "in cases where the district engineer determines that the activity may affect the properties, listed, or eligible for listing, in the National Register of Historic Places (NRHP), the activity is not authorized until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied."

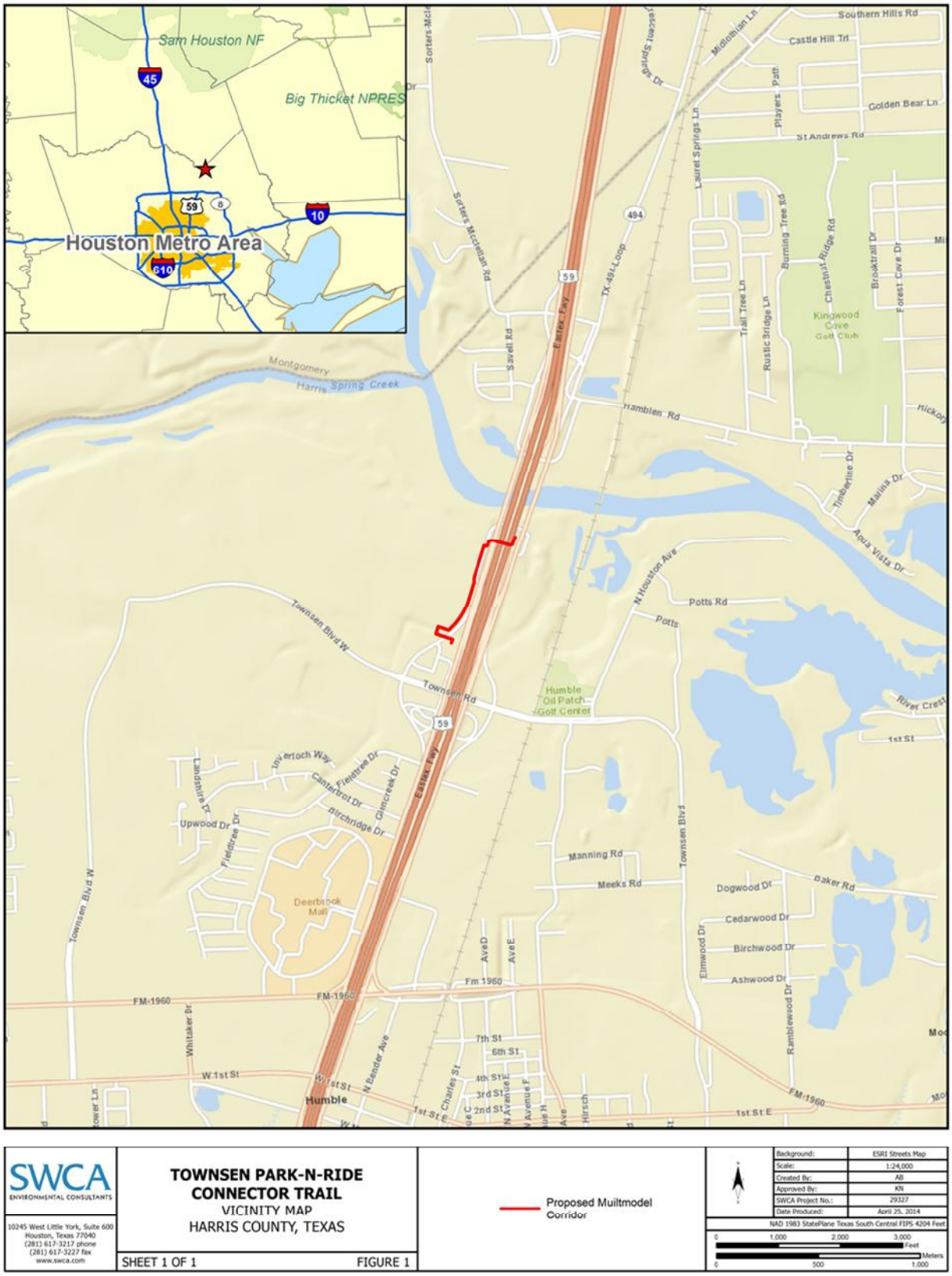

Figure 1. Project layout map.

3.1 Natural Resources

The Endangered Species Act (ESA) of 1973 (16 United States Code [USC] A-1535-1543, P.L. 93-205) prohibits any person or entity from causing a ***take*** of any plant or animal species on the Secretary of the Interior's list of threatened and endangered species (Section 9(a)(1)(b)) and states that it is the responsibility of each federal agency to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence, or result in the destruction or adverse modification of habitat determined to be critical to the conservation of any such species (Section 7(a)(2)). The ESA defines a ***take*** as the harassment, harm, pursuit, hunting, shooting, killing, trapping, capture, or collection of such species.

According to the U.S. Fish and Wildlife Service (USFWS) Section 7 of the ESA informational letter (Appendix A), if after completing a habitat evaluation and/or any necessary surveys of the project area, it is determined that the proposed project will not affect federally listed species or critical habitat (i.e., suitable habitat for the species occurring in the project county is not present in or adjacent to the project action area), no further coordination or contact with the USFWS is necessary (USFWS 2012).

The Bald and Golden Eagle Protection Act (BGEPA), originally passed in 1940, and amended in 1962, provides for the protection of the bald eagle (***Haliaeetus leucocephalus***) and the golden eagle (***Aquila chrysaetos***) by prohibiting the take of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 USC 668(a); 50 Code of Federal Regulations [CFR] 22). The BGEPA defines a ***take*** as the pursuit, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing of a bald or golden eagle.

3.2 Cultural Resources

Projects in Texas can come under the purview of two primary cultural resource regulations: the NHPA and the Texas Antiquities Code (TAC). Both are administered by the Texas Historical Commission (THC) located in Austin.

If an undertaking is federally permitted, licensed, funded, or partially funded, the project must comply with Section 106 of the NHPA, as amended. Section 106 requires that every federal agency or federally funded or permitted project consider the undertaking's effects on historic properties. The process begins with a historic properties inventory and evaluation. Under Section 106, any property listed in or eligible for the NRHP is considered significant. The NRHP is the official list of the Nation's historic places worthy of preservation. Authorized by the NHPA, the NRHP is maintained by the National Park Service (NPS), a division of the Department of the Interior. The NRHP list includes buildings, structures, objects, sites, districts, and archaeological resources. These regulations are defined in Protection of Historic Properties, 36 CFR 800 of the NHPA. Examples of projects in Texas requiring compliance with the NHPA include those conducted on federal lands, those federally funded, or ones acquiring a federal permit, such as a Section 404 permit from the USACE.

Cultural resource sites, historic and prehistoric, located on lands owned or controlled by the State of Texas or one of its political subdivisions are protected by the TAC. The TAC requires state agencies and political subdivisions of the state, including cities, counties, river authorities, municipal utility districts, and school districts, to notify the THC of any action on public land involving five or more acres of ground disturbance, 5,000 or more cubic yards of earth moving, or those that have the potential to disturb recorded archaeological sites. The THC's Archeology Division manages compliance with TAC, including the issuance of formal TAC Permits, which stipulate the conditions under which scientific investigations will occur. Under TAC, any historic or prehistoric property located on state land may be determined

eligible as a State Antiquities Landmark (SAL). Projects in Texas that typically necessitate compliance with the TAC include entities such as the TxDOT, cities, counties, and others, such as the HCPID.

In addition to the protection provided by NHPA and TAC, the U.S. Department of Transportation (DOT) Act of 1966 established the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. The law is implemented by the Federal Highway Administration (FHWA) through the regulation 23 CFR 774. Section 4(f) applies to projects that receive funding from or require approval by an agency of the DOT. Section 4(f) also states that the FHWA cannot approve of the use of land from public or private historic sites unless there is no feasible and prudent alternate use of the land or the action includes all possible planning to minimize harm to the property resulting from use.

In order to facilitate the discussion of the proposed project area, this document will be divided into two sections: natural and cultural resources assessments.

4. NATURAL RESOURCES ASSESSMENT

4.1 Natural Resource Investigation Methods

On April 22, 2014, SWCA evaluated the project site for the potential presence of waters of the United States and threatened and endangered (T&E) species habitat.

SWCA conducted a wetland determination based on, but not in strict accordance with, the ***USACE 1987 Wetlands Delineation Manual*** (Manual) and the ***Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Region*** (Supplement). The purpose of the wetland determination was to identify potentially jurisdictional waters of the United States, including wetlands, as defined under Section 404 of the CWA and by the USACE so that the trail alignment and associated construction measures could be selected in a manner that avoids and/or minimizes impacts to these waters to the maximum extent possible. The project is located in the USACE Galveston District.

SWCA performed a threatened and endangered species review to determine which federally listed species have the potential to occur within the project area. SWCA initiated the evaluation with a review of the USFWS species list for Harris County (Appendix B) and occurrence data from the Texas Natural Diversity Database (TXNDD). The TXNDD consists of known locations of rare or sensitive species. The TXNDD list was requested in April 2014. Based on documented habitat requirements for each of the listed species, SWCA evaluated the project area via desktop resources and field observations for the absence/presence of suitable habitat and potential presence of listed species.

4.2 Results of the Constraints Analysis-Natural Resources

4.2.1 Water of the United States, including Wetlands

During the field determination, one waterbody, one palustrine emergent (PEM) wetland, and one palustrine forested (PFO) wetland were identified within or adjacent to the proposed project area (Table 1 and Figure 2).

Table 1. Wetland and waterbody characteristics.

Feature ID	Type	Acres
SA001	Perennial Stream	0.15
WA001	PFO Wetland	0.08
WA002	PEM Wetland	0.05

The PEM wetland occurred within the proposed corridor and abutted SA001. The PEM was comprised of an herbaceous layer dominated by alligator weed (***Alternanthera philoxeroides***), perennial ryegrass (***Lolium perenne***), pennywort (***Hydrocotyle verticillata***), common rush (***Juncus effusus***), Pennsylvania smartweed (***Polygonum pennsylvanicum***), black medic (***Medicago lupulina***), and reversed clover (***Trifolium resupinatum***).

The PFO wetland occurred adjacent to, but outside of the ROW for the proposed project. The PFO was comprised of a tree and sapling shrub layer dominated by bald cypress (***Taxodium distichum***). An herbaceous layer was dominated by lizard's tail (***Saururus cernuus***), Cherokee sedge (***Carex cherokeensis***), and giant ragweed (***Ambrosia trifida***). A vine layer of muscadine (***Vitis rotundifolia***) and peppervine (***Ampelopsis arborea***) was also observed.

Two additional vegetation communities were identified in the project area: herbaceous upland and scrub-shrub upland. The herbaceous upland community occurs throughout existing ROW in the project area. The dominant herbaceous species within the herbaceous upland community are perennial ryegrass, cereal rye (***Secale cereal***), Carolina geranium (***Geranium carolinianum***), garden vetch (***Vicia sativa***), and tuberous vervain (***Verbena rigida***). The scrub-shrub upland community occurs outside of the existing ROW in the project area. The tree and sapling/shrub layer is dominated by yaupon (***Ilex vomitoria***), sweetgum (***Liquidambar styraciflua***), American beautyberry (***Callicarpa americana***), and redbay (***Persea borbonia***). The herbaceous layer was dominated by redbay and sassafras (***Sassafras albidum***). A vine layer of muscadine (***Vitis rotundifolia***) was also observed. Please refer to Appendix C for photographs of each of the vegetation communities and wetland features.

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) has mapped the soils within the proposed corridor to be of the following classifications: Kaman Clay, Ozan Loam, and Voss Sand. All of these soil types are listed as hydric soils.

One perennial waterbody, Blacks Branch, was identified within the project area.

4.2.2 Federally Listed Species

According to USFWS (USFWS 2014), one species is federally listed as threatened or endangered under the ESA for Harris County. Although the bald eagle is no longer federally listed by USFWS, it falls under the protection of the BGEPA and is known to inhabit southeastern Texas. See Table 2 below for a list of species and their listing status. A discussion of these two species is included below.

Table 2. USFWS Species List for Harris County, Texas

Common Name	Scientific Name	Group	Listing Status
Bald Eagle	Haliaeetus leucocephalus	Bird	Delisted
Texas prairie dawnflower	Hymenoxys texana	Plant	Endangered

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle, though currently delisted in Harris County, is federally protected under the BGEPA of 1940 and the Migratory Bird Act of 1918. Bald eagles prefer nesting areas with low human disturbance,

suitable forest structure, and an abundant supply of prey. They generally inhabit areas near large bodies of open water such as lakes, marshes, rivers, and sea coasts. Bald eagles build large stick nests lined with soft materials such as grass, leaves, and Spanish moss. Nests are used for several years by the same pair of eagles, with the birds adding materials each year. Nests are often very large, measuring 6 feet across and weighing hundreds of pounds. In southeast Texas, eagle nest-building activities generally begin in October of each year. Peak egg-laying occurs in December and hatching occurs in January. The young eagles generally fledge in April after 10–12 weeks of growth but parental care continues in the nesting territory for another 4–6 weeks. Adults and juveniles begin to migrate north in May (Campbell 2003).

Once a suitable breeding territory is found, breeding pairs will return to the same area year after year, often using alternate nests within the territory during different breeding years. Although a given nest may be lost due to weather or age of the tree, a pair often returns to the same territory to begin building another nest. In cases where one member of a pair dies, the nest may be colonized by the surviving member returning with a new mate. Nesting territories can also be inherited by subsequent generations (Campbell 2003).

The TXNDD lists this species as occurring approximately 8.2 miles northwest of the project area. Due to the distance from any known occurrences and the lack of observed bald eagle nests within the project area, it is our professional opinion that the proposed project will have no effect on this species.

Texas Prairie Dawn (*Hymenoxys texana*)

The Texas prairie dawn is a plant listed as endangered within Harris County and is endemic to Texas. Habitat includes poorly drained, sparsely vegetated areas (slick spots) at the base of mima mounds in open grasslands or in almost barren areas on fine-sandy, slightly saline soils that are sticky when wet and powdery when dry (Texas Parks and Wildlife Department [TPWD] 2014).

The TXNDD lists this species as occurring approximately 6.1 miles southeast of the project area. Due to the distance from known species occurrences and lack of suitable habitat within the proposed project area, it is our professional opinion that the proposed project will have no effect on this species.

4.3 Natural Resources Summary and Conclusions

The proposed project may cross one waterbody and one PEM wetland (Figure 2). Due to the nature of the activity and the notification requirements of NWP 42, a pre-construction notification (PCN) would be required if waterbodies and wetlands are impacted. The findings presented in this letter report are restricted to and based on SWCA's professional opinion. Only the USACE and/or U.S. Environmental Protection Agency (EPA) have final and legal authority in determining the absence/presence of jurisdictional waters of the United States and the extent of their boundaries.

SWCA performed a threatened and endangered species review of the proposed project and determined that two federally listed or otherwise federally protected species are listed for Harris County. Based upon field observations, habitat requirements of listed species, and distances from known species occurrences, it is SWCA's opinion that the project will have no effect on any federally threatened, endangered, or managed species listed for the proposed project area.

Federal agencies are not required to contact USFWS if a proposed action will have no effect on listed species, or if no listed species are present in the action area. No further ESA consultation or coordination is necessary for projects where the federal agency action or non-Federal project proponent has determined that proposed project activities will have no effect on federally listed species. Service concurrence with a no effect determination is not required under the ESA and will not be provided by the Clear Lake Ecological Services Field Office (CLESFO). Please refer to Appendix A for a copy of the USFWS CLESFO - Section 7 of the ESA Informational Letter.

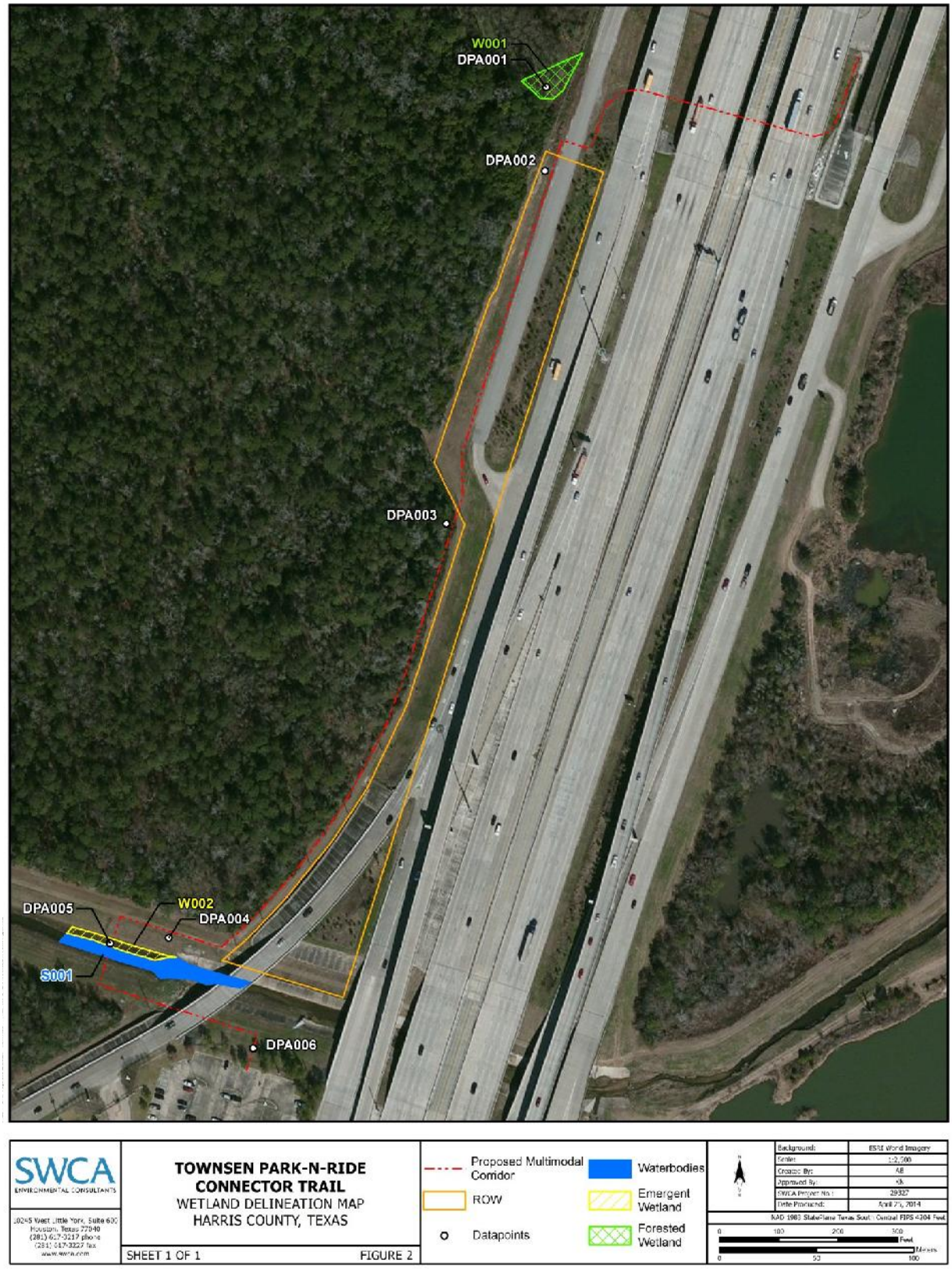

Figure 2. Natural resources preliminary wetland determination map.

5. CULTURAL RESOURCES ASSESSMENT

5.1 Cultural Resources Investigation Methods

The cultural resources constraints analysis consisted of a background cultural resource and environmental literature search of the project area. An SWCA archaeologist reviewed the corresponding Maeden, Texas, U.S. Geological Survey 7.5-minute topographic quadrangle map on the Texas Archeological Sites Atlas (TASA) for any previously recorded surveys and historic or prehistoric sites located in or near the project area. Site files, relevant maps, NRHP properties, SAL listings, Recorded Texas Historic Landmarks (RTHL), cemeteries, and local neighborhood surveys were also examined. This source provides information on the nature and location of previously conducted archaeological surveys, previously recorded cultural resource sites, and historic properties. Listings are limited to projects under purview of the TAC or the NHPA. Therefore, all previous work conducted in an area may not be available. The Texas Historic Sites Overlay, aerial photographs, Bureau of Economic Geology Maps, and the NRCS Web Soil Survey, were also examined for historical and environmental information related to the project area.

Utilizing this information, the project area was assessed for the potential to possess archaeological and/or historic properties. The project area was then divided into high, medium, and low-probability areas, based on the potential to possess archaeological and historical resources. High-probability areas are defined as locales that possess or have a high likelihood of possessing significant cultural resources. These areas are generally identified by distinct landforms and deposits that have been shown in other regional surveys to contain archaeological sites. In the case of historic resources, high-probability areas are identified by the presence of historic-age properties within project area. Moderate or low-probability areas are defined as locales where archaeological and/or historical resources are likely absent or have limited potential to be preserved or significant (e.g., upland settings or areas with intensive development).

5.2 Cultural Resources Results of Investigations

5.2.1 Project Areas Soils and Geology

The project area is situated on the Deweyville formation (Qd) (Barnes 1992). The Deweyville formation is composed of sand, silt, clay, and gravel. This formation includes point bar, natural levee, and sand dune deposits. There may be some areas where the remnants of meanders are present.

The project area is situated in the floodplain of the San Jacinto River. Soils in the project include Kamen clay, Ozan loam, and Voss Sand. Kamen clay and Ozan loam are recent soils that are formed in Alluvium. Voss sand is formed from deep, sandy sediments (NRCS 2014). According to Abbott (2001), Voss sand possesses high geoarchaeological potential and Ozan loam possesses medium-high geoarchaeological potential. The geoarchaeological potential for Kamen clay is not provided by Abbott (2001).

According to Abbott's 2001 Houston-PALM, a guide to archaeological potential related to geomorphology in the Harris County area, the project area is mapped within Map Units 3 and 3a. Both Map Units recommend no surface survey, but deep testing is recommended if deep project impacts are anticipated (Abbott 2001).

5.2.2 Background Literature Review

The results of the background review revealed that the project area has not been subjected to a cultural resources survey. There have been eight surveys conducted within a 1-mile radius of the project area.

These are listed in Table 3 (see Figure 3). One survey, Spring Creek Greenway Trail Phase IV (TAP #6469) is adjacent to the current proposed project area. A copy of documentation relating to survey of IH 69/US 59 was not available for review.

There are six archaeological sites located within a 1-mile radius of the project area. These are listed in Table 4. None of these sites are located within the project area. There is a single NRHP listed structure located to the northeast of the project area. This structure, the State Highway 35 Bridge, is listed in the NHRP under Criterion C in the area of engineering at the state level of significance (Table 5). The current project will tie into existing ramps associated with this bridge.

Table 3.Previously conducted cultural resource surveys within a 1-mile radius of the project area.

Distance to Project Area	TAP #	Year	Description	Sponsoring Agency	Additional Information
0.26 mi	1711	1996	Linear Survey	Unknown	Townsen Blvd West ROW
Adjacent	6469	2014	Linear Survey	HCP4-PD	Spring Creek Greenway Phase IV
0.21 mi	None	2003	Area Survey	USACE	Townsen Plaza Shopping Center
0.53 mi	None	1993	Linear Survey	FHWA	No additional information provided
0.28 mi	None	2001	Area Survey	USACE	Super Target Center
0.28 mi	None	2001	Area Survey	USACE	Super Target Center Borrow Pits
0.83 mi	None	1990	Area survey	COE-VD	No additional information provided
0.56 mi	4765	2005	Area survey	FHA	No additional information provided

Table 4. Previously recorded archeological sites within a 1-mile radius of the project area.

Type	Site No	Distance to Project Area	Date	Description	NRHP Eligibility
Site	41HR412	Within 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Undetermined
Site	41HR413	Within 1 mile	Undefined Historic	Surface Historic Scatter	Not Eligible
Site	41HR1146	Within 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Undetermined
Site	41HR1147	Within 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Undetermined
Site	41HR1148	Within 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Undetermined
Site	41HR1149	Within 1 mile	Undefined Prehistoric	Subsurface Lithic Scatter	Not Eligible

Table 5. NRHP listed historic properties within a 1-mile radius of the project area.

Type	NPS Reference Number	Distance to Project Area	Name	Date Built	Description	NRHP Eligibility
Structure: Bridge	96001110	Adjacent	State Highway 35 Bridge at the West Fork of the San Jacinto River	1931	Two, 200-foot Parker through truss spans and 30 concrete girder approach spans.	Listed (1996)

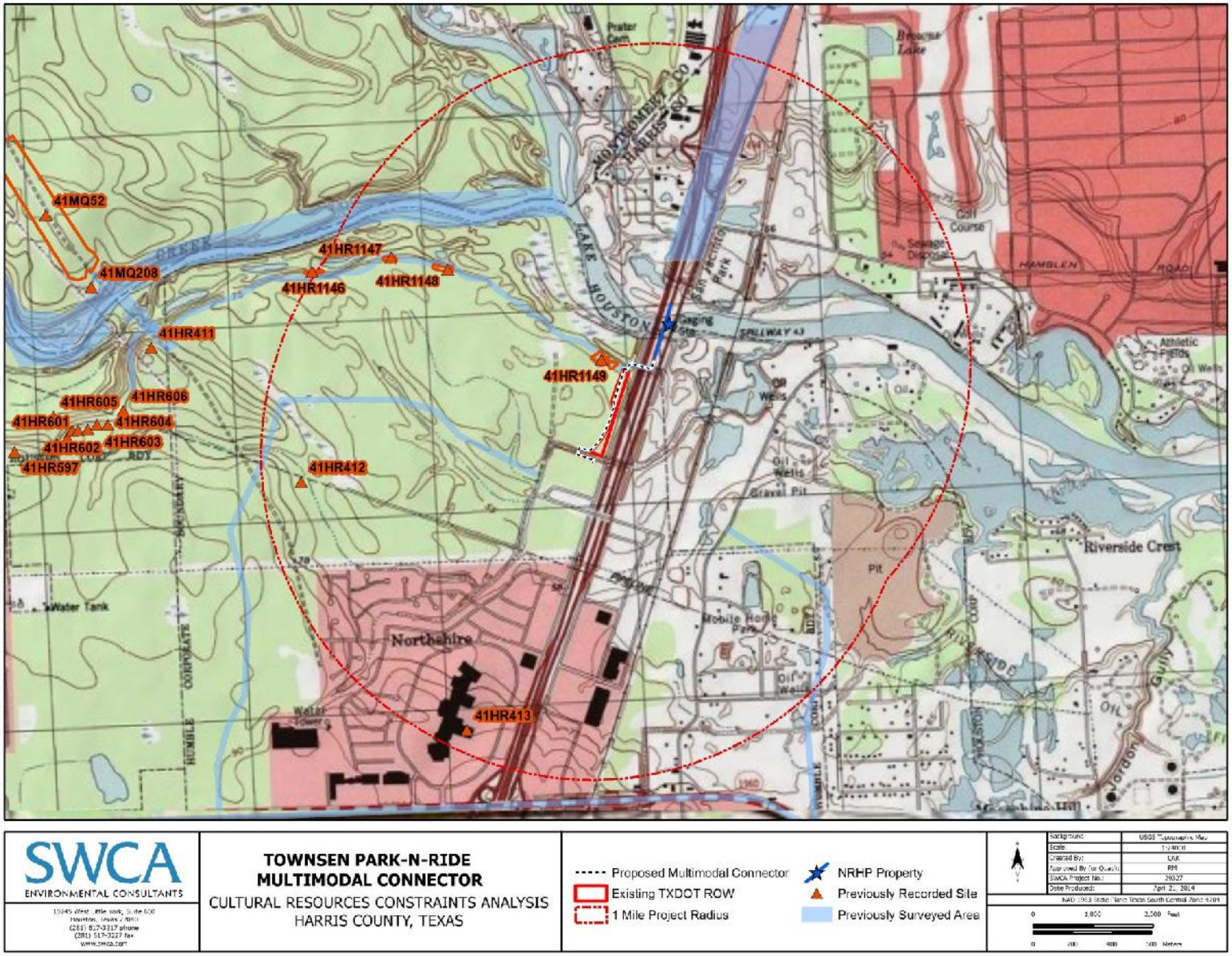

Figure 3. Previously recorded cultural resources and cultural surveys.

5.3 Archaeological Assessment

The background review revealed that the proposed project has not been surveyed for archaeological resources. However, the project area is adjacent to IH 69/US 59 which would have likely been surveyed prior to recent widening and construction. A review of aerial photographs indicates that the proposed project area is located within and adjacent to existing highway ROW. The construction of the highway, associated feeder roads, a large drainage canal, and the existing park and ride facility has impacted much of the project area.

The review of the soils, geology, historical topographic maps and aerial photography, and previous investigations indicate that there is a low probability for significant archaeological deposits within the previously disturbed ROW. However, within the undisturbed portions of the ROW (approximately 825 feet, from south of the feeder road to the drainage canal), there exists at least a moderate potential for the presence of intact, significant archaeological deposits. An intensive archaeological survey of these undisturbed areas is therefore recommended.

5.4 Architectural Assessment

The State Highway 35 Bridge at the West Fork of the San Jacinto River, constructed 1930–1931, is listed in the NRHP under Criterion C in the area of Engineering at the state level of significance (Table 5). The bridge was designed and constructed by the Texas Highway Department, the precursor agency to TxDOT, as part of the construction of State Highway 35 connecting Humble to the Montgomery County line. By 1935, the road was extended to include a segment from Houston to Corpus Christi traveling through Bay City, Palacios, Port Lavaca, and Rockport. The northern section of this road was renamed US 59 in the early 1940s, and is also currently known as IH 69. The bridge consists of two 200-foot Parker through truss spans and 30 concrete girder approach spans.

The bridge is currently open only for pedestrian and bicycle traffic and is parallel to the recently upgraded and expanded IH 69/US 59. Based on information in the NRHP nomination, the bridge was removed from vehicular service ca. 1996 and converted to non-vehicular use. It is likely that the concrete, non-historic ramps associated with the bridge were added around this time. The proposed multimodal connector will be tied into an existing ramp; it is unlikely that this tie-in will affect the bridge directly or indirectly (visually). As such, it is unlikely that an architectural survey of the already-documented bridge would be warranted (Figures 4 through 7).

Figure 4. Overview of the existing ramp to bridge, facing north.

Figure 5.Overview of existing pedestrian bridge, facing north.

Figure 6.Overview of bridge showing supports, facing north.

Figure 7.Overview of truss, facing north.

5.5 Cultural Resources Summary and Conclusions

SWCA conducted an archaeological and historic resources assessment of the proposed Townsen Park-N-Ride Multimodal Connector project in northeastern Harris County, Texas. The purpose of this assessment was to gather available information on previously recorded archaeological surveys, archaeological sites, and historic resources and to assess the potential for the presence of significant resources within the project area.

The background review revealed that that project area does not appear to have been surveyed. However, it is likely that portions of the area have been surveyed in association with the construction of IH 69/US 59. These records are not currently available. There are two previously recorded archaeological sites located within a 1-mile radius of the project area and one NRHP-listed structure; only the NRHP-listed structure exists immediately adjacent to the project area (the proposed trail will tie-in to an existing non-historic, concrete pedestrian ramp associated with the bridge).

The results of the analysis indicate that the potential for significant archaeological deposits in the project area is negligible within the previously disturbed TxDOT ROW. However, because portions of the project area have not been disturbed, SWCA recommends additional work to survey this area and determine if any archaeological sites are present. This would include intensive pedestrian survey and shovel testing of the undisturbed areas, which includes approximately 825 feet of land that falls outside of the TxDOT ROW.

Should compliance with cultural resource regulations such as the NHPA or the Antiquities Code of Texas be required for any future development of the property, ***an exact scope of any requisite cultural resource investigations would need to be developed in coordination with the involved regulatory agencies.***

6. REFERENCES

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APPENDIX A

USFWS Clear Lake Ecological Field Office Section 7 Informational Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
17629 El Camino Real, Suite 211
281/286-8282 / (FAX) 281/488-5882

February, 2012

Thank you for your request for threatened and endangered species information in the Clear Lake Ecological Services Office's area of responsibility. According to Section 7(a)(2) of the Endangered Species Act and the implementing regulations, it is the responsibility of each Federal agency to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any federally listed species.

Please note that while a Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment, the Federal agency must notify the U.S. Fish and Wildlife Service (Service) in writing of such designation. The Federal agency shall also independently review and evaluate the scope and contents of a biological assessment prepared by their designated non-Federal representative before that document is submitted to the Service.

A county-by-county listing of federally-listed threatened and endangered species that occur within this office's work area can be found at http://www.fws.gov/southwest/es/EndangeredSpecies/EndangeredSpecies_Lists/EndangeredSpecies_Lists_Main.cfm. You should use the county-by-county listing and other current species information to determine whether suitable habitat for a listed species is present at your project site. If suitable habitat is present, a qualified individual should conduct surveys to determine whether a listed species is present.

After completing a habitat evaluation and /or any necessary surveys, you should evaluate the project for potential effects to the listed species and make one of the following determinations:

No effect – the proposed action will not affect federally listed species or critical habitat (i.e., suitable habitat for species occurring in the project county is not present in, or adjacent to, the action area). No coordination or conduct with the Service is necessary. However, if the project changes or additional information on the distribution of listed or proposed species becomes available, the project should be reanalyzed for effects not previously considered.

Is not likely to adversely affect – the project may affect listed species and/or critical habitat: however, the effects are expected to be discountable, insignificant, or completely beneficial. Certain avoidance and minimization measures may need to be implemented in order to reach this level of effects. The Federal agency or the designated non-Federal representative should seek written concurrence from the Service that adverse effects have been eliminated. Be sure to include all the information and documentation used to reach your decision with your concurrence. The Service must have this documentation before issuing a concurrence.

Is likely to adversely affect – adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species but also likely to cause some adverse effect to individuals or that species, then the proposed action "is likely to adversely affect" the listed species. An "is likely to adversely affect" determination requires the Federal action agency to initiate formal Section 7 consultation with this office.

Regardless of your determination, the Service recommends that you maintain a complete record of the evaluation, including steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related articles. The Service's Consultation Handbook is available online to assist you with further information on definitions, process, and fulfilling Endangered Species Act requirements for your projects at http://www.fws.gov/endangered/esa-libray/pdf/esa_section7_handbook.pdf.

If we can further assist you in understanding a federal agency's obligations under the Endangered Species Act, please contact Donna Anderson, Moni Belton, Kelsey Gocke, Jeff Hill, Charrish Stevens, or Arturo Vale at 281-286-8282.

Sincerely,

Edith Erfling
Field Supervisor

APPENDIX B

USFWS Threatened/Endangered Species List- Harris County

Ecological Services

Southwest Region

USFWS Social Media Hub
Media GALLERY

Ecological Services
Email Ecological Services
Endangered Species
Electronic Library
Environmental Contaminants
Energy
Partners Program
Texas Coastal Program
National Wetlands Inventory
Field Offices

Back to Start

List of species by county for Texas:

Counties Selected: Harris

Select one or more counties from the following list to view a county list:

Anderson
Andrews
Angelina
Aransas
Archer

View County List

Harris County

Common Name	Scientific Name	Species Group	Listing Status	Species Image	Species Distribution Map	Critical Habitat	More Info
Texas prairie dawn-flower	Hymenoxys texana	Flowering Plants	E				P

APPENDIX C

Preliminary Wetland Determination Photolog

PHOTO 1 View of palustrine emergent wetland community at DPA005, facing west.

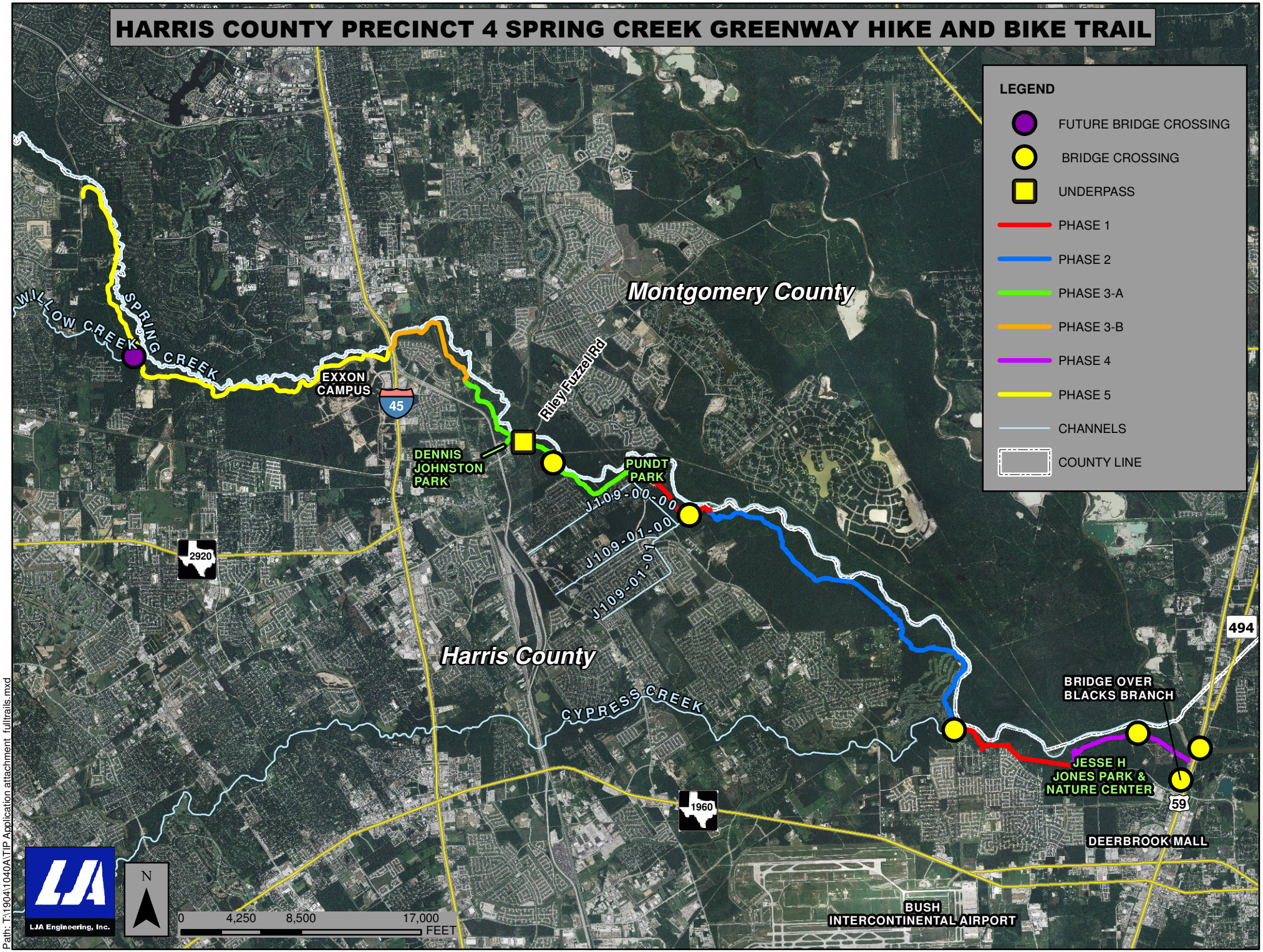
PHOTO 2 View of palustrine forested wetland community at DPA001, facing north.

PHOTO 3 View of herbaceous upland community at DP006, facing east.

PHOTO 4 View of scrub-shrub upland community at DP003, facing west.

PHOTO 5 View of SA001 and palustrine emergent wetland, facing east.

PHOTO 6 View of SA001 and palustrine emergent wetland, facing west.


HARRIS COUNTY PRECINCT 4 SPRING CREEK GREENWAY HIKE AND BIKE TRAIL
LEGEND
FUTURE BRIDGE CROSSING
BRIDGE CROSSING
UNDERPASS
PHASE 1
PHASE 2
PHASE 3-A
PHASE 3-B
PHASE 4
PHASE 5
CHANNELS
COUNTY LINE
Montgomery County
Harris County
WILLOW CREEK
SPRING CREEK
EXXON CAMPUS
45
Riley Fuzzel Rd
DENNIS JOHNSTON PARK
PUNDT PARK
J109-00-00
J109-01-00
J109-01-01
2920
CYPRESS CREEK
1960
494
BRIDGE OVER BLACKS BRANCH
JESSE H JONES PARK & NATURE CENTER
59
DEERBROOK MALL
BUSH INTERCONTINENTAL AIRPORT
LJA Engineering, Inc.
N
0 4,250 8,500 17,000
FEET
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SPRING CREEK TRAIL

TOWNSEN PARK AND RIDE CONNECTIVITY EXHIBIT

May, 2014

Legend

- TOWNSEN PARK AND RIDE
- PROJECTED TRAIL (5 MI. MEASURED FROM PARK AND RIDE)
- SPRING CREEK TRAIL SCHEMATICS
- CITY OF HOUSTON BIKEWAYS
- POTENTIAL CONSUMERS (WITHIN 1 MI OF TRAIL)
- CONSUMERS OUTSIDE OF BUFFER ZONE

BUFFER DISTANCE FROM TRAIL

- 0.5 MI. BUFFER ZONE
- 1 MI. BUFFER ZONE

0 2,000 4,000 8,000 Feet

N W E S

DATA SOURCE: TOWNSEN PARK AND RIDE- METRO
CONSUMER DATA-INFOUSA CONSUMER DATABASE
CITY OF HOUSTON BIKEWAYS- CITY OF HOUSTON

AERIAL PHOTOGRAPH DATE: MARCH 2012

Path: T:\1904\exhibits\springcreek_townsen_parkandride.mxd