CITY OF BATON ROUGE
AND
PARISH OF EAST BATON ROUGE

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

NICHOLSON DRIVE (LA 30) SEGMENT 1
(BRIGHTSIDE/W. LEE TO GOURRIER/BURBANK)
CITY/PARISH PROJECT NO. 08-CS-HC-0035
STATE PROJECT NO. 414-01-0039

C.P. NO. 08-CS-HC-0026
S.P. NO. 414-01-0039

VICINITY MAP

CSLM 2.507
STA. 358+96.49 LA 30
END S.P. 414-01-0039
(NICHOLSON DRIVE)

CSLM 3.584
STA. 302+09.27 LA 30
BEG S.P. 414-01-0039
(NICHOLSON DRIVE)

LAYOUT MAP

SCALE: 1 INCH = 2,000 FEET

2000' 0 2000' 4000' 6000'

DESIGN STUDY

STATE OF LOUISIANA
BRIAN A. HAZLIP
REG. No. 34714
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

9-26-2011

ROADWAY CLASS = UA-2 (NICHOLSON DRIVE)

DESIGN SPEED = 45 MPH (NICHOLSON DRIVE)

TRAFFIC DATA
- 2010 A.D.T. = 27,794
- 2030 A.D.T. = 50,198
- D = 55.0%
- K = 10.0%
- T = 9.3%

TYPE OF CONSTRUCTION : ASPHALTIC CONCRETE PAVEMENT, PORTLAND CEMENT CONCRETE PAVEMENT, BASE COURSE, DRAINAGE STRUCTURES, GRADING, BOX CULVERT, AND RR CROSSING IMPROVEMENTS.

DATUM USED : MEAN SEA LEVEL
MAG. VAR. :
BEARINGS ARE LSPCS: NAD 83 (SOUTH)
TRANSIT BOOKS :
LEVEL BOOKS :

SCALES
- PLAN : 1" = 20'
- PROFILE : HOR. 1" = 20'
  VER. 1" = 4'

NOTE:
THE 1997 EDITION OF THE CITY OF BATON ROUGE, PARISH OF EAST BATON ROUGE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, AS AMENDED BY THE PROJECT SPECIFICATIONS, SHALL GOVERN ON THE PROJECT.

LENGTH OF PROJECT

	DESCRIPTION	ALGEBRAIC SUM OF ALL EQUATIONS	GROSS LENGTH	EXCEPTION	BRIDGE LENGTH		ROADWAY LENGTH	
	STA. TO STA.	FEET	FEET	FEET	FEET	MILES	FEET	MILES
LA 30	302+09.27 – 358+96.49	–	5687.22	–	–	–	5687.22	1.077
JENNIFER JEAN	500+38.50 – 502+31.82	–	193.32	–	–	–	193.32	0.037
BOB PETIT	402+41.70 – 402+82.63	–	40.93	–	–	–	40.93	0.008
EAST BOYD	600+43.70 – 601+94.33	–	150.63	–	–	–	150.63	0.029
	TOTAL LENGTH OF BRIDGES				–	–		
	TOTAL LENGTH OF ROADWAY						6072.10	1.150
	TOTAL MILES				1.150			

SHEET NUMBER 1

EAST BATON ROUGE | PARISH | 414-01-0039 | FEDERAL PROJECT | STATE PROJECT

DESIGNED JRE | CHECKED AFT | DETAILED JFO | CHECKED BAH | DATE 9-23-2011 | SHEET 1

NO. | DATE | BY | REVISION DESCRIPTION

TITLE SHEET & LAYOUT MAP

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE TABLADA

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DESIGN STUDY
FOR
NICHOLSON DRIVE (LA 30) SEGMENT 1
STATE PROJECT NO. 414-01-0039
CITY/PARISH PROJECT NO. 08-CS-HC-0035

Prepared for:
PARISH OF EAST BATON ROUGE
GREEN LIGHT PLAN PROGRAM

September 26, 2011

Prepared By:

FORTE AND TABLADA INC.
Consulting Engineers / Land Surveyors
9107 Interline Avenue
Baton Rouge, LA 70809
T (225) 927-9321
F (225) 927-9326
WWW.FORTEANDTABLADA.COM

In Association With:

VOLKERT & ASSOCIATES, INC.

Executive Summary

Nicholson Drive, Segment 1 is presently a two-lane asphalt roadway with asphalt shoulders which extends from 1,164 feet north of the Brightside Lane and West Lee Drive at Nicholson Drive intersection to 100 feet south of the Burbank Drive and Gourrier Avenue at Nicholson Drive intersection. The existing roadway section will be improved to provide better access to and from the LSU area and downtown Baton Rouge. The new roadway will improve driver sight distance across the railroad track at the intersection of Jennifer Jean Dr and Bob Petit Blvd. At the southernmost point, the project will provide a connection with the proposed intersection improvements at Nicholson Drive and Brightside Lane and West Lee Drive (State Project Nos. 414-01-0036 and 742-17-0130). Nicholson Drive, Segment 1 is classified as an Urban Arterial roadway and is 5,687 feet (1.08 miles) in length. Currently, there is a railroad operated by Canadian National and an asphalt bicycle/walking path that extends along the entire west side of the roadway corridor within the railroad right of way. The adjacent properties are mostly urbanized and include the LSU golf course and commercial and residential developments. The proposed design study section consists of a four-lane boulevard with a raised median with turn lanes. Proposed also with this study are bike lanes on both sides of the roadway and one sidewalk located on the east side of Nicholson Drive. The study also incorporates other recommendations for connectivity for bicycles and pedestrians within this entire area. The suggestions provided in this design study have been analyzed to ensure safety and aesthetics not only for the motoring public but for pedestrians and bicyclists alike while improving connectivity around the LSU area.

Proposed Typical Section, Horizontal Alignment and Vertical Profile

The proposed typical section, horizontal alignment, and vertical profile were developed by considering numerous designs in order to select the best alternative for this particular project. The best alternative for the section, alignment, and profile was based on the design which minimized the impacts on the existing developments along with minimizing the amount of right of way to be acquired. The existing right of way is 85’ along most of Nicholson Drive Segment 1. The required right of way should be set at 95’ to 102’ to allow construction of the proposed boulevard section and utility relocations.

Project Costs

The engineer’s estimated construction cost for this project is shown in Tables 16 and 17 as 13.3 million dollars for concrete pavement and 11.4 million dollars for asphaltic pavement. This cost includes earthwork, base and subbase courses, surface courses, pavements, structures, drainage work, pavement markings, and concrete curb and sidewalks, and traffic signalization. It also accounts for mobilization and a contingency factor for unforeseen conditions. There are additional costs to provide for utility relocations, testing, lighting and landscaping, environmental studies, engineering, environmental mitigation, and right of ways. Therefore, the total engineer’s estimated project cost is shown in Table 18 as being 22.6 million dollars for concrete pavement and 20.3 million dollars for asphaltic pavement.

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INTRODUCTION

In 2005, East Baton Rouge Parish citizens voted and passed the extension of the one half percent sales and use tax, which is used to improve local streets and roadways in the parish. The extension of the tax program is until the year 2030. The program is referred to as the *Green Light Plan*, which will allow the parish to complete projects both for a reduced cost and at a faster rate.

The Nicholson Drive, Segment 1 project is an extension of the Nicholson Drive at Brightside Lane and West Lee Drive intersection improvement currently under design as an urban systems project. Segment 1 proposes to improve the congestion along Nicholson Drive by changing the existing 2-lane roadway to 4 lanes. The limits of the project are about 1,164 feet north of the intersection of Nicholson Drive at Brightside Lane and Lee Drive to 300 feet south of Burbank Drive and Gourrier Avenue at Nicholson Drive intersection. The East Baton Rouge Parish engineering selection board selected *Forte and Tablada, Inc.* to generate a design study of Nicholson Drive, Segment 1, which includes 1.08 miles of commercial, residential, and recreational developments. This design study discusses the existing and proposed lane configuration, alignments, traffic signalization, and drainage.

The East Baton Rouge Parish has also made a renewed commitment to those citizens wanting a quality of life which safely allows for bicycles and pedestrians to have more access within the City-Parish. This study includes an area-wide bicycle and pedestrian access study with approximate limits of LSU to the North, Ben Hur to the South, the Mississippi River Levee to the West and Burbank Drive to the East with important links to the River Levee Trail, Tiger Town and LSU.

EXISTING CONDITIONS

1. Existing Facility

Nicholson Drive, Segment 1 is classified as an urban arterial roadway with a design speed of 45 mph. The existing roadway section for this project is a two-lane asphaltic concrete roadway with asphaltic concrete shoulders. The storm water drainage along the project is mostly open ditch. Otherwise, the existing drainage is subsurface. The existing right-of-way varies in width from 80’-130’ feet along the length of the project. A railroad track owned by Canadian National Railroad is located west of Nicholson Drive and extends along the entire length of the project. The railroad right of way extends 50 feet from the railroad centerline.

The main drainage outfall for the surrounding areas is Bayou Fountain. Nicholson Drive crosses Bayou Fountain twice within the confines of the Segment 1 project. The first crossing is at station 307+13 by way of (3) 8’x 8’x171’ reinforced concrete box culverts at a 30 degree left crossing. Bob Petit Boulevard has a 60 foot bridge which crosses Bayou Fountain approximately 66 feet west of the railroad crossing. Then, Bayou Fountain crosses Nicholson Drive again at station 337+56 by way of 1- 8’x 8 ’reinforced concrete box culvert and 1-84” steel culvert at a 45 degree right crossing.

The existing bicycle/pedestrian facility parallels the roadway within the railroad right of way. The 8’ wide asphaltic concrete path actually can be inundated with water during heavy rain conditions and potentially allows for bicycle/pedestrian conflicts on and near the railroad crossing particularly within the existing intersections.

The existing traffic conditions warrant major improvements not only along the road corridor, but at all of the intersections along the corridor. In addition, several turn outs exists along Nicholson Drive accessing multiple businesses and apartment complexes.

2. Adjacent Development

Nicholson Drive serves as a major access corridor for the LSU and downtown areas as well as the industrialized areas south of LSU into Iberville and Ascension Parishes. The adjacent property to Nicholson Drive, Segment 1 is mixed between commercial, residential, and recreational. The vicinity map for this project is shown in Figure 1. The LSU golf course and LSU baseball stadium are located to the west of the railroad tracks near the intersection of Gourrier Avenue and Nicholson Drive. Approximately 3240 feet (0.61 miles) north of the end of this project (400 feet south of Gourrier Avenue) is the LSU football stadium, which has a capacity of 92,400 people. Therefore, the proposed additional lanes to Nicholson Drive will reduce traffic congestion into and out of the LSU area during these times of high traffic volume such as after LSU football games. There are only 2 adjacent streets along segment 1 of Nicholson Drive, which include East Boyd Drive and Bob Petit Boulevard (turns into Jennifer Jean Drive on the East side of Nicholson). On the east side of Nicholson Drive, Segment 1 there are commercial and primarily college residential developments. Specifically, north of East Boyd there is around 800 feet of residential developments, which includes one hotel named Staybridge Suites Hotel. The hotel is currently being developed and is the most northern development along the length of the project. Between East Boyd and Jennifer Jean Drive there is around 400 feet of commercial development and near the end (south) of the project length there is approximately 400 feet of residential properties.

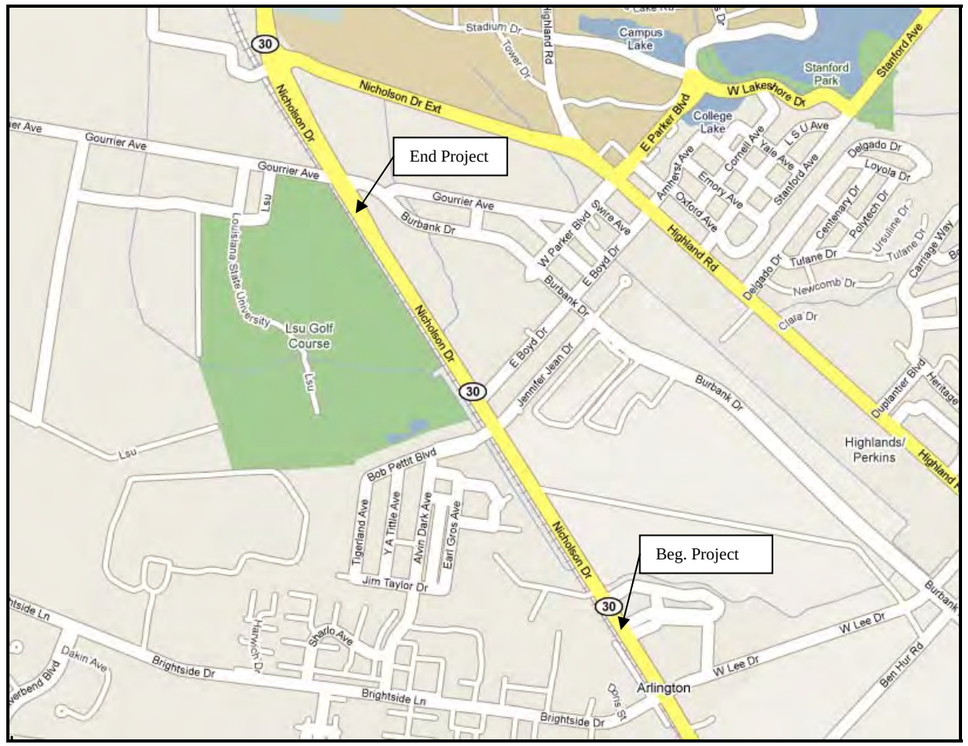


Figure 1: Nicholson Drive, Segment 1 Vicinity Map

3. Topographic Features, Existing ROW & Existing Utilities

Topographic surveys for Nicholson Drive, Segment 1 were completed by *Baton Rouge Land Surveying.* The survey denotes, in English units, the locations of all of the topographic features required for design and construction of the new roadway. These features include, but are not limited to, the existing horizontal and vertical alignments, drainage, trees and shrubbery, railroad, sidewalks, drives, visible and provided locations of existing utilities, and apparent right of way limits within the project area.

The horizontal coordinates and bearings used for this project are based on the State Plane Coordinates, Louisiana South Zone, NAD83 (Geoid 03) from GPS Static Observation. Specifically, the primary control points were established by classical static long duration GPS observations processed using the OPUS solution through the NGS website. All other control points were established by using multiple RTK observations from multiple OPUS control points and obtaining the mean of these RTK positions.

The vertical control used is referenced to the North American Datum of 1988 (NAVD88). The elevations were based upon the East Baton Rouge Department of Public Works control benchmark number 17B004, which is located on Ben Hur at Nicholson Drive. The elevation of this benchmark is 20.14 feet.

The Green Light Plan Program managers provided the title abstracts for this project. The Right of Way Base Maps, which show the existing right of way and property lines were produced by utilizing both the location of the property irons, found while surveying, and the provided title abstracts. The average depths of the lots adjacent to the east of Nicholson Drive, Segment 1 vary from 100 feet to 2500 feet deep. There is a railroad that runs parallel to the west of Nicholson Drive throughout the length of the project. To the west of the railroad, the average depths of the lots vary greatly from 200 to 6700 feet deep. The existing right of way along Nicholson is approximately 85'. The property survey maps may be found in this report as ***Exhibit 47***.

There are numerous utilities located along the roadway that service the commercial, residential, and recreational developments in the surrounding areas. When the project was surveyed, LA One Call was contacted and 6 tickets (90259418, 90259448, 90259466, 90259492, 90259503, 90259522) were submitted in order to collect the location of the underground utilities. The list displays the utilities which were found along the project route.

- Water – Baton Rouge Water Company
- Sanitary Sewer (Gravity and Force Main) – EBRP Department of Public Works
- Gas – Entergy Gas
- Overhead Electric – Entergy Electric
- Underground Electric – Entergy Electric
- Overhead Telephone – AT&T
- Underground Telephone – AT&T
- Traffic Signals – EBRP Department of Public Works
- TV/ Cable – Cox Communications
- Gas – Acadian Gas

Based on a combination of field investigation, topographic surveying, and information provided by individual utility companies a projected list of major utilities that will be required to be relocated to accommodate widening of LA 30 is shown in Table 1. Stationing is based on the LA 30 projected & adopted alignment. The required right of way shown in this design study is intended to be able to accommodate all required utility relocations. However, Entergy may prefer to acquire their own servitude outside the right of way for their main transmission lines. Further coordination with utility owners will be required during the design stage of the project to accommodate all utilities.

TABLE 1: MAJOR UTILITY RELOCATION INVENTORY			
UTILITY OWNE	**DESCRIPTION**	**BEG STA.**	**END STA.**
ENTERGY	OVERHEAD ELECTRIC	302+09.27 RT.	335+52.16 RT.
ENTERGY	2" GAS LINE	302+09.27 RT.	305+05.56 RT.
BR WATER	12" WATER LINE	302+09.27 RT.	335+52.16 RT.
BR WATER	16" WATER LINE	335+52.16 LT.	357+54.00 LT.
EBRP DPW	12" SEWER FORCE MAIN	302+09.27 RT.	335+80.00 RT.
ACADIAN GAS	GAS LINE	307+00.00 LT.	310+00.00 LT.
AT&T	UNDERGROUND TELEPHONE	308+81.88 RT.	332+68.91RT.
EBRP DPW	UNDERGROUND TRAFFIC SIGNAL LIN	302+09.27 RT.	357+54.00 RT.
ENTERGY	2" - 4" GAS LINE	326+86.25 RT.	336+64.95 RT.
ACADIAN GAS	GAS LINE	336+50.00 LT.	339+00.00 LT.
ENTERGY	OVERHEAD ELECTRIC	329+77.79 LT.	340+90.00 LT.
LEVEL 3	FIBER LINE	302+09.27 RT.	357+54.00 RT.

DESIGN STUDY OBJECTIVES

The objectives that will be considered in this design study are as follows:

- Present a typical section for this project that will meet the LA DOTD and Green Light Program design standards.
- Present a horizontal alignment and vertical profile which will meet the LA DOTD and Green Light Program design standards.
- Provide an open ditch and subsurface storm water sewer system to handle the calculated storm water runoff.
- Provide a hydraulic analysis of existing and proposed cross drains.
- Analysis of traffic to ensure proper signalization, which will reduce congestion and provide safer travel for the public.
- Consider alternate methods of design and construction in order to reduce the displacement of residences and businesses along the project length.

DESIGN STUDY RECOMMENDATIONS

1. Design Criteria

The state of Louisiana (DOTD) has classified Nicholson Drive as an Urban Arterial (class 2). The design standards listed below in Table 2 and the corresponding footnotes are taken from the *Louisiana Department of Transportation and Development Design Standards* signed December 4, 2009 by the Chief Engineer.

Item	**UA-2**
Design Speed (mph)	45
Level of Service[1]	C
Number of Lanes	2 (min) – 4 (typ)
Width of Travel Lanes (ft.)	11-12
Width of Shoulders (minimum) (ft)[2]	
(a) Inside on multilane facilities	N/A
(b) Outside	8
Shoulder Type	Paved
Parking Lane Width (ft)	10-12
Width of Median on Multilane Facilities (ft.)	
(a) Depressed	N/A
(b) Raised	6[3] – 30
(c) Two way left turn lane	11- 14 typ.[4]
Width of Sidewalk (minimum) (where used) (ft.)[5]	
(a)Offset from curb	4
(b)Adjacent to curb	6
Fore Slope (vertical – horizontal)	1:3(min) – 1:4 (des)
Back Slope	1:3
Pavement Cross Slope (%)	2.5
Stopping Sight Distance (ft.)	
45 mph	360
Maximum Superelevation (%)	4
Minimum Radius (ft) [6,7]	
(a)With normal crown (-2.5% cross-slope)	1,000
(b)With 2.5% superelevation	750
(c)With full superelevation	700
Maximum Grade (%)	6
Minimum Vertical Clearance (ft.) [8]	16
Minimum Horizontal Clearance (ft.)	
(a)From edge of travel lane	24[9]
(b)Outside (from back of curb) (when curb is used)	6 (min) – 22(des)[11]
(c)Median (from back of curb)[12] (when curb is used)	4 (min) – 18 (des)
Bridge Design Live Load[13]	AASHTO
Width of Bridges (minimum) (face to face of bridge rail at gutter line) [14]	
(a)Curbed Facilities (without sidewalks)	Traveled[14] way plus 8’
(b)Shoulder facilities	Roadway width
Guardrail Required at Bridge Ends	[14]

The Footnotes corresponding to the UA-2 Design Standards shown above in Table 1 are shown below.

1. Level of service D allowable in heavily developed urban areas.
2. Curb may be used in place of shoulders on UA-1 and UA-2 facilities. If used on UA-3, UA-4, or UA-5 facilities, curb should be placed at edge of shoulder. For design speeds greater than 45 mph, curb will not be placed in front of guardrail.
3. With Chief Engineer's approval, curb offsets may be eliminated and the minimum median width can be reduced to 4 feet. On principal arterials, particularly at intersections, the upper limit should be considered.
4. Cannot be used on multilane roadways (with four or more through lanes) without the Chief Engineer's approval.
5. Sidewalks must be separated from the shoulder and should be placed as near the right of way line as possible. On high speed facilities, they should preferably be placed outside the minimum clear zone.
6. It may be necessary to increase the radius of the curve and/or increase the shoulder width (maximum of 12 feet) to provide adequate stopping sight distance on structure.
7. The following radii apply at divisional islands. The radius selected must match the design speed of the road. These radii also apply to the other standards where divisional islands are mentioned.

Design Speed (mph)	Radius (rounded) (ft)	Degree of Curve
45	3,850	1°30'

8. An additional 6 inches should be added for additional future surfacing.
9. Applies to facilities with shoulders. Refer to the Roadside Design Guide when 1:3 fore slopes are used or for slopes flatter than 1:4.
10. The distance may be reduced by 6 feet if 1:6 slopes are used. For outside shoulders wider than 8 feet, further reduction should be proportional to the added shoulder width.
11. If outside shoulders and curb are used, refer to the Roadside Design Guide.
12. Where left turn lanes are provided or where the median is less than 6 feet in width, the minimum clearance will be 1.5 feet from back of curb. For median slopes steeper than 1:6, refer to the Roadside Design Guide for the desirable clearzone.
13. LRFD for bride design
14. Refer to EDSM II.3.1.4 when sidewalks are provided and for guardrail requirements.

General Note: DOTD pavement preservation guidelines or 3R design standards (separate sheets) shall be applicable to those projects for which the primary purpose is to improve the riding surface.

2. Preliminary Typical Section

Based on past studies, the Green Light Program has proposed to improve Nicholson Drive, Segment 1 from a two-lane roadway to four-lanes (11' travel lanes) with a 16' median section, and including 8' shoulder/bike lanes in both directions along Nicholson Drive, along with a 6' sidewalk. ***Forte and Tablada, Inc.*** was chosen by the East Baton Rouge Parish engineering selection board to produce a design study for this project. The LA DOTD has proposed two equivalent pavement sections for use on this project. These flexible and rigid alternate sections are shown in ***Exhibits 1 and 2***.

In order to properly design the cross drains, typical sections were generated to visualize any clearance issues with the new roadway. The typical sections for both of the major cross drain locations are shown in ***Exhibit 2***.

The pavement design was received in a letter from LA DOTD pavement design engineers dated March 3, 2010. Their recommendations are summarized in Table 3 below.

TABLE 3 : PAVEMENT DESIGN

STRUCTURAL DESIGN		
CURRENT ADT - 2010	=	18,000
MEDIUM ADT	=	
DESIGN ADT - 2030	=	27,800
PERFORMANCE PERIOD (YEARS)	=	20
FLEXIBLE STRUCTURAL DESIGN		
18 KIP ESALS	=	5,386,439
SOIL RESILIENT MODULUS (PSI)	=	4.3
STRUCTURE NUMBER REQUIRED (INCHES)	=	5.05
STRUCTURAL NUMBER PROVIDED (INCHES PER LAYER)		
1-WEARING COURSE, SUPERPAVE (LEVEL 2F)	=	0.88
2-BINDER COURSE, SUPERPAVE (LEVEL 2)	=	1.76
3-BASE COURSE, SUPERPAVE (LEVEL 1)	=	1.19
4-BASE COURSE, CLASS II (STONE)	=	0.5
5-BASE COURSE, CLASS II (SOIL CEMENT)	=	0.76
STRUCTURAL NUMBER PROVIDED (TOTAL INCHES)	=	5.09
RIGID STRUCTURAL DESIGN		
PAVEMENT TYPE	=	JPCP
18-KIP ESALS OVER INITIAL PERFORMANCE PERIOD	=	6,695,537
INITIAL SERVICEABILITY	=	4.3
TERMINAL SERVICEABILITY	=	2.5
28-DAY MEAN PCC MODULUS OF RUPTURE	=	600 PSI
28-DAY MEAN ELASTIC MODULUS OF SLAB	=	4,200,000 PSI
MEAN EFFECTIVE K-VALUE	=	350 PSI/IN
RELIABILITY LEVEL	=	97%
OVERALL STANDARD DEVIATION	=	0.37
LOAD TRANSFER COEFFICIENT, J	=	2.5
OVERALL DRAINAGE COEFFICIENT, CD	=	1
CALCULATED DESIGN THICKNESS	=	9.12 IN

3. Horizontal Alignment

The horizontal alignment for LA 30 was created using the geometry of the railroad as the overall limiting factor. For this design the railroads 50' eastern right of way line was maintained as the LA 30 western right of way line. We used a best fit line for the alignment

that achieved our goal of having the back of curb of the proposed roadway at least 1' off the railroad right of way line, thus minimizing the impact of right of way acquisition on the east side of the project. Any place where something permanent is constructed on the railroad's right of way, "Required R/W" will be shown around the item. All improvements located in the railroad right of way will require approval, agreements, and permits from the railroad company. At the beginning of the project the alignment ties to the end of the Nicholson @ Brightside & W. Lee intersection improvements at STA.302+09.27. This is shown on Exhibit 4. The LA 30 alignment proceeds from this point on a single bearing of N 32° 39' 04"W at a distance of 6,836 feet. Alignments were also created for Jennifer Jean, Bob Petit, and E. Boyd as seen on their respective plan and profile sheets included in this study. The design vehicle used for design of geometric turnouts is a BUS 40 turning from outside lane to outside lane. The following turnouts were designed to accommodate the full turning radius of a BUS 40 from outside lane to outside lane; LA 30 northbound rights turn onto Jennifer Jean, Jennifer Jean westbound right turn onto LA 30, LA 30 northbound right turn lane onto East Boyd, East Boyd right turn lane onto LA 30 and the middle entrance to Southgate Towers Development. The horizontal alignment station and curve report can be found in ***Appendix 1***.

4. Vertical Profile

Exhibit 3 displays the surrounding areas for this project on the East Baton Rouge Parish Flood Insurance Rate Map (FIRM), dated May 2, 2008. This map shows that Nicholson Drive, Segment 1 is mostly in Flood Zone X and some in Flood Zone AE. According to this map, the area to the west of Nicholson Drive and the Illinois Central Railroad has a 100 year flood elevation of 23 feet. At the intersection of Nicholson Drive and Bayou Fountain, which is south of Jennifer Jean Drive, the 100 year flood elevation decreases. Specifically, the 100 year flood elevation is 22 feet on the west side of Nicholson Drive and 21 feet on the east side.

As per guidelines provided by the Green Light Program, the minimum roadway elevation is required to be one foot above the 50 year flood elevation. In order to determine multiple 50 year flood profile elevations of Bayou Fountain the FEMA Flood Profiles were obtained from the Flood Insurance Study dated May 2, 2008. The profiles, sheets 13P and 14P, are included in ***Exhibits 4 and 5***. At cross section BA a box culvert is located to allow Bayou Fountain to flow under Nicholson Drive near station 307+13. The 50 year flood profile elevation at cross section BA is 20.5 feet on the east side of the culvert and 21.6 feet on the west. The next cross section location is denoted BB, where Bayou Fountain crosses under Bob Petit Boulevard. At this location, the 50 year flood profile elevation is 22.5 feet. The last major cross section (BC) is where the Bayou crosses under the Illinois Central Railroad Bridge and back under Nicholson Drive at station 337+56. This cross section has a 50 year flood profile elevation of 23 feet.

A series of vertical curves and tangents were used to design the vertical profile. At the beginning of the project the vertical profile ties into the decreasing slope of the Nicholson @ Brightside project. Vertical curve lengths of 140' were provided along LA HWY 30 with K values within tolerable ranges. In order to improve sight distance at the intersection of LA 30 with Jennifer Jean and Bob Petit the intersection will be raised by introducing a 2.5% reverse crown along the la 30 roadway through the intersection. This will improve the current grade of Bob Petit Blvd at the rail crossing which is about 8% currently see picture below. The vertical profile can be found on the plan and profile sheets ***Exhibits 6-21***. The Vertical curve report can be found in ***Appendix 2***.

Figure 2: Picture of LA 30 @ Bob Petit RR crossing taken by Jason Ellis May 9, 2009

5. Traffic Analysis

The traffic study was conducted utilizing a design year of 2030. The study provides information on storage and taper lengths for turn lanes. The most current traffic study for this project was completed by Urban Systems on May 12, 2009. It states that E Boyd is to become a right in, right out roadway while allowing vehicles traveling south on LA 30 to turn east by a properly designed left turn lane in the median. At the intersection of the middle driveway to Southgate Towers a full access median is to be provided. There will also be left turn lanes provided on all 4 legs of the LA 30 @ Bob Petit/ Jennifer Jean intersection.

6. Construction and Maintenance of Traffic

During the construction phase of the project at least three tasks will have to be carefully planned in order to keep LA 30 open during this period. The first is the construction of the southernmost cross drain extensions. If traffic utilizes the existing roadway then this shouldn't pose any problems during the construction. The second is the construction of the raised intersection at Jennifer Jean/Bob Petit. The roadway will have to be elevated approximately 1.5' above current grade. This will cause problems with traffic but may be achieved by partial construction of travel lanes and use of temporary maintenance aggregate. During the design phase of the project a suggested sequence of construction map will be provided to detail how traffic may be maintained during construction. Rail traffic may have to be closed for a short duration in the vicinity of the Jennifer Jean/ Bob Petit Intersection. Finally the removal and replacement of the northern cross drains will form a problem, due to right of way area limitations a detour road is not feasible here. The cross drain will have to be removed and replaced so that two permanent or temporary lanes can be constructed on the east side of LA 30. It will be possible to maintain two-way traffic along the existing roadway

while building the outer lanes for the new roadway. Once the outer lanes are constructed the traffic can be pushed to the outer lanes while the inner lanes and the median are constructed.

7. Displacement of Residences and Businesses

No buildings are in conflict with the current design however Tiger Mart located at LA 30 & Jennifer Jean will lose a significant amount of parking on the LA 30 side of the building. After the roadway is constructed the Tiger Mart structure will be the closest building approximately 24' from the edge of the new sidewalk. In addition the enclosed gas line substation will have to be relocated because it will lie approximately 15' into the roadway right of way. A picture of the gas substation is provided below.

Figure 3: Picture of gas substation taken by Jason Ellis May 9, 2009

8. Environmental Assessment & Wetland Finding

Environmental Site Assessment

Phase 1 Environmental Assessment was completed in February 2009 by Gulf South Research Corporation (GSRC). A UST pit is located on the east side of the existing Nicholson Drive Right of Way. The UST is adjacent to the Right of Way at 4245 Nicholson Drive. This location is that of the Cracker Barrel/Shell gas station, and would be affected by construction along the east side of Nicholson Drive. Evidence of a former UST and gasoline dispenser island was found at the Tigerland Grocery parking lot. In conclusion no business environmental risk exists for the project area. However, special precautions will need to be taken near the construction of widening improvements adjacent to the existing UST sites listed above.

Wetlands

On December 22, 2008, C-K Associates conducted a field investigation to gather information about possible wetlands and other waters inside the limits of the project area. The field investigation discovered 0.083 acres of possible jurisdictional wetlands as well as 0.31 acres of other waters.

9. Geotechnical Assessment

Ardaman & Associates conducted the geotechnical investigation of the project site their results are included in a report dated August 5, 2009.

HYDRAULIC ANALYSIS AND RECOMMENDATIONS

Bayou Fountain is the main drainage outfall for the projects surrounding areas. There are two branches of Bayou Fountain, one to the west of Nicholson drive and the other to the east. The two branches come together around 0.18 miles north of Bob Petit Boulevard and 0.03 miles (125 feet) to the west of the railroad track. The storm water drainage along Nicholson Drive, Segment 1 is mostly open ditch, with the remainder of the drainage subsurface. There are multiple soil types in the surrounding areas of this project, which were obtained from the USDA Web Soil Survey and is provided on a map in ***Exhibit 22*** of this report. Specifically, the majority (54.6%) of the soil is Schriever Clay (SeA). The second highest soil content (21.2%) in the area is referred to as Urban Land(UrA). Based on these soil types, the soil classification for this area for the purpose of hydrologic modeling is determined to be Hydrologic Soil Group D.

The existing drainage map for this project is shown in ***Exhibit 28*** of this report. The existing drainage map shows that there are 3 outfall locations along the project length of Nicholson Drive. The outfall locations are discussed further below. Currently the area between LA 30 and the railroad track is used to drain the area from the centerline of the railway to the centerline of the roadway by forming a ditch/ low area that conveys existing runoff to the three outfalls mentioned above. The proposed drainage improvements will minimize adverse impact on the existing ditches/ low areas in this vicinity by providing a newly graded ditch which will carry any increase in discharge from the roadway to the outfalls that are already being utilized for drainage in the area.

1. Outfall Locations

The first outfall location is at the (3) 8’ X 8’ reinforced concrete box culverts that allow Bayou Fountain to pass east beneath the existing roadway at STA. 307+13. See picture below.

Figure 4: Picture of (3) RCBC’s at Sta. 307+13 taken by Jason Ellis May 9, 2009

The next outfall location is at STA. 337+56 which also allows Bayou Fountain to pass west beneath Nicholson Drive. Currently there is one 84” steel pipe and one 8’x 8’ reinforced concrete box culvert passing beneath the roadway. On the east side of the cross drains there is a 70’ diameter open pit with (2) 10’ X 8’ RCBC’s stubbed out on the opposite side. See picture below.

Figure 5: Picture of 8’ X 8’ RCBC and 84” steel culvert at Sta. 337+56 taken by Jason Ellis May 9, 2009

The final outfall location is at STA. 346+10 where two 36” corrugated metal arch pipes carry storm water from the LSU golf course area across Nicholson drive to the enclosed bayou Fountain to the east.

Figure 6: Picture of (2) 36” CMPA’s at Sta. 346+10 taken by Jeff Diamond May 15, 2009

2. Cross Drain Design

The drainage areas were delineated based on elevations found by topographic survey and with LIDAR contour data found on the LSU Atlas website. The area affecting Nicholson Drive, Segment 1 begins approximately one mile north of the intersection of Nicholson Drive and Gourrier Avenue because that location is approximately the beginning of Bayou Fountain. With the acquired rainfall data and drainage areas, the discharges for the existing cross drain structures were calculated based on the SCS method with a design storm frequency of 50 years. The hydrologic data and results for the SCS method peak runoff calculations were generated by use of the HYDR 1130 LA DOTD program and the results are shown in ***Appendix 3***. The existing and proposed cross drains were modeled and analyzed with HEC-RAS. The allowable headwater elevation is one foot below the outside edge of the travel lane (22.23 feet). The three existing cross drains which pass underneath Nicholson Drive, Segment 1 are summarized in Table 4 below. Based on the data obtained from HEC-RAS, all three structures sizes were adequate for the existing conditions. The existing cross drain structure, A-1, will remain as 3- 8’ x 8’ reinforced concrete box culverts, but will be extended to account for the proposed additional roadway and designated B-1. Bayou Fountain will need to be partially relocated and realigned up to 210 feet in order to

accommodate the widening of the roadway corridor. Cross drain structures A-2 and A-3 will be replaced with 2-10’ x 8’ reinforced box culverts, designated B-2, in order to connect with the existing 2- 10’ x 8’ reinforced box culverts that are located at approximately station 337+56. This connection is necessary due to the open pit along the east side of Nicholson that will need to be enclosed to accommodate the proposed additional roadway. The third and final cross drain location designated as A-4 is located at station 346+10 and will remain. A summary of the existing and proposed cross drain analysis performed using the HEC-RAS hydraulics program are presented in ***Exhibits 23-27***.

TABLE 4: CROSS DRAIN LOCATIONS

Subsurface Str No.	Outfall Station	Existing Structure Size & Type	Proposed Structure Size & Type
A-1	307+13	3-8'x8'x171' R.C. Box Culv. 30° left crossing	SEE B-1
A-2	337+56	1-84"x80' Steel Culv. 45° right crossing	SEE B-2
A-3	337+56	1-8'x8'x90' R.C. Box Culv. 45° right crossing	SEE B-2
A-4	346+10	2-36”x140' CMPA	Existing to Remain
B-1	307+13		3-8'x8'x285' R.C. Box Culv. 30° left crossing
B-2	337+56		2-10'x8'x1605' R.C. Box Culv. 45° right crossing

3. Storm Sewer Network

The storm sewer network was designed utilizing the rational method with a 10 year design storm for DOTD rainfall region I. The storm sewer network was designed by aid of the LA DOTD hydraulics program HYDRWIN. The inlet spacing and width of flooding were determined through use of the LA DOTD HYDR6000 program. The output results for the inlet spacing computations are located in ***Appendix 4.*** The maximum width of flooding along Nicholson drive has been limited to 13.5’. The storm sewer design was completed utilizing the HYDR6020 program. LA DOTD requirements of 1’ of hydraulic clearance and minimum velocities of 3 ft/sec were attained in this design. A subsurface system was designed on the east side of Nicholson Drive because of right of way constraints and the high amount of commercial establishments located there. On the west side of Nicholson Drive open ditches currently drain the area from the west of the roadway centerline to the east of the railroad centerline. Because the roadway improvements will have little impact on the capacity of these ditches a paved gutter drain system was designed to utilize natural drainage patterns already in place and to minimize the impact of the permanent footprint of drainage structures inside the railroad right of way. The storm sewer network is separated into 10 individual systems. The results of the HYDR 6020 Storm Sewer design are included in ***Appendix 5***. A summary of the required pipe and drainage structures for the project is provided below in table 5. The design drainage maps which summarize the storm sewer network are included in ***Exhibits 29-33***.

Table 5: Storm Sewer Inventory

Size	Unit	Quantity
CB-01	Each	29
CB-06	Each	35
CB-08	Each	11
CB-09	Each	1
MH-06	Each	4
Paved Gutter Drain	Each	29
15" SDP	Lin Ft	1641
18" SDP	Lin Ft	923
24" SDP	Lin Ft	1351
30" SDP	Lin Ft	1980
36" SDP	Lin Ft	75
8'X8' RCB EXT	Lin Ft	285
10'X8' RCB EXT	Lin Ft	356

SANITARY SEWER ANALYSIS AND RECOMMENDATIONS

1. Existing Sanitary Sewer Utilities

After reviewing the EBROSCO maps and topographic survey data there appears to be no gravity sewer lines within the limits of construction for this project. However the topographic survey conducted by Baton Rouge Land Surveying Inc. has indicated that there is an existing 12 inch sewer force main with valves that runs from the right side of the beginning of project to approximately Station 335+80 right. This 12 inch force main serves the Southgate Towers development area and it originates where it exits a pump station at the Southern driveway/entrance to Southgate Towers. This force main was installed in 2002 and is located approximately 6+/- feet from the eastern edge of the existing shoulder. The topographic survey also indicated the existence of two sewer manholes beyond the limits of construction on East Boyd Ave. There is also a sewer manhole located at station 328+17 right on Nicholson Drive just north of the Tiger Mart building which appears to be beyond the limits of construction. In addition after receiving a review from the BR SSO Program there are currently no plans for sewer improvements within the limits of the project area.

2. Recommendation for the relocation of Sanitary Sewer Utilities

The existing 12 inch sewer force main with valves that runs from the right side of the beginning of project to approximately Station 335+80 right will have to be relocated to outside the roadway with other existing utilities as noted in Table 1. The cost of this relocation is estimated to be approximately $ 200,000.

PEDESTRIAN/BIKE PATH

Connecting Baton Rouge: the Multimodal Way!

What a great time to be living in the City of Baton Rouge. The economy is turning around, citizen involvement seems to be at an all-time high, and the City is taking a proactive approach to promoting a multi-modal transportation network by adding 44.2 miles of bike lanes, sharrow routes, and trails. This new way of getting around the City is providing access for more people than ever before and creating a platform for more downtown commuting and recreational use.

The area around the LSU campus and Tigerland, as well as the River Levee, is ripe for multi-modal transportation expansion; the re-design of the Nicholson Drive corridor is a perfect place to begin this transformation.

To assist the City in creating this vision, a conceptual bicycle/pedestrian master plan for the area has been developed. The plan brings together the energy and local knowledge of stakeholder groups, city staff, LADOTD and an engineering consultant planning and design team dedicated to achieving this goal.

Accordingly, the plan brings together all pertinent information and stakeholder input in determining the safest and most cost effective method to provide connectivity for nontraditional multi-modal bicycle and pedestrian links to the:

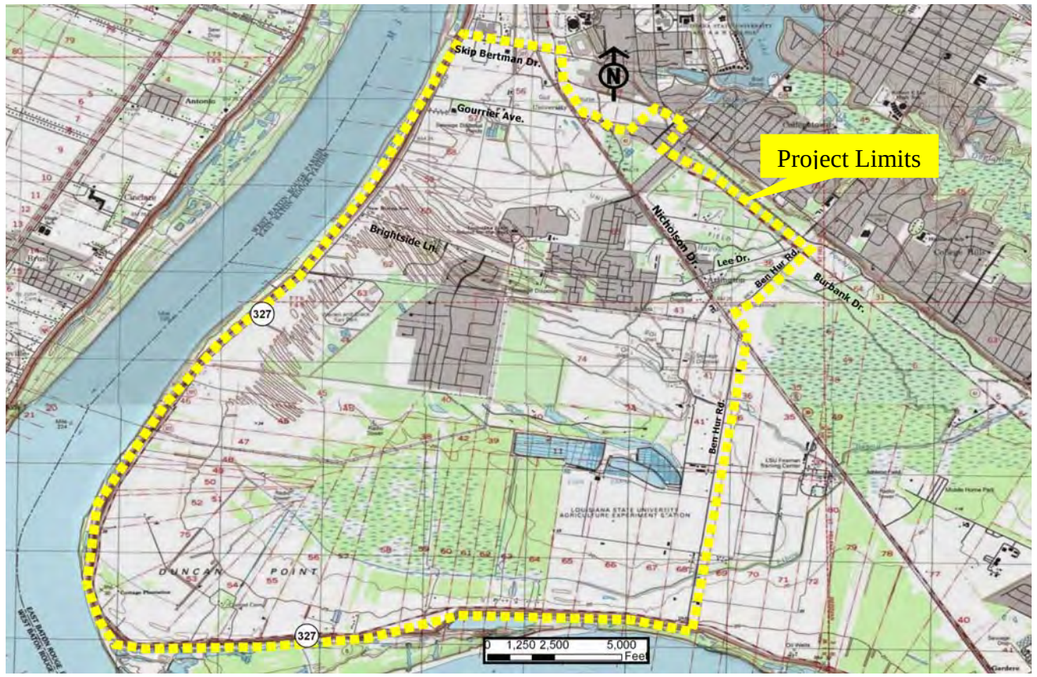
- River Levee Trail,
- the downtown area,
- the lake parks,
- Tigerland,
- the LSU campus and
- other origin/destinations

Goals and Objectives

The purpose of the Bicycle and Pedestrian Access Study is to determine the safest and most cost effective method to provide connectivity for multimodal bicycle and pedestrian links to the River Levee Trail, Tigerland, the LSU campus and other origin and destinations. This study recommends alternatives which transform the existing transportation network to provide pedestrian and bicycle linkages. This study also provides alternatives for expanding the off-street shared use pathway system which preserves natural resources while providing aesthetically pleasing facilities and promoting greenways. If implemented, these recommendations can help reduce harmful motor vehicle emissions and encourage increased physical activity. The limits of this study (shown in Figure 7) are LSU to the North, Ben Hur to the South, the Mississippi River Levee to the West and Burbank Drive to the East.

Although the overall goal of the study was to recommend facilities that would create a connected network within the project limits, emphasis was placed on Nicholson Dr. between Brightside Ln. and LSU because of the high volumes of bike, pedestrian and vehicular traffic currently utilizing this corridor.

Figure 7
Vicinity Map



Development of the Plan

The recommendations will be in accordance with the guidelines, standards, and requirements of the Louisiana Department of Transportation and Development (LADOTD) Bicycle and Pedestrian Unit. All proposed bikeway improvements will be designed in accordance with the latest version of the *AASHTO Guide to Development of Bicycle Facilities* and LA DOTD guidance concerning bikeway and pedestrian facility design. Appropriate bikeway signage and pavement markings will be in conformance with the *Manual of Uniform Traffic Control Devices.*

A rational approach to developing a comprehensive plan has been designed which includes:

1. Data collection to determine the scale of the project, the existing level of use of the various bicycle/pedestrian users, and specific project elements such as land use, natural systems, and existing network facilities.

2. Inventory and analysis of the existing segments, crossings, local interaction, land use generators, and on and off road facilities' level of service analysis;

3. Demonstrate the viability of existing and future facilities and whether they play a role in the development of a comprehensive master plan system; and

4. The comprehensive evaluation of the viable corridors identified, including physical characteristics such as opportunities and conflicts, capacity, crossings, right-of-way, cross-sections, environmental issues, and planning level cost estimates.

Trip Origins/Destinations

Alex Box Stadium, Farr Park, the LSU golf course, Tigerland, the River Levee Trail, and Tiger Stadium represent just a few of the attractions located within the project vicinity. This area is home to several locally adored restaurants, nationally recognized food chains, bars, residential communities, shopping centers and a major international hotel. The properties in this region consist of residential, commercial, and recreational uses. In addition to the origins and destinations within this locality, this area serves as a corridor to Downtown Baton Rouge.

Creating a Vision

Clearly, the residents of Baton Rouge want multimodal facilities and "Smart Growth". During Mayor –President Kip Holden's listening tour, hundreds of residents stressed their desire for more bike paths. According to an article in the Advocate (March 8, 2009) concerns were expressed about bike paths which lead to "no where" and a lack of sidewalks. Properly understanding the needs and desires of the potential pedestrian and bike facility users is a must in the completion of a successful master plan.

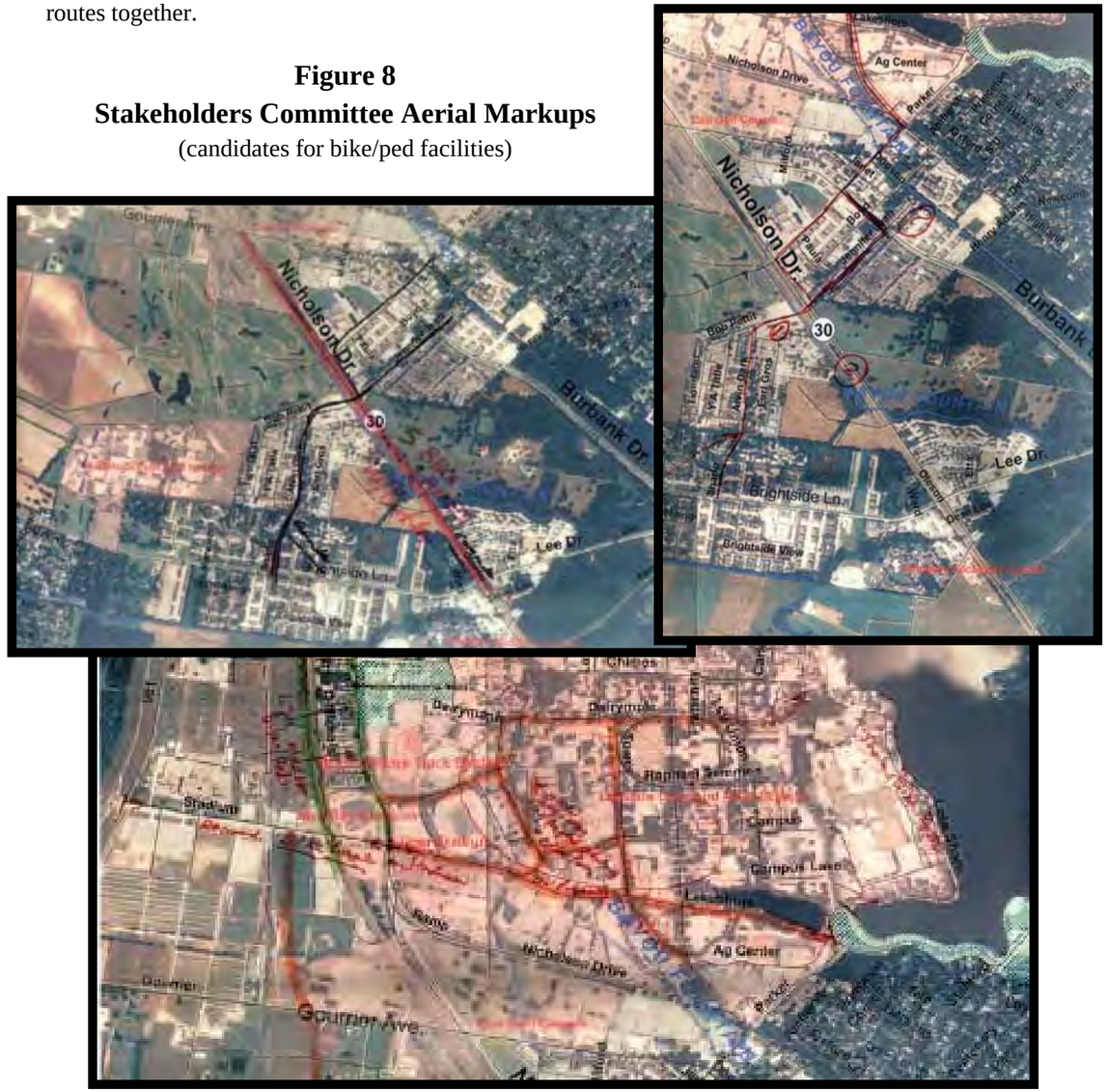
In an attempt to address the concerns of the community, a stakeholders committee was created which included representatives from LADOTD, MPO BPAC, East Baton Rouge Public Works, LSU and BREC. The vision for the facility improvements originated from statements and perspective obtained during individual interviews with committee members. Members made recommendations regarding alternatives for bike facilities along Nicholson Dr. and expressed their viewpoints regarding other corridors which might provide pedestrian and bicycle linkages. During these interviews, they were provided aerials to mark desired locations for pedestrian and bike facilities.

Overall, stakeholders agreed that bike lanes should be provided along Nicholson Dr. Specific concerns are that the bike lanes should be wide enough to provide adequate comfort to the user and that a buffer be provided between the bike lane and vehicular traffic. Stakeholders agreed that the heavy traffic volumes along Nicholson Dr. could serve as justification for providing a bike lane width above AASHTO's minimum requirements.

Stakeholders have recommended that bike linkages be provided along Brightside Ln., through Tigerland, across and along Nicholson Dr. and up to the LSU campus. Several corridors of specific interest are Burbank Dr., Jennifer Jean Dr., Boyd Ave., Bob Pettit Blvd., Alvin Dark Ave. and Highland Rd. There was some agreement that, collectively, this network provides a direct route for daily commuters and ties student housing to the heart of the LSU campus.

Several stakeholders have recommended that a shared use path be constructed between Brightside Ln. and Gourrier Ave. They also recommend that trailheads be placed along Brightside Ln. and Gourrier Ave. There is agreement among the stakeholders that this shared use path may function more as a recreational facility. Figure 8 shows aerials with the mark-ups from the stakeholders indicating their preferences as to the way their vision of the future should bring these multi-modal routes together.

Figure 8
Stakeholders Committee Aerial Markups
(candidates for bike/ped facilities)



Relevant Studies and Future Plans

As part of the Community's commitment to provide multimodal facilities, several projects have been planned and funded under programmed improvements. They include a new trailhead, sidewalks, shared lanes and dedicated bike lanes along existing roadway corridors. These improvements lead into existing attractions, connect to existing bicycle/pedestrian facilities, and create opportunities for a larger network and future linkages.

The Baton Rouge Recreation and Park Commission (BREC) has announced, as part of the Capital Area Pathway Project (CAPP) plans, to construct a trailhead in Farr Park. This trail head will include a large pavilion and event area in addition to other amenities.

Three Green Light Projects are located within the study vicinity. Each of these projects will provide sidewalks and dedicated bike lanes on both sides of the roadways. The corridors included in these projects are Brightside Ln. (River Rd. to Nicholson Dr.), and Nicholson Dr. (Brightside Ln. to Gourrier).

The LSU Campus Multi Modal Transportation Management Team completed a study on March 5, 2010 to determine enhancements which could be made to encourage pedestrian/bicycle safety and multimodal transportation. The recommendations from this study are all within the LSU campus. Three of the recommended bike facilities are adjacent to this project and are as follows:

1. Skip Bertman Dr. (Nicholson to River Rd) – add dedicated bike lanes in both directions
2. S. Stadium Dr. (Nicholson to Highland) – establish shared lanes with parallel parking
3. CEBA Ln. (Nicholson Dr. Ext. to Stadium Dr.) – provide shared lanes

Exhibit 34, and Exhibit 35 shows the proposed pedestrian and bike facilities respectively.

Inventory of Existing Roadways

Frequently, destinations and origins for pedestrians and bicyclist exist along the existing roadway network. Therefore, existing roadway corridors often serve as solutions to creating an interconnected and integrated network of pedestrian and bicycle facilities. The list of roadways considered in this study was created in a four part process. **Step one** was to create a list of all existing streets within the project limits. **Step two** was to filter out those streets with existing or proposed facilities. It was assumed that these roads function as good bicycle and pedestrian facilities. **Step three** was to filter streets without traffic count data because the prioritization process and pedestrian/bicycle level of service calculations could not be completed without this data.

The list that resulted from these steps is as follows:

Alvin Dark Ave.	Ben Hur Rd.
Bob Pettit Blvd.	Burbank Dr.
Gourrier Ave.	Nicholson Dr.
Nicholson Dr. Ext.	W. Lee Dr.

Step four was to determine streets whose traffic volumes might be conservatively approximated. The roadways under this category are located in Tigerland. They are Earl Gros Ave, Jim Taylor Dr., YA Tittle Ave and Tigerland Ave. These roadways were analyzed by averaging the peak volumes from the main entrances (Alvin Dark Ave. and Bob Pettit Blvd.). Based on site observation, these entrance streets have higher traffic volumes than what would be expected by any local street they serve. These approximated volumes were used to calculate LOS values and make proposed recommendations.

In addition to the roadways mentioned, courtesy LOS calculations were completed for Brightside Ln. These calculations utilized the roadway section proposed under the Green Light Program.

Evaluation of Existing Pedestrian and Bicycle Facilities

An evaluation of the existing facilities was performed to determine missing links and opportunities to improve connectivity. The current trends in local planning, program development and infrastructure investment were evaluated for potential incorporation into the study's recommendations.

Existing Pedestrian Facilities' Conditions

Most of the existing pedestrian facilities within the study limits consist of sidewalks. In cases where sidewalks are utilized, it is preferred that they be provided for both sides of the roadway which maximizes connectivity, pedestrian accessibility, and safety. Some of the vicinity has fairly good sidewalk coverage which provides desirable pedestrian facilities. However, there are areas with notable connectivity issues. These issues exist because walks are not provided along both sides of the roadway or due to breaks in the existing sidewalk network. The roadways identified with pedestrian accessibility issues are listed below:

1. Burbank Dr. (Nicholson Dr. to Ben Hur Rd.)
2. Nicholson Dr. (east side Lee Dr. to Southgate Towers)
3. Lee Dr. (Nicholson Dr. to Burbank Dr.)
4. Brightside Ln.
5. Jennifer Jean Dr. (south side at the Nicholson Dr. intersection)
6. E Boyd Dr. (Nicholson Dr. and Burbank Dr.)
7. Ben Hur Rd.
8. Alvin Dark Ave. (at Jim Taylor Dr.)

In addition, a segment of sidewalk panels should be removed and replaced along Bob Pettit Blvd. between Alvin Dark Ave. and Nicholson Dr. Exhibit 34 shows the existing pedestrian facilities.

Existing Bicycle Facilities' Conditions

A bicycle lane is a section of the roadway that is delineated from the adjacent motor vehicle travel lane by pavement markings. Bike lanes are usually along the right edge of the roadway, but may be designated to the left of parking or right-turn lanes. Bicycle lanes in East Baton Rouge Parish are predominantly located in residential developments. There is a movement within the Baton Rouge bicyclist community recently to support incorporating bicycle facilities in the initial planning of roadway improvements. This is most evident in the engineering, design and construction associated with the Green Light Program (GLP) Projects.

A shared roadway is a roadway open to both bicycle and motor vehicle travel. This may be a shared lane, a street with wide outside lanes, or a road with paved shoulders. Shared roadways are appropriate on local streets in a well connected grid. Shared roadways have been recently integrated into the existing infrastructure throughout East Baton Rouge Parish and provide linkages for origins and destinations by utilizing roadways which are too narrow for a striped bike lane. Shared lanes have been proposed for Burbank Dr. (Nicholson Dr. to E. Parker Blvd) as part of Mayor-President Melvin L. "Kip" Holden's initiative to promote active living in the city.

Although existing roadway networks provide an effective and economical method of providing connectivity for bicycling facilities there is still a portion of the population who may feel uncomfortable riding close to vehicular traffic. Shared use paths are paths that are physically separated from motorized vehicular traffic by an open space or barrier and intended for the use of bicycles, pedestrians and other non-motorized users. Shared use paths provide an increased level of comfort and, security, and an enjoyable recreational opportunity. However, these perceived safety conditions should be balanced against potential "side-friction" of intersections and driveways. "Wrong-way" bicyclist travel may prove harmful even within the confines of a sidepath adjacent to extensive land use conditions. The project vicinity contains shared use paths which are located in areas which have low conflicts with vehicular traffic.

The conditions of the existing bicycle facilities vary from very good to poor. There are shared use facilities along the levee, Brightside Ln., and Nicholson Dr. The Levee Trail is in excellent condition. The paths along Brightside Ln. and Nicholson Dr. require maintenance; however, they will be replaced as part of several GLP projects. Exhibit 35 shows the existing and proposed bike lane facilities in the project vicinity.

Evaluation of the Nicholson Dr. Alternatives

While the opinion of stakeholders is of great importance in selecting the proposed bike and pedestrian facilities, before any improvements can be designed and constructed along the Nicholson Dr. corridor, several critical technical issues must be adequately addressed. Some of these issues include right-of-way, the LADOTD requirements for the roadway and bike design, the LADOTD policies for striping and signing bike facilities, and tie points for the origin and termination of the bike facilities. A technical committee was created to determine an appropriate section for Nicholson Dr. which considers the input from the stakeholders while adequately addressing these issues.

The Technical Advisory Committee consisted of members from LADOTD, EBR Public Works, LSU, GLP, CPPC, Forte and Tablada, Inc., and Volkert Inc. Four alternatives were considered for Nicholson Dr. (as shown in Exhibit 36) These alternatives are 1) on street bike lanes; 2) a shared use path along Nicholson Dr.; 3) a shared use path west of the Railroad; and 4) side walk only. This committee met to review the elements of the multi-modal plan with an emphasis on creating a safe, effective, and sustainable environment for non-motorized users. The cornerstone of the discussions was a decision matrix which evaluated various criteria and measurements within the alternative designs. The matrix and its associated results are presented in Exhibits 37-40.

The technical committee expressed varying opinions about the merits of the on-road and off-road alternatives. Fundamentally, the group articulated a desire to provide efficient and safe access along the corridor with an emphasis on connectivity. Intuitively, there seemed to be a propensity to provide off-street utilization for bicyclists and pedestrians; the notion being that off-road means a safer, less conflicting environment. Generally speaking, this conclusion seems reasonable. After all, off-road facilities mean, by definition, fewer encounters with motor vehicles.

Unfortunately, this condition of "non-conflict" can only be sustained in a true free-flow trail operation where only limited access by motor vehicles is accommodated. The Nicholson Corridor, particularly on the east side as well as to some extent on the west side, is riddled with driveway conflicts and significant intersections such as Lee Dr., Jennifer Jean Dr./ Bob Pettit Blvd., E Boyd Dr., W. Parker Blvd and Burbank Dr. A two-way trail or sidepath complicates safety by the propensity of motor vehicle drivers to focus their attention on on-coming traffic. This "normal" driver action results from the drivers' instinct to protect themselves and a conscious effort to be responsible for other drivers' safety. In essence, the clear action is to look left and virtually ignore non-motorists' traffic from the right. This interaction with "side friction" has been documented to show that riding against traffic is three times more likely to result in an accident than riding with traffic (www.bicyclinglife.com/library/riskfactors.htm).

This travel direction safety element was clearly understood by the technical committee and, to some extent, the stakeholders at large. Their "post-educational" judgment resulted in the expression of a new paradigm of design and operations. Armed with the evidence, the matrix was filled-in against specific measures and scored accordingly.

Evaluation of the Alternatives for other Corridors

The methods used to determine the bike facilities for the remaining corridors included in this study are shown in Exhibit 41. Four alternatives were considered 1) A bike lane, 2) shared use lanes with a 14 foot wide curb lane, 3) shared use lanes with standard curb lane widths and 4) a shared use path with a buffer between the back of curb. The alternatives were evaluated based on the existing pavement/shoulder width and LOS calculations.

Bicycle Compatibility Index and Level of Service

The Bicycle Compatibility Index (BCI) is used to evaluate the capability of specific roadways to accommodate motorist and bicyclists. It uses the lane width, traffic volumes, vehicular speed, land use, and shoulder/bike lane width to calculate a BCI number. Table 6 shows the BCI model, variable definitions and adjustment factors. The BCI numbers have ranges which are associated with a compatibility Level Of Service (LOS) which range from A (best) to F (worst). LOS values obtained through the BCI reflect the level of convenience and freedom to maneuver which the user experiences. Similar to the LOS values for vehicular traffic found in the Highway Capacity Manual the bicycle LOS values reflect the user perceptions of measures that characterize the operational conditions of the roadway. The BCI ranges associated with each LOS are shown in Table 7.

Bicycle LOS calculations were completed for each of the roadway corridors considered for recommended bicycle facilities. Traffic data for Nicholson Dr. was obtained from the Traffic Design Report (Revised) Nicholson Dr., Segment I, CP Project No. 08-CS-HC-0035, DOTD Project No. 414-01-0039 completed by Urban Systems, Inc. Traffic data for Brightside Ln was obtained from the Brightside Lane Traffic Report completed by HNTB Corporation for CP Project No. 06-CS-HC-0027. Where possible, these studies were also utilized as a source for traffic data required for intersecting streets.

The most current East Baton Rouge Parish Traffic Engineering Department's Traffic Counts were used for the remaining roadways. The peak flows were calculated from the total counts (in both directions) with the default values for K and D factors of 10% and 55% respectively as recommended in Federal Highway Administrations' *The Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual* (BCI Implementation Manual). A peak hour factor of 0.9 was used as required.

Approximated volumes were conservatively calculated for four Roadways: Earl Gros Ave., Jim Taylor Dr., Tigerland Ave, and YA Tittle Ave. An average between the peak volumes for Alvin Dark Dr. and Bob Petit Blvd. was used to approximate what LOS might be provided along these four routes. Alvin Dark Dr. and Bob Pettit Blvd. serve as main entrances to these four roadways and should each have a peak volume larger than any one of the aforementioned streets.

Truck percentages were determined based on BCI Implementation Manual recommended values which provide an assumed truck percentage based on the roadway classification. LADOTD's Highway Functional Classification Urbanized Area Map with Baton Rouge Metropolitan Area dated, May 2009, was used to determine the roadway classifications when possible. The remaining roadway classifications were assumed based on their functional system characteristics. The hourly right turn volumes were assumed to be less than 270 per hour for each roadway.

Table 6
Bicycle Compatibility Index Model

$$BCI = 3.67 - 0.966\,BL - 0.125\,BLW - 0.152\,CLW + 0.002\,CLV + 0.0004\,OLV + 0.035\,SPD + 0.506\,PKG - 0.264\,AREA + AF$$

where:

BL = Presence of a bike lane or paved shoulder $\geq$ 3.0 ft
No = 0
Yes = 1

BLW = Bicycle lane (or paved shoulder) width
ft (to the nearest tenth)

CLW = Curb Lane Width
ft (to the nearest tenth)

CLV = Curb Lane Volume
vph in one direction

OLV = Other Lane(s) volume – same direction
vph

SPD = 85th percentile speed of traffic
mi/h

PKG = presence of a parking lane with more than 30 percent occupancy
no = 0
yes = 1

AREA = type of roadside development
residential = 1
other type = 0

AF = $f_t + f_p + f_{rt}$

where:

f_t = adjustment factor for truck volumes (see below)

f_p = adjustment factor for parking turnover (see below)

f_{rt} = adjustment factor for right-turn volumes (see below)

Adjustment Factors

Hourly Curb Lane Large Truck Volume [1]	f_t	Parking Time Limit (min)	f_p
$\geq$ 120	0.5	$\leq$ 15	0.6
60-119	0.4	16 -30	0.5
30-59	0.3	31 -60	0.4
20-29	0.2	61 -120	0.3
10-19	0.1	121 -240	0.2
< 10	0.0	241 -480	0.1
		> 480	0.0
Hourly Right Turn Volume [2]	**f_{rt}**		
$\geq$270	0.1		
<270	0.0		

1 Large trucks are defined as a vehicles with six or more tires.
2 Includes total number of right turns into driveways or minor intersections along a roadway segment

Table 7
Bicycle Compatibility Index Ranges Associated with Level of Servces Designations and Compatiblity Level Qualifiers

LOS	BCI Range	Compatibility Level 1
A	≤1.50	Extremely High
B	1.51 - 2.30	Very High
C	2.31 - 3.40	Moderately High
D	3.41 - 4.40	Moderately Low
E	4.41 - 5.30	Very Low
F	≥5.30	Extremely Low

1 Qualifiers for compatibility level pertain to the average adult bicyclist.

LOS calculations were determined for the proposed bike lanes and the proposed shared lane facilities. A LOS of D or better was assumed to be acceptable. For multilane facilities, the peak volumes were distributed with 60 percent of the traffic in the curb lane. The posted speeds for Ben Hur Rd., Tigerland Ave, Jay Herbert Earl Gros Ave. and Jim Taylor Dr. could not be determined during site visits. The speed limit for Ben Hur Rd was assumed to be 35 MPH while the remaining streets were assumed to have a posted speed of 30 MPH. The 85th % speed is calculated as 10 MPH above the posted speed limit. The curb lane widths used in the LOS calculations exclude the bike lane and curb/gutter width. The results from this analysis were utilized as a guide in evaluating the appropriateness of each of the recommended bicycle facilities. Table 8 shows the BCI and LOS calculations.

Table 8
Bicycle Compatibility Index LOS Calculations for Shared Lane and Bike Lane Facilities

Bicycle Compatibility Index and Level of Service Computations												
Location	BCI Model Variables									Results		
Midblock Identifier (Route/Intersecting Streets, Segment Number, Link Number, Etc.)	BL	BLW	CLW	CLV	OLV	SPD	PKG	AREA	AF	BCI	Level of Service	Bicycle Compatibility Level
Alvin Dark (Brightside to Bob Pettit)	0	0	12	336	0	40	0	1	0	3.7	D	Moderately Low
Bob Petit (Alvin Dark to Nicholson)	1	4	15	745	0	40	0	1	0	2.6	C	Moderately High
Burbank (W Parker to Jennifer Jean)	1	4	12	836	558	45	0	0	0.2	4.1	D	Moderately Low
Jennifer Jean (Nicholson to Burbank)	0	0	12	331	0	45	0	1	0	3.8	D	Moderately Low
W Parker (Burbank to Highland)	0	0	14	699	0	40	0	1	0	4.1	D	Moderately Low
Gourrier (River Road to Nicholson)	0	0	10	199	0	45	0	0	0	4.1	D	Moderately Low
E Boyd (Nicholson to Burbank)	0	0	12	65	0	40	0	1	0	3.1	C	Moderately High
Ben Hur Rd. (Nicholson to Burbank)	0	0	10	87	0	45	0	1	0	3.6	D	Moderately Low
Nicholson Dr. Ext. (Nicholson to Highland)	0	0	12	722	0	30	0	0	0	4.3	D	Moderately Low
W. Lee Dr. (Nicholson to Burbank)	0	0	12	607	405	55	0	0	0.1	5.2	E	Very Low
Brightside Dr. (River to Nicholson)	0	4	12	912	0	55	0	1	0	4.8	E	Very Low
Earl Gros (Jay Herbert to Jim Taylor)	0	0	12	541	0	40	0	1	0	4.1	D	Moderately Low
Jay Herbert (Alvin Dark to Earl Gros)	0	0	12	541	0	40	0	1	0	4.1	D	Moderately Low
Jim Taylor (Tigerland Earl Gros)	0	0	12	541	0	40	0	1	0	4.1	D	Moderately Low
Tigerland (Jim Taylor to Bob Pettit)	0	0	12	541	0	40	0	1	0	4.1	D	Moderately Low
YA Tittle (Jim Taylor to Bob Pettit)	0	0	12	541	0	40	0	1	0	4.1	D	Moderately Low

Pedestrian Level of Service

The pedestrian Level of Service (LOS) Model (Table 9) was used to evaluate the walking conditions along roadway networks included in this study. It determines the roadway suitability for pedestrians utilizing data such as roadway width, on street parking, buffer width between sidewalk and travel lane, traffic volumes, number of lanes, speed of motor vehicle traffic, presence of bike lanes and sidewalks. The pedestrian LOS final equation determines a score which is associated with LOS categories.

Table 9
Pedestrian Segment Model

Ped Seg LOS = $-1.2276\ln(W_{ol} + W_l + f_p \times \%OSP + f_b \times W_b + f_{sw} \times Ws) + 0.0091(Vol_{15}/L) + 0.0004\mathbf{SPD}^2 + 6.0468$

where:

W_{ol} = Width of outside lane

W_l = Width of shoulder or bicycle lane

f_p = On street parking effect coefficient (=0.20)

%OSP = Percent of segment with on-street parking

f_b = Buffer area coefficient (5.37 for trees spaced 20 feet on center)

W_b = Buffer width (distance between edge of pavement and sidewalk, in feet)

f_{sw} = Sidewalk presence coefficient (=6-0.3W_s)

W_s = Width of sidewalk

Vol_{15} = Volume of motorized vehicles in the peak 15 minute period

L = Total number of directional through lanes

SPD = Average running speed of motorized vehicle traffic (mi/h)

Pedestrian LOS calculations were preformed for each of the roadway networks included in this study. The results of these calculations are shown in Table 10.

Table 10
Pedestrian LOS Calculations

Pedestrian Level of Service Computations														
Location	BCI Model Variables										Results			
Midblock Identifier (Route/Intersecting Streets, Segment Number, Link Number, Etc.)	W_{ol}	W_I	f_p	%OSP	f_b	W_b	f_{av}	W_v	PHV	Vol_{15}	L	SPD	Ped Numerical Score	Ped LOS
Alvin Dark (Brightside to Bob Pettit)	12	0	0.2	0	0	10	5	4	336	93	1	30	2.4	B
Bob Petit (Alvin Dark to Nicholson)	20	0	0.2	0	0	12	5	4	745	207	1	30	2.6	B
Bob Petit (Alvin Dark to Tigerland)	12	0	0.2	0	0	12	5	4	745	207	1	30	2.4	B
Burbank (W Parker to Jennifer Jean)	12	0	0.2	0	0	10	5	4	1394	387	2	35	2.4	B
Jennifer Jean (Nicholson to Burbank)	12	0	0.2	0	0	12	5	4	331	92	1	35	2.4	B
W Parker (Burbank to Highland)	13	3	0.2	0	0	9	5	4	699	194	1	30	2.5	B
Gourrier (River Road to Nicholson)	10	0	0.2	0	0	30	4	8	199	55	1	30	2.6	B
E Boyd (Nicholson to Burbank)	12	0	0.2	0	0	3	3	10	65	18	1	45	2.7	B
Ben Hur Rd. (Nicholson to Burbank)	12	0	0.2	0	0	3	3	10	87	24	2	45	2.7	B
Nicholson Dr. Ext.	12	0	0.2	0	0	5	4	6	722	201	1	30	2.6	B
W. Lee Dr. (Nicholson to Burbank)	12	0	0.2	0	0	5	4	6	607	169	1	45	2.6	B
Brightside Dr. (River to Nicholson)	12	4	0.2	0	0	12	5	5	912	253	1	45	2.6	B
Earl Gros (Jay Herbert to Jim Taylor)	12	0	0.2	0	0	10	5	5	541	150	1	30	2.5	B
Jay Herbert (Alvin Dark to Earl Gros)	12	0	0.2	0	0	10	5	5	541	150	1	30	2.5	B
Jim Taylor (Tigerland Earl Gros)	12	0	0.2	0	0	10	5	5	541	150	1	30	2.5	B
Tigerland (Jim Taylor to Bob Pettit)	12	0	0.2	0	0	10	5	5	541	150	1	30	2.5	B

Recommendations

Nicholson Dr.
Based on the critical issues considered by the technical committee and the opinions of the stakeholders, bike lanes appear to be the most desirable alternative for the Nicholson Dr. corridor. The roadway classification of Nicholson Dr. is UA-2 which requires a minimum paved shoulder width of 8 feet.

Recommended widths for bicycle lanes are generally 4-5 feet as per AASHTO guidelines.
Bicycle lane width:

- 4 feet (1.2m): minimum width of bike lane on roadways with no curb and gutter;
- 5 feet (1.5m): minimum width of bike lane when adjacent to parking, from the face of the curb or guardrail;
- 6 feet (1.7m): preferred width of bike lane where significant truck traffic and higher operating speeds are expected;
- 11 feet (3.3m): total width for shared bike lane and parking area, no curb face; and
- 12 feet (3.6m): shared bike lane and parking area with a curb face.

Considering that the average width of vehicles vary (passenger vehicle - 5.5 feet, SUV - 7 feet, and trucks - 8.5 feet) bike lanes wider than 6 feet may be used for parking or viewed as travel lanes by motorists. With this in mind, it is recommended that a "buffer" area between the bike lane and travel lane be provided by placing double solid lines pavement markings between the travel lane and the bike lane.

In addition, it is reccomended that all intersections have countdown pedestrian signals and high emphasis ladder crosswalks or colorized texturized crossswalks.

Bicycle Facility Recommendations:

Based on the opinions expressed by the stakeholders, LOS calculations and an evaluation of linkages between the existing and proposed bicycle facilities, the following bike facilities (as shown in Exhibit 43) are recommended:

1. Shared Use Paths should be provided between Brightside Ln. and Gourrier Ave.; along Burbank Dr.; and along W. Lee Dr.
    a. The Shared Use Path between Brightside Ln. and Gourrier Ave. would begin west of the Louisiana School for the Deaf and continue north along the western boundary of the LSU Golf Course, between Gourrier Ave. and Skip Bertman Dr. This study proposes that the path continue east of the LSU Petroleum Engineering Laboratory Building, take a western turn and end along Skip Bertman Dr., west of the Special Olympics Pool. The final alignment for this path will have to be determined based on close coordination with and the authorization of LSU during the design phase.
    b. A Shared Use Path along Burbank Dr. was recommended because of its low bicycle LOS for on street bicycle facilities. It is recommended that a 10ft Shared Use Path be provided along the northeast side of Burbank. This would likely require the purchase of right-of-way but is the safest and most cost efficient alternative.
    c. A Shared Use Path along W. Lee Dr. was recommended because of its low bicycle LOS for on street bicycle facilities. It is recommended that a 10ft Shared Use Path be provided along the south side of W. Lee.
2. Shared Lanes should be provided along Alvin Dark Ave. (as shown in Exhibit 44), Bob Pettit Blvd., Nicholson Ext., Jennifer Jean Dr., E Boyd Ave., W Parker Blvd., Gourrier Ave., Ben Hur Rd., Tigerland, YA Tittle, Earl Gros, Jim Taylor and Jay Herbert.
    a. It is recommended that a 10 MPH speed reduction be considered for the posted speed limits along Gourrier Ave. and Nicholson Ext. This would allow each of these roadways to function with an acceptable Bicycle LOS.
    b. The remaining proposed shared lane roadways will not require speed reductions for acceptable Bicycle LOS.
3. Ben Hur Rd. between Nicholson and River Rd could not be evaluated due to lack of traffic counts but this roadway could serve as a connector to the existing and proposed facilities.

Pedestrian Facility Recommendations:

It is recommended that the following pedestrian facilities (shown in Exhibit 43) be provided to offer linkages between existing walks and to create improved pedestrian access to origins and destinations:

1. Sidewalks should be provided along W Boyd Dr., Jennifer Jean, Alvin Dark Ave and Ben Hur Rd. It should be noted that a disconnect in the recommended pedestrian facilities will exist at the bridge along Ben Hur Rd. because of the bridges' narrow width. It is recommended that any potential future replacements of this bridge consider providing pedestrian access. In addition, it is recommended that Ben Hur Rd. be reevaluated as future developments are completed to determine the potential impacts on the capability of the roadway to accommodate motorist and bicyclists.

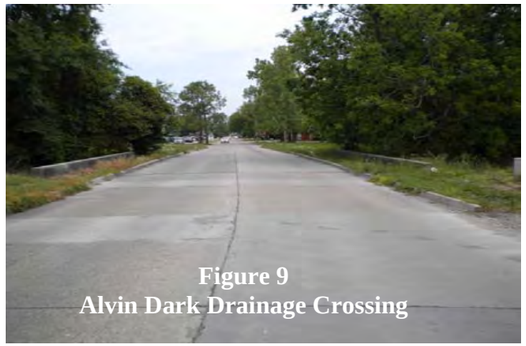


Figure 9
Alvin Dark Drainage Crossing

2. Where Alvin Dark Ave. crosses Fountain Bayou (see photo shown in Figure 10), a barrier may be required in addition to the recommended sidewalk on the back side of the sidewalk.
3. Bob Pettit Blvd. (along the south side of the roadway) requires approximately 100 feet of sidewalk repair between Alvin Dark Ave. and the railroad.

Construction Cost Estimates

Planning Level Construction Cost Estimates were completed for each of the proposed improvements excluding Nicholson Dr. These estimates represent the engineers "best guess" at the probable cost associated with each recommendation based on information obtained through field visits aerial data and engineering judgment. Excluded from these cost are design, surveying, permitting and geotechnical services. Items presented in these estimates are subject to change based on survey, geotechnical data and final design calculations. The unit prices were determined based on bid tabs for similar construction, LADOTD 2009 Weighted Item Prices and engineering judgment. Table 11 shows the total estimated cost for each of the facilities. An itemized cost estimate has been provided in Table 12 and Table 13 for two of the shared use paths due to their high estimated construction cost.

Table 11
Preliminary Construction Cost Estimates for Proposed Bike Facilities

PRELIMINARY ENGINEER'S ESTIMATE OF CONSTRUCTION COST	
ROADWAY	ESTIMATED CONSTRUCTION COST
ALVIN DARK AVE	37,491
BEN HUR RD	29,088
BOB PETTIT BLVD	20,176
BURBANK DR *	340,978
EARL GROS AVE	13,058
GOURRIER AVE	42,606
JENNIFER JEAN DR	19,260
JIM TAYLOR DR	12,056
W. LEE DR.	658,364
NICHOLSON EXT.	50,299
W. PARKER BLVD	15,222
TIGERLAND AVE	11,858
E. BOYD DR	19,320
Y.A. TITTLE AVE	13,406
JAY HERBERT	5,426
*COST SHOWN FOR BURBANK DR INCLUDE ESTIMATED COSTS FOR ROW.	

It is worth mentioning that a significant portion of the construction cost for W. Lee Dr. Shared Use Path is comprised of a hand rail along the entire project length. AASHTO recommends that two-way shared use paths have a minimum 5 foot buffer between the shared use path and the adjacent highway. In cases where this buffer cannot be provided, a barrier is recommended. There does not appear to be enough width between W. Lee Dr. and the ROW to provide this buffer. It was assumed that the hand rail would be provided instead of purchasing additional ROW.

A significant portion of the cost for Alvin Dark Ave. is due to hand rail for the drainage crossing at Bayou Fountain.

Table 12
Shared Use Trail Preliminary Construction Cost Estimate

PRELIMINARY ENGINEER'S ESTIMATE OF CONSTRUCTION COST SHARED USE TRAIL (BRIGHTSIDE LN. TO SKIP BERTMAN DR.)					
ITEM	DESCRIPTION	QUANTITY	UNIT	COST	TOTAL
	APPROXIMATE PATH LENGTH =	11,760	LF		
201-01	CLEARING/GRUBBING	1	LS	40,000.00	40,000
203-01	GENERAL EXCAVATION	300	CY	10.00	3,000
203-03	BORROW (VEHICULAR MEASUREMENT)	7,600	CY	25.00	190,000
705-09	REBUILT FENCE	11,760	LF	50.00	588,000
706-01-A	PORTLAND CEMENT CONCRETE WALK (4" THICK)	15680	SY	60.00	940,800
729-01	SIGN (TYPE A)	635.04	SF	30.00	19,051
729-21	U-CHANNEL POST	98	EA	75.00	7,350
739-01	HYDROSEEDING	10	ACRE	3,500.00	35,000
	2 TRAILHEADS				-
203-01	GENERAL EXCAVATION	300	CY	12.00	3,600
203-07	BORROW (VEHICULAR MEASUREMENT)	600	CY	25.00	15,000
401-01	AGGREGATE SURFACE COURSE (NET SECTION)	20	CY	100.00	2,000
711-04	GEOTEXTILE FABRIC	650	SY	2.75	1,788
S-001	SIGNAGE	1	LS	8,000.00	8,000
S-002	PRECAST PARKING STOPS	12	EA	70.00	840
	GENERAL				-
719-04	LANDSCAPING	1	LS	75,000.00	75,000
727-01	MOBILIZATION	1	LS	100,000.00	100,000
740-01	CONSTRUCTION LAYOUT	1	LS	15,000.00	15,000
S-003	DRAINAGE	1	LS	126,500.00	126,500
S-004	HAND RAIL	4500	LF	90.00	405,000
S-005	TEMPORARY EROSION CONTROL	1	LS	50,000.00	50,000
S-006	PRECAST CONCRETE BENCHES	12	EA	950.00	11,400
	CONTINGENCY (20%)				525,186
	TOTAL PRELIMINARY ESTIMATE OF CONSTRUCTION COST =				3,162,514

Table 13
River Levee Trail Preliminary Construction Cost Estimate

PRELIMINARY ENGINEER'S ESTIMATE OF CONSTRUCTION COST RIVER LEVEE TRAIL (BEN HUR TO FARR PARK)					
ITEM	DESCRIPTION	QUANTITY	UNIT	COST	TOTAL
	APPROXIMATE PATH LENGTH =	38,000	LNFT		
201-01	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	1	LS	200,000.00	200,000
203-04	EMBANKMENT	38,000	CUYD	25.00	950,000
203.09	GEOTEXTILE FABRIC	50,667	SQYD	1.50	76,000
302-02	CLASS II BASE COURSE (4" THICK)	50,667	SQYD	13.00	658,667
502-01-D	SUPERPAVE ASPHALTIC CONCRETE INCIDENTAL PAVING (4" THICK)	11146.66667	TON	60.00	668,800
705-01	BARBED WIRE FENCE	38,000	LNFT	8.00	304,000
705-06-C	CHAIN LINK FENCE (6-FOOFT HEIGHT)	90	LNFT	50.00	4,500
706-01-A	CONCRETE WALK (4"THICK)	1111	SQYD	60.00	66,667
713-01	TEMPORARY SIGNS AND BARRICADES	1	LUMP	25,000.00	25,000
727-01	MOBILIZATION	1	LUMP	393,263.00	393,263
729-01	SIGN (TYPE A)	2,052	SQFT	30.00	61,560
729-21	U-CHANNEL POST	228	EA	125.00	28,500
739-01	HYDRO-SEEDING	54	AC	1,500.00	81,600
	GENERAL				-
S-001	DRAINAGE	1	LS	130,800.00	130,800
S-002	TEMPORARY EROSION CONTROL	1	LS	120,800.00	120,800
S-003	LANDSCAPING	1	LS	50,000.00	50,000
S-004	LIGHTING	1	LS	380,000.00	380,000
S-005	PAVEMENT MARKINGS	1	LS	52,800.00	52,800
S-003	STEEL BENCHES	12	EA	1,800.00	21,600
S-004	TRASH RECEPTACLES	6	EA	1,000.00	6,000
S-005	35 FOOT FLAGPOLE	1	EA	2,500.00	2,500
S-006	30 FOOT FLAGPOLE	2	EA	2,300.00	4,600
S-007	CONCRETE STAIRS	1	LS	12,000.00	12,000
S-008	BICYCLE LOOP RACK	6	EA	600.00	3,600
S-009	COLORED AND PATTERNED CONCRETE PAVING (6" THICK)	78	SY	80.00	6,240
S-010	CONCRETE PLANTERS (8 FT X 8 FT)	4	EA	3,500.00	14,000
S-011	METAL BOLLARDS	6	EA	400.00	2,400
	CONTINGENCY (20%)				865,179
	TOTAL PRELIMINARY ESTIMATE OF CONSTRUCTION COST =				5,191,076

Table 14
Preliminary Engineers' Estimate of Construction Cost for Proposed Sidewalk Facilities

ROADWAY	ESTIMATED COST
ALVIN DARK AVE	$ 24,000.00
BOB PETTIT BLVD	$ 3,778.00
BEN HUR RD.	$112,866.67
E. BOYD DR.	$105,000.00
JENNIFER JEAN DR.	$ 6,666.67

Prioritization Process

A list of prioritized bicycle facility projects was created to direct the funding towards the segments which demonstrate the highest need for facilities. The origins and destinations for pedestrians and bicyclist are commonly located along existing roadways. Consequently, on-road facility systems are effective tools to create networks for pedestrian and bicyclist linkages. The prioritization process was completed for all proposed on street bike facilities. Shared use paths were not included in this process because the compatibility LOS calculations do not apply to these facilities. The prioritization was completed in a two step process.

The **first step** in the prioritization process was to determine a Benefit Cost Index. The index used in this study is similar to methods used for planning and programming infrastructure funding. The index is determined based on the demand, stakeholders input, LOS and cost. The potential demand was estimated based on the population adjacent to the proposed facility. The stakeholders input was determined based on the individual interviews. The LOS was determined based on the BCI calculations, and the conceptual cost estimates were completed for each proposed improvement.

The **second step** was to prioritize candidate road segments for bicycle or pedestrian facility construction by sorting them in descending Benefit-Cost Index score. The list of the prioritized road segments are provided in Table 15.

The Benefit Cost Index equation is provided below:

$$Benefit\ Cost\ Index = \frac{LOS + Demand + SR + Link}{Cost}$$

Where:

LOS	= the calculated bike level of service (A=25,000; B=20,000; C=15,000; D=10,000; E=0)
Demand	= the potential bicycle activity along a particular road segment
Cost	= the conceptual cost for the proposed improvement
SR	= Stakeholders Recommended Facility (yes = 25000; no = 0)
Link	= Provides Links to existing/funded bike routes (at begin or end of recommended location 30,000; at begin and end of recommended location 60,000)

The demand for bicycle facilities is determined utilizing the methods outlined in the National Cooperative Highway Research Program Report 552, *Guidelines for Analysis of Investments in Bicycle Facilities*. This method uses the number of residents within buffers of the facility and U.S. Census data to estimate the potential demand for bicycling facilities. Table 15 shows the results of the prioritization process in order of descending order of Benefit Cost Indices.

Table 15
Bicycle Prioritization Listing Based on Benefit Cost Indices

Roadway	Assigned LOS Value	Segment Demand	Assigned Linkage Value	Segment Cost	Assigned SR Value	BCI
W Parker (Burbank to Highland)	10000	12,579.00	60,000.00	$ 15,222.00	0	**5.42**
E Boyd (Nicholson to Burbank)	15000	12,452.00	30,000.00	$ 19,320.00	25000	**4.27**
Jennifer Jean (Nicholson to Burbank)	10000	12,631.00	30,000.00	$ 19,260.00	25000	**4.03**
Bob Petit (Alvin Dark to Nicholson)	15000	8,655.00	30,000.00	$ 20,176.00	25000	**3.90**
Jay Herbert (Alvin Dark to Earl Gros)	10000	10,890.00	0.00	$ 5,426.00	0	**3.85**
Alvin Dark (Brightside to Bob Pettit)	10000	13,338.00	30,000.00	$ 37,491.00	25000	**2.09**
Tigerland (Jim Taylor to Bob Pettit)	10000	12,921.00	0.00	$ 11,858.00	0	**1.93**
Nicholson Dr. Ext. (Nicholson to Highland)	10000	25,563.00	60,000.00	$ 50,299.00	0	**1.90**
Earl Gros (Jay Herbert to Jim Taylor)	10000	13,298.00	0.00	$ 13,058.00	0	**1.78**
Gourrier (River Road to Nicholson)	10000	5,057.00	60,000.00	$ 42,606.00	0	**1.76**
YA Tittle (Jim Taylor to Bob Pettit)	10000	13,410.00	0.00	$ 13,406.00	0	**1.75**
Jim Taylor (Tigerland Earl Gros)	10000	10,955.00	0.00	$ 12,056.00	0	**1.74**
Ben Hur Rd. (Nicholson to Burbank)	10000	9,975.00	30,000.00	$ 29,088.00	0	**1.72**
Burbank (W Parker to Jennifer Jean)	10000	10,520.00	60,000.00	$ 340,978.00	25000	**0.31**
W Lee Dr. (Nicholson to Burbank)	10000	16,179.00	60,000.00	$ 658,364.00	0	**0.13**

CONSTRUCTION COSTS

The total cost for this project is dependent on the use of either the Portland Cement Concrete alternative or the Asphaltic Cement Concrete alternative. Therefore we have provided two separate construction cost estimates to enable the selection of the more viable alternative. Table 16 is the estimated construction cost for a Portland cement concrete pavement roadway and Table 17 is the estimated construction cost for Asphaltic cement concrete pavement. Unit prices were developed using LA DOTD 2nd Quarter 2010 Bid Weighted Item Prices and engineering judgment. Costs associated with items such as traffic signalization, right of way acquisition, utility relocation, surveying, and engineering are added to construction costs and presented in the total estimated project cost shown in Table 18 below.

Table 16
Preliminary PCCP Alternate Construction Cost Estimate

ITEM	DESCRIPTION	PAY UNIT	UNIT PRICE	QUANTITY	TOTAL
201-01-00100	CLEARING AND GRUBBING	LUMP SUM	$ 50,000.00	1	$ 50,000.00
202-01-00100	REMOVAL OF STRUCTURES & OBSTRUCTIONS	LUMP SUM	$ 50,000.00	1	$ 50,000.00
202-02-38500	REMOVAL OF SURFACING AND STABILIZED BASE	SQ. YD.	$ 8.00	26986	$ 215,888.00
203-01-00100	GENERAL EXCAVATION	CU. YD.	$ 4.00	32000	$ 128,000.00
203-03-00100	EMBANKMENT	CU. YD.	$ 6.00	10815	$ 64,890.00
302-02-01060	CLASS II BASE COURSE (4" THICK) (STONE OR RECYCLED PCCP)	SQ. YD.	$ 12.00	50919	$ 611,028.00
302-02-02020	CLASS II BASE COURSE (6" THICK) (SOIL CEMENT)	SQ. YD.	$ 18.00	50919	$ 916,542.00
304-05-00100	LIME TREATMENT (TYPE E) (12" THICK, 9% BY VOLUME)	SQ. YD.	$ 4.00	50919	$ 203,676.00
601-01-00500	PORTLAND CEMENT CONCRETE PAVEMENT (10" THICK)	SQ. YD.	$ 90.00	46484	$ 4,183,560.00
601-02-01100	PORTLAND CEMENT CONCRETE PAVEMENT (9" THICK) (CROSSOVERS & TURNOUTS)	SQ. YD.	$ 100.00	2446	$ 244,600.00
701-03-01000	STORM DRAIN PIPE (15" RCP/RPVCP)	LIN. FT.	$ 75.00	1641	$ 123,075.00
701-03-01020	STORM DRAIN PIPE (18" RCP/RPVCP)	LIN. FT.	$ 85.00	923	$ 78,455.00
701-03-01040	STORM DRAIN PIPE (24" RCP/RPVCP)	LIN. FT.	$ 95.00	1351	$ 128,345.00
701-03-01060	STORM DRAIN PIPE (30" RCP/RPVCP)	LIN. FT.	$ 110.00	1980	$ 217,800.00
701-03-01080	STORM DRAIN PIPE (36" RCP/RPVCP)	LIN. FT.	$ 130.00	75	$ 9,750.00
702-02-00100	MANHOLE (MH-06)	EACH	$ 6,000.00	4	$ 24,000.00
702-03-00100	CATCH BASINS (CB-01)	EACH	$ 3,200.00	29	$ 92,800.00
702-03-00500	CATCH BASINS (CB-06)	EACH	$ 4,000.00	35	$ 140,000.00
702-03-00700	CATCH BASINS (CB-08)	EACH	$ 7,200.00	11	$ 79,200.00
702-03-00800	CATCH BASINS (CB-09)	EACH	$ 5,000.00	1	$ 5,000.00
704-03-00100	BLOCKED OUT GUARD RAIL	LIN. FT.	$ 25.00	230	$ 5,750.00
704-08-00200	GUARD RAIL TRANSITIONS (DOUBLE THRIE BEAM)	LIN. FT.	$ 75.00	170	$ 12,750.00
704-11-00200	GUARD RAIL END TREATMENT (TANGENT)	EACH	$ 2,500.00	2	$ 5,000.00
706-01-00100	CONCRETE WALK (4" THICK)	SQ. YD.	$ 60.00	3329	$ 199,740.00
706-02-00300	CONCRETE DRIVE (6" THICK)	SQ. YD.	$ 65.00	804	$ 52,286.00
706-04-00100	HANDICAPPED CURB RAMPS	EACH	$ 1,000.00	8	$ 8,000.00
707-01-00200	CONCRETE CURB(BARRIER)	LIN. FT.	$ 18.00	5542	$ 99,756.00
707-01-00300	CONCRETE CURB(MOUNTABLE)	LIN. FT.	$ 25.00	20587	$ 514,675.00
711-01-03020	RIPRAP (30 LB, 18" THICK)	SQ. YD.	$ 100.00	206	$ 20,600.00
713-01-00100	TEMPORARY SIGNS & BARRICADES	LUMP SUM	$200,000.00	1	$ 200,000.00
713-02-00100	TEMPORARY PAVEMENT MARKINGS (4" WIDTH)	LIN. FT.	$ 0.35	24077	$ 8,426.95
713-02-00300	TEMPORARY PAVEMENT MARKINGS (8" WIDTH)	LIN. FT.	$ 0.45	515	$ 231.75
713-02-00500	TEMPORARY PAVEMENT MARKINGS (24" WIDTH)	LIN. FT.	$ 1.00	247	$ 247.00
713-05-00100	TEMPORARY PAVEMENT LEGENDS & SYMBOLS (ARROWS)	EACH	$ 80.00	24	$ 1,920.00
713-05-00400	TEMPORARY PAVEMENT	EACH	$ 140.00	5	$ 700.00

ITEM	DESCRIPTION	PAY UNIT	UNIT PRICE	QUANTITY	TOTAL
	LEGENDS & SYMBOLS (RR CROSSING)				
713-07-00100	TEMPORARY PRECAST CONCRETE BARRIER (CONTRACTOR FURNISHED)	EACH	$ 950.00	100	$ 95,000.00
722-02-00100	PROJECT SITE LABORATORY (EQUIPPED)	EACH	$ 15,000.00	1	$ 15,000.00
726-01-00100	BEDDING MATERIAL	CU. YD.	$ 70.00	1229	$ 86,030.00
727-01-00100	MOBILIZATION	LUMP SUM	$800,000.00	1	$ 800,000.00
731-02-00100	REFLECTORIZED RAISED PAVEMENT MARKERS	EACH	$ 7.50	309	$ 2,317.50
732-01-01000	PLASTIC PAVEMENT STRIPING (SOLID LINE) [4" WIDTH]	LIN. FT.	$ 0.75	29139	$ 21,854.25
732-01-01020	PLASTIC PAVEMENT STRIPING (SOLID LINE) [6" WIDTH]	LIN. FT.	$ 1.10	24226	$ 26,648.60
732-01-01040	PLASTIC PAVEMENT STRIPING (SOLID LINE) [8" WIDTH]	LIN. FT.	$ 1.40	1545	$ 2,163.00
732-01-01060	PLASTIC PAVEMENT STRIPING (SOLID LINE) [12" WIDTH]	LIN. FT.	$ 2.50	1545	$ 3,862.50
732-01-01080	PLASTIC PAVEMENT STRIPING (SOLID LINE) [24" WIDTH]	LIN. FT.	$ 4.00	206	$ 824.00
732-04-01020	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ARROW - STRAGHT)	EACH	$ 170.00	21	$ 3,570.00
732-04-01040	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ARROW - DOUBLE)	EACH	$ 250.00	5	$ 1,250.00
732-04-01080	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ARROW - LEFT TURN)	EACH	$ 200.00	8	$ 1,600.00
732-04-01100	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ARROW - RIGHT TURN)	EACH	$ 200.00	8	$ 1,600.00
732-04-02000	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (BICYCLE) (W ARROW & CHEVRON)	EACH	$ 300.00	66	$ 19,800.00
732-04-15020	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ONLY)	EACH	$ 200.00	7	$ 1,400.00
732-04-18000	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (RR CROSSING)	EACH	$ 475.00	5	$ 2,375.00
739-01-00100	HYDRO-SEEDING	ACRE	$ 1,800.00	11	$ 19,800.00
740-01-00100	CONSTRUCTION LAYOUT	LUMP SUM	$138,000.00	1	$ 138,000.00
805-01-00300	CLASS A CONCRETE (BOX CULVERT HEADWALLS)	CU. YD.	$ 1,200.00	150	$ 179,400.00
805-12-37000	REINFORCED CONCRETE BOX CULVERTS (8' X 8') (EXTENSION)	LIN. FT.	$ 760.00	285	$ 216,600.00
805-12-37040	REINFORCED CONCRETE BOX CULVERTS (10' X 8') (EXTENSION)	LIN. FT.	$ 850.00	356	$ 302,600.00
806-01-00100	DEFORMED REINFORCING STEEL	POUND	$ 1.25	12185	$ 15,231.50
NS-MSC-00120	NS DRAINAGE STRUCTURE (PAVED GUTTER DRAIN (PG-03)	EACH	$ 4,000.00	29	$ 116,000.00
				TOTAL	**$ 10,769,618.05**

Table 17
Preliminary ACCP Alternate Construction Cost Estimate

ITEM	DESCRIPTION	PAY UNIT	UNIT PRICE	QUANTITY	TOTAL
201-01-00100	CLEARING AND GRUBBING	LUMP SUM	$ 50,000.00	1	$ 50,000.00
202-01-00100	REMOVAL OF STRUCTURES & OBSTRUCTIONS	LUMP SUM	$ 50,000.00	1	$ 50,000.00
203-01-00100	GENERAL EXCAVATION	CU. YD.	$ 4.00	32000	$ 128,000.00
203-03-00100	EMBANKMENT	CU. YD.	$ 6.00	10815	$ 64,890.00
202-02-38500	REMOVAL OF SURFACING AND STABILIZED BASE	SQ. YD.	$ 8.00	26986	$ 215,888.00
302-02-01060	CLASS II BASE COURSE (4" THICK) (STONE OR RECYCLED PCCP)	SQ. YD.	$ 12.00	50919	$ 611,028.00
302-02-02020	CLASS II BASE COURSE (6" THICK) (SOIL CEMENT)	SQ. YD.	$ 18.00	50919	$ 916,542.00
304-05-00100	LIME TREATMENT (TYPE E) (12" THICK, 9% BY VOLUME)	SQ. YD.	$ 4.00	50919	$ 203,676.00
502-01-00100	SUPERPAVE ASPHALTIC CONCRETE (10" THICK)	TON	$ 90.00	25012	$ 2,251,080.00
502-02-00200	SUPERPAVE ASPHALTIC	TON	$ 100.00	1278	$ 127,800.00

ITEM	DESCRIPTION	PAY UNIT	UNIT PRICE	QUANTITY	TOTAL
	CONCRETE DRIVES, TURNOUTS AND MISCELLANEOUS (10" THICK)				
701-03-01000	STORM DRAIN PIPE (15" RCP/RPVCP)	LIN. FT.	$ 75.00	1641	$ 123,075.00
701-03-01020	STORM DRAIN PIPE (18" RCP/RPVCP)	LIN. FT.	$ 85.00	923	$ 78,455.00
701-03-01040	STORM DRAIN PIPE (24" RCP/RPVCP)	LIN. FT.	$ 95.00	1351	$ 128,345.00
701-03-01060	STORM DRAIN PIPE (30" RCP/RPVCP)	LIN. FT.	$ 110.00	1980	$ 217,800.00
701-03-01080	STORM DRAIN PIPE (36" RCP/RPVCP)	LIN. FT.	$ 130.00	75	$ 9,750.00
702-02-00100	MANHOLE (MH-06)	EACH	$ 6,000.00	4	$ 24,000.00
702-03-00100	CATCH BASINS (CB-01)	EACH	$ 3,200.00	29	$ 92,800.00
702-03-00500	CATCH BASINS (CB-06)	EACH	$ 4,000.00	35	$ 140,000.00
702-03-00700	CATCH BASINS (CB-08)	EACH	$ 7,200.00	11	$ 79,200.00
702-03-00800	CATCH BASINS (CB-09)	EACH	$ 5,000.00	1	$ 5,000.00
704-03-00100	BLOCKED OUT GUARD RAIL	LIN. FT.	$ 25.00	230	$ 5,750.00
704-08-00200	GUARD RAIL TRANSITIONS (DOUBLE THRIE BEAM)	LIN. FT.	$ 75.00	170	$ 12,750.00
704-11-00200	GUARD RAIL END TREATMENT (TANGENT)	EACH	$ 2,500.00	2	$ 5,000.00
706-01-00100	CONCRETE WALK (4" THICK)	SQ. YD.	$ 60.00	3329	$ 199,740.00
706-02-00300	CONCRETE DRIVE (6" THICK)	SQ. YD.	$ 65.00	804	$ 52,286.00
706-04-00100	HANDICAPPED CURB RAMPS	EACH	$ 1,000.00	8	$ 8,000.00
707-03-00100	COMBINATION CONCRETE CURBAND GUTTER	LIN. FT.	$ 38.00	26129	$ 992,902.00
711-01-03020	RIPRAP (30 LB, 18" THICK)	SQ. YD.	$ 100.00	206	$ 20,600.00
713-01-00100	TEMPORARY SIGNS & BARRICADES	LUMP SUM	$ 200,000.00	1	$ 200,000.00
713-02-00100	TEMPORARY PAVEMENT MARKINGS (4" WIDTH)	LIN. FT.	$ 0.35	24077	$ 8,426.95
713-02-00300	TEMPORARY PAVEMENT MARKINGS (8" WIDTH)	LIN. FT.	$ 0.45	515	$ 231.75
713-02-00500	TEMPORARY PAVEMENT MARKINGS (24" WIDTH)	LIN. FT.	$ 1.00	247	$ 247.00
713-05-00100	TEMPORARY PAVEMENT LEGENDS & SYMBOLS (ARROWS)	EACH	$ 80.00	24	$ 1,920.00
713-05-00400	TEMPORARY PAVEMENT LEGENDS & SYMBOLS (RR CROSSING)	EACH	$ 140.00	5	$ 700.00
713-07-00100	TEMPORARY PRECAST CONCRETE BARRIER (CONTRACTOR FURNISHED)	EACH	$ 950.00	100	$ 95,000.00
722-02-00100	PROJECT SITE LABORATORY (EQUIPPED)	EACH	$ 15,000.00	1	$ 15,000.00
726-01-00100	BEDDING MATERIAL	CU. YD.	$ 70.00	1229	$ 86,030.00
727-01-00100	MOBILIZATION	LUMP SUM	$ 800,000.00	1	$ 800,000.00
731-02-00100	REFLECTORIZED RAISED PAVEMENT MARKERS	EACH	$ 7.50	309	$ 2,317.50
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732-01-01060	PLASTIC PAVEMENT STRIPING (SOLID LINE) [12" WIDTH]	LIN. FT.	$ 2.50	1545	$ 3,862.50
732-01-01080	PLASTIC PAVEMENT STRIPING (SOLID LINE) [24" WIDTH]	LIN. FT.	$ 4.00	206	$ 824.00
732-04-01020	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ARROW - STRAGHT)	EACH	$ 170.00	21	$ 3,570.00
732-04-01040	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ARROW - DOUBLE)	EACH	$ 250.00	5	$ 1,250.00
732-04-01080	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ARROW - LEFT TURN)	EACH	$ 200.00	8	$ 1,600.00
732-04-01100	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ARROW - RIGHT TURN)	EACH	$ 200.00	8	$ 1,600.00
732-04-02000	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (BICYCLE) (W ARROW & CHEVRON)	EACH	$ 300.00	66	$ 19,800.00
732-04-15020	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (ONLY)	EACH	$ 200.00	7	$ 1,400.00
732-04-18000	PLASTIC PAVEMENT LEGENDS AND SYMBOLS (RR CROSSING)	EACH	$ 475.00	5	$ 2,375.00

ITEM	DESCRIPTION	PAY UNIT	UNIT PRICE	QUANTITY	TOTAL
739-01-00100	HYDRO-SEEDING	ACRE	$ 1,800.00	11	$ 19,800.00
740-01-00100	CONSTRUCTION LAYOUT	LUMP SUM	$ 138,000.00	1	$ 138,000.00
805-01-00300	CLASS A CONCRETE (BOX CULVERT HEADWALLS)	CU. YD.	$ 1,200.00	150	$ 179,400.00
805-12-37000	REINFORCED CONCRETE BOX CULVERTS (8' X 8') (EXTENSION)	LIN. FT.	$ 760.00	385	$ 292,600.00
805-12-37040	REINFORCED CONCRETE BOX CULVERTS (10' X 8') (EXTENSION)	LIN. FT.	$ 850.00	356	$ 302,600.00
806-01-00100	DEFORMED REINFORCING STEEL	POUND	$ 1.25	12185	$ 15,231.50
NS-MSC-00120	NS DRAINAGE STRUCTURE (PAVED GUTTER DRAIN (PG-03)	EACH	$ 4,000.00	29	$ 116,000.00
				TOTAL	**$ 9,174,809.05**

Table 18
Engineer's Preliminary Project Cost Estimate

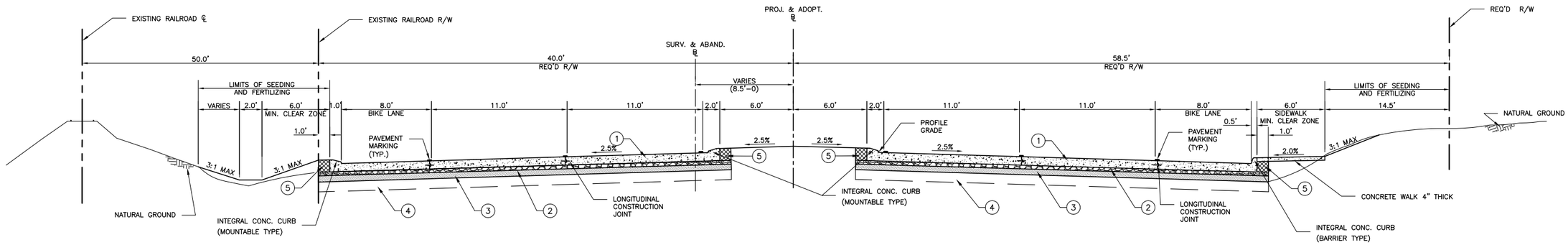
ITEM NO.	DESCRIPTION	AMOUNT (PCCP)	AMOUNT (ACCP)
1	Roadway Construction Cost Subtotal	$ 10,769,618	$ 9,174,809
2	Traffic Signalization Cost Subtotal	$ 350,000	$ 350,000
3	20% Contingency	$ 2,223,924	$ 1,904,962
	Total Construction Costs	**$ 13,343,542**	**$ 11,429,771**
3	Testing (2.5% of Construction Costs)	$ 333,589	$ 285,744
4	Utility Relocations*	$ 666,000	$ 666,000
5	Lighting, Landscaping and Seeding (4% of CC)	$ 533,742	$ 457,191
6	Environmental Mitigation / Environmental Study	$ 395,000	$ 395,000
7	Engineering Costs (11.5% of CC)	$ 1,534,507	$ 1,314,424
8	Right-of-Way	$ 5,827,217	$ 5,827,217
	Total Project Costs	**$ 22,633,596**	**$ 20,375,347**

* Costs assume that Entergy Transmission will absorb all of their relocation costs because their lines are within the existing Nicholson Drive right of way.

EXHIBITS

LEGEND: RIGID ALTERNATE

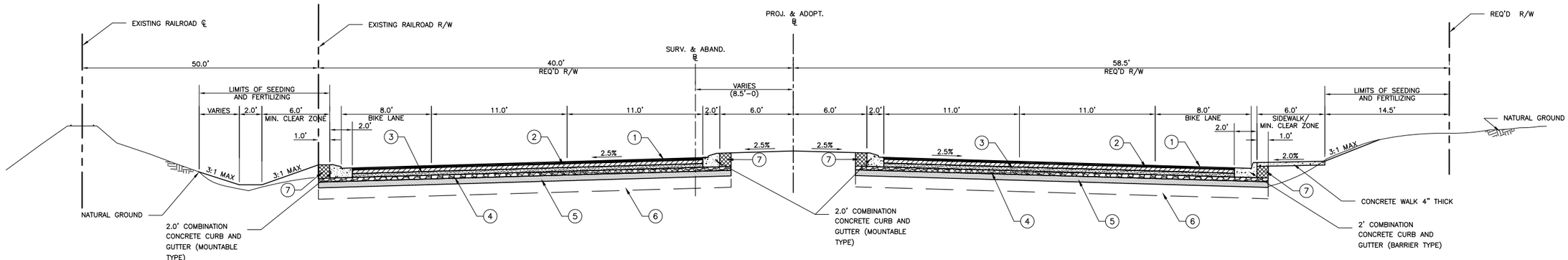
	1	10" JOINTED PLAIN CONCRETE PAVEMENT
	2	4" CLASS II BASE COURSE (CRUSHED STONE OR RECYCLED PCCP)
	3	6" CLASS II BASE COURSE (SOIL CEMENT)
	4	12" TYPE E LIME TREATMENT 9% BY VOLUME (TO BE USED AS DIRECTED BY THE PROJECT ENGINEER)
	5	EMBANKMENT NO DIRECT PAY



RIGID ALTERNATE
TYPICAL FINISHED SECTION
N.T.S.
APPLIES:
NICHOLSON DRIVE SEGMENT 1

LEGEND: FLEXIBLE ALTERNATE

	1	2" SUPERPAVE AC WEARING COURSE LEVEL 2F
	2	4" SUPERPAVE AC BINDER COURSE LEVEL 2
	3	4" SUPERPAVE AC BASE COURSE LEVEL 1
	4	4" CLASS II BASE COURSE (CRUSHED STONE OR RECYCLED PCCP)
	5	6" CLASS II BASE COURSE (SOIL CEMENT)
	6	12" TYPE E LIME TREATMENT 9% BY VOLUME (TO BE USED AS DIRECTED BY THE PROJECT ENGINEER)
	7	EMBANKMENT NO DIRECT PAY



FLEXIBLE ALTERNATE
TYPICAL FINISHED SECTION
N.T.S.
APPLIES:
NICHOLSON DRIVE SEGMENT 1

STRUCTURAL DESIGN	
CURRENT ADT – 2010	= 18,000
MEDIUM ADT	=
DESIGN ADT – 2030	= 27,800
PERFORMANCE PERIOD (YEARS)	= 20
FLEXIBLE STRUCTURAL DESIGN	
18 KIP ESALS	= 5,386,439
SOIL RESILIENT MODULUS (PSI)	= 4.3
STRUCTURE NUMBER REQUIRED (INCHES)	= 5.05
STRUCTURAL NUMBER PROVIDED (INCHES PER LAYER)	
1–WEARING COURSE, SUPERPAVE (LEVEL 2F)	= 0.88
2–BINDER COURSE, SUPERPAVE (LEVEL 2)	= 1.76
3–BASE COURSE, SUPERPAVE (LEVEL 1)	= 1.19
4–BASE COURSE, CLASS II (STONE)	= 0.50
5–BASE COURSE, CLASS II (SOIL CEMENT)	= 0.76
STRUCTURAL NUMBER PROVIDED (TOTAL INCHES)	= 5.09

RIGID STRUCTURAL DESIGN	
PAVEMENT TYPE	= JPCP
18–KIP ESALS OVER INITIAL PERFORMANCE PERIOD	= 6,695,537
INITIAL SERVICEABILITY	= 4.3
TERMINAL SERVICEABILITY	= 2.5
28–DAY MEAN PCC MODULUS OF RUPTURE	= 600 PSI
28–DAY MEAN ELASTIC MODULUS OF SLAB	= 4,200,000 PSI
MEAN EFFECTIVE K–VALUE	= 350 PSI/IN
RELIABILITY LEVEL	= 97%
OVERALL STANDARD DEVIATION	= 0.37
LOAD TRANSFER COEFFICIENT, J	= 2.5
OVERALL DRAINAGE COEFFICIENT, CD	= 1
CALCULATED DESIGN THICKNESS	= 9.12 IN

BRIAN A. HAZLIP
NAME
PRELIMINARY
4-11-2011
DATE
34714
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SHEET NUMBER EX–1

EAST BATON ROUGE | | 414–01–0039
PARISH | FEDERAL PROJECT | STATE PROJECT

DESIGNED JRE | CHECKED AFT | DETAILED JPO | CHECKED BAH | DATE 4–11–2011 | SHEET EX–1

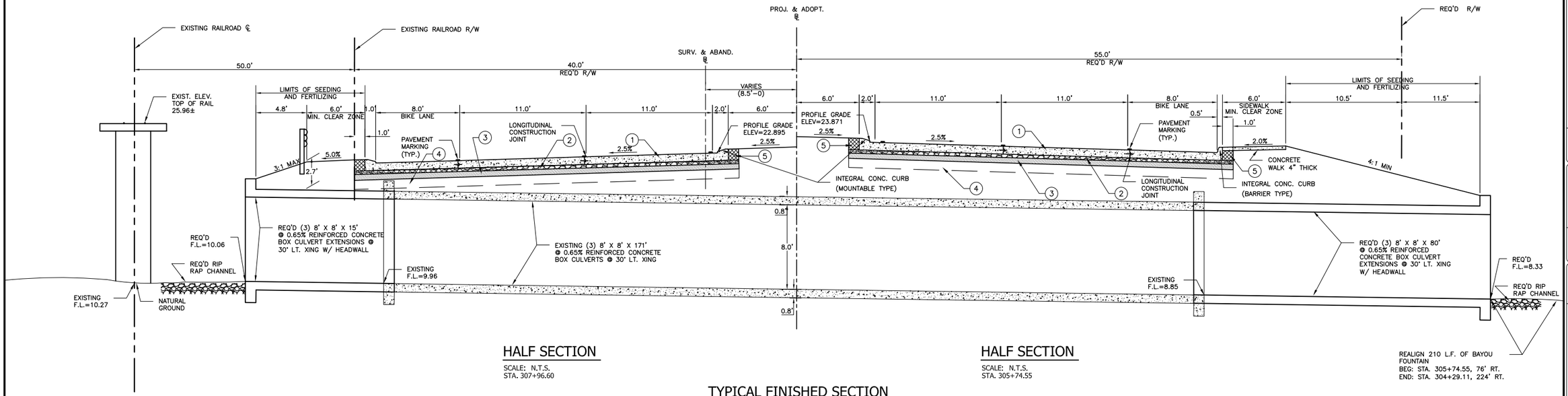
REVISION DESCRIPTION | BY | DATE | NO.

TYPICAL SECTIONS

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C–TS01.DWG



HALF SECTION

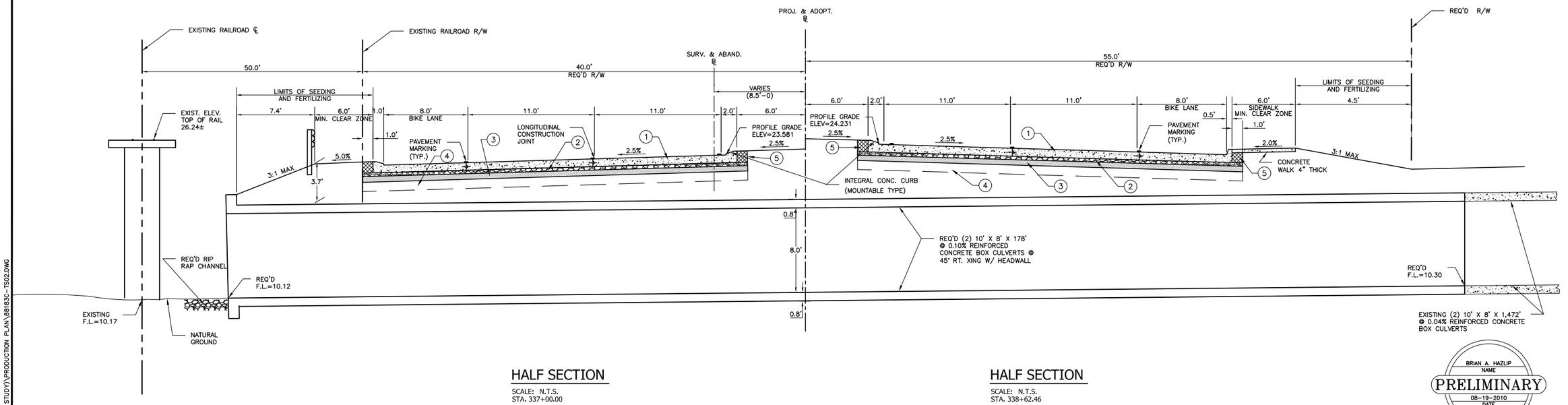
SCALE: N.T.S.
STA. 307+96.60

HALF SECTION

SCALE: N.T.S.
STA. 305+74.55

TYPICAL FINISHED SECTION

N.T.S.
APPLIES: STA. 305+21.72 TO STA. 308+16.29
NICHOLSON DRIVE



HALF SECTION

SCALE: N.T.S.
STA. 337+00.00

HALF SECTION

SCALE: N.T.S.
STA. 338+62.46

TYPICAL FINISHED SECTION

N.T.S.
APPLIES: STA. 337+00.00 TO STA. 338+62.46
NICHOLSON DRIVE

BRIAN A. HAZLIP
NAME
PRELIMINARY
08-19-2010
DATE
34714
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SHEET NUMBER	EX-2
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED	JRE
CHECKED	AFT
DETAILED	JPO
CHECKED	BAH
DATE	08-19-2010
SHEET	EX-2

NO.	REVISION DESCRIPTION	DATE	BY

TYPICAL SECTIONS

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183-TS02.DWG

Exhibit 3: FEMA Flood Insurance Rate Map (May 2, 2008)

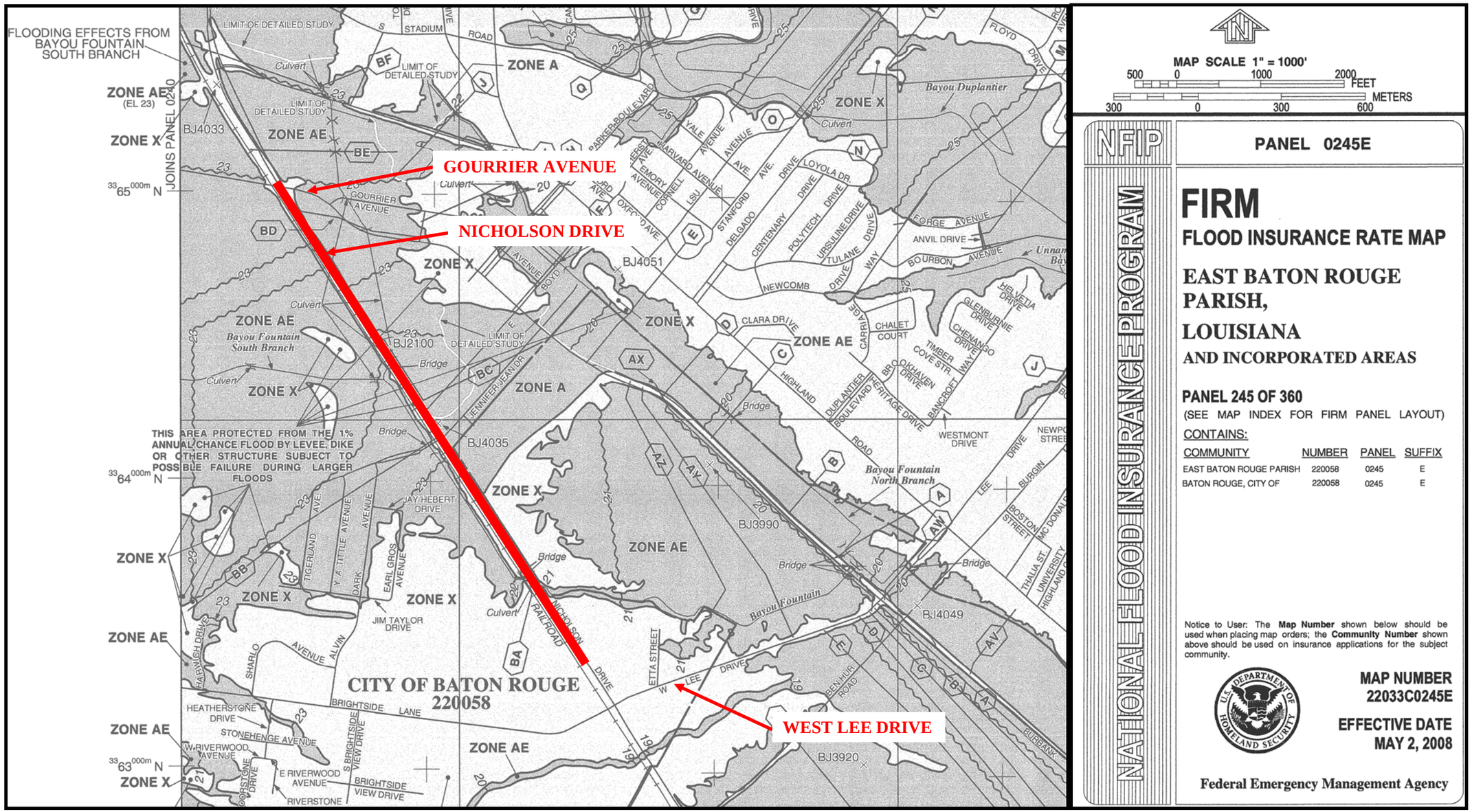


Exhibit 4: EBR FEMA Flood Insurance Study displaying Flood Profile 13P

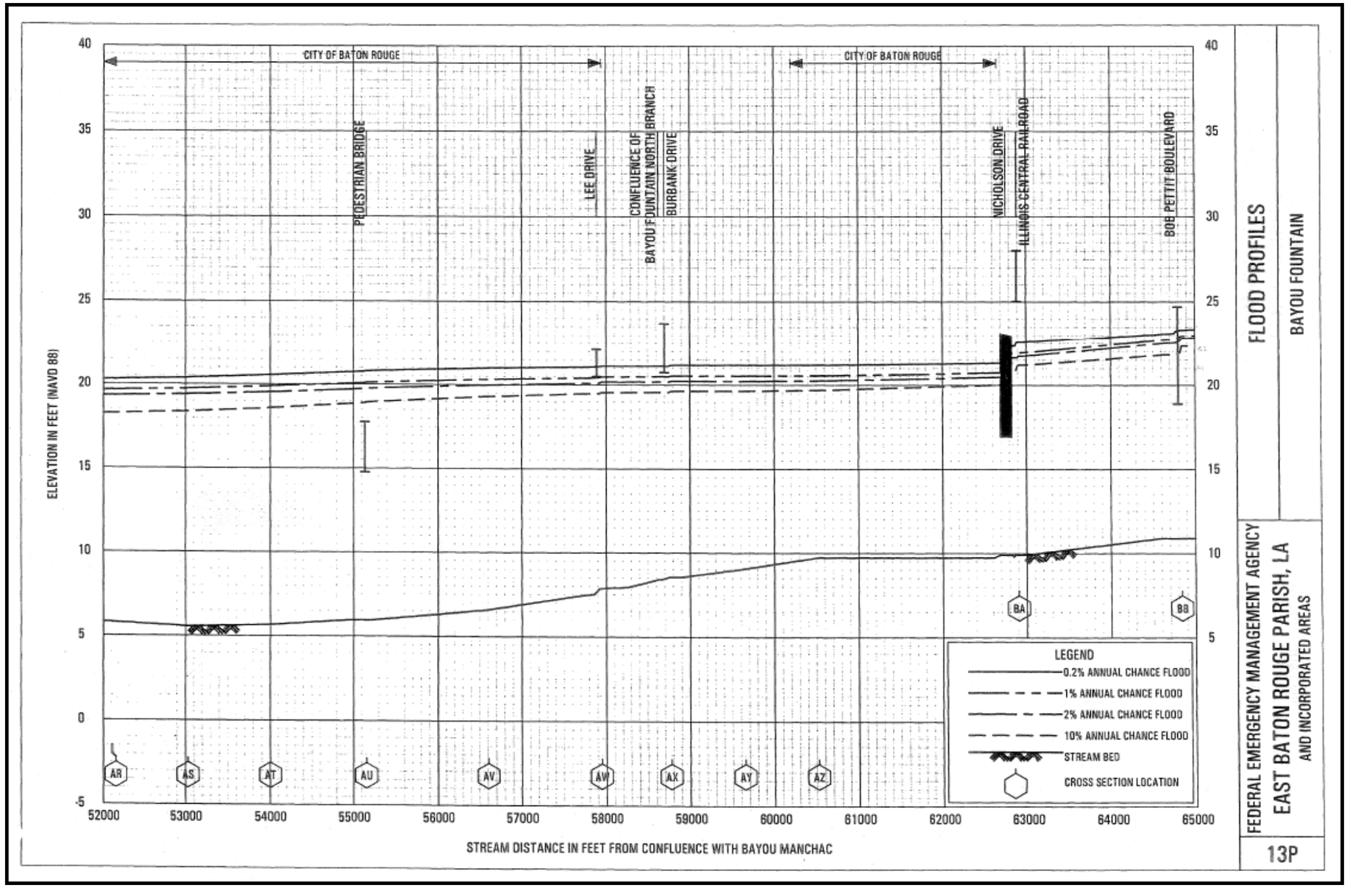
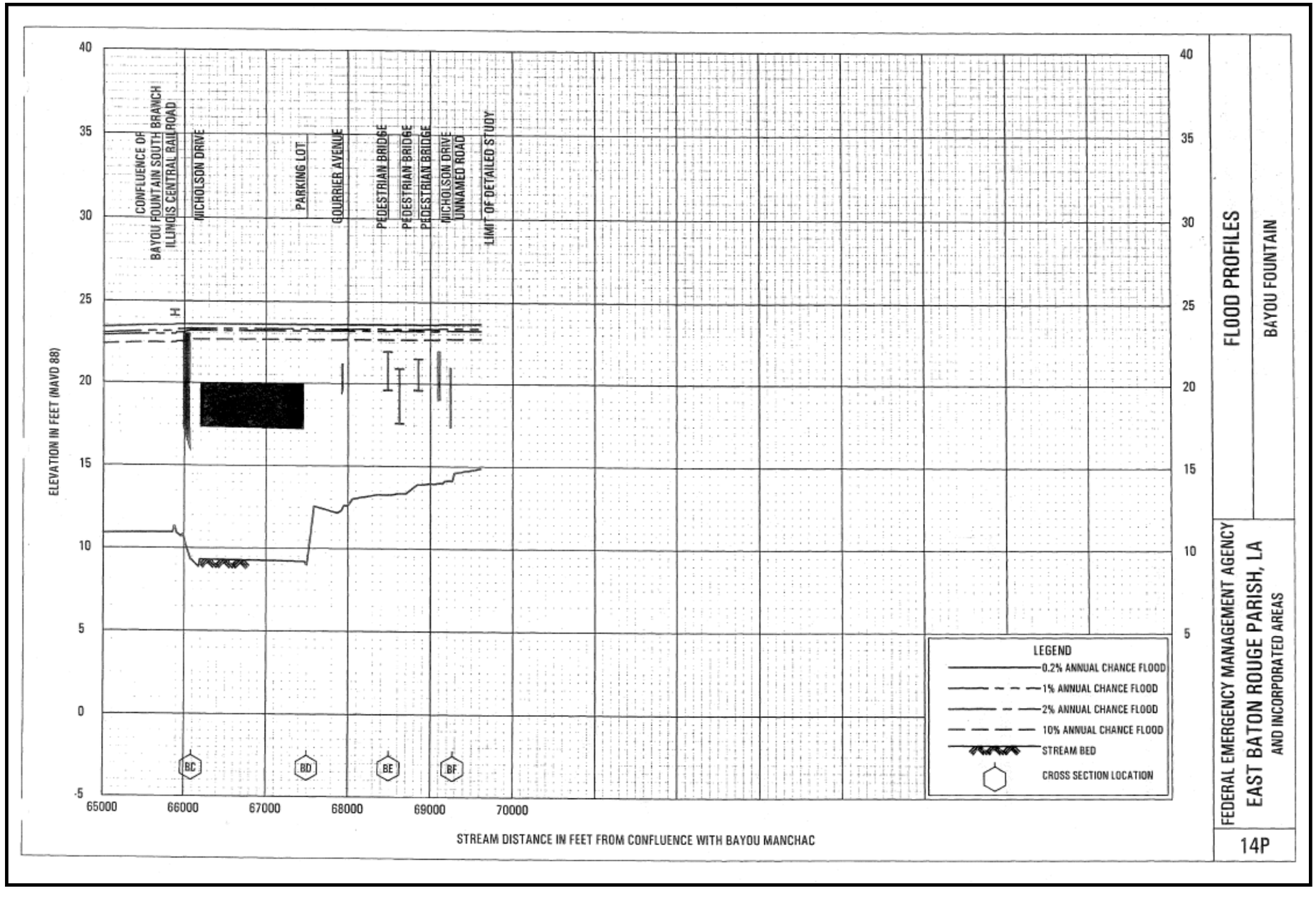


Exhibit 5: EBR FEMA Flood Insurance Study displaying Flood Profile 14P



LEGEND – EXISTING TOPOGRAPHY

CONTROL POINT		GAS LINE	G
PHOTO TARGET		GAS METER	
PAVEMENT EDGE		GAS SERVICE (NO METER)	
SHOULDER EDGE		GAS REGULATOR	GR
SLOPE TOE		GAS RISER	
GUARDRAIL TOP		GAS TEST BOX	GT
HIGH BANK		GAS VALVE	
WATER'S EDGE		GAS LINE/CASING	G
HIGH WATER MARK		GAS VENT	
BOX CULVERT		RAILROAD MILEPOST	MP
PIPE CULVERT		RAILROAD SIGNAL	
CATCH BASIN TOP (ROUND)		RAILROAD SWITCH	
DROP INLET TOP (ROUND)		RAILROAD TRACK	
DRAINAGE MANHOLE TOP		RR TRAFFIC SIGNAL BOX	SB
LEVEE TOP		SEWER LINE	S
DITCH CENTERLINE		SEWER MANHOLE TOP	
TREE		SEWER BLOWOUT VALVE	
WOODS EDGE		SEWER CLEANOUT	
MARSH LINE		SEPTIC TANK	
SWAMP LINE		SEWER PUMP (PRIVATE)	
TREE CLUSTER		SEWER TREATMENT (INDIVIDUAL)	
HEDGE		FEDERAL AID MARKER	F
BUSH		TRAFFIC CONTROLLER BOX	
TREE LINE		TRAFFIC COUNTER	
FENCE LINE	X	TRAFFIC SIGNAL	
GATE		TRAFFIC SIGNAL SUPPORT POLE	
CATTLE GUARD		LIGHT POLE	
PROPERTY CORNER		LIGHT PEDESTAL	
RIGHT OF WAY MONUMENT		LIGHT POWER VAULT	
SECTION CORNER		TRAFFIC SIGN	
FENCE CORNER		PARKING METER	
TELEVISION CABLE	TV	TELEPHONE POLE	
TELEVISION PEDESTAL	TV	TELEPHONE LINE	T
POWER POLE		TELEPHONE BOOTH	TB
DEADMAN		TELE CROSS CONNECT BOX	TX
POWER LINE	P	TELEPHONE PEDESTAL	
POWER JUNCTION BOX	P	TELEPHONE PRESSURE BOX	
POWER VAULT	PV	WATER LINE	W
TRANSFORMER	T	WATER LINE/CASING	W
COMBINATION POLE		WATER CLEANOUT	W
POWER DROP		WATER METER	
PIPELINE	O	WATER VALVE	
PIPELINE VENT	V	WATER VALVE VAULT	
PIPELINE REGULATOR	OR	WATER WELL	
GAS WELL		FIRE HYDRANT	
OIL WELL		BILLBOARD	
SWALE DITCH		FUEL PUMP	
		POST	
		SIGN POST	
		STORAGE TANK (ROUND)	
		GRAVE	
		MAILBOX	
		ORNAMENTAL LIGHT	
		FLAG POLE	

GENERAL NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN HEREON ARE BASED ON ABOVE-GROUND STRUCTURES OR AS-BUILT DRAWINGS. LOCATIONS OF UNDERGROUND UTILITIES/STRUCTURES MAY VARY FROM LOCATIONS SHOWN HEREON. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED. NO EXCAVATIONS WERE MADE DURING THE PROGRESS OF THIS SURVEY TO LOCATE BURIED UTILITIES/STRUCTURES. ALL UTILITY COMPANIES WITHIN THE SURVEYED AREA WERE NOTIFIED TO LOCATE AND MARK THEIR UTILITIES. LOUISIANA ONE CALL (TICKET NO. 90259418, 90259448, 90259466, 90259492, 90259503, 90259522)

2. HORIZONTAL CONTROL

   PRIMARY CONTROL POINTS 1,2,3, 21 & 24 ESTABLISHED BY CLASSICAL STATIC LONG DURATION GPS OBSERVATIONS PROCESSED USING THE OPUS SOLUTION THRU NGS WEBSITE.

   HORIZONTAL CONTROL MONUMENTS:
   C.P. NO. 1 N=689788.712, E=3329988.549
   C.P. NO. 2 N=687035.885, E=331615.235
   C.P. NO. 3 N=687380.548, E=331389.914
   C.P. NO. 21 N=692514.166, E=3328193.591
   C.P. NO. 24 N=693088.857, E=3327801.311

   ALL OTHER CONTROL POINTS ESTABLISHED USING MULTIPLE RTK OBSERVATIONS FROM MULTIPLE OPUS CONTROL POINTS AND OBTAINING THE MEAN OF THESE RTK POSITIONS.

   COORDINATES AND BEARINGS SHOWN HEREON ARE GRID AND ARE BASED ON THE LOUISIANA COORDINATE SYSTEM, SOUTH ZONE, NAD 83, GEOID 03.

   SCALE FACTOR AT CENTER OF PROJECT: 0.99995277.

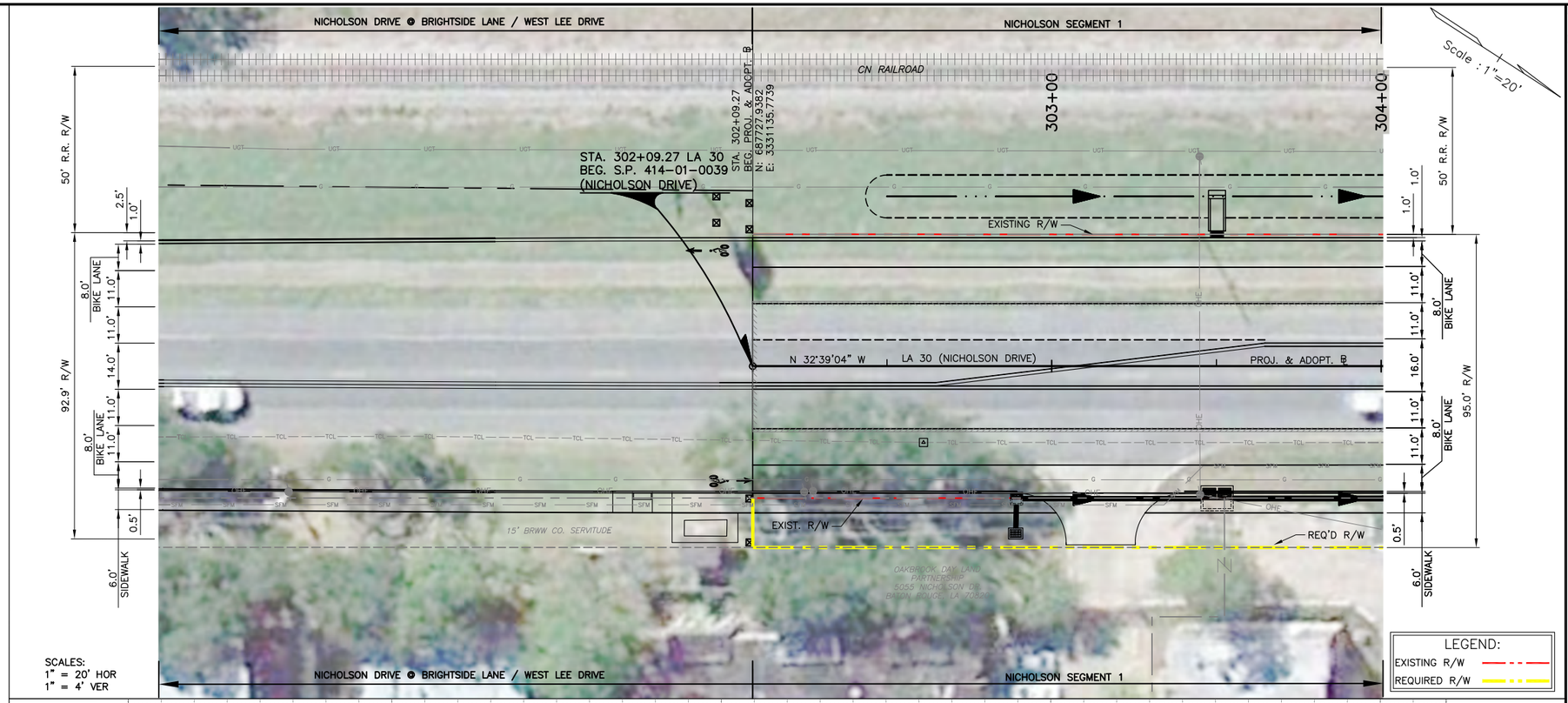
   ALL CONTROL POINTS ARE 1/2" IRON PIPES 24" LONG SET IN THE GROUND WITH THE TOP OF PIPE BEING 6" BELOW GRADE AND ALL ARE GROUTED IN WITH CONCRETE.

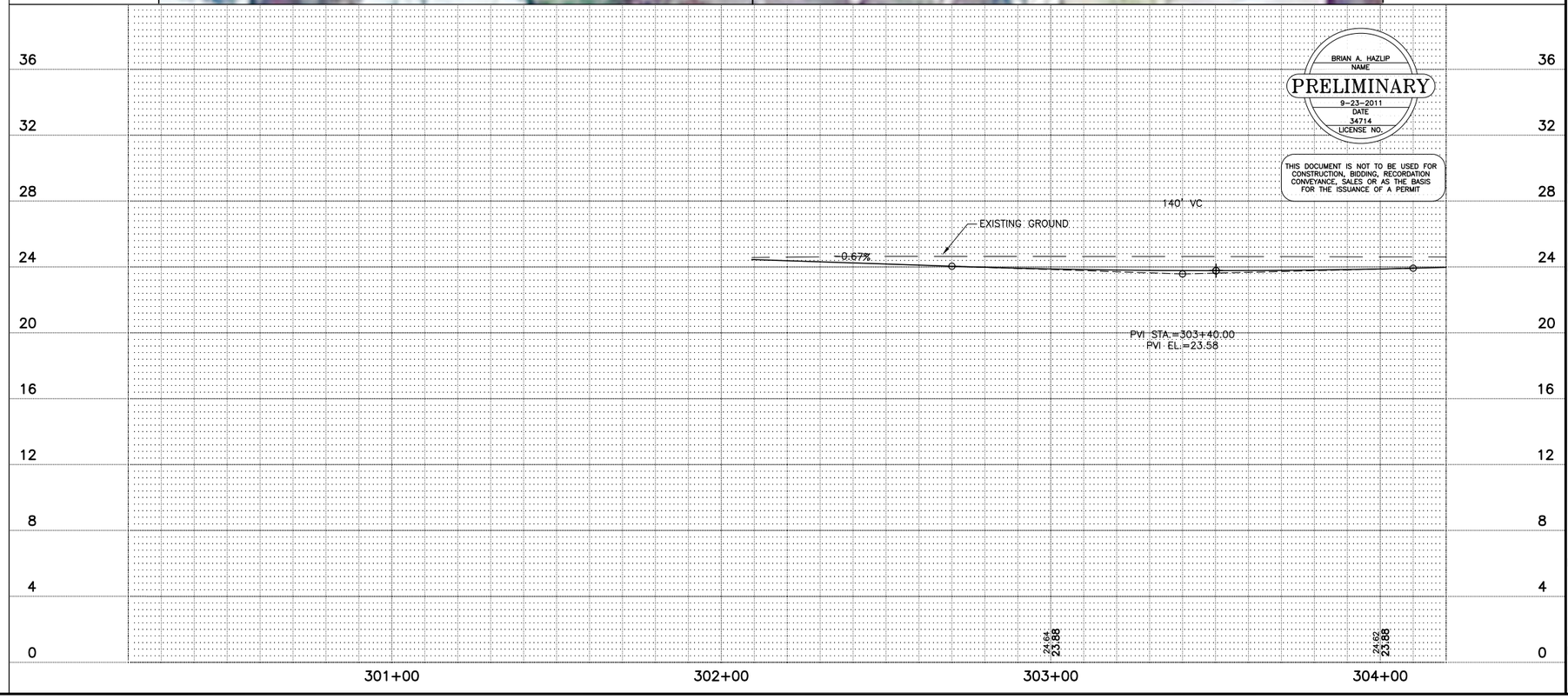
   SEE MAP "CLOSURE SKETCH OF THE TRAVERSE FOR NICHOLSON DRIVE SEGMENT 1" DATED APRIL 7, 2009, BY CARL A. JEANSONNE, JR., P.L.S., LIC. NO. 4543 FOR ADDITIONAL HORIZONTAL CONTROL INFORMATION.

3. VERTICAL CONTROL

   ELEVATIONS SHOWN HEREON WERE BASED UPON EBR DEPARTMENT OF PUBLIC WORKS CONTROL BENCHMARK NO. 17B004 , BEN HUR AT NICHOLSON. ELEVATION = 20.14' NAVD 88 (AS PER GLP INSTRUCTIONS)

   SEE MAP "TBM LOCATION SKETCH NICHOLSON DRIVE SEGMENT 1" DATED MAY 12, 2009, BY CARL A. JEANSONNE, JR., P.L.S., LIC. NO. 4543 FOR ADDITIONAL VERTICAL CONTROL INFORMATION.





BRIAN A. HAZLIP
NAME
PRELIMINARY
9-23-2011
DATE
34714
LICENSE NO.

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SHEET NUMBER	EX-6
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED	JRE
CHECKED	AFT
DETAILED	JPO
CHECKED	MJK
DATE	6/30/2009
SHEET	EX-6

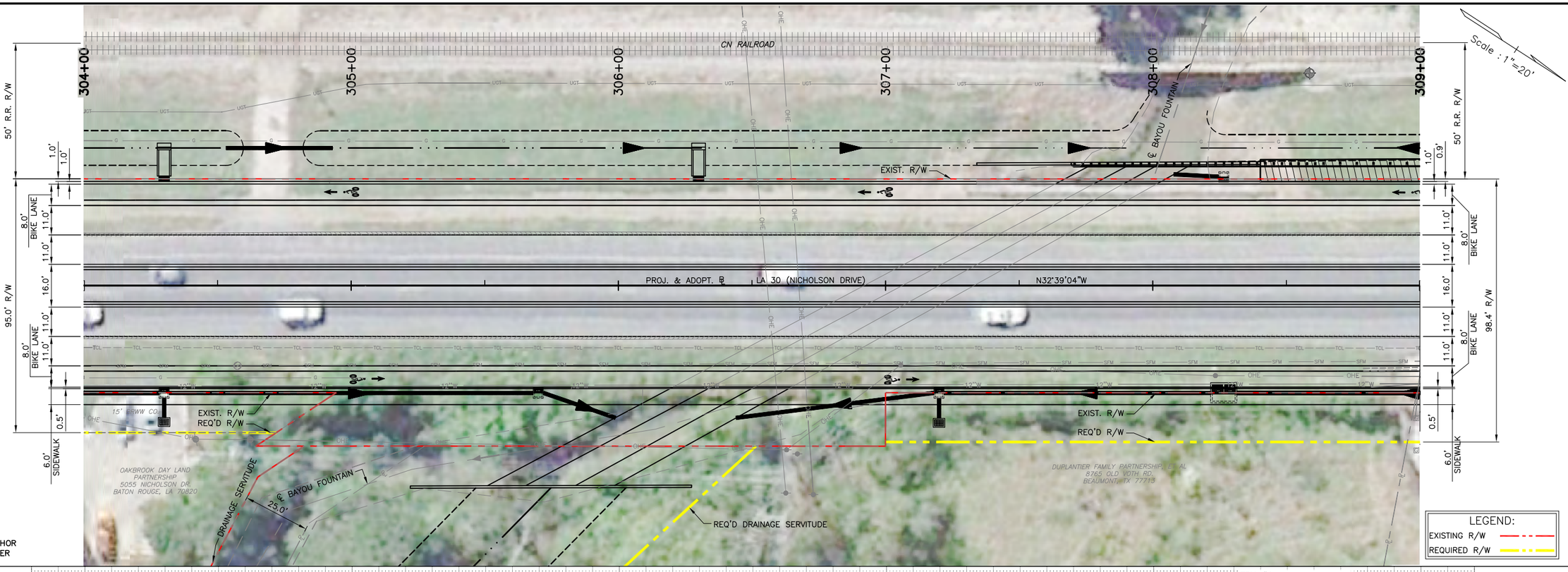
NO.	REVISION DESCRIPTION	BY	DATE

PLAN AND PROFILE - 01

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP01.DWG



SCALES:
1" = 20' HOR
1" = 4' VER

TBM #4
STA. 308+58.69-79.75 LT.
60d NAIL IN HEADWALL
OFF RR BRIDGE
ELEV = 21.84'

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SHEET NUMBER	EX-7
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED	JRE
CHECKED	AFT
DETAILED	JPO
CHECKED	M.K.
DATE	6/30/2009
SHEET	EX-7

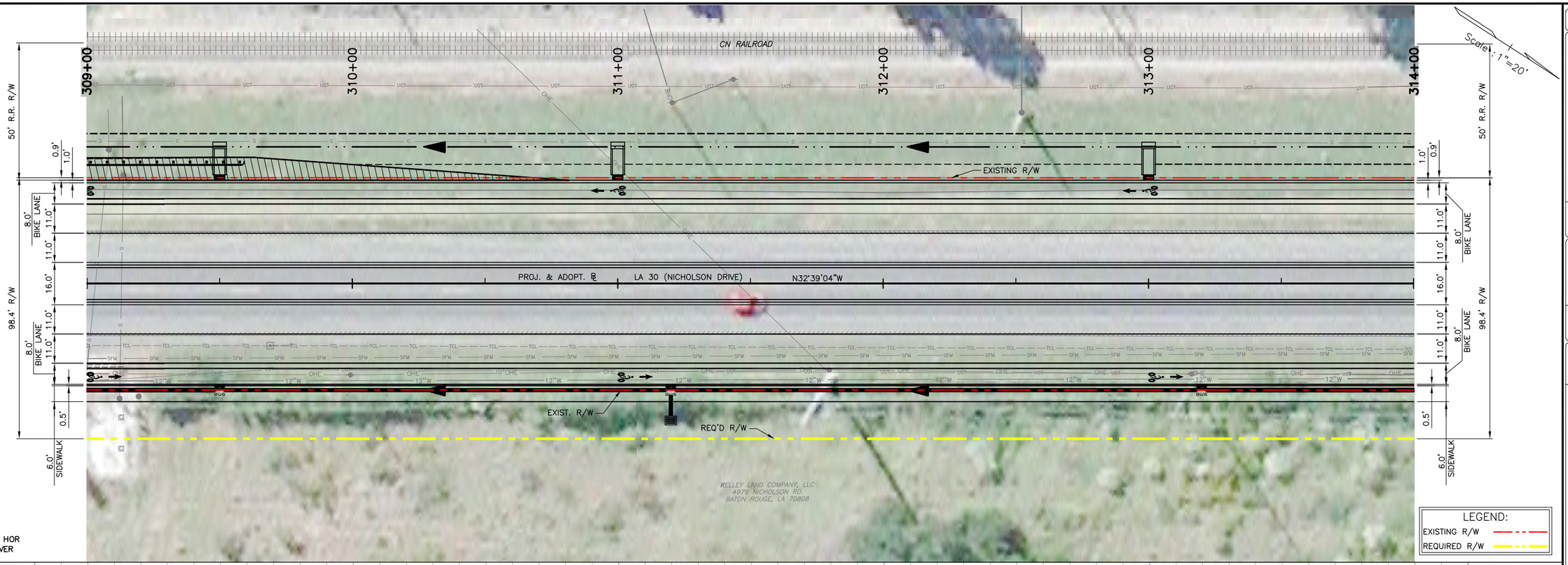
REVISION DESCRIPTION | BY | NO. | DATE

PLAN AND PROFILE - 02

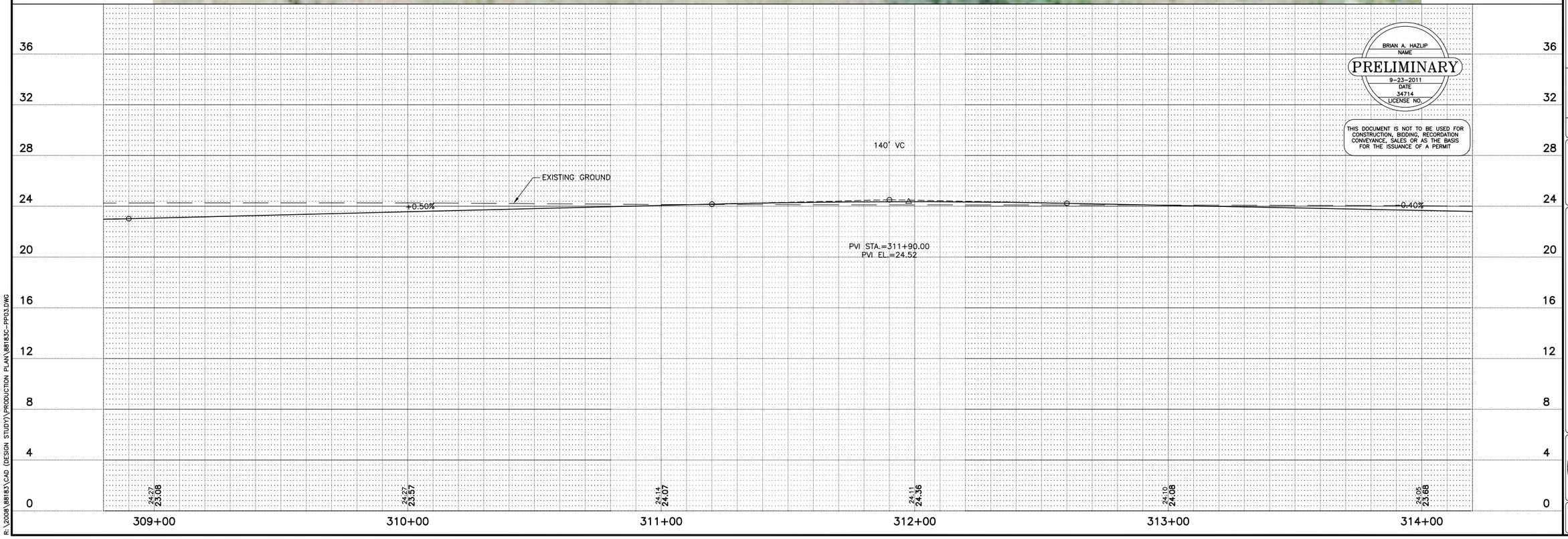
NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP02.DWG



SCALES:
1" = 20' HOR
1" = 4' VER



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SHEET NUMBER	EX-8
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED	JRE
CHECKED	BAH
DETAILED	JPO
CHECKED	MJK
DATE	6/30/2009
SHEET	EX-8

NO.	REVISION DESCRIPTION	DATE	BY

PLAN AND PROFILE - 03

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

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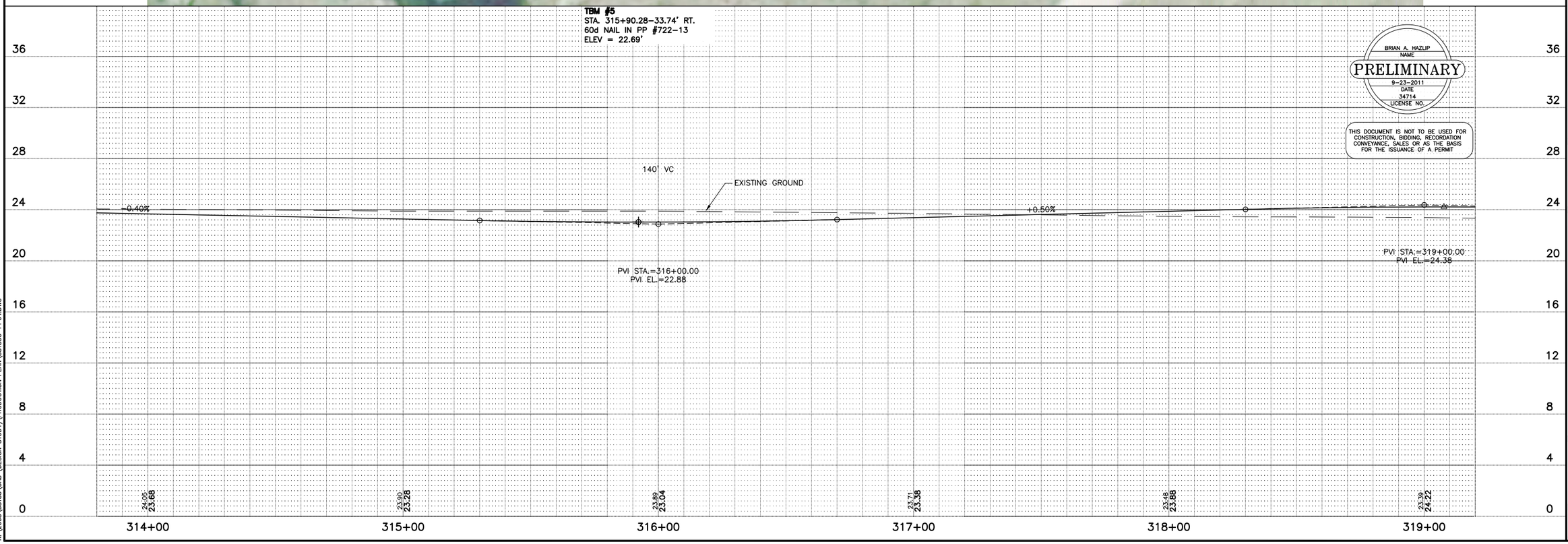
SCALES:
1" = 20' HOR
1" = 4' VER

LEGEND:
EXISTING R/W
REQUIRED R/W

TBM #5
STA. 315+90.28–33.74' RT.
60d NAIL IN PP #722–13
ELEV = 22.69'



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SHEET NUMBER	EX-9
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED	JRE
CHECKED	AFT
DETAILED	JPO
CHECKED	MJK
DATE	6/30/2009
SHEET	EX-9

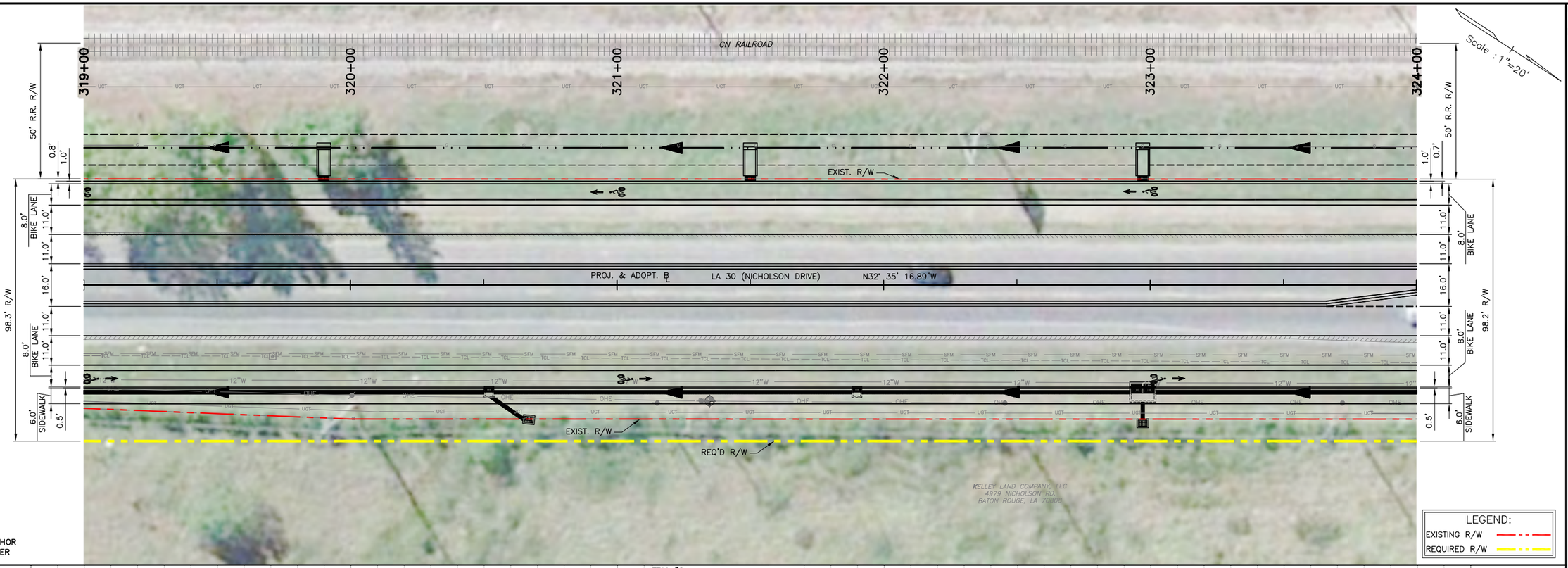
REVISION DESCRIPTION | BY | DATE | NO.

PLAN AND PROFILE - 04

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

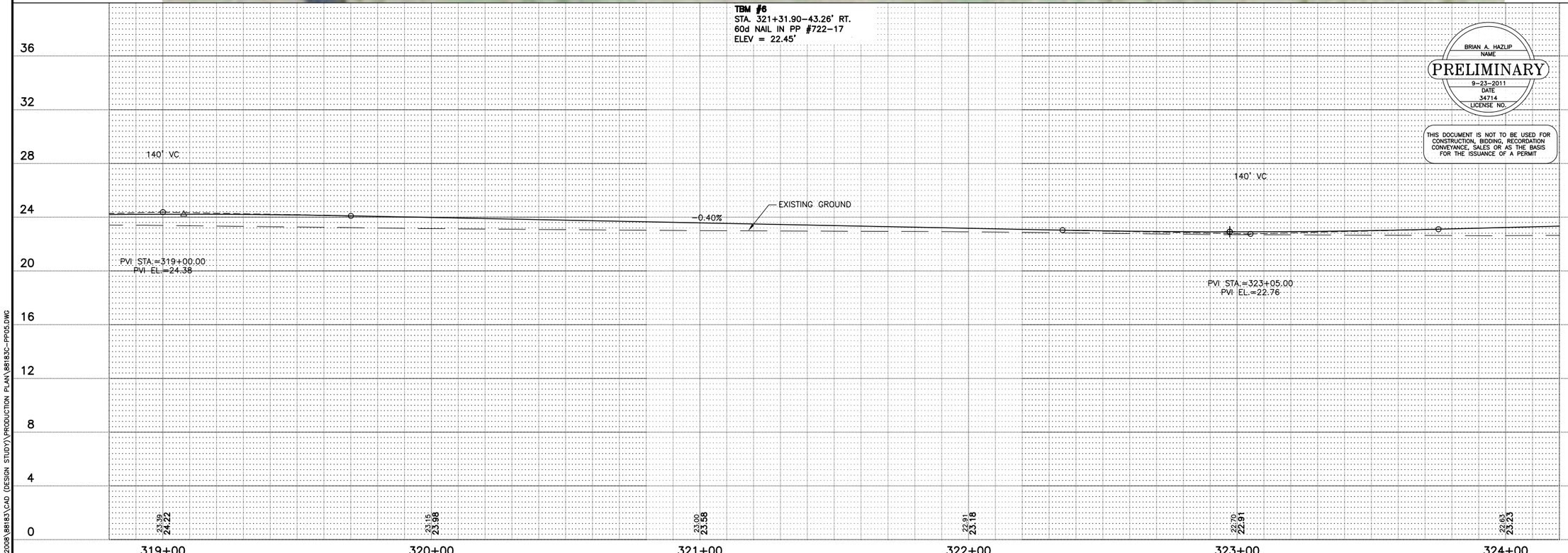
R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP04.DWG



SCALES:
1" = 20' HOR
1" = 4' VER

LEGEND:
EXISTING R/W
REQUIRED R/W

TBM #6
STA. 321+31.90–43.26' RT.
60d NAIL IN PP #722–17
ELEV = 22.45'



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SHEET NUMBER	EX-10
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED	JRE
CHECKED	AFT
DETAILED	JPO
CHECKED	MJK
DATE	6/30/2009
SHEET	EX-10

NO.	REVISION DESCRIPTION	DATE	BY

PLAN AND PROFILE - 05

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

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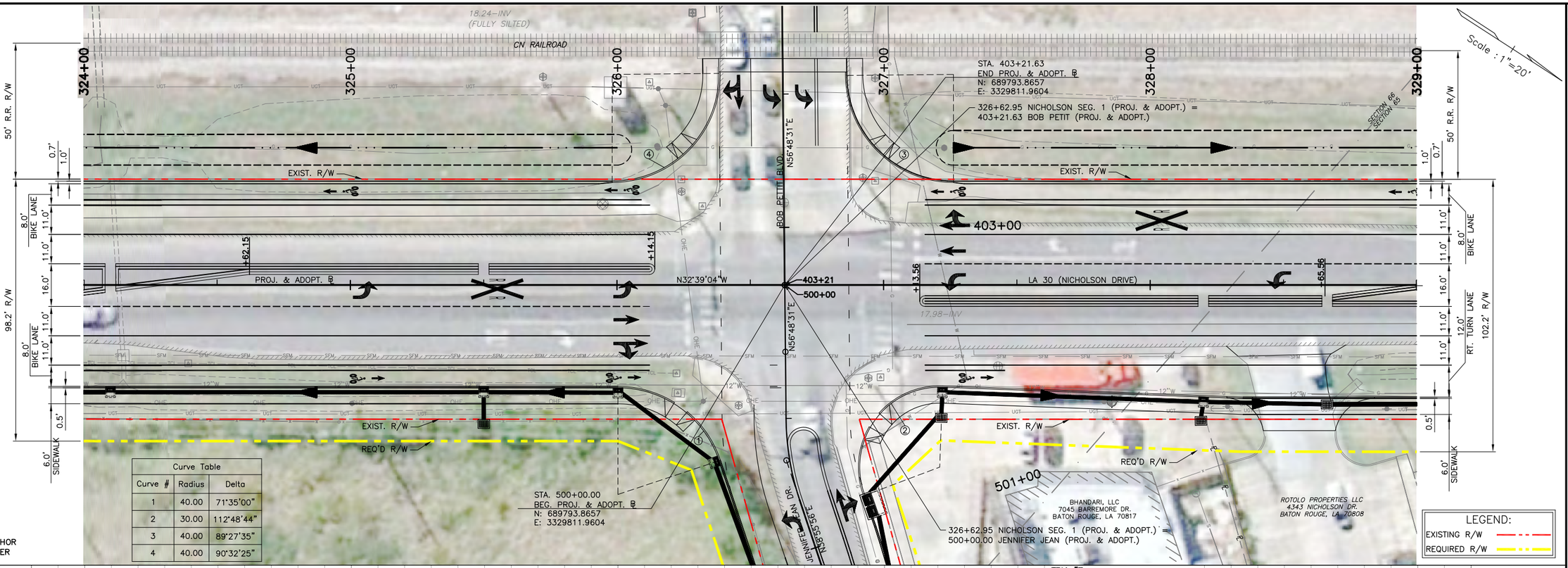
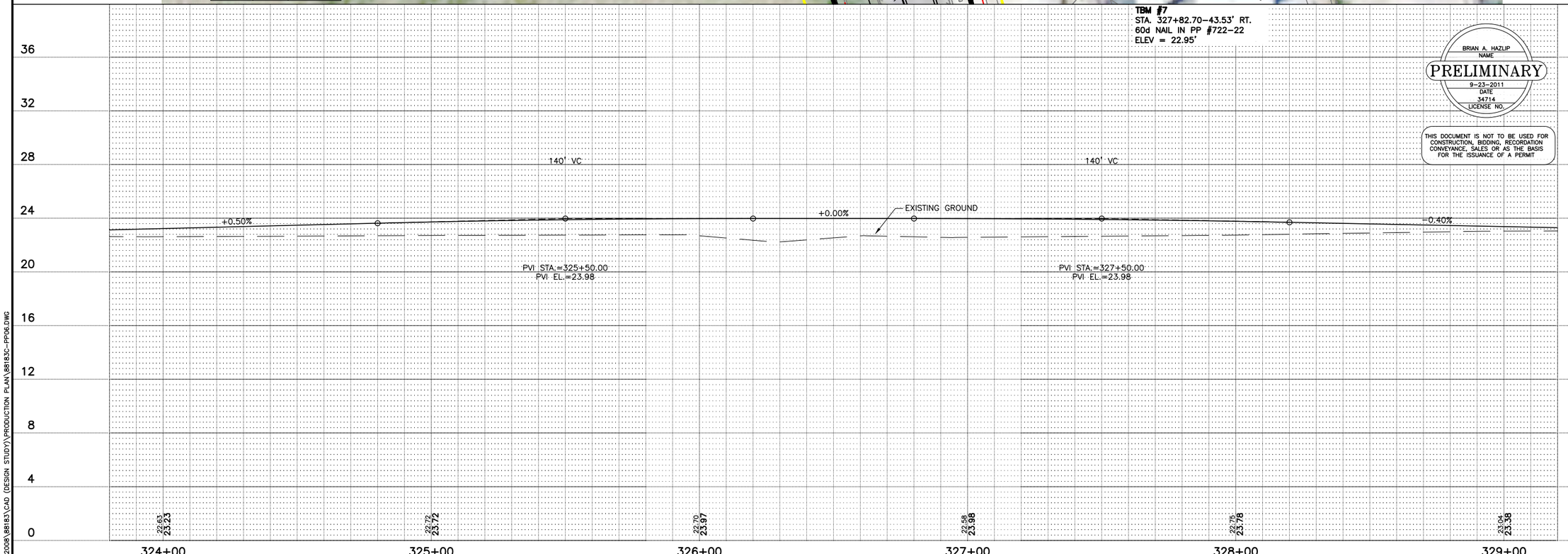


Curve Table		
Curve #	Radius	Delta
1	40.00	71°35'00"
2	30.00	112°48'44"
3	40.00	89°27'35"
4	40.00	90°32'25"

SCALES:
1" = 20' HOR
1" = 4' VER

TBM #7
STA. 327+82.70–43.53' RT.
60d NAIL IN PP #722–22
ELEV = 22.95'



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DATE
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SHEET NUMBER	EX–11
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414–01–0039
DESIGNED	JRE
CHECKED	BAH
DETAILED	JPO
CHECKED	MJK
DATE	6/30/2009
SHEET	EX–11

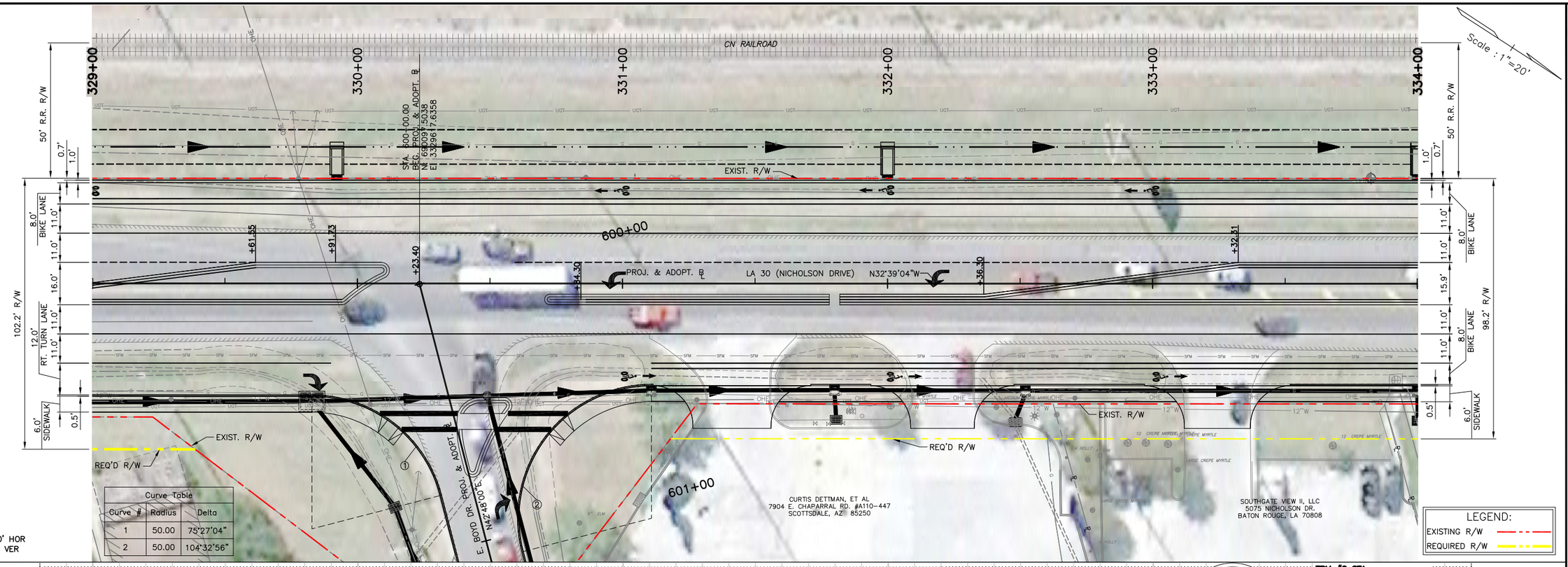
NO.	REVISION DESCRIPTION	BY	DATE

PLAN AND PROFILE – 06

NICHOLSON DRIVE SEGMENT 1

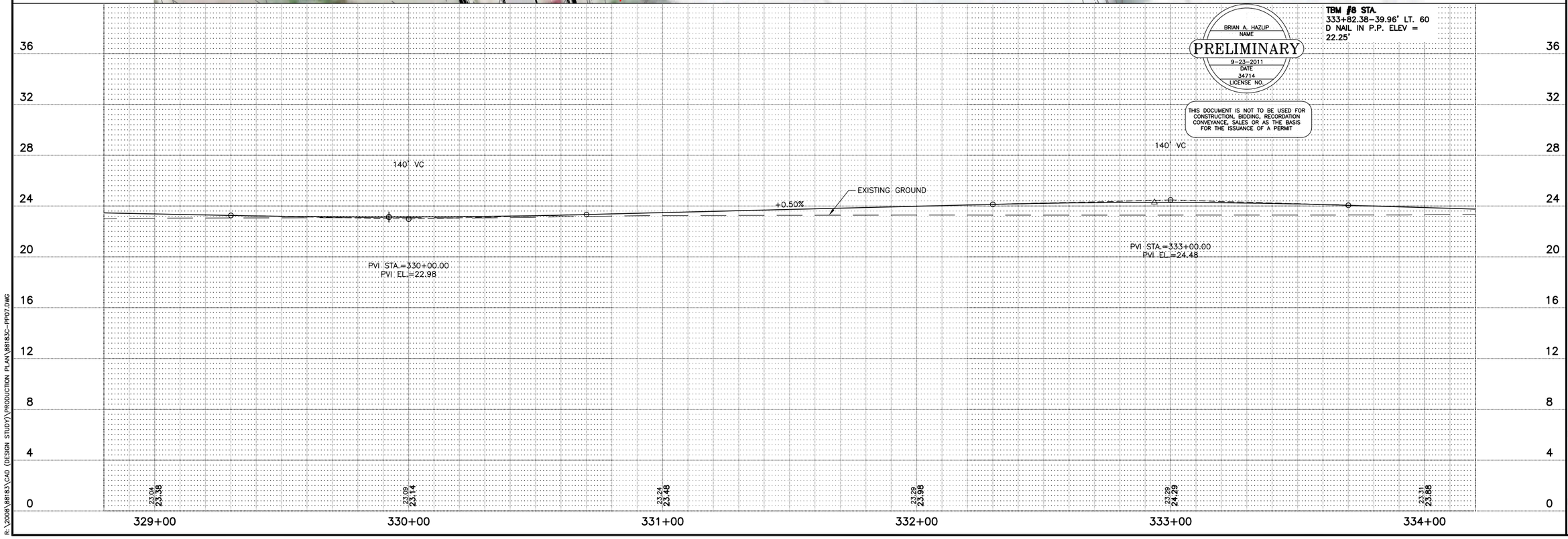
FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C–PP06.DWG



Curve Table		
Curve #	Radius	Delta
1	50.00	75°27'04"
2	50.00	104°32'56"

SCALES:
1" = 20' HOR
1" = 4' VER



TBM #8 STA.
333+82.38-39.96' LT. 60
D NAIL IN P.P. ELEV =
22.25'

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SHEET NUMBER EX-12

PARISH	FEDERAL PROJECT	STATE PROJECT
EAST BATON ROUGE		414-01-0039

DESIGNED	CHECKED	DETAILED	CHECKED	DATE	SHEET
JRE	BAH	JPO	MJK	6/30/2009	EX-12

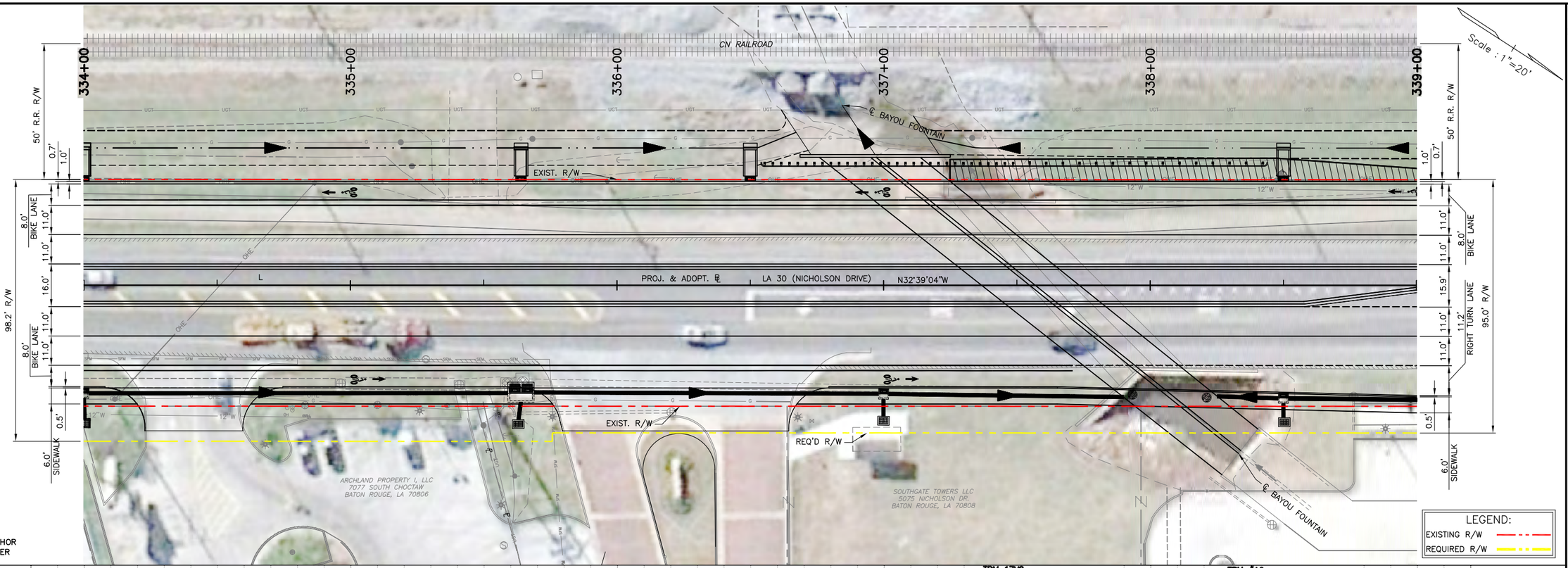
NO.	DATE	REVISION DESCRIPTION	BY

PLAN AND PROFILE - 07

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

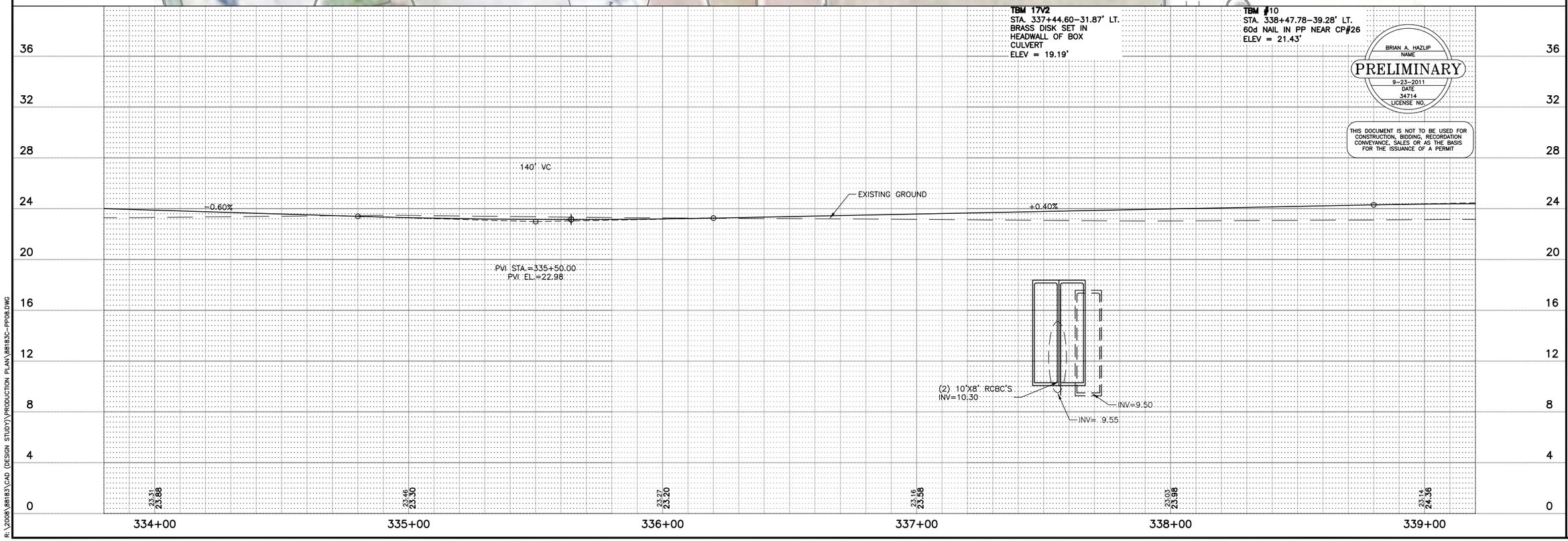
R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP07.DWG



SCALES:
1" = 20' HOR
1" = 4' VER

TBM 17V2
STA. 337+44.60–31.87' LT.
BRASS DISK SET IN
HEADWALL OF BOX
CULVERT
ELEV = 19.19'

TBM #10
STA. 338+47.78–39.28' LT.
60d NAIL IN PP NEAR CP#26
ELEV = 21.43'



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SHEET NUMBER EX-13

PARISH	FEDERAL PROJECT	STATE PROJECT
EAST BATON ROUGE		414-01-0039

DESIGNED	CHECKED	DETAILED	CHECKED	DATE	SHEET
JRE	BAH	JPO	MJK	6/30/2009	EX-13

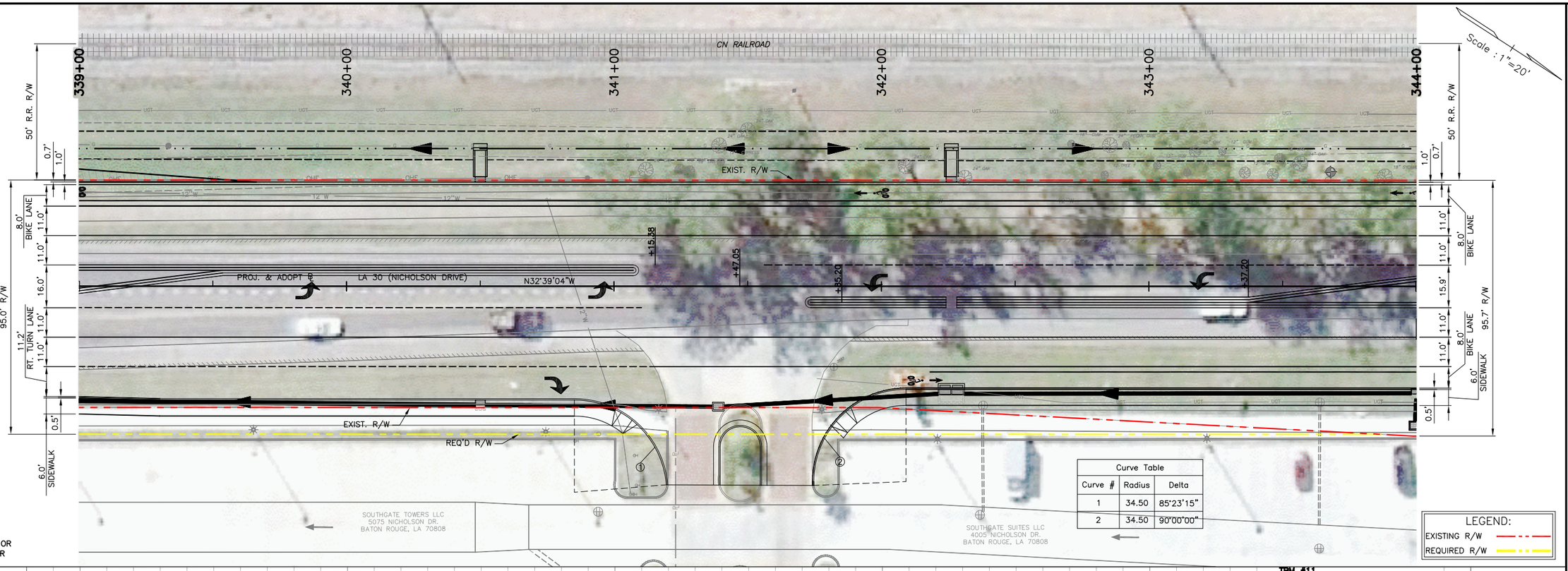
NO.	REVISION DESCRIPTION	DATE	BY

PLAN AND PROFILE - 08

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP08.DWG

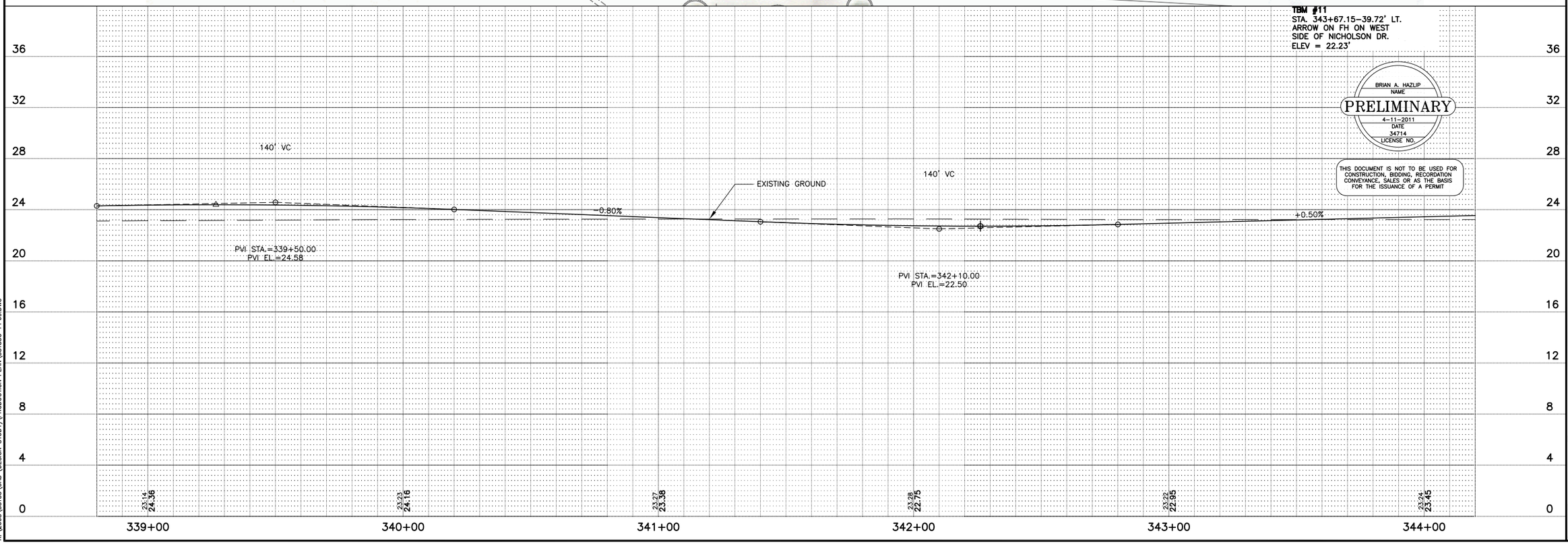


Curve Table		
Curve #	Radius	Delta
1	34.50	85°23'15"
2	34.50	90°00'00"

LEGEND:
EXISTING R/W
REQUIRED R/W

SCALES:
1" = 20' HOR
1" = 4' VER

TBM #11
STA. 343+67.15–39.72' LT.
ARROW ON FH ON WEST
SIDE OF NICHOLSON DR.
ELEV = 22.23'



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NAME
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4-11-2011
DATE
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SHEET NUMBER EX-14

PARISH	FEDERAL PROJECT	STATE PROJECT
EAST BATON ROUGE		414-01-0039

DESIGNED	CHECKED	DETAILED	CHECKED	DATE	SHEET
JRE	BAH	JPO	MJK	6/30/2009	EX-14

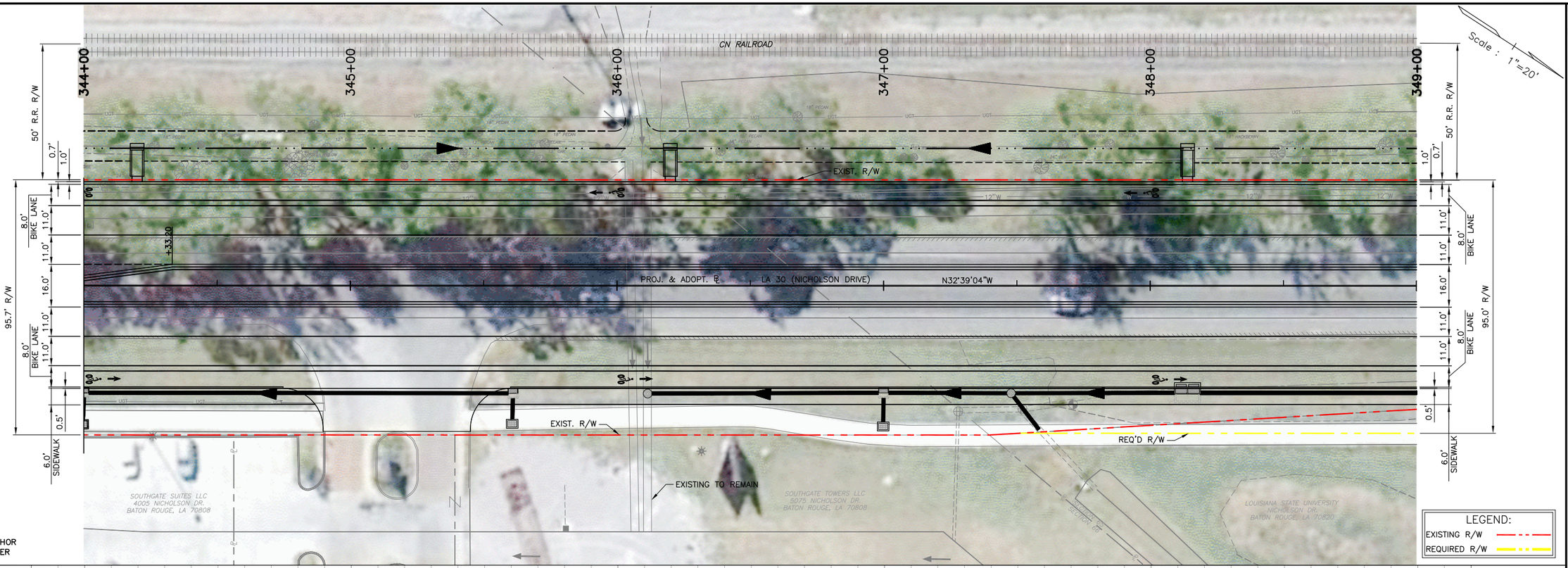
NO.	DATE	REVISION DESCRIPTION	BY

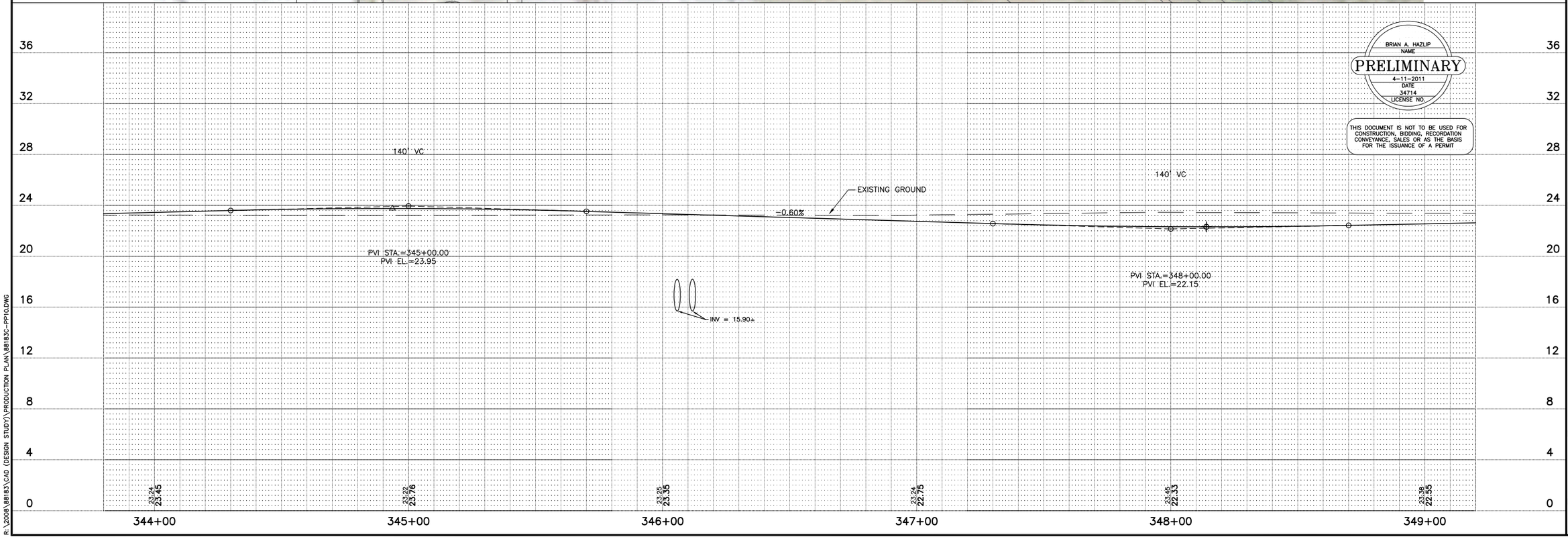
PLAN AND PROFILE - 09

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP09.DWG





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SHEET NUMBER EX-15

PARISH: EAST BATON ROUGE
FEDERAL PROJECT:
STATE PROJECT: 414-01-0039

DESIGNED JRE
CHECKED BAH
DETAILED JPO
CHECKED BAH
DATE 6/30/2009
SHEET EX-15

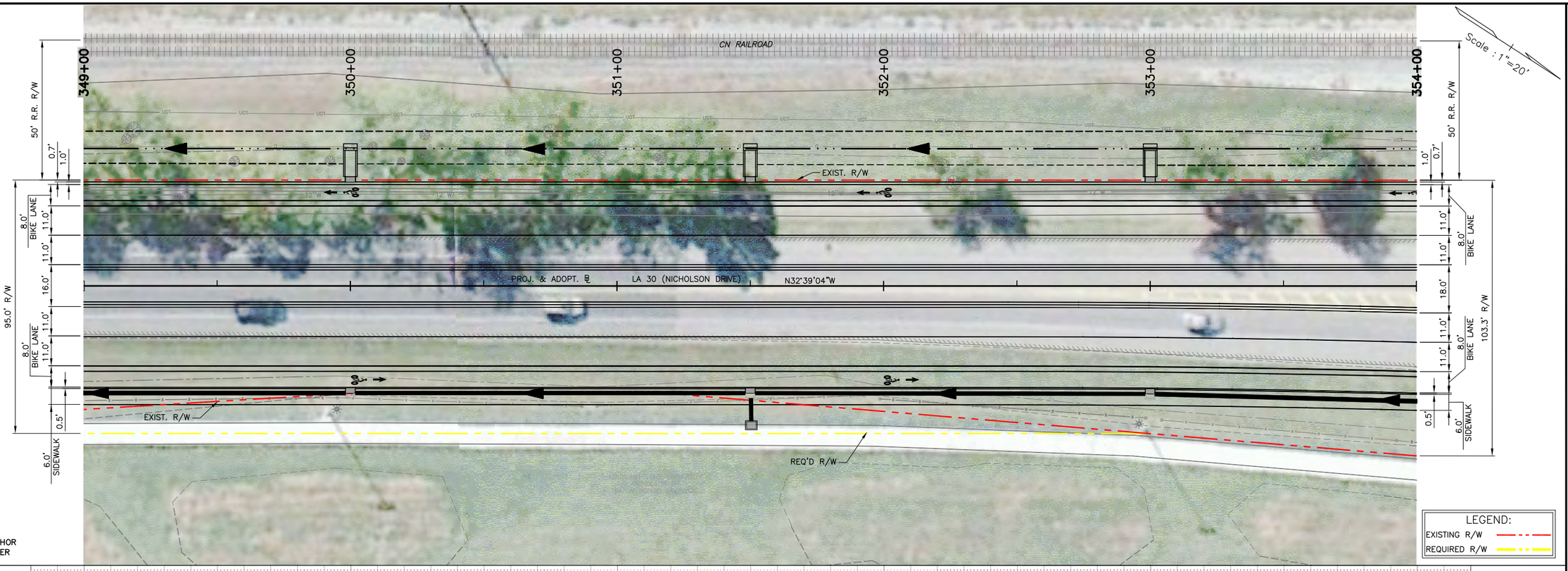
REVISION DESCRIPTION | DATE | BY | NO.

PLAN AND PROFILE - 10

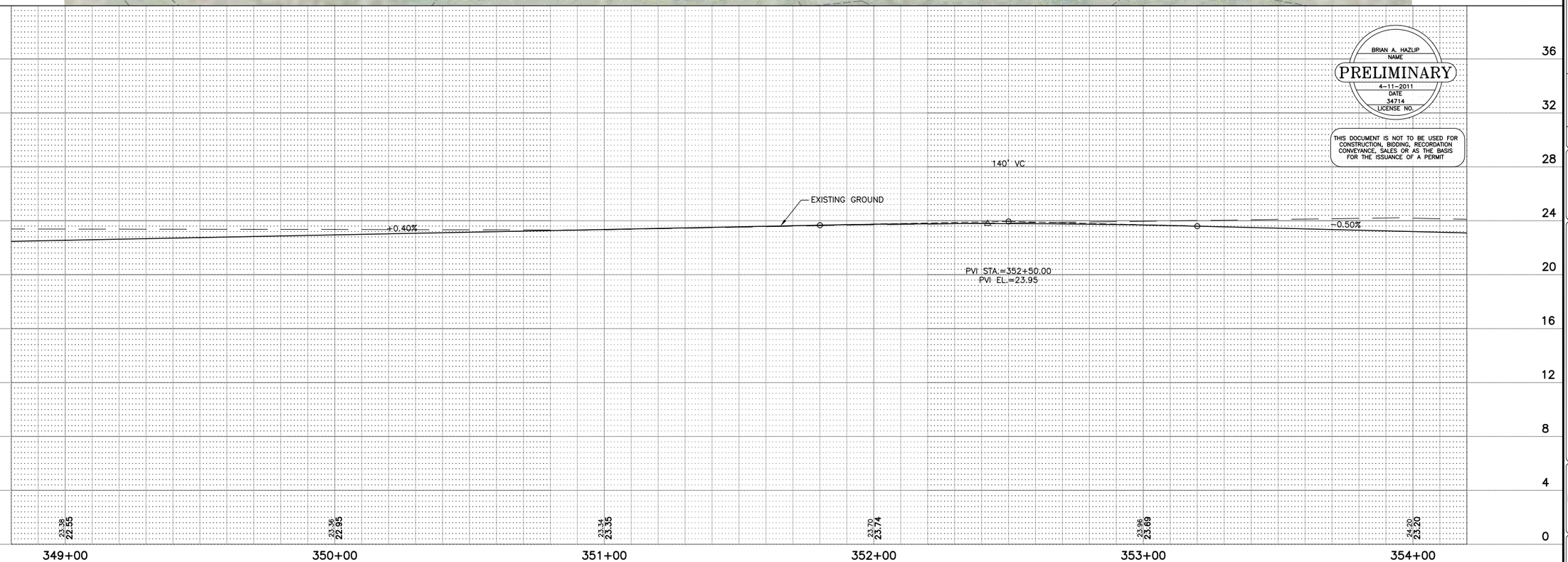
NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP10.DWG



SCALES:
1" = 20' HOR
1" = 4' VER



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SHEET NUMBER	EX-16
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED	JRE
CHECKED	BAH
DETAILED	JPO
CHECKED	BAH
DATE	6/30/2009
SHEET	EX-16

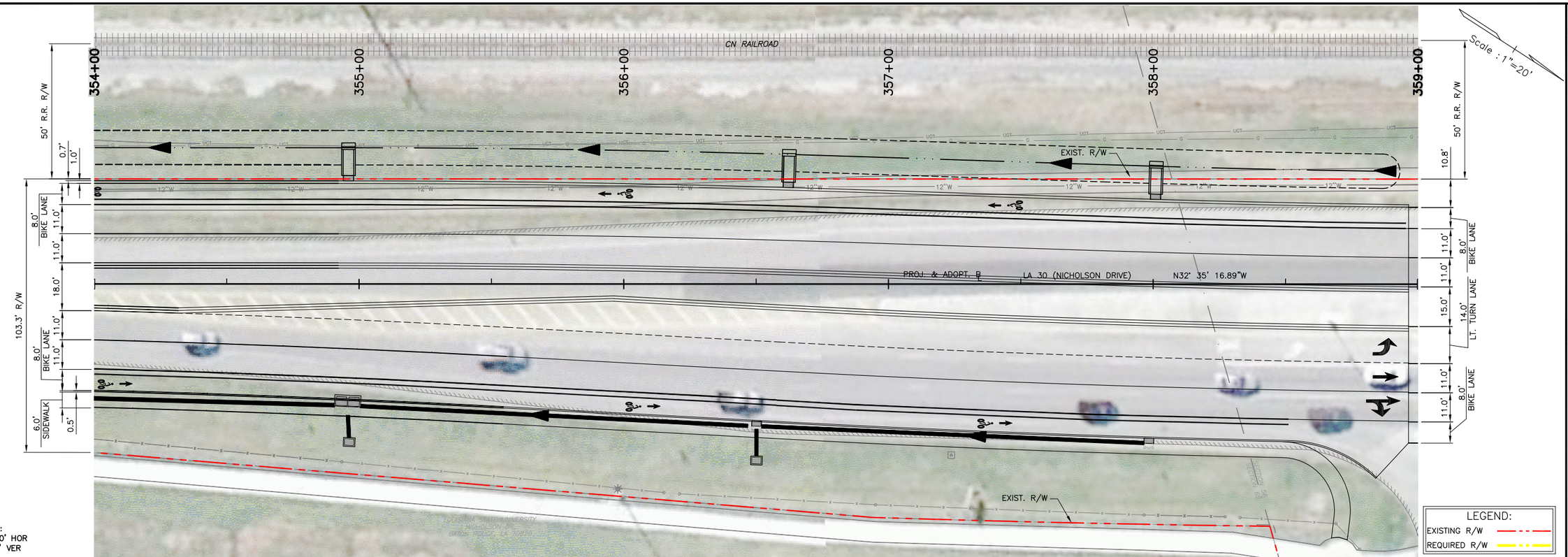
NO.	REVISION DESCRIPTION	BY	DATE

PLAN AND PROFILE - 11

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP11.DWG



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NAME

PRELIMINARY

4-11-2011
DATE

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SHEET NUMBER: EX-17

PARISH	FEDERAL PROJECT	STATE PROJECT
EAST BATON ROUGE		414-01-0039

DESIGNED	JRE	DATE	6/30/2009
CHECKED	BAH	SHEET	EX-17
DETAILED	JPO		
CHECKED	MJK		

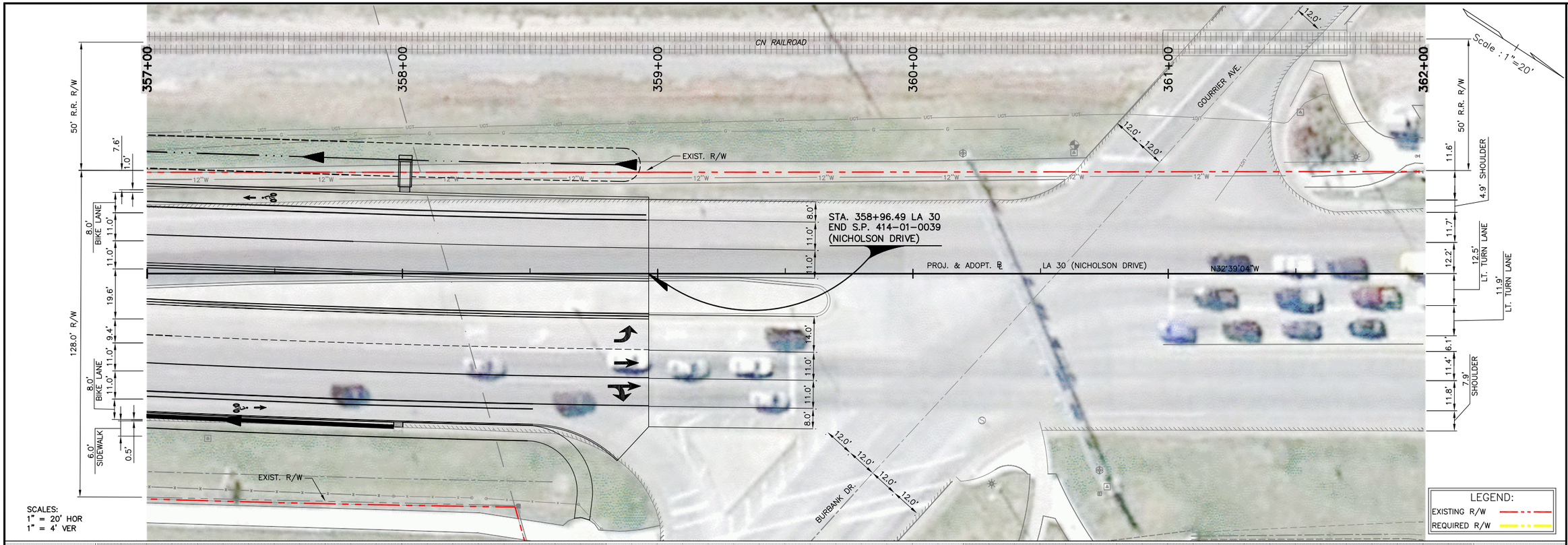
NO.	REVISION DESCRIPTION	DATE	BY

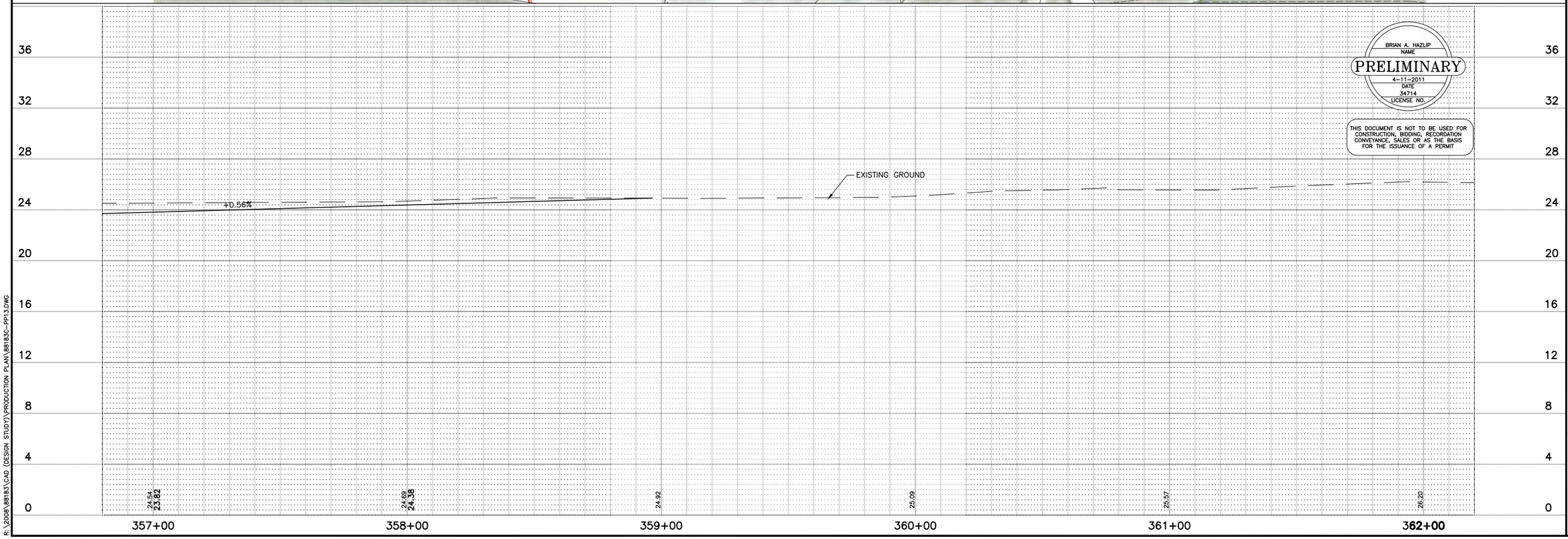
PLAN AND PROFILE - 12

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP12.DWG





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4-11-2011
DATE
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LICENSE NO.

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SHEET NUMBER EX-18

PARISH	FEDERAL PROJECT	STATE PROJECT
EAST BATON ROUGE		414-01-0039

DESIGNED	JRE	DATE	6/30/2009
CHECKED	BAH	SHEET	EX-18
DETAILED	JPO		
CHECKED	MJK		

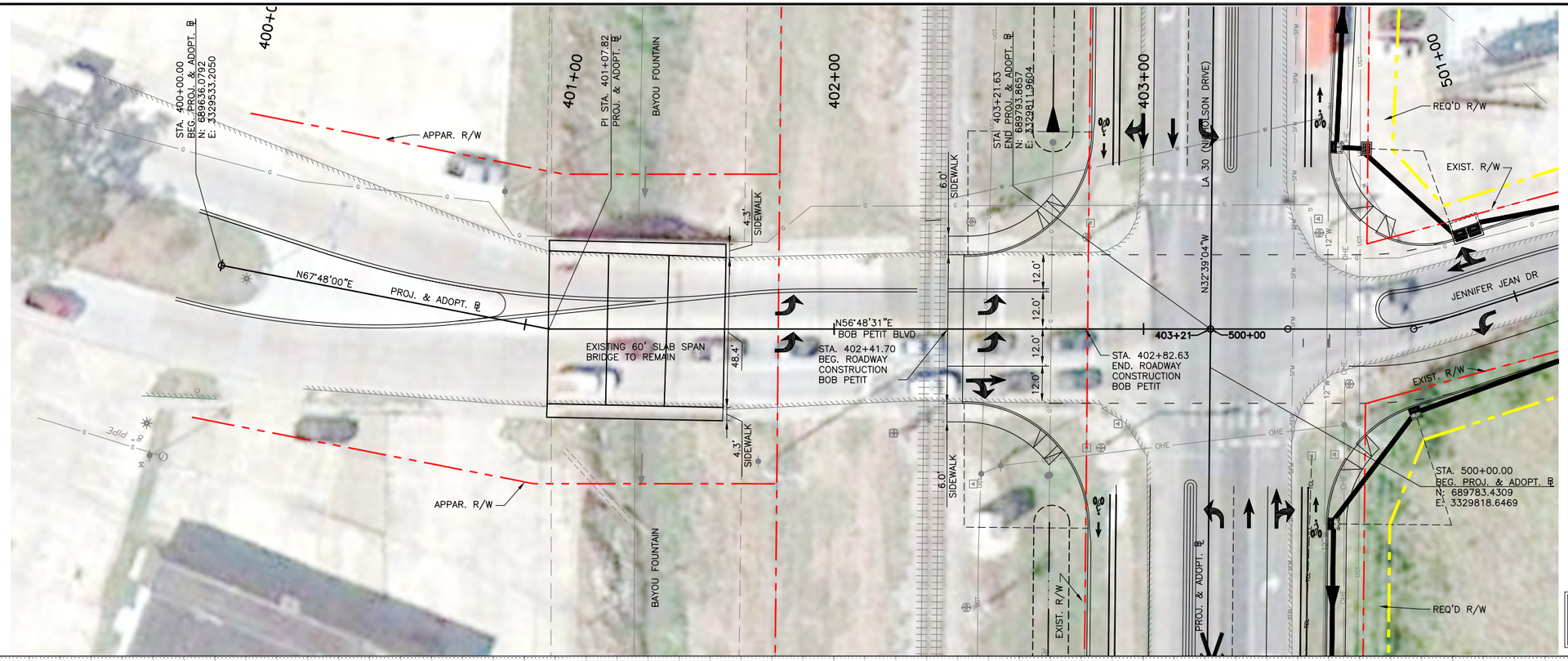
NO.	REVISION DESCRIPTION	BY	DATE

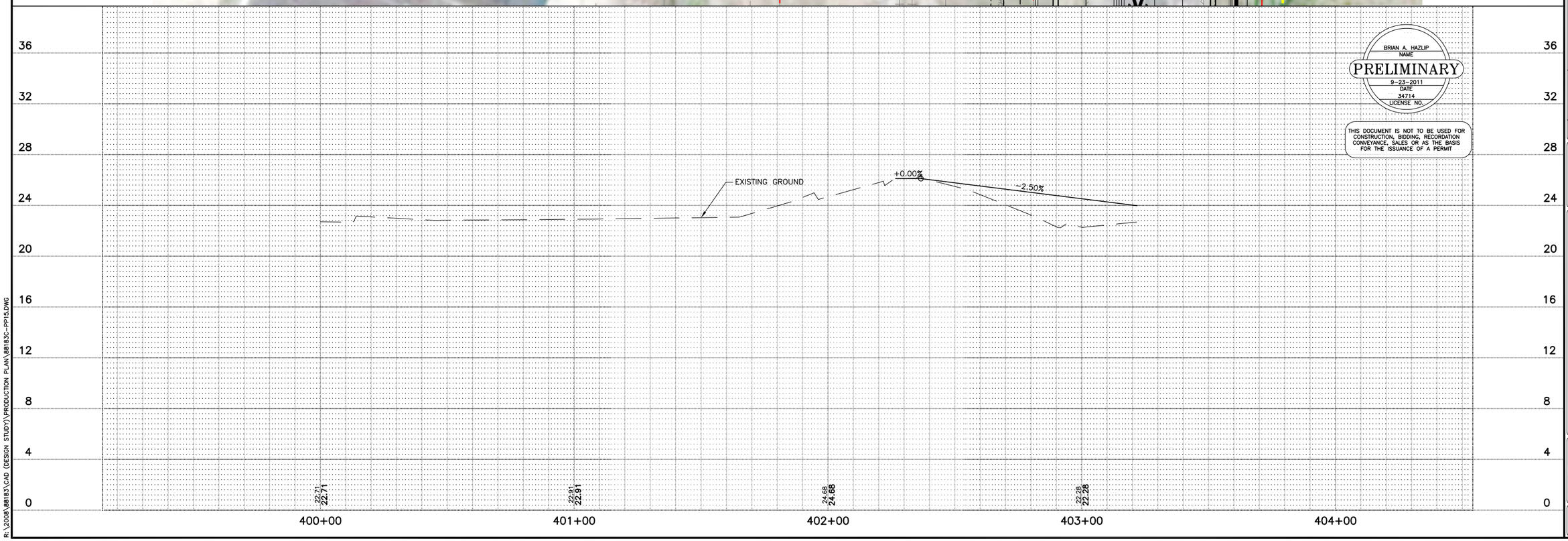
PLAN AND PROFILE - 13

NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP13.DWG





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SHEET NUMBER	EX-19
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED	JRE
CHECKED	BAH
DETAILED	JPO
CHECKED	MJK
DATE	6/30/2009
SHEET	EX-19

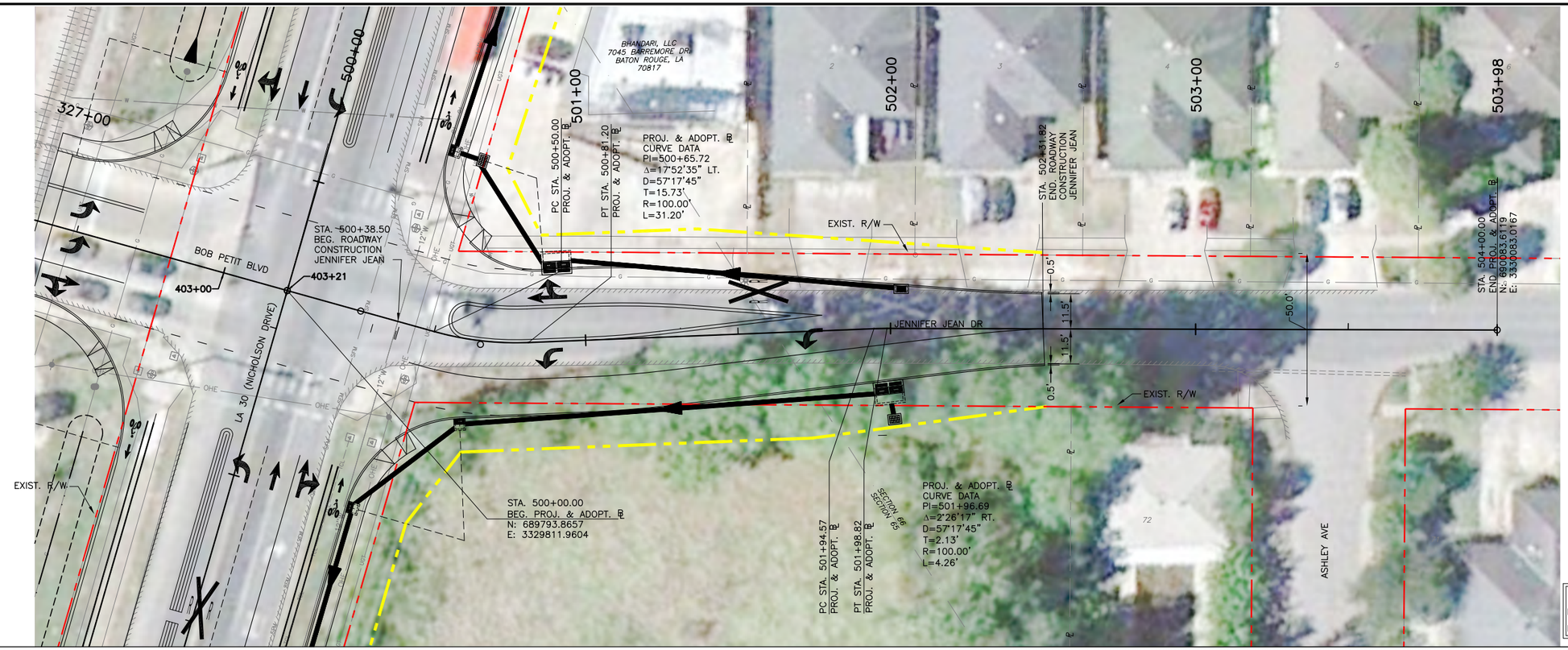
NO.	REVISION DESCRIPTION	DATE	BY

PLAN AND PROFILE - 14

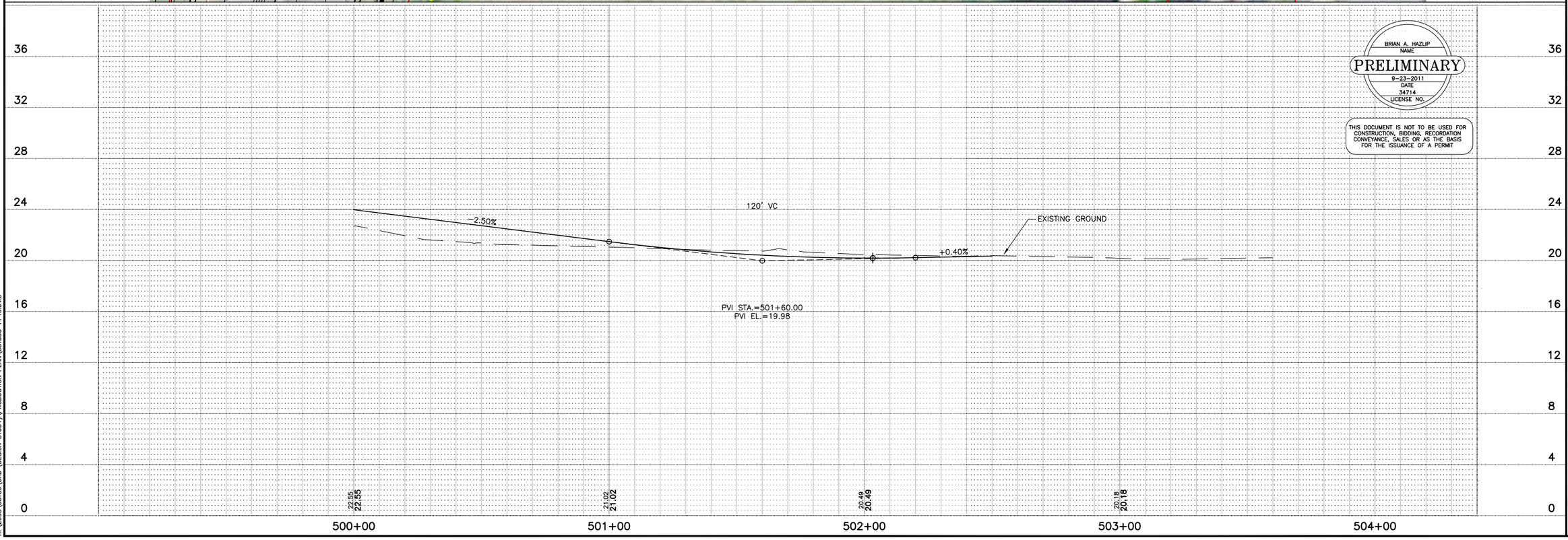
NICHOLSON DRIVE SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-PP15.DWG



SCALES:
1" = 20' HOR
1" = 4' VER



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SHEET NUMBER	EX-20
EAST BATON ROUGE	
PARISH	FEDERAL PROJECT: —
STATE PROJECT	414-01-0039
DESIGNED JRE / CHECKED BAH	
DETAILED JPO / CHECKED MJK	
DATE 9-23-2011 / SHEET EX-20	

NO.	DATE	REVISION DESCRIPTION	BY

PLAN AND PROFILE - 15

NICHOLSON DRIVE SEGMENT 1

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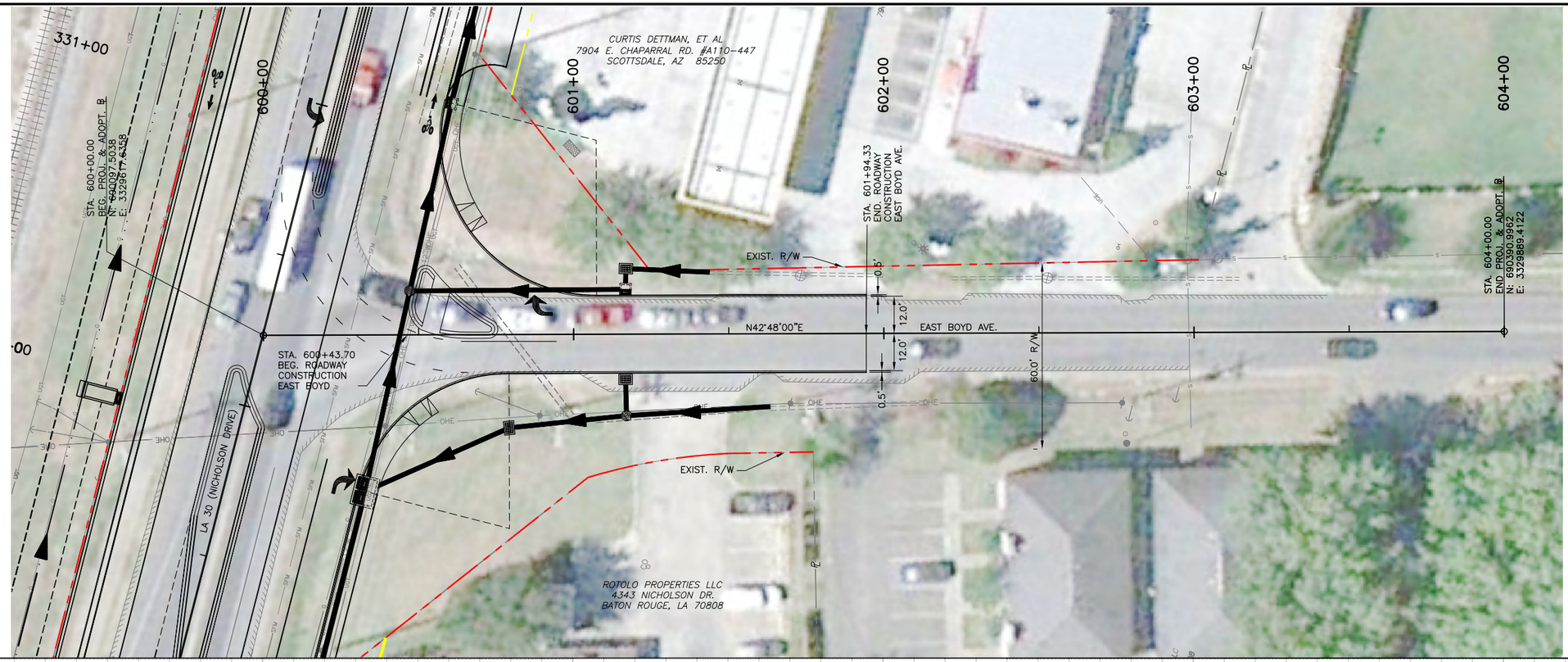
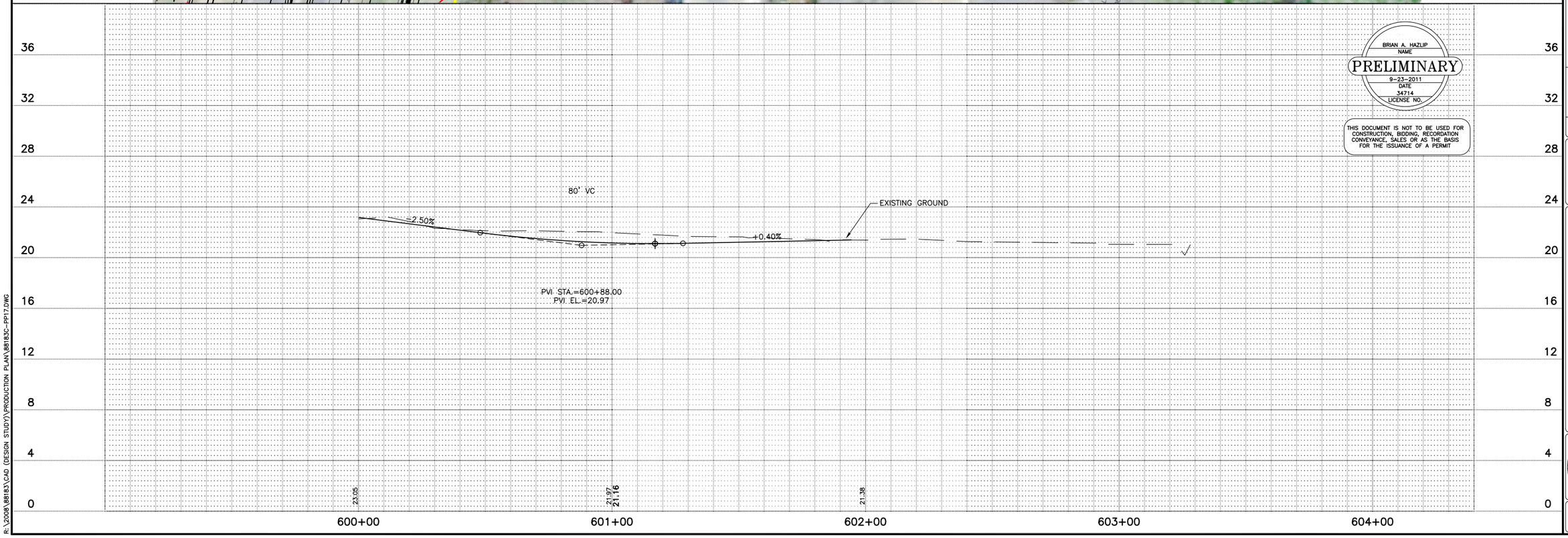


SCALES:
1" = 20' HOR
1" = 4' VER



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SHEET NUMBER	EX-21
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED / CHECKED	JRE / BAH
DETAILED / CHECKED	JPO / MJK
DATE / SHEET	6/30/2009 / EX-21

NO.	REVISION DESCRIPTION	DATE	BY

PLAN AND PROFILE - 16

NICHOLSON DRIVE SEGMENT 1

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Exhibit No. 22: USDA Web Soil Survey Data and Map, October 1, 2007

Exhibit No 23: HEC RAS Detailed Output for Cross Drain Structure A-1, (3) 3- 8'x 8' x 171' Existing RCB Culverts at Outfall Station 307+13

Plan: Nich South Existing Bayou Fountain RS: 5.5 Culv Group: 3- 8' x 8' Boxes Profile: 50yr			
Q Culv Group (cfs)	1014	Culv Full Len (ft)	171
# Barrels	3	Culv Vel US (ft/s)	5.28
Q Barrel (cfs)	338	Culv Vel DS (ft/s)	5.28
E.G. US. (ft)	21.10	Culv Inv El Up (ft)	10.11
W.S. US. (ft)	21.08	Culv Inv El Dn (ft)	8.85
E.G. DS (ft)	20.55	Culv Frctn Ls (ft)	0.12
W.S. DS (ft)	20.54	Culv Exit Loss (ft)	0.21
Delta EG (ft)	0.55	Culv Entr Loss (ft)	0.22
Delta WS (ft)	0.54	Q Weir (cfs)	
E.G. IC (ft)	16.9	Weir Sta Lft (ft)	
E.G. OC (ft)	21.1	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	18.11	Weir Max Depth (ft)	
Culv WS Outlet (ft)	16.85	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	3.81	Min El Weir Flow (ft)	24.01

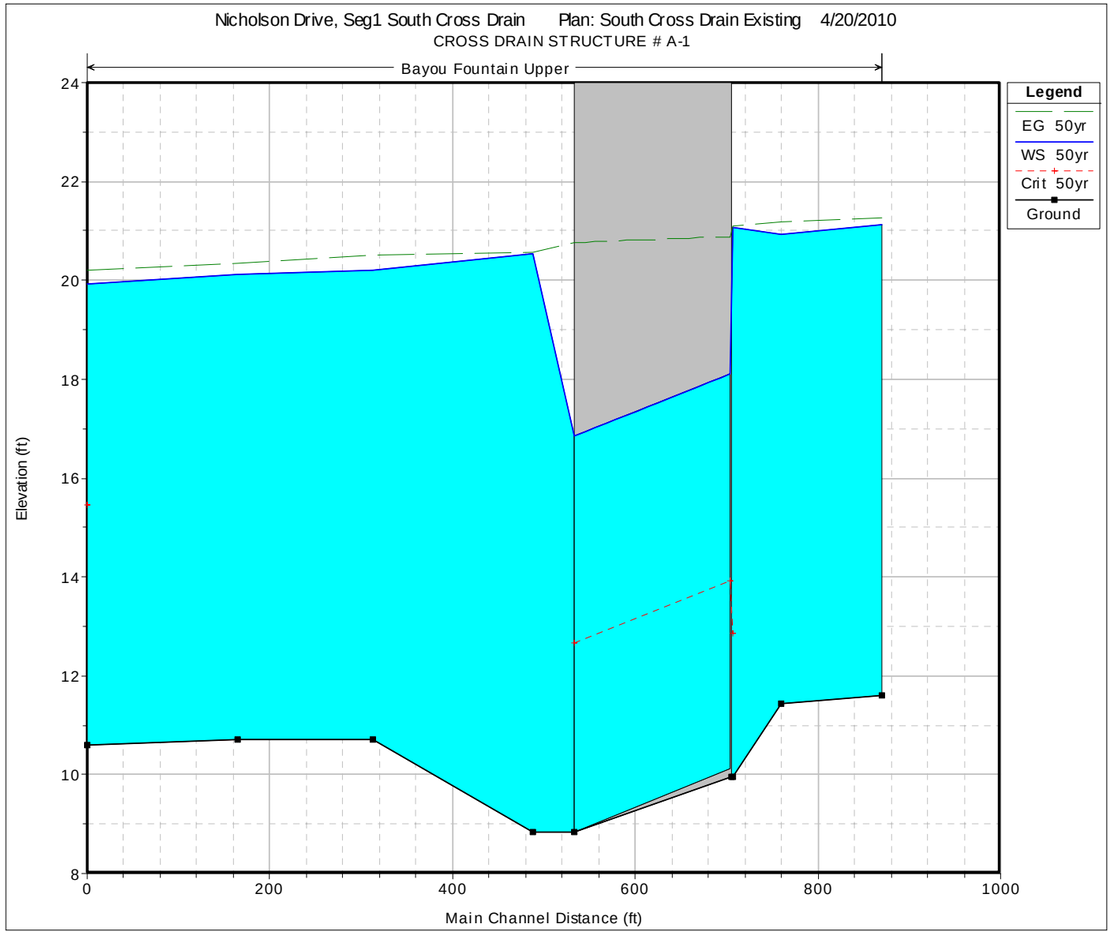


Exhibit No 24: HEC RAS Detailed Output for Cross Drain Structure B-1, (3)- 8'x 8' x 266' Proposed RCB Culverts at Outfall Station 307+13

Plan: Nich South Proposed Bayou Fountain RS: 4.5 Culv Group: (3) 8' x 8' Box Proposed Profile: 50yr			
Q Culv Group (cfs)	1014	Culv Full Len (ft)	266
# Barrels	3	Culv Vel US (ft/s)	5.28
Q Barrel (cfs)	338	Culv Vel DS (ft/s)	5.28
E.G. US. (ft)	21.16	Culv Inv El Up (ft)	10.06
W.S. US. (ft)	21.10	Culv Inv El Dn (ft)	8.33
E.G. DS (ft)	20.55	Culv Frctn Ls (ft)	0.19
W.S. DS (ft)	20.51	Culv Exit Loss (ft)	0.20
Delta EG (ft)	0.61	Culv Entr Loss (ft)	0.22
Delta WS (ft)	0.59	Q Weir (cfs)	
E.G. IC (ft)	16.85	Weir Sta Lft (ft)	
E.G. OC (ft)	21.16	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	18.06	Weir Max Depth (ft)	
Culv WS Outlet (ft)	16.33	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	3.81	Min El Weir Flow (ft)	24.01

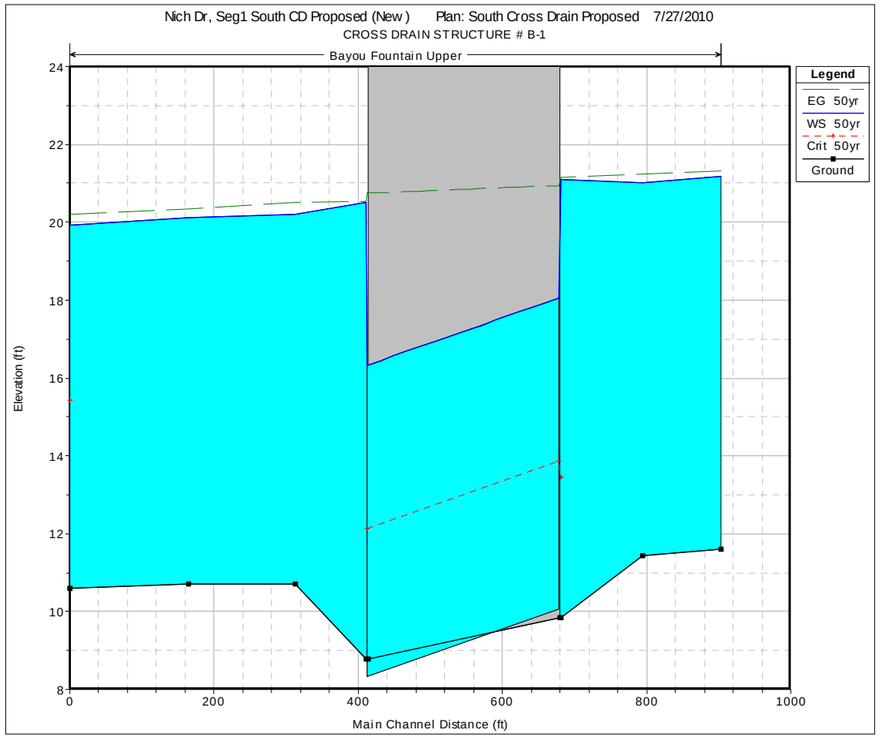


Exhibit No 25: HEC RAS Detailed Output for Cross Drain Structure A-2 & A-3, 1- 84”x 90’ & 1 8’ x 8’ x 90’ RCB Existing Steel Culverts at Outfall Station 337+56

Plan: Nich North Existing Bayou Fountain RS: 2.5 Culv Group: 1- 84" Steel Pipe Profile: 50 yr			
Q Culv Group (cfs)	268.36	Culv Full Len (ft)	90
# Barrels	1	Culv Vel US (ft/s)	4.2
Q Barrel (cfs)	268.36	Culv Vel DS (ft/s)	4.2
E.G. US. (ft)	19.01	Culv Inv El Up (ft)	9.39
W.S. US. (ft)	19.00	Culv Inv El Dn (ft)	9.62
E.G. DS (ft)	18.61	Culv Frctn Ls (ft)	0.04
W.S. DS (ft)	18.56	Culv Exit Loss (ft)	0.23
Delta EG (ft)	0.40	Culv Entr Loss (ft)	0.14
Delta WS (ft)	0.44	Q Weir (cfs)	
E.G. IC (ft)	14.57	Weir Sta Lft (ft)	
E.G. OC (ft)	19.01	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	17.39	Weir Max Depth (ft)	
Culv WS Outlet (ft)	17.62	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	3.3	Min El Weir Flow (ft)	23.01

Plan: Nich North Existing Bayou Fountain RS: 2.5 Culv Group: 1- 8' x 8' Box Profile: 50 yr			
Q Culv Group (cfs)	158.64	Culv Full Len (ft)	90
# Barrels	1	Culv Vel US (ft/s)	4.12
Q Barrel (cfs)	158.64	Culv Vel DS (ft/s)	4.12
E.G. US. (ft)	19.01	Culv Inv El Up (ft)	8.96
W.S. US. (ft)	19.00	Culv Inv El Dn (ft)	10.17
E.G. DS (ft)	18.61	Culv Frctn Ls (ft)	0.05
W.S. DS (ft)	18.56	Culv Exit Loss (ft)	0.22
Delta EG (ft)	0.40	Culv Entr Loss (ft)	0.13
Delta WS (ft)	0.44	Q Weir (cfs)	
E.G. IC (ft)	13.67	Weir Sta Lft (ft)	
E.G. OC (ft)	19.01	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	15.96	Weir Max Depth (ft)	
Culv WS Outlet (ft)	17.17	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	3.27	Min El Weir Flow (ft)	23.01

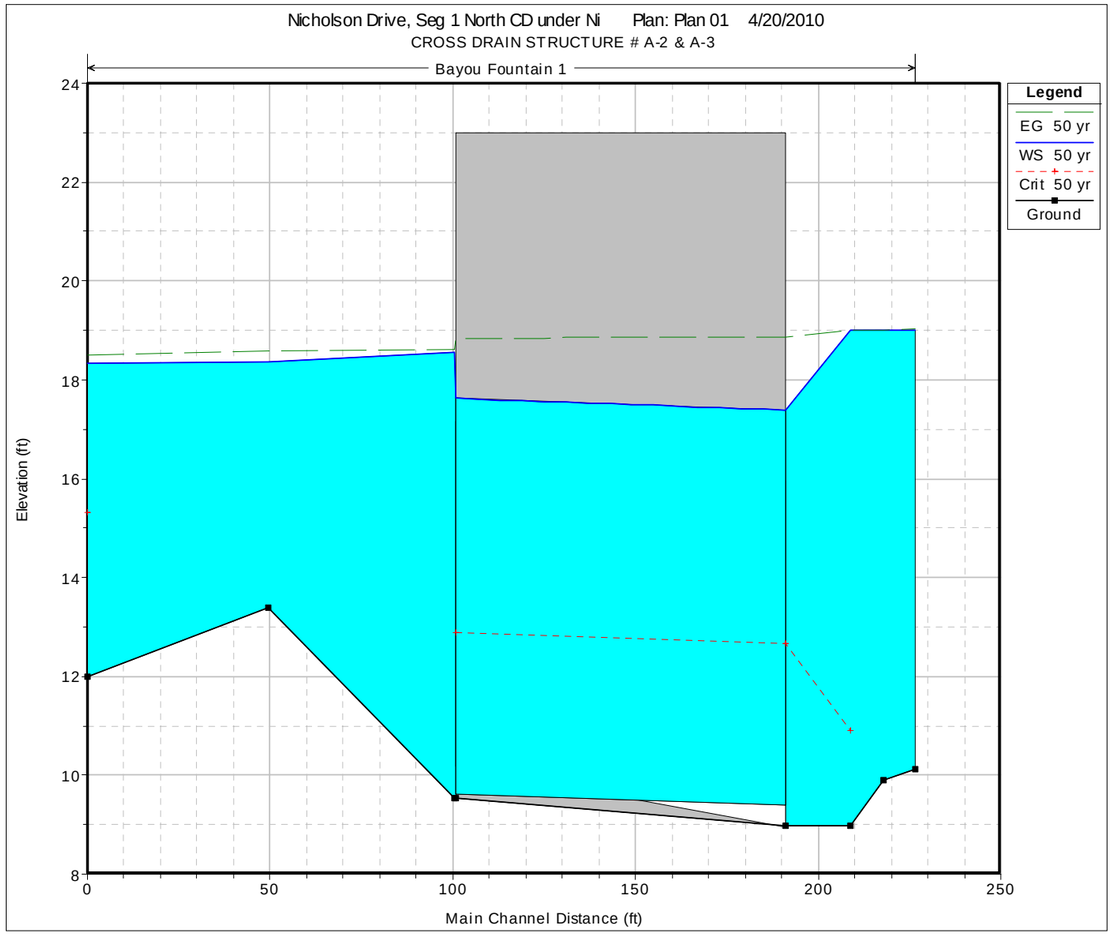


Exhibit No 26: HEC RAS Detailed Output for Cross Drain Structure B-2, (2) 10' x 8' x 1605' RCB Culverts at Outfall Station 337+56

Plan: Nich North Proposed Bayou Fountain RS: 3.5 Culv Group: 8' x 10' Box Proposed Profile: 50 yr			
Q Culv Group (cfs)	427	Culv Full Len (ft)	1605
# Barrels	2	Culv Vel US (ft/s)	2.67
Q Barrel (cfs)	213.5	Culv Vel DS (ft/s)	2.67
E.G. US. (ft)	18.99	Culv Inv El Up (ft)	10.36
W.S. US. (ft)	18.92	Culv Inv El Dn (ft)	10.12
E.G. DS (ft)	18.61	Culv Frctn Ls (ft)	0.26
W.S. DS (ft)	18.56	Culv Exit Loss (ft)	0.07
Delta EG (ft)	0.38	Culv Entr Loss (ft)	0.06
Delta WS (ft)	0.36	Q Weir (cfs)	
E.G. IC (ft)	14.19	Weir Sta Lft (ft)	
E.G. OC (ft)	18.99	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	18.36	Weir Max Depth (ft)	
Culv WS Outlet (ft)	18.12	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	2.42	Min El Weir Flow (ft)	23.01

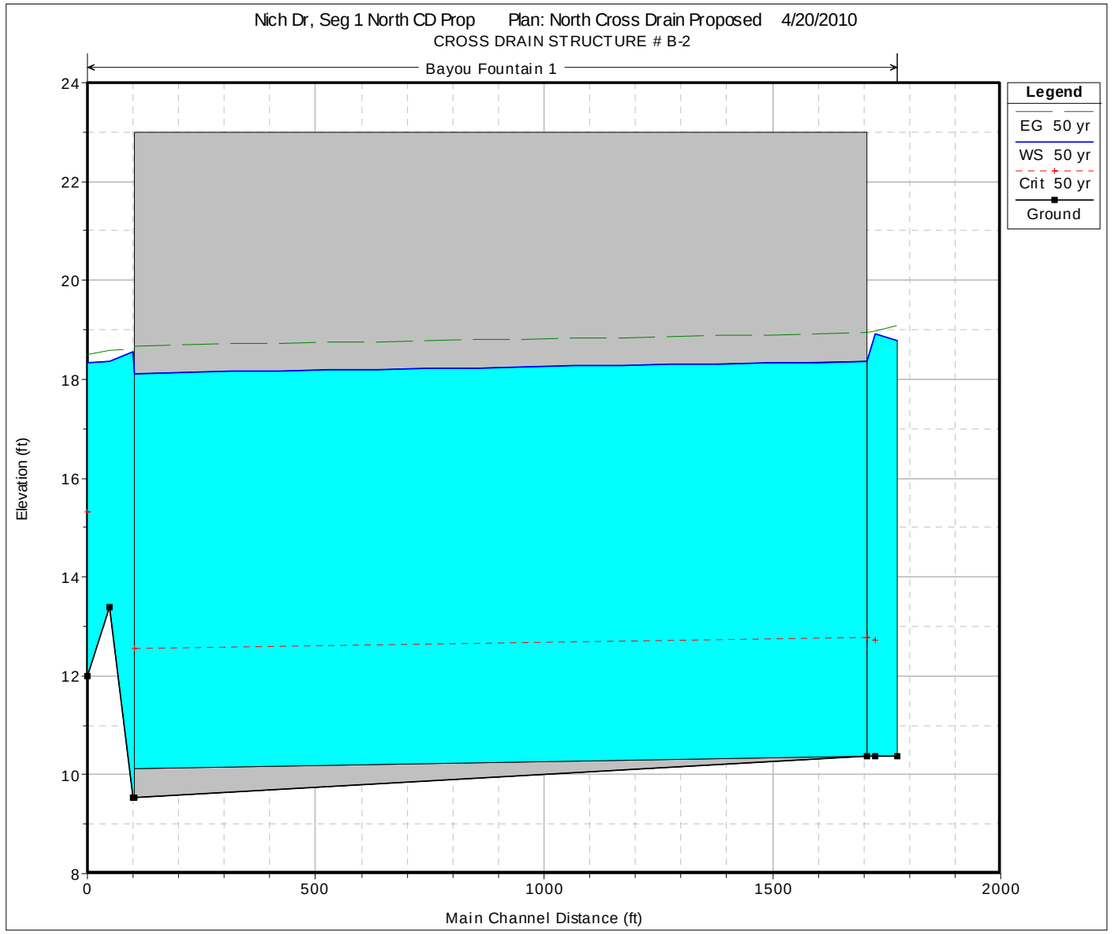
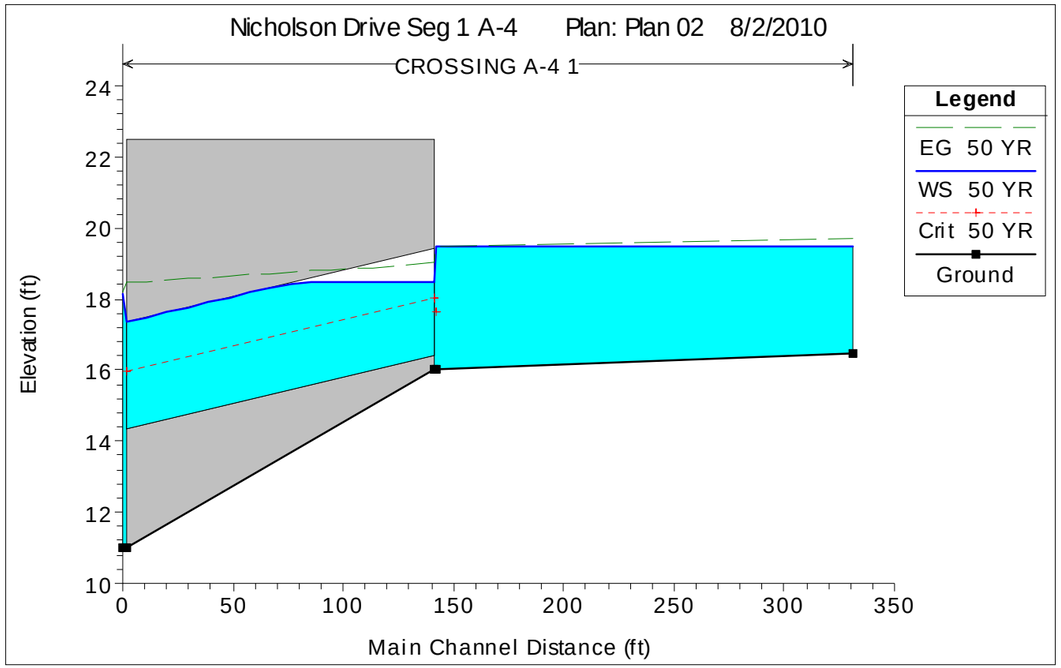


Exhibit No 27: HEC RAS Detailed Output for Cross Drain Structure A-4, (2) 36" x 140' CMPA Culverts at Outfall Station 346+10

Plan: A-4 Bayou Fountain RS: 1200 Culv Group: Culvert #1 Profile: 50 YR			
Q Culv Group (cfs)	104	Culv Full Len (ft)	74
# Barrels	2	Culv Vel US (ft/s)	5.91
Q Barrel (cfs)	52	Culv Vel DS (ft/s)	4.56
E.G. US. (ft)	19.50	Culv Inv El Up (ft)	16.42
W.S. US. (ft)	19.47	Culv Inv El Dn (ft)	14.35
E.G. DS (ft)	18.20	Culv Frctn Ls (ft)	0.54
W.S. DS (ft)	18.14	Culv Exit Loss (ft)	0.27
Delta EG (ft)	1.30	Culv Entr Loss (ft)	0.49
Delta WS (ft)	1.32	Q Weir (cfs)	
E.G. IC (ft)	19.28	Weir Sta Lft (ft)	
E.G. OC (ft)	19.50	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	18.47	Weir Max Depth (ft)	
Culv WS Outlet (ft)	17.35	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.37	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	1.61	Min El Weir Flow (ft)	22.51



Scale : 1"=200'

JIM TAYLOR DR
TIGERLAND AVE
Y A TITTLE AVE
EARL GROS AVE
JAY HEBERT DR
ALVIN DARK AVE
BOB PETIT BLVD
BAYOU FOUNTAIN SOUTH BRANCH

302+09 305+00 310+00 315+00 320+00 325+00 330+00 335+00 340+00 345+00 350+00 355+00

BOX CULVERT Inv.9.96'
R.R. BRIDGE
(A-1) 3-8'X8' BOX CULVERTS
PIPE CULVERT Inv.19.62'
PIPE CULVERT Inv.19.26'
27"RCP
BOX CULVERT Inv.8.85'
BAYOU FOUNTAIN
NICHOLSON DRIVE (LA30)
PIPE CULVERT Inv.18.02'
60' SLAB SPAN BRIDGE
PIPE CULVERT Inv.17.97'
30"RCP
PIPE CULVERT Inv.18.31'
18"RCP
PIPE CULVERT Inv.18.43'
PIPE CULVERT Inv.17.81'
PIPE CULVERT Inv.17.74'
PIPE CULVERT Inv.18.19'
24"CMP
PIPE CULVERT Inv.18.61'
PIPE CULVERT Inv.18.52'
18"RCP
PIPE CULVERT Inv.18.32'
PIPE CULVERT Inv.18.62'
15"CMP
PIPE CULVERT Inv.18.53'
ASHLEY DR
JENNIFER JEAN
BOX CULVERT Inv.11.24'
BOX CULVERT Inv.11.16'
2-6'X6' BOX CULVERTS
PIPE CULVERT Inv.10.17'
BOX CULVERT Inv.9.54'
R.R. BRIDGE
18"RCP
(A-2) 84" STEEL CULVERT
(A-3) 8'X8' BOX CULVERT
30"RCP
30"RCP
42"RCPA
48"RCPA
48"RCPA
12"PVC
PIPE CULVERT Inv.18.37'
12"RCPA
PIPE CULVERT Inv.18.36'
12"RCPA
12"RCPA
PIPE CULVERT Inv.13.43'
PIPE CULVERT Inv.8.96'
BOX CULVERT Inv.9.39'
BOX CULVERT Inv.10.35'
E BOYD DR
24" CMP
PIPE CULVERT Inv.16.58'
PIPE CULVERT Inv.16.68'
36" CMPA
PIPE CULVERT Inv.16.92'
PIPE CULVERT Inv.16.79'
R.R. BRIDGE
PIPE CULVERT Inv.16.42'
2-10'X8' BOX CULVERTS
2-8'X8' BOX CULVERTS
24" CMP
60" CMPA
24" CMP
24" BCCMP
24" CPP
2-8'X7' BOX CULVERTS
BOX CULVERT Inv.10.86'±
BAYOU FOUNTAIN
MILFORD AVE
COURRIER AVE
BURBANK DR
W. PARKER BLVD
JANET AVE
NICHOLSON DR EXT

HYDROLOGIC SUMMARY

STRUCTURE NO.	STATION	STRUCTURE SIZE & TYPE	F.L. LT.	F.L. RT.	D.A. (ACRES)	SCS METHOD				DESIGN DISCHARGE (CFS)	OUTLET VELOCITY (FPS)
						SOIL CLASS	CURVE NUMBER	AVERAGE WATERSHED SLOPE (%)	HYDRAULIC LENGTH (FT)		
A-1	303+03.7	3-8'X8'X171' R.C. BOX CULV. 30° LT. CROSSING	10.11	8.85	1235	D	84	0.1	12469	1014	5.28
A-2	337+59.4	1-84"X80' STEEL CULV. 45° RT. CROSSING	8.96	10.17	288	D	90	0.1	8345	161.51	4.20
A-3	337+76.8	1-8'X8'X90' R.C. BOX CULV. 45° RT. CROSSING	9.39	9.62						265.49	4.15

1. SOIL CONSERVATION SERVICE (SCS) METHOD IS USED FOR WATERSHEDS HAVING DRAINAGE AREAS OF 2000 ACRES AND LESS.
2. DESIGN STORM FOR CROSS DRAINS AND BRIDGES = 50 YEARS

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SHEET NUMBER EX-28

PARISH: EAST BATON ROUGE
FEDERAL PROJECT:
STATE PROJECT: 414-01-0039

DESIGNED JRE
CHECKED AFT
DETAILED JPO
CHECKED MJK
DATE 4-11-2011
SHEET EX-28

REVISION DESCRIPTION | DATE | BY | NO.

EXISTING DRAINAGE MAP

NICHOLSON DRIVE (LA 30) SEGMENT 1

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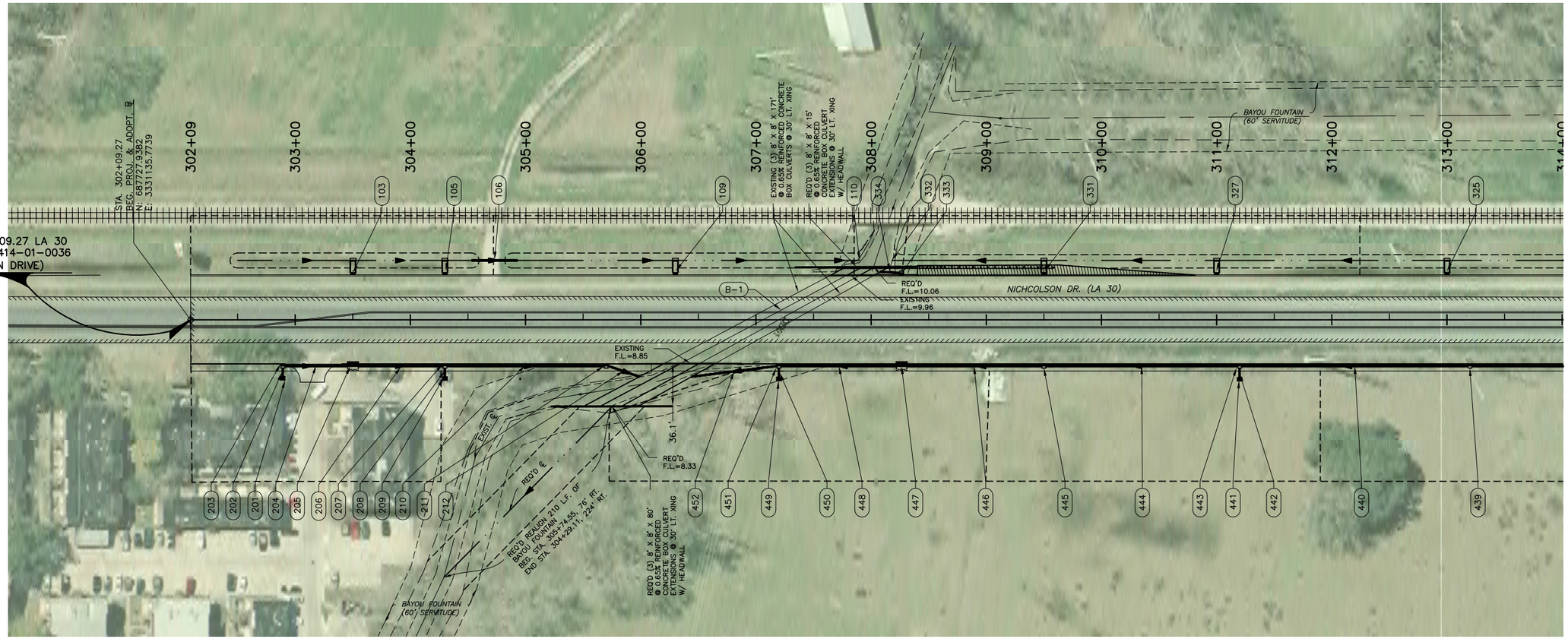
100 SYSTEM						
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
103	303+50.17	PG-03			0.20	0.95
105	304+30.00	PG-03			0.08	0.95
106	304+75		15	1.80		
109	306+30.00	PG-03			0.10	0.95
110	307+80.00	OUTFALL	DITCH	2.78		

Scale : 1"=50'

300 SYSTEM						
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
325	313+00.08	PG-03			0.10	0.95
327	311+00.14	PG-03			0.08	0.95
331	309+50.05	PG-03			0.13	0.95
332	308+85.54	OUTFALL	DITCH	8.31		
333	308+26.63	CB-06			0.28	0.95
334	308+26.63		18	0.92		

STORM SEWER DESIGN CRITERIA
1. 10 YR. STORM
2. Q= CIA
3. C= 0.35 – 0.95
4. N= 0.013 (RC PIPE)



200 SYSTEM						
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
201	302+89	CB-01			0.26	0.55
202	302+89		15	1.03		
203	302+89	CB-06			0.07	0.95
204	303+18		15	1.50		
205	303+50	CB-08			0.15	0.95
206	303+92		15	2.47		
207	304+30	CB-06			0.10	0.95
208	304+30		15	0.90		
209	304+30	CB-01			0.22	0.55
210	305+00		15	3.88		
211	305+70	CB-06			0.06	0.95
212	308+17		15	4.16		

HYDROLOGIC SUMMARY										
STRUCTURE NO.	STATION	STRUCTURE SIZE & TYPE	F.L. LT.	F.L. RT.	D.A. (ACRES)	SCS METHOD				DESIGN DISCHARGE (CFS)	OUTLET VELOCITY (FPS)
						SOIL CLASS	CURVE NUMBER	AVERAGE WATERSHED SLOPE (%)	HYDRAULIC LENGTH (FT)		
B-1	307+13	3-8'X8'X266' R.C. BOX CULV. 30° LT. CROSSING	10.06	8.33	1235	D	84	0.1	12469	1014	5.28

1. SOIL CONSERVATION SERVICE (SCS) METHOD IS USED FOR WATERSHEDS HAVING DRAINAGE AREAS OF 2000 ACRES AND LESS.
2. DESIGN STORM FOR CROSS DRAINS AND BRIDGES = 50 YEARS

400 SYSTEM						
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
439	313+20	CB-06			0.14	0.95
440	312+20		30	12.63		
441	311+20	CB-01			0.63	0.35
442	311+20		15	1.29		
443	311+20	CB-06			0.08	0.95
444	310+35		30	13.64		
445	309+50	CB-06			0.17	0.95
446	308+89		30	14.14		
447	308+27	CB-08			0.23	0.95
448	307+72		30	14.90		
449	307+20	CB-01			0.69	0.35
450	307+20		15	1.38		
451	307+20	CB-06			0.15	0.95
452	306+81		36	16.39		

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CHECKED MJK
DATE 08-19-2010
SHEET EX-29

PARISH EAST BATON ROUGE
FEDERAL PROJECT
STATE PROJECT 414-01-0039

SHEET NUMBER EX-29

DESIGN DRAINAGE MAP-1

NICHOLSON DRIVE (LA 30) SEGMENT 1

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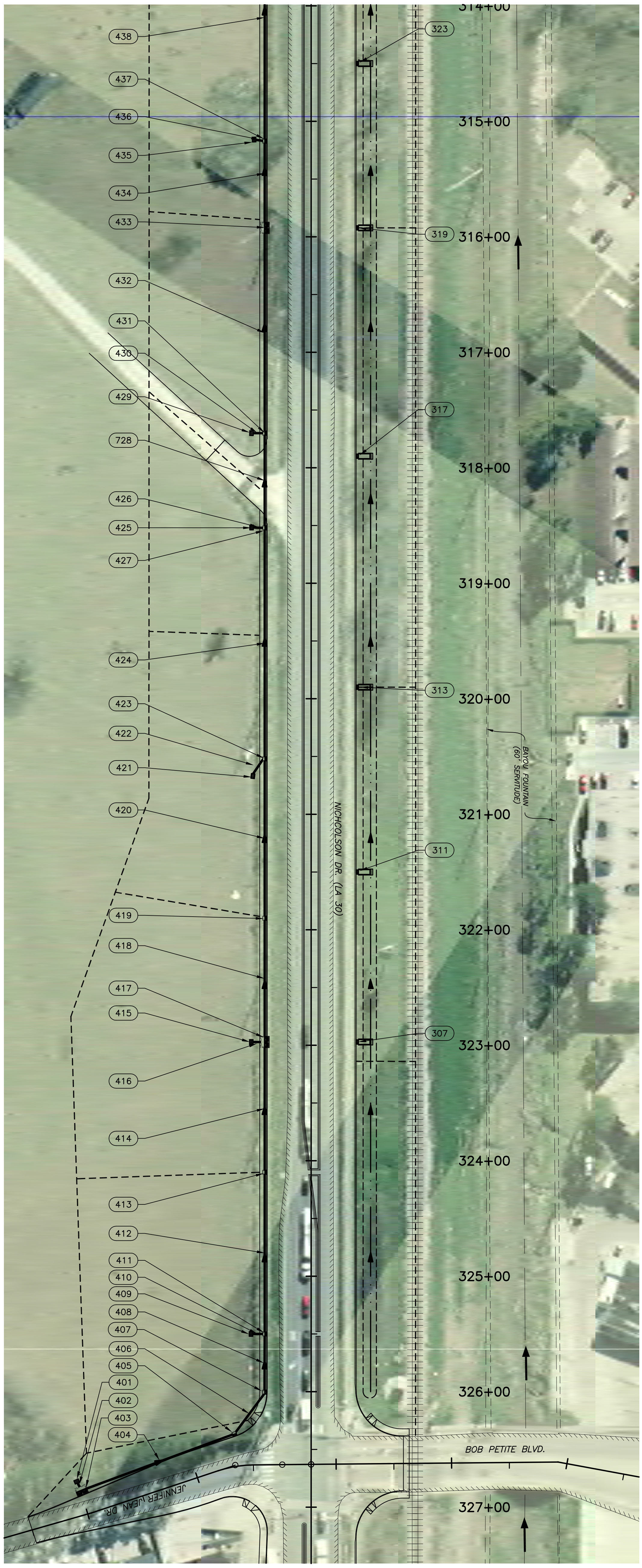
Scale : 1"=50'



400 SYSTEM

STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
401	502+01	CB-01			0.09	0.35
402	502+01		15	0.19		
403	502+00	CB-08			0.09	0.95
404	501+31		15	0.70		
405	500+63	CB-06			0.07	0.95
406	326+19		15	1.02		
407	326+00	CB-06			0.10	0.95
408	325+76		15	1.45		
409	325+50	CB-01			0.30	0.35
410	325+50		15	0.60		
411	325+50	CB-06			0.13	0.95
412	324+80		18	2.58		
413	324+10	CB-06			0.16	0.95
414	323+55		18	3.25		
415	322+97	CB-01			0.84	0.35
416	322+97		15	1.69		
417	322+97	CB-08			0.22	0.95
418	322+42		24	5.66		
419	321+90	CB-06			0.14	0.95
420	321+21		24	6.22		
421	320+67	CB-01			0.55	0.35
422	320+59		15	1.14		
423	320+52	CB-06			0.16	0.95
424	319+52		24	7.72		
425	318+52	CB-01			0.37	0.35
426	318+52		15	0.78		
427	318+52	CB-06			0.05	0.95
428	318+11		24	8.37		
429	317+70	CB-01			0.43	0.35
430	317+70		15	0.85		
431	317+70	CB-06			0.08	0.95
432	316+83		30	9.36		
433	315+92	CB-08			0.27	0.95
434	315+52		30	10.28		
435	315+16	CB-01			0.86	0.35
436	315+16		15	1.59		
437	315+17	CB-06			0.18	0.95
438	314+20		30	12.31		

300 SYSTEM

STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
307	322+97	PG-03			0.26	0.95
311	321+50	PG-03			0.14	0.95
313	319+90	PG-03			0.08	0.95
317	317+90	PG-03			0.10	0.95
319	315+92	PG-03			0.30	0.95
323	314+50	PG-03			0.13	0.95

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FORTE & TABLADA

DESIGN DRAINAGE MAP-2

NICHOLSON DRIVE (LA 30) SEGMENT 1

NO.	DATE	REVISION DESCRIPTION	BY

DESIGNED	JRE
CHECKED	BAH
DETAILED	JPO
CHECKED	MJK
DATE	08-19-2010
SHEET	EX-30
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
SHEET NUMBER	EX-30

500 SYSTEM					
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
507	329+92	PG-03			0.26	0.95
509	332+00	PG-03			0.09	0.95
511	334+00	PG-03			0.17	0.95
515	335+64	PG-03			0.22	0.95
517	336+50	PG-03			0.18	0.95
518	336+70	OUTFALL	DITCH	6.10		

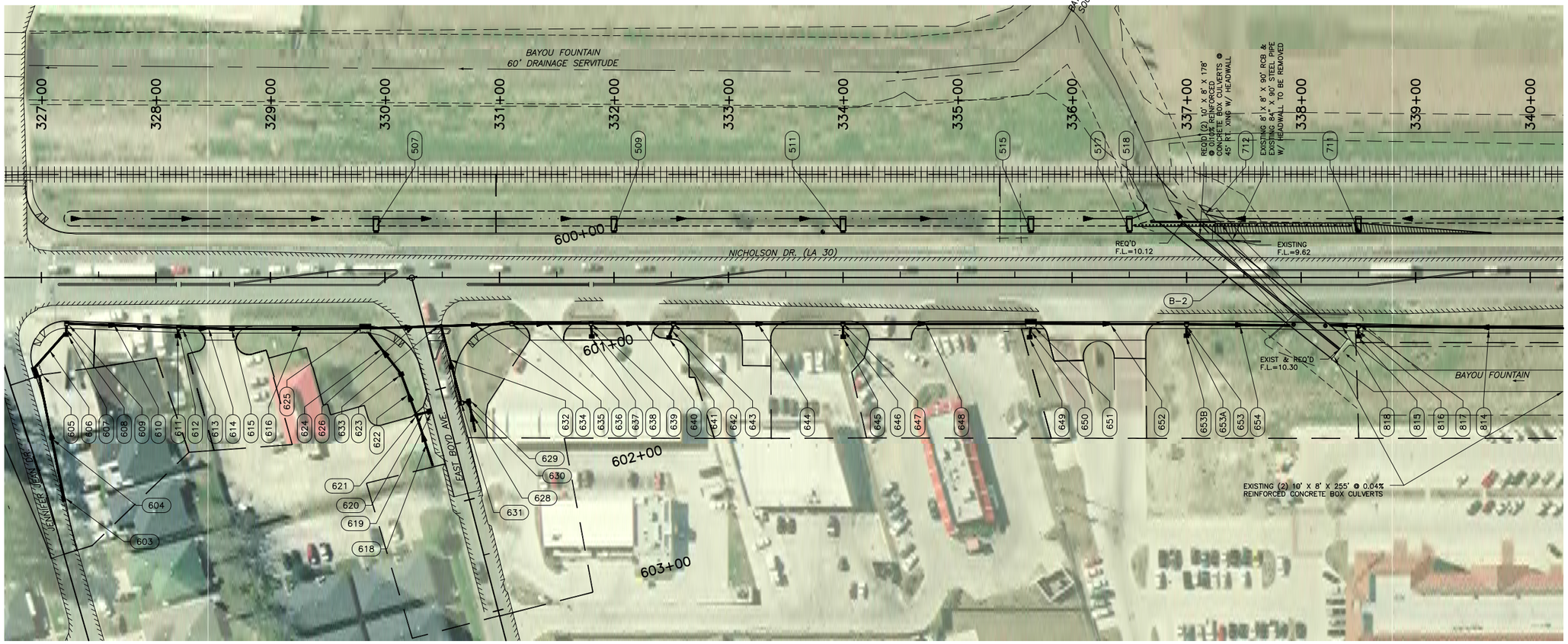
Scale : 1"=50'

HYDROLOGIC SUMMARY

STRUCTURE NO.	STATION	STRUCTURE SIZE & TYPE	F.L. LT.	F.L. RT.	D.A. (ACRES)	SCS METHOD				DESIGN DISCHARGE (CFS)	OUTLET VELOCITY (FPS)
						SOIL CLASS	CURVE NUMBER	AVERAGE WATERSHED SLOPE (%)	HYDRAULIC LENGTH (FT)		
B-2	337+56	2-10'X8'X178' R.C. BOX CULV. 45° RT. CROSSING	10.12	10.30	288	D	90	0.1	8345	427.00	2.67

1. SOIL CONSERVATION SERVICE (SCS) METHOD IS USED FOR WATERSHEDS HAVING DRAINAGE AREAS OF 2000 ACRES AND LESS.
2. DESIGN STORM FOR CROSS DRAINS AND BRIDGES = 50 YEARS

700 SYSTEM					
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
711	338+50	PG-03			0.09	0.95
712	337+10	OUTFALL	DITCH	3.65		



600 SYSTEM						
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
603	502+03	CB-09			0.38	0.65
604	501+49		15	1.87		
605	500+91	CB-08			0.08	0.95
606	327+07		15	2.37		
607	327+22	CB-01			0.04	0.35
608	327+22		18	2.45		
609	327+22	CB-06			0.11	0.35
610	327+71		18	2.49		
611	328+19	CB-01			0.10	0.35
612	328+19		15	0.21		
613	328+20	CB-06			0.19	0.95
614	328+43		18	3.47		
615	328+66	CB-01			0.23	0.65
616	329+25		24	4.32		
618	601+40		15	0.52		
619	601+17	CB-01			0.04	0.95
620	601+17		15	0.31		
621	601+17	MH-06			0.00	0.00
622	600+98		15	0.71		
623	600+79	CB-01			0.17	0.35
624	600+56		15	1.03		
625	329+83	CB-08			0.19	0.95
626	330+16		24	6.02		
628	601+30		15	0.62		
629	601+17	CB-01			0.08	0.35
630	601+17		15	0.78		
631	601+17	CB-06			0.05	0.95
632	600+82		15	1.06		
633	330+49	MH-06			0.00	0.00
653A	330+49		15	0.32		
653B	330+49	CB-01			0.04	0.95
634	330+80		24	7.68		
635	331+11	CB-06			0.07	0.95
636	331+44		24	7.98		
637	331+80	CB-01			0.25	0.35
638	331+80		15	0.55		
639	331+80	CB-06			0.07	0.95
640	332+16		30	8.72		
641	332+48	CB-01			0.10	0.35
642	332+50		18	0.23		
643	332+52	CB-06			0.05	0.95
644	333+26		30	9.05		
645	334+00	CB-01			0.17	0.35
646	334+00		15	0.39		
647	334+00	CB-06			0.13	0.95
648	334+81		30	9.76		
649	335+63	CB-01			0.16	0.35
650	335+63		15	0.34		
651	335+63	CB-06			0.35	0.95
652	336+33		30	11.47		
653	337+00	CB-06			0.16	0.95
654	337+46		30	12.03		

800 SYSTEM						
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
814	339+50		18	4.00		
815	338+50	CB-01			0.06	0.35
816	338+50		15	0.12		
817	338+50	CB-06			0.09	0.95
818	338+37		24	4.44		

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R:\2008\V881837\CAD (DESIGN STUDY)\PRODUCTION PLAN\881837C-DD03.DWG

SHEET NUMBER EX-31

PARISH: EAST BATON ROUGE
FEDERAL PROJECT: -
STATE PROJECT: 414-01-0039

DESIGNED JRE
CHECKED BAH
DETAILED JPO
CHECKED MJK
DATE 08-19-2010
SHEET EX-31

NO.	DATE	REVISION DESCRIPTION	BY

DESIGN DRAINAGE MAP-3

NICHOLSON DRIVE (LA 30) SEGMENT 1

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700 SYSTEM					
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
702	346+03	OUTFALL	DITCH	0.79		
703	344+20	PG-03			0.07	0.95
705	342+26	PG-03			0.33	0.95
709	340+50	PG-03			0.09	0.95

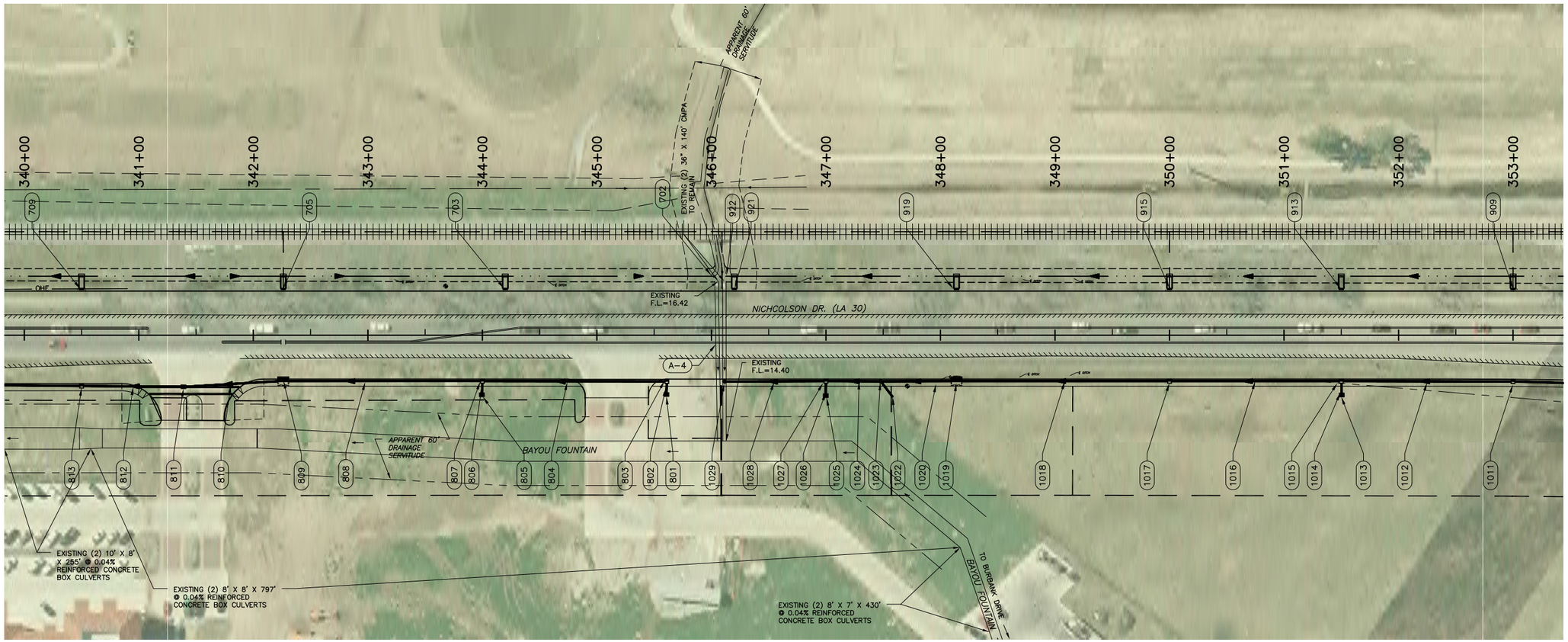
Scale : 1"=50'

HYDROLOGIC SUMMARY

STRUCTURE NO.	STATION	STRUCTURE SIZE & TYPE	F.L. LT.	F.L. RT.	D.A. (ACRES)	SCS METHOD				DESIGN DISCHARGE (CFS)	OUTLET VELOCITY (FPS)
						SOIL CLASS	CURVE NUMBER	AVERAGE WATERSHED SLOPE (%)	HYDRAULIC LENGTH (FT)		
A-4	346+10	2-36"X140' CMPA	16.42	14.40	29	D	90	0.1	2000	104.00	4.56

1. SOIL CONSERVATION SERVICE (SCS) METHOD IS USED FOR WATERSHEDS HAVING DRAINAGE AREAS OF 2000 ACRES AND LESS.
2. DESIGN STORM FOR CROSS DRAINS AND BRIDGES = 50 YEARS

900 SYSTEM					
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
909	353+00	PG-03			0.06	0.95
913	351+50	PG-03			0.09	0.95
915	350+00	PG-03			0.13	0.95
919	348+14	PG-03			0.33	0.95
921	346+20	PG-03			0.12	0.95
922	346+14	OUFALL	DITCH	6.16		



800 SYSTEM					
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
801	345+61	CB-01			0.07	0.35
802	345+61		15	0.17		
803	345+61	CB-06			0.09	0.95
804	344+82		15	0.72		
805	344+00	CB-01			0.09	0.35
806	344+00		15	0.84		
807	344+00	CB-06			0.10	0.95
808	343+14		15	1.39		
809	342+26	CB-08			0.29	0.95
810	341+81		18	2.86		
811	341+39	CB-01			0.10	0.95
812	340+94		18	3.33		
813	340+50	CB-06			0.14	0.95

1000 SYSTEM					
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
1011	353+00	CB-06			0.06	0.95
1012	352+26		24	6.58		
1013	351+50	CB-01			0.84	0.35
1014	351+50		15	1.62		
1015	351+50	CB-06			0.11	0.95
1016	350+75		24	8.58		
1017	350+00	CB-06			0.15	0.95
1018	349+08		30	9.18		
1019	348+14	CB-08			0.30	0.95
1020	347+79		30	10.38		
1022	347+53		24	0.77		
1023	347+48	MH-06			0	0
1024	347+25		30	10.91		
1025	347+00	CB-01			0.32	0.35
1026	347+00		30	11.41		
1027	347+00	CB-06			0.14	0.95
1028	346+55		30	12.06		
1029	346+12	MH-06			0	0

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SHEET NUMBER EX-32

PARISH	FEDERAL PROJECT	STATE PROJECT
EAST BATON ROUGE	-	414-01-0039

DESIGNED	JRE	
CHECKED	BAH	
DETAILED	JPO	
CHECKED	MJK	
DATE	08-19-2010	
SHEET	EX-32	

NO.	DATE	REVISION DESCRIPTION	BY

DESIGN DRAINAGE MAP-4

NICHOLSON DRIVE (LA 30) SEGMENT 1

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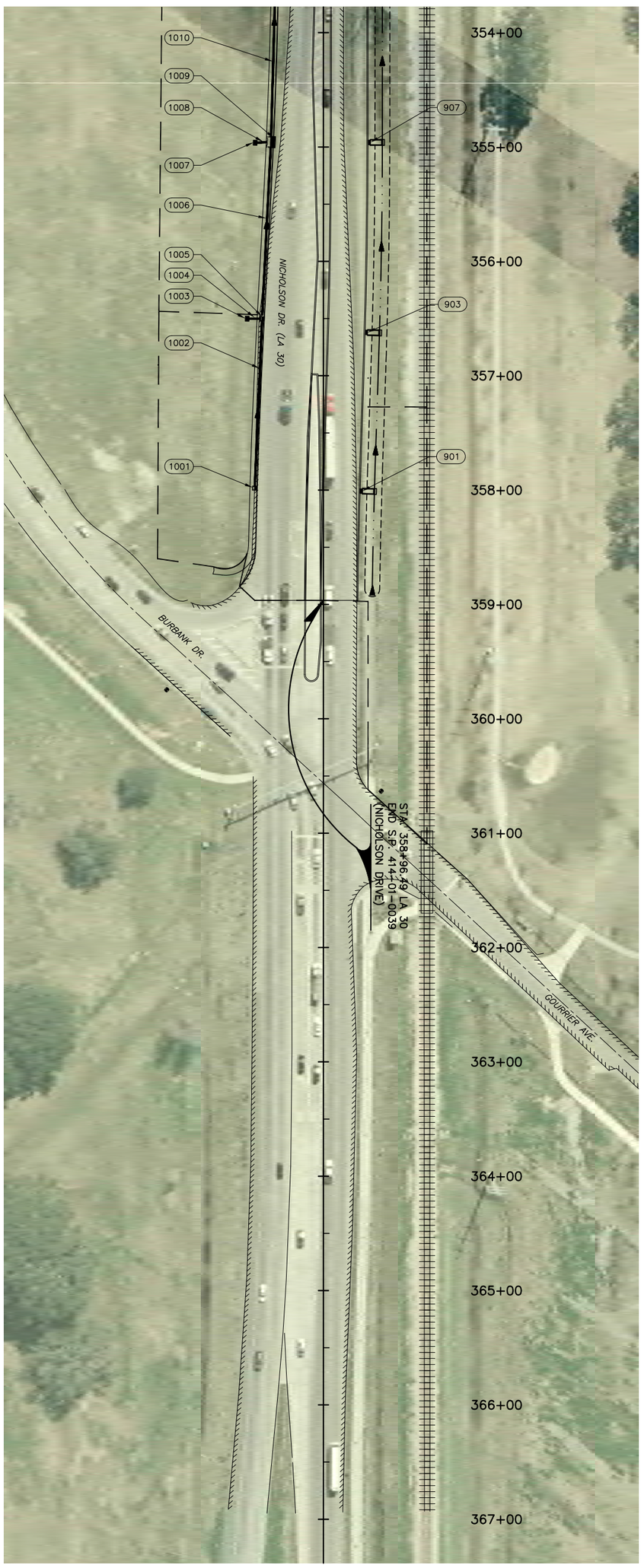
R:\2008\B8183\CAD (DESIGN STUDY)\PRODUCTION PLAN\B8183C-D004.DWG

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-DD05.DWG

900 SYSTEM						
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
1001	357+98	CB-06			0.15	0.95
1002	357+25		15	1.15		
1003	356+50	CB-01			0.41	0.35
1004	356+50		15	0.85		
1005	356+50	CB-06			0.21	0.95
1006	355+71		18	2.87		
1007	354+96	CB-01			0.71	0.35
1008	354+96		15	1.42		
1009	354+96	CB-08			0.42	0.95
1010	353+98		24	6.46		



900 SYSTEM						
STR #	STATION	INLET TYPE	SIZE (IN)	Q (CFS)	A (AC)	C
901	358+01	PG-03			0.42	0.35
903	356+62	PG-03			0.12	0.95
907	354+96	PG-03			0.34	0.95

Scale : 1"=50'

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08-19-2010
DATE
LICENSE NO.

DESIGN DRAINAGE MAP-5

NICHOLSON DRIVE (LA 30) SEGMENT 1

NO.	DATE	REVISION DESCRIPTION	BY

DESIGNED	JRE	PARISH	EAST BATON ROUGE
CHECKED	BAH		
DETAILED	JPO	FEDERAL PROJECT	–
CHECKED	MJK		
DATE	08-19-2010	STATE PROJECT	414-01-0039
SHEET	EX-33		

SHEET NUMBER EX-33

Exhibit 34
Existing and Planned Pedestrian Facilities

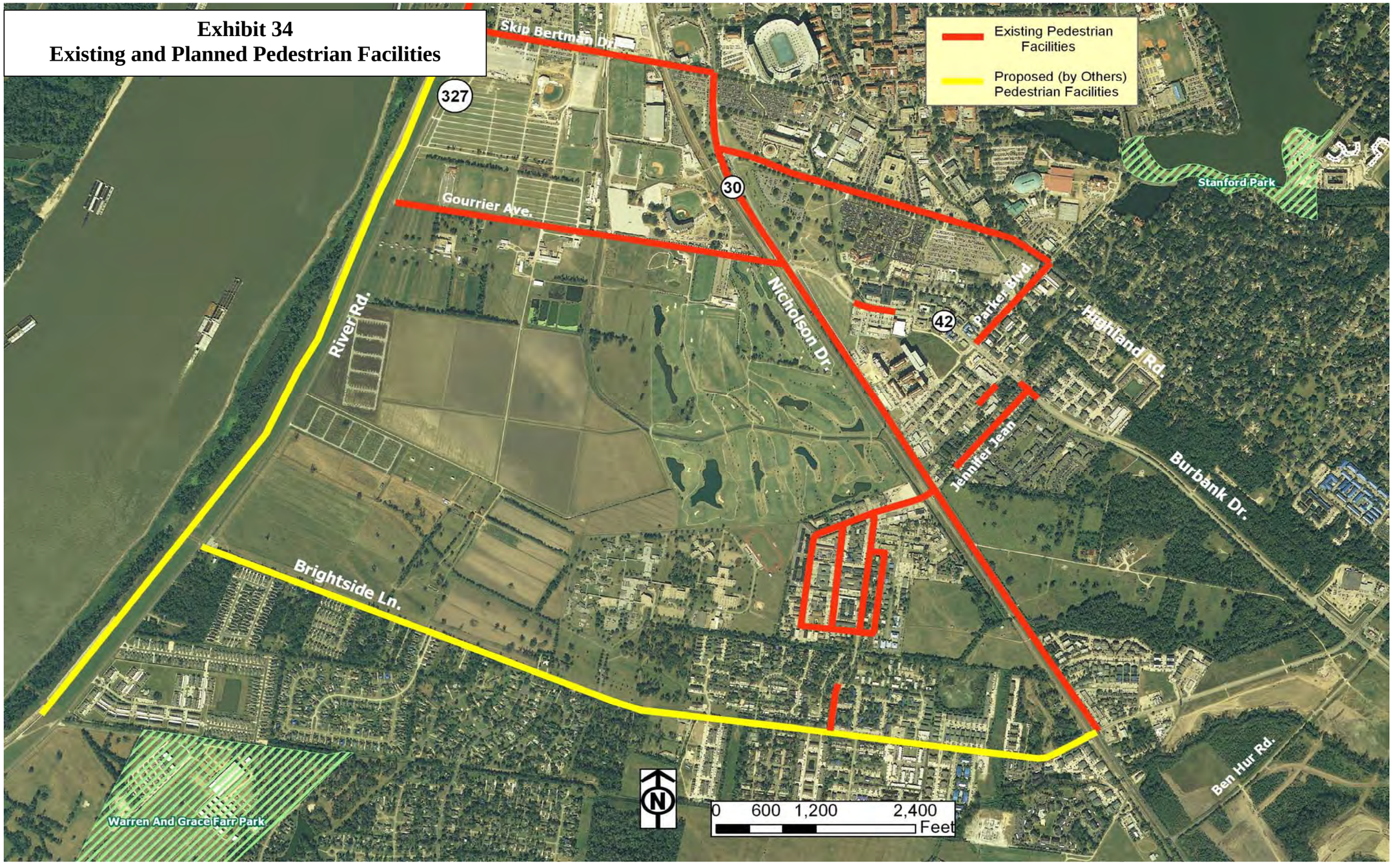


Exhibit 35
Existing and Planned Bike Facilities

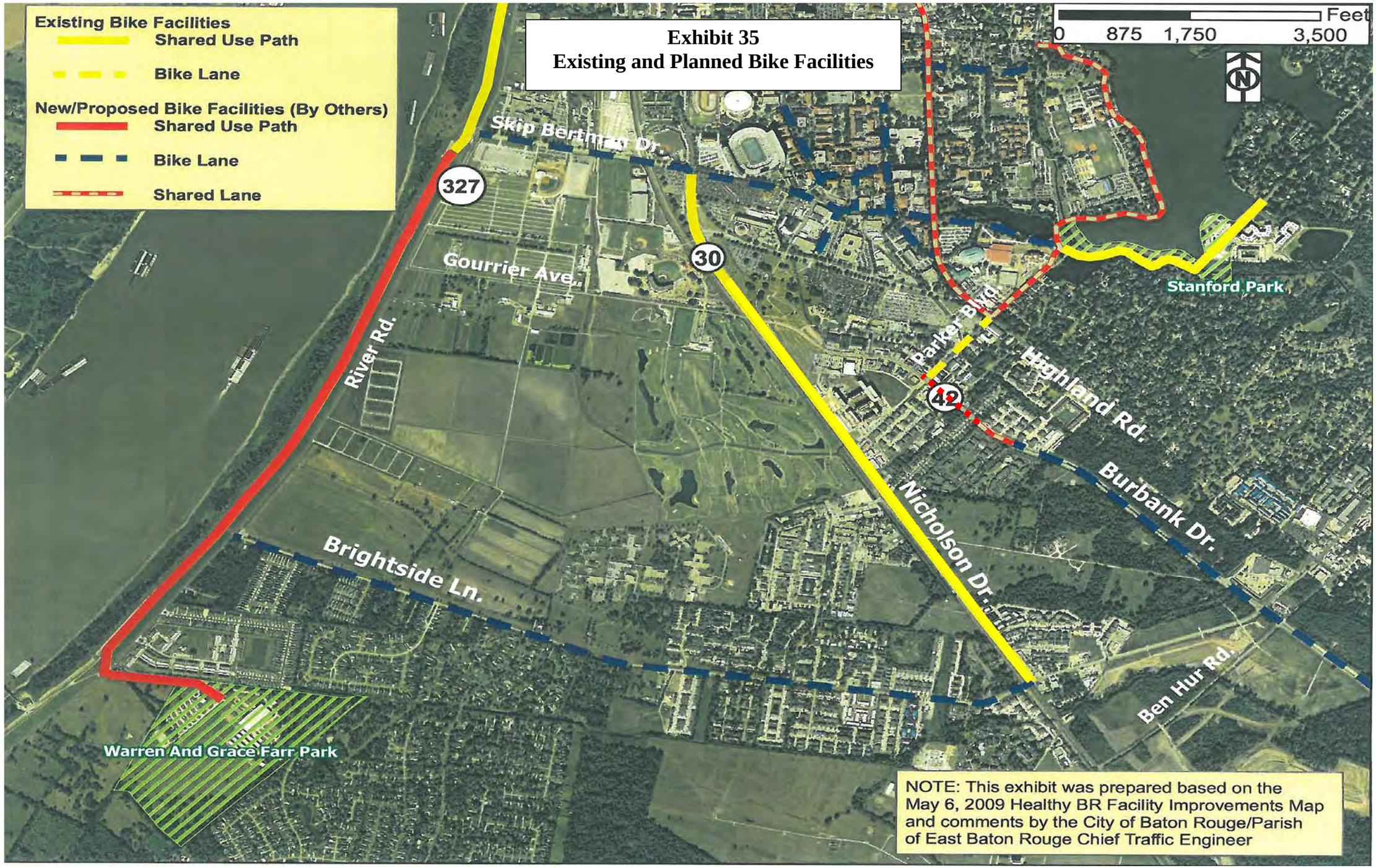
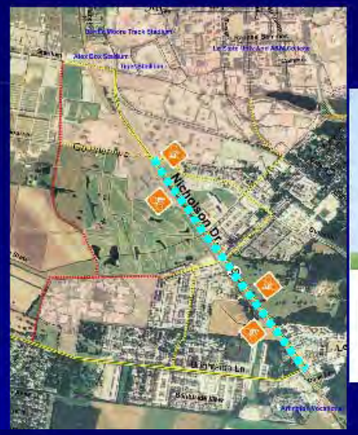
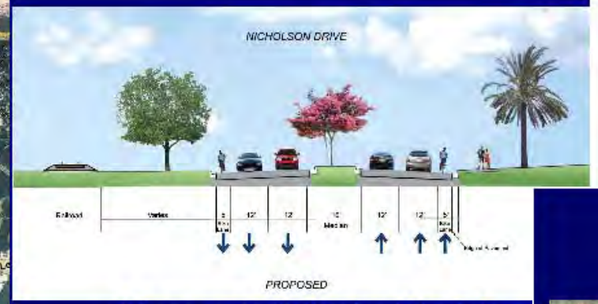


Exhibit 36
Nicholson Drive Corridor Alternatives

Alternative 1



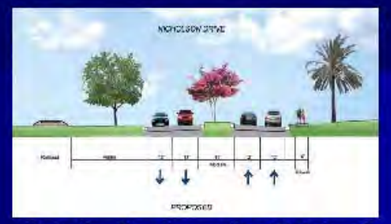


5-foot on-street bi-directional bicycle lanes

Alternative 2

10-foot off-street multi use side path east of Nicholson Drive

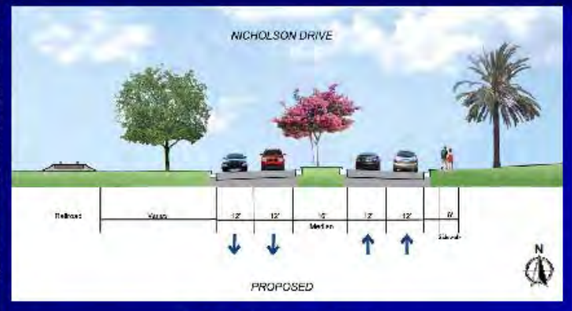
Alternative 3



6-foot sidewalk on the east side of Nicholson Dr.

12-foot off-street multi use trail on the west side of the railroad tracks

Alternative 4



6-foot sidewalk (only)

Exhibit 37
Nicholson Drive Multi-Modal Alternatives Matrix
Safety Criteria
(see Exhibit 40 for scores)

Criteria Rank	Criteria (weight)	Measurement	Weighting Factors	Alt 1 (On- street Bike lanes / sidewalk)	Alt 2 (10 foot side path)	Alt 3 (sidewalk/path w. of RR)	Alt 4 (sidewalk only)
1	Safety (30)	Minimizes Conflicts (turning/crossing) with Motorized Vehicles (ped)	3.75	-1	-1	2	-1
		Alternate 1, 2, 4 are the same for ped. They each receive low rankings based on the conflicts due to the number of drives on the east side of roadway. Alternate 3 has fewer conflicts with driveways.					
		Minimizes Conflicts (turning/crossing) with Motorized Vehicles (bike-commuter)	3.75	1	-1	2	1
		Alternate 1, 4 are the same for bike because of the assumption that they are on the roadway. Alt 3 has fewer conflicts because of the western path. Alt 2 has many driveway conflicts.					
		Minimizes Conflicts (turning/crossing) with Motorized Vehicles (bike-recreation)	3.75	0	1	2	-1
		Alt 4 ranked lowest because it doesn't accommodate the recreational user. Alt 3 is ranked highest because it accommodated rec. user without driveway conflicts. Alt. 2 accommodates the rec. user but has driveway conflicts. Alt. 1 forces the rec. user to ride on the roadway which is not where they would prefer to be.					
		Minimizes Conflicts with Non-Motorized Vehicles (bike-bike or bike-ped).	3.75	2	0	1	-1
		Alt. 1 and 3 separates the bikers from peds but not the rec. from commuter. Alt. 2 places the peds and bikers on same path assumed without striping to delineate appropriate location. Alt 4 provides no facility for the rec biker but the commuter biker is assumed to use roadway.					
		Minimizes Physical Environmental Concerns (surface condition)	3.75	-1	2	2	2
		Alt. 1 is ranked low due to debris from traffic.					
		Maximizes Allocation of Space for Non-motorized users	3.75	2	0	1	-1
		Alt 1 is clearly identified bike space. Alt 2 forces ped and bike onto the same space assuming no pavement markings to delineate. Alt 3 separates bike and ped but assumes no markings for directional delineation of the space.					
		Maximizes Likelihood of Same as roadway travel direction for all bicyclists	3.75	2	-1	-1	-1
		Alt 2 has clear pavement markings for same as roadway travel.					
		Maximizes safety at intersections for bike turning movements	3.75	2	-1	-1	2
		Alt 1 & 4 assume most bikes on roadway (same direction as veh. Traffic) which means less conflict for turning movements.					

Exhibit 38
Nicholson Drive Multi-Modal Alternatives Matrix
Accessibility/ Directness and Connectivity Criteria
(see Exhibit 40 for scores)

Criteria Rank	Criteria (weight)	Measurement	Weighting Factors	Alt 1 (On- street Bike lanes / sidewalk)	Alt 2 (10 foot side path)	Alt 3 (sidewalk/path w. of RR)	Alt 4 (sidewalk only)
2	Accessibility/ Directness (25)	Provides direct access to the path at multiple locations	5.0	2	1	0	-1
		This is assumed to only apply to bike because ped access is the same for all due to walk. Alt 1 has greatest because lane in both directions. Alt 4 no marked access for bike. Alt 2 bike access on only one side of roadway. Alt 3 bike access with RR as barrier.					
		Avoid obstructions/barriers which impede direct access to and from the route	5.0	2	0	-1	0
		Provide clear and direct pedestrian entries from Nicholson Dr.	5.0	1	1	0	1
		Alt 3 requires ped to cross over RR to gain access to Nicholson Dr.					
		Provide direct access to buildings	5.0	1	1	-1	1
		Alt 3 has few buildings on western path. Other alts scored less than 2 because peds must travel across existing parking lots to reach building entrances.					
		Land Uses and activities adjacent to the route maximizes the potential for usage	5.0	2	2	-1	2

Criteria Rank	Criteria (weight)	Measurement	Weighting Factors	Alt 1 (On- street Bike lanes / sidewalk)	Alt 2 (10 foot side path)	Alt 3 (sidewalk/path w. of RR)	Alt 4 (sidewalk only)
3	Connectivity (20)	Starts at proposed or existing bike route	3.3	2	2	2	2
		Ends at proposed or existing bike route	3.3	2	2	2	2
		Provides direct connections to trip origins and destinations for pedestrians	3.3	2	2	0	2
		Provides direct connections to trip origins and destinations for cyclists	3.3	2	2	0	-1
		Provides direct connections to the Public Transit System for pedestrians	3.3	2	2	2	2
		Provides direct connections to the Public Transit System for cyclists	3.3	2	1	-1	1

Exhibit 39
Nicholson Drive Multi-Modal Alternatives Matrix
Level of Service, Cost and Visibility Criteria
(see Exhibit 40 for scores)

Criteria Rank	Criteria (weight)	Measurement	Weighting Factors	Alt 1 (On- street Bike lanes / sidewalk)	Alt 2 (10 foot side path)	Alt 3 (sidewalk/path w. of RR)	Alt 4 (sidewalk only)
4	Level of Service* (15)	Provides desired LOS for pedestrians	5	2	1	2	2
		Alternate 2 ranked low because bike and ped share same path while Alt 1 &4 assumes bikes on roadway and Alt 3 assumes no bikes on sidewalk.					
		Provides desired LOS for commuter cyclists	5	1	0	1	-1
		Alt 1 shares rec and com bike but separates ped. Alt. 2 shares all users. Alt 3 separates ped from bike with walks but forces shared use of west path.					
		Provides desired LOS recreational cyclists	5	1	2	2	-1
		Assumed recreational cyclists prefer riding off of roadway therefore Alt 2 and 3 rank highest. Alt 1 provides wide bike lane which is better than the unmarked outer lane assumed in Alt. 4.					
Criteria Rank	Criteria (weight)	Measurement	Weighting Factors	Alt 1 (On- street Bike lanes / sidewalk)	Alt 2 (10 foot side path)	Alt 3 (sidewalk/path w. of RR)	Alt 4 (sidewalk only)
5	Cost Installation (10)	Comparison of the Cost per LF of improved section for each alternative. (does not include utility relocate costs)	10	-1	1	0	2
6	Visibility (5)	Provide visible connections to key destinations and potential users	1.7	2	2	-1	2
		Provides visibility to potential users	1.7	2	1	-1	1
		Alt 1 is most visible because it is on street.					
		Maximizes Crime Prevention Through Environmental Design	1.7	2	2	-1	2

*Level of Service is not based on computed values as these would not apply to every case. The Level of Service is in this instance a ranking based on the perceptions of the Technical Committee Members.

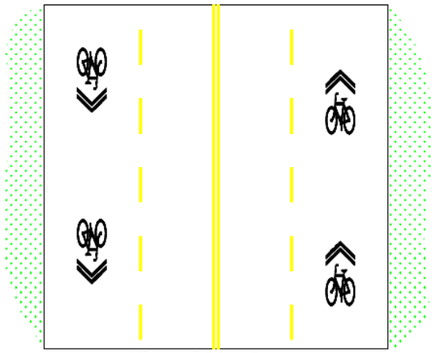
Exhibit 40
Nicholson Drive Multi-Modal Alternatives Matrix
Total Scores

			Weighting Factors	Alt 1 (On- street Bike lanes / sidewalk)	Alt 2 (10 foot side path)	Alt 3 (sidewalk/path w. of RR)	Alt 4 (sidewalk only)
	TOTAL (Perfect score = 210)			126	91	51	70
	Public Interest	Does the Route meet the objectives which stakeholders mentioned as priorities and is it viable for public presentation?		Y	Y	Y	N
	Available Right-of-Way	Does the route fit appropriately within the existing right-of-way?		Y	Y	N	Y

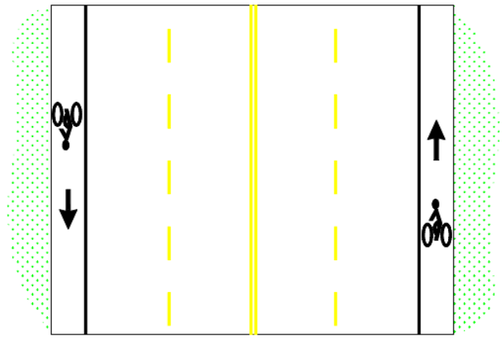
Alternatives are scored as follows	
Very Positive	2 points
Positive	1 point
Neutral	0 points
Negative	-1 point

Exhibit 41*

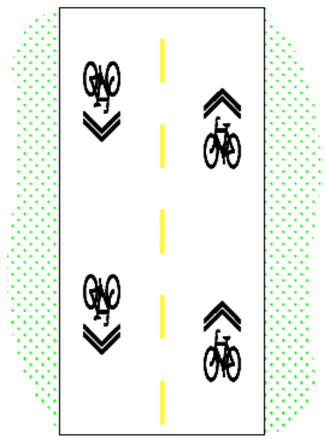
Bicycle Facility Selection Process



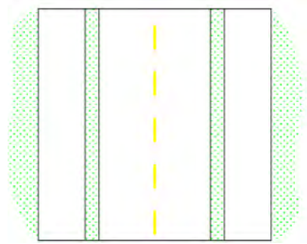
Shared Use Lanes
with 16 foot wide curb lane



Bike Lanes



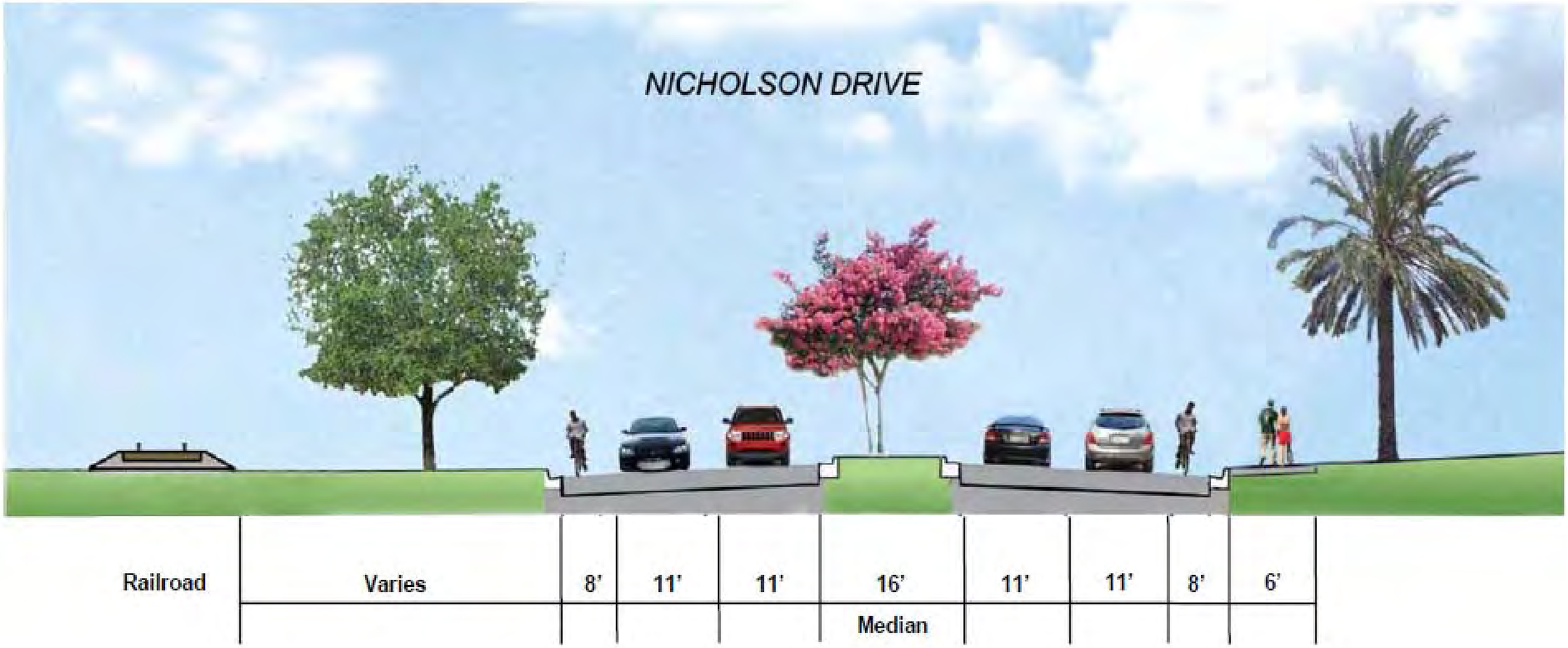
Shared Use Lanes
with standard lane widths



Shared Use Path

*Bicycle Facility Selection Process does not apply to Nicholson Ext. See Recommendations section for information pertaining to the Nicholson Ext. facility selection process

Exhibit 42
Proposed Nicholson Dr. Typical Section



PROPOSED

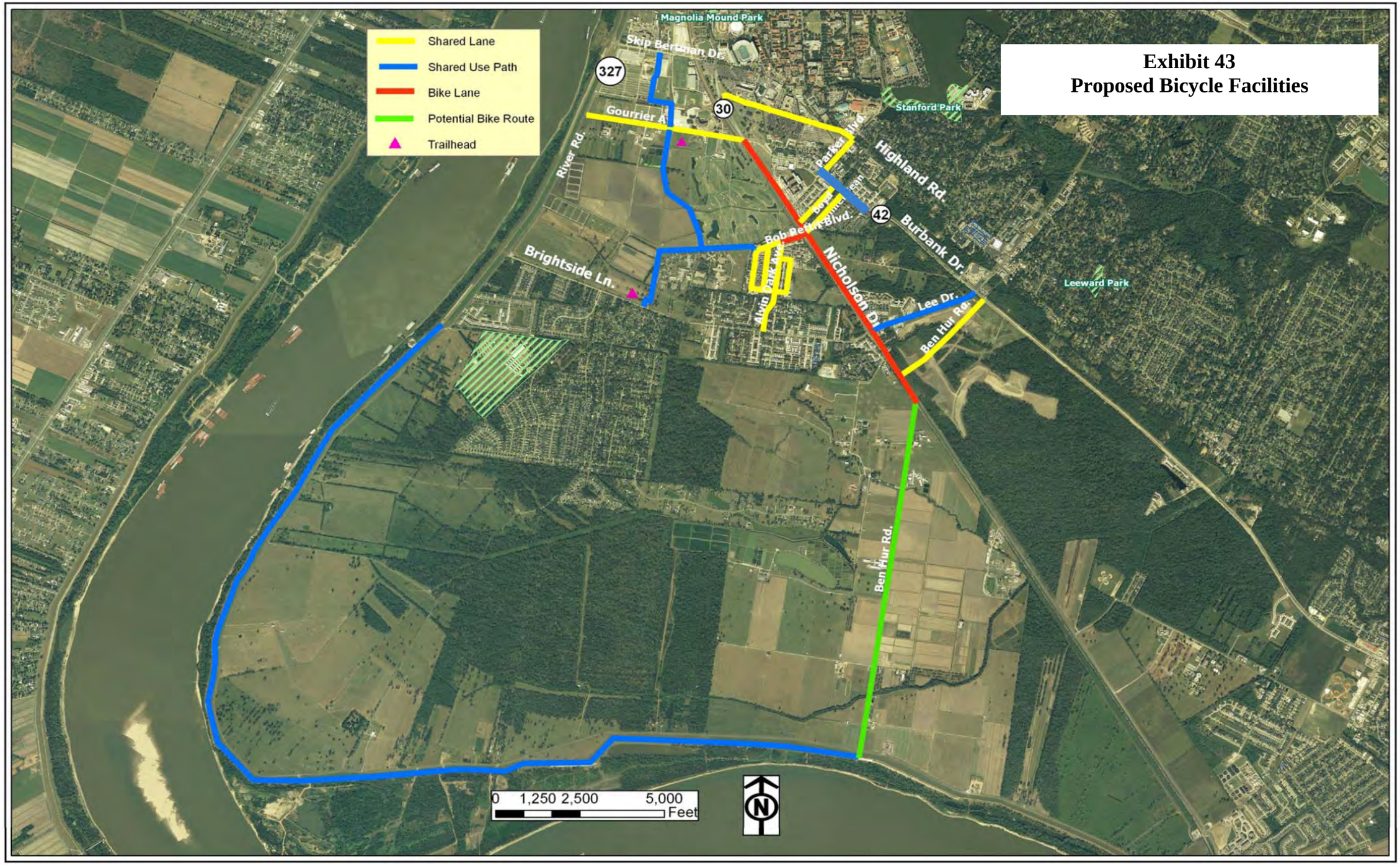
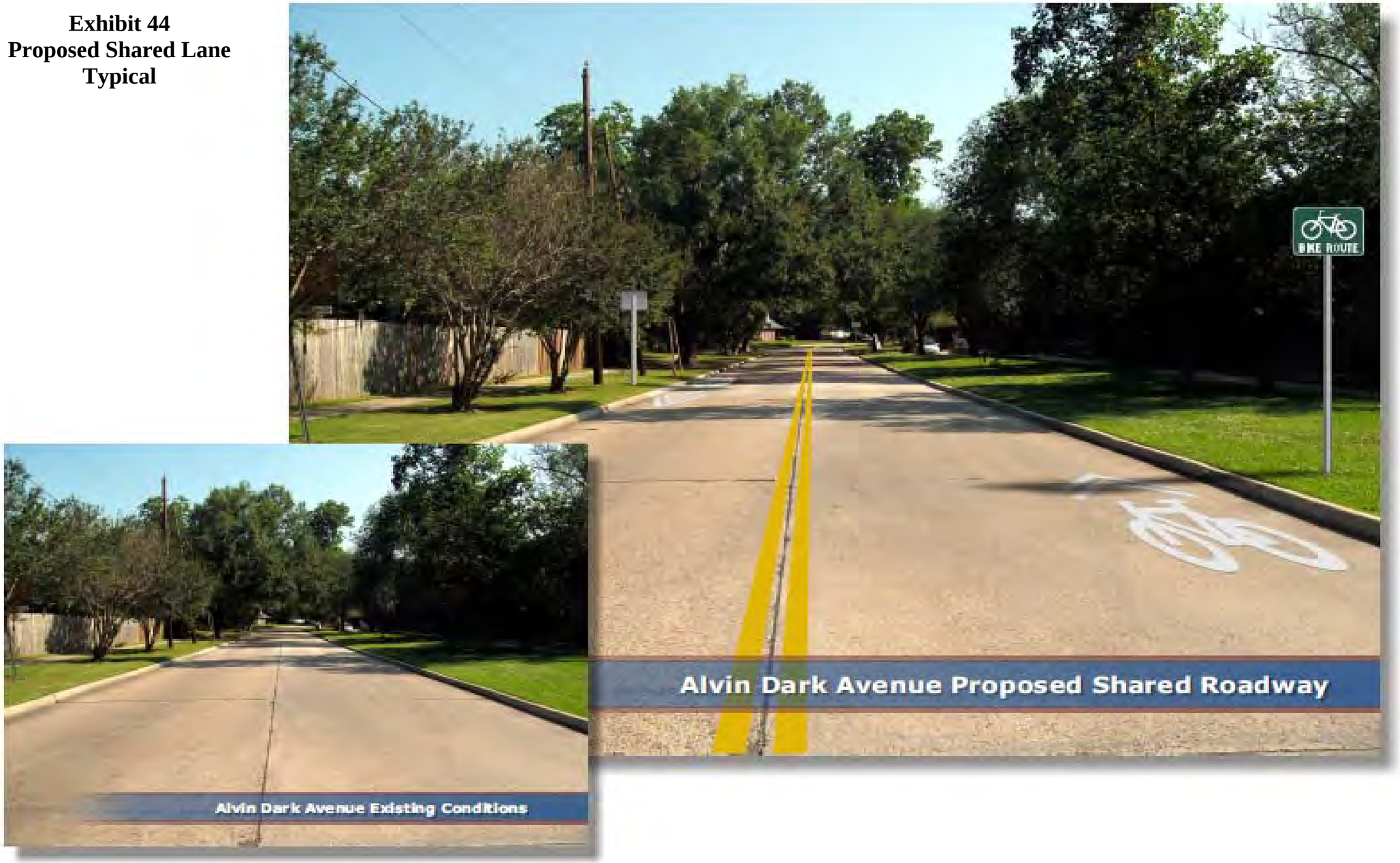


Exhibit 43
Proposed Bicycle Facilities
Shared Lane
Shared Use Path
Bike Lane
Potential Bike Route
Trailhead
Magnolia Mound Park
Skip Bertman Dr.
327
30
Gourrier Ave.
River Rd.
Stanford Park
Parker Blvd.
Highland Rd.
42
Burbank Dr.
Bob Pettit Blvd.
Brightside Ln.
Alvin Dark Way
Nicholson Dr.
Lee Dr.
Ben Hur Rd.
Leeward Park
Ben Hur Rd.
0 1,250 2,500 5,000
Feet
N

Exhibit 44
Proposed Shared Lane
Typical



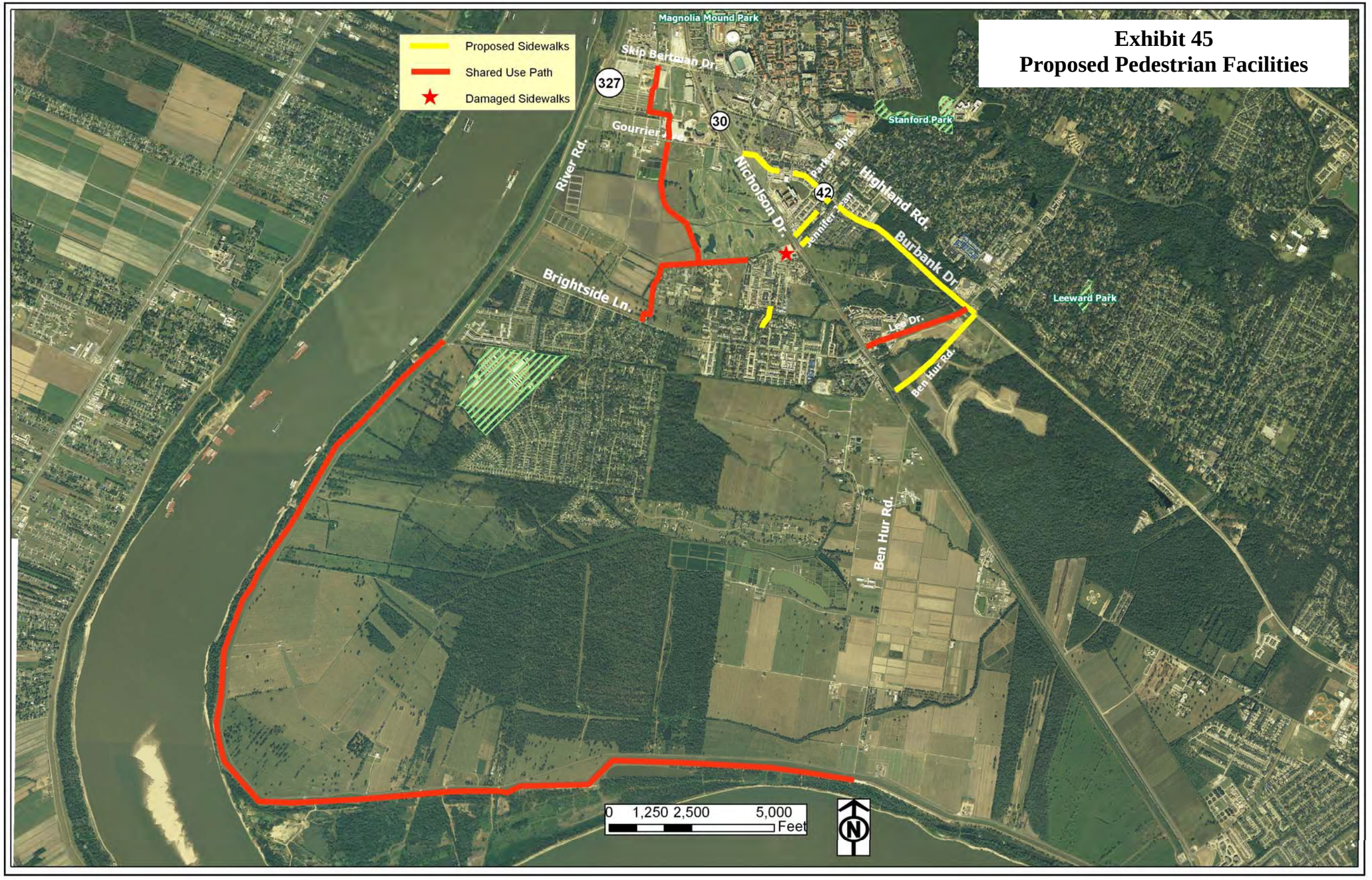
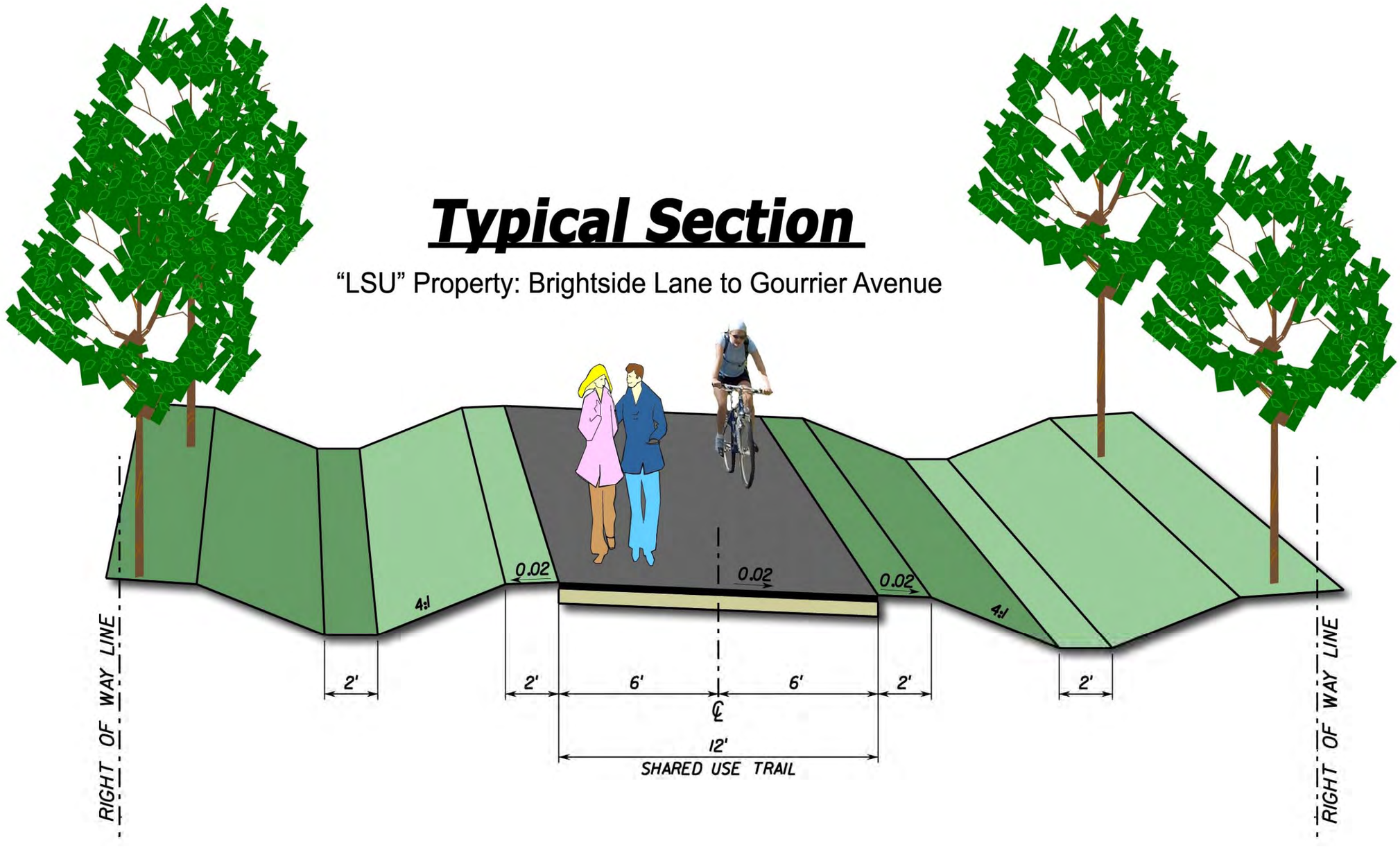


Exhibit 45
Proposed Pedestrian Facilities
Proposed Sidewalks
Shared Use Path
Damaged Sidewalks
Magnolia Mound Park
Skip Bertman Dr.
327
30
Gourrier
River Rd.
Stanford Park
Parker Blvd.
Nicholson Dr.
42
Jennifer Ln.
Highland Rd.
Burbank Dr.
Brightside Ln.
Leeward Park
Lee Dr.
Ben Hur Rd.
0 1,250 2,500 5,000
Feet
N

Exhibit 46
Shared Use Path Typical Section



INDEX TO SHEETS

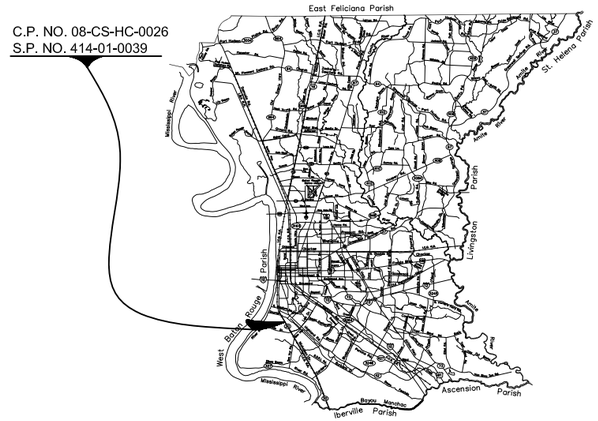
SHEET NO.	DESCRIPTION
EX–47	TITLE SHEET
EX–48 – EX–52	PLAN SHEETS
EX–53	RESIDUAL MAP

CITY OF BATON ROUGE
AND
PARISH OF EAST BATON ROUGE

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

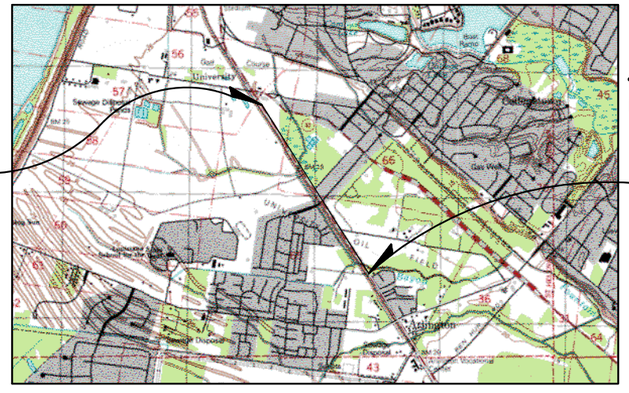
RIGHT OF WAY MAPS OF
PROPOSED IMPROVEMENTS TO

NICHOLSON DRIVE (LA 30) SEGMENT 1
(BIGHTSIDE/W. LEE TO GOURRIER/BURBANK)
CITY/PARISH PROJECT NO. 08-CS-HC-0035
STATE PROJECT NO. 414-01-0039



VICINITY MAP

CSLM 2.507
STA. 358+96.49 LA 30
END S.P. 414–01–0039
(NICHOLSON DRIVE)



CSLM 3.584
STA. 302+09.27 LA 30
BEG S.P. 414–01–0039
(NICHOLSON DRIVE)

LOCATION MAP

SCALE: 1 INCH = 2,000 FEET

2000' 0 2000' 4000' 6000'

JAMIE M. BORDELON
NAME
PRELIMINARY
2/2011
DATE
4799
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SHEET NUMBER	EX–47
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414–01–0039
DESIGNED	JRE
CHECKED	JMB
DETAILED	JPO
CHECKED	JMB
DATE	4–11–2011
SHEET	EX–47

REVISION DESCRIPTION | BY | NO. | DATE

TITLE SHEET

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C–TT02.DWG

GREENSBURG LAND DISTRICT
T8S–R1W
SECTION 65

* NOTE: FEE OWNERSHIP OF BAYOU FOUNTAIN (BOTH SIDES OF ROAD) TO BE DETERMINED AT A LATER DATE.

0 100' 200'

LEGEND:

EXIST. R/W ——— - - ——— - - ———

PROPERTY LINES ——— - ——— - ——— - ———

FOUND I.P. ●

SHEET NUMBER EX–48

PARISH: EAST BATON ROUGE
FEDERAL PROJECT:
STATE PROJECT: 414–01–0039

DESIGNED JRE
CHECKED JMB
DETAILED JPO
CHECKED JMB
DATE 4–11–2011
SHEET EX–48

REVISION DESCRIPTION | DATE | BY | NO.

EXISTING PROPERTY MAPS

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C–RW01.DWG

GREENSBURG LAND DISTRICT
T8S–R1W
SECTION 65

JAMIE M. BORDELON
NAME
PRELIMINARY
2/2011
DATE
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LICENSE NO.

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0 100' 200'

LEGEND:

EXIST. R/W

PROPERTY LINES

FOUND I.P.

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-RW01.DWG

SHEET NUMBER EX–49

PARISH: EAST BATON ROUGE
FEDERAL PROJECT:
STATE PROJECT: 414–01–0039

DESIGNED	JRE	
CHECKED	JMB	
DETAILED	JPO	
CHECKED	JMB	
DATE	4–11–2011	
SHEET	EX–49	

NO.	REVISION DESCRIPTION	BY	DATE

EXISTING PROPERTY MAPS

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

GREENSBURG LAND DISTRICT
T8S–R1W
SECTIONS 65 & 66

0 100' 200'

LEGEND:
EXIST. R/W
PROPERTY LINES
FOUND I.P.

JAMIE M. BORDELON
NAME
PRELIMINARY
2/2011
DATE
4799
LICENSE NO.

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SHEET NUMBER EX-50

PARISH	FEDERAL PROJECT	STATE PROJECT
EAST BATON ROUGE		414-01-0039

DESIGNED	JRE	
CHECKED	BAH	
DETAILED	JPO	
CHECKED	MJK	
DATE	4-11-2011	
SHEET	EX-50	

NO.	REVISION DESCRIPTION	DATE	BY

EXISTING PROPERTY MAPS

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C-RW01.DWG

GREENSBURG LAND DISTRICT
T8S–R1W
SECTIONS 65 & 66

LEGEND:

EXIST. R/W ——— - - ——— - - ———

PROPERTY LINES ——— - ——— - ——— - ———

FOUND I.P. ●

JAMIE M. BORDELON
NAME
PRELIMINARY
2/2011
DATE
4799
LICENSE NO.

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SHEET NUMBER	EX-51
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
STATE PROJECT	414-01-0039
DESIGNED / CHECKED	JRE / BAH
DETAILED / CHECKED	JPO / MJK
DATE / SHEET	4-11-2011 / EX-51

REVISION DESCRIPTION | DATE | NO. | BY

EXISTING PROPERTY MAPS

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

R:\2008\68183\CAD (DESIGN STUDY)\PRODUCTION PLAN\68183C-RW01.DWG

GREENSBURG LAND DISTRICT
T8S–R1W
SECTIONS 65 & 57

0 100' 200'

LEGEND:

EXIST. R/W ——— – – ——— – – ———

PROPERTY LINES ——— – ——— – ——— – ———

FOUND I.P. ●

JAMIE M. BORDELON
NAME
PRELIMINARY
2/2011
DATE
4799
LICENSE NO.

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SHEET NUMBER EX–52

PARISH: EAST BATON ROUGE
FEDERAL PROJECT:
STATE PROJECT: 414–01–0039

DESIGNED: JRE
CHECKED: BAH
DETAILED: JPO
CHECKED: MJK
DATE: 4–11–2011
SHEET: EX–52

REVISION DESCRIPTION | BY | NO. | DATE

EXISTING PROPERTY MAPS

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C–RW01.DWG

GREENSBURG LAND DISTRICT
T8S–R1W
SECTIONS 65, 66 & 57

302+09 305+00 310+00 315+00 320+00 325+00 330+00 335+00 340+00 345+00 350+00 355+00 360+00

Scale : 1" = 400'

STA. 302+09.27 LA 30
BEG. S.P. 414–01–0036
(NICHOLSON DRIVE)

STA. 358+96.49 LA 30
END S.P. 414–01–0039
(NICHOLSON DRIVE)

SECTION 65
SECTION 66

SECTION 65
SECTION 66

SECTION 57
SECTION 65

GOURRIER AVE.

BAYOU FOUNTAIN

CANADIAN NATIONAL RAILWAY

BOB PETTIT BLVD.

CANADIAN NATIONAL RAILWAY

NICHOLSON DR.

LA 30

JENNIFER JEAN DR.

E. BOYD DR.

BURBANK DR.

PARCEL W–3
OAKBROOK DAY LAND PARTNERSHIP
TRACT B
ARLINGTON PLANTATION

PARCEL W–4
OAKBROOK DAY LAND PARTNERSHIP
TRACT A
ARLINGTON PLANTATION

PARCEL W–5
DUPLANTIER FAMILY PARTNERSHIP, ET AL
TRACT 2
EVANS DUPLANTIER TRACT

PARCEL W–6
KELLEY LAND COMPANY, LLC
TRACT 1
DENIS DUPLANTIER TRACT

PARCEL W–7
BHANDARI, LLC
LOT 1
UNIVERSITY SOUTH

PARCEL W–8
ROTOLO PROPERTIES LLC
LOT 2–A–1
JAMES T. AMISS TRACT

PARCEL W–9
CURTIS DETTMAN, ET AL
LOT 1
JAMES T. AMISS TRACT

PARCEL W–10
SOUTHGATE VIEW II, LLC
TRACT 2B–1–C
JAMES T. AMISS TRACT

PARCEL W–11
ARCHLAND PROPERTY I, LLC
TRACT 2B–1–B
JAMES T. AMISS TRACT

PARCEL W–13
SOUTHGATE TOWERS LLC
LOT 2A–1–A–3–A
JAMES T. AMISS PROPERTY

PARCEL
W–12
SOUTHGATE
TOWERS
LLC
LOT
2A–1–A–2–A–1–B1
JAMES T.
AMISS
PROPERTY

PARCEL W–14
SOUTHGATE SUITES LLC
LOT 2A–1–C–3–A–1–A
JAMES T. AMISS PROPERTY

PARCEL W–15
SOUTHGATE TOWERS LLC
LOT 2A–1–A–1–C–2–A
JAMES T. AMISS PROPERTY

PARCEL W–16
SOUTHGATE SUITES LLC
LOT 2A–1–A–1–C–2–B
JAMES T. AMISS PROPERTY

PARCEL
W–17
LOUISIANA
STATE
UNIVERSITY

0 400' 800'

LEGEND:

EXIST. R/W

PROPERTY LINES

FOUND I.P.

JAMIE M. BORDELON
NAME
PRELIMINARY
2/2011
DATE
4799
LICENSE NO.

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R:\2008\88183\CAD (DESIGN STUDY)\PRODUCTION PLAN\88183C–RW01.DWG

SHEET NUMBER EX–53

PARISH	FEDERAL PROJECT	STATE PROJECT
EAST BATON ROUGE		414–01–0039

DESIGNED	CHECKED	DETAILED	CHECKED	DATE	SHEET
JRE	BAH	JPO	MJK	4–11–2011	EX–53

NO.	REVISION DESCRIPTION	DATE	BY

STATE OF LOUISIANA

EXISTING PROPERTY MAPS

NICHOLSON DRIVE (LA 30) SEGMENT 1

FORTE & TABLADA

APPENDICIES

Appendix No. 1: Alignment Station and Curve Report

Forte and Tablada Inc.

9107 Interline Ave.

Suite #321

Baton Rouge, LA 70809

Alignment Station and Curve Report
Project Name: R:\2008\88183\cad (Design Study)\Base Plan\Profiles\88183_PR01.dwg
Report Date: 8/4/2010 12:48:31 PM

Client: Client Company
Project Description:
Prepared by: Jason R. Ellis

Alignment: Alignment - Bob Petit (Surv. & Adopt.)

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	400+00.00	689636.0792	3329533.2050
End:	401+07.82	689676.8196	3329633.0356

Tangent Data

Parameter	Value	Parameter	Value
Length:	107.82	Course:	N 67° 47' 59.51" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	401+07.82	689676.8196	3329633.0356
End:	403+21.63	689793.8657	3329811.9604

Tangent Data

Parameter	Value	Parameter	Value
Length:	213.81	Course:	N 56° 48' 31.49" E

Alignment: Alignment - East Boyd (Surv. & Adopt.)

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	600+00.00	690097.5038	3329617.6358
End:	604+00.00	690390.9962	3329889.4122

Tangent Data

Parameter	Value	Parameter	Value
Length:	400.00	Course:	N 42° 47' 59.76" E

Alignment: Alignment - Jennifer Jean (Surv. & Adopt.)

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	500+00.00	689793.8657	3329811.9604
End:	500+50.00	689821.2375	3329853.8028

Tangent Data

Parameter	Value	Parameter	Value
Length:	50.00	Course:	N 56° 48' 31.49" E

Curve Point Data

Description	Station	Northing	Easting
PC:	500+50.00	689821.2375	3329853.8028
RP:		689904.9223	3329799.0593
PT:	500+81.20	689842.0822	3329876.8482

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	17° 52' 35.38"	Type:	LEFT
Radius:	100.00		
Length:	31.20	Tangent:	15.73
Mid-Ord:	1.21	External:	1.23
Chord:	31.07	Course:	N 47° 52' 13.79" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	500+81.20	689842.0822	3329876.8482
End:	501+94.57	689930.2691	3329948.0880

Tangent Data

Parameter	Value	Parameter	Value

Horizontal Alignment Station and Curve Report Page 3 of 3

Length:	113.37	Course:	N 38° 55' 56.10" E

Curve Point Data

Description	Station	Northing	Easting
PC:	501+94.57	689930.2691	3329948.0880
RP:		689867.4290	3330025.8770
PT:	501+98.82	689933.5214	3329950.8318

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	02° 26' 17.40"	Type:	RIGHT
Radius:	100.00		
Length:	4.26	Tangent:	2.13
Mid-Ord:	0.02	External:	0.02
Chord:	4.26	Course:	N 40° 09' 04.80" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	501+98.82	689933.5214	3329950.8318
End:	503+98.82	690083.6119	3330083.0167

Tangent Data

Parameter	Value	Parameter	Value
Length:	200.00	Course:	N 41° 22' 13.50" E

Alignment: Alignment - Seg 1 (Proj. & Adopt.)

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	302+09.27	687727.9382	3331135.7739
End:	370+45.03	693483.4589	3327447.7278

Tangent Data

Parameter	Value	Parameter	Value
Length:	6835.77	Course:	N 32° 39' 03.97" W

Appendix No. 2: Vertical Curve Report

Profile Vertical Curve Report

Client:	**Prepared by:**
Client	Jason R. Ellis
Client Company	Forte and Tablada Inc.
Address 1	9107 Interline Ave.

Date: 8/4/2010 12:32:09 PM

Vertical Alignment: Bob Petit Proposed Profile
Description:
Station Range: Start: 402+26.63, End: 403+21.84

Vertical Alignment: East Boyd Proposed Profile
Description:
Station Range: Start: 600+00.10, End: 601+94.33

Vertical Curve Information:(sag curve)			
PVC Station:	600+48.00	Elevation:	21.971'
PVI Station:	600+88.00	Elevation:	20.971'
PVT Station:	601+28.00	Elevation:	21.131'
Low Point:	601+16.97	Elevation:	21.109'
Grade in(%):	-2.50%	Grade out(%):	0.40%
Change(%):	2.90%	K:	27.59'
Curve Length:	80.00'	Curve Radius	2,758.62'
Headlight Distance:	273.71'		

Vertical Alignment: Jennifer Jean Proposed Profile
Description:
Station Range: Start: 500+00.00, End: 502+50.00

Vertical Curve Information:(sag curve)			
PVC Station:	501+00.00	Elevation:	21.481'
PVI Station:	501+60.00	Elevation:	19.981'
PVT Station:	502+20.00	Elevation:	20.224'
Low Point:	502+03.30	Elevation:	20.190'
Grade in(%):	-2.50%	Grade out(%):	0.40%
Change(%):	2.90%	K:	41.32'
Curve Length:	120.00'	Curve Radius	4,131.91'
Headlight Distance:	322.99'		

Vertical Alignment: Nicholson - Seg 1 FG Profile
Description:
Station Range: Start: 302+09.23, End: 358+96.49

Vertical Curve Information:(sag curve)			
PVC Station:	302+70.00	Elevation:	24.047'
PVI Station:	303+40.00	Elevation:	23.578'
PVT Station:	304+10.00	Elevation:	23.928'
Low Point:	303+50.17	Elevation:	23.778'
Grade in(%):	-0.67%	Grade out(%):	0.50%
Change(%):	1.17%	K:	119.66'
Curve Length:	140.00'	Curve Radius	11,965.81'
Headlight Distance:			

Vertical Curve Information:(crest curve)			
PVC Station:	304+50.00	Elevation:	24.128'
PVI Station:	305+20.00	Elevation:	24.478'
PVT Station:	305+90.00	Elevation:	24.058'
High Point:	305+13.64	Elevation:	24.287'
Grade in(%):	0.50%	Grade out(%):	-0.60%
Change(%):	1.10%	K:	127.27'
Curve Length:	140.00'	Curve Radius	12,727.27'
Passing Distance:	1,475.78'	Stopping Distance:	674.16'

Vertical Curve Information:(sag curve)			
PVC Station:	307+50.00	Elevation:	23.098'
PVI Station:	308+20.00	Elevation:	22.678'
PVT Station:	308+90.00	Elevation:	23.026'
Low Point:	308+26.55	Elevation:	22.868'
Grade in(%):	-0.60%	Grade out(%):	0.50%
Change(%):	1.10%	K:	127.59'
Curve Length:	140.00'	Curve Radius	12,758.62'
Headlight Distance:			

Vertical Curve Information:(crest curve)			
PVC Station:	311+20.00	Elevation:	24.170'
PVI Station:	311+90.00	Elevation:	24.518'

PVT Station:	312+60.00	Elevation:	24.238'
High Point:	311+97.59	Elevation:	24.363'
Grade in(%):	0.50%	Grade out(%):	-0.40%
Change(%):	0.90%	K:	156.02'
Curve Length:	140.00'	Curve Radius	15,602.41'
Passing Distance:	1,793.36'	Stopping Distance:	810.64'

Vertical Curve Information:(sag curve)

PVC Station:	315+30.00	Elevation:	23.158'
PVI Station:	316+00.00	Elevation:	22.878'
PVT Station:	316+70.00	Elevation:	23.228'
Low Point:	315+92.22	Elevation:	23.034'
Grade in(%):	-0.40%	Grade out(%):	0.50%
Change(%):	0.90%	K:	155.56'
Curve Length:	140.00'	Curve Radius	15,555.56'
Headlight Distance:			

Vertical Curve Information:(crest curve)

PVC Station:	318+30.00	Elevation:	24.028'
PVI Station:	319+00.00	Elevation:	24.378'
PVT Station:	319+70.00	Elevation:	24.098'
High Point:	319+07.73	Elevation:	24.222'
Grade in(%):	0.50%	Grade out(%):	-0.40%
Change(%):	0.90%	K:	155.47'
Curve Length:	140.00'	Curve Radius	15,546.97'
Passing Distance:	1,787.23'	Stopping Distance:	808.01'

Vertical Curve Information:(sag curve)

PVC Station:	322+35.00	Elevation:	23.036'
PVI Station:	323+05.00	Elevation:	22.756'
PVT Station:	323+75.00	Elevation:	23.106'
Low Point:	322+97.27	Elevation:	22.912'
Grade in(%):	-0.40%	Grade out(%):	0.50%
Change(%):	0.90%	K:	155.47'
Curve Length:	140.00'	Curve Radius	15,546.97'
Headlight Distance:			

Vertical Curve Information:(crest curve)

PVC Station:	324+80.00	Elevation:	23.631'
PVI Station:	325+50.00	Elevation:	23.981'
PVT Station:	326+20.00	Elevation:	23.981'
High Point:	326+20.00	Elevation:	23.981'
Grade in(%):	0.50%	Grade out(%):	0.00%
Change(%):	0.50%	K:	280.00'
Curve Length:	140.00'	Curve Radius	28,000.00'
Passing Distance:	3,162.72'	Stopping Distance:	1,399.15'

Vertical Curve Information:(crest curve)

PVC Station:	326+80.00	Elevation:	23.981'
PVI Station:	327+50.00	Elevation:	23.981'
PVT Station:	328+20.00	Elevation:	23.701'
High Point:	326+80.00	Elevation:	23.981'
Grade in(%):	0.00%	Grade out(%):	-0.40%
Change(%):	0.40%	K:	350.00'
Curve Length:	140.00'	Curve Radius	35,000.00'
Passing Distance:	3,935.91'	Stopping Distance:	1,731.44'

Vertical Curve Information:(sag curve)

PVC Station:	329+30.00	Elevation:	23.261'
PVI Station:	330+00.00	Elevation:	22.981'
PVT Station:	330+70.00	Elevation:	23.331'
Low Point:	329+92.22	Elevation:	23.137'
Grade in(%):	-0.40%	Grade out(%):	0.50%
Change(%):	0.90%	K:	155.56'
Curve Length:	140.00'	Curve Radius	15,555.56'
Headlight Distance:			

Vertical Curve Information:(crest curve)

PVC Station:	332+30.00	Elevation:	24.131'
PVI Station:	333+00.00	Elevation:	24.481'
PVT Station:	333+70.00	Elevation:	24.061'
High Point:	332+93.64	Elevation:	24.290'
Grade in(%):	0.50%	Grade out(%):	-0.60%

Change(%):	1.10%	K:	127.27'
Curve Length:	140.00'	Curve Radius	12,727.27'
Passing Distance:	1,475.78'	Stopping Distance:	674.16'

Vertical Curve Information:(sag curve)

PVC Station:	334+80.00	Elevation:	23.401'
PVI Station:	335+50.00	Elevation:	22.981'
PVT Station:	336+20.00	Elevation:	23.261'
Low Point:	335+64.00	Elevation:	23.149'
Grade in(%):	-0.60%	Grade out(%):	0.40%
Change(%):	1.00%	K:	140.00'
Curve Length:	140.00'	Curve Radius	14,000.00'
Headlight Distance:			

Vertical Curve Information:(crest curve)

PVC Station:	338+80.00	Elevation:	24.301'
PVI Station:	339+50.00	Elevation:	24.581'
PVT Station:	340+20.00	Elevation:	24.021'
High Point:	339+26.67	Elevation:	24.394'
Grade in(%):	0.40%	Grade out(%):	-0.80%
Change(%):	1.20%	K:	116.67'
Curve Length:	140.00'	Curve Radius	11,666.67'
Passing Distance:	1,358.64'	Stopping Distance:	623.81'

Vertical Curve Information:(sag curve)

PVC Station:	341+40.00	Elevation:	23.061'
PVI Station:	342+10.00	Elevation:	22.501'
PVT Station:	342+80.00	Elevation:	22.851'
Low Point:	342+26.15	Elevation:	22.716'
Grade in(%):	-0.80%	Grade out(%):	0.50%
Change(%):	1.30%	K:	107.69'
Curve Length:	140.00'	Curve Radius	10,769.23'
Headlight Distance:			

Vertical Curve Information:(crest curve)

PVC Station:	344+30.00	Elevation:	23.601'

PVI Station:	345+00.00	Elevation:	23.951'
PVT Station:	345+70.00	Elevation:	23.531'
High Point:	344+93.64	Elevation:	23.760'
Grade in(%):	0.50%	Grade out(%):	-0.60%
Change(%):	1.10%	K:	127.27'
Curve Length:	140.00'	Curve Radius	12,727.27'
Passing Distance:	1,475.78'	Stopping Distance:	674.16'

Vertical Curve Information:(sag curve)

PVC Station:	347+30.00	Elevation:	22.571'
PVI Station:	348+00.00	Elevation:	22.151'
PVT Station:	348+70.00	Elevation:	22.431'
Low Point:	348+14.00	Elevation:	22.319'
Grade in(%):	-0.60%	Grade out(%):	0.40%
Change(%):	1.00%	K:	140.00'
Curve Length:	140.00'	Curve Radius	14,000.00'
Headlight Distance:			

Vertical Curve Information:(crest curve)

PVC Station:	351+80.00	Elevation:	23.671'
PVI Station:	352+50.00	Elevation:	23.951'
PVT Station:	353+20.00	Elevation:	23.601'
High Point:	352+42.22	Elevation:	23.795'
Grade in(%):	0.40%	Grade out(%):	-0.50%
Change(%):	0.90%	K:	155.56'
Curve Length:	140.00'	Curve Radius	15,555.56'
Passing Distance:	1,788.18'	Stopping Distance:	808.42'

Vertical Curve Information:(sag curve)

PVC Station:	354+30.00	Elevation:	23.051'
PVI Station:	355+00.00	Elevation:	22.701'
PVT Station:	355+70.00	Elevation:	23.094'
Low Point:	354+95.97	Elevation:	22.886'
Grade in(%):	-0.50%	Grade out(%):	0.56%
Change(%):	1.06%	K:	131.95'
Curve Length:	140.00'	Curve Radius	13,194.96'
Headlight Distance:			

Appendix No. 3: HYDR 1130 Output Report

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR1130-071498
HYDRAULICS SECTION
DESIGNER: Jason Ellis DATE: 04-20-2010
REMARKS: **Cross Drain Structure A-1**

STATE PROJECT NUMBER 414-01-0039
SCS PEAK DISCHARGE

STATION	307+13(10year)
DRAINAGE AREA (ACRES)	1234.56
HYDRAULIC LENGTH (FEET)	12469.00
CURVE NUMBER	84.03
RAINFALL (INCHES)	7.80
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.12
PEAK DISCHARGE (CFS)	659.

SCS PEAK DISCHARGE

STATION	307+13(50year)
DRAINAGE AREA (ACRES)	1234.56
HYDRAULIC LENGTH (FEET)	12469.00
CURVE NUMBER	84.03
RAINFALL (INCHES)	11.10
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.12
PEAK DISCHARGE (CFS)	1014.

SCS PEAK DISCHARGE

STATION	307+13(100 year)
DRAINAGE AREA (ACRES)	1234.56
HYDRAULIC LENGTH (FEET)	12469.00
CURVE NUMBER	84.03
RAINFALL (INCHES)	12.80
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.12
PEAK DISCHARGE (CFS)	1198.

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR1130-071498
HYDRAULICS SECTION
DESIGNER: Jason Ellis DATE: 04-20-2010
REMARKS: **Cross Drain Structures A-2 & A-3**

STATE PROJECT NUMBER 414-01-0039
SCS PEAK DISCHARGE

STATION	337+56(10year)
DRAINAGE AREA (ACRES)	288.00
HYDRAULIC LENGTH (FEET)	8345.00
CURVE NUMBER	90.05
RAINFALL (INCHES)	7.80
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.25
PEAK DISCHARGE (CFS)	288.

SCS PEAK DISCHARGE

STATION	337+56(50year)
DRAINAGE AREA (ACRES)	288.00
HYDRAULIC LENGTH (FEET)	8345.00
CURVE NUMBER	90.05
RAINFALL (INCHES)	11.10
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.25
PEAK DISCHARGE (CFS)	427.

SCS PEAK DISCHARGE

STATION	337+56(100year)
DRAINAGE AREA (ACRES)	288.00
HYDRAULIC LENGTH (FEET)	8345.00
CURVE NUMBER	90.05
RAINFALL (INCHES)	12.60
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.25
PEAK DISCHARGE (CFS)	491.

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR1130-071498
HYDRAULICS SECTION

DESIGNER: Jason Ellis DATE: 07-30-2010
REMARKS: **Cross Drain Structure A-4**

STATE PROJECT NUMBER 08-CS-HC-00

SCS PEAK DISCHARGE

STATION	346+10 (10 Year)
DRAINAGE AREA (ACRES)	28.90
HYDRAULIC LENGTH (FEET)	2000.00
CURVE NUMBER	90.05
RAINFALL (INCHES)	7.80
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.25
PEAK DISCHARGE (CFS)	71.

SCS PEAK DISCHARGE

STATION	346+10 (50 Year)
DRAINAGE AREA (ACRES)	28.90
HYDRAULIC LENGTH (FEET)	2000.00
CURVE NUMBER	90.05
RAINFALL (INCHES)	11.10
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.25
PEAK DISCHARGE (CFS)	104.

SCS PEAK DISCHARGE

STATION	346+10 (100 Year)
DRAINAGE AREA (ACRES)	28.90
HYDRAULIC LENGTH (FEET)	2000.00
CURVE NUMBER	90.05
RAINFALL (INCHES)	12.60
SLOPE (PERCENT)	.10
PEAK ADJUSTMENT FACTOR	1.25
PEAK DISCHARGE (CFS)	119.

Appendix No. 4: HYDR 6000 Output Report

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 100

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 2
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 302+09.23
PROJECT END AT STATION = 306+30.00
GRADE AT THE BEGINNING OF THE PROJECT= -.670 PERCENT
GRADE AT THE END OF THE PROJECT = -.600 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	303+40.00	23.58
2	305+20.00	24.48

CATCH BASIN NUMBER	STATION	DRAINAGE BASIN TYPE	LENGTH (FEET)	SLOPE (%)	RUNOFF COEFFICIENT
103	303+50.17	CB08	.00	.500	.95
105	304+30.00	CB06	.00	.500	.95
109	306+30.00	CB06	.00	.600	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 100

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 2
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 302+09.23
PROJECT END AT STATION = 306+30.00
GRADE AT THE BEGINNING OF THE PROJECT= -.670 PERCENT
GRADE AT THE END OF THE PROJECT = -.600 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	302+70.00	303+40.00	23.58	304+10.00	-.670	.500
2	140.00	304+50.00	305+20.00	24.48	305+90.00	.500	-.600

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	303+40.00			303+50.17	23.78
2	140.00	305+20.00	305+13.64	24.29		

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LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 100

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	DRAINAGE BASIN RUNOFF COEFF.	TOTAL AREA (ACRES)
103	CB08	303+50.17	38.00	220.77	.500	.19	.95	.19
105	CB06	304+30.00	38.00	83.64	.500	.07	.95	.07
109	CB06	306+30.00	38.00	116.36	.600	.10	.95	.10

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
103	CB08	303+50.17	.183	145.97	6.03	7.80	1.428
105	CB06	304+30.00	.069	91.86	5.03	8.05	.558
109	CB06	306+30.00	.096	122.41	5.43	7.95	.767

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 100

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
103	CB08	303+50.17	1.428	1.428	.000	5.25	1.00
105	CB06	304+30.00	.558	.558	.500	5.60	1.00
109	CB06	306+30.00	.767	.767	-.600	6.10	.99

INLET NO.	INLET TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
103	CB08	303+50.17	.000	---	22.83	
105	CB06	304+30.00	.000	103	23.08	
109	CB06	306+30.00	.011	---	22.87	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

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LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 200

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 2
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 302+09.23
PROJECT END AT STATION = 305+90.00
GRADE AT THE BEGINNING OF THE PROJECT= -.670 PERCENT
GRADE AT THE END OF THE PROJECT = -.600 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	303+40.00	23.58
2	305+20.00	24.48

CATCH BASIN NUMBER	CATCH BASIN STATION	DRAINAGE BASIN TYPE	DRAINAGE BASIN LENGTH (FEET)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN RUNOFF COEFFICIENT
203	302+89.00	CB06	6.00	.670	.95
205	303+50.17	CB08	6.00	.500	.95
207	304+30.00	CB06	6.00	.500	.95
211	305+70.00	CB06	6.00	.600	.95
1	305+90.00	CB06	.00	.600	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 200

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 2
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 302+09.23
PROJECT END AT STATION = 305+90.00
GRADE AT THE BEGINNING OF THE PROJECT= -.670 PERCENT
GRADE AT THE END OF THE PROJECT = -.600 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	302+70.00	303+40.00	23.58	304+10.00	-.670	.500
2	140.00	304+50.00	305+20.00	24.48	305+90.00	.500	-.600

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	303+40.00			303+50.17	23.78
2	140.00	305+20.00	305+13.64	24.29		

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 200

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	DRAINAGE BASIN RUNOFF COEFF.	TOTAL AREA (ACRES)
203	CB06	302+89.00	38.00	79.77	.511	.01	.95	.08
205	CB08	303+50.17	38.00	141.00	.500	.02	.95	.14
207	CB06	304+30.00	38.00	83.64	.500	.01	.95	.08
211	CB06	305+70.00	38.00	56.36	.443	.01	.95	.06
1	CB06	305+90.00	38.00	20.00	.600	.02	.95	.02

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
203	CB06	302+89.00	.077	88.36	5.00	8.06	.617
205	CB08	303+50.17	.135	88.41	5.00	8.06	1.090
207	CB06	304+30.00	.080	91.86	5.03	8.05	.646
211	CB06	305+70.00	.054	67.98	5.00	8.06	.436
1	CB06	305+90.00	.017	42.94	5.00	8.06	.134

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 200

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
203	CB06	302+89.00	.617	.617	-.511	5.79	1.00
205	CB08	303+50.17	1.090	1.090	.000	4.39	1.00
207	CB06	304+30.00	.646	.646	.500	5.92	1.00
211	CB06	305+70.00	.436	.436	-.443	5.22	1.00
1	CB06	305+90.00	.134	.134	-.600	3.17	1.00

INLET NO.	INLET TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
203	CB06	302+89.00	.000	205	22.99	
205	CB08	303+50.17	.000	---	22.83	
207	CB06	304+30.00	.000	205	23.08	
211	CB06	305+70.00	.000	1	23.21	
1	CB06	305+90.00	.000	---	23.11	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 300

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 5
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 306+30.00
PROJECT END AT STATION = 324+60.00
GRADE AT THE BEGINNING OF THE PROJECT= -.600 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	308+20.00	22.68
2	311+90.00	24.52
3	316+00.00	22.88
4	319+00.00	24.38
5	323+05.00	22.76

CATCH BASIN NUMBER	CATCH BASIN STATION	DRAINAGE BASIN TYPE	DRAINAGE BASIN LENGTH (FEET)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN RUNOFF COEFFICIENT
333	308+26.55	CB08	.00	.500	.95
331	309+50.00	CB06	.00	.500	.95
327	311+00.00	CB06	.00	.500	.95
325	313+00.00	CB06	.00	.400	.95
323	314+50.00	CB06	.00	.400	.95
319	315+92.22	CB08	.00	.400	.95
317	317+90.00	CB06	.00	.500	.95
313	319+90.00	CB06	.00	.400	.95
311	321+50.00	CB06	.00	.400	.95
307	322+97.22	CB08	.00	.500	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 300

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 5
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 306+30.00
PROJECT END AT STATION = 324+60.00
GRADE AT THE BEGINNING OF THE PROJECT= -.600 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	307+50.00	308+20.00	22.68	308+90.00	-.600	.497
2	140.00	311+20.00	311+90.00	24.52	312+60.00	.497	-.400
3	140.00	315+30.00	316+00.00	22.88	316+70.00	-.400	.500
4	140.00	318+30.00	319+00.00	24.38	319+70.00	.500	-.400
5	140.00	322+35.00	323+05.00	22.76	323+75.00	-.400	.500

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	308+20.00			308+26.55	22.87
2	140.00	311+90.00	311+97.59	24.36		
3	140.00	316+00.00			315+92.22	23.04
4	140.00	319+00.00	319+07.78	24.22		
5	140.00	323+05.00			322+97.22	22.92

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 300

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	DRAINAGE BASIN RUNOFF COEFF.	TOTAL AREA (ACRES)
333	CB08	308+26.55	38.00	320.00	.500	.28	.95	.28
331	CB06	309+50.00	38.00	150.00	.500	.13	.95	.13
327	CB06	311+00.00	38.00	97.59	.500	.09	.95	.09
325	CB06	313+00.00	38.00	102.41	.400	.09	.95	.09
323	CB06	314+50.00	38.00	150.00	.400	.13	.95	.13
319	CB08	315+92.22	38.00	340.00	.400	.30	.95	.30
317	CB06	317+90.00	38.00	117.78	.500	.10	.95	.10
313	CB06	319+90.00	38.00	82.22	.400	.07	.95	.07
311	CB06	321+50.00	38.00	160.00	.400	.14	.95	.14
307	CB08	322+97.22	38.00	310.00	.500	.27	.95	.27

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
333	CB08	308+26.55	.265	200.19	6.82	7.62	2.020
331	CB06	309+50.00	.124	154.74	6.17	7.77	.966
327	CB06	311+00.00	.081	104.73	5.29	7.98	.646
325	CB06	313+00.00	.085	109.23	5.62	7.90	.671
323	CB06	314+50.00	.124	154.74	6.45	7.70	.958
319	CB08	315+92.22	.282	201.40	7.15	7.54	2.126
317	CB06	317+90.00	.098	123.76	5.65	7.89	.771
313	CB06	319+90.00	.068	90.58	5.23	8.00	.545
311	CB06	321+50.00	.133	164.45	6.60	7.67	1.017
307	CB08	322+97.22	.257	167.16	6.36	7.72	1.985

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010

STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 300

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
333	CB08	308+26.55	2.020	2.034	.000	6.65	1.00
331	CB06	309+50.00	.966	.966	.497	6.89	.99
327	CB06	311+00.00	.646	.646	.497	5.92	1.00
325	CB06	313+00.00	.671	.671	-.400	6.26	1.00
323	CB06	314+50.00	.958	.958	-.400	7.15	1.00
319	CB08	315+92.22	2.126	2.126	.000	6.85	1.00
317	CB06	317+90.00	.771	.771	.500	6.32	1.00
313	CB06	319+90.00	.545	.545	-.400	5.79	1.00
311	CB06	321+50.00	1.017	1.017	-.400	7.31	1.00
307	CB08	322+97.22	1.985	1.985	.000	6.54	1.00

INLET NO.	TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
333	CB08	308+26.55	.000	---	21.92	
331	CB06	309+50.00	.014	333	22.38	
327	CB06	311+00.00	.000	331	23.12	
325	CB06	313+00.00	.000	323	23.13	
323	CB06	314+50.00	.000	319	22.53	
319	CB08	315+92.22	.000	---	22.09	
317	CB06	317+90.00	.000	319	22.88	
313	CB06	319+90.00	.000	311	23.07	
311	CB06	321+50.00	.000	307	22.43	
307	CB08	322+97.22	.000	---	21.97	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza/JRE DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: JENNIFER JEAN - 400

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 1
ROADWAY WIDTH (FEET) = 18.00
PROJECT BEGIN AT STATION = 500+00.00
PROJECT END AT STATION = 502+50.00
GRADE AT THE BEGINNING OF THE PROJECT= -2.500 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	501+60.00	20.42

CATCH BASIN NUMBER	CATCH BASIN STATION	DRAINAGE BASIN TYPE	DRAINAGE BASIN LENGTH (FEET)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN RUNOFF COEFFICIENT
405	500+63.00	CB06	8.00	.500	.95
403	502+00.00	CB08	10.00	.500	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza/JRE DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: JENNIFER JEAN - 400

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 1
ROADWAY WIDTH (FEET) = 18.00
PROJECT BEGIN AT STATION = 500+00.00
PROJECT END AT STATION = 502+50.00
GRADE AT THE BEGINNING OF THE PROJECT= -2.500 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	120.00	501+00.00	501+60.00	20.42	502+20.00	-2.500	.500

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	120.00	501+60.00			502+00.00	20.67

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza/JRE DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: JENNIFER JEAN - 400

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	WIDTH (FT.)	SLOPE (%)	AREA (ACRES)	RUNOFF COEFF.	TOTAL AREA (ACRES)
405	CB06	500+63.00	8.00	63.00	.500	.01	.95	.04
403	CB08	502+00.00	18.00	187.00	.500	.04	.95	.12

INLET NO.	TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
405	CB06	500+63.00	.036	63.51	5.00	8.06	.288
403	CB08	502+00.00	.114	138.18	5.90	7.83	.895

DESIGNER: Brett Liuzza/JRE DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: JENNIFER JEAN - 400

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
405	CB06	500+63.00	.288	.288	-2.500	3.23	.99
403	CB08	502+00.00	.895	.898	.000	3.86	1.00

INLET NO.	TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
405	CB06	500+63.00	.003	403	22.40	
403	CB08	502+00.00	.000	---	20.22	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 400

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 5
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 305+70.00
PROJECT END AT STATION = 327+00.00
GRADE AT THE BEGINNING OF THE PROJECT= -.600 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	308+20.00	22.68
2	311+90.00	24.52
3	316+00.00	22.88
4	319+00.00	24.38
5	323+05.00	22.76

CATCH BASIN NUMBER	STATION	TYPE	DRAINAGE BASIN LENGTH (FEET)	SLOPE (%)	RUNOFF COEFFICIENT
451	307+20.00	CB06	6.00	.600	.95
447	308+26.55	CB08	6.00	.500	.95
445	309+50.00	CB06	6.00	.500	.95
443	311+20.00	CB06	6.00	.500	.95
439	313+20.00	CB06	6.00	.400	.95
437	315+00.00	CB06	6.00	.400	.95
433	315+92.22	CB08	6.00	.400	.95
431	317+70.00	CB06	6.00	.500	.95
427	318+52.00	CB06	6.00	.500	.95
423	320+52.00	CB06	6.00	.400	.95
419	321+90.00	CB06	6.00	.400	.95
417	322+97.22	CB08	6.00	.500	.95
413	324+10.00	CB06	12.50	.500	.95
411	325+50.00	CB06	12.50	.500	.95
407	326+00.00	CB06	60.00	.500	.95

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 400

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 5
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 305+70.00
PROJECT END AT STATION = 327+00.00
GRADE AT THE BEGINNING OF THE PROJECT= -.600 PERCENT

GRADE AT THE END OF THE PROJECT = .500 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	307+50.00	308+20.00	22.68	308+90.00	-.600	.497
2	140.00	311+20.00	311+90.00	24.52	312+60.00	.497	-.400
3	140.00	315+30.00	316+00.00	22.88	316+70.00	-.400	.500
4	140.00	318+30.00	319+00.00	24.38	319+70.00	.500	-.401
5	140.00	322+35.00	323+05.00	22.76	323+75.00	-.401	.500

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	308+20.00			308+26.55	22.87
2	140.00	311+90.00	311+97.59	24.36		
3	140.00	316+00.00			315+92.22	23.04
4	140.00	319+00.00	319+07.69	24.22		
5	140.00	323+05.00			322+97.31	22.91

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 400

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	DRAINAGE BASIN RUNOFF COEFF.	TOTAL AREA (ACRES)
451	CB06	307+20.00	38.00	150.00	.600	.02	.95	.15
447	CB08	308+26.55	38.00	230.00	.500	.03	.95	.23
445	CB06	309+50.00	38.00	170.00	.497	.02	.95	.17
443	CB06	311+20.00	38.00	77.59	.497	.01	.95	.08
439	CB06	313+20.00	38.00	122.41	.400	.02	.95	.12
437	CB06	315+00.00	38.00	180.00	.400	.02	.95	.18
433	CB08	315+92.22	6.00	270.00	.400	.04	.95	.27
431	CB06	317+70.00	38.00	82.00	.500	.01	.95	.08
427	CB06	318+52.00	38.00	55.69	.358	.01	.95	.06
423	CB06	320+52.00	38.00	144.31	.401	.02	.95	.15
419	CB06	321+90.00	38.00	138.00	.401	.02	.95	.14
417	CB08	322+97.22	38.00	220.00	.500	.03	.95	.22
413	CB06	324+10.00	38.00	140.00	.500	.04	.95	.16
411	CB06	325+50.00	38.00	50.00	.500	.01	.95	.06
407	CB06	326+00.00	60.00	100.00	.500	.14	.95	.22

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
451	CB06	307+20.00	.144	154.74	5.95	7.82	1.126
447	CB08	308+26.55	.221	129.17	5.75	7.87	1.737
445	CB06	309+50.00	.163	174.20	6.47	7.70	1.256
443	CB06	311+20.00	.074	86.40	5.00	8.06	.600
439	CB06	313+20.00	.117	128.17	5.99	7.81	.918

437	CB06	315+00.00	.173	183.97	6.90	7.60	1.313
433	CB08	315+92.22	.259	177.88	6.81	7.62	1.974
431	CB06	317+70.00	.079	90.38	5.00	8.06	.634
427	CB06	318+52.00	.053	67.42	5.00	8.06	.431
423	CB06	320+52.00	.138	149.23	6.35	7.73	1.070
419	CB06	321+90.00	.132	143.14	6.25	7.75	1.026
417	CB08	322+97.22	.211	119.01	5.56	7.92	1.671
413	CB06	324+10.00	.154	145.07	6.01	7.81	1.204
411	CB06	325+50.00	.055	62.80	5.00	8.06	.444
407	CB06	326+00.00	.214	116.62	5.52	7.93	1.694

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 400

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
451	CB06	307+20.00	1.126	1.126	-.600	7.04	.90
447	CB08	308+26.55	1.737	1.937	.000	6.44	1.00
445	CB06	309+50.00	1.256	1.256	.497	7.60	.93
443	CB06	311+20.00	.600	.600	.497	5.76	1.00
439	CB06	313+20.00	.918	.918	-.400	7.04	1.00
437	CB06	315+00.00	1.313	1.313	-.400	8.05	.99
433	CB08	315+92.22	1.974	1.994	.000	6.56	1.00
431	CB06	317+70.00	.634	.634	.500	5.88	1.00
427	CB06	318+52.00	.431	.431	.358	5.41	1.00
423	CB06	320+52.00	1.070	1.070	-.401	7.45	1.00
419	CB06	321+90.00	1.026	1.026	-.401	7.34	1.00
417	CB08	322+97.22	1.671	1.747	.000	6.01	1.00
413	CB06	324+10.00	1.204	1.204	.500	7.47	.94
411	CB06	325+50.00	.444	.673	.500	6.01	1.00
407	CB06	326+00.00	1.694	1.694	.500	8.50	.86

INLET NO.	INLET TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
451	CB06	307+20.00	.112	447	22.33	
447	CB08	308+26.55	.000	---	21.92	
445	CB06	309+50.00	.088	447	22.38	
443	CB06	311+20.00	.000	445	23.22	
439	CB06	313+20.00	.000	437	23.05	
437	CB06	315+00.00	.019	433	22.33	
433	CB08	315+92.22	.000	---	22.09	
431	CB06	317+70.00	.000	433	22.78	
427	CB06	318+52.00	.000	431	23.17	
423	CB06	320+52.00	.000	419	22.82	
419	CB06	321+90.00	.000	417	22.27	
417	CB08	322+97.22	.000	---	21.96	
413	CB06	324+10.00	.076	417	22.33	
411	CB06	325+50.00	.000	413	23.03	
407	CB06	326+00.00	.230	411	23.28	WIDTH FLOOD?

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 88183 REGION: 1
REMARKS: NICHOLSON SEG 1 - 500

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 3
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 329+18.00
PROJECT END AT STATION = 339+50.00
GRADE AT THE BEGINNING OF THE PROJECT= -.400 PERCENT
GRADE AT THE END OF THE PROJECT = .400 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	330+00.00	22.98
2	333+00.00	24.48
3	335+50.00	22.98

CATCH BASIN NUMBER	CATCH BASIN STATION	DRAINAGE BASIN TYPE	DRAINAGE BASIN LENGTH (FEET)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN RUNOFF COEFFICIENT
507	329+92.22	CB08	.00	.400	.95
509	332+00.00	CB06	.00	.500	.95
511	334+00.00	CB06	.00	.600	.95
515	335+64.00	CB08	.00	.400	.95
517	336+50.00	CB06	.00	.400	.95
711	338+50.00	CB06	.00	.400	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 88183 REGION: 1
REMARKS: NICHOLSON SEG 1 - 500

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 3
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 329+18.00
PROJECT END AT STATION = 339+50.00
GRADE AT THE BEGINNING OF THE PROJECT= -.400 PERCENT
GRADE AT THE END OF THE PROJECT = .400 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	329+30.00	330+00.00	22.98	330+70.00	-.400	.500
2	140.00	332+30.00	333+00.00	24.48	333+70.00	.500	-.600
3	140.00	334+80.00	335+50.00	22.98	336+20.00	-.600	.400

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	330+00.00			329+92.22	23.14
2	140.00	333+00.00	332+93.64	24.29		
3	140.00	335+50.00			335+64.00	23.15

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 88183 REGION: 1
REMARKS: NICHOLSON SEG 1 - 500

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	DRAINAGE BASIN RUNOFF COEFF.	TOTAL AREA (ACRES)
507	CB08	329+92.22	38.00	282.00	.400	.25	.95	.25
509	CB06	332+00.00	38.00	93.64	.500	.08	.95	.08
511	CB06	334+00.00	38.00	106.36	.600	.09	.95	.09
515	CB08	335+64.00	38.00	250.00	.400	.22	.95	.22
517	CB06	336+50.00	38.00	200.00	.400	.17	.95	.17
711	CB06	338+50.00	38.00	100.00	.400	.09	.95	.09

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
507	CB08	329+92.22	.234	211.23	7.28	7.51	1.756
509	CB06	332+00.00	.078	101.05	5.22	8.00	.621
511	CB06	334+00.00	.088	112.95	5.26	7.99	.705
515	CB08	335+64.00	.207	168.34	6.66	7.65	1.586
517	CB06	336+50.00	.166	203.58	7.18	7.54	1.249
711	CB06	338+50.00	.083	106.98	5.58	7.91	.656

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 88183 REGION: 1
REMARKS: NICHOLSON SEG 1 - 500

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
507	CB08	329+92.22	1.756	1.756	.000	6.03	1.00
509	CB06	332+00.00	.621	.621	.500	5.83	1.00
511	CB06	334+00.00	.705	.705	-.600	5.91	1.00
515	CB08	335+64.00	1.586	1.591	.000	5.65	1.00
517	CB06	336+50.00	1.249	1.249	.400	7.90	1.00
711	CB06	338+50.00	.656	.656	.400	6.21	1.00

INLET NO.	TYPE	STATION	BYPASS Q (CFS)	TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
507	CB08	329+92.22	.000	---	22.19	SPACING>200?
509	CB06	332+00.00	.000	507	23.03	
511	CB06	334+00.00	.000	515	22.93	
515	CB08	335+64.00	.000	---	22.20	
517	CB06	336+50.00	.006	515	22.43	
711	CB06	338+50.00	.000	517	23.23	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

Page 3

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: JENNIFER JEAN - 600

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 1
ROADWAY WIDTH (FEET) = 12.00
PROJECT BEGIN AT STATION = 200+00.00
PROJECT END AT STATION = 202+32.76
GRADE AT THE BEGINNING OF THE PROJECT= -2.500 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	201+60.00	19.98

CATCH BASIN NUMBER	CATCH BASIN STATION	DRAINAGE BASIN TYPE	DRAINAGE BASIN LENGTH (FEET)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN RUNOFF COEFFICIENT
603	202+00.00	CB08	.00	.500	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: JENNIFER JEAN - 600

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 1
ROADWAY WIDTH (FEET) = 12.00
PROJECT BEGIN AT STATION = 200+00.00
PROJECT END AT STATION = 202+32.76
GRADE AT THE BEGINNING OF THE PROJECT= -2.500 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	120.00	201+00.00	201+60.00	19.98	202+20.00	-2.500	.500

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	120.00	201+60.00			202+00.00	20.23

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

Page 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: JENNIFER JEAN - 600

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	WIDTH (FT.)	SLOPE (%)	AREA (ACRES)	RUNOFF COEFF.	TOTAL AREA (ACRES)
603	CB08	202+00.00	12.00	232.76	.500	.06	.95	.06

INLET NO.	TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
603	CB08	202+00.00	.061	200.36	6.82	7.62	.464

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: JENNIFER JEAN - 600

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
603	CB08	202+00.00	.464	.464	.000	2.48	1.00

INLET NO.	TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
603	CB08	202+00.00	.000	---	19.93	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 600

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 3
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 327+00.00
PROJECT END AT STATION = 339+50.00
GRADE AT THE BEGINNING OF THE PROJECT= -.400 PERCENT
GRADE AT THE END OF THE PROJECT = .400 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	330+00.00	22.98
2	333+00.00	24.48
3	335+50.00	22.98

CATCH BASIN NUMBER	STATION	DRAINAGE BASIN TYPE	LENGTH (FEET)	SLOPE (%)	RUNOFF COEFFICIENT
607	327+06.00	CB06	60.00	.400	.95
611	328+20.00	CB06	.00	.400	.95
617	329+92.22	CB08	6.00	.400	.95
621	330+73.00	CB06	9.00	.500	.95
625	331+80.00	CB06	.00	.500	.95
631	332+52.00	CB06	.00	.500	.95
635	334+00.00	CB06	.00	.600	.95
641	335+64.00	CB08	.00	.400	.95
643	337+00.00	CB06	.00	.400	.95
819	338+50.00	CB06	.00	.400	.95

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 600

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 3
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 327+00.00
PROJECT END AT STATION = 339+50.00
GRADE AT THE BEGINNING OF THE PROJECT= -.400 PERCENT
GRADE AT THE END OF THE PROJECT = .400 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT

1	140.00	329+30.00	330+00.00	22.98	330+70.00	-.400	.500
2	140.00	332+30.00	333+00.00	24.48	333+70.00	.500	-.600
3	140.00	334+80.00	335+50.00	22.98	336+20.00	-.600	.400

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	330+00.00			329+92.22	23.14
2	140.00	333+00.00	332+93.64	24.29		
3	140.00	335+50.00			335+64.00	23.15

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 600

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	DRAINAGE BASIN RUNOFF COEFF.	TOTAL AREA (ACRES)
607	CB06	327+06.00	60.00	6.00	.400	.01	.95	.01
611	CB06	328+20.00	38.00	114.00	.400	.10	.95	.10
617	CB08	329+92.22	6.00	253.00	.400	.03	.95	.26
621	CB06	330+73.00	38.00	107.00	.500	.02	.95	.12
625	CB06	331+80.00	38.00	72.00	.500	.06	.95	.06
631	CB06	332+52.00	38.00	41.64	.500	.04	.95	.04
635	CB06	334+00.00	38.00	106.36	.600	.09	.95	.09
641	CB08	335+64.00	38.00	300.00	.400	.26	.95	.26
643	CB06	337+00.00	38.00	150.00	.400	.13	.95	.13
819	CB06	338+50.00	38.00	100.00	.400	.09	.95	.09

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
607	CB06	327+06.00	.013	60.30	5.00	8.06	.103
611	CB06	328+20.00	.094	120.17	5.84	7.85	.742
617	CB08	329+92.22	.243	172.32	6.72	7.64	1.855
621	CB06	330+73.00	.110	113.55	5.46	7.94	.871
625	CB06	331+80.00	.060	81.41	5.00	8.06	.481
631	CB06	332+52.00	.035	56.37	5.00	8.06	.278
635	CB06	334+00.00	.088	112.95	5.26	7.99	.705
641	CB08	335+64.00	.249	168.34	6.66	7.65	1.903
643	CB06	337+00.00	.124	154.74	6.45	7.70	.958
819	CB06	338+50.00	.083	106.98	5.58	7.91	.656

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 600

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
607	CB06	327+06.00	.103	.103	-.400	3.10	1.00
611	CB06	328+20.00	.742	.742	-.400	6.50	1.00
617	CB08	329+92.22	1.855	1.855	.000	6.25	1.00
621	CB06	330+73.00	.871	.871	.500	6.62	1.00
625	CB06	331+80.00	.481	.481	.500	5.30	1.00
631	CB06	332+52.00	.278	.278	.327	4.67	1.00
635	CB06	334+00.00	.705	.705	-.600	5.91	1.00
641	CB08	335+64.00	1.903	1.903	.000	6.36	1.00
643	CB06	337+00.00	.958	.958	.400	7.15	1.00
819	CB06	338+50.00	.656	.656	.400	6.21	1.00

INLET NO.	INLET TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
607	CB06	327+06.00	.000	611	23.21	
611	CB06	328+20.00	.000	617	22.75	
617	CB08	329+92.22	.000	---	22.19	
621	CB06	330+73.00	.000	617	22.40	
625	CB06	331+80.00	.000	621	22.93	
631	CB06	332+52.00	.000	625	23.27	
635	CB06	334+00.00	.000	641	22.93	
641	CB08	335+64.00	.000	---	22.20	
643	CB06	337+00.00	.000	641	22.63	
819	CB06	338+50.00	.000	643	23.23	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 700

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 1
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 339+50.00
PROJECT END AT STATION = 345+00.00
GRADE AT THE BEGINNING OF THE PROJECT= -.800 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	342+10.00	22.50

CATCH BASIN NUMBER	CATCH BASIN STATION	DRAINAGE BASIN TYPE	DRAINAGE BASIN LENGTH (FEET)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN RUNOFF COEFFICIENT
709	340+50.00	CB06	.00	.800	.95
705	342+26.15	CB08	.00	.500	.95
703	344+20.00	CB06	.00	.500	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 700

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 1
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 339+50.00
PROJECT END AT STATION = 345+00.00
GRADE AT THE BEGINNING OF THE PROJECT= -.800 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	341+40.00	342+10.00	22.50	342+80.00	-.800	.500

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	342+10.00			342+26.15	22.72

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
Page 1

HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 700

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS
RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	DRAINAGE BASIN RUNOFF COEFF.	TOTAL AREA (ACRES)
709	CB06	340+50.00	38.00	100.00	.800	.09	.95	.09
705	CB08	342+26.15	38.00	370.00	.500	.32	.95	.32
703	CB06	344+20.00	38.00	80.00	.500	.07	.95	.07

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
709	CB06	340+50.00	.083	106.98	5.00	8.06	.668
705	CB08	342+26.15	.307	197.54	6.79	7.63	2.338
703	CB06	344+20.00	.066	88.57	5.00	8.06	.534

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 700

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS
INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
709	CB06	340+50.00	.668	.668	-.800	5.49	.95
705	CB08	342+26.15	2.338	2.372	.000	7.37	1.00
703	CB06	344+20.00	.534	.534	.500	5.51	1.00

INLET NO.	INLET TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
709	CB06	340+50.00	.034	705	22.83	
705	CB08	342+26.15	.000	---	21.77	
703	CB06	344+20.00	.000	705	22.60	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

Page 2

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 800

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 1
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 339+50.00
PROJECT END AT STATION = 345+00.00
GRADE AT THE BEGINNING OF THE PROJECT= -.800 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	342+10.00	22.50

CATCH BASIN NUMBER	STATION	DRAINAGE BASIN TYPE	LENGTH (FEET)	SLOPE (%)	RUNOFF COEFFICIENT
815	340+50.00	CB06	.00	.800	.95
811	342+26.15	CB08	.00	.500	.95
805	344+00.00	CB06	.00	.500	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 800

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 1
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 339+50.00
PROJECT END AT STATION = 345+00.00
GRADE AT THE BEGINNING OF THE PROJECT= -.800 PERCENT
GRADE AT THE END OF THE PROJECT = .500 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	341+40.00	342+10.00	22.50	342+80.00	-.800	.500

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	342+10.00			342+26.15	22.72

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
Page 1

HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 800

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS
RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	WIDTH (FT.)	SLOPE (%)	AREA (ACRES)	RUNOFF COEFF.	TOTAL AREA (ACRES)
815	CB06	340+50.00	38.00	100.00	.800	.09	.95	.09
811	CB08	342+26.15	38.00	350.00	.500	.31	.95	.31
805	CB06	344+00.00	38.00	100.00	.500	.09	.95	.09

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
815	CB06	340+50.00	.083	106.98	5.00	8.06	.668
811	CB08	342+26.15	.290	180.20	6.55	7.68	2.228
805	CB06	344+00.00	.083	106.98	5.34	7.97	.661

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 800

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS
INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
815	CB06	340+50.00	.668	.668	-.800	5.49	.95
811	CB08	342+26.15	2.228	2.262	.000	7.14	1.00
805	CB06	344+00.00	.661	.661	.500	5.97	1.00

INLET NO.	INLET TYPE	STATION	BYPASS Q (CFS)	TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
815	CB06	340+50.00	.034	811	22.83	
811	CB08	342+26.15	.000	---	21.77	
805	CB06	344+00.00	.000	811	22.50	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

Page 2

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - WEST OF CENTERLINE - SOUTH OF JENNIFER JEAN - 100 & 200

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 3
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 345+00.00
PROJECT END AT STATION = 357+59.20
GRADE AT THE BEGINNING OF THE PROJECT= -.600 PERCENT
GRADE AT THE END OF THE PROJECT = .740 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	348+00.00	22.15
2	352+50.00	23.95
3	355+00.00	22.70

CATCH BASIN NUMBER	CATCH BASIN STATION	DRAINAGE BASIN TYPE	DRAINAGE BASIN LENGTH (FEET)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN RUNOFF COEFFICIENT
921	346+20.00	CB06	.00	.600	.95
919	348+14.00	CB08	.00	.400	.95
915	350+00.00	CB06	.00	.400	.95
913	351+50.00	CB06	.00	.500	.95
909	353+00.00	CB06	.00	.500	.95
907	354+86.45	CB08	.00	.500	.95
903	356+50.00	CB06	.00	.740	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - WEST OF CENTERLINE - SOUTH OF JENNIFER JEAN - 100 & 200

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 3
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 345+00.00
PROJECT END AT STATION = 357+59.20
GRADE AT THE BEGINNING OF THE PROJECT= -.600 PERCENT
GRADE AT THE END OF THE PROJECT = .740 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	347+30.00	348+00.00	22.15	348+70.00	-.600	.400
2	140.00	351+80.00	352+50.00	23.95	353+20.00	.400	-.500
3	140.00	354+30.00	355+00.00	22.70	355+70.00	-.500	.740

Page 1

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	348+00.00			348+14.00	22.32
2	140.00	352+50.00	352+42.22	23.79		
3	140.00	355+00.00			354+86.45	22.91

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - WEST OF CENTERLINE - SOUTH OF JENNIFER JEAN - 100 & 200

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	DRAINAGE BASIN RUNOFF COEFF.	TOTAL AREA (ACRES)
921	CB06	346+20.00	38.00	120.00	.600	.10	.95	.10
919	CB08	348+14.00	38.00	380.00	.400	.33	.95	.33
915	CB06	350+00.00	38.00	150.00	.400	.13	.95	.13
913	CB06	351+50.00	38.00	92.22	.400	.08	.95	.08
909	CB06	353+00.00	38.00	57.78	.500	.05	.95	.05
907	CB08	354+86.45	38.00	350.00	.500	.31	.95	.31
903	CB06	356+50.00	38.00	109.20	.740	.10	.95	.10

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
921	CB06	346+20.00	.099	125.87	5.49	7.94	.789
919	CB08	348+14.00	.315	197.69	7.10	7.56	2.379
915	CB06	350+00.00	.124	154.74	6.45	7.70	.958
913	CB06	351+50.00	.076	99.74	5.43	7.95	.608
909	CB06	353+00.00	.048	69.15	5.00	8.06	.386
907	CB08	354+86.45	.290	190.28	6.69	7.65	2.218
903	CB06	356+50.00	.090	115.62	5.09	8.04	.727

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - WEST OF CENTERLINE - SOUTH OF JENNIFER JEAN - 100 & 200

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
921	CB06	346+20.00	.789	.789	-.600	6.16	.98
919	CB08	348+14.00	2.379	2.396	.000	7.42	1.00
915	CB06	350+00.00	.958	.958	.400	7.15	1.00
913	CB06	351+50.00	.608	.608	.400	6.03	1.00

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909	CB06	353+00.00	.386	.386	-.371	5.16	1.00
907	CB08	354+86.45	2.218	2.257	.000	7.13	1.00
903	CB06	356+50.00	.727	.727	.740	5.75	.95

INLET NO.	INLET TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
921	CB06	346+20.00	.016	919	22.28	
919	CB08	348+14.00	.000	---	21.37	
915	CB06	350+00.00	.000	919	22.00	
913	CB06	351+50.00	.000	915	22.60	
909	CB06	353+00.00	.000	907	22.74	
907	CB08	354+86.45	.000	---	21.96	
903	CB06	356+50.00	.039	907	22.86	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

Page 3

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza / JRE DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 1000

INPUT:

REGION = 1
DESIGN STORM (YEARS) = 10
NO. OF VERTICAL CURVES = 3
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 345+00.00
PROJECT END AT STATION = 357+59.20
GRADE AT THE BEGINNING OF THE PROJECT= -.600 PERCENT
GRADE AT THE END OF THE PROJECT = .740 PERCENT

CURVE NUMBER	PI STATION	PI ELEVATION
1	348+00.00	22.15
2	352+50.00	23.95
3	355+00.00	22.70

CATCH BASIN NUMBER	CATCH BASIN STATION	DRAINAGE BASIN TYPE	DRAINAGE BASIN LENGTH (FEET)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN RUNOFF COEFFICIENT
1025	347+00.00	CB06	.00	.600	.95
1017	348+14.00	CB08	.00	.400	.95
1015	350+00.00	CB06	.00	.400	.95
1013	351+50.00	CB06	.00	.400	.95
1009	353+00.00	CB06	.00	.500	.95
1007	354+86.45	CB08	.00	.500	.95
1003	356+50.00	CB06	.00	.740	.95

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza / JRE DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 1000

ROADWAY PROFILE
NO. OF VERTICAL CURVES = 3
ROADWAY WIDTH (FEET) = 38.00
PROJECT BEGIN AT STATION = 345+00.00
PROJECT END AT STATION = 357+59.20
GRADE AT THE BEGINNING OF THE PROJECT= -.600 PERCENT
GRADE AT THE END OF THE PROJECT = .740 PERCENT

VERTICAL CURVE DATA:

CURVE NUMBER	LENGTH (FEET)	PC STATION	PI STATION	PI ELEV.	PT STATION	G1 (PERCENT)	G2 (PERCENT
1	140.00	347+30.00	348+00.00	22.15	348+70.00	-.600	.400
2	140.00	351+80.00	352+50.00	23.95	353+20.00	.400	-.500

Page 1

3	140.00	354+30.00	355+00.00	22.70	355+70.00	-.500	.740	

CURVE NUMBER	LENGTH (FEET)	PI STATION	HIGH POINT STATION	HIGH POINT ELEVATION	LOW POINT STATION	LOW POINT ELEVATION
1	140.00	348+00.00			348+14.00	22.32
2	140.00	352+50.00	352+42.22	23.79		
3	140.00	355+00.00			354+86.45	22.91

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza / JRE DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 1000

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

RUNOFF COMPUTATIONS:

INLET NO.	INLET TYPE	STATION	DRAINAGE BASIN LENGTH (FT.)	DRAINAGE BASIN WIDTH (FT.)	DRAINAGE BASIN SLOPE (%)	DRAINAGE BASIN AREA (ACRES)	RUNOFF COEFF.	TOTAL AREA (ACRES)
1025	CB06	347+00.00	38.00	200.00	.600	.17	.95	.17
1017	CB08	348+14.00	38.00	300.00	.400	.26	.95	.26
1015	CB06	350+00.00	38.00	150.00	.400	.13	.95	.13
1013	CB06	351+50.00	38.00	92.22	.400	.08	.95	.08
1009	CB06	353+00.00	38.00	57.78	.500	.05	.95	.05
1007	CB08	354+86.45	38.00	350.00	.500	.31	.95	.31
1003	CB06	356+50.00	38.00	109.20	.740	.10	.95	.10

INLET NO.	INLET TYPE	STATION	TOTAL AREA X COEF.	HYDRAULIC LENGTH (FT.)	TIME OF CONC. (MIN.)	RAINFALL INTENSITY (IN./HR.)	Q (CFS)
1025	CB06	347+00.00	.166	203.58	6.62	7.66	1.270
1017	CB08	348+14.00	.249	189.84	6.98	7.58	1.885
1015	CB06	350+00.00	.124	154.74	6.45	7.70	.958
1013	CB06	351+50.00	.076	99.74	5.43	7.95	.608
1009	CB06	353+00.00	.048	69.15	5.00	8.06	.386
1007	CB08	354+86.45	.290	190.28	6.69	7.65	2.218
1003	CB06	356+50.00	.090	115.62	5.09	8.04	.727

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6000-082098
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza / JRE DATE: 08-04-2010
STATE PROJECT NUMBER 414-01-0039 REGION: 1
REMARKS: NICHOLSON SEG 1 - 1000

INLET SPACING AND SELECTION
DESIGN STORM = 10 YEARS

INLET SPACING AND SELECTION:

INLET NO.	INLET TYPE	STATION	Q (CFS)	Q+QBYPASS (CFS)	LONGITUDINAL SLOPE (PERCENT)	WIDTH OF FLOODING (FEET)	INTERCEPTION RATIO
1025	CB06	347+00.00	1.270	1.270	-.600	7.37	.87
1017	CB08	348+14.00	1.885	2.044	.000	6.67	1.00
1015	CB06	350+00.00	.958	.958	.400	7.15	1.00
1013	CB06	351+50.00	.608	.608	.400	6.03	1.00

Page 2

1009	CB06	353+00.00	.386	.386	-.371	5.16	1.00
1007	CB08	354+86.45	2.218	2.257	.000	7.13	1.00
1003	CB06	356+50.00	.727	.727	.740	5.75	.95

INLET NO.	INLET TYPE	STATION	BYPASS Q (CFS)	BYPASS TO INLET NO.	PROFILE GUTTER ELEV.	REMARKS
1025	CB06	347+00.00	.160	1017	21.80	
1017	CB08	348+14.00	.000	---	21.37	
1015	CB06	350+00.00	.000	1017	22.00	
1013	CB06	351+50.00	.000	1015	22.60	
1009	CB06	353+00.00	.000	1007	22.74	
1007	CB08	354+86.45	.000	---	21.96	
1003	CB06	356+50.00	.039	1007	22.86	

A RUNOFF COEFFICIENT OF 0.95 WAS USED FOR PAVED ROADWAYS.

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Appendix No. 5: HYDR 6020 Output Report

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza/JRE DATE: 08-02-2010
REMARKS: Nicholson - 200

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 16.85

INPUT DATA:

LIN NUM	UPP END	LOW END	PIPE LEN (FT)	DRAINAGE HYDL (FT)	DRAINAGE SLOP (%)	DRAINAGE AREA ACRES	RUN OFF COEF	TIME OF CONC	CONST SLOPE FT/FT	PIPE DIAM (IN)	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV. (FT)
202	201	203	11	112	1	.26	.55	0	.001	15	0	15.64	23.08
204	203	205	55	67	2.5	.07	.95	0	.001	15	0	15.58	23.08
206	205	207	74	124	2.5	.15	.95	0	.001	15	0	15.51	22.82
208	209	207	11	80	1	.22	.55	0	.001	15	0	15.51	22.9
210	207	211	136	101	2.5	.095	.95	0	.001	15	0	15.37	23.07
212	211	999	29	61	2.5	.055	.95	0	.030	15	0	14.50	23.20

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza/JRE DATE: 08-02-2010
REMARKS: Nicholson - 200

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 16.85

OUTPUT RESULTS - PART 1

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	PIPE LENGTH (FT)	DRAINAGE AREA DIST (FT)	DRAINAGE AREA SLOPE (%)	DRAINAGE AREA INCR. (ACRE)	DRAINAGE AREA TOTAL (ACRE)	RUNOFF COEFF.	ACRES X COEFF INCR.	ACRES X COEFF TOTAL
202	201	203	11.0	112.0	1.00	.26	.26	.55	.14	.14
204	203	205	55.0	67.0	2.50	.07	.33	.95	.07	.21
206	205	207	74.0	124.0	2.50	.15	.48	.95	.14	.35
208	209	207	11.0	80.0	1.00	.22	.22	.55	.12	.12
210	207	211	136.0	101.0	2.50	.10	.80	.95	.09	.56
212	211	999	29.0	61.0	2.50	.06	.85	.95	.05	.62

OUTPUT RESULTS - PART 2

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	TRAVEL TIME IN PIPE	TIME OF CONCEN.	RAIN-FALL INTENS.	CONST. SLOPE (FT/FT)	REQD. HYDR. SLOPE	Q CAPAC. (CFS)	CONST CLEAR (FT)
202	201	203	.22	8.79	7.20	.0010	.0002	2.21	4.35
204	203	205	.75	9.01	7.15	.0010	.0005	2.21	4.36
206	205	207	.61	9.76	7.01	.0010	.0012	2.21	4.15
208	209	207	.25	7.70	7.42	.0010	.0002	2.21	4.30
210	207	211	.72	10.37	6.89	.0010	.0031	2.21	4.48
212	211	999	.14	11.09	6.77	.0300	.0035	12.12	4.75

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
Page 1

HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza/JRE DATE: 08-02-2010
REMARKS: Nicholson - 200

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 16.85

OUTPUT RESULTS - PART 3

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	Q (CFS)	PIPE DIAM (IN)	V FT/SEC	VELOC. HEAD (FT)	FRICT. LOSS (FT)	JUNCTION LOSS (FT)	HYDRAULIC GRADE LINE ELEVATION UPPER	HYDRAULIC GRADE LINE ELEVATION LOWER
202	201	203	1.03	15	.84	.01	.00	.02	17.97	17.96
204	203	205	1.50	15	1.22	.02	.03	.01	17.94	17.92
206	205	207	2.47	15	2.01	.06	.09	.03	17.89	17.80
208	209	207	.90	15	.73	.01	.00	.01	17.81	17.80
210	207	211	3.88	15	3.16	.16	.42	.16	17.64	17.22
212	211	999	4.16	15	3.39	.18	.10	.09	17.13	17.03

OUTPUT RESULTS - PART 4

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV (FT)	HYDRAULIC CLEARANCE (FT)	REMARKS
202	201	203	15.65	15.64	23.08	5.11	
204	203	205	15.64	15.58	23.08	5.14	
206	205	207	15.58	15.51	22.82	4.93	
208	209	207	15.52	15.51	22.90	5.09	
210	207	211	15.51	15.37	23.07	5.43	
212	211	999	15.37	14.50	23.20	6.07	

EXIT LOSS = .18
MANNING'S ROUGHNESS COEFFICIENT OF .012 USED.
1.0 VELOCITY HEAD WAS USED FOR LOSSES AT MANHOLES.
ROADWAY THICKNESS= 19.0 INCHES.

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LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza/JRE DATE: 08-06-2010
REMARKS: Nicholson - 400

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 16.85

INPUT DATA:

LIN NUM	UPP END	LOW END	PIPE LEN (FT)	DRAINAGE HYDL (FT)	DRAINAGE SLOP (%)	DRAINAGE AREA ACRES	RUN OFF COEF	TIME OF CONC	CONST SLOPE FT/FT	PIPE DIAM (IN)	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV. (FT)
402	401	403	8	120	1	.09	.35	0	.002	0	0	16.00	20.2
404	403	405	136	95	2.5	.09	.95	0	.001	0	0	15.12	19.8
406	405	407	160	150	2.5	.07	.95	0	.001	0	0	14.94	19.98
408	407	411	48	134	2.5	.10	.95	0	.001	0	0	14.89	22.93
410	409	411	11	200	1	.30	.35	0	.002	0	0	16.00	21.0
412	411	413	137	169	2.5	.125	.95	0	.001	0	0	14.75	22.93
414	413	417	107	145	2.5	.157	.95	0	.001	0	0	14.64	22.32
416	415	417	9	185	1	.836	.35	0	.002	0	0	16.00	21.0
418	417	419	102	119	2.5	.221	.95	0	.001	0	0	14.54	21.96
420	419	423	135	138	2.5	.141	.95	0	.001	0	0	14.40	22.26
422	421	423	17	150	1	.549	.35	0	.0012	0	0	16.00	21.0
424	423	427	197	154	2.5	.159	.95	0	.001	0	0	14.20	22.81
426	425	427	11	130	1	.366	.35	0	.002	0	0	16.00	21.0
428	427	431	79	64	2.5	.052	.95	0	.001	0	0	14.12	23.16
430	429	431	11	211	1	.427	.35	0	.002	0	0	16.00	21.0
432	431	433	172	92	2.5	.084	.95	0	.001	0	0	13.94	22.77
434	433	437	70	180	2.5	.269	.95	0	.001	0	0	13.87	22.08
436	435	437	8	331	1	.860	.35	0	.002	0	0	16.00	21.0
438	437	439	194	178	2.5	.184	.95	0	.001	0	0	0	22.32
440	439	443	196	130	2.5	.136	.95	0	.001	0	0	13.48	23.04
442	441	443	11	178	1	.633	.35	0	.002	0	0	16.00	21.0
444	443	445	166	80	2.5	.075	.95	0	.001	0	0	0	23.21
446	445	447	117	170	2.5	.173	.95	0	.001	0	0	13.19	22.37
448	447	451	101	123	2.5	.228	.95	0	.001	0	0	13.08	21.91
450	449	451	10	195	1	.690	.35	0	.002	0	0	16.00	21.0
452	451	999	74	150	2.5	.153	.95	0	.001	0	0	13.00	22.32

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza/JRE DATE: 08-06-2010
REMARKS: Nicholson - 400

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 16.85

OUTPUT RESULTS - PART 1

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	PIPE LENGTH (FT)	DRAINAGE AREA DIST (FT)	DRAINAGE AREA SLOPE (%)	DRAINAGE AREA INCR. (ACRE)	DRAINAGE AREA TOTAL (ACRE)	RUNOFF COEFF.	ACRES X COEFF INCR.	ACRES X COEFF TOTAL
402	401	403	8.0	120.0	1.00	.09	.09	.35	.03	.03

404	403	405	136.0	95.0	2.50	.09	.18	.95	.09	.12
406	405	407	160.0	150.0	2.50	.07	.25	.95	.07	.18
408	407	411	48.0	134.0	2.50	.10	.35	.95	.10	.28
410	409	411	11.0	200.0	1.00	.30	.30	.35	.11	.11
412	411	413	137.0	169.0	2.50	.13	.78	.95	.12	.50
414	413	417	107.0	145.0	2.50	.16	.93	.95	.15	.65
416	415	417	9.0	185.0	1.00	.84	.84	.35	.29	.29
418	417	419	102.0	119.0	2.50	.22	1.99	.95	.21	1.15
420	419	423	135.0	138.0	2.50	.14	2.13	.95	.13	1.29
422	421	423	17.0	150.0	1.00	.55	.55	.35	.19	.19
424	423	427	197.0	154.0	2.50	.16	2.84	.95	.15	1.63
426	425	427	11.0	130.0	1.00	.37	.37	.35	.13	.13
428	427	431	79.0	64.0	2.50	.05	3.26	.95	.05	1.81
430	429	431	11.0	211.0	1.00	.43	.43	.35	.15	.15
432	431	433	172.0	92.0	2.50	.08	3.77	.95	.08	2.04
434	433	437	70.0	180.0	2.50	.27	4.04	.95	.26	2.29
436	435	437	8.0	331.0	1.00	.86	.86	.35	.30	.30
438	437	439	194.0	178.0	2.50	.18	5.08	.95	.17	2.77
440	439	443	196.0	130.0	2.50	.14	5.22	.95	.13	2.90
442	441	443	11.0	178.0	1.00	.63	.63	.35	.22	.22
444	443	445	166.0	80.0	2.50	.08	5.92	.95	.07	3.19
446	445	447	117.0	170.0	2.50	.17	6.10	.95	.16	3.36
448	447	451	101.0	123.0	2.50	.23	6.33	.95	.22	3.57
450	449	451	10.0	195.0	1.00	.69	.69	.35	.24	.24
452	451	999	74.0	150.0	2.50	.15	7.17	.95	.15	3.96

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza/JRE DATE: 08-06-2010
REMARKS: Nicholson - 400

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 16.85

OUTPUT RESULTS - PART 2

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	TRAVEL TIME IN PIPE	TIME OF CONCEN.	RAIN-FALL INTENS.	CONST. SLOPE (FT/FT)	REQD. HYDR. SLOPE	Q CAPAC. (CFS)	CONST CLEAR (FT)
402	401	403	.85	15.05	6.14	.0020	.0000	3.13	1.10
404	403	405	3.95	15.90	6.03	.0010	.0001	2.21	1.46
406	405	407	3.22	19.84	5.54	.0010	.0002	2.21	1.80
408	407	411	.68	23.06	5.20	.0010	.0004	2.21	4.91
410	409	411	.38	18.38	5.71	.0020	.0001	3.13	1.89
412	411	413	1.56	23.74	5.13	.0010	.0005	3.60	4.71
414	413	417	.97	25.30	4.99	.0010	.0008	3.60	4.24
416	415	417	.11	17.83	5.77	.0020	.0006	3.13	1.90
418	417	419	.94	26.27	4.91	.0010	.0005	7.75	3.48
420	419	423	1.14	27.22	4.83	.0010	.0006	7.75	3.89
422	421	423	.30	16.42	5.95	.0012	.0003	2.42	1.90
424	423	427	1.34	28.35	4.73	.0010	.0010	7.75	4.58
426	425	427	.29	15.53	6.08	.0020	.0001	3.13	1.89
428	427	431	.49	29.69	4.63	.0010	.0012	7.75	5.13
430	429	431	.27	18.77	5.66	.0020	.0001	3.13	1.89
432	431	433	1.50	30.18	4.59	.0010	.0004	14.05	4.24
434	433	437	.56	31.69	4.48	.0010	.0005	14.05	3.72
436	435	437	.10	22.39	5.27	.0020	.0005	3.13	1.90
438	437	439	1.29	32.24	4.44	.0010	.0008	14.05	4.03

440	439	443	1.27	33.53	4.36	.0010	.0008	14.05	4.95
442	441	443	.17	17.56	5.81	.0020	.0003	3.13	1.89
444	443	445	1.00	34.80	4.28	.0010	.0009	14.05	5.32
446	445	447	.68	35.80	4.21	.0010	.0010	14.05	4.65
448	447	451	.55	36.48	4.17	.0010	.0011	14.05	4.31
450	449	451	.15	18.20	5.73	.0020	.0004	3.13	1.90
452	451	999	.53	37.03	4.14	.0010	.0005	22.85	4.33

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza/JRE DATE: 08-06-2010
REMARKS: Nicholson - 400

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 16.85

OUTPUT RESULTS - PART 3

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	Q (CFS)	PIPE DIAM (IN)	V FT/SEC	VELOC. HEAD (FT)	FRICT. LOSS (FT)	JUNCTION LOSS (FT)	HYDRAULIC GRADE LINE ELEVATION UPPER	HYDRAULIC GRADE LINE ELEVATION LOWER
402	401	403	.19	15	.16	.00	.00	.00	19.38	19.38
404	403	405	.70	15	.57	.01	.01	.00	19.38	19.36
406	405	407	1.02	15	.83	.01	.03	.01	19.36	19.32
408	407	411	1.45	15	1.18	.02	.02	.01	19.31	19.29
410	409	411	.60	15	.49	.00	.00	.01	19.30	19.29
412	411	413	2.58	18	1.46	.03	.07	.03	19.26	19.19
414	413	417	3.25	18	1.84	.05	.09	.03	19.16	19.07
416	415	417	1.69	15	1.38	.03	.01	.04	19.12	19.07
418	417	419	5.66	24	1.80	.05	.05	.05	19.02	18.97
420	419	423	6.22	24	1.98	.06	.09	.03	18.94	18.85
422	421	423	1.14	15	.93	.01	.00	.02	18.88	18.85
424	423	427	7.72	24	2.46	.09	.20	.09	18.76	18.56
426	425	427	.78	15	.63	.01	.00	.01	18.57	18.56
428	427	431	8.37	24	2.67	.11	.09	.11	18.45	18.36
430	429	431	.85	15	.69	.01	.00	.01	18.37	18.36
432	431	433	9.36	30	1.91	.06	.08	.06	18.30	18.23
434	433	437	10.28	30	2.09	.07	.04	.03	18.19	18.16
436	435	437	1.59	15	1.29	.03	.00	.04	18.20	18.16
438	437	439	12.31	30	2.51	.10	.15	.10	18.06	17.91
440	439	443	12.63	30	2.57	.10	.16	.05	17.86	17.70
442	441	443	1.29	15	1.05	.02	.00	.03	17.73	17.70
444	443	445	13.64	30	2.78	.12	.16	.12	17.58	17.42
446	445	447	14.14	30	2.88	.13	.12	.06	17.36	17.24
448	447	451	14.90	30	3.04	.14	.11	.07	17.17	17.06
450	449	451	1.38	15	1.27	.03	.00	.04	17.09	17.06
452	451	999	16.39	36	2.32	.08	.04	.08	16.97	16.93

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 5

DESIGNER: Brett Liuzza/JRE DATE: 08-06-2010
REMARKS: Nicholson - 400

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
Page 3

DESIGN STAGE ELEVATION AT OUTFALL = 16.85

OUTPUT RESULTS - PART 4

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV (FT)	HYDRAULIC CLEARANCE (FT)	REMARKS
402	401	403	16.02	16.00	20.20	.82	
404	403	405	15.26	15.12	19.80	.42	
406	405	407	15.10	14.94	19.98	.62	
408	407	411	14.94	14.89	22.93	3.62	
410	409	411	16.02	16.00	21.00	1.70	
412	411	413	14.89	14.75	22.93	3.67	
414	413	417	14.75	14.64	22.32	3.16	
416	415	417	16.02	16.00	21.00	1.88	
418	417	419	14.64	14.54	21.96	2.94	
420	419	423	14.54	14.40	22.26	3.32	
422	421	423	16.02	16.00	21.00	2.12	
424	423	427	14.40	14.20	22.81	4.05	
426	425	427	16.02	16.00	21.00	2.43	
428	427	431	14.20	14.12	23.16	4.71	
430	429	431	16.02	16.00	21.00	2.63	
432	431	433	14.11	13.94	22.77	4.47	
434	433	437	13.94	13.87	22.08	3.89	
436	435	437	16.02	16.00	21.00	2.80	
438	437	439	13.87	13.68	22.32	4.26	
440	439	443	13.68	13.48	23.04	5.18	
442	441	443	16.02	16.00	21.00	3.27	
444	443	445	13.47	13.31	23.21	5.63	
446	445	447	13.31	13.19	22.37	5.01	
448	447	451	13.18	13.08	21.91	4.74	
450	449	451	16.02	16.00	21.00	3.91	PART FULL
452	451	999	13.07	13.00	22.32	5.35	

EXIT LOSS = .08
MANNING'S ROUGHNESS COEFFICIENT OF .012 USED.
1.0 VELOCITY HEAD WAS USED FOR LOSSES AT MANHOLES.
ROADWAY THICKNESS= 19.0 INCHES.

Page 4

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza/JRE DATE: 08-03-2010
REMARKS: Nicholson - 600

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

INPUT DATA:

LIN NUM	UPP END	LOW END	PIPE LEN (FT)	DRAINAGE HYDL (FT)	DRAINAGE SLOP (%)	DRAINAGE AREA ACRES	RUN OFF COEF	TIME OF CONC	CONST SLOPE FT/FT	PIPE DIAM (IN)	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV. (FT)
604	603	605	108	100	1.0	.38	.65	0	.001	0	0	15.41	19.9
606	605	607	38	45	2.5	.08	.95	0	.001	0	0	15.37	21.0
608	607	609	9	25	1.0	.04	.35	0	.001	0	0	15.36	21.0
610	609	613	95	106	2.5	.11	.35	0	.001	0	0	15.26	23.0
612	611	613	6	150	1.0	.10	.35	0	.001	0	0	16.00	21.0
614	613	615	44	110	2.5	.19	.95	0	.001	0	0	15.21	22.2
616	615	625	112	95	2.0	.23	.65	0	.001	0	0	15.09	21.5
618	00	621	46	160	1.0	.25	.35	0	.0743	0	0	15.18	19.8
620	619	621	11	140	2.5	.04	.95	0	.001	0	0	15.18	21.0
622	621	623	37	0	0	0	0	0	.001	0	0	15.14	20.8
624	623	625	47	75	1.0	.17	.35	0	.001	0	0	15.09	19.8
626	625	633	61	85	2.5	.19	.95	0	.001	0	0	15.02	22.5
628	00	629	26	170	2.0	.29	.35	0	.09	0	0	15.95	20.4
630	629	631	6	52	1.0	.08	.35	0	.0128	0	0	15.09	20.3
632	631	633	67	75	2.5	.05	.95	0	.001	0	0	15.02	20.5
634	633	635	61	89	2.5	.15	.95	0	.001	0	0	14.96	22.0
636	635	639	68	50	2.5	.07	.95	0	.001	0	0	14.89	22.0
638	637	639	10	100	1.0	.25	.35	0	.001	0	0	16.00	21.0
640	639	643	69	125	2.5	.07	.95	0	.001	0	0	14.82	23.4
642	641	643	11	75	1.0	.10	.35	0	.001	0	0	16.00	22.0
644	643	647	145	122	2.5	.05	.95	0	.001	0	0	14.68	23.6
646	645	647	10	79	1.0	.17	.35	0	.001	0	0	16.00	21.2
648	647	651	159	650	2.5	.13	.95	0	.001	0	0	14.52	23.4
650	649	651	9	120	1.0	.16	.35	0	.001	0	0	16.00	20.0
652	651	653	130	140	2.5	.35	.95	0	.001	0	0	14.39	22.7
654	653	999	89	82	2.5	.16	.95	0	.001	0	0	14.30	23.1

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza/JRE DATE: 08-03-2010
REMARKS: Nicholson - 600

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

OUTPUT RESULTS - PART 1

LINE NO.	STRUCTURE- UPPER END	STRUCTURE- LOWER END	PIPE LENGTH (FT)	DRAINAGE AREA DIST (FT)	DRAINAGE AREA SLOPE (%)	DRAINAGE AREA INCR. (ACRE)	DRAINAGE AREA TOTAL (ACRE)	RUNOFF COEFF.	ACRES X COEFF INCR.	ACRES X COEFF TOTAL
604	603	605	108.0	100.0	1.00	.38	.38	.65	.25	.25

606	605	607	38.0	45.0	2.50	.08	.46	.95	.08	.32
608	607	609	9.0	25.0	1.00	.04	.50	.35	.01	.34
610	609	613	95.0	106.0	2.50	.11	.61	.35	.04	.38
612	611	613	6.0	150.0	1.00	.10	.10	.35	.04	.04
614	613	615	44.0	110.0	2.50	.19	.90	.95	.18	.59
616	615	625	112.0	95.0	2.00	.23	1.13	.65	.15	.74
618	00	621	46.0	160.0	1.00	.25	.25	.35	.09	.09
620	619	621	11.0	140.0	2.50	.04	.04	.95	.04	.04
622	621	623	37.0	.0	.00	.00	.29	.00	.00	.13
624	623	625	47.0	75.0	1.00	.17	.46	.35	.06	.19
626	625	633	61.0	85.0	2.50	.19	1.78	.95	.18	1.11
628	00	629	26.0	170.0	2.00	.29	.29	.35	.10	.10
630	629	631	6.0	52.0	1.00	.08	.37	.35	.03	.13
632	631	633	67.0	75.0	2.50	.05	.42	.95	.05	.18
634	633	635	61.0	89.0	2.50	.15	2.35	.95	.14	1.43
636	635	639	68.0	50.0	2.50	.07	2.42	.95	.07	1.49
638	637	639	10.0	100.0	1.00	.25	.25	.35	.09	.09
640	639	643	69.0	125.0	2.50	.07	2.74	.95	.07	1.65
642	641	643	11.0	75.0	1.00	.10	.10	.35	.04	.04
644	643	647	145.0	122.0	2.50	.05	2.89	.95	.05	1.73
646	645	647	10.0	79.0	1.00	.17	.17	.35	.06	.06
648	647	651	159.0	650.0	2.50	.13	3.19	.95	.12	1.91
650	649	651	9.0	120.0	1.00	.16	.16	.35	.06	.06
652	651	653	130.0	140.0	2.50	.35	3.70	.95	.33	2.30
654	653	999	89.0	82.0	2.50	.16	3.86	.95	.15	2.45

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza/JRE DATE: 08-03-2010
REMARKS: Nicholson - 600

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

OUTPUT RESULTS - PART 2

LINE NO.	STRUCTURE- UPPER END	STRUCTURE- LOWER END	TRAVEL TIME IN PIPE	TIME OF CONCEN.	RAIN- FALL INTENS.	CONST. SLOPE (FT/FT)	REQD. HYDR. SLOPE	Q CAPAC. (CFS)	CONST CLEAR (FT)
604	603	605	1.18	6.96	7.59	.0010	.0007	2.21	1.30
606	605	607	.33	8.14	7.33	.0010	.0011	2.21	2.51
608	607	609	.11	8.47	7.26	.0010	.0005	3.60	2.30
610	609	613	1.13	11.95	6.62	.0010	.0005	3.60	4.31
612	611	613	.59	16.42	5.95	.0010	.0000	2.21	1.91
614	613	615	.37	17.01	5.88	.0010	.0009	3.60	3.61
616	615	625	1.36	17.39	5.83	.0010	.0003	7.75	2.46
618	00	621	1.82	16.85	5.90	.0743	.0002	19.08	-1.88
620	619	621	.73	5.00	8.06	.0010	.0000	2.21	2.73
622	621	623	1.06	18.67	5.67	.0010	.0001	2.21	2.54
624	623	625	.94	19.73	5.55	.0010	.0002	2.21	1.58
626	625	633	.53	20.67	5.45	.0010	.0006	7.75	3.59
628	00	629	.85	15.03	6.14	.0900	.0001	20.99	-.97
630	629	631	.16	15.89	6.03	.0128	.0001	7.92	2.05
632	631	633	1.29	16.04	6.01	.0010	.0002	2.21	2.33
634	633	635	.42	21.20	5.39	.0010	.0010	7.75	3.15
636	635	639	.45	21.61	5.35	.0010	.0011	7.75	3.21
638	637	639	.37	14.01	6.29	.0010	.0001	2.21	1.91
640	639	643	.65	22.06	5.30	.0010	.0004	14.05	4.09

642	641	643	.99	12.52	6.53	.0010	.0000	2.21	2.91
644	643	647	1.31	22.71	5.24	.0010	.0004	14.05	4.36
646	645	647	.53	12.78	6.48	.0010	.0000	2.21	2.11
648	647	651	1.33	24.02	5.11	.0010	.0005	14.05	4.30
650	649	651	.54	15.05	6.14	.0010	.0000	2.21	.91
652	651	653	.93	25.35	4.99	.0010	.0007	14.05	3.76
654	653	999	.61	26.28	4.91	.0010	.0007	14.05	4.29

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 4

DESIGNER: Brett Liuzza/JRE DATE: 08-03-2010
REMARKS: Nicholson - 600

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

OUTPUT RESULTS - PART 3

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	Q (CFS)	PIPE DIAM (IN)	V FT/SEC	VELOC. HEAD (FT)	FRICT. LOSS (FT)	JUNCTION LOSS (FT)	HYDRAULIC GRADE LINE ELEVATION UPPER	HYDRAULIC GRADE LINE ELEVATION LOWER
604	603	605	1.87	15	1.53	.04	.08	.05	19.74	19.60
606	605	607	2.37	15	1.93	.06	.04	.03	19.58	19.53
608	607	609	2.45	18	1.39	.03	.00	.03	19.50	19.50
610	609	613	2.49	18	1.41	.03	.05	.02	19.48	19.44
612	611	613	.21	15	.17	.00	.00	.00	19.44	19.44
614	613	615	3.47	18	1.97	.06	.04	.06	19.38	19.34
616	615	625	4.32	24	1.37	.03	.03	.03	19.31	19.27
618	00	621	.52	15	.73	.01	.01	.00	19.30	19.30
620	619	621	.31	15	.25	.00	.00	.00	19.30	19.30
622	621	623	.71	15	.58	.01	.00	.01	19.29	19.29
624	623	625	1.03	15	.84	.01	.01	.01	19.28	19.27
626	625	633	6.02	24	1.92	.06	.04	.06	19.22	19.18
628	00	629	.62	15	.65	.01	.00	.00	19.21	19.20
630	629	631	.78	15	.64	.01	.00	.00	19.20	19.20
632	631	633	1.06	15	.87	.01	.02	.01	19.19	19.18
634	633	635	7.68	24	2.45	.09	.06	.09	19.09	19.03
636	635	639	7.98	24	2.54	.10	.07	.05	18.98	18.90
638	637	639	.55	15	.45	.00	.00	.00	18.91	18.90
640	639	643	8.72	30	1.78	.05	.03	.05	18.85	18.83
642	641	643	.23	15	.19	.00	.00	.00	18.83	18.83
644	643	647	9.05	30	1.84	.05	.06	.05	18.78	18.71
646	645	647	.39	15	.31	.00	.00	.00	18.72	18.71
648	647	651	9.76	30	1.99	.06	.08	.06	18.65	18.58
650	649	651	.34	15	.28	.00	.00	.00	18.58	18.58
652	651	653	11.47	30	2.34	.08	.09	.08	18.49	18.41
654	653	999	12.03	30	2.45	.09	.07	.05	18.36	18.29

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 5

DESIGNER: Brett Liuzza/JRE DATE: 08-03-2010
REMARKS: Nicholson - 600

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
Page 3

DESIGN STAGE ELEVATION AT OUTFALL = 18.20

OUTPUT RESULTS - PART 4

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV (FT)	HYDRAULIC CLEARANCE (FT)	REMARKS
604	603	605	15.52	15.41	19.90	.16	
606	605	607	15.41	15.37	21.00	1.42	
608	607	609	15.37	15.36	21.00	1.50	
610	609	613	15.36	15.26	23.00	3.52	
612	611	613	16.01	16.00	21.00	1.56	
614	613	615	15.25	15.21	22.20	2.82	
616	615	625	15.20	15.09	21.50	2.19	
618	00	621	18.60	15.18	19.80	.50	CONST CLEAR?
620	619	621	15.19	15.18	21.00	1.70	
622	621	623	15.18	15.14	20.80	1.51	
624	623	625	15.14	15.09	19.80	.52	
626	625	633	15.08	15.02	22.50	3.28	
628	00	629	18.29	15.95	20.40	1.19	CONST CLEAR?
630	629	631	15.17	15.09	20.30	1.10	
632	631	633	15.09	15.02	20.50	1.31	
634	633	635	15.02	14.96	22.00	2.91	
636	635	639	14.96	14.89	22.00	3.02	
638	637	639	16.01	16.00	21.00	2.09	
640	639	643	14.89	14.82	23.40	4.55	
642	641	643	16.01	16.00	22.00	3.17	
644	643	647	14.83	14.68	23.60	4.82	
646	645	647	16.01	16.00	21.20	2.48	
648	647	651	14.68	14.52	23.40	4.75	
650	649	651	16.01	16.00	20.00	1.42	
652	651	653	14.52	14.39	22.70	4.21	
654	653	999	14.39	14.30	23.10	4.74	

EXIT LOSS = .09
MANNING'S ROUGHNESS COEFFICIENT OF .012 USED.
1.0 VELOCITY HEAD WAS USED FOR LOSSES AT MANHOLES.
ROADWAY THICKNESS= 19.0 INCHES.

Page 4

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza/ JRE DATE: 08-03-2010
REMARKS: Nicholson - 800

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

INPUT DATA:

LIN NUM	UPP END	LOW END	PIPE LEN (FT)	DRAINAGE HYDL (FT)	SLOP (%)	AREA ACRES	RUN OFF COEF	TIME OF CONC	CONST SLOPE FT/FT	PIPE DIAM (IN)	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV. (FT)
802	801	803	11	53	1.0	.07	.35	0	.001	0	0	15.01	20.9
804	803	805	159	71	2.5	.09	.95	0	.001	0	0	14.85	22.5
806	805	807	10	106	1.0	.09	.35	0	.001	0	0	16.00	20.5
808	807	809	168	143	2.5	.10	.95	0	.001	0	0	14.69	22.5
810	809	811	81	180	2.5	.290	.95	0	.001	0	0	14.61	21.7
812	811	813	86	98	2.5	.10	.95	0	.001	0	0	14.52	22.1
814	813	815	197	111	2.5	.14	.95	0	.001	0	0	14.32	23.2
816	815	817	6	157	1	.06	.35	0	.001	0	0	16.00	20.5
818	817	999	23	113	2.5	.09	.95	0	.001	0	0	14.30	23.3

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza/ JRE DATE: 08-03-2010
REMARKS: Nicholson - 800

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

OUTPUT RESULTS - PART 1

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	PIPE LENGTH (FT)	DRAINAGE AREA DIST (FT)	DRAINAGE AREA SLOPE (%)	DRAINAGE AREA INCR. (ACRE)	DRAINAGE AREA TOTAL (ACRE)	RUNOFF COEFF.	ACRES X COEFF INCR.	ACRES X COEFF TOTAL
802	801	803	11.0	53.0	1.00	.07	.07	.35	.02	.02
804	803	805	159.0	71.0	2.50	.09	.16	.95	.09	.11
806	805	807	10.0	106.0	1.00	.09	.25	.35	.03	.14
808	807	809	168.0	143.0	2.50	.10	.35	.95	.10	.24
810	809	811	81.0	180.0	2.50	.29	.64	.95	.28	.51
812	811	813	86.0	98.0	2.50	.10	.74	.95	.10	.61
814	813	815	197.0	111.0	2.50	.14	.88	.95	.13	.74
816	815	817	6.0	157.0	1.00	.06	.94	.35	.02	.76
818	817	999	23.0	113.0	2.50	.09	1.03	.95	.09	.85

OUTPUT RESULTS - PART 2

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	TRAVEL TIME IN PIPE	TIME OF CONCEN.	RAIN-FALL INTENS.	CONST. SLOPE (FT/FT)	REQD. HYDR. SLOPE	Q CAPAC. (CFS)	CONST CLEAR (FT)
802	801	803	1.35	10.93	6.79	.0010	.0000	2.21	2.80
804	803	805	4.50	12.28	6.56	.0010	.0001	2.21	4.41

806	805	807	.24	16.78	5.91	.0010	.0001	2.21	1.41
808	807	809	2.47	17.03	5.88	.0010	.0004	2.21	4.56
810	809	811	.84	19.50	5.58	.0010	.0006	3.60	3.68
812	811	813	.76	20.34	5.48	.0010	.0009	3.60	4.16
814	813	815	1.45	21.10	5.40	.0010	.0012	3.60	5.35
816	815	817	.04	22.55	5.25	.0010	.0012	3.60	1.16
818	817	999	.27	22.59	5.25	.0010	.0003	7.75	5.14

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza/ JRE DATE: 08-03-2010
REMARKS: Nicholson - 800

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

OUTPUT RESULTS - PART 3

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	Q (CFS)	PIPE DIAM (IN)	V FT/SEC	VELOC. HEAD (FT)	FRICT. LOSS (FT)	JUNCTION LOSS (FT)	HYDRAULIC GRADE LINE ELEVATION UPPER	HYDRAULIC GRADE LINE ELEVATION LOWER
802	801	803	.17	15	.14	.00	.00	.00	18.89	18.89
804	803	805	.72	15	.59	.01	.02	.00	18.89	18.87
806	805	807	.84	15	.68	.01	.00	.00	18.87	18.87
808	807	809	1.39	15	1.13	.02	.07	.01	18.86	18.79
810	809	811	2.86	18	1.62	.04	.05	.04	18.75	18.70
812	811	813	3.33	18	1.88	.06	.07	.03	18.67	18.60
814	813	815	4.00	18	2.26	.08	.24	.04	18.56	18.32
816	815	817	4.00	18	2.26	.08	.01	.04	18.28	18.27
818	817	999	4.44	24	1.41	.03	.01	.03	18.24	18.23

OUTPUT RESULTS - PART 4

LINE NO.	STRUCTURE UPPER END	STRUCTURE LOWER END	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV (FT)	HYDRAULIC CLEARANCE (FT)	REMARKS
802	801	803	15.02	15.01	20.90	2.01	
804	803	805	15.01	14.85	22.50	3.61	
806	805	807	16.01	16.00	20.50	1.63	FLOW LINE ?
808	807	809	14.86	14.69	22.50	3.64	
810	809	811	14.69	14.61	21.70	2.95	
812	811	813	14.61	14.52	22.10	3.43	
814	813	815	14.52	14.32	23.20	4.64	
816	815	817	16.01	16.00	20.50	2.22	FLOW LINE ?
818	817	999	14.32	14.30	23.30	5.06	

EXIT LOSS = .03
MANNING'S ROUGHNESS COEFFICIENT OF .012 USED.
1.0 VELOCITY HEAD WAS USED FOR LOSSES AT MANHOLES.
ROADWAY THICKNESS= 19.0 INCHES.

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 1

DESIGNER: Brett Liuzza / JRE DATE: 08-04-2010
REMARKS: Nicholson - 1000

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

INPUT DATA:

LIN NUM	UPP END	LOW END	PIPE LEN (FT)	DRAINAGE HYDL (FT)	DRAINAGE SLOP (%)	DRAINAGE AREA ACRES	RUN OFF COEF	TIME OF CONC	CONST SLOPE FT/FT	PIPE DIAM (IN)	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV. (FT)
1002	1001	1005	145	75	2.5	.15	.95	0	.001	0	0	16.41	21.0
1004	1003	1005	11	150	1	.41	.35	0	.001	0	0	16.41	21.0
1006	1005	1009	147	140	2.5	.21	.95	0	.001	0	0	16.26	20.7
1008	1007	1009	11	196	1	.71	.35	0	.001	0	0	16.26	20.2
1010	1009	1011	190	122	2.5	.42	.95	0	.001	0	0	16.07	20.7
1012	1011	1015	147	111	2.5	.06	.95	0	.001	0	0	15.92	23.1
1014	1013	1015	11	250	1	.84	.35	0	.001	0	0	15.92	21.0
1016	1015	1017	147	155	2.5	.11	.95	0	.001	0	0	15.78	22.5
1018	1017	1019	180	193	2.5	.15	.95	0	.001	0	0	15.60	21.3
1020	1019	1023	62	390	2.5	.30	.95	0	.001	0	0	15.54	21.9
1022	00	1023	16	102	1	.35	.35	0	.1264	0	0	15.54	21.0
1024	1023	1025	46	0	0	0	0	0	.001	0	0	15.49	21.3
1026	1025	1027	11	105	1	.32	.35	0	.001	0	0	15.49	21.0
1028	1027	999	87	214	2.5	.14	.95	0	.001	0	0	15.40	22.5

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 2

DESIGNER: Brett Liuzza / JRE DATE: 08-04-2010
REMARKS: Nicholson - 1000

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

OUTPUT RESULTS - PART 1

LINE NO.	STRUCTURE- UPPER END	STRUCTURE- LOWER END	PIPE LENGTH (FT)	DRAINAGE AREA DIST (FT)	DRAINAGE AREA SLOPE (%)	DRAINAGE AREA INCR. (ACRE)	DRAINAGE AREA TOTAL (ACRE)	RUNOFF COEFF.	ACRES X COEFF INCR.	ACRES X COEFF TOTAL
1002	1001	1005	145.0	75.0	2.50	.15	.15	.95	.14	.14
1004	1003	1005	11.0	150.0	1.00	.41	.41	.35	.14	.14
1006	1005	1009	147.0	140.0	2.50	.21	.77	.95	.20	.49
1008	1007	1009	11.0	196.0	1.00	.71	.71	.35	.25	.25
1010	1009	1011	190.0	122.0	2.50	.42	1.90	.95	.40	1.13
1012	1011	1015	147.0	111.0	2.50	.06	1.96	.95	.06	1.19
1014	1013	1015	11.0	250.0	1.00	.84	.84	.35	.29	.29
1016	1015	1017	147.0	155.0	2.50	.11	2.91	.95	.10	1.59
1018	1017	1019	180.0	193.0	2.50	.15	3.06	.95	.14	1.73
1020	1019	1023	62.0	390.0	2.50	.30	3.36	.95	.29	2.02
1022	00	1023	16.0	102.0	1.00	.35	.35	.35	.12	.12
1024	1023	1025	46.0	.0	.00	.00	3.71	.00	.00	2.14
1026	1025	1027	11.0	105.0	1.00	.32	4.03	.35	.11	2.25

1028	1027	999	87.0	214.0	2.50	.14	4.17	.95	.13	2.38

OUTPUT RESULTS - PART 2

LINE NO.	STRUCTURE- UPPER END	STRUCTURE- LOWER END	TRAVEL TIME IN PIPE	TIME OF CONCEN.	RAIN-FALL INTENS.	CONST. SLOPE (FT/FT)	REQD. HYDR. SLOPE	Q CAPAC. (CFS)	CONST CLEAR (FT)
1002	1001	1005	2.58	5.00	8.06	.0010	.0003	2.21	1.36
1004	1003	1005	.26	16.42	5.95	.0010	.0001	2.21	1.50
1006	1005	1009	1.51	16.69	5.92	.0010	.0006	3.60	.96
1008	1007	1009	.16	18.24	5.73	.0010	.0004	2.21	.85
1010	1009	1011	1.54	18.40	5.71	.0010	.0007	7.75	.61
1012	1011	1015	1.17	19.94	5.53	.0010	.0007	7.75	3.20
1014	1013	1015	.14	20.06	5.51	.0010	.0005	2.21	1.99
1016	1015	1017	.90	21.11	5.40	.0010	.0012	7.75	2.74
1018	1017	1019	1.60	22.00	5.31	.0010	.0004	14.05	1.10
1020	1019	1023	.49	23.61	5.15	.0010	.0005	14.05	1.88
1022	00	1023	.43	14.12	6.28	.1264	.0001	24.88	.35
1024	1023	1025	.34	24.10	5.10	.0010	.0006	14.05	1.35
1026	1025	1027	.08	24.44	5.07	.0010	.0007	14.05	1.08
1028	1027	999	.59	24.52	5.06	.0010	.0007	14.05	2.60

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR6020-02042000
HYDRAULICS SECTION PAGE 3

DESIGNER: Brett Liuzza / JRE DATE: 08-04-2010
REMARKS: Nicholson - 1000

STATE PROJECT NUMBER 414-01-0039 REGION: 1

STORM SEWER DESIGN
DESIGN STORM = 10 YEARS
DESIGN STAGE ELEVATION AT OUTFALL = 18.20

OUTPUT RESULTS - PART 3

LINE NO.	STRUCTURE- UPPER END	STRUCTURE- LOWER END	Q (CFS)	PIPE DIAM (IN)	V FT/SEC	VELOC. HEAD (FT)	FRICT. LOSS (FT)	JUNCTION LOSS (FT)	HYDRAULIC GRADE LINE ELEVATION UPPER	HYDRAULIC GRADE LINE ELEVATION LOWER
1002	1001	1005	1.15	15	.94	.01	.04	.02	19.59	19.53
1004	1003	1005	.85	15	.70	.01	.00	.01	19.54	19.53
1006	1005	1009	2.87	18	1.63	.04	.09	.04	19.49	19.39
1008	1007	1009	1.42	15	1.16	.02	.00	.03	19.43	19.39
1010	1009	1011	6.46	24	2.06	.07	.13	.07	19.33	19.19
1012	1011	1015	6.58	24	2.09	.07	.11	.03	19.16	19.05
1014	1013	1015	1.62	15	1.32	.03	.01	.04	19.10	19.05
1016	1015	1017	8.58	24	2.73	.12	.18	.12	18.94	18.76
1018	1017	1019	9.18	30	1.87	.05	.08	.05	18.70	18.63
1020	1019	1023	10.38	30	2.11	.07	.03	.03	18.59	18.56
1022	00	1023	.77	15	.73	.01	.00	.00	18.56	18.56
1024	1023	1025	10.91	30	2.22	.08	.03	.08	18.48	18.45
1026	1025	1027	11.41	30	2.32	.08	.01	.04	18.41	18.40
1028	1027	999	12.06	30	2.46	.09	.06	.05	18.36	18.29

OUTPUT RESULTS - PART 4

LINE NO.	STRUCTURE- UPPER END	STRUCTURE- LOWER END	FLOW LINE ELEVATION UPPER	FLOW LINE ELEVATION LOWER	STREET ELEV (FT)	HYDRAULIC CLEARANCE (FT)	REMARKS
1002	1001	1005	16.56	16.41	21.00	1.41	

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1004	1003	1005	16.42	16.41	21.00	1.46	
1006	1005	1009	16.41	16.26	20.70	1.21	
1008	1007	1009	16.27	16.26	20.20	.77	
1010	1009	1011	16.26	16.07	20.70	1.37	CONST CLEAR?
1012	1011	1015	16.07	15.92	23.10	3.94	
1014	1013	1015	15.93	15.92	21.00	1.90	
1016	1015	1017	15.93	15.78	22.50	3.56	FLOW LINE ?
1018	1017	1019	15.78	15.60	21.30	2.60	
1020	1019	1023	15.60	15.54	21.90	3.31	
1022	00	1023	17.56	15.54	21.00	2.44	CONST CLEAR?
1024	1023	1025	15.54	15.49	21.30	2.82	
1026	1025	1027	15.50	15.49	21.00	2.59	FLOW LINE ?
1028	1027	999	15.49	15.40	22.50	4.14	

EXIT LOSS = .09
MANNING'S ROUGHNESS COEFFICIENT OF .012 USED.
1.0 VELOCITY HEAD WAS USED FOR LOSSES AT MANHOLES.
ROADWAY THICKNESS= 19.0 INCHES.