## **DESIGN STUDY**

# SOUTH CHOCTAW DRIVE (Flannery Road to Central Thruway) Project No. 02-CS-HC-0006

# FOR CITY OF BATON ROUGE/PARISH OF EAST BATON ROUGE

#### Prepared By:

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In association with:

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GERALD G. MENARD REG. No. 20437 REGISTERE PROFESSIONAL ENGL. M BRINE Audd S. Mund Mardd S. Mund

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March 2003 (Revised June 2003)

# SOUTH CHOCTAW DRIVE WIDENING FLANNERY ROAD TO CENTRAL THRUWAY DESIGN STUDY TABLE OF CONTENTS

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## **SECTION I - INTRODUCTION**

Evans-Graves Engineers, Inc., in association with Burk-Kleinpeter, Inc., was selected by the City of Baton Rouge/Parish of East Baton Rouge to perform professional engineering and land surveying services required to widen the existing South Choctaw Drive between Flannery Road and Central Thruway from 2 lanes to 4 lanes (see figure 1). The first phase of engineering required for this project is to provide a topographic survey, traffic analysis, Phase I Environmental Site Assessment, and a Design Study.

The purpose of this study is to investigate the best method to implement the widening of South Choctaw Drive between Flannery Road and the proposed Central Thruway. The study will also investigate options for improving the Flannery/South Choctaw intersection and methods to connect to the proposed Central Thruway project. Traffic engineering data collection, traffic data analysis and recommendations, and a Phase I Environmental Site Assessment are also included in the scope of services for the Design Study. However, a separate document will be presented for both the Traffic and Environmental portions of the Design Study.

#### HISTORY

The Choctaw Drive Extension east of Flannery Road and then southward to Florida Boulevard was constructed in the late 1980's. It was constructed in two phases as follows:

Phase I-A:Flannery Road to Foxlane DrivePhase I-B:Foxlane Drive to Florida Boulevard

Phase I-A was constructed as a 4-lane concrete curb and gutter between Flannery and Larkswood Drive and a two-lane concrete section from Larkswood to Foxlane Drive. Phase I-B was constructed as a two-lane concrete section with open ditches. The two-lane construction included provisions for future extension to four-lane curb & gutter. Some of these provisions include the following:

- Drainage outfalls were created or improved to accommodate future widening.
- The subsurface drainage system was designed for future widening. When subsurface drainage crossed the road, these portions were installed and capped for future connection to the subsurface trunk lines.
- An 80' wide right-of-way was obtained.

A typical section showing the existing pavement and base course and grading is included with the figures included in this study.

As part of the Phase I-A construction, Flannery Road was widened to create both northbound and southbound left turn lanes. The intersection was overlayed with asphaltic concrete. The Flannery/Choctaw intersection is currently signalized.

#### **EXISTING SITE CONDITIONS**

#### South Choctaw from Flannery to Florida Boulevard

The existing horizontal geometry between Larkswood and Florida contains curves with degree of curvature between 5° and 6°30'. The roadway is not superelevated within these curves. These curves are adequate for a 40 mph design speed utilizing the criteria for low speed urban streets in AASHTO. It should be noted, however, that the low speed urban street criteria does not allow a 45 mph design speed. If a 45 mph design speed is required, the roadway should be superelevated, otherwise the design will not meet AASHTO criteria for 45 mph design speed.

The South Choctaw connection with Florida Boulevard has an added left turn lane. There is also a two-way service road very close to Florida Boulevard. The intersection is currently signalized. LDOTD has developed plans to improve O'Neal Lane south of Florida Boulevard, but the O'Neal Lane project is apparently not on the current LDOTD letting list for construction. It should be noted that the Central Thruway project will demolish and reconstruct the existing South Choctaw/Flannery intersection.

A study was performed utilizing the topographic survey data to determine the existing roadway cross slopes and longitudinal grades on Choctaw between Larkswood Drive and the Central Thruway Connection. Approximately 100 roadway cross slopes were computed, generally at 100' intervals. A summary of cross slopes are included in the following table:

Cross Slope Range	No. of Locations Within Range
2.75% and greater	25
2.25% to 2.75%	37
1.75 to 2.25%	35
less than 1.75%	7

It is apparent from the data above that the average existing cross slope is less than 2.5%.

The existing Choctaw roadway plans generally used a longitudinal grade of 0.35% to accomplish roadway drainage. This was common practice at the time that the plans were developed. At one location on the plans, a longitudinal grade of 0.32% was used (Sta. 27+20 to 31+00). Today, designers normally use 0.4% as the minimum longitudinal grade to facilitate drainage.

A review of the as-built longitudinal grades which were shown on the plans to be 0.35% were surveyed to range from 0.32% to 0.38%. The grade shown on the plans as 0.32% was constructed at 0.31%. In general, the longitudinal grades were constructed with reasonable tolerance.

The existing pavement on Choctaw is in relatively good condition. A cursory inspection revealed that several pavement panels have been replaced. Existing striping is in satisfactory condition.

The Choctaw corridor contains numerous utilities. A 10" sewer force main runs parallel on the south side of Choctaw for almost the entire length of the project. There is also a large water main running parallel to Choctaw on the north side of the road. Overhead power lines and high pressure gas lines are also within the corridor.

The Design Drainage Layouts for both Phase I-A and I-B were reviewed as part of this study. A cursory review of these layouts yielded no obvious deficiencies. The two major outfalls include Lively Bayou which crosses both Choctaw and Flannery near the Flannery/Choctaw intersection. The other major outfall is denoted as Stream 51 on the E.B.R. Stream Index Map. Stream 51 flows into the Comite River near the Comite's confluence with the Amite River just north of Florida Boulevard. Stream 51 does not cross Choctaw Drive, and generally runs parallel to Choctaw, approximately 1000' away at its closest point. Several lateral ditches from Choctaw to Stream 51 were created or improved in Phase I-B to facilitate adequate drainage.

#### South Choctaw/Flannery Intersection

The horizontal geometry for the west approach to the intersection includes a curve with a degree of curvature of approximately 11° as measured from the field survey. The P.T. of this curve is very close to the intersection, thus little or no tangent exists on the intersection approach. This results in limited sight distance and reaction time when approaching the intersection. See photographs included with this study.

The south approach to the intersection includes a curve with a degree of curvature of 10°40' +/- which requires superelevation for a design speed of 40 mph. This curve continues through the intersection. It is undesirable to have an intersection in a horizontal curve. Since Flannery Road is superelevated through the intersection, this causes an undesirable profile for traffic on Choctaw traversing across Flannery through the intersection.

The north and east approaches do not have any apparent deficiencies caused by horizontal geometry.

The existing Flannery Road is a two-lane asphalt roadway with an additional left turn lane on both approaches to South Choctaw. Asphalt and striping are in good condition.

Drainage on Flannery is facilitated with open ditches and a small amount of subsurface drainage pipes. There are numerous underground utilities along Flannery with the most significant being an 8" high pressure gas pipeline on the east side of Flannery.

Lively Bayou crosses Flannery approximately 500' south of the South Choctaw/Flannery intersection. The existing bridge over Lively Bayou is 24' wide. This bridge appears to be in relatively good condition except that approach guardrails are in a state of disrepair.

## SECTION 2 - PROPOSED CONSTRUCTION & ALIGNMENT

The project consists of widening the existing 2-lane South Choctaw Drive from Larkswood Drive to its connection with the proposed Central Thruway. A temporary connection to Florida Boulevard will also be provided, in the event that the Central Thruway project is not completed prior to completion of South Choctaw Widening. The design criteria, as stated in the Design Memorandum included with the Request for Proposal for Engineering Services, is summarized as follows:

## Design Criteria

Street Classification:	Collector Street
Geometric Design:	AASHTO, Millenium Edition (See Note 1)
Design Speed:	45 mph on Choctaw, 40 mph on Flannery (See Note 2)
Street Width:	4-12' lanes
Pavement Type:	8" minimum thick concrete over 6" stone base
Sidewalk Width:	4 feet (6' if adjacent to curb)
Design Vehicle:	WB-50

Notes:

- 1. The Design Memorandum included with the Request for Proposals listed the AASHTO "Green Book", 1990 Edition. Since the Millenium Edition is now available, it is prudent to use the latest edition.
- 2. A design speed of 45 mph was shown in the Design Memorandum. It is assumed that this speed applies to South Choctaw only. We have proposed a design speed of 40 mph for interim alignment of Flannery prior to the 5-lane project for Flannery.

#### PROPOSED SOUTH CHOCTAW ALIGNMENT

It is recommended that the existing South Choctaw horizontal alignment between Flannery and the Central Thruway connection be maintained as is. Although it does not meet AASHTO criteria for a 45 mph design speed, it has been adequately functioning for over a decade; therefore, we recommend no changes to the horizontal alignment. Flannery Road is shown on the Major Street Plan to eventually become a 5-lane roadway with a 125' right-of-way.

## SOUTH CHOCTAW/FLANNERY INTERSECTION

The existing horizontal alignment of the south and west approaches to the intersection are considered to be undesirable because of the items previously mentioned which include poor sight distance and an undesirable "bump" for traffic traversing across Flannery on South Choctaw. Any future widening of Flannery in its current location would cause the bump to be worsened. Therefore, it is not recommended to leave this intersection in its present configuration.

Our proposed intersection improvements include moving the intersection approximately 35' eastward (See Figures 4 and 8). In order to accomplish this movement, Flannery will cross Choctaw at a 78° angle crossing. The approach curves on Flannery are limited to a degree of curvature of 8°00' or less. The proposed geometry provides approach tangents and eliminates superelevation on Flannery.

It is proposed to add exclusive left turn lanes on both eastbound and westbound Choctaw approaches. This will require modification to the Choctaw bridge over Lively Bayou.

Additional right-of-way will be required in the northwest, northeast, and southeast quadrants of the intersection. Properties in the east quadrants are presently zoned as commercial, and are vacant. The required right-of-way shown in based on the 125' right-of-way width shown on the major street plan for Flannery Road. The northwest quadrant required right-of-way would require the elimination of several parking stalls on this property.

It is proposed to construct the ultimate intersection which would include the turnouts for the 5-lane curb and gutter on Flannery. A temporary 2-lane (with left turn lanes) asphalt connection would be provided to tie to the existing north and south of the intersection. It is also proposed to add Flannery right turn lanes onto Choctaw on both the north and south approach.

Since the revised geometry would put the P.C. closer to the bridge on Flannery, it is proposed that the bridge approach guardrails should be improved to meet current design standards.

The proposed Flannery alignment would cause relocation of an 8" high pressure gas line, underground telephone, and overhead power lines. Utilities on the west side of Flannery and on Choctaw would have minimal relocations necessary.

#### **CENTRAL THRUWAY CONNECTION**

In general, South Choctaw Drive is proposed to tee into Central Thruway in the final condition after all construction on South Choctaw and Central Thruway is completed. Two alignment options are included for the Central Thruway/South Choctaw intersection.

## Option 1, Figure 6

Option 1 includes extending the existing tangent of Choctaw directly into the Central Thruway. This alignment would cause the intersection to be at a skew angle of approximately 62°.

# Option 2, Figure 7

Option 2 includes an approach curve on the west approach to Central Thruway. The curve is utilized to reduce the intersection approach angle to approximately 80°.

## **SECTION 3 - PROJECT CONCERNS**

#### **Right-of-Way**

Right-of-Way will be required near the Flannery/Choctaw intersection (assuming relocated intersection) and near the Central Thruway/Choctaw connection. The required right-of-way is shown on the exhibits provided with this study. The business in the northwest quadrant of the Choctaw/Flannery intersection would lose several parking stalls. However, no businesses or dwellings will be affected in the northeast and southeast quadrants.

### Sequence of Construction & Impacts to Traffic

The widening of Choctaw between Larkswood and the Central Thruway connection will cause a major impact to existing traffic, especially during concrete paving operation. It is our recommendation that drainage and base course construction could occur with existing traffic on Choctaw, but that Choctaw should be closed to thru traffic during paving and concrete curing.

While the construction of the Choctaw/Flannery intersection will impact traffic, the relocated intersection proposed will have less traffic impact than if it were constructed in the existing location. Because of the new alignment of the Flannery approaches, much of the construction can occur with minimal impact to Flannery traffic.

It is unknown at this time whether the Central Thruway or the Choctaw Widening project will be constructed first. Therefore, for the purpose of this study, it was assumed that the connection from Choctaw to Central Thruway will be constructed with this project.

We have provided a phased sequence of construction plan for the Choctaw/Central Thruway connection which utilized temporary detours to the existing Choctaw Drive connection to Florida Boulevard.

#### Utilities

The impacts to existing utilities is deemed to be minor for this project. Since the existing Choctaw was constructed with provisions for future widening, the utilities are far enough from the centerline of the project as to not cause major impacts. The 8" gas line on Flannery will need to be relocated.

## Drainage

Since drainage outfalls were created and/or improved with the original Choctaw construction, it appears that existing drainage outfalls are adequate.

## SECTION 4 - ESTIMATE OF PROBABLE CONSTRUCTION COSTS

Based on past experience of similar construction projects, an Estimate of Probable Construction Costs is \$6,000,000. Documentation for this cost is included in the appendix. Approximately 3.5 acres of right-of-way property will be required which is not included in the construction cost above.

Traffic signal costs are included for the South Choctaw/Flannery intersection only. It is assumed that the traffic signal at the Central Thruway/Choctaw Intersection will be included with the Central Thruway construction.

### SECTION 5 – RECOMMENDATION AND CONCLUSION

The South Choctaw Drive, between Larkswood and the Central Thruway, can simply be widened by incorporating the provisions that were allowed for in the original design. It is recommended that this section of roadway should have a posted speed limit of 40 mph, since the geometry does not meet the 45 mph design speed as required by AASHTO.

Although the existing cross slope on South Choctaw Drive, between Larkswood Drive and the Central Thruway Connection, is deficient in several areas, we feel that this condition is not serious enough to warrant overlay to obtain a 2.5% cross slope.

It is recommended that the South Choctaw/Flannery intersection should be re-aligned as proposed in this study for the reasons stated.

We also recommend Option 2 for Central Thruway connection. If concurrence for Option 2 is obtained from the City-Parish, this information should be supplied to the consulting engineer for the Central Thruway project.

Due to the proximity of the Flannery Road Bridge to this project, it may also be beneficial to consider the widening of this bridge as a part of this project. Our preliminary estimate to construction a new bridge is approximately \$400,000. It is apparent that this could be added to the project, with the estimated construction cost of the total project being less than the \$7 million anticipated by City-Parish for the project.



Choctaw/Flannery Intersection, West Approach Note limited visibility & "Bump" warning sign.



Choctaw/Flannery Intersection, South Approach Note Flannery superelevation, curvature on approach



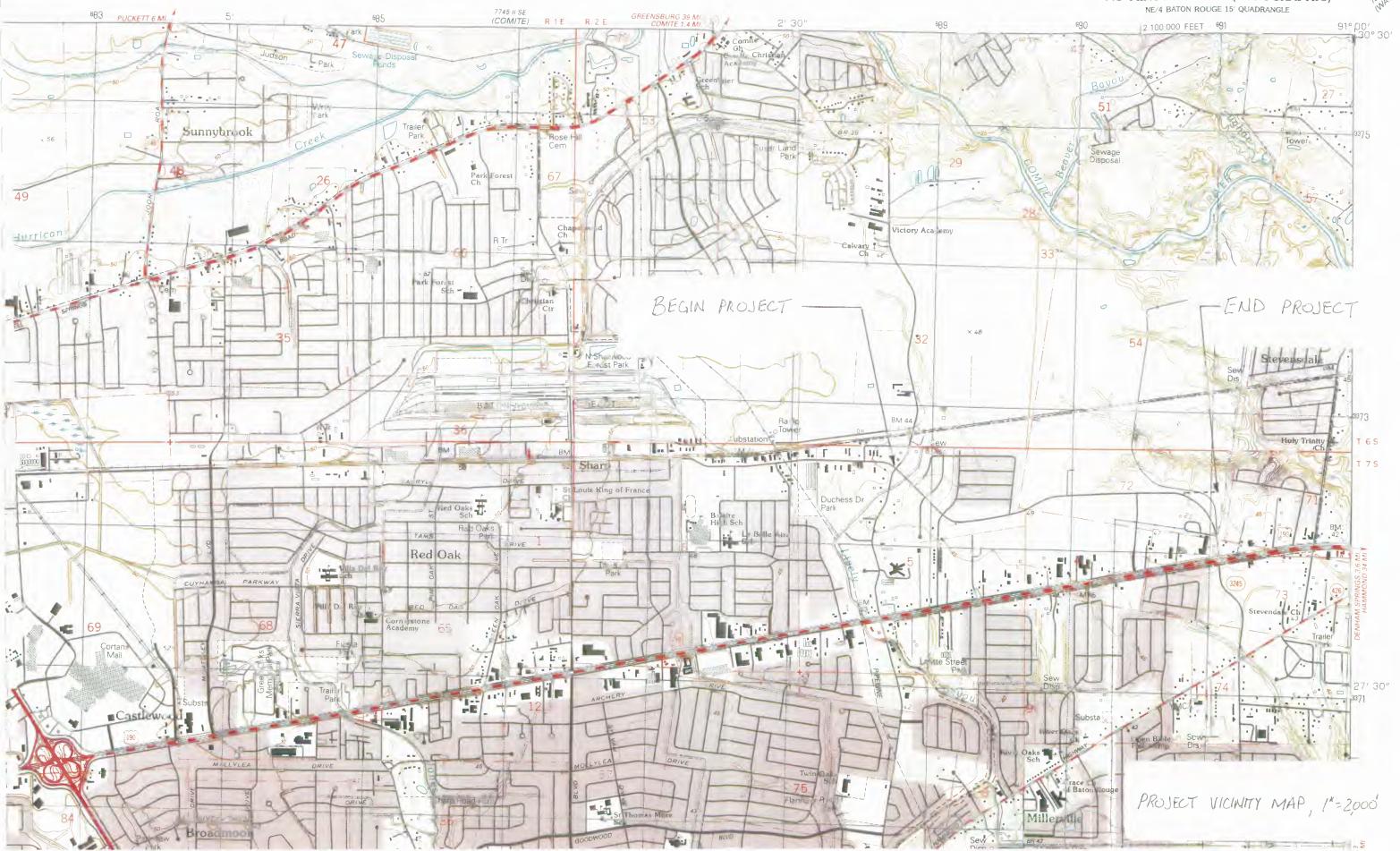
Choctaw/Flannery Intersection, East Approach



South Choctaw near Larkswood Drive Transition from 4-lane to 2-lane

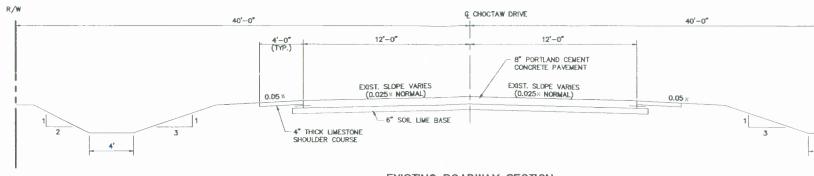
# SOUTH CHOCTAW DRIVE WIDENING FLANNERY ROAD TO CENTRAL THRUWAY DESIGN STUDY TABLE OF CONTENTS LIST OF FIGURES

Quad Map
Lot & Block Map
Typical Sections
Aerial Photo – Flannery/Choctaw Intersection to Foxlane
Aerial Photo – Foxlane Drive to Centerpointe Thruway
Aerial Photo – Centerline to Florida Blvd. with Central Thruway Connection (Option 1)
Aerial Photo – Centerpointe to Florida Blvd. with Central Thruway Connection (Option 2)
Flannery/Choctaw Intersection with Topographic Survey
Sequence of Construction – Central Thruway Connection

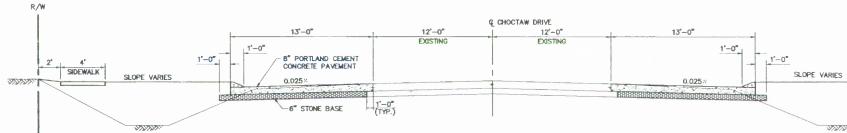


#### BATON ROUGE EAST QUADRANGLE LOUISIANA-EAST BATON ROUGE PARISH 7.5 MINUTE SERIES (TOPOGRAPHIC) NE/4 BATON ROUGE 15' QUADRANGLE

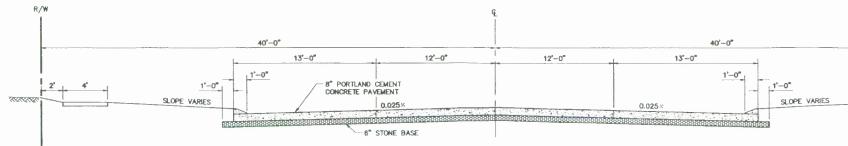




EXISTING ROADWAY SECTION (LARKSWOOD DRIVE TO CENTRAL THRUWAY CONNECTION)



FINISHED FINISHED SECTION (LARKSWOOD DRIVE TO CENTRAL THRUWAY CONNECTION)



FINISHED TYPICAL SECTION CENTRAL THRUWAY CONNECTION

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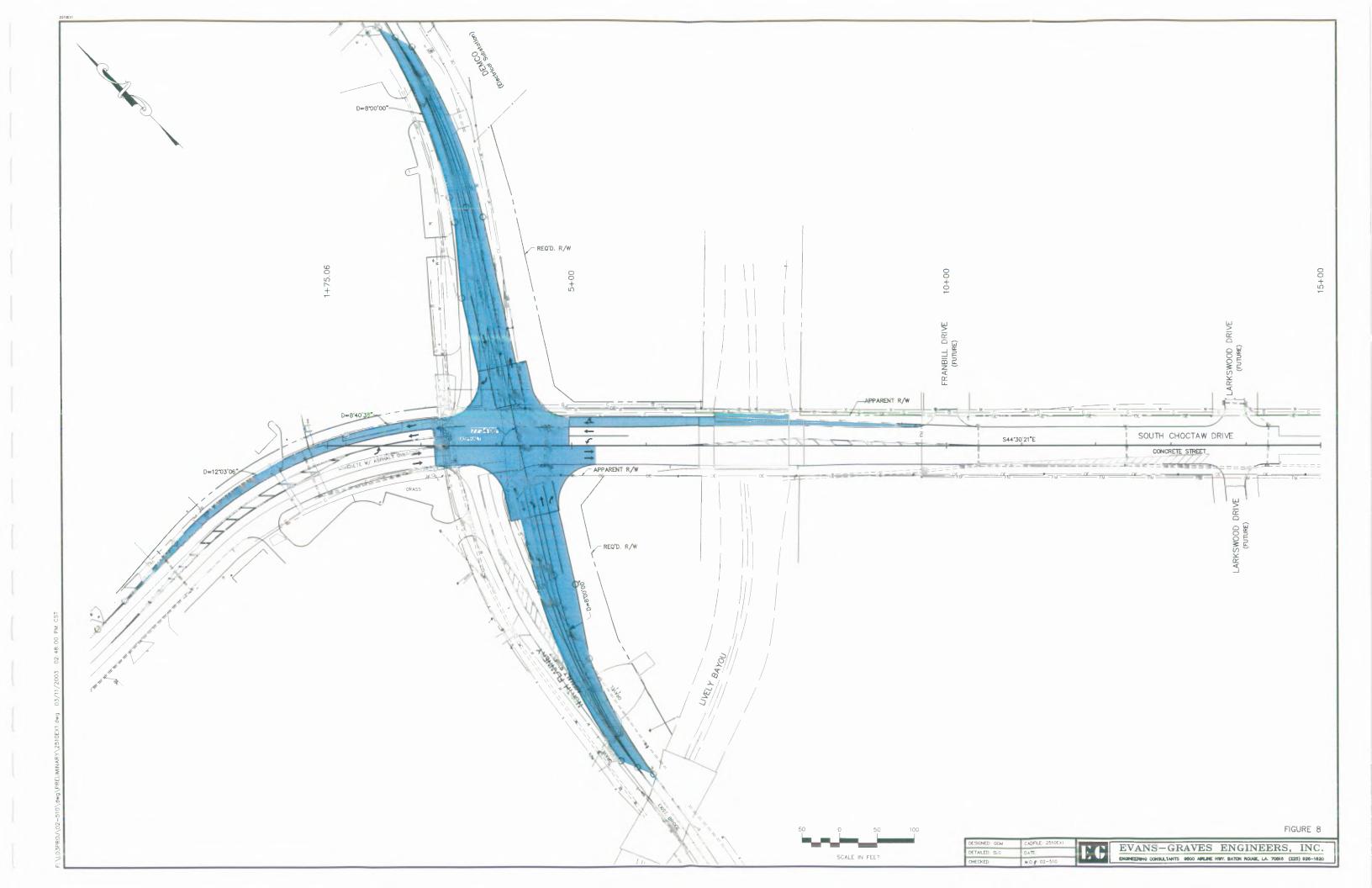
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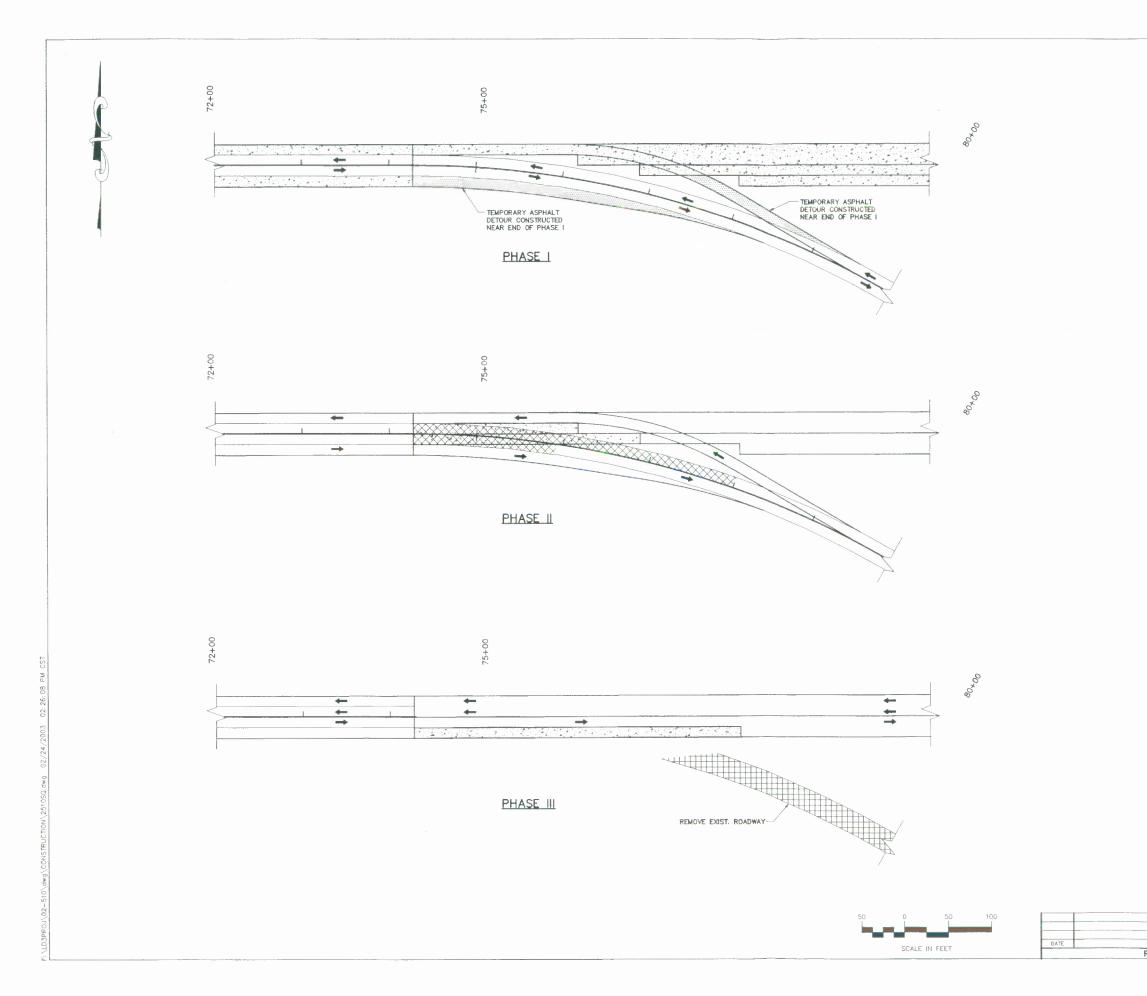
FIGURE ( OATE DATE DIAL DATE DATE DATE DATE DATE DATE DATE DATE	S. CHOCTAW DRIVE AERIAL PHOTO CENTERPOINTE THRUWAY TO FLORIDA BLVD. CENTRAL THRUWAY CONNECTION OPTION 1			
FIGURE 6 2S, INC. 10 (22) 925-1620	Z			 



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FIGURE 7 VEERS, INC. E 14 70616 (225) 528-1620	TO TION		





CITY PROJECT NO.	PARISH	SHEET NO.
	EAST BATON ROUGE	

LEGEND:

	PERMANENT CONSTRUCTION
	TEMPORARY DETOUR CONSTRUCTION
+	TRAFFIC DIRECTION & LOCATION
	PAVEMENT TO BE REMOVED

FIGURE 9 SEQUENCE OF CONSTRUCTION SOUTH CHOCTAW EXTENSION FLANNERY TO CENTRAL THRUWAY ENGINEERING DIMISION DEPARTMENT OF PUBLIC WORKS CITY OF BATON ROUGE & PARISH OF EAST BATON ROUGE ECO EVANS-GRAVES ENGINEERS, INC. HIGHEDHIG CHIGHET S 9800 AREAE HIM: BATCH ROUGE LA DAILE (221) 504. MARC ESIGNED: GGM DETAILED: SLI CHECKED: CHECKED: CHECKED: BY DESCRIPTION REVISIONS

APPENDIX

<b>EVANS-GRAVES ENGINEERS, INC.</b> 9800 AIRLINE HIGHWAY STE. 200 BATON ROUGE, LA 70816	JOB S. Choctaw h	lidening
9800 AIRLINE HIGHWAY STE. 200	SHEET NO.	OF
BATON ROUGE, LA 70816	CALCULATED BYGGM	DATE June '03
	CHECKED BY	DATE

ESTIMATE OF PROBABLE CONSTRUCTION COSTS SUMMARY:

Major Items: \$180,000 Earthwork Removal of P.P.C. Conc. 170,000 1,100,000 Drainage Concrete Pavement (8" Thick) 1,080,000 Base Course (Stone, 6" Thick) 412,500 Flannery Rd. Reconstruction 450,000 100,000 Curb 180,000 Sidewalk 55,000 Bridge Reconstruction Traffic Signal (Choctow/Flannery) 250,000 3,977,500 Add 20% for minor items 795,500 4,773,000 Subtotal Add 10% for Mobilization 477,000 Subtotal 5,250,000 Add 15% Contingency 788,000 6,038,000

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Use 6.0 Million

<b>EVANS-GRAVES ENGINEERS, INC.</b> 9800 AIRLINE HIGHWAY STE. 200 BATON ROUGE, LA 70816	JOB S. Choctaw	Widening
9800 AIRLINE HIGHWAY STE. 200	SHEET NO	OF
BATON ROUGE, LA 70816	CALCULATED BY GGM	DATE
	CHECKED BY	DATE

Drainage Costs	(from existing plans showing	fature pipe sizes)
15" RCP	1320 I.f. @ \$35 / I.f.	46,200
18" RCP	520 I.f. @ \$40	20,800
24"	1152 @ \$45	51,840
30"	100 @ 60	6,000
36"	931 @ 70	65,170
4 2"	788 @ 100	78,800
48"	1072 @ 130	139,360
54"	1625 @ 150	244,000
single side inle	+ 42 @ 3000	126,000
double "	19 @ 6000	114,000
manholes (larg	e) 3 @ 5000	15,000
9		907,170

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Add \$150,000 for drainage on Choctow west of Flannery and side drains on Flannery.

Use \$1,100,000

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Sta. 14+00 to 74+30, length = 6,030 l.f. Construct outside lones @ 13' ca.  $6,030(2\times13) = 17,420$  sig. Central Throway Conn. 800' × 50' wide 800 ×50' 4,440 5.4. Choctow / Flannery Intersection 1,800 5.4 23,660 sy. Use 24,000 s.y. Cost 24,000 sig. @ \$45. = \$ 1,080,000 Base Course Use 25,000 s.y @ \$16.50 = \$412,500 Curb 14,000 ± 1.f. @ \$7/ 1.f. = \$98,000 Use \$100,000 Sidewalk 16,000 lif. @ 4' wide/q = 7,100 s.y. @ 25 = 177,000

Use \$130,000