



INTERSECTION SAFETY STUDY

**U.S. BUSINESS 41/S.R. 45/8TH AVENUE WEST AT
23RD STREET WEST**

**MANATEE COUNTY
SECTION NO.: 13030000
MILEPOST: 0.867**

FM No. 409224-1-32-91
Contract No. C9M86

September 2018

PREPARED FOR
Florida Department of Transportation, District 1
Project Manager: Michael Kautz
801 N. Broadway Street
Bartow, Florida 33830

PROFESSIONAL ENGINEER ENDORSEMENT

I hereby certify that I am a Registered Professional Engineer in the State of Florida and practicing with HNTB Corporation. HNTB Corporation is authorized via Certificate Number EB-0006500 to operate as an Engineering Business by the Florida State Board of Professional Engineers, State of Florida Department of Professional Regulation. I have prepared or supervised the preparation of the evaluation, findings, conclusions, recommendations, or professional opinions/advice contained in this document. My endorsement constitutes my approval of these items.

PROJECT: District-Wide Safety Studies
FPN: 409224-1-32-91

LOCATION: Safety Study – Section No. 13030000
U.S. Business 41/S.R. 45/8th Avenue West at 23rd Street
West, Milepost 0.867

CLIENT: Florida Department of Transportation
District One

The results contained in this report were developed using procedures and references standard to the transportation engineering practice. These references and procedures were applied using professional judgment and experience.

Name: Steffanie Lynne Workman, PE

P.E. No.: 58218

Date: September 4, 2018

Signature

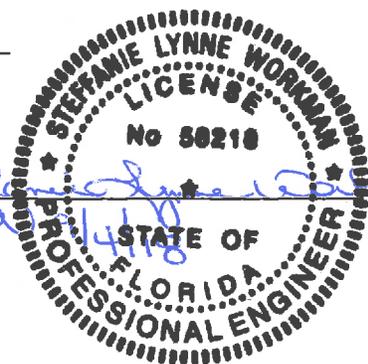


TABLE OF CONTENTS

SECTION	PAGE
TABLE OF CONTENTS	1
EXECUTIVE SUMMARY	3
1. INTRODUCTION	5
2. EXISTING CONDITIONS	5
3. DATA COLLECTION.....	7
3.1 Crash Data.....	7
3.1.1 Daily Traffic Volume Data.....	8
3.1.2 Turning Movement Count Data	9
3.2 Recently Completed/Future Projects.....	9
4. QUALITATIVE ASSESSMENT.....	10
4.1 Operational Analysis	10
4.2 Crash Analysis	13
4.3 Maintenance	14
5. RECOMMENDATIONS	16
FIGURES	
Figure 1: Project Location Map	6
Figure 2: Horizontal Curve on Southbound U.S. Business 41	10
Figure 3: 23 rd Street West, Crest Vertical Curve at Intersection Approach.....	11
Figure 4: U.S. Business 41, Vehicles Queued in the Median.....	12
Figure 5: Existing Intersection Pavement Condition	15
Figure 6: U.S. Business 41, Broken Object Marker at Drainage End Wall	15
TABLES	
Table 1: Crash Summary	8



APPENDICES

APPENDIX A: STRAIGHT LINE DIAGRAM

APPENDIX B: CONDITION DIAGRAM

APPENDIX C: AS-BUILT PLANS

APPENDIX D: TURNING MOVEMENT COUNT DATA

APPENDIX E: SYNCHRO SUMMARY SHEETS

APPENDIX F: CRASH DATA

APPENDIX G: INTERSECTION PHOTOS

APPENDIX H: CONCEPTUAL DESIGN PLANS

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District One Safety Office has retained HNTB Corporation as part of the district-wide traffic safety contract to perform a safety study for the intersection of U.S. 41/S.R. 45 at 23rd Street West in the City of Palmetto in Manatee County, Florida. Based on the results of the data collection, crash analysis, qualitative assessment, operational assessment and engineering judgment, the following recommendations were developed:

Recommendation: Consider reconstructing the existing full median opening at 23rd Street West to a northbound directional median opening, including milling and resurfacing the intersection.

Justification: Additional uncertified crash reports from January 2016 through April 2018 were reviewed to assess the intersection safety to the present. The occurrence of angle crashes increased significantly for vehicles traveling eastbound on 23rd Street West to turn left turn onto northbound U.S. Business 41. One of the angle crashes involved a fatality in 2017. As mentioned in the *Signal Warrant Study - U.S. 41 (Business) at 23rd Street West* by Traffic Engineering Data Solutions, Inc., “Should the angle crash pattern continue or the frequency of angle crashes increase, it is recommended to reconstruct the existing full median opening to a northbound directional median opening.”

Recommendation: Consider extending the length of the southbound left turn lane at 20th Street West from 140 to 290 feet, and reduce the length of the northbound left turn lane at 23rd Street West from 655 to 570 feet to accommodate the displaced U-turn movement from 23rd Street West.

Justification: During both the AM peak hour and the PM peak hour, 28 right turn movements are anticipated to be displaced as U-turn movements at 20th Street West resulting from the reconstruction of 23rd Street West. The total deceleration and storage distances provided by the existing left turn lane at 20th Street West are 140 and 50 feet, respectively. Per FDM 212.6 (Exhibit 212-1), a total deceleration distance of 240 feet plus a minimum queue length of 50 feet (FDM 212.14.2) is required for the 50 mph design speed. Therefore, the total proposed left turn lane length is 290 feet (including 50-foot taper). In order to extend the southbound left turn lane at 20th Street West, reducing the length of the northbound left turn lane at 23rd Street West from 655 feet to 570 feet would be required. The proposed length of the northbound left turn lane at 23rd Street West would accommodate the required total



deceleration length plus provide a queue length of 330 feet for storage, which exceeds the total required length.

1. INTRODUCTION

The Florida Department of Transportation (FDOT) District One Safety Office has retained HNTB Corporation as part of the district-wide traffic safety contract to perform a safety study for the intersection of U.S. Business 41/S.R. 45/8th Avenue West at 23rd Street West in the City of Palmetto in Manatee County, Florida.

2. EXISTING CONDITIONS

This section of the report describes the existing physical and operational conditions of the U.S. Business 41 at 23rd Street West intersection.

U.S. Business 41 at 23rd Street West is a one-way stop-controlled intersection with a STOP sign on 23rd Street West. Within the study area, U.S. Business 41 is a north-south roadway with a 4-lane divided, suburban typical section with two 12-foot lanes in each direction that are separated by a variable width median (maximum 18 feet). The facility has 12-foot outside shoulder with 5-foot paved in each direction. U.S. Business 41 is classified as an urban principal arterial (other). 23rd Street West is an east-west roadway with a 2-lane undivided typical section with 11-foot lanes. The northbound approach to the intersection consists of two through lanes and an exclusive left-turn lane. The southbound approach to the intersection consist of two through lanes and an exclusive right-turn lane. The eastbound approach consists of an exclusive left-turn lane and exclusive right-turn lane. There are no sidewalks or designated bicycle lanes provided along either U.S. Business 41 or 23rd Street West within the study corridor. Lighting within the vicinity of the intersection is provided along both sides of U.S. Business 41 from the intersection to the north and on the east side of U.S. Business 41 south of the intersection. **Figure 1** shows an overview of the study intersection.

The nearest signalized intersection to the north is a flashing beacon at SW 26th Street West 49th, which is located approximately 0.40 miles away. The nearest signalized intersection to the south is 17th Street West/Memphis Road which is about 0.40 miles away. There are no signalized intersections to the west.

The posted speed limit along U.S. Business 41 is 50 mph north of the intersection and 45 mph south of the intersection. The posted speed limit along 23rd Street West is 35 mph with a 20 mph advisory speed approaching the intersection. Land use within the vicinity of the intersection consists of vacant/agricultural land.

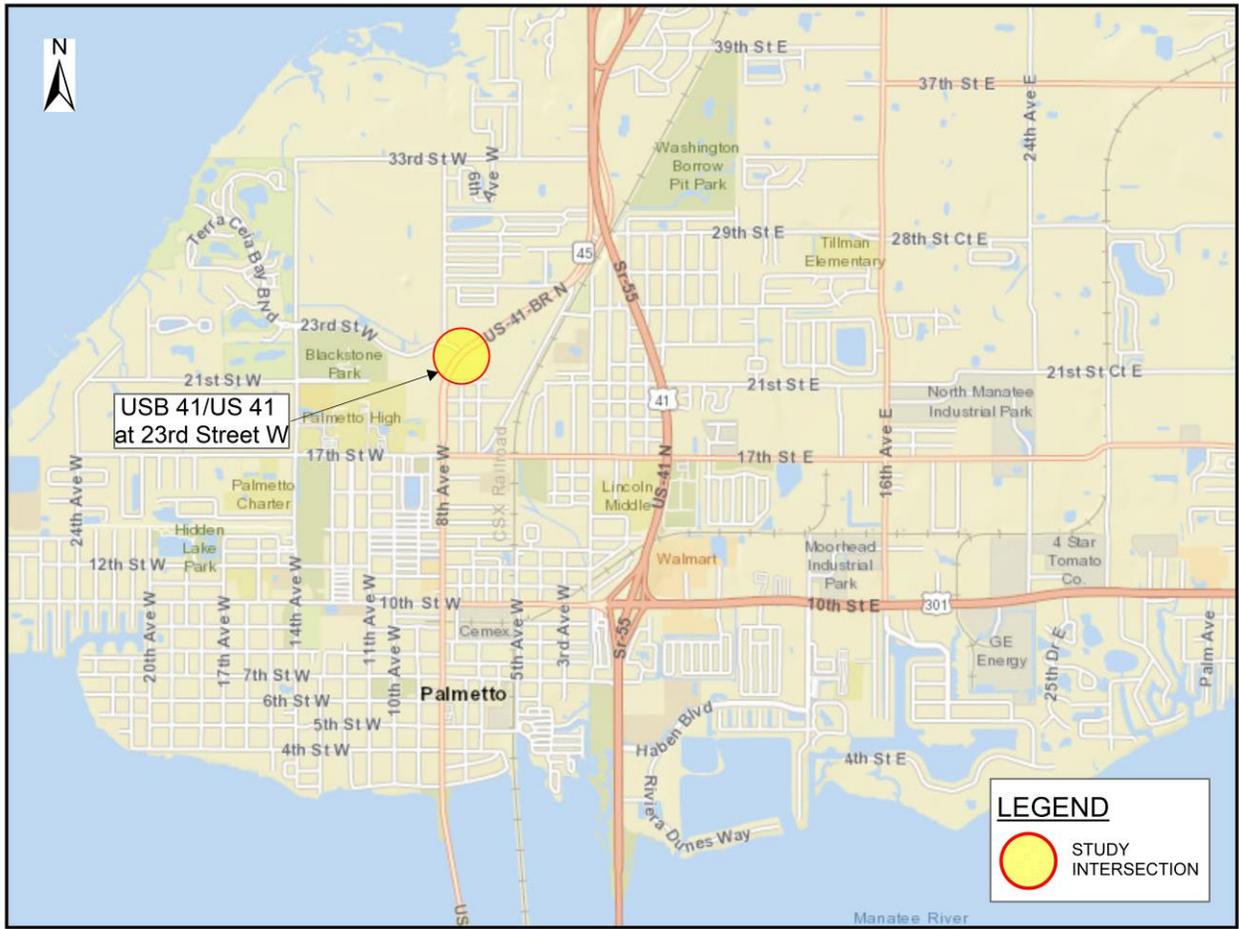


Figure 1: Project Location Map

3. DATA COLLECTION

This section of the report presents the data that was obtained for this study. For the purposes of this study, it was determined that the following information would be required:

- Crash data from January 2011 through December 2015.
- Field observations of the intersection operations during an average weekday.
- Vehicle count data from count station located within the study limits.
- Eight-hour turning movement counts.
- Recently-completed or future planned projects within the study limits.

3.1 Crash Data

Crash data was provided by the FDOT CARS Database and Signal 4 Analytics for the period extending from January 2011 to December 2015. Crash summaries for this time-period are presented in **Table 1**. Areas of concern are discussed in the Crash Analysis section of this report.

Table 1: Crash Summary
U.S. Business 41/S.R. 45/8th Avenue West at 23rd Street West
January 2011 – December 2015

COLLISION TYPE	2011	2012	2013	2014	2015	TOTAL
Rear End	1	0	0	0	1	2
Left Turn	1	0	0	0	0	1
Angle	1	1	1	1	2	6
Sideswipe	0	0	1	1	0	2
Right Turn	0	0	0	2	0	2
Head On	0	0	0	0	1	1
Run Off Road	0	0	1	1	0	2
Backed Into	0	0	0	0	0	0
Collision w/ Object	0	0	0	0	0	0
Pedestrian/Bicycle	0	0	0	0	0	0
Other	0	1	0	0	0	1
Total	3	2	3	5	4	17
Fatal	0	0	0	0	0	0
Injury	2	1	2	1	1	7
Property Damage Only	1	1	1	4	3	10
Day	3	2	1	4	3	13
Night	0	0	2	1	1	4
Wet	0	0	0	0	0	0
Dry	3	2	3	5	4	17
Spot Crash Rate (Crashes/MEV)	0.337	0.244	0.354	0.561	0.451	0.389
Statewide Avg Crash Rate (Crashes/MEV)	0.192	0.220	0.255	0.270	0.289	0.245

3.1.1 Daily Traffic Volume Data

Traffic volume data along U.S. Business 41 was obtained from the Florida Department of Transportation’s Transportation Statistics Office’s 2017 Historical AADT Report. Within the project limits, there was one portable traffic monitoring site identified. Site 135027 is located on U.S. Business 45, north of 21st Street West, and was reported to have an AADT of 23,000 with 3.8% truck traffic in 2017.

3.1.2 Turning Movement Count Data

Eight hour turning movement counts were performed at the intersection of U.S. Business 41/U.S. 41 and 23rd Street West. Pedestrian and bicycle count data was also collected during the turning movement counts. This data was collected on Wednesday, June 6, 2018, from 7:00 AM to 10:00 AM, 11:00 AM to 1:00 PM, and 3:00 PM to 6:00 PM. The count data is summarized in **Appendix D** of this report.

3.2 Recently Completed/Future Projects

Based on a review of FDOT's Work Program, two projects were identified within the study limits. The first project (FPID 195902-2) was a milling and resurfacing project along U.S. Business 41 from north of 17th Street West to North of Bayshore Road. Construction was completed and the project was accepted November 2004. The second project (FPID 436983-1) is a sidewalk construction project along 14th Avenue West, 23rd Street West and U.S. Business 41. Pre-Construction is underway and is scheduled to be complete within 30 days. There are no future planned projects identified in the FDOT Work Program for this segment.

4. QUALITATIVE ASSESSMENT

The intersection of U.S. Business 41 and 23rd Street West was observed by a registered professional engineer during the morning and afternoon peak periods of an average weekday to assess the existing operating conditions and to determine what, if any, improvements could be made to improve the safety and efficiency at this intersection.

4.1 Operational Analysis

The operational analysis includes the efficiency of operations and interaction of motor vehicles, pedestrians, and bicycles on the roadway. The results of these observations are summarized below.

- U.S. Business 41 intersects 23rd Street West near the apex of a horizontal curve that becomes tangent north of 23rd Street West with a radius of approximately 1,146 feet. U.S. Business 41 has a 50 mph design speed with degree of curvature equal to 5°00'00.00" and a superelevation rate of 2.3%. This horizontal alignment creates a perception issue for motorists turning right and left onto U.S. Business 41 from 23rd Street West. The eastbound to northbound left turn movement was most affected because it was difficult for motorists to identify and judge the speed and lane assignment of on-coming northbound vehicles before executing their left turn. This movement was accomplished as a two-stage maneuver.



Figure 2: Horizontal Curve on Southbound U.S. Business 41

- 23rd Street West intersects U.S. Business 41 within a crest vertical curve.



Figure 3: 23rd Street West, Crest Vertical Curve at Intersection Approach

- Traffic on U.S. Business 41 is low to moderate with approximately 12,700 vehicles traveling north and south during the eight-hour count period. Vehicles appeared to be traveling at, or slightly above, the posted speed limit. The speed limit transitions between 45 mph and 50 mph at the intersection, which adds to the complexity of the intersection.
- The intersection has a full median opening (18 feet wide, 92 feet in length from nose to nose) with STOP control on 23rd Street West.
- U.S. Business 41 has an access management designation of Class 7 (both median types), which requires 660 feet separation for full median openings, 330 feet separation for directional median openings, 1,320 feet separation for signalized intersections and 125 feet separation for driveway connections.
- Vehicles arriving along the southbound and eastbound intersection approaches were random, due to the absence of adjacent signalized intersections, which effected the availability of adequate gaps for traffic from 23rd Street West to enter U.S. Business 41.
- During the eight-hour count and field review, two pedestrians and one bicyclist were observed crossing the west leg of the intersection.
- Palmetto High School is located approximately 0.9 miles southwest of the intersection, on the northeast corner of 14th Avenue West and 17th Street West/Memphis Road.
- Blackstone Park is located approximately 0.4 miles west of the intersection, on the southeast corner of 23rd Street West and 14th Avenue West. Traffic volumes at this intersection are anticipated to increase during sporting events held at Blackstone Park, which typically occur on the weekends.

- The highest approach volume from 23rd Street West was 103 vehicles from 8:30 AM to 9:30 AM for the left and right turn movements. The maximum queue was observed to be two vehicles with an hourly left turn volume of 40 vehicles. Westbound left and right turn movements were observed to have minimal delay queued during the AM peak period.
- Southbound is the peak direction with a directional split of 62% / 38%. Maximum vehicle queue observed for the northbound to westbound left turn movement was two.
- The peak hour occurs between 5:00 PM – 6:00 PM. The northbound approach is the peak direction in the PM peak hour with a directional split of 54% / 46%.
- The highest turning movement volume occurred on U.S. Business 41 during the PM peak period and was the northbound to westbound left turn movement with 97 vehicles from 4:00 PM to 5:00 PM. The southbound to westbound right turn movement had 62 vehicles from 5:00 PM to 6:00 PM. The northbound to westbound left turn movement had a maximum of five vehicles queued in the median resulting in sight distance issues for the eastbound to northbound left turn movement. Sight distance was identified as an issue when motorists had to rotate their heads to identify on-coming traffic and identify a gap to complete their left turn maneuver onto U.S. Business 41.



Figure 4: U.S. Business 41, Vehicles Queued in the Median

An operational analysis was conducted using Synchro 9 to determine the operational effects of the recommendations. The intersections were analyzed with existing traffic volumes during the AM and PM peak hours with the existing geometry and with the proposed geometry. During AM peak hour conditions, the overall intersection delay for the intersection of US 41 Business/23rd Street reduced from 27.3 seconds per vehicle to 14.6 seconds per vehicle. During PM peak hour conditions, the overall intersection delay reduced from 47.7 seconds per vehicle to 13.3 seconds per vehicle. Synchro summary sheets are included in **Appendix E** of this report.

4.2 Crash Analysis

Vehicle, pedestrian, and bicycle safety at the intersection was assessed through review of crash reports, identification of significant crash trends, and correlation with field conditions. Following are the observations relating to the safety of this intersection:

- Crash data was obtained from FDOT for the period extending between January 2011 and December 2015. The collision data is summarized in **Table 1**.
- According to the collision data, there have been 17 collisions reported at this intersection during this time-period. The types of collisions that occurred at this intersection consisted of six (34%) angle crashes, two (12%) rear end, two (12%) sideswipes, two (12%) right turn, two (12%) run off road, one (6%) left turn, one (6%) head on collision, and one (6%) other collision. Of the total crashes, seven (41%) resulted in personal injury. Also, four (24%) of the collisions occurred at night. None of the collisions occurred during wet road conditions or involved a fatality.
- The six angle crashes involved a vehicle traveling along eastbound 23rd Street West, crossing U.S. Business 41 and turning left directly into the path of an oncoming vehicle. In addition, two right turn crashes occurred when vehicles traveling eastbound along 23rd Street West turned right onto southbound U.S. Business 41.
- The two sideswipe crashes occurred along southbound U.S. Business 41, one north and one south of the intersection. The sideswipe crashes were caused when vehicles made an improper lane change.
- Out of the two rear end crashes, one of the crashes occurred along southbound U.S. Business 41, south of 23rd Street West, and the other crash occurred along eastbound 23rd Street West.
- The two run-off the road crashes resulted when vehicles traveling along eastbound 23rd Street West failed to turn left onto northbound U.S. Business 41 instead continued to travel eastbound, hitting the curb and then a tree.
- The left turn crash involved a vehicle turning left from northbound U.S. Business 41 onto 23rd Street West, which turned into the path a vehicle traveling along southbound U.S. 41.
- A head on collision occurred when a vehicle traveling southbound along U.S. Business 41 made a wide right turn into the path of a vehicle in the left turn lane along eastbound 23rd Street West.
- The other collision involved a vehicle speeding and hitting a tree. The driver was charged with driving under the influence (DUI).
- The crash data is summarized in **Appendix F** of this report.

Additional uncertified crash reports from January 2016 through April 2018 were reviewed to assess the intersection safety to the present. A total of 12 crashes were reported for this 28-month period consisting of nine (76%) angle, one (8%) rear end, one (8%) sideswipe and one (8%) overturned

vehicle crashes. The occurrence of angle crashes increased significantly for vehicles traveling eastbound on 23rd Street West to turn left turn onto northbound U.S. Business 41. One of the angle crashes involved a fatality in 2017. As mentioned in the *Signal Warrant Study - U.S. 41 (Business) at 23rd Street West* by Traffic Engineering Data Solutions, Inc., “Should the angle crash pattern continue or the frequency of angle crashes increase, it is recommended to reconstruct the existing full median opening to a northbound directional median opening.” **Consider reconstructing the existing full median opening at 23rd Street West to a northbound directional median opening, including milling and resurfacing the intersection.**

A total of 56 right turn movements (28 during both AM and PM peaks) are anticipated to be displaced from the reconstruction of 23rd Street West as additional U-turn movements at 20th Street West. The total deceleration and storage distances provided by the existing left turn lane at 20th Street West are 140 and 50 feet, respectively. Per FDM 212.6 (Exhibit 212-1), a total deceleration distance of 240 feet plus a minimum queue length of 50 feet (FDM 212.14.2) is required for the 50 mph design speed. Therefore, the total proposed left turn lane length is 455 feet (including 50-foot taper). In order to extend the southbound left turn lane at 20th Street West, reducing the length of the northbound left turn lane at 23rd Street West from 655 feet to 570 feet would be required. The proposed length of the northbound left turn lane at 23rd Street West would accommodate the required total deceleration length plus provide a queue length of 330 feet for storage, which exceeds the total proposed left turn lane length requirement. In addition, the existing roadway network provides an alternate route to access northbound U.S. Business 41 via 14th Avenue West and the signalized intersection of 17th Street West/Memphis Road.

4.3 Maintenance

In addition to observing operational and safety conditions during the field review, correctible maintenance items were also identified. A summary of the maintenance items identified at this intersection is provided below.

- The pavement at the intersection is in poor condition with extensive raveling and pavement gouging present.



Figure 5: Existing Intersection Pavement Condition

- There is one missing object marker (south of the intersection, east side) and one broken object marker (north of the intersection, west side) at the drainage end walls.



Figure 6: U.S. Business 41, Broken Object Marker at Drainage End Wall

Appendix B includes a condition diagram of the study area and photographs of each of the intersection approaches are included in **Appendix G**.

5. RECOMMENDATIONS

Based on the results of the data collection, crash analysis, qualitative assessment, operational assessment and engineering judgment, the following recommendations were developed:

1. Consider reconstructing the existing full median opening at 23rd Street West to a northbound directional median opening, including milling and resurfacing the intersection.
2. Consider extending the length of the southbound left turn lane at 20th Street West from 140 to 290 feet, and reduce the length of the northbound left turn lane at 23rd Street West from 655 to 570 feet to accommodate the displaced U-turn movement from 23rd Street West.

Refer to **Appendix H** for the corresponding Conceptual Design Plans.



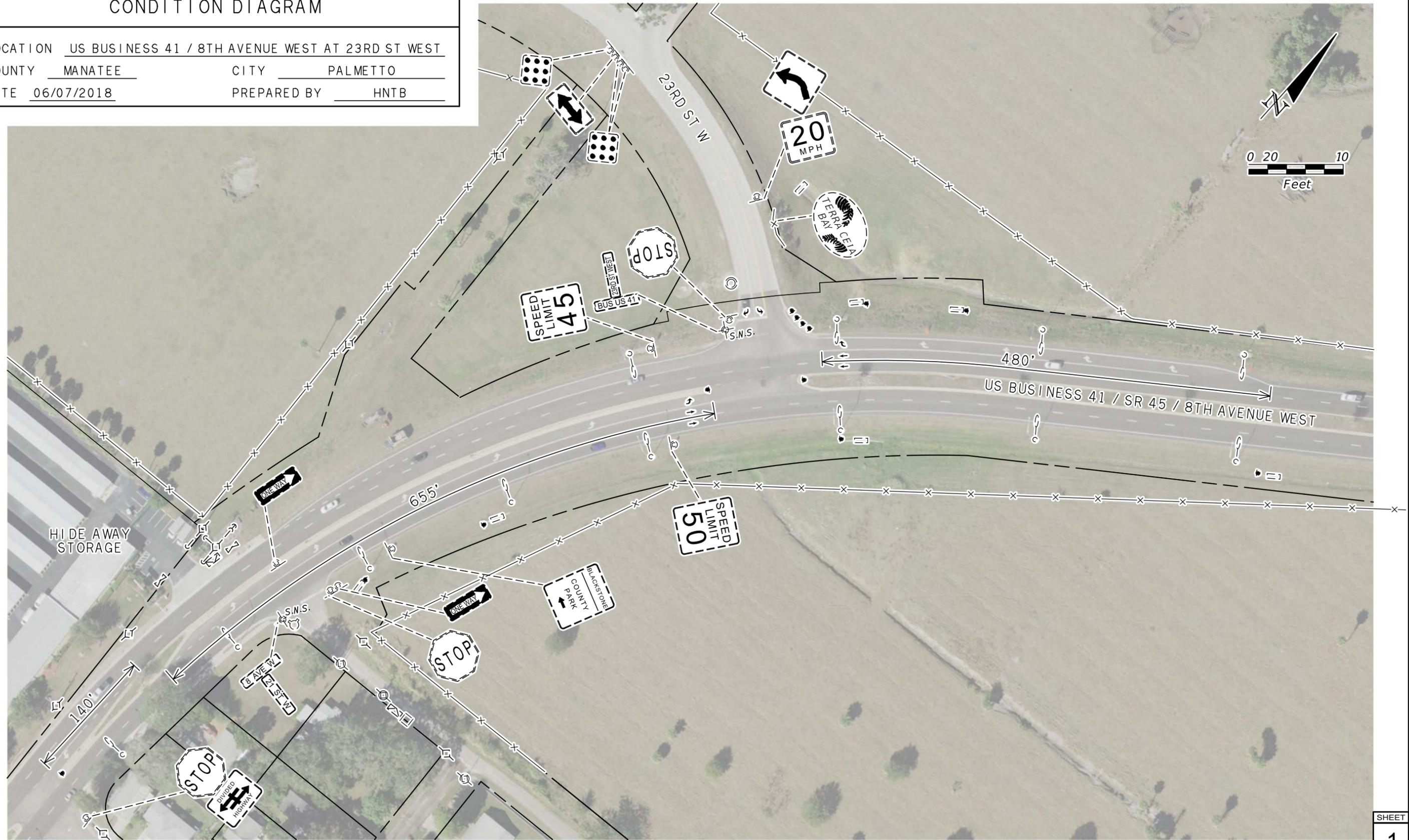
APPENDIX A: STRAIGHT LINE DIAGRAM



APPENDIX B: CONDITION DIAGRAM

CONDITION DIAGRAM

LOCATION US BUSINESS 41 / 8TH AVENUE WEST AT 23RD ST WEST
 COUNTY MANATEE CITY PALMETTO
 DATE 06/07/2018 PREPARED BY HNTB



SHEET
1

SYMBOLS

	RETAINING WALL		DELINEATOR		CROSS DRAIN		POWER POLE		SINGLE POST SIGN		VALVE
	FENCE		HYDRANT		R/W LINE		COMBINATION POLE		BILLBOARD		STREET NAME SIGN
	MANHOLE		LIGHT PULL BOX		LIGHT POLE		METER		CONCRETE MONUMENT		MITERED END SECTION
					GUY WIRE		UTILITY SERVICE BOX				

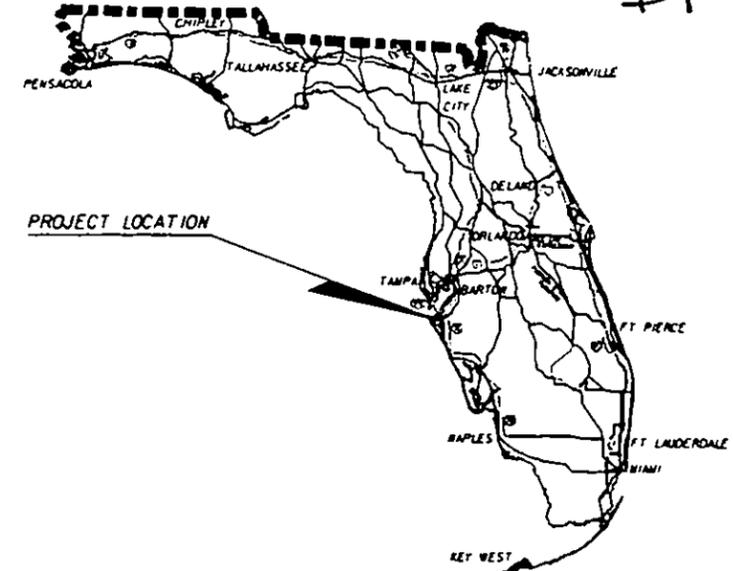


APPENDIX C: AS-BUILT PLANS

COMPONENTS OF CONTRACT PLANS SET
 ROADWAY PLANS
 SIGNING AND PAVEMENT MARKING PLANS

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION
FINAL AS-BUILT PLANS
CONTRACT PLANS

FINANCIAL PROJECT ID 195902-2-52-01
 MANATEE COUNTY (13030)
 STATE ROAD 45
 (BUSINESS U.S. 41)



A DETAILED INDEX APPEARS ON THE
 KEY SHEET OF EACH COMPONENT

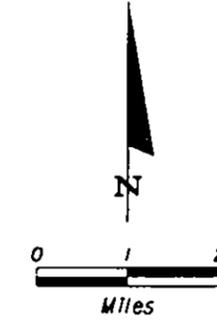
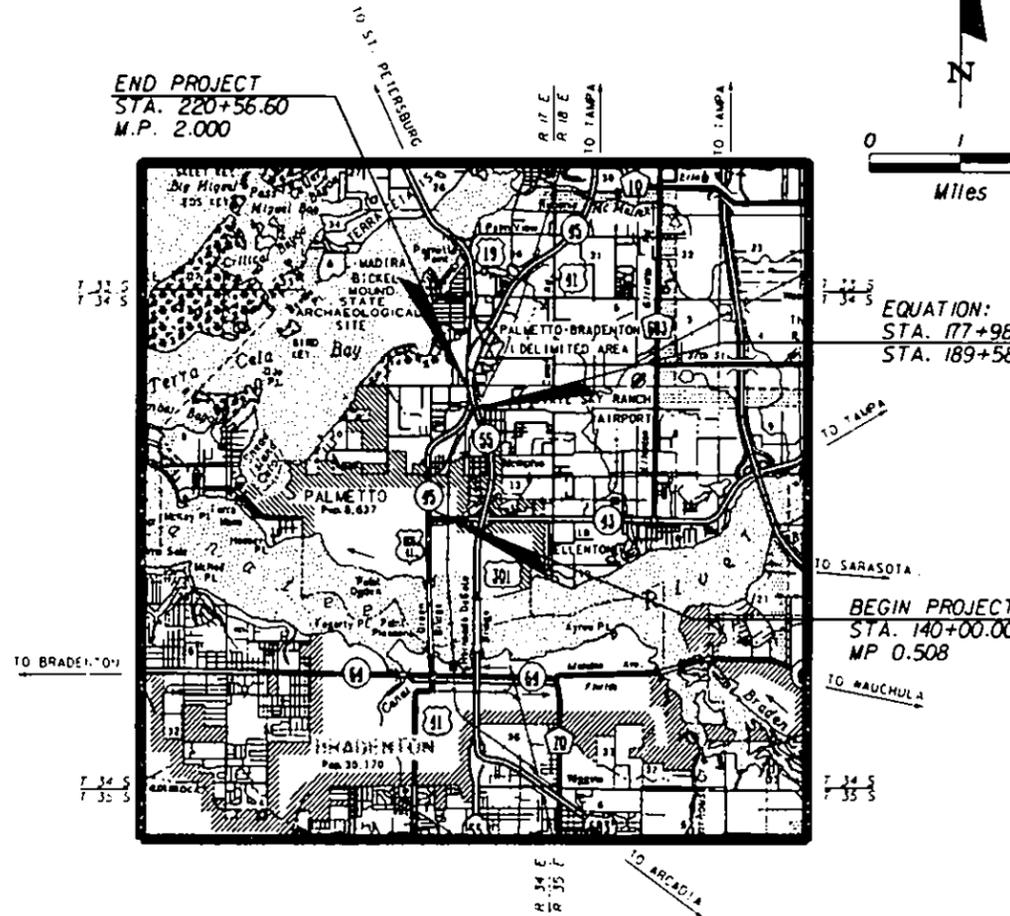
INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	SUMMARY OF PAY ITEMS
3-4	TYPICAL SECTION
5	REFERENCE POINTS/BENCH MARKS
6	GENERAL NOTES AND SUMMARY OF QUANTITIES
7-22	ROADWAY PLAN SHEETS
23	TRAFFIC CONTROL PLAN
24-30	INTERIM DESIGN STANDARDS
31-33	STORMWATER POLLUTION PREVENTION PLAN

ASPHALT COMPUTER INVOICES

# OF BOOKS	DESIGN MIX#
1	02-2202A
10	04-3459A
4	04-3055A

END PROJECT
 STA. 220+56.60
 M.P. 2.000



CONTRACTOR: AJAX PAVING INDUSTRIES, INC.
 DISTRICT SECRETARY: STANLEY M. CANN, P.E.
 OPERATIONS ENGINEER: LANCE GRACE, P.E.
 PROJECT MANAGER: JAY WINTER
 PROJECT ADMINISTRATOR: SCOTT GUTHRIE
 DATE WORK STARTED: 7/26/2004
 DATE WORK ACCEPTED: 11/5/2004

EQUATION:
 STA. 177+98.54 @ SURVEY BACK=
 STA. 189+58.78 (NORTHBOUND) AHEAD

BEGIN PROJECT
 STA. 140+00.00
 MP 0.508

PLANS PREPARED BY:
 ENGINEER OF RECORD:
JE Jacobs Civil Inc.
 18302 Highwoods Preserve Parkway
 Highwoods Plaza, Suite 200
 Tampa, FL 33647
 Tel. (813) 977-3434
 Certificate of Authorization No. 6572
 Consultant Contract No. C-7505
 Vendor No. 43-15216-H

NOTE: THE SCALE OF THESE PLANS MAY
 HAVE CHANGED DUE TO REPRODUCTION.

"This project was constructed in substantial compliance with these plans as provided by the Engineer of Record. If changes were made, those changes are indicated by black ink revision and bear the seal and signature of the Responsible Engineer."

GOVERNING STANDARDS AND SPECIFICATIONS:
 FLORIDA DEPARTMENT OF TRANSPORTATION,
 DESIGN STANDARDS DATED JANUARY 2002, AND
 STANDARDS SPECIFICATIONS FOR ROAD AND BRIDGE
 CONSTRUCTION DATED 2004,
 AS AMENDED BY CONTRACT DOCUMENTS.



PROJECT LENGTH IS BASED ON @ SURVEY NORTHBOUND SR 45.

LENGTH OF PROJECT		
	LINEAR FEET	MILES
ROADWAY	6896.36	1.306
BRIDGES	-	-
NET LENGTH OF PROJECT	6896.36	1.306
EXCEPTIONS	-	-
GROSS LENGTH OF PROJECT	6896.36	1.306

KEY SHEET REVISIONS		
DATE	BY	DESCRIPTION

ROADWAY PLANS
 ENGINEER OF RECORD: RICHARD C. ROCKOFF, P.E.
 P.E. NO. 12723

YEAR	SHEET NO.
04	1

DOT PROJECT MANAGER: JAY WINTER

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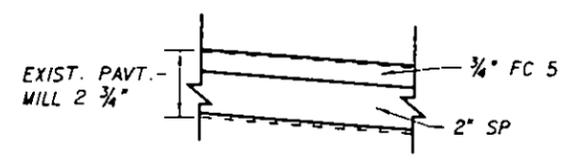
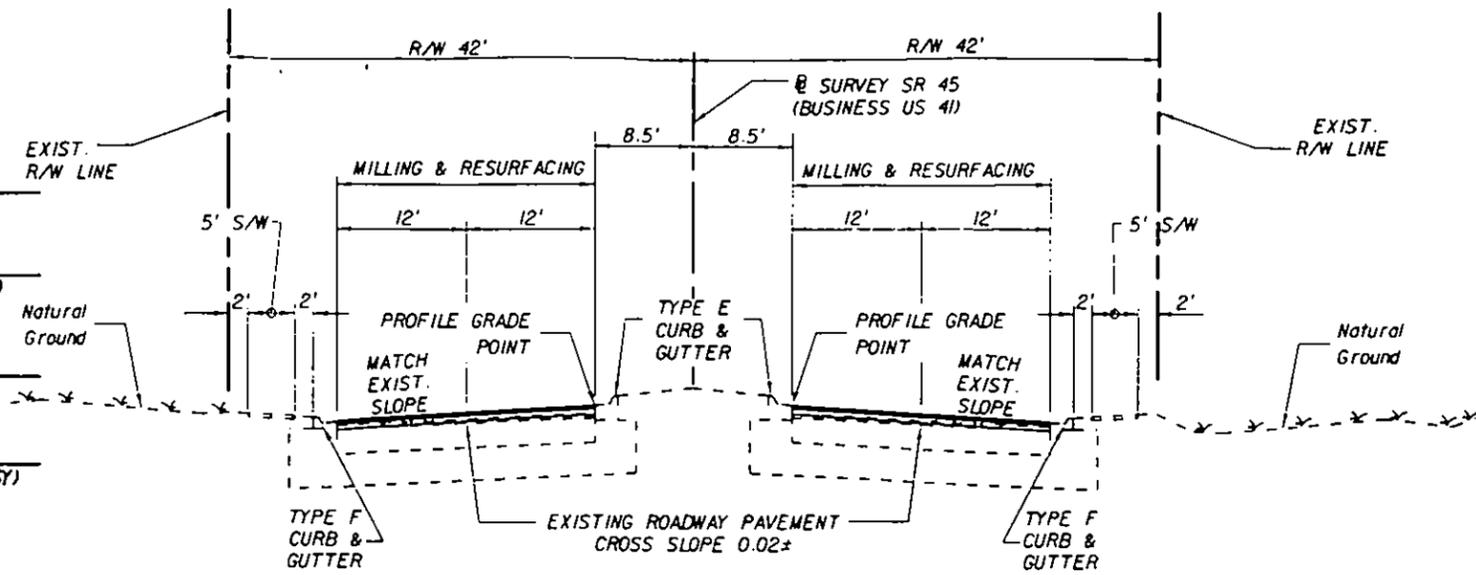
PAVEMENT DESIGN

MAINLINE MILLING
MILL EXISTING ASPHALT PAVEMENT (2-3/4" AVG. DEPTH)

MAINLINE RESURFACING
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (200 LBS/SY)
AND FRICTION COURSE FC-5 (80 LBS/SY) (RUBBER)

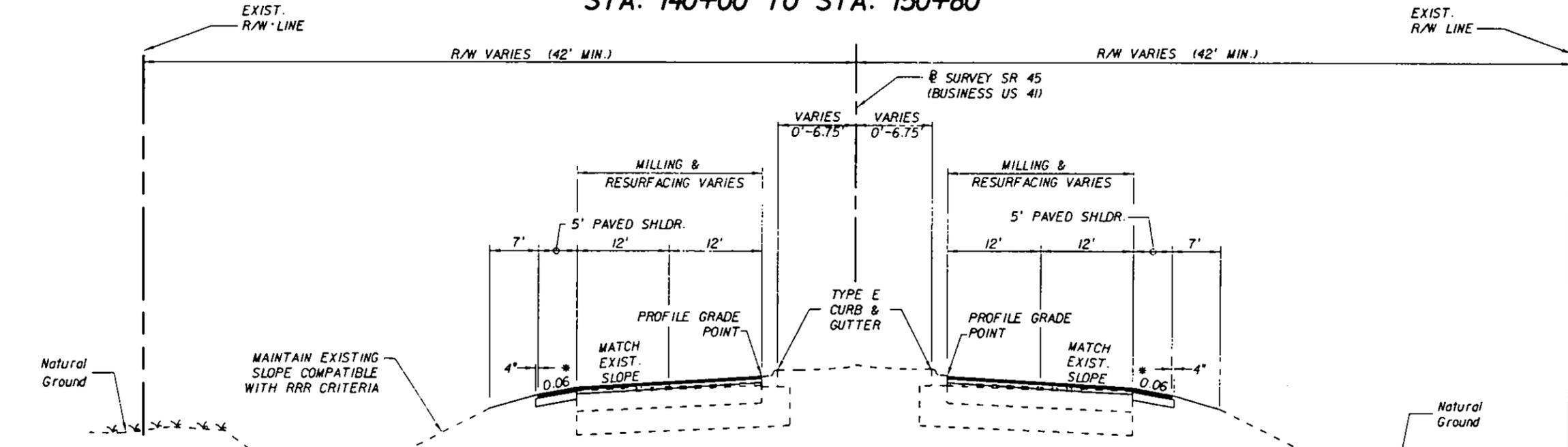
TURN LANE AND CROSSOVER MILLING
MILL EXISTING ASPHALT PAVEMENT (2-3/4" AVG. DEPTH)

TURN LANE AND CROSSOVER RESURFACING
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (200 LBS/SY)
AND FRICTION COURSE FC-5 (80 LBS/SY) (RUBBER)



TYPICAL PAVEMENT DESIGN LAYERING DETAIL

**TYPICAL SECTION
SR 45 (BUSINESS US 41)
STA. 140+00 TO STA. 150+80**



PAVEMENT DESIGN

MAINLINE MILLING
MILL EXISTING ASPHALT PAVEMENT (2-3/4" AVG. DEPTH)

MAINLINE RESURFACING
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (200 LBS/SY)
AND FRICTION COURSE FC-5 (80 LBS/SY) (RUBBER)

TURN LANE, CROSSOVER AND EXISTING SHOULDER MILLING
MILL EXISTING ASPHALT PAVEMENT (2-3/4" AVG. DEPTH)

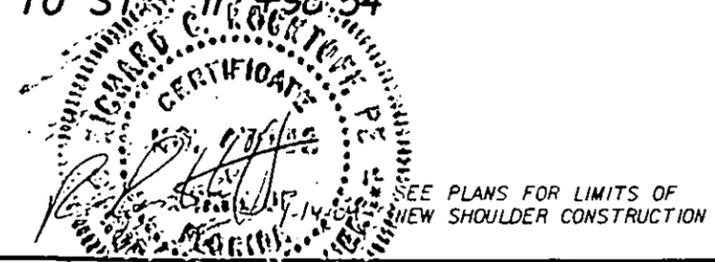
TURN LANE, CROSSOVER AND EXISTING SHOULDER RESURFACING
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (200 LBS/SY)
AND FRICTION COURSE FC-5 (80 LBS/SY) (RUBBER)

NEW SHOULDER PAVEMENT
OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (200 LBS/SY)
AND FRICTION COURSE FC-5 (80 LBS/SY) (RUBBER)

**TYPICAL SECTION
SR 45 (BUSINESS US 41)
STA. 150+80 TO STA. 177+98.54**



TRAFFIC DATA
CURRENT YEAR ESTIMATE - 2003 AADT = 19,500
OPENING YEAR ESTIMATE - 2004 AADT = 20,200
DESIGN YEAR ESTIMATE - 2024 AADT = 34,900
K = 10.3 D = 53.2% 24 HOUR T = 4.8%
DESIGN HOUR T = 2.4%
DESIGN SPEED = 50 MPH
POSTED SPEED = VARIES, 50 MPH MAX.



SEE PLANS FOR LIMITS OF
NEW SHOULDER CONSTRUCTION

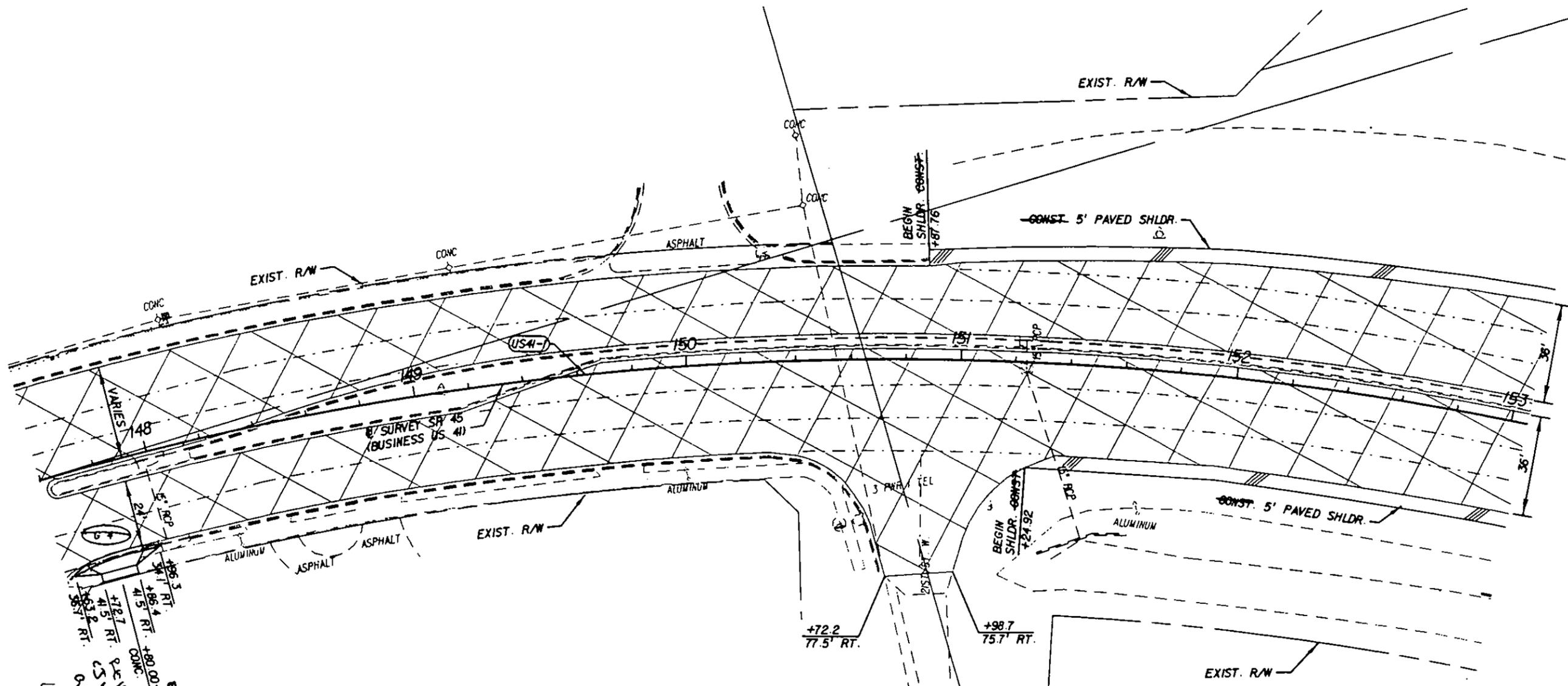
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

JE Jacobs Civil Inc.
18302 Highwoods Preserve Parkway
Highwoods Plaza, Suite 200
Tampa, FL 33647
Tel. (813) 977-3434
Certificate of Authorization No. 6572
ENGINEER OF RECORD:
R. ROCKTDOFF, P.E. No. 47032

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 45	MANATEE	195902-2-52-01

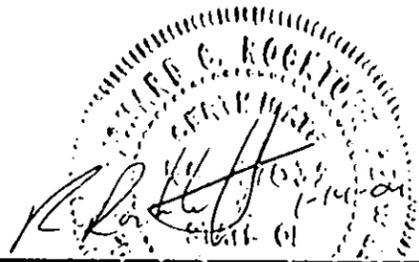
**TYPICAL SECTION
BUSINESS U.S. 41**

SHEET NO.
3



EXISTING
 196.5 RT.
 41.5 RT. CONC. DRIVEWAY TO C.M.I.L. COM
 178.7 RT. RE-EGG
 41.5 RT. CONC. DRIVEWAY TO C.M.I.L. COM
 183.2 RT. 5m WIND @ CROSS COM
 0-01-05
 Letter facing sheet 4

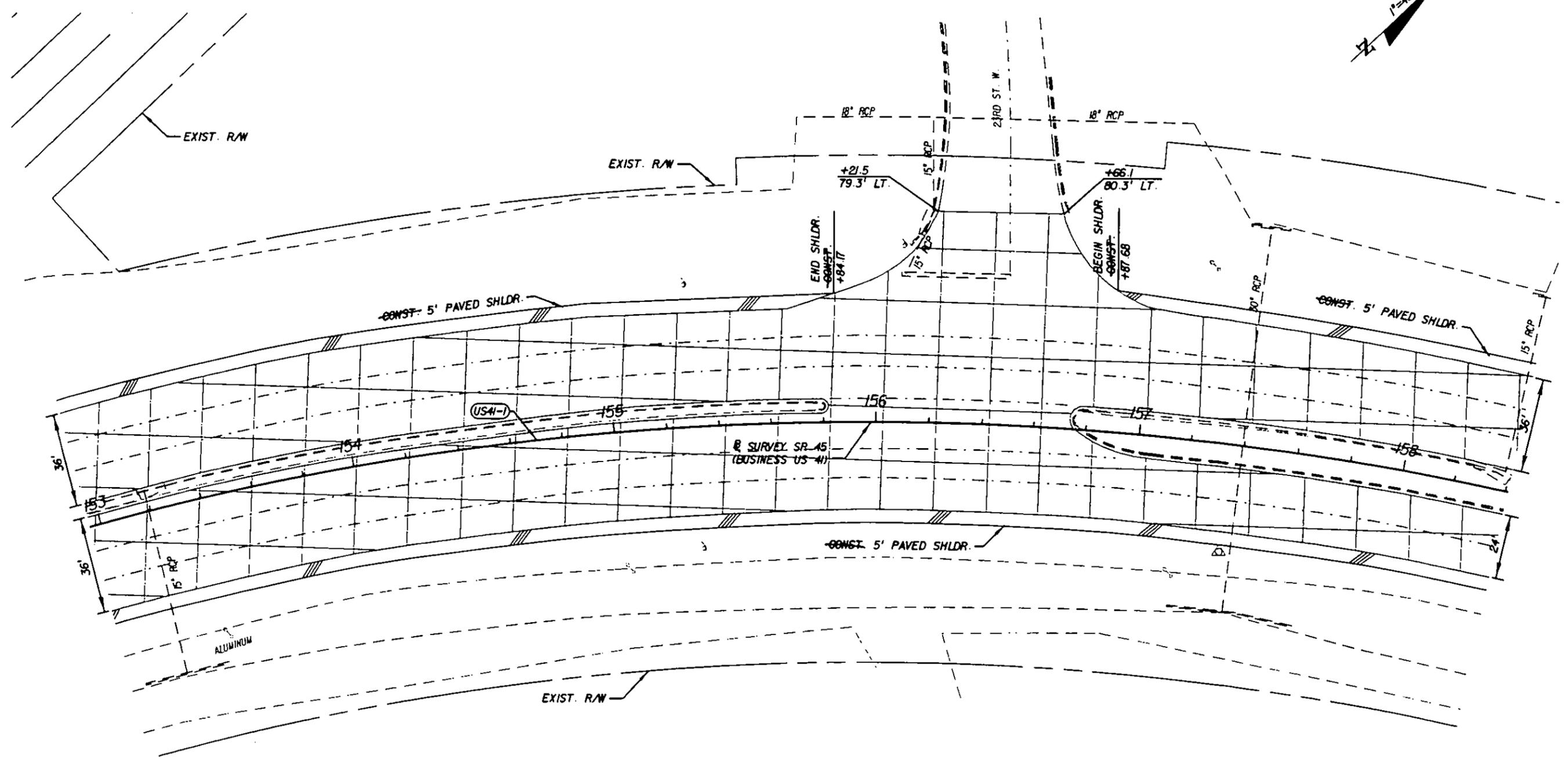
US41-1
 PI STA 153+71.37
 $\Delta = 57^{\circ}24'20''$ (RT.)
 D = 5700'00"
 T = 627'44"
 L = 1248.11'
 R = 1445.92'
 PC STA 147+43.93
 PT STA 158+92.05
 e = 0.023



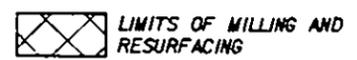
LIMITS OF MILLING AND RESURFACING

P:\9592\15\1000\100\959202\roadway\plan\p03.dgn
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 rlf(wr)

REVISIONS						Jacobs Civil Inc. 18302 Highwoods Preserve Parkway Highwoods Plaza, Suite 200 Tampa, FL 33647 Tel. (813) 977-3434 Certificate of Authorization No. 6572 ENGINEER OF RECORD R. ROCKOFF, P.E., No. 47032	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			PLAN SHEET (3) STA. 147+60 TO STA. 153+00	SHEET NO. 9
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
						SR 45	MANATEE	195902-2-52-01			



US41-1
 PI STA 153+71.37
 $\Delta = 57^{\circ}24'20''$ (RT.)
 $D = 5^{\circ}00'00''$
 $T = 627.44'$
 $L = 1,48.11'$
 $R = 1,45.92'$
 PC STA 147+43.93
 PT STA 158+92.05
 $e = 0.023$



P:\ES\9243\7000\AD\955025\roadway\planr04.dgn
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 ref(1)

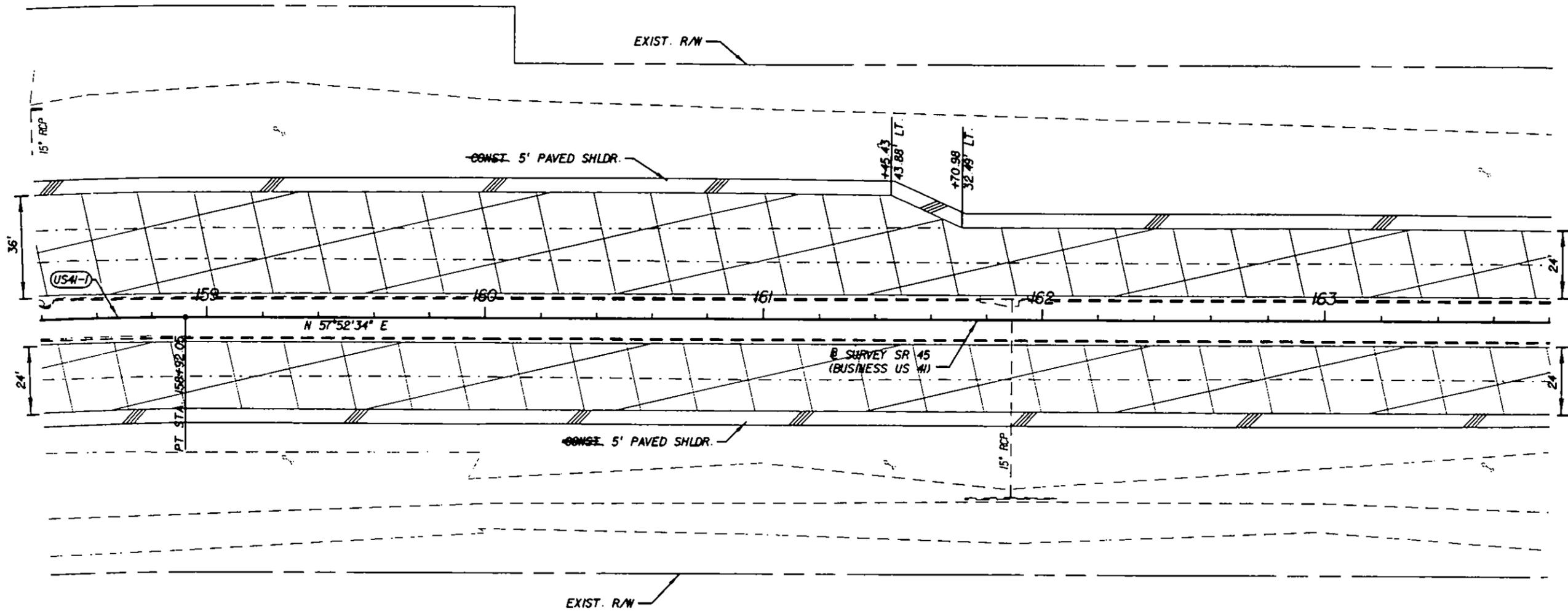
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

J Jacobs Civil Inc.
 18302 Highwoods Parkway, Parkway
 Highwoods Plaza, Suite 200
 Tampa, FL 33647
 Tel. (813) 977-3434
 Certificate of Authorization No. 6572
 ENGINEER OF RECORD
 R. ROCKTOFF, P.E. No. 47032

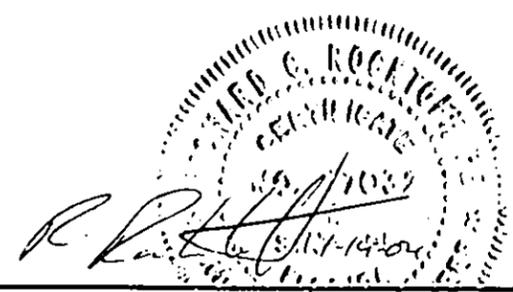
STATE OF FLORIDA		
DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 45	MANATEE	195902-2-52-01

PLAN SHEET (4)
STA. 153+00 TO STA. 158+40

SHEET NO.
 10



US4-1
 PI STA 153+71.37
 $\Delta = 57^{\circ}24'20''$ (RT.)
 $D = 5^{\circ}00'00''$
 $T = 627.44'$
 $L = 1,448.11'$
 $R = 1,445.92'$
 PC STA 147+43.93
 PT STA 158+92.05
 $e = 0.023$



 LIMITS OF MILLING AND RESURFACING

P:\95924\3\700\420\959022\roadway\plan\05.dgn
 (r:\m\j)
 D-DEC-2003 8:18

REVISIONS						 Jacobs Civil Inc. 18302 Highwoods Preserve Parkway Highwoods Plaza, Suite 200 Tampa, FL 33647 Tel. (813) 977-3434 Certificate of Authorization No. 6572 ENGINEER OF RECORD: R. ROCKTOFF, P.E. No. 47032	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			PLAN SHEET (5) STA. 158+40 TO STA. 163+80	SHEET NO. 11
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID#		
						SR 45	MANATEE	195902-2-52-01			

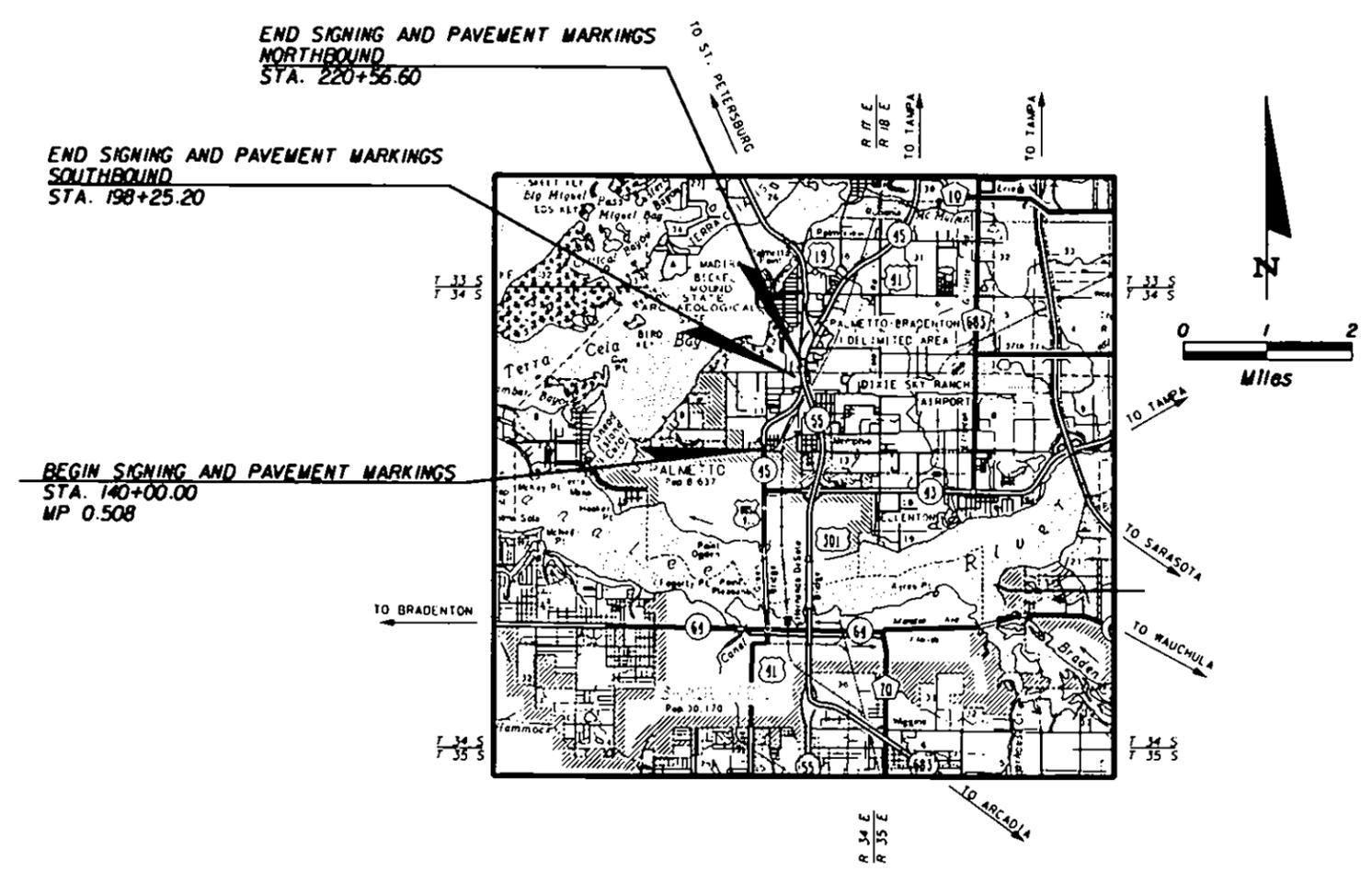
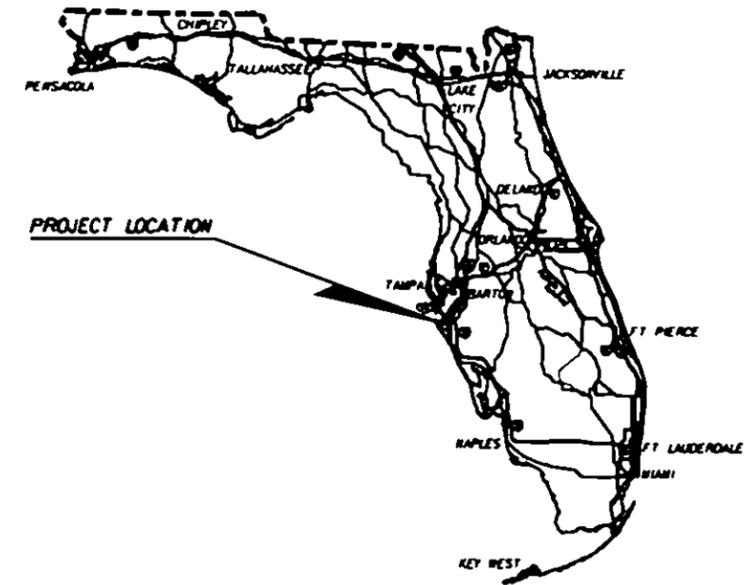
**STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION**

CONTRACT PLANS

FINANCIAL PROJECT ID 195902-2-52-01
MANATEE COUNTY (13030)
U.S. 41/BUSINESS 41
SIGNING AND PAVEMENT MARKING PLANS

INDEX OF SIGNING AND PAVEMENT MARKING PLANS

SHEET NO.	SHEET DESCRIPTION
S-1	KEY SHEET
S-2	GENERAL NOTES
S-3 - S-15	PLAN SHEETS
S-16 - S-17	GUIDE SIGN WORK SHEETS
S-18	SIGNING AND MARKING CROSS SECTION SHEET



SIGNING AND PAVEMENT MARKING PLANS ENGINEER OF RECORD
AMY J. SHAFER, P.E.
FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 1 OFFICE
P.O. BOX 1249
BARTOW, FL 33831-1249
OR
801 N. BROADWAY AVE.
BARTOW, FL 33830-3809

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

GOVERNING STANDARDS AND SPECIFICATIONS:
FLORIDA DEPARTMENT OF TRANSPORTATION,
DESIGN STANDARDS DATED JANUARY 2004, AND
STANDARDS SPECIFICATIONS FOR ROAD AND BRIDGE
CONSTRUCTION DATED 2004,
AS AMENDED BY CONTRACT DOCUMENTS.

REVISIONS

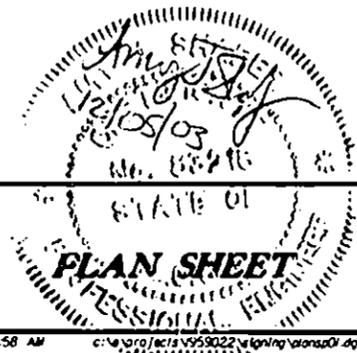
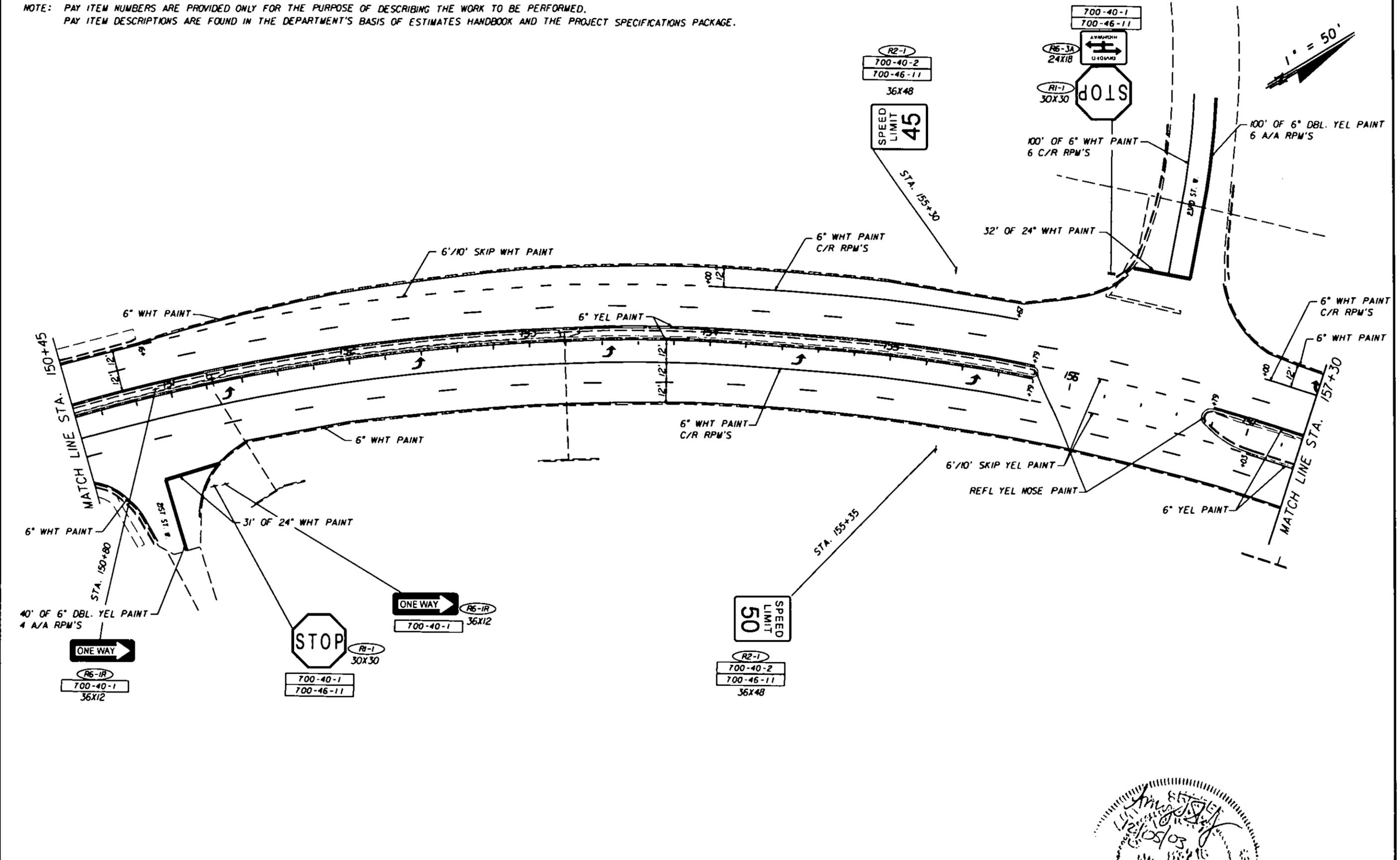
KEY SHEET REVISIONS		
DATE	BY	DESCRIPTION

FDOT PROJECT MANAGER: RICHARD L. BARMAN

SIGNING AND PAVEMENT MARKING PLANS
ENGINEER OF RECORD: AMY J. SHAFER, P.E.
12/05/03 12:05 PM
P.E. NO. 53218

FISCAL YEAR	SHEET NO.
2004	S-1

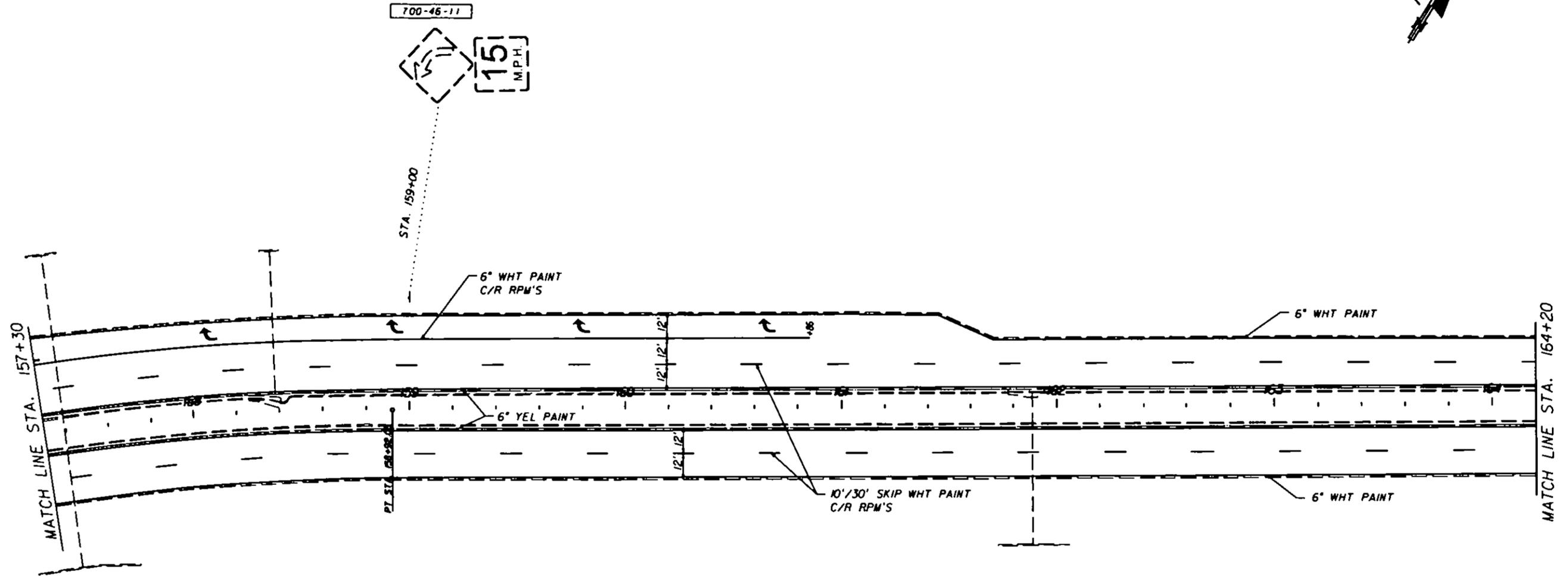
NOTE: PAY ITEM NUMBERS ARE PROVIDED ONLY FOR THE PURPOSE OF DESCRIBING THE WORK TO BE PERFORMED.
 PAY ITEM DESCRIPTIONS ARE FOUND IN THE DEPARTMENT'S BASIS OF ESTIMATES HANDBOOK AND THE PROJECT SPECIFICATIONS PACKAGE.



REVISIONS						SIGNING AND MARKING PLANS ENGINEER OF RECORD AMY J. SHAFER, PE 5328 FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 1 OFFICE P.O. BOX 1249 BARTON, FL. 33831-1249	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. S-5
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
						SR-45	Manatee	195902-2-52-01		

NOTE: PAY ITEM NUMBERS ARE PROVIDED ONLY FOR THE PURPOSE OF DESCRIBING THE WORK TO BE PERFORMED.
 PAY ITEM DESCRIPTIONS ARE FOUND IN THE DEPARTMENT'S BASIS OF ESTIMATES HANDBOOK AND THE PROJECT SPECIFICATIONS PACKAGE.

1" = 50'



REVISIONS						SIGNING AND MARKING PLANS ENGINEER OF RECORD AMY J. SHAFER, PE 5328 FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 1 OFFICE P.O. BOX 1249 BARTON, FL. 33831-1249	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			PLAN SHEET	SHEET NO. S-6
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
						SR-45	Manatee	195902-2-52-01			

August 12, 2003
 No. 182716
 STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION
 DISTRICT 1 OFFICE
 BARTON, FLORIDA

CONTRACT PLANS COMPONENTS

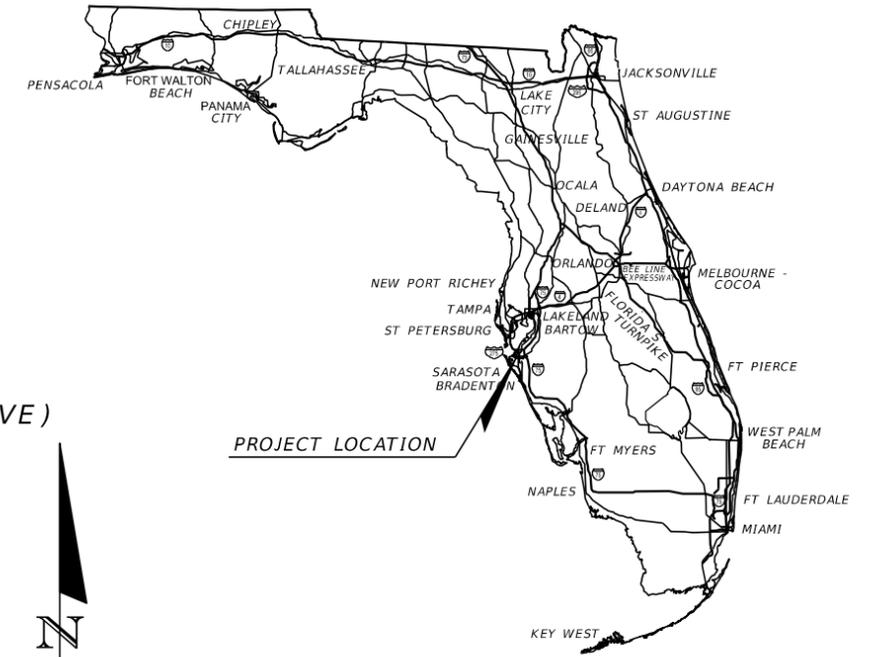
ROADWAY PLANS
SIGNING AND PAVEMENT MARKING PLANS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

CONTRACT PLANS

FINANCIAL PROJECT ID 436983-1-52-01
(FEDERAL FUNDS)
MANATEE COUNTY (13000)

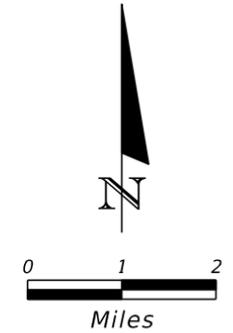
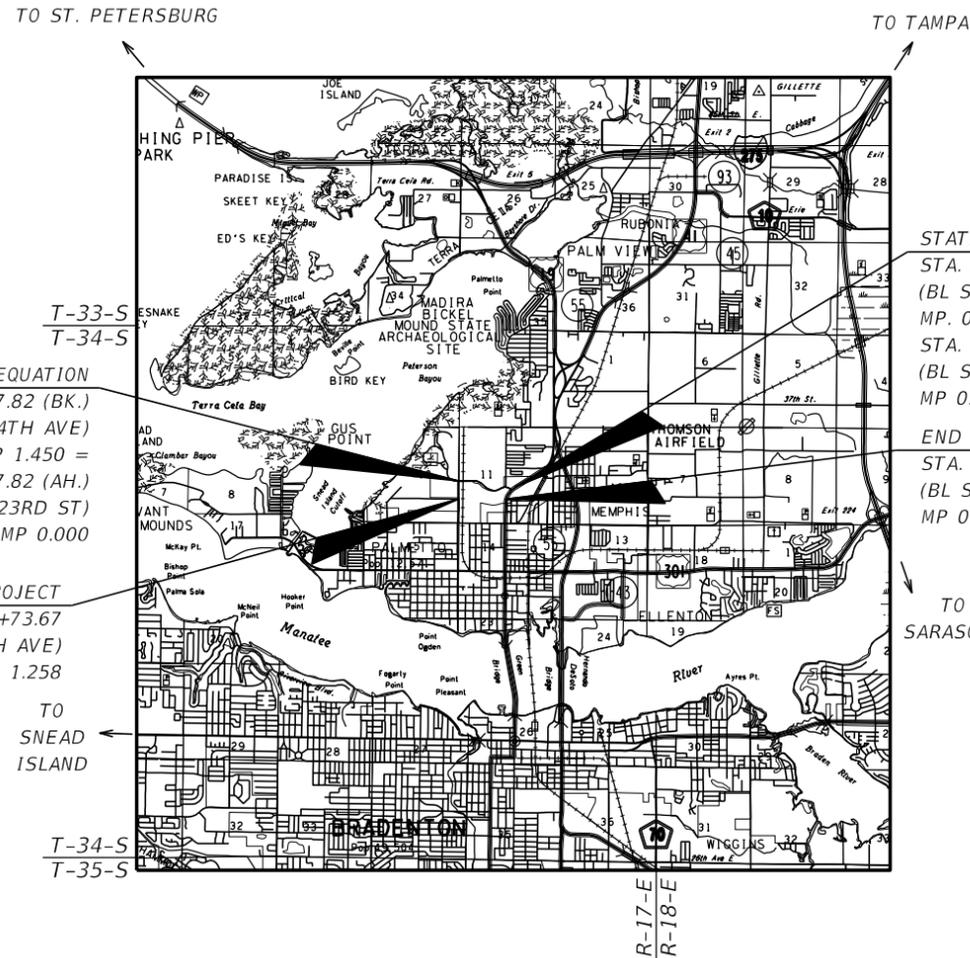
BLACKSTONE PARK
14TH AVENUE WEST, 23RD STREET WEST, AND BUSINESS 41 (VALENCIA DRIVE)



INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	SUMMARY OF PAY ITEMS
3-4	TYPICAL SECTIONS
SQ-1 TO SQ-4	SUMMARY OF QUANTITIES
5	SUMMARY OF DRAINAGE STRUCTURES
6	OPTIONAL MATERIALS TABULATION
7	PROJECT LAYOUT
8-10	PROJECT CONTROL
11	GENERAL NOTES
12-20	ROADWAY PLANS
21-22	DRAINAGE STRUCTURES
23-48	CROSS SECTIONS
49-50	STORMWATER POLLUTION PREVENTION PLAN
51	TEMPORARY TRAFFIC CONTROL PLAN
52-60	UTILITY ADJUSTMENTS
61	SELECTIVE CLEARING AND GRUBBING
62	CONTAMINATION SITE PLAN
UTV-1*	VERIFIED UTILITY LOCATE SHEET

* This sheet is included in the Index of Roadway Plans only to indicate that it is part of the Roadway Plans. This sheet is contained in a separate digitally signed and sealed document.

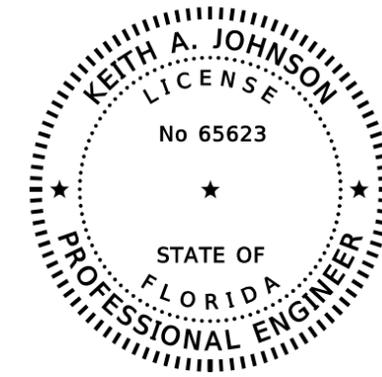


STATION EQUATION
STA. 243+22.81
(BL SURVEY 23RD ST)
MP. 0.613 =
STA. 156+23.78 (AH.)
(BL SURVEY BUS US 41)
MP 0.861

END PROJECT
STA. 150+79.50
(BL SURVEY BUS US 41)
MP 0.758

STATION EQUATION
STA. 210+87.82 (BK.)
(BL SURVEY 14TH AVE)
MP 1.450 =
STA. 210+87.82 (AH.)
(BL SURVEY 23RD ST)
MP 0.000

BEGIN PROJECT
STA. 200+73.67
(BL SURVEY 14TH AVE)
MP 1.258



THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY:

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON THE ELECTRONIC DOCUMENTS.

GOVERNING DESIGN STANDARDS:

Florida Department of Transportation, FY2017-18 Design Standards eBook (DSeB) and applicable Design Standards Revisions (DSRs) at the following website:
<http://www.fdot.gov/roadway/designstandards/standards.shtm>

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, January 2018, Standard Specifications for Road and Bridge Construction at the following website:
<http://www.fdot.gov/programmanagement/Implemented/SpecBooks>

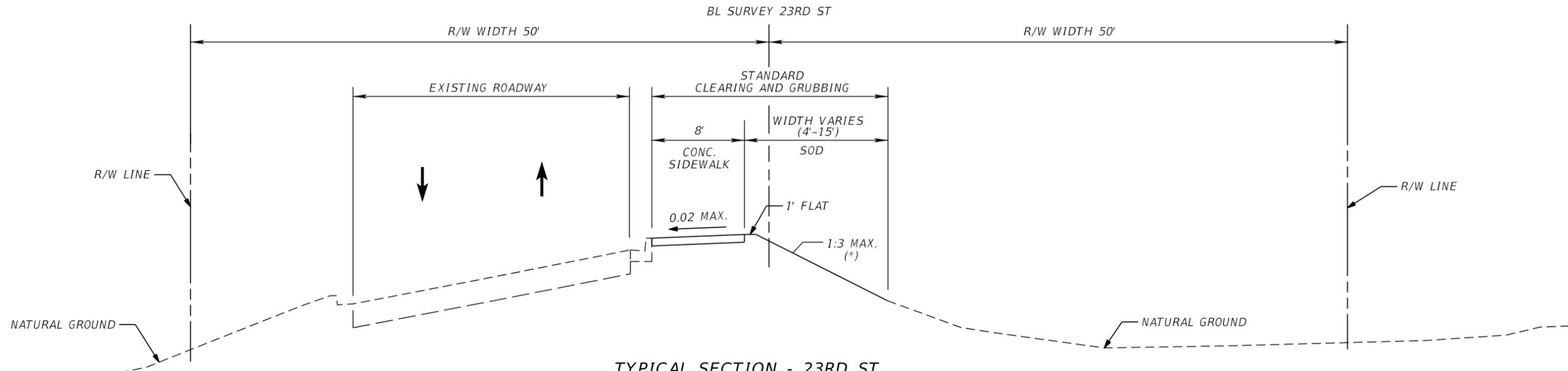
ROADWAY PLANS
ENGINEER OF RECORD:

KEITH A. JOHNSON, P.E.
P.E. NO.: 65623
PEGASUS ENGINEERING, LLC
301 WEST STATE ROAD 434
SUITE 309
WINTER SPRINGS, FL 32708
(407) 992-9160
CONSULTANT CONTRACT NO.: C9C26
VENDOR NO.: F260806410-001
CERTIFICATE OF AUTHORIZATION NO. 27770

FDOT PROJECT MANAGER:
ANTONE SHERRARD

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
T1699	18	1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

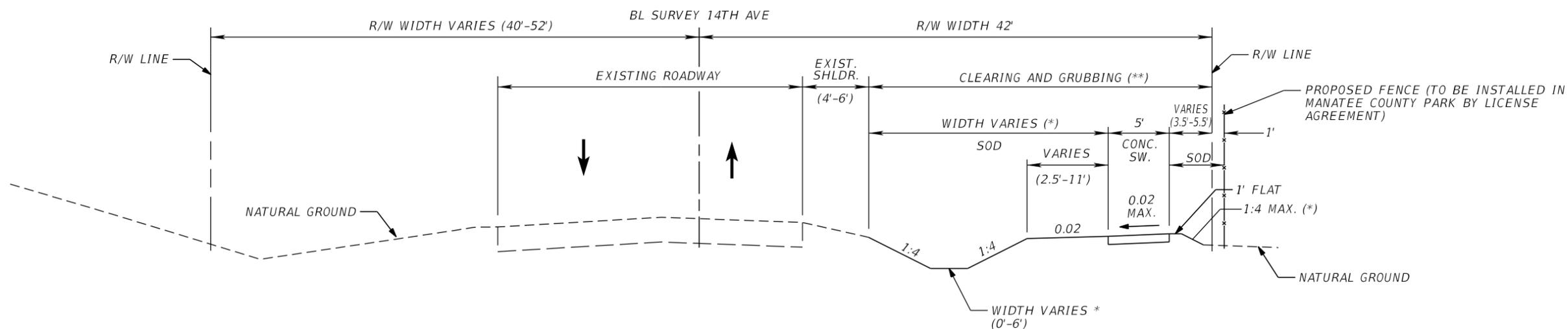


TYPICAL SECTION - 23RD ST.
 STA. 210+87.82 TO STA. 243+22.81
 STA. 243+22.81 (BK.) = STA. 156+23.78 (AH.)

* NOTE: SEE PLANS AND CROSS SECTION SHEETS FOR ADDITIONAL DETAILS

TRAFFIC DATA

CURRENT YEAR = 2017 AADT = 3,200
 K = 9.0% D = 55.9% T = 9.4% (24 HOUR)
 DESIGN SPEED = 35 MPH
 POSTED SPEED = 35 MPH



TYPICAL SECTION - 14TH AVE.
 STA. 200+73.67 TO STA. 210+87.82

(* NOTE: SEE PLANS AND CROSS SECTION SHEETS FOR ADDITIONAL DETAILS

(**) STANDARD CLEARING AND GRUBBING FROM STA. 200+73.67 TO STA. 202+10.00 AND STA. 207+80.00 TO STA. 210+87.82

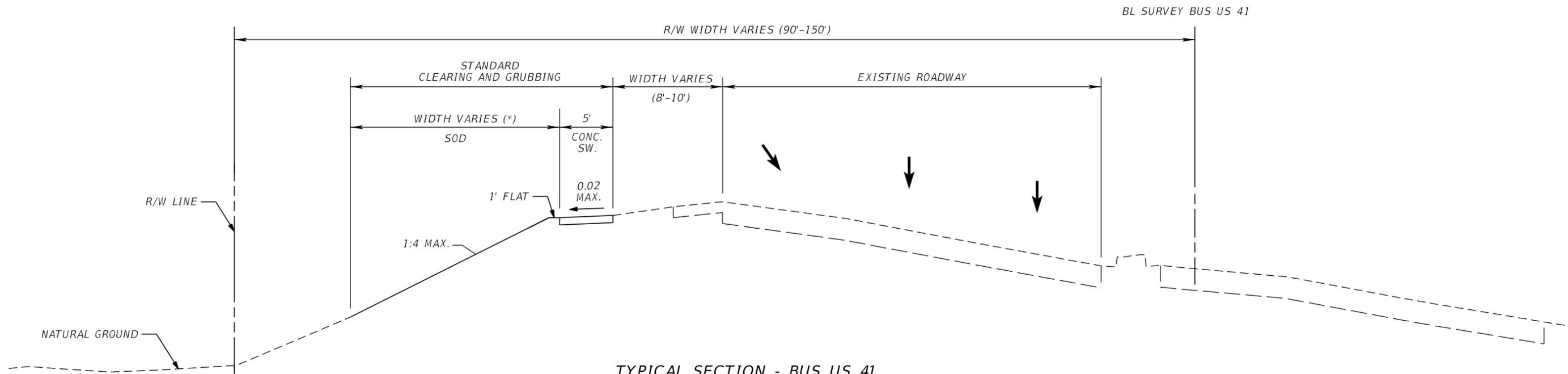
SELECTIVE CLEARING AND GRUBBING FROM STA. 202+10.00 TO STA. 207+80.00

TRAFFIC DATA

CURRENT YEAR = 2017 AADT = 2,050
 K = 9.0% D = 55.9% T = 1.9% (24 HOUR)
 DESIGN SPEED = 35 MPH
 POSTED SPEED = 35 MPH

REVISIONS				KEITH A. JOHNSON, P.E. P.E. NO. 65623	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				PEGASUS ENGINEERING, LLC 301 WEST STATE ROAD 434, SUITE 309 WINTER SPRINGS, FLORIDA 32708 TEL. (407) 992-9160 CERTIFICATE OF AUTHORIZATION NO. 27770		MANATEE	436983-1-52-01	3
<i>TYPICAL SECTIONS (1)</i>								

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

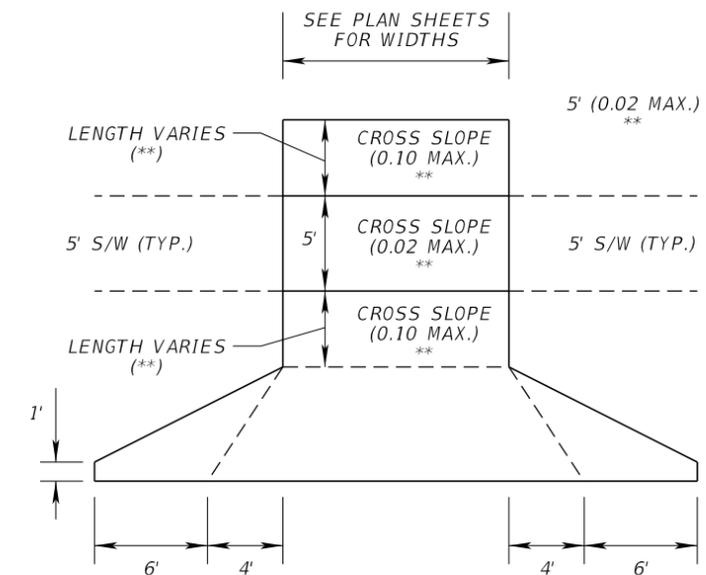


TYPICAL SECTION - BUS US 41
STA. 150+79.50 TO STA. 156+23.78

(*) NOTE: SEE PLANS AND CROSS SECTION SHEETS FOR ADDITIONAL DETAILS

CONCRETE DRIVEWAY
TYPICAL DETAIL
(6" THICK)

N.T.S.



** SEE PLAN SHEETS AND CROSS SECTIONS FOR ADDITIONAL DETAILS.

TRAFFIC DATA

CURRENT YEAR = 2017 AADT = 24,200
K = 9.0% D = 56.2% T = 4.3% (24 HOUR)
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

KEITH A. JOHNSON, P.E.
P.E. NO. 65623

PEGASUS ENGINEERING, LLC
301 WEST STATE ROAD 434, SUITE 309
WINTER SPRINGS, FLORIDA 32708
TEL. (407) 992-9160
CERTIFICATE OF AUTHORIZATION NO. 27770

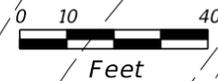
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	MANATEE	436983-1-52-01

TYPICAL SECTIONS (2)

SHEET NO.

4



EX-135
SEW
INV. = 5.57

EX-136
MES
INV. = 8.81

EX-137
STORM MANHOLE
LID = 21.45
NE. INV. = 8.37
SW. INV. = 8.34
SE. INV. = 13.70

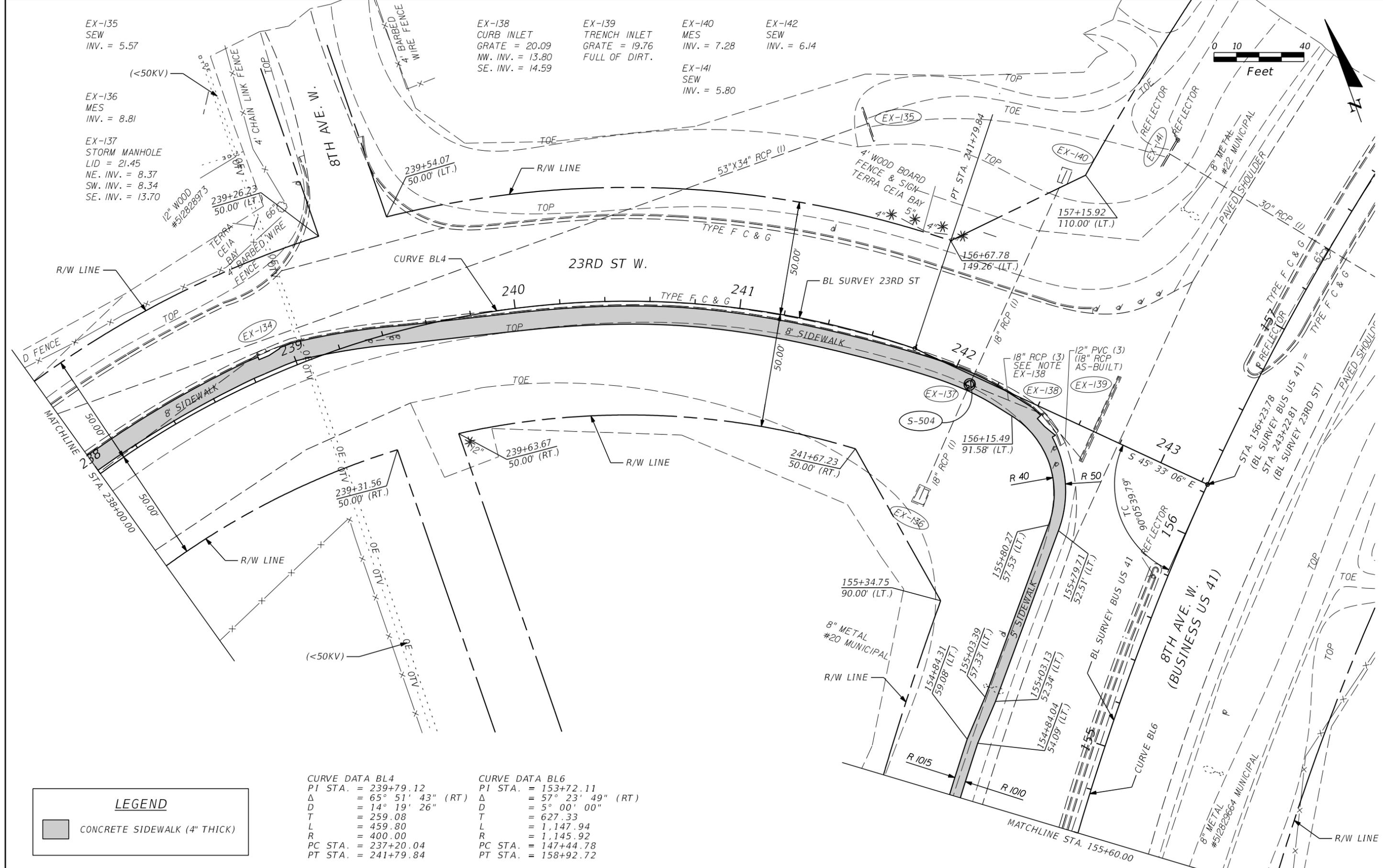
EX-138
CURB INLET
GRATE = 20.09
NW. INV. = 13.80
SE. INV. = 14.59

EX-139
TRENCH INLET
GRATE = 19.76
FULL OF DIRT.

EX-140
MES
INV. = 7.28

EX-142
SEW
INV. = 6.14

EX-141
SEW
INV. = 5.80



LEGEND	
	CONCRETE SIDEWALK (4" THICK)

<p>CURVE DATA BL4 PI STA. = 239+79.12 Δ = 65° 51' 43" (RT) D = 14° 19' 26" T = 259.08 L = 459.80 R = 400.00 PC STA. = 237+20.04 PT STA. = 241+79.84</p>	<p>CURVE DATA BL6 PI STA. = 153+72.11 Δ = 57° 23' 49" (RT) D = 5° 00' 00" T = 627.33 L = 1,147.94 R = 1,145.92 PC STA. = 147+44.78 PT STA. = 158+92.72</p>
---	--

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KEITH A. JOHNSON, P.E.
P.E. NO. 65623

PEGASUS ENGINEERING, LLC
301 WEST STATE ROAD 434, SUITE 309
WINTER SPRINGS, FLORIDA 32708
TEL. (407) 992-9160
CERTIFICATE OF AUTHORIZATION NO. 27770

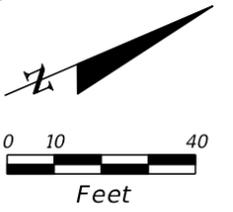
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	MANATEE	436983-1-52-01

ROADWAY PLAN (8)		SHEET NO. 19
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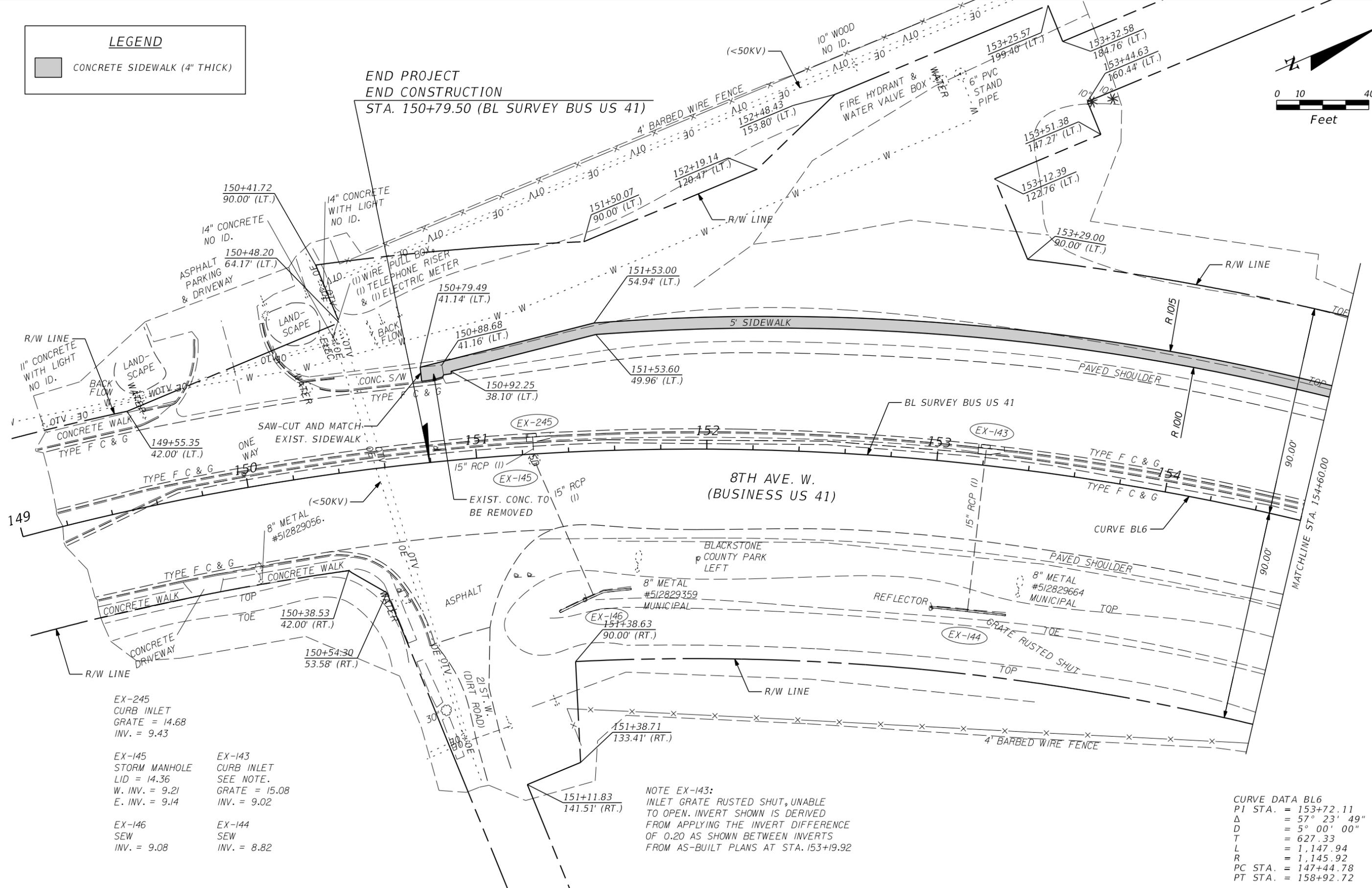
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LEGEND

CONCRETE SIDEWALK (4" THICK)



END PROJECT
END CONSTRUCTION
STA. 150+79.50 (BL SURVEY BUS US 41)



EX-245
CURB INLET
GRATE = 14.68
INV. = 9.43

EX-145
STORM MANHOLE
LID = 14.36
W. INV. = 9.21
E. INV. = 9.14

EX-146
SEW
INV. = 9.08

EX-143
CURB INLET
SEE NOTE.
GRATE = 15.08
INV. = 9.02

EX-144
SEW
INV. = 8.82

NOTE EX-143:
INLET GRATE RUSTED SHUT, UNABLE
TO OPEN. INVERT SHOWN IS DERIVED
FROM APPLYING THE INVERT DIFFERENCE
OF 0.20 AS SHOWN BETWEEN INVERTS
FROM AS-BUILT PLANS AT STA. 153+19.92

CURVE DATA BL6
PI STA. = 153+72.11
Δ = 57° 23' 49" (RT)
D = 5° 00' 00"
T = 627.33
L = 1,147.94
R = 1,145.92
PC STA. = 147+44.78
PT STA. = 158+92.72

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KEITH A. JOHNSON, P.E.
P.E. NO. 65623

PEGASUS ENGINEERING, LLC
301 WEST STATE ROAD 434, SUITE 309
WINTER SPRINGS, FLORIDA 32708
TEL. (407) 992-9160
CERTIFICATE OF AUTHORIZATION NO. 27770

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	MANATEE	436983-1-52-01

ROADWAY PLAN (9)

SHEET NO.
20

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



APPENDIX D: TURNING MOVEMENT COUNT DATA

Cars

Street Name	SB (USB 41)				WB ()				NB (USB 41)				EB (23rd ST W)				
	Start Time	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn
7:00	0	186	4	0	0	0	0	0	0	4	141	0	1	15	0	11	0
7:15	0	213	6	0	0	0	0	0	0	2	125	0	0	8	0	10	0
7:30	0	248	13	0	0	0	0	0	0	6	154	0	0	7	0	11	0
7:45	0	277	12	0	0	0	0	0	0	6	135	0	2	4	0	14	0
8:00	0	245	23	0	0	0	0	0	0	7	128	0	0	12	0	15	0
8:15	0	244	16	0	0	0	0	0	0	11	123	0	1	5	0	12	0
8:30	0	219	19	0	0	0	0	0	0	6	118	0	1	12	0	17	0
8:45	0	248	11	0	0	0	0	0	0	15	129	0	0	7	0	12	0
9:00	0	216	11	0	0	0	0	0	0	5	97	0	1	12	0	20	0
9:15	0	161	8	0	0	0	0	0	0	8	106	0	0	7	0	12	0
9:30	0	179	8	0	0	0	0	0	0	14	114	0	1	7	0	14	0
9:45	0	187	6	0	0	0	0	0	0	11	111	0	1	7	0	16	0
11:00	0	175	8	0	0	0	0	0	0	11	112	0	1	2	0	10	0
11:15	0	196	9	0	0	0	0	0	0	24	160	0	1	9	0	17	0
11:30	0	168	12	0	0	0	0	0	0	18	111	0	2	6	0	14	0
11:45	0	148	10	0	0	0	0	0	0	17	143	0	1	25	0	6	0
12:00	0	165	6	0	0	0	0	0	0	14	113	0	0	4	0	8	0
12:15	0	173	4	0	0	0	0	0	0	24	163	0	0	12	0	9	0
12:30	0	151	9	0	0	0	0	0	0	16	141	0	0	1	0	14	0
12:45	0	132	1	0	0	0	0	0	0	16	131	0	0	8	0	22	0
15:00	0	161	6	1	0	0	0	0	0	28	166	0	1	1	0	14	0
15:15	0	153	9	1	0	0	0	0	0	18	153	0	1	10	0	11	0
15:30	0	153	10	0	0	0	0	0	0	17	200	0	0	13	0	14	0
15:45	0	181	9	0	0	0	0	0	0	10	197	0	0	9	0	10	0
16:00	0	157	12	0	0	0	0	0	0	26	208	0	2	3	0	13	0
16:15	0	162	7	0	0	0	0	0	0	27	201	0	0	4	0	2	0
16:30	0	200	7	0	0	0	0	0	0	22	270	0	1	15	0	9	0
16:45	0	215	18	0	0	0	0	0	0	21	272	0	0	8	0	13	0
17:00	0	218	10	0	0	0	0	0	0	26	257	0	3	4	0	17	0
17:15	0	223	11	0	0	0	0	0	0	21	270	0	1	9	0	14	0
17:30	0	227	20	0	0	0	0	0	0	17	272	0	2	8	0	8	0
17:45	0	233	21	0	0	0	0	0	0	30	271	0	1	6	0	13	0

Trucks

Street Name	SB (USB 41)				WB ()				NB (USB 41)				EB (23rd ST W)				
	Start Time	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn	Left	Thru	Right	U Turn
7:00	0	4	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
7:15	0	7	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0
7:30	0	9	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0
7:45	0	12	0	0	0	0	0	0	0	0	4	0	0	0	0	1	0
8:00	0	6	0	0	0	0	0	0	0	1	6	0	0	0	0	0	0
8:15	0	10	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
8:30	0	10	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0
8:45	0	4	1	0	0	0	0	0	0	2	0	0	0	0	0	1	0
9:00	0	3	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0
9:15	0	10	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0
9:30	0	8	0	0	0	0	0	0	0	1	2	0	0	0	0	1	0
9:45	0	8	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
11:00	0	5	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0
11:15	0	4	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0
11:30	0	8	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
11:45	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	2	0
12:00	0	0	0	0	0	0	0	0	0	0	12	0	0	1	0	2	0
12:15	0	5	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0
12:30	0	7	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
12:45	0	4	1	0	0	0	0	0	0	1	5	0	0	0	0	1	0
15:00	0	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
15:15	0	4	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0
15:30	0	4	2	0	0	0	0	0	0	1	4	0	0	2	0	1	0
15:45	0	0	2	0	0	0	0	0	0	0	4	0	0	1	0	0	0
16:00	0	4	0	0	0	0	0	0	0	1	7	0	1	1	0	0	0
16:15	0	3	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0
16:30	0	6	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
16:45	0	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
17:00	0	2	0	0	0	0	0	0	0	1	6	0	0	0	0	0	0
17:15	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	4	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0

TURNING MOVEMENT COUNT: USB 41 @ 23rd St W
 EAST/WEST ST: 23rd St W

TIME: 7am-6pm
 NORTH/SOUTH ST: USB 41
 COUNTED BY: Video Cam2

ALL VEHICLES

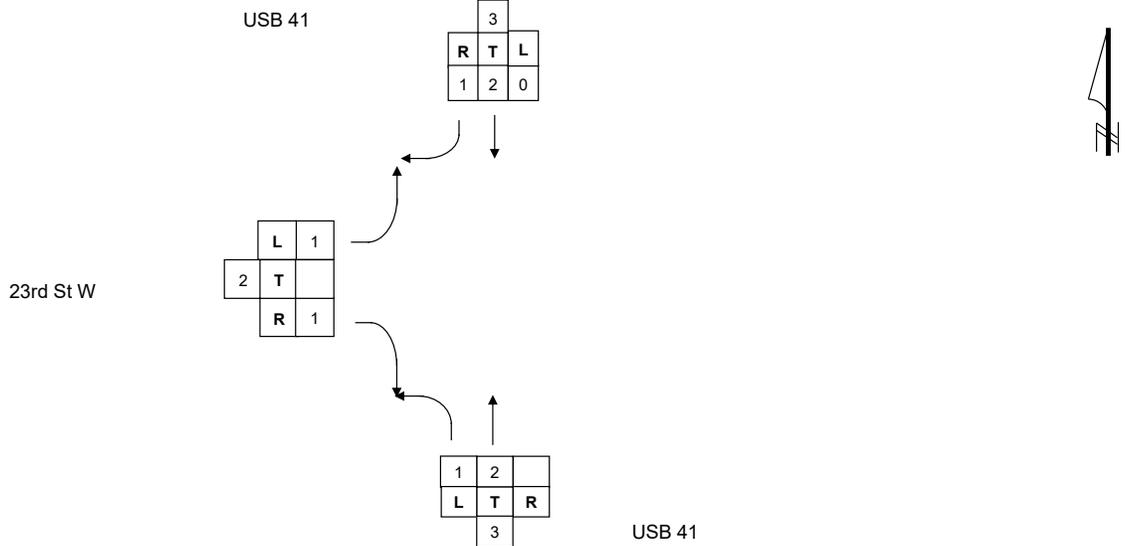
START TIME	NORTHBOUND					SOUTHBOUND					NS TOTAL	EASTBOUND					WESTBOUND					EW TOTAL	GRAND TOTAL
	LEFT	THRU	RIGHT	U-TURN	TOTAL	LEFT	THRU	RIGHT	U-TURN	TOTAL		LEFT	THRU	RIGHT	U-TURN	TOTAL	LEFT	THRU	RIGHT	U-TURN	TOTAL		
7:00	4	142	0	1	147	0	190	4	0	194	341	16	0	11	0	27	0	0	0	0	0	27	368
7:15	2	133	0	0	135	0	220	6	0	226	361	8	0	10	0	18	0	0	0	0	0	18	379
7:30	6	156	0	0	162	0	257	14	0	271	433	7	0	11	0	18	0	0	0	0	0	18	451
7:45	6	139	0	2	147	0	289	12	0	301	448	4	0	15	0	19	0	0	0	0	0	19	467
Total	18	570	0	3	591	0	956	36	0	992	1,583	35	0	47	0	82	0	0	0	0	0	82	1,665
8:00	8	134	0	0	142	0	251	23	0	274	416	12	0	15	0	27	0	0	0	0	0	27	443
8:15	11	125	0	1	137	0	254	16	0	270	407	5	0	12	0	17	0	0	0	0	0	17	424
8:30	6	121	0	1	128	0	229	19	0	248	376	13	0	17	0	30	0	0	0	0	0	30	406
8:45	17	129	0	0	146	0	252	12	0	264	410	7	0	13	0	20	0	0	0	0	0	20	430
Total	42	509	0	2	553	0	986	70	0	1,056	1,609	37	0	57	0	94	0	0	0	0	0	94	1,703
9:00	5	98	0	1	104	0	219	11	0	230	334	13	0	21	0	34	0	0	0	0	0	34	368
9:15	8	110	0	0	118	0	171	9	0	180	298	7	0	12	0	19	0	0	0	0	0	19	317
9:30	15	116	0	1	132	0	187	8	0	195	327	7	0	15	0	22	0	0	0	0	0	22	349
9:45	11	113	0	1	125	0	195	6	0	201	326	7	0	16	0	23	0	0	0	0	0	23	349
Total	39	437	0	3	479	0	772	34	0	806	1,285	34	0	64	0	98	0	0	0	0	0	98	1,383
11:00	11	115	0	1	127	0	180	9	0	189	316	2	0	10	0	12	0	0	0	0	0	12	328
11:15	24	165	0	1	190	0	200	9	0	209	399	9	0	17	0	26	0	0	0	0	0	26	425
11:30	18	114	0	2	134	0	176	12	0	188	322	6	0	14	0	20	0	0	0	0	0	20	342
11:45	17	147	0	1	165	0	152	10	0	162	327	25	0	8	0	33	0	0	0	0	0	33	360
Total	70	541	0	5	616	0	708	40	0	748	1,364	42	0	49	0	91	0	0	0	0	0	91	1,455
12:00	14	125	0	0	139	0	165	6	0	171	310	5	0	10	0	15	0	0	0	0	0	15	325
12:15	25	165	0	0	190	0	178	4	0	182	372	12	0	9	0	21	0	0	0	0	0	21	393
12:30	16	142	0	0	158	0	158	10	0	168	326	1	0	14	0	15	0	0	0	0	0	15	341
12:45	17	136	0	0	153	0	136	2	0	138	291	8	0	23	0	31	0	0	0	0	0	31	322
Total	72	568	0	0	640	0	637	22	0	659	1,299	26	0	56	0	82	0	0	0	0	0	82	1,381
15:00	28	167	0	1	196	0	165	6	1	172	368	1	0	14	0	15	0	0	0	0	0	15	383
15:15	18	157	0	1	176	0	157	10	1	168	344	10	0	11	0	21	0	0	0	0	0	21	365
15:30	18	204	0	0	222	0	157	12	0	169	391	15	0	15	0	30	0	0	0	0	0	30	421
15:45	10	201	0	0	211	0	181	11	0	192	403	10	0	10	0	20	0	0	0	0	0	20	423
Total	74	729	0	2	805	0	660	39	2	701	1,506	36	0	50	0	86	0	0	0	0	0	86	1,592
16:00	27	215	0	3	245	0	161	12	0	173	418	4	0	13	0	17	0	0	0	0	0	17	435
16:15	27	207	0	0	234	0	165	7	0	172	406	4	0	2	0	6	0	0	0	0	0	6	412
16:30	22	273	0	1	296	0	206	7	0	213	509	15	0	9	0	24	0	0	0	0	0	24	533
16:45	21	273	0	0	294	0	220	18	0	238	532	8	0	13	0	21	0	0	0	0	0	21	553
Total	97	968	0	4	1,069	0	752	44	0	796	1,865	31	0	37	0	68	0	0	0	0	0	68	1,933
17:00	27	263	0	3	293	0	220	10	0	230	523	4	0	17	0	21	0	0	0	0	0	21	544
17:15	21	270	0	1	292	0	229	11	0	240	532	9	0	14	0	23	0	0	0	0	0	23	555
17:30	18	273	0	2	293	0	231	20	0	251	544	9	0	8	0	17	0	0	0	0	0	17	561
17:45	30	276	0	1	307	0	233	21	0	254	561	6	0	13	0	19	0	0	0	0	0	19	580
Total	96	1,082	0	7	1,185	0	913	62	0	975	2,160	28	0	52	0	80	0	0	0	0	0	80	2,240

FLORIDA DEPARTMENT OF TRANSPORTATION

SUMMARY OF VEHICLE MOVEMENTS

SECTION: N/A CITY: Palmetto COUNTY: Manatee
 INTR ROUTE: 23rd St W STATE ROUTE: USB 41 MILEPOST:
 OBSERVER: Video Cam2 DATE: 06/06/18
 WEATHER: Sunny - Clear ROAD CONDITION: Dry - Good
 REMARKS:

FORM COMPLETED BY: TM DATE: 06/18/18



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL	
	BEGIN/END	L	T	R	U	TOT	L	T	R	U		TOT	N/S	L	T	R	U	TOT	L	T	R		U
7 - 8	18	570	0	3	591	0	956	36	0	992	1,583	35	0	47	0	82	0	0	0	0	0	0	82
8 - 9	42	509	0	2	553	0	986	70	0	1,056	1,609	37	0	57	0	94	0	0	0	0	0	0	94
9 - 10	39	437	0	3	479	0	772	34	0	806	1,285	34	0	64	0	98	0	0	0	0	0	0	98
11 - 12	70	541	0	5	616	0	708	40	0	748	1,364	42	0	49	0	91	0	0	0	0	0	0	91
12 - 1	72	568	0	0	640	0	637	22	0	659	1,299	26	0	56	0	82	0	0	0	0	0	0	82
3 - 4	74	729	0	2	805	0	660	39	2	701	1,506	36	0	50	0	86	0	0	0	0	0	0	86
4 - 5	97	968	0	4	1,069	0	752	44	0	796	1,865	31	0	37	0	68	0	0	0	0	0	0	68
5 - 6	96	1,082	0	7	1,185	0	913	62	0	975	2,160	28	0	52	0	80	0	0	0	0	0	0	80
TOTAL	508	5,404	0	26	5,938	0	6,384	347	2	6,733	12,671	269	0	412	0	681	0	0	0	0	0	0	681

FLORIDA DEPARTMENT OF TRANSPORTATION

PEDESTRIAN MOVEMENT SUMMARY

SECTION: N/A
 INTER. ROUTE: 23rd St W
 OBSERVER: Video Cam2

CITY: Palmetto
 STATE ROUTE: USB 41
 DATE: 06/06/18

COUNTY: Manatee

REMARKS: _____

FORM COMPLETED BY: TM

DATE: 06/18/18

USB 41



	7-8	8-9	9-1	11-12	12-1	3-4	4-5	5-6	Total
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
Total	0								

	7-8	8-9	9-10	11-12	12-1	3-4	4-5	5-6	Total
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
Total	0	0	2	1	3				

23rd St W

	7-8	8-9	9-10	11-12	12-1	3-4	4-5	5-6	Total
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0				

	7-8	8-9	9-1	11-12	12-1	3-4	4-5	5-6	Total
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
Total	0								

USB 41



APPENDIX E: SYNCHRO SUMMARY SHEETS

Intersection

Int Delay, s/veh 1.4

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	28	53	31	554	1051	65
Future Vol, veh/h	28	53	31	554	1051	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	340	675	-	-	475
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	58	34	602	1142	71

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1510	571	1142	0	-	0
Stage 1	1142	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	111	464	608	-	-	-
Stage 1	266	-	-	-	-	-
Stage 2	670	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	105	464	608	-	-	-
Mov Cap-2 Maneuver	105	-	-	-	-	-
Stage 1	266	-	-	-	-	-
Stage 2	633	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	27.3	0.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	608	-	105	464	-	-
HCM Lane V/C Ratio	0.055	-	0.29	0.124	-	-
HCM Control Delay (s)	11.3	-	52.7	13.9	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.1	0.4	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↓		↔	↑↑
Traffic Vol, veh/h	10	10	575	10	10	1094
Future Vol, veh/h	10	10	575	10	10	1094
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	11	625	11	11	1189

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1246	318	0	0	636
Stage 1	630	-	-	-	-
Stage 2	616	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	166	678	-	-	943
Stage 1	493	-	-	-	-
Stage 2	501	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	164	678	-	-	943
Mov Cap-2 Maneuver	164	-	-	-	-
Stage 1	493	-	-	-	-
Stage 2	495	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	264	943
HCM Lane V/C Ratio	-	-	0.082	0.012
HCM Control Delay (s)	-	-	19.9	8.9
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Intersection						
Int Delay, s/veh	2.2					
Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	28	52	96	1082	913	62
Future Vol, veh/h	28	52	96	1082	913	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	340	675	-	-	475
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	57	104	1176	992	67

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1789	496	992	0	-	0
Stage 1	992	-	-	-	-	-
Stage 2	797	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	72	519	693	-	-	-
Stage 1	320	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	61	519	693	-	-	-
Mov Cap-2 Maneuver	61	-	-	-	-	-
Stage 1	320	-	-	-	-	-
Stage 2	343	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	47.7	0.9	0
HCM LOS	E		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	693	-	61	519	-	-
HCM Lane V/C Ratio	0.151	-	0.499	0.109	-	-
HCM Control Delay (s)	11.1	-	112.4	12.8	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	2	0.4	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↓		↔	↑↑
Traffic Vol, veh/h	10	10	1168	10	10	955
Future Vol, veh/h	10	10	1168	10	10	955
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	11	1270	11	11	1038

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1816	640	0	0	1280
Stage 1	1275	-	-	-	-
Stage 2	541	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	69	418	-	-	538
Stage 1	226	-	-	-	-
Stage 2	548	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	68	418	-	-	538
Mov Cap-2 Maneuver	68	-	-	-	-
Stage 1	226	-	-	-	-
Stage 2	537	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	42.7	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	117	538
HCM Lane V/C Ratio	-	-	0.186	0.02
HCM Control Delay (s)	-	-	42.7	11.8
HCM Lane LOS	-	-	E	B
HCM 95th %tile Q(veh)	-	-	0.6	0.1

Intersection

Int Delay, s/veh 0.9

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations		↗	↘	↕	↕	↗
Traffic Vol, veh/h	0	81	31	582	1051	65
Future Vol, veh/h	0	81	31	582	1051	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	675	-	-	475
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	88	34	633	1142	71

Major/Minor

	Minor2	Major1	Major2		
Conflicting Flow All	-	571	1142	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-
Pot Cap-1 Maneuver	0	464	608	-	-
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	464	608	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach

	SE	NE	SW
HCM Control Delay, s	14.6	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt

	NEL	NET SELn1	SWT	SWR
Capacity (veh/h)	608	-	464	-
HCM Lane V/C Ratio	0.055	-	0.19	-
HCM Control Delay (s)	11.3	-	14.6	-
HCM Lane LOS	B	-	B	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-

Intersection							
Int Delay, s/veh	0.5						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	W		T			T	T
Traffic Vol, veh/h	10	10	575	10	28	10	1094
Future Vol, veh/h	10	10	575	10	28	10	1094
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	11	11	625	11	30	11	1189

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	1307	318	0	0	635	636	0
Stage 1	630	-	-	-	-	-	-
Stage 2	677	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	6.44	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.52	2.22	-
Pot Cap-1 Maneuver	151	678	-	-	568	943	-
Stage 1	493	-	-	-	-	-	-
Stage 2	466	-	-	-	-	-	-
Platoon blocked, %			-	-			-
Mov Cap-1 Maneuver	151	678	-	-	627	627	-
Mov Cap-2 Maneuver	151	-	-	-	-	-	-
Stage 1	493	-	-	-	-	-	-
Stage 2	466	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	247	627
HCM Lane V/C Ratio	-	-	0.088	0.066
HCM Control Delay (s)	-	-	21	11.1
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.3	0.2

Intersection

Int Delay, s/veh 1

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations		↗	↘	↕↕	↕↕	↗
Traffic Vol, veh/h	0	80	96	1110	913	62
Future Vol, veh/h	0	80	96	1110	913	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	675	-	-	475
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	87	104	1207	992	67

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	496	992
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	2.22
Pot Cap-1 Maneuver	0	519	693
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	519	693
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	13.3	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NEL	NET SELn1	SWT	SWR
Capacity (veh/h)	693	-	519	-
HCM Lane V/C Ratio	0.151	-	0.168	-
HCM Control Delay (s)	11.1	-	13.3	-
HCM Lane LOS	B	-	B	-
HCM 95th %tile Q(veh)	0.5	-	0.6	-

Intersection							
Int Delay, s/veh	0.8						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	W		T			T	T
Traffic Vol, veh/h	10	10	1168	10	28	10	955
Future Vol, veh/h	10	10	1168	10	28	10	955
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	11	11	1270	11	30	11	1038

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	1877	640	0	0	1279	1280	0
Stage 1	1275	-	-	-	-	-	-
Stage 2	602	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	6.44	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.52	2.22	-
Pot Cap-1 Maneuver	63	418	-	-	219	538	-
Stage 1	226	-	-	-	-	-	-
Stage 2	510	-	-	-	-	-	-
Platoon blocked, %			-	-			-
Mov Cap-1 Maneuver	63	418	-	-	254	254	-
Mov Cap-2 Maneuver	63	-	-	-	-	-	-
Stage 1	226	-	-	-	-	-	-
Stage 2	510	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	46.1	0	0.8
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	109	254
HCM Lane V/C Ratio	-	-	0.199	0.163
HCM Control Delay (s)	-	-	46.1	21.9
HCM Lane LOS	-	-	E	C
HCM 95th %tile Q(veh)	-	-	0.7	0.6



APPENDIX F: CRASH DATA

Section: 13030
 Location: 23rd St W
 Study Period: 1/1/2012 to 12/31/2012
 No. of Years: 1

State Route: US B 41
 M.P.: 0.867 -
 County: Manatee

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Comments
1	1/5/2012	Thu.	13:03	Other			x	Day	Dry	Careless Driving	
2	10/13/2012	Sat.	14:40	Angle		x		Day	Dry	Careless Driving	

Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Ran Into Ditch	Rear End	Side Swipe	Collision w/ Sign	Overtaken	Collision w/ Pole	Hit Animal	Run Off Road	Other
2	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1
%	0	50	50	50	0	0	0	0	0	0	0	0	0	0	50
One Vehicle	Ped/Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0
0	0	100	0	100	0	100	0	0	0	0	0	0	0	0	0

Notice:

Please be aware that the records you requested contain information compiled and collected for the purpose of obtaining Federal-aid funding for safety improvement projects. Under Federal law (23 U.S.C. § 409), these records are not subject to discovery or admissible into evidence in any court proceeding and may not be considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in the records.

Section: 13030
 Location: 23rd St W
 Study Period: 1/1/2014 to 12/31/2014
 No. of Years: 1

State Route: US B 41
 M.P.: 0.867 -
 County: Manatee

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/ Night	Wet/ Dry	Contributing Cause	Comments
1	1/9/2014	Thu.	15:31	Angle			x	Day	Dry	FTYRW	
2	4/11/2014	Fri.	7:40	Right Turn			x	Day	Dry	Careless Driving	
3	4/14/2014	Mon.	14:56	Right Turn		x		Day	Dry	FTYRW	
4	8/16/2014	Sat.	4:38	Off Road			x	Night	Dry	Disregarded Stop Sign	
5	9/2/2014	Tue.	9:30	Sideswipe			x	Day	Dry	No Improper Driving	

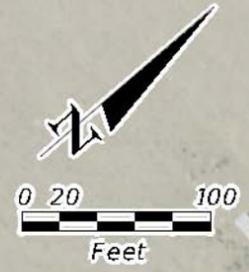
Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Right Turn	Rear End	Side Swipe	Collision w/ Sign	Overturned	Collision w/ Pole	Hit Animal	Run Off Road	Other
5	0	1	4	1	0	0	2	0	1	0	0	0	0	1	0
%	0	20	80	20	0	0	40	0	20	0	0	0	0	20	0
One Vehicle	Ped/ Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Disregarded Stop Sign	Improper Load	No Improper Driving	Other
0	0	4	1	5	0	1	2	0	0	0	0	1	0	1	0
0	0	80	20	100	0	20	40	0	0	0	0	20	0	20	0

Notice:

Please be aware that the records you requested contain information compiled and collected for the purpose of obtaining Federal-aid funding for safety improvement projects. Under Federal law (23 U.S.C. § 409), these records are not subject to discovery or admissible into evidence in any court proceeding and may not be considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in the records.

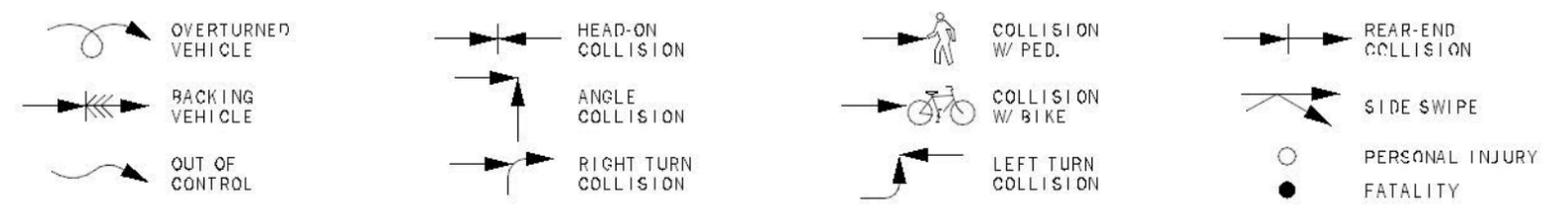
COLLISION DIAGRAM

LOCATION US 41 BUSINESS/US 41 AT 23RD ST W
 COUNTY MANATEE CITY PALMETTO
 DATE RANGE 01/01/2011 TO 12/31/2011 PREPARED BY HNTB



SHEET
1

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	1	2	0	3
NIGHTTIME	0	0	0	0
TOTAL	1	2	0	3

COLLISION DIAGRAM

LOCATION US 41 BUSINESS/US 41 AT 23RD ST W
 COUNTY MANATEE CITY PALMETTO
 DATE RANGE 01/01/2012 TO 12/31/2012 PREPARED BY HNTB



SYMBOLS

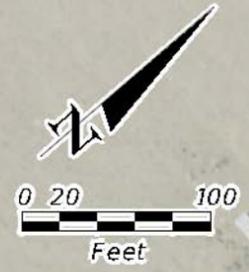


CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	1	1	0	2
NIGHTTIME	0	0	0	0
TOTAL	1	1	0	2

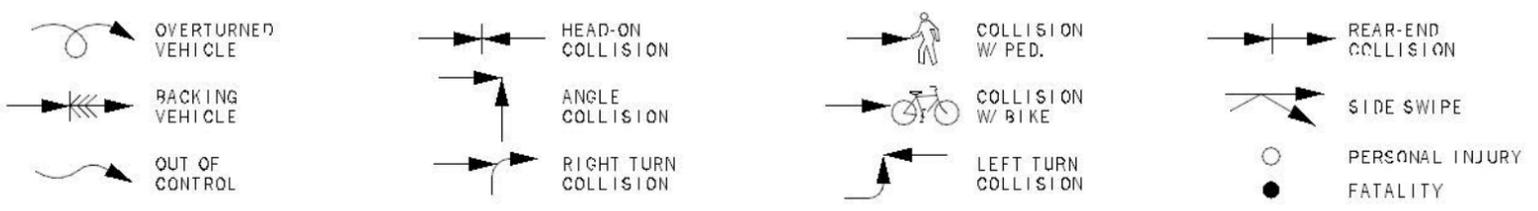
COLLISION DIAGRAM

LOCATION US 41 BUSINESS/US 41 AT 23RD ST W
 COUNTY MANATEE CITY PALMETTO
 DATE RANGE 01/01/2013 TO 12/31/2013 PREPARED BY HNTB



SHEET
3

SYMBOLS

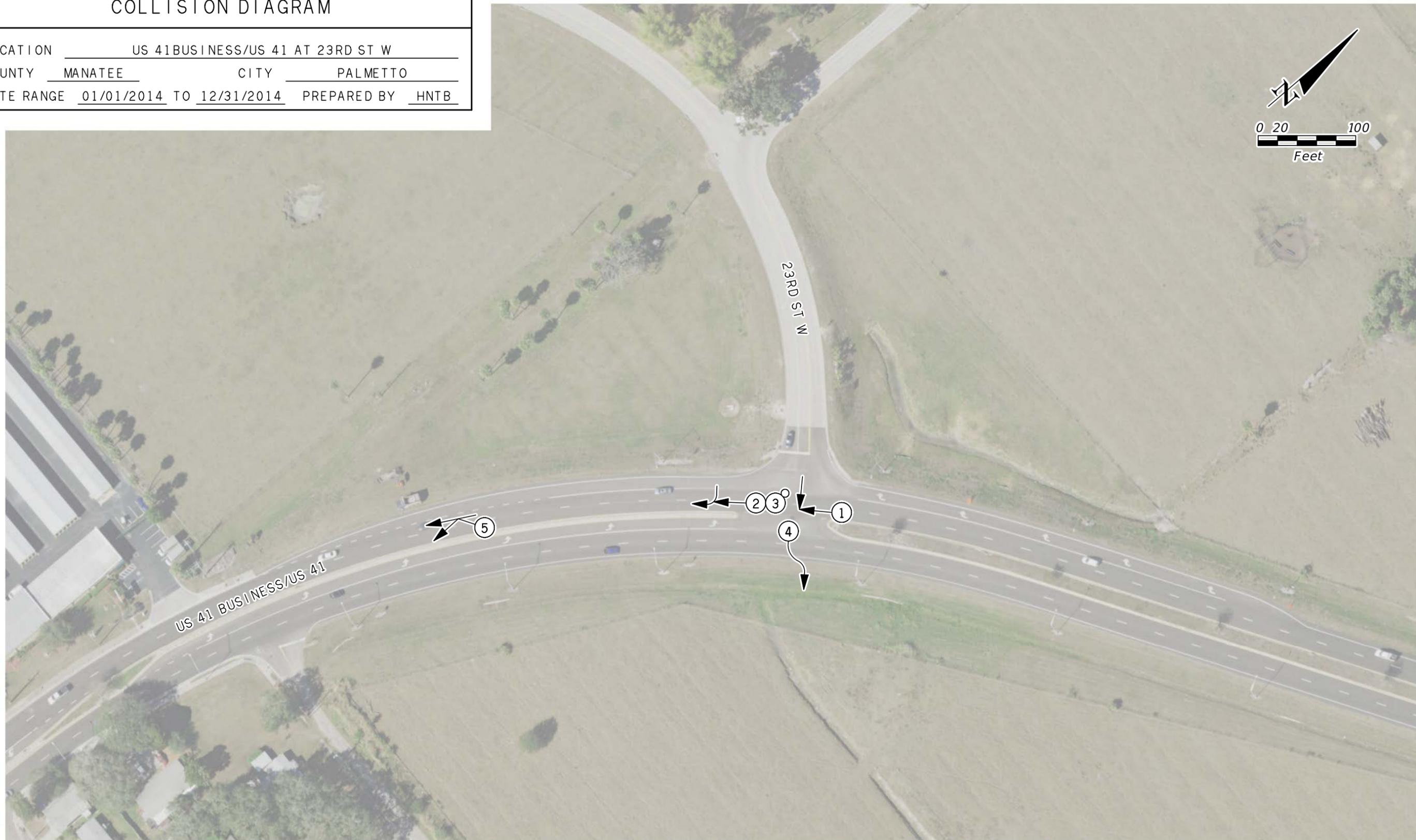
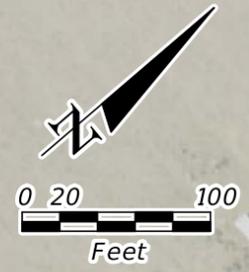


CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	1	0	0	1
NIGHTTIME	0	2	0	2
TOTAL	1	2	0	3

COLLISION DIAGRAM

LOCATION US 41 BUSINESS/US 41 AT 23RD ST W
 COUNTY MANATEE CITY PALMETTO
 DATE RANGE 01/01/2014 TO 12/31/2014 PREPARED BY HNTB



SHEET
4

SYMBOLS

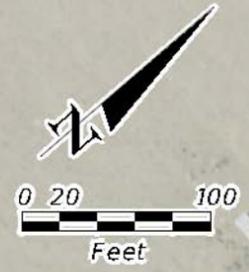
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CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	3	1	0	4
NIGHTTIME	1	0	0	1
TOTAL	4	1	0	5

COLLISION DIAGRAM

LOCATION US 41 BUSINESS/US 41 AT 23RD ST W
 COUNTY MANATEE CITY PALMETTO
 DATE RANGE 01/01/2015 TO 12/31/2015 PREPARED BY HNTB



SHEET
5

SYMBOLS

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> OVERTURNED VEHICLE BACKING VEHICLE OUT OF CONTROL | <ul style="list-style-type: none"> HEAD-ON COLLISION ANGLE COLLISION RIGHT TURN COLLISION | <ul style="list-style-type: none"> COLLISION W/ PED. COLLISION W/ BIKE LEFT TURN COLLISION | <ul style="list-style-type: none"> REAR-END COLLISION SIDE SWIPE PERSONAL INJURY FATALITY |
|--|---|--|---|

CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	2	1	0	3
NIGHTTIME	1	0	0	1
TOTAL	3	1	0	4



APPENDIX G: INTERSECTION PHOTOS

Northbound Approach



Looking north into the intersection from U.S. Business 41



Looking south from the intersection into U.S. Business 41

Southbound Approach



Looking south into the intersection from U.S. Business 41



Looking north from the intersection into U.S. Business 41

Eastbound Approach



Looking east into the intersection from 23rd Street West



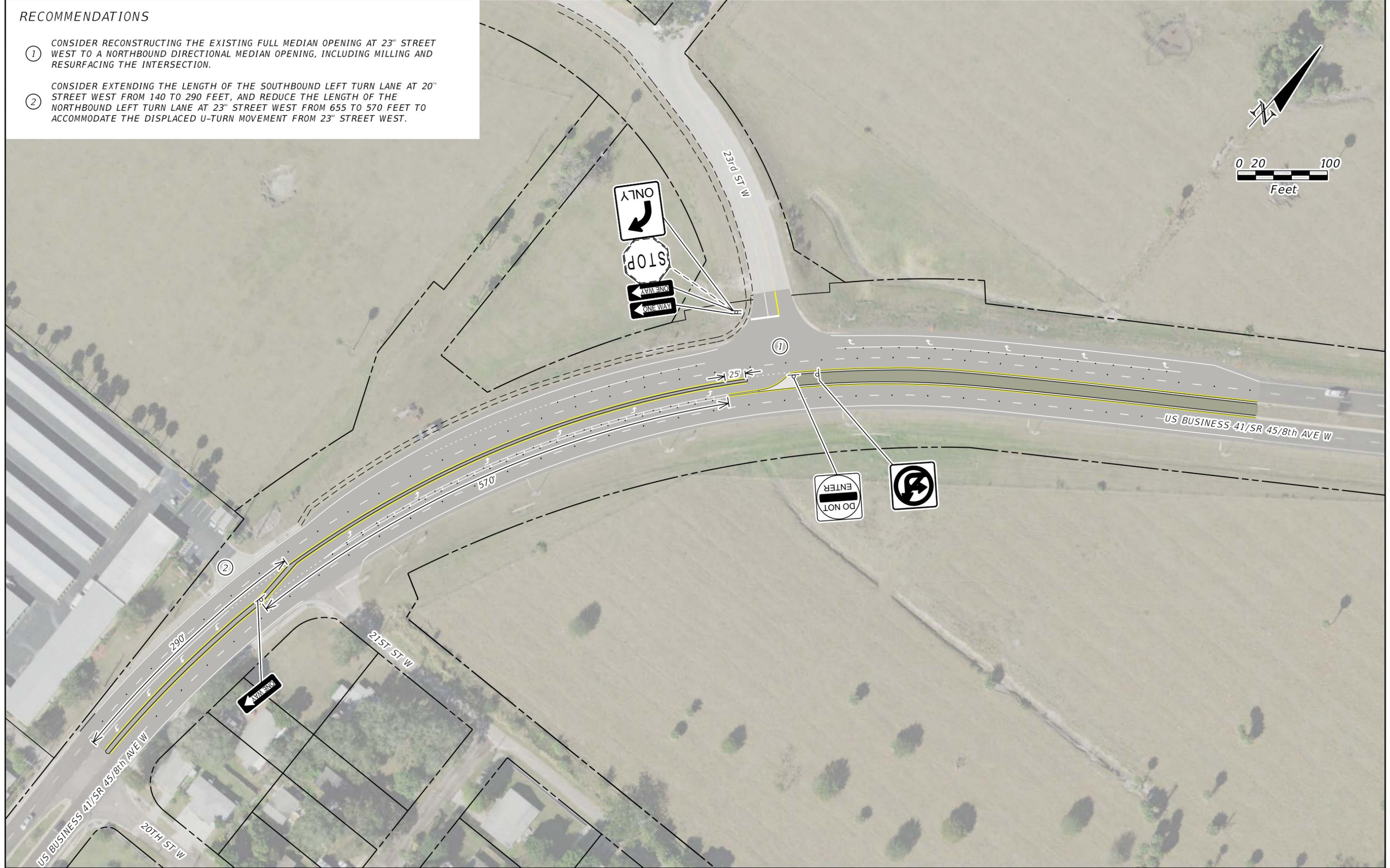
Looking west from the intersection into 23rd Street West



APPENDIX H: CONCEPTUAL DESIGN PLANS

RECOMMENDATIONS

- ① CONSIDER RECONSTRUCTING THE EXISTING FULL MEDIAN OPENING AT 23RD STREET WEST TO A NORTHBOUND DIRECTIONAL MEDIAN OPENING, INCLUDING MILLING AND RESURFACING THE INTERSECTION.
- ② CONSIDER EXTENDING THE LENGTH OF THE SOUTHBOUND LEFT TURN LANE AT 20TH STREET WEST FROM 140 TO 290 FEET, AND REDUCE THE LENGTH OF THE NORTHBOUND LEFT TURN LANE AT 23RD STREET WEST FROM 655 TO 570 FEET TO ACCOMMODATE THE DISPLACED U-TURN MOVEMENT FROM 23RD STREET WEST.



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

PREPARED BY:
 HNTB CORPORATION
 201 N. FRANKLIN ST., SUITE 1200
 TAMPA, FL 33602
 PHONE: (813) 402-4150
 CERTIFICATE OF AUTHORIZATION NO. 6500
 STEFFANIE LYNNE WORKMAN, P.E. 58218

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
45	MANATEE	409224-1-32-91

CONCEPTUAL DIAGRAM
USB 41/S.R. 45/8TH AVE W AT
23RD ST W

SHEET NO.
 1