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Preliminary Design Memorandum

MORSE BOULEVARD PHASE 1
(CR 466 to North of Rio Grande Avenue)

Sumter County, Florida

Prepared for:

Sumter County Board of County Commissioners

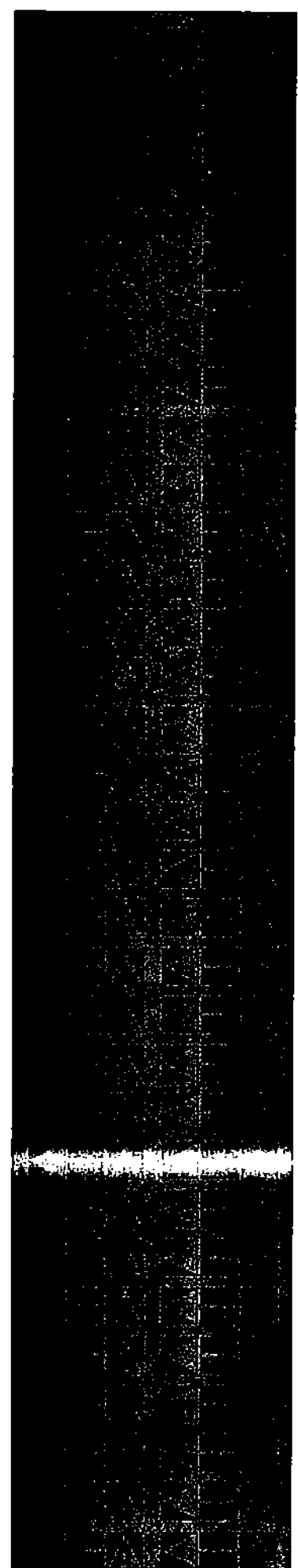
Prepared by:

Kimley-Horn and Associates, Inc.

142109001
October 2008
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INTRODUCTION

Kimley-Horn and Associates, Inc. (KHA) was retained by the Sumter County Board of County Commissioners (“the BOCC”) to provide planning and design services for Morse Boulevard Phase 1. The project limits include Morse Boulevard from CR 466 to north of Rio Grande Avenue in The Villages, Florida. *Figure 1* on the following page illustrates the project limits and surrounding property.

The BOCC is seeking to accomplish two objectives with this project. First, Morse Boulevard is scheduled for routine resurfacing. Second, the BOCC would like to alleviate existing and forecasted congestion at the Morse Boulevard intersections with Rio Grande Avenue and San Marino Drive.

KHA obtained usable base information from Farner Barley and Associates, Inc., performed field visits, developed and illustrated options, obtained crash history data, and discussed the project with Sumter County Public Works staff, representatives from The Villages, and Southwest Florida Water Management District (SWFWMD) staff. This memorandum summarizes these tasks and provides reasoning behind a preferred option for improving traffic conditions on Morse Boulevard.

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AERIAL EXHIBIT

MORSE BOULEVARD
PHASE 1
SANTER COUNTY
FLORIDA

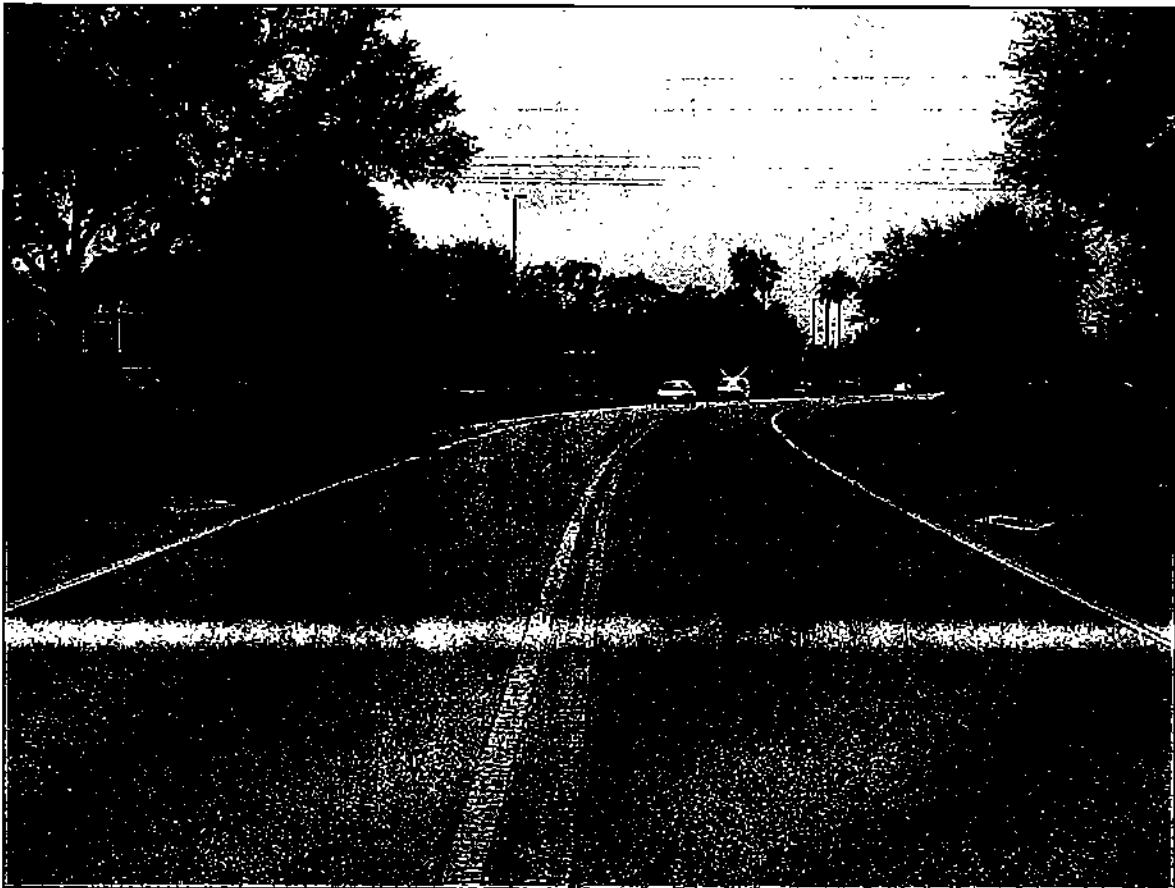
PROJECT NO
142109001

SHEET NUMBER
FIGURE 1

EXISTING CONDITIONS

Morse Boulevard Phase 1 is classified as a Major Collector in the Sumter County Comprehensive Plan. Major Collectors serve a vital purpose of moving people and goods safely between local streets and arterials. The corridor carried approximately 15,000 vehicles a day in the peak season of 2008. The posted speed limit is 30 miles per hour (mph).

The existing corridor is a two-lane road with a 6-foot cart lane on each side of a travel lane. The road has open drainage swales. The right-of-way is 80 feet wide, with varied adjacent uses, such as wetlands, residential lots, Villages Community Development District (CDD) common area, and other uses. Most of the corridor has a 20-foot easement on either side of the right-of-way owned by one of The Villages' CDDs. These easements allow the CDD to maintain landscaping, drainage, utilities, and cart paths on private property.



Existing typical section view of Morse Boulevard

Within the study limits, Morse Boulevard is a rural roadway section with drainage conveyed by roadside swales. These swales ultimately discharge water into a large wetland on the east side of Morse Boulevard. The drainage system also includes a few cross drain pipes that connect swales to each other.



Drainage swale and pipe at Rio Grande Avenue

Approximately 18% of the peak hour traffic volume on the road is golf cart traffic. Under existing conditions, any golf cart that needs to turn left must enter the automobile lane and turn left as an automobile would at an intersection. On the southern end of the project area, just north of the Villages gate, the golf cart lanes are only 5 feet wide in some sections, which brings automobiles and carts very close to each other.

The Sumter County Sherriff's Department provided crash data recorded from January 2005 through June 2008. Based on the crash data, two incidents have occurred within the Morse Boulevard right-of-way involving a golf cart and an automobile. In both cases, the golf cart struck the automobile, and no injuries or fatalities were reported.



A traffic signal was constructed at the Rio Grande Avenue intersection two years ago. Because there is no southbound left turn lane, the traffic signal is currently operating as a split phase signal, where northbound and southbound vehicles are not allowed to go at the same time. This operation is very inefficient, and many residents have reported observing northbound vehicles queuing back through the San Marino intersection to the south during the peak season.

PROPOSED MODIFICATIONS

Morse Boulevard is proposed to be milled, resurfaced, and restriped through routine roadway maintenance to repair cracking and distressed pavement areas. In addition, based on previous engineering studies, the following modifications are proposed:

- ◆ Add a northbound right turn bay at the intersection of Morse Boulevard and Rio Grande Avenue.
- ◆ Signalize the intersection of Morse Boulevard and San Marino Drive.
- ◆ Synchronize the signals at Rio Grande Avenue and San Marino Drive.
- ◆ Replace any disturbed signal poles and equipment due to roadway modifications at Rio Grande Avenue.
- ◆ Provide wider cart lanes just north of the Morse Boulevard gate (7-foot lanes recommended).

The northbound right turn lane at Rio Grande Avenue will require extending the existing drainage pipe by approximately 200' and the replacement of the existing signal pole.

The two traffic signals should be interconnected using signal cable inside buried conduit. The signals should run on a Time-of Day plan during most of the day, and operate individually under full red-yellow-green operation during low volume time periods. The signals are not recommended to operate on flash at any time due to driver expectancy.

When the road is restriped, seven foot cart paths should be provided to give more room between automobiles and golf carts. The automobile travel lanes would be reduced from 12' to 11' which is still an acceptable width based on design standards for collector roads.

In addition to the above modifications, three options were developed that deal with left turn lanes and golf cart/automobile interaction in the corridor. Typical sections and conceptual layouts for these options are provided as tabbed attachments at the end of this Memorandum. A discussion of each option follows.



Option 1: Separate cart path between Rio Grande Avenue and the Postal Center; Left turn lanes at signalized intersections.

Option 1 maintains the existing 36 feet of asphalt, but provides a separate golf cart path on the west side of Morse Boulevard that runs within the 20-foot easement. See the *Option 1 Tab* at the end of this Memorandum for an illustration of the concept.

Automobiles: Providing left turn lanes at the signals will result in a significant improvement to automobile congestion. Left turners will no longer cause through traffic to stop. The traffic signals will be able to operate much more efficiently; each intersection will realize over a 30% increase in capacity. In addition, having the golf carts traveling away from the road will increase automobile speeds.

Golf Carts: Having a separate golf cart path will allow golf cart drivers to travel in a more leisurely fashion because of the increased distance from automobiles; however, their travel time will be increased, which may cause frustration. Some may decide to stay on Morse Boulevard to save time. Using the separate cart path introduces at least three additional stops within this short section of roadway. Having the golf cart drivers use the signal at Rio Grande could create a driver expectancy issue, because there is currently no other instance in the community where golf carts navigate a traffic signal on their own approach.



Proposed cart path would be constructed between the existing wall and vegetation.



Drainage Impacts: Due to the grading and disturbance/modification of existing drainage patterns that could be required to construct the cart path, a SWFWMD permit may be required. Engineers for The Villages have advised that no excess stormwater capacity is available.

Right-of-Way: Option 1 would require the endorsement of Villages CDD 1. The cart path would have to be constructed mostly on private property. Property owners were not expecting a cart path in the easement, so there may be resistance to allowing the path in the easement.

Budget Impact: Constructing a separate cart path that meets the requirements of the Americans with Disabilities Act (ADA) will require grading, stack block walls, railings, and substantial landscaping modifications. It may result in the project costing more than what is currently allocated.

Summary: While Option 1 provides a significant improvement to automobile congestion and travel speed, it increases travel time for golf carts and requires private property acceptance, added permitting efforts, and added construction costs.



Option 2: Left turn lanes at signalized intersections; golf cart paths on Morse Boulevard

Option 2 maintains the existing 36 feet of asphalt at the midblock between signals, but widens the asphalt to 46 feet through the intersections to provide cart paths and left turn lanes. See the *Option 2 Tab* at the end of this Memorandum for an illustration of the concept.

Automobiles: Providing left turn lanes at the signals will result in a significant improvement to automobile congestion. Left turners will no longer cause through traffic to stop. The traffic signals will be able to operate much more efficiently; each intersection will realize over a 30% increase in capacity. Automobiles will have to share the road with golf carts, resulting in a slower controlled speed through the intersections to allow for left and right turning golf carts.

Golf Carts: The travel experience for golf carts should be similar to the current existing conditions with Option 2, because they will still have their own cart path lane, but it will be on the road beside an automobile lane. Golf carts that need to turn left or right will need to navigate into an automobile lane.

Drainage Impacts: While Option 2 does require 5 feet of pavement widening on each side of the road, no permit is expected to be required from the SWFWMD. The SWFWMD does not usually require permits for safety improvements and shoulder widening. Based on our preliminary discussions with SWFWMD staff, no permit is expected for Option 2.

Right-of-Way: All of the proposed modifications for Option 2 can be constructed within the existing right-of-way.

Budget impact: While widening 5 feet on either side will cost more than maintaining the existing pavement width, Option 2 should be feasible within the County's allocated budget for the project.

Summary: Option 2 should provide substantial reduction in automobile congestion, while also providing some additional room for carts and cars to comeingle.



Option 3: Left turn lanes at the signals; cart paths merge with automobile lanes

Option 3 maintains the existing 36 feet of asphalt throughout the corridor, which requires all golf carts to merge into the automobile lane when they travel through the Rio Grande Avenue and San Marino Drive intersections. See the *Option 3 Tab* at the end of this Memorandum for an illustration of the concept.

Automobiles: Providing left turn lanes at the signals will result in a significant improvement to automobile congestion. Left turners will no longer cause through traffic to stop. The traffic signals will be able to operate much more efficiently; each intersection will realize over a 30% increase in capacity. Having all golf carts merge into travel lanes will require much lower speeds through the signalized intersections.

Golf Carts: Automobiles and golf carts will be traveling even closer in some areas than they do today. Some golf cart drivers can be expected to be very uncomfortable driving through the corridor.

Drainage Impacts: There are no additional drainage impacts with Option 3. The SWFWMD is not expected to require a permit.

Right-of-Way: All of the proposed modifications for Option 3 can be constructed within the existing right-of-way.

Budget impact: Option 3 is the cheapest of the options. Option 3 should be able to be constructed within the County's allocated budget for the project.

Summary: By providing left turn lanes at the traffic signals, Option 3 does provide increased capacity in the corridor; however, travel speeds would be much lower, especially during off-peak times. There is the greatest opportunity for an increase in automobile/golf cart collisions under Option 3 because all golf carts are required to merge into the automobile lanes, and there is generally a speed differential between automobiles and golf carts.



Recommendation

In addition to the proposed modifications common to all three Options, Option 2 is recommended for construction. Based on 3.5 years of crash data, there have been no recorded incidents of automobiles striking golf carts, and no personal injuries recorded either. This crash history results in over 15 million vehicle miles traveled with no recorded personal injuries due to golf cart/automobile interaction. That history is significantly below national averages for crash rates.

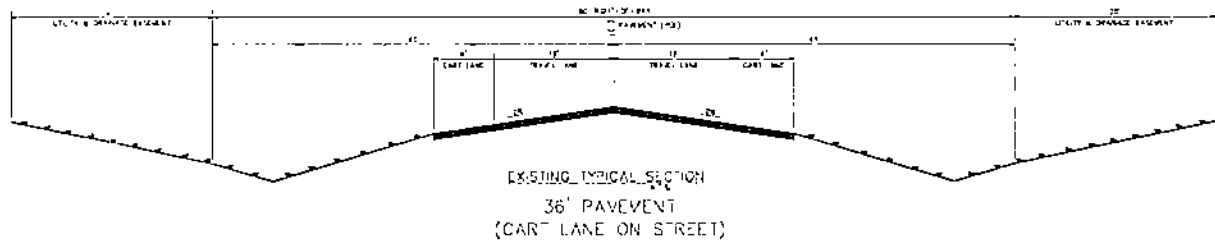
Having both left turn lanes and golf cart paths at the signalized intersections can be expected to significantly improve traffic operations without a negative effect on corridor safety. Since carts do comeingle with automobiles at the traffic signals, a yellow warning sign should be posted at each signal's approach that provides a suggested speed of 20 MPH. In addition, SHARE THE ROAD signs should also be provided that alert automobile drivers of the presence of golf carts in the road. These SHARE THE ROAD signs exist in other corridors in The Villages.


KHA recommends that the BOCC directs Public Works to design and construct the modifications illustrated in Option 2.

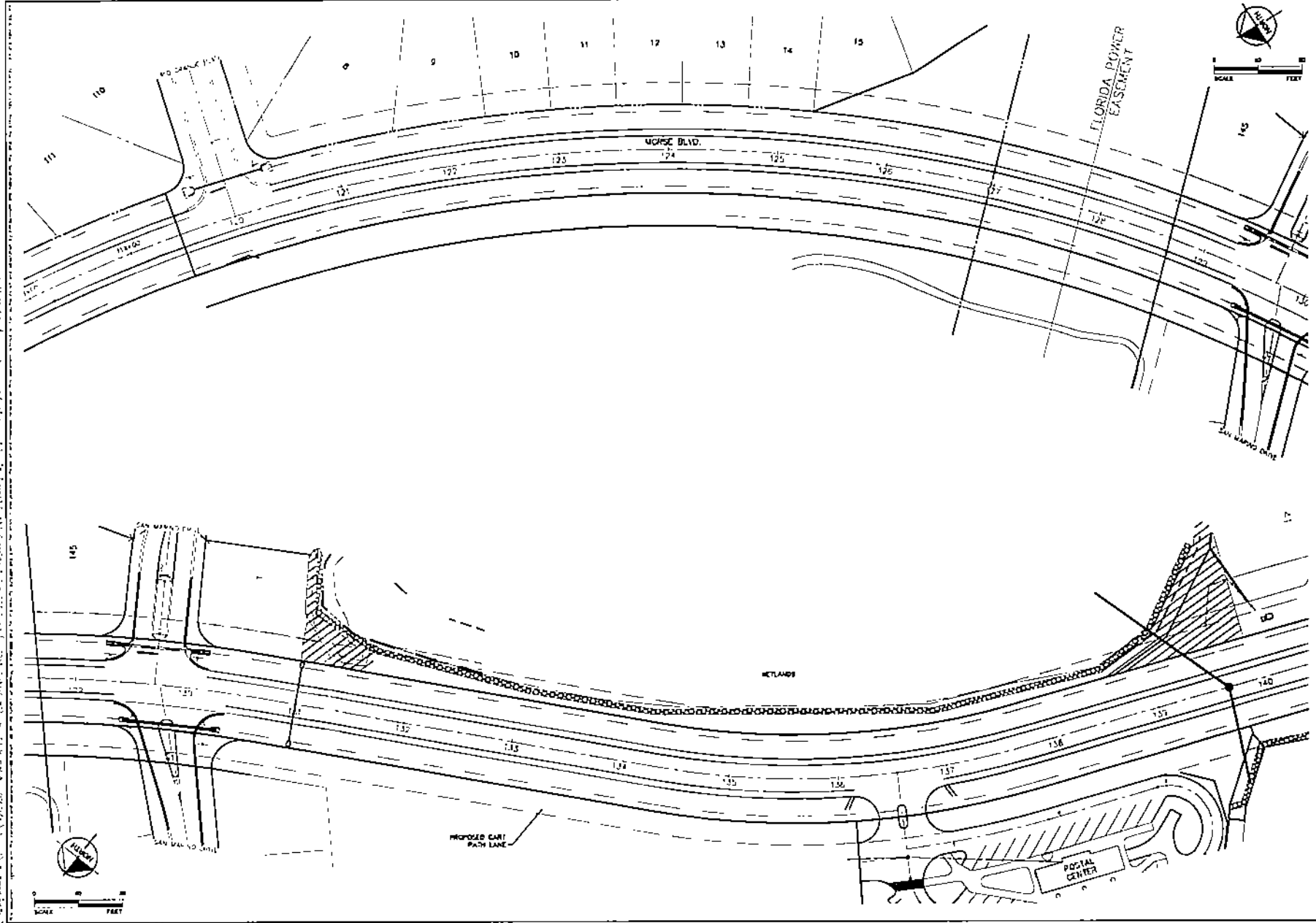


***EXISTING CONDITIONS
TYPICAL SECTION
PLAN VIEW***

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<small>PROJECT NO.</small> 142109001	<small>SHEET NUMBER</small> 11	

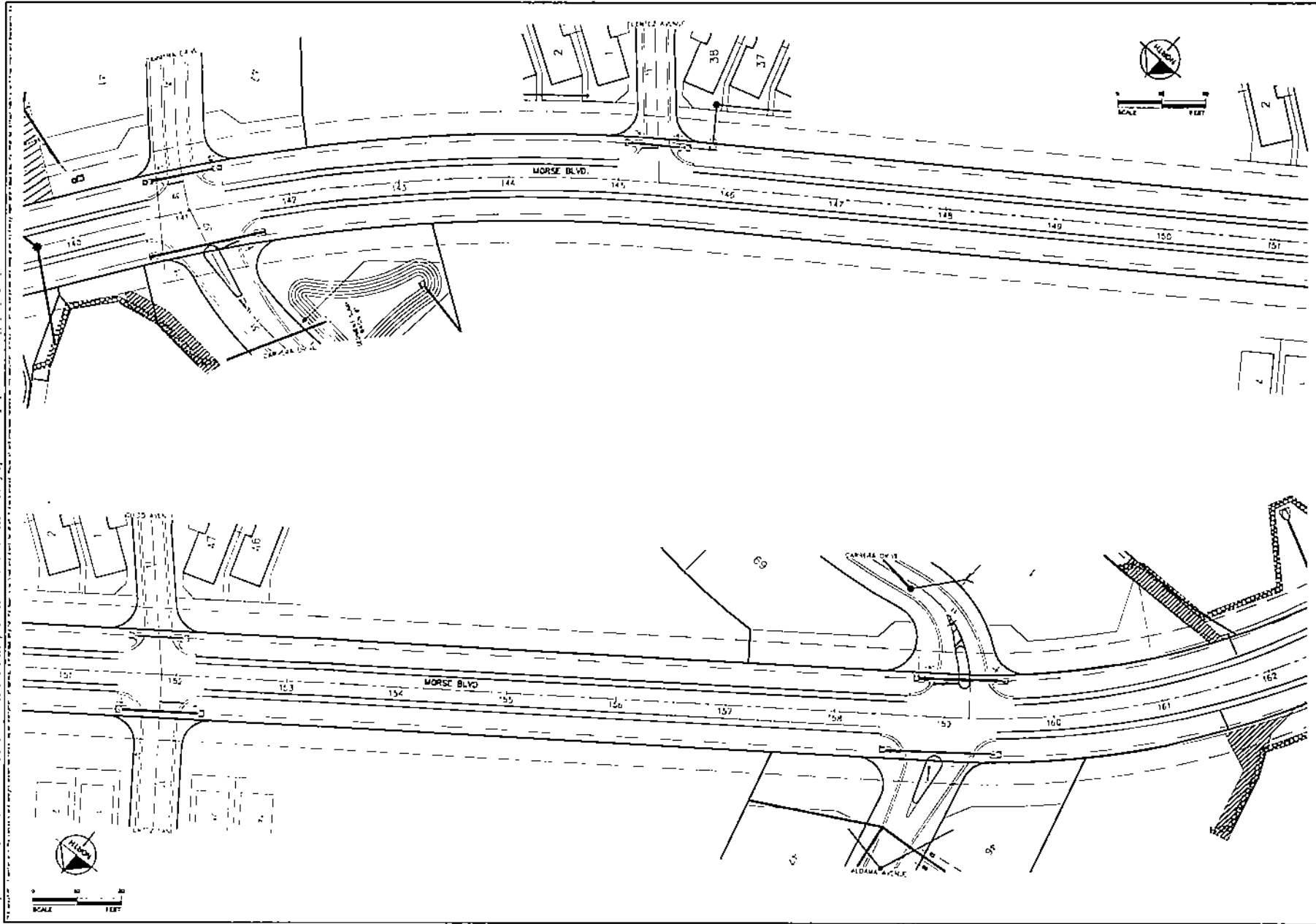


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EXISTING CONDITIONS

**MORSE BOULEVARD
PHASE 1**
 SOUTHER COUNTY FLORIDA

PROJECT 6
 142162001
 SHEET NUMBER
12

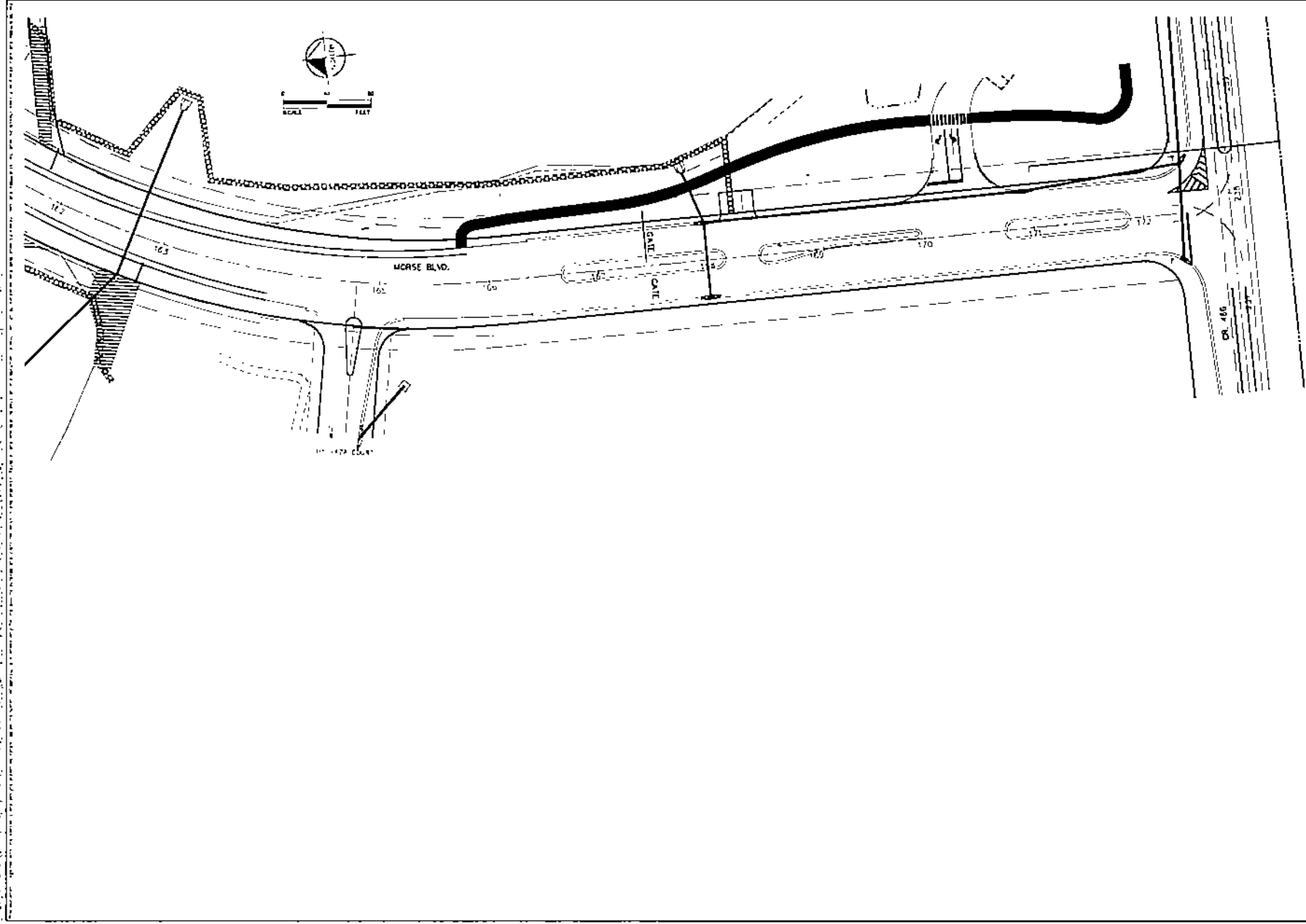


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EXISTING CONDITIONS

**MORSE BOULEVARD
 PHASE 1**
 S. DUFFY COUNTY FLORIDA

PROJECT NO.
 142102001
 SHEET NUMBER
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SHEET NUMBER
11
4

PROJECT NO.
142100201

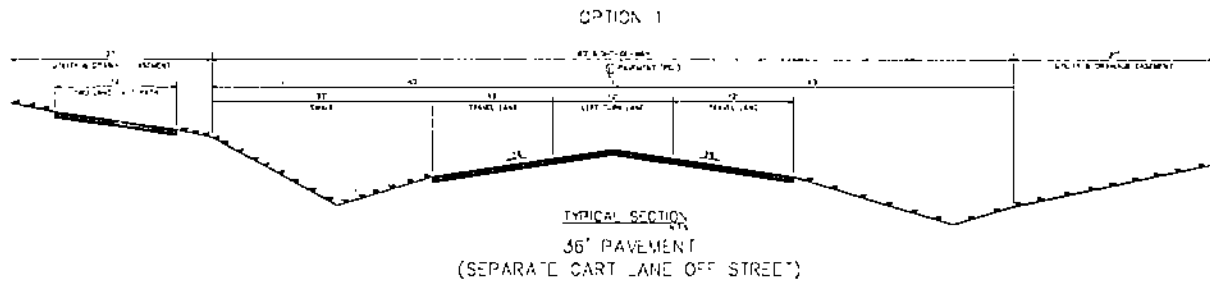
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PHASE 1**
S. WATER COUNTY, FLORIDA

EXISTING CONDITIONS

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OPTION 1
TYPICAL SECTION
PLAN VIEWS

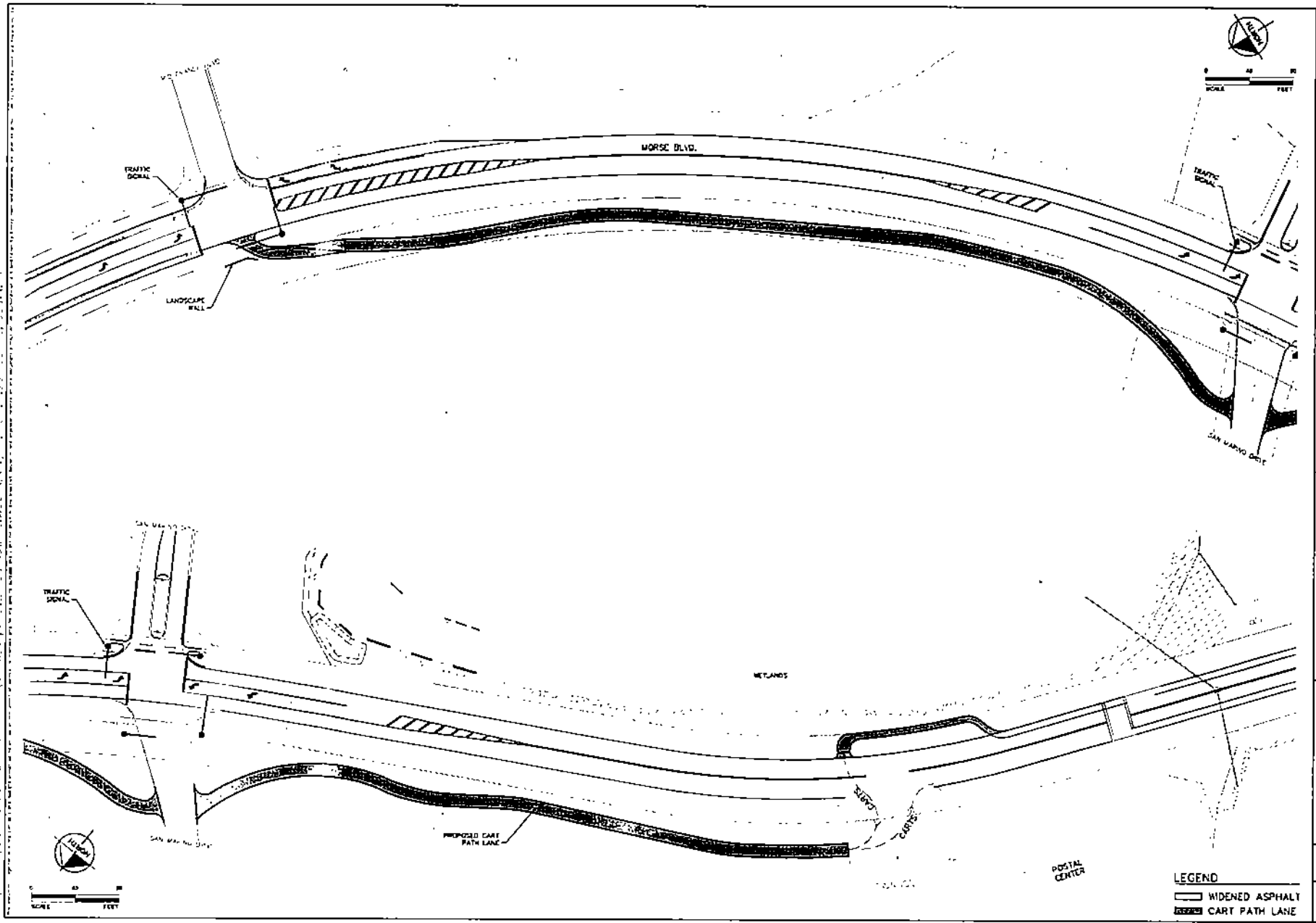


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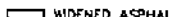

MORSE BOULEVARD
PHASE 1
SULLY COUNTY
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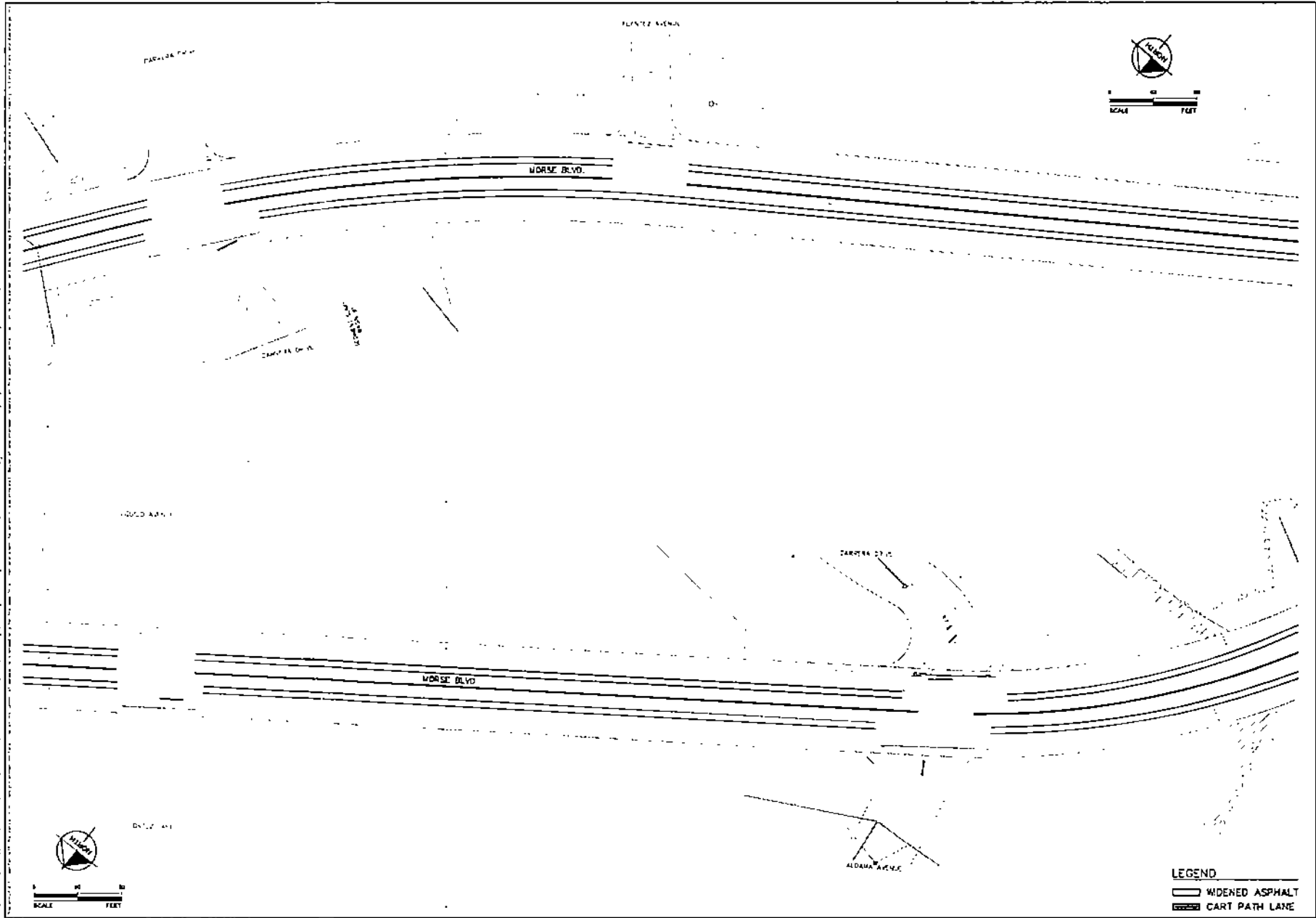
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SHEET NUMBER
1.1



	
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 CART PATH LANE

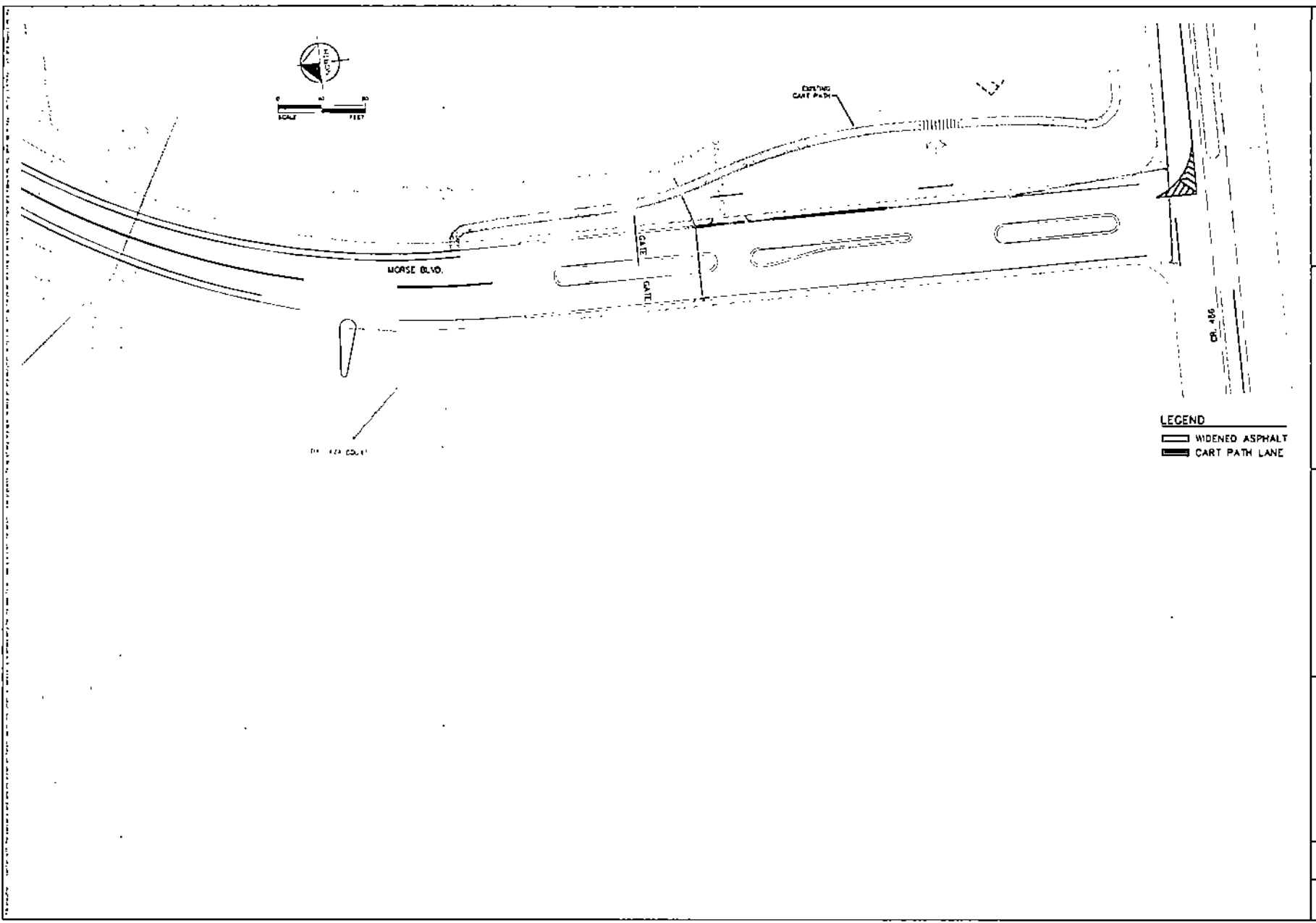


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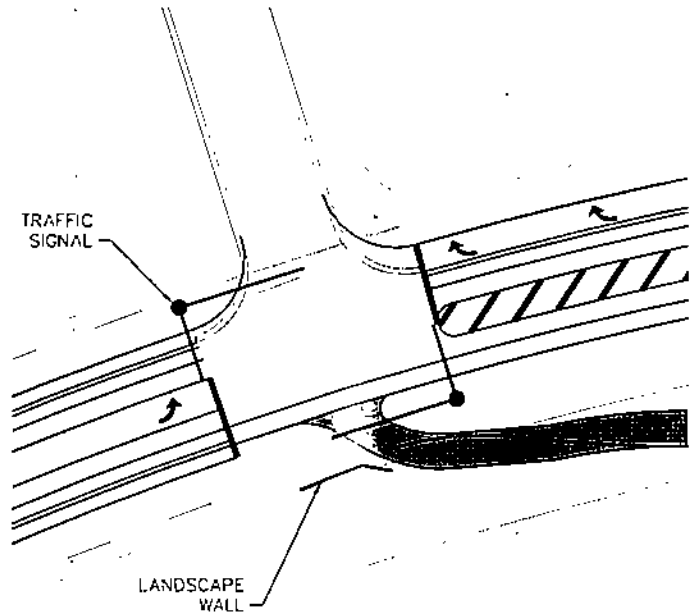
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SEPARATE CART PATH**

**MORSE BOULEVARD
PHASE 1**
 SULLY COUNTY ILL. 62424

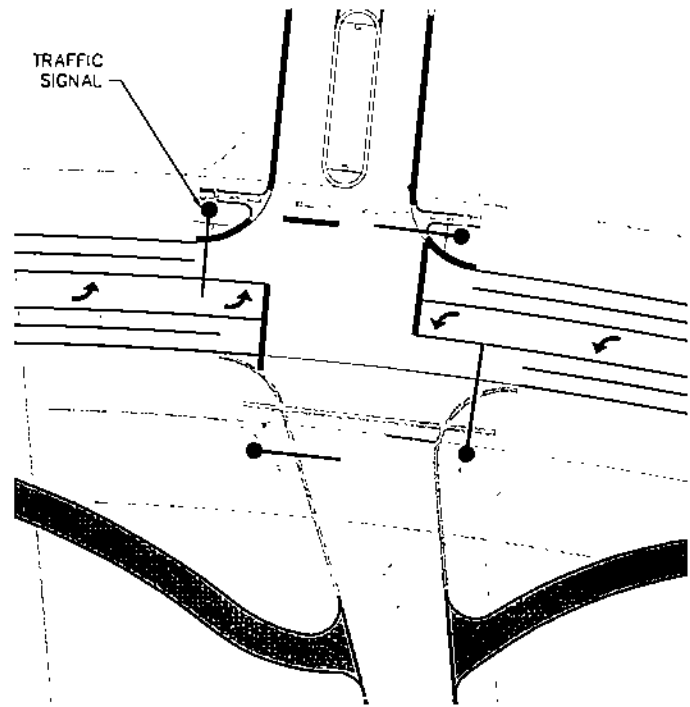
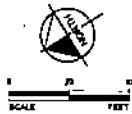
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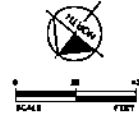
<p>Kirtley-Ham and Associates, Inc. 2008 BENTLEY ROAD, SUITE 100, WILMINGTON, DE 19804 TEL: 302.436.1234 FAX: 302.436.1235 WWW.KHARTS.COM</p>	<p>OPTION 1 SEPARATE CART PATH</p>	<p>MORSE BOULEVARD PHASE 1 SOUTH COUNTY</p>	<p>PROJECT NO. 142102021</p>	<p>SHEET NUMBER 1.4</p>
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MORSE BOULEVARD
@ RIO GRANDE



MORSE BOULEVARD
@ SAN MARINO



LEGEND
 HIDDEN ASPHALT
 CART PATH LANE

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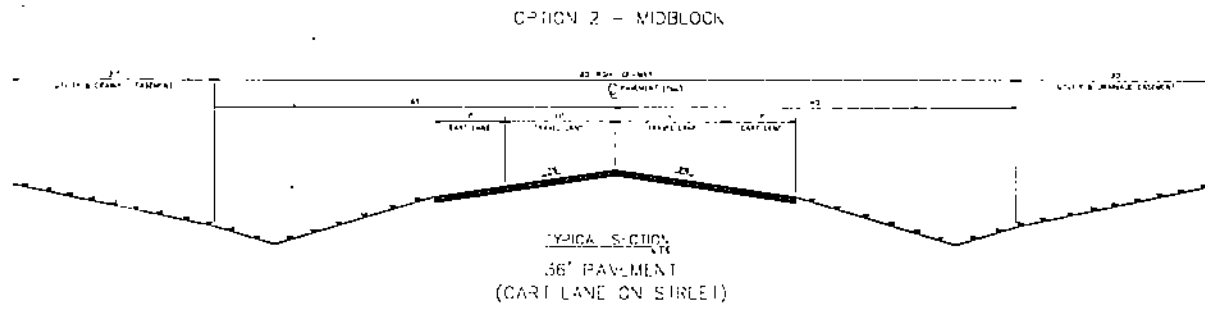
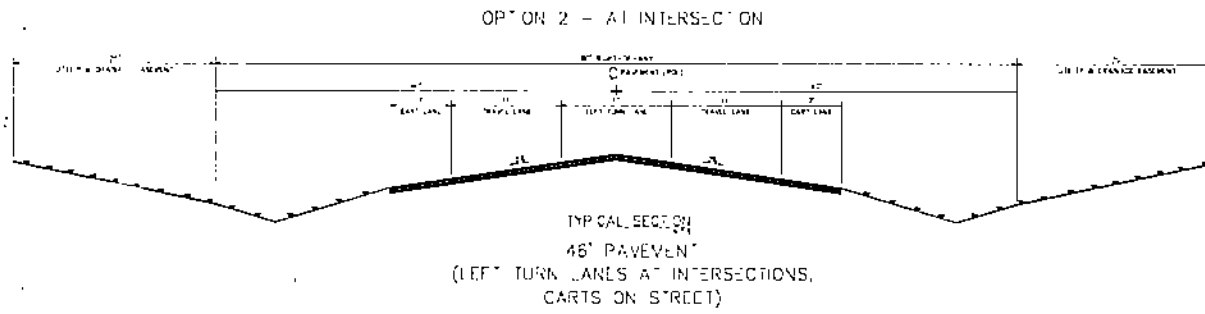
OPTION 1
SEPARATE CART PATH

MORSE BOULEVARD
PHASE 1
FLORIDA
SUNTER COUNTY

PROJECT #
142109021
SHEET NUMBER
1.5



OPTION 2
TYPICAL SECTION
PLAN VIEWS



OPTION 2
TYPICAL SECTION

MORSE BOULEVARD
PHASE 1
SUNTER COUNTY
FLORIDA

PROJECT NO.
142102031


REVISION
2.1

SHEET NUMBER
2.3

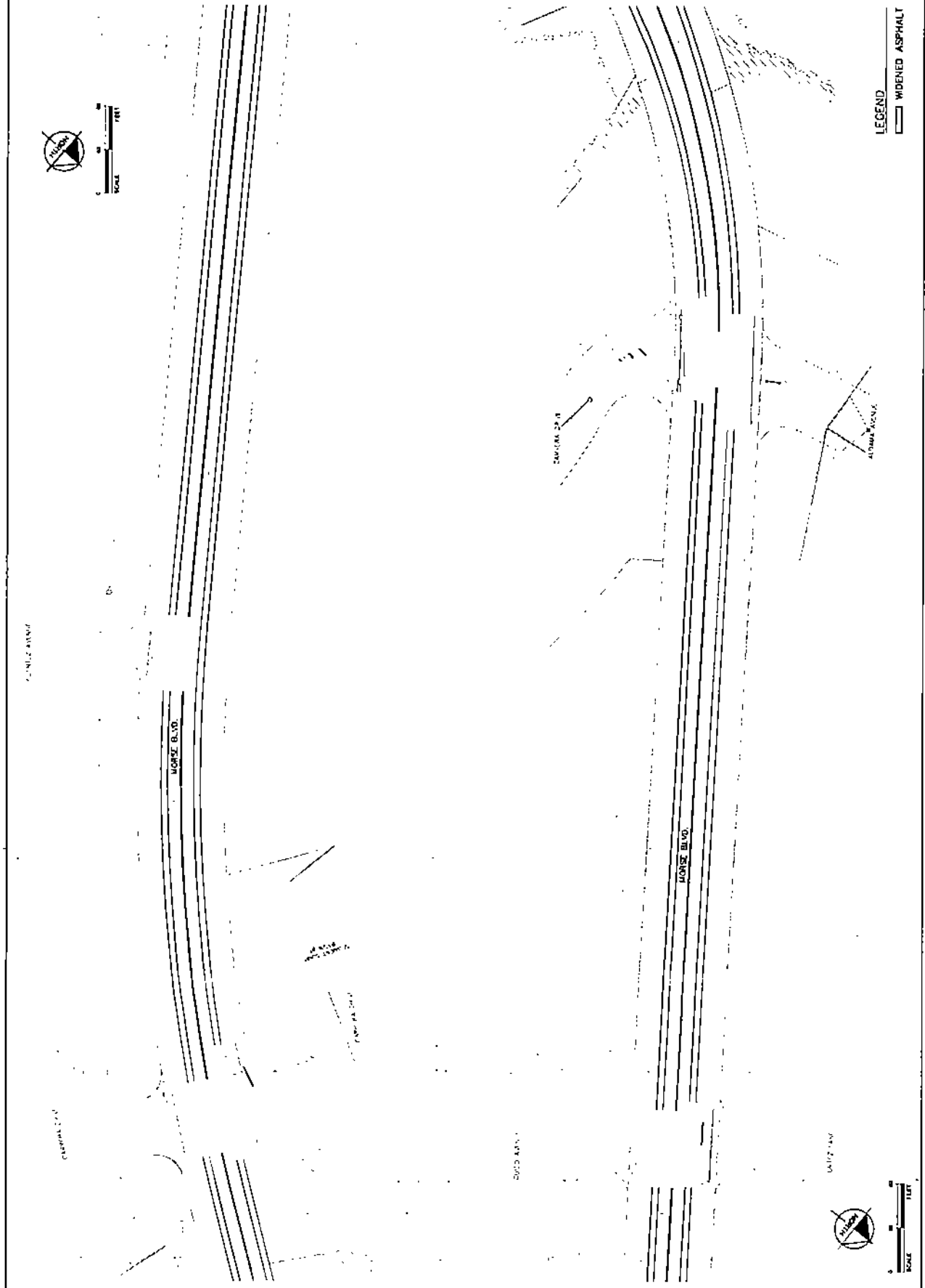
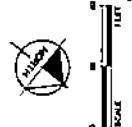
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140100201

MORSE BOULEVARD
PHASE 1
FLORIDA

OPTION 2
ADDED LEFT TURNS AT RIO
GRANDE AND SAN MARINO
SEPARATE CART LANES


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LEGEND
 WIDENED ASPHALT



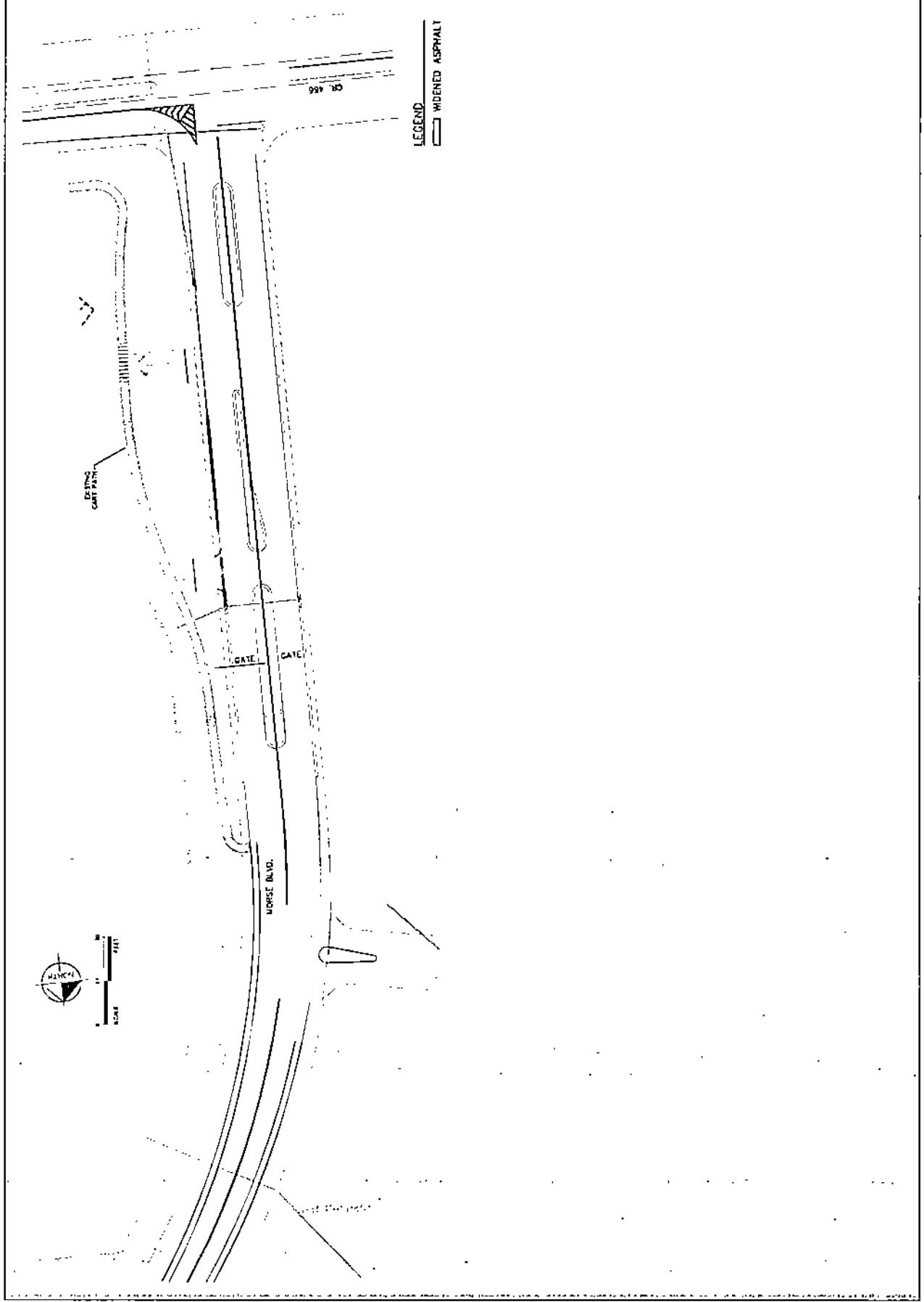
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SHEET NUMBER


142700001
PROJECT NO

ALACHUA COUNTY
MORSE BOULEVARD
PHASE 1

OPTION 2
ADDED LEFT TURNS AT RIO
GRANDE AND SAN MARINO
SEPARATE CART LANES


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LEGEND
 WIDENED ASPHALT



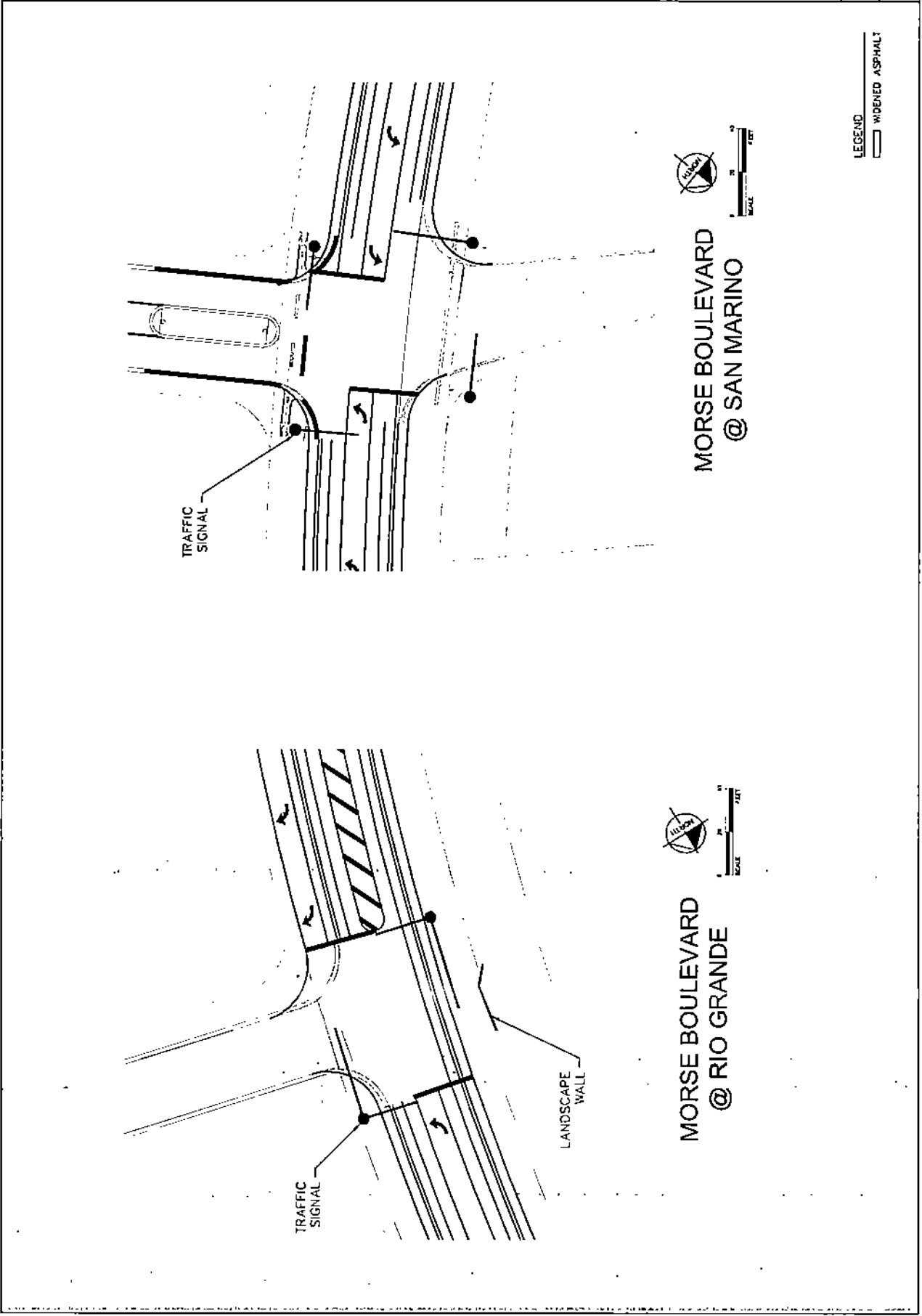
OPTION 2
 ADDED LEFT TURNS AT RIO
 GRANDE AND SAN MARINO
 SEPARATE CART LINES

ARTLEY-HORN
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SWIFTER COUNTY
 MORSE BOULEVARD
 PHASE 1
 FLOOR PLAN

PROJECT NO.
 147102001

SHEET NUMBER
 2.5



MORSE BOULEVARD
 @ SAN MARINO

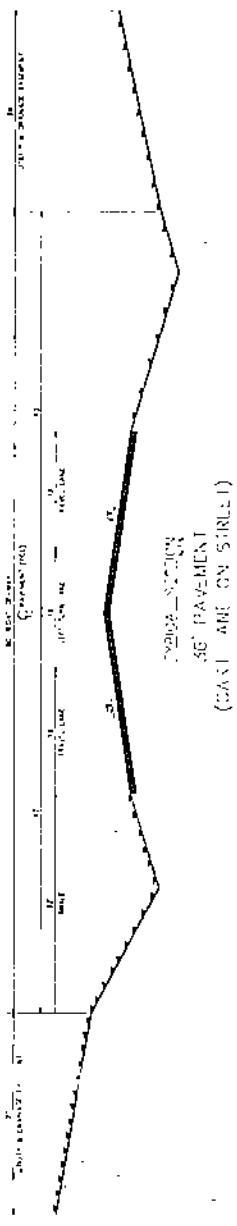
MORSE BOULEVARD
 @ RIO GRANDE

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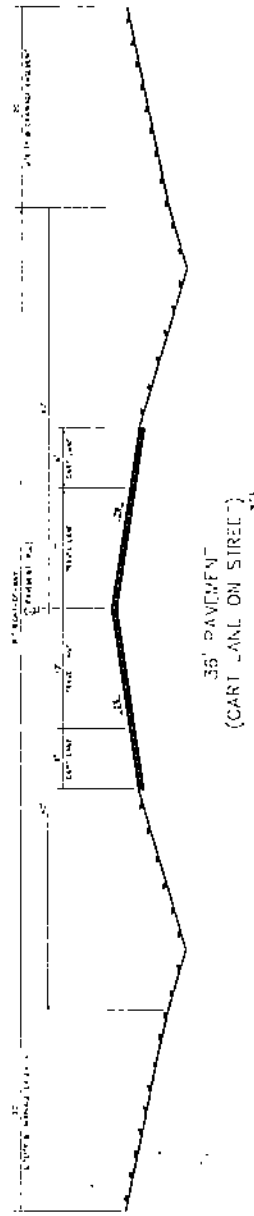


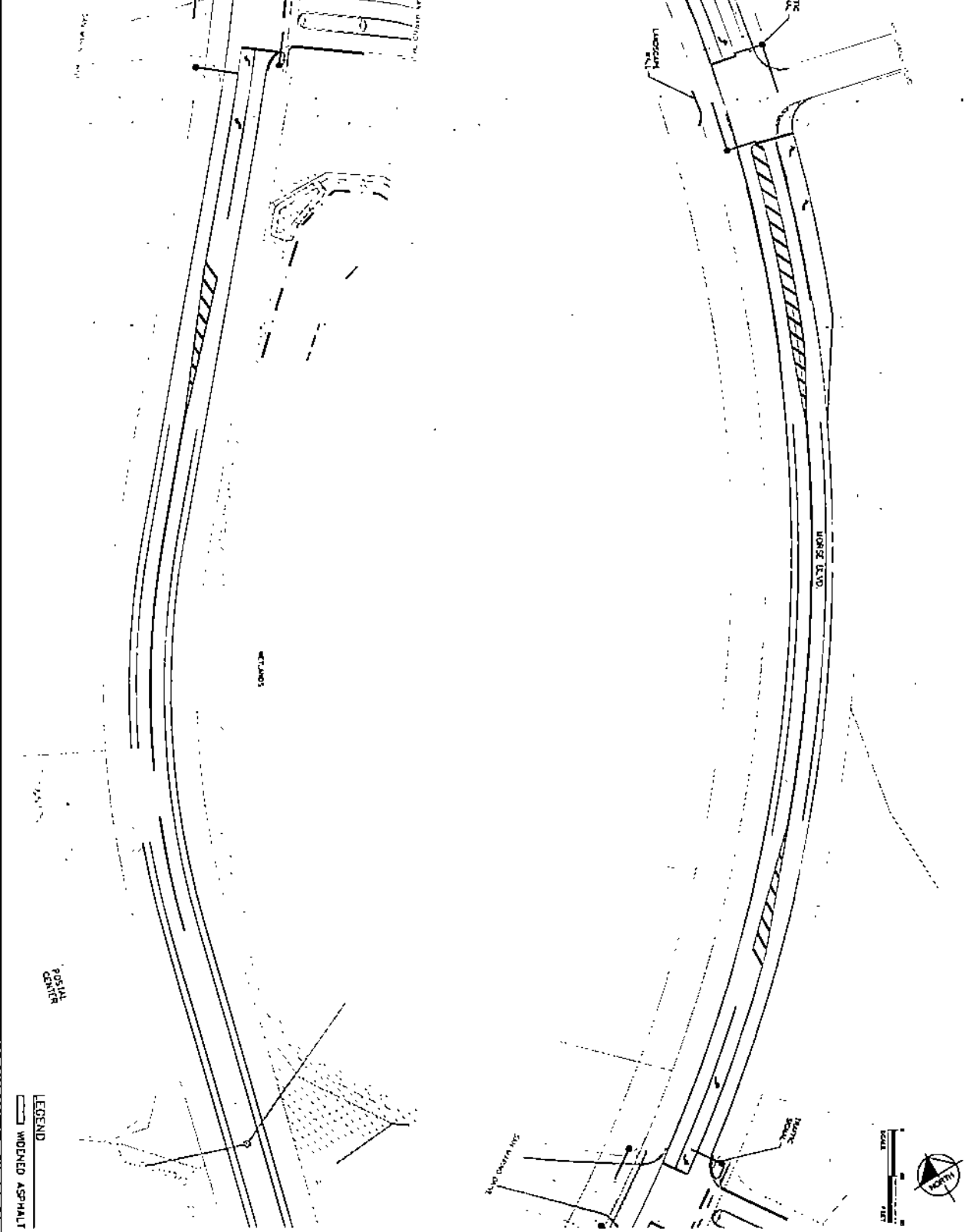
OPTION 3
TYPICAL SECTION
PLAN VIEWS

OPTION 3 - AT INTERSECTION



OPTION 3 - MIDBLOCK





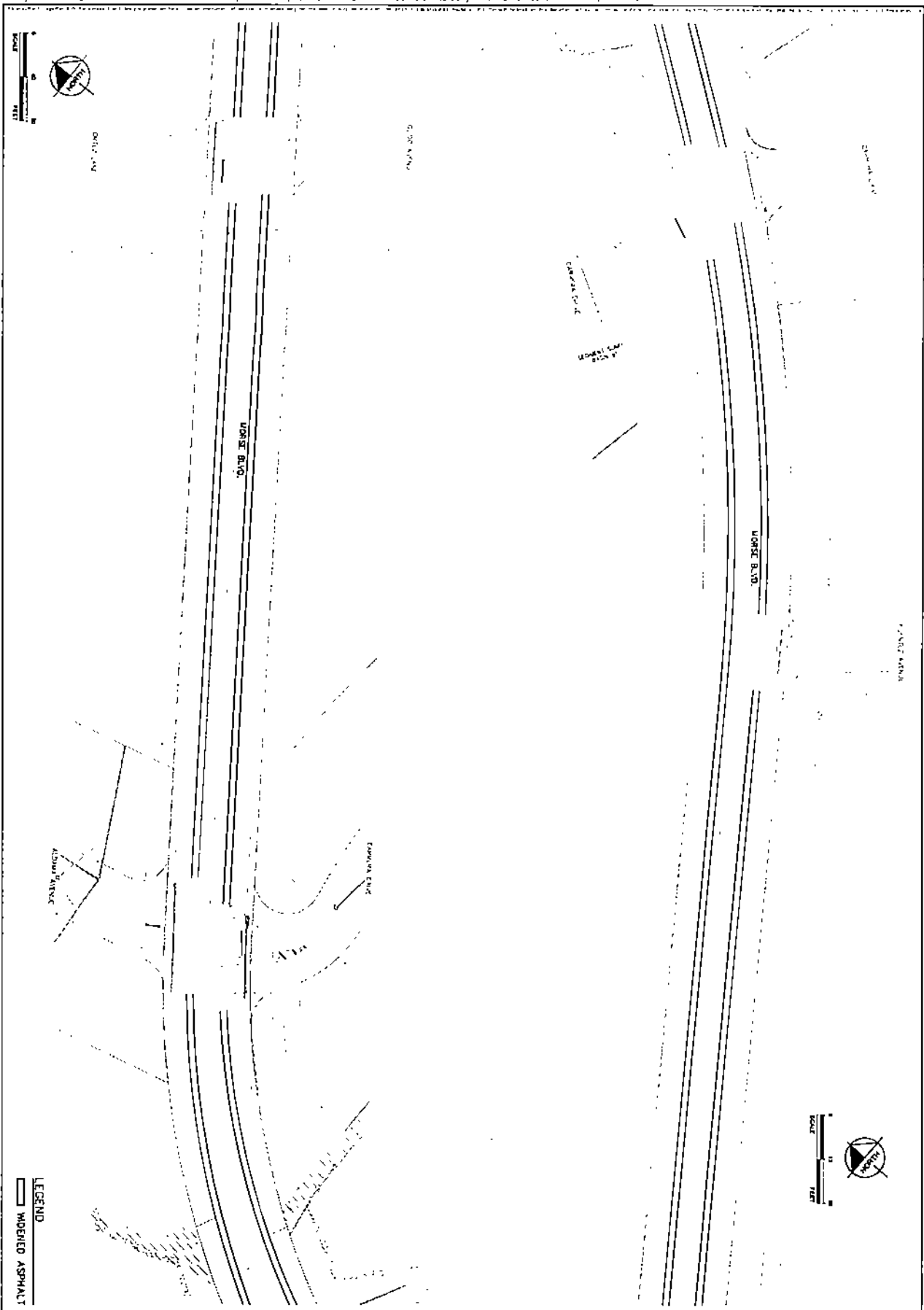
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PROJECT NO.
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 SHEET NUMBER
3.2

**MORSE BOULEVARD
 PHASE 1**
 SUMTER COUNTY FLORIDA

**OPTION 3
 ADDED LEFT TURNS AT RIO
 GRANDE AND SAN MARINO
 CARTS SHARE ROAD
 THROUGH INTERSECTIONS**

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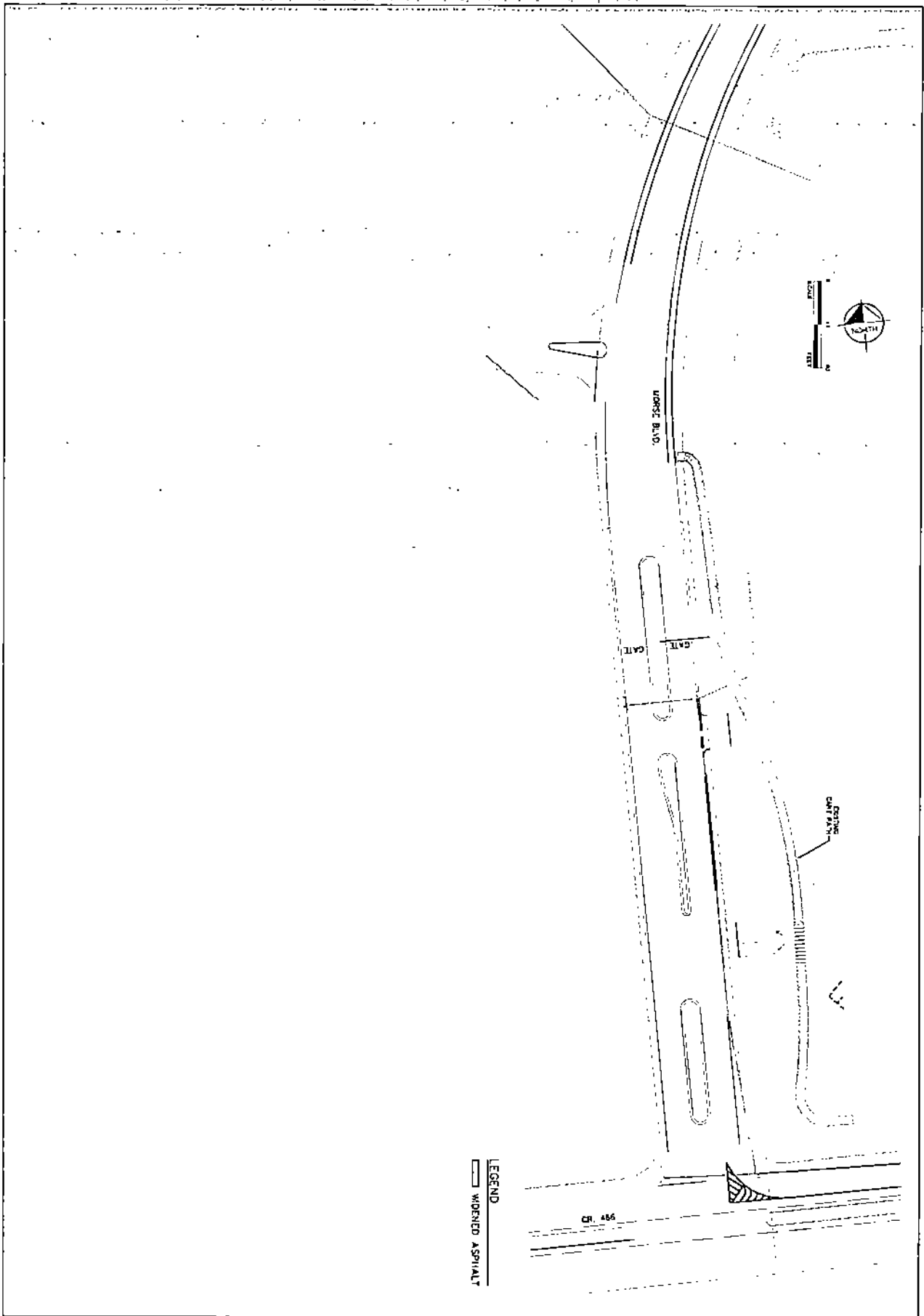
LEGEND
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SHEET NUMBER
3.3

PROJECT NO.
 147100001
 SLURRY COUNTY 11.03.24

**OPTION 3
 ADDED LEFT TURNS AT RIO
 GRANDE AND SAN MARINO
 CARTS SHARE ROAD
 THROUGH INTERSECTIONS**

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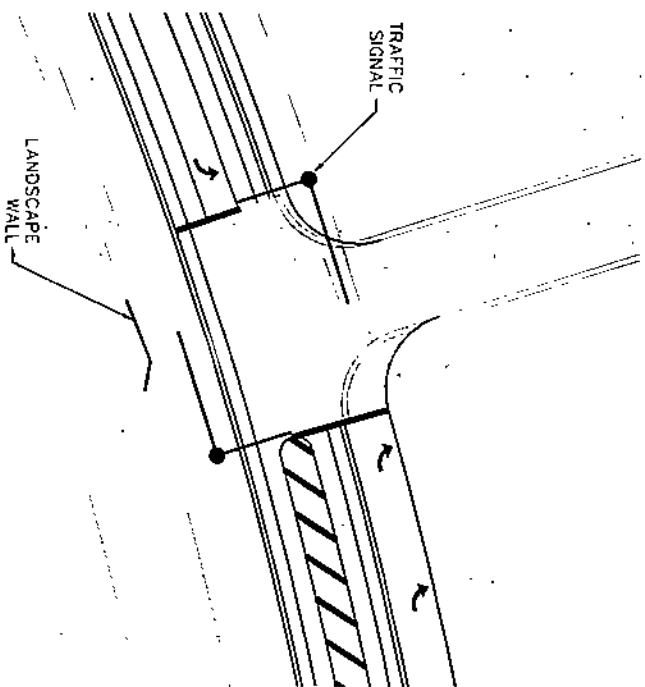


PROJECT NO.
 149102501
 SHEET NUMBER
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 MORSE BOULEVARD
 PHASE 1
 CLAYTON COUNTY 11-11-24

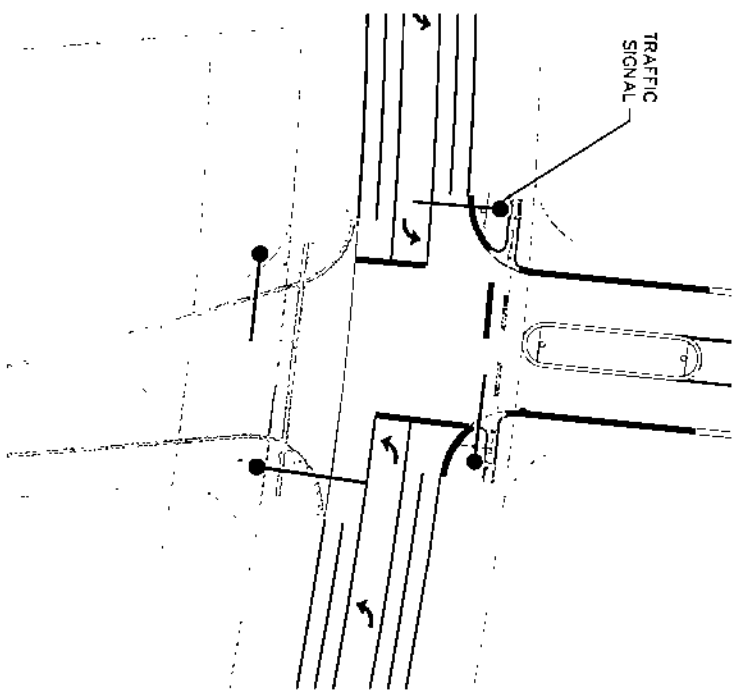
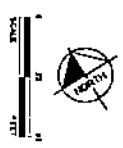
**OPTION 3
 ADDED LEFT TURNS AT RIO
 GRANDE AND SAN MARINO
 CANTS SHARE ROAD
 THROUGH INTERSECTIONS**


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(This area is reserved for additional information or notes.)




MORSE BOULEVARD
@ RIO GRANDE



MORSE BOULEVARD
@ SAN MARINO



LEGEND
WIDENED ASPHALT

PROJECT NO. 147-03901 SHEET NUMBER 3.5	MORSE BOULEVARD PHASE 1 SUNTER COUNTY 11-07-03	OPTION 3 ADDED LEFT TURNS AT RIO GRANDE AND SAN MARINO CARTS SHARE ROAD THROUGH INTERSECTIONS	 Kinley-Horn and Associates, Inc. 2225 198th AVENUE, SUITE 100 SUNNYVALE, CALIFORNIA 95088 PHONE 925-718-7141 FAX 925-718-7144 WWW.KH-INC.COM CA 00084816	
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