



**Conceptual Study Report**  
**Route 100 (Manchester Road) Rehabilitation**  
**from Ballas Road to Route 141**

**February 5, 2018 (DRAFT)**  
**MoDOT Job No. 6P3274**

Prepared By:



Hanson Professional Services, Inc.  
13801 Riverport Drive, Suite 300  
Maryland Heights, MO 63043



## MEMORANDUM

### Missouri Department of Transportation

---

**DATE:** February 1, 2018

**TO:** Tom Blair  
District Engineer

**FROM:** Matthew Dawson  
Project Engineer

**SUBJECT:** District St. Louis – Design  
Route 100, St. Louis County  
Route 100 Rehabilitation  
From Ballas Road to Route 141  
Job No. 6P3274  
Conceptual Study Report

#### Purpose of Study



The purpose of this conceptual study is to develop a detailed conceptual cost estimate to both rehabilitate the existing pavement and provide pedestrian facilities in compliance with the draft Proposed Right-of-Way Accessibility Guidelines (PROWAG). Pavement maintenance activities, including the proposed overlay for this project, require that all pedestrian facilities along the route be brought into compliance with PROWAG. Land use along the corridor consists of both older and newer commercial developments where existing sidewalks do not meet current requirements. Some of the newer developments have sidewalk features that are not in compliance and require correction. This study reviewed the entire corridor and developed a conceptual design to improve existing facilities to meet PROWAG requirements while also looking for locations where existing gaps in the sidewalk system could be closed to provide improved access throughout the project corridor.

#### Summary of Proposed Improvements

With the need for pavement maintenance, Hanson worked with MoDOT to develop a conceptual plan to bring the approximate 3.65 mile Route 100 corridor between Ballas Road (Sta. 392+45) and Route 141 (Sta. 585+00) in St. Louis County into compliance with current PROWAG standards as required when undertaking pavement maintenance activities such as the overlay proposed for this project. The following improvements are being proposed: milling the existing asphalt and overlaying with SuperPave, modification of all existing signalized

intersection to provide pedestrian accommodations which includes audible pedestrian signals, sidewalk improvements to improve access at existing bus stop locations, new sidewalk and curb ramp to provide for a full PROWAG compliant pedestrian facilities along the project corridor.

Below is a summary of information that was used for this conceptual design. This information includes traffic data, conceptual cost estimates, existing facilities and bridge information, and proposed design criteria for the project.

#### DESIGN TRAFFIC

ADT (Construction) = XXXXX (XXXX)

ADT (Design) = XXXXX (XXXX)

% Trucks = XX.X%

Operational (Posted) Speed = 35 mph

Functional Classification = Principal Arterial (Major Route)

#### CONCEPTUAL COST

Right of Way: TBD

Construction: TBD

#### Existing Facilities

The following record drawings were made available and reviewed for the project:

Year	Project No.	Start Work	End Work	Scope of Work
1958(?)	F-100-1(2)	Old State Road	Mason Road	Original Construction and Widening
1972	96(3)U	Approx. I-270	Ballas Road	Widening
1983	6-U-100-223B	Route 141	Mason Road	Widening
2005	J6U0132	Mason Road	Ballas Road	Construction of Westbound Route 100 separate from Eastbound
1997	J6U0804E	Route 141 Interchange		Modification of Interchange to Create the Current SPUI

Information on the exact pavement structure present today is difficult to determine in many locations. The oldest shown in the 1958 plans consisted of nine inches of reinforced concrete pavement, but these plans do not cover the length of the corridor. Widening work constructed in 1958, 1972, and 1983 consisted of nine inches of non-reinforced concrete pavement. In 2005 some of the new westbound pavement was built 12 inches of non-reinforced concrete pavement. Except for at the I-270 interchange all of pavement has received at least one, and in many cases multiple, overlays. Pavement cores during design will be the only way to fully determine what the existing pavement structure is for a given segment.

A variety of edge conditions are present along the corridor including:

- Integral Type 'B' curb
- Type 'S' modified curb
- Curb & Gutter (with overlay placed in gutter)
- Shoulders with open ditches

Roadbed width varies from 65 feet to 113.5 feet with four to eight lanes present throughout the corridor with a 5-lane section being most prevalent. The widest sections exist at either end of the project where the roadway widens at Ballas Road and near the Route 141 Interchange.

While sidewalks are present throughout this section there are numerous lengthy gaps in the sidewalk network and isolated sections that serve only a few parcels. Limited sections currently have sidewalks on both sides of the roadway. Nearly all of the existing sidewalk ramps are out of compliance with PROWAG guidelines for slope and/or detectable warnings. See Appendix B for pictures showing some of the concerns noted in the field.

A fair amount of large scale development has occurred over the years resulting in big box stores and shopping centers set back from the roadway with no pedestrian access to Route 100. Many bus stops are not connected to the adjacent sidewalk or have no pedestrian access to them beyond the paved shoulder of the roadway. Some locations are no more than a sign along the roadway with no safe way to access them or for standing while waiting for the bus.

## **PROPOSED PAVEMENT DESIGN**

### **Existing Pavement Conditions**

Existing pavement within the Route 100 corridor is in need of maintenance due to the poor condition. Available record drawings were reviewed covering various sections of the existing roadway to help determine the existing roadway cross section. Existing plans for some sections were not available or did not provide much detail for existing pavement that was being added to in the available plans. As a result, the exact existing pavement structure is not fully known at this time.

Based on the available information older sections of the roadway were widened with nine inches of reinforced concrete base course widening. Widening of the eastbound pavement during the eastbound/westbound split were widened with nine to twelve inches of non-reinforced Portland cement concrete pavement while the new westbound lanes were 16.25 inches of full depth asphalt pavement. Pavement within the I-270 interchange is concrete with no overlay, this area is being excluded from the proposed improvements. Except for the I-270 interchange all of the existing pavement has received one or more overlay treatments.

### **Proposed Pavement Treatment**

While a preliminary pavement recommendation has not been provided a previously prepared SET Estimate for an identical project of the adjacent section from US 67/Kirkwood Road to Ballas Road indicated a total proposed overlay thickness of 3.75 inches consisting of 2.00 inches of Asphaltic Concrete Mixture PG 76-22 (SP190B Mix) and 1.75 inches Asphaltic Concrete Mixture PG 76-22 (SP125BLP Mix). For the purposes of this concept study this pavement design will also be applied to this section. Cold milling will be performed prior to placement of the overlay to minimize the overall change in surface grades.

## **PROPOSED ROADWAY AND PEDESTRIAN DESIGN**

Below is a summary of the existing conditions and proposed improvements along Route 100 within the project limits from Ballas Road to Route 141. The following discussions detail the existing typical section of the roadway including existing pedestrian accommodations and then explains the proposed conceptual design improvements to provide for a fully PROWAG compliant corridor. The summaries also briefly discuss improvements proposed at the existing signalized intersections; for additional details see the Proposed Traffic Signal Design section. Right of way impacts are briefly discussed below and shown in the concept plan strip maps. See the Appendix A for Existing/Proposed Typical Sections for Route 100.

Existing right-of-way line work was acquired from the St. Louis County GIS system and does not reflect any easements that may be present. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work. Proposed easements are noted in the strip maps with the proposed improvements, and will need to be confirmed during the next phase of work to confirm which are needed and the appropriate limits.

### **Ballas Road to West County Center Drive (Eastbound/Westbound)**

#### **Existing Conditions**

The existing section of Route 100 between Sta. 392+45 to Sta. 400+00 is within the City Limits of Des Peres. Existing roadway cross section consists of 9 total lanes, each approximately 11 feet wide. Eastbound features two through lanes, two dedicated left turn lanes, and one dedicated right turn lane. Westbound features three through lanes, one right turn lane, and one left turn lane. The additional westbound through becomes the northbound I-270 ramp. Another westbound develops on the inside to deliver traffic to the southbound I-270 loop ramp. Curb and gutter is present along the eastbound side while Type 'B' curb is found on the westbound side. Modern sidewalks are present along both side of Route 100 and is generally in good condition. There are trip hazard locations present in some locations that require attention.

#### **Proposed Improvements and Right of Way Impacts**

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. Trip hazards along the existing sidewalk will be repaired and ramp slopes will be verified. No overhead utility poles are present in this section.

Some of the existing sidewalk appears to be located off of the existing right-of-way owned by the State. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work. In this section encroachments off the State right-of-way are present on both side of Route 100.

## **I-270 Ramp Terminal Intersection to I-270 Overpass (Eastbound/Westbound)**

### Existing Conditions

The section of Eastbound Route 100 between Sta. 400+00 and Sta. 406+00 is within the City Limits of Des Peres. Existing roadway cross section consists of five to six eastbound lanes and four westbound lanes that separate from eastbound in the section to create separate eastbound and westbound facilities for Route 100. Lane widths are approximately 11.5 feet wide. Eastbound consists of three through lanes with two dedicated left turn and one dedicated right turn lane at the West County Center Drive intersection and a contra flow lane to the southbound I-270 on ramp. Westbound includes three through lanes and a dedicated right turn lane to JJ Kelley Memorial Drive. Curb and gutter is present along the eastbound side while Type 'B' curb is found on the westbound side. A raised median separates eastbound from westbound. Modern sidewalks are present along both side of Route 100 and is generally in good condition. There are trip hazard locations present in some locations that require attention.

### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. Trip hazards along the existing sidewalk will be repaired and ramp slopes will be verified. No overhead utility poles are present in this section.

All of the existing sidewalk appear to be located on the existing right-of-way owned by the State. No right-of-way is anticipated for this section of Route 100.

## **I-270 Interchange to Des Peres Road Ramps (Eastbound)**

### Existing Conditions

The section of Route 100 between Sta. 416+00 and Sta. 431+50 is within the City Limits of Des Peres. Existing roadway cross section consists of five lanes, each approximately 12 feet wide. Three through lane are present throughout the section with a fourth through lane marked as being access to I-270 south. A fifth outer weave lane is present between the on ramp from Des Peres Road and Old Des Peres Road. Shoulders are present on the south side of the road and Type 'B' curbs are found on the north side. Existing sidewalks are only present up to the limits of the work from the I-270/Des Peres Road interchanges.

No pedestrian accommodations are provided through the I-270 interchange or across the Des Peres Road overpass. Sections of sidewalk are found on the south side of Route 100 between the interchanges. Sidewalk begins again on both sides starting at the Des Peres ramps and heading west. Existing sidewalks are in poor condition in some locations and many of the sidewalk ramps currently lack detectable warnings and have concerns with excessive slopes.

### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes only rehabilitation of pedestrian facilities. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks and driveway approaches that are not compliant with current PROWAG requirements and replacement of hazardous sections. All of the intersection curb ramps will be reconstructed with corrected slopes and to provide detectable warnings.

Overhead utility poles are located north of the eastbound pavement and do not interfere with existing or proposed sidewalk improvements.

Several segments of the existing sidewalk appear to be located off of the existing right-of-way owned by the State. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

### **Des Peres Road Ramps to the Eastbound/Westbound Merge (Eastbound)**

#### Existing Conditions

The section of Route 100 between Sta. 431+50 and Sta. 470+40 is within the City Limits of Des Peres. Existing roadway cross section consists of three to five lanes, each approximately 12 feet wide. Three through lane are present throughout the section. A dedicated right turn lane is provided at the ramp to Des Peres Road and a fourth through lane is added at the turn around connector between the westbound and eastbound roadway segments heading east. The outside paved shoulder is striped with a bike lane from Centeroyal Drive to Sarala Road. Integral Curb Type 'B' and Type 'S' modified curbs are present along both sides of the roadway.

Existing sidewalks suffer from both poor condition and PROWAG compliance issues including excessive slopes and toe trip hazards. Most of the sidewalk ramps currently lack detectable warnings and several have ramp slope concerns or non-compliant depressed curbs. Heading east from Topping Lane the sidewalk on south side has a longitudinal gap of up to two inches in width that could be hazardous for pedestrians.

### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks and driveway approaches that are not compliant with current PROWAG requirements and replacement of hazardous sections. One missing segment will be filled in on the north side of Route 100 west of Westmark Drive. All of the intersection curb ramps will be reconstructed with corrected slopes and to provide detectable warnings.



Overhead utility poles are located in the turn buffer between the back of curb and sidewalk and do not appear to interfere with the proposed improvements. This will need to be confirmed during design.

Several segments of the existing sidewalk appear to be located off of the existing right-of-way owned by the State. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

### **Des Peres Road Ramps to the Westbound/Eastbound Turnaround (Westbound)**

#### Existing Conditions

The section of westbound Route 100 between Sta. 1425+45 and Sta. 1464+40 is within the City Limits of Des Peres. Existing roadway cross section consists of three to four lanes, each approximately 11.5 to 12 feet wide. Three through lane are present throughout the section. A weave lane is provided between the Des Peres on ramp and Topping Road, a merge lane is provided for merging traffic from Topping Road, and a left turn lane is added for the Westbound to Eastbound turnaround. The outside paved shoulder has a marked bike lane from the west side of the I-270 interchange to Sams Drive. Shoulders are present along both sides of the road with a three different of edge treatments including:

- Open Ditches
- Concrete barrier and noise walls
- Concrete barrier and retaining walls/back slope

No sidewalks are currently present on either side of Route 100 and no businesses are readily accessible from the roadway. To the north residential and commercial developments are set well back from Route 100 with no pedestrian access to Route 100. Similarly the commercial developments located between westbound and eastbound Route 100 do not provide any pedestrian connections to the westbound roadway.

#### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100—includes pavement rehabilitation only.

There are no overhead utility poles located longitudinally along westbound Route 100 and the poles for facilities crossing the road are located back from the roadway.

No easements have been identified for this segment since the work is limited to pavement maintenance.

## **Westbound/Eastbound Turnaround to the Westbound/Eastbound Merge (Westbound)**

### Existing Conditions

The section of westbound Route 100 between Sta. 1464+40 to Sta. 1474+00 is within the City Limits of Des Peres. Existing roadway cross section consists of three to four lanes, each approximately 11.5 to 12 feet wide. Three through lane are present throughout the section with a right turn lane added for Sams Drive.

The outside paved shoulder has a marked bike lane from the west side of the I-270 interchange to Sams Drive. Shoulders are present along both sides of the road with open ditches.

No sidewalks are currently present on either side of Route 100 and no businesses are readily accessible from the roadway.

### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes pavement rehabilitation only.

There are no overhead utility poles located longitudinally along westbound Route 100 and the poles for facilities crossing the road are located back from the roadway.

No easements have been identified for this segment since the work is limited to pavement maintenance.

## **Eastbound/Westbound Merge to East of Barret Station Road (Eastbound/Westbound)**

### Existing Conditions

The section of Route 100 between Sta. 470+40 and Sta. 482+85 (westbound Sta. 1474+00 to Sta. 1486+55) is within the City Limits of Des Peres. Existing roadway cross section consists of six to seven lanes, each approximately 12 feet wide. Three through lane are provided in each direction separated by a Type 'C' concrete median barrier and inside shoulders. A fourth westbound lane is added to accommodate vehicles turning to and from the side roads. Outside shoulders are provided along the length of the eastbound lanes and up to Sams Drive on the westbound lanes. West of Sams Drive Type 'B' curb is provided along the outside of the westbound shoulder to Barrett Parkway Drive. West of Barret Parkway Drive guardrail quickly transitions to a concrete barrier.

Existing sidewalk on the westbound side begins at the western driveway to Sam's Club. Along eastbound sidewalk begins east of the Centeroyal Drive intersection. Existing sidewalks suffer from both poor condition and PROWAG compliance issues including excessive slopes and toe trip hazards. All sidewalk ramps appear to have compliant detectable warnings.

### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks that are not compliant with current PROWAG requirements.

Overhead utility poles are generally located behind the sidewalks and do not appear to interfere with the proposed improvements. This will need to be confirmed during design.

Several segments of the existing sidewalk appear to be located off of the existing right-of-way owned by the State, especially west of Centeroyal Drive/Barrett Parkway Drive. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

### **East of Barrett Station Road to Barrett Parkway Drive**

#### Existing Conditions

The section of Route 100 between Sta. 482+85 and Sta. 493+40 (westbound Sta. 1486+55 to 1497+09) extends past the City Limits of Des Peres into unincorporated St. Louis County. Existing roadway cross section consists of six to seven lanes, each approximately 12 feet wide. Three through lanes are provided in each direction separated by a variable width raised concrete median. Additionally a dedicated right turn lane is provided ~~along~~ westbound at the Barrett Station Road intersection.

Type 'B' Curb is present along the eastbound side of the road through the intersection. Westbound transitions from a concrete barrier to a Type 'B' curb before Barrett Station Road and then continues to the west.

Sidewalk is located along both sides of Route 100 through the Barrett Station Road intersection and ending east of the Barrett Parkway Drive intersection. Portions of the existing sidewalk suffer from poor condition and PROWAG compliance issues including excessive cross slopes and toe trip hazards. Some of the sidewalk ramps away from the Barrett Station Road intersection currently lack detectable warnings and several have ramp slope concerns or non-compliant depressed curbs.

### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks that are not compliant with current PROWAG

requirements. Where needed intersection curb ramps will be reconstructed with corrected slopes and to provide detectable warnings.

Overhead power lines are present along the north side of the roadway. East of Barrett Station Road the poles are located behind the existing sidewalk and to the west the poles are located in the parkway between the back of curb and sidewalk. No conflicts with existing poles have been noted at this time.

Most of the existing sidewalk appears to be at least partially located off of the existing right-of-way owned by the State. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

### **Barrett Parkway Drive to East of South Mason Road**

#### Existing Conditions

The section of Route 100 between Sta. 493+40 and Sta. 501+00 is located in unincorporated St. Louis County. Existing roadway cross section consists of six to seven lanes, each approximately 12 feet wide. East of Mason Lane three through lanes are provided in each direction with a center two way left turn lane. Between Mason Lane and Mason Road two through lanes are provided in each direction with dedicated left and right turn lanes for westbound traffic. Shoulders are present along both sides with a width of approximately 10 feet.

Just west of Barrett Parkway Drive Route 100 is carried by a three cell box culvert across Grand Glaize East Creek. Guardrail is present along both sides of the roadway with modern looking terminal end sections. A cantilever sign for North Barrett Station Road is located behind the guardrail south of the road and west of creek. Type 'B' Curb is present along both sides of the roadway at the edge of shoulder.

Sidewalk is missing completely from the north side of Route 100 but covers most of the south side except in the area of the creek crossing. East of Mason Lane the sidewalk has concerns with slopes, trip hazards, and narrow widths in one location. One ramp at Mason Lane was noted to have missing detectable warnings.

#### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks and driveway approaches that are not compliant with current PROWAG requirements. Where needed intersection curb ramps will be reconstructed with corrected slopes and to provide detectable warnings. A connection is proposed across the creek on the south side of the road to tie existing sidewalk from the west to existing sidewalk east of Barrett Parkway Drive. This will require work in the island of Barrett Parkway Drive to create a crossing. It appears there is room for sidewalk behind the guardrail

but a more detailed analysis is needed. If deemed feasible a fence or railing is suggested to mitigate the fall hazard. Adding sidewalk to the north side of the creek cross may also be possible but the general lack of sidewalk on the north side west of Barrett Station Road makes this option less attractive for providing more continuous pedestrian access along Route 100.

Overhead power lines are present along the north side of the roadway and do not appear to be conflict with any existing or proposed sidewalk improvements.

Nearly all of the existing sidewalk appears to be located off of the existing right-of-way owned by the State. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

### **East of Mason Road to Dietrich Drive**

#### Existing Conditions

The section of Route 100 between Sta. 501+00 and Sta. 529+20 is located in unincorporated St. Louis County. Existing roadway cross section generally consists of five lanes, each approximately 12 feet wide. Two through lanes are provide with a two way left turn lane in the center. At intersections dedicated left and right turn lanes are added at various locations.

Shoulders are present along both sides with a width of approximately 10 feet. Type 'B' curbs are located along the outer edges except on the high side of the super elevated section which has no curbs but does have an open ditch. Just east of Dietrich Drive Route 100 is carried by a three cell box culvert across Grand Glaize Creek. Guardrail is present along both sides of the roadway with obsolete turned down ends.

Sidewalk is missing completely from the north side of Route 100 but is located in several segments along the south side. Existing sidewalks suffer from both poor condition and PROWAG compliance issues including excessive cross slopes, narrow width, and toe trip hazards. Many of the sidewalk ramps currently lack detectable warnings and several have ramp slope concerns or non-compliant depressed curbs.

#### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks and driveway approaches that are not compliant with current PROWAG requirements. Where needed intersection curb ramps will be reconstructed with corrected slopes and to provide detectable warnings. A widened sidewalk connection is proposed across the creek on the south side of the road along with new modern guardrail on both sides of Route 100. New sidewalk connections are proposed to connect bus stops northwest and southeast of the Manchester Meadows Intersection with the sidewalk network along the south side. This includes a new cross walk on the west side of the

Manchester Meadows signal to allow pedestrians to more easily move to and from the westbound bus stop not currently served by any sidewalk.

Overhead power lines are present along the north side of the roadway and do not appear to be conflict with any existing or proposed sidewalk improvements.

A majority of the existing sidewalk appears to be located off of the existing right-of-way owned by the State. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

### **Dietrich Drive to Knollhaven Drive**

#### Existing Conditions

The section of Route 100 between Sta. 529+20 and Sta. 562+77 is located in unincorporated St. Louis County. Existing roadway cross section generally consists of five lanes, each approximately 12 feet wide. Two through lanes are provided ~~are provide~~ with a two way left turn lane in the center. At intersections dedicated left and right turn lanes are added at various locations. Shoulders are present along both sides with a width of approximately 10 feet. Sporadic Type 'B' curbs are present at some intersections and commercial entrances. Open ditches provide drainage along most of this section.

Sections of sidewalk are present along the south side of Route 100, primarily around and east of the Weidman Road intersection and again at the Braeshire Drive intersection. Along the north side, sidewalk is only found at the Weidman Road intersection. Existing sidewalks suffer from both poor condition and PROWAG compliance issues including excessive cross slopes, and toe trip hazards. Most of the sidewalk ramps currently lack detectable warnings and several have ramp slope concerns or non-compliant depressed curbs.

#### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks and driveway approaches that are not compliant with current PROWAG requirements. Where needed intersection curb ramps will be reconstructed with corrected slopes and to provide detectable warnings.

Several section of new sidewalk are proposed along the south side of Route 100 to connect existing segments and ~~connected~~ bus stops around the Weidman Road intersection. West of Weidman Road, the sidewalk ends on both sides until Braeshire Drive due to open ditches and possible commercial business encroachment on the State's right of way (Sta. 547+70 to 549+10). At Braeshire Drive an accessible cross walk will be added across the southern leg and the existing sidewalk will be extend ~~slighting~~ west to an ~~unserved~~ eastbound bus shelter. There is also a westbound bus stop northwest of the Braeshire Drive intersection but the existing

open ditch drainage would be negatively impacted by adding sidewalk. Additionally, there are no existing segments on the north side to connect to, limiting the utility of such an improvement. Bi-State Development should be contacted during the next phase to determine if this stop location could be shifted to a location where sidewalk could be more easily provided. West of Braeshire Drive sidewalk again ends until the Knollhaven Drive intersection. Ditches and existing grades would make adding sidewalk in these locations more expensive and would likely require right of way along the south side. An existing eastbound bus stop located west of Knollhaven Drive is proposed to be moved to the east of that intersection and connected to Knollhaven Drive with new sidewalk. This relocation will also need to be coordinated with Bi-State Development.

Overhead power lines are present along the north side of the roadway and do not appear to be in conflict with any existing or proposed sidewalk improvements.

A majority of the existing sidewalk appears to be located off of the existing right-of-way owned by the State. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

### **Knollhaven Drive to Gaywood Drive**

#### Existing Conditions

The section of Route 100 between Sta. 562+77 and Sta. 585+00 is located within the city limits of Manchester. Existing roadway cross section generally consists of five to seven lanes that are approximately 12 feet wide. Two through lanes are provided with a two way left turn lane in the center east of Enchanted Parkway. West of Enchanted Parkway the roadway widens to three through lanes in each direction with additional dedicated left and right turn lanes at most intersections. A raised median is also present west of Enchanted Parkway for access control. Shoulders are present along both sides with a width of approximately 10 feet. Type 'A' curb and gutters are located along the outer edges.

Sidewalk is missing from both side of Route 100 between Knollhaven Drive and Highlands Boulevard Drive. Starting just east of Highlands Boulevard Drive unconnected sections of sidewalk are present along the south side heading west. There is no sidewalk on the north side of Route 100. Existing sidewalks suffer from both poor condition and PROWAG compliance issues including excessive cross slopes, and toe trip hazards. Many of the sidewalk ramps currently lack detectable warnings and several have ramp slope concerns or non-compliant depressed curbs.

#### Proposed Improvements and Right of Way Impacts

The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks and driveway approaches that are not compliant



with current PROWAG requirements. Where needed intersection curb ramps will be reconstructed with corrected slopes and to provide detectable warnings.

New sidewalk connections are proposed to connect eastbound bus shelters near the Highlands Boulevard Drive and Gaywood Drive intersections. A continuous sidewalk connection on the south side between Highlands Boulevard Drive and Gaywood Drive is not currently possible due to a commercial business with right of way out to the back of existing curb and gutter.

Overhead power lines are present along the south side of the roadway between the back of gutter and sidewalk but do not appear to be conflict with any existing or proposed sidewalk improvements.

All of the existing sidewalk appears to be located partially or fully off of the existing right-of-way owned by the State. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

### **Gaywood Drive to West of the Route 141 Interchange**

#### **Existing Conditions**

The section of Route 100 between Sta. 585+00 and Sta. 592+64 is located within the city limits of Manchester. Existing roadway cross section generally consists of six to nine lanes that are approximately 12 feet wide. Two through lanes are provided through the interchange with dual left turn lanes, dedicated right turn lanes, and off ramp merge lanes to form for the Single Point Urban Interchange under Route 141 which passes over Route 100. A raised concrete median is present to separate the directions of travel. Type 'N' curbs are located along the outside edges of the roadway.

Sidewalk is available on the north side approaching from the west but ends within the interchange and no segments exist farther east to connect to. South of Route 100 sidewalk continues from the east and passes under the interchange and continues west.

Existing sidewalks suffer from both poor condition and PROWAG compliance issues including excessive cross slopes, and toe trip hazards. Many of the sidewalk ramps currently lack detectable warnings or a depressed ramp.

#### **Proposed Improvements and Right of Way Impacts**


The proposed conceptual design for this section of Route 100 includes both pavement and pedestrian facility rehabilitation. To provide for better pedestrian accommodations, the design includes reconstruction of existing sidewalks that are not compliant with current PROWAG requirements. Where needed intersection curb ramps will be reconstructed with corrected slopes and to provide detectable warnings. No new segments of sidewalk are proposed through this section.



Overhead power lines are present along the south side of the roadway between the back of gutter and sidewalk but turn down a long access drive west of Gaywood Drive. West of the interchange utility poles are again present heading west but their location is at the end of the proposed improvements.

On either side of Gaywood Road the existing sidewalk appears to be located partially or fully off of the existing right-of-way owned by the State. Within the interchange all sidewalk appears to be located on State right of way. A combination of temporary construction easements and permanent utility and sidewalk easements are anticipated to complete the proposed work.

## ALTERNATIVE PEDESTRIAN ACCOMMODATIONS

The conceptual design included a review of gaps present in the current sidewalk system to determine where new connections could be considered. After identifying these locations the relative feasibility and benefit of each potential new segment was considered. A primary goal of this review was provide pedestrian access to all of the bus stops by connecting to or extending of existing sidewalk located near the stops. Only one bus stop location is proposed to remain without a sidewalk connection due to potential ditch impacts and pedestrian safety. 

A secondary goal was provide a continuous sidewalk network along both sides of Route 100 for the length of the project. A variety of barriers exist to this goal such as the I-270/Des Peres Road interchanges and other physical constraints such as steep grades and lack of ROW.

General details on the most common challenges are provided below and examples are provided in Appendix D.

- **Steep back/fore slopes**  
In numerous locations the existing terrain is steeply sloped close behind the curb or edge of shoulder with limited right of way to add sidewalk and regrade. Some locations also feature retaining walls or landscaping that would be compromised by any attempt to regrade the slope.
- **Right of Way Restrictions and Encroachment**  
Over the years, Route 100 has been widened a number of times by the State, and private developers have likely added new turn lanes as well. Right of way widths are not always consistent, and in some locations the State's right of way is immediately behind the curb for the roadway. In at least one location, it appears that a business has built a fence for an outdoor display area on State right of way.

It also appears that a large portion of the existing sidewalk is located off of State right of way. There may be existing permanent easements for these sidewalks but those do not appear in the St. Louis County GIS system.

- **Drainage Impacts**  
Shoulders with open ditches are found in various locations, especially on the north side of Route 100. Normally, when shoulders are present, the sidewalks would be located back from the roadway to provide a buffer from vehicles. However, doing this would place the sidewalk in the existing ditch and compromise drainage for the roadway. An alternative to this would be to add curb along the roadway with sidewalk located immediately behind or with a narrow parkway. Doing this would require the introduction of new storm sewer to collect the roadway drainage and outlet it to the existing ditch or adjacent storm sewer if present. This approach may still result in grading that would reduce the ditch capacity. In some locations, it appears that the

ditch may also serve as detention for storm water runoff, but at this time that is not clear.

- Lack of Connecting Facilities

Many of the cross streets do not have existing sidewalk, especially north of Route 100. Businesses also tend to have large setbacks along the north side with no sidewalk connections to Route 100. While some areas could easily add sidewalk the benefit would be marginal if it does not connect to the larger system or back to the businesses along Route 100. If a segment does not ~~expand and~~ connect to the existing system in a meaningful way, it is not seen as being cost effective.

Based on the above considerations the proposed improvements look to add new sidewalk connections where feasible and appears to provide a benefit to users. Most improvements are shown along the south side of Route 100 where more existing sidewalk is present and fewer constraints exist.

## **OTHER DESIGN CONSIDERATIONS**

### **Bicycle Accommodations**

Currently there are limited bicycle facilities within the corridor. Marked bikes lanes are present on the outer shoulders in two locations. Eastbound bike lane extends from Sarala Road to Centeroyal Drive. Westbound bike lane begins on the I-270 overpass and ends at Sams Drive. A few signs exist outside of these sections directing vehicles to share the road or to yield to bikes at the start of a right turn lane.

A review of the Gateway Bike Plan indicates that Route 100 is part of the long-range bike route plan for the area with buffered bike lanes or a cycle track being proposed for this section as a part of the Route 66 Multi-State On-Street Routes. Given the scope of the project and limited cross section available the addition of dedicated bike facilities is not practical at this time without major changes to the existing cross section. ~~A future project will~~ review options for incorporating buffered bike lanes or a cycle track as indicated by the Gateway Bike Plan.

### **Metro Bus Stops**

There are 17 existing bus stops along the Route 100 project corridor with varying levels of accessibility. While many of the stops are located along the existing sidewalk network several, mainly on the westbound side, do not have any sidewalk nearby. Seven locations feature existing shelters and most have sidewalk nearby but few of them actually have a connection between the sidewalk and the shelter. See Appendix B for pictures of the various types present and the table on the following page for a summary of the existing stop locations.

A goal for these improvements is to provide sidewalk access to each stop location and a connection out to the lane for riders to board and alight more safely. At present no stops have been proposed for removal and no new stops are being proposed. During the detailed design phase, it is suggested that Bi-State Development be contacted to discuss the proposed improvements and to determine if any additional work is desired to accommodate future shelters or stop relocations.

Table of Metro Bus stop locations with current and proposed levels of pedestrian access:



Station	Direction	Type	Sidewalk to Stop?	Connection to Back of Curb?	Proposed Sidewalk Improvements
394+45	Westbound	Bench	Yes	Yes	None
435+55	Eastbound	Sign Only	Yes	No	Add sidewalk connection to back of curb.
440+60	Eastbound	Sign Only	Yes	No	Add sidewalk connection to back of curb.
465+00	Eastbound	Sign Only	Yes	No	Add sidewalk connection to back of curb.
485+00	Eastbound	Shelter	Yes	No	Add sidewalk connection to back of curb.
490+20	Westbound	Sign Only	Yes	No	Add sidewalk connection to back of curb.
504+90	Westbound	Sign Only	Yes	No	Add sidewalk connection to edge of shoulder and standing area.
517+80	Eastbound	Shelter	Partial	No	Add sidewalk connection to back of shoulder and connect sidewalk gap.
522+20	Westbound	Sign Only	No	No	Add sidewalk from intersection to stop and to edge of shoulder with a standing area.
540+25	Westbound	Shelter	Yes	Yes	None
542+95	Eastbound	Shelter	No	No	Add sidewalk from intersection to stop and to edge of shoulder.
555+05	Westbound	Sign Only	No	No	None - existing drainage does not allow space for construction of sidewalk.
555+25	Eastbound	Shelter	No	No	Add sidewalk to connect to the shelter.
565+20	Eastbound	Sign Only	No	No	Relocate stop east of Knollhaven Drive and add sidewalk from intersection to stop.
567+30	Westbound	Sign Only	No	No	Add standing area. No nearby sidewalk to connect to.
577+70	Eastbound	Shelter	Yes	No	Add sidewalk to connect to the shelter.
582+30	Eastbound	Shelter	Yes	No	Add sidewalk to connect to the shelter.

## **PROPOSED DRAINAGE IMPROVEMENTS**

### **Existing Drainage**

The drainage infrastructure along the Route 100 corridor is a combination of MoDOT and Metropolitan St. Louis Sewer District (MSD) owned storm water facilities. The MSD owned facilities are typically identified in the GIS mapping that MSD provided Hanson on November 16, 2017. This project is within the limits of the Grand Glaize Creek Watershed. The storm and sanitary sewers should be separated in this area of St. Louis County. Locations with combined sewers are typically located within the City of St. Louis and in several communities adjacent to the City of St. Louis.

### **Findings**

*Locations of proposed drainage improvements still need to be discussed with MoDOT maintenance staff during the project walk through. Some existing drainage concerns were noted during field reconnaissance based on water marks left on the pavement and small depressions that were noted to be holding water. More significant improvements are expected from the maintenance staff which will be incorporated into the overall improvements.*



## **PROPOSED TRAFFIC SIGNAL DESIGN**

There are ten traffic signals along Route 100 between just east of Ballas Road and Route 141. Modifications and upgrades are recommended to some of the traffic signals within the project limits to accommodate the proposed pavement overlay and to comply with current PROWAG design guidelines. None of the ten intersections will require a full replacement. All intersections, where applicable, have already been upgraded to Flashing Yellow Arrow (FYA), so new controllers will not be necessary. Five of the ten intersections currently have pavement loop detection. This detection will need to be replaced as the pavement overlay will disturb the loops. It is recommended that these signals be upgraded to video detection including:

- Barrett Station Road
- Manchester Meadows Shopping Center
- Weidman Road
- Knollhaven Lane
- Enchanted Parkway

### **Proposed Traffic Signal Modifications.**

#### *West County Center Drive*

This signal has full pedestrian facilities crossing the north and south legs, including crosswalks, ramps, pedestrian signal heads, and pushbuttons. The pushbuttons are not accessible to the level landing areas in the northwest, northeast, and southeast quadrants. New pushbuttons with necessary extenders are suggested.

#### *Barrett Station Road*

This signal has full pedestrian facilities crossing all four legs, including crosswalks, ramps, pedestrian signal heads, and pushbuttons. Four posts are required however to get the necessary 10' of separation between the pushbuttons in each quadrant. This signal has pavement loop detection and should be upgraded to video detection.

#### *Mason Road*

This signal currently has no pedestrian facilities. There are existing sidewalks in the northwest, northeast, southeast quadrants but they do not extend to the signal. Currently the signal operates left turn permissive only for the north and south legs, and is controlled by a R-Y-G ball signal with a R10-12 (Left Turn Yield on Green) sign. Consideration should be given to running the north and south legs with a split phase to offer a protected left turn movement. This would require replacing the signal heads to a R-Y-G-Gr Arrow configuration.

#### *Manchester Meadows Shopping Center*

This signal has no pedestrian facilities. There is an existing sidewalk ramps and island cuts along the south leg of the intersection. Proposed improvements include adding sidewalk along the northwest and southeast quadrants to access existing bus stops for westbound and eastbound Route 100 respectively. Pedestrian signal heads and push buttons are proposed for the crossings of the west and south legs. The north-south movements already operate as a split

phase, so it may be possible to accommodate the pedestrian crossing of Route 100 with the existing signal timing. This signal has pavement loop detection and should be upgraded to video detection.

#### *Weidman Road*

This signal has pedestrian facilities for crossing the north, west, and south legs of the intersection. The Route 100 crossing is push button controlled but both of the east-west crossings of Weidman Road are pretimed and operate with the Route 100 through phase. Placement of new posts and push buttons is proposed for these east-west movements, to alert pedestrians of when it is safe to cross. This signal has pavement loop detection and should be upgraded to video detection.

#### *Braeshire Drive*

This signal currently has no pedestrian facilities. There are existing sidewalks to the southeast and southwest of the intersection, however, there are no ramps or accommodations to cross the south leg of Braeshire Drive. New ramps and a connection through the corner island in the southeast quadrant is proposed to help connect the existing sidewalk through the intersection. This will require two new posts, along with pedestrian signal heads and push buttons for this east-west crossing. Currently the signal operates left turn permissive only for the north and south legs, and is controlled by a R-Y-G ball signal with a R10-12 (Left Turn Yield on Green) sign. Consideration should be given to running the north and south legs with a split phase to offer a protected left turn movement. This would require replacing the signal heads to a R-Y-G-Arrow configuration.

#### *Knollhaven Lane*

This signal has no pedestrian facilities. There is a proposed sidewalk along the southeast quadrant to connect the residents of the Orchard Village to the proposed relocated bus stop approximately 90 feet to the east of the intersection. This signal has pavement loop detection and should be upgraded to video detection.

#### *Enchanted Parkway*

This signal has no pedestrian facilities. There is a sidewalk that comes from the south and terminates at the signal. The ramp for this sidewalk will need detectable warnings. This signal has pavement loop detection and should be upgraded to video detection.

#### *Highlands Boulevard Drive*

There are pedestrian push button facilities crossing the east leg of the intersection. There is a median island refuge with two push buttons on the same mast arm post. New posts are proposed within the median island to achieve the required 10' of separation between pedestrian push buttons. There is a paver style crosswalk across the southern leg of the intersection with a pedestrian ramp on the east side, there is no ramp or sidewalk on the west side of this crosswalk. The eastern ramp will require detectable warnings.



### *Route 141 Interchange*

The interchange of Route 100 and Route 141 is a single point urban interchange (SPUI) with Route 141 passing over the signal controlled Route 100. There are dual left turn lanes along with two through lanes for Route 100. Northbound and southbound Route 141 exit ramps consist of dual left and right turn lanes that are signal controlled and allow right turn on red. The right turns from eastbound and westbound Route 100 are a yield movement to Route 141. There are pedestrian ramps with brick style paver sidewalk along Route 100, which is proposed to be replaced with PCC sidewalk. There are no pedestrian signal heads or push buttons. The detector loops at the intersection of Route 141 and Route 100 will need to be replaced, as the bridge prohibits camera use.

### **PROPOSED BRIDGE MODIFICATION DESIGN**

West of Barrett Parkway Drive Route 100 is carried over Grand Glaize East Creek by a three cell box culvert. No concerns have been expressed with the current structure and it is expected to remain in place. Proposed work does include adding sidewalk across the box culvert on the south side of Route 100 behind the existing guardrail. The change in grade for the sidewalk and the need for a barrier to protect pedestrians from the drop off to the creek may require some minor modifications to this structure.

East of Deitrich Drive Route 100 is carried over Grand Glaize Creek by a three cell box culvert. No concerns have been expressed with the current structure and it is expected to remain in place. Proposed work does include widening the existing sidewalk along the south side to become PROWAG compliant. This will also require the existing guardrail to be replaced behind the sidewalk. The change in grade for the sidewalk and the need to relocate of the guardrail require some minor modifications to this structure.

## **UTILITIES**

The proposed Route 100 project corridor from Ballas Road to Route 141 is a developed urban environment with widely varying existing right of way. In many locations there is little room available to move utilities and the goal for the project is work around and with existing utility locations as much as feasible.

### **Utility Poles**

There are existing power poles along the entire length of the project. Existing pole locations vary back and forth between the back of curb and existing right-of-way line. To avoid impacting these existing pole locations the existing sidewalks also move back and forth around the poles. New connections are proposed to follow a similar approach of working around the existing pole locations.

A guy wire encroachment exists over the sidewalk along the north side of eastbound Route 100 across from Sarala Road. This encroachment may violate the vertical clearance requirements in PROWAG.

There is a utility pole near the proposed sidewalk and ramp on the west side of Dietrich Road, the new walk should be able to be constructed without impacting the pole, but this pole may need to be relocated.

There is a utility pole and a storm inlet in the southeast corner island of Braeshire Drive intersection. Given the large size of the island it may be possible to build the new sidewalk to avoid these obstructions.

### **Water**

The majority of the impacts to the water main will be minor in the form of valve and meter adjustments due to the pavement rehabilitation, curb and gutter installation and sidewalk and curb ramp improvements. Work should be coordinated with Missouri American Water. Due to aging water infrastructure some areas along Route 100 may have a higher risk of water main breaks, therefore it is worthwhile to discuss the possibility of full water main replacement in conjunction with the construction project.

### **Gas**

Similar to the water impacts, impacts to the gas mains will be minor and mostly be valve adjustments due to the proposed work. Work should be coordinated with Spire, formerly Laclede Gas Company. Spire may have plans to replace existing gas infrastructure, therefore this work should be performed in advance of this Route 100 rehabilitation project.

### **Sewer**

The existing sanitary sewer within the project limits is owned and maintained by MSD. The sanitary sewer runs under the pavement parallel to the roadway between Route 141 and Enchanted Parkway. For the rest of the corridor the sewer is outside the limits of the pavement, except for perpendicular sewer crossings of Route 100. The impacts are anticipated to be limited to manhole adjustments.

As part of a Consent Decree MSD has implemented a District-Wide program known as MSD Project Clear. MSD is working to improve the sanitary sewer systems throughout the MSD boundaries and some of this work has or will be performed within the corridor of the proposed Route 100 project. This work may include total sewer replacement, sewer rehabilitation using cured-in-place pipe and manhole rehabilitation. The sewer separation portion of this work may require improvements to storm water infrastructure within the Route 100 corridor.

## ENVIRONMENTAL SUMMARY

### Land Use

This section of Route 100 is in an urban commercial corridor within the city limits of Manchester, Des Peres and Unincorporated St. Louis County. The land use for this section of Route 100 is all commercial, with multi-family residential at Knollhaven Drive. This part of the Route 100 corridor has a green space buffer between the pavement and adjacent commercial properties. The commercial businesses include a combination of small and large scale strip malls, large office complexes, small office buildings, car dealerships, gas stations, auto repair and restaurants.

### Regulatory Floodways and Wet Lands

Route 100 crosses two named creeks Grand Glaize Creek and Grand Glaize East Creek. West of Grand Glaize Creek there is a portion of Route 100 located in the 500 and 100 year flood plain that extends to approximately 800 feet to the west that encompasses Route 100.



Source: FEMA ArcGIS map viewer

There are no known wetlands impacted by this project.

### **Hazardous Waste**

Route 100 services many commercial developments, some of which may currently or have in the past contained hazardous waste. This could stem from certain land uses such as gas stations, auto repair, dry cleaning, and other commercial land uses. The improvements suggested consist of new sidewalks, ramps, reworking of some driveways, and traffic signal improvements. Therefore the impact of any potential hazardous waste should be minimal.

### **Threatened and Endangered Species**

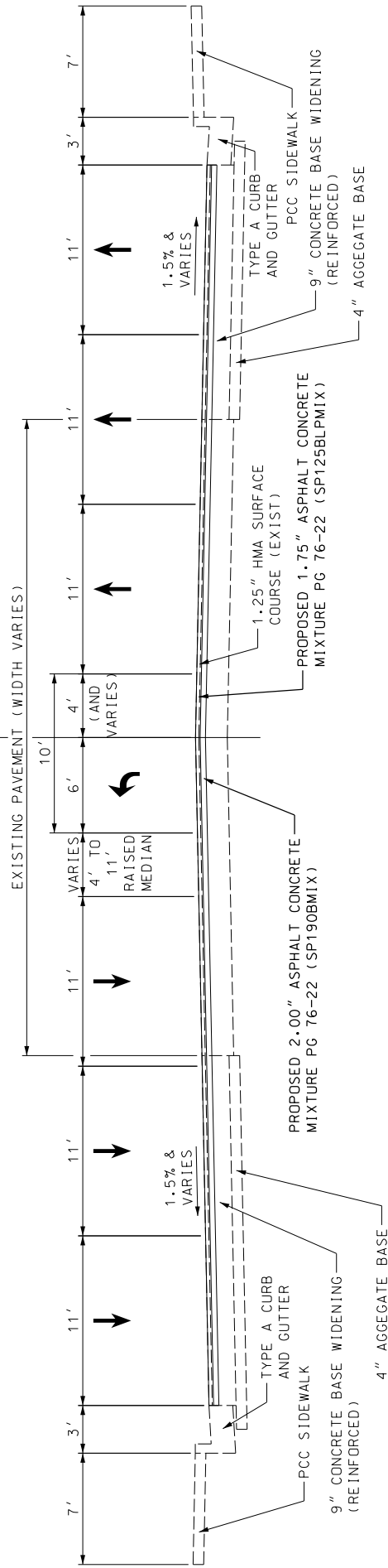
At this time, the impact to threatened and endangered species within the project corridor is unknown. During the next phase MoDOT will submit the request for environmental services (RES) which will determine if the project will require any special considerations prior to or during construction.

---

# **Appendix A**

## **Typical Sections**

# Ø ROUTE 100



TYPICAL SECTION NO. 1  
WEST COUNTY CENTER DR. TO  
I-270 RAMP TERMINAL INTERSECTION  
(400+00 TO 406+00)



© Copyright Hanson Professional Services Inc. 2018

MANCHESTER ROAD (ROUTE 100)

APPENDIX A  
TYPICAL SECTIONS

HANSON JOB NO. 17H0097B

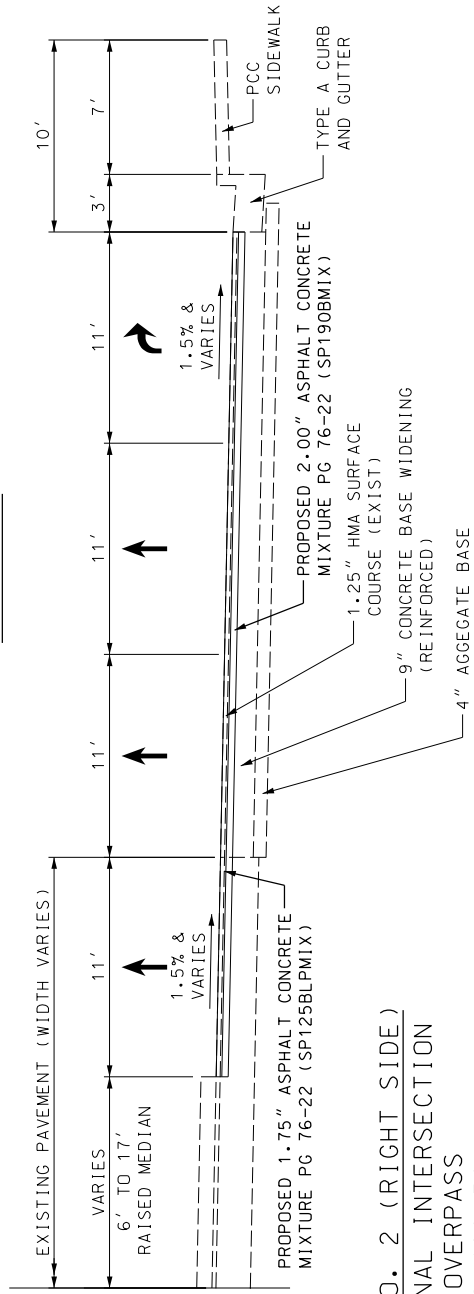
MODOT JOB NO. 6P3274

EXISTING CONDITIONS BASED ON PLANS  
FOR PROJECT 96(3)U COMPLETED 1972.



# Ø ROUTE 100

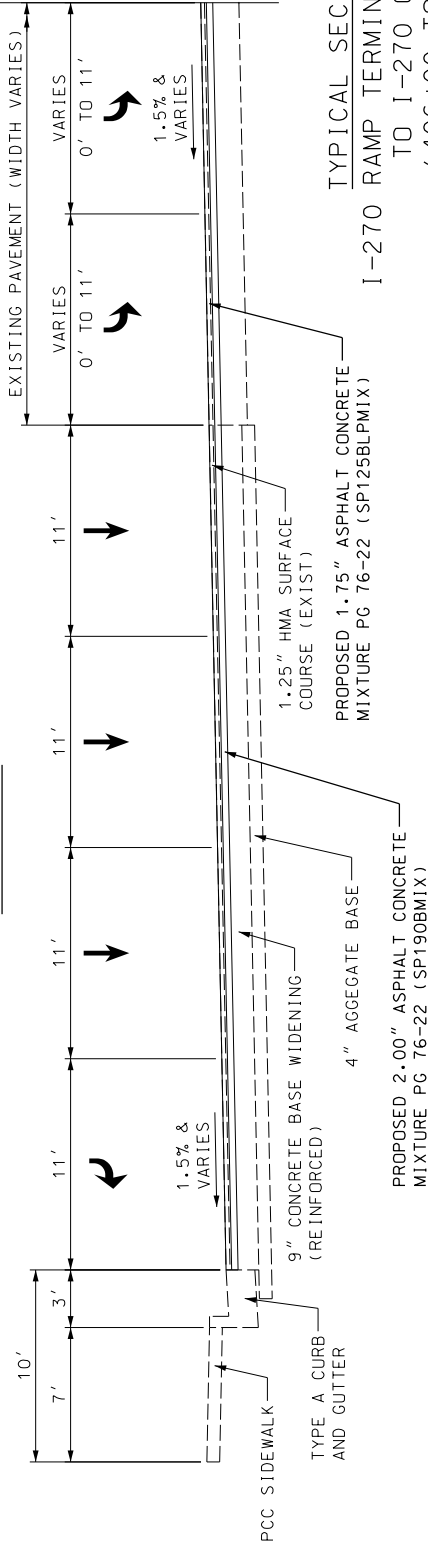
## WESTBOUND



### TYPICAL SECTION NO. 2 (RIGHT SIDE) I-270 RAMP TERMINAL INTERSECTION TO I-270 OVERPASS (406+00 TO 409+50)

## Ø ROUTE 100

## EASTBOUND



### TYPICAL SECTION NO. 2 I-270 RAMP TERMINAL INTERSECTION TO I-270 OVERPASS (406+00 TO 409+50)

## MANCHESTER ROAD (ROUTE 100)

## APPENDIX A TYPICAL SECTIONS



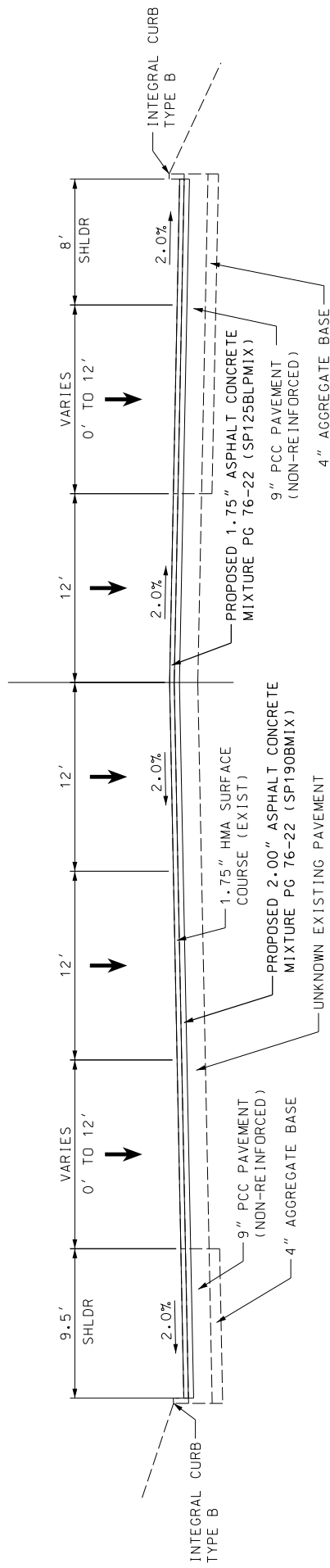
EXISTING CONDITIONS BASED ON PLANS  
FOR PROJECT 96(3)U COMPLETED 1972.

© Copyright Hanson Professional Services Inc. 2018

HANSON JOB NO. 17H0097B

MODOT JOB NO. 6P3274

# ☐ ROUTE 100



## TYPICAL SECTION NO. 3

I-270 INTERCHANGE TO THE  
EASTBOUND / WESTBOUND MERGE  
(EASTBOUND 431+50 TO 470+40)

MANCHESTER ROAD (ROUTE 100)

## APPENDIX A TYPICAL SECTIONS



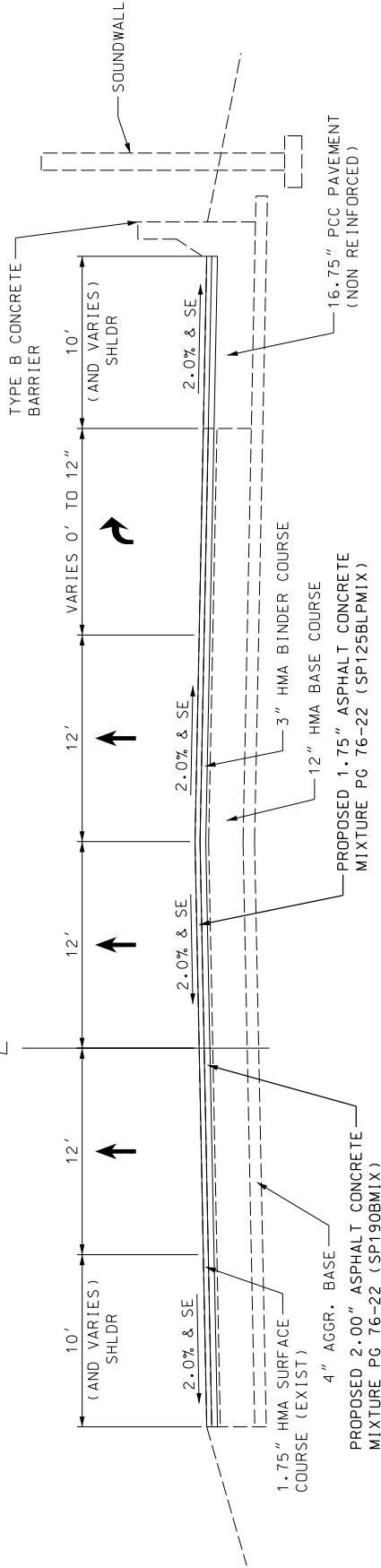
EXISTING CONDITIONS BASED ON PLANS  
FOR PROJECT J6U0132 COMPLETED 2005.

© Copyright Hanson Professional Services Inc. 2018

HANSON JOB NO. 17H0097B

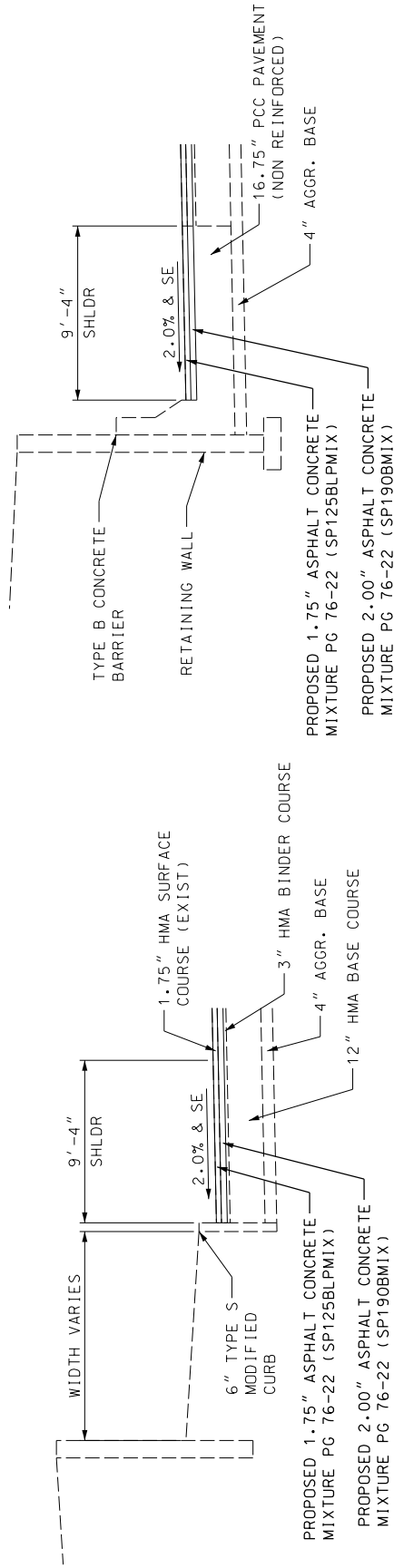
MODOT JOB NO. 6P3274

# WB ROUTE 100



## TYPICAL SECTION NO. 4

DES PERES RD. TO WESTBOUND/EASTBOUND TURN AROUND  
(WESTBOUND 1425+45 TO 1464+40)



LEFT SIDE DETAILS  
1443+00 TO 1450+70



EXISTING CONDITIONS BASED ON PLANS FOR PROJECT J6U0132 COMPLETED 2005.

MANCHESTER ROAD (ROUTE 100)

APPENDIX A  
TYPICAL SECTIONS

Copyright Hanson Professional Services Inc. 2018

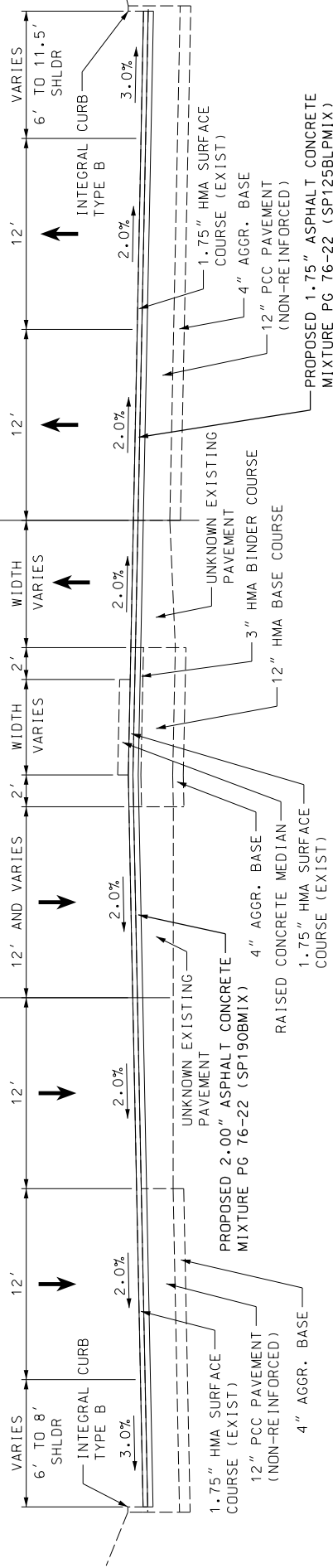
HANSON JOB NO. 17H0097B

MODOT JOB NO. 6P3274

MODOT JOB NO. 6P3274

# ϕ EB RTE 100

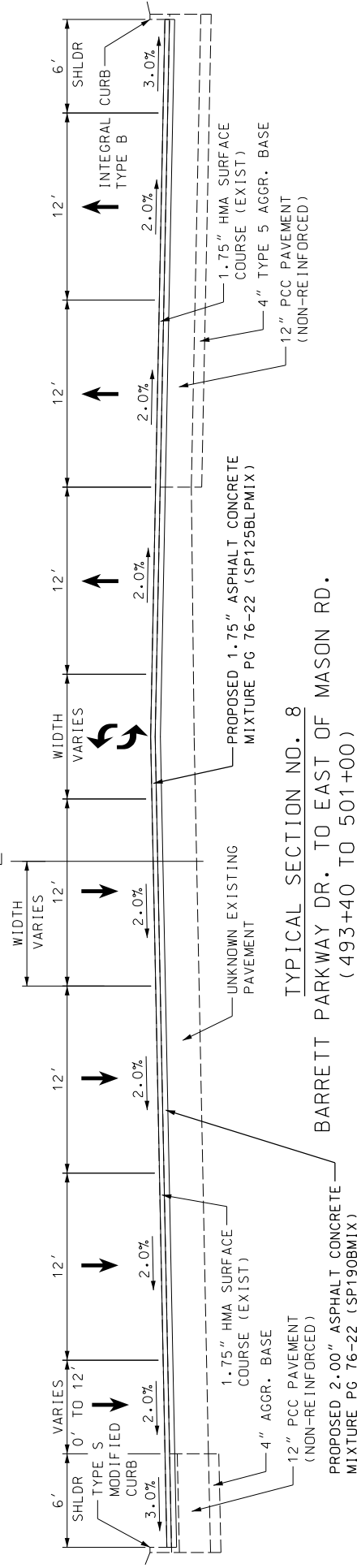
# ϕ WB RTE 100



TYPICAL SECTION NO. 7

EAST OF BARRETT STATION RD. TO BARRETT PARKWAY DR.  
(WESTBOUND RTE 100 1486+55 TO 1497+09)  
(EASTBOUND RTE 100 482+85 TO 493+40)

# ϕ EXIST. RTE 100



TYPICAL SECTION NO. 8

BARRETT PARKWAY DR. TO EAST OF MASON RD.  
(493+40 TO 501+00)

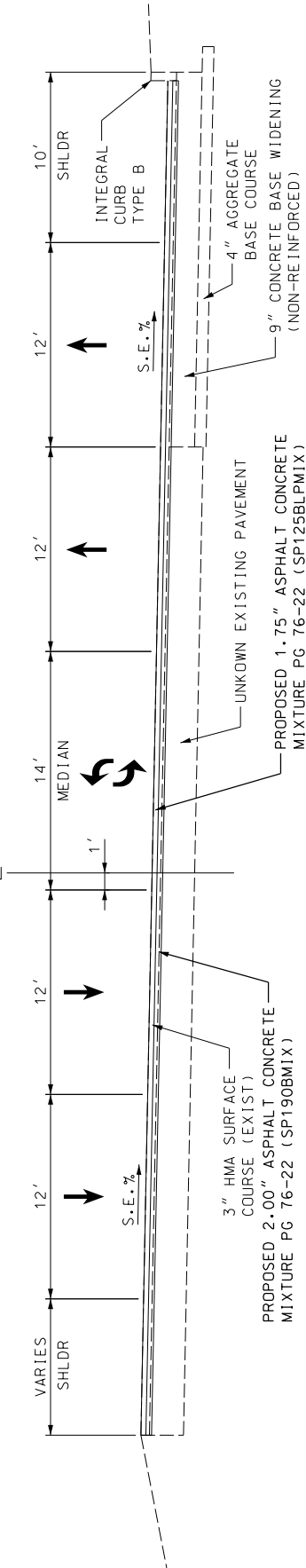
MANCHESTER ROAD (ROUTE 100)



APPENDIX A  
TYPICAL SECTIONS

EXISTING CONDITIONS BASED ON PLANS  
FOR PROJECT J6U0132 COMPLETED 2005.

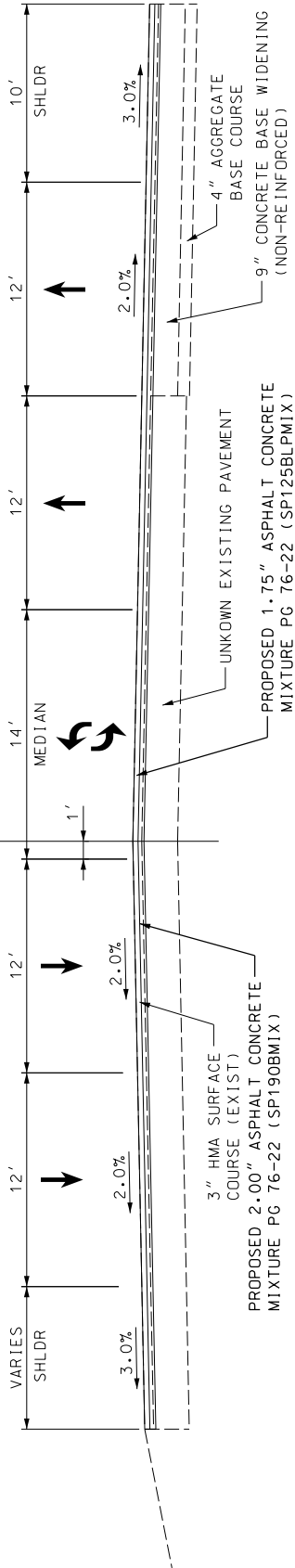
# ☐ RTE 100



## TYPICAL SECTION NO. 9

EAST OF MASON RD. TO DIETRICH DR.  
(501+00 TO 529+20)

# ☐ RTE 100



## TYPICAL SECTION NO. 10

DIETRICH DR. TO KNOLLHAVEN DR.  
(529+20 TO 562+77)

MANCHESTER ROAD (ROUTE 100)

APPENDIX A  
TYPICAL SECTIONS



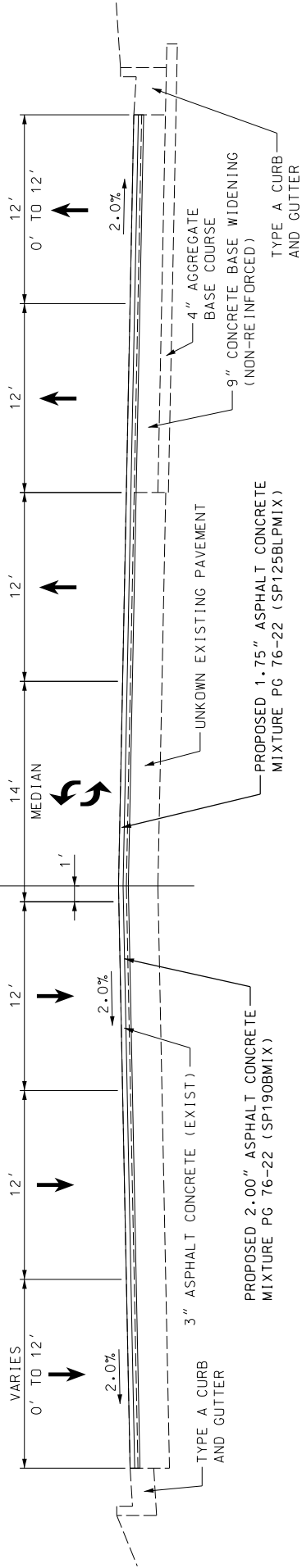
EXISTING CONDITIONS BASED ON PLANS  
FOR PROJECT 6-U-100-223B COMPLETED 1983.

© Copyright Hanson Professional Services Inc. 2018

HANSON JOB NO. 17H0097B

MODOT JOB NO. 6P3274

CL RTE 100



TYPICAL SECTION NO. 11  
KNOLLHAVEN DR. TO GAYWOOD DR.  
(562+77 TO 585+00)

EXISTING CONDITIONS BASED ON PLANS  
FOR PROJECT 6-U-100-223B COMPLETED 1983.



© Copyright Hanson Professional Services Inc. 2018

MANCHESTER ROAD (ROUTE 100)

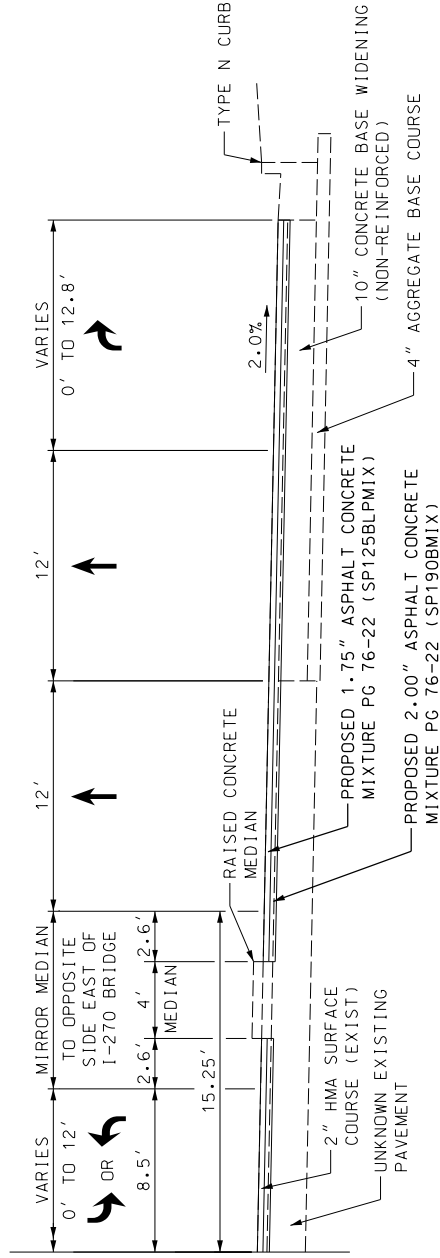
APPENDIX A  
TYPICAL SECTIONS

HANSON JOB NO. 17H0097B

MODOT JOB NO. 6P3274

# Ø RTE 100

## WESTBOUND

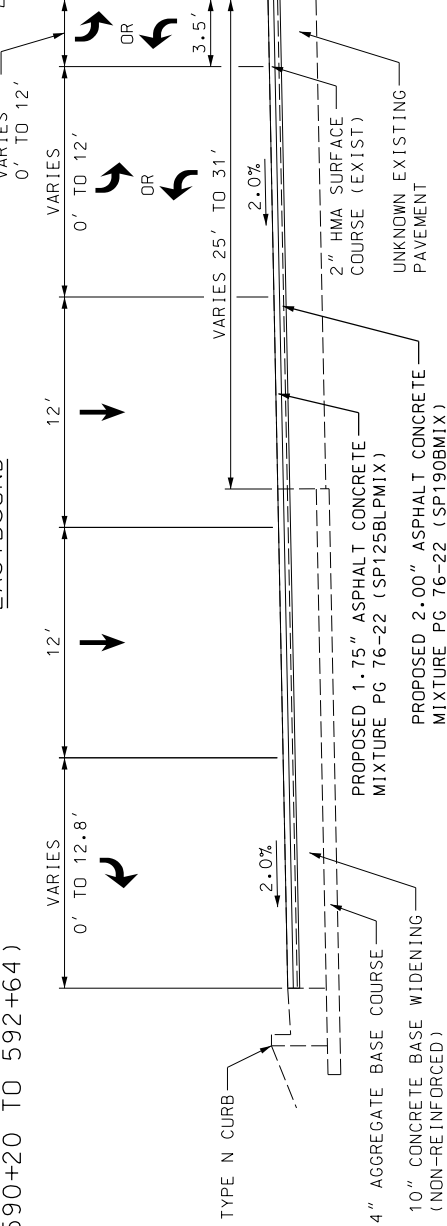


### TYPICAL SECTION NO. 12

GAYWOOD DR. TO RTE 141 BRIDGE  
(585+00 TO 588+75)  
RTE 141 BRIDGE TO END  
(590+20 TO 592+64)

## EASTBOUND

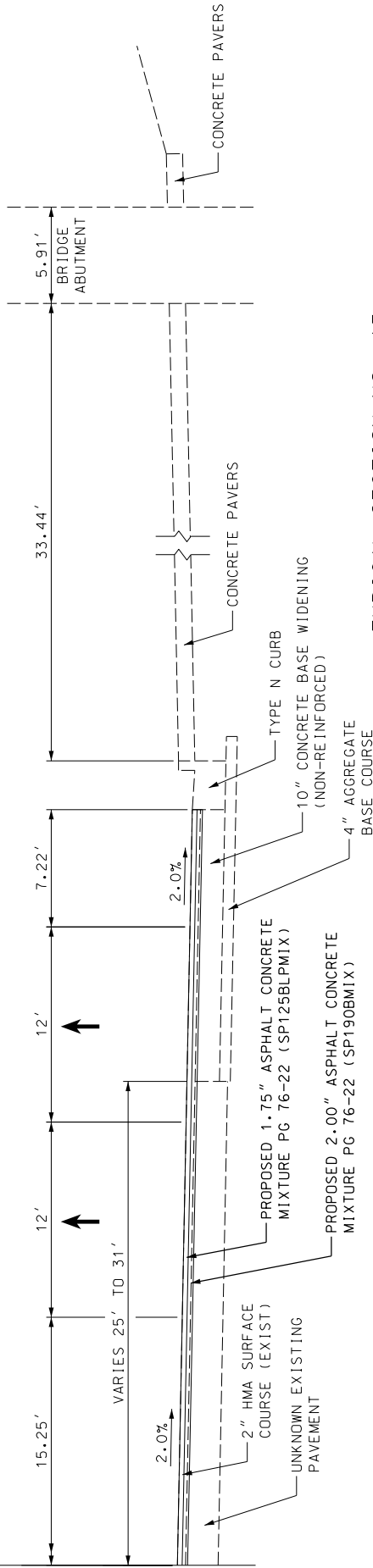
## Ø RTE 100





Ø RTE 100

WESTBOUND

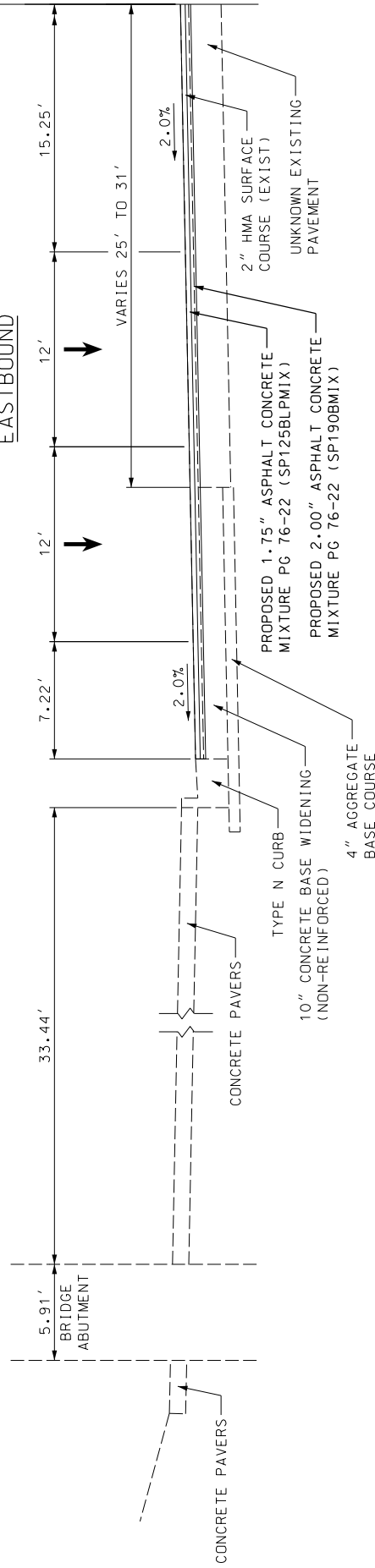


TYPICAL SECTION NO. 13

THROUGH BRIDGE LIMITS  
(588+75 TO 590+20)

Ø RTE 100

EASTBOUND



MANCHESTER ROAD (ROUTE 100)

APPENDIX A  
TYPICAL SECTIONS



EXISTING CONDITIONS BASED ON PLANS  
FOR PROJECT J6U0804E COMPLETED 1997.

---



# **Appendix B**

## **Examples of Sidewalk and Signal Concern**

## **Example Sidewalk Concerns**



**Sidewalk width less than 4 feet and trip hazards.**



**Excessive cross slope and trip hazards.**



Entrance with large hole in the pedestrian access route.





Horizontal encroachment on sidewalk by property owner.



**Vertical encroachment due to vegetation.**





**Vertical encroachment due to guy wire.**

## **Example Traffic Signal/Intersection Concerns**



Sidewalk ramp with no warnings and no receiving ramp on opposite side.



No detectable warnings or pedestrian buttons. Steep ramp grades.





**Pedestrian buttons not 10 feet apart.**

---

# **Appendix C**

## **Bus Stop Examples**

DRAFT

## **Typical bus stop examples.**



**Bus Shelter along shoulder. Sidewalk behind shelter but not connected up to shoulder.**



**Bus Stop Sign Only, sidewalk present but not connected to back of curb.**





**Bus Stop Sign Only along shoulder, no sidewalk or space to wait.**

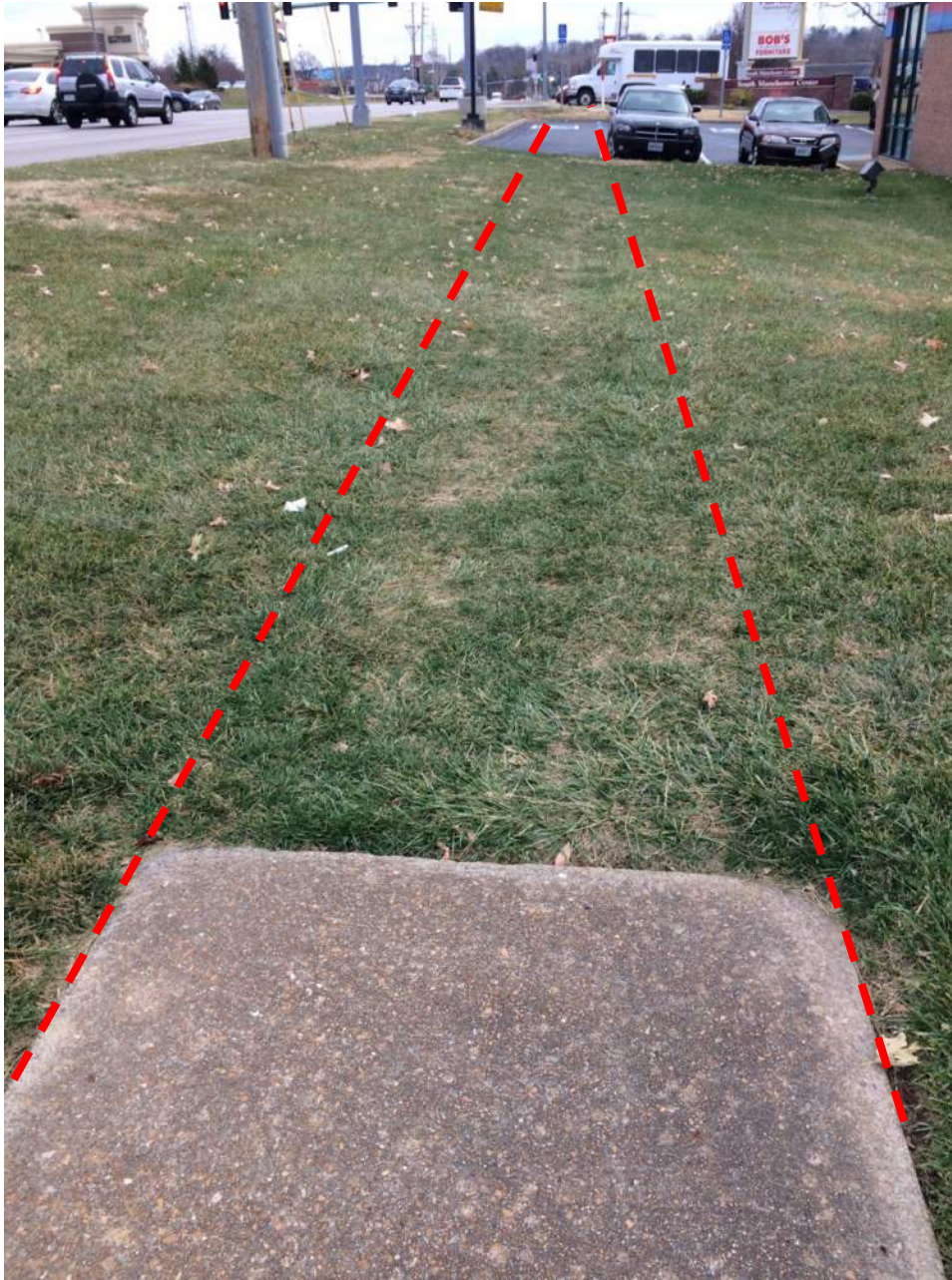


**Bus Stop with Bench and Sidewalk.**

---

# **Appendix D Existing Barriers to Adding Sidewalk**

## **Examples of Physical Barriers**



**Commercial property goes to back of curb, no room for sidewalk to continue.**





**Shoulders with open ditches and steep back slopes.**



**Steep back slopes and landscaping**



Owner improvements extend onto State owned right of way.