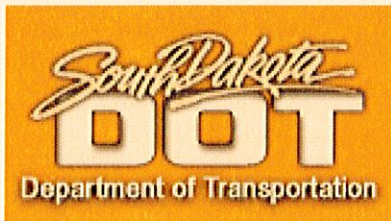


**SOUTH DAKOTA DEPARTMENT
OF TRANSPORTATION
&
CITY OF PIERRE**



**RAILROAD CROSSINGS
WITH DM&E RAILROAD**

**SDDOT No. NH 2014(11)229 PCN 00T6
Hughes County
HDR Project No. 40611**

Railroad Crossing Options

20-Nov-06

INTRODUCTION

Railroads and communities have continued to work together in order to improve the safety of the rail crossings within those communities. As the number of trains increase through a number of reasons, the increasing need to address the crossing concerns becomes more apparent. Coal traffic, the historic mainstay of the rail industry, has been increasing rapidly. The relatively low price of coal for generating electricity, compared to natural gas and oil, has led many utilities to increase the use of coal where possible. Responding to legislation to reduce emissions, many utilities have switched to low-sulfur coal from the Powder River Basin in northeastern Wyoming and nearby areas. This coal is now being hauled to utilities in the south and east.

One primary question continues to come up during conversations with the public. That question is "Will this project happen? At this time, it is impossible to answer, but one must consider the increasing cost of oil. As of July, 2006, oil had reached a price of \$78 a barrel, and increase of approximately 300% from the \$25 a barrel it sold for in 2000. If oil prices remain close to current (or higher) levels, the need for the coal from the Powder River Basin and other areas will grow rapidly. With the need comes the need for additional trains to haul the coal. If it is not the DM&E, it will be another rail company as the current coal hauling rail lines are at their maximum capacity.

As is the case in many communities across the country, Pierre grew up around the railroad, which means the railroad runs right through the middle of town creating nine (9) locations that cause concern for the citizens of Pierre. Before we move forward, we must address the possibility of creating an elevated or trenched rail run through the city. There are many factors that would make this almost impossible to consider. Before we discuss these factors, we can immediately eliminate the trench option due elevation of ground water in the area. For almost 50% of the run through town, the trench would be below the ground water table. Even if we forget about the initial cost of the pumps (approximately \$250,000 per half mile), the expense of continuous pumping would create the need for additional taxes. In addition to the costs of the pumps, the trench would require the installation of retaining walls. The walls would cost approximately \$20,000,000 per mile of track. Based on just the numbers presented, we can determine the trench option would not be in the best interest of the public tax payer.

As part of the expansion of the DM&E Railroad (DM&E) from Wyoming through Minnesota, various improvements and upgrades to the existing rail crossings are being looked at through the City of Pierre. The upgrades to be discussed in this report range from creating grade separated crossings to crossing improvements allowing for a "whistle-free" zone through the City of Pierre.

The first location to be analyzed for the feasibility of a grade separate crossing is the "S-Curve" crossing located between Sioux and Wells Avenue. A grade separated crossing at this location would create only the second grade separated crossing in Pierre. Additional information along with analysis and options are detailed later in this report.

The second location that will be analyzed for rail crossing improvements is at Pierre Street. Pierre Street is currently the only crossing in Pierre that has a grade separation. However, the roadway alignment as well as the vertical clearance creates traffic hazards other than an at-grade crossing. The horizontal alignment north of the crossing consists of two right angle turns (one left and one right turn). This creates safety hazards for both pedestrian and vehicle traffic traveling in the area. In addition to the poor horizontal alignment, the vertical clearance is at 11'-4". The current standard for clearance is 16'-4" and minimum clearance for emergency vehicles currently utilized by the City of Pierre is 13'-0". Therefore, emergency vehicles cannot utilize this street to avoid being delayed by train traffic. The goal of this report is to discuss reconstruction options that would first improve the vertical clearance and second improve the horizontal alignment.

A third location to be reviewed for the potential of a grade separated crossing is at Poplar Avenue. However, due to the existing terrain of the area surrounding this crossing, it is considered to not be feasible as the impacts to private property would be too great.

A final objective of this report is to discuss improvements required at the remaining crossings in order to create a "quiet zone" zone through the City of Pierre. In general, requirements to create a "quiet zone" require improvements at each of the crossings including center raised medians, gates, and grade separations. The at-grade crossings included in this report are located at Sand Wedge Drive, Lowell Avenue, Harrison Avenue, Monroe, Ree Street, Highland Avenue, Central Avenue, and Poplar Avenue. Also, a no-build option for the S-curve will include required "quiet zone" improvements.

S-CURVE

1.0 ROADWAY ALIGNMENT OPTIONS COMPARISON

Following is a brief summary of seven railroad crossing options analyzed. These options were formulated to display and compare impacts to adjacent property, constructability, and construction costs when considering several different variables of the S-curve grade-separated intersection. The options, as described below, range from a “No-Build” or do nothing option to relocating the crossing to the east and creating an overpass at an entirely different location.

The options shown are purposely shown as concepts which allow for flexibility meaning that several details and variables can be revised within any of the options in response to feedback.

Reconstruction limits for all options were determined from the vertical profiles using a 6% maximum grade and a 40 mph design speed.

1.1 S-CURVE – OPTION 1

Option 1 is the No-Build option with respect to reconstructing the crossing to create a grade separated crossing. This option does however, include upgrades required for the “whistle-free” crossing to allow for a quiet zone through Pierre.

Improvements made with this option consist of constructing a raised median within the existing center turn lane for approximately 75' in advance of the tracks. In addition to the raised median, a four quadrant gate system would be installed in order to prevent traffic from crossing the rail as a train approaches the crossing.

This option is the cheapest of the options analyzed and would improve the safety of the crossing, but does not address the need for an additional grade separated crossing in Pierre.

Benefits of Option 1 include:

- Least expensive
- Will not impact adjacent landowners
- Will not impact existing public and private utilities

Drawbacks of Option 1 include:

- Does not address delays and concern of emergency vehicle access
- The median will impact storage for the center left turn lane

1.2 S-CURVE – OPTION 2

Option 2 consists of reconstructing the S-Curve on the existing roadway alignment with Sioux Avenue going under the tracks. The structure utilized for this option is a 4-Span bridge with a 5' deck depth. Because of the 4-span bridge, a raised median will be required to protect the center bridge pier. The raised median will be located at the center of the roadway, eliminating the center turn lane for a short distance at the bridge. This median would create minimal traffic impacts for westbound traffic turning south onto Washington Avenue, but would impact eastbound traffic wishing to turn onto Capitol/Wells Avenue. The vertical clearance attained with this option is 16'-4".

The need for the raised median in the center turn lane would impact traffic wishing to make a left turn onto Washington or Wells/Capitol Avenue. The median would create minimal impacts for westbound traffic turning south onto Washington Avenue, but would impact eastbound traffic wishing to turn onto Capitol/Wells Avenue as there would be minimal vehicle storage and could potentially block through traffic. The purpose of the center median is that the span lengths are reduced significantly reducing the structure costs.

The Option 2 layout shows the use of 4/1 slopes from the back of the new sidewalk to tie into the existing ground. Large Panel MSE walls are used. The proposed final surface elevation for the S-Curve would be slightly above the reported ground water levels, but would require a storm water pumping system due the sump situation..

Benefits of Option 2 include:

- Least expensive bridge option
- Adequate site distance under bridge and at adjacent intersections
- Shallower structure depth minimizes the limits of roadway reconstruction
- Utilizes a combination of retaining walls and slopes to minimize landowner impacts

Drawbacks of Option 2 include:

- 4 buildings will be impacted
- The sump will require a storm water pumping system
- The median will impact storage for the center left turn lane
- Impacts to existing public and private utilities

1.3 S CURVE – OPTION 3

Option 3 consists of shifting the S-Curve alignment approximately 100' to the east and Sioux/Wells Avenue going under the railroad tracks. The purpose of this option was to reduce and even eliminate property impacts to the west of the S-Curve. By eliminating the impacts to property to the west of the S-curve, there would be increased impacts to the property east of the S-curve. The structure utilized with this option is a 3-span bridge. Instead of a bridge pier located in the center of the roadway impacting turning traffic, this bridge option locates the bridge piers outside the roadway limits.

Similar to all options located in the vicinity of the existing S-curve, this option does require a temporary railroad shoo-fly to allow for rail traffic during construction.

Benefits of Option 3 include:

- Limited use of Large Panel MSE retaining walls
- 3-Span bridge eliminates the need for a bridge pier in the roadway
- Building impacts reduced to two
- Improved S-curve/Sioux Avenue/Washington Avenue intersection
- Roadway to rail skew angle is reduced which shortens the bridge length
- Reduced traffic impacts during construction

Drawbacks of Option 3 include:

- Impacting and buying out an office building and strip mall
- The alignment shift impacts the most right of way area
- Uses more expensive 3-span bridge option
- The sump will require a storm water pumping system
- Impacts to existing public and private utilities

1.4 S CURVE – OPTION 4

Option 4 is similar to Option 3 in that the alignment is shifted; however the alignment is shifted to the west with this option. The proposed bridge would be the same as Option 3 and consists of a 3-span bridge with a combination of 4:1 back slopes and large panel MSE retaining walls. The goal of this alignment shift is to determine impacts to properties to the west of the S-curve. Other significant changes in this option are to the tie in limits and locations of adjacent intersections. A temporary railroad Shoo-fly would be required to maintain rail traffic during construction.

Benefits of Option 4 include:

- Limited use of Large Panel MSE retaining walls
- 3-Span bridge eliminates the need for a bridge pier in the roadway
- Building impacts reduced to single landowner
- Reduced traffic impacts during construction

Drawbacks of Option 4 include:

- Significant impacts to a single landowner (UBC)
- Uses more expensive 3-span bridge option
- The sump will require a storm water pumping system
- Impacts to existing public and private utilities

1.5 S CURVE – OPTION 5

Option 5 relocates the primary crossing from the existing S-curve location east to Monroe Avenue and construction a roadway overpass across the tracks. The overpass structure will be required to span a set of parallel tracks to allow for DM&E expansion. The overpass bridge would consist of a single span bridge with steel girders in order to minimize the bridge depth. The vertical profile meets the required 23'-6" vertical clearance over the tracks.

The existing S-curve crossing at Washington Avenue will be reconstructed. The reconstruction of Washington Avenue would include the necessary equipment to meet the quiet zone requirements and would become a secondary crossing location. Sioux Avenue from Washington Avenue to the reconstruction limits of the new S-curve will have to be reconstructed to accommodate a 5-lane section.

Benefits of Option 5 include:

- No impacts to landowners adjacent to the existing S-curve location
- Overpass removes the need for storm water pumping system
- Removes the need for expensive temporary railroad shoo-fly
- Vehicle bridge considerably cheaper than railroad bridge
- The existing elevations of Wells Avenue allow for reduced limits of reconstruction along Wells Avenue
- Impacts to existing public and private utilities are significantly reduced

Drawbacks of Option 5 include:

- Relocates the landowner impacts to entirely new area
- Increased ROW impacts due to new location
- Increased impacts to public due to reconstruction of Sioux Avenue
- Will impact 4 buildings
- Access to Wells Avenue is eliminated at Monroe and Jackson Avenues north of Wells Avenue
- Access to Sioux Avenue from Madison and Monroe Avenues has been removed
- Access impacts to businesses along Sioux Avenue between Jefferson and Madison Avenues
- Additional costs of reconstructing the existing S-curve to a whistle free crossing

1.6 S CURVE – OPTION 6

Option 6 is similar to Option 5 in that the S-curve is relocated, but the relocated grade separate crossing is further east to Harrison Avenue. As is the case with Option 5, the bridge will consist of an overpass; however the bridge will be longer because the location is adjacent to the existing DM&E rail switching yard and accommodate future rail expansion.

The existing S-curve crossing at Washington Avenue will be reconstructed to accommodate whistle free crossing requirements. The reconstruction of Washington Avenue would become a secondary crossing location. In addition to the reconstruction of Washington Avenue, Sioux Avenue will have to be reconstructed from Washington Avenue east to the reconstruction limits of the new S-curve to accommodate a 5-lane section.

The structure will be a single span bridge with steel girders and will be constructed to allow for the required 23'-6" minimum vertical clearance over the railroad tracks.

Benefits of Option 6 include:

- No impacts to landowners adjacent to the existing S-curve location
- Overpass removes the need for storm water pumping system
- Removes the need for expensive temporary railroad shoo-fly
- Vehicle bridge considerably cheaper than railroad bridge
- The existing elevations of Wells Avenue allow for reduced limits of reconstruction on Wells Avenue east of the curve
- Impacts to existing public and private utilities are significantly reduced

Drawbacks of Option 6 include:

- Relocates the landowner impacts to entirely new area
- Increased ROW impacts due to new location
- Increased impacts to public due to reconstruction of Sioux Avenue
- Will impact 4 buildings
- Access to Wells Avenue is eliminated at Monroe and Jackson Avenues north of Wells Avenue
- Access to Sioux Avenue from Madison and Monroe Avenues has been removed
- Access impacts to businesses along Sioux Avenue between Jefferson and Madison Avenues
- Additional costs of reconstructing the existing S-curve to a whistle free crossing

1.7 S CURVE – OPTION 6A

Option 6A is very similar to Option 6 in that the S-curve is relocated to Harrison Avenue. This option shows the S-curve place approximately 300' further to the east of option 6 to allow the Harrison and Tyler Avenue intersections to remain open as the proposed grade would be lower.

However the bridge will be even longer because of the location further into the DM&E rail switching yard and a large amount of property would need to be acquired from DM&E.

2.0 ROADWAY CONSTRUCTION PHASING

2.1 OPTION 1

These improvements could be constructed with minimal disturbance to traffic. The 5 lane roadway would need to be restricted to one lane in either direction while the center median is being added.

2.2 OPTIONS 2, 3, & 4

Due to the phasing for the new railroad bridge, traffic on the roadways in the project will need to be detoured during construction. However, special detour consideration will be provided for uninterrupted access to the nearby hospital. Temporary pavement can be constructed to maintain east-west traffic on Wells and Sioux Avenues for the majority of the project construction timeline.

2.3 OPTIONS 5, 6, & 6A

Due to the phasing for the new overpass and roadway bridge, traffic on the roadways in the project will need to be detoured during construction. However, a large portion of the earth and bridge work could be constructed in an initial phase of the project which would minimize the amount of time that the roadways are affected.

3.0 ROADWAY OPTIONS CONCEPTUAL COST COMPARISON

A cost estimate was prepared for each of the layout options using average bid prices from previous projects. The estimates are broken into 3 sections including roadway costs, Structure costs, right of way impacts, and building impacts. The number of buildings affected along with the amount of right of way required for the option has been calculated and included in the estimated. Table 1 depicts the total conceptual cost of each roadway and is meant for comparison of options only.

Table 1: Conceptual Cost Comparison

Option	1	2	3	4	5	6
Cost	\$ 300,000	\$ 3,553,000	\$ 4,046,000	\$ 3,907,000	\$ 5,116,000	\$ 5,350,000

4.0 S-CURVE BRIDGE ALTERNATIVES COMPARISON

4.1 RAILROAD BRIDGE ALTERNATIVE A

This bridge alternative is utilized in Option 2 and consists of a 200-ft four-span bridge spanning over the roadway with a pier in the roadway median. The spans would consist of rolled steel beam with a steel deck pan and would be made up of dark brown, self-weathering steel. The TPG would be made up of dark brown, self-weathering steel and fabricated with welded top and bottom flanges, with most other connections bolted. The structure depth, from top of tie to low chord, would be about 5-ft. The bridge would be skewed with the roadway approximately 45 degrees.

The middle two spans would rest on tall piers consisting of a cap beam, two oblong columns, and a pile cap, all supported by driven H-pile. Each approach span would rest on a pier and a shallow abutment. From the sidewalks, the groundline would slope up to each abutment at a 2H:1V.

4.2 RAILROAD BRIDGE ALTERNATIVE B

This bridge alternative is utilized in Options 3 and 4 and consists of a 228-ft three-span bridge spanning over the roadway. The middle span would be a steel TPG and would be made up of dark brown, self-weathering steel. The TPG would be fabricated with welded top and bottom flanges, with most other connections bolted. The structure depth, from top of tie to low chord, would be about 5-ft. The bridge would be skewed with the roadway approximately 45 degrees.

Roller steel beam spans would be utilized on the approach spans. The roadway traffic would pass underneath the TPG span, while the sidewalks would be routed around each pier and underneath the approach spans.

The middle span would rest on tall piers consisting of a cap beam, three oblong columns, and a pile cap, all supported by driven H-pile. Each approach span would rest on a pier and a shallow abutment.

Each shallow abutment will be a cast-in-place concrete cap resting on driven H-pile. The term "shallow" is used to describe these abutments because each abutment cap is only about four feet tall. From the sidewalk, the groundline would slope up to the abutment at a 2H:1V. The pile will be embedded in the concrete cap. Short wingwalls on each side of the abutment would need to be constructed to retain fill at the bridge approach.

This alternative could also be constructed with the middle span would be a steel DPG and would be made up of dark brown, self-weathering steel. This alternative B2 would be less costly but would negatively effect the roadway profile due to the structure depth, from top of tie to low chord, would be about 9-ft.

4.3 ROADWAY BRIDGE ALTERNATIVE C

This bridge alternative is utilized in Options 5, 6, and 7 and consists of a single span steel girder bridge spanning over the railroad tracks. The proposed bridge would be a 5-lane roadway section with jersey barriers, sidewalk and protective fencing on both sides. The bridge span would vary based on the number of tracks required to span. Options 6 and 7 would be longer because of the location of the rail yard with relation to the crossing. The bridge would require vertical abutments with large panel MSE walls with a 25' horizontal clearance from the centerline of the tracks to the wall. The structure depth, from crown of roadway to low point of the girders, would be approximately 5-ft. The vertical clearance from the low point of the girders to the top of rail is shown as 23'-6" as typically required for railroad tracks. The bridge would be skewed with the tracks approximately 45 degrees.

5.0 BRIDGE CONSTRUCTION PHASING

5.1 OPTIONS 2, 3, and 4

The railroad bridge will be constructed in a single phase. Traffic traveling along Wells and Sioux Avenue will be detoured around the construction as the stretch of roadway between Sioux Avenue and Wells Avenue will be closed. However, special detour consideration will be provided for uninterrupted access to the hospital.

Construction will begin with building a shoofly track 30-ft to the north of the existing track centerline and shifting train traffic onto the shoofly. The site will be excavated and pile driven to support the cast-in-place concrete pier and abutment substructures. Once the foundations and substructures are completed, the steel spans will be erected and the bridge deck prepared with ballast and track. Train traffic would be shifted to the new bridge, the shoofly track deconstructed, and excavation completed for the new roadway underpass.

5.2 OPTIONS 5, 6, & 7

As is the case with the railroad bridge construction, the overpass bridge for Options 5, 6, & 7 would be built in a single phase. During the construction, Monroe Avenue would be closed from Wells Avenue to Sioux Avenue and traffic will be detoured east to Harrison Avenue.

Because an overpass will be constructed for Options 5, 6, and 7; a temporary railroad shoo-fly will not be required, which will save time and money. The site will be excavated at the location of the vertical abutments and pile driven to support the abutments. Once the foundations and abutments are completed, the steel spans will be installed and the concrete deck completed.

6.0 BRIDGE OPTIONS CONCEPTUAL COST COMPARISON

An estimate of conceptual costs was prepared for the bridge alternatives using order of magnitude unit costs on a per track-foot basis for comparison of the railroad bridge alternatives only. These unit costs were based on experience with past railroad and roadway bridge construction projects. The following table depicts the total conceptual cost of each bridge alternative and is meant for comparison of alternatives only.

Table 3: Conceptual Bridge Cost

Alternative	A	B	C
Cost	\$ 4,370,000	\$ 3,360,000	\$ 5,280,000

7.0 RECOMMENDED BRIDGE ALTERNATIVE

As a result of this conceptual comparison study, Alternative C is recommended due to the lesser probable structure cost, ease of constructability, aesthetic appeal, and ease of maintenance. The recommended alternative consists of a 200-ft bridge utilizing rolled steel beam spans. Based on our conceptual design each pier would consist of cast-in-place concrete cap beams, two oblong columns, and a pile cap supported by driven HP14x89# steel piles, while each abutment would consist of a cast-in-place concrete cap with wingwalls, supported by driven piles.

PIERRE STREET

1.0 ROADWAY ALIGNMENT OPTIONS COMPARISON

Following is a brief summary of three railroad crossing options analyzed at Pierre Street. The purpose of these options would be to reconstruct the Pierre Street roadway and railroad bridge to increase the vertical clearance under the bridge from the existing 11'-3" to a desirable 16'. An additional "do nothing" option is not shown but should also be considered.

1.2 PIERRE STREET – OPTION 1

Option 1 consists of reconstructing Pierre Street on the existing roadway alignment with the roadway going under the tracks. The structure shown for this option is a Single Span bridge with vertical abutments and MSE walls on either side of the roadway. The vertical clearance attained with this option is 16' with a 4' bridge deck depth.

The roadway would need to be reconstructed as shown in order to adjust the profile and gain the additional clearance under the bridge. A cul-de-sac is shown as the connection from Pleasant Avenue to Pierre Street going north can not be maintained in this option due to the existing steep grades on Pierre Street from Pleasant Avenue to Capitol Avenue. This will require all traffic using the Pierre Street underpass to either use Pleasant Avenue to go east or west or jog over to Euclid Avenue to proceed north. Additional grading and reconstruction will be needed to maintain access to the gas station and parking lots in the area.

Benefits of Option 1 include:

- No ROW acquisition required
- 0 buildings will be impacted
- No center median needed so no impact to storage for the center left turn lane and site distance under bridge
- Shallowest structure depth minimizes the depth and limits of the roadway reconstruction
- Utilizes a combination of retaining walls and slopes to minimize landowner impacts

Drawbacks of Option 1 include:

- Eliminates connection of Sioux Avenue north of Pleasant Avenue.
- Impacts to existing public and private utilities
- Most costly of the railroad bridge options
- Required railroad shoo-fly may disturb existing building
- The use of expensive MSE block walls for vertical abutments
- Does not eliminate the 1-block "jog" for the Pierre Street through traffic

1.3 PIERRE STREET – OPTION 2

Option 2 consists of reconstructing Pierre Street with a new bridge and the roadway going under the tracks but modifies the roadway alignment to include 100' radius curves for through traffic on Pierre Street and Euclid Avenue. The structure shown for this option is a Four Span bridge with gradual slopes tying into the existing ground on either side of the roadway. MSE walls are proposed only in the areas needed to minimize or eliminate effects to adjacent buildings and landowners. The vertical clearance attained with this option is 16' with a 5' bridge deck depth.

The roadway could easily be realigned at no additional cost from Option number 1 because it needs to be reconstructed anyways in order to adjust the profile and gain the additional clearance under the bridge. A cul-de-sac is shown on this option too as the connection from Pleasant Avenue to Pierre Street going north can not be maintained in this option due to the existing steep grades on Pierre Street from Pleasant Avenue to Capitol Avenue. This will require all traffic using the Pierre Street underpass to either use Pleasant Avenue to go east or west or jog over to Euclid Avenue to proceed north. Additional grading and reconstruction will be needed to maintain access to the gas station and parking lots in the area.

Benefits of Option 2 include:

- 0 buildings will be impacted
- Utilizes a combination of retaining walls and slopes to minimize landowner impacts
- Improves the alignment and traffic flow for the 1-block "jog" for the Pierre Street through traffic

Drawbacks of Option 2 include:

- Some ROW acquisition required to allow for larger radius curves
- Center median needed and would impact to storage for the center left turn lane
- Center pier impacts the site distance and safety under bridge
- Deepest structure depth requires more excavation and increases the limits of the roadway reconstruction
- Eliminates connection of Sioux Avenue north of Pleasant Avenue.
- Impacts to existing public and private utilities
- Required railroad shoo-fly may disturb existing building

1.4 PIERRE STREET – OPTION 3

Option 3 consists of reconstructing Pierre Street with a new bridge and the roadway going under the tracks but modifies the roadway alignment to angle across the existing gas station property to tie into Euclid Avenue. The structure shown for this option is a Three Span bridge with gradual slopes tying into the existing ground on either side of the roadway. The vertical clearance attained with this option is 16' with a 4'-6" bridge deck depth.

The roadway realignment on this option would be most beneficial to the through north-south traffic using Pierre Street and Euclid Avenue. This would also come as minimal additional construction costs from Options 1 and 2 because of the need to reconstruct the roadway anyways to adjust the profile and gain the additional clearance under the bridge. However, there would be additional cost for property acquisition and buildings that would be affected by this proposed alignment. A connection from Pleasant Avenue to Pierre Street going north is shown on this option because the connection from Pleasant Avenue to Pierre Street going north can not be maintained due to the existing steep grades on Pierre Street from Pleasant Avenue to Capitol Avenue. This will further benefit the through traffic on Pierre/Euclid as it would eliminate an intersection. Additional grading and reconstruction will be needed to maintain access to the parking lots in the area.

Benefits of Option 3 include:

- No need for costly MSE retaining walls to minimize landowner impacts
- Least costly bridge options
- No center median with piers to impact the storage for the center left turn lane or site distance and safety under bridge
- Greatly improves the alignment and traffic flow for the 1-block "jog" for the Pierre Street through traffic

Drawbacks of Option 3 include:

- Cost of property and building acquisition required to allow for roadway realignment
- Eliminates connection of Sioux Avenue north of Pleasant Avenue.
- Impacts to existing public and private utilities

2.0 PIERRE STREET BRIDGE ALTERNATIVES COMPARISON

2.1 RAILROAD BRIDGE ALTERNATIVE 1

This alternative consists of an 80-ft single-span steel through-plate girder (TPG) bridge spanning over the roadway. The TPG would be made up of dark brown, self-weathering steel and fabricated with welded top and bottom flanges, with most other connections bolted. The structure depth, from top of tie to low chord, would be about 4-ft. The bridge would be square with the roadway.

The span would rest on tall and massive abutments supported by driven H-pile. The abutments are described as "tall" because they would extend from below the roadway and sidewalk up to the bottom flange of the TPG girders and would retain fill as well. In order to support the train vertical and longitudinal loading, TPG dead loads, and retain a large amount of fill behind the abutment, a large amount of concrete is necessary to provide enough mass to counteract these loads.

In addition, tall and long wingwalls would need to be constructed to retain fill adjacent to the sidewalks. The concrete abutments could be formlined to provide an aesthetically pleasing texture.

2.2 RAILROAD BRIDGE ALTERNATIVE 2

This alternative consists of a 140-ft three-span bridge spanning over the roadway. The spans would consist of rolled steel beams with a steel deck pan and would be made up of dark brown, self-weathering steel with bolted connections. The structure depth, from top of tie to low chord, would be about 5-ft. The bridge would be square with the roadway.

The middle two spans would rest on tall piers consisting of a cap beam, two oblong columns, and a pile cap, all supported by driven H-pile. Each approach span would rest on a pier and a shallow abutment. From the sidewalks, the groundline would slope up to each abutment at a 2H:1V.

2.3 RAILROAD BRIDGE ALTERNATIVE 3

This alternative consists of a 150-ft four-span bridge spanning over the roadway with a pier in the roadway median. The spans would consist of rolled steel beams with a steel deck pan and would be made up of dark brown, self-weathering steel with bolted connections. The structure depth, from top of tie to low chord, over the roadway would be about 4.5-ft. The bridge would be square with the roadway.

The middle two spans would rest on tall piers consisting of a cap beam, two oblong columns, and a pile cap, all supported by driven H-pile. Each approach span would rest on a pier and a shallow abutment. From the sidewalks, the groundline would slope up to each abutment at a 2H:1V.

3.0 BRIDGE CONSTRUCTION PHASING

The new bridge will be constructed in a single phase. Traffic on adjacent roadways will be detoured during construction of the new bridge.

Construction will begin with building a shoofly track 30-ft to the north of the existing track centerline and shifting train traffic onto the shoofly. The existing bridge will be demolished, the site excavated, and pile driven to support the cast-in-place concrete pier and abutment substructures. Once the foundations and substructures are completed, the steel spans will be erected and the bridge deck prepared with ballast and track. Train traffic would be shifted to the new bridge, the shoofly track deconstructed, and excavation completed for the new roadway underpass.

4.0 BRIDGE ALTERNATIVES CONCEPTUAL COST COMPARISON

An estimate of conceptual costs was prepared for the alternatives using order of magnitude unit costs on a per track-foot basis for comparison of bridge alternatives only. These unit costs were based on experience with past railroad bridge construction projects. The following table depicts the total conceptual cost of each bridge alternative and is meant for comparison of alternatives only.

Table 1: Conceptual Cost Comparison

Alternative	1	2	3
Cost	\$ 2,500,000	\$ 1,950,000	\$ 2,080,000

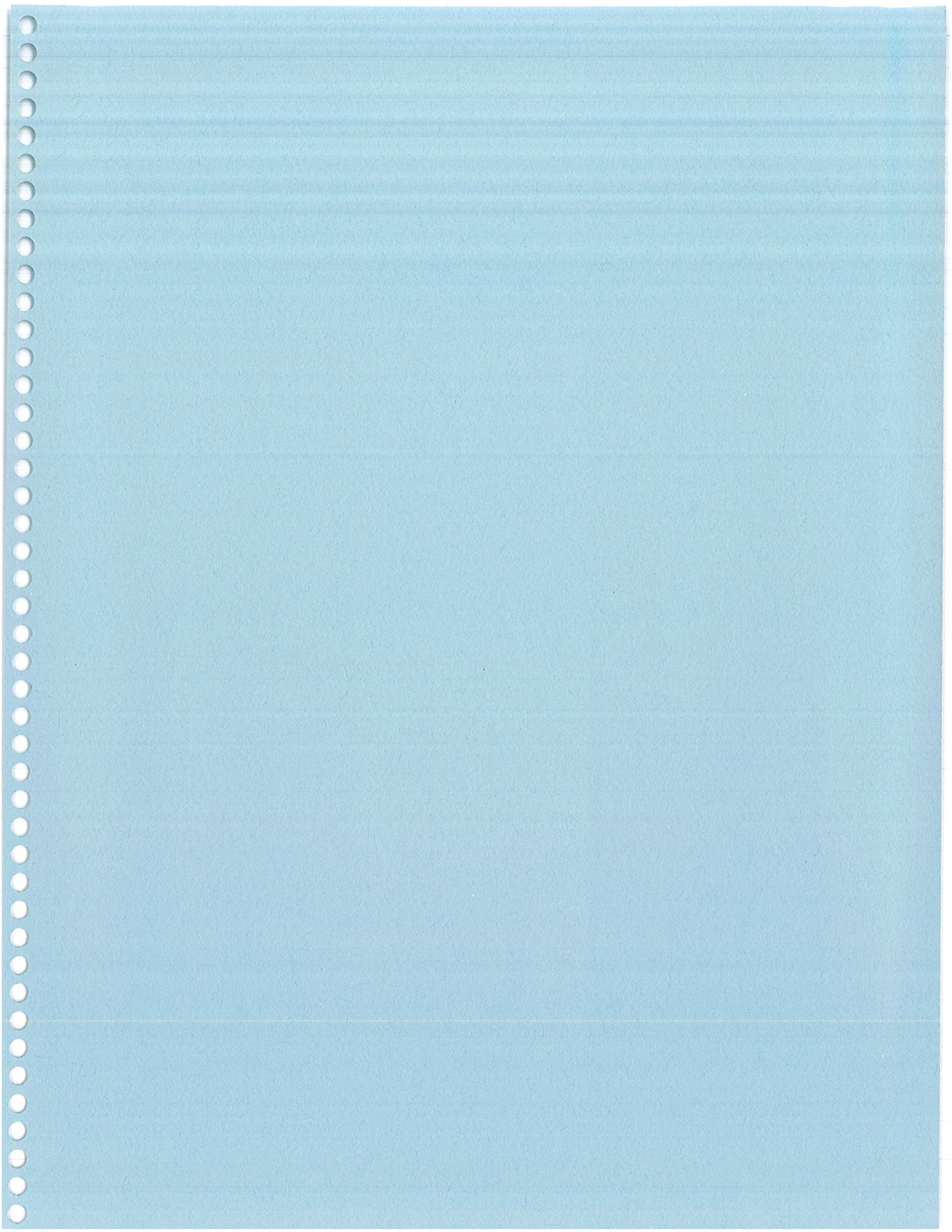
5.0 RECOMMENDED BRIDGE ALTERNATIVE

As a result of this conceptual comparison study, Alternative 2 is recommended due to the lesser probable structure cost, ease of constructibility, aesthetic appeal, and ease of maintenance. The recommended alternative consists of a 140-ft bridge utilizing rolled steel beam spans. Based on our conceptual design each pier would consist of cast-in-place concrete cap beams, two oblong columns, and a pile cap supported by driven HP14x89# steel piles, while each abutment would consist of a cast-in-place concrete cap with wingwalls, supported by driven piles.

POPLAR AVENUE

1.0 ROADWAY ALIGNMENT OPTIONS COMPARISON

A grade separated intersection was analyzed at Poplar Avenue for this report. The existing elevations at Poplar street are approximately 45' higher at Capitol Avenue on the North side of the tracks than Sioux Avenue on the south side. This results in an existing slope of more than 6% in the area of the railroad tracks. In order to reconstruct the roadway for an underpass, the new grades would be in excess of 12% to meet the required clearance under a new railroad bridge. This would also result in a closure of the Pleasant Drive connections along with driveway connections for the homes on Poplar Avenue. The combination of these issues makes it very difficult and likely unfeasible to construct of a underpass at Poplar Avenue.



AT "S-CURVE"

OPTION 1

("No Build" With Whistle Free Improvements)

Preliminary Project Costs

At Grade Intersection, Whistle Free Improvements Only						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	0	LS	\$ 12,000.00	\$ -
2	004	Remove Detour	0	LS	\$ 2,000.00	\$ -
3	009	Mobilization	1	LS	\$ 10,000.00	\$ 10,000.00
4	009	Staking	1	LS	\$ 2,000.00	\$ 2,000.00
5	009	Structure Staking	0	EACH	\$ 7,500.00	\$ -
6	009	Three Man Survey Crew	24	HOUR	\$ 150.00	\$ 3,600.00
7	110	Clear & Grub	0	LS	\$ 5,000.00	\$ -
8	110	Misc. Removals	1	LS	\$ 2,000.00	\$ 2,000.00
9	110	Remove Pavement	240	SQYD	\$ 4.00	\$ 1,000.00
10	120	Unclassified Excavation	0	CUYD	\$ 4.00	\$ -
11	120	Borrow Unclassified Excavation	0	CUYD	\$ 3.50	\$ -
12	120	Undercut	0	CUYD	\$ 3.00	\$ -
13	120	Water for Embankment	0	MGAL	\$ 14.00	\$ -
14	120	Water for Granular Material	2	MGAL	\$ 14.00	\$ -
15	230	Contractor Furnished Topsoil	16	CUYD	\$ 3.50	\$ -
16	250	Incidental Work, Grading	1	LS	\$ 3,000.00	\$ 3,000.00
17	250	Incidental Work, Structure	0	LS	\$ 125,000.00	\$ -
18	260	Base Course	0	TON	\$ 14.00	\$ -
19	260	Gravel Cushion	150	TON	\$ 14.00	\$ 2,000.00
20	320	Asphalt Concrete Composite	0	TON	\$ 60.00	\$ -
21	380	10.5" Nonreinforced PCC	0	SQYD	\$ 44.00	\$ -
22	380	Dowel Bar	0	EACH	\$ 60.00	\$ -
23	450	XX" RCP (Furn)	0	FT	\$ 35.00	\$ -
24	450	XX" RCP (Inst)	0	FT	\$ 18.50	\$ -
25	450	XX" End (Furn)	0	EACH	\$ 575.00	\$ -
26	450	XX" End (Inst)	0	EACH	\$ 250.00	\$ -
27	451	Sanitary Sewer Modifications	0	LS	\$ 35,000.00	\$ -
28	451	Watermain Modifications	0	LS	\$ 35,000.00	\$ -
29	600	Type II Field Laboratory	0	EACH	\$ 15,000.00	\$ -
30	632	Misc. Permanent Signing	0	LS	\$ 4,000.00	\$ -
31	633	Pavement Marking	1	LS	\$ 6,000.00	\$ 6,000.00
32	634	Traffic Control	1	LS	\$ 2,600.00	\$ 2,600.00
33	635	Roadway Lighting	0	LS	\$ 50,000.00	\$ -
34	635	Signal System	0	EACH	\$ 175,000.00	\$ -
35	650	Type B610.5 Concrete Curb and Gutter	200	FT	\$ 14.00	\$ 3,000.00
36	651	6" Concrete Sidewalk	400	SQYD	\$ 36.00	\$ 14,000.00
37	670	Frame and Grate	0	LS	\$ 650.00	\$ -
38	670	Drop Inlet	0	EACH	\$ 1,500.00	\$ -
39	670	Storm Sewer - Sump Pumping System	0	LS	\$ 380,000.00	\$ -
40	730-734	Erosion Control & Restoration	1	LS	\$ 1,200.00	\$ 1,200.00
					Subtotal:	\$ 50,400.00
					Contingency (20%)	\$ 10,080.00
					Roadway Subtotal:	\$ 60,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure and Rail						
41	410	RR Bridge Structure - 4 Span	0	LS	\$ 2,800,000.00	\$ -
42	410	Track Raising - Ballast & Surfacing	0	FT	\$ 100.00	\$ -
43	410	Temporary RR Shoo Fly w/ Shoring	0	FT	\$ 200.00	\$ -
44	530	MSE Large Panel Wall	0	SQFT	\$ 70.00	\$ -
45		RR Signal System	1	LS	\$ 200,000.00	\$ 200,000.00
					Subtotal:	\$ 200,000.00
					Contingency (20%)	\$ 40,000.00
					Structure & Rail Subtotal:	\$ 240,000.00

Construction Total: \$ 300,000.00

NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE	
Right-of-Way And Utilities						
47	Right-of-Way Impacts	0	SQFT	\$ 5.00	\$ -	
48	Impacts to Buildings	0	EACH	\$ 75,000.00	\$ -	
49	Private Utility Relocations	0	LS	\$ 50,000.00	\$ -	
					ROW Subtotal:	\$ -

Grand Total: \$ 300,000.00

**US14/83 RR CROSSING
AT "S-CURVE"
OPTION 2
(Existing Alignment Underpass)
Preliminary Project Costs**

S-Curve Grade Separated Underpass - Existing Alignment, 4-Span Bridge Structure						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	1	LS	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	1	LS	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	1	LS	\$ 650,000.00	\$ 650,000.00
4	009	Staking	1	LS	\$ 95,000.00	\$ 95,000.00
5	009	Structure Staking	1	EACH	\$ 7,500.00	\$ 7,500.00
6	009	Three Man Survey Crew	50	HOUR	\$ 150.00	\$ 7,500.00
7	110	Clear & Grub	1	LS	\$ 5,000.00	\$ 5,000.00
8	110	Misc. Removals	1	LS	\$ 10,000.00	\$ 10,000.00
9	110	Remove Pavement	20,130	SQYD	\$ 4.00	\$ 81,000.00
10	120	Unclassified Excavation	62,000	CUYD	\$ 4.00	\$ 248,000.00
11	120	Borrow Unclassified Excavation	0	CUYD	\$ 3.50	\$ -
12	120	Undercut	4,060	CUYD	\$ 3.00	\$ 12,000.00
13	120	Water for Embankment	0	MGAL	\$ 14.00	\$ -
14	120	Water for Granular Material	56	MGAL	\$ 14.00	\$ 1,000.00
15	230	Contractor Furnished Topsoil	1,497	CUYD	\$ 3.50	\$ 5,000.00
16	250	Incidental Work, Grading	1	LS	\$ 15,000.00	\$ 15,000.00
17	250	Incidental Work, Structure	1	LS	\$ 125,000.00	\$ 125,000.00
18	260	Base Course	530	TON	\$ 14.00	\$ 7,000.00
19	260	Gravel Cushion	4,124	TON	\$ 14.00	\$ 58,000.00
20	320	Asphalt Concrete Composite	426	TON	\$ 60.00	\$ 26,000.00
21	380	10.5" Nonreinforced PCC	12,193	SQYD	\$ 46.00	\$ 561,000.00
22	380	Dowel Bar	3,640	EACH	\$ 8.00	\$ 29,000.00
23	450	XX" RCP (Furn)	1,800	FT	\$ 35.00	\$ 63,000.00
24	450	XX" RCP (Inst)	1,800	FT	\$ 18.50	\$ 33,000.00
25	450	XX" End (Furn)	0	EACH	\$ 575.00	\$ -
26	450	XX" End (Inst)	0	EACH	\$ 250.00	\$ -
27	451	Sanitary Sewer Modifications	1	LS	\$ 52,000.00	\$ 52,000.00
28	451	Watermain Modifications	1	LS	\$ 40,000.00	\$ 40,000.00
29	600	Type II Field Laboratory	1	EACH	\$ 15,000.00	\$ 15,000.00
30	632	Misc. Permanent Signing	1	LS	\$ 4,000.00	\$ 4,000.00
31	633	Pavement Marking	1	LS	\$ 8,000.00	\$ 8,000.00
32	634	Traffic Control	1	LS	\$ 20,000.00	\$ 20,000.00
33	635	Roadway Lighting	1	LS	\$ 50,000.00	\$ 50,000.00
34	635	Signal System	1	EACH	\$ 175,000.00	\$ 175,000.00
35	650	Type B610.5 Concrete Curb and Gutter	4,393	FT	\$ 14.00	\$ 62,000.00
36	651	6" Concrete Sidewalk	2,144	SQYD	\$ 36.00	\$ 77,000.00
37	670	Frame and Grate	8	LS	\$ 650.00	\$ 5,000.00
38	670	Drop Inlet	8	EACH	\$ 1,500.00	\$ 12,000.00
39	670	Storm Sewer - Sump Pumping System	1	LS	\$ 380,000.00	\$ 380,000.00
40	730-734	Erosion Control & Restoration	1	LS	\$ 8,000.00	\$ 8,000.00
Subtotal:						\$ 2,961,000.00
Contingency (20%)						\$ 592,200.00
Roadway Subtotal:						\$ 3,553,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure and Rail						
41	410	RR Bridge Structure - 4 Span	1	LS	\$ 2,800,000.00	\$ 2,800,000.00
42	410	Track Raising - Ballast & Surfacing	2,085	FT	\$ 100.00	\$ 208,500.00
43	410	Temporary RR Shoo Fly w/ Shoring	917	FT	\$ 200.00	\$ 183,400.00
44	530	MSE Large Panel Wall	11,200	SQFT	\$ 70.00	\$ 784,000.00
Subtotal:						\$ 3,975,900.00
Contingency (20%)						\$ 795,180.00
Structure & Rail Subtotal:						\$ 4,771,000.00

Construction Total: \$ 8,324,000.00

NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Right-of-Way And Utilities					
45	Right-of-Way Impacts	39,300	SQFT	\$ 5.00	\$ 196,500.00
46	Impacts to Buildings	1	EACH	\$ 75,000.00	\$ 75,000.00
47	Private Utility Relocations	1	LS	\$ 50,000.00	\$ 50,000.00
ROW Subtotal:					\$ 321,500.00

Grand Total: \$ 8,645,500.00

**US14/83 RR CROSSING
AT "S-CURVE"
OPTION 3
(Alignment shifted East)
Preliminary Project Costs**

Grade Separated Underpass - Single Span Deck Plate Girder Bridge						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	1	LS	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	1	LS	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	1	LS	\$ 650,000.00	\$ 650,000.00
4	009	Staking	1	LS	\$ 95,000.00	\$ 95,000.00
5	009	Structure Staking	1	EACH	\$ 7,500.00	\$ 7,500.00
6	009	Three Man Survey Crew	50	HOUR	\$ 150.00	\$ 7,500.00
7	110	Clear & Grub	1	LS	\$ 5,000.00	\$ 5,000.00
8	110	Misc. Removals	1	LS	\$ 10,000.00	\$ 10,000.00
9	110	Remove Pavement	27,391	SQYD	\$ 4.00	\$ 110,000.00
10	120	Unclassified Excavation	76,000	CUYD	\$ 4.00	\$ 304,000.00
11	120	Borrow Unclassified Excavation	0	CUYD	\$ 3.50	\$ -
12	120	Undercut	4,800	CUYD	\$ 3.00	\$ 14,000.00
13	120	Water for Embankment	0	MGAL	\$ 14.00	\$ -
14	120	Water for Granular Material	32	MGAL	\$ 14.00	\$ -
15	230	Contractor Furnished Topsoil	2,350	CUYD	\$ 3.50	\$ 8,000.00
16	250	Incidental Work, Grading	1	LS	\$ 15,000.00	\$ 15,000.00
17	250	Incidental Work, Structure	1	LS	\$ 125,000.00	\$ 125,000.00
18	260	Base Course	515	TON	\$ 14.00	\$ 7,000.00
19	260	Gravel Cushion	4,878	TON	\$ 14.00	\$ 68,000.00
20	320	Asphalt Concrete Composite	393	TON	\$ 60.00	\$ 24,000.00
21	380	10.5" Nonreinforced PCC	14,382	SQYD	\$ 46.00	\$ 662,000.00
22	380	Dowel Bar	4,360	EACH	\$ 8.00	\$ 35,000.00
23	450	XX" RCP (Furn)	1,800	FT	\$ 35.00	\$ 63,000.00
24	450	XX" RCP (Inst)	1,800	FT	\$ 18.50	\$ 33,000.00
25	450	XX" End (Furn)	0	EACH	\$ 575.00	\$ -
26	450	XX" End (Inst)	0	EACH	\$ 250.00	\$ -
27	451	Sanitary Sewer Modifications	1	LS	\$ 52,000.00	\$ 52,000.00
28	451	Watermain Modifications	1	LS	\$ 40,000.00	\$ 40,000.00
29	600	Type II Field Laboratory	1	EACH	\$ 15,000.00	\$ 15,000.00
30	632	Misc. Permanent Signing	1	LS	\$ 4,000.00	\$ 4,000.00
31	633	Pavement Marking	1	LS	\$ 8,000.00	\$ 8,000.00
32	634	Traffic Control	1	LS	\$ 20,000.00	\$ 20,000.00
33	635	Roadway Lighting	1	LS	\$ 50,000.00	\$ 50,000.00
34	635	Signal System	2	EACH	\$ 175,000.00	\$ 350,000.00
35	650	Type B610.5 Concrete Curb and Gutter	5,475	FT	\$ 14.00	\$ 77,000.00
36	651	6" Concrete Sidewalk	2,610	SQYD	\$ 36.00	\$ 94,000.00
37	670	Frame and Grate	8	LS	\$ 650.00	\$ 5,000.00
38	670	Drop Inlet	8	EACH	\$ 1,500.00	\$ 12,000.00
39	670	Storm Sewer - Sump Pumping System	1	LS	\$ 380,000.00	\$ 380,000.00
40	730-734	Erosion Control & Restoration	1	LS	\$ 8,000.00	\$ 8,000.00
Subtotal:						\$ 3,372,000.00
Contingency (20%)						\$ 674,400.00
Roadway Subtotal:						\$ 4,046,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure and Rail						
41	410	RR Bridge Structure - 4 Span	1	LS	\$ 2,800,000.00	\$ 2,800,000.00
42	410	Track Raising - Ballast & Surfacing	2,085	FT	\$ 100.00	\$ 208,500.00
43	410	Temporary RR Shoo Fly w/ Shoring	917	FT	\$ 200.00	\$ 183,400.00
44	530	MSE Large Panel Wall	5,600	SQFT	\$ 70.00	\$ 392,000.00
Subtotal:						\$ 3,583,900.00
Contingency (20%)						\$ 716,780.00
Structure & Rail Subtotal:						\$ 4,301,000.00

Construction Total: \$ 8,347,000.00

NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE	
Right-of-Way And Utilities						
45	Right-of-Way Impacts	127,000	SQFT	\$ 5.00	\$ 635,000.00	
46	Impacts to Buildings	3	EACH	\$ 75,000.00	\$ 225,000.00	
47	Private Utility Relocations	1	LS	\$ 50,000.00	\$ 50,000.00	
ROW Subtotal:						\$ 910,000.00

Grand Total: \$ 9,257,000.00

**US14/83 RR CROSSING
AT "S-CURVE"
OPTION 4
(Alignment shifted West)
Preliminary Project Costs**

Grade Separated Underpass - 3 Span Bridge						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	1	LS	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	1	LS	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	1	LS	\$ 650,000.00	\$ 650,000.00
4	009	Staking	1	LS	\$ 95,000.00	\$ 95,000.00
5	009	Structure Staking	1	EACH	\$ 7,500.00	\$ 7,500.00
6	009	Three Man Survey Crew	50	HOUR	\$ 150.00	\$ 7,500.00
7	110	Clear & Grub	1	LS	\$ 5,000.00	\$ 5,000.00
8	110	Misc. Removals	1	LS	\$ 10,000.00	\$ 10,000.00
9	110	Remove Pavement	21,726	SQYD	\$ 4.00	\$ 87,000.00
10	120	Unclassified Excavation	74,000	CUYD	\$ 4.00	\$ 296,000.00
11	120	Borrow Unclassified Excavation	0	CUYD	\$ 3.50	\$ -
12	120	Undercut	4,400	CUYD	\$ 3.00	\$ 13,000.00
13	120	Water for Embankment	0	MGAL	\$ 14.00	\$ -
14	120	Water for Granular Material	60	MGAL	\$ 14.00	\$ 1,000.00
15	230	Contractor Furnished Topsoil	1,707	CUYD	\$ 3.50	\$ 6,000.00
16	250	Incidental Work, Grading	1	LS	\$ 15,000.00	\$ 15,000.00
17	250	Incidental Work, Structure	1	LS	\$ 125,000.00	\$ 125,000.00
18	260	Base Course	567	TON	\$ 14.00	\$ 8,000.00
19	260	Gravel Cushion	4,450	TON	\$ 14.00	\$ 62,000.00
20	320	Asphalt Concrete Composite	455	TON	\$ 60.00	\$ 27,000.00
21	380	10.5" Nonreinforced PCC	13,321	SQYD	\$ 46.00	\$ 613,000.00
22	380	Dowel Bar	4,060	EACH	\$ 8.00	\$ 32,000.00
23	450	XX" RCP (Furn)	1,800	FT	\$ 35.00	\$ 63,000.00
24	450	XX" RCP (Inst)	1,800	FT	\$ 18.50	\$ 33,000.00
25	450	XX" End (Furn)	0	EACH	\$ 575.00	\$ -
26	450	XX" End (Inst)	0	EACH	\$ 250.00	\$ -
27	451	Sanitary Sewer Modifications	1	LS	\$ 52,000.00	\$ 52,000.00
28	451	Watermain Modifications	1	LS	\$ 40,000.00	\$ 40,000.00
29	600	Type II Field Laboratory	1	EACH	\$ 15,000.00	\$ 15,000.00
30	632	Misc. Permanent Signing	1	LS	\$ 4,000.00	\$ 4,000.00
31	633	Pavement Marking	1	LS	\$ 8,000.00	\$ 8,000.00
32	634	Traffic Control	1	LS	\$ 20,000.00	\$ 20,000.00
33	635	Roadway Lighting	1	LS	\$ 50,000.00	\$ 50,000.00
34	635	Signal System	2	EACH	\$ 175,000.00	\$ 350,000.00
35	650	Type B610.5 Concrete Curb and Gutter	4,737	FT	\$ 14.00	\$ 66,000.00
36	651	6" Concrete Sidewalk	2,109	SQYD	\$ 36.00	\$ 76,000.00
37	670	Frame and Grate	8	LS	\$ 650.00	\$ 5,000.00
38	670	Drop Inlet	8	EACH	\$ 1,500.00	\$ 12,000.00
39	670	Storm Sewer - Sump Pumping System	1	LS	\$ 380,000.00	\$ 380,000.00
40	730-734	Erosion Control & Restoration	1	LS	\$ 8,000.00	\$ 8,000.00
Subtotal:						\$ 3,256,000.00
Contingency (20%)						\$ 651,200.00
Roadway Subtotal:						\$ 3,907,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure and Rail						
41	410	RR Bridge Structure - 4 Span	1	LS	\$ 2,800,000.00	\$ 2,800,000.00
42	410	Track Raising - Ballast & Surfacing	2,085	FT	\$ 100.00	\$ 208,500.00
43	410	Temporary RR Shoo Fly w/ Shoring	917	FT	\$ 200.00	\$ 183,400.00
44	530	MSE Large Panel Wall	4,200	SQFT	\$ 70.00	\$ 294,000.00
Subtotal:						\$ 3,485,900.00
Contingency (20%)						\$ 697,180.00
Structure & Rail Subtotal:						\$ 4,183,000.00

Construction Total: \$ 8,090,000.00

NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Right-of-Way And Utilities					
45	Right-of-Way Impacts	47,200	SQFT	\$ 5.00	\$ 236,000.00
46	Impacts to Buildings	2	EACH	\$ 75,000.00	\$ 150,000.00
47	Private Utility Relocations	1	LS	\$ 50,000.00	\$ 50,000.00
ROW Subtotal:					\$ 436,000.00

Grand Total: \$ 8,526,000.00

**US 14/83 RR CROSSING
AT "S-CURVE"
OPTION 5
(Monroe Avenue)
Preliminary Project Costs**

Grade Separated Overpass at Monroe Avenue						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	1	LS	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	1	LS	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	1	LS	\$ 575,000.00	\$ 575,000.00
4	009	Staking	1	LS	\$ 95,000.00	\$ 95,000.00
5	009	Structure Staking	1	EACH	\$ 5,000.00	\$ 5,000.00
6	009	Three Man Survey Crew	50	HOUR	\$ 150.00	\$ 8,000.00
7	110	Clear & Grub	1	LS	\$ 2,500.00	\$ 3,000.00
8	110	Misc. Removals	1	LS	\$ 10,000.00	\$ 10,000.00
9	110	Remove Pavement	50,421	SQYD	\$ 3.90	\$ 197,000.00
10	120	Unclassified Excavation	1,000	CUYD	\$ 3.00	\$ 3,000.00
11	120	Borrow Unclassified Excavation	141,000	CUYD	\$ 3.50	\$ 494,000.00
12	120	Undercut	10,000	CUYD	\$ 3.00	\$ 30,000.00
13	120	Water for Embankment	660	MGAL	\$ 14.00	\$ 9,000.00
14	120	Water for Granular Material	123	MGAL	\$ 14.00	\$ 2,000.00
15	230	Contractor Furnished Topsoil	2,674	CUYD	\$ 3.50	\$ 9,000.00
16	250	Incidental Work, Grading	1	LS	\$ 7,500.00	\$ 8,000.00
17	250	Incidental Work, Structure	1	LS	\$ 125,000.00	\$ 125,000.00
18	260	Gravel Cushion	10,052	TON	\$ 14.00	\$ 141,000.00
19	260	Base Course	232	TON	\$ 14.00	\$ 3,000.00
20	320	Asphalt Concrete Composite	184	TON	\$ 60.00	\$ 11,000.00
21	380	10.5" Nonreinforced PCC	30,579	SQYD	\$ 46.00	\$ 1,407,000.00
22	380	Dowel Bar	6,400	EACH	\$ 8.00	\$ 51,000.00
23	450	XX" RCP (Furn)	2,200	FT	\$ 35.00	\$ 77,000.00
24	450	XX" RCP (Inst)	2,200	FT	\$ 18.50	\$ 41,000.00
25	450	XX" End (Furn)	2	EACH	\$ 575.00	\$ 1,000.00
26	450	XX" End (Inst)	2	EACH	\$ 250.00	\$ 1,000.00
27	451	Sanitary Sewer Modifications	1	LS	\$ 16,000.00	\$ 16,000.00
28	451	Watermain Modifications	1	LS	\$ 32,000.00	\$ 32,000.00
29	600	Type II Field Laboratory	1	EACH	\$ 15,000.00	\$ 15,000.00
30	632	Misc. Permanent Signing	1	LS	\$ 3,500.00	\$ 4,000.00
31	633	Pavement Marking	1	LS	\$ 8,000.00	\$ 8,000.00
32	634	Traffic Control	1	LS	\$ 20,000.00	\$ 20,000.00
33	635	Roadway Lighting	1	LS	\$ 50,000.00	\$ 50,000.00
34	635	Signal System	2	EACH	\$ 175,000.00	\$ 350,000.00
35	650	Type B610.5 Concrete Curb and Gutter	10,278	FT	\$ 14.00	\$ 144,000.00
36	651	6" Concrete Sidewalk	3,944	SQYD	\$ 36.00	\$ 142,000.00
37	670	Frame and Grate	16	EACH	\$ 650.00	\$ 10,000.00
38	670	Drop Inlet	16	EACH	\$ 1,500.00	\$ 24,000.00
39	670	Junction Box	8	EACH	\$ 15,000.00	\$ 120,000.00
40	670	Storm Sewer - Sump Pumping System	0	LS	\$ 380,000.00	\$ -
41	730-734	Erosion Control & Restoration	1	LS	\$ 8,000.00	\$ 8,000.00
Subtotal:						\$ 4,263,000.00
Contingency (20%)						\$ 852,600.00
Roadway:						\$ 5,116,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure and Rail						
42	410	Sioux Ave Roadway Bridge - Concrete Girders	1	LS	\$ 875,000.00	\$ 875,000.00
43	530	MSE Large Panel Wall	22,000	SQFT	\$ 70.00	\$ 1,540,000.00
44	997	Track Raising - Ballast & Surfacing	0	FT	\$ 100.00	\$ -
45	997	Temporary RR Shoo Fly w/ Shoring	0	FT	\$ 200.00	\$ -
Structure Subtotal:						\$ 2,415,000.00

Construction Total: \$ 7,531,000.00

NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Right-of-Way And Utilities					
46	Right of Way Impacts	118,700	SQFT	\$ 5.00	\$ 593,500.00
47	Impacts to Building Structures	6	EACH	\$ 75,000.00	\$ 450,000.00
48	Relocation of Private Utilities	1	LS	\$ 50,000.00	\$ 50,000.00
ROW Subtotal:					\$ 1,093,500.00

Option 2 Total: \$8,624,500.00

**US 14/83 RR CROSSING
AT "S-CURVE"
OPTION 6
(Harrison Avenue)
Preliminary Project Costs**

Grade Separated Overpass at Harrison Avenue						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	1	LS	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	1	LS	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	1	LS	\$ 640,000.00	\$ 640,000.00
4	009	Staking	1	LS	\$ 95,000.00	\$ 95,000.00
5	009	Structure Staking	1	EACH	\$ 5,000.00	\$ 5,000.00
6	009	Three Man Survey Crew	50	HOURL	\$ 150.00	\$ 8,000.00
7	110	Clear & Grub	1	LS	\$ 2,500.00	\$ 3,000.00
8	110	Misc. Removals	1	LS	\$ 10,000.00	\$ 10,000.00
9	110	Remove Pavement	48,423	SQYD	\$ 3.90	\$ 189,000.00
10	120	Unclassified Excavation	1,000	CUYD	\$ 3.00	\$ 3,000.00
11	120	Borrow Unclassified Excavation	98,000	CUYD	\$ 3.50	\$ 343,000.00
12	120	Undercut	12,700	CUYD	\$ 3.00	\$ 38,000.00
13	120	Water for Embankment	92	MGAL	\$ 14.00	\$ 1,000.00
14	120	Water for Granular Material	78	MGAL	\$ 14.00	\$ 1,100.00
15	230	Contractor Furnished Topsoil	3,110	CUYD	\$ 3.50	\$ 11,000.00
16	250	Incidental Work, Grading	1	LS	\$ 7,500.00	\$ 8,000.00
17	250	Incidental Work, Structure	1	LS	\$ 125,000.00	\$ 125,000.00
18	260	Gravel Cushion	12,279	TON	\$ 14.00	\$ 172,000.00
19	260	Base Course	661	TON	\$ 14.00	\$ 9,000.00
20	320	Asphalt Concrete Composite	565	TON	\$ 60.00	\$ 34,000.00
21	380	10.5" Nonreinforced PCC	38,059	SQYD	\$ 46.00	\$ 1,751,000.00
22	380	Dowel Bar	12,800	EACH	\$ 8.00	\$ 102,000.00
23	450	XX" RCP (Furn)	2,200	FT	\$ 35.00	\$ 77,000.00
24	450	XX" RCP (Inst)	2,200	FT	\$ 18.50	\$ 41,000.00
25	450	XX" End (Furn)	2	EACH	\$ 575.00	\$ 1,000.00
26	450	XX" End (Inst)	2	EACH	\$ 250.00	\$ 1,000.00
27	451	Sanitary Sewer Modifications	1	LS	\$ 16,000.00	\$ 16,000.00
28	451	Watermain Modifications	1	LS	\$ 32,000.00	\$ 32,000.00
29	600	Type II Field Laboratory	1	EACH	\$ 15,000.00	\$ 15,000.00
30	632	Misc. Permanent Signing	1	LS	\$ 3,500.00	\$ 4,000.00
31	633	Pavement Marking	1	LS	\$ 12,000.00	\$ 12,000.00
32	634	Traffic Control	1	LS	\$ 20,000.00	\$ 20,000.00
33	635	Roadway Lighting	1	LS	\$ 50,000.00	\$ 50,000.00
34	635	Signal System	1	EACH	\$ 175,000.00	\$ 175,000.00
35	650	Type B610.5 Concrete Curb and Gutter	11,211	FT	\$ 14.00	\$ 157,000.00
36	651	6" Concrete Sidewalk	3,695	SQYD	\$ 36.00	\$ 133,000.00
37	670	Frame and Grate	16		\$ 650.00	\$ 10,000.00
38	670	Drop Inlet	16	EACH	\$ 1,500.00	\$ 24,000.00
39	670	Junction Box	8	LS	\$ 15,000.00	\$ 120,000.00
40	670	Storm Sewer - Sump Pumping System	0	LS	\$ 380,000.00	\$ -
41	730-734	Erosion Control & Restoration	1	LS	\$ 8,000.00	\$ 8,000.00
Subtotal:						\$ 4,458,000.00
Contingency (20%)						\$ 891,600.00
Roadway Subtotal:						\$ 5,350,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure						
42	410	Sioux Ave Roadway Bridge - Concrete Girders	1	LS	\$ 950,000.00	\$ 950,000.00
43	530	MSE Large Panel Wall	18,800	SQFT	\$ 70.00	\$ 1,316,000.00
44	410	Track Raising - Ballast & Surfacing	0	FT	\$ 100.00	\$ -
45	410	Temporary RR Shoo Fly w/ Shoring	0	FT	\$ 200.00	\$ -
Structure Subtotal:						\$ 2,266,000.00

Construction Total: \$ 7,616,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
RIGHT-OF-WAY						
46		Right of Way Impacts	141,100	SQFT	\$ 5.00	\$ 705,500.00
47		Impacts to Building Structures	0	EACH	\$ 75,000.00	\$ -
48		Relocation of Private Utilities	1	LS	\$ 75,000.00	\$ 75,000.00
ROW Total:						\$ 780,500.00

Project Total: \$ 8,396,500.00

**US 14/83 RR CROSSING
AT PIERRE STREET
OPTION 1
(Single Span Bridge)
Preliminary Project Costs**

Grade Separated Underpass at Pierre Street - Single Span Bridge						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	1	LS	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	1	LS	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	1	LS	\$ 320,000.00	\$ 320,000.00
4	009	Staking	1	LS	\$ 60,000.00	\$ 60,000.00
5	009	Structure Staking	1	EACH	\$ 5,000.00	\$ 5,000.00
6	009	Three Man Survey Crew	50	HOURL	\$ 150.00	\$ 8,000.00
7	110	Clear & Grub	1	LS	\$ 2,500.00	\$ 3,000.00
8	110	Misc. Removals	1	LS	\$ 10,000.00	\$ 10,000.00
9	110	Remove Pavement	8,900	SQYD	\$ 3.90	\$ 35,000.00
10	120	Unclassified Excavation	7,740	CUYD	\$ 3.00	\$ 23,000.00
11	120	Borrow Unclassified Excavation	0	CUYD	\$ 3.50	\$ -
12	120	Undercut	2,100	CUYD	\$ 3.00	\$ 6,000.00
13	120	Water for Embankment	0	MGAL	\$ 14.00	\$ -
14	120	Water for Granular Material	32	MGAL	\$ 14.00	\$ 400.00
15	230	Contractor Furnished Topsoil	200	CUYD	\$ 3.50	\$ 1,000.00
16	250	Incidental Work, Grading	1	LS	\$ 5,000.00	\$ 5,000.00
17	250	Incidental Work, Structure	1	LS	\$ 50,000.00	\$ 50,000.00
18	260	Gravel Cushion	570	TON	\$ 14.00	\$ 8,000.00
19	260	Base Course	2,100	TON	\$ 14.00	\$ 29,000.00
20	320	Asphalt Concrete Composite	540	TON	\$ 60.00	\$ 32,000.00
21	380	10.5" Nonreinforced PCC	5,100	SQYD	\$ 46.00	\$ 235,000.00
22	380	Dowel Bar	1,250	EACH	\$ 8.00	\$ 10,000.00
23	450	XX" RCP (Furn)	1,000	FT	\$ 40.00	\$ 40,000.00
24	450	XX" RCP (Inst)	1,000	FT	\$ 20.00	\$ 20,000.00
25	450	XX" End (Furn)	0	EACH	\$ 575.00	\$ -
26	450	XX" End (Inst)	0	EACH	\$ 250.00	\$ -
27	451	Sanitary Sewer Modifications	1	LS	\$ 25,000.00	\$ 25,000.00
28	451	Watermain Modifications	1	LS	\$ 30,000.00	\$ 30,000.00
29	600	Type II Field Laboratory	1	EACH	\$ 15,000.00	\$ 15,000.00
30	632	Misc. Permanent Signing	1	LS	\$ 3,500.00	\$ 4,000.00
31	633	Pavement Marking	1	LS	\$ 4,000.00	\$ 4,000.00
32	634	Traffic Control	1	LS	\$ 10,000.00	\$ 10,000.00
33	635	Roadway Lighting	1	LS	\$ 20,000.00	\$ 20,000.00
34	635	Signal System	0	EACH	\$ 175,000.00	\$ -
35	650	Type B610.5 Concrete Curb and Gutter	2,170	FT	\$ 14.00	\$ 30,000.00
36	651	6" Concrete Sidewalk	1,450	SQYD	\$ 36.00	\$ 52,000.00
37	670	Frame and Grate	8		\$ 650.00	\$ 5,000.00
38	670	Drop Inlet	8	EACH	\$ 1,500.00	\$ 12,000.00
39	670	Junction Box	5	LS	\$ 15,000.00	\$ 75,000.00
40	670	Storm Sewer - Sump Pumping System	0	LS	\$ 380,000.00	\$ -
41	730-734	Erosion Control & Restoration	1	LS	\$ 4,000.00	\$ 4,000.00
Subtotal:						\$ 1,200,000.00
Contingency (20%):						\$ 240,000.00
Roadway Subtotal:						\$ 1,440,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure						
42	410	RR Bridge Structure - Single Span TPG	1	LS	\$ 2,500,000.00	\$ 2,500,000.00
43	530	MSE Large Panel Wall	2,520	SQFT	\$ 70.00	\$ 176,400.00
44	410	Track Raising - Ballast & Surfacing	2,085	FT	\$ 100.00	\$ 208,500.00
45	410	Temporary RR Shoo Fly w/ Shoring	917	FT	\$ 200.00	\$ 183,400.00
Structure Subtotal:						\$ 3,068,300.00

Construction Total: \$ 4,508,300.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
RIGHT-OF-WAY						
46		Right of Way Impacts	0	SQFT	\$ 5.00	\$ -
47		Impacts to Building Structures	0	EACH	\$ 75,000.00	\$ -
48		Relocation of Private Utilities	1	LS	\$ 30,000.00	\$ 30,000.00
ROW Total:						\$ 30,000.00

Project Total: \$ 4,538,300.00

**US 14/83 RR CROSSING
AT PIERRE STREET
OPTION 2
(4-Span Bridge)
Preliminary Project Costs**

Grade Separated Underpass at Pierre Street - 4 Span Bridge						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	1	LS	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	1	LS	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	1	LS	\$ 320,000.00	\$ 320,000.00
4	009	Staking	1	LS	\$ 60,000.00	\$ 60,000.00
5	009	Structure Staking	1	EACH	\$ 5,000.00	\$ 5,000.00
6	009	Three Man Survey Crew	50	HOURL	\$ 150.00	\$ 8,000.00
7	110	Clear & Grub	1	LS	\$ 2,500.00	\$ 3,000.00
8	110	Misc. Removals	1	LS	\$ 10,000.00	\$ 10,000.00
9	110	Remove Pavement	9,300	SQYD	\$ 3.90	\$ 36,000.00
10	120	Unclassified Excavation	7,050	CUYD	\$ 3.00	\$ 21,000.00
11	120	Borrow Unclassified Excavation	0	CUYD	\$ 3.50	\$ -
12	120	Undercut	2,260	CUYD	\$ 3.00	\$ 7,000.00
13	120	Water for Embankment	0	MGAL	\$ 14.00	\$ -
14	120	Water for Granular Material	32	MGAL	\$ 14.00	\$ 400.00
15	230	Contractor Furnished Topsoil	200	CUYD	\$ 3.50	\$ 1,000.00
16	250	Incidental Work, Grading	1	LS	\$ 5,000.00	\$ 5,000.00
17	250	Incidental Work, Structure	1	LS	\$ 50,000.00	\$ 50,000.00
18	260	Gravel Cushion	670	TON	\$ 14.00	\$ 9,000.00
19	260	Base Course	1,960	TON	\$ 14.00	\$ 27,000.00
20	320	Asphalt Concrete Composite	640	TON	\$ 60.00	\$ 38,000.00
21	380	10.5" Nonreinforced PCC	4,700	SQYD	\$ 46.00	\$ 216,000.00
22	380	Dowel Bar	1,350	EACH	\$ 8.00	\$ 11,000.00
23	450	XX" RCP (Furn)	1,000	FT	\$ 35.00	\$ 35,000.00
24	450	XX" RCP (Inst)	1,000	FT	\$ 18.50	\$ 19,000.00
25	450	XX" End (Furn)	0	EACH	\$ 575.00	\$ -
26	450	XX" End (Inst)	0	EACH	\$ 250.00	\$ -
27	451	Sanitary Sewer Modifications	1	LS	\$ 25,000.00	\$ 25,000.00
28	451	Watermain Modifications	1	LS	\$ 30,000.00	\$ 30,000.00
29	600	Type II Field Laboratory	1	EACH	\$ 15,000.00	\$ 15,000.00
30	632	Misc. Permanent Signing	1	LS	\$ 3,500.00	\$ 4,000.00
31	633	Pavement Marking	1	LS	\$ 4,000.00	\$ 4,000.00
32	634	Traffic Control	1	LS	\$ 10,000.00	\$ 10,000.00
33	635	Roadway Lighting	1	LS	\$ 20,000.00	\$ 20,000.00
34	635	Signal System	0	EACH	\$ 175,000.00	\$ -
35	650	Type B610.5 Concrete Curb and Gutter	2,380	FT	\$ 14.00	\$ 33,000.00
36	651	6" Concrete Sidewalk	1,590	SQYD	\$ 36.00	\$ 57,000.00
37	670	Frame and Grate	8		\$ 650.00	\$ 5,000.00
38	670	Drop Inlet	8	EACH	\$ 1,500.00	\$ 12,000.00
39	670	Junction Box	5	LS	\$ 15,000.00	\$ 75,000.00
40	670	Storm Sewer - Sump Pumping System	0	LS	\$ 380,000.00	\$ -
41	730-734	Erosion Control & Restoration	1	LS	\$ 4,000.00	\$ 4,000.00
Subtotal:						\$ 1,189,000.00
Contingency (20%)						\$ 237,800.00
Roadway Subtotal:						\$ 1,427,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure						
42	410	RR Bridge Structure - 3 Span	1	LS	\$ 1,950,000.00	\$ 1,950,000.00
43	530	MSE Large Panel Wall	2,280	SQFT	\$ 70.00	\$ 159,600.00
44	410	Track Raising - Ballast & Surfacing	2,085	FT	\$ 100.00	\$ 208,500.00
45	410	Temporary RR Shoo Fly w/ Shoring	917	FT	\$ 200.00	\$ 183,400.00
Structure Subtotal:						\$ 2,501,500.00

Construction Total: \$ 3,928,500.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
RIGHT-OF-WAY						
46		Right of Way Impacts	1,600	SQFT	\$ 5.00	\$ 8,000.00
47		Impacts to Building Structures	0	EACH	\$ 75,000.00	\$ -
48		Relocation of Private Utilities	1	LS	\$ 30,000.00	\$ 30,000.00
ROW Total:						\$ 38,000.00

Project Total: \$ 3,966,500.00

**US 14/83 RR CROSSING
AT PIERRE STREET
OPTION 3
(3 Span Bridge)
Preliminary Project Costs**

Grade Separated Underpass at Pierre Street - 3 Span Bridge						
NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Roadway						
1	004	Construction & Maintenance of Detours	1	LS	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	1	LS	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	1	LS	\$ 320,000.00	\$ 320,000.00
4	009	Staking	1	LS	\$ 60,000.00	\$ 60,000.00
5	009	Structure Staking	1	EACH	\$ 5,000.00	\$ 5,000.00
6	009	Three Man Survey Crew	50	HOUR	\$ 150.00	\$ 8,000.00
7	110	Clear & Grub	1	LS	\$ 2,500.00	\$ 3,000.00
8	110	Misc. Removals	1	LS	\$ 10,000.00	\$ 10,000.00
9	110	Remove Pavement	10,500	SQYD	\$ 3.90	\$ 41,000.00
10	120	Unclassified Excavation	7,920	CUYD	\$ 3.00	\$ 24,000.00
11	120	Borrow Unclassified Excavation	0	CUYD	\$ 3.50	\$ -
12	120	Undercut	1,950	CUYD	\$ 3.00	\$ 6,000.00
13	120	Water for Embankment	0	MGAL	\$ 14.00	\$ -
14	120	Water for Granular Material	27	MGAL	\$ 14.00	\$ 400.00
15	230	Contractor Furnished Topsoil	200	CUYD	\$ 3.50	\$ 1,000.00
16	250	Incidental Work, Grading	1	LS	\$ 5,000.00	\$ 5,000.00
17	250	Incidental Work, Structure	1	LS	\$ 50,000.00	\$ 50,000.00
18	260	Gravel Cushion	440	TON	\$ 14.00	\$ 6,000.00
19	260	Base Course	1,800	TON	\$ 14.00	\$ 25,000.00
20	320	Asphalt Concrete Composite	420	TON	\$ 60.00	\$ 25,000.00
21	380	10.5" Nonreinforced PCC	4,400	SQYD	\$ 46.00	\$ 202,000.00
22	380	Dowel Bar	1,280	EACH	\$ 8.00	\$ 10,000.00
23	450	XX" RCP (Furn)	1,000	FT	\$ 35.00	\$ 35,000.00
24	450	XX" RCP (Inst)	1,000	FT	\$ 18.50	\$ 19,000.00
25	450	XX" End (Furn)	0	EACH	\$ 575.00	\$ -
26	450	XX" End (Inst)	0	EACH	\$ 250.00	\$ -
27	451	Sanitary Sewer Modifications	1	LS	\$ 25,000.00	\$ 25,000.00
28	451	Watermain Modifications	1	LS	\$ 30,000.00	\$ 30,000.00
29	600	Type II Field Laboratory	1	EACH	\$ 15,000.00	\$ 15,000.00
30	632	Misc. Permanent Signing	1	LS	\$ 3,500.00	\$ 4,000.00
31	633	Pavement Marking	1	LS	\$ 4,000.00	\$ 4,000.00
32	634	Traffic Control	1	LS	\$ 10,000.00	\$ 10,000.00
33	635	Roadway Lighting	1	LS	\$ 20,000.00	\$ 20,000.00
34	635	Signal System	0	EACH	\$ 175,000.00	\$ -
35	650	Type B610.5 Concrete Curb and Gutter	1,980	FT	\$ 14.00	\$ 28,000.00
36	651	6" Concrete Sidewalk	1,140	SQYD	\$ 36.00	\$ 41,000.00
37	670	Frame and Grate	8		\$ 650.00	\$ 5,000.00
38	670	Drop Inlet	8	EACH	\$ 1,500.00	\$ 12,000.00
39	670	Junction Box	5	LS	\$ 15,000.00	\$ 75,000.00
40	670	Storm Sewer - Sump Pumping System	0	LS	\$ 380,000.00	\$ -
41	730-734	Erosion Control & Restoration	1	LS	\$ 4,000.00	\$ 4,000.00
Subtotal:						\$ 1,142,000.00
Contingency (20%):						\$ 228,400.00
Roadway Subtotal:						\$ 1,370,000.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
Structure						
42	410	RR Bridge Structure - 4 Span	1	LS	\$ 2,080,000.00	\$ 2,080,000.00
43	530	MSE Large Panel Wall	1,680	SQFT	\$ 70.00	\$ 117,600.00
44	410	Track Raising - Ballast & Surfacing	2,085	FT	\$ 100.00	\$ 208,500.00
45	410	Temporary RR Shoo Fly w/ Shoring	917	FT	\$ 200.00	\$ 183,400.00
Structure Subtotal:						\$ 2,589,500.00

Construction Total: \$ 3,959,500.00

NO.	ITEM NO.	ITEM DESCRIPTION	APPROX QUANTITY	UNIT	UNIT BID PRICE	EXTENDED PRICE
RIGHT-OF-WAY						
46		Right of Way Impacts	18,650	SQFT	\$ 5.00	\$ 93,250.00
47		Impacts to Building Structures	2	EACH	\$ 75,000.00	\$ 150,000.00
48		Relocation of Private Utilities	1	LS	\$ 30,000.00	\$ 30,000.00
ROW Total:						\$ 273,250.00

Project Total: \$ 4,232,750.00

