

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



**US14B RAILROAD CROSSING
WITH DM&E RAILROAD**

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

S-Curve Alignment Options

August 31, 2006

Subject: Citizens Advisory Committee Meeting	
Client: South Dakota Department of Transportation (SDDOT)	
Project: US14B Rail Crossings through Pierre, SD	Project No: NH 2014(11)229
Meeting Date: August 31, 2006	Meeting Location: Room 153 in Becker-Hansen Building
Notes by: HDR	

Attendees:			
Kevin Murphy – Public	Dalton Huber – Public	Andy Fuhrman – Public	Bill Newling – Public
Dale Bertsch – Public	Larry & Hazel Melvin – Public	Chuck Fergen – Public	Mark Rilling - Public
Terry Keller – SDDOT	Don McCammon – HDR	Jody Page – HDR	Steve Hoff – HDR

Topics Discussed:	Action/Notes:
General Meeting Overview	This was the first meeting of the Citizens Advisory Committee (CAC). The primary goal for this meeting was to begin discussing options at the “S-Curve” location that have been developed to date. Status of the other crossings through Pierre was also discussed.
Preliminary Alternatives	<p>A handout/booklet was provided that included ten (10) alternatives along with a description and estimated cost for each of the alternatives. A brief pro’s/con’s for each option along with a preliminary comparison matrix for the structure options was included.</p> <p>The alignment alternatives HDR developed were presented and discussion took place. Some of the comments and questions that were shared include:</p> <ul style="list-style-type: none"> • Accommodation for a second rail line was shown on all options and bridge structures. This was done as a result of preliminary discussions with DME. • There is a concern with visibility to businesses located close to the existing S-Curve location if an underpass with retaining walls was constructed. This is especially true if the retaining walls are located directly behind the sidewalks. Some businesses may prefer to be removed from their current locations rather than be hindered by a retaining wall. • Sidewalks – There are safety concerns with the south sidewalk between Sioux Avenue and Wells Avenue. Due to the curve, the sidewalk may be impacted often due to visibility and winter driving conditions. Consider sidewalk on north side only, with cross walks to allow access to either side of the street east and west of the S-curve. • The question was raised if DME would participate in paying for raising the tracks. The cost estimates do not include any DME

	<p>participation and it hasn't been discussed with them at this point, but they can be approached in further stages of this study.</p> <ul style="list-style-type: none"> • A storm sewer pump will most likely be required with each of the underpass options. Groundwater and snow removal are also major concerns with an underpass at the existing S-Curve location. Ideas discussed to reduce the underpass depths were constructing bridge structures with less depths, reducing the roadway vertical clearance, and raising the tracks. • The bridge option with the pier located in the middle of the street section would require guardrail protection. The pier and guardrail present an additional hazard and causes concern with visibility. Due to the horizontal curve along with the vertical curve, any obstruction within the roadway causes an accident concern. • A cul-de-sac at Adams Avenue was not well received. It would severely impact the produce business located in the corner of Wells and Adams Avenue. Additional review of Adams Avenue or a possibility of providing a wider alley approach with additional driveway could be considered. • Some improvements could be made to the private parking lots to lessen the impacts and use of walls. • Consideration of extending Washington Avenue north to Wells Avenue and keep an at-grade crossing there with the alternatives that relocate the S-Curve east to either Monroe Avenue or Harrison Avenue. • The overpass option that the existing S-curve location was not well received due to aesthetic issues and difficulty of tying in the adjacent roadways. However, an over pass may be more suitable at the Monroe and Harrison locations due that those are primarily industrial land uses. • The existing grade-line of Wells Avenue in the vicinity of Monroe Avenue may work well with an overpass as Wells Avenue is higher than the rail.
<p>Data Gathering Status</p>	<p>The members of the CAC were give contact information for Steve Hoff and were strongly encouraged to contact him with further comments and ideas concerning the preliminary options. All comments will be considered and/or implemented into the final version of the preliminary design report that will be released to the public. The CAC members were also given a preliminary report on the improvements necessary to convert the other Pierre at-grade crossings to "whistle free" crossings. HDR is awaiting additional survey information for the S-Curve, Pierre Street, and Poplar Street crossings. Also as a follow-up from this meeting, additional survey information has been requested at Monroe and Harrison Avenue.</p> <p>Information requested from the City of Pierre include:</p> <ul style="list-style-type: none"> • 100-year flood information and • Existing Plans of previous projects in the area
<p>Schedule & Milestone Update</p>	<p>A schedule will be submitted to the SDDOT and CAC once the requested additional topographic survey information has been scheduled or completed.</p> <p>The next CAC meeting will be dependent on the above schedule, but will be held prior to the next Open House.</p>

SDDOT / CITY OF PIERRE

S-CURVE ROADWAY PRELIMINARY ALIGNMENT ALTERNATIVES COMPARISON

The following is a brief summary of ten preliminary roadway alignment options. These options were formulated to display the impacts and costs when considering several different variables of the S-curve grade-separated intersection. These options are flexible and can be revised to substitute any of these variables throughout any of the options to be shown in further stages of preliminary design. Some of these variables include the following:

- Bridge Structure Types
- Sioux Avenue Typical Roadway Sections
- Alternate Layouts of the Adjacent Intersections
- Bridge Structure Depths and Vertical Clearance
- Use of MSE walls versus 4/1 tie in slopes
- Alternate Locations for the S Curve alignment
- Sioux Avenue profile going over or under RR tracks

1.1 OPTION 1

Existing Roadway Alignment, Vertical Abutment Walls at Bridge, 18' Vertical Clearance

This alternative consists of reconstructing the S-curve in the existing location with Sioux Avenue going under the railroad tracks. It shows using MSE walls on all quadrants in order to minimize impacts to the adjacent properties. The exhibit shows the A2 single-span steel deck-plate girder (DPG) bridge spanning over the roadway. The vertical profile was set using an 18' Vertical Clearance with an 8'-6" bridge structure depth. Reconstruction limits for all options were determined from the vertical profiles using a 6% maximum grade and a 40 mph design speed.

ADVANTAGES:

Minimal right of way impacts, 0 buildings affected, Low cost of bridge option

DISADVANTAGES:

Large amount of expensive MSE walls, Low sight distances due to walls under bridge structure, Storm water pumping system needed, Deeper vertical profile from greater bridge depth creates larger pavement reconstruction area

1.2 OPTION 2

Existing Roadway Alignment, Slopes with Shallow Abutments at Bridge, 18' Vertical Clearance

This alternative consists of reconstructing the S-curve in the existing location with Sioux Avenue going under the railroad tracks. The difference from option 1 is that it shows using a 4/1 tie in slope from the back of the new sidewalk to the existing ground instead of vertical walls. The exhibit shows the B1 three-span railroad bridge option over the roadway with piers on either side of the roadway. The vertical profile was set using an 18' Vertical Clearance with a 5' bridge structure depth.

ADVANTAGES:

No Use of expensive MSE walls, Good sight distances under bridge structure and at intersections, Existing alignment uses existing ROW, Smaller structure depth lessens roadway reconstruction limits.

DISADVANTAGES:

Right of Way Impacts due to tie in slopes, 4 buildings affected, Storm water pumping system needed, Highest cost of bridge options

1.3 OPTION 3

Existing Roadway Alignment Without Center Turn lane, Vertical Abutment Walls at Bridge, 16'-4" Vertical Clearance

This alternative is very similar to Option 1 and consists of reconstructing the S-curve in it's existing location but reducing to four lanes under the bridge structure on Sioux Avenue. The other difference is that this option shows the A1 single-span steel through-plate girder (TPG) bridge with a deck depth of only 5' and a reduced vertical clearance of 16'-4. This was done to evaluate the cost savings of minimizing the depth of the vertical profile and comparing that to the additional cost of the TPG bridge structure. There could possibly be some additional savings as well in this option if, when further investigated, it's indicated that the storm water pumping system could be avoided.

ADVANTAGES:

Minimal right of way impacts, 0 buildings affected, shorter bridge span due to eliminating the center turn lane, , Smallest roadway reconstruction area, possibly eliminates storm water pumping system

DISADVANTAGES:

Large amount of expensive MSE walls, Low sight distances due to walls under bridge structure, 2nd most costly bridge option, Traffic impacts by eliminating left turn lane storage at adjacent intersections

1.4 OPTION 4

cheapest \$ bridge

Existing Roadway Alignment with a Raised Median section, Slopes with Shallow Abutments at Bridge, 18' Vertical Clearance

This alternative consists of reconstructing the S-curve in the existing location with Sioux Avenue going under the railroad tracks with the additional feature of a raised median in the center of the roadway in order to place a set of bridge piers there. This minimizes the span lengths on the bridge and saves on the structure cost, but would constrain the left turn lane lengths at the adjacent intersections. The layout shows using a 4/1 tie in slope from the back of the new sidewalk to the existing ground. The vertical profile was set using an 18' Vertical Clearance with a 6' bridge structure depth.

ADVANTAGES:

No Use of expensive MSE walls, Lowest cost of bridge options, Good Sight distances under bridge structure and at adjacent intersections, Existing alignment uses existing ROW, Shallower structure depth lessens roadway reconstruction limits.

DISADVANTAGES:

Right of Way impacts due to tie in slopes, 4 buildings affected, Storm water pumping system needed, Traffic impact by limiting left turn lane storage at adjacent intersections

1.5 OPTION 5

A 30 Degree Skew Roadway Alignment, Slopes with Shallow Abutments at Bridge, 18' Vertical Clearance

This alternative consists of reconstructing the S-curve in the same location but with altering the skew angle to 30 degrees where Sioux Avenue goes under the railroad tracks. This change to the skew angle was to analyze its effects on the layout of the roadway reconstruction limits and a shorter bridge span. It is shown using the 3 Span bridge option with 4/1 tie in slopes from the back of the new sidewalk on the roadway to the existing ground. An alternate layout for the Sioux Avenue and Washington intersection is shown on this layout as well.

ADVANTAGES:

No Use of expensive MSE walls, Alignment change saves affects to 2 buildings, Good Sight distances under bridge structure and at intersections, Shallower structure depth lessens roadway reconstruction limits, shorter bridge span and cost due to lessening the skew angle

DISADVANTAGES:

Right of Way Impacts due to tie in slopes, 2 buildings affected, Alignment change incurs more right of way impacts, Uses more expensive 3 span bridge option, Storm water pumping system needed

1.6 OPTION 6

S-Curve Alignment Shifted East of Existing, Slopes with Shallow Abutments at Bridge, 18' Vertical Clearance

This alternative consists of reconstructing the S-curve approximately 100' to the east of the existing with Sioux Avenue going under the railroad tracks. This alignment change was done to analyze the right of way and building impacts of moving off of the existing alignment. The other significant changes in this option are to the tie in limits and locations of the adjacent intersections. It shows using the 3 Span bridge option with 4/1 tie in slopes from the back of the new sidewalk on the roadway to the existing ground.

ADVANTAGES:

No Use of expensive MSE walls, Alignment change saves affects to buildings to the west, Good Sight distances under bridge structure and at intersections, Lesser of a traffic impact during construction

DISADVANTAGES:

Right of Way Impacts due to tie in slopes and shifted alignment, Significant impact to buildings east of S-curve, Uses more expensive 3 span bridge option, Storm water pumping system needed

1.7 OPTION 7

S-Curve Alignment Shifted West of Existing, Slopes with Shallow Abutments at Bridge, 18' Vertical Clearance

This alternative is similar to Option 6, but shifts the alignment to the west instead of to the east. This alignment change was done to analyze the right of way and building impacts of moving off of the existing alignment. The other significant changes in this option are to the tie in limits and locations of the adjacent intersections. It shows using the 3 Span bridge option with 4/1 tie in slopes from the back of the new sidewalk on the roadway to the existing ground.

ADVANTAGES:

No Use of expensive MSE walls, Alignment change saves affects to buildings to the east, Good sight distances under bridge structure and at intersections, Lesser of a traffic impact during construction

DISADVANTAGES:

Right of Way Impacts due to tie in slopes and shifted alignment, Significant impact to buildings west of S-curve, Uses more expensive 3 span bridge option, Storm water pumping system needed

1.8 OPTION 8

Moves the Location of the S-Curve to Monroe Avenue, Slopes with Shallow Abutments at Bridge, 18' Vertical Clearance

This alternative displays the layout of moving the S-curve from the existing location to Monroe Avenue. This would eliminate the RR crossing at Washington. Due to the amount of traffic on Sioux it is shown to be reconstructed to a 5 lane section throughout. It shows using the 3 Span bridge option with 4/1 tie in slopes from the back of the new sidewalk on the roadway to the existing ground.

ADVANTAGES:

No effects to the properties at the existing S-curve, Possible sale of ROW parcels at existing S-curve No use of expensive MSE walls, Good sight distances under bridge structure and at intersections, Lesser of a traffic impact during construction

DISADVANTAGES:

Greater Right of Way Impacts due to changing the S-curve location, Impacts to 4 buildings at the new location, large amount of roadway reconstruction to widen to 5 lane section, Additional cost of abandoning existing S-curve crossing, Uses more expensive 3 span bridge option, Storm water pumping system needed

1.9 OPTION 9

Moves the Location of the S-Curve to Harrison Avenue, Slopes with Shallow Abutments at Bridge, 18' Vertical Clearance

This alternative displays the layout of moving the S-curve from the existing location to Harrison Avenue. This would eliminate the RR crossing at Washington. This option does not show a widening of Sioux Avenue to 5 lanes which would likely be needed. It shows using the 3 Span bridge option with 4/1 tie in slopes from the back of the new sidewalk on the roadway to the existing ground.

ADVANTAGES:

No effects to the properties at the existing S-curve, Possible sale of ROW parcels at existing S-curve, No use of expensive MSE walls, Good Sight distances under bridge structure and at intersections, Lesser of a traffic impact during construction

DISADVANTAGES:

Greater Right of Way Impacts due to changing the S-curve location, Impacts to 2 buildings at the new location, Additional cost of abandoning existing S-curve crossing, Uses more expensive 3 span bridge option, Storm water pumping system needed

1.10 OPTION 10

Existing Roadway Alignment, Sioux Avenue going Over RR Tracks with MSE walls, 23'-6" Vertical Clearance

This alternative shows a layout of Sioux Avenue going over the railroad tracks. It shows using MSE walls at all back of sidewalks in order to minimize impacts to the adjacent properties and the amount of fill material needed. The vertical profile was set using a 23'6" Vertical Clearance for the railroad tracks.

ADVANTAGES:

Minimal Right of Way impacts, 0 buildings affected, Low cost of roadway bridge compared to railroad bridge, no need for storm water pumping system

DISADVANTAGES:

Aesthetics and cost of extensive amount of MSE walls, Extensive amount of roadway reconstruction due to greater clearance in vertical profile, Difficulty/Unavailability of connecting Washington and Wells Avenues

ROADWAY CONSTRUCTION PHASING

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.

ROADWAY OPTIONS CONCEPTUAL COST COMPARISON

A cost estimate was prepared for each of the layout options using average bid prices from previous projects. The number of buildings affected and the amount of right of way needed was calculated and shown for each option, but no costs were included in the totals. The attached tables depict the total conceptual cost of each roadway and is meant for comparison of alternatives only.

S-CURVE BRIDGE ALTERNATIVES COMPARISON

1.1 Alternative A1

This alternative consists of a 140-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 5-ft. The bridge would be skewed with the roadway approximately 45 degrees.

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.

1.2 Alternative A2

This alternative consists of a 140-ft single-span deck-plate girder (DPG) bridge across the roadway. The DPG 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 9-ft. The bridge would be skewed with the roadway approximately 45 degrees.

The span would rest on tall and massive abutments supported by driven H-pile, very similar to Alternative A1. Tall and long wingwalls would need to be constructed to retain fill adjacent to the sidewalks. The concrete abutments could also be formlined to provide an aesthetically pleasing texture.

1.3 Alternative B1

This alternative 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.

Rolled 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.

1.4 Alternative B2

This alternative consists of a 228-ft three-span bridge spanning over the roadway. The middle span would be a steel DPG and would be made up of dark brown, self-weathering steel. The DPG 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 9-ft. The bridge would be skewed with the roadway approximately 45 degrees.

Rolled 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 piers and abutments would be similar to Alternative B1.

1.5 Alternative C

This alternative 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.

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. However, special detour consideration will be provided for uninterrupted access to the nearby 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.

BRIDGE OPTIONS 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	A1	A2	B1	B2	C
Cost	\$ 4,370,000	\$ 3,360,000	\$ 5,280,000	\$ 3,980,000	\$ 2,800,000

COMPARISON OF BRIDGE ALTERNATIVES

Listed below in Table 2 is a graphical representation of the alternatives comparison based on the above analyses. The emptier the circle, the better, or the least damaging of the bridge alternatives.

- - Least impact, lowest cost, meets criteria, "best" option
- ◐ - Some impact, median cost, closely meets criteria, "intermediate" option
- - Major impact, highest cost, does not meet criteria, "least favorable" option

Table 1: Bridge Alternatives Evaluation Matrix

Bridge Alternative -->	A1	A2	B1	B2	C
Construction Impacts	●	●	◐	○	○
Pumphouse Facility Impacts	◐	●	◐	●	○
Right-of-way Impacts	◐	◐	○	○	○
Railroad Operations / Impact	◐	●	◐	●	○
Railroad Bridge Maintenance	●	◐	●	◐	○
Bridge Cost (could Δ to Project Cost)	●	◐	●	◐	○
Bicycle/Pedestrian Access	◐	○	◐	○	○
Emergency Services Access	○	○	○	○	●
Site Distance	◐	◐	○	○	●
Safety	○	○	◐	◐	◐

RECOMMENDED BRIDGE ALTERNATIVE

As a result of this conceptual comparison study, Alternative C is recommended due to the lesser probable structure cost, ease of constructibility, 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.

S-Curve - OPTION 1 - Existing Alignment, DPG Bridge Structure

Vertical Abutments, 18' Clearance, 8'-6" Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE	
Roadway						
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00 \$ 12,000.00	
2	004	Remove Detour	L.S.	1	\$ 2,000.00 \$ 2,000.00	
3	009	Mobilization	L.S.	1	\$ 750,000.00 \$ 750,000.00	
4	110	Misc. Removals	L.S.	1	\$ 10,000.00 \$ 10,000.00	
5	110	Remove Pavement	Sq.Yd.	19,728	\$ 4.00 \$ 78,912.00	
6	120	Unclassified Excavation	Cu.Yd.	96,500	\$ 3.00 \$ 289,500.00	
7	120	Option Borrow Excavation	Cu.Yd.	0	\$ 3.50 \$ -	
8	230	Salvage & Place Topsoil	Cu.Yd.	860	\$ 3.50 \$ 3,010.00	
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00 \$ 15,000.00	
10	260	Gravel Cushion	Ton	5,035	\$ 15.00 \$ 75,525.00	
11	380	9.5" Nonreinforced PCC	Sq.Yd.	13,470	\$ 42.00 \$ 565,740.00	
12	380	Asphalt Concrete Composite	Ton	434	\$ 60.00 \$ 26,040.00	
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00 \$ 4,000.00	
14	633	Pavement Marking	L.S.	1	\$ 8,000.00 \$ 8,000.00	
15	634	Traffic Control	L.S.	1	\$ 20,000.00 \$ 20,000.00	
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00 \$ 50,000.00	
17	635	Remove/Reset Traffic Signal System	Each	2	\$ 180,000.00 \$ 360,000.00	
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	4,399	\$ 14.00 \$ 61,586.00	
19	651	6" Concrete Sidewalk	Sq.Yd.	2,706	\$ 4.50 \$ 12,177.00	
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00 \$ 52,000.00	
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00 \$ 40,000.00	
22	670	Drop Inlet	Each	14	\$ 5,000.00 \$ 70,000.00	
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00 \$ 100,000.00	
24	670	Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00 \$ 380,000.00	
25	530	MSE Wall	Sq.Ft.	25,200	\$ 50.00 \$ 1,260,000.00	
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00 \$ 8,000.00	
					Contingency (20%)	\$ 850,698.00
					Roadway Subtotal:	\$ 5,104,188.00
Bridge Structure						
27	410	RR Bridge Structure - 3 Span	L.S.	1	\$5,228,000.00 \$ 5,228,000.00	
28	410	Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$100.00 \$ 208,500.00	
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$200.00 \$ 183,400.00	
					Contingency (20%)	\$ 1,123,980.00
					Structure Subtotal:	\$ 6,743,880.00
					Construction Total:	\$ 11,848,068.00
Right of Way Impacts		Sq.Ft.	17,700	\$5.00	\$ 88,500.00	
Impacts to Building Structures		Each	0	\$75,000.00	\$ -	

Grand Total: \$ 11,937,000.00

S-Curve - OPTION 2 - Existing Alignment, 3-Span Bridge Structure

Shallow Abutments, 18' Clearance, 5' Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE	
Roadway						
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00 \$ 12,000.00	
2	004	Remove Detour	L.S.	1	\$ 2,000.00 \$ 2,000.00	
3	009	Mobilization	L.S.	1	\$ 750,000.00 \$ 750,000.00	
4	110	Misc. Removals	L.S.	1	\$ 10,000.00 \$ 10,000.00	
5	110	Remove Pavement	Sq.Yd.	19,257	\$ 4.00 \$ 77,028.00	
6	120	Unclassified Excavation	Cu.Yd.	80,800	\$ 3.00 \$ 242,400.00	
7	120	Option Borrow Excavation	Cu.Yd.	0	\$ 3.50 \$ -	
8	230	Salvage & Place Topsoil	Cu.Yd.	1,166	\$ 3.50 \$ 4,081.00	
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00 \$ 15,000.00	
10	260	Gravel Cushion	Ton	4,074	\$ 15.00 \$ 61,110.00	
11	380	9.5" Nonreinforced PCC	Sq.Yd.	11,374	\$ 42.00 \$ 477,708.00	
12	380	Asphalt Concrete Composite	Ton	223	\$ 60.00 \$ 13,380.00	
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00 \$ 4,000.00	
14	633	Pavement Marking	L.S.	1	\$ 8,000.00 \$ 8,000.00	
15	634	Traffic Control	L.S.	1	\$ 20,000.00 \$ 20,000.00	
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00 \$ 50,000.00	
17	635	Remove/Reset Traffic Signal System	Each		\$ 180,000.00 \$ -	
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	3,530	\$ 14.00 \$ 49,420.00	
19	651	6" Concrete Sidewalk	Sq.Yd.	2,217	\$ 4.50 \$ 9,976.50	
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00 \$ 52,000.00	
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00 \$ 40,000.00	
22	670	Drop Inlet	Each	12	\$ 5,000.00 \$ 60,000.00	
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00 \$ 100,000.00	
24	670	Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00 \$ 380,000.00	
25	530	MSE Wall	Sq.Yd.	0	\$ 50.00 \$ -	
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00 \$ 8,000.00	
					Contingency (20%)	\$ 489,220.70
					Roadway Subtotal:	\$ 2,935,324.20

Bridge Structure						
27	410	RR Bridge Structure - 3 Span	L.S.	1	\$ 5,228,000.00 \$ 5,228,000.00	
28	410	Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$ 100.00 \$ 208,500.00	
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$ 200.00 \$ 183,400.00	
					Contingency (20%)	\$ 1,123,980.00
					Structure Subtotal:	\$ 6,743,880.00
					Construction Total:	\$ 9,679,204.20

Right of Way Impacts	Sq.Ft.	88,300	\$ 5.00	\$ 441,500.00
Impacts to Building Structures	Each	4	\$ 75,000.00	\$ 300,000.00

Grand Total: \$10,421,000.00

S-Curve - OPTION 3 - Existing Alignment (4 Lane), TPG Bridge Structure

Vertical Abutments, 16'-4" Clearance, 5' Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE	
Roadway						
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00 \$ 12,000.00	
2	004	Remove Detour	L.S.	1	\$ 2,000.00 \$ 2,000.00	
3	009	Mobilization	L.S.	1	\$ 750,000.00 \$ 750,000.00	
4	110	Misc. Removals	L.S.	1	\$ 10,000.00 \$ 10,000.00	
5	110	Remove Pavement	Sq.Yd.	16,576	\$ 4.00 \$ 66,304.00	
6	120	Unclassified Excavation	Cu.Yd.	66,100	\$ 3.00 \$ 198,300.00	
7	120	Option Borrow Excavation	Cu.Yd.	0	\$ 3.50 \$ -	
8	230	Salvage & Place Topsoil	Cu.Yd.	978	\$ 3.50 \$ 3,423.00	
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00 \$ 15,000.00	
10	260	Gravel Cushion	Ton	4,744	\$ 15.00 \$ 71,160.00	
11	380	9.5" Nonreinforced PCC	Sq.Yd.	11,139	\$ 42.00 \$ 467,838.00	
12	380	Asphalt Concrete Composite	Ton	253	\$ 60.00 \$ 15,180.00	
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00 \$ 4,000.00	
14	633	Pavement Marking	L.S.	1	\$ 8,000.00 \$ 8,000.00	
15	634	Traffic Control	L.S.	1	\$ 20,000.00 \$ 20,000.00	
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00 \$ 50,000.00	
17	635	Remove/Reset Traffic Signal System	Each		\$ 180,000.00 \$ -	
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	3,623	\$ 14.00 \$ 50,722.00	
19	651	6" Concrete Sidewalk	Sq.Yd.	2,239	\$ 4.50 \$ 10,075.50	
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00 \$ 52,000.00	
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00 \$ 40,000.00	
22	670	Drop Inlet	Each	12	\$ 5,000.00 \$ 60,000.00	
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00 \$ 100,000.00	
24	670	Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00 \$ 380,000.00	
25	530	MSE Wall	Sq.Yd.	2,000	\$ 50.00 \$ 100,000.00	
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00 \$ 8,000.00	
					Contingency (20%)	\$ 498,800.50
					Roadway Subtotal:	\$ 2,992,803.00

Bridge Structure						
27	410	RR Bridge Structure - 3 Span	L.S.	1	\$ 5,228,000.00 \$ 5,228,000.00	
28	410	Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$ 100.00 \$ 208,500.00	
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$ 200.00 \$ 183,400.00	
					Contingency (20%)	\$ 1,123,980.00
					Structure Subtotal:	\$ 6,743,880.00
					Construction Total:	\$ 9,736,683.00

Right of Way Impacts		Sq.Ft.	16,500	\$ 5.00	\$ 82,500.00
Impacts to Building Structures		Each	0	\$ 75,000.00	\$ -

Grand Total: \$ 9,819,000.00

S-Curve - OPTION 4 - Existing Alignment (With Median), 4-Span Bridge Structure

Shallow Abutments, 18' Clearance, 4'-6" Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE	
Roadway						
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	L.S.	1	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	L.S.	1	\$ 750,000.00	\$ 750,000.00
4	110	Misc. Removals	L.S.	1	\$ 10,000.00	\$ 10,000.00
5	110	Remove Pavement	Sq.Yd.	20,212	\$ 4.00	\$ 80,848.00
6	120	Unclassified Excavation	Cu.Yd.	85,400	\$ 3.00	\$ 256,200.00
7	120	Option Borrow Excavation	Cu.Yd.	0	\$ 3.50	\$ -
8	230	Salvage & Place Topsoil	Cu.Yd.	1,533	\$ 3.50	\$ 5,365.50
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00	\$ 15,000.00
10	260	Gravel Cushion	Ton	4,139	\$ 15.00	\$ 62,085.00
11	380	9.5" Nonreinforced PCC	Sq.Yd.	11,811	\$ 42.00	\$ 496,062.00
12	380	Asphalt Concrete Composite	Ton	191	\$ 60.00	\$ 11,460.00
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00	\$ 4,000.00
14	633	Pavement Marking	L.S.	1	\$ 8,000.00	\$ 8,000.00
15	634	Traffic Control	L.S.	1	\$ 20,000.00	\$ 20,000.00
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00	\$ 50,000.00
17	635	Remove/Reset Traffic Signal System	Each		\$ 180,000.00	\$ -
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	3,718	\$ 14.00	\$ 52,052.00
19	651	6" Concrete Sidewalk	Sq.Yd.	1,743	\$ 4.50	\$ 7,843.50
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00	\$ 52,000.00
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00	\$ 40,000.00
22	670	Drop Inlet	Each	12	\$ 5,000.00	\$ 60,000.00
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00	\$ 100,000.00
24	670	Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00	\$ 380,000.00
25	530	MSE Wall	Sq.Yd.	0	\$ 50.00	\$ -
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00	\$ 8,000.00
					Contingency (20%)	\$ 496,583.20
					Roadway Subtotal:	\$ 2,979,499.20
Bridge Structure						
27	410	RR Bridge Structure - 3 Span	L.S.	1	\$ 5,228,000.00	\$ 5,228,000.00
28	410	Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$ 100.00	\$ 208,500.00
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$ 200.00	\$ 183,400.00
					Contingency (20%)	\$ 1,123,980.00
					Structure Subtotal:	\$ 6,743,880.00
					Construction Total:	\$ 9,723,379.20
Right of Way Impacts		Sq.Ft.	91,200	\$ 5.00	\$ 456,000.00	
Impacts to Building Structures		Each	4	\$ 75,000.00	\$ 300,000.00	

Grand Total: \$10,479,000.00

S-Curve - OPTION 5 - 30 Degree Skew Alignment, 3-Span Bridge Structure

Shallow Abutments, 18' Clearance, 5' Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE	
Roadway						
1	004 Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00	\$ 12,000.00	
2	004 Remove Detour	L.S.	1	\$ 2,000.00	\$ 2,000.00	
3	009 Mobilization	L.S.	1	\$ 750,000.00	\$ 750,000.00	
4	110 Misc. Removals	L.S.	1	\$ 10,000.00	\$ 10,000.00	
5	110 Remove Pavement	Sq.Yd.	23,965	\$ 4.00	\$ 95,860.00	
6	120 Unclassified Excavation	Cu.Yd.	88,800	\$ 3.00	\$ 266,400.00	
7	120 Option Borrow Excavation	Cu.Yd.	0	\$ 3.50	\$ -	
8	230 Salvage & Place Topsoil	Cu.Yd.	1,864	\$ 3.50	\$ 6,524.00	
9	250 Incidental Work, Grading	L.S.	1	\$ 15,000.00	\$ 15,000.00	
10	260 Gravel Cushion	Ton	4,606	\$ 15.00	\$ 69,090.00	
11	380 9.5" Nonreinforced PCC	Sq.Yd.	12,559	\$ 42.00	\$ 527,478.00	
12	380 Asphalt Concrete Composite	Ton	285	\$ 60.00	\$ 17,100.00	
13	632 Misc. Permanent Signing	L.S.	1	\$ 4,000.00	\$ 4,000.00	
14	633 Pavement Marking	L.S.	1	\$ 8,000.00	\$ 8,000.00	
15	634 Traffic Control	L.S.	1	\$ 20,000.00	\$ 20,000.00	
16	635 Roadway Lighting	L.S.	1	\$ 50,000.00	\$ 50,000.00	
17	635 Remove/Reset Traffic Signal System	Each		\$ 180,000.00	\$ -	
18	650 Type B69.5 Concrete Curb and Gutter	L.Ft.	4,404	\$ 14.00	\$ 61,656.00	
19	651 6" Concrete Sidewalk	Sq.Yd.	2,539	\$ 4.50	\$ 11,425.50	
20	451 Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00	\$ 52,000.00	
21	451 Watermain Modifications	L.S.	1	\$ 40,000.00	\$ 40,000.00	
22	670 Drop Inlet	Each	14	\$ 5,000.00	\$ 70,000.00	
23	670 Storm Sewer Pipe	L.S.	1	\$ 100,000.00	\$ 100,000.00	
24	670 Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00	\$ 380,000.00	
25	530 MSE Wall	Sq.Yd.	0	\$ 50.00	\$ -	
26	730-734 Erosion Control & Restoration	L.S.	1	\$ 8,000.00	\$ 8,000.00	
					Contingency (20%)	\$ 515,306.70
					Roadway Subtotal:	\$ 3,091,840.20

Bridge Structure						
27	410 RR Bridge Structure - 3 Span	L.S.	1	\$ 5,228,000.00	\$ 5,228,000.00	
28	410 Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$ 100.00	\$ 208,500.00	
29	410 Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$ 200.00	\$ 183,400.00	
					Contingency (20%)	\$ 1,123,980.00
					Structure Subtotal:	\$ 6,743,880.00
					Construction Total:	\$ 9,835,720.20

Right of Way Impacts	Sq.Ft.	104,500	\$ 5.00	\$ 522,500.00
Impacts to Building Structures	Each	2	\$ 75,000.00	\$ 150,000.00

Grand Total: \$10,508,000.00

S-Curve - OPTION 6 - Alignment Shifted West, 3-Span Bridge Structure

Shallow Abutments, 18' Clearance, 5' Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE	
Roadway						
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	L.S.	1	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	L.S.	1	\$ 750,000.00	\$ 750,000.00
4	110	Misc. Removals	L.S.	1	\$ 10,000.00	\$ 10,000.00
5	110	Remove Pavement	Sq.Yd.	27235	\$ 4.00	\$ 108,940.00
6	120	Unclassified Excavation	Cu.Yd.	103500	\$ 3.00	\$ 310,500.00
7	120	Option Borrow Excavation	Cu.Yd.	0	\$ 3.50	\$ -
8	230	Salvage & Place Topsoil	Cu.Yd.	6231	\$ 3.50	\$ 21,808.50
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00	\$ 15,000.00
10	260	Gravel Cushion	Ton	4980	\$ 15.00	\$ 74,700.00
11	380	9.5" Nonreinforced PCC	Sq.Yd.	14228	\$ 42.00	\$ 597,576.00
12	380	Asphalt Concrete Composite	Ton	171	\$ 60.00	\$ 10,260.00
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00	\$ 4,000.00
14	633	Pavement Marking	L.S.	1	\$ 8,000.00	\$ 8,000.00
15	634	Traffic Control	L.S.	1	\$ 20,000.00	\$ 20,000.00
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00	\$ 50,000.00
17	635	Remove/Reset Traffic Signal System	Each		\$ 180,000.00	\$ -
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	4758	\$ 14.00	\$ 66,612.00
19	651	6" Concrete Sidewalk	Sq.Yd.	2446	\$ 4.50	\$ 11,007.00
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00	\$ 52,000.00
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00	\$ 40,000.00
22	670	Drop Inlet	Each	14	\$ 5,000.00	\$ 70,000.00
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00	\$ 100,000.00
24	670	Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00	\$ 380,000.00
25	530	MSE Wall	Sq.Yd.	0	\$ 50.00	\$ -
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00	\$ 8,000.00
					Contingency (20%)	\$ 544,480.70
					Roadway Subtotal:	\$ 3,266,884.20
Bridge Structure						
27	410	RR Bridge Structure - 3 Span	L.S.	1	\$ 5,228,000.00	\$ 5,228,000.00
28	410	Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$ 100.00	\$ 208,500.00
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$ 200.00	\$ 183,400.00
					Contingency (20%)	\$ 1,123,980.00
					Structure Subtotal:	\$ 6,743,880.00
					Construction Total:	\$ 10,010,764.20
Right of Way Impacts		Sq.Ft.	156,000	\$ 5.00	\$ 780,000.00	
Impacts to Building Structures		Each	3	\$ 75,000.00	\$ 225,000.00	

Grand Total: \$11,016,000.00

S-Curve - OPTION 7 - Alignment Shifted East, 3-Span Bridge Structure

Shallow Abutments, 18' Clearance, 5' Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE
Roadway					
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00 \$ 12,000.00
2	004	Remove Detour	L.S.	1	\$ 2,000.00 \$ 2,000.00
3	009	Mobilization	L.S.	1	\$ 750,000.00 \$ 750,000.00
4	110	Misc. Removals	L.S.	1	\$ 10,000.00 \$ 10,000.00
5	110	Remove Pavement	Sq.Yd.	24,094	\$ 4.00 \$ 96,376.00
6	120	Unclassified Excavation	Cu.Yd.	99,800	\$ 3.00 \$ 299,400.00
7	120	Option Borrow Excavation	Cu.Yd.	0	\$ 3.50 \$ -
8	230	Salvage & Place Topsoil	Cu.Yd.	1,896	\$ 3.50 \$ 6,636.00
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00 \$ 15,000.00
10	260	Gravel Cushion	Ton	4,959	\$ 15.00 \$ 74,385.00
11	380	9.5" Nonreinforced PCC	Sq.Yd.	12,778	\$ 42.00 \$ 536,676.00
12	380	Asphalt Concrete Composite	Ton	541	\$ 60.00 \$ 32,460.00
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00 \$ 4,000.00
14	633	Pavement Marking	L.S.	1	\$ 8,000.00 \$ 8,000.00
15	634	Traffic Control	L.S.	1	\$ 20,000.00 \$ 20,000.00
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00 \$ 50,000.00
17	635	Remove/Reset Traffic Signal System	Each		\$ 180,000.00 \$ -
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	4,582	\$ 14.00 \$ 64,148.00
19	651	6" Concrete Sidewalk	Sq.Yd.	2,453	\$ 4.50 \$ 11,038.50
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00 \$ 52,000.00
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00 \$ 40,000.00
22	670	Drop Inlet	Each	12	\$ 5,000.00 \$ 60,000.00
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00 \$ 100,000.00
24	670	Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00 \$ 380,000.00
25	530	MSE Wall	Sq.Yd.	0	\$ 50.00 \$ -
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00 \$ 8,000.00
					Contingency (20%) \$ 526,423.90
					Roadway Subtotal: \$ 3,158,543.40

Bridge Structure					
27	410	RR Bridge Structure - 3 Span	L.S.	1	\$ 5,228,000.00 \$ 5,228,000.00
28	410	Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$ 100.00 \$ 208,500.00
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$ 200.00 \$ 183,400.00
					Contingency (20%) \$ 1,123,980.00
					Structure Subtotal: \$ 6,743,880.00
					Construction Total: \$ 9,902,423.40

Right of Way Impacts	Sq.Ft.	115,800	\$ 5.00	\$ 579,000.00
Impacts to Building Structures	Each	2	\$ 75,000.00	\$ 150,000.00

Grand Total: \$10,631,000.00

S-Curve - OPTION 8 - S-Curve Moved to Monroe Avenue, 3-Span Bridge Structure

Shallow Abutments, 18' Clearance, 5' Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE	
Roadway						
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	L.S.	1	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	L.S.	1	\$ 750,000.00	\$ 750,000.00
4	110	Misc. Removals	L.S.	1	\$ 10,000.00	\$ 10,000.00
5	110	Remove Pavement	Sq.Yd.	46818	\$ 4.00	\$ 187,272.00
6	120	Unclassified Excavation	Cu.Yd.	104400	\$ 3.00	\$ 313,200.00
7	120	Option Borrow Excavation	Cu.Yd.	0	\$ 3.50	\$ -
8	230	Salvage & Place Topsoil	Cu.Yd.	2753	\$ 3.50	\$ 9,635.50
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00	\$ 15,000.00
10	260	Gravel Cushion	Ton	8964	\$ 15.00	\$ 134,460.00
11	380	9.5" Nonreinforced PCC	Sq.Yd.	26046	\$ 42.00	\$ 1,093,932.00
12	380	Asphalt Concrete Composite	Ton	423	\$ 60.00	\$ 25,380.00
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00	\$ 4,000.00
14	633	Pavement Marking	L.S.	1	\$ 8,000.00	\$ 8,000.00
15	634	Traffic Control	L.S.	1	\$ 20,000.00	\$ 20,000.00
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00	\$ 50,000.00
17	635	Remove/Reset Traffic Signal System	Each		\$ 180,000.00	\$ -
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	8100	\$ 14.00	\$ 113,400.00
19	651	6" Concrete Sidewalk	Sq.Yd.	2373	\$ 4.50	\$ 10,678.50
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00	\$ 52,000.00
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00	\$ 40,000.00
22	670	Drop Inlet	Each	26	\$ 5,000.00	\$ 130,000.00
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00	\$ 100,000.00
24	670	Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00	\$ 380,000.00
25	530	MSE Wall	Sq.Yd.	0	\$ 50.00	\$ -
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00	\$ 8,000.00
					Contingency (20%)	\$ 693,791.60
					Roadway Subtotal:	\$ 4,162,749.60

Bridge Structure						
27	410	RR Bridge Structure - 3 Span	L.S.	1	\$ 5,228,000.00	\$ 5,228,000.00
28	410	Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$ 100.00	\$ 208,500.00
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$ 200.00	\$ 183,400.00
					Contingency (20%)	\$ 1,123,980.00
					Structure Subtotal:	\$ 6,743,880.00
					Construction Total:	\$ 10,906,629.60

Right of Way Impacts	Sq.Ft.	174,500	\$ 5.00	\$ 872,500.00
Impacts to Building Structures	Each	4	\$ 75,000.00	\$ 300,000.00

Grand Total: \$12,079,000.00

S-Curve - OPTION 9 - S-Curve Moved to Harrison Avenue, 3-Span Bridge Structure

Shallow Abutments, 18' Clearance, 5' Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE
Roadway					
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00 \$ 12,000.00
2	004	Remove Detour	L.S.	1	\$ 2,000.00 \$ 2,000.00
3	009	Mobilization	L.S.	1	\$ 750,000.00 \$ 750,000.00
4	110	Misc. Removals	L.S.	1	\$ 10,000.00 \$ 10,000.00
5	110	Remove Pavement	Sq.Yd.	24869	\$ 4.00 \$ 99,476.00
6	120	Unclassified Excavation	Cu.Yd.	87500	\$ 3.00 \$ 262,500.00
7	120	Option Borrow Excavation	Cu.Yd.	0	\$ 3.50 \$ -
8	230	Salvage & Place Topsoil	Cu.Yd.	2145	\$ 3.50 \$ 7,507.50
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00 \$ 15,000.00
10	260	Gravel Cushion	Ton	6192	\$ 15.00 \$ 92,880.00
11	380	9.5" Nonreinforced PCC	Sq.Yd.	16602	\$ 42.00 \$ 697,284.00
12	380	Asphalt Concrete Composite	Ton	673	\$ 60.00 \$ 40,380.00
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00 \$ 4,000.00
14	633	Pavement Marking	L.S.	1	\$ 8,000.00 \$ 8,000.00
15	634	Traffic Control	L.S.	1	\$ 20,000.00 \$ 20,000.00
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00 \$ 50,000.00
17	635	Remove/Reset Traffic Signal System	Each		\$ 180,000.00 \$ -
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	5527	\$ 14.00 \$ 77,378.00
19	651	6" Concrete Sidewalk	Sq.Yd.	1795	\$ 4.50 \$ 8,077.50
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00 \$ 52,000.00
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00 \$ 40,000.00
22	670	Drop Inlet	Each	22	\$ 5,000.00 \$ 110,000.00
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00 \$ 100,000.00
24	670	Storm Sewer - Sump Pumping System	L.S.	1	\$ 380,000.00 \$ 380,000.00
25	530	MSE Wall	Sq.Yd.	350	\$ 50.00 \$ 17,500.00
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00 \$ 8,000.00
					Contingency (20%) \$ 572,796.60
					Roadway Subtotal: \$ 3,436,779.60
Bridge Structure					
27	410	RR Bridge Structure - 3 Span	L.S.	1	\$ 5,228,000.00 \$ 5,228,000.00
28	410	Track Raising - Ballast & Surfacing	L.Ft.	2,085	\$ 100.00 \$ 208,500.00
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	917	\$ 200.00 \$ 183,400.00
					Contingency (20%) \$ 561,990.00
					Structure Subtotal: \$ 6,181,890.00
					Construction Total: \$ 9,618,669.60
Right of Way Impacts		Sq.Ft.	168,900	\$ 5.00	\$ 844,500.00
Impacts to Building Structures		Each	2	\$ 75,000.00	\$ 150,000.00

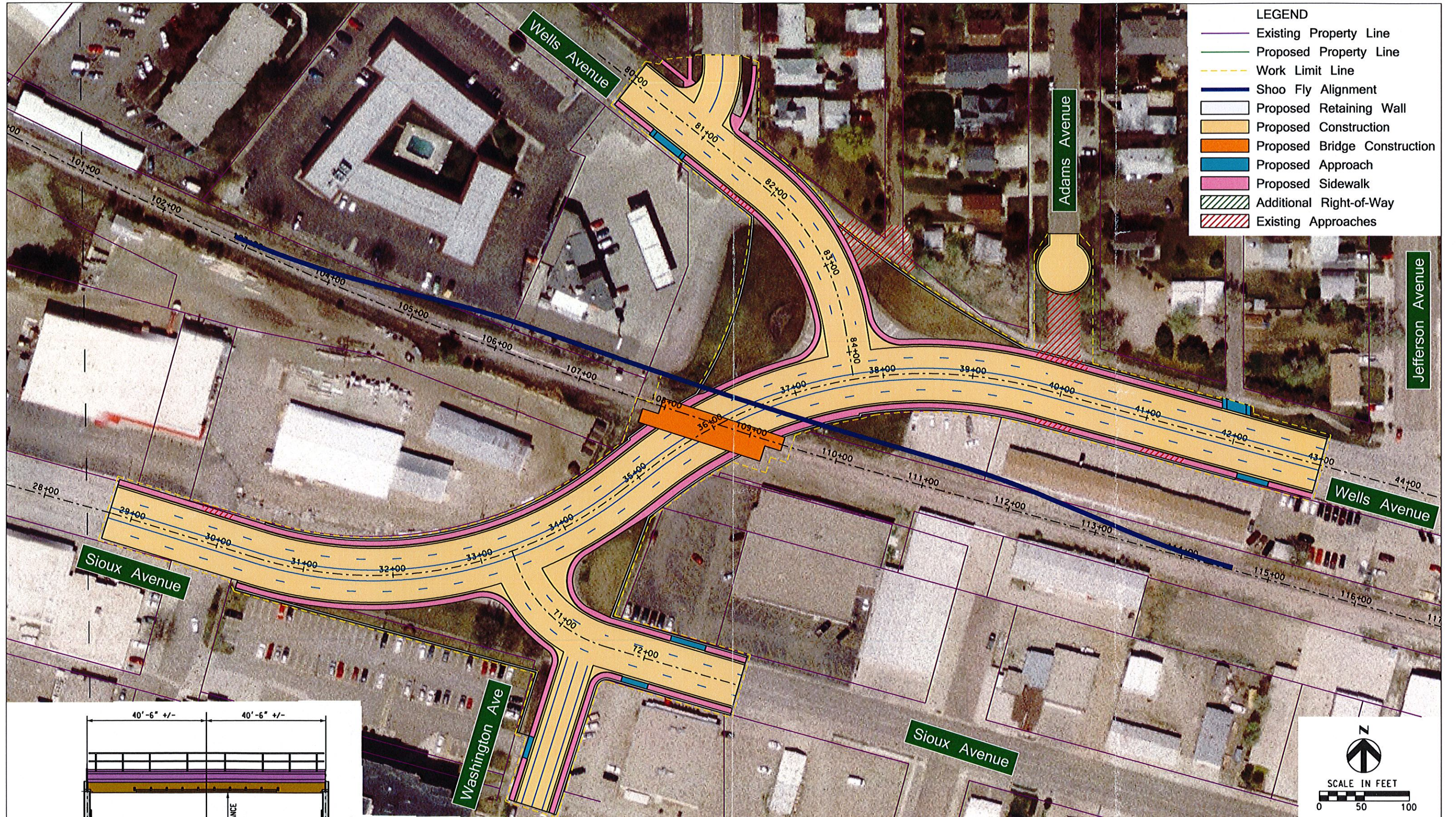
Grand Total: \$10,613,000.00

S-Curve - OPTION 10 - Existing Alignment (Sioux Over RR), Roadway Bridge Structure

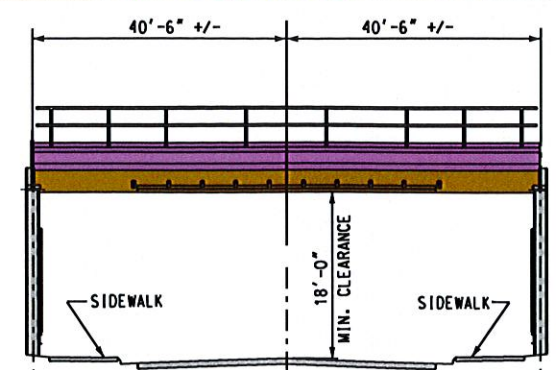
Vertical Abutments, 23'-6" Clearance, 5' Bridge Depth

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX QUANTITY	UNIT BID PRICE	EXTENDED PRICE	
Roadway						
1	004	Construction & Maintenance of Detours	L.S.	1	\$ 12,000.00	\$ 12,000.00
2	004	Remove Detour	L.S.	1	\$ 2,000.00	\$ 2,000.00
3	009	Mobilization	L.S.	1	\$ 750,000.00	\$ 750,000.00
4	110	Misc. Removals	L.S.	1	\$ 10,000.00	\$ 10,000.00
5	110	Remove Pavement	Sq.Yd.	21,108	\$ 4.00	\$ 84,432.00
6	120	Unclassified Excavation	Cu.Yd.	0	\$ 3.00	\$ -
7	120	Option Borrow Excavation	Cu.Yd.	95,600	\$ 3.50	\$ 334,600.00
8	230	Salvage & Place Topsoil	Cu.Yd.	227	\$ 3.50	\$ 794.50
9	250	Incidental Work, Grading	L.S.	1	\$ 15,000.00	\$ 15,000.00
10	260	Gravel Cushion	Ton	4,942	\$ 15.00	\$ 74,130.00
11	380	9.5" Nonreinforced PCC	Sq.Yd.	14,552	\$ 42.00	\$ 611,184.00
12	380	Asphalt Concrete Composite	Ton	0	\$ 60.00	\$ -
13	632	Misc. Permanent Signing	L.S.	1	\$ 4,000.00	\$ 4,000.00
14	633	Pavement Marking	L.S.	1	\$ 8,000.00	\$ 8,000.00
15	634	Traffic Control	L.S.	1	\$ 20,000.00	\$ 20,000.00
16	635	Roadway Lighting	L.S.	1	\$ 50,000.00	\$ 50,000.00
17	635	Remove/Reset Traffic Signal System	Each		\$ 180,000.00	\$ -
18	650	Type B69.5 Concrete Curb and Gutter	L.Ft.	4,480	\$ 14.00	\$ 62,720.00
19	651	6" Concrete Sidewalk	Sq.Yd.	3,195	\$ 4.50	\$ 14,377.50
20	451	Sanitary Sewer Modifications	L.S.	1	\$ 52,000.00	\$ 52,000.00
21	451	Watermain Modifications	L.S.	1	\$ 40,000.00	\$ 40,000.00
22	670	Drop Inlet	Each	14	\$ 5,000.00	\$ 70,000.00
23	670	Storm Sewer Pipe	L.S.	1	\$ 100,000.00	\$ 100,000.00
24	670	Storm Sewer - Sump Pumping System	L.S.	0	\$ 380,000.00	\$ -
25	530	MSE Wall	Sq.Yd.	6,900	\$ 50.00	\$ 345,000.00
26	730-734	Erosion Control & Restoration	L.S.	1	\$ 8,000.00	\$ 8,000.00
					Contingency (20%)	\$ 533,647.60
					Roadway Subtotal:	\$ 3,201,885.60
Bridge Structure						
27	410	Sioux Ave Bridge - Concrete Girders	L.S.	1	\$ 675,000.00	\$ 675,000.00
28	410	Track Raising - Ballast & Surfacing	L.Ft.	0	\$ 100.00	\$ -
29	410	Temporary RR Shoo Fly w/ Shoring	L.Ft.	0	\$ 200.00	\$ -
					Contingency (20%)	\$ 135,000.00
					Structure Subtotal:	\$ 810,000.00
					Construction Total:	\$ 4,011,885.60
Right of Way Impacts		Sq.Ft.	19,800	\$ 5.00	\$ 99,000.00	
Impacts to Building Structures		Each	0	\$ 75,000.00	\$ -	

Grand Total: \$4,111,000.00

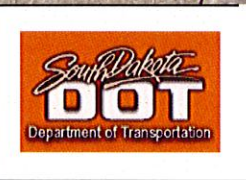
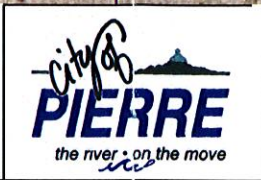


- LEGEND**
- Existing Property Line
 - Proposed Property Line
 - - - Work Limit Line
 - Shoo Fly Alignment
 - Proposed Retaining Wall
 - Proposed Construction
 - Proposed Bridge Construction
 - Proposed Approach
 - Proposed Sidewalk
 - ▨ Additional Right-of-Way
 - ▨ Existing Approaches

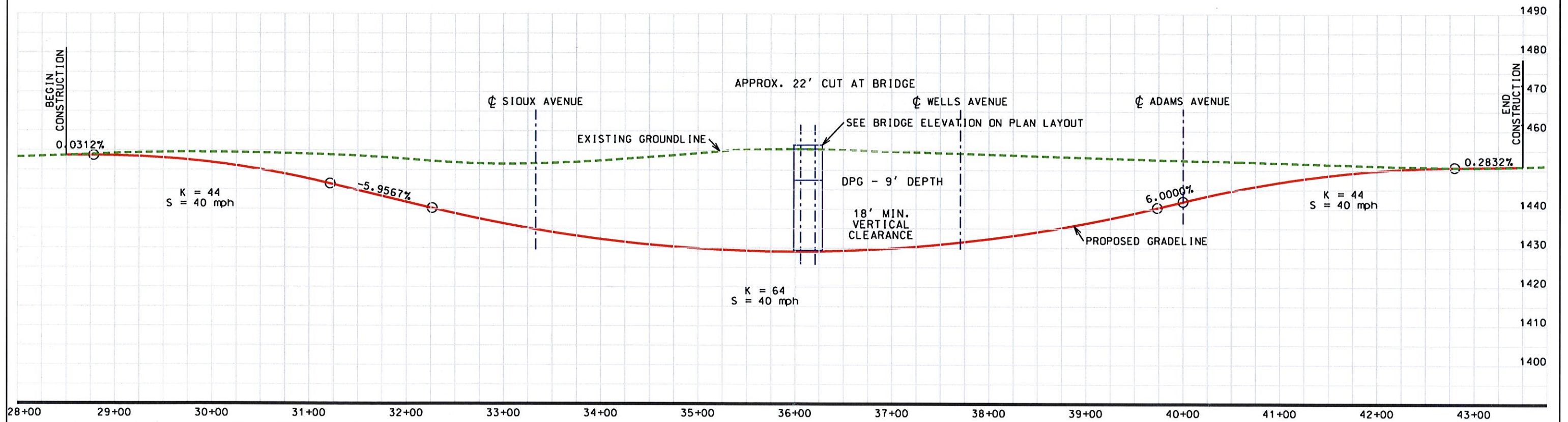


A2 Single-Span, Deck Plate Girder, 8'-6" Depth

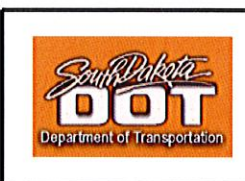
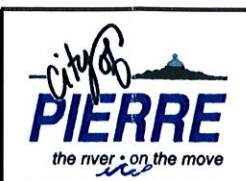
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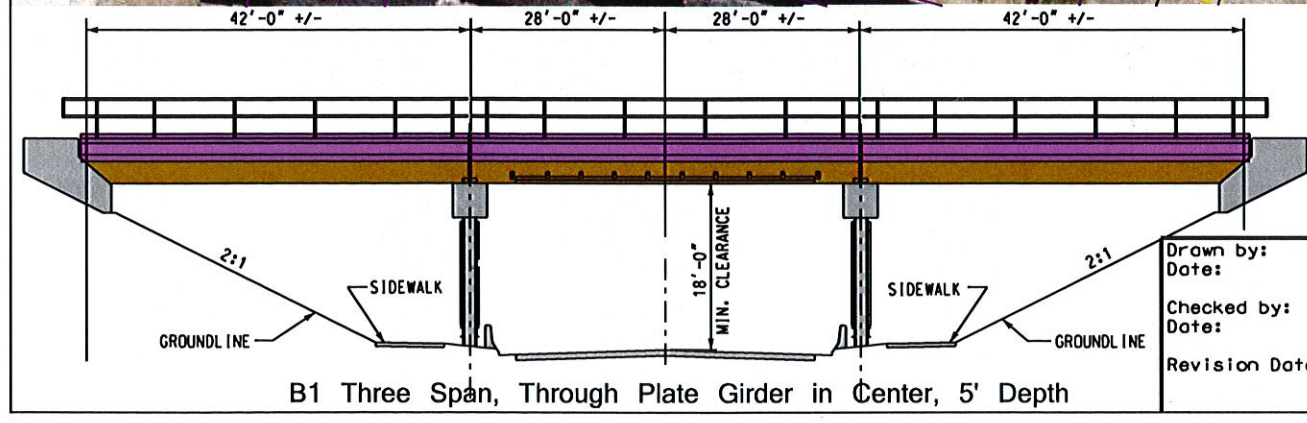
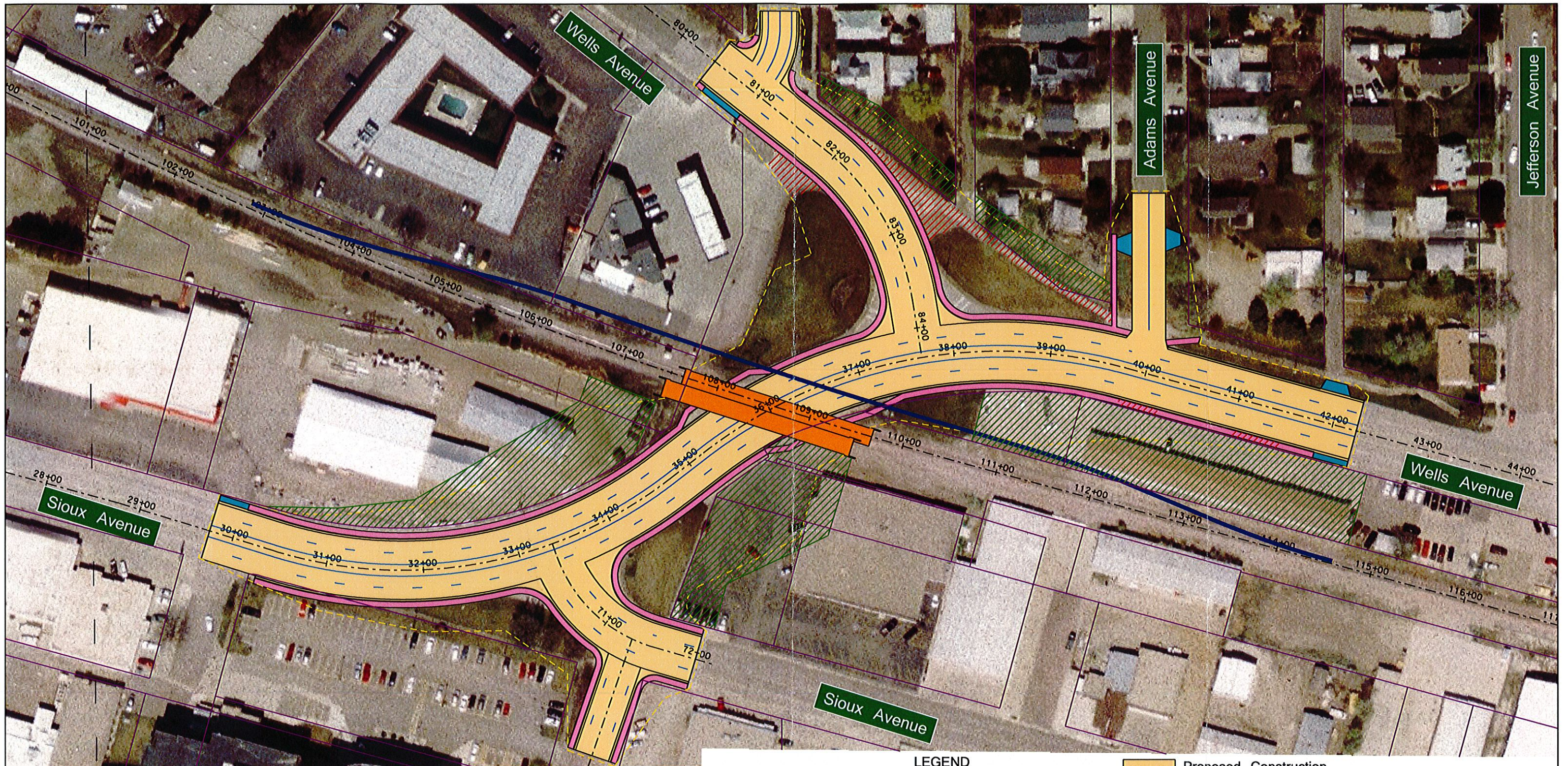
Option 1 - S-Curve
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



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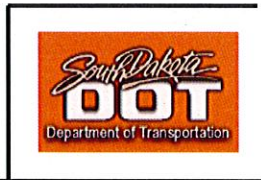
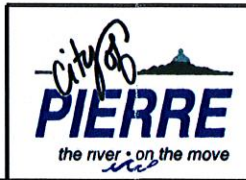
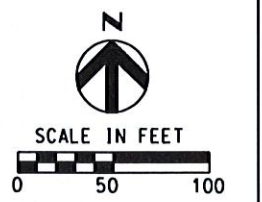
Option 1 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



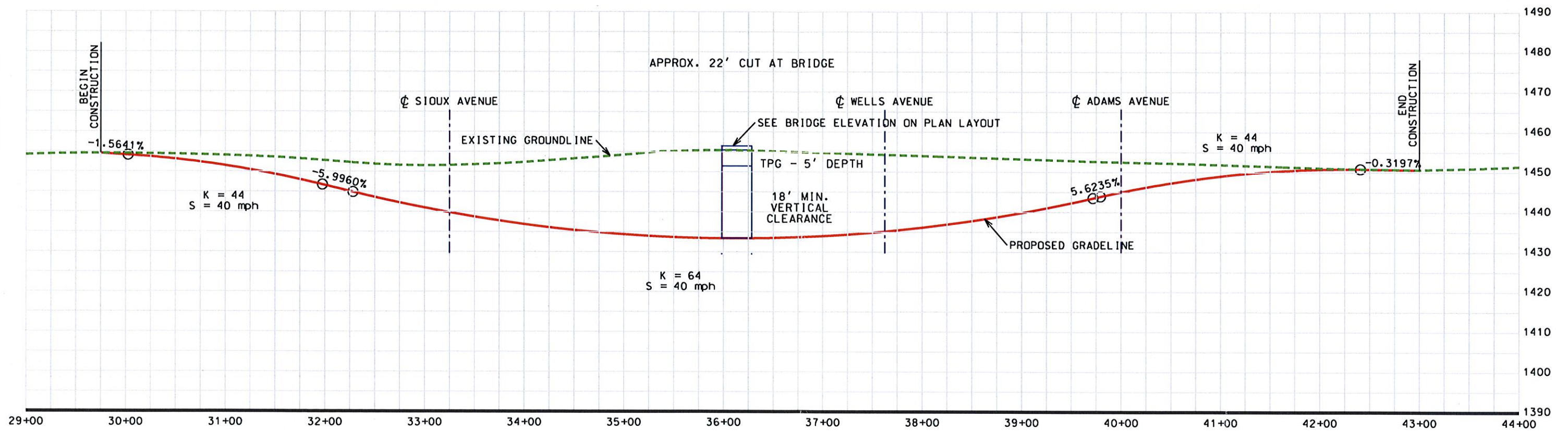
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Revision Date:

- LEGEND**
- Existing Property Line
 - Proposed Property Line
 - Work Limit Line
 - Shoo Fly Alignment
 - Proposed Retaining Wall

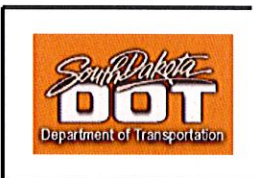
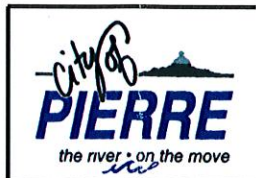
- Proposed Construction
- Proposed Bridge Construction
- Proposed Approach
- Proposed Sidewalk
- Additional Right-of-Way
- Existing Approaches



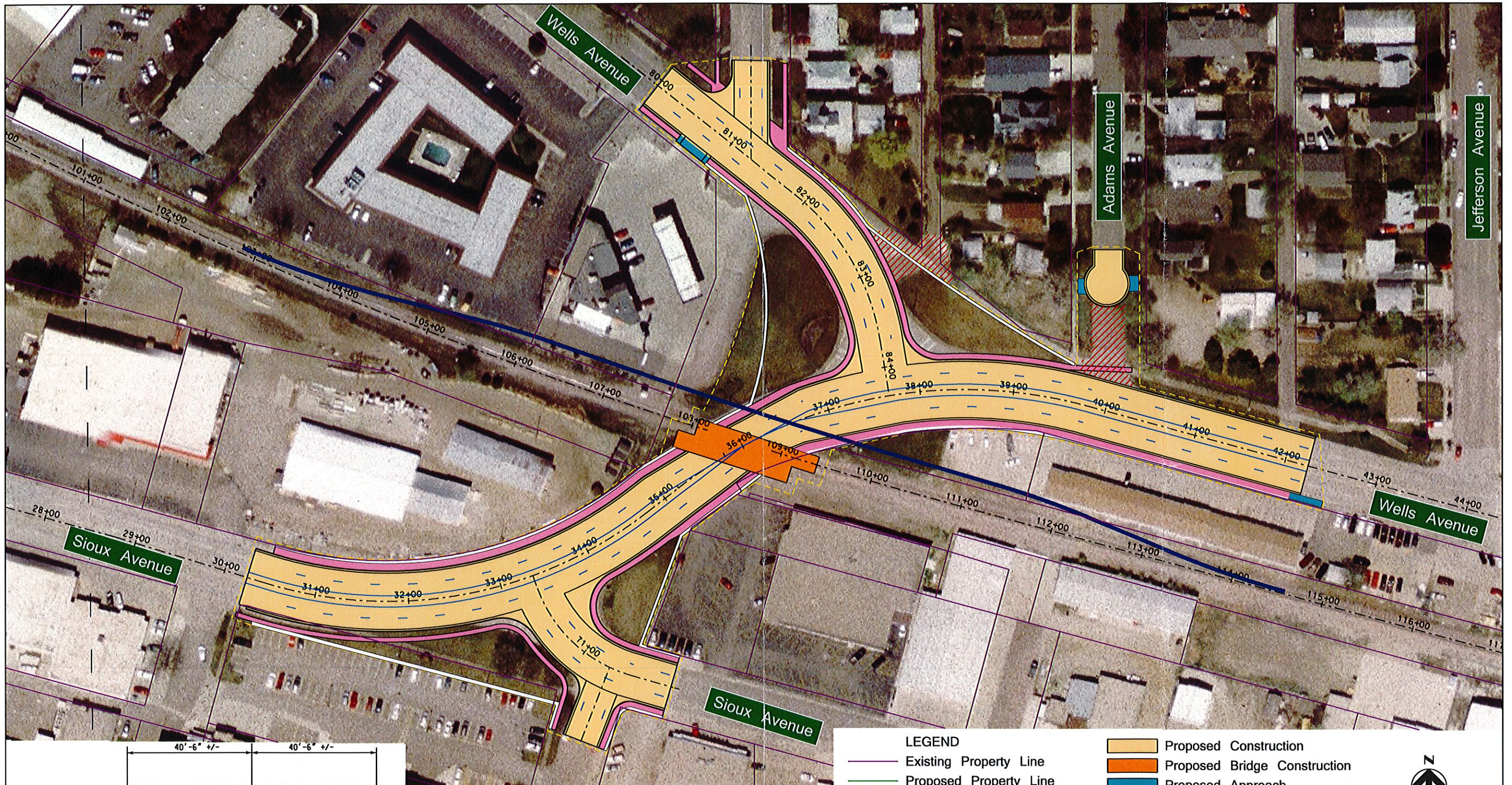
Option 2 - S-Curve
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



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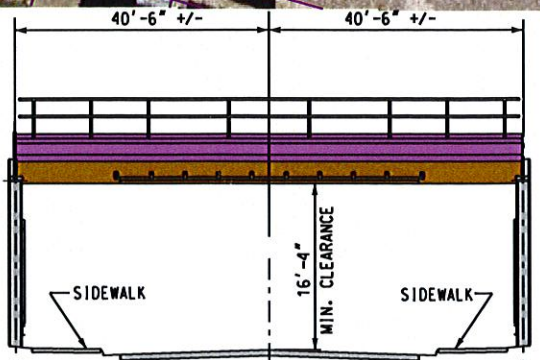
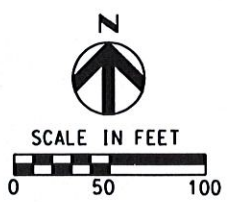


Option 2 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



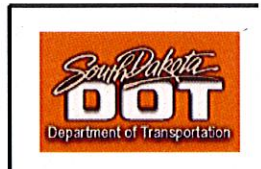
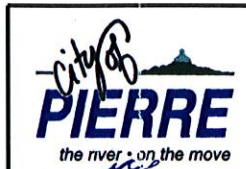
LEGEND

- Existing Property Line
- Proposed Property Line
- Work Limit Line
- Shoo Fly Alignment
- Proposed Retaining Wall
- Proposed Construction
- Proposed Bridge Construction
- Proposed Approach
- Proposed Sidewalk
- Additional Right-of-Way
- Existing Approaches

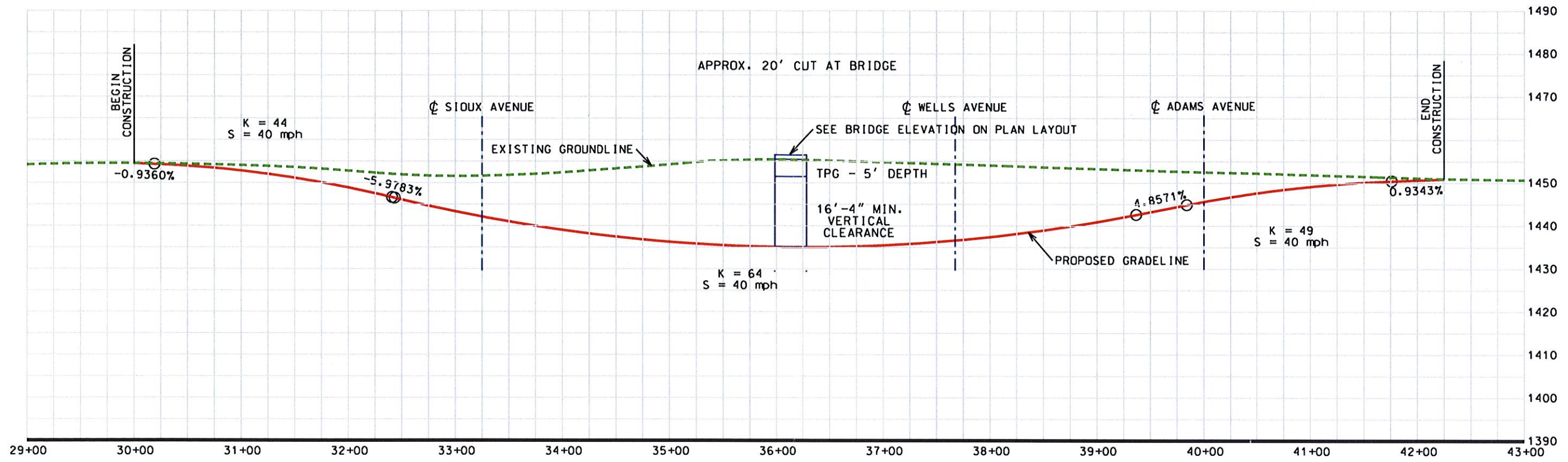


A1 Single-Span, Through Plate Girder, 5' Depth

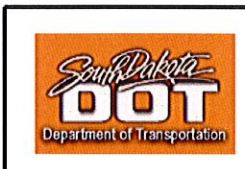
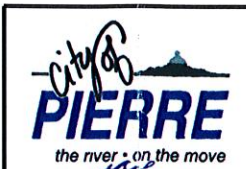
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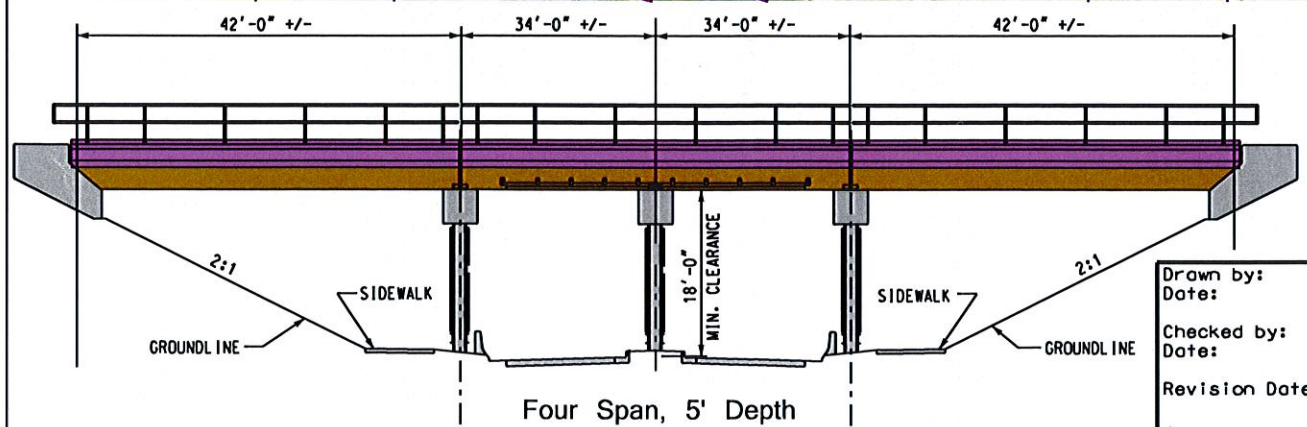
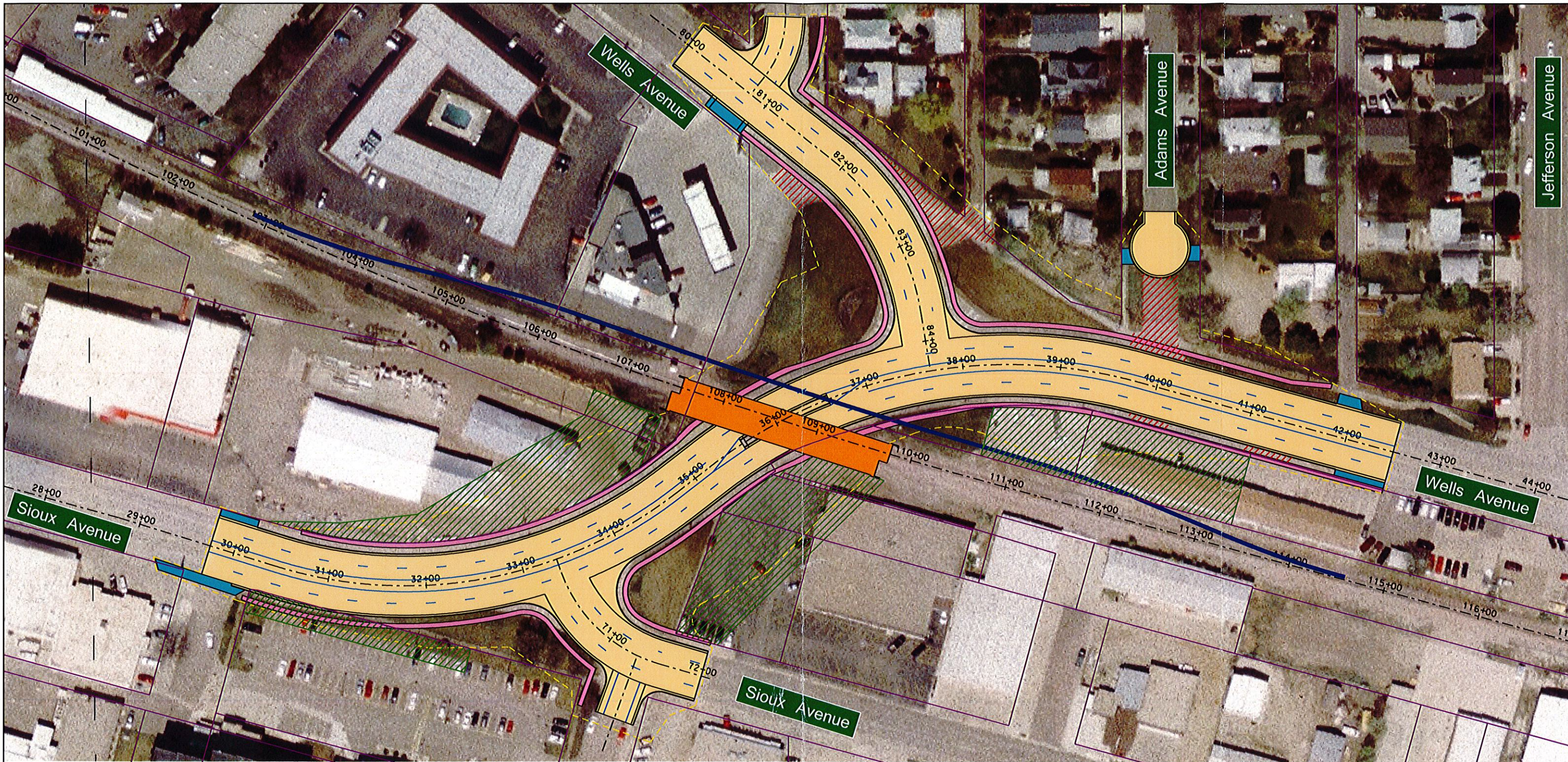
Option 3 - S-Curve
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



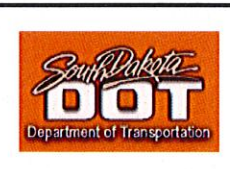
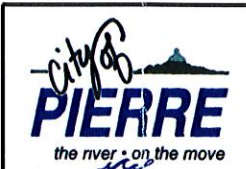
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Option 3 - S-Curve Profile
Pierre/DM&E - Railroad Crossings
Project NH 2014(11)229 PCN 00T6

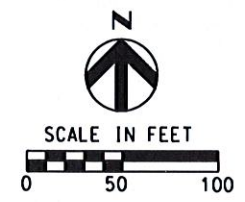


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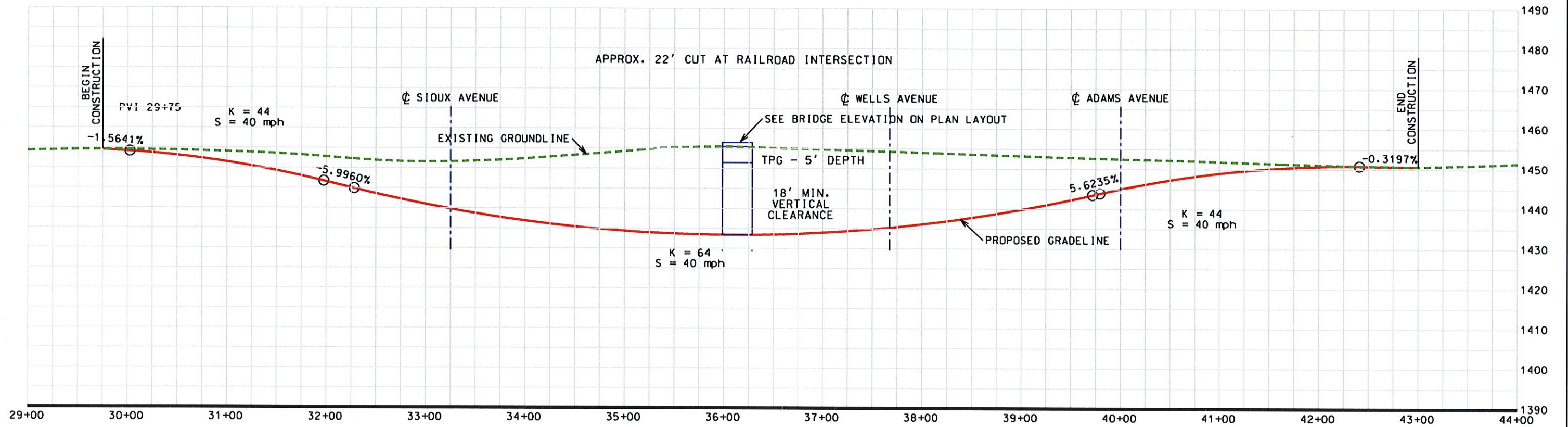


- LEGEND**
- Existing Property Line
 - Proposed Property Line
 - Work Limit Line
 - Shoo Fly Alignment
 - Proposed Retaining Wall

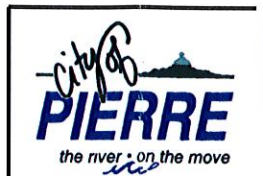
- Proposed Construction
- Proposed Bridge Construction
- Proposed Approach
- Proposed Sidewalk
- Additional Right-of-Way
- Existing Approaches



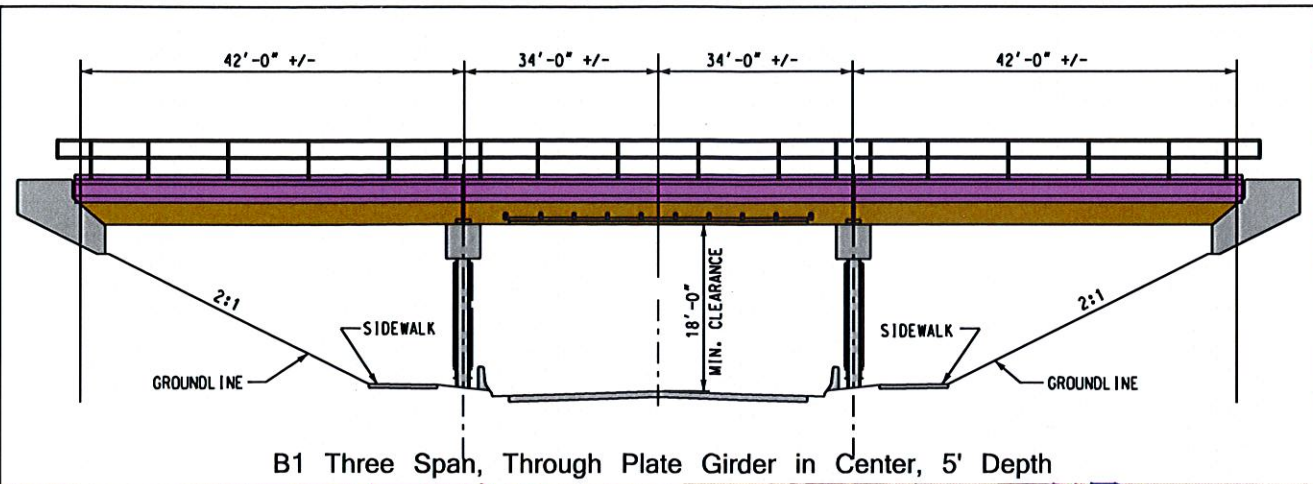
Option 4 - S-Curve
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



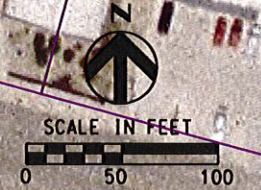
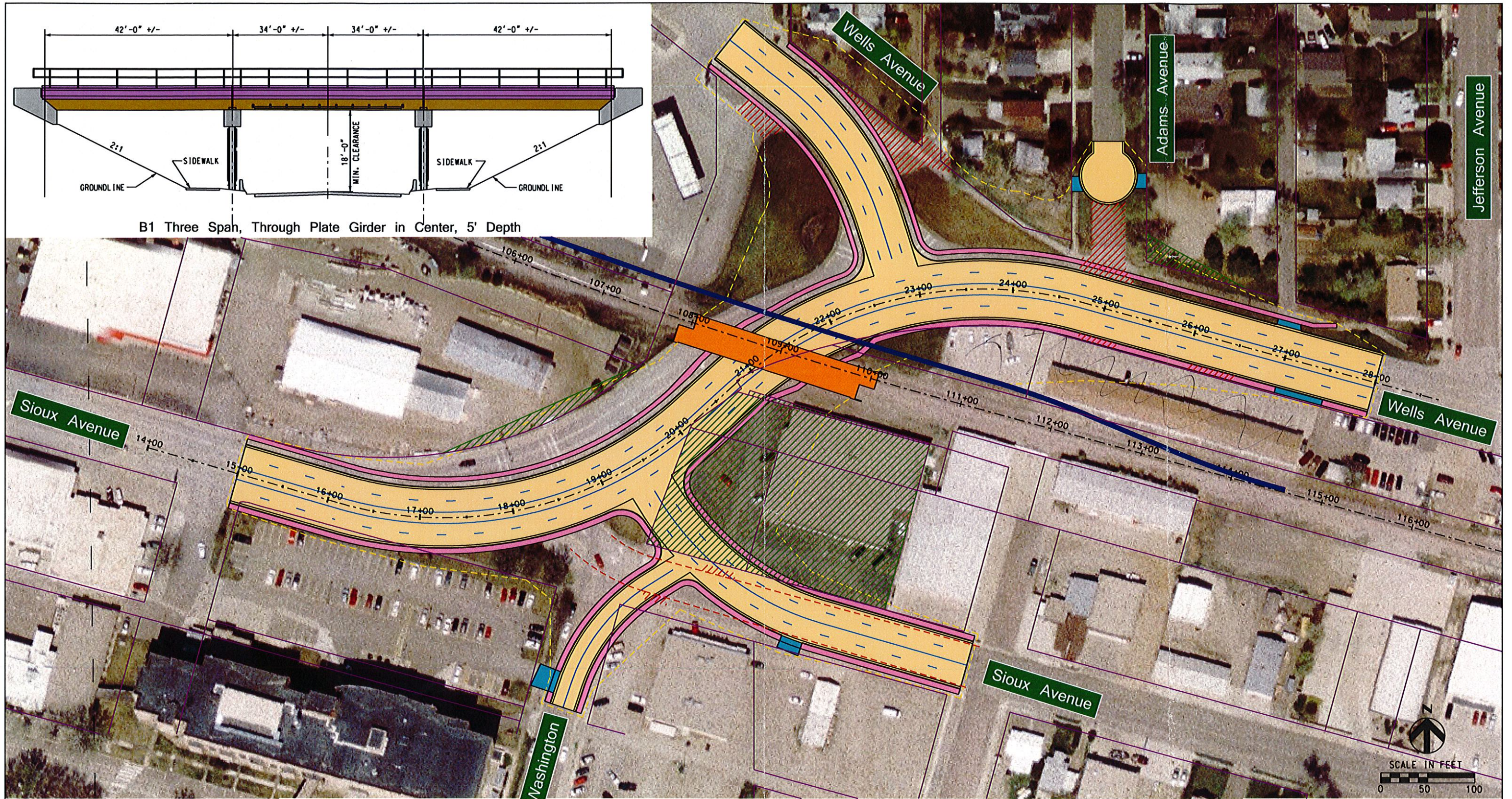
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Option 4 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



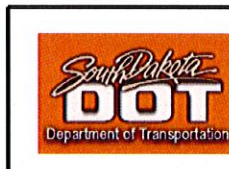
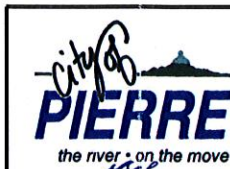
B1 Three Span, Through Plate Girder in Center, 5' Depth



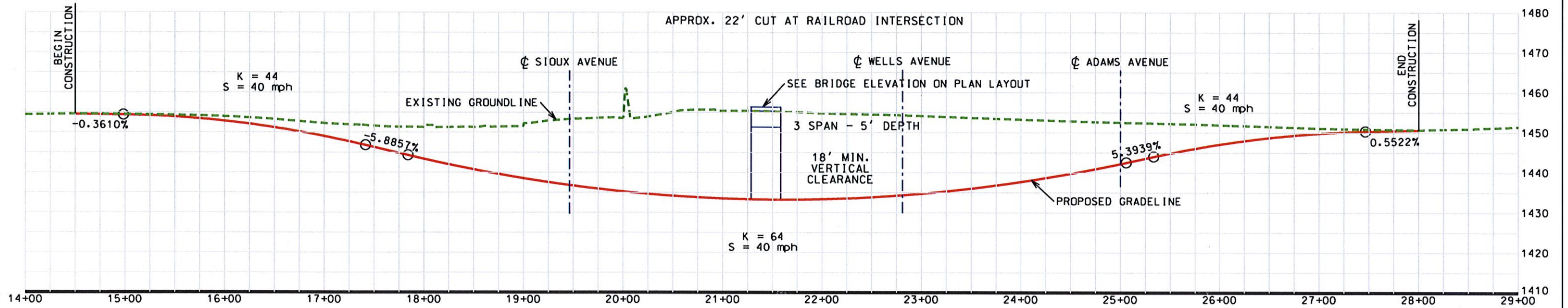
LEGEND

- Existing Property Line
- Proposed Property Line
- Work Limit Line
- Shoo Fly Alignment
- Proposed Retaining Wall
- Proposed Construction
- Proposed Bridge Construction
- Proposed Approach
- Proposed Sidewalk
- Additional Right-of-Way
- Existing Approaches

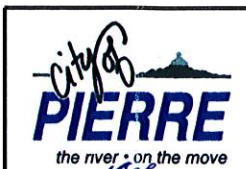
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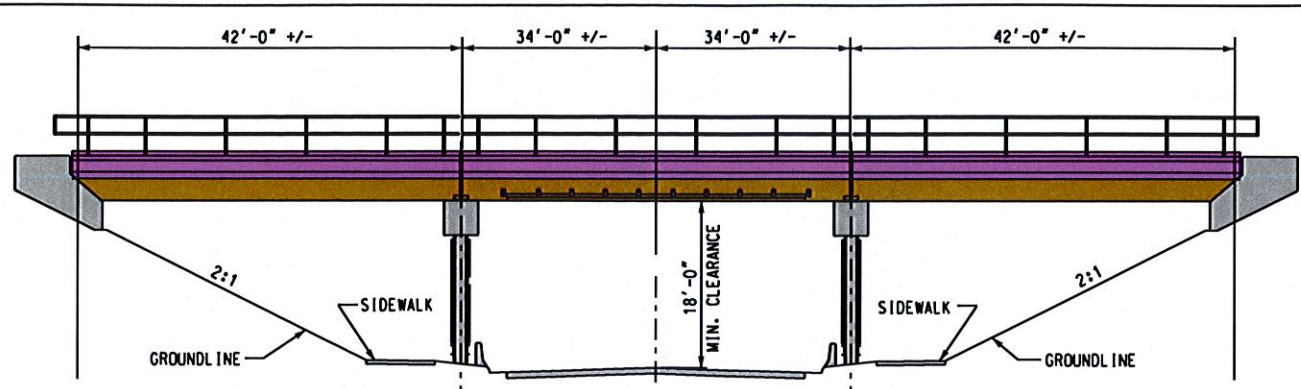
Option 5 - S-Curve
Pierre/DM&E - Railroad Crossings
Project NH 2014(11)229 PCN 00T6



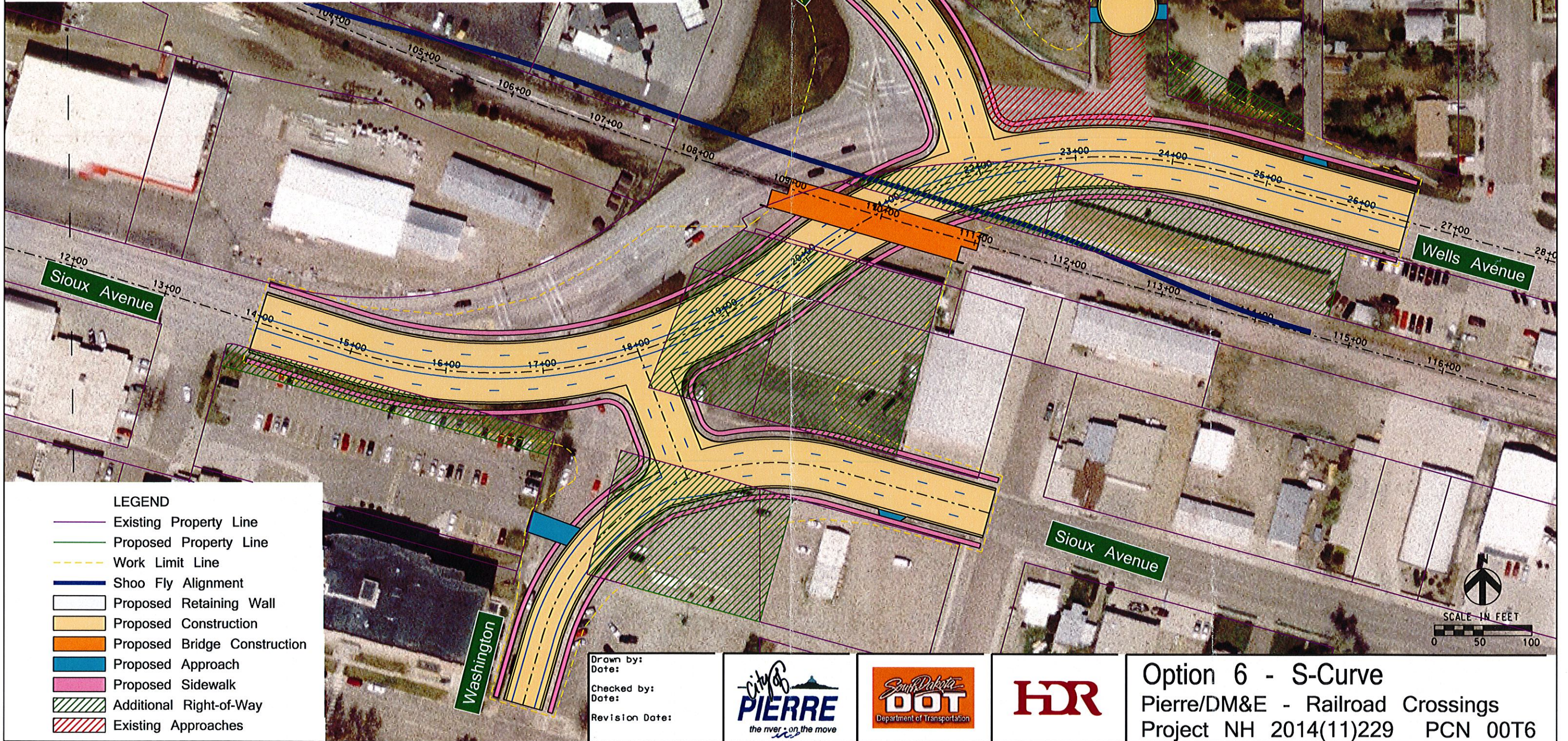
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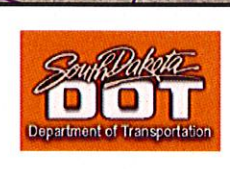
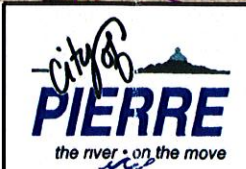
Option 5 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



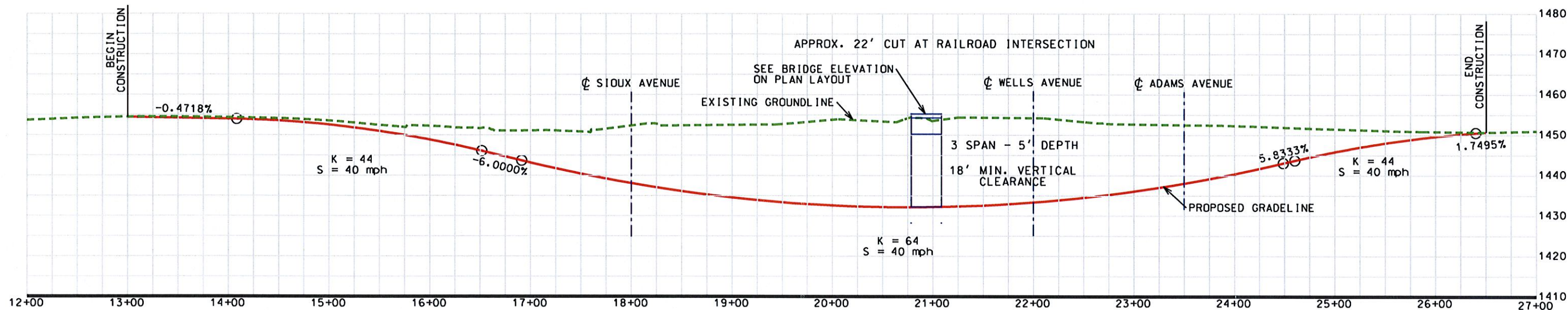
B1 Three Span, Through Plate Girder in Center, 5' Depth



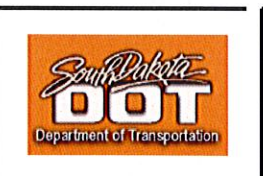
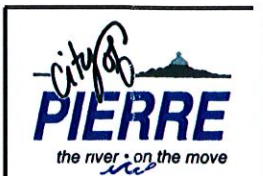
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Revision Date:



Option 6 - S-Curve
Pierre/DM&E - Railroad Crossings
Project NH 2014(11)229 PCN 00T6



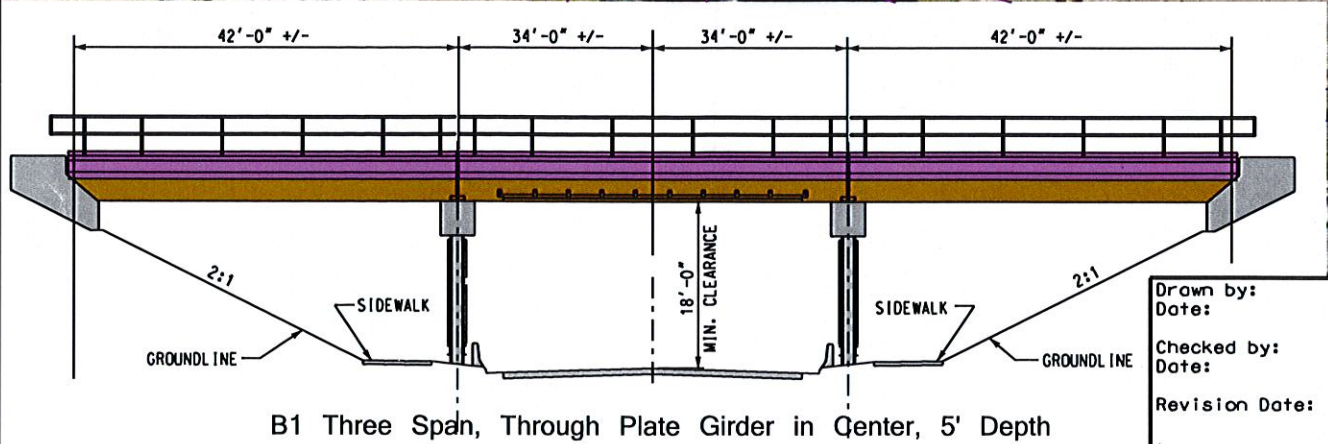
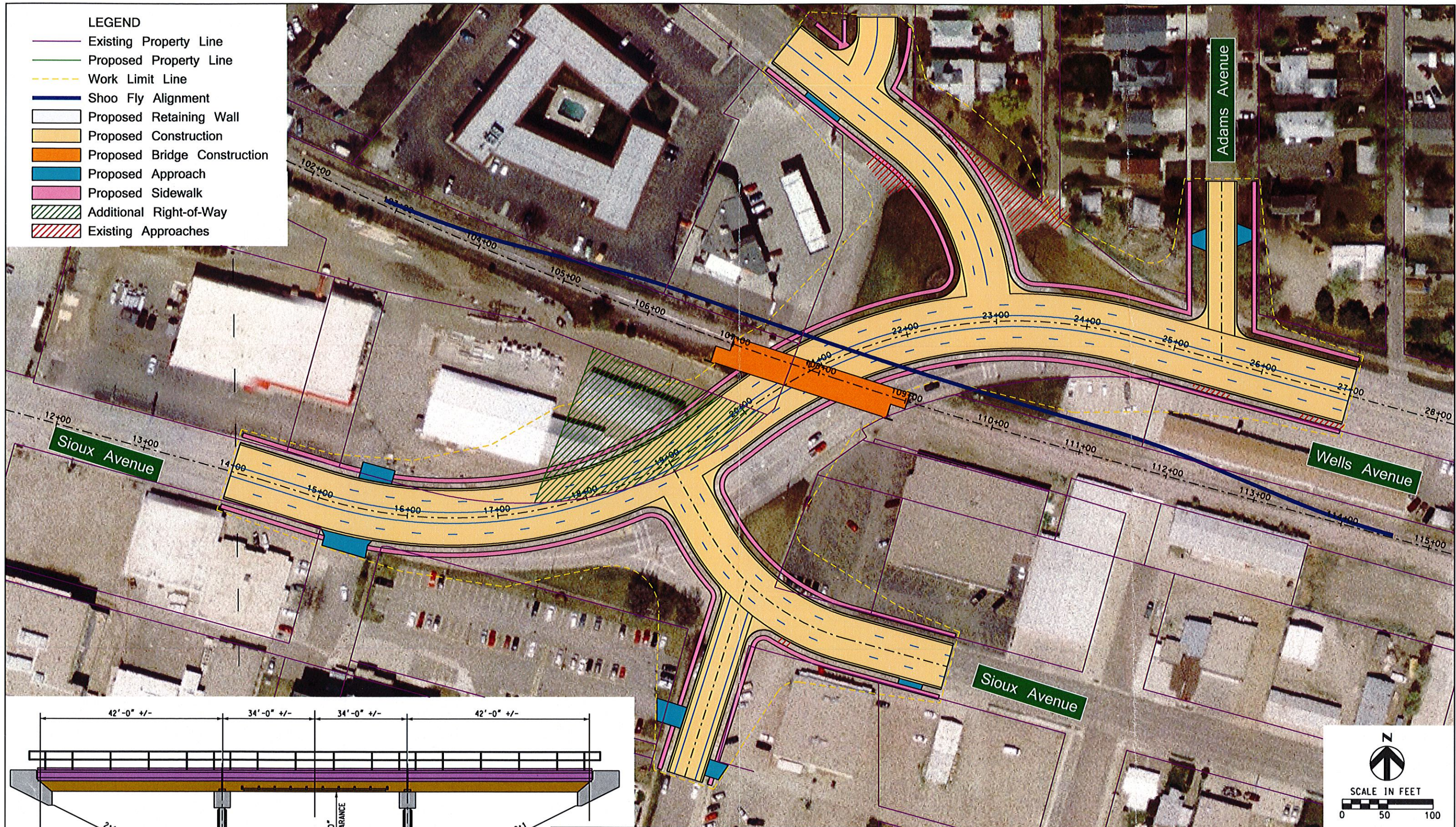
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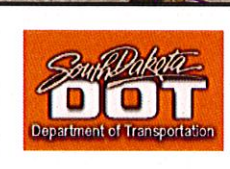
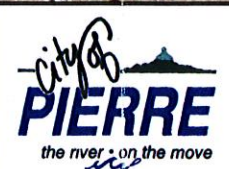
Option 6 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6

LEGEND

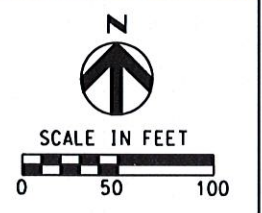
- Existing Property Line
- Proposed Property Line
- Work Limit Line
- Shoo Fly Alignment
- Proposed Retaining Wall
- Proposed Construction
- Proposed Bridge Construction
- Proposed Sidewalk
- Additional Right-of-Way
- Existing Approaches

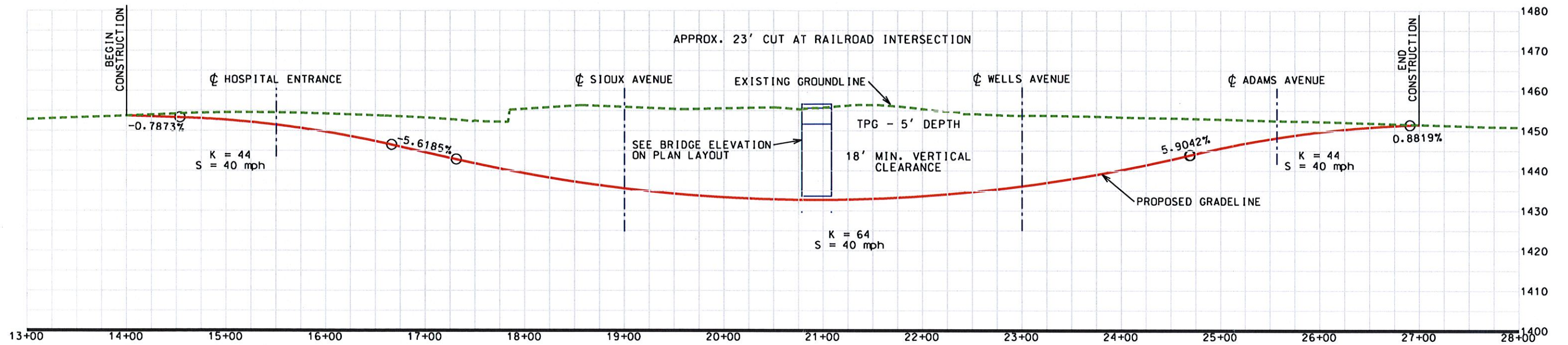


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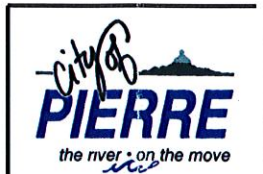


Option 7 - S-Curve
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6

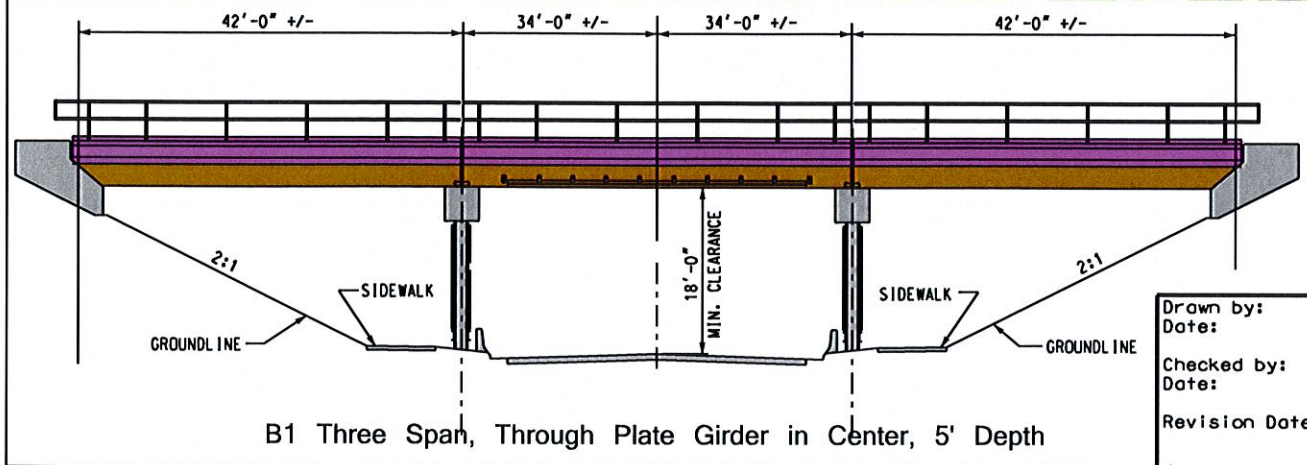
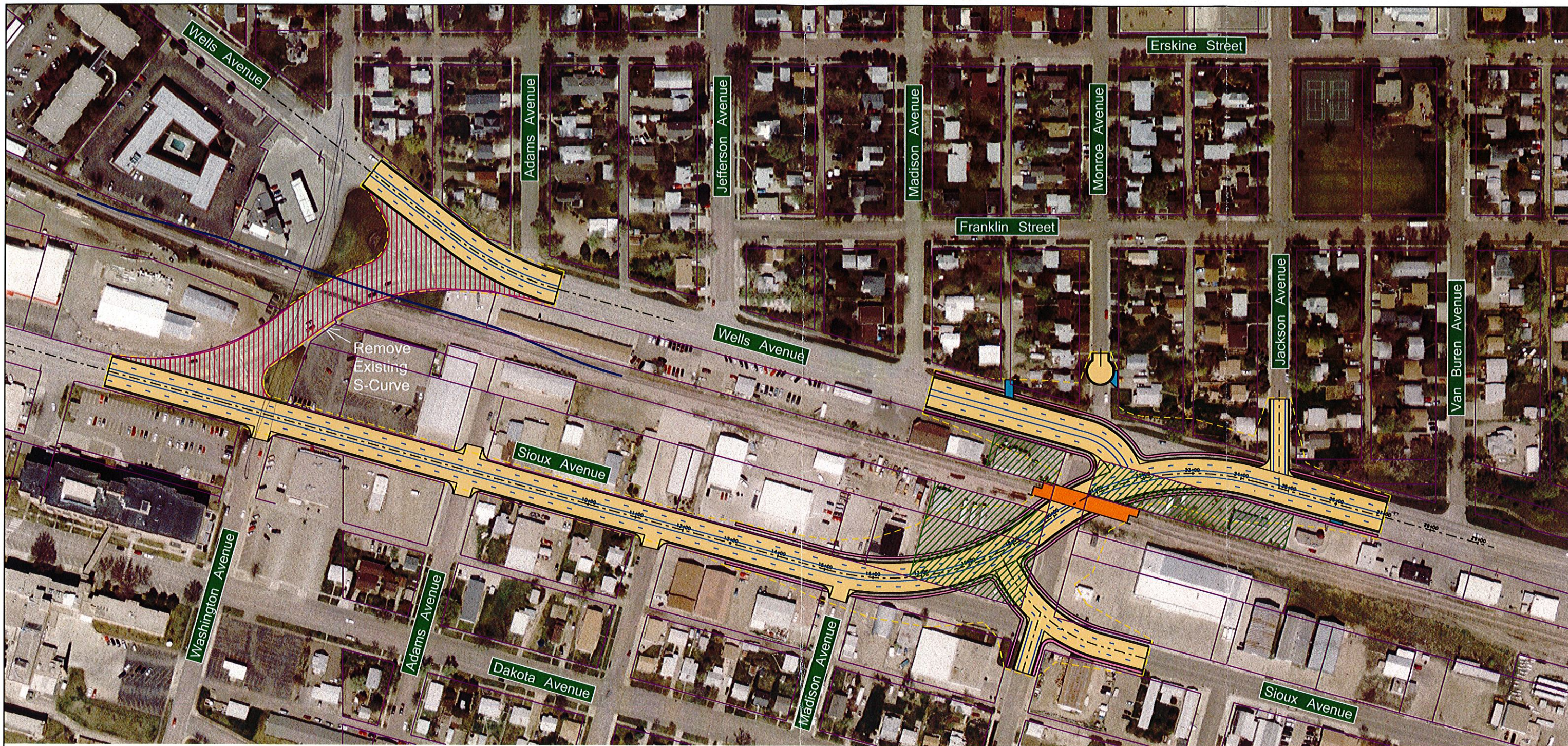




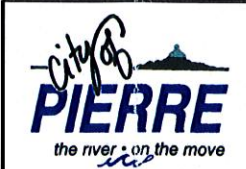
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Option 7 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6

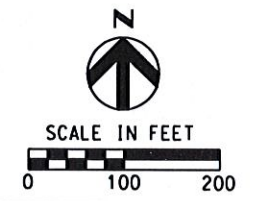


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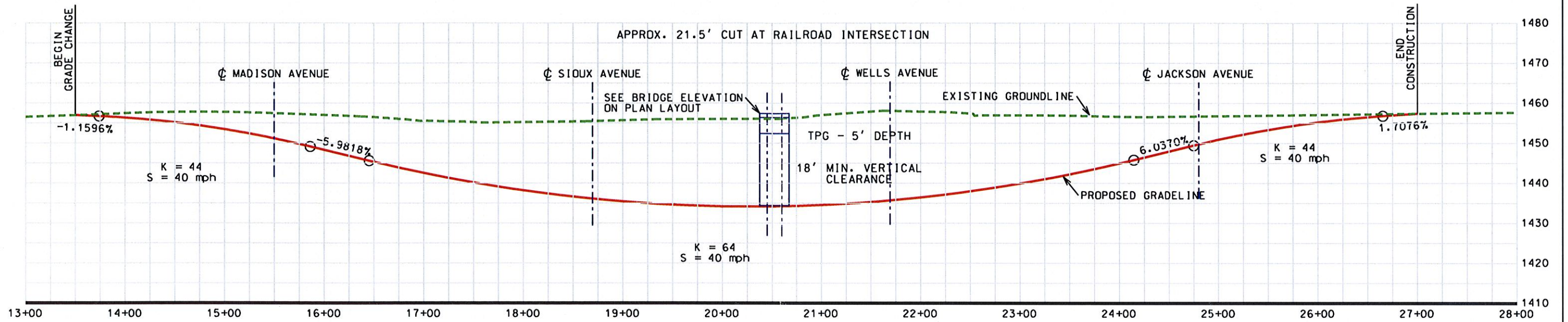


LEGEND

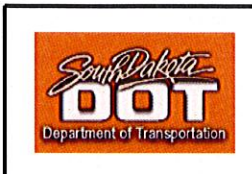
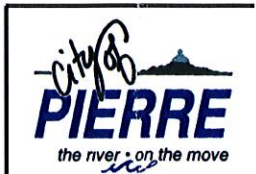
- Existing Property Line
- Proposed Property Line
- Work Limit Line
- Shoo Fly Alignment
- Proposed Retaining Wall
- Proposed Construction
- Proposed Bridge Construction
- Proposed Approach
- Proposed Sidewalk
- Additional Right-of-Way
- Existing Approaches



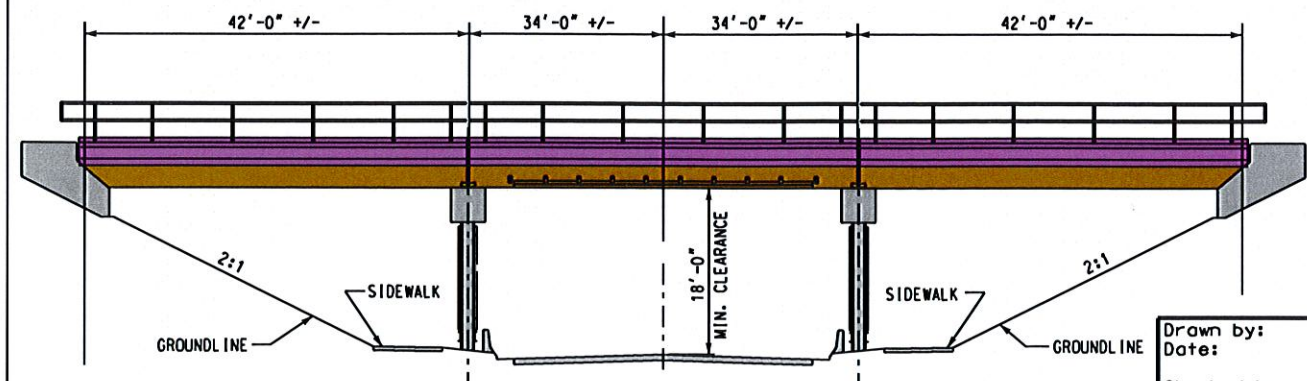
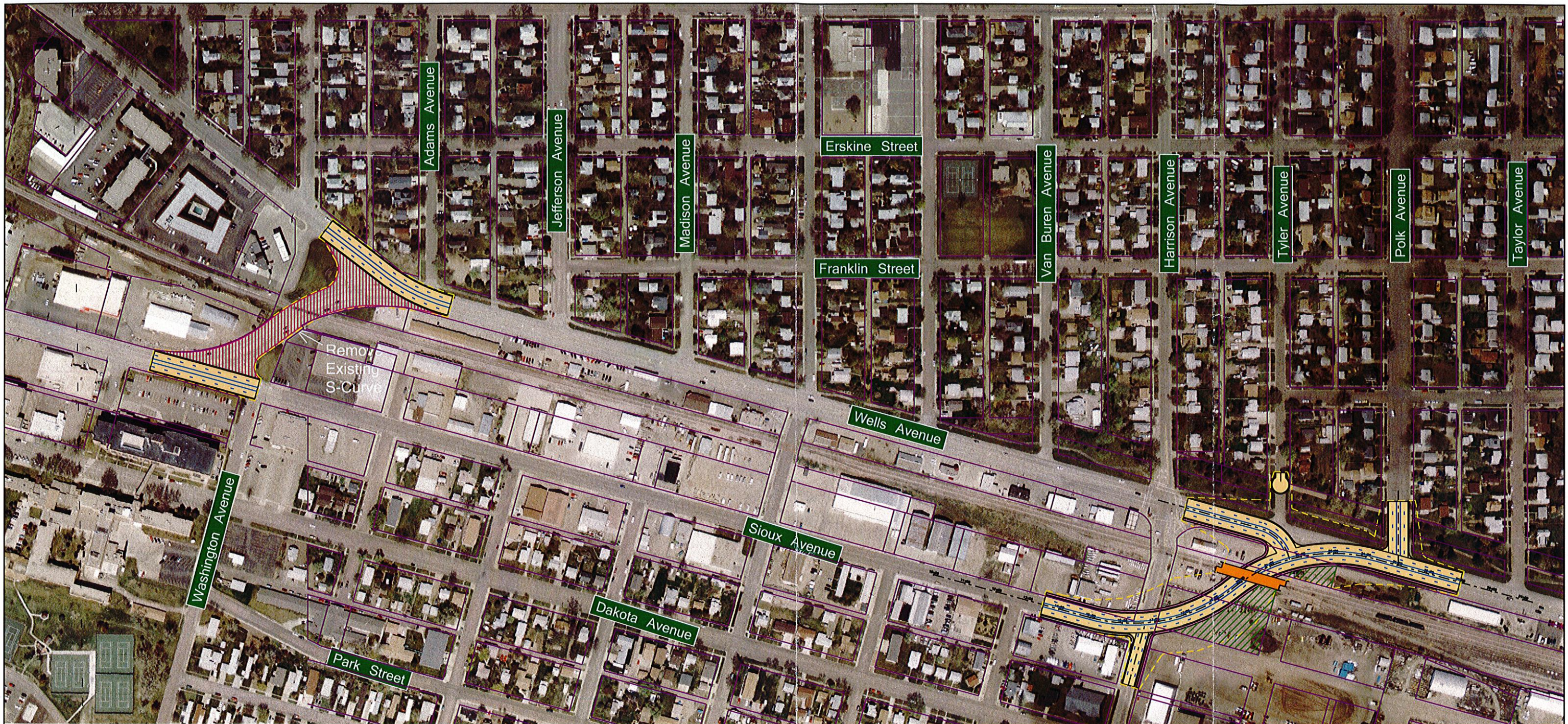
Option 8 - S-Curve
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



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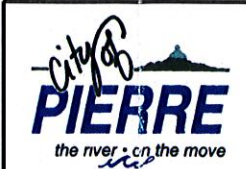


Option 8 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
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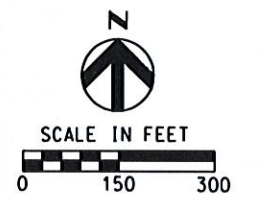
B1 Three Span, Through Plate Girder in Center, 5' Depth

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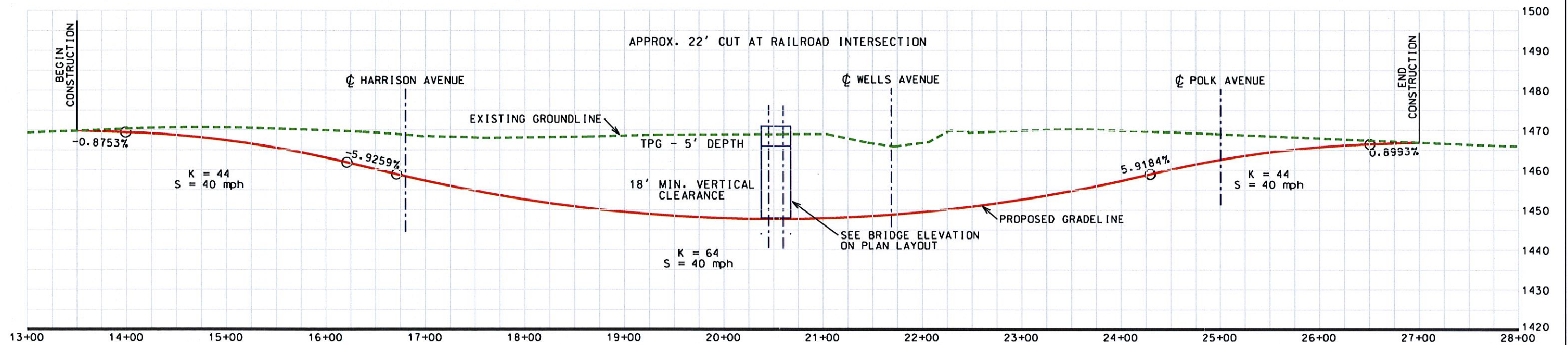


LEGEND

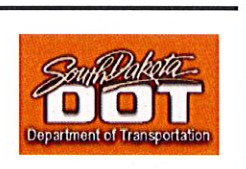
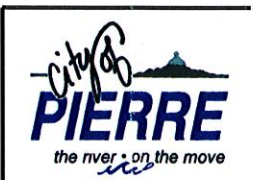
- Existing Property Line
- Proposed Property Line
- Work Limit Line
- Shoo Fly Alignment
- Proposed Retaining Wall
- Proposed Construction
- Proposed Bridge Construction
- Proposed Approach
- Proposed Sidewalk
- Additional Right-of-Way
- Existing Approaches



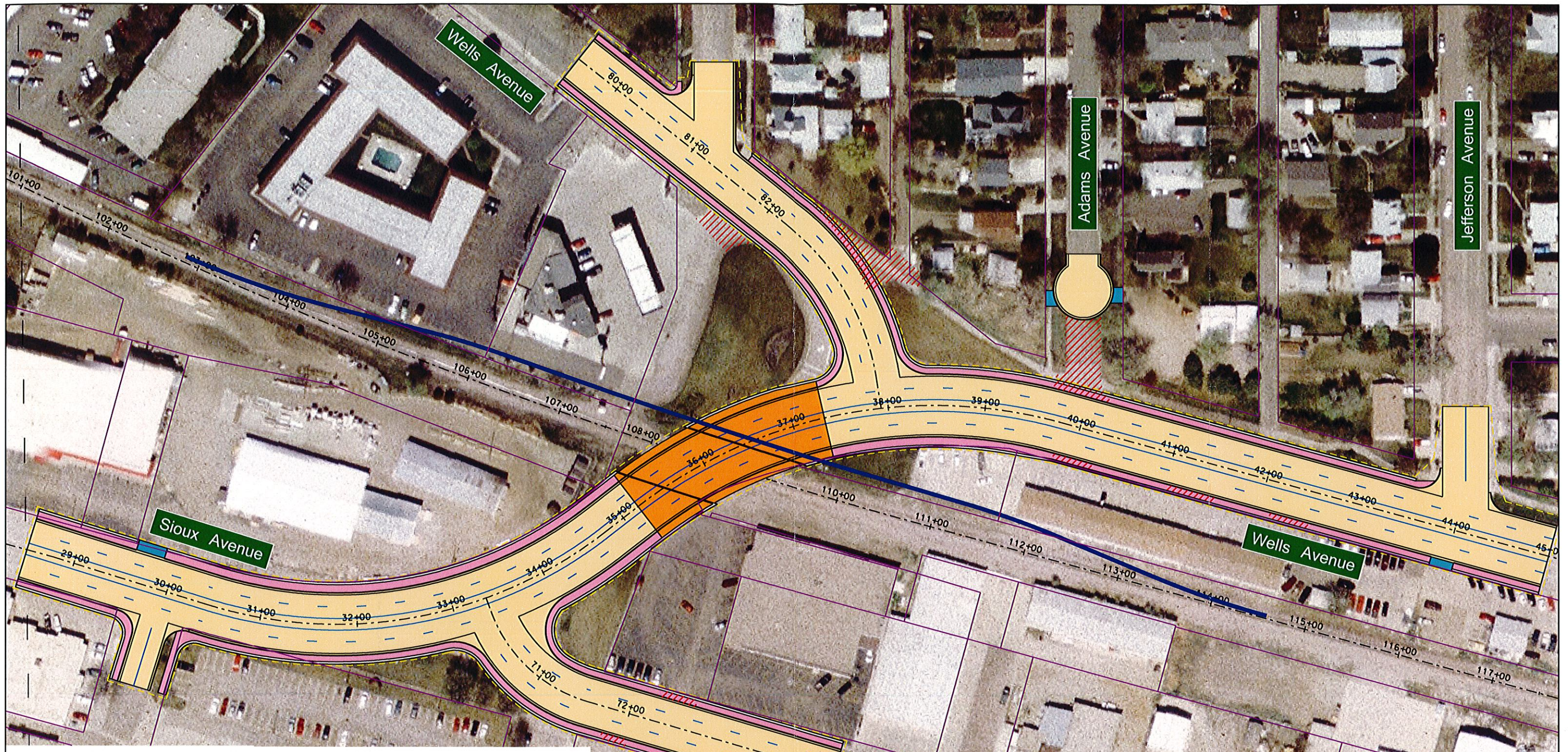
Option 9 - S-Curve
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



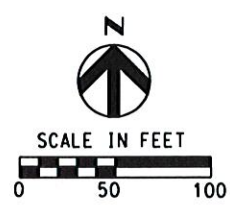
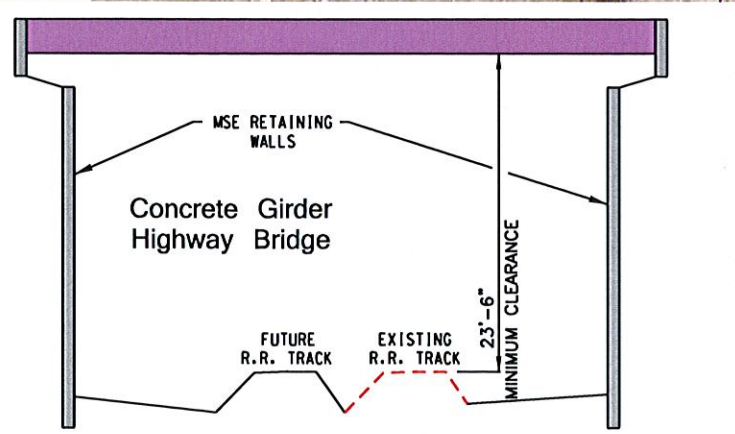
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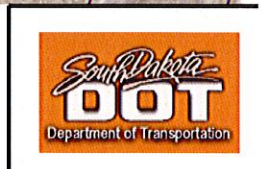
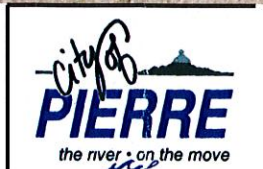
Option 9 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



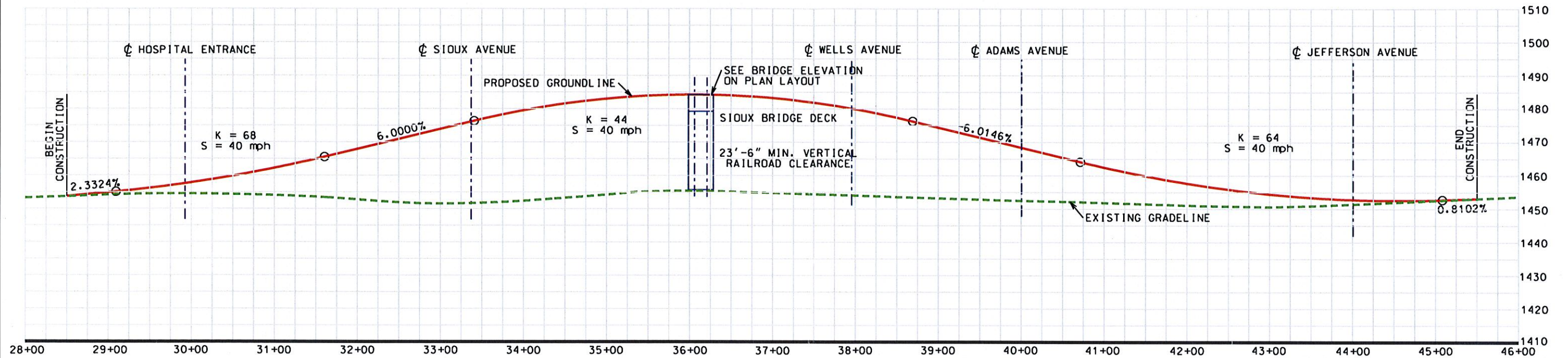
LEGEND	
	Proposed Construction
	Proposed Bridge Construction
	Proposed Approach
	Proposed Sidewalk
	Additional Right-of-Way
	Existing Approaches
	Existing Property Line
	Proposed Property Line
	Work Limit Line
	Shoo Fly Alignment
	Proposed Retaining Wall



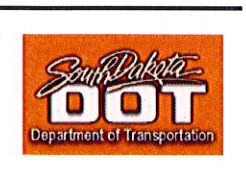
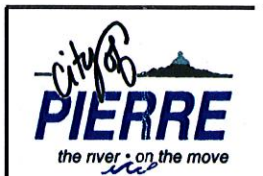
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Option 10 - S-Curve
 Pierre/DM&E - Railroad Crossings
 Project NH 2014(11)229 PCN 00T6



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Checked by:
Date:
Revision Date:



Option 10 - S-Curve Profile
 Pierre/DM&E - Railroad Crossings
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