

**Feasibility Report  
Town of Silt to Coal Ridge High  
School  
Bike Pedestrian Trail US 6**

**CDOT Project No. C 0063-017  
Code: 15132**

**Prepared for:**



**Colorado Department of  
Transportation and  
Town of Silt**

**Prepared by:  
James E. Patton, PE/PLS  
Short Elliott Hendrickson, Inc.**



May 12, 2005

RE: Feasibility Report – Town of  
Silt to Coal Ridge High  
School Bike Pedestrian Trail  
SEH No. ACODOT0501.00

Mr. Jim Nall  
Region 3 Traffic Engineer  
Colorado Department of Transportation  
222 South 6<sup>th</sup> Street  
Grand Junction, CO 81501

Dear Mr. Nall:

Short, Elliott Hendrickson Inc. (SEH®) is pleased to present the Feasibility Report for the project referenced above. The report provides a comparison of the advantages, disadvantages and costs for three feasible design alternates that were considered for this study. Alternate One with Option 2 at Davis Point was selected as the preferred alternate.

Alternate One provides the most separation of pedestrian bicycle traffic from the vehicular traffic on US 6 making it the safest alternate. Safety was a primary goal of the feasibility study.

Thank you for giving us the opportunity to provide this feasibility report to you. If you have questions or wish to discuss this further please call.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

James Patton, PE, PLS  
Project Manager

JEP/jp  
cc: Owen Leonard  
File

**CERTIFICATION PAGE**  
**FEASIBILITY REPORT**  
**TOWN OF SILT TO COAL RIDGE HIGH SCHOOL BIKE PEDESTRIAN**  
**TRAIL**

SEH No. A-CODOT0501.01

CDOT Project No. C 0063-017  
Code: 15132

May 12, 2005

I hereby certify that this feasibility report was prepared by me or under my direct supervision, and that I am a duly registered Professional Engineer with the State of Colorado.

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James E. Patton, PE/PLS

Reg. No. 11671

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Reviewed by: Owen Leonard, PE

May 12, 2005

Short Elliott Hendrickson Inc.  
Bank of Colorado Building, Suite 202  
200 Grand Avenue  
Grand Junction, CO 81501

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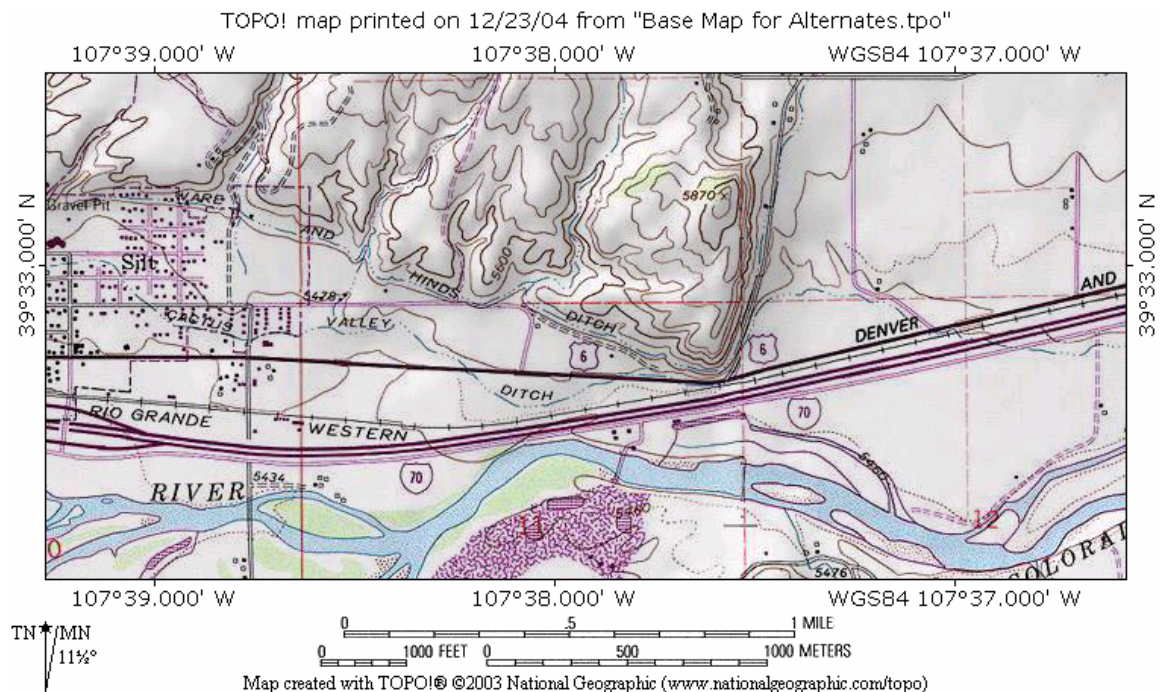
## **Abstract**

Comparison of the advantages, disadvantages and costs for three feasible design alternates were considered for this study. Alternate One with Option 2 at Davis Point was selected as the preferred alternate. This alternate provides two methods for crossing wetlands areas.

Alternate One provides the most separation of pedestrian bicycle traffic from the vehicular traffic on US 6 making it the safest alternate. Safety was a primary goal of the feasibility study.

## **Project Location**

This feasibility report is for a proposed bike pedestrian trail that connects on the west end with an existing trail termini near the east town boundary of Silt, Colorado in Garfield County. The proposed trail extends this existing trail East along US 6 to the Coal Ridge High School scheduled to open in the fall of 2005. The existing trail termini is near Mile Marker 100 on US 6 on the north side of the roadway. Project length is about 6,400 feet or 1.2 miles. Figure 1 is a topographic map of the project location.



**FIGURE 1 – Topographic Map of Project Location**



## **Project Scope - Introduction**

The Colorado Department of Transportation Region 3 (CDOT R3) requested that Short Elliott Hendrickson Inc. (SEH) prepare a feasibility report for providing a bike pedestrian trail along US 6 from the Town of Silt east to Coal Ridge High School. This feasibility report compares favorability (i.e., advantages and disadvantages) and costs for three alternate preliminary design concepts. The primary purpose of this trail is to provide safe pedestrian and bicycle non-motorized access from Silt to Coal Ridge High School. Recreational use is secondary to safety for this trail. The feasibility report identifies potential environmental, utility, irrigation and other impacts that affect the design. All alternates will require additional right-of-way. An estimate of additional right-of-way needs is made for each alternate.

Other important project stakeholders include the Town of Silt, Town of New Castle and Garfield County School District RE-2. Representatives from the Town of Silt participated in the development of this report.



Photo 1 - North side of US 6 viewing east toward Davis Point.

## **Existing Conditions**

Following the project kickoff meeting, SEH gathered information regarding the US 6 corridor that was necessary for evaluating the alternate design concepts for the bike pedestrian trail. A minimal field survey was necessary to determine potential alternates and their costs.

Below is information gathered that will affect the design of the bike pedestrian trail:

1. **Right-of-Way.** Jay Janney with CDOT R3 Right-of-Way provided as-constructed plans of US 6 from CDOT Project No. F 001-1(19) and ROW maps in the area east of Silt from CDOT Project FAP 145-C. Generally the ROW is 50 feet each side of US 6 center line. Exceptions are at Davis Point where the ROW on the north side of US 6 expands to 70 feet for approximately 1900 feet and approximately 2500 ft. west of the Coal Ridge High School the ROW on the north side contracts to 40 feet. Additional right-of-way would be required for each of the alternates.
2. **Accident History for US 6.** Hans Egghart with CDOT R3 Traffic provided a five-year analysis of accident history. This analysis is included in Appendix A. The CDOT Statewide average crash rates for 2002 are also included in Appendix A. The accident history provided is for 2.3 miles on US 6 from Mile Marker 99.38 to Mile Marker 101.70. This project is 1.2 miles within these limits. The five-year weighted hazard index is -3.26 which is well below the State average of 1.56 for Federal Aid Primary Rural. There were seventeen accidents within this five-year period. Slightly less than half of these accidents occurred at roadway or driveway intersections. Six of these accidents involved collisions with wild animals. Most accidents occurred under good weather conditions during hours of daylight. Since most accidents happened at intersections it is important the bike pedestrian trail cross roadways at safe locations with good sight distance. It is important for safety of the pedestrian and bicyclist that points of conflict with motorists be minimized.
3. **County Road 235 – Davis Point Road.** This intersection with US 6 is east of Davis Point. Sight distance at the intersection is limited to the west of the intersection. The 2002 Average Daily Traffic is 307 according to Jeff Nelson, Assistant County Engineer. Future development may take place to the north of this intersection. If so, consideration should be made for realigning the intersection for better sight distance.
4. **Topographic Constraints.** The primary topographic constraint is Davis Point. This prominent steep hillside combined with the location of the Lower Cactus Valley Ditch, Denver and Rio Grande Western Railroad and Interstate 70 limit options for the bike pedestrian trail for this section. Refer to Figure 1 (middle right) for a visual of this topographic constraint. Two options are available at this location and will be described in more detail later.
5. **Irrigation, Drainage and Utilities.** There is an irrigation ditch crossing of US 6 approximately 300 feet east of Mile Marker 100. This is the Lower Cactus Valley Ditch. The structure is a double 6'x 4' cell CBC skewed to US 6. Aerial



photos and the as-built CDOT Project Number F 001-1(19) plans show this crossing and the skew angle. The irrigation ditch is about twelve to sixteen feet wide at the top with steep side slopes. The ditch is about three to four feet deep and five to twelve feet wide at the bottom. There is a lot of vegetation of wetland plants along the sides and bottom. The CBC is partially filled with silt (40 to 50%) restricting full flow through the structure (See Photo 2). The grade of the channel is less than 1 per cent.

The same irrigation ditch crosses US 6 twice further east of this crossing prior to the Davis Point location. Between these two crossings, the Lower Cactus Valley Ditch is close to the roadway and parallel to it for some distance (approximately 850 feet). The ditch is approximately the same size but has more wetlands vegetation, however the Army Corps of Engineers does not consider ditch bottoms as wetlands. The structures across US 6 are the same size as above. Headwalls for all three structures are very close to US 6 with little shoulder. There is no guard rail protection at these structures. The grade of the channel is less than 1 per cent. Pictures were taken of the CBCs and the ditch channel. Photo 3 shows the ditch channel between these two CBCs. The ditch between the two CBC's could be placed in a relatively large culvert pipe for this distance. Initial contacts with the ditch maintenance personnel indicate that they are receptive to this. CDOT maintenance forces are willing to help with this effort since it would improve safety for this section. Photo 4 shows the CBC outlet nearest Davis Point.



Photo 2 – Double Cell 6' x 4' Concrete Box Culvert – Lower Cactus Valley Ditch



Photo 3 – Lower Cactus Valley Ditch between CBCs 2 and 3 viewing west. Note: Wetlands in ditch bottom.

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Photo 4 – Double Cell 6' x 4' CBC at the outlet west of Davis Point.

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The fourth irrigation ditch crossing of US 6 is immediately east of the Davis Point Road intersection. This is also the Lower Cactus Valley Ditch. The ditch section and CBC are similar to those described previously.

The fifth irrigation ditch crossing of US 6 is at a private road off of US 6 to the northwest. This road follows along the ditch to the northeast after it crosses the highway. Again, the ditch and CBC is a similar structure to the other crossings. This too is the Lower Cactus Valley Ditch.

The estimated capacity to the Lower Cactus Valley Ditch west of Davis Point is 30 to 40 cubic feet per second (cfs). The capacity flow of the double cell 6'x4' CBCs with 40% silting is about 60 to 80 cfs at each crossing of US 6. Therefore, the CBCs are currently adequate for the ditch size even with the current silting condition.

There are a number of US 6 drainage cross culverts that range in size from 18-inch to 36-inch diameter. These are shown on the as-built plans named previously.

Utilities were not visibly prevalent. Further investigation will be required prior to preliminary design with the field survey. It was noted that there is a railroad communication line along the tracks on the south of US 6. There are also a number of telephone pedestals at various locations on the north side of US 6 along the entire corridor. These are relatively close to the roadway. Utilities located within the CDOT right-of-way that need relocation would be moved at the owner's expense according to Dwight Burgess, R3 Utilities Engineer. Utilities located outside of the CDOT right-of-way would be moved at CDOT or the local entity expense.

6. **Wetlands.** The definition of wetlands as used by the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA) since the 1970s for regulatory purposes: "Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Wetlands are extensive along the entire corridor on both the north and south side of US 6.

It appears that all the alternates will have some impact on wetlands environments. West of Davis Point wetlands plants are primarily limited to the bottom of irrigation ditches. Generally, the Corps of Engineers has not required mitigation for these situations involving irrigation ditches. Mark Gilfillan with the Corps of Engineers - Grand Junction office (phone 970-243-1199 ext. 15) believes that the wetlands adjacent to US 6 east of Davis Point are caused primarily by high ground water which surfaces as it approaches US 6. Mr. Gilfillan said that even with selection of a preferred alternate with this report; he would want to review the wetlands impacts of the other alternates. If one of the other alternates has fewer wetlands impacts, then acceptable justification for the preferred alternate is needed. He said that impacts less than one half acre are covered under a nationwide permit.

Wetlands mitigation techniques cannot be made until preliminary design is undertaken. Field review of the areas impacted will need to be made. Preliminary field staking of the alignment may be necessary.

### **Design Criteria**

1. Design for the alternate selected should be in accordance with American Association of State Highway and Transportation Officials publication entitled, Guide for the Development of Bicycle Facilities, 1999. This is a widely

- accepted guide nationally and provides the best information that I have found for design criteria and considerations for development of the bikeways.
2. Another valuable source that should be used for the design should be the Colorado Department of Transportation Design Manual using the section regarding bikeways.
  3. **Materials Recommendations.** Rex Goodrich with CDOT R3 Materials provided the materials recommendations for widening US 6 which is necessary for each of the alternates albeit for varied segment lengths and locations. Stabilization requirements for the widening of US 6 are: Hot Bituminous Pavement (Grading SX)(75) is 6 inches in two or three lifts, 4 inches of Aggregate Base Course (Class 6) for base and 7 inches of Aggregate Base Course (Class 1) for subbase. PG 76-28 asphalt shall be used for the top 2-inch layer of HBP and PG 64-28 asphalt shall be used for the bottom layers of HBP. The materials recommendations letter is included in Appendix C. Stabilization for the separated bike/pedestrian trail is 3 inches of HBP (Grading SX)(75) and 4 inches of ABC (Class 6) for base. This was not a recommendation from CDOT R3 Materials but is typical of stabilization used for a bike pedestrian facility. Additional stabilization is required for building upon wetlands areas.

## **Study Approach**

1. **Constraints.**
  - a. Topographic. Topographic constraints have been described previously under “Existing Conditions”. The primary topographic constraint affecting design is Davis Point. Secondary topographic constraints affecting design are locations of the wetlands and irrigation crossings of the Lower Cactus Valley Ditch.
  - b. Design. Design standards for vertical and horizontal alignment of the trail will not be difficult to obtain with exception of the Davis Point location. Sight distance and grade may be difficult at this location. To obtain design criteria for grade alignment, the trail may need to be lengthened and temporarily misdirected in order to “chase grade”. Sight distance at Davis Point Road and US 6 is a problem now and will continue to be so.
2. **Segments.** The length of trail was divided into three segments for consideration of design features and costs. Segment 1 is west of Davis Point, Segment 2 is at Davis Point and Segment 3 is east of Davis Point. Figure 2 shows the beginning and end of the project and limits of the segments. These segments are also illustrated on the layout drawings for each alternate considered. These segments may be useful if the project is phased for construction in the future.
3. **Options at Davis Point.** Two options were considered at Davis Point:
  - a. Option 1 is alignment of the bituminous surfaced 6 foot wide bike pedestrian trail above the roadway mechanically stabilized earth (MSE) wall upon an existing bench. This alternate requires extension of the

- roadway MSE wall as well as the MSE wall upslope. This option is shown in section on Typical Section Sheet 2. This option is viable with Alternate One or perhaps Alternate Two but not Alternate Three.
- b. Option 2 is alignment of the bike pedestrian trail adjacent to the US 6 roadway and below the MSE wall. This section of the trail is a 6 foot concrete surfaced sidewalk. This option is shown in section on Typical Section Sheet 3. This option is viable for all three alternates.
  - c. Advantages/Disadvantages of Options. Option 1 moves trail traffic further from roadway vehicular traffic but has the disadvantage of increased grades and distances required meet design standards for maximum grade. The cost of Option 1 is greater. Option 2 requires less distance for the trail and is viable for all three alternates, however it places bike pedestrian traffic closer to the vehicular traffic. Another disadvantage is that it requires a shift to the south of the vehicular traffic for US 6 to accommodate the sidewalk section. Speeds for US 6 would need to be reduced to less than 45 mph due to the sidewalk curb.
4. **Cost Estimates.** Cost estimates are preliminary based upon a minimal survey using present day costs of anticipated bid items. All estimates have the addition of at least 15 percent for construction engineering and contingency. The estimate for the separate alignment, that is Alternate One, has an addition of 20 percent for construction engineering and contingency due to higher risk in estimating accurate quantities. Likewise, Option 1 for Segment 2 has an addition of 20 percent for construction engineering and contingency due to higher risk in estimating accurate quantities. Although the cost estimates are preliminary, they are adequate for making comparative decisions regarding the feasibility of the alternates.

Wetlands mitigation requirements could not be fully assessed at the time of this report. Therefore, costs could not be fully determined. Although a preferred alternate is selected with this study, it is recommended that further evaluation of the alternates be made during preliminary design based upon wetlands requirements and recommendations following a field review of the staked alignments by the Corps of Engineers. A wetlands walkway cost estimate was prepared by Schmueser, Gordon and Meyer based upon a recent project in wetlands near Wolcott. This estimate is included in the cost for Alternate One for Segment 3 less duplication of some work items in the SEH cost estimate. Actual extents of the walkway will not be known until preliminary design after the Corps of Engineers has reviewed the project on site. This estimate is conservative in that the entire length for Segment 3 was considered to have this type of walkway.

Right-of-Way costs were not included in these estimates. Anticipated right-of-way needs for each alternate is provided, however.

**CBC Extensions Vs. Bridge.** Concrete Box Culvert Extensions are feasible for Alternates 1, 2 and 3 if the alignment is adjacent to US 6 for the crossings of the Lower Cactus Valley Ditch. Alternate 1 and the west portion of Alternate 2 could

cross the canal with a bridge, large culvert pipe, or concrete box culvert. The cost of the bridge crossing is very feasible and cost effective. Don Brueggeman with Big “R” in Greeley provided a preliminary estimate of \$10,795 for a 15 ft. x 10 ft. wide truss bridge and \$12865 for a 20 ft. x 10 ft. wide truss bridge delivered to the site. These costs do not include abutments, site preparation, crane costs and installation costs. Savings are possible if a number of locations are ready when the manufactured bridge units are delivered. A similar bridge type is provided in Photo 5.



Photo 5 – Big “R” Truss Bridge Design

The total cost of each bridge crossing is approximately \$15,000 to \$20,000. This is comparable to the cost of each concrete box culvert extension.

### **Alternates Considered**

#### **1. Alternate One.**

- a. **Description.** Alternate One maximizes separation of the bike pedestrian trail along the north side of US 6. The trail connects with the existing bike pedestrian trail on the west end near Mile Marker 100 on US 6 in Silt. On the east end, approximately 1.2 miles further the bike pedestrian trail ends at the new Coal Ridge High School. Due to the trail separation from US 6, this alternate requires additional right-of-way. At Davis Point, Alternate One has both Options 1 and 2 available. Alternate One crosses County Road 235, Davis Point Road immediately beyond Davis Point. After crossing CR 235, the Alternate One alignment is partially through wetlands environment. Alternate 1A is for a bituminous trail for Segment 3 and Alternate 1B is for a boardwalk trail for Segment 3.
- b. **Typical Section.** Typical Section Sheets 1, 2, and 3 show Alternate One Typical Sections. Typical Section Sheet 1 shows the typical section for Segments 1 and 3, as well as, stabilization through wetlands areas. The



stabilization for wetlands areas typical may need revision depending upon Corps of Engineer requirements following their review of the preliminary design. The wetlands walkway boardwalk may be a required option for at least some of the wetlands locations. Typical Section Sheet 1 show Option 1 for Segment 2 and Typical Section Sheet 2 show Option 2 for Segment 2. Both of these options are available for Alternate One.

- c. **Layout Drawing.** The layout drawing is shown on the aerial mapping designated Alternate One. The alignment is separated from US 6 for most of its extent. The alignment parallels US 6 except with the introduction of flat smooth curvature to take advantage of topographic features and maintain interest along the route. Grades for the alignment are similar to grades for US 6 unless Option 1 is selected for Segment 2 at Davis Point.
- d. **Advantages and Disadvantages.** Table 2 provides a summary of advantages and disadvantages in comparison of Alternates 1A and 1B with the other alternates. Alternate One provides the safest alternate due to separation and least vehicular conflicts.
- e. **Engineering Cost Estimate.** This alternate is the least costly with regard to construction cost. However, the cost may be higher depending upon environmental requirements for wetlands areas. The cost of right-of-way is not known. Reference the separate cost estimates for segments 1, 2 and 3 for alternate one. Segment 3 cost estimate includes costs for either a bituminous trail with additional stabilization across wetlands areas (Alternate 1A) or wetlands boardwalk (Alternate 1B). The total construction cost for this alternate is \$780,403 for Alternate 1A with Option 2 at Davis Point and \$1,366,979 for Alternate 1B with Option 2 at Davis Point.

## 2. Alternate Two.

- a. **Description.** Alternate Two is a separated bike pedestrian trail along the north side of US 6 for Segment 1 similar to Alternate One. The trail connects with the existing bike pedestrian trail on the west end near Mile Marker 100 on US 6 in Silt. On the east end, approximately 1.2 miles further the bike pedestrian trail ends at the new Coal Ridge High School. At Davis Point, Alternate Two has both Options 1 and 2 available. Alternate Two crosses County Road 235, Davis Point Road immediately beyond Davis Point. After crossing CR 235, the Alternate Two alignment is a ten-foot widening of US 6 for the remainder of its length through Segment 3 to Coal Ridge High School.
- b. **Typical Section.** Typical Sections for Alternate Two are shown on Typical Section Sheet 1 for Segment 1, Typical Section Sheets 2 and 3 for Options 1 and 2 for Segment 2 and Typical Section Sheet 4 for Segment 3. Both Options 1 and 2 are available for Alternate Two.
- c. **Layout Drawing.** The layout drawing is shown on the aerial mapping sheet designated Alternate Two. The layout is similar to Alternate One for Segment 1. The alignment is widening of the north shoulder of US 6 for most of its extent through Segment 3. Grades for the alignment are the

same as those for US 6 unless Option 1 is selected for Segment 2 at Davis Point.

- d. **Advantages and Disadvantages.** Table 2 provides a summary of advantages and disadvantages in comparison with the other alternates. This alternate provides the least impact to wetlands environment at a moderate cost. An advantage is that maintenance can be accomplished with normal roadway maintenance. A safety disadvantage is that some travel is “out of direction” with vehicles.
- e. **Engineering Cost Estimate.** This alternate is at moderate construction cost. There may be some environmental impacts in wetlands areas requiring additional costs. Some right-of-way will be required with a cost unknown. Reference the separate cost estimates for segments 1, 2 and 3 for alternate two. The total construction cost for this alternate is 759,130 with Option 2 at Davis Point.

### 3. Alternate Three.

- a. **Description.** Alternate Three places bike/pedestrian travel along both shoulders of US 6. The trail connects with the existing bike pedestrian trail on the west end near Mile Marker 100 on US 6 in Silt. On the east end, approximately 1.2 miles further the bike pedestrian trail ends at the new Coal Ridge High School. For eastbound travel along US 6, bicyclists must cross the highway at two locations, once on the west end and once on the east end. At Davis Point, Alternate Three has only Option 2 available. Alternate Three crosses County Road 235, Davis Point Road immediately beyond Davis Point for westbound travel only. After crossing CR 235, the Alternate Three alignment along both shoulders of US 6 through Segment 3.
- b. **Typical Section.** Typical Sections for Alternate Three are shown on Typical Section Sheets 4 for Segments 1 and 3 and Typical Section Sheet 3 for Segment 2.
- c. **Layout Drawing.** The layout drawing is shown on the aerial mapping sheet designated Alternate Three. The layout is along US 6 with widening for shoulders on each side through much of the extents. Where crossings of US 6 are required, the alignment needs to loop outward so that the crossing is at right angles to the roadway for adequate sight distance. Grades for the alignment are the same as those for US 6.
- d. **Advantages and Disadvantages.** Table 2 provides a summary of advantages and disadvantages in comparison with the other alternates. This alternate provides the advantages that maintenance can be accomplished with normal roadway maintenance and bicyclist travel is uniform with vehicular travel direction. Disadvantages are that two crossings of US 6 are required for eastbound travel and this alternate is the least direct route. Wetlands mitigation may be required on both sides of the roadway.
- e. **Engineering Cost Estimate.** This alternate is the most expensive construction cost. There may be some environmental impacts in wetlands

areas requiring additional costs. Some right-of-way will be required with a cost unknown. Reference the separate cost estimates for segments 1, 2 and 3 for Alternate Three. The total construction cost for this alternate is \$1,213,416.

### **Summary of Alternates**

Table 1 is a Summary of Alternate Construction Costs. Costs are separated into three segments along the project length. Segment 1 is west of Davis Point, Segment 2 is at Davis Point and Segment 3 is east of Davis Point as shown in Figure 2.

Table 2 is a Summary of Advantages and Disadvantages of each Alternate.

### **Conclusions and Recommended Alternate**

Alternate One is selected as the preferred alternate because it is the safest alternate due to separation of bike and pedestrian traffic from vehicular traffic throughout the majority of its length. As stated in the Project Scope – Introduction on Page 7, “The primary purpose of this trail is to provide safe pedestrian and bicycle non-motorized access from Silt to Coal Ridge High School.” This alternate best fulfills this goal.

A primary disadvantage of Alternate One is that it has the most impact on wetlands areas. These areas are primarily in Segment 3. Alternate 1A crosses wetlands with a bituminous trail using additional stabilization that is free draining. Mitigation may be required for this alternate with the creation of new wetlands areas. Alternate 1B crosses wetlands at higher cost with an elevated bridged boardwalk trail. In reality, Alternate One should use a combination of these options with the cost somewhere in between the range of costs for Alternates 1A and 1B.

Although Alternate Two is the least expensive alternate, it does not provide for separation of pedestrian, bike and vehicular traffic. Bike and pedestrian traffic on the north shoulder through Segments 2 and 3 will be dual directional while vehicular travel is west only on this side. This creates safety problems. Alternate Three also has safety problems in that bicyclists need to cross US 6 twice for eastbound travel from Silt to the high school. For both alternates pedestrian and bike travel is immediately adjacent to US 6 vehicular travel.

Option 2 is preferred for Segment 2. This option is the least expensive and involves the least risk for stabilization and slide potential. Although it will involve some extension of the MSE wall, this extension will be less than that required for Option 1. Option 2 will require a shift of US 6 to the south to accommodate the trail. This shift however will improve sight distance for the intersection of CR 235 (Davis Point Road). The concrete raised sidewalk trail through this section is 6 feet in width with a four foot shoulder. This is a narrow section but is necessary due to the tight constraints presented at Davis Point.

Horizontal alignment for Alternate One should be placed as far from US 6 as is feasible throughout its length excepting Segment 2 at Davis Point. The alignment should have gentle curves within design criteria for its length rather than long straight tangents. Adequate sight distance is important at Davis Point.



Photo 6 – Coal Ridge High School under construction at east end of bike pedestrian trail

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### **List of Typical Sections**

Sheet 1	Alternate One – Segments 1 and 3, Alternate Two – Segment 1; Alternate One - Wetlands Areas
Sheet 2	Alternates One or Two – Option 1, Roadway Segment 2 (Davis Point)
Sheet 3	Alternates One, Two or Three – Option 2, Roadway Segment 2 (Davis Point)
Sheet 4	Alternate Two – Segment 3 Alternate Three – Segments 1 and 3

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### **List of Layout Drawings**

Drawing 1	Alternate One – Project Location Bike Pedestrian Trail
Drawing 2	Alternate Two – Project Location Bike Pedestrian Trail
Drawing 3	Alternate Three – Project Location Bike Pedestrian Trail



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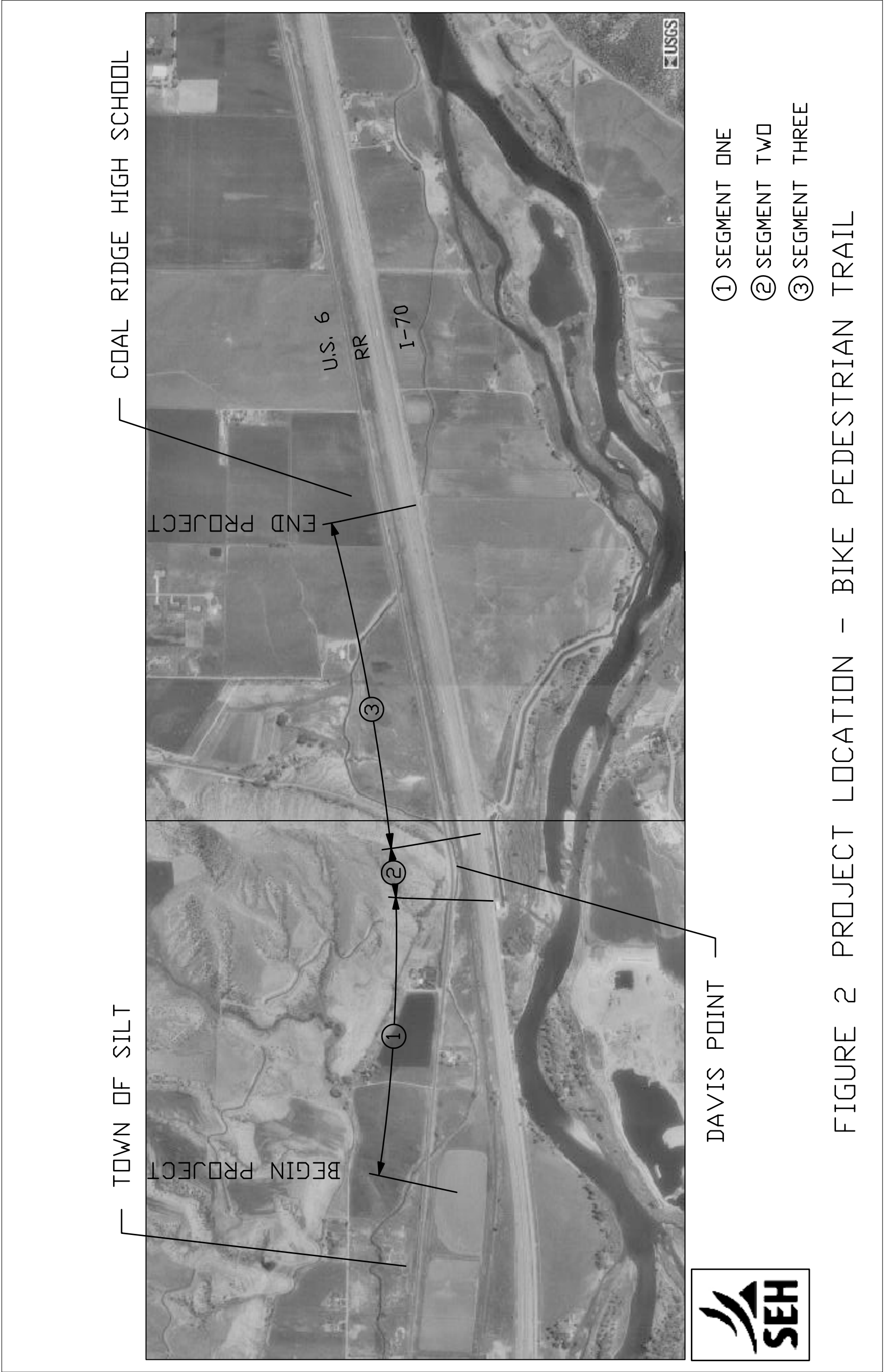
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Estimate 2	Alternate 3, Roadway Segment 1 (Silt to Davis Point)
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Estimate 4	Alternates 1,2, or 3, Option 2, Roadway Segment 2 (Davis Point)
Estimate 5	Alternate 1, Roadway Segment 3 (Davis Point to Coal Ridge High School)
Estimate 6	Alternate 2, Roadway Segment 3 (Davis Point to Coal Ridge High School)
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Wetlands Walkway Cost Estimate – Schmueser, Gordon and Meyer Engineers & Surveyors	

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### **List of Appendices**

Appendix A	5-Year Analysis of US 6 Accident History
Appendix B	CDOT 2002 Accident and Rates
Appendix C	2002 Average Daily Traffic Volume – County Road 235 (Davis Point Road)
Appendix D	Materials Recommendation Letter



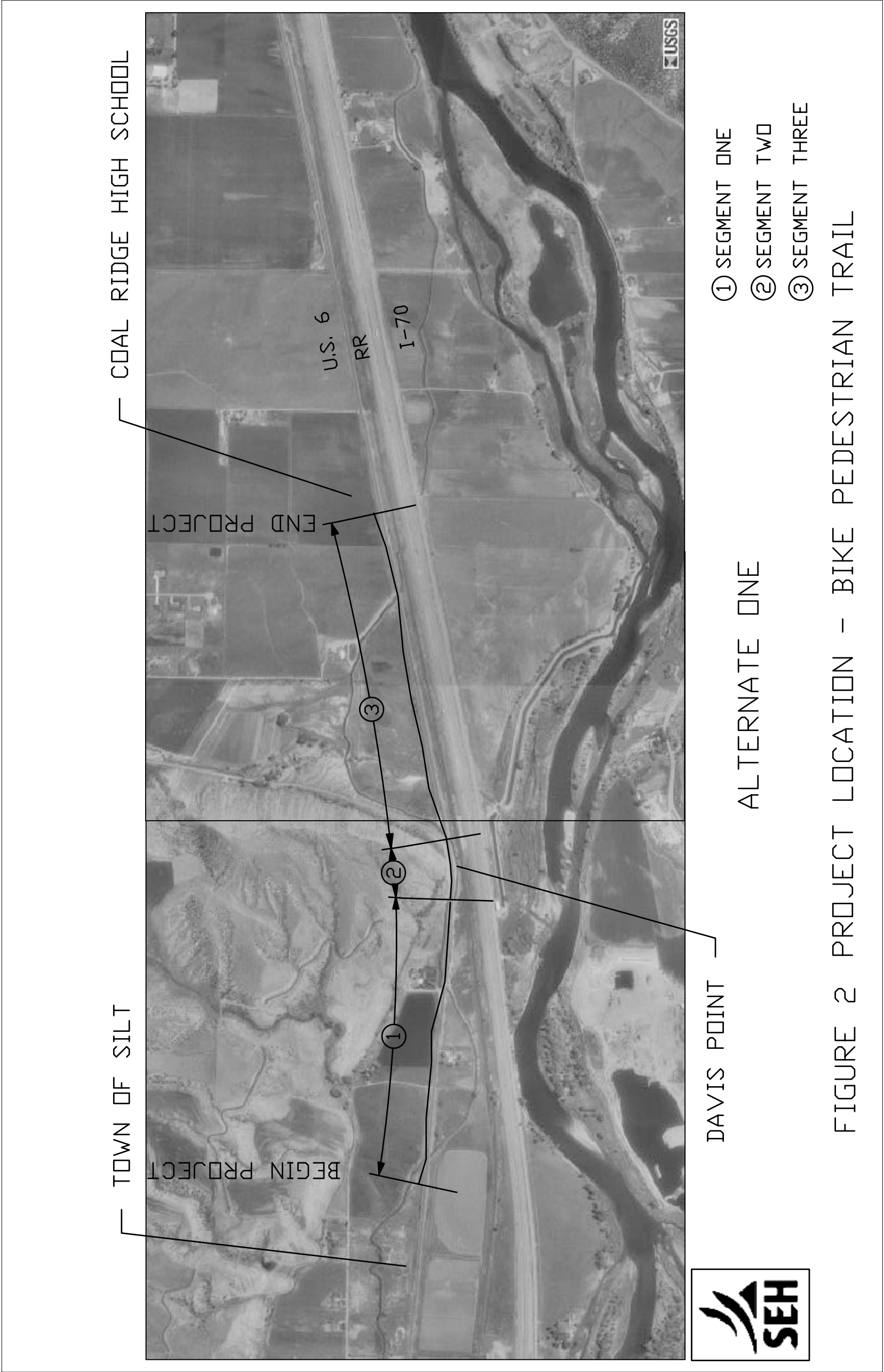
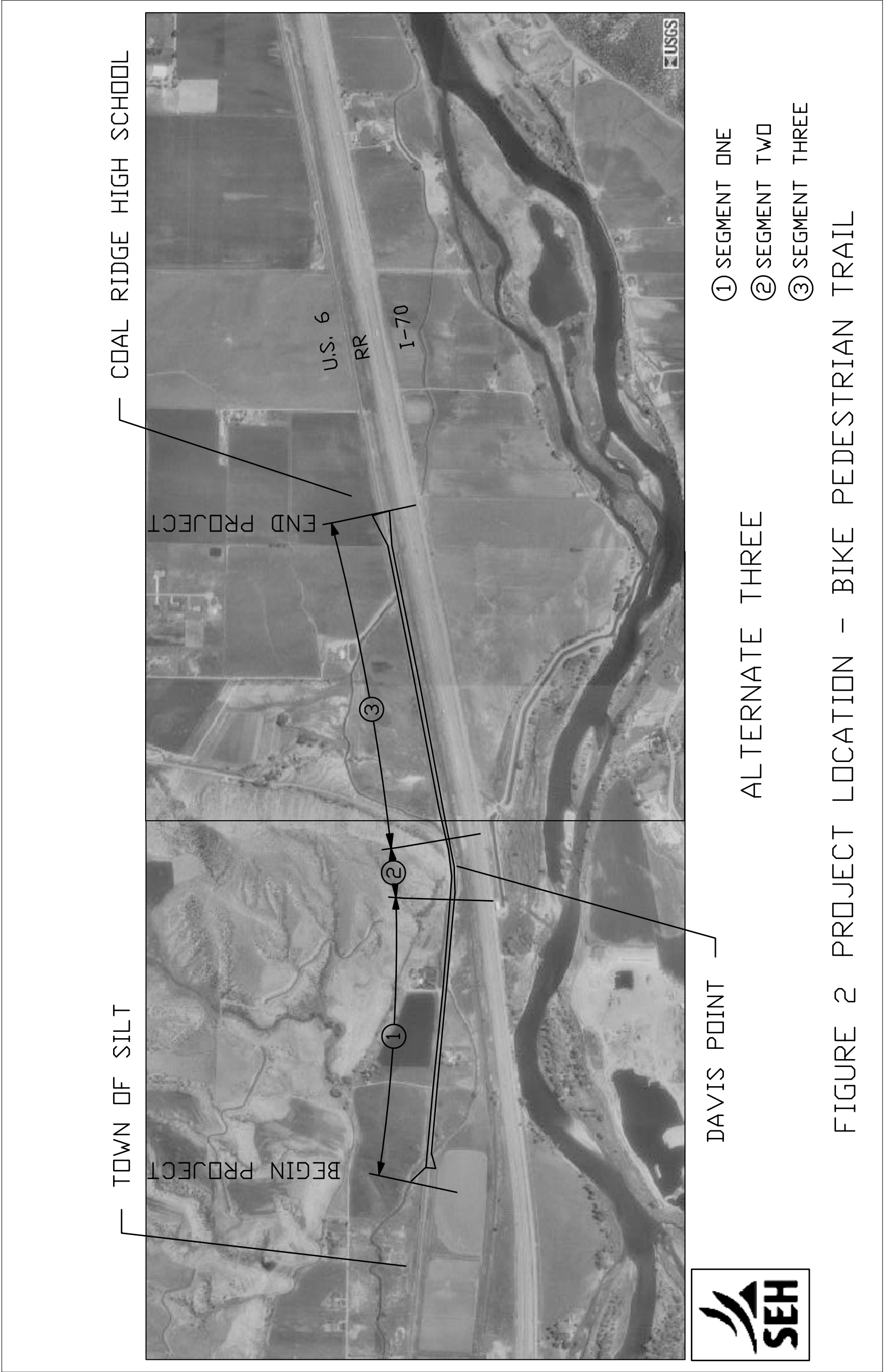
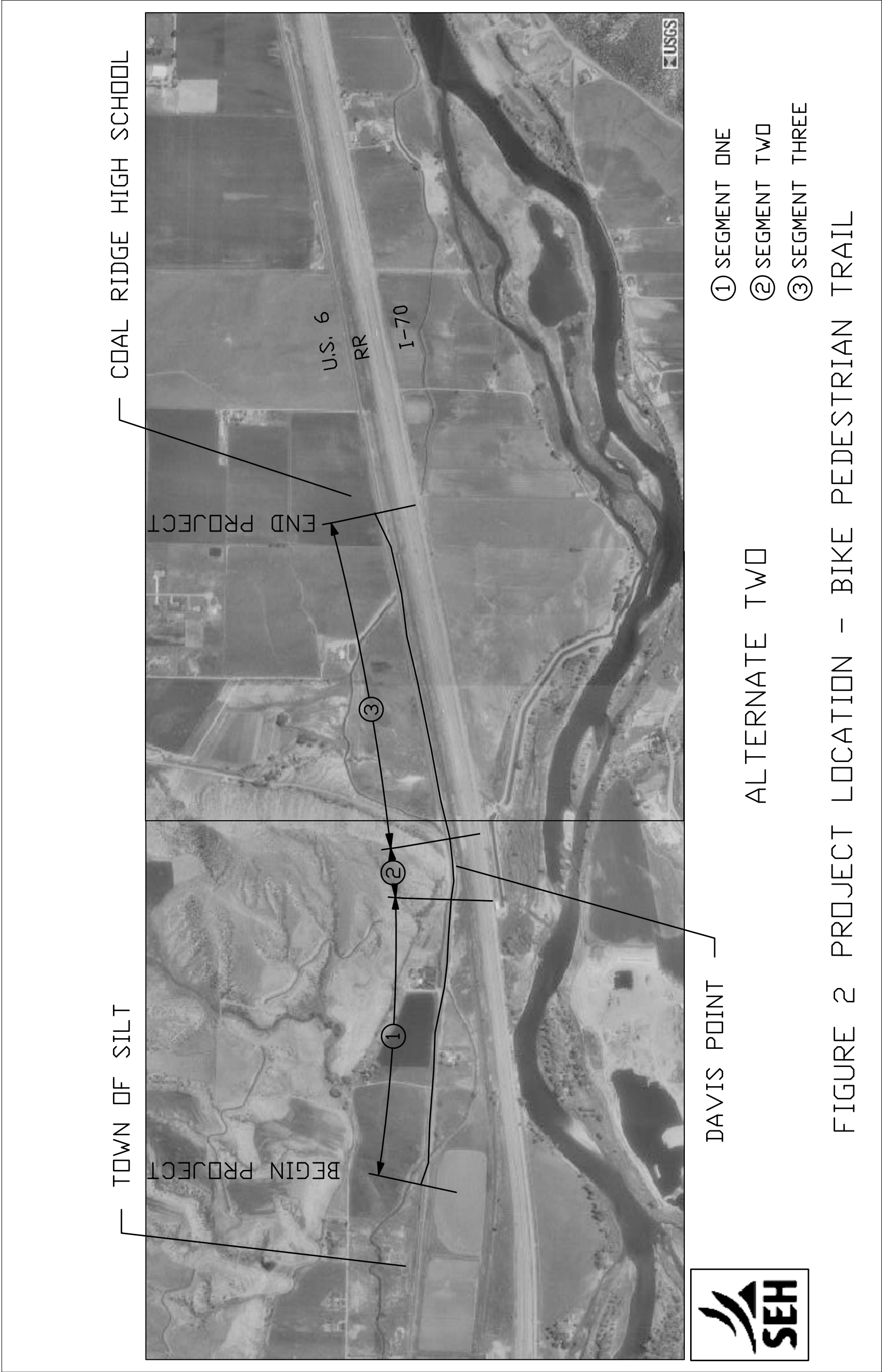


FIGURE 2 PROJECT LOCATION - BIKE PEDESTRIAN TRAIL

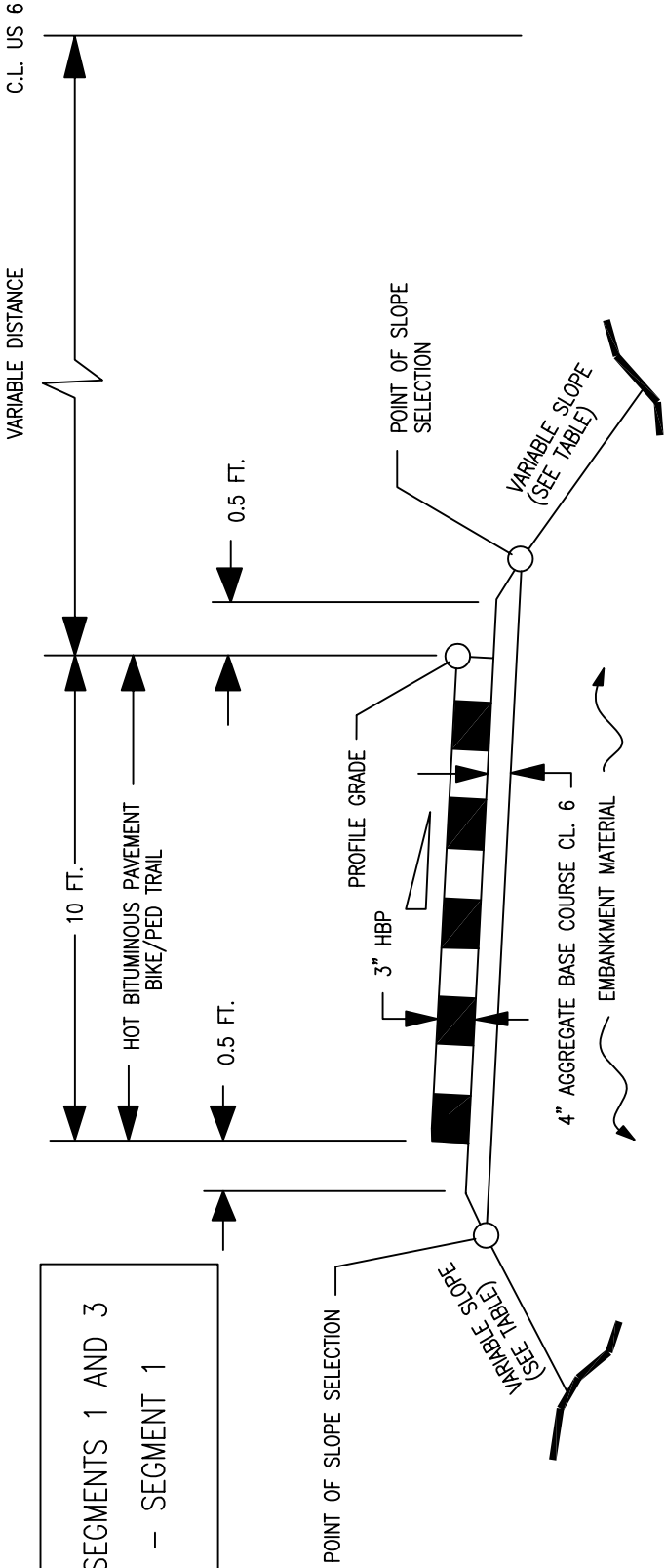








ALTERNATE ONE – SEGMENTS 1 AND 3  
ALTERNATE TWO – SEGMENT 1



TYPICAL SECTION NOTES

- The contractor will be required to place 4 inches of topsoil to this line after completion of paving operation.
- Break points in slopes and in bottoms of ditches shall be rounded during construction for a pleasing appearance.
- 2 % roadway slope.
- Vertical alignment control points.

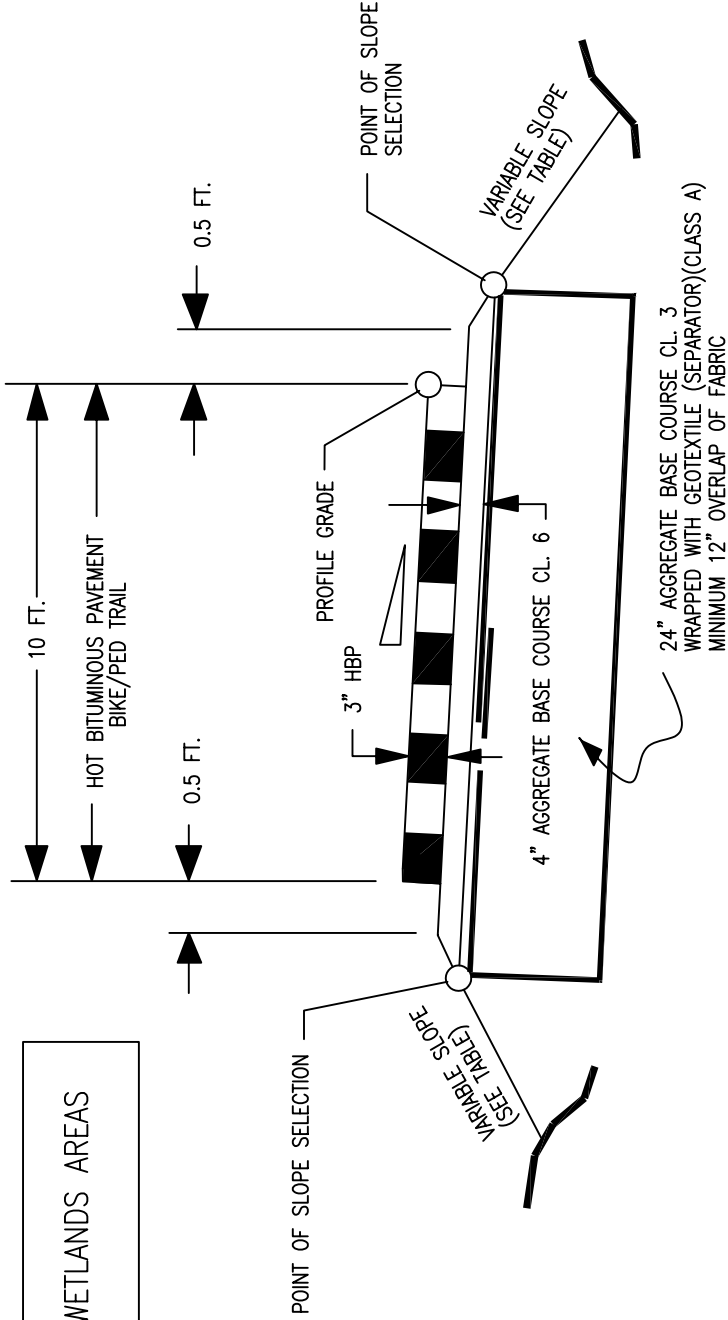
SLOPE SELECTION

Height of Cut or Fill	Sideslope
Less than 10 feet	1:4
Over 10 feet	1:2
In special cases, slope may be steepened	

NOTE FOR WETLANDS LOCATIONS:

The 10 foot wetlands walkway may be a boardwalk in some locations if required by the Army Corps of Engineers.

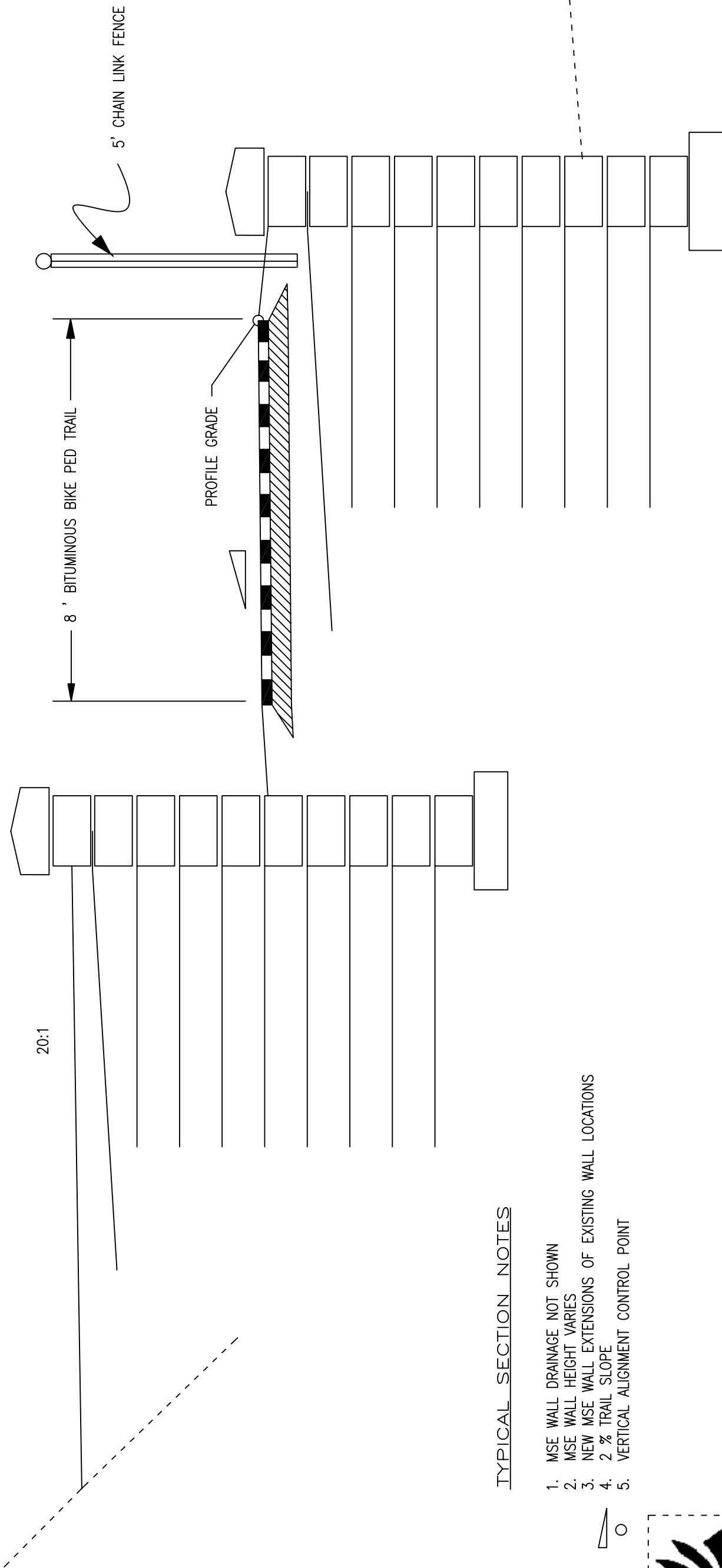
ALTERNATE ONE – WETLANDS AREAS



 Colorado Department of Transportation 222 South Sixth Street Grand Junction, CO 80501 City, State Zip Code Phone: 970-248-7230 FAX: 970-248-7254 Region Three JN	Typical Sections Sheet			Project No./Code	
				C 0063-017	
				Designer: J. Patton	Structure Numbers
				Detailer: J. Patton	15132
				Sheet Subset: XXXXXX	Subset Sheets: XXX of XXX
Computer File Information		Sheet Revisions		As Constructed	
Creation Date: 01/17/05	Initials: JEP	(R-X)	mm/dd/yy XXXX	No Revisions: mm/dd/yy	
Last Modification Date: 02/01/05	Initials: JEP	(R-X)	mm/dd/yy XXXX	Revised: mm/dd/yy	
Full Path: \\XXXXX\XXXXX		(R-X)	mm/dd/yy XXXX	Void: mm/dd/yy	
Drawing File Name: XXXXXXXX.dwg		(R-X)	mm/dd/yy XXXX		
Acad VerR2004	Scale: X:XXXX	(R-X)	mm/dd/yy XXXX		

ALTERNATE ONE or TWO— OPTION 1, ROADWAY SEGMENT 2 (DAVIS POINT)

6 FOOT BITUMINOUS BIKE PEDESTRIAN TRAIL LEFT



TYPICAL SECTION NOTES

1. MSE WALL DRAINAGE NOT SHOWN
2. MSE WALL HEIGHT VARIES
3. NEW MSE WALL EXTENSIONS OF EXISTING WALL LOCATIONS
4. 2 % TRAIL SLOPE
5. VERTICAL ALIGNMENT CONTROL POINT





SEH





Colorado Department of Transportation		Computer File Information		Sheet Revisions		As Constructed		Typical Sections Sheet		Project No./Code	
222 South Sixth Street Grand Junction, CO 80501		Creation Date: 01/17/05		(R-X)		mm/dd/yy XXXX				C 0063-017	
City, State Zip Code		Last Modification Date: 02/15/05		(R-X)		mm/dd/yy XXXX					
Phone: 970-248-7230		Full Path: \\XXXXX\XXXXX		(R-X)		mm/dd/yy XXXX		Designer: J. Patton		15132	
FAX: 970-248-7254		Drawing File Name: XXXXXXXX.dwg		(R-X)		mm/dd/yy XXXX		Detailer: J. Patton			
Region Three		Acad Ver2004		(R-X)		mm/dd/yy XXXX		Sheet Subset: XXXXXX		Sheet Number 2 OF 4	
JN		Scale: X:XXXX						Sheet Sheets: XXX of XXX			
		Units: XXXX									

TYPICAL SECTION NOTES

- 

The contractor will be required to place 4 inches of topsoil to this line after completion of paving operation.
- 

Break points in slopes and in bottoms of ditches shall be rounded during construction for a pleasing appearance.
- 

2 % roadway slope.
- 

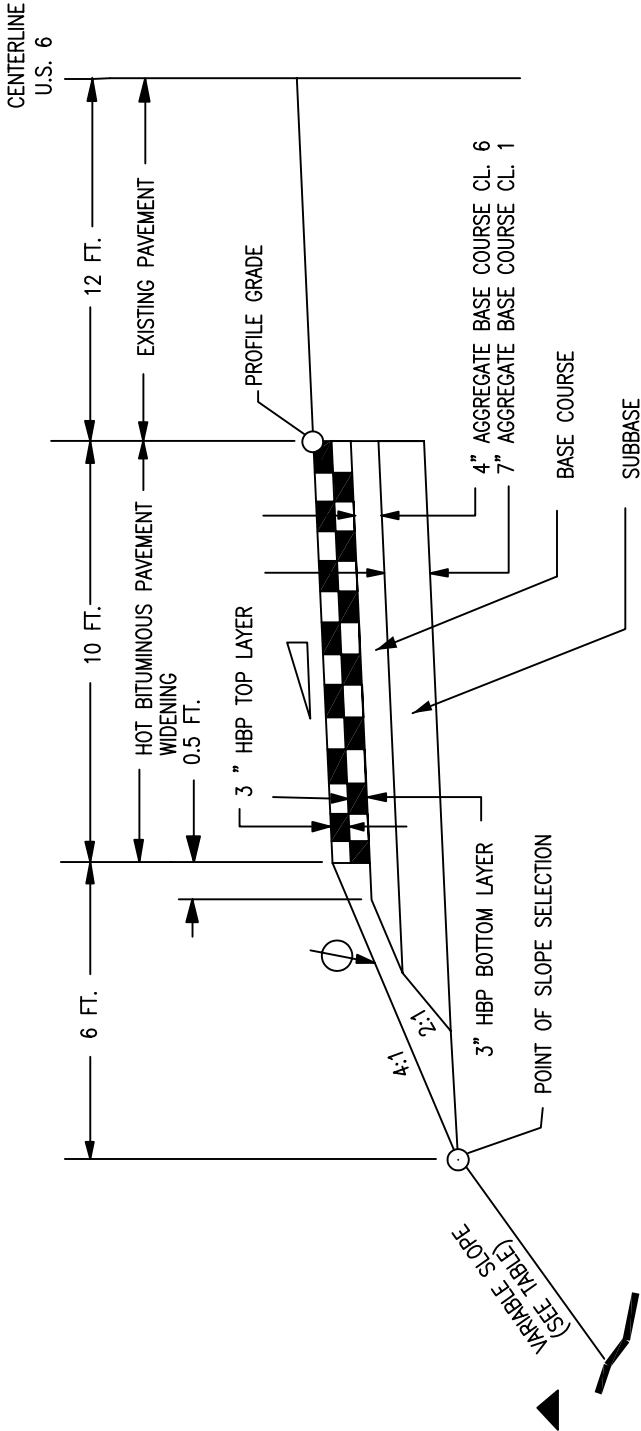
Vertical alignment control points.

PAVEMENT DESIGN PARAMETERS

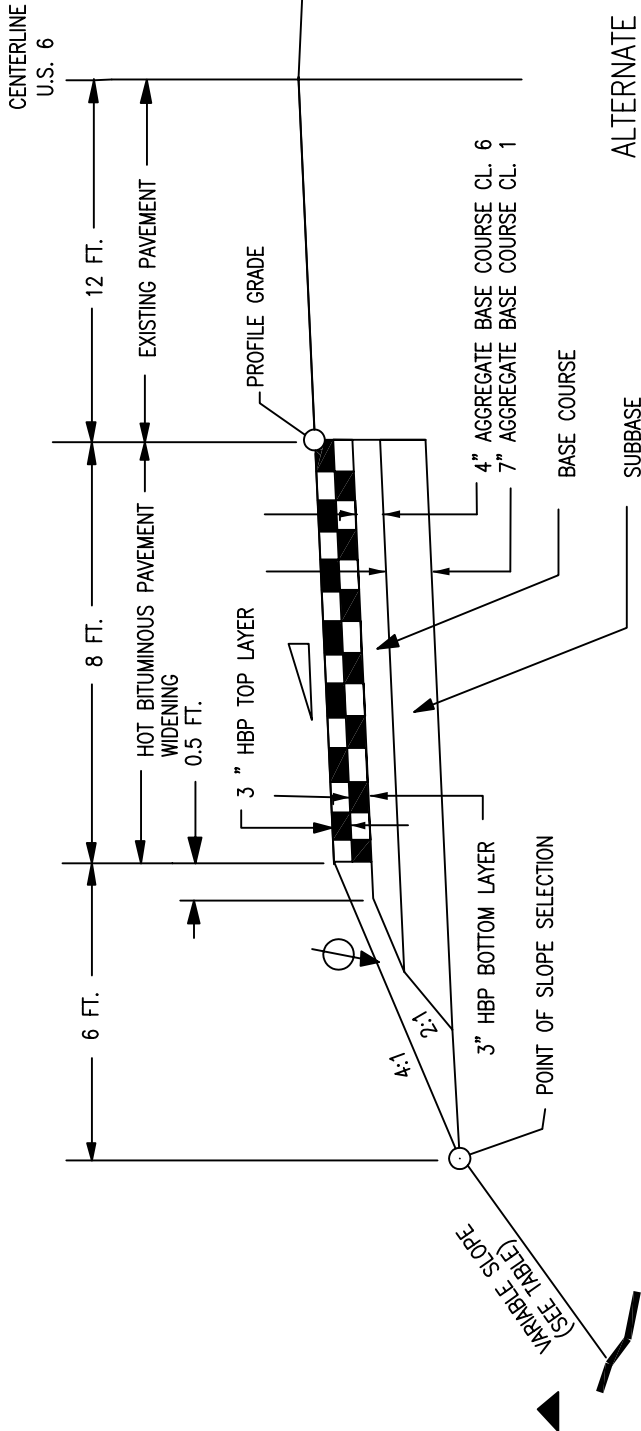
Stabilization Data		Mainline
Design life (years) Reliability (%)		20
		80
PSI Loss 80 kN ESALS		2
Structural Number		477,000
		3.86

SLOPE SELECTION

Height of Cut or Fill	Sideslope
Less than 10 feet	1:4
Over 10 feet	1:2
In special cases, slope may be steepened	



ALTERNATE TWO – SEGMENT 3



ALTERNATE THREE – SEGMENTS 1 AND 3



Colorado Department of Transportation 222 South Sixth Street Grand Junction, CO 80501 City, State Zip Code Phone: 970-248-7230 FAX: 970-248-7254 Region Three	Computer File Information		Sheet Revisions		As Constructed		Typical Sections Sheet		Project No./Code	
	Creation Date: 01/17/05	Initials: JEP	(R-X)	mm/dd/yy XXXX	(R-X)	mm/dd/yy XXX			C 0063-017	
	Last Modification Date: 02/01/05	Initials: JEP	(R-X)	mm/dd/yy XXXX	(R-X)	mm/dd/yy XXX			15132	
	Full Path: \\XXXXX\XXXXX		(R-X)	mm/dd/yy XXXX	(R-X)	mm/dd/yy XXX			15132	
Region Three	Drawing File Name: XXXXXXXX.dwg		(R-X)	mm/dd/yy XXXX	(R-X)	mm/dd/yy XXX	Designer: J. Patton	Structure Numbers	15132	
	Acad VerR2004	Scale: X:XXXX	(R-X)	mm/dd/yy XXXX	(R-X)	mm/dd/yy XXX	Detailer: J. Patton		Sheet Number 4 OF 4	
		Units: XXXXX	(R-X)	mm/dd/yy XXXX	(R-X)	mm/dd/yy XXX	Sheet Subset: XXXXXX	Subset Sheets: XXX of XXX		



Colorado Department of Transportation  
Transportation Safety and Traffic Engineering  
Detailed Accident Summary Report

01/14/2005

Job #: 20050114111429

Highway: 6D Begin: 99.38 End: 101.70 From: 01/01/1999 To: 12/31/2003

**Severity**

PDO: 13  
INJ: 4 5 :Injured  
FAT: 0 0 :Killed

**Total: 17**

**Multi-Vehicle**

One Vehicle: 8  
Two Vehicles: 8  
Three or More: 1  
Unknown: 0

**Total: 17**

**Location**

On Road: 15 Off in Median: 0  
Off Road Left: 0 Unknown: 0  
Off Road Right: 2  
Off Road at Tee: 0

**Total: 17**

**Accident Type**

Overturning: 0	Domestic Animal: 0	Tree: 0
Other Non Collision: 1	Wild Animal: 6	Large Boulder: 0
School Age Peds: 0	Light/Utility Pole: 0	Rocks in Roadway: 0
Other Pedestrians: 1	Traffic Signal Pole: 0	Barricade: 0
Broadside: 2	Sign: 0	Wall/Building: 0
Head On: 0	Bridge Rail: 0	Crash Cushion: 0
Rear End: 2	Guard Rail: 0	Mailbox: 0
Sideswipe (Same): 0	Median Barrier: 0	Other Fixed Object: 0
Sideswipe (Opposite): 0	Bridge Abutment: 0	Involving Other Object: 0
Approach Turn: 2	Column/Pier: 0	Road Maintenance Equipment: 0
Overtaking Turn: 2	Culvert/Headwall: 0	Unknown: 0
Parked Motor Vehicle: 0	Embankment: 1	<b>Total: 17</b>
Railway Vehicle: 0	Curb: 0	Total Fixed Objects: 1
Bicycle: 0	Delineator Post: 0	Total Other Objects: 0
Motorized Bicycle: 0	Fence: 0	

**Lighting Conditions**

Daylight: 11  
Dawn or Dusk: 0  
Dark - Lighted: 0  
Dark - Unlighted: 6  
Unknown: 0

**Total: 17**

**Weather Conditions**

None: 16 Dust: 0  
Rain: 0 Wind: 0  
Snow/Sleet/Hail: 1 Unknown: 0  
Fog: 0

**Total: 17**

**Road Description**

At Intersection: 5  
At Driveway Access: 4  
Intersection Related: 0  
Non Intersection Urban: 1  
In Alley: 0  
Non Intersection Rural: 7  
Highway Interchange: 0  
Unknown: 0

**Total: 17**

**Road Conditions**

Dry: 15  
Wet: 1  
Muddy: 0  
Snowy: 1  
Icy: 0  
Slushy: 0  
Foreign Material: 0  
With Road Treatment: 0  
Dry w/Icy Road Treatment: 0  
Wet w/Icy Road Treatment: 0  
Snowy w/Icy Road Treatment: 0  
Icy w/Icy Road Treatment: 0  
Slushy w/Icy Road Treatment: 0  
Unknown: 0

**Total: 17**

**Mainline/Ramps/Frontage Rds**

Mainline: 17  
Crossroad (Ramp A): 0  
Frontage Rd: 0

**Ramps**

B: 0	H: 0
C: 0	I: 0
D: 0	J: 0
E: 0	K: 0
F: 0	T: 0
G: 0	

**Intsx Frontage/Ramps**

M: 0	N: 0
O: 0	P: 0

HOV Lanes: 0

Ukwn: 0 **Total: 17**

**Accident Rates**

PDO: 0.91 MVMT Total: 1.19 MVMT  
Injury: 0.28 MVMT  
Fatal: 0.00 100 MVMT

ADT: 3380 WHI: -3.26 Length: 2.31

Coris File: tcoris2004.dbf



**Colorado Department of Transportation**  
**Transportation Safety and Traffic Engineering**  
**Detailed Accident Summary Report**

01/14/2005

Job #: 20050114111429

Highway: 6D

Begin: 99.38 End:101.70 From:01/01/1999 To:12/31/2003

Vehicle Type	Veh 1	Veh 2	Veh 3	Vehicle Movement	Veh 1	Veh 2	Veh 3
Passenger Car/Van:	10	5	1	Going Straight:	12	4	0
Passenger Car/Van w/Trl:	0	0	0	Slowing:	0	1	0
Pickup Truck/Utility Van:	7	3	0	Stopped in Traffic:	0	0	0
Pickup Truck/Utility Van w/Trl:	0	0	0	Making Right Turn:	0	1	0
Truck 10k lbs or Less:	0	0	0	Making Left Turn:	3	3	0
Trucks > 10k lbs/Bus > 15 People:	0	0	0	Making U-Turn:	0	0	0
School Bus < 15 People:	0	0	0	Passing:	2	0	0
Non School Bus < 15 People:	0	0	0	Backing:	0	0	0
Motorhome:	0	0	0	Enter/Leave Parked Position:	0	0	0
Motorcycle:	0	0	0	Starting in Traffic:	0	0	0
Bicycle:	0	0	0	Parked:	0	0	0
Motorized Bicycle:	0	0	0	Changing Lanes:	0	0	0
Farm Equipment:	0	1	0	Avoiding Object in Road:	0	0	0
Hit and Run - Unknown:	0	0	0	Weaving:	0	0	0
Other:	0	0	0	Other:	0	0	1
Unknown:	0	0	0	Unknown:	0	0	0
<b>Total:</b>	<b>17</b>	<b>9</b>	<b>1</b>	<b>Total:</b>	<b>17</b>	<b>9</b>	<b>1</b>

Contributing Factor	Veh 1	Veh 2	Veh 3
No Apparent Contributing Factor:	13	8	1
Asleep at the Wheel:	0	0	0
Illness:	0	0	0
Distracted by Passenger:	0	0	0
Driver Inexperience:	1	0	0
Driver Fatigue:	0	0	0
Driver Preoccupied:	2	1	0
Driver Unfamiliar with Area:	0	0	0
Driver Emotionally Upset:	0	0	0
Evading Law Enforcement Officer:	0	0	0
Physical Disability:	1	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>17</b>	<b>9</b>	<b>1</b>

Direction	Veh 1	Veh 2	Veh 3	Condition of Driver	Veh 1	Veh 2	Veh 3
North:	0	0	1	No Impairment Suspected:	13	7	0
Northeast:	0	0	0	Alcohol Involved:	0	0	0
East:	6	4	0	RX Drugs or Medication Involved:	0	0	0
Southeast:	0	0	0	Illegal Drugs Involved:	0	0	0
South:	2	0	0	Alcohol and Drugs Involved:	0	0	0
Southwest:	0	0	0	Driver/Pedestrian not Observed:	2	0	0
West:	9	5	0	Unknown:	2	2	1
Northwest:	0	0	0	<b>Total:</b>	<b>17</b>	<b>9</b>	<b>1</b>
Unknown:	0	0	0				
<b>Total:</b>	<b>17</b>	<b>9</b>	<b>1</b>				

ADT: 3380 WHI: -3.26 Length: 2.31

Coris File: tcoris2004.dbf



## Memorandum 2004

**Date:** Friday, January 14, 2005

**To:** Sean Yeates

**From:** Region 3 Materials

**Subject:** Materials Information

**project number unknown?, 006 Silt widening at MP 100 - 102 for bike path S/A:**

The materials recommendations for the above named project is as follows:

18kESAL: 477,000

Environmental: Moderate

Design: 20 Years

PSI Loss: 2

Reliability: 80

Evaluation: Component Date: Thursday, January 13, 2005

Result: SN: 3.86

HBP Acceptance by: Gradations-Asphalt Content-Density

Estimated AC Content (from gyration historical data, adjusted for design Air Voids minus 1%): 6.2%

006 Silt widening at MP 100 - 102 for bike path, Traffic project.

The stabilization requirements are 6 inches of HBP, 4 inches of Class 6 and 7 inches of Class 1. The 6 inches of HBP should be placed in 2 or 3 lifts with a maximum lift thickness of 3 inches. PG76-28 shall be used for the top 2 inch lift and PG64-28 for the bottom lifts.

The loads for the structural template given are based on 2 lane traffic.

If shoulder gravel is required use Class 7 with a minimum R value of 70.

	SC	Widening/ New Construction		
Concrete				
HBP Gr. SX	.44	6		
ABC Cl. 6	.12	4		
ABC Cl. 1	.11	7		

Other Region Materials recommendations:

Class 2 Field Lab

Moisture density control for this project shall be AASHTO T99 full depth of all embankments and 6 inches in bases of cuts and fills.

Included as attachments and listed on the next page of this letter are all recommended revisions to the specifications.

cc: Resident Engineer  
file

Program Revision: August 2004

## Notice

The following revisions should be included in the plans for project number unknown?, 006 Silt widening at MP 100 - 102 for bike path. If the revisions marked with a “#” are necessary, they should be modified as noted and included.

#Revision of Section 304      AGGREGATE BASE COURSE

Base Course: Class 6, R-value 78

Subbase: Class 1, R-value 70

---

The following Materials Related Special Provisions or Project Special Provisions should be included in this project. This list may not be complete. Please check the Standard Project Special Provisions Index.

Revision of Section 105 – Conformity with Plans and Specifications

Revision of Section 203 - Proof Rolling

Revision of Section 105, 106 and 203 Quality of Embankment

Revision of Sections 105 and 106 - Quality of Hot Bituminous Pavement

Revision of Section 702 - Superpave PG Binders

Revision of Section 401 - Plant Mix Pavements

Revision of Section 401 - Plant Mix Pavements – General

Revision of Section 401 – Bituminous Pavers

Revision of Section 401 – Weather Limitations and Placement Temperatures

Revision of Sections 105, 202, 401, 405, 406, 412 – Roadway Smoothness

Revision of Sections 106 and 620 – Qualifications of Testing Personnel and Laboratories

Revision of Section 620 – Field Laboratories with Forced Air Convection Oven

REVISION OF SECTION 403  
HOT BITUMINOUS PAVEMENT (GRADING SX) (75)

Section 403 of the Standard Specifications is hereby revised for this project as follows:

Subsection 403.02 shall include the following:

The design mix for hot bituminous pavement shall conform to the following:

TABLE 403-1

VALUE FOR PROPERTY	TEST METHOD	GRADING
		SX (75)
Air Voids, percent at N(des)	CPL 5115	3.5-4.5
Lab Compaction (Revolutions) N(des)	CPL 5115	75
Stability, minimum	CPL 5106	28
Aggregate retained on the No. 4 sieve with at least 2 Mechanically Induced fractured faces, % minimum	CP 45	70
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80
Minimum Dry Split Tensile Strength, psi (kPa)	CPL 5109 Method B	30 (205)
Grade of Asphalt Cement, Top Layer		PG 76-28
Grade of Asphalt Cement, Layers Below Top		PG 64-28
Voids in the Mineral Aggregate (VMA), % min	CP 48	See TABLE 403-2
Voids Filled with Asphalt (VFA), %	AI MS-2	65-80
Dust to Asphalt Ratio Fine Gradation	CP-50	0.6 — 1.2
Coarse Gradation	CP-50	0.8 — 1.6

Note: AI MS-2 = Asphalt Institute Manual Series 2

Note: The current version of CPL 5115 is available from the Region Materials Engineer

Note: Mixes with gradations having less than 40% passing the No. 4 sieve shall be approached with caution because of constructability problems.

Note: Gradations for mixes with a nominal maximum aggregate size of one-inch or larger are considered a coarse gradation if they pass below the maximum density line at the #4 screen.  
Gradations for mixes with a nominal maximum aggregate size of ¾ inch or smaller are considered a coarse gradation if they pass below the maximum density line at the #8 screen.

All mix designs shall be run with a gyratory compaction angle of 1.25 degrees and properties must satisfy Table 403-1. CDOT Form #43 will establish construction targets for Asphalt Cement and all mix properties at Air Voids up to 1.0% below the mix design optimum.

REVISION OF SECTION 403  
HOT BITUMINOUS PAVEMENT (GRADING SX) (75)

-2-

TABLE 403-2  
Minimum Voids in the Mineral Aggregate (VMA)

Nominal Maximum Size * Inches (mm)		***Design Air Voids **		
		3.5%	4.0%	4.5%
1 1/2	(37.5)	11.6	11.7	11.8
1	(25.0)	12.6	12.7	12.8
3/4	(19.0)	13.6	13.7	13.8
1/2	(12.5)	14.6	14.7	14.8
3/8	(9.5)	15.6	15.7	15.8

\* The nominal size is defined as one sieve larger than the first sieve to retain more than 10%

\*\* Interpolate specified VMA values for design air voids between those listed.

\*\*\* Extrapolate specified VMA values for production air voids beyond those listed.

The Contractor shall prepare a quality control plan outlining the steps taken to minimize segregation of HBP. This plan shall be submitted to the Engineer and approved prior to beginning the paving operations. When the Engineer determines that segregation is unacceptable, the paving shall stop and the cause of segregation shall be corrected before paving operations will be allowed to resume.

A minimum of one percent hydrated lime by mass (weight) of the combined aggregate shall be added to the aggregate for all hot bituminous pavement.

Acceptance samples shall be taken at the location specified in either Method B or C of CP 41, as determined by the Region Construction and Materials personnel.

The hot bituminous pavement shall not contain any reclaimed asphalt pavement.

Hot bituminous pavement for patching shall conform to the requirements for Hot Bituminous Pavement (GRADING SX) (75).

In Subsection 403.05 delete the third paragraph and replace with the following:

Aggregate, asphalt recycling agent, additives, hydrated lime, and all other work necessary to complete each hot bituminous pavement item will not be paid for separately but shall be included in the unit price bid. Asphalt cement will be measured and paid for in accordance with Section 411 except that asphalt cement used in Hot Bituminous Pavement (Patching) will not be measured and paid for separately, but shall be included in the work.

**From:** Roussin, Daniel  
**Sent:** Monday, February 14, 2005 3:20 PM  
**To:** Nall, Jim; Hudson, Skip  
**Cc:** Egghart, Hans  
**Subject:** FW:

These are 2002 24 hour counts for Davis Point Road. This is will be our baseline number if there is a development to the North. I will keep everyone informed.

Thanks

]

Dan Roussin

**From:** Jeff Nelson [mailto:[jnelson@garfield-county.com](mailto:jnelson@garfield-county.com)]  
**Sent:** Monday, February 14, 2005 1:12 PM  
**To:** Roussin, Daniel  
**Subject:**

**Cr 235 Davis Point= 307 ADT**

Jeff T Nelson

Assistant County Engineer

[jnelson@garfield-county.com](mailto:jnelson@garfield-county.com)

Garfield County Engineering Dept.

144 E Third St.

Rifle, Co. 81650

tel: 970-625-6172

fax: 970-625-0908

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**Table 1 - Summary of Alternate Construction Costs**

Segment	Alternate	Estimate No.	Alternate Description	Construction Cost from Estimates**	Estimated Additional ROW Needed (Acres)
Segment 1 Silt to Davis Point, West End	One or Two	1	10-ft Bituminous Bike Pedestrian Trail Separated from US 6 Including Three Ditch Crossings	\$ 262,960.80	1.80
	Three	2	8-ft Bituminous Shoulders on US 6 for directional biking	\$ 537,629.60	0.70
Segment 2 at Davis Point	One or Two, Option 1	3	8-ft Bituminous Bike Pedestrian Trail Separated from US 6 Located on Upper Bench	\$ 186,440.40	0.40
	One or Two, Option 2	4	6-ft Concrete Bike Pedestrian Trail Adjacent to US 6 Along North Shoulder	\$ 164,402.28	0.00
	Three, Option 2	4	8-ft Bituminous Shoulders on US 6 for directional biking	\$ 164,402.28	0.00
Segment 3 Davis Point to Coal Ridge High School	One - A	5A	10-ft Bituminous Bike Pedestrian Trail Separated from US 6 Including Two Ditch Crossings	\$ 353,040.00	3.60
	One - B	5B	10-ft Boardwalk Bike Pedestrian Trail Separated from US 6 Including Two Ditch Crossings	\$ 939,615.60	1.80
	Two	6	10-ft Bituminous North Shoulder on US 6	\$ 331,776.73	1.60
	Three	7	8-ft Bituminous Shoulders on US 6 for directional biking	\$ 511,384.30	2.60
** Includes 15% (or 20% depending on alternate) for Construction Engineering and Contingencies (See Report for Explanation)					

**Table 2 - Evaluation of Alternates**

Alternate	Safety Features	Advantages	Disadvantages	Construction Cost from Estimates**	Comments
Alternate 1A - Bituminous Trail for Segment 3; Separation from US 6	Good sight distances possible with exception of Davis Point ①	Reduced conflicts with motorists	Construction in sensitive areas	\$ 780,403	① Improvement of sight distance can be made at Davis Point by closure or realignment of County Road No. 235 (Davis Point Road) ② Although maintenance is included with normal roadway maintenance, it places additional burden on CDOT forces ③ Provide "No Parking" Signs near High School
	Separation from US 6 with reduced conflict points	Better aesthetics possible	Most impact to wetlands areas		
		Safest alternate due to separation	Steepest grades for short distances near Davis Point		
		Next to least expensive alternate	Does not provide separation of pedestrian and bike traffic		
			Gates may be required at some locations along route for locations outside of US 6 right-of-way		
Alternate 1B - Boardwalk Trail for Segment 3; Separation from US 6	Good sight distances possible with exception of Davis Point ①	Reduced conflicts with motorists	Construction in sensitive areas	\$ 1,366,979	
	Separation from US 6 with reduced conflict points	Better aesthetics possible	Steepest grades for short distances near Davis Point		
		Safest alternate due to separation	Does not provide separation of pedestrian and bike traffic		
			Gates may be required at some locations along route for locations outside of US 6 right-of-way		
			Most expensive alternate due to boardwalks in wetland areas for Segment 3		
Alternate 2 - Adjoining US 6, North Shoulder	Grades comparable to US 6	Maintenance can be included with normal roadway maintenance ②	Bike travel is inconsistent with motorist travel direction east direction	\$ 759,130	
	Provide 8-Inch edge strip on north side	Provides moderate expensive alternate	Travel may be blocked occasionally with parked cars ③		
	Good sight distances	Requires the least additional right-of-way and least wetlands impact	Does not provide separation of pedestrian, bike and vehicular traffic		
		Least expensive alternate	Signage is difficult due to dual direction of pedestrians and bicyclists along north shoulder.		
Alternate 3 - Adjoining US 6, Shoulder Widening Both Sides	Grades comparable to US 6	Bike travel is consistent with motorist travel direction	Requires two crossings of US 6 for travel east	\$ 1,213,500	
	Provide 8-Inch edge strip on north side	Maintenance can be included with normal roadway maintenance ②	Travel may be blocked with parked cars ③		
	Bike travel directional with motorist		Least direct route of the other alternates		
	Provide 90 ° Crossings of US 6		User may cross over US 6 at unexpected times		
	Good sight distances				
** Includes 15% (or 20% depending on alternate) for Engineering and Contingencies; all estimated alternate costs include Option 2 for Segment 2 for like comparison					





April 14, 2005

Ms. Janet Steinbach, Community Development Director  
Town of Silt  
231 No. 7<sup>th</sup> Street  
P.O. Box 70  
Silt CO 81652

**RE: Wetlands Walkway Cost Estimate**  
**SGM Project No. 2002-151.001 Phase 12**

Dear Janet:

Per your request, we have prepared an estimate for a boardwalk, 10 ft. wide and approximately 3000 ft in length, to cross wetlands west of the new Coal Ridge High School. It is based on the following system:

- Helical piers placed at 10 ft on center, average depth 15 ft.
- Treated wood beams and joists
- Trex-deck type composite weatherproof decking
- Timber railing

We have used this system previously on a project in wetlands near Wolcott. We understand that the boardwalk will be within the highway right of way, so it will be near or adjacent to the highway. We have therefore assumed the pier installation equipment will be able to operate on the shoulder. Where no shoulder exists, traffic control will be needed during pier and boardwalk installation.

Our estimate is based on pricing from local materials suppliers, and published data for labor production rates. Accuracy of the foundation (pier) design will depend upon actual geotechnical investigations, which should be completed for final design.

Based on this, we estimate a total cost of \$1,017,690. Please see the attached spreadsheet for a breakdown of values. Costs include engineering and construction.

We trust this is adequate for your needs at the present time. Should you have any questions, please call me at 945-1004.

Sincerely,

**SCHMUESER GORDON MEYER, INC.**

William B. Swigert, PE SE  
File I:2002-151\001-Engineering\12-Coal Ridge Trail



14-Apr-05

Coal Ridge Trail Boardwalk, 2925 ft length

Town of Silt

SGM Job No. 2002-151.001-12

	UOM	QUANTITY	UNIT PRICE	TOTAL
helical piers, 15 ft length, installed	ea	600 \$	475.00 \$	285,000.00
pier cap assembly	ea	600 \$	30.00 \$	18,000.00
4x14 beam, 10 ft length, treated	ea	294 \$	60.67 \$	17,836.98
2x10 joists, 10 ft length, treated	ea	2048 \$	14.13 \$	28,938.24
5/4 x 6 TREX decking, 20 ft length	ea	2925 \$	36.80 \$	107,640.00
heavy timber railing & posts, 42" high	lf	6000 \$	3.71 \$	22,260.00
epoxy coated wire mesh guard	sf	24000 \$	2.45 \$	58,800.00
labor - framing	sf	30000 \$	3.39 \$	101,700.00
2 ton crane	hr	240 \$	120.00 \$	28,800.00
construction surveying	ls	\$ 10,000.00	\$	10,000.00
mobilization	ls	\$ 20,000.00	\$	20,000.00
construction traffic control	hr	300 \$	50.00 \$	15,000.00
profit & overhead	ls	\$ 134,100.00	\$	134,100.00
		subtotal	\$	848,075.22
		20% for engineering & contingencies	\$	169,615.04
		total	\$	1,017,690

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**Note:**

This estimate is an opinion of probable cost based on information furnished by the client and the best available data known to the engineer at the time. It is for budgetary purposes only and is **not** a guarantee of overall project costs.



**Engineer's Preliminary Cost Estimate 1**  
**Silt Bike Pedestrian Trail Separated from US 6 on North Side**  
**Alternates 1 or 2, Roadway Segment 1 (Silt to Davis Point)**

<b>Prepared By:</b>	J. Patton		
<b>Date:</b>	4/20/2005		
<b>Location:</b>	Town of Silt to Coal Ridge High School		
<b>County:</b>	Garfield		
<b>Description of Work:</b>	10-ft Bituminous Bike Pedestrian Trail; Connect to Existing Trail on West to Davis Point (Segment 2)		
<b>Sheet No.</b>	One of Two	<b>Segment Length (Feet)</b>	2850.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
201-00000	Clearing and Grubbing	LS	1	\$ 12,000.00	\$ 12,000.00
202-00150	Removal of Wall	Each	6	\$ 800.00	\$ 4,800.00
202-00220	Removal of Asphalt Mat	SY	30	\$ 6.00	\$ 180.00
203-00010	Unclassified Excavation (Complete in Place)	CY	5000	\$ 6.00	\$ 30,000.00
203-00100	Muck Excavation	CY	500	\$ 10.00	\$ 5,000.00
203-01100	Proof Rolling	Hour	16	\$ 100.00	\$ 1,600.00
205-01597	Potholing	Hour	10	\$ 400.00	\$ 4,000.00
206-00000	Structure Excavation	CY	170	\$ 10.00	\$ 1,700.00
206-00100	Structure Backfill (Class 1)	CY	100	\$ 20.00	\$ 2,000.00
206-01000	Bed Course Material	CY	18	\$ 40.00	\$ 720.00
208-00010	Erosion Log	Each	20	\$ 9.00	\$ 180.00
208-00200	Erosion Control Supervisor	LS	1	\$ 3,000.00	\$ 3,000.00
210-00090	Reset Delineator	Each	6	\$ 20.00	\$ 120.00
210-00810	Reset Ground Sign	Each	2	\$ 150.00	\$ 300.00
212-00006	Seeding (Native)	Acre	1.5	\$ 500.00	\$ 750.00
213-00004	Mulching (Weed Free Straw)	Acre	1.5	\$ 300.00	\$ 450.00
213-00061	Mulch Tackifier	Lb	23	\$ 8.00	\$ 184.00
304-01000	Aggregate Base Course (Class 1)	Ton	430	\$ 26.00	\$ 11,180.00
304-03005	Aggregate Base Course (Class 3)	CY	500	\$ 35.00	\$ 17,500.00
304-06000	Aggregate Base Course (Class 6)	Ton	805	\$ 15.00	\$ 12,075.00
403-00720	Hot Bituminous Pavement (Patching)(Asphalt)	Ton	20	\$ 75.00	\$ 1,500.00
403-34701	Hot Bituminous Pavement (Grading SX)(75)	Ton	750	\$ 30.00	\$ 22,500.00
411-03345	Asphalt Cement (PG 76-28)	Ton	47	\$ 240.00	\$ 11,280.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
411-10255	Emulsified Asphalt (Slow Setting)	Gal.	50	\$ 1.50	\$ 75.00
411-21020	Liquid Asphaltic Material (MC-70)	Gal.	1200	\$ 1.20	\$ 1,440.00
420-00130	Geotextile (Separator) (Class A)	SY	500	\$ 3.00	\$ 1,500.00
514-01040	Bikeway Rail (Steel)	LF	60	\$ 90.00	\$ 5,400.00
601-03030	Concrete Class D (Box Culvert)	CY	40	\$ 360.00	\$ 14,400.00
601-03050	Concrete Class D (Wall)	CY	20	\$ 340.00	\$ 6,800.00
602-00000	Reinforcing Steel	LB	8300	\$ 1.00	\$ 8,300.00
603-01185	18 Inch Reinforced Concrete Pipe (CIP)	LF	60	\$ 40.00	\$ 2,400.00
614-xxxxx	Permanent Signing	LS	1	\$ 2,500.00	\$ 2,500.00
622-00270	Bollard	Each	2	\$ 400.00	\$ 800.00
625-00000	Construction Surveying	LS	1	\$ 8,000.00	\$ 8,000.00
626-00000	Mobilization	LS	1	\$ 20,000.00	\$ 20,000.00
630-00000	Construction Traffic Control	LS	1	\$ 4,500.00	\$ 4,500.00
					\$ -
	Subtotal				\$ 219,134.00
	Plus 20 % for Engineering and Contingencies				\$ 43,826.80
	<b>Total</b>				<b>\$ 262,960.80</b>



**Engineer's Preliminary Cost Estimate No. 2  
Silt Bike Pedestrian Trail Along Both Sides of US 6  
Alternate 3, Roadway Segment 1 (Silt to Davis Point)**

<b>Prepared By:</b>	J. Patton		
<b>Date:</b>	2/17/2005		
<b>Location:</b>	Town of Silt to Coal Ridge High School		
<b>County:</b>	Garfield		
<b>Description of Work:</b>	8-ft Bituminous Shoulders US 6 for directional biking; Connect to Existing Trail West End to Davis Point (Segment 2)		
<b>Sheet No.</b>	One of Two	<b>Segment Length (Feet) -</b>	2850.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
201-00000	Clearing and Grubbing	LS	1	\$ 9,000.00	\$ 9,000.00
202-00150	Removal of Wall	Each	12	\$ 800.00	\$ 9,600.00
202-00220	Removal of Asphalt Mat	SY	30	\$ 6.00	\$ 180.00
203-00010	Unclassified Excavation (Complete in Place)	CY	4500	\$ 6.00	\$ 27,000.00
203-00100	Muck Excavation	CY	500	\$ 10.00	\$ 5,000.00
203-01100	Proof Rolling	Hour	16	\$ 100.00	\$ 1,600.00
205-01597	Potholing	Hour	20	\$ 400.00	\$ 8,000.00
206-00000	Structure Excavation	CY	180	\$ 10.00	\$ 1,800.00
206-00100	Structure Backfill (Class 1)	CY	90	\$ 20.00	\$ 1,800.00
206-01000	Bed Course Material	CY	20	\$ 40.00	\$ 800.00
208-00010	Erosion Log	Each	30	\$ 9.00	\$ 270.00
208-00200	Erosion Control Supervisor	LS	1	\$ 3,000.00	\$ 3,000.00
210-00090	Reset Delineator	Each	12	\$ 20.00	\$ 240.00
210-00810	Reset Ground Sign	Each	5	\$ 150.00	\$ 750.00
212-00006	Seeding (Native)	Acre	1.5	\$ 500.00	\$ 750.00
213-00004	Mulching (Weed Free Straw)	Acre	1.5	\$ 300.00	\$ 450.00
213-00061	Mulch Tackifier	Lb	23	\$ 8.00	\$ 184.00
304-01000	Aggregate Base Course (Class 1)	Ton	2900	\$ 26.00	\$ 75,400.00
304-03005	Aggregate Base Course (Class 3)	CY	500	\$ 35.00	\$ 17,500.00
304-06000	Aggregate Base Course (Class 6)	Ton	1640	\$ 15.00	\$ 24,600.00
403-00720	Hot Bituminous Pavement (Patching)(Asphalt)	Ton	20	\$ 75.00	\$ 1,500.00
403-34701	Hot Bituminous Pavement (Grading SX)(75)	Ton	2300	\$ 30.00	\$ 69,000.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
411-03345	Asphalt Cement (PG 76-28)	Ton	150	\$ 240.00	\$ 36,000.00
411-10255	Emulsified Asphalt (Slow Setting)	Gal.	320	\$ 1.50	\$ 480.00
411-21020	Liquid Asphaltic Material (MC-70)	Gal.	2000	\$ 1.20	\$ 2,400.00
420-00130	Geotextile (Separator) (Class A)	SY	500	\$ 3.00	\$ 1,500.00
514-01040	Bikeway Rail (Steel)	LF	120	\$ 90.00	\$ 10,800.00
601-03030	Concrete Class D (Box Culvert)	CY	150	\$ 360.00	\$ 54,000.00
601-03050	Concrete Class D (Wall)	CY	80	\$ 340.00	\$ 27,200.00
602-00000	Reinforcing Steel	LB	30500	\$ 1.00	\$ 30,500.00
603-01185	18 Inch Reinforced Concrete Pipe (CIP)	LF	60	\$ 40.00	\$ 2,400.00
614-xxxxx	Permanent Signing	LS	1	\$ 3,000.00	\$ 3,000.00
622-00270	Bollard	Each	2	\$ 400.00	\$ 800.00
625-00000	Construction Surveying	LS	1	\$ 10,000.00	\$ 10,000.00
626-00000	Mobilization	LS	1	\$ 25,000.00	\$ 25,000.00
630-00000	Construction Traffic Control	LS	1	\$ 5,000.00	\$ 5,000.00
					\$ -
Subtotal					\$ 467,504.00
Plus 15 % for Engineering and Contingencies					\$ 70,125.60
<b>Total</b>					<b>\$ 537,629.60</b>



**Engineer's Preliminary Cost Estimate No. 3**  
**Bike Pedestrian Trail Separated From US 6 Located on Upper Bench -**  
**Alternate 1 or 2, Option 1 Roadway Segment 2 (Davis Point)**

Prepared By:	J. Patton				
Date:	4/20/2005				
Location:	Town of Silt to Coal Ridge High School				
County:	Garfield				
Description of Work:	8-ft Bituminous Bike Pedestrian Trail; Additional MSE Wall and Block Facing Required				
Sheet No.	One of One	Segment Length (Feet) -			625.00
CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
203-00060	Embankment Material (Complete in Place)	CY	1070	\$ 8.00	\$ 8,560.00
203-00595	Rock Scaling	SY	100	\$ 15.00	\$ 1,500.00
203-01550	Dozing	Hour	20	\$ 125.00	\$ 2,500.00
206-00000	Structure Excavation	CY	300	\$ 10.00	\$ 3,000.00
206-00100	Structural Backfill (Class 1)	CY	240	\$ 20.00	\$ 4,800.00
206-00360	Mechanical Reinforcement of Soil	CY	750	\$ 15.00	\$ 11,250.00
210-00040	Reset Water Line	LS	1	\$ 6,500.00	\$ 6,500.00
304-06000	Aggregate Base Course (Class 6)	Ton	185	\$ 15.00	\$ 2,775.00
403-34701	Hot Bituminous Pavement (75)	Ton	129	\$ 24.00	\$ 3,096.00
411-03352	Asphalt Cement (PG 58-28)	Ton	8	\$ 200.00	\$ 1,600.00
411-21020	Liquid Asphaltic Material (MC-70)	Gal.	255	\$ 1.20	\$ 306.00
504-04410	Block Facing	SF	4500	\$ 15.00	\$ 67,500.00
601-03020	Concrete Class D (Miscellaneous)	CY	10	\$ 320.00	\$ 3,200.00
602-00000	Reinforcing Steel	Lb.	300	\$ 0.60	\$ 180.00
607-53160	Fence Chain Link (60 Inch)	Lin. Ft.	500	\$ 30.00	\$ 15,000.00
608-10010	Sidewalk Drain	Each	4	\$ 900.00	\$ 3,600.00
626-00000	Mobilization	LS	1	\$ 20,000.00	\$ 20,000.00
Subtotal					\$ 155,367.00
Plus 20 % for Engineering and Contingencies					\$ 31,073.40
Total					\$ 186,440.40





**Engineer's Preliminary Cost Estimate No. 4**  
**Silt Bike Pedestrian Trail Adjacent to US 6**  
**Alternates 1, 2 or 3, Option 2, Roadway Segment 2 (Davis Point)**

<b>Prepared By:</b>	J. Patton		
<b>Date:</b>	2/21/2005		
<b>Location:</b>	Town of Silt to Coal Ridge High School		
<b>County:</b>	Garfield		
<b>Description of Work:</b>	6-foot Concrete Bike Pedestrian Trail; Additional MSE Wall and Block Facing Required		
<b>Sheet No.</b>	One of One	<b>Segment Length (Feet) -</b>	625.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
202-00220	Removal of Asphalt Mat	SY	550	\$ 6.00	\$ 3,300.00
202-00810	Removal of Ground Sign	Each	2	\$ 100.00	\$ 200.00
202-01140	Removal of Guard Rail Type 4	LF	500	\$ 20.00	\$ 10,000.00
203-00010	Unclassified Excavation (Complete in Place)	CY	760	\$ 6.00	\$ 4,560.00
205-01597	Potholing	Hour	4	\$ 400.00	\$ 1,600.00
206-00000	Structure Excavation	CY	100	\$ 10.00	\$ 1,000.00
206-00100	Structure Backfill (Class 1)	CY	80	\$ 20.00	\$ 1,600.00
206-00360	Mechanical Reinforcement of Soil	CY	200	\$ 15.00	\$ 3,000.00
304-01000	Aggregate Base Course (Class 1)	Ton	415	\$ 26.00	\$ 10,790.00
304-06000	Aggregate Base Course (Class 6)	Ton	300	\$ 15.00	\$ 4,500.00
403-00720	Hot Bituminous Pavement (Patching)(Asphalt)	Ton	20	\$ 75.00	\$ 1,500.00
403-34701	Hot Bituminous Pavement (Grading SX)(75)	Ton	540	\$ 30.00	\$ 16,200.00
411-03345	Asphalt Cement (PG 76-28)	Ton	35	\$ 240.00	\$ 8,400.00
411-10255	Emulsified Asphalt (Slow Setting)	Gal.	155	\$ 1.50	\$ 232.50
411-21020	Liquid Asphaltic Material (MC-70)	Gal.	230	\$ 1.20	\$ 276.00
504-04410	Block Facing	SF	500	\$ 15.00	\$ 7,500.00
603-50018	18 Inch Plastic Pipe	LF	300	\$ 40.00	\$ 12,000.00
604-19005	Inlet Type R L 5 (5 Foot)	Each	2	\$ 1,500.00	\$ 3,000.00
608-00000	Concrete Sidewalk	SY	400	\$ 30.00	\$ 12,000.00
608-00010	Concrete Curb Ramp	SY	10	\$ 60.00	\$ 600.00
608-10010	Sidewalk Drain	Each	4	\$ 900.00	\$ 3,600.00
609-21020	Curb and Gutter Type 2 (Section II-B)	LF	600	\$ 14.00	\$ 8,400.00
614-xxxxx	Permanent Signing	LS	1	\$ 1,500.00	\$ 1,500.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
625-00000	Construction Surveying	LS	1	\$ 6,000.00	\$ 6,000.00
626-00000	Mobilization	LS	1	\$ 20,000.00	\$ 20,000.00
627-00002	Thermoplastic Pavement Marking	SF	100	\$ 2.00	\$ 200.00
627-00005	Epoxy Pavement Marking	Gal.	20	\$ 50.00	\$ 1,000.00
Subtotal					\$ 142,958.50
Plus 15 % for Engineering and Contingencies					\$ 21,443.78
<b>Total</b>					<b>\$ 164,402.28</b>



**Engineer's Preliminary Cost Estimate No. 5A**  
**Silt Bike Pedestrian Trail Separated from US 6 on North Side**  
**Alternate 1A, Roadway Segment 3 (Davis Point to Coal Ridge HS)**  
**Note: Alternate 1A is for bituminous trail with additional stabilization**  
**across wetlands areas.**

<b>Prepared By:</b>	J. Patton		
<b>Date:</b>	4/20/2005		
<b>Location:</b>	Town of Silt to Coal Ridge High School		
<b>County:</b>	Garfield		
<b>Description of Work:</b>	10-ft Bituminous Bike Pedestrian Trail; Davis Point (Segment 2) to Coal Ridge High School		
<b>Sheet No.</b>	One of Two	<b>Segment Length (Feet) -</b>	2925.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
201-00000	Clearing and Grubbing	LS	1	\$ 13,000.00	\$ 13,000.00
202-00150	Removal of Wall	Each	4	\$ 800.00	\$ 3,200.00
202-00220	Removal of Asphalt Mat	SY	10	\$ 6.00	\$ 60.00
203-00061	Embankment Material (Complete in Place)	CY	6500	\$ 6.00	\$ 39,000.00
203-00100	Muck Excavation	CY	1850	\$ 10.00	\$ 18,500.00
203-01100	Proof Rolling	Hour	30	\$ 100.00	\$ 3,000.00
205-01597	Potholing	Hour	10	\$ 400.00	\$ 4,000.00
206-00000	Structure Excavation	CY	120	\$ 10.00	\$ 1,200.00
206-00100	Structure Backfill (Class 1)	CY	70	\$ 20.00	\$ 1,400.00
206-01000	Bed Course Material	CY	10	\$ 40.00	\$ 400.00
208-00010	Erosion Log	Each	30	\$ 9.00	\$ 270.00
208-00200	Erosion Control Supervisor	LS	1	\$ 3,000.00	\$ 3,000.00
210-00090	Reset Delineator	Each	6	\$ 20.00	\$ 120.00
210-00810	Reset Ground Sign	Each	4	\$ 150.00	\$ 600.00
212-00006	Seeding (Native)	Acre	2	\$ 500.00	\$ 1,000.00
213-00004	Mulching (Weed Free Straw)	Acre	2	\$ 300.00	\$ 600.00
213-00061	Mulch Tackifier	Lb	30	\$ 8.00	\$ 240.00
304-03005	Aggregate Base Course (Class 3)	CY	1850	\$ 35.00	\$ 64,750.00
304-06000	Aggregate Base Course (Class 6)	Ton	820	\$ 15.00	\$ 12,300.00
403-34701	Hot Bituminous Pavement (Grading SX)(75)	Ton	590	\$ 30.00	\$ 17,700.00
411-03345	Asphalt Cement (PG 76-28)	Ton	37	\$ 240.00	\$ 8,880.00
411-21020	Liquid Asphaltic Material (MC-70)	Gal.	1150	\$ 1.20	\$ 1,380.00
420-00130	Geotextile (Separator) (Class A)	SY	7600	\$ 3.00	\$ 22,800.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
514-01040	Bikeway Rail (Steel)	LF	40	\$ 90.00	\$ 3,600.00
601-03030	Concrete Class D (Box Culvert)	CY	40	\$ 360.00	\$ 14,400.00
601-03050	Concrete Class D (Wall)	CY	20	\$ 340.00	\$ 6,800.00
602-00000	Reinforcing Steel	LB	8300	\$ 1.00	\$ 8,300.00
603-01185	18 Inch Reinforced Concrete Pipe (CIP)	LF	140	\$ 40.00	\$ 5,600.00
614-xxxxx	Permanent Signing	LS	1	\$ 2,000.00	\$ 2,000.00
622-00270	Bollard	Each	4	\$ 400.00	\$ 1,600.00
625-00000	Construction Surveying	LS	1	\$ 10,000.00	\$ 10,000.00
626-00000	Mobilization	LS	1	\$ 20,000.00	\$ 20,000.00
630-00000	Construction Traffic Control	LS	1	\$ 4,500.00	\$ 4,500.00
					\$ -
Subtotal					\$ 294,200.00
Plus 20 % for Engineering and Contingencies					\$ 58,840.00
<b>Total</b>					<b>\$ 353,040.00</b>



**Engineer's Preliminary Cost Estimate No. 5B**  
**Silt Bike Pedestrian Trail Separated from US 6 on North Side**  
**Alternate 1B, Roadway Segment 3 (Davis Point to Coal Ridge HS)**  
**Note: Alternate 1B is for trail on boardwalk across wetlands areas.**

<b>Prepared By:</b>	J. Patton		
<b>Date:</b>	4/20/2005		
<b>Location:</b>	Town of Silt to Coal Ridge High School		
<b>County:</b>	Garfield		
<b>Description of Work:</b>	10-ft Bituminous Bike Pedestrian Trail; Davis Point (Segment 2) to Coal Ridge High School		
<b>Sheet No.</b>	One of Two	<b>Segment Length (Feet) -</b>	2925.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
201-00000	Clearing and Grubbing	LS	1	\$ 5,000.00	\$ 5,000.00
202-00150	Removal of Wall	Each	4	\$ 800.00	\$ 3,200.00
202-00220	Removal of Asphalt Mat	SY	10	\$ 6.00	\$ 60.00
203-00061	Embankment Material (Complete in Place)	CY	1200	\$ 6.00	\$ 7,200.00
205-01597	Potholing	Hour	10	\$ 400.00	\$ 4,000.00
206-00000	Structure Excavation	CY	80	\$ 10.00	\$ 800.00
206-00100	Structure Backfill (Class 1)	CY	40	\$ 20.00	\$ 800.00
206-01000	Bed Course Material	CY	10	\$ 40.00	\$ 400.00
208-00010	Erosion Log	Each	15	\$ 9.00	\$ 135.00
208-00200	Erosion Control Supervisor	LS	1	\$ 3,000.00	\$ 3,000.00
210-00090	Reset Delineator	Each	6	\$ 20.00	\$ 120.00
210-00810	Reset Ground Sign	Each	4	\$ 150.00	\$ 600.00
212-00006	Seeding (Native)	Acre	1	\$ 500.00	\$ 500.00
213-00004	Mulching (Weed Free Straw)	Acre	1	\$ 300.00	\$ 300.00
213-00061	Mulch Tackifier	Lb	15	\$ 8.00	\$ 120.00
304-06000	Aggregate Base Course (Class 6)	Ton	135	\$ 15.00	\$ 2,025.00
403-34701	Hot Bituminous Pavement (Grading SX)(75)	Ton	100	\$ 30.00	\$ 3,000.00
411-03345	Asphalt Cement (PG 76-28)	Ton	6	\$ 240.00	\$ 1,440.00
411-21020	Liquid Asphaltic Material (MC-70)	Gal.	115	\$ 1.20	\$ 138.00
514-01040	Bikeway Rail (Steel)	LF	40	\$ 90.00	\$ 3,600.00
601-03030	Concrete Class D (Box Culvert)	CY	40	\$ 360.00	\$ 14,400.00
601-03050	Concrete Class D (Wall)	CY	20	\$ 340.00	\$ 6,800.00
602-00000	Reinforcing Steel	LB	8300	\$ 1.00	\$ 8,300.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
603-01185	18 Inch Reinforced Concrete Pipe (CIP)	LF	40	\$ 40.00	\$ 1,600.00
608-xxxxx	Boardwalk (10-Foot)(15-Foot Helical Piers)①	LF	2425	\$ 275.00	\$ 666,875.00
614-xxxxx	Permanent Signing	LS	1	\$ 2,000.00	\$ 2,000.00
622-00270	Bollard	Each	4	\$ 400.00	\$ 1,600.00
625-00000	Construction Surveying	LS	1	\$ 10,000.00	\$ 10,000.00
626-00000	Mobilization	LS	1	\$ 20,000.00	\$ 20,000.00
630-00000	Construction Traffic Control	LS	1	\$ 15,000.00	\$ 15,000.00
Subtotal					\$ 783,013.00
Plus 20 % for Engineering and Contingencies					\$ 156,602.60
<b>Total</b>					<b>\$ 939,615.60</b>
① Price per foot is based upon an estimated cost for 3,000 Lin. Ft. prepared by William Swigert, PE SE with Schmueser, Gordon and Meyer Inc.					



**Engineer's Preliminary Cost Estimate No. 6**  
**Silt Bike Pedestrian Trail Along North Shoulder US 6**  
**Alternate 2, Roadway Segment 3 (Davis Point to Coal Ridge HS)**

<b>Prepared By:</b>	J. Patton		
<b>Date:</b>	2/21/2005		
<b>Location:</b>	Town of Silt to Coal Ridge High School		
<b>County:</b>	Garfield		
<b>Description of Work:</b>	8-ft Bituminous Shoulder US 6; Davis Point (Segment 2) to Coal Ridge High School		
<b>Sheet No.</b>	One of Two	<b>Segment Length (Feet) -</b>	2925.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
201-00000	Clearing and Grubbing	LS	1	\$ 12,000.00	\$ 12,000.00
202-00150	Removal of Wall	Each	4	\$ 800.00	\$ 3,200.00
202-00220	Removal of Asphalt Mat	SY	20	\$ 6.00	\$ 120.00
203-00010	Unclassified Excavation (Complete in Place)	CY	3000	\$ 6.00	\$ 18,000.00
203-00100	Muck Excavation	CY	1000	\$ 10.00	\$ 10,000.00
203-01100	Proof Rolling	Hour	30	\$ 100.00	\$ 3,000.00
205-01597	Potholing	Hour	20	\$ 400.00	\$ 8,000.00
206-00000	Structure Excavation	CY	100	\$ 10.00	\$ 1,000.00
206-00100	Structure Backfill (Class 1)	CY	60	\$ 20.00	\$ 1,200.00
206-01000	Bed Course Material	CY	10	\$ 40.00	\$ 400.00
208-00010	Erosion Log	Each	30	\$ 9.00	\$ 270.00
208-00200	Erosion Control Supervisor	LS	1	\$ 4,000.00	\$ 4,000.00
210-00090	Reset Delineator	Each	8	\$ 20.00	\$ 160.00
210-00810	Reset Ground Sign	Each	6	\$ 150.00	\$ 900.00
212-00006	Seeding (Native)	Acre	1.5	\$ 500.00	\$ 750.00
213-00004	Mulching (Weed Free Straw)	Acre	1.5	\$ 300.00	\$ 450.00
213-00061	Mulch Tackifier	Lb	23	\$ 8.00	\$ 184.00
304-01000	Aggregate Base Course (Class 1)	Ton	1500	\$ 26.00	\$ 39,000.00
304-03005	Aggregate Base Course (Class 3)	CY	1000	\$ 35.00	\$ 35,000.00
304-06000	Aggregate Base Course (Class 6)	Ton	800	\$ 15.00	\$ 12,000.00
403-00720	Hot Bituminous Pavement (Patching)(Asphalt)	Ton	30	\$ 75.00	\$ 2,250.00
403-34701	Hot Bituminous Pavement (Grading SX)(75)	Ton	1180	\$ 30.00	\$ 35,400.00
411-03345	Asphalt Cement (PG 76-28)	Ton	75	\$ 240.00	\$ 18,000.00



CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
411-10255	Emulsified Asphalt (Slow Setting)	Gal.	165	\$ 1.50	\$ 247.50
411-21020	Liquid Asphaltic Material (MC-70)	Gal.	1025	\$ 1.20	\$ 1,230.00
420-00130	Geotextile (Separator) (Class A)	SY	1000	\$ 3.00	\$ 3,000.00
514-01040	Bikeway Rail (Steel)	LF	40	\$ 90.00	\$ 3,600.00
601-03030	Concrete Class D (Box Culvert)	CY	28	\$ 360.00	\$ 10,080.00
601-03050	Concrete Class D (Wall)	CY	14	\$ 340.00	\$ 4,760.00
602-00000	Reinforcing Steel	LB	5600	\$ 1.00	\$ 5,600.00
603-01185	18 Inch Reinforced Concrete Pipe (CIP)	LF	80	\$ 40.00	\$ 3,200.00
603-10180	18 Inch Corrugated Steel Pipe	LF	20	\$ 40.00	\$ 800.00
603-10240	24 Inch Corrugated Steel Pipe	LF	24	\$ 50.00	\$ 1,200.00
603-10360	36 Inch Corrugated Steel Pipe	LF	40	\$ 80.00	\$ 3,200.00
614-xxxxx	Permanent Signing	LS	1	\$ 3,500.00	\$ 3,500.00
622-00270	Bollard	Each	2	\$ 400.00	\$ 800.00
625-00000	Construction Surveying	LS	1	\$ 12,000.00	\$ 12,000.00
626-00000	Mobilization	LS	1	\$ 25,000.00	\$ 25,000.00
630-00000	Construction Traffic Control	LS	1	\$ 5,000.00	\$ 5,000.00
					\$ -
Subtotal					\$ 288,501.50
Plus 15 % for Engineering and Contingencies					\$ 43,275.23
<b>Total</b>					<b>\$ 331,776.73</b>



**Engineer's Preliminary Cost Estimate No. 7**  
**Silt Bike Pedestrian Trail Along Both Sides of US 6**  
**Alternate 3, Roadway Segment 3 (Davis Point to Coal Ridge HS)**

<b>Prepared By:</b>	J. Patton		
<b>Date:</b>	2/21/2005		
<b>Location:</b>	Town of Silt to Coal Ridge High School		
<b>County:</b>	Garfield		
<b>Description of Work:</b>	6-ft Bituminous Shoulders US 6 for directional biking; Davis Point (Segment 2) to Coal Ridge High School		
<b>Sheet No.</b>	One of Two	<b>Segment Length (Feet) -</b>	2925.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
201-00000	Clearing and Grubbing	LS	1	\$ 15,000.00	\$ 15,000.00
202-00150	Removal of Wall	Each	8	\$ 800.00	\$ 6,400.00
202-00220	Removal of Asphalt Mat	SY	20	\$ 6.00	\$ 120.00
203-00010	Unclassified Excavation (Complete in Place)	CY	5600	\$ 6.00	\$ 33,600.00
203-00100	Muck Excavation	CY	1500	\$ 10.00	\$ 15,000.00
203-01100	Proof Rolling	Hour	40	\$ 100.00	\$ 4,000.00
205-01597	Potholing	Hour	40	\$ 400.00	\$ 16,000.00
206-00000	Structure Excavation	CY	200	\$ 10.00	\$ 2,000.00
206-00100	Structure Backfill (Class 1)	CY	120	\$ 20.00	\$ 2,400.00
206-01000	Bed Course Material	CY	20	\$ 40.00	\$ 800.00
208-00010	Erosion Log	Each	40	\$ 9.00	\$ 360.00
208-00200	Erosion Control Supervisor	LS	1	\$ 5,000.00	\$ 5,000.00
210-00090	Reset Delineator	Each	16	\$ 20.00	\$ 320.00
210-00810	Reset Ground Sign	Each	12	\$ 150.00	\$ 1,800.00
212-00006	Seeding (Native)	Acre	2	\$ 500.00	\$ 1,000.00
213-00004	Mulching (Weed Free Straw)	Acre	2	\$ 300.00	\$ 600.00
213-00061	Mulch Tackifier	Lb	30	\$ 8.00	\$ 240.00
304-01000	Aggregate Base Course (Class 1)	Ton	2435	\$ 26.00	\$ 63,310.00
304-03005	Aggregate Base Course (Class 3)	CY	1500	\$ 35.00	\$ 52,500.00
304-06000	Aggregate Base Course (Class 6)	Ton	1260	\$ 15.00	\$ 18,900.00
403-00720	Hot Bituminous Pavement (Patching)(Asphalt)	Ton	30	\$ 75.00	\$ 2,250.00
403-34701	Hot Bituminous Pavement (Grading SX)(75)	Ton	1890	\$ 30.00	\$ 56,700.00
411-03345	Asphalt Cement (PG 76-28)	Ton	120	\$ 240.00	\$ 28,800.00

CDOT Item No.	Bid Item Description	Unit	Quantity	Unit Price	Item Cost
411-10255	Emulsified Asphalt (Slow Setting)	Gal.	260	\$ 1.50	\$ 390.00
411-21020	Liquid Asphaltic Material (MC-70)	Gal.	1660	\$ 1.20	\$ 1,992.00
420-00130	Geotextile (Separator) (Class A)	SY	1500	\$ 3.00	\$ 4,500.00
514-01040	Bikeway Rail (Steel)	LF	80	\$ 90.00	\$ 7,200.00
601-03030	Concrete Class D (Box Culvert)	CY	60	\$ 360.00	\$ 21,600.00
601-03050	Concrete Class D (Wall)	CY	30	\$ 340.00	\$ 10,200.00
602-00000	Reinforcing Steel	LB	11200	\$ 1.00	\$ 11,200.00
603-01185	18 Inch Reinforced Concrete Pipe (CIP)	LF	80	\$ 40.00	\$ 3,200.00
603-10180	18 Inch Corrugated Steel Pipe	LF	40	\$ 40.00	\$ 1,600.00
603-10240	24 Inch Corrugated Steel Pipe	LF	50	\$ 50.00	\$ 2,500.00
603-10360	36 Inch Corrugated Steel Pipe	LF	80	\$ 80.00	\$ 6,400.00
614-xxxxx	Permanent Signing	LS	1	\$ 4,000.00	\$ 4,000.00
622-00270	Bollard	Each	2	\$ 400.00	\$ 800.00
625-00000	Construction Surveying	LS	1	\$ 12,000.00	\$ 12,000.00
626-00000	Mobilization	LS	1	\$ 25,000.00	\$ 25,000.00
630-00000	Construction Traffic Control	LS	1	\$ 5,000.00	\$ 5,000.00
					\$ -
	Subtotal				\$ 444,682.00
	Plus 15 % for Engineering and Contingencies				\$ 66,702.30
	<b>Total</b>				<b>\$ 511,384.30</b>