Appendix A – EAST CANNON RIVER TRAIL CONNECTIONS

BOLTON & MENK
Real People. Real Solutions.

2035 County Road D East
Maplewood, MN 55109-5314

Ph: (651) 704-9970
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Bolton-Menk.com

MEMORANDUM

Date: August 12, 2020

To: Sean Simonson, Engineering Manager

From: Eric Seaburg, PE

Cc: David Bennet, Public Works Director/City Engineer

Subject: Feasibility Study for East Cannon River Trail Connection from Honeylocust Drive
City of Northfield
Project No.: T18.121210

Background

The City of Northfield operates and maintains a robust sidewalk and trail system within the City. The system includes several miles of mixed-use trails, sidewalks, and bike lanes. The system is a destination-based system allowing pedestrians to access the many schools, parks, and businesses with the City. City policy makers continuously look for opportunities to create new connections to the system allowing for more and better access. The City has developed the *Northfield Planned Walking & Bicycling Network* document, shown in Appendix A, to further detail long-range system improvements.

In coordination with City staff, Bolton & Menk has reviewed possible trail alignments to connect Honeylocust Drive to the East Cannon River Trail. This would allow users another access point to this popular trail and complete a planned connection from the City's master plan.

Alignment 1 and Alignment 2

City staff and Bolton & Menk reviewed two trail alignments from Honeylocust Drive. The first, Alignment 1, utilizes a northerly route through privately owned property. The second, Alignment 2, utilizes a southerly route through property owned by the State of Minnesota. Alignment 1 and Alignment 2 are shown in Appendix B and Appendix C, respectively.

The two alignments are similar in length with similar construction footprints and material needs. As discussed later in this memorandum, the floodplain, wetland, and right-of-way impacts are also very similar. The main difference between the two alignments is that Alignment 2 requires box culverts to cross an existing drainage-way while Alignment 1 avoids the drainage-way and connects to the East Cannon River Trail near an existing box culvert.

Wetland Impacts

There are existing wetlands surrounding the Cannon River and East Cannon River Trail. An analysis of existing GIS-based wetland data shows that approximately one-quarter acre of existing wetlands will be permanently impacted by either alignment.

Anticipated wetland impacts associated with the proposed trail project include 0.22-0.28 acres of permanent impacts as shown in Appendix B and Appendix C, respectively. Permanent impact refers to loss in quantity, quality, or biological diversity of a wetland caused by draining, filling of wetlands or by excavation in Type 3, 4, or 5 wetlands. For this project, permanent impact refers to the filling and grading required to construct

the trail. Wetland replacement will be required to mitigate for the proposed permanent impacts, with the minimum replacement ratios being 2:1. The average price per wetland credit (1 credit = 1 acre) are $45,000 in Bank Service Area 8. Based on the conceptual wetland impacts and cost to mitigate, wetland mitigation will cost approximately $9,900 & $12,600 for Alternative 1 and Alternative 2, respectively. This is just an estimation based on off-site review and therefore impact size and cost may vary after a delineation and trail design have been completed.

Floodplain Impacts
Alternative 1 and Alternative 2 have similar footprints within the existing floodplain and floodway as shown in Appendix B and Appendix C, respectively. The City of Northfield administers a floodplain ordinance and regulates uses within the floodway and flood fringe districts.

- *Floodway:*
    - Trails are a permitted use within the floodway but must "…not obstruct flood flows or increase flood elevations and shall not involve structures, fill, obstructions, excavations or storage of materials or equipment." Placement of fill and excavation related to a trail (permitted use) are conditional uses in a floodway with the following caveat: "No…fill (including fill for roads and levees), deposit, obstruction…may be allowed as a conditional use that will cause any increase in the stage of the 100-year or regional flood or cause an increase in flood damages in the reach or reaches affected."

- *Flood fringe:*
    - Trails are a permitted use within the flood fringe and could be constructed on fill up to the elevation of the 100-year flood, but also could be much lower since: "Minor or auxiliary roads…may be constructed at a lower elevation where failure or interruption of transportation services would not endanger the public health or safety."

<u>Option 1</u>

- Construct the trail at an elevation at or below the existing grade which will by definition ensure that the trail does not obstruct flood flows or increase flood elevations.

<u>Option 2</u>

- Construct the trail so that within the floodplain the cut and fill volumes balance. This will demonstrate that there is no net loss of floodplain storage, but this option will still require a hydraulic analysis to determine that flood flows are not obstructed, and flood elevations are not increased. FEMA guidance on work within floodways states: "Any project in a floodway must be reviewed to determine if the project will increase flood heights. An engineering analysis must be conducted before a permit can be issued. The community's permit file must have a record of the results of this analysis, which can be in the form of a No-rise Certification. This No-rise Certification must be supported by technical data and signed by a registered professional engineer. The supporting technical data should be based on the standard step-backwater computer model used to develop the 100-year floodway shown on the Flood Insurance Rate Map (FIRM) or Flood Boundary and Floodway Map (FBFM)."

  The general process for completing a no rise certificate are listed below. The engineering costs of this work are estimated to be in the range of approximately $6,000 to $8,000.

1. Obtain the Effective flood insurance study hydraulic model from FEMA.
2. Run the effective model and create a Duplicate Effective model.
3. Create a Corrected Effective model. Add cross sections of the existing conditions where the anticipated trail improvements and potential excavation and fill will occur. The results of this model will indicate the 100-year flood elevations in the area of interest.
4. Proposed Conditions model. Include the features of the proposed trail improvements and run the proposed conditions model to demonstrate that flood elevations are not increased due to the proposed excavation and fill.
5. However, if the model results indicate that flood elevations will increase, the project will need to be redesigned to remove the effect or a request to FEMA for a map revision, i.e. an application for a Conditional Letter of Map Revision (CLOMR), will need to be submitted. Once a CLOMR is approved, the proposed project could be constructed, and record drawings submitted to FEMA along with the final application for the Map Revision. A ballpark estimate for the engineering costs associated with the preparation of a CLOMR application is $20,000. The FEMA fees for CLOMR and LOMR applications are currently $6,750 and $8,250, respectively.

Right-of-Way Impacts

Alignment 1 and Alignment 2 have similar easement acquisition needs as shown in Appendix B and Appendix C, respectively. Both alignments come off Honeylocust Drive within City right-of-way and then run northwest along the shared property line where an existing drainage and utility easement exists. Both alignments have been established to minimize segmentation of the existing parcels so that the property owners' usability of their site is maximized. Property owner engagement should be performed early in project development to determine property owner needs and their willingness to participate in this City project.

The second half of each trail alignment runs through property which is already owned by the City of Northfield and therefore would not require additional easement acquisition.

Project Cost Estimates

Because Alignment 1 and Alignment 2 are so similar in shape and size, their construction costs are very similar except for the box culvert included in Alignment 2. Itemized project cost estimates have been prepared for each alignment and are included in Appendix B and Appendix C. Project costs shown below include project contingency and project indirect costs (legal, engineering, administrative, and finance).

Alignment 1	$308,000
Alignment 2	$408,000

This project, while relatively small in length, includes several challenging components including wetland delineation and mitigation, floodplain permitting, and easement acquisition. As such, project indirect costs are estimated at 50% of the estimated construction total.

Schedule (No Floodway Increase)

City Council Accepts Feasibility Report & Orders Project	September 8, 2020
Topographic Survey	September 2020
Wetland Delineation	October - November 2020
Final Trail Design	October 2020
Wetland Permitting & Mitigation Approval	January 2020 - February 2021
Easement Acquisition	November 2020 - May 2021
Floodplain No-Rise Certification	January 2021
Bidding	February 2021
Construction	Summer 2021

Schedule (Floodway Increase)

City Council Accepts Feasibility Report & Orders Project	September 8, 2020
Topographic Survey	September 2020
Wetland Delineation	October - November 2020
Final Trail Design	October 2020
Wetland Permitting & Mitigation Approval	January - February 2021
Easement Acquisition	November 2020 - May 2021
FEMA CLMOR & LMOR	January - June 2021
Bidding	February 2021
Construction	Fall 2021

Summary

The two alignments discussed in this memorandum are both feasible and can be constructed and administered with a similar approach. Alignment 2 has higher construction costs due mostly to the need for a box culvert. Selecting a preferred alignment should include considerations for both estimated project costs as well as easement acquisition and property owner participation. If desired, the project can be ready for 2021 construction if authorize in the early fall of 2020.

Sincerely,

Bolton & Menk, Inc.

Eric Seaburg, PE
Project Manager

Enclosures: *Appendix A – Background Documents*

Northfield Planned Walking & Bicycling Network

Appendix B – Alignment 1

Figure - Trail Layout
Figure - Trail Profile
Figure – Wetland Impacts
Figure – Floodplain Impacts
Figure – Right-of-Way Impacts
Detailed Cost Estimate

Appendix C – Alignment 2

Figure - Trail Layout
Figure - Trail Profile
Figure – Wetland Impacts
Figure – Floodplain Impacts
Figure – Right-of-Way Impacts
Detailed Cost Estimate

Appendix A: Background Documents

Northfield Planned Walking and Bicycling Network

City Of Northfield Minnesota

LEGEND

- City Boundary
- Natural Greenway Corridors
- Parks
- Water body

Existing Network

- Sidewalk
- On-Street Bikeway
- Off-Street Trail / Path
- Existing Mill Towns State Trail Segment

Planned Network

- Sidewalk
- * On-Street Bikeway
- Off-Street Trail / Path
- Planned Mill Towns State Trail Segment

** Planned on-street bikeways could take the form of a standard bicycle lane, buffered bicycle lane, advisory bicycle lane, separated bicycle lane, or bicycle boulevard. The exact facility type for each on-street bikeway should be determined through each project development process. Several factors should be considered while identifying the facility type, such as community member preferences, right-of-way availability, implementation cost, motor vehicle traffic volumes, and speed limit.*

North

0 0.5 1 mi

NOTES:

1. The Mill Towns State Trail route north of Wall Street Road is to be determined. Further analysis and planning is needed to determine the trail alignment.
2. An alternative Mill Towns State Trail route, known as the 'Local Downtown Spur', was evaluated as part of this study. The route follows the existing on-street bikeways on 4th Street, Union Street, and 5th Street and then connects to Wall Street Road until reaching Spring Creek Road. While most of this route is shown on the map as an existing on-street bikeway, this route is planned to be enhanced in the future. Planned enhancements and facility type is to be determined. The alignment of the 'Local Downtown Spur' is shown on the Mill Towns State Trail route map on page 28 of the report.

TOOLE DESIGN

Appendix B: Alignment 1

City Of Northfield Minnesota

ECRT Connection
Northfield, MN

Alignment 1 - Trail Layout
July 2020

BOLTON & MENK

STATE OF MINNESOTA

CITY OF NORTHFIELD

EAST CANNON RIVER TRAIL

EXISTING CULVERT

CITY OF NORTHFIELD

MRKL REAL ESTATE PARTNERSHIP

Honeylocust Drive

A-10

1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00

905 910 915 920 925 930 935 940

0 25 50
HORZ. SCALE FEET

LEGEND

- BITUMINOUS TRAIL
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- CONSTRUCTION LIMITS
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXISTING NWI WETLANDS
- EXISTING FLOODPLAIN
- EXISTING FLOODWAY

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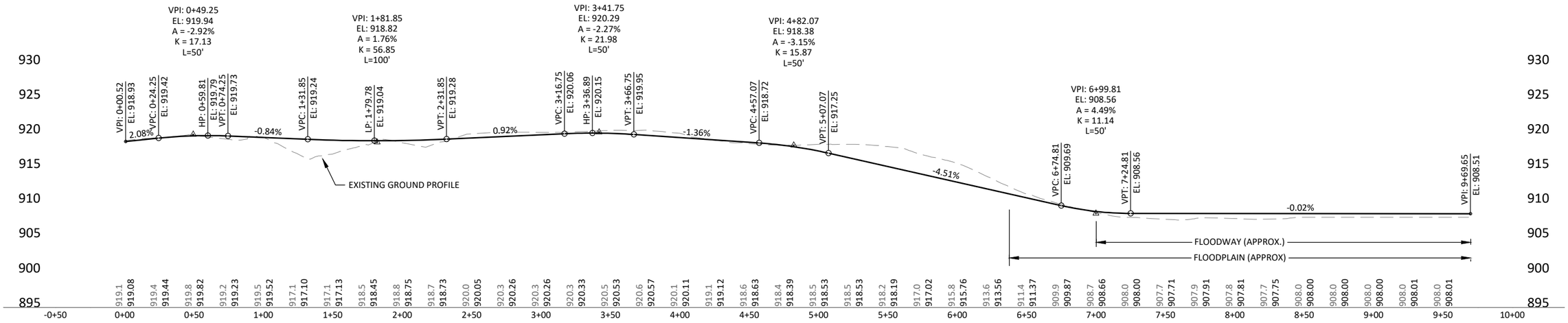


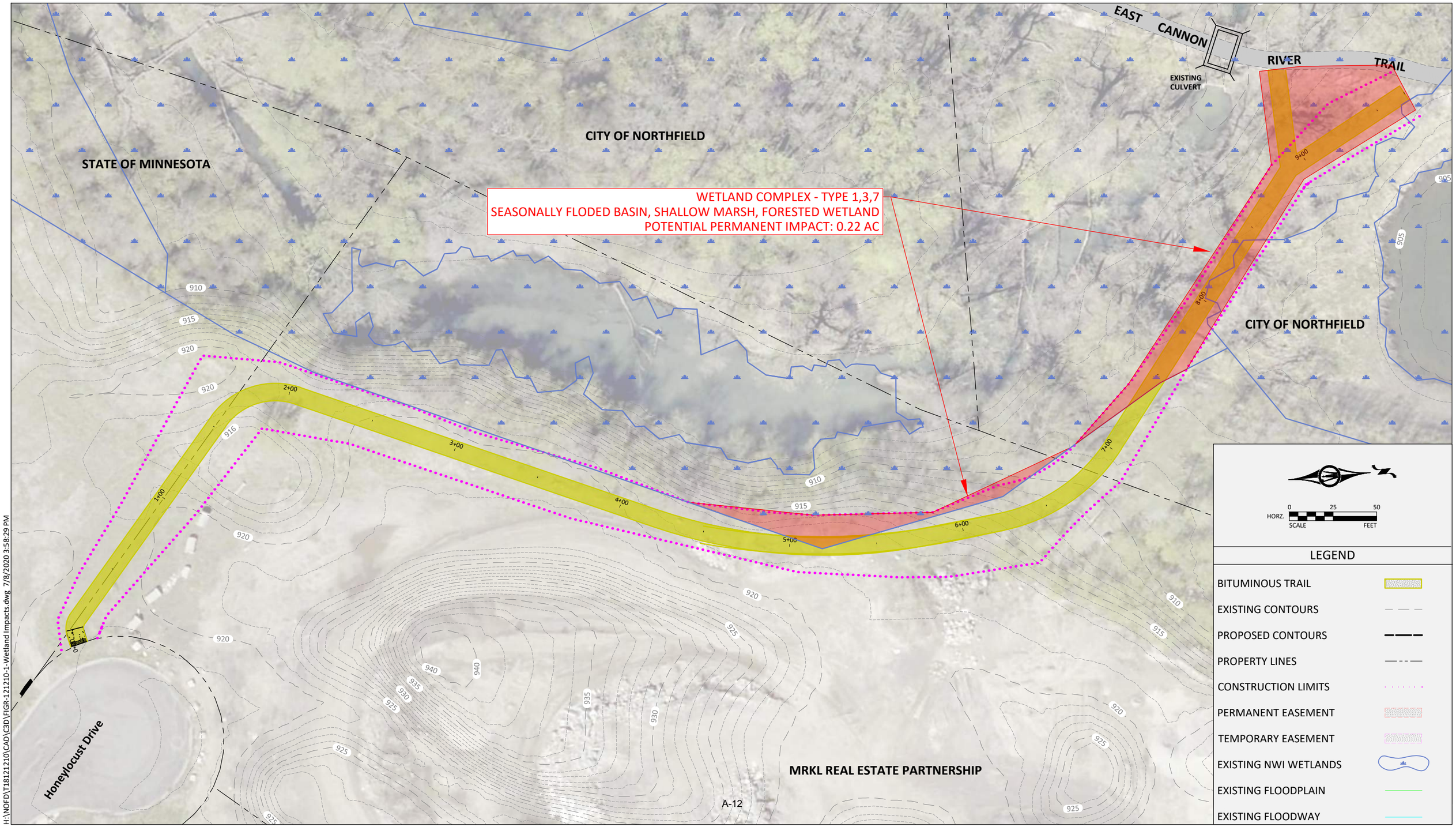
PRELIMINARY TRAIL PROFILE
(NOT TO SCALE)

City Of Northfield Minnesota

ECRT Connection
Northfield, MN

Alignment 1 - Wetland Impacts
July 2020

BOLTON & MENK



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City Of Northfield Minnesota

ECRT Connection
Northfield, MN

Alignment 1 - Floodplain & Floodway Impacts
July 2020

BOLTON & MENK

STATE OF MINNESOTA

CITY OF NORTHFIELD

NO FILL ALLOWED IN FLOODWAY/FLOODPLAIN
WITHOUT A NO-RISE CERTIFICATION

EAST CANNON RIVER TRAIL

EXISTING CULVERT

CITY OF NORTHFIELD

MRKL REAL ESTATE PARTNERSHIP

Honeylocust Drive

A-13

0 25 50
HORZ. SCALE FEET

LEGEND

- BITUMINOUS TRAIL
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- CONSTRUCTION LIMITS
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXISTING NWI WETLANDS
- EXISTING FLOODPLAIN
- EXISTING FLOODWAY

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City Of Northfield Minnesota

ECRT Connection
Northfield, MN

Alignment 1 - Right-of-Way Impacts
July 2020

BOLTON & MENK

STATE OF MINNESOTA

CITY OF NORTHFIELD

20' PERMANENT EASEMENT: 13,700 SF

VARIABLE WIDTH TEMPORARY EASEMENT: 11,000 SF

EAST CANNON RIVER TRAIL

EXISTING CULVERT

CITY OF NORTHFIELD

Honeylocust Drive

MRKL REAL ESTATE PARTNERSHIP

A-14

0 25 50
HORZ. SCALE FEET

LEGEND

- BITUMINOUS TRAIL
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- CONSTRUCTION LIMITS
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXISTING NWI WETLANDS
- EXISTING FLOODPLAIN
- EXISTING FLOODWAY

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CITY OF NORTHFIELD

ECRT CONNECTION - PRELIMINARY ENGINEERS ESTIMATE - *ALIGNMENT 1*

CITY PROJECT:

BMI PROJECT NO. T18.120210

7/24/2020

ITEM NO.	MNDOT SPEC.NO	DESCRIPTION	NOTES	UNIT	UNIT COST	QUANTITY	PRICE
1	2021.501	MOBILIZATION		LS	$12,000.00	1	$12,000.00
2	2101.524	CLEARING		TREE	$750.00	10	$7,500.00
3	2101.524	GRUBBING		TREE	$500.00	10	$5,000.00
4	2104.503	REMOVE CURB & GUTTER		LF	$10.00	50	$500.00
5	2104.504	REMOVE BITUMINOUS PAVEMENT		SY	$50.00	17	$850.00
6	2106.507	EXCAVATION - COMMON	(P), (EV)	CY	$21.00	960	$20,160.00
7	2106.507	COMMON EMBANKMENT	(CV)	CY	$5.00	580	$2,900.00
8	2211.509	AGGREGATE BASE CLASS 5 - TRAIL		TON	$23.00	453	$10,423.60
9	2357.506	BITUMINOUS MATERIAL FOR TACK COAT		GAL	$1.25	80	$100.00
10	2360.509	TYPE SP 9.5 WEARING COURSE MIXTURE (2,B) - TRAIL		TON	$110.00	239	$26,290.00
11	2412.502	6X6 PRECAST CONCRETE BOX CULV END SECTION		EACH	$15,000.00	0	$0.00
12	2412.503	6X6 PRECAST CONCRETE BOX CULVERT		LF	$1,000.00	0	$0.00
13	2521.618	CONCRETE PEDESTRIAN CURB RAMP		SF	$15.00	100	$1,500.00
14	2531.503	CONCRETE CURB AND GUTTER DESIGN B618		LF	$35.00	50	$1,750.00
15	2531.618	TRUNCATED DOMES		SF	$65.00	20	$1,300.00
16	2557.503	CHAIN LINK FENCE		LF	$50.00	0	$0.00
17	2573.502	STORM DRAIN INLET PROTECTION		EACH	$300.00	2	$600.00
18	2573.503	SILT FENCE, TYPE MS		LF	$3.00	2000	$6,000.00
19	2573.503	FLOTATION SILT CURTAIN - TYPE MOVING WATER		LF	$25.00	40	$1,000.00
20	2574.507	TOPSOIL BORROW		CY	$45.00	353	$15,885.00
21	2575.505	SEEDING		AC	$500.00	2	$1,000.00
22	2575.508	SEED MIXTURE 35-241		LB	$30.00	73	$2,190.00
23	2575.508	HYDRAULIC BONDED FIBER MATRIX		LB	$2.00	5000	$10,000.00
						CONSTRUCTION SUBTOTAL	**$126,949**
						+15% CONTINGENCY	$19,042
						TOTAL CONSTRUCTION	**$145,991**
						PERMANENT EASEMENT ($3.00/SF)	$41,100
						TEMPORARY EASEMENT ($0.75/SF)	$8,250
						WETLAND MITIGATION ($45,000/AC)	$9,900
						PROJECT SUBTOTAL:	**$205,241**
						+50% INDIRECT	$102,620
						PROJECT TOTAL:	**$307,861**

Appendix C: Alignment 2

City Of Northfield Minnesota

ECRT Connection
Northfield, MN

Alignment 2 - Trail Layout
July 2020

BOLTON & MENK

STATE OF MINNESOTA

CITY OF NORTHFIELD

MRKL REAL ESTATE PARTNERSHIP

EAST CANNON RIVER TRAIL

Honeylocust Drive

NEW BOX CULVERT

1+00
2+00
3+00
4+00
5+00
6+00

915
916
920

0 25 50
HORZ. SCALE FEET

LEGEND

- BITUMINOUS TRAIL
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- CONSTRUCTION LIMITS
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXISTING NWI WETLANDS
- EXISTING FLOODPLAIN
- EXISTING FLOODWAY

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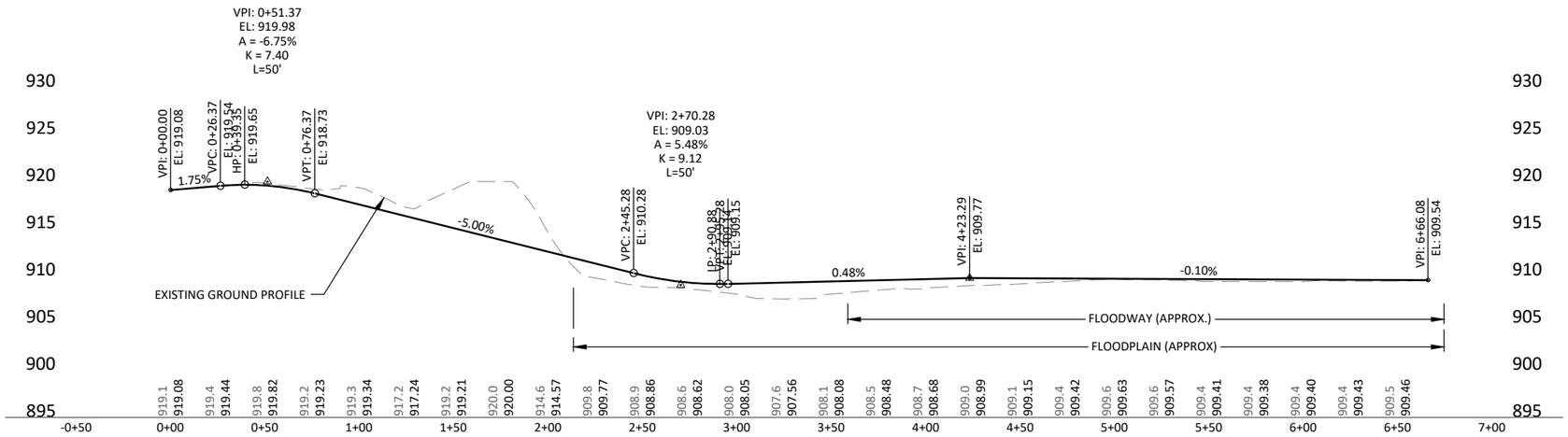

PRELIMINARY TRAIL PROFILE
(NOT TO SCALE)

City Of Northfield Minnesota

ECRT Connection
Northfield, MN

Alignment 2 - Wetland Impacts
July 2020

BOLTON & MENK

WETLAND COMPLEX - TYPE 1,3,7
SEASONALLY FLODED BASIN, SHALLOW MARSH, FORESTED WETLAND
POTENTIAL PERMANENT IMPACT: 0.28 AC

NEW BOX CULVERT

EAST CANNON RIVER TRAIL

CITY OF NORTHFIELD

MRKL REAL ESTATE PARTNERSHIP

Honeylocust Drive

0+00 1+00 2+00 3+00 4+00 5+00 6+00

915 916 920

HORZ. SCALE 0 25 50 FEET

LEGEND

- BITUMINOUS TRAIL
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- CONSTRUCTION LIMITS
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXISTING NWI WETLANDS
- EXISTING FLOODPLAIN
- EXISTING FLOODWAY

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City Of Northfield Minnesota

ECRT Connection
Northfield, MN

Alignment 2 - Floodplain & Floodway Impacts
July 2020

BOLTON & MENK

STATE OF MINNESOTA

NO FILL ALLOWED IN FLOODWAY/FLOODPLAIN
WITHOUT A NO-RISE CERTIFICATION

NEW BOX CULVERT

1+00
2+00
3+00
4+00
5+00
6+00

EAST CANNON RIVER TRAIL

CITY OF NORTHFIELD

MRKL REAL ESTATE PARTNERSHIP

Honeylocust Drive

A-20

0 25 50
HORZ. SCALE FEET

LEGEND

- BITUMINOUS TRAIL
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- CONSTRUCTION LIMITS
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXISTING NWI WETLANDS
- EXISTING FLOODPLAIN
- EXISTING FLOODWAY

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City Of Northfield Minnesota

ECRT Connection
Northfield, MN

Alignment 2 - Right-of-Way Impacts
July 2020

BOLTON & MENK

STATE OF MINNESOTA

20' PERMANENT EASEMENT: 7,100 SF

VARIABLE WIDTH TEMPORARY EASEMENT: 6,100 SF

NEW BOX CULVERT

EAST CANNON RIVER TRAIL

CITY OF NORTHFIELD

MRKL REAL ESTATE PARTNERSHIP

Honeylocust Drive

0+00 1+00 2+00 3+00 4+00 5+00 6+00

915 916 920

HORZ. SCALE 0 25 50 FEET

LEGEND

- BITUMINOUS TRAIL
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- CONSTRUCTION LIMITS
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXISTING NWI WETLANDS
- EXISTING FLOODPLAIN
- EXISTING FLOODWAY

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CITY OF NORTHFIELD

ECRT CONNECTION - PRELIMINARY ENGINEERS ESTIMATE - *ALIGNMENT 2*

CITY PROJECT:

BMI PROJECT NO. T18.120210

7/24/2020

ITEM NO.	MNDOT SPEC.NO	DESCRIPTION	NOTES	UNIT	UNIT COST	QUANTITY	PRICE
1	2021.501	MOBILIZATION	0	LS	$19,000.00	1	$19,000.00
2	2101.524	CLEARING	0	TREE	$750.00	10	$7,500.00
3	2101.524	GRUBBING	0	TREE	$500.00	10	$5,000.00
4	2104.503	REMOVE CURB & GUTTER	0	LF	$10.00	50	$500.00
5	2104.504	REMOVE BITUMINOUS PAVEMENT	0	SY	$50.00	17	$850.00
6	2106.507	EXCAVATION - COMMON	(P), (EV)	CY	$21.00	700	$14,700.00
7	2106.507	COMMON EMBANKMENT	(CV)	CY	$5.00	100	$500.00
8	2211.509	AGGREGATE BASE CLASS 5 - TRAIL	0	TON	$23.00	317	$7,286.40
9	2357.506	BITUMINOUS MATERIAL FOR TACK COAT	0	GAL	$1.25	56	$70.00
10	2360.509	TYPE SP 9.5 WEARING COURSE MIXTURE (2,B) - TRAIL	0	TON	$110.00	167	$18,370.00
11	2412.502	6X6 PRECAST CONCRETE BOX CULV END SECTION	0	EACH	$15,000.00	4	$60,000.00
12	2412.503	6X6 PRECAST CONCRETE BOX CULVERT	0	LF	$1,000.00	32	$32,000.00
13	2521.618	CONCRETE PEDESTRIAN CURB RAMP	0	SF	$15.00	100	$1,500.00
14	2531.503	CONCRETE CURB AND GUTTER DESIGN B618	0	LF	$35.00	50	$1,750.00
15	2531.618	TRUNCATED DOMES	0	SF	$65.00	20	$1,300.00
16	2557.503	CHAIN LINK FENCE	0	LF	$50.00	40	$2,000.00
17	2573.502	STORM DRAIN INLET PROTECTION	0	EACH	$300.00	2	$600.00
18	2573.503	SILT FENCE, TYPE MS	0	LF	$3.00	2000	$6,000.00
19	2573.503	FLOTATION SILT CURTAIN - TYPE MOVING WATER	0	LF	$25.00	40	$1,000.00
20	2574.507	TOPSOIL BORROW	0	CY	$45.00	221	$9,945.00
21	2575.505	SEEDING	0	AC	$500.00	2	$1,000.00
22	2575.508	SEED MIXTURE 35-241	0	LB	$30.00	73	$2,190.00
23	2575.508	HYDRAULIC BONDED FIBER MATRIX	0	LB	$2.00	5000	$10,000.00
						CONSTRUCTION SUBTOTAL	**$203,061**
						+15% CONTINGENCY	$30,459
						TOTAL CONSTRUCTION	**$233,521**
						PERMANENT EASEMENT ($3.00/SF)	$21,300
						TEMPORARY EASEMENT ($0.75/SF)	$4,575
						WETLAND MITIGATION ($45,000/AC)	$12,600
						PROJECT SUBTOTAL:	**$271,996**
						+50% INDIRECT	$135,998
						PROJECT TOTAL:	**$407,993**