



CITY OF SHAKOPEE PEDESTRIAN BRIDGE ALTERNATIVES STUDY

PRELIMINARY STUDY

SHAKOPEE, MN

August 6, 2021

Prepared for:
City of Shakopee
485 Gorman Street
Shakopee, MN 55379

WSB PROJECT NO. R-017896-000



Table of Contents

1. EXECUTIVE SUMMARY	2
2. BACKGROUND	3
2.1 Project Location	3
2.2 Existing Condition	4
2.3 Project Need.....	5
2.4 TH 169 Existing Sign Structures	6
3. PROPOSED DESIGN	7
3.1 Bridge Location	7
3.2 Proposed Bridge Type and Size	12
3.3 Bridge Design Considerations.....	14
3.4 Bridge Design Assumptions	14
3.5 Trail Design and Assumptions	14
4. PROPOSED ALTERNATIVES	15
4.1 General.....	15
4.2 Rejected Alternatives	15
4.3 Alternative 1 – Helix Ramp South Side.....	16
4.4 Alternative 2 – South Trail Crossover Connection	17
4.5 Alternative 3 – South Trail Parallel Ramp with East Side Connection *Preferred Option*	18
4.6 Alternative 4 – South Trail Parallel Ramp with West Side Connection	19
4.7 Alternatives Matrix.....	20
4.8 Alternatives Cost Analysis.....	22
4.9 Preferred Alternative	22
5. CONCLUSION	25
6. APPENDIX A:	26
7. APPENDIX B:	27
8. APPENDIX C:	28

1. EXECUTIVE SUMMARY

The City of Shakopee received \$2.0 million in legislative funding managed by Minnesota Management and Budget (MMB) for a pedestrian bridge over Trunk Highway (TH) 169, approximately 1.5 miles east of Canterbury Road near the FedEx facility. The City's goal is to connect Quarry Lake Park north of TH 169 to the trail system near Dean Lake and the neighborhood to the southeast of the proposed bridge.

Several alternative bridge design configurations were initially developed as part of this study. The four most feasible alternatives were advanced, refined, and included in this study report. The goal was to identify alternatives that are feasible, cost-effective, aesthetically-appealing, considers maintenance, minimizes impacts to existing infrastructure and features, and minimizes inconvenient or circuitous movements for pedestrians and cyclists. Below is a table of the alternatives considered as part of this study.

The bridge crossing over TH 169 is in the same location for all the alternatives as it was determined to be the optimal location. Multiple bridge locations were reviewed but eliminated due to negative impacts to wetlands, the Prior Lake Outlet Channel (PLOC), and sight distances for the existing sign structures. Placing the bridge behind the existing overhead sign structure was also considered but not included in the study due to negative impacts to the nearby neighborhood's privacy and other impacts discussed in Section 4.2.

Based on the detailed findings in this study and discussions with the City it was determined that Alternative 3 is the preferred option. This alternative has many advantages and the least amount of impacts. Further discussion on the benefits of Alternative 3 is included in Section 4.9.

Alternative ID	DESCRIPTION
1	Helix Ramp South Side
2	South Trail Crossover Connection
3	South Trail Parallel Ramp with East Side Connection
4	South Trail Parallel Ramp with West Side Connection

2. BACKGROUND

2.1 Project Location

Truck Highway 169 (TH 169) passes through the City of Shakopee. A thriving Commercial & Light Industrial district as well as a recreation area are located on the north side of TH 169, while residential neighborhoods and trails are located to the south of the highway (See Figure 1).



Figure 1 – Project location Map

Major area amenities include:

- Southbridge Community Dog Park
- Savanna Oaks Park
- Quarry Lake Park
- Xcel Energy Mountain Bike Park
- Residential Housing
- Commercial Businesses

The development of a pedestrian overpass would benefit

- Nearby Schools and Housing
- Connect the community –neighborhood (South) to Commercial Businesses & Quarry Lake Park (North)
- Public health – encourage recreation and exercise

2.2 Existing Condition

There are trail facilities both north and south of TH 169 in this area but no facilities to cross TH 169. The nearest crossing of TH 169 is located 1.5 miles to the east at Canterbury Road. Near the location of the proposed bridge there is an existing trail that ends approximately 600 feet north of the highway and a trail that runs east and west south of TH 169. There is also an existing pedestrian bridge along the south trail that carries pedestrians over the PLOC. Quarry Lake Park is also located north of TH 169 where the new Xcel Energy Mountain Bike Park exists.



Figure 2 – Existing Conditions Looking South



Figure 3 – Existing Conditions Looking North

2.3 Project Need

This Preliminary study is intended to develop and vet alternatives for bridge location and bridge type, determining the optimal connection points to existing trails, and to providing preliminary cost estimates of each alternative.

This preliminary study addresses the following questions:

- What locations would be best suited for a pedestrian bridge?
- What are the impacts of each alternative?
- What bridge types and size could be considered?
- What is the best way to connect to existing trails?
- Which alternative provides the best experience for the pedestrian?
- What are the general pedestrian bridge and trail costs?

2.4 TH 169 Existing Sign Structures

As previously mentioned, one of the main components to consider when locating the pedestrian bridge is how it interacts with the existing sign structures. There is a westbound sign structure that is located approximately 1 mile east of the Canterbury Road exit, and an eastbound sign structure located approximately 1.5 miles west of County State Aid Highway (CSAH) 18. Staff has coordinated with MnDOT to determine that the proposed bridge is not impacting the westbound sign structure's sight distance. The proposed bridge is at its furthest east location to not negatively impact the eastbound sign structure. Additional analysis is shown in section 3.1.



Figure 4 – Existing Sign East of Proposed Bridge



Figure 5 – Existing Sign West of Proposed Bridge

3. PROPOSED DESIGN

3.1 Bridge Location

One of the main considerations for the pedestrian bridge crossing location is its proximity to two TH 169 overhead sign structures. The proposed bridge location is between an eastbound and a westbound overhead sign structure with the easterly sign 311 feet away and the westerly sign 512 feet away. With the pedestrian bridge and sign structures being closely spaced there is a potential for sight distance to the signs being reduced below an acceptable distance. The Minnesota Manual on Uniform Traffic Control Devices (MNMUTCD) requires 30 feet of sign legibility for every 1" of letter height. The guide signs placed on the overhead structures have standard 16" maximum letter size which has a legibility distance of 480 feet. This means the sign needs to be fully visible when a driver can first read it at 480 feet away. Figure 6, the analysis for the westbound sign, represents a sight distance of 810.4 feet and Figure 9 for the eastbound sign has a sight distance of 567.3 feet to the existing sign and 518.4 feet to a future proposed sign MNDOT will be installing. The sight distance to the signs is greater than the legibility distance for both the eastbound and westbound signs meeting MNMUTCD requirements.

Moving the easterly sign structure further west or east was analyzed, however in addition to the added cost, moving the sign is not considered feasible due to the proximity to the beginning of the added lane that is developed for exiting to Trunk Highway 13 and County Road 21. Moving the sign to the west would create a confusing situation with the sign being placed above a shoulder but may be mistaken for a lane. Moving the sign too far to the east would potentially cause confusion because the beginning of the outside lane would not have a description of the intent of the new lane. Causing motorists to enter the lane without the intent to exit.

Moving the location of the pedestrian bridge both further east and west was reviewed when determining the optimal location. If the pedestrian bridge location was to move further west it would have a greater impact on existing wetlands. There is some room to move the bridge further to the east but only about 10 to 15 feet before we would no longer meet the sight line requirements for the overhead sign structures.

Moving the location of the pedestrian bridge to the east side of the overhead sign was also reviewed. This would provide the most direct path over TH 169 but there were enough negative impacts to exclude this alternative. Due to the required height of the bridge over TH 169 there would be a direct sight line from the pedestrians using the bridge into nearby homes. This would have a negative impact to the neighborhood's privacy. Other reasons for excluding this option included more impacts to trees, the need for a helix at the southern connection, higher cost, and increased construction cost and maintenance cost/challenges.

It was determined that the proposed location of the pedestrian bridge would provide the least amount of negative impacts and provide an optimal location for pedestrians to cross TH 169 and tie into the existing trail system.

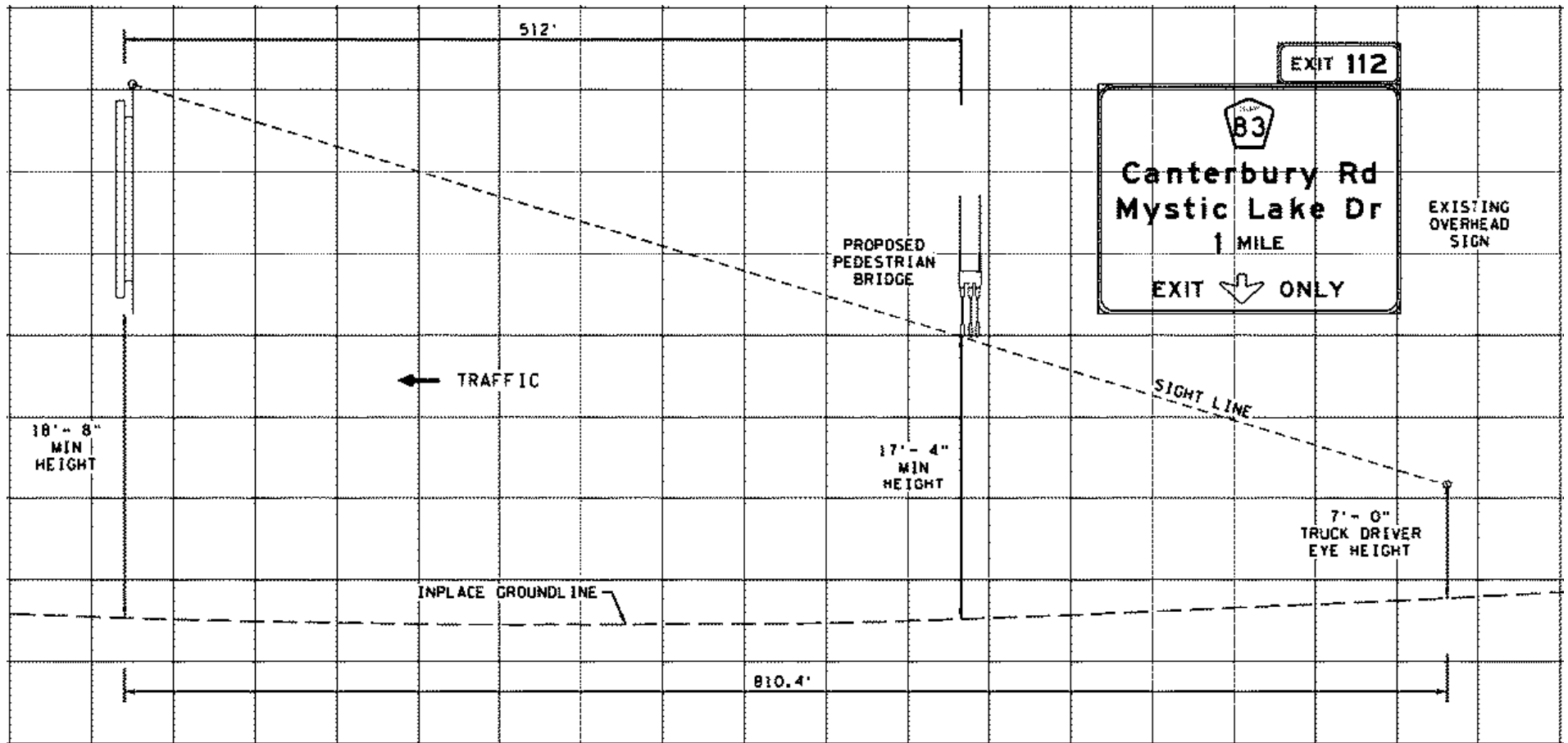


Figure 6 – Sight Lines for Westbound TH 169 Traffic

Description: Figure 6 shows the analysis of the sight lines for vehicles viewing the sign bridge on westbound TH 169, images of the existing sign bridge can be seen in Figure 7 and 8. Based on the above analysis design standards are being meet.



Figure 7 – Sign Bridge on Westbound TH 169 – 1

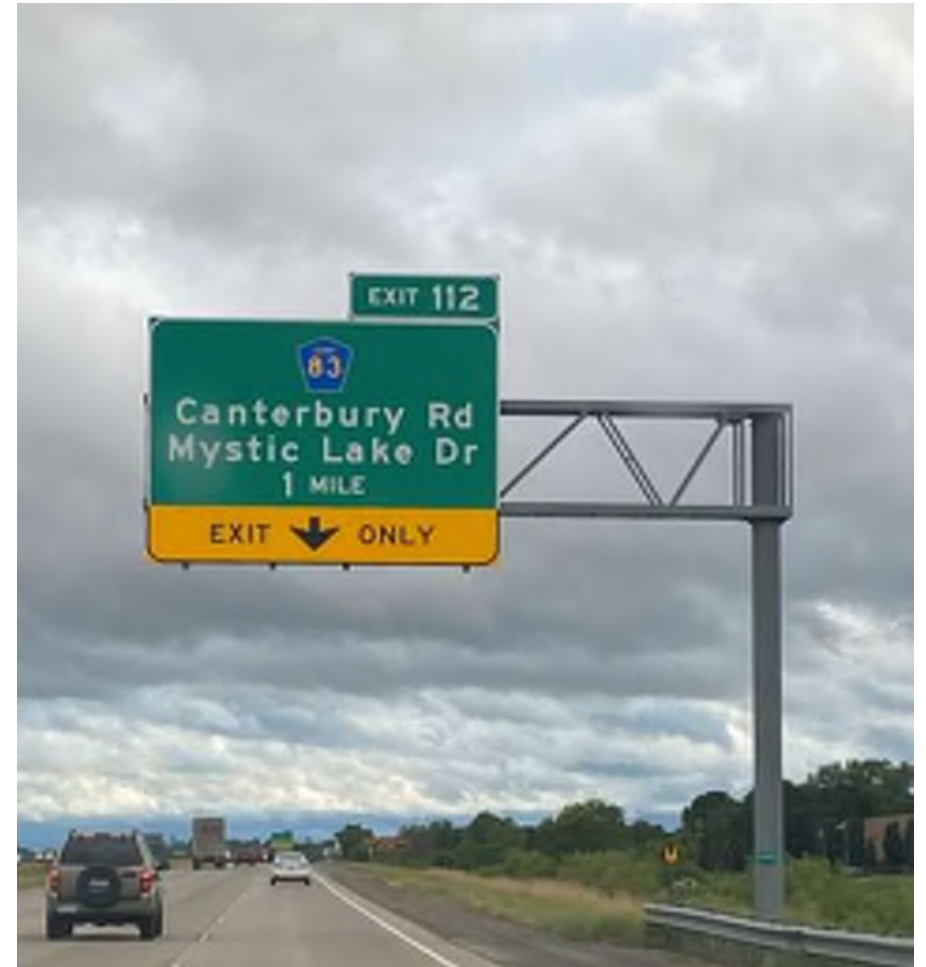


Figure 8 – Sign Bridge on Westbound TH 169 – 2

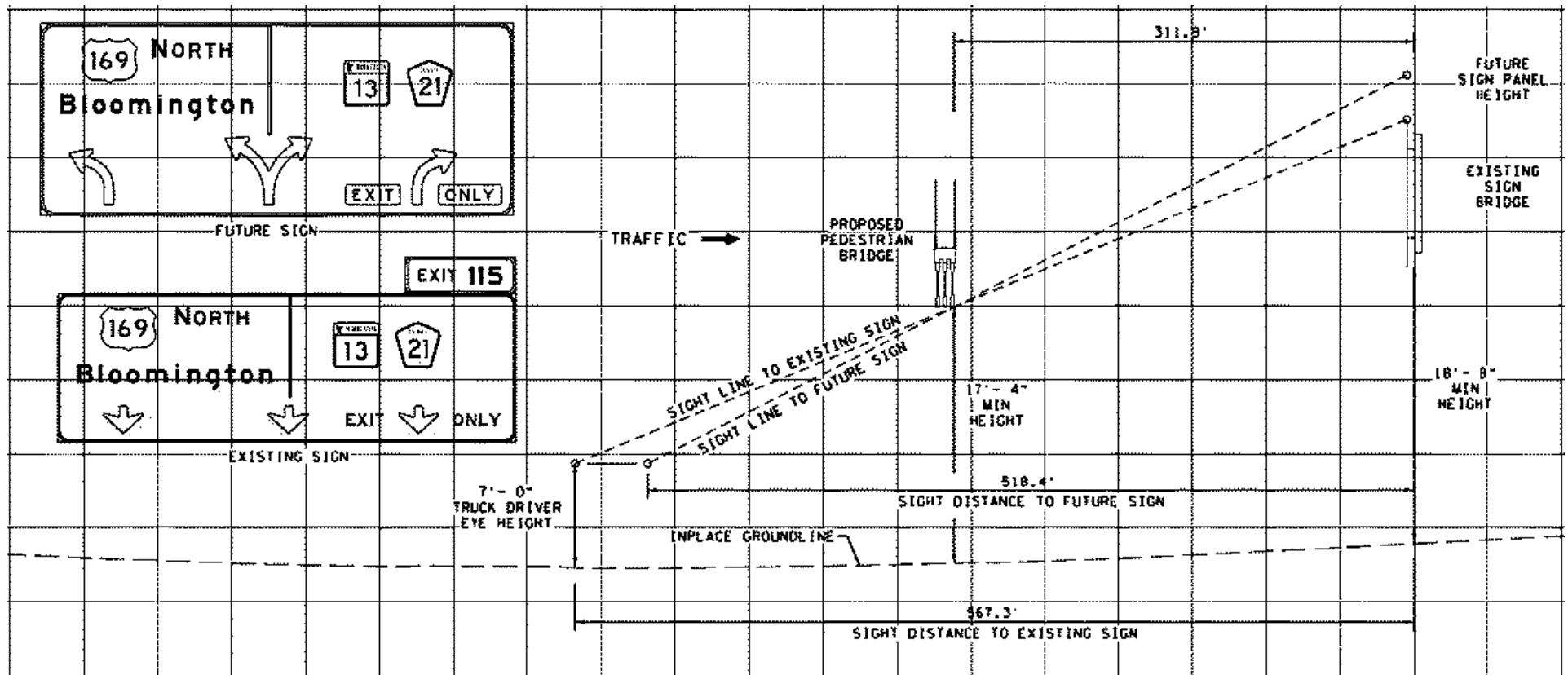


Figure 9 – Sight Lines for Eastbound TH 169 Traffic

Description: Figure 9 is the analysis of the sight lines for vehicles viewing the existing/proposed sign bridge on eastbound TH 169, images of the existing sign bridge can be seen in Figure 10 and 11. Based on the above analysis design standards are being met.



Figure 10 – Sign Bridge on Eastbound TH 169 – 1



Figure 11 – Sign Bridge on Eastbound TH 169 – 2

3.2 Proposed Bridge Type and Size

Based on discussions with the City of Shakopee the proposed bridge will match many features of the existing prestressed girder pedestrian bridge crossing over TH 169 at the intersection with Marschall Road, which will also match the new proposed pedestrian bridge on the west side of the Marshall Road bridge being built by Scott County in 2022.



Figure 12 – Marschall Road Pedestrian Bridge over TH 169 – 1



Figure 13 – Marschall Road Pedestrian Bridge over TH 169 – 2



Figure 14 – Marschall Road Pedestrian Bridge over TH 169 – 3



Figure 15 – Marschall Road Pedestrian Bridge over TH 169 – 4

3.3 Bridge Design Considerations

Design Considerations include the location, width, length, span layout, desired features (such as helix or straight ramps), foundation types, and aesthetics (colors, textures, railings, and lighting). While there are often multiple solutions to the location constraints, vertical clearance requirements are unchanging and often control the design.

Vertical clearance requirements for a new bridge vary depending on the geographic feature that the bridge spans. For a bridge over TH 169, the Minnesota Department of Transportation (MnDOT) requires a minimum vertical clearance of 17'-6". For a girder bridge, longer spans require deeper beams, which increase the bridge deck height above TH 169 and lengthen the trail approach ramps.

3.4 Bridge Design Assumptions

This study used the following design assumptions to develop the opinion of probable cost for each option.

- The minimum vertical clearance over TH 169 is 17'-6". With a 4'-4" deep superstructure, the top of bridge deck will be approximately 22 feet above TH 169.
- A 14' wide bridge with a 12' trail width from curb-to-curb is required to accommodate two-way recreational uses.
- 40' minimum radius on the Helix ramp for Alternative 1.
- Connector trails will be 10' wide.
- Bridge will have curb and ornamental metal railing.
- Bridge will be designed for 90 psf pedestrian load and H-10 vehicle.
- 75-year design life.
- Snow removal (when necessary) will be performed by a plow or equivalent.
- Decorative lighting will be placed on the bridge to increase security for users.

3.5 Trail Design and Assumptions

The alternatives were designed to provide users a safe and efficient way to cross TH 169. Considerations were made to reduce impacts to existing utilities, wetlands, pedestrians, and local residents will providing cost effective options.

The study used the following design assumptions when developing the different alternatives.

- Trail width equals 10 feet.
- Retaining walls were used to avoid wetlands and the existing trail.
- Design speed equals 20 mph, except as approaching the bridge.

4. PROPOSED ALTERNATIVES

4.1 General

Several distinct pedestrian bridge alternatives were developed and evaluated as a part of this study. Many of these options were discarded due to impacts to the surrounding area. This report summarizes the most feasible 4 bridge and trail alternatives. The alternatives have a similar design north of TH 169 and cross TH 169 at the same general location due to previously discussed constraints. The main difference between the options is how and where the trail/bridge connect with the existing trail south of TH 169. Cross sections have been included, except for option 1 as the limits north of TH 169 will be very similar to the other alternatives and the limits south will be much smaller and contained to the location of the helix, in the appendix to verify all options are feasible.

4.2 Rejected Alternatives

Additional alternatives were initially reviewed during the process of developing this analysis. These options were rejected and not included in this study due to significant design complexities, increased impacts (neighborhood privacy, transportation system, PLOC), reduced pedestrian safety, reduced ease of use, and/or higher cost. An alternative to connect the trail east of the overhead sign was considered a possibility, as it is a more direct route for the trail. However, this option was eliminated due to the invasion of privacy for the homeowners near the southern connection. Due to the height of the bridge and location to the residents, there would be a direct sight line from the bridge to the resident's homes. This option also needs to include a helix at the southern connection which increases construction cost and adds long term maintenance costs and challenges. Another negative aspect of this alternative is the large impact to trees south of the existing trail from the helix connection. Ultimately the alternatives included in this memo were determined to be better options to carry pedestrians over TH 169.

4.3 Alternative 1 – Helix Ramp South Side

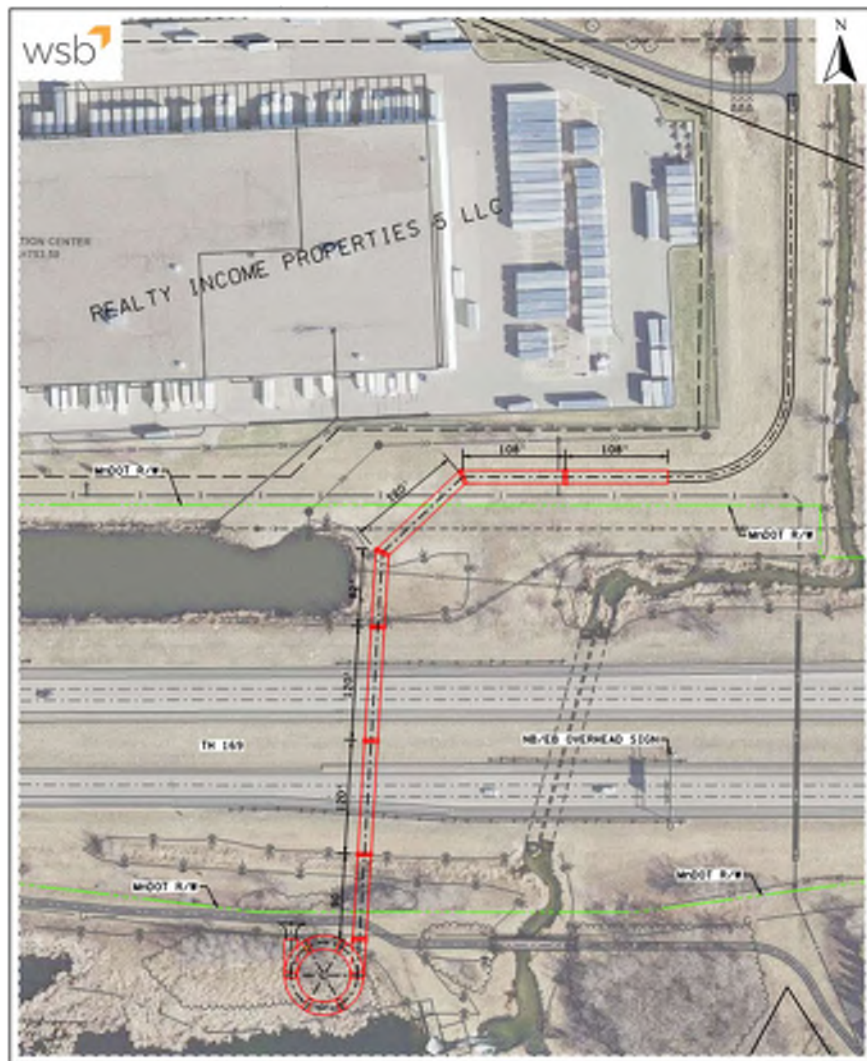


Figure 16 – Pedestrian Bridge Option 1

Overview: Alternative 1 connects to the existing trail with a helix design.

Alternative 1

Pros:

- Has the smallest footprint.
- Minimal utility impacts.
- Minimal impacts to MnDOT R/W.
- Option doesn't impact the Prior Lake Outlet Channel.

Cons:

- Most expensive option.
- Helix can be more difficult for pedestrians to maneuver and to maintain.
- Location of helix will impact wetlands.

Cost: \$5,690,000

4.4 Alternative 2 – South Trail Crossover Connection

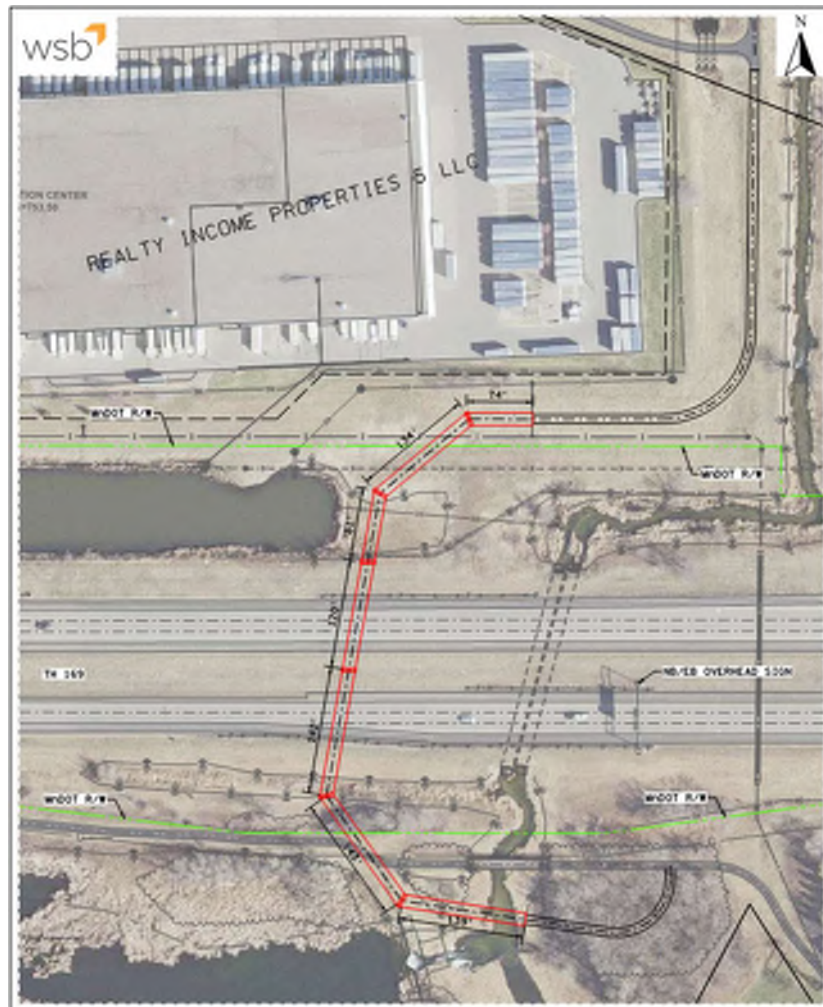


Figure 17 – Pedestrian Bridge Option 2

Overview: Alternative 2 connects to the existing trail near the neighborhood south of the existing trail.

Pros:

- Alignment has gradual curves; this makes it easy to use and maintain.
- Lowest cost to construct.
- Ties into existing trail near neighborhood.
- Minimal impact to MnDOT R/W.
- Minimal utility impacts.

Cons:

- Trail and bridge will impact wetlands.
- Will require more R/W to construct.
- Will be impacts Prior Lake Outlet Channel.
- Longest bridge.

Cost: \$4,311,000

4.5 Alternative 3 – South Trail Parallel Ramp with East Side Connection *Preferred Option*

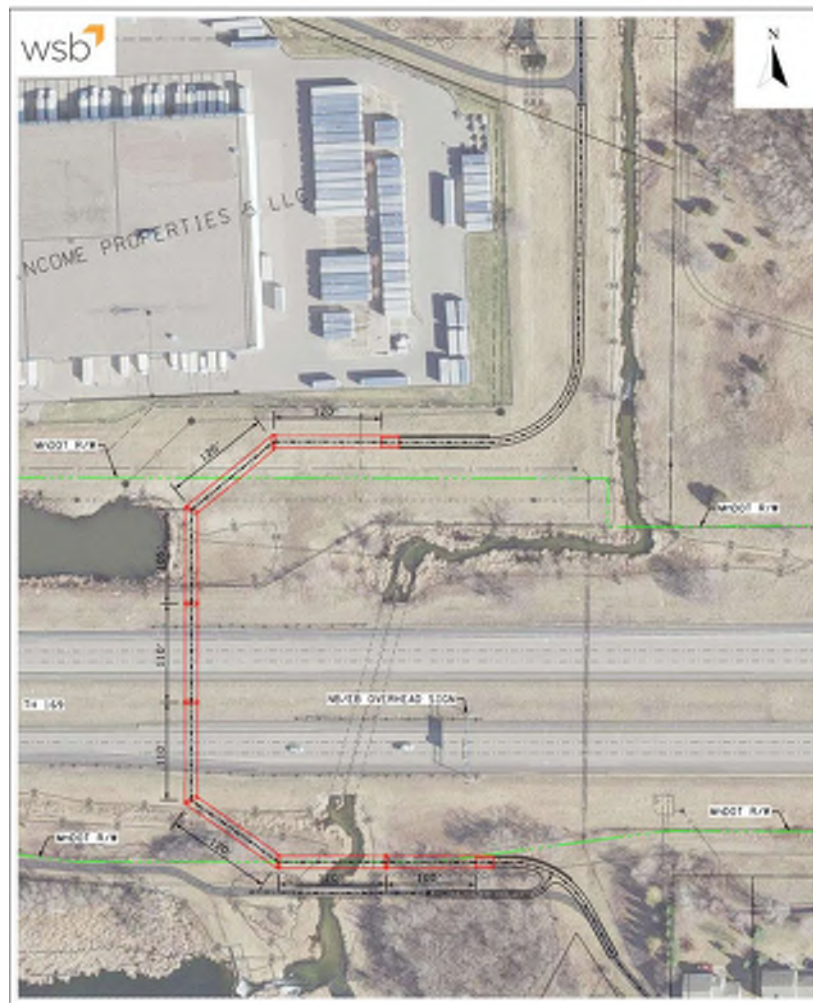


Figure 18 – Pedestrian Bridge Option 3

Overview: Alternative 3 connects to the existing trail near the neighborhood north of the existing trail.

Pros:

- Lower cost to construct.
- Ties into existing trail near neighborhood.
- Easy for residents to use.

Cons:

- Requires work within MnDOT R/W to construct the trail.
- Potentially more utility impacts.
- Alignment curves are sharper to stay north of the existing trail.
- Impacts Prior Lake Outlet Channel (Final design will limit impacts).

Cost: \$4,323,000

4.6 Alternative 4 – South Trail Parallel Ramp with West Side Connection



Figure 19 – Pedestrian Bridge Option 4

Overview: Alternative 4 connects to the existing trail away from the neighborhood within MnDOT R/W.

Pros:

- Minimal impacts to wetlands.
- Option doesn't impact the Prior Lake Outlet Channel.
- Requires less R/W.
- Easier to construct as the alignment stays out of wetlands.

Cons:

- Requires the most work within MnDOT R/W.
- Potentially more impacts to utilities.
- Requires the most amount of retaining walls.
- Alignment at the connection with the existing trail is sharp due to limited space.
- Goal of the project is to get pedestrians north and south and less east and west.

Cost: \$4,525,000

4.7 Alternatives Matrix

Figure 20 on the following page contains an alternatives matrix outlining different factors/items we considered important when analyzing each alternative. Each row ranks if the alternative has a positive, average, or negative impact on the item being considered. The ranking system used is ++, +, and -. If the alternative is ranked with a ++ for that specific item then it was determined to have a low impact, low cost or high benefit. If the alternative is ranked with a + it was determined to have an average impact, cost, or benefit. If the alternative is ranked with a - it was considered to have a high impact, high cost, or low benefit to the item being analyzed.

Alternatives Matrix															
ITEM/FACTOR	ALTERNATIVES								Notes						
	ALTERNATIVE 1		ALTERNATIVE 2		ALTERNATIVE 3 *PREFERRED*		ALTERNATIVE 4								
	Helix Ramp South Side		South Trail Crossover Connection		South Trail Parallel Ramp with East Side Connection		South Trail Parallel Ramp with West Side Connection								
Construction Cost	-	Total project cost \$5,690,000.	++	Total project cost \$4,311,000.	++	Total project cost \$4,323,000.	+	Total project cost \$4,525,000.	Cost to construct the bridge and trail alternatives, includes 20% contingency.						
Pedestrian Accessibility/Distance Traveled	+	Length of trail equals 1,660 feet. Intersects the existing trail south of TH 169 with helix. This is slightly more difficult for pedestrians to maneuver.	++	Length of trail equals 1,620 feet. Intersects existing trail south of TH 169 near neighborhood, allowing for easy access to residents.	++	Length of trail equals 1,650 feet. Intersects existing trail south of TH 169 near neighborhood, allowing for easy access to residents. Direct north to south connection.	-	Length of trail equals 1,720 feet. Intersects existing trail south of TH 169 away from neighborhood, making it more difficult for residents of that neighborhood to use.	The easy for pedestrians to use the bridge/trail and access the trail south of TH 169.						
Pedestrian Safety/Ease of Use	-	Helix may be more difficult for some pedestrians to utilize.	++	Easy connection for residents living south of TH 169. Provides gradual curves when connecting into the existing trail.	++	Easy connection for residents living south of TH 169. Provides gradual curves when connecting into the existing trail.	+	Connects further away for residents living south of TH 169. Provides good sight lines at intersection with existing trail.	The safety of each option for pedestrians to use the bridge/trail.						
Resident Impacts	+	Will impact traffic on TH 169 and will impact pedestrians using the existing trail south of TH 169. Similar impacts for all options.	+	Will impact traffic on TH 169 and will impact pedestrians using the existing trail south of TH 169. Similar impacts for all options.	+	Will impact traffic on TH 169 and will impact pedestrians using the existing trail south of TH 169. Similar impacts for all options.	+	Will impact traffic on TH 169 and will impact pedestrians using the existing trail south of TH 169. Similar impacts for all options.	Amount of impacts to the local residents and businesses.						
Impacts to wetlands	-	The Helix is located south of the existing trail south of TH 169 and will be located within a wetland. Will include wetland impacts.	+	Will have wetland impacts to construct the bridge south of TH 169, slightly more impacts due to trail being located south of existing trail.	++	Will have wetland impacts to construct the bridge south of TH 169, less impacts due to the trail being located north of the existing trail.	++	Will have minimal impacts to wetlands.	Amount of Wetland impacts based on the preliminary wetland delineation. All alternatives will have similar impacts north of TH 169.						
Right of Way Impacts	+	One parcel impacted north of TH 169.	+	One parcel impacted north of TH 169.	+	One parcel impacted north of TH 169.	+	One parcel impacted north of TH 169.	Amount of Right of Way needed to construct each alternative. All alternatives will have similar R/W impacts north of TH 169 and City owns property south of TH 169.						
Impacts to MnDOT Facilities	++	Only the bridge piers will need to be constructed within MnDOT R/W.	++	Only the bridge piers will need to be constructed within MnDOT R/W.	+	Bridge piers will need to be constructed within MnDOT R/W. A portion of the bridge that parallels the existing trail falls within MnDOT R/W and will require a permit to construct.	+	Bridge piers will need to be constructed within MnDOT R/W. This alternative will also require a permit to construct the trail within MnDOT R/W.	Impacts required within the MnDOT Right of way. All alternatives will have similar impacts north of TH 169.						
Utility Impacts	++	Will have similar utility impacts. Initial investigation shows minimal impacts.	++	Will have similar utility impacts. Initial investigation shows minimal impacts.	++	Will have similar utility impacts. Initial investigation shows minimal impacts.	-	This alternative may have additional impacts due to more utilities being located within MnDOT R/W. There is the potential to impact more utilities.	Extent of utility impacts needed to construct each alternative.						
Maintenance	-	Most difficult alternative to maintain since there are steel girders in the helix and tight curves	+	Typical maintenance efforts needed. A passenger truck turning template will be used to ensure the bridge works for snow removal equipment.	+	Typical maintenance efforts needed. A passenger truck turning template will be used to ensure the bridge works for snow removal equipment.	+	Typical maintenance efforts needed. A passenger truck turning template will be used to ensure the bridge works for snow removal equipment.	Amount of maintenance effort needed for each alternative.						
Tree Impacts	-	Increased impacts due to the location of the helix.	-	Increased impacts due to trail being located south of existing trail.	+	Minimal tree impacts due to trail being located north of existing trail.	++	Minimal to no tree impacts.	Amount of trees that will need to be removed due to trail/bridge location, no impacts north of TH 169.						
Impacts to Prior Lake Outlet Channel	++	This alternative will not impact the channel.	-	This alternative will have some impacts due to the bridge crossing over the channel south of TH 169, slightly more due to the trail crossing south of the existing trail.	+	This alternative may have some impacts due to the bridge crossing over the channel south of TH 169, slightly less due to the trail crossing north of the existing trail.	++	This alternative will not impact the channel.	Impacts to the channel based on each alternative. All options will avoid impacting the channel north of TH 169.						
		Key						Date: 8-6-2021							
		++ No/Low Impact, Low Cost, or High Benefit													
		+ Average Impact, Cost or Benefit													
		- High Impact, High Cost, or Low Benefit													

Figure 20 – Alternatives Matrix

4.8 Alternatives Cost Analysis

Each alternative was analyzed for the cost to construct the bridge and trail separately showing how each design alternative will impact the overall cost of the project. Bridge costs were determined by using a base unit cost per square foot and then factoring in amenities needed for each bridge. Quantities were calculated for the trial portion of the project including earthwork, bituminous, retaining walls, guardrail, and miscellaneous items. A contingency of twenty percent was added for unknown costs that couldn't be determine at this time. Figure 21 shows the cost broke out for each alternative.

Alternative ID	DESCRIPTION	BRIDGE: ESTIMATED COST	TRAIL: ESTIMATED COST	DESIGN ENGINEERING	RIGHT OF WAY COST	TOTAL: ESTIMATED COST
1	Helix Ramp South Side	\$4,000,000	\$440,000	\$1,000,000	\$250,000	\$5,690,000
2	South Trail Crossover Connection	\$2,560,000	\$501,000	\$1,000,000	\$250,000	\$4,311,000
3	South Trail Parallel Ramp with East Side Connection	\$2,550,000	\$523,000	\$1,000,000	\$250,000	\$4,323,000
4	South Trail Parallel Ramp with West Side Connection	\$2,500,000	\$775,000	\$1,000,000	\$250,000	\$4,525,000

Figure 21 – Alternatives Construction Cost

4.9 Preferred Alternative

During the process of developing the alternatives analysis several alternatives were considered to provide a grade-separated pedestrian connection over TH 169. Many of these initial options were not advanced, as they were not deemed feasible due to costs and impacts. The four most promising alternatives were advanced, refined, and vetted. Based on the detailed findings in this study and discussions with the City, it was determined that Alternative 3 is the preferred alternative. This option has many benefits such as minimal tree, utility, neighborhood, PLOC, and wetland impacts. This also wasn't the most expensive option to construct and doesn't provide as many maintenance challenges. Alternative 3 ultimately provides the best connection for pedestrians to access the trails north and south of TH 169 while aligning with the City's long-term trail connectivity plan.

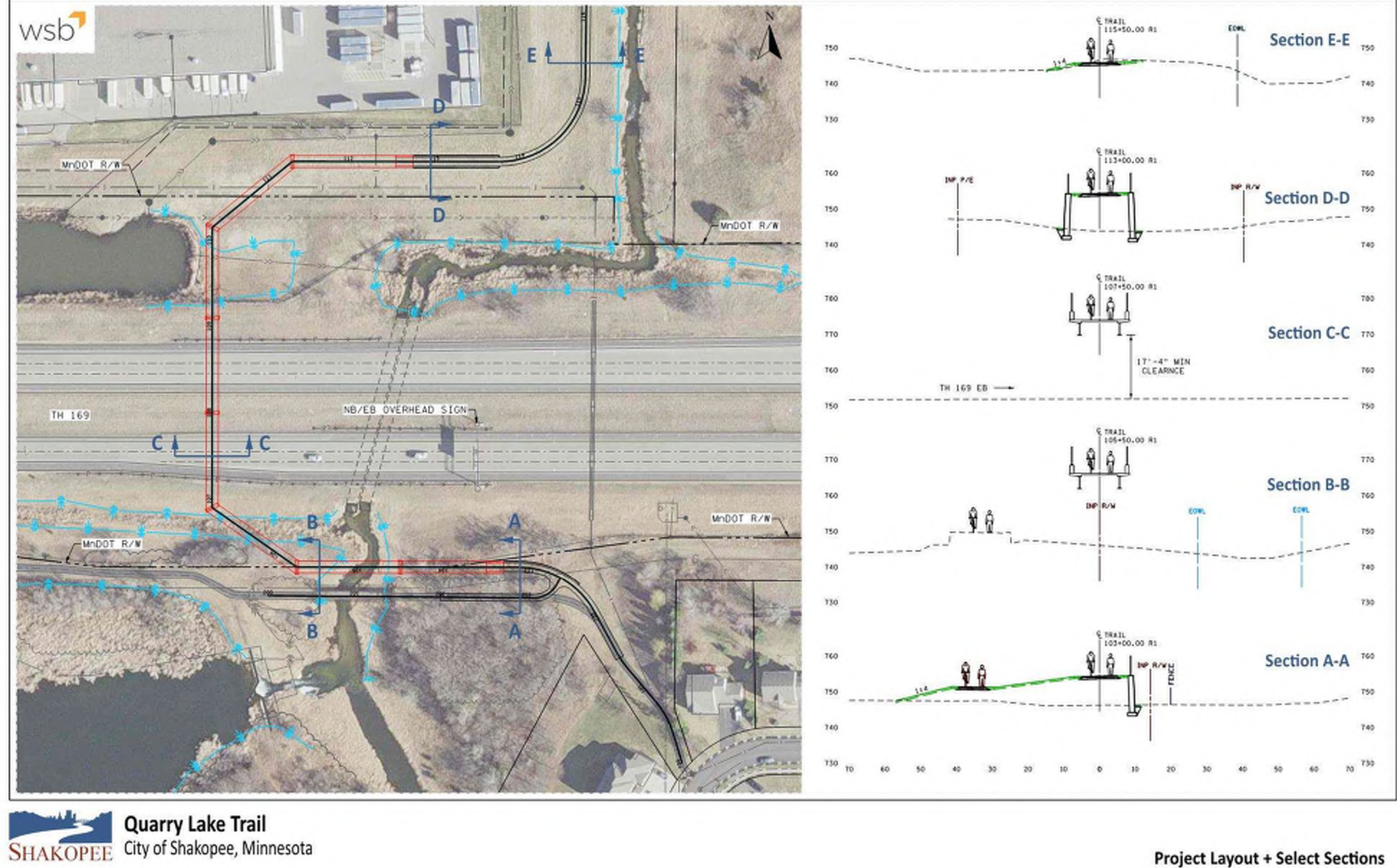
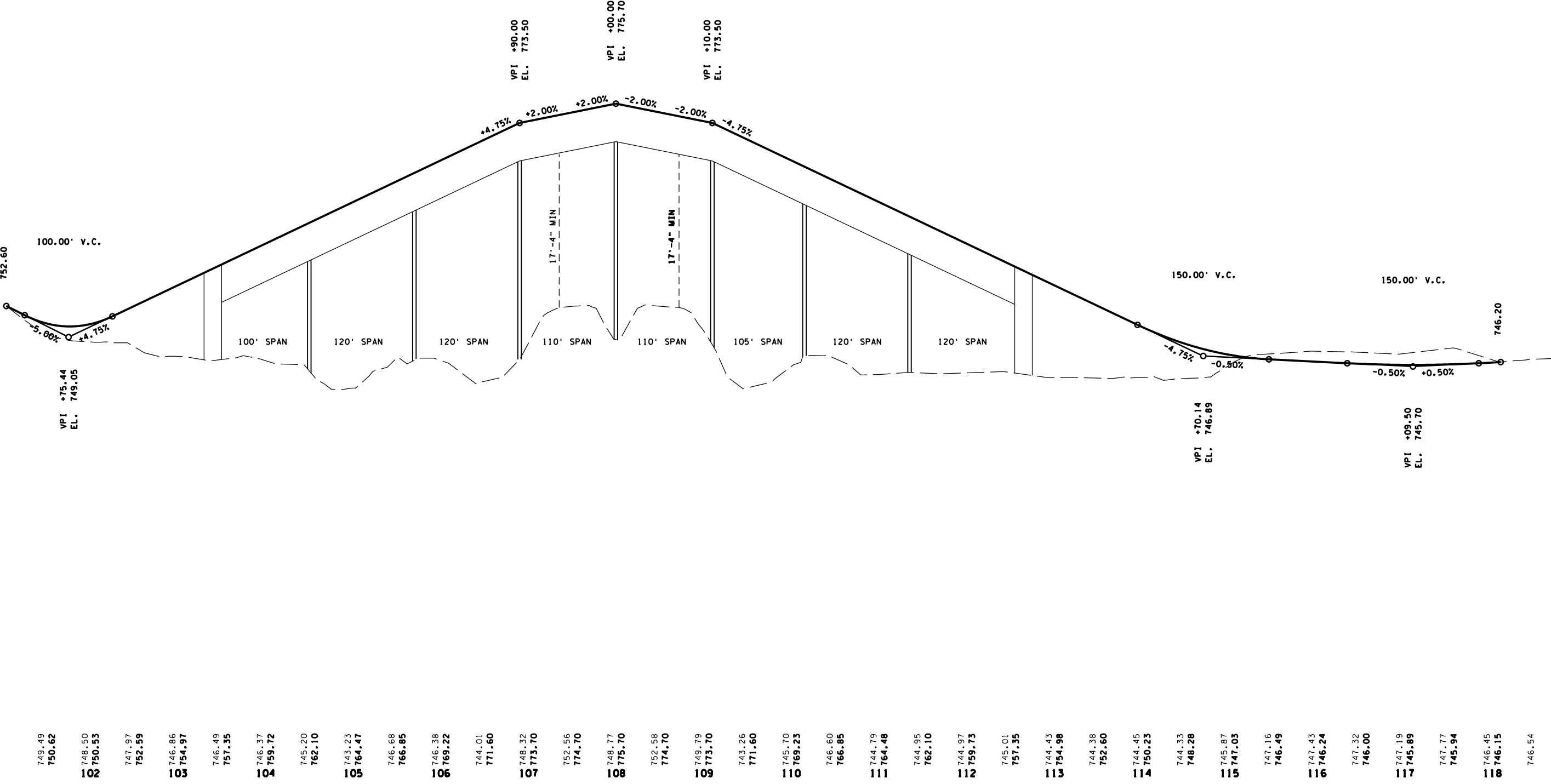


Figure 22 – Proposed Alternative



5. CONCLUSION

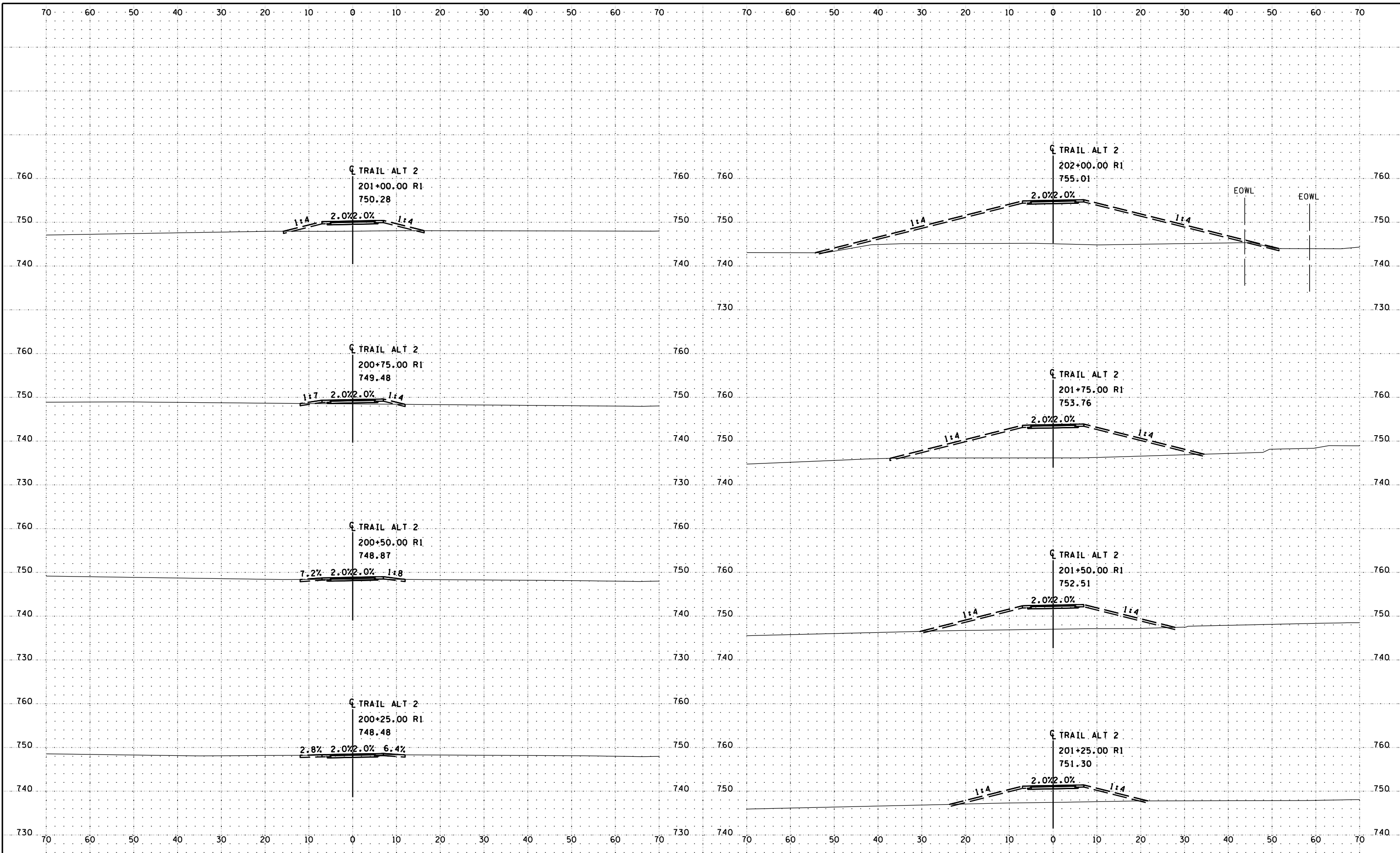
The purpose of this alternatives analysis was to identify pedestrian bridge alternatives that provide a safe, grade-separate pedestrian crossing over TH 169 in the city of Shakopee. Each option is feasible, and they all have their advantages and disadvantages.

Although each option considered is feasible, Alternative 3 accomplishes the goals of the project best by balancing cost, maintenance demands, impacts (neighborhood, R/W, utilities, MnDOT infrastructure, wetlands, PLOC), as well as, ease of use and direct connectivity. As we move into final design, advanced consideration will be given to lighting, aesthetics, drainage and utilities. We recommend moving forward with the Alternative 3 design.

6. APPENDIX A: CROSS SECTIONS

PLOTTED/REVISED: 7/12/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50L_ALT_2Adgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP



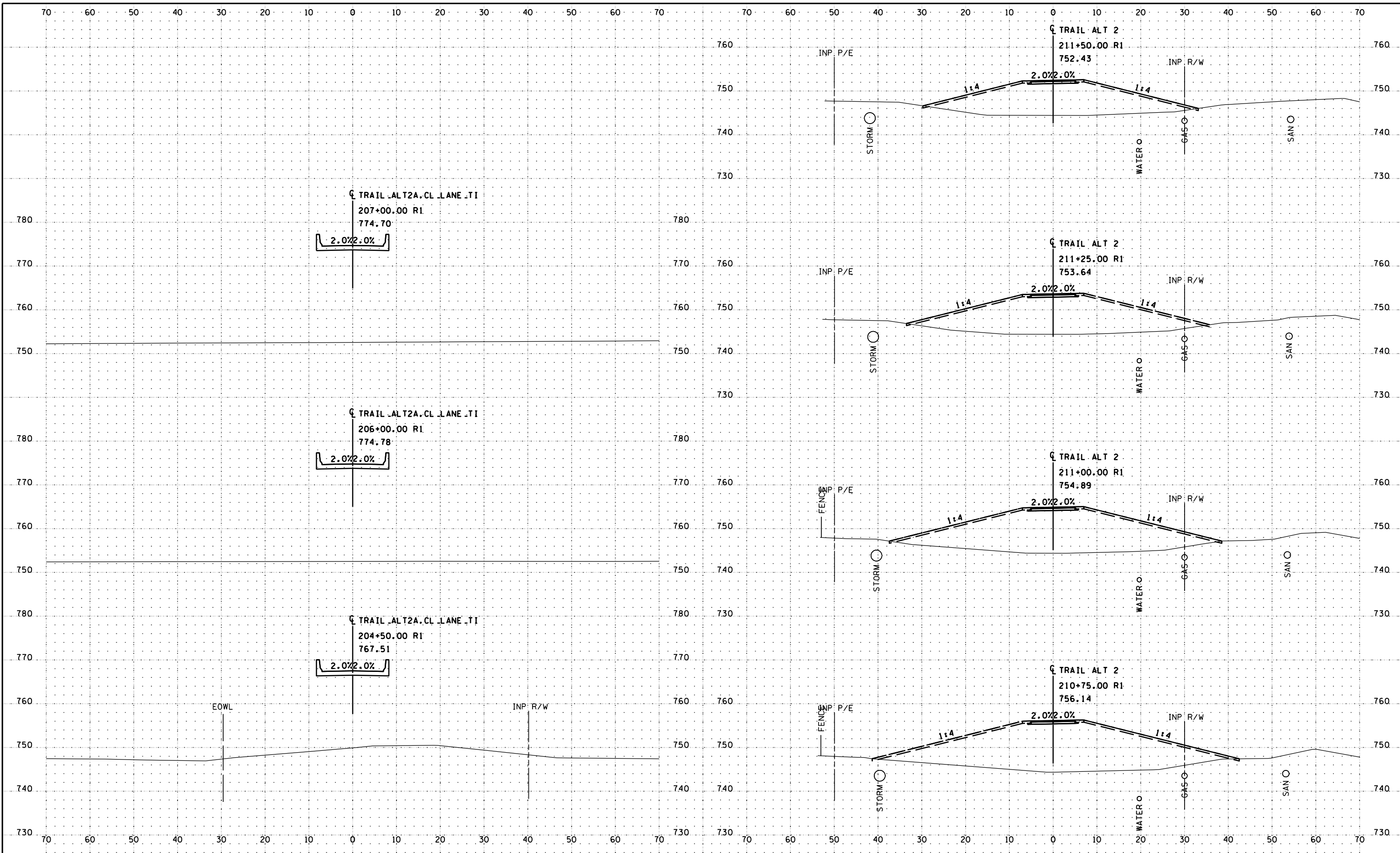
Quarry Lake Trail and Pedestrian Bridge
 City of Shakopee, Minnesota

CITY OF SHAKOPEE, MINNESOTA
 STA. 200+25.00 TO STA. 202+00.00
CROSS SECTIONS
 PR-22-004

SHEET
X1-1
 OF
14
 SHEETS

PLOTTED/REVISED: 7/12/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50L_ALT_2A.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP



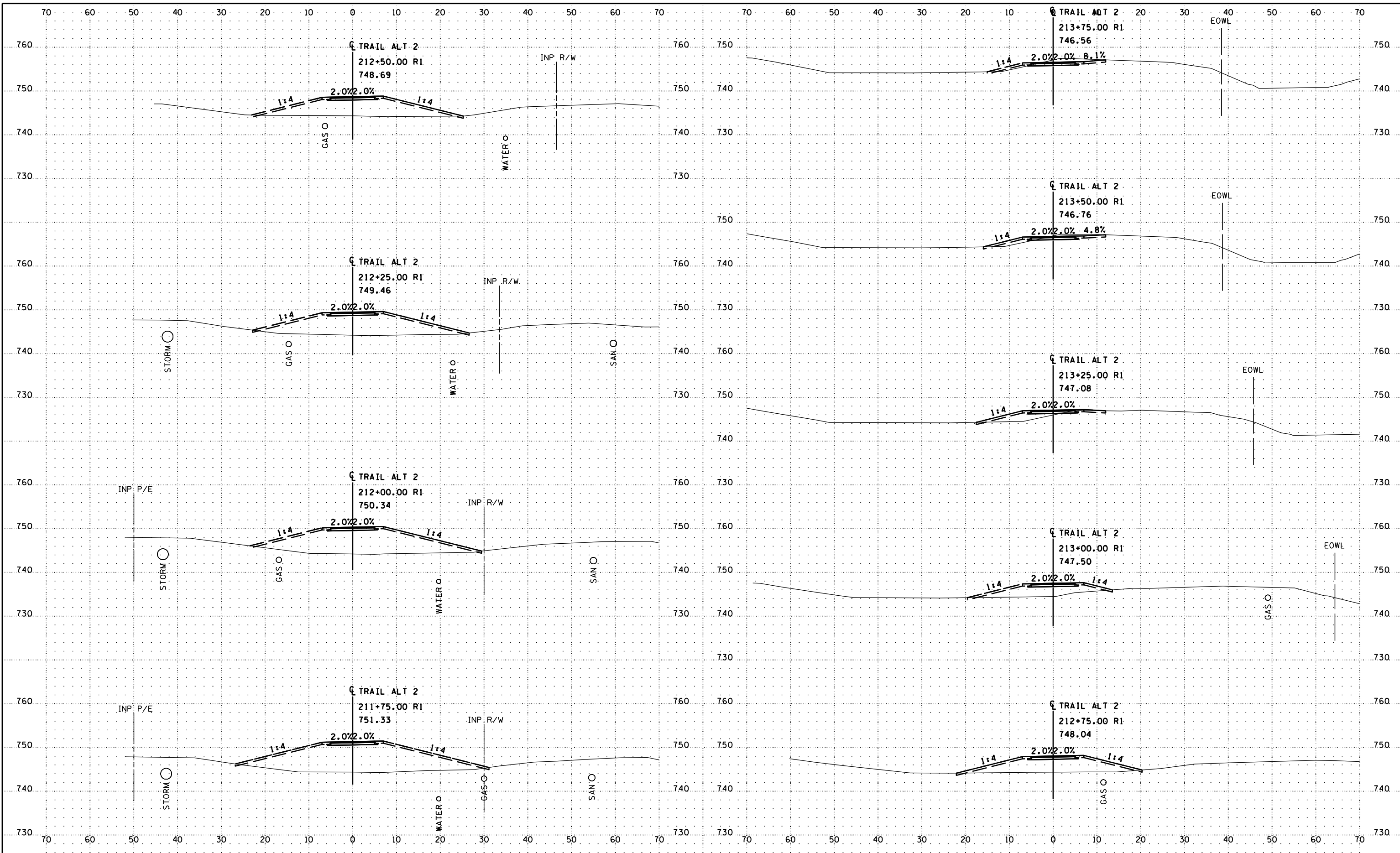

Quarry Lake Trail and Pedestrian Bridge
 City of Shakopee, Minnesota

CITY OF SHAKOPEE, MINNESOTA	
STA. 204+50.00 TO STA. 211+50.00	
CROSS SECTIONS	
PR-22-004	

SHEET	X1-2
OF	14
SHEETS	

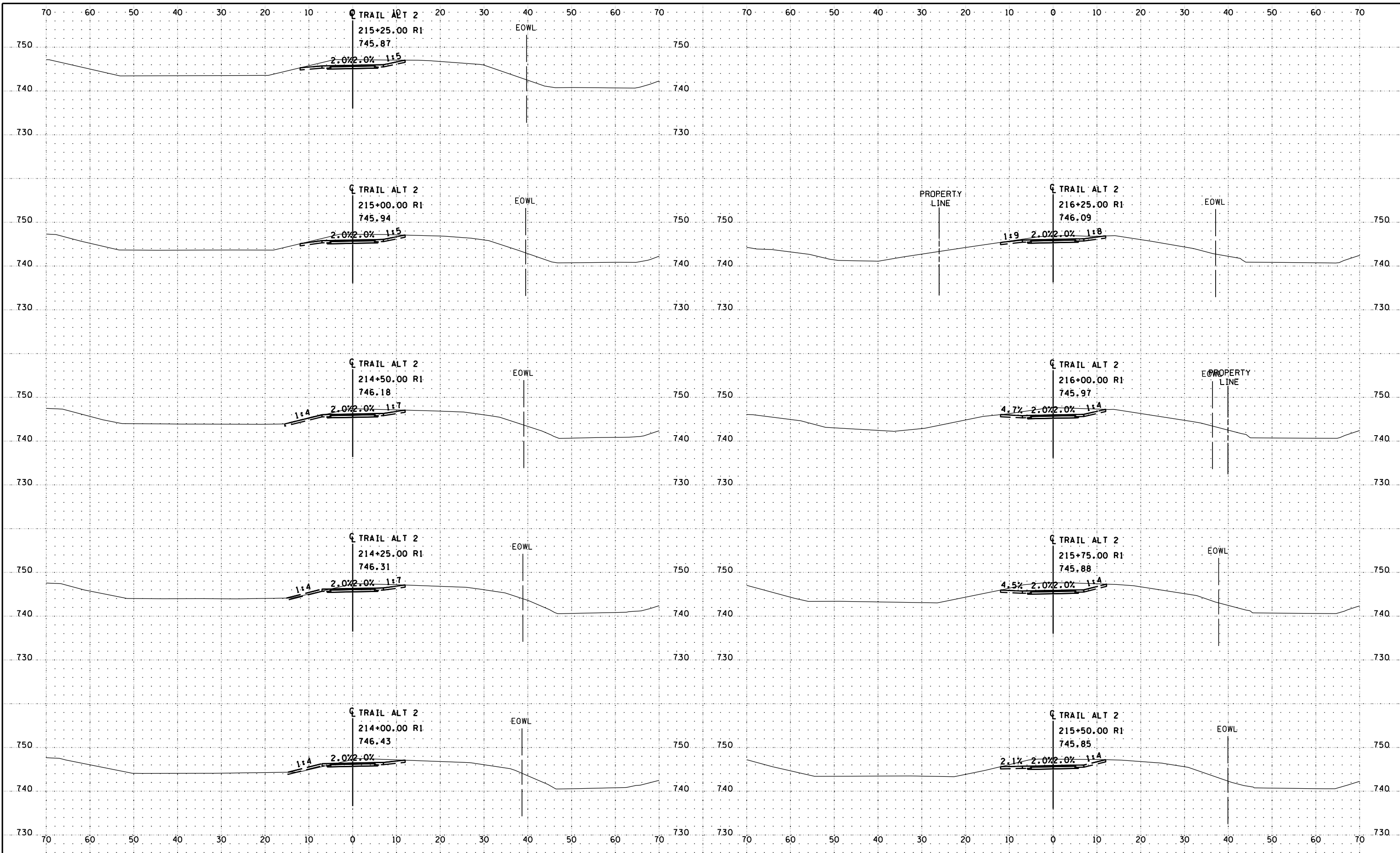
PLOTTED/REVISED: 7/12/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50L_ALT_2Adgn



PLOTTED/REVISED: 7/12/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50I_ALT_2A.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP



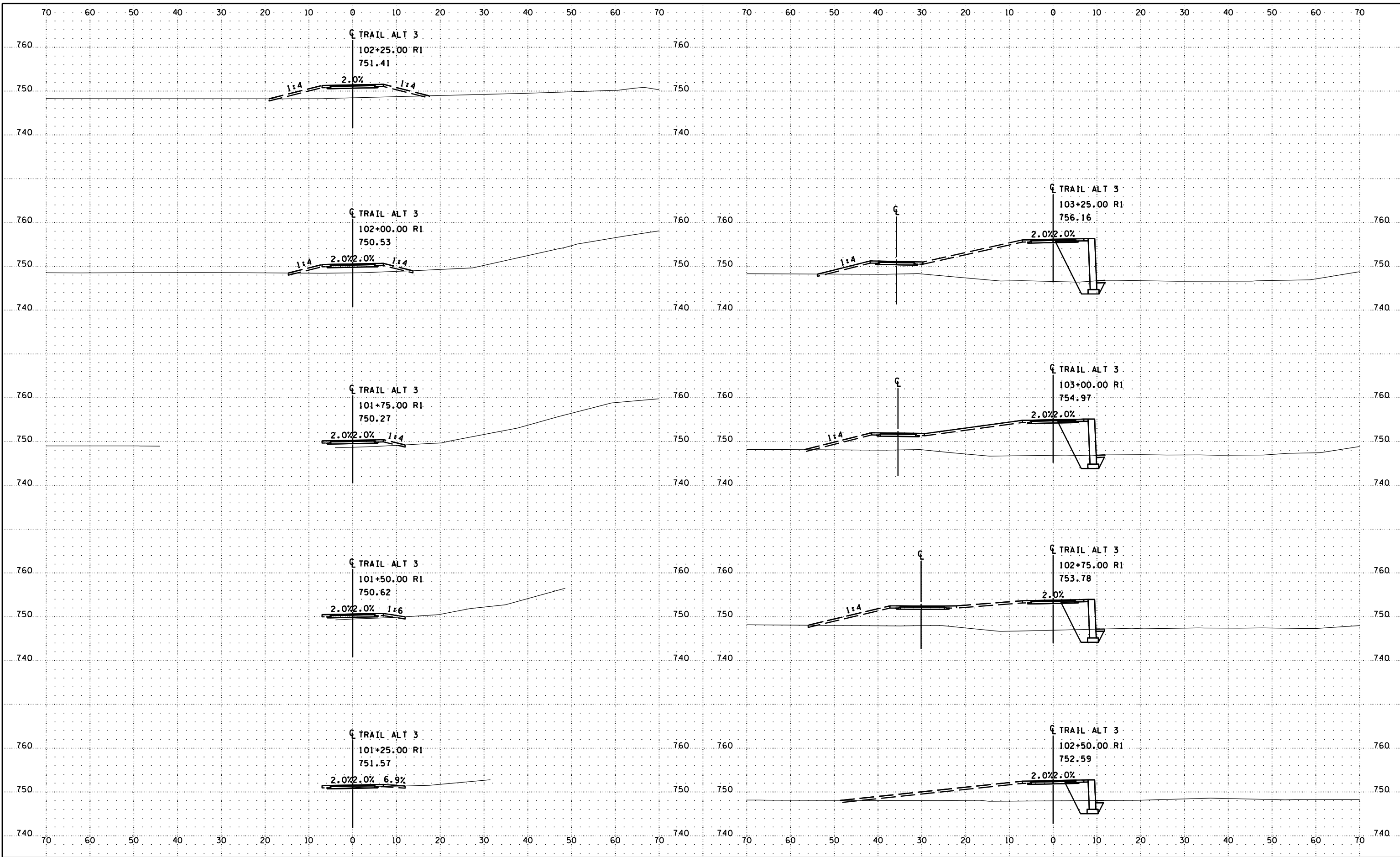
Quarry Lake Trail and Pedestrian Bridge
 City of Shakopee, Minnesota

CITY OF SHAKOPEE, MINNESOTA
 STA. 214+00.00 TO STA. 216+25.00
CROSS SECTIONS
 PR-22-004

SHEET
X1-4
 OF
14
 SHEETS

PLOTTED/REVISED: 7/29/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50I_ALT_3.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP



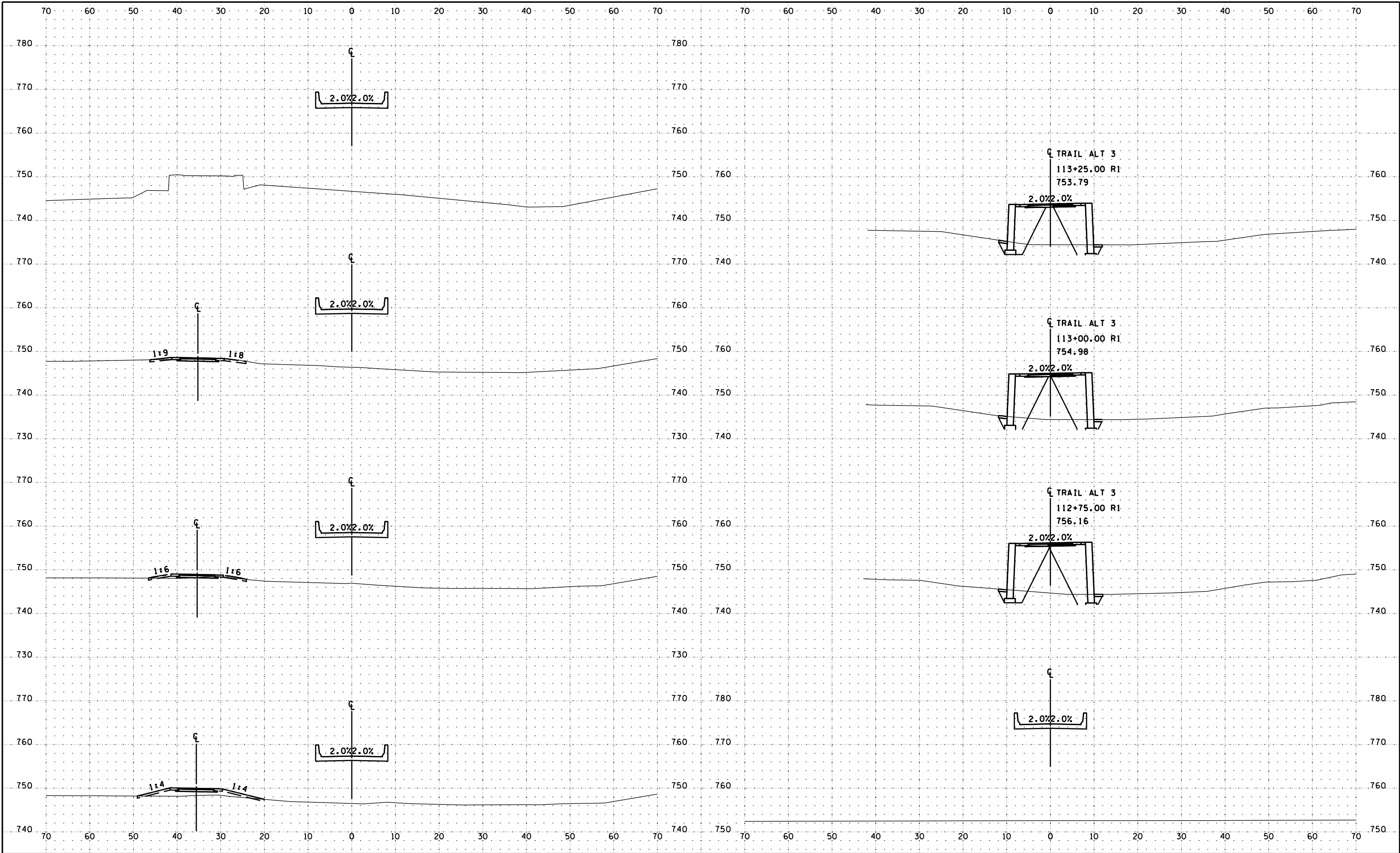
**Quarry Lake Trail and
Pedestrian Bridge**
 City of Shakopee, Minnesota

CITY OF SHAKOPEE, MINNESOTA
 STA. 101+25.00 TO STA. 103+25.00
CROSS SECTIONS
 PR-22-004

SHEET
X1-1
 OF
TOT
 SHEETS

PLOTTED/REVISED: 7/29/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50I_ALT_3.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP

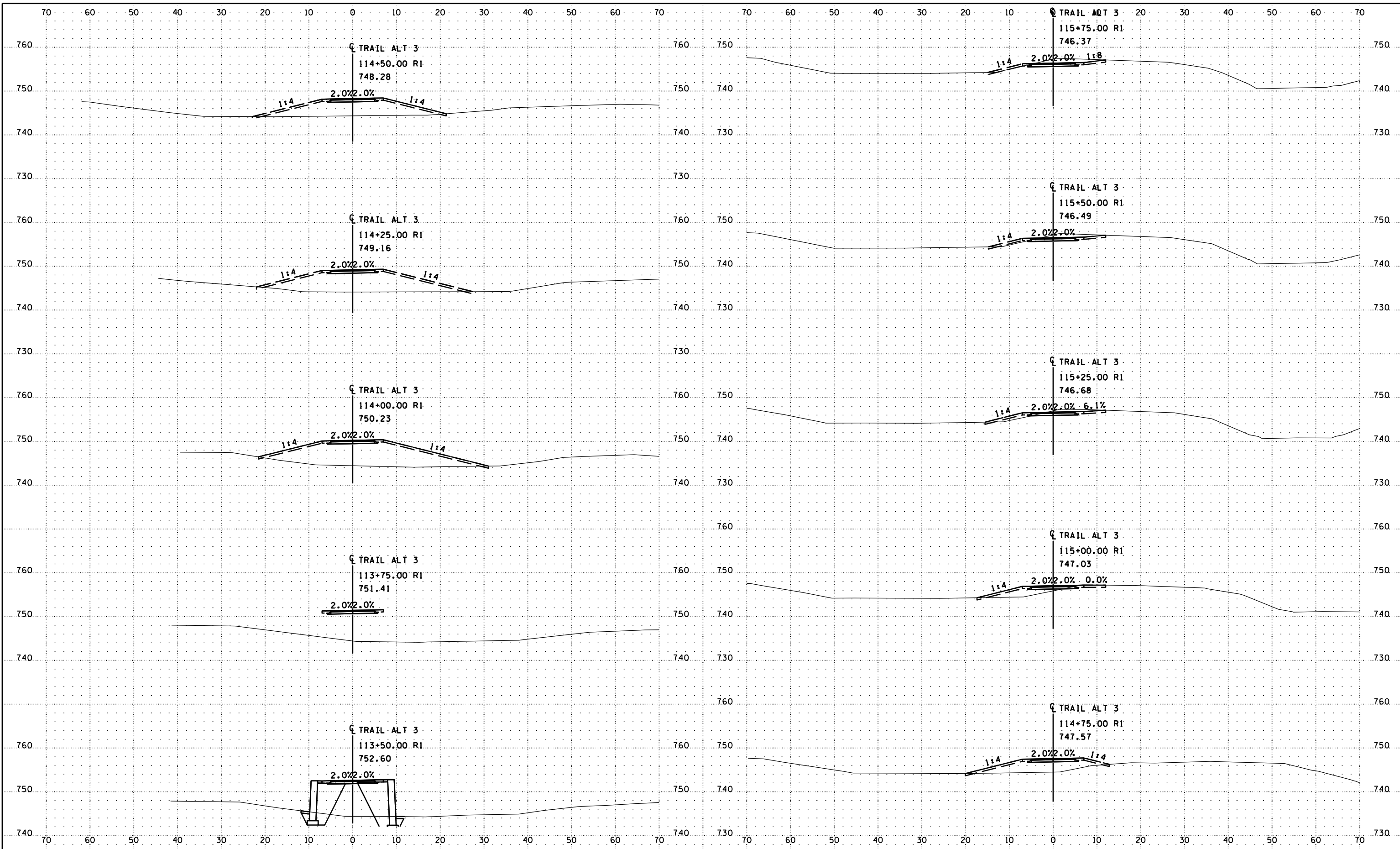


Quarry Lake Trail and
Pedestrian Bridge
City of Shakopee, Minnesota

CITY OF SHAKOPEE, MINNESOTA
STA. 103+50.00 TO STA. 113+25.00
CROSS SECTIONS
PR-22-004

SHEET
X1-2
OF
TOT
SHEETS

PATH & FILENAME: K:\017896-000\CadPlan\7896-000_xs01_ALT_3.dgn

[illegible]

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP



Quarry Lake Trail and Pedestrian Bridge

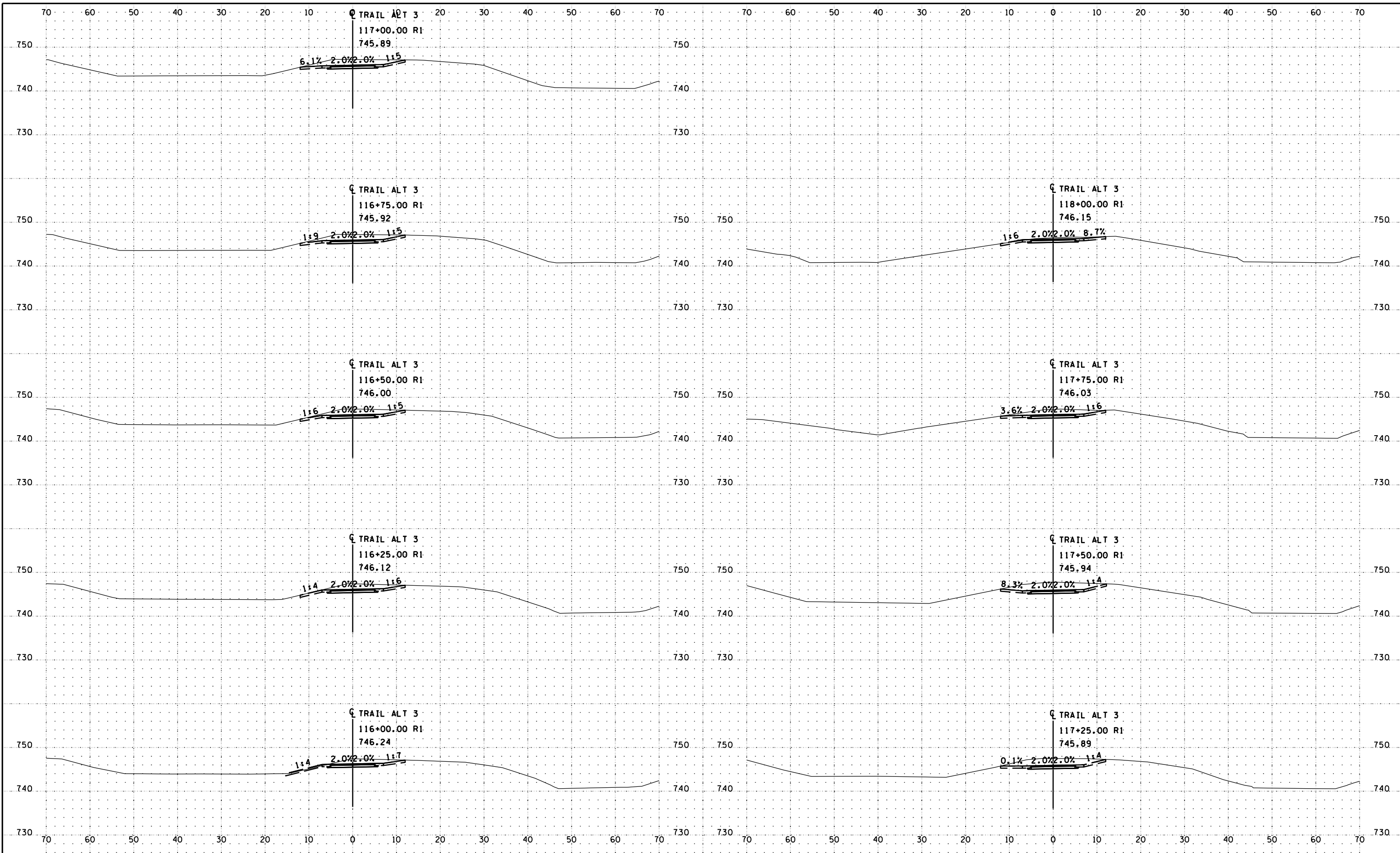
City of Shakopee, Minnesota

CITY OF SHAKOPEE, MINNESOTA STA. 113+50.00 TO STA. 115+75.00 CROSS SECTIONS PR-22-004

SHEET
X1-3
OF
TOT
HEETS

PLOTTED/REVISED: 7/29/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50I_ALT_3.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP

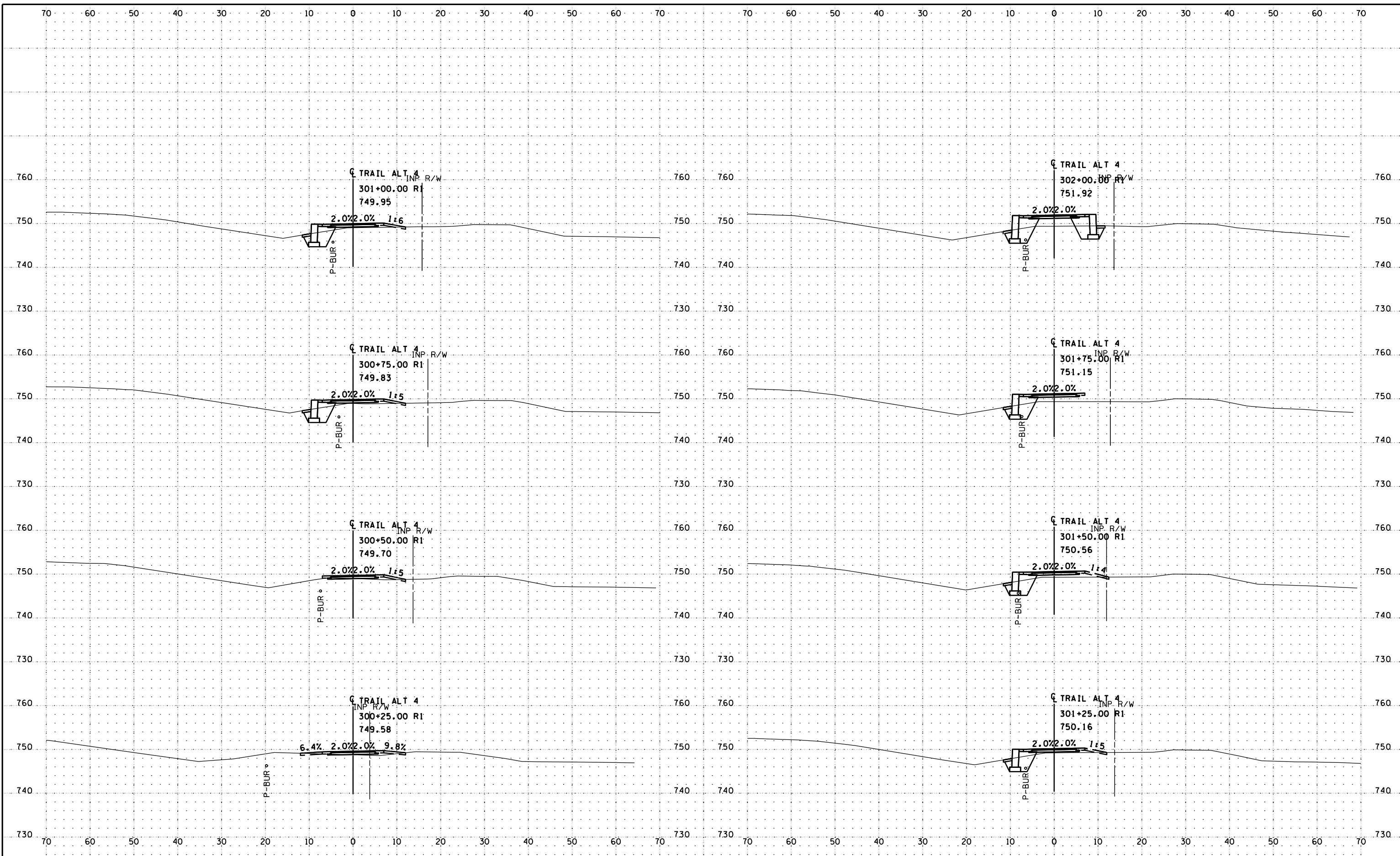


Quarry Lake Trail and
 Pedestrian Bridge
 City of Shakopee, Minnesota

CITY OF SHAKOPEE, MINNESOTA
 STA. 116+00.00 TO STA. 118+00.00
CROSS SECTIONS
 PR-22-004

SHEET
X1-4
 OF
TOT
 SHEETS

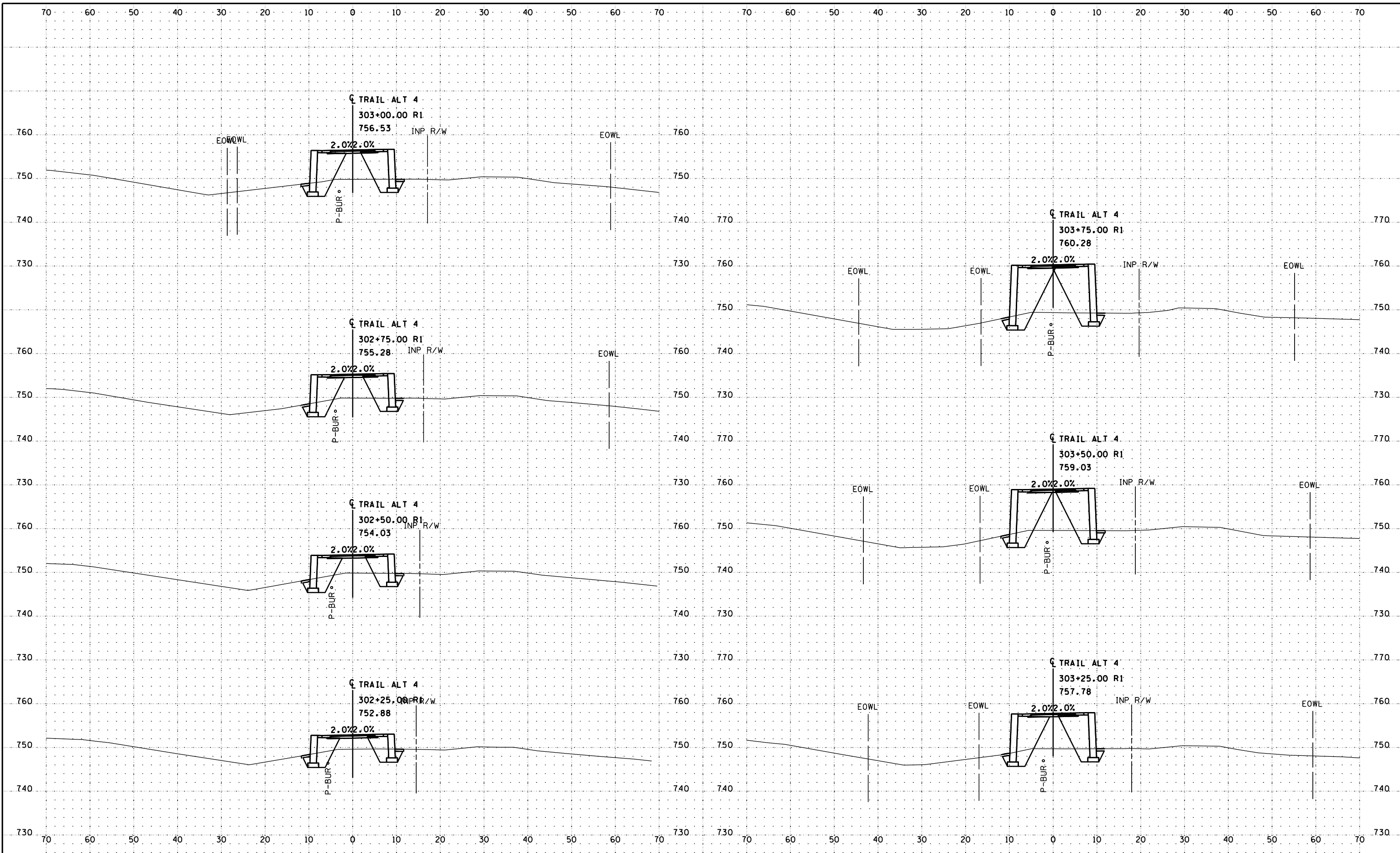
PATH & FILENAME: K:\017896-000\Cad\Plan\7896-000_xs01_ALT_2C.dgn



NO.	DATE	BY	CHK	REVISIONS	Design By: CWK	  Quarry Lake Trail and Pedestrian Bridge City of Shakopee, Minnesota	CITY OF SHAKOPEE, MINNESOTA STA. 300+25.00 TO STA. 302+00.00 CROSS SECTIONS PR-22-004	SHEET X1-1 OF 14 SHEETS
				Plan By: CWK				
				Checked By: AJP				
				Approved By: AJP				

PLOTTED/REVISED: 7/12/2021

PATH & FILENAME: K:\07896-000\CadPlan\7896-000_xs01_ALT_2C.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP



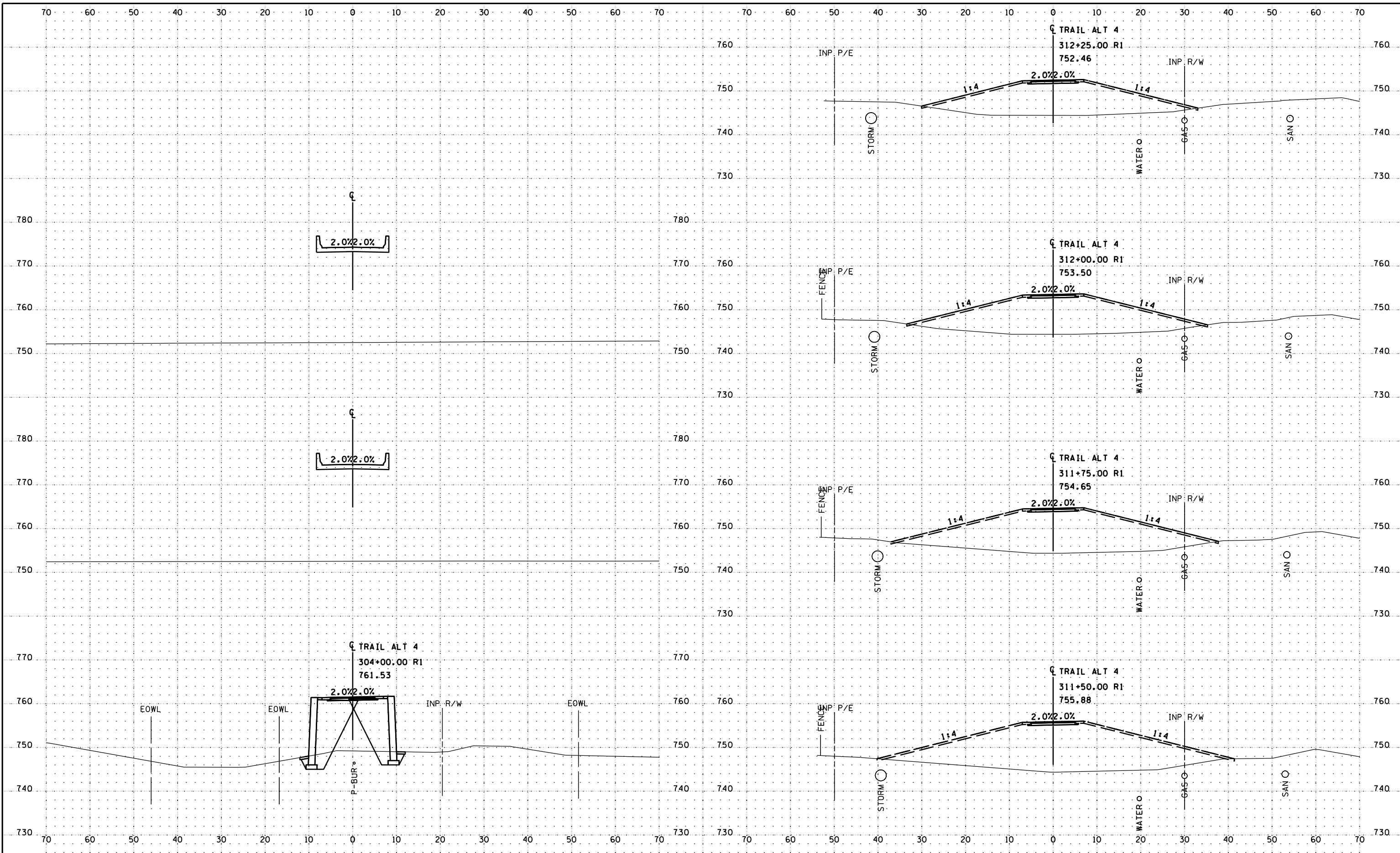
Quarry Lake Trail and Pedestrian Bridge
 City of Shakopee, Minnesota

CITY OF SHAKOPEE, MINNESOTA
 STA. 302+25.00 TO STA. 303+75.00
CROSS SECTIONS
 PR-22-004

SHEET
X1-2
 OF
14
 SHEETS

PLOTTED/REVISED: 7/12/2021

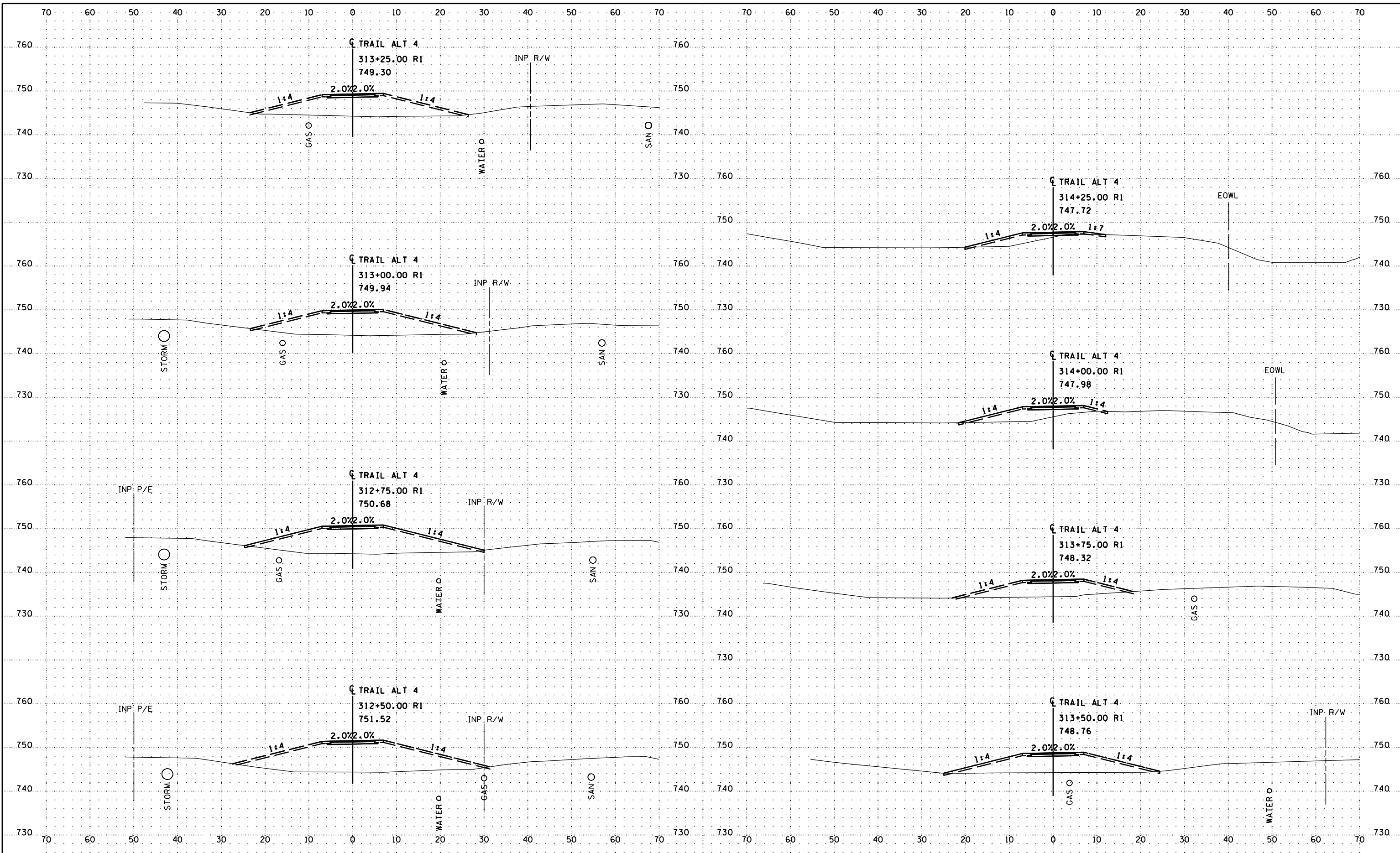
PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50L_ALT_2C.dgn



NO.	DATE	BY	CHK	REVISIONS	Design By:	Plan By:	Checked By:	Approved By:	wsb SHAKOPEE Quarry Lake Trail and Pedestrian Bridge City of Shakopee, Minnesota	CITY OF SHAKOPEE, MINNESOTA STA. 304+00.00 TO STA. 312+25.00 CROSS SECTIONS PR-22-004	SHEET X1-3 OF 14 SHEETS
					CWK						
					CWK						
					AJP						
					AJP						

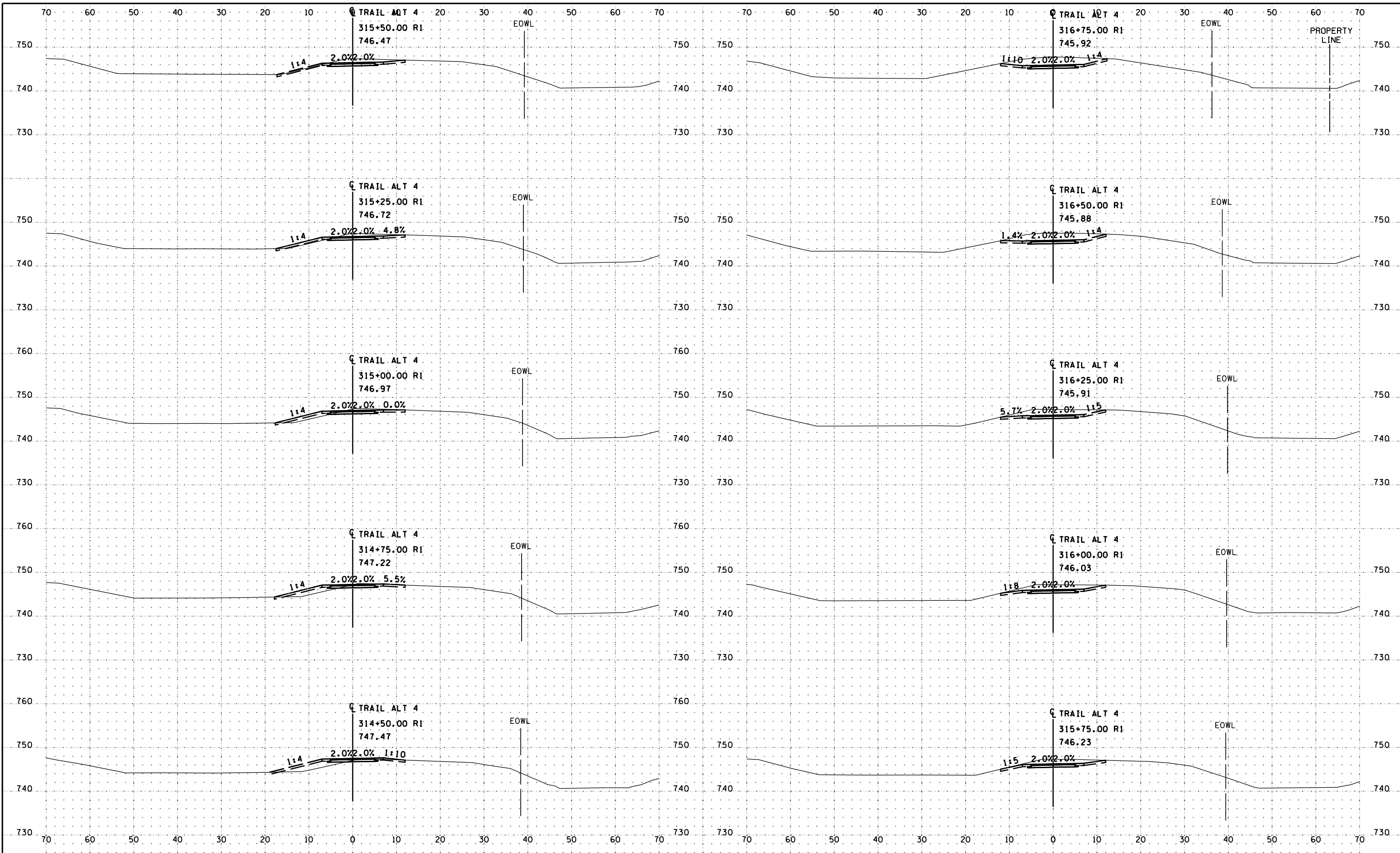
PLOTTED/REVISED: 7/12/2021

PATH & FILENAME: K:\07896-000\CadPlan\7896-000_x50I_ALT_2C.dgn



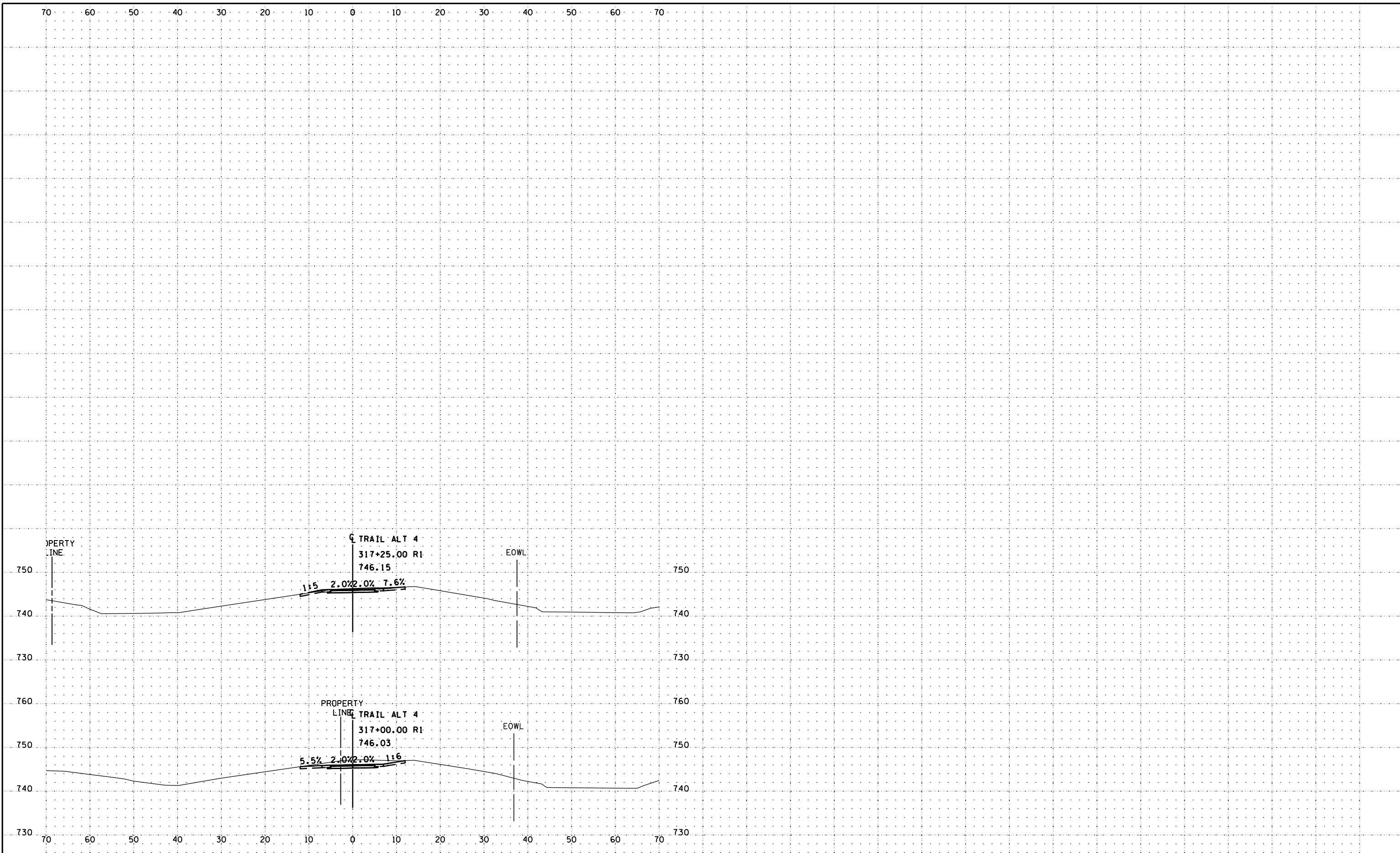
PLOTTED/REVISED: 7/12/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50I_ALT_2C.dgn



PLOTTED/REVISED: 7/12/2021

PATH & FILENAME: K:\07896-000\Cad\Plan\7896-000_x50I_ALT_2C.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	CWK
Plan By:	CWK
Checked By:	AJP
Approved By:	AJP



Quarry Lake Trail and Pedestrian Bridge
 City of Shakopee, Minnesota

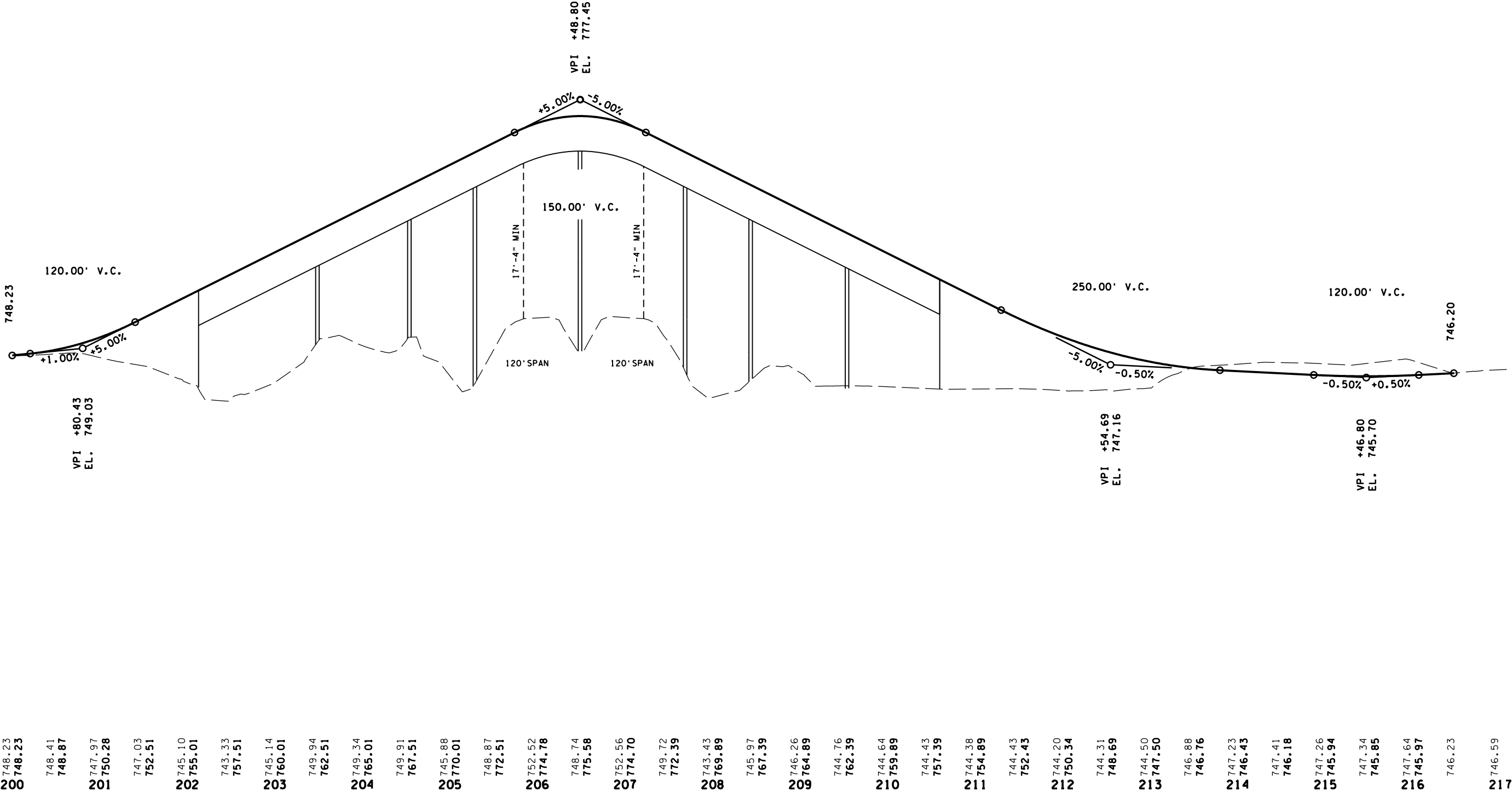
CITY OF SHAKOPEE, MINNESOTA
 STA. 317+00.00 TO STA. 317+25.00
CROSS SECTIONS
 PR-22-004

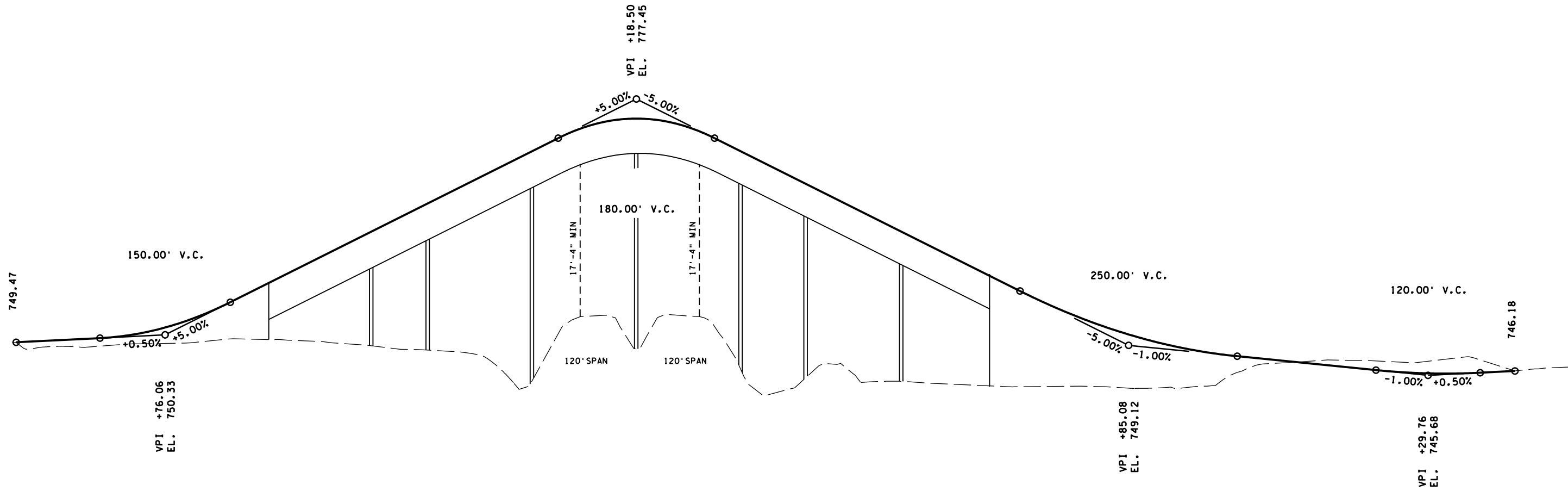
SHEET
X1-6
 OF
14
 SHEETS

7. APPENDIX B: PROFILES



Preliminary Alternative 1 Profile





749.42	749.00	749.02	749.30	749.38	749.85	749.78	749.59	749.19	748.67	748.46	747.39	745.34	752.27	751.21	752.63	752.12	744.45	744.21	746.95	744.97	744.80	744.57	744.36	744.40	744.39	744.18	744.25	745.56	747.04	747.35	747.38	747.18	747.52	747.12	746.39
300	749.70	749.95	750.56	751.92	754.03	756.53	759.03	761.53	764.03	766.53	769.03	771.53	773.90	775.11	774.93	773.36	770.88	768.38	765.88	763.38	760.88	758.38	755.88	753.50	751.52	749.94	748.76	747.98	747.47	746.97	746.47	746.03	745.88	746.03	



8. APPENDIX C: COST ESTIMATES

PRELIMINARY SCHEDULE I

WSB Project: Alternative 1
 Project Location: City of Shakopee
 WSB Project No: 017896-000
 Date: 8/6/2021

Project Total						
Item Number	Description	Unit	Notes	Unit Price	Estimated Quantity	Estimated Cost
2021.501	MOBILIZATION	LUMP SUM		\$200,000.00	1	\$200,000.00
2106.507	EXCAVATION - COMMON	CU YD	(P)	\$8.00	494	\$3,952.00
2106.507	COMMON EMBANKMENT (CV)	CU YD	(P)	\$6.00	983	\$5,898.00
2211.507	AGGREGATE BASE (CV) CLASS 5	CU YD	(P)	\$35.00	104	\$3,640.00
2521.518	3" BITUMINOUS WALK	S F	1	\$2.00	5252	\$10,504.00
	LIGHTING	EACH		\$2,500.00	10	\$25,000.00
2554.502	END TREATMENT-TANGENT TERMINAL	EACH		\$1,350.00	4	\$5,400.00
2554.503	TRAFFIC BARRIER DESIGN TYPE 31	LIN FT		\$25.00	890	\$22,250.00
2563.601	TRAFFIC CONTROL	LUMP SUM		\$40,000.00	1	\$40,000.00
	DRAINAGE	LUMP SUM		\$20,000.00	1	\$20,000.00
	SIGNING	LUMP SUM		\$10,000.00	1	\$10,000.00
	EROSION CONTROL	LUMP SUM		\$10,000.00	1	\$10,000.00
	TURF ESTABLISHMENT	LUMP SUM		\$10,000.00	1	\$10,000.00
TOTAL TRAIL ESTIMATE						\$366,644.00
CONTINGENCY						20% \$73,328.80
TOTAL TRAIL PROJECT COST						\$440,000.00
BRIDGE COST						\$4,000,000.00
RIGHT OF WAY						\$250,000.00
DESIGN ENGINEERING						\$1,000,000.00
TOTAL PROJECT COST						\$5,690,000.00

NOTES:
 1. TACK COAT INCIDENTAL.
 (P) PLAN QUANTITY

PRELIMINARY SCHEDULE I							
WSB Project: Alternative 2 Project Location: City of Shakopee WSB Project No: 017896-000 Date: 8/6/2021							
					Project Total		
Item Number	Description	Unit	Notes	Unit Price	Estimated Quantity	Estimated Cost	Notes
2021.501	MOBILIZATION	LUMP SUM		\$145,000.00	1	\$145,000.00	5% PROJECT COST, INCLUDING BRIDGE COST
2106.507	EXCAVATION - COMMON	CU YD	(P)	\$8.00	736	\$5,888.00	
2106.507	COMMON EMBANKMENT (CV)	CU YD	(P)	\$6.00	3121	\$18,726.00	
2211.507	AGGREGATE BASE (CV) CLASS 5	CU YD	(P)	\$35.00	162	\$5,670.00	
	LIGHTING	EACH		\$2,500.00	10	\$25,000.00	
2411.618	PREFABRICATED MODULAR BLOCK WALL	SQ FT		\$55.00	1440	\$79,200.00	
2521.518	3" BITUMINOUS WALK	S F	1	\$2.00	8167	\$16,334.00	
2554.502	END TREATMENT-TANGENT TERMINAL	EACH		\$1,350.00	4	\$5,400.00	
2554.503	TRAFFIC BARRIER DESIGN TYPE 31	L F		\$25.00	1228	\$30,700.00	
2557.503	WIRE FENCE DESIGN 32-9322	LIN FT		\$150.00	180	\$27,000.00	
2563.601	TRAFFIC CONTROL	LUMP SUM		\$27,000.00	1	\$27,000.00	1.0% PROJECT COST
	DRAINAGE	LUMP SUM		\$13,000.00	1	\$13,000.00	0.5% PROJECT COST
	SIGNING	LUMP SUM		\$6,000.00	1	\$6,000.00	0.25% PROJECT COST
	EROSION CONTROL	LUMP SUM		\$6,000.00	1	\$6,000.00	0.25% PROJECT COST
	TURF ESTABLISHMENT	LUMP SUM		\$6,000.00	1	\$6,000.00	0.25% PROJECT COST
TOTAL ESTIMATE						\$416,918.00	
CONTINGENCY				20%		\$83,383.60	
TOTAL TRAIL PROJECT COST						\$501,000.00	
BRIDGE COST						\$2,560,000.00	
RIGHT OF WAY						\$250,000.00	
DESIGN ENGINEERING						\$1,000,000.00	
TOTAL PROJECT COST						\$4,311,000.00	

NOTES:
 1. TACK COAT INCIDENTAL
 (P) PLAN QUANTITY

PRELIMINARY SCHEDULE I							
WSB Project: Alternative 3 Project Location: City of Shakopee WSB Project No: 017896-000 Date: 8/6/2021							
					Project Total		
Item Number	Description	Unit	Notes	Unit Price	Estimated Quantity	Estimated Cost	Notes
2021.501	MOBILIZATION	LUMP SUM		\$145,000.00	1	\$145,000.00	5% PROJECT COST, INCLUDING BRIDGE COST
2106.507	EXCAVATION - COMMON	CU YD	(P)	\$8.00	753 (P)	\$6,024.00	
2106.507	COMMON EMBANKMENT (CV)	CU YD	(P)	\$6.00	3196 (P)	\$19,176.00	
2211.507	AGGREGATE BASE (CV) CLASS 5	CU YD	(P)	\$35.00	170 (P)	\$5,950.00	
	LIGHTING	EACH		\$2,500.00	10	\$25,000.00	
2411.618	PREFABRICATED MODULAR BLOCK WALL	SQ FT		\$55.00	1610	\$88,550.00	
2521.518	3" BITUMINOUS WALK	S F	1	\$2.00	8546	\$17,092.00	
2554.502	END TREATMENT-TANGENT TERMINAL	EACH		\$1,350.00	4	\$5,400.00	
2554.503	TRAFFIC BARRIER DESIGN TYPE 31	LIN FT		\$25.00	1228	\$30,700.00	
2557.503	WIRE FENCE DESIGN 32-9322	LIN FT		\$150.00	230	\$34,500.00	
2563.601	TRAFFIC CONTROL	LUMP SUM		\$27,000.00	1	\$27,000.00	1.0% PROJECT COST
	DRAINAGE	LUMP SUM		\$13,000.00	1	\$13,000.00	0.5% PROJECT COST
	SIGNING	LUMP SUM		\$6,000.00	1	\$6,000.00	0.25% PROJECT COST
	EROSION CONTROL	LUMP SUM		\$6,000.00	1	\$6,000.00	0.25% PROJECT COST
	TURF ESTABLISHMENT	LUMP SUM		\$6,000.00	1	\$6,000.00	0.25% PROJECT COST
TOTAL ESTIMATE						\$435,392.00	
CONTINGENCY				20%		\$87,078.40	
TOTAL TRAIL PROJECT COST						\$523,000.00	
BRIDGE COST						\$2,550,000.00	
RIGHT OF WAY						\$250,000.00	
DESIGN ENGINEERING						\$1,000,000.00	
TOTAL PROJECT COST						\$4,323,000.00	

NOTES:
1. TACK COAT INCIDENTAL.
(P) PLAN QUANTITY

PRELIMINARY SCHEDULE I							
WSB Project: Alternative 4 Project Location: City of Shakopee WSB Project No: 017896-000 Date: 8/6/2021							
					Project Total		
Item Number	Description	Unit	Notes	Unit Price	Estimated Quantity	Estimated Cost	Notes
2021.501	MOBILIZATION	LUMP SUM		\$150,000.00	1	\$150,000.00	5% PROJECT COST, INCLUDING BRIDGE COST
2106.507	EXCAVATION - COMMON	CU YD	(P)	\$8.00	715	\$5,720.00	
2106.507	COMMON EMBANKMENT (CV)	CU YD	(P)	\$6.00	3630	\$21,780.00	
2211.507	AGGREGATE BASE (CV) CLASS 5	CU YD	(P)	\$35.00	204	\$7,140.00	
	LIGHTING	EACH		\$2,500.00	10	\$25,000.00	
2411.618	PREFABRICATED MODULAR BLOCK WALL	SQ FT		\$55.00	4235	\$232,925.00	
2521.518	3" BITUMINOUS WALK	S F	1	\$2.00	10302	\$20,604.00	
2554.502	END TREATMENT-TANGENT TERMINAL	EACH		\$1,350.00	4	\$5,400.00	
2554.503	TRAFFIC BARRIER DESIGN TYPE 31	LIN FT		\$25.00	1648	\$41,200.00	
2557.503	WIRE FENCE DESIGN 32-9322	LIN FT		\$150.00	480	\$72,000.00	
2563.601	TRAFFIC CONTROL	LUMP SUM		\$29,000.00	1	\$29,000.00	1.0% PROJECT COST
	DRAINAGE	LUMP SUM		\$14,000.00	1	\$14,000.00	0.5% PROJECT COST
	SIGNING	LUMP SUM		\$7,000.00	1	\$7,000.00	0.25% PROJECT COST
	EROSION CONTROL	LUMP SUM		\$7,000.00	1	\$7,000.00	0.25% PROJECT COST
	TURF ESTABLISHMENT	LUMP SUM		\$7,000.00	1	\$7,000.00	0.25% PROJECT COST
TOTAL ESTIMATE						\$645,769.00	
CONTINGENCY				20%		\$129,153.80	
TOTAL TRAIL PROJECT COST						\$775,000.00	
BRIDGE COST						\$2,500,000.00	
RIGHT OF WAY						\$250,000.00	
DESIGN ENGINEERING						\$1,000,000.00	
TOTAL PROJECT COST						\$4,525,000.00	

NOTES:
 1. TACK COAT INCIDENTAL.
 (P) PLAN QUANTITY