County Road 180 Feasibility Study

County Road 180 under Canadian Pacific Railroad Bridge

Report Version 1.0

Steele County Highway Department

Prepared by:

SRF

Date August 2022

SRF No. 14282.0

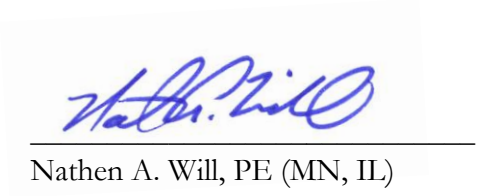
FEASIBILITY STUDY AND REPORT

for

STEEL COUNTY, MINNESOTA
COUNTY ROAD 180 UNDER CANADIAN
PACIFIC RAILROAD BRIDGE

SRF Consulting Group, Inc.
3701 Wayzata Boulevard Suite 100
Minneapolis, MN 55416-3791
(763) 249-6761

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.



Nathen A. Will, PE (MN, IL)

26391 — Reg. No.

8/29/2022 — Date

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Executive Summary

This report assesses the feasibility of increasing the vertical clearance between County Road (CR) 180 (East School Road) and the existing railroad bridge located in the southeast corner of the City of Owatonna approximately 1,230' east of County State Aid Highway (CSAH) 48 (East Main Street) on CR 180. The purpose for this vertical clearance increase is to provide a solution that meets or exceeds the minimum 14'-6" vertical clearance set by Minnesota State Statute. The existing vertical clearance is approximately 12' and several vehicle collisions have occurred in the past with the railroad bridge. A goal of this study was to identify viable alternatives and identify areas of concern that require further analysis and investigation beyond the scope of this project.

County Road 180 is a two-lane rural road that serves as a significant east-west connector to other County roadways (e.g., CSAH 2 to the west) and connects with road systems to the east including a future north-south County roadway. The importance of this connection will be heightened by a planned connection in 2022 to Old US Highway 14 to the east including the City of Claremont.

This segment of CR 180 includes one railroad bridge structure, Bridge No. 6037, owned and maintained by Canadian Pacific Railway (CPR) and one concrete box culvert, Bridge No. 4686, that allows drainage under CR 180 for Isaak Walton Creek. These existing bridge structures are in the same location and will need to be addressed in conjunction with one another.

The CPR bridge, built in 1908, does not meet the current minimum vertical bridge clearance criteria (14'-6" Urban Design or 16'-4" Rural-Suburban Design). Steele County has recorded several incidents where the sub-standard clearance has resulted in vehicles striking the bridge. The restricted clearance also limits emergency vehicles from using this corridor to service areas east within the City of Owatonna. CPR does not have any plans to improve or replace the bridge.

The concrete box culvert was built in 1925 and is designated as structurally deficient. It will need to be replaced soon regardless of any improvements to the existing vertical clearance to safely allow vehicles to continue using CR 180.

This report includes a preferred alternative and a conceptual roadway layout and profile (see Appendix A - Exhibit 4). Also provided is a cost comparison of the various alternatives that were developed and reviewed before identifying the preferred alternative (see Appendix B - Exhibit 1).

Project Introduction and Objectives

This project's main objectives include identifying options to increase the vertical clearance to meet the minimum requirements and address replacement of the concrete box culvert to improve safety for the traveling public and maintain railroad track integrity.

Presently, there is a 12' clearance between the road surface and the bottom of the CPR bridge, which is less than the current minimum vertical clearance of 14'-6". Due to this clearance issue,

several vehicles have hit the bridge, which could potentially damage the bridge structurally and impact the safety of the traveling public.

CR 180 is a two-lane road that serves as a significant connection from CSAH 48 to points in eastern Steele County and crosses the CPR track twice. The first crossing is an at-grade stop sign-controlled crossing approximately 100' east of CSAH 48. The second crossing is about 1,230' east of CSAH 48 and utilizes the existing railroad bridge to pass under the railroad tracks.

In addition to reviewing a railroad bridge replacement, a grade-separated trail parallel to CR 180 is included in this report. The 10' off-road trail would allow users to pass under the railroad and the proposed railroad bridge would be designed to provide non-motorized traffic a safer, cost-effective alternative to the current on-road design.

The purpose of this study is to:

- Conduct conceptual analysis of alignments and profiles for CR 180 and CPR bridge alternatives that meet or exceed the 14'-6" minimum vertical clearance
- Identify impacts to properties and potential right of way easements and acquisitions
- Identify impacts to existing utilities
- Identify surface stormwater and other environmental or contamination impacts
- Provide a cost estimate of the proposed improvements

Existing Conditions and Design Constraints

The posted speed limit of CR 180 in the feasibility study area is 30 mph. This lower speed correlates to the sharp horizontal curvature, vertical profile, and adjacent residential neighborhoods. There is existing curb and gutter from CSAH 48 east approximately 800' that ends prior to the railroad bridge. The remaining roadway is rural in nature with steel plate-beam guardrail that protects the steep slopes and abutments along the box culvert and railroad bridge abutments. Existing ditches convey the stormwater along CR 180 from east to west and discharge at the box culvert.

The typical road section includes two 12' through lanes with 6' shoulders. The existing roadway and shoulders are bituminous, and the paved shoulders vary from 6" to 6'. Shoulders that are not paved the full width of 6' have aggregate surfacing. Currently there are no existing off-road pedestrian routes along CR 180, which forces non-motorized traffic to travel within a few feet of rapidly moving vehicular traffic by using the roadway shoulder. Refer to Appendix A–Exhibit 2 for a graphic showing the existing conditions.

Alignments were investigated to best serve CR 180 users and fit within site constraints. The evaluation criteria included, but was not limited to, maintaining the existing roadway, impact of utilities and right of way, minimizing bridge structures (railroad and/or roadway), maximizing vertical bridge clearance, maintaining existing drainage patterns, reducing the frequency of roadway flooding, and minimizing impacts to environmentally sensitive areas within the project limits.

Profiles were created to mimic the existing roadway profile and clear zone requirements. These profiles also addressed ways to minimize right of way impacts. Retaining walls were considered when larger impacts to right of way were unavoidable by either altering the alignment or the profile.

The recommended minimum clearance between the roadway surface and the bottom of the bridge is 14'-6". Due to its existing restricted clearance of 12', there have been several hits to the bridge that, with time, are causing a significant safety concern.

The box culvert bridge carrying Isaak Walton Creek is structurally deficient. The concrete box culvert creates flooding issues when the Isaak Walton Creek rises above the creek banks and overtops CR 180 under the CPR bridge. Based on hydraulic information, the tailwater elevations created during flood events heavily drives the seasonal flooding events that overtop CR 180 under the railroad bridge. The challenge with raising the road is maintaining the minimum required clearance to the railroad bridge. Properly sizing and designing the drainage system and roadway will help minimize the frequency of seasonal flooding and ensure the road's structural integrity.

Neither of these existing structures are wide enough to accommodate a proposed sidepath trail separated from the roadway. The proposed design allows for a trail location that is safer for recreational users immediately following construction. The separate sidepath facility will become an important component of this project, as it will provide for planned future off-road trail systems that will provide a more cost-effective solution than retrofitting a solution in the future.

Additional concerns include utilities in the project corridor. A watermain that the City of Owatonna has identified to be replaced runs along CR 180 and passes through the structurally deficient box culvert. The existing watermain daylights from the ground on the south side of CR 180, connects to the upper part of the box culvert, travels through the inside top of the culvert, and exits on the north end of the culvert before continuing back underground.

Existing sanitary sewer and various private utilities will also need to be located and addressed during preliminary design and construction. High voltage overhead transmission lines and large diameter steel poles parallel the east side of the railroad embankment and are not expected to be relocated as part of this project, but a close review will be required during design for avoidance.

Bridge Types

Three railroad bridges were evaluated, refer to Appendix C-Exhibit 1. Due to the need to increase vertical bridge clearance and to raise the roadway to help reduce the frequency of flooding, a through-plate-girder ("Type 1") bridge was determined to be the most feasible alternative to meet the design parameters. It allows the support girders to support the main superstructure in a way that keeps the bottom of the bridge higher, provides the shallowest bridge section (3'-9$^3/_4$"), and therefore maximizes the clearance to the road surface.

The bridge types and alignment alternatives were reviewed with representatives from CPR. Over the course of several meetings, the design group discussed the various bridge types and alignment

alternatives. The design team received general acceptance from CPR designers to allow the use of through-plate-girder ("Type 1") bridge with the following items in place for acceptance:

- The bridge shall have a ballast deck.
- The bridge cannot be a skewed span.
- If the vertical clearance from the top of the highway to the low steel is less than 16'-0" it requires a crash beam (this would be required for the CR 180 underpass).
- The top flange must have a 2:1 taper at the ends of the span.
- The girders must have a spacing of 20-foot center to center.
- It is anticipated that raising the track is not feasible.

Proposed Road Typical

The proposed road typical section would utilize curb and gutter to help minimize impacts to the surrounding properties and would include a minimum 6-foot boulevard that separates the 10-foot sidepath trail from the travel lanes as shown in Appendix A-Exhibit 4.

The ultimate desired project outcome is to maximize vertical bridge clearance between the road surface and the bottom of the railroad bridge, replace the deficient box culvert, evaluate options for reducing the seasonal flooding of CR 180 by raising the roadway and possibly lowering the tailwater on Isaak Walton Creek under the railroad to accommodate both the roadway and the off-road trail.

The existing bridge would need to be protected during construction as the proposed new bridge would be constructed on the existing railroad alignment, while minimizing track closures, by constructing the new bridge abutments behind the existing large stone abutments that support the current railroad bridge.

Utility Impacts

An introductory investigation of existing utilities along the corridor has been completed. Continuation of utility investigations would be required in the preliminary design phase of the project as potential impacts became better defined. The options presented in this report will require an undefined amount of adjustment/relocation of public and private utilities.

Utilities within the project area were contacted through Gopher State One Call (GSOC) and requests for as-built plans and maps were made on call ticket number 210883673. Utility companies contacted by GSOC include:

- Arvig
- CenturyLink
- Charter Communications
- City of Owatonna Sanitary Sewer

- City of Owatonna Storm Sewer
- Jaguar Communications
- MetroNet
- Owatonna Public Utilities (OPU) – Electric
- Owatonna Public Utilities (OPU) – Fiber
- Owatonna Public Utilities (OPU) – Gas
- Owatonna Public Utilities (OPU) – Water
- OPU & Southern Minnesota Municipal Power Agency (SMMPA) – Overhead High Voltage Transmission Lines

Many utilities in the corridor will likely need adjustment and/or relocation should this project move forward with construction. A more detailed look, but still preliminary, included stormwater drainage improvements, relocation of the existing watermain that currently passes through the box culvert under CR 180, and the large OPU & SMMPA transmission lines that run parallel, approximately 25' offset east from the CPR track, on the railroad embankment. Other individual utility impacts in the corridor have not been evaluated at this time.

Drainage, Hydraulics, and Permits

The project is located within Cannon River Watershed Joint Powers Organization (CRWJPO). New impervious area resulting from the improved roadway and trail construction will exceed the watershed's threshold requiring the project to comply with Stormwater Management Rules (other rules may also apply). However, a permit from CRWJPO is not required as the City of Owatonna administers the CRWJPO Stormwater Management Rule on their behalf. In addition, the project will require a National Pollutant Discharge Elimination System (NPDES) permit administered by the Minnesota Pollution Control Agency (MPCA) which will include volume control and sediment reduction. The MS4 volume control rules for reconstructed impervious surfaces should also be discussed with the County at the time of design.

The existing drainage patterns along CR 180 are primarily rural with some segments of curb and gutter and very little storm sewer. The addition of the trail and curb and gutter will convert the area to urban drainage along the roadway. The newly urbanized roadway will need to be analyzed to confirm that the spread meets State Aid standards and that any needed storm sewer will be adequate to convey the runoff to stormwater best management practices (BMPs) or existing discharge points. At a minimum, any storm sewer draining to wetlands or surface waters will need treatment with a sump manhole or other BMPs.

As design progresses, opportunities to maximize stormwater BMPs necessary to address stormwater runoff may be able to provide treatment for some existing roadway that is currently untreated, while simultaneously meeting CRWJPO and NPDES requirements. If a suitable site(s) can be located, the

stormwater BMPs would likely consist of vegetated infiltration/filtration basins that will also aid in rate mitigation.

Work in the creek crossing will trigger the Minnesota Department of Natural Resources (MnDNR) Minnesota Water Permitting and Reporting System (MPARS) permit, as it is a public water. Wetland delineations and impacts will also need to be assessed to determine the Joint Permit (U.S. Army Corps of Engineers and Minnesota Board of Water & Soil Resources) needs.

Of particular importance at this location is the crossing of a tributary to Maple Creek. Some documentation identifies it as an unnamed tributary and others have as Isaak Walton Creek. This creek is a designated Federal Emergency Management Agency (FEMA) Zone AE (FEMA Map Number 27147C0154C, Panel 154 of 400, December 2, 2011) with detailed modeling and a defined floodway. See Appendix C-Exhibit 3 for a copy of the FEMA map. The box culvert crossing at CR 180 is a significant pinch point for the creek, and it constrains and disconnects the upstream and downstream flood fringes. The crossing is also impacted by high tailwater conditions from the downstream crossing at Rice Lake Street East.

A regulatory hydraulic model (OWATON2.dat) for the Isaak Walton Creek was obtained from the FEMA Hydraulic Model Download Application (https://arcgis.dnr.state.mn.us/ewr/hydra_model_download/index.html#), which is administered by the MnDNR. Coordination with MnDNR floodplain staff confirmed it to be the correct model.

The hydraulic model was converted to HEC-RAS to assess the existing crossing and alternatives. Per the regulatory model, the existing crossing has a 10-year flood protection with no freeboard. All events over the 10-year overtop CR 180.

Coordination with the local floodplain administrator, the MnDNR, and possibly FEMA will be required for any changes to the crossing. Stage increases to the Base Flood (100-year) will automatically trigger the Conditional Letter of Map Revision and Letter of Map Revisions (CLOMR/LOMR) process. Meeting 'No-Rise' Conditions will avoid permitting needs. Lowering the water surface elevation may trigger the LOMR process at the floodplain administrator's discretion.

Environmental Conditions Review

Purpose

The purpose of this environmental review is to provide a high-level desktop review of potential environmental conditions for the CR 180 Project Area, see Appendix C-Exhibit 2.

Existing Conditions

This review looked at online information at the MPCA website 'What's In My Neighborhood' https://www.pca.state.mn.us/data/whats-my-neighborhood, and the National Wetland Inventory (NWI) and floodplain maps contained within the SRF GIS database. The MPCA database includes information about potential environmental contamination as well as permits and registrations related

to a site. Appendix C-Exhibit 2 shows NWI-mapped wetlands and floodplain for the two sites under consideration.

The following summarizes potential environmental concerns, including contamination, flooding, and permitting.

Site 2 – County Road 180 Project Area

This site is surrounded by wetlands and floodplain. It would be difficult to complete any construction activities without impacts to these resources, therefore permitting would take more time at this location and could require additional time for permit preparation and processing and mitigation costs.

Table 1 includes details of the sites noted in the MPCA database within the polygon of Site 2 (Appendix C-Exhibit 2). The table does not include businesses noted in the database for construction stormwater permits which are inactive, indicating construction is complete.

Table 1. Site 2 Environmental Conditions – County Road 180

Business Name	Issue	Status
Enron Owatonna	Investigation and Cleanup. No Action Letter issued 1997	Inactive
Gleason Automotive Machine	Aboveground Storage Tank	Active
Riverplace Auto Center Inc	Hazardous Waste Generator License	Inactive
Jones Cable Income Fund	Underground tank leak, soil corrective action approved 1991	Inactive
Meisel Violins Inc	Hazardous Waste Generator License	Inactive
Gleason Automotive Machine	Hazardous Waste Generator License	Inactive

Source: MPCA

Alternatives Developed

This feasibility study identified six alternatives. Early in the study, Alternative 6 was dismissed and no exhibits were created. In conjunction with the five identified alternatives, three different bridge types were also reviewed. Each alternative was evaluated for its feasibility and its likely costs and included the likely cost impacts based on each of the three bridge types. Refer to Appendix A–Exhibit 3 for the Alternatives reviewed.

Alternative 1

Alternative 1 leaves the alignment, drainage, and utilities as they exist today, so no additional right of way or easements are needed. Other than some surface improvements, the clearance issue between the road surface to bottom of bridge would remain, the multiuse trail would not be constructed, and the road flooding issue would continue.

Alternative 2

Alternative 2 closely followed the existing alignment, but both the railroad bridge and the concrete box culvert would be replaced, and CR 180 would be constructed as an urban section with the sidepath trail located along the north side.

Including the impacts to the railroad right of way, this alternative anticipates impacts to 14 parcels. While following the existing alignment as close as practical helps minimize disruption to the surrounding properties, property impacts will be necessary to allow the necessary improvements to meet the minimum bridge clearance criteria, minimize right of way costs, raise the road slightly to reduce the frequency of seasonal floods overtopping the roadway, replace the deficient box culvert and reconstruct the existing watermain to avoid passing through the box culvert.

Additional hydraulic analysis and modeling would be necessary to explore options for lowering the existing tailwater elevations between Rice Lake Road and CR 180. Potential improvements to the existing culvert crossing under Rice Lake Road and supporting hydraulic modeling may provide some allowance to lower the tailwater at the proposed CR 180 box culvert creek crossing resulting in anticipated less overtopping frequency. Adjustments to flood elevations would require additional FEMA coordination as discussed previously in this report.

Alternative 3

Alternative 3 reroutes CR 180 and bypasses the railroad bridge but still provides trail access under the railroad bridge. This alternative reroutes CR 180 to East Rose Street and Partridge Avenue Southeast, proceeding south on Partridge Avenue Southeast. Partridge Avenue Southeast would be reconstructed from Rice Lake Road to East Rose Street and an extension of Partridge Avenue Southeast would be constructed from CR 180 to Rice Lake Road. The route would include a grade separated trail and the existing bridge area would be reconstructed so that trail access can be provided under the railroad to accommodate future trail connections. The concrete box culvert and the watermain would also need to be designed and realigned to meet current design standards.

Alternative 3 eliminates the expense of constructing a new railroad bridge and addresses roadway clearance issue but adds several other expenses, such as the purchase of a significant amount of right of way, construction/reconstruction of a significant amount of additional roadway, and trail construction. This alternative anticipates impacts to 43 parcels including the impacts to the railroad right of way.

This alternative is expected to increase traffic levels on other roadways that lead to the new CR 180 connection and eliminates a point on the county roadway system where vehicles (including emergency vehicles) can cross the railroad tracks unhindered. Due to the removal of CR 180 below the railroad bridge, emergency services (police, fire, and ambulance) may incur slower response times to the southeast area of the City of Owatonna. Surrounding county areas as alternate routes would need to be considered and would likely pass through an at-grade railroad crossing with potential blockage from passing trains.

Alternative 4

Alternative 4 relocates CR 180 and the railroad bridge southeast (SE) of its present location, allowing for the required clearance. The off-road trail would parallel the new CR 180 alignment and pass under the railroad. This alternative would create a 30-mph speed advisory due to a sharp curve that reduces the length of road realignment and impacts to property. Including the impacts to the railroad right of way, this alternative anticipates impacts to 15 parcels.

This alternative allows the existing railroad bridge to remain and would require construction of a new CR 180 roadway bridge, west of the new railroad bridge, that would allow Izzak Walton Creek to pass under CR 180. This alternative would provide an opportunity to relocate and install existing utilities using current design standards. The overhead transmission line and large steel poles will need special attention during design of this alternative so that they can be avoided during final design.

This alternative is costly as it involves a new alignment for CR 180, requires construction of a new CR 180 bridge, impacts a large area of mature trees and environmentally sensitive areas that likely would trigger FEMA permitting and remapping.

Alternative 5

Alternative 5 is like Alternative 4, except that it improves the sharp curves to accomplish a higher design speed. Including the impacts to the railroad right of way, this alternative anticipates impacts to 33 parcels.

To increase the speed from 30 mph to 45 mph, the horizontal curve needs to be larger. The proposed railroad bridge length would also need to be increased (beyond Alternative 4) to accommodate the increased skew angle between the new roadway alignment and the existing railroad track alignment. This would require a detailed and very critical look at how to avoid the transmission lines and poles during design, as this design has the highest potential for conflict.

Another concern with this option is its significant impact to property access along CR 180. There will be a significant elevation changes required to pass CR 180 under the new railroad bridge that requires a longer roadway profile transition length to tie into the existing roadway at an acceptable grade. This elevation change requires closure of several existing driveways along CR 180 as the driveway grades would become excessively steep for vehicle access.

Alternative 6

Alternative 6 was dismissed early in the project as not feasible due to the numerous impacts anticipated to local residential and commercial properties and overall cost to construct. This alternative included realigning CR 180 to pass over the CPR with a new roadway bridge. The minimum vertical clearance from top of rail to bottom of bridge superstructure is 22’-0”. Elevating CR 180 would have required relocation of the high voltage transmission line, disconnection of several local streets, and constructing steep vertical grades on CR 180 to tie into the existing

roadway. Several existing driveways would have been impacted due to the steep grades likely resulting in full acquisition of the properties.

Project Costs

Estimated project costs were derived from applying 2020 construction costs to readily quantifiable construction items from the design items and assumed costs for potential surface water treatment, utility relocations, and right of way impacts. A 30% contingency was included for additional items unknown at this time including potential wetland mitigation. Costs for engineering, inspection, administration, and capitalized interest components of the overall project cost were not included. This estimate is for probable construction cost only.

Using this information, we estimate the total project cost for preferred Alternative 2 to be approximately $5.5 million. Refer to Appendix B-Exhibit 1 for a summary of costs for each alternative studied. A detailed cost breakdown of the preferred Alternative 2 is included in Appendix B-Exhibit 2.

Summary

We recommend proceeding with moving forward with preliminary design of Alternative 2 to replace the deficient box culvert, increase the vertical bridge clearance to meet or exceed the minimum 14'-6", construct a sidepath trail to facilitate pedestrians along the corridor, replace the existing watermain and replace the existing railroad bridge with a through-plate-girder ("Type 1") bridge. This will provide a safe and functional roadway for the traveling public, improve emergency vehicle passage along CR 180 and provide future opportunities for additional trail connections. As previously mentioned in the Executive Summary, additional investigation to prepare a comprehensive hydraulic study was not included in the scope of this feasibility study. We further recommend that additional hydraulic surveys and analysis be completed to explore options for lowering the hydraulic tailwater elevations between Rice Lake Road and CR 180 for increasing the flood resiliency of CR 180 under the CPR railroad bridge.

APPENDIX A

Exhibits

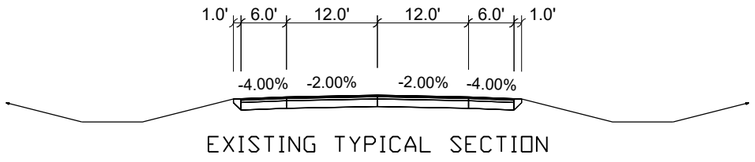
Exhibit 1 - Location Map

SRF

County Road 180

Steele County

Exhibit 2 - Existing Conditions



EXISTING TYPICAL SECTION

LEGEND

- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- E(OH) EXISTING OVERHEAD ELECTRIC

N

0 50 100

SCALE IN FEET

EX OVERHEAD ELECTRIC

ELECTRICAL SUBSTATION

EX OVERHEAD ELECTRIC

ISAAK WALTON CREEK

SHADY AVE

EX RR BRIDGE

CR 180

E SCHOOL RD

EX BOX CULVERT

ISAAK WALTON CREEK

EX OVERHEAD ELECTRIC

CR 180

CANADIAN PACIFIC RAILWAY

NO	DATE	BY	CKD	APPR

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SRF

COUNTY ROAD 180

EXISTING CONDITIONS

STEELE COUNTY, MINNESOTA

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Additional Alternatives Considered for CR 180

Exhibit 3 - Alternatives Reviewed

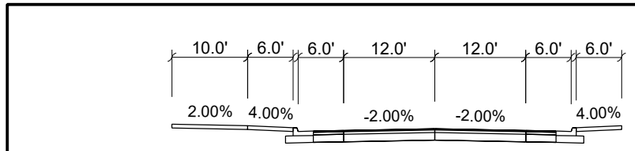
Alt 1 - Existing Bridge (No Build)

Alt 3 - No Bridge and Reroute

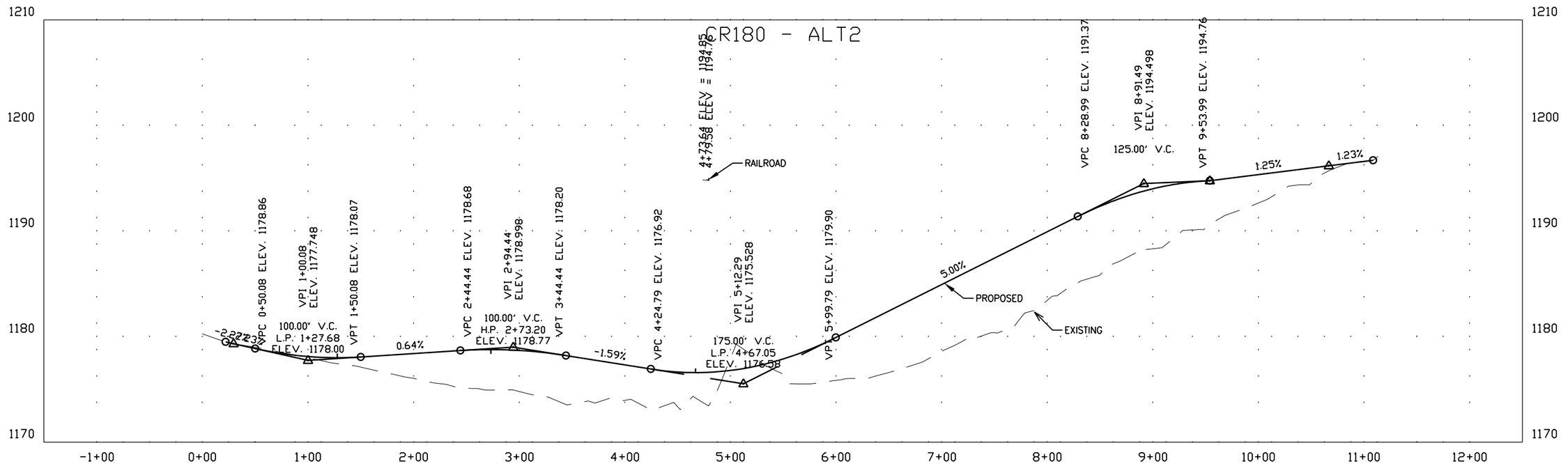
Alt 4 - New RR Bridge with Speed Advisory

Alt 5 - New RR Bridge with 30 mph Curves

Exhibit 4 - Preferred Alternative



PROPOSED TYPICAL SECTION



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NOT FOR CONSTRUCTION
CONCEPTUAL ONLY

SRF

COUNTY ROAD 180

FEASIBIITY PLAN & PROFILE

STEELE COUNTY, MINNESOTA

SHEET 1 OF 1

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APPENDIX B

Engineer's Opinion of Probable Cost

Exhibit 1 - Cost Summary

Summary of Estimated Costs for the Reconstruction of CR 180 Alternatives

Alternative	Estimate of Construction Costs		
	with Bridge Type 1	with Bridge Type 2	with Bridge Type 3
Alternative 1: Refurbish Road, No Improvements	$ 717,000	$ 717,000	$ 717,000
Alternative 2: Reconstruct Road and RR Bridge, add Trail, no Road Bridge	$ 5,540,000	$ 4,930,000	$ 4,850,000
Alternative 3: Reroute Road and add Trail, No RR Bridge or Road Bridge	$ 7,840,000	$ 7,840,000	$ 7,840,000
Alternative 4: Reconstruct Road and RR Bridge, add Trail, add Road Bridge	$ 9,300,000	$ 8,700,000	$ 8,620,000
Alternative 5: Reconstruct Road and RR Bridge, add Trail, add Road Bridge	$ 12,010,000	$ 11,410,000	$ 11,330,000

SRF Comm No ????
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Exhibit 2 - Preferred Alternative Detailed Costs

Project: 14282 Steele Co. County Road 180 - Alternative 2 (Ex Alignment, 2-Lane, RR Bridge Replacement, No Road Bridge)

Concept Cost Estimate (based upon 2020 bid price information)

Prepared By: SRF Consulting Group, Inc., 02/28/2022

					RR Bridge Type 1		RR Bridge Type 2		RR Bridge Type 3	
	ITEM DESCRIPTION		UNIT	UNIT PRICE	EST. QUANTITY	EST. AMOUNT	EST. QUANTITY	EST. AMOUNT	EST. QUANTITY	EST. AMOUNT
PAVING AND GRADING COSTS										
GrP 1a	2106 Excavation - common & subgrade		cu. yd.	$10.00	4,800	$48,000	4,800	$48,000	4,800	$48,000
GrP 1b	2106 Excavation - muck	(9)	cu. yd.	$11.00	960	$10,560	960	$10,560	960	$10,560
GrP 1c	2106 Excavation - rock		cu. yd.	$100.00						
GrP 2a	2106 Common Embankment (CV)		cu. yd.	$6.00	15,100	$90,600	15,100	$90,600	15,100	$90,600
GrP 2b	2106 Granular Embankment - Muck Backfill (CV)		cu. yd.	$12.00	3,020	$36,240	3,020	$36,240	3,020	$36,240
GrP 2c	2106 Select Granular - Structural Backfill (CV)		cu. yd.	$16.00						
GrP 2d	2106 Granular Subgrade (CV)		cu. yd.	$15.00	3,200	$48,000	3,200	$48,000	3,200	$48,000
GrP 3e	County Road Pavement	(1)	sq. yd.	$35.00	3,300	$115,500	3,300	$115,500	3,300	$115,500
GrP 3f	County Road Shoulder Pavement	(1)	sq. yd.	$20.00	1,500	$30,000	1,500	$30,000	1,500	$30,000
GrP 3h	Driveway Pavement	(1)	sq. yd.	$20.00						
GrP 3i	Driveway Pavement - Concrete	(1)	sq. yd.	$90.00						
GrP 4a	Concrete Walk / Trail / Median	(2)	sq. yd.	$75.00						
GrP 4b	Bituminous Walk / Trail	(2)	sq. yd.	$40.00	2,400	$96,000	2,400	$96,000	2,400	$96,000
GrP 4c	ADA Pedestrian Curb Ramp		each	$1800.00	2	$3,600	2	$3,600	2	$3,600
GrP 5	Concrete Curb and Gutter		lin. ft.	$27.00	2,200	$59,400	2,200	$59,400	2,200	$59,400
GrP 6	Concrete Median Barrier (Permanent)		lin. ft.	$125.00						
GrP 7	Pavement Edge Drains		lin. ft.	$8.00	4,800	$38,400	4,800	$38,400	4,800	$38,400
GrP 8a	Removals - Pavement		sq. yd.	$6.00						
GrP 8b	Removals - Buildings		each	$40,000						
GrP 8c	Removals - Drainage		lin. ft.	$20	200	$4,000	200	$4,000	200	$4,000
	SUBTOTAL PAVING AND GRADING COSTS:					**$580,300**		**$580,300**		**$580,300**
DRAINAGE, UTILITIES AND EROSION CONTROL										
Dr 1	Local Utilities - Sanitary Sewers		lin. ft.							
Dr 2	Local Utilities - Watermains		lin. ft.							
Dr 3	Water Quality Ponds		l.s.							
Dr 4	Wetland Mitigation		l.s.							
Dr 5	Drainage - urban									
Dr 6	Drainage - rural	(3)	mile	$110,000	0.10	$11,000	0.10	$11,000	0.10	$11,000
Dr 7	Turf Establishment & Erosion Control		10%			$59,000		$59,000		$59,000
Dr 8	Landscaping		2%			$12,000		$12,000		$12,000
	SUBTOTAL DRAINAGE, UTILITIES AND EROSION CONTROL					**$82,000**		**$82,000**		**$82,000**
BRIDGE COSTS										
Br 1	Bridge - RR Type 1		Lump Sum	$ 1,860,000.00	1	$1,860,000				
Br 2	Bridge - RR Type 2		Lump Sum	$ 1,508,000.00			1	$1,508,000		
Br 3	Bridge - RR Type 3		Lump Sum	$ 1,464,000.00					1	$1,464,000
Br 4	Bridge - Road (115 LF)		sq. ft.	$225						
Br 5	Bridge - Road (125 LF)		sq. ft.	$225						
	SUBTOTAL BRIDGE COSTS:					**$1,860,000**		**$1,508,000**		**$1,464,000**
RETAINING WALLS & OTHER MINOR STRUCTURAL COSTS										
RW 1	Box Culvert -	(4)	lin. ft.	$1,400	125	$175,000	125	$175,000	125	$175,000
	SUBTOTAL RETAINING WALLS & OTHER MINOR STRUCTURAL COSTS:					**$175,000**		**$175,000**		**$175,000**
SIGNAL AND LIGHTING COSTS										
SGL 6	Intersection Lighting (permanent, standard)		each	$20,000	2	$40,000	2	$40,000	2	$40,000
	SUBTOTAL SIGNAL AND LIGHTING COSTS:					**$40,000**		**$40,000**		**$40,000**
SIGNING & STRIPING COSTS										
SGN 1	Mainline Signing (C&D)		mile	$35,000	0.20	$7,000	0.20	$7,000	0.20	$7,000
SGN 2	Mainline Striping		mile	$5,000	0.20	$1,000	0.20	$1,000	0.20	$1,000
SGN 3	Mainline Signing (A, OH, Br Mtd)		each	$50,000						
	SUBTOTAL SIGNING & STRIPING COSTS:					**$8,000**		**$8,000**		**$8,000**
	SUBTOTAL CONSTRUCTION COSTS:					**$2,745,300**		**$2,393,300**		**$2,349,300**
MISCELLANEOUS COSTS										
M 1	Mobilization		5%			$138,000		$120,000		$118,000
M 2	Non Quantified Minor Items		20%			$550,000		$479,000		$470,000
M3	Anti Icing System		Lump Sum							
M 4	Roadway Weather Information System (RWIS)		Lump Sum							
M 5	Raise Railroad Track		Lump Sum	$ 600,000.00	1	$600,000	1	$600,000	1	$600,000
M 6										
M 7	Temporary Pavement & Drainage		5%			$138,000		$120,000		$118,000
M 8	Traffic Control		3%			$83,000		$72,000		$71,000
	SUBTOTAL MISCELLANEOUS COSTS:					**$1,509,000**		**$1,391,000**		**$1,377,000**
	ESTIMATED TOTAL CONSTRUCTION COSTS without Contingency:					**$4,254,300**		**$3,784,300**		**$3,726,300**
1	Contingency or "risk"		30%			$1,277,000		$1,136,000		$1,118,000
	ESTIMATED TOTAL CONSTRUCTION COSTS PLUS CONTINGENCY:					**$5,531,300**		**$4,920,300**		**$4,844,300**

	OTHER PROJECT COSTS:									
	RAILROAD AGREEMENTS		Lump Sum	$1						
	UTILITY AGREEMENTS		Lump Sum	$1						
	TURN BACK AGREEMENTS		Lump Sum	$1						
	PROJECT MITIGATION		Lump Sum	$1						
	R/W ACQUISITIONS		Lump Sum	$1						
			Lump Sum							
	SUBTOTAL OTHER PROJECT COSTS									
	TOTAL PROJECT COST					**$5,531,300**		**$4,920,300**		**$4,844,300**
	INFLATION COST (CURRENT YR. TO YR. OF OPEI		Years	3%						
	TOTAL PROJECT COST (OPENING YEAR DOLLARS)					**$5,531,300**		**$4,920,300**		**$4,844,300**

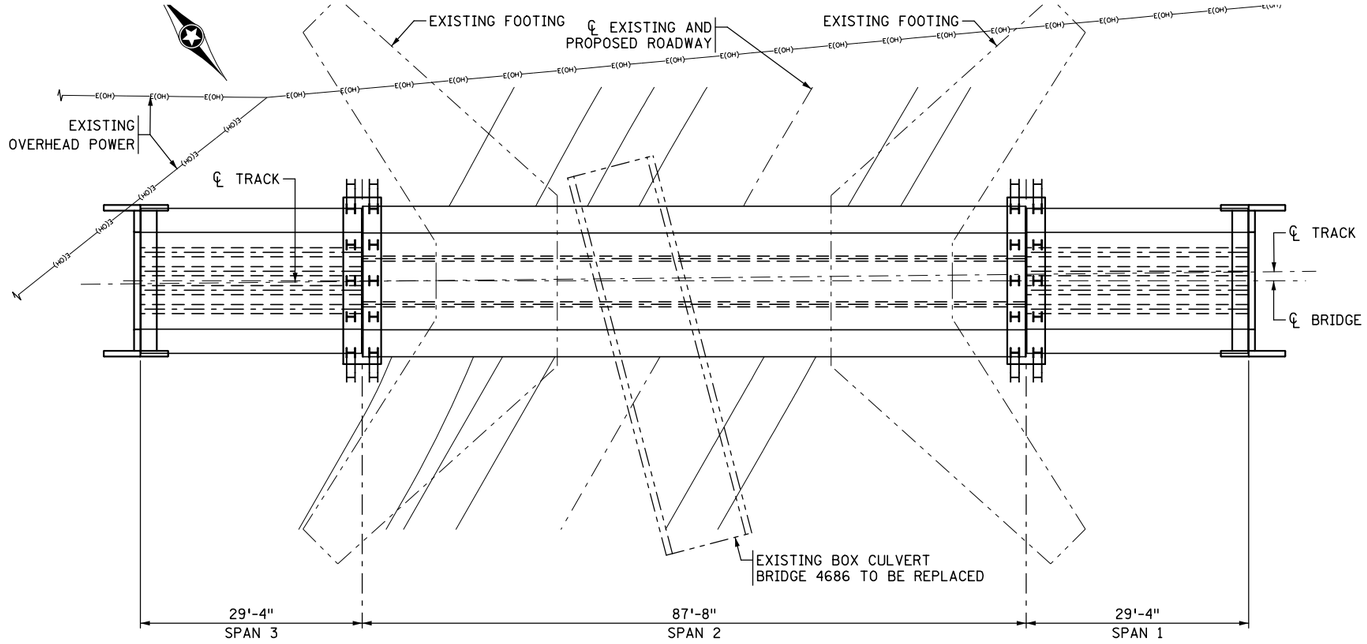
NOTE:
(1) Includes aggregate base class 5 and PASB or OGAB, as appropriate.
(2) Includes aggregate base class 5.
(3) Does not include pavement edge drains, see separate item.
(4) Does not include excavation or backfill.
(5) Assumes Mn/DOT Standard Plan Sheet designs; does not include excavation or backfill.
(6) Does not include Moment Slab.
(7) Includes moment slab and concrete barrier.
(8) Tie back system required for exposed retained heights greater than 15 Feet. This cost is additional to the item for temporary steel sheet pile.
(9) Muck Excavation assumed to be 20% of Common Excavation

Utility Agreements based upon:
R/W Acquisitions based upon:

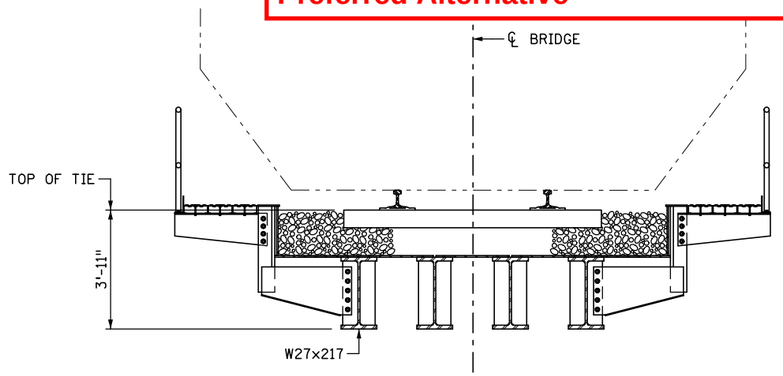
APPENDIX C

Other Information

Exhibit 1: Railroad Bridge Type 1
Preferred Alternative

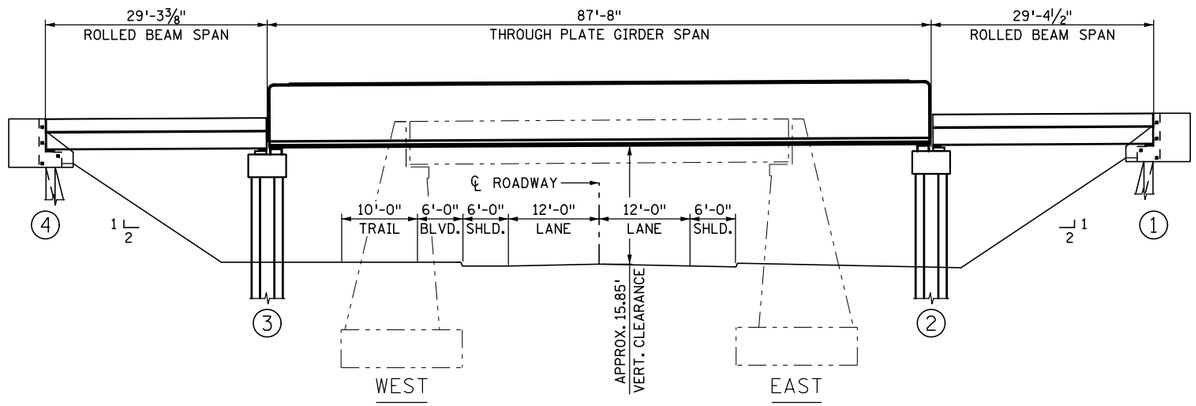


PLAN VIEW

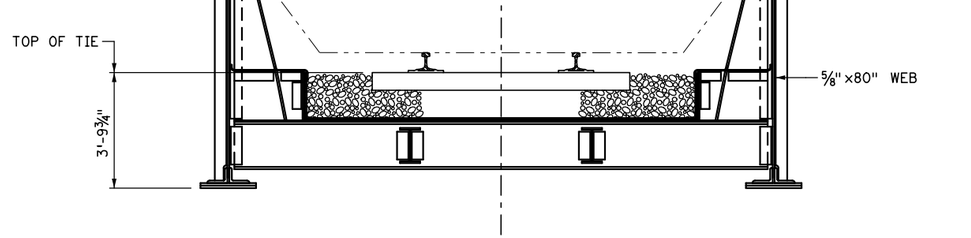


TRANSVERSE SECTION - SPANS 1 AND 3

ROLLED BEAM SPANS



ELEVATION



TRANSVERSE SECTION - SPAN 2

THROUGH PLATE GIRDER SPAN

NOTE:

ALTERNATIVE CONCEPT DEPICTED IN THIS PLAN ASSUMES NO RAILROAD TRACK RAISE, AND THE ROADWAY PROFILE MATCHES EXISTING.

CR 180 Feasibility Report
Type 1 Railroad Bridge

TKDA
444 Cedar Street, Suite 1500
Saint Paul, MN 55101
651.292.4400
tkda.com

FEASIBILITY STUDY
BRIDGE NO. M211
(MnDOT BRIDGE 6037)
GENERAL PLAN AND ELEVATION

CPRR OVER CR 180
AND ISAAK WALTON CREEK

CITY OF OWATONNA, MN STEELE COUNTY

ALTERNATIVE 1

DES: JES	DR: DRH	SHEET NO. 1 OF 1 SHEETS
CHK: MJD	CHK: MJD	

DATE: 8/11/2021 TIME: 2:39:13 PM
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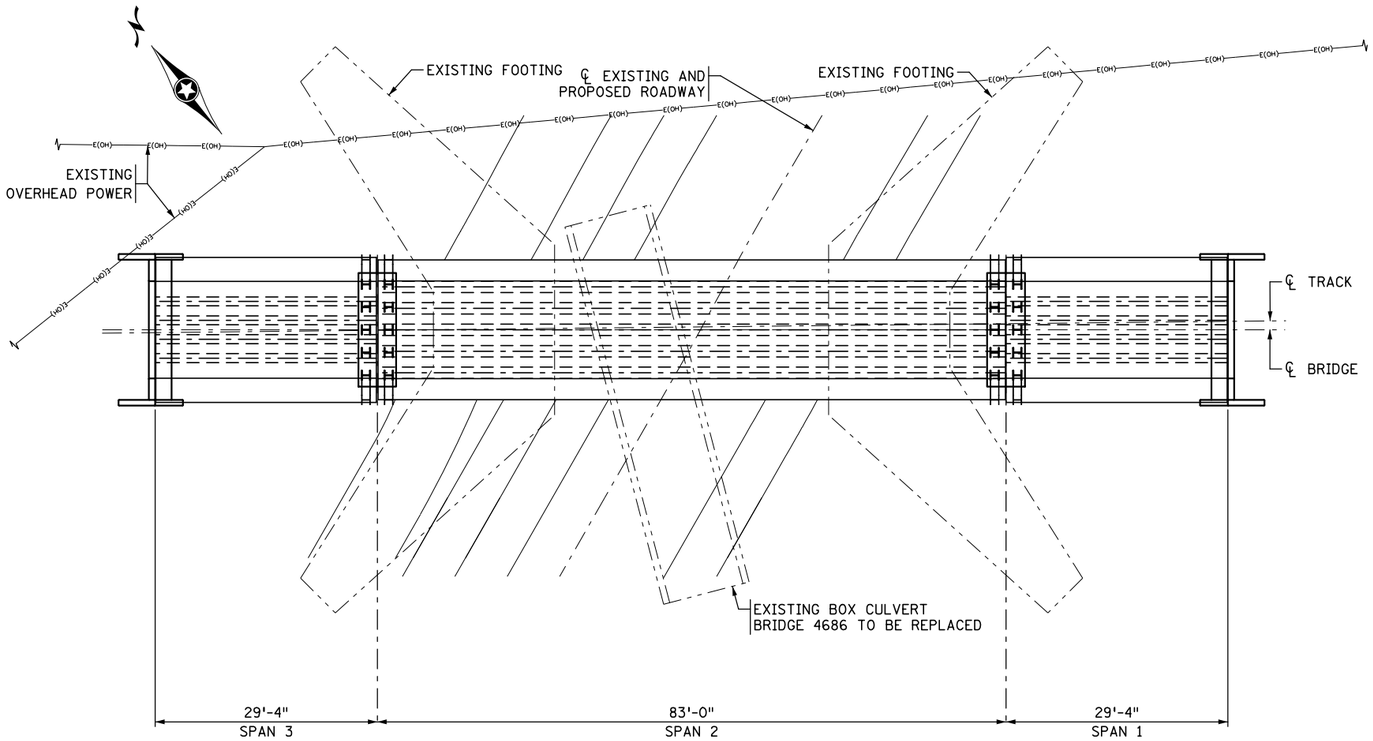
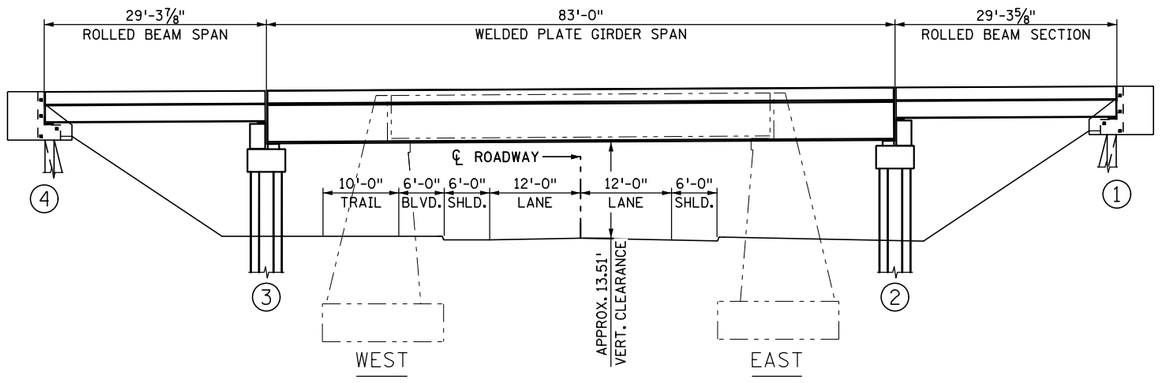
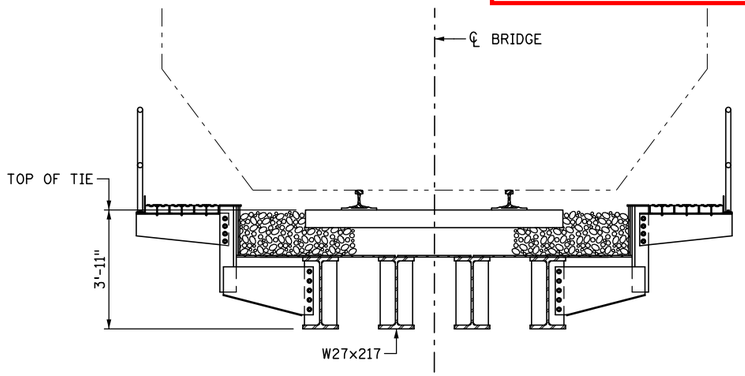
Exhibit 1: Railroad Bridge Type 2



PLAN VIEW

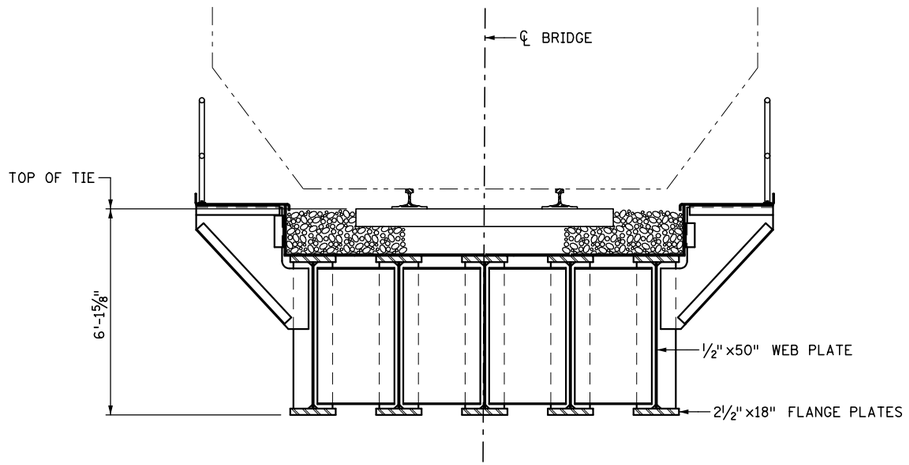


ELEVATION



TRANSVERSE SECTION - SPANS 1 AND 3

ROLLED BEAM SPANS



TRANSVERSE SECTION - SPAN 2

WELDED PLATE GIRDER SPAN

NOTE:

ALTERNATIVE CONCEPT DEPICTED IN THIS PLAN ASSUMES NO RAILROAD TRACK RAISE, AND THE ROADWAY PROFILE MATCHES EXISTING.

CR 180 Feasibility Report
Type 2 Railroad Bridge

TKDA
444 Cedar Street, Suite 1500
Saint Paul, MN 55101
651.292.4400
tkda.com

FEASIBILITY STUDY
BRIDGE NO. M211
(MnDOT BRIDGE 6037)
GENERAL PLAN AND ELEVATION

CPRR OVER CR 180
AND ISAAK WALTON CREEK

CITY OF OWATONNA, MN STEELE COUNTY

ALTERNATIVE 2

DES: JES	DR: DRH	SHEET NO. 1 OF 1 SHEETS	
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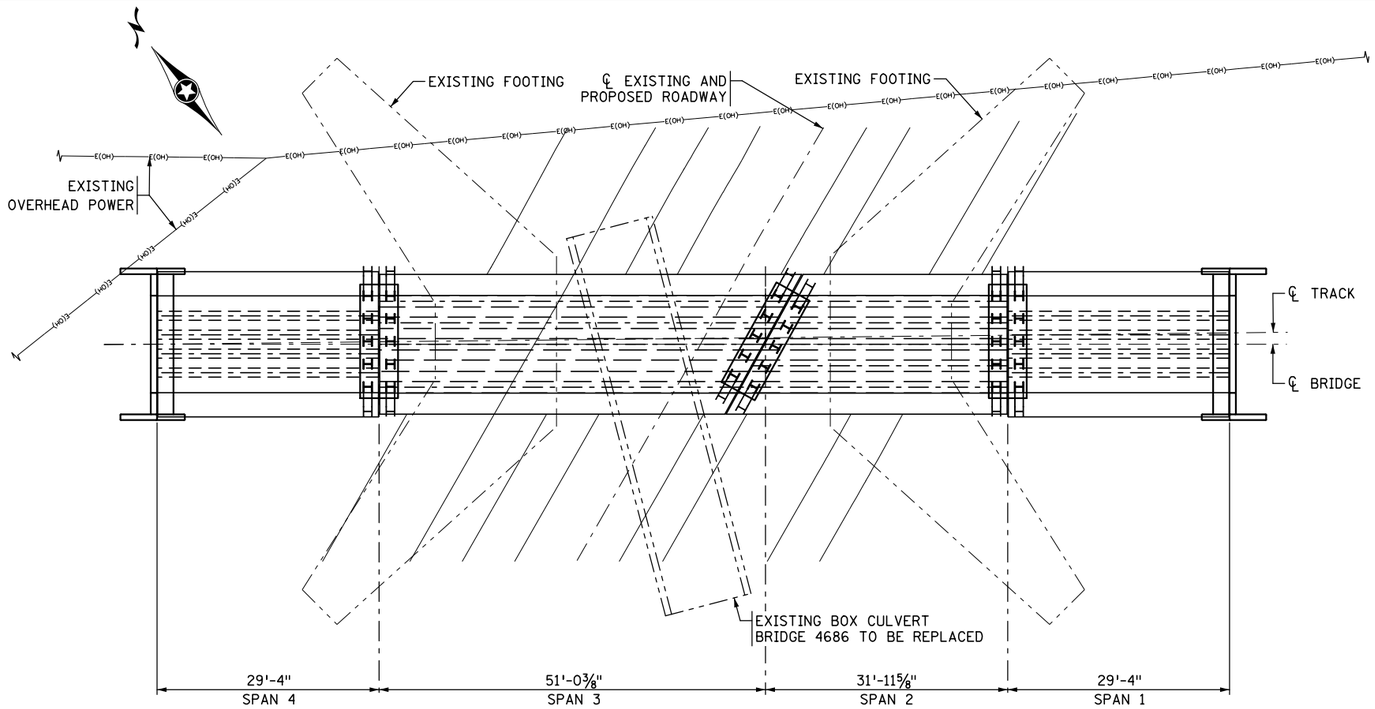
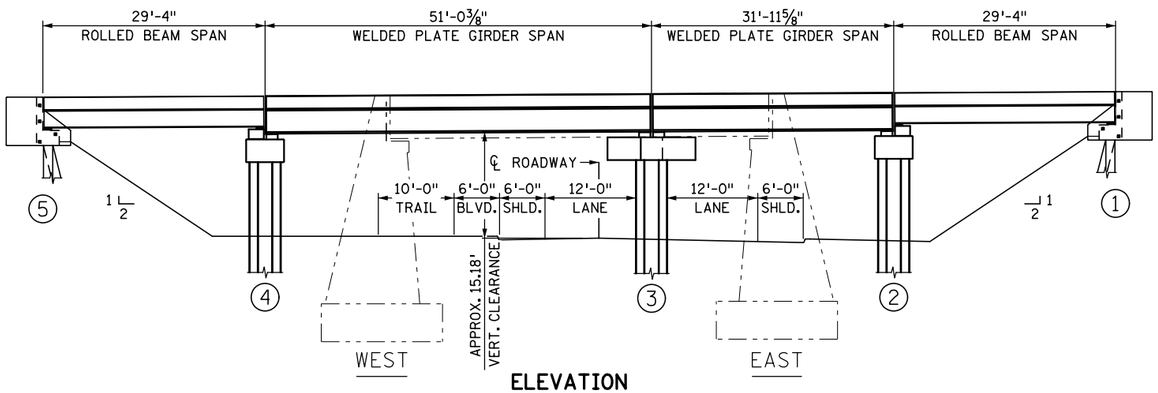
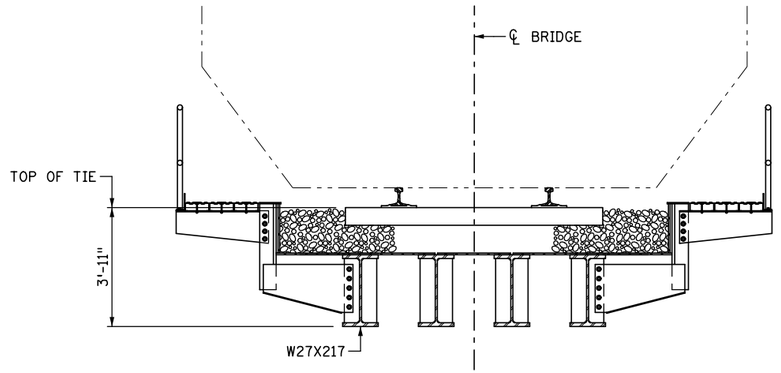
Exhibit 1: Railroad Bridge Type 3



PLAN VIEW

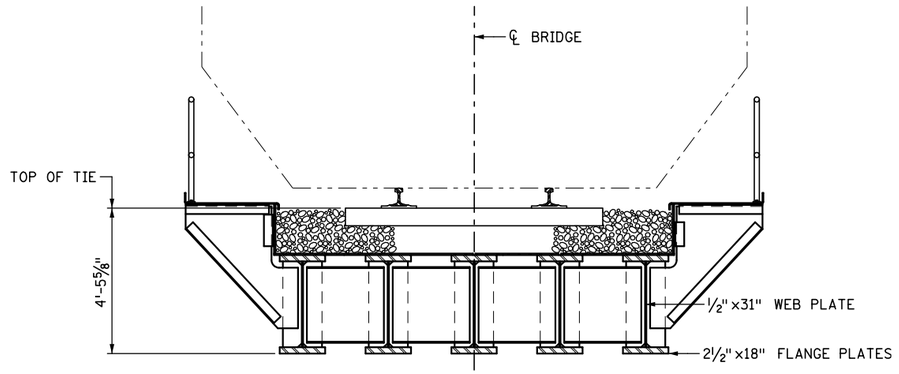


ELEVATION



TRANSVERSE SECTION - SPANS 1 AND 4

ROLLED BEAM SPANS



TRANSVERSE SECTION - SPANS 2 AND 3

WELDED PLATE GIRDER SPAN

NOTE:

ALTERNATIVE CONCEPT DEPICTED IN THIS PLAN ASSUMES NO RAILROAD TRACK RAISE, AND THE ROADWAY PROFILE MATCHES EXISTING.

CR 180 Feasibility Report
Type 3 Railroad Bridge

TKDA
444 Cedar Street, Suite 1500
Saint Paul, MN 55101
651.292.4400
tkda.com

FEASIBILITY STUDY
BRIDGE NO. M211
(MnDOT BRIDGE 6037)
GENERAL PLAN AND ELEVATION

CPRR OVER CR 180
AND ISAAK WALTON CREEK

CITY OF OWATONNA, MN STEELE COUNTY

ALTERNATIVE 3

DES: JES	DR: DRH	SHEET NO. 1 OF 1 SHEETS
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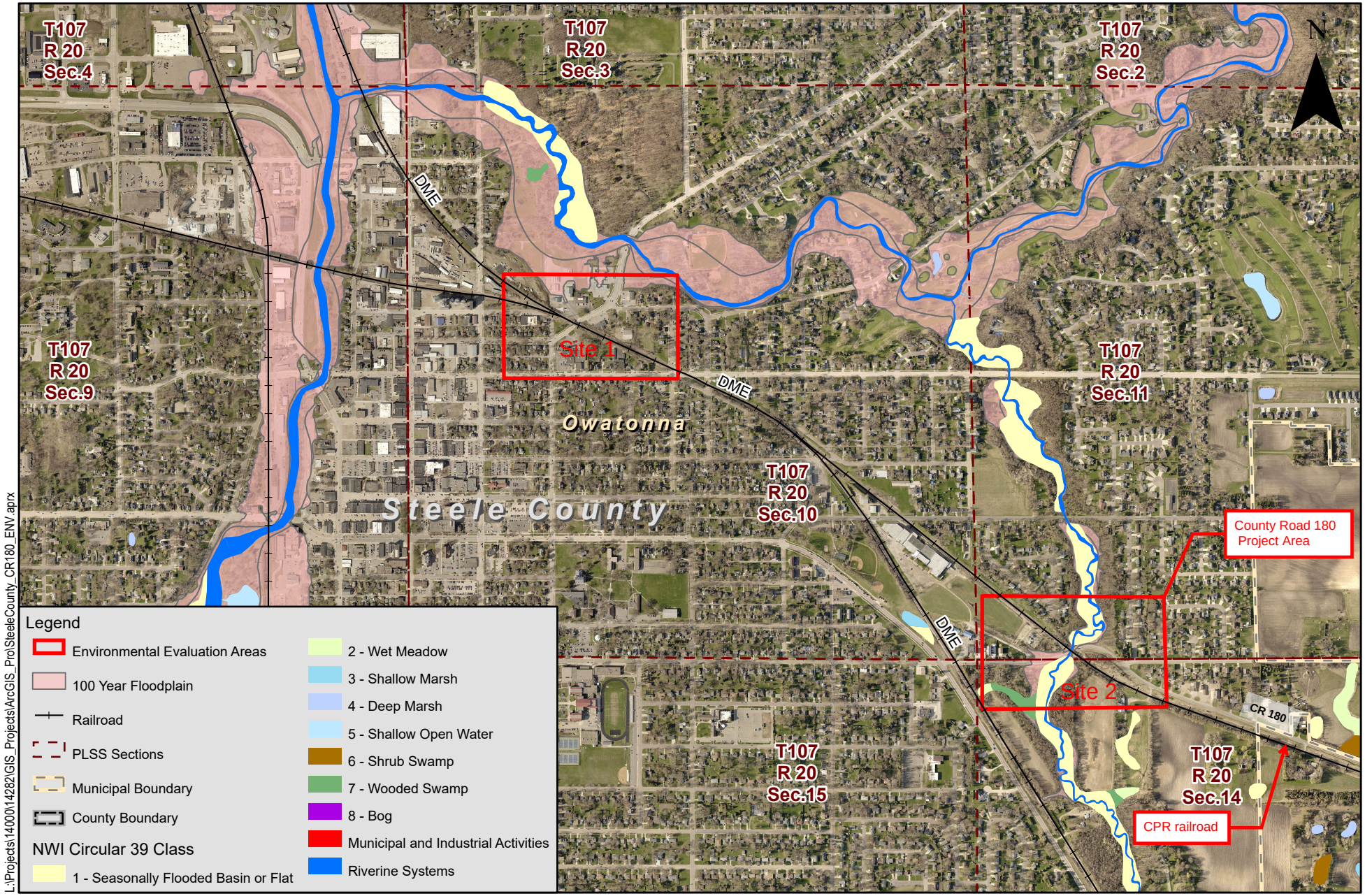
Exhibit 2 - Environmental Screening



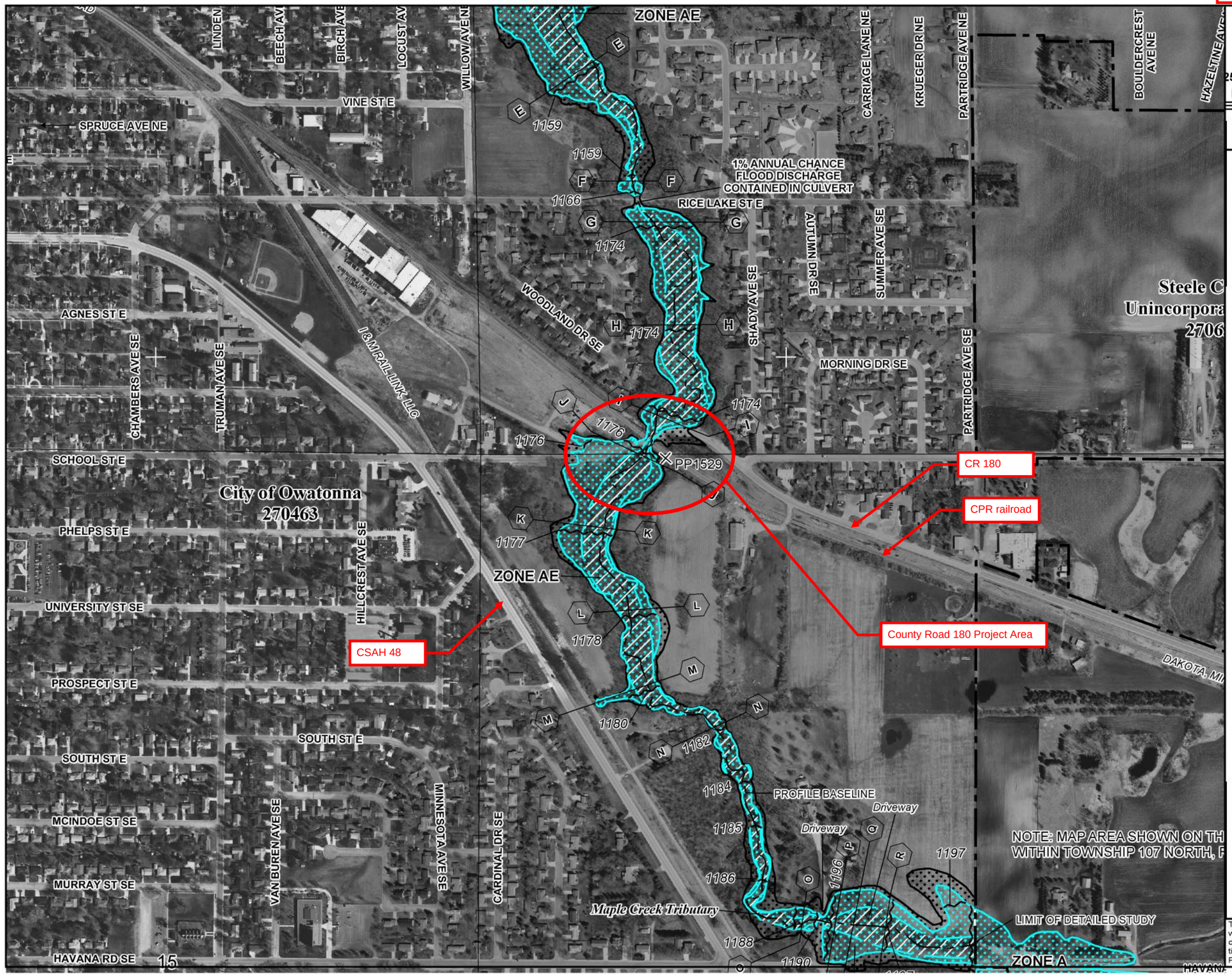
Areas Evaluated for Environmental Concerns

CR 180 Bridges and Mineral Spring Railroad Bridge Study

Steele County

Figure 1

Exhibit 3 - FEMA Floodplain Map



NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0154C

FIRM

FLOOD INSURANCE RATE MAP

STEELE COUNTY, MINNESOTA
AND INCORPORATED AREAS

PANEL 154 OF 400
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OWATONNA, CITY OF	270463	0154	C
STEELE COUNTY	270635	0154	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
27147C0154C

EFFECTIVE DATE
DECEMBER 2, 2011

Federal Emergency Management Agency