Appendices for:
Development of Cost-competitive Timber Bridge Designs for Long-Term Performance

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University of Minnesota Duluth

June 2020

Research Project
Final Report 2020-16A
Steel Stringers with a Transverse Glulam Deck

Transverse deck panels

Asphalt wearing surface with waterproof membrane

Crash-tested railing systems

The bridge design information depicted on these drawings was developed under a cooperative research agreement between Minnesota Local Road Research Board (LRRB), Minnesota Department of Transportation, The University of Minnesota Duluth - Natural Resource Research Institute (NRRI), and the USDA Forest Service - Forest Products Laboratory.

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**Glulam Deck Design**

Transverse glulam decking consists of glulam deck panels oriented across supporting beams (stringers). Glulam decking has been successfully used with timber, steel, and concrete stringers. The deck is attached to the stringers using specialty connectors available from timber bridge supply companies.

There are two types of transverse glulam decks: interconnected and noninterconnected. Interconnected decks use shear transfer devices between adjacent panels to minimize differential panel deflections. Decks that do not use shear transfer devices are considered to be noninterconnected.

The use of a longitudinal stiffener is recommended as the shear transfer device for both types of decks. The stiffeners are placed midway between stringers. The stiffener is attached to the decking with dome-head bolts and should have slotted holes to allow for transverse movement as the glulam moisture content varies in service.

The transverse glulam deck charts show the maximum design span and overhangs for a given deck thickness and species, according to the following design parameters:

- AASHTO-LRFD Bridge Design Specifications (2017)
- HL93 live load
- 6-in. asphalt dead load
- Interconnected and noninterconnected design spans
- L/425 and 0.10-in. deflection limits
- Wet-stress reductions apply to all glulam members

Slots (approximately 2 by 13/16 in.) are provided by the manufacturer in the glulam stiffeners. This allows for movement from any forces caused by panel width changes. AASHTO requires that the minimum EI value of the stiffener be 80,000 kip-in². Stiffeners must run continuous as far as practical. If need be, they can be butt-joined at a panel midpoint. Proper fasteners must be used.

**Design Span** is equal to the clear span plus half width of stringer, but not to exceed clear span plus the deck thickness. **Deck overhang** extends from the center of the edge stringer to the outside edge of deck.
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Design Notes -
Steel stringer bridges consist of single span W-shape steel beam sections braced with steel intermediate diaphragms at quarter points of the span length. The design charts included show the maximum design span and stringer spacing for various W-shape sections, according to the following design parameters:

- 2017 AASHTO-LRFD bridge design specifications
- HL93 live load
- 6 in. asphalt dead load
- L/500 steel girder deflection limit
- single span design
- single and multilane superstructures
- bridge skew < 20 degrees
- Bolted diaphragms are located over the abutment bearing and at intermediate locations at quarter-span points. See more details on Sheet 5.
- structural steel (Fy - 50 ksi)
- Minimum inventory rating factor of 1.05 (AASHTO-LRF)

Design charts include up to W-shape girder (weight per foot and overall depth) options for the span length, girder spacing, and transverse glulam deck panel inter-connectivity. The overall depth (in.) of each W-shape is also included per the American Institute of Steel Construction Manual, 14th Edition.

Only commonly used and available shapes for steel bridge engineering were considered in developing this rolled steel girder superstructure design table. Shallow sections (less than 18 inch depth, or jumbo shapes) are not included. Do not use salvaged or re-purposed steel girders unless they have been verified to meet or exceed structural steel yield strength of 50 ksi.

Cross-Section -- 6-ft Girder Spacing
[5 girders with a 3 ft deck overhang]

Cross-Section -- 5 ft Girder Spacing
[6 girders with a 2.5 ft deck overhang]
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Notes -

Abutment bearing details shown are for reference only and shall be designed by others based on site specific conditions.

When a glulam deck panel backwall is used at abutment bearings, a waterproof membrane should be applied to its backside to eliminate soil contact.

When the concrete abutment is extended up to the top of deck panels, a steel cover plate should be used to prevent asphalt cracking directly over the steel girder abutment bearings.

Diaphragm topside offset should be sufficient to provide clearance for the glulam stiffener beam attached to the underside of the glulam deck.

For additional information about bolted diaphragms, refer to Minnesota DOT standard detail B402.
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Note: More information is available in the Transportation Research Record (TRR-1743) journal including steel rail and post systems and transition railings.

Curbless Bridge Rail - Test Level 2 (NCHRP-350)

End View
Railpost spacing 8 ft. (Typ.)

Rear View

Front View

Note: More information is available in the Transportation Research Record (TRR-1696) journal including steel rail and post systems and transition railings.

Bridge Rail with Curb - Test Level 4 (NCHRP-350)

End View
Railpost spacing 8 ft. (Typ.)

Rear View

Front View
Durability Detail Notes -

The use of a waterproof geotextile membrane in conjunction with an asphalt wearing surface is recommended for most timber bridge applications. Proper application of a waterproof wearing surface can help to improve the long-term durability of timber bridge decks. The waterproofing membrane should “sandwiched” between base course and finish course of asphalt paving. A membrane strip is first placed along the deck edges, prior to the installation of curbs and scupper blocks, and should be sized to extend the full deck depth (outer edge) and beyond the inside curb face by more than 3-inches. The main membrane sandwiched in between the asphalt paving layers should extend to interior curb faces, providing a minimum membrane overlap.

In some cases, the use of metal flashing in lieu of the membrane strip, may be more beneficial as with curbless bridge railing systems. In this case, the metal flashing is nailed to the top deck edge with roofing nails prior to attachment of rail post hardware assemblies. Metal flashing segments are designed for “straddling post” and “between post” locations, while maintaining a minimum overlap of 5 inches at all joints. Flashing segments at the bridge corners should be sloped to drain away from the bridge abutments.

Post caps are available which shields the timber/glulam post from UV light degradation while sheltering the end grain from wetting at the same time. Post caps should be designed and manufactured to meet the following requirements:

- Manufactured from 1/8” high density polyethylene plastic, color black.
- Cap configuration shall allow for air circulation to the top of timber posts on all four sides.
- Fixing the plastic cap to the post using (stainless or galvanized) steel screws. No screws should be placed into the top of the posts, but rather into the post sides. This will prevent moisture from seeping through connections into topside end-grain of the post.
- Drip edges shall be provided on cap for the post sides and back.
- Water channel on top of cap will facilitate run-off and provide for air circulation beneath cap.
APPENDIX B
GLULAM STRINGERS AND A TRANSVERSE GLULAM DECK
Glulam Stringers and a Transverse Glulam Deck

Asphalt wearing surface with waterproof membrane

Crash-tested railing systems

Longitudinal stringers

Transverse deck panels

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Stringer bridges with transverse glulam decking are probably the most common type of glulam timber bridge structure. For this bridge superstructure system, glulam stringers span longitudinally between the abutments. A panelized glulam deck system is placed transversely on top of the stringers. The glulam components (stringers and transverse deck panels) are interconnected with mechanical fasteners. A bridge railing system that meets FHWA crash testing requirements is installed at the deck edges. Lastly, a protective asphalt layer, in conjunction with a waterproof membrane, is placed over the transverse panels to keep them dry and to provide a durable surface against vehicle wear.

The glulam stringer bridge charts show the optimum configuration for a given span length and glulam species combination, according to the following assumed design parameters:

- AASHTO-LRFD Bridge Design Specifications (2017)
- HL-93 live load
- 6-in. asphalt dead load
- Multilane width of 24 ft (face-face of curb)
- Predetermined deck thickness of 5 and 6-3/4 in. for SYP bridges and 5-1/8 and 6-3/4 in. for DF bridges
- L/425 live load deflection limit
- Dry-stress design values applied to stringers only
- Wet-stress design values apply to all other elements
- Simple span designs
Glulam Girders and Transverse Glulam Deck Design Aids For Minnesota Timber Bridges

The bridge design information depicted on these drawings was developed under a cooperative research agreement between Minnesota Local Road Research Board (LRRB), Minnesota Department of Transportation, The University of Minnesota Duluth - Natural Resource Research Institute (NRRI), and the USDA Forest Service - Forest Products Laboratory.

Interconnection of Stringers and Deck Panels

An underside view of the bridge superstructure reveals that the longitudinal glulam stringers are braced with diaphragms and the transverse deck panels are interconnected with longitudinal stiffeners. Stringer bridges require the use of diaphragms (perpendicular to stringers) for lateral stability and to help resist global deflections. Diaphragms are manufactured from glulam timber or galvanized steel.

Glulam diaphragms are attached to the stringers with 3/4-in.-diameter tie rods. The diaphragms are prefabricated with grooves (ply routs) routed into the interior plies creating a chase running the length of the diaphragm. The diaphragms are offset to each other allowing access to the tie rod nuts and washers.

Galvanized steel diaphragms are manufactured from 3- by 3/8- by 3/8-in., angles with 3/8- by 3-in. plate diagonals. The diaphragms are attached to the stringers with 3/4-in.-diameter bolts and are installed in alignment.

The use of longitudinal stiffeners is recommended with 5-in. and 5-1/8-in. decking to aid in the reduction of differential deflection between the deck panels. The stiffeners are placed midway between and parallel to the stringers. The stiffener is attached to the decking underside with dome-head through-bolts. Stiffeners must run continuous as far as practical. If need be, they can be butt-jointed at a panel midwidth. AASHTO requires that the minimum (EI) value of the stiffener beam be 80,000 kip-in².

It is not uncommon for traverse glulam decking to go through minor dimensional changes throughout its service life. Although glulam material is dry when put in service, it may gain moisture, such as humidity from underlying water in hot summer months, causing it to adjust to its microclimate conditions at the bridge site. To allow for these moisture driven fluctuations in panel widths, slotted holes (approximately 2 by 13/16 in.) are provided in stiffeners during prefabrication.
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**Glulam Girders and Transverse Glulam Deck**

**Design Aids For Minnesota Timber Bridges**

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**Fastening Deck Panels to Stringers**

The glulam transverse deck panels are connected to the stringers using one of two fastener options: aluminum deck brackets or lag screws. Both types of fasteners attach the deck directly to the top side of the stringer.

The aluminum deck brackets are available from timber bridge supply companies. Brackets must meet the spacing requirements shown. The bolts for attaching the deck bracket are placed 1-1/2 in. from the face of the stringer. Grooves in the stringer may be continuous (full length of stringer) or discontinuous and staggered (8-in.-wide gaps) as illustrated. We recommend that the decking be provided with slotted holes (approximately 2 by 1/16 in.) for deck bracket to allow for adjustments during assembly. Deck brackets require 5/8-in.-diameter bolts.

Attaching the deck panels to the stringers with lag screws requires field-drilling a pilot hole for the lag screw. The holes in the deck panel must be predrilled with the same diameter as the lags. After setting the deck panel, the predrilled holes are used as a guide to drill lead holes in the stringer. The holes in the stringer should be 1/8 in. smaller than the lag screw diameter. Doing this exposes an untreated hole in the top face of the stringer. It is imperative that the lead holes be field-treated according to ASPA Standard M4 prior to installing the lags. Longitudinal stiffener beams must be used if a deck is lagged to the stringers.
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Stringer Abutment Connections -

Glulam stringer bridge superstructures are anchored to all types of substructure supports. For concrete and steel abutments, bearings consist of either a one-piece bearing assembly or a flat steel base plate with bearing angles. In either case, a 3/4-in.-thick neoprene bearing pad is placed between the concrete or steel and the glulam stringer. Holes for the anchor bolts are drilled into the concrete after the stringers are set and diaphragms tightened. After cleaning the holes, an epoxy or nonshrink grout is applied and anchors installed. For steel, the bearings can be welded or bolted to the channel in prefabricated slots.

For timber abutments, bearing angles with no neoprene bearing pad are used. Again, the angles are secured to the bearing cap with 3/4-in.-diameter bolts after the stringers are set and diaphragms tightened.
Crash-Tested Bridge Rail System -

Fully crash-tested railing systems are approved and available with glulam timber or steel options. Full-scale crash tests were successfully performed, satisfying the criteria for federal bridge funding. Please refer to the Federal Highway Administration (www.fhwa.dot.gov/safety) for additional guidance on bridge railings for timber bridges and new requirements for crash testing methodologies. Strict adherence to size and quality of the lumber, glulam, and hardware components of the crash-tested railing systems is required. Any changes or substitutions to these crash-tested designs require further analysis and approval.

There are many timber crash-tested rail types available:
- Glulam or steel rails, test level 2.
- Glulam timber or steel rails, test level 4.

Primarily, all glulam structures use glulam or solid timber railing elements; however, there are crash-tested design options using steel rail components.

Long-term serviceability of timber decks can be greatly increased by the proper application of a wearing surface. It is highly recommended that treated timber bridge decks receive some sort of wearing surface covering to protect them from the elements. The use of an asphalt wearing surface is most beneficial for bridges on unpaved, gravel roadways to decrease vehicle wear. Also, extending the asphalt pavement approximately 50 ft onto the roadway approaches is beneficial.

Proper application techniques favor the “sandwiching” of a waterproofing membrane between a base course and finish course of paving. Wrapping a membrane strip under the curbing provides an effective drip edge for any water runoff.

Full documentation of applications and techniques is in the document “Guidelines for Design, Installation, and Maintenance of a Waterproof Wearing Surface for Timber Bridge Decks” (Weyers and others 2001).

Test Level 4 – NCHRP-350 Test Standards

Asphalt Wearing Surface Recommendation

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APPENDIX C
LONGITUDINAL SPIKE-LAMINATED TIMBER DECK
Design Notes -

Longitudinal spike-laminated bridges consist of a series of 4-in. dimension lumber laminations that are prefabricated into partial-width deck panels. The deck panels are placed side-by-side and interconnected with a shiplap joint along the panel interface. Transverse stiffener beams are attached to the deck underside at prescribed intervals for each bridge span to provide load transfer between panels. The design chart included shows the maximum design span for various deck thickness values, according to the following design parameters:

- AASHTO-LRFD bridge design specifications, 8th Ed.
- HL93 live load
- 3 in. uniform asphalt layer dead load
- L/425 deflection limit
- single span design
- single and multilane superstructures
- bridge skew < 20 degrees
- Incising factor based on alternative guidelines in the 2018 NDS for Wood Construction
- Laminations shall be continuous and span the bridge supports without butt-joints.

Deck panels are prefabricated at the fabrication plant to ensure quality control manufacturing. Decking planks are predrilled following the prescribed repetitive pattern in lamination pairs. As lamination pairs are added to the starter set, ring shank steel spikes (3/8-in. diameter) are simultaneously driven with equal force using a mechanical press that extends the full length of deck panel, ensuring all spike heads are flush with the timber plank surface. Pneumatic impact tools are not recommended for driving the steel spikes as the laminations can easily be damaged. All timber members that are to be cut or drilled after initial pressure treatment, should be field treated with an appropriate wood preservative approved by AWPA.

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Laminating Process to Pre-Fabricate Deck Panels

Test Level 4 System for Longitudinal Decks -- NCHRP-350 Test Standards
Note: More information is available Federal Highway Administration website (www.fhwa.dot.gov) including information on transition railings.
The use of a waterproof geotextile membrane in conjunction with an asphalt wearing surface is recommended for most timber bridge applications. Proper application of a waterproof wearing surface can help to improve the long-term durability of timber bridge decks. The waterproofing membrane should be "sandwiched" between the base course and finish course of asphalt paving. A membrane strip is first placed along the deck edges, prior to the installation of curbs and scupper blocks, and should be sized to extend the full deck depth (outer edge) and beyond the inside curb face by more than 3-inches. The main membrane sandwiched in between the asphalt paving layers should extend to interior curb faces, providing a minimum membrane overlap. The use of metal flashing on the inside curb face (Z-shaped) and in the scupper openings (U-shaped) along with sufficient overlaps, should reduce debris and moisture accumulation along the bridge edge (gutter zones). It is attached with roofing nails and the minimum overlap of flashing should be 5-inches.

Post caps are available which shields the timber or glulam post top surface from UV light degradation and shelters the end grain from wetting and drying. Post caps should be designed and manufactured to meet the following requirements:

- Manufactured from 1/8" high density polyethylene plastic, color black.
- Cap configuration shall allow for air circulation to the top of timber posts on all four sides.
- Fixing the plastic cap to the post using (stainless or galvanized) steel screws. No screws should be placed into the top of the posts, but rather into the post sides. This will prevent moisture from seeping through the connections into the topside end-grain of the post.
- Drip edges shall be provided on cap for the post sides and back.
- Water channel on top of cap will facilitate run-off and provide for air circulation beneath cap.

Asphalt Wearing Surface Recommendation

Protective Railpost Cap

U-Shaped Metal Flashing - Scupper Openings

Z-Shaped Flashing - Inside Curb

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APPENDIX D

ST. LOUIS COUNTY TIMBER BRIDGE DEMONSTRATION PROJECT
MINNESOTA DEPARTMENT OF TRANSPORTATION
SAINT LOUIS COUNTY

CONSTRUCTION PLAN FOR CONSTRUCT BRIDGE 69A58 AND APPROACHES
OVER EMBARRASS RIVER, 7.4 MILES W/SW OF BABBIT, MN

LOCATED ON CR 796 BETWEEN CR 615 AND CSAH 21


COUNTY PROJ. NO. 0796-271375.

GROSS LENGTH 600.00 FEET 0.114 MILES
BRIDGES-LENGTH 57.33 FEET 0.011 MILES
EXCEPTIONS-LENGTH 0.00 FEET 0.000 MILES
NET LENGTH 600.00 FEET 0.114 MILES

END CP 0796-271375 STA. 8+00.00

CONSTRUCT BRIDGE 69A58 (BR 516) STA. 4+87.50
57'-4" STEEL BEAM SPAN BRIDGE NO SKEW ROADWAY WIDTH= 24' SHLD. TO SHLD.

REMOVE INPLACE BRIDGE 88773 83.5' STEEL LOW TRUSS BRIDGE NO SKEW Q STA. 5+16 REMOVE, NO SALVAGE

BEGIN CP 0796-271375 STA. 2+00.00

MINN. PROJ. NO.
GOVERNING SPECIFICATIONS
THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

INDEX OF SHEETS

DRAWING DESCRIPTION

1 SHEET 1 OF 18 SHEETS
### Statement of Estimated Quantities

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### Basis for Quantities

**Bituminous Material for Shouldertack**
- 0.18 GALLONS PER SQ. YD.
- 94 LBS. PER ACRE
- 100 LBS. PER ACRE
- 96 GALLONS PER ACRE

**Fertilizer, Type 3**

**Rapid Stabilization Method 3**

### Known Utility Companies

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**Notes:**

1. Clearing and grubbing limits are to the right of way and construction easements.
2. Quantity is based off of a 90 ft long wall with 30 ft sheets.

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**Utility Information (Utility Quality Level D):**

This quality level was determined according to the guidelines of CI/ASCE 38-02. Entitled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data."
**EARTHWORK SUMMARY**

**KEY NOTES:**

1. All excavation and embankment quantities shown in the chart have no conversion, shrinkage or compaction factors applied to them. It is the responsibility of the contractor to determine these factors and do the project accordingly. Field changes will be measured and quantities adjusted as necessary.

2. To determine the total quantities of excavation and embankment shown in the plan are determined by the total needs of the project. The excavation quantities shown in the plan are excavated volume; the embankment quantities are compacted volume. For bidding purposes, the contractor shall determine, within each segment, where the excavated material (in compliance with the plan & special provisions) will be incorporated into the work. How much actual excess may be generated, how much actual common embankment will be available from roadway excavations, and how much common embankment will have to be hauled in from outside sources.

3. Exclusion and backfill for manhole culvert and sanitary sewer are incidental, unless a treatment is being constructed. In this case, the plan will identify structure excavation, granular backfill and aggregate bedding as necessary.

4. For information only, not a pay item. Removal of this material is included in the quantity of common excavation.

5. Topsoil borrow calculated from disturbed slope area at a 3' depth for the length of the project.

**DEFINITIONS OF EXCAVATION AND EMBANKMENT ITEMS**

**ROCK EXCAVATION**

Rock excavation is divided into two categories. These categories are solid rock, and detached boulders greater than 2 cubic yards, in both cases, the solid rock excavation will be charged 100% top pass over a 3 inch sieve, and all excavation for solid rock and large detached boulders that will need to be excavated and blasted. The contractor may be required to determine the quantity for rock excavation and excludes surface material that is part of the total quantity of excavation. Rock excavation, whether it be loose rock or detached boulders, will only be allowed to be used as regular fill outside of the 1.1 slopes as shown on the plans.

**EXCAVATION COMMON**

Extraction common includes all excavation required to complete the construction, including excavating the embankment, and backfill common. But excluding structure excavation and rock excavation. This excavation shall be used to meet the requirements of regular fill, and shall fill, if the embankment, shall meet the requirements of select granular embankment, or CV as defined.

**CULVERT EXCAVATION, CLASS U**

Culvert common includes all excavation below the embankment common elevation which is necessary for the construction of centerline pipe treatments. This quantity, and the areas affected, are shown in charts and detail drawings shown in the plan.

---

**COMMON EMBANKMENT (NOT A PAY ITEM)**

Common embankment is the fill required to fill out the embankments as shown on the typicals. All of this material shall come from excavated material from the project limits. This material can be any soil classification as approved by the engineer. The contractor shall provide the proper grade and shall measure B.C. to conform to the embankment. This material shall be a minimum of 1 foot below the top of the proposed topsoil to prevent damage to workers and other maintenance equipment.

**COMMON EMBANKMENT — SLOPE DRESSING (NOT A PAY ITEM)**

Slope dressing shall be the natural topsoil stripped off the project limits or a combination of mineral soil, and organic matter free of stones, sticks and debris. Approved by the engineer. This material may come from on or off the project, no measurement or direct payment will be made for this item.

**SELECT GRANULAR EMBANKMENT MODIFIED 7% (CV)**

Select granular embankment modified 7% is a planned quantity item. Placement shall be as shown on the typical sections. It shall meet the requirements of select granular borrow (least 3149), and is modified as follows: 10% to pass a 3 inch sieve, and of that portion passing a 1 inch sieve, not more than 7% by weight will pass a No. 200 sieve. This material shall be screened or crushed prior to placement on the roadway.

**COARSE AGGREGATE BEDDING (CV)**

Bedding required to construct centerline pipe treatments as shown in the plan. Coarse aggregate bedding shall be 100% virgin coarse aggregate meeting the following gradation requirements:

<table>
<thead>
<tr>
<th>Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/2 in (37.5 mm)</td>
<td>120</td>
</tr>
<tr>
<td>No. 4 (4.75mm)</td>
<td>0-10</td>
</tr>
</tbody>
</table>

**GRANULAR BACKFILL MOD 12% (CV)**

Granular backfill mod 12% is a planned quantity item. All granular backfill material shall meet all of the requirements of granular backfill as per 3149.20. As follows: 10% to pass a 3 inch sieve, and of that portion passing a 1 inch sieve, not more than 12% by weight will pass a No. 200 sieve. This material shall be screened or crushed prior to placement on the roadway.

**GRANULAR EMBANKMENT (CV)**

All granular embankment (CV) material shall meet all the requirements of granular borrow as per 3149.201.
NOTES:

(1) All ditch bottoms, toe of fills, slopes, and top of backslopes shall be rounded.

(2) All excavation shown on the typical will be paid for as excavation — common, MnDOT 210b.

(3) Common topsoil borrow, MnDOT 2574.

(4) All utility poles and unyielding objects shall be removed and relocated outside the clear zone.

(5) Granular embankment (CV), MnDOT 2108.

(6) Compaction of the shoulder material shall be by mechanical means to a point three feet beyond the shoulder PI, as approved by the engineer. The finished shoulder and embankment shall have no ridge which would trap runoff and concentrate flow.

(7) Any additional excavation, as deemed necessary by the engineer, will be added to the excavation — common quantity and paid for at the unit bid price. Embankment for this will be granular embankment (CV) and will be paid for at the unit bid price.

(8) This material shall be screened or crushed to less than 3" prior to placing on the roadway.

(9) Common embankment — regular grading material, MnDOT 2108.

(10) Shoulder tack to be placed at a width of 4' centered at the shoulder PI.

*Drawing not to scale*
NOTES:

(1) ALL DITCH BOTTOMS, TOE OF FILL SLOPES, AND TOP OF BACK SLOPES SHALL BE ROUNDED.

(2) ALL EXCAVATION SHOWN ON THE TYPICAL WILL BE PAID FOR AS EXCAVATION — COMMON, MnDOT 2106.

(3) COMMON TOPSOIL BORROW, MnDOT 2574.

(4) ALL UTILITY POLES AND UNyieldING OBJECTS SHALL BE REMOVED AND RELOCATED OUTSIDE THE CLEAR ZONE.

(5) GRANULAR EMBANKMENT (CV), MnDOT 2106.

(6) COMPACTION OF THE SHOULDER MATERIAL SHALL BE BY MECHANICAL MEANS TO A POINT THREE FEET BEYOND THE SHOULDER PI, AS APPROVED BY THE ENGINEER. THE FINISHED SHOULDER AND INSLOPE SHALL HAVE NO RIDGE WHICH WOULD TRAP RUNOFF AND CONCENTRATE FLOW.

(7) ANY ADDITIONAL EXCAVATION, AS DEEMED NECESSARY BY THE ENGINEER, WILL BE ADDED TO THE EXCAVATION — COMMON QUANTITY AND PAID FOR AT THE UNIT PRICE. EMBANKMENT FOR THIS WILL BE GRANULAR EMBANKMENT (CV) AND WILL BE PAID FOR AT THE UNIT PRICE.

(8) MATERIAL SHALL BE SCREENED OR CRUSHED TO LESS THAN 3" PRIOR TO PLACING ON THE ROADWAY.

(9) COMMON EMBANKMENT — REGULAR GRADING MATERIAL, MnDOT 2106.

(10) SHOULDER TACK TO BE PLACED AT A WIDTH OF 4' CENTERED AT THE SHOULDER PI.
CONSTRUCT BRIDGE 69A58
(CO BR 516)
E STA. 4+87.53
NOSK
ROADWAY WIDTH = 28' SHLD.
NO SKEW

REMOVENOSALVAGE
BRG. N 03°54'15" E

BEGIN CP 0796—271375
STA. 2+00.00
E 30692277.69
N 4844077.08

EXIST R/W

PVC STA. 1+51.29
PVC STA. 1+51.29
PVC STA. 1+51.29
PVC STA. 3+51.29
PVC STA. 4+85.00
PVC STA. 4+85.00
PVC STA. 5+81.00
PVC STA. 6+53.45
PVC STA. 6+53.45
PVC STA. 6+53.45
PVC STA. 8+00.00
PVC STA. 8+00.00
PVC STA. 8+00.00
PVC STA. 9+00.00

1431.00
1432.00
1433.00
1434.00
1435.00
1436.00
1437.00
1438.00
1439.00
1440.00
1441.00
1442.00
1443.00
1444.00
1445.00
1446.00

0.200
200.00 VO
0.400
2.31
2.87
2.00 VO
-8.64
-1.89
-2.48
2.57
2.91
2.80
2.78
2.76
2.75
2.74
2.73
2.72
2.71
2.70

4+00
6+00
7+00
8+00
9+00

END CP 0796—271375
STA. 9+00.00
E 3069876.30
N 4844117.93

I HEREBY CERTIFY THAT THIS PLAN SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A VALIDLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

MATTHEW W. HEMMILA

REGISTRATION ANY SHEET 0796—271375 Sheet 6 of 18 Sheets
1. NATURAL GROUND
2. DRAINAGE SYSTEM TYPE B910. SEE BRIDGE PLANS FOR DETAILS.
3. STRUCTURE EXCAVATION. BACKFILL WITH SELECT GRANULAR EMBANKMENT (INCIDENTAL). QUANTITY OF MATERIAL IS BASED ON DIMENSIONS SHOWN. Mn/DOT SPEC. 1903 SHALL NOT APPLY IF THE CONTRACTOR CHOOSES TO INCREASE DIMENSIONS IN ORDER TO FACILITATE CONSTRUCTION OPERATIONS AND ANY QUANTITY INCREASES SHALL BE CONSIDERED INCIDENTAL.
4. TOP OF SLOPE (FORMS LINE PARALLEL TO END OF BRIDGE)
5. SEE BRIDGE PLANS FOR SLOPE AND SLOPE PROTECTION.
6. PAVING FABRIC TO BE EXTENDED BEYOND THE BRIDGE DECK TO THE LENGTH OF THE BITUMINOUS APPROACH. PAIVING FABRIC TO BE PAID FOR UNDER BRIDGE CONTRACT.
7. BITUMINOUS WEDGE IS TO BE CONSTRUCTED OF THE SAME MIX AS THE WEARING SURFACE AND IS TO BE PLACED BEFORE THE PAVING FABRIC. BITUMINOUS WEDGE WILL BE PLACED IN NO GREATER THAN 4" LIFTS AND COMPACTED BY HAND WHEN NOT ABLE TO USE MECHANICAL MEANS. PAYMENT FOR BITUMINOUS WEDGE IS INCLUDED IN THE APPROACH QUANTITIES AND ALL OTHER BITUMINOUS IS INCLUDED IN THE BRIDGE QUANTITIES.
1. Retaining wall length used for quantity calculations is 90 feet.
2. Sheet pile requirements:
   - Piles to be P222 (or approved equal)
   - $f_y = 50$ KSI
   - Min thickness = 0.375" - P222
   - Nominal height = 30" - P222
3. Steel cap channel requirements:
   - $f_y = 50$ KSI
   - Weathering steel
   - MC18x42.7 (or approved equal)
   - Weld to sheet piling 1" in 12' (incidental to sheet piling)
4. Contractor shall provide a connection to the wingwall as approved by the engineer.

Top of NE Wingwall

Profile View

Top of NE Wingwall

Geotextile Fabric Type V (incidental)

Plan View

Steel Cap Channel (typ. for entire wall) (incidental)
TEMPORARY TURF ESTABLISHMENT
RAPID STABILIZATION METHOD 3
SPEC: 2574.571
APPLICATION RATE OF 6 M GALLONS PER ACRE
SEE NOTE "A".

<table>
<thead>
<tr>
<th>STA TO STA</th>
<th>AREA (ACRES)</th>
<th>MAX MULCH BLOONS</th>
<th>TOTAL ACRES</th>
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<tr>
<td>2+00 - 8+00</td>
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<td>0.50</td>
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<tr>
<td>2 APPLICATIONS</td>
<td>1.00</td>
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<td>1.00</td>
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<tr>
<td>TOTAL ACRES</td>
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<td>0.50</td>
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<tr>
<td>600 GAL/ACRE</td>
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<td>3.60</td>
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SILT FENCE TYPE HAND-INSTALLED

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<th>STA-STA</th>
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<th>FEET</th>
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<td>BOP-BRIDGE</td>
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<td>BRIDGE-EOP</td>
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FLOTATION SILT CURTAIN TYPE MOVING WATER

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<td>AT BRIDGE</td>
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<td>200</td>
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<tr>
<td>TOTAL</td>
<td>200</td>
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GENERAL NOTES:

1. PRIOR TO TEMPORARY SEEDING OR EROSION CONTROL INSTALLATION, THE PROVISIONS OF MnDOT 2574.571 REQUIRE THE CONTRACTOR TO PROVIDE SMOOTH-ROUGH GRADING OF THE AREA TO BE COVERED, WHICH CALLS FOR THE REMOVAL OF SOIL CLODS LARGER THAN 6 INCHES AND THE FILLING OF RUTS DEEPER THAN 6 INCHES. SUCH WORK IS INCIDENTAL TO THE PROJECT.

2. THE QUANTITIES AND LOCATIONS OF ALL ITEMS SHOWN ON THE DETAIL SHEETS (EXCEPT SEEDING) ARE APPROXIMATE AND WILL BE VERIFIED IN THE FIELD BY THE ENGINEER.

3. PLAN BID ITEMS SHALL BE USED TO MEET THE REQUIREMENTS OF THE SPECIFICATIONS. NO ADDITIONAL COMPENSATION SHALL BE PAID FOR THE NUMBER OF MOBILIZATIONS REQUIRED OR AREA COVERED DURING SUCH MOBILIZATIONS.

4. FOR TEMPORARY TURF ESTABLISHMENT, RAPID STABILIZATION METHOD 3 WILL BE USED. ESTIMATED AT 6 M GALLONS PER ACRE FOR 2 APPLICATIONS. THE NEED MAY BE MORE OR LESS THAN THE ESTIMATE BASED ON SITE CONDITIONS. SEE SPECIAL PROVISIONS.

5. FOR PERMANENT TURF ESTABLISHMENT: PLACE FERTILIZER TYPE 3, ANALYSIS 22-5-10 AT 300 LBS PER ACRE PRIOR TO SEED PLACEMENT AND TILL AS REQUIRED TO 3 INCH MINIMUM DEPTH. PLACE SEED MIXTURE 25-141 AT 50 LBS PER ACRE (NOTE REQUIREMENT FOR A TRACER OF HIS TYPE 5 WITH SEED WHEN USING HYDROSEEDER).

6. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT EROSION PROTECTION WALL THAT DISCHARGES WATER FROM ANY PORTION OF THE CONSTRUCTION SITE, OR SHEETS WATER AROUND THE SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR THE POINT OF DISCHARGE INTO SURFACE WATER. STABILIZATION OF THE LAST 200 LINEAL FEET MUST BE COMPLETED WITHIN 24 HOURS AFTER CONNECTING TO A SURFACE WATER.

7. ALL EXPOSED SOIL AREAS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION BUT IN NO CASE LATER THAN SEVEN (7) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.

FOR PERMANENT TURF ESTABLISHMENT:

SEEDING = 0.50 ACRES
SEED MIXTURE 25-141 = 30 POUNDS (50 LBS/ACRE)
FERTILIZER TYPE 3 = 180 POUNDS (300 LBS/ACRE)

EROSION CONTROL BLANKET CAT 3 TO BE PLACED AS REQUIRED FOR PERMANENT STABILIZATION ON ALL DISTURBED AREAS OF THE PROJECT.

<table>
<thead>
<tr>
<th>STA TO STA</th>
<th>LT/RT</th>
<th>LOCATION</th>
<th>SQ YD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2+00 - 8+00</td>
<td>LT/RT</td>
<td>ALL EXPOSED SOILS</td>
<td>2420</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>2420</td>
</tr>
</tbody>
</table>
ITEM NO. | ITEM | UNIT | QUANTITY
--- | --- | --- | ---
(1) 2554 | TRAFFIC BARRIER DESIGN BB307 | LIN FT | 100
(2) 2554 | TRAFFIC BARRIER DESIGN BB307 | LIN FT | 100
(2) 2554 | END TREATMENT - ENERGY ABSORBING TERMINAL | EACH | 4

NOTES:

(1) TRAFFIC BARRIER DESIGN BB307 PAY LENGTH SHALL INCLUDE THE MATERIALS AND INSTALLATION OF THE PAY LENGTH STEEL PLATE, ISRAM GUARDRAIL, WOOD POSTS, PLATES, BOLTS, NUTS, WASHERS, RUBRAIL, SPLICES AND ALL SUCH MATERIALS AS REQUIRED IN THE PLAN AND STANDARD PLATES TO PROVIDE FOR A COMPLETE INSTALLATION.

(2) BACKFILLING SHALL BE ACCOMPLISHED IN ACCORDANCE WITH MN/DOT SPECIFICATION 2451.30.
GENERAL ASSEMBLY DETAILS

NOTES:

1. ADDITIONAL BLOCKING MAY BE REQUIRED AT POST NO. 1 OR 10.
2. HEIGHT IS 2' 2" FROM 0' TO 12' 6" FROM BRIDGE. HEIGHT TAPERS FROM 2' 2" TO 11' 9" BETWEEN 12' 6" TO 25' 0" FROM BRIDGE.

Sheet 14 of 18 Sheets
1. ROAD CLOSURE SIGNING SHALL BE ERECTED PRIOR TO CONSTRUCTION OPERATIONS, AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE PROJECT. ALL SIGNING MUST BE REMOVED IMMEDIATELY AFTER THE PROJECT IS OPEN TO TRAFFIC.

**POSTED SPEED LIMIT PRIOR TO STARTING (mph)**

<table>
<thead>
<tr>
<th>SPEED LIMIT</th>
<th>SPACING OF ADVANCE WARNING SIGNS (feet) (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 30</td>
<td>250</td>
</tr>
<tr>
<td>35 - 40</td>
<td>325</td>
</tr>
<tr>
<td>45 - 50</td>
<td>600</td>
</tr>
<tr>
<td>55</td>
<td>750</td>
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**LEGEND:**
- FLASHER
- SIGN
- BARRICADE
- WORK ZONE

**TRAFFIC CONTROL DEVICES (2)**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESIGN NO.</th>
<th>REMARKS</th>
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<tbody>
<tr>
<td>STOP SIGN</td>
<td>R1-1</td>
<td>IN PLACE—MAINTAIN ONLY</td>
</tr>
<tr>
<td>ROAD CLOSED</td>
<td>R1-2</td>
<td>48&quot; x 48&quot; DOUBLE POST MOUNTED</td>
</tr>
<tr>
<td>ROAD CLOSED 0.5 MILES AHEAD</td>
<td>R1-3</td>
<td>50&quot; x 50&quot; MOUNTED ON BARRICADE</td>
</tr>
<tr>
<td>ROAD CLOSED 1.5 MILES AHEAD</td>
<td>R1-4</td>
<td>60&quot; x 60&quot; MOUNTED ON BARRICADE</td>
</tr>
<tr>
<td>ROAD WORK AHEAD</td>
<td>W20-1</td>
<td>48&quot; x 48&quot; DOUBLE POST MOUNTED</td>
</tr>
<tr>
<td>DETOUR AHEAD</td>
<td>W20-2</td>
<td>48&quot; x 48&quot; DOUBLE POST MOUNTED</td>
</tr>
<tr>
<td>ROAD CLOSED AHEAD</td>
<td>W20-3</td>
<td>48&quot; x 48&quot; DOUBLE POST MOUNTED</td>
</tr>
<tr>
<td>SIDE ARGY</td>
<td>W20-100p</td>
<td>42&quot; x 18&quot; DOUBLE POST MOUNTED</td>
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<tr>
<td>ROUTE MARKER (CR 796)</td>
<td>M1-X4</td>
<td>18&quot; x 18&quot; POST MOUNTED</td>
</tr>
<tr>
<td>DETOUR</td>
<td>M4-8</td>
<td>24&quot; x 12&quot; SINGLE POST MOUNTED</td>
</tr>
<tr>
<td>DETOUR (RIGHT)</td>
<td>M4-8a</td>
<td>24&quot; x 12&quot; DOUBLE POST MOUNTED</td>
</tr>
<tr>
<td>DETOUR (LEFT)</td>
<td>M4-8b</td>
<td>48&quot; x 18&quot; MOUNTED ON BARRICADE</td>
</tr>
<tr>
<td>DETOUR (RIGHT)</td>
<td>M4-8b</td>
<td>48&quot; x 18&quot; MOUNTED ON BARRICADE</td>
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<tr>
<td>ADVANCE RIGHT TURN ARROW</td>
<td>M5-T1</td>
<td>21&quot; x 15&quot; POST MOUNTED</td>
</tr>
<tr>
<td>ADVANCE LEFT TURN ARROW</td>
<td>M5-L1</td>
<td>21&quot; x 15&quot; POST MOUNTED</td>
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<tr>
<td>TURN ARROW</td>
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<tr>
<td>THRU ARROW</td>
<td>M6-3</td>
<td>21&quot; x 15&quot; POST MOUNTED</td>
</tr>
<tr>
<td>END ROAD WORK</td>
<td>G20-2</td>
<td>48&quot; x 24&quot; DOUBLE POST MOUNTED</td>
</tr>
<tr>
<td>ROAD CLOSED BEGINNING XXX</td>
<td>G20-X1</td>
<td>72&quot; x 60&quot; DOUBLE POST MOUNTED</td>
</tr>
<tr>
<td>PLASTIC BARRES</td>
<td>TYPE: II M4-X100p</td>
<td>PLACE AS REQUIRED</td>
</tr>
<tr>
<td>BARRICADES</td>
<td>TYPE: II M5-X100p</td>
<td>PLACE AS REQUIRED</td>
</tr>
<tr>
<td>FLASHER TYPE A</td>
<td>LOW INTENSITY 12</td>
<td>BREAKAWAY WITH FLASHERS, DOUBLE SIDED</td>
</tr>
</tbody>
</table>

**TRAFFIC CONTROL**

**CP 0796-271375**

**Sheet 16 of 18 Sheets**
KEY NOTES:

1. CONTROL POINT
   Q. CR 796 STA 4+40.66
   SOUTH WORKING LINE @ W.P. "A"

2. CONSISTS OF 83.5' STEEL LOW TRUSS BRIDGE.
   THE REMOVE EXISTING BRIDGE
   PAY ITEM WILL CONSIST OF REMOVING THE
   SUBSTRUCTURE/SUPERSTRUCTURE OF BRIDGE 88773 TO
   THE EXTENT NECESSARY TO CONSTRUCT BRIDGE 69A58.
   REFER TO GRADING PLANS FOR APPROACH
   GRADING DETAILS.

3. CONTRACTOR SHALL EXCAVATE TO THESE LINES FOR
   26'—D' EACH SIDE OF THE TAPER ON NATURAL
   SLOPES AT 1:3 SLOPE. INCLUDED FOR PAYMENT
   UNDER ITEM "SLOPE PREPARATION".

CONSTRUCTION NOTES:

- THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF
  TRANSPORTATION "STANDARDS SPECIFICATION FOR CONSTRUCTION" AND
  THE 2016 EDITION OF THE "MATERIALS LAB SUPPLEMENTAL
  SPECIFICATION FOR CONSTRUCTION" SHALL GOVERN.

- THE BAR SIZES IN THIS PLAN ARE IN THE U.S. CUSTOMARY
  DESIGNATIONS.

- BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN
  ACCORDANCE WITH SPEC. 3301

- BRIDGE APPROACH EMBANKMENTS AND TREATMENTS ARE TO BE
  CONSTRUCTED UNDER THE GRADING CONTRACT.

- THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING
  NORMAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING UNID
  METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD
  SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN
  THE SPECIAL PROVISIONS.

- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY
  QUALITY LEVEL 1, I.E., THIS QUALITY LEVEL, WAS DETERMINED ACCORDING
  TO THE GUIDELINES OF CI/ASCE 38-02 ENTITLED "STANDARD
  GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING
  SUBSURFACE UTILITY DATA."

B.M. ELEV. 1430.4' (N.A.V.D. 88)
DES: BM "A" IN 67 SPRUCE TREK
55' LT OF STA. 8-67

BRIDGE NO. 69A53
LOCATION 5.4 MILES SOUTH OF JCT. OF HWY 37 81 ER JCT. T175
CONSTRUCTION NO. 7-8

GENERAL PLAN AND ELEVATION

GENERAL PLAN

SCALE 1:20

GENERAL ELEVATION

SCALE 1:20

SOUTH ABUT.

NORTH ABUT.
### STATEMENT OF ESTIMATED QUANTITIES

<table>
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<th>NOTE</th>
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<th>QUANTITY</th>
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<td>STRUCTURAL CONCRETE (IBID) (P)</td>
<td>CU YD</td>
<td>78</td>
<td></td>
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<tr>
<td>2407.541</td>
<td>REINFORCEMENT BARS (EPOXY-COATED) (P)</td>
<td>POUND</td>
<td>5,030</td>
<td></td>
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<tr>
<td>2402.021</td>
<td>STRUCTURAL STEEL (IBID) (P)</td>
<td>POUND</td>
<td>52,001</td>
<td></td>
</tr>
<tr>
<td>2402.092</td>
<td>ELASTOMERIC BEARING PAD</td>
<td>EACH</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>2403.506</td>
<td>HARDWARE (P)</td>
<td>POUND</td>
<td>303</td>
<td></td>
</tr>
<tr>
<td>2402.503</td>
<td>STEEL HITTEST PILE 88 FT LONG 10&quot;</td>
<td>EACH</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2402.630</td>
<td>TIE PLT PROTECTION 10&quot;</td>
<td>EACH</td>
<td>10</td>
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<tr>
<td>2402.633</td>
<td>STEEL HURRICANE 10&quot;</td>
<td>LIN FT</td>
<td>900</td>
<td></td>
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<tr>
<td>2502.002</td>
<td>DRAINAGE SYSTEM TYPE (IBID)</td>
<td>LUMP SUM</td>
<td>1</td>
<td></td>
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<tr>
<td>2501.001</td>
<td>RANDOM RIPRAP CLAUSB 111</td>
<td>CU YD</td>
<td>140</td>
<td></td>
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<tr>
<td>2501.010</td>
<td>GEOTEXTILE FILTER TYPE VII</td>
<td>SQ YD</td>
<td>280</td>
<td></td>
</tr>
<tr>
<td>2503.601</td>
<td>TRAFFIC CONTROL</td>
<td>LUMP SUM</td>
<td>0.7</td>
<td></td>
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</tbody>
</table>

### LIST OF SHEETS

<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>B1</td>
<td>GENERAL PLAN AND ELEVATION</td>
</tr>
<tr>
<td>B2</td>
<td>BRIDGE LAYOUT &amp; STATEMENT OF ESTIMATED QUANTITIES</td>
</tr>
<tr>
<td>B3</td>
<td>TRANSVERSE SECTION &amp; MATERIAL SUMMARY</td>
</tr>
<tr>
<td>B4-B7</td>
<td>ABUTMENT &amp; WIDENING DETAILS</td>
</tr>
<tr>
<td>B8</td>
<td>FRAMING PLAN</td>
</tr>
<tr>
<td>B9</td>
<td>BEAM &amp; BEARING PLATE DETAILS</td>
</tr>
<tr>
<td>B10</td>
<td>RIPRAP SLOPE WITH GEOTEXTILE FILTER</td>
</tr>
<tr>
<td>B11</td>
<td>ELASTOMERIC BEARING PAD &amp; DRAINAGE SYSTEM</td>
</tr>
<tr>
<td>B12</td>
<td>BRIDGE NAMEPLATE &amp; PILE SPICE</td>
</tr>
<tr>
<td>B13</td>
<td>BOLTED ARMSMANS &amp; STIFTER DETAILS</td>
</tr>
<tr>
<td>B14</td>
<td>TIMBER RAIL &amp; GUARDRAIL CONNECTION DETAIL</td>
</tr>
<tr>
<td>B15</td>
<td>BRIDGE SURVEY</td>
</tr>
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</table>

### Dimensions Between Working Points

<table>
<thead>
<tr>
<th>POINT</th>
<th>STATION</th>
<th>X-COORD (FT)</th>
<th>Y-COORD (FT)</th>
<th>ELEVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4+60.66</td>
<td>4844082.02</td>
<td>3669538.62</td>
<td>1436.36</td>
</tr>
<tr>
<td>B</td>
<td>5+14.33</td>
<td>4844082.68</td>
<td>3669532.17</td>
<td>1436.36</td>
</tr>
<tr>
<td>C</td>
<td>4+60.66</td>
<td>4844084.83</td>
<td>3669537.75</td>
<td>1436.36</td>
</tr>
<tr>
<td>D</td>
<td>5+14.33</td>
<td>4844098.49</td>
<td>3669531.30</td>
<td>1436.36</td>
</tr>
<tr>
<td>E</td>
<td>4+60.66</td>
<td>4844107.63</td>
<td>3669536.88</td>
<td>1436.36</td>
</tr>
<tr>
<td>F</td>
<td>5+14.33</td>
<td>4844111.29</td>
<td>3669540.42</td>
<td>1436.36</td>
</tr>
</tbody>
</table>

### TOP OF ROADWAY TO BRIDGE SEAT AT ROAD CENTERLINE

<table>
<thead>
<tr>
<th>SOUTH ABUTMENT</th>
<th>NORTH ABUTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITUMINOUS DEPTH</td>
<td>0.417&quot;</td>
</tr>
<tr>
<td>DECK THICKNESS</td>
<td>0.427&quot;</td>
</tr>
<tr>
<td>BEAM HEIGHT</td>
<td>2.483&quot;</td>
</tr>
<tr>
<td>STEEL BEARING HEIGHT</td>
<td>0.062&quot;</td>
</tr>
<tr>
<td>ELASTOMERIC BOARDING</td>
<td>0.042&quot;</td>
</tr>
<tr>
<td>TOTAL</td>
<td>41.17&quot;</td>
</tr>
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</table>

### SOUTH EAST CORNER DETAILS

**SOUTHEAST CORNER DETAILS**

**WORKING POINT LAYOUT**
STRUCTURAL STEEL (3309)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>LB/EA</th>
<th>POUNDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>33° x 88 STEEL BEAM</td>
<td>433.33 ft</td>
<td>108.80</td>
<td>48,000</td>
</tr>
<tr>
<td>24&quot; x 12&quot; x 8&quot; STEEL BEARING PLATE</td>
<td>15</td>
<td>61.00</td>
<td>900</td>
</tr>
<tr>
<td>3&quot; x 8&quot; x 6&quot; x 3.5&quot; x 8&quot; STEEL DIAPHRAGM</td>
<td>25</td>
<td>108.5</td>
<td>2,713</td>
</tr>
<tr>
<td>10&quot; x 7&quot; x 3&quot; STEEL STIFFENER</td>
<td>74</td>
<td>21.05</td>
<td>1,558</td>
</tr>
</tbody>
</table>

All structural steel is to be galvanized.

REINFORCING STEEL (EPOXY COATED)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>POUNDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUTH ABUTMENT</td>
<td>4,019</td>
</tr>
<tr>
<td>NORTH ABUTMENT</td>
<td>4,019</td>
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</table>

Total 8,038

HARDWARE

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>LB/EA</th>
<th>POUNDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; x 1/2&quot; ANCHOR ROD</td>
<td>32</td>
<td>5.60</td>
<td>180</td>
</tr>
<tr>
<td>S NUTS</td>
<td>32</td>
<td>0.42</td>
<td>13</td>
</tr>
<tr>
<td>1/4&quot; CUT WASHERS</td>
<td>32</td>
<td>0.19</td>
<td>7</td>
</tr>
</tbody>
</table>

All hardware is to be galvanized.

TOTAL 202

STRUCTURAL CONCRETE 3B52

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>CU YD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUTH ABUTMENT</td>
<td>20</td>
</tr>
<tr>
<td>NORTH ABUTMENT</td>
<td>30</td>
</tr>
</tbody>
</table>

Total 50

TMER BEAMS (54'-10" LONG)

1. A SHIM COAT OF BITUMINOUS IS TO BE PLACED ON THE TIMBER DECK PRIOR TO PLACEMENT OF THE PAVING FABRIC IN ORDER TO CREATE AN EVEN SURFACE AS DETERMINED BY THE ENGINEER.

NOTES:

MWH: 2 DR: NSB 1 APPROVED: I CO. BR. 516

SHEET B3 of B15 SHEETS

DES: MAN MHE W. HEMMILA REG: 375 LSNT LOUIS CITY CERTIFY THAT THIS PLAN SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

NAME: MAEW W. HEMMILA REG: 4734  SATE
ABUTMENT PLAN

SCALE: 4' = 1-

ABUTMENT ELEVATION

SCALE: 4' = 1-

KEY NOTES

1. Wingwall Coping (Typ).
2. Face of Wingwall (Typ).
3. Drainage System Type (BG10).
4. South Abutment is shown. All concrete headwalls are to face downstream. See sheet B11 for details.
5. Drainage pipe to be placed under the wingwall.
NOTE:

Provide Standard Hooks for Dimensions not shown.

Bent bar dimensions are cut-to-cut. Actual bar lengths shall be determined from detail dimensions shown in the bar bending diagrams. Total bar lengths shown are for use in computing reinforcement bar weights for payment only.

All reinforcement shall be delivered to site in bundles identified by substructure & bar mark. Quantities for each bar mark are the sum of both abutments. One half of the quantity of each bar mark is for each abutment.

<table>
<thead>
<tr>
<th>BAR MARK</th>
<th>NO. OF BARS</th>
<th>NO. OF SECTIONS</th>
<th>LENGTH (FT.-IN.)</th>
<th>SHAPE</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A601E</td>
<td>32</td>
<td></td>
<td>36'-3&quot;</td>
<td>STR.</td>
<td>ABUTMENT - HORIZONTAL</td>
</tr>
<tr>
<td>A502E</td>
<td>12</td>
<td></td>
<td>36'-3&quot;</td>
<td>STR.</td>
<td>ABUTMENT - HORIZONTAL</td>
</tr>
<tr>
<td>A502C</td>
<td>36</td>
<td></td>
<td>4'-8&quot;</td>
<td>STR.</td>
<td>ABUTMENT - HORIZONTAL</td>
</tr>
<tr>
<td>A804E</td>
<td>72</td>
<td></td>
<td>11'-6&quot;</td>
<td>BENT</td>
<td>ABUTMENT - STIRRUP</td>
</tr>
<tr>
<td>A505E</td>
<td>72</td>
<td></td>
<td>8'-0&quot;</td>
<td>BENT</td>
<td>ABUTMENT - SEAT TIE</td>
</tr>
<tr>
<td>A505C</td>
<td>72</td>
<td></td>
<td>8'-0&quot;</td>
<td>BENT</td>
<td>ABUTMENT - PARET TIE</td>
</tr>
<tr>
<td>A407E</td>
<td>40</td>
<td></td>
<td>8'-0&quot;</td>
<td>BENT</td>
<td>ABUTMENT - PILE TIE</td>
</tr>
<tr>
<td>A508E</td>
<td>24</td>
<td></td>
<td>14'-11&quot;</td>
<td>BENT</td>
<td>ABUTMENT - HORIZONTAL</td>
</tr>
<tr>
<td>A606E</td>
<td>16</td>
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<td>BENT</td>
<td>ABUTMENT - HORIZONTAL</td>
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<tr>
<td>A510E</td>
<td>12</td>
<td></td>
<td>8'-0&quot;</td>
<td>BENT</td>
<td>ABUTMENT - MINI TIE</td>
</tr>
<tr>
<td>A511E</td>
<td>104</td>
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<td>7'-3&quot;</td>
<td>BENT</td>
<td>WINDWALLS - VERTICAL</td>
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<tr>
<td>A512E</td>
<td>72</td>
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<td>5'-4&quot;</td>
<td>BENT</td>
<td>WINDWALLS - HORIZONTAL</td>
</tr>
<tr>
<td>A513E</td>
<td>52</td>
<td></td>
<td>4'-11&quot;</td>
<td>BENT</td>
<td>WINDWALL - TOP TIE</td>
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<tr>
<td>A414E</td>
<td>24</td>
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<td>4'-4&quot;</td>
<td>BENT</td>
<td>ABUTMENT - TIE</td>
</tr>
<tr>
<td>A515E</td>
<td>12</td>
<td></td>
<td>12'-0&quot;</td>
<td>BENT</td>
<td>ABUTMENT CHAFTER - TOP HORIZONTAL</td>
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</table>

SUMMARY OF QUANTITIES FOR BOTH ABUTMENTS

<table>
<thead>
<tr>
<th>UNIT</th>
<th>S. ABRUT.</th>
<th>N. ABRUT.</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>STRUCTURAL CONCRETE (CBRS)</td>
<td>CU YD</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>REINFORCEMENT BARS (EPOXY COATED)</td>
<td>LB</td>
<td>6238</td>
<td></td>
</tr>
<tr>
<td>STEEL</td>
<td>H-PILING</td>
<td>1&quot;</td>
<td>300</td>
</tr>
<tr>
<td>STEEL</td>
<td>H-TEST PILE</td>
<td>80 FT</td>
<td>10&quot;</td>
</tr>
<tr>
<td>STRUCTURE EXCAVATION</td>
<td>LUMP SUM</td>
<td>0.50</td>
<td>0.50</td>
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<tr>
<td>PILE TIP PROTECTION</td>
<td>LUMP SUM</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>DRAINAGE SYSTEM TYPE</td>
<td>DESIGN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

KEY NOTES:

1. Does not include test pile
2. Membrane waterproofing system to be used at optional joint locations per WA/DOT spec. 2441-26 (horizontal)
3. See bearing plate detail on sheet BR.
4. Provide 2 inches minimum clear distance between anchor rods and longitudinal reinforcement bars.

<table>
<thead>
<tr>
<th>NORTH &amp; SOUTH ABUTMENTS</th>
</tr>
</thead>
</table>

**COMPUTED PILE LOAD - TONS/PILE**

FACTORED DEAD LOAD + EARTH PRESSURE: 32.0

FACTORED LIVE LOAD: 28.7

* FACTORED DESIGN LOAD: 58.7

**BASED ON STRENGTH 1 LOAD COMBINATION**

<table>
<thead>
<tr>
<th>NORTHERN SOUTH ABUTMENTS</th>
</tr>
</thead>
</table>

**REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE**

FIELD CONTROL METHOD

Me/DOT PILE FORMULA 2012 (MPY12)

Mn/DOT PILE FORMULA 2012 Mn/DOT FORMULA 2012

PDA: 0.65

Rn/MPY12 = 97.5

Rn/MPY12 = 90.4

**PILE NOTES**

2 - 1342 STEEL H TEST PILES, 80' LONG
3 - 1342 STEEL H-PILES, EST. LENGTH 75'
10 - 1342 STEEL H-PILES REC'D FOR 2 ABUTS.

All abutment piles shall be HP10x42 STEEL, H-PILES.

See detail 0230 for pile splices.

All piles shall have pile tip protection.
STRUCTURAL STEEL NOTES

1. All structural steel shall conform to Mn/DOT Spec. 3309 (ASTM A709 Gr. 50W) and shall be galvanized unless otherwise noted.

2. Bearers, stiffeners at abutments shall be vertical. Intermediate stiffeners shall be perpendicular to flange. Ends of beams shall be vertical.

3. All lengths shown in framing plan are measured horizontally.

4. Lengths of diaphragms are based on the 1" clearance to beam according to detail B402.

5. No field or shop beam splices are permitted.

6. No holes are permitted in the outside stiffeners at fascia beams.

7. Install beams normal, crown up.

INVESTIGATOR'S CERTIFICATION

I hereby certify that the site was prepared by me or under my direct supervision and it is: DES: DR: APPROVED: CO: BR: CP 0796—271375
GENERAL NOTES

GEOTEXTILE FILTER TYPE 7 PER SPEC. 3733, BY THE SQ. YD.

RIPRAP PER SPEC. 3752, RANDOM RIPRAP CLASS IV — BY THE CU. YD.

SLOPES ARE EXPRESSED AS A RATIO OF VERTICAL DISTANCE: HORIZONTAL DISTANCE.

BOTTOM OF TRENCHES SUB PARALLEL TO ABUTMENT FACE TO PROVIDE POSITIVE DRAINAGE.

1. SEE PLAN SHEET NO.__ FOR DIMENSIONS, AND FOR ELEVATIONS OF RIPRAP TOE AND PASSAGE BENCHES.

2. PLACE RIPRAP IN TRENCH TO HOLD THE GEOTEXTILE FABRIC IN PLACE BEFORE PLACING REST OF RIPRAP FROM THE BOTTOM OF THE SLOPE.

3. OVERLAP GEOTEXTILE FILTER 2'-0 MINIMUM.

4. WRAP GEOTEXTILE FILTER AROUND TOE, OVERHANG BETWEEN 1ST AND 2ND LAYER OF RIPRAP, USE HAND PLACEMENT OR SIMILAR METHODS TO ESTABLISH PROFILE AND PLACE FABRIC IF UNDER WATER.

5. BURY EDGES OF GEOTEXTILE FILTER TO DIRECT WATER FLOW OVER THE FABRIC WITHOUT UNDERMINING.

6. OMIT THE TRENCH SHOWN IN DETAIL "D" AND THE 15'-0 MAXIMUM SPACING BETWEEN TRENCHES FOR SLOPES 1:3 OR FLATTER.

7. SURFACE BENCHES WITH AGGREGATE CLASS 5 INCIDENTAL TO RIPRAP/BLEND TO NATURAL GROUNDLINES OUTSIDE OF BRIDGE.

---

SECTION A-A WITH PASSAGE BENCH

SECTION B-B

SECTION C-C

SECTION A-A (WITHOUT PASSAGE BENCH)

SECTION B-B

SECTION C-C

DETAIL "A"

DETAIL "B"

DETAIL "C"

DETAIL "D"

LAYOUT FOR SLOPES BETWEEN BRIDGES

REVIEWED 09-11-2014

APPROVED MAY 24, 2011

REVISED 09-11-2014

CERTIFIED BY: ____________________________

NAME: ____________________________

LICENSE NO. ____________________________

FIG. 5-397,309

RIPRAP SLOPE WITH GEOTEXTILE FILTER (SLOPES 1:2 AND FLATTER)

SHEET NO. B100F B15 SHEETS

BRIDGE NO. 69A58
PLANN (BEAM NOT SHOWN)

SECTION X-X

SIDE ELEVATION

<table>
<thead>
<tr>
<th>BEARING PAD</th>
<th>BEAM SIZE</th>
<th>BEARING PAD SIZE</th>
<th>SHAFT FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUTMENT</td>
<td>W30X108</td>
<td>12</td>
<td>1/8</td>
</tr>
<tr>
<td>ABUTMENT</td>
<td>W30X108</td>
<td>12</td>
<td>1/8</td>
</tr>
</tbody>
</table>

NOTES:
- Elastomeric materials and pad construction shall comply with Spec. 3741.
- Payment for elastomeric bearing pad included in item "elastomeric bearing pad" per each.
  1. "H" indicates the thickness of the bearing pad.
  2. Holes are not to be made in the field.
- All pipe to comply with Spec. 3245.
- Wrap perforated pipe with geotextile per Spec. 3733, Type 1. Attach to pipe per Spec. 2502.

NOTES:
- Payment will be included in the single lump sum price for "drainage system type B910," included but is not limited to 4" diameter perforated and non-perforated pipe, elbows, ends, caps, couplings, sleeves, and precast concrete headwalls.
- All pipe to comply with Spec. 3245.
- At contractor's option, may tie approach panel drainage system and abutment drainage system into a single precast concrete headwall or into a catch basin as long as a minimum of 1:6 positive slope can be maintained.
- Use precast concrete headwall with rodent screen. See standard plate 3381 for details.
- Referring to grading plans for abutment backfill requirements.
SECTION AT JOINT

SECTION A-A

100% BUTT WELDED PILE SPlice

NOTES:

CELLUOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

I HEREBY CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A DIPLOMATE IN THE FIELD OF BRIDGE ENGINEERING UNDER THE LAW OF THE STATE OF MINNESOTA.

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

PILE SPlice
(Steel H Bearing Piles 10" to 14")

APPROVED: NOVEMBER 22, 2002

STATE BRIDGE ENGINEER

B202
PLATE BEAM RAIL ATTACHMENT DETAIL

(TYPICAL ALL TRAFFIC RAIL ENDS)

1. FULL LENGTH GLU-LAM RAIL TOP (F.F.)
2. BACKING 10-1/2"x3-1/8"x9'-0 3/8" TOP (B.F.)
3. 6-3/4"x6"x10'-6 GLU-LAM RAIL BOTT. (F.F.)
4. BACKING 6"x3-1/8"x9'-0 3/8" BOT. (B.F.)

FIELD DRILL HOLES
(4) 5/8" BOLTS (1" LONG), NUTS & WASHERS
REQUIRED FOR RAIL CONNECTION
PRICE INCLUDED W/ GUARDRAIL ITEMS
Preservative treatment certification required. A Certificate of treatment shall be furnished by a certified AWPA treating facility. The treating certification shall list the identification of job, species of materials, type and retention level shall be 0.6 PCF.

All timber to be treated with the following oil type preservatives in accordance with AASHTO Material Standards, M133 and M168 and shall conform to the AWPA Use Code Standards, an approved preservative field treatment as per AWPA M4.

STRUCTURAL GLUED LAMINATED TIMBER (WOOD):

An engineered stress-rated product of a timber laminating plant, comprised of wood laminations bonded together with adhesives. The grains of all laminations are approximately parallel longitudinally. See AITC 117 for a more detailed explanation.

The structure shall be designed for the following loads and dimensions:

Dead Load (timber 50 PCF / wearing surface 140 PCF)

Live Load deflection (L/425)

BY


Glulam members shall be finished to Industrial Appearance Grade as per AITC 110-2001.

Wet-Stress design values shall be used when applicable.

The glulam manufacturer shall be a qualified licensee of the AITC or APA/EWS.

All preservative treatments shall be applied in accordance with Best Management Practices for Wood Preservatives in Aquatic Environments.

All steel plates and shapes to be galvanized (ASTM A-153) mild steel ASTM A-36.

Steel construction details shall be in accordance with AASHTO specifications and American National Standard for Wood Products-Structural Glued Laminated Timber ANSI A190.1- (Latest edition).

Shall be in full conformance with AITC 117 Structural Glued Laminated Timber - General and nomenclature, and A190.1-2007 M133A850M2400 framing members. Use pre-qualified and/ or certified field treatment products.

27'-10 1/4" x 3'-8" x 8'-0" x 8'-0" x 3'-8" x 8'-0" x 5'-11" x 2'-0" x 1'-2" x 1'-6" x 5'-11"

DATE: 12/29/16

REVISIONS:

SCALE: SHOWN FOR CLARITY

DECKING AND RAILING PLAN

TYPICAL SECTION THRU BRIDGE
TYPICAL GUIDE RAIL DETAIL

GLULAM PANEL END GRAIN PROTECTION DETAIL

TYPICAL BEARING DETAIL

FOR ADDITIONAL DRAWING DETAILS INFORMATION, PLEASE REFER TO THE DOCUMENT:
"Development of Two-Level 6 Brigade Railing and Transitions for the Transverse Glue-Laminated Deck Bridge"
TRANSPORTATION RESEARCH RECORD 1743
PAPER NO. 01-0378

GLULAM POST
W 30 x 108 STEEL BEAMS
3/8" THICK STEEL COVER PLATE RECESSED IN TOP OF BACKWALL
GLULAM DECKING

GLULAM DECKING

APPLICATIONS 18" HORIZ. MIN AND WRAP OVER CONCRETE BACKWALL
GLULAM POST

W30  x 108  STRINGER
TYPICAL DECK TO STEEL DETAIL
3/8" STEEL DECK CLIP
5/8" DIA. DH BOLTS
Minnesota Structure Inventory Report

Bridge ID: LB081  CR 202(ELM CRK RD) over ELM CREEK

### GENERAL

| Agency Br. No. | 130 |
| District     | 05 |
| Maint. Area  | 100 |
| County       | 027 - Hanspin |
| City         | Dayton |
| Township     | 1.5 Mi E of JCT CSAH 121 |
| Sect., Twp., Range | 35 - 120N - 22W |
| Latitude     | 45 d 09 m 47.54 s |
| Longitude    | -93 d 26 m 11.87 s |
| Custodian    | 02 - County Highway Agency |
| Owner        | 02 - County Highway Agency |
| Year Built   | 1973 |
| Date Opened to Traffic | 1/1/1973 |
| FHWA Year Remodeled | |
| MN Year Remodeled | |

### ROADWAY ON BRIDGE

| Road Name       | ELM CRK RD (CR 202) |
| Class           | Functional Class - 09 - Rural - Local |
| ADT SBD YEAR.   | 580 YEAR 2014 |
| ADT HCADT       | ADT % |
| National Highway System | Route Sys/Nbr 07 - CNTY / 202 |
| Ref. Point (TIE) | |
| Detour Length   | 6 mi. |
| Lanes           | 1 Lane On Bridge |
| Control Section | TH Only |
| Type            | 3 - One lane bridge for 2-way traffic |
| Bridge Match ID | 0 |
| Key             | Route On Structure |

### INSPECTION

| Structural Deficient | Y |
| Functionally Obsolete | N |
| Suficiency Rating    | 19.8 |
| Last Routine Inspect Date | 09/24/2018 |
| Routine Inspect Frequency | 12 |
| Inspector Name       | Hagstrom, Pat |
| Status               | P - Posted for Load |

### NB1 CONDITION RATINGS

| Deck | 5 |
| Superstructure | 4 |
| Substructure | 5 |
| Channel | 5 |
| Culvert | N |

### ROADWAY DIMENSIONS ON BRIDGE

| If Divided | NS-EB SB-WB |
| Roadway Width | 16.50 ft |
| Vertical Clearance | ft ft |
| Max. Vert. Clear. | ft ft |
| Horizontal Clear. | ft ft |
| Appr. Surface Width | 22.0 ft |
| Bridge Roadway Width | 15.5 ft |
| Median Width On Bridge | ft |

### NB1 APPRAISAL RATINGS

| Structure Evaluation | 3 |
| Deck Geometry | 2 |
| Underclearances | N |
| Waterway Adequacy | 8 |
| Approach Alignment | 4 |

### SAFETY FEATURES

| Bridge Rating | 0 - SUBSTANDARD |
| GR Transition | 0 - SUBSTANDARD |
| Apr. Guardrail | 1 - MEETS STANDARDS |
| GR Terminai | 0 - SUBSTANDARD |

### SPECIAL INSPECTIONS

| Frac. Critical | Underwater |
| Pinned Ashly. | |

### WATERWAY

| Drainage Area (sq ml) | 216 |
| Waterway Opening (sq ft) | 0 |
| Navigation Control | 0 - No nav. control on wayway |
| Pler Protection | |
| Nav. Cr. (ft) | Vert. 0.0 |
| Nav. Vert. Lift Bridge Clear. | 8 ft |
| MN Scour Code | K - LIMITED RISK |
| Scour Evaluation Year | 2009 |

### BRIDGE SIGNS

| Posted Load | 2 - Vehicle & Semi (Type R:12.6) |
| Traffic | 0 - Not Required |
| Horizontal | 2 - Violate Restrictions |
| Vertical | N - Not Applicable |

### CAPACITY RATINGS

| Design Load | 0 - Other/Unknown |
| Operating Rating | 2 - HS TRUCK 5.14 |
| Inventory Rating | 2 - HS TRUCK 5.44 |
| Posting VEH | 8 SEMI: 12 |
| Rating Date | 09/29/2015 |

### OVERWEIGHT PERMIT CODE

| A | X |
| B | X |
| C | X |
**BRIDGE L8081  CR 202(ELM CRK RD) OVER ELM CREEK**

<p>| County: | Hennepin |
| City: | Dayton |
| Township: | Control Section: |
| Section: | 35 | Township: | 120N | Range: | 22W | Maint. Area: |
| Span Type: | 3 - Steel 2 - Stringer/Multi-beam or Girder |
| NB Deck: | 5 | Super: | 4 | Sub: | 5 | Chan: | 5 | Culv: | N |
| Appraisal Ratings - Approach: | 4 | Waterway: | 8 |</p>
<table>
<thead>
<tr>
<th>ELEM NBR</th>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSPEC. DATE</th>
<th>QUANTITY</th>
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<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
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<tr>
<td>31</td>
<td>Timber Deck</td>
<td>Routine</td>
<td>09/24/2018</td>
<td>621 SF</td>
<td>0</td>
<td>621</td>
<td>0</td>
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<tr>
<td>510</td>
<td>Wearing Surfaces</td>
<td>Routine</td>
<td>09/24/2016</td>
<td>581 SF</td>
<td>461</td>
<td>12</td>
<td>108</td>
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<tr>
<td>510</td>
<td>Wearing Surfaces</td>
<td>Routine</td>
<td>09/11/2017</td>
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<td>519</td>
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<tr>
<td>107</td>
<td>Steel Open Girder/Beam</td>
<td>Routine</td>
<td>09/24/2018</td>
<td>407 LF</td>
<td>0</td>
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<td>380</td>
<td>27</td>
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<td>515</td>
<td>Steel Protective Coating</td>
<td>Routine</td>
<td>09/24/2018</td>
<td>2205 SF</td>
<td>0</td>
<td>22</td>
<td>221</td>
<td>1962</td>
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<tr>
<td>216</td>
<td>Timber Abutment</td>
<td>Routine</td>
<td>09/24/2018</td>
<td>76 LF</td>
<td>0</td>
<td>69</td>
<td>6</td>
<td>1</td>
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<tr>
<td>Notes:</td>
<td>31. '15-bottom of deck is leaking &amp; some boards wet w/ small areas of mold. '16-deck has many areas of staining. Mod checks &amp; splits on ends of planks. '17, '18-no change.</td>
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<tr>
<td>Notes:</td>
<td>510. Tire wear has reduced plank thickness. New bit O/L added in '05. 1/2'-1 1/2' deflection under live load @ midspan. Many trans cracks. Old bit O/L in '01. Timber deck has been saturated w/ water in past. Numerous trans cracks in bit O/L. '13-cracks are spaced 3'-5' apart. '15-vegetation growing along curb lines. Move to CS 3 because of mod to large sized cracks in bit O/L w/ spacing &lt;6'. '16-mod-large trans cracks spaced 1'-3' apart. 2 full length mod sized long cracks. 1 SF Spall @ E. '17-spall @ E patched w/ bit. Cracks @ ends in app patches. '18-map cracking @ W end. Few minor spalls @ ends. Mod density (3'-4') in NE, cracks large in size.</td>
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<tr>
<td>Notes:</td>
<td>107. Stringers rusted. E &amp; W 1/3 of flanges mod rusted w/ some section loss. Reinforcement plate has been bolted over 5&quot; X 1&quot; hole in web of fascia beam bearing areas in NW &amp; SW corners. N fascia channel tipped. Diaphragm added between N fascia &amp; adj beam @ W end. Sheet rust on lower flanges @ numerous bearings. '10-exterior of fascia channels heavily sheet rusted. Approx 1&quot; hole in bottom flange of N fascia 3&quot; from W end. 80% of top &amp; bottom flanges are sheet rusted. '12-N fascia channel has a 10&quot; X 3&quot; hole in the web +/- 10' from E abut. '13-most bottom flanges are mod-heavy sheet rusted. Hole in N fascia is now 12&quot; X 3&quot;. A few of the beams @ W abut do not have sheet rust on bottom flange. From plans, original bottom flange of beam is 465&quot; or 7/16&quot;; web thickness = 265&quot;. '14-heavy pitting of both fascias, up to 1/8&quot; on S fascia. Hole web of N fascia by E abut is now 12&quot; X 6&quot;; another hole on W end is 3&quot; X 1&quot;. The bottom of the original web in NW has a 1-1/2&quot; X 15&quot; area of total section loss - 2 bottom bolts of steel reinforcement plate don't hold anything. '15-hole in N fascia by E abut is 14&quot; X 8&quot;, 1&quot; X 1&quot; hole in N fascia, 7&quot; from W abut. 1-1/2&quot; X 4&quot; area of section loss on bottom flange of S fascia @ W abut. Most bottom flanges have some degree of sheet rust. '16-N fascia channel has numerous perforations. Hole by E abut is now 18&quot; X 9 1/2&quot;. '17-S fascia has 4-1 SF more section loss. '18-15% of 100% section loss on S channel fascia, 10% on N channel fascia. 4th beams from N @ E abut has 2 of beam deformed.</td>
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<tr>
<td>Notes:</td>
<td>515. '16-paint is mostly gone. Remaining paint is faded, chipped or flaking. '17-no change. '18-est 1% faded, 10% flaked, peeled &amp; 85% failed.</td>
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<tr>
<td>Notes:</td>
<td>216. '13-both abuts weathered. EAST-4 cable tie-backs. '14, '15-no change. '16-splintered plank 4th from top in SE. 2nd plank from top @ N end of E has 2' of decay. '17-no change. WEST-14 hollow sound about 2 h' while tapping @ N end about 5' below pier cap. '15-minor crack in 3rd board from cap between 2nd &amp; 3rd col from S. Leakage @ SW below 3rd board from cap. '16-delam between 2nd &amp; 3rd from S, 3rd board from top. 2&quot; X 4&quot; backfill infill @ SW corner. '17, '18-no change.</td>
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</tbody>
</table>

Wingwall notes: SE pile rotted & top board deteriorated. '13, '14, '15-no change. '16-Several boards in SE have some decay, crushing. '17, '18-no change.
<table>
<thead>
<tr>
<th>Elem Nbr</th>
<th>Element Name</th>
<th>Report Type</th>
<th>Insp. Date</th>
<th>Quantity</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
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<tr>
<td>228</td>
<td>Timber Pile</td>
<td>Routine</td>
<td>09/24/2018</td>
<td>52 LF</td>
<td>0</td>
<td>52</td>
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<td>0</td>
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<td></td>
<td></td>
<td>Routine</td>
<td>09/11/2017</td>
<td>52 LF</td>
<td>0</td>
<td>52</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: 228. Pile @ abut 8 & 2 @ each wing. '13-many checks in all @ E abut. About 12' @ the base of the 2nd post from S @ E abut is rolled. '14-3rd column from S @ E shows some decay. S column @ E also has some minor decay. '15-some checks mod in size, 3' of decay in 2nd from S @ E abut. Dry rot in 2nd from S @ W 5 boards below cap. '15-top of columns in SW & SE are mod splintered. '16-SE pile is severely decayed. Pile in NE has minor decay. '17, '18-no change.

| 235      | Timber Pile Cap      | Routine     | 09/24/2018 | 42 EA    | 0        | 0        | 0        | 24       |
|          |                      | Routine     | 09/11/2017 | 42 EA    | 0        | 0        | 0        | 24       |

Notes: 235. 15" steel channel for beams to bear on. 3 1/4" legs. Tilted @ E abut. '13-sheet rust on steel covering both caps. '14-'16-no change. '16-added 4" in each corner for cap extensions. '17, '18-no change.

| 311      | Movable Bearing      | Routine     | 09/24/2018 | 24 EA    | 0        | 0        | 0        | 24       |
|          |                      | Routine     | 09/11/2017 | 24 EA    | 0        | 0        | 0        | 24       |

Notes: 311. Bearings are severely sheet rusted w/ much section loss. '13-'16, annually-no change.

| 330      | Metal Bridge Railing | Routine     | 09/24/2018 | 59 LF    | 0        | 0        | 10       | 59       |
|          |                      | Routine     | 09/11/2017 | 59 LF    | 0        | 0        | 10       | 59       |

Notes: 330. Railings rusted & tipped out. '13-posts @ midspan spreader are mod rusted & twisted - N one is worse. S has pack rust @ connection. Small holes in railing @ most vert guardrail braces. '14-missing bolt on vert rail to S fascia beam. '15-coin sized to 3"x3" holes in lower rail, mostly near post locations. '16-upper rails have pack rust on most outside. Up to 1"x4" holes. '17-lower connection has many loose bolts & areas w/ section loss & pack rust for most of the length. '18-no change.

| 515      | Steel Protective Coating | Routine | 09/24/2018 | 230 SF | 0        | 0        | 138      | 92       |
|          |                      | Routine | 09/11/2017 | 230 SF | 0        | 0        | 46       | 184      |

Notes: 515. '16-most rail has surface or freckled rust. Remaining paint is flaking, heavily faded & blistered. '17-no change. '18-est 60% flaked/pilled & 40% failed.

| 800      | Critical Deficiencies or Safety Hazards | Routine | 09/24/2018 | 1 EA   | 1        | 0        | 0        | 0        |
|          |                                      | Routine | 09/11/2017 | 1 EA   | 1        | 0        | 0        | 0        |

Notes: 800. No critical structural deficiencies or serious safety hazards are present on this structure.

| 822      | Bituminous Approach Roadway | Routine | 09/24/2018 | 2 EA   | 0        | 0        | 2        | 0        |
|          |                              | Routine | 09/11/2017 | 2 EA   | 0        | 0        | 2        | 0        |

Notes: 822. Approaches settled @ both ends. '13-settlement has caused some larger cracks @ deck connection, especially the E end. '14-approaches have been patched, but dips are still prevalent. '15-some minor cracking showing through patches. Dip remains. '16-spall in E at bridge. Mod cracks in both @ abut. '17-settlement @ apps. Spall patches @ E. Large cracks @ W, minor cracks in patches @ E. '18-minor portholes in W/W no additional settlement. Settlement is 2"-3" in SE, 1"-2" in NE.

| 855      | Secondary Members (Superstructure) | Routine | 09/24/2018 | 1 EA   | 0        | 0        | 1        | 0        |
|          |                                      | Routine | 09/11/2017 | 1 EA   | 0        | 0        | 1        | 0        |

Notes: 855. Spreader beam @ midspan is moderately rusted w/ small web hole. Angle braces installed @ SW & NW corners in '07. A channel brace added to brace N fascia channel. '13-spread beam is bowed. '14-no change. '15-mod to heavy rust on spreader beam. '16-2 areas of 100% section loss on spreader. Spreaders do not contact beams except @ N fascia @ 1st 3 beams on S end. '17, '18-no change.

| 881      | Steel Section Loss | Routine | 09/24/2018 | 1 EA   | 0        | 0        | 0        | 1        |
|          |                    | Routine | 09/11/2017 | 1 EA   | 0        | 0        | 0        | 1        |

Notes: 881. 5-10% section loss on flanges of 40% of stringers. BJY did a load rating check using the 2005 rating as a basis. He assumed 15% section loss on beams and found rating was still OK as section loss on beams has not yet reached that mark. '13-field measurements taken have few bottom flanges @ 1/2", HC engineer verified section loss has not reached the 15% mark. '14-Section Loss of bottom flange measurements; 4th beam from S, 1'W of spreader beam = 13/32", 9th beam from S, 6" W of spreader beam = 11/32" (worse case), 2nd beam from N, 1'W of spreader beam = 5/6" (expansion of flange from rust). At least some section loss has occurred on most beams. An estimated average would be between 8% - 10%. '15-measurement of 4th beam from S, 1'W of spreader beam = 3/8". Holes in N fascia, see element 107. '15-used calipers to measure flange thickness-1/4" @ 9th beam from S: 15/32" @ 2nd from N; 9/32" @ 4th from S. 18" x 9.5" hole in N fascia 10' from E abut. '17, '18-larger areas of channels rusted thru. No more notable section loss of beams.
## BRIDGE L8081 CR 202(ELM CRK RD) OVER ELM CREEK

<table>
<thead>
<tr>
<th>ELEM NBR</th>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSPECT DATE</th>
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<tr>
<td>885</td>
<td>Scour</td>
<td>Routine</td>
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<td>1 EA</td>
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<tr>
<td></td>
<td></td>
<td>Routine</td>
<td>09/11/2017</td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
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</tr>
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</table>

**Notes:** 885. X - Limited risk. Monitoring required. '14-due to lots of rain from April to June of this year, much of the drift that had accumulated in the channel was washed away. We cross sectioned both sides of the bridge in September to get new baseline readings. Channel bottom @ E abut is slightly below the bottom of the timber boards on the E side. Continue to monitor. '15-no significant runoff events this year. Will continue to monitor. '16-major rain event on 9/22 caused closure of bridge as water touched bottom of beams. Bridge was monitored for scour during this time and on 10/13 bridge staff evaluated structure and found no concerns. Bridge was opened up to traffic on 10/14. '17, '18-no change.

| 890      | Load Posting or Vertical Clearance Signing | Routine     | 09/24/2018     | 1 EA     | 1        | 0        | 0        | 0        |
|          |                                                | Routine     | 09/11/2017     | 1 EA     | 1        | 0        | 0        | 0        |

**Notes:** 890. '16-load posting signs are in place & in good condition. '17, '18-no change.

| 891      | Other Bridge Signing                           | Routine     | 09/24/2018     | 1 EA     | 1        | 0        | 0        | 0        |
|          |                                                | Routine     | 09/11/2017     | 1 EA     | 1        | 0        | 0        | 0        |

**Notes:** 891. Horiz clearance signs @ all corners. NW clearance sign is bent. One Lane Bridge signs @ approaches. Permanent type III barricade @ SW guardrail end for EB traffic. '13-SW & NW horiz clearance signs are scraped, slightly bent. '14-no change. '15-NW & SW signs have been repaired/replaced. In September, bridge received new load rating & signs were placed in October. '16-new horiz clearance markers in all corners. '17, '18-no change.

| 892      | Slopes & Slope Protection                      | Routine     | 09/24/2018     | 1 EA     | 0        | 1        | 0        | 0        |
|          |                                                | Routine     | 09/11/2017     | 1 EA     | 0        | 1        | 0        | 0        |

**Notes:** 892. '16-vegetated; mod erosion around NE, NW & SW wings. '17, '18-no change.

| 893      | Guardrail                                       | Routine     | 09/24/2018     | 1 EA     | 0        | 1        | 0        | 0        |
|          |                                                | Routine     | 09/11/2017     | 1 EA     | 0        | 1        | 0        | 0        |

**Notes:** 893. Guardrail continuous over bridge-attached to steel railing. All ends turned down. Plate beam has minor damage. NW has moderate damage. '13-no change. '14-SW has minor damage. '15-SW & SE ends have been replaced w/ crashworthy end treatments. '16-SW has impact damage, slightly bent & 1 post leaning. 2 posts broken in NW. '17, '18-no change.

| 894      | Deck & Approach Drainage                       | Routine     | 09/24/2018     | 1 EA     | 0        | 0        | 1        | 0        |
|          |                                                | Routine     | 09/11/2017     | 1 EA     | 0        | 0        | 1        | 0        |

**Notes:** 894. '16-no deck drains, debris along both curbs shows runoff may not be getting off deck. '17, '18-veg along curb.

| 895      | Sidewalk, Curb, & Median                        | Routine     | 09/24/2018     | 1 EA     | 0        | 1        | 0        | 0        |
|          |                                                | Routine     | 09/11/2017     | 1 EA     | 0        | 1        | 0        | 0        |

**Notes:** 895. Timber curb on N side is cracked and gouged. '14-no change. '15-N curb is 50% deteriorated near center of span. '16-cracks in S on W half. Large split in N @ E end. N curb is deteriorated throughout. '17-veg growing, moss beginning to cover curbs. '18-no change.

| 899      | Miscellaneous Items                             | Routine     | 09/24/2018     | 1 EA     | 1        | 0        | 0        | 0        |
|          |                                                | Routine     | 09/11/2017     | 1 EA     | 1        | 0        | 0        | 0        |

**Notes:** 899. USGS monitoring station in NW. '14-bank erosion in NW corner is within 6' of USGS station. '16-bank erosion is within 4' of USGS station. '17-new delineators on bridge about 2' from outside beams to reduce loading on outer beams. '18-one delineator loose in SW.

| 900      | Protected Species                               | Routine     | 09/24/2018     | 1 EA     | 0        | 1        | 0        | 0        |
|          |                                                | Routine     | 09/11/2017     | 1 EA     | 1        | 0        | 0        | 0        |

**Notes:** 900. '16-none noted. '17, '18-no change.

**General Notes:** BRIDGE L8081(190) CR 202 (Elm Creek Rd)/Elm Creek 9/24/18 PTH, DSP & TSM. Jurisdictional transfer in '05. Bridge to be replaced beginning 12/2018; HC Proj 0408, New bridge #27C53

**Recommended Repairs:**
31. Seal deck cracks.
107. Monitor stringers for section loss.
311. Monitor bearings.
869. Monitor channel erosion in NW near USGS station.
869. Reattach loose traffic delineator in SW.

**Deck NEI:** '16-large cracks in bit overlay. Timber planks are stained w/ many checks and splits.
<table>
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<tr>
<th>ELEM NBR</th>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
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<td>CS 1</td>
<td>CS 2</td>
<td>CS 3</td>
<td>CS 4</td>
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</table>

36A. Brdg Railings NBl:  
36B. Transitions NBl:  
36C. Appr Guardrail NBl:  
36D. Appr Guardrail  
Terminal NBl:  
59. Superstructure NBl:  "16-steel beams have areas of section loss. Bearings severely rusted w/ section loss."
60. Substructure NBl:  "15-moderate decay of few timber columns at abutments."
61. Channel NBl:  Stream has had lateral migration to the west at the south end. Bank in NW has extensive erosion.
62. Culvert NBl:  
71. Waterway Adeq NBl:  
72. Appr Roadway  
Alignment NBl:  15 MPH curve just west of bridge.

---

Pat Hagstrom  
Inspector’s Signature  

Jacob Bronder  
Reviewer’s Signature
## Statement of Estimated Quantities

**Sheets:**

- [ ] Plan Quantity
- [ ] Notes

**Design by:**

- Andrew C. McGovern, Professional Engineer

**License No.:**

- 48041

**Date:**

- 08/30/2018

**Project:**

- C.R. 202, Hennepin County Project 0408

**Approach:**

- Hennepin County

**Approach:**

- Federal

**Approach:**

- Township

**Approach:**

- Federal

**Approach:**

- Township

### Notes

1. **Existing Building:**
   - See Special Provisions

2. **Existing Building:**
   - See Special Provisions

3. **Existing Building:**
   - See Special Provisions

4. **Existing Building:**
   - See Special Provisions

5. **Existing Building:**
   - See Special Provisions

6. **Existing Building:**
   - See Special Provisions

### Table: Estimated Quantities

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**Last Revision:**

- D. Seiler

**Date:**

- 08/30/2018
### Statement of Estimated Quantities

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**I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.**

**DESIGN BY:**

**CHECKED BY:**

**LAST REVISION:**

**STATEMENT OF ESTIMATED QUANTITIES**

**SHEET**

**C.R. 202 HENNEPIN COUNTY PROJECT 0408**

**S.P. 027-596-009**

**404041 08/30/2018**

**ANDREW C. MCGOVERN, PROFESSIONAL ENGINEER**

**D. SEILER**

**J. SCHERER**

**PA: 3932 08/30/2018**
BASIS OF ESTIMATED QUANTITIES

| AGGREGATE BASE CLASS 5 | 0.0675 TONS PER CU. FT. |
| AGGREGATE SURFACING CLASS 2 | 0.0675 TONS PER CU. FT. |
| WATER | 50 (M) GALLONS PER DIRECTIONAL MILE |
| CALCULUM CHLORIDE SOLUTION | 0.23 GALLONS PER SQ. YD. OF GRADING |
| WEARING AND NON-WEARING BITUMINOUS MIXTURE | 113 LBS. PER SQ. YD. PER 1" THICKNESS |
| BITUMINOUS MATERIAL FOR TACK COAT | 0.05 GAL. PER SQ. YD. |
| FERTILIZER TYPE 3 SLOW RELEASE 0-10-20 (NPK) | 90 POUNDS PER ACRE |
| SEED MIXTURE 36-241 | 55.5 POUNDS PER ACRE |
| BITUMINOUS MIXTURE FOR TACK COAT | 0.05 GAL. / SQ. YD. |

THE FOLLOWING STANDARD PLATES APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION SHALL APPLY ON THIS PROJECT.

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NOTE: ADDITIONAL STANDARD PLATES CAN BE FOUND ON PLAN SHEET TC1

SOIL / CONSTRUCTION NOTES

1. GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE.
2. SUITABLE GRADING MATERIAL ON THIS PROJECT, WHETHER OBTAINED LOCALLY OR FROM DUSHOW, SHALL CONSIST OF ALL SOILS EXCEPT TOPSOIL, DEBRIS, PEAT, MUCK AND ORGANIC OR OTHER UNSTABLE MATERIAL. ALL SUITABLE GRADING MATERIAL SHOULD BE EITHER A UNIFORM SOIL TYPE OR SUFFICIENTLY MIXED AND BLENDED TO BE UNIFORM. ALL MATERIAL IS SUBJECT TO THE DISCRETION OF THE ENGINEER.
3. GRAULAM MATERIAL SHALL MEET THE REQUIREMENTS OF MINN DOT SPEC. 3149.251
4. SELECT GRANULAR MATERIAL SHALL MEET THE REQUIREMENTS OF MINN DOT SPEC. 3149.252
5. SELECT GRANULAR MATERIAL MODIFIED (10%) SHALL MEET THE REQUIREMENTS OF MINN DOT SPEC. 3149.282, MODIFIED SUCH THAT THE PORTION PASSING A 1" SIEVE, NOT MORE THAN 10% SHALL PASS A NO. 200 SIEVE.
6. GRAULAM BASELINE IS DEFINED AS THE BOTTOM OF THE SELECT GRANULAR MATERIAL.
7. SUBGRADE EXCAVATION IS MEASURED FROM THE GRAULAM BASELINE TO THE GRADING GRADE.
8. STRIP SOIL AND TOPSOIL FROM AREAS TO BE BURIED BY CONSTRUCTION AND REUSE AS SLOPE DRESSING. FOR ESTIMATING PURPOSES, THE DEPTH OF THE TOPSOIL AVAILABLE IS CONSIDERED TO BE FOUR INCHES.
9. ALL TOPSOIL STRIPPING SHALL BE CONSIDERED TO BE COMMON EXCAVATION.
10. IN FILL SECTIONS, TOPSOIL AND OTHER UNSUITABLE MATERIALS SHALL BE ELIMINATED FROM THE UPPER 3 FEET OF THE GRAULAM GRADE BENEATH THE ROADWAY, WITHIN THE LIMITS SHOWN IN THE CROSS SECTIONS.
11. DETERMINE COMPACTION ON THE GRADING PORTION OF PERMANENT CONSTRUCTION IN ACCORDANCE WITH THE "QUALITY COMPACTION METHOD - ROADBED EMBANKMENT" (SEE SPECIAL PROVISIONS).
12. COMPACTATION OF THE ADOUCITCE BAF Layer SHall BE DETERMINED IN ACCORDANCE WITH THE QUALITY COMPACTION METHOD.
13. COMPACTATION OF THE GRADING AND AGGREGATE ITEMS ON DRIVEWAYS, DRUMMENOUS TRAILS, BYWAYS AND OTHER TEMPORARY WORK SHALL BE DONE BY THE "QUALITY COMPACTATION METHOD."
14. WHERE CONNECTING TO INPLACE ROADWAYS AT THE TERMINI OF PROPOSED CONSTRUCTION, CUT VERTICALLY TO THE BOTTOM OF THE INPLACE SURFACING OR TO THE BOTTOM OF THE NEW SURFACING, WHICHsoever IS DEEPER, THEN 1/4" TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION, UNLESS OTHERWISE NOTED, USE A SAWTOOTH TO PROVIDE A SMOOTH JOINT.
15. PROVIDE 1V2" HORIZONTAL TAPERS WHEN CHANGING EXCAVATION DEPTHS.
17. IN FILL SECTIONS, TOPSOIL AND OTHER UNSUITABLE MATERIALS SHALL BE ELIMINATED FROM THE UPPER 3 FEET OF THE GRAULAM GRADE BENEATH THE ROADWAY, WITHIN THE LIMITS SHOWN IN THE CROSS SECTIONS.
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(1) See Bridge Plans Sheet 6 (Notes)

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(1) Offsets are to end of apron
(2) 1/4 Last 3 pipes leading to apron

### G. Removals

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PROJ TOTAL | 2046 | 1058 |
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</table>

### UTILITY CONTACTS:

- **CONNEEXUS ENERGY**
  - Phone: 612-323-4215
  - 1460 Rangey Blvd N
  - Minneapolis, MN 55403

- **U.S. GEOLOGICAL SURVEY**
  - Phone: 612-793-3295
  - 2230 Hvoole Drive
  - Mounds View, MN 55112

### NOTES:

Utilities are shown at approximate locations. The contractor shall determine the actual location of all utilities in the field.

All utility work shown on these sheets shall be done by others unless noted.

It shall be the contractor's responsibility to utilize the Minnesota State One Call System to determine the exact location of all underground utility locations.

The subsurface utility information in this plan is utility quality level B. This utility quality level was determined according to the guidelines of the State of Minnesota, Chapter 270B for all underground utility locations.

The subsurface utility information in this plan is utility quality level B. This utility quality level was determined according to the guidelines of the State of Minnesota, Chapter 270B for all underground utility locations.

**STA. 8+83 TO STA. 15+00**

---

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DUTY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Andrew S. McGovern, Professional Engineer

---

PUBLIC UTILITY PLAN AND TABULATION

C.R. 202 Hennepin County Project 0408
S.P. 027-596-009

7/59
Typical Section with Guardrail

Sta. 15428 to 15499
Sta. 16467 to 20450

Guardrail

Clear Zone

Grading Grade

Profile Grade

Inset "A"

Typical Section Without Guardrail

Sta. 8483 to 15428

Guardrail

Clear Zone

Grading Grade

Profile Grade

Inset "A"

Notes:

2. See MNDOT Standard Plans Sheets 21-33 for Guardrail details and Guardrail P.I. Requirements. Place 3" strip of Cl. 2 agg. at bituminous edge.
4. Max. 0.07 rollover in Super-elevation Areas.
5. Extended Shoulder Station 12+67.7 to 14+80.6 Right.
6. Incline of ditch section 9480 to 14435 Right 16.7%. All grades are ft/ft.
7. 12" Minimum rollover for compaction and uniformity.
8. 4" Drain tile See Sheets 40-41 for locations. Tiles to drain to headwall inverts. Fine Filter aggregate incidental to drain tile.
Rounding Shoulders and Backslopes

Converting Road Cuts

Shaping for Drainage Along the Toe of Fill Slopes

Shaping and Topsoiling Inslopes

Shaping Adjacent to Curbs When Sod is Placed

Notes:

See Spec 2575.3 for additional information.

1. Construct tapers as directed by the engineer.

Engineer's Notes:

- See Spec 2575.3 for additional information.
- Construct tapers as directed by the engineer.

Permanant Erosion Control

Along Roadways, Ditches and Flumes

Minnesota Department of Transportation

State Project Number

Sheet No. 10 of 59 Sheets
SLOPES FLATTER THAN 1:2
1200 STAPLES PER 100 SQ YD

SLOPES 1:12 TO 1:1
1370 STAPLES PER 100 SQ YD

CHANNEL AND DITCH APPLICATIONS
1090 STAPLES PER 100 SQ YD

PLACE SINGLE ROW STAPLES AT 3' SPACING along the bottom of the trench.

PLACE SINGLE ROW STAPLES AT 12" SPACING between the bottom of the trench and the backfill.

PLACE DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER.

OVERLAP/WRAP BLANKET 6" (MIN.) AT EACH END. OVERLAP BOTTOM END OF UPPER BLANKET.

STAPLE ALONG OVERLAP EVERY 1.5'.

REINFORCED MATRIX FIBER MATRIX OR HYDRAULIC BONDED PATTERNS.

GENERAL BLANKET INSTALLATION REQUIREMENTS

PREPARE SOIL AS PER SPECIFICATION 2574.
LAY PARALLEL OR PERPENDICULAR TO THE DIRECTION OF WATER FLOW.
OVERLAP ADJACENT STRIPS EDGES A MINIMUM OF 4 INCHES.
OVERLAP BLANKET 6" (MIN.) AT EACH END. OVERLAP BOTTOM END OF LAYERED BLANKETS EVERY 10'.

CHECK SLOT REQUIREMENTS
DIG A 6 INCH BY 6 INCH TRENCH.
INsert BLANKET INTO COMPLETE TRENCH PERIMETER.
PLACE SINGLE ROW STAPLES AT 3' SPACING ALONG THE Bottom of the trench.

CHECK SLOT AT BEGINNING OF BLANKET
USE CHECK SLOT DETAIL (NO ALTERNATES).

OVERLAP ADJACENT STRIPS EDGES A MINIMUM OF 4 INCHES.
OVERLAP BLANKET 6" (MIN.) AT EACH END. OVERLAP BOTTOM END OF LAYERED BLANKETS EVERY 10'.

CHECK SLOT WHERE BLANKET CONTINUES
CHECK SLOT REQUIREMENTS
DIG A 6 INCH BY 6 INCH TRENCH.
INsert BLANKET INTO COMPLETE TRENCH PERIMETER.
PLACE SINGLE ROW STAPLES AT 3' SPACING ALONG THE Bottom of the trench.

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CHECK SLOT REQUIREMENTS
DIG A 6 INCH BY 6 INCH TRENCH.
INsert BLANKET INTO COMPLETE TRENCH PERIMETER.
INSTALLATION GUIDELINES
FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB

1. For anchor spacing and weight requirements, see Spec. 2573.
2. In areas where the plan calls for an anchor at a bridges, culverts, or slopes, a temporary rock berm constructed from the riprap can be used to provide additional protection when the work is complete. The riprap can then be moved to the permanent location indicated in the plans. The temporary rock berm is incidental.
3. On U.S. coast guard or other motorized waterways, buoys are required to mark the ends and special areas for visibility. Place buoys as required for navigational purposes.
4. Minimum water depth applies to the deepest point along the riprap being protected. Minimum water depth for temporary riprap should be determined after installation of riprap.
5. Steel curtain should be removed when the area contributing to direct runoff has been temporarily or permanently stabilized. Steel curtain should also be removed before winter if ice up or ice flow is anticipated.
6. Embed post into bottom a minimum of 48 in. of the water depth (including wave height, but in no case shall embedment be less than 2 feet).
7. Anchor float must be connected securely to sleeve with a minimum tensile strength of 300 lbs. Connection method must allow for sleeve to move freely on post.
8. Provide sufficient number of post anchors to maintain steel curtain position.

INSTALLATION GUIDELINES FOR temporary sediment control
SILT CURTAIN OR SILT FENCE TYPE TB

1. FOR ANCHOR SPACING AND WEIGHT REQUIREMENTS, SEE SPEC. 2573.
2. IN AREAS WHERE THE PLAN CALLS FOR AN ANCHOR AT A BRIDGE, CULVERT, OR SLOPE, A TEMPORARY ROCK BERM CONSTRUCTED FROM THE RIPRAP CAN BE USED TO PROVIDE ADDITIONAL PROTECTION WHEN THE WORK IS COMPLETE. THE RIPRAP CAN THEN BE MOVED TO THE PERMANENT LOCATION INDICATED IN THE PLANS. THE TEMPORARY ROCK BERM IS INCIDENTAL.
3. ON U.S. COAST GUARD OR OTHER MOTORIZED WATERWAYS, BUOYS ARE REQUIRED TO MARK THE ENDS AND SPECIAL AREAS FOR VISIBILITY. PLACE BUOYS AS REQUIRED FOR NAVIGATIONAL PURPOSES.
4. MINIMUM WATER DEPTH APPLIES TO THE DEEPEST POINT ALONG THE RIPRAP CURTAIN OR SILT FENCE TYPE TB.
5. SILT CURTAIN SHOULD BE REMOVED WHEN THE AREA CONTRIBUTING TO DIRECT RUNOFF HAS BEEN TEMPORARILY OR PERMANENTLY STABILIZED. SILT CURTAIN SHOULD ALSO BE REMOVED BEFORE WINTER IF ICE UP OR ICE FLOW IS ANTICIPATED.
6. EMBED POST INTO BOTTOM A MINIMUM OF 48 IN. OF THE WATER DEPTH (INCLUDING WAVE HEIGHT, BUT IN NO CASE SHALL EMBEDMENT BE LESS THAN 2 FEET).
7. ANCHOR FLOAT MUST BE CONNECTED SECURELY TO SLEEVE WITH A MINIMUM TENSILE STRENGTH OF 300 LBS. CONNECTION METHOD MUST ALLOW FOR SLEEVE TO MOVE FREELY ON POST.
8. PROVIDE SUFFICIENT NUMBER OF POST ANCHORS TO MAINTAIN STEEL CURTAIN POSITION.
SEDIMENT CONTROL LOGS

1 in. x 2 in. x 24 in. long wooden stakes shall be driven through the back half of the sediment control log as an angle of 45 degrees with the top of the stake pointing upstream. Place sediment control log in shallow trench 6 to 2 in. deep.

Sediment Control Log Placement:

- Backfill and compact soil from trench or upgradient size of sediment control log.
- Place sediment control log in shallow trench 6 to 2 in. deep.
- Types: Straw, wood fiber, or coir.

Other Applications:

Space between stakes shall be a maximum of 1 foot for ditch checks or 2 feet for slopes or as needed due to other factors. Stakes shall be incidental. Place stakes as needed to prevent movement of sediment control logs placed on slopes or as needed due to other factors. Stakes shall be incidental.

Types:
- Wood chip, compost, or rock.

NOTES:

- See specs. 2573, 3149, 3874, 3882, 3886, & 3897.
- Type 1 (Compost), Type 2 (Slash Mulch or Topsoil), Type 3 (Rock Weeper), Type 4 (Rock).
- Filter berm placement:
  - Type 3: Rock Weeper
  - Type 5: Rock
  - Type 1 (Compost), Type 2 (Slash Mulch or Topsoil)

Trench Method:

- Flow
- Water
- 2 ft.
- 8 ft.
- 5 ft.
- 2 ft.
- 4 ft.
- 2 ft.
- 6 ft.
- 2 ft.
- 5 ft.
- 2 ft.
- 4 ft.

Filter Bерms:

- Type 3: Rock Weeper
- Type 5: Rock
- Type 1 (Compost), Type 2 (Slash Mulch or Topsoil)

Bale Barriers:

- Flow
- Water
- 2 in. x 2 in. x 24 in. wood stakes or reinforcing bars in each bale embedded 18 inches minimum in the ground.
- Embed bales 4 in. into ground.
- Flow
- Water
- 6 in. staples at 1 ft. o.c.
- Embedment Method
- Blanket Method (Alternate)
- Type 3 Erosion Control Blanket 6 ft. high

Temporary Sediment Control:

Filter Berms, Sediment Control Logs, and Bale Barriers
For use on rough graded areas:

- **Erosion Control Blankets**
  - Type IV (Spec. 3733)
  - Spaced 1' 0" on center
  - 8" x 11 ga. staples spaced 1' 0" on center

- **Filter Berms**
  - Type 3 (Rock Weeper) or Type 5 (Rock) (shown)

- **Sediment Control Logs**
  - Wood fiber, or Type Compost (shown)

**Notes:**

- See Spec. 2573, 3681, 3733, 3885, 3886 & 3889.

- For ditch checks, place sediment control log perpendicular to flow and in a crescent shape with the ends facing upstream.

- Approximate spacing between each ditch check should be determined from the following spacing formula:

  \[ \text{Spacing} = \frac{\text{Channel Width}}{\text{Channel Slope} + 1} \]

- Point A must be a minimum of 6 inches higher than Point B to ensure that water flows over the dike and not around the ends.

- Permanent rock ditch checks placed within the clearance zone are to be 3'0" or less in height, a 1:6 approach and departure slope shall be provided.

- Ditch grade 3% - 5%, max. flow velocity 12 ft/sec.

- Ditch grade 1.5% - 3%, max. flow velocity 4.5 ft/sec.

- Ditch grade 1.5% - 3%, max. flow velocity 1.5 ft/sec.

- Ditch grade 3% - 5%, max. flow velocity 12 ft/sec.

- Ditch grade 1.5% - 3%, max. flow velocity 4.5 ft/sec.
ROCK SOCK OR SAND BAGS IN PLACE OF THE FLAP POCKETS. FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2 INCH X 4 INCH OR USE A STEEL COVER 3/16" THICK (MIN.) STEEL PLATE 3/16" THICK (MIN.) ROCK LOG/COMPOST LOG

CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION. AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE HEAT BONDED SEAM (OR APPROVED EQUIVALENT). FILL ROCK LOG WITH OPEN GRADED JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER. SEAM TO BE WIRE REINFORCED WITH 36" GEOTEXTILE. SEE SPECS. 2573, 3137, & 3886.

THAT WOULD IMPED TRAFFIC FLOW. DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY TO ACHIEVE THE 3 INCH SIDE CLEARANCE. WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES. PLACED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE OF 3 INCHES BETWEEN MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE SEDIMENT CONTROL BARRIER SHALL BE A METAL BUTT JOINTS SET WIDE ENOUGH TO PREVENT LOSS OF OPEN GRADES AGGREGATE FILL. SECURED WITH PREVENT LOSS OF OPEN GRADED ENDS SECURELY CLOSED TO AGGREGATE FILL. SECURED WITH WIRE OR PLASTIC TIES. BAGS SHALL BE HEAT CUT INTO ALL FOUR SIDE PANELS.

NOTES:
- USE SPEC. 2573, 3137, & 3886.
- DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY THAT WOULD IMPED TRAFFIC FLOW.
- ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3137.
- FINISHED SIZE INCLUDING POCKETS WHERE REQUIRED SHALL EXTEND A MINIMUM OF 12 INCHES AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- INSTALLATION NOTES:
  1. DO NOT PLACE FILTER BAG INSERT IN INLETS SHALLOWER THAN 30 INCHES.
  2. FLAP SOCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2 INCH X 4 INCH OR USE A ROCK SOCK OR SAND BAGS IN PLACE OF THE FLAP SOCKETS.
  3. SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING ON ROADWAY.
  4. GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER SEAM TO BE JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A HEAT BONDED SEAM OR APPROVED EQUIVALENT. FULL ROCK LOG WITH OPEN GRADES AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF CORRESPONDING TO SPEC. 3137 TABLE 3137-CRA-3 GRADATION.
SHEET PAD CONSTRUCTION EXIT

SLASH MULCH, CRUSHED ROCK, OR SHEET PAD CONSTRUCTION EXIT

RUMBLE PAD CONSTRUCTION EXIT

GEOTEXTILE FABRIC
GROUND INPLACE
6'' MIN.
COMPACTED SOIL
CROSS SLOPE 3% OR FLATTER
GEOTEXTILE FABRIC
CORRUGATED STEEL PANELS
SLASH MULCH
TO 2'' CRUSHED ROCK OR 6'' MIN. DEPTH OF 1''

NOTES:

1. MINIMUM LENGTH SHALL BE THE GREATER OF 58 FEET OR A LENGTH SUFFICIENT TO ALLOW A MINIMUM OF 5 TIRE ROTATIONS ON THE PROVIDED PAD. MINIMUM LENGTH SHALL BE CALCULATED USING THE LARGEST TIRE WHICH WILL BE USED IN TYPICAL OPERATIONS.
2. PROVIDE RADIUS OR WIDEN PAD SUFFICIENTLY TO PREVENT VEHICLE TIRES FROM TRACKING OFF OF PAD WHEN LEAVING SITE.
3. IF RAINFOREST FROM DISTURBED AREAS FLOWS TOWARDS CONSTRUCTION EXITS, PREVENT RUNOFF FROM DRAINING DIRECTLY TO PUBLIC ROAD OVER CONSTRUCTION EXIT BY CROWNING THE EXIT OR SLOPING TO ONE SIDE. IF SURFACE GRADING IS INSUFFICIENT, PROVIDE OTHER MEANS OF INTERCEPTING RUNOFF.
4. IF RUNOFF FROM CONSTRUCTION EXITS WILL DRAIN OFF OF PROJECT SITE, PROVIDE A SEDIMENT TRAP WITH STABILIZED OVERFLOW.
5. IF A TIRE WASH-OFF IS REQUIRED, THE CONSTRUCTION EXITS SHALL BE GRADED TO DRAIN THE WASH WATER TO A SEDIMENT TRAP.
6. MINIMUM LENGTH OF RUMBLE PAD SHALL BE 20 FEET OR AS REQUIRED TO REMOVE SEDIMENT FROM TIRES. IF SIGNIFICANT SEDIMENT IS TRACKED FROM THE SITE, THE RUMBLE PAD SHALL BE LENGTHENED OR THE DESIGN MODIFIED TO PROVIDE ADDITIONAL VIBRATION. WASH-OFF LENGTH SHALL BE AS REQUIRED TO EFFECTIVELY REMOVE CONSTRUCTION SEDIMENT FROM VEHICLE TIRES.
7. MAINTENANCE OF CONSTRUCTION EXITS SHALL OCCUR WHEN THE EFFECTIVENESS OF SEDIMENT REMOVAL HAS BEEN REDUCED. MAINTENANCE SHALL CONSIST OF REMOVING SEDIMENT AND CLEANING THE MATERIALS OR PLACING ADDITIONAL MATERIAL (SLASH MULCH OR CRUSHED ROCK) OVER SEDIMENT FILLED MATERIAL TO RESTORE EFFECTIVENESS.

MIN. LENGTH = 2
MIN. 10 FT
MIN. 10 FT

S.P. 027-596-009
HENN. CO. PROJ. NO. 0408 C.R. 202

STATE DESIGN ENGINEER

TRANSPORTATION DEPARTMENT

STATE PROJ. NO. SHEET NO. 17 OF 59 SHEETS

STANDARD PLAN 5-297.405 5 OF 8
SILT FENCE TYPE SD (SUPER DUTY)  
BARRIER WITHOUT LOOP BARS

SILT FENCE TYPE SD (SUPER DUTY)  
BARRIER WITH LOOP BARS

NOTES:
- SEE SPECS. 2533, 2573 & 3886.
- SILT FENCE TYPE SD USED TO PROTECT CRITICAL AREAS FROM SHEET FLOW, AND AREAS WHERE OTHER SILT FENCES CANNOT BE PLACED. MAXIMUM CONTRIBUTING AREA: 1 ACRE.
- PLACE SILT FENCE TYPE SD ALONG A CONSTANT ELEVATION.
- SILT FENCE TYPE SD CAN UTILIZE EITHER A CONCRETE, OR WATER FILLED, TEMPORARY MEDIAN BARRIER.
- PLACING STOCK PILES NEXT TO AN ENVIRONMENTALLY SENSITIVE AREA IS NOT RECOMMENDED. WHEN THERE ARE NO FEASIBLE ALTERNATIVES, PLACE SILT FENCE SD AS SHOWN OR AS DIRECTED BY THE ENGINEER.
- CRITICAL AREAS INCLUDE WETLANDS, JUDICIAL DITCHES, STREAMS, WATER BODIES, AND OTHER AREAS REQUIRING PROTECTION.

- SILT FENCE TYPE SD CAN UTILIZE EITHER A CONCRETE, OR WATER FILLED, TEMPORARY MEDIAN BARRIER.
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- CRITICAL AREAS INCLUDE WETLANDS, JUDICIAL DITCHES, STREAMS, WATER BODIES, AND OTHER AREAS REQUIRING PROTECTION.
CULVERT STANDPIPE INSERT (D-RISER)

- PVC PIPE
- INSERT 1/3 DIAMETER OF RISER PIPE
- BREAK AWAY CONNECTION

EMERGENCY SPILLWAY (FLOOD STAGE)

- TOP OF RISER MUST BE BELOW ELEVATION

SEDIMENT CONTROL LOG TYPE ROCK
- SPRAY USED TO FILL ONLY TO TOP OF CULVERT PIPE

LONGITUDINAL SECTION

- FLOW
- TOP VIEW

TIE ENDS INTO EMBANKMENT TO PREVENT END-AROUND SCOURING
- WOOD PLANKS TIGHTLY ABUTTED TOGETHER AND AGAINST THE CULVERT END.

WOOD PLANK WEIR
- FLOW
- PLAN VIEW

SEDIMENT CONTROL LOG WEIR
- COMPPOST, WOOD CHIP, OR ROCK
- TIE ENDS INTO EMBANKMENT TO PREVENT END-AROUND SCOURING

NOTES:
- SEE SPECS. 2873, 3891 & 3893.
- FOR USE WHEN TEMPORARY PONDING IS NEEDED IN DITCH SECTIONS FOR SEDIMENT CONTROL.
- MANUFACTURED ALTERNATIVES LISTED ON MNDO"T'S APPROVED PRODUCTS LIST MAY BE SUBSTITUTED AT ADDITIONAL COST.
- ROCK LOG OR RIPRAP TO HOLD STANDPIPE AND ACT AS A SEAL BETWEEN RISER PIPE AND CULVERT.
- PLACE CULVERT APRON AND SLIDE TEMPORARY STANDPIPE INTO CSP OR RCP CULVERT.
- ALL GEOTEXTILE USED FOR CULVERT PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886.
- WOOD PLANKS TIGHTLY ABUTTED TOGETHER AND AGAINST THE CULVERT END.
- SPRAY NOTCHED IN TOP PLANKS, VARY THE NUMBER OF PLANKS TO CONTROL WATER LEVEL.
SUBSURFACE DRAIN, WIDENED PAVEMENT DESIGN WITH PAVEMENT EDGE DRAIN

NOTES:
1. See special provisions for material and construction details.
2. Bituminous shoulder should overlap pavement maximum amount permitted by structural design but bottom should not be above the bottom of inplace pavement.
3. As required by design standards.
4. Drain shall be pavement edge drain type. After compaction, fine filter aggregate in drain shall extend at least 4" above the bottom of the future permeable aggregate base.
5. Geotextile may be deleted if class 5 or 6 base exists inplace under permeable base.
6. If class 5 or 6 base is inplace below the P&B, bottom of filter pipe should be a minimum of 3" below base/subgrade interface or a maximum of 6", whichever is deeper.

NEW BITUMINOUS SHOULDER
4'' PERF. PE PIPE, 3278 (NO WRAP)

SUBSURFACE DRAIN, PAVEMENT EDGE DRAIN TYPE

NOTES:
1. See special provisions for material and construction details.
2. Design for 12" cover from top of pipe to top of shoulder 12" minimum.

SUBSURFACE DRAIN, PERMEABLE AGGREGATE BASE & DRAIN USED WITH PASSRC

NOTES:
1. PASSRC - Permeable Asphalt Stabilized Stress Relief Course.
2. See special provisions for material and construction details.
3. Width as needed to support paver track.
4. Permeable aggregate to be compacted 2" above top of passrc after compaction.
5. Interceptor drains typically used at this location. See details & special provisions if applicable.
6. If the bituminous shoulder remains inplace, the passrc and shoulder can be removed by milling, trenching, or other methods, provided the remaining bituminous shoulder is not disturbed/depleted.

SUBSURFACE DRAINS
SECTION VIEW

NOTES:

1. THE UPSTREAM ENDS OF THE PERFORATED PIPE SHALL BE CAPPED AS APPROVED BY THE PROJECT ENGINEER. THE CAPS ARE INCIDENTAL. PLACE PERFORATED PIPE WITH THE PERFORATIONS DOWN.

2. MAXIMUM LENGTH 500 FT., EXCEPT 300 FT. MAXIMUM FOR GRADES LESS THAN 0.2%. LENGTH INCLUDED AND PAID FOR AS SPEC. 2502, 4 INCH DIA. TP PIPE DRAIN.

3. LENGTH INCLUDED AND PAID FOR AS SPEC. 2502, 4 INCH PRECAST CONCRETE HEADWALL.

4. DETAILS OF CONNECTION AND COUPLING TO PIPE SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR "T"-AND EXTRA CONNECTION, 11" INCH TP PIPE AND COUPLING TO BE INCIDENTAL.

5. SEE DRAWN TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.

6. SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS.

7. 3 INCH OR 4 INCH DIAMETER.

8. DRIVING LANE

9. SHOULDER

TYPICAL PLAN VIEW (LOW POINT "T" DISCHARGE) ③

SEE SUBSURFACE DRAIN DETAILS

SEE TABULATION FOR LOCATIONS
NOTES:

1. ALL CROSS SLOPES ARE IN FT/FT UNLESS OTHERWISE NOTED.
2. ALL GUARDRAIL POSTS SHALL BE 6 FT. 3 IN. CENTER TO CENTER (DESIGN B).
3. WHEN GUARDRAIL HARDWARE ARE NOT INCIDENTAL TO GUARDRAIL INSTALLATION, GRADING AND DRAINAGE HARDWARE ARE NOT INCIDENTAL TO GUARDRAIL INSTALLATION.
4. THE LAST 50 FT. OF TANGENT TERMINALS CAN BE PLACED AT 1:10 TAPER.
5. WHEN GRADING PLATFORMS ARE BUILT, THEY MUST BE SMOOTHLY TRANSITIONED TO EXISTING SIDE SLOPE SO THE ENTIRE ROADSIDE APPROACH TO THE BARRIER REMAINS TRAVERSABLE, AS WELL AS THE AREA IMMEDIATELY BEHIND IT.
6. SEE STANDARD PLATE 837.
7. SNOWPLOW MARKER (X4-5) WITH A 2 LB/FT. DELINERATOR POST 8 FT. LONG; SNOWPLOW DRIVEN INTO THE GROUND, EXTEND 3 FT. ABOVE TERMINAL. MARKER IS INCIDENTAL FOR WHICH NO DIRECT PAYMENT WILL BE MADE. MARK BOTH THE BEGINNING AND END OF PLATE BEAM GUARDRAIL INSTALLATION.
8. USE FLARED SLOPE P.I.
9. GRADUALLY BLEND SLOPE FROM TRAVERSABLE AREA TO STEEP EXISTING SLOPE WHEN SLOPE IS STEEPER THAN 1:6.
10. IF THE TERRAIN BEYOND THE TERMINAL END AND IMMEDIATELY BEHIND THE BARRIER IS NOT SAFELY TRAVERSABLE, A TANGENT ENERGY-ABSORBING TERMINAL SHALL BE USED.

FOR SLOPES STEEPER THAN 1:3 THE AREA IMMEDIATELY BEHIND AND BEYOND THE END TERMINAL SHOULD, AT LEAST, BE SIMILAR IN CROSS SECTION TO THE UNSHIELDED ROADSIDE AREA UPSTREAM OF THE END TERMINAL.

WHEN GRADING PLATFORMS ARE BUILT, THEY MUST BE SMOOTHLY TRANSITIONED TO EXISTING SIDE SLOPE SO THE ENTIRE ROADSIDE APPROACH TO THE BARRIER REMAINS TRAVERSABLE, AS WELL AS THE AREA IMMEDIATELY BEHIND IT.
NOTES:

1. Anchor bracket bolted to beam with (8) ⅝" x 1½" hex head bolts, grade 5, and ⅝" washer.

2. Foundation tube shall be manufactured using ASTM A500B steel and shall conform to ASTM A588 grade B material.

All rail and hardware components per AASHTO Spec. M 188.

Foundation tube shall conform to ASTM A588 grade B material.
SEE CURB DETAILS ON SHEET 4 OF 5.
SEE STANDARD PLAN 5-297.695.

THRIE BEAM ANCHORAGE PLATE (STANDARD PLATE 8350), INCIDENTAL.

SINGLE SLOPE CONNECTION WEDGE PLATE (STANDARD PLATE 8352), INCIDENTAL.

A MINIMUM OF 12'-6" OF W-BEAM RAIL IS REQUIRED BEFORE END TREATMENT.

OF 12-GAUGE W-BEAM RAIL SHALL BE NESTED. THIS ADDED COMPONENT WHERE CURB EXTENDS UPSTREAM OF POST NO. 8, THIS 12'-6" SECTION POST 8 AND 37'-6" UPSTREAM FROM THE BARRIER ANCHORAGE PLATE.

CURB TRANSITION, NO CHANGE IN CURB DESIGN CAN OCCUR BETWEEN

W-BEAM RAIL SPLICE BOLTS AND NUTS AS SPECIFIED BY AASHTO SPEC. M 180.

ALL POSTS STAMPED WITH POST SIZE AND LENGTH VISIBLE AFTER BEING PLACED.

W-BEAM RAIL SPLICE BOLTS AND NUTS AS SPECIFIED BY AASHTO SPEC. M 180.

1. CURB TRANSITION, NO CHANGE IN CURB DESIGN CAN OCCUR BETWEEN
POST 8 AND 37'-6" UPSTREAM FROM THE BARRIER ANCHORAGE PLATE.

2. WHERE CURB EXTENDS UPSTREAM OF POST NO. 8 THIS 12'-6" SECTION
OF 12-GAUGE W-BEAM RAIL SMALL BE NESTED, THIS ADDED COMPONENT IS INCIDENTAL.

3. A MINIMUM OF 12'-6" OF W-BEAM RAIL IS REQUIRED BEFORE END TREATMENT.

4. SINGLE SLOPE CONNECTION WEDGE PLATE (STANDARD PLATE 8352), INCIDENTAL.

5. THRIE BEAM ANCHORAGE PLATE (STANDARD PLATE 8350), INCIDENTAL.

6. SEE STANDARD PLAN 5-297.695.

7. SEE CURB DETAILS ON SHEET 4 OF 5.

8. BIT CURB INCIDENTAL TO GUARDRAIL INSTALLATION. (SEE SPECIAL PROVISIONS)
ALL GUARDRAIL HARDWARE PER AASHTO SPEC. M 180.

ALL POSTS STAMPED WITH POST SIZE VISIBLE AFTER BEING PLACED.

WOOD BLOCKOUTS SHOWN. PROPRIETARY BLOCKOUTS THAT MEET THE REQUIREMENTS OF MASH MAY BE SUBSTITUTED AT NO ADDITIONAL COST. BLOCKOUTS SHALL NOT ROTATE AFTER INSTALLATION.

NOTES:
36"/42" SINGLE SLOPE BARRIER

6" BIT. CURB TO 6" BIT. CURB TRANSITION

54" SINGLE SLOPE BARRIER

6" BIT. CURB TO 0"/NO CURB TRANSITION

NOTES:
36", 42", AND 54" SINGLE SLOPE BARRIERS AVAILABLE.

(1) FOR ALL SINGLE SLOPE BARRIER HEIGHTS, 54" CURB TRANSITION LOCATION IS BETWEEN POSTS 6 AND POST 8.

(2) SEE BRIDGE APPROACH PANEL LAYOUT SHEETS FOR DIMENSION.

(3) SEE STANDARD PLAN 5-297.229

(4) BIT CURB INCIDENTAL TO GUARDRAIL INSTALLATION, SEE SPECIAL PROVISIONS.
NOTES:

REFER TO BRIDGE PLAN SHEET B17 FOR ADDITIONAL INFORMATION.
BIT CURB INCIDENTAL TO GUARDRAIL INSTALLATION.
SEE SPECIAL PROVISIONS:

① SEE STANDARD PLATE 0350.
② SEE STANDARD PLATE 0352.
ASYMMETRICAL W-BEAM TO THRIE BEAM TRANSITION

SECTION B-B
STANDARD W-BEAM RAIL THRU SECTION

NOTES:
STEEL PLATE BEAM GUARDRAIL SHALL CONFORM TO AASHTO M180.
ASYMMETRICAL TRANSITION DETAIL IS MIRRORED FOR OPPOSITE SIDE INSTALLATION.
DRAINAGE, SUPERELEVATION & TURF ESTABLISHMENT PLAN
C.R. 202 HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER
48041 8/23/2018

LEGEND

- EDGE OF PAVEMENT
- LANE LINE
- EDGE OF GRAVEL SHOULDER
- TRAFFIC DIRECTION
- SUBSURFACE DRAIN
- PRECEDING TYPE 3 AND EROSION CONTROL BLANKET CATEGORY 3N

STA. 8+83 TO STA. 15+00

ELEV. = 861.72
ELEV. = 860.25

EXISTING WOOD 6"x6" POSTS

WEED, FERTILIZER TYPE 3 AND EROSION SEED MIXTURE 35-241 W/

SCALE 1" = 50'
MATCHLINE STA 15+00 TO STA. 20+50
EXISTING WOOD 6"x6" POSTS
ELEV. = 858.5
HEADWALL INV. ELEV. = 858.4
HEADWALL INV. ELEV. = 858.5

MATCHLINE STA 15+00 TO STA. 20+50
EXISTING WOOD 6"x6" POSTS
ELEV. = 858.5
HEADWALL INV. ELEV. = 858.4
HEADWALL INV. ELEV. = 858.5

LEGEND
- EDGE OF PAVEMENT
- LANE LINE
- EDGE OF GRAVEL SHOULDER
- DRAINAGE FLOW
- SEED MIXTURE 35-241 W/ FERTILIZER TYPE 3 AND EROSION CONTROL BLANKET CATEGORY 3N
- DRAINAGE FLOW
- RANDOM RIPRAP CLASS IV
- SUBSURFACE DRAIN

STRAIGHT RUNS
ON GRADE CONSTRUCTION

DRAINAGE, SUPERELEVATION & TURF ESTABLISHMENT PLAN
C.R. 202 HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
STA. 20+50.00

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER
48041 08/23/2018
DESIGN BY: TSM
CHECKED BY: TSM
LAST REVISION: 08/23/2018

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
SWPPP INTRODUCTION (PART III.A)
HENNEPIN COUNTY HAS DEVELOPED THIS STORM WATER POLLUTION PREVENTION PLAN (SWPPP) TO COMPLY WITH THE REQUIREMENTS OF THE MPCP Nuisance and Violation Notification Regulations, 303K-20, Paragraph H 1.A. This SWPPP includes a narrative that describes the temporary and permanent erosion and sediment control plan and the storm water management plan for this project. The information in parenthesis after each paragraph heading refers to the section of the general permit the SWPPP paragraph is consistent with or referencing.

PROJECT SUMMARY (PART III.A)
THIS RECONSTRUCTION PROJECT IS LOCATED IN HENNEPIN COUNTY ON CR. 202 FROM ELM CREEK 700' WEST AND 30' EAST OF ELM CREEK (PROPOSED BRIDGE). THE PROJECT WILL INCLUDE, REMOVAL OF EXISTING BRIDGE, BERTIMING, SEDIMENT CLIFF, STORM WATER DRAINAGE DITCHES & CulVERTS TO BAR & BRIDGE ELEV. THE BRIDGE WILL BE SPECIFICLY DESIGNED FOR FLUID CONTROL AND SWPP.

PROJECT DESCRIPTION (PART III.A)
HENNEPIN COUNTY TRANSPORTATION DEPARTMENT, IN COOPERATION WITH THE CITY OF DAYTON, AND THREE RIVERS PARK DISTRICT IS USING FEDERAL FUNDS FROM BRIDGES ACTION PLAN AND MINNEAPOLIS FUNDS FOR ROADWAY RECONSTRUCTION. THE PROJECT WILL IMPROVE THE ROAD TO STATE AND STANDARDS FOR A TWO LANE ROAD. REPLACE THE CURRENT ONE LANE BRIDGE WITH TWO LANE BRIDGE TO STATE STANDARDS. THE PROJECT WOULD NOT REQUIRE ANY PERMANENT RIGHT OF WAY ACQUISITIONS. THE PROJECT WILL CHANGE THE ROADWAY HORIZONTAL AND VERTICAL ALIGNMENT, CROSS SECTION, AND OVERALL WIDTH OF THE CORRIDOR. SWPP IMPLEMENTATION.

CONSTRUCTION AND OPERATIONS METHODS
CONSTRUCTION AND OPERATIONS METHODS THAT WILL CAUSE OR INVOLVE PHYSICAL MANIPULATION OF THE ENVIRONMENT FOR THE PROPOSED PROJECT WILL BE TO INVOLVE:
- EXCAVATION AND REMOVAL OF EXISTING BRIDGE AND ROADWAY.
- FLOODPLAIN CULVERTS AND DRAINAGE CULVERT.
- GRAVING, BERTIMING, SEDIMENT CLIFF.
- SWPP EROSION PREVENTION MEASURES.
- TEMPORARY AND PERMANENT EROSION PREVENTION, SEDIMENT CONTROL, AND TIER ESTABLISHMENT.

TIMING AND DURATION
CONSTRUCTION OF THIS PROJECT IS SCHEDULED TO BE IN THE WINTER OF 2018 AND THE COMPLETION IS SCHEDULED FOR SUMMER OF 2019. THROUGH TRAFFIC WILL BE DETOURED.

SWPPP IMPLEMENTATION (PART III.A)
The contractor is responsible to comply with all aspects of the general permit at all times per Minnesota standard specification 2171.

EROSION CONTROL (EC) SUPERVISOR
DURING THE PRE-CONSTRUCTION CONFERENCE, A PERSON CERTIFIED (PER MINN. REQUIREMENTS) AND KNOWLEDGABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BMPS, WILL BE NAMED BY THE CONTRACTOR AS THE EC SUPERVISOR. THE CONTRACTOR MUST PROVIDE PROOF OF CERTIFICATION AT THE PRE-CONSTRUCTION CONFERENCE AND WILL NOT ALLOW TO COME TO WORK UNLESS CERTIFICATION HAS BEEN PROVIDED PRIOR TO PERFORMANCE OF THE PROJECT.

THE PROJECT SPECIAL PROVISIONS DESCRIBE IN DETAIL THE ROLE OF THE EC SUPERVISOR. FOLLOWING IS A SUMMARY OF THE EC SUPERVISOR'S RESPONSIBILITIES FOR ASSURING IMPLEMENTATION OF THE SWPPP.

1. OVERALL RESPONSIBILITY FOR ENSURING EROSION PREVENTION AND SEDIMENT CONTROL BMPs ARE ADEQUATELY INSTALLED, INSPECTED, AND MAINTAINED ON THE PROJECT BEGINS AND DURSES CONSTRUCTION.
2. OVERSEE THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs BEFORE DURSES AND DURING THE PROJECT. THE NOTICE OF TERMINATION IS ISSUED FOR THE CONSTRUCTION AS OUTLINED IN THIS SWPPP.
3. COORDINATE, SCHEDULES OVERSEE THE WORK OF SUBCONTRACTORS TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED.

MAINTAINING A QUALITY CONTROL PROGRAM SHALL CONSIST OF:
1. ENSURING PERMIT REQUIREMENTS ARE HEED TO THE CONTRACTOR'S AND SUBCONTRACTOR'S CONSTRUCTION ACTIVITIES ARE ADHERED TO.
2. ENSURING THAT ALL OPERATIONS ARE IN THE PROPER OR SUBCONTRACTORS ON-SITE HAVE THE PROPER EROSION PREVENTION AND SEDIMENT CONTROL CERTIFICATION.
3. ENSURING THAT THE ENGINEER WHEN THE REQUIRED CERTIFIED EROSION PREVENTION SEDIMENT CONTROL, PERSONNEL HAVE NOT BEEN PROVIDED.
4. CONDUCT THE INSPECTIONS REQUIRED BY THE GENERAL PERMIT.
5. MAINTAIN THE NPCP INSPECTION LOG.
6. ENSURING CORRECTIVE ACTIONS ARE TAKEN IN THE PROPER TIME FRAME REQUIRED BY THE GENERAL PERMIT FOR PROBLEM AREAS IDENTIFIED DURING THE NPCP INSPECTIONS.
7. ENSURING THAT EROSION CONTROL IS INTEGRATED INTO THE WORK IN A TIMELY MANNER AND THAT DISTURBED AREAS ARE STABILIZED WITH MULCHING, VEGETATION COVER OR IMPERVIOUS TARPING ON A SECTION BY SECTION BASIS.
8. ENSURING, IN ACCORDANCE WITH MINN. 257.3.7, THAT TEMPORARY EROSION PREVENTION OR SEDIMENT CONTROL DEVICES ARE MAINTAINED.

ALL INSPECTIONS AND MAINTENANCE CONDUCTED DURING CONSTRUCTION MUST BE RECORDED IN WRITING AND THESE RECORDS MUST BE RETAINED WITH THE SWPPP. INSPECTION REPORTS MUST BE SUBMITTED TO THE PROJECT ENGINEER IN A FORMAT THAT MEETS THE PROJECT ENGINEER'S EXACT STANDARDS. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY SHOULD INCLUDE:
1. DATE AND TIME OF INSPECTIONS
2. NAME OF PERSONS CONDUCTING INSPECTIONS
3. FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS
4. CORRECTIVE ACTIONS TO BE TAKEN
5. DATE AND TIME OF INSPECTION
6. DOCUMENTATION OF ANY DISCREPANCIES PER GENERAL PERMIT (PART IV.C.2)
7. DOCUMENTS AND CHAIN OF RESPONSIBILITY OF THE CONTRACTOR.

LONG TERM OPERATION AND MAINTENANCE
HENNEPIN COUNTY OPERATIONS STAFF WILL BE RESPONSIBLE FOR THE LONG-TERM OPERATION AND MAINTENANCE OF THE PERMANENT STORM WATER SYSTEM.

CHAIN OF RESPONSIBILITY (PART III.A.2)
A CONTRACTOR WILL PROVIDE AND ASSIGN AN EC SUPERVISOR WHO WILL WORK WITH THE PROJECT ENGINEER TO DEVELOP A CHAIN OF COMMAND WITH ALL OPERATORS ON SITES, AND COORDINATE, SCHEDULE AND OVERSEE THE WORK OF SUBCONTRACTORS ON SITES TO ENSURE THAT THE SWPPP IS IMPLEMENTED AND REMAINS IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE. THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION AND A NOTICE OF TERMINATION HAS BEEN SUBMITTED TO THE NPCP. THIS INFORMATION WILL BE PROVIDED IN AN AMENDMENT TO THE SWPPP.

PROJECT CONTACTS

ORGANIZATION
HENNEPIN COUNTY DESIGN PROJECT MANAGER
HARRISON FELDA, P.E.
612-596-0720

HENNEPIN COUNTY TRANSPORTATION DESIGN
DAVE SEILER, SWPPP DESIGNER
612-596-0391

THREE RIVERS PARK DISTRICT CONSTRUCTION CONTRACT
JOSH SHORE
763-694-2083

EROSION CONTROL SUPERVISOR
MINNESOTA POLLUTION CONTROL COUNCIL
PAUL FERDINAND
651-757-2863

MPCA 24 HOUR EMERGENCY NOTIFICATIONS: 651-649-5451 / 800-422-0798

SWPPP TRAINING (PART III.A.3 & III.F)
SWPPP DESIGNER: DAVE SEILER

SWPPP DESIGNER IS A CERTIFIED SWPPP DESIGNER By THE UNIVERSITY OF MINNESOTA EROSION AND STORM WATER MANAGEMENT CERTIFICATION PROGRAM. CERTIFICATIONS ARE ON FILE WITH HENNEPIN COUNTY TRANSPORTATION DEPARTMENT AND ARE AVAILABLE TO THE CONTRACTOR TO CONSIDER USE. THE SWPPP IMPLEMENTATION MUST BE CONDUCTED, INSPECTED, AND AMENDED BY INDIVIDUALS CERTIFIED BY THE SAME ORGANIZATION ABOVE OR ITS EQUIVALENT AS DETERMINED BY THE MPCA. DOCUMENTATION MUST BE MADE AVAILABLE BY THE CONTRACTOR TO THE REQUESTER FOR REVIEW.

DRAINAGE NARRATIVE (PART III.A.4)
HENNEPIN COUNTY, IN COOPERATION WITH THE CITY OF DAYTON, AND THREE RIVERS PARK DISTRICT IS RECONSTRUCTING 0.2 MILES OF CR. 202 AT ELM CREEK.

THE PURPOSE OF THE PROJECT IS TO REPLACE BRIDGE LOSSES WITH BRIDGE 27C55 AND RECONSTRUCT 915' OF CR. 202 TO ACCOMMODATE THE NEW BRIDGE AND BRING THAT PORTION OF THE ROAD TO STATE AID STANDARDS.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DESIGN BY:
S. SEILER
J. SCHERER
D. McGOVERN
LICENSE NO. 59
DATE: 7/26/2018
C.R. 202 HENNEPIN COUNTY PROJECT 0408
S.P. 027 996-009
STORMWATER POLLUTION PREVENTION PLAN SHEET 42
48041
THE PROJECT WILL HAVE A NEW HORIZONTAL AND VERTICAL ALIGNMENT AND SURFACED CROSS-SECTION TO MEET STATE AID STANDARDS. TWO-LANE RURAL CONSTRUCTION WITH 2-TONUMOUS LANES AND SHOULDERs. GUARDRAILS WILL ALSO BE INSTALLED IN DESIGNATED AREAS.


THE PROJECT WAS DESIGNED USING ATLAS 14 FOR RUN-ROU INENSITY. LOW POINTS ARE DESIGNED USING A 25 YEAR EVENT AND NO TRUE SAGS EXIST ON THE PROJECT. THE PROJECT AREA IS PRARIAE TYPE D SOILS.

INCORPORATING THIS SWPPP INTO THE FINAL PLANS (PART III.A.5)

HENNEPIN COUNTY AND THE CITY OF DAYTON WILL MEET THE SWPPP REQUIREMENTS INCORPORATING THE SWPPP ELEMENTS INTO THE PROJECT’S FINAL PLANS, SPECIFICATIONS, AND PROJECT DOCUMENTATION, AS APPROPRIATE. THE FINAL PLANS, SPECIFICATIONS, AND PROJECT DOCUMENTATION WILL COMPLY WITH THE REQUIREMENTS OF PART III.A.4 AND APPENDIX A.C.1.2 OF THE GENERAL PERMIT. DRAINAGE LAYOUTS DEPICTING THE RECEIVING WATER BODIES FROM THIS PROJECT Corridor is MAINTAINED BY HENNEPIN COUNTY DEPARTMENT OF TRANSPORTATION.

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

ENVIRONMENTAL REVIEW MITIGATION MEASURES (PART III.A.6)

THERE ARE NO STORMWATER MITIGATION MEASURES REQUIRED AS A RESULT OF AN ENVIRONMENTAL, ARCHAEOLOGICAL, OR AGENCY REVIEW. ALL MITIGATION MEASURES HAVE BEEN ADDRESS IN THIS PROJECT SET OF THE SPECIAL PROVISIONS.

KARST AREAS (PART III.A.7)

THERE ARE NO KARST AREAS IDENTIFIED WITHIN THE PROJECT SITE.

IMPAIRED WATERS (PART III.A.8)

THERE ARE IMPAIRED WATERS WITHIN ONE MILE RADIUS OF THIS PROJECT SITE. ELK CREEK IS IMPAIRED FOR DISSOLVED OXGEN.

AMENDMENT TO THE SWPPP (PART III.B)

HENNEPIN COUNTY AND THE CITY OF DAYTON WILL AMEND/UPDATE THIS SWPPP AS NEEDED AND/OR AS REQUIRED BY THE GENERAL PERMIT TO ADDRESS DEFICIENCIES IN THE PREVENTION OF STORM WATER POLLUTION.

TEMPORARY SEDIMENTATION BASINS (PART III.C) (APPENDIX A.C.1b)

TEMPORARY SEDIMENTATION BASINS ARE NOT REQUIRED FOR THIS PROJECT. THE PROJECT WILL NOT DISTURB 10 OR MORE ACRES OF SOIL THAT DRAWN TO A COMMON LOCATION.

PERMANENT STORM WATER MANAGEMENT SYSTEM (PART III.C)

ALL STORM WATER WILL BE DISCHARGED IN A MANNER THAT DOES NOT CAUSE NUISANCE CONDITIONS, EROSION IN RECEIVING CHANNELS OR ON DOWNSTREAM PROPERTIES. OR INJURY TO WETLANDS CAUSING A SIGNIFICANT ADVERSE IMPACT TO THE WETLANDS.

RECORD RETENTION (PART III.E)

HENNEPIN COUNTY, THE CITY OF DAYTON AND ANY OTHER PERMITTEE WHO HAS OPERATIONAL CONTROL OVER THE SITE WILL KEEP THE FOLLOWING ITEMS ON SITE DURING CONSTRUCTION:

SWPPP

SWPPP AMENDMENTS

INSPECTION AND MAINTENANCE RECORDS

HENNEPIN COUNTY KEEPS THE FOLLOWING ITEMS ON FILE FOR A MINIMUM OF THREE (3) YEARS AFTER SUBMITAL OF THE NOTICE OF TERMINATION TO THE MPCA:

- SWPPP
- SWPPP AMENDMENTS
- ANY OTHER PERMITS REQUIRED FOR THE PROJECT
- RECORDS OF ALL INSPECTION AND MAINTENANCE CONDUCTED DURING CONSTRUCTION
- ALL PERMANENT OPERATIONAL AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED, INCLUDING ALL RIGHT OF WAY, CONTRACTS, COVENANTS AND OTHER BONDING REQUIREMENTS REGARDING PERPETUAL MAINTENANCE.
- ALL REQUIRED CALCULATIONS FOR DESIGN OF THE TEMPORARY AND PERMANENT STORM WATER MANAGEMENT SYSTEMS.

IMPLEMENTATION OF THE SWPPP DURING CONSTRUCTION (PART IV.A)

HENNEPIN COUNTY AND ITS CONTRACTOR WILL IMPLEMENT THE REQUIREMENTS OF THE GENERAL PERMIT, PART IV.A, APPENDIX A.C.1.2, THE SWPPP, AND THE PLANS AND SPECIFICATIONS DURING CONSTRUCTION TO PREVENT EROSION AND CONTROL SEDIMENT. THE CONTRACTOR WILL SELECT, INSTALL, AND MAINTAIN ALL BMPs IN AN APPROPRIATE AND FUNCTIONAL MANNER.

THE CONTRACTOR WILL PREPARE AND SUBMIT A SITE PLAN FOR THE PROJECT ENGINEER APPROVAL, PER SECTION 1717 (AIR, LAND, AND WATER POLLUTION) OF THE SPECIAL PROVISIONS, FOR CONCRETE MANAGEMENT WORK IN ENVIRONMENTALLY SENSITIVE AREAS. AREAS IDENTIFIED IN THE PLANS AS "SITE PLAN REQUIREMENT AREAS" ANY WORK THAT WILL REQUIRE DRAINING, THE STAGING OF INLET PROTECTION DEVICES OVER THE LIFE OF THE CONTRACT, AND AS REQUESTED BY THE PROJECT ENGINEER. ALL SITE PLANS MUST BE SUBMITTED TO THE PROJECT ENGINEER IN WRITING. THE CONTRACTOR SHALL ALLOW A MINIMUM OF 7 DAYS FOR HENNEPIN COUNTY TO REVIEW AND APPROVE SITE PLAN SUBMISSIONS.

THE CONTRACTOR WILL NOT BE ALLOWED TO COMMENCE WORK FOR WHICH A SITE PLAN IS REQUIRED UNLESS APPROVAL HAS BEEN GRANTED BY THE PROJECT ENGINEER. THE CONTRACTOR WILL NOT BE GIVEN ANY EXTRA TIME IN THE CONTRACT DUE TO "THE UNTEMPLIFIED SUBMITAL OF A SITE PLAN.

EROSION PREVENTION AND SEDIMENT CONTROL PRACTICES (PART IV.B & C) (APPENDIX A.C.1.2)

TO PREVENT EROSION AND CONTROL SEDIMENT ON THIS PROJECT DURING CONSTRUCTION, HENNEPIN COUNTY WILL PLAN AND IMPLEMENT BMPs AND CONSTRUCTION PRACTICES THAT MINIMIZE EROSION, CONTROL SEDIMENT, AND ENFORCE THE CONTRACTOR COMPLIES WITH THE INSPECTIONS AND MAINTENANCE REQUIREMENTS OF PART IV.E OF THE GENERAL PERMIT.

THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs SHALL BE INSTALLED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ONSITE. ALL EROSION CONTROL MEASURES IN PLACE PRIOR TO ANY REMOVAL WORK AND/OR GROUND DISTURBING ACTIVITIES CONTINUE TO BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED.

SEDIMENT CONTROL DEVICES MUST BE ERECTED ON ALL DOWN-GRADES PERMITTED BEFORE ANY UP-GRADE LAND DISTURBING ACTIVITIES BEGIN. SEDIMENT CONTROL DEVICES INCLUDE, BUT ARE NOT LIMITED TO:

A. PERIMETER CONTROL SHALL BE LOCATED ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY FLOW SHEETS DOWN-GRADE OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS WITH THE BMPs HOOKED AT A MAXIMUM OF 100-FOOT INTERVALS AND SHALL CONTAIN NO MORE THAN ONE QUARTER ACER OF DRAINAGE AREA.

B. INLET PROTECTION WILL BE AS INDICATED ON THE PLAN DURING ALL PHASES OF CONSTRUCTION.

1. INLET PROTECTION SHALL BE ANY METHOD DESIGNED IN THE EROSION CONTROL DETAILS. THE TYPE USED IS THE CHOICE OF THE CONTRACTOR OR DESIGNED BY THE ENGINEER.

C. SEDIMENT DRAINAGE FROM STOCKPILES WILL BE MINIMIZED BY PLACING A ROW OF SILT FENCE A MINIMUM OF 6 FEET FROM THE TOE OF SLOPE. IF THERE IS NOT A SUITABLE PROJECT AREA TO PLACE THE SILT FENCE A MINIMUM OF 5 FEET FROM THE TOE OF SLOPE, THE CONTRACTOR MAY SUBSTITUTE AN ALTERNATIVE FOR APPROVAL BY THE PROJECT ENGINEER.

THE CONTRACTOR SHALL PLACE VEHICLE TRACKING BMPs AS NECESSARY TO PREVENT TRACKING OF SEDIMENT INTO DVD SURFACES, IN COMPLIANCE WITH PART IV.E OF THE GENERAL PERMIT. VEHICLE TRACKING BMPs SHALL BE SUITABLY SIZED AND MAINTAINED TO PREVENT TRACK OUT. THIS WORK SHALL BE CONSIDERED INCIDENTAL, WHEN VEHICLE TRACKING BMPs DO NOT ADEQUATELY PREVENT TRACKING, STREET SWEEPING MUST BE PERFORMED IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

THE CONTRACTOR MUST USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT DISCHARGE OR PLACEMENT OF BITUMINOUS MARRING, CUTTINGS, MILLINGS, AND OTHER BITUMINOUS WASTES IN AREAS OF EXISTING OR FUTURE VEGETATED SOILS OR STORMWATER CONVEYANCE SYSTEMS, SUCH AS DITCHES.

THE CONTRACTOR MUST USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT CONCRETE DUST, PARTICLES, SAWDUST NURDING, PLANNING WASTE, AND OTHER CONCRETE INSECTS FROM LEAVING HENNEPIN COUNTY RIGHT OF WAY, DEPOSITING IN AREAS OF EXISTING OR FUTURE VEGETATED SOILS, OR ENTERING STORMWATER CONVEYANCE SYSTEMS SUCH AS DITCHES AND DITCHES.
STORMWATER POLLUTION PREVENTION PLAN

C.R. 202   HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER
48041
06/21/2018

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DESIGN BY: D. SEILER

CAD BY: J. SCHEER

CHECKED BY: D. McGOVERN

LAST REVISION: 06/21/2018

DEWATERING AND BASIN DRAINING (PART IV.D)

TEMPORARY DEWATERING ACTIVITIES MAY BE REQUIRED FOR GRADING AND UTILITY WORK. THEREFORE, IT IS POSSIBLE THAT A PERMIT FOR THE TEMPORARY APPROPRIATION OF WATERS OF THE STATE, NON-IRRIGATION FROM MINORS WILL BE REQUIRED FOR THIS PROJECT. THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING THIS PERMIT. ALL TEMPORARY DEWATERING SHALL BE DISCHARGED TO AN APPROVED LOCATION FOR TREATMENT PRIOR TO DISCHARGE TO THE RECEIVING WATER. THE CONTRACTOR IS REQUIRED TO SUBMIT SITE PLANS TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK ACCORDING TO SECTION 1727 (AIR, LAND, AND WATER POLLUTION) OF THE SPECIAL PROVISIONS.

BASIN DRAINING ACTIVITIES OF TURF OR SOIL SEDIMENT LADEN WATER WILL BE DISCHARGED TO TEMPORARY SEDIMENT BASINS WHENEVER POSSIBLE. IN THE EVENT THAT IT IS NOT POSSIBLE TO DISCHARGE THE SEDIMENT LADEN WATER TO A TEMPORARY SEDIMENT BASIN, THE WATER MUST BE TREATED SO THAT IT DOES NOT CAUSE A POLLUTION CONDITION IN THE RECEIVING WATER OR TO DOWNSTREAM PROPERTIES. THE CONTRACTOR SHALL FOLLOW ALL REQUIREMENTS OF SECTION 2105 (DEWATERING) OF THE SPECIAL PROVISIONS.

INSPECTIONS AND MAINTENANCE (PART IV.E)

THE EROSION CONTROL SUPERVISOR WILL BE RESPONSIBLE FOR ROUTINELY INSPECTING THE CONSTRUCTION SITE EVERY 7 DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. ALL INSPECTIONS AND REPAIRS WILL BE COMPLETED IN ACCORDANCE WITH PART IV.E OF THE GENERAL PERMIT.

POUllATION PREVENTION MANAGEMENT MEASURES (PART IV.F)

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POLLUTION PREVENTION MANAGEMENT BMPS ASSOCIATED WITH THE SWPPP. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH PART IV.F OF THE GENERAL PERMIT. CONTRACTOR IS ADVISED THAT ALL LIQUID AND SOLID WASTES GENERATED BY CONCRETE MASHOUT OPERATIONS ARE TO BE CONTAINED IN A LEAK-PROOF CONTAINMENT FACILITY OR IMPERVIOUS LINING. SORBING OF ANY MATERIAL IS NOT ALLOWED WITHIN THE PROJECT BOUNDARY.

THE CONTRACTOR IS RESPONSIBLE FOR CREATING AND FOLLOWING A WRITTEN DISPOSAL PLAN FOR ALL WASTE MATERIALS. THE PLAN WILL INCLUDE HOW THE MATERIAL WILL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE AND WILL BE SUBMITTED TO THE PROJECT ENGINEER.

FINAL STABILIZATION (PART IV.G)

HENNEPIN COUNTY WILL ENSURE FINAL STABILIZATION OF THE DISTURBED AREAS OF THIS PROJECT. THE CONTRACTOR SHALL COMPLY WITH PART IV.G OF THE GENERAL PERMIT AND THE CONSTRUCTION PLANS TO ENSURE FINAL STABILIZATION.

IN ADDITION, THE CONTRACTOR SHALL REMOVE ALL SEDIMENT PREVENTION AND EROSION CONTROL DEVICES THAT NEED TO BE REMOVED. THE CONTRACTOR SHALL CLEAR SEDIMENT FROM ALL CONVEYANCES AND SEDIMENT BASINS. THE CONTRACTOR WILL SUBMIT A NOTICE OF TERMINATION WITHIN 30 DAYS OF FINAL STABILIZATION.

ADDITIONAL BMPs FOR SPECIAL WATERS AND IMPAIRED WATERS (APPENDIX A.B & C)

THERE ARE NO STORM WATER DISCHARGES TO ANY SPECIAL WATERS ASSOCIATED WITH THIS PROJECT. IMPAIRED WATERS RECENT DISCHARGE FROM THIS PROJECT CORRIDOR AS MENTIONED PREVIOUSLY IN THIS SWPPP DOCUMENT. THE ADDITIONAL BMPs REQUIRED FOR IMPAIRED WATERS IN APPENDIX A SHALL BE INCORPORATED INTO THIS PROJECT.

REQUIREMENTS FOR DISCHARGING TO WETLANDS (APPENDIX A.D)

THIS PROJECT WILL NOT IMPACT ANY WETLANDS AND DOES NOT HAVE ANY STORM WATER DISCHARGES WITH A POTENTIAL FOR ADVERSE IMPACTS TO A WETLAND.

DISCHARGES REQUIRING ENVIRONMENTAL REVIEW (APPENDIX A.E)

HENNEPIN COUNTY AND THE CITY OF CANTON HAVE COMPLIED WITH ALL ENVIRONMENTAL REVIEW REQUIREMENTS PERTAINING TO THIS PROJECT.

DISCHARGES AFFECTING ENDANGERED OR THREATENED SPECIES (APPENDIX A.F)

THERE ARE NO ADVERSE IMPACTS TO ANY ENDANGERED OR THREATENED SPECIES.

DISCHARGES AFFECTING HISTORIC PLACES OR ARCHEOLOGICAL SITES (APPENDIX A.G)

THERE ARE NO ADVERSE IMPACTS TO ANY HISTORIC PLACE OR ARCHEOLOGICAL SITES.
### General Information

1. All traffic control devices shall conform and be installed in accordance with the latest edition of the "Minnesota Manual on Uniform Traffic Control Devices" (MMUFD) and Part VI, "Field Manual for Temporary Traffic Control Zone Layouts".

2. All inplace pavement markings and inplace traffic control devices, including overhead signs on roads open to traffic that are not consistent with traffic control operations shall be covered, removed or revised.

3. All traffic control devices are shown in their approximate locations. Actual locations shall be determined in the field.

4. The contractor shall furnish, install, maintain and remove the traffic control devices in this traffic control plan and all additional traffic control devices as required to facilitate traffic operations and field conditions.

5. Portable precast concrete barrier with delineators shall be placed as shown in the plan. Delineators shall have a minimum of 24 sq. in. of reflective surface area and be placed facing traffic along and at the top edge of the barrier at approximately 4' spacing.

6. Temporary signing shall be mounted on posts driven into the ground or on portable supports. When the temporary signs are removed the sign posts shall also be removed.

7. All streets and entrances shall remain open to traffic at all times and shall be built under traffic as required unless specifically shown in this traffic control plan. Any temporary closure shall be approved by the engineer.

8. If the contractor decides to perform the construction work in a sequence other than shown on this traffic control plan the contractor shall provide a complete revised traffic control plan.

9. The contractor shall replace any inplace pavement markings removed to facilitate the traffic control.

10. All work as detailed in Notes 1 - 9 shall be as directed by and to the satisfaction of the engineer and all costs shall be included in the unit price bid for traffic control (LS).

### Tabulation of Quantities (1)

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Unit</th>
<th>Total</th>
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<tr>
<td>Traffic Control</td>
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<tr>
<td>Portable precast concrete barrier (DES 8337)</td>
<td>LIN FT</td>
<td>50</td>
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### The Following Standard Plates, Approved by the Federal Highway Administration, Shall Apply on This Project

<table>
<thead>
<tr>
<th>Plate No.</th>
<th>Plate Description</th>
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<tbody>
<tr>
<td>8000J</td>
<td>Channelizers, 13 sheets</td>
</tr>
<tr>
<td>8337C</td>
<td>Temporary portable precast concrete barrier (type F), 13 sheets</td>
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</table>

### Traffic Control Legend

- **\-\** Appropriate sign as indicated mounted on posts or portable tubular metal frame
- **9'-0"** Type III Barricade, unless noted with appropriate sign as indicated
- **\-** Flashing light
- **H.I.** High Intensity Flashing Light
- **-** Portable precast concrete barrier with delineators facing traffic

### Index

- **TC1 - TC6** Traffic Control Detail Sheets
- **TC7** Traffic Control Plan Sheet

---

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the State of Minnesota.

RYAN T. ALLENS, PROFESSIONAL ENGINEER

LICENSE NO. 45896

6/13/18

Hennequin

DESIGN BY: J. WING

CHECKED BY: J. WING

LAST REVISION: 6/13/18
KNEE BRACE SPLICE

1/4" STAINLESS STEEL BOLTS WITH NYLON INSERT LOCK NUTS PLACED NEAR TOP AND BOTTOM HOLEs.

REAR POST AND SPLICE PERMITTED

2x3/8" STAINLESS STEEL BOLTS WITH NYLON INSERT LOCK NUTS PLACED IN TOP AND BOTTOM HOLES.

Typical Urban Mounting

Typical "A-Frame" Installation

Type "D" Signs

Typical Rural Mounting

NOTES:
1. USE 1/4" STUB POSTS, RIDER POSTS, STRAINERS, KNEE BRACES, LATERAL BRACES AND KNEE BRACE STUB POSTS. ALL SHALL CONFORM TO MSCO 39-70.
2. MOUNTING (MOUNTING GUIDE) FOR TYPE "A" SIGNS PANELS SHALL BE AS INDICATED IN THE STANDARD SIGNS MANUAL UNLESS OTHERWISE SPECIFIED.
3. ALL RIDER (VERTICAL) "U" POSTS SHALL BE SPLICE. DRIVEN STUB POSTS SHALL BE AT LEAST 7' LONG.
4. USE STAINLESS STEEL 5/16" BOLTS, WASHERS, AND NYLON INSERT LOCK NUTS AS SHOWN FOR ALL GROUND MOUNTED AND OVERHEAD MOUNTED SIGNS.
5. STAINLESS STEEL WASHERS WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEAD.
6. BRACING STUDS SHALL BE NO MORE THAN 4" ABOVE GROUND AND ENGAGED AT LEAST 3 1/2".
7. A-FRAME BRACKET SHALL BE STEEL CONFORMING TO MSCO 3900 AND GALVANIZED IN ACCORDANCE WITH MSCO 3910.
8. COLLARS SHALL BE USED TO SEAL OVERLAYS AND DECOMBATANT LEAKAGE FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. Mandatory 7/16".
9. 2 POST TYPE "A" SIGNS SHALL BE REMOVED WITH AT LEAST ONE LATERAL BRACE INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60" OR MORE SMALL WAVE THE LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
10. WHERE 2 SINGLE POST TYPE "A" SIGNS ARE INSTALLED SIDE BY SIDE THEY SHALL BE REMOVED THROUGHOUT BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS.
11. WHERE 3 OR MORE TYPE "A" SIGNS ARE INSTALLED SIDE BY SIDE THEY SHALL BE REMOVED THROUGHOUT BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND POST SECTION AND LOCATED APPROXIMATELY AT THE QUARTER POINTS AS SHOWN IN THE MODIFIED TYPE C INSTALLATION,
12. TYPE "M" SIGN PANELS SHALL BE BOLTED TO STRAINERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH THE TYPE "M" STRAINER AND PANEL-JOINT DETAIL SEE STANDARD SIGNS MANUAL.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DUTY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DESIGN BY: J. WING

TRAFFIC CONTROL DETAIL SHEET

CO. RD. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009

45896 6/13/18 0

CHECKED BY: R. ALLERS

SHEET TC2 107
**TRAFFIC CONTROL DEVICES (1)**

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<td>R-12-3 ROAD CLOSED AHEAD ON PR</td>
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<td>60 x 30</td>
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<td>(1) 202 HENNEPIN COUNTY PARK ACCESS</td>
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111 THE QUANTITIES SHOWN WITHIN THIS SHEET ARE FOR INFORMATION ONLY AND SHALL BE PAID FOR UNDER THE PAY ITEM TRAFFIC CONTROL (LS).  
121 ALL SIGNING SHALL USE CAT 3 SIGN SHEETING.  
131 POSTS TO BE PORTABLE TUBULAR METAL FRAME.  
141 SEE SIGN DETAIL 1 ON SHEET TC3.  
151 DATE TO BE DETERMINED BY ENGINEER AND THE SIGN SHALL BE INSTALLED A MINIMUM OF 3 DAYS IN ADVANCE OF ROAD CLOSURE.  
161 THESE SIGNS ARE LARGER AND SHALL ONLY BE USED ALONG T.H. 610.  
171 SEE SIGN DETAIL 2 ON SHEET TC3.  
181 INCLUDES ONE HIGH INTENSITY AMBER FLASHING LIGHT ON EACH SIGN.  
191 IF TYPE SS1 BARRICADE LEFT WITH THE AMBER FLASHING LIGHTS ON EACH BARRICADE.  
201 BLACK BORDER AND LEGEND ON A ORANGE BACKGROUND.  
211 SEE SIGN DETAIL 4 ON SHEET TC4.  
221 SEE SIGN DETAIL 5 ON SHEET TC4.

**TRAFFIC CONTROL DETAIL SHEET**

CO. RD. 202 / HENNEPIN COUNTY PROJECT 0408  
S.P. 027-596-009

**Design by:** J. Wing  
**Checked by:** J. Wing  
**Drawn by:** S. Allers  
**Date:** 6/13/18  
**License No.:** 45896  
**Revision:** TC4/TC7

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

RYAN STIVES, PROFESSIONAL ENGINEER  
45896 6/13/18  
Co. Rd. 202 / Hennepin County Project 0408  
S.P. 027-596-009

**Drawing Scale:** 1/2" = 1'-0"  
**Drawing Method:** MACS  
**Color:** Red = Sign, Black = Legend, Orange = Background
### TRAFFIC CONTROL DEVICES (1)

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(1) The quantities shown within this subdivision are for information only and shall be paid for under the clause traffic control (1).  
(2) All signing shall use good sign sheeting.  
(3) Posts or portable modular metal frame.  
(4) See sign detail 1 on sheet 2C.  
(5) Date to be determined by the Engineer and the sign shall be install a minimum of 7 days in advance of road closure.  
(6) These signs are larger and shall only be used along T.H. 610.  
(7) See sign detail 2 on sheet 2C.  
(8) Includes one high intensity amber flashing light on each sign.  
(9) B type 111 barricade left with two amber flashing lights on each barricade.  
(10) Black border and reflector on a orange background.  
(11) See sign detail 4 on sheet 2C.  
(12) See sign detail 5 on sheet 2C.
<table>
<thead>
<tr>
<th>SIGN NO.</th>
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</table>

1) THE QUANTITIES SHOWN WITHIN THIS TABLE ARE FOR INFORMATION ONLY AND SHALL BE PAID FOR UNDER THE PAY ITEM TRAFFIC CONTROL (LS).  
2) ALL SIGNING SHALL USE OOS SIGN SHEETING.  
3) POSTS OF PORTABLE VARIOUS METAL FRAME.  
4) SEE SIGN DETAIL 1 ON SHEET TCD.  
5) DATE TO BE DETERMINED BY THE ENGINEER AND THE SIGN SHALL BE INSTALL A MINIMUM OF 7 DAYS IN ADVANCE OF ROAD CLOSURE.  
6) THESE SIGNS ARE LARGER AND SHALL ONLY BE USED ALONG T.H. 610.  
7) SEE SIGN DETAIL 2 ON SHEET TCD.  
8) INCLUDES ONE HIGH INTENSITY AMBER FLASHER LIGHT ON EACH SIGN.  
9) TYPICAL AHEAD BARRIERS LEFT WITH TWO AMBER FLASHER LIGHTS EACH BARRIERS.  
10) BLACK BORDERS AND LABELS ON A GRAY BACKGROUND.  
11) SEE SIGN DETAIL 4 ON SHEET TCD.  
12) SEE SIGN DETAIL 5 ON SHEET TCD.
ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE AASHTO "TRAFFIC ENGINEERING MANUAL" AND THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MN METCD) AND AS DIRECTED BY THE ENGINEER. THESE GUIDELINES ARE TYPICAL AND MODIFICATIONS MAY BE REQUIRED FOR UNUSUAL CONDITIONS.

SIGNING TYPE C

ALL SIGN POSTS SHALL BE 3 POUNDS PER FOOT. GALVANIZED "U" POSTS.

THE CONTRACTOR SHALL PROVIDE AND INSTALL THE PROPOSED SIGN PANELS WITH SUPPORTS. PROPOSED PERMANENT STRIPING AND PROPOSED PAVEMENT MESSAGES AS NOTED, SHOWN ELSEWHERE IN THIS PLAN AS DIRECTED BY AND TO THE SATISFACTION OF THE ENGINEER.

ALL SIGNS SHALL HAVE HOLES PUNCHED ONLY FOR THE NUMBER OF POSTS REQUIRED.

IF DIRECTED BY THE ENGINEER THE CONTRACTOR SHALL INSTALL THE PROPOSED SIGN PANELS ON AN INPLACE POST (TO REDUCE THE OVERALL NUMBER OF SIGN POSTS).

LATERAL BRACES MAY BE USED AS A STIFFENER FOR SIGNS IF REQUIRED BY THE ENGINEER.

KNEE BRACES SHALL NOT BE USED UNLESS REQUIRED BY THE ENGINEER.

PERMANENT STRIPING AND PAVEMENT MARKINGS

ALL LONGITUDINAL LINES SHALL BE 4" WIDE MULTI COMPONENT GROUND IN (GROOVED), UNLESS NOTED.

THE ENGINEER'S INVOLVEMENT IN THE APPLICATION OF THE MATERIAL SHALL BE LIMITED TO FIELD CONSULTATION AND INSPECTION.

THE CONTRACTOR WILL PLACE NECESSARY "SPOTTEST" AT APPROPRIATE POINTS TO PROVIDE HORIZONTAL CONTROL FOR STRIPING AND TO DETERMINE NECESSARY STARTING AND CUTOFF POINTS. LONGITUDINAL JOINTS, PAVEMENT EDGES AND EXISTING MARKINGS MAY SERVE AS HORIZONTAL CONTROL, WHEN SO DIRECTED.

### TABULATION OF QUANTITIES

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<th>ITEM DESCRIPTION</th>
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<td>SIGN PANELS TYPE C</td>
<td>SQFT</td>
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111 COLOR SHALL BE YELLOW

### INDEX

- SS1 - SS2 PERMANENT SIGNING AND STRIPING DETAIL SHEETS
- SS3 INPLACE SIGNING TABULATION SHEET
- SS4 PROPOSED SIGNING TABULATION SHEET
- SS5 PERMANENT SIGNING AND STRIPING PLAN SHEET
### INPLACE SIGN PANELS

<table>
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<tr>
<th>SIGN NO.</th>
<th>SIGN TYPE</th>
<th>NOTES</th>
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<td>C</td>
<td>121</td>
<td>NO PARKING</td>
</tr>
<tr>
<td>B</td>
<td>C</td>
<td>121</td>
<td>CURVE AHEAD</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>123</td>
<td>15 MPH</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>121</td>
<td>SMALL LANE BRIDGE</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>121</td>
<td>NO PARKING</td>
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<tr>
<td>D</td>
<td>C</td>
<td>121</td>
<td>SNOWMOBILE CROSSING</td>
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<td>E</td>
<td>C</td>
<td>121</td>
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<tr>
<td>F</td>
<td>C</td>
<td>121</td>
<td>WEIGHT LIMIT</td>
</tr>
<tr>
<td>G</td>
<td>C</td>
<td>121</td>
<td>TYPE 3 OBJECT MARKER</td>
</tr>
<tr>
<td>H</td>
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<td>TYPE 3 OBJECT MARKER</td>
</tr>
<tr>
<td>I</td>
<td>C</td>
<td>121</td>
<td>TYPE 3 OBJECT MARKER</td>
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<tr>
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<td>C</td>
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<td>C</td>
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<td>O</td>
<td>C</td>
<td>121</td>
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(1) PROJECT AND PRESERVE INPLACE.
(2) REMOVE.
### SIGN PANELS TYPE C

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<th>QUAN.</th>
<th>POST NO.</th>
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<th>AREA (SQ. F1.)</th>
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<td>W13-1P</td>
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<td>2</td>
<td>1</td>
<td>1.00</td>
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**Sub Total Sign Panels Type C:** 36.75 SQ. FT.

1. To bottom edge of lowest sign.
TRANSVERSE SECTION AND SCHEDULE OF QUANTITIES

TRANSVERSE SECTION

INSET "A"

2" TYPE SP 12.5 WEARING COURSE MIXTURE (3,C) (SPWEB340C)

TIMBER SUPERSTRUCTURE QUANTITIES SHOWN FOR INFORMATIONAL PURPOSES.

ALL MATERIALS SHOWN TO BE INCIDENTAL TO 2403.618 "GLUED LAMINATED PANELS".

CONSTRUCTION REQUIREMENTS SHALL CONFORM TO SPEC. 2403.3.

STATEMENT OF QUANTITIES KEYNOTES:

ITEM NO. ITEM DESCRIPTION ESTIMATED QUANTITIES FOR ENTIRE BRIDGE ~ FOR INFORMATION ONLY

<table>
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<tr>
<th>ITEM NO.</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>PARTICIPATING QUANTITY</th>
<th>NON-PARTICIPATING QUANTITY</th>
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INSET "A"

INSET A

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</table>
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JOHN D. EKOLA, PROFESSIONAL ENGINEER

WORKING POINT LOCATION

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<th>Point Type</th>
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<th>Northing</th>
<th>Easting</th>
<th>Radius / Theta</th>
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DIMENSIONS BETWEEN WORKING POINTS

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<th>Rotation Direction</th>
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<td>W. P. &quot;D&quot;</td>
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ELEVATION

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WORKING LINE

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<tr>
<td>W. P. &quot;M&quot;</td>
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SCALE 1/100

WORKING POINT LOCATION
WEST ABUTMENT PLAN AND ELEVATION

NOTES:
2. DETAIL SHOWN ON B7.
3. INSTALL BRACKET WITH ¼" EXPANSION MATERIAL AFTER TIMBER SUPERSTRUCTURE IS SECURED TO PILE CAPS. SEE SPECIAL PROVISIONS.
4. VERTICALLY PLANE EACH SIDE OF PILE CAP ABOVE EACH PILE CAP TO.
ABUTMENT PILE NOTES

PILE SPACING IS AT BOTTOM OF FOOTING.

NOMINAL PILE BEARING RESISTANCE SHALL BE DETERMINED BY THE USE OF A PILE DRIVING ANALYZER (PDA).

FILES TO HAVE NOMINAL DIAMETER OF 12".

FOR FILE SPLICE DETAIL SEE DETAIL B201.

DRIVE SPLICES ARE NOT ALLOWED.

2. CAST-IN-PLACE TEST PILES 85 FT. LONG
7. CAST-IN-PLACE PILES EST. LENGTH 85 FT. (W)
7. CAST-IN-PLACE PILES EST. LENGTH 85 FT. (E)
16. CAST-IN-PLACE REQUIRED.

SUMMARY OF QUANTITIES FOR BOTH ABUTMENTS

<table>
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<tr>
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<td>C-1 P CONCRETE PLUG INSTALLED 12&quot;</td>
<td>LIN. FT.</td>
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<td>C-1 P CONCRETE TEST PILE 85 FT. LONG 13&quot;</td>
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<tr>
<td>PILE REBAR</td>
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<td>PILE ANCHOR</td>
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<td>PILE POLES 12&quot;</td>
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<tr>
<td>HP14x73 x 4-1/2&quot;</td>
<td>EACH</td>
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</tr>
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</table>

(1) STRUCTURAL STEEL MINIMUM INCLUDES HP14x73 CAPS

POUND 11435

NEW STEEL SHEETING ONLY.

ALL ABUTMENT STEEL SHEET PLATES SHALL MEET OR EXCEED THE SECTION PROPERTIES IN THE STEEL SHEET MINIMUM SECTION PROPERTIES TABLE.

ALL ABUTMENT STEEL SHEET PLATES SHALL BE 4-001 FORMED PER ASTM709 GR 50W UNCOATED.

STEEL SHEET PLATES SHALL BE IN ACCORDANCE WITH 2452 AND HAVE THE FOLLOWING SECTION PROPERTIES:

MATERIAL TO BE HOT ROLLED PER ASTM A328 OR COLD FORMED PER ASTM A572 OR SHEET SPECIFIED.

SECTION A-A

"X"=20" STEEL COVER PLATE WIDTH OF DECK INSTALLED ON TOP OF TIMBER DECK HEAD.

"X"=20" STEEL COVER PLATE WIDTH OF DECK INSTALLED ON TOP OF TIMBER DECK HEAD.

WELDED TO END OF SHEET CAP (AVOID DECK HARDWARE).

FIELD DRILL SHEET PILE.

3-1/8" A325 BOLTS .75" STIFF. PLATE EACH SIDE.

3" BITUMINOUS. 3 SIDES.

2-3/8" 14x73 SHEET CAP.

WELDED TO END OF SHEET CAP (AVOID DECK HARDWARE).

SECTION A-A

ABUTMENT PILE CUT-OFF DETAIL

SHEET PILE CAP AT CORNER.

SET ON TOP OF BEARING CAP AT CORNER.

SHOWN SUPERSTRUCTURE DETAIL SHEETS FOR HARDWARE PLACEMENT.

2-3/8" 14x73 SHEET CAP.

WELDED TO END OF SHEET CAP (AVOID DECK HARDWARE).

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JOHN D. EKOLA, PROFESSIONAL ENGINEER

DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JOHN D. EKOLA, PROFESSIONAL ENGINEER

MANAGEMENT.

FULLY RESPONSIBLE FOR THE COMPLETENESS AND CORRECTNESS OF THIS PLAN.

JOHN D. EKOLA, PROFESSIONAL ENGINEER

LICENSE NO. 51757 08/23/18
PIER DETAILS

C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

SECTION A-A

HP 18x135 TYP.

I HEREBY CERTIFY THAT THE PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JOHN D. EKOLA, PROFESSIONAL ENGINEER

LICENSE NO. 53076
DATE 08/23/18
CONSTRUCTION SEQUENCE

1. THE FIRST SPAN TO BE CONSTRUCTED IS SPAN 3 (PANELS "A18", "B18", "C18", & "D18").
2. PANEL "A" IS THE FIRST PANEL TO BE PLACED IN ITS FINAL LOCATION ON THE CAPS.
3. DRILL 13/16" DIA. HOLES THRU THE PANEL AND INTO THE CAPS AT THE LOCATIONS SHOWN (SEE SHEET B17 FOR DETAILS) AND FASTEN THE 3/4" C DM HD. BOLTS.
4. PLACE PANEL "C" SO ITS UPPER SPLICE BLOCK IS OVER THE LOWER SPLICE BLOCK ON PANEL "A" AND DRAW TIGHT TOGETHER WITH MINIMUM 3 TON LEVER HOIST.
5. USING THE SHOP-DRILLED HOLES IN THE UPPER SPLICE BLOCK ON PANEL "A" AS A GUIDE, DRILL AND SPEED THE 3/4" DIA. HOLES IN PANEL "C"
6. DRILL 13/16" DIA. HOLES THRU THE PANEL AND INTO THE ABUTMENT CAP AT THE LOCATIONS SHOWN (SEE SHEET B17 FOR DETAILS) AND FASTEN THE 3/4" DIA. HD. BOLTS.
7. REPEAT STEPS 4-6 FOR THE REMAINING "C" PANELS, "D" PANEL AND THE 15" PANEL.
8. REPEAT STEPS 2-5 FOR SPAN 1 (PANELS "A12", "B12", "C12", & "D12").
9. FASTEN PANELS TOGETHER OVER PIERS AS SHOWN IN DETAIL ON SHEET B17.

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9. FASTEN PANELS TOGETHER OVER PIERS AS SHOWN IN DETAIL ON SHEET B17.
**SUPERSTRUCTURE DETAILS**

C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

---

**TRANSVERSE SECTION THRU SPREADER BEAM**

---

**SPREADER BEAM NOTES**

- Eyebolts for lifting shall not coincide with spreader beam holes. Eyebolt holes shall be plugged with 3/4" treated dowels after panels are lifted into place.
- Deck panels shall be shop drilled as shown.

---

**I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.**

JOHN D. EKOLA, PROFESSIONAL ENGINEER

LICENSE NO. 53076

DATE: 06/11/18

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SIGNATURE Block
SUPERSTRUCTURE DETAILS

C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JOHN D. EKOLA, PROFESSIONAL ENGINEER

LICENSE NO. 53076
DATE 06/11/18

DESIGN BY: JDE
DRAWN BY: JEB
CHECKED BY: JES
CHECKED BY: JOE

SCALE:

40' OUT-TO-OUT OF PANELS

SPAN 2

NORTH

SOUTH

FIELDr DRILLED PANEL & CAP
(3/4"x12" DR. SPIKES (TYP.))

FIELD DRILLED PANEL & CAP
(3/4"x12" DR. SPIKES (TYP.))

SHOP DRILLED PANEL
(1) 8"x8"x3/8"-8
(1) 19'-4" SPREADER BEAMS

FIELD DRILLED UPPER SPLICE BLOCK (TYP.)

SHOP DRILLED UPPER SPLICE BLOCK (TYP.)

FIELD DRILLED LOWER SPLICE BLOCK (TYP.)

12" PANEL

(9) 3'-6" PANEL, "C" WITH UPPER & LOWER SPLICE BLOCK

7/24/2018
pw4519
Default

SPREADER BEAM NOTES

EYEBOLTS FOR LIFTING SHALL NOT COINCIDE WITH SPREADER BEAM HOLES. EYEBOLT HOLES SHALL BE PLUGGED WITH 3/4" TREATED DOWELS AFTER PANELS ARE LIFTED INTO PLACE.

DECK PANELS SHALL BE SHOP DRILLED AS SHOWN.

SPREADER BEAMS ARE FIELD DRILLED USING THE SHOP DRILLED HOLES IN THE DECK PANELS AS A GUIDE.

1) SEE SPREADER BEAM NOTES ABOVE.
2) COUNTERSINK HEAD OF DM. HD. BOLT.
3) 3"x12" 3/4"-8" SPREADER BEAM SPLICE, ONE EACH SIDE. FASTEN TO SPREADER BEAM WITH (8) 3/4"x14" MACHINE BOLTS AND (2) 3"x3"x5/16" PLATE WASHERS EA. BOLT.

TRANSVERSE SECTION THROUGH SPREADER BEAM

SCALE:

SPACING OF 3/4"x12" DM. HD. BOLTS WITH (1) 3/4" CUT WASHER AND (1) LOCK NUT EACH.

AT "A" PANEL

NORTH

FIELD DRILLED PANEL & CAP
(3/4"x12" DR. SPIKES (TYP.))

SHOP DRILLED PANEL
(1) 8"x8"x3/8"-8
(1) 19'-4" SPREADER BEAMS

FIELD DRILLED UPPER SPLICE BLOCK (TYP.)

SHOP DRILLED UPPER SPLICE BLOCK (TYP.)

FIELD DRILLED LOWER SPLICE BLOCK (TYP.)

12" PANEL

(9) 3'-6" PANEL, "C" WITH UPPER & LOWER SPLICE BLOCK

7/24/2018
pw4519
Default

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TRANSVERSE SECTION AT PIER

SCALE:

SPACING OF 3/4"x12" DM. HD. BOLTS WITH (1) 3/4" CUT WASHER AND (1) LOCK NUT EACH.

AT "A" PANEL

NORTH

FIELD DRILLED PANEL & CAP
(3/4"x12" DR. SPIKES (TYP.))

SHOP DRILLED PANEL
(1) 8"x8"x3/8"-8
(1) 19'-4" SPREADER BEAMS

FIELD DRILLED UPPER SPLICE BLOCK (TYP.)

SHOP DRILLED UPPER SPLICE BLOCK (TYP.)

FIELD DRILLED LOWER SPLICE BLOCK (TYP.)

12" PANEL

(9) 3'-6" PANEL, "C" WITH UPPER & LOWER SPLICE BLOCK

7/24/2018
pw4519
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TRANSVERSE SECTION AT PIER

SCALE:

SPACING OF 3/4"x12" DM. HD. BOLTS WITH (1) 3/4" CUT WASHER AND (1) LOCK NUT EACH.

AT "A" PANEL

NORTH

FIELD DRILLED PANEL & CAP
(3/4"x12" DR. SPIKES (TYP.))

SHOP DRILLED PANEL
(1) 8"x8"x3/8"-8
(1) 19'-4" SPREADER BEAMS

FIELD DRILLED UPPER SPLICE BLOCK (TYP.)

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12" PANEL

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TO MAKE A 2'-4" PANEL.

TO MAKE A 3'-8" PANEL.

15 SPACES @ 2'-0" = 30'

A32

3 @ 2'-0" = 6'

1'-3"

C32

1'-6"

128

15 SPACES @ 2'-0" = 30'

TO MAKE A 4'-0" PANEL.

22

6"

B32

TO MAKE A 3'-4" PANEL.

18

6"

C32

TO MAKE A 4'-0" PANEL.

10"

A32

ONLY

SEE SHEET B10 FOR SPREADER BEAM BOLT HOLE SPACING.

SHOP DRILLED 5/8" HOLES.

SHOP DRILL 5/8" HOLES.

SEE SPACING IN PLAN.

4"x8" PLANK (TYP.)

4"x16" PLANK (TYP.)

PLANKS TO BE NAILED AS INDICATED

SPLICE BLOCK

4"x8" UPPER

4"x8" LOWER

5. ATTACH THE 4"x8" PLANK(S) AS SHOWN (DEPENDING ON THE PANEL TYPE) TO PANEL USING 11" GALV. RING SHANK NAILS.

TREATING TIMBER FOR PANELS

SUPERSTRUCTURE DETAILS

TREATED TIMBER FOR PANELS

1. 4 PLANK STARTER DETAIL

2. 2'-4", 3'-4", 3'-8" AND 4'-0" WIDE UNITS.

3. FIRST FABRICATE 4 PLANK STARTER USING 4 "A" PLANKS AS SHOWN.

4. ADD 2 "B" PLANK ALTERNATING WITH 2 "A" PLANK AS REQUIRED TO MAKE A 3'-4" & 4'-0" WIDE PANEL.

5. 4 PLANK STARTER DETAIL

6. ADD 2 "B" PLANK ALTERNATING WITH 2 "A" PLANK AS REQUIRED TO MAKE A 3'-4" & 4'-0" WIDE PANEL.

7. SET RING SHANK NAILS IN POSITION IN PREBORED HOLES OF 2 PLANK UNITS OR PLUS 1 PLANK TO MAKE A 3'-8" WIDE PANEL.

8. ATTACH THE 4"x8" PLANKS AS SHOWN (DEPENDING ON THE PANEL TYPE) TO PANEL USING 11" GALV. RING SHANK NAILS.

9. SHOP DRILL 5/8" HOLES.

10. LOCATION OF 1/8" HOLES FOR 3/4" SPREADER BEAM BOLTS. REFER TO SHEET B12 FOR BOLT SPACING ON PANEL A32, B32, C32 AND D32.

SHOP ADJUST SPACING IN "A" & "B" PANELS TO MISS HOLES FOR RAILPOST CONNECTION RODS.

PLANKS TO BE PRESSURE TREATED AS PER SPEC 3491 AND THE SPECIAL PROVISIONS.

CONSTRUCTION SEQUENCE:

1. PLANKS ARE TO BE PREBORED AS PER DETAILS BEFORE BEING TREATED.


3. FIRST FABRICATE 4 PLANK STARTER USING 4 "A" PLANKS AS SHOWN.

4. ADD 2 "B" PLANK ALTERNATING WITH 2 "A" PLANK AS REQUIRED TO MAKE A 3'-4" & 4'-0" WIDE PANEL. ADD 1 PLANK SECTION PLUS 1 PLANK TO MAKE A 3'-8" WIDE PANEL. SET RING SHANK NAILS IN POSITION IN PREBORED HOLES OF 2 PLANK UNITS OR PLUS 1 PLANK TO MAKE A 3'-8" WIDE PANEL.

5. ATTACH THE 4"x8" PLANKS AS SHOWN (DEPENDING ON THE PANEL TYPE) TO PANEL USING 11" GALV. RING SHANK NAILS.

CHECKED BY: JDE

DESIGN BY: JDE

DRAWN BY: JDE

SHEET 826

C.R. 202 / HENNEPIN COUNTY PROJECT 0408

S.P. 027-596-009

BRIDGE 275'3"
SUPERSTRUCTURE DETAILS

C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

SECTION AT RAIL POST

TIMBER RAILING

SECTIONS

NOTES:
1. Shop notch 6 1/8" x 1 1/4" x 2 6 1/8" for internal plate.
2. Shop c' bore 2" x 3" deep c' bore for 5/8" nut.
3. High-strength dome head bolts do not have fins under the head at the shank.
4. 3 1/4" x 4" paving strip, Adv. attach to deck with 60d nails at 18" centers. Predrill holes to avoid splitting.
5. Split ring connectors shall be manufactured from SAE 1010 hot rolled carbon steel.
6. Timber deck flashing on south side of bridge only. See Special Provisions.

stress rod attachment detail

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the state of Minnesota.

JOHN D. EKOLA, PROFESSIONAL ENGINEER
LICENSE NO. 53076
DATE 08/23/18

DESIGN BY: JDE
CHECKED BY: JDE
DRAWN BY: JDE
CHECKED BY: JDE

Henneke

Sheets: 53076 08/23/18

Superstructure Details

B15 826
SUPERSTRUCTURE DETAILS

C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-569-009
BRIDGE 27C53

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JOHN D. EKOLA, PROFESSIONAL ENGINEER
BASED ON THE LICENSE NO.:
DATE

53076  06/11/18

LICENSE No.

DESIGN BY:  J. EKOLA
CHECKED BY:  J. EKOLA
DRAWN BY:  J. BRONDER
CHECKED BY:  J. EKOLA

END CURB
SHOP DRILLED

SHEET

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JOHN D. EKOLA, PROFESSIONAL ENGINEER
BASED ON THE LICENSE No.:
DATE

53076  06/11/18

LICENSE No.

DESIGN BY:  J. EKOLA
CHECKED BY:  J. EKOLA
DRAWN BY:  J. BRONDER
CHECKED BY:  J. EKOLA

END CURB
SHOP DRILLED

SHEET
LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.

WEB OF CHANNEL CAP.  UPSET THREADS OF BOLTS.

" DIA. GALVANIZED BOLTS.  FASTEN PLATE TO ½ CAP FOR " DIA. HOLES IN PLATE AND IN WEB OF CHANNEL.

DRILL AND GRIND OFF EMBEDMENT STEMS ON BACK OF PLATE AND

ALL DIMENSIONS FOR ¾" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".

TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.

FURNISH 2 STEEL BOLTS ⅞" x 3" LONG WITH EACH PLATE.

TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.

FULL BUTT WELD ALL AROUND (TYP.)

1234567890-)

PLAN VIEW - SPLICE BACK-UP RING

PLAN VIEW

PLAN VIEW - SPLICE BACK-UP RING

SECTION A-A

SECTION B-B

SECTION "A"

DETAIL "A"

NOTES:

MATERIAL SHALL COMPLY WITH SPEC. 3327.

LETTERS AND NUMBERS SHALL BE BURNISHED.

DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".

MATERIAL SHALL COMPLY WITH SPEC. 3327.

TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.

FULL BUTT WELD ALL AROUND (TYP.)

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011.

E-6010 OR E-6011.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011.

MATERIAL SHALL COMPLY WITH SPEC. 3327.

FULL BUTT WELD ALL AROUND (TYP.)

FULL BUTT WELD ALL AROUND (TYP.)

BACK-UP RING SHALL HAVE A TIGHT FIT.

BACK-UP RING SHALL HAVE A TIGHT FIT.

FOR PILE SHELL THICKNESSES GREATER THAN ¼", USE A 05/11/18 B-U4a WELD CONFIGURATION. SEE DETAIL "A".

FOR PILE SHELL THICKNESSES GREATER THAN ¼", USE A 05/11/18 B-U4a WELD CONFIGURATION. SEE DETAIL "A".

FOR PILE SHELL THICKNESSES GREATER THAN ¼", USE A 05/11/18 B-U4a WELD CONFIGURATION. SEE DETAIL "A".
SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN

For the design of the structure foundation to obtain relative data concerning the character of material in and upon which the foundation might be built, borings and/or soundings were made at points approximately as indicated on this drawing. With the loss of such exploration data as interpreted for such design purposes as shown. The explorations were made by ordinary and conventional methods. The kind and character of material at the site where the foundations are built may vary substantially from that indicated. The explorations were made by ordinary and conventional methods and the collection and depiction of existing sub-surface utility data is determined according to the guidelines of CI/ASCE 38-02, entitled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data."

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS
UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."
## LOG OF BORING

### T-1

<table>
<thead>
<tr>
<th>Depth</th>
<th>Symbol</th>
<th>Description of Materials</th>
<th>BP</th>
<th>WL</th>
<th>PP</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>661.9</td>
<td>18.5</td>
<td>1/2 inches of bitumen over 7 inches of aggregates base.</td>
<td></td>
<td>11.5</td>
<td>0.1</td>
<td>Benchmark: Elevations were obtained using G75 and the State of Minnesota's permanent base station network.</td>
</tr>
<tr>
<td>661.9</td>
<td>12</td>
<td>CL ORGANIC CLAY, with interbedded Peat layers, black, moist.</td>
<td></td>
<td>11.5</td>
<td>0.1</td>
<td>(Swamp Deposit)</td>
</tr>
<tr>
<td>885.9</td>
<td>0.1</td>
<td>0.1</td>
<td>MC=39, LL=30, PL=30, P=19</td>
<td></td>
<td>11.5</td>
<td>0.1</td>
</tr>
<tr>
<td>845.4</td>
<td>2.2</td>
<td>END OF BORING. Water observed at a depth of 8 feet with 14 feet of hollow Saint Louis in the ground. Boring then grouted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### T-2

<table>
<thead>
<tr>
<th>Depth</th>
<th>Symbol</th>
<th>Description of Materials</th>
<th>BP</th>
<th>WL</th>
<th>PP</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>652.7</td>
<td>18.0</td>
<td>FILL: Clayey Sand, trace fine Gravel, slightly organic, dark brown, moist.</td>
<td></td>
<td>11.5</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>885.9</td>
<td>2.2</td>
<td>ORGANIC CLAY, with interbedded Silty Sand seams and organic, trace wood, grey, wet, very soft to soft. (Swamp Deposit)</td>
<td></td>
<td>11.5</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>843.7</td>
<td>19.6</td>
<td>POORLY GRADED SAND with SILT, fine to medium-grained, trace fine Gravel, shells and roots, slightly organic, grey, waterbearing, loose.</td>
<td></td>
<td>11.5</td>
<td>0.1</td>
<td>(Aluvium)</td>
</tr>
<tr>
<td>834.7</td>
<td>2.0</td>
<td>CL LEAN CLAY, slightly organic, trace of shells, grey, wet, very soft to stable soft. (Swamp Deposit)</td>
<td></td>
<td>11.5</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>826.7</td>
<td>1.0</td>
<td>FILL: Silty Sand, fine to medium-grained, interbedded Lean Clay inclusions and wood, dark brown to grey, moist.</td>
<td></td>
<td>11.5</td>
<td>0.1</td>
<td></td>
</tr>
</tbody>
</table>

**DESIGN BY:** J. Ekola  
**CHECKED BY:** J. Bronder  
**DRAWN BY:** J. Scherer  
**LICENSE NO.:** 53076  
**DATE:** 06/11/18
### LOG OF BORING

**Braun Project B1707427**  
Geotechnical Evaluation  
Elm Creek Bridge Replacement  
Elm Creek Road (CR 202) Over Elm Creek  
Champlin, MN  

<table>
<thead>
<tr>
<th>Elev.</th>
<th>Depth (ft)</th>
<th>Symbol</th>
<th>Description of Materials</th>
<th>BRR</th>
<th>Wt</th>
<th>PE</th>
<th>ppm</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B29.7</td>
<td>33.0</td>
<td>CL</td>
<td>LEAN CLAY, grey, wet, medium. (Allochthon)</td>
<td>5</td>
<td>10</td>
<td>100</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>B21.7</td>
<td>41.0</td>
<td>CL</td>
<td>SANDY LEAN CLAY, trace fine Gravel, with occasional waterlogging Silty Sand layers, grey, wet, stiff to hard. (Glacial Till)</td>
<td>3</td>
<td>5</td>
<td>50</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>B06.7</td>
<td>56.0</td>
<td>SM</td>
<td>POORLY GRADED Silt, fine to medium-grained, trace fine Gravel, greyish brown, waterlogging, medium dense to dense. (Glacial Outwash)</td>
<td>2</td>
<td>26</td>
<td>260</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

**Drawing:**  
J. Cheak  
**Method:** 3 1/4" HSA, Ashenhammer  
**Date:** 6/11/17  
**Scale:** 1" = 1'  

**Checked by:** J. Bronder  
**Drawn by:** J. Scherer  
Design by: J. Ekola  

---

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
### Log of Boring T-2 (cont.)

**Braun Project B1707427**  
Geotechnical Evaluation  
Elm Creek Bridge Replacement  
Elm Creek Road (CR 202) Over Elm Creek  
Champlin, MN

<table>
<thead>
<tr>
<th>Depth</th>
<th>Symbol</th>
<th>Description of Materials</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>757.7</td>
<td>105.0</td>
<td>DILTY SAND, fine- to coarse-grained, trace fine and coarse gravel, light brown, water-bearing, dense to very dense.</td>
<td>(Glacial Till) (continued)</td>
</tr>
<tr>
<td>747.7</td>
<td>115.0</td>
<td>POORLY GRADED SAND with SILT, fine- to medium-grained, trace fine gravel, light brown, water-bearing, very dense.</td>
<td>(Glacial Outwash)</td>
</tr>
<tr>
<td>741.7</td>
<td>121.0</td>
<td>POORLY GRADED SAND with SILT, fine- to medium-grained, trace fine gravel, light brown, water-bearing, very dense.</td>
<td>(Glacial Outwash)</td>
</tr>
</tbody>
</table>

**END OF BORING.**  
Water observed at a depth of 0 feet with 10 feet of hollow-stem auger in the ground.  
Boring then grouted.
### EXPANSION JOINTS

**Joint Manufacturer:**

- Manufacturer's Identification
- MFR's No. and/or Letter Designation for Joint Used
- Size of Joint
- Manufacturer's Identification
- MFR's No. and/or Letter Designation for Joint Used

**Elastomeric Bearing Pads**

- Pad Manufacturer
- Name and Address (City, State)

**Special Surface Finish**

- System
- Color

**Finishing roadway faces of barrier railing**

- Type
- Color

**Anti-graffiti Coating**

- Manufacturer
- Name and Address (City, State)
- Product Name
- Location

### Paint System

<table>
<thead>
<tr>
<th>Paint System</th>
<th>Mn/Dot Specification Number</th>
<th>Manufacturer</th>
<th>Name and Address (City, State)</th>
<th>Prime Coat</th>
<th>Mn/Dot Material Specification Number</th>
<th>Intermediate Coat</th>
<th>Mn/Dot Material Specification Number</th>
<th>Finish Coat</th>
<th>Mn/Dot Material Specification Number</th>
<th>Color</th>
</tr>
</thead>
</table>

### Plan Quality

- Rate 1 (Agree), 2 (Neutral), or 3 (Disagree). Please comment below.
- Dimensioning and detailing adequately described required construction.
- Bar lists and quantities were typically complete and free of errors.
- Scale of drawings and overall legibility of lines and text was good.
- ALL SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT.

### Summary of Significant As-Built Changes

- List significant errors or omissions in plan details or pay quantities in the space provided at right.
- Notify the Bridge Office Bridge Management Unit with this information as soon as possible. (651) 366-4557

### Bridge Removal / Bridge Opening

- Number of and date old bridge was removed (if applicable)
- Bridge Number
- Date Removed

- Date new bridge was opened to traffic

- Notify the Bridge Office Bridge Management Unit with this information as soon as possible. (651) 366-4557

### Other Items

- Utilities added during construction and specialty items.
- Final quantities entered on schedule of quantities.

---

**Certified by:**

JOHN D. EKOLA, PROFESSIONAL ENGINEER

LIC. NO. 53076

05/11/18

---

**Title:**

AS-BUILT BRIDGE DATA

**Sheet No.**

B26 of B26 Sheets

**Number of and Date Old Bridge Was Removed:**

**Date New Bridge Was Opened to Traffic:**

**Notify the Bridge Office Bridge Management Unit with this information as soon as possible.**
INDEX TO DIVISION SB

DIVISION SB

<table>
<thead>
<tr>
<th>Section No.</th>
<th>Item</th>
<th>Page No.</th>
</tr>
</thead>
</table>

HERE

BRIDGE PLANS

The plans for this project, consisting of the sheets tabulated below, were approved by the State Bridge Engineer.

<table>
<thead>
<tr>
<th>BRIDGE NO.</th>
<th>TOTAL SHEETS</th>
<th>SHEET NO.</th>
<th>DATE OF APPROVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>27C53</td>
<td>26</td>
<td>B1-B26</td>
<td></td>
</tr>
</tbody>
</table>

New or revised sheets were approved as listed below:

<table>
<thead>
<tr>
<th>BRIDGE NO.</th>
<th>SHEET NO.</th>
<th>DATE OF APPROVAL</th>
</tr>
</thead>
</table>
DIVISION SB

SB-1  BRIDGE PLANS

SB-2  (1502)  PLANS AND WORKING DRAWINGS

SB-3  (1513)  RESTRICTIONS ON MOVEMENT AND STORAGE OF HEAVY LOADS AND EQUIPMENT

SB-4  (1706)  EMPLOYEE HEALTH AND WELFARE

SB-5  (2104)  REMOVAL OF ASBESTOS AND REGULATED WASTE (BRIDGE)

SB-6  (2105)  BRIDGE ABTUMENT CONSTRUCTION

SB-7  (2360)  PLANT MIXED ASPHALT PAVEMENT

SB-8  (2402)  STEEL BRIDGE CONSTRUCTION

SB-9  (2403)  TIMBER BRIDGE CONSTRUCTION

SB-10 (2442)  REMOVAL OF EXISTING BRIDGES

SB-11 (2451)  STRUCTURE EXCAVATIONS AND BACKFILLS

SB-12 (2452)  PILING

SB-13 (2511)  RIPRAP

SB-14 (3371)  STEEL SHELLS FOR CONCRETE PILING

SB-15 (3391)  FASTENERS
SB-1   BRIDGE PLANS

Plans of existing structures are available at the Minnesota Department of Transportation, Bridge Office, 3485 Hadley Ave N, Oakdale, MN, 55128-3307, for review and inspection by bidders; electronic copies are also available for viewing, printing and downloading on the MnDOT Consumer Access eDOCS (Electronic Document Management System) at http://dotapp7.dot.state.mn.us/eDIGS_guest/DMResultSet/. However, the state neither warrants nor represents that existing structures conform exactly to the details shown in those plans.

SB-2   (1502) PLANS AND WORKING DRAWINGS

_The provisions of 1502, "Plans and Working Drawings," are supplemented as follows:_

The Department will provide revised bridge drawings, bridge specifications, or provide bridge engineering analysis for the Contractor’s means and methods if:

1. Deemed necessary by the Department, in its sole discretion, to rectify materials or workmanship not meeting specifications, or
2. Requested by the Contractor in writing.

The Department may, its option, perform the work with its own staff, or by engaging a consultant pre-qualified by the Department for Work Type 3.1 "Bridge and Structure Design". If the Department is unable to perform the work, the Department may require the Contractor to have the work performed by a consultant acceptable to the Department.

If the Department performs further bridge engineering studies, bridge redesign, or provides additional bridge engineering analysis, the Contractor must reimburse the costs incurred by the Department. Work performed by the Department will be charged at actual hourly rates of pay (including overtime premium when applicable) and customary additives and overhead. Work performed by a consultant will be charged at the amount invoiced by the consultant. The Department will prepare a Change Order for reimbursement, and will deduct the costs from any payment(s) due the Contractor.

When such work is performed by the Department or its consultant, the work will be considered a review for the Department’s own purposes, and will not be considered work commissioned by the Contractor.

SB-3   (1513) RESTRICTIONS ON MOVEMENT AND STORAGE OF HEAVY LOADS AND EQUIPMENT

The Contractor shall haul Materials and move and store equipment in accordance with the Highway Traffic Regulation Act and applicable provisions of Minnesota Rules when using public Roads or completed Structures, base courses, and pavements within the Project that are open to traffic and becoming a part of the permanent improvement.

The Contractor shall comply with legal load restrictions and with special restrictions required by the Contract when hauling or storing Materials and moving or storing equipment on Structures, completed Subgrades, base courses, and pavements within the Project, under construction or completed but not yet open to traffic.
The Contractor shall complete and place a cab card in each vehicle used for hauling bituminous mixture, aggregate, batch concrete, and grading material (including borrow and excess) before starting work. This cab card shall identify the truck or tractor and trailer by Minnesota or prorated license number and shall contain the tare, maximum allowable legal gross mass, supporting information, and the signature of the owner. The Contractor shall make the card available to the Engineer upon request. The Contract Unit Prices include Contractor-related costs in providing, verifying, and spot checking the cab card information, including weighing empty and loaded trucks on certified commercial scales.

The Contractor shall not operate equipment mounted on crawler tracks or steel tired wheels on or across concrete or bituminous surfaces.

When construction operations require crossing an existing pavement, Bridges, or completed portions of the Pavement Structure with otherwise prohibited equipment or loads, the Contractor shall submit methods or load distribution or bridging in writing and obtain the Engineer's written approval. This approval does not relieve the Contractor of responsibility for any damages to the work.

The Contractor will not be relieved of liability for damages resulting from the operation and movement of construction equipment because of the issuance of a special permit, or by adherence to any other restrictions imposed.

The Contractor may temporarily store or park construction Materials and Equipment on a Bridge deck during Bridge construction. Storage of Materials and Equipment shall be limited as follows:

1. No stockpiles
2. No individual stockpiles of Materials
3. No single vehicle or equipment
4. No combination vehicles, materials, and other equipment

If loading exceeds the above defined limits, the Contractor shall submit the proposed loads and structural analysis of the deck and beams certified by a Professional Engineer to the Bridge Engineer for the Bridge Engineer’s review within a minimum of 7 calendar days before placement of loads.

SB-4 (1706) EMPLOYEE HEALTH AND WELFARE

The provisions of 1706, "Employee Health and Welfare," are supplemented as follows:

The Contractor shall submit a safety plan at the preconstruction conference providing all OSHA required safety equipment (safety nets, static lines, false decks, etc.) for all work areas whose working surface is 6 feet or more above the ground, water, or other surface. Submittal of this plan will in no way relieve the Contractor of his/her responsibility for providing a safe working area.

All safety equipment, in accordance with the Contractor's plan, must be in place and operable in adequate time to allow Department personnel to perform their required inspection duties at the appropriate time. Don’t place concrete in any areas affected by such required inspection until the inspection has been completed.

The installation of safety lines, safety nets, or other systems whose purpose is to reduce the hazards of bridge work may require the attachment of anchorage devices to beams, girders, diaphragms, bracing or other components of the structure. Clamp type anchorage systems which do not require modification of structural members may be used, provided they do not interfere with proper execution of the work; if using an anchorage system which requires modification of structural members, request approval, in writing, for plan modifications as provided in MnDOT specifications. Requests to install systems which require field welding or drilling of primary stress carrying members of a bridge will not be approved. The Contractor shall indicate any portions of anchorage devices which will remain permanently in the structure.
On both ends of each pier cap extending 6 feet or more above the ground, the Contractor shall install an insert or other suitable anchorage to which safety lines can be attached. Remove any portion of said device extending outside the finished lines of the pier cap unless otherwise approved by the Engineer. The Contractor shall repair or seal any void or cavity resulting from the installation or removal of this device to prevent the ponding or entry of water as directed by the Engineer.

The Contractor shall furnish, install and remove approved anchorage systems at no increased cost to the state for materials, fabrication, erection, or removal of the bridge component or anchorage system.

**SB-5  REMOVAL OF ASBESTOS AND REGULATED WASTE (BRIDGE)**

Remove and dispose of any regulated waste found on existing bridges or from the utilities located on the bridge in accordance with the applicable MnDOT Standard Specifications and the following:

If, during the course of removal or renovation of utility or bridge, additional asbestos materials or regulated wastes other than that noted in the Assessment Summary are encountered, notify the Project Engineer to suspend work and furnish a documented inspection and evaluation by a MnDOT approved certified MDH contractor prior to resuming work. The work, as outlined in this paragraph, will be paid for as Extra Work.

Dispose of all asbestos and/or regulated waste in accordance with MnDOT’s manual. Only those listed in this manual as pre-approved for asbestos and/or regulated waste will be allowed to work on this project. Use MnDOT approved companies for testing, waste transport and disposal as provided and described in MnDOT’s manual "Asbestos and Regulated Waste Manual For Structure Demolition Or Relocations for Construction Projects" available on the following website: [http://www.dot.state.mn.us/environment/buildingbridge/index.html](http://www.dot.state.mn.us/environment/buildingbridge/index.html). Contact Mark Vogel at 651.366.3630 or Jackie Klein at 651.366.3637, Office of Environmental Stewardship, 651.366.3630, with any questions regarding the manual.

A pre-activity meeting will be conducted to outline the action items to the satisfaction of the Engineer prior to removing any regulated materials and any bridge renovation or demolition activities.

All material shall be removed, identified, and disposed of in accordance with Section S-1701 (LAWS TO BE OBSERVED (BRIDGE)) of these Special Provisions. Permission to begin the regulated waste removals, with the exception of material needed for hazardous and regulated waste assessment or testing, will not be granted until the Engineer has copies of all required notices.

Permission to proceed with the demolition or renovation of bridges will not be granted until the Engineer has received copies of all required notifications as indicated in Section S-1701 (LAWS TO BE OBSERVED (BRIDGE)) of these Special Provisions.

Notify any utility owners at least three (3) days prior to the removal of any regulated waste which may affect the utility, allowing the utility owner time to have a representative on site.

See the attached "Asbestos and Regulated Waste Inspection Report" for information on whether or not asbestos or regulated waste was detected in the bridge(s) to be removed or renovated.

The assessment summary along with the plan or Special Provisions is intended for informational purposes. Quantity, type and analysis of any asbestos or regulated waste containing material are estimates intended as a general guide.

No measurement will be made of any portion of the asbestos or regulated waste material removal, but the complete removal thereof as specified shall be construed to be included in the single lump sum for which payment is made under Item 2104.601 "REMOVE REGULATED WASTE MATERIAL (BRIDGE)".

**SB-6  BRIDGE ABUTMENT CONSTRUCTION**
Do not start construction of each abutment until (at least 72 hours after) the approach fill at that abutment has been constructed to the full height and cross section.

SB-7  **PLANT MIXED ASPHALT PAVEMENT**

MnDOT Spec. 2360, and the following shall apply:

This work consists of installing the bituminous wear course on the timber structure. A waterproof reinforcing membrane is required prior to paving surface. The following conditions shall be followed:

- The bridge deck shall be clean and clear of all aggregate, debris and dirt prior to installation.
- The bridge deck shall be dry prior to paving.
- A tack coat will be applied to the timber deck followed by the waterproof membrane.
- A base layer of bituminous (no thicker than one inch) will be applied to the deck after the tack coat and compacted. It will likely require hand rolling and tamping at the bituminous edge.
- The bituminous needs to cool to 175-200 degrees F prior to adding the waterproof membrane.
- The waterproof membrane should be rolled out on the top of the base layer and go to within 1 inch of the bituminous edge. A broom can be used to smooth the surface as it is rolled out. Various roll sizes are available. Overlap should be two inches on the edges and 4 inches on the ends. The wrap should extend 10 ft beyond the bridge deck. A plastic release paper is on the bottom side of the membrane and can be removed by pulling at a 45 degree angle as the product is rolled out. Pressure rolling should be done to ensure contact, especially at overlapped seams.
- The wear course of bituminous should be applied at between 275-300F.
- No mastic is required when use with bituminous.
- The Contractor shall confirm these installation methods with the waterproof membrane supplier.

The following items are an acceptable waterproofing membrane for timber bridge decks:

1. ProtectoWrap 440A
2. TenCate – Mirafi – Miratak self- adhering waterproofing membrane
3. Or Engineer approved equivalent

The procurement, preparation of timber deck and installation of the timber wear course, waterproof membrane and tack coat shall be incidental to Item No. 2403.618 “GLUED LAMINATED DECK PANELS”.

SB-8  **(2402) STEEL BRIDGE CONSTRUCTION**

The provisions of 2402, "Steel Bridge Construction," are supplemented with the following:

SB-8.1  Connections

Delete the last paragraph of section 2402.3.B.2, "High Strength Fasteners," and add the following:
Before fasteners are delivered to the bridge site, provide documentation of rotational capacity (ROCAP) testing in accordance with ASTM F3125, Supplementary Requirement S4, "Rotational Capacity Testing". The fasteners must be received in packages that match the fastener assembly combination as tested. If documentation of ROCAP testing is not received; then perform this testing in the field prior to installation.

Before installation, ensure that the fastener condition has not changed due to weathering, mixture of tested assembly lots, or other reasons. In the event that changes have occurred, the Engineer will require re-qualification using ROCAP testing in the field for a minimum of three fastener assemblies of each combination to be used in permanent bolting.

*Add the following after the third paragraph of section 2402.3.G.2.c(1), "Bolt Tension":*

Perform Pre-Installation Verification (PIV) testing on all bolted connections requiring the use of Direct Tension Indicator (DTI) washers. DTIs will be required as indicated elsewhere in this Proposal. To enable more accurate bolt tensioning, the Contractor may propose precision bolting systems. A precision bolting system is defined as the use of tools that have been calibrated to produce repeatable results in conjunction with an installation plan that addresses snugging and tensioning of a connection.

Provide the Engineer with a detailed job-specific fastener installation plan at least four weeks before the start of steel erection. The plan will include PIV testing in accordance with the Research Council on Structural Connections (RCSC), "Specification for Structural Joints Using High-Strength Bolts" (http://www.boltcouncil.org). PIV testing requires the use of a properly calibrated hydraulic load cell in order to verify the following in the field prior to permanent bolting:

1. Ensuring the bolt crew is familiar with tightening procedures;
2. Ensuring tools and equipment are capable of performing adequately;
3. Ensuring structural bolting assemblies (including lubrication) are in suitable condition for proper bolting procedure and achieving needed results; and
4. Expanding a greater range of acceptance criteria [2402.3 G.2.d(3)] when utilized with precision bolting systems for snugging and final tightening, respectively.

For bolts that are too short to utilize a calibrated hydraulic load cell, calibrated DTIs will be used as a load cell. Once the DTIs have been calibrated, test the fastener assembly in a steel plate of similar thickness to that used in the permanent condition. Refer to the previously referenced RCSC Specification for more detail, except only one calibrated DTI needs to be used in the fastener assembly for each PIV test.

Perform PIV testing on at least three complete fastener assemblies of each combinations of diameter, length, grade, and lot to be used in the work. PIV testing must be performed no earlier than two weeks prior to permanent bolting. The fastener installation plan will be updated with the results from the PIV testing. The hydraulic load cell must have been calibrated within one year of the date of use in order to be used for PIV testing.

*Add the following to section 2402.3.G.2.c, "Installation":*

G.2.c(5) Quality Management for Installation

Develop a Quality Control plan that includes at a minimum the following items:

1. Materials tracking process for components of fastener assemblies (bolts, nuts, washers, etc.);
2. Procedure for tracking when permanent bolts were installed and when final tensioning occurred;
3. Record keeping of final tensioning and DTI readings;
4. Develop a snugging and tensioning sequence for each connection detail;
5. Develop a procedure that ensures the Contractor’s Quality Manager Staff will verify the fastener installation plans were followed;
6. Lists the Contractor’s staff that will be performing the work using the precision bolting system tools. Include details of relevant training, experience, or both for each individual; and

7. Develop a procedure Pre-Installation Verification (PIV) tests for each lot shipped to the project site prior to installation of the permanent bolt assemblies.

Additional ROCAP and PIV tests are required whenever the condition of the fasteners is in question by the Engineer or the condition changes from when the initial ROCAP or PIV tests were performed. In the event field ROCAP testing is required, follow the procedure described in Annex A2 of ASTM F3125.

Submit Quality Control plan to Engineer at least four weeks before the start of steel erection.

*Add the following to the end of section 2402.3.G.2.d(3), "Inspection Procedure for Direct Tension Indicators (DTI)"*

Use the following procedure for inspection when bolting operations utilize PIV testing and precision bolting systems:

1. Verify bolting operations were performed in accordance with the job-specific fastener installation plan;
2. An initial visual inspection of the DTIs after the bolts are snug tight. Remove and replace DTIs with more than half of the protrusions completely crushed during snugging operations and recalibrate snugging procedure; and
3. After final tightening, randomly select 10 percent of the DTIs, but not less than 2 DTIs, in each connection to inspect in accordance with the job-specific fastener installation plan. The appropriate feeler gauge should be refused in at least half of the spaces between DTI protrusions.

**SB-8.2 Bolted Connections**

Prepare and install all bolted field connections for steel bridges using Direct Tension Indicator (DTI) washers. Ensure DTIs conform to the requirements of 3391, "Fasteners," and ASTM F959. All DTIs must have unique markings to indicate the gap locations between the protrusions and to allow the inspector to visibly differentiate them from a standard washer after installation. Mechanically galvanize supplied DTIs in accordance to 3392, "Galvanized Hardware".

Install fasteners in accordance with the DTI manufacturer’s recommendations and 2402, "Steel Bridge Construction," as well as the requirements of AASHTO LRFD Bridge Construction Specifications, Third Edition, Article 11.5.6.4.7 Direct Tension Indicator Installation Method. Ensure a DTI manufacturer’s representative is on-site at the beginning of the bolting operations to provide training and ensure proper installation.

Use of DTIs, as described above, are an incidental expense to the structural steel and no direct compensation will be made.

**SB-9 (2403) TIMBER BRIDGE CONSTRUCTION**

The provisions of 2403, "Timber Bridge Construction," are supplemented as follows:

**SB-9.1 Preservative Treatment**
All timber in the bridge shall be treated with Copper Naphthenate, or other oil-based treatment as approved by the Engineer, in accordance with Specification 3491 and the current AWPA Standards, according to Best Management Practices.

The spike laminated deck panels and glue laminated crash rail shall be shop drilled and treated to avoid field treatment, see plans.

**SB-9.2 Glue Laminated Rail Construction Requirements**

This work shall consist of the fabrication and installation of glued laminated rails and shall be performed in accordance with the provisions of 2403.3 and the following:

All applicable provisions of 2403.3.N.2 shall apply to flued laminated rail.

Hardware that attaches the Bridge Railing to the Spike Laminated Deck shall be hand tightened only during cold weather and the Contractor will refrain from upsetting the hardware at this time. The Contractor shall then tighten the fasteners at the Engineer’s direction once weather permits and upset the hardware at the final torque.

Plastic caps shall be installed on the top of each timber post. The caps shall be purpose built to timber bridge rails to prevent moisture entering the end grain. Protective plastic caps shall be incidental to the Glue Laminated Rail. The caps shall be black in color. See photo below:
SB-9.3 Timber Deck Expansion Material

Contractor to install cork or neoprene padding material that is a minimum of 1/4 inch thick between timber material and steel L brackets located on the top of each abutment and pier. The cost of installation and material shall be incidental to the Glued Laminated Deck, Item No. 2403.618.

SB-9.4 Timber Deck Flashing Material

Contractor to install 26 gag. (minimum) galvanized flashing material on the south edge of the bridge deck for the entire length as noted in the plans. The flashing shall extend a minimum of 3” off the deck to assure rain does not run down the end grain. Vertical flashing shall be installed on all timber curb members to protect each scupper block on the south edge. The cost of installation and material shall be incidental to the Glued Laminated Deck, Item No. 2403.618.

SB-9.5 Method of Measurement

Glued Laminated rails will be measured by the linear foot, based on the out to out length of the rail.

Spike laminated bridge panels will be measured by the square foot.

SB-9.6 Basis of Payment

Payment for flued laminated railing will be made as Item No. 2403.603 “Timber Railing” at the Contract price per linear foot, which shall include compensation for all costs of manufacturing, preserving, hardware, transporting, and installing the timber bridge rails complete in place.

Payment for spike laminated bridge panels will be made as Item No. 2403.618 “Glued Laminated Deck Panels” at the Contract price per square foot, which shall include compensation for all costs of manufacturing, preserving, hardware.

SB-10 (2442) REMOVAL OF EXISTING BRIDGES

The provisions of 2442, "Removal of Existing Bridges," are supplemented as follows:

SB-10.1 Removal of Existing Bridges

Add the following to the end of the third paragraph of 2442.3.A, "General":

Completely remove piling and obstructions that interfere with the new structure.

SB-10.2 Supplemental Provisions

Dispose of materials in accordance with 1506, "Supervision By Contractor," 2104.3.C, "Removal Operations," MnDOT Managing regulated materials on building and bridge projects per the Office Of Environmental Stewardship and the following:
Furnish written information to the Engineer as to disposal of steel bridge beams and other steel bridge components coated with paint containing hazardous materials (i.e. Lead or PCB). Include method of stabilization and disposal; name, address, and telephone number of disposal site; certification that Contractor has notified disposal site of presence of the hazardous paint; acknowledgment by Contractor of OSHA requirements relating to lead or PCB; and certification that Contractor is familiar with proper handling and disposal of materials with lead or PCB based paint systems. Stabilize all hazardous paint that has been identified as peeling by coating with an approved product, as listed on the MnDOT Approved Products website [www.dot.state.mn.us/products](http://www.dot.state.mn.us/products) under "Lead Paint Encasement Product". Prevent the peeling paint from flaking off during demolition, or scrape and contain the peeling paint. If the coating option is used apply 16 mils of the product. Applying more than 16 mils of the product on a bridge over any water will require that the bridge have a diaper apron be attached under the bridge to contain the drips. Complete all work as per the MnDOT Office of Environmental Stewardship. The form supplied in this special provision must include the signature of the authorized Superintendent verifying that the information is correct.
NOTIFICATION FORM ON DISPOSAL OF BRIDGE STEEL

The Contractor is required to provide certain information on disposal of bridge steel which has been painted with lead-based paint. By signing this document, the Contractor certifies that information supplied by the Contractor is correct and that the Contractor is familiar with proper handling and disposal of materials with lead-based paint. This information must be furnished to the Project Engineer a minimum of 30 calendar days prior to removal of the bridge steel from the project site. Any change in method or location of disposal would require resubmittal and a 30 calendar day notice.

MnDOT Project No. ________________________________       Bridge No. __________

Description of Bridge Steel ________________________________________________

Paint System is MnDOT Spec.  ________________  ________________

(Primer)  (Top Coat)

Project Engineer: _________________________________________________________

Contractor/Subcontractor: _________________________________________________

(Name, mailing address, telephone no.)

I ___________________________ certify that the following information is correct:

(print name of authorized representative)

The above bridge steel will be disposed of by the following method(s):

____________________________

(list name, address and telephone no. of recipient, estimated delivery date, and intended use.)

I also certify that ___________________________ is familiar with

(Contractor/Subcontractor name)

the requirements in OSHA 29 CFR 1926.62 relating to lead and PCBs, precautions to be taken when working with lead or PCB, and proper handling and disposal of materials with lead-based or PCB-based paint systems and that ___________________________ has been notified of the presence of lead-based or PCB-based paint.

(name of recipient)

_________________________  __________________________

(signature)  (date)

Received by Project Engineer/Inspector:

_________________________  __________________________

(date)  (signature)

cc: Project File
Office of Environmental Stewardship
SB-11 (2451) STRUCTURE EXCAVATIONS AND BACKFILLS

The provisions of 2451 are noted here and in Division S - 2451, "Structure Excavations and Backfills," are supplemented as follows:

SB-11.1 Structure Excavation

Excavate, sheet, shore and/or protect, prepare foundation, and place backfill necessary for construction of Bridge(s) No 27C53, which are not specifically included in the grading portion of the Contract. Dispose of surplus material.

Do not measure the excavated or backfill material. All work performed as specified above will be considered to be included in a single lump sum for which payment is made under Item No. 2401.601, "STRUCTURE EXCAVATION".

For purposes of partial payments, the portion of the lump sum Structure Excavation at each substructure unit will be defined as follows:

Bridge 27C53

Each Abutment 25%

Each Pier 25%

SB-11.2 Dewatering

For informational purposes, the current flow conditions under the existing bridge are noted below. This information can be utilized to develop a dewatering plan. All dewatering efforts and material are incidental.

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<th>Flowline Elevation</th>
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<tr>
<td>5 year</td>
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<td>25 year</td>
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SB-12 (2452) PILING

The provisions of 2452, "Piling," are supplemented as follows:

SB-12.1 Commercial Drive Fit Splices for CIP Piling

Commercial drive fit splices will NOT be permitted (on this project) (on Bridge 27C53).

SB-12.2 Piling Furnished and Installed
Modify all references to "piling delivered" and "piling driven" under 2452.3, "Construction Requirements," 2452.4, "Method of Measurement," and 2452.5, "Basis of Payment," to read "Piling."

Add the following to the end of 2452.3.E.1, "General":

When the conditions of this section have been met for the test pile, the resulting pile cut-off becomes the property of the Contractor.


Replace 2452.4.B, "Piling Delivered," with the following:

The Engineer will measure piling for payment by the length of acceptable piling below cut-off.

Replace 2452.5.B, "Piling Delivered," with the following:

All treated timber piles, untreated timber piles, steel pipe piles, steel H-piles, and concrete piles driven will be paid for by the linear foot. Payment will be made only for the actual number of linear feet of acceptable piling complete in place as needed for design or as directed by the Engineer.

Splices will be compensated at the rate of six (6) times the contract unit price for piling furnished and installed, if the splice was made and only after piling is driven to estimated test pile length for that structure and bearing is not achieved. Maximum of one splice will be paid per pile. No additional payment will be made for splices made solely for the Contractor’s convenience.

If the quantity of driven piling is less than the estimated plan quantity, the Department will pay 50% of the cost to re-stock unused piling if the Contractor elects to re-stock piling and provides a paid invoice showing the re-stocking fee not to exceed the difference of estimated pile length in the plan and actual driven length. Payment for the Department’s portion of the restocking fee will be made as a backsheet item under "Piling, Restock" superseding any claims due from 1907, "Payment for Surplus Material".

The following costs are included in the cost of the piling:
• predrilling pilot holes;
• pile sleeves;
• maintaining open holes during pile driving;
• broken, bent, damaged, or misplaced piles;
• concrete filling or concrete encasement;
• misplaced pile or corrective location or alignment measures;
• modifying or replacing pile driving equipment;
• redriving piles which have heave more than ¼";
• piles which are damaged during handling or if the Engineer determines that the damage was caused by the Contractor’s carelessness or negligence while driving;
• piles which were not driven in accordance with these specifications;
• piles driven with the tops lower than the cut-off elevation;
• spudding or jetting of piles;
• cutting and trimming, and coating steel H-pile and steel shell pile;
• providing and attaching driving shoes for pipe piles;
• all labor, equipment, and necessary incidentals; and
• disposal of all pile cut-offs.

A. Method of Measurement

The Engineer will measure piling by the length of acceptable piling below cut-off elevation.
No additional payment will be made if the Contractor elects to furnish and drive thicker wall pipe piles than specified.

The cost of mobilization and demobilization for pile driving operations is included in the cost of mobilization and demobilization in accordance with 2452.5, "Basis of Payment".

The cost to control sediment in water from jetting operations is included in the cost of piling.

B. Basis of Payment

Payment for Item No. 2452.603 "C-I-P CONCRETE PILING 12" & Item No. 2452.603 "C-I-P CONCRETE PILING 16" will be made at the Contract unit price per linear foot and shall be compensation in full for furnishing and installing the Piling complete and inplace as described above, including all incidentals thereto.

SB-12.3 Pile Coating

*The provisions of 2452.3.J, "Coating Steel H Piles and Steel Pile Shells," are modified as follows:*

Delete 2452.3.J.2, "Galvanized Piles."

The Steel Pile Shells shall be coated with Federal Standard 595C No. 17038 (black) in a semi-gloss finish. All references to federal colors in provision 2452.3J1 shall be replaced with Federal Standard 595C No. 17038 (black) in semi-gloss finish. The steel sheet piling & miscellaneous steel components listed on plan sheets B4 through B9 are not to be painted.

SB-12.4 STEEL SHEET PILING

This work shall consist of furnishing and driving steel sheet piling in accordance with MnDOT 2452, at the locations and details in the Plans, and the following:

a. **The Contractor shall furnish and place new steel sheet piling required in the Contract or by the Engineer. USED SHEET PILING WILL NOT BE ACCEPTED.**

b. **Measurement will be made by the total area in square feet of sheet piling that is necessary for the intended use. The Engineer may order a different area prior to driving the piling based on field conditions.**

Payment will be made under Item 2452.618 (Steel Sheet Piling) at the Contract bid price per square foot, which shall be compensation in full for all costs of furnishing and installing acceptable piling.

SB-13 RIPRAP

*The provisions of 2511, "Riprap," apply in addition to:*
All riprap placement above the normal water line shall be installed as root rap. Per 2577 specification and Root Rap Guidance document in appendix, root rap shall be rip rap material in conjunction with compost material and seeding. Root rap material will be compensated with item Nos. 2511.504 “Geotextile Filter Type 7”, 2511.507 “Random Riprap Class IV”, 2574.507 “Compost Grade 3”, 2574.508 “Fertilizer Type 4” & 2575.508 “Seed Mixture 35-241”. Root rap procurement, placement and cleanup costs shall be incidental to Item No. 2574.507 “Compost Grade 3”.

**SB-14**  
**STEELE SHELLS FOR CONCRETE PILING**

*The provisions of 3371, "Steel Shells for Concrete Piling," are supplemented as follows:*

Supplement the fourth paragraph of 3371.2, "Requirements," with the following:

Give pipe containing a non-permissible irregularity as described above one of the following dispositions:

1. Remove the non-permissible irregularity by grinding in such a way that the ground area blends in smoothly with the contour of the pipe. Ensure the wall thickness in the ground area is not adversely affected. Smoothly contoured welds with a clean appearance need not be ground flush. The only permissible irregularity will be one caused from the original manufacturing of the pipe (e.g. weld seam of a Double Submerge Arc Weld process), or a field weld that has a clean appearance.
2. Cut off the section of pipe containing the non-permissible irregularity.
3. The entire pipe containing a non-permissible irregularity may be rejected at the Engineer's discretion.

**SB-15**  
**FASTENERS**

Add the following after the third paragraph of section 3391.2.B, "High Strength Structural Steel Bolts":

For bolts meeting the requirements of ASTM F3125, "Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions," include Supplementary Requirement S4 "Rotational Capacity Testing". Ship required documentation with the fastener assemblies and provided to the Engineer.
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<tr>
<th>Item No.</th>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
<th>Price</th>
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**APPENDIX C**

**Contract Bid Abstract**

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**Contract Total:**

- Redstone Construction, LLC: $1,396,584.80
- Meyer Contracting Inc.: $1,406,086.55
- Edward Kraemer & Sons, Inc.: $1,440,442.34
- S.M. Henniges & Sons, Inc.: $1,498,575.35
- Robert R. Schroeder Construction, Inc.: $1,641,666.62

**Total: $6,520,352.52**
NOTES:
- Drill shallow lap joint on this panel, after the drilling for the rod. Adjust lap joint spacing as necessary.

**SPAN 1 DECKS PREFRAMING**

**Dowel Laminated Deck Panel Thus – Span 1**

(1) 6'-0" x 18'-0"

Panel C

Next to A Panel

(3) 6'-0" x 18'-0"

Panel D

Part C 1/4" Below

**SPAN 2**

**SPAN 3**

**DECK PANEL DESIGNATIONS**
Dowel Laminated Deck Panel Plan - Span 2

1. A x 16" x 32'-0"
2. B x 8" x 32'-0"
3. C x 8" x 32'-0"
4. D x 16" x 32'-0"

Span 1: 3'-0" x 4'-0"
Span 2: 3'-0" x 4'-0"
Span 3: 3'-0" x 4'-0"

Top View

Section A-A

Last 16" Plank Before Splice On "A" Panel

Deck Panel Designations

Table:

<table>
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Wheeler Engineering
100 W. Broad St, Ste 100
Eden Prairie, MN 55344
952-354-7856
info@wheeler1892.com
wheeler1892.com
18' x 3' 
1'-3" 1'-9" 1'-6" 1'-9" 
3 @ 2'-0" = 6'-0"
1'-6" 1'-6" 1'-6" 1'-3"

SIMPLE JOINT SPACING

BUTTER HOLE PANELS
ON WALL JOINT ONLY

(14) 1/4" (6mm) HOLES

DECK SPACING

SPARCE BLOCK, 515, (TPS)

FLOOR, 515, (TPS)

JOIN PANELS TO 3" X 3" DEEP CHIMNEYS FOR STRESSING AND OUT.
PLACE 1" DOWN FROM TOP OF LAST ATTACHED PANEL.

DOWEL LAMINATED DECK PANEL THUS - SPAN 3

(1) 6" X 4" X 18' (576") FLOORING, 515, 6" X 4"
NEXT TO "B" PANEL
515, C-16" X 4"

SPAN 1 SPAN 2 SPAN 3

A A A

B C C

C C C B

D D C

B B

DECK PANEL DESIGNATIONS

SPAN 3 DECKS PREFRAMING

Wheeler

DATE: 1/09/10
TRACKING NO. 703447 SHEET NO.

Wheeler1892.com