DEPARTMENT OF TRANSPORTATION

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

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Natural Resources Research Institute
University of Minnesota Duluth

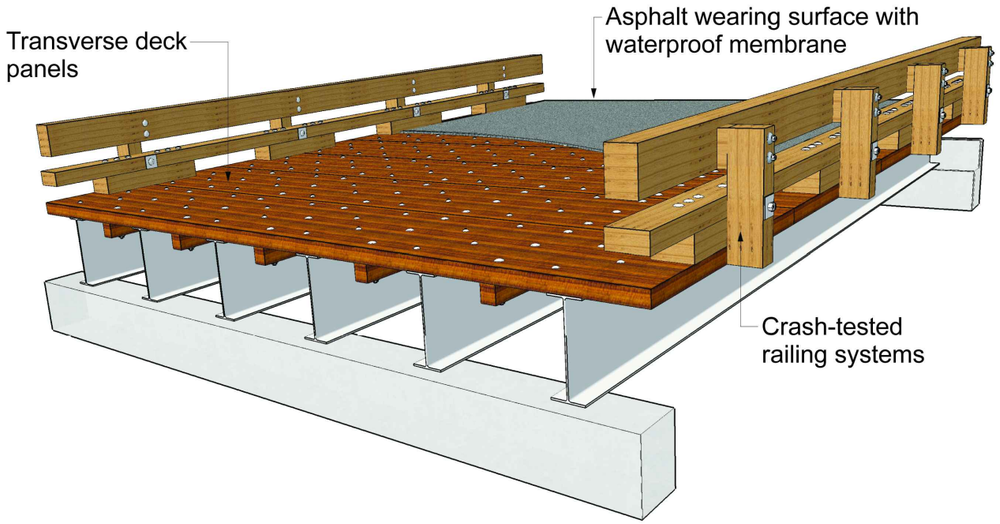
June 2020

Research Project
Final Report 2020-16A

LRRB
LOCAL ROAD RESEARCH BOARD

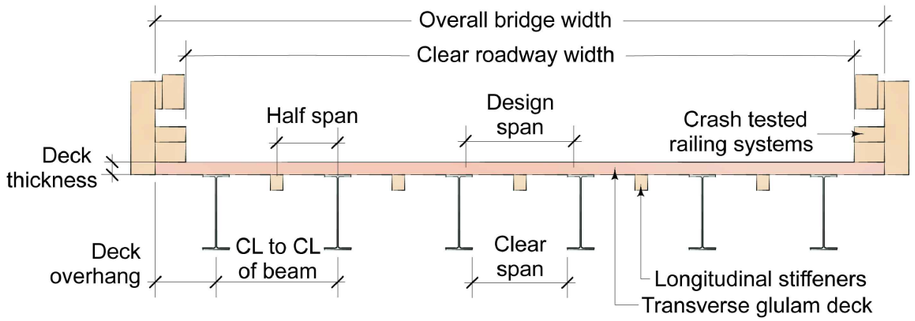
APPENDIX A
STEEL STRINGERS WITH A TRANSVERSE GLULAM DECK

Steel Stringers with a Transverse Glulam Deck

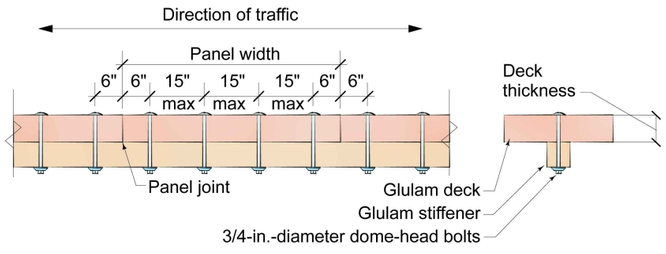


The bridge design information depicted on these drawings was developed under a cooperative research agreement between Minnesota Local Road Research Board (LRRB), Minnesota Department of Transportation, The University of Minnesota Duluth - Natural Resource Research Institute (NRRI), and the USDA Forest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

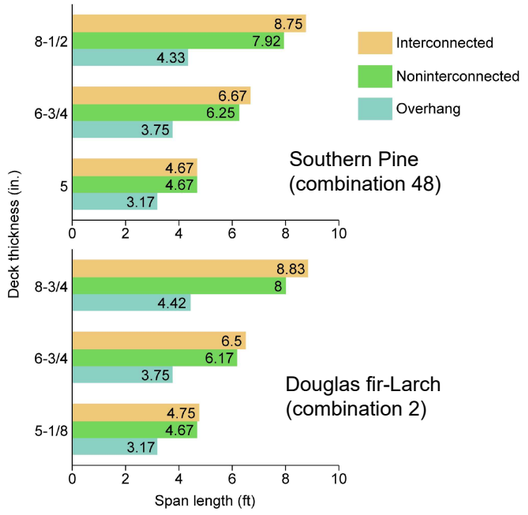
Steel Girders and Transverse Glulam Deck	Perspective Drawing / Photograph View
Design Aids For Minnesota Timber Bridges	June 2020
	Sheet Number 1



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.



Longitudinal Stiffener Detail



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-jointed at a panel midwidth. Proper fasteners must be used.

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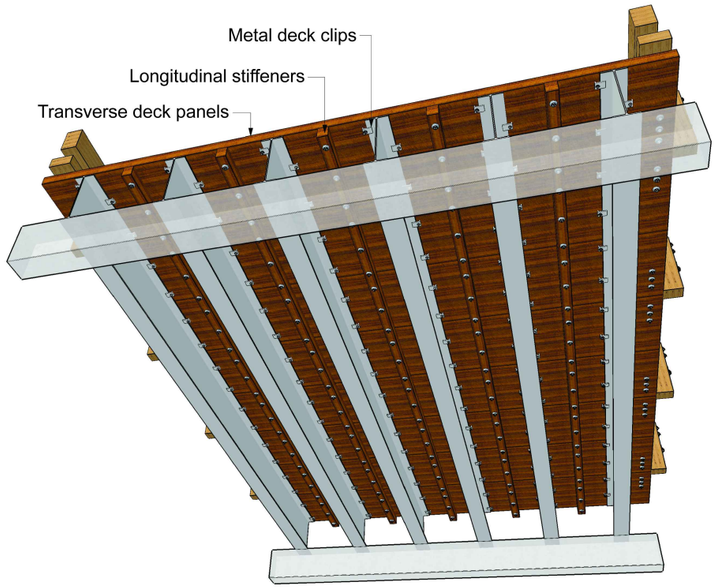
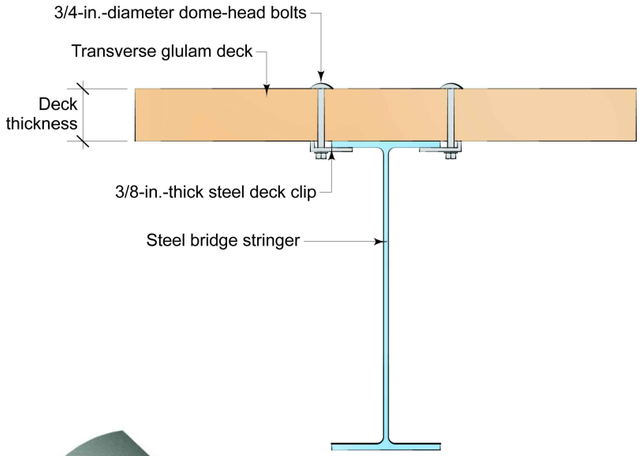
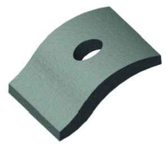
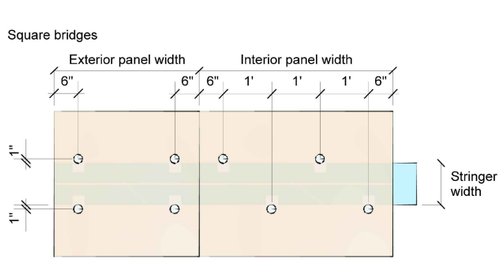
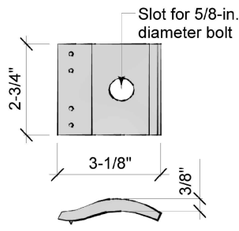




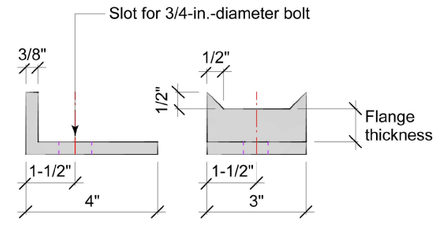




Thru-Bolted Glulam Deck Clip Layout



Cast Iron "C" Clips
(for steel flanges with a max. thickness of $\frac{3}{4}$ in.)



Steel Deck Clip
(suitable for all steel flange thicknesses)

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Steel Girders and Transverse Glulam Deck

Glulam Panel-to-Stringer Connections

Design Aids For Minnesota Timber Bridges

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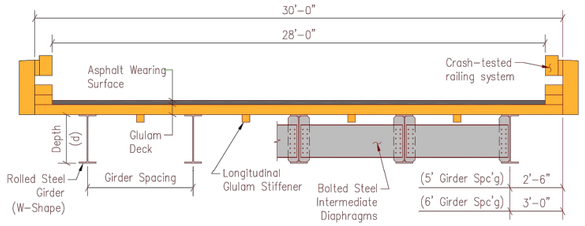
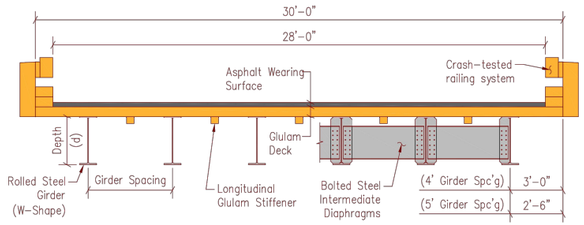
Sheet Number 3



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]

ROLLED STEEL GIRDER SUPERSTRUCTURE DESIGN TABLE

SPAN LENGTH (CTR.–CTR. BRG.)	4'–0" GIRDER SPACING WITH 5" (S.P.), 5 1/8" (D.F.) OR 6 3/4" (S.P. & D.F.) NON–INTERCONNECTED & INTERCONNECTED T.G.D.		5'–0" GIRDER SPACING WITH 6 3/4" OR 8 1/2" (S.P. & D.F.) NON–INTERCONNECTED & INTERCONNECTED T.G.D.		6'–0" GIRDER SPACING WITH 6 3/4" OR 8 1/2" (S.P. & D.F.) NON–INTERCONNECTED & INTERCONNECTED T.G.D.	
	W–SHAPE	DEPTH (IN.)	W–SHAPE	DEPTH (IN.)	W–SHAPE	DEPTH (IN.)
24 FT.	–	–	W18 X 60 W21 X 57 W24 X 55	18 1/4 21 23 5/8	W18 X 71 W21 X 62 W24 X 62	18 1/2 21 23 3/4
26 FT.	–	–	W18 X 71 W21 X 62 W24 X 62	18 1/2 21 23 3/4	W18 X 76 W21 X 68 W24 X 68	18 1/4 21 1/8 23 3/4
28 FT.	–	–	W18 X 86 W21 X 68 W24 X 62	18 3/8 21 1/8 23 3/4	W18 X 97 W21 X 83 W24 X 68	18 5/8 21 3/8 23 3/4
30 FT.	–	–	W21 X 83 W24 X 68 W27 X 84	21 3/8 23 3/4 26 3/4	W21 X 93 W24 X 76 W27 X 84	21 5/8 23 7/8 26 3/4
32 FT.	–	–	W21 X 93 W24 X 76 W27 X 84	21 5/8 23 7/8 26 3/4	W24 X 84 W27 X 84 W30 X 90	24 1/8 26 3/4 29 1/2
34 FT.	–	–	W24 X 84 W27 X 84 W30 X 90	24 1/8 26 3/4 29 1/2	W27 X 84 W30 X 90 W33 X 118	26 3/4 29 1/2 32 7/8
36 FT.	–	–	W24 X 94 W27 X 84 W30 X 90	24 1/4 26 3/4 29 1/2	W27 X 94 W30 X 90 W33 X 118	26 7/8 29 1/2 32 7/8
38 FT.	–	–	W24 X 103 W27 X 94 W30 X 90	24 1/2 26 7/8 29 1/2	W27 X 102 W30 X 90 W33 X 118	27 1/8 29 1/2 32 7/8
40 FT.	–	–	W27 X 102 W30 X 90 W33 X 118	27 1/8 29 1/2 32 7/8	W27 X 114 W30 X 108 W33 X 118	27 1/4 29 7/8 32 7/8
42 FT.	–	–	W27 X 114 W30 X 99 W33 X 118	27 1/4 29 5/8 32 7/8	W30 X 116 W33 X 118 W36 X 135	30 32 7/8 35 1/2
44 FT.	–	–	W30 X 108 W33 X 118 W36 X 135	29 7/8 32 7/8 35 1/2	W33 X 118 W36 X 135	32 7/8 35 1/2
46 FT.	–	–	W30 X 116 W33 X 118 W36 X 135	30 32 7/8 35 1/2	W33 X 118 W36 X 135	32 7/8 35 1/2
48 FT.	–	–	W33 X 118 W36 X 135	32 7/8 35 1/2	W33 X 130 W36 X 135	33 1/8 35 1/2
50 FT.	–	–	W33 X 118 W36 X 135	32 7/8 35 1/2	W33 X 130 W36 X 135	33 1/8 35 1/2
52 FT.	–	–	W33 X 130 W36 X 135	33 1/8 35 1/2	W33 X 152 W36 X 135	33 1/2 35 1/2
54 FT.	–	–	W33 X 141 W36 X 135	33 1/4 35 1/2	W36 X 150	35 7/8
56 FT.	–	–	W33 X 152 W36 X 135	33 1/2 35 1/2	W36 X 160	36
58 FT.	–	–	W36 X 150	35 7/8	W36 X 170	36 1/8
60 FT.	W33 X 141 W36 X 135	33 1/4 35 1/2	W36 X 150	35 7/8	–	–
62 FT.	W33 X 152 W36 X 135	33 1/2 35 1/2	W36 X 160	36	–	–
64 FT.	W36 X 150	35 7/8	W36 X 170	36 1/8	–	–
66 FT.	W36 X 150	35 7/8	–	–	–	–
68 FT.	W36 X 160	36	–	–	–	–
70 FT.	W36 X 170	36 1/8	–	–	–	–

S.P. = southern pine; D.F. = douglas fir-larch; T.G.D = transverse glulam deck; T.G.D. thickness shown in table represents minimum required thickness for each girder spacing; Empty cells (denoted with "-") indicate that there are no acceptable rolled steel girder shapes for that span and girder spacing;

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 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-LRFR)

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.

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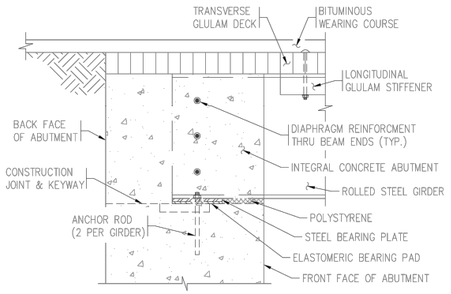
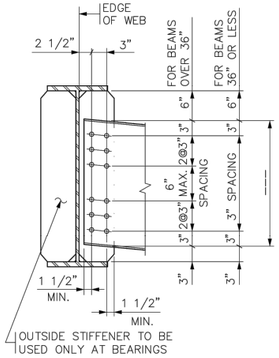
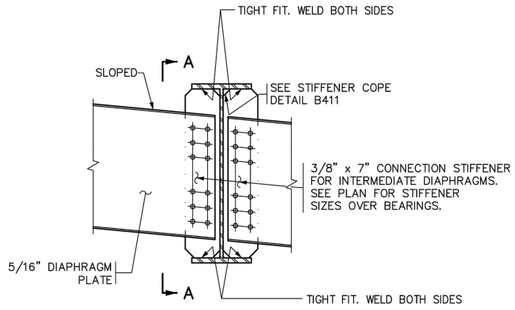


Stringer on Concrete Abutment

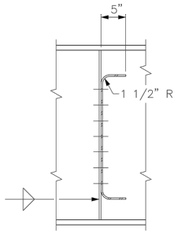


Fascia Beam

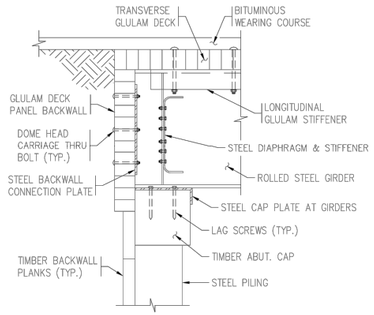


Interior Beam

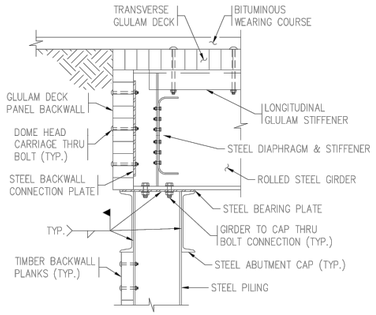
Intermediate Diaphragm Locations



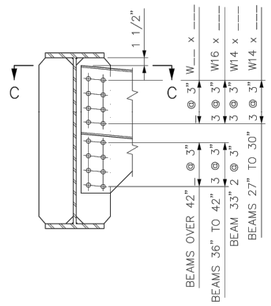
Section A-A



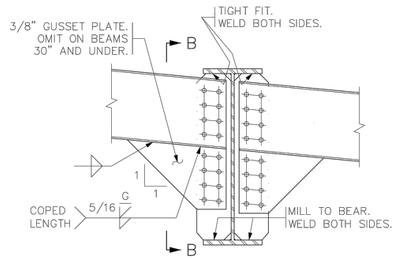
Stringer on Timber Abutment



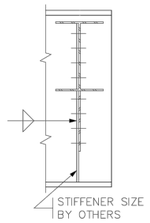
Stringer on Steel Abutment



Fascia Beam



Interior Beam



Section A-A

Abutment Diaphragm Locations

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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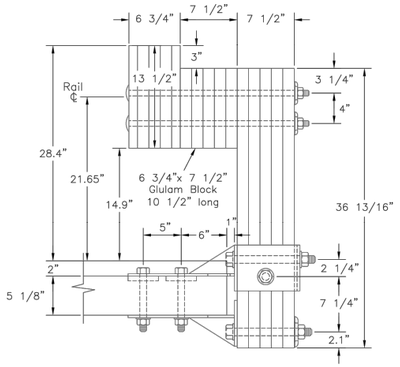
Steel Girders and Transverse Glulam Deck

Girder Diaphragm and Abutment Bearings

Design Aids For Minnesota Timber Bridges

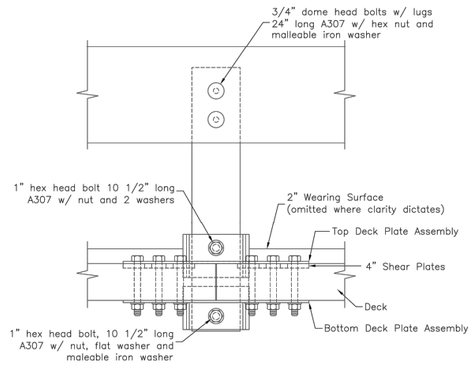
June 2020

Sheet Number 5

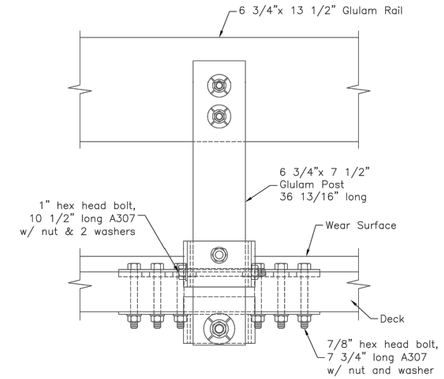


End View

Railpost spacing 8 ft. (Typ.)



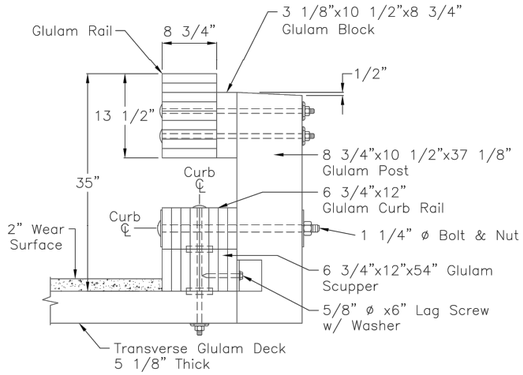
Front View



Rear View

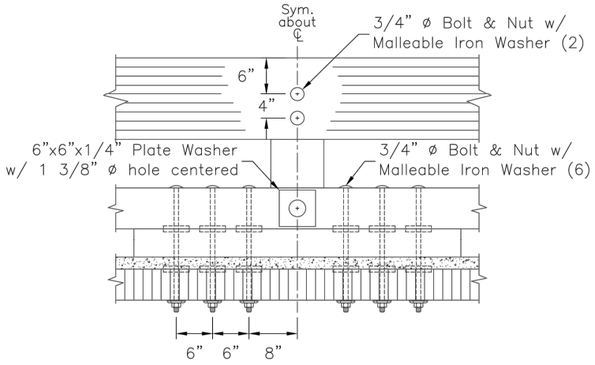
Curbless Bridge Rail - Test Level 2 (NCHRP-350)

Note: More information is available in the Transportation Research Record (**TRR-1743**) journal including steel rail and post systems and transition railings.

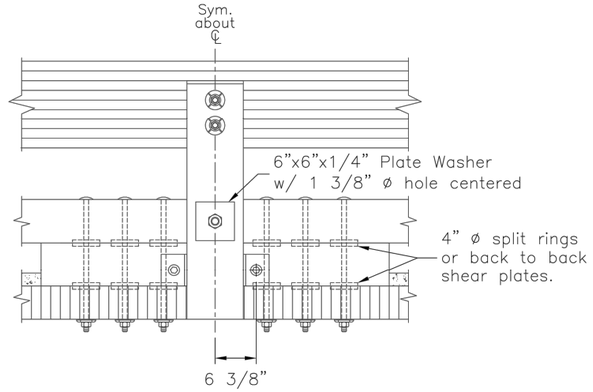


End View

Railpost spacing 8 ft. (Typ.)



Front View



Rear View

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

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

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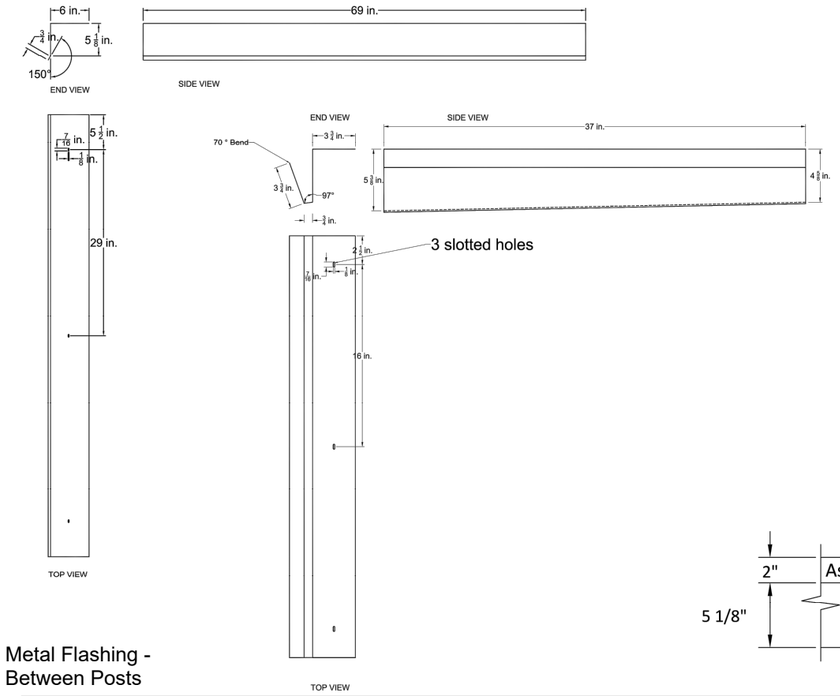
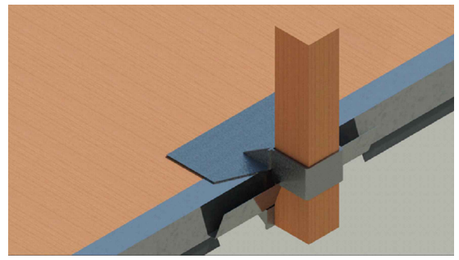
Steel Girders and Transverse Glulam Deck	Crash-Tested Bridge Rail System
Design Aids For Minnesota Timber Bridges	June 2020 / Sheet Number 6



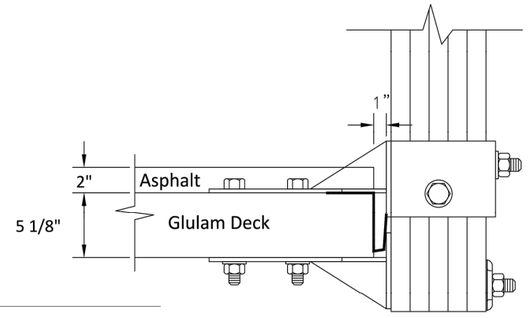
Metal Flashing -
Between Posts

Metal Flashing -
Straddling Posts

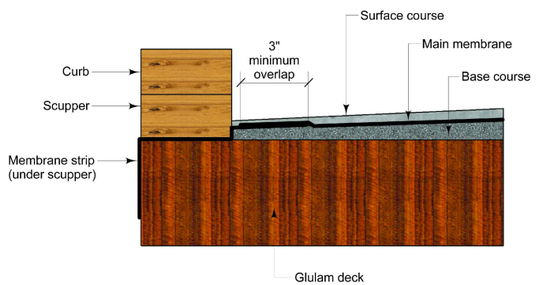


Rendering of Metal Flashing at Post

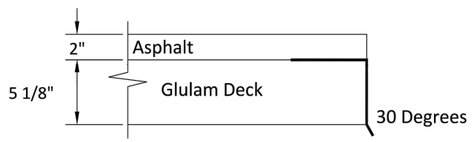
Protective Railpost Cap



End View -- Flashing Straddling Posts



Asphalt Wearing Surface Recommendation



End View -- Flashing Between Posts

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 maintaing a minimum overlap of 5 inches at all joints. Flahing segments at the bridge corners should be sloped to drain away from the bridge abutments.

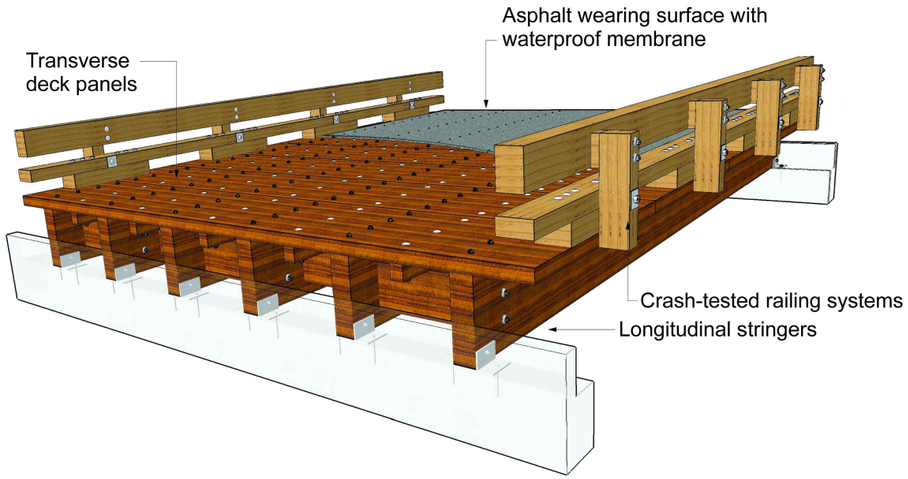
Post caps are available which shields the timber/glulam post from UV light degradation while sheltering the end grain from wetting at the same time. Post caps should be designed and manufactured to meet the following requirements:

- 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

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.

APPENDIX B
GLULAM STRINGERS AND A TRANSVERSE GLULAM DECK

Glulam Stringers and a Transverse Glulam Deck



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.

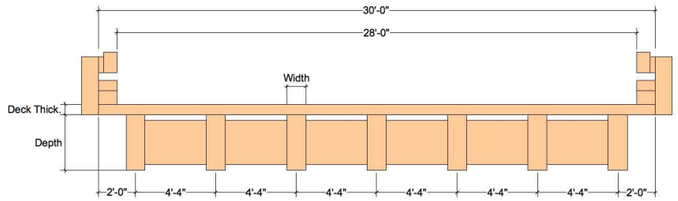
Glulam Girders and Transverse Glulam Deck

Perspective Drawing / Photograph View

Design Aids For Minnesota Timber Bridges

June 2020

Sheet Number 1



Southern Pine Stringer
24F-V3

Span (ft)	Width (in.)		Depth (in.)
24	6 3/4	x	27 1/2
26			28 7/8
28			31 5/8
30			33
32			34 3/8
34			35 3/4
36			38 1/2
38			39 7/8
40	8 1/2	x	37 1/8
42			38 1/2
44			39 7/8
46			42 5/8
48			44
50			45 3/8
52			46 3/4
54			49 1/2
56			50 7/8
58	10 1/2	x	46 3/4
60			48 1/8
62			50 7/8
64			52 1/4
66			53 5/8
68			55
70			56 3/8
72			57 3/4
74			59 1/8
76			60 1/2
78			61 7/8
80	12	x	59 1/8

Douglas Fir-Larch Stringer
24F-V4

Span (ft)	Width (in.)		Depth (in.)
24	6 3/4	x	28 1/2
26			30
28			33
30			34 1/2
32			36
34			37 1/2
36			40 1/2
38	8 3/4	x	37 1/2
40			39
42			40 1/2
44			42
46			45
48			46 1/2
50			48
52			49 1/2
54			52 1/2
56	10 3/4	x	49 1/2
58			51
60			52 1/2
62			54
64			55 1/2
66			58 1/2
68			60
70			61 1/2
72			63
74			64 1/2
76	12 1/4	x	61 1/2
78			63
80			64 1/2

General Design -

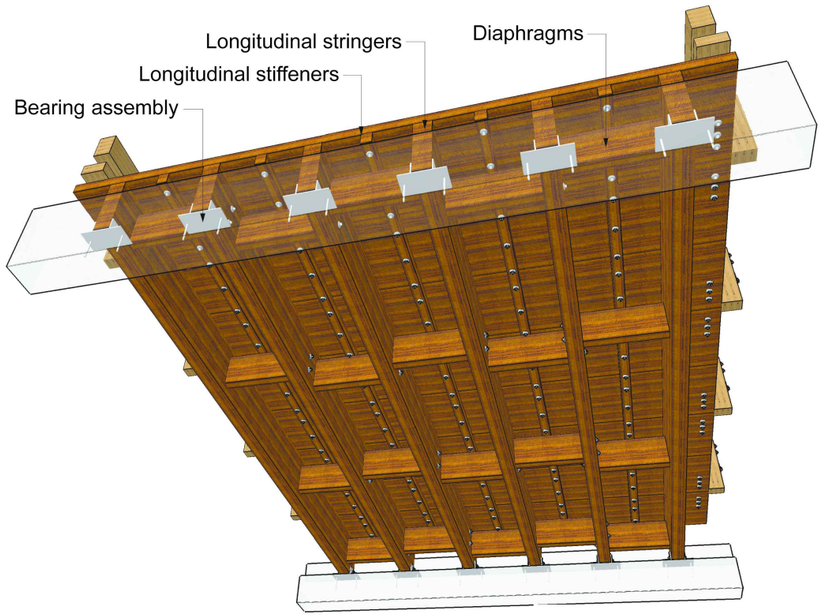
Stringer bridges with transverse glulam decking are probably the most common type of glulam timber bridge structure. For this bridge superstructure system, glulam stringers span longitudinally between the abutments. A panelized glulam deck system is placed transversely on top of the stringers. The glulam 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

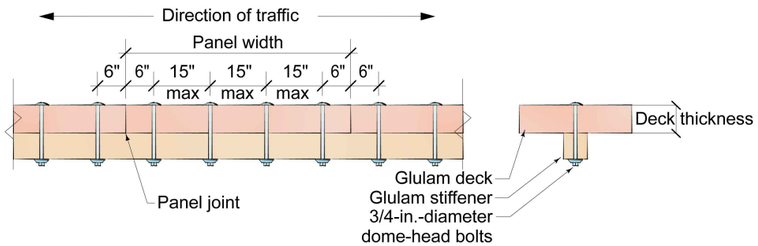
.

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:

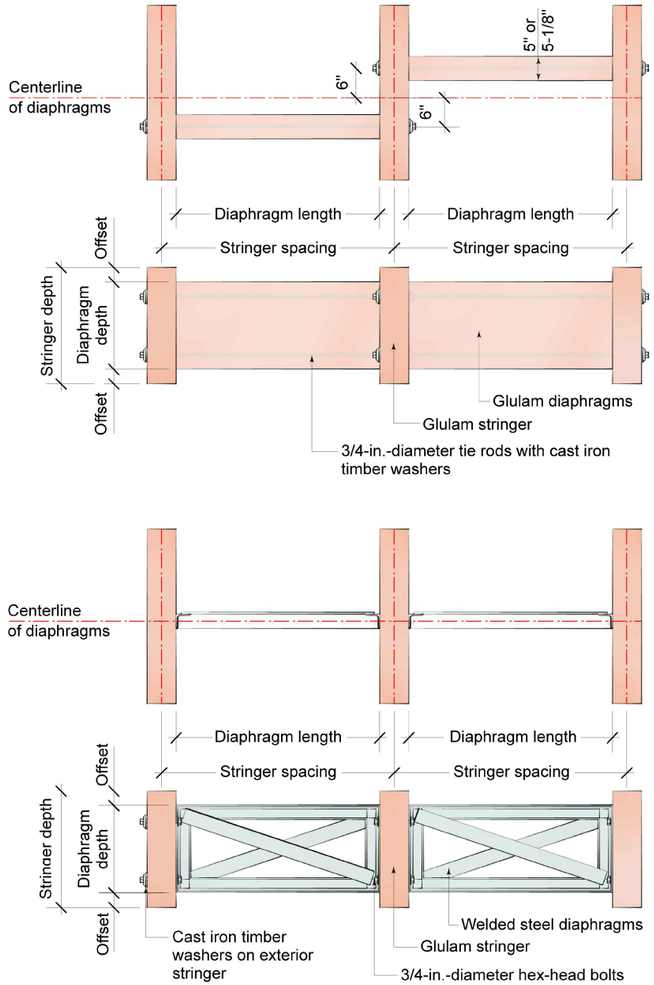
- AASHTO-LRFD Bridge Design Specifications (2017)
- HL-93 live load
- 6-in. asphalt dead load
- Multilane width of 24 ft (face-face of curb)
- Predetermined deck thickness of 5 and 6-3/4 in. for SYP bridges and 5-1/8 and 6-3/4 in. for DF bridges
- L/425 live load deflection limit
- Dry-stress design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

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.





Longitudinal Stiffener Detail



Diaphragm Alternatives

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.

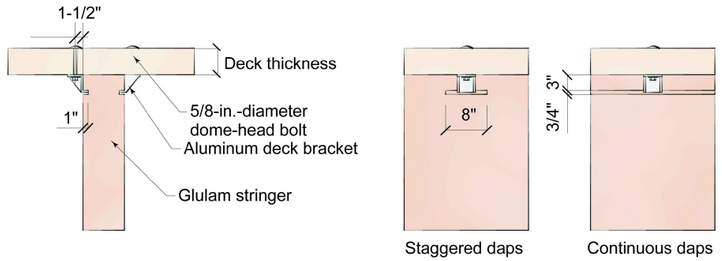
Glulam diaphragms are attached to the stringers with 3/4-in.-diameter tie rods. The diaphragms are prefabricated with grooves (ply routs) routed into the interior plies creating a chase running the length of the diaphragm. The diaphragms are offset to each other allowing access to the tie rod nuts and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

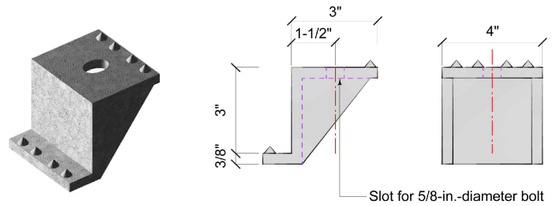
Galvanized steel diaphragms are manufactured from 3- by 3- by 3/8-in. angles with 3/8- by 3-in. plate diagonals. The diaphragms are attached to the stringers with 3/4-in.-diameter bolts and are installed in alignment.

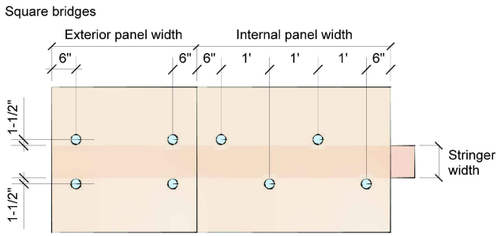
The use of longitudinal stiffeners is recommended with 5-in. and 5-1/8-in. decking to aid in the reduction of differential deflection between the deck panels. The stiffeners are placed midway between and parallel to the stringers. The stiffener is attached to the decking underside with dome-head through-bolts. 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.

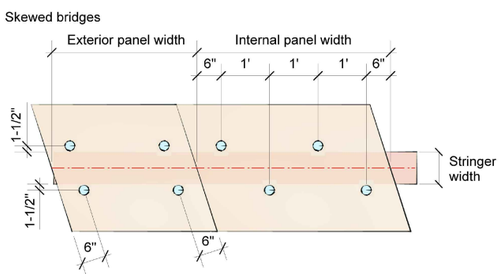
It is not uncommon for traverse glulam decking to go through minor dimensional changes throughout its service life. Although glulam material is dry when put in service, it may gain moisture, such as humidity from underlying water in hot summer months, causing it to adjust to its microclimate conditions 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.

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.

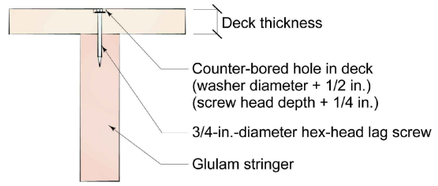


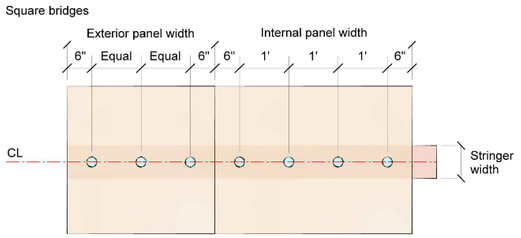


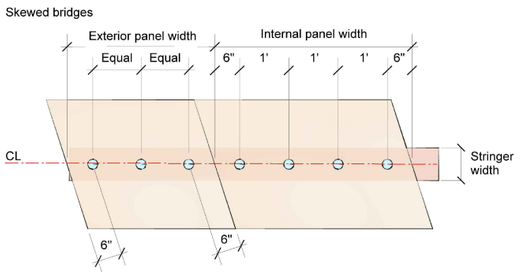




Aluminum Deck Bracket Option







Lag Screw Option

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 11/16 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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Glulam Girders and Transverse Glulam Deck

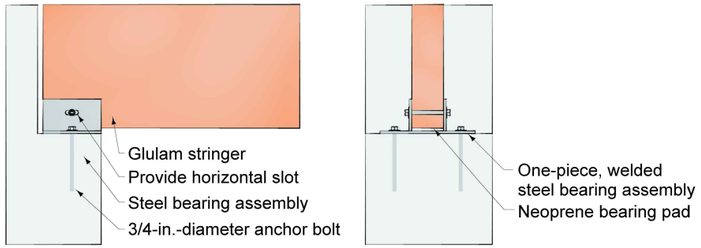
Glulam Panel-to-Stringer Connections

Design Aids For Minnesota Timber Bridges

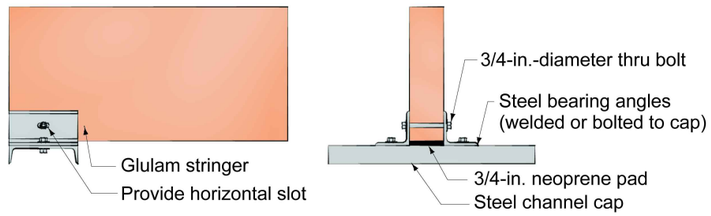
June 2020

Sheet Number 4

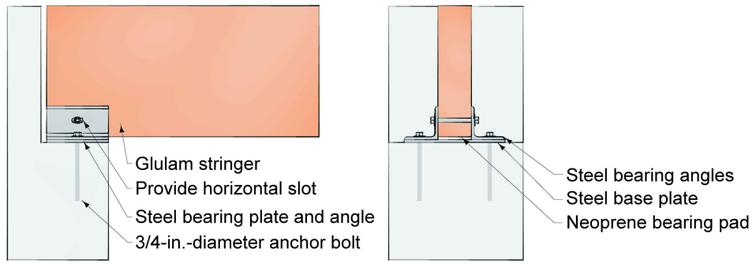
Stringer to concrete abutment detail



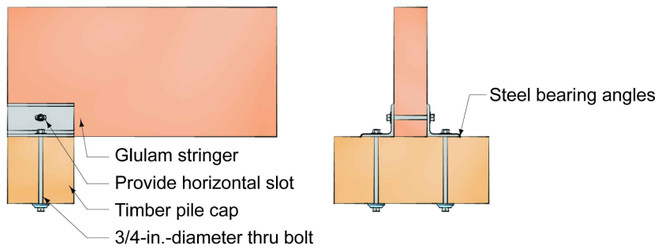
Stringer to steel abutment detail



Stringer to concrete abutment detail



Stringer to timber abutment detail



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.

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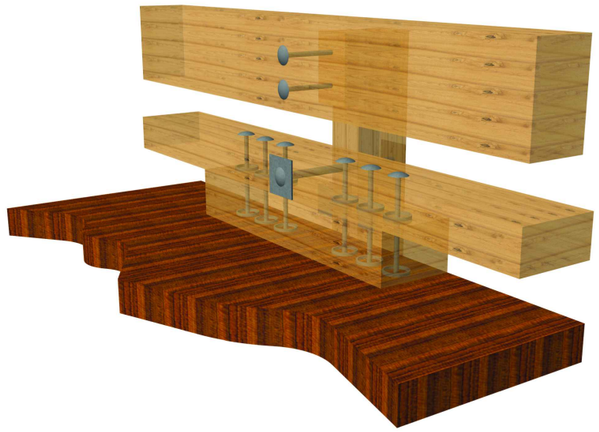
Glulam Girders and Transverse Glulam Deck

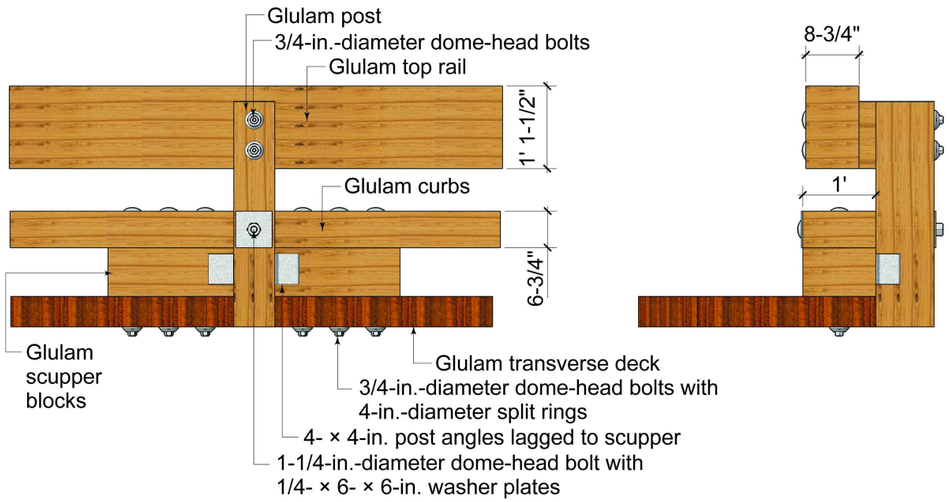
Substructure Details

Design Aids For Minnesota Timber Bridges

June 2020

Sheet Number 5





Test Level 4 -- NCHRP-350 Test Standards

Bridge Rail and Wearing Surface -

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 railing types available:

Glulam or steel rails, test level 2,

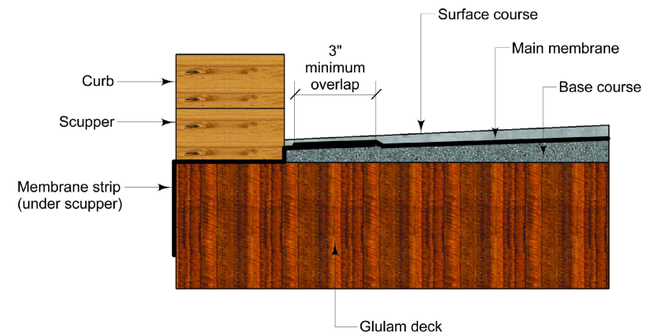
Glulam timber or steel rails, test level 4

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).



Asphalt Wearing Surface Recommendation

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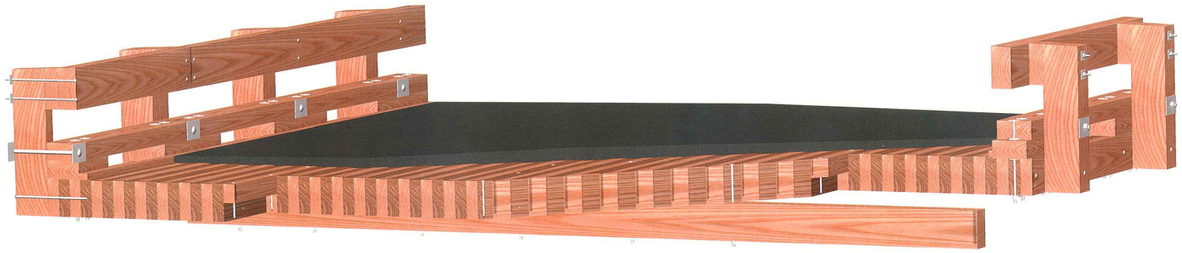
Glulam Girders and Transverse Glulam Deck	Crash-Tested Bridge Rail System
Design Aids For Minnesota Timber Bridges	June 2020
	Sheet Number 6

APPENDIX C
LONGITUDINAL SPIKE-LAMINATED TIMBER DECK

Longitudinal Spike-Laminated Timber Deck



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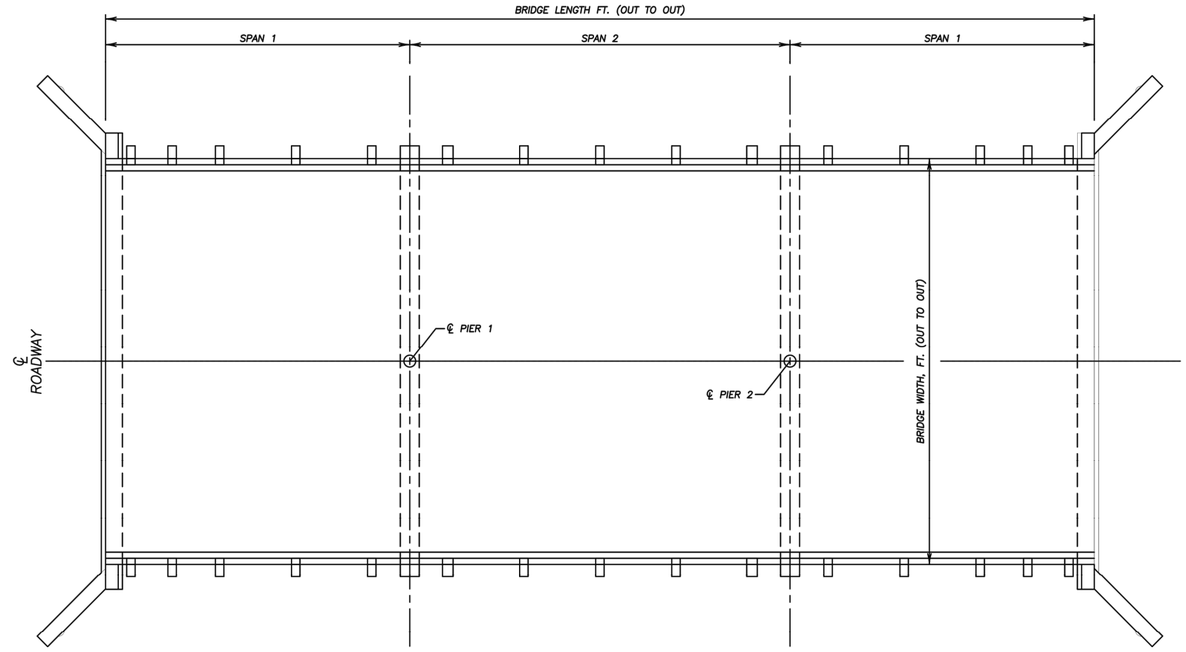
Longitudinal Spike-Laminated Decks

Perspective Drawing / Photograph View

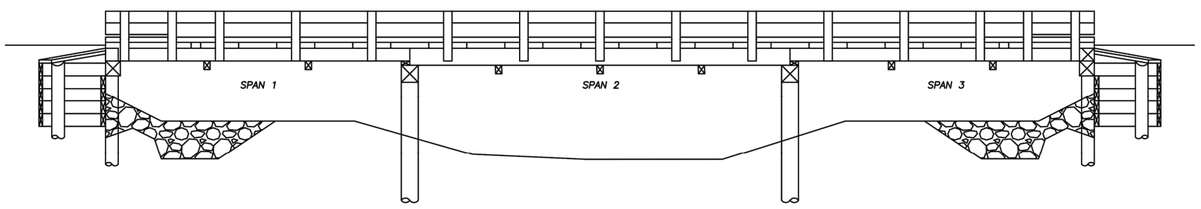
Design Aids For Minnesota Timber Bridges

June 2020

Sheet Number 1



Plan View



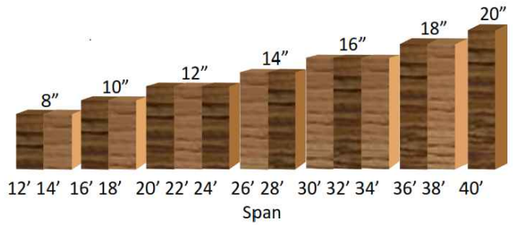
Profile View

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. Tranverse 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 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 (See sheet 4 for additional details). 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, enduring 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.



Maximum Span by Deck Thickness

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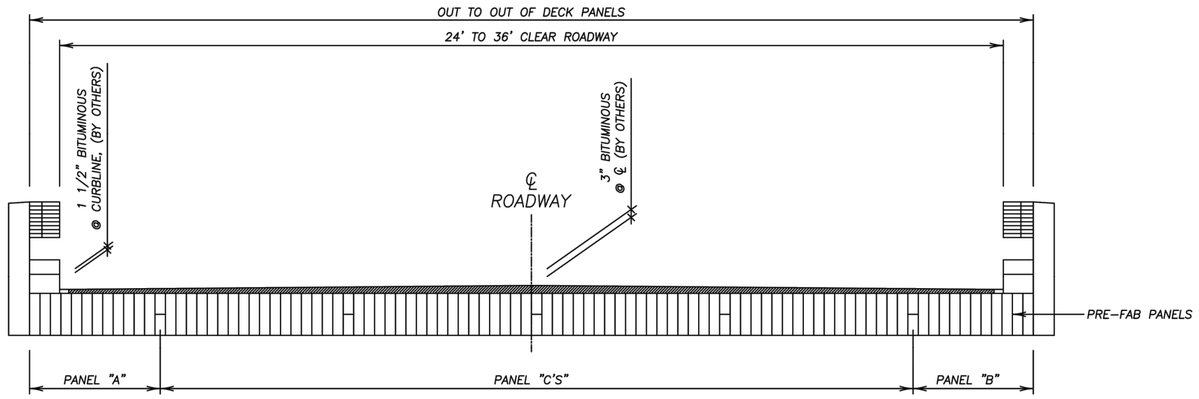
Longitudinal Spike-Laminated Decks

Design Aids For Minnesota Timber Bridges

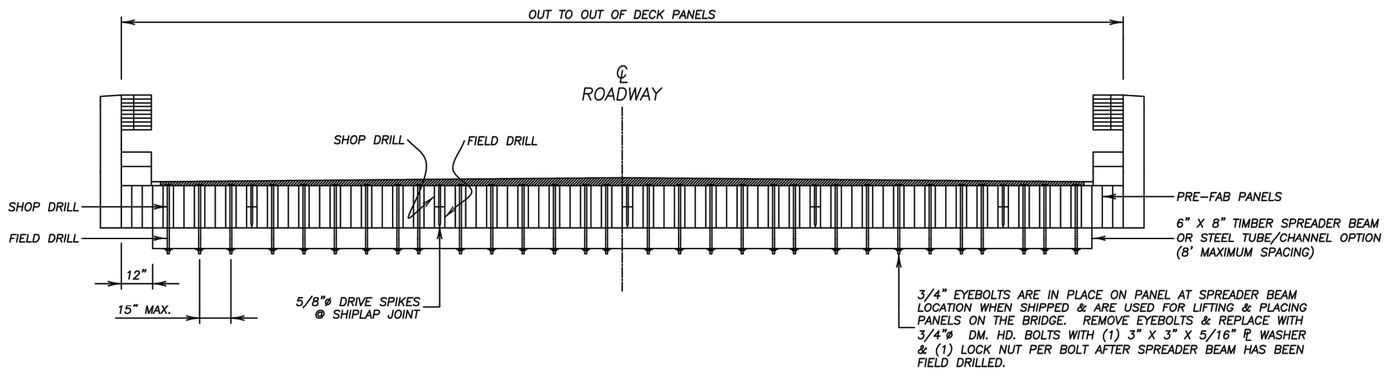
Plan / Profile / Design Notes

June 2020

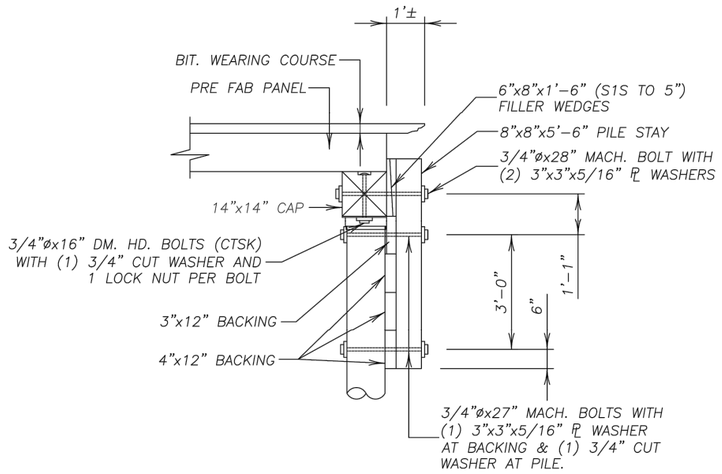
Sheet Number 2



Cross-section View of Deck - Jointed Panel Configuration



Cross-section View of Deck - Stiffener Beam



Cross-section View of Pile Abutment - Deck Attachment

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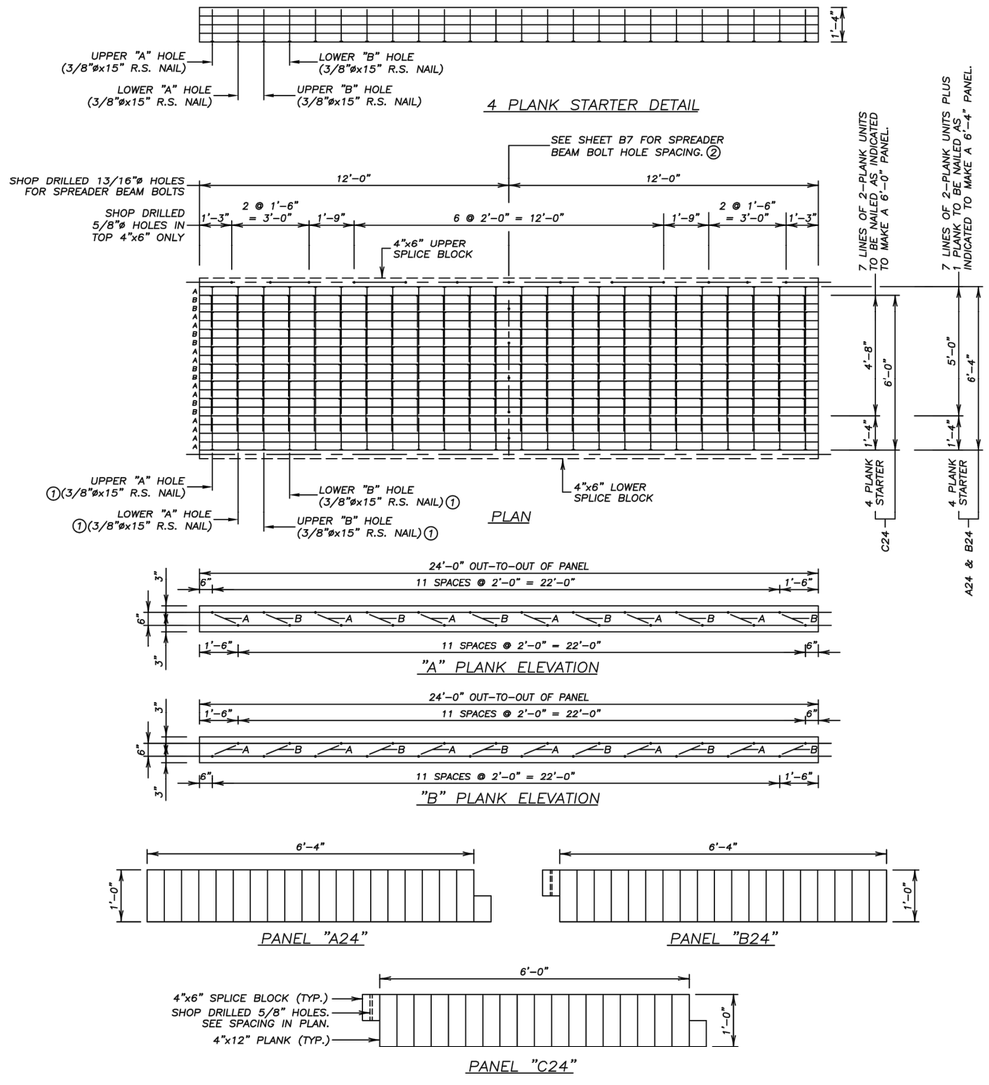
Longitudinal Spike-Laminated Decks

Design Aids For Minnesota Timber Bridges

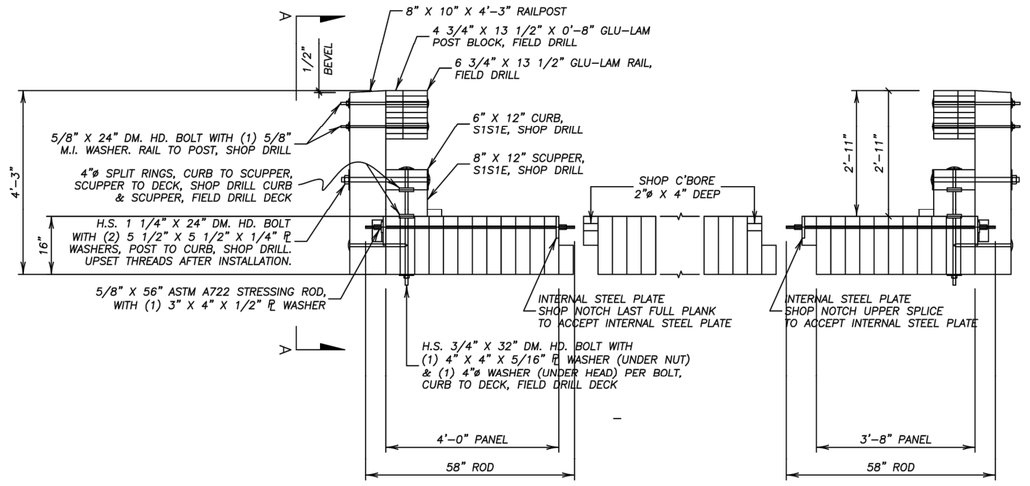
X-Section View / Abutment Details

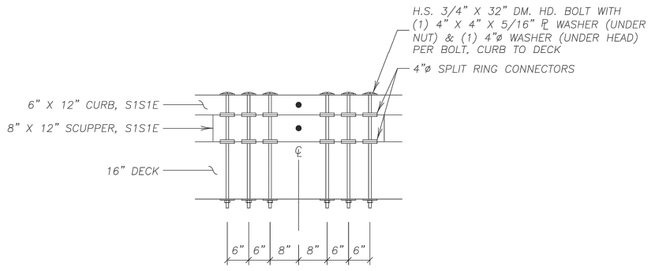
June 2020

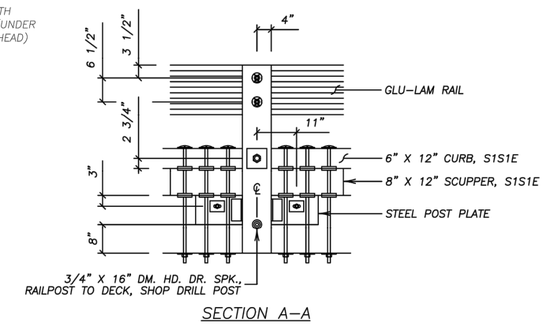
Sheet Number 3



Laminating Process to Pre-Fabricate Deck Panels







SECTION A-A

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.

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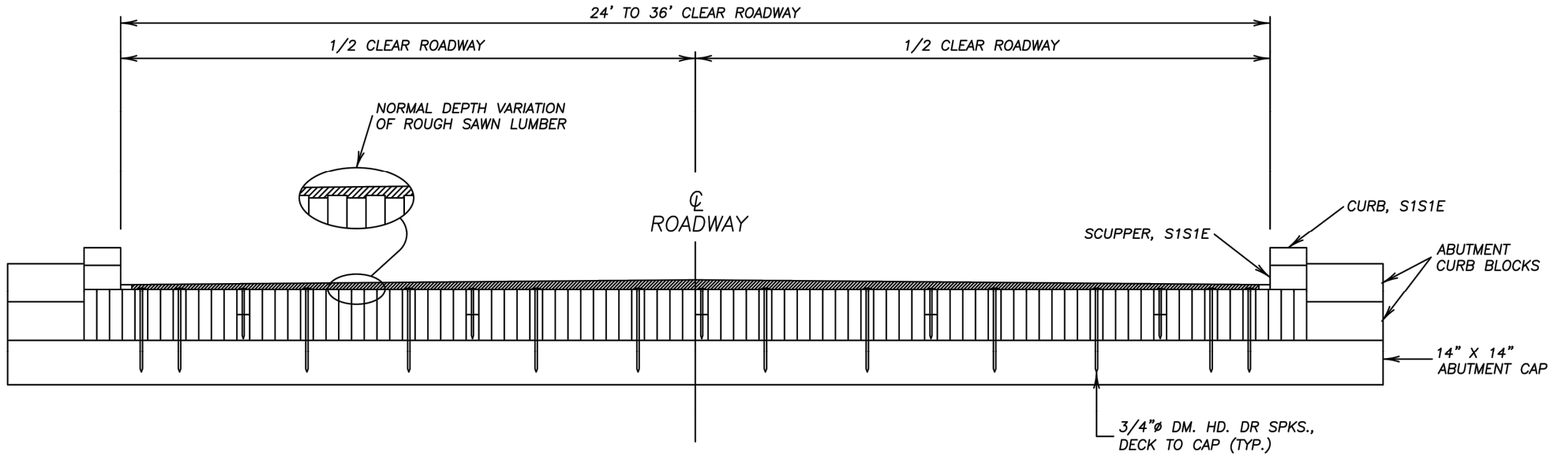
Longitudinal Spike-Laminated Decks

Deck Panels / Crash-Tested Rail

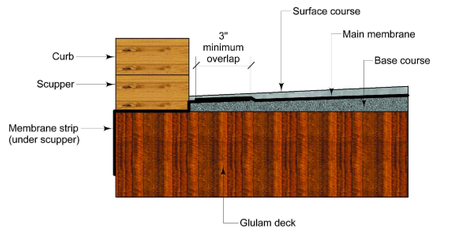
Design Aids For Minnesota Timber Bridges

June 2020

Sheet Number 4

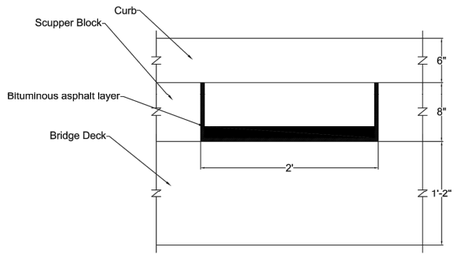


Timber Pile Cap Attachment - Section View

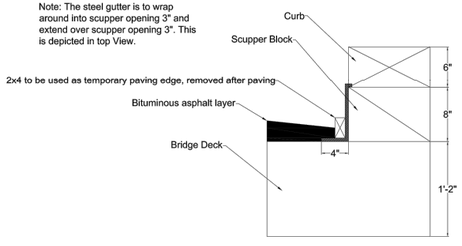


Asphalt Wearing Surface Recommendation

Protective Railpost Cap



U-Shaped Metal Flashing - Scupper Openings



Z-Shaped Flashing - Inside Curb

Detailing for Durability 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 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

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.

APPENDIX D
ST. LOUIS COUNTY TIMBER BRIDGE DEMONSTRATION PROJECT

MINNESOTA DEPARTMENT OF TRANSPORTATION
SAINT LOUIS COUNTY

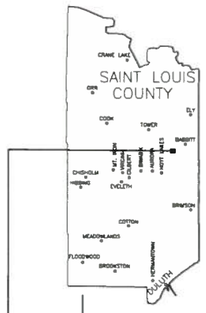
CONSTRUCTION PLAN FOR: CONSTRUCT BRIDGE 69A58 AND APPROACHES OVER EMBARRASS RIVER, 7.4 MILES W/SW OF BABBITT, MN

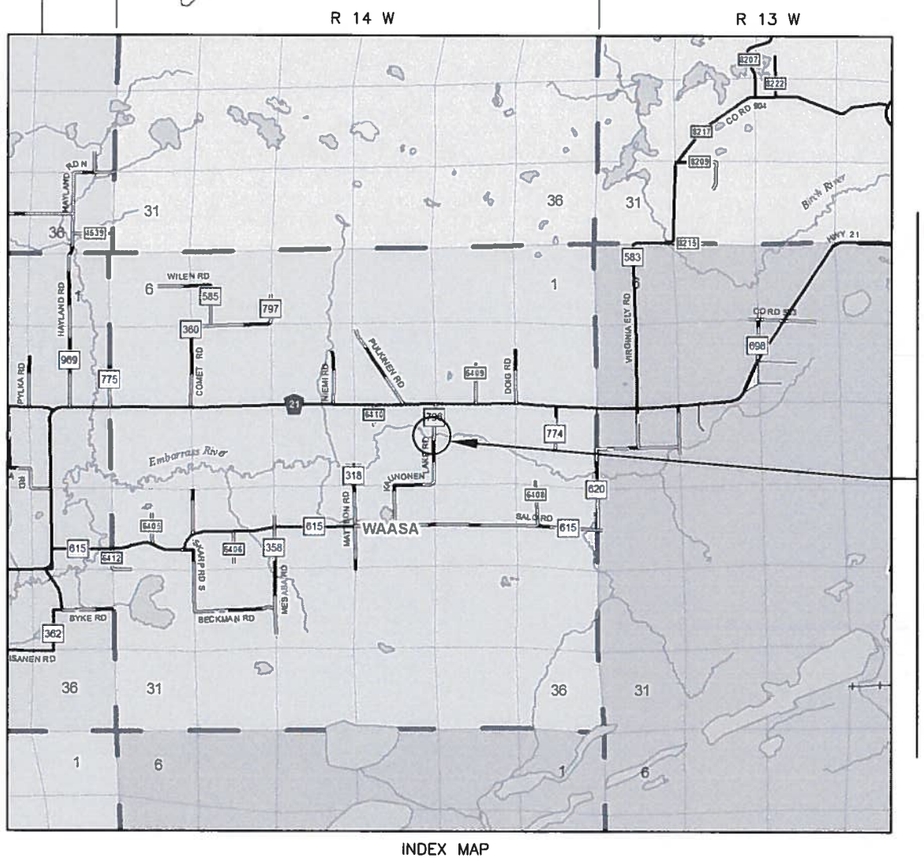
LOCATED ON CR 796 BETWEEN CR 615 AND CSAH 21

FROM 222.08 FT. N. AND 13.96 FT. E. OF E 1/4 COR. OF SEC 15 T60N R14W TO 1800.09 FT. S. AND 114.62 FT. W. OF WEST COR. OF SEC 15 T60N R14W

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





INDEX MAP

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
℄ STA. 5+16
REMOVE, NO SALVAGE

BEGIN CP 0796-271375
STA. 2+00.00

SAINT LOUIS COUNTY BRIDGE DEPT. PUBLIC WORKS

PLAN SYMBOLS

SECTION SUBDIVISION LINE
EXISTING R/W
NEW R/W
TEMP EASE
RAILROAD R/W
ROAD SHOULDER
EDGE OF LAKE
SWAMP BOUNDARY
MISCELLANEOUS BOUNDARY
CORPORATE OR CITY LIMITS
PROPERTY LINE
RECREATIONAL TRAIL
ROAD ALIGNMENT 11+00 12+00
ALIGNMENT POINTS P.I. P.I.
RIVER OR CREEK
DRAINAGE DITCH
BRIDGE
RAILROAD (SINGLE TRACK)
RR CROSSING PAVEMENT MARKING
RR CROSSING GATE
RR CROSSBUCK SIGN
RR CROSSBUCK SIGN W/LIGHTS
BARBED WIRE FENCE
CHAIN LINK FENCE XC
WOVEN WIRE, COMBINATION WOVEN AND BARB XW
WOOD FENCE
BILLBOARD
RETAINING WALL
GUARDRAIL (CABLE)
GUARDRAIL (PLATE BEAM)
DRAIN TILE
CULVERT
CULVERT WITH APRONS
TREELINE OR BRUSHLINE
DECIDUOUS TREES
CONIFER (EVERGREEN) TREES
HEDGE
BUSH OR SHRUB
SWAMP OR MARSH
MONUMENT (CI,ACT,ACP,BCP,...)
CONCRETE OR STONE MONUMENT
IRON PIPE, PIN OR REBAR
IRON PIN WITH BRASS DISK
NAIL, PK NAIL, SPIKE, SFP, T-BAR, ...
VERTICAL CONTROL
HORIZONTAL CONTROL
POWER POLE
LIGHT POLE
LIGHT AND TELEPHONE POLE
LIGHT, TELEPHONE AND POWER POLE
GUY POLE
POLE ANCHOR
TELEPHONE POLE
TELEPHONE AND POWER POLE
UNDERGROUND UTILITY PEDESTAL TV FO E T
TELEPHONE MANHOLE (VAULT) MH
ELECTRIC CABLE IN CONDUIT P
TELEPHONE CABLE IN CONDUIT T
BURIED ELECTRIC CABLE P-BUR
BURIED TELEPHONE CABLE T-BUR
GAS LINE GAS
WATER LINE W
VALVE
FIRE HYDRANT
WATER MANHOLE
WELL
LAWN SPRINKLER HEAD
MANHOLE
CATCH BASIN
SEPTIC TANK SEPTIC TANK
FORCE MAIN LIFT STA. LIFT
SEWER LINE
PERMANENT BARRICADE
TRAFFIC SIGNAL LIGHT
HAND HOLE
ENTRANCE
BUILDING NUMBER 1-S-F
SATELLITE DISH
STEEL TOWER TOWER
FLAG POLE
SIGN
TYPE III BARRICADE
CHANNELIZING DEVICE
TYPE A WARNING LIGHT

SCALES
PLAN 0 50 FT.
PROFILE 0 50 FT. HORIZ. 0 5 FT. VERT.
INDEX MAP 0 2 MILES

PLAN REVISIONS

DATE	SHEET NO.	APPROVED BY

MINN. PROJ. NO.

GOVERNING SPECIFICATIONS

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

INDEX OF SHEETS

THIS PLAN CONTAINS 33 SHEETS

DESIGN DESIGNATION

R VALUE= ____ ΣN18$_{20}$ = ____
ADT (Current Year) 2016 = 5
ADT (Future Year) 2036 = 6
D (Directional Distr.) = 50-50%
T (Heavy Commercial) = ____
Proj. Soil Factor = ____
Shoulder Width = 1'
Design Loading = 7 TON
Bridge 69A58 HL 93 LIVE LOAD
Design Speed 40 MPH
Based on STOPPING Sight Distance
Height Of Eye 3.5 Height of object 2.0
Design Speed not achieved at:
STA. ____ TO STA. ____ MPH ____
STA. ____ TO STA. ____ MPH ____
Rural Minor Arterial Classification
Lanes 2- 11' Traffic 2- 1' Shoulders
Parking Lanes - None

DESIGNERS NEIL BERGSTEDT (BRIDGE DEPT)

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.

PRINT NAME: MATTHEW W. HEMMILA

SIGNATURE: Matthew Hemmila

DATE: 8/31/16 REG. #: 43973

CP 0796-271375 | Sheet 1 of 18 Sheets

H:\Bridge\BR 500-599\BR 516\CP 0796-271375\Design\Working Drawings\BR 516 Design.dwg, COVER, 8/30/2016 10:33:46 AM, bergstedtn

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.

STATEMENT OF ESTIMATED QUANTITIES

SHEET	NOTE	ITEM NO.	ITEM	UNIT	QUANTITY	
					Bonding Ineligible	Bonding Eligible
		2021.501	MOBILIZATION	LUMP SUM	0.30	
2	1	2101.511	CLEARING & GRUBBING	LUMP SUM	1	
3,16-17		2106.501	EXCAVATION - COMMON (P)	CU YD	189	
3,16-17		2106.521	GRANULAR EMBANKMENT (CV) (P)	CU YD	2,003	
3,16-17		2118.607	AGGREGATE SURFACING (CV) CLASS 5 (P)	CU YD	616	
2,4-5		2357.606	BITUMINOUS MATERIAL FOR SHOULDER TACK	GALLON	90	
7		2360.501	TYPE SP 12.5 WEARING COURSE MIX (3,C)	TON	11	
7		2401.601	STRUCTURE EXCAVATION	LUMP SUM	1	
6		2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1	
2,6,17	2	2452.618	STEEL SHEET PILING (PERMANENT)	SQ FT	2,700	
3,6		2501.501	CULVERT EXCAVATION CLASS U (P)	CU YD	480	
6		2501.521	77" SPAN CAS PIPE-ARCH CULVERT	LIN FT	160	
6		2501.525	77" SPAN CAS PIPE-ARCH APRON	EACH	8	
11-12		2554.501	TRAFFIC BARRIER DESIGN SPECIAL	LIN FT	100	
11		2554.501	TRAFFIC BARRIER DESIGN B8307	LIN FT	100	
11,13		2554.523	END TREATMENT-TANGENT TERMINAL	EACH	4	
14		2563.601	TRAFFIC CONTROL	LUMP SUM	0.30	
8-9		2573.502	SILT FENCE, TYPE HI	LIN FT	1,155	
8,10		2573.505	FLOTATION SILT CURTAIN TYPE MOVING WATER	LIN FT	200	
		2573.550	EROSION CONTROL SUPERVISOR	LUMP SUM	1	
8		2574.508	FERTILIZER TYPE 3	POUND	180	
3-5		2574.525	COMMON TOPSOIL BORROW	CU YD	211	
8		2575.501	SEEDING	ACRE	1	
8		2575.502	SEED MIXTURE 25-141	POUND	30	
8		2575.571	RAPID STABILIZATION METHOD 3	M GALLON	6	

BASIS FOR QUANTITIES

BITUMINOUS MATERIAL FOR SHOULDER TACK	0.18 GALLONS PER SQ. YD.
SEED, MIXTURE 25-141	59 LBS. PER ACRE
FERTILIZER, TYPE 3	350 LBS. PER ACRE
RAPID STABILIZATION METHOD 3	6M GALLONS PER ACRE

KNOWN UTILITY COMPANIES		
TELEPHONE NO.	COMPANY	
1-800-421-9959	LAKE COUNTRY POWER	(OVERHEAD POWER)
1-800-252-1166	GOPHER STATE ONE CALL	(LOCATERS)

THE SUBSURFACE UTILITY INFORMATION IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-2, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

STANDARD PLATES	
THE FOLLOWING STANDARD PLATES AS APPROVED BY THE F.W.H.A. SHALL APPLY TO THIS PROJECT.	
PLATE NO.	DESCRIPTION
3040 F	CORRUGATED METAL PIPE CULVERT (STANDARD CORRUGATION)
3122 K	METAL APRON FOR C.M. PIPE-ARCH CULVERT
8000 I	STANDARD BARRICADES
8307 S	W-BEAM GUARDRAIL & END ANCHORAGES

I HEREBY 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.

MATTHEW W. HEMMILA — TYPED NAME
43973 — REG. NO.
SIGNATURE
8/31/16 — DATE

CR 796 – CO. BR. 516 – ST. BR. 69A58

ESTIMATED QUANTITIES, STANDARD PLATES & UTILITIES

CP 0796-271375

EARTHWORK SUMMARY ① ② ③

LOCATION	EXCAVATION					BITUMINOUS		EMBANKMENT									
	2105 ROCK EXC.	2106 EXC. COMMON (REG) (P)	EXC. COMMON (TOPSOIL) ④	BITUMINOUS ④	2501 CULVERT EXC. CLASS U (P)	TYPE SP 12.5 WEARING COURSE MIX (3,C)	TYPE SP 12.5 NON-WEARING COURSE MIX (3,C)	2574 COMMON TOPSOIL BORROW (LV) ⑤	2106 GRANULAR EMBANKMENT (CV) (P)	COMMON EMBANKMENT SLOPE DRESSING	2106 SELECT GRANULAR EMBANKMENT MOD. 7% (CV)(P)	2118 AGGREGATE SURFACING CL 5 (CV)(P)	2211 AGGREGATE BASE (CV) CL 5 (P)	2221 AGGREGATE SHOULDERING CL 5 (CV)(P)	2451 COARSE AGGREGATE BEDDING (CV) (P)	2451 GRANULAR BACKFILL MOD 12% (CV) (P)	COMMON EMB.	2511 RANDOM RIPRAP CL III
	CU. YD.	CU. YD.	CU. YD.	SQ. YD.	CU. YD.	TONS	TONS	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.
2+00 – 8+00	–	189	–	–	–	–	–	211	1583	–	–	616	–	–	–	–	–	–
FLOODPLAIN CULVERTS	–	–	–	–	480	–	–	–	420	–	–	–	–	–	–	–	–	–
TOTALS	–	189	–	–	480	–	–	211	2003	–	–	616	–	–	–	–	–	–

KEY NOTES:

① ALL EXCAVATION AND EMBANKMENT QUANTITIES SHOWN IN THIS CHART HAVE NO CONVERSION, SHRINKAGE OR COMPACTION FACTORS APPLIED TO THEM. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THESE FACTORS AND BID THE PROJECT ACCORDINGLY. FIELD CHANGES WILL BE MEASURED AND QUANTITIES ADJUSTED AS NECESSARY.

② ALL TYPES OF EXCAVATION AND EMBANKMENT QUANTITIES 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 EXCAVATION AND BACKFILL FOR MAINLINE 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 LEDGE ROCK, AND DETACHED BOULDERS GREATER THAN 2 CUBIC YARDS. IN BOTH CASES, THE CONTRACTOR SHALL EXPOSE ALL LEDGE ROCK AND LARGE DETACHED BOULDERS THAT WILL NEED TO BE EXCAVATED AND ALLOW THE ENGINEER AMPLE TIME TO FIELD CROSS SECTION OR MEASURE THE ROCK. THE ENGINEER WILL CALCULATE AND ADJUST THE QUANTITY FOR ROCK EXCAVATION AND EXCAVATION SPECIAL BASED ON THESE FIELD MEASUREMENTS. ROCK EXCAVATION, WHETHER IT BE LEDGE ROCK OR DETACHED BOULDERS, WILL ONLY BE ALLOWED TO BE USED AS REGULAR FILL OUTSIDE OF THE 1:1 SLOPES AS SHOWN ON THE TYPICALS.

EXCAVATION COMMON

EXCAVATION COMMON INCLUDES ALL EXCAVATION REQUIRED TO COMPLETE THE CONSTRUCTION, INCLUDING EXCAVATING THE INPLACE TOPSOIL AND BITUMINOUS PAVEMENT, BUT EXCLUDING STRUCTURE EXCAVATION AND ROCK EXCAVATION. THIS EXCAVATION SHALL BE USED TO MEET THE REQUIREMENTS OF REGULAR FILL AND SHALL, IF THE CONTRACTOR ELECTS, BE USED TO MEET THE REQUIREMENTS OF SELECT GRANULAR EMBANKMENT MODIFIED 7% (CV) AS DEFINED.

CULVERT EXCAVATION, CLASS U

CULVERT EXCAVATION, CLASS U, INCLUDES ALL EXCAVATION BELOW THE EXCAVATION COMMON ELEVATION WHICH IS NECESSARY FOR THE CONSTRUCTION OF CENTERLINELINE 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 INSLOPES AS SHOWN ON THE TYPICALS. ALL OF THIS MATERIAL SHALL COME FROM EXCAVATED MATERIAL FROM WITHIN THE PROJECT LIMITS. THIS MATERIAL CAN BE ANY SOIL CLASSIFICATION AS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL UTILIZE THE POORER SOILS AS REGULAR FILL. ALL BOULDERS OR BLASTED ROCK PLACED IN THIS FILL SHALL BE BURIED A MINIMUM OF 1 FOOT BELOW THE TOP OF THE PROPOSED TOPSOIL TO PREVENT DAMAGE TO MOWERS AND OTHER MAINTENANCE EQUIPMENT.

COMMON EMBANKMENT – SLOPE DRESSING (NOT A PAY ITEM)

SLOPE DRESSING SHALL BE THE NATURAL TOPSOIL STRIPPED FROM THE PROJECT LIMITS OR A COMBINATION OF MINERAL SOIL AND ORGANIC MATTER FREE OF STONES, STICKS AND DEBRIS, APPROVED OF BY THE ENGINEER. THIS MATERIAL MAY COME FROM ON OR OFF THE PROJECT, NO MEASUREMENT OR DIRECT PAYMENT WILL BE MADE FOR THIS ITEM.

GRANULAR BACKFILL MOD 12% (CV)

GRANULAR BACKFILL MOD IS A PLANNED QUANTITY ITEM. ALL GRANULAR BACKFILL MATERIAL SHALL MEET ALL THE REQUIREMENTS OF GRANULAR BACKFILL AS PER 3149.2D. AS FOLLOWS:

100% 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.

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 (MnDOT 3149), AND IS MODIFIED AS FOLLOWS: 100% 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:

SIEVE SIZE	PERCENT PASSING
1 1/2 IN. [37.5 mm]	100
NO. 4 [4.75mm]	0–10

GRANULAR EMBANKMENT (CV)

ALL GRANULAR EMBANKMENT (CV) MATERIAL SHALL MEET ALL THE REQUIREMENTS OF GRANULAR BORROW AS PER 3149.2B1.

I HEREBY 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.

MATTHEW W. HEMMILA — TYPED NAME

43973 — REG. NO.

SIGNATURE

8/31/16 — DATE

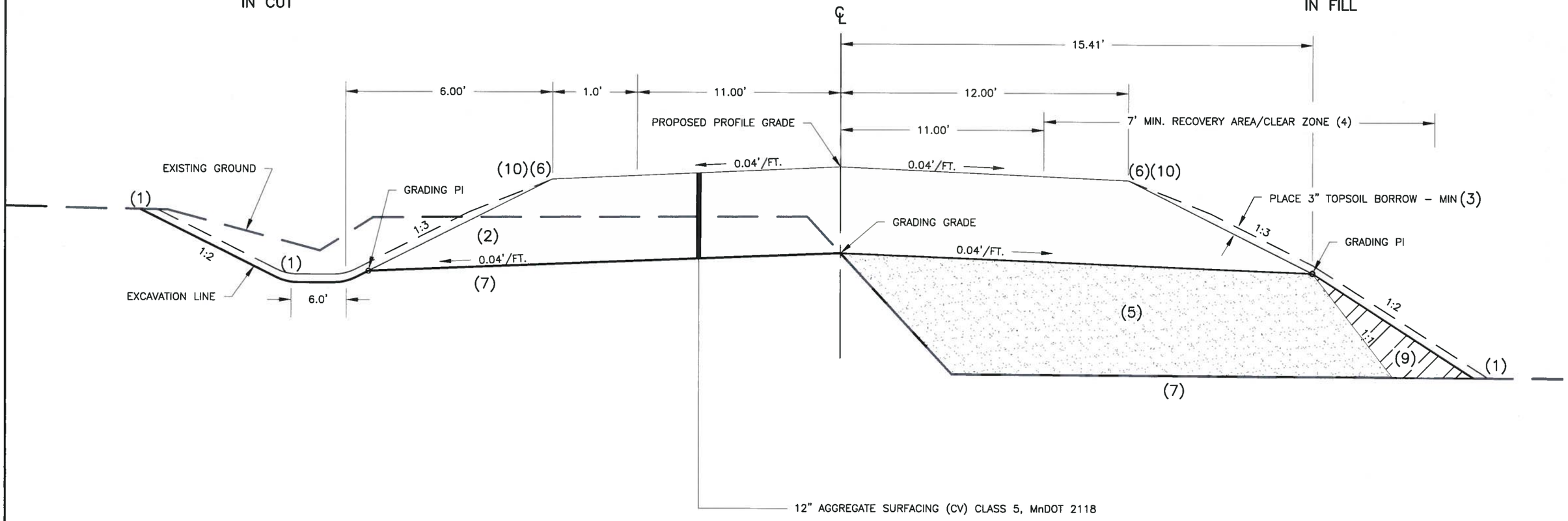
CR 796 – CO. BR. 516 – ST. BR. 69A58

EARTHWORK QUANTITIES

CP 0796–271375

Sheet 3 of 18 Sheets

TYPICAL SECTION
CR 796
STA. 2+00.00 TO STA. 3+08.83
STA. 6+66.17 TO STA. 8+00.00
(50' TRANSITION BETWEEN TYPICALS)



NOTES:

(1) ALL DITCH BOTTOMS, TOE OF FILLSLOPES, AND TOP OF BACKSLOPES 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 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 2106.

(10) SHOULDER TACK TO BE PLACED AT A WIDTH OF 4' CENTERED AT THE SHOULDER PI.

*DRAWING NOT TO SCALE

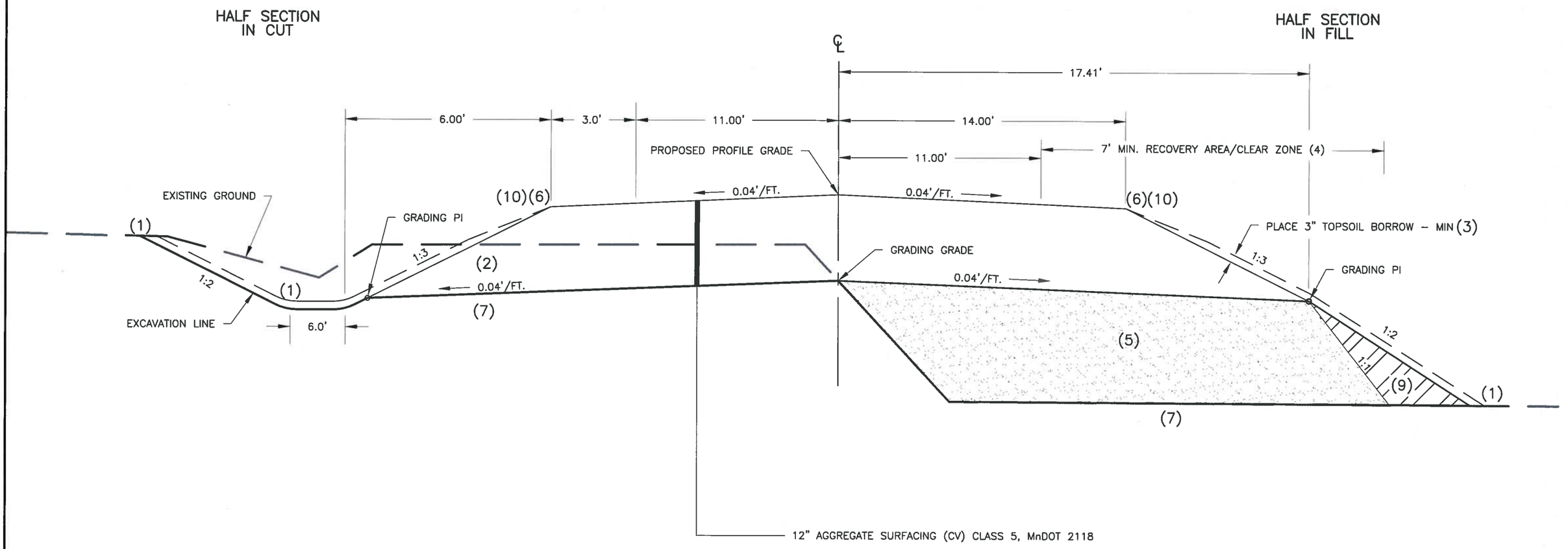
I HEREBY CERTIFY THAT THIS PLAN SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

MATTHEW W. HEMMILA (TYPED NAME) | 43973 (REG. NO.) | SIGNATURE | 8/31/16 (DATE)

CR 796 – CO. BR. 516 – ST. BR. 69A58	TYPICAL SECTION
CP 0796–271375	Sheet 4 of 18 Sheets

H:\Bridge\BR 500-599\BR 516\CP 0796-271375\Design\Working Drawings\BR 516 Design.dwg, TYPICAL 12, 8/30/2016 10:39:01 AM, bergstedtn

TYPICAL SECTION
CR 796
STA. 3+58.83 TO STA. 6+16.17
(50' TRANSITION BETWEEN TYPICALS)



NOTES:

(1) ALL DITCH BOTTOMS, TOE OF FILLSLOPES, AND TOP OF BACKSLOPES SHALL BE ROUNDED.

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(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 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 2106.

(10) SHOULDER TACK TO BE PLACED AT A WIDTH OF 4' CENTERED AT THE SHOULDER PI.

*DRAWING NOT TO SCALE

I HEREBY 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.

MATTHEW W. HEMMILA	43973		8/31/14
TYPED NAME	REG. NO.	SIGNATURE	DATE

CR 796 – CO. BR. 516 – ST. BR. 69A58	TYPICAL SECTION
CP 0796–271375	Sheet 5 of 18 Sheets

CONSTRUCT BRIDGE 69A58
(CO BR 516)
℄ STA. 4+87.50
57'-4" SBS BRIDGE
NO SKEW
ROADWAY WIDTH= 28' SHLD.
TO SHLD.

REMOVE INPLACE BRIDGE 88773
83.5' STEEL TRUSS BRIDGE
NO SKEW
℄ STA. 5+15.00
REMOVE, NO SALVAGE

EMBARRASS RIVER

PROPOSED SHOULDER

80' T.E.

50' PROP. R/W

EXIST. R/W

77" SPAN CAS ARCH CULVERT (FLOODPLAIN)

SHEETPILE WALL W/ CAP

77" SPAN CAS ARCH CULVERT (FLOODPLAIN)

PROPOSED & EXISTING
℄ C.R. 796
BRG. N 03°54'15" E

BEGIN CP 0796-271375
STA. 2+00.00
N 3669277.69
E 4844077.08

PROPOSED
BR. 69A58

END CP 0796-271375
STA. 8+00.00
N 3669876.30
E 4844117.93

HOR. 0 50'
VERT. 0 5'
CONSTRUCTION LIMITS
FLOW ARROW

BM "B" EL. 1430.90' IN 6" SPRUCE 65' RT OF STA. 2+97

BM "A" EL. 1430.46' IN 6" SPRUCE 56' LT OF STA. 8+87

PVC STA. 1+51.29
PVC ELEV. 1431.80
0.20%

PVI STA. 2+51.29
PVI ELEV. 1432.00
200.00 VC
AD 2.36

PVT STA. 3+51.29
PVT ELEV. 1434.57
2.57%

PVC STA. 3+85.00
PVC ELEV. 1435.43
2.57%

PVI STA. 4+85.00
PVI ELEV. 1438.00
200.00 VC
AD -5.04

PVT STA. 5+85.00
PVT ELEV. 1435.52
-2.48%

PVC STA. 6+53.45
PVC ELEV. 1433.83
-2.48%

PVI STA. 7+53.45
PVI ELEV. 1431.35
200.00 VC
AD 2.58

PVT STA. 8+53.45
PVT ELEV. 1431.45
0.10%

1435
1430
1425

BEGIN CP 0796-271375
STA. 2+00.00
EL. 1432.03'

77" SPAN CAS ARCH FLOODPLAIN CULVERT
INVERT EL. 1427.80' (INLET & OUTLET)
NO SKEW

EL. 1434.0'
EL. 1433.0'

EXCAVATION LIMITS 1:1.5 (TYP)

77" SPAN CAS ARCH FLOODPLAIN CULVERT.
INVERT EL. 1427.10' (INLET & OUTLET)
NO SKEW

END CP 0796-271375
STA. 8+00.00
EL. 1431.59'

1+00	2+00	3+00	4+00	5+00	6+00	7+00	8+00	9+00
1431.58	1432.03	1432.46	1433.58	1434.46	1425.18	1428.42	1434.11	1433.08	1432.35	1431.91	1431.59	1431.59	1431.63
1431.69	1432.03	1433.41	1435.79	1436.57	1436.72	1436.24	1435.15	1433.91	1432.81	1432.04	1431.59		
	1432.57	1434.53											

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MATTHEW W. HEMMILA — TYPED NAME
43973 — REG. NO.
SIGNATURE
8/31/16 — DATE

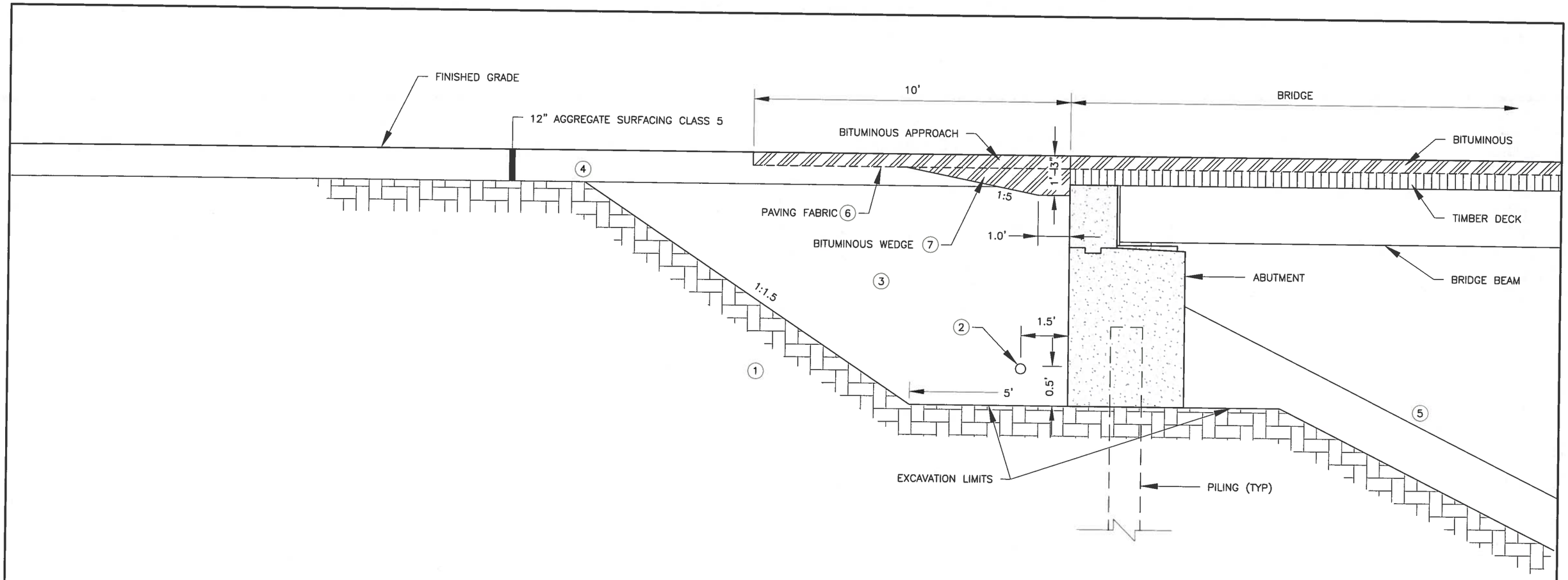
CR 796 – CO. BR. 516 – ST. BR. 69A58

PLAN AND PROFILE

CP 0796-271375

Sheet 6 of 18 Sheets

H:\Bridge\BR 500-599\BR 516\CP 0796-271375\Design\Working Drawings\BR 516 Design.dwg, Plan Prof, 8/31/2016 1:36:22 PM, bergstedtn



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. PAVING 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.

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8/31/16 — DATE

CR 796 – CO. BR. 516 – ST. BR. 69A58

BRIDGE APPROACH TREATMENT

CP 0796-271375

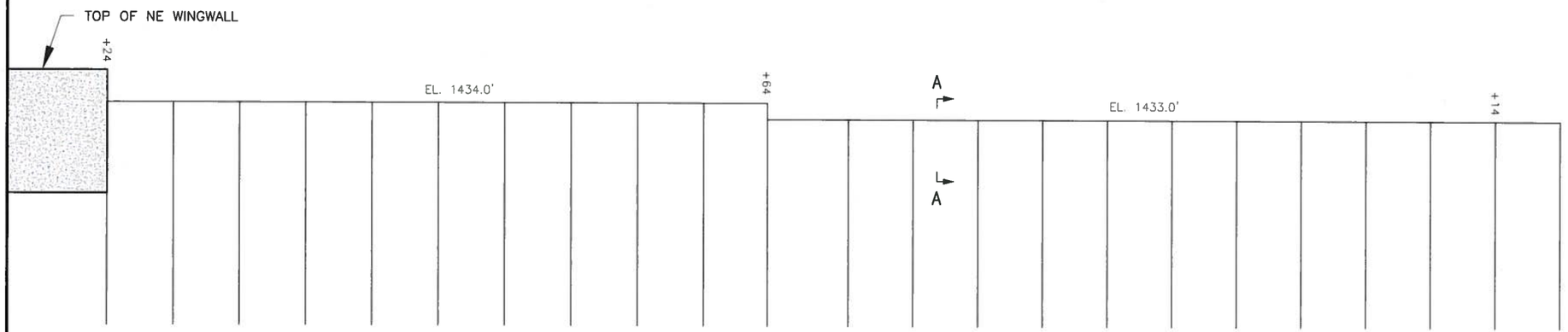
Sheet 7 of 18 Sheets

1. RETAINING WALL LENGTH USED FOR QUANTITY CALCULATIONS IS 90 FEET.

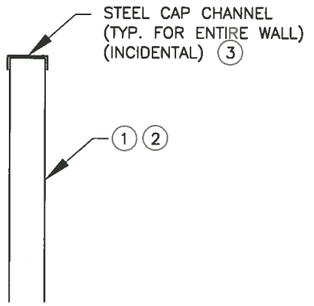
2. SHEET PILE REQUIREMENTS:
   PILES TO BE PZ22 (OR APPROVED EQUAL
   Fy = 50 KSI
   HOT ROLLED
   MIN. THICKNESS = 0.375" –PZ22
   NOMINAL HEIGHT = 30' –PZ22

3. STEEL CAP CHANNEL REQUIREMENTS:
   Fy = 50 KSI
   WEATHERING STEEL
   MC18x42.7 (OR APPROVED EQUAL)
   WELD TO SHEET PILING 1" IN 12"
   (INCIDENTAL TO SHEET PILING)

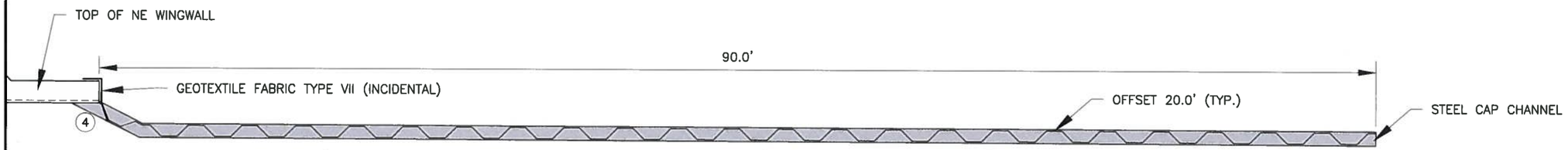
4. CONTRACTOR SHALL PROVIDE A CONNECTION TO THE WINGWALL AS APPROVED BY THE ENGINEER.



PROFILE VIEW



A–A



PLAN VIEW

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SHEET PILE WALL DETAILS

CP 0796–271375

Sheet 8 of 18 Sheets

TEMPORARY TURF ESTABLISHMENT

RAPID STABILIZATION METHOD 3
SPEC 2575.571
APPLICATION RATE OF 6 M GALLONS PER ACRE
SEE NOTE "4"

STA TO STA	AREA (ACRES)	MINUS EC BLANKETS AND RIPRAP	TOTAL ACRES
2+00 – 8+00	0.50		0.50
		TOTAL ACRES	0.50
		2 APPLICATIONS	1.00
		6M GAL/ACRE	6.00

SILT FENCE TYPE HAND–INSTALLED

STA–STA	LT/RT	FEET
BOP–BRIDGE	RT	290
BOP–BRIDGE	LT	260
BRIDGE–EOP	RT	290
BRIDGE–EOP	LT	315
	TOTAL	1155

FLOTATION SILT CURTAIN TYPE MOVING WATER

STA–STA	LT/RT	FEET
AT BRIDGE	LT & RT	200
	TOTAL	200

GENERAL NOTES:

(1.) PRIOR TO TEMPORARY SEEDING OR EROSION CONTROL INSTALLATION, THE PROVISIONS OF MnDOT 2574.3A2 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. SAID 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 NPDES PERMIT, THE PLAN, AND 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 350 LBS PER ACRE PRIOR TO SEED PLACEMENT AND TILL AS REQUIRED TO 3 INCH MINIMUM DEPTH. PLACE SEED MIXTURE 25–141 AT 59 LBS PER ACRE (NOTE REQUIREMENT FOR A TRACER OF HSS TYPE 5 WITH SEED WHEN USING HYDROSEEDER).

(6.) THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH OR SWALE THAT DRAINS WATER FROM ANY PORTION OF THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE INTO ANY 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 (59 LBS/ACRE)
FERTILIZER TYPE 3 = 180 POUNDS (350 LBS/ACRE)

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

STA TO STA	LT/RT	LOCATION	SQ YD
2+00–8+00	LT/RT	ALL EXPOSED SOILS	2420
		TOTAL	2420

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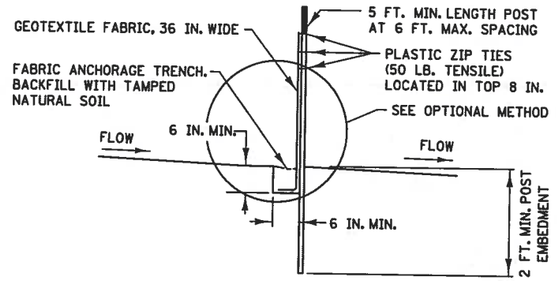
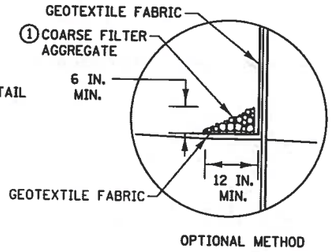
8/31/16 — DATE

CR 796 – CO. BR. 516 – ST. BR. 69A58 | SWPPP SHEET – QUANTITIES

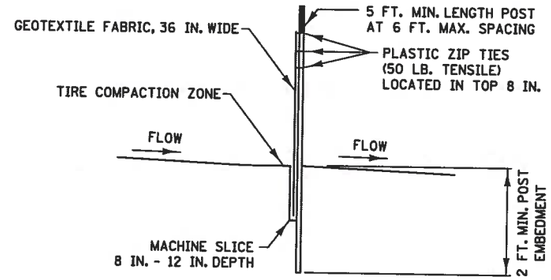
CP 0796–271375 | Sheet 9 of 18 Sheets



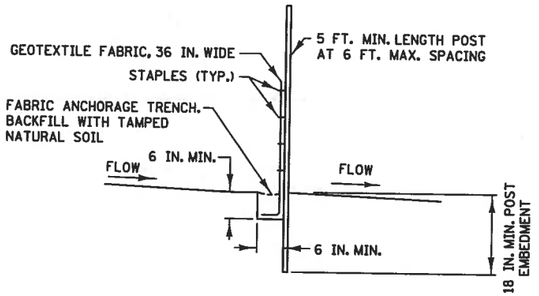
SILT FENCE TYPE HI ②
(HAND INSTALLED)



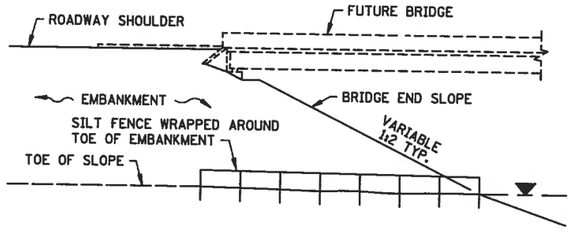
OPTIONAL METHOD



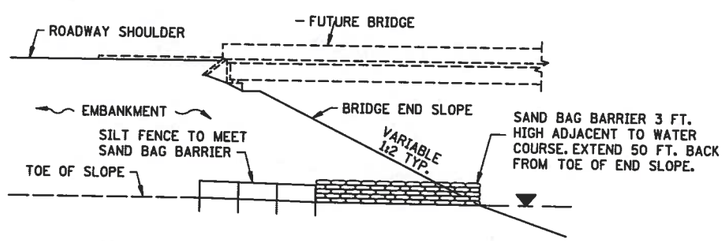
SILT FENCE TYPE MS ②
(MACHINE SLICED)



SILT FENCE TYPE PA ③
(PREASSEMBLED)

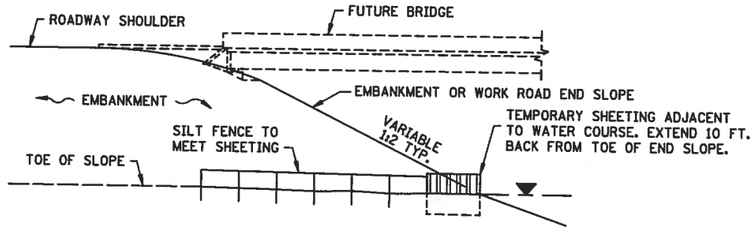


SILT FENCE ONLY ④

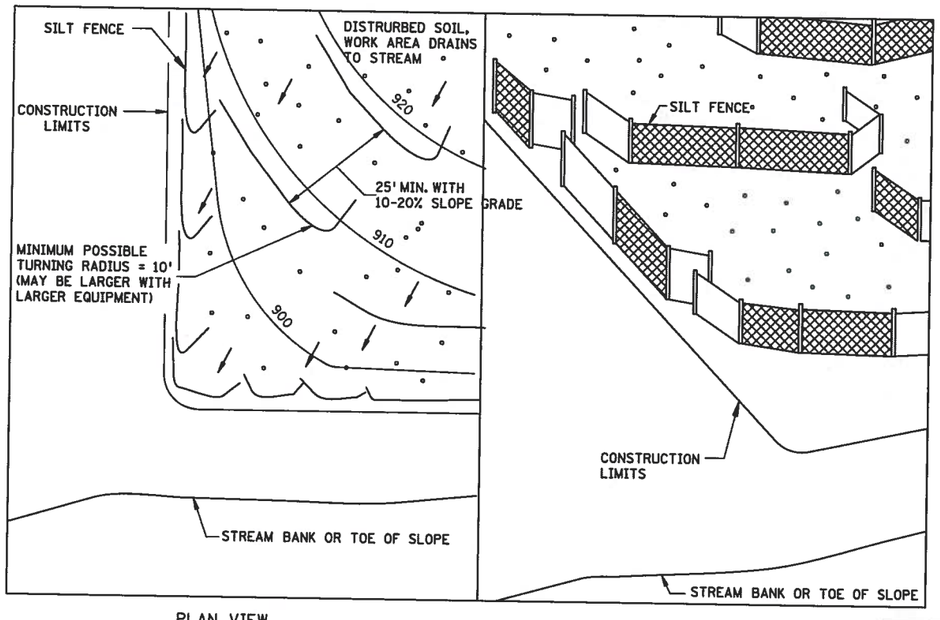


SILT FENCE WITH SAND BAGS ⑤

INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER



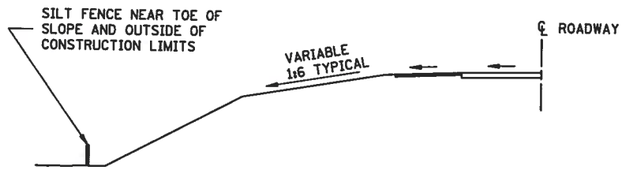
SILT FENCE WITH SHEETING ⑥



PLAN VIEW

PERSPECTIVE VIEW

J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:
SEE SPECS. 2573, 3149 & 3886.

① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.
② TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 1 ACRE.
③ TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 0.25 ACRE.
④ WATER COURSE FLOW VELOCITY: STANDING. CONTRIBUTING SLOPE AREA: 1./2 ACRE.
⑤ WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC. CONTRIBUTING SLOPE AREA: 1. ACRE.
⑥ WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC. CONTRIBUTING SLOPE AREA: 3 ACRES.

REVISION:
APPROVED: 8-6-2014
CHIEF ENVIRONMENTAL OFFICER

REVISED:
APPROVED: 8-6-2014
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
SILT FENCE

STANDARD PLAN 5-297.405 | 6 OF 7

I HEREBY 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.

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43973 — REG. NO.
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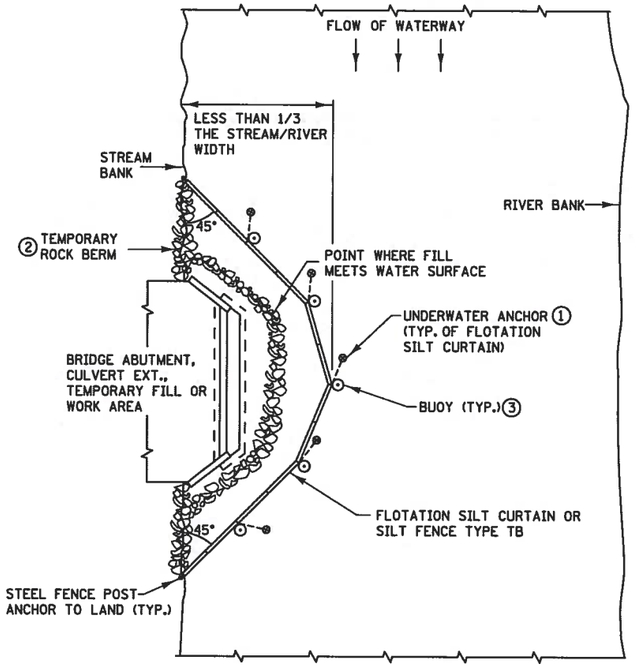
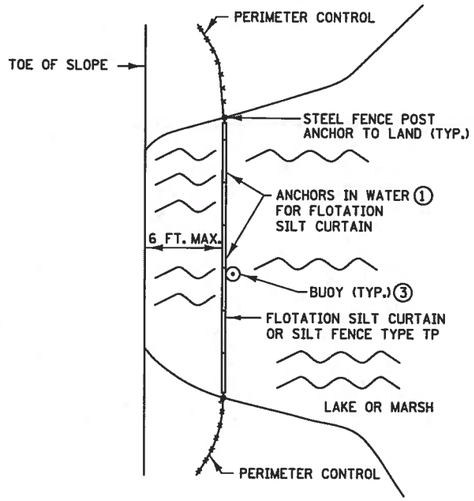
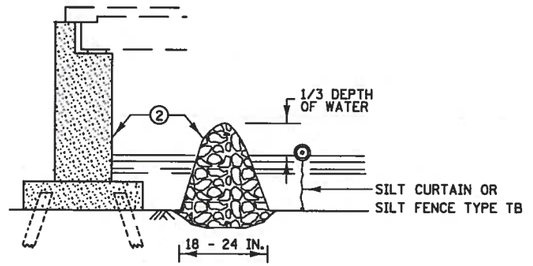
CR 796 – CO. BR. 516 – ST. BR. 69A58
SILT FENCE
CP 0796-271375
Sheet 10 of 18 Sheets



PLAN VIEW FOR STREAM ⑤



PLAN VIEW FOR LAKE OR MARSH ⑤

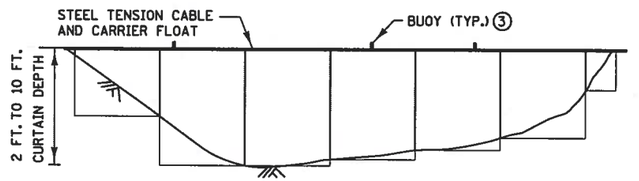


TEMPORARY ROCK BERM
FOR SEDIMENT CONTROL

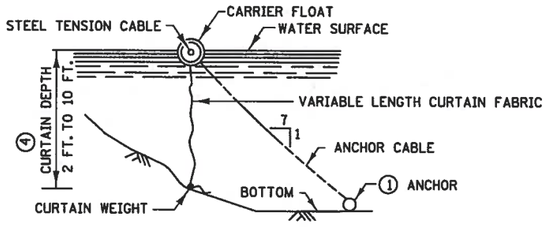
INSTALLATION GUIDELINES
SILT FENCE TYPE TB
MINIMUM WATER DEPTH: 1 FT.
MAXIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.

INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN
TYPE: STILL WATER
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 2 FT./SEC.
MAXIMUM WAVE HEIGHT: 1 FT

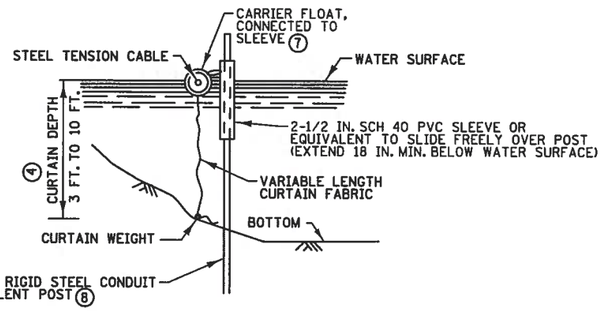
INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN
TYPE: MOVING WATER
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.
MAXIMUM WAVE HEIGHT: 2 FT.



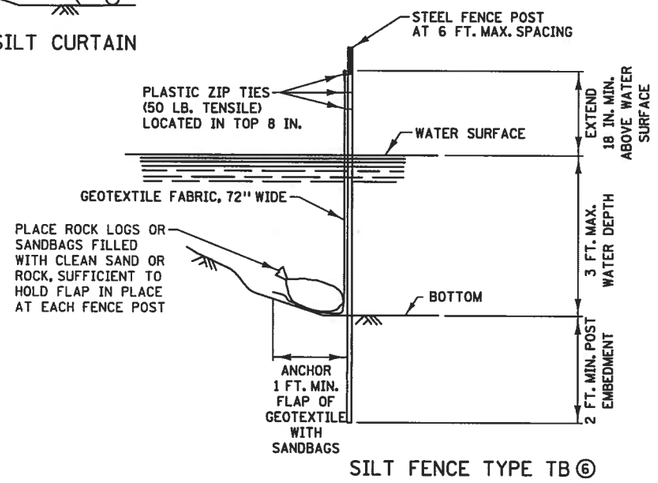
FRONT VIEW FOR FLOTATION SILT CURTAIN



FLOTATION SILT CURTAIN



ALTERNATE FLOTATION SILT CURTAIN



SILT FENCE TYPE TB ⑥

NOTES:

SEE SPECS. 2573, 3886, 3887 & 3893.

① FOR ANCHOR SPACING AND WEIGHT REQUIREMENTS, SEE SPEC. 2573.

② IN AREAS WHERE THE PLAN CALLS FOR RIPRAP 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 FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB FOR DETERMINING APPLICABILITY OF FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB.

⑤ SILT CURTAIN SHOULD BE REMOVED WHEN THE AREA CONTRIBUTING 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 40% 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 100 LBS. CONNECTION METHOD MUST ALLOW FOR SLEEVE TO MOVE FREELY ON POST.

⑧ PROVIDE SUFFICIENT NUMBER OF POST ANCHORS TO MAINTAIN SILT CURTAIN POSITION.

REVISION:

APPROVED: 8-6-2014
CHIEF ENVIRONMENTAL OFFICER

REVISED:

APPROVED: 8-6-2014
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
SILT CURTAIN OR SILT FENCE TYPE TB

STANDARD PLAN 5-297.405

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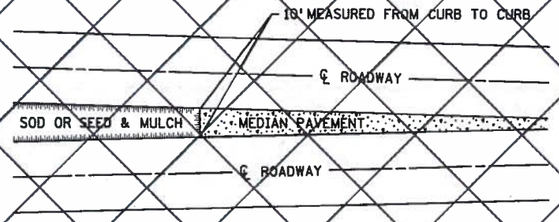
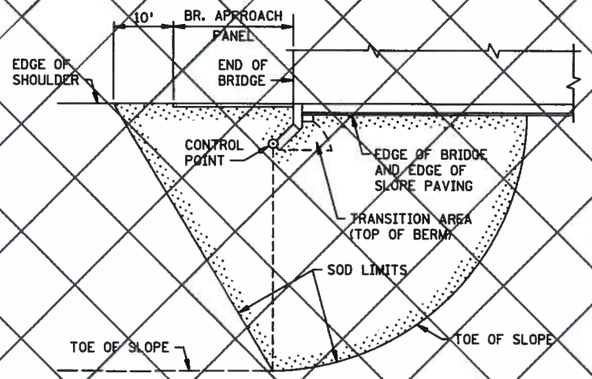
SILT CURTAIN

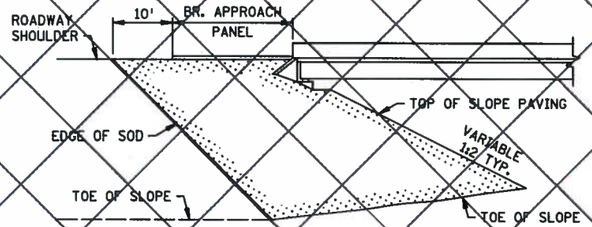
CP 0796–271375



SODDING LIMITS AT GORE AREA

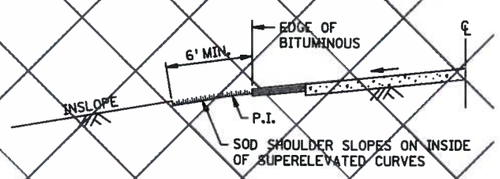


PLAN

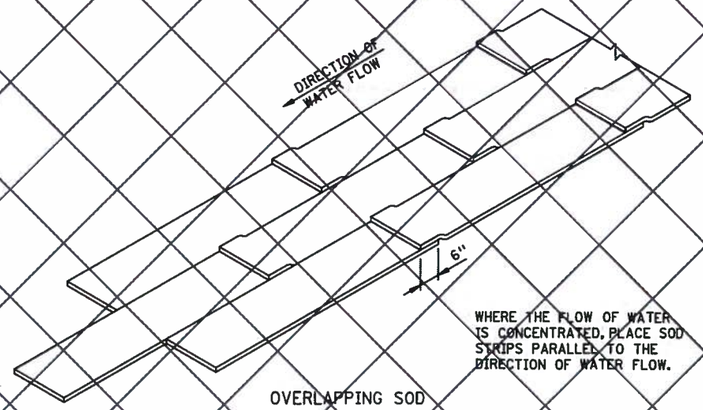


ELEVATION

SODDING LIMITS AT BRIDGE APPROACH FILLS

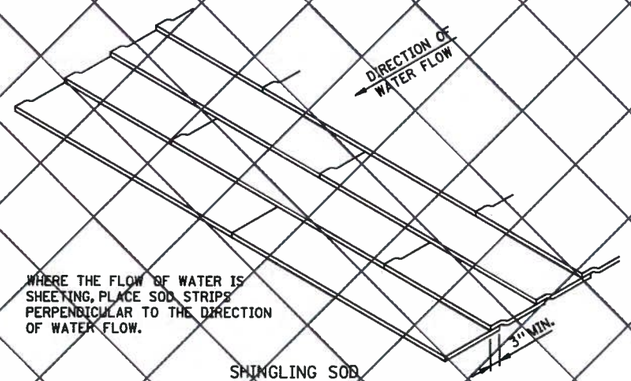


SODDING INSLOPES OF SUPERELEVATED CURVES



OVERLAPPING SOD

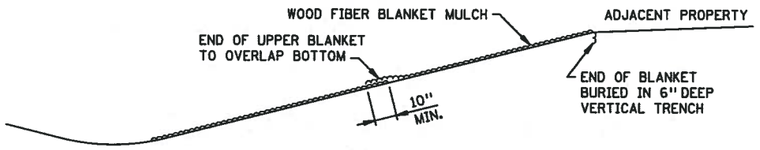
WHERE THE FLOW OF WATER IS CONCENTRATED, PLACE SOD STRIPS PARALLEL TO THE DIRECTION OF WATER FLOW.



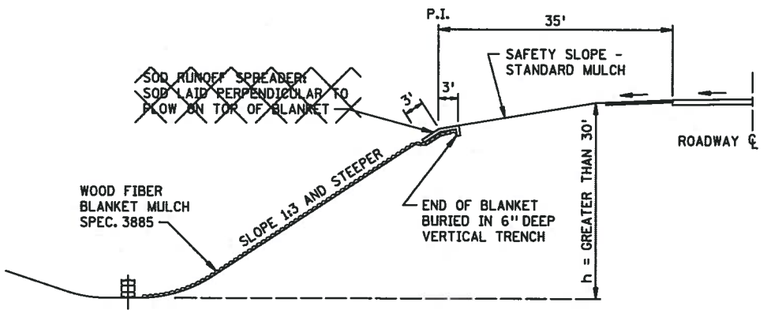
SHINGLING SOD

WHERE THE FLOW OF WATER IS SHEETING, PLACE SOD STRIPS PERPENDICULAR TO THE DIRECTION OF WATER FLOW.

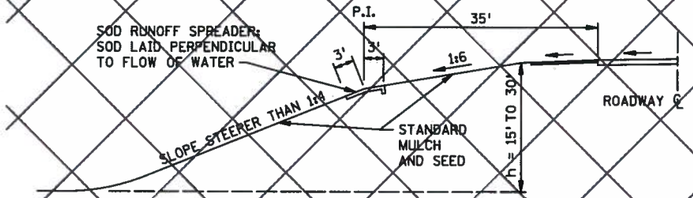
SPECIAL SOD PLACEMENT TECHNIQUES



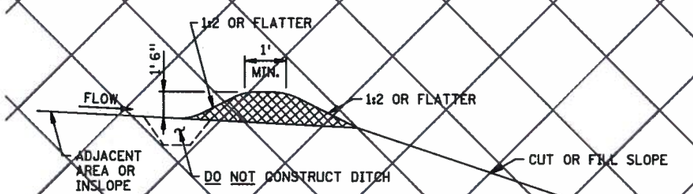
WOOD FIBER BLANKET INSTALLATION ON A CUT SLOPE



WOOD FIBER BLANKET INSTALLATION ON AN INSLOPE
(WHEN REQUIRED)



BROKEN-BACK SAFETY FILL SLOPE



PERMANENT SLOPE PROTECTION DIKE

REVISION:

APPROVED: 8-6-2014

CHIEF ENVIRONMENTAL OFFICER

REVISED:

APPROVED: 8-6-2014

STATE DESIGN ENGINEER

PERMANENT SEDIMENT CONTROL
ALONG ROADWAYS AND AT GORE AREAS & BRIDGE APPROACH FILLS

STANDARD PLAN 5-297.406 | 1 OF 1

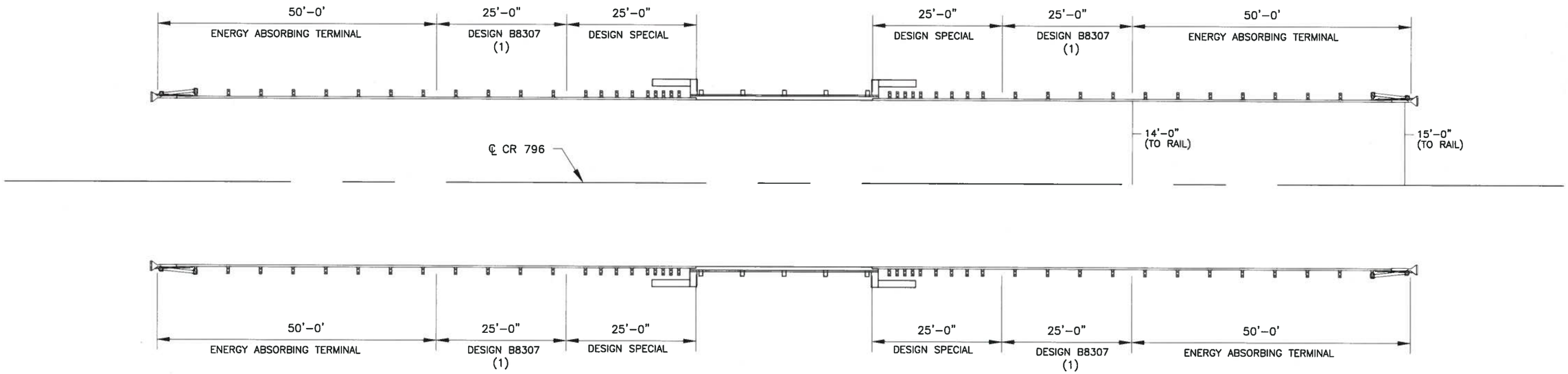
I HEREBY CERTIFY THAT THIS PLAN SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

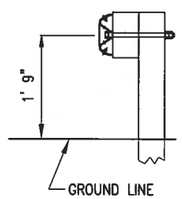
MATTHEW W. HEMMILA — TYPED NAME
43973 — REG. NO.
SIGNATURE
8/31/16 — DATE

CR 796 – CO. BR. 516 – ST. BR. 69A58 | EROSION CONTROL BLANKET

CP 0796-271375 | Sheet 12 of 18 Sheets

STATE BRIDGE NO. 69A58
COUNTY BRIDGE NO. 516





TYPICAL PROFILE VIEW

	ITEM NO.	ITEM	UNIT	QUANTITY
(2)	2554	TRAFFIC BARRIER DESIGN SPECIAL B8307	LIN FT	100
(1)(2)	2554	TRAFFIC BARRIER DESIGN B8307	LIN FT	100
(2)	2554	END TREATMENT– ENERGY ABSORBING TERMINAL	EACH	4

NOTES:

(1) TRAFFIC BARRIER DESIGN B8307 PAY LENGTH SHALL INCLUDE THE MATERIALS AND INSTALLATION OF THE PAY LENGTH STEEL PLATE BEAM 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) BACK FILLING SHALL BE ACCOMPLISHED IN ACCORDANCE WITH MN/DOT SPECIFICATION 2451.3D.

NOT TO SCALE

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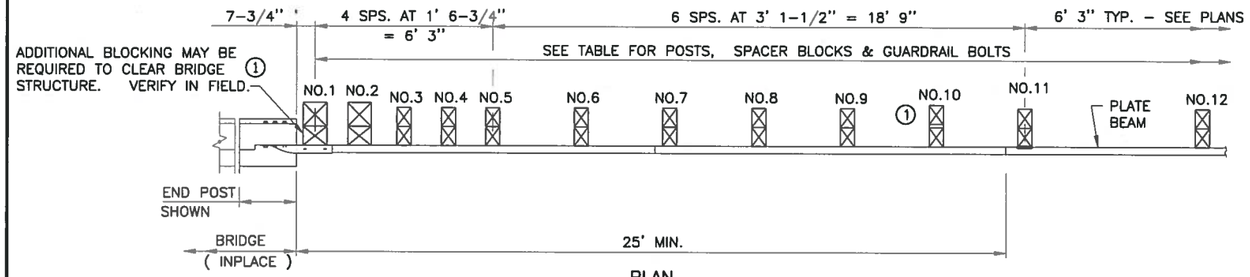
CR 796 – CO. BR. 516 – ST. BR. 69A58

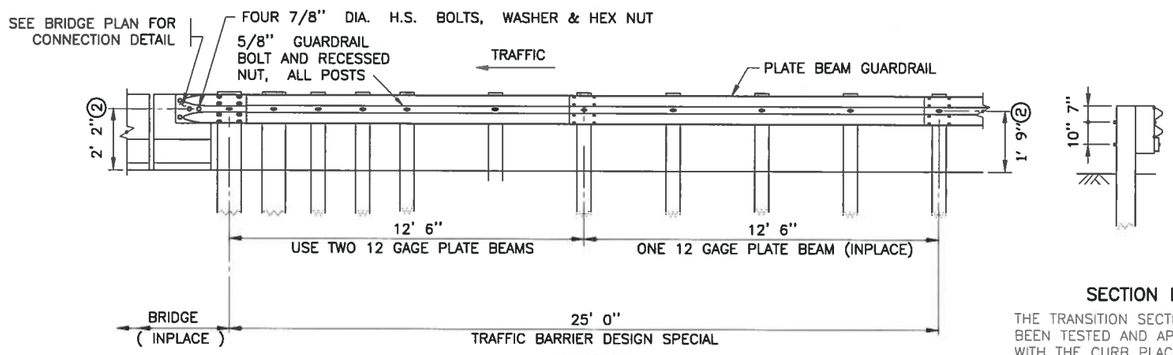
GUARDRAIL LAYOUT (1 OF 3)

CP 0796–271375

Sheet 13 of 18 Sheets



PLAN

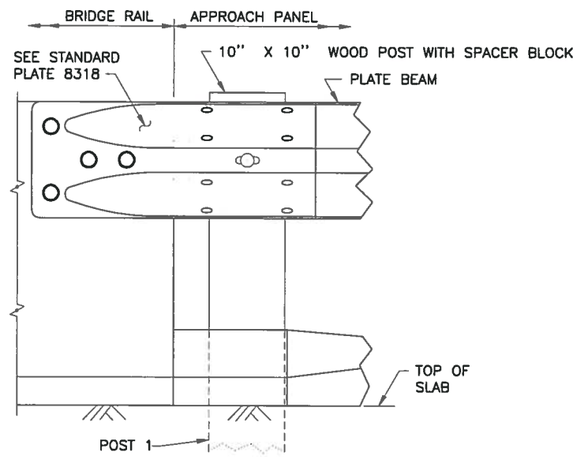


ELEVATION

SECTION B–B

THE TRANSITION SECTION HAS BEEN TESTED AND APPROVED WITH THE CURB PLACED AS SHOWN.

GENERAL ASSEMBLY DETAILS



TRAFFIC SIDE ELEVATION

RAIL ATTACHMENT DETAIL

NOTES:

STRUCTURAL STEEL TO BE 3306, EXCEPT AS NOTED.

ALL SLOTTED HOLES ARE 11/16" X 2".

ALL SQUARE HOLES ARE 11/16".

GALVANIZE STRUCTURAL SHAPES PER SPEC. 3394 AFTER FABRICATION, EXCEPT AS NOTED.

MATERIALS AND CONSTRUCTION PER SPEC. 2554, EXCEPT AS NOTED.

GALVANIZE ALL HARDWARE PER SPEC. 3392.

POST, SPACER BLOCK & BOLT TABLE

DESCRIPTION	POST NO.	SIZE
POST	1 & 2	10" X 10" X 8' 0" MIN. LONG
	3 – 5	6" X 8" X 7' 0" MIN. LONG
	6 – 12	6" X 8" X 6' 0" MIN. LONG
SPACER BLOCK	1 – 2	10" X 8" X 21"
	3 – 9	6" X 8" X 21"
	10 – 12	6" X 8" X 14"
GUARDRAIL BOLT & RECESSED NUT	1 – 2	5/8" DIA. X 20"–GUARDRAIL
	3 – 12	5/8" DIA. X 18"–GUARDRAIL
	1 – 2	5/8" DIA. X 22"–RUB RAIL
	3 – 9	5/8" DIA. X 20"–RUB RAIL

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 1' 9" BETWEEN 12' 6" TO 25' 0" FROM BRIDGE.

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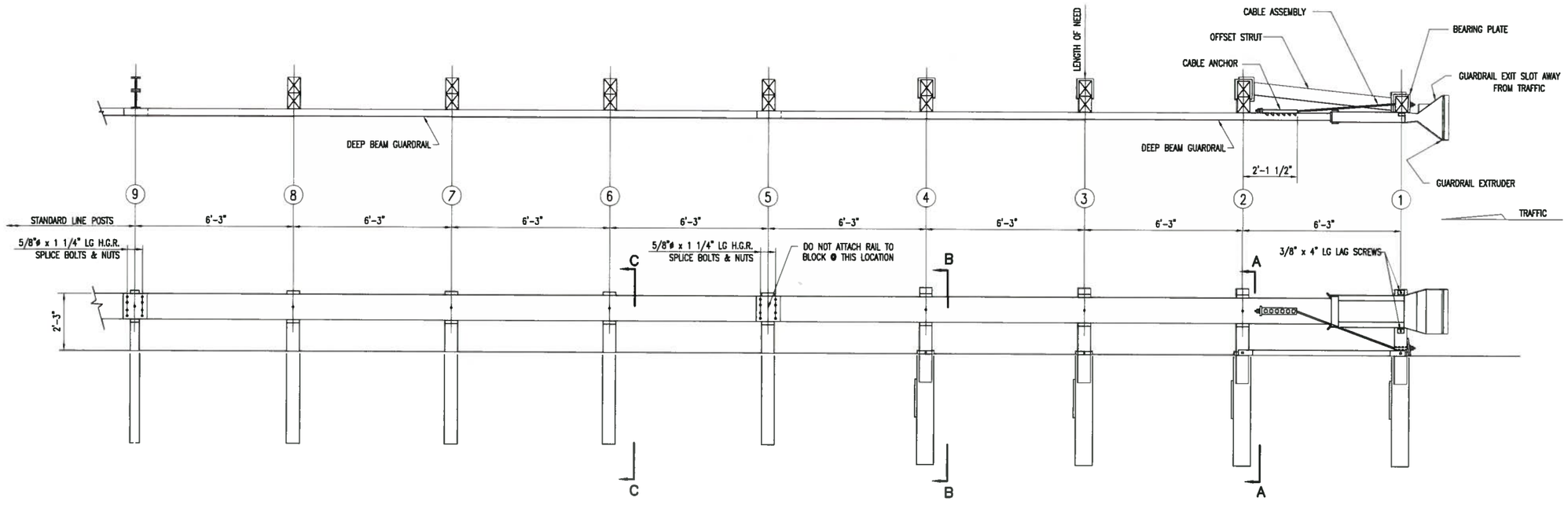
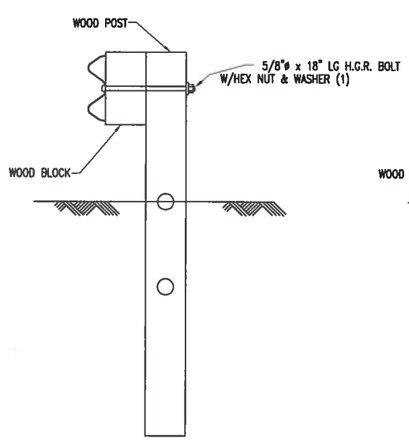
CR 796 – CO. BR. 516 – ST. BR. 69A58

GUARDRAIL (2 OF 3)

CP 0796–271375

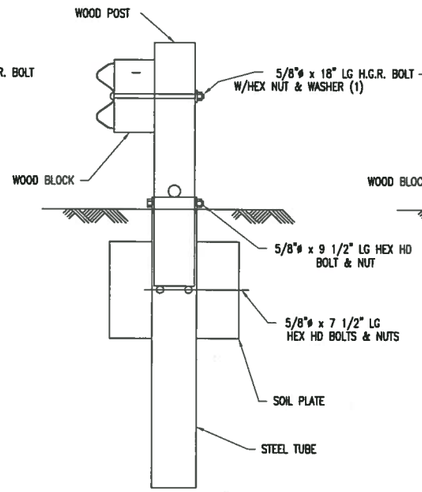
Sheet 14 of 18 Sheets



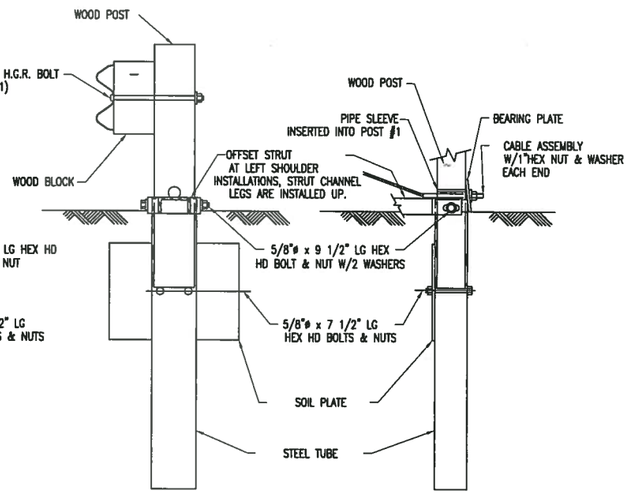


NOTE:
SECTION "C-C" IS SIMILAR @ POST #5 EXCEPT RAIL IS NOT ATTACHED.

SECTION "C-C"
(TYP @ POSTS #6, 7 & 8)



SECTION "B-B"
(TYP @ POSTS #3 & 4)



SECTION "A-A"
(@ POST #2)

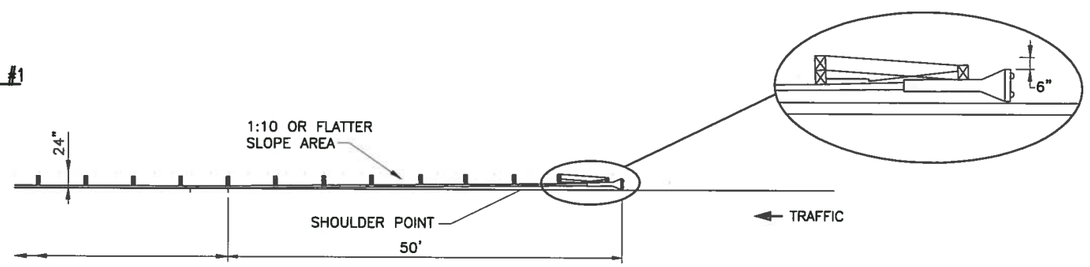
PARTIAL VIEW @ POST #1

QUANTITIES FOR TREATMENT (2)	
QTY	DESCRIPTION
1	12/25/6'3/S (GUARDRAIL)
1	12/25/6'3/S ANC (GUARDRAIL)
1	CABLE ANCHOR BRACKET
1	2" x 5 1/2" PIPE
4	4'6 TUBE SLEEVE
4	1/4" x 18" x 24" SOIL PLATE
1	5/8" x 8" x 8" BEARING PLATE
1	ET-2000 EXTRUDER
1	CABLE 3/4 x 6'6
11	5/8" WASHER
35	5/8" HEX NUT
16	5/8"ø x 1 1/4" SPLICE BOLT
8	5/8"ø x 7 1/2" HEX HD BOLT
4	5/8"ø x 9 1/2" HEX HD BOLT
7	5/8"ø x 18" POST BOLT
2	1" WASHER
2	1" HEX NUT
4	WD 6'0 POST 6 x 8
4	WD 3'9 POST 5 1/2 x 7 1/2
7	WD BLOCK 1'2 x 5 1/2 x 7 1/2
2	3/8"ø x 4" LAG SCREW
1	6'3 STRUT
1	18" x 18" REFLECTOR (AMBER & BLACK)

NOTES:

(1) THE 5/8" FLAT WASHER IS USED UNDER THE NUT, BEHIND THE POST ONLY. NO WASHER IS USED AT THE RAIL.

(2) QUANTITIES LISTED ARE FOR INFORMATIONAL PURPOSES. ANY ADDITIONAL MINOR ITEMS AND SLIGHT CHANGES IN QUANTITIES REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION. SOME ITEMS LISTED ARE FROM "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE" AS APROVED BY AASHTO.



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SIGNATURE
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CR 796 – CO. BR. 516 – ST. BR. 69A58

GUARDRAIL (3 OF 3)

CP 0796-271375

Sheet 15 of 18 Sheets

ROAD CLOSURE SIGNING

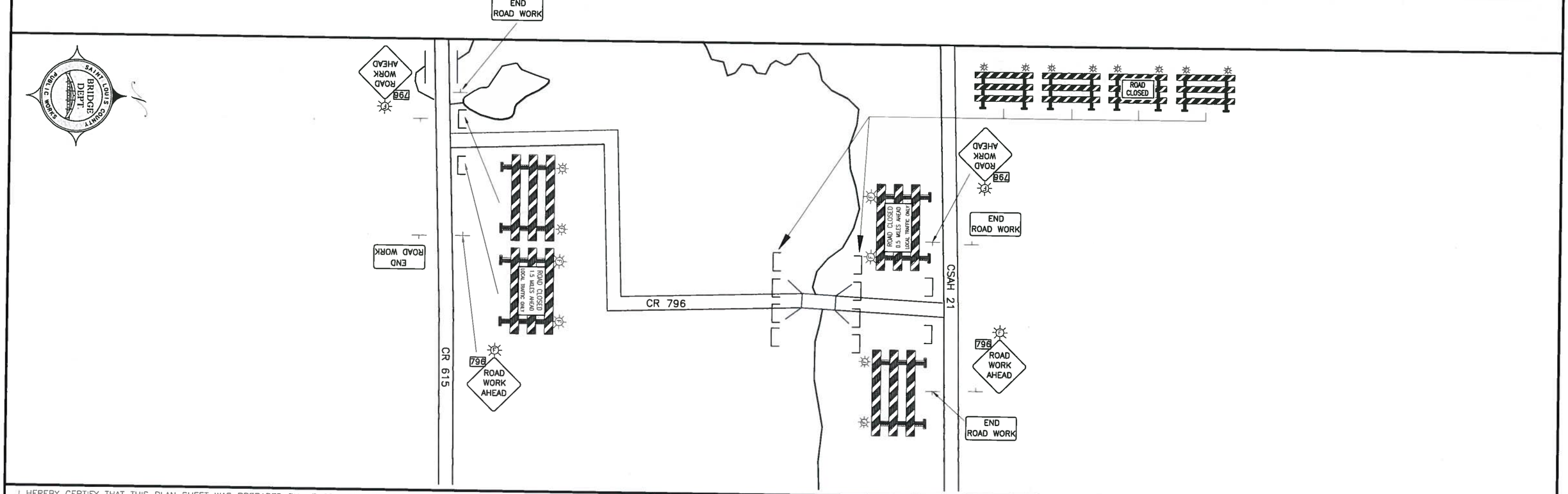
POSTED SPEED LIMIT PRIOR TO STARTING (mph)	SPACING OF ADVANCE WARNING SIGNS (feet) (A)
0 – 30	250
35 – 40	325
45 – 50	600
55	750

LEGEND:

- FLASHER
- SIGN
- BARRICADE
- WORK ZONE

1. ROAD CLOSURE SIGNING SHALL BE ERECTED PRIOR TO CONSTRUCTION OPERATIONS, AND SHALL REMAIN INPLACE FOR THE DURATION OF THE PROJECT. ALL SIGNING MUST BE REMOVED IMMEDIATELY AFTER THE PROJECT IS OPEN TO TRAFFIC.

TRAFFIC CONTROL DEVICES (2)			
ITEM	DESIGN	NO.	REMARKS
STOP SIGN	R1–1		IN PLACE–MAINTAIN ONLY
ROAD CLOSED	R11–2	x	48" x 30" MOUNTED ON BARRICADE
ROAD CLOSED 0.5 MILES AHEAD	R11–3a	1	60" x 30" MOUNTED ON BARRICADE
ROAD CLOSED 1.5 MILES AHEAD	R11–3a	1	60" x 30" MOUNTED ON BARRICADE
ROAD WORK AHEAD	W20–1	4	48" X 48" DOUBLE POST MOUNTED WITH FLASHER
DETOUR AHEAD	W20–2	x	48" x 48" DOUBLE POST MOUNTED WITH FLASHER
ROAD CLOSED AHEAD	W20–3	x	48" x 48" DOUBLE POST MOUNTED WITH FLASHER
500 FEET	W20–100p	x	42" x 18" DOUBLE POST MOUNTED
ROUTE MARKER (CR 796)	M1–X4	4	18" x 18" POST MOUNTED
DETOUR	M4–8	x	24" X 12" SINGLE POST MOUNTED
END DETOUR	M4–8a	x	24" X 18" DOUBLE POST MOUNTED
DETOUR (RIGHT)	M4–10R	x	48" X 18" MOUNTED ON BARRICADE
DETOUR (LEFT)	M4–10L	x	48" X 18" MOUNTED ON BARRICADE
ADVANCE RIGHT TURN ARROW	M5–1R	x	21" X 15" POST MOUNTED
ADVANCE LEFT TURN ARROW	M5–1L	x	21" X 15" POST MOUNTED
TURN ARROW	M6–1	x	21" X 15" POST MOUNTED
THRU ARROW	M6–3	x	21" X 15" POST MOUNTED
END ROAD WORK	G20–2a	4	48" X 24" DOUBLE POST MOUNTED
ROAD CLOSED BEGINNING XXX	G20–X1	x	72" X 60" DOUBLE POST MOUNTED
PLASTIC BARRELS			PLACE AS REQUIRED
BARRICADES	TYPE III	12	BREAKAWAY WITH FLASHERS, DOUBLE SIDED
FLASHER, TYPE A	LOW INTENSITY	28	SEE PLAN FOR PLACEMENT



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43973 — REG. NO.

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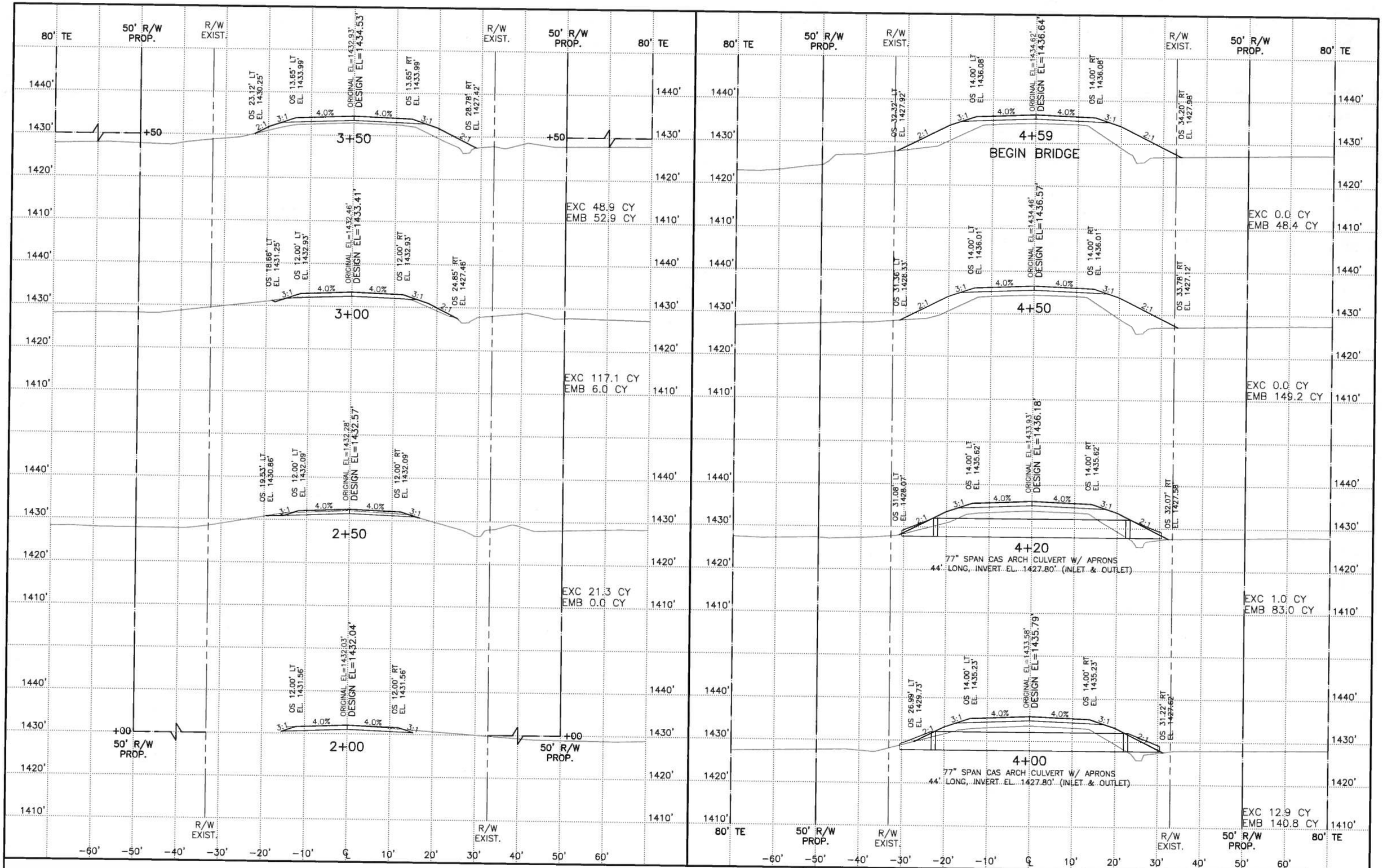
8/31/16 — DATE

CR 796 – CO. BR. 516 – ST. BR. 69A58

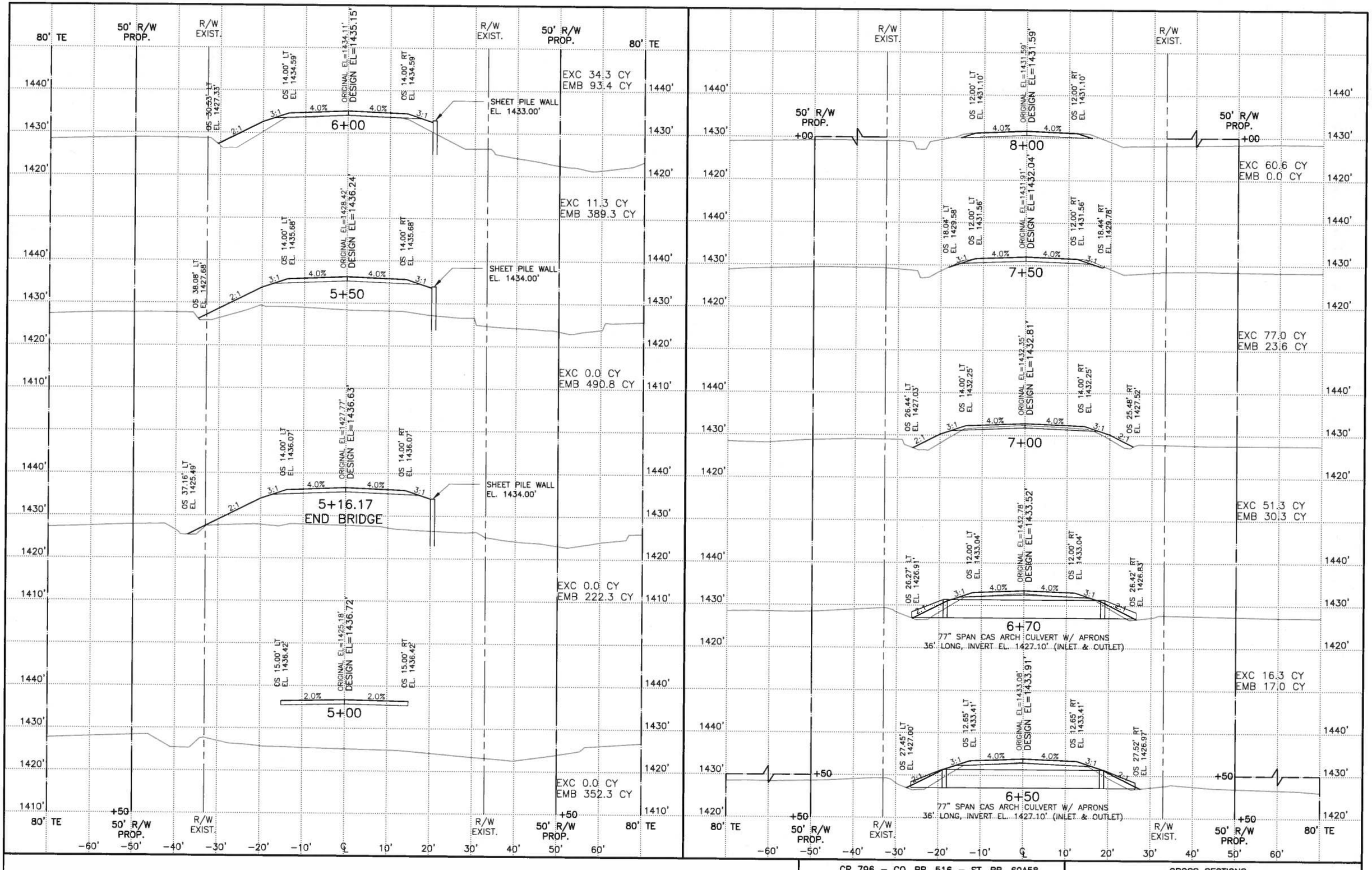
TRAFFIC CONTROL

CP 0796–271375



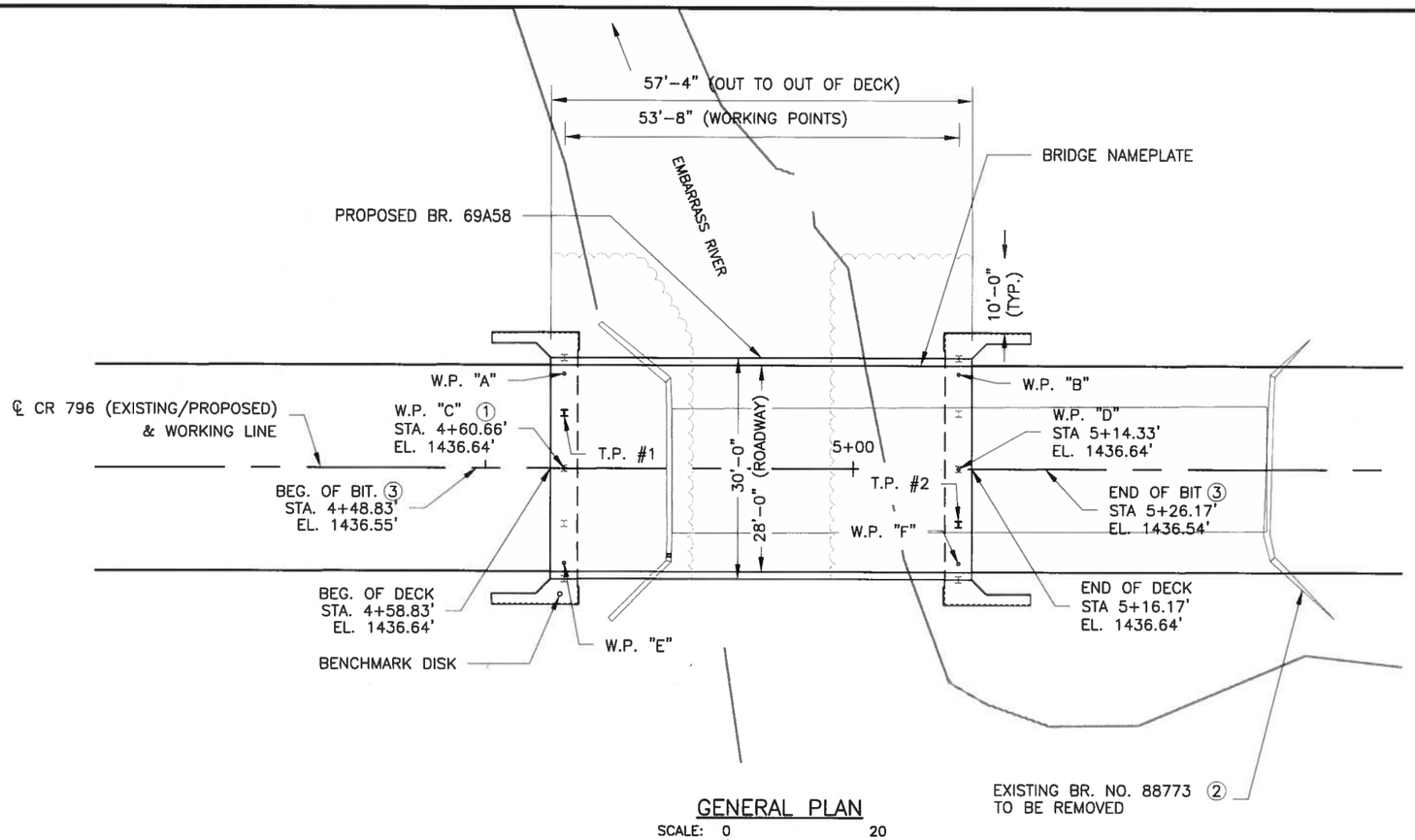
CR 796 – CO. BR. 516 – ST. BR. 69A58 | CROSS SECTIONS

CP 0796-271375 | Sheet 17 of 18 Sheets



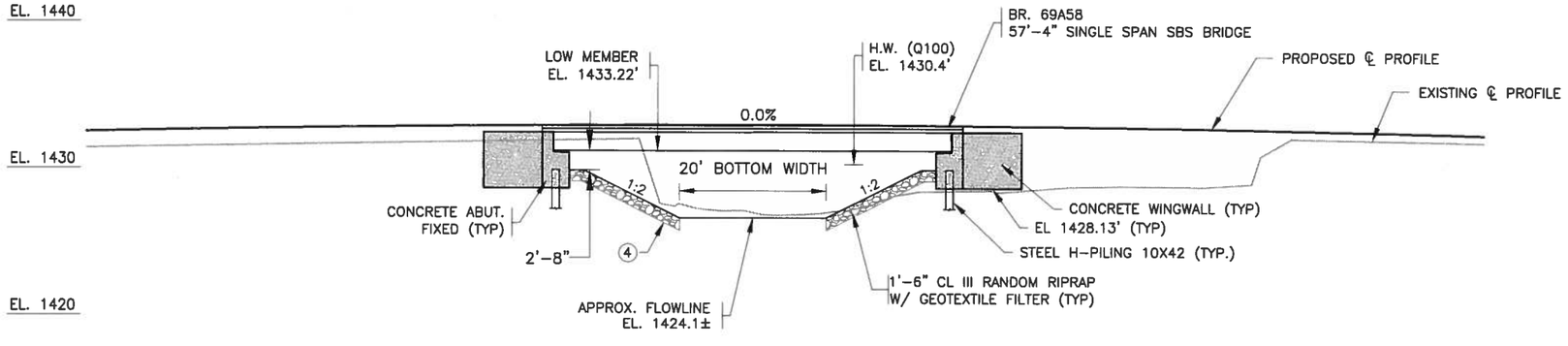
CR 796 – CO. BR. 516 – ST. BR. 69A58 | CROSS SECTIONS

CP 0796-271375 | Sheet 18 of 18 Sheets



GENERAL PLAN

SCALE: 0 20



GENERAL ELEVATION

SCALE: 0 20

KEY NOTES:

1. CONTROL POINT
   ℄ CR 796 STA 4+60.66
   SOUTH WORKING LINE @ W.P. "C"
   X = 4844094.83
   Y = 3669537.75
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.
3. REFER TO GRADING PLANS FOR APPROACH GRADING DETAILS.
4. CONTRACTOR SHALL EXCAVATE TO THESE LINES FOR 28'-0" EACH SIDE OF ℄ THEN TAPER TO NATURAL SLOPES AT 1:3 SLOPE. INCLUDED FOR PAYMENT UNDER ITEM "SLOPE PREPARATION".

CONSTRUCTION NOTES:

- THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND THE 2016 EDITION OF THE "MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.
- THE BARS 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 NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD 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 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."

COUNTY PROJ. NO. 0796-271375

DESIGN DATA AND PROJECTED TRAFFIC VOLUMES

DESIGNED IN ACCORDANCE WITH 2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
HL 93 LIVE LOAD

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
fc = 4 ksi CONCRETE
fy = 60 ksi PLAIN AND EPOXY COATED BARS
n = 8 FOR REINFORCEMENT
STRUCTURAL STEEL:
Fy = 50 ksi STRUCTURAL STEEL SPEC 3309 (GALVANIZED)
WOOD:
Fbo = 2.40 ksi GLUED LAMINATED TIMBER RAILS
Fbo = 1.75 ksi RAIL POSTS
Fbo = 1.20 ksi ALL OTHER TIMBER
PROJECTED A.D.T. 6 (2036)
CURRENT A.D.T. 5 (2016)
DESIGN SPEED = 40 MPH
HL 93 LRFR
BRIDGE OPERATING RATING FACTOR = 1.57
APPROXIMATE DECK AREA = 1720 S.F.

B.M. ELEV. 1430.46' (N.A.V.D. 88)

DESC: BM "A" IN 6" SPRUCE TREE
56' LT OF STA. 8+87

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT 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.

SIGNED _____
BY MATTHEW W. HEMMILA
DATE _____ LICENSE NO. 43973

BRIDGE NO. 69A58

LOCATED 0.4 MILES SOUTH OF JCT. OF CSAH 21 ON CR 796 OVER THE EMBARRASS RIVER.

57'-4" SINGLE SPAN SBS BRIDGE
IDENTIFICATION NO. 301 0° SKEW

GENERAL PLAN AND ELEVATION

SEC. 14 T 60 N R 14 W
WAASA TOWNSHIP ST. LOUIS COUNTY

DES: MWH	DR: NSB	69A58
CHK: JWS	CHK: LJR	

ST. LOUIS COUNTY BRIDGE NO. 516
COUNTY PROJ. NO. 0796-271375
SHEET B1 OF B15 SHEETS

(1) CONTROL POINT
℄ CR 796 STA 4+60.66
SOUTH WORKING LINE @ W.P. "C"
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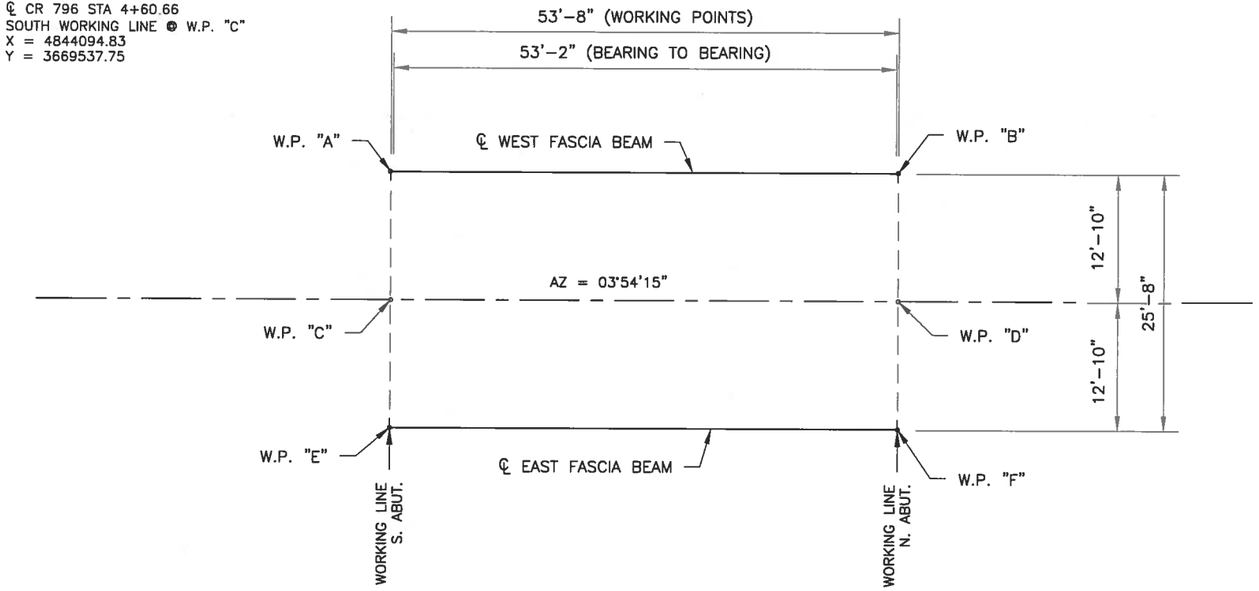
Y = 3669537.75

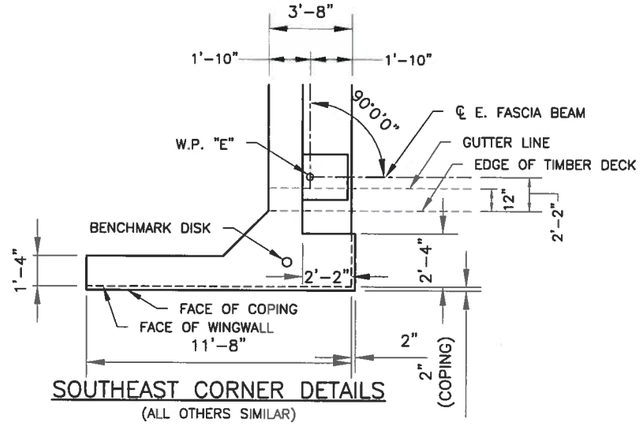


WORKING POINT LAYOUT

STATEMENT OF ESTIMATED QUANTITIES

NOTE	ITEM NO.	ITEM	UNIT	QUANTITY	
				Bonding Ineligible	Bonding Eligible
	2021.501	MOBILIZATION	LUMP SUM	0.7	
	2331.604	ASPHALT OVERLAY TEXTILE (PAVING FABRIC) HEAVY DUTY	SQ YD	206	
	2360.501	TYPE SP 12.5 WEARING COURSE MIX (3,C)	TON	46	
	2401.501	STRUCTURAL CONCRETE (3B52) (P)	CU YD	78	
	2401.541	REINFORCEMENT BARS (EPOXY COATED) (P)	POUND	8,038	
	2402.521	STRUCTURAL STEEL (3309) (P)	POUND	52,051	
	2402.590	ELASTOMERIC BEARING PAD	EACH	16	
	2403.506	HARDWARE (P)	POUND	202	
	2452.520	STEEL H-TEST PILE 80 FT LONG 10"	EACH	2	
	2452.530	PILE TIP PROTECTION 10"	EACH	10	
	2452.603	STEEL H-PILING 10"	LIN FT	600	
	2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	1	
	2511.501	RANDOM RIPRAP CLASS III	CU YD	140	
	2511.515	GEOTEXTILE FILTER TYPE VII	SQ YD	280	
	2563.601	TRAFFIC CONTROL	LUMP SUM	0.7	

TOP OF ROADWAY TO BRIDGE SEAT AT ROAD CENTERLINE							
	BITUMINOUS DEPTH	DECK THICKNESS	BEAM HEIGHT	STEEL BEARING HEIGHT	ELASTOMERIC BEARING HEIGHT	TOTAL	
						INCHES	FEET
SOUTH ABUTMENT	0.417'	0.427'	2.483'	0.062'	0.042'	41.17"	3.431'
NORTH ABUTMENT	0.417'	0.427'	2.483'	0.062'	0.042'	41.17"	3.431'



SOUTHEAST CORNER DETAILS
(ALL OTHERS SIMILAR)

DIMENSIONS BETWEEN WORKING POINTS										ELEVATIONS			
POINT	STATION	X–COORD	Y–COORD	A	B	C	D	E	F	TOP OF RDWY	TOP OF RDWY TO BR. SEAT	BRIDGE SEAT	POINT
A	4+60.66	4844082.02	3669538.62		53.67		55.18		59.49	1436.36'	3.23'	1433.13'	A
B	5+14.33	4844085.68	3669592.17			55.18		59.49		1436.36'	3.23'	1433.13'	B
C	4+60.66	4844094.83	3669537.75				53.67		55.18	1436.64'	3.51'	1433.13'	C
D	5+14.33	4844098.48	3669591.30					55.18		1436.64'	3.51'	1433.13'	D
E	4+60.66	4844107.63	3669536.88						53.67	1436.36'	3.23'	1433.13'	E
F	5+14.33	4844111.29	3669590.42							1436.36'	3.23'	1433.13'	F

LIST OF SHEETS

CP 0796–271375

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

I HEREBY 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: MATTHEW W. HEMMILA REG #: 43973 DATE 8/31/16

TITLE: BRIDGE LAYOUT & STATEMENT OF ESTIMATED QUANTITIES

DES: MWH | DR: NSB | APPROVED:
CHK: JWS | CHK: LJR

Sheet B2 of B15 Sheets

CO. BR. 516
ST. BR. NO. 69A58

H:\Bridge\BR 500-599\BR 516\CP 0796-271375\Design\Working Drawings\BR 516 Design.dwg, Bridge Layout, 8/30/2016 11:08:10 AM, bergstedtn

STRUCTURAL STEEL (3309)

DESCRIPTION	QUANTITY	LB/EA	POUNDS
W30x108 STEEL BEAM	433.33 FT	108 LB/FT	46,800
24"x12"x ¾" STEEL BEARING PLATE	16	61.20	980
3'-5 ½"x2'-5 ½"x 5/16" STEEL DIAPHRAGM	25	108.5	2,713
19 ¾"x7"x ⅜" STIFFENER	74	21.05	1,558
ALL STRUCTURAL STEEL IS TO BE GALVANIZED.		TOTAL	52,051

REINFORCING STEEL (EPOXY COATED)

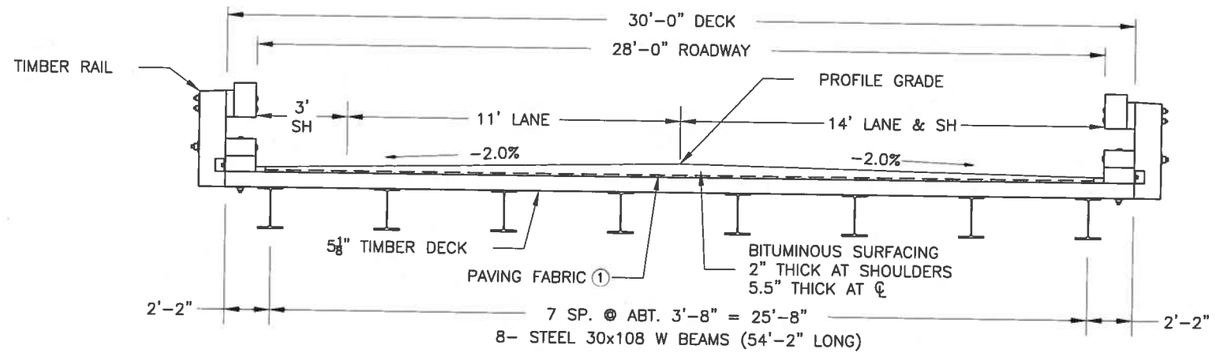
LOCATION	POUNDS
SOUTH ABUTMENT	4,019
NORTH ABUTMENT	4,019
TOTAL	8,038

HARDWARE

DESCRIPTION	QUANTITY	LB/EA	POUNDS
1" ø X 15" ANCHOR ROD	32	5.60	180
1" NUTS	32	0.42	15
1" CUT WASHERS	32	0.19	7
ALL HARDWARE IS TO BE GALVANIZED.		TOTAL	202

STRUCTURAL CONCRETE 3B52

LOCATION	CU YD
SOUTH ABUTMENT	39
NORTH ABUTMENT	39
TOTAL	78



TRANSVERSE SECTION

SCALE: 0 5'

(1) A SKIM 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.

CP 0796-271375

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

I HEREBY 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.

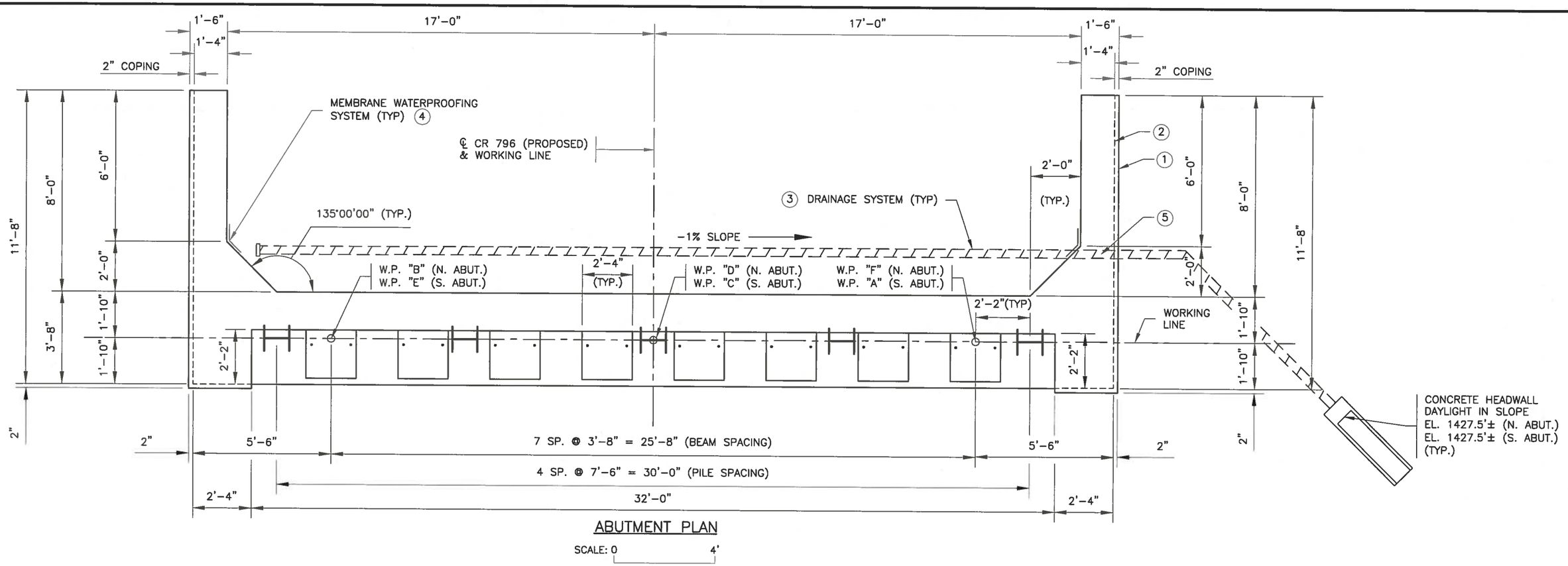
NAME: MATTHEW W. HEMMILA REG #: 43973 DATE: 8/31/16

TITLE: TRANSVERSE SECTION & MATERIAL SUMMARY

DES: MWH	DR: NSB	APPROVED:
CHK: JWS	CHK: LJR	

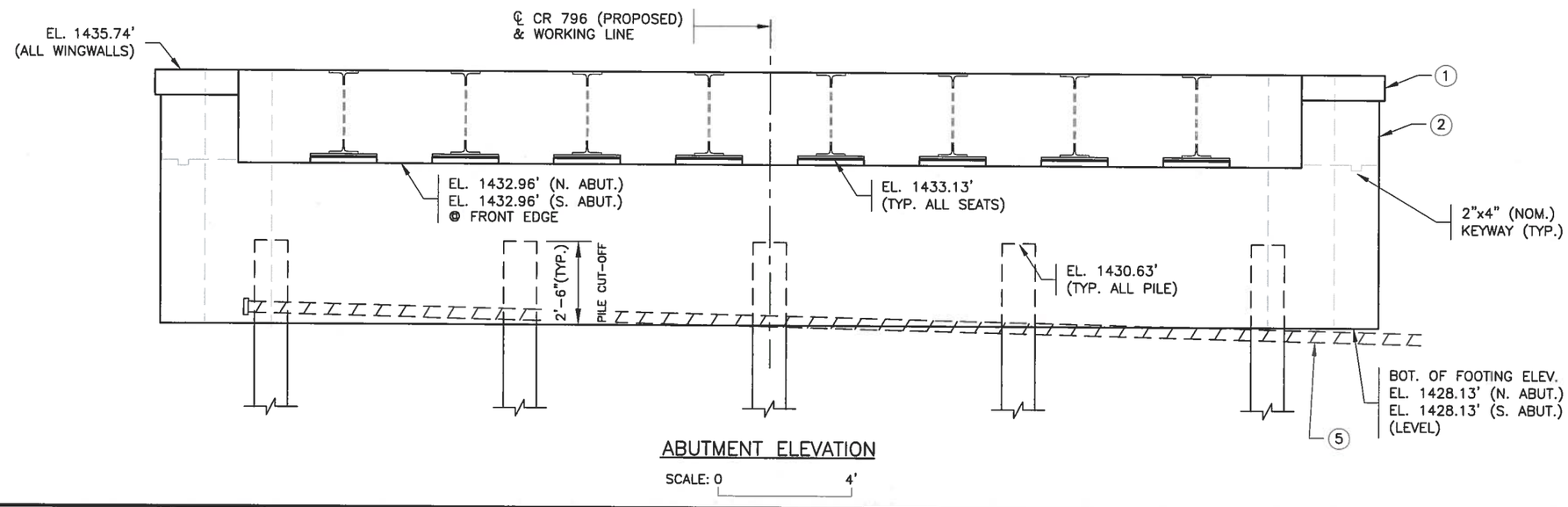
Sheet B3 of B15 Sheets

CO. BR. 516
ST. BR. NO. 69A58



ABUTMENT PLAN

SCALE: 0 4'



ABUTMENT ELEVATION

SCALE: 0 4'

KEY NOTES

1. WINGWALL COPING (TYP).
2. FACE OF WINGWALL (TYP).
3. DRAINAGE SYSTEM TYPE (B910). SOUTH ABUTMENT IS SHOWN. ALL CONCRETE HEADWALLS ARE TO FACE DOWNSTREAM. SEE SHEET B11 FOR DETAILS.
4. TO BE USED AT OPTIONAL JOINT LOCATIONS (INCIDENTAL).
5. DRAINAGE PIPE TO BE PLACED UNDER THE WINGWALL.

CP 0796-271375

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

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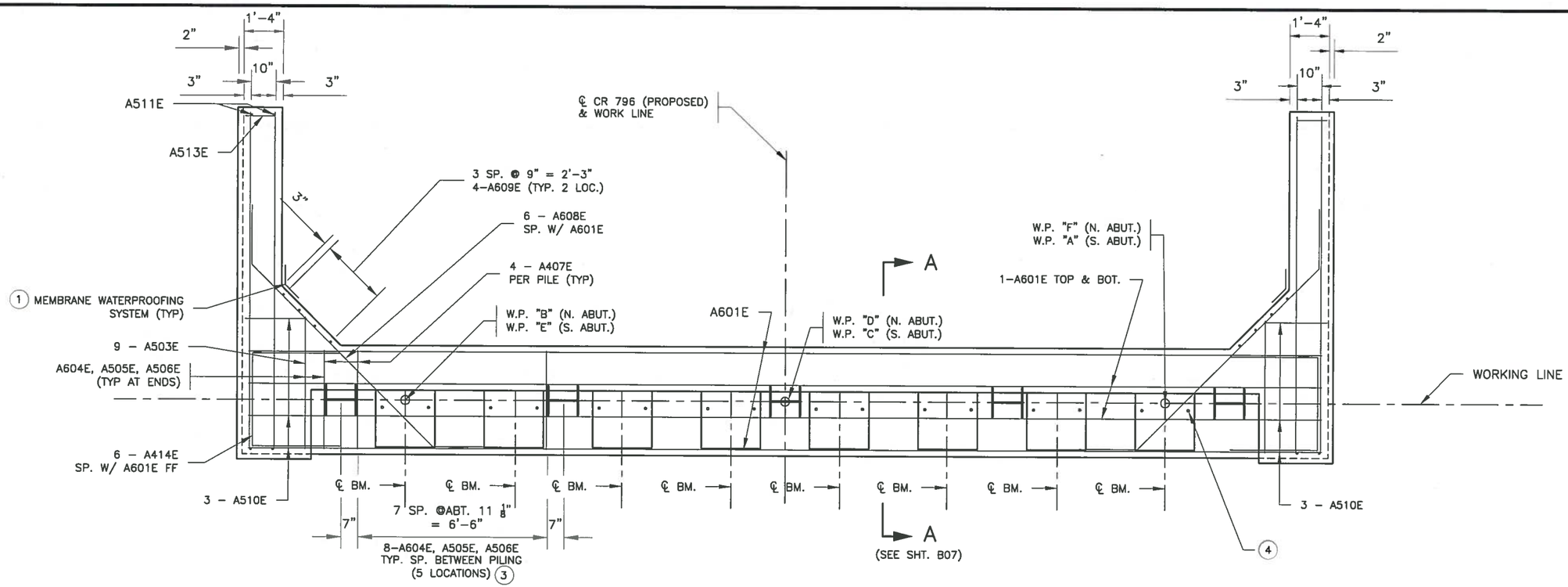
NAME: MATTHEW W. HEMMILA REG #: 43973 DATE 8/31/16

TITLE: ABUTMENT GEOMETRICS (NORTH & SOUTH ABUTMENTS)

DES: MWH	DR: NSB	APPROVED:
CHK: JWS	CHK: LJR	

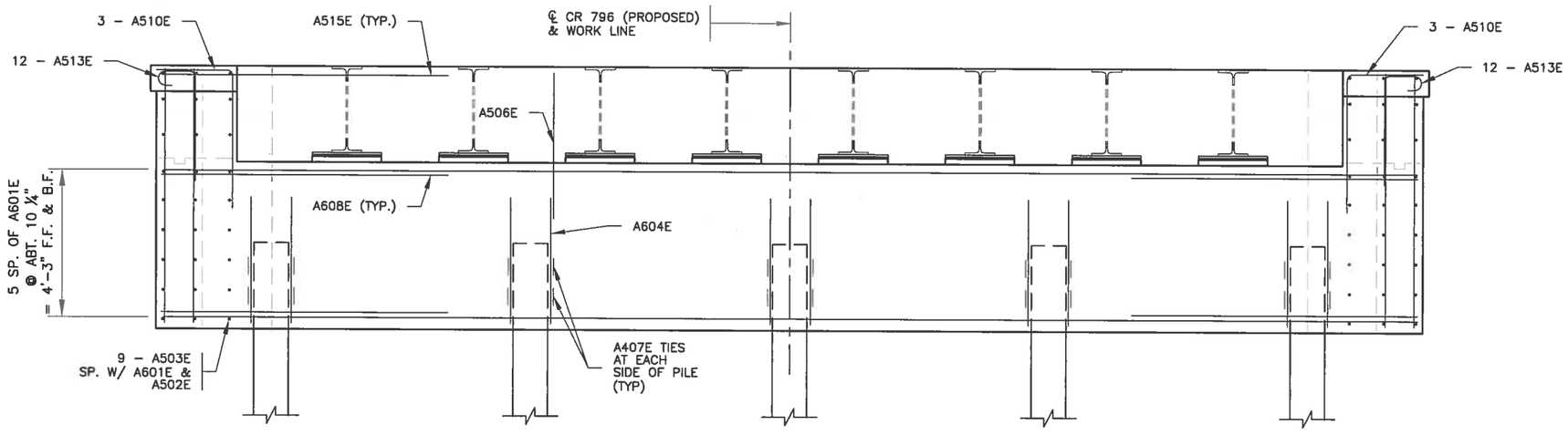
Sheet B4 of B15 Sheets

CO. BR. 516
ST. BR. NO. 69A58



ABUTMENT PLAN

SCALE: 0 4'



ABUTMENT ELEVATION

SCALE: 0 4'

KEY NOTES

1. TO BE USED AT OPTIONAL JOINT LOCATIONS (INCIDENTAL)
2. B.F. = BACK FACE
   F.F. = FRONT FACE
3. ENSURE 2" OF CLEAR SPACE BETWEEN ANCHORS AND REINFORCEMENT BARS.
4. ANCHOR ROD (TYP.)
   SEE SHT. B9 FOR LAYOUT

CP 0796-128462

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

I HEREBY 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.

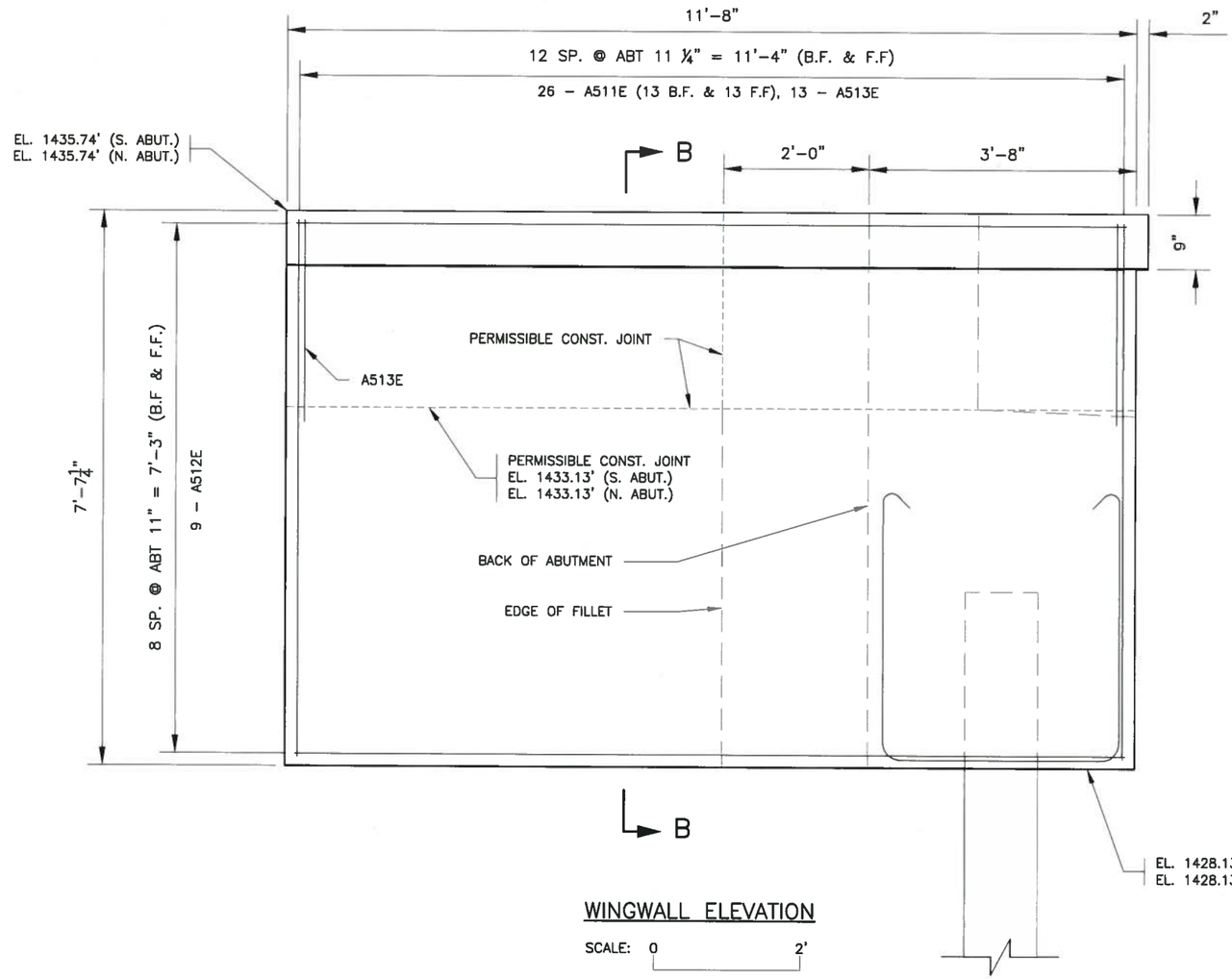
NAME: MATTHEW W. HEMMILA REG #: 43973 DATE: 8/31/16

TITLE: ABUTMENT REINFORCEMENT (NORTH AND SOUTH ABUTMENTS)

DES: MWH	DR: NSB	APPROVED:
CHK: JWS	CHK: LJR	

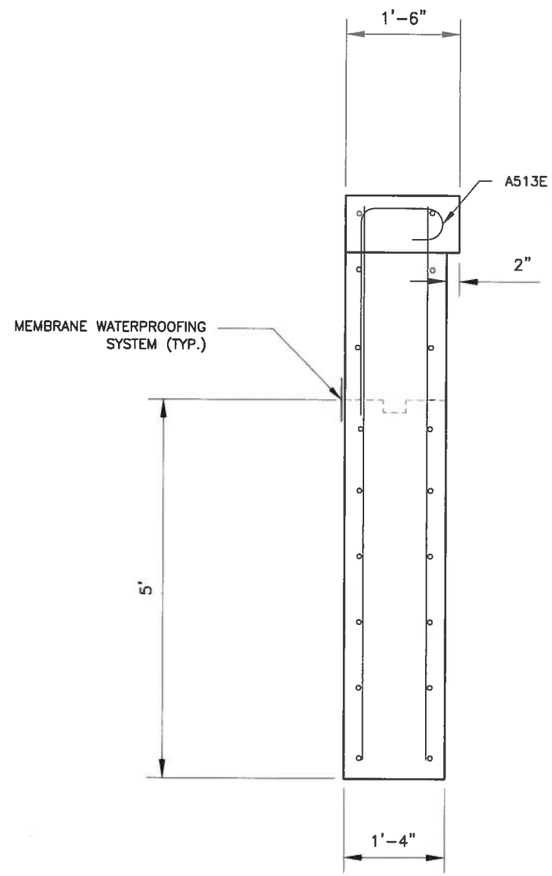
Sheet B5 of B15 Sheets

CO. BR. 516
ST. BR. NO. 69A58



WINGWALL ELEVATION

SCALE: 0 2'



SECTION B-B

SCALE: 0 2'

CP 0796-271375	SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.	I HEREBY 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: MATTHEW W. HEMMILA REG #: 43973 DATE 8/31/16	TITLE: WINGWALL REINFORCEMENT (TYPICAL)	DES: MWH DR: NSB APPROVED: CHK: JWS CHK: LJR	Sheet B6 of B15 Sheets	CO. BR. 516 ST. BR. NO. 69A58

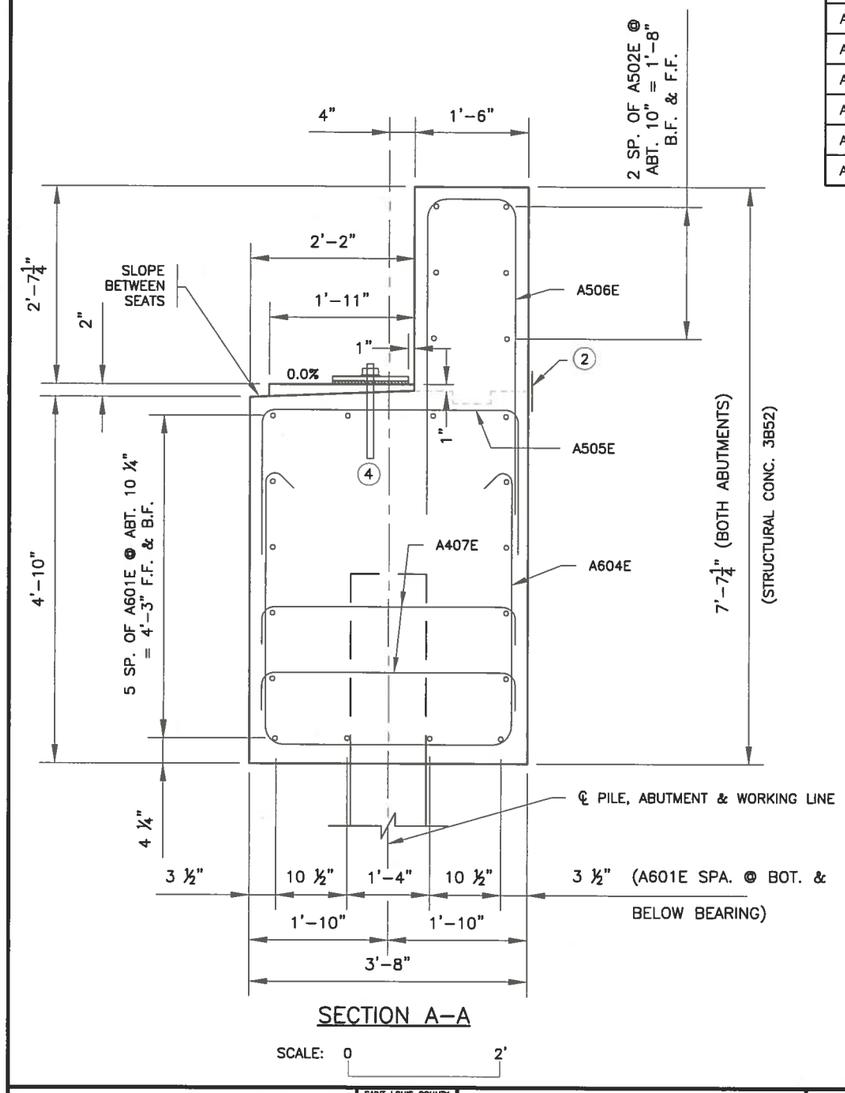
NOTE:

PROVIDE STANDARD HOOKS FOR DIMENSIONS NOT SHOWN.

BENT BAR DIMENSIONS ARE OUT-TO-OUT. ACTUAL BAR LENGTHS SHALL BE DETERMINED BASED ON 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 INDENTIFIED 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.



SECTION A-A

SCALE: 0 2'

BILL OF REINFORCEMENT FOR BOTH ABUTMENTS

BAR MARK	NO. OF BARS	NO. OF SERIES	LENGTH (FT.-IN.)	SHAPE	LOCATION
A601E	32		36'-3"	STR.	ABUTMENT - HORIZONTAL
A502E	12		36'-3"	STR	ABUTMENT - HORIZONTAL
A503E	36		4'-5"	STR	ABUTMENT - HORIZONTAL
A604E	72		11'-6"	BENT	ABUTMENT - STIRRUP
A505E	72		8'-0"	BENT	ABUTMENT - SEAT TIE
A506E	72		9'-6"	BENT	ABUTMENT - PARAPET TIE
A407E	40		4'-8"	BENT	ABUTMENT - PILE TIE
A608E	24		14'-11"	BENT	ABUTMENT CHAMFER - HORIZONTAL
A609E	16		7'-3"	STR	ABUTMENT CHAMFER - VERTICAL
A510E	12		6'-2"	BENT	ABUTMENT - WING TIE
A511E	104		7'-3"	STR	WINGWALLS - VERTICAL
A512E	72		10'-4"	STR	WINGWALLS - HORIZONTAL
A513E	52		4'-11"	BENT	WINGWALL - TOP TIE
A414E	24		9'-4"	BENT	ABUTMENT - TIE
A515E	12		12'-0"	BENT	ABUTMENT CHEMFER - TOP HORIZONTAL

SUMMARY OF QUANTITIES FOR BOTH ABUTMENTS

	UNIT	S. ABUT.	N. ABUT.	TOTAL
STRUCTURAL CONCRETE (3B52)	CU YD	39	39	78
REINFORCEMENT BARS (EPOXY COATED)	POUND	4019	4019	8038
STEEL H-PILING 10" (1)	LIN FT	300	300	600
STEEL H-TEST PILE 80 FT LONG 10"	EACH	1	1	2
STRUCTURE EXCAVATION	LUMP SUM	0.50	0.50	1
PILE TIP PROTECTION 10"	EACH	5	5	10
DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	0.5	0.5	1

KEY NOTES:

(1) DOES NOT INCLUDE TEST PILE

(2) MEMBRANE WATERPROOFING SYSTEM TO BE USED AT OPTIONAL JOINT LOCATIONS PER Mn/DOT SPEC. 2481.3B (INCIDENTAL)

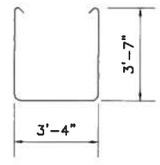
(3) SEE BEARING PLATE DETAIL ON SHEET B9.

(4) PROVIDE 2 INCHES MINIMUM CLEAR DISTANCE BETWEEN ANCHOR RODS AND LONGITUDINAL REINFORCEMENT BARS.

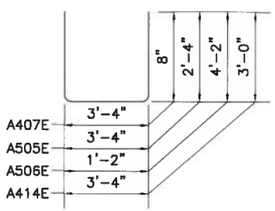
NORTH & SOUTH ABUTMENTS
COMPUTED PILE LOAD - TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	32.0
FACTORED LIVE LOAD	26.7
* FACTORED DESIGN LOAD	58.7

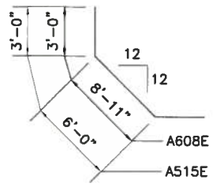
* BASED ON STRENGTH I LOAD COMBINATION



A604E



A407E, A505E, A506E, A414E



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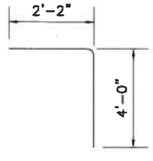

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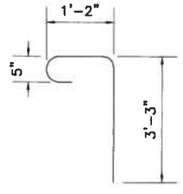


A513E

NORTH & SOUTH ABUTMENTS
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	** Rn
Mn/DOT PILE FORMULA 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{S})$	0.60	97.9
PDA	0.65	90.4

**Rn = (FACTORED DESIGN LOAD)/φ_{dyn}

PILE NOTES

2 - 10X42 STEEL H TEST PILES, 80' LONG
8 - 10X42 STEEL H-PILES, EST. LENGTH 75'
10 - 10X42 STEEL H-PILES REQ'D FOR 2 ABUTS.

ALL ABUTMENT PILES SHALL BE HP10X42 STEEL H-PILES.

SEE DETAIL B202 FOR PILE SPLICES.

ALL PILES SHALL HAVE PILE TIP PROTECTION.

CP 0796-271375

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

I HEREBY 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: MATTHEW W. HEMMILA REG # 43973 DATE 8/31/16

TITLE: ABUTMENT BILL OF REINFORCEMENT

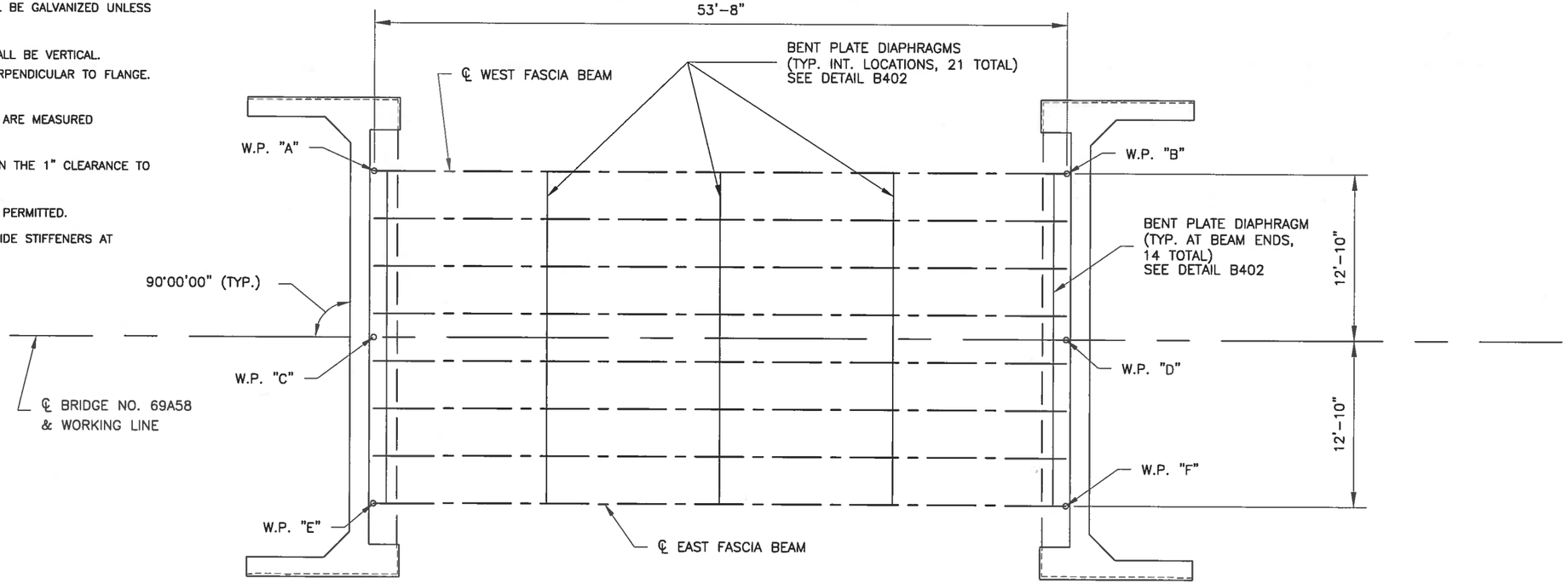
DES: MWH	DR: NSB	APPROVED:	CO. BR. 516
CHK: JWS	CHK: LJR		ST. BR. NO. 69A58

Sheet B7 of B15 Sheets

H:\Bridge\BR 500-599\BR 516\CP 0796-271375\Design\Working Drawings\BR 516 Design.dwg, ABUT BILL REINF, 8/30/2016 9:53:56 AM, bergstedtn

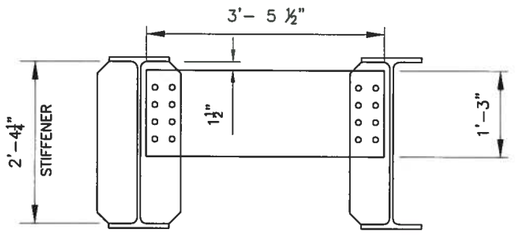
STRUCTURAL STEEL NOTES

1. ALL STRUCTURAL STEEL SHALL CONFORM TO Mn/DOT SPEC. 3309 (ASTM A709 GR. 50W) AND SHALL BE GALVANIZED UNLESS OTHERWISE NOTED.
2. BEARING 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 BEAMS 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.



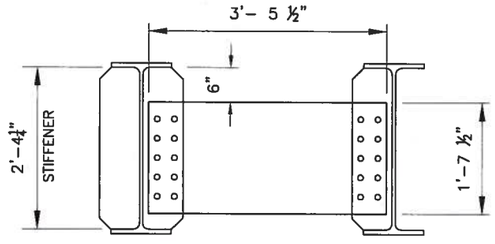
FRAMING PLAN

SCALE: 0 10



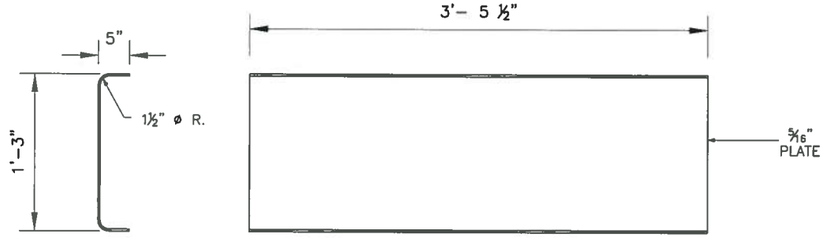
TYP. ABUTMENT DIAPHRAGMS

NOT TO SCALE



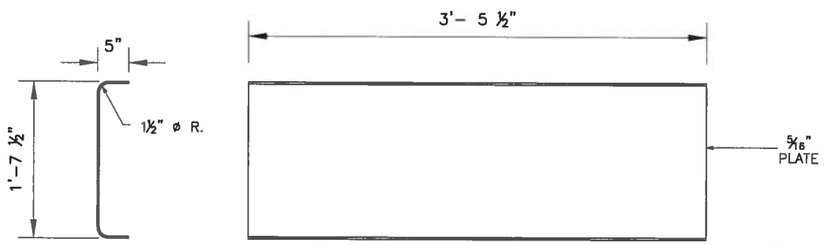
TYP. INTERMEDIATE DIAPHRAGMS

NOT TO SCALE



ABUTMENT DIAPHRAGMS

NOT TO SCALE



INTERMEDIATE DIAPHRAGMS

NOT TO SCALE

CP 0796-271375

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

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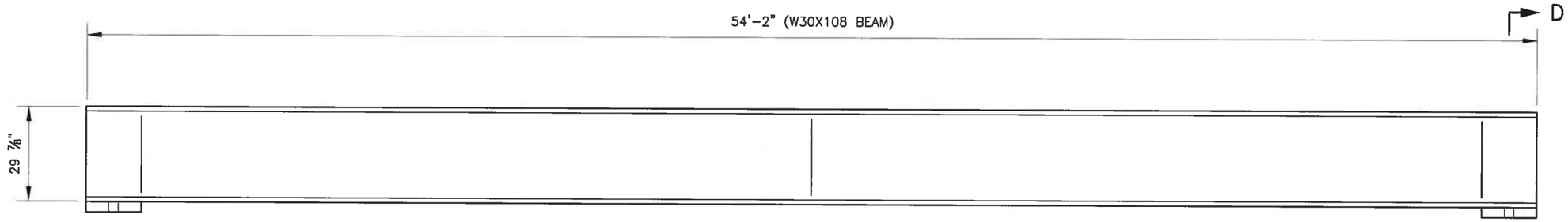
NAME: MATTHEW W. HEMMILA REG #: 43973 DATE: 8/31/16

TITLE: FRAMING PLAN

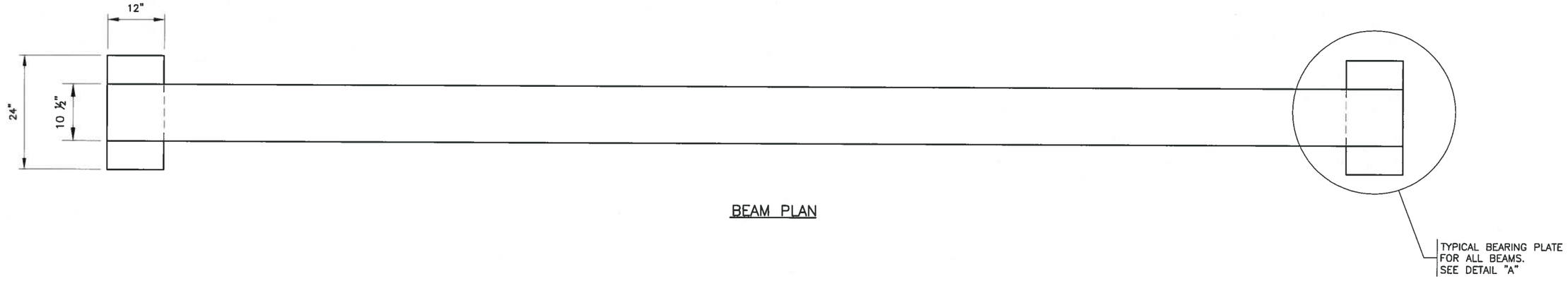
DES: MWH	DR: NSB	APPROVED:
CHK: JWS	CHK: LJR	

Sheet B8 of B15 Sheets

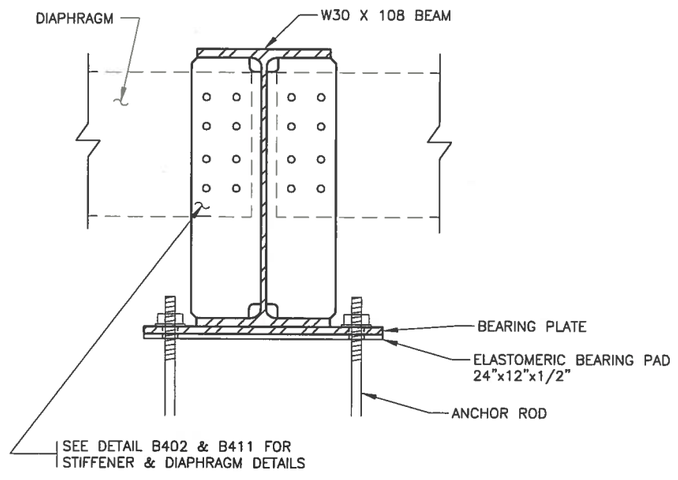
CO. BR. 516
ST. BR. NO. 69A58



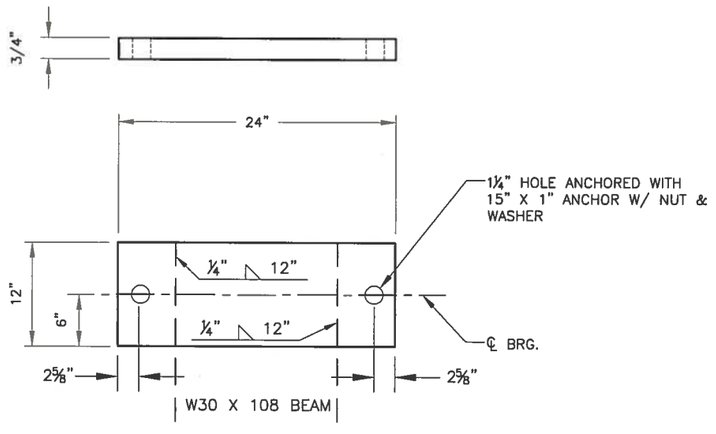
BEAM PROFILE



BEAM PLAN



SECTION D-D
(TYP. ALL BEAM ENDS)



DETAIL "A"
BEARING PLATE
PLAN VIEW

CP 0796-128462

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

I HEREBY 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

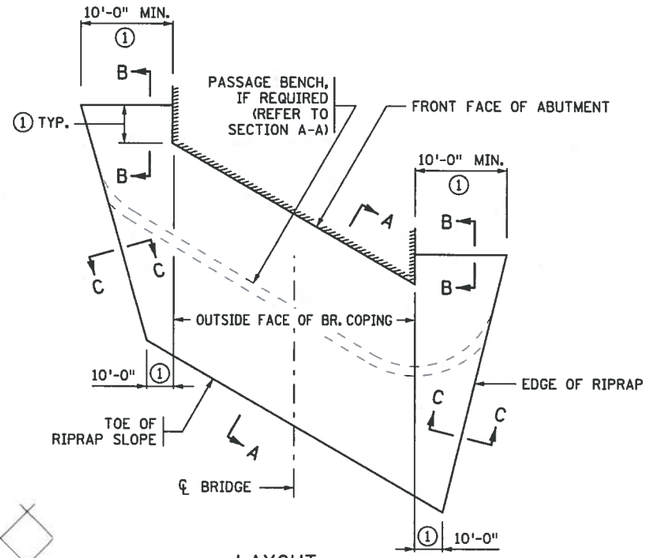
NAME: MATTHEW W. HEMMILA REG #: 43973 DATE: 8/31/16

TITLE: BEAM & BEARING PLATE DETAILS

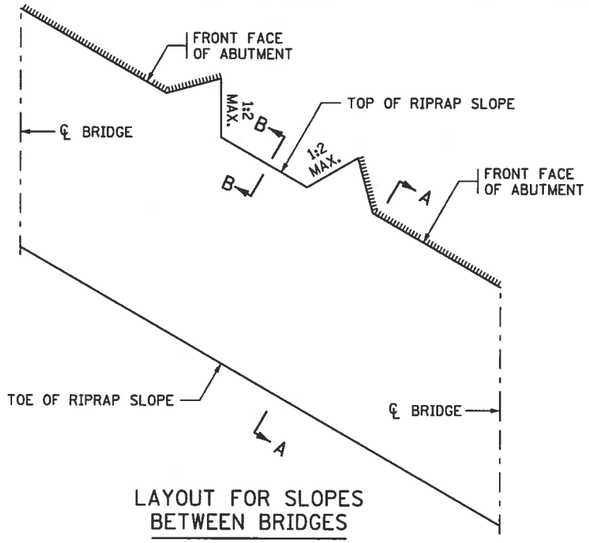
DES: MWH	DR: NSB	APPROVED:
CHK: JWS	CHK: LJR	

Sheet B9 of B15 Sheets

CO. BR. 516
ST. BR. NO. 69A58



LAYOUT



LAYOUT FOR SLOPES BETWEEN BRIDGES

GENERAL NOTES

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

RIPRAP PER SPEC. 2511, RANDOM RIPRAP CLASS ___ BY THE CU. YD.

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

SLOPE BOTTOM OF TRENCHES 1:20 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 THE REST OF THE RIPRAP (FROM THE BOTTOM OF THE SLOPE).

(3) OVERLAP GEOTEXTILE FILTER 2'-0" MINIMUM.

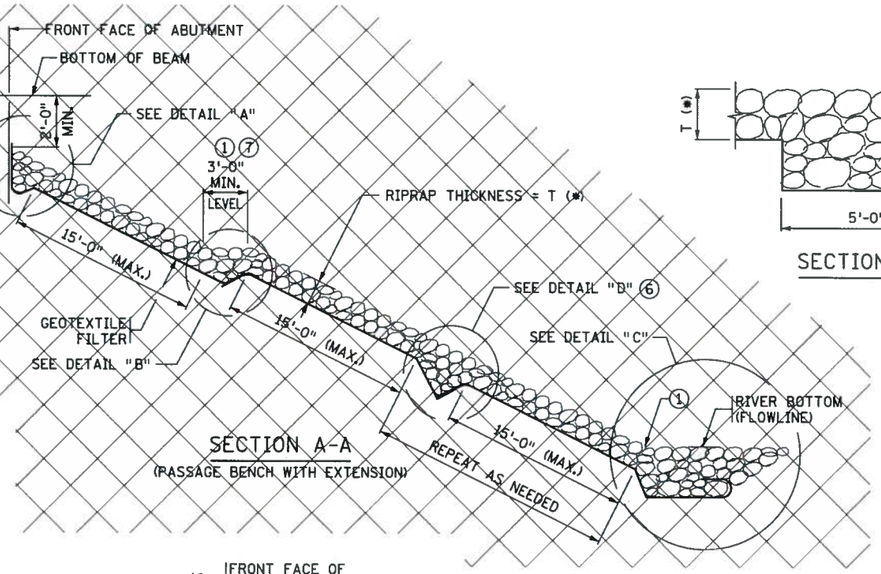
(4) WRAP GEOTEXTILE FILTER AROUND TOE, OVERHANG BETWEEN 1ST AND 2ND LAYER OF RIPRAP. USE HAND PLACEMENT OR SIMILAR METHODS TO ESTABLISH PROFILE AND PLACE FABRIC IF UNDER WATER.

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

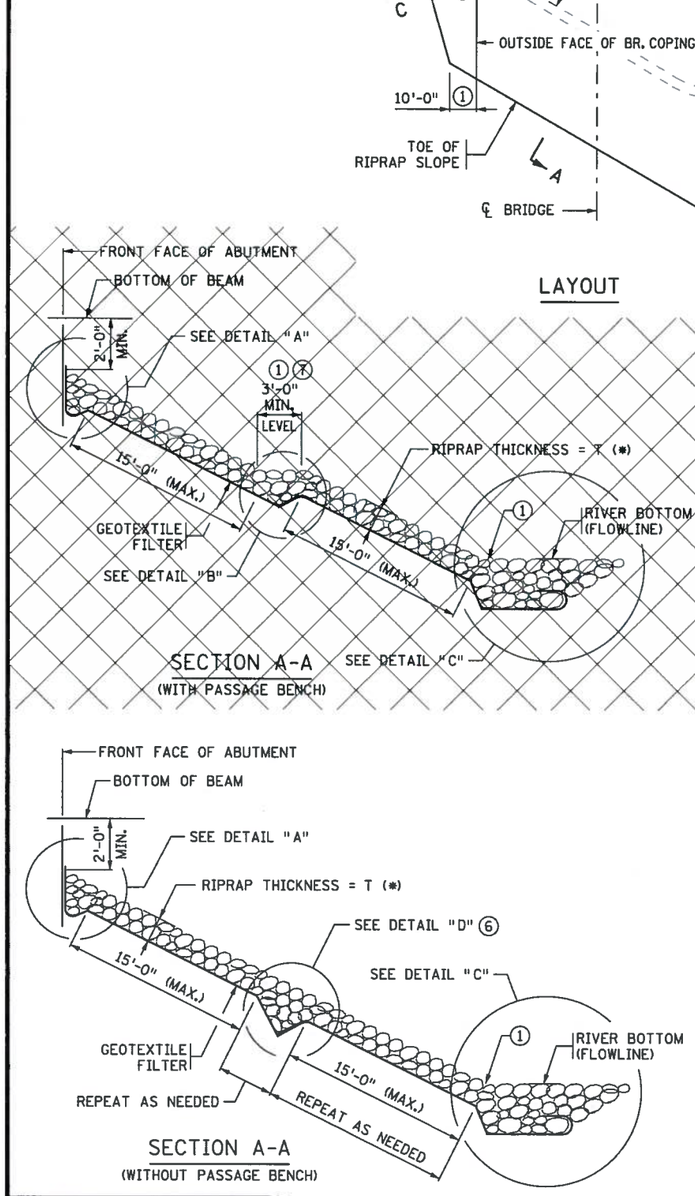
(6) OMIT THE TRENCH SHOWN IN DETAIL "D" AND THE 15'-0" MAXIMUM SPACING BETWEEN TRENCHES FOR SLOPES 1:3 OR FLATTER.

(7) SURFACE BENCHES WITH AGGREGATE CLASS 5 (INCIDENTAL TO RIPRAP). TIE BENCHES TO NATURAL GROUNDLINES OUTSIDE OF BRIDGE.

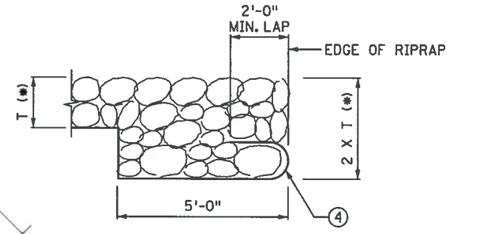
SECTION A-A
(WITH PASSAGE BENCH)



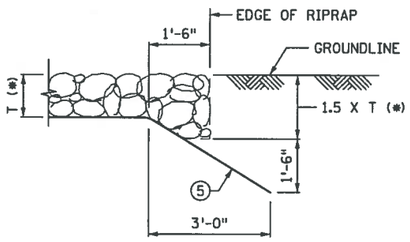
SECTION A-A
(PASSAGE BENCH WITH EXTENSION)



SECTION A-A
(WITHOUT PASSAGE BENCH)

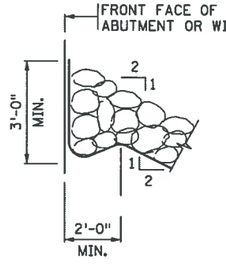


SECTION C-C

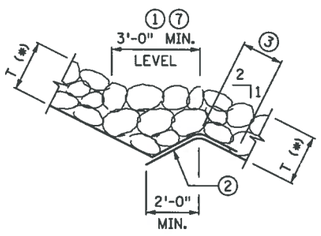


SECTION B-B

*	DIMENSION T
	CLASS III = 1'-6"
	CLASS IV = 2'-0"



DETAIL "A"



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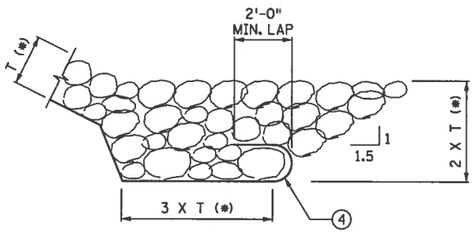
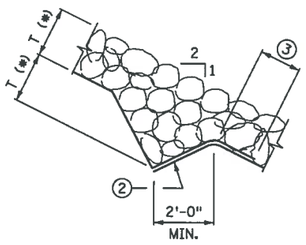


DETAIL "C"



DETAIL "D"

REVISED: 09-11-2014

APPROVED: MAY 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ 8/31/16
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: LIC. NO.

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

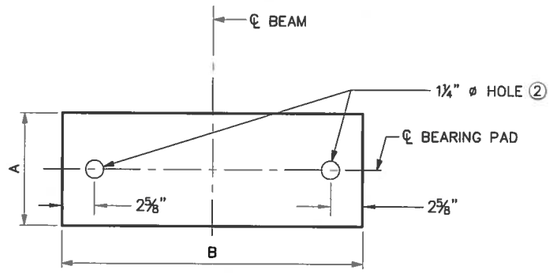
DES: DR: CHK: CHK:

APPROVED:

FIG. 5-397.309

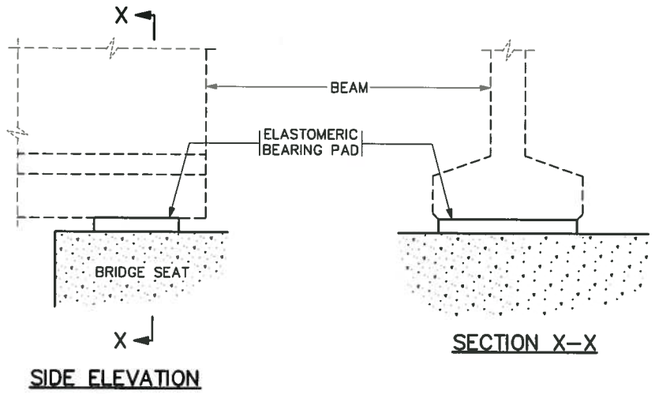
SHEET NO. B10 OF B15 SHEETS

BRIDGE NO. 69A58



PLAN

(BEAM NOT SHOWN)



SIDE ELEVATION

SECTION X–X

TABLE						
PAD TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			SHAPE FACTOR
			A	B	D ①	
1	S. ABUTMENT	W30X108	12	24	1/2	8.0
1	N. ABUTMENT	W30X108	12	24	1/2	8.0

NOTES:

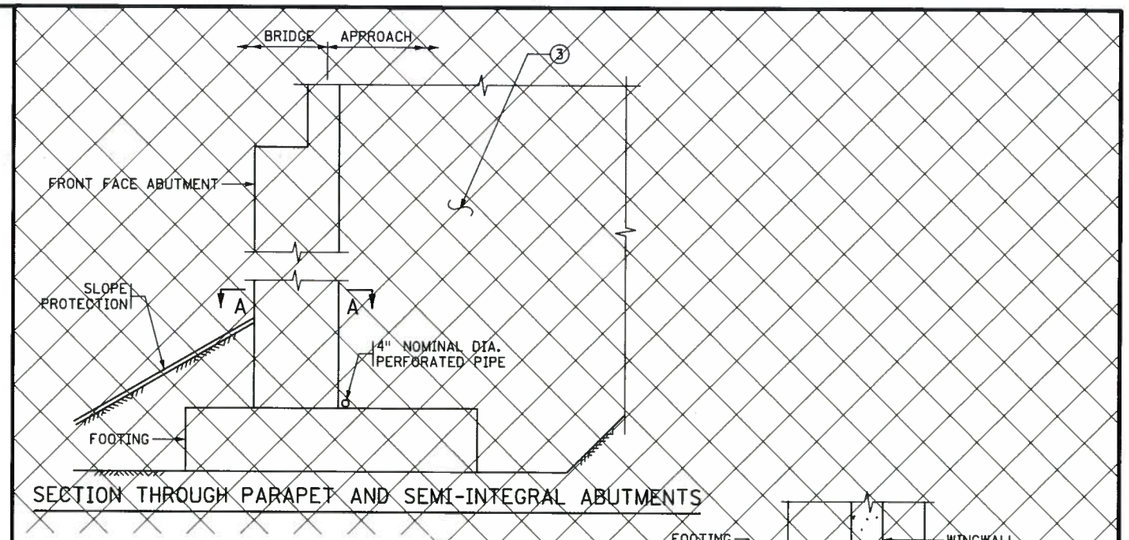
ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH SPEC. 3741.

PAYMENT FOR ELASTOMERIC BEARING PAD INCLUDED IN ITEM "ELASTOMERIC BEARING PAD" PER EACH.

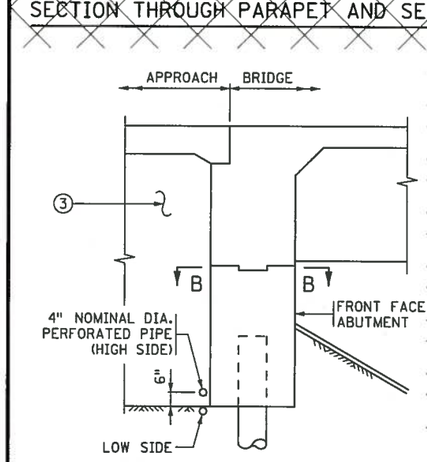
① "D" INDICATES THE THICKNESS OF THE BEARING PAD.

② HOLES ARE NOT TO BE MADE IN THE FIELD.

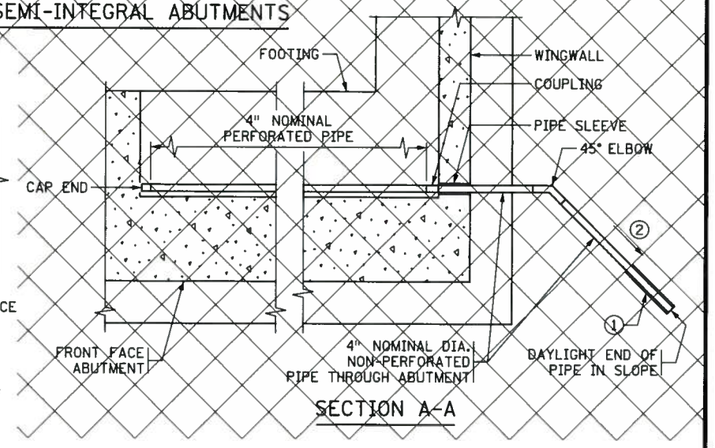
APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 12-17-2008 05-24-2012 01-13-2015	DETAIL NO.
MODIFIED STATE BRIDGE ENGINEER	ELASTOMERIC BEARING PAD		B305



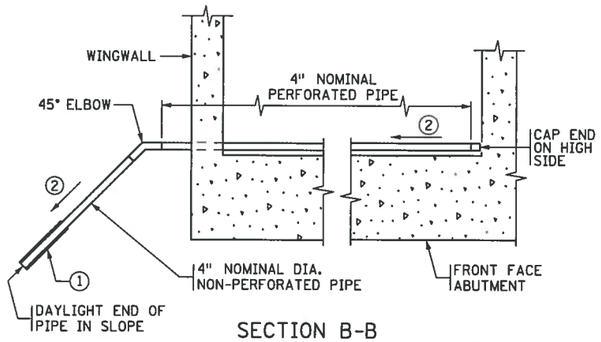
SECTION THROUGH PARAPET AND SEMI-INTEGRAL ABUTMENTS



SECTION THROUGH INTEGRAL ABUTMENT



SECTION A-A



SECTION B-B

NOTES:

PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON-PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

① 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% POSITIVE SLOPE CAN BE MAINTAINED.

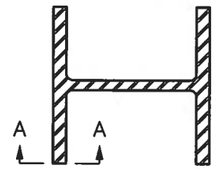
USE PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.

② ⅛" PER FT. MINIMUM SLOPE.

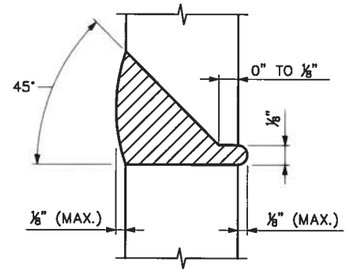
③ REFER TO GRADING PLANS FOR ABUTMENT BACKFILL REQUIREMENTS.

APPROVED: JANUARY 13, 2015	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 12-02-2015	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	DRAINAGE SYSTEM		B910

CP 0796-271375	SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.	I HEREBY 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: MATTHEW W. HEMMILA REG #: 43973 DATE 8/31/16	TITLE: BRIDGE DETAILS (ELASTOMERIC BEARING PAD & DRAINAGE SYSTEM)	DES: MWH DR: NSB CHK: JWS CHK: LJR APPROVED:	CO. BR. 516 ST. BR. NO. 69A58
				Sheet B11 of B15 Sheets	



SECTION AT JOINT



SECTION A–A

100% BUTT WELDED PILE SPLICE

NOTES:

CELLULOSIC 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.

APPROVED: NOVEMBER 22, 2002

Daniel D Wozniak
STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

PILE SPLICE
(STEEL H BEARING PILES 10" TO 14")

REVISION

DETAIL NO. B202

CP 0796–271375

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

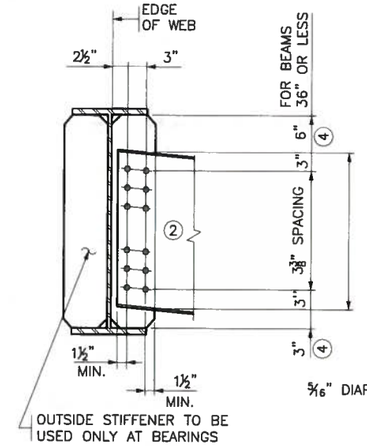
I HEREBY CERTIFY THAT THIS PLAN, SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

NAME: MATTHEW W. HEMMILA REG #: 43973 DATE: 8/31/16

TITLE: BRIDGE DETAILS

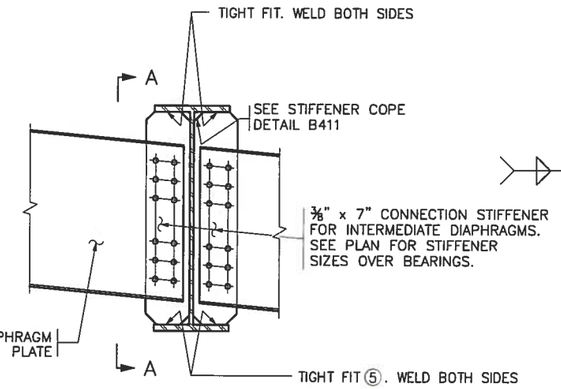
DES: MWH	DR: NSB	APPROVED:	CO. BR. 516
CHK: JWS	CHK: LJR		ST. BR. NO. 69A58

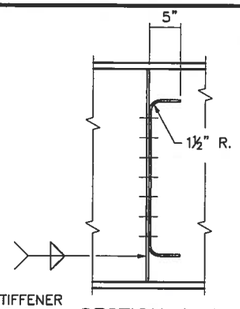
Sheet B12 of B15 Sheets



FASCIA BEAM

AT PIER AND INTERMEDIATE DIAPHRAGMS

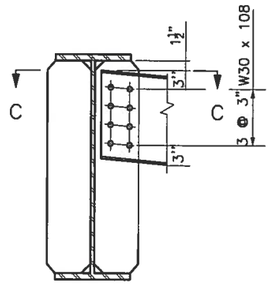




SECTION A–A

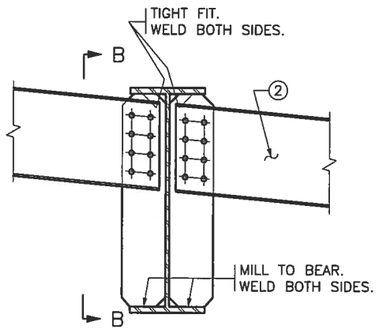
INTERIOR BEAM

AT PIER AND INTERMEDIATE DIAPHRAGMS



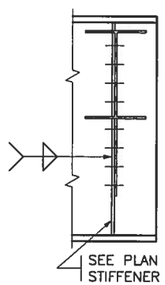
FASCIA BEAM

AT ABUTMENT DIAPHRAGMS



INTERIOR BEAM

AT ABUTMENT DIAPHRAGMS



SECTION B–B

NOTES:

ALL STEEL SHALL CONFORM TO Mn/DOT SPEC. 3309.

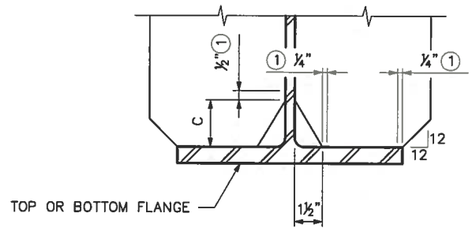
~~① USE SAME SHEAR STUD HEIGHT AS USED ON THE BEAMS.~~

② SEE FRAMING PLAN FOR SIZE OF DIAPHRAGM.

③ FOR PLATE GIRDERS, END DIAPHRAGMS SHALL BE AT LEAST THE BEAM HEIGHT.

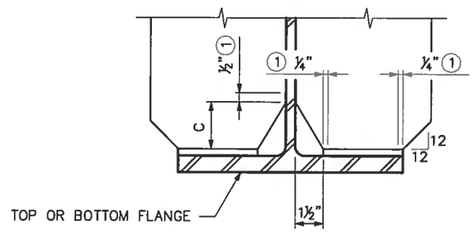
④ DIAPHRAGMS MAY BE PLACED LEVEL, PROVIDED MINIMUM CLEARANCES ARE MET.

⑤ MILL TO BEAR FOR BEARING STIFFENERS.



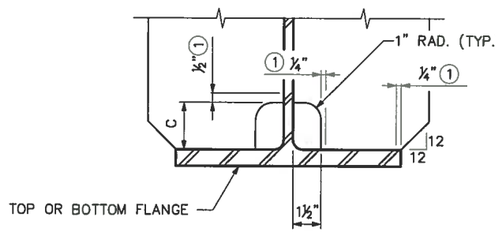
STIFFENER TO FLANGE CONNECTION

OPTION 1



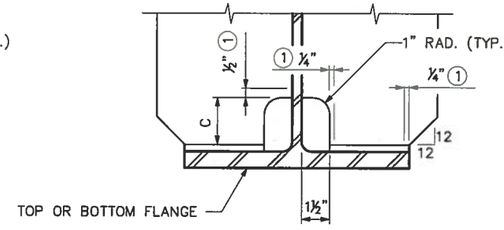
STIFFENER TO TAB PLATE CONNECTION

OPTION 1



STIFFENER TO FLANGE CONNECTION

OPTION 2

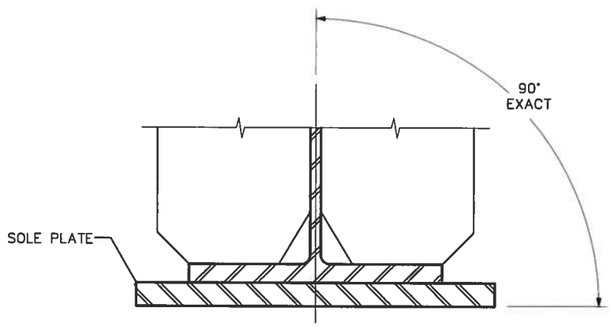


STIFFENER TO TAB PLATE CONNECTION

OPTION 2

STIFFENER COPE DETAIL

PLATE GIRDER OR ROLLED BEAM



SOLE PLATE AT BEARING

WEB THICKNESS	DIMENSION C
½", 9/16", 5/8"	2½"
11/16", ¾"	3"

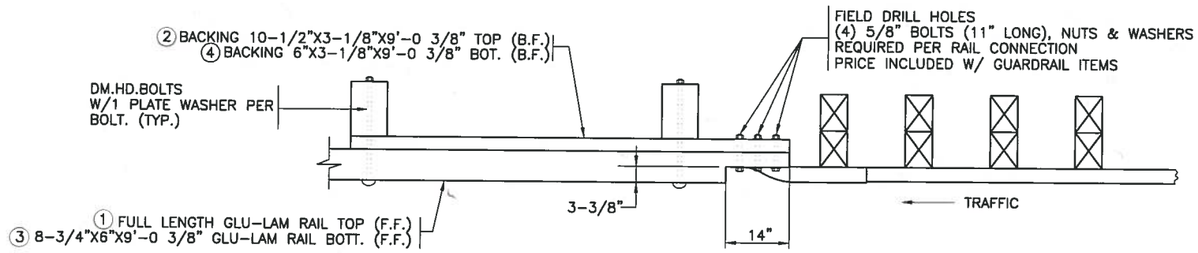
NOTES:

① DO NOT WELD IN THIS AREA. SEE B410 FOR CONNECTION DETAILS.

APPROVED: MARCH 26, 2009	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
MODIFIED STATE BRIDGE ENGINEER	BOLTED DIAPHRAGMS (FOR STEEL BEAMS)		B402

APPROVED: OCTOBER 22, 2008	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel D. Morgan STATE BRIDGE ENGINEER	STIFFENER DETAILS (FOR STEEL BEAMS)		B411

CP 0796–271375	SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.		I HEREBY 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: MATTHEW W. HEMMILA REG #: 43973 8/31/16 DATE	TITLE: BRIDGE DETAILS	DES: MWH DR: NSB APPROVED: CHK: JWS CHK: LJR Sheet B13 of B15 Sheets	CO. BR. 516 ST. BR. NO. 69A58



PLAN VIEW

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 8-3/4"X6"X9'-0 3/8" GLU-LAM RAIL BOTT. (F.F.)
④ BACKING 6"X3-1/8"X9'-0 3/8" BOT. (B.F.)

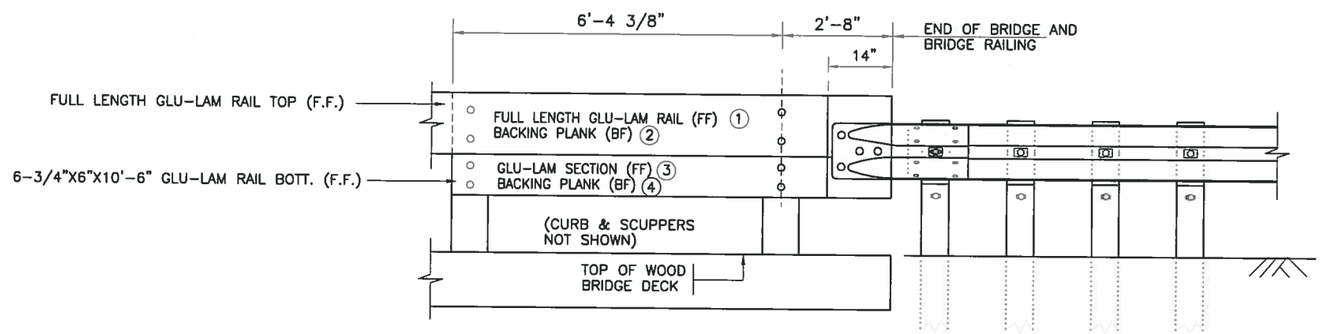
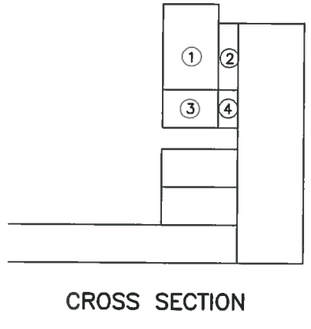


PLATE BEAM RAIL
ATTACHMENT DETAIL
(TYPICAL ALL TRAFFIC RAIL ENDS)



CROSS SECTION

CP 0796-271375

SAINT LOUIS COUNTY PUBLIC WORKS
BRIDGE DEPT.

I HEREBY 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: MATTHEW W. HEMMILA REG #: 43973 DATE 8/31/16

TITLE: TIMBER RAIL & GUARDRAIL CONNECTION DETAIL

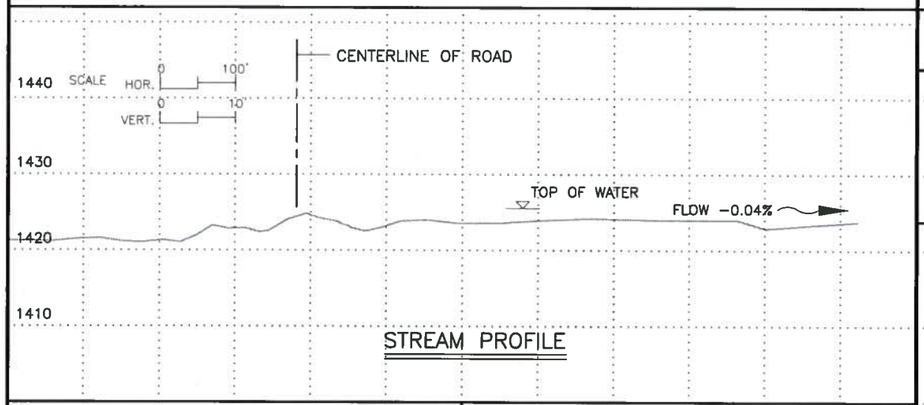
DES: MWH	DR: NSB	APPROVED:
CHK: JWS	CHK: LJR	

Sheet B14 of B15 Sheets

CO. BR. 516
ST. BR. NO.
69A58

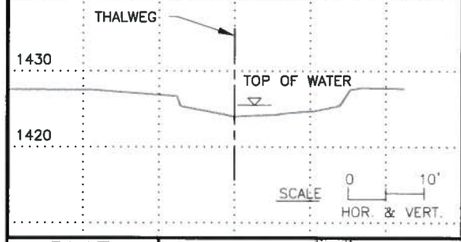
STREAM DATA

SCALES AS SHOWN

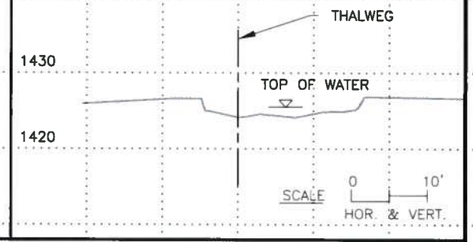


STREAM PROFILE

STREAM X-SECTION
STREAM STATION S5+50

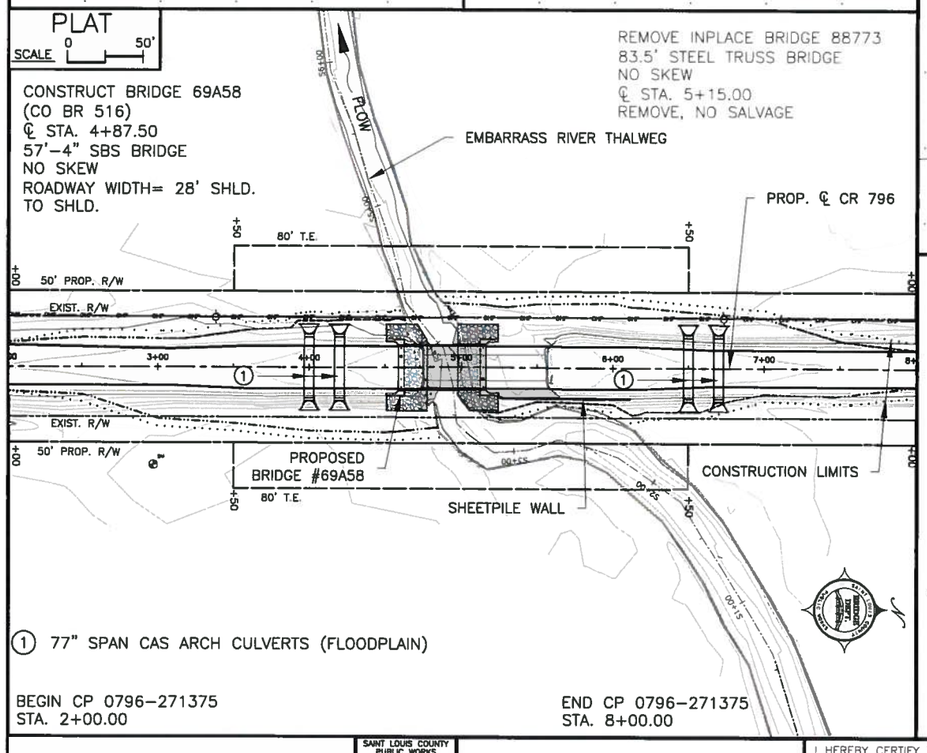


STREAM X-SECTION
STREAM STATION S7+70



PLAT

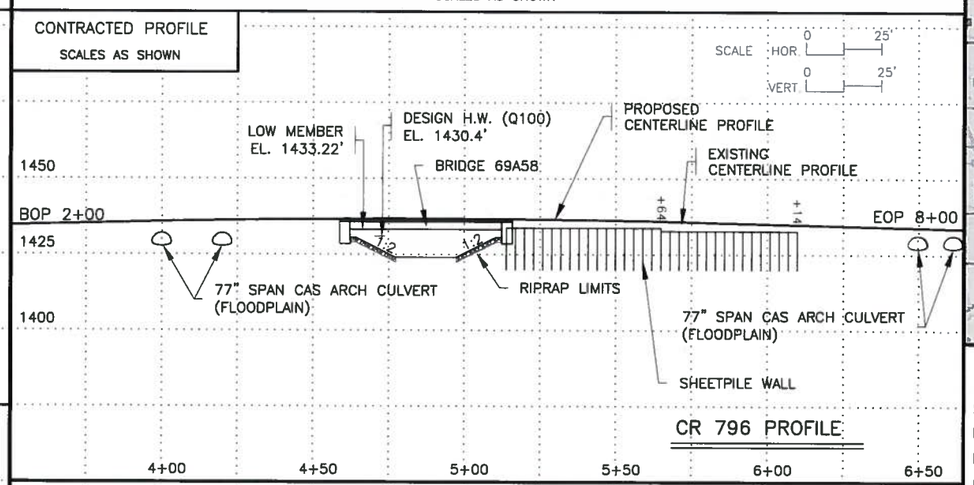
SCALE 0 50'



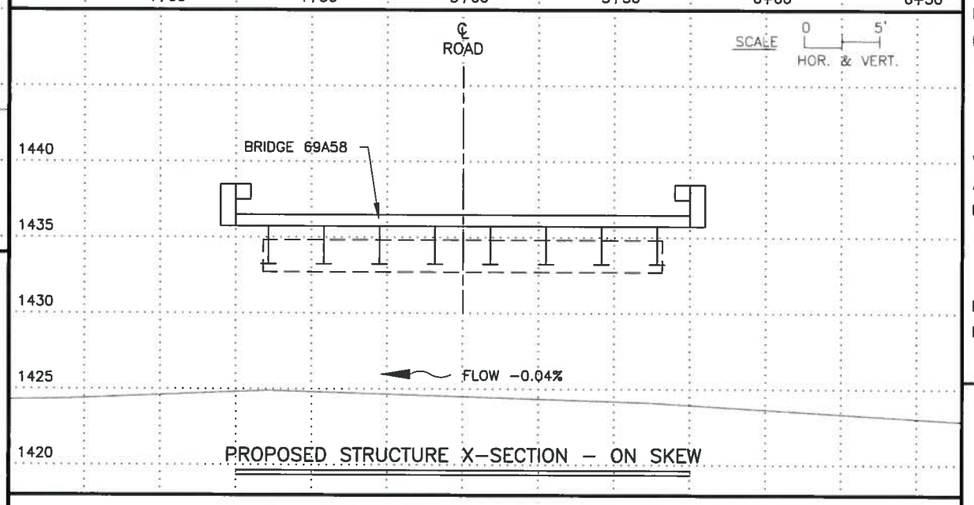
CULVERT DATA

SCALES AS SHOWN

CONTRACTED PROFILE
SCALES AS SHOWN



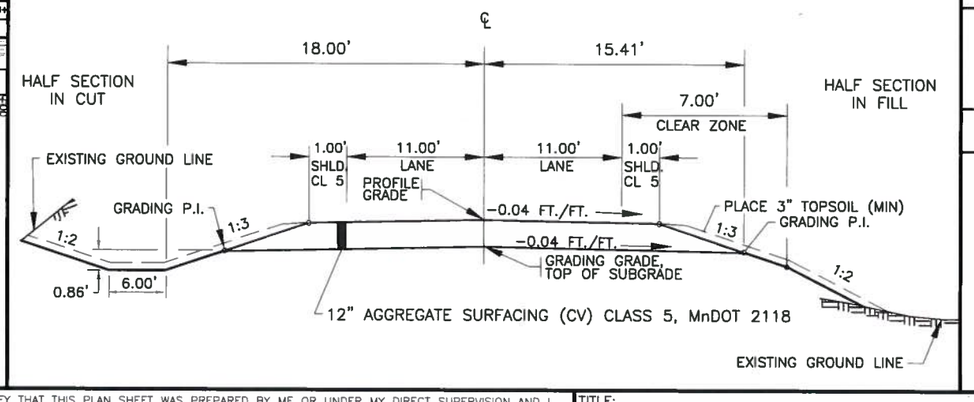
CR 796 PROFILE

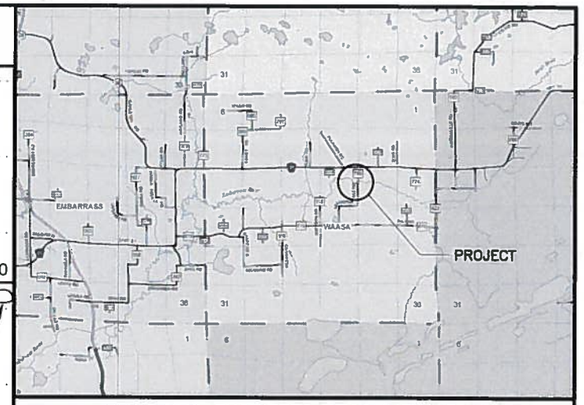


PROPOSED STRUCTURE X-SECTION - ON SKEW

TYPICAL SECTION

CR 796
NO SCALE
2+00 TO 8+00





HYDRAULIC ENGINEERS RECOMMENDATION
DATE: 3-1-16

STREAM OR DITCH DESIGNATION: EMBARRASS RIVER
DRAINAGE AREA: 31.5 SQ. MI.
MAX. FLOOD ON RECORD: (UNKNOWN) C.F.S.
MAXIMUM OBSERVED HIGHWATER ELEVATION: (UNKNOWN) FT.
DESIGN FLOOD (100 YR. FREQ.): 990 C.F.S.
- HEADWATER ELEVATION: 1430.4 FT.
- DESIGN MEAN VELOCITY THROUGH STRUCTURE: 4.3 F.P.S.
- TOTAL STAGE INCREASE: 0.5 FT.
- LOW MEMBER AT OR ABOVE ELEVATION: 1433.22 FT.

WATERWAY AREA REQUIRED BELOW ELEV. 1430.4 = 274 SQ. FT.
AT RIGHT ANGLES TO CHANNEL.
BASIC FLOOD (100 YR. FREQ.): 990 C.F.S.
- HEADWATER ELEVATION: 1430.4 FT.
- TOTAL STAGE INCREASE: 0.5 FT.
- MEAN VELOCITY THROUGH STRUCTURE: 4.3 F.P.S.

FLOWLINE ELEVATION: 1424.1 FT. SKEW ANGLE: 0°
ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL.: N/A
(500 or OT YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE: XX-XX-XX

TOTAL SCOUR AT PIER EL.: N/A (500 or OT YR. FREQ.)
SCOUR CODE: L

BRIDGE SURVEY SHEETS MADE FROM. ST. LOUIS COUNTY BRIDGE SURVEY DATED 2005
BENCH MARK ELEVATION 1430.46' (NAVD 88)
LOCATION STA 8+85 OFFSET 55' LT IN A 8" PINE

SAINT LOUIS COUNTY

BRIDGE PLAN

AT MILE POINT 1.6 ON CR 796
PROPOSED BRIDGE LOCATED 7.4 MILES W/SW OF BABBITT, MINNESOTA
SEC. 14 TWP. 60N R. 14W
TOWNSHIP WAASA COUNTY ST. LOUIS
STATE BRIDGE NO. OLD 88773 NEW 69A58
COUNTY BRIDGE NO. 516

CP 0796-271375

SAINT LOUIS COUNTY PUBLIC WORKS BRIDGE DEPT.

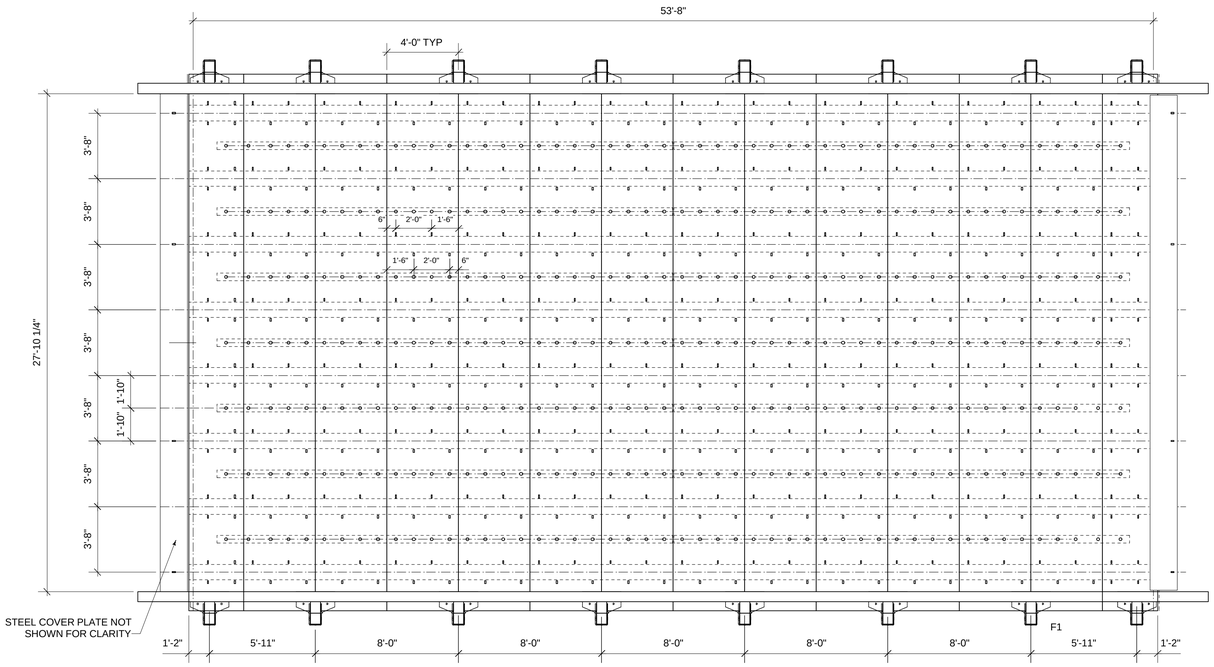
I HEREBY CERTIFY THAT THIS PLAN SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
NAME: MATTHEW W. HEMMILA REG #: 43973 DATE 8/31/16

TITLE: BRIDGE SURVEY

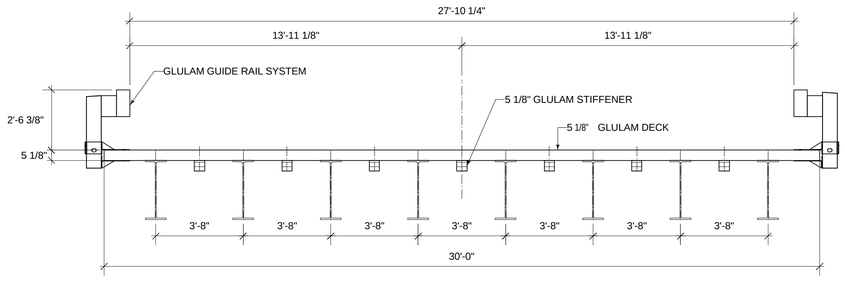
DES: MWH	DR: NSB	APPROVED:	CO. BR. 516
CHK: JWS	CHK: LJR		ST. BR. NO. 69A58

Sheet B15 of B15 Sheets

H:\Bridge\BR 500-599\BR 516\CP 0796-271375\Design\Working Drawings\BR 516 Design.dwg, SURVEY, 8/31/2016 1:41:15 PM, bergstedtn



DECKING AND RAILING PLAN



TYPICAL SECTION THRU BRIDGE

STANDARD FOR GLUED LAMINATED TIMBER BRIDGES

1. SPECIFICATION SCOPE FOR GLUED LAMINATED TIMBER SUPERSTRUCTURES

Provide a standard for production of glued laminated wood used in the bridge superstructure installation. This standard is intended to cover several types of glulam bridge structures. This standard is intended to augment, or support, design requirements that may be issued by the owner.

2. DEFINITIONS AND ABBREVIATIONS

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.

GLULAM: Structural glued laminated timber (wood)

AITC: American Institute of Timber Construction

APA/EWS: Trademark appears on products manufactured by APA - The Engineered Wood Association members

AWPA: American Wood Protection Association

AASHTO: American Association of State Highway and Transportation Officials

WWPI: Western Wood Preservers Institute

3. QUALIFICATIONS OF FABRICATOR

3.1 The glulam manufacturer shall be a qualified licensee of the AITC or APA/EWS.
3.2 All Glued laminated timber shall be factory fabricated (as far as practical). This shall include cutting drilling and other fabrication as shown on shop drawings.

4. CODES AND STANDARDS

In addition to complying with all pertinent codes and regulations, material and installation procedures shall comply with the following:

4.1 AASHTO. 2017. LRFD Standard Specifications for Highway Bridges, 5th edition.
4.2 American National Standard for Wood Products-Structural Glued Laminated Timber ANSI A190. 1- (Latest edition)
4.3 AITC 117-2015 Standard Specifications for Structural Glued Laminated Timber of Softwood Species.
4.4 AWPA Book of Standards (Latest Edition)
4.5 WWPI Best Management Practice for Treating Wood in Aquatic Environment

5. CERTIFICATIONS

5.1 Certifications required by the laminator: The laminator shall provide an AITC or APA/EWS Certificate of Conformance to AITC/ANSI A190.1-2007
5.2 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 preservative provided, as well as the AWPA standard used as the guide for treating. In the event treated timber originates from more than one treating facility then certification shall be furnished from each facility providing timber for this project.

6. STRUCTURAL DESIGN

The bridge shall be designed in accordance with good engineering practices and in accordance with the standard specifications as adopted by the American Association of State Highway and Transportation Officials (AASHTO). The Bridge design shall be a glulam system comprised of either longitudinal decks, stringer systems or transverse deck systems.

6.1 The structure shall be designed for the following loads and dimensions:
6.1.1 Dead Load (timber 50 PCF / wearing surface 140 PCF)
6.1.2 Live Load HL93
6.1.3 Wet-Stress design values shall be used when applicable
6.1.4 Live Load deflection (L/425)

7. TIMBER MATERIALS

7.1 Lumber-intended for glulam production shall be visually or mechanically graded in conformance with accepted standards for LRFD unit stresses (See AASHTO Section 8) and with the National Design Specifications for Wood Construction.
7.2 Glulam members shall be finished to Industrial Appearance Grade as per AITC 110-2001
7.3 All lumber utilized in these standards shall be either Coastal Douglas Fir orSouthern Pine.
7.4 All glulam members shall be factory fabricated (holes, cuts, etc.) prior to preservative treatment. Some minor fabrication and adjustments may be required in teh field. If so, field treat all exposed cuts, holes, etc. with an approved preservative field treatment as pr AWPA M4

8. PRESERVATIVE TREATMENT

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

8.1 Pentachlorophenol or Copper Naphthenate in Type A, heavy oil conforming to AWPA Standard UC4B, P-8 & P9. Retention level shall be 0.6 PCF
8.2 All preservative treatments shall be applied in accordance with Best Management Practices for Wood Preservatives in Aquatic Environments.
8.3 AWPA Treatment Spec References:
AWPA M2 Inspection of Treated Timber Products
AWPA M4 Care of Preservative Treated Timber Products
AWPA P8 Oil-borne Preservatives
AWPA P9 Standards for Solvents

9. HARDWARE

9.1 Fabricator shall provide all connection steel and hardware for joining wood members to each other and to their supports exclusive of anchoring embedded in concrete.
9.2 All fasteners, except prestressing bars, shall be galvanized (ASTM A-123) mild steel ASTM A307. Washers to be cast iron or malleable iron, timber type.
9.3 All steel plates and shapes to be galvanized (ASTM A-153) mild steel ASTM A-36
9.4 Hardware Specification References
AASHTO. 2011, Standard Specifications for Transportation Materials and Methods of Sampling and Testing. 31st Edition.
M111 Zinc (Hot-Dip Galvanized) Coatings for Iron and Steel Products
M232 Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM. 2011. (American Society of Testing and Materials) Annual Book of Standards
ASTM A36 Standard Specification for Structural Steel
ANSI/ASME. B18.2.1 Square and Hex Bolts and Screws (Inch Series), American Society of Mechanical Engineers

10 MATERIAL: DELIVERY, STORAGE AND HANDLING

10.1 Special care shall be taken for all materials required for the project. Shipping, storage and erection practices shall be in accordance with industry standards.
10.2 For wearing surface information, refer to the USDA Forest Service document "Guidelines for Design, Installation and Maintenance of a waterproof wearing surface for timber bridge decks" USDA paper FPL-GTR-123

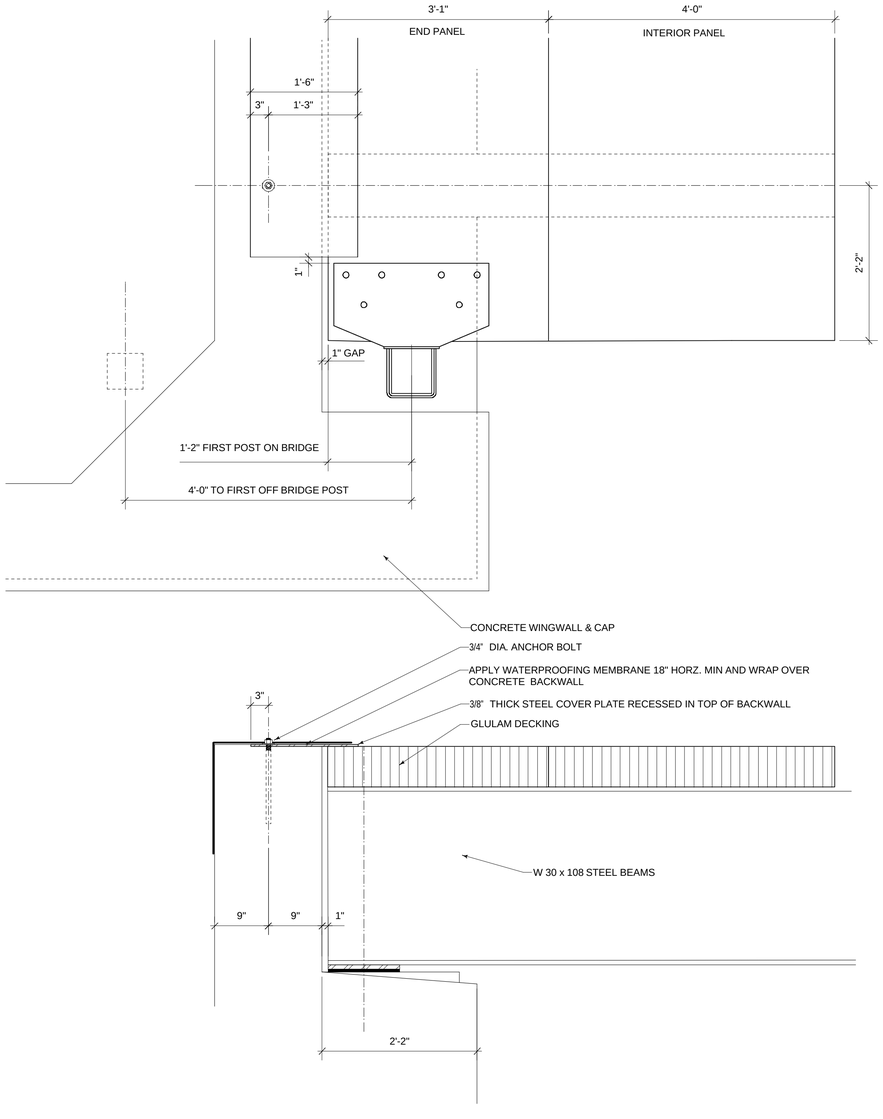
DRAWN	MSS	DATE	12/09/16	REVISIONS			
CHK'D		DATE		NO.	DATE	BY	REVISIONS
APP'D		DATE		1	12/29/16	SS	REVISE DECK
SCALE							

PROJECT NAME: ST. LOUIS COUNTY BRIDGE NO. 516
COUNTY PROJECT NO. 0796-271375
WAASA TOWNSHIP ST. LOUIS COUNTY

PROJECT JOB NO.: 0416-58-TD

PREPARED FOR: ST. LOUIS COUNTY MINNESOTA

SHEET NO.: 1 of 2

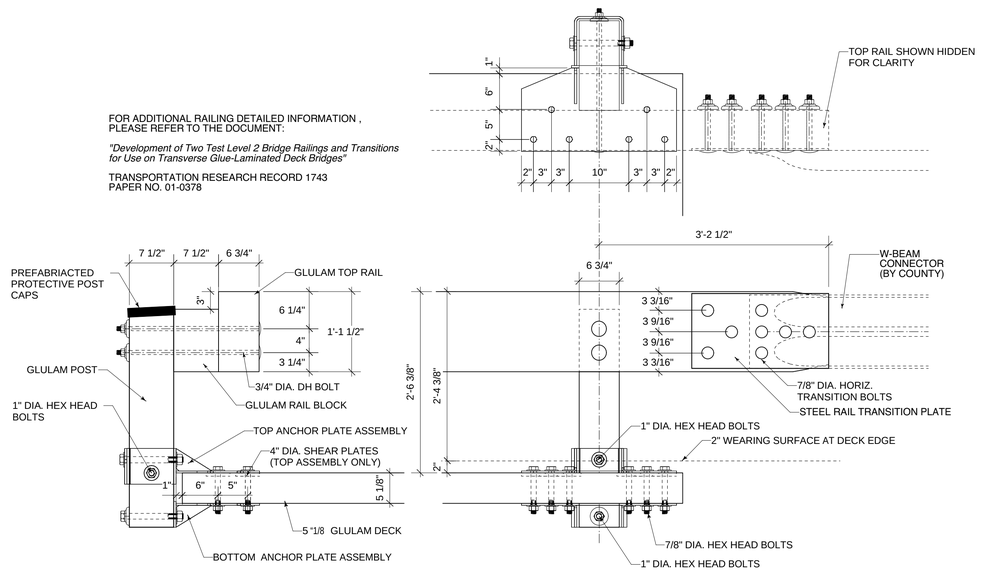


TYPICAL BEARING DETAIL

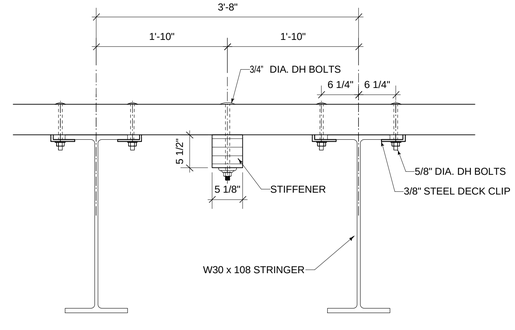
FOR ADDITIONAL RAILING DETAILED INFORMATION , PLEASE REFER TO THE DOCUMENT:

"Development of Two Test Level 2 Bridge Railings and Transitions for Use on Transverse Glue-Laminated Deck Bridges"

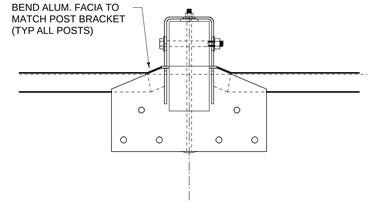
TRANSPORTATION RESEARCH RECORD 1743
PAPER NO. 01-0378



TYPICAL GUIDE RAIL DETAIL



TYPICAL DECK TO STEEL DETAIL



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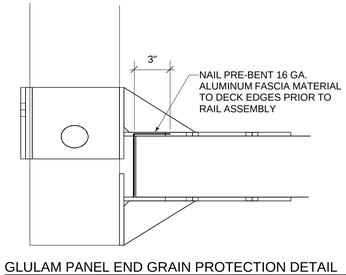


GLULAM PANEL END GRAIN PROTECTION DETAIL

DRAWN	MSS	DATE	12/09/16	REVISIONS			
CHK'D		DATE		NO.	DATE	BY	REVISIONS
APP'D		DATE		1	12/29/16	SS	REVISE DECK
SCALE							

PROJECT NAME
ST. LOUIS COUNTY BRIDGE NO. 516
COUNTY PROJECT NO. 0796-271375
WAASA TOWNSHIP ST. LOUIS COUNTY

PROJECT JOB NO.
0416-58-TD

PREPARED FOR
ST. LOUIS COUNTY
MINNESOTA

SHEET NO.
2 of 2

PART & MATERIAL LIST

WOOD MATERIAL LIST

NO. REQD	DESCRIPTION	MARK	SIZE	LENGTH	NOM. LAMS	Layup Comb.	CAMBER	DETAIL ON SHT.	NOTES	
2	DECK PANEL	D1	5.125" X 37"	30'-0"	2"	50	NONE	ST-4		
12	DECK PANEL	D2	5.125" X 48"	30'-0"	2"	50	NONE	ST-4		
7	STIFFENER	A1	5.125" X 5.5"	50'-0"	2"	48	NONE	ST-5		
16	POST	P1	6.75" X 7.5"	3'-0 13/16"	2"	48	NONE	ST-4		
16	BLOCKING	BK1	6.75" X 7.5"	0'-10 1/2"	2"	47	NONE	ST-4		
2	RAIL	R1	6.75" X 13.5"	58'-3"	2"	48	NONE	ST-4		

HARDWARE SCHEDULE

MARK	CONN.	NO.	DESCRIPTION	DETAIL ON SHT	NOTES
MK-1	S1	16	WELD ASSEMBLY	ST-3	HDG
MK-2	S1	16	WELD ASSEMBLY	ST-3	HDG
MK-3	S4	4	3/16"X12.25X23 PLATE	ST-3	HDG
		448	5/8"Ø X 7 1/2" DH BOLT	-	HDG
		350	3/4"Ø X 12" DH BOLT	-	HDG
		32	3/4"Ø X 24" DH BOLT	-	HDG
		32	7/8"Ø X 9" DH BOLT	-	HDG
		96	7/8"Ø X 7" M.B.	-	HDG
		48	1"Ø X 10" M.B.	-	HDG
		448	5/8"Ø NUTS	-	HDG
		382	3/4"Ø NUTS	-	HDG
		128	7/8"Ø NUTS	-	HDG
		48	1"Ø NUTS	-	HDG
		382	3/4"Ø MALLEABLE WASHER	-	HDG
		32	7/8"Ø MALLEABLE WASHER	-	HDG
		16	1"Ø MALLEABLE WASHER	-	HDG
		96	4"Ø (7/8" BOLT) SHEAR PLATE	-	HDG
		448	3/8" DECK CLIP (A36)	ST-3	HDG

NOTE: ALL GLB SHALL BE FABRICATED PRIOR TO PRESSURE TREATMENT, PER NOTE 7.4 ON SHEET 1 PROJECT 0416-58-TD

APPROVER VERIFY ALL DIMENSIONS, SPACING, ETC.
SINCE ALL GLULAM WILL BE FABRICATED IN THE SHOP

CODES:

AASHTO 2017 LRFD STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 5TH ED.
AMERICAN NATIONAL STANDARD FOR WOOD PRODUCTS - STRUCTURAL GLUED LAMINATED TIMBER ANSI A190.1 (LATEST EDITION).
AITC 117-2015 STANDARD SPECIFICATIONS FOR STRUCTURAL GLUED LAMINATED TIMBER OF SOFTWOOD SPECIES.
AWPA BOOK OF STANDARDS (LATEST EDITION).
WWPI BEST MANAGEMENT PRACTICE FOR TREATING WOOD IN AQUATIC ENVIRONMENT.
NDS 2012: NATIONAL DESIGN SPECIFICATIONS.

LAMINATED WOOD SPECIFICATIONS:
SPECIES:..... SP
TREATING:.....PENTACHLOROPHENOL TYPE A WITH RETENTION OF 0.6 PCF
LAMINATION THICKNESS:.....2" (NOMINAL)
STRESS COMBINATION:.....SEE MATERIAL LIST
ADHESIVE:.....RESORCINOL
APPEARENCE GRADE:.....INDUSTRIAL
GLB FINISH:.....NONE
PROTECTION:.....NONE

WOOD SHOP NOTES:
1. MATERIALS, MANUFACTURE AND QUALITY CONTROL OF GLULAM SHALL BE IN CONFORMANCE WITH "AMERICAN NATIONAL STANDARD FOR WOOD PRODUCTS - STRUCTURAL GLUED LAMINATED TIMBER ANSI/AITC A190.1-2002".
2. MEMBERS SHALL BE MARKED (IN AN UNSEEN LOCATION) WITH AN AITC QUALITY MARK AND, IN ADDITION, AN AITC CERTIFICATE OF CONFORMANCE SHALL BE PROVIDED TO INDICATE CONFORMANCE WITH "ANSI/AITC A190.1-2002".
3. ALL HOLES IN WOOD TO BE 13/16"Ø U.N.O.
4. GLULAM BEAMS SHALL BE FACTORY FABRICATED PRIOR TO PRESSURE TREATMENT.

STEEL & HARDWARE SHOP NOTES:
1. ALL STEEL PLATES TO BE ASTM A36.
2. ALL WELDING IS TO BE DONE IN ACCORDANCE WITH THE LATEST AWS STANDARDS. IF WELD ARE NOT SPECIFIED, ALL WELDS ARE TO DEVELOP FULL STRENGTH OF ALL COMPONENTS PARTS. WELDING BY OTHERS.
3. ALL BOLTS TO BE ASTM A307.
4. ALL LAGS TO CONFORM TO ANSI/ASME STANDARD B18.2.1-1996.
5. ALL HOLES IN STEEL TO BE 13/16"Ø U.N.O.
6. ALL FABRICATED STEEL TO BE HOT DIPPED GALVANIZED (WHERE NOTED).
7. ALL BOLTS, NUTS, WASHERS AND LAGS TO BE HOT DIPPED GALVANIZED (WHERE NOTED).
8. IF GALVANAZING IS USED ON FABRICATED STEEL OR HARDWARE, VERIFY HOLE TOLERANCES AND TOLERANCES OF THREADED PARTS FOR COMPATIBILITY.
9. SHAPED STEEL PLATES MAY BE CUT TO SHAPE FROM ONE LARGER PLATE OR CONSTRUCTED OF INDIVIDUAL PLATES, BEVELED, FULL PENETRATION WELDED AND THEN GROUND SMOOTH.

ERECTION NOTES:
ALL WOOD MEMBERS MUST BE PROPERLY BRACED UNTIL THE COMPLETE STRUCTURAL SYSTEM HAS BEEN CONSTRUCTUED. CORRECTION OF MINOR MISFITS AND A REASONABLE AMOUNT OF CUTTING, REAMING, REDRILLING OR ALIGNMENT WITH DRIFT PINS WILL BE CONSIDERED A LEGITIMATE EXPENSE OF ERECTION.
IN THE EVENT OF ERROR, DEFECT IN MATERIALS, AND/OR WORKMANSHIP OF SHOP WORK WHICH PREVENTS PROPER ASSEMBLING AND FITTING UP OF PARTS BY THE MODERATE USE OF DRIFTS PINS, OR A MODERATE AMOUNT OF REAMING AND SLIGHT CUTTING, IMMEDIATELY REPORT TO THE SELLER AND OBTAIN SELLER'S APPROVAL OF THE METHOD OF CORRECTION.
BOLTS THAT ARE THROUGH SLOTTED HOLES IN STEEL ARE TO BE LEFT FINGER TIGHT ONLY TO ALLOW FOR FUTURE MOVEMENT.
A MOISTURE BARRIER MUST BE PROVIDED BETWEEN WOOD MEMBERS AND MASONRY OR CONCRETE AT ALL LOCATIONS (N.I.C.).

ARCHITECT/CONTRACTOR/OWNER NOTE:
CONSIDERATION MUST BE MADE TO ACCOMODATE DEFLECTIONS OF THE STRUCTURAL FRAMING SYSTEM. CONSIDERATION MUST ALSO BE MADE TO ACCOMODATE DIMENSIONAL CHANGES IN WOOD MEMBERS DUE TO CYCLIC CHANGES IN HUMIDITY CONDITIONS.

N.I.C. = NOT IN CONTRACT.

APPROVAL OF THESE SHOP DRAWINGS WILL BE CONSIDERED AS AN ACCEPTANCE OF ALL THE DATA SHOWN THEREON UNLESS OTHERWISE NOTED BY APPROVING AGENCY.

Bell Structural Solutions
778 1st St. NW
New Brighton, MN 55112
STRUCTURAL SOLUTIONS
Bell
Stewardship Excellence Entrepreneurial Spirit

REVISION	DATE	DESCRIPTION
1	05-10-17	RE-ISSUED FOR APPROVAL

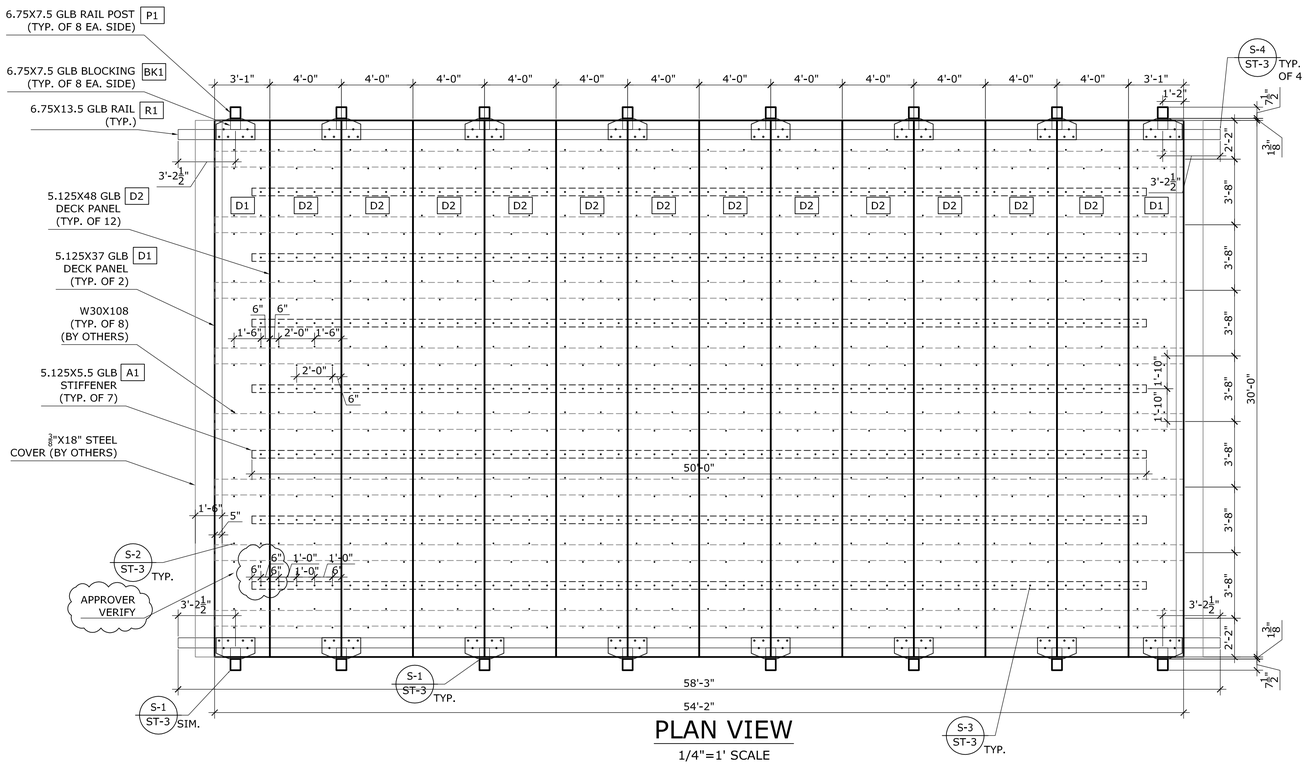
ST. LOUIS COUNTY BRIDGE NO. 516
ST. LOUIS COUNTY, MINNESOTA

MATERIAL LIST

	DATE
DESIGNED FB	03-24-2017
DRAWN FB	03-24-2017
CHECKED	

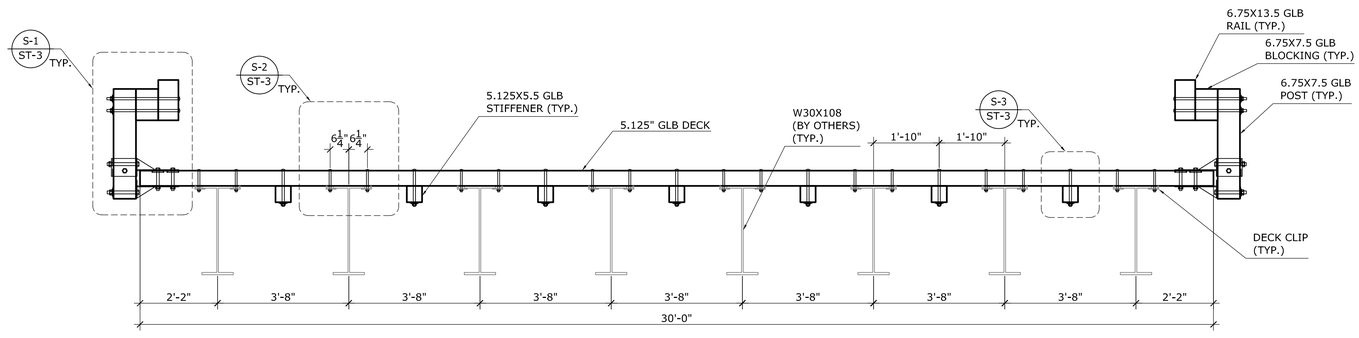
JOB NO.
2017-005

ST-01



PLAN VIEW

1/4"=1' SCALE



SECTION 1

1/2"=1' SCALE

Bell Structural Solutions
778 1st St. NW
New Brighton, MN 55112
STRUCTURAL SOLUTIONS
Stewardship Excellence Entrepreneurial Spirit

REVISION	DATE	DESCRIPTION
1	05-10-17	RE-ISSUED FOR APPROVAL

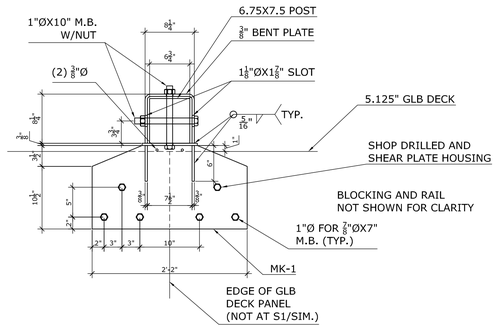
ST. LOUIS COUNTY BRIDGE NO. 516
ST. LOUIS COUNTY, MINNESOTA

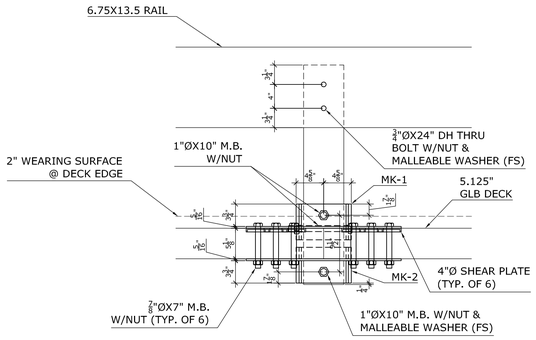
PLAN VIEW AND SECTION

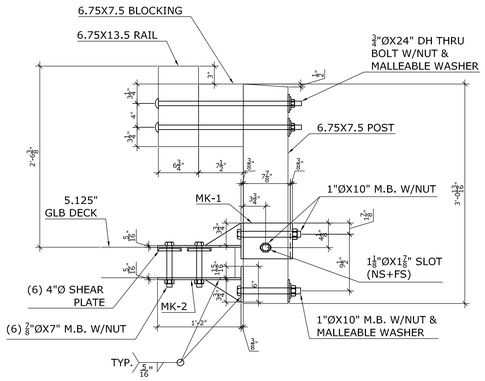
	DATE
DESIGNED FB	03-24-2017
DRAWN FB	03-24-2017
CHECKED	

JOB NO. 2017-005

ST-02

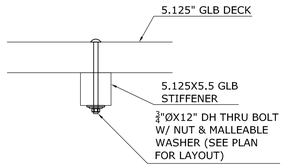




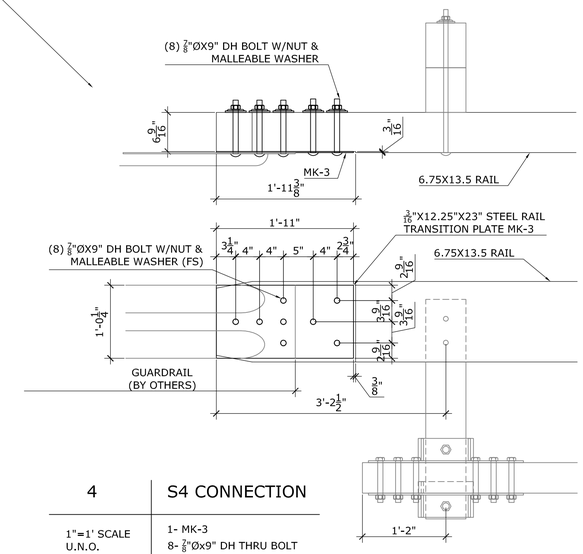


16	S1 CONNECTION
1"=1' SCALE U.N.O.	1- MK-1 1- MK-2 2- ¾"ØX24" DH BOLTS 6- ⅞"Øx7" M.B. 3- 1"ØX10" M.B. 2- ¾"Ø NUTS 6- ⅞"Ø NUTS 3- 1"Ø NUTS 2- ¾"Ø MALLEABLE WASHERS 1- 1"Ø MALLEABLE WASHER 6- 4" O.D. SHEAR PLATES

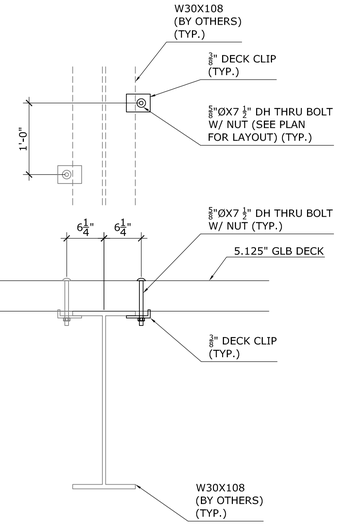
NOTE: RAILING DETAILED INFORMATION PER FIGURES 8 & 9 FROM THE DOCUMENT"DEVELOPMENT OF TWO TEST LEVEL 2 BRIDGE RAILINGS AND TRANSITIONS FOR USE ON TRANSVERSE GLUE-LAMINATED DECK BRIDGES", TRANSPORTATION RESEARCH RECORD 1743 PAPER NO. 01-0378.



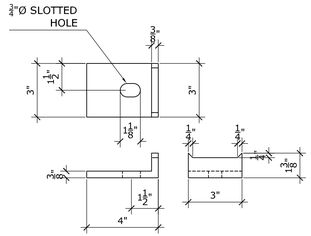
350	S3 CONNECTION
1"=1' SCALE U.N.O.	1- ¾"Øx12" DH THRU BOLT 1- ¾"Ø NUT 1- ¾"Ø MALLEABLE WASHER



4	S4 CONNECTION
1"=1' SCALE U.N.O.	1- MK-3 8- ⅞"Øx9" DH THRU BOLT 8- ⅞"Ø NUT 8- ⅞"Ø MALLEABLE WASHER



448	S2 CONNECTION
1"=1' SCALE U.N.O.	1- ⅞"Øx7 ½" DH THRU BOLT 1- ⅞"Ø NUT 1- ⅞" DECK CLIP



⅞" CLIP: (448) REQ'D
3"=1'-0" SCALE

⅞" DECK CLIP DETAILED PER USDA STANDARD PLANS FOR TIMBER BRIDGE SUPERSTRUCTURE, "GLULAM DECKS FOR STEEL BRIDGES" SHEET 3 OF 7, DATED DECEMBER 2000.

ALTERNATE CLIP: CAST IRON "C" CLIP BY LAMINATED CONCEPTS, INC.

Bell Structural Solutions
778 1st St. NW
New Brighton, MN 55112
STRUCTURAL SOLUTIONS
Stewardship Excellence Entrepreneurial Spirit

REVISION	DATE	DESCRIPTION
1	05-10-17	RE-ISSUED FOR APPROVAL

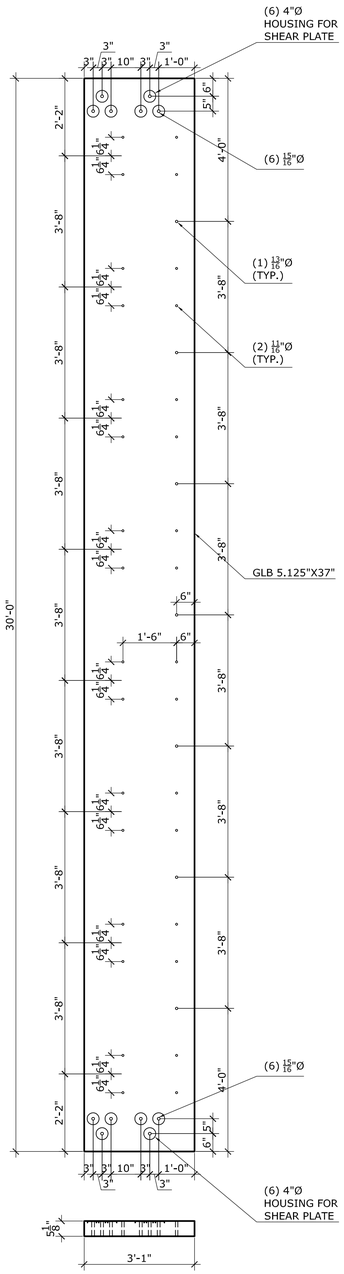
ST. LOUIS COUNTY BRIDGE NO. 516
ST. LOUIS COUNTY, MINNESOTA

DETAILS

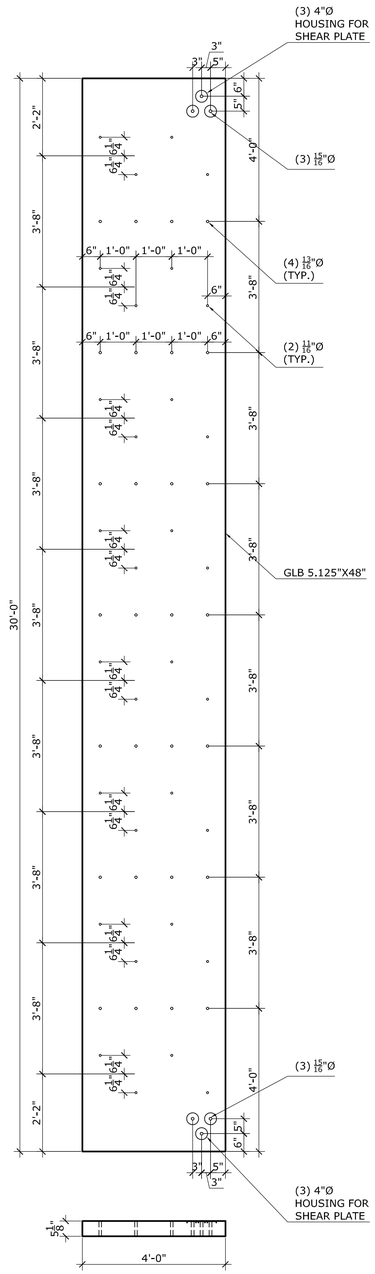
	DATE
DESIGNED FB	03-24-2017
DRAWN FB	03-24-2017
CHECKED	

JOB NO.
2017-005

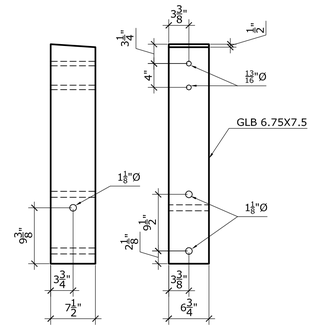
ST-03



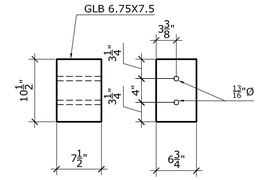
DECK D1 - (2) REQ'D
1/2"=1'-0" SCALE



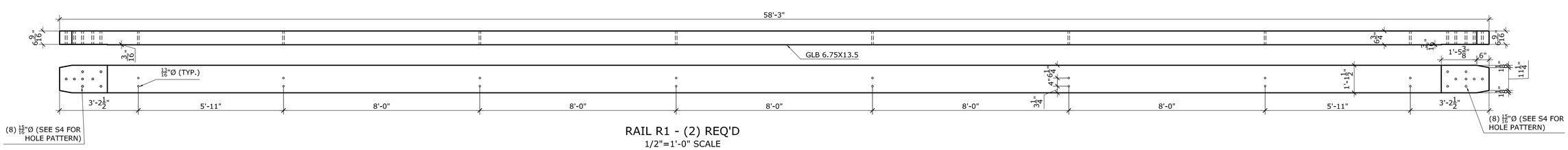
DECK D2 - (12) REQ'D
1/2"=1'-0" SCALE



POST P1 - (16) REQ'D
1"=1'-0" SCALE



BLOCKING BK1 - (16) REQ'D
1"=1'-0" SCALE



RAIL R1 - (2) REQ'D
1/2"=1'-0" SCALE

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REVISION	DATE	DESCRIPTION
1	05-10-17	RE-ISSUED FOR APPROVAL

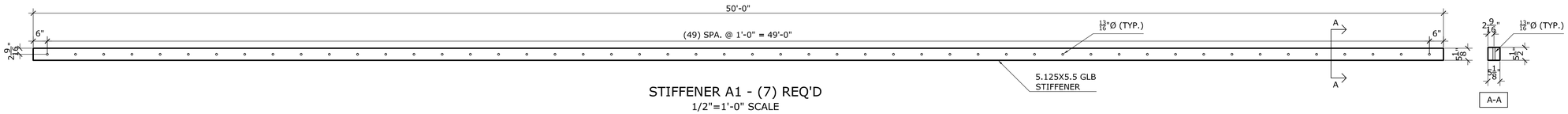
ST. LOUIS COUNTY BRIDGE NO. 516
ST. LOUIS COUNTY, MINNESOTA

DETAILS

	DATE
DESIGNED FB	03-24-2017
DRAWN FB	03-24-2017
CHECKED	

JOB NO.
2017-005

ST-04



STIFFENER A1 - (7) REQ'D
1/2"=1'-0" SCALE

Bell Structural Solutions
778 1st St. NW
New Brighton, MN 55112
STRUCTURAL SOLUTIONS
Stewardship Excellence Entrepreneurial Spirit

REVISION	DATE	DESCRIPTION
1	05-10-17	RE-ISSUED FOR APPROVAL

ST. LOUIS COUNTY BRIDGE NO. 516
ST. LOUIS COUNTY, MINNESOTA

DETAILS

	DATE
DESIGNED FB	03-24-2017
DRAWN FB	03-24-2017
CHECKED	

JOB NO.
2017-005

ST-05

APPENDIX E
HENNEPIN COUNTY TIMBER BRIDGE DEMONSTRATION PROJECT

Minnesota Structure Inventory Report

Bridge ID: L8081 CR 202(ELM CRK RD) over ELM CREEK

+ GENERAL +

Agency Br. No.	190
District	05 Maint. Area
County	027 - Hennepin
City	Dayton
Township	
Desc. Loc.	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
MN Year Remodeled	
FHWA Year Reconstructed	
Bridge Plan Location	4 - MUNICIPAL
Potential ABC	2 - N/A

+ STRUCTURE +

Service On	1 - Highway
Service Under	5 - Waterway
Main Span Type	3 - Steel
Main Span Design	01 - Beam Span
Main Span Detail	
Appr. Span Type	
Appr. Span Design	
Appr. Span Detail	
Skew	16 RIGHT
Culvert Type	
Barrel Length	

Number of Spans

MAIN: 1 APPR: 0 TOTAL:

Main Span Length	27.3	ft
Structure Length	34.9	ft
Deck Width (Out-to-Out)	17.8	ft
Deck Material	8 - Wood or Timber	
Deck Installation Year		
Wear Surf Type	6 - Bituminous	
Wear Surf Install Year	2005	
Wear Course/Fill Depth	0.16	ft
Deck Membrane	0 - None	
Deck Rebars	N - Not Applicable (no deck)	
Structure Area (Out-to-Out)	621	sq ft
Roadway Area (Curb-to-Curb)	581	sq ft
Sidewalk Width - L/R	0.00 ft	0.00 ft
Curb Height - L/R	0.67 ft	0.67 ft
Rail Codes - L/R	32	32

+ ROADWAY ON BRIDGE +

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

+ RDWY DIMENSIONS ON BRIDGE +

If Divided:	NB-EB	SB-WB
Roadway Width	16.50 ft	ft
Vertical Clearance	ft	ft
Max. Vert. Clear.	ft	ft
Horizontal Clear.	ft	ft
Appr. Surface Width	22.0 ft	
Bridge Roadway Width	16.5 ft	
Median Width On Bridge	ft	

+ MISC. BRIDGE DATA +

Structure Flared	0 - No flare
Parallel Structure	N - No parallel structure
Field Conn. ID	
Cantilever ID	

Foundations (Material/Type)

Abutment	2 - TIMBER	4 - PILE BENT
Pier	N - N/A	N - N/A
Historic Status	5 - Not eligible	
On - Off System	0 - OFF	

+ PAINT +

Year Painted	1973
Painted Area	2205 sq ft
Primer Type	1 - Lead - non 3309
Finish Type	C - Lead Silica Chromate

+ BRIDGE SIGNS +

Posted Load	2 - Vehicle & Semi (Type R12-5)
Traffic	0 - Not Required
Horizontal	2 - Width Restrictions
Vertical	N - Not Applicable

+ INSPECTION +

Structurally Deficient	Y
Functionally Obsolete	N
Sufficiency Rating	19.8
Last Routine Insp Date	09/24/2018
Routine Insp Frequency	12
Inspector Name	Hagstrom, Pat
Status	P - Posted for Load

+ NBI CONDITION RATINGS +

Deck	5
Superstructure	4
Substructure	5
Channel	5
Culvert	N

+ NBI APPRAISAL RATINGS +

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

+ SAFETY FEATURES +

Bridge Railing	0 - SUBSTANDARD
GR Transition	0 - SUBSTANDARD
Appr. Guardrail	1 - MEETS STANDARDS
GR Termini	0 - SUBSTANDARD

+ SPECIAL INSPECTIONS +

	Y/N	Freq	Date
Frac. Critical			
Underwater			
Pinned Asbly.			

+ WATERWAY +

Drainage Area (sq mi)	
Waterway Opening (sq ft)	216
Navigation Control	0 - No nav. control on waterway
Pier Protection	
Nav. Clr. (ft)	Vert. 0.0 Horiz. 0.0
Nav. Vert. Lift Bridge Clear. (ft)	
MN Scour Code	K - LIMITED RISK
Scour Evaluation Year	2009

+ CAPACITY RATINGS +

Design Load	0 - Other/Unknown
Operating Rating	2 - HS TRUCK 5.74
Inventory Rating	2 - HS TRUCK 3.44
Posting	VEH: 6 SEMI: 12 DBL: 12
Rating Date	09/29/2015

Overweight Permit Codes

A: X B: X C: X

MINNESOTA BRIDGE INSPECTION REPORT

12/06/2018

BRIDGE L8081 CR 202(ELM CRK RD) OVER ELM CREEK

County: Hennepin
City: Dayton
Township:
Section: 35 Township: 120N Range: 22W
Span Type: 3 - Steel 2 - Stringer/Multi-beam or Girder
List:
NBI Deck: 5 Super: 4 Sub: 5 Chan: 5 Culv: N

Location: 1.5 MI E OF JCT CSAH 121
Route: 07 - CNTY 202 Ref. Pt.: 003+00.990
Control Section:
Maint. Area:
Local Agency Bridge Nbr.: 190
Open, Posted, Closed: P - Posted for Load
MN Scour Code: K - LIMITED RISK

Length: 34.9 ft.
Deck Width: 17.8 ft.
Rdwy. Area/ Pct. Unsnd: 581 sq. ft. / %
Paint Area/ Pct. Unsnd: 2205 sq. ft. / 90%
Culvert: N/A
Postings: 6 12 12

Appraisal Ratings - Approach: 4 Waterway: 8
Required Bridge Signs - Load Posting: 2 - Vehicle & Semi (Type R12-5) Traffic: 0 - Not Required
Horizntal: 2 - Width Restrictions Vertical: N - Not Applicable

Unofficial Structurally Deficient Y
Unofficial Functionally Obsolete N
Unofficial Sufficiency Rating 19.8

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
31	Timber Deck	Routine	09/24/2018	621 SF	0	621	0	0
		Routine	09/11/2017	621 SF	0	621	0	0
	Notes: 31. '15-bottom of deck is leaking & some boards wet w/ small areas of mold. '16-deck has many areas of staining. Mod checks & splits on ends of planks. '17, '18-no change.							
	510 - Wearing Surfaces	Routine	09/24/2018	581 SF	461	12	108	0
		Routine	09/11/2017	581 SF	519	9	53	0
	Notes: 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 unsealed, mod to large in size. '14-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 <5'. '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.							
107	Steel Open Girder/Beam	Routine	09/24/2018	407 LF	0	0	380	27
		Routine	09/11/2017	407 LF	0	0	390	17
	Notes: 107. Stringers rusted. E & W 1/3 of flanges mod rusted w/ some section loss. Reinforcement plate has been bolted over 5 " X 1" hole in web of fascia beam bearing areas in NW & SW corners. N fascia channel tipped. Diaphragm added between N fascia & adj beam @ W end. Sheet rust on lower flanges @ numerous bearings. '10-exterior of fascia channels heavily sheet rusted. Approx 1" hole in bottom flange of N fascia 3' from W end. 80% of top & bottom flanges are sheet rusted. '12-N fascia channel has a 10" x 3" hole in the web +/- 10' from E abut. '13-most bottom flanges are mod-heavily sheet rusted. Hole in N fascia is now 12" x 3". A few of the beams @ the W abut do not have sheet rust on bottom flange. From plans, original bottom flange of beam is .465" or 7/16"; web thickness = .265". '14-heavy pitting of both fascias, up to 1/8" on S fascia. Hole web of N fascia by E abut is now 12" x 6"; another hole on W end is 3" x 1". The bottom of the original web in NW has a 1-1/2" x 15" 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" x 8". 1" x 1" hole in N fascia, 7' from W abut. 1-1/2" x 4" 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" x 9 1/2". '17-S fascia has +/- 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.							
	515 - Steel Protective Coating	Routine	09/24/2018	2205 SF	0	22	221	1962
		Routine	09/11/2017	2205 SF	0	220	0	1985
	Notes: 515. '16-paint is mostly gone. Remaining paint is faded, chipped or flaking. '17-no change. '18-est 1% faded, 10% flaked/peeled & 89% failed.							
216	Timber Abutment	Routine	09/24/2018	76 LF	0	69	6	1
		Routine	09/11/2017	76 LF	0	69	6	1
	Notes: 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' horiz while tapping @ N end about 5' below pier cap. '15-minor crack in 3rd board from cap between 2nd & 3rd col from S. Leakage @ SW below 3rd board from cap. '16-delam between 2nd & 3rd from S, 3rd board from top. 2' x 4' backfill infiltration @ SW corner. '17, '18-no change.							
	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.							

BRIDGE L8081 CR 202(ELM CRK RD) OVER ELM CREEK

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
228	Timber Pile	Routine	09/24/2018	18 EA	0	13	3	2
		Routine	09/11/2017	18 EA	0	13	3	2
	Notes: 228. Piles @ abut & 2 @ each wing. '13-many checks in all @ E abut. About 12" @ the base of the 2nd post from S @ E abut is rotted. '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 Pier Cap	Routine	09/24/2018	52 LF	0	52	0	0
		Routine	09/11/2017	52 LF	0	52	0	0
	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-'15-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-'18, annually-no change.							
330	Metal Bridge Railing	Routine	09/24/2018	69 LF	0	0	10	59
		Routine	09/11/2017	69 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" x 3" holes in lower rail, mostly near post locations. '16-upper rails have pack rust on most outsides. Up to 1' x 4" 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/peeled & 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 potholes 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-spreader beam is bowed. '14-no change. '15-mod to heavy rust on spreader beam. '16-2 areas of 100% section loss on spreader. Spreader does 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. BJJ 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 = 11/32"(worst case); 2nd beam from N, 1' W of spreader beam = 5/8"(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. '16-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

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
885	Scour	Routine	09/24/2018	1 EA	1	0	0	0
		Routine	09/11/2017	1 EA	1	0	0	0
	Notes: 885. K - 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.
822. Pave bit approaches to ramp onto bridge. Seal cracks. Monitor ramped bit apps.
311. Monitor bearings.
899. Monitor channel erosion in NW near USGS station.
899. Reattach loose traffic delineator in SW.

58. Deck NBI: '16-large cracks in bit overlay. Timber planks are stained w/ many checks and splits.

BRIDGE L8081 CR 202(ELM CRK RD) OVER ELM CREEK

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4

36A. Brdg Railings NBI:

36B. Transitions NBI:

36C. Appr Guardrail NBI:

36D. Appr Guardrail Terminal NBI:

59. Superstructure NBI: '16-steel beams have areas of section loss. Bearings severely rusted w/ section loss.

60. Substructure NBI: '15-moderate decay of few timber columns at abutments.

61. Channel NBI: Stream has had lateral migration to the west at the south end. Bank in NW has extensive erosion.

62. Culvert NBI:

71. Waterway Adeq NBI:

72. Appr Roadway Alignment NBI: 15 MPH curve just west of bridge.

Pat Hagstrom
Inspector's Signature

Jacob Bronder
Reviewer's Signature

MINNESOTA DEPARTMENT OF TRANSPORTATION
HENNEPIN COUNTY TRANSPORTATION DEPARTMENT

CONSTRUCTION PLAN FOR: BRIDGE REPLACEMENT, GRADING, AND BITUMINOUS PAVEMENT

COUNTY STATE AID HIGHWAY NO. 202

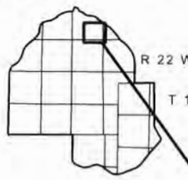
CITY OF DAYTON

LOCATION: BR. NO. L8081 OVER ELM CREEK ON ELM CREEK RD.

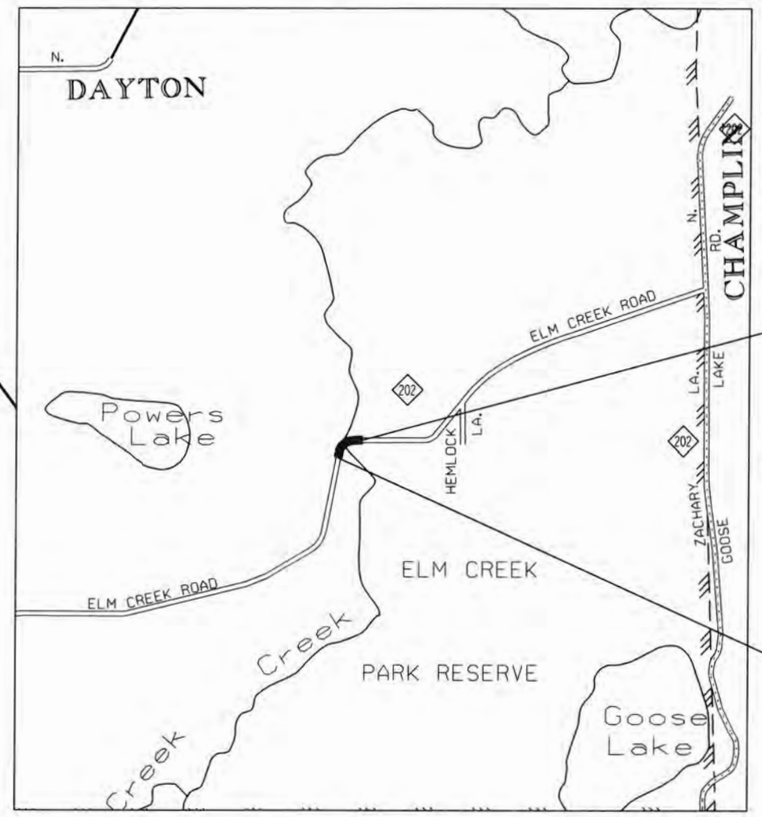
GROSS LENGTH	**1167.00** FEET	**0.221** MILES
BRIDGE LENGTH	**68.00** FEET	**0.013** MILES
EXCEPTION LENGTH	**682.14** FEET	**0.13** MILES
NET LENGTH	**1167.00** FEET	**0.221** MILES

PROJECT IS LOCATED WITHIN THE FOLLOWING LAND SECTIONS:

T 120 N, R 22 W SECTIONS: 35



PROJECT LOCATION
HENNEPIN COUNTY
MnDOT METRO DISTRICT



END S.P. 027-596-009
℄ 202 20+50.00

BEGIN S.P. 027-596-009
℄ 202 STA. 8+83.00

BRIDGE NO. INPLACE L8081
BRIDGE NO. PROPOSED 27C53
STA. 15+99.12 TO STA. 16+67.23

N

PLAN SYMBOLS

COUNTY LINE
SECTION LINE
QUARTER LINE
SIXTEENTH LINE
NEW RIGHT OF WAY LINE
PRESENT RIGHT OF WAY LINE
PROPERTY LINE (EXCEPT LAND LINES)
VACATED PLATTED PROPERTY
CORPORATE OR CITY LIMITS
TRUNK HIGHWAY CENTER LINE
RETAINING WALL
RAILROAD
WATER LINE
MEANDER CORNER
DRAINAGE DITCH
DRAIN TILE
CULVERT
GUARD RAIL
BARBED WIRE FENCE
CHAIN LINK FENCE
STONE WALL OR FENCE
HEDGE
RAILROAD CROSSING SIGN
MARSH
WOODS, ORCHARD, BRUSH, NURSERY
CATCH BASIN
FIRE HYDRANT
OVERPASS (HIGHWAY OVER)
UNDERPASS (HIGHWAY UNDER)
BRIDGE
BUILDING
IRON PIPE OR ROD
MONUMENT (STONE, CONCRETE OR METAL)
SMALL SIGN
CONSTRUCTION ZONE LINE

UTILITY SYMBOLS

POWER POLE
TELEPHONE POLE
ANCHOR
STEEL TOWER
STREET LIGHT
TELEVISION CABLE RISER
WATER MAIN
CONDUIT
TELEPHONE CABLE IN CONDUIT
ELECTRIC CABLE IN CONDUIT
TELEPHONE MANHOLE
ELECTRIC MANHOLE
BURIED TELEPHONE CABLE
BURIED ELECTRIC CABLE
STORM SEWER
SEWER MANHOLE
SANITARY SEWER
GAS MAIN
TELEVISION CABLE
FIBER OPTIC

SCALES

PLAN	1"= 50'
INDEX MAP	1"= 16,000'
GENERAL LAYOUT	1"= 100'
PROFILE	50' HORIZ. 5' VERT.

DESIGN DESIGNATION

ADT (CURRENT YEAR) 2018	= **800**	$\sum N18$ (20) **86,000**
ADT (DESIGN YEAR) 2038	= **1000**	DESIGN SPEED **35 MPH**
DHV (DESIGN HR. VOL.)	= **N/A**	BASED ON **STOPPING** SIGHT DISTANCE
D (DIRECTIONAL DISTR.)	= **N/A**	HEIGHT OF EYE **3.5'**
T (HEAVY COMMERCIAL)	= **N/A**	HEIGHT OF OBJECT **2.0'**
R VALUE	= **30**	FUNCTIONAL CLASS **MINOR COLLECTOR**
10 TON DESIGN LOAD		NO. OF TRAFFIC LANES **2**
		NO. OF PARKING LANES **0**
		SHOULDER WIDTH **4.0'**

DESIGN EXCEPTION: DESIGN SPEED NOT ACHIEVED AT; STA. 9+95.66 TO STA. 16+77.80 30 MPH

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

MINN. PROJ. NO. BROS 2718 (125)

GOVERNING SPECIFICATIONS

THE 2018 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION", AND ALL SUPPLEMENTS THERETO, SHALL GOVERN. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE INSTALLED IN ACCORDANCE TO THE MOST RECENT EDITION OF THE " MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".

INDEX

THIS PLAN CONTAINS 97 SHEETS

APPROVED _____ HENNEPIN COUNTY: COUNTY HIGHWAY ENGINEER — DATE 6/12/18

RECOMMENDED FOR APPROVAL _____ HENNEPIN COUNTY: BRIDGE DIVISION ENGINEER — DATE 6/12/18

APPROVED _____ CITY OF DAYTON ENGINEER — DATE 6/13/18

_____ DISTRICT STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE AND FEDERAL AID RULES/POLICY — DATE 6/22/18

APPROVED FOR STATE AND FEDERAL AID FUNDING: STATE AID ENGINEER — DATE 6/22/18

Hennepin

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 — 53076 LICENSE NO. — 06/11/18 DATE

DESIGN SQUAD
J. SCHERER D. SEILER
E. KELLNER T. MATTONEN

TITLE SHEET

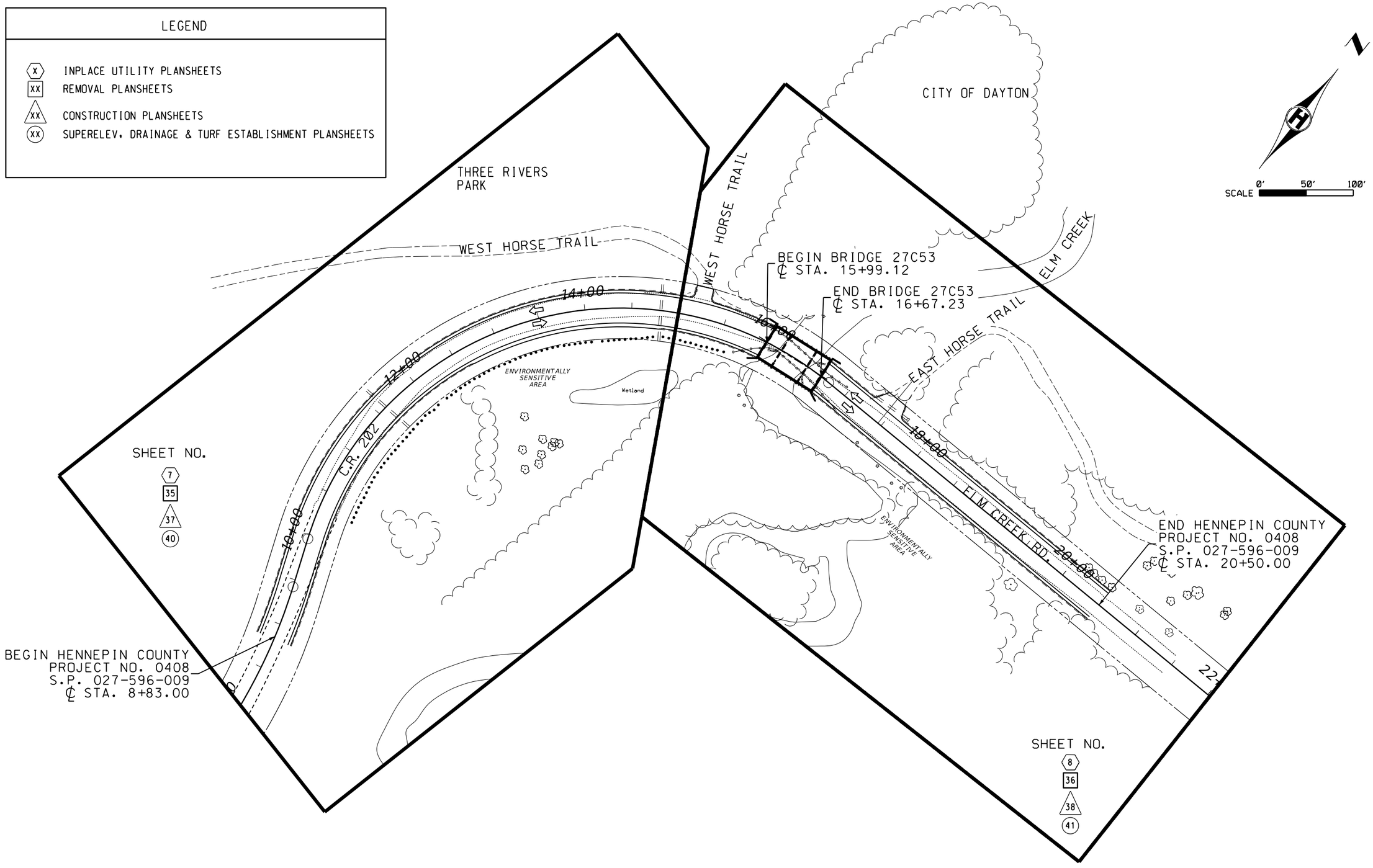
C.S.A.H. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009

SHEET 1 / 97

Default p=4.0" 6/12/2018 \\tempo\proj\202.0408.27C53\Design\Plan\0408_titlesheet.dgn

LEGEND

- (X) INPLACE UTILITY PLANSHEETS
- [XX] REMOVAL PLANSHEETS
- △XX CONSTRUCTION PLANSHEETS
- (XX) SUPERELEV., DRAINAGE & TURF ESTABLISHMENT PLANSHEETS



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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

6/13/18 DATE

DESIGN BY:	D. SEILER
CAD BY:	J. SCHERER
CHECKED BY:	D. SEILER
LAST REVISION:	05/16/18

GENERAL LAYOUT

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

SHEET 2/59

GENERAL LAYOUT [2 Sheet] 6/13/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408_gl00.dgn

NOTES

(1) AVERAGE EXISTING BITUMINOUS THICKNESS OF 4".

(2) BITUMINOUS MATERIAL FOR TACK COAT IS INCIDENTAL.

(3) SPECIAL FINISH TO BE APPLIED. SEE SPECIAL PROVISIONS.

(4) SEE CROSS SECTIONS FOR CULVERT LOCATIONS

(5) SEE BRIDGE PLANS

(6) BIT. CURB INCIDENTAL TO GUARD RAIL INSTALLATION APPROX. 75 LF

(7) WATERPROOF REINFORCING MEMBRANE. INCIDENTAL TO GLUED LAMINATED DECK SEE SHEET B2 AND SPECIAL PROVISIONS.

(8) UTILIZED FOR ROOT-RAP SEE SPECIAL PROVISION SB-13.

(9) SHALL BE PLACED UNDERNEATH ALL RANDOM RIPRAP CLASS 4

(P) PLAN QUANTITY

NOTES	TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION		UNIT	TOTAL PROJECT QUANTITY	BRIDGE HENNEPIN COUNTY FEDERAL PARTICIPATING S.P. 027-596-009 QUANTITY	APPROACH HENNEPIN COUNTY FEDERAL PARTICIPATING S.P. 027-596-009 QUANTITY	APPROACH HENNEPIN COUNTY NON-PARTICIPATING QUANTITY
			2021.501	MOBILIZATION		LUMP SUM	1	0.9		0.1
			2031.502	FIELD OFFICE TYPE D		EACH	1	0.9		0.1
			2101.501	CLEARING & GRUBBING		LUMP SUM	1		1	
		SS1	2104.502	REMOVE SIGN TYPE C		EACH	18			18
	G	6	2104.503	SAWING BITUMINOUS PAVEMENT		LIN FT	47		47	
	G	6	2104.503	REMOVE METAL CULVERT		LIN FT	170		170	
	G	6	2104.503	REMOVE GUARDRAIL		LIN FT	190		190	
1	G	6	2104.504	REMOVE BITUMINOUS PAVEMENT	P	SQ YD	3104		2794	310
			2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)		LUMP SUM	1	1		
			2105.504	GEOTEXTILE FABRIC TYPE 6		SQ YD	5190		4671	519
			2105.509	STABILIZING AGGREGATE		TON	100		90	10
	A	6	2106.507	EXCAVATION - COMMON	P	CU YD	1680		1512	168
	A	6	2106.507	COMMON EMBANKMENT (CV)	P	CU YD	1016		914	102
	H	6	2118.509	AGGREGATE SURFACING CLASS 2		TON	196		176	20
			2123.610	STREET SWEEPER (WITH PICKUP BROOM)		HOUR	20		18	2
			2130.523	WATER		MGALLON	6			6
			2131.506	CALCIUM CHLORIDE SOLUTION		GALLON	185		166	19
			2211.509	AGGREGATE BASE CLASS 5	P	TON	1483		1335	148
2	H	6	2360.509	TYPE SP 12.5 WEARING COURSE MIX (3,C)		TON	933		840	93
5	A	6	2401.601	STRUCTURE EXCAVATION		LUMP SUM	1	1		
			2402.508	STRUCTURAL STEEL (3309)	P	POUND	23038	23038		
			2403.603	TIMBER RAILING	P	LIN FT	136	136		
7			2403.618	GLUED LAMINATED DECK PANELS	P	SQ FT	2720	2720		
5			2442.501	REMOVE EXISTING BRIDGE		LUMP SUM	1	1		
			2452.502	C-I-P CONC TEST PILE 85 FT LONG 12"		EACH	2	2		
			2452.502	C-I-P CONC TEST PILE 85 FT LONG 16"		EACH	2	2		
			2452.502	PILE REDRIVING		EACH	32	32		
			2452.502	PILE ANALYSIS		EACH	2	2		
			2452.502	PILE POINTS 12"		EACH	16	16		
			2452.502	PILE POINTS 16"		EACH	16	16		
			2452.603	C-I-P CONCRETE PILING 12"	P	LIN FT	1190	1190		
			2452.603	C-I-P CONCRETE PILING 16"	P	LIN FT	1190	1190		
			2452.618	STEEL SHEET PILING	P	SQ FT	2430	2430		
4	I	6	2501.502	18" RC PIPE APRON		EACH	2			2
4	I	6	2501.502	24" RC PIPE APRON		EACH	4			4
4	I	6	2501.502	28" SPAN CAS PIPE-ARCH APRON		EACH	2			2
4	I	6	2501.503	24" RC PIPE CULVERT CLASS III		LIN FT	96			96
4	I	6	2501.503	18" RC PIPE CULVERT DES 3006 CL III		LIN FT	52			52
4	I	6	2501.603	28" SPAN PIPE-ARCH CULVERT		LIN FT	44			44
			2502.502	4" PRECAST CONCRETE HEADWALL		EACH	4		4	
			2502.503	4" PERF TP PIPE DRAIN		LIN FT	1000		1000	
9			2511.504	GEOTEXTILE FILTER TYPE 7		SQ YD	1050	1050		
			2511.507	RANDOM RIPRAP CLASS IV		CU YD	830	830		
			2533.503	PORTABLE PRECAST CONC BARRIER DES 8337		LIN FT	100		100	
3			2554.502	ANCHORAGE ASSEMBLY - TYPE 31		EACH	3		3	
3			2554.502	END TREATMENT-ENERGY ABSORBING TERMINAL		EACH	1		1	
3			2554.503	TRAFFIC BARRIER DESIGN TYPE 31		LIN FT	491		491	
3,6			2554.503	TRAFFIC BARRIER DESIGN TRANS TYPE 31		LIN FT	100		100	
			2563.601	TRAFFIC CONTROL SUPERVISOR		LUMP SUM	1		1	
			2563.601	TRAFFIC CONTROL		LUMP SUM	1		1	
			2563.602	PORTABLE CHANGEABLE MESSAGE SIGN		EACH	2		2	
		SS1	2564.518	SIGN PANELS TYPE C		SQ FT	36.3		36.3	
			2572.503	TEMPORARY FENCE		LIN FT	500		450	50
			2573.501	EROSION CONTROL SUPERVISOR		LUMP SUM	1		1	
	F	6	2573.502	STORM DRAIN INLET PROTECTION		EACH	4		4	
	F	6	2573.503	SILT FENCE; TYPE HI		LIN FT	1540		1386	154

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 — LICENSE NO.

08/30/2018 — DATE

DESIGN BY: D. SEILER
CAD BY: J. SCHERER
CHECKED BY: D. SEILER
LAST REVISION: 08/30/18

STATEMENT OF ESTIMATED QUANTITIES

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

SHEET 3 / 59

NOTES

(1) AVERAGE EXISTING BITUMINOUS THICKNESS OF 4".

(2) BITUMINOUS MATERIAL FOR TACK COAT IS INCIDENTAL.

(3) SPECIAL FINISH TO BE APPLIED. SEE SPECIAL PROVISIONS.

(4) SEE CROSS SECTIONS FOR CULVERT LOCATIONS

(5) SEE BRIDGE PLANS

(6) BIT. CURB INCIDENTAL TO GUARD RAIL INSTALLATION APPROX. 75 LF

(7) WATERPROOF REINFORCING MEMBRANE. INCIDENTAL TO GLUED LAMINATED DECK SEE SHEET B2 AND SPECIAL PROVISIONS.

(8) UTILIZED FOR ROOT-RAP SEE SPECIAL PROVISION SB-13.

(9) SHALL BE PLACED UNDERNEATH ALL RANDOM RIPRAP CLASS 4

(P) PLAN QUANTITY

NOTES	TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITY	BRIDGE HENNEPIN COUNTY FEDERAL PARTICIPATING S.P. 027-596-009 QUANTITY	APPROACH HENNEPIN COUNTY FEDERAL PARTICIPATING S.P. 027-596-009 QUANTITY	APPROACH HENNEPIN COUNTY NON-PARTICIPATING QUANTITY
	F	6	2573.503	SILT FENCE; TYPE SD	LIN FT	250		225	25
	F	6	2573.503	SILT FENCE; TYPE MS	LIN FT	820		738	82
	F	6	2573.503	FLOTATION SILT CURTAIN TYPE MOVING WATER	LIN FT	448		448	
			2573.510	SEDIMENT REMOVAL BACKHOE	HOUR	10		10	
8			2574.507	COMPOST GRADE 3	CU YD	175		175	
			2574.508	FERTILIZER TYPE 4	POUND	100		100	
	F	6	2575.504	EROSION CONTROL BLANKETS CATEGORY 3N	SQ YD	2615		2353	262
	F		2575.504	RAPID STABILIZATION METHOD 4	SQ YD	2787		2508	279
			2575.508	SEED MIXTURE 35-241	POUND	30		27	3
			2582.503	4" DBLE SOLID LINE MULTI COMP GR IN	LIN FT	1170		1053	117

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Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

08/30/2018 DATE

DESIGN BY: D. SEILER
CAD BY: J. SCHERER
CHECKED BY: D. SEILER
LAST REVISION: 08/30/18

STATEMENT OF ESTIMATED QUANTITES

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

SHEET 4 / 59

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
CALCIUM 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)	60 POUNDS PER ACRE
SEED MIXTURE 35-241	36.5 POUNDS PER ACRE
BITUMINOUS MIXTURE FOR TACK COAT	0.05 GAL. / S.Y.

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

STANDARD PLATES	
PLATE NO.	**DESCRIPTION**
3000L	REINFORCED CONCRETE PIPE (1 OF 5 SHEETS)
3000L	REINFORCED CONCRETE PIPE (2 OF 5 SHEETS)
3000L	REINFORCED CONCRETE PIPE (3 OF 5 SHEETS)
3000L	REINFORCED CONCRETE PIPE (4 OF 5 SHEETS)
3000L	REINFORCED CONCRETE PIPE (5 OF 5 SHEETS)
3006G	GASKET JOINT FOR R.C. PIPE (1 OF 2 SHEETS)
3006G	GASKET JOINT FOR R.C. PIPE (2 OF 2 SHEETS)
3007E	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES
3014J	REINFORCED CONCRETE PIPE ARCH (1 OF 2 SHEETS)
3014J	REINFORCED CONCRETE PIPE ARCH (2 OF 2 SHEETS)
3022C	PRECAST CONCRETE SAFETY APRON (1 OF 3 SHEETS)
3022C	PRECAST CONCRETE SAFETY APRON (2 OF 3 SHEETS)
3022C	PRECAST CONCRETE SAFETY APRON (3 OF 3 SHEETS)
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3110G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE-ARCH
3131C	PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS
3145G	CONCRETE PIPE OR PRECAST BOX CULVERT TIES
8000J	CHANNELIZERS - TYPE A (1 OF 3 SHEETS)
8000J	CHANNELIZERS - TYPE B (2 OF 3 SHEETS)
8000J	CHANNELIZERS - TYPE C (3 OF 3 SHEETS)
8337C	TEMPORARY PORTABLE PRECAST CONCRETE BARRIER (TYPE F) (1 OF 3 SHEETS)
8337C	TEMPORARY PORTABLE PRECAST CONCRETE BARRIER (TYPE F) (2 OF 3 SHEETS)
8337C	TEMPORARY PORTABLE PRECAST CONCRETE BARRIER (TYPE F) (3 OF 3 SHEETS)
8350A	THRIE BEAM ANCHORAGE PLATE

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 BORROW, 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.) GRANULAR MATERIAL SHALL MEET THE REQUIREMENTS OF MN/DOT SPEC. 3149.2B1

4.) SELECT GRANULAR MATERIAL SHALL MEET THE REQUIREMENTS OF MN/DOT SPEC. 3149.2B2

5.) SELECT GRANULAR MATERIAL MODIFIED (10%) SHALL MEET THE REQUIREMENTS OF MN/DOT SPEC. 3149.2B2, MODIFIED SUCH THAT OF THE PORTION PASSING A 1" SIEVE, NOT MORE THAN 10% SHALL PASS A NO. 200 SIEVE.

6.) GRANULAR BASELINE IS DEFINED AS THE BOTTOM OF THE SELECT GRANULAR MATERIAL.

7.) SUBGRADE EXCAVATION IS MEASURED FROM THE GRANULAR BASELINE TO THE GRADING GRADE.

8.) STRIP SOD AND TOPSOIL FROM AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE AS SLOPE DRESSING. FOR ESTIMATING PURPOSES, THE DEPTH OF THE TOPSOIL AVAILABLE IS CONSIDERED TO BE FOUR INCHES. ALL TOPSOIL STRIPPING SHALL BE CONSIDERED TO BE COMMON EXCAVATION.

9.) DISPOSITION OF EXCAVATED MATERIAL SHALL BE IN ACCORDANCE WITH MN/DOT SPEC. 2105.3D. EXCAVATED MATERIAL (EXCEPT BITUMINOUS PAVEMENT, TOPSOIL, DEBRIS, PEAT, MUCK AND ORGANIC OR OTHER UNSTABLE MATERIAL, SHALL BE REUSED, TO THE EXTENT REQUIRED, AS SUITABLE GRADING MATERIAL, GRANULAR MATERIAL, OR SELECT GRANULAR MATERIAL AS DETERMINED BY THE ENGINEER. EXCAVATED MATERIAL NOT REQUIRED FOR REUSE ON THE PROJECT AND BITUMINOUS AND OR CONCRETE ITEMS REMOVED BY CONSTRUCTION SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF THE PROJECT LIMITS.
EXCESS TOPSOIL AND MUCK MATERIAL SHALL BE USED THROUGHOUT THE PROJECT WHEN DIRECTED BY THE ENGINEER.

10.) IN FILL SECTIONS, TOPSOIL AND OTHER UNSUITABLE MATERIALS SHALL BE ELIMINATED FROM THE UPPER 3 FEET OF THE GRADING GRADE BENEATH THE ROADWAY, WITHIN THE LIMITS SHOWN IN THE CROSS SECTIONS.

11.) OBTAIN COMPACTION ON THE GRADING PORTION OF PERMANENT CONSTRUCTION IN ACCORDANCE WITH THE "QUALITY COMPACTION METHOD - ROADBED EMBANKMENT" (SEE SPECIAL PROVISIONS).

12.) COMPACTION OF THE AGGREGATE BASE LAYER SHALL BE OBTAINED IN ACCORDANCE WITH THE QUALITY COMPACTION METHOD.

13.) COMPACTION OF THE GRADING AND AGGREGATE ITEMS ON DRIVEWAYS, BITUMINOUS TRAILS, BYPASSES AND OTHER TEMPORARY WORK SHALL BE DONE BY THE "QUALITY COMPACTION 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, WHICHEVER IS DEEPER, THEN 1V:4H TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION, UNLESS OTHERWISE NOTED. USE A SAWCUT TO PROVIDE A UNIFORM JOINT.

15.) PROVIDE 1V:20H LONGITUDINAL TAPERS WHEN CHANGING EXCAVATION DEPTHS.

16.) DITCH BOTTOMS, TOE OF FILL, CUT RUNOUTS AND THE TOP EDGE OF THE BACKSLOPES SHALL BE ROUNDED REGARDLESS OF THE SECTION USED ON THE CROSS SECTION SHEETS.

17.) IN FILL SECTIONS, TOPSOIL AND OTHER UNSUITABLE MATERIALS SHALL BE ELIMINATED FROM THE UPPER 3 FEET OT THE GRADING GRADE BENEATH THE ROADWAY, WITHIN THE LIMITS SHOWN IN THE CROSS SECTIONS.

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 — LICENSE NO.

08/21/2018 — DATE

DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	JLS
LAST REVISION:	08/20/2018

STD PLATES, BASIS OF EST. QUANTITES, SOIL & CONSTRUCTION NOTES

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

SHEET 5 / 59

A EARTHWORK TABULATION - COUNTY ROAD 202

ALIGNMENTS		EXCAVATION		EMBANKMENT		TOTAL EXCAVATION	TOTAL EMBANKMENT
		COMMON	STRUCTURE(1)	COMMON (CV)	SELECT(1)		
		CU YD	CU YD	CU YD	CU YD	CU YD	CU YD
CL 202	8+83						
CL 202	9+00	18		11		18	11
CL 202	9+50	63		36		63	36
CL 202	10+00	71		25		71	25
CL 202	10+50	73		26		73	26
CL 202	11+00	79		34		79	34
CL 202	11+50	81		25		81	25
CL 202	12+50	111		19		111	19
CL 202	13+00	132		18		132	18
CL 202	13+50	141		20		141	20
CL 202	14+00	124		22		124	22
CL 202	14+50	59		49		59	49
CL 202	15+00	5		100		5	100
CL 202	15+50	0		198		0	198
CL 202	15+99	125		231	125	125	356
	Bridge		300	0		300	0
CL 202	16+67	105		0	105	105	105
CL 202	17+00	4		104		4	104
CL 202	17+50	52		55		52	55
CL 202	18+00	119		32		119	32
CL 202	18+50	113		46		113	46
CL 202	19+00	78		55		78	55
CL 202	19+50	46		87		46	87
CL 202	20+00	38		84		38	84
CL 202	20+50	43		61		43	61
	TOTAL	1680	300	1338	230	1980	1568

(1) SEE BRIDGE PLANS SHEET B6 (NOTES)

H SURFACING MATERIAL TABULATION

STATION TO STATION		TYPE SP 12.5 WEARING COURSE MIX (3,C)	AGG. BASE (CV) CLASS 5	AGG. SURFACING (CV) CLASS 2
		TON	TON	TON
CL 202 8+83	CL 202 20+50	933	1483	196
PROJ. TOTAL		933	1483	196

G REMOVALS

STATION TO STATION		REMOVE BITUMOUS PAVEMENT	SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)	REMOVE GUARDRAIL	REMOVE CULVERT
		SY	LF	LF	LF
8+83	16+00	2046			
16+67	20+50	1058			
8+83	8+83		24		
20+50	20+50		23		
15+69	20+50			48	
15+80	20+50			44	
16+67	17+02			55	
16+67	16+95			43	
11+58					65
14+82					64
17+25					41
PROJ. TOTAL		3104	47	190	170

I UNDERGROUND CONSTRUCTION DATA (CULVERTS)

INVERT NO.	STATION C.R. 202	LOCATION	FLOW LINE	GRADE	18 IN CL III	24 IN CL III	28 IN ARCH	RC PIPE APRON
			ELEV	%				EACH
IN 5000	14+72	32.0 LT	860.03	0.10				1
OUT 5001	14+72	32.0 RT	859.95	0.10	52			1
IN 5003	18+30	27.0 RT	859.60	0.00				1
OUT5002	18+30	29.0 LT	859.60	0.00			44	1
IN 5005	19+10	30.0 RT	859.60	0.00				1
OUT 5004	19+10	30.0 LT	859.60	0.00		48		1
IN 5007	19+50	30.0 RT	859.60	0.00				1
OUT 5006	19+50	30.0 LT	859.60	0.00		48		1
SHEET TOTAL					52	96	44	8

NOTES: (1) OFFSETS ARE TO END OF APRON
(2) TIE LAST 3 PIPES LEADING TO APRON

F EROSION CONTROL

STATION TO STATION				CULVERT INLET PROTECTION	SILT FENCE, TYPE MS	SILT FENCE, TYPE HI	SILT FENCE, TYPE SD	RAPID STABILIZATION METHOD 4	FLOATATION SILT CURTAIN	SEEDING 35-241
				EACH	LF		LF	SY	LIN FT	POUND
CL 202	8+83	CL 202	16+27	1	820	670	125	1713	141	13
	16+47		20+50	3		870	125	1074	307	8
PROJ. TOTAL				4	820	1540	250	2787	448	21

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER | 48041 LICENSE NO. | 06/21/2018 DATE

DESIGN BY: D. SEILER
CAD BY: J. SCHERER
CHECKED BY: D. SEILER
LAST REVISION: 05 /16 /18

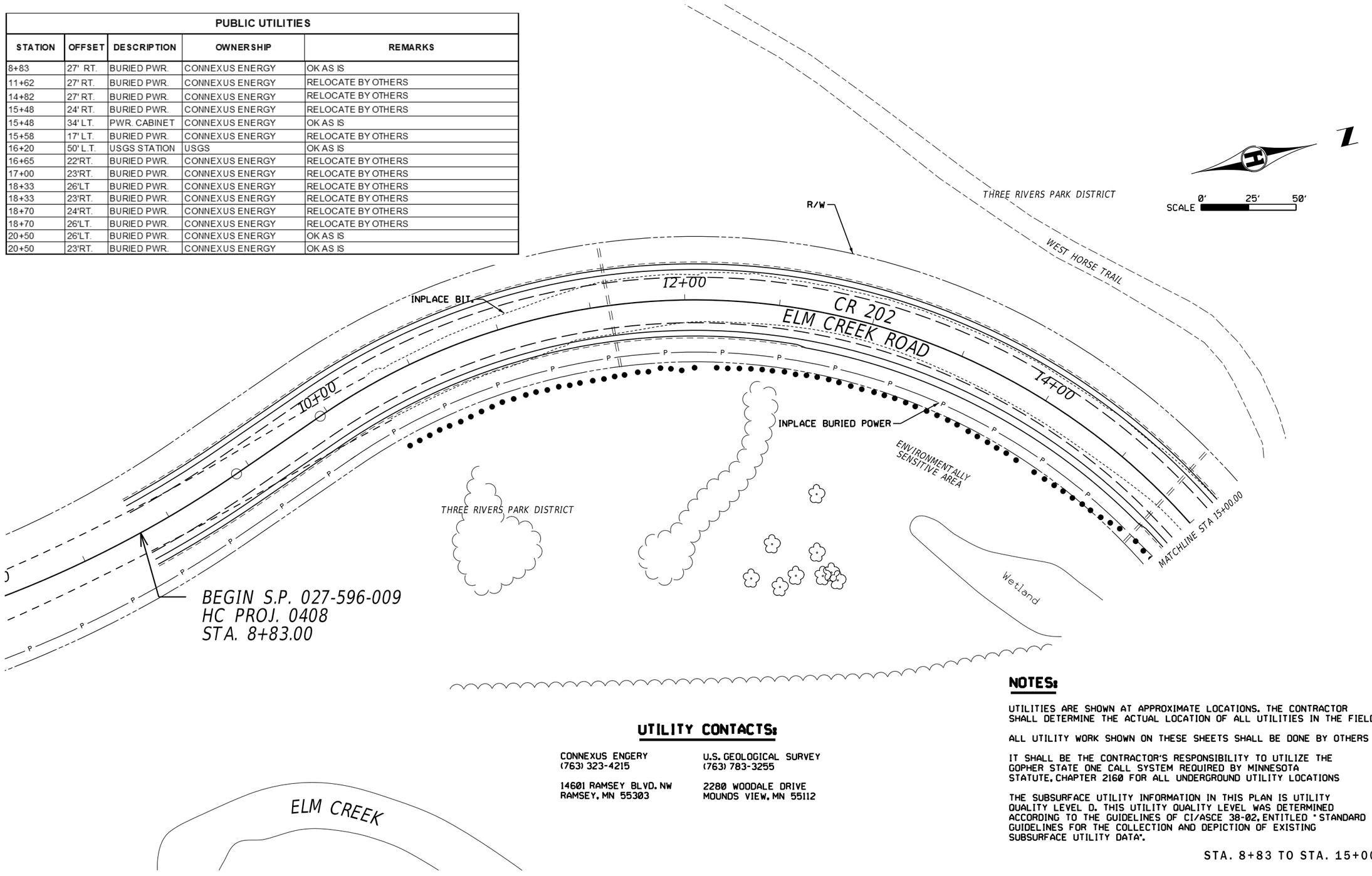
QUANTITY TABULATIONS

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

SHEET 6 / 59

SURFACE MATERIAL TABULATION-1 [Sheet]pw2729 6/21/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-tb.dgn

PUBLIC UTILITIES				
STATION	OFFSET	DESCRIPTION	OWNERSHIP	REMARKS
8+83	27' RT.	BURIED PWR.	CONNEXUS ENERGY	OK AS IS
11+62	27' RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
14+82	27' RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
15+48	24' RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
15+48	34' LT.	PWR. CABINET	CONNEXUS ENERGY	OK AS IS
15+58	17' LT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
16+20	50' LT.	USGS STATION	USGS	OK AS IS
16+65	22'RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
17+00	23'RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
18+33	26'LT	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
18+33	23'RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
18+70	24'RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
18+70	26'LT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
20+50	26'LT.	BURIED PWR.	CONNEXUS ENERGY	OK AS IS
20+50	23'RT.	BURIED PWR.	CONNEXUS ENERGY	OK AS IS



UTILITY CONTACTS:

CONNEXUS ENGERY
(763) 323-4215

14601 RAMSEY BLVD. NW
RAMSEY, MN 55303

U.S. GEOLOGICAL SURVEY
(763) 783-3255

2280 WOODALE 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 GOPHER STATE ONE CALL SYSTEM REQUIRED BY MINNESOTA STATUTE, CHAPTER 2160 FOR ALL UNDERGROUND UTILITY LOCATIONS

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".

STA. 8+83 TO STA. 15+00

Hennepin

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Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

6/13/18 DATE

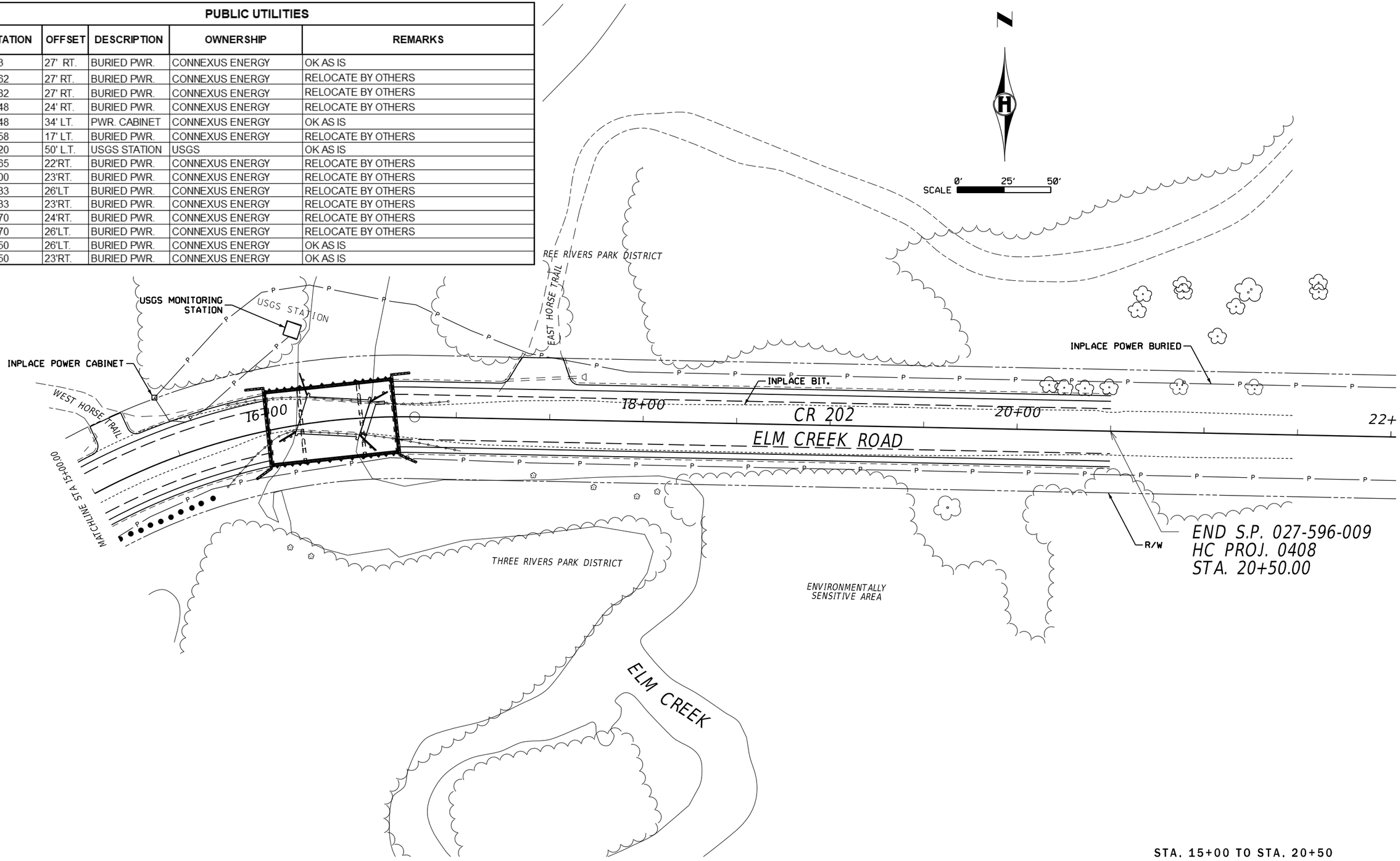
DESIGN BY:	J. SCHERER
CAD BY:	J. SCHERER
CHECKED BY:	D. SEILER
LAST REVISION:	05/18/18

PUBLIC UTILITY PLAN AND TABULATION

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

SHEET 7 / 59

PUBLIC UTILITIES				
STATION	OFFSET	DESCRIPTION	OWNERSHIP	REMARKS
8+83	27' RT.	BURIED PWR.	CONNEXUS ENERGY	OK AS IS
11+62	27' RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
14+82	27' RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
15+48	24' RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
15+48	34' LT.	PWR. CABINET	CONNEXUS ENERGY	OK AS IS
15+58	17' LT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
16+20	50' L.T.	USGS STATION	USGS	OK AS IS
16+65	22'RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
17+00	23'RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
18+33	26'LT	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
18+33	23'RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
18+70	24'RT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
18+70	26'LT.	BURIED PWR.	CONNEXUS ENERGY	RELOCATE BY OTHERS
20+50	26'LT.	BURIED PWR.	CONNEXUS ENERGY	OK AS IS
20+50	23'RT.	BURIED PWR.	CONNEXUS ENERGY	OK AS IS



STA. 15+00 TO STA. 20+50

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER | 48041 LICENSE NO. | 6/13/18 DATE

DESIGN BY:	J. SCHERER
CAD BY:	J. SCHERER
CHECKED BY:	D. SEILER
LAST REVISION:	05/18/18

PUBLIC UTILITY PLAN AND TABULATION

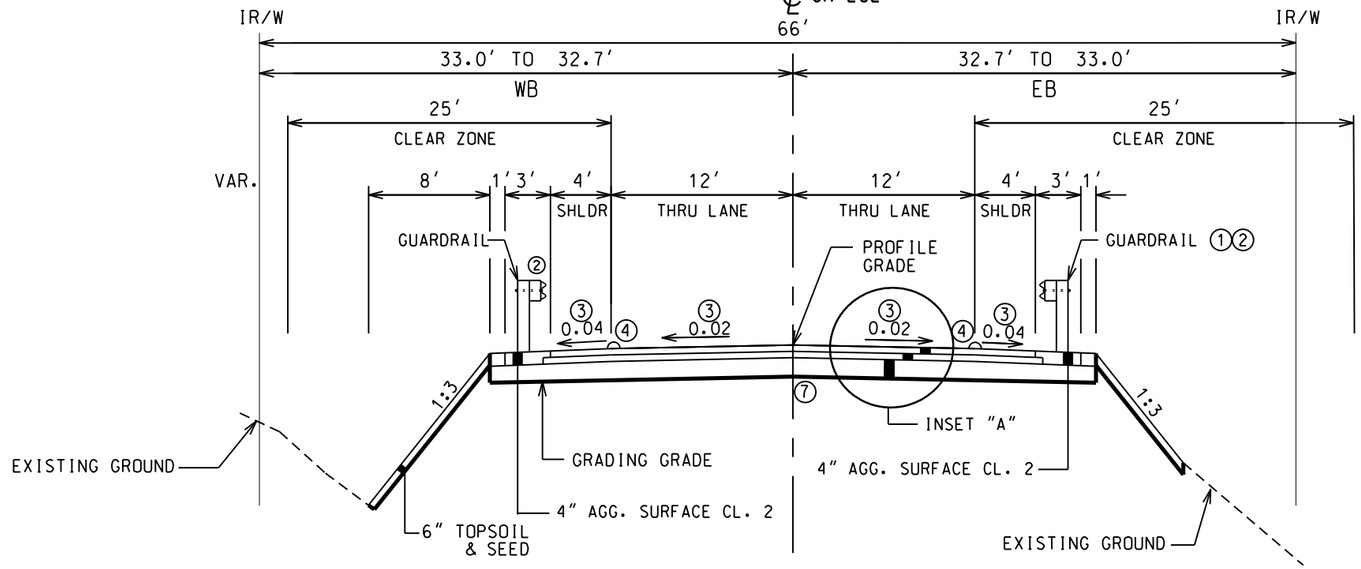
C.R. 202 HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009

SHEET 8 / 59

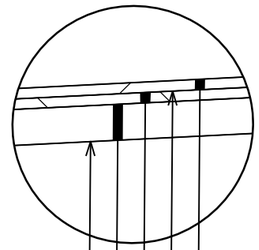
PUBLIC UTILITY PLAN [Sheet 6/13/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408_iut100.dgn

TYPICAL SECTION WITH GUARDRAIL

STA. 15+28 TO 15+99
STA. 16+67 TO 20+50



INSET A



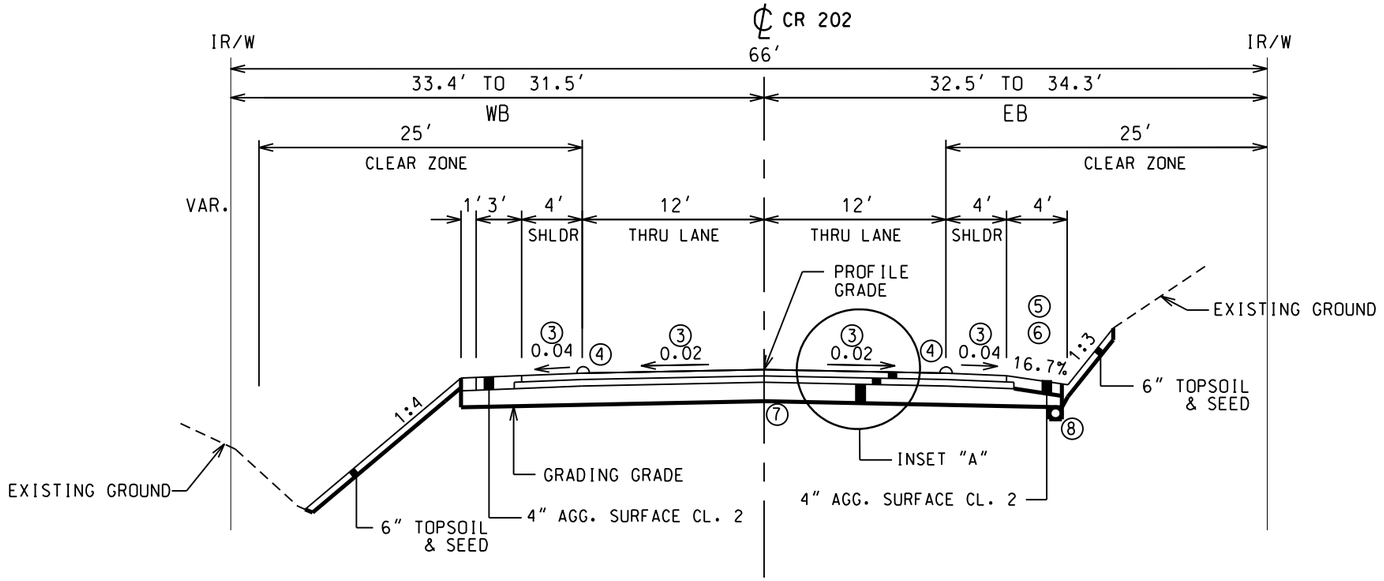
2" TYPE SP 12.5 WEARING COURSE MIXTURE (3,C) (SPWEB340C)
TACK COAT (INCIDENTAL)
2" TYPE SP 12.5 WEARING COURSE MIXTURE (3,C) (SPWEB340C)
6" AGGREGATE BASE, CL. 5
GEOTEXTILE FABRIC TYPE VI

GENERAL NOTES:

THE GRADING GRADE X-SLOPES WILL BE THE SAME AS THE PROPOSED THRU LANES.

TYPICAL SECTION WITHOUT GUARDRAIL

STA. 8+83 TO 15+28



NOTES:

① GUARDRAIL PLACEMENT AREA - SEE CONSTRUCTION SHEETS 37-38 FOR LOCATION

② SEE MNDOT STANDARD PLAN SHEETS 23-33 FOR GUARDRAIL DETAILS AND GRADING P.I. REQUIREMENTS. PLACE 3′ STRIP OF CL. 2 AGG. AT BITUMINOUS EDGE.

③ VARIABLE CROSS SLOPE. SEE SUPERELEVATION DRAINAGE AND TURF ESTABLISHMENT PLANS SHEETS 40-41 FOR CROSS SLOPE

④ MAX. 0.07 ROLLOVER IN SUPERELEVATION AREAS

⑤ EXTENDED SHOULDER STATION 12+67.7 TO 14+80.6 RIGHT

⑥ INSLOPE OF DITCH SECTION 9+80 TO 14+35 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.

Hennepin

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Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

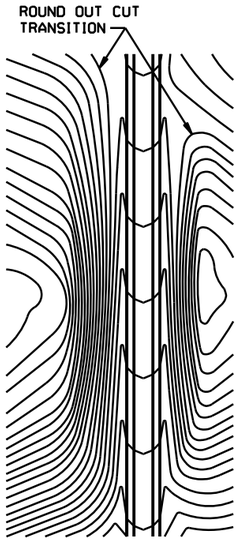
08/21/2018 DATE

DESIGN BY:	D. SEILER
CAD BY:	J. SCHERER
CHECKED BY:	D. SEILER
LAST REVISION:	08/20/18

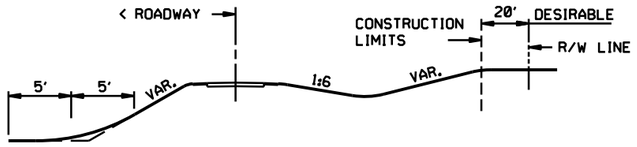
TYPICAL SECTIONS

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

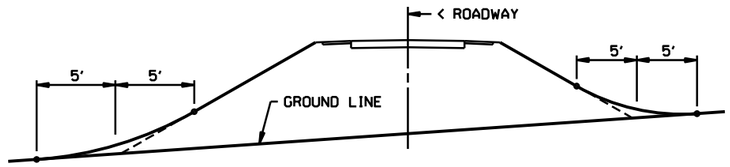
SHEET 9 / 59



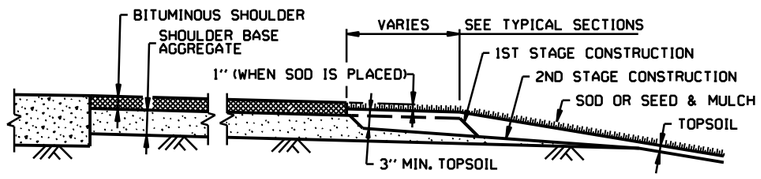
CONTOURING ROAD CUTS



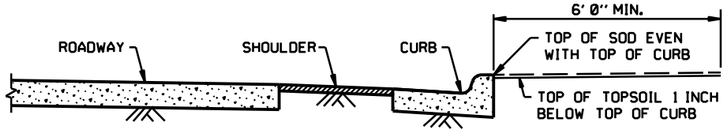
ROUNDING SHOULDERS AND BACKSLOPES



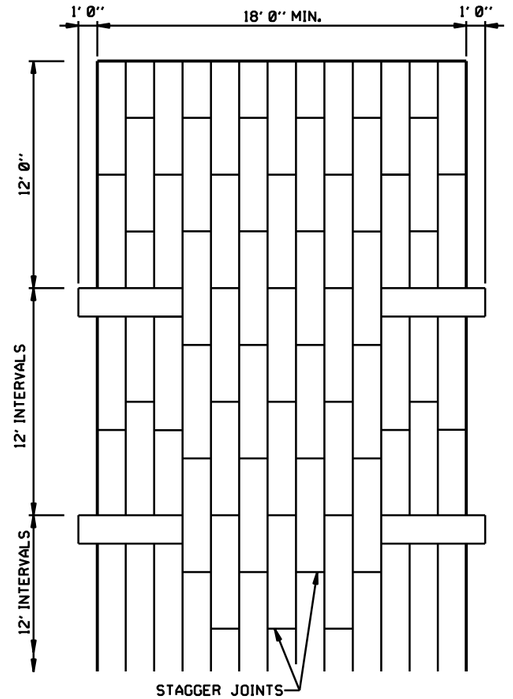
SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES



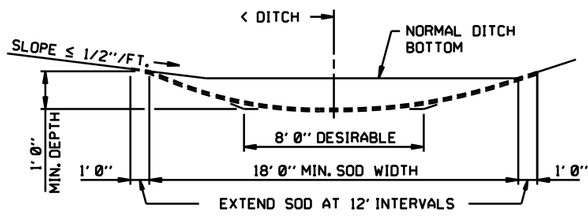
SHAPING AND TOPSOILING INSLOPES



SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED

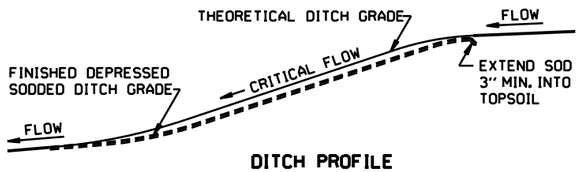


PLAN VIEW



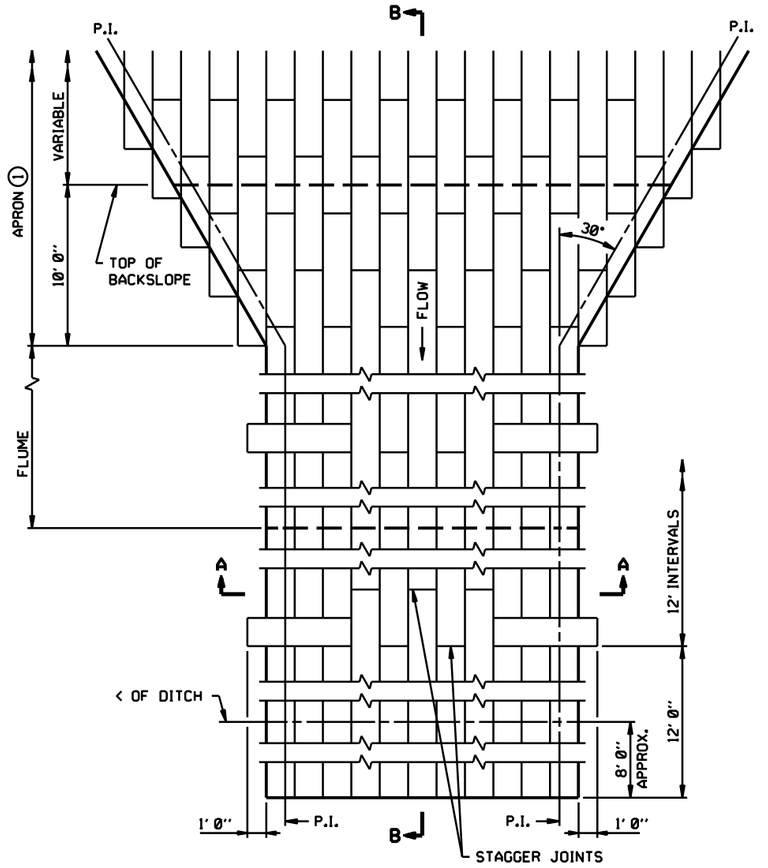
SODDED DITCH CROSS SECTION

WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.), FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.

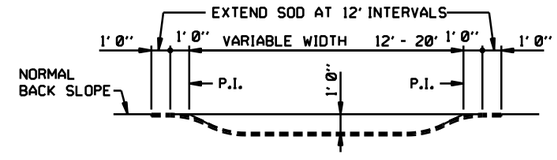


DITCH PROFILE

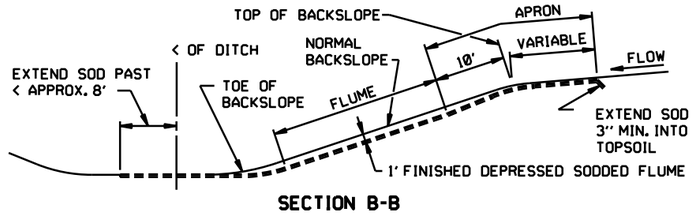
SODDED DITCH DETAILS



PLAN VIEW



SECTION A-A



SECTION B-B

SODDED FLUME DETAILS

NOTES:
SEE SPEC. 2575.3 FOR ADDITIONAL INFORMATION.
① CONSTRUCT TAPER AS DIRECTED BY THE ENGINEER.

REVISION:
APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

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

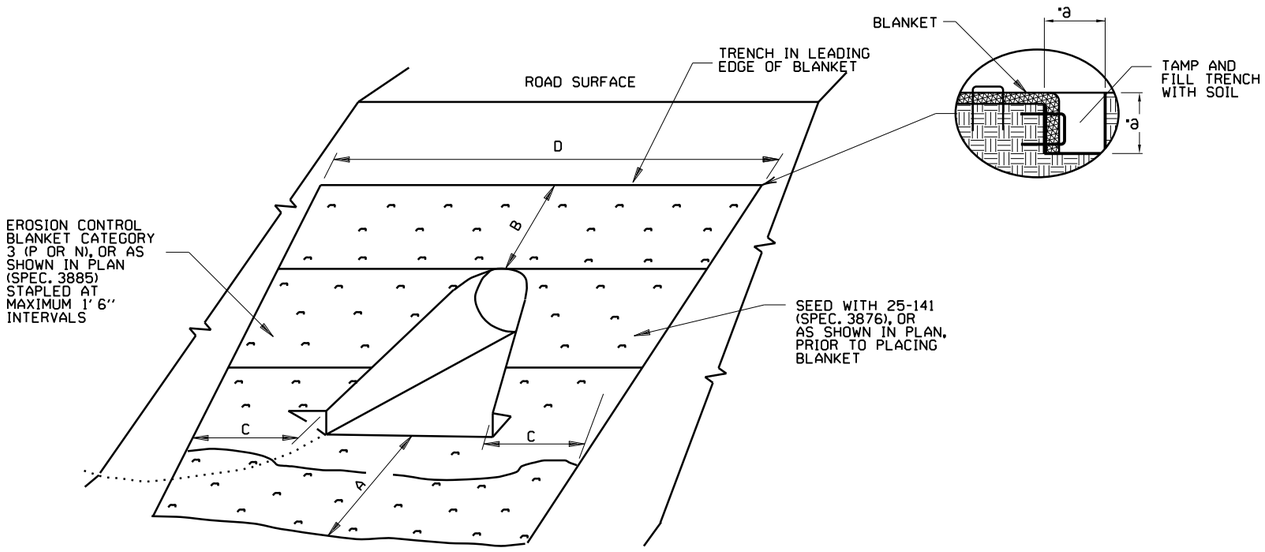
MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.404 | 1 OF 3

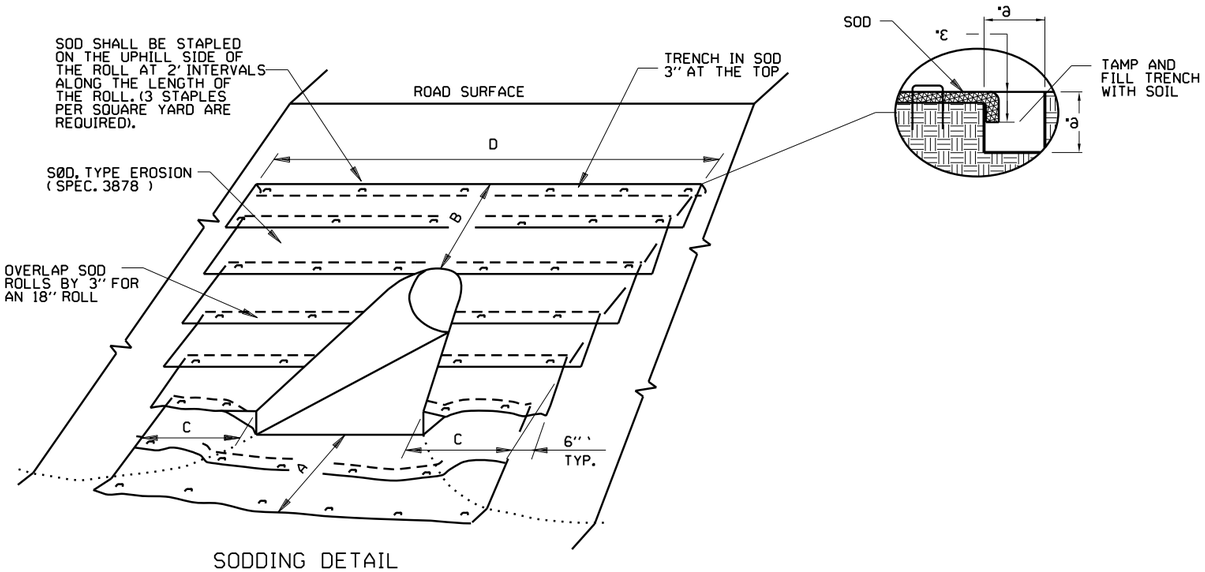
APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

PERMANENT EROSION CONTROL
ALONG ROADWAYS, DITCHES AND FLUMES

STATE PROJ. NO. (T.H.) SHEET NO. 10 OF 59 SHEETS



EROSION CONTROL BLANKET & SEED DETAIL



SODDING DETAIL

CULVERT INLET APRON①

CULVERT DIAMETER ②	SOD OR EROSION CONTROL BLANKET (SQ. YDS.)						"A"	"B"	"C"	"D"
	CIRCULAR AND ARCH PIPE METAL APRON (PLATE 3123, PLATE 3122)	CIRCULAR AND ARCH PIPE CONCRETE APRON (PLATE 3100, PLATE 3110)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:4 SLOPE (PLATE 3148)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:6 SLOPE (PLATE 3148)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:6 SLOPE (PLATE 3128)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:4 SLOPE (PLATE 3128)				
15"	9	9	8	8	N/A	N/A	3'	1.5'	3'	13'
18"	13	12	12	14	16	N/A	3'	3'	3'	16'
21"	14	14	14	16	18	14	3'	3'	3'	17'
24"	16	15	16	19	21	17	3'	3'	3'	18'
27"	N/A	20	N/A	N/A	N/A	N/A	3'	4.5'	3'	20'
30"	23	22	25	30	32	N/A	3'	4.5'	3'	22'
36"	34	34	39	48	51	37	4.5'	4.5'	4.5'	27'
42"	43	40	51	64	N/A	N/A	4.5'	6'	4.5'	30'
48"	54	50	66	82	N/A	N/A	4.5'	7.5'	4.5'	34'
54"	65	58	81	102	N/A	N/A	4.5'	9'	4.5'	37'
60"	69	59	91	115	N/A	N/A	4.5'	9'	4.5'	39'
66"	69	63	N/A	N/A	N/A	N/A	4.5'	9'	4.5'	39'
72"	78	72	99	122	N/A	N/A	4.5'	10.5'	4.5'	41'

CULVERT OUTLET APRON①

CULVERT DIAMETER ②	SOD OR EROSION CONTROL BLANKET (SQ. YDS.)						"A"	"B"	"C"	"D"
	CIRCULAR AND ARCH PIPE METAL APRON (PLATE 3123, PLATE 3122)	CIRCULAR AND ARCH PIPE CONCRETE APRON (PLATE 3100, PLATE 3110)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:4 SLOPE (PLATE 3148)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:6 SLOPE (PLATE 3148)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:6 SLOPE (PLATE 3128)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:4 SLOPE (PLATE 3128)				
15"	10	10	9	10	N/A	N/A	4.5'	1.5'	3'	13'
18"	13	13	12	14	15	N/A	6'	1.5'	3'	14'
21"	16	14	16	18	19	15	6'	1.5'	3'	15'
24"	18	18	18	21	22	18	7.5'	1.5'	3'	16'
27"	N/A	19	N/A	N/A	N/A	N/A	7.5'	1.5'	3'	17'
30"	23	23	24	28	29	N/A	9'	1.5'	3'	18'
36"	36	35	38	47	48	37	10.5'	1.5'	4.5'	23'
42"	43	40	47	58	N/A	N/A	12'	1.5'	4.5'	25'
48"	50	46	57	70	N/A	N/A	13.5'	1.5'	4.5'	27'
54"	57	50	67	84	N/A	N/A	15'	1.5'	4.5'	29'
60"	74	63	90	113	N/A	N/A	16.5'	1.5'	6'	33'
66"	75	67	N/A	N/A	N/A	N/A	16.5'	1.5'	6'	33'
72"	77	70	92	114	N/A	N/A	16.5'	1.5'	6'	34'

NOTES:

AREA SHOWN IN SQUARE YARDS IS FOR ONE CULVERT END.

QUANTITIES ARE CALCULATED TO INCLUDE SOD REQUIRED TO PROVIDE A 3" OVERLAP ON ALL 18" WIDE ROLLS. THIS ALLOWS FOR SHRINKAGE OF THE SOD.

FOR PIPE ARCHES USE EQUIVALENT PIPE DIAMETER TO APPROXIMATE AREA.

FOR CORRUGATED POLYETHYLENE PIPE METAL APRON (PLATE 3129), USE THE METAL APRON COLUMN (PLATE 3123).

AREAS AND DIMENSIONS ARE APPROXIMATE AND ARE BASED ON APRON SIDE SLOPES OF NO STEEPER THAN 1:2, UNLESS INDICATED AS FOR SAFETY APRONS.

CARE SHOULD BE TAKEN IN SELECTING SOD TO STABILIZE THE APRON. RIP-RAP SHOULD BE USED FOR FLOW VELOCITIES GREATER THAN 6 FPS.

① ADDITIONAL QUANTITIES MAY BE SHOWN IN THE PLAN OR REQUIRED BY THE ENGINEER.

② FOR ARCH PIPE USE CLOSEST CIRCULAR PIPE DIAMETER AND APRON SLOPE. (DIAMETERS LARGER THAN 72" REQUIRE SPECIAL DESIGNS.)

PLOTTED/REVISED: $$$$@DATE@$$$$

DISTRICT #: $@DISTRICT@$
IPLOT NAME: $$@IPLOT$NAME@$$
PATH & FILENAME: $$$@PATHFILENAME@$$$

REVISION:

APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

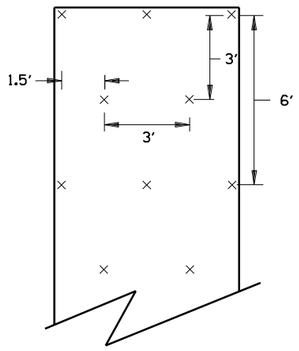
STANDARD PLAN 5-297.404 | 2 OF 3

APPROVED: 2-28-2017
REVISED:

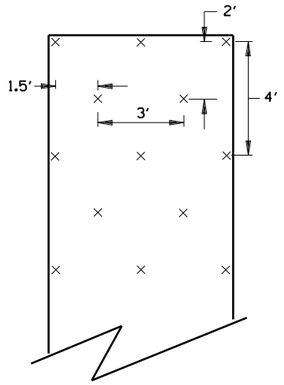
STATE DESIGN ENGINEER

PERMANENT EROSION CONTROL
TURF ESTABLISHMENT DETAIL AT CULVERT ENDS

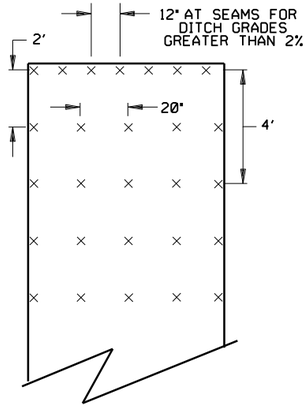
STATE PROJ. NO. (T.H.) SHEET NO. 11 OF 59 SHEETS



SLOPES FLATTER THAN 1:2
(120 STAPLES PER 100 SQ YD)

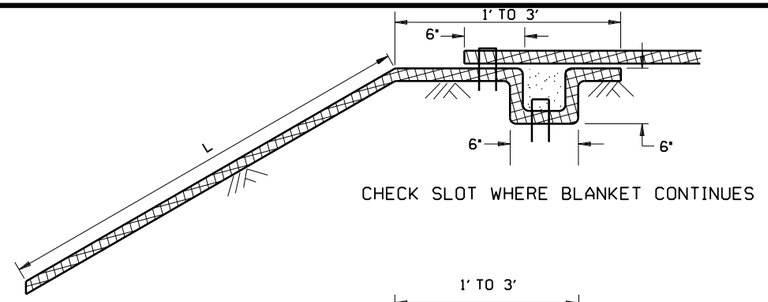


SLOPES 1:2 TO 1:1
(170 STAPLES PER 100 SQ YD)

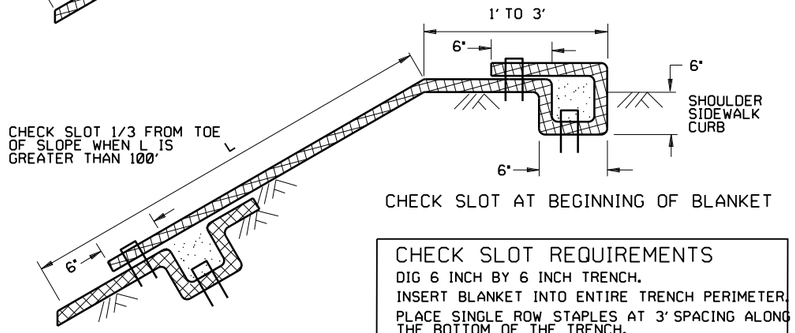


CHANNEL AND DITCH APPLICATIONS
(350 STAPLES PER 100 SQ YD)

BLANKET STAPLE PATTERN



CHECK SLOT WHERE BLANKET CONTINUES



CHECK SLOT AT BEGINNING OF BLANKET

CHECK SLOT REQUIREMENTS

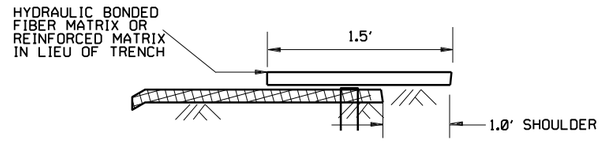
DIG 6 INCH BY 6 INCH TRENCH.

INSERT BLANKET INTO ENTIRE TRENCH PERIMETER.

PLACE SINGLE ROW STAPLES AT 3' SPACING ALONG THE BOTTOM OF THE TRENCH.

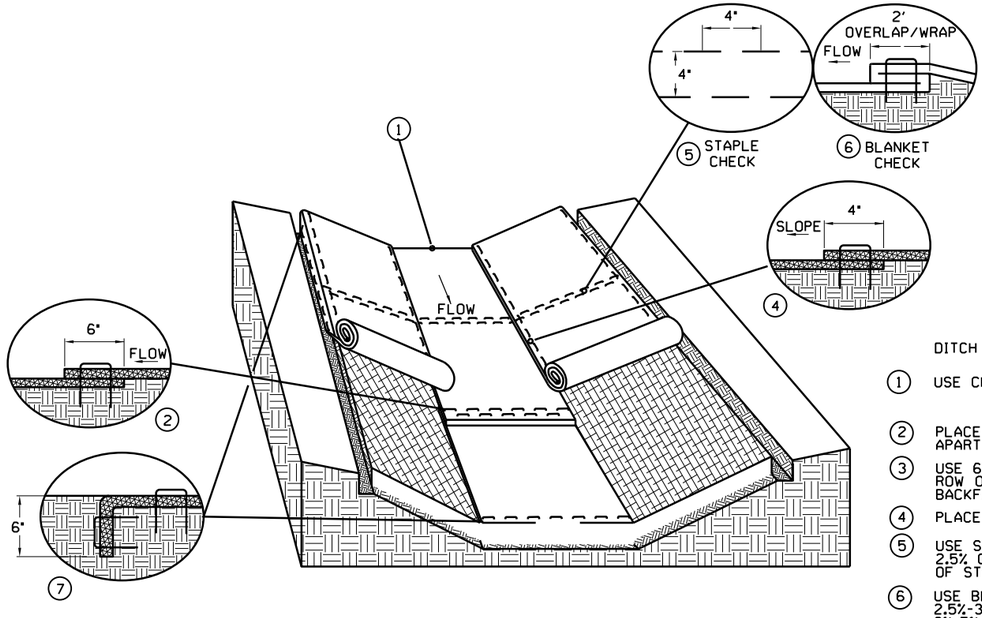
BACKFILL TRENCH WITH SOIL AND TAMP.

PLACE SINGLE ROW STAPLES AT 3' SPACING ON OVERLAP.

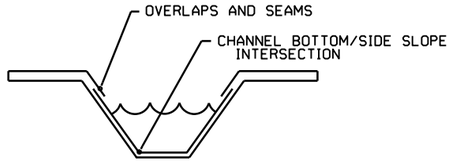


CHECK SLOT ALTERNATIVE
PLACE SINGLE ROW STAPLES AT 12" SPACING

CHECK SLOT DETAILS



DITCH BLANKET STAPLE DETAIL



DITCH BLANKET CRITICAL POINTS (7)

DITCH BLANKET STAPLE DETAIL NOTES

(1) USE CHECK SLOT DETAIL (NO ALTERNATES).

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

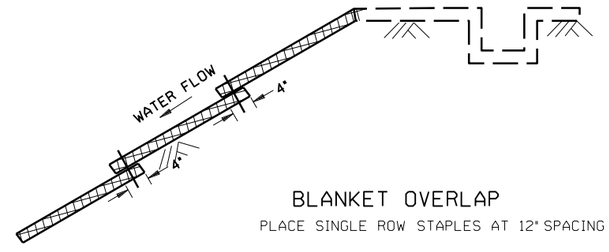
(3) USE 6" X 6" TRENCH TO PLACE BLANKET. PLACE SINGLE ROW OF STAPLES ON TOP AND TRENCH SIDES AT 12" SPACING. BACKFILL TRENCH WITH SOIL AND TAMP.

(4) PLACE SINGLE ROW OF STAPLES AT 12" SPACING.

(5) USE STAPLE CHECK FOR CHANNEL SLOPES LESS THAN 2.5% GRADE AT 100 FOOT INTERVALS. PLACE DOUBLE ROW OF STAPLES STAGGERED 4" APART AND AT 4" SPACING.

(6) USE BLANKET CHECKS FOR THE FOLLOWING SLOPES:
2.5%-3% 100 FT INTERVALS
3%-5% 50 FT INTERVALS
5%-7% 25 FT INTERVALS

(7) CRITICAL POINTS SHALL BE SECURED WITH PROPER STAPLE PATTERNS.



BLANKET OVERLAP
PLACE SINGLE ROW STAPLES AT 12" SPACING

GENERAL BLANKET INSTALLATION REQUIREMENTS

PREPARE SOIL AS PER SPECIFICATION 2574.

LAY PARALLEL OR PERPENDICULAR TO THE DIRECTION OF WATER FLOW.

OVERLAP ADJACENT STRIP EDGES A MINIMUM OF 4 INCHES.

OVERLAP BLANKET 6" (MIN.) AT EACH END. OVERLAP BOTTOM END OF UPPER BLANKET OVER TOP END OF LOWER BLANKET. STAPLE ALONG OVERLAP EVERY 1.5'.

THE UPPERMOST BLANKET OF ALL SLOPE APPLICATIONS MUST START IN A CHECK SLOT. IF SLOPE LENGTH (L) IS 100' OR GREATER, INSERT BLANKET INTO A CHECK SLOT 1/3 FROM THE BOTTOM OF THE SLOPE.

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MINNESOTA DEPARTMENT OF TRANSPORTATION

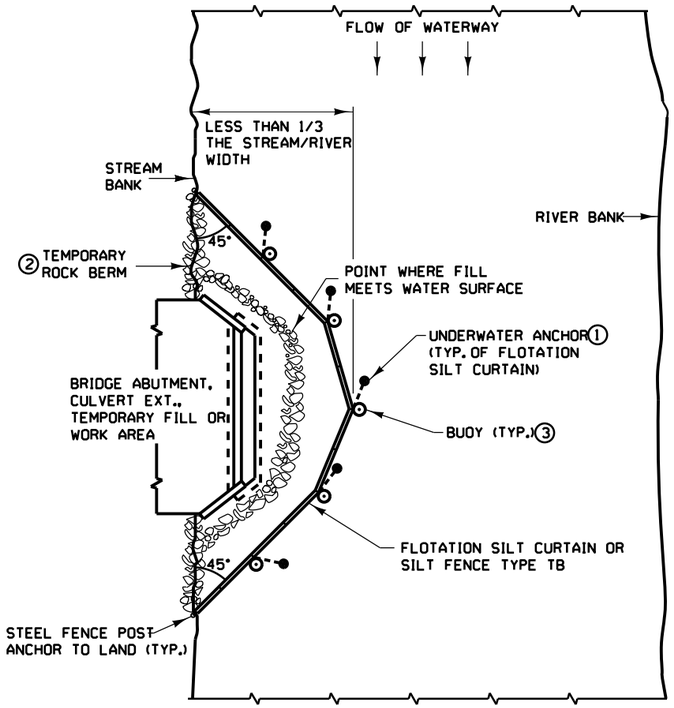
STANDARD PLAN 5-297.404 | 3 OF 3

APPROVED: 2-28-2017
REVISED:

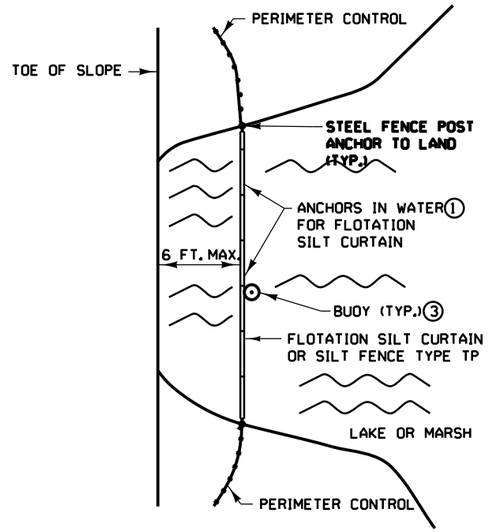
STATE DESIGN ENGINEER

PERMANENT EROSION CONTROL
BLANKET STAPLE PATTERN FOR SLOPES

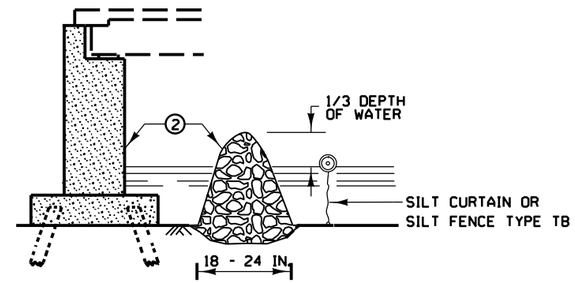
STATE PROJ. NO. (T.H.) SHEET NO. 12 OF 59 SHEETS



PLAN VIEW FOR STREAM ⑤



PLAN VIEW FOR LAKE OR MARSH ⑤



TEMPORARY ROCK BERM
FOR SEDIMENT CONTROL

INSTALLATION GUIDELINES
SILT FENCE TYPE TB

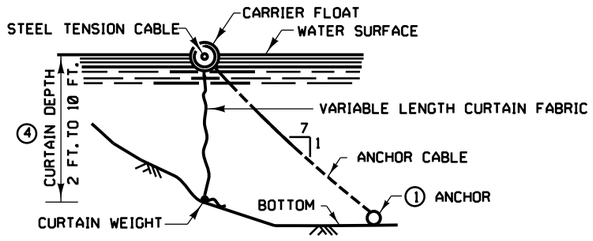
MINIMUM WATER DEPTH: 1 FT.
MAXIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.

INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN
TYPE: STILL WATER

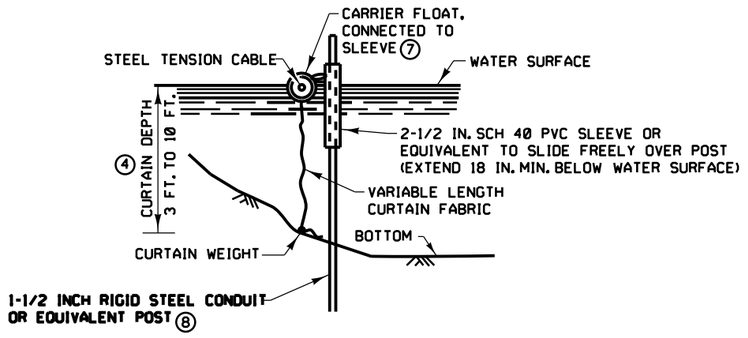
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 2 FT./SEC.
MAXIMUM WAVE HEIGHT: 1 FT

INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN
TYPE: MOVING WATER

MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.
MAXIMUM WAVE HEIGHT: 2 FT.

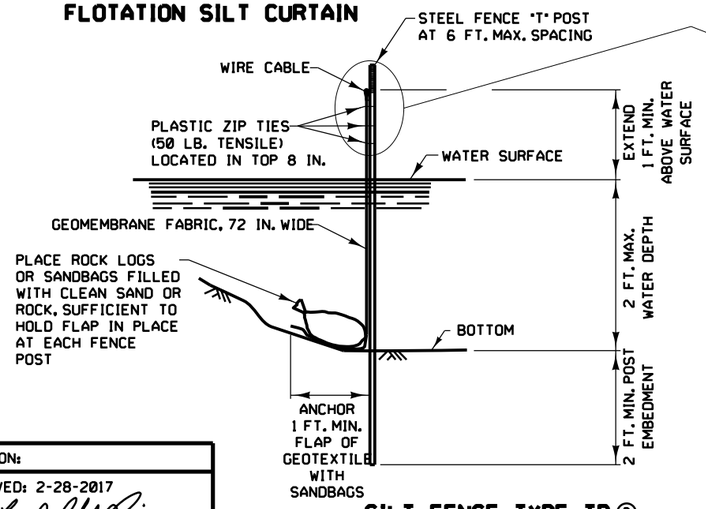


FLOTATION SILT CURTAIN

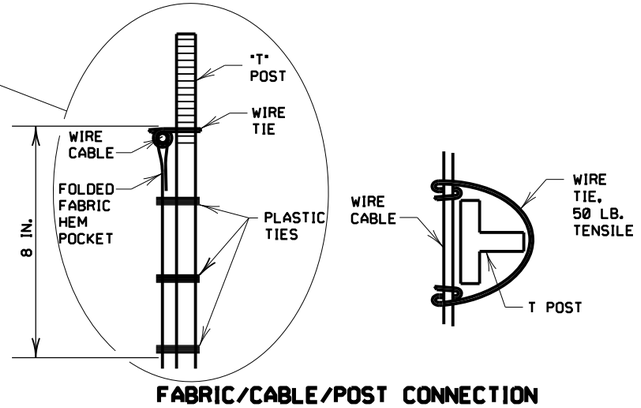


ALTERNATE FLOTATION SILT CURTAIN

FRONT VIEW FOR FLOTATION SILT CURTAIN



SILT FENCE TYPE TB ⑥



FABRIC/CABLE/POST CONNECTION

NOTES:

SEE SPECS. 2573, 3886, 3887 & 3893.

① FOR ANCHOR SPACING AND WEIGHT REQUIREMENTS, SEE SPEC. 2573.

② IN AREAS WHERE THE PLAN CALLS FOR RIPRAP 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 FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB FOR DETERMINING APPLICABILITY OF FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB.

⑤ SILT CURTAIN SHOULD BE REMOVED WHEN THE AREA CONTRIBUTING 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 40% 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 100 LBS. CONNECTION METHOD MUST ALLOW FOR SLEEVE TO MOVE FREELY ON POST.

⑧ PROVIDE SUFFICIENT NUMBER OF POST ANCHORS TO MAINTAIN SILT CURTAIN POSITION.

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MINNESOTA DEPARTMENT OF TRANSPORTATION

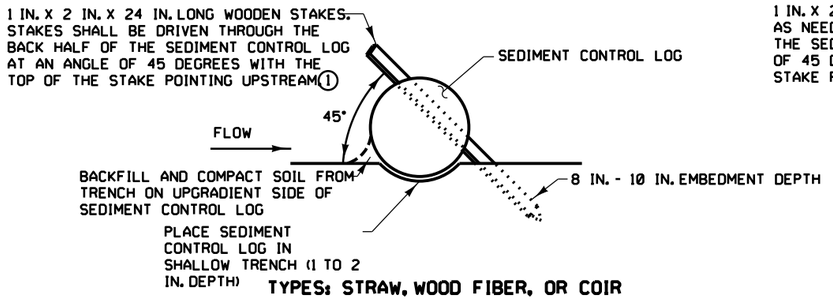
STANDARD PLAN 5-297.405 | 1 OF 8

APPROVED: 2-28-2017
REVISED:

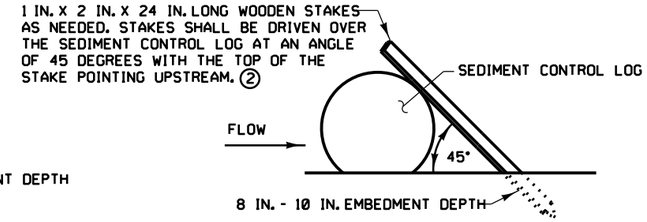
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
SILT CURTAIN OR SILT FENCE TYPE TB

STATE PROJ. NO. (T.H.) SHEET NO. 13 OF 59 SHEETS

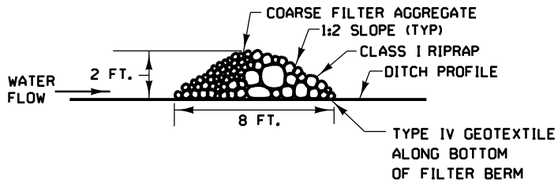


TYPES: STRAW, WOOD FIBER, OR COIR

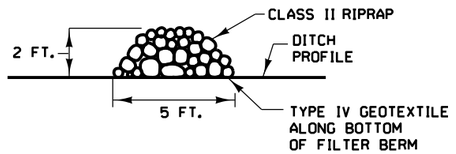


TYPES: WOOD CHIP, COMPOST, OR ROCK

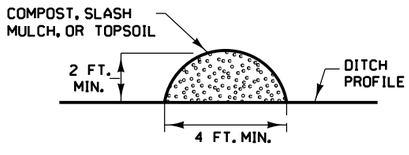
SEDIMENT CONTROL LOGS



TYPE 3 (ROCK WEEPER)

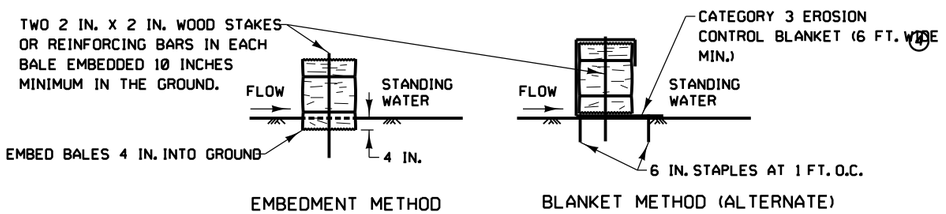


TYPE 5 (ROCK)



TYPE 1 (COMPOST), TYPE 2 (SLASH MULCH), OR TYPE 4 (TOPSOIL)

FILTER BERMS



EMBEDMENT METHOD

BLANKET METHOD (ALTERNATE)

BALE BARRIERS (3)

NOTES:

SEE SPECS. 2573, 3149, 3874, 3882, 3886, & 3897.

(1) SPACE BETWEEN STAKES SHALL BE A MAXIMUM OF 1 FOOT FOR DITCH CHECKS OR 2 FEET FOR OTHER APPLICATIONS.

(2) 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.

(3) TO BE USED FOR CRITICAL PERIMETER CONTROL AREAS WHERE STANDING WATER OCCURS (6 INCH MAX. DEPTH). BALES SHALL CONSIST OF TYPE 1 MULCH OF APPROXIMATELY 14 IN. X 18 IN. X 36 IN. LONG. BALES SHALL BE PLACED ON EDGE AND BUTTED TIGHT TO ADJACENT BALES.

(4) INSTEAD OF TRENCHING, PLACE BALE ON THE BLANKET AND WRAP BLANKET AROUND THE BALE. PLACE STAKE THROUGH BALE AND BLANKET.

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MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 2 OF 8

APPROVED: 2-28-2017
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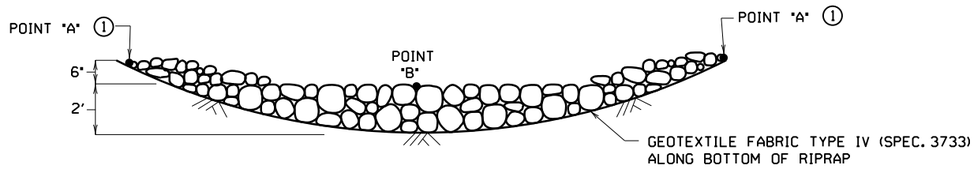
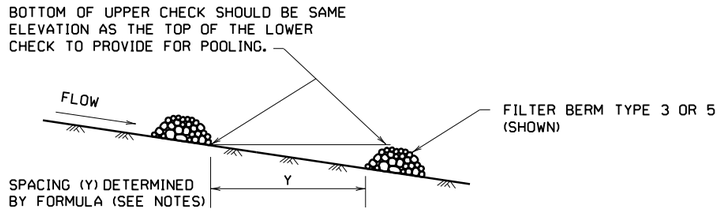
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
FILTER BERMS, SEDIMENT CONTROL LOGS, AND BALE BARRIERS

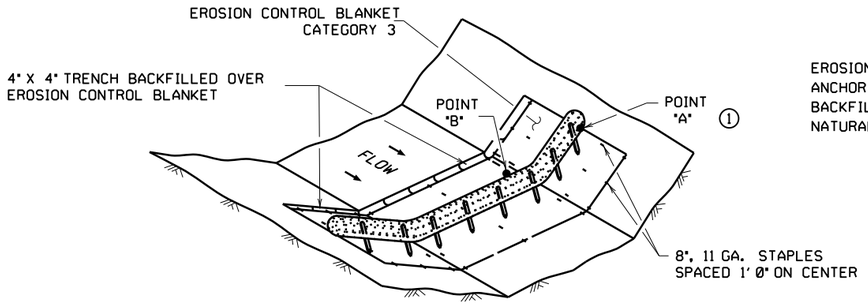
STATE PROJ. NO. (T.H.) SHEET NO. 14 OF 59 SHEETS

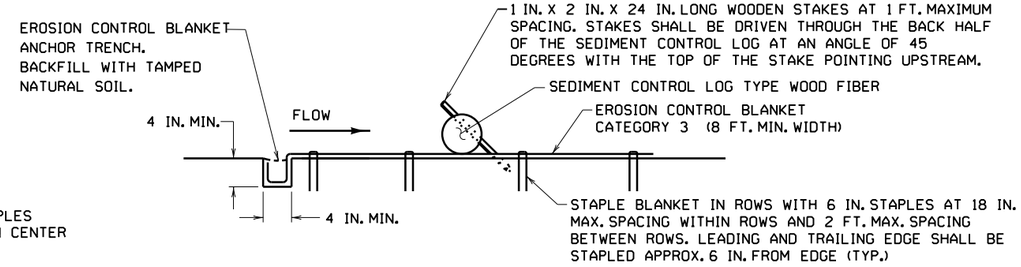


ROCK DITCH CHECKS
FILTER BERMS TYPE 3 (ROCK WEEPER) OR FILTER TYPE 5 (ROCK) ②③
(FOR USE ON ROUGH GRADED AREAS)

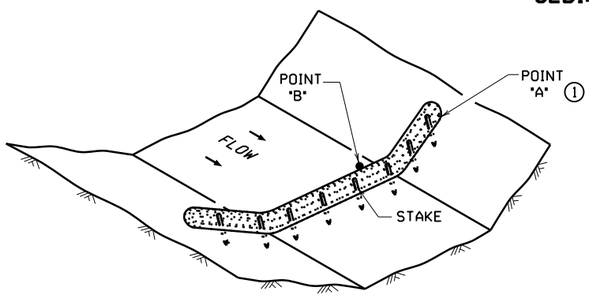


DITCH CHECK SPACING
(FOR ALL FILTER BERM TYPES)





SEDIMENT CONTROL LOG TYPE BLANKET SYSTEM ④



SEDIMENT CONTROL LOG TYPE WOOD FIBER, OR TYPE COMPOST ⑤
(FOR USE ON ROUGH GRADED AREAS)

NOTES:

SEE SPECS. 2573, 3601, 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:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\text{\% CHANNEL SLOPE}} \times 100$$

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.

② PERMANENT ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE ARE TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

③ DITCH GRADE 3% - 5%, MAX. FLOW VELOCITY 12 FT./SEC..

④ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 4.5 FT./SEC..

⑤ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 1.5 FT./SEC..

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MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 3 OF 8

APPROVED: 2-28-2017
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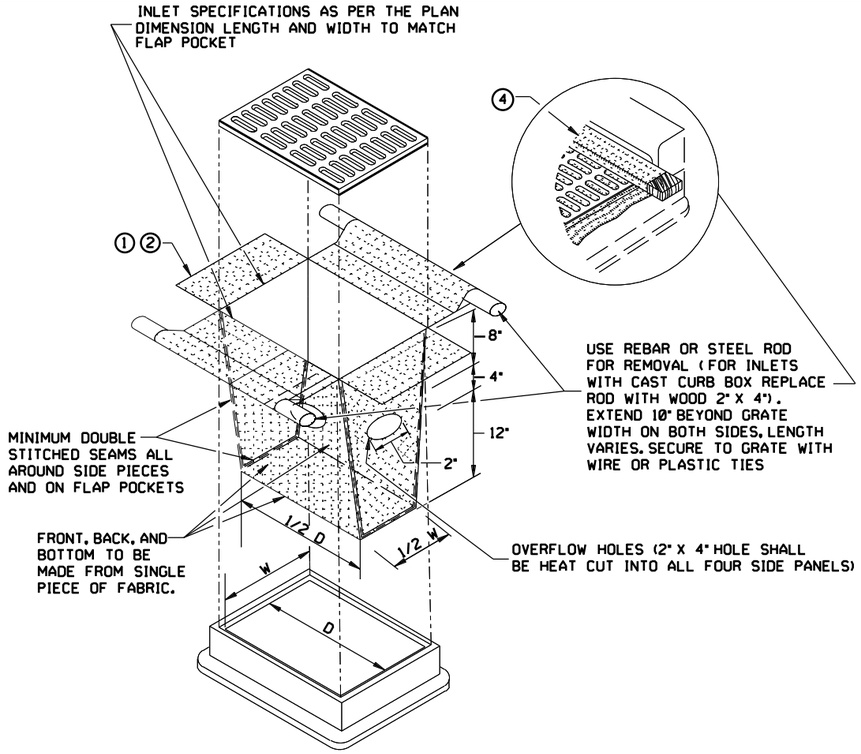
STATE DESIGN ENGINEER

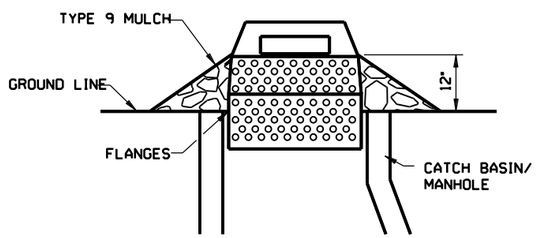
TEMPORARY SEDIMENT CONTROL
DITCH CHECK

STATE PROJ. NO. (T.H.) SHEET NO. 15 OF 59 SHEETS



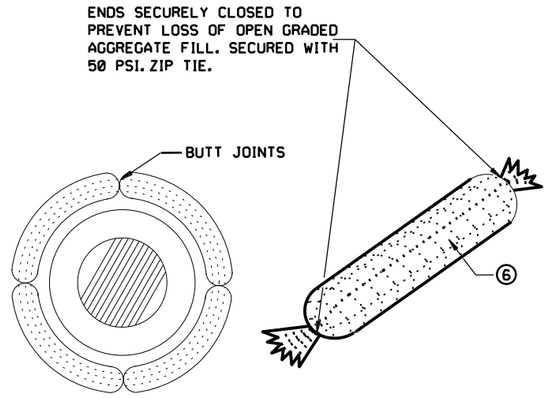
FILTER BAG INSERT③

(CAN BE INSTALLED IN ANY INLET TYPE
WITH OR WITHOUT A CURB BOX)

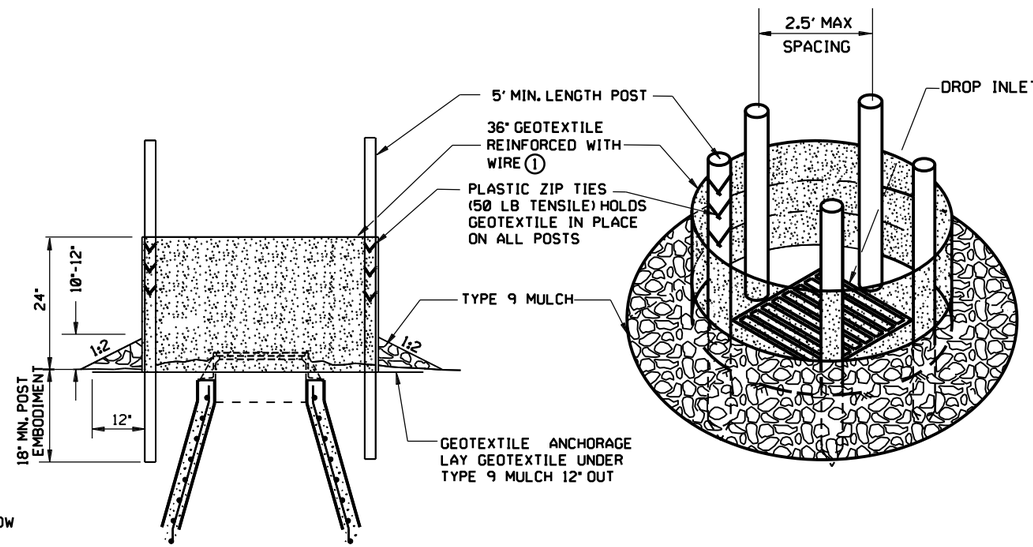


SEDIMENT CONTROL INLET HAT

NOTE:
THE SEDIMENT CONTROL BARRIER SHALL BE A METAL OR PLASTIC/POLYETHYLENE RISER SIZED TO FIT INSIDE THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING, FLANGES AND A LID/COVER.

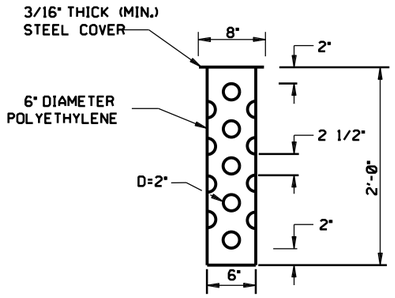


ROCK LOG/COMPOST LOG

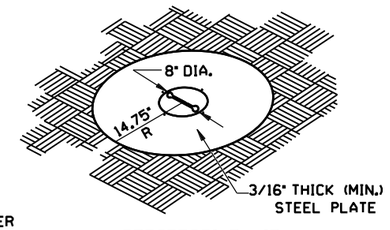


SILT FENCE RING AND ROCK FILTER BERM

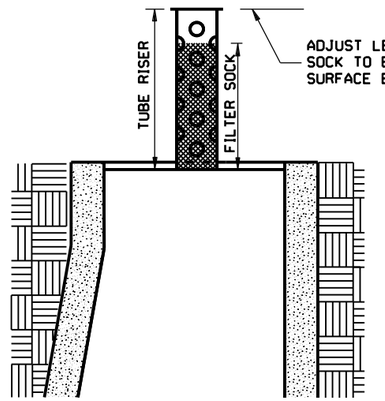
USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 or LESS



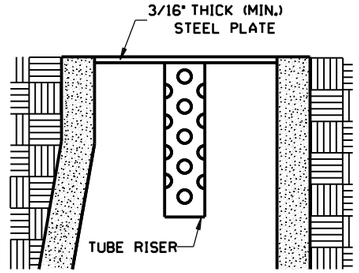
TUBE RISER



PERSPECTIVE VIEW



SECTION
(UP POSITION)



SECTION
(DOWN POSITION)

POP-UP HEAD

NOTES:
SEE SPECS. 2573, 3137, & 3886.

DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY THAT WOULD IMPEED TRAFFIC FLOW.

① ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886.

② FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED SHALL EXTEND A MINIMUM OF 10 INCHES AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

③ INSTALLATION NOTES:
DO NOT PLACE FILTER BAG INSERT IN INLETS SHALLOWER THAN 30 INCHES, MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE PLACED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE OF 3 INCHES BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES. WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3 INCH SIDE CLEARANCE.

④ FLAP POCKETS 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 POCKETS.

⑤ SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING OF THE ROADWAY.

⑥ 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). FILL ROCK LOG WITH OPEN GRADED AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION.

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HENN. CO. PROJ. NO. 0408 C.R. 202
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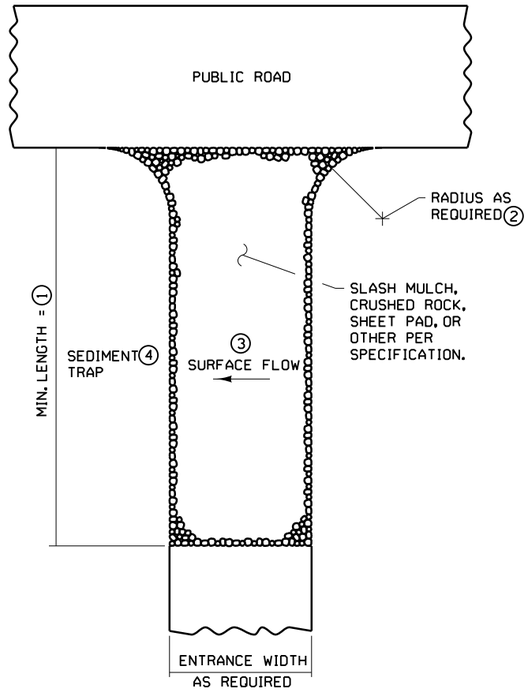
MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 4 OF 8

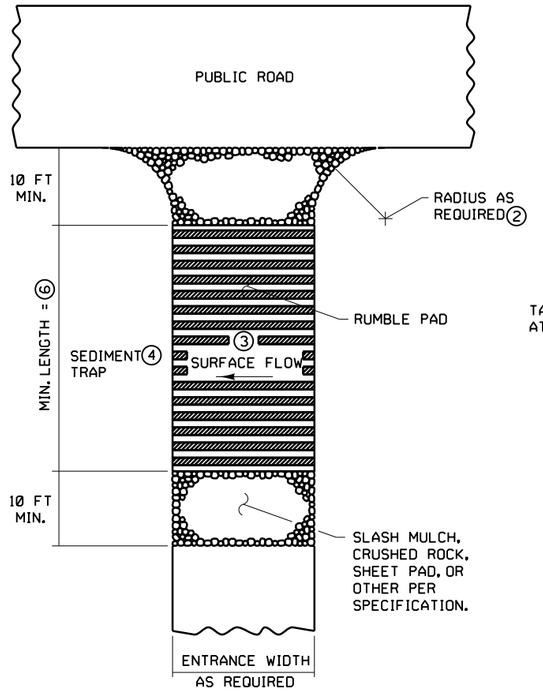
APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
STORM DRAIN INLET PROTECTION

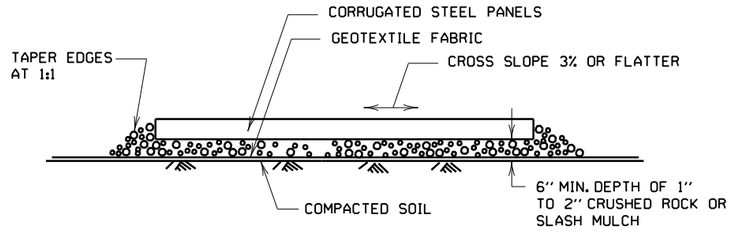
STATE PROJ. NO. (T.H.) SHEET NO. 16 OF 59 SHEETS



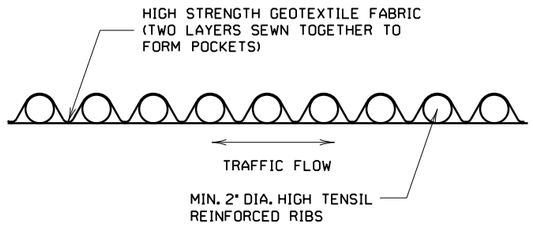
SLASH MULCH, CRUSHED ROCK, OR SHEET PAD CONSTRUCTION EXIT ⑤⑦



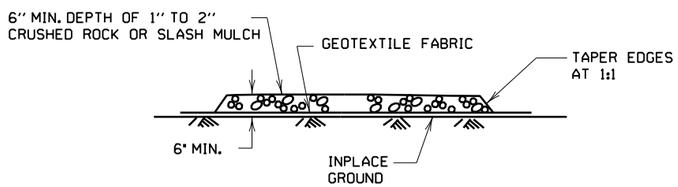
RUMBLE PAD CONSTRUCTION EXIT ⑤⑦



RUMBLE PAD



SHEET PAD



SLASH MULCH OR CRUSHED ROCK

NOTES:

SEE SPECS. 2573 & 3882.

① MINIMUM LENGTH SHALL BE THE GREATER OF 50 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 RUNOFF FROM DISTURBED AREAS FLOWS TOWARD 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 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.

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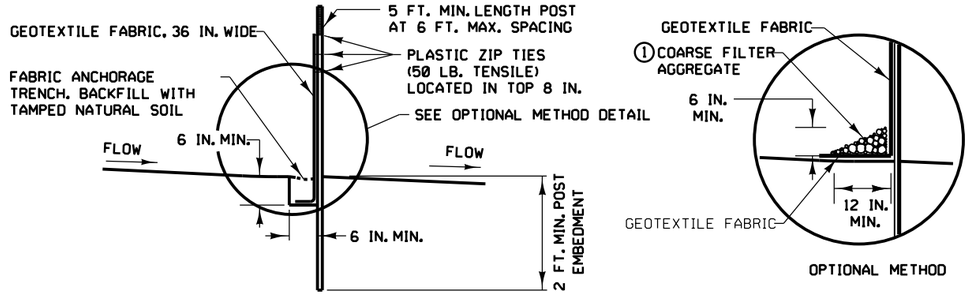
MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 5 OF 8

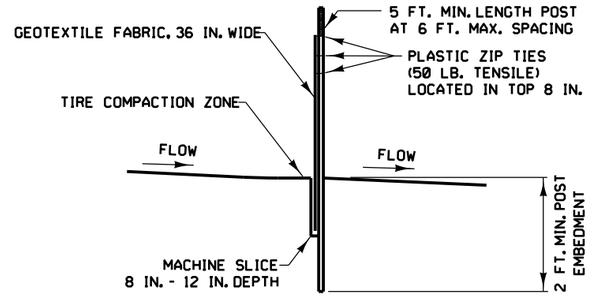
APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
STABILIZED CONSTRUCTION EXIT

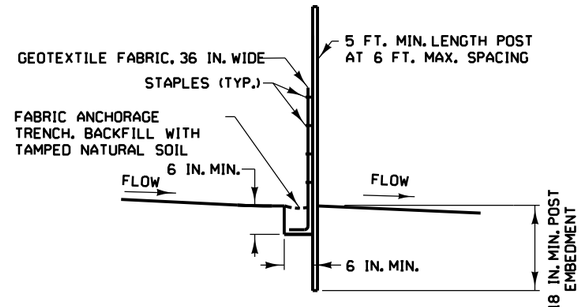
STATE PROJ. NO. (T.H.) SHEET NO. 17 OF 59 SHEETS



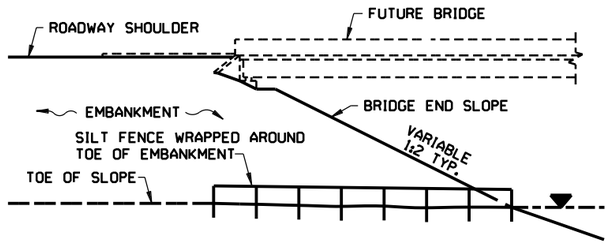
SILT FENCE TYPE HI ②
(HAND INSTALLED)



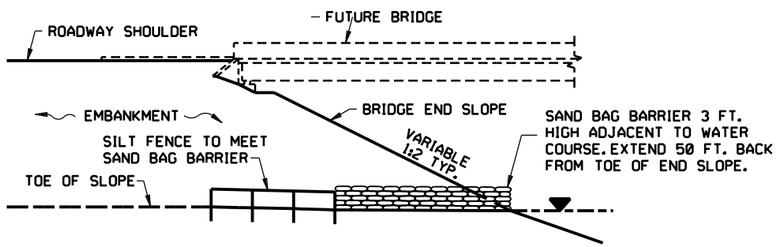
SILT FENCE TYPE MS ②
(MACHINE SLICED)



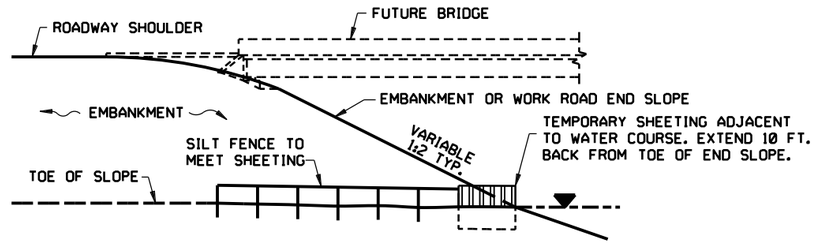
SILT FENCE TYPE PA ③
(PREASSEMBLED)



SILT FENCE ONLY ④

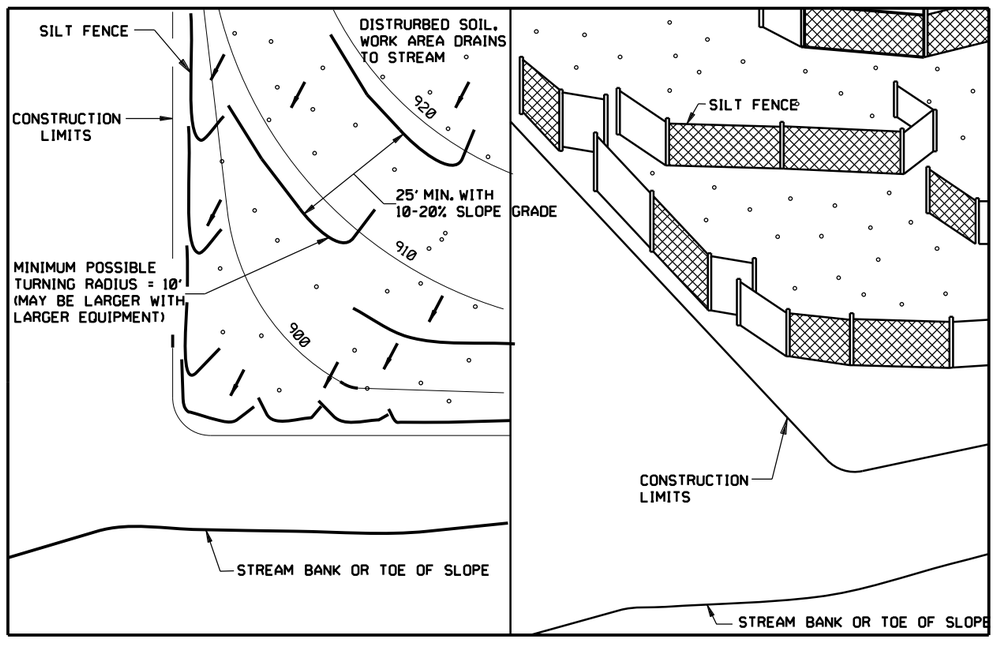


SILT FENCE WITH SAND BAGS ⑤



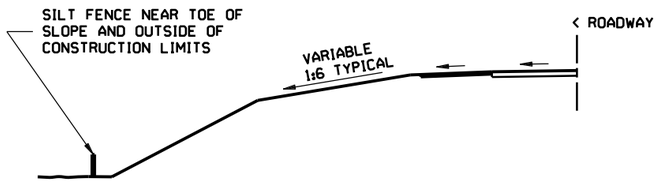
SILT FENCE WITH SHEETING ⑥

INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER



PLAN VIEW **PERSPECTIVE VIEW**

J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:

SEE SPECS. 2573, 3149 & 3886.

① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

② TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 1 ACRE.

③ TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 0.25 ACRE.

④ WATER COURSE FLOW VELOCITY: STANDING.
CONTRIBUTING SLOPE AREA: 1./2 ACRE.

⑤ WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC.
CONTRIBUTING SLOPE AREA: 1. ACRE.

⑥ WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC.
CONTRIBUTING SLOPE AREA: 3 ACRES.

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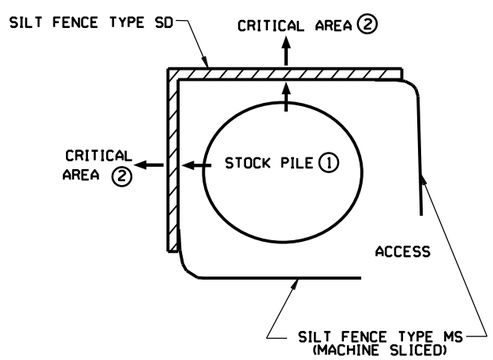
MINNESOTA DEPARTMENT OF TRANSPORTATION

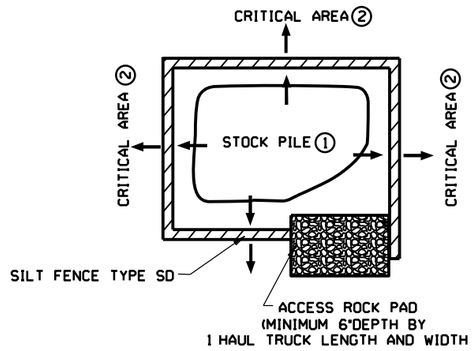
STANDARD PLAN 5-297.405 | 6 OF 8

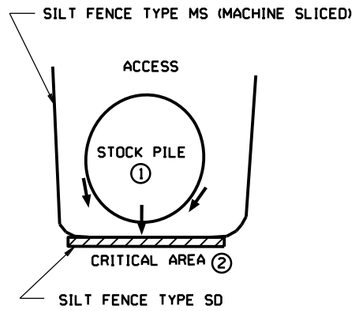
APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
SILT FENCE

STATE PROJ. NO. (T.H.) SHEET NO. 18 OF 59 SHEETS

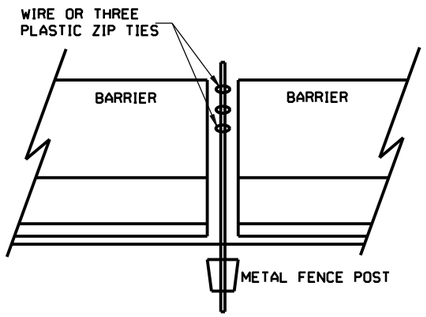




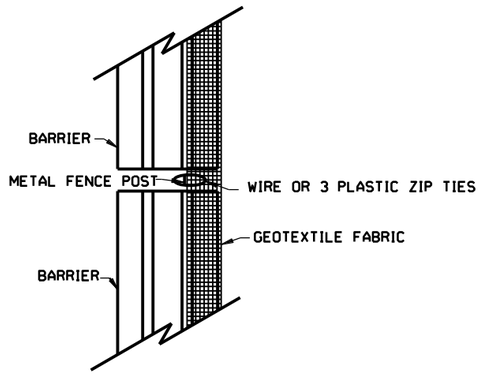


STOCK PILE CONTAINMENT

STOCKPILE SEDIMENT CONTROL

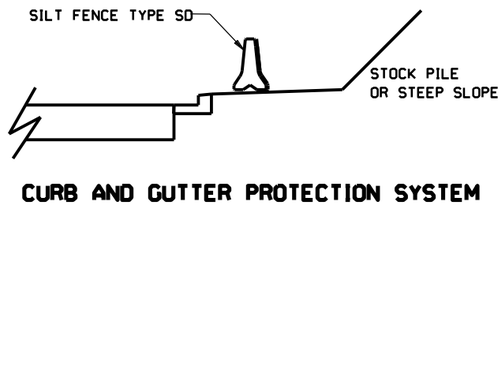


PROFILE VIEW

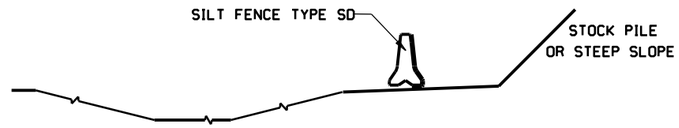


TOP VIEW

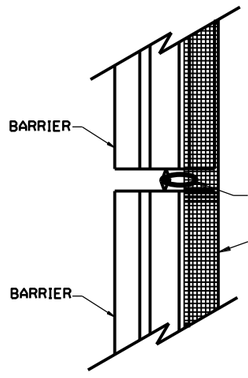
SILT FENCE TYPE SD (SUPER DUTY)
BARRIER WITHOUT LOOP BARS



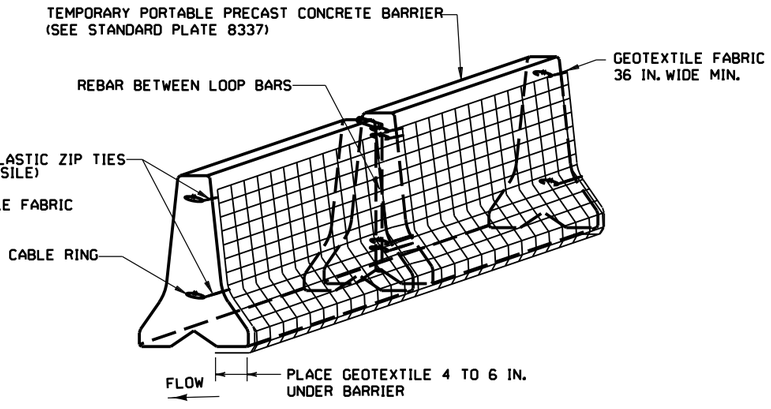
CURB AND GUTTER PROTECTION SYSTEM



DITCH PROTECTION SYSTEM



TOP VIEW



PERSPECTIVE VIEW

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.

(1) 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.

(2) CRITICAL AREAS INCLUDE WETLANDS, JUDICIAL DITCHES, STREAMS, WATER BODIES, AND OTHER AREAS REQUIRING PROTECTION.

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MINNESOTA DEPARTMENT OF TRANSPORTATION

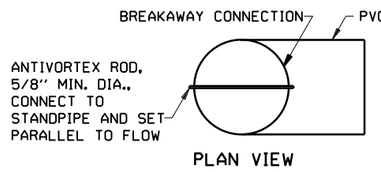
STANDARD PLAN 5-297.405 | 7 OF 8

APPROVED: 2-28-2017
REVISED:

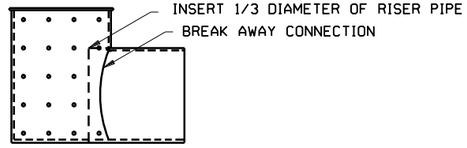
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
SUPER DUTY SILT FENCE

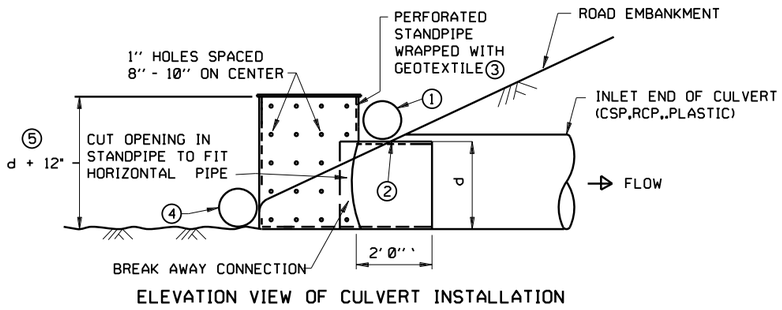
STATE PROJ. NO. (T.H.) SHEET NO. 19 OF 59 SHEETS



PLAN VIEW



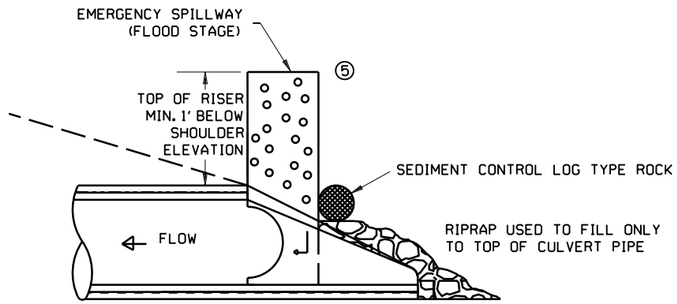
CULVERT STANDPIPE



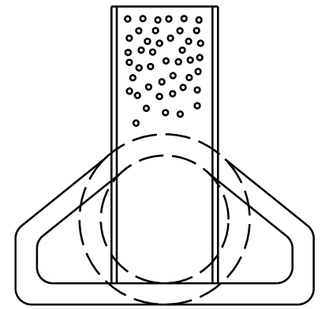
ELEVATION VIEW OF CULVERT INSTALLATION

CULVERT STANDPIPE INSERT (D-RISER)

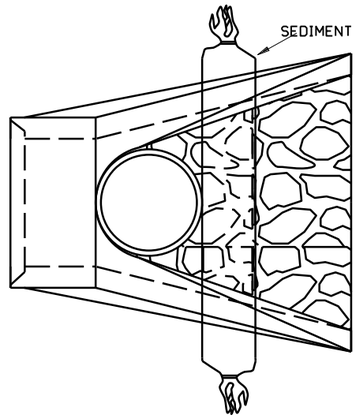
d= CULVERT SIZE: 12" - 36"



LONGITUDINAL SECTION



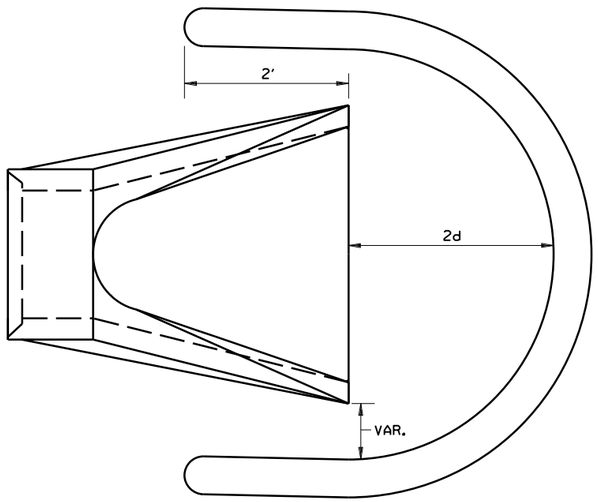
END VIEW



TOP VIEW

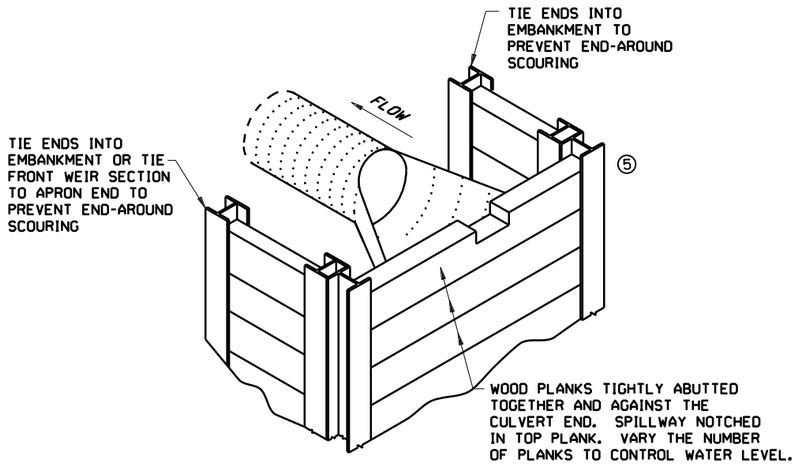
NOTE: SEDIMENT CONTROL LOG TYPE ROCK MAY BE WRAPPED AROUND RISER

CULVERT STANDPIPE INSERT (D-RISER)



SEDIMENT CONTROL LOG WEIR (COMPOST, WOOD CHIP, OR ROCK)

d = CULVERT SIZE: 12"-36"



WOOD PLANK WEIR

NOTES:

SEE SPECS. 2573, 3891 & 3893.

FOR USE WHEN TEMPORARY PONDING IS NEEDED IN DITCH SECTIONS FOR SEDIMENT CONTROL.

MANUFACTURED ALTERNATIVES LISTED ON MnDOT'S APPROVED PRODUCTS LIST MAY BE SUBSTITUTED AT NO ADDITIONAL COST.

① ROCK LOG OR SANDBAG TO HOLD STANDPIPE AND ACT AS A SEAL BETWEEN RISER PIPE AND CULVERT.

② PLACE CULVERT APRON AND SLIDE TEMPORARY STANDPIPE INTO CSP OR RCP CULVERT.

③ ALL GEOTEXTILE USED FOR CULVERT PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886 FOR MACHINE SLICED.

④ ROCK LOG OR RIP RAP TO HOLD STANDPIPE AND ACT AS A FILTER BETWEEN RISER PIPE AND CULVERT.

⑤ HEIGHT OVERFLOW NOT TO CAUSE FLOODING OF ROAD OR ADJACENT PROPERTIES.

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

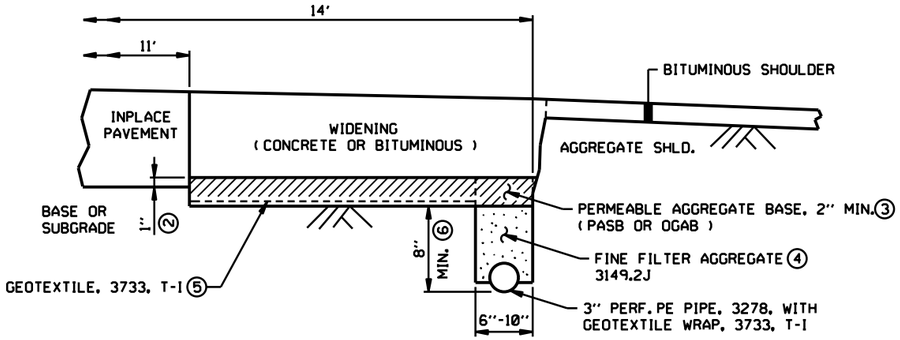
MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 8 OF 8

APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
CULVERT END CONTROLS

STATE PROJ. NO. (T.H.) SHEET NO. 20 OF 59 SHEETS



SUBSURFACE DRAIN, WIDENED PAVEMENT DESIGN WITH PAVEMENT EDGE DRAIN①

NOTES:

① SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS.

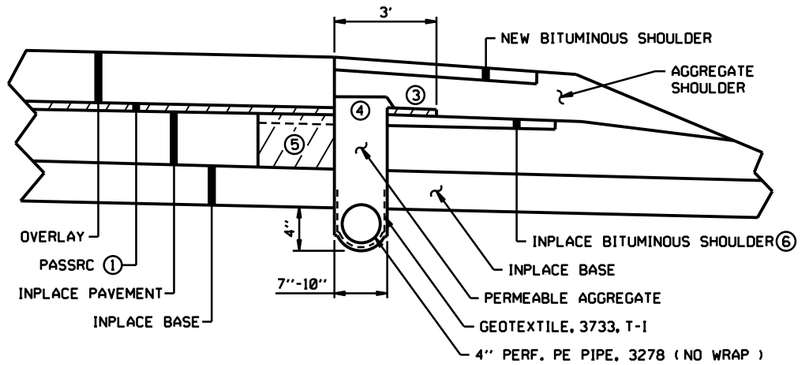
② PERMEABLE BASE SHOULD OVERLAP PAVEMENT MAXIMUM AMOUNT PERMITTED BY STRUCTURAL DESIGN, BUT BOTTOM SHOULD NOT BE ABOVE THE BOTTOM OF INPLACE PAVEMENT.

③ AS REQUIRED BY DESIGN STANDARDS.
PASB - PERMEABLE ASPHALT STABILIZED BASE.
OGAB - OPEN GRADED AGGREGATE BASE.
PAB - OPTION

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 PAB, BOTTOM OF PIPE SHOULD BE A MINIMUM OF 3" BELOW BASE/SUBGRADE INTERFACE OR A MINIMUM OF 8", WHICHEVER IS DEEPER.



SUBSURFACE DRAIN, PERMEABLE BASE & DRAIN USED WITH PASSRC ①②

NOTES:

① PASSRC - PERMEABLE ASPHALT STABILIZED STRESS RELIEF COURSE.

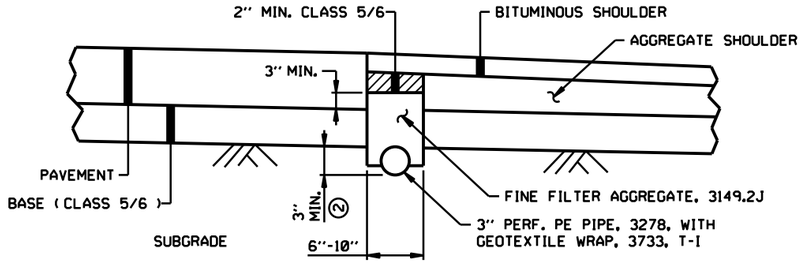
② SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS.

③ WIDTH AS NEEDED TO SUPPORT PAVER TRACK.

④ PERMEABLE AGGREGATE TO BE HEAPED 2" ABOVE TOP OF PASSRC AFTER COMPACTION.

⑤ INTERCEPTOR DRAINS TYPICALLY USED AT THIS LOCATION. SEE DETAIL & SPECIAL PROVISIONS IF APPLICABLE.

⑥ IF THE BITUMINOUS SHOULDER REMAINS INPLACE, THE PASSRC AND SHOULDER CAN BE REMOVED BY MILLING, TRENCHING, OR OTHER METHOD, PROVIDED THE REMAINING BITUMINOUS SHOULDER IS NOT DISTURBED/DISPLACED.

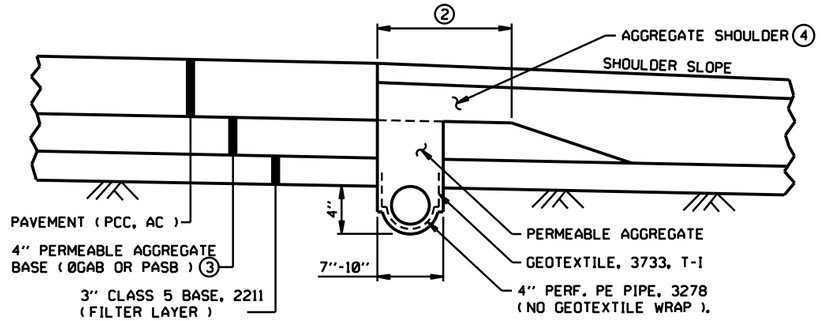


SUBSURFACE DRAIN, PAVEMENT EDGE DRAIN TYPE ①

NOTES:

① SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS.

② DESIGN FOR 15" COVER FROM TOP OF PIPE TO TOP OF SHOULDER (12" MINIMUM).



SUBSURFACE DRAIN, PERMEABLE AGGREGATE BASE TYPE①

(RIGHT SIDE OF ROADWAY SHOWN)

NOTES:

① SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS. TYPICAL SECTION SHOWN IS FOR PERMEABLE ASPHALT STABILIZED BASE (PASB). DRAIN TRENCH FOR OPEN GRADED AGGREGATE BASE (OGAB) IS MOVED 6" AWAY FROM THE PAVEMENT EDGE.

② USE 36" FOR EITHER PASB OR OGAB UNDER PCC PAVEMENT. USE 12" FOR PASB UNDER AC PAVEMENT.

③ OGAB - OPEN GRADED AGGREGATE BASE.
PASB - PERMEABLE ASPHALT STABILIZED BASE.
USE PASB WITH AC PAVEMENTS.
USE PASB OR OGAB WITH PCC PAVEMENTS.

④ CLASS 3, 5 OR 6, AS SPECIFIED

REVISION:

APPROVED: 8-6-2014
DIRECTOR, OFFICE OF MATERIALS AND ROAD RESEARCH

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.432 | 1 OF 1

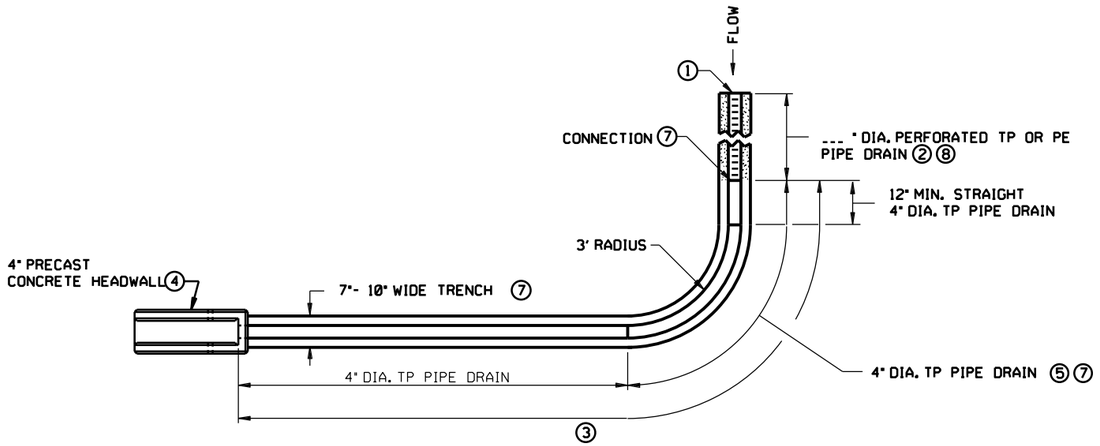
APPROVED: 8-6-2014
REVISED:

STATE DESIGN ENGINEER

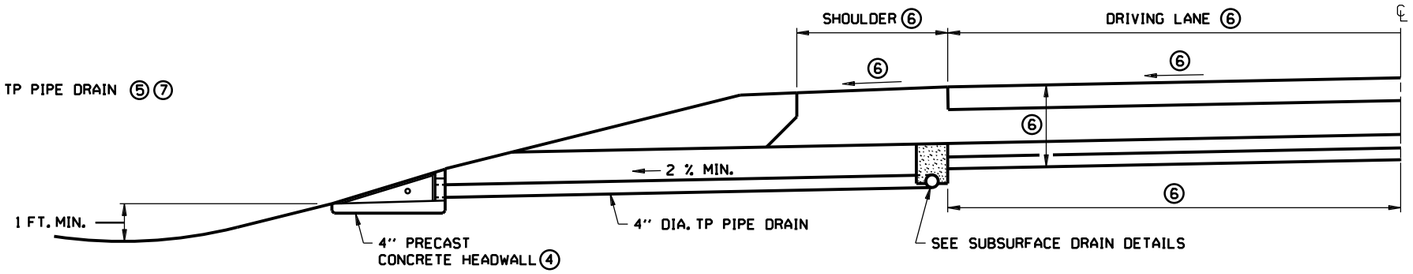
SUBSURFACE DRAINS

STATE PROJ. NO. (T.H.) SHEET NO. 21 OF 59 SHEETS

DISTRICT #: $$@DISTRICT@$
IPLOT NAME: $$@IPLOT$NAME@$$$
PATH & FILENAME: $$$@PATHFILENAME@$$$
PLOTTED/REVISED: $$$$@DATE@$$$$

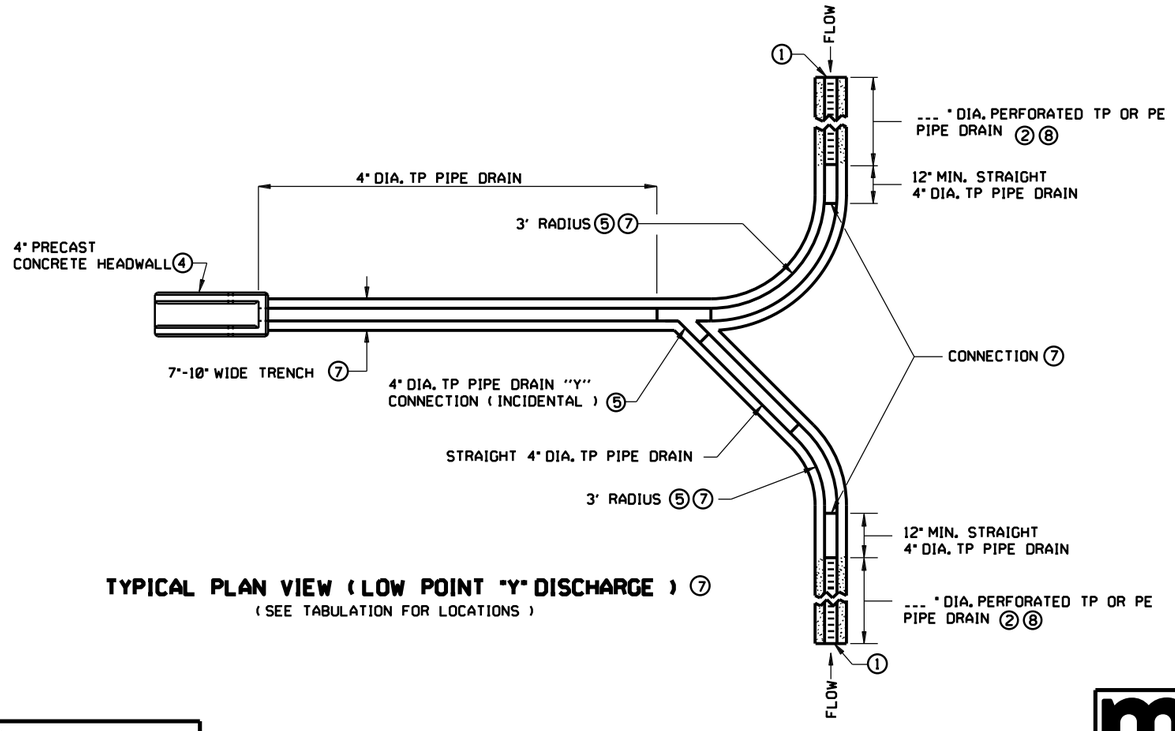


TYPICAL PLAN VIEW (SINGLE DISCHARGE 17
(SEE TABULATION FOR LOCATIONS)



SECTION VIEW

TYPICAL EDGE DRAIN AND DISCHARGE CROSS SECTION 7
(SEE TABULATION FOR LOCATIONS)



TYPICAL PLAN VIEW (LOW POINT "Y" DISCHARGE) 7
(SEE TABULATION FOR LOCATIONS)

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, -- INCH PERFORATED TP OR PE PIPE DRAIN.
3. LENGTH INCLUDED AND PAID FOR AS SPEC. 2502, 4 INCH DIA. TP PIPE DRAIN.
4. PRECAST CONCRETE HEADWALL STANDARD PLATE 3131 PAID FOR AS SPEC. 2502, 4 INCH PRECAST CONCRETE HEADWALL.
5. DETAILS OF CONNECTION AND COUPLING TO PIPE SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR " Y " AND EXTRA CONNECTION, 11 INCH TP PIPE AND COUPLING TO BE INCIDENTAL.
6. SEE ROADWAY TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.
7. SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS.
8. 3 INCH OR 4 INCH DIAMETER.

REVISION:

APPROVED: 8-6-2014
DIRECTOR, OFFICE OF MATERIALS AND ROAD RESEARCH

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

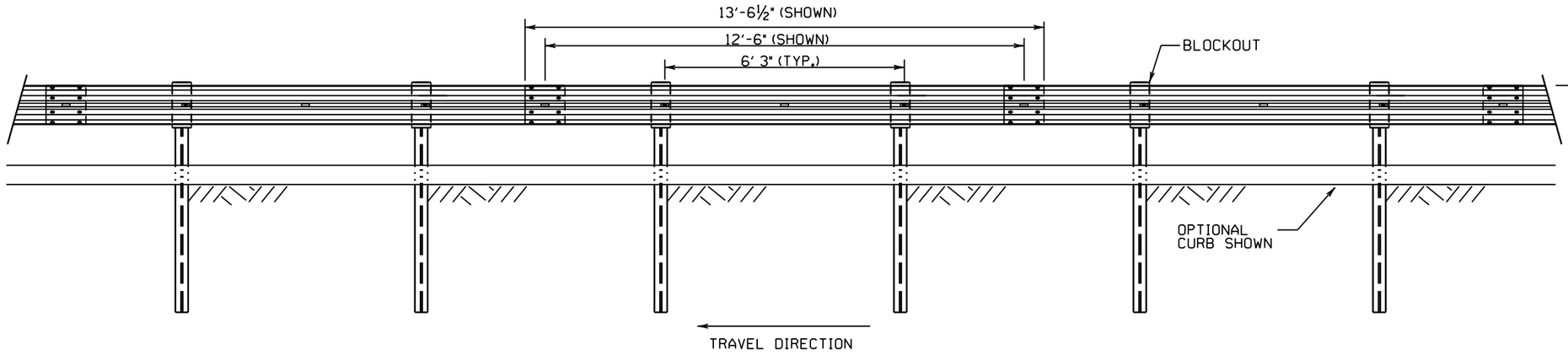
STANDARD PLAN 5-297.433 | 1 OF 1

APPROVED: 8-6-2014
REVISED:

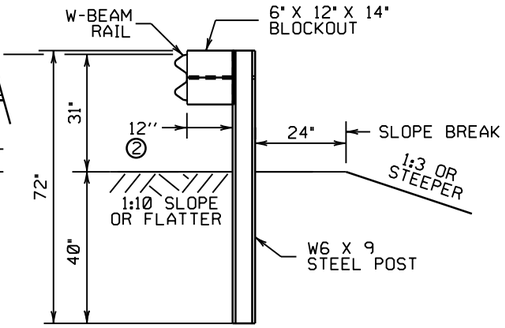
STATE DESIGN ENGINEER

SUBSURFACE DRAINS
OUTLET PIPES FOR EDGE AND SUBCUT DRAINS

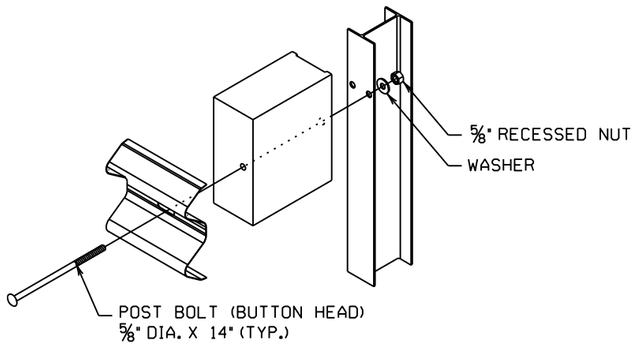
STATE PROJ. NO. (T.H.) SHEET NO. 22 OF 59 SHEETS

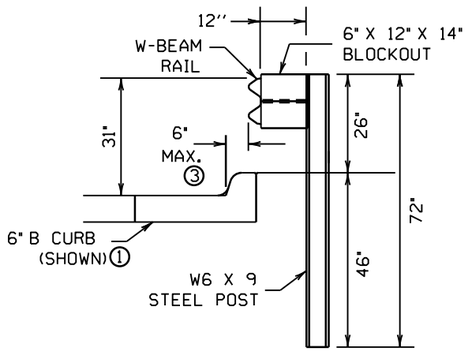


FRONT VIEW

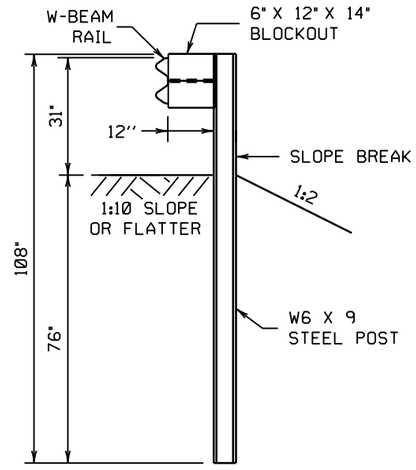


SIDE VIEW

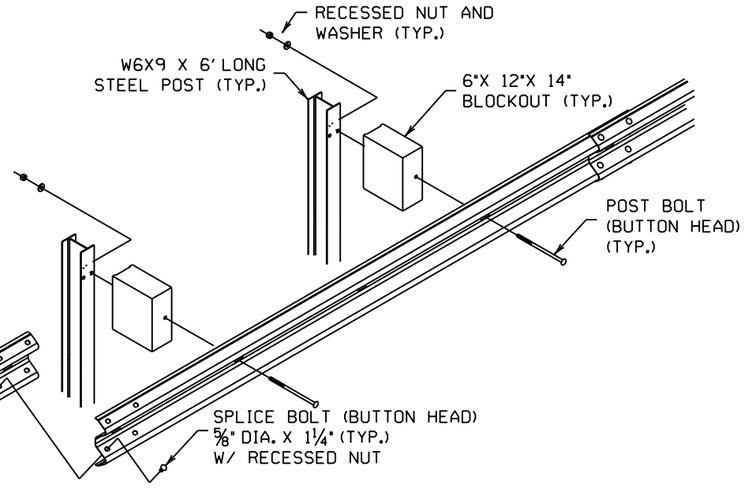




TYPE 31 GUARDRAIL
WITH CURB



TYPE 31 GUARDRAIL WITH
1:2 BACK SLOPE AT POST



ISOMETRIC VIEW

NOTES:

GUARDRAIL IS PLACED ON SLOPES 1:10 OR FLATTER WITH SLOPE EXTENDING A MINIMUM 24" BEHIND POST TO SLOPE BREAK POINT.

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

ALL RAIL AND HARDWARE COMPONENTS PER AASHTO SPEC. M 180

① B CURB OR D CURB ACCEPTABLE.

② MAXIMUM OF 24" MAY BE USED WHERE UNDERGROUND POST OBSTRUCTIONS ARE ENCOUNTERED.

③ 0" TO 6" MAXIMUM.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

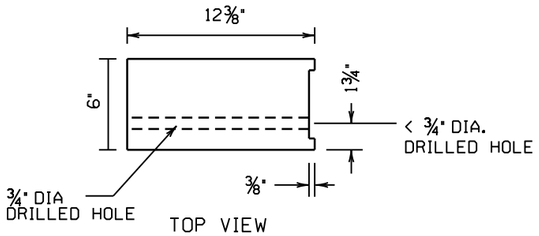
STANDARD PLAN 5-297.690 | 1 OF 2

APPROVED: 7-19-2016
REVISED:

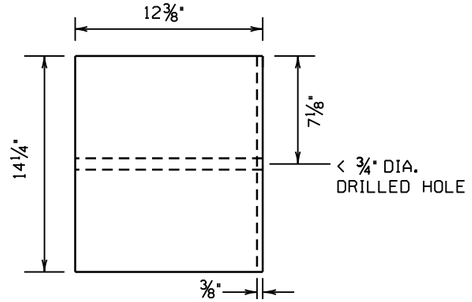
STATE DESIGN ENGINEER

TRAFFIC BARRIER TYPE 31
ASSEMBLY DETAILS

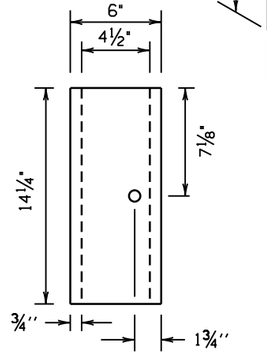
STATE PROJ. NO. (T.H.) SHEET NO. 230F 59 SHEETS



TOP VIEW

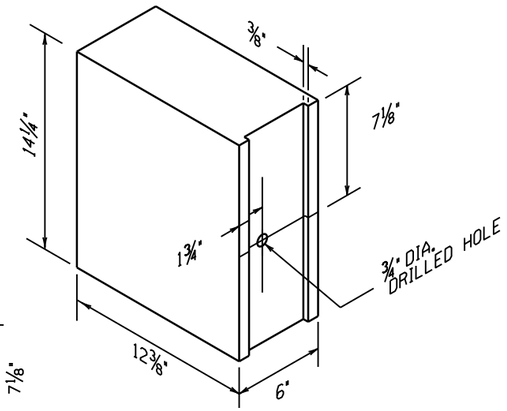


SIDE VIEW

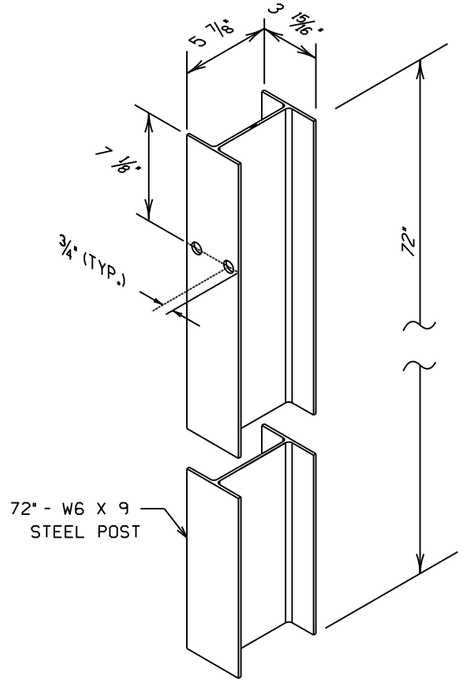


FRONT VIEW

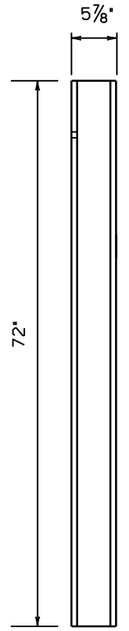
BLOCKOUT
WITH ROUTED GROOVE



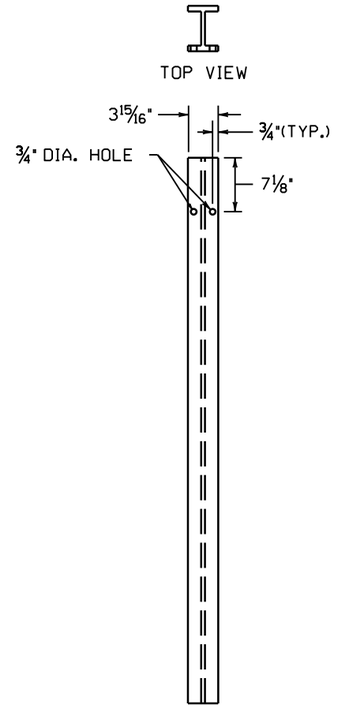
ISOMETRIC BACK VIEW



ISOMETRIC FRONT VIEW

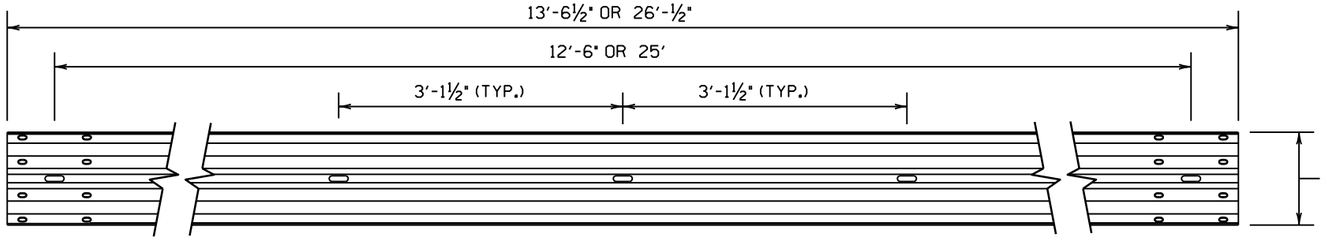


SIDE VIEW

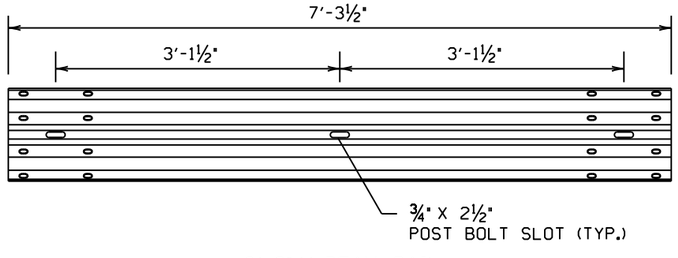


FRONT VIEW

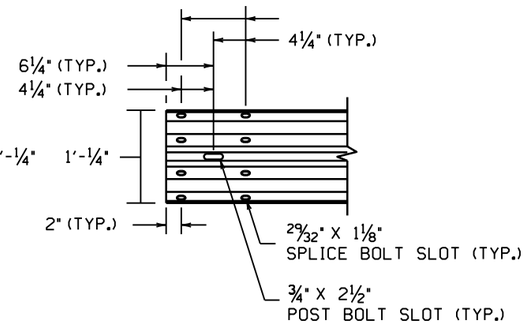
LINE POST①



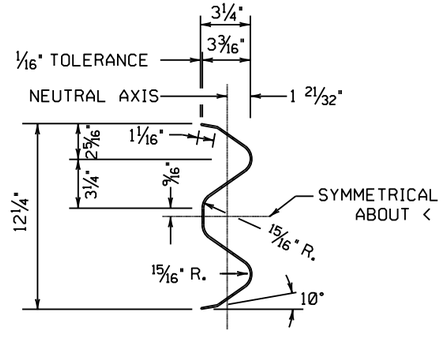
12'-6" OR 25' W-BEAM RAIL



6'-3" W-BEAM RAIL



W-BEAM RAIL
SPLICE BOLT/POST BOLT DETAIL



W-BEAM CROSS SECTION
AASHTO DESIGNATION M 180-11

NOTES:
ALL POSTS SHALL BE STAMPED INDICATING THE POST SIZE AND LENGTH. STAMP SHALL BE VISIBLE AFTER BEING PLACED.
① 72" - W6 X 9 STEEL POST SHOWN.

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.690 | 2 OF 2

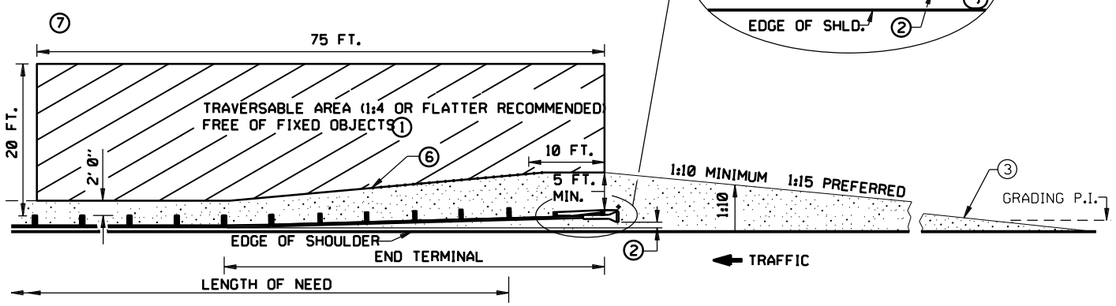
APPROVED: 7-19-2016
REVISED:

STATE DESIGN ENGINEER

TRAFFIC BARRIER TYPE 31
LINE POST, SPACER BLOCK, AND W-BEAM RAIL DETAILS

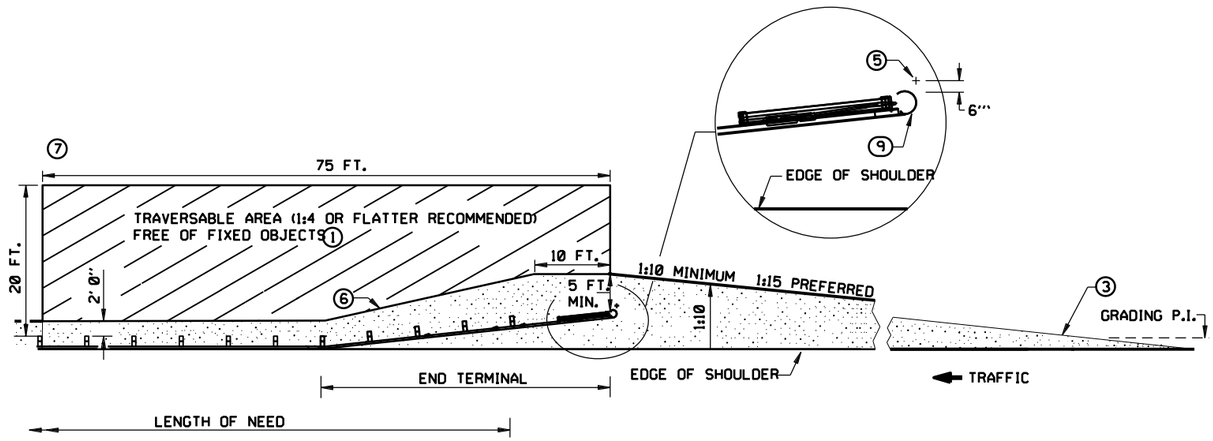
HENN. CO. PROJ. NO. 0408 C.R. 202
S.P. 027-596-009

STATE PROJ. NO. (T.H.) SHEET NO. 24 OF 59 SHEETS



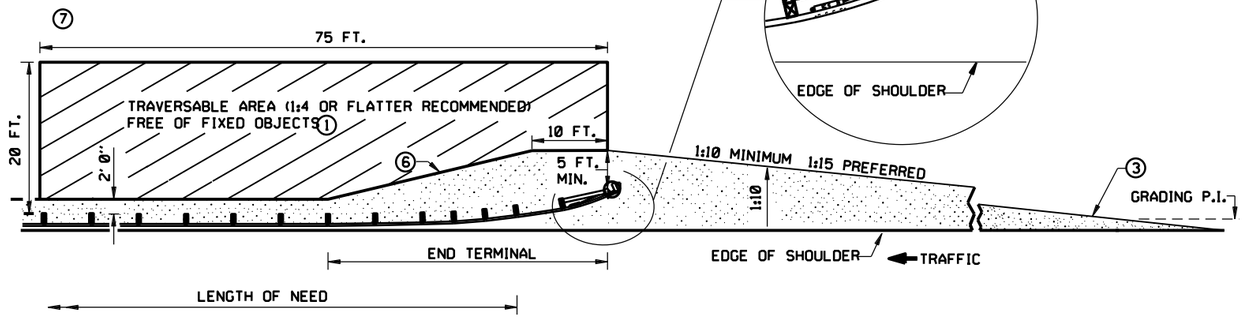
PLAN VIEW

(PROPRIETARY TANGENT TERMINAL SHOWN AS EXAMPLE)



PLAN VIEW ⑧

(PROPRIETARY FLARED TERMINAL SHOWN AS EXAMPLE)



PLAN VIEW ④ ⑧

(ELT)

NOTES:

ALL CROSS SLOPES ARE IN FOOT/FOOT UNLESS OTHERWISE NOTED.

ALL GUARDRAIL POSTS SHALL BE 6 FT. 3 IN. CENTER TO CENTER (DESIGN B), EXCEPT WHERE NOTED.

CHANGES (TO SUBJECTS COVERED BY THIS SHEET) INDICATED IN THE PLANS OR ON PLATES WITH MORE RECENT APPROVAL DATES SHALL APPLY.

GRADING AND DRAINAGE HARDWARE ARE NOT INCIDENTAL TO GUARDRAIL INSTALLATION.

① SLOPES BETWEEN 1:3 AND 1:4 PERMITTED WHEN 1:4 OR FLATTER IS NOT POSSIBLE. 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.

② THE LAST 50 FT. OF TANGENT TERMINALS CAN BE FLARED AT 1:50 TAPER.

③ 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.

④ SEE STANDARD PLATE 8329.

⑤ SNOWPLOW MARKER (X4-5) WITH A 2 LB./FT. DELINEATOR POST 8 FT. LONG (SPEC. 3401) DRIVEN INTO THE GROUND. EXTEND 3 FT. ABOVE TERMINAL. THE MARKER IS INCIDENTAL FOR WHICH NO DIRECT PAYMENT WILL BE MADE. MARK BOTH THE BEGINNING AND END OF PLATE BEAM GUARDRAIL INSTALLATION.

⑥ 1:10 OR FLATTER SLOPE P.I.

⑦ GRADUALLY BLEND SLOPE FROM TRAVERSABLE AREA TO STEEP EXISTING SLOPE (WHEN SLOPE IS STEEPER THAN 1:6).

⑧ IF THE TERRAIN BEYOND THE TERMINAL END AND IMMEDIATELY BEHIND THE BARRIER IS NOT SAFELY TRAVERSABLE, A TANGENT (ENERGY- ABSORBING) TERMINAL SHALL BE USED.

⑨ MARK THE APPROACH END OF PLATE BEAM GUARDRAIL INSTALLATIONS WITH A STRIPED OBJECT MARKER SIZED TO FIT THE END TERMINAL, HAVING ALTERNATING BLACK AND REFLECTIVE YELLOW (WIDE ANGLE PRISMATIC RETROREFLECTIVE SHEETING). STRIPES SHALL SLOPE DOWNWARD AT A 45 DEGREE ANGLE TOWARD THE SIDE ON WHICH TRAFFIC PASSES. FOR FLAT END TREATMENTS THE OBJECT MARKER SHALL FIT INSIDE THE RECESSED AREA. FOR ROUNDED END TREATMENTS THE OBJECT MARKER SHALL WRAP AROUND THE CIRCULAR END AND BE MOUNTED SO THE TOP OF THE OBJECT MARKER LINES UP WITH THE TOP OF THE END TREATMENT.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

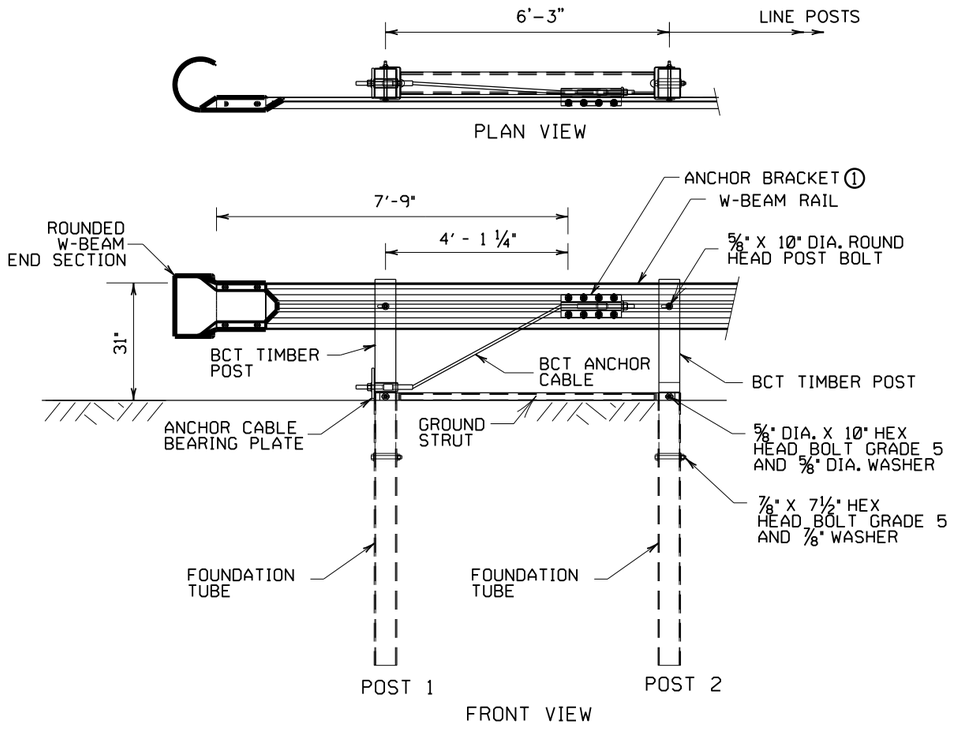
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.601 | 3 OF 3

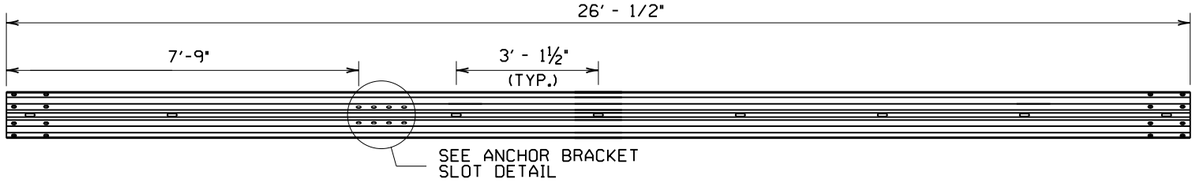
APPROVED: 5-27-2014
REVISED:

GUARDRAIL INSTALLATIONS AT MEDIANS AND END TREATMENTS
(FOR NEW CONSTRUCTION AND RETROFITS WITHOUT SITE RESTRICTIONS)

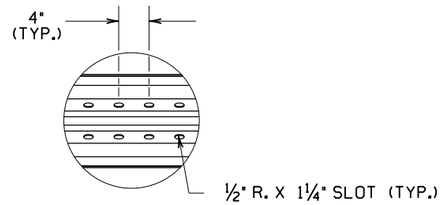
STATE PROJ. NO. (T.H.) SHEET NO. 25 OF 59 SHEETS



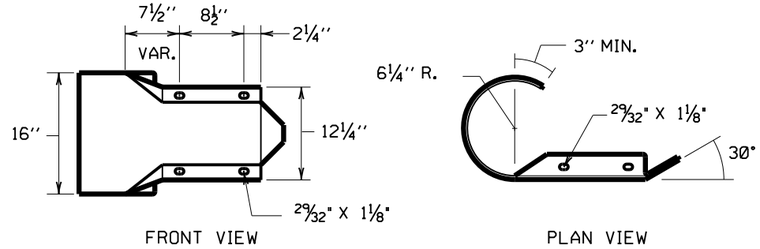
END RAIL DETAIL



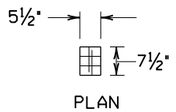
END RAIL BEAM

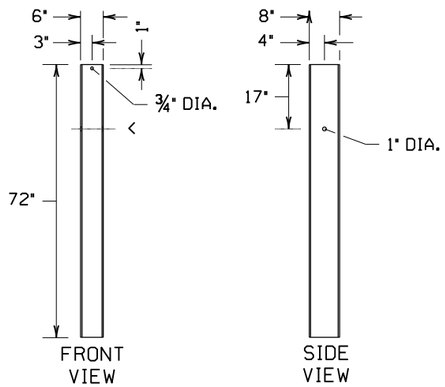


ANCHOR BRACKET SLOT DETAIL

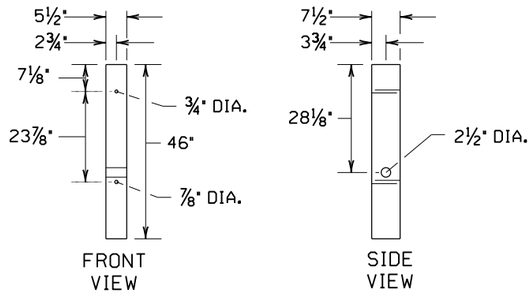


ROUNDED W-BEAM END SECTION





FOUNDATION TUBE②



BCT TIMBER POST (MGS LENGTH)

NOTES:

ALL RAIL AND HARDWARE COMPONENTS PER AASHTO SPEC. M 180.

① BRACKET BOLTED TO BEAM WITH (8) ⅝" DIA. X 1½" HEX HEAD BOLT GRADE 5 AND ⅝" DIA. WASHER.

② FOUNDATION TUBE SHALL BE MANUFACTURED USING ASTM A500B STEEL AND SHALL CONFORM TO ASTM A500 GRADE B MATERIAL.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

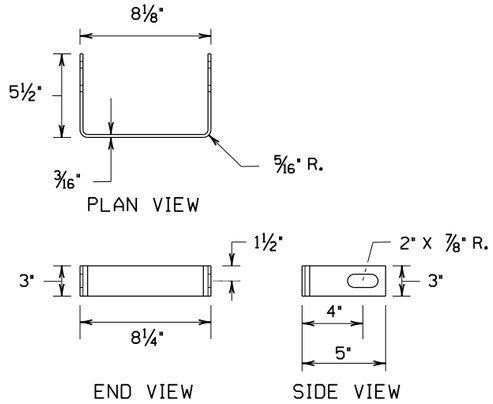
STATE DESIGN ENGINEER

APPROVED: 7-19-2016
REVISED:

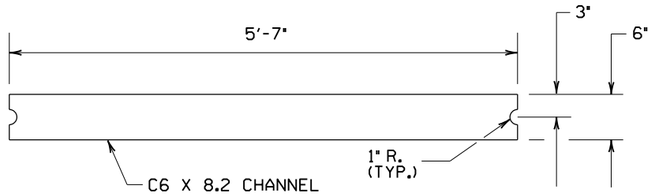
STANDARD PLAN 5-297.692 | 1 OF 2

TRAFFIC BARRIER TYPE 31 END ANCHORAGE ASSEMBLY DETAILS

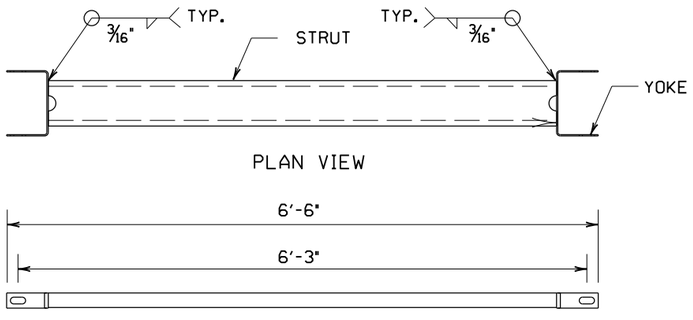
STATE PROJ. NO. (T.H.) SHEET NO. 26 OF 59 SHEETS



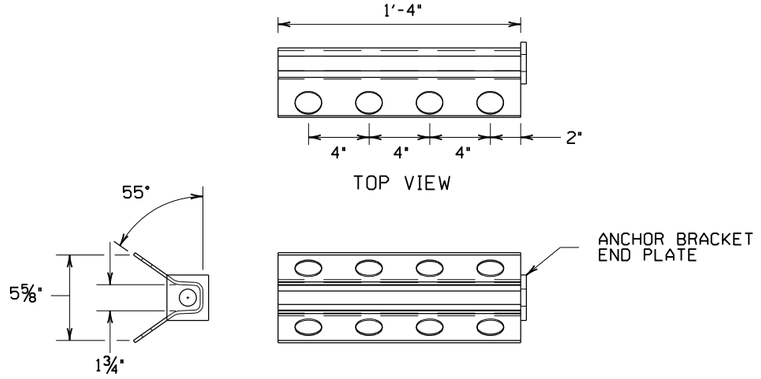
YOKE DETAILS



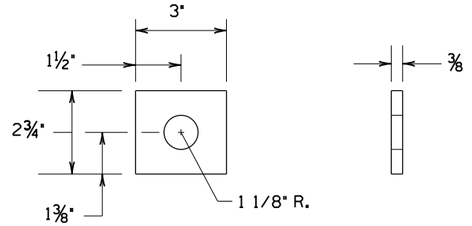
PLAN VIEW
STRUT DETAIL



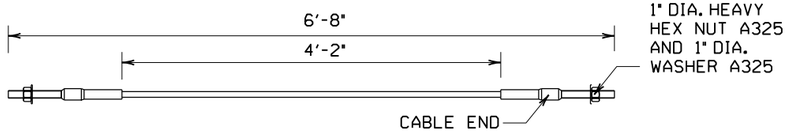
STRUT AND YOKE ASSEMBLY



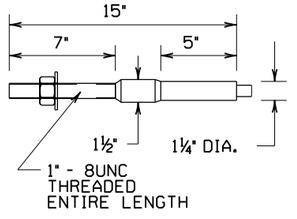
ANCHOR BRACKET



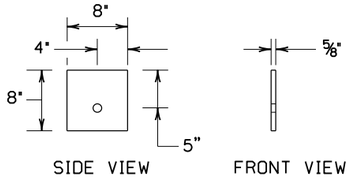
ANCHOR BRACKET END PLATE



BCT ANCHOR CABLE



BCT ANCHOR CABLE END DETAIL



BCT ANCHOR CABLE BEARING PLATE

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

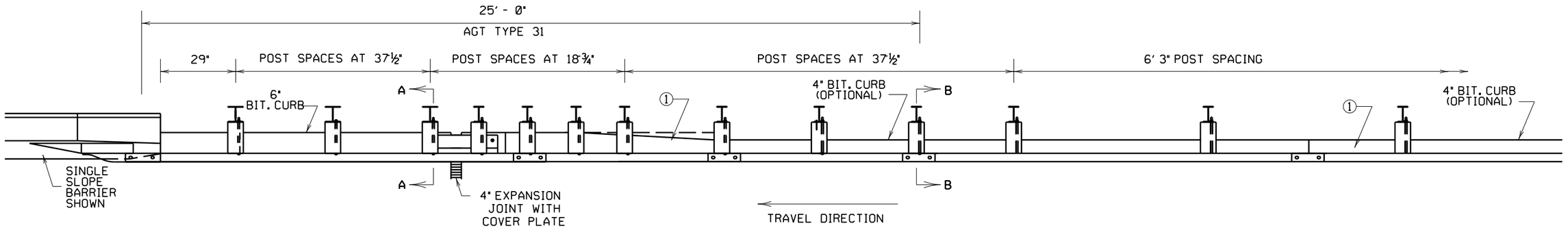
STANDARD PLAN 5-297.692 | 2 OF 2

APPROVED: 7-19-2016
REVISED:

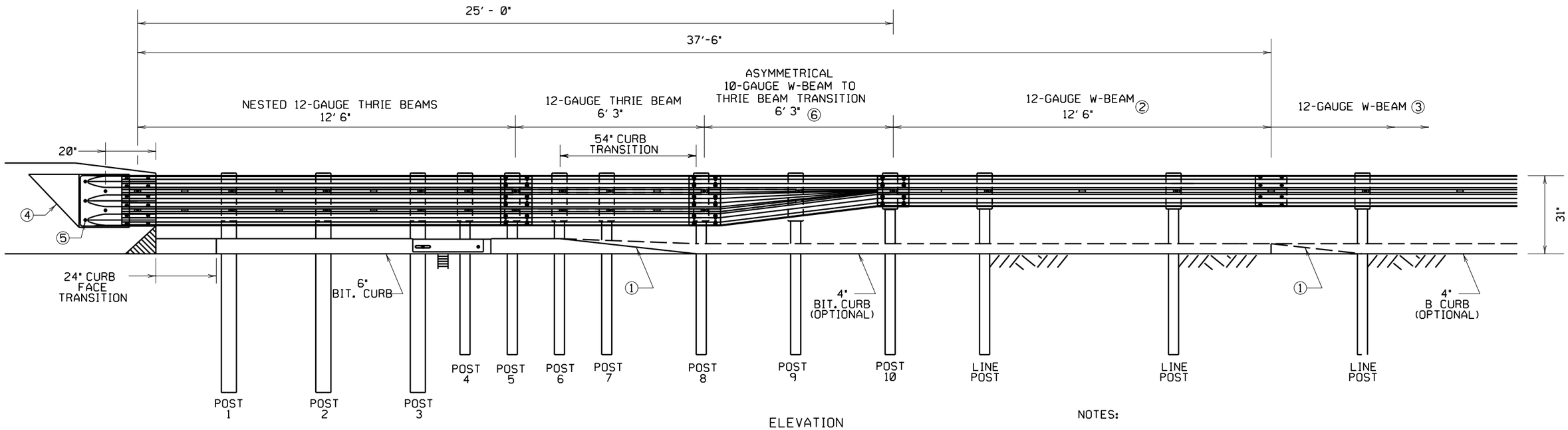
STATE DESIGN ENGINEER

TRAFFIC BARRIER TYPE 31 END ANCHORAGE
COMPONENT DETAILS

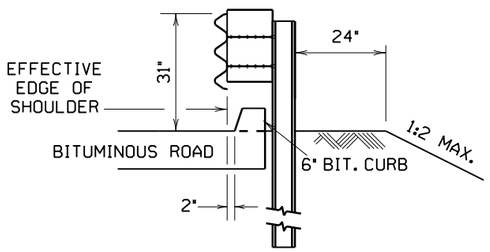
STATE PROJ. NO. (T.H.) SHEET NO. 27 OF 59 SHEETS



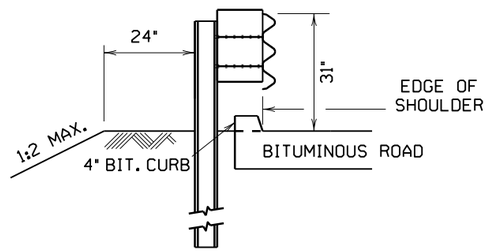
PLAN VIEW



ELEVATION
APPROACH GUARDRAIL TRANSITION



SECTION A-A
(THRIE BEAM/AGT) ⑦⑧



SECTION B-B
(THRIE BEAM/AGT) ⑦⑧

TRANSITION POST/BLOCK SIZING		
POST #	STEEL POST SIZE	BLOCKOUT SIZE
1-3	84" - W6 x 15	6 x 12 x 19"
4-9	72" - W6 x 9	6 x 12 x 19"
10	72" - W6 x 9	6 x 12 x 14"

NOTES:

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-GUAGE W-BEAM RAIL SHALL 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)

MODIFIED

CERTIFIED BY JOHN D. EKOLA, PROFESSIONAL ENGINEER
LIC. NO. 53076 06/20/18

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

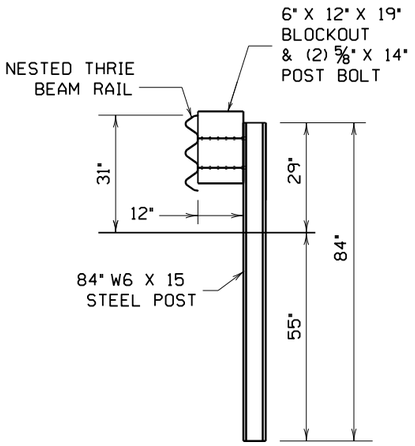
STANDARD PLAN 5-297.694 | 1 OF 5

APPROVED: 7-19-2016
REVISED:

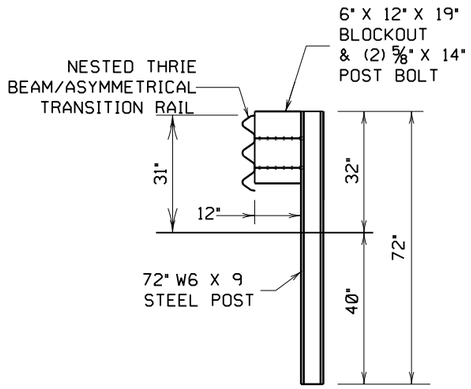
STATE DESIGN ENGINEER

APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31
ASSEMBLY DETAILS

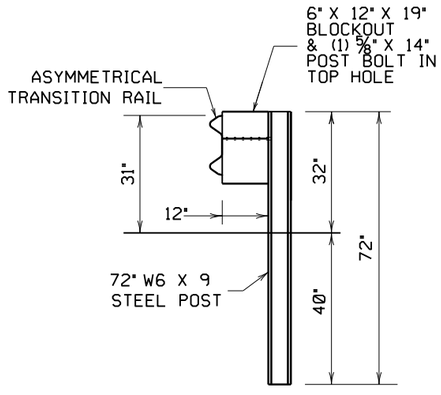
STATE PROJ. NO. (T.H.) SHEET NO. 28 OF 59 SHEETS



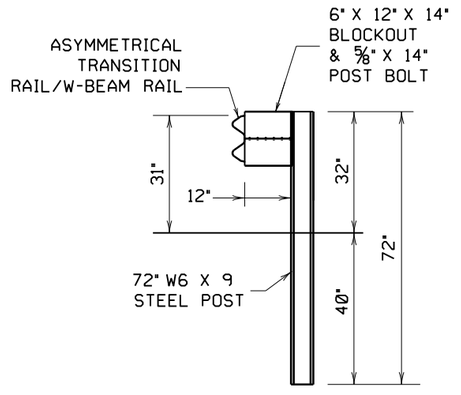
POSTS 1-3



POSTS 4-8

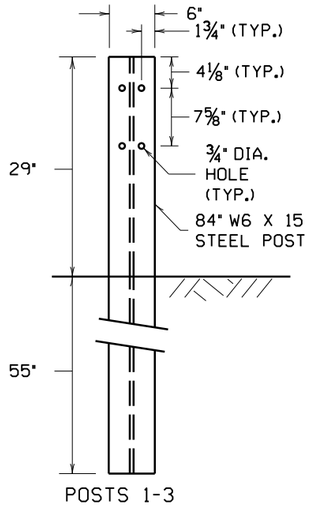


POST 9

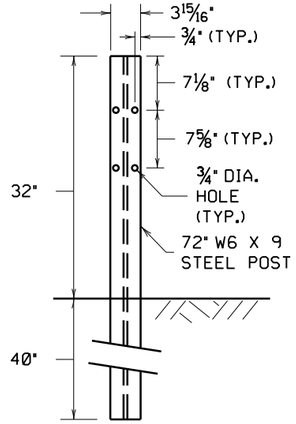


POST 10

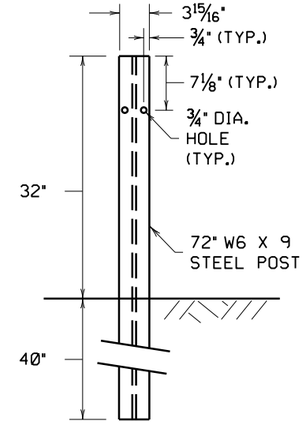
TRANSITION POSTS
WITH BLOCKOUT AND RAIL
SIDE VIEW



POSTS 1-3

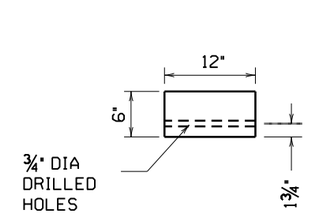


POSTS 4-8

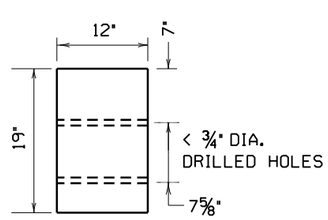


POSTS 9-10

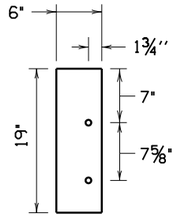
TRANSITION POSTS
FRONT VIEW



TOP VIEW

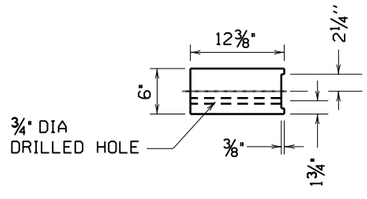


SIDE VIEW

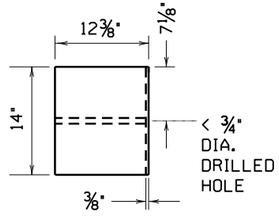


FRONT VIEW

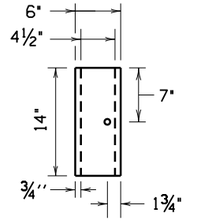
BLOCKOUT POSTS 1-9



TOP VIEW



SIDE VIEW



FRONT VIEW

BLOCKOUT POST 10

NOTES:

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.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

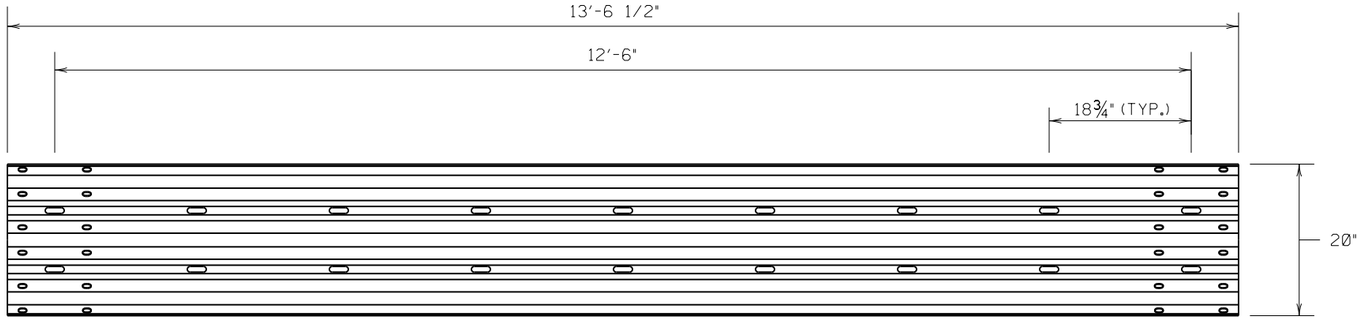
STATE DESIGN ENGINEER

APPROVED: 7-19-2016
REVISED:

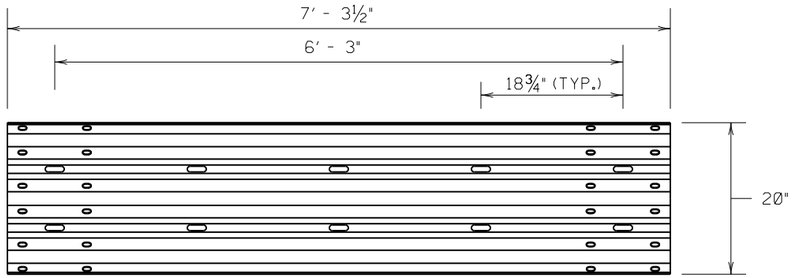
STANDARD PLAN 5-297.694 | 2 OF 5

APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31
COMPONENT DETAILS

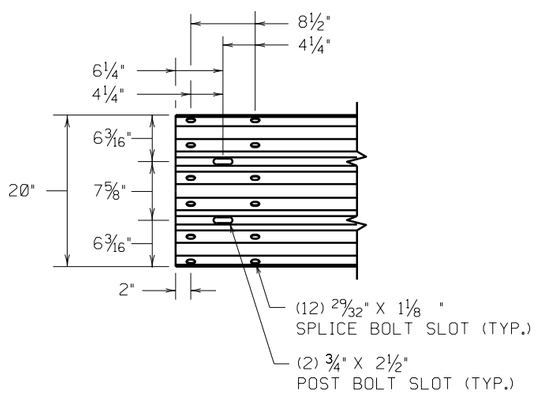
STATE PROJ. NO. (T.H.) SHEET NO. 29 OF 59 SHEETS



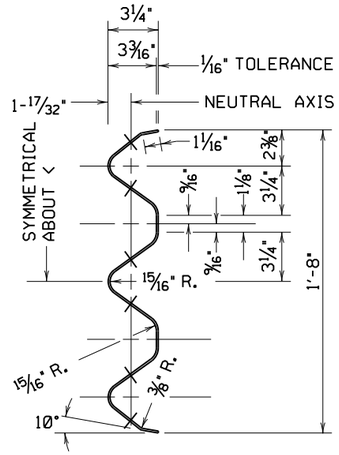
12'-6" THRIE BEAM RAIL



6'-3" THRIE BEAM RAIL



THRIE BEAM RAIL
SPLICE BOLT/POST BOLT DETAIL

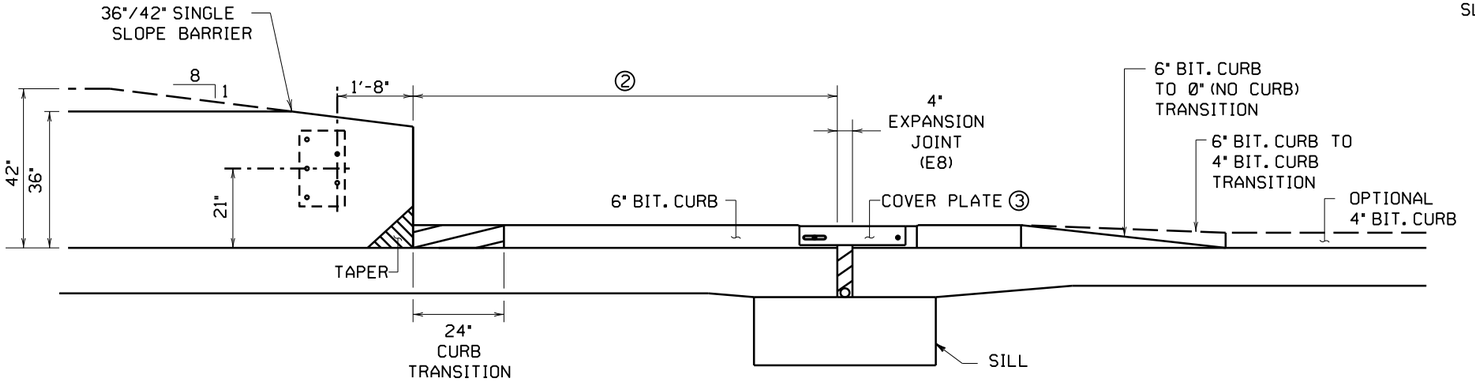


THRU SECTION

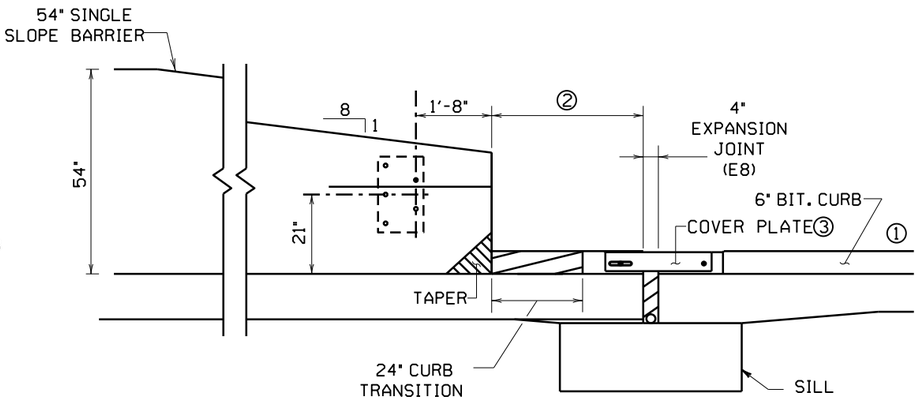
NOTES:
PLATE BEAM RAIL PER AASHTO SPEC. M 180.

PLOTTED/REVISED: $$$$@DATE@$$$$
DISTRICT *: $@DISTRICT@$
IPLOT NAME: $$@IPLOT$NAME@$$
PATH & FILENAME: $$$@PATHFILENAME@$$$

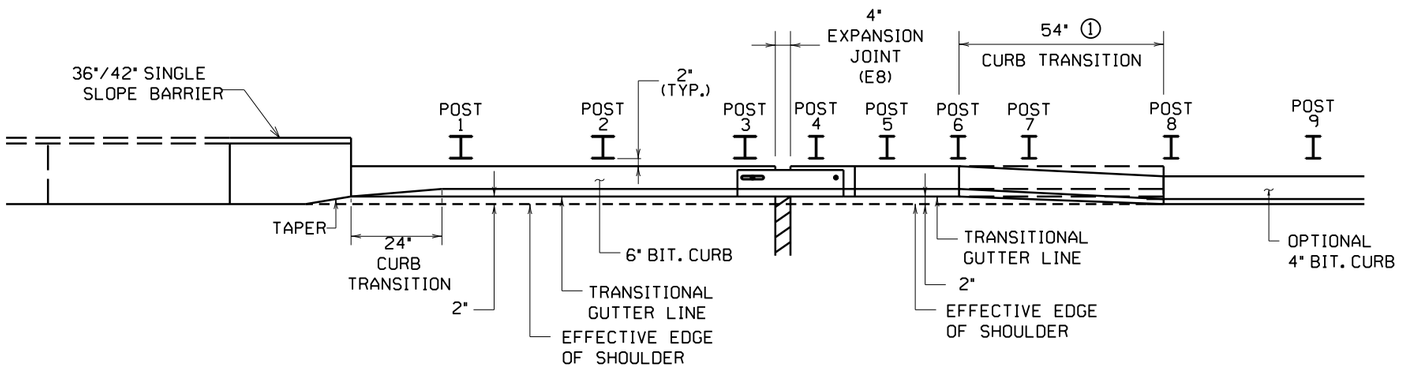
HENN. CO. PROJ. NO. 0408 C.R. 202 S.P. 027-596-009	MINNESOTA DEPARTMENT OF TRANSPORTATION	STANDARD PLAN 5-297.694 — 3 OF 5
	STATE DESIGN ENGINEER	APPROVED: 7-19-2016 REVISED:
		APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31 THRIE-BEAM RAIL DETAILS
		STATE PROJ. NO. (T.H.) SHEET NO. 30 OF 59 SHEETS



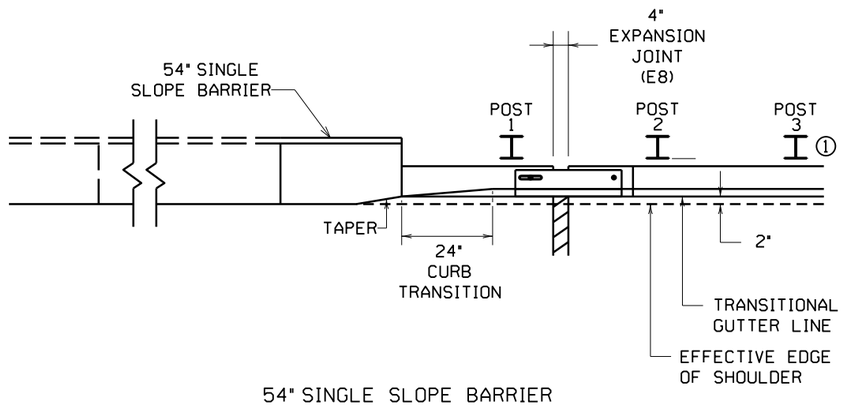
36"/42" SINGLE SLOPE BARRIER ④
FRONT VIEW



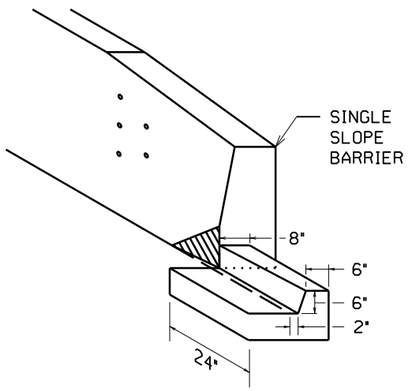
54" SINGLE SLOPE BARRIER
FRONT VIEW



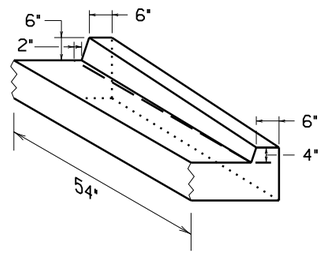
36"/42" SINGLE SLOPE BARRIER ④
PLAN VIEW



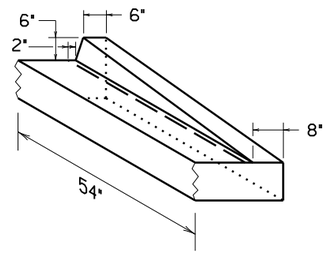
54" SINGLE SLOPE BARRIER
PLAN VIEW



24" CURB TRANSITION FROM
VERTICAL FACE TO 6" BIT. CURB
(SINGLE SLOPE BARRIER)



54" CURB TRANSITION FROM ①
6" BIT. CURB TO 4" BIT. CURB



54" CURB TRANSITION FROM ①
6" BIT CURB TO 0"-NO CURB

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)

MODIFIED

CERTIFIED BY JOHN D. EKOLA, PROFESSIONAL ENGINEER
LIC. NO. 53076 06/20/18

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.694 | 4 OF 5

APPROVED: 7-19-2016
REVISED:

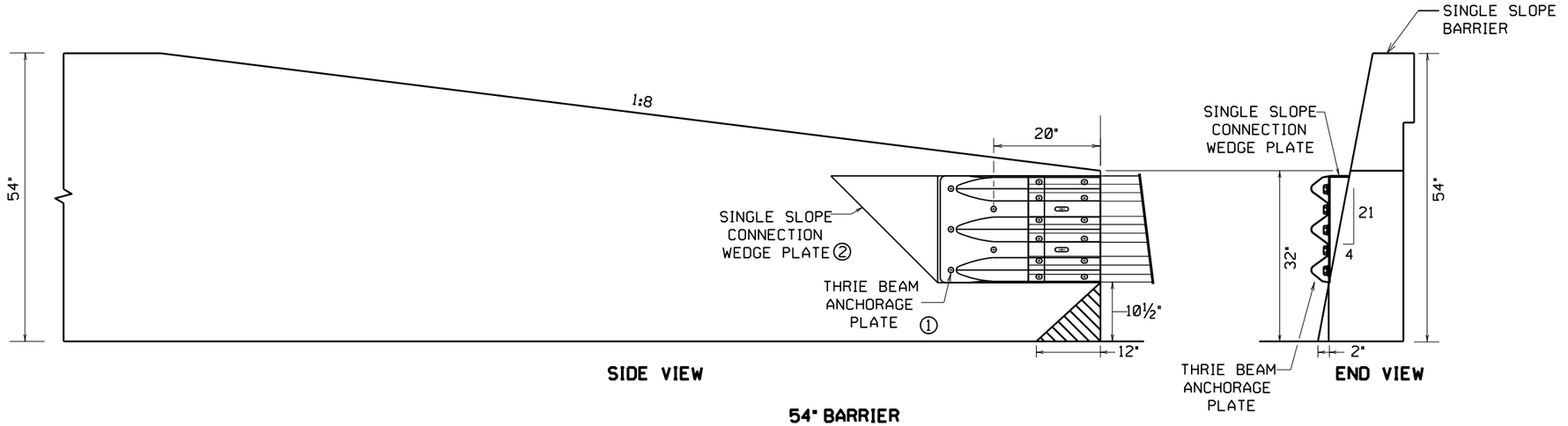
STATE DESIGN ENGINEER

APPROACH GUARDRAIL TRANSITION TYPE (AGT) 31
CURB DETAILS AT SINGLE SLOPE BARRIER

STATE PROJ. NO. (T.H.) SHEET NO. 31 OF 59 SHEETS

PLOTTED/REVISED: $$$$@DATE@$$$$

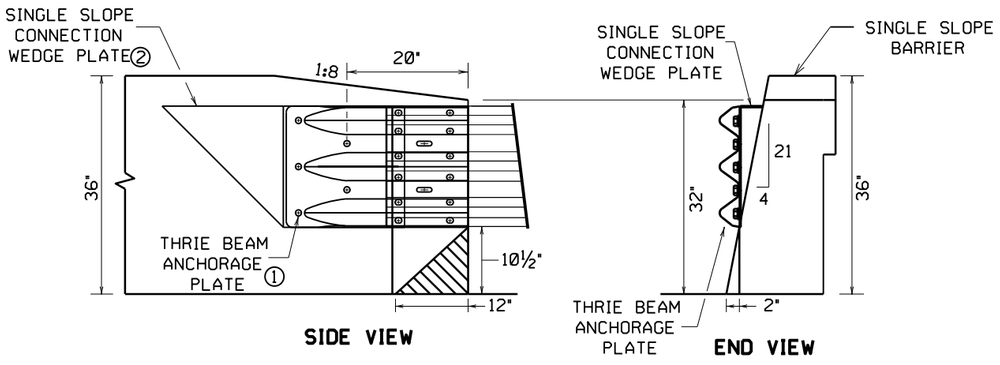
DISTRICT *: $@DISTRICT@$
IPLOT NAME: $$@IPLOT$NAME@$$
PATH & FILENAME: $$$@PATHFILENAME@$$$



SIDE VIEW

END VIEW

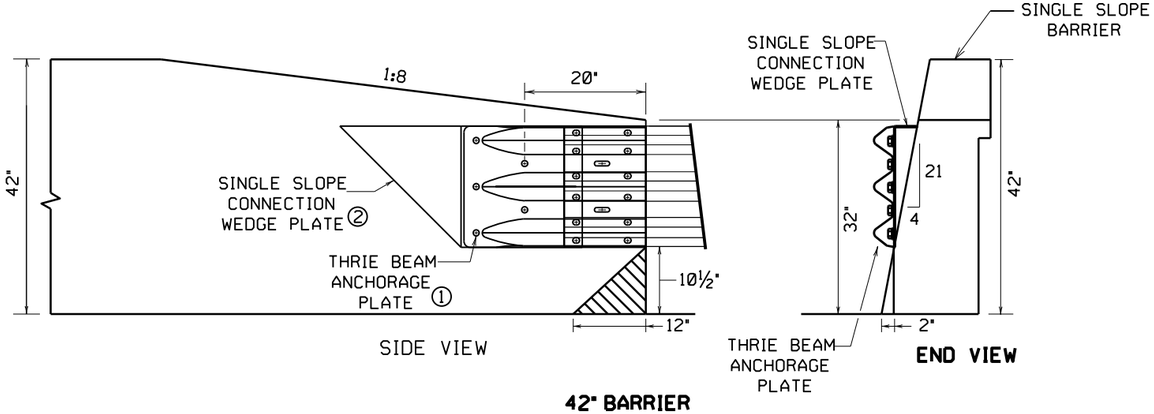
54" BARRIER



SIDE VIEW

END VIEW

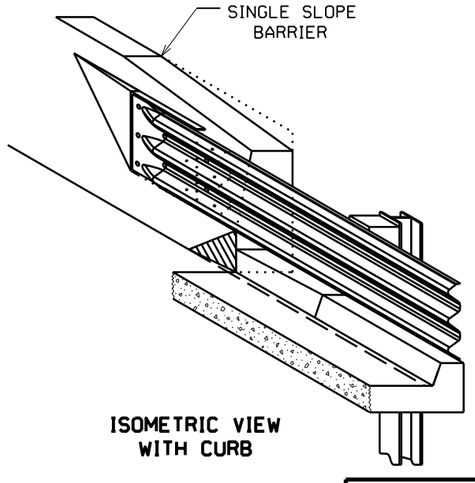
36" BARRIER



SIDE VIEW

END VIEW

42" BARRIER



ISOMETRIC VIEW WITH CURB

NOTES:

REFER TO BRIDGE PLAN SHEET B17 FOR ADDITIONAL INFORMATION.

BIT CURB INCIDENTAL TO GUARDRAIL INSTALLATION. (SEE SPECIAL PROVISIONS)

① SEE STANDARD PLATE 8350.

② SEE STANDARD PLATE 8352.

MODIFIED

CERTIFIED BY _____ JOHN D. EKOLA, PROFESSIONAL ENGINEER
LIC. NO. 53076 06/20/18

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

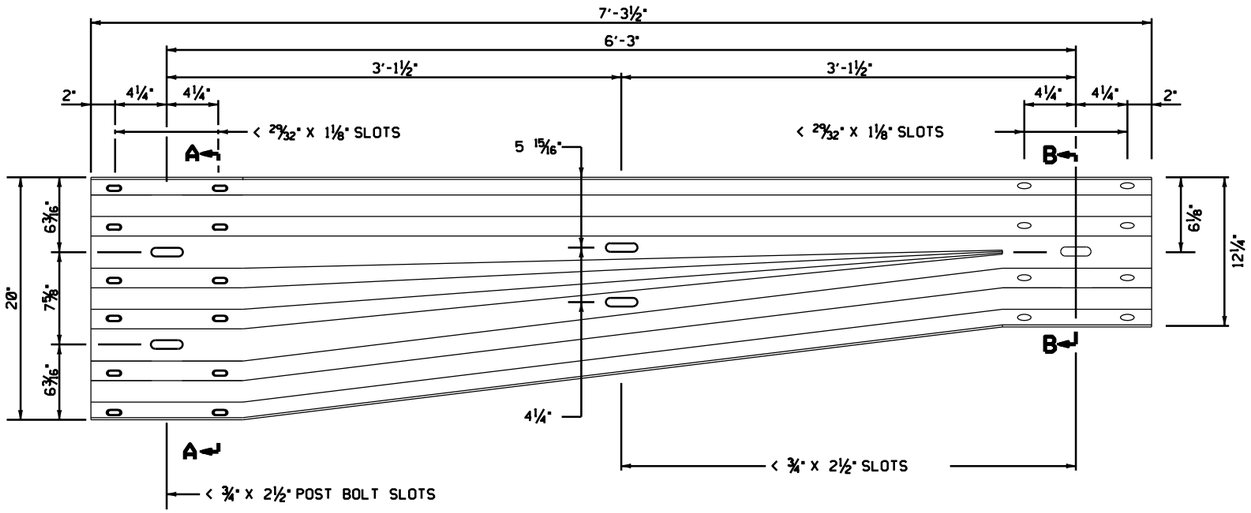
STANDARD PLAN 5-297.694 | 5 OF 5

APPROVED: 7-19-2016
REVISED:

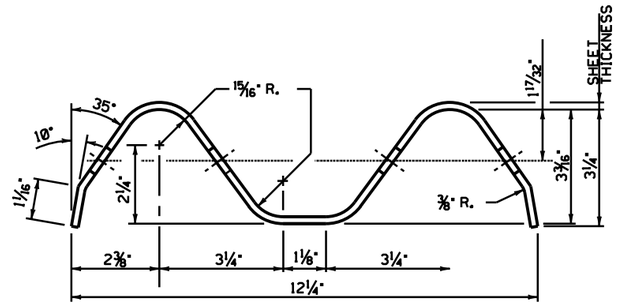
STATE DESIGN ENGINEER

APPROACH GUARDRAIL TRANSITION TYPE (AGT) 31
CONNECTION TO SINGLE SLOPE BARRIER

STATE PROJ. NO. (T.H.) SHEET NO. 32 OF 59 SHEETS



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.

DISTRICT *: $$DISTRICT@$
IPLOT NAME: $$@IPLOT$NAME@$$
PATH & FILENAME: $$$@PATHFILENAME@$$$

PLOTTED/REVISED: $$$$@DATE@$$$$

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

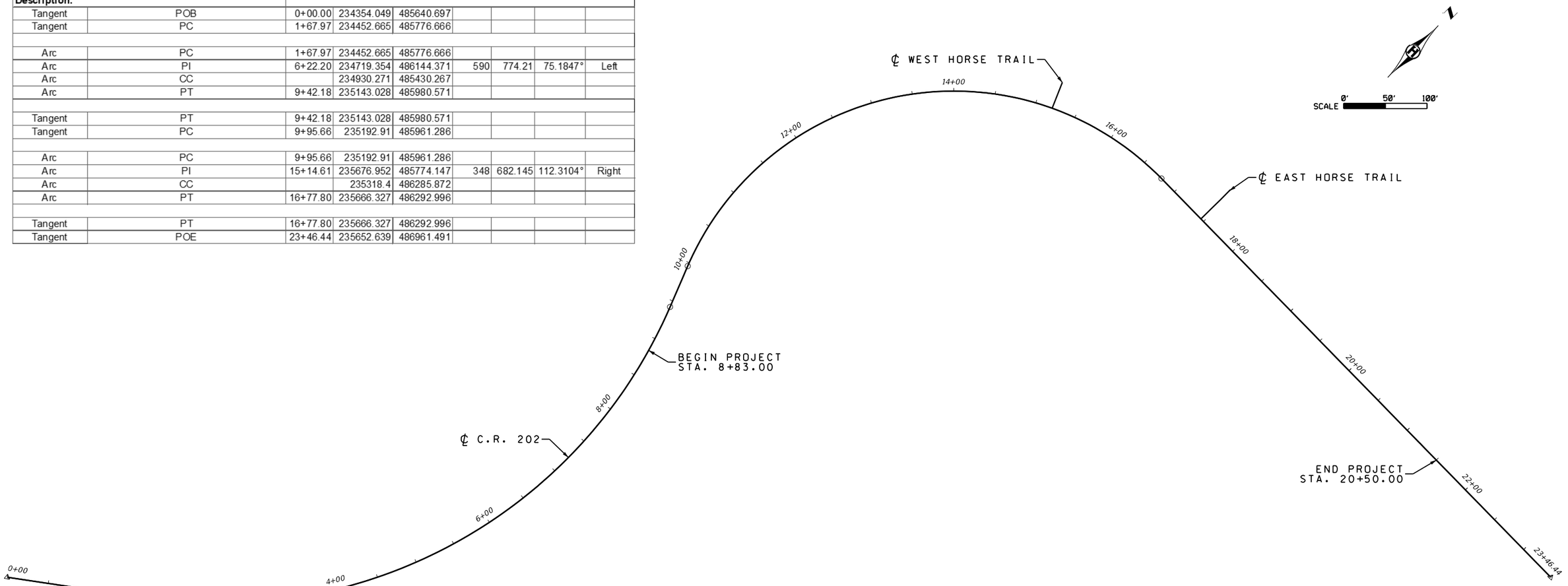
STANDARD PLAN 5-297.695 | 1 OF 1

APPROVED: 7-19-2016
REVISED:

STEEL PLATE BEAM GUARDRAIL DETAILS
ASYMMETRICAL W-BEAM/THRIE BEAM TRANSITION

STATE PROJ. NO. (T.H.) SHEET NO. 33 OF 59 SHEETS

Element	Point Type	Station	Northing	Easting	Radius	Length	Delta / Theta	Rotation Direction
Aligment Name: CR 202								
Description:								
Tangent	POB	0+00.00	234354.049	485640.697				
Tangent	PC	1+67.97	234452.665	485776.666				
Arc	PC	1+67.97	234452.665	485776.666				
Arc	PI	6+22.20	234719.354	486144.371	590	774.21	75.1847°	Left
Arc	CC		234930.271	485430.267				
Arc	PT	9+42.18	235143.028	485980.571				
Tangent	PT	9+42.18	235143.028	485980.571				
Tangent	PC	9+95.66	235192.91	485961.286				
Arc	PC	9+95.66	235192.91	485961.286				
Arc	PI	15+14.61	235676.952	485774.147	348	682.145	112.3104°	Right
Arc	CC		235318.4	486285.872				
Arc	PT	16+77.80	235666.327	486292.996				
Tangent	PT	16+77.80	235666.327	486292.996				
Tangent	POE	23+46.44	235652.639	486961.491				



COORDINATED ARE HENNEPIN COUNTY GROUND FEET,
BASED OF THE MINNESOTA COORDINATE SYSTEM,
SOUTHERN ZONE, NAD83, 1986 (NON HARN VALUES)

C.P. 10 (5/8" IRON)
N=235670.246
E=487117.535

C.P. BEND (5/8" IRON)
N=235664.952
E=486429.954

Element	Point Type	Point Number	Station	Northing	Easting	Radius	Length	Delta / Theta	Rotation Direction
Aligment Name: West Horse trail									
Description:									
Tangent	POB		0+00.00	235634.537	486140.401				
Tangent	POE		0+33.24	235665.14	486127.419				

Element	Point Type	Point Number	Station	Northing	Easting	Radius	Length	Delta / Theta	Rotation Direction
Aligment Name: East Horse trail									
Description:									
Tangent	POB		0+00.00	235664.94	486360.766				
Tangent	PI		0+12.00	235676.937	486361.011				
Tangent	PI		0+12.00	235676.937	486361.011				
Tangent	PI		0+16.00	235680.936	486361.093				
Tangent	PI		0+16.00	235680.936	486361.093				
Tangent	PI		0+33.00	235697.933	486361.441				
Tangent	PI		0+33.00	235697.933	486361.441				
Tangent	POE		0+63.00	235727.933	486361.441				

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 — LICENSE NO.

8/23 / 18 — DATE

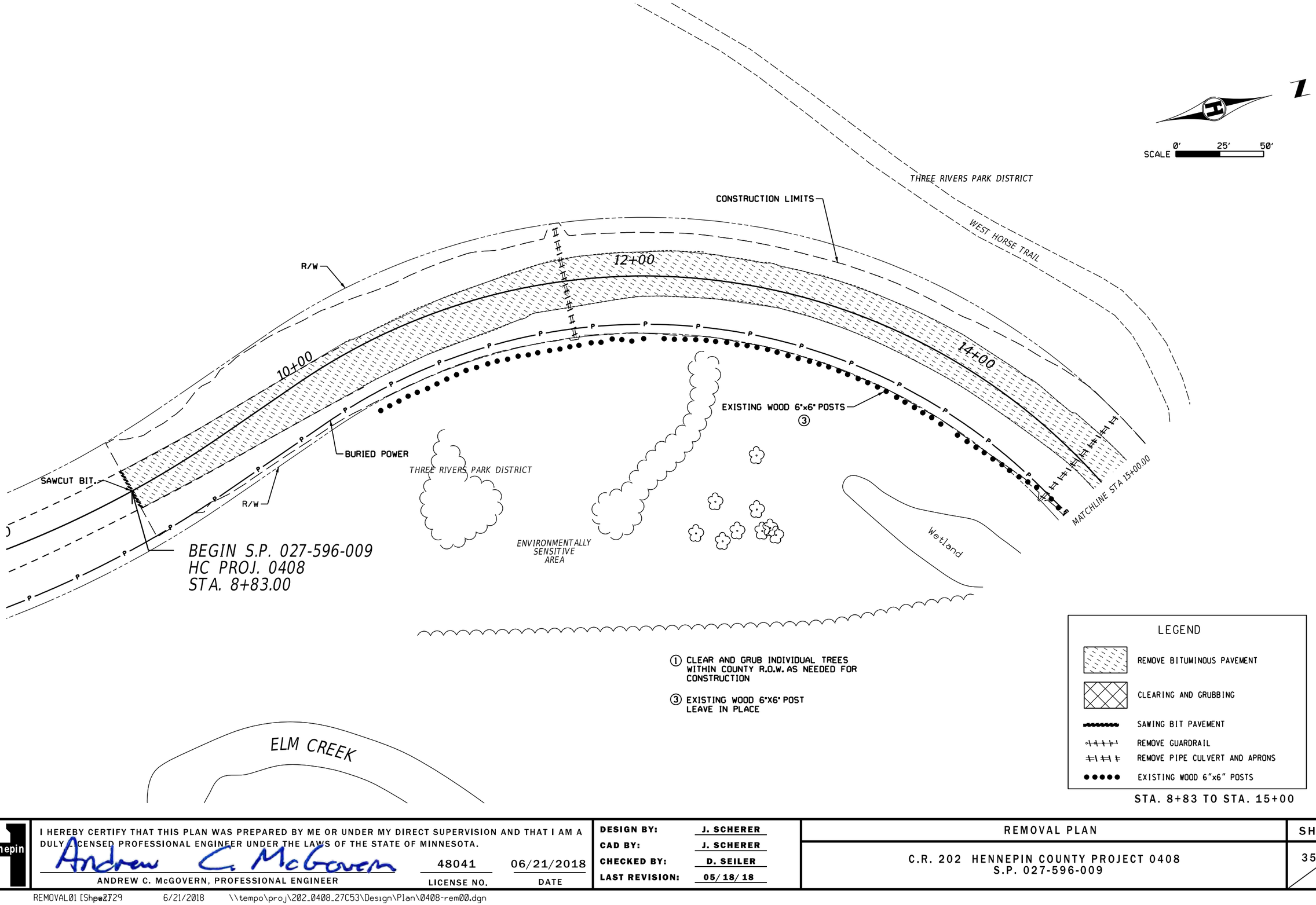
DESIGN BY:	**D. SEILER**
CAD BY:	**J.SCHERER**
CHECKED BY:	**D. SEILER**
LAST REVISION:	**05 /22 /18**

HORIZONTAL ALIGNMENT & TABULATION

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

SHEET 34 / 59

HORIZONTAL ALIGNMENT AND TABULATION 8/23/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408_aL00.dgn



Hennepin

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Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

06/21/2018 DATE

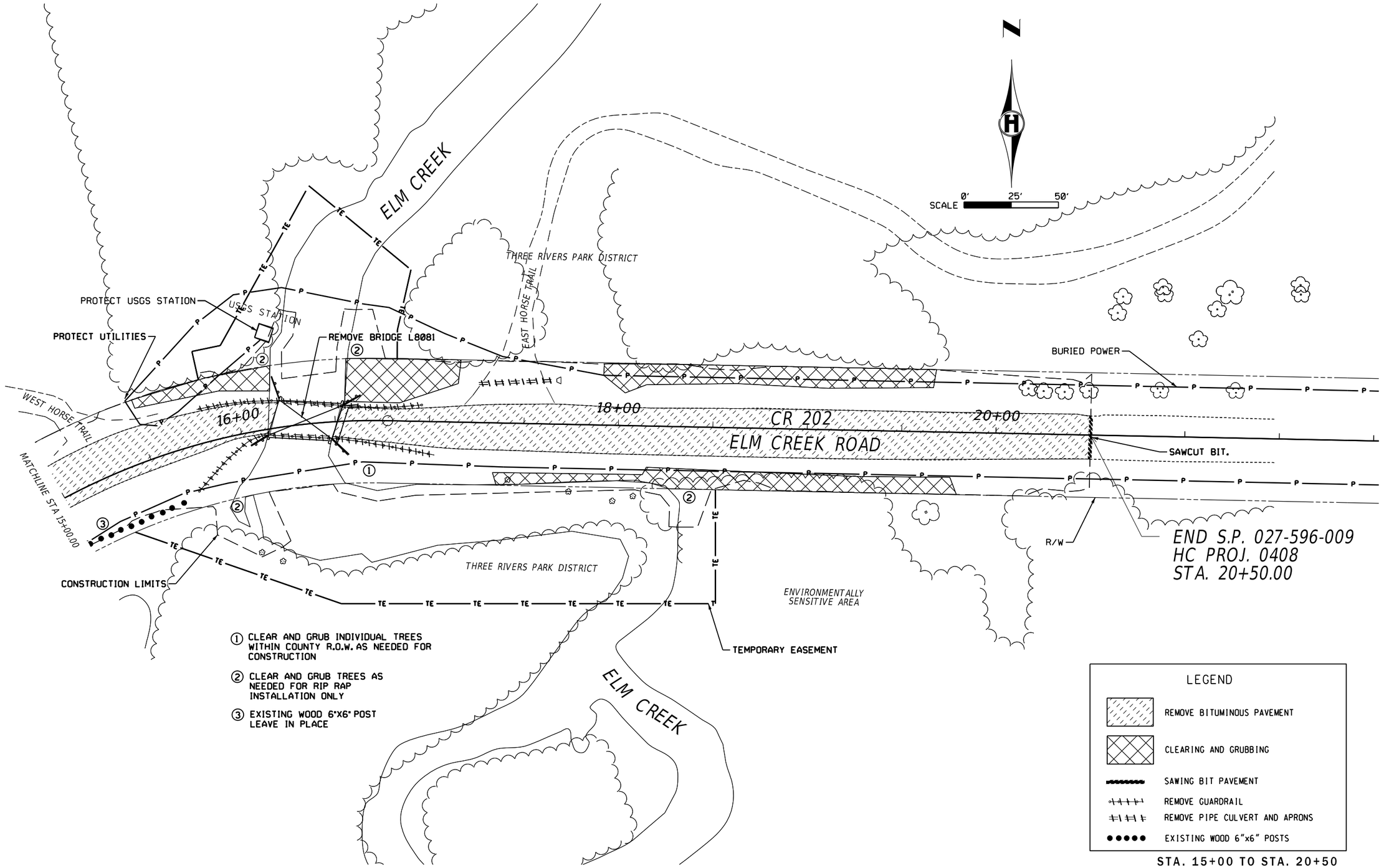
DESIGN BY:	J. SCHERER
CAD BY:	J. SCHERER
CHECKED BY:	D. SEILER
LAST REVISION:	05/18/18

REMOVAL PLAN

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

SHEET 35 / 59

REMOVAL01 [Shee2729 6/21/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-rem00.dgn



STA. 15+00 TO STA. 20+50

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

06/21/2018 DATE

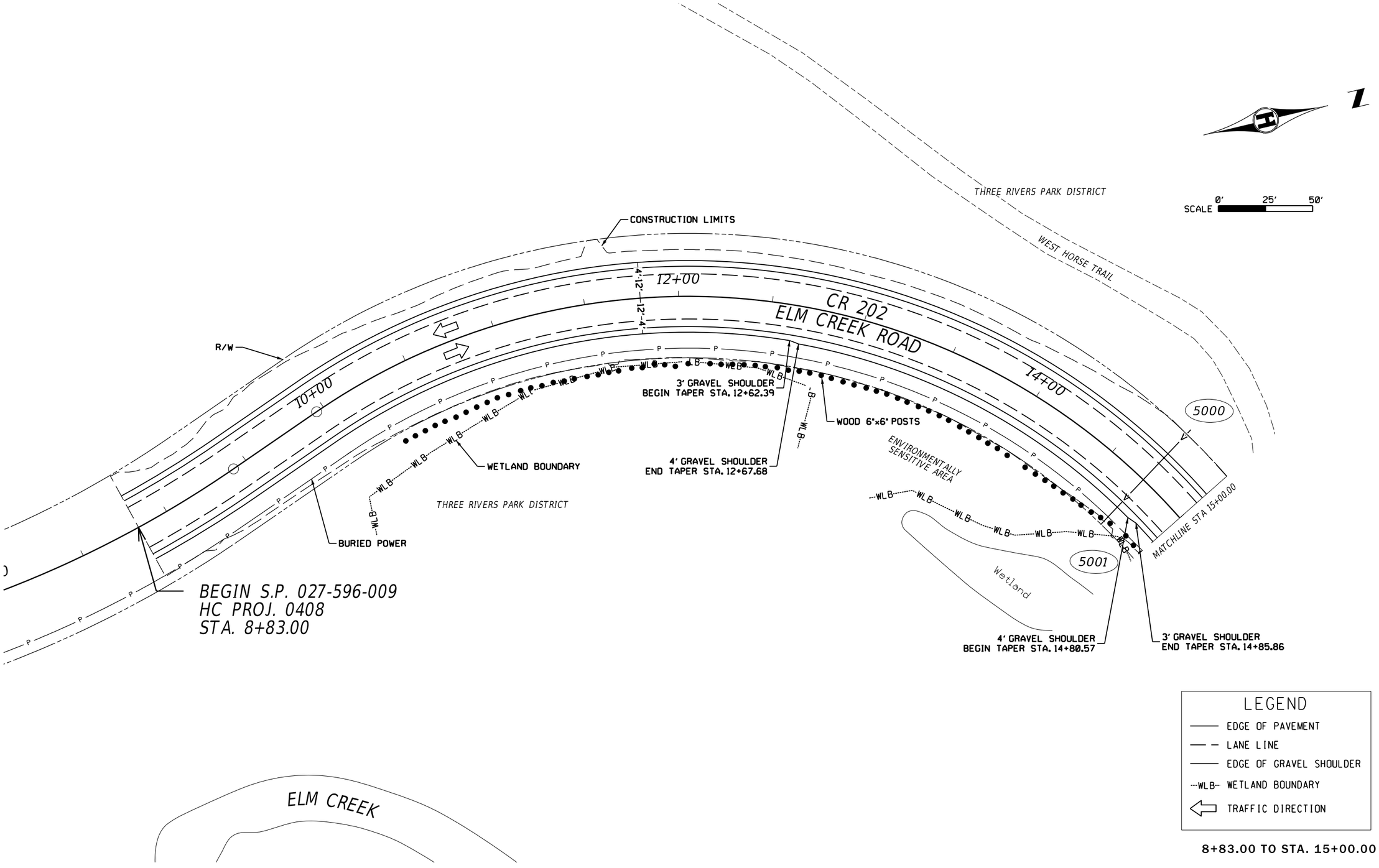
DESIGN BY:	J.SCHERER
CAD BY:	J. SCHERER
CHECKED BY:	D. SEILER
LAST REVISION:	05 /18 /18

REMOVAL PLAN

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

SHEET 36 / 59

REMOVAL02 [Sheet2] 6/21/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-rem00.dgn



8+83.00 TO STA. 15+00.00

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.

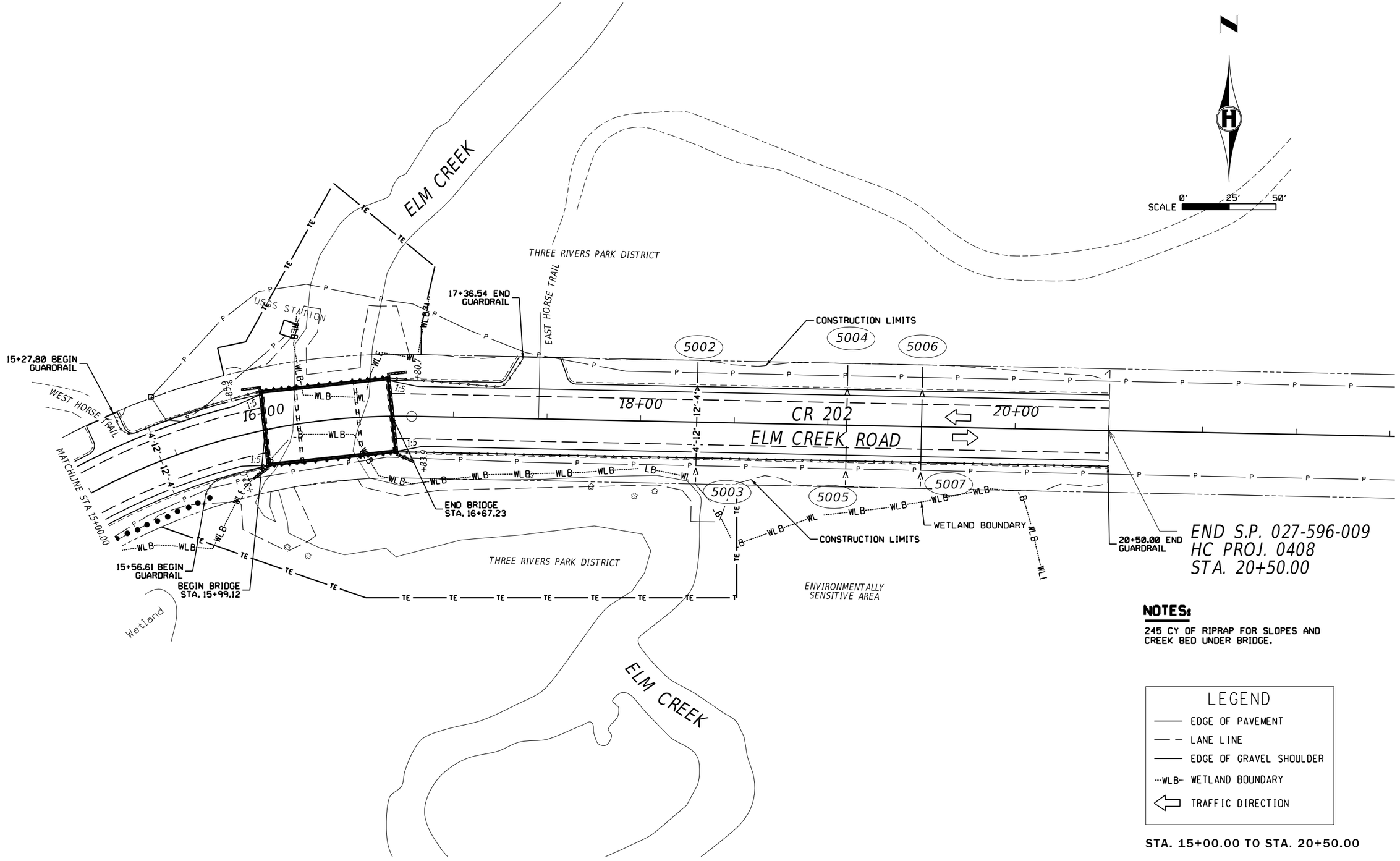
ANDREW C. McGOVERN, PROFESSIONAL ENGINEER — 48041 LICENSE NO. — 6/13/18 DATE

DESIGN BY:	TSM
CAD BY:	TSM
CHECKED BY:	JLS
LAST REVISION:	05/22/2018

CONSTRUCTION PLAN

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

SHEET 37 / 59



NOTES:

245 CY OF RIPRAP FOR SLOPES AND CREEK BED UNDER BRIDGE.

LEGEND

- EDGE OF PAVEMENT
- LANE LINE
- EDGE OF GRAVEL SHOULDER
- WLB WETLAND BOUNDARY
- TRAFFIC DIRECTION

STA. 15+00.00 TO STA. 20+50.00

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

06/21/2018 DATE

DESIGN BY:	TSM
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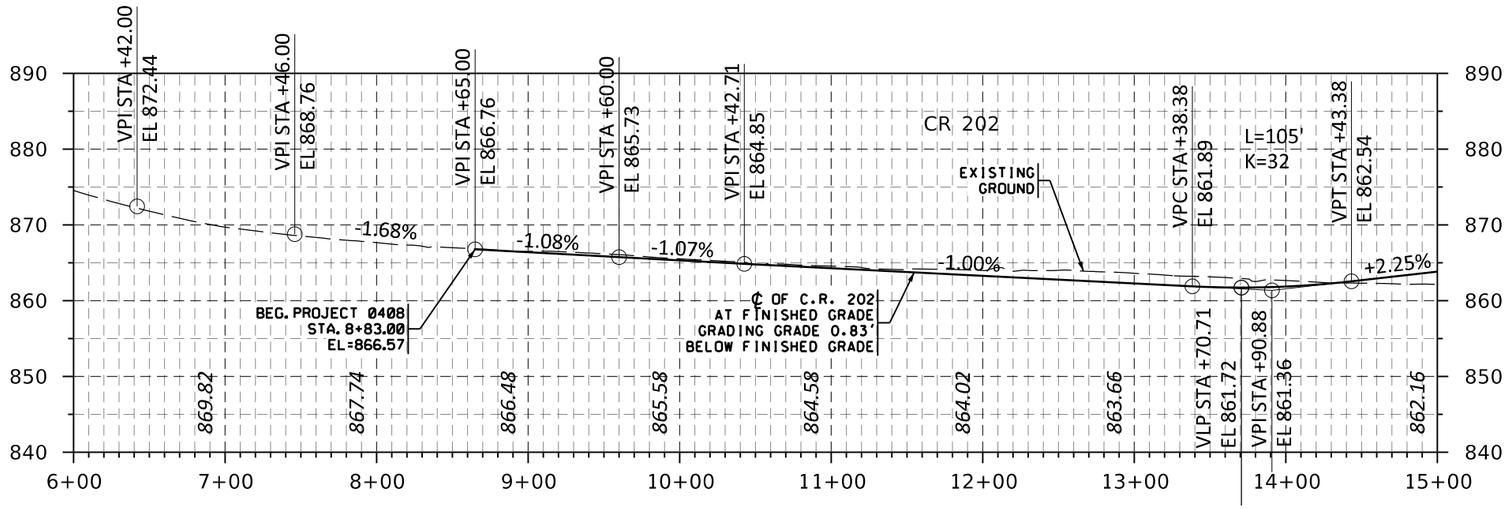
CHECKED BY:	JLS
LAST REVISION:	05/22/2018

CONSTRUCTION PLAN

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

SHEET 38 / 59

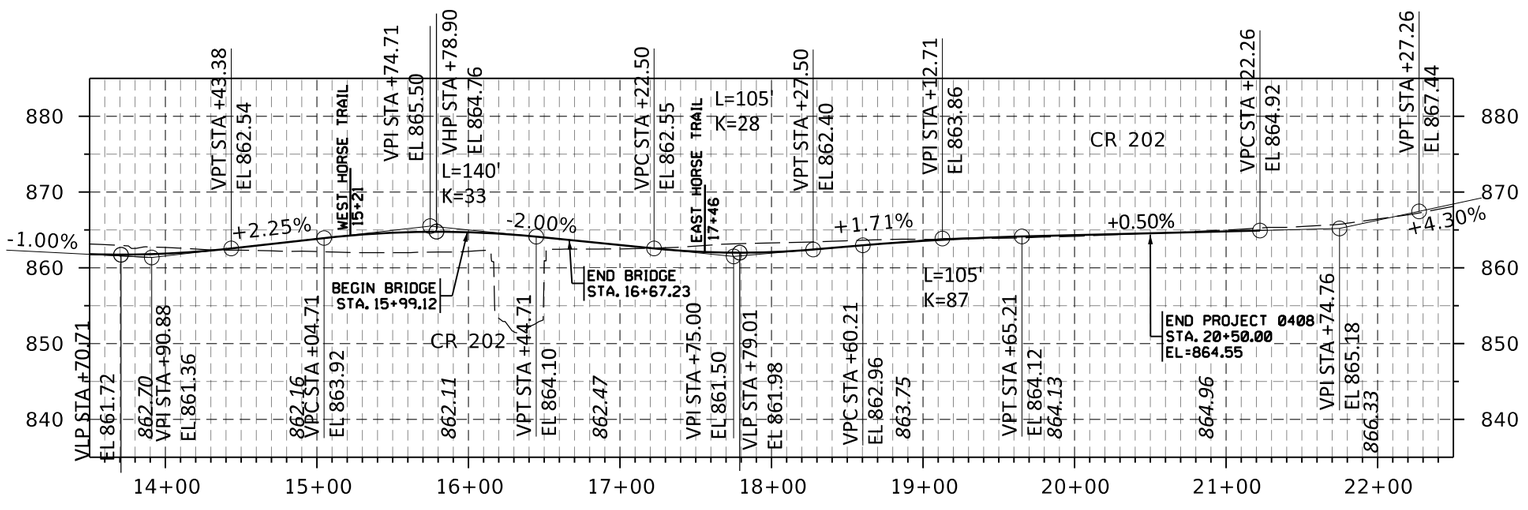


C.R. 202

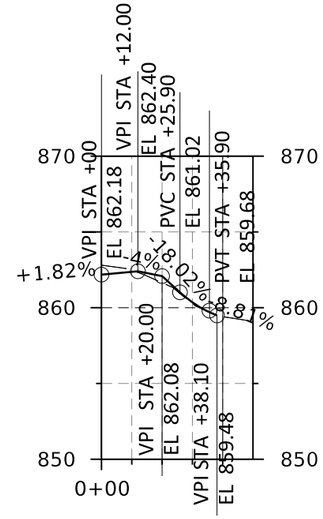
BENCH MARK DATA:
VERTICAL DATUM NGVD 1929

ELEVATION 860.618
SPIKE IN SW WING WALL OF
BRIDGE L8081 OVER ELM CREEK

ELEVATION 864.944
SPIKE IN TREE SOUTH SIDE C.R. 202
+/-600' EAST OF BRIDGE L8081

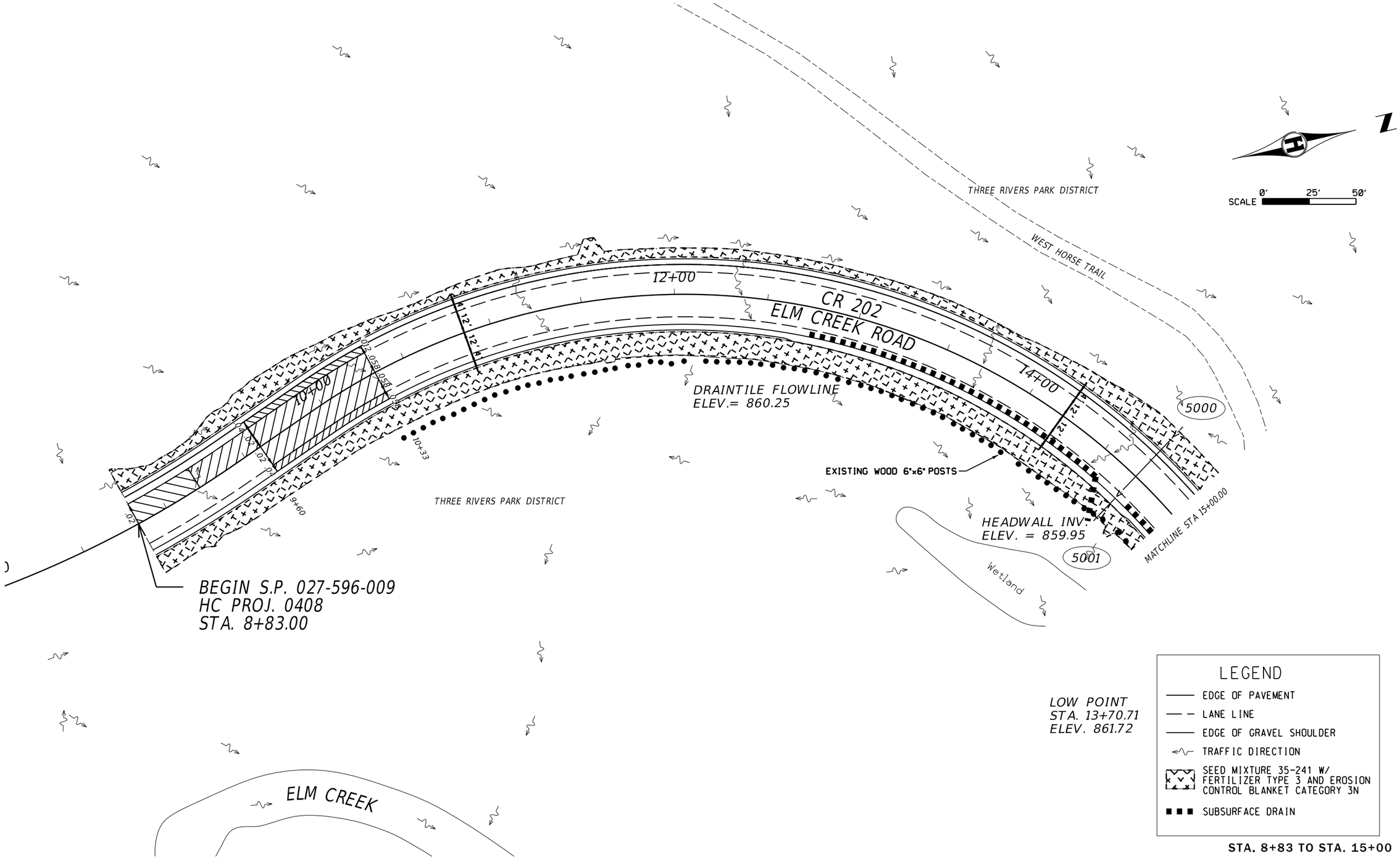


C.R. 202



EAST HORSE TRAIL

Hennepin	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. Andrew C. McGovern — ANDREW C. McGOVERN, PROFESSIONAL ENGINEER; 48041 LICENSE NO.; 6/21/18 DATE	DESIGN BY: J. SCHERER CAD BY: J. SCHERER CHECKED BY: D. SEILER LAST REVISION: 06/05/18	PROFILE C.R. 202 HENNEPIN COUNTY PROJECT 0408 S.P. 027-596-009	SHEET 39/59



STA. 8+83 TO STA. 15+00

Hennepin

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Andrew C. McGovern

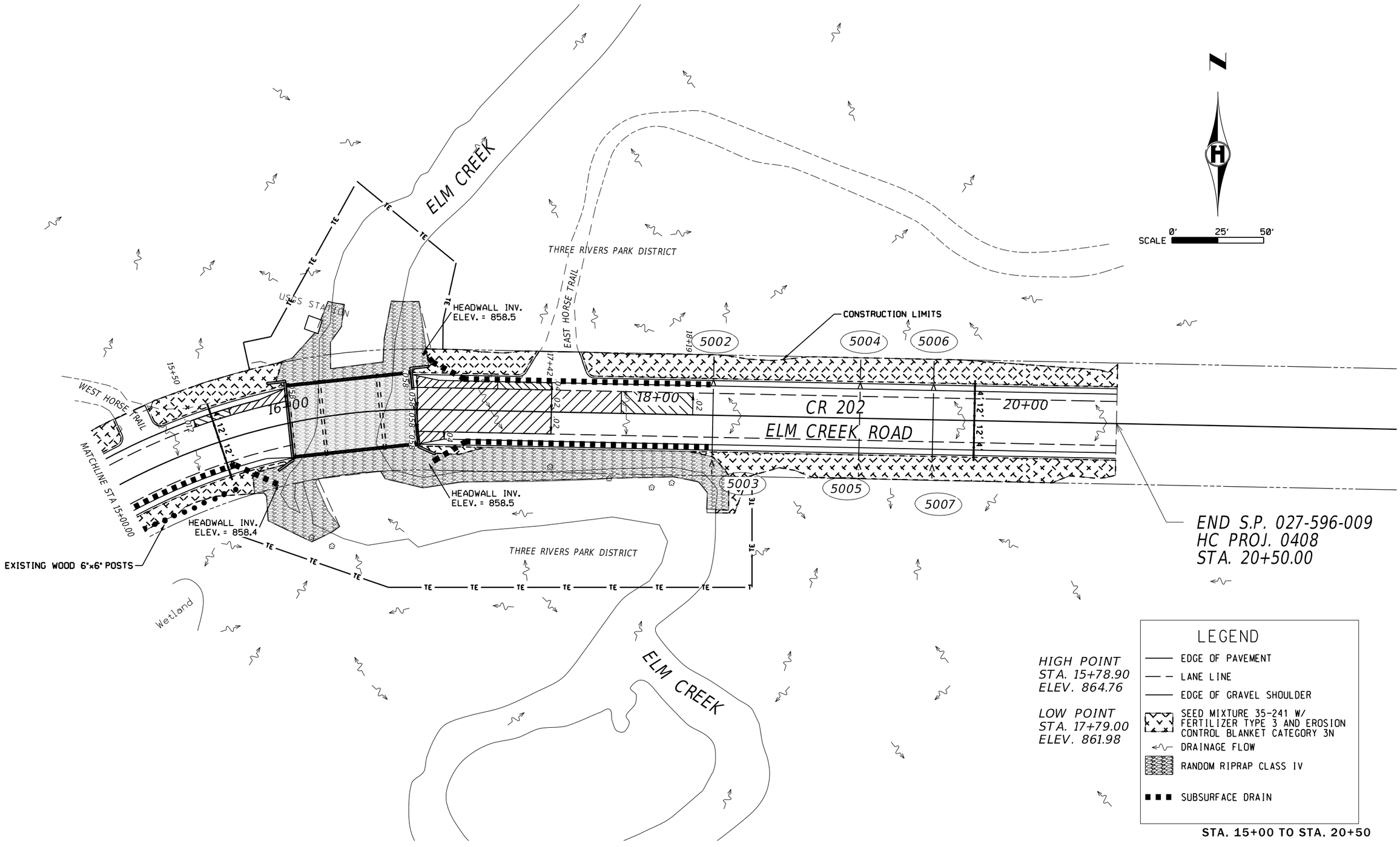
ANDREW C. McGOVERN, PROFESSIONAL ENGINEER | 48041 LICENSE NO. | 8/23/2018 DATE

DESIGN BY:	TSM
CAD BY:	TSM
CHECKED BY:	JLS
LAST REVISION:	08/23/2018

DRAINAGE, SUPERELEVATION & TURF ESTABLISHEMENT PLAN

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

SHEET 40 / 59



STA. 15+00 TO STA. 20+50

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 — LICENSE NO.

08/23/2018 — DATE

DESIGN BY:	TSM
CAD BY:	TSM
CHECKED BY:	JLS
LAST REVISION:	08/23/2018

DRAINAGE, SUPERELEVATION & TURF ESTABLISHEMENT PLAN

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

SHEET 41 / 59

SWPPP INTRODUCTION (PART III.A)

HENNEPIN COUNTY HAS DEVELOPED THIS STORM WATER POLLUTION PREVENTION PLAN (SWPPP) TO COMPLY WITH THE REQUIREMENTS OF THE MPCA NPDES GENERAL PERMIT NUMBER MN R100001 (GENERAL PERMIT), PARTS III AND IV AND APPENDIX A. THIS SWPPP INCLUDES A NARRATIVE THAT DESCRIBES THE TEMPORARY AND PERMANENT EROSION PREVENTION AND SEDIMENT CONTROL PLAN AND THE STORMWATER 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 COMPLYING WITH OR REFERENCING.

PROJECT SUMMARY (PART III.A)

THIS RECONSTRUCTION PROJECT IS LOCATED IN HENNEPIN COUNTY ON C.R. 202 FROM ELM CREEK 700' WEST AND 380' EAST OF ELM CREEK (PROPOSED BRIDGE). THIS PROJECT WILL INCLUDE: REMOVAL OF BRIDGE L8081 AND REPLACING WITH BRIDGE 27C53, GRADING, BITUMINOUS SURFACING, STORM WATER DRAINAGE (DITCHES & CULVERTS) THE 3 CULVERTS EAST OF THE BRIDGE WILL BE SPECIFICALLY FOR FLOOD CONTROL, AND RIPRAP. CHANGES TO THE UTILITIES ALONG THIS PROJECT WILL INVOLVE AS NEEDED LOCAL CHANGES IN GRADE TO ACCOMMODATE CONSTRUCTION.

TOTAL PROJECT DISTURBED AREA =	1.71 ACRES
TOTAL EXISTING IMPERVIOUS SURFACE AREA =	0.80 ACRES
TOTAL PROPOSED IMPERVIOUS SURFACE AREA =	1.04 ACRES
TOTAL PROPOSED NET CHANGE IMPERVIOUS SURFACE AREA =	0.24 ACRES

PROJECT DESCRIPTION (PART III.A)

HENNEPIN COUNTY TRANSPORTATION DEPARTMENT, IN COOPERATION WITH THE CITY OF DAYTON, AND THREE RIVERS PARK DISTRICT IS USING FEDERAL FUNDING FOR BRIDGE REPLACEMENT AND MUNICIPAL FUNDS FOR ROADWAY RECONSTRUCTION. THIS PROJECT WILL IMPROVE THE ROADWAY TO STATE AID STANDARDS FOR A TWO LANE ROADWAY. REPLACE THE CURRENT ONE LANE BRIDGE WITH TWO LANE BRIDGE TO LRFD STANDARDS. THE PROJECT WILL NOT REQUIRE ANY PERMANENT RIGHT OF WAY ACQUISITIONS. THE PROJECT WILL CHANGE THE ROADWAY HORIZONTAL AND VERTICAL ALIGNMENT, CROSS SLOPE, AND OVERALL WIDTH OF THE CORRIDOR. FLOODPLAINS ARE MITIGATED WITH PROJECT EARTHWORK. NO WETLANDS WILL BE IMPACTED.

CONSTRUCTION AND OPERATION METHODS

CONSTRUCTION AND OPERATION METHODS THAT WILL CAUSE OR INVOLVE PHYSICAL MANIPULATION OF THE ENVIRONMENT FOR THE PROPOSED PROJECT ARE EXPECTED TO INCLUDE:

- EXCAVATION AND REMOVAL OF EXISTING BRIDGE AND ROADWAY.
- FLOOD PLAIN CULVERTS AND DRAINAGE CULVERT
- UTILITY RELOCATIONS
- GRADING, BASE, BITUMINOUS SURFACING.
- RIP RAP SLOPE STABILIZATION
- TEMPORARY AND PERMANENT EROSION PREVENTION, SEDIMENT CONTROL, AND TURF ESTABLISHEMENT.

TIMING AND DURATION

CONSTRUCTION OF THIS PROJECT IS SCHEDULED TO BEGIN IN THE WINTER OF 2018 AND THE COMPLETION IS SCHEDULED FOR SUMMER OF 2019. THRU 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 MNDOT STANDARD SPECIFICATION 1717.

EROSION CONTROL (EC) SUPERVISOR

DURING THE PRE-CONSTRUCTION CONFERENCE, A PERSON CERTIFIED (PER MNDOT REQUIREMENTS) AND KNOWLEDGEABLE 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 BE ALLOWED TO COMMENCE WORK UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT ENGINEER.
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 BEFORE AND DURING CONSTRUCTION.
2. OVERSEE THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING AND UNTIL THE NOTICE OF TERMINATION IS ISSUED FOR THE CONSTRUCTION (AS OUTLINED IN THIS SWPPP).
3. COORDINATE, SCHEDULE AND OVERSEE THE WORK OF SUBCONTRACTORS TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED.
4. UPDATE AND/OR AMEND THE SWPPP AS NECESSARY TO ADDRESS DEFICIENCIES IN THE PREVENTION OF STORM WATER POLLUTION IMPACTS OR CONSTRUCTION CHANGES PER THE PROJECT SPECIAL PROVISIONS.

ENSURE THAT THE SWPPP IS IMPLEMENTED AND MAINTAINED UNTIL
(A) THE CONSTRUCTION PROJECT IS COMPLETE,
(B) THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION, AND
(C) A NOTICE OF TERMINATION HAS BEEN SUBMITTED TO THE MPCA.

MAINTAINING A QUALITY CONTROL PROGRAM SHALL CONSIST OF:

1. ENSURING PERMIT REQUIREMENTS RELATED TO THE CONTRACTOR'S AND SUBCONTRACTOR('S) CONSTRUCTION ACTIVITIES ARE ADHERED TO.
2. ENSURING THAT ALL OPERATORS AND/OR SUBCONTRACTOR(S) ON SITE HAVE THE PROPER EROSION PREVENTION AND SEDIMENT CONTROL CERTIFICATION.
3. INFORMING THE ENGINEER WHEN THE REQUIRED CERTIFIED EROSION PREVENTION SEDIMENT CONTROL PERSONNEL HAVE NOT BEEN PROVIDED.
4. CONDUCTING THE INSPECTIONS REQUIRED BY THE GENERAL PERMIT.
5. MAINTAINING THE NPDES INSPECTION LOG.
6. ENSURING CORRECTIVE ACTIONS ARE TAKEN IN THE PROPER TIME FRAME REQUIRED BY THE GENERAL PERMIT FOR PROBLEM AREAS IDENTIFIED DURING THE NPDES INSPECTIONS.
7. ENSURING THAT EROSION CONTROL IS INCORPORATED INTO THE WORK IN A TIMELY MANNER AND THAT DISTURBED AREAS ARE STABILIZED WITH MULCH/SEED, VEGETATIVE COVER OR IMPERVIOUS TARPOLINS ON A SECTION-BY-SECTION BASIS.
8. ENSURING, IN ACCORDANCE WITH MNDOT 2573.3, 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 EXPECTATIONS. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY SHALL 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 TAKEN INCLUDING DATES, TIMES, AND PARTY COMPLETING CORRECTIVE ACTION
5. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCHES IN 24 HOURS
6. DOCUMENTATION OF OBSERVED DISCHARGES PER GENERAL PERMIT (PART IV.E.2.f)
7. DOCUMENTS AND CHANGES MADE TO THE SWPPP.

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)

AS CO-PERMITTEE, THE 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 SITE, AND COORDINATE, SCHEDULE AND OVERSEE THE WORK OF SUBCONTRACTORS ON THE PROJECT 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 MPCA. THIS INFORMATION WILL BE PROVIDED IN AN AMENDMENT TO THE SWPPP.

PROJECT CONTACTS

ORGANIZATION	CONTACT NAME	PHONE
HENNEPIN COUNTY DESIGN PROJECT MANAGER	JOHN EKOLA, P.E.	612-596-0370
HENNEPIN COUNTY TRANSPORTATION/DESIGN	DAVE SEILER, SWPPP DESIGNER	612-596-0391
THREE RIVERS PARK DISTRICT CONSTRUCTION CONTACT	JOSH BOWE	763-694-2063
EROSION CONTROL SUPERVISOR	CONTRACTOR	
MINNESOTA POLLUTION CONTROL AGENCY (MPCA)	PAUL ERDMANN	651-757-2883

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

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

SWPPP DESIGNER: DAVE SEILER

THE SWPPP DESIGNER IS A CERTIFIED SWPPP DESIGNER BY THE UNIVERSITY OF MINNESOTA'S EROSION AND STORM WATER MANAGEMENT CERTIFICATION PROGRAM. COPIES OF THE CERTIFICATIONS ARE ON FILE WITH HENNEPIN COUNTY TRANSPORTATION DEPARTMENT AND ARE AVAILABLE UPON REQUEST. 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 BOTH THE COUNTY AND THE MPCA WITHIN 72 HOURS OF REQUEST BY EITHER HENNEPIN COUNTY OR MPCA.

DRAINAGE NARRATIVE (PART III.A.4)

HENNEPIN COUNTY, IN COOPERATION WITH THE CITY OF DAYTON, AND THREE RIVERS PARK DISTRICT IS RECONSTRUCTING 0.22 MILES OF C.R. 202 AT ELM CREEK.

THE PURPOSE OF THE PROJECT IS TO REPLACE BRIDGE L8081 WITH BRIDGE 27C53 AND RECONSTURCT 1167' OF C.R. 202 TO ACCOMMODATE THE NEW BRIDGE AND BRING THAT PORTION OF THE ROAD TO STATE AID STANDARDS.

THE PROJECT CREATES 0.24 ACRES OF NEW IMPERVIOUS AND HAS 1.71 ACRES OF FULL DEPTH RECONSTRUCTION.

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER | 48041 LICENSE NO. | 7/26/2018 DATE

DESIGN BY:	D. SEILER
CAD BY:	J. SCHERER
CHECKED BY:	D. McGOVERN
LAST REVISION:	06/05/2018

STORMWATER POLLUTION PREVENTION PLAN

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

SHEET 42/59

THE PROJECT WILL HAVE A NEW HORIZONTAL AND VERTICAL ALIGNMENT AND SUPERELEVATED CROSS SLOPE TO MEET STATE AID STANDARDS. TWO LANE RURAL CONSTRUCTION WITH BITUMINOUS LANES AND SHOULDERS. GUARDRAIL WILL ALSO BE INSTALLED IN DESIGNATED AREAS.

THE EXISTING TWO-LANE PORTION OF C.R. 202 CURRENTLY HAS A RURAL DRAINAGE SYSTEM UTILIZING DITCHES AND CULVERTS. THE PROPOSED TWO-LANE SECTION WILL ALSO BE A RURAL SECTION WITH DITCHES AND CULVERTS, WITH THE ADDITION OF 3 FLOOD PLANE CULVERTS. HENNEPIN COUNTY WILL MAINTAIN THE BRIDGE AND DRAINAGE STRUCTURES.

THE PROJECT WAS DESIGNED USING ATLAS 14 FOR RAINFALL INTENSITY. LOW POINTS ARE DESIGNED USING A 25 YEAR EVENT AND NO TRUE SAGS EXIST ON THE PROJECT. THE PROJECT AREA IS PRIMARILY TYPE C AND 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.5A-M, 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

DESCRIPTION	LOCATION
TEMPORARY EROSION CONTROL MEASURES	SHEET(S) 45 - 46
PERMANENT EROSION AND SEDIMENT CONTROL MEASURES	SHEET(S) 40 - 41
DIRECTION OF FLOW	SHEET(S) 40 – 41, 45 - 46
FINAL STABILIZATION	SHEET(S) 40 - 41
SOILS AND CONSTRUCTION NOTES	SHEET(S) 5
EROSION AND SEDIMENT CONTROL DETAILS	SHEET(S) 10 - 20

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

THERE ARE NO STORMWATER MITIGATION MEASURES REQUIRED AS A RESULT OF AN ENVIRONMENTAL, ARCHEOLOGICAL OR AGENCY REVIEW. ALL MITIGATION MEASURES HAVE BEEN ADDRESSED IN THIS PLAN SET OR 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. ELM CREEK IS IMPAIRED FOR DISSOLVED OXYGEN.

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 PROVISIONS OF 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 DRAIN TO A COMMON LOCATION.

PERMANENT STORM WATER MANAGEMENT SYSTEM (PART III.D)

ALL STORM WATER WILL BE DISCHARGED IN A MANNER THAT DOES NOT CAUSE NUISANCE CONDITIONS, EROSION IN RECEIVING CHANNELS OR ON DOWNSLOPE PROPERTIES, OR INUNDATION IN 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 OPERATION AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED, INCLUDING ALL RIGHT OF WAY, CONTRACTS, COVENANTS AND OTHER BINDING 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, 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'S 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 AREA," ANY WORK THAT WILL REQUIRE DEWATERING, 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 SUBMITTALS.
THE CONTRACTOR WILL NOT BE ALLOWED TO COMMENCE WORK FOR WHICH A SITE PLAN IS REQUIRED UNTIL APPROVAL HAS BEEN GRANTED BY THE PROJECT ENGINEER. THE CONTRACTOR WILL NOT BE GIVEN ANY EXTRA TIME IN THE CONTRACT DUE TO THE UNTIMELY SUBMITTAL 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 ENSURE 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 COMMENCE SHALL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED.

SEDIMENT CONTROL DEVICES MUST BE ESTABLISHED ON ALL DOWN-GRADIENT PERIMETERS BEFORE ANY UP-GRADIENT 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 SHEET FLOWS DOWN-GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS WITH THE BMP J-HOOKED AT A MAXIMUM OF 100-FOOT INTERVALS AND SHALL CONTAIN NO MORE THAN ONE QUARTER ACRE OF DRAINAGE AREA .

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

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

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

THE CONTRACTOR SHALL PLACE VEHICLE TRACKING BMPs AS NECESSARY TO PREVENT TRACKING OF SEDIMENT ONTO PAVED SURFACES, IN COMPLIANCE WITH PART IV OF THE GENERAL PERMIT. VEHICLE TRACKING BMPs SHALL BE SUFFICIENTLY SIZED AND MAINTAINED TO PREVENT TRACK OUT. THIS WORK SHALL BE CONSIDERED INCIDENTAL. WHEN VEHICLE TRACKING BMPs DO NOT ADEQUATELY PREVENT SEDIMENT 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 GRINDINGS, 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, SAW CUT SLURRY, PLANNING WASTE, AND OTHER CONCRETE WASTES FROM LEAVING HENNEPIN COUNTY RIGHT OF WAY, DEPOSITING IN AREAS OF EXISTING OR FUTURE VEGETATED SOILS, OR FROM ENTERING STORMWATER CONVEYANCE SYSTEMS, SUCH AS GUTTERS AND DITCHES.

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER | 48041 LICENSE NO. | 7/26/2018 DATE

DESIGN BY:	D. SEILER
CAD BY:	J. SCHERER
CHECKED BY:	D. McGOVERN
LAST REVISION:	06/05/2018

STORMWATER POLLUTION PREVENTION PLAN

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

DITCHES AND EXPOSED SOILS MUST BE KEPT IN AN EVEN ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES AND BLANKETS.

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

ALL EXPOSED SOIL AREAS WILL BE STABILIZED PRIOR TO THE ONSET OF WINTER. ANY WORK STILL BEING PERFORMED WILL BE MULCHED, SEEDED, OR BLANKETED WITHIN THE TIME FRAMES LISTED IN THE GENERAL PERMIT.

THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING INSPECTION AND MAINTENANCE REQUIREMENTS:

A. SILT FENCE MUST BE REPAIRED, REPLACE OR SUPPLEMENTED WHEN IT BECOMES NON-FUNCTIONAL OR SEDIMENT REACHES ONE-THIRD THE HEIGHT OF THE SILT FENCE.REPAIRS MUST BE MADE WITHIN 24 HOURS OF DISCOVERY.

B. INLET PROTECTION DEVICES MUST BE REPAIRED WHEN THEY BECOME NON-FUNCTIONAL OR SEDIMENT REACHES ONE-THIRD THE HEIGHT OF THE INLET PROTECTION. REPAIRS MUST BE MADE WITHIN 24 HOURS OF DISCOVERY.

C. TRACKED SEDIMENT MUST BE SWEPT WITHIN 24 HOURS OF DISCOVERY OF TRACKING ONTO PAVED SURFACES INCLUDING PAVED SURFACES DRAINING TO GUTTERS. INLETS. DITCHES. OR PONDS.PAVEMENT SHALL BE WETTED PRIOR TO SWEEPING. THIS WORK IS INCIDENTAL TO STREET SWEEPER (WITH PICKUP BROOM).

D. ANY SUBSURFACE DRAINAGE TILES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED, REPLACED, OR REROUTED, AND CONNECTED TO THE EXISTING TILE OR DRAINAGE SYSTEM TO ENSURE THAT EXISTING UPLAND DRAINAGE IS PERPETUATED.

E. ALL OTHER NON-FUNCTIONAL BMPS MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WITHIN 24 HOURS OF DISCOVERY.

FILTER LOGS SHALL BE INSTALLED, AS NEEDED, TO TRAP SEDIMENT ON THE LOWER EDGE OF BEDS OR TREE HOLES. FILTER LOGS WILL BE LEFT TO PHOTO DEGRADE.TILLING FOR BEDS OR TREE HOLES MUST BE PLANTED AND MULCHED WITH WOODCHIPS WITHIN 1 DAYS OR STRAW MULCHED UNTIL PLANTING OPERATIONS CAN BE COMPLETED .

OUTLETS TO SURFACE WATERS SHALL BE STABILIZED WITH ENERGY DISSIPATION WITHIN 24 HOURS OF BEING CONSTRUCTED. IF SEDIMENT DEPOSITS IN A WATER OF THE STATE, THE MATERIAL MUST BE REMOVED WITHIN 7 DAYS.

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 MNDNR 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 1717 (AIR, LAND, AND WATER POLLUTION) OF THE SPECIAL PROVISIONS.

BASIN DRAINING ACTIVITIES OF TURBID OR 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 NUISANCE CONDITION IN THE RECEIVING WATERS 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.

POLLUTION 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 WASHOUT OPERATIONS ARE TO BE CONTAINED IN A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER. BURNING 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 CLEAN 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 RECEIVE 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 DAYTON 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 ARCHELOGICAL SITES.

Hennepin

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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 — LICENSE NO.

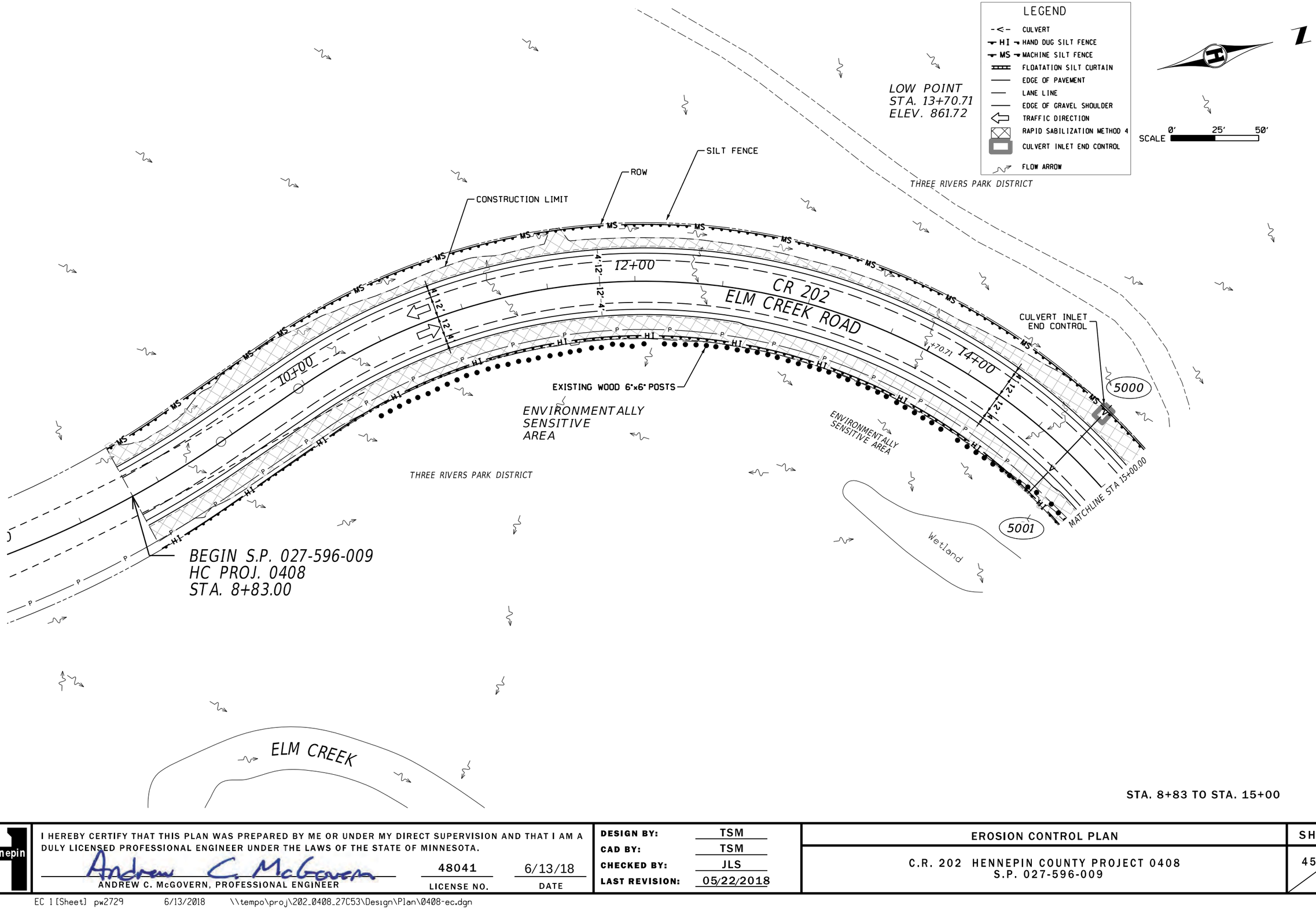
06/21/2018 — DATE

DESIGN BY:	D. SEILER
CAD BY:	J. SCHERER
CHECKED BY:	D. McGOVERN
LAST REVISION:	06/05/2018

STORMWATER POLLUTION PREVENTION PLAN

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

SHEET 44 / 59



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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.

Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER | 48041 LICENSE NO. | 6/13/18 DATE

DESIGN BY:	TSM
CAD BY:	TSM
CHECKED BY:	JLS
LAST REVISION:	05/22/2018

EROSION CONTROL PLAN

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

SHEET 45 / 59

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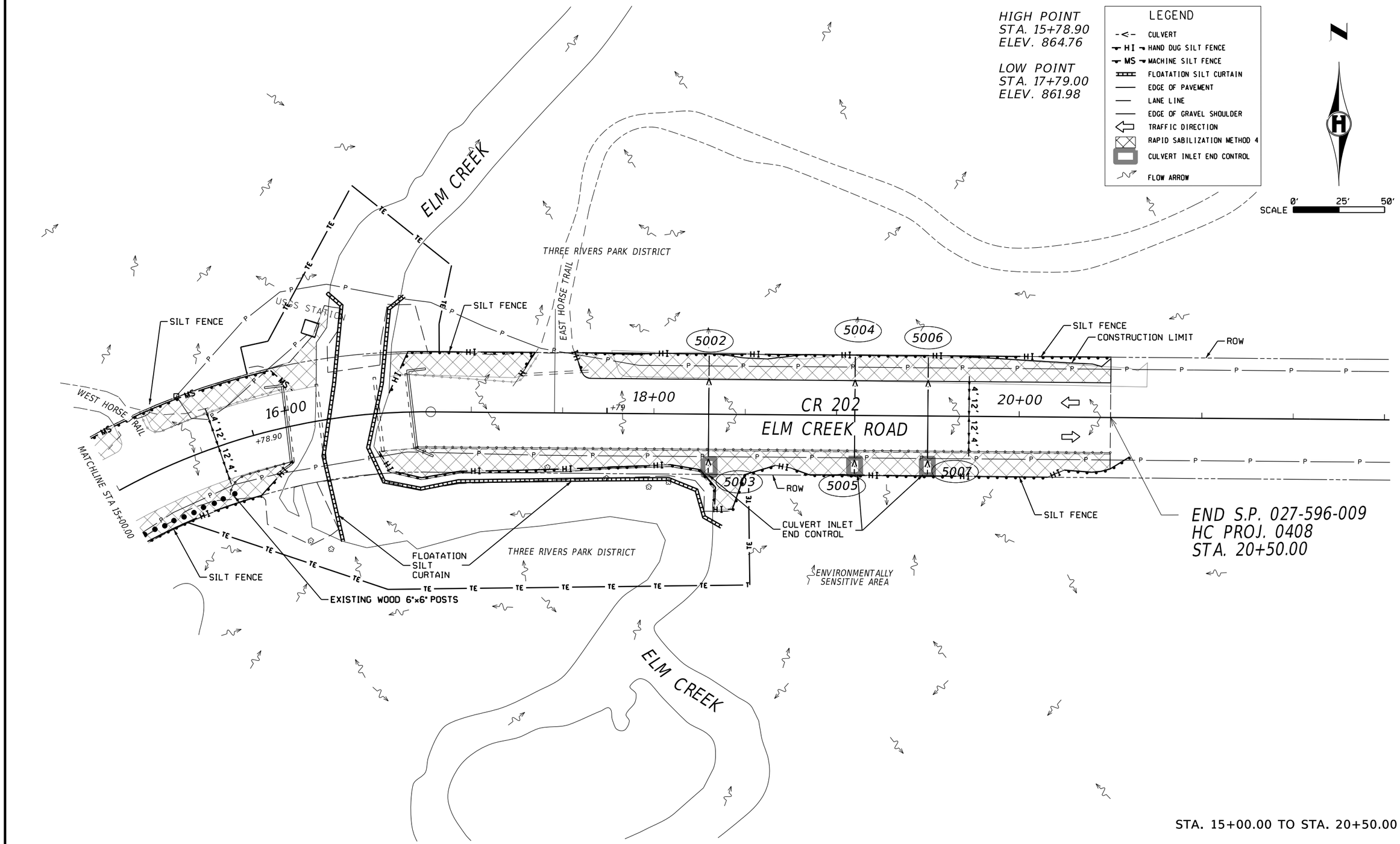

STA. 15+00.00 TO STA. 20+50.00

Hennepin

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Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

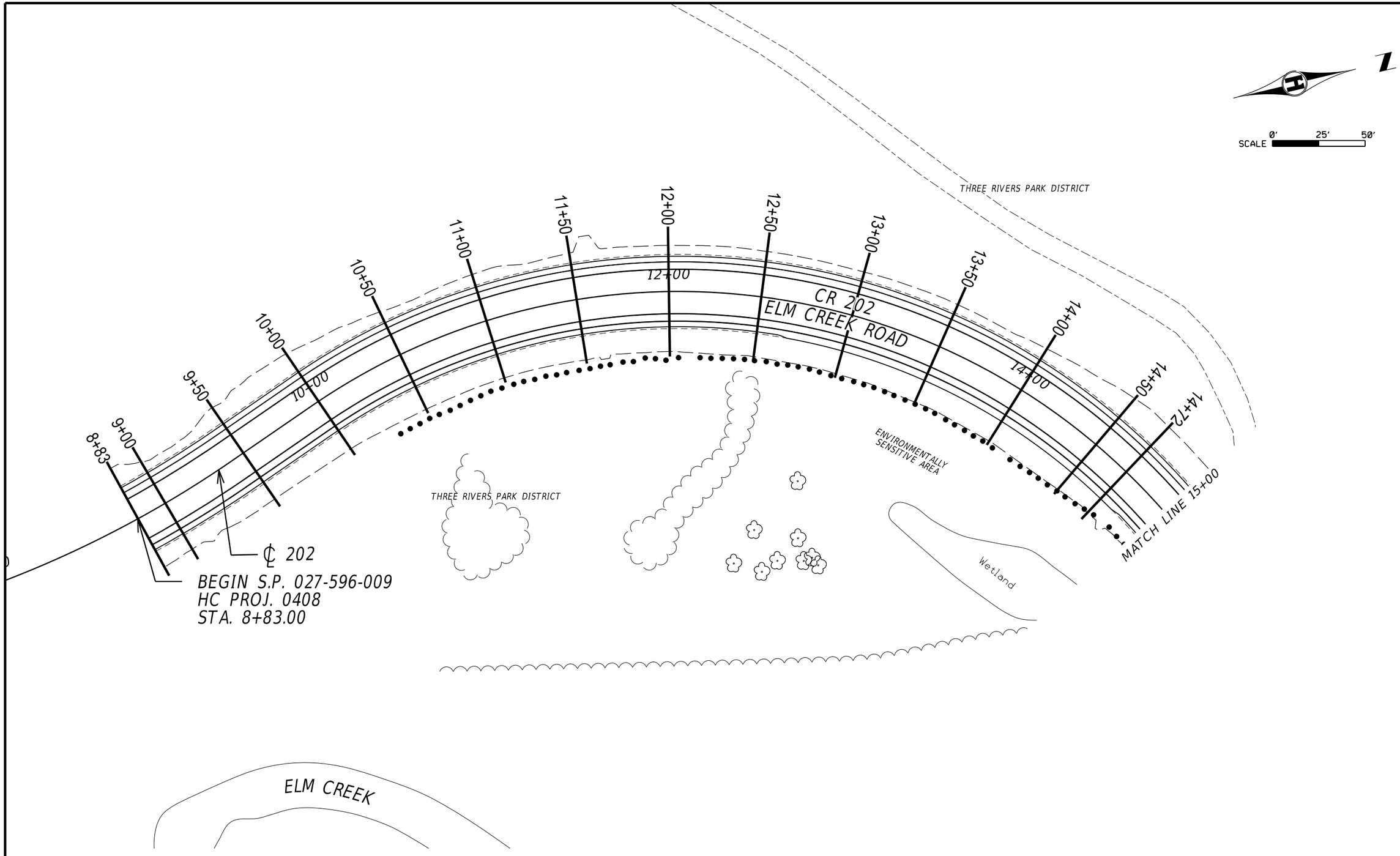
06/21/2018 DATE

DESIGN BY:	TSM
CAD BY:	TSM
CHECKED BY:	JLS
LAST REVISION:	05/22/2018

EROSION CONTROL PLAN

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

SHEET 46 / 59



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Andrew C. McGovern

ANDREW C. McGOVERN, PROFESSIONAL ENGINEER

48041 LICENSE NO.

6/13/18 DATE

DESIGN BY:	E. KELLNER
CAD BY:	E. KELLNER
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LAST REVISION:	06/06/2018

CROSS SECTION MATCH LINE LAYOUT

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

SHEET 47/59

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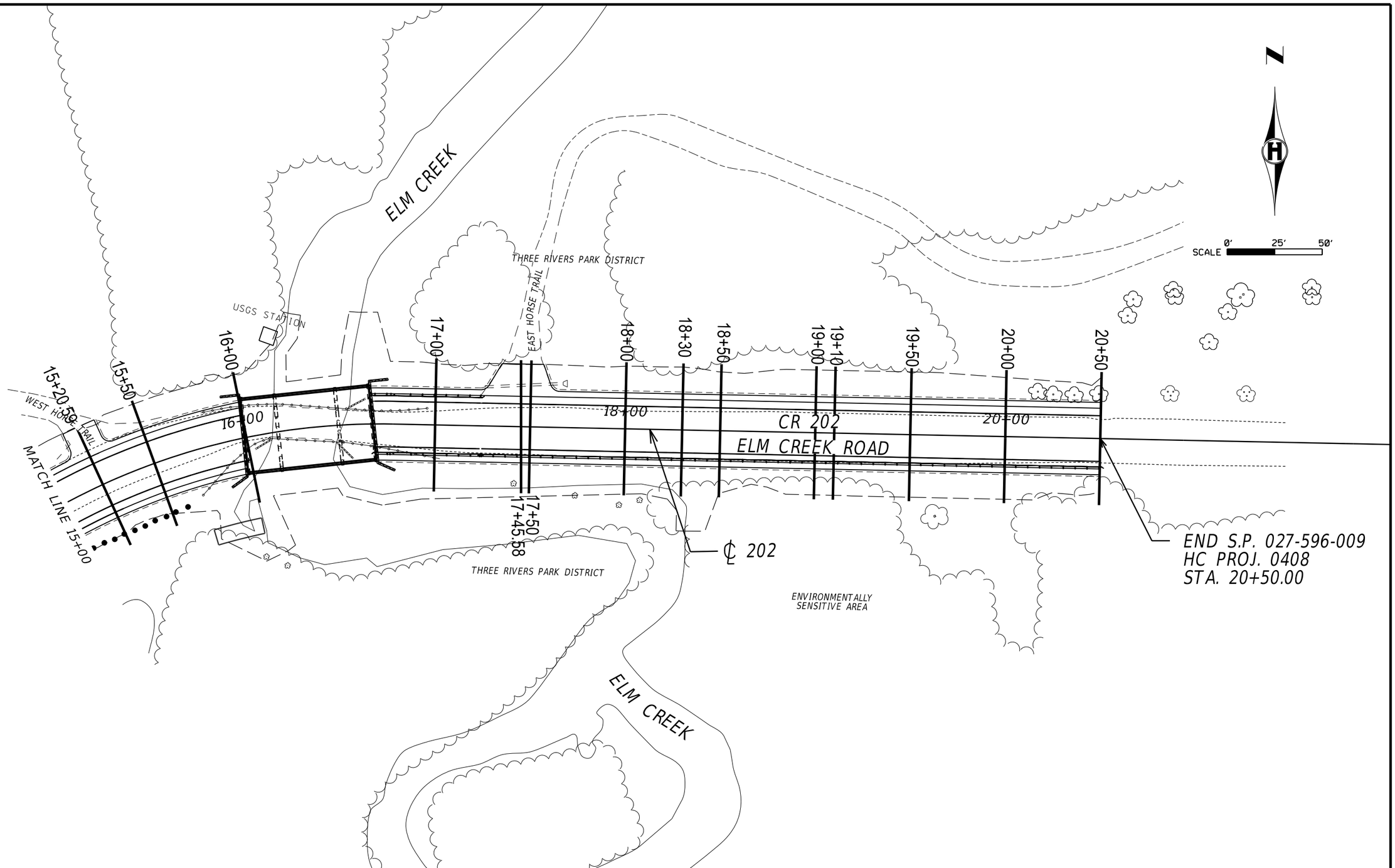

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Andrew C. McGovern

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48041 — LICENSE NO.

6/13/18 — DATE

DESIGN BY:	E. KELLNER
CAD BY:	E. KELLNER
CHECKED BY:	D. SEILER
LAST REVISION:	06/05 /2018

CROSS SECTION MATCH LINE LAYOUT

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

SHEET 48/59

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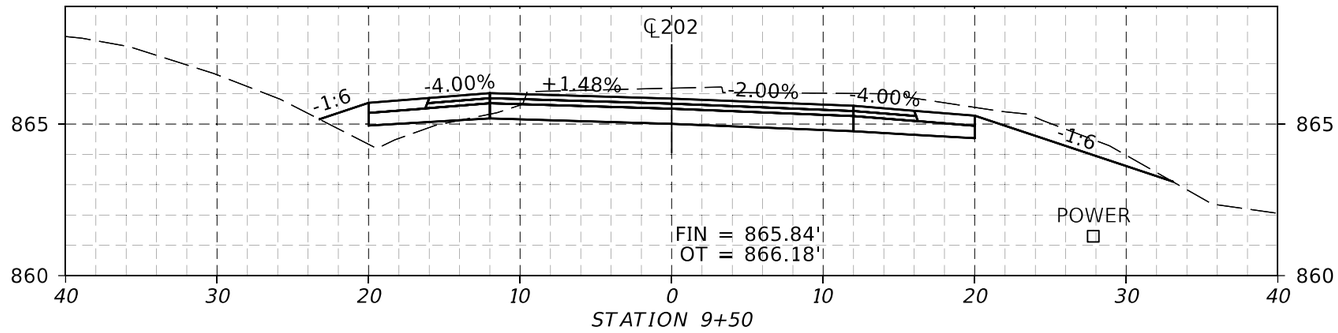

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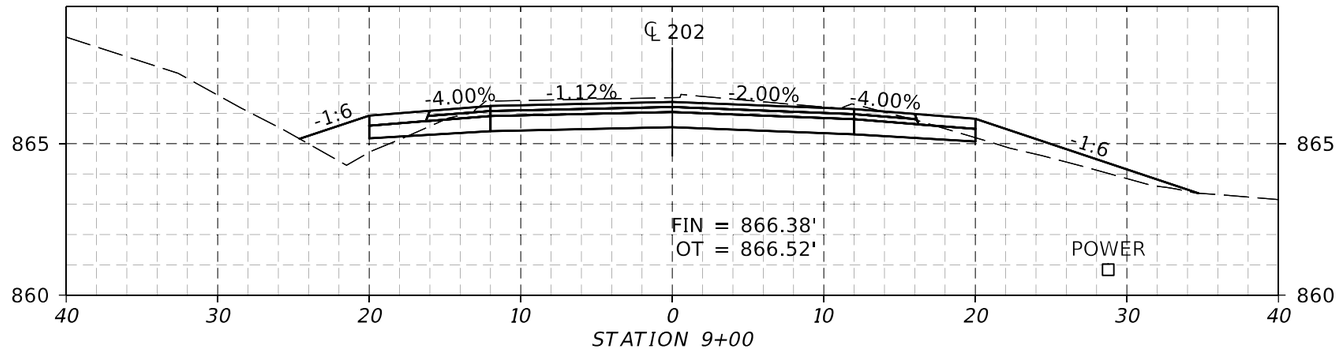

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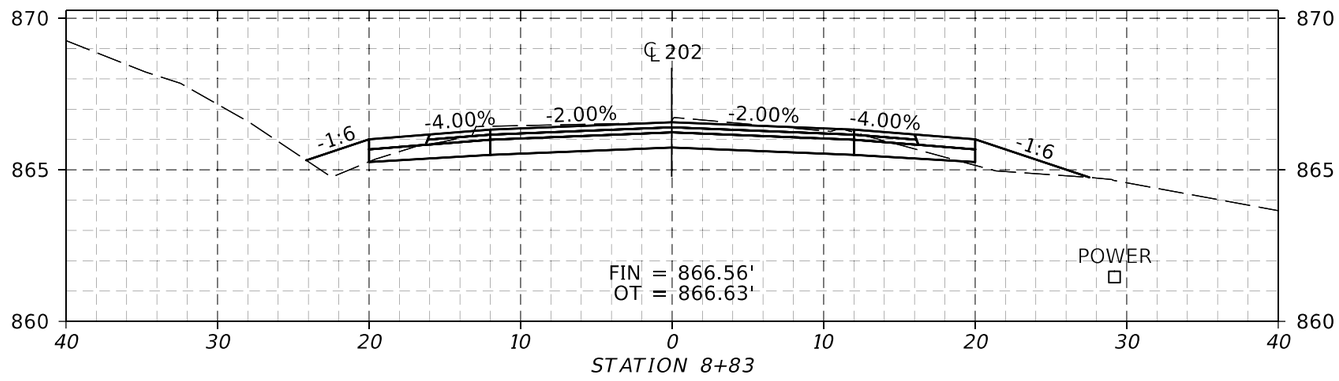

STATION 8+83

Hennepin

SCALE H 0′ 10′ 20′

SCALE V 0′ 5′ 10′

DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 8+83 TO STATION 9+50

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

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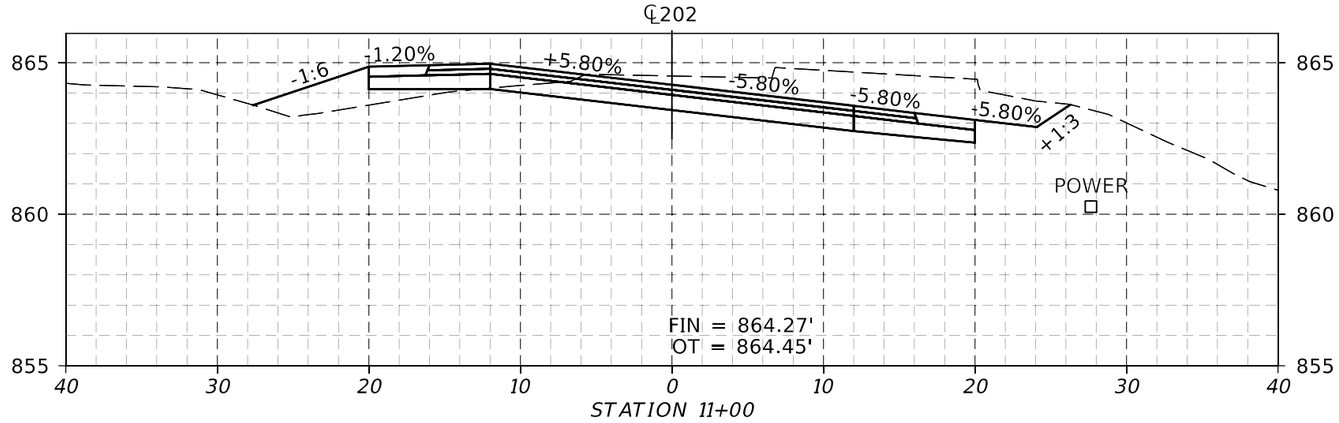

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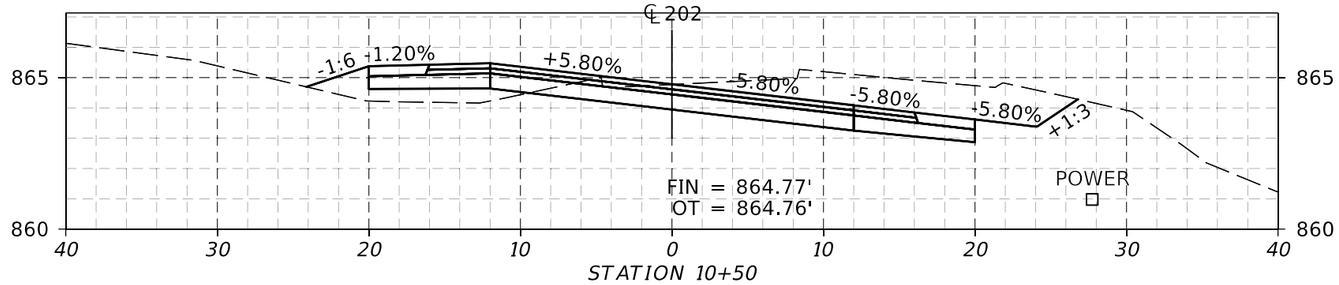

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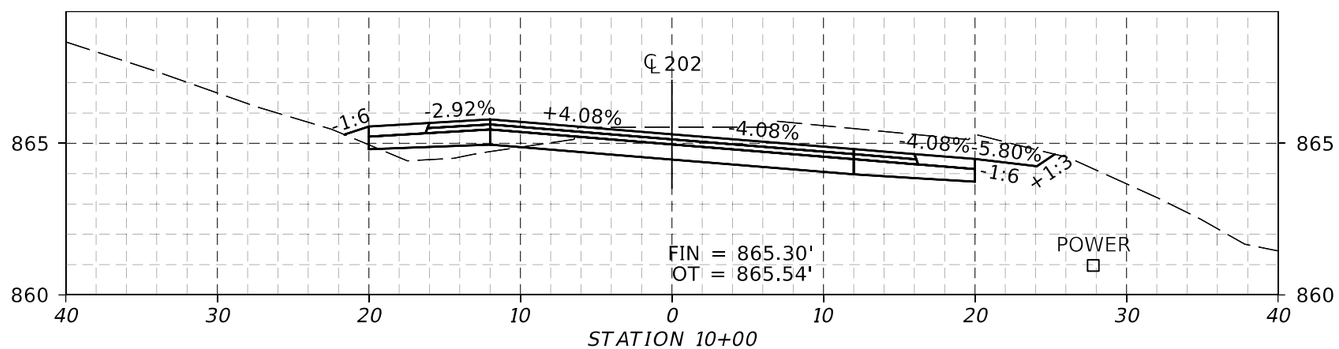

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Hennepin

SCALE H 0' 10' 20'

SCALE V 0' 5' 10'

DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 10+00 TO STATION 12+00

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

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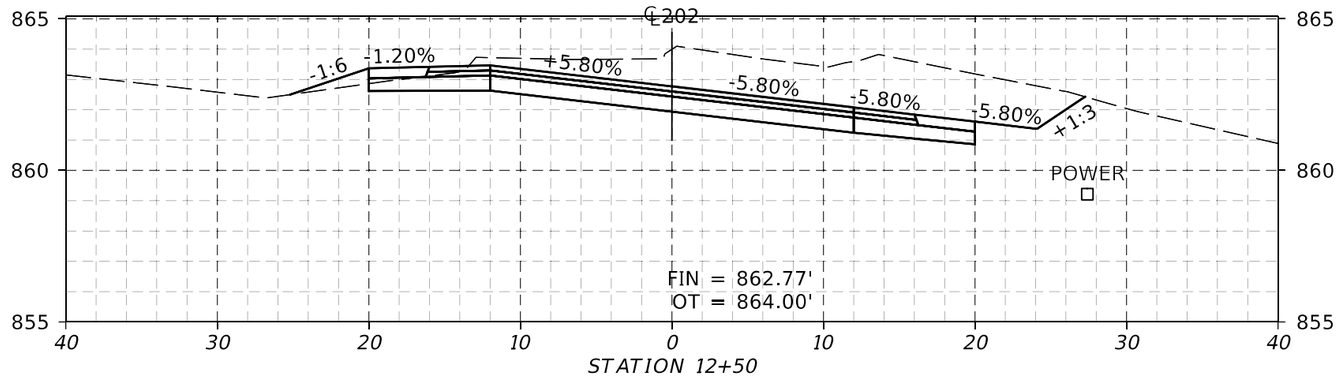

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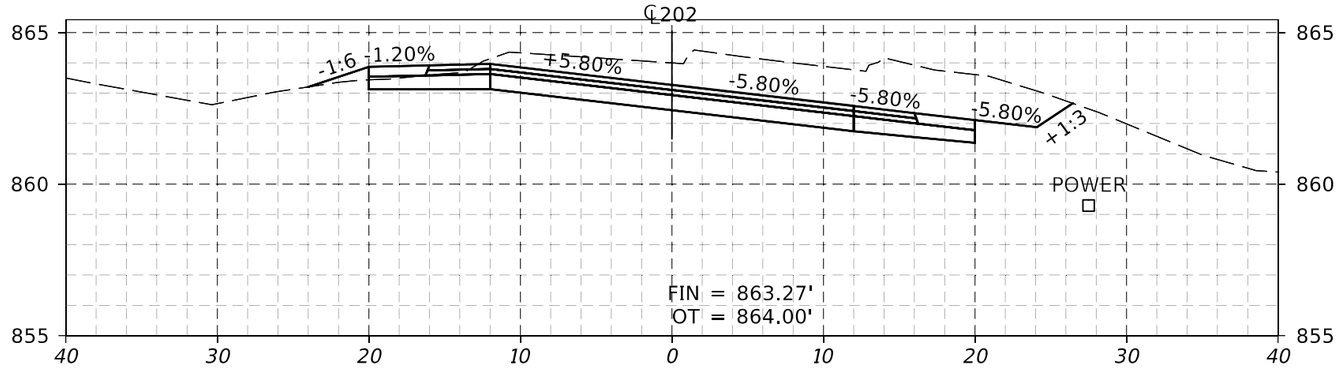

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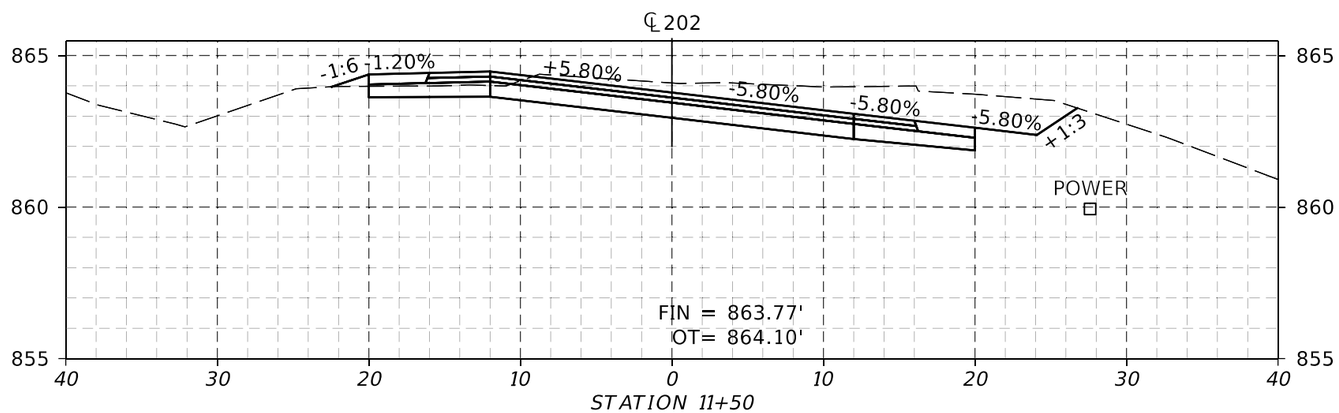

STATION 11+50

Hennepin

SCALE H 0' 10' 20'

SCALE V 0' 5' 10'

DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 11+50 TO STATION 12+50

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

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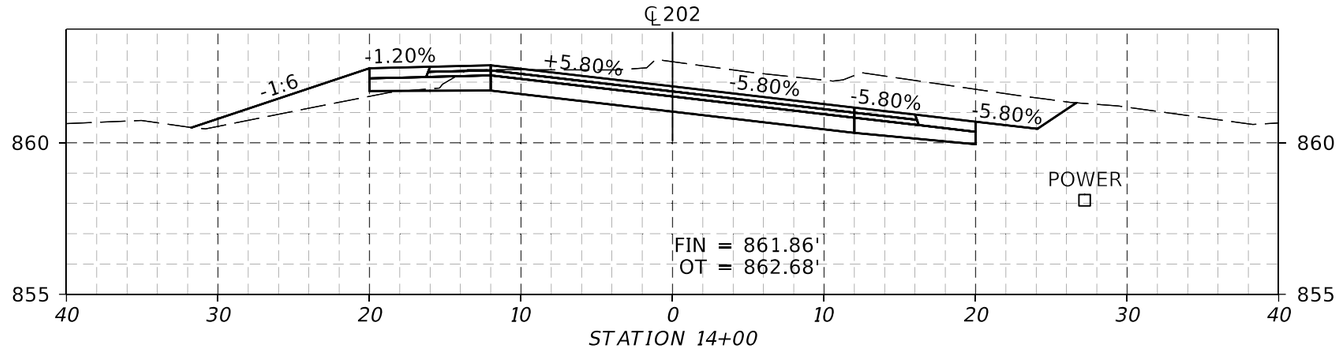

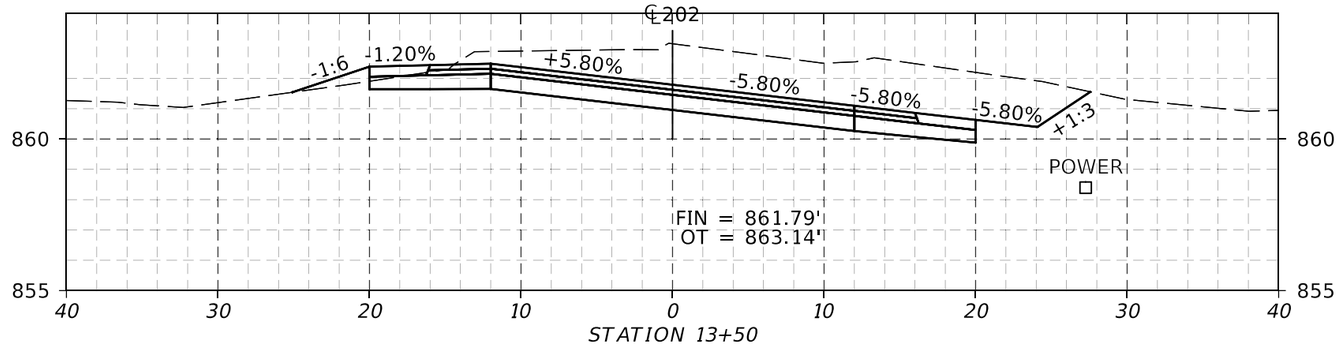

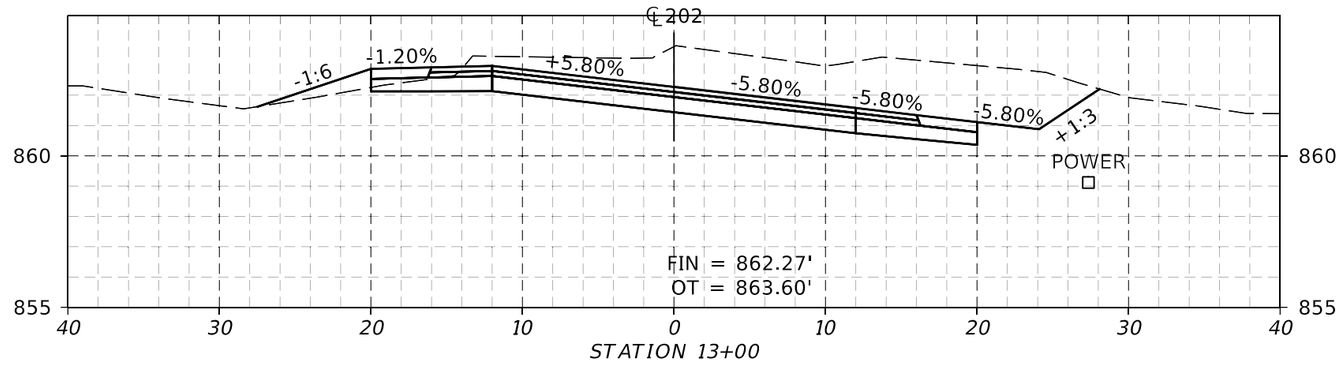

Hennepin

SCALE H 0' 10' 20'

SCALE V 0' 5' 10'

DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 13+00 TO STATION 14+00

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

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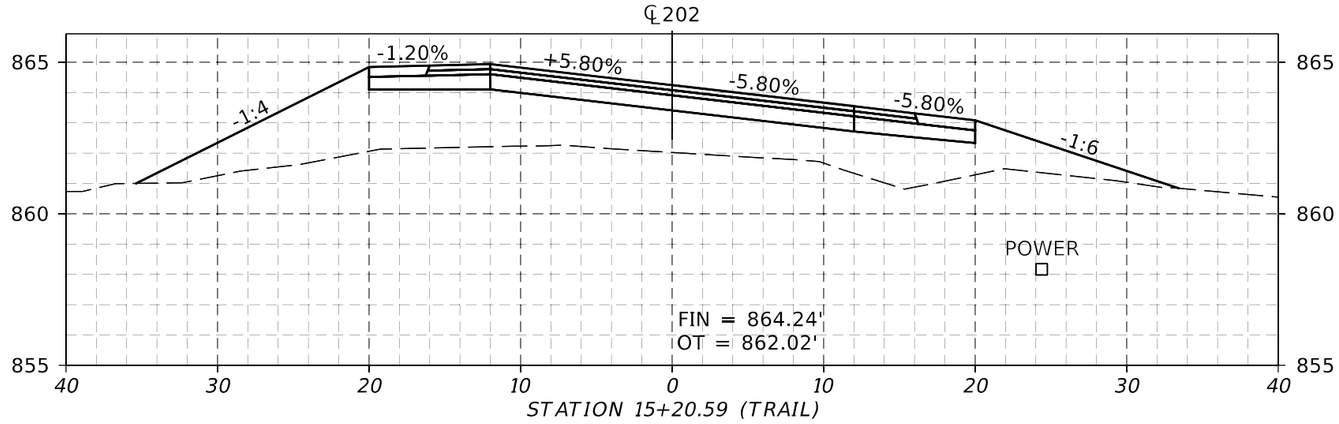
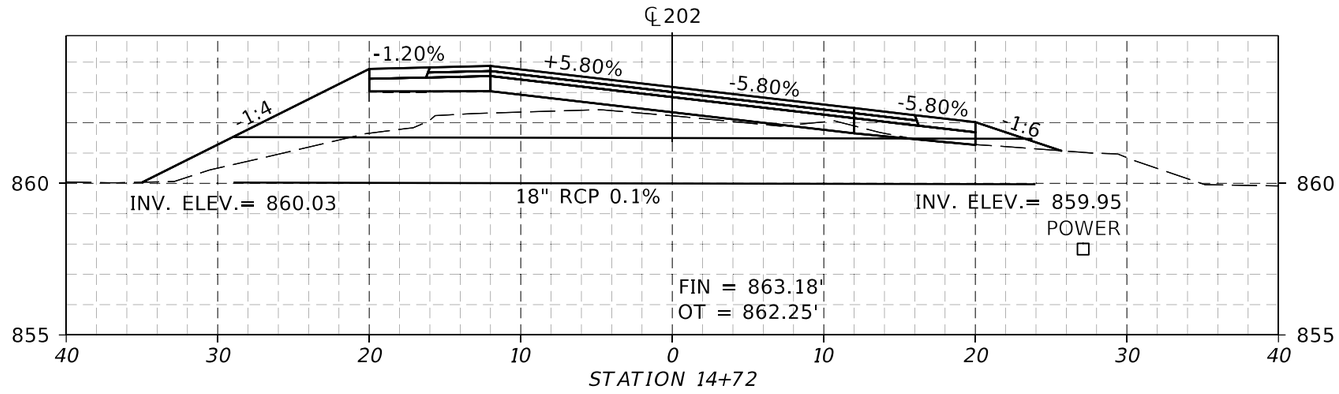
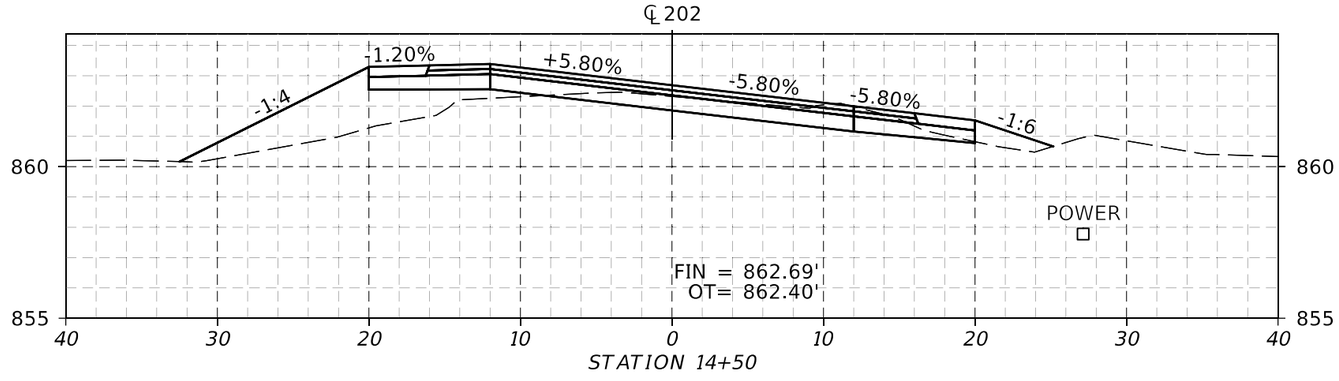


STATION 15+20.59 (TRAIL)



STATION 14+72



STATION 14+50

Hennepin

SCALE H 0' 10' 20'

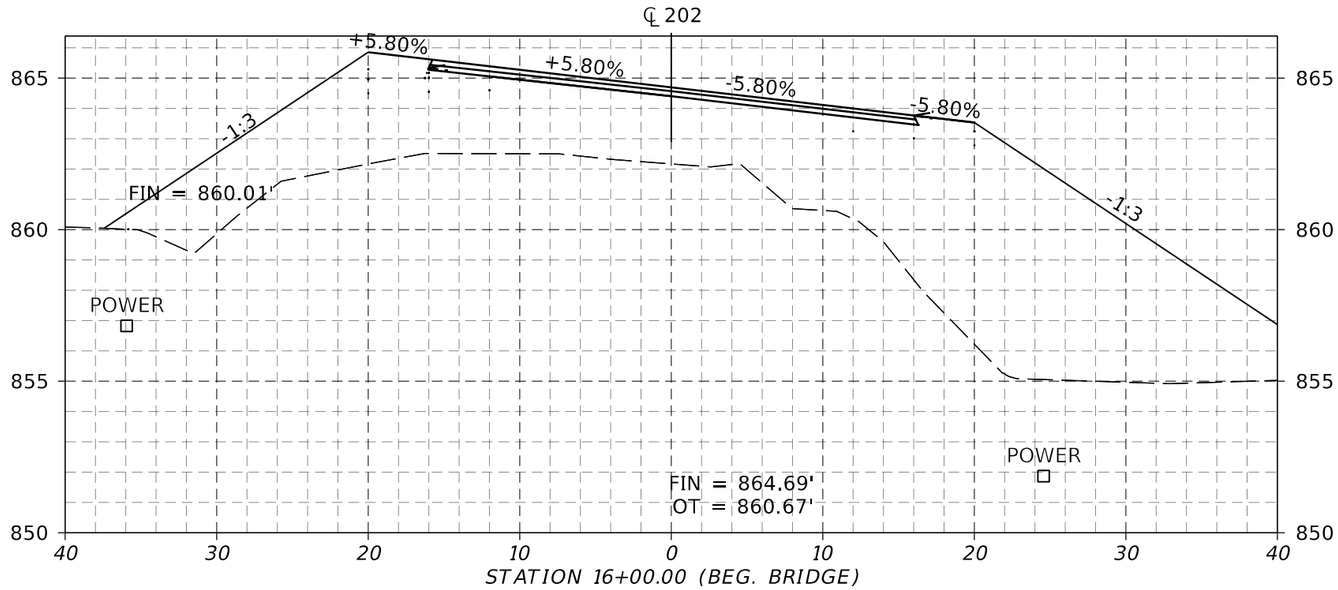
SCALE V 0' 5' 10'

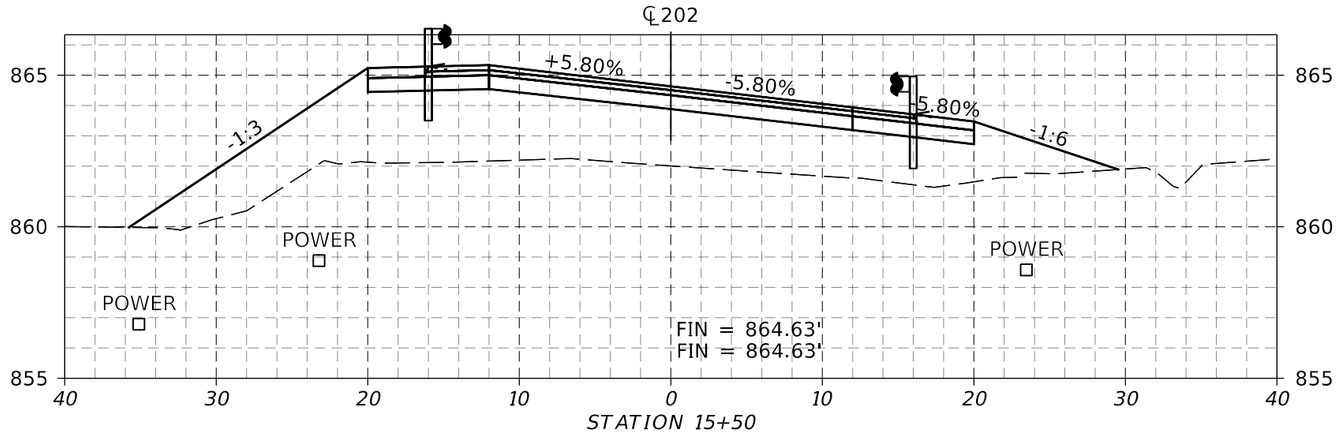
DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 14+50 TO STATION 15+21

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

SHEET 53 / 59





Hennepin

SCALE H 0′ 10′ 20′

SCALE V 0′ 5′ 10′

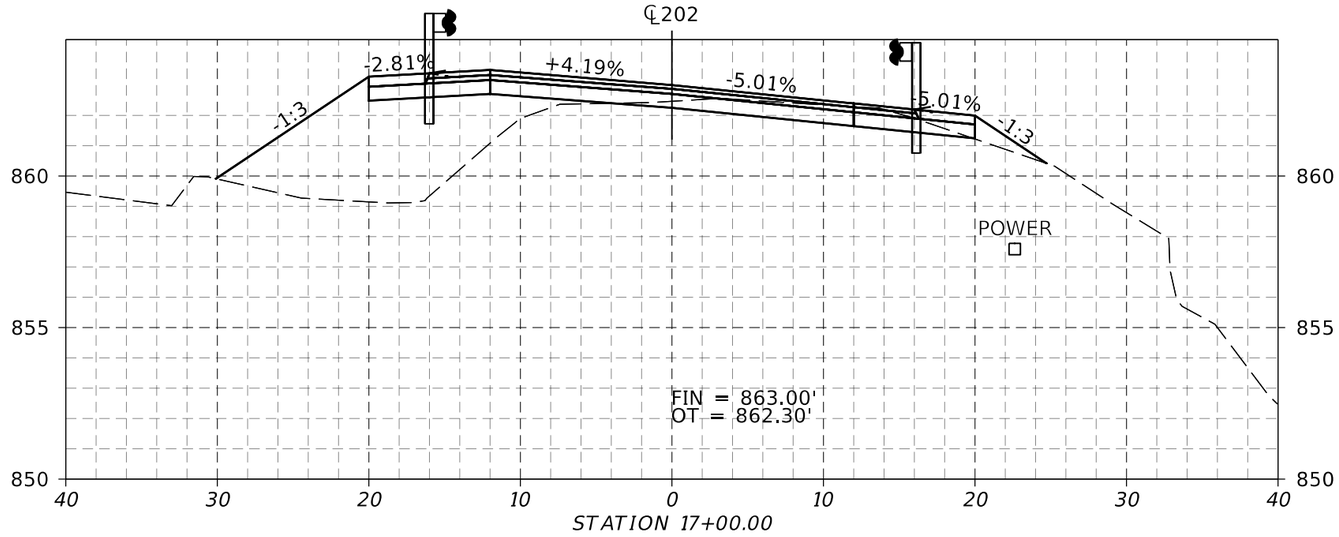
DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 15+50 TO STATION 16+00

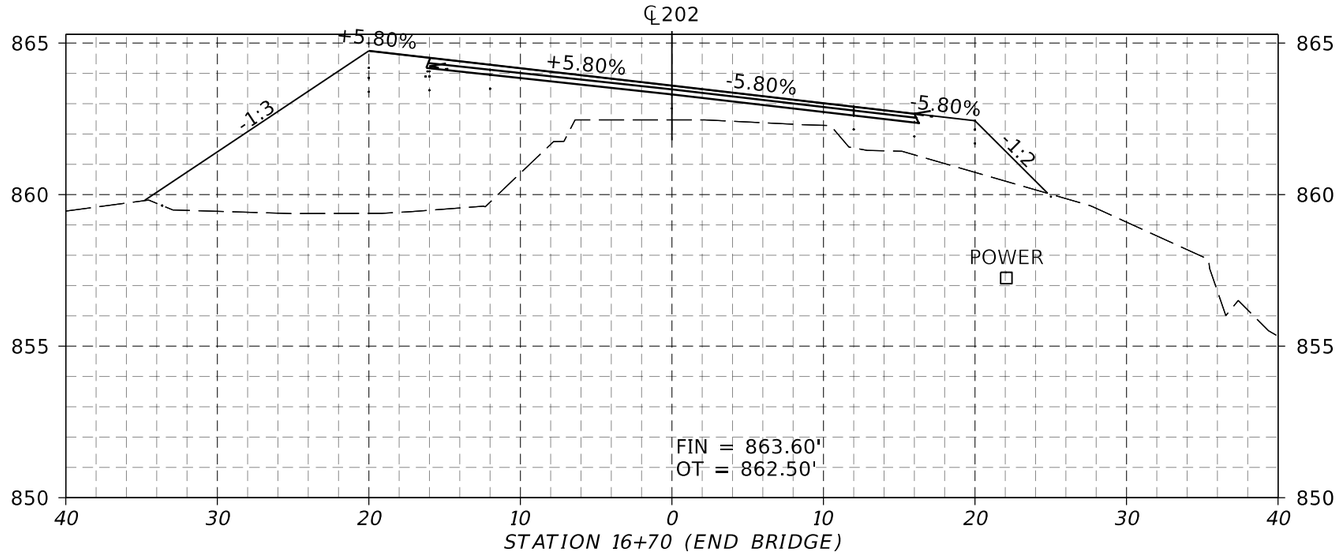
C.R. 202 HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009

SHEET 54/59

15+50 - 16+00pw[37291] 8/23/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-XS-2.dgn



STATION 17+00.00



STATION 16+70 (END BRIDGE)

Hennepin

SCALE H 0′ 10′ 20′

SCALE V 0′ 5′ 10′

DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 16+70 TO STATION 17+00

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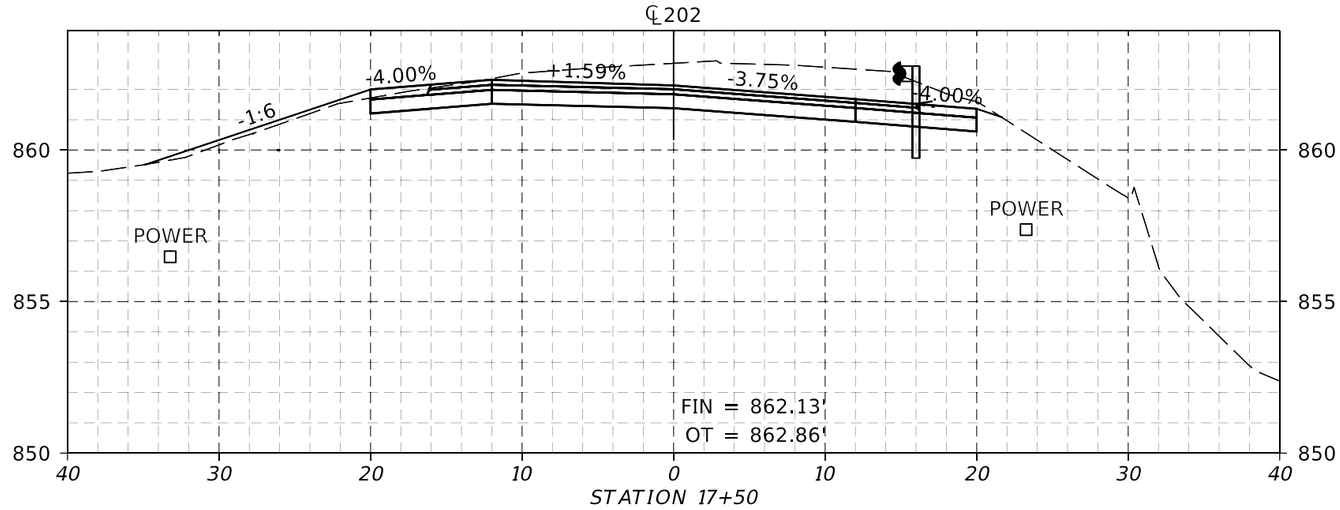
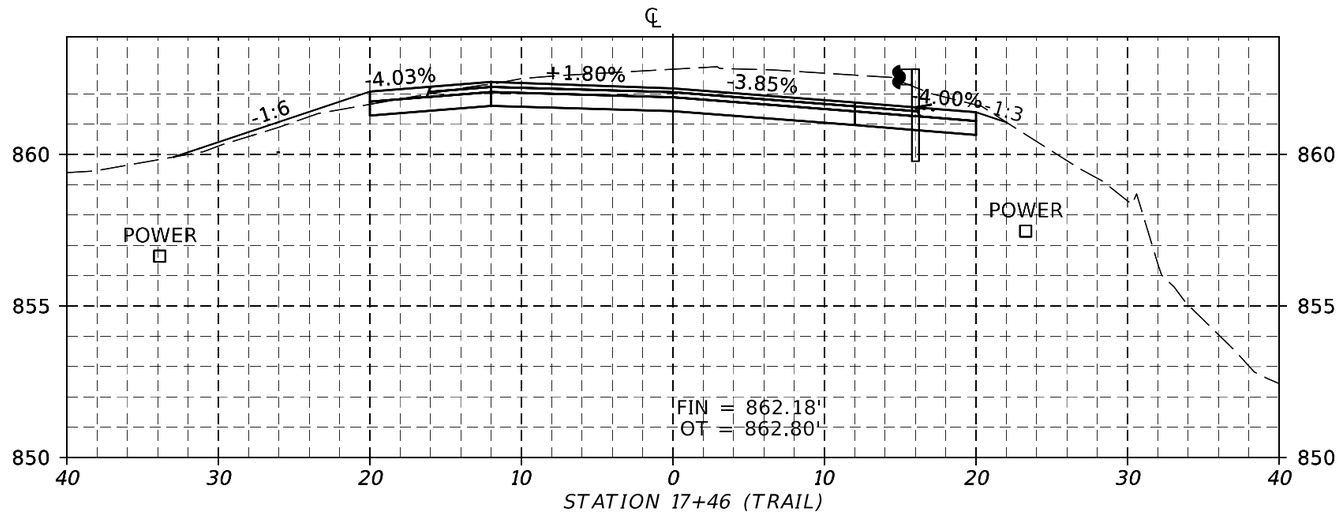
S.P. 027-596-009

SHEET 55/59

16+70 -17+00 pwaeid 8/23/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-XS-2.dgn





Hennepin

SCALE H 0' 10' 20'

SCALE V 0' 5' 10'

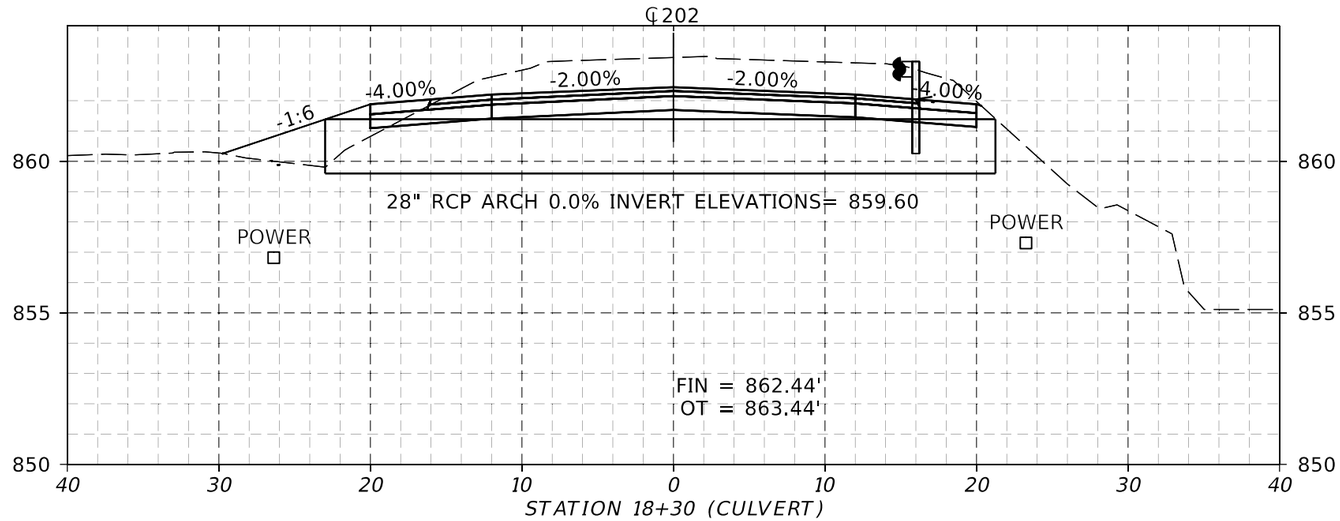
DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

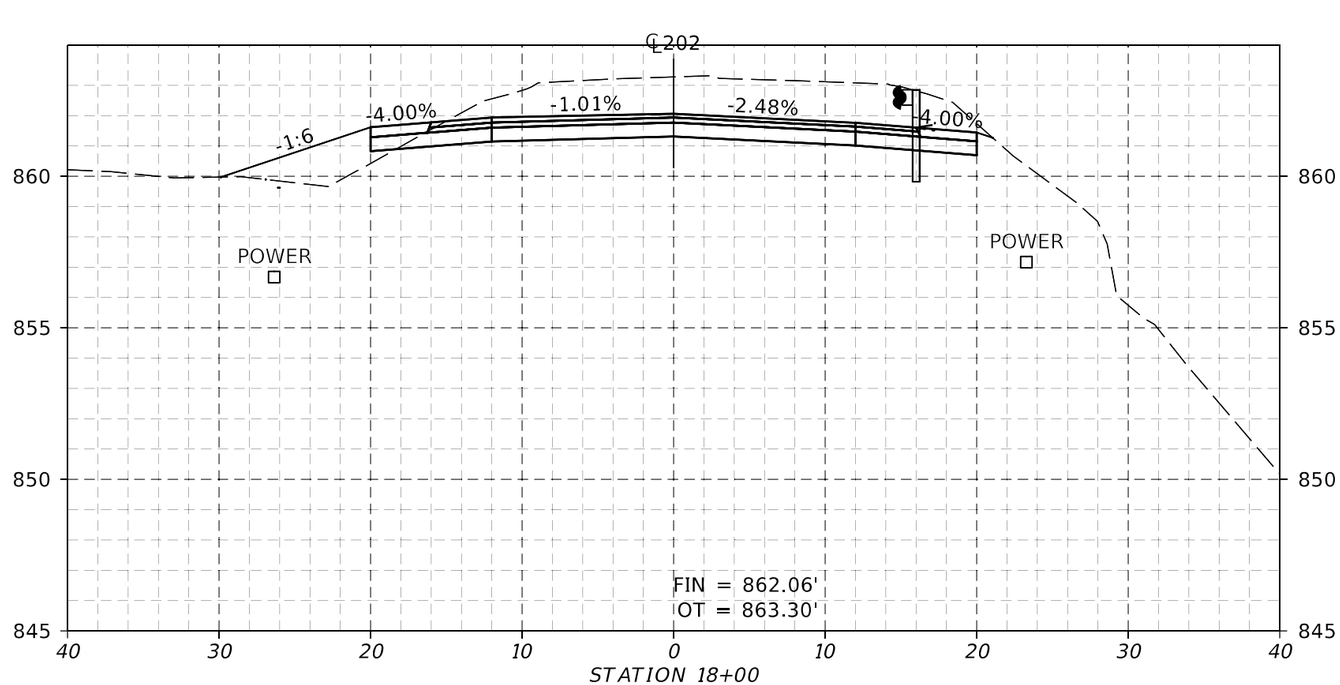
X-SECTIONS STATION 17+46 TO STATION 17+50

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

SHEET 56/59

17+46 - 17+50SIG2729 6/13/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-XS-2.dgn





Hennepin

SCALE H 0′ 10′ 20′

SCALE V 0′ 5′ 10′

DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 18+00 TO STATION 18+30

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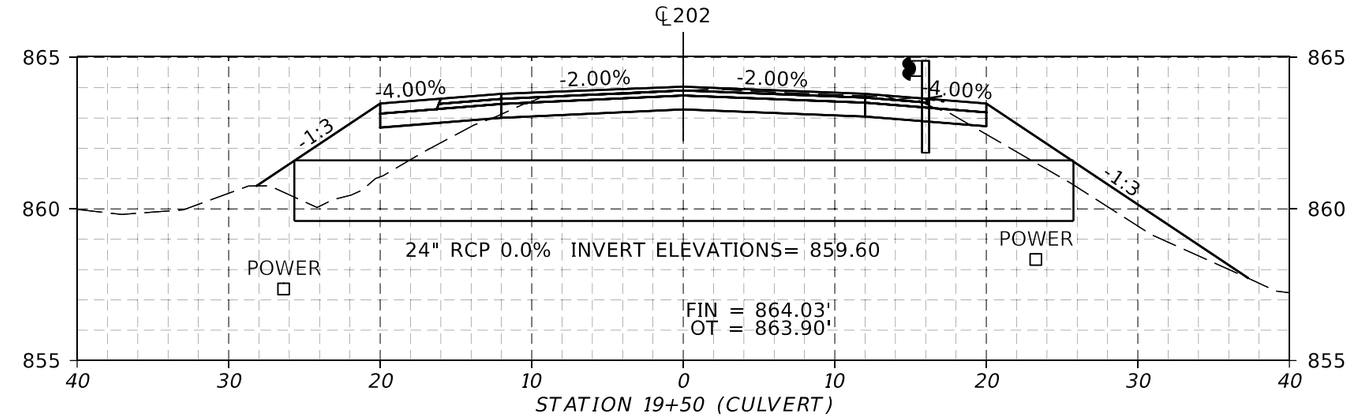
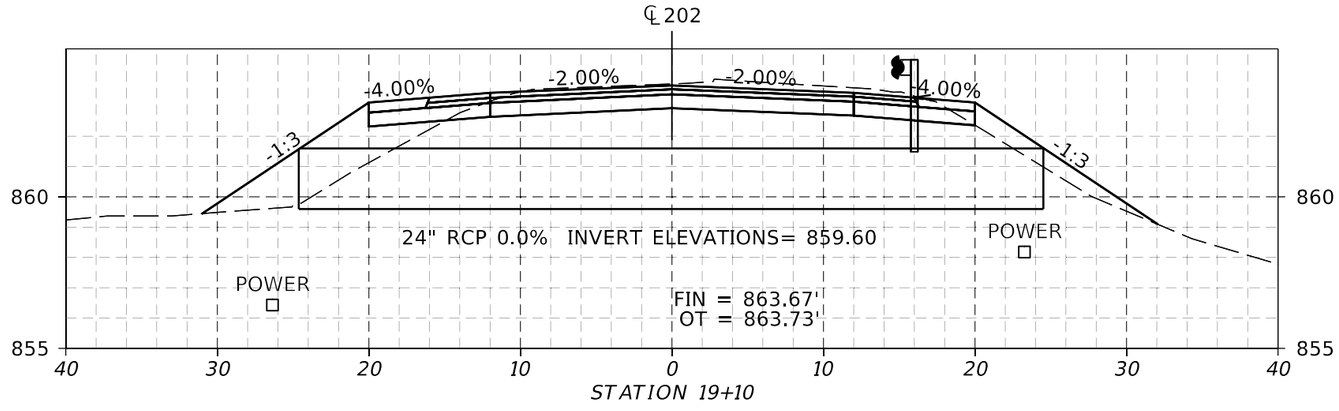
S.P. 027-596-009

SHEET 57/59

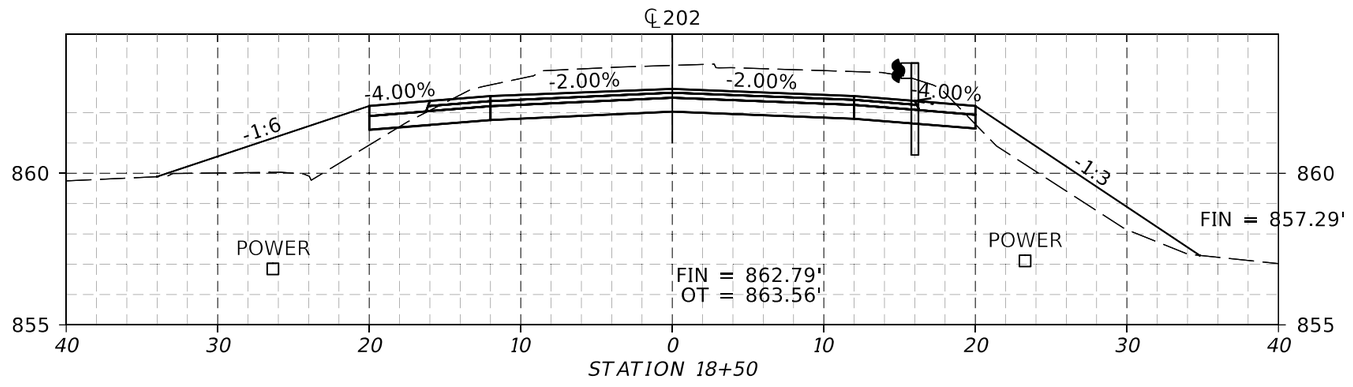
18+00 -18+30[SheetID] 6/13/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-XS-2.dgn



STATION 19+50 (CULVERT)



STATION 19+10



STATION 18+50

Hennepin

SCALE H 0′ 10′ 20′

SCALE V 0′ 5′ 10′

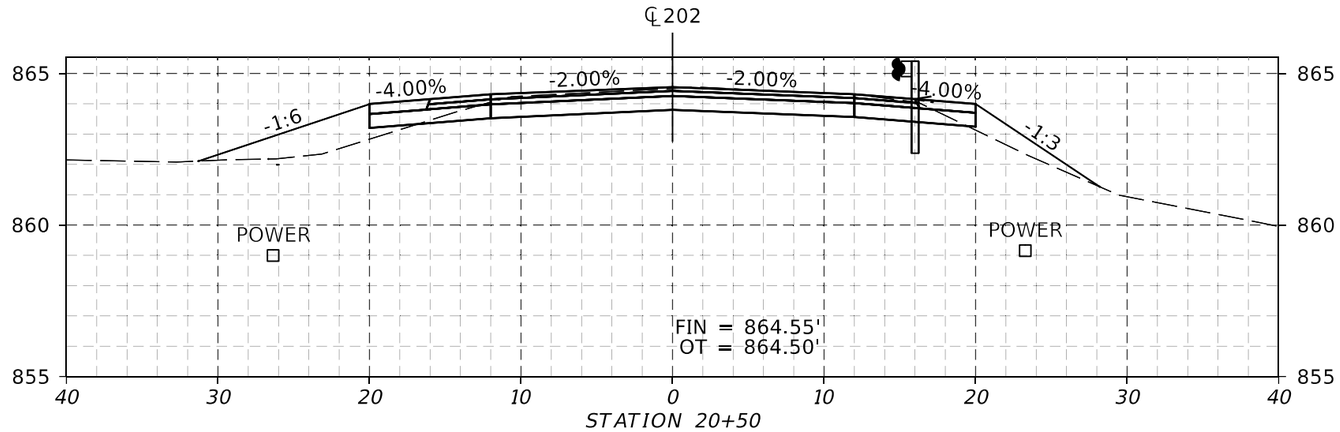
DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

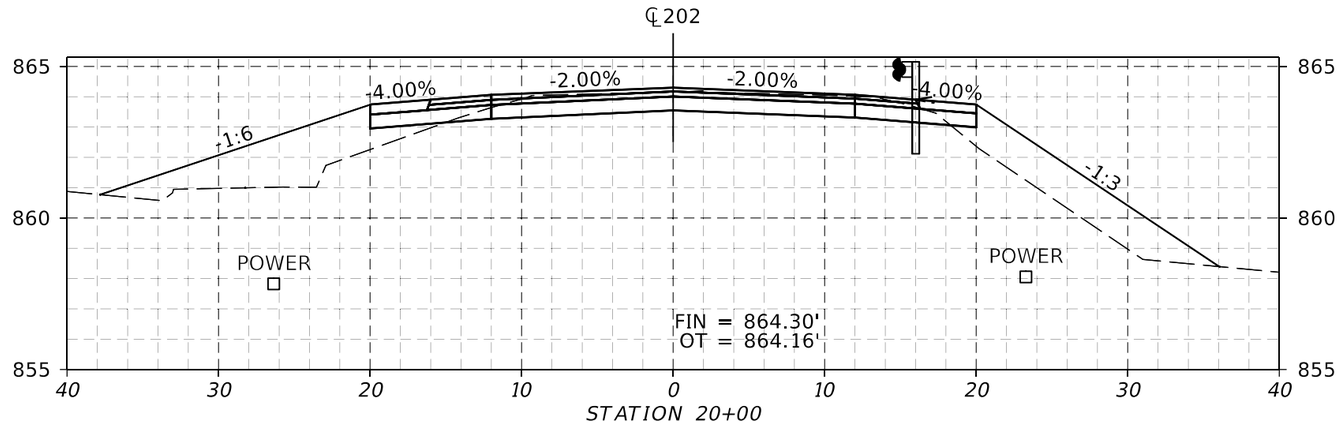
X-SECTIONS STATION 18+50 TO STATION 19+50

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

SHEET 58/59

18+50-20+00 [Sheet2] 6/13/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-XS-2.dgn





Hennepin

SCALE H 0′ 10′ 20′

SCALE V 0′ 5′ 10′

DESIGN BY:	DWS
CAD BY:	DWS
CHECKED BY:	EK
LAST REVISION:	06/12/2018

X-SECTIONS STATION 20+00 TO STATION 20+50

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

SHEET 59 / 59

20+00-20+50.dgn 7588et] 6/13/2018 \\tempo\proj\202_0408_27C53\Design\Plan\0408-XS-2.dgn

TABULATION OF QUANTITIES (1)		
ITEM DESCRIPTION	UNIT	TOTAL
TRAFFIC CONTROL	LS	1
PORTABLE PRECAST CONC BARRIER DES 8337	LIN FT	50
TRAFFIC CONTROL SUPERVISOR	LS	1

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

STANDARD PLATES		
	PLATE NO.	PLATE DESCRIPTION
	8000J	CHANNELIZERS, (3 SHEETS)
	8337C	TEMPORARY PORTABLE PRECAST CONCRETE BARRIER (TYPE F), (3 SHEETS)

TRAFFIC CONTROL LEGEND

- APPROPRIATE SIGN AS INDICATED MOUNTED ON POSTS OR PORTABLE TUBULAR METAL FRAME
- 8' - 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
- PERMANENT CONSTRUCTION AREA

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" (MN MUTCD) 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 IN 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).

INDEX

Hennepin

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. ALLERS, PROFESSIONAL ENGINEER — 45896 LICENSE NO. — 6/13/18 DATE

DESIGN BY:	J. WING
CAD BY:	J. WING
CHECKED BY:	R. ALLERS
LAST REVISION:	/ /

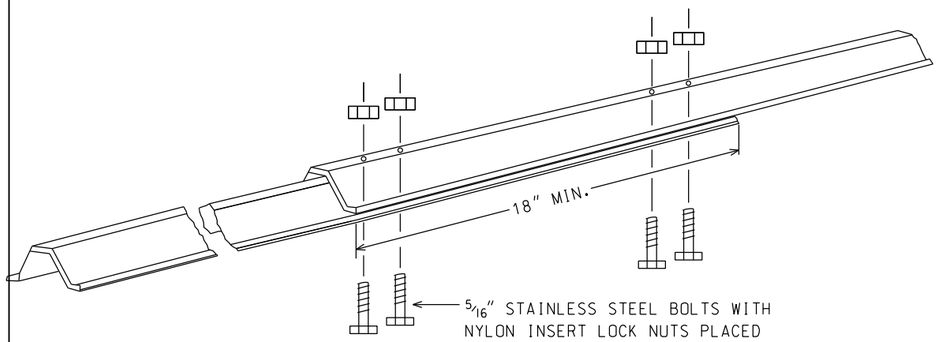
TRAFFIC CONTROL DETAIL SHEET

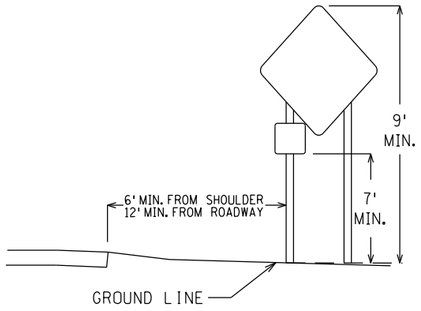
CO. RD. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009

SHEET TC1 / TC7

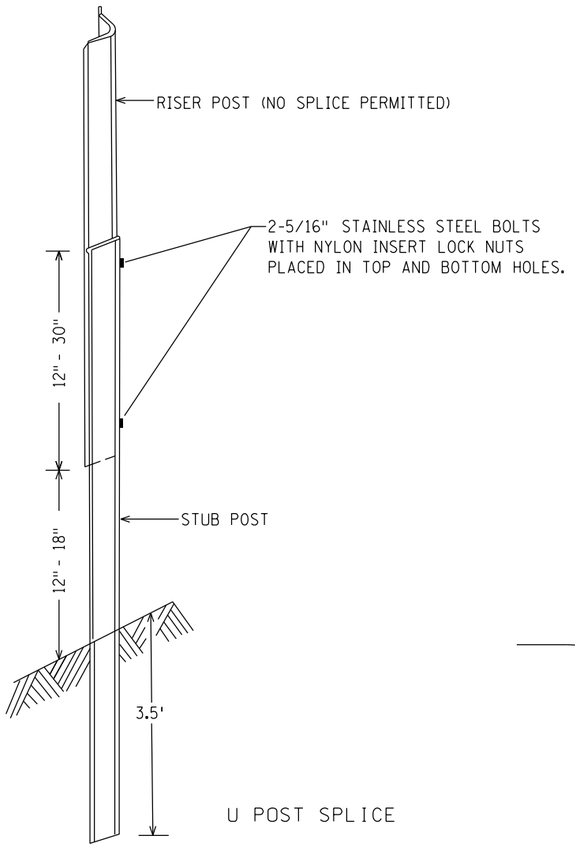
Default pwz805 6/19/2018 \\Tempo\proj\202.0408.27C53\Traffic Design\TRAFFIC CONTROL\0408 TRAFFIC CONTROL DETAILS.DGN

KNEE BRACE SPLICE

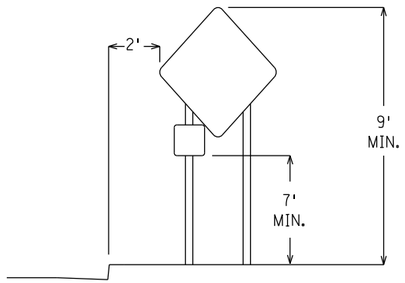




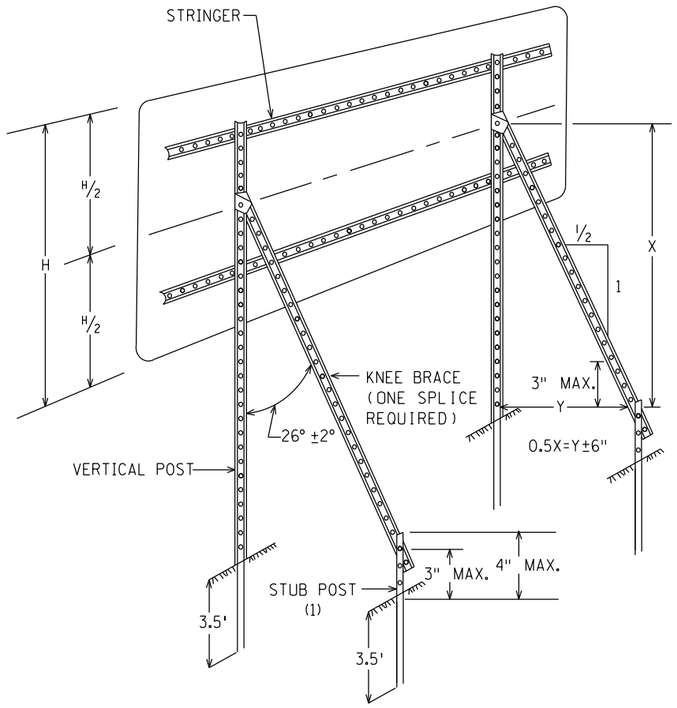
TYPICAL RURAL MOUNTING



U POST SPLICE



TYPICAL URBAN MOUNTING



(1) OFFSET STUB POST 1' TOWARD ROADWAY RELATIVE TO VERTICAL POST. ATTACH STUB POST AND KNEE BRACE BACK TO BACK.

TYPICAL "A-FRAME" INSTALLATION
TYPE "D" SIGNS

NOTES:

1. USE 3# STUB POSTS, RISER POSTS, STRINGERS, KNEE BRACES, LATERAL BRACES AND KNEE BRACE STUB POSTS. ALL SHALL CONFORM TO MN/DOT 3401.
2. MOUNTING (PUNCHING CODE) FOR TYPE "C" SIGN PANELS SHALL BE AS INDICATED IN THE STANDARD SIGNS MANUAL UNLESS OTHERWISE SPECIFIED.
3. ALL RISER (VERTICAL) "U POSTS" SHALL BE SPLICED. 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 WASHER WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.
6. BRACING STUBS SHALL BE NO MORE THAN 4" ABOVE GROUND AND EMBEDDED AT LEAST 3 1/2'.
7. A-FRAME BRACKET SHALL BE STEEL CONFORMING TO MN/DOT 3306 AND GALVANIZED IN ACCORDANCE WITH MN/DOT 3394.
8. COLLARS SHALL BE USED TO SHIM OVERLAYS AND DEMOUNTABLE LEGEND AWAY FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. MN/DOT 3352.2A5.
9. 2 POST TYPE "C" SIGNS SHALL BE REINFORCED WITH AT LEAST ONE LATERAL BRACE, INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60" OR MORE SHALL HAVE TWO LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
10. WHERE 2 SINGLE POST TYPE "C" SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED LATERALLY BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS.
11. WHERE 3 OR MORE TYPE "C" SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED LATERALLY 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 "D" SIGN PANELS SHALL BE BOLTED TO STRINGERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH THE TYPE "D" STRINGER AND PANEL-JOINT DETAIL (SEE STANDARD SIGNS MANUAL).

Hennepin

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. Allers

RYAN T. ALLERS, PROFESSIONAL ENGINEER | 45896 LICENSE NO. | 6/13/18 DATE

DESIGN BY:	J. WING
CAD BY:	J. WING
CHECKED BY:	R. ALLERS
LAST REVISION:	/ /

TRAFFIC CONTROL DETAIL SHEET

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

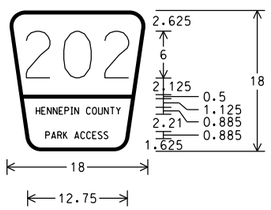
SHEET TC2 / TC7

Default pwz805 6/13/2018 \\Tempo\proj\202_0408_27C53\Traffic Design\TRAFFIC CONTROL\0408 TRAFFIC CONTROL DETAILS.DGN

SIGN DETAIL 1

9" RADIUS, 1 MARGIN, 1.5 BORDER,
D SERIES LETTERING, DG3 SIGN SHEETING,
BLACK BORDER AND TEXT ON A ORANGE BACKGROUND.

SIGN DETAIL 3



2" RADIUS,
NO MARGIN,
0.5 BORDER,
D SERIES LETTERING,
DG3 SIGN SHEETING,
WHITE BORDER AND TEXT
ON A BROWN BACKGROUND.
USE FOR SIGN DETAIL 1

SIGN DETAIL 2

12" RADIUS, 1 MARGIN, 2 BORDER,
D SERIES LETTERING, DG3 SIGN SHEETING,
BLACK BORDER AND TEXT ON A ORANGE BACKGROUND.

Hennepin

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Ryan T. Allers

RYAN T. ALLERS, PROFESSIONAL ENGINEER

45896 LICENSE NO.

6/13/18 DATE

DESIGN BY:	J. WING
CAD BY:	J. WING
CHECKED BY:	R. ALLERS
LAST REVISION:	/ /

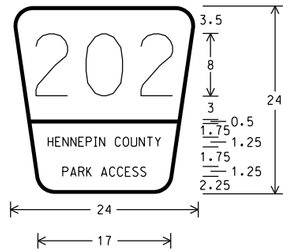
TRAFFIC CONTROL DETAIL SHEET

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

SHEET TC3 / TC7

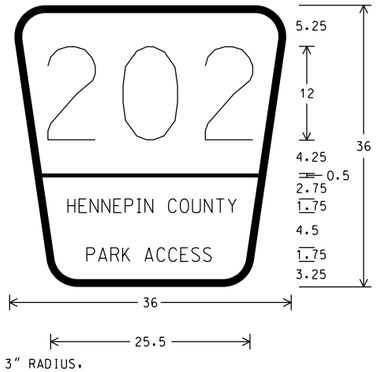
Default pwz805 6/13/2018 \\Tempo\proj\202.0408.27C53\Traffic Design\TRAFFIC CONTROL\0408 TRAFFIC CONTROL DETAILS.DGN

SIGN DETAIL 4



2.5" RADIUS.
NO MARGIN.
0.5 BORDER.
D SERIES LETTERING.
DG3 SIGN SHEETING.
WHITE BORDER AND TEXT
ON A BROWN BACKGROUND.

SIGN DETAIL 5



3" RADIUS.
NO MARGIN.
0.5 BORDER.
D SERIES LETTERING.
DG3 SIGN SHEETING.
WHITE BORDER AND TEXT
ON A BROWN BACKGROUND.

TRAFFIC CONTROL DEVICES (1)					
SIGN NO.	QUAN.	MOUNTING	SIGN PANEL SIZE (IN.)	CODE NO.	PANEL LEGEND / DESCRIPTION (2)
1	7	(3)	96 X 84	(4)	WORK ZONE ADVANCE NOTICE (5)
2 (6)	1	(3)	132 X 108	(7)	WORK ZONE ADVANCE NOTICE (5)
3	2	(3)	54 X 48	G20-X1	CLOSURE NOTICE
4	2	(3)	48 X 48	W20-3	ROAD CLOSED AHEAD (8)
5	2	(9)	48 X 30	R11-2	ROAD CLOSED
6	2	(9)	60 X 30	R11-4	ROAD CLOSED TO THRU TRAFFIC
7	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-2	EAST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M5-1	ADVANCE 90° TURN ARROW LEFT (10)
8	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-2	EAST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M6-1	HORIZONTAL 90° SINGLE HEAD ARROW LEFT (10)
9	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-2	EAST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M5-1	ADVANCE 90° TURN ARROW RIGHT (10)

(1) THE QUANTITIES SHOWN WITHIN THIS TABULATION ARE FOR INFORMATION ONLY AND SHALL BE PAID FOR UNDER THE PAY ITEM TRAFFIC CONTROL (LS).
(2) ALL SIGNING SHALL USE DG3 SIGN SHEETING.
(3) POSTS OR PORTABLE TUBULAR METAL FRAME.
(4) SEE SIGN DETAIL 1 ON SHEET TC3.
(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 TC3.
(8) INCLUDES ONE HIGH INTENSITY AMBER FLASHING LIGHT ON EACH SIGN.
(9) 8' TYPE III BARRICADE LEFT WITH TWO AMBER FLASHING LIGHTS ON EACH BARRICADE.
(10) BLACK BORDER AND LEGEND ON A ORANGE BACKGROUND.
(11) SEE SIGN DETAIL 4 ON SHEET TC4.
(12) SEE SIGN DETAIL 5 ON SHEET TC4.

Hennepin

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RYAN T. ALLERS, PROFESSIONAL ENGINEER — 45896 LICENSE NO. — 6/13/18 DATE

DESIGN BY:	J. WING
CAD BY:	J. WING
CHECKED BY:	R. ALLERS
LAST REVISION:	/ /

TRAFFIC CONTROL DETAIL SHEET

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

SHEET TC4 / TC7

TRAFFIC CONTROL DEVICES (1)

SIGN NO.	QUAN.	MOUNTING	SIGN PANEL SIZE (IN.)	CODE NO.	PANEL LEGEND / DESCRIPTION (2)
10	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-2	EAST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M6-1	HORIZONTAL 90° SINGLE HEAD ARROW RIGHT (10)
11	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-2	EAST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M5-2	ADVANCE 45° TURN ARROW LEFT (10)
12	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-2	EAST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M6-2	HORIZONTAL 45° SINGLE HEAD ARROW LEFT (10)
13	7	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-2	EAST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M6-3	VERTICAL SINGLE HEAD ARROW UP (10)
14	1	(3)	24 X 12	M4-6	END (10)
			24 X 12	M4-8	DETOUR
			24 X 12	M3-2	EAST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
15 (6)	1	(3)	36 X 18	M4-8	DETOUR
			36 X 18	M3-2	EAST (10)
			36 X 36	(12)	202 HENNEPIN COUNTY PARK ACCESS
			30 X 24	M5-1	ADVANCE 90° TURN ARROW LEFT (10)
16 (6)	1	(3)	36 X 18	M4-8	DETOUR
			36 X 18	M3-2	EAST (10)
			36 X 36	(12)	202 HENNEPIN COUNTY PARK ACCESS
			30 X 24	M6-1	HORIZONTAL 90° SINGLE HEAD ARROW LEFT (10)
17 (6)	1	(3)	36 X 18	M4-8	DETOUR
			36 X 18	M3-2	EAST (10)
			36 X 36	(12)	202 HENNEPIN COUNTY PARK ACCESS
			30 X 24	M5-2	ADVANCE 45° TURN ARROW RIGHT (10)
18 (6)	1	(3)	36 X 18	M4-8	DETOUR
			36 X 18	M3-2	EAST (10)
			36 X 36	(12)	202 HENNEPIN COUNTY PARK ACCESS
			30 X 24	M6-2	HORIZONTAL 45° SINGLE HEAD ARROW RIGHT (10)
19 (6)	2	(3)	36 X 18	M4-8	DETOUR
			36 X 18	M3-2	EAST (10)
			36 X 36	(12)	202 HENNEPIN COUNTY PARK ACCESS
			30 X 24	M6-3	VERTICAL SINGLE HEAD ARROW UP (10)

(1) THE QUANTITIES SHOWN WITHIN THIS TABULATION ARE FOR INFORMATION ONLY AND SHALL BE PAID FOR UNDER THE PAY ITEM TRAFFIC CONTROL (LS).
(2) ALL SIGNING SHALL USE DG3 SIGN SHEETING.
(3) POSTS OR PORTABLE TUBULAR METAL FRAME.
(4) SEE SIGN DETAIL 1 ON SHEET TC3.
(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 TC3.
(8) INCLUDES ONE HIGH INTENSITY AMBER FLASHING LIGHT ON EACH SIGN.
(9) 8' TYPE III BARRICADE LEFT WITH TWO AMBER FLASHING LIGHTS ON EACH BARRICADE.
(10) BLACK BORDER AND LEGEND ON A ORANGE BACKGROUND.
(11) SEE SIGN DETAIL 4 ON SHEET TC4.
(12) SEE SIGN DETAIL 5 ON SHEET TC4.

Hennepin

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Ryan T. Allers

RYAN T. ALLERS, PROFESSIONAL ENGINEER

45896 LICENSE NO.

6/13/18 DATE

DESIGN BY: J. WING
CAD BY: J. WING
CHECKED BY: R. ALLERS
LAST REVISION: / /

TRAFFIC CONTROL DETAIL SHEET

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

SHEET TC5 / TC7

TRAFFIC CONTROL DEVICES (1)

SIGN NO.	QUAN.	MOUNTING	SIGN PANEL SIZE (IN.)	CODE NO.	PANEL LEGEND / DESCRIPTION (2)
20	4	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-4	WEST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M5-1	ADVANCE 90° TURN ARROW LEFT (10)
21	4	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-4	WEST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M6-1	HORIZONTAL 90° SINGLE HEAD ARROW LEFT (10)
22	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-4	WEST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M5-1	ADVANCE 90° TURN ARROW RIGHT (10)
23	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-4	WEST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M6-1	HORIZONTAL 90° SINGLE HEAD ARROW RIGHT (10)
24	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-4	WEST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M5-2	ADVANCE 45° TURN ARROW RIGHT (10)
25	1	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-4	WEST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M6-2	HORIZONTAL 45° SINGLE HEAD ARROW RIGHT (10)
26	9	(3)	24 X 12	M4-8	DETOUR
			24 X 12	M3-4	WEST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
			21 X 15	M6-3	VERTICAL SINGLE HEAD ARROW UP (10)
27	1	(3)	24 X 12	M4-6	END (10)
			24 X 12	M4-8	DETOUR
			24 X 12	M3-4	WEST (10)
			24 X 24	(11)	202 HENNEPIN COUNTY PARK ACCESS
28 (6)	1	(3)	36 X 18	M4-8	DETOUR
			36 X 18	M3-4	WEST (10)
			36 X 36	(12)	202 HENNEPIN COUNTY PARK ACCESS
			30 X 24	M5-2	ADVANCE 45° TURN ARROW RIGHT (10)
29 (6)	1	(3)	36 X 18	M4-8	DETOUR
			36 X 18	M3-4	WEST (10)
			36 X 36	(12)	202 HENNEPIN COUNTY PARK ACCESS
			30 X 24	M6-2	HORIZONTAL 45° SINGLE HEAD ARROW RIGHT (10)
30 (6)	3	(3)	36 X 18	M4-8	DETOUR
			36 X 18	M3-4	WEST (10)
			36 X 36	(12)	202 HENNEPIN COUNTY PARK ACCESS
			30 X 24	M6-3	VERTICAL SINGLE HEAD ARROW UP (10)

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(12) SEE SIGN DETAIL 5 ON SHEET TC4.

Hennepin

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Ryan T. Allers

RYAN T. ALLERS, PROFESSIONAL ENGINEER

45896 LICENSE NO.

6/13/18 DATE

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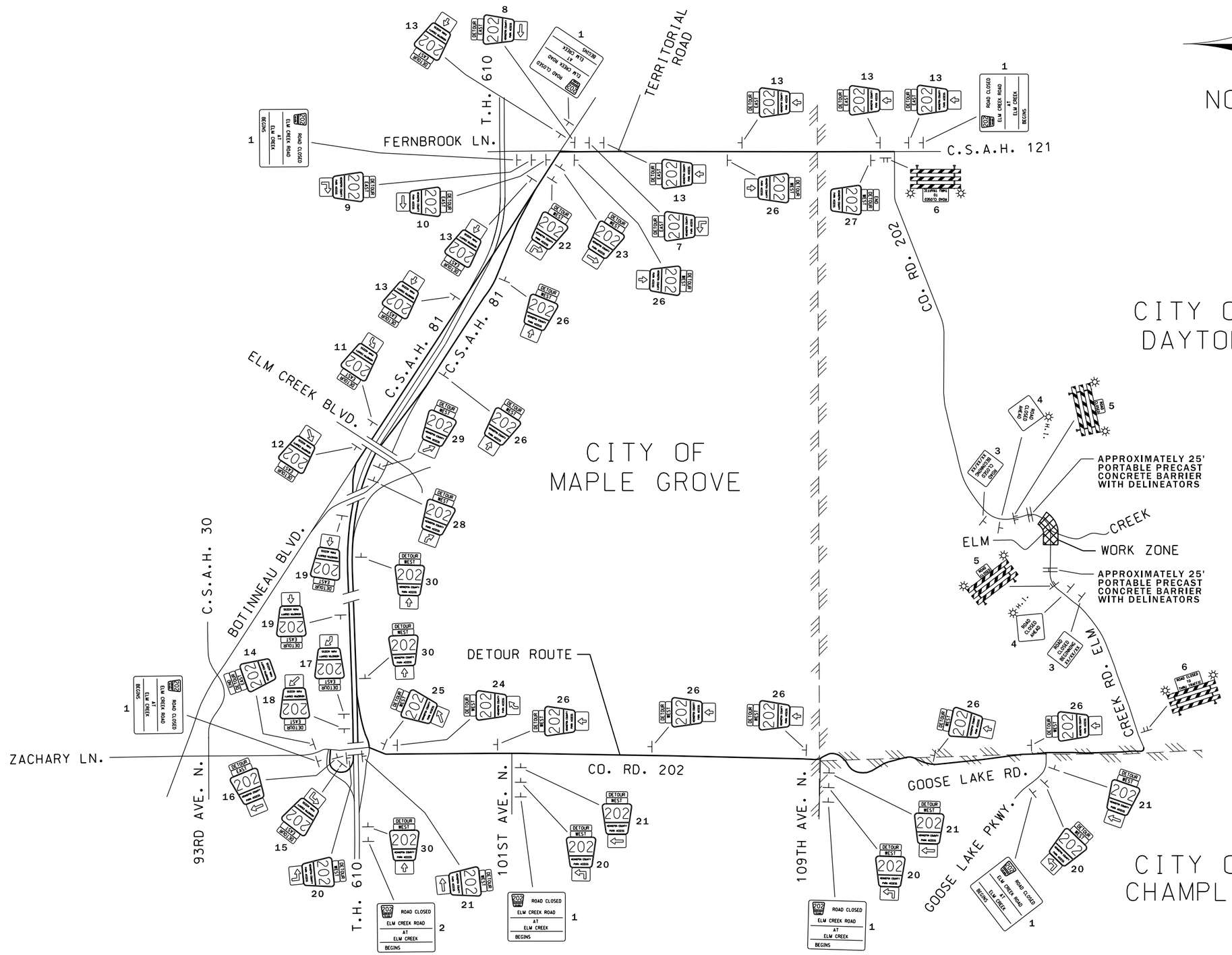
CAD BY:	J. WING
CHECKED BY:	R. ALLERS
LAST REVISION:	/ /

TRAFFIC CONTROL DETAIL SHEET

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

SHEET TC6 / TC7

NO SCALE



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TRAFFIC CONTROL PLAN SHEET

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

SHEET TC7 / TC7

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GENERAL

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE MNDOT "TRAFFIC ENGINEERING MANUAL" AND THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MN MUTCD) 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.

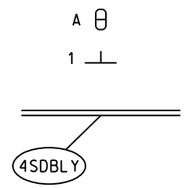
KNEE BRACES SHALL NOT BE USED UNLESS REQUIRED BY THE ENGINEER.

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 "SPOTTING" 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.

PERMANENT SIGNING AND STRIPING LEGEND



A — INPLACE SIGN TYPE C SIGN

1 — APPROPRIATE SIGN TYPE C AS INDICATED

4SDBLY — 4" DOUBLE SOLID LINE YELLOW MULTI COMPONENT GROUND IN

TABULATION OF QUANTITIES

ITEM DESCRIPTION	UNIT	TOTAL
4" DOUBLE SOLID LINE MULTI COMPONENT GROUND IN (1)	LF	1170
REMOVE SIGN TYPE C	EACH	18
SIGN PANELS TYPE C	SQFT	36.25

(1) COLOR SHALL BE YELLOW

INDEX

Hennepin

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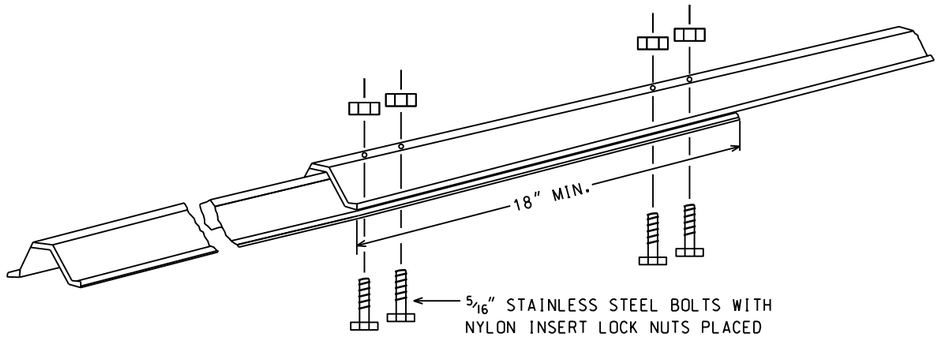
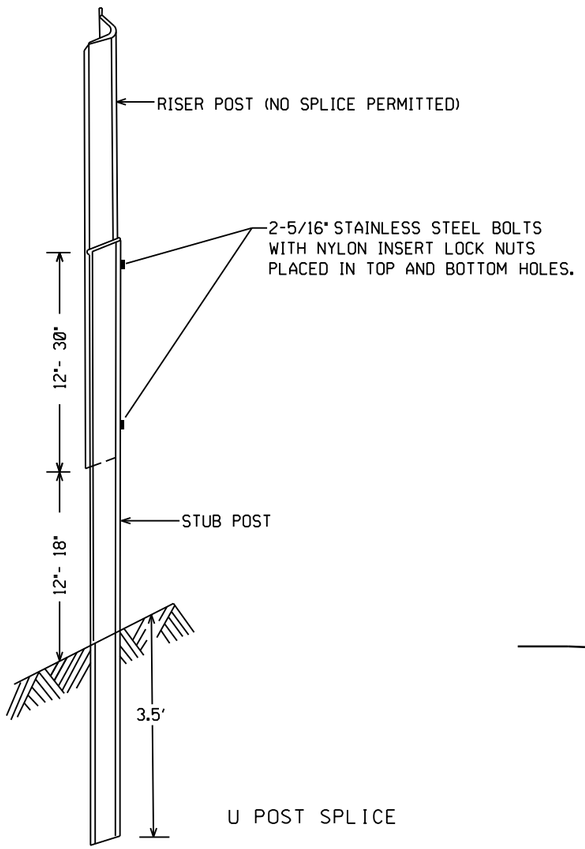
PERMANENT SIGNING AND STRIPING DETAIL SHEET

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

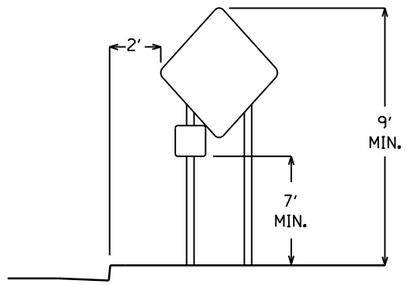
SHEET SS1 / SS5

KNEE BRACE SPLICE

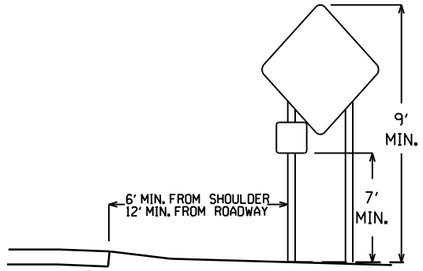




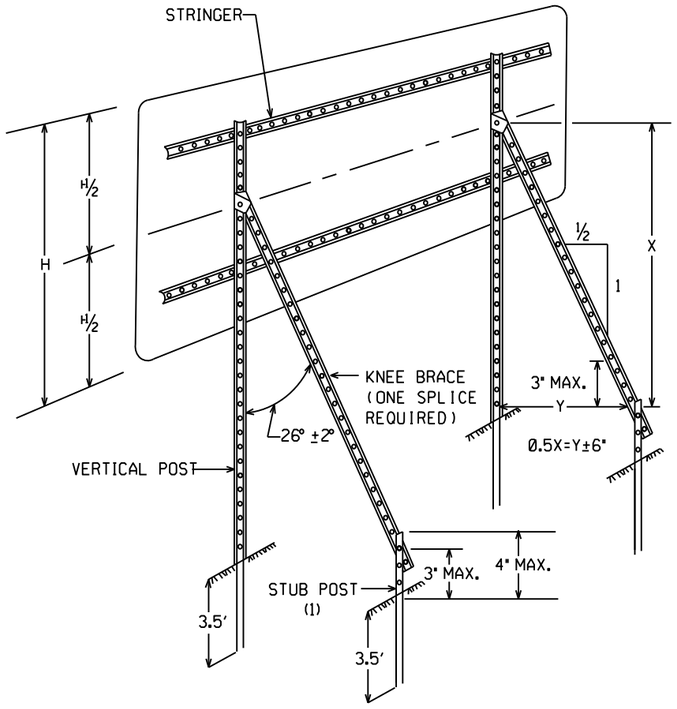
U POST SPLICE



TYPICAL URBAN MOUNTING



TYPICAL RURAL MOUNTING



(1) OFFSET STUB POST 1' TOWARD ROADWAY RELATIVE TO VERTICAL POST. ATTACH STUB POST AND KNEE BRACE BACK TO BACK.

TYPICAL "A-FRAME" INSTALLATION
TYPE "D" SIGNS

NOTES:

1. USE 3# STUB POSTS, RISER POSTS, STRINGERS, KNEE BRACES, LATERAL BRACES AND KNEE BRACE STUB POSTS. ALL SHALL CONFORM TO MN/DOT 3401.
2. MOUNTING (PUNCHING CODE) FOR TYPE "C" SIGN PANELS SHALL BE AS INDICATED IN THE STANDARD SIGNS MANUAL UNLESS OTHERWISE SPECIFIED.
3. ALL RISER (VERTICAL) "U POSTS" SHALL BE SPLICED. 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 WASHER WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.
6. BRACING STUBS SHALL BE NO MORE THAN 4" ABOVE GROUND AND EMBEDDED AT LEAST 3 1/2'.
7. A-FRAME BRACKET SHALL BE STEEL CONFORMING TO MN/DOT 3306 AND GALVANIZED IN ACCORDANCE WITH MN/DOT 3394.
8. COLLARS SHALL BE USED TO SHIM OVERLAYS AND DEMOUNTABLE LEGEND AWAY FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. MN/DOT 3352.2A5.
9. 2 POST TYPE "C" SIGNS SHALL BE REINFORCED WITH AT LEAST ONE LATERAL BRACE, INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60" OR MORE SHALL HAVE TWO LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
10. WHERE 2 SINGLE POST TYPE "C" SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED LATERALLY BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS.
11. WHERE 3 OR MORE TYPE "C" SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED LATERALLY 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 "D" SIGN PANELS SHALL BE BOLTED TO STRINGERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH THE TYPE "D" STRINGER AND PANEL-JOINT DETAIL (SEE STANDARD SIGNS MANUAL).

Hennepin

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Ryan T. Allers

RYAN T. ALLERS, PROFESSIONAL ENGINEER | 45896 LICENSE NO. | 6/13/18 DATE

DESIGN BY:	A. CHALUPSKY
CAD BY:	A. CHALUPSKY
CHECKED BY:	R. ALLERS
LAST REVISION:	/ /

PERMANENT SIGNING AND STRIPING DETAIL SHEET

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

SHEET SS2 / SS5

INPLACE SIGN PANELS

SIGN NO.	SIGN TYPE	NOTES	PANEL LEGEND
A	"C"	(1)	NO PARKING
B	"C"	(2)	CURVE AHEAD
	"C"	(2)	15 MPH
C	"C"	(2)	ONE LANE BRIDGE
	"C"	(2)	NO PARKING
D	"C"	(2)	SNOWMOBILE CROSSING
E	"C"	(2)	NO PARKING
F	"C"	(2)	WEIGHT LIMIT
G	"C"	(2)	TYPE 3 OBJECT MARKER
H	"C"	(2)	TYPE 3 OBJECT MARKER
I	"C"	(2)	TYPE 3 OBJECT MARKER
J	"C"	(2)	TYPE 3 OBJECT MARKER
K	"C"	(2)	WEIGHT LIMIT
	"C"	(2)	3-POST BARRICADE
L	"C"	(2)	SNOWMOBILE CROSSING
	"C"	(2)	NO PARKING
M	"C"	(1)	NO PARKING
N	"C"	(2)	CURVE AHEAD
	"C"	(2)	15 MPH
O	"C"	(2)	ONE LANE BRIDGE

TOTAL REMOVE SIGN TYPE C: 18

(1) PROTECT AND PRESERVE INPLACE.
(2) REMOVE.

Hennepin

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INPLACE SIGNING TABULATION SHEET

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

SHEET SS3 / SS5

SIGN PANELS TYPE C

SIGN NO.	QUAN.	POSTS NO.	MTG HT (FT.) (1)	SIGN PANEL SIZE (IN.)	AREA (SQ. FT.)	TOTAL AREA (SQ. FT.)	CODE NO.	PANEL LEGEND
1	1	1	7.00	30 X 30	6.25	6.25	W1-1 R	RIGHT TURN
				18 X 18	2.25	2.25	W13-1P	30 MPH
2	2	1	7.00	18 X 18	2.25	4.50	R8-3	NO PARKING
3	1	1	7.00	30 X 30	6.25	6.25	W11-6	SNOWMOBILE CROSSING
4	1	1	7.00	30 X 30	6.25	6.25	W1-1 L	LEFT TURN
				18 X 18	2.25	2.25	W13-1P	30 MPH
5	1	1	7.00	30 X 30	6.25	6.25	W11-6	SNOWMOBLIE CROSSING
				18 X 18	2.25	2.25	R8-3	NO PARKING
SUB TOTAL SIGN PANELS TYPE C : 36.25 SQ. FT.								

(1) TO BOTTOM EDGE OF LOWEST SIGN.

Hennepin

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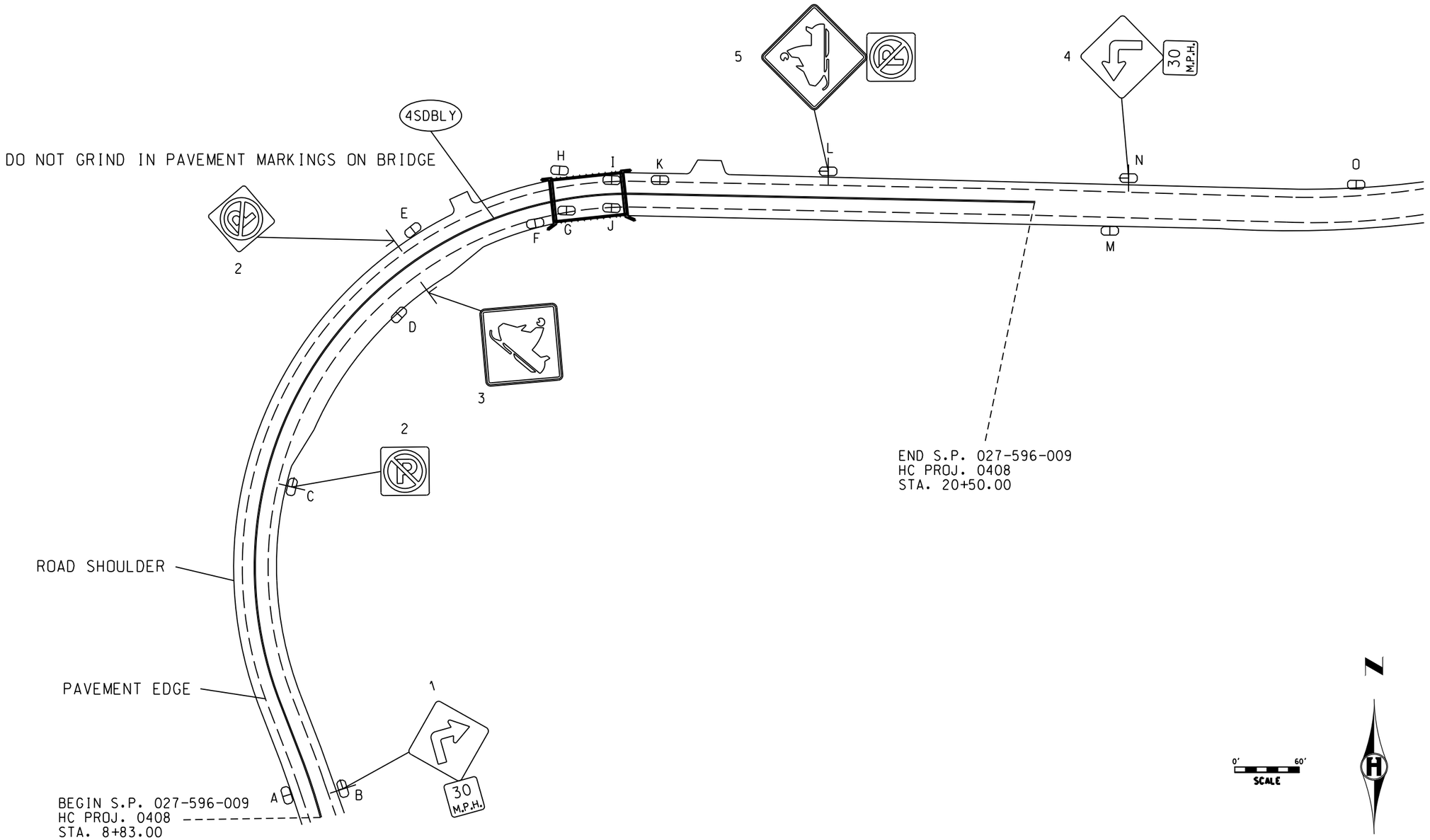
PROPOSED SIGNING TABULATION SHEET

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

SHEET SS4 / SS5



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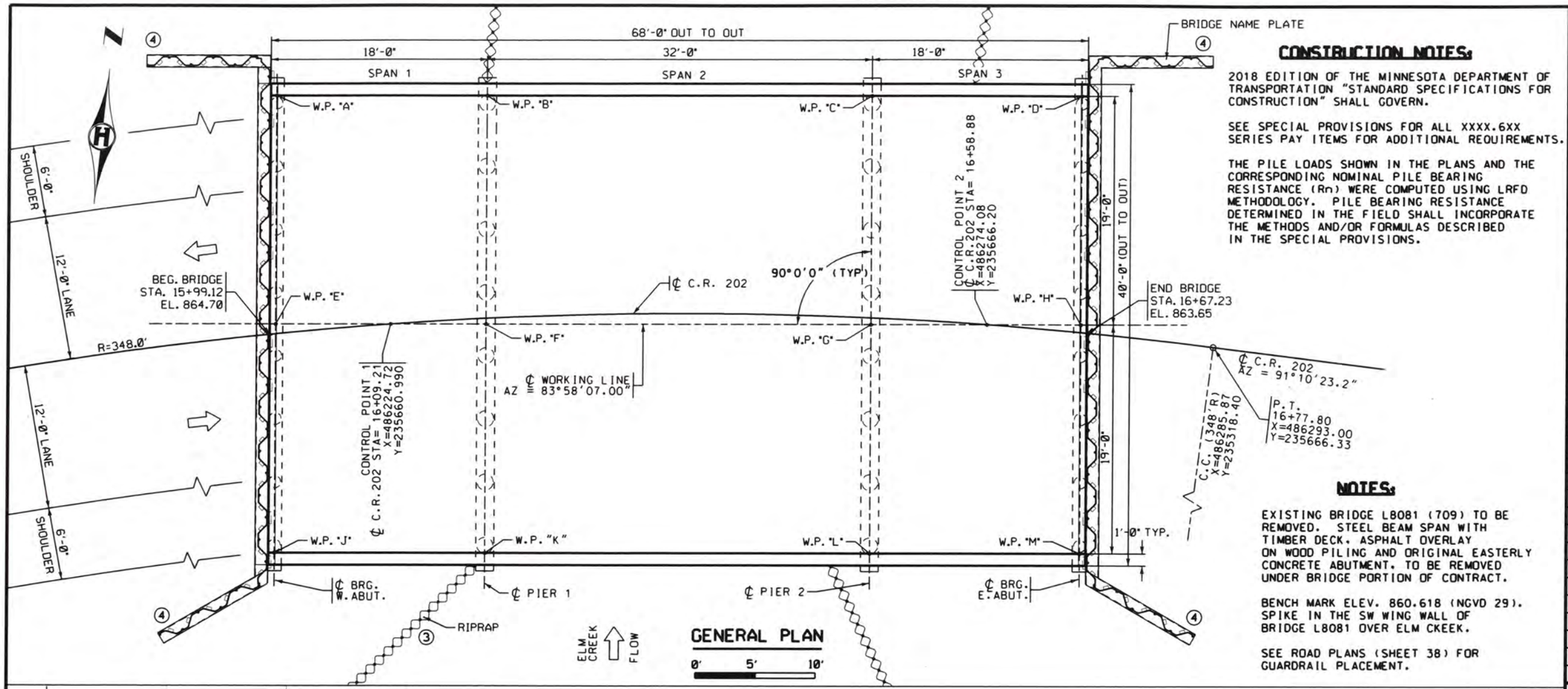
LAST REVISION:	/ /

PERMANENT SIGNING AND STRIPING

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

SHEET SS5 / SS5



CONSTRUCTION NOTES:

2018 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

SEE SPECIAL PROVISIONS FOR ALL XXXX.6XX SERIES PAY ITEMS FOR ADDITIONAL REQUIREMENTS.

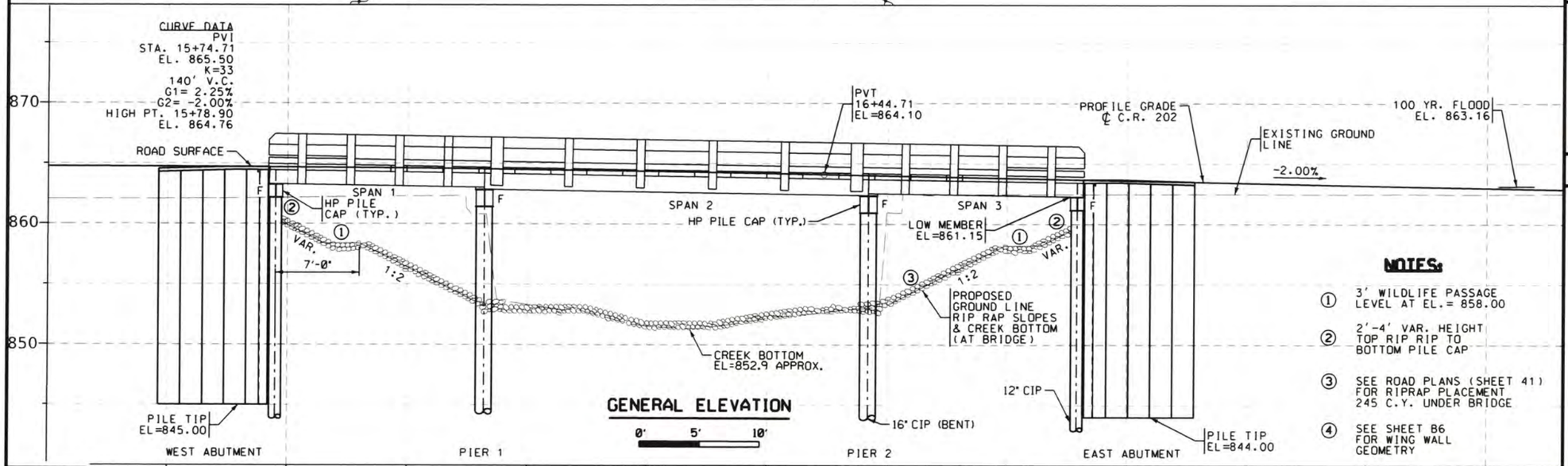
THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

NOTES:

EXISTING BRIDGE L8081 (709) TO BE REMOVED. STEEL BEAM SPAN WITH TIMBER DECK. ASPHALT OVERLAY ON WOOD PILING AND ORIGINAL EASTERLY CONCRETE ABUTMENT. TO BE REMOVED UNDER BRIDGE PORTION OF CONTRACT.

BENCH MARK ELEV. 860.618 (NGVD 29). SPIKE IN THE SW WING WALL OF BRIDGE L8081 OVER ELM CKEEK.

SEE ROAD PLANS (SHEET 38) FOR GUARDRAIL PLACEMENT.



NOTES:

① 3' WILDLIFE PASSAGE LEVEL AT EL.= 858.00

② 2'-4' VAR. HEIGHT TOP RIP RIP TO BOTTOM PILE CAP

③ SEE ROAD PLANS (SHEET 41) FOR RIPRAP PLACEMENT 245 C.Y. UNDER BRIDGE

④ SEE SHEET B6 FOR WING WALL GEOMETRY

MINN PROJ. NO. BROS 2718(125)

DESIGN DATA

2017 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
LOAD AND RESISTANCE FACTOR DESIGN METHOD
HL 93 LIVE LOAD
DEAD LOAD INCLUDES 20 p.s.f. ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS
MATERIAL DESIGN PROPERTIES:
TIMBER:
Fbo =1.00 ksi PREFAB PANELS (SPANS 1, 2 & 3) (DOUGLAS FIR-LARCH NO. 1)
Fbo =1.20ksi PILE CAPS (DOUG. FIR-LARCH NO. 1)
Fbo =1.75ksi RAIL POSTS (DOUG. FIR-LARCH D.S.S.)
Fbo =1.20ksi ALL OTHER TIMBER (DOUGLAS FIR-LARCH NO. 1)
GLUE LAMINATED RAILING - SEE DETAIL SHEETS
STRUCTURAL STEEL:
F_y = 36 ksi spec. 3306
REINFORCED CONCRETE:
f'_c = 4 ksi F_y = 60 ksi
DECK AREA=2720 SQ. FT.
DESIGN SPEED = 35 MPH
CURRENT ADT (2018)=800 PROJ. ADT (2040)=1000
HL 93 LRFR OPERATING RATING RF = 1.60

LIST OF SHEETS

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.

SIGNED _____ DATE 6/12/18

NAME JOHN D. EKOLA LICENSE 53076

COUNTY OF HENNEPIN
C.R. NO. 202

BRIDGE NO. 27C53
GENERAL PLAN AND ELEVATION

C.R. NO. 202 (ELM CREEK ROAD) OVER ELM CREEK
1.5 MI. EAST OF JCT. CSAH 121
68'-0" TIMBER SLAB SPAN, 3 SPAN BRIDGE
38'-0" ROADWAY

IDENTIFICATION NO. 709

SEC 35 T 120 N R 22 W

CITY OF DAYTON HENNEPIN COUNTY

APPROVED _____ COUNTY BRIDGE ENGINEER

DATE 6/12/18

APPROVED _____ STATE BRIDGE ENGINEER

DATE 6/12/18

DES: JDE	DR: JLS
CHK: JZB	CHK: JDE

HENNEPIN COUNTY PROJ. NO. 0408 | S.P. NO. 027-596-009 | SHEET NO. B1 OF B26 SHEETS | 27C53

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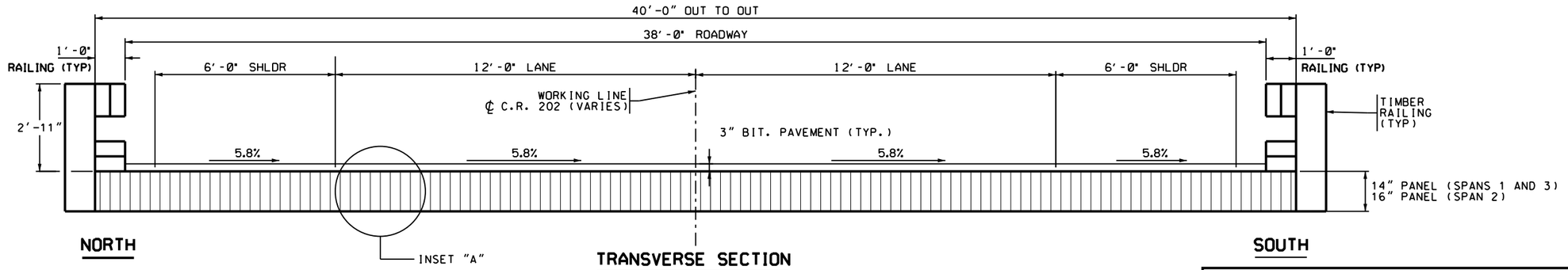
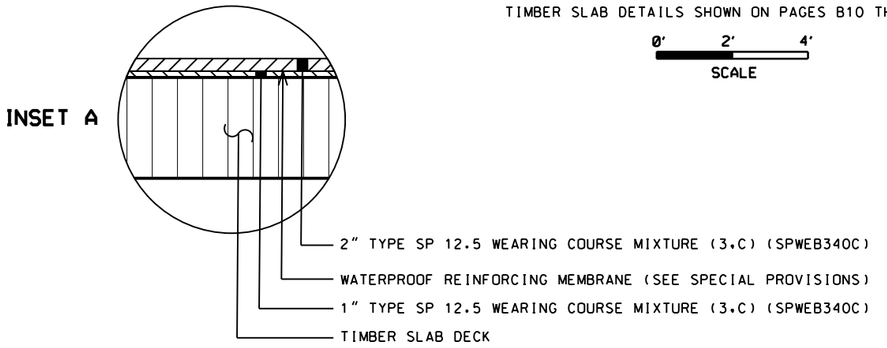


TRANSVERSE SECTION

TIMBER SLAB SPAN (SHOWN LEVEL)
TIMBER SLAB DETAILS SHOWN ON PAGES B10 THROUGH B14

0' 2' 4'
SCALE



ESTIMATED QUANTITIES FOR ENTIRE BRIDGE ~ FOR INFORMATION ONLY

ITEM NO.	ITEM DESCRIPTION	UNIT	PARTICIPATING QUANTITY	NON-PARTICIPATING QUANTITY	TOTAL QUANTITY
2402	STRUCTURAL STEEL (3306)	POUND			3113
2403	TREATED WOOD	M.B.M.			4.814
2403	HARDWARE	POUND			5087
2403	PREFAB WOOD PANELS TYPE A18	EACH			2
2403	PREFAB WOOD PANELS TYPE B18	EACH			2
2403	PREFAB WOOD PANELS TYPE C18	EACH			8
2403	PREFAB WOOD PANELS TYPE D18	EACH			2
2403	PREFAB WOOD PANELS TYPE A32	EACH			1
2403	PREFAB WOOD PANELS TYPE B32	EACH			1
2403	PREFAB WOOD PANELS TYPE C32	EACH			8
2403	PREFAB WOOD PANELS TYPE D32	EACH			1
2403	TIMBER RAILING	LIN. FT.			136 (P)

STATEMENT OF QUANTITIES KEYNOTES:

TIMBER SUPERSTRUCTURE QUANTITIES SHOWN FOR INFORMATIONAL PURPOSES.
ALL MATERIALS SHOWN TO BE IINCIDENTAL TO 2403.603 "TIMBER RAILING"
OR 2403.618 "GLUED LAMINATED PANELS".

TIMBER CONSTRUCTION NOTES

CONSTRUCTION REQUIREMENTS SHALL CONFORM TO SPEC. 2403.3.
ALL TIMBER IS TO BE PRESSURE TREATED PER SPEC. 3491 AND THE SPECIAL PROVISIONS.
ALL HARDWARE IS TO BE GALVANIZED PER SPEC. 3392.
STEEL INDICATED IN THE PLANS TO BE GALVANIZED SHALL BE GALVANIZED PER SPEC. 3394.
THREAD ON ALL BOLTS TO BE UPSET AFTER INSTALLATION.
ALL TIMBER IS ROUGH UNLESS OTHERWISE NOTED.
ALL TIMBER CUT OR DRILLED IN THE FIELD SHALL BE TREATED PER SPEC. 2403.3E.
ALL TIMBER FABRICATION TO BE DETAILED ON SHOP DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE SEALING ENGINEER FOR APPROVAL PRIOR TO SHIPPING MATERIALS.

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE

S.P. NO. 027-596-009

NOTE	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL QUANTITY
	2021	MOBILIZATION	LUMP SUM	1
	2104	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LUMP SUM	1
3	2401	STRUCTURE EXCAVATION	LUMP SUM	1
	2402	STRUCTURAL STEEL (3309) (P)	POUND	23038
4,5	2403	TIMBER RAILING (P)	LIN FT	136
5,7	2403	GLUED LAMINATED DECK PANELS (P)	SQ FT	2720
6	2442	REMOVE EXISTING BRIDGE	LUMP SUM	1
	2452	C-I-P CONC TEST PILE 85 FT LONG 12" (P)	EACH	2
	2452	C-I-P CONC TEST PILE 85 FT LONG 16" (P)	EACH	2
1	2452	PILE REDRIVING	EACH	32
	2452	PILE ANALYSIS	EACH	2
1	2452	PILE POINTS 12"	EACH	16
1	2452	PILE POINTS 16"	EACH	16
2	2452	C-I-P CONCRETE PILING 12"	LIN FT	1190
2	2452	C-I-P CONCRETE PILING 16"	LIN FT	1190
	2452	STEEL SHEET PILING (PERMANENT) (P)	SQ FT	2430
	2511	GEOTEXTILE FILTER TYPE 7	SQ YD	1050
	2511	RANDOM RIPRAP CLASS 4	CU YD	830

(P) DENOTES PLAN QUANTITY
(1) INCLUDES TEST PILES.
(2) DOES NOT INCLUDE TEST PILES.
(3) SEE SHEET B6 FOR DETAILS
(4) PAYMENT LENGTH FOR GLUED LAMINATED RAIL IS THE END TO END LENGTH OF RAIL
(5) HARDWARE AND ACCESSORIES INCIDENTAL TO ITEM. SEE SPECIAL PROVISIONS
(6) INCLUDES EXISTING BRIDGE L8081 AND ANY OTHER MISC. SUBSTRUCTURE FROM PREVIOUS BRIDGES
(7) FLASHING (INCLUDED IN BID PRICE FOR DECK). SEE SHEETS B10 & B15. SEE SPECIAL PROVISIONS.

Hennepin

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 — 53076 LICENSE NO. — 08/22/18 DATE

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

TRANSVERSE SECTION AND SCHEDULE OF QUANTITIES

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

SHEET B2 / B26

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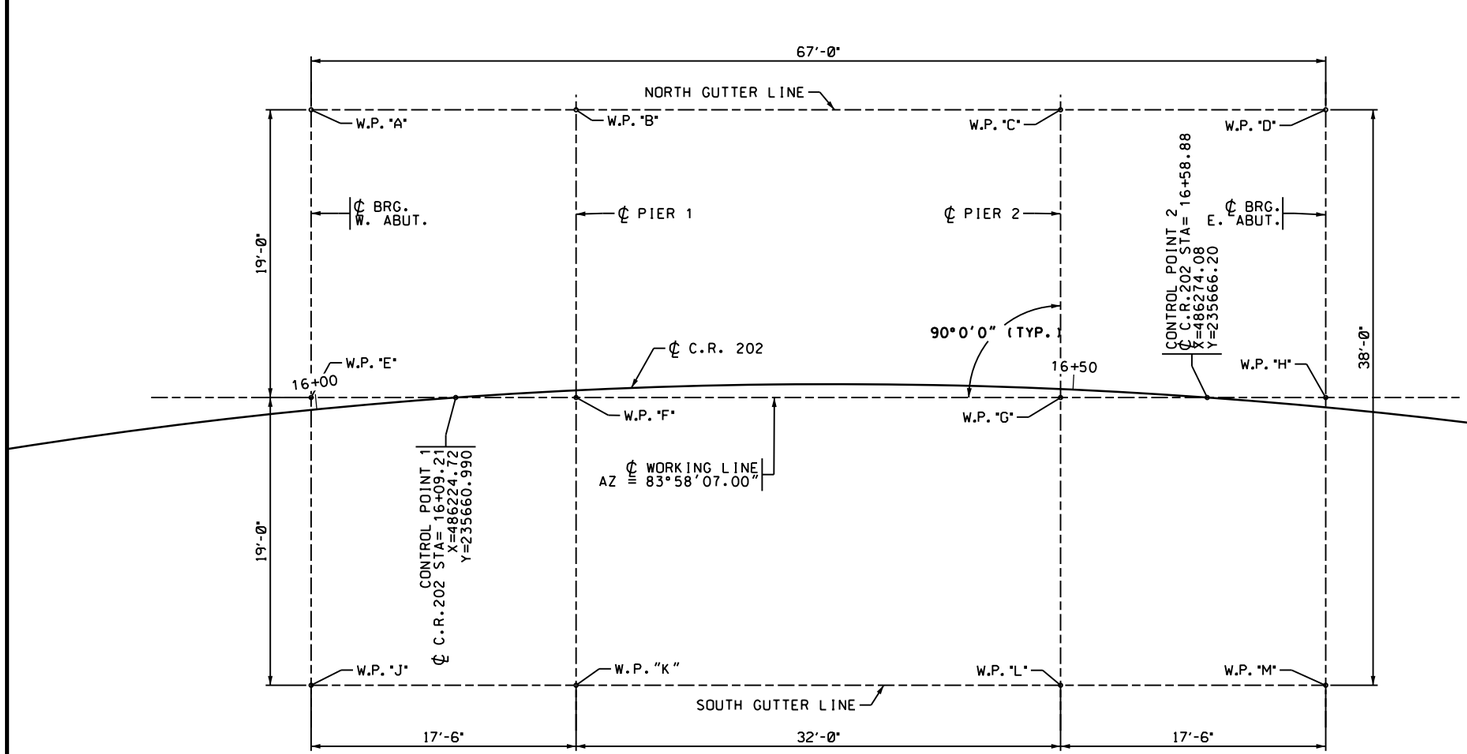
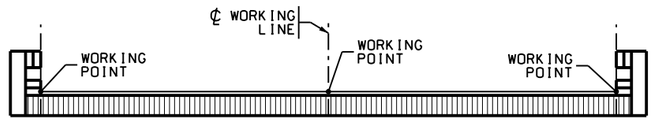




WORKING POINT LOCATION

WORKING POINT LOCATION

Element	Point Type	Station	Northing	Easting	Radius	Length	Delta / Theta	Rotation Direction
Aligment Name: CR 202								
Description:								
Tangent	POB	0+00.00	234354.049	485640.697				
Tangent	PC	1+67.97	234452.665	485776.666				
Arc	PC	1+67.97	234452.665	485776.666				
Arc	PI	6+22.20	234719.354	486144.371	590	774.21	75.1847°	Left
Arc	CC		234930.271	485430.267				
Arc	PT	9+42.18	235143.028	485980.571				
Tangent	PT	9+42.18	235143.028	485980.571				
Tangent	PC	9+95.66	235192.91	485961.286				
Arc	PC	9+95.66	235192.91	485961.286				
Arc	PI	15+14.61	235676.952	485774.147	348	682.145	112.3104°	Right
Arc	CC		235318.4	486285.872				
Arc	PT	16+77.80	235666.327	486292.996				
Tangent	PT	16+77.80	235666.327	486292.996				
Tangent	POE	23+46.44	235652.639	486961.491				

	DIMENSIONS BETWEEN WORKING POINTS																ELEVATION					
POINT	STATION	X-COORDINATE	Y-COORDINATE	A	B	C	D	E	F	G	H	J	K	L	M	(1)	(2)	(3)	(4)	(5)	POINT
A	16+01.47	486213.226	235678.877													865.82	1.42		864.41		A
B	16+18.02	486230.629	235680.716	17.50												865.60	1.42	1.58	864.19	864.02	B
C	16+48.42	486262.452	235684.078	49.50	32.00											865.10	1.42	1.58	863.68	863.52	C
D	16+64.98	486279.855	235685.917	67.00	49.50	17.50										864.83	1.42		863.42		D
E	15+99.70	486215.222	235659.982	19.00	25.83	53.02	69.64									864.74	1.42		863.32		E
F	16+17.15	486232.626	235661.821	25.83	19.00	37.22	53.02	17.50								864.51	1.42	1.58	863.09	862.93	F
G	16+49.20	486264.448	235665.183	53.02	37.22	19.00	25.83	49.50	32.00							863.98	1.42	1.58	862.56	862.40	G
H	16+66.66	486281.851	235667.022	69.64	53.02	25.83	19.00	67.00	49.50	17.50						863.70	1.42		862.29		H
J	15+97.72	486217.219	235641.087	38.00	41.84	62.40	77.03	19.00	25.83	53.02	69.64					863.66	1.42		862.24		J
K	16+16.17	486234.622	235642.926	41.84	38.00	49.68	62.40	25.83	19.00	37.22	53.02	17.50				863.42	1.42	1.58	862.01	861.84	K
L	16+50.08	486266.445	235646.288	62.40	49.68	38.00	41.84	53.02	37.22	19.00	25.83	49.50	32.00			862.86	1.42	1.58	861.45	861.28	L
M	16+68.54	486283.848	235648.127	77.03	62.40	41.84	38.00	69.64	53.02	25.83	19.00	67.00	49.50	17.50		862.57	1.42		861.15		M
CP-1	16+09.21	486224.720	235660.990	21.26	20.59	44.24	60.51	9.55	7.95	39.95	57.45	21.27	20.60	44.24		864.62					
CP-2	16+58.88	486274.080	235666.200	62.16	45.81	21.33	20.55	59.19	41.68	9.69	7.81	62.16	45.81	21.33		863.82					

(1) TOP OF ROADWAY.
(2) TOP ROADWAY TO BOTTOM DECK (SPANS 1 & 3)
(3) TOP OF ROADWAY BOTTOM DECK (SPAN 2)
(4) BOTTOM DECK (SPANS 1 & 3)
(5) BOTTOM DECK ELEVATION (SPAN 2)

Hennepin

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

53076 — LICENSE NO.

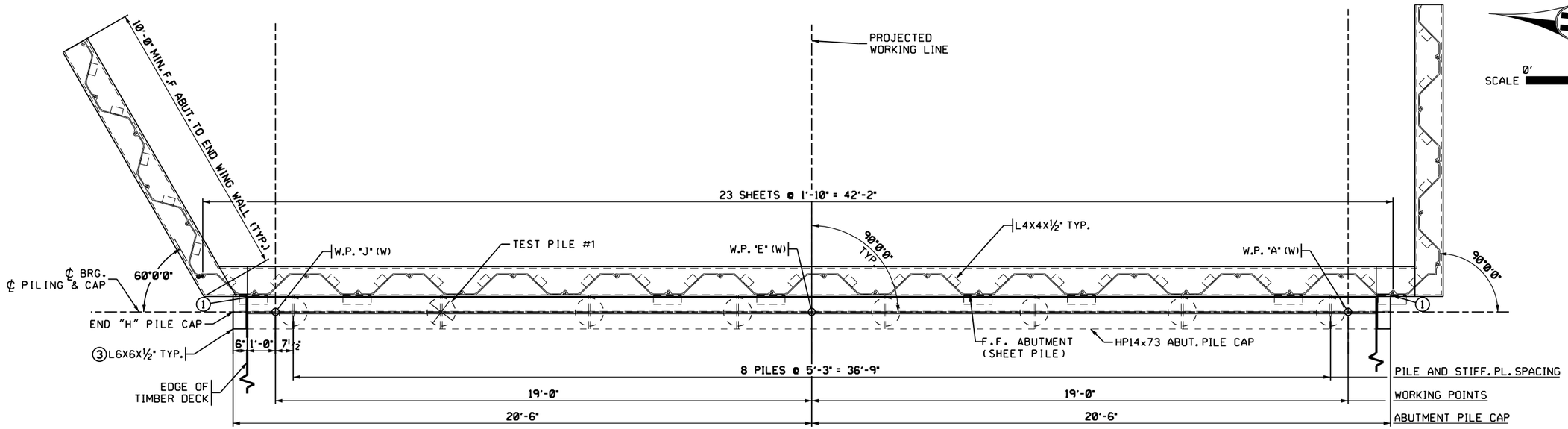
06/11/18 — DATE

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

BRIDGE LAYOUT

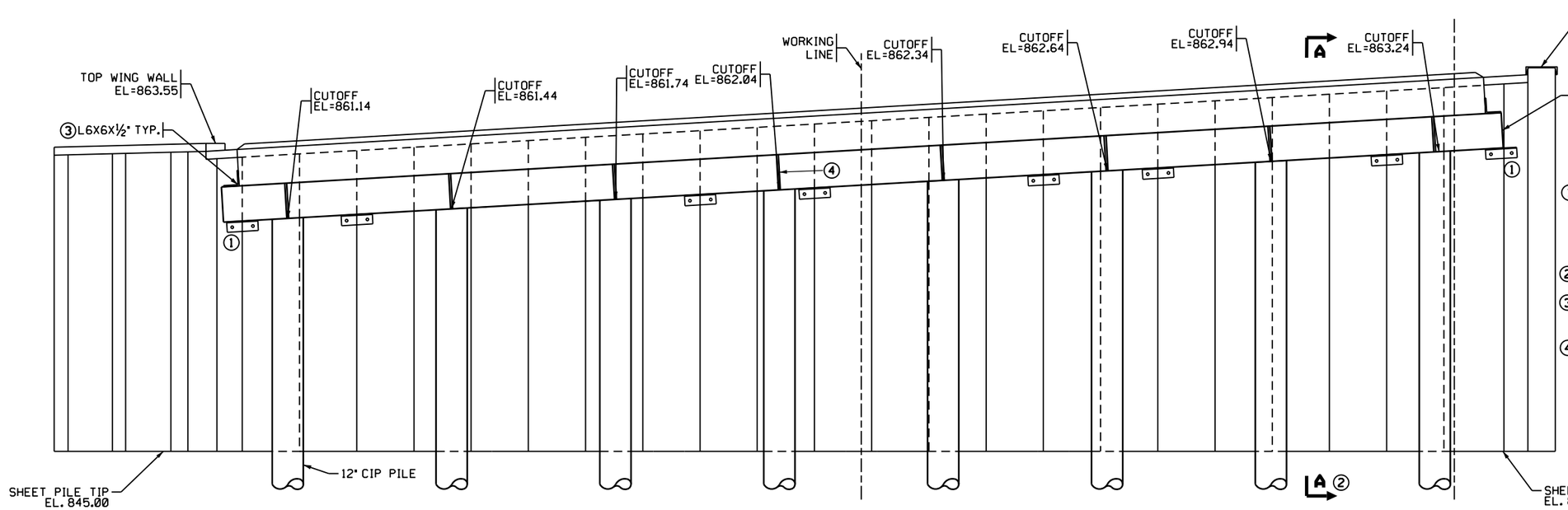
C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

SHEET B3 / B26



SOUTH **WEST ABUTMENT PLAN** **NORTH**

(DIMENSIONS SHOWN IN PLAN VIEW ARE HORIZONTAL)



SOUTH **ABUTMENT ELEVATION** **NORTH**

NOTES:

① PLACE SHEETING ALONG ABUTMENT SO THAT AT THE ENDS OF THE H PILE CAP THE FLANGE INTERLOCK IS AT THE F.F. ABUT. PLACE CAP/ SHEET PILE BRACKETS AT ENDS OF H PILE AND WHERE SHOWN.

② DETAIL SHOWN ON B7.

③ INSTALL BRACKET WITH ¼" EXPANSION MATERIAL AFTER TIMBER SUPERSTRUCTURE IS SECURED TO PILE CAP. (SEE SPECIAL PROVISIONS)

④ ¾" STIFF. PLATE EACH SIDE. OF PILE CAP. ABOVE EACH PILE. (TYP.)

Hennepin

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JOHN D. EKOLA, PROFESSIONAL ENGINEER

53076 LICENSE NO.

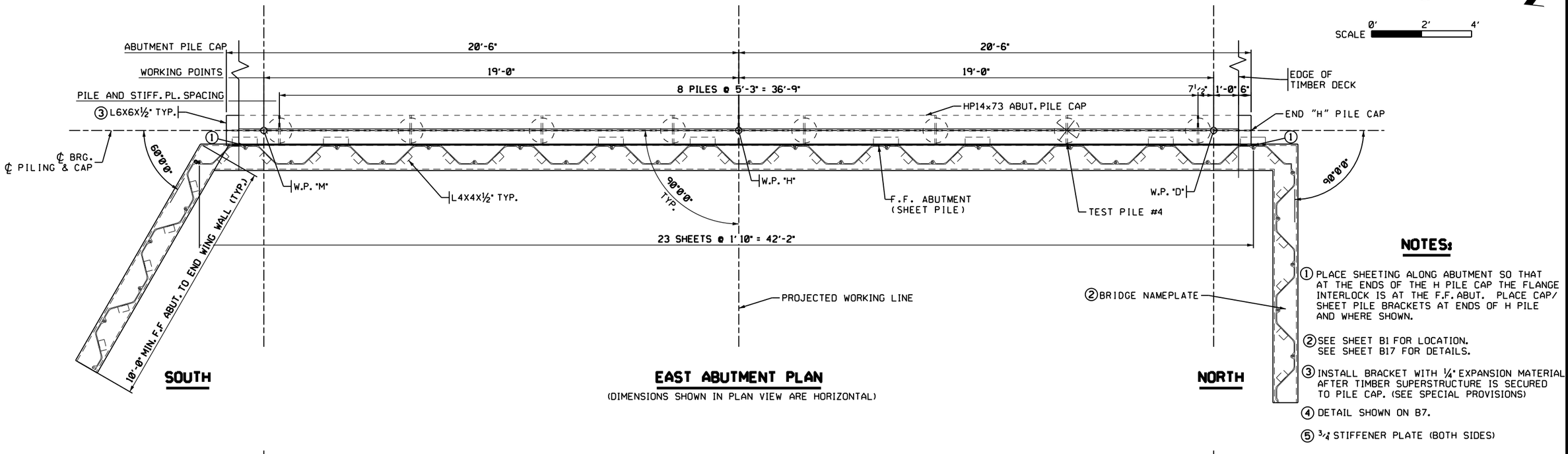
06/11/18 DATE

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

WEST ABUTMENT PLAN AND ELEVATION

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

SHEET B4 / B26

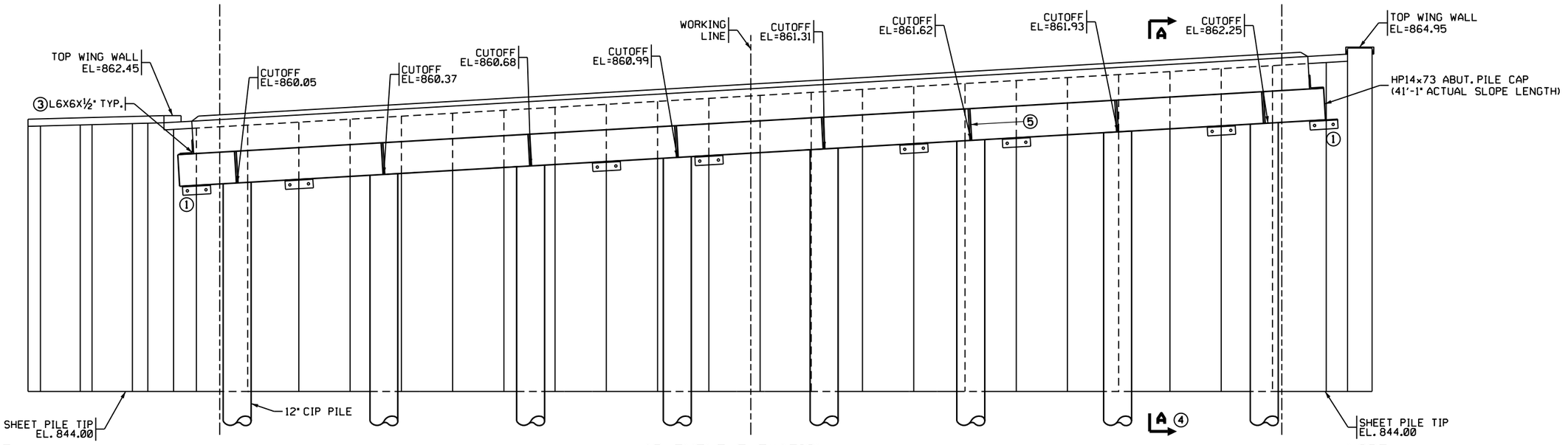


EAST ABUTMENT PLAN

(DIMENSIONS SHOWN IN PLAN VIEW ARE HORIZONTAL)

NOTES:

1. PLACE SHEETING ALONG ABUTMENT SO THAT AT THE ENDS OF THE H PILE CAP THE FLANGE INTERLOCK IS AT THE F.F. ABUT. PLACE CAP/ SHEET PILE BRACKETS AT ENDS OF H PILE AND WHERE SHOWN.
2. SEE SHEET B1 FOR LOCATION. SEE SHEET B17 FOR DETAILS.
3. INSTALL BRACKET WITH ¼" EXPANSION MATERIAL AFTER TIMBER SUPERSTRUCTURE IS SECURED TO PILE CAP. (SEE SPECIAL PROVISIONS)
4. DETAIL SHOWN ON B7.
5. ¾" STIFFENER PLATE (BOTH SIDES)



ABUTMENT ELEVATION

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JOHN D. EKOLA, PROFESSIONAL ENGINEER

53076 LICENSE NO.

06/11/18 DATE

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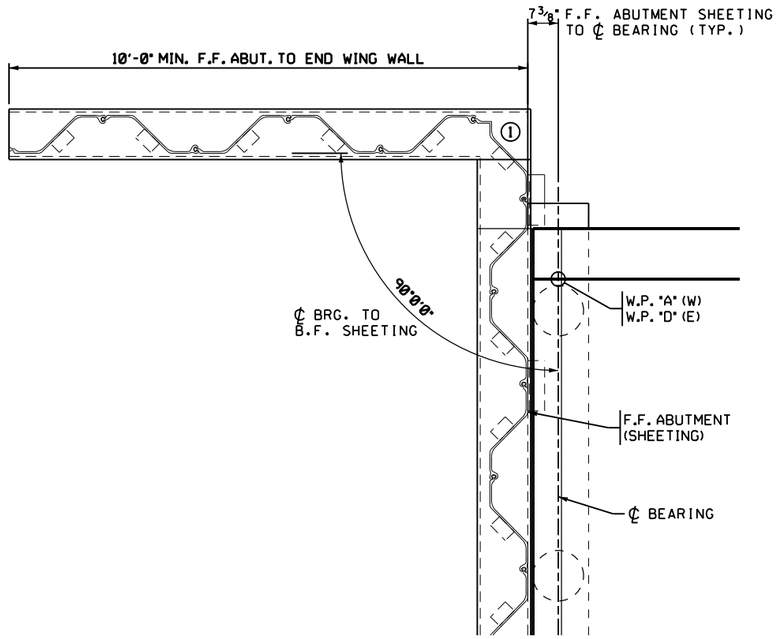
DRAWN BY:	J. SCHERER
CHECKED BY:	J. EKOLA

EAST ABUTMENT PLAN AND ELEVATION

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

SHEET B5 / B26



NW & NE CORNER DETAILS

NOTES:

CONTRACTOR TO SUPPLY EITHER FABRICATED CORNER SHEET PILING OR ANGLED CONNECTORS TO ACHIEVE WING WALL CORNERS BEYOND H PILE CAP.

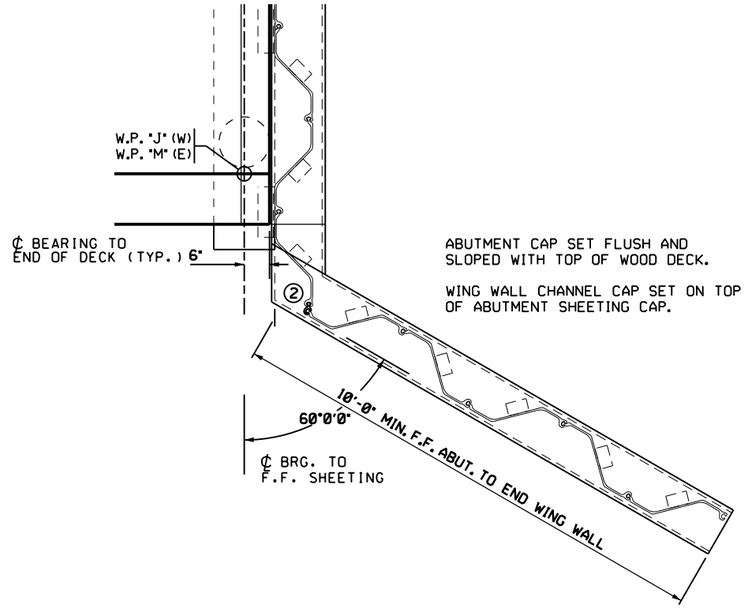
① CORNER SHOWN WITH FABRICATED CORNER PILE

② CORNER SHOWN WITH ANGLED PILE CONNECTOR

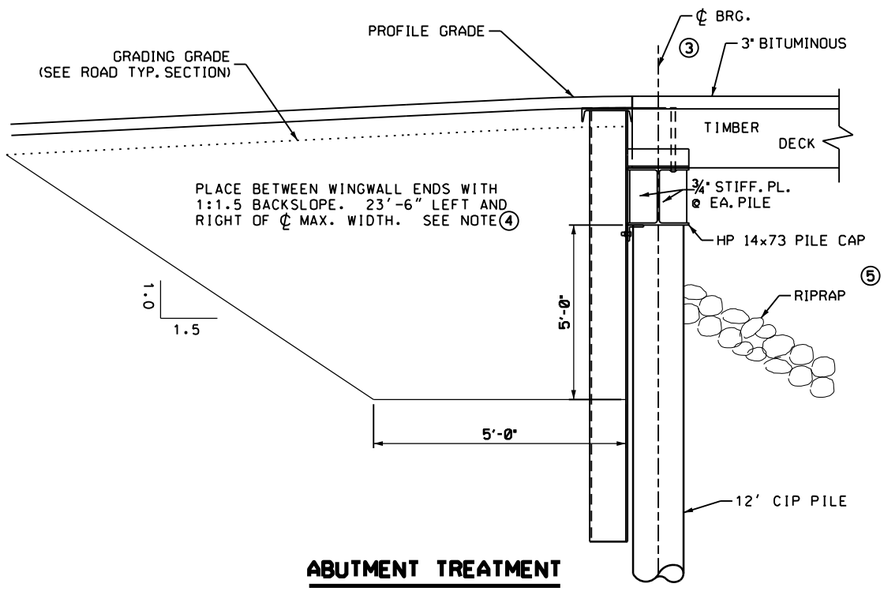
③ RAILING NOT SHOWN FOR CLARITY (SEE TIMBER SUPERSTRUCTURE DETAILS SHEETS B10-B18)

④ SELECT GRANULAR BORROW PER SPEC. 3149.2B2 APPROX QUANTITY (C.V.)=230 C.Y. SHALL BE INCLUDED IN PRICE BID FOR STRUCTURE EXCAVATION. EXCAVATED MATERIAL VOLUME INCLUDED IN EARTH WORK TABULATION UNDER COMMON EX. MATERIAL SHALL BE PLACED BY THE CONTRACTOR AFTER THE COMPLETION OF THE ABUTMENT AND TIMBER SUPERSTRUCTURE.

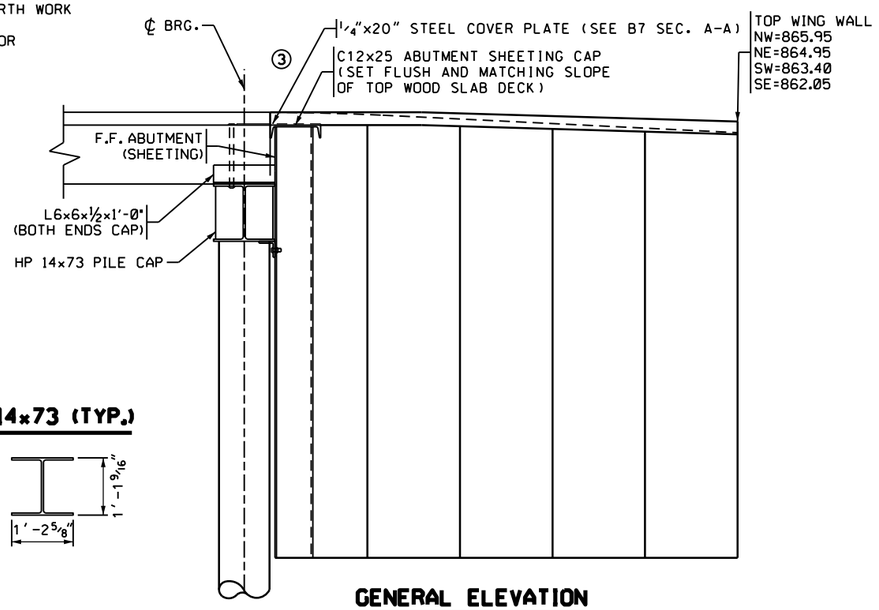
⑤ STRUCTURE EXAVATION APPROX. QUANTITY = 300 C.Y. (BOTH ABUTMENTS)



SW & SE CORNER DETAILS



ABUTMENT TREATMENT



GENERAL ELEVATION

HP 14x73 (TYP.)

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

53076 — LICENSE NO.

06/11/18 — DATE

DESIGN BY:	J. EKOLA
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CHECKED BY:	J. EKOLA

ABUTMENT CORNER DETAILS

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

SHEET B6 / B26

EACH ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	13.0
FACTORED LIVE LOAD	48.3
* FACTORED DESIGN LOAD	61.3

* BASED ON STRENGTH I LOAD COMBINATION

EACH ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	Φ_{dyn}	$*R_n$
MnDOT Pile Formula 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times \log(\frac{10}{S})$	0.50	122.6
PDA	0.65	94.3

* R_n = FACTORED DESIGN LOAD / φ dyn

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).

PILES TO HAVE NOMINAL DIAMETER OF 12".

FOR PILE 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 PILES REQUIRED.

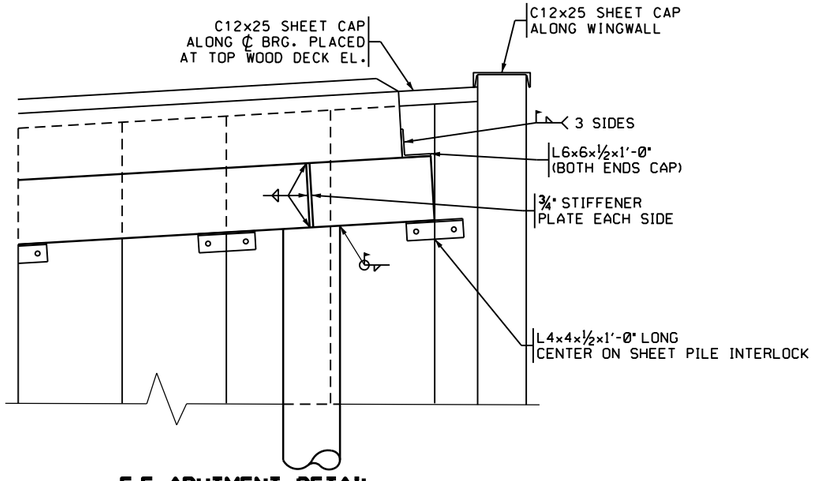
SUMMARY OF QUANTITIES FOR BOTH ABUTMENTS

ITEM	UNIT	QUANTITY
STEEL SHEET PILING	SQ. FT.	2480
STRUCTURE EXCAVATION	LUMP SUM	1
C-I-P CONCRETE PILING INSTALLED 12"	LIN. FT.	1190
C-I-P CONC TEST PILE 85 FT LONG 12"	EACH	2
PILE REDRIVING	EACH	16
PILE ANALYSIS	EACH	1
PILE POINTS 12"	EACH	16
HP14x73 x 41'-1"	EACH	2
(1) STRUCTURAL STEEL 3309 (INCLUDES HP14x73 CAPS)	POUND	11435

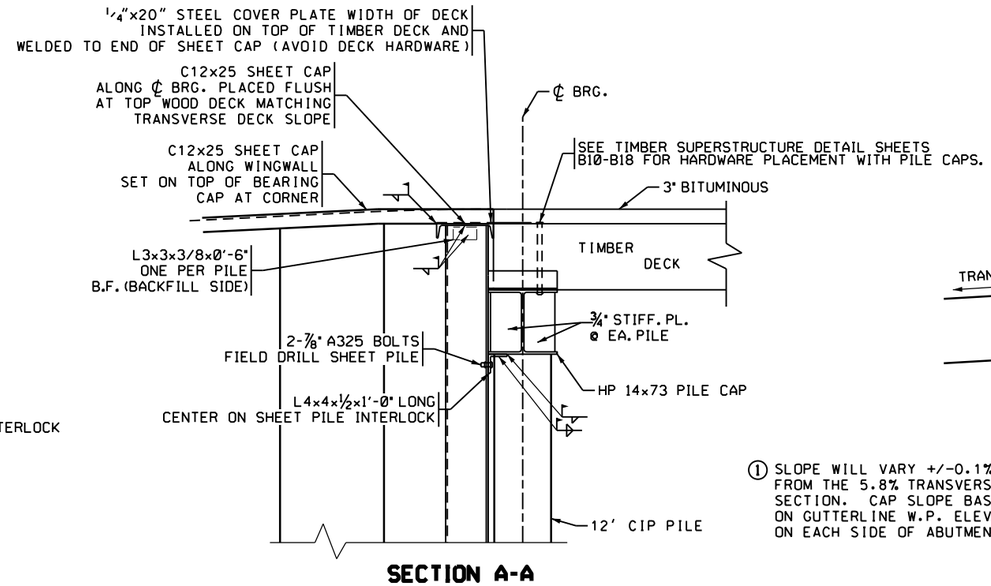
(1) INCLUDES ALL FASTENERS, STIFFENERS, PLATES AND HARDWARE FOR ABUTMENTS

NEW STEEL SHEETING ONLY.
ALL ABUTMENT STEEL SHEET PILES SHALL MEET OR EXCEED THE SECTION PROPERTIES IN THE STEEL SHEET MINIMUM SECTION PROPERTIES TABLE.
ALL ABUTMENT STEEL SHEET PILES SHALL BE MnDOT SPEC. 3373
STEEL SHEET PILING SHALL BE IN ACCORDANCE WITH 2452 AND HAVE THE FOLLOWING SECTION PROPERTIES:
MATERIAL TO BE HOT ROLLED PER ASTM A328 OR COLD FORMED PER ASTM709 GR 50W UNCOATED.

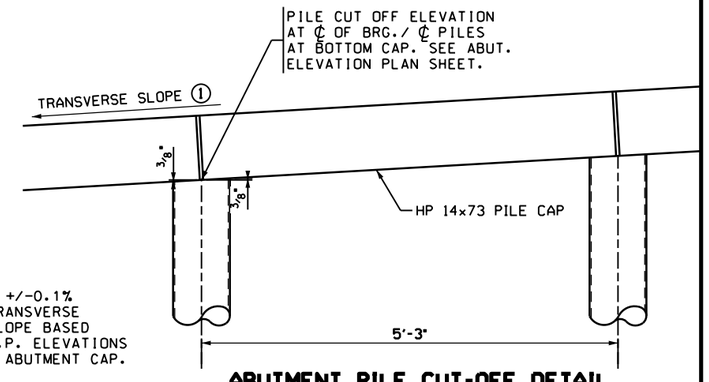
STEEL SHEET PILE MINIMUM SECTION PROPERTIES	
MOMENT OF INERTIA	84.4 IN^4 FT. MIN
SECTION MODULUS	18.1 IN^4 FT. MIN
DEPTH	9.0 INCHES
WALL THICKNESS	0.375 IN. MIN



F.F. ABUTMENT DETAIL



SECTION A-A



(1) SLOPE WILL VARY +/-0.1% FROM THE 5.8% TRANSVERSE SECTION. CAP SLOPE BASED ON GUTTERLINE W.P. ELEVATIONS ON EACH SIDE OF ABUTMENT CAP.

ABUTMENT PILE CUT-OFF DETAIL

Hennepin

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

53076 LICENSE NO.

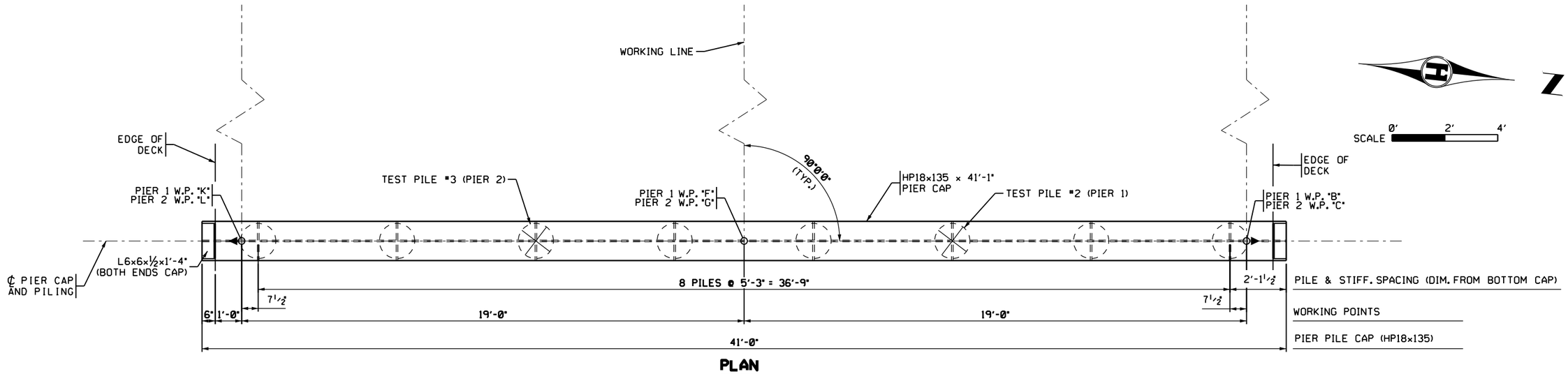
08/23/18 DATE

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

ABUTMENT DETAILS

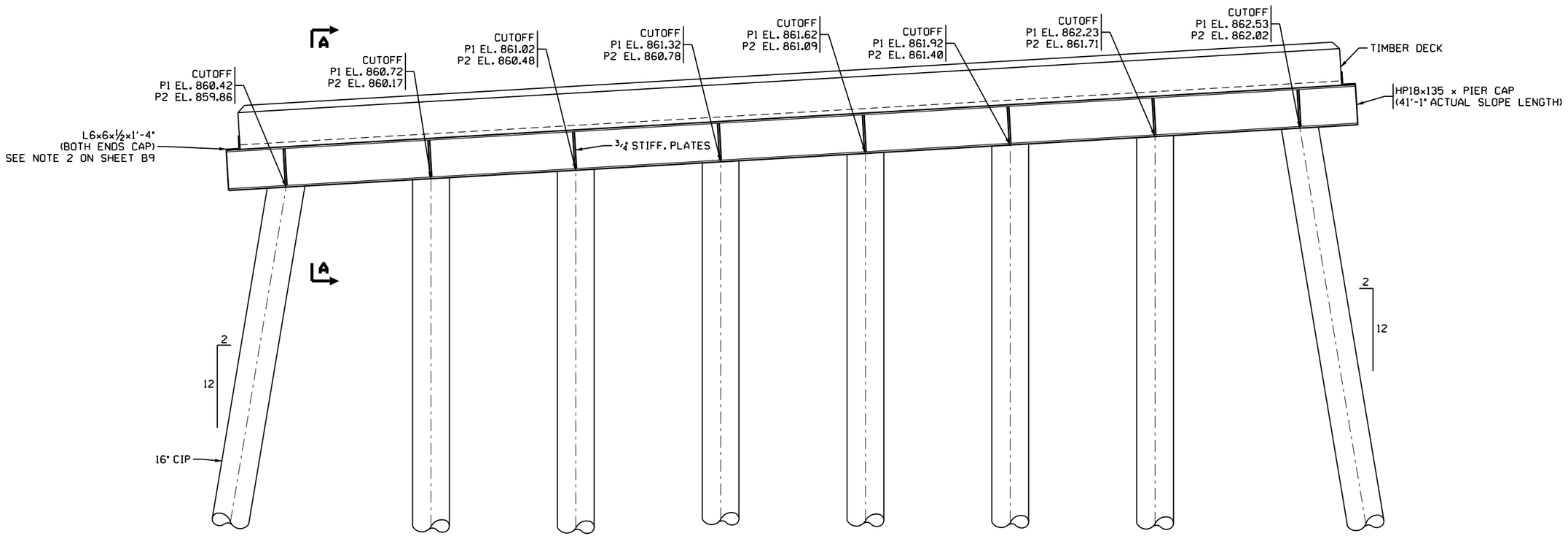
C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

SHEET B7 / B26



PLAN

(DIMENSIONS SHOWN IN PLAN VIEW ARE HORIZONTAL)



SOUTH

ELEVATION

NORTH

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JOHN D. EKOLA, PROFESSIONAL ENGINEER | 53076 LICENSE NO. | 06/11/18 DATE

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

PIER PLAN AND ELEVATION

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SHEET B8 / B26

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PIER 1 AND 2 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	31.9
FACTORED LIVE LOAD	53.9
* FACTORED DESIGN LOAD	85.8

* BASED ON STRENGTH I LOAD COMBINATION

PIER 1 AND 2 REQUIRED NOMINAL PILE BEARING RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	Φ dyn	* R_n
MnDOT Pile Formula 2012 (MPF12) $R_n=20\sqrt{\frac{W\times H}{1000}}\times\log(\frac{10}{S})$	0.50	171.6
PDA	0.65	132.0

* R_n = FACTORED DESIGN LOAD / φ dyn

SUMMARY OF QUANTITIES FOR PIERS 1 AND 2		
ITEM	UNIT	QUANTITY
C-I-P CONCRETE PILING INSTALLED 16"	LIN. FT.	1190
C-I-P CONC TEST PILE 85 FT LONG 16"	EACH	2
PILE REDRIVING	EACH	16
PILE ANALYSIS	EACH	1
PILE POINTS 16"	EACH	16
HP18x135 x 41'-1"	EACH	2
(1) STRUCTURAL STEEL 3309 (INCLUDES HP18x135 CAPS)	POUND	11602

(1) INCLUDES ALL FASTENERS, STIFFENERS, PLATES AND HARDWARE FOR PIERS

PIER PILE NOTES

PILE SPACING IS AT BOTTOM OF H PILE PIER CAP.

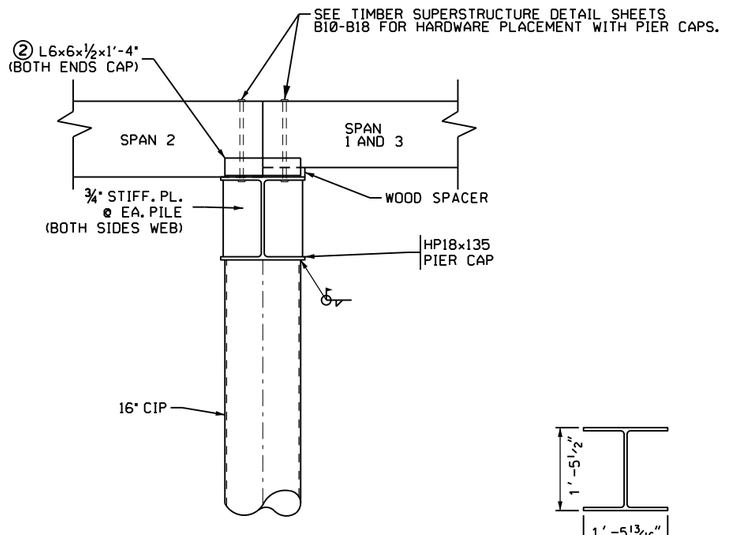
PILES MARKED THUS ◯➤ TO BE BATTERED 2 INCHES PER FOOT IN THE DIRECTION SHOWN.

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

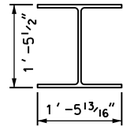
PILES TO HAVE NOMINAL DIAMETER OF 16".

FOR PILE SPLICE DETAIL SEE DETAIL B201.
DRIVE SPLICES ARE NOT ALLOWED.

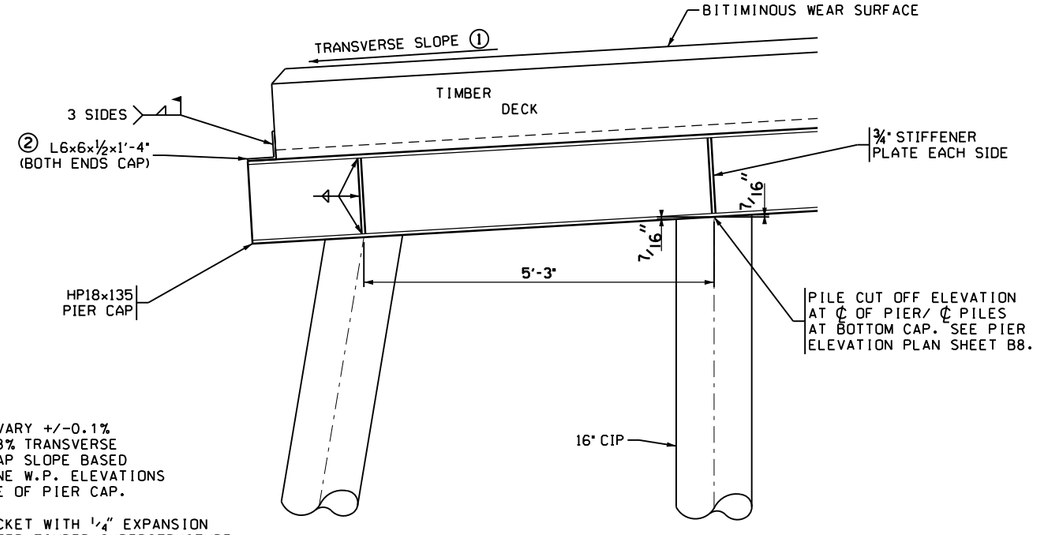
2 CAST-IN-PLACE TEST PILES 85 FT. LONG
7 CAST-IN-PLACE PILES EST. LENGTH 85 FT. (P1)
7 CAST-IN-PLACE PILES EST. LENGTH 85 FT. (P2)
16 CAST-IN-PLACE PILES REQUIRED.



SECTION A-A



HP 18x135 (TYP.)



FRONT DETAIL

① SLOPE WILL VARY +/-0.1% FROM THE 5.8% TRANSVERSE SECTION. CAP SLOPE BASED ON GUTTERLINE W.P. ELEVATIONS ON EACH SIDE OF PIER CAP.

② INSTALL BRACKET WITH ¼" EXPANSION MATERIAL AFTER TIMBER SUPERSTRUCTURE IS SECURED TO PILE CAP. (SEE SPECIAL PROVISIONS)

Hennepin

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 | 53076 LICENSE NO. | 08/23/18 DATE

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

PIER DETAILS

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

SHEET B9 / B26

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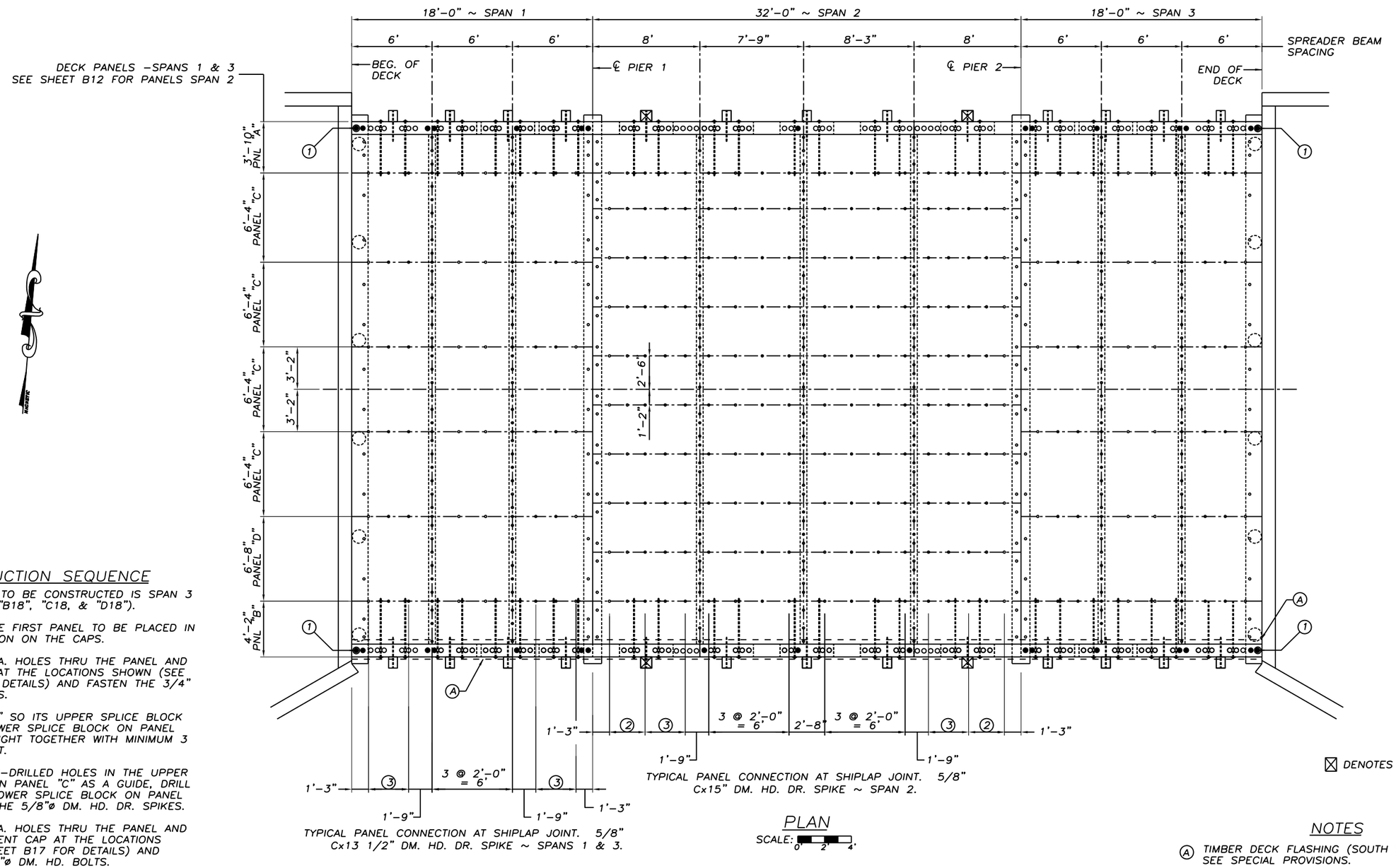

TYPICAL PANEL CONNECTION AT SHIPLAP JOINT. 5/8" Cx13 1/2" DM. HD. DR. SPIKE ~ SPANS 1 & 3.

TYPICAL PANEL CONNECTION AT SHIPLAP JOINT. 5/8" Cx15" DM. HD. DR. SPIKE ~ SPAN 2.

⊠ DENOTES RAIL SPLICE POST

PLAN

SCALE: 0 2 4

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 "C" AS A GUIDE, DRILL HOLES IN THE LOWER SPLICE BLOCK ON PANEL "A" AND DRIVE THE 5/8"ø DM. HD. DR. SPIKES.
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"ø DM. HD. BOLTS.
7. REPEAT STEPS 4-6 FOR THE REMAINING "C" PANELS, "D" PANEL AND THE "B" PANEL.
8. REPEAT STEPS 2-5 FOR SPAN 2 (PANELS "A32", "B32", "C32" & "D32") AND STEPS 2-6 FOR SPAN 1 (PANELS "A18", "B18", "C18" & "D18").
9. FASTEN PANELS TOGETHER OVER PIERS AS SHOWN IN DETAIL ON SHEET B17.

(1) 3/4"ø x 20" HEX LAGS (A449) W/ 4"ø ℄ WASHER CURB TO DECK OVER CAPS AND SPREADER BEAMS AS REQUIRED.

(2) 2 SPACES @ 1'-4" = 2'-8"

(3) 2 SPACES @ 1'-6" = 3'-0"

NOTES

(A) TIMBER DECK FLASHING (SOUTH SIDE DECK ONLY) SEE SPECIAL PROVISIONS.

BOLT PROJECTIONS EXCEEDING 1" SHALL BE CUT OFF. REPAIR END OF BOLT BY PAINTING WITH AN APPROVED ZINC RICH PRIMER.

HOLES DRILLED FOR DM. HD. DR. SPIKES ARE TO BE 1/16" DIA. SMALLER THAN SPIKE SIZE.

HOLES DRILLED FOR BOLTS ARE TO BE 1/16" DIA. LARGER THAN BOLT SIZE.

SEE SHEET B18 FOR SUPERSTRUCTURE QUANTITIES.

SUPERSTRUCTURE DETAILS

Hennepin

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JOHN D. EKOLA, PROFESSIONAL ENGINEER | 53076 LICENSE NO. | 08/22/18 DATE

DESIGN BY:	JDE
CHECKED BY:	JZB
DRAWN BY:	JLS
CHECKED BY:	JDE

SUPERSTRUCTURE DETAILS

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

SHEET B10 / B26

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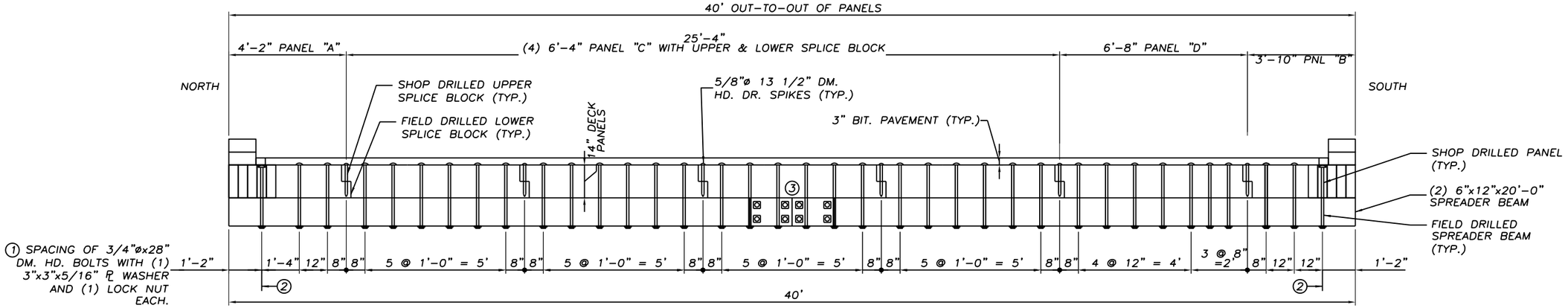


TRANSVERSE SECTION THRU SPREADER BEAM

SPANS 1 & 3

SCALE: 0 2' 4'

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.

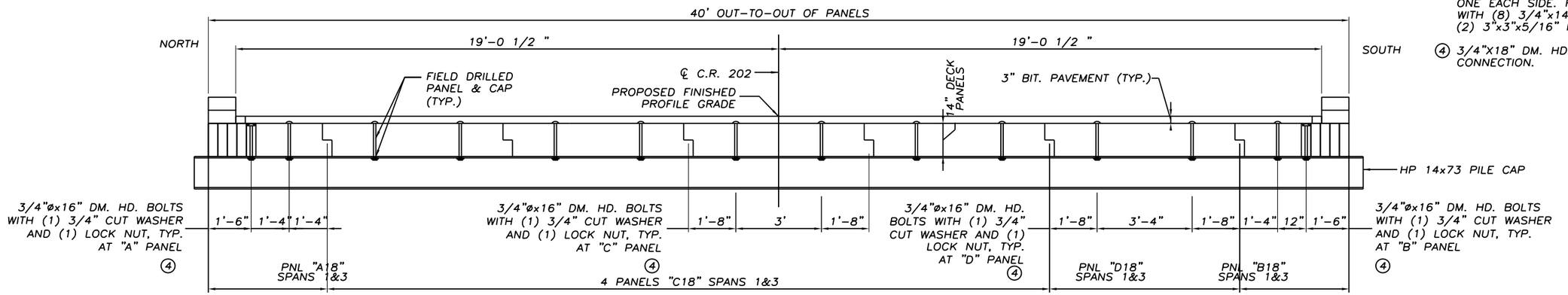
SPREADER BEAMS ARE FIELD DRILLED USING THE SHOP DRILLED HOLES IN THE DECK PANELS AS A GUIDE.

(1) SEE SPREADER BEAM NOTES ABOVE.

(2) COUNTERSINK HEAD OF DM. HD. BOLT.

(3) 3"x12"x3'-0" 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.

(4) 3/4"X18" DM. HD. BOLTS AT PIER CONNECTION.



TRANSVERSE SECTION AT ABUTMENT

CONNECTION TO PIER SIMILAR – SPANS 1 & 3 (4)

SCALE: 0 2' 4'

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JOHN D. EKOLA, PROFESSIONAL ENGINEER

53076 LICENSE NO.

06/11/18 DATE

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

SUPERSTRUCTURE DETAILS

C.R. 202 / HENNEPIN COUNTY PROJECT 0408
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BRIDGE 27C53

SHEET B11 / B26

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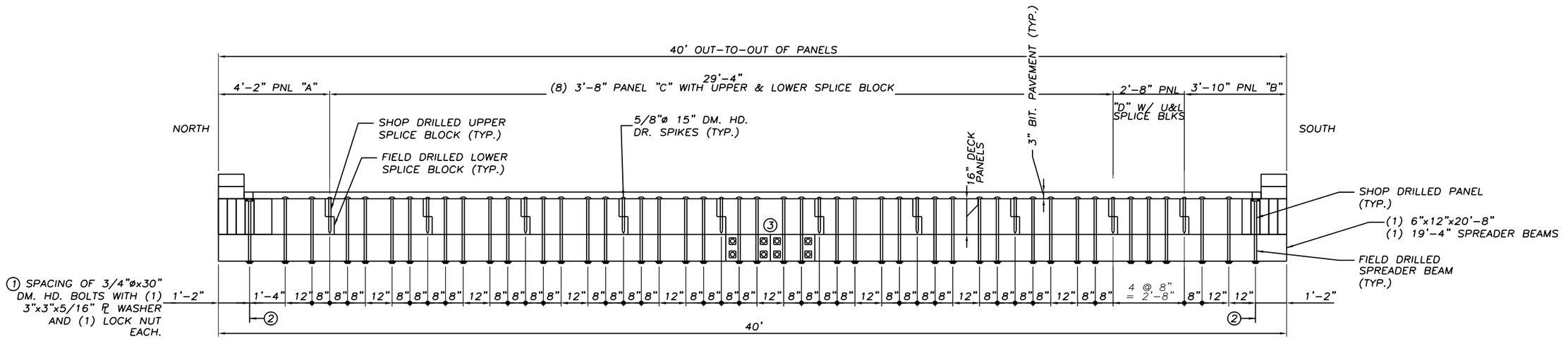


TRANSVERSE SECTION THRU SPREADER BEAM

SPAN 2

SCALE: 0 2' 4'

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.

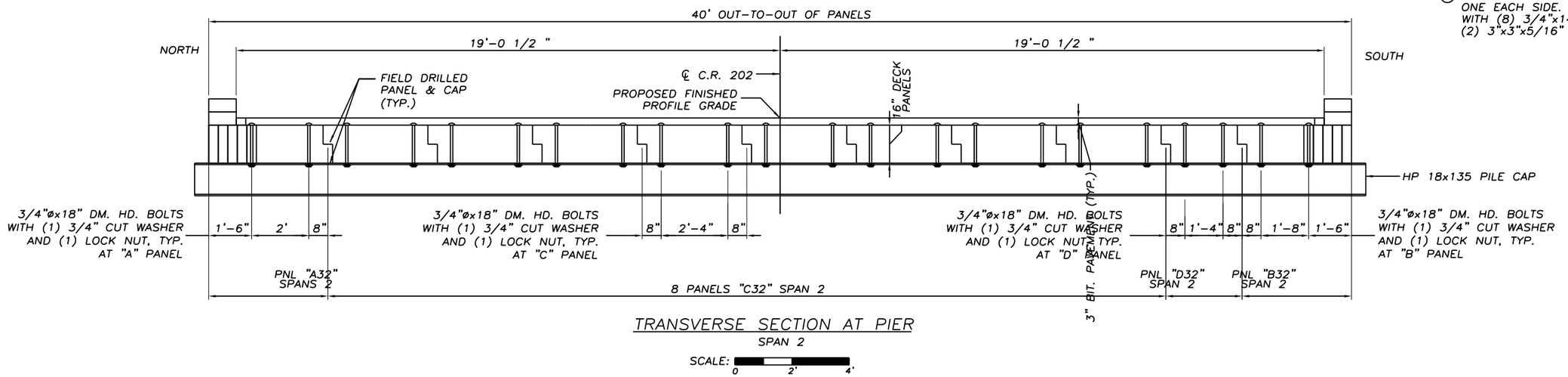
DECK PANELS SHALL BE SHOP DRILLED AS SHOWN.

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"x3'-4" 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 AT PIER

SPAN 2

SCALE: 0 2' 4'

Hennepin

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SUPERSTRUCTURE DETAILS

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

SHEET B12 / B26

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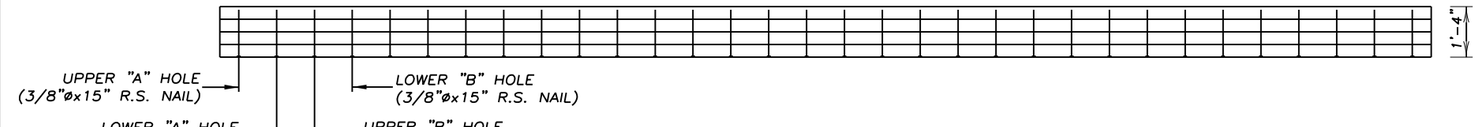
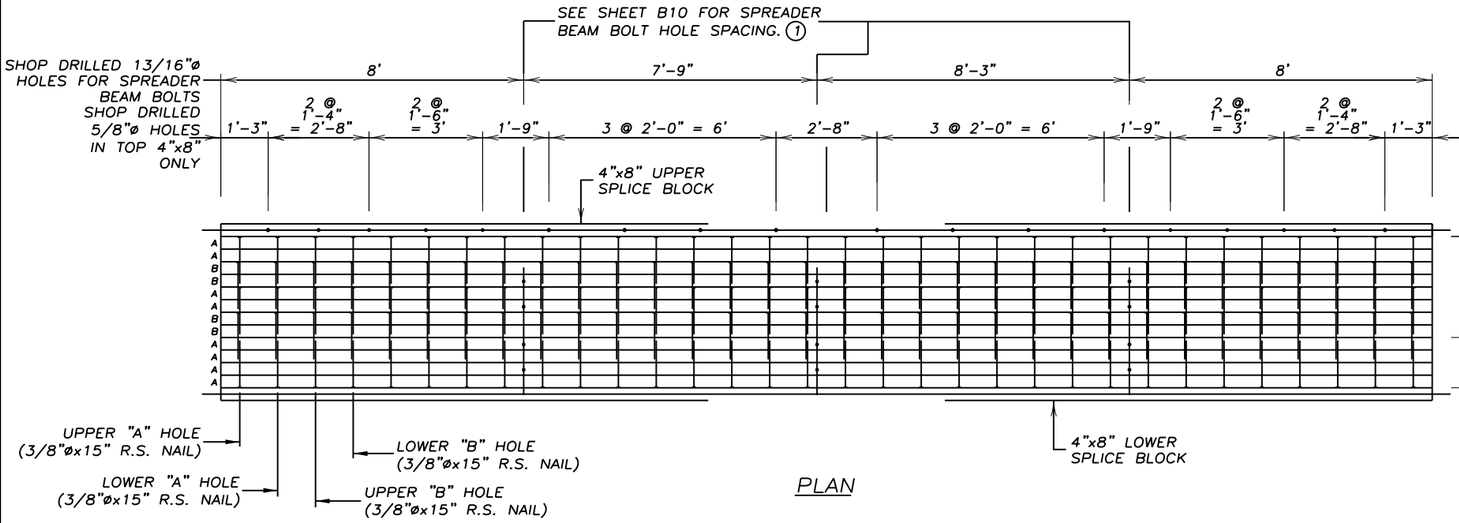
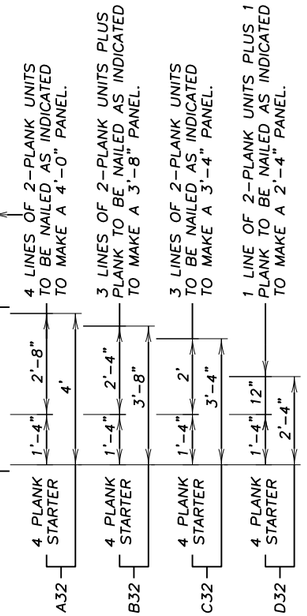


4 PLANK STARTER DETAIL



PLAN



FABRICATION NOTES

LAMINATE 4"x16" PLANKS USING 3/8"ø x11" & 3/8"ø x15" GALV. RING SHANK NAILS AS REQUIRED.

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

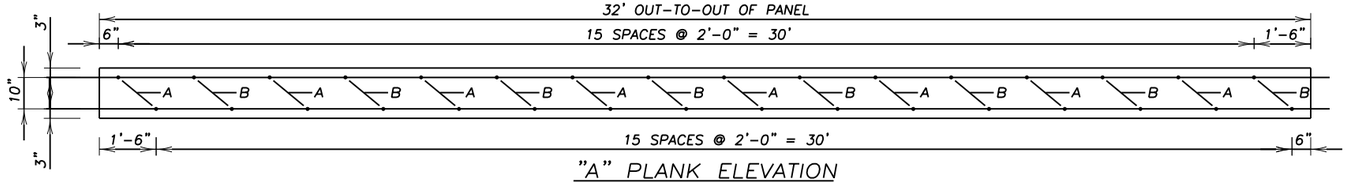
CONSTRUCTION SEQUENCE:

1. ALL PLANKS ARE SURFACED ONE SIDE SO THAT THE UNITS WILL BE 2'-4", 3'-4", 3'-8" OR 4'-0" WIDE AFTER FABRICATING THE PANELS.
2. PLANKS ARE TO BE PREBORED AS PER DETAILS BEFORE BEING TREATED. DRILL 5/8"ø HOLES IN THE UPPER 4"x8" PLANK AS DETAILED. DRILL 13/16"ø HOLES FOR PLACING 3/4"ø EYEBOLTS FOR HANDLING AND FOR FASTENING 3/4"ø SPREADER BEAM BOLTS.
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 2'-4" WIDE PANEL OR 2 PLANK SECTIONS PLUS 1 PLANK TO MAKE A 3'-8" WIDE PANEL. SET RING SHANK NAILS IN POSITION IN PREBORED HOLES OF 2 PLANK UNITS OR SINGLE PLANK. MECHANICAL PRESS TO BE USED TO DRIVE THE NAILS SO PLANKS ARE DRIVEN TIGHT TOGETHER TO MAKE DIMENSIONS OF 2'-4", 3'-4", 3'-8" AND 4'-0" WIDE UNITS.
5. ATTACH THE 4"x8" PLANK(S) AS SHOWN (DEPENDING ON THE PANEL TYPE) TO PANEL USING 11" GALV. RING SHANK NAILS.

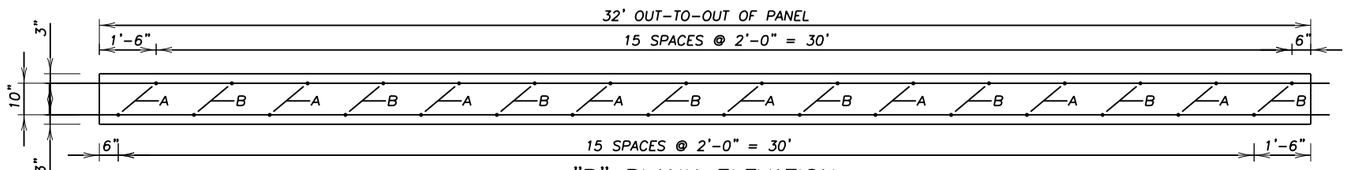
(1) LOCATION OF 13/16"ø HOLES FOR 3/4"ø SPREADER BEAM BOLTS. REFER TO SHEET B12 FOR BOLT SPACING ON PANEL A32, B32, C32 AND D32.

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

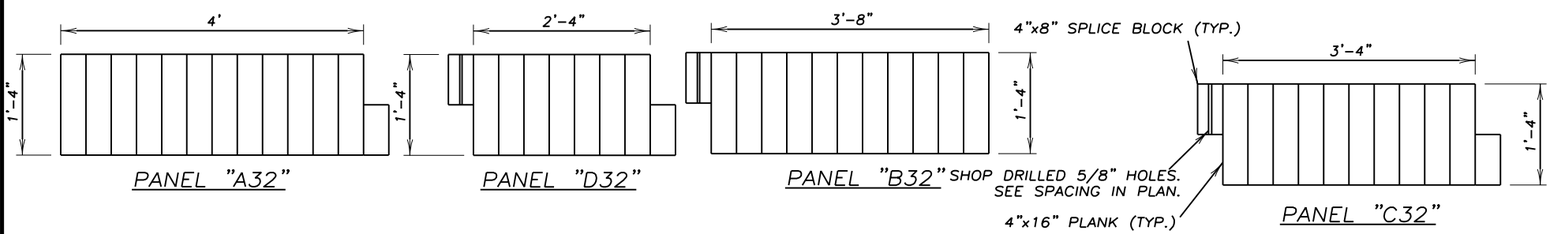
32' PREFAB WOOD PANEL DETAIL

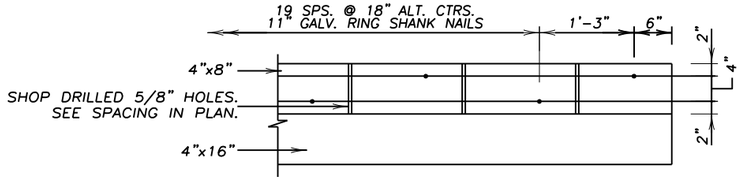


"A" PLANK ELEVATION



"B" PLANK ELEVATION





NAILING OF 4"x8" TIMBER TO PLANK

TREATED TIMBER FOR PANELS

NUMBER REQUIRED				ITEM	M.B.M.			
"A32"	"B32"	"C32"	"D32"		"A32"	"B32"	"C32"	"D32"
12	11	10	7	4"x16"x32'-0"	2.048	1.874	1.707	1.195
1	1	2	2	4"x8"x32'-0"	0.086	0.086	0.171	0.171
				TOTAL M.B.M.	2.134	1.960	1.878	1.366

GALVANIZED HARDWARE FOR PANELS

NUMBER REQUIRED				ITEM	WEIGHT			
"A32"	"B32"	"C32"	"D32"		"A32"	"B32"	"C32"	"D32"
160	128	128	64	3/8"ø x15" R.S. NAILS	80	64	64	32
22	54	44	76	3/8"ø x11" R.S. NAILS	9	22	18	31
				TOTAL	89	86	82	63

Hennepin

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JOHN D. EKOLA, PROFESSIONAL ENGINEER

53076 LICENSE NO. | 06/11/18 DATE

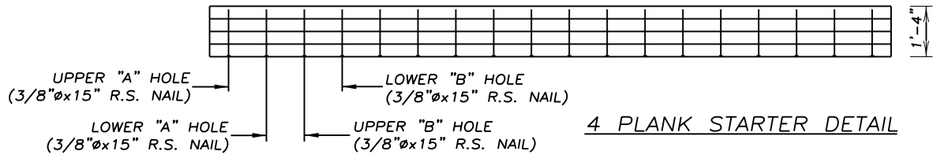
DESIGN BY:	JDE
CHECKED BY:	JZB
DRAWN BY:	JLS
CHECKED BY:	JDE

SUPERSTRUCTURE DETAILS

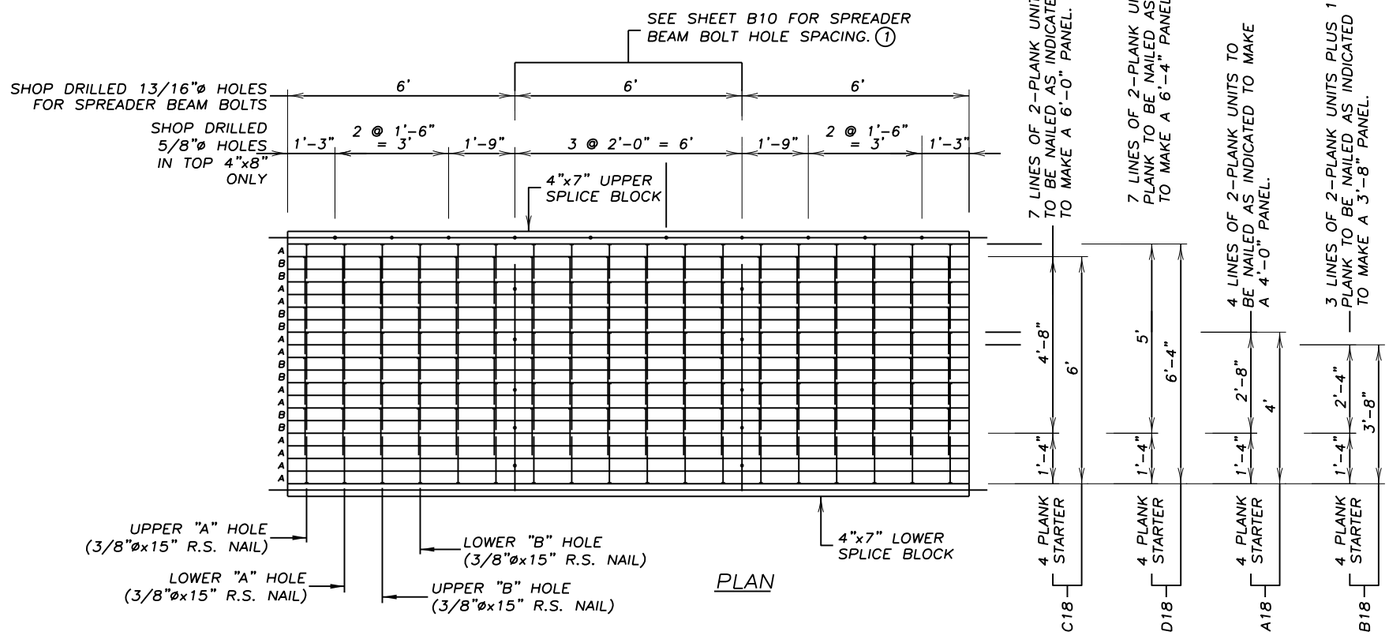
C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

SHEET B13 / B26

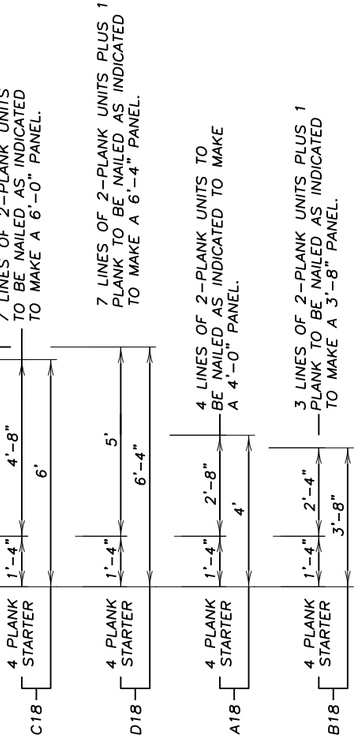
Default



4 PLANK STARTER DETAIL



PLAN



FABRICATION NOTES

LAMINATE 4"x14" PLANKS USING 3/8"ø x11" & 3/8"ø x15" GALV. RING SHANK NAILS AS REQUIRED.

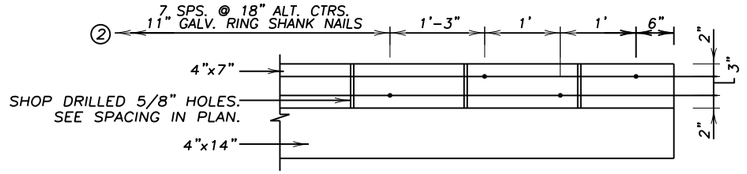
PLANKS TO BE PRESSURE TREATED AS PER SPEC. 3491 AND THE SPECIAL PROVISIONS.

CONSTRUCTION SEQUENCE:

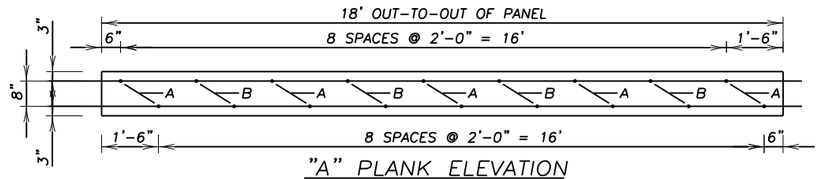
1. ALL PLANKS ARE SURFACED ONE SIDE SO THAT THE UNITS WILL BE 3'-8", 4'-0", 6'-0" OR 6'-4" WIDE AFTER FABRICATING THE PANELS.
2. PLANKS ARE TO BE PREBORED AS PER DETAILS BEFORE BEING TREATED. DRILL 5/8"ø HOLES IN THE UPPER 4"x7" PLANK AS DETAILED. DRILL 13/16"ø HOLES FOR PLACING 3/4"ø EYEBOLTS FOR HANDLING AND FOR FASTENING 3/4"ø SPREADER BEAM BOLTS.
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 4'-0" & 6'-0" WIDE PANEL OR ADD 2 PLANK SECTIONS PLUDS 1 PLANK TO MAKE A 3'-8" & 6'-4' WIDE PANEL. SET RING SHANK NAILS IN POSITION IN PREBORED HOLES OF 2 PLANK UNITS OR SINGLE PLANK. MECHANICAL PRESS TO BE USED TO DRIVE THE NAILS SO PLANKS ARE DRIVEN TIGHT TOGETHER TO MAKE DIMENSIONS OF 3'-8', 4'-0", 6'-0" AND 6'-4" WIDE UNITS.
5. ATTACH THE 4"x7" PLANK(S) AS SHOWN (DEPENDING ON THE PANEL TYPE) TO PANEL USING 11" GALV. RING SHANK NAILS.

(1) LOCATION OF 13/16"ø HOLES FOR 3/4"ø SPREADER BEAM BOLTS. REFER TO SHEET B10 FOR BOLT SPACING ON PANEL A18, B18, C18 AND PANEL D18.

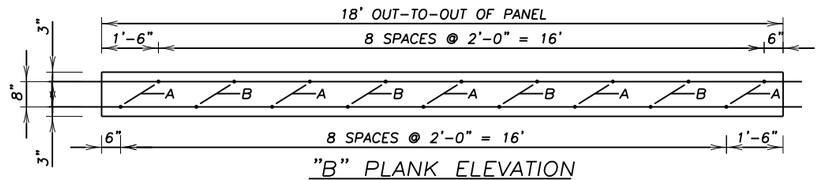
(2) SHOP ADJUST SPACING IN "A" & "B" PANELS TO MISS HOLES FOR RAILPOST CONNECTION RODS.



NAILING OF 4"x7" TIMBER TO PLANK



"A" PLANK ELEVATION



"B" PLANK ELEVATION

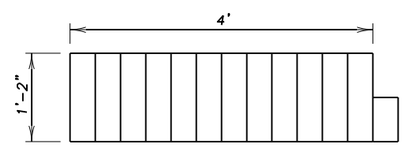
18' PREFAB WOOD PANEL DETAIL

TREATED TIMBER FOR PANELS

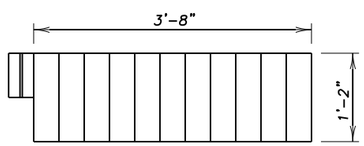
NUMBER REQUIRED				ITEM	M.B.M.			
"A18"	"B18"	"C18"	"D18"		"A18"	"B18"	"C18"	"D18"
12	11	18	19	4"x14"x18'-0"	1.008	0.924	1.512	1.596
1	1	2	2	4"x7"x18'-0"	0.042	0.042	0.084	0.084
				TOTAL M.B.M.	1.050	0.966	1.596	1.680

GALVANIZED HARDWARE FOR PANELS

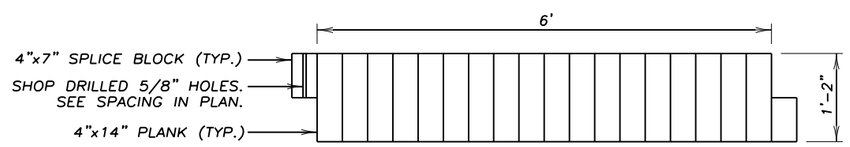
NUMBER REQUIRED				ITEM	WEIGHT			
"A18"	"B18"	"C18"	"D18"		"A18"	"B18"	"C18"	"D18"
90	90	144	144	3/8"ø x15" R.S. NAILS	45	45	72	72
14	14	28	28	3/8"ø x11" R.S. NAILS	6	6	12	12
				TOTAL	51	51	84	84



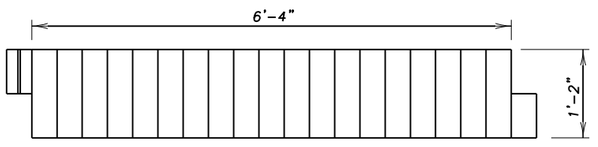
PANEL "A18"



PANEL "B18"



PANEL "C18"



PANEL "D18"

Hennepin

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

53076 LICENSE NO.

06/11/18 DATE

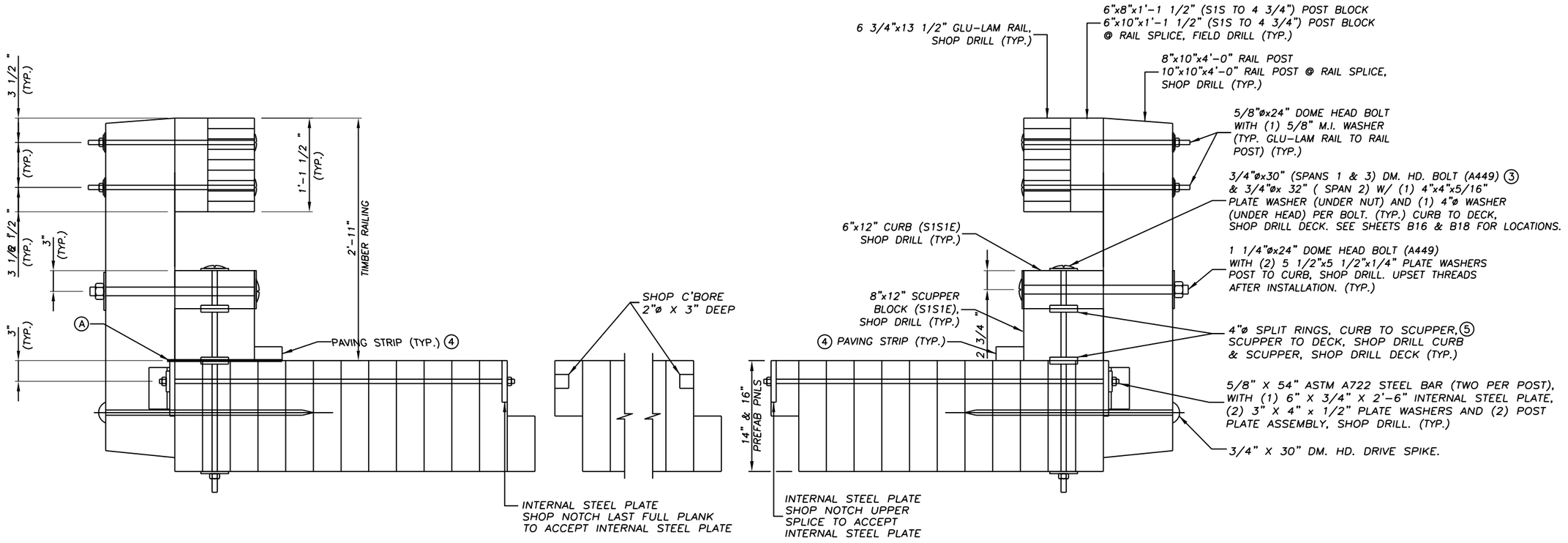
DESIGN BY:	JDE
CHECKED BY:	JZB
DRAWN BY:	JLS
CHECKED BY:	JDE

SUPERSTRUCTURE DETAILS

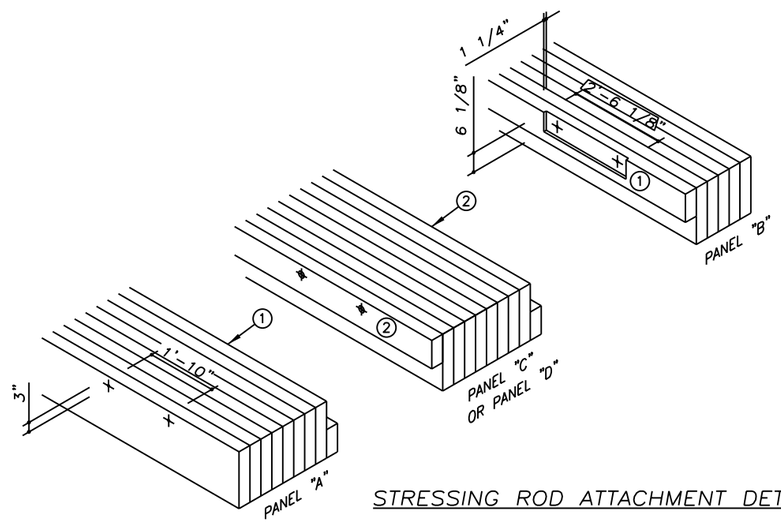
C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

SHEET B14 / B26

Default



SECTION AT RAIL POST



STRESSING ROD ATTACHMENT DETAIL

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"ø 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" X 4" PAVING STRIP, RGH, 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.

A. TIMBER DECK FLASHING ON SOUTH SIDE OF BRIDGE ONLY. SEE SPECIAL PROVISIONS.

Hennepin

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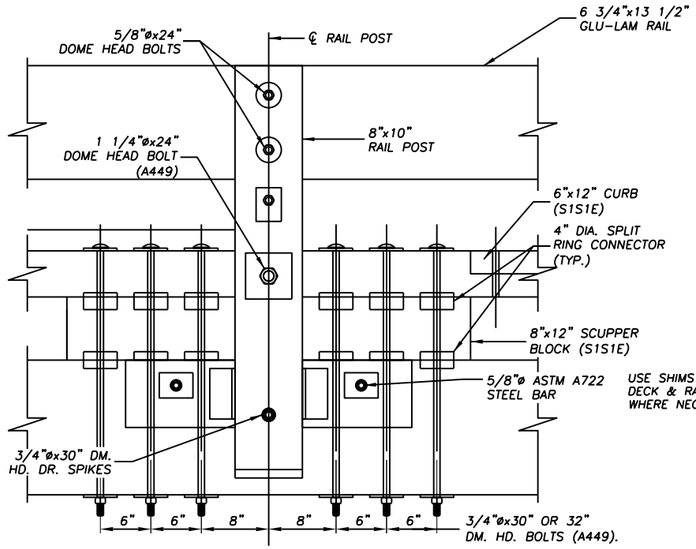
JOHN D. EKOLA, PROFESSIONAL ENGINEER | 53076 LICENSE NO. | 08/23/18 DATE

DESIGN BY:	JDE
CHECKED BY:	JZB
DRAWN BY:	JLS
CHECKED BY:	JDE

SUPERSTRUCTURE DETAILS

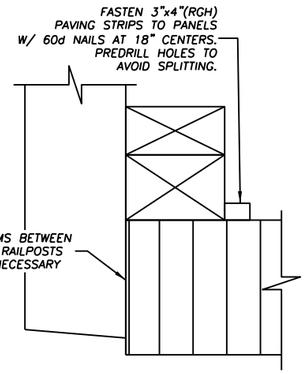
C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-596-009
BRIDGE 27C53

SHEET B15 / B26



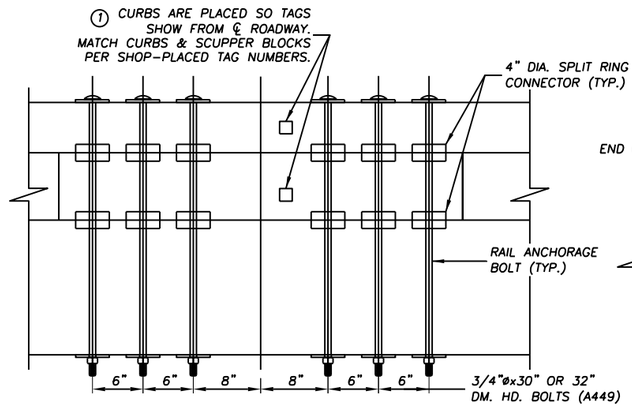
RAIL POST ELEVATION

SCALE: 0' 1' 2'
1 1/2"=1'-0"



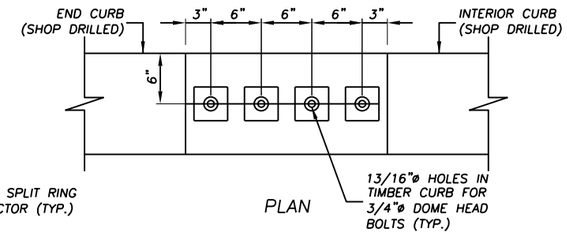
PARTIAL DECK SECTION @ EDGE STRIP

SCALE: 0' 1' 2'
1 1/2"=1'-0"

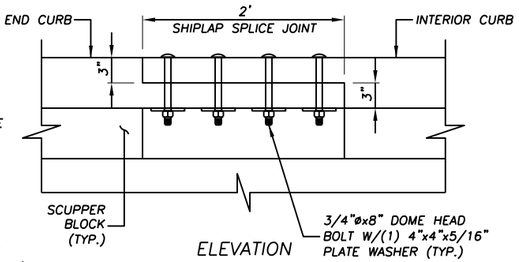


CURB & SCUPPER BLOCK ASSEMBLY DETAIL

SCALE: 0' 1' 2'
1 1/2"=1'-0"



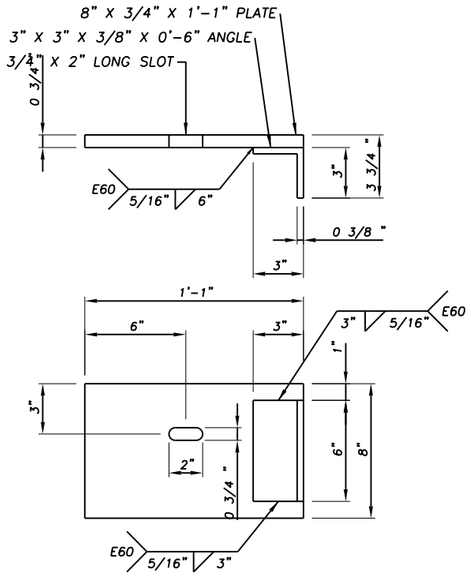
PLAN



ELEVATION

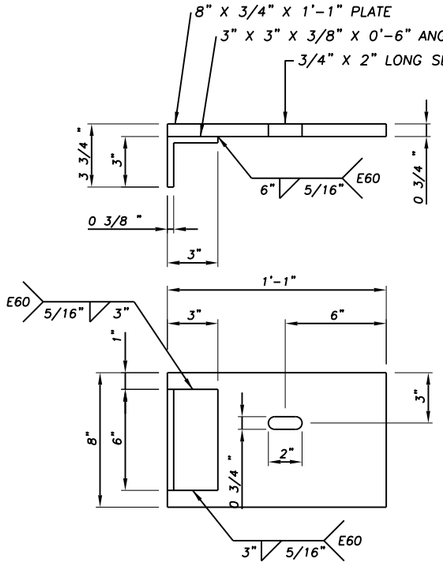
CURB SPLICE DETAIL

SCALE: 0' 1' 2'
1 1/2"=1'-0"



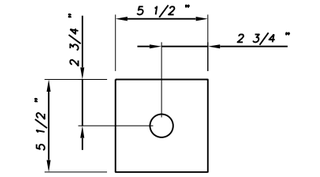
LEFT STEEL POST PLATE THUS

LEFT STEEL POST PLATE
ASTM A36, H.D.G.



RIGHT STEEL POST PLATE THUS

RIGHT STEEL POST PLATE
ASTM A36, H.D.G.



RAILPOST PLATE WASHER THUS

5 1/2" X 5 1/2" X 1/4"
1 3/8"ø HOLE
ASTM A36, H.D.G.

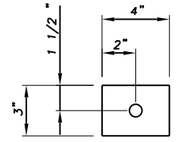
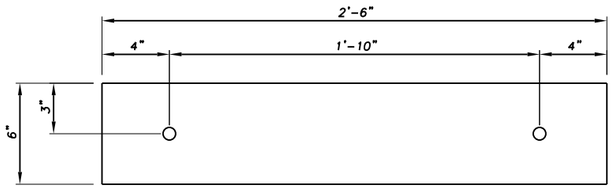


PLATE WASHER FOR POST PLATE THUS

3" X 1/2" X 0'-4"
3/4"ø HOLE
ASTM A36, H.D.G.



INTERNAL STEEL PLATE

INTERNAL STEEL PLATE THUS
6" X 3/4" X 2'-6"
ALL HOLES ARE 3/4"ø
ASTM A36, H.D.G.

TIMBER RAILING DETAILS

Hennepin

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

53076 LICENSE NO.

06/11/18 DATE

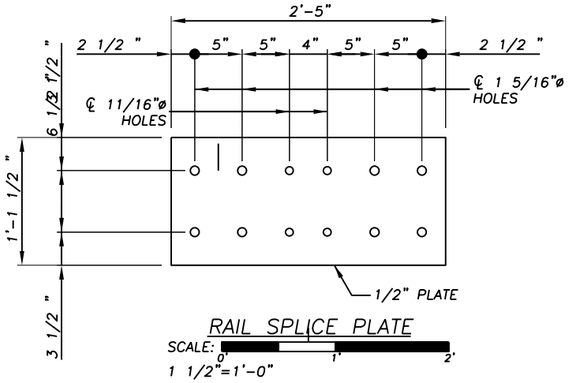
DESIGN BY:	J. EKOLA
CHECKED BY:	J. BRONDER
DRAWN BY:	J. SCHERER
CHECKED BY:	J. EKOLA

SUPERSTRUCTURE DETAILS

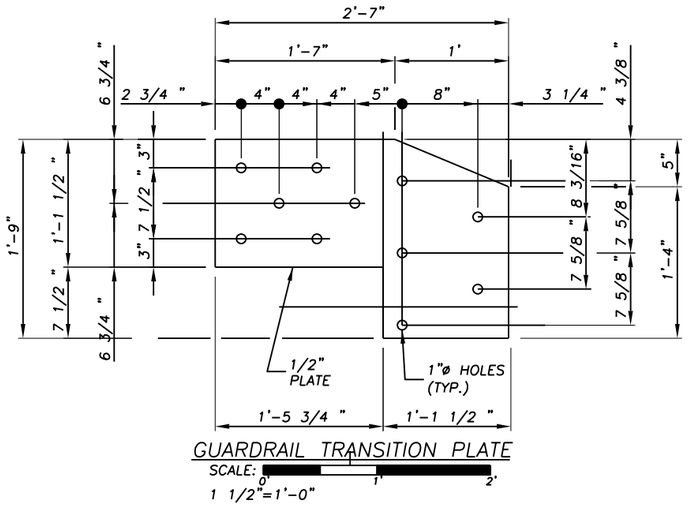
C.R. 202 / HENNEPIN COUNTY PROJECT 0408
S.P. 027-569-009
BRIDGE 27C53

SHEET B16 / B26

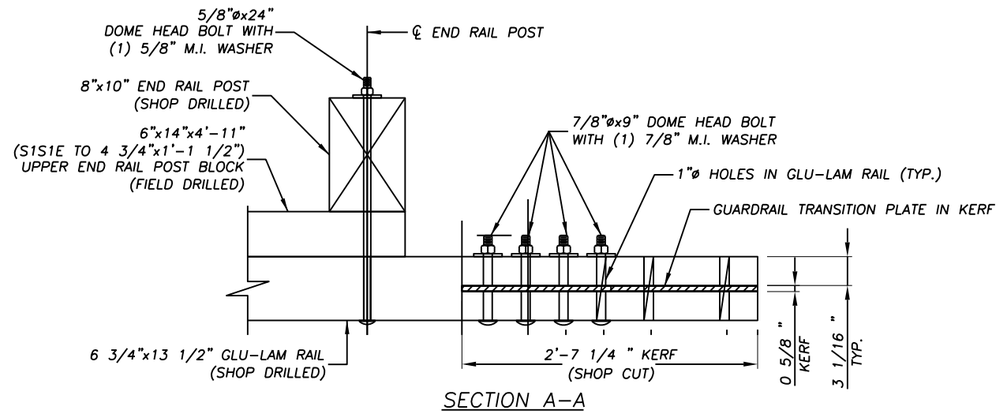
Default pw4519 6/11/2018 \\tempo\proj\202.0408.27C53\Bridge\Plan\SuperStructure.dgn



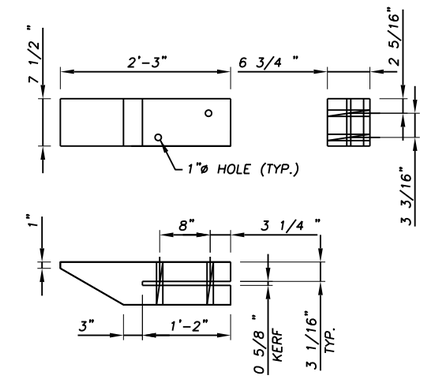
RAIL SPLICE PLATE



GUARDRAIL TRANSITION PLATE

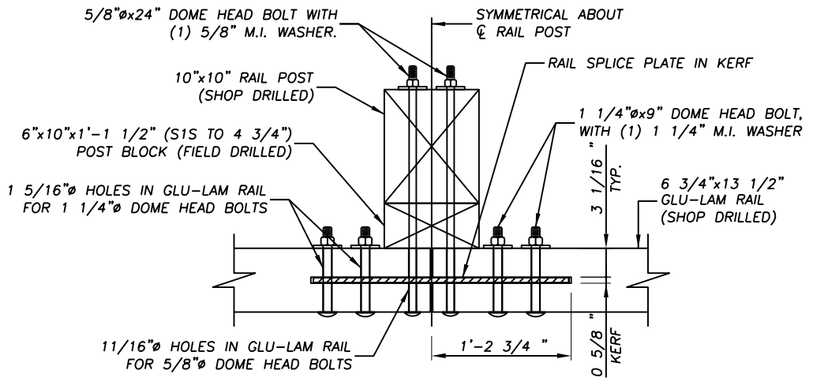


SECTION A-A

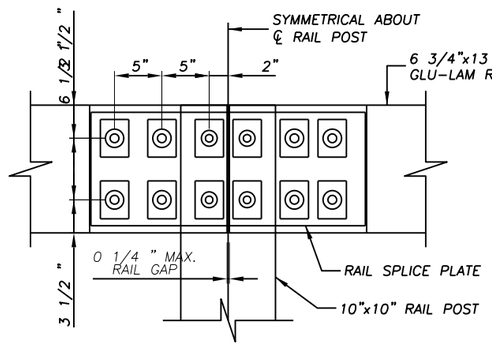


CURB TRANSITION BLOCK

SCALE: 0' 1' 2'
1 1/2"=1'-0"



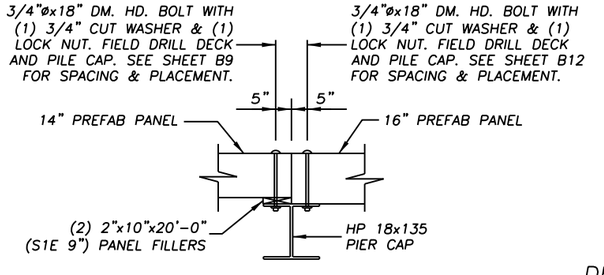
PLAN RAIL SPLICE DETAIL



ELEVATION

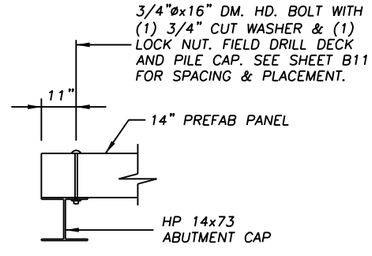
GLU-LAM RAIL SPLICE DETAIL

SCALE: 0' 1' 2'
1 1/2"=1'-0"



DECK TO PIER CAP CONECTION

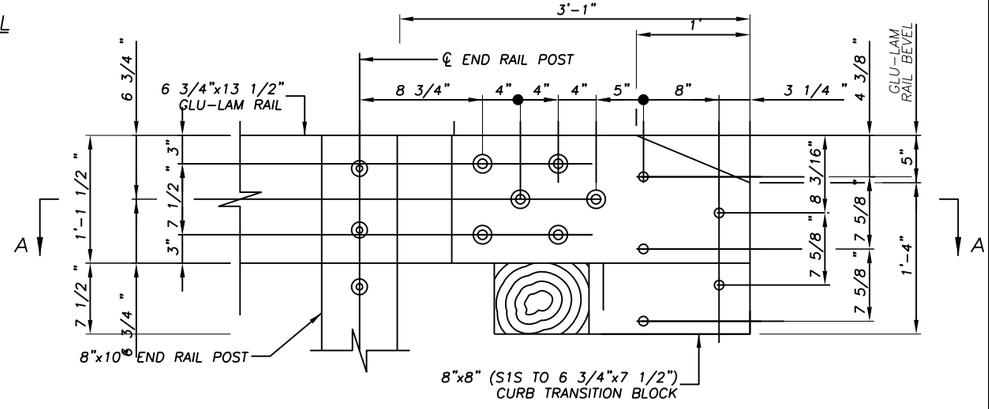
SCALE: 0' 1' 2'



DECK TO ABUTMENT CAP CONECTION

SCALE: 0' 1' 2'

TIMBER RAILING DETAILS



GUARDRAIL TRANSITION DETAIL (ELEVATION)

SCALE: 0' 1' 2'

Hennepin

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

53076 LICENSE NO.

06/11/18 DATE

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

SUPERSTRUCTURE DETAILS

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

SHEET B17 / B26

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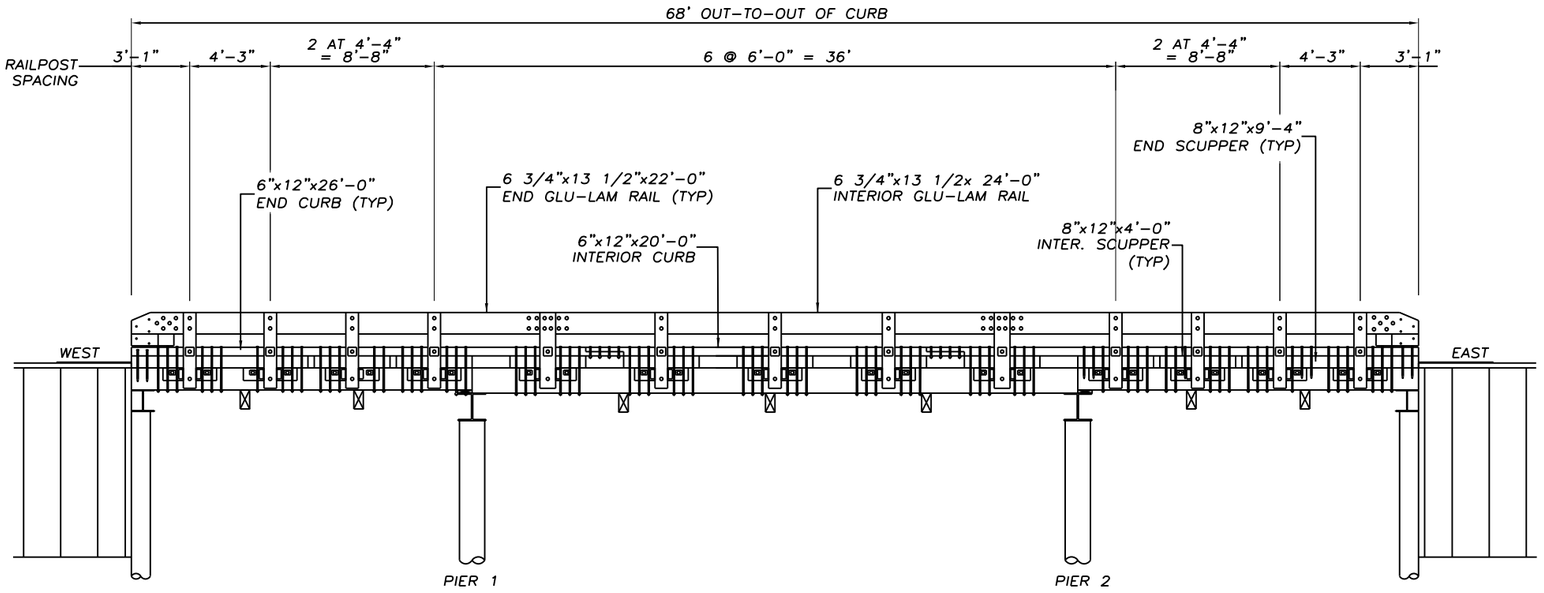

ELEVATION

SCALE: 0' 2' 4'

BILL OF TREATED TIMBER ~ SUPERSTRUCTURE

	ITEM	QTY.	FINISH	SIZE	LENGTH	F.B.M.
	SPREADER BEAM	8	R	6x12	20'-0"	960
	SPREADER BEAM	3	R	6x12	20'-8"	372
	SPREADER BEAM	3	R	6x12	19'-4"	348
	SPREADER BM SPLICE	8	R	3x12	3'-0"	72
	SPREADER BM SPLICE	6	R	3x12	3'-4"	60
(5)	PNL FILLER @ PIER	4	S1E	2x10	20'-0"	134
	RAIL POST	22	R	8x10	4'-0"	587
(1)	RAIL POST BLOCK	14	S1S	6x8	1'-1 1/2"	63
(3)	UPPER END POST BLK	4	S1S1E	6x14	4'-11"	138
(4)	CURB TRANSITION BLK	4	S1S1E	8x8	2'-3"	48
	RAIL POST	4	R	10x10	4'-0"	134
(1)	RAIL POST BLOCK	4	S1S	6x10	1'-1 1/2"	23
	CURB ~ END	4	S1S1E	6x12	26'-0"	624
	CURB ~ INTERIOR	2	S1S1E	6x12	20'-0"	240
	SCUPPER ~ END	4	S1S1E	8x12	9'-4"	299
	SCUPPER ~ INTERIOR	18	S1S1E	8x12	4'-0"	576
	EDGE STRIP	17	R	3x4	8'-0"	136
	TOTAL TRTD. TIMBER ~ SUPERSTRUCTURE (F.B.M.)					4814
					M.B.M.	4.814

(1) S1S TO 4 3/4"
(3) S1S1E TO 4 3/4"x13 1/2"
(4) S1S1E TO 4 3/4"x7 1/2"
(5) S1E TO 9

(2) BILL OF GLU-LAM RAILING

END RAIL	4 PCS. 10 3/4"x6"x22'-0"
INTERIOR RAIL	2 PCS. 10 3/4"x6"x24'-0"
TOTAL GLU-LAM RAILING (LIN. FT.)	136

(2) SEE SPECIAL PROVISIONS.

BILL OF STRUCTURAL STEEL (3306) GALVANIZED

ITEM	QTY.	SIZE	LENGTH	WT.
RAIL SPLICE PLATE	4	1/2"x13 1/2"	2'-5"	236
GUARDRAIL TRANSITION PLATE	4	1/2"x1'-9"	2'-7"	392
POST PLATE ASSEMBLY	52	SEE SHEET B16		1430
INTERNAL STEEL PLATE	26	3/4"x6"	2'-6"	1055
TOTAL STRUCTURAL STEEL (3306) (LBS.)				3113

SUPERSTRUCTURE DETAILS

BILL OF HARDWARE ~ SUPERSTRUCTURE

WT./ea.	QTY.	ITEM		WT.
2.40	34	3/4"ø x20" HEX LAGS (A449)	~ CURB TO PANEL	82
1.40	120	5/8"ø x13 1/2" DM. HD. DR. SPIKE	~ PANEL SPLICE	168
1.52	180	5/8"ø x15" DM. HD. DR. SPIKE	~ PANEL SPLICE	274
2.80	28	3/4"ø x16" DM. HD. BOLT	~ PNL TO ABUT	79
3.04	72	3/4"ø x18" DM. HD. BOLT	~ PANEL TO PIER	219
3.89	26	3/4"ø x30" DM. HD. DR. SPIKE	~ POST TO PANEL	102
2.49	60	5/8"ø x24" DM. HD. BOLT	~ RAIL TO POST	150
4.30	24	7/8"ø x9" DM. HD. BOLT	~ RAIL TRANSITION	104
6.81	32	1 1/4"ø x9" DM. HD. BOLT	~ RAIL SPLICE	218
4.24	148	3/4"ø x28" DM. HD. BOLT	~ SPREADER BEAM	628
4.48	123	3/4"ø x30" DM. HD. BOLT	~ SPREADER BEAM	552
5.48	54	3/4"ø x32" DM. HD. BOLT (A449)	~ CURB TO PANEL	296
4.48	76	3/4"ø x30" DM. HD. BOLT (A449)	~ CURB TO PANEL	341
1.84	16	3/4"ø x8" DM. HD. BOLT	~ CURB SPLICE	30
11.96	26	1 1/4"ø x24" DM. HD. BOLT (A449)	~ POST TO CURB	311
18/#		60d NAILS	~ EDGE STRIP	6
0.60	24	7/8" M.I. WASHERS		15
0.94	164	4" DIA. PL WASHERS	(3/4"ø BOLTS)	155
0.85	271	3"x3"x5/16" PL WASHERS	(3/4"ø BOLTS)	231
1.50	146	4"x4"x5/16" PL WASHERS	(3/4"ø BOLTS)	219
0.20	371	3/4" LOCK NUTS		75
0.70	328	4" SPLIT RING CONNECTORS		230
2.28	52	5 1/2"x5 1/2"x1/4" PL WASHERS	(1 1/4"ø BOLTS)	119
0.12	100	3/4" CUT WASHERS	(3/4"ø BOLTS)	12
1.81	52	3"x4"x1/2" PL WASHERS	(5/8"ø STEEL BAR)	95
0.22	60	5/8" M.I. WASHERS		14
1.54	32	1 1/4" M.I. WASHERS		50
6.00	52	5/8"ø x54" A722 STEEL BAR W/(2) NUTS		312
TOTAL HARDWARE ~ SUPERSTRUCTURE (LBS.)				5,087

Hennepin

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JOHN D. EKOLA, PROFESSIONAL ENGINEER

53076 LICENSE NO.

06/11/18 DATE

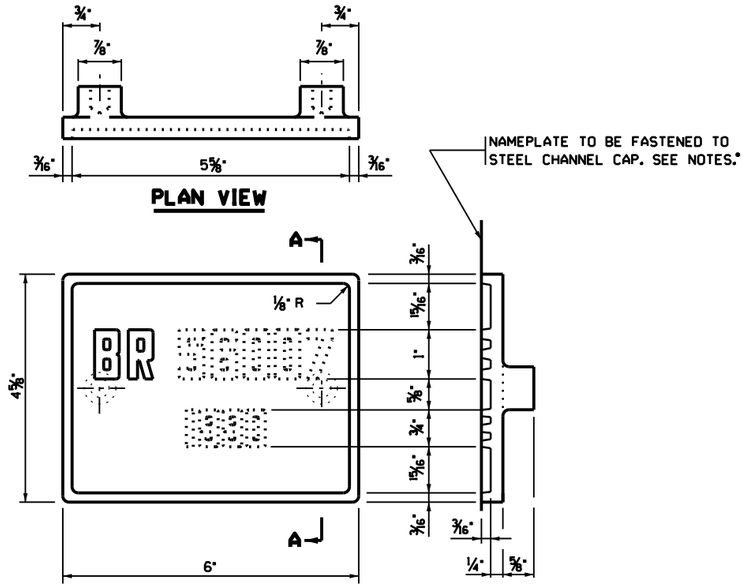
DESIGN BY:	JDE
CHECKED BY:	JZB
DRAWN BY:	JLS
CHECKED BY:	JDE

SUPERSTRUCTURE DETAILS

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

SHEET B18 / B26

Default pw45l9 6/20/2018 \\tempo\proj\202.0408.27C53\Bridge\Plan\SuperStructure.dgn



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 27C53

YEAR 2019

NUMBERS FOR NAMEPLATE

NOTES:

MATERIAL SHALL COMPLY WITH SPEC. 3327.

LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.

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

HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

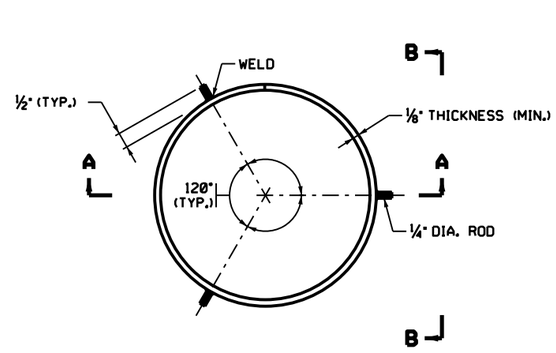
TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.

~~FURNISH 2 STEEL BOLTS ⅜ DIA. x 3" LONG WITH EACH PLATE.~~

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

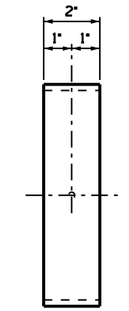
• GRIND OFF EMBEDMENT STEMS ON BACK OF PLATE AND DRILL 3⁄16 DIA. HOLES IN PLATE AND IN WEB OF CHANNEL CAP FOR ½ DIA. GALVANIZED BOLTS. FASTEN PLATE TO WEB OF CHANNEL CAP. UPSET THREADS OF BOLTS.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 09-11-2014	DETAIL NO.
Daniel L Worgan STATE BRIDGE ENGINEER	**BRIDGE NAMEPLATE** (FOR NEW BRIDGES)		**B101**



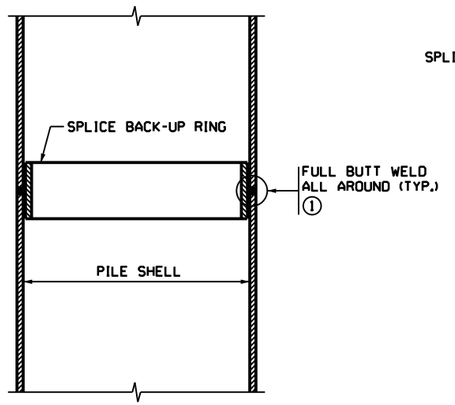
PLAN VIEW - SPLICE BACK-UP RING

PILE NOT SHOWN

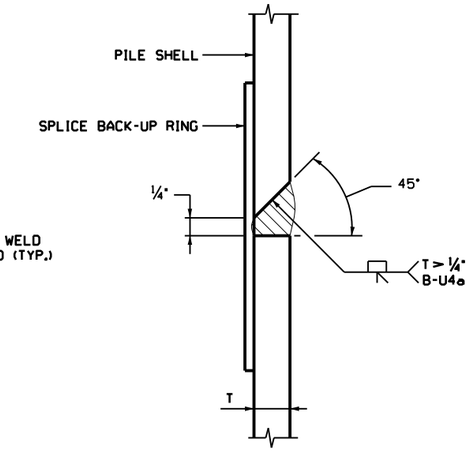


SECTION B-B

PILE NOT SHOWN



SECTION A-A



DETAIL "A" ①

NOTES:

APPROVED COMMERCIAL PILE SPLICE BACK-UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED, PROVIDED THAT ¼" ROOT IS MAINTAINED. BACK-UP RING SHALL HAVE A TIGHT FIT.

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

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.

① FOR PILE SHELL THICKNESSES GREATER THAN ¼", USE A B-U4a WELD CONFIGURATION. SEE DETAIL "A".

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 11-06-2013	DETAIL NO.
Daniel L Worgan STATE BRIDGE ENGINEER	**PILE SPLICE** (CAST-IN-PLACE CONCRETE PILES)		**B201**

Hennepin

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 — 53076 LICENSE NO. — 05/11/18 DATE

DESIGNED BY:	TSM
CHECKED BY:	JZB
DRAWN BY:	TSM
CHECKED BY:	WJM

STANDARD DETAILS B101 AND B201

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

SHEET B19 / B26

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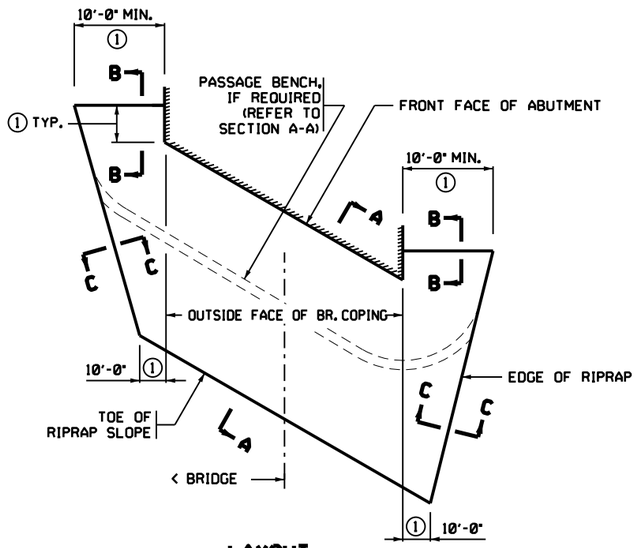
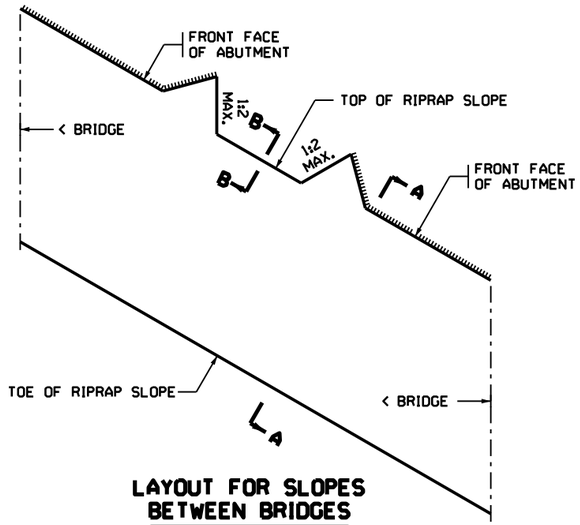


LAYOUT



LAYOUT FOR SLOPES BETWEEN BRIDGES

GENERAL NOTES

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

RIPRAP PER SPEC. 2511, RANDOM RIPRAP CLASS ___ BY THE CU. YD.

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

SLOPE BOTTOM OF TRENCHES 1:20 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 STARTING FROM THE BOTTOM OF THE SLOPE. DO NOT PLACE RIP RAP IN TRENCH UNTIL RIPRAP HAS BEEN PLACED ON ENTIRE SLOPE BENEATH THE TRENCH.

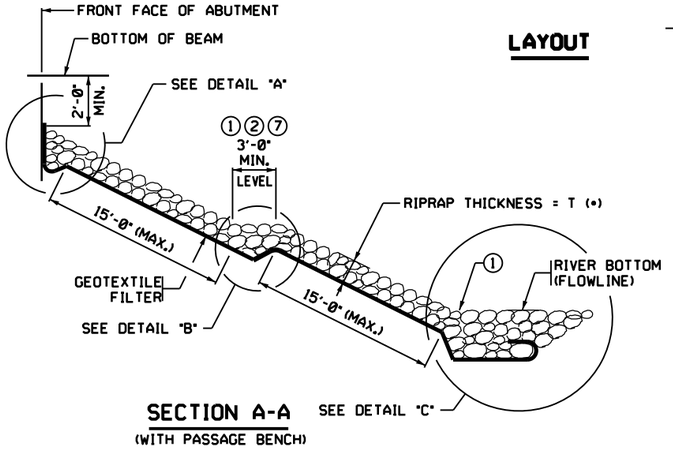
③ OVERLAP GEOTEXTILE FILTER 2'-0" MINIMUM.

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.

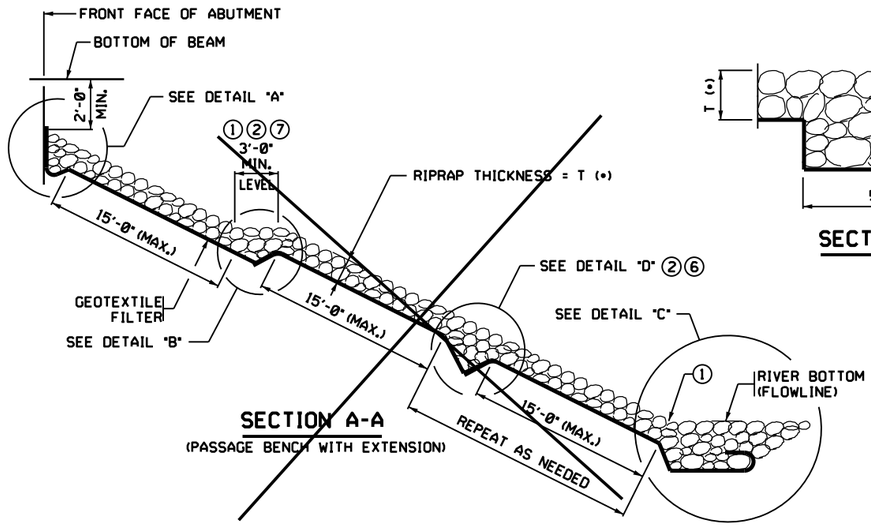
⑤ BURY EDGES OF GEOTEXTILE FILTER TO DIRECT WATER FLOW OVER THE FABRIC WITHOUT UNDERMINING.

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

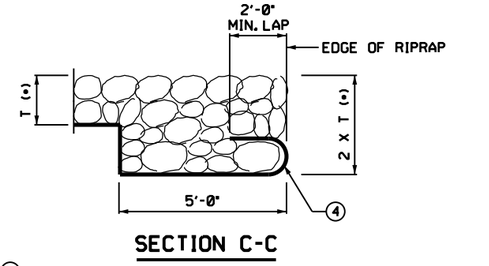
⑦ SURFACE BENCHES WITH AGGREGATE CLASS 5 (INCIDENTAL TO RIPRAP). TIE BENCHES TO NATURAL GROUNDLINES OUTSIDE OF BRIDGE.



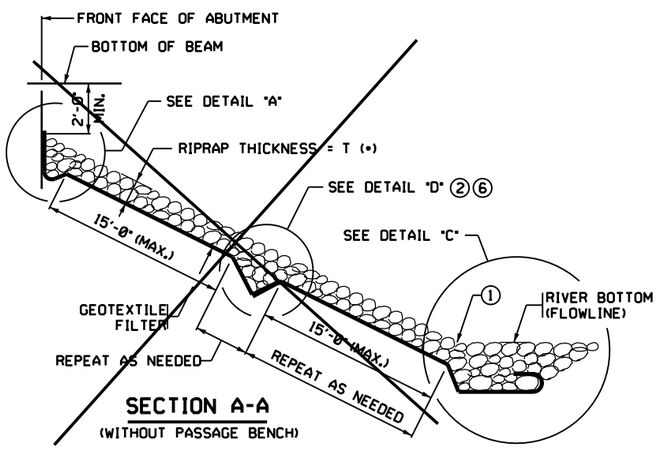
SECTION A-A
(WITH PASSAGE BENCH)



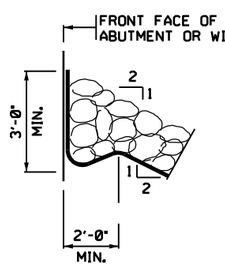
SECTION A-A
(PASSAGE BENCH WITH EXTENSION)



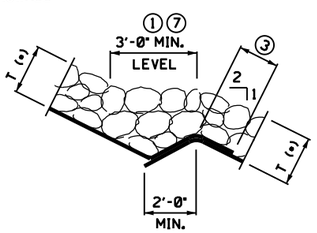
SECTION C-C



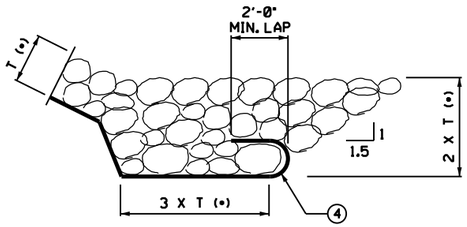
SECTION A-A
(WITHOUT PASSAGE BENCH)



DETAIL "A"

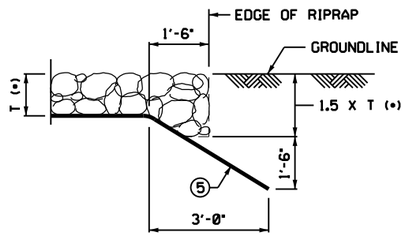


DETAIL "B"

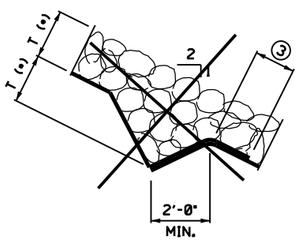


DETAIL "C"

DIMENSION T
~~CLASS III = 1'-6"~~
CLASS IV = 2'-0"
~~CLASS V = 2'-6"~~



SECTION B-B



DETAIL "D"

REVISED: 01-05-2017

APPROVED: MAY 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY
JOHN D. EKOLA, PROFESSIONAL ENGINEER
06/11/18
DATE
LIC. NO. 53076

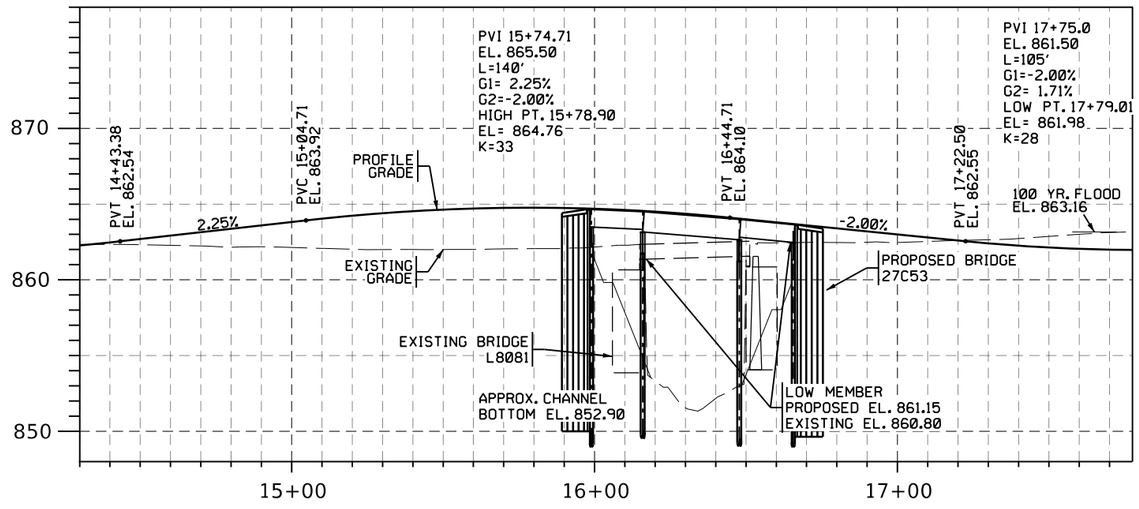
TITLE: RIPRAP SLOPE WITH GEOTEXTILE FILTER (SLOPES 1:2 AND FLATTER)

S.P. 027-596-009	FIG. 5-397.309
DES: TSM DR: JLS	APPROVED:
CHK: JZB CHK: JDE	BRIDGE NO. 27C53
SHEET NO. 20 OF 26 SHEETS	

SCALE: 0 — 50' HORIZONTAL; 0 — 10' VERTICAL

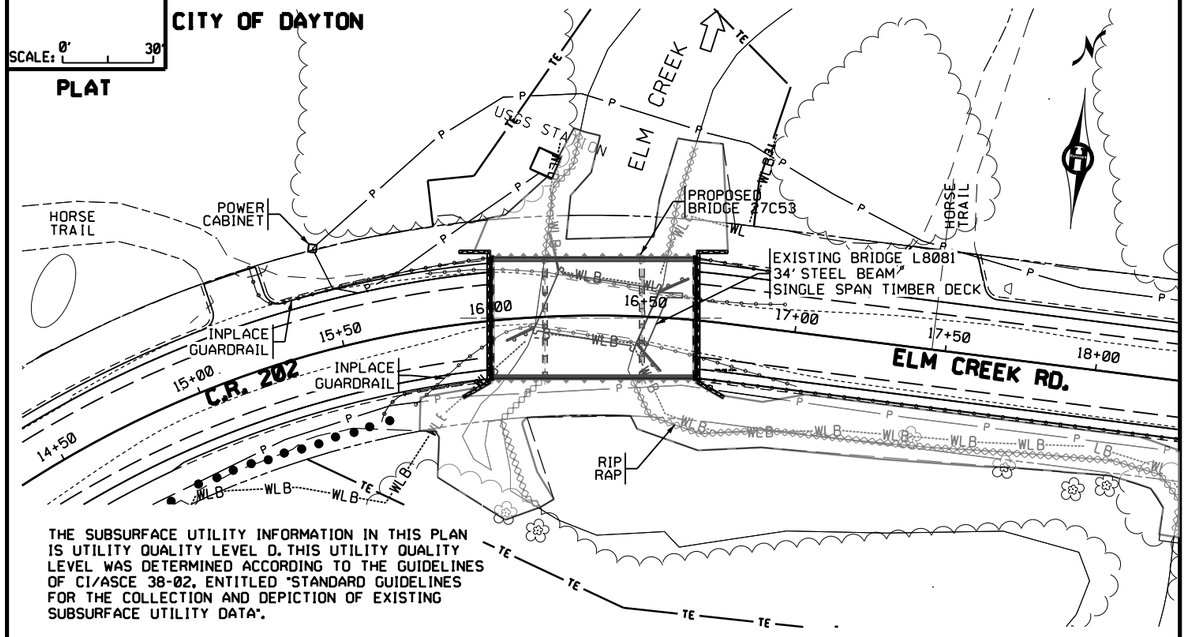
C.R. 202 (ELM CREEK RD.)

CONTRACTED PROFILE



SCALE: 0' — 30'

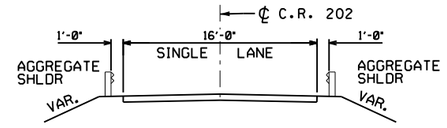
PLAT



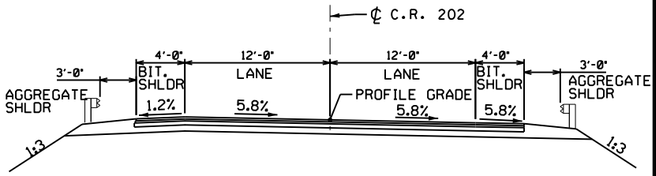
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

TYPICAL SECTIONS & PERTINENT DATA

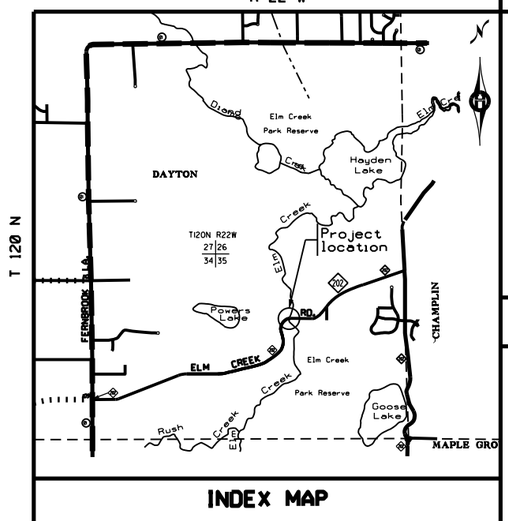
HORIZONTAL SCALE: 0 — 5' — 10'



EXISTING ROADWAY APPROACH SECTION



PROPOSED ROADWAY APPROACH SECTION



INDEX MAP

LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING. USGS OBSERVATION STATION 40' UPSTREAM ON WEST BANK
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARLY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC. BRIDGE 90617 CONC BOX CULVERT ON RUSH CRK OVER FERNBROOK LN, 9500' UPSTREAM. BRIDGE 1934 CONC SLAB SPAN ON ELM CRK OVER TERRITORIAL ROAD 10,300' UPSTREAM.
3. APPARENT HIGHWATER ELEVATION. OBTAINED FROM: ITEM 4 DATA MN. DNR
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEERS RECOMMENDATION

STREAM ELM CREEK
DRAINAGE AREA 86 SQ. MI.
MAX. FLOOD ON RECORD SEPTEMBER 24, 2016
DESIGN FLOOD (25 YR. FREQ.) 1860 C.F.S.
MAXIMUM OBSERVED HIGHWATER ELEVATION 860.95
DESIGN STAGE 861.57
MEAN VELOCITY THROUGH STRUCTURE 4.73 F.P.S.
TOTAL STAGE INCREASE 0 FT.
LOW MEMBER AT OR ABOVE ELEVATION 861.15
WATERWAY AREA REQUIRED BELOW EL. 861.15 = 389 SQ. FT.
AT RIGHT ANGLES TO CHANNEL
BASIC FLOOD (100 YR. FREQ.) 2880 C.F.S.
STAGE 863.09
TOTAL STAGE INCREASE 0 FT.
MEAN VELOCITY THROUGH STRUCTURE 5.56 F.P.S.
APPROX. FLOWLINE EL. 852.90 SKEW ANGLE 10 DEG.
ESTIMATED ABUTMENT SCOUR ELEV. 840.90 (100 YEAR FREQ.)
SCOUR CODE: N

BRIDGE SURVEY SHEETS MADE FROM:
COUNTY SURVEY COMPLETED 10/17/17 FILES:
202.0408.27C53\Survey\ODDEN\0408.bridge topo.dgn
& 202.0408.27C53\Survey\ODDEN\creek shots.dgn

BENCH MARK ELEVATION 860.618 (NGVD29)
LOCATION SPIKE IN SW WING WALL OF BRIDGE L8081 OVER ELM CREEK

2nd BENCH MARK ELEVATION 864.944 (NGVD29)
LOCATION SPIKE IN TREE SOUTH SIDE C.R. 202 +/-600' EAST OF BRIDGE L8081

DEPARTMENT OF TRANSPORTATION
COUNTY OF HENNEPIN
STATE OF MINNESOTA

BRIDGE SURVEY

C.R. NO. 202 (ELM CREEK RD.) OVER ELM CREEK
1.5 MI. EAST OF JCT. CSAH 121 & C.R. 202
68'-0" TIMBER SLAB SPAN, 3 SPAN BRIDGE
38'-0" ROADWAY
IDENTIFICATION NO. 709
SEC 35 T 120 N R 22 W
CITY OF DAYTON HENNEPIN COUNTY

Hennepin

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 — 53076 LICENSE NO. — 06/11/18 DATE

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

BRIDGE SURVEY

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

SHEET B21 / B26

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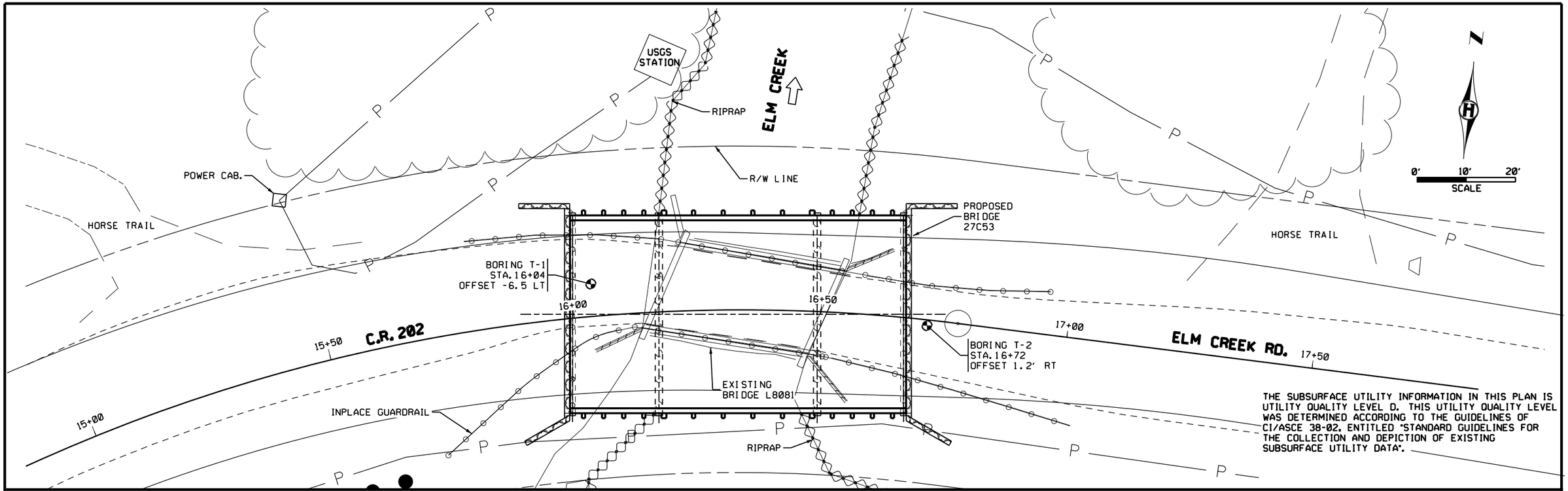
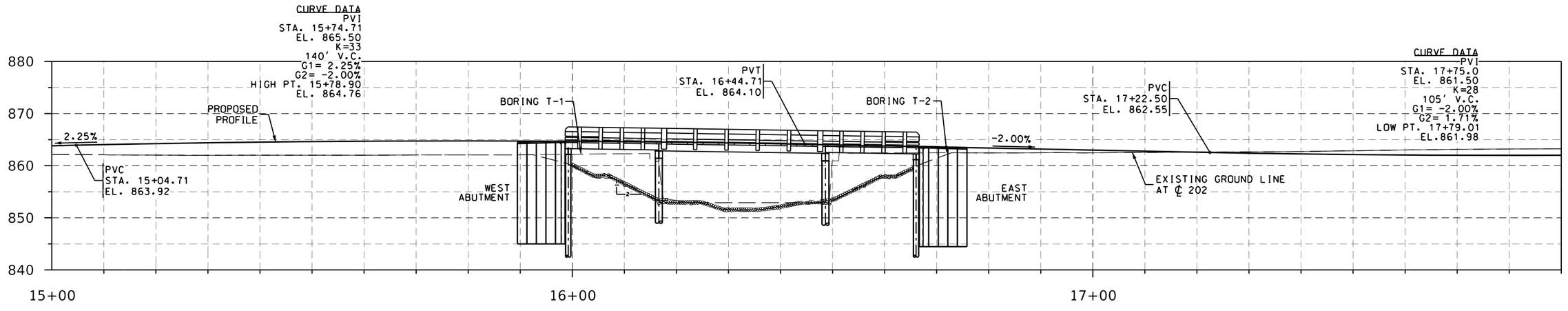




SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN

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 LOG OF SUCH EXPLORATION DATA AS INTERPRETED FOR SUCH DESIGN PURPOSE AS SHOWN. THE EXPLORATIONS WERE MADE BY ORDINARY AND CONVENTIONAL METHODS AND CARE DEEMED ADEQUATE FOR SUCH PURPOSE. HOWEVER, SINCE IT IS A MATTER OF COMMON KNOWLEDGE THAT THE EXACT CHARACTER OF ANY MATERIAL AND ITS REACTION IS DIFFICULT TO DETERMINE FROM SUCH SUBSURFACE EXPLORATION AND THAT THE KIND AND CHARACTER OF MATERIAL AT THE SITE WHERE THE FOUNDATIONS ARE BUILT MAY VARY SUBSTANTIALLY FROM THAT INDICATED BY THE LOG THEY ARE MADE AVAILABLE TO THE BIDDERS SIMPLY FOR WHAT THEY ARE WORTH, WITHOUT ANY WARRANTY, EXPRESSED OR IMPLIED THAT THE MATERIAL TO BE ENCOUNTERED IN BUILDING THE FOUNDATION WILL CONFORM THEREWITH. IF THE LOG IS USED BY THE CONTRACTOR IN MAKING HIS BID, IT IS HEREBY EXPRESSLY STIPULATED THAT THE HIGHWAY DEPARTMENT ACCEPTS NO RESPONSIBILITY FOR SAID USE.

EXISTING GROUND AT ℄ C.R. 202
- - - - - - - - -

Hennepin

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

53076 — LICENSE NO.

08/21/18 — DATE

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

BRIDGE PLAN AND PROFILE

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

SHEET B22 / B26

Default pw4519 8/22/2018 \\tempo\proj\202.0408.27C53\Bridge\Plan\27C53_survey2.dgn

BRAUN INTERTEC

LOG OF BORING

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

BORING: **T-1**
LOCATION: See attached sketch.

DRILLER: J. Chermak | METHOD: 3 1/4" HSA, Autohammer | DATE: **8/14/17** | SCALE: **1" = 4'**

(See Descriptive Terminology sheet for explanation of abbreviations)

Elev. feet	Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	PID ppm	Tests or Notes
862.9	0.0						
861.9	1.0	PAV	5 1/2 inches of bituminous over 7 inches of aggregate base.				Benchmark: Elevations were obtained using GPS and the State of Minnesota's permanent base station network.
		FILL	FILL: Clayey Sand, trace fine Gravel, intermixed Silty Sand inclusions, brown and gray, moist.	18		0.5	
858.9	4.0			12		0.2	
		OL	ORGANIC CLAY, with interbedded Peat layers, black, moist. (Swamp Deposit)	8		0.4	
855.9	7.0						
		SM	SILTY SAND, fine-grained, gray, wet. (Swamp Deposit)	7		0.1	
854.4	8.5						
		CL	LEAN CLAY, with interbedded Silty Sand seams and organics, trace wood, gray, wet, very soft to soft. (Swamp Deposit)	3	▽	0.1	MC=39, LL=39, PL=20, PI=19
				WH		0.2	MC=67, OC=7
				2		0.1	An open triangle in the water level (WL) column indicates the depth at which groundwater was observed while drilling. Groundwater levels fluctuate.
848.4	14.5		END OF BORING. Water observed at a depth of 9 feet with 14 feet of hollow-stem auger in the ground. Boring then grouted.				

LOG OF BORING N:\GINT\PROJECTS\AX PROJECTS\2017\07427.GPJ BRAUN_V8_CURRENT.GDT 5/24/18 15:37

BRAUN INTERTEC

LOG OF BORING

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

BORING: **T-2**
LOCATION: See attached sketch.

DRILLER: J. Chermak | METHOD: 3 1/4" HSA, Autohammer | DATE: **8/14/17** | SCALE: **1" = 4'**

(See Descriptive Terminology sheet for explanation of abbreviations)

Elev. feet	Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	PID ppm	Tests or Notes
862.7	0.0						
862.1	0.6	PAV	1 inch of bituminous over 6 inches of aggregate base.				
		FILL	FILL: Clayey Sand, trace fine Gravel, slightly organic, dark brown, moist.	18		0.3	
860.7	2.0						
		FILL	FILL: Silty Sand, fine- to medium-grained, intermixed Lean Clay inclusions and wood, dark brown to gray, moist.	10		0.1	
				3		0.1	
			- becoming waterbearing at the 8-foot depth	1	▽	0.1	
852.7	10.0						
		SP-SM	POORLY GRADED SAND with SILT, fine- to coarse-grained, trace fine Gravel, shells and roots, slightly organic, gray, waterbearing, loose. (Swamp Deposit)	5		0.1	
				2		0.1	
848.7	14.0			10		0.1	
		CL	LEAN CLAY, slightly organic, trace of shells, gray, wet, very soft to rather soft. (Swamp Deposit)	2			MC=47, LL=36, PL=19, PI=17
				5			MC=41, OC=3
843.2	19.5						
		SP-SM	POORLY GRADED SAND with SILT, fine- to medium-grained, trace fine Gravel, gray, waterbearing, loose. (Alluvium)	5			
				7			
				9			
834.7	28.0						
		SM	SILTY SAND, fine- to medium-grained, dark gray, waterbearing, loose. (Alluvium)	10			

LOG OF BORING N:\GINT\PROJECTS\AX PROJECTS\2017\07427.GPJ BRAUN_V8_CURRENT.GDT 5/24/18 15:37

Hennepin

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 | 53076 LICENSE NO. | 06/11/18 DATE

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

LOG OF BORING T-1 & T-2

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

SHEET B23 / B26

BOR 6 pw45l9 6/11/2018 \\tempo\proj\202.0408.27C53\Bridge\Plan\Borlog.dgn

BRAUN INTERTEC

LOG OF BORING

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

BORING: **T-2 (cont.)**
LOCATION: See attached sketch.

DRILLER: J. Chermak | METHOD: 3 1/4" HSA, Autohammer | DATE: **8/14/17** | SCALE: **1" = 4'**

Elev. feet	Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	PID ppm	Tests or Notes
830.7	32.0						
829.7	33.0	CL	LEAN CLAY, gray, wet, medium. (Alluvium)	6			
				18			
821.7	41.0	CL	SANDY LEAN CLAY, trace fine Gravel, with occasional waterbearing Silty Sand layers, gray, wet, stiff to hard. (Glacial Till)	13			
				26			
				37			
806.7	56.0	SP-SM	POORLY GRADED SAND with SILT, fine- to medium-grained, trace fine Gravel, grayish brown, waterbearing, medium dense to dense. (Glacial Outwash)	13			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING N:\GINT\PROJECTS\AX PROJECTS\2017\707427.GPJ BRAUN_V8_CURRENT.GDT 5/24/18 15:37

BRAUN INTERTEC

LOG OF BORING

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

BORING: **T-2 (cont.)**
LOCATION: See attached sketch.

DRILLER: J. Chermak | METHOD: 3 1/4" HSA, Autohammer | DATE: **8/14/17** | SCALE: **1" = 4'**

Elev. feet	Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	PID ppm	Tests or Notes
798.7	64.0		POORLY GRADED SAND with SILT, fine- to medium-grained, trace fine Gravel, grayish brown, waterbearing, medium dense to dense. (Glacial Outwash) *(continued)*	33*			*no sample retrieved
				14			
				26			
782.7	80.0	SP	POORLY GRADED SAND, coarse-grained, trace fine and coarse Gravel, light brown, waterbearing, loose. (Glacial Outwash)	10			
778.7	84.0	SP	POORLY GRADED SAND, fine- to medium-grained, light brown, waterbearing, medium dense to dense. (Alluvium)	30			
				37			
769.7	93.0	SM	SILTY SAND, fine- to coarse-grained, trace fine and coarse Gravel, light brown, waterbearing, dense to very dense. (Glacial Till)	55			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING N:\GINT\PROJECTS\AX PROJECTS\2017\707427.GPJ BRAUN_V8_CURRENT.GDT 5/24/18 15:38

Hennepin

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 — 53076 LICENSE NO. — 06/11/18 DATE

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

LOG OF BORING T-2

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

SHEET B24/B26

BOR 7 pw4519 6/11/2018 \\tempo\proj\202.0408.27C53\Bridge\Plan\Borlog.dgn

BRAUN INTERTEC

LOG OF BORING

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

BORING: **T-2 (cont.)**
LOCATION: See attached sketch.
DRILLER: J. Chermak | METHOD: 3 1/4" HSA, Autohammer | DATE: **8/14/17** | SCALE: **1" = 4'**

(See Descriptive Terminology sheet for explanation of abbreviations)

Elev. feet	Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	PID ppm	Tests or Notes
766.7	96.0		SILTY SAND, fine- to coarse-grained, trace fine and coarse Gravel, light brown, waterbearing, dense to very dense. (Glacial Till) *(continued)*	38			
757.7	105.0	SP-SM	POORLY GRADED SAND with SILT, fine- to medium-grained, trace fine Gravel, light brown, waterbearing, very dense. (Glacial Outwash)	92			
747.7	115.0	SP-SM	POORLY GRADED SAND with SILT, fine- to coarse-grained, with fine and coarse Gravel, light brown, waterbearing, very dense. (Glacial Outwash)	68			
741.7	121.0		END OF BORING. Water observed at a depth of 8 feet with 10 feet of hollow-stem auger in the ground. Boring then grouted.				

LOG OF BORING N:\GINT\PROJECTS\AX PROJECTS\2017\707427.GPJ BRAUN_V8_CURRENT.GDT 5/24/18 15:38

Hennepin

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 — 53076 LICENSE NO. — 06/11/18 DATE

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

LOG OF BORING T-2

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

SHEET B25/B26

BOR 8 pw4514 6/11/2018 \\tempo\proj\202.0408.27C53\Bridge\Plan\Borlog.dgn

CONCRETE WEARING COURSE

☐ LOW SLUMP

☐ OTHER _____
TYPE OR MANUFACTURER

EXPANSION JOINTS

JOINT MANUFACTURER

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SIZE OF GLAND _____

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND 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

Mn/DOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRIME COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

INTERMEDIATE COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

FINISH COAT _____ _____
Mn/DOT MATERIAL SPECIFICATION NUMBER COLOR

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. _____

(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____

COMMENTS: _____

NUMBER OF BRIDGE SUPPLEMENTAL AGREEMENTS: _____ COST: $ _____

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

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 ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

_____ _____
INSPECTOR(S) SIGNATURE DATE

CHECKED BY: _____ _____
PROJECT ENGINEER/SUPERVISOR SIGNATURE DATE

AT THE TIME OF THE FINAL, THIS COMPLETED AS-BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE - ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).

REVISION: 10-28-2008

APPROVED: SEPTEMBER 26, 2003
STATE BRIDGE ENGINEER

AS-BUILT DETAILS (AS NEEDED)

FIG. 5-397.900

CERTIFIED BY _____
JOHN D. EKOLA, PROFESSIONAL ENGINEER
LIC. NO. 53076 05/11/18

TITLE: AS-BUILT BRIDGE DATA
S.P. 027-596-009

DES: TSM	DR: TSM	APPROVED:	BRIDGE NO. 27C53
CHK: JDE	CHK: JLS		
SHEET NO. B26 OF B26 SHEETS			

INDEX TO DIVISION SB

DIVISION SB

BRIDGE PLANS

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

BRIDGE NO.	TOTAL SHEETS	SHEET NO.	DATE OF APPROVAL
27C53	26	B1-B26	

New or revised sheets were approved as listed below:

BRIDGE NO.	SHEET NO.	DATE OF APPROVAL

DIVISION SB

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. 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 adhearing 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.

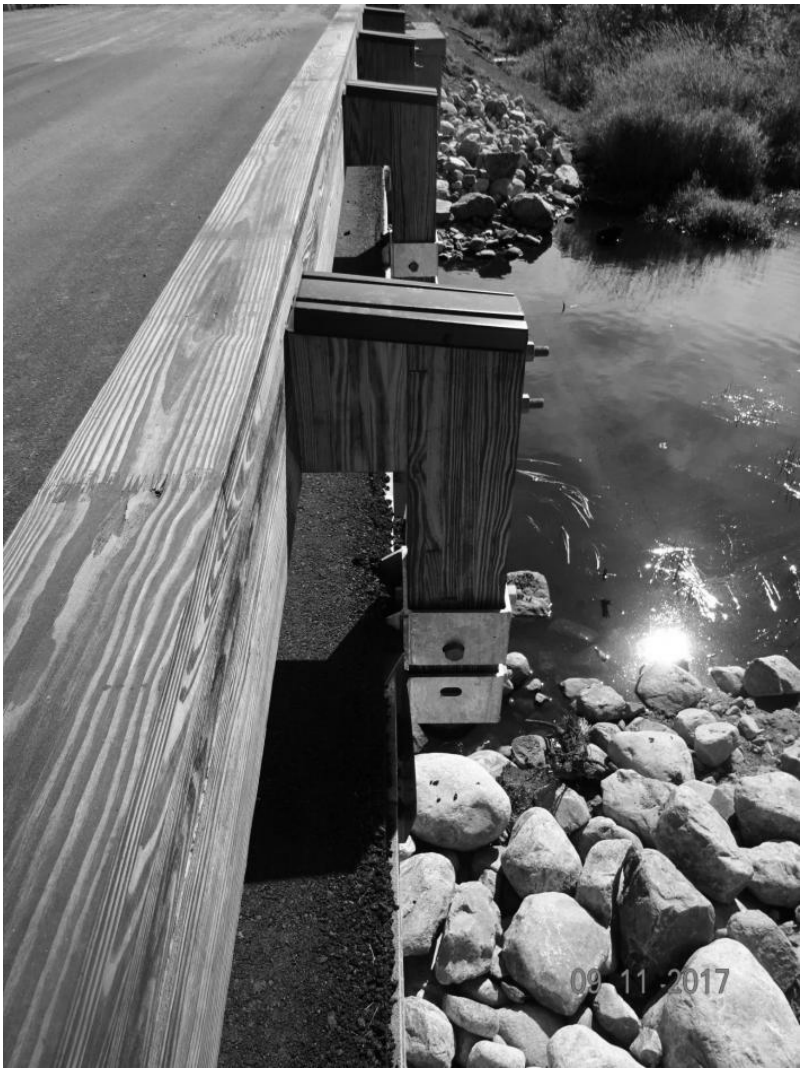
SB-9.2 Glue Laminated Rail Construction Requirements

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 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.

Flow Event	Flow	Flowline Elevation
2 year	451 cfs	859.1 ft.
5 year	889 cfs	860.2 ft.
10 year	1,260 cfs	860.9 ft.
25 year	1,860 cfs	861.6 ft.

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 r**eferences 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.

Delete the following sections 2452.3.G, "Disposal of Pile Cut-Offs," 2452.4.C, "Piling Driven," and 2452.5.C, "Piling Driven".

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 (2511) 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 (3371) STEEL 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.

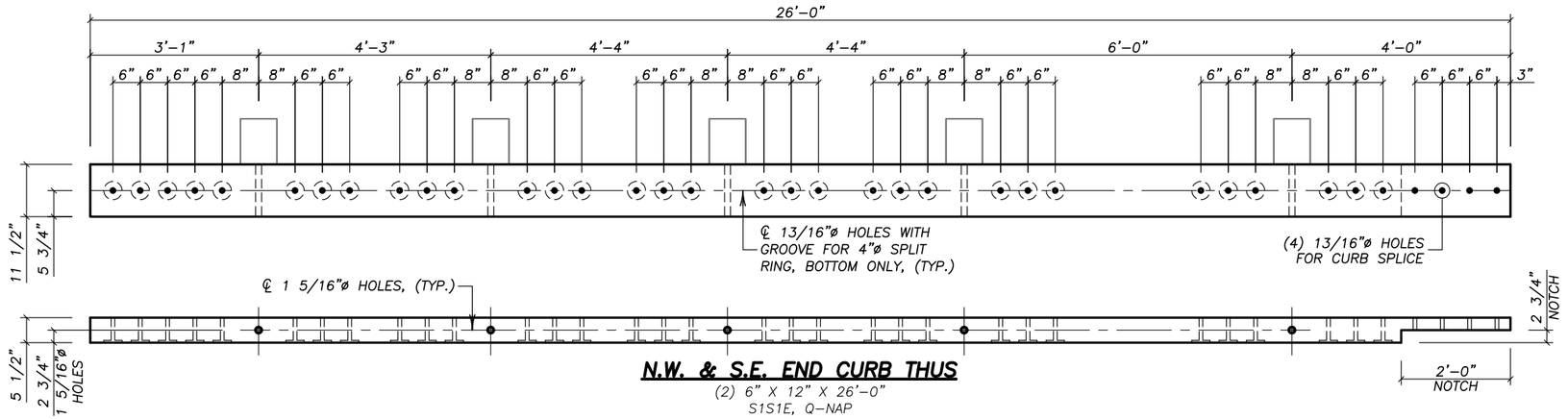
SB-15 (3391) FASTENERS

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.

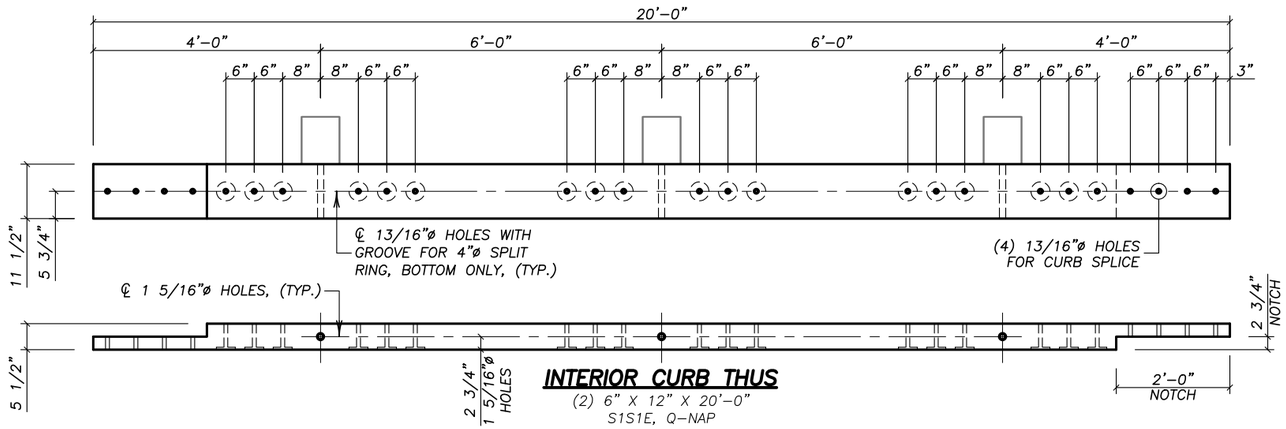
APPENDIX C. Contract Bid Abstract

2040800 - CR 202- ELM CREEK BRIDGE REPLACEMENT				Redstone Construction, LLC		Meyer Contracting Inc.		Edward Kraemer & Sons, Inc.		S.M. Hentges & Sons, Inc.		Robert R. Schroeder Construction, Inc.	
Item No.	Item	Units	Quantity	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
2021.501	MOBILIZATION	LUMP SUM	1	$158,000.00	$158,000.00	$68,898.24	$68,898.24	$73,600.00	$73,600.00	$67,750.00	$67,750.00	$305,465.00	$305,465.00
2031.502	FIELD OFFICE TYPE D	EACH	1	$15,000.00	$15,000.00	$10,000.00	$10,000.00	$16,000.00	$16,000.00	$50,000.00	$50,000.00	$40,000.00	$40,000.00
2101.501	CLEARING & GRUBBING	LUMP SUM	1	$9,000.00	$9,000.00	$6,422.00	$6,422.00	$14,000.00	$14,000.00	$6,775.00	$6,775.00	$11,000.00	$11,000.00
2104.502	REMOVE SIGN TYPE C	EACH	18	$35.00	$630.00	$35.00	$630.00	$35.00	$630.00	$36.05	$648.90	$35.00	$630.00
2104.503	REMOVE GUARDRAIL	LIN FT	190	$10.00	$1,900.00	$4.60	$874.00	$4.72	$896.80	$11.00	$2,090.00	$4.72	$896.80
2104.503	REMOVE METAL CULVERT	LIN FT	170	$9.00	$1,530.00	$11.00	$1,870.00	$8.00	$1,360.00	$13.00	$2,210.00	$9.00	$1,530.00
2104.503	SAWING BITUMINOUS PAVEMENT	LIN FT	47	$2.25	$105.75	$2.30	$108.10	$20.00	$940.00	$2.35	$110.45	$8.75	$411.25
2104.504	REMOVE BITUMINOUS PAVEMENT (P)	SQ YD	3,104	$3.75	$11,640.00	$3.10	$9,622.40	$3.80	$11,795.20	$4.50	$13,968.00	$3.85	$11,950.40
2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LUMP SUM	1	$2,450.00	$2,450.00	$3,000.00	$3,000.00	$6,000.00	$6,000.00	$3,600.00	$3,600.00	$500.00	$500.00
2105.504	GEOTEXTILE FABRIC TYPE 6	SQ YD	5,190	$2.50	$12,975.00	$2.80	$14,532.00	$2.00	$10,380.00	$2.25	$11,677.50	$2.50	$12,975.00
2105.509	STABILIZING AGGREGATE	TON	100	$40.00	$4,000.00	$30.00	$3,000.00	$39.00	$3,900.00	$19.50	$1,950.00	$40.00	$4,000.00
2106.507	COMMON EMBANKMENT (CV) (P)	CU YD	1,016	$14.00	$14,224.00	$10.00	$10,160.00	$18.72	$19,019.52	$16.50	$16,764.00	$14.00	$14,224.00
2106.507	EXCAVATION - COMMON (P)	CU YD	1,680	$18.50	$31,080.00	$12.25	$20,580.00	$21.86	$36,724.80	$12.50	$21,000.00	$18.50	$31,080.00
2118.509	AGGREGATE SURFACING CLASS 2	TON	196	$54.00	$10,584.00	$33.50	$6,566.00	$21.90	$4,292.40	$35.00	$6,860.00	$54.00	$10,584.00
2123.61	STREET SWEEPER (WITH PICKUP BROOM)	HOUR	20	$130.00	$2,600.00	$138.00	$2,760.00	$130.00	$2,600.00	$165.00	$3,300.00	$130.00	$2,600.00
2130.523	WATER	M GALLON	6	$250.00	$1,500.00	$35.00	$210.00	$50.00	$300.00	$50.00	$300.00	$250.00	$1,500.00
2131.506	CALCIUM CHLORIDE SOLUTION	GALLON	185	$5.00	$925.00	$1.00	$185.00	$2.00	$370.00	$1.00	$185.00	$5.00	$925.00
2211.509	AGGREGATE BASE CLASS 5 (P)	TON	1,483	$32.50	$48,197.50	$19.00	$28,177.00	$14.42	$21,384.86	$22.00	$32,626.00	$32.50	$48,197.50
2360.509	TYPE SP 12.5 WEARING COURSE MIX (3;C)	TON	933	$87.00	$81,171.00	$93.00	$86,769.00	$93.00	$86,769.00	$95.50	$89,101.50	$87.00	$81,171.00
2401.601	STRUCTURE EXCAVATION	LUMP SUM	1	$25,000.00	$25,000.00	$117,334.41	$117,334.41	$30,800.00	$30,800.00	$81,550.00	$81,550.00	$18,000.00	$18,000.00
2402.508	STRUCTURAL STEEL (3309) (P)	POUND	23,038	$3.25	$74,873.50	$2.60	$59,898.80	$5.08	$117,033.04	$4.35	$100,215.30	$4.00	$92,152.00
2403.603	TIMBER RAILING (P)	LIN FT	136	$350.00	$47,600.00	$549.00	$74,664.00	$726.00	$98,736.00	$780.00	$106,080.00	$640.00	$87,040.00
2403.618	GLUED LAMINATED DECK PANELS (P)	SQ FT	2,720	$105.00	$285,600.00	$108.50	$295,120.00	$100.00	$272,000.00	$116.50	$316,880.00	$110.00	$299,200.00
2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1	$30,000.00	$30,000.00	$6,752.00	$6,752.00	$45,000.00	$45,000.00	$38,500.00	$38,500.00	$15,000.00	$15,000.00
2452.502	PILE POINTS 16"	EACH	16	$345.00	$5,520.00	$310.50	$4,968.00	$375.00	$6,000.00	$300.00	$4,800.00	$320.00	$5,120.00
2452.502	C-I-P CONC TEST PILE 85 FT LONG 12" (P)	EACH	2	$10,000.00	$20,000.00	$7,562.00	$15,124.00	$7,000.00	$14,000.00	$8,000.00	$16,000.00	$12,000.00	$24,000.00
2452.502	PILE REDRIVING	EACH	32	$250.00	$8,000.00	$650.00	$20,800.00	$510.00	$16,320.00	$150.00	$4,800.00	$150.00	$4,800.00
2452.502	C-I-P CONC TEST PILE 85 FT LONG 16" (P)	EACH	2	$12,000.00	$24,000.00	$9,949.00	$19,898.00	$8,500.00	$17,000.00	$9,000.00	$18,000.00	$20,000.00	$40,000.00
2452.502	PILE POINTS 12"	EACH	16	$240.00	$3,840.00	$252.50	$4,040.00	$265.00	$4,240.00	$250.00	$4,000.00	$220.00	$3,520.00
2452.502	PILE ANALYSIS	EACH	2	$2,200.00	$4,400.00	$3,907.00	$7,814.00	$2,750.00	$5,500.00	$2,300.00	$4,600.00	$2,000.00	$4,000.00
2452.603	C-I-P CONCRETE PILING 16"	LIN FT	1,190	$55.00	$65,450.00	$102.50	$121,975.00	$78.00	$92,820.00	$70.00	$83,300.00	$63.00	$74,970.00
2452.603	C-I-P CONCRETE PILING 12"	LIN FT	1,190	$40.00	$47,600.00	$64.50	$76,755.00	$56.00	$66,640.00	$48.00	$57,120.00	$38.00	$45,220.00
2452.618	STEEL SHEET PILING (P)	SQ FT	2,430	$36.00	$87,480.00	$35.25	$85,657.50	$30.00	$72,900.00	$27.00	$65,610.00	$36.00	$87,480.00
2501.502	28" SPAN CAS PIPE-ARCH APRON	EACH	2	$2,000.00	$4,000.00	$761.50	$1,523.00	$4,800.00	$9,600.00	$2,175.00	$4,350.00	$2,000.00	$4,000.00
2501.502	18" RC PIPE APRON	EACH	2	$1,500.00	$3,000.00	$1,131.00	$2,262.00	$1,900.00	$3,800.00	$1,460.00	$2,920.00	$1,500.00	$3,000.00
2501.502	24" RC PIPE APRON	EACH	4	$1,850.00	$7,400.00	$1,218.00	$4,872.00	$2,800.00	$11,200.00	$2,085.00	$8,340.00	$1,850.00	$7,400.00
2501.503	18" RC PIPE CULVERT DES 3006 CL III	LIN FT	52	$76.00	$3,952.00	$54.50	$2,834.00	$100.00	$5,200.00	$57.50	$2,990.00	$76.00	$3,952.00
2501.503	24" RC PIPE CULVERT CLASS III	LIN FT	96	$82.50	$7,920.00	$62.50	$6,000.00	$112.00	$10,752.00	$66.50	$6,384.00	$82.50	$7,920.00
2501.603	28" SPAN PIPE-ARCH CULVERT	LIN FT	44	$140.00	$6,160.00	$47.00	$2,068.00	$170.00	$7,480.00	$117.50	$5,170.00	$140.00	$6,160.00
2502.502	4" PRECAST CONCRETE HEADWALL	EACH	4	$375.00	$1,500.00	$257.50	$1,030.00	$150.00	$600.00	$240.00	$960.00	$375.00	$1,500.00
2502.503	4" PERF TP PIPE DRAIN	LIN FT	1,000	$13.00	$13,000.00	$11.25	$11,250.00	$8.00	$8,000.00	$14.50	$14,500.00	$13.10	$13,100.00
2511.504	GEOTEXTILE FILTER TYPE 7	SQ YD	1,050	$2.75	$2,887.50	$1.80	$1,890.00	$6.00	$6,300.00	$3.25	$3,412.50	$4.00	$4,200.00
2511.507	RANDOM RIPRAP CLASS IV	CU YD	830	$80.00	$66,400.00	$74.50	$61,835.00	$105.00	$87,150.00	$92.50	$76,775.00	$90.00	$74,700.00
2533.503	PORTABLE PRECAST CONC BARRIER DES 8337	LIN FT	50	$30.00	$1,500.00	$30.00	$1,500.00	$30.00	$1,500.00	$31.00	$1,550.00	$30.00	$1,500.00
2554.502	END TREATMENT-ENERGY ABSORBING TERMINAL	EACH	1	$3,500.00	$3,500.00	$2,975.00	$2,975.00	$2,921.44	$2,921.44	$3,605.00	$3,605.00	$2,921.44	$2,921.44
2554.502	ANCHORAGE ASSEMBLY - TYPE 31	EACH	3	$1,500.00	$4,500.00	$1,115.00	$3,345.00	$1,204.52	$3,613.56	$1,545.00	$4,635.00	$1,204.52	$3,613.56
2554.503	TRAFFIC BARRIER DESIGN TYPE 31	LIN FT	491	$25.00	$12,275.00	$30.50	$14,975.50	$23.62	$11,597.42	$25.75	$12,643.25	$23.62	$11,597.42
2554.503	TRAFFIC BARRIER DESIGN TRANS TYPE 31	LIN FT	100	$130.00	$13,000.00	$135.50	$13,550.00	$102.13	$10,213.00	$134.00	$13,400.00	$102.13	$10,213.00
2563.601	TRAFFIC CONTROL	LUMP SUM	1	$27,500.00	$27,500.00	$30,000.00	$30,000.00	$24,000.00	$24,000.00	$26,500.00	$26,500.00	$24,000.00	$24,000.00
2563.601	TRAFFIC CONTROL SUPERVISOR	LUMP SUM	1	$3,400.00	$3,400.00	$2,000.00	$2,000.00	$6,000.00	$6,000.00	$15,000.00	$15,000.00	$2,000.00	$2,000.00
2563.613	PORTABLE CHANGEABLE MESSAGE SIGN	UNIT DAY	40	$50.00	$2,000.00	$50.00	$2,000.00	$50.00	$2,000.00	$51.50	$2,060.00	$50.00	$2,000.00
2564.518	SIGN PANELS TYPE C	SQ FT	36.3	$60.00	$2,178.00	$60.00	$2,178.00	$60.00	$2,178.00	$62.00	$2,250.60	$60.00	$2,178.00
2572.503	TEMPORARY FENCE	LIN FT	500	$3.00	$1,500.00	$0.50	$250.00	$8.00	$4,000.00	$3.30	$1,650.00	$3.10	$1,550.00
2573.501	EROSION CONTROL SUPERVISOR	LUMP SUM	1	$1,500.00	$1,500.00	$2,000.00	$2,000.00	$500.00	$500.00	$5,000.00	$5,000.00	$500.00	$500.00
2573.502	STORM DRAIN INLET PROTECTION	EACH	4	$200.00	$800.00	$75.00	$300.00	$200.00	$800.00	$206.00	$824.00	$225.00	$900.00
2573.503	SILT FENCE; TYPE MS	LIN FT	820	$5.25	$4,305.00	$2.00	$1,640.00	$2.45	$2,009.00	$2.50	$2,050.00	$5.25	$4,305.00
2573.503	SILT FENCE; TYPE SD	LIN FT	250	$25.00	$6,250.00	$32.00	$8,000.00	$20.00	$5,000.00	$18.50	$4,625.00	$35.00	$8,750.00
2573.503	SILT FENCE; TYPE HI	LIN FT	1,540	$6.75	$10,395.00	$6.00	$9,240.00	$4.50	$6,930.00	$4.65	$7,161.00	$6.85	$10,549.00
2573.503	FLOTATION SILT CURTAIN TYPE MOVING WATER	LIN FT	448	$36.50	$16,352.00	$20.00	$8,960.00	$26.00	$11,648.00	$26.75	$11,984.00	$36.50	$16,352.00
2573.51	SEDIMENT REMOVAL BACKHOE	HOUR	10	$145.00	$1,450.00	$75.00	$750.00	$225.00	$2,250.00	$190.00	$1,900.00	$145.00	$1,450.00
2574.507	COMPOST GRADE 3	CU YD	175	$100.00	$17,500.00	$57.00	$9,975.00	$52.00	$9,100.00	$51.00	$8,925.00	$100.00	$17,500.00
2574.508	FERTILIZER TYPE 4	POUND	100	$1.00	$100.00	$0.85	$85.00	$1.00	$100.00	$1.05	$105.00	$1.00	$100.00
2575.504	EROSION CONTROL BLANKETS CATEGORY 3N	SQ YD	2,615	$1.95	$5,099.25	$1.50	$3,922.50	$2.20	$5,753.00	$2.30	$6,014.50	$1.95	$5,099.25
2575.504	RAPID STABILIZATION METHOD 4	SQ YD	2,787	$2.00	$5,574.00	$1.80	$5,016.60	$2.00	$5,574.00	$2.05	$5,713.35	$2.00	$5,574.00
2575.508	SEED MIXTURE 35-241	POUND	30	$20.00	$600.00	$15.75	$472.50	$17.00	$510.00	$17.50	$525.00	$20.00	$600.00
2582.503	4" DBLE SOLID LINE MULTI COMP GR IN	LIN FT	1,170	$1.89	$2,211.30	$1.90	$2,223.00	$1.89	$2,211.30	$1.95	$2,281.50	$2.00	$2,340.00
Contract Total:					**$1,396,584.80**		**$1,406,086.55**		**$1,440,442.34**		**$1,498,575.35**		**$1,641,666.62**



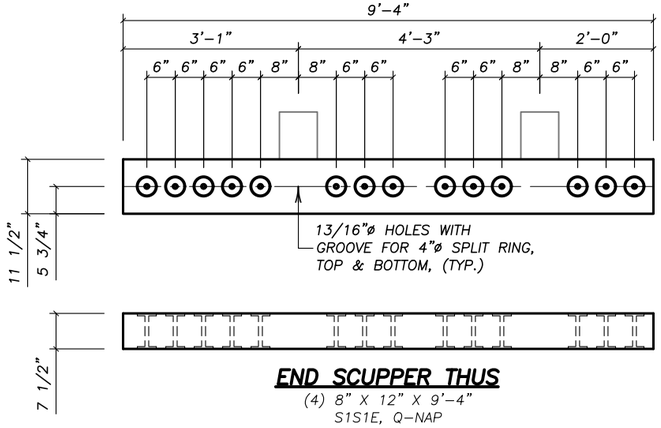
N.W. & S.E. END CURB THUS

(2) 6" X 12" X 26'-0"
S1S1E, Q-NAP



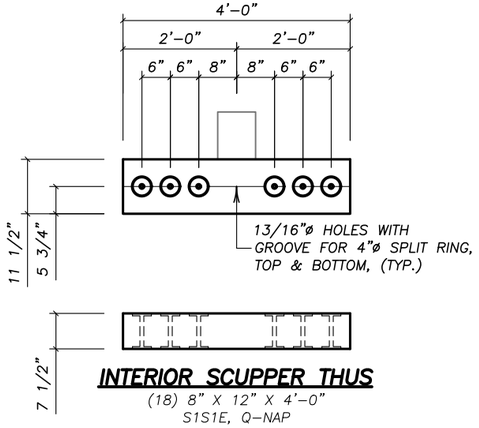
INTERIOR CURB THUS

(2) 6" X 12" X 20'-0"
S1S1E, Q-NAP



END SCUPPER THUS

(4) 8" X 12" X 9'-4"
S1S1E, Q-NAP



INTERIOR SCUPPER THUS

(18) 8" X 12" X 4'-0"
S1S1E, Q-NAP

MATCHMARK

MATCHMARK CORRESPONDING CURBS & SCUPPERS

SHEET TITLE:

TIMBER PREFRAMING

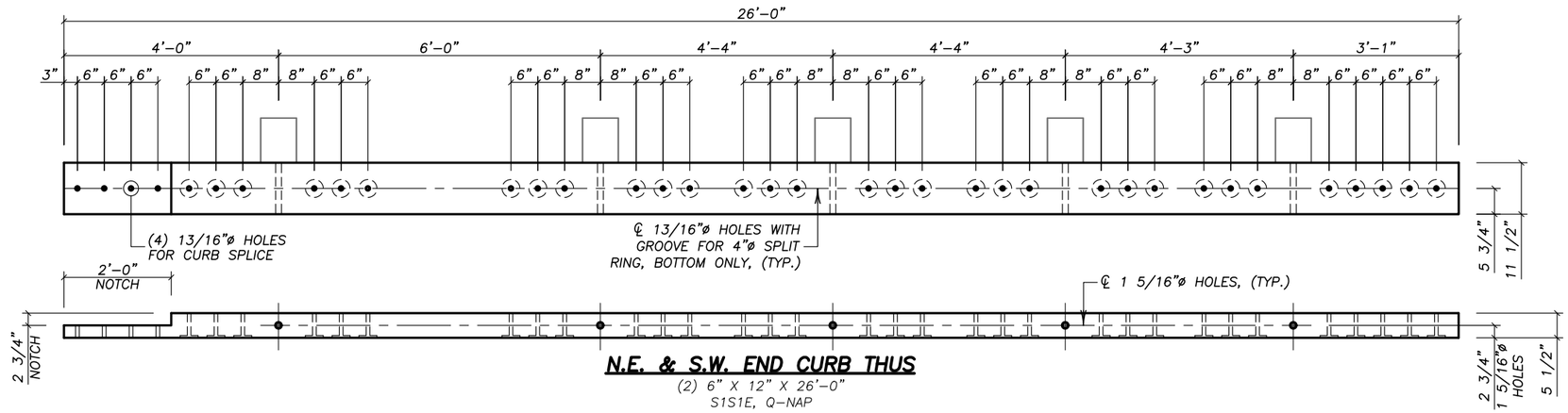
18'/32'/18' TREATED TIMBER SPANS
40'-0" OUT TO OUT OF DECKS
C.R.202 BRIDGE NO.27C53
HENNEPIN COUNTY, MINNESOTA

Wheeler

9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952-929-7854
info@wheeler1892.com
wheeler1892.com

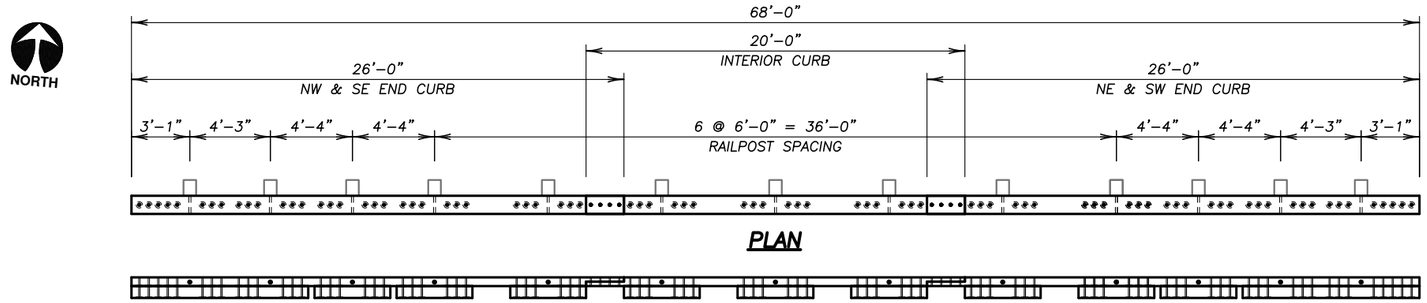
DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	1 OF 18

July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)



N.E. & S.W. END CURB THUS

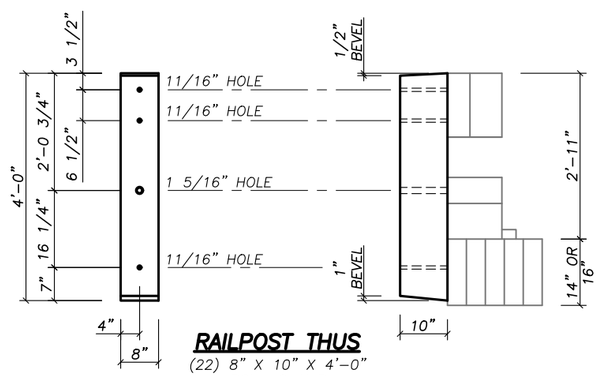
(2) 6" X 12" X 26'–0"
S1S1E, Q–NAP



PLAN

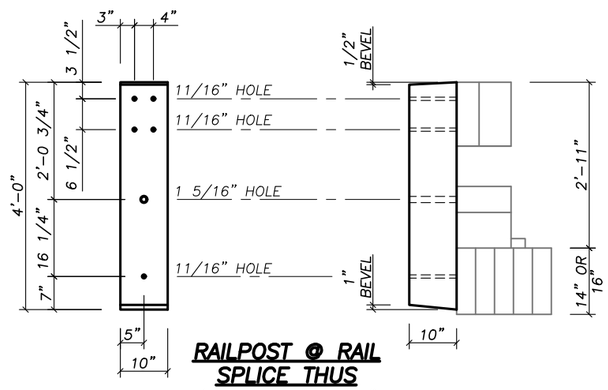
NORTH CURB LAYOUT ELEVATION

SOUTH CURB THE SAME SPUN 180 DEGREES



RAILPOST THUS

(22) 8" X 10" X 4'–0"
RGH., Q–NAP



RAILPOST @ RAIL SPLICE THUS

(4) 10" X 10" X 4'–0"
RGH., Q–NAP

MATCHMARK
MATCHMARK CORRESPONDING CURBS & SCUPPERS

SHEET TITLE:

TIMBER PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952–929–7854
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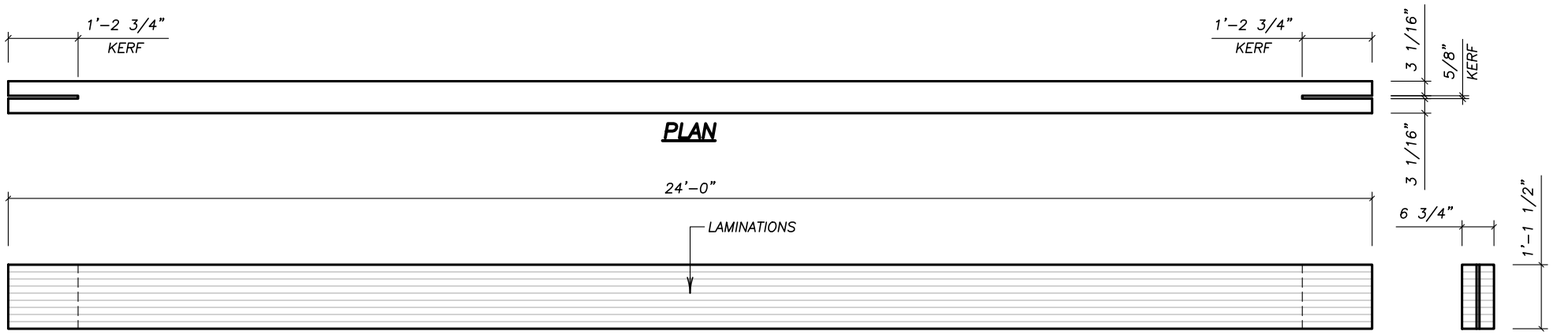
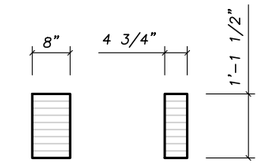
wheeler1892.com

DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651–14372	2 OF 18

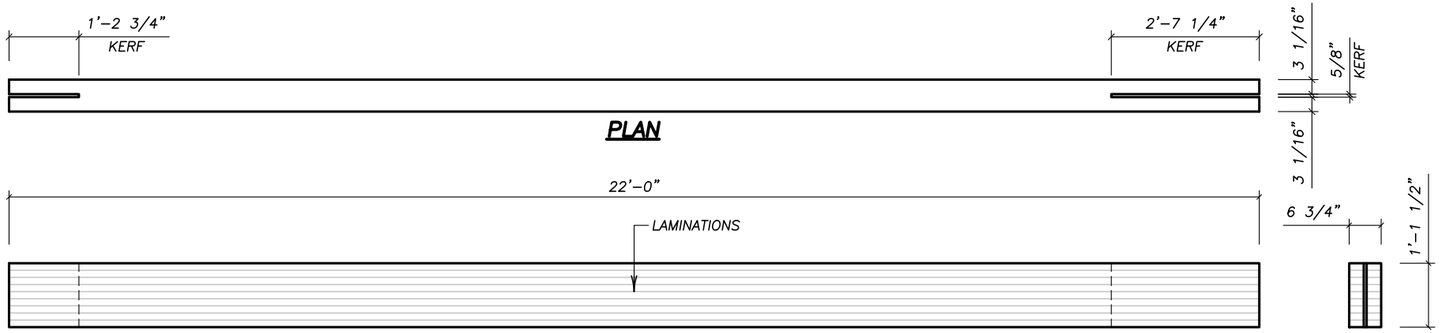
July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)



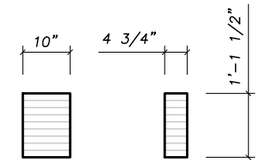
INTERIOR GLU-LAM RAIL THUS
(2) 6 3/4" X 13 1/2" X 24'-0"
COMB. NO.2, DF/DF, Q-NAP



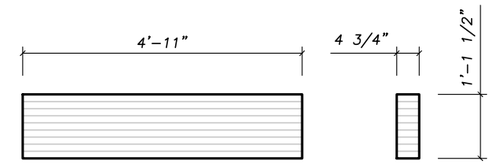
GLU-LAM RAILPOST BLOCK THUS
(14) 4 3/4" X 13 1/2" X 0'-8"
COMB. NO.2, DF/DF, Q-NAP



END GLU-LAM RAIL THUS
(4) 6 3/4" X 13 1/2" X 22'-0"
COMB. NO.2, DF/DF, Q-NAP



GLU-LAM RAILPOST BLOCK @ RAIL SPLICE THUS
(4) 4 3/4" X 13 1/2" X 0'-10"
COMB. NO.2, DF/DF, Q-NAP



GLU-LAM END RAILPOST BLOCK THUS
(4) 4 3/4" X 13 1/2" X 4'-11"
COMB. NO.2, DF/DF, Q-NAP

ALL HOLES TO BE FIELD DRILLED

SPECIFICATIONS:

GLU-LAM RAIL TO BE DOUGLAS FIR, COMBINATION NO.2, DF/DF.

GLU-LAMS TO BE INDUSTRIAL APPEARANCE GRADE COMPLYING WITH AITC 110.

GLU-LAMS ARE NOT TO BE END SEALED, SURFACE SEALED, OR WRAPPED.

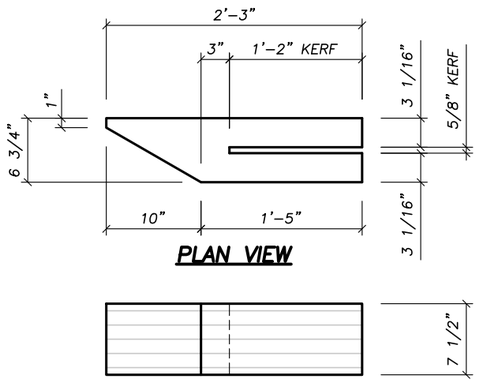
GLU-LAMS TO BE COPPER NAPHTHENATE TREATED AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M133.

ENDS OF GLU-LAMS TO BE PLUMB.

GLU-LAMS SHALL BE INCISED FOR TREATING.

GLU-LAMS SHALL BE MANUFACTURED USING WET-USE ADHESIVES.

GLU-LAMS SHALL BE MARKED WITH A QUALIFIED INSPECTION AND TESTING AGENCY MARK PRIOR TO TREATMENT AND A CERTIFICATE AND TEST RESULTS INDICATING CONFORMANCE TO ANSI/AITC A190.1 SHALL BE PROVIDED.



GLU-LAM TRANSITION BLOCK THUS
(4) 6 3/4 X 7 1/2" X 2'-3"
IDENTIFIATION NO.2, DF/DF, Q-NAP

DISCLAIMER:

FABRICATION DRAWINGS ARE FOR FABRICATION PURPOSES ONLY. SIZE OF GLU-LAMS GIVEN.

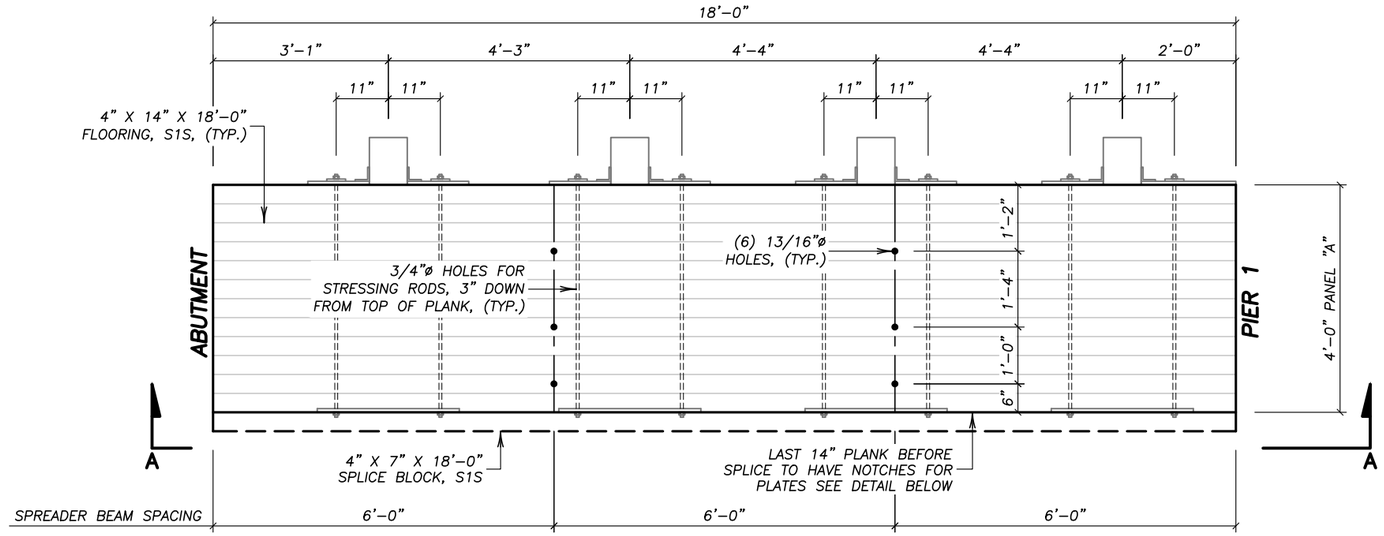
WHEELER NOT RESPONSIBLE FOR DESIGN LOADS.

SHEET TITLE:
GLU-LAM PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952-929-7854
info@wheeler1892.com
wheeler1892.com

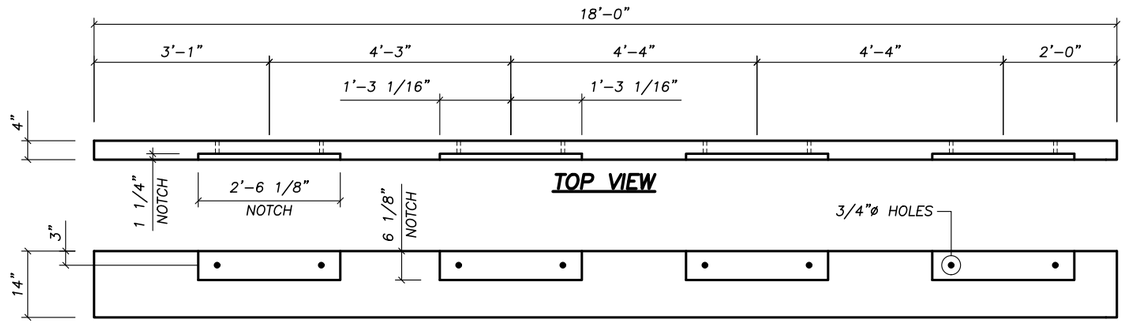
DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	3 OF 18

July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (C:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)



DOWEL LAMINATED DECK PANEL THUS – SPAN 1

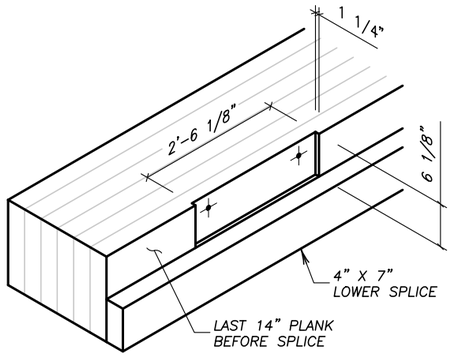
(1) 4'-0" X 18'-0" PANEL "A"
S1S, Q-NAP



TOP VIEW

SECTION A-A
LAST 14" PLANK BEFORE SPLICE ON "A" PANEL

(1) 4" X 14" X 18'-0"
S1S, Q-NAP



PANEL "A" NOTCH DETAIL

NORTH

SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
C	C	C
	C	
D	C	D
	D	
B	B	B

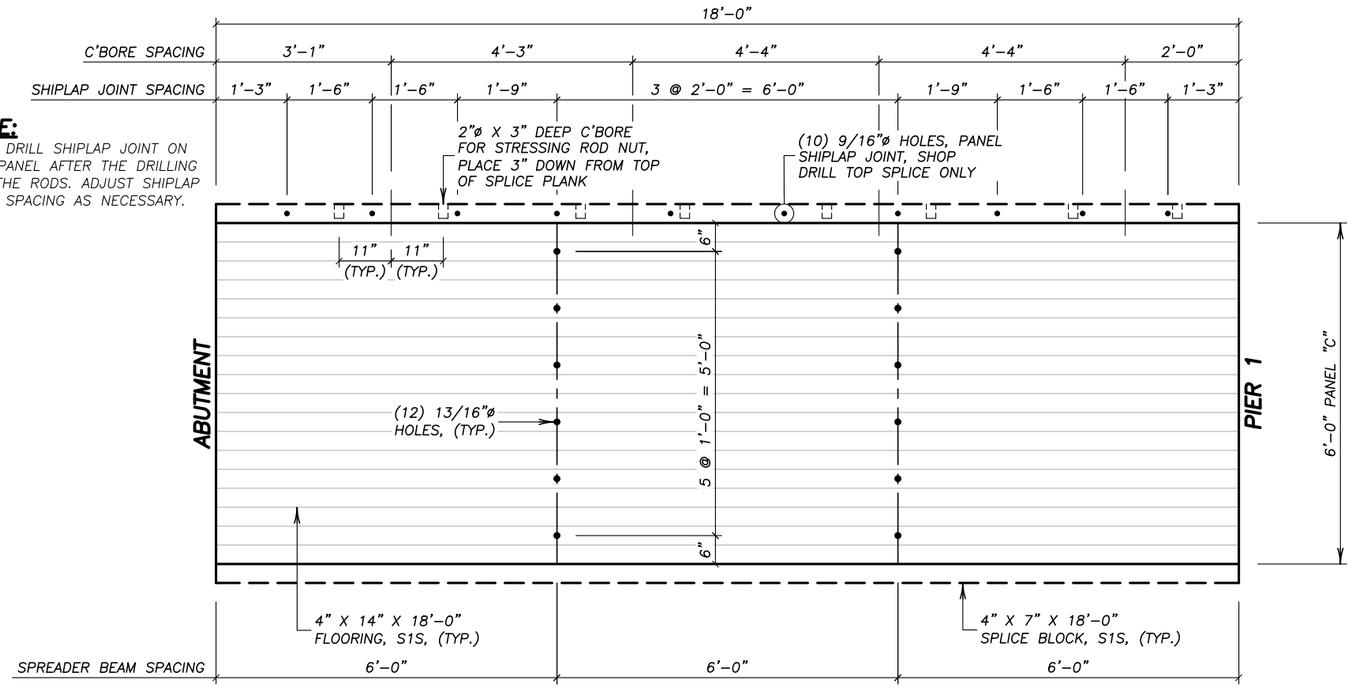
DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 1 DECKS PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952-929-7854
info@wheeler1892.com
wheeler1892.com

DATE: 11/20/18		TRACKING NO. T20457	SHEET NO. 4 OF 18
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	

July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)

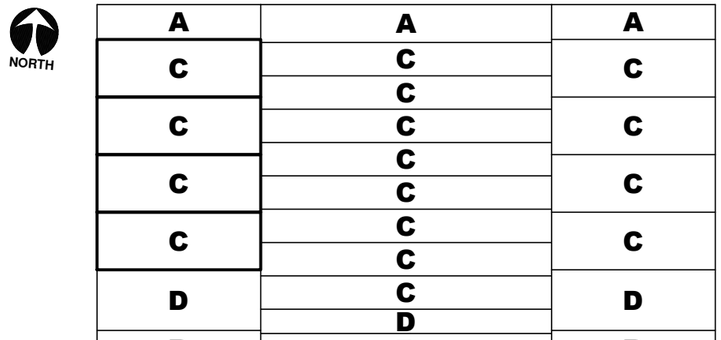


DOWEL LAMINATED DECK PANEL THUS – SPAN 1

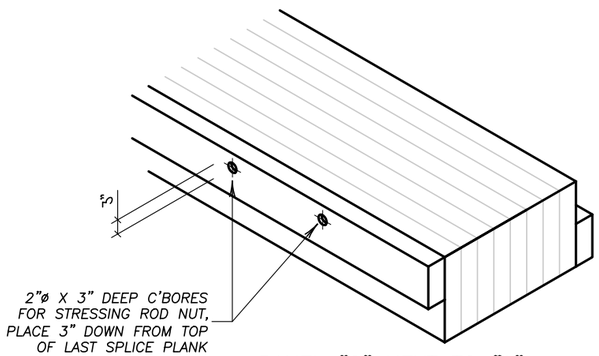
(1) 6'–0" X 18'–0" PANEL "C"
NEXT TO "A" PANEL
S1S, Q–NAP

DOWEL LAMINATED DECK PANEL THUS – SPAN 1

(3) 6'–0" X 18'–0" PANEL "C"
S1S, Q–NAP



DECK PANEL DESIGNATIONS



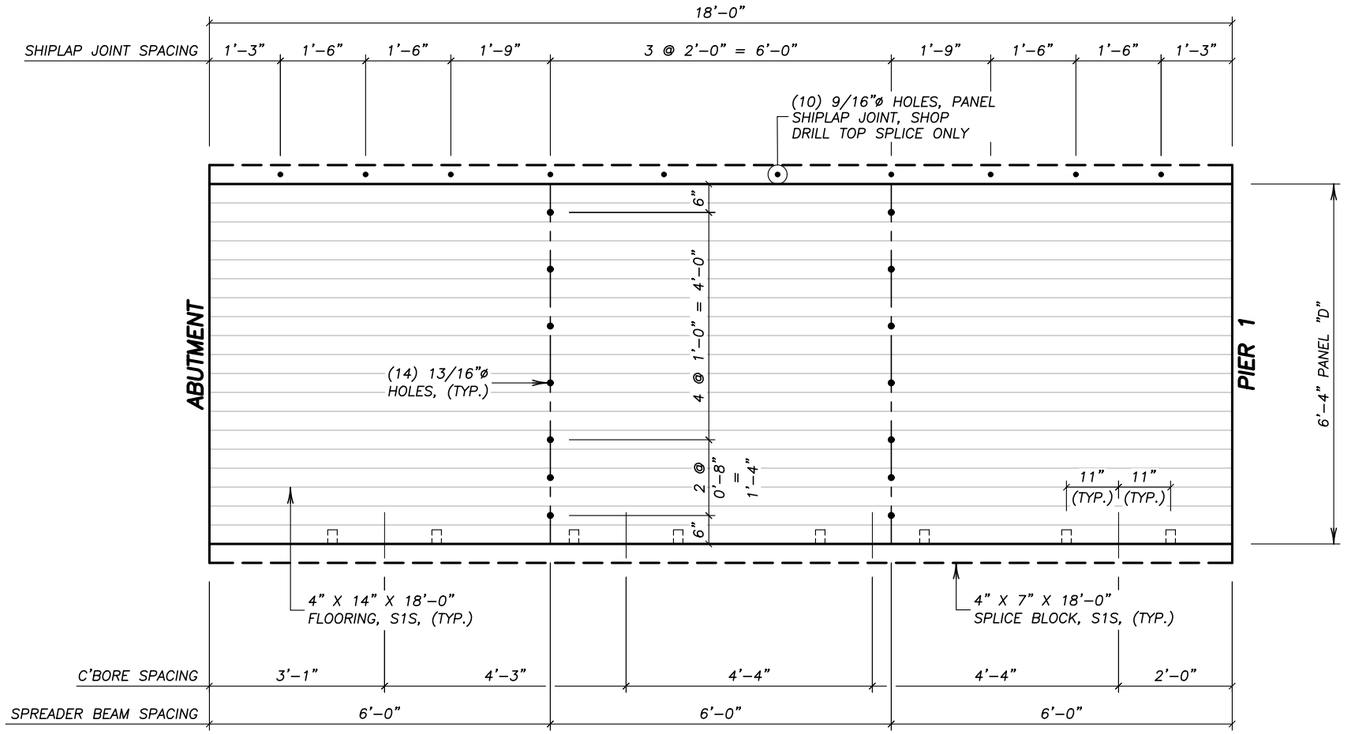
PANEL "C" NEXT TO "A"

SHEET TITLE:
SPAN 1 DECKS PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952–929–7854
info@wheeler1892.com
wheeler1892.com

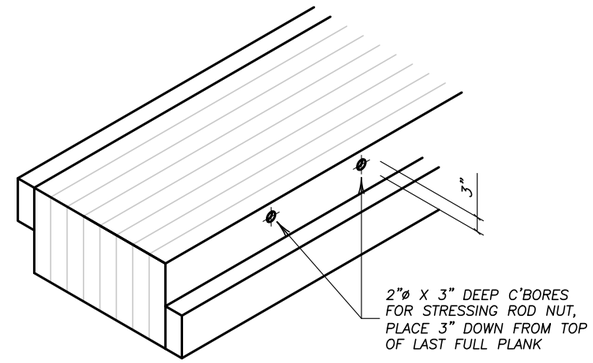
DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651–14372	5 OF 18

July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)

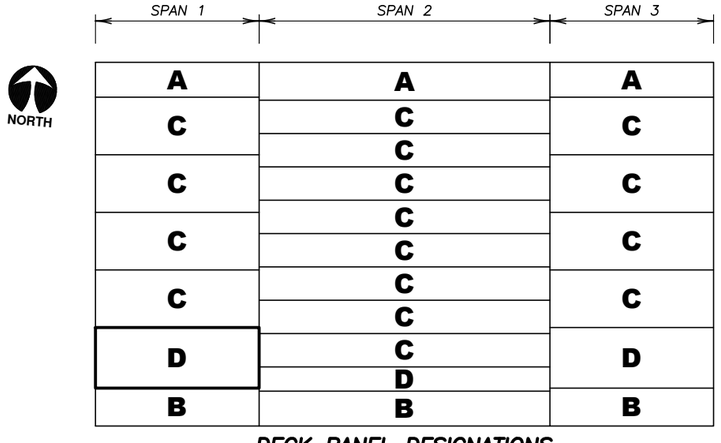


DOWEL LAMINATED DECK PANEL THUS – SPAN 1

(1) 6'-4" X 18'-0" PANEL "D"
NEXT TO "B" PANEL
S1S, Q-NAP



PANEL "D" NEXT TO "B"



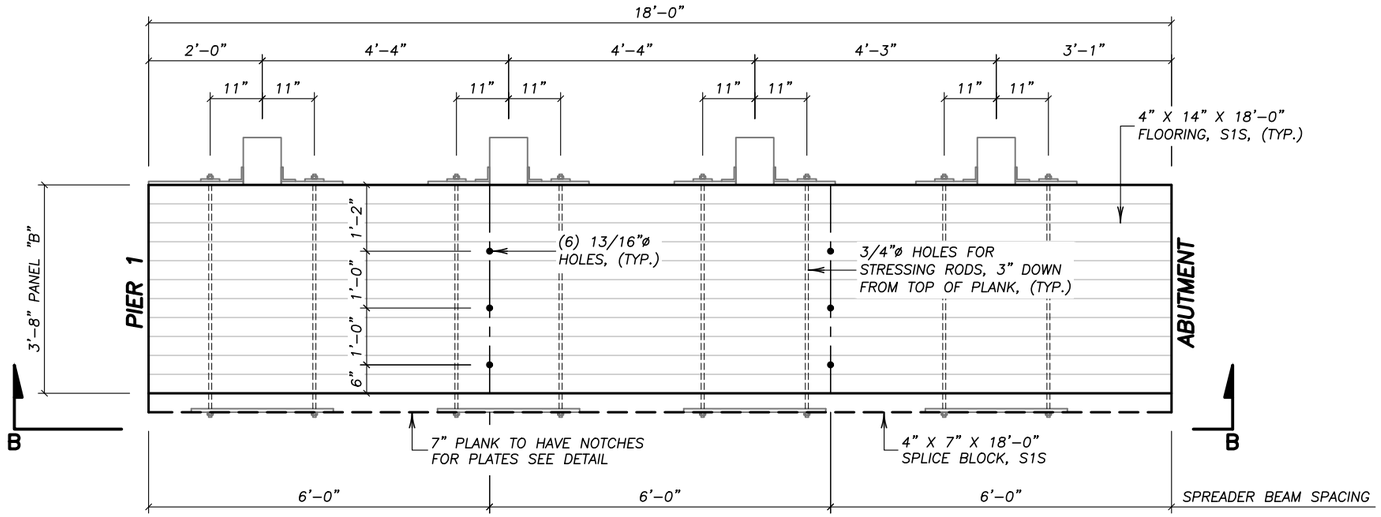
DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 1 DECKS PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952-929-7854
info@wheeler1892.com
wheeler1892.com

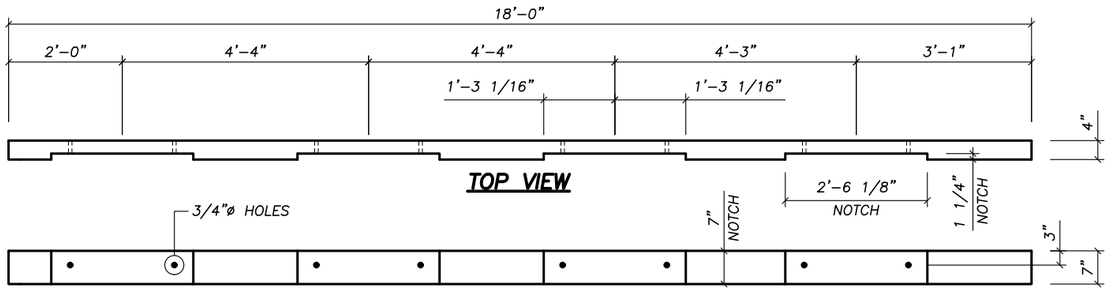
DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	6 OF 18

July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)



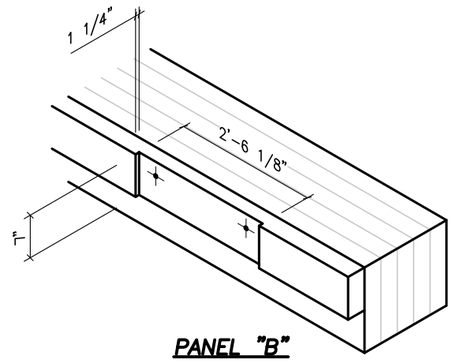
DOWEL LAMINATED DECK PANEL THUS – SPAN 1

(1) 3'-8" X 18'-0" PANEL "B"
S1S, Q-NAP



SECTION B–B
SHIPLAP JOINT "B" THUS

(1) 4" X 7" X 18'-0"
S1S, Q-NAP



PANEL "B"

NORTH

SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
D	C	D
	D	
B	B	B

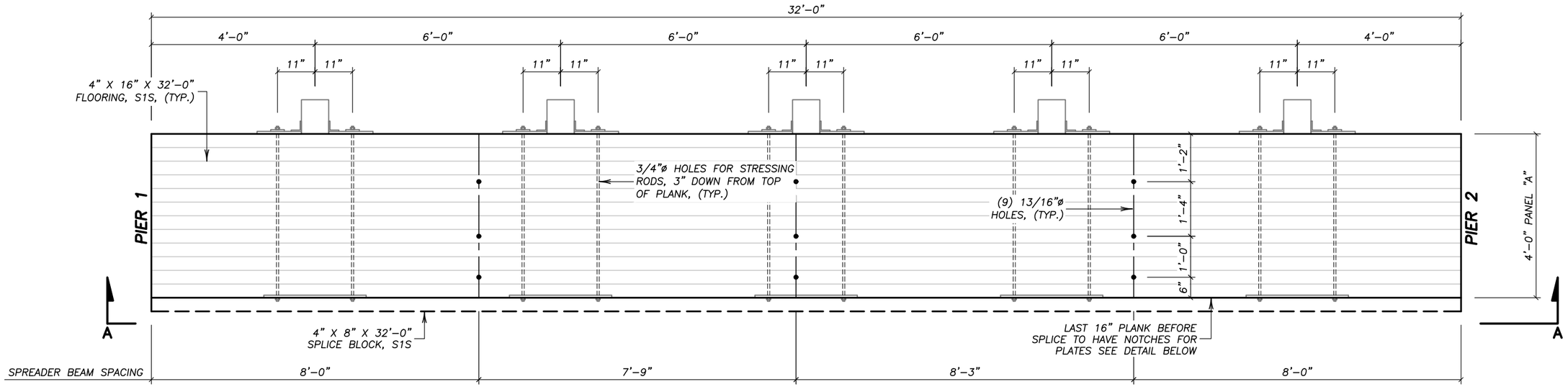
DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 1 DECKS PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952-929-7854
info@wheeler1892.com
wheeler1892.com

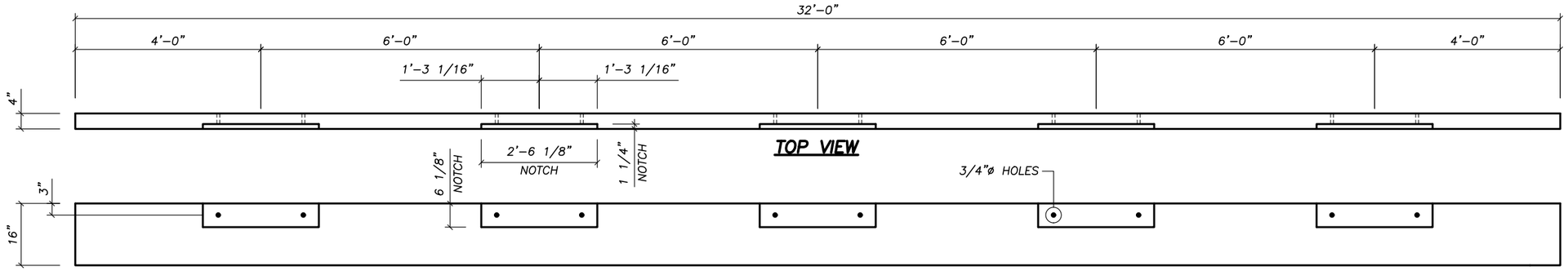
DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	7 OF 18

July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)



DOWEL LAMINATED DECK PANEL THUS – SPAN 2

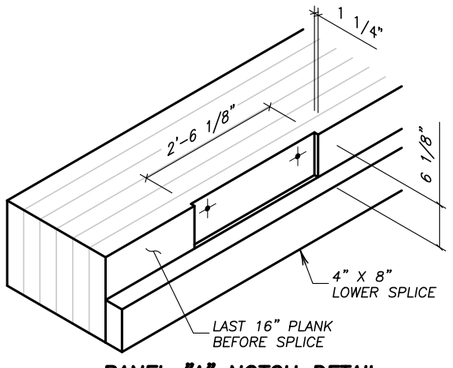
(1) 4'-0" X 32'-0" PANEL "A"
S1S, Q-NAP



TOP VIEW

SECTION A-A
LAST 16" PLANK BEFORE SPLICE ON "A" PANEL

(1) 4" X 16" X 32'-0"
S1S, Q-NAP



PANEL "A" NOTCH DETAIL

NORTH

SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
D	C	D
	D	
B	B	B

DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 2 DECKS PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952-929-7854
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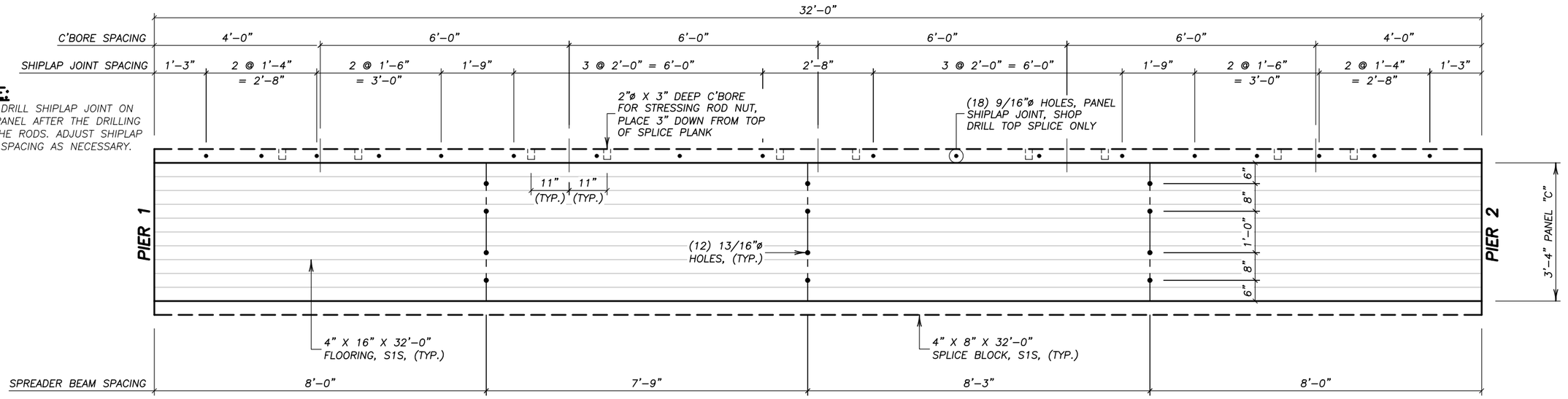
wheeler1892.com

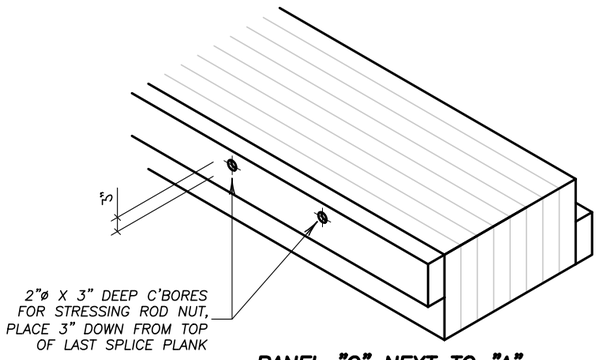
DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	8 OF 18

July 26, 2018, 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)



DOWEL LAMINATED DECK PANEL THUS – SPAN 2

(1) 3'-4" X 32'-0" PANEL "C"
NEXT TO "A" PANEL
S1S, Q-NAP



PANEL "C" NEXT TO "A"

NORTH

SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
	C	
D	C	D
	D	
B	B	B

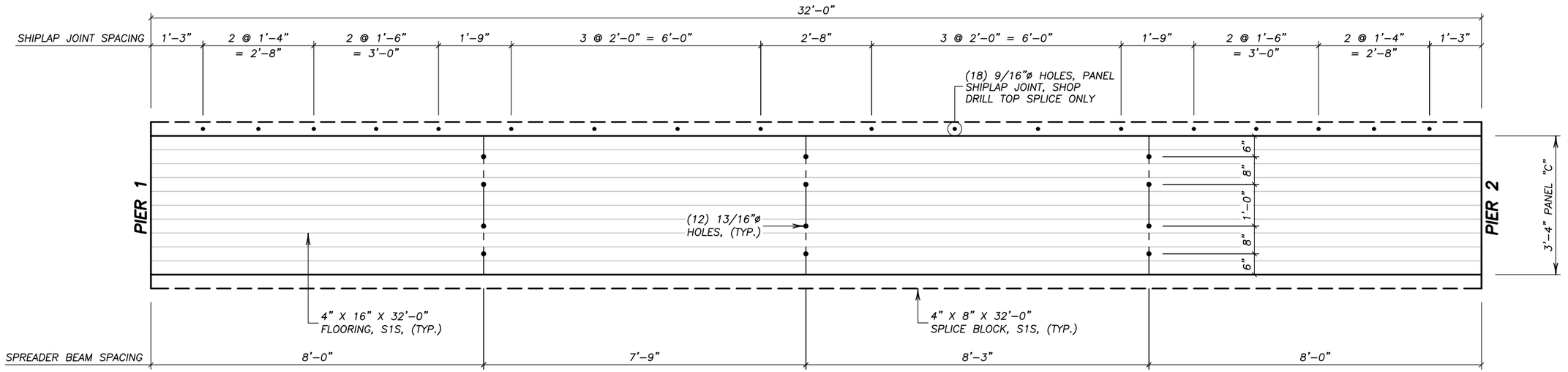
DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 2 DECKS PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
952-929-7854
info@wheeler1892.com
wheeler1892.com

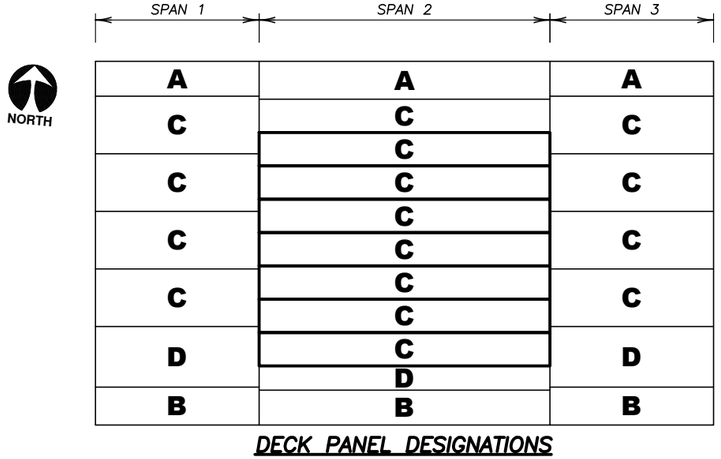
DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	9 OF 18

July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)



DOWEL LAMINATED DECK PANEL THUS – SPAN 2

(7) 3'-4" X 32'-0" PANEL "C"
S1S, Q-NAP



DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 2 DECKS PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
Eden Prairie, MN 55344
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DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	10 OF 18

July 26, 2018 9:15:08 a.m.
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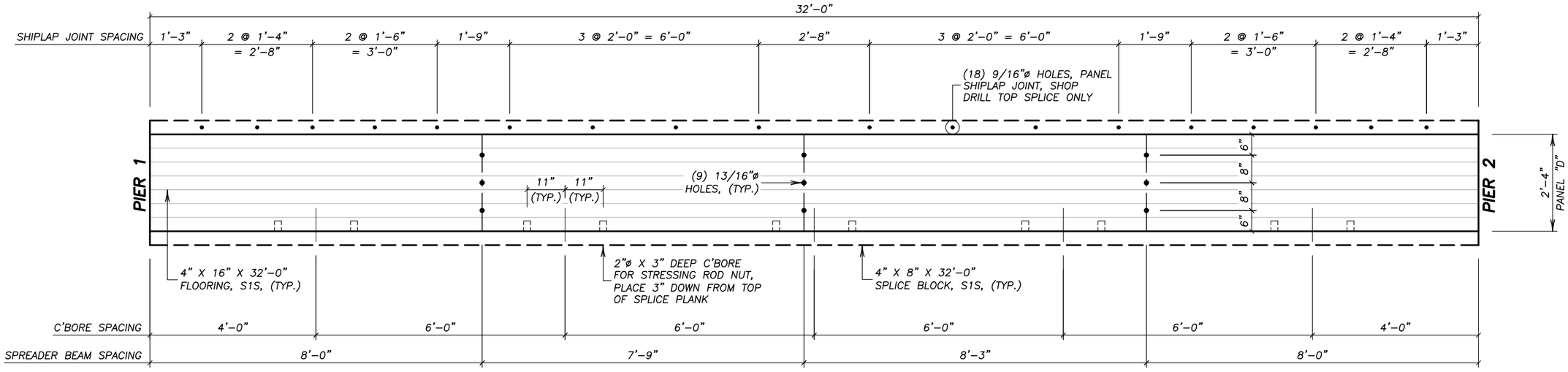
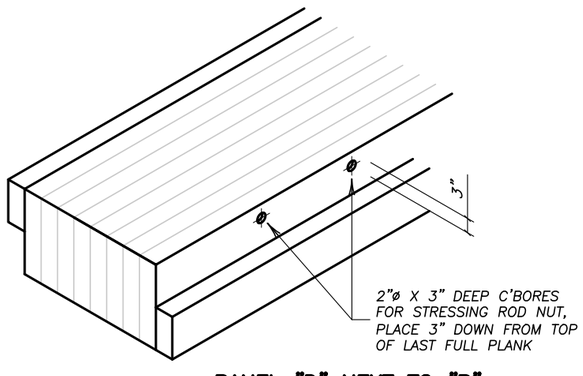


DOWEL LAMINATED DECK PANEL THUS – SPAN 2

(1) 2'-4" X 32'-0" PANEL "D"
NEXT TO "B" PANEL
S1S, Q-NAP



PANEL "D" NEXT TO "B"

NORTH

SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
D	C	D
	D	
B	B	B

DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 2 DECKS PREFRAMING

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DWN: LAF	CHK: WEH	ORDER NO. 651-14372	11 OF 18

July 26, 2018 9:15:08 a.m.
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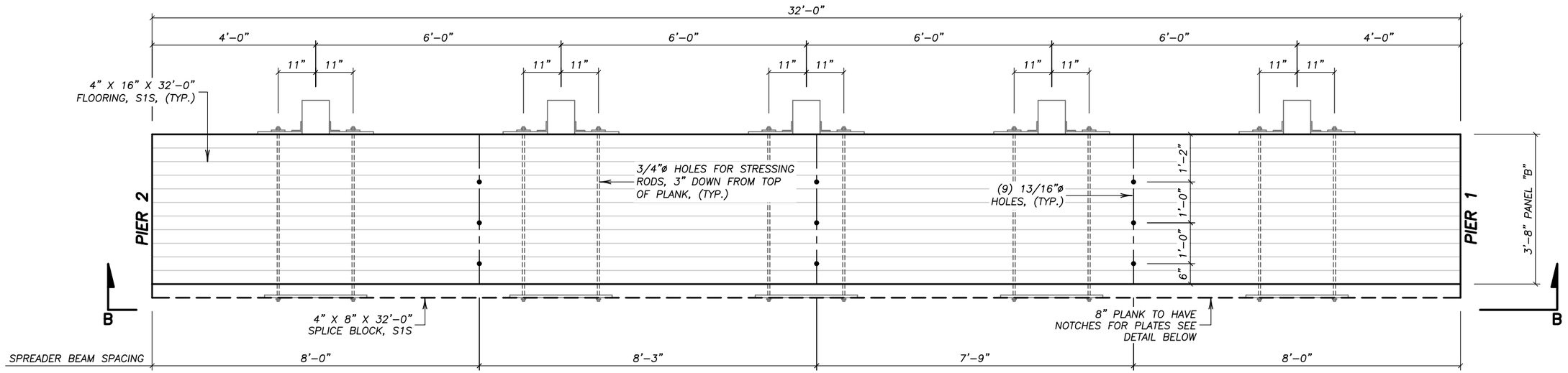
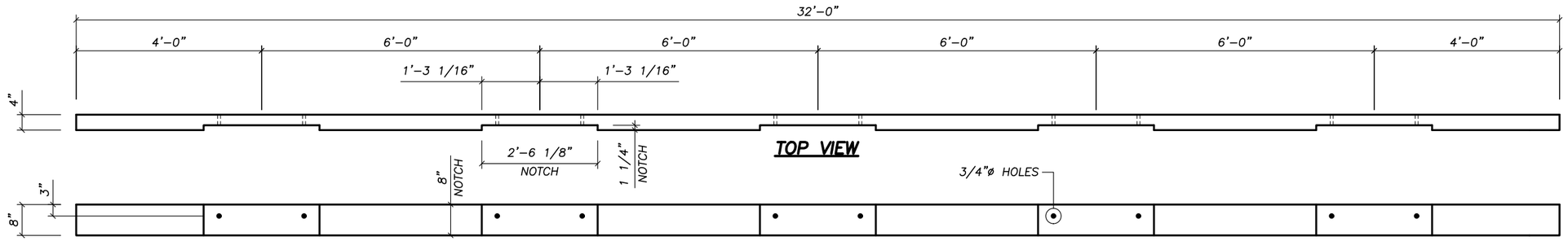


DOWEL LAMINATED DECK PANEL THUS – SPAN 2

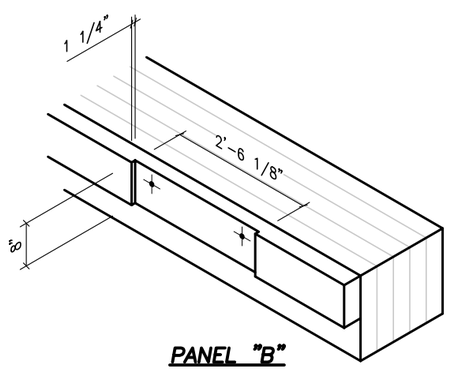
(1) 3'-8" X 32'-0" PANEL "B"
S1S, Q-NAP



TOP VIEW

SECTION B-B
SHIPLAP JOINT "B" THUS

(1) 4" X 8" X 32'-0"
S1S, Q-NAP



PANEL "B"

NORTH

SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
D	C	D
	D	
B	B	B

DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 2 DECKS PREFRAMING

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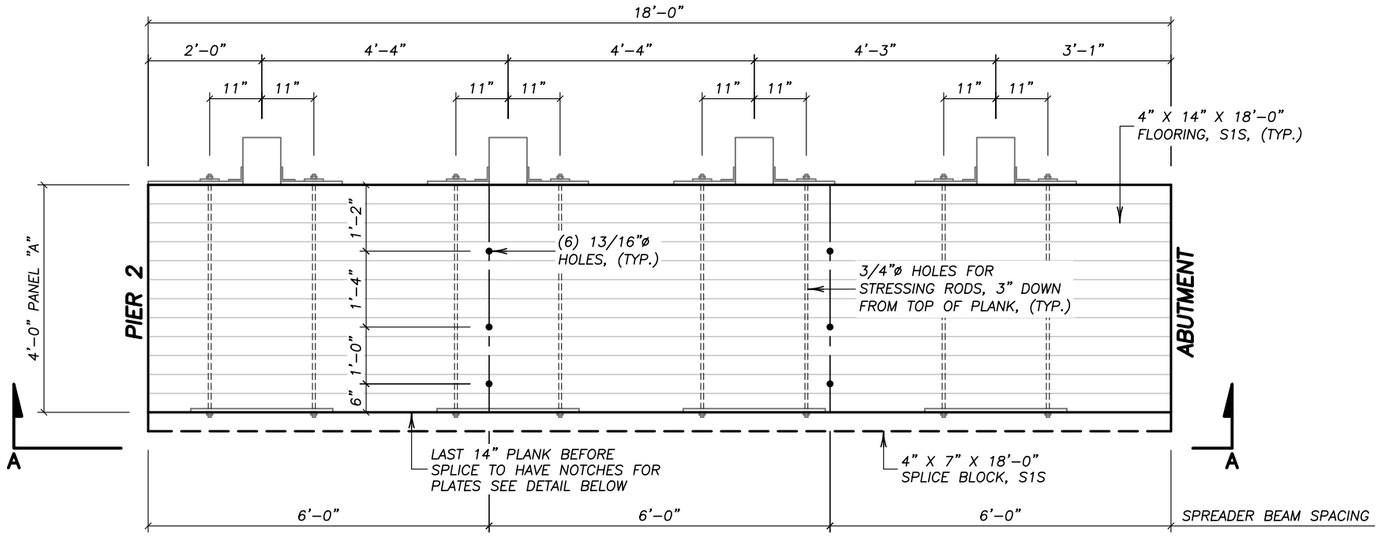
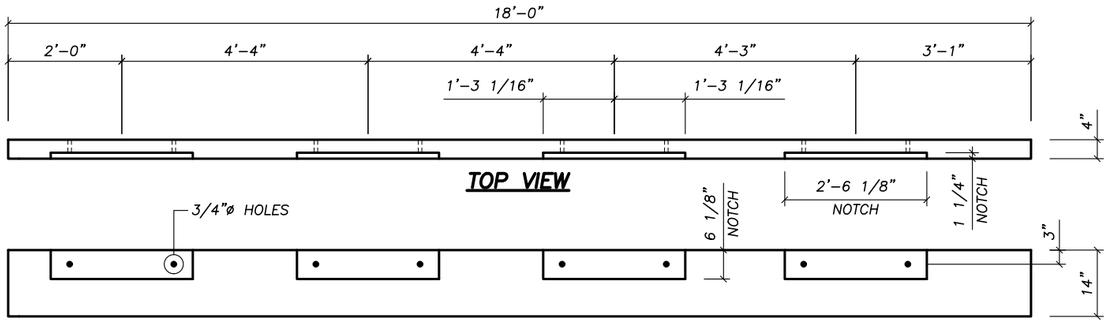
DATE: 11/20/18		TRACKING NO. T20457	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 651-14372	12 OF 18

July 26, 2018 9:15:08 a.m.
Drawing: 1428I SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 1428I SWINGEN, MN\)



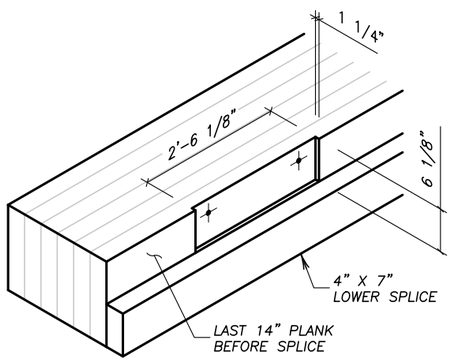
DOWEL LAMINATED DECK PANEL THUS – SPAN 3

(1) 4'-0" X 18'-0" PANEL "A"
S1S, Q-NAP



SECTION A-A
LAST 14" PLANK BEFORE SPLICE ON "A" PANEL

(1) 4" X 14" X 18'-0"
S1S, Q-NAP



PANEL "A" NOTCH DETAIL

NORTH

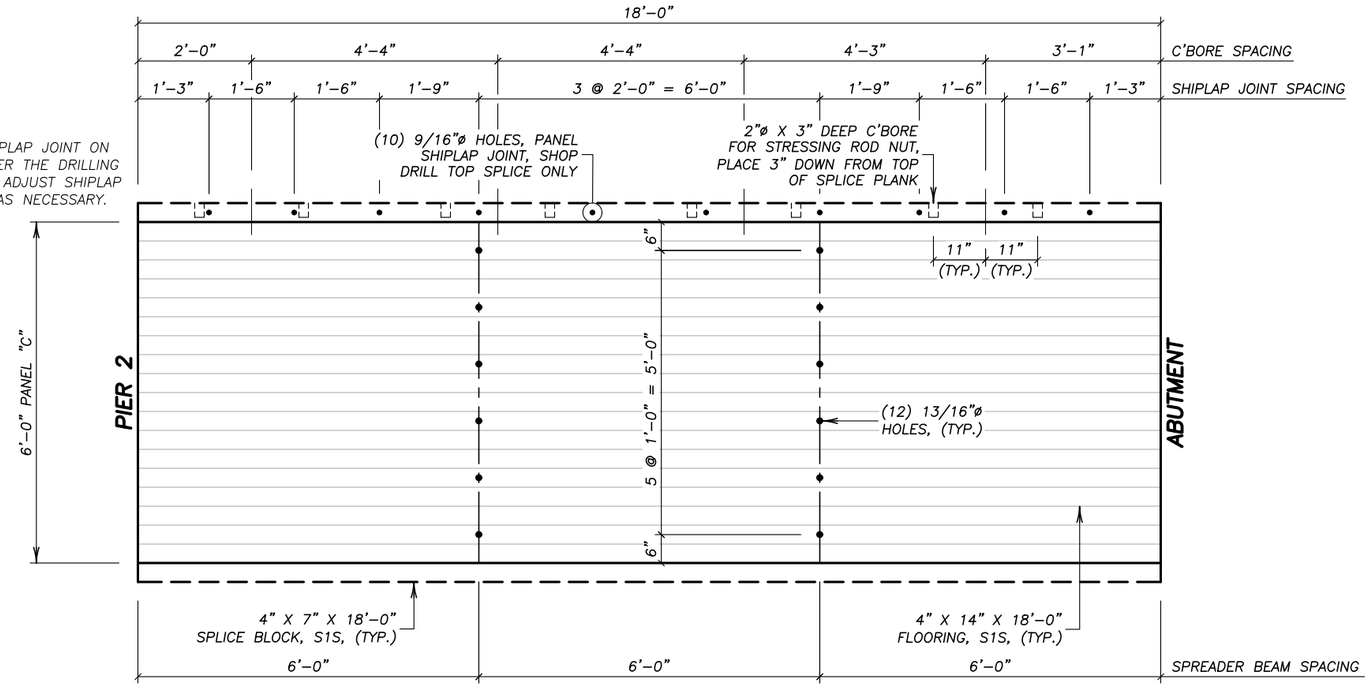
SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
D	C	D
	D	
B	B	B

DECK PANEL DESIGNATIONS

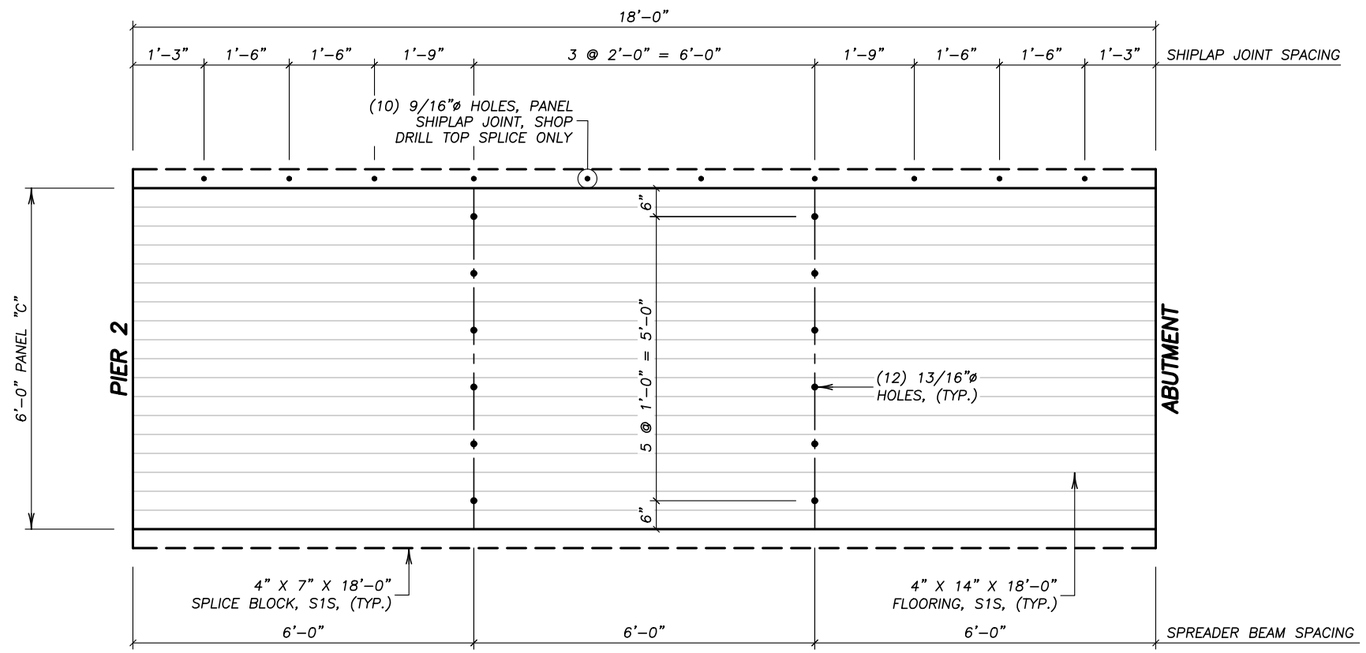
SHEET TITLE:	**SPAN 3 DECKS PREFRAMING**
Wheeler	9531 W.78th Street, Ste.100 Eden Prairie, MN 55344 952-929-7854 info@wheeler1892.com wheeler1892.com
DATE: 11/20/18	TRACKING NO. T20457
DWN: LAF / CHK: WEH	ORDER NO. 651-14372
SHEET NO.	13 OF 18

July 26, 2018 9:15:08 a.m.
Drawing: 14281 SHOPS.DWG (FISH) (O:\AUTOCAD\T-FOLDERS\T20543 14281 SWINGEN, MN\)

NOTE:
SHOP DRILL SHIPLAP JOINT ON THIS PANEL AFTER THE DRILLING FOR THE RODS. ADJUST SHIPLAP JOINT SPACING AS NECESSARY.



DOWEL LAMINATED DECK PANEL THUS – SPAN 3
(1) 6'-0" X 18'-0" PANEL "C"
NEXT TO "A" PANEL
S1S, Q-NAP

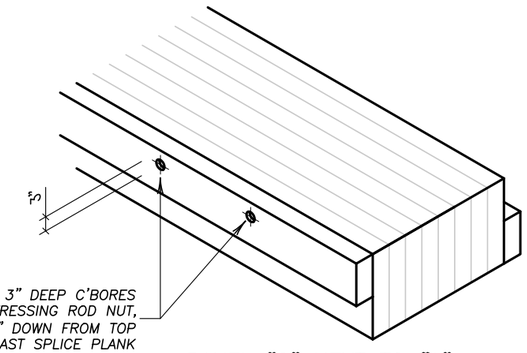


DOWEL LAMINATED DECK PANEL THUS – SPAN 3
(3) 6'-0" X 18'-0" PANEL "C"
S1S, Q-NAP

NORTH

SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
D	C	D
	D	
B	B	B

DECK PANEL DESIGNATIONS



PANEL "C" NEXT TO "A"

SHEET TITLE:
SPAN 3 DECKS PREFRAMING

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9531 W.78th Street, Ste.100
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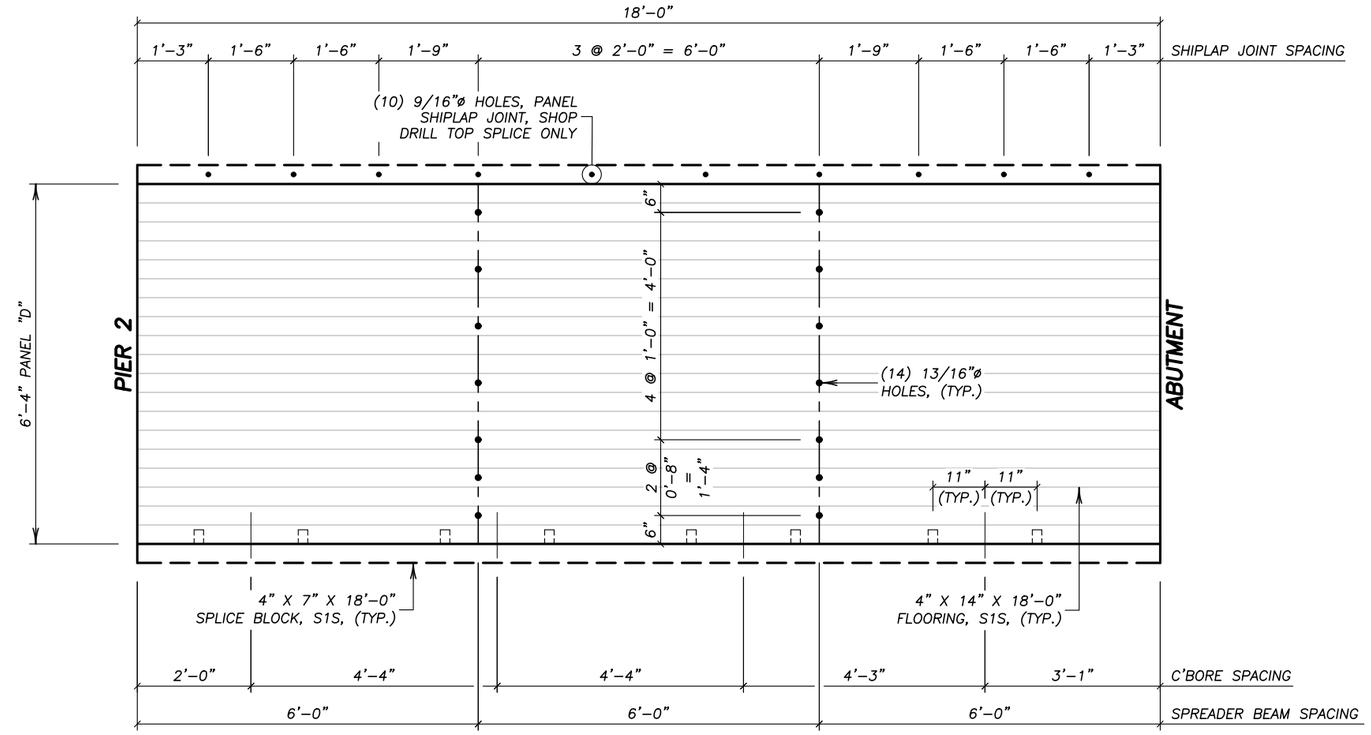
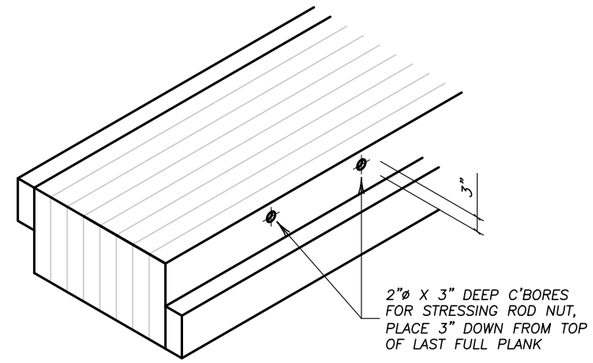
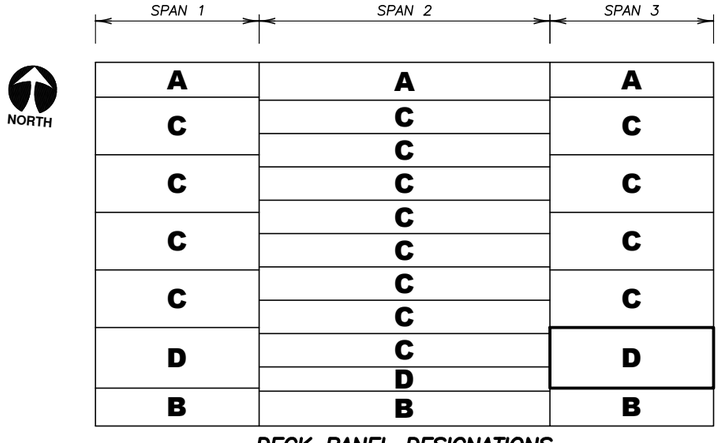


DOWEL LAMINATED DECK PANEL THUS – SPAN 3

(1) 6'-4" X 18'-0" PANEL "D"
NEXT TO "B" PANEL
S1S, Q-NAP



PANEL "D" NEXT TO "B"



DECK PANEL DESIGNATIONS

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DWN: LAF	CHK: WEH	ORDER NO. 651-14372	15 OF 18

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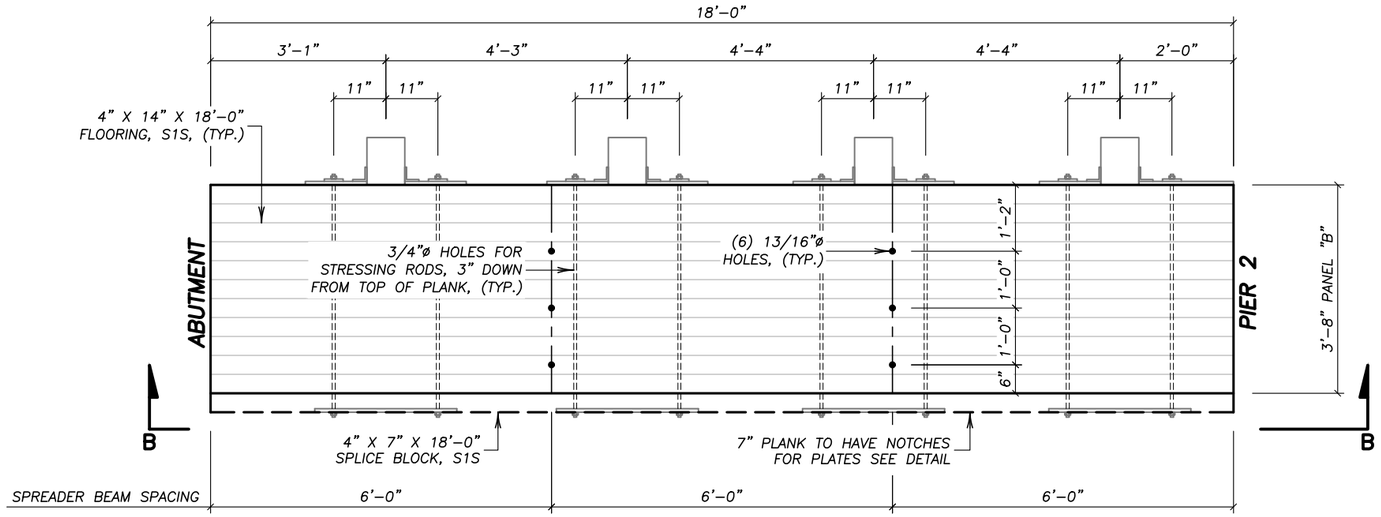
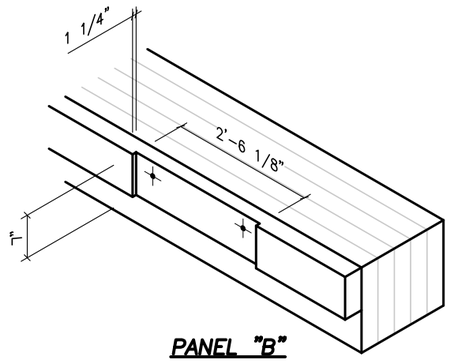
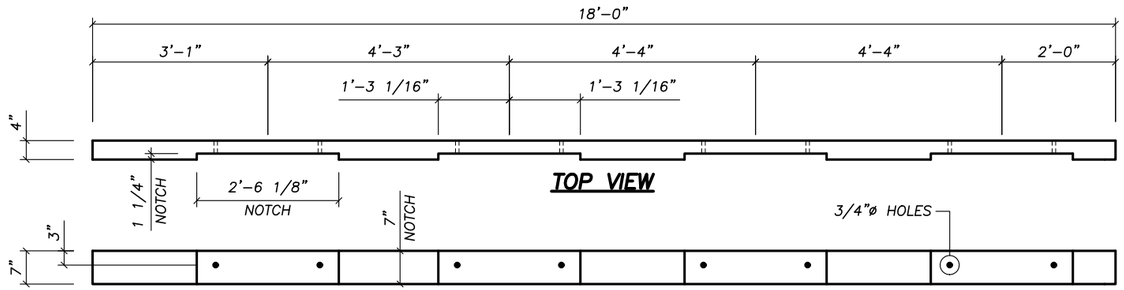


DOWEL LAMINATED DECK PANEL THUS – SPAN 3

(1) 3'-8" X 18'-0" PANEL "B"
S1S, Q-NAP



PANEL "B"



TOP VIEW

SECTION B–B
SHIPLAP JOINT "B" THUS

(1) 4" X 7" X 18'-0"
S1S, Q-NAP

NORTH

SPAN 1	SPAN 2	SPAN 3
A	A	A
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
C	C	C
	C	
D	C	D
	D	
B	B	B

DECK PANEL DESIGNATIONS

SHEET TITLE:
SPAN 3 DECKS PREFRAMING

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DWN: LAF	CHK: WEH	ORDER NO. 651-14372	16 OF 18

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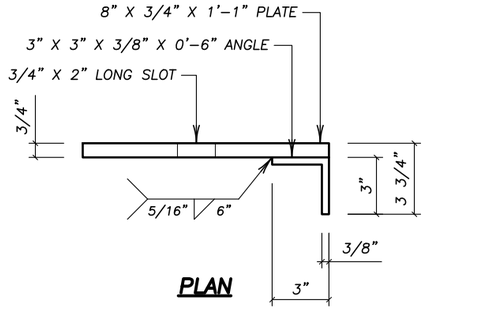
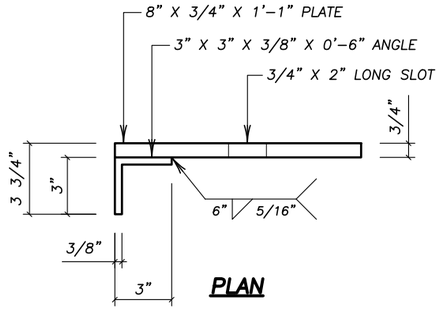
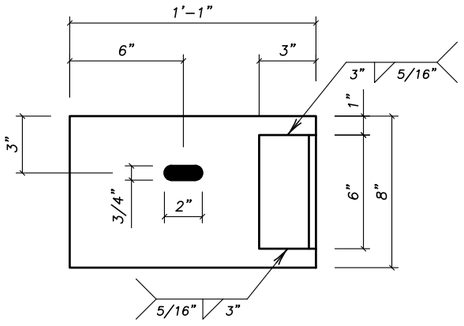
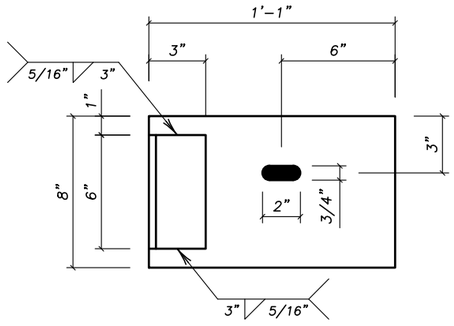






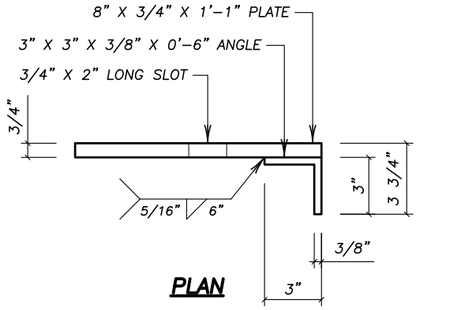
LEFT STEEL POST PLATE THUS

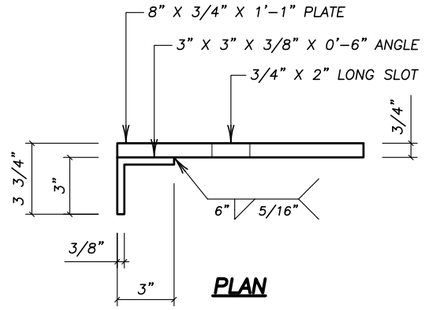
(22) LEFT STEEL POST PLATE
ASTM A36, H.D.G.

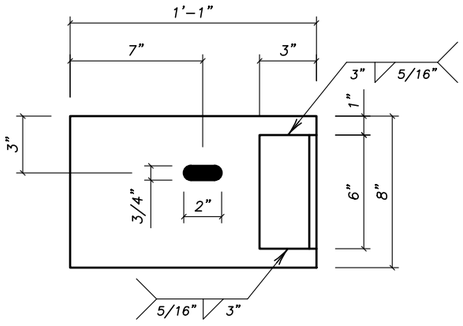


RIGHT STEEL POST PLATE THUS

(22) RIGHT STEEL POST PLATE
ASTM A36, H.D.G.

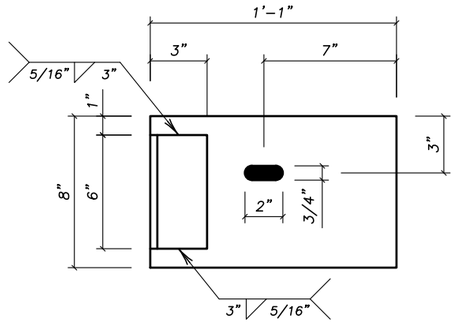






LEFT STEEL POST PLATE THUS
@ SPLICE RAILPOST

(4) LEFT STEEL POST PLATE
ASTM A36, H.D.G.



RIGHT STEEL POST PLATE THUS
@ SPLICE RAILPOST

(4) RIGHT STEEL POST PLATE
ASTM A36, H.D.G.

NOTE:
THE WELDING PROCESS SHALL BE THE FLUX CORE ARC WELDING PROCESS, UTILIZING E81T1-W2/W2M ELECTRODES

SHEET TITLE:
STEEL PREFRAMING

Wheeler
9531 W.78th Street, Ste.100
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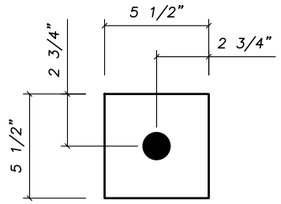
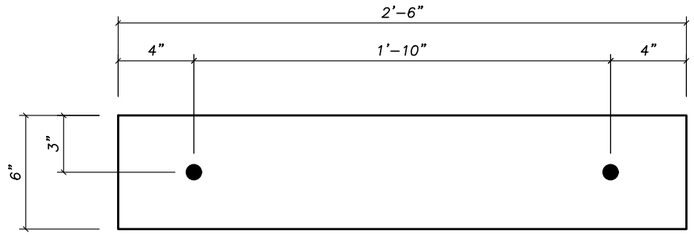


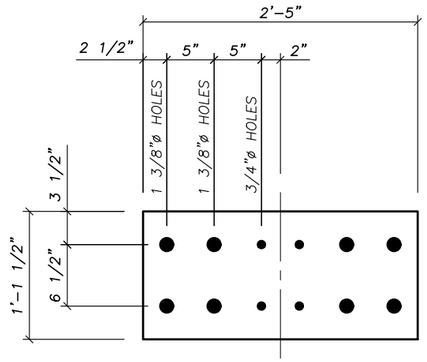
RAILPOST PLATE WASHER THUS

(52) 5 1/2" X 5 1/2" X 1/4"
1 3/8"ø HOLE
ASTM A36, H.D.G.



INTERNAL STEEL PLATE

(26) 6" X 3/4" X 2'-6"
ALL HOLES ARE 3/4"ø
ASTM A36, H.D.G.



STEEL SPLICE PLATE

(4) 1'-1 1/2" X 1/2" X 2'-5"
ASTM A36, H.D.G.

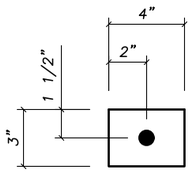
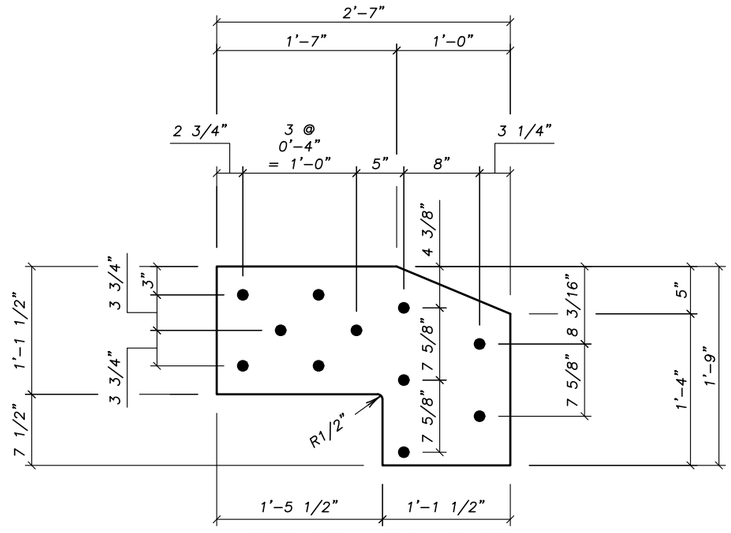


PLATE WASHER FOR POST PLATE THUS

(52) 3" X 4" X 1/2"
3/4"ø HOLE
ASTM A36, H.D.G.



STEEL TRANSITION PLATE

(4) 1'-9" X 1/2" X 2'-7"
ALL HOLES ARE 1"ø
ASTM A36, H.D.G.

SHEET TITLE:

STEEL PREFRAMING

Wheeler
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