



CPED STAFF REPORT

Prepared for the Heritage Preservation Commission
 HPC Agenda Item #3
 May 17, 2016
 BZH-29102

HERITAGE PRESERVATION APPLICATION SUMMARY

Property Location: Godfrey Parkway at East 46th Street
Project Name: East 46th Street Bridge over Godfrey Parkway Replacement
Prepared By: Lisa Steiner, Senior City Planner, (612) 673-3950
Applicant: Hennepin County Transportation Department
Project Contact: Jessica Berglin, Hess Roise and Company
Ward: 12
Neighborhood: Hiawatha
Request: To demolish and replace the existing bridge.
Required Applications:

Certificate of Appropriateness	To allow the demolition of the existing East 46 th Street bridge over Godfrey Parkway.
Certificate of Appropriateness	To construct a new bridge.

HISTORIC PROPERTY INFORMATION

Current Name	East 46 th Street Bridge over Godfrey Parkway
Historic Name	Godfrey Road Viaduct
Historic Address	East 46 th Street Bridge & Godfrey Parkway
Original Construction Date	1925-1926
Original Architect	Martin Sigvart Grytbak
Original Builder	Unknown
Original Engineer	Martin Sigvart Grytbak
Historic Use	Bridge
Current Use	Bridge
Proposed Use	Bridge

Date Application Deemed Complete	April 22, 2016	Date Extension Letter Sent	Not applicable
End of 60-Day Decision Period	June 21, 2016	End of 120-Day Decision Period	Not applicable

CLASSIFICATION

Local Historic District	Minnehaha Historic District
Period of Significance	19 th Century and 20 th Century
Criteria of Significance	Architecture, Commerce, Conservation, Literature, Transportation, Urban Planning
Date of Local Designation	1986
Date of National Register Listing	1969
Applicable Design Guidelines	<i>Secretary of the Interior's Standards for Treatment of Historic Properties</i>

SUMMARY

BACKGROUND. The Godfrey Bridge was designed by Martin Sigvart Grytbak as the initial approach for the Intercity Bridge (Ford Bridge) over the Mississippi River connecting Ford Parkway in Saint Paul with East 46th Street in Minneapolis. The Godfrey Bridge is a three-span reinforced concrete deck-girder structure with an arched fascia. The bridge has a 152 foot span separated by two piers with arched openings. A wide central span accommodates vehicular traffic while the two narrower outer spans accommodate pedestrians. The upper deck of the bridge connects to the lower path along Godfrey Parkway by a stairway along the west side of the south abutment. The original deck and railings were replaced in 1972.

In 1889, the land surrounding Minnehaha Falls was purchased by the State of Minnesota and acquired by the Park Board. It was one of the first state parks in the United States. In 1969, the Minnehaha Park Historic District was listed on the National Register of Historic Places, the first historic district in Minneapolis listed on the National Register. In 1986, the Minnehaha Historic District was locally designated, adopting the National Register nomination form as the designation study for the local district.

APPLICANT'S PROPOSAL. The applicant is proposing to demolish the existing Godfrey Bridge and replace it with a new single-span reinforced concrete bridge with pre-stressed concrete beams and slightly arched fascia forming the superstructure. An ornamental metal railing, similar in style to the railing of the Ford Bridge, would be located between cast-in-place concrete railing posts along the upper deck. The substructure would have abutment walls four feet in width and 30-foot, 4 inch wingwalls. Rusticated details would be located on the outer corners of the abutment walls as well as on the pilasters and arches along the abutment walls. The rest of the bridge would be of a uniform gray color concrete with a smooth finish. The bridge's abutments would utilize micropiles rather than the traditional sheet-pile design in order to minimize impact on nearby trees. The proposed deck of the new bridge would be approximately 10 feet wider than the existing bridge to accommodate a shoulder lane for bicyclists and wider sidewalks.

PUBLIC COMMENTS. No comments had been received as of the writing of this report. Any correspondence received prior to the public meeting will be forwarded on to the Heritage Preservation Commission for consideration.

ANALYSIS**CERTIFICATE OF APPROPRIATENESS**

The Department of Community Planning and Economic Development has analyzed the application to allow the demolition of the existing East 46th Street bridge over Godfrey Parkway based on the following findings:

1. *The alteration is compatible with the designation of the landmark or historic district, including the period and criteria of significance.*

Although located within the boundary of the historic district, the Godfrey Bridge is not mentioned in the designation of the Minnehaha Historic District. No formal period of significance for the district was noted in the original National Register nomination, as was common with early nominations. The Grand Rounds Parkway, an overlapping feature which is not locally designated but has been studied for potential National Register designation, has an identified period of significance of 1884-1942. The Godfrey Bridge was completed in 1926, within this informal period of significance for the Grand Rounds.

The Minnehaha Historic District statement of significance notes that the park “preserves the environment of five or six historic sites illustrating commercial, transportation, pioneering and architectural themes, and is itself an expression of inspired foresight in urban planning. The influential feature of the historic district is Minnehaha Creek with its falls and glen. This stream and cascade have attracted explorers, settlers, tourists and entrepreneurs since the beginning of recorded Minnesota history.” While the bridge was constructed in 1926, no documents related to the designation of the local historic district note the significance of the bridge within the district. The bridge is unrelated to Minnehaha Creek as it was constructed as part of the approach to the Ford Bridge (Intercity Bridge). Due to the limited significance of the bridge within the historic district, the demolition would be compatible with the criteria of significance identified in the district designation.

The nomination focused upon the important balance of the built and natural environment in Minnehaha Park. Specific elements of the built environment described in the nomination were the Stevens House, Longfellow House, Godfrey’s Mill, and Minnehaha Station. The natural environment of Minnehaha Park was specifically detailed in the designation, particularly the topography, geography, ecology, and wildlife of the district. The Godfrey Bridge is not mentioned in the nomination form. The alterations will not affect the specific buildings mentioned in the study or their surrounding sites. As further analyzed below, the demolition of the Godfrey Bridge would be compatible with and continue to support the designation of the Minnehaha Historic District.

2. *The alteration will ensure the continued integrity of the landmark or historic district.*

The demolition of the existing bridge would not negatively impair the integrity of the historic district. The bridge does not contribute to the significance of the historic district, which is stated in the nomination to be based largely upon the natural environment of the district as well as several elements of the built environment, including the Stevens House, Longfellow House, Godfrey’s Mill, and Minnehaha Station.

3. *The alteration is consistent with the applicable design guidelines adopted by the commission.*

There are no adopted design guidelines associated with the Minnehaha Historic District. Please see an evaluation of the *Secretary of the Interior’s Standards* below.

4. *The alteration is consistent with the applicable recommendations contained in The Secretary of the Interior's Standards for the Treatment of Historic Properties.*

The following standards for rehabilitation are most applicable to the proposal:

- A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
- The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
- Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.
- Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

The bridge is proposed to be demolished and replaced with a new bridge, so the property will continue to be used for its historic purpose. The historic character and historic materials that characterize the existing bridge would be removed, as well as its distinctive features. The standards recommend the repair of deteriorated features rather than replacement. The bridge would be entirely replaced. However, the designation study for the Minnehaha Historic District does not identify this bridge as a significant feature in the district. Rather, the study identifies several other buildings, the topography, geography, ecology, and wildlife in the district as the significant features of the district. Due to this, staff finds that the demolition of the existing bridge would be consistent with the rehabilitation guidelines as it would have limited impact on the integrity of the historic district. Staff recommends, however, that a photographic recordation of the bridge shall be prepared and submitted to staff that is in accordance with the guidelines of the Minnesota Historic Property Record.

5. *The alteration is consistent with the spirit and intent of the preservation ordinance, the applicable policies of the comprehensive plan, and the applicable preservation policies in small area plans adopted by the city council.*

The following preservation policies of the comprehensive plan are most applicable to this proposal:

Heritage Preservation Policy 8.1: Preserve, maintain, and designate districts, landmarks, and historic resources which serve as reminders of the city's architecture, history, and culture.

- 8.1.1 Protect historic resources from modifications that are not sensitive to their historic significance.
- 8.1.3 Encourage new developments to retain historic resources, including landscapes, incorporating them into new development rather than removal.

Heritage Preservation Policy 8.5: Recognize and preserve the important influence of landscape on the cultural identity of Minneapolis.

- 8.5.1 Identify and protect important historic and cultural landscapes.
- 8.5.2 Encourage planting and maintenance of street trees and other natural elements in historic districts to promote livability.

As stated above, although located within the Minnehaha Historic District, the bridge is not identified as significant to the historic district in any documentation of the district. While the retention of historic resources is recommended, the landscape elements which are significant to the district would be minimally impacted by the demolition of the existing bridge.

Additional Findings for Destruction

Before approving a certificate of appropriateness that involves the destruction, in whole or in part, of any landmark, property in an historic district or nominated property under interim protection, the commission shall make the following findings:

1. *The destruction is necessary to correct an unsafe or dangerous condition on the property; or*
2. *That there are no reasonable alternatives to the destruction. In determining whether reasonable alternatives exist, the commission shall consider, but not be limited to:*
 - a. *The significance of the property;*
 - b. *The integrity of the property; and*
 - c. *The economic value or usefulness of the existing structure, including its current use, costs of renovation and feasible alternative uses.*

UNSAFE OR DANGEROUS CONDITION

While the applicant does not contend that the destruction is necessary to correct an unsafe or dangerous condition on the property, the applicant has indicated that the Godfrey Bridge is considered structurally deficient. In 2015, the bridge received a 33.4% sufficiency rating, a numeric value based on several factors which indicates the sufficiency of a bridge to remain in service (see Minnesota Structure Inventory Report and Bridge Inspection Report in the appendix). The Federal Highway Administration's bridge program states that bridges with sufficiency ratings less than 80 are eligible for rehabilitation and bridges under 50 are eligible for replacement or rehabilitation. Out of 890 total bridges in Hennepin County, 44 were considered structurally deficient in 2015.¹ The Bridge Inspection Report from 2015 notes that though the Godfrey Bridge is considered structurally deficient, "No critical structural deficiencies or serious safety hazards are present on this structure."

REASONABLE ALTERNATIVES TO DEMOLITION

Significance: The applicant has considered alternatives to the destruction of the bridge. As noted in the findings above, the Godfrey Bridge is located within the Minnehaha Historic District but is not identified in any of the district documentation as a significant feature in the district. The 1969 National Register district study states that the district "preserves the environment of five or six historic sites illustrating commercial, transportation, pioneering and architectural themes, and is itself an expression of inspired foresight in urban planning. The influential feature of the historic district is Minnehaha Creek with its falls and glen. This stream and cascade have attracted explorers, settlers, tourists and entrepreneurs since the beginning of recorded Minnesota history." The study does not identify the Godfrey Bridge as one of the historic sites within the district which illustrates the themes of significance. When the district was locally designated in 1986, the National Register nomination form was adopted as the local designation. No additional documentation or information was included in the local designation to identify other structures as significant to the local district.

¹ Federal Highway Administration – Bridges and Structures, "Highway Bridges by State and County 2015," <http://www.fhwa.dot.gov/bridge/0650dsup.cfm>

The *Minnehaha Park Renovation Plan* completed by the Minneapolis Park and Recreation Board in 1992 provided guidance for the park through a long-range improvement plan. Although this bridge was not proposed to be replaced at that time, the plan noted that “the existing underpass at Godfrey Road and Forty-Sixth Street provides a wonderful opportunity to enhance the arrival experience by the introduction of park signage and ornamental lighting to the structure. The introduction will positively change the perception of the structure from that of an underpass to that of a gateway to the park.”

Integrity: The integrity of the bridge’s location and setting remain. While the integrity of original materials is intact, the substructure has severe concrete delamination, structural decay, and deterioration. The integrity of the original design of the bridge has been negatively impacted by the removal of original railings and lights but the overall form of the original bridge is still present. The feeling and association of the bridge as a gateway between Minnehaha Park and West River Parkway remains intact. Overall, the bridge retains most of its integrity, with the exception of the deteriorating materials and the replaced deck and railings.

Economic Value or Usefulness of the Existing Structure: The applicant has evaluated an alternative option to rehabilitate the historic bridge rather than replace the bridge. This option would replace the non-historic concrete deck, barrier, and approach panels and retain and reinforce the historic abutments, piers, and beams. The cost of this rehabilitation is estimated to be \$5,024,047, and the bridge would have a projected useful life of 20-40 more years. In comparison, the cost of demolishing the existing bridge and replacing it with a new bridge is estimated to be \$3,059,724, and the new bridge would have a projected useful life of over 75 years. The cost of rehabilitating the bridge would be 64% higher than replacing it.

The intensity of rehabilitation work would also threaten the remaining integrity of the historic bridge. Footings for the existing abutments and piers rest on a layer of bedrock that is approximately 12 feet below grade. The existing abutments and piers would need extensive structural reinforcing to meet current loading standards. Standard sheet-pile design, which is often used to minimize the extent of excavations for abutments, would need to be embedded 40 to 50 feet deep. This method is not feasible due to the existing shallow bedrock layer, so large open-cut excavations would be required to reach current structural and OSHA standards. Like the abutments, the piers would need to be strengthened to meet current and future loading, and such reinforcement would require large open-cut excavations that would threaten the surrounding landscape. Additionally, the applicant has indicated that the pier cap of the existing bridge is structurally integrated with the concrete beams of the superstructure, making isolated reinforcement infeasible. The distance between the top of the arches and the bottom of the beams is not enough to ensure that the arches would survive the demolition of the superstructure and part of the pier cap necessary to strengthen the structure.

Conclusion: For the above reasons, there are no reasonable alternatives to the demolition of the existing bridge and replacement with a new bridge. Although the Godfrey Bridge retains a fair level of integrity, the bridge has limited significance to the Minnehaha Historic District, and while an alternative rehabilitation option exists, that option is not feasible considering the historic bridge’s limited significance and limitations of rehabilitation work without impacting the surrounding landscape. As mitigation for the demolition of the existing bridge, CPED staff is recommending that a photographic recordation of the bridge shall be prepared and submitted to staff that is in accordance with the guidelines of the Minnesota Historic Property Record.

CERTIFICATE OF APPROPRIATENESS

The Department of Community Planning and Economic Development has analyzed the application to allow the construction of a new bridge based on the following findings:

1. *The alteration is compatible with the designation of the landmark or historic district, including the period and criteria of significance.*

Although located within the boundary of the historic district, the Godfrey Bridge is not mentioned in the designation of the Minnehaha Historic District. The Minnehaha Historic District statement of significance notes that the park “preserves the environment of five or six historic sites illustrating commercial, transportation, pioneering and architectural themes, and is itself an expression of inspired foresight in urban planning. The influential feature of the historic district is Minnehaha Creek with its falls and glen. This stream and cascade have attracted explorers, settlers, tourists and entrepreneurs since the beginning of recorded Minnesota history.” No formal period of significance for the district was noted in the original National Register nomination, as was common with early nominations.

The proposed replacement bridge would be compatible with the designation of the Minnehaha Historic District as the work would not impact the five or six historic sites noted in the designation study and would have limited impact on the identified significant landscape features of the district. Additionally, the new bridge abutments would be supported by micropiles, which use smaller equipment than standard sheet-pile construction which could cause significant damage to existing trees. The applicant contends that excavation, staging, and construction would have as minimal of an impact to the surrounding landscape as possible.

2. *The alteration will ensure the continued integrity of the landmark or historic district.*

Integrity is the ability of a property to convey its significance. Both the National Register and the City of Minneapolis preservation regulations evaluate integrity based on the following seven aspects:

Location: The proposed bridge would be in the same location as the historic bridge.

Design: Design is the combination of elements that create the form, plan, space, structure, and style of a property. The replacement bridge would have a single-span design. An ornamental metal railing, similar in style to that of the Ford Bridge, would be located between cast-in-place concrete railing posts along the upper deck. Rusticated details would be placed on the outer corners of the abutment walls as well as on the pilasters and arches along the abutment walls. The rest of the bridge would be of a uniform light gray color concrete with a smooth finish.

Setting: Setting is the physical environment of a historic property. The excavation, staging, and construction for the proposed bridge would have as minimal of an impact to the surrounding landscape as possible. The single-span design minimizes the extent of excavations by limiting the number of footings for the bridge. The proposal will preserve and protect fifty trees, including several species noted in the National Register nomination for the district, but will require the removal of eight trees.

Materials: Materials are the physical elements that were combined during a particular period of time and in a particular pattern or configuration to form a historic property. Both the historic bridge and the proposed bridge would be reinforced concrete. The applicant is proposing to utilize a smooth finish to maintain a similar material appearance to the existing historic bridge.

Workmanship: Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history. The proposed bridge will not negatively impair the integrity of workmanship.

Feeling: Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. Although the bridge design will differ from the existing three span design with a wide central span and two narrower outer spans, the feeling of the bridge as a gateway between Minnehaha Park and West River Parkway will remain.

Association: Association is the direct link between an important historic event or person and a historic property. The proposed project will maintain the association of the bridge as a gateway between Minnehaha Park and West River Parkway.

3. *The alteration is consistent with the applicable design guidelines adopted by the commission.*

No design guidelines for the Minnehaha Historic District have been adopted by the commission. Please see an evaluation of the *Secretary of the Interior's Standards* below.

4. *The alteration is consistent with the applicable recommendations contained in The Secretary of the Interior's Standards for the Treatment of Historic Properties.*

The following standards for rehabilitation are most applicable to the proposal:

- A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
- Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
- New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
- New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

The proposed new bridge would be utilized in the same way as the existing bridge. The deck will be approximately 10 feet wider to accommodate both bicycle lanes and wider sidewalks. While the bridge would utilize a smooth concrete finish with some areas of rusticated details to echo some of the defining features of the historic bridge, the new bridge will not create a false sense of historical development. The micropiles for the new bridge abutments would minimize the construction impact to the surrounding landscape and topography, ensuring that the essential form and integrity of the significant landscape features of the historic district and its environment would be unimpaired. The new bridge is consistent with the applicable recommendations in the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

5. *The alteration is consistent with the spirit and intent of the preservation ordinance, the applicable policies of the comprehensive plan, and the applicable preservation policies in small area plans adopted by the city council.*

The following policies are most applicable to this proposal:

Heritage Preservation Policy 8.1: Preserve, maintain, and designate districts, landmarks, and historic resources which serve as reminders of the city's architecture, history, and culture.

- 8.1.1 Protect historic resources from modifications that are not sensitive to their historic significance.
- 8.1.2 Require new construction in historic districts to be compatible with the historic fabric.
- 8.1.3 Encourage new developments to retain historic resources, including landscapes, incorporating them into new development rather than removal.

Heritage Preservation Policy 8.5: Recognize and preserve the important influence of landscape on the cultural identity of Minneapolis.

- 8.5.1 Identify and protect important historic and cultural landscapes.
- 8.5.2 Encourage planting and maintenance of street trees and other natural elements in historic districts to promote livability.

The preservation ordinance is intended to promote the recognition, preservation, protection and reuse of historic districts, to promote the economic growth and general welfare of the city, to further educational and cultural enrichment, and to implement the policies of the comprehensive plan. The new bridge would be supported by micropiles and would utilize a single-span design which would minimize potential impact on the nearby landscape features of the district. The bridge design would be compatible with the historic fabric in the Minnehaha Historic District as analyzed above. The Minnehaha Historic District is an important historic landscape and the proposal aims to limit the impact on nearby trees and other landscape elements. Since the new bridge would be in the same location as the existing, the gateway experience between Minnehaha Park and West River Parkway would remain as travelers pass below the bridge. The alteration is compatible with the spirit and intent of the ordinance, as well as the applicable policies of the comprehensive plan.

RECOMMENDATIONS

The Department of Community Planning and Economic Development recommends that the Heritage Preservation Commission adopt staff findings for the applications by Hess Roise and Company for the property located at East 46th Street and Godfrey Parkway in the Minnehaha Historic District:

A. Certificate of Appropriateness.

Recommended motion: **Approve** the certificate of appropriateness to allow the demolition of the existing Godfrey Bridge, subject to the following conditions:

1. Photographic recordation of the bridge shall be prepared and submitted to staff that is in accordance with the guidelines of the Minnesota Historic Property Record.
2. By ordinance, approvals are valid for a period of two years from the date of the decision unless required permits are obtained and the action approved is substantially begun and proceeds in a continuous basis toward completion. Upon written request and for good cause, the planning director may grant up to a one year extension if the request is made in writing no later than May 17, 2018.
3. By ordinance, all approvals granted in this certificate of appropriateness shall remain in effect as long as all of the conditions and guarantees of such approvals are observed. Failure to comply with such conditions and guarantees shall constitute a violation of this Certificate of Appropriateness and may result in termination of the approval.

B. Certificate of Appropriateness.

Recommended motion: **Approve** the certificate of appropriateness to allow the construction of a new bridge, subject to the following conditions:

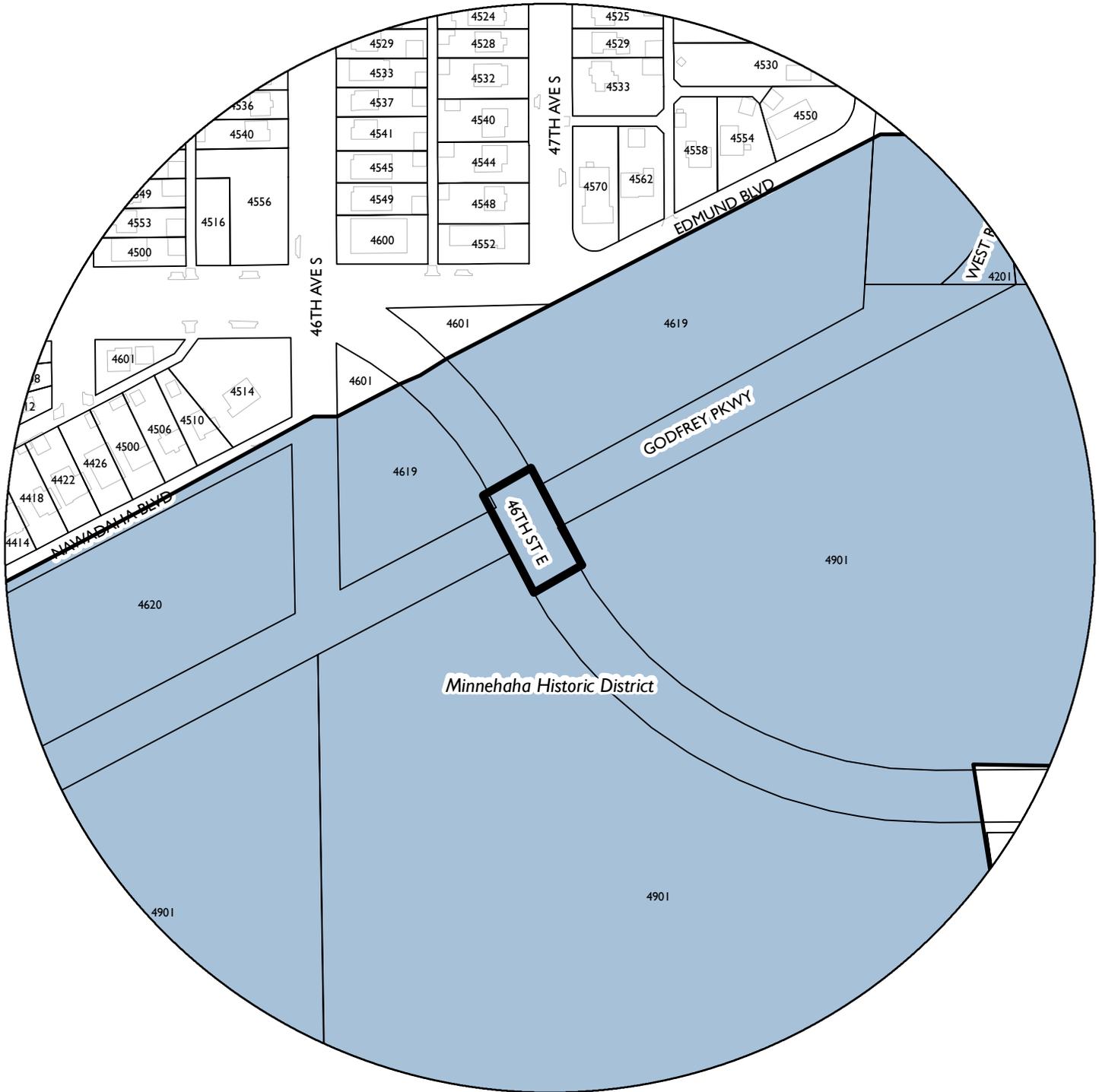
1. By ordinance, approvals are valid for a period of two years from the date of the decision unless required permits are obtained and the action approved is substantially begun and proceeds in a continuous basis toward completion. Upon written request and for good cause, the planning director may grant up to a one year extension if the request is made in writing no later than May 17, 2016.
2. By ordinance, all approvals granted in this certificate of appropriateness shall remain in effect as long as all of the conditions and guarantees of such approvals are observed. Failure to comply with such conditions and guarantees shall constitute a violation of this Certificate of Appropriateness and may result in termination of the approval.

ATTACHMENTS

1. BZH Map
2. 1926 Photo
3. Written description and findings submitted by applicant
4. Photos
5. Minnesota Structure Inventory Report
6. Minnesota Bridge Inspection Report
7. Cost Estimates
8. Plans
9. Correspondence

NAME OF APPLICANT

WARD



PROPERTY ADDRESS

East 46th Street Bridge over Godfrey Parkway

FILE NUMBER

BZH-29102



1926 - Hennepin County Special Collections



**REPLACEMENT OF HENNEPIN COUNTY BRIDGE NO. 90585
EAST FORTY-SIXTH STREET (CSAH 46) OVER GODFREY PARKWAY,
MINNEHAHA PARK, MINNEAPOLIS**

CERTIFICATE OF APPROPRIATENESS APPLICATION
MINNEAPOLIS HERITAGE PRESERVATION COMMISSION
SUBMITTED APRIL 15, 2016
FOR PUBLIC HEARING MAY 17, 2016

CONTENTS

Project Overview	1
Project Description.....	2
Historical Background and Description.....	2
Existing Conditions.....	5
Proposed Design	8
Current Photographs	9
Certificate of Appropriateness Findings per Section 599.350 of the Minneapolis Code of Ordinances	16
Appendices	
Minnesota Department of Transportation Bridge Inspection Report	
Notification to Council Member Andrew Johnson	
Notification to Melanie Majors, Executive Director of the Longfellow Community Council	
Authorization Letter from Hennepin County	

PROJECT OVERVIEW

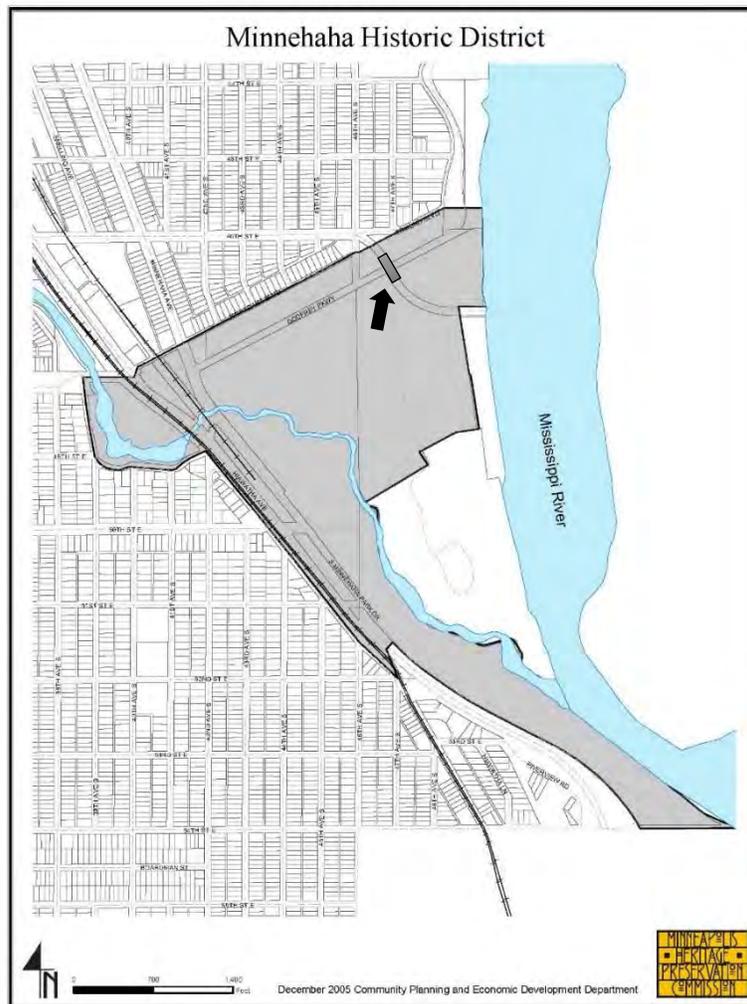
Replacement of Hennepin County Bridge No. 90585

East Forty-sixth Street (CSAH 46) over Godfrey Parkway, Minnehaha Park, Minneapolis

Owner: Hennepin County
Engineer: TKDA
Historian: Hess, Roise and Company

Historic District: Minnehaha Historic District (both local and National Register designations)

Site Status: The bridge is not identified in the National Register nomination but falls within the district boundary.



Minnehaha Historic District

The location of Bridge No. 90585 is identified with an arrow.

(Map from Minneapolis Heritage Preservation Commission website:

http://www.ci.minneapolis.mn.us/www/groups/public/@cped/documents/webcontent/convert_272951.pdf)

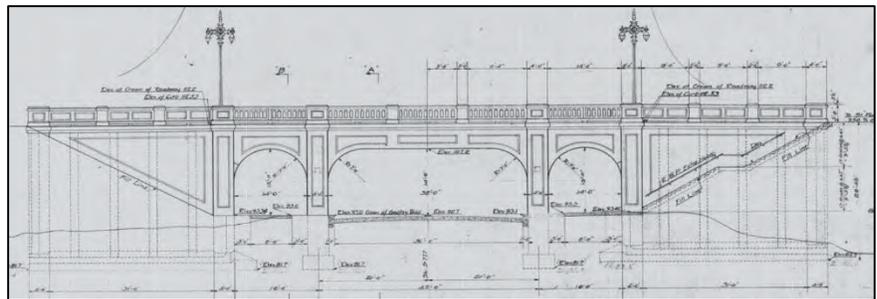
PROJECT DESCRIPTION

Hennepin County proposes to replace the ninety-year-old Hennepin County Bridge No. 90585, often referred to as the “Godfrey Bridge,” which shows severe signs of deterioration and has been determined to be structurally deficient. The bridge is located within the Minnehaha Historic District, which was listed in the National Register of Historic Places in 1969 and designated a local historic district in 1986. The boundaries of the local district mirror those identified in the National Register nomination. Although the Godfrey Bridge falls within the boundaries of the Minnehaha Historic District, the structure is not identified as a contributing resource. There is no separate local district nomination, so this application relies on documentation within the National Register nomination. Similarly, there are no design guidelines for the local district, so the Secretary of the Interior’s Standards will be applied to evaluate the proposed work.

Historical Background and Description

The Godfrey Bridge was designed in 1925 as an approach to the Intercity Bridge, more commonly known as the Ford Bridge, which was listed in the National Register of Historic Places in 1989. The Godfrey Bridge carries East Forty-sixth Street (CSAH 46) over Godfrey Parkway in south Minneapolis, and the Intercity Bridge carries the road over the Mississippi River to connect to Ford Parkway in Saint Paul. Martin Sigvart Grytbak—a bridge engineer for the city of Saint Paul—designed both structures, but the Godfrey Bridge opened in 1926, a year ahead of the Intercity Bridge’s completion. The roadway originally carried driving lanes for motorists as well as tracks for electric streetcars.¹

Historically called the Godfrey Road Viaduct, the bridge is a three-span, reinforced-concrete, deck-girder structure with an arched fascia. It is 152’ long overall, with a central 38’ span flanked by two 14’ spans. The spans are separated by two 4’-wide piers, and the abutment and back wall on both ends of the bridge measure 39’ long. Two piers with arched openings support the upper deck. A flight of concrete stairs along the west side of the south abutment connects the lower footpath to the upper deck of the bridge. The concrete deck is approximately 64’ wide, with a 50’-wide roadway flanked by two 6’-wide sidewalks. The railings are low, modern, concrete parapets and metal



*Grytbak’s original scheme for the Godfrey Bridge included open balustrades, recessed panels, and ornate light fixtures along the upper deck. These were replaced in the 1970s.
(Hennepin County Department of Public Works)*

¹ Jeffrey Hess, Minnesota Historic Bridge Inventory Form for Godfrey Bridge, Bridge Number 90585, October 8, 1996; M. S. Grytbak, “Mississippi River Bridge Between St. Paul and Minneapolis Connecting Ford Ave. St Paul and 46th Ave. So. Minneapolis, Plan and Profile of Minneapolis Approach,” Sheets 63–70, July 8, 1925 (hereafter Plans for Godfrey Bridge, 1925).

pipe. Both the deck and the railings were installed in the early 1970s and are not original features.

The structure crosses Godfrey Parkway and Minnehaha Park, which are both part of the Grand Rounds, a system of parks and parkways that encircles the city of Minneapolis. Running approximately fifty miles in length, the park and parkway system was originally conceived in 1883 by Horace William Shaler Cleveland, a nationally renowned landscape architect. Christened the Grand Rounds in the early 1890s, the system was extended throughout the early twentieth century under the guidance of Minneapolis parks superintendent Theodore Wirth. The network links some of the city's most important natural and manmade features in a continuous scenic path that encourages recreational touring, bicycling, and pedestrian activity. Godfrey Parkway creates one such link. It extends through the northern stretch of Minnehaha Park and connects Minnehaha Parkway to West River Parkway, providing an overland route between two of the most important natural features of Cleveland's vision: Minnehaha Falls and the Mississippi River.



*The western approach road curves through the northeastern corner of Minnehaha Park. The Godfrey Bridge (circled) is located near the eastern end of Godfrey Parkway, where the road transitions around a bend to become West River Parkway.
(Minnesota Historical Aerial Photographs Online Collection)*

Built in conjunction with the Intercity Bridge, the Godfrey Bridge helps link south Minneapolis to the Highland Park neighborhood in Saint Paul, where the Ford Motor Company opened a plant in 1924. On the Saint Paul side, the Intercity Bridge lines up directly with Ford Parkway. On the Minneapolis side, the approach road makes a sweeping curve through the northeastern corner of Minnehaha Park, and the Godfrey Bridge carries it over Godfrey Parkway to align with East Forty-sixth Street just outside the park. The gentle curve on the Minneapolis side was likely a practical decision to connect to a city street as directly as possible while minimizing the intrusion into land owned by the park board. From an aesthetic perspective, however, the curve provides a unique visual experience to drivers approaching the Intercity Bridge from Minneapolis, who travel through wooded parkland before the scenic vista of the Mississippi River gorge is revealed upon their final turn to cross the river.²

² Plans for Godfrey Bridge, 1925; Robert Frame, "Intercity Bridge," National Register of Historic Places nomination, August 15, 1988, 8:1–2.

Historic accounts reveal that it is not the design of the Godfrey Bridge itself that was widely acclaimed, but rather the setting and the experience provided by the winding western approach to the Intercity Bridge. In 1926, the *Minneapolis Tribune* noted: “No small part of the [Intercity] bridge’s beauty on the Minneapolis side will be the long, winding approach, starting a block away, rising up on an embankment over the swampy land near the river bank, crossing Minnehaha parkway on a viaduct . . . and rounding a curve to come out on the bridge itself, affording a sweeping view of the river at one of its most beautiful points.” Although the Godfrey Bridge was constructed as part of the Intercity Bridge, it does not fall within the boundary specified in the National Register nomination for Gyrtbak’s masterpiece.³

The Minneapolis Park Board’s annual report for 1927 extolled the soaring structure over the Mississippi: “This new bridge between the two cities is in every respect one of the finest examples of good design and perfect workmanship. It was therefore most appropriate that the park departments of both cities should do their share to make the approaches to the bridge as attractive as possible. . . . Minnehaha State Park and the Municipal Tourist Camp [the current site of the Wabun Picnic Area] afford a good setting for the Minneapolis end of the Intercity Bridge and as such they must be maintained in the good condition which this year’s improvements have brought about.”⁴

Although the Godfrey Bridge falls within the Minnehaha Historic District, it is not specified as a contributing resource in the National Register nomination, which was completed in 1969. The ecological features of the park, however, are noted as historically significant and contributing resources to the district. The proposed replacement bridge will preserve the site’s documented setting and have a minimal impact to the landscape while maintaining the characteristic alignment of the Intercity Bridge’s western approach road. The proposed design is a response to a number of existing conditions, which are outlined in the next section.

³ “Ford Bridge Gradually Taking Form as ‘Highway in the Sky’ Over River,” *Minneapolis Tribune*, February 21, 1926.

⁴ Minneapolis Board of Park Commissioners (hereafter MBPC), *Forty-fifth Annual Report, 1927*, 24.

Existing Conditions

In May 2015, the Godfrey Bridge received a sufficiency rating of 33.4 percent, a very poor rating that is considered structurally deficient (inspection report appended to this application). It has substandard railings, leaky expansion joints, and severe delamination of the concrete on both the substructure and the superstructure. In the 2015 inspection, the deck and superstructure both received fair condition ratings, meaning that “all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.” The substructure received a poor condition, meaning that there was “advanced section loss, deterioration, spalling, or scour.” Furthermore, the bridge does not have the structural capacity to carry a potential future light-rail transit (LRT) track, a requirement for this corridor. Reinforcing the existing substructure to meet these standards would require extensive excavation and the removal of a significant number of mature trees on the embankment in the surrounding Minnehaha Park area (illustrated on page seven). On January 21, 2016, engineers from Hennepin County and TKDA met with arborists from the Minneapolis Park Board to identify significant trees that would need to be saved during the construction process. The arborists authorized the removal of only eight trees in the vicinity of the bridge. More than fifty trees—including several species that are documented in the National Register nomination—must be preserved and protected, so excavation, staging, and construction will need to have as minimal an impact to the landscape as possible.⁵

The existing reinforced-concrete abutment walls are 18” thick, heavily counterforted by wing walls. Altogether, the abutment and wing wall on each end of the bridge run 39’ long. Footings for both rest on a layer of bedrock approximately 12’ below the surface. (For comparison, the thickness of a typical MnDOT abutment stem is 54” thick and the bottom of the footing is 4’-6” below grade.) The existing abutment walls are severely delaminated in some areas, with significant rusting visible on the concrete face. The condition of the back face reinforcement is not known, but a new support system would be necessary to meet current loading standards and the potential LRT loading. A standard sheet-pile design, which is often used to minimize the extent of excavations, would need to be embedded 40’ to 50’ deep. This method is not feasible, however, due to the existing bedrock layer approximately 12’ below grade, so large open-cut excavations would be required to reach current structural and OSHA standards. Such excavations would threaten the surrounding landscape and ecological features within the park.

The existing concrete piers forming the substructure of the bridge also rest on the approximately 12’-deep layer of bedrock. Like the abutments, the piers would need to be strengthened to meet current and future loading, and such reinforcement would require large open-cut excavations that would threaten the surrounding landscape. The pier cap is integrated with the concrete beams of the superstructure, making isolated reinforcement infeasible. Furthermore, the distance between the top of the arches and the bottom of the beams is not enough to ensure that the arches would survive the demolition of the superstructure and part of the pier cap to strengthen the structure.

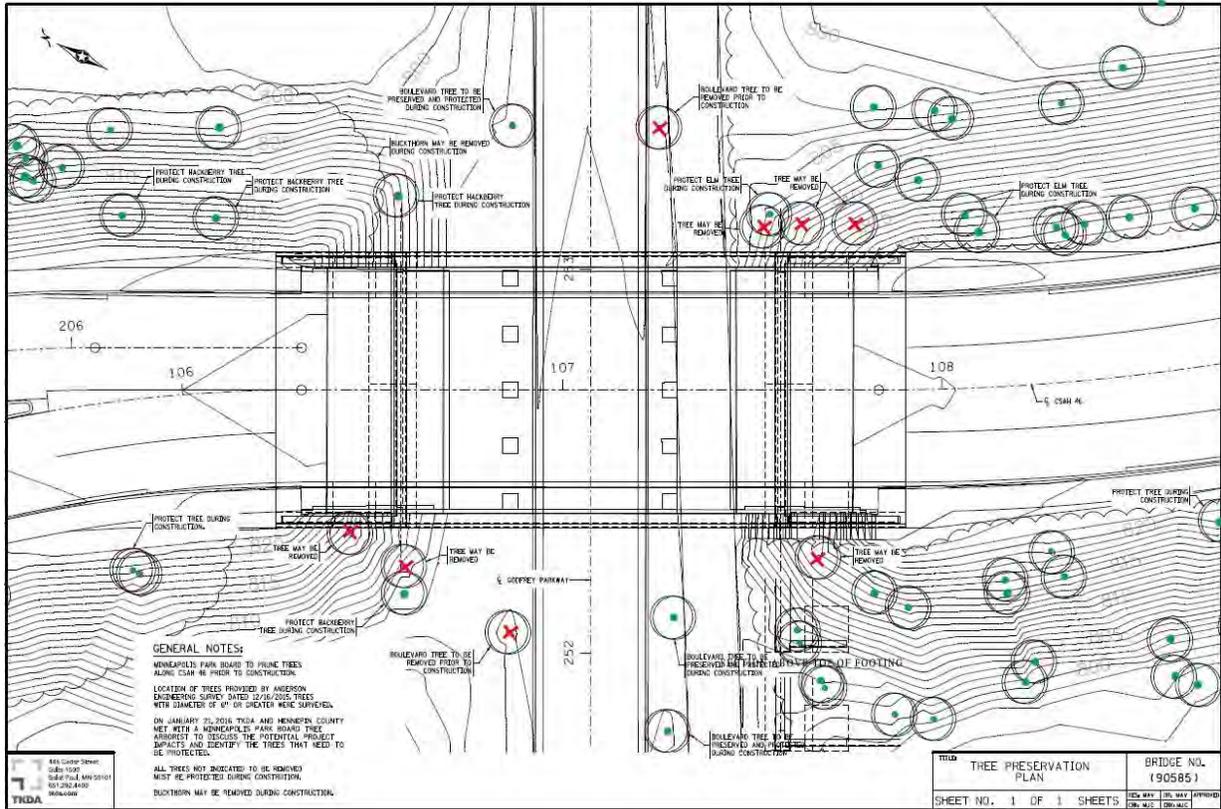
The proposed replacement bridge cannot extend beyond the boundaries of the existing right-of-way without triggering a “conversion of use” finding under Section 6(f) of the Land and Water Conservation Fund Act, which preserves land for public outdoor recreational use. If the bridge

⁵ Thomas Ryan, J. Eric Mann, Zachary Cahill, Bryan Ott, *Bridge Inspector’s Reference Manual* (Arlington, Va.: Federal Highway Administration National Highway Institute, 2012), 4.2.3.

extended beyond the existing right-of-way, Hennepin County would have to acquire additional land to replace the displaced parkland.

Traffic also complicates the construction process. East Forty-sixth Street (CSAH 46) is classified as a minor augmentor and has an average daily traffic volume of 16,200. The county highway carries traffic from Minneapolis over the Mississippi River and into Saint Paul via the Intercity Bridge, a crucial southern connection for both cities. The road also provides a primary route to Minnehaha Park, a popular regional destination that attracts nearly 850,000 visitors annually. Furthermore, Godfrey Parkway creates a link between two of the most significant parkways in the Grand Rounds: Minnehaha Parkway and West River Parkway. A number of large events take place along the route, including the Twin Cities Marathon, and the park board has requested that the design and construction plan allow for these events to proceed without interruption.

The park board has also requested that the new bridge be a single-span structure to enhance public safety. The current sequence of closely spaced piers, coupled with arched fascia on either end, creates a dark, tunnel-like environment for pedestrians along the parkway. Such features are at odds with current bridge engineering practices, which attempt to reduce tunnels and spaces with areas where people could potentially hide.



Green dots represent trees that must be protected during construction. Fifty are shown on this drawing, but there are additional trees that add to the wooded character of the area (pictured below). Red “X” marks indicate the eight trees that may be removed. The understory is overgrown with buckthorn, a non-historic invasive species that may be removed during construction.



Above: Trees on the north (left) and south (right) embankments along the west elevation of the bridge.
 Below: Trees on the south (left) and north (right) embankments along the east elevation of the bridge.
 Photographs taken April 2016.



Proposed Design

The proposed replacement bridge is a single-span, reinforced-concrete bridge with pre-stressed concrete beams and subtly arched fascia forming the superstructure. The concrete deck will be 7" deep with a 2" overlay. An ornamental metal railing will run between cast-in-place concrete railing posts along the upper deck. The substructure will be composed of 4'-wide abutment walls backed by wingwalls measuring 30'-4". As a contemporary nod to the existing bridge's Neoclassical design, the outer corners of the abutment walls will have pilasters with rusticated details, which will also appear on pilasters and arches along the abutment walls. Except for these areas of rustication, the concrete surfaces will have a smooth finish. All of the concrete will have a uniform gray color. This new construction will be differentiated from the appearance of the older bridge, and these details will create a new structure that is sympathetic to the character of the Minnehaha Historic District while remaining a construct of its own time.

The design and construction staging plan will minimize impacts to Godfrey Parkway, East Forty-sixth Street (CSAH 46), and the surrounding ecological features, which are documented as contributing resources in the Minnehaha Historic District National Register nomination. The bridge's abutments will be supported by micropiles, which use smaller equipment than standard sheet-pile construction because the large cranes and pile driving equipment necessary for a traditional sheet-pile design could cause significant damage to the existing trees. The location of the abutments and the elevation of their footings will be set to minimize the extent of large open-cut excavations, which could also cause considerable damage to the landscape. A single-span configuration, as opposed to a three-span configuration, minimizes the extent of excavations by limiting the number of footings for the bridge. The single-span configuration also provides a more open design, which is preferable for public safety. The engineers have proposed a staging plan that would minimize disruptions to traffic and park board programming. Travel on the upper roadway will be reduced to single lanes on one-half of the bridge while the other half is under construction.

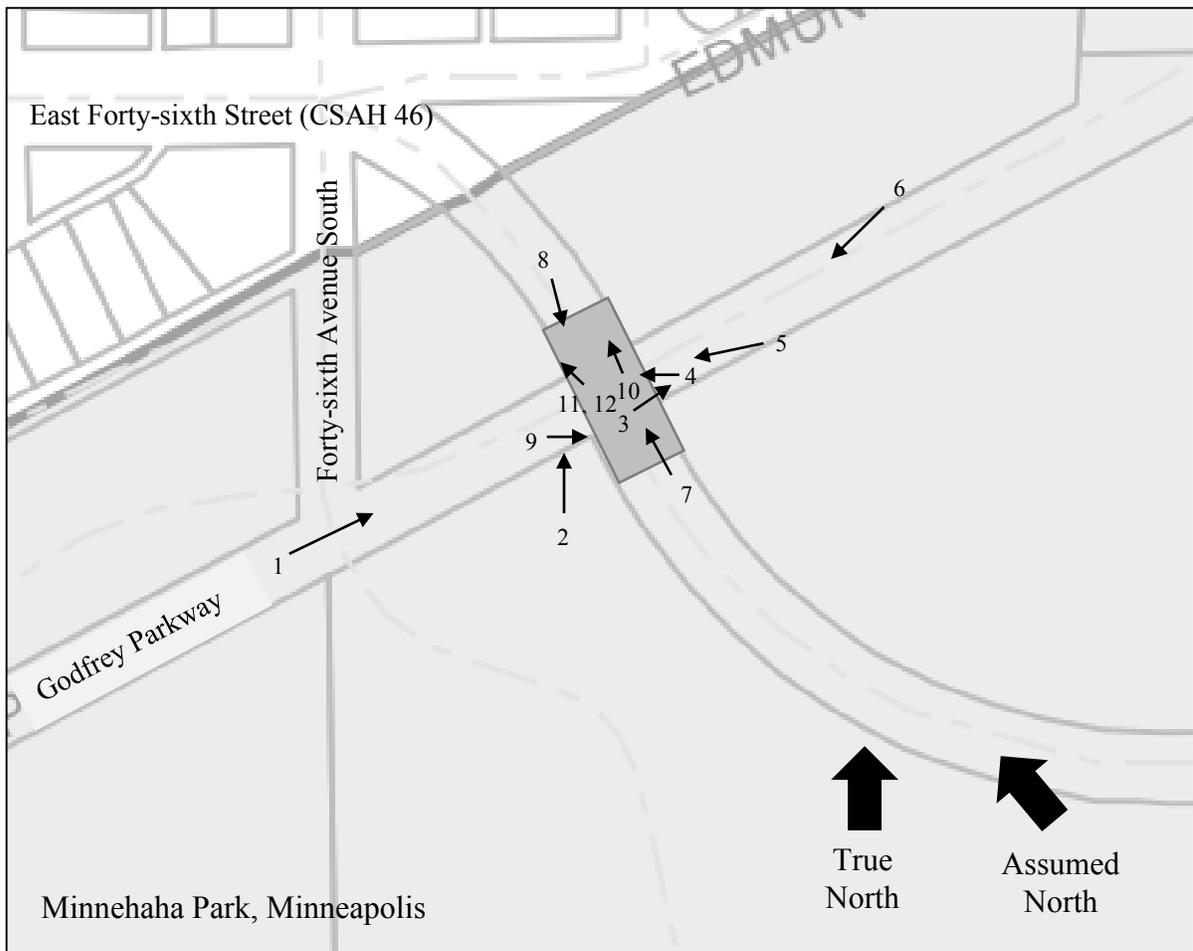


A rendering of the proposed replacement bridge. (TKDA, April 2016)

CURRENT PHOTOGRAPHS

The following photographs show the existing bridge within the surrounding landscape and illustrate its deteriorating structural conditions.

Key to current views on the following pages





1 (above): The western elevation of the Godfrey Bridge in its surrounding landscape.

2 (below): A closer view of the western elevation and trees immediately next to the structure.





3 (left): The substructure creates a dark, tunnel-like environment.

4 (below): The beams that form the superstructure are physically integrated into the pier cap.





5 (above): The eastern elevation of the bridge.

6 (below): The eastern elevation of the bridge within the surrounding landscape.





7 (above): The roadway carrying East Forty-sixth Street (CSAH 46) passes through a mature tree canopy.

8 (below): The present railings were installed in the 1970s and do not meet current bridge safety standards.





*9 (left) and 10 (below):
Views of the severe delamination and
structural decay on the abutment walls
and underneath the deck.*





11 (left): Additional view showing the severe delamination and structural decay on the abutments.

12 (below): A view of the delamination on the underside of the concrete deck.



CERTIFICATE OF APPROPRIATENESS FINDINGS PER SECTION 599.350 OF THE MINNEAPOLIS CODE OF ORDINANCES

Note: The following analysis assumes that information in the National Register nomination applies to the local district as well. In the absence of local design guidelines, the Secretary of the Interior's Standards will be applied.

1. *The alteration is compatible with the designation of the landmark or historic district, including the period and criteria of significance.*

Although the Godfrey Bridge lies within the boundary of the Minnehaha Historic District, it is not mentioned in the nomination as a contributing element. The surrounding ecological features, however, are specifically called out as important resources to the cultural landscape. The description section of the nomination states: "A variety of ecological conditions are found in the park. Plant life in the glen varies greatly from that on the high upper grounds. Oak, Elm, Basswood, and Hackberry trees, Currant bushes and Grapevines are seen on the upper level." These are the same varieties of trees found on the embankments next to the Godfrey Bridge that would be threatened by the construction work necessary to reinforce and rehabilitate the existing structure. The nomination also relays the significance of Minnehaha Park as being one of Horace Cleveland's primary elements of his plan for the Minneapolis park system, which "emphasized the natural beauty of the river banks and lakes." The Minneapolis Board of Park Commissioners "worked for decades to preserve these resources," and enhanced their natural beauty in landscape campaigns over the years. Such was the case after the Intercity Bridge opened. The park board's 1927 annual report relays the agency's desire to enhance and preserve the wooded setting along the bridge's western approach road through Minnehaha Park.⁶

The nomination does not delineate a period of significance, as was common with early nominations. Similarly, no registration criteria are specified, although conservation and urban planning are identified as two of the areas of significance.

2. *The alteration will ensure the continued integrity of the landmark or historic district.*

A resource's integrity is measured through seven aspects of integrity, including location, design, setting, materials, workmanship, feeling, and association. The proposed work will ensure the continued integrity of Minnehaha Park's cultural landscape and the ecological features documented in the National Register nomination.

- a. **Location:** The proposed bridge will be in the same location in the northeast corner of Minnehaha Park. It will maintain the existing right-of-way as the existing bridge.
- b. **Design:** The proposed bridge will preserve the sweeping curve of the western approach road to the Intercity Bridge, a characteristic landscape feature in this section

⁶ MBPC, *Forty-fifth Annual Report, 1927*, 24; John Grossman, "Minnehaha State Park/Minnehaha Historic District," National Register of Historic Places nomination, October 2, 1969, 7:1-2, 8:1-2.

of Minnehaha Park that was documented by the *Minneapolis Tribune* and the Minneapolis Park Board's 1927 annual report.⁷

The design of the replacement bridge will be complementary to the aesthetic of the existing bridge to remain compatible with the cultural landscape. The Neoclassical design of the existing bridge created a monolithic appearance by using a uniform material and color: gray reinforced concrete. Although the railings were replaced in the 1970s, historic photographs and drawings show that the pilasters were visually carried through to the railing posts to appear like a unified piece. There was also a rhythm of primary and secondary posts, with the larger posts corresponding to the pilasters below. The bridge has smooth finishes compared to the rustic stone and concrete bridges found elsewhere in the park. Lastly, arched piers create a rhythmic sequence for those passing beneath the bridge and the arched fascia frames distant vistas of Minnehaha Park and West River Parkway.

The proposed bridge will incorporate many of these elements. It will be a reinforced-concrete bridge with smooth surfaces and a uniform gray color. The pilasters will have a rusticated appearance as a contemporary nod to the original Neoclassical design. They will correspond to larger, primary, railing posts along the upper deck, which will alternate with smaller, secondary, posts. An ornamental metal railing will run between the posts. The new railing meets current safety standards, and its design is complementary to the Neoclassical aesthetic and corresponds to the railing along the nearby Intercity Bridge. Historically, the two bridges featured similar, but not identical, railings. On the substructure, a sequence of rusticated pilasters and arches will run along the abutment walls to create a rhythmic sequence for passersby. Pre-stressed concrete beams will emulate the historic appearance of concrete girders overhead. Lastly, subtly arched fascia on the east and west elevations will continue to frame distant vistas of Minnehaha Park and West River Parkway.

- c. **Setting:** *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* indicates that some aspects of integrity can be more “particularly vital” to a property than others. The aspect of setting is perhaps the most important consideration in assessing how the proposed work will ensure the continued integrity of the Minnehaha Historic District. The desire to preserve and enhance the natural setting in Minnehaha Park and along the bluffs of the Mississippi River is documented not only in Cleveland’s plan for the Minneapolis park system, but also in the park board’s annual reports. Cleveland called the river “the grand natural feature” of the city, recommending that a “broad avenue be laid out on each side.” The mastermind suggested that the setting would be that of a “continuous park” that would have “such picturesque character as no art could create and no other city can possess.” The park that Cleveland envisioned would terminate on the southern end at a park surrounding Minnehaha Falls, which was outside of city limits at the time. Cleveland’s sentiment was widely accepted according to the park board’s 1893 annual report: “Public opinion has for many years been in favor of securing the wooded banks of the river and preserving them in their natural state. . . . The sanitary

⁷ “Highway in the Sky;” MBPC, *Forty-fifth Annual Report, 1927*, 24.

effect of this will be felt when our city reaches the proportions we all know it must grow to. Cities as well as animals must have lungs.” After the Intercity Bridge opened, the park board determined that it was “most appropriate that the park departments of both cities should do their share to make the approaches to the bridge as attractive as possible.”⁸

Due to the layer of bedrock approximately 12’ below the surface of the ground, rehabilitating and reinforcing the existing bridge would require large open-cut excavations that would threaten the surrounding landscape features. Constructing a single-span bridge with abutments supported by micropiles limits the number of footings necessary to meet current structural standards and the potential LRT loading. A micropile design also allows smaller equipment to be used during construction instead of large cranes and standard pile driving equipment, which could cause significant damage to the surrounding landscape.

- d. **Materials:** Materials are defined as the “physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.” In a cultural landscape like the Minnehaha Historic District, these can include paving materials, vegetation and planting specimens, and the types of materials used to construct buildings, structures, and site furnishings.

The National Register nomination for the district includes planting specimens of oak, elm, basswood, and hackberry trees on the upper level of the park. These varieties are found along the embankments of the Godfrey Bridge. By preserving and protecting these existing trees and minimizing the damage to the adjacent lawn areas, the proposed bridge design ensures the continued integrity of vegetative materials within the Minnehaha Historic District. Similarly, Godfrey Parkway and its characteristic pavement with rose-colored aggregate will be preserved by eliminating the need for large open-cut excavations to reinforce and rehabilitate the existing piers and abutments.

The existing bridge shows severe physical deterioration. The intensity of the work necessary to reinforce the structure would destroy the existing bridge. The materials of the proposed bridge are compatible with the historic palette, which consisted of reinforced concrete with smooth finishes.

- e. **Workmanship:** The aspect of workmanship demonstrates the physical labor that went into building a historic resource. The nearby Intercity Bridge has long been noted as an engineering marvel, but the undertaking of constructing the winding western approach road is not as widely considered. Grade separations, such as the Godfrey Bridge, were created along many of the Minneapolis parkways to separate commuter traffic from recreational traffic and to maintain an uninterrupted leisurely

⁸ Horace William Shaler Cleveland, *Suggestions for a System of Parks and Parkways for the City of Minneapolis* (Minneapolis: Johnson, Smith and Harrison, 1883), 6–7; MBPC, *Eleventh Annual Report, 1893*, 6, and *Forty-fifth Annual Report, 1927*, 24.

driving experience. They were often introduced by greatly altering the natural topography of the land by grading and filling. Extensive filling was necessary to build the embankment carrying the western approach road, as illustrated by a photograph of the Godfrey Bridge while it was under construction (below). The natural, flat, topography is apparent on the northern side of the bridge, which had not been filled when the photograph was taken in February 1926.⁹



This 1926 photograph illustrates the extent of filling that was necessary to create the embankment. The natural flat topography is apparent on the left (north) side of the bridge in contrast to the graded earth visible on the right (south). (Minneapolis Collection, Hennepin County Central Library Special Collections)

Construction of the proposed replacement bridge will ensure that the manmade topography along the embankments, as well as the gradual slope rising north from Godfrey Parkway to East Forty-sixth Street, will not be damaged by the large open-cut excavations that would be required to rehabilitate and reinforce the existing structure.

- f. **Feeling:** There is a certain sensory experience for motorists approaching the Intercity Bridge, who travel through wooded parkland before the scenic vista of the Mississippi River gorge is revealed upon their final turn to cross the river. The mature tree canopy along the embankments significantly contributes to this feeling. There is also a sensory experience for motorists, pedestrians, and bicyclists along the parkway. The existing concrete structure creates a gateway between Godfrey Parkway and West River Parkway, signifying to travelers that they are leaving one segment of the Grand Rounds and entering another. Although the parkway is one continuous roadway, its character changes as users pass under the Godfrey Bridge. Visitors emerge in a new setting through this transition: West River Parkway is a scenic residential corridor with densely wooded boulevards along the bluffs of the Mississippi River, while the tree-lined Godfrey Parkway edges the sylvan picnic grounds of Minnehaha Park's upper glen. By incorporating the previously discussed design elements, the proposed replacement bridge can create a compatible gateway

⁹ "Highway in the Sky."

experience for parkway users while preserving important ecological features that are documented in the National Register nomination for the Minnehaha Historic District.¹⁰

- g. **Association:** This is defined as “the direct link between an important historic event or person and a historic property.” The Godfrey Bridge was constructed during an era when city agencies were responding to increased automobile use throughout the metropolitan area. Grade separations were introduced in several places along the Minneapolis park and parkway system to separate commuters from recreational motorists. The Minneapolis Park Board responded to the construction of the Intercity Bridge by preserving and enhancing the natural setting along its western approach road. Several mature trees in the vicinity of the Godfrey Bridge are the result of the park board’s campaigns to protect the natural resources found in Minnehaha Park and along the bluffs of the Mississippi River. By continuing to protect and preserve the mature landscape, the proposed alteration will ensure the continued integrity of the Minnehaha Historic District.

3. *The alteration is consistent with the applicable design guidelines adopted by the commission.*

The Minnehaha Historic District does not have associated design guidelines, so HPC staff indicated that the *Secretary of the Interior’s Standards for the Treatment of Historic Properties* be applied. Because the Minnehaha Historic District is a cultural landscape, the updated version of *The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* offers an appropriate framework to evaluate the proposed work and its overall impact on the park.¹¹

The first consideration when evaluating a cultural landscape like the Minnehaha Historic District is assessing a site’s spatial organization and land patterns, followed by determining the character-defining features of the landscape: topography, vegetation, circulation features, water features, and structures, site furnishings, and objects. After these are identified, a treatment option—Preservation, Rehabilitation, Restoration, or Reconstruction—can be selected. The most applicable treatment option for this project is Rehabilitation, which allows compatible alterations and new construction to ensure the landscape’s continued integrity and use.¹²

- a. **Spatial organization and land patterns** are largely tied to land use, but also include the visual relationships between spaces. In the northeast corner of Minnehaha Park, a tree-lined parkway passes beneath a grade separation that carries a county highway through a mature tree canopy. At the parkway level, distant scenic vistas are framed by a reinforced-concrete bridge.

¹⁰ Ibid.

¹¹ Charles A. Birnbaum and Christine Capella Peters, *The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (Washington, D.C.: U.S. Department of the Interior, 1996), 15–16.

¹² Ibid.

The Rehabilitation Guidelines recommend maintaining the elements that “comprise the overall pattern of the cultural landscape.” The proposed alteration will maintain the existing spatial organization and land patterns by preserving the separation of recreational and commuter traffic. Maintaining the exact location of the existing bridge will preserve the spatial organization of the site and the characteristic viewsheds of the landscape. Although a new structure is proposed, the county highway will continue to pass through a mature tree canopy and distant vistas of wooded parkland will be framed by a bridge at the parkway level because these vegetative features will be spared from the extensive excavations necessary for reinforcing the existing bridge. The Rehabilitation Guidelines also advise against introducing new construction that is visually incompatible with the landscape. The design elements outlined in Item 2 will ensure that the size, scale, materials, color, and texture of the new bridge are sympathetic to the overall cultural landscape.¹³

- b. **Topography** is the shape of the ground plane, which can be naturally occurring or manmade. In the project area, the topography is the result of human manipulation. It is gently undulating, rising to steeper embankments near the bridge. The ground plane gradually rises north of Godfrey Parkway to accommodate the grade change.

The Rehabilitation Guidelines advise against “placing a new feature where it may cause damage or is incompatible with historic topography,” and “locating a new feature in such a way that it detracts from or alters the historic topography.” The proposed alteration will preserve the historic manmade topography by eliminating the need for large open-cut excavations along the embankments that would be necessary for reinforcing the existing bridge.¹⁴

- c. According to the Guidelines, “**vegetation** may derive its significance from historical associations, horticultural or genetic value, or aesthetic or functional qualities. It is a primary dynamic component of the landscape’s character.” The vegetation features within the Minnehaha Historic District are specifically defined as significant resources in the National Register nomination: “A variety of ecological conditions are found in the park. Plant life in the glen varies greatly from that on the high upper grounds. Oak, Elm, Basswood and Hackberry trees, Currant bushes and Grapevines are seen on the upper level. Descending into the lower level, you enter a darker, damper, more protected environment that nourishes mosses, lichens and ferns. Prints of ancient fossil plants may be seen in the limestone.” These are the natural features landscape architect Horace William Shaler Cleveland sought to preserve in his plan for the Minneapolis parks and parkways. According to the Minnehaha Historic District nomination, Cleveland’s “plan emphasized the natural beauty of the river banks and lakes, recommended a linked series of open spaces, woods, vistas and recreation areas along the water ways. Enlightened Park Boards worked for decades to preserve these resources and with much success.”¹⁵

¹³ Ibid., 59.

¹⁴ Ibid., 62.

¹⁵ Ibid., 15; Grossman, “Minnehaha Historic District,” 7:1-2, 8:1-2.

Grassy lawns with scattered trees are on either side of the parkway on the west side of the bridge. East of the bridge, a grassy lawn is dotted with trees on the north side of the parkway, but the stretch south of the parkway is more heavily wooded. Approximately fifty mature trees in the vicinity of the Godfrey Bridge have been marked to be protected and preserved during the construction process.

The Rehabilitation Guidelines advise against “placing a new feature where it may cause damage or is incompatible with the character of the historic vegetation,” and “locating any new vegetation feature in such a way that it detracts from or alters the historic vegetation.” The proposed alteration will protect vegetative resources by eliminating the need for large open-cut excavations that would be necessary for rehabilitating and reinforcing the existing bridge.¹⁶

- d. **Circulation** refers to features such as roads, parkways, footpaths, parking concourses, and trails that cross a cultural landscape. In the project area, circulation features include a scenic parkway that is grade-separated from a county highway. A recreational trail extends along the southern run of the parkway on the lower level, while concrete sidewalks parallel the upper roadway on both sides.

The Rehabilitation Guidelines recommend “designing and installing compatible new circulation features when required by the new use to assure the preservation of the historic character of the landscape.” The alteration will maintain the historic arrangement of the landscape’s circulation features, and paving materials remain consistent with the present materials. Godfrey Parkway and its associated recreational trail will be preserved by eliminating the large open-cut excavation necessary to rehabilitate and reinforce the existing Godfrey Bridge. Although a new deck will be laid along the county highway, its design and materials are compatible with the historic configuration. Safety barriers will separate the sidewalks from the driving lanes. Ornamental metal railings and concrete railing posts will line the outside run of the sidewalks. The heights of the ornamental railing (4’-6”) and the concrete railing posts (5’) conform to current safety standards.¹⁷

- e. There are no associated **water features** in the project area that will be impacted by the proposed alteration.
- f. **Structures, site furnishings, and objects** can contribute to a cultural landscape’s character. The existing bridge acts as a gateway between two sections of the park system, but it does not have the structural capacity to meet current standards or the potential LRT loading requirements. The intensity of the work necessary to meet these standards would destroy the existing bridge. The Rehabilitation Guidelines state: “When alterations to a cultural landscape are needed to assure its continued use, it is most important that such alterations do not radically change, obscure, or destroy character-defining spatial organization and land patterns or features and materials. . . . If, after a thorough evaluation of alternative solutions, a new addition is still judged to

¹⁶ Birnbaum and Capella, *Guidelines for the Treatment of Cultural Landscapes*, 66.

¹⁷ *Ibid.*, 72.

be the only viable alternative, it should be planned, designed, and installed to be clearly differentiated from the character-defining features, so that these features are not radically changed, obscured, damaged, or destroyed.” Extensive planning and consideration have gone into the design of the proposed replacement bridge to protect the surrounding landscape and ecological features that are documented within the National Register nomination for the Minnehaha Historic District. Design elements on the replacement bridge are compatible with the materials, finishes, and color of the existing bridge to ensure it is sympathetic to the cultural landscape and does not detract from the surrounding environment.¹⁸

4. *The alteration is consistent with the applicable recommendations contained in The Secretary of the Interior’s Standards for the Treatment of Historic Properties.*

See Item 3.

5. *The alteration is consistent with the spirit and intent of the preservation ordinance, the applicable policies of the comprehensive plan, and the applicable preservation policies in small area plans adopted by the city council.*

The proposed alteration is consistent with the following city policies and ordinances:

- a. **Open Space Policy 7.1:** Promote the physical and mental health of residents and visitors by recognizing that safe outdoor amenities and spaces support exercise, play, relaxation, and socializing.
 - 7.1.2:** Ensure safety in open spaces by encouraging Crime Prevention through Environmental Design strategies.
 - 7.1.3:** Provide safe pedestrian and bike routes to open spaces and parks.

By proposing a single-span bridge in lieu of a three-span bridge, the alteration creates a more open and safer environment for pedestrians passing beneath East Forty-sixth Street (CSAH 46). Following current bridge-design practices, the new structure will minimize the dark, tunnel-like experience and eliminate spaces where people could potentially hide.

- b. **Open Space Policy 7.3:** Maintain and improve the accessibility of open spaces and parks to all residents.
 - 7.3.6:** Ensure that in all areas of the city people feel safe so that they are comfortable using parks and open spaces.

See previous entry.

- c. **Open Space Policy 7.4:** Work to restore and preserve ecosystem functions in green open space areas.

¹⁸ Ibid., 79.

7.4.3: Identify ecological impacts on open spaces and parks caused by urban uses . . . and work to mitigate these impacts in order to advance environmental and human health.

7.4.4: Encourage the protection, conservation, and maintenance of the environment in the design and operation of open spaces.

The proposed design will protect and preserve the historic ecological features found in the upper level of Minnehaha Park. By preserving the mature trees along the embankment, the proposed design will also preserve the sensory experience provided to motorists traveling along the western approach road to the Intercity Bridge.

- d. **Open Space Policy 7.5:** Protect landscapes that are significant to the historic legacy of Minneapolis, the region and state, and preserve and expand artistic features in publicly accessed open spaces.

7.5.4: Use open space to protect prime public view corridors such as those of landmark buildings, significant open spaces, and/or water bodies.

The proposed design will protect the Minnehaha Park landscape and its ecological features. Like the existing bridge, the proposed replacement bridge will frame the scenic vistas of Minnehaha Park and West River Parkway, which are characterized by mature tree canopies.

- e. **Open Space Policy 7.6:** Continue to beautify open spaces through well design landscaping that complements and improves the city's urban form on many scales—from street trees to expansive views of lakes and rivers.

7.6.1: Where open spaces and the built environment interface, seek greater design integration between them to create interesting spaces for active and passive use.

7.6.2: Provide visual and physical connections between urban areas and open spaces including lakes and rivers.

7.6.3: Invest in the greening of streets, particularly those that connect into and supplement the parks and open spaces network.

7.6.7: Maintain multimodal transportation corridors to link open spaces and parks with surrounding neighborhoods.

The proposed design has thoughtfully considered the integration between the built environment and the ecological features within the site. The proposed replacement bridge will maintain the existing visual and physical connections between Minnehaha Park and West River Parkway. By protecting the mature tree canopy, the proposed bridge will also maintain the connection between East Forty-sixth Street (CSAH 46) and Minnehaha Park by preserving the wooded corridor that motorists pass through on the county highway. The proposed design will also protect the investments the park board has already made in greening the streets that connect and supplement park and open space areas. Lastly, the proposed design will maintain the existing multimodal transportation corridors of Godfrey Parkway and West River Parkway, but it will also expand multimodal transportation opportunities on East Forty-sixth

Street (CSAH 46) by enhancing bicycle lanes and accommodating the potential growth of the LRT system.

- f. **Open Space Policy 7.8:** Strengthen existing and create new partnerships, including public-private partnerships, to deliver the best park and open space system possible.
 - 7.8.2:** Support the preservation of former transportation corridors that are intact or largely intact and use them to connect neighborhoods to each other and to major amenities.

The Intercity Bridge was originally constructed to connect neighborhoods in south Minneapolis and Saint Paul. In addition to driving lanes for automobiles, the roadway carried tracks for electric streetcars. The proposed design will maintain this connection between Minneapolis and Saint Paul and increase connectivity to Minnehaha Park through a variety of transportation options, including the potential growth of the LRT system.

- g. **Preservation Policy 8.1:** Preserve, maintain, and designate districts, landmarks, and historic resources which serve as reminders of the city's architecture, history, and culture.
 - 8.1.1:** Protect historic resources from modifications that are not sensitive to their historic significance.
 - 8.1.2:** Require new construction in historic districts to be compatible with the historic fabric.
 - 8.1.3:** Encourage new developments to retain historic resources, including landscapes, incorporating them into new development rather than removal.

The proposed alteration will preserve the ecological features that are listed as contributing resources in the National Register nomination for the Minnehaha Historic District. The design of the replacement bridge will be sympathetic to the historic district by using compatible materials, finishes, design elements, and colors.

- h. **Preservation Policy 8.5:** Recognize and preserve the important influence of landscape on the cultural identity of Minneapolis.
 - 8.5.1:** Identify and protect important historic and cultural landscapes.

See previous entry.

6. *The destruction is necessary to correct an unsafe or dangerous condition on the property; or there are no reasonable alternatives to the destruction. In determining whether reasonable alternatives exist, the commission shall consider, but not be limited to:*
 - a. *The significance of the property;*
 - b. *The integrity of the property; and*
 - c. *The economic value or usefulness of the existing structure, including its current use, costs of renovation and feasible alternative uses.*

The Godfrey Bridge has fallen into structural obsolescence and is past its useful life. In May 2015, the Godfrey Bridge received a sufficiency rating of 33.4 percent, a very poor rating that is considered structurally deficient. It has substandard railings, leaky expansion joints, and severe concrete delamination on the substructure that continues to decay. In the 2015 inspection, the deck and superstructure both received fair condition ratings, meaning that “all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.” The substructure received a poor condition, meaning that there was “advanced section loss, deterioration, spalling, or scour.” Although the bridge has fair historic integrity, it does not contribute to the significance of the Minnehaha Historic District as outlined in the site’s National Register nomination. Furthermore, the existing bridge does not have the structural capacity to carry the potential LRT loading required for this corridor. Reinforcing and rehabilitating the Godfrey Bridge to carry such loading would require construction processes that would threaten the surrounding landscape and ecological features, which are documented as contributing features in the district’s National Register nomination.

The intensity of the work would also destroy the remaining integrity of the historic bridge. Footings for the existing abutments and piers rest on a layer of bedrock that is approximately 12’ below grade. The abutments and piers would need extensive structural reinforcing to meet current loading standards and the potential future LRT loading. A standard sheet-pile design, which is often used to minimize the extent of excavations for abutments, would need to be embedded 40’ to 50’ deep. This method is not feasible, however, due to the existing shallow bedrock layer at 12’ below grade, so large open-cut excavations would be required to reach current structural and OSHA standards. Like the abutments, the piers would need to be strengthened to meet current and future loading, and such reinforcement would require large open-cut excavations that would threaten the surrounding landscape. Additionally, the pier cap is structurally integrated with the concrete beams of the superstructure, making isolated reinforcement infeasible. The distance between the top of the arches and the bottom of the beams is not enough to ensure that the arches would survive the demolition of the superstructure and part of the pier cap to strengthen the structure.

In repairing and reinforcing the existing structure, the bridge would essentially be replaced and the surrounding landscape would be negatively impacted due to the large open-cut excavations necessary to reconstruct the existing design. The proposed bridge’s design and construction plan will have less impact on the surrounding landscape and ecological features, which are contributing resources to the Minnehaha Historic District.

APPENDICES

Minnesota Department of Transportation Bridge Inspection Report

Notification of Public Hearing:

- Council Member Andrew Johnson, Ward 12
- Melanie Majors, Executive Director of the Longfellow Community Council

Authorization Letter from Hennepin County

Minnesota Department of Transportation Bridge Inspection Report

Bridge 90585, May 18, 2015

04/21/2016

MINNESOTA BRIDGE INSPECTION REPORT

Inspected by: HENNEPIN COUNTY

BRIDGE 90585 CSAH 46(E 46TH ST) OVER STR 1203(GODFREY RD)

INSP. DATE: 05-18-2015

County: HENNEPIN Location: 0.3 MI W OF COUNTY LINE Length: 76.8 ft
 City: MINNEAPOLIS Route: CSAH 46 Ref. Pt.: 003+00.996 Deck Width: 64.3 ft
 Township: Control Section: Maint. Area: Rdwy. Area / Pct. Unsnd: 3,843 sq ft
 Section: 17 Township: 028N Range: 23W Local Agency Bridge Nbr: 738 Paint Area / Pct. Unsnd:
 Span Type: CONC DECK GIRD Culvert: N/A
 NBI Deck: 5 Super: 5 Sub: 4 Chan: N Culv: N
 Open, Posted, Closed: OPEN
 Appraisal Ratings - Approach: 6 Waterway: N MN Scour Code: A-NON WATERWAY Def. Stat: S.D. Suff. Rate: 33.4
 Required Bridge Signs - Load Posting: NOT REQUIRED Traffic: NOT REQUIRED
 Horizontal: NOT REQUIRED Vertical: NOT APPLICABLE

ELEM NBR	ELEMENT NAME	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
800	CRITICAL DEFS OR SAFETY HAZARDS	05-18-2015	1 EA	1	0	0	0
Notes: No critical structural deficiencies or serious safety hazards are present on this structure.							
12	REINFORCED CONCRETE DECK	05-18-2015	4,938 SF	4,444	0	494	0
Notes: 359. Delams, scaling and long cracks w/ efflor mostly in 3rd and 5th bays from W. Few spalls and delams w/ rebar exp in center span @ 3rd bay from W. Diag cracks in 1st bay from W and E in all spans. Trans cracks in cantilever. Spalls in all bays of N span. '13-Approx 75 SF of spalls w/ rebar exp. Delams in 3rd and 5th bays from W have become spalls w/ rebar exp. '14-N span-minor spall(<1 SF) w/ rebar exp in E bay. Diag cracks w/ efflor in 3rd bay from W. 50 SF spall in 3rd bay from W. 2 minor delams in 4th from W. Several minor spalls(total < 2 SF) in 5th from W. Center span-1 small spall(<1 SF) w/ rebar exp in 1st bay from E. 2 small spalls (total < 1 SF) w/ rebar exp in 2nd from E. Multiple spalls(total <2 SF), 2 w/ rebar exp and long crack w/ efflor in 3rd from E. Trans & long crack w/ efflor in 4th from E. 18 SF of spall w/ rebar exp and a long crack w/ efflor in 3rd from W. '15-20 SF of spall w/ rebar exp in 3rd bay from W; 10 SF in 5th from W. Full length long crack w/ efflor in							
510	WEARING SURFACE	05-18-2015	3,843 SF	3,766	0	77	0
Notes: Low Slump Overlay with Uncoated Rebar Notes: 22. Deck repaired and new conc O/L in 2001. Excessive long, diag and map cracks. Cracks sealed in '10. '13-No change. '14-cracks unsealed. '15-no change.							
810	CONC WEAR SURF-CRACKING SEALING	05-18-2015	0 LF	0	0	0	0
Notes: 358. Deck cracks sealed in '10. '12-some cracks unsealed. '13-No change. '14-unsealed map cracks. '15-same.							
300	STRIP SEAL DECK JOINT	05-18-2015	125 LF	0	125	0	0
Notes: 300. New strip seal and walk protection plate in 2001. Between bridge and approach panel. Joints filled w/ sand. '13-both joints opened +/- 1". '14-both joints filled w/ debris. '15-most debris cleared-joints holding water. Metal rails have surface rust.							
302	COMPRESSION DECK JOINT	05-18-2015	128 LF	0	128	0	0
Notes: 302. End of approaches. N and S joints partially deteriorated. '13-No change. '14-about 10% of N joint and 25% of S joint are deteriorated. '15-no change.							
330	METAL BRIDGE RAILING	05-18-2015	305 LF	0	305	0	0
Notes: [2016] Migrator assumed concrete/metal combination type rail. 333. Galvanized railing. Vert cracks in railbase w/ efflor. Railbase pitted @ NE corner. Conc spalled @ name plate @ SE corner. NW railbase spalled. Top rail hit and deformed in NE corner by light base. Cracks sealed in '10. '13-SW railbase spalled. '14-map cracking/spalling on NE rail where light base is located. Sealed cracks are spaced 1'-3' apart. Minor scale on E railbase. '15-no change.							
515	STEEL PROTECTIVE COATING	05-18-2015	999 SF	999	0	0	0
Notes: [2016] Migrator assumed CS1 and a quantity of 999 SF.							
331	REINFORCED CONC BRIDGE RAILING	05-18-2015	305 LF	0	305	0	0
Notes: [2016] Migrator assumed concrete/metal combination type rail. 333. Galvanized railing. Vert cracks in railbase w/ efflor. Railbase pitted @ NE corner. Conc spalled @ name plate @ SE corner. NW railbase spalled. Top rail hit and deformed in NE corner by light base. Cracks sealed in '10. '13-SW railbase spalled. '14-map cracking/spalling on NE rail where light base is located. Sealed cracks are spaced 1'-3' apart. Minor scale on E railbase. '15-no change.							

321	CONCRETE APPROACH SLAB	05-18-2015	2,000 SF	0	2,000	0	0
Notes: [2016] Migrator assumed an approach slab length of 20FT and used the inventory quantity of 50FT for the width. 321. Trans cracks routed and sealed on S approach in 1999. New O/L in 2001. Patches in SW and SE corner(35 SF). Sealed trans and long cracks in N panel. '10-Diag cracks in S panel. Patch in NE corner of N. '14-S panel shows traffic wear. '15-no change.							
110	REINFORCED CONC GIRDER OR BEAM	05-18-2015	614 LF	315	201	98	0
Notes: 110. Bridge has been hit @ scraped over each lane. Conc cracked @ several bearing areas. '14-surface finish peeling. NORTH SPAN: NW fascia bearing area spalled and delam'd w/ rebar exposed @ abut. NE bearing area cracked and delam'd @ abut. Conc spalled w/ rebar exposed @ 3rd bearing from E @ abut. '10-Hairline vert cracks in S 1/2 of 5 of 6 interior girders. '13-No change. '14-NE bearing area is spalled. '15-2' x 3' spall w/ rebar exp in center of 3rd beam from E. CENTER SPAN: Conc cracked and delam'd @ bottom of 1st, 3rd, 4th and 5th girders from E. 4th(4 SF in '14) and 5th(2 SF in '14) girders from E have large spalls w/ rebar exposed. E fascia hit and spalled w/ rebar exposed-(0.5' x 2'). '13-No change. '14-2 small spalls(total<2 SF) in W face of E fascia. 2 small spalls(total<1 SF) on W face of 2nd beam from E. '15-Spall in 4th from E is now 6 SF. SOUTH SPAN: Rebar exp and rusted @ 3rd from W. '10-Hairline vert cracks in N 1/2 of all girders near haunch. Shear crack on ins							
205	REINFORCED CONCRETE COLUMN	05-18-2015	10 EA	0	10	0	0
Notes: 205. Horiz cracks and spalls in N and S columns. Spall on E face of E column of N and S span. Spalls in 2nd column from W, S span. Vert crack in W face of E column, S span. Minor areas of surface finish peeling. Spall w/ rebar exp in E face of NW column. '13-No change. '14-small spall in NE corner of center column of N pier. '15-no change.							
215	REINFORCED CONCRETE ABUTMENT	05-18-2015	168 LF	10	30	93	35
Notes: [2016] Migrator added 40 LF to abutment quantity to account for wingwalls (CS1:10 CS2:30 CS3:0 CS4:0). 215. Special surface finish flaking off both abuts. Rust stains from seat - some leakage. Spalls w/ rebar exp and efflor, both abuts. Spalls and rebar exp, both parapets. Rust stains on both. North:Conc deteriorated and spalled w/ rebar exp @ NW and NE seat corners. Seat spalled @ 1st and 3rd stringer from E. Vert cracks w/ efflor @ NW corner. '11-Seat spalled @ 2nd beam from W. '13-Horiz cracks under bearing seats @ 3rd, 5th & 6th beams from W. '14-spall(<1 SF) under 4th beam from E & 3rd from W. Full height vert crack @ center. Vert crack under 3rd beam from E and 3rd from W. Parapet spalled in NE. Total of +/-70 SF of spalls. '15-small spalls @ vert crack in center. 80 SF of spall w/ rebar exp. South: SW seat corner repaired. 2nd and 4th bearing seat from W spalled @ S-part of 2nd repaired. Horiz cracks and spall @ 3rd bearing seat from W. '11-Vert crack under 3rd bearing from							
234	REINFORCED CONCRETE PIER CAP	05-18-2015	131 LF	131	0	0	0
Notes: 234.Rust stains in bottom of all cap arches. Vert crack in 2nd and 3rd arch from W @ S pier. '13-Vert crack in 2nd & 3rd arch from W @ N pier. '14-vert crack in 2nd arch from W @ N pier. Delam(<1 SF) on S face of W arch @ N pier. '15-no change.							
311	EXPANSION BEARING	05-18-2015	16 EA	0	16	0	0
Notes: 311. Badly rusted. '13-No change. '14-same. '15-same.							
855	SECONDARY MEMBERS (SUPER)	05-18-2015	1 EA	0	1	0	0
Notes: 380. Repaired shotcreted diaphragms 2, 3, 5, 6 and 7 @ N span and 3 and 5 @ center span. Diaphragm 7 spalled and rebars exp in N span. End diaphragms @ corner are spalled w/ rebar exp, except NW. '13-Shotcrete gone @ spall @ diaphragm 7 of N span. '14-center diaphragm @ N abut spalled w/ rebar exp. '15-1, 2, 5 & 6th from W @ S abut have spalls w/ rebar exp; 3rd from W is cracked.							
880	IMPACT DAMAGE	05-18-2015	1 EA	0	1	0	0
Notes: 362. Conc girders have been hit/scraped over both lanes in center span. '13-No change. '14-same. '15-same.							
883	CONCRETE SHEAR CRACKING	05-18-2015	1 EA	1	0	0	0
Notes: Use this element to monitor the presence of shear cracking on concrete elements. Pay particular attention to the concrete pier caps.							
890	LOAD PST OR VERTICAL CLR SIGNING	05-18-2015	1 EA	1	0	0	0
Notes: [2016] Structure requires a vertical clearance sign or load posting sign.							
891	OTHER BRIDGE SIGNING	05-18-2015	1 EA	1	0	0	0

Notes: 981. No parking @ NW and SW corners. '15-no change.

892	SLOPES & SLOPE PROTECTION	05-18-2015	1 EA	0	1	0	0
Notes: 985. Some erosion on SE and NW corners. SE and NE have been stabilized w/ bit. '13-No change. '14-vegetation in NE corner has been trimmed and trees removed. Minor erosion in SE corner. '15-veg has grown back in NE. SE continues to erode.							
894	DECK & APPROACH DRAINAGE	05-18-2015	1 EA	1	0	0	0
Notes: 984.							
895	SIDEWALK, CURB, & MEDIAN	05-18-2015	1 EA	0	0	0	1
Notes: 986. SE and SW approach walks are cracked @ manholes. Trans cracks in walk. Curb settled @ NE, NW & SW corners. Patches in E walk. Spall in E approach curb @ strip seal. Cracks sealed in '10. '13-NW approach walk cracked @ manhole. '14-settlement in all 4 corners. NE and SE app walks have been repaired to match bridge elev. < 1 SF spalling on curb face in NE corner. Cracks in walk are sealed. '15-no change.							
899	MISCELLANEOUS ITEMS	05-18-2015	1 EA	0	1	0	0
Notes: 988. Light standard on railbase in SW corner. Pole and light base removed from NE rail between '10 and '11 insp. 3" diam RMC in both walks. Stairs w/ railing in SW. Walk and stairs in SW have settled 1"-2". '14-5th stair from top has 1 SF spall w/ rebar exp. '15-multiple steps have small spalls w/ exp rebar.							
900	PROTECTED SPECIES	05-18-2015	1 EA	1	0	0	0
Notes: Use this element to track the presence of protected species living on this structure.							

General Notes: Bridge 90585(738) CSAH 46(E 46th St)/Godfrey Rd 5/18/15. PTH & JDE.

Notes: See CP 9922; SP 27-030-03 for repaired deck area and concrete O/L plan in '01. Poured deck joint removed during '01 O/L. Scheduled for replacement in 2016.

Recommended Repairs:

110. Monitor conc beams and conc bearing areas. Repair center span beam diaphragm, slab spalls and other substructure spalls. Also delams in many areas. Blast rebar in center span and coat w/ sealer.

300. Clean strip seal joints and check seals for damage.

MINNESOTA BRIDGE INSPECTION REPORT OLD ELEMENT SYSTEM

04/21/2016

Inspected by: HENNEPIN COUNTY

BRIDGE 90585 CSAH 46(E 46TH ST) OVER STR 1203(GODFREY RD)**INSP. DATE: 05-18-2015**

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4	QTY CS 5
22	LS O/L (CONC DECK)	4	05-18-2015 05-21-2014	4,941 SF 4,941 SF	0 0	4,941 4,941	0 0	0 0	0 0
Notes: 22. Deck repaired and new conc O/L in 2001. Excessive long, diag and map cracks. Cracks sealed in '10. '13-No change. '14-cracks unsealed. '15-no change.]									
300	STRIP SEAL JOINT	4	05-18-2015 05-21-2014	125 LF 125 LF	0 0	125 125	0 0	N/A N/A	N/A N/A
Notes: 300. New strip seal and walk protection plate in 2001. Between bridge and approach panel. Joints filled w/ sand. '13-both joints opened +/- 1". '14-both joints filled w/ debris. '15-most debris cleared-joints holding water. Metal rails have surface rust.]									
302	COMPRESSION JOINT	4	05-18-2015 05-21-2014	128 LF 128 LF	0 0	128 128	0 0	N/A N/A	N/A N/A
Notes: 302. End of approaches. N and S joints partially deteriorated. '13-No change. '14-about 10% of N joint and 25% of S joint are deteriorated. '15-no change.]									
321	CONC APPROACH SLAB	2	05-18-2015 05-21-2014	2 EA 2 EA	0 0	2 2	0 0	0 0	N/A N/A
Notes: 321. Trans cracks routed and sealed on S approach in 1999. New O/L in 2001. Patches in SW and SE corner(35 SF). Sealed trans and long cracks in N panel. '10-Diag cracks in S panel. Patch in NE corner of N. '14-S panel shows traffic wear. '15-no change.]									
333	RAILING - OTHER	4	05-18-2015 05-21-2014	305 LF 305 LF	0 0	305 305	0 0	N/A N/A	N/A N/A
Notes: 333. Galvanized railing. Vert cracks in railbase w/ efflor. Railbase pitted @ NE corner. Conc spalled @ name plate @ SE corner. NW railbase spalled. Top rail hit and deformed in NE corner by light base. Cracks sealed in '10. '13-SW railbase spalled. '14-map cracking/spalling on NE rail where light base is located. Sealed cracks are spaced 1'-3' apart. Minor scale on E railbase. '15-no change.]									
110	CONCRETE GIRDER	3	05-18-2015 05-21-2014	614 LF 614 LF	315 315	201 201	98 98	0 0	N/A N/A
Notes: 110. Bridge has been hit @ scraped over each lane. Conc cracked @ several bearing areas. '14-surface finish peeling. NORTH SPAN: NW fascia bearing area spalled and delam'd w/ rebar exposed @ abut. NE bearing area cracked and delam'd @ abut. Conc spalled w/ rebar exposed @ 3rd bearing from E @ abut. '10-Hairline vert cracks in S 1/2 of 5 of 6 interior girders. '13-No change. '14-NE bearing area is spalled. '15-2' x 3' spall w/ rebar exp in center of 3rd beam from E. CENTER SPAN: Conc cracked and delam'd @ bottom of 1st, 3rd, 4th and 5th girders from E. 4th(4 SF in '14) and 5th(2 SF in '14) girders from E have large spalls w/ rebar exposed. E fascia hit and spalled w/ rebar exposed-(0.5' x 2'). '13-No change. '14-2 small spalls(total<2 SF) in W face of E fascia. 2 small spalls(total<1 SF) on W face of 2nd beam from E. '15-Spall in 4th from E is now 6 SF. SOUTH SPAN: Rebar exp and rusted @ 3rd from W. '10-Hairline vert cracks in N 1/2 of all girders near haunch. Shear crack on inside face of W fascia. E fascia @ abut is spalled and delam'd. '13-No change. '14-same. '15- spall w/ rebar exp @ 2nd beam from W.]									
380	SECONDARY ELEMENTS	3	05-18-2015 05-21-2014	1 EA 1 EA	0 0	1 1	0 0	0 0	N/A N/A
Notes: 380. Repaired shotcreted diaphragms 2, 3, 5, 6 and 7 @ N span and 3 and 5 @ center span. Diaphragm 7 spalled and rebars exp in N span. End diaphragms @ corner are spalled w/ rebar exp, except NW. '13-Shotcrete gone @ spall @ diaphragm 7 of N span. '14-center diaphragm @ N abut spalled w/ rebar exp. '15-1, 2, 5 & 6th from W @ S abut have spalls w/ rebar exp; 3rd from W is cracked.]									
311	EXPANSION BEARING	3	05-18-2015 05-21-2014	16 EA 16 EA	0 0	16 16	0 0	N/A N/A	N/A N/A
Notes: 311. Badly rusted. '13-No change. '14-same. '15-same.]									

MINNESOTA BRIDGE INSPECTION REPORT

OLD ELEMENT SYSTEM

04/21/2016

Inspected by: HENNEPIN COUNTY

BRIDGE 90585 CSAH 46(E 46TH ST) OVER STR 1203(GODFREY RD)

INSP. DATE: 05-18-2015

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4	QTY CS 5
205	CONCRETE COLUMN	3	05-18-2015 05-21-2014	10 EA 10 EA	0 0	10 10	0 0	0 0	N/A N/A
Notes: 205. Horiz cracks and spalls in N and S columns. Spall on E face of E column of N and S span. Spalls in 2nd column from W, S span. Vert crack in W face of E column, S span. Minor areas of surface finish peeling. Spall w/ rebar exp in E face of NW column. '13-No change. '14-small spall in NE corner of center column of N pier. '15-no change.]									
215	CONCRETE ABUTMENT	3	05-18-2015 05-21-2014	128 LF 128 LF	0 0	0 0	93 93	35 35	N/A N/A
Notes: 215. Special surface finish flaking off both abuts. Rust stains from seat - some leakage. Spalls w/ rebar exp and efflor, both abuts. Spalls and rebar exp, both parapets. Rust stains on both. North:Conc deteriorated and spalled w/ rebar exp @ NW and NE seat corners. Seat spalled @ 1st and 3rd stringer from E. Vert cracks w/ efflor @ NW corner. '11-Seat spalled @ 2nd beam from W. '13-Horiz cracks under bearing seats @ 3rd, 5th & 6th beams from W. '14-spall(<1 SF) under 4th beam from E & 3rd from W. Full height vert crack @ center. Vert crack under 3rd beam from E and 3rd from W. Parapet spalled in NE. Total of +/-70 SF of spalls. '15-small spalls @ vert crack in center. 80 SF of spall w/ rebar exp. South: SW seat corner repaired. 2nd and 4th bearing seat from W spalled @ S-part of 2nd repaired. Horiz cracks and spall @ 3rd bearing seat from W. '11-Vert crack under 3rd bearing from E @ S. '13-3rd & 7th bearing seat from W spalled. '14-efflor @ cracks. 30 SF of spall w/ rebar exp & 10 SF of spalls. Horiz cracks under 3rd beam from W have spalled. '15-now 15 SF of spalls. 1.5 SF spall w/ rebar exp on outside of S at both wings.]									
234	CONCRETE CAP	3	05-18-2015 05-21-2014	131 LF 131 LF	131 131	0 0	0 0	0 0	N/A N/A
Notes: 234.Rust stains in bottom of all cap arches. Vert crack in 2nd and 3rd arch from W @ S pier. '13-Vert crack in 2nd & 3rd arch from W @ N pier. '14-vert crack in 2nd arch from W @ N pier. Delam(<1 SF) on S face of W arch @ N pier. '15-no change.]									
387	CONCRETE WINGWALL	3	05-18-2015 05-21-2014	4 EA 4 EA	1 1	3 3	0 0	0 0	N/A N/A
Notes: 387. Surface finish flaking and peeling @ all. NE-Small spall. Vert crack @ base of abut joint. SE-Full height vert crack. SW-Delams @ lower wall. Spalls w/ rebar exp. Full height vert crack. NW-Vert and horiz crack. Spalls @ abut joint. Surface finish flaking and peeling. '13-No change. '14-spall in NE is <1 SF. '15-vert cracks w/ stains in NW & SW.]									
358	CONC DECK CRACKING	2	05-18-2015 05-21-2014	1 EA 1 EA	0 0	1 1	0 0	0 0	N/A N/A
Notes: 358. Deck cracks sealed in '10. '12-some cracks unsealed. '13-No change. '14-unsealed map cracks. '15-same.]									
359	CONC DECK UNDERSIDE	2	05-18-2015 05-21-2014	1 EA 1 EA	0 0	0 0	1 1	0 0	0 0
Notes: 359. Delams, scaling and long cracks w/ efflor mostly in 3rd and 5th bays from W. Few spalls and delams w/ rebar exp in center span @ 3rd bay from W. Diag cracks in 1st bay from W and E in all spans. Trans cracks in cantilever. Spalls in all bays of N span. '13-Approx 75 SF of spalls w/ rebar exp. Delams in 3rd and 5th bays from W have become spalls w/ rebar exp. '14-N span-minor spall(<1 SF) w/ rebar exp in E bay. Diag cracks w/ efflor in 3rd bay from W. 50 SF spall in 3rd bay from W. 2 minor delams in 4th from W. Several minor spalls(total < 2 SF) in 5th from W. Center span-1 small spall(<1 SF) w/ rebar exp in 1st bay from E. 2 small spalls (total < 1 SF) w/ rebar exp in 2nd from E. Multiple spalls(total <2 SF), 2 w/ rebar exp and long crack w/ efflor in 3rd from E. Trans & long crack w/ efflor in 4th from E. 18 SF of spall w/ rebar exp and a long crack w/ efflor in 3rd from W. '15-20 SF of spall w/ rebar exp in 3rd bay from W; 10 SF in 5th from W. Full length long crack w/ efflor in 3rd bay from W; 50 LF of long crack w/ efflor in center span.]									
362	TRAFFIC IMPACT	2	05-18-2015 05-21-2014	1 EA 1 EA	0 0	1 1	0 0	N/A N/A	N/A N/A
Notes: 362. Conc girders have been hit/scraped over both lanes in center span. '13-No change. '14-same. '15-same.]									
964	CRITICAL FINDING	2	05-18-2015 05-21-2014	1 EA 1 EA	1 1	0 0	N/A N/A	N/A N/A	N/A N/A
Notes: 964.]									

MINNESOTA BRIDGE INSPECTION REPORT OLD ELEMENT SYSTEM

04/21/2016

Inspected by: HENNEPIN COUNTY

BRIDGE 90585 CSAH 46(E 46TH ST) OVER STR 1203(GODFREY RD)**INSP. DATE: 05-18-2015**

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4	QTY CS 5
981	SIGNING	2	05-18-2015	1 EA	1	0	0	0	0
			05-21-2014	1 EA	1	0	0	0	0
Notes: 981. No parking @ NW and SW corners. '15-no change.									
984	DRAINAGE	2	05-18-2015	1 EA	1	0	0	N/A	N/A
			05-21-2014	1 EA	1	0	0	N/A	N/A
Notes: 984.									
985	SLOPES	2	05-18-2015	1 EA	0	1	0	N/A	N/A
			05-21-2014	1 EA	0	1	0	N/A	N/A
Notes: 985. Some erosion on SE and NW corners. SE and NE have been stabilized w/ bit. '13-No change. '14-vegetation in NE corner has been trimmed and trees removed. Minor erosion in SE corner. '15-veg has grown back in NE. SE continues to erode.									
986	CURB & SIDEWALK	2	05-18-2015	1 EA	0	0	1	N/A	N/A
			05-21-2014	1 EA	0	0	1	N/A	N/A
Notes: 986. SE and SW approach walks are cracked @ manholes. Trans cracks in walk. Curb settled @ NE, NW & SW corners. Patches in E walk. Spall in E approach curb @ strip seal. Cracks sealed in '10. '13-NW approach walk cracked @ manhole. '14-settlement in all 4 corners. NE and SE app walks have been repaired to match bridge elev. < 1 SF spalling on curb face in NE corner. Cracks in walk are sealed. '15-no change.									
988	MISCELLANEOUS	2	05-18-2015	1 EA	0	1	0	N/A	N/A
			05-21-2014	1 EA	0	1	0	N/A	N/A
Notes: 988. Light standard on railbase in SW corner. Pole and light base removed from NE rail between '10 and '11 insp. 3" diam RMC in both walks. Stairs w/ railing in SW. Walk and stairs in SW have settled 1"-2". '14-5th stair from top has 1 SF spall w/ rebar exp. '15-multiple steps have small spalls w/ exp rebar.									

General Notes: Bridge 90585(738) CSAH 46(E 46th St)/Godfrey Rd 5/18/15. PTH & JDE.
Notes: See CP 9922; SP 27-030-03 for repaired deck area and concrete O/L plan in '01. Poured deck joint removed during '01 O/L. Scheduled for replacement in 2016.

Recommended Repairs:

- 110. Monitor conc beams and conc bearing areas. Repair center span beam diaphragm, slab spalls and other substructure spalls. Also delams in many areas. Blast rebar in center span and coat w/ sealer.
- 300. Clean strip seal joints and check seals for damage.

Steiner, Lisa

From: Jessica Berglin <berglin@hessroise.com>
Sent: Wednesday, May 04, 2016 2:59 PM
To: Steiner, Lisa
Subject: RE: Godfrey Bridge - COA cost estimates

Lisa:

And one more thing to add, the rehabbed bridge would have a projected useful life of about 20–40 years, versus the replacement bridge’s expected lifespan of 75+ years.

Thanks,
Jessica

From: Jessica Berglin
Sent: Wednesday, May 04, 2016 2:47 PM
To: 'Steiner, Lisa' <Lisa.Steiner@minneapolismn.gov>
Subject: Godfrey Bridge - COA cost estimates

Lisa:

I have attached the cost estimates for rehabbing the existing bridge and the proposed replacement bridge. The rehabbed figures include replacing the concrete deck, barrier, and approach panels (which are all non-historic elements) and retaining the abutments, piers, and beams (all extant historic elements). It should be noted, however, that the rehabbed bridge scenario would still not meet the requirements of the project scope, including having the structural capacity to carry potential LRT loads in the future. The rehabbed abutments, piers, and beams would not have the structural capacity to carry the required loads and cannot be reinforced to meet those requirements without causing significant damage to the surrounding landscape and destroying any extant historic material of the bridge, as is outlined in the COA application.

Also, I received the orange notices today, so I will get those posted and the affidavit returned to you as soon as possible.

Let me know if you have any additional questions.

Many thanks,
Jessica

Jessica Berglin
Hess, Roise and Company
100 North First Street
Minneapolis MN 55401
612-338-1987
berglin@hessroise.com

Bridge No. 90585 (Godfrey Bridge) Cost Estimates

Prepared May 4, 2016

BRIDGE 27B84 - CONSTRUCTION COST ESTIMATE (REPLACE)					
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
2104.501	REMOVE CONCRETE BARRIER	LIN FT	336	\$80.00	\$26,880.00
2104.505	REMOVE CONCRETE APPROACH PANEL	SQ YD.	243	\$20.00	\$4,860.00
2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LUMP SUM	1	\$5,000.00	\$5,000.00
2401.501	STRUCTURAL CONCRETE (1G52)	CU YD	770	\$500.00	\$385,000.00
2401.501	STRUCTURAL CONCRETE (3B52)	CU YD	238	\$800.00	\$190,400.00
2401.513	TYPE P-2 BARRIER CONCRETE (3S52)	LIN FT	506	\$110.00	\$55,660.00
2401.513	TYPE F MOD., TL-4 BARRIER CONCRETE (3S52)	LIN FT	336	\$90.00	\$30,240.00
2401.541	REINFORCEMENT BARS	POUND	18,920	\$1.20	\$22,704.00
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	101,880	\$1.35	\$137,538.00
2401.541	REINFORCEMENT BARS (STAINLESS-60 KSI)	POUND	2,740	\$6.80	\$18,632.00
2401.601	FOUNDATION PREPARATION NORTH ABUT	LUMP SUM	1	\$100,000.00	\$100,000.00
2401.601	FOUNDATION PREPARATION SOUTH ABUT	LUMP SUM	1	\$100,000.00	\$100,000.00
2401.618	BRIDGE SLAB CONCRETE (3YHPC-S)	SQ FT	7,448	\$40.00	\$297,920.00
2402.583	ORNAMENTAL METAL RAILING	LIN FT	371	\$300.00	\$111,300.00
2402.584	STRUCTURAL TUBE RAILING DESIGN T-1	LIN FT	115	\$150.00	\$17,250.00
2402.595	BEARING ASSEMBLY	EACH	18	\$1,500.00	\$27,000.00
2404.501	CONCRETE WEARING COURSE (3U17A)	SQ FT	7,953	\$5.00	\$39,765.00
2405.501	PRESTRESSED CONCRETE BEAMS TYPE MN45	EACH	9	\$30,000.00	\$270,000.00
2405.511	DIAPHRAGMS FOR TYPE MN45 PRESTRESSED BEAMS	LIN FT	132	\$125.00	\$16,500.00
2406.553	BRIDGE APPROACH PANELS	SQ YD.	496	\$300.00	\$148,800.00
2406.553	TEMPORARY BRIDGE APPROACH PANELS	SQ YD.	243	\$225.00	\$54,675.00

Bridge No. 90585 (Godfrey Bridge) Cost Estimates
 Prepared May 4, 2016

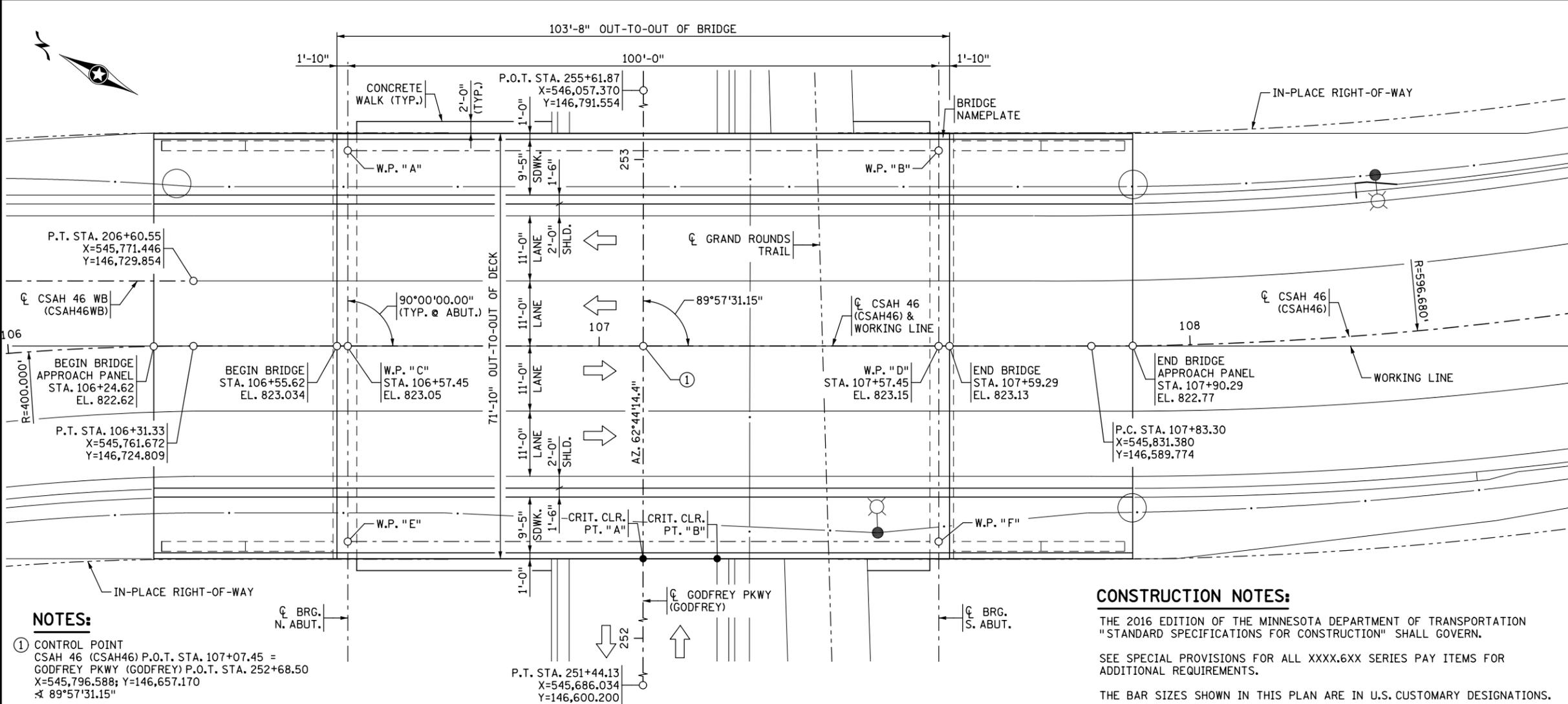
2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1	\$60,000.00	\$60,000.00
2452.601	MICROPILE MOBILIZATION	LUMP SUM	1	\$10,000.00	\$10,000.00
2452.602	MICROPILES	EACH	216	\$4,000.00	\$864,000.00
2452.602	MICROPILE PROOF LOAD TEST	EACH	4	\$8,000.00	\$32,000.00
2472.525	COUPLERS (REINFORCEMENT BARS) T-4	EACH	248	\$40.00	\$9,920.00
2472.525	COUPLERS (REINFORCEMENT BARS) T-5	EACH	240	\$40.00	\$9,600.00
2472.525	COUPLERS (REINFORCEMENT BARS) T-6	EACH	102	\$40.00	\$4,080.00
2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	1	\$5,000.00	\$5,000.00
2545.509	CONDUIT SYSTEM LIGHTING	LUMP SUM	1	\$5,000.00	\$5,000.00
				TOTAL COST (ROUNDED) :	\$3,059,724

BRIDGE 27B84 - CONSTRUCTION COST ESTIMATE (REHABILITATE)					
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
2021.501	MOBILIZATION	LS	1	\$50000.00	\$50,000.00
2104.501	REMOVE CONCRETE BARRIER	LIN FT	336	\$80.00	\$26,880.00
2104.505	REMOVE CONCRETE APPROACH PANEL	SQ YD	243	\$20.00	\$4,860.00
2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LS	1	\$5,000.00	\$5,000.00
2401.501	STRUCTURAL CONCRETE (3B52)	CU YD	238	\$800.00	\$190,400.00
2401.513	TYPE P-2 BARRIER CONCRETE (3S52)	LIN FT	304	\$110.00	\$33,440.00
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	10,188	\$1.35	\$13,753.80
2401.541	REINFORCEMENT BARS (STAINLESS-60 KSI)	POUND	1,602	\$6.80	\$10,892.55
2433.505	REMOVE CONCRETE BRIDGE DECK	SQ FT	4,954	\$80.00	\$396,291.28
2401.618	BRIDGE SLAB CONCRETE (3YHPC-S)	SQ FT	4,954	\$40.00	\$198,160.00
2402.583	ORNAMENTAL METAL RAILING	LIN FT	304	\$300.00	\$91,200.00
2404.501	CONCRETE WEARING COURSE (3U17A)	SQ FT	4,954	\$5.00	\$24,770.00
2406.553	BRIDGE APPROACH PANELS	SQ YD	992	\$300.00	\$297,600.00
2433.618	CONCRETE SURFACE REPAIR	SQ FT	23,274	\$160.30	\$3,730,799.80
TOTAL COST (ROUNDED) :					\$5,024,047

This estimate includes replacing the concrete deck, barrier, and approach panels (all non-historic elements) and rehabilitating the abutments, piers, and beams (extant historic elements).



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- NOTES:**
- CONTROL POINT
CSAH 46 (CSAH46) P.O.T. STA. 107+07.45 =
GODFREY PKWY (GODFREY) P.O.T. STA. 252+68.50
X=545,796.588; Y=146,657.170
AZ. 89°57'31.15"
 - CRITICAL CLEARANCE PT. "A"
14.62' VERTICAL CLEARANCE
 - CRITICAL CLEARANCE PT. "B"
14.76' VERTICAL CLEARANCE
- THE CONCRETE ARCH IS LOWER IN ELEVATION THAN THE PCB'S. CLEARANCE CALCULATIONS ARE TO THE CONCRETE ARCH.

GENERAL PLAN

SCALE 1" = 10' FEET

VPI STA. 107+05.000
EL. 824.260
M = -0.930'
200.000' V.C.
G1 = +2.000%
G2 = -1.720%

CONSTRUCTION NOTES:

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

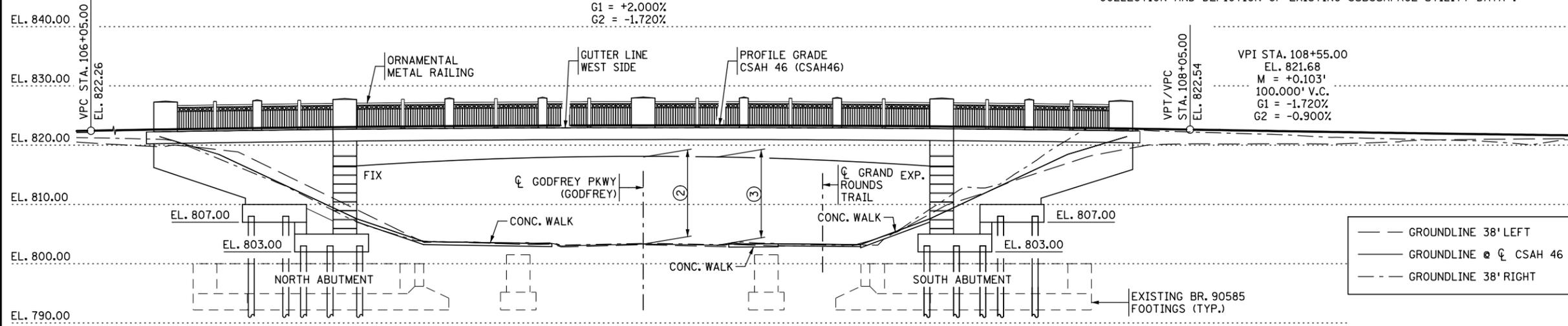
SEE SPECIAL PROVISIONS FOR ALL XXXX.6XX SERIES PAY ITEMS FOR ADDITIONAL REQUIREMENTS.

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

BAR SIZES MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

BAR SIZES MARKED WITH THE SUFFIX "S" SHALL BE STAINLESS STEEL IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

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".



GENERAL ELEVATION

SCALE 1" = 10' FEET

--- GROUNDLINE 38' LEFT
 --- GROUNDLINE @ CSAH 46
 --- GROUNDLINE 38' RIGHT

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPEC.
 HL 93 LIVE LOAD
 DEAD LOAD INCLUDES 20 POUNDS PER SQUARE FOOT ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
 f'c = 4 KSI CONCRETE
 fy = 60 KSI PLAIN AND EPOXY COATED BARS
 fy = 60 KSI STAINLESS STEEL BARS
 n = 8 FOR REINFORCEMENT
PRETENSIONED CONCRETE:
 f'c = 9.0 KSI CONCRETE
 fpu = 270 KSI LOW RELAXATION STRANDS
 n = 1 FOR REINFORCEMENT
 0.75 fpu FOR INITIAL PRESTRESS

DESIGN SPEED:
 OVER = 30 MILES PER HOUR
 UNDER = 25 MILES PER HOUR

APPROXIMATE DECK AREA = 7,447 SQUARE FEET

2036 PROJECTED TRAFFIC VOLUMES

ROADWAY OVER	ADT	ROADWAY UNDER
20,600		10,200
2,050	DHV	1,120
1,030	ADTT	510

HL93 LRFR
 BRIDGE OPERATING RATING FACTOR RF = 2.51

LIST OF SHEETS

NO.	DESCRIPTION
1	GENERAL PLAN AND ELEVATION
2	TRANSVERSE SECTION
3	BRIDGE LAYOUT
4-7	STAGING PLAN
8-9	AESTHETIC DETAILS
10-43	NORTH AND SOUTH ABUTMENT DETAILS
44-57	SUPERSTRUCTURE DETAILS
58-76	BARRIERS AND RAILING DETAILS
77-80	STANDARD DETAILS
81-91	APPROACH PANELS
92-96	BRIDGE SURVEY SHEETS

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

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.

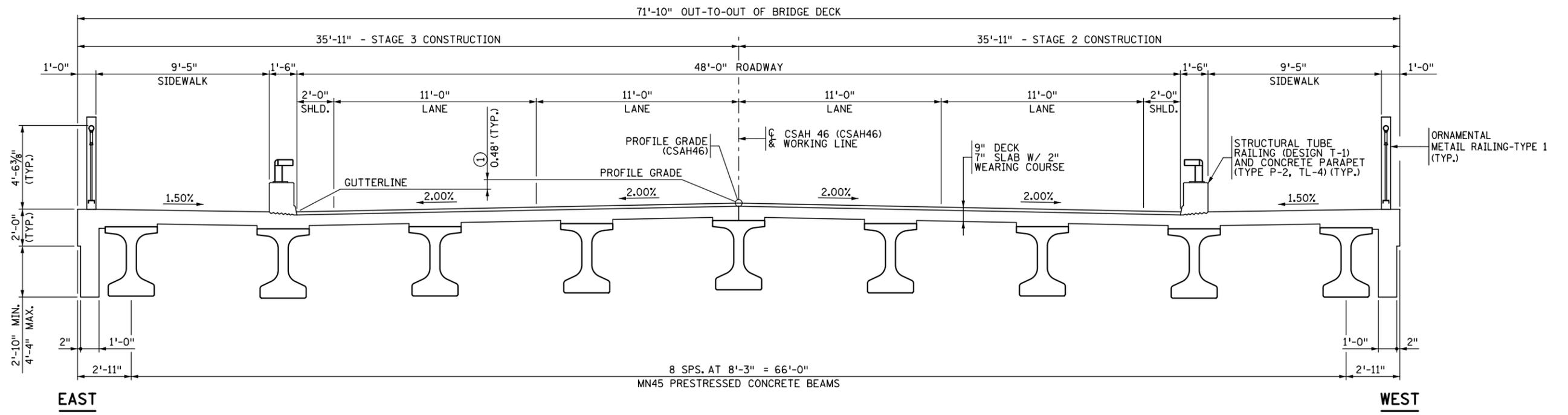
SIGNED _____ DATE _____
 NAME _____ LICENSE _____

MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 27B84
GENERAL PLAN AND ELEVATION
 CSAH 46 OVER GODFREY PARKWAY
 0.3 MILES WEST OF COUNTY LINE
 100'-0" PRESTRESSED CONCRETE BEAM SPAN
 48'-0" RDWY. 0° SKEW TWO 9'-5" SIDEWALKS
 TWO TYPE P-2 CONC. PARAPETS & ORNAM. RAILING
 IDENTIFICATION NO. 501

SEC. 17 T 028 N R 23 W
 CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED _____ COUNTY ENGINEER
 DATE _____
 APPROVED _____ STATE BRIDGE ENGINEER
 DATE _____



TRANSVERSE SECTION

SCHEDULE OF QUANTITIES

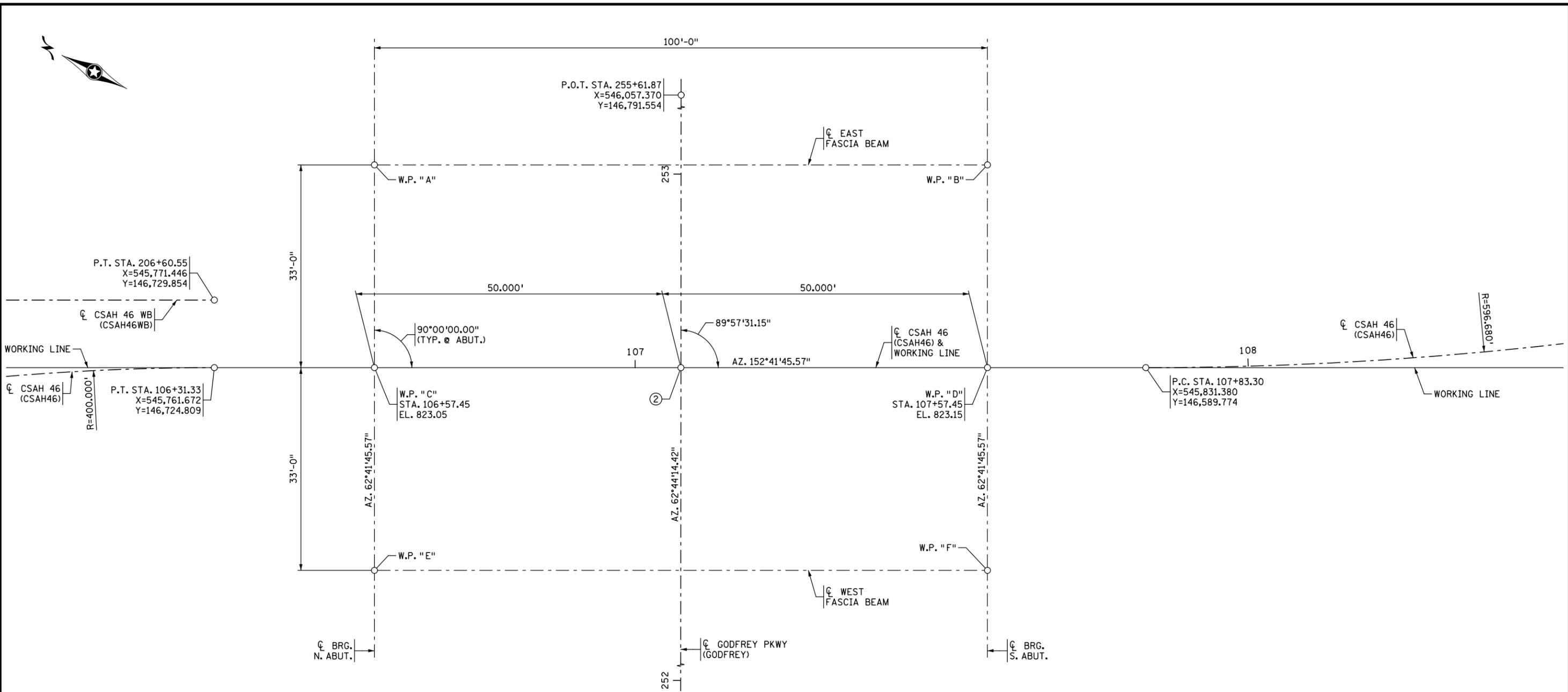
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY
④ 2104.501	REMOVE CONCRETE BARRIER	LIN FT	336 (P)
③ 2104.505	REMOVE CONCRETE APPROACH PANEL	SQ YD.	243 (P)
2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LUMP SUM	1
2401.501	STRUCTURAL CONCRETE (1G52)	CU YD	770 (P)
2401.501	STRUCTURAL CONCRETE (3B52)	CU YD	238 (P)
2401.513	TYPE P-2 BARRIER CONCRETE (3S52)	LIN FT	506 (P)
2401.513	TYPE F MOD., TL-4 BARRIER CONCRETE (3S52)	LIN FT	336 (P)
2401.541	REINFORCEMENT BARS	POUND	18,920 (P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	101,880 (P)
2401.541	REINFORCEMENT BARS (STAINLESS-60 KSI)	POUND	7,448 (P)
2401.601	FOUNDATION PREPARATION NORTH ABUT	LUMP SUM	1
2401.601	FOUNDATION PREPARATION SOUTH ABUT	LUMP SUM	1
2401.618	BRIDGE SLAB CONCRETE (3YHPC-S)	SQ FT	7,448 (P)
2402.583	ORNAMENTAL METAL RAILING	LIN FT	371 (P)
2402.584	STRUCTURAL TUBE RAILING DESIGN T-1	LIN FT	494 (P)
2402.595	BEARING ASSEMBLY	EACH	18 (P)
2404.501	CONCRETE WEARING COURSE (3U17A)	SQ FT	7,953 (P)
2405.501	PRESTRESSED CONCRETE BEAMS TYPE MN45	EACH	9 (P)
2405.511	DIAPHRAGMS FOR TYPE MN45 PRESTRESSED BEAMS	LIN FT	132 (P)
① 2406.553	BRIDGE APPROACH PANELS	SQ YD.	496 (P)
② 2406.553	TEMPORARY BRIDGE APPROACH PANELS	SQ YD.	243 (P)
⑤ 2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1
2452.601	MICROPILE MOBILIZATION	LUMP SUM	1
2452.602	MICROPILES	EACH	216 (P)
2452.602	MICROPILE PROOF LOAD TEST	EACH	4 (P)
2472.525	COUPLERS (REINFORCEMENT BARS) T-4	EACH	248 (P)
2472.525	COUPLERS (REINFORCEMENT BARS) T-5	EACH	240 (P)
2472.525	COUPLERS (REINFORCEMENT BARS) T-6	EACH	102 (P)
2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	1
2545.509	CONDUIT SYSTEM LIGHTING	LUMP SUM	1

- (P) DENOTES PLAN QUANTITY PAY ITEM AS PER SPEC. 1901.
- ① INCLUDES PERMANENT APPROACH PANEL.
- ② INCLUDES TEMPORARY APPROACH PANEL CONSTRUCTED IN STAGE 1 CONSTRUCTION.
- ③ REMOVAL OF TEMPORARY APPROACH PANEL CONSTRUCTED IN STAGE 1. TO BE REMOVED IN STAGE 3.
- ④ REMOVAL OF TEMPORARY CAST-IN-PLACE BARRIER CONSTRUCTED IN STAGES 1 AND 2.
- ⑤ INCLUDES REMOVAL OF EXISTING APPROACH PANELS.

NOTES:
 ① ELEVATION CHANGE FROM PROFILE GRADE TO SIDEWALK GUTTERLINE.

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DATE: 4/1/2016 TIME: 12:48:40 PM FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\genera\NCBR27\B84_s1203.dgn

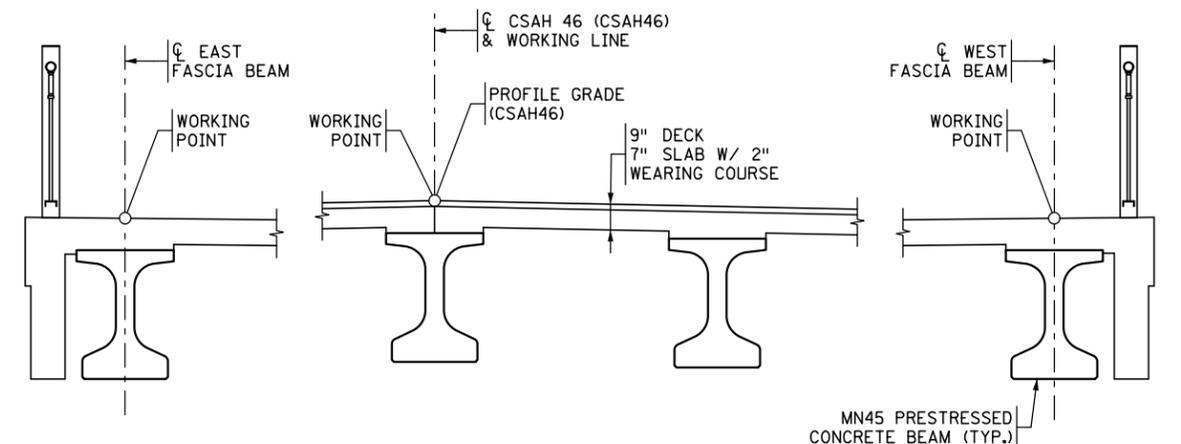


TOP OF ROADWAY TO BRIDGE SEAT		
	N. ABUT.	S. ABUT.
SLAB THICKNESS	9"	9"
STOOL HEIGHT	2"	2"
BEAM HEIGHT	45"	45"
BEARING ASSEMBLY HEIGHT	3.25"	5.25"
TOTAL (INCHES)	59.250	61.250
TOTAL (FEET)	4.938	5.104

- NOTES:**
- ① DIMENSIONS ARE GIVEN IN FEET, EXCEPT AS NOTED.
 - ② CONTROL POINT CSAH 46 (CSAH46) P.O.T. STA. 107+07.454 = GODFREY PKWY (GODFREY) P.O.T. STA. 252+68.496 X=545,796.588; Y=146,657.170 \angle 89°57'31.2"

WORKING POINT LAYOUT

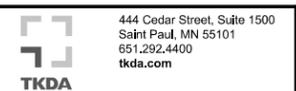
DIMENSIONS BETWEEN WORKING POINTS ①										ELEVATIONS ①			
POINT	STATION	X-COORD.	Y-COORD.	A	B	C	D	E	F	TOP OF DECK	TOP/DECK TO BR. SEAT	BRIDGE SEAT	POINT
A	106+57.454	545,802.976	146,716.737		100.00	33.00	105.30		119.82	822.69	4.94	817.75	A
B	107+57.454	545,848.847	146,627.878				33.00	119.82		822.78	5.10	817.68	B
C	106+57.454	545,773.653	146,701.599				100.00	33.00	105.30	823.05	-----	-----	C
D	107+57.454	545,819.524	146,612.741						33.00	823.15	-----	-----	D
E	106+57.454	545,744.330	146,686.462						100.00	822.69	4.94	817.75	E
F	107+57.454	545,790.201	146,597.603							822.78	5.10	817.68	F



WORKING POINT LOCATIONS

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



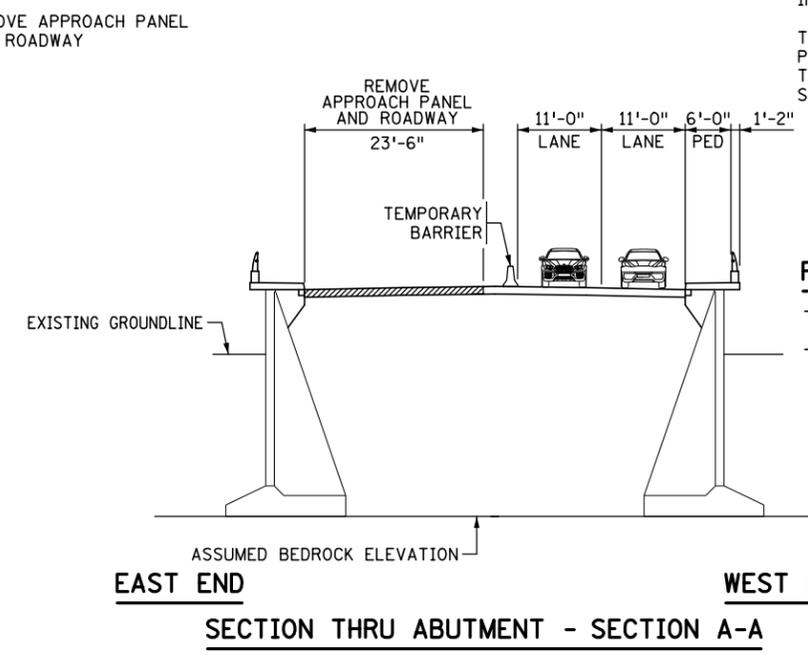
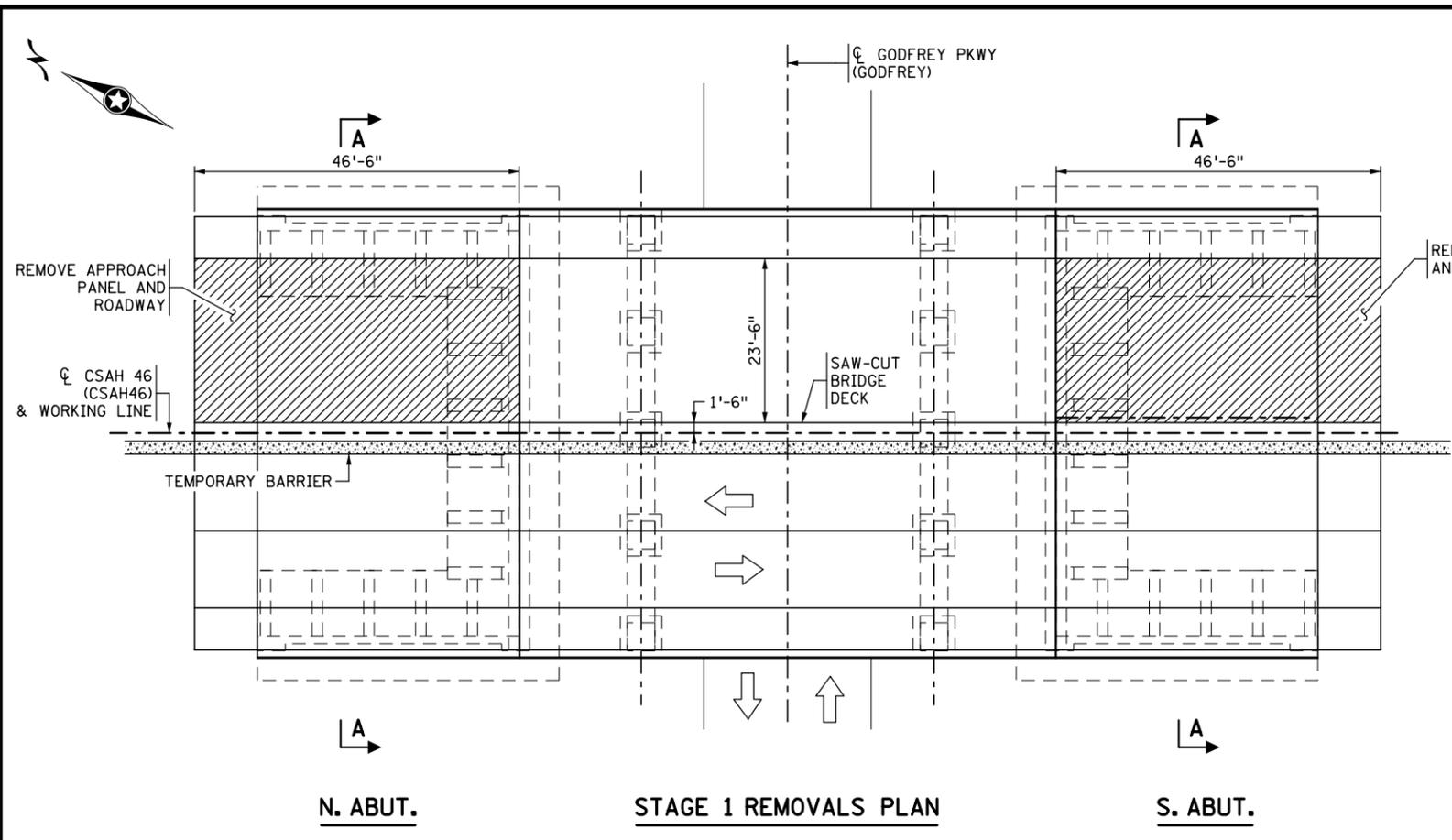
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **BRIDGE LAYOUT**

DES: LJJ DR: LJJ APPROVED
 CHK: MJC CHK: MJC
 SHEET NO. 3 OF 96 SHEETS

BRIDGE NO. **27B84**

DATE: 4/1/2016 TIME: 12:48:41 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\genera\NCBR27B84_sl204.dgn



STAGING OBJECTIVES:

STAGE 1 IS AN IMPORTANT PREPARATORY STAGE.

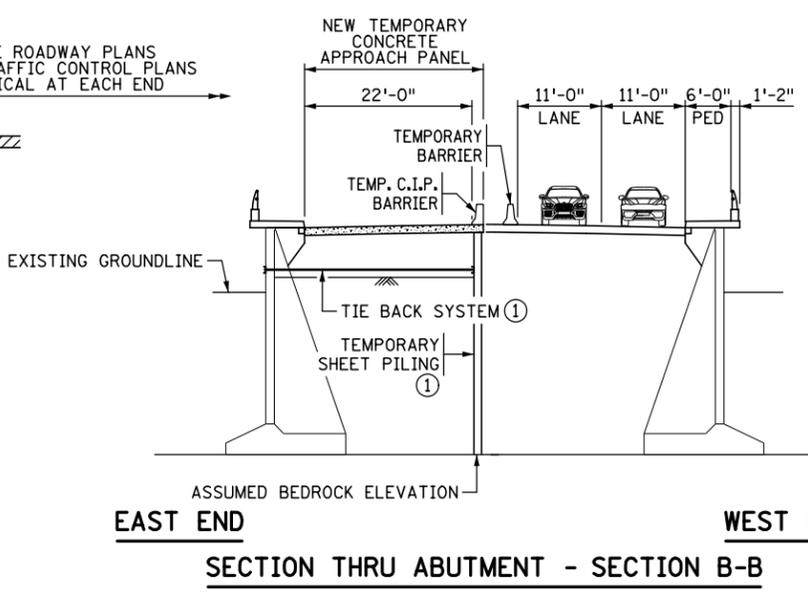
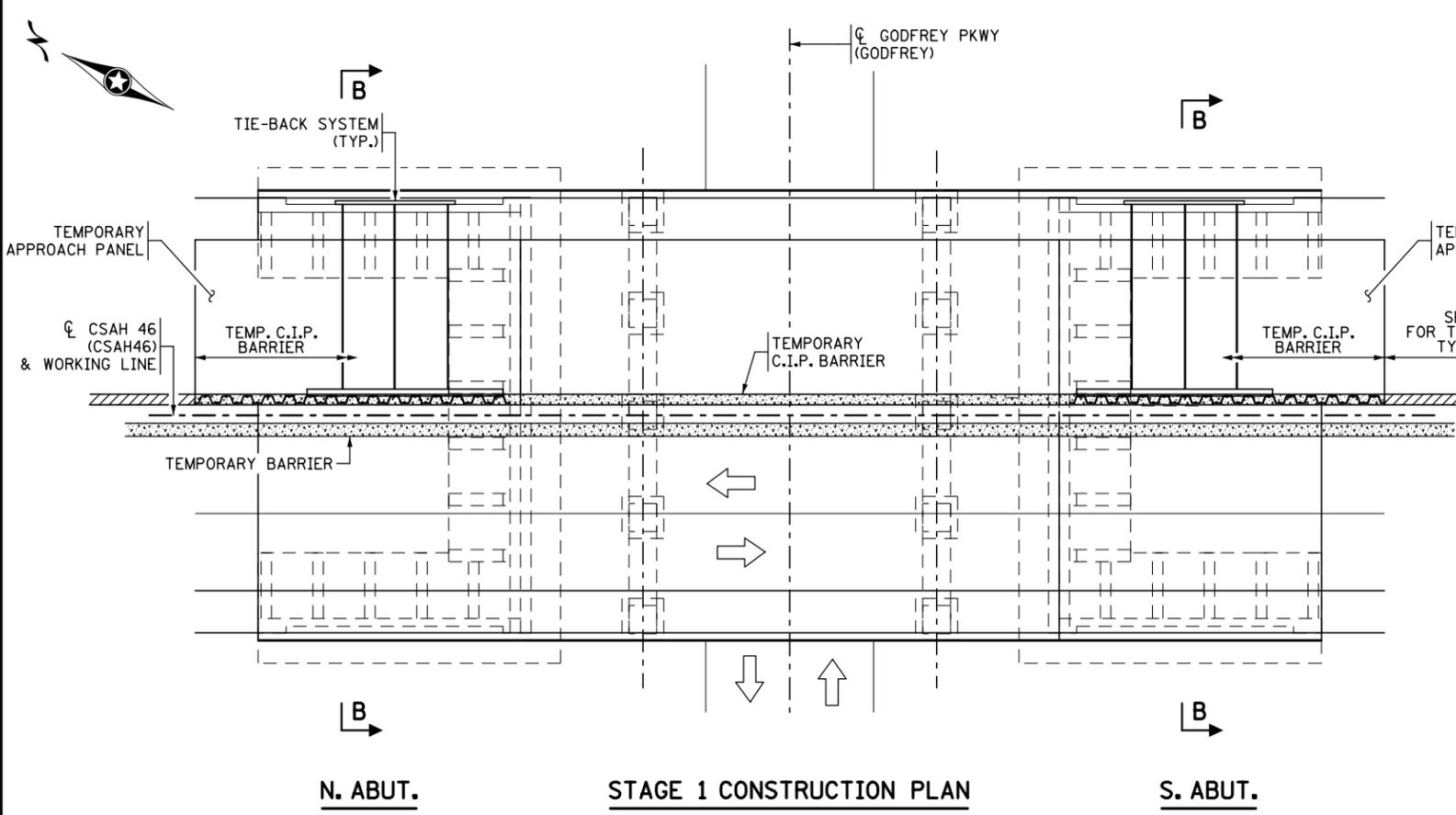
FIRST, THE TRAFFIC GETS SHIFTED TO THE WEST PORTION OF THE EXISTING BRIDGE.

SECOND, THE INSTALLATION OF THE TEMPORARY SHEET PILE WALLS AND TIE-BACKS BEHIND THE EXISTING ABUTMENTS STABILIZE THE BRIDGE APPROACHES AND ALLOW THE STRUCTURE EXCAVATION FOR THE ABUTMENTS IN PHASE 2.

THIRD, THE CONSTRUCTION OF THE TEMPORARY APPROACH PANELS ALLOWS THE CONSTRUCTION OF A CONTINUOUS TEMPORARY TRAFFIC BARRIER AND ENABLES THE TRAFFIC SHIFT TO THE EAST PORTION OF THE EXISTING BRIDGE.

REMOVAL OPERATIONS:

- SAW CUT BRIDGE DECK AS SHOWN.
- REMOVE APPROACH PANELS AND ROADWAY AS SHOWN.



CONSTRUCTION OPERATIONS:

- DRIVE SHEET PILING TO TOP OF BEDROCK. INSTALL TIE-BACK SYSTEM. ATTACH WALE SYSTEM TO FRONT FACE OF EXISTING ABUTMENT WINGWALL. SEE "FOUNDATION PREPARATION" ITEM IN THE SPECIAL PROVISIONS.
- BACKFILL OVER TIE BACKS.
- INSTALL TEMPORARY CONCRETE APPROACH PANEL. MATCH EXISTING ROADWAY ELEVATIONS.
- INSTALL TEMPORARY CAST-IN-PLACE BARRIER.

NOTES:

- ① SYSTEM TO BE DESIGNED BY CONTRACTOR.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 _____ LIC. NO. _____

DATE: 4/1/2016

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

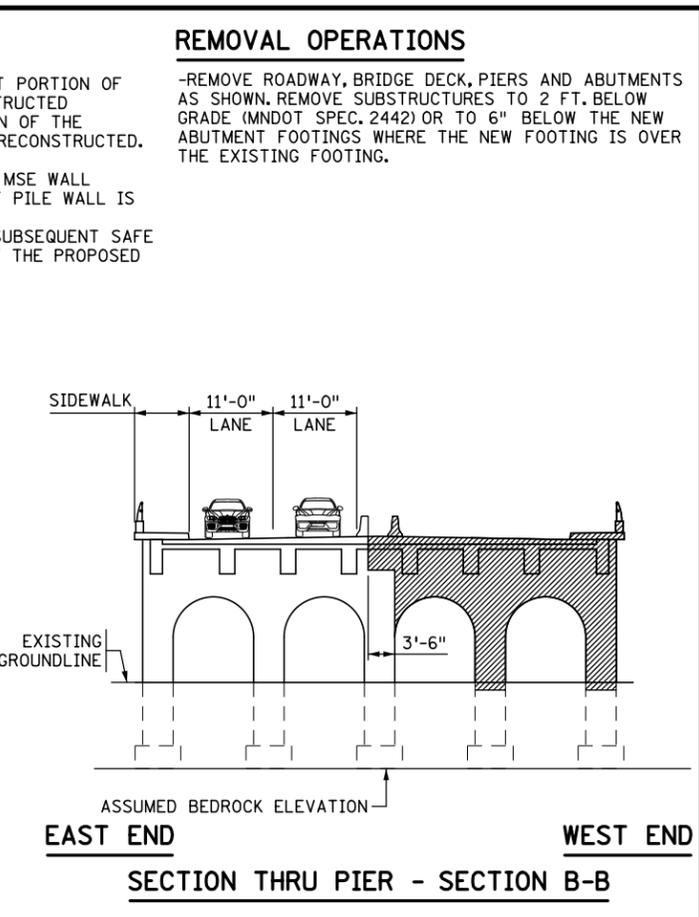
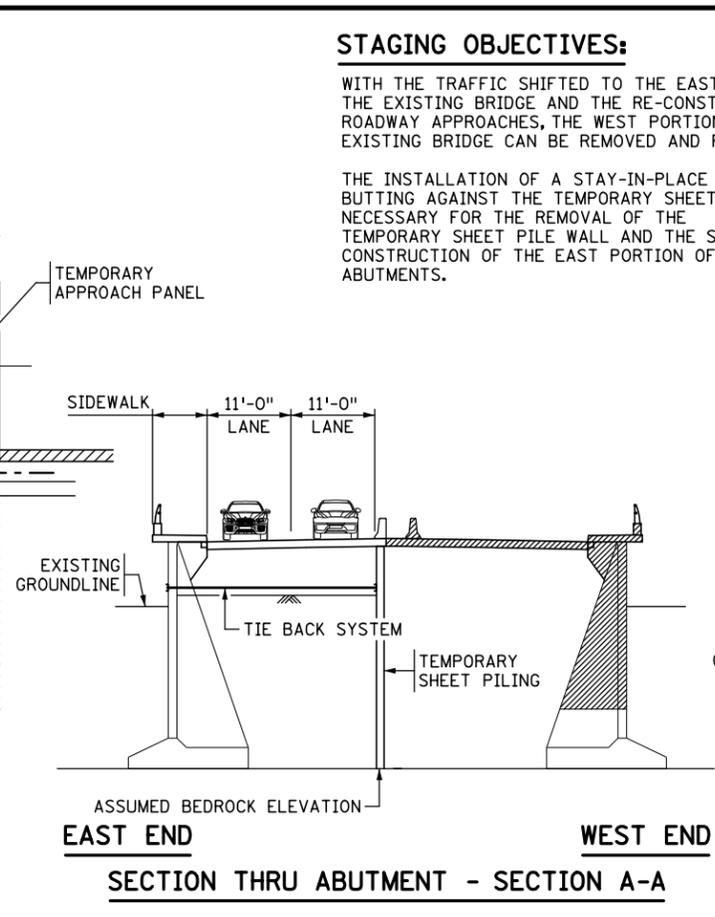
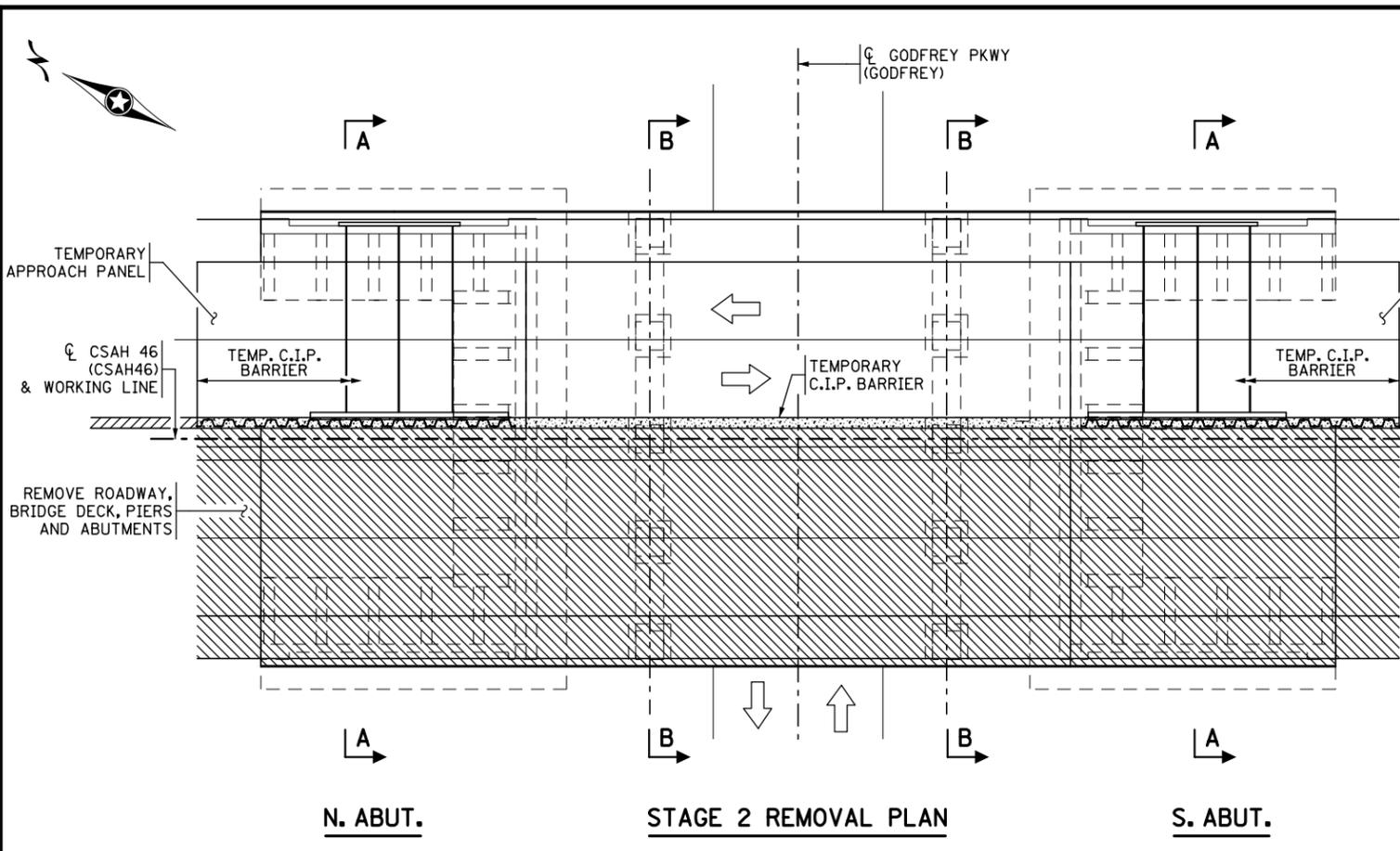
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
STAGE 1 PLAN

DES: LJL	DR: LJL	APPROVED
CHK: MJC	CHK: MJC	
SHEET NO. 4 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:48:43 PM
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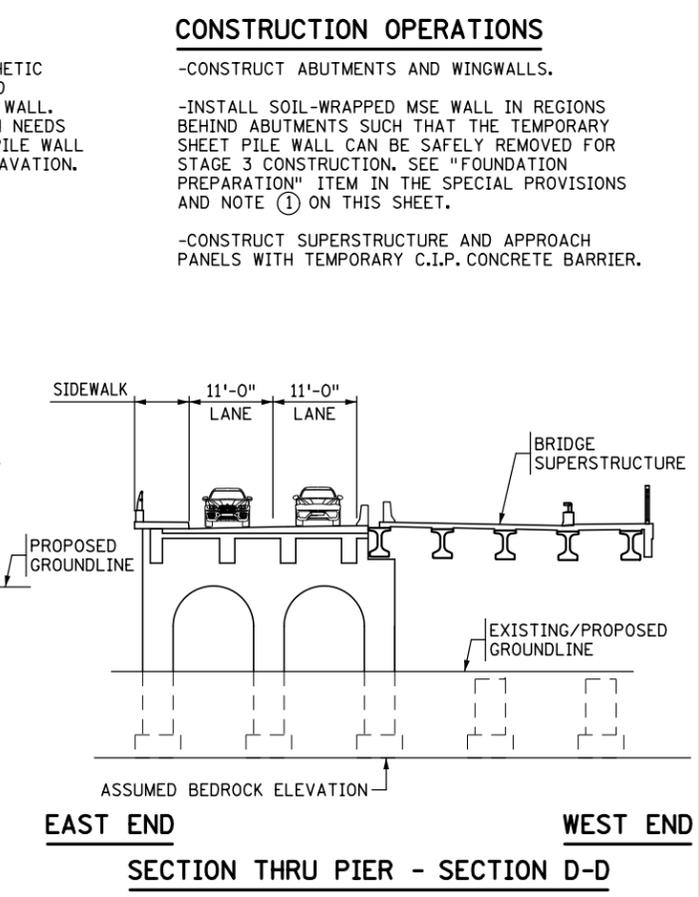
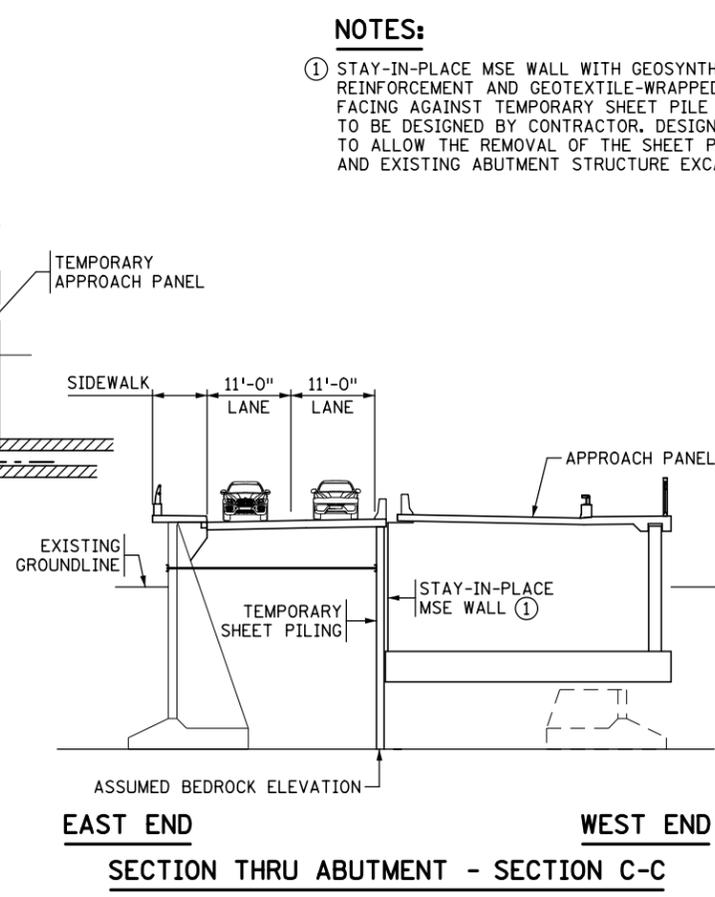
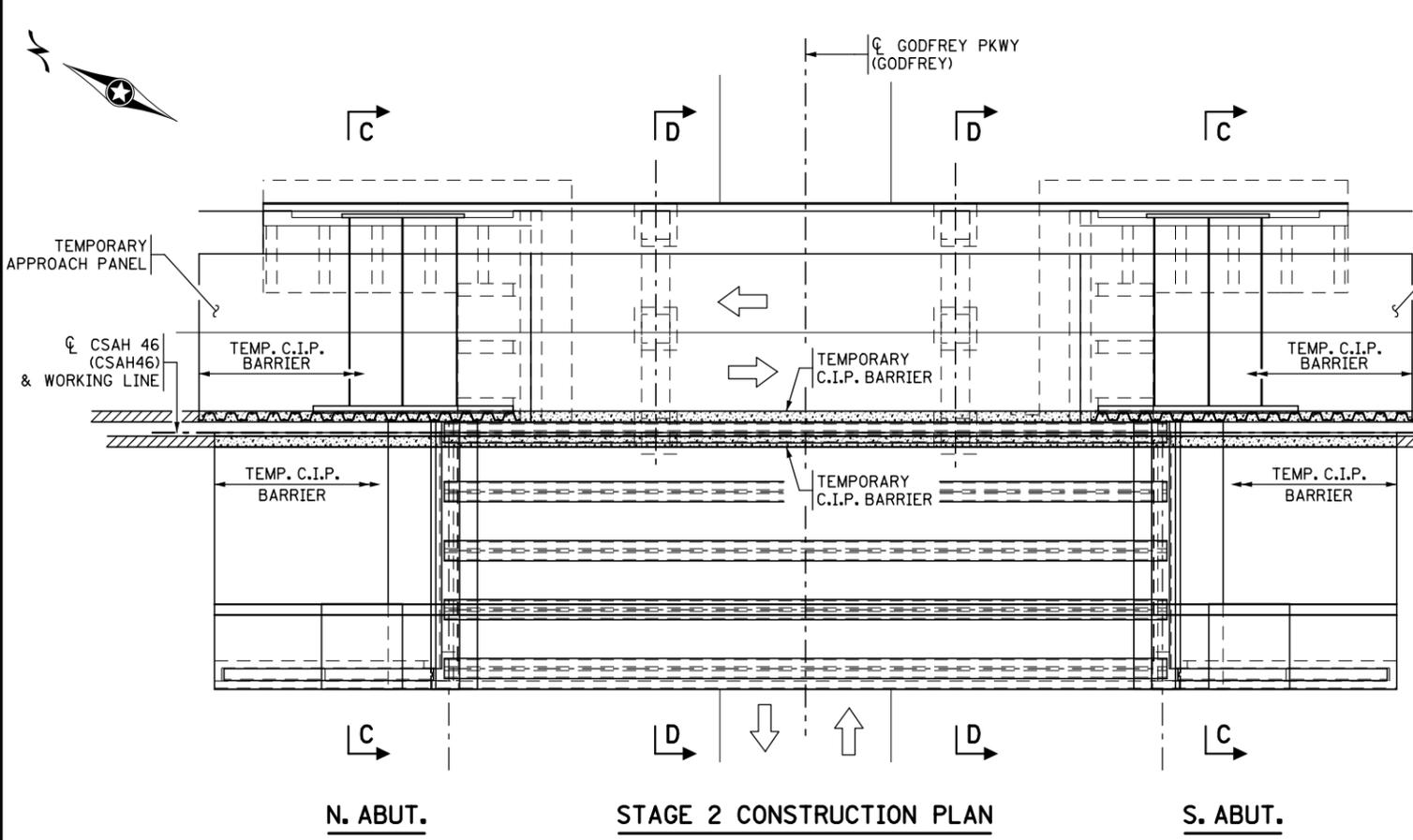
STAGING OBJECTIVES:

WITH THE TRAFFIC SHIFTED TO THE EAST PORTION OF THE EXISTING BRIDGE AND THE RE-CONSTRUCTED ROADWAY APPROACHES, THE WEST PORTION OF THE EXISTING BRIDGE CAN BE REMOVED AND RECONSTRUCTED.

THE INSTALLATION OF A STAY-IN-PLACE MSE WALL BUTTING AGAINST THE TEMPORARY SHEET PILE WALL IS NECESSARY FOR THE REMOVAL OF THE TEMPORARY SHEET PILE WALL AND THE SUBSEQUENT SAFE CONSTRUCTION OF THE EAST PORTION OF THE PROPOSED ABUTMENTS.

REMOVAL OPERATIONS

-REMOVE ROADWAY, BRIDGE DECK, PIERS AND ABUTMENTS AS SHOWN. REMOVE SUBSTRUCTURES TO 2 FT. BELOW GRADE (MNDOT SPEC. 2442) OR TO 6" BELOW THE NEW ABUTMENT FOOTINGS WHERE THE NEW FOOTING IS OVER THE EXISTING FOOTING.



NOTES:

- ① STAY-IN-PLACE MSE WALL WITH GEOSYNTHETIC REINFORCEMENT AND GEOTEXTILE-WRAPPED FACING AGAINST TEMPORARY SHEET PILE WALL. TO BE DESIGNED BY CONTRACTOR. DESIGN NEEDS TO ALLOW THE REMOVAL OF THE SHEET PILE WALL AND EXISTING ABUTMENT STRUCTURE EXCAVATION.

CONSTRUCTION OPERATIONS

- CONSTRUCT ABUTMENTS AND WINGWALLS.
- INSTALL SOIL-WRAPPED MSE WALL IN REGIONS BEHIND ABUTMENTS SUCH THAT THE TEMPORARY SHEET PILE WALL CAN BE SAFELY REMOVED FOR STAGE 3 CONSTRUCTION. SEE "FOUNDATION PREPARATION" ITEM IN THE SPECIAL PROVISIONS AND NOTE ① ON THIS SHEET.
- CONSTRUCT SUPERSTRUCTURE AND APPROACH PANELS WITH TEMPORARY C.I.P. CONCRETE BARRIER.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: _____ LIC. NO.: _____

DATE: 4/1/2016



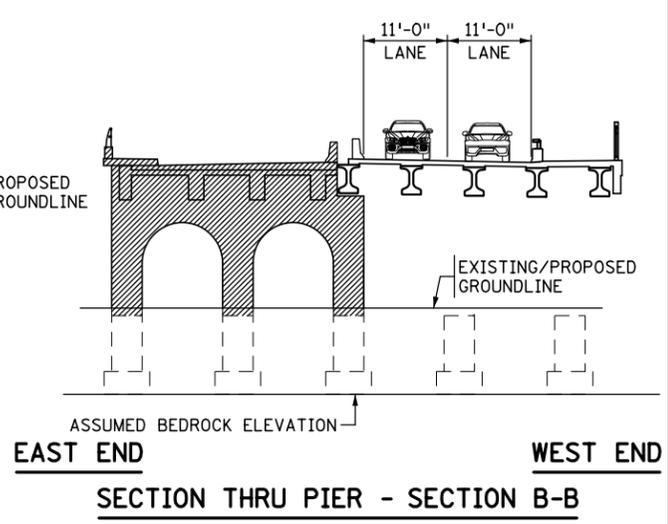
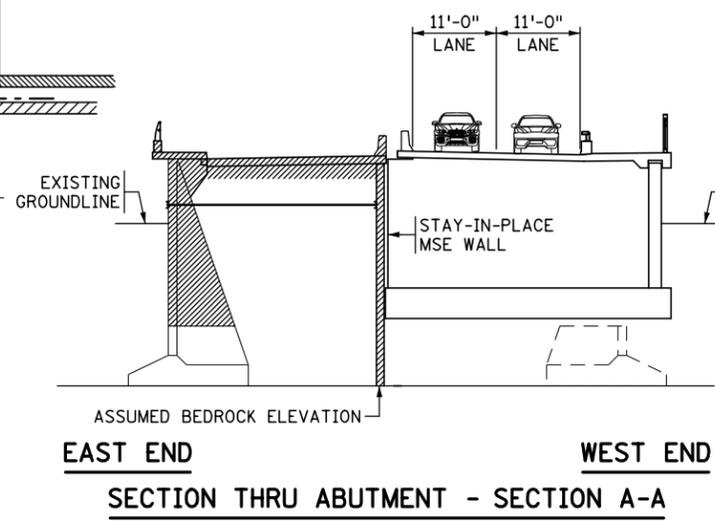
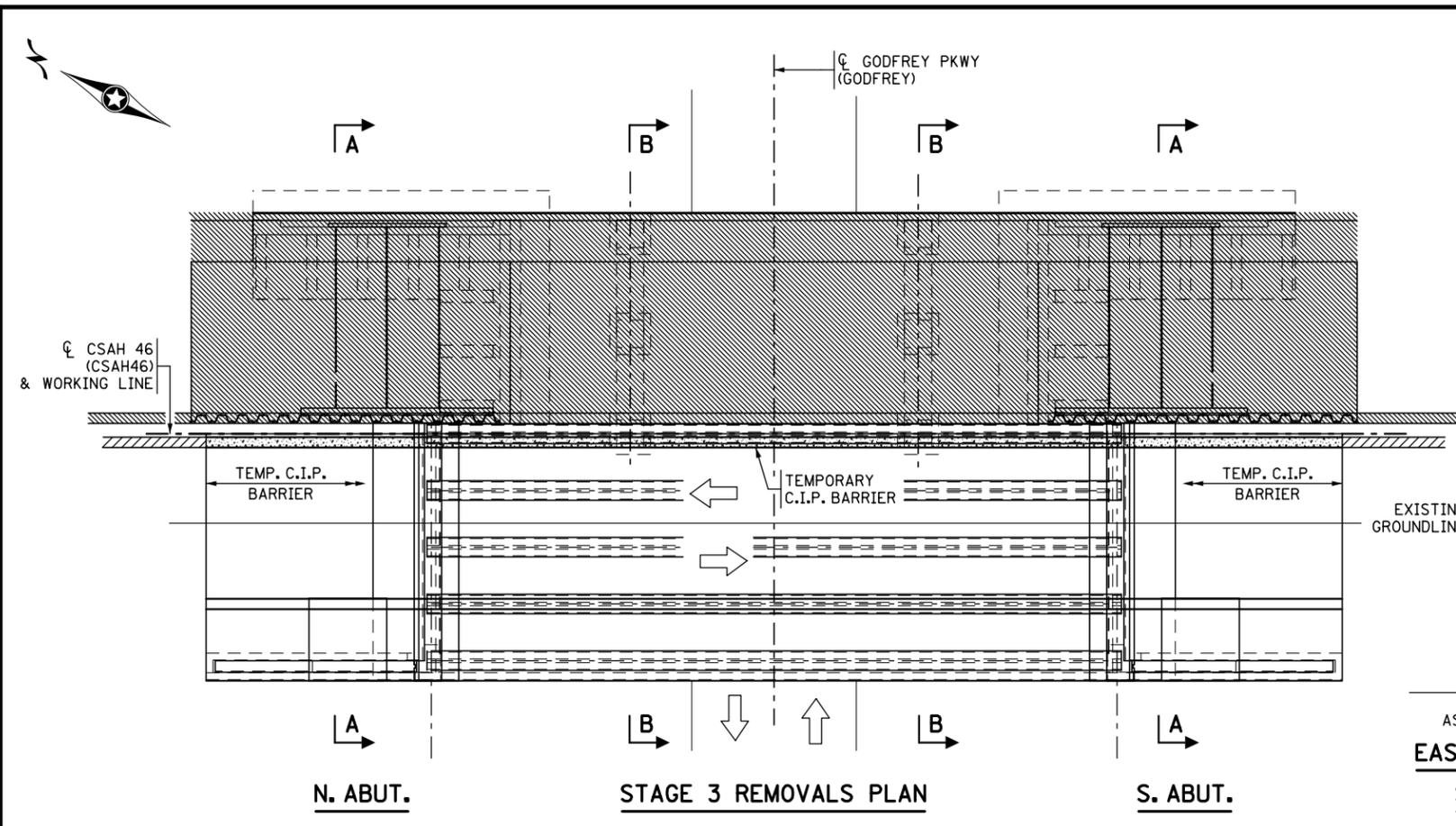
444 Cedar Street, Suite 1500
 Saint Paul, MN 55101
 651.292.4400
 tkda.com

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

DES: LJL	DR: LJL	APPROVED
CHK: MJC	CHK: MJC	
SHEET NO. 5 OF 96 SHEETS		

BRIDGE NO.
 27B84

DATE: 4/1/2016 TIME: 12:48:44 PM
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STAGING OBJECTIVES:

WITH THE TRAFFIC SHIFTED TO THE NEWLY-CONSTRUCTED WEST PORTION OF THE PROPOSED BRIDGE, THE REMOVAL OF THE REMAINING EXISTING BRIDGE AND ALL TEMPORARY SYSTEMS MAY TAKE PLACE.

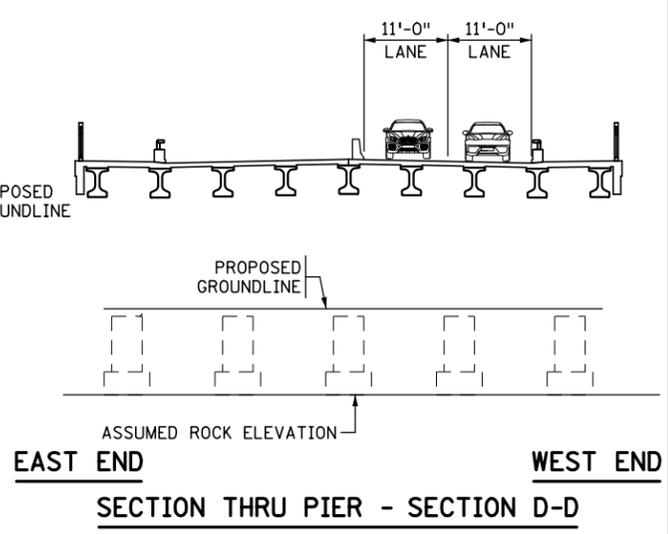
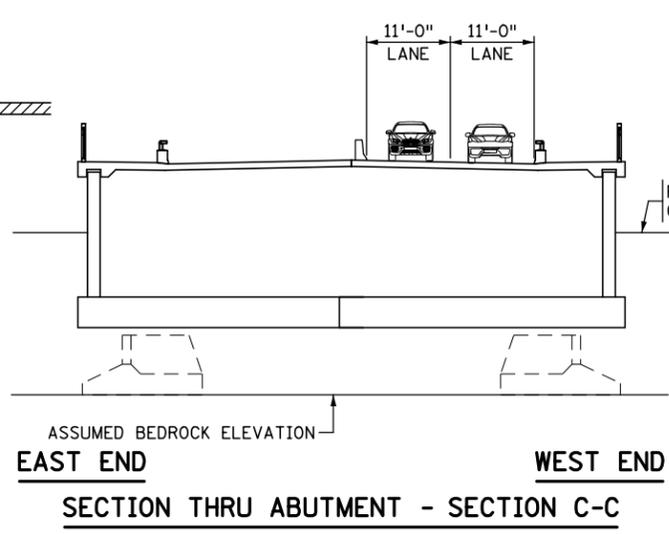
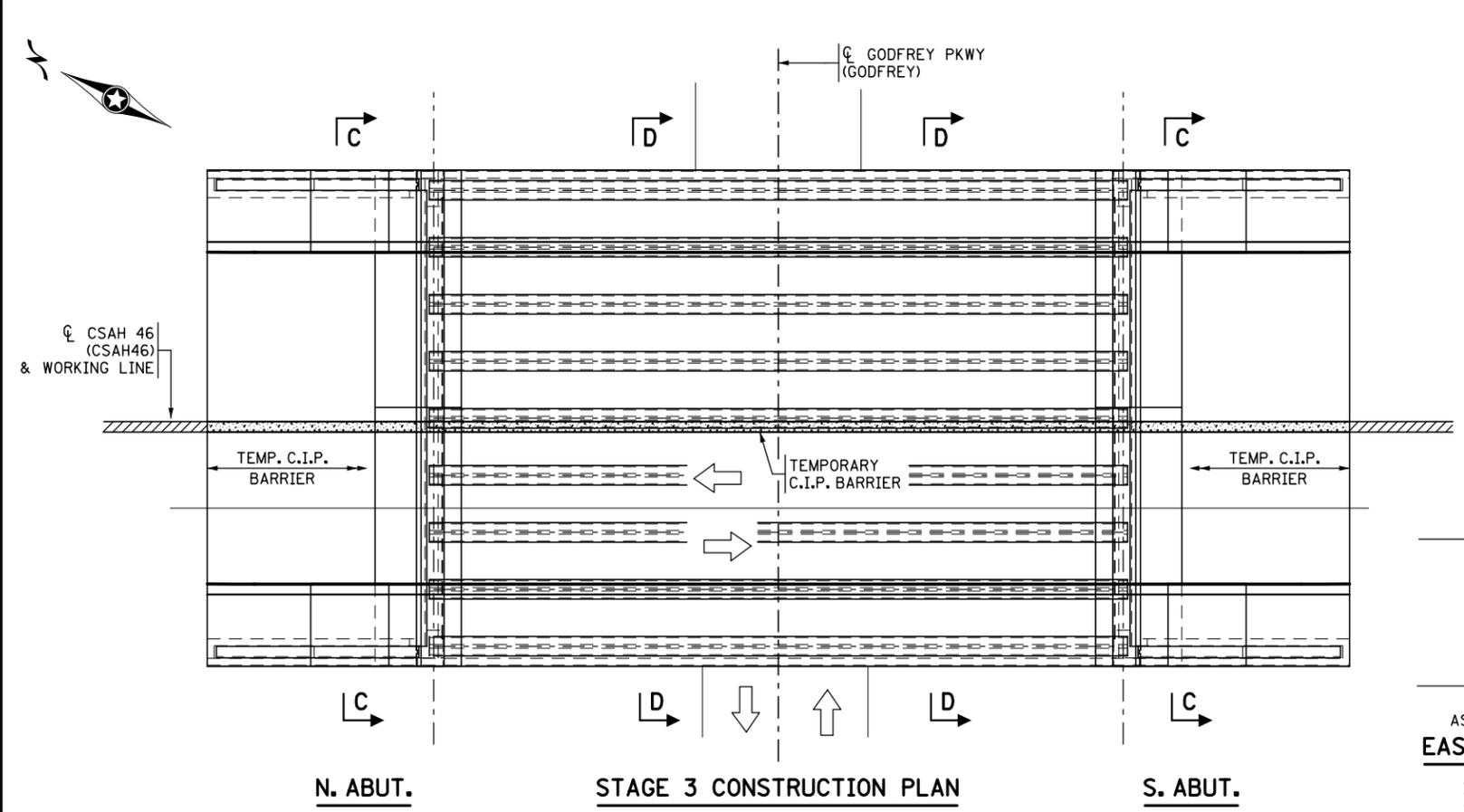
THE TEMPORARY C.I.P. CONCRETE BARRIER SHALL NOT BE REMOVED UNTIL THE BRIDGE DECK IS CONTINUOUS FROM WEST TO EAST AND THE EAST TRAFFIC BARRIER IS IN PLACE.

THE LOW-SLUMP CONCRETE WEARING COURSE OF STAGE 3 CONSTRUCTION SHALL BE PLACED AFTER THE TEMPORARY TRAFFIC BARRIER HAS BEEN REMOVED.

REMOVAL OPERATIONS:

-REMOVE ROADWAY, BRIDGE DECK, PIERS, ABUTMENTS, AND TEMPORARY SHEET PILING AND TIE-BACK SYSTEM AS SHOWN. REMOVE SUBSTRUCTURES TO 2 FT. BELOW GRADE (MNDOT SPEC. 2442) OR TO 6" BELOW THE NEW ABUTMENT FOOTINGS WHERE THE NEW FOOTING IS OVER THE EXISTING FOOTING.

-WITH CONCRETE DECK AND APPROACH PANELS CONNECTED TO STAGE 2 CONSTRUCTION, REMOVE TEMPORARY C.I.P. CONCRETE BARRIER.



CONSTRUCTION OPERATIONS:

-CONSTRUCT ABUTMENTS AND WINGWALLS.

-CONSTRUCT BRIDGE SUPERSTRUCTURE AND APPROACH PANELS.

-PLACE LOW-SLUMP WEARING COURSE OVER STAGE 2 AND STAGE 3 BRIDGE DECK AND APPROACH PANELS.

-OPEN BRIDGE TO TRAFFIC.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



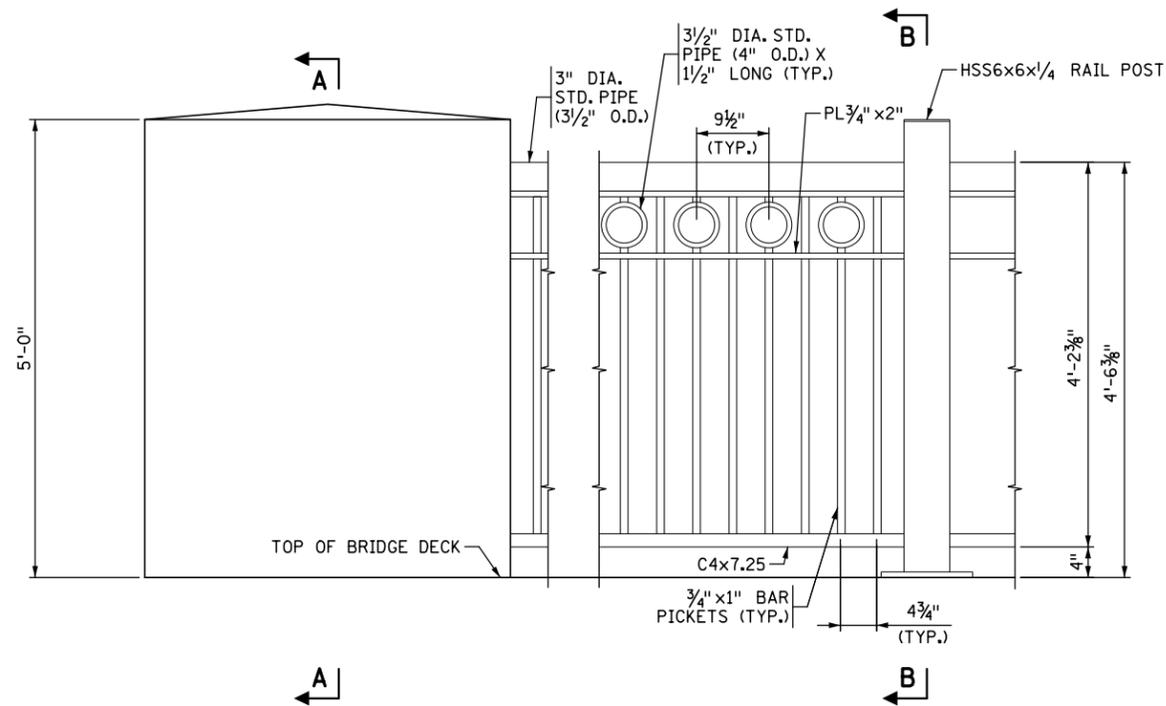
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
 STAGE 3 PLAN

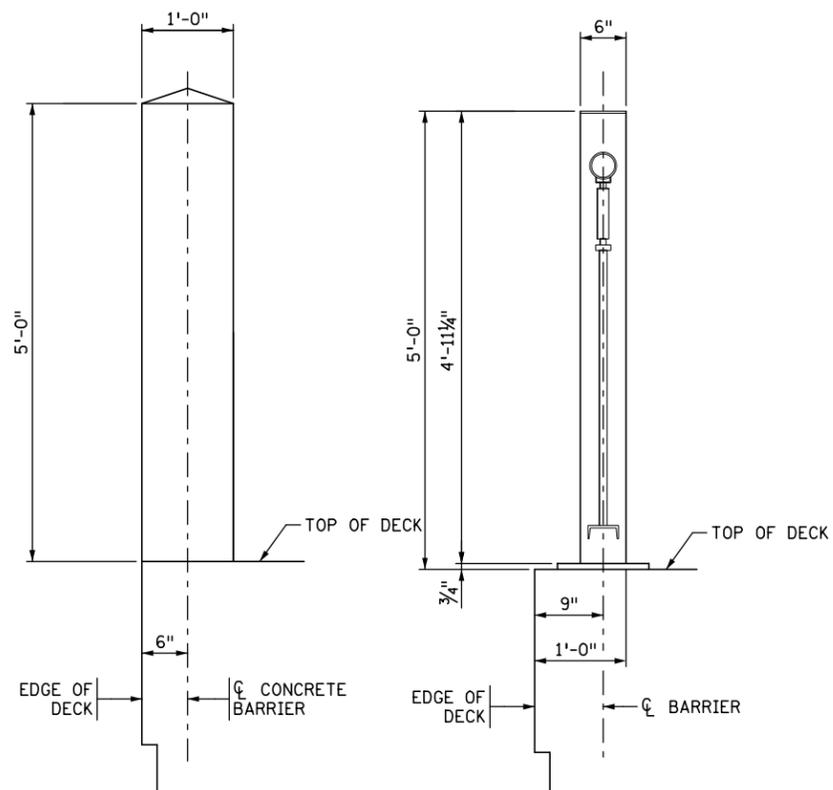
DES: LJL DR: LJL APPROVED
 CHK: MJC CHK: MJC
 SHEET NO. 6 OF 96 SHEETS

BRIDGE NO.
 27B84

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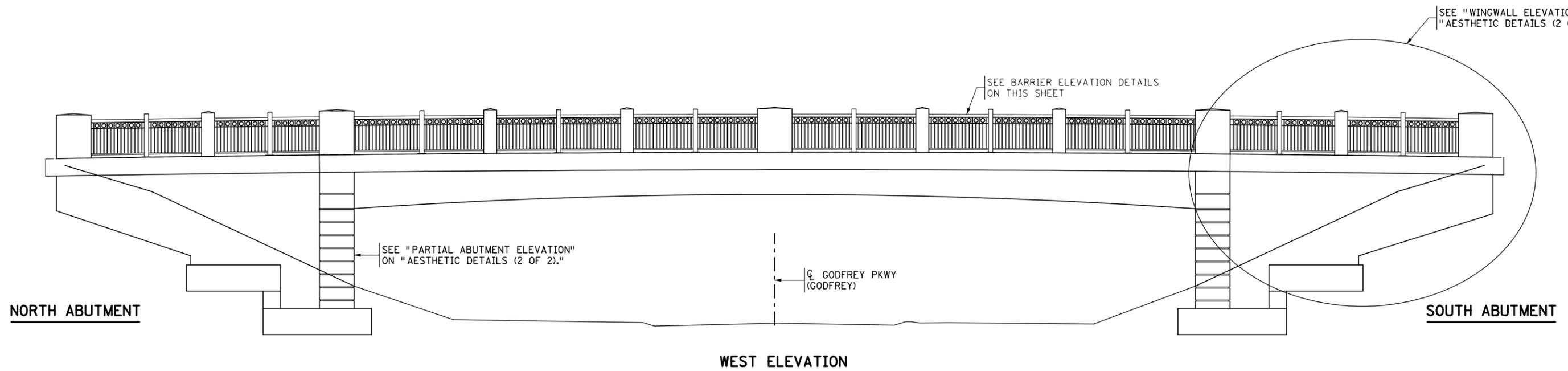


TYPICAL BARRIER ELEVATION



SECTION A-A

SECTION B-B



WEST ELEVATION

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



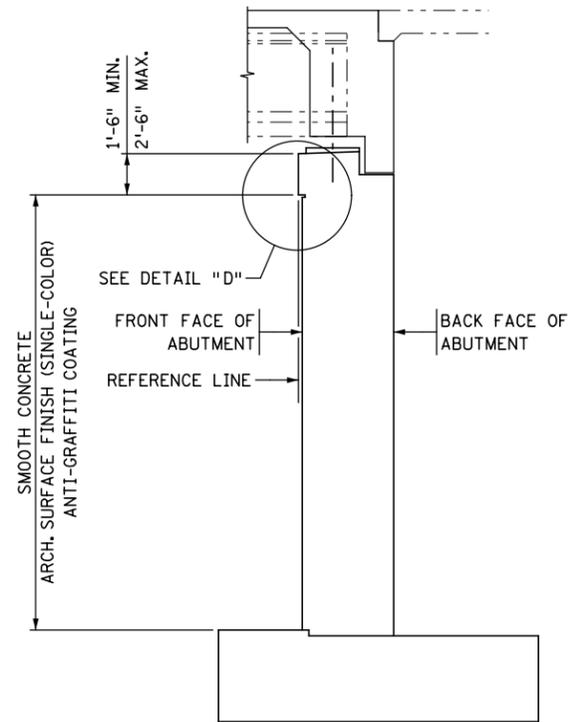
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **AESTHETIC DETAILS**
 (1 OF 2)

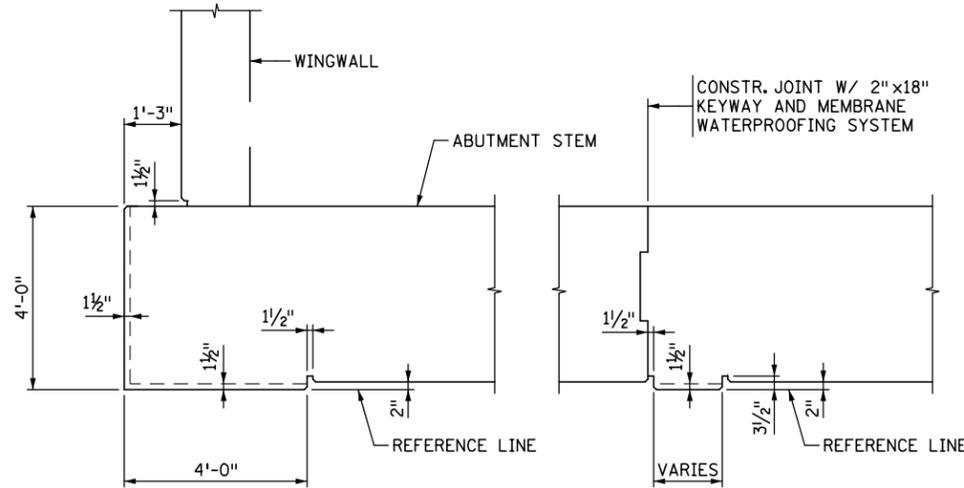
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CHK: MAV	CHK: MAV	
SHEET NO. 8 OF 96 SHEETS		

BRIDGE NO.
27B84

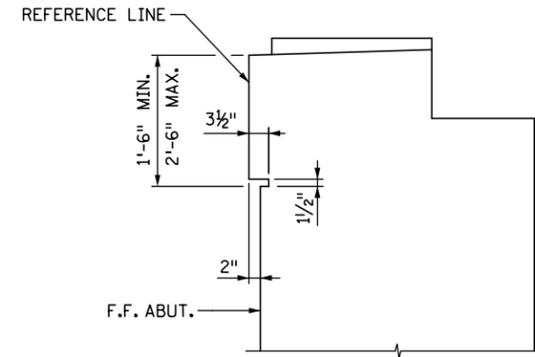
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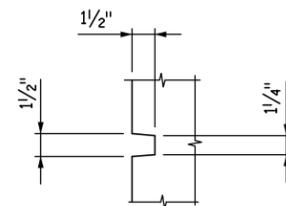
SECTION A-A



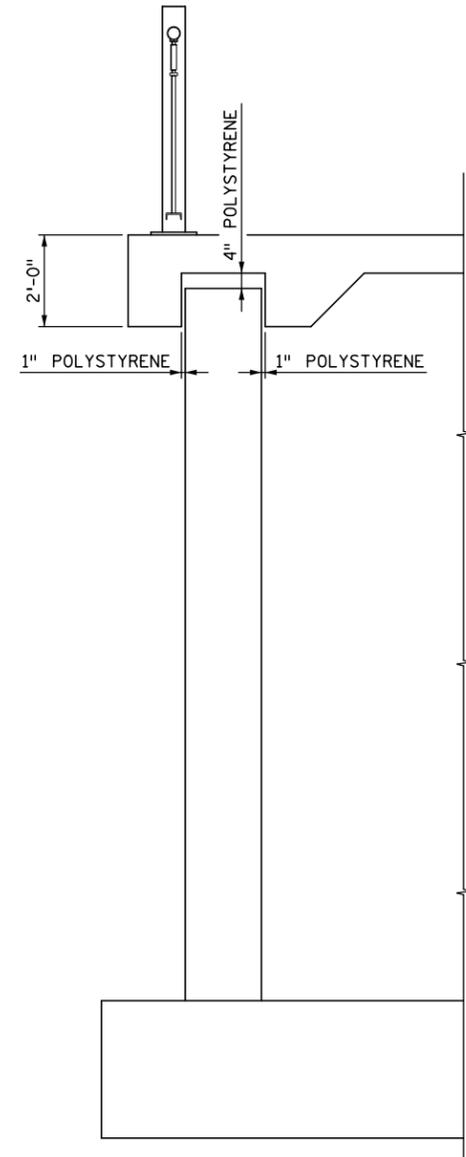
SECTION B-B



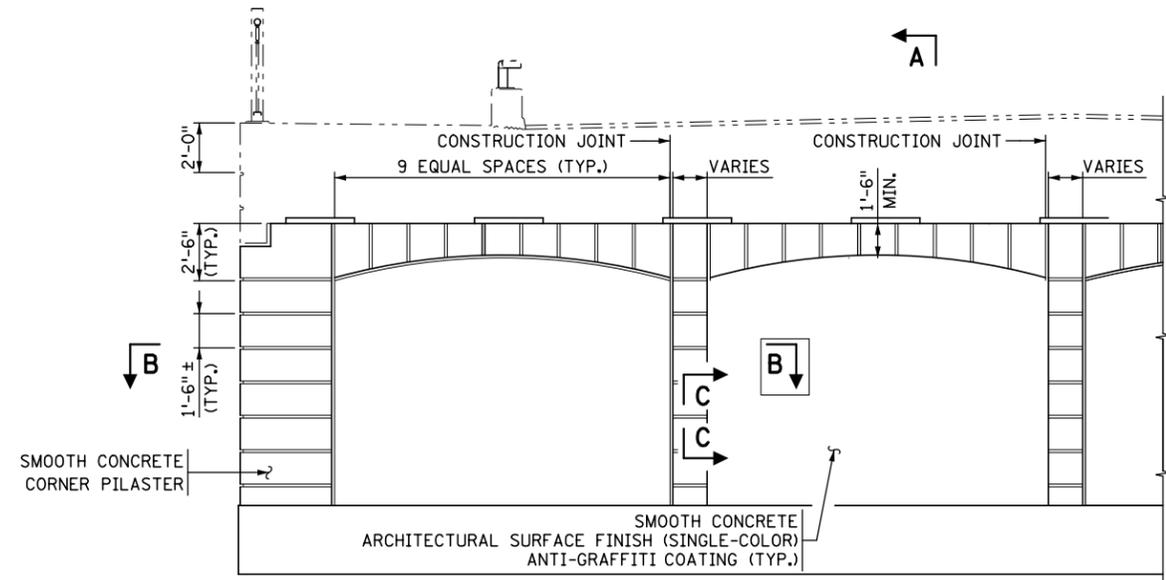
DETAIL "D"



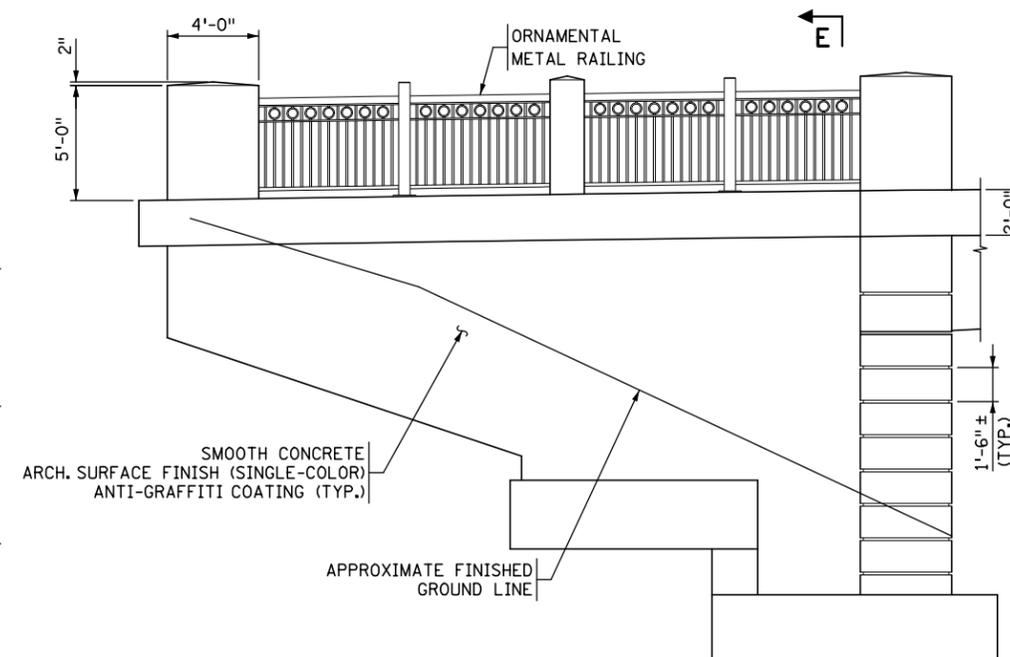
SECTION C-C



SECTION E-E



PARTIAL ABUTMENT ELEVATION



WINGWALL ELEVATION

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: AESTHETIC DETAILS
 (2 OF 2)

DES: LJJ	DR: LJJ	APPROVED
CHK: MAV	CHK: MAV	
SHEET NO. 9 OF 96 SHEETS		

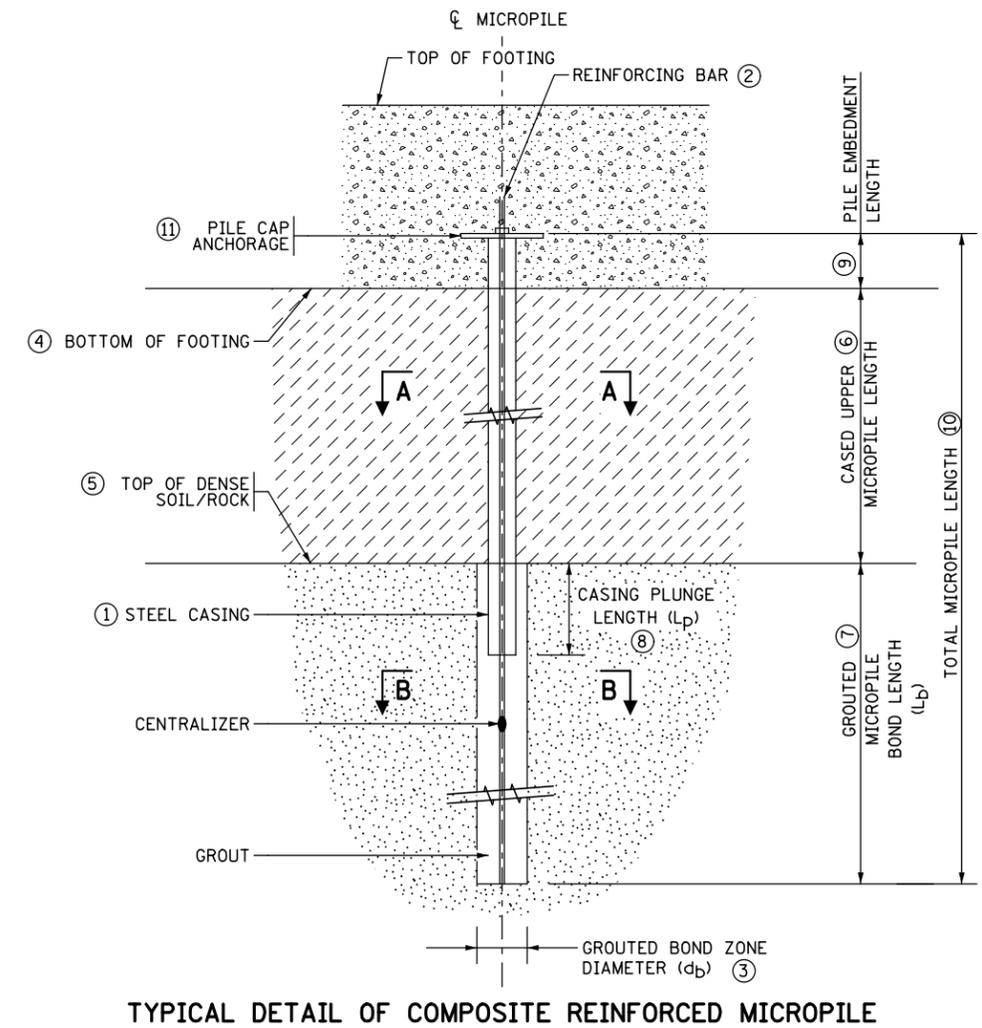
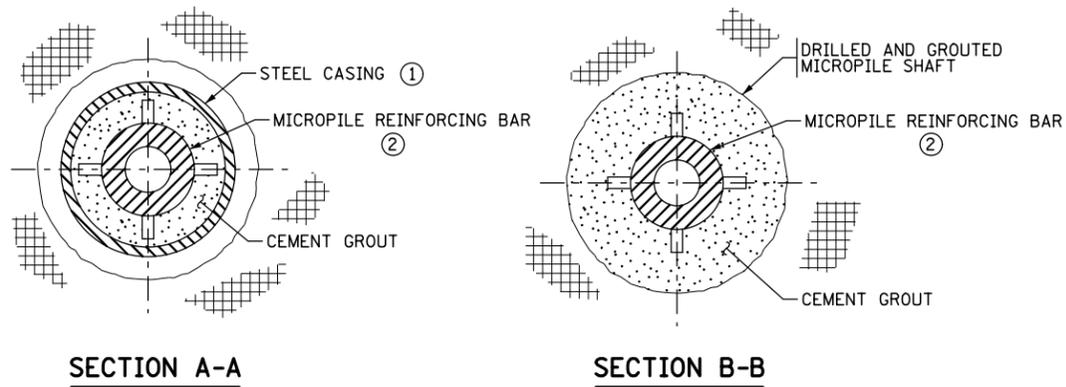
BRIDGE NO.
 27B84

DATE: 4/1/2016 TIME: 12:48:47 PM
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MICROPILE DETAILS														
LOCATION	NUMBER EACH	① STEEL CASING SIZE	② MICROPILE REINFORCING SIZE	③ GROUTED BOND ZONE DIA.	FACTORED DESIGN LOAD (TONS)	REQ'D NOM. BEARING CAPACITY (TONS)	④ BOTTOM FOOTING ELEVATION	⑤ TOP BEDROCK ELEVATION	⑥ CASED LENGTH (FT)	⑦ GROUTED BOND LENGTH (FT)	⑧ PLUNGE LENGTH (FT)	⑨ FOOTING EMBEDMENT LENGTH (FT)	⑩ TOTAL MICROPILE LENGTH (FT)	NOTES
NORTH ABUTMENT - STAGE 2	56	5 1/2" DIA. W/ 0.36" WALL THICKNESS	USE 75KSI REBAR BAR WITH MIN. AREA OF 1.27 SQ. IN.	6	41	57	803.00	793.60	9.40	7.00	1.00	1.00	18.00	
NORTH ABUTMENT - STAGE 3	52	5 1/2" DIA. W/ 0.36" WALL THICKNESS	USE 75KSI REBAR BAR WITH MIN. AREA OF 1.27 SQ. IN.	6	41	57	803.00	793.60	9.40	7.00	1.00	1.00	18.00	
SOUTH ABUTMENT - STAGE 2	56	5 1/2" DIA. W/ 0.36" WALL THICKNESS	USE 75KSI REBAR BAR WITH MIN. AREA OF 1.27 SQ. IN.	6	41	57	803.00	793.60	9.40	7.00	1.00	1.00	18.00	
SOUTH ABUTMENT - STAGE 3	52	5 1/2" DIA. W/ 0.36" WALL THICKNESS	USE 75KSI REBAR BAR WITH MIN. AREA OF 1.27 SQ. IN.	6	41	57	803.00	793.60	9.40	7.00	1.00	1.00	18.00	

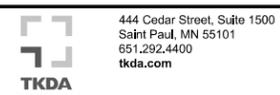
NOTES:

- ⑪ PILE CAP ANCHORAGE TO BE DESIGNED BY CONTRACTOR TO SUPPORT CAPACITY OF MICROPILE.



NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.:

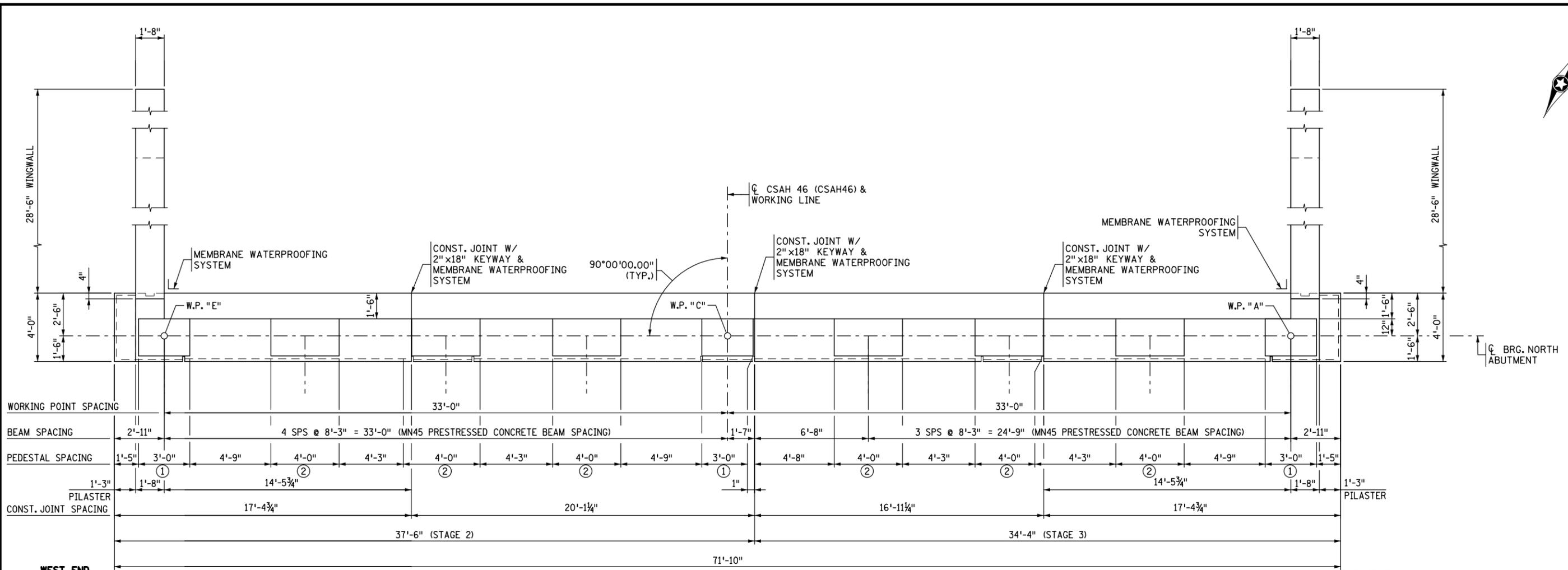


HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

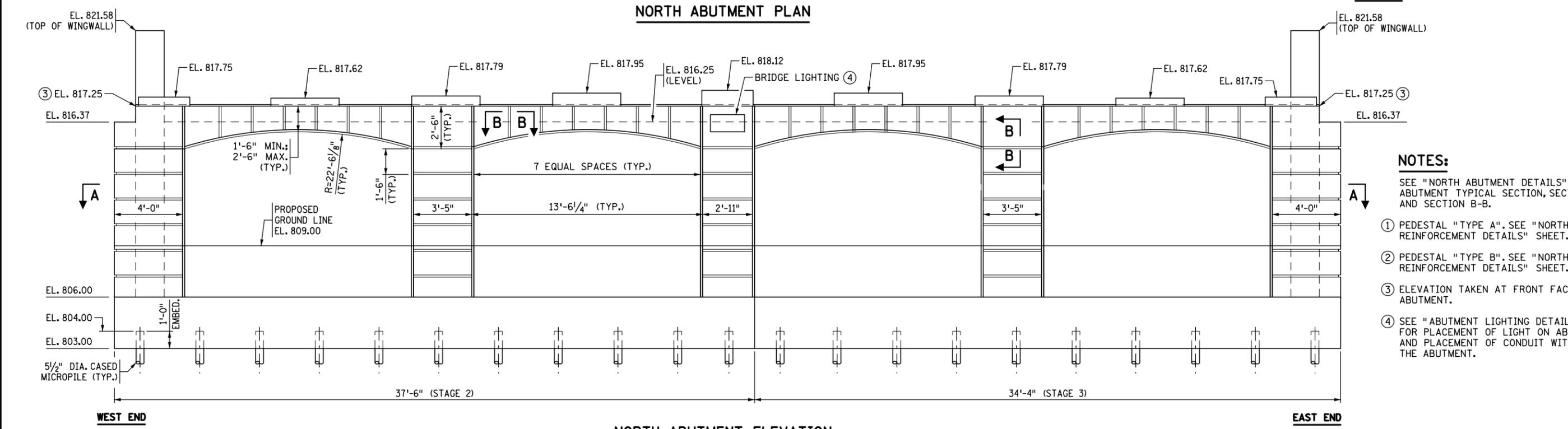
TITLE:
MICROPILE DETAILS

DES: MAV DR: MAV APPROVED
 CHK: GM CHK: GM
 SHEET NO. 10 OF 96 SHEETS

BRIDGE NO.
27B84



NORTH ABUTMENT PLAN



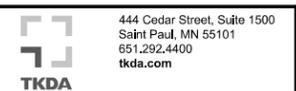
NORTH ABUTMENT ELEVATION

- NOTES:**
- SEE "NORTH ABUTMENT DETAILS" SHEET FOR ABUTMENT TYPICAL SECTION, SECTION A-A, AND SECTION B-B.
 - ① PEDESTAL "TYPE A". SEE "NORTH ABUTMENT REINFORCEMENT DETAILS" SHEET.
 - ② PEDESTAL "TYPE B". SEE "NORTH ABUTMENT REINFORCEMENT DETAILS" SHEET.
 - ③ ELEVATION TAKEN AT FRONT FACE OF ABUTMENT.
 - ④ SEE "ABUTMENT LIGHTING DETAILS" SHEET FOR PLACEMENT OF LIGHT ON ABUTMENT AND PLACEMENT OF CONDUIT WITHIN THE ABUTMENT.

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NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

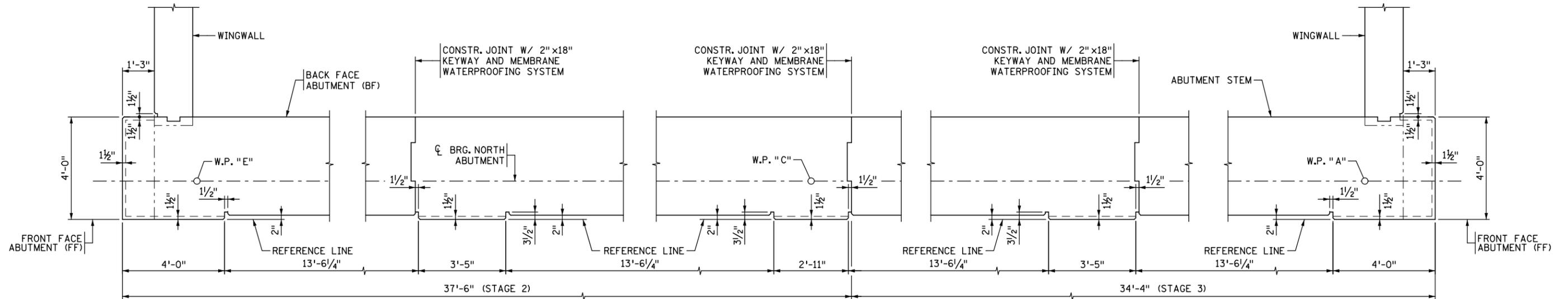
TITLE: **NORTH ABUTMENT PLAN & ELEVATION**

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	

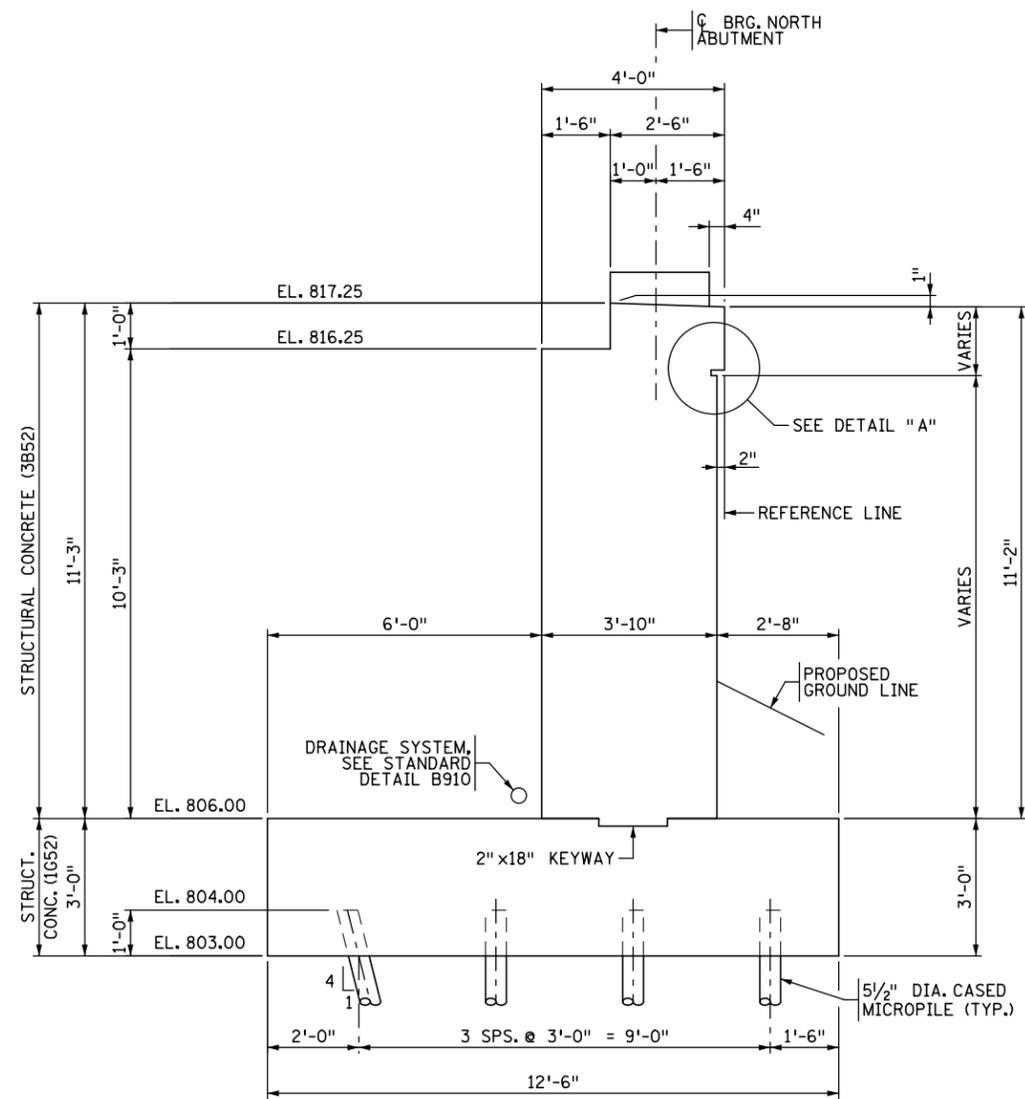
SHEET NO. 11 OF 96 SHEETS

BRIDGE NO. **27B84**

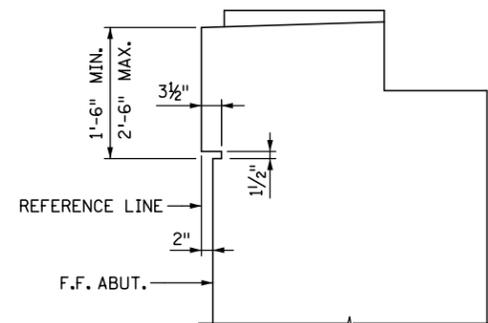
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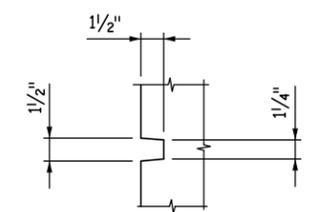
SECTION A-A



TYPICAL SECTION



DETAIL "A"



SECTION B-B
(TYPICAL RUSTICATION DETAIL)

SUMMARY OF QUANTITIES FOR NORTH ABUTMENT				
ITEM DESCRIPTION	UNIT	STAGE 2	STAGE 3	TOTAL
STRUCTURAL CONCRETE (1G52)	CU YD	68	64	132
STRUCTURAL CONCRETE (3B52)	CU YD	61	58	119
REINFORCEMENT BARS	POUND	4870	4590	9,460
REINFORCEMENT BARS (EPOXY COATED)	POUND	8780	8460	17,240
FOUNDATION PREPARATION NORTH ABUT	LUMP SUM	PART	PART	1
MICROPILE MOBILIZATION	LUMP SUM	PART	PART	PART
MICROPILES	EACH	56	52	108
PROOF LOAD TEST	EACH	1	1	2
COUPLERS (REINFORCEMENT BARS) T-6	EACH	24	0	24
COUPLERS (REINFORCEMENT BARS) T-6E	EACH	27	0	27
DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	PART	PART	PART

- ② COUPLERS (REINFORCEMENT BARS) T-6
- ② COUPLERS (REINFORCEMENT BARS) T-6E
- ① DRAINAGE SYSTEM, SEE DETAIL B910.
- ② PAYMENT FOR COUPLERS INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-6".

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.: _____

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

TKDA

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **NORTH ABUTMENT DETAILS**

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 12 OF 96 SHEETS		

BRIDGE NO.
27B84



NORTH ABUTMENT - STAGE 2	
COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	36.3
FACTORED LIVE LOAD	4.2
* FACTORED DESIGN LOAD	40.5

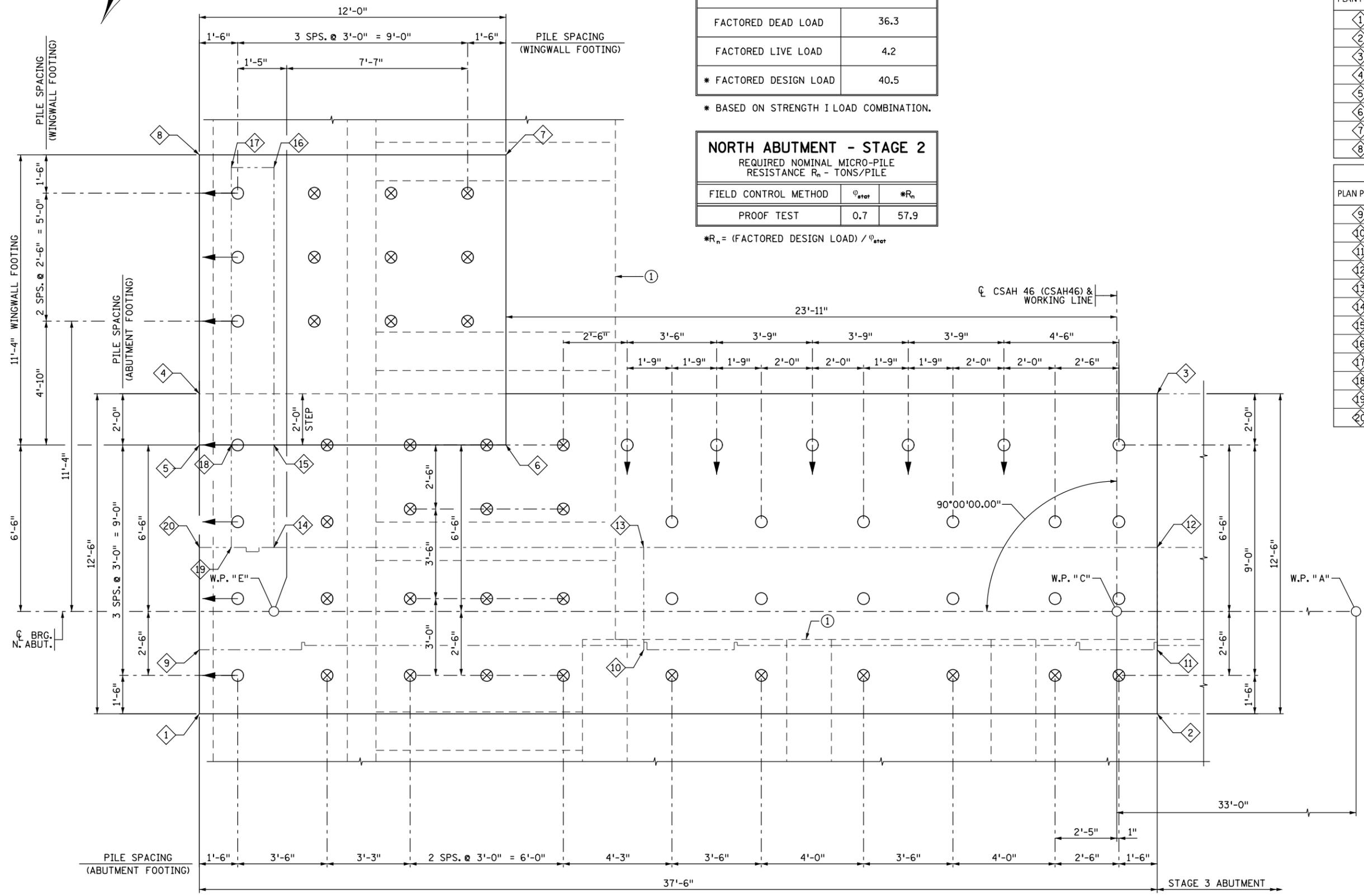
* BASED ON STRENGTH I LOAD COMBINATION.

NORTH ABUTMENT - STAGE 2		
REQUIRED NOMINAL MICRO-PILE RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	ϕ_{factor}	* R_n
PROOF TEST	0.7	57.9

* R_n = (FACTORED DESIGN LOAD) / ϕ_{factor}

FOOTING COORDINATES			
PLAN POINT	X-COORDINATE	Y-COORDINATE	B/FTG. EL.
1	545,743.573	146,681.570	803.00
2	545,776.895	146,698.771	803.00
3	545,771.161	146,709.879	803.00
4	545,737.839	146,692.677	803.00
5	545,738.756	146,690.900	807.00
6	545,749.419	146,696.404	807.00
7	545,744.221	146,706.475	807.00
8	545,733.558	146,700.970	807.00

STEM COORDINATES		
PLAN POINT	X-COORDINATE	Y-COORDINATE
9	545,742.426	146,683.791
10	545,757.884	146,691.771
11	545,775.748	146,700.993
12	545,774.601	146,703.214
13	545,756.049	146,695.325
14	545,743.183	146,688.683
15	545,741.348	146,692.238
16	545,736.379	146,701.864
17	545,734.898	146,701.099
18	545,739.867	146,691.473
19	545,741.702	146,687.919
20	545,740.591	146,687.345



PILE NOTES:

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

ALL PILES TO BE 5/2" DIA. MICROPILES.

PILES MARKED WITH ⊗ SHALL BE CORED THROUGH EXISTING ABUTMENT FOOTING.

PILES MARKED WITH → SHALL BE BATTERED IN THE DIRECTION SHOWN.

1 PROOF TEST.
19 MICROPILES REQ'D FOR EAST ABUT. FTG.

SEE "MICROPILE DETAILS" SHEET AND GEOTECHNICAL REPORT FOR MORE INFORMATION.

PILE THAT WILL BE PROOF TESTED WILL BE COORDINATED BY THE ENGINEER AND THE CONTRACTOR.

NOTES:

① EXISTING ABUTMENT FOOTING AND ABUTMENT COUNTERFORTS. PILE SPACED TO AVOID CONFLICTS WITH EXISTING COUNTERFORTS.

NORTH ABUTMENT FOOTING PLAN - STAGE 2

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NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



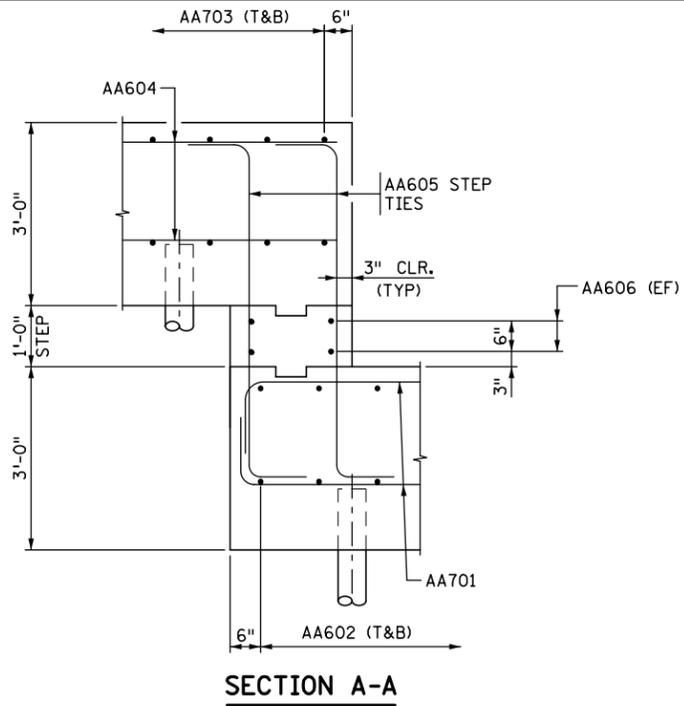
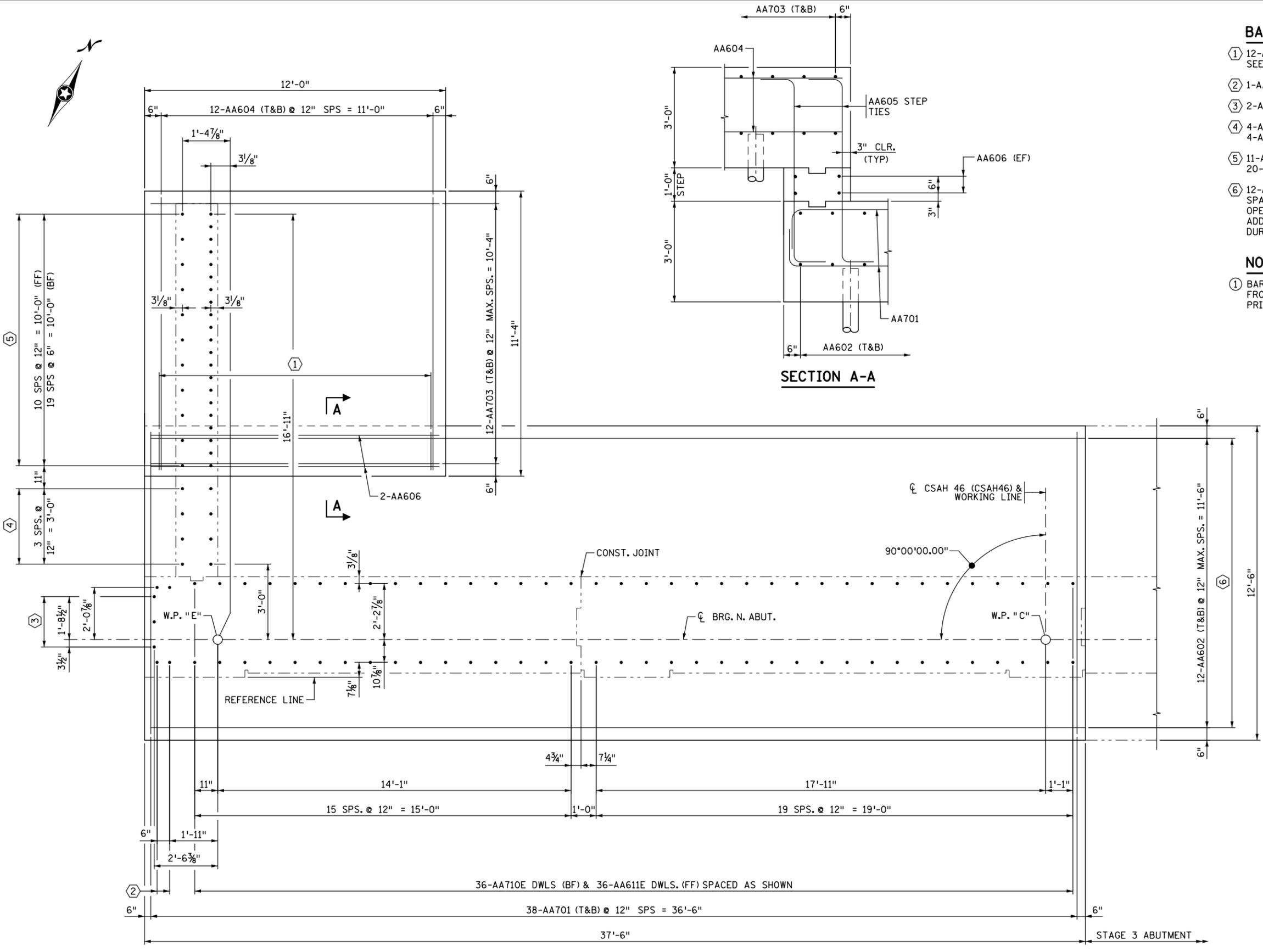
HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
S.A.P. 027-646-007

TITLE: **NORTH ABUTMENT FOOTING PLAN (STAGE 2)**

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 13 OF 96 SHEETS		

BRIDGE NO. **27B84**

DATE: 4/1/2016 TIME: 12:48:51 PM
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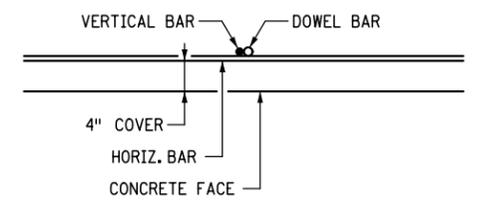
BAR CALL-OUTS

- ① 12-AA605 STEP TIES (EF) @ 12" MAX SPS. = 11'-0". SEE SECTION A-A FOR PLACEMENT DETAILS.
- ② 1-AA611E DWL. (EF) SPACE AS SHOWN.
- ③ 2-AA611E DWLS. @ 12" SPS. = 2'-0".
- ④ 4-AA611E DWLS. (FF) SPACED AS SHOWN. 4-AA710E DWLS. (BF) SPACED AS SHOWN.
- ⑤ 11-AA611E DWLS. (FF) SPACED AS SHOWN. 20-AA710E DWLS. (BF) SPACED AS SHOWN.
- ⑥ 12-AA607 (T&B) W/ #6 BAR COUPLERS (T&B) SPACED TO MATCH AA602 BARS. LOCATE OPEN END OF COUPLERS SUCH THAT ADDITIONAL BARS MAY BE INSTALLED DURING STAGE 3 CONSTRUCTIONS. ①

NOTES:

- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

NORTH ABUTMENT FOOTING REINFORCEMENT - STAGE 2



TYPICAL BAR PLACEMENT

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

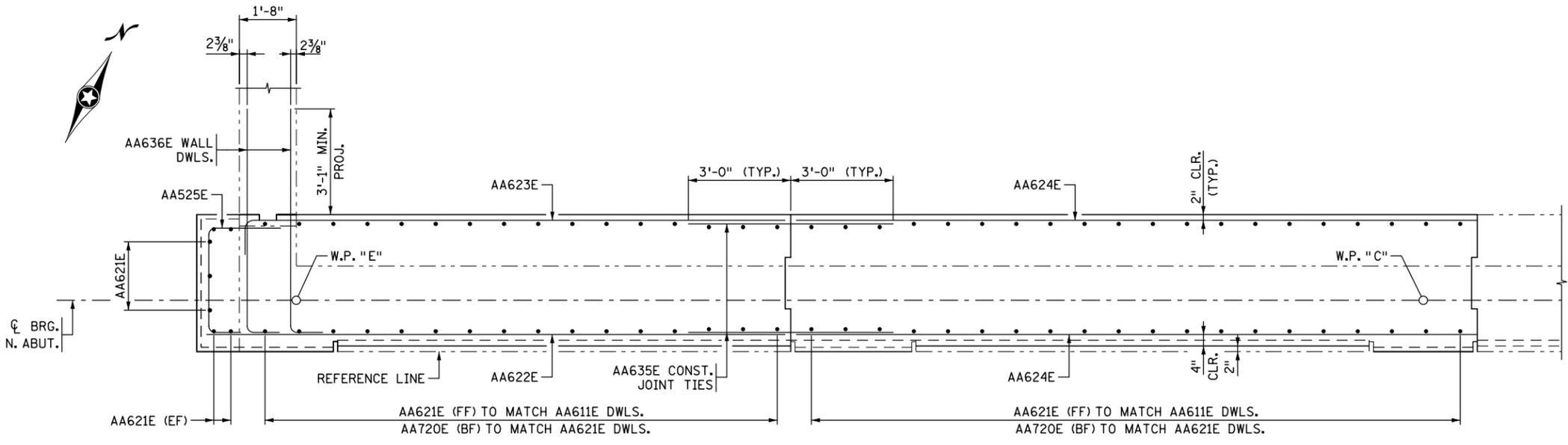
TITLE: **NORTH ABUTMENT FOOTING REINFORCEMENT (STAGE 2)**

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	

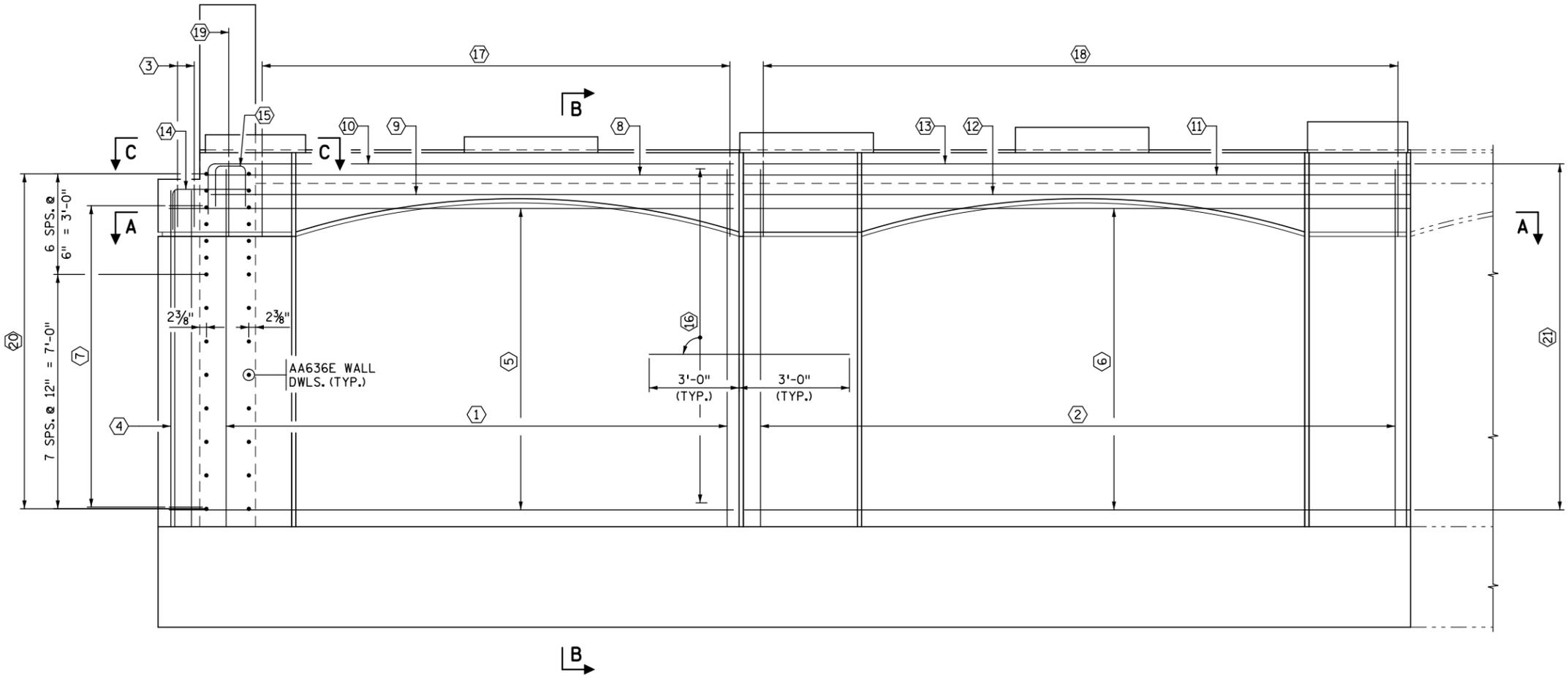
SHEET NO. 14 OF 96 SHEETS

BRIDGE NO. **27B84**

DATE: 4/1/2016 TIME: 12:48:52 PM
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SECTION A-A



NORTH ABUTMENT REINFORCEMENT - STAGE 2

(FOOTING PILE AND REINFORCEMENT NOT SHOWN FOR CLARITY)

BAR CALL-OUTS

- ① 16-AA621E (FF) SPACED TO MATCH AA621E DWLS.
16-AA720E (BF) SPACED TO MATCH AA720E DWLS.
- ② 20-AA621E (FF) SPACED TO MATCH AA621E DWLS.
20-AA720E (BF) SPACED TO MATCH AA720E DWLS.
- ③ 1-AA621E (EF) SPACED TO MATCH AA611E DWL.
- ④ 3-AA621E SPACED TO MATCH AA611E DWLS.
- ⑤ 10-AA622E (FF) SPACED AS SHOWN IN SECTION B-B.
10-AA623E (BF) SPACED AS SHOWN IN SECTION B-B.
- ⑥ 10-AA624E (FF) SPACED AS SHOWN IN SECTION B-B.
- ⑦ 10-AA525E END TIES SPACED TO MATCH AA622E.
- ⑧ 1-AA626E (EF) SPACED AS SHOWN IN SECTION B-B.
- ⑨ 2-AA527E SPACED AS SHOWN IN SECTION B-B.
- ⑩ 3-AA528E SPACED AS SHOWN IN SECTION B-B.
- ⑪ 1-AA624E (EF) SPACED AS SHOWN IN SECTION B-B.
- ⑫ 2-AA529E SPACED AS SHOWN IN SECTION B-B.
- ⑬ 3-AA529E SPACED AS SHOWN IN SECTION B-B.
- ⑭ 3-AA530E SPACED TO MATCH AA621E VERTICALS.
- ⑮ 2-AA531E SPACED AS SHOWN IN SECTION C-C.
- ⑯ 27-AA635E CONST. JT TIES SPACED TO MATCH HORIZONTAL BARS.
- ⑰ 16-AA532E W/ 16-AA533E SPACED TO MATCH AA720E VERTICALS. SEE SECTION B-B FOR PLACEMENT DETAILS.
- ⑱ 20-AA532E W/ 20-AA533E SPACED TO MATCH AA720E VERTICALS. SEE SECTION B-B FOR PLACEMENT DETAILS.
- ⑲ 1-AA534E SPACED TO MATCH AA721E.
- ⑳ 14-AA636E WALL DWLS. (EF) SPACED AS SHOWN.
- ㉑ 27-AA640E W/ #6 BAR COUPLERS SPACED TO MATCH HORIZONTAL BARS. LOCATE OPEN END OF COUPLERS SUCH THAT ADDITIONAL BARS MAY BE INSTALLED DURING STAGE 3 CONSTRUCTIONS. ①

NOTES:

- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:

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 Saint Paul, MN 55101
 651.292.4400
 tkda.com
TKDA

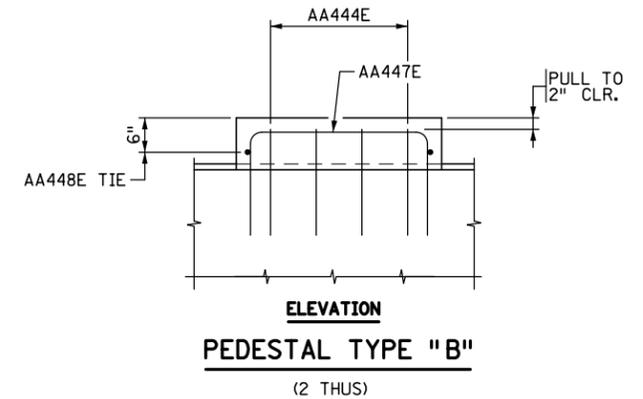
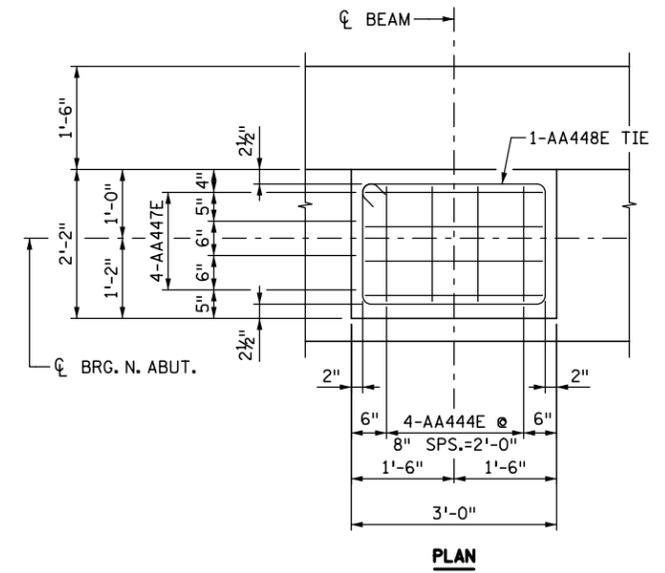
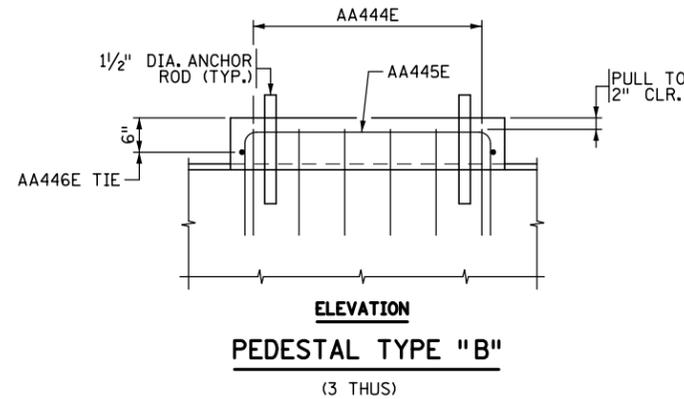
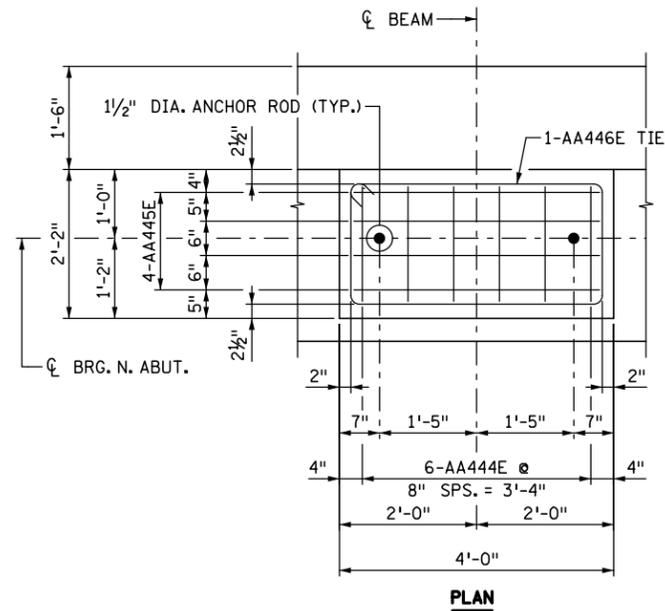
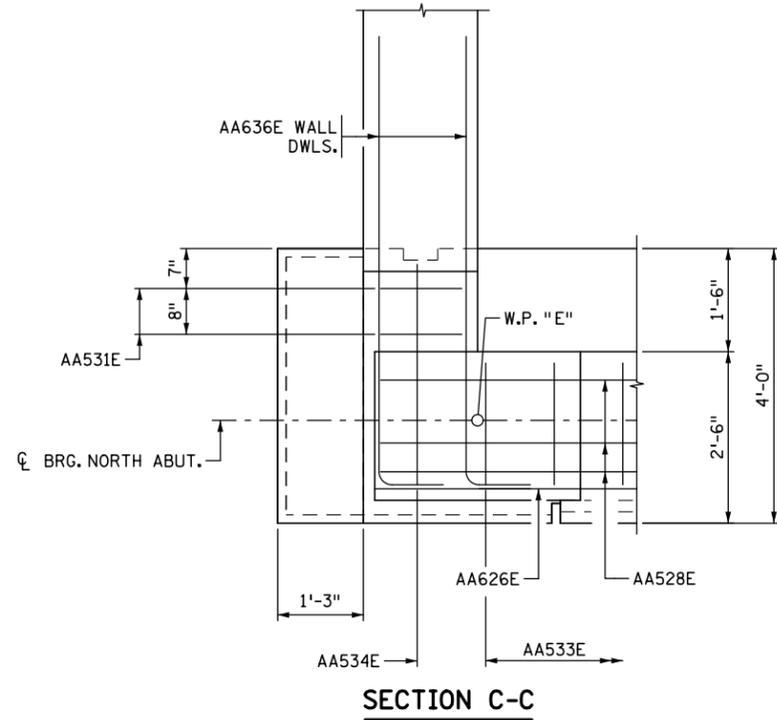
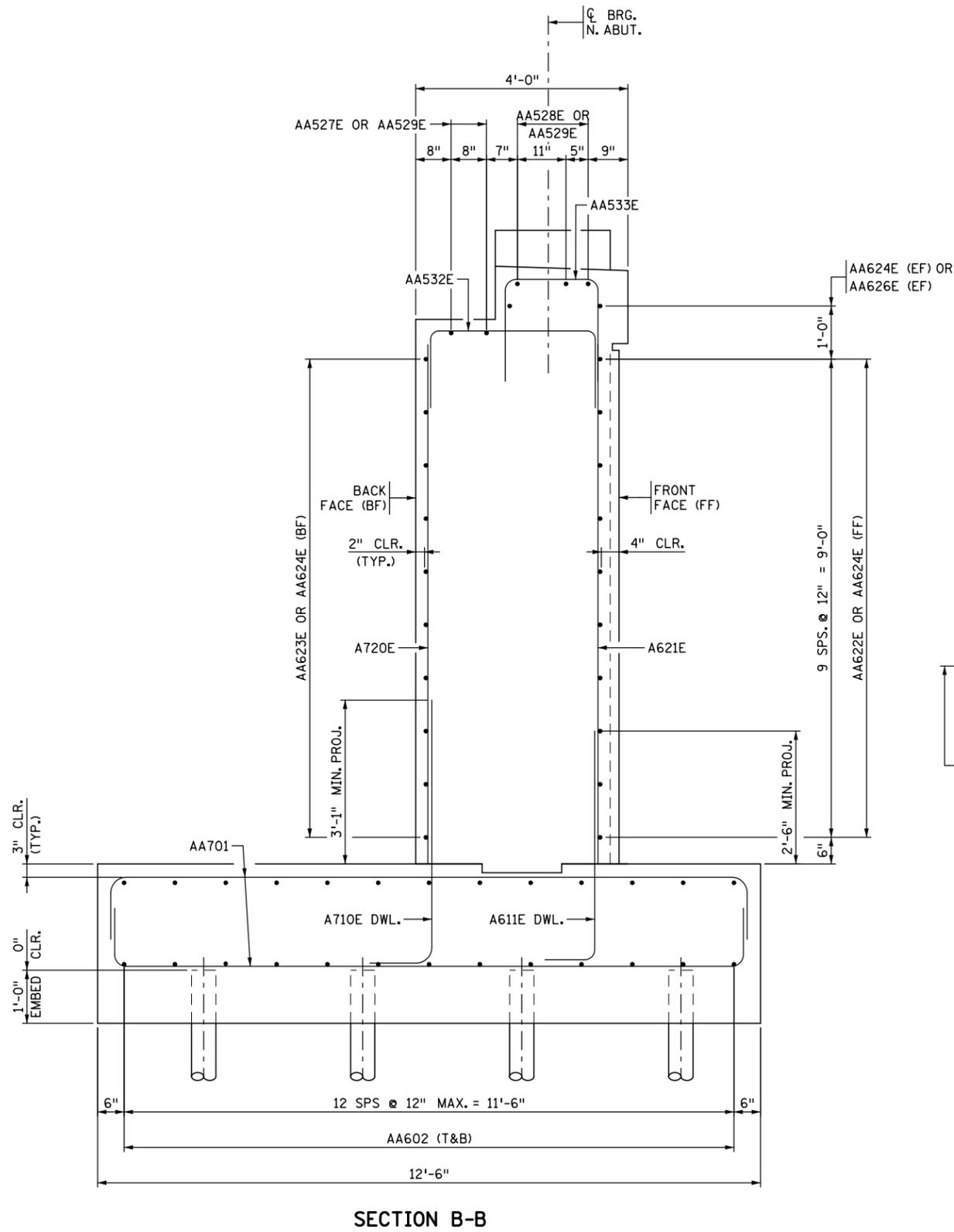
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **NORTH ABUTMENT REINFORCEMENT (STAGE 2)**

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 15 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:48:53 PM
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NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



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

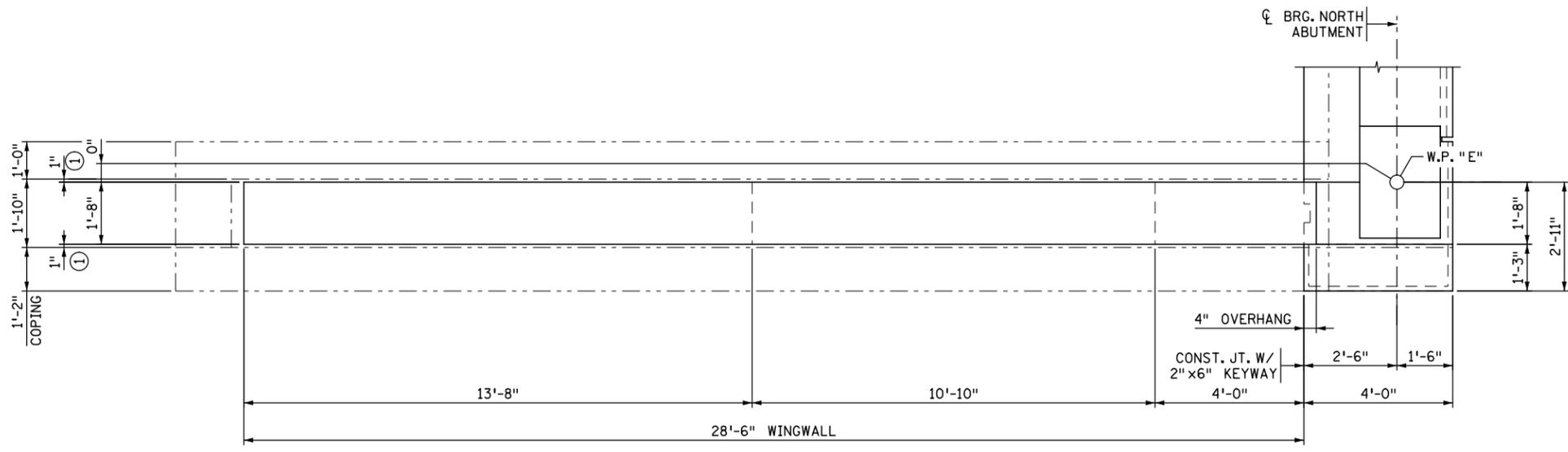
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: NORTH ABUMENT
 REINFORCEMENT DETAILS
 (STAGE 2)

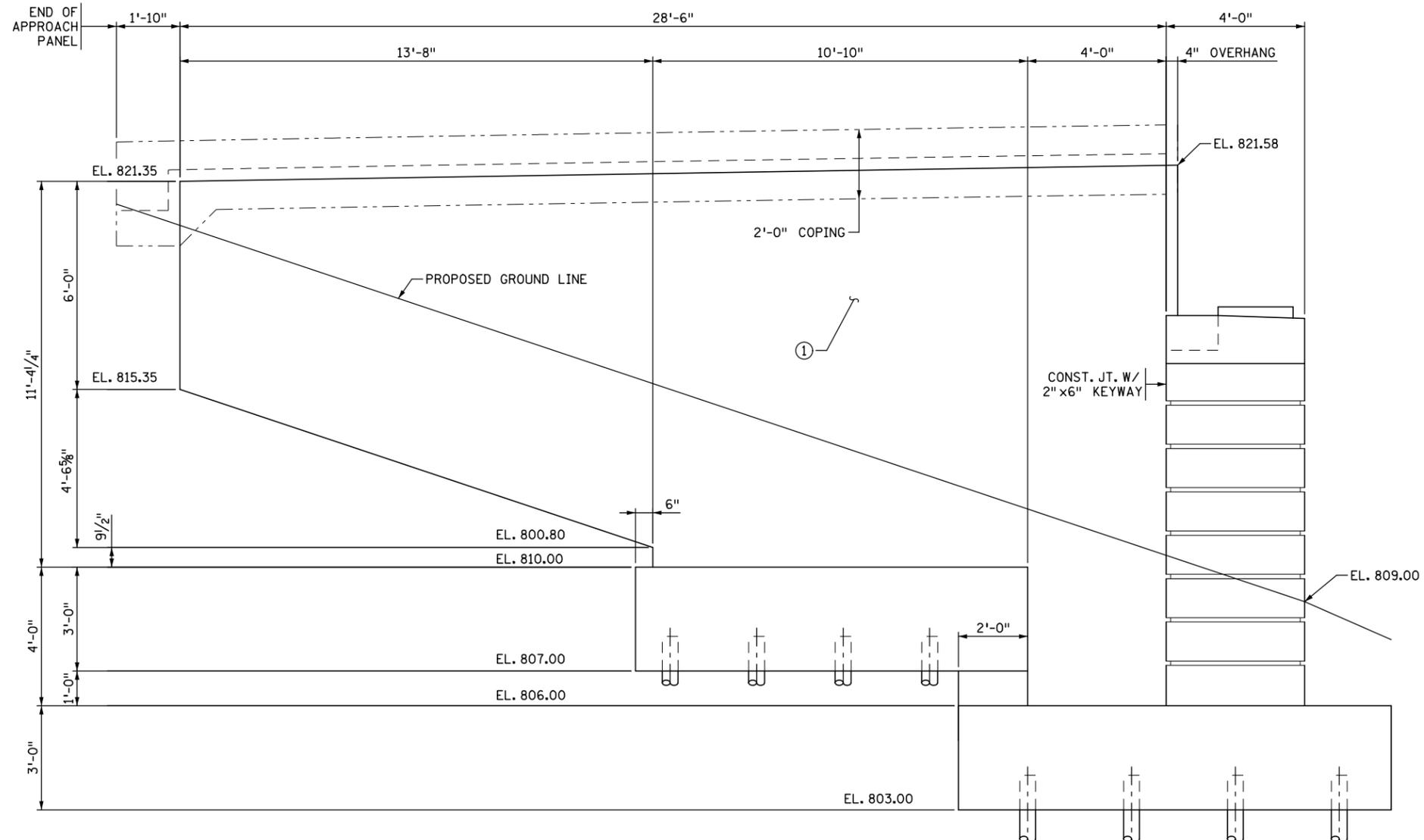
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 CHK: GM CHK: GM
 SHEET NO. 16 OF 96 SHEETS

BRIDGE NO.
 27B84

DATE: 4/1/2016 TIME: 12:48:54 PM
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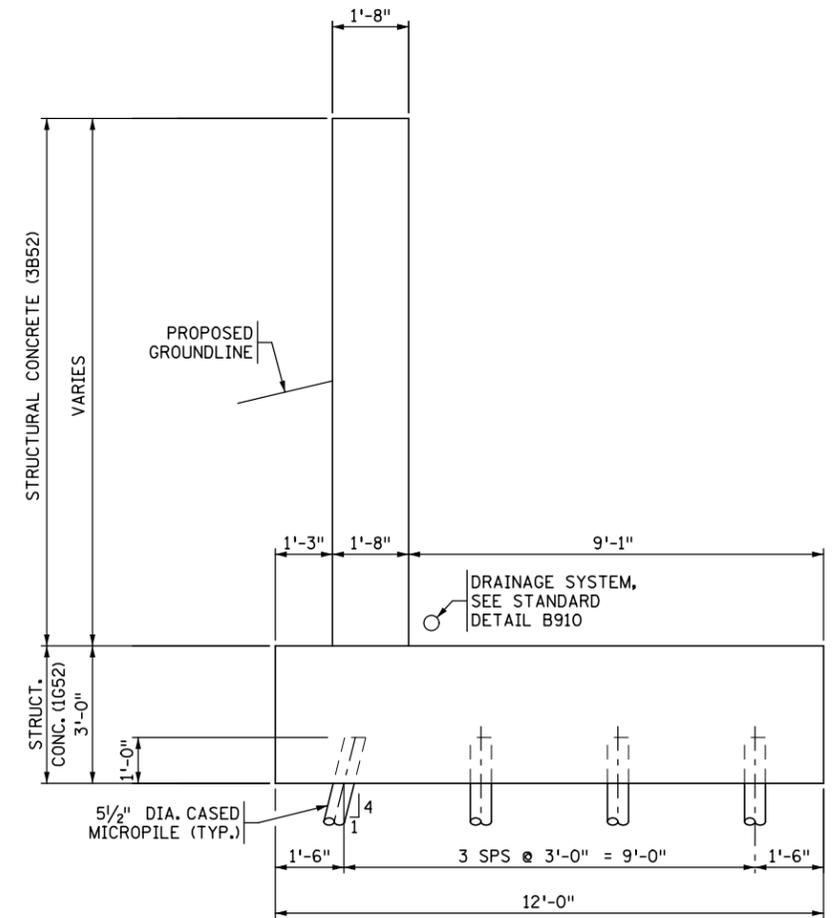
NORTHWEST WINGWALL PLAN



NORTHWEST WINGWALL ELEVATION



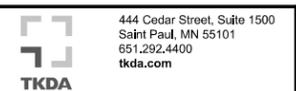
NOTES:
 ① PLACE 1" POLYSTYRENE BETWEEN WINGWALL AND APPROACH PANEL.



TYPICAL NORTHWEST WINGWALL SECTION

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:



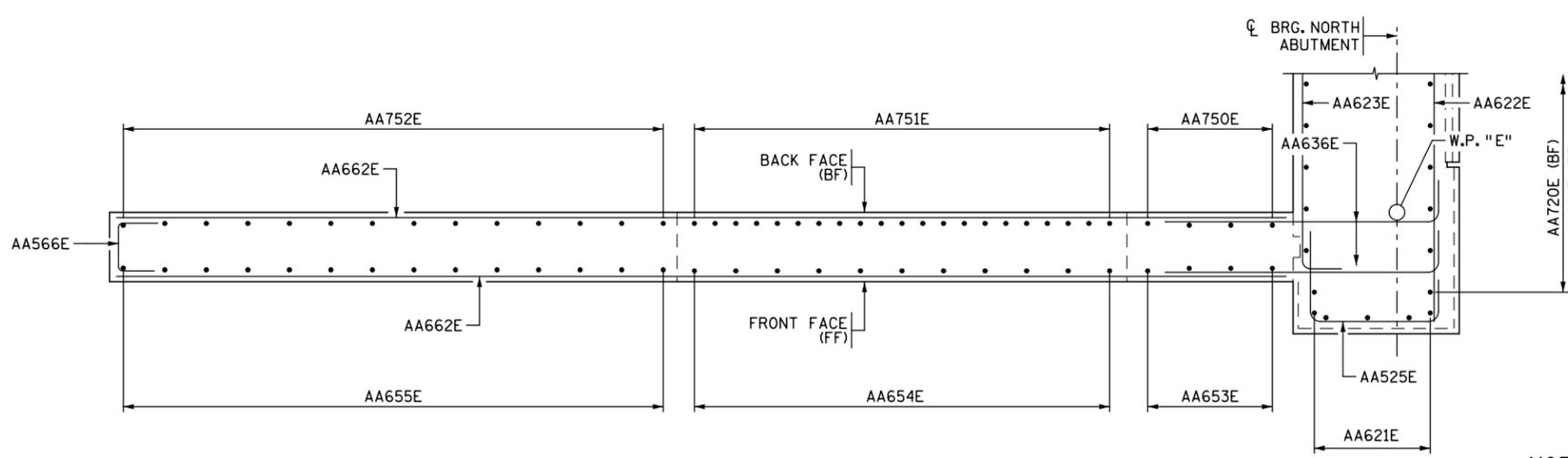
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **NORTHWEST WINGWALL PLAN & ELEVATION**

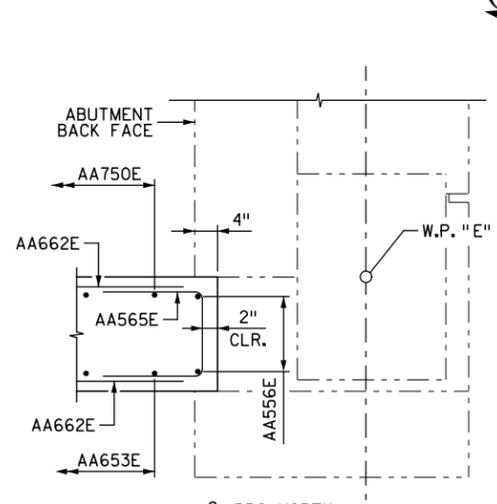
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 CHK: GM CHK: GM
 SHEET NO. 17 OF 96 SHEETS

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:48:55 PM
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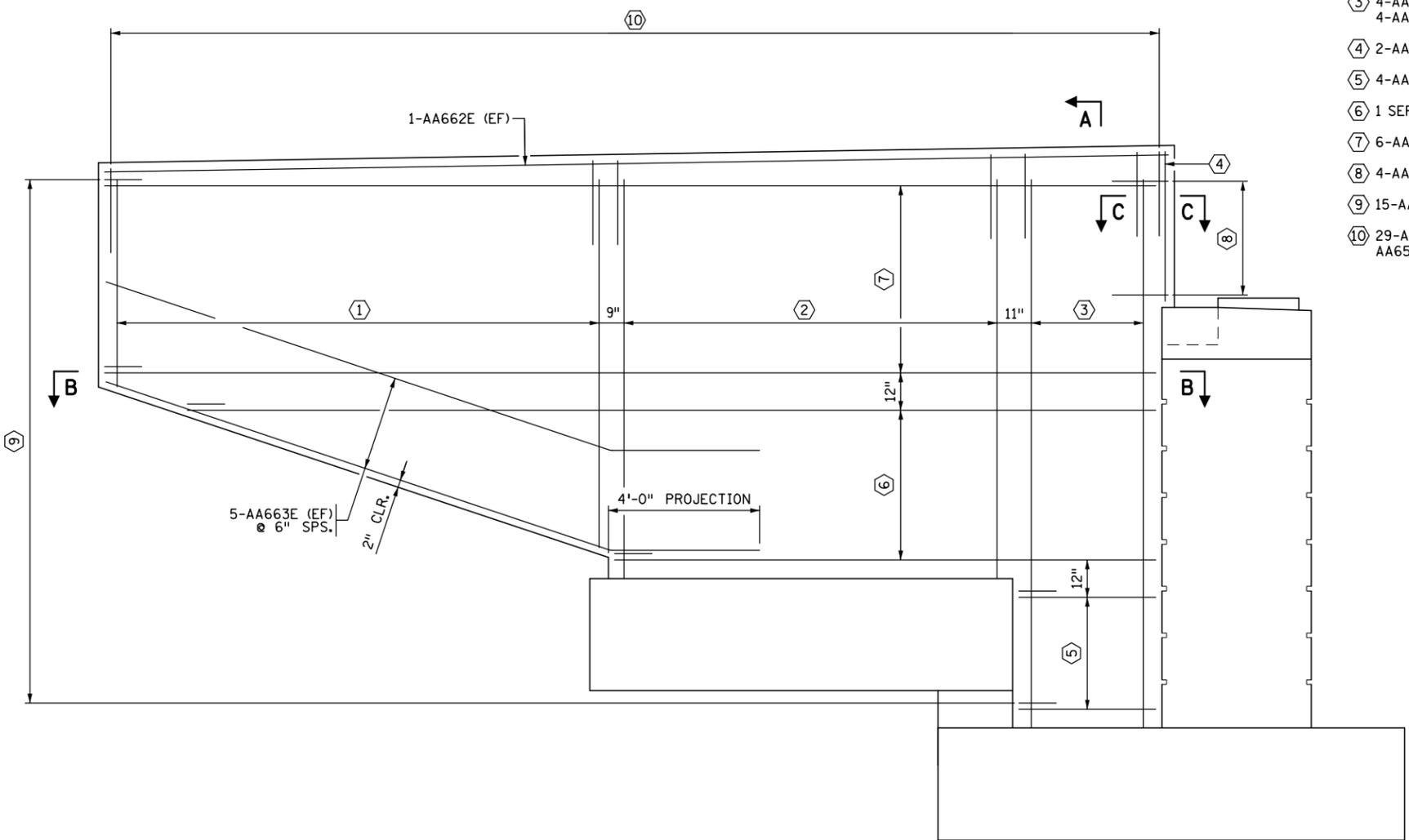


SECTION B-B

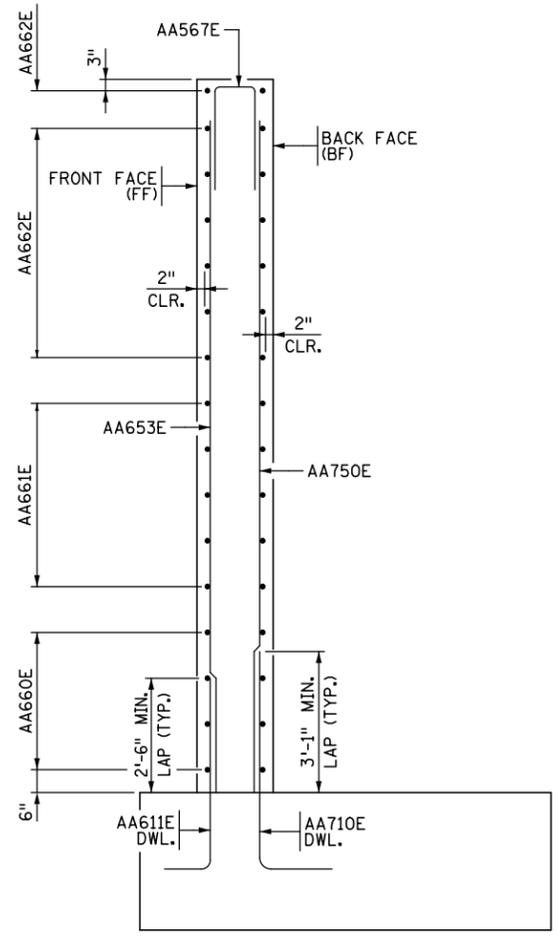


SECTION C-C

- NOTES:**
- ① 1 SER. OF 12-AA752E (BF) @ 12" SPS. = 13'-0"
 1 SER. OF 12-AA655E (FF) @ 12" SPS. = 13'-0"
 - ② 22-AA751E (BF) @ 6" SPS. = 10'-0"
 11-AA655E (FF) @ 12" MAX. SPS. = 10'-0"
 - ③ 4-AA750E (BF) @ 12" SPS. = 3'-0"
 4-AA653E (FF) @ 12" SPS. = 3'-0"
 - ④ 2-AA556E PLACED IN THE CORNERS OF AA655E.
 - ⑤ 4-AA660E (EF) @ 12" SPS. = 3'-0".
 - ⑥ 1 SER. OF 5-AA661E (EF) @ 12" SPS. = 4'-0".
 - ⑦ 6-AA662E (EF) @ 12" SPS. = 5'-0".
 - ⑧ 4-AA565E @ 12" SPS. = 3'-0".
 - ⑨ 15-AA566E TO MATCH HORIZONTAL REINFORCEMENT.
 - ⑩ 29-AA567E TO MATCH AA653E (FF), AA654E (FF), AA655E (FF) & AA556E



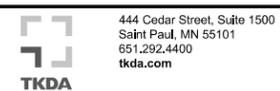
NORTHWEST WINGWALL REINFORCEMENT
 (FOOTING REINFORCEMENT AND PILE NOT SHOWN FOR CLARITY)



SECTION A-A

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **NORTHWEST WINGWALL REINFORCEMENT**

DES: MAV	DR: ADL	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 18 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:48:56 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\abuf\cbr-27B84_inabf15.dgn

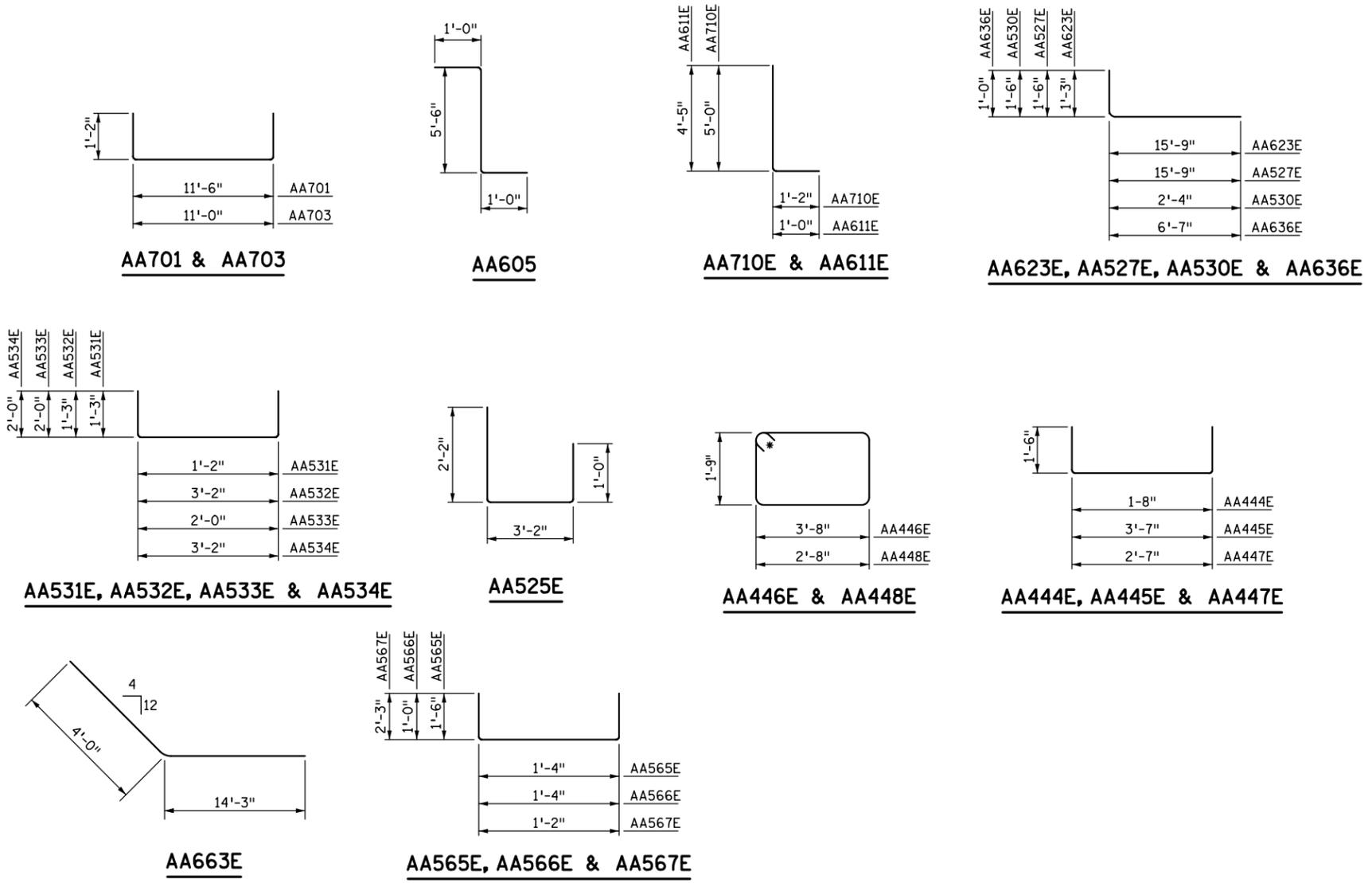
BILL OF REINFORCEMENT - NORTH ABUTMENT (STAGE 2)				
BAR	NO.	LENGTH	SHAPE	LOCATION
AA701	76	13'-10"		FOOTING TRANSVERSE TOP & BOT.
AA602	24	37'-0"		FOOTING LONG. TOP & BOT.
AA703	24	13'-4"		WINGWALL FOOTING TRANS. TOP & BOT.
AA604	24	10'-10"		WINGWALL FOOTING LONG. TOP & BOT.
AA605	24	7'-6"		FOOTING STEP TIE
AA606	4	11'-6"		FOOTING STEP LONG.
AA607	24	3'-0"		STAGED CONSTRUCTION JOINT FTG. DWL.
AA710E	60	6'-2"		FOOTING DOWEL BACK FACE
AA611E	58	5'-5"		FOOTING DOWEL FRONT FACE
AA720E	60	10'-0"		STEM BACK FACE VERTICAL
AA621E	58	10'-0"		STEM FRONT FACE VERTICAL
AA622E	10	16'-11"		STEM FRONT FACE HORIZONTAL
AA623E	10	17'-0"		STEM BACK FACE HORIZONTAL
AA624E	22	19'-11"		STEM HORIZONTAL
AA525E	10	6'-4"		STEM END TIE
AA626E	2	15'-8"		STEM CAP HORIZONTAL
AA527E	2	15'-8"		STEM CAP HORIZONTAL
AA528E	3	17'-3"		STEM CAP HORIZONTAL
AA529E	5	19'-9"		STEM CAP HORIZONTAL
AA530E	3	3'-10"		STEM TOP TIE
AA531E	2	3'-8"		STEM TOP TIE
AA532E	36	4'-8"		STEM TOP TIE
AA533E	36	6'-0"		STEM TOP TIE
AA534E	1	7'-2"		STEM TOP TIE
AA635E	27	6'-0"		CONSTRUCTION JOINT DOWEL
AA636E	28	7'-7"		WINGWALL CONST. JOINT DOWEL
AA640E	27	3'-0"		STAGED CONSTRUCTION JOINT STEM DWL.
AA444E	50	4'-8"		PEDESTAL TRANSVERSE
AA445E	12	6'-7"		TYPE "A" PEDESTAL LONG.
AA446E	3	11'-7"		TYPE "A" PEDESTAL TIE
AA448E	8	5'-7"		TYPE "B" PEDESTAL LONG.
AA447E	2	9'-7"		TYPE "B" PEDESTAL TIE
AA750E	4	14'-8"		WW BACK FACE VERTICAL
AA751E	22	10'-8"		WW BACK FACE VERTICAL
AA752E	14	SER. 1		WW BACK FACE VERTICAL
AA653E	4	14'-8"		WW FRONT FACE VERTICAL
AA654E	11	10'-8"		WW FRONT FACE VERTICAL
AA655E	14	SER. 1		WW FRONT FACE VERTICAL
AA756E	2	4'-0"		WW VERTICAL
AA660E	8	3'-8"		WW HORIZONTAL
AA661E	10	SER. 2		WW HORIZONTAL
AA662E	14	28'-2"		WW HORIZONTAL
AA663E	10	18'-3"		WW HORIZONTAL
AA565E	4	4'-4"		WW END TIE
AA566E	15	3'-4"		WW END TIE
AA567E	29	5'-8"		WW TOP TIE

SER. 1 = 2 SERIES OF 7 BARS (5'-6" TO 9'-10")
 SER. 2 = 2 SERIES OF 5 BARS (14'-6" TO 25'-11")

NOTE:
 BENT BAR DIMENSIONS GIVEN ARE OUT-TO-OUT.
 ACTUAL BAR LENGTHS SHALL BE DETERMINED
 BASED ON THE DETAIL DIMENSIONS SHOWN IN
 THE BAR BENDING DIAGRAMS.
 * DENOTES STANDARD STIRRUP HOOK.

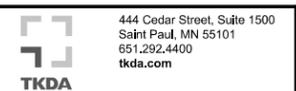
NOTES:
 ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING
 FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT
 PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

BAR BENDING DIAGRAMS



NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
 SIGNED _____
 DATE: 4/1/2016 LIC. NO.:



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
 NORTH ABUMTENT
 BARLIST (STAGE 2)

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 19 OF 96 SHEETS		

BRIDGE NO.
 27B84



FOOTING COORDINATES			
PLAN POINT	X-COORDINATE	Y-COORDINATE	B/FTG. EL.
1	545,776.895	146,698.771	803.00
2	545,807.403	146,714.520	803.00
3	545,801.669	146,725.628	803.00
4	545,771.161	146,709.879	803.00
5	545,791.923	146,718.346	807.00
6	545,802.586	146,723.851	807.00
7	545,797.388	146,733.921	807.00
8	545,786.725	146,728.417	807.00

NORTH ABUTMENT - STAGE 3	
COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	36.3
FACTORED LIVE LOAD	4.2
* FACTORED DESIGN LOAD	40.5

* BASED ON STRENGTH I LOAD COMBINATION.

NORTH ABUTMENT - STAGE 3		
REQUIRED NOMINAL MICRO-PILE RESISTANCE R _n - TONS/PILE		
FIELD CONTROL METHOD	φ _{stat}	*R _n
PROOF TEST	0.7	57.9

*R_n = (FACTORED DESIGN LOAD) / φ_{stat}

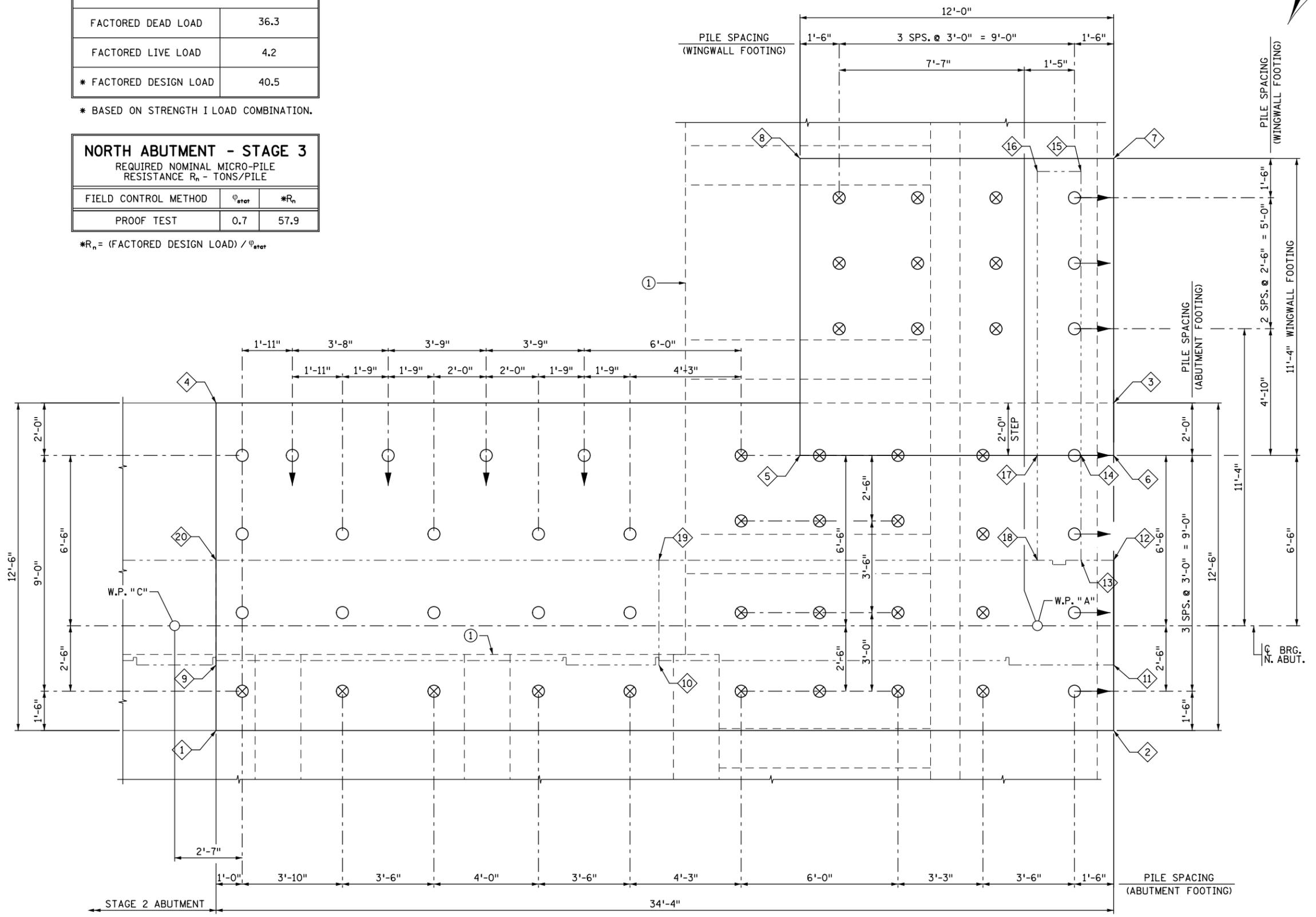
STEM COORDINATES		
PLAN POINT	X-COORDINATE	Y-COORDINATE
9	545,775.748	146,700.993
10	545,790.798	146,708.762
11	545,806.256	146,716.742
12	545,804.421	146,720.296
13	545,803.310	146,719.723
14	545,801.476	146,723.277
15	545,796.506	146,732.903
16	545,795.025	146,732.139
17	545,799.995	146,722.513
18	545,801.829	146,718.958
19	545,788.963	146,712.317
20	545,773.913	146,704.547

PILE NOTES:

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
 ALL PILES TO BE 5 1/2" DIA. MICROPILES.
 PILES MARKED WITH ⊗ SHALL BE CORED THROUGH EXISTING ABUTMENT FOOTING.
 PILES MARKED WITH → SHALL BE BATTERED IN THE DIRECTION SHOWN.
 1 PROOF TEST.
 19 MICROPILES REQ'D FOR EAST ABUT. FTG.
 SEE "MICROPILE DETAILS" SHEET AND GEOTECHNICAL REPORT FOR MORE INFORMATION.
 PILE THAT WILL BE PROOF TESTED WILL BE COORDINATED BY THE ENGINEER AND THE CONTRACTOR.

NOTES:

- ① EXISTING ABUTMENT FOOTING AND ABUTMENT COUNTERFORTS. PILE SPACED TO AVOID CONFLICTS WITH EXISTING COUNTERFORTS.



NORTH ABUTMENT FOOTING PLAN - STAGE 3

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NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____ LIC. NO.: _____
 DATE: 4/1/2016



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: NORTH ABUTMENT FOOTING PLAN (STAGE 3)

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 20 OF 96 SHEETS		

BRIDGE NO. 27B84

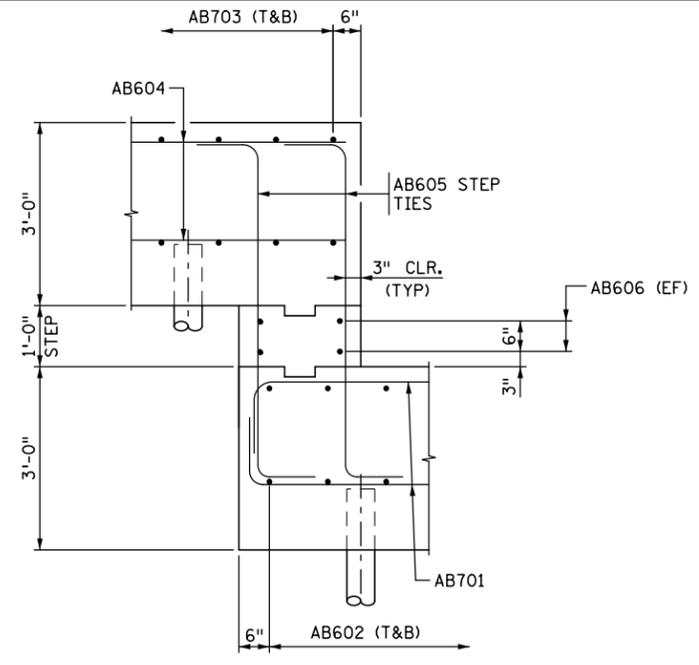
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BAR CALL-OUTS

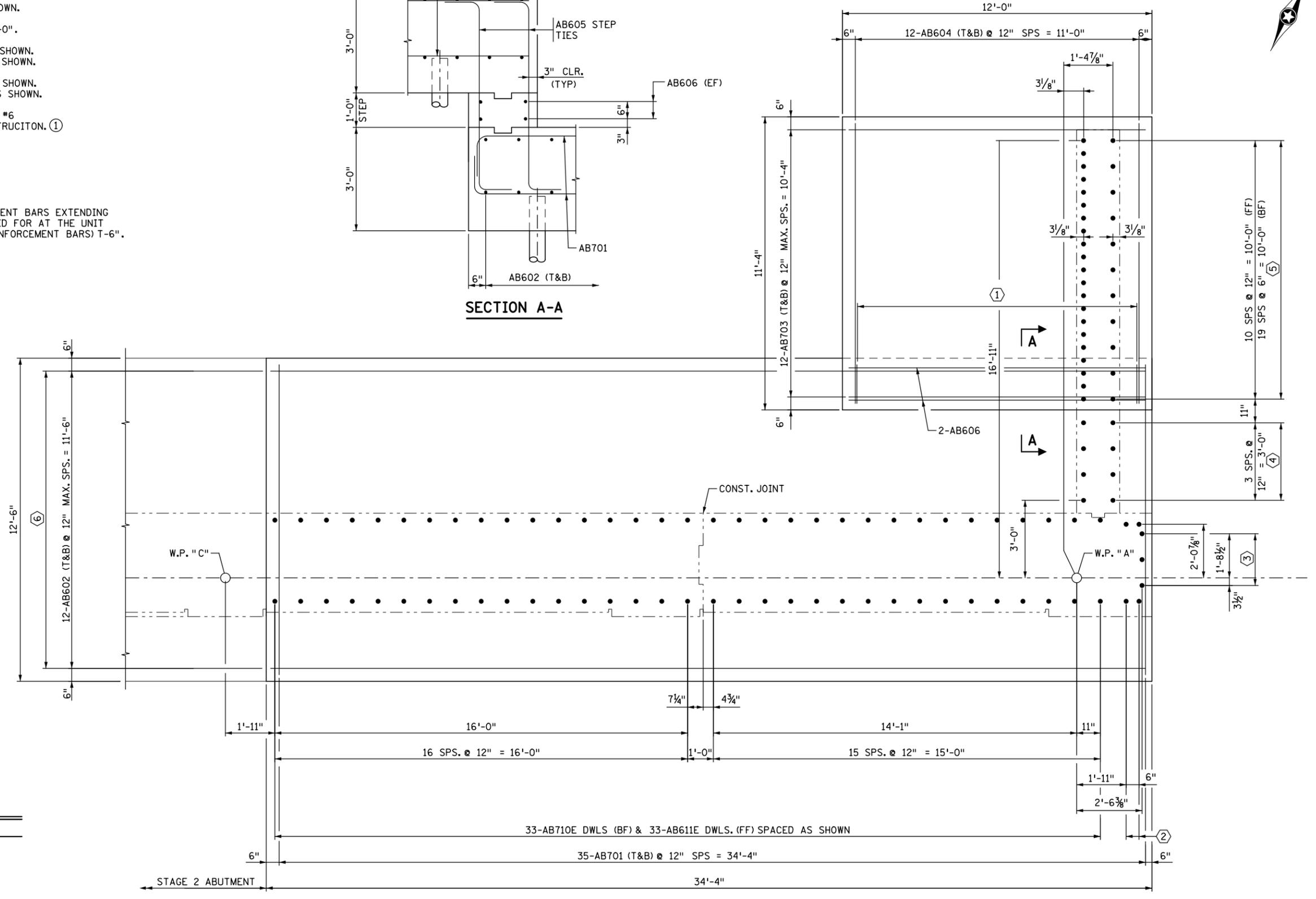
- ① 12-AB605 STEP TIES (EF) @ 12" MAX SPS. = 11'-0". SEE SECTION A-A FOR PLACEMENT DETAILS.
- ② 1-AB611E DWL. (EF) SPACE AS SHOWN.
- ③ 2-AB611E DWLS. @ 12" SPS. = 2'-0".
- ④ 4-AB611E DWLS. (FF) SPACED AS SHOWN. 4-AB710E DWLS. (BF) SPACED AS SHOWN.
- ⑤ 11-AB611E DWLS. (FF) SPACED AS SHOWN. 20-AB710E DWLS. (BF) SPACED AS SHOWN.
- ⑥ 12-AB607 (T&B) TO MATCH INTO #6 COUPLERS FROM STAGE 2 CONSTRUCTION. ①

NOTES:

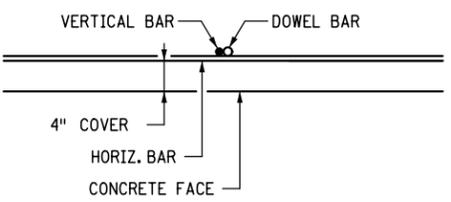
- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".



SECTION A-A



NORTH ABUTMENT FOOTING REINFORCEMENT - STAGE 3



TYPICAL BAR PLACEMENT



NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____

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

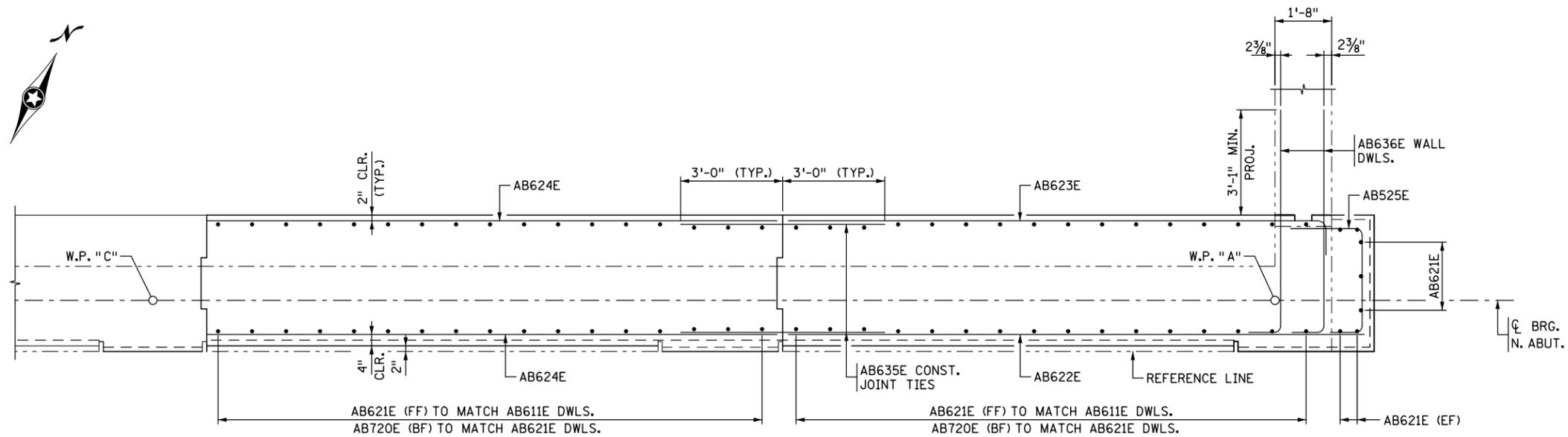
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **NORTH ABUTMENT FOOTING REINFORCEMENT (STAGE 3)**

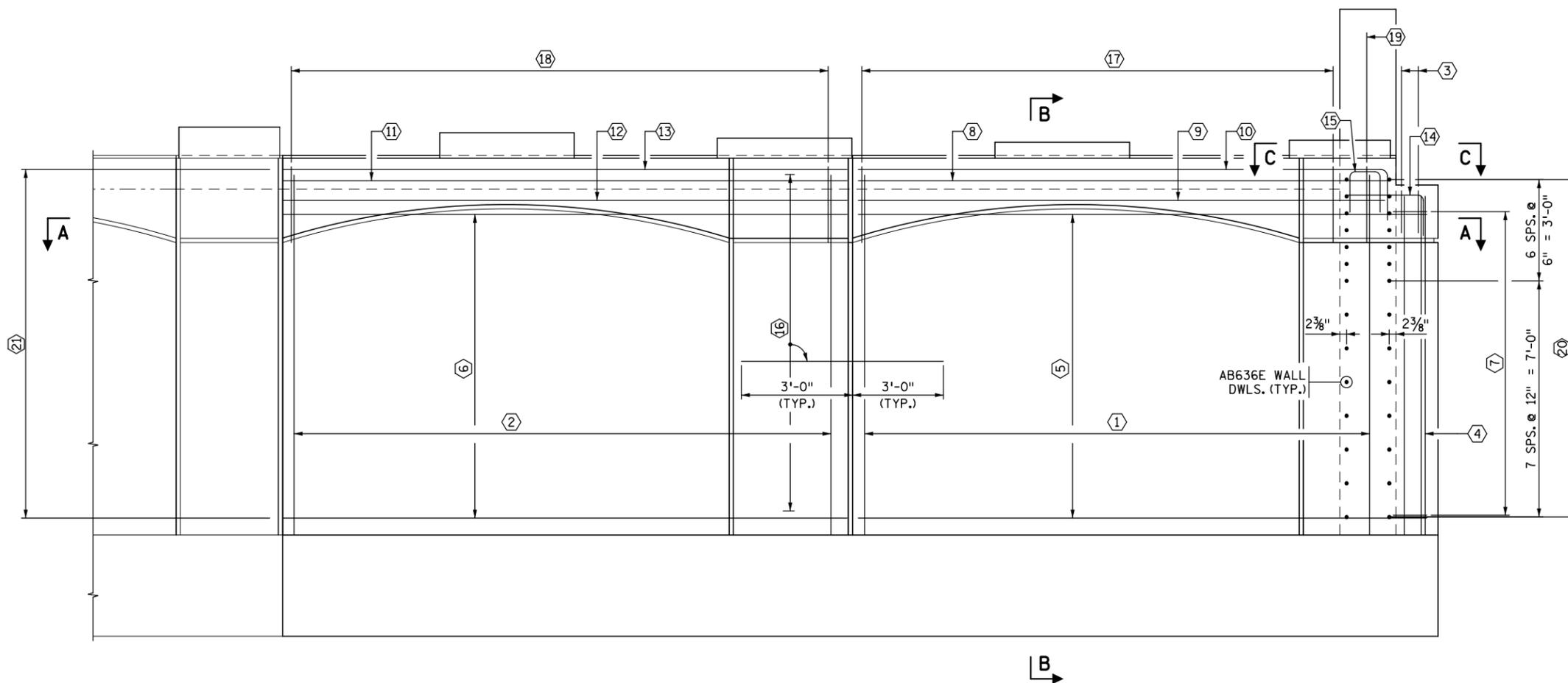
DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	

SHEET NO. 21 OF 96 SHEETS

BRIDGE NO. **27B84**



SECTION A-A



NORTH ABUTMENT REINFORCEMENT - STAGE 3

(FOOTING PILE AND REINFORCEMENT NOT SHOWN FOR CLARITY)

BAR CALL-OUTS

- ① 16-AB621E (FF) SPACED TO MATCH AB621E DWLS.
16-AB720E (BF) SPACED TO MATCH AB720E DWLS.
- ② 17-AB621E (FF) SPACED TO MATCH AB621E DWLS.
17-AB720E (BF) SPACED TO MATCH AB720E DWLS.
- ③ 1-AB621E (EF) SPACED TO MATCH AB611E DWL.
- ④ 3-AB621E SPACED TO MATCH AB611E DWLS.
- ⑤ 10-AB622E (FF) SPACED AS SHOWN IN SECTION B-B.
10-AB623E (BF) SPACED AS SHOWN IN SECTION B-B.
- ⑥ 10-AB624E (FF) SPACED AS SHOWN IN SECTION B-B.
- ⑦ 10-AB525E END TIES SPACED TO MATCH AB622E.
- ⑧ 1-AB626E (EF) SPACED AS SHOWN IN SECTION B-B.
- ⑨ 2-AB527E SPACED AS SHOWN IN SECTION B-B.
- ⑩ 3-AB528E SPACED AS SHOWN IN SECTION B-B.
- ⑪ 1-AB624E (EF) SPACED AS SHOWN IN SECTION B-B.
- ⑫ 2-AB529E SPACED AS SHOWN IN SECTION B-B.
- ⑬ 3-AB529E SPACED AS SHOWN IN SECTION B-B.
- ⑭ 3-AB530E SPACED TO MATCH AB621E VERTICALS.
- ⑮ 2-AB531E SPACED AS SHOWN IN SECTION C-C.
- ⑯ 27-AB635E CONST. JT TIES SPACED TO MATCH HORIZONTAL BARS.
- ⑰ 16-AB532E W/ 16-AB533E SPACED TO MATCH AB720E VERTICALS. SEE SECTION B-B FOR PLACEMENT DETAILS.
- ⑱ 17-AB532E W/ 17-AB533E SPACED TO MATCH AB720E VERTICALS. SEE SECTION B-B FOR PLACEMENT DETAILS.
- ⑲ 1-AB534E SPACED TO MATCH AB721E.
- ⑳ 14-AB636E WALL DWLS. (EF) SPACED AS SHOWN.
- ㉑ 27-AB640E TO MATCH INTO #6 COUPLERS FROM STAGE 2 CONSTRUCTION. ①

NOTES:

- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

DATE: 4/1/2016 TIME: 12:48:59 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\abuf\ncbr\27B84_nabtl.dgn

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 _____
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 Saint Paul, MN 55101
 651.292.4400
 tkda.com

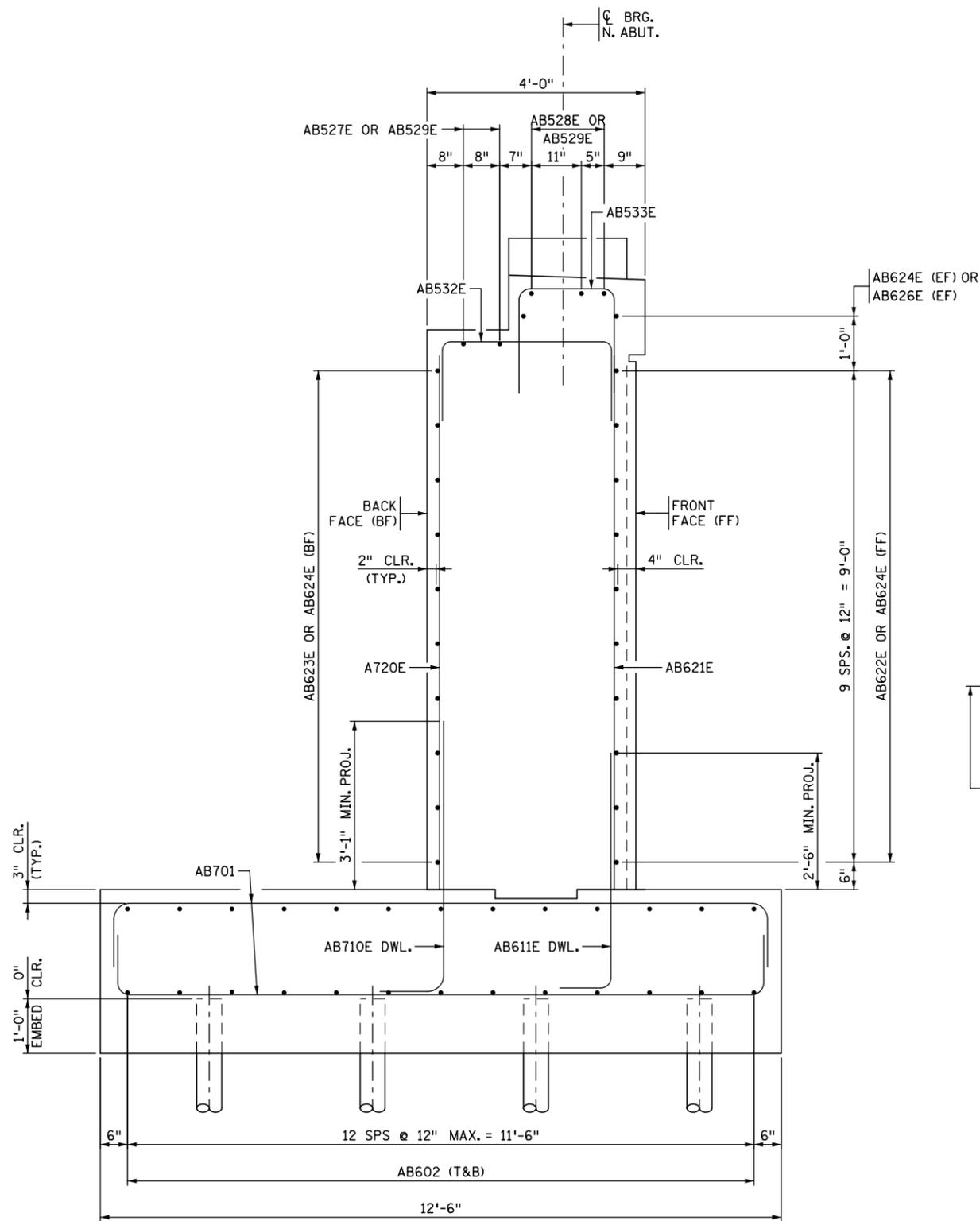
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **NORTH ABUTMENT REINFORCEMENT (STAGE 3)**

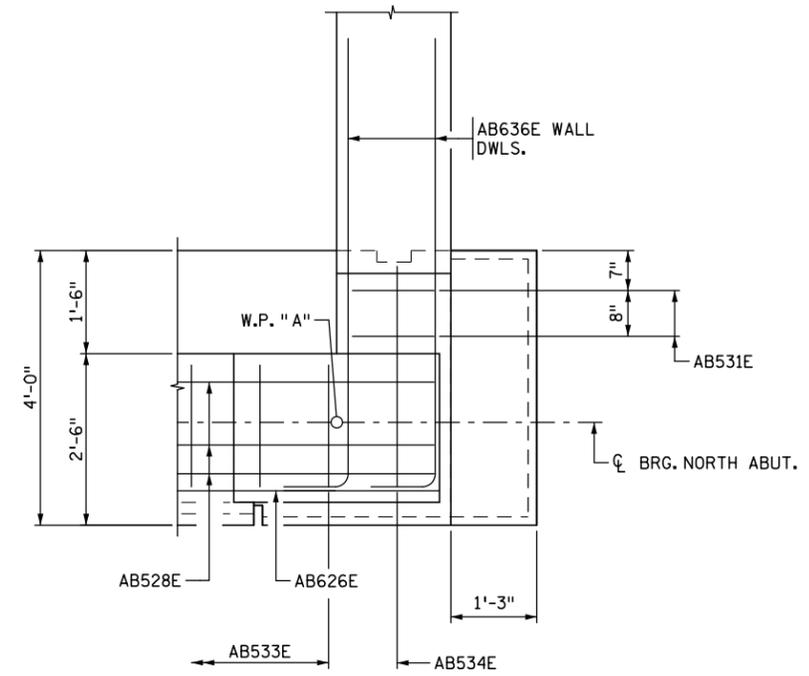
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CHK: GM	CHK: GM	
SHEET NO. 22 OF 96 SHEETS		

BRIDGE NO.
27B84

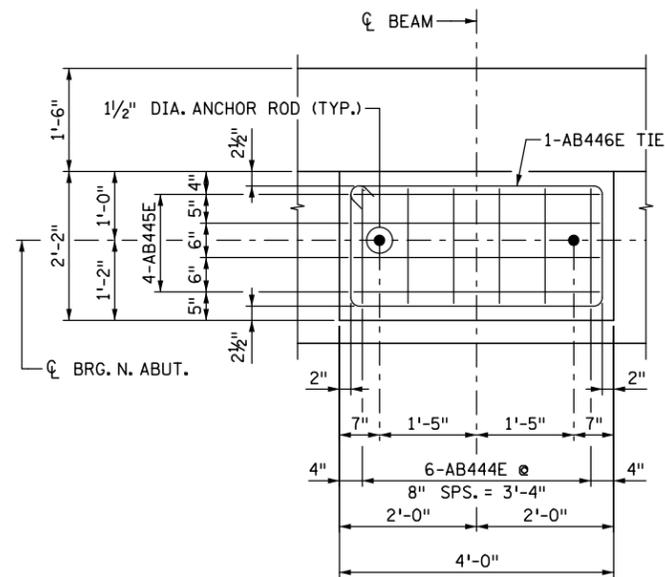
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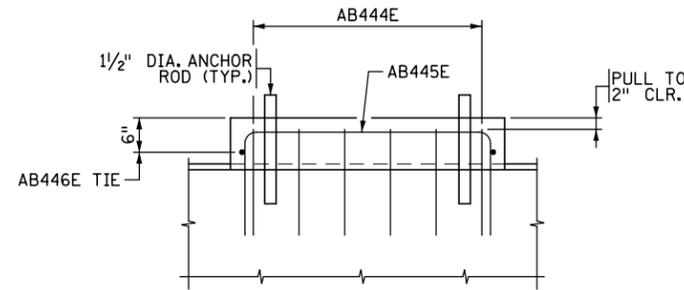
SECTION B-B



SECTION C-C



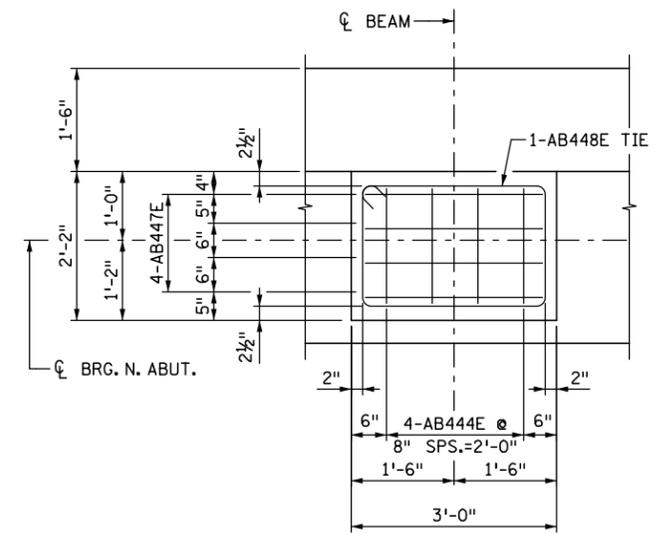
PLAN



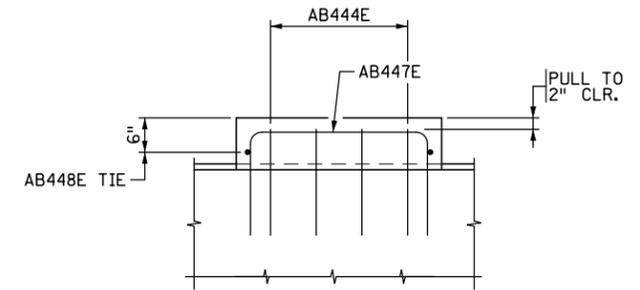
ELEVATION

PEDESTAL TYPE "B"

(3 THUS)



PLAN



ELEVATION

PEDESTAL TYPE "A"

(1 THUS)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.: _____



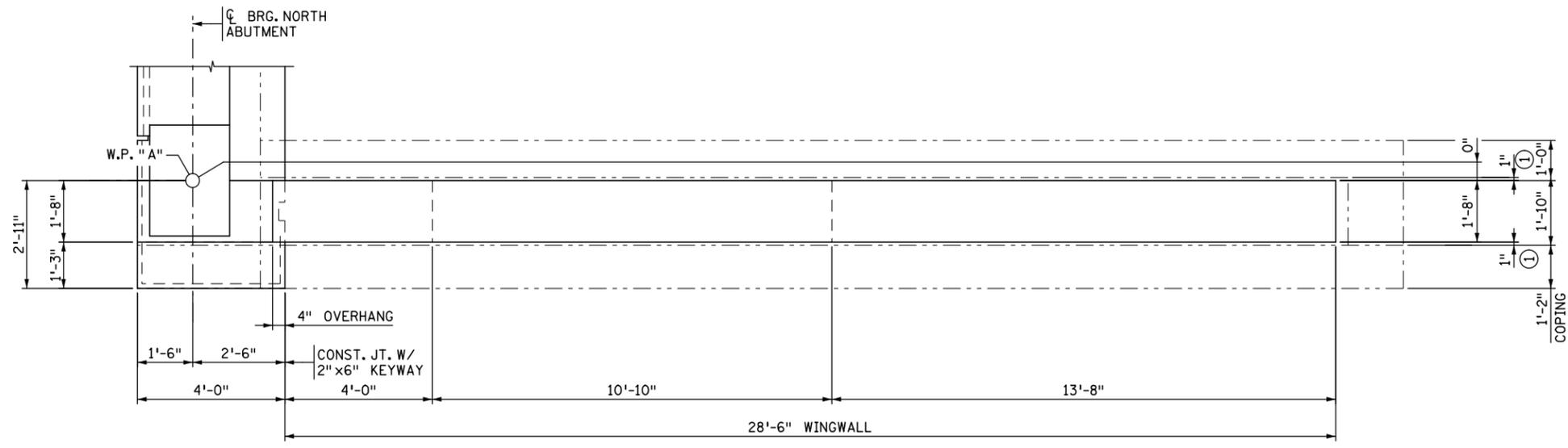
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **NORTH ABUMENT REINFORCEMENT DETAILS (STAGE 3)**

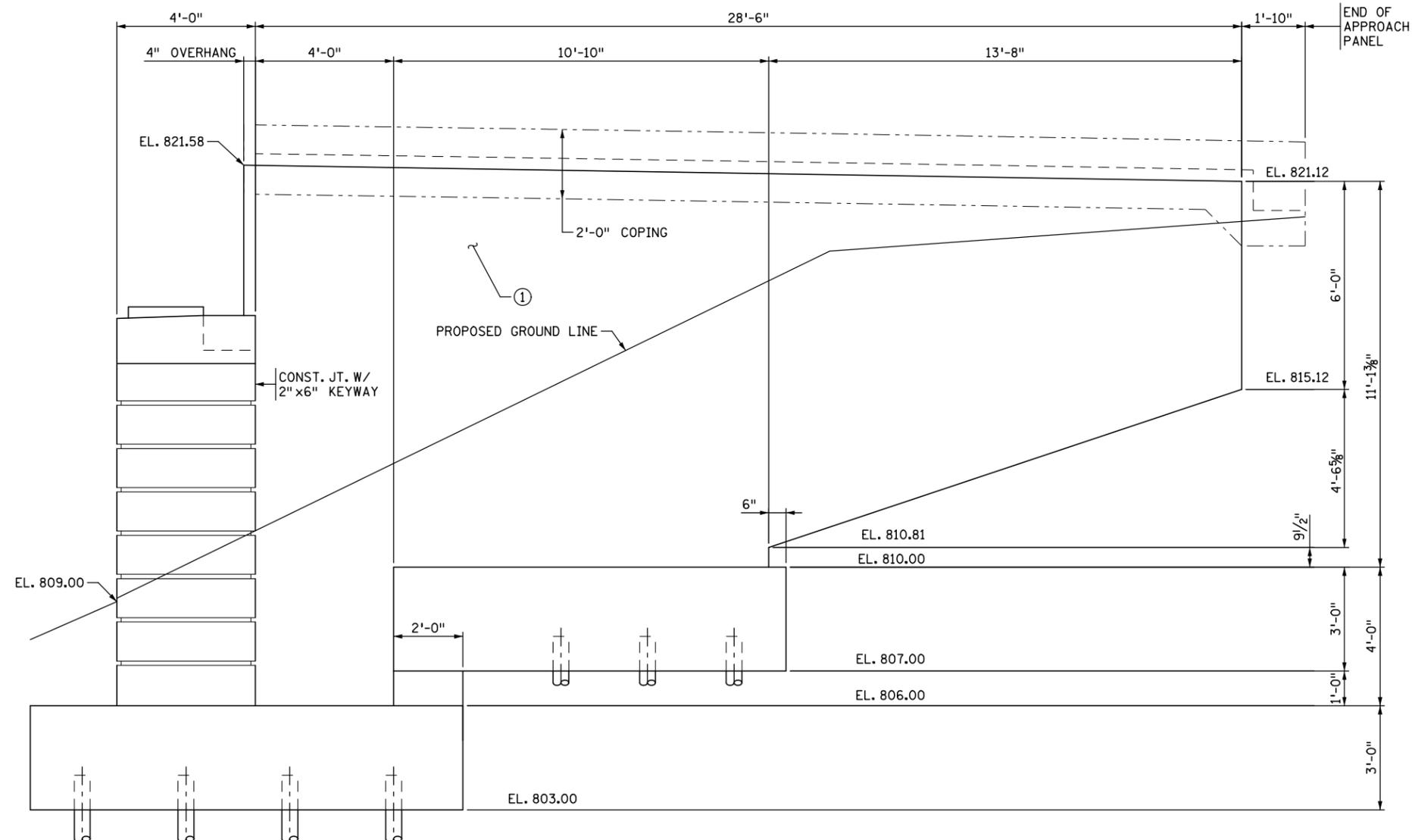
DES: MAV DR: MAV APPROVED
 CHK: GM CHK: GM
 SHEET NO. 23 OF 96 SHEETS

BRIDGE NO. **27B84**

DATE: 4/1/2016 TIME: 12:49:01 PM
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NORTHEAST WINGWALL PLAN

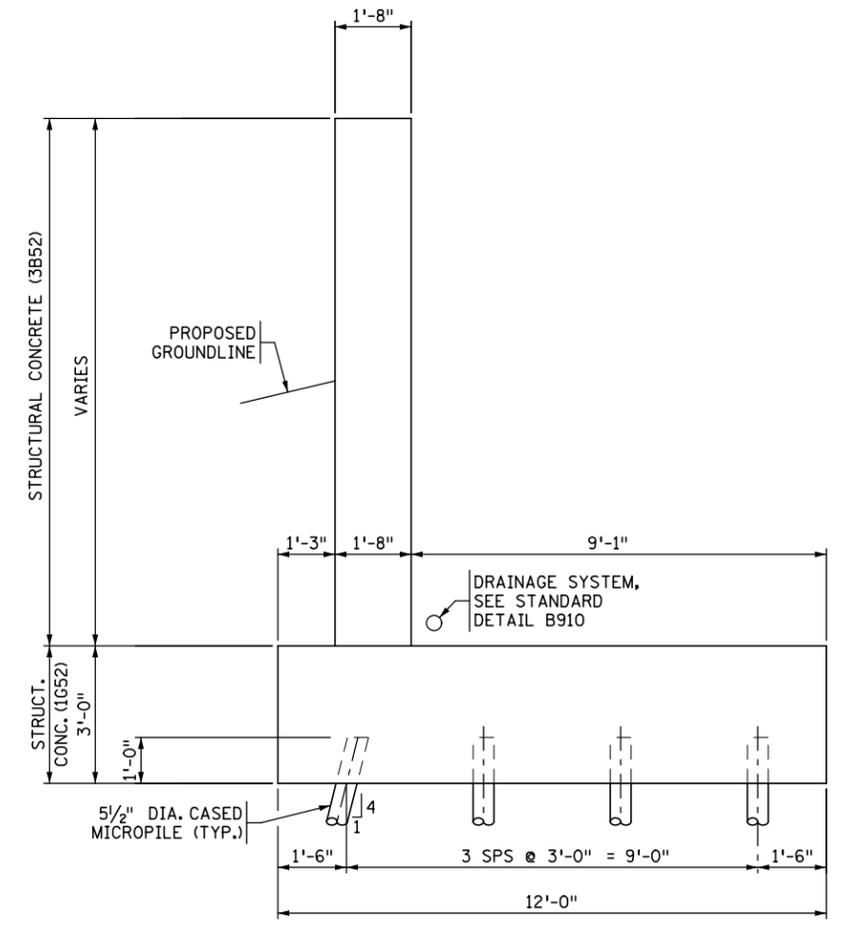


NORTHEAST WINGWALL ELEVATION



NOTES:

- ① PLACE 1" POLYSTYRENE BETWEEN WINGWALL AND APPROACH PANEL.



TYPICAL NORTHEAST WINGWALL SECTION

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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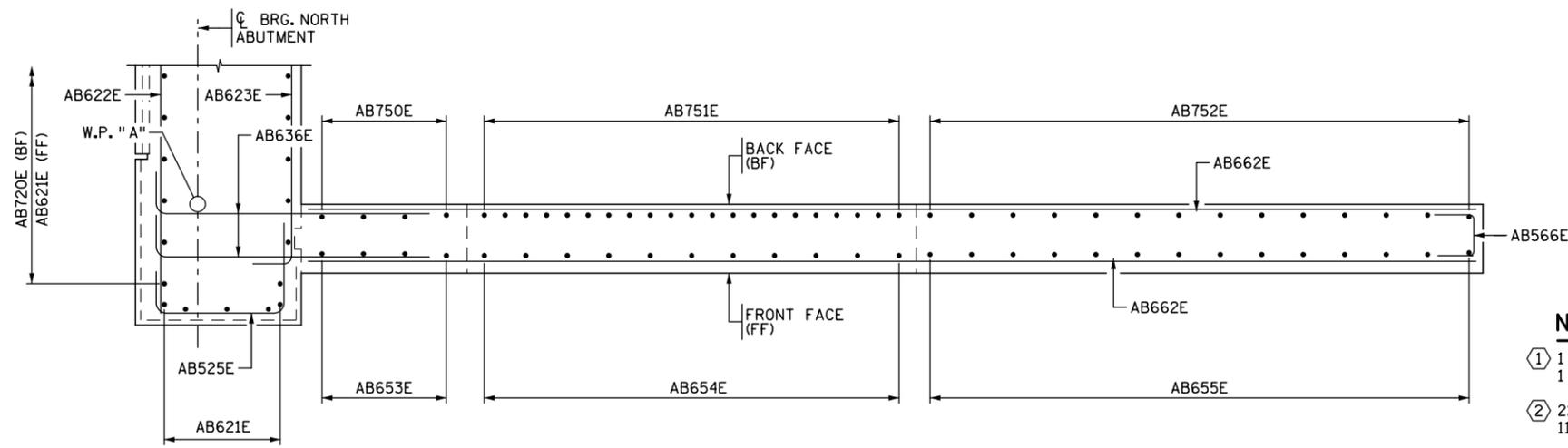
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **NORTHEAST WINGWALL PLAN AND ELEVATION**

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 24 OF 96 SHEETS		

BRIDGE NO.
27B84

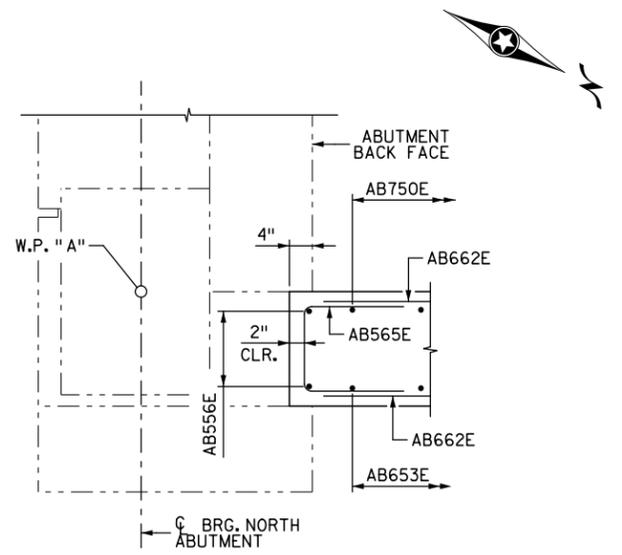
DATE: 4/1/2016 TIME: 12:49:01 PM
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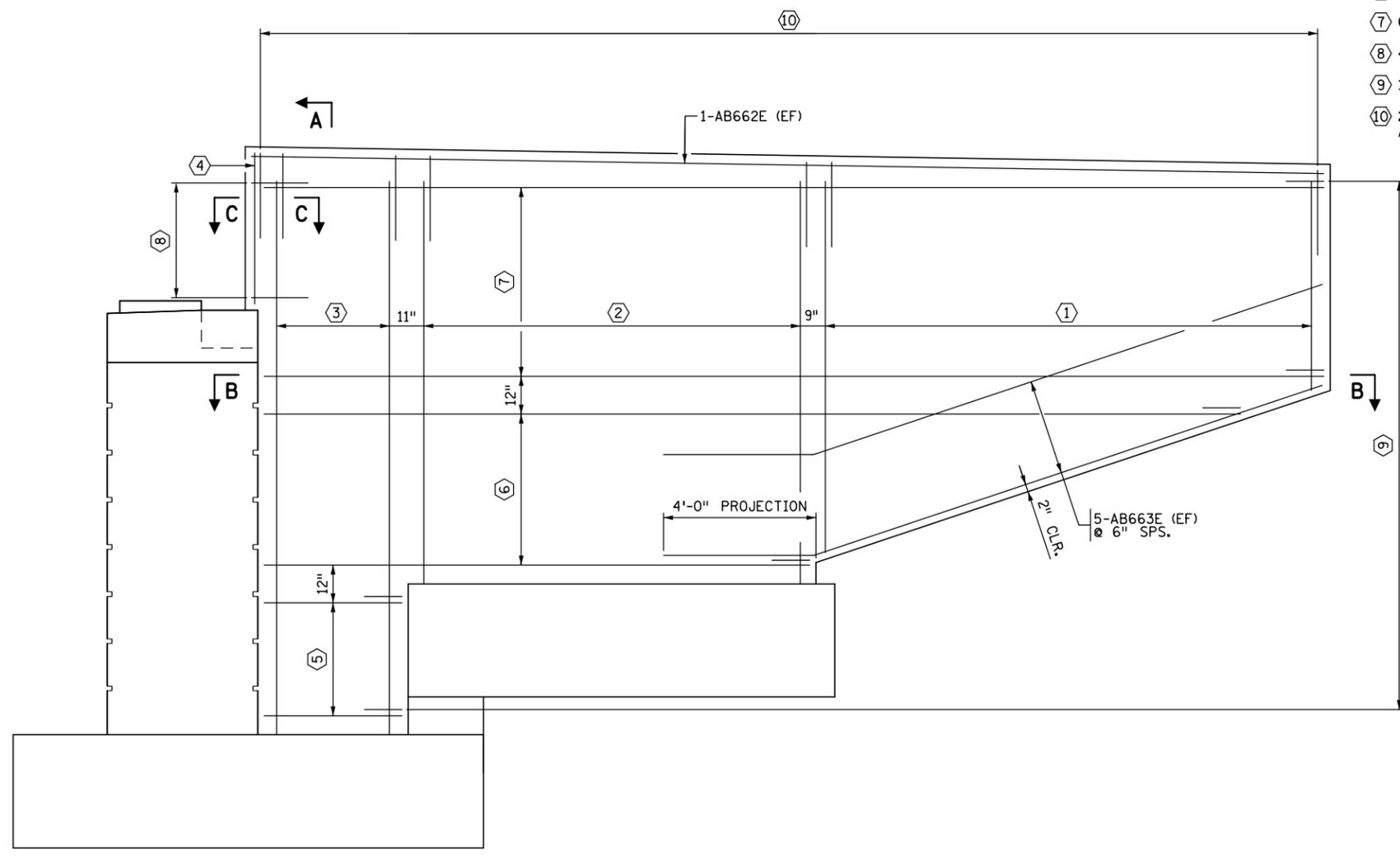
SECTION B-B

NOTES:

- ① 1 SER. OF 12-AB752E (BF) @ 12" SPS. = 13'-0"
 1 SER. OF 12-AB655E (FF) @ 12" SPS. = 13'-0"
- ② 22-AB751E (BF) @ 6" SPS. = 10'-0"
 11-AB655E (FF) @ 12" MAX. SPS. = 10'-0"
- ③ 4-AB750E (BF) @ 12" SPS. = 3'-0"
 4-AB653E (FF) @ 12" SPS. = 3'-0"
- ④ 2-AB566E PLACED IN THE CORNERS OF AB565E.
- ⑤ 4-AB660E (EF) @ 12" SPS. = 3'-0".
- ⑥ 1 SER. OF 5-AB661E (EF) @ 12" SPS. = 4'-0".
- ⑦ 6-AB662E (EF) @ 12" SPS. = 5'-0".
- ⑧ 4-AB565E @ 12" SPS. = 3'-0".
- ⑨ 15-AB566E TO MATCH HORIZONTAL REINFORCEMENT.
- ⑩ 29-AB567E TO MATCH AB653E (FF), AB654E (FF), AB655E (FF) & AB566E

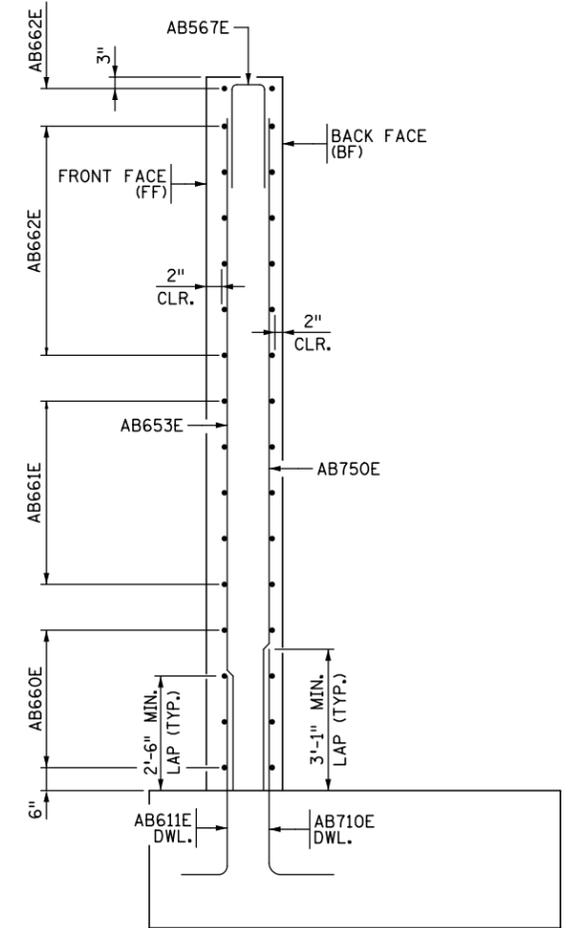


SECTION C-C



NORTHEAST WINGWALL REINFORCEMENT

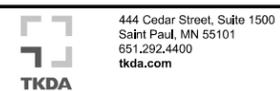
(FOOTING REINFORCEMENT AND PILE NOT SHOWN FOR CLARITY)



SECTION A-A

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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TITLE:
NORTHEAST WINGWALL REINFORCEMENT

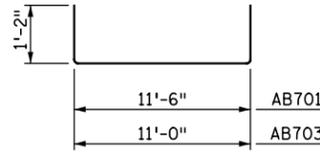
DES: MAV	DR: ADL	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 25 OF 96 SHEETS		

BRIDGE NO.
27B84

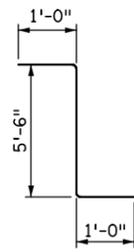
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BILL OF REINFORCEMENT - NORTH ABUTMENT (STAGE 3)				
BAR	NO.	LENGTH	SHAPE	LOCATION
AB701	70	13'-10"		FOOTING TRANSVERSE TOP & BOT.
AB602	24	33'-11"		FOOTING LONG. TOP & BOT.
AB703	24	13'-4"		WINGWALL FOOTING TRANS. TOP & BOT.
AB604	24	10'-10"		WINGWALL FOOTING LONG. TOP & BOT.
AB605	24	7'-6"		FOOTING STEP TIE
AB606	4	11'-6"		FOOTING STEP LONG.
AB607	24	3'-0"		STAGED CONSTRUCTION JOINT FTG. DWL.
AB710E	57	6'-2"		FOOTING DOWEL BACK FACE
AB611E	55	5'-5"		FOOTING DOWEL FRONT FACE
AB720E	57	10'-0"		STEM BACK FACE VERTICAL
AB621E	55	10'-0"		STEM FRONT FACE VERTICAL
AB622E	10	16'-11"		STEM FRONT FACE HORIZONTAL
AB623E	10	17'-0"		STEM BACK FACE HORIZONTAL
AB624E	22	16'-11"		STEM HORIZONTAL
AB525E	10	6'-4"		STEM END TIE
AB626E	2	15'-8"		STEM CAP HORIZONTAL
AB527E	2	15'-8"		STEM CAP HORIZONTAL
AB528E	3	17'-3"		STEM CAP HORIZONTAL
AB529E	5	16'-9"		STEM CAP HORIZONTAL
AB530E	3	3'-10"		STEM TOP TIE
AB531E	2	3'-8"		STEM TOP TIE
AB532E	33	4'-8"		STEM TOP TIE
AB533E	33	6'-0"		STEM TOP TIE
AB534E	1	7'-2"		STEM TOP TIE
AB635E	27	6'-0"		CONSTRUCTION JOINT DOWEL
AB636E	28	7'-7"		WINGWALL CONST. JOINT DOWEL
AB640E	27	3'-0"		STAGED CONSTRUCTION JOINT STEM DWL.
AB444E	50	4'-8"		PEDESTAL TRANSVERSE
AB445E	12	6'-7"		TYPE "A" PEDESTAL LONG.
AB446E	3	11'-7"		TYPE "A" PEDESTAL TIE
AB448E	8	5'-7"		TYPE "B" PEDESTAL LONG.
AB447E	2	9'-7"		TYPE "B" PEDESTAL TIE
AB750E	4	14'-8"		WW BACK FACE VERTICAL
AB751E	22	10'-8"		WW BACK FACE VERTICAL
AB752E	14	SER. 1		WW BACK FACE VERTICAL
AB653E	4	14'-8"		WW FRONT FACE VERTICAL
AB654E	11	10'-8"		WW FRONT FACE VERTICAL
AB655E	14	SER. 1		WW FRONT FACE VERTICAL
AB756E	2	4'-0"		WW VERTICAL
AB660E	8	3'-8"		WW HORIZONTAL
AB661E	10	SER. 2		WW HORIZONTAL
AB662E	14	28'-2"		WW HORIZONTAL
AB663E	10	18'-3"		WW HORIZONTAL
AB565E	4	4'-4"		WW END TIE
AB566E	15	3'-4"		WW END TIE
AB567E	29	5'-8"		WW TOP TIE

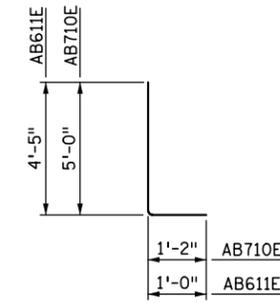
BAR BENDING DIAGRAMS



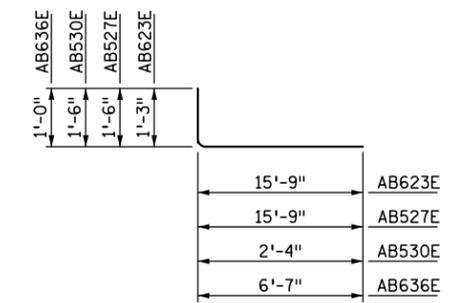
AB701 & AB703



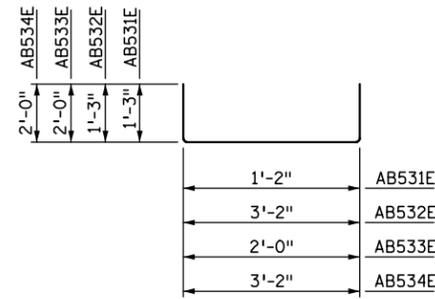
AB605



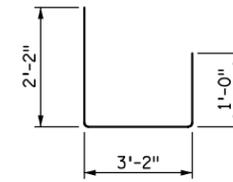
AB710E & AB611E



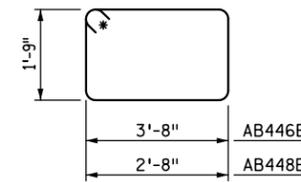
AB623E, AB527E, AB530E & AB636E



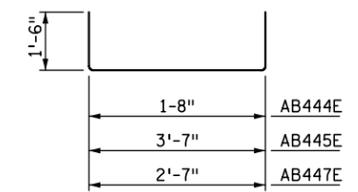
AB531E, AB532E, AB533E & AB534E



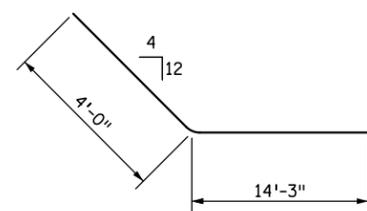
AB525E



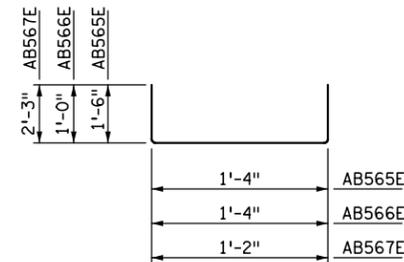
AB446E & AB448E



AB444E, AB445E & AB447E



AB663E



AB565E, AB566E & AB567E

SER. 1 = 2 SERIES OF 7 BARS (5'-6" TO 9'-10")
 SER. 2 = 2 SERIES OF 5 BARS (14'-6" TO 25'-11")

NOTE:

BENT BAR DIMENSIONS GIVEN ARE OUT-TO-OUT. ACTUAL BAR LENGTHS SHALL BE DETERMINED BASED ON THE DETAIL DIMENSIONS SHOWN IN THE BAR BENDING DIAGRAMS.

* DENOTES STANDARD STIRRUP HOOK.

NOTES:

- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 _____
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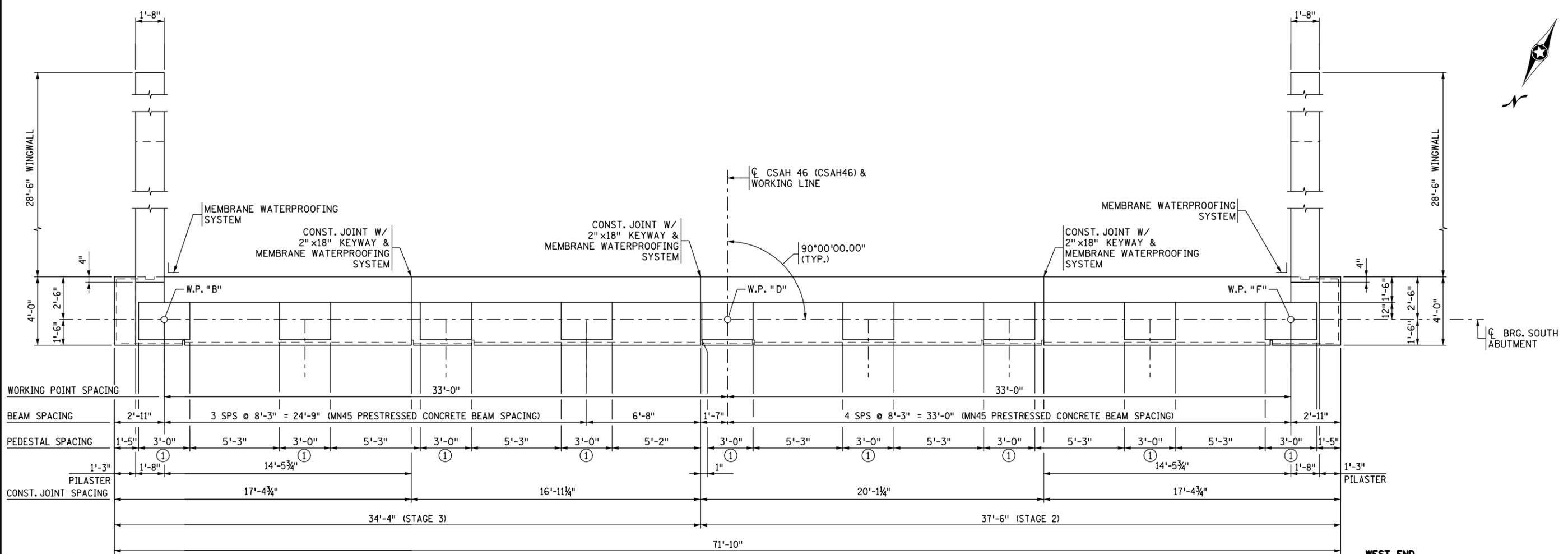
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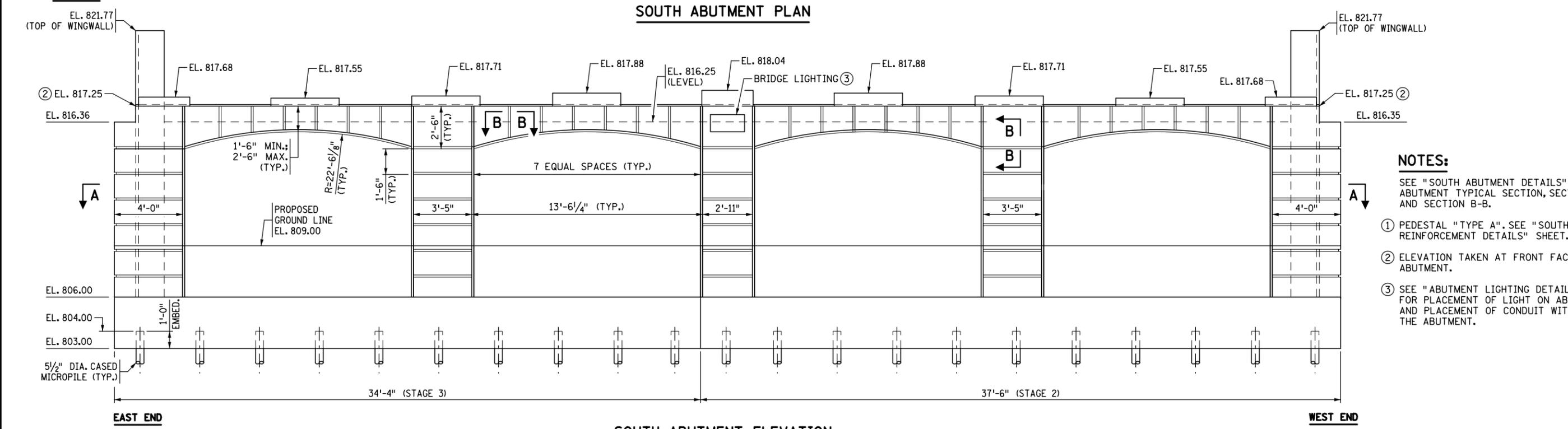
TITLE:
 NORTH ABUMTENT
 BARLIST (STAGE 3)

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 26 OF 96 SHEETS		

BRIDGE NO.
 27B84



SOUTH ABUTMENT PLAN



SOUTH ABUTMENT ELEVATION

- NOTES:**
- SEE "SOUTH ABUTMENT DETAILS" SHEET FOR ABUTMENT TYPICAL SECTION, SECTION A-A, AND SECTION B-B.
 - ① PEDESTAL "TYPE A". SEE "SOUTH ABUTMENT REINFORCEMENT DETAILS" SHEET.
 - ② ELEVATION TAKEN AT FRONT FACE OF ABUTMENT.
 - ③ SEE "ABUTMENT LIGHTING DETAILS" SHEET FOR PLACEMENT OF LIGHT ON ABUTMENT AND PLACEMENT OF CONDUIT WITHIN THE ABUTMENT.

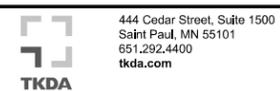
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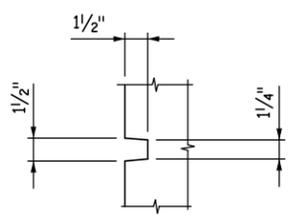
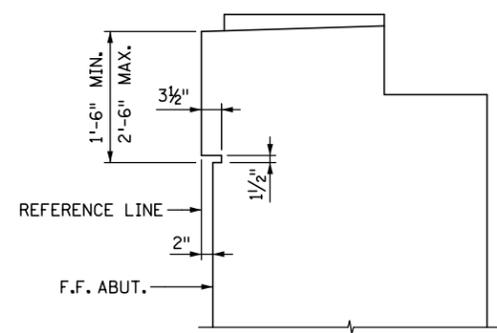
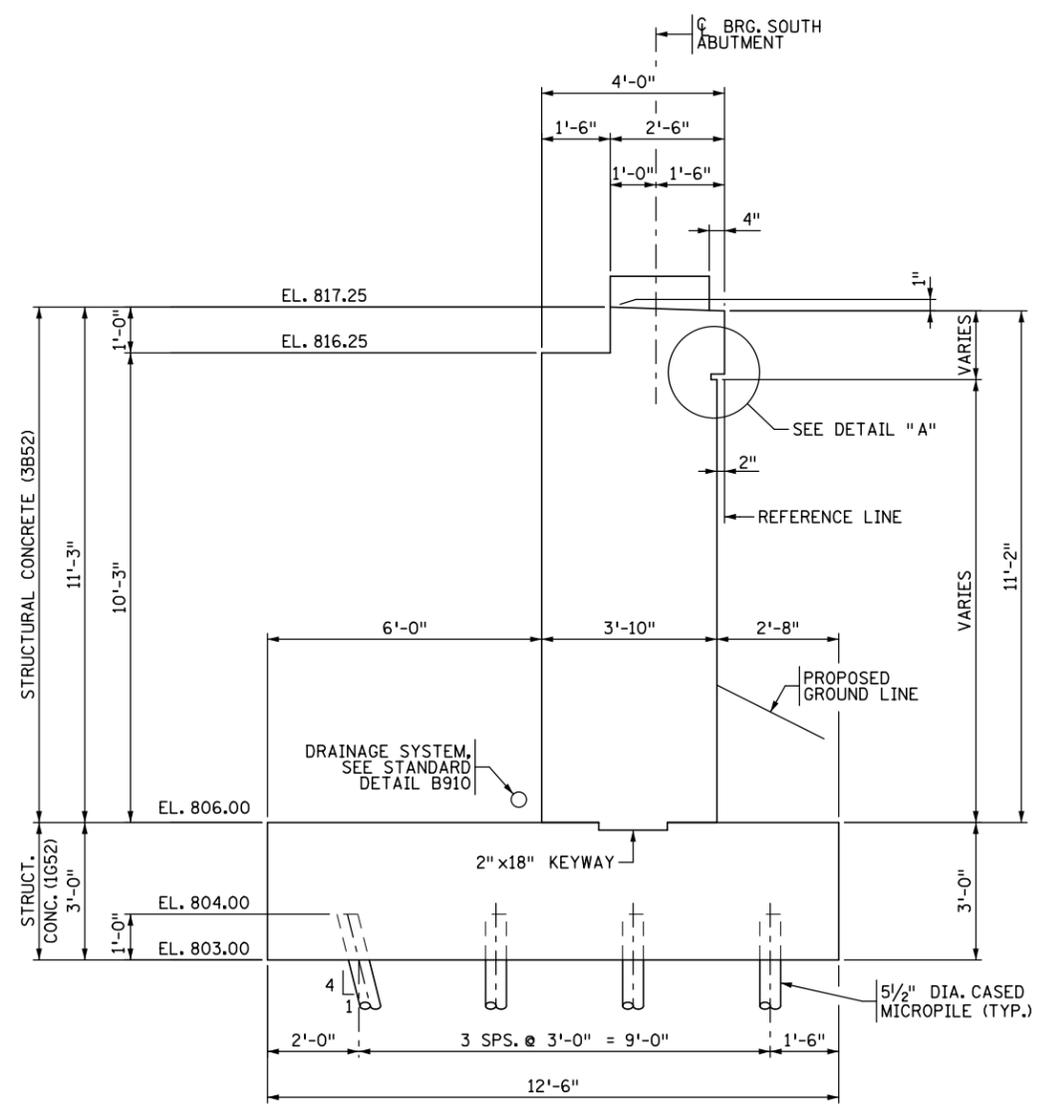
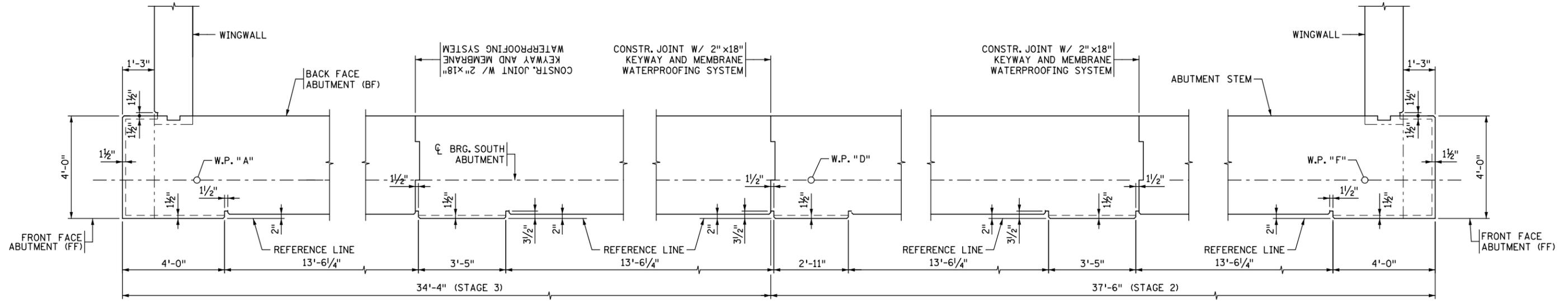
TITLE: **SOUTH ABUTMENT PLAN & ELEVATION**

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	

SHEET NO. 27 OF 96 SHEETS

BRIDGE NO. **27B84**

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SUMMARY OF QUANTITIES FOR SOUTH ABUTMENT				
ITEM DESCRIPTION	UNIT	STAGE 2	STAGE 3	TOTAL
STRUCTURAL CONCRETE (1G52)	CU YD	68	64	132
STRUCTURAL CONCRETE (3B52)	CU YD	61	58	119
REINFORCEMENT BARS	POUND	4870	4590	9,460
REINFORCEMENT BARS (EPOXY COATED)	POUND	8780	8460	17,240
FOUNDATION PREPARATION SOUTH ABUT	LUMP SUM	PART	PART	1
MICROPILE MOBILIZATION	LUMP SUM	PART	PART	PART
MICROPILES	EACH	56	52	108
PROOF LOAD TEST	EACH	1	1	2
COUPLERS (REINFORCEMENT BARS) T-6	EACH	24	0	24
COUPLERS (REINFORCEMENT BARS) T-6E	EACH	27	0	27
DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	PART	PART	PART
BENCH MARK DISK	EACH	-	-	1

- ① DRAINAGE SYSTEM, SEE DETAIL B910.
- ② STATE WILL FURNISH DISK. BEND PRONGS OUTWARD TO ANCHOR DISK. TOP TO BE PLACED FLUSH WITH CONCRETE. PAYMENT FOR PLACING SHALL BE CONSIDERED INCIDENTAL TO CONCRETE PAY ITEMS.
- ③ PAYMENT FOR COUPLERS INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-6".

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TKDA

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TITLE: SOUTH ABUTMENT DETAILS

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 28 OF 96 SHEETS		

BRIDGE NO.
27B84



FOOTING COORDINATES			
PLAN POINT	X-COORDINATE	Y-COORDINATE	B/FTG. EL.
1	545,785.774	146,599.820	803.00
2	545,819.096	146,617.021	803.00
3	545,824.830	146,605.914	803.00
4	545,791.508	146,588.712	803.00
5	545,790.591	146,590.490	807.00
6	545,801.254	146,595.994	807.00
7	545,806.452	146,585.924	807.00
8	545,795.789	146,580.419	807.00

STEM COORDINATES		
PLAN POINT	X-COORDINATE	Y-COORDINATE
9	545,786.921	146,597.598
10	545,802.379	146,605.578
11	545,820.243	146,614.800
12	545,822.078	146,611.246
13	545,804.213	146,602.024
14	545,791.348	146,595.382
15	545,793.182	146,591.828
16	545,798.152	146,582.201
17	545,796.671	146,581.437
18	545,791.701	146,591.063
19	545,789.867	146,594.617
20	545,788.756	146,594.044

SOUTH ABUTMENT - STAGE 2	
COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	36.3
FACTORED LIVE LOAD	4.2
* FACTORED DESIGN LOAD	40.5

* BASED ON STRENGTH I LOAD COMBINATION.

SOUTH ABUTMENT - STAGE 2		
REQUIRED NOMINAL MICRO-PILE RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	ϕ_{stat}	* R_n
PROOF TEST	0.7	57.9

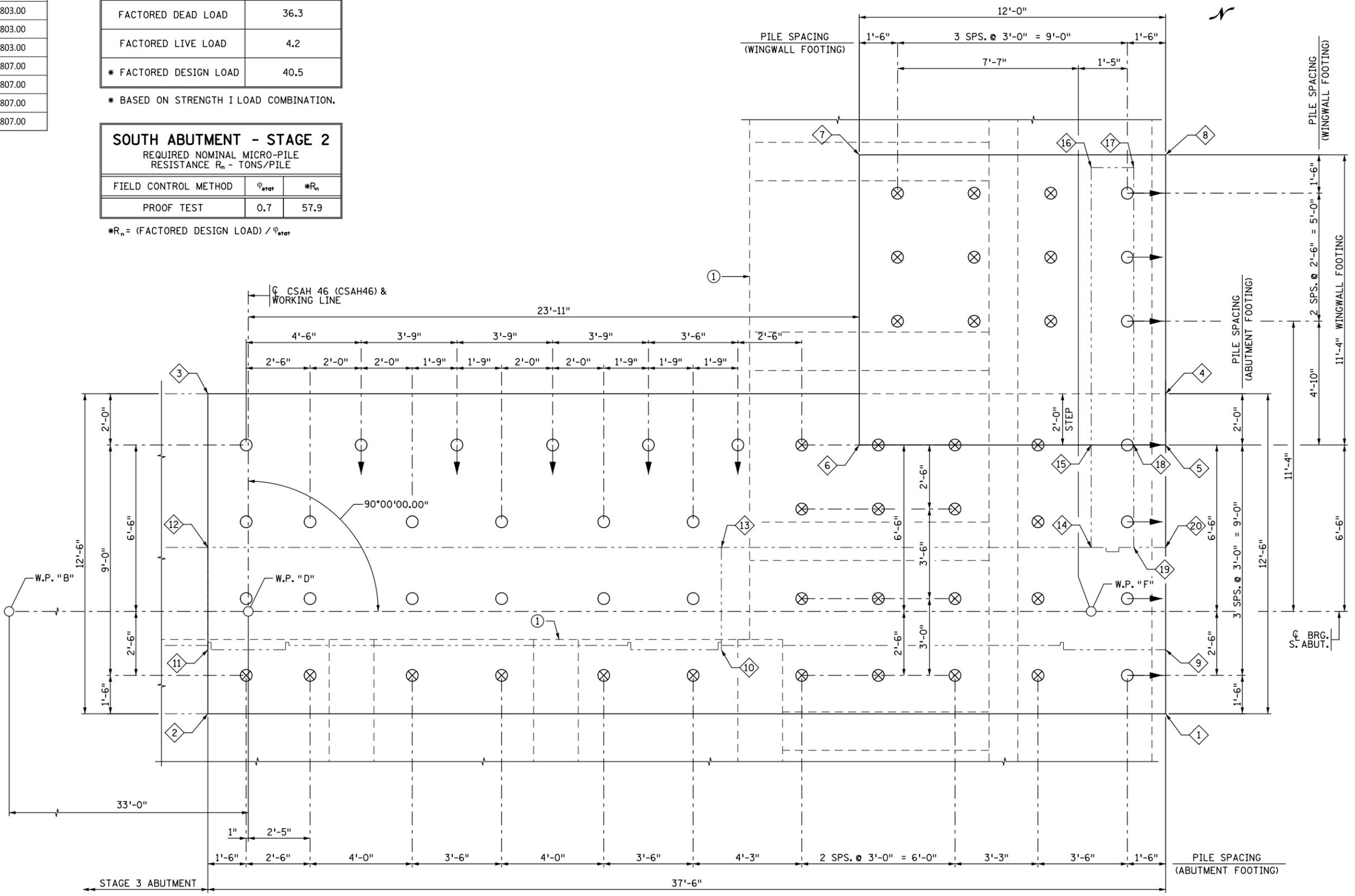
* $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{stat}$

PILE NOTES:

- PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
- ALL PILES TO BE 5/2" DIA. MICROPILES.
- PILES MARKED WITH ⊗ SHALL BE CORED THROUGH EXISTING ABUTMENT FOOTING.
- PILES MARKED WITH → SHALL BE BATTERED IN THE DIRECTION SHOWN.
- 1 PROOF TEST, 19 MICROPILES REQ'D FOR EAST ABUT. FTG.
- SEE "MICROPILE DETAILS" SHEET AND GEOTECHNICAL REPORT FOR MORE INFORMATION.
- PILE THAT WILL BE PROOF TESTED WILL BE COORDINATED BY THE ENGINEER AND THE CONTRACTOR.

NOTES:

- ① EXISTING ABUTMENT FOOTING AND ABUTMENT COUNTERFORTS. PILE SPACED TO AVOID CONFLICTS WITH EXISTING COUNTERFORTS.



SOUTH ABUTMENT FOOTING PLAN - STAGE 2

DATE: 4/1/2016 TIME: 12:49:05 PM FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\brdg\abuf\ncbr\27B84_sabf03.dgn

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 _____ LIC. NO.: _____
 DATE: 4/1/2016



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: SOUTH ABUTMENT FOOTING PLAN (STAGE 2)

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 29 OF 96 SHEETS		

BRIDGE NO. 27B84

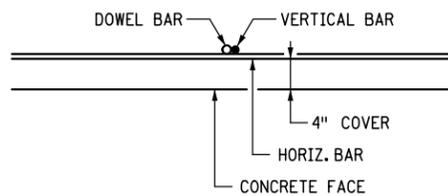
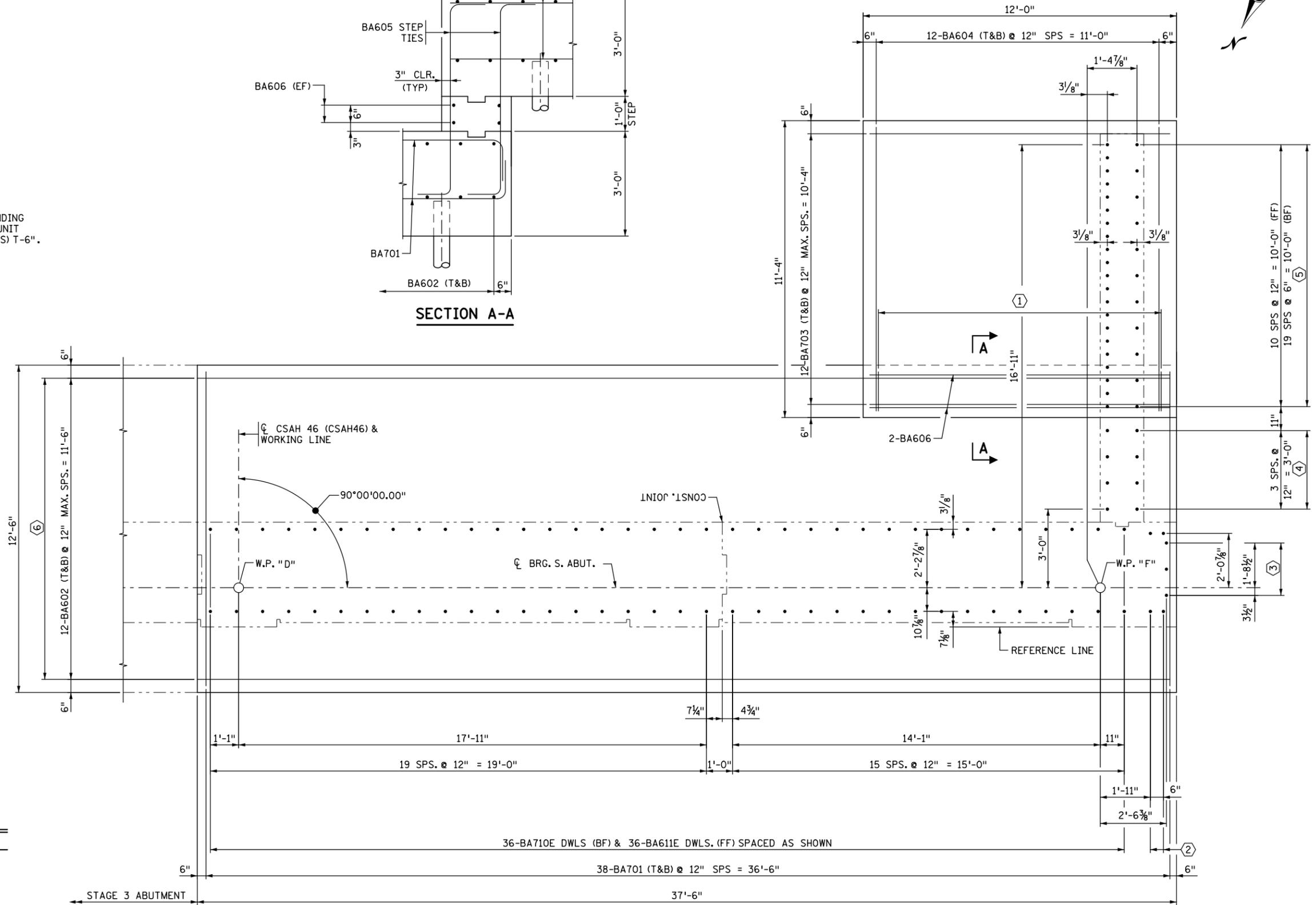
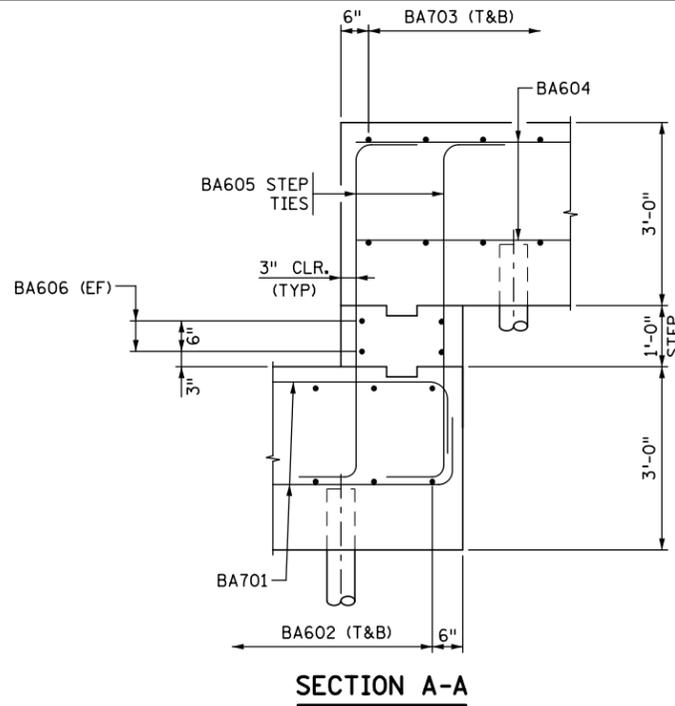
DATE: 4/1/2016 TIME: 12:49:06 PM
 FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\brdg\abut\cbr-27B84_sabf04.dgn

BAR CALL-OUTS

- ① 12-BA605 STEP TIES (EF) @ 12" MAX SPS. = 11'-0". SEE SECTION A-A FOR PLACEMENT DETAILS.
- ② 1-BA611E DWL. (EF) SPACE AS SHOWN.
- ③ 2-BA611E DWLS. @ 12" SPS. = 2'-0".
- ④ 4-BA611E DWLS. (FF) SPACED AS SHOWN. 4-BA710E DWLS. (BF) SPACED AS SHOWN.
- ⑤ 11-BA611E DWLS. (FF) SPACED AS SHOWN. 20-BA710E DWLS. (BF) SPACED AS SHOWN.
- ⑥ 12-BA607 (T&B) W/ #6 BAR COUPLERS (T&B) SPACED TO MATCH BA602 BARS. LOCATE OPEN END OF COUPLERS SUCH THAT ADDITIONAL BARS MAY BE INSTALLED DURING STAGE 3 CONSTRUCTIONS. ①

NOTES:

- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".



TYPICAL BAR PLACEMENT

SOUTH ABUTMENT FOOTING REINFORCEMENT - STAGE 2

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



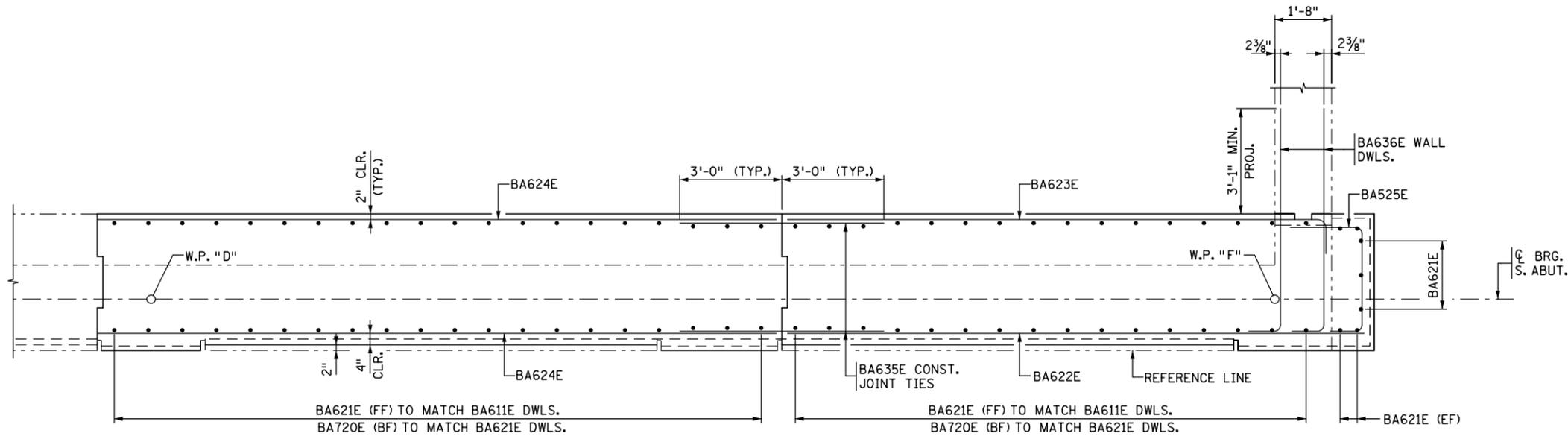
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SOUTH ABUTMENT FOOTING REINFORCEMENT (STAGE 2)**

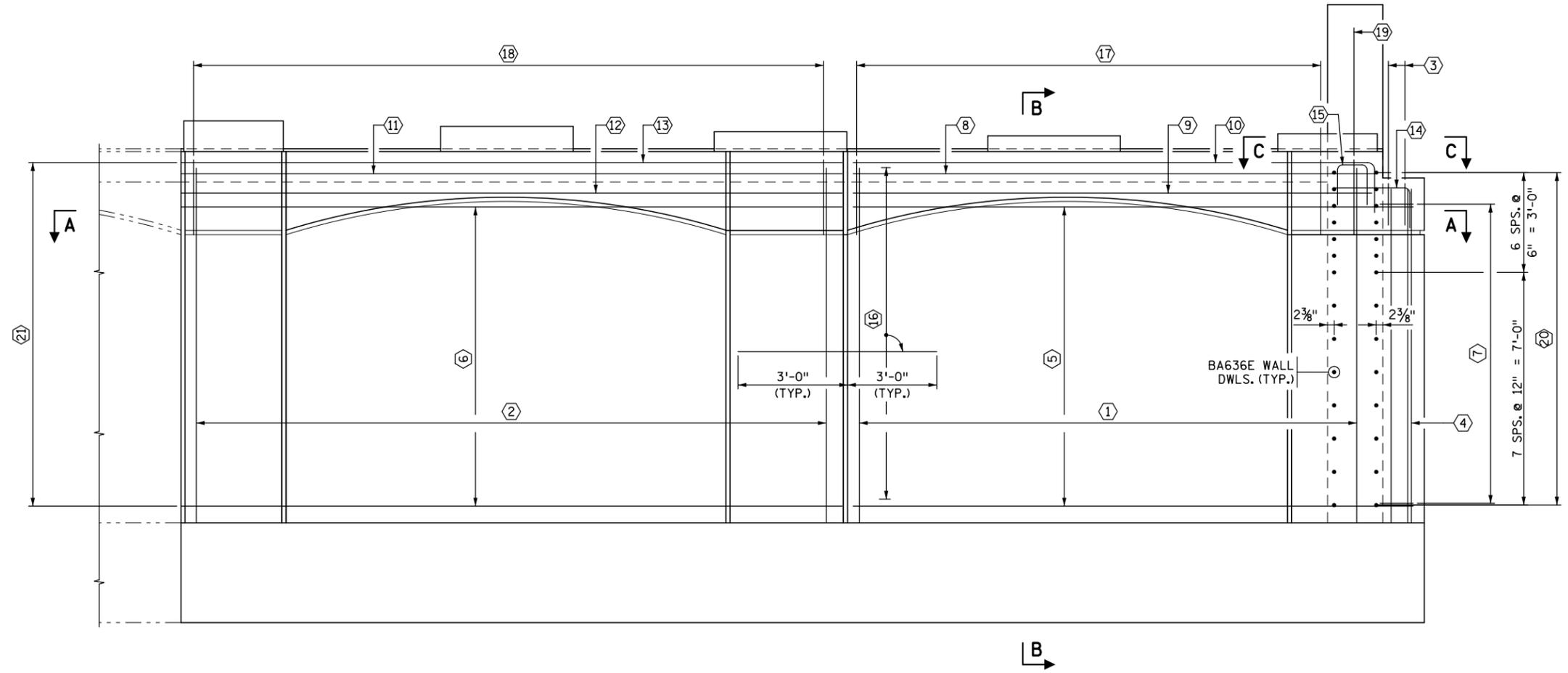
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CHK: GM	CHK: GM	
SHEET NO. 30 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:07 PM
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SECTION A-A



SOUTH ABUTMENT REINFORCEMENT - STAGE 2

(FOOTING PILE AND REINFORCEMENT NOT SHOWN FOR CLARITY)

BAR CALL-OUTS

- ① 16-BA621E (FF) SPACED TO MATCH BA621E DWLS.
16-BA720E (BF) SPACED TO MATCH BA720E DWLS.
- ② 20-BA621E (FF) SPACED TO MATCH BA621E DWLS.
20-BA720E (BF) SPACED TO MATCH BA720E DWLS.
- ③ 1-BA621E (EF) SPACED TO MATCH BA611E DWL.
- ④ 3-BA621E SPACED TO MATCH BA611E DWLS.
- ⑤ 10-BA622E (FF) SPACED AS SHOWN IN SECTION B-B.
10-BA623E (BF) SPACED AS SHOWN IN SECTION B-B.
- ⑥ 10-BA624E (FF) SPACED AS SHOWN IN SECTION B-B.
- ⑦ 10-BA525E END TIES SPACED TO MATCH BA622E.
- ⑧ 1-BA626E (EF) SPACED AS SHOWN IN SECTION B-B.
- ⑨ 2-BA527E SPACED AS SHOWN IN SECTION B-B.
- ⑩ 3-BA528E SPACED AS SHOWN IN SECTION B-B.
- ⑪ 1-BA624E (EF) SPACED AS SHOWN IN SECTION B-B.
- ⑫ 2-BA529E SPACED AS SHOWN IN SECTION B-B.
- ⑬ 3-BA529E SPACED AS SHOWN IN SECTION B-B.
- ⑭ 3-BA530E SPACED TO MATCH BA621E VERTICALS.
- ⑮ 2-BA531E SPACED AS SHOWN IN SECTION C-C.
- ⑯ 27-BA635E CONST. JT TIES SPACED TO MATCH HORIZONTAL BARS.
- ⑰ 16-BA532E W/ 16-BA533E SPACED TO MATCH BA720E VERTICALS. SEE SECTION B-B FOR PLACEMENT DETAILS.
- ⑱ 20-BA532E W/ 20-BA533E SPACED TO MATCH BA720E VERTICALS. SEE SECTION B-B FOR PLACEMENT DETAILS.
- ⑲ 1-BA534E SPACED TO MATCH BA721E.
- ⑳ 14-BA636E WALL DWLS. (EF) SPACED AS SHOWN.
- ㉑ 27-BA640E W/ #6 BAR COUPLERS SPACED TO MATCH HORIZONTAL BARS. LOCATE OPEN END OF COUPLERS SUCH THAT ADDITIONAL BARS MAY BE INSTALLED DURING STAGE 3 CONSTRUCTIONS. ①

NOTES:

- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:

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

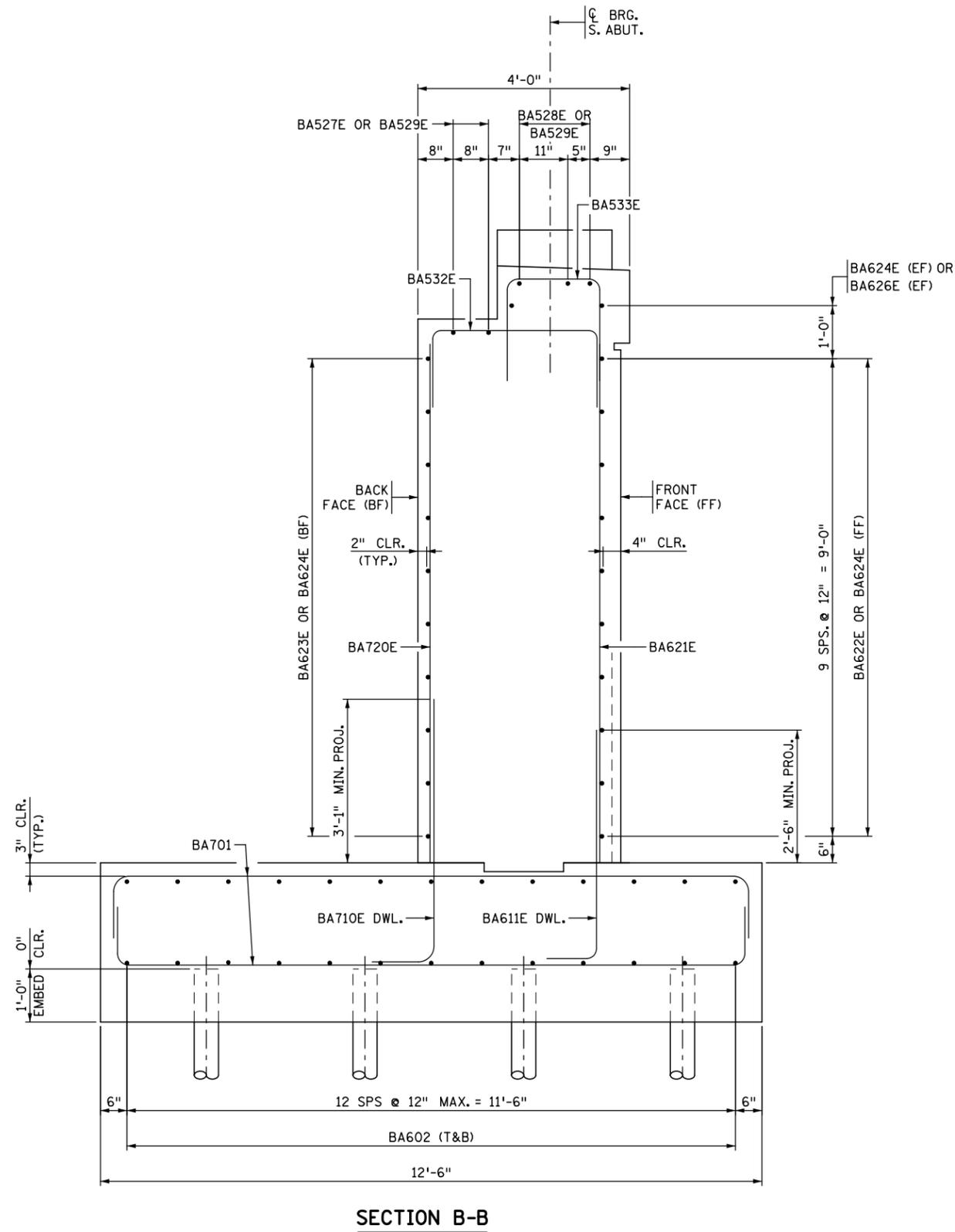
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SOUTH ABUTMENT REINFORCEMENT (STAGE 2)**

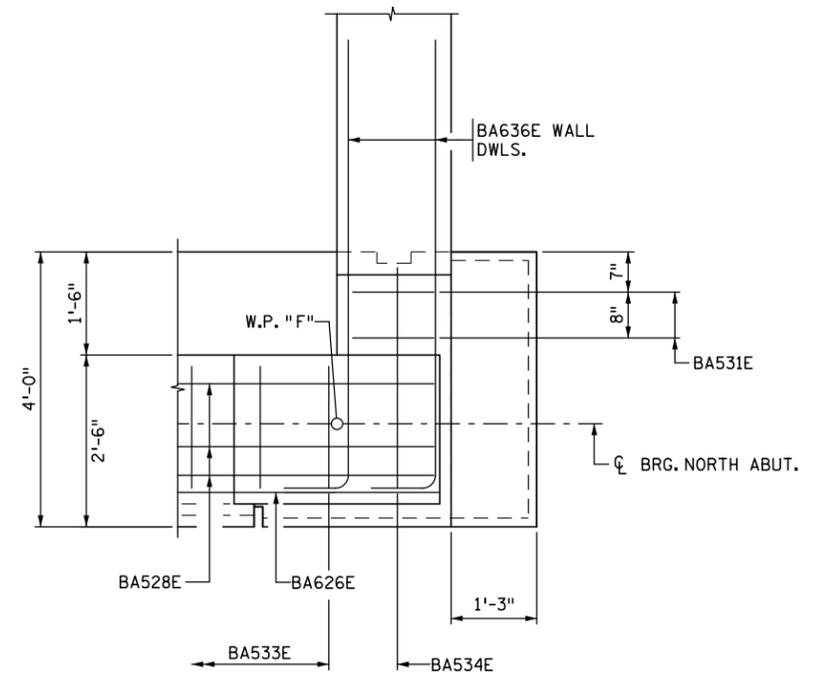
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CHK: GM	CHK: GM	
SHEET NO. 31 OF 96 SHEETS		

BRIDGE NO.
27B84

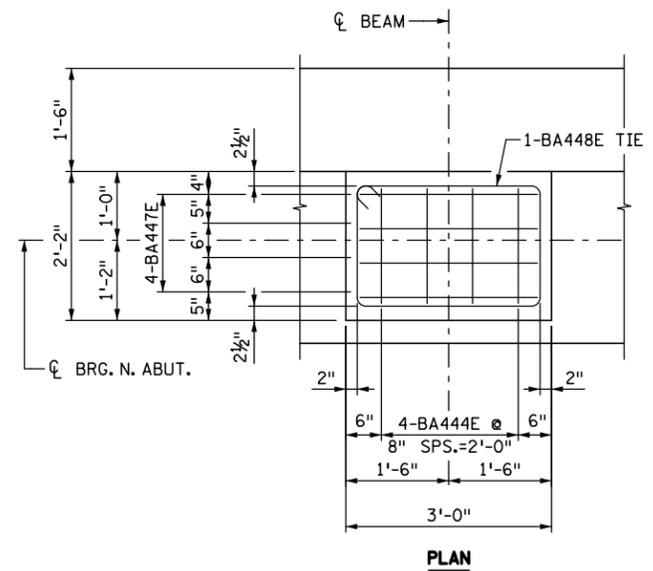
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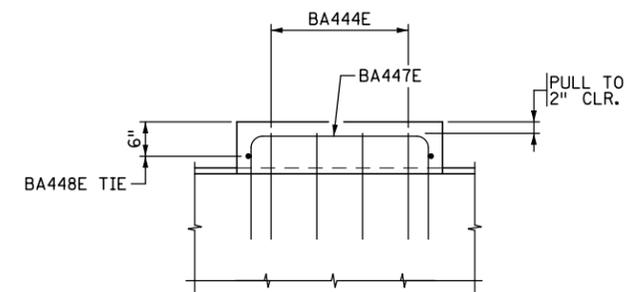
SECTION B-B



SECTION C-C



PLAN



**ELEVATION
 PEDESTAL TYPE "B"**

(5 THUS)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



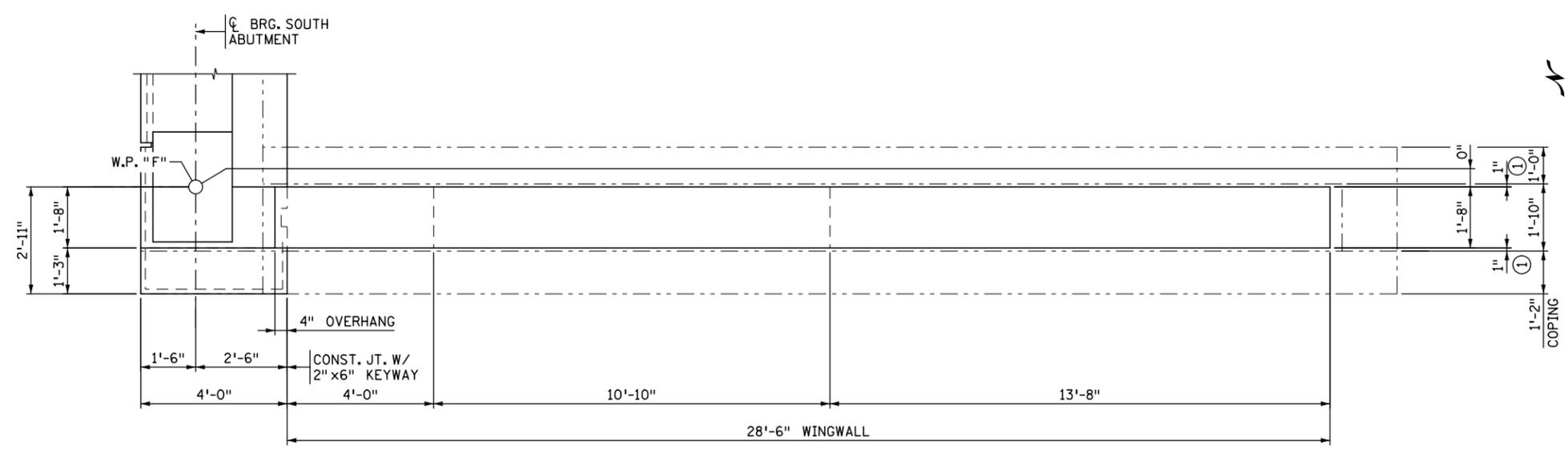
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SOUTH ABUMENT
 REINFORCEMENT DETAILS
 (STAGE 2)**

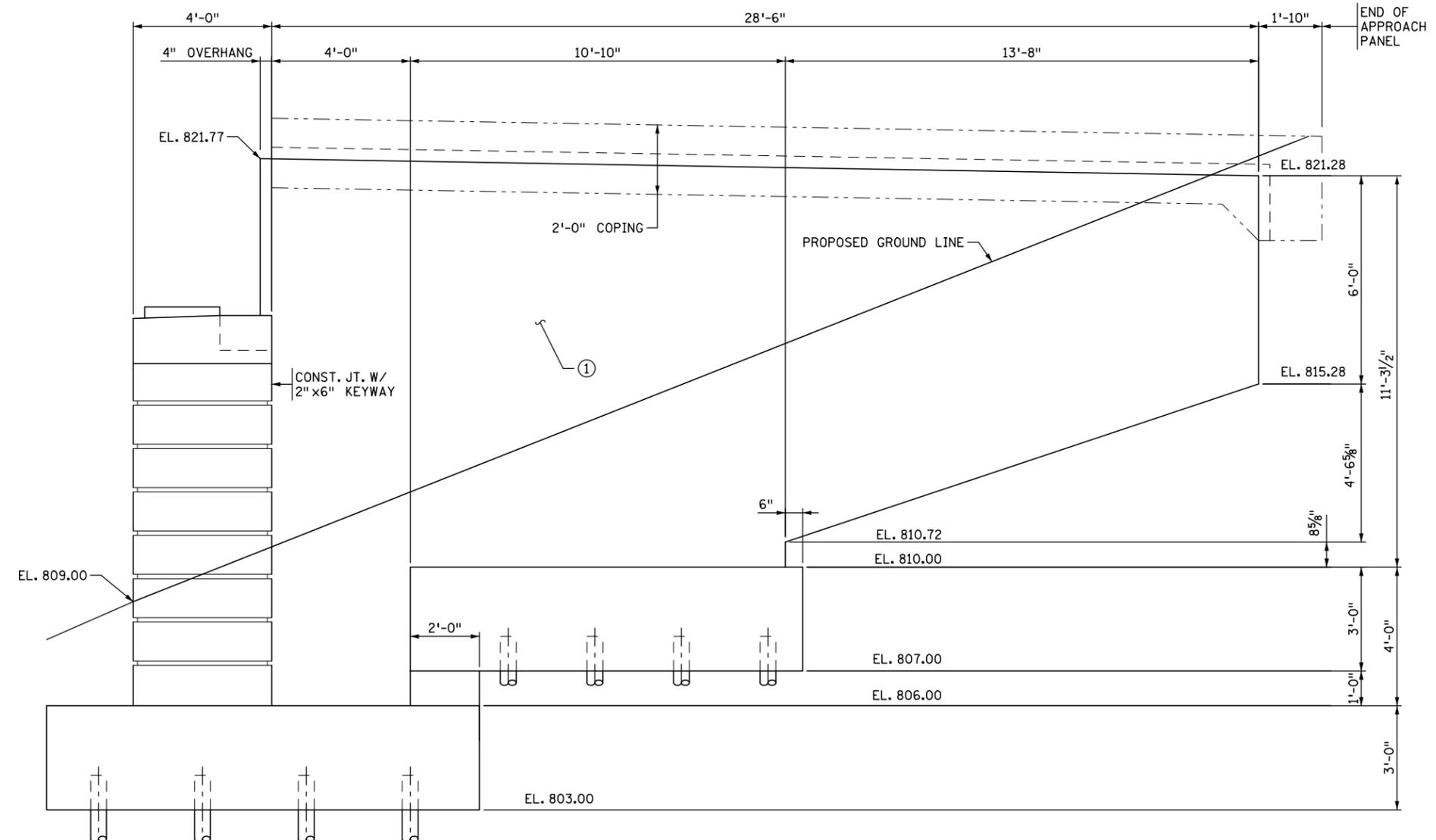
DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 32 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:09 PM
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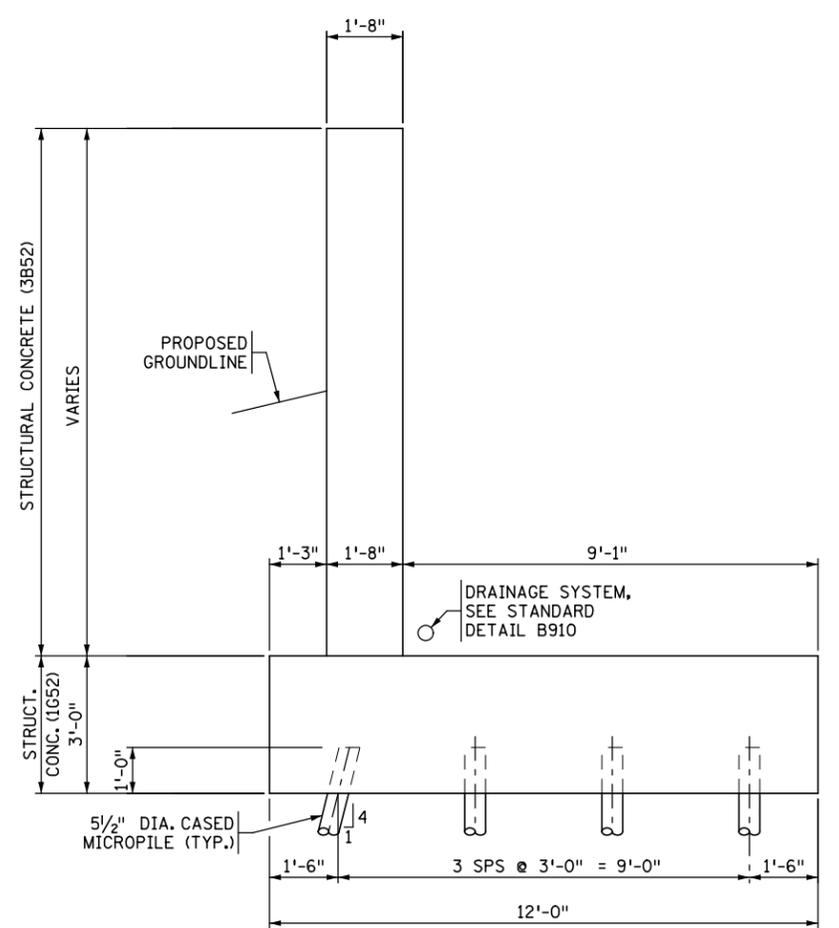
SOUTHWEST WINGWALL PLAN



SOUTHWEST WINGWALL ELEVATION



NOTES:
 ① PLACE 1" POLYSTYRENE BETWEEN WINGWALL AND APPROACH PANEL.



TYPICAL SOUTHWEST WINGWALL SECTION

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



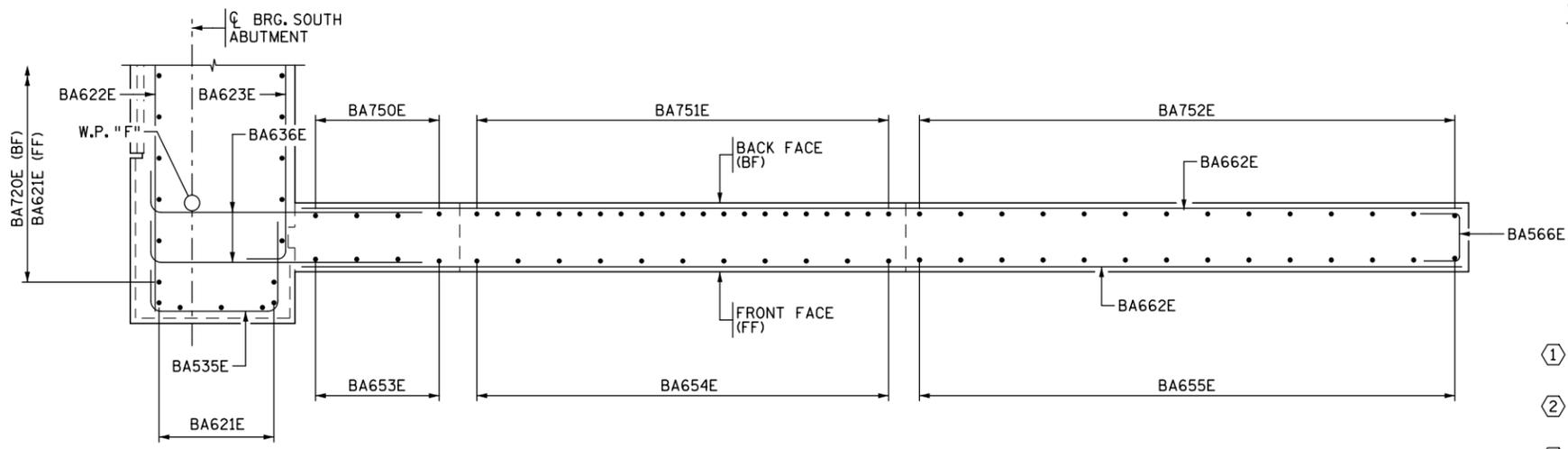
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SOUTHWEST WINGWALL PLAN & ELEVATION**

DES: MAV DR: MAV APPROVED
 CHK: GM CHK: GM
 SHEET NO. 33 OF 96 SHEETS

BRIDGE NO. **27B84**

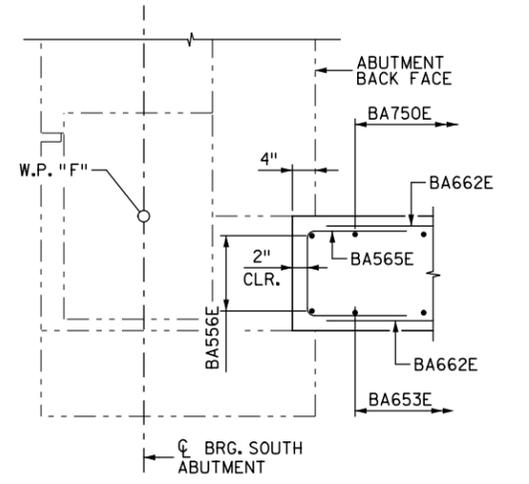
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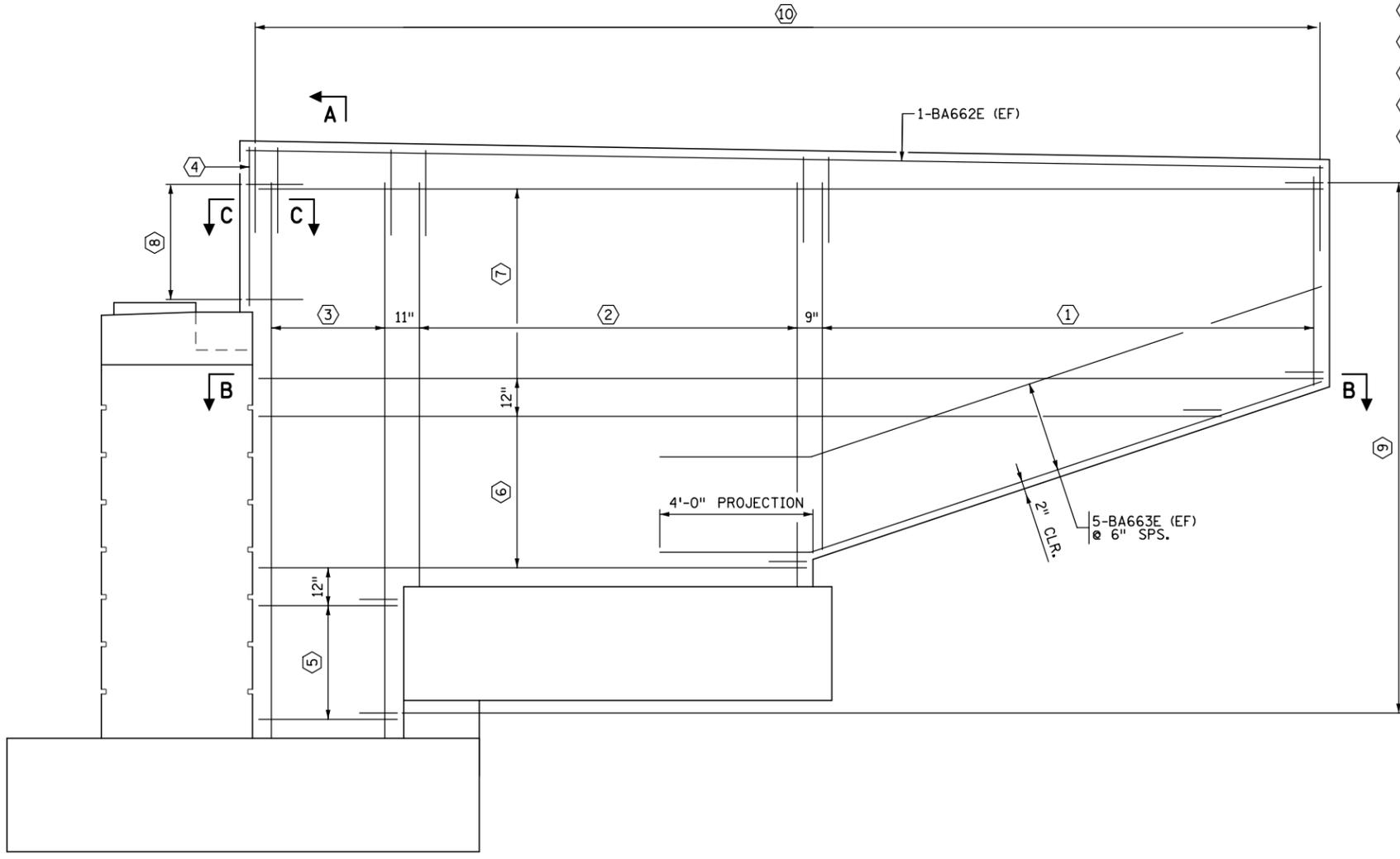
SECTION B-B

NOTES:

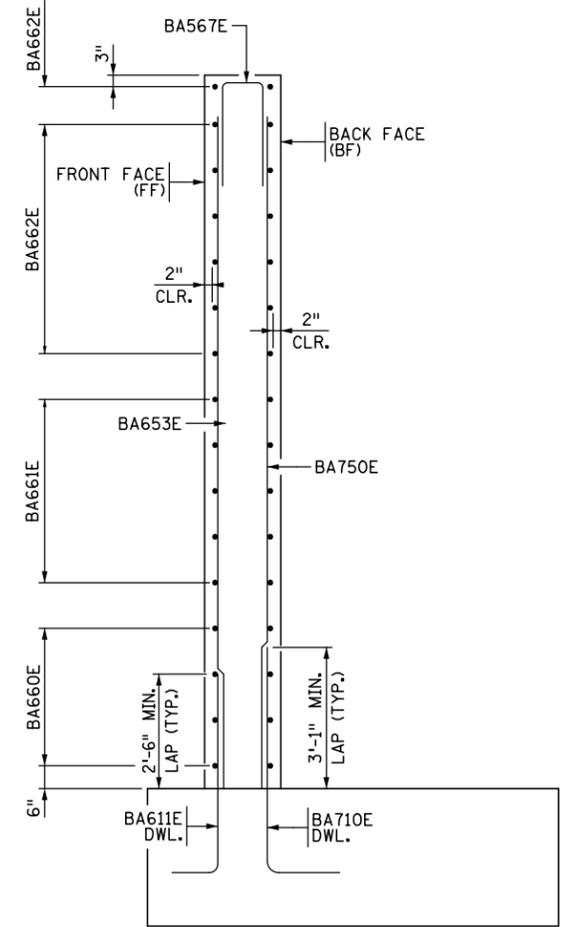
- ① 1 SER. OF 12-BA752E (BF) @ 12" SPS. = 13'-0"
 1 SER. OF 12-BA655E (FF) @ 12" SPS. = 13'-0"
- ② 22-BA751E (BF) @ 6" SPS. = 10'-0"
 11-BA655E (FF) @ 12" MAX. SPS. = 10'-0"
- ③ 4-BA750E (BF) @ 12" SPS. = 3'-0"
 4-BA653E (FF) @ 12" SPS. = 3'-0"
- ④ 2-BA556E PLACED IN THE CORNERS OF BA655E.
- ⑤ 4-BA660E (EF) @ 12" SPS. = 3'-0".
- ⑥ 1 SER. OF 5-BA661E (EF) @ 12" SPS. = 4'-0".
- ⑦ 6-BA662E (EF) @ 12" SPS. = 5'-0".
- ⑧ 4-BA565E @ 12" SPS. = 3'-0".
- ⑨ 15-BA566E TO MATCH HORIZONTAL REINFORCEMENT.
- ⑩ 29-BA567E TO MATCH BA653E (FF), BA654E (FF), BA655E (FF) & BA556E



SECTION C-C



SOUTHWEST WINGWALL REINFORCEMENT
 (FOOTING REINFORCEMENT AND PILE NOT SHOWN FOR CLARITY)



SECTION A-A

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SOUTHWEST WINGWALL REINFORCEMENT**

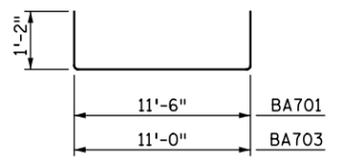
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CHK: GM	CHK: GM	
SHEET NO. 34 OF 96 SHEETS		

BRIDGE NO.
27B84

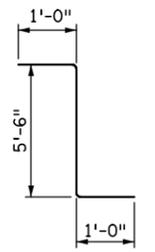
DATE: 4/1/2016 TIME: 12:49:11 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\bar\ncbr-27\B84_sabtl5.dgn

BILL OF REINFORCEMENT - SOUTH ABUTMENT (STAGE 2)				
BAR	NO.	LENGTH	SHAPE	LOCATION
BA701	76	13'-10"		FOOTING TRANSVERSE TOP & BOT.
BA602	24	37'-0"		FOOTING LONG. TOP & BOT.
BA703	24	13'-4"		WINGWALL FOOTING TRANS. TOP & BOT.
BA604	24	10'-10"		WINGWALL FOOTING LONG. TOP & BOT.
BA605	24	7'-6"		FOOTING STEP TIE
BA606	4	11'-6"		FOOTING STEP LONG.
BA607	24	3'-0"		STAGED CONSTRUCTION JOINT FTG. DWL.
BA710E	60	6'-2"		FOOTING DOWEL BACK FACE
BA611E	58	5'-5"		FOOTING DOWEL FRONT FACE
BA720E	60	10'-0"		STEM BACK FACE VERTICAL
BA621E	58	10'-0"		STEM FRONT FACE VERTICAL
BA622E	10	16'-11"		STEM FRONT FACE HORIZONTAL
BA623E	10	17'-0"		STEM BACK FACE HORIZONTAL
BA624E	22	19'-11"		STEM HORIZONTAL
BA525E	10	6'-4"		STEM END TIE
BA626E	2	15'-8"		STEM CAP HORIZONTAL
BA527E	2	15'-8"		STEM CAP HORIZONTAL
BA528E	3	17'-3"		STEM CAP HORIZONTAL
BA529E	5	19'-9"		STEM CAP HORIZONTAL
BA530E	3	3'-10"		STEM TOP TIE
BA531E	2	3'-8"		STEM TOP TIE
BA532E	36	4'-8"		STEM TOP TIE
BA533E	36	6'-0"		STEM TOP TIE
BA534E	1	7'-2"		STEM TOP TIE
BA635E	27	6'-0"		CONSTRUCTION JOINT DOWEL
BA636E	28	7'-7"		WINGWALL CONST. JOINT DOWEL
BA640E	27	3'-0"		STAGED CONSTRUCTION JOINT STEM DWL.
BA444E	50	4'-8"		PEDESTAL TRANSVERSE
BA445E	12	6'-7"		TYPE "A" PEDESTAL LONG.
BA446E	3	11'-7"		TYPE "A" PEDESTAL TIE
BA448E	8	5'-7"		TYPE "B" PEDESTAL LONG.
BA447E	2	9'-7"		TYPE "B" PEDESTAL TIE
BA750E	4	14'-8"		WW BACK FACE VERTICAL
BA751E	22	10'-8"		WW BACK FACE VERTICAL
BA752E	14	SER. 1		WW BACK FACE VERTICAL
BA653E	4	14'-8"		WW FRONT FACE VERTICAL
BA654E	11	10'-8"		WW FRONT FACE VERTICAL
BA655E	14	SER. 1		WW FRONT FACE VERTICAL
BA756E	2	4'-0"		WW VERTICAL
BA660E	8	3'-8"		WW HORIZONTAL
BA661E	10	SER. 2		WW HORIZONTAL
BA662E	14	28'-2"		WW HORIZONTAL
BA663E	10	18'-3"		WW HORIZONTAL
BA565E	4	4'-4"		WW END TIE
BA566E	15	3'-4"		WW END TIE
BA567E	29	5'-8"		WW TOP TIE

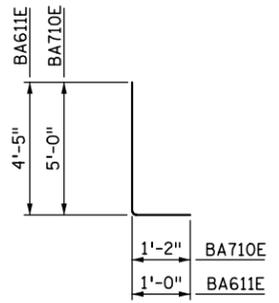
BAR BENDING DIAGRAMS



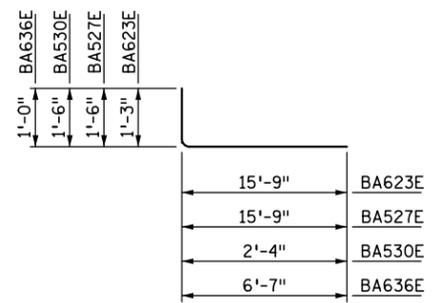
BA701 & BA703



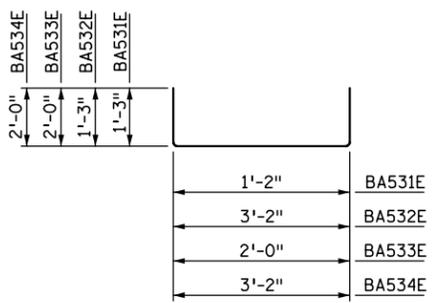
BA605



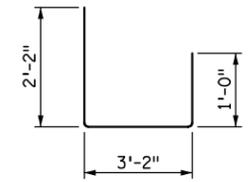
BA710E & BA611E



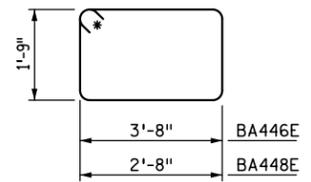
BA623E, BA527E, BA530E & BA636E



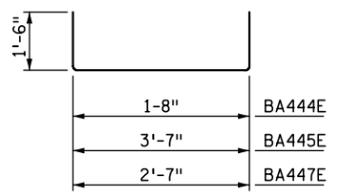
BA531E, BA532E, BA533E & BA534E



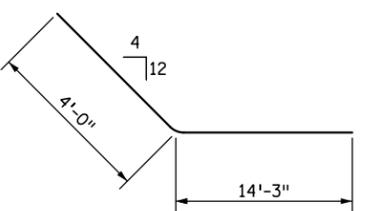
BA525E



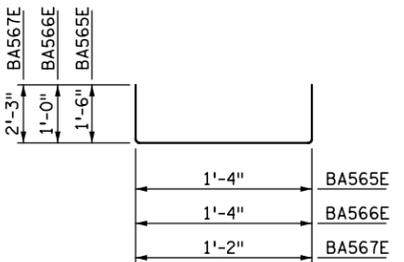
BA446E & BA448E



BA444E, BA445E & BA447E



BA663E



BA565E, BA566E & BA567E

SER. 1 = 2 SERIES OF 7 BARS (5'-6" TO 9'-10")
 SER. 2 = 2 SERIES OF 5 BARS (14'-6" TO 25'-11")

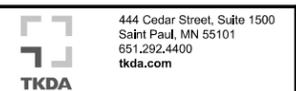
NOTE:
 BENT BAR DIMENSIONS GIVEN ARE OUT-TO-OUT.
 ACTUAL BAR LENGTHS SHALL BE DETERMINED
 BASED ON THE DETAIL DIMENSIONS SHOWN IN
 THE BAR BENDING DIAGRAMS.

* DENOTES STANDARD STIRRUP HOOK.

NOTES:
 ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING
 FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT
 PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

NO.	DATE	BY	DESCRIPTION OF REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER
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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.:



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

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
**SOUTH ABUMTENT
 BARLIST (STAGE 2)**

DES:	DR:	APPROVED
MAV	MAV	
CHK:	GM	CHK: GM

SHEET NO. 35 OF 96 SHEETS

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:12 PM
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SOUTH ABUTMENT - STAGE 3	
COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	36.3
FACTORED LIVE LOAD	4.2
* FACTORED DESIGN LOAD	40.5

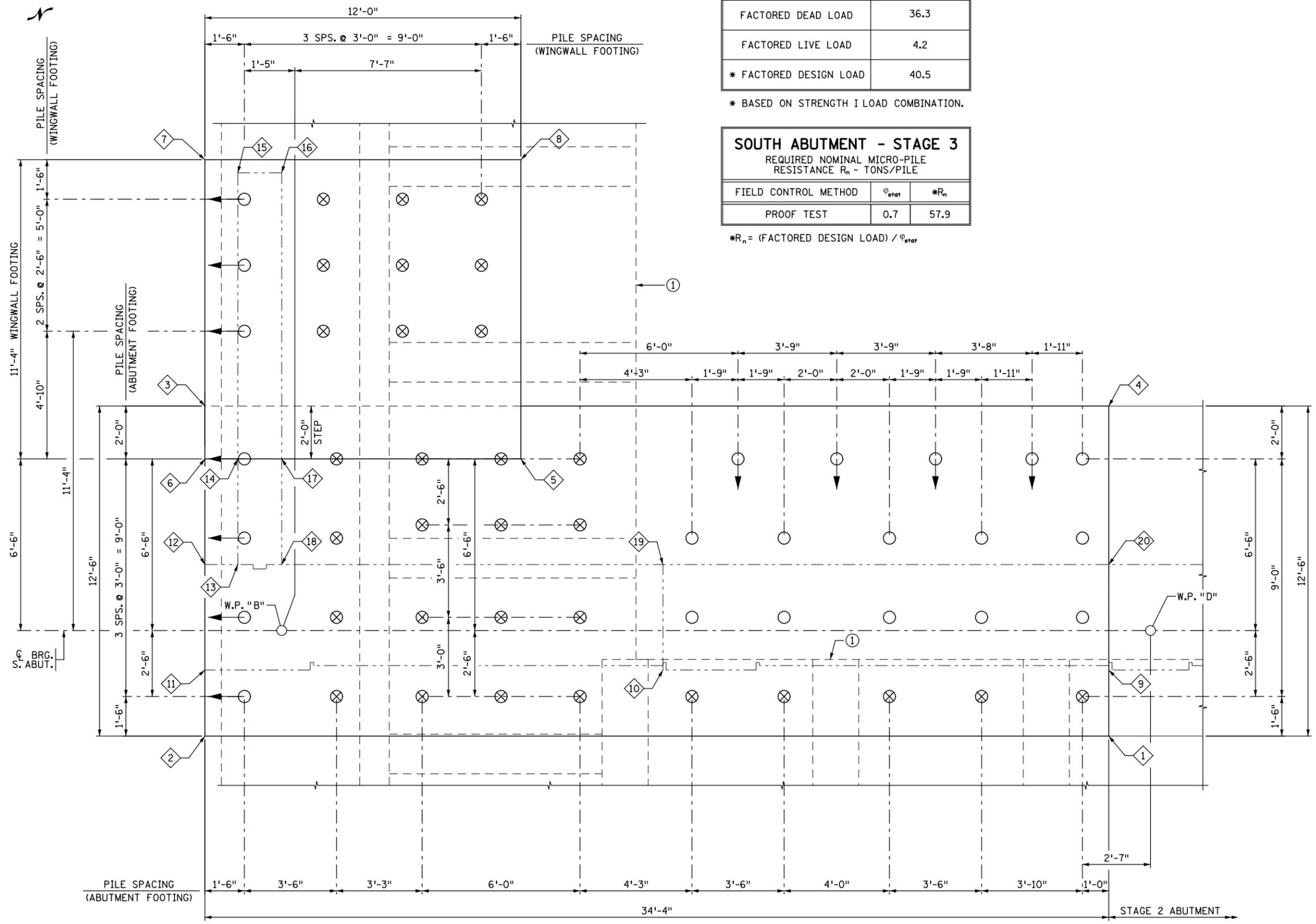
* BASED ON STRENGTH I LOAD COMBINATION.

SOUTH ABUTMENT - STAGE 3		
REQUIRED NOMINAL MICRO-PILE RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	ϕ_{stor}	* R_n
PROOF TEST	0.7	57.9

* $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{stor}$

FOOTING COORDINATES			
PLAN POINT	X-COORDINATE	Y-COORDINATE	B/FTG. EL.
1	545,819.096	146,617.021	803.00
2	545,849.604	146,632.771	803.00
3	545,855.338	146,621.663	803.00
4	545,824.830	146,605.914	803.00
5	545,843.758	146,617.936	807.00
6	545,854.421	146,623.440	807.00
7	545,859.619	146,613.370	807.00
8	545,848.956	146,607.865	807.00

STEM COORDINATES		
PLAN POINT	X-COORDINATE	Y-COORDINATE
9	545,820.243	146,614.800
10	545,835.293	146,622.569
11	545,850.751	146,630.549
12	545,852.586	146,626.995
13	545,851.475	146,626.421
14	545,853.310	146,622.867
15	545,858.279	146,613.241
16	545,856.798	146,612.476
17	545,851.829	146,622.103
18	545,849.994	146,625.657
19	545,837.128	146,619.015
20	545,822.078	146,611.246



PILE NOTES:

- PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
- ALL PILES TO BE 5/2" DIA. MICROPILES.
- PILES MARKED WITH ⊗ SHALL BE CORED THROUGH EXISTING ABUTMENT FOOTING.
- PILES MARKED WITH → SHALL BE BATTERED IN THE DIRECTION SHOWN.
- 1 PROOF TEST.
- 19 MICROPILES REQ'D FOR EAST ABUT. FTG.
- SEE "MICROPILE DETAILS" SHEET AND GEOTECHNICAL REPORT FOR MORE INFORMATION.
- PILE THAT WILL BE PROOF TESTED WILL BE COORDINATED BY THE ENGINEER AND THE CONTRACTOR.

NOTES:

- ① EXISTING ABUTMENT FOOTING AND ABUTMENT COUNTERFORTS. PILE SPACED TO AVOID CONFLICTS WITH EXISTING COUNTERFORTS.

SOUTH ABUTMENT FOOTING PLAN - STAGE 3

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

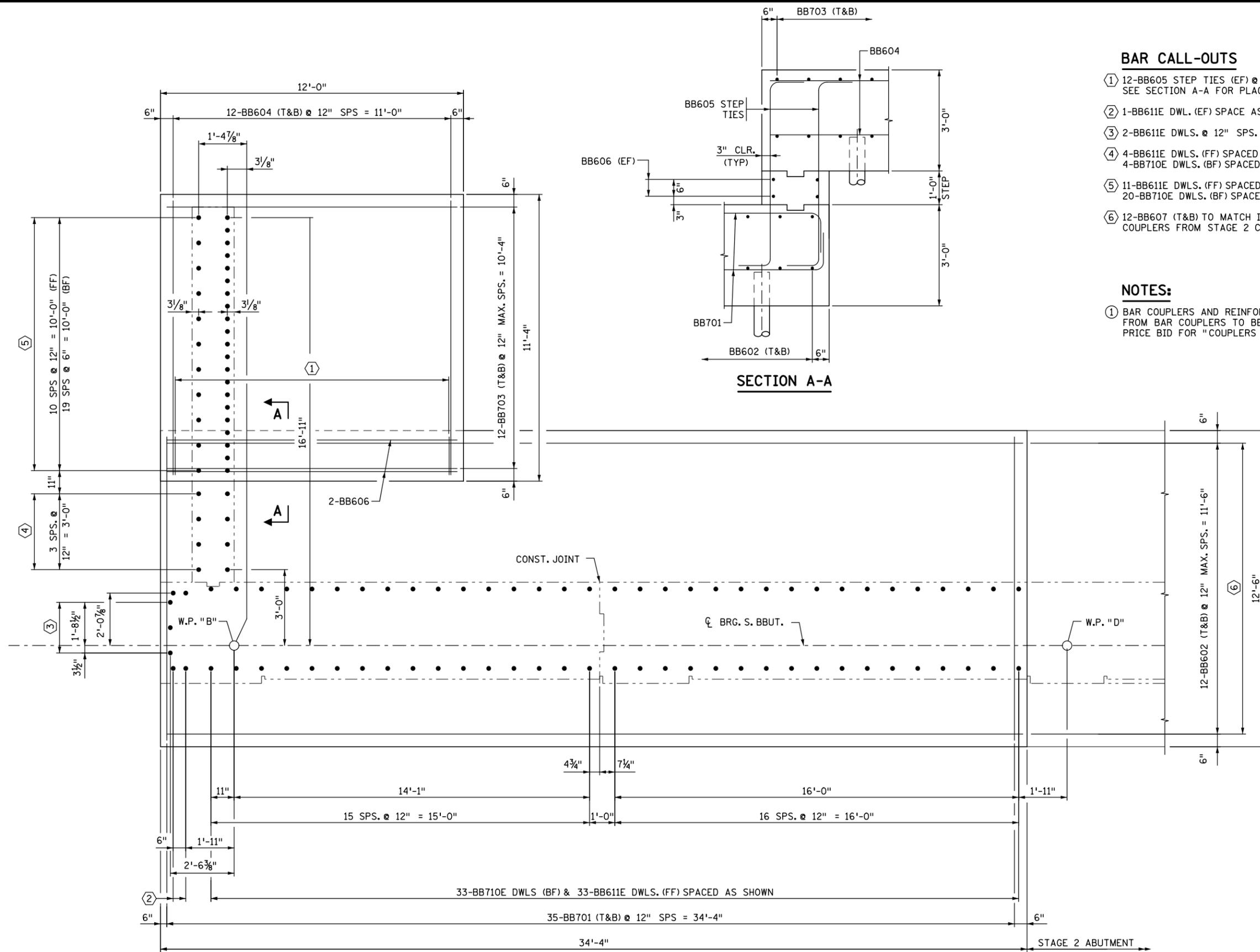
TITLE: SOUTH ABUTMENT FOOTING PLAN (STAGE 3)

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 36 OF 96 SHEETS		

BRIDGE NO. 27B84



DATE: 4/1/2016 TIME: 12:49:13 PM
 FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\brdg\abuf\ncbr\27B84_sabft10.dgn



BAR CALL-OUTS

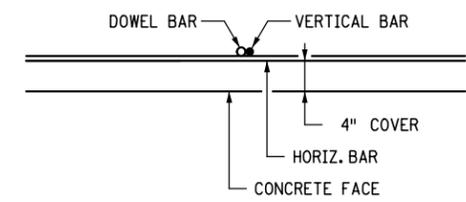
- ① 12-BB605 STEP TIES (EF) @ 12" MAX SPS. = 11'-0". SEE SECTION A-A FOR PLACEMENT DETAILS.
- ② 1-BB611E DWL. (EF) SPACE AS SHOWN.
- ③ 2-BB611E DWLS. @ 12" SPS. = 2'-0".
- ④ 4-BB611E DWLS. (FF) SPACED AS SHOWN. 4-BB710E DWLS. (BF) SPACED AS SHOWN.
- ⑤ 11-BB611E DWLS. (FF) SPACED AS SHOWN. 20-BB710E DWLS. (BF) SPACED AS SHOWN.
- ⑥ 12-BB607 (T&B) TO MATCH INTO #6 COUPLERS FROM STAGE 2 CONSTRUCTION. ①

NOTES:

- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

SECTION A-A

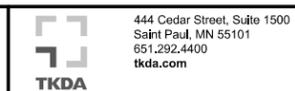
SOUTH ABUTMENT FOOTING REINFORCEMENT - STAGE 3



TYPICAL BAR PLACEMENT

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



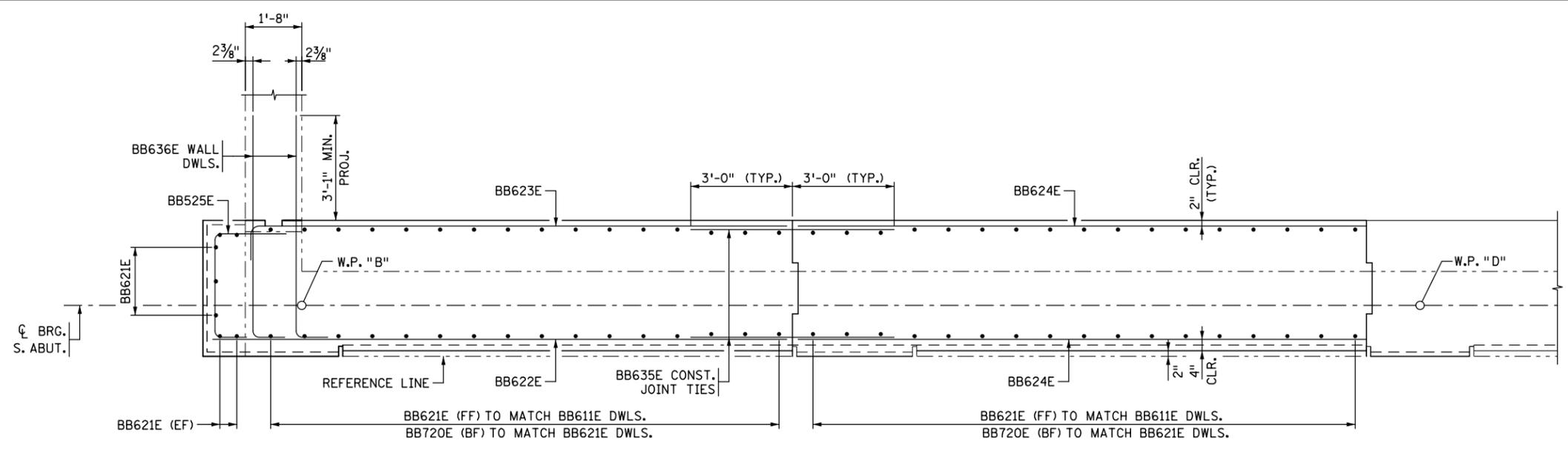
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: SOUTH ABUTMENT FOOTING REINFORCEMENT (STAGE 3)

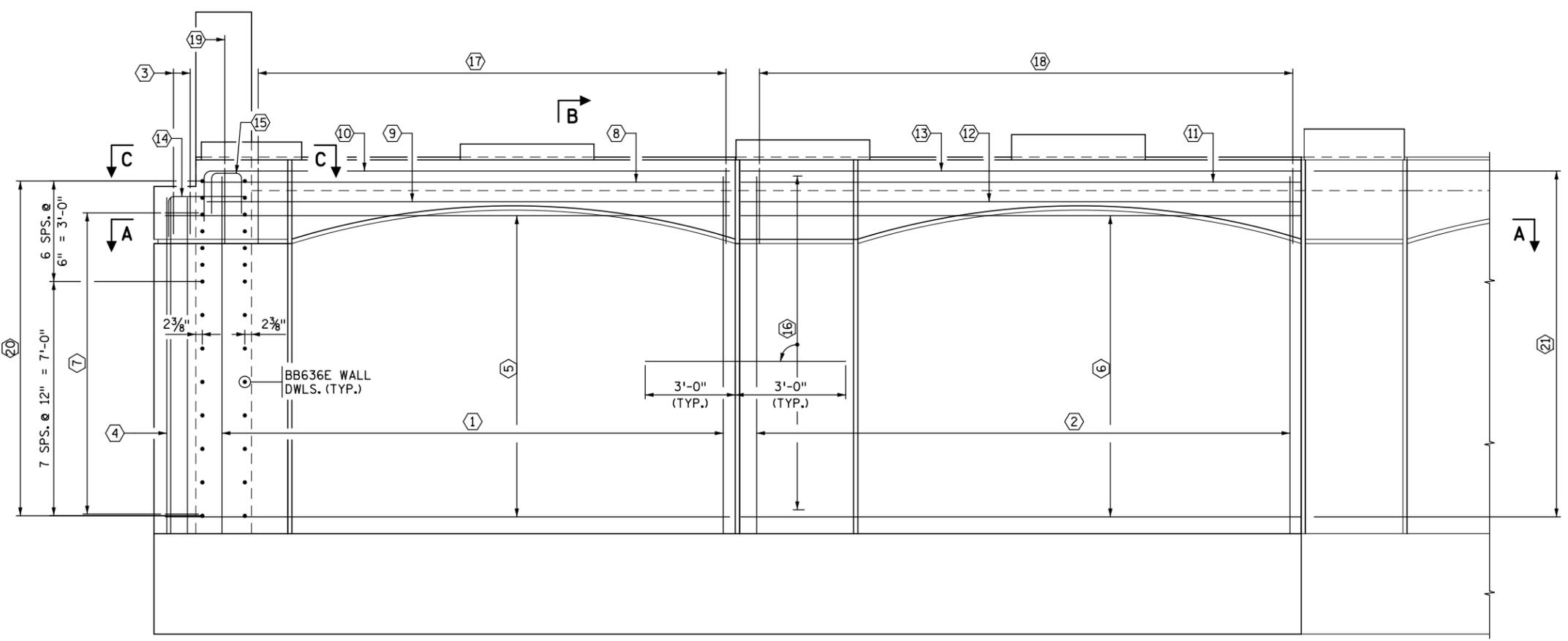
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CHK: GM	CHK: GM	
SHEET NO. 37 OF 96 SHEETS		

BRIDGE NO. 27B84

DATE: 4/1/2016 TIME: 12:49:14 PM
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SECTION A-A



SOUTH ABUTMENT REINFORCEMENT - STAGE 3

(FOOTING PILE AND REINFORCEMENT NOT SHOWN FOR CLARITY)

BAR CALL-OUTS

- ① 16-BB621E (FF) SPACED TO MATCH BB621E DWLS.
16-BB720E (BF) SPACED TO MATCH BB720E DWLS.
- ② 17-BB621E (FF) SPACED TO MATCH BB621E DWLS.
17-BB720E (BF) SPACED TO MATCH BB720E DWLS.
- ③ 1-BB621E (EF) SPACED TO MATCH BB611E DWL.
- ④ 3-BB621E SPACED TO MATCH BB611E DWLS.
- ⑤ 10-BB622E (FF) SPACED AS SHOWN IN SECTION B-B.
10-BB623E (BF) SPACED AS SHOWN IN SECTION B-B.
- ⑥ 10-BB624E (FF) SPACED AS SHOWN IN SECTION B-B.
- ⑦ 10-BB525E END TIES SPACED TO MATCH BB622E.
- ⑧ 1-BB626E (EF) SPACED AS SHOWN IN SECTION B-B.
- ⑨ 2-BB527E SPACED AS SHOWN IN SECTION B-B.
- ⑩ 3-BB528E SPACED AS SHOWN IN SECTION B-B.
- ⑪ 1-BB624E (EF) SPACED AS SHOWN IN SECTION B-B.
- ⑫ 2-BB529E SPACED AS SHOWN IN SECTION B-B.
- ⑬ 3-BB529E SPACED AS SHOWN IN SECTION B-B.
- ⑭ 3-BB530E SPACED TO MATCH BB621E VERTICALS.
- ⑮ 2-BB531E SPACED AS SHOWN IN SECTION C-C.
- ⑯ 27-BB635E CONST. JT TIES SPACED TO MATCH HORIZONTAL BARS.
- ⑰ 16-BB532E W/ 16-BB533E SPACED TO MATCH BB720E VERTICALS. SEE SECTION B-B FOR PLACEMENT DETAILS.
- ⑱ 17-BB532E W/ 17-BB533E SPACED TO MATCH BB720E VERTICALS. SEE SECTION B-B FOR PLACEMENT DETAILS.
- ⑲ 1-BB534E SPACED TO MATCH BB721E.
- ⑳ 14-BB636E WALL DWLS. (EF) SPACED AS SHOWN.
- ㉑ 27-BB640E TO MATCH INTO #6 COUPLERS FROM STAGE 2 CONSTRUCTION. ①

NOTES:

- ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.:



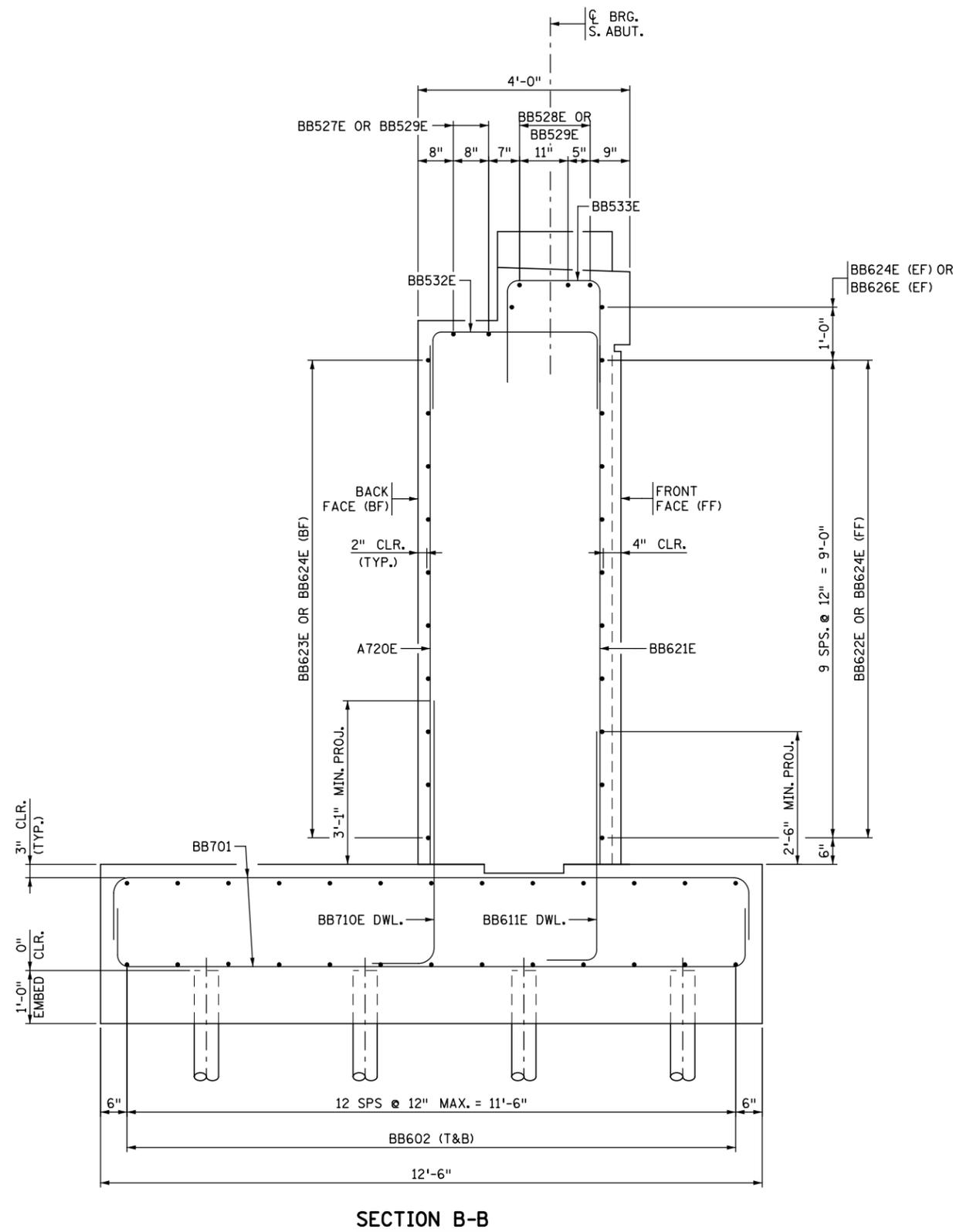
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SOUTH ABUTMENT REINFORCEMENT (STAGE 3)**

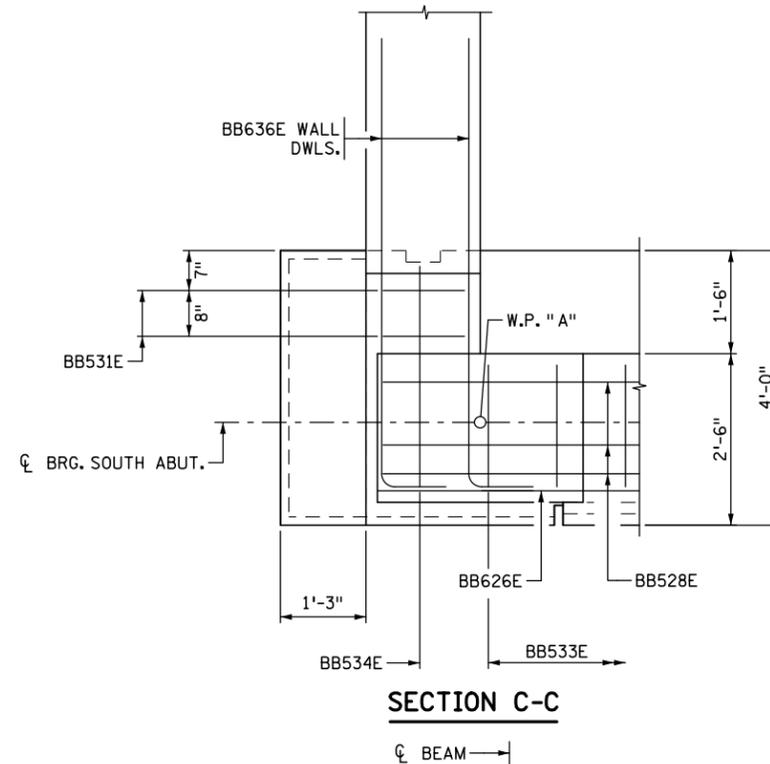
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CHK: GM	CHK: GM	
SHEET NO. 38 OF 96 SHEETS		

BRIDGE NO. **27B84**

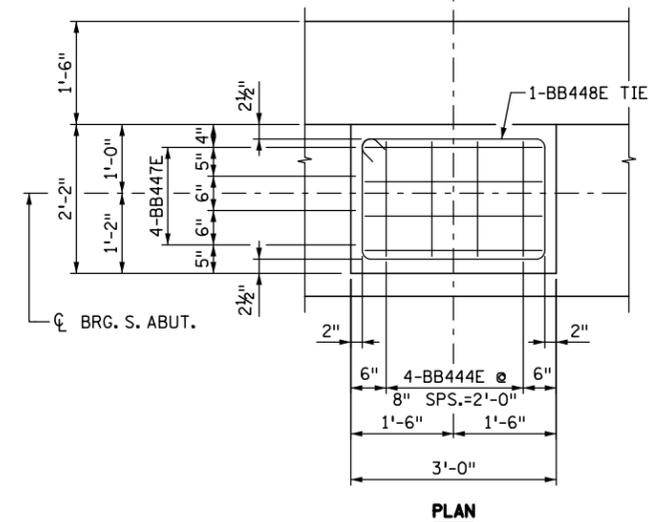
DATE: 4/1/2016 TIME: 12:49:14 PM
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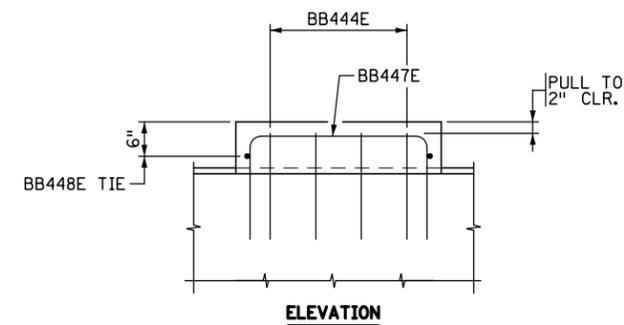
SECTION B-B



SECTION C-C



PLAN



ELEVATION

PEDESTAL TYPE "A"

(4 THUS)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



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

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

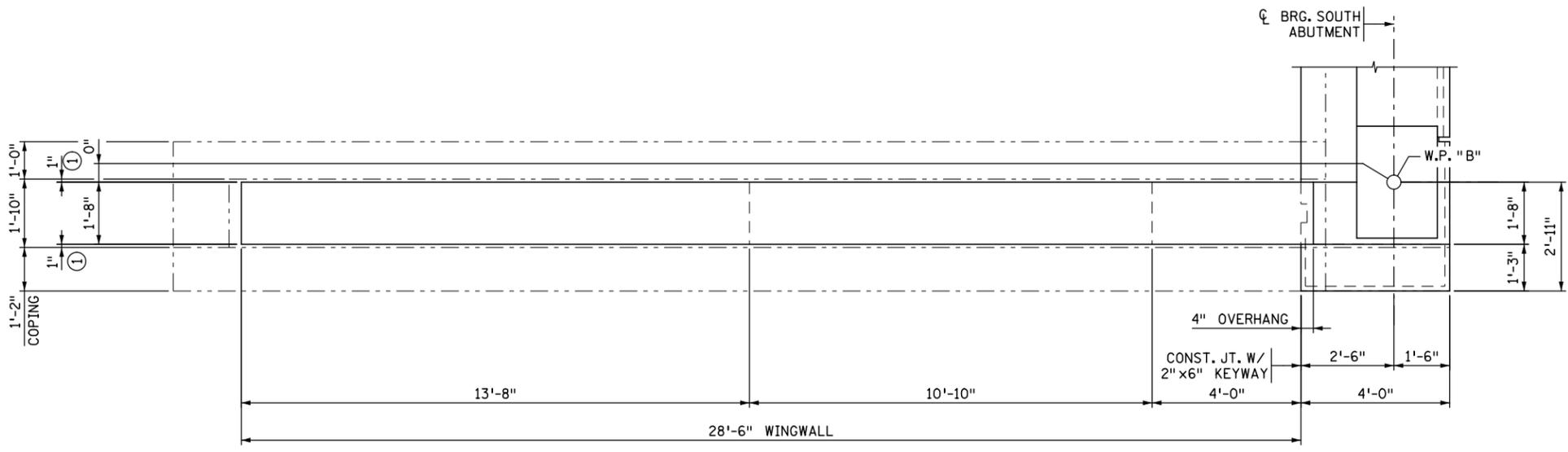
TITLE: SOUTH ABUMENT
 REINFORCEMENT DETAILS
 (STAGE 3)

DES: MAV	DR: MAV	APPROVED
CHK: GM	CHK: GM	

SHEET NO. 39 OF 96 SHEETS

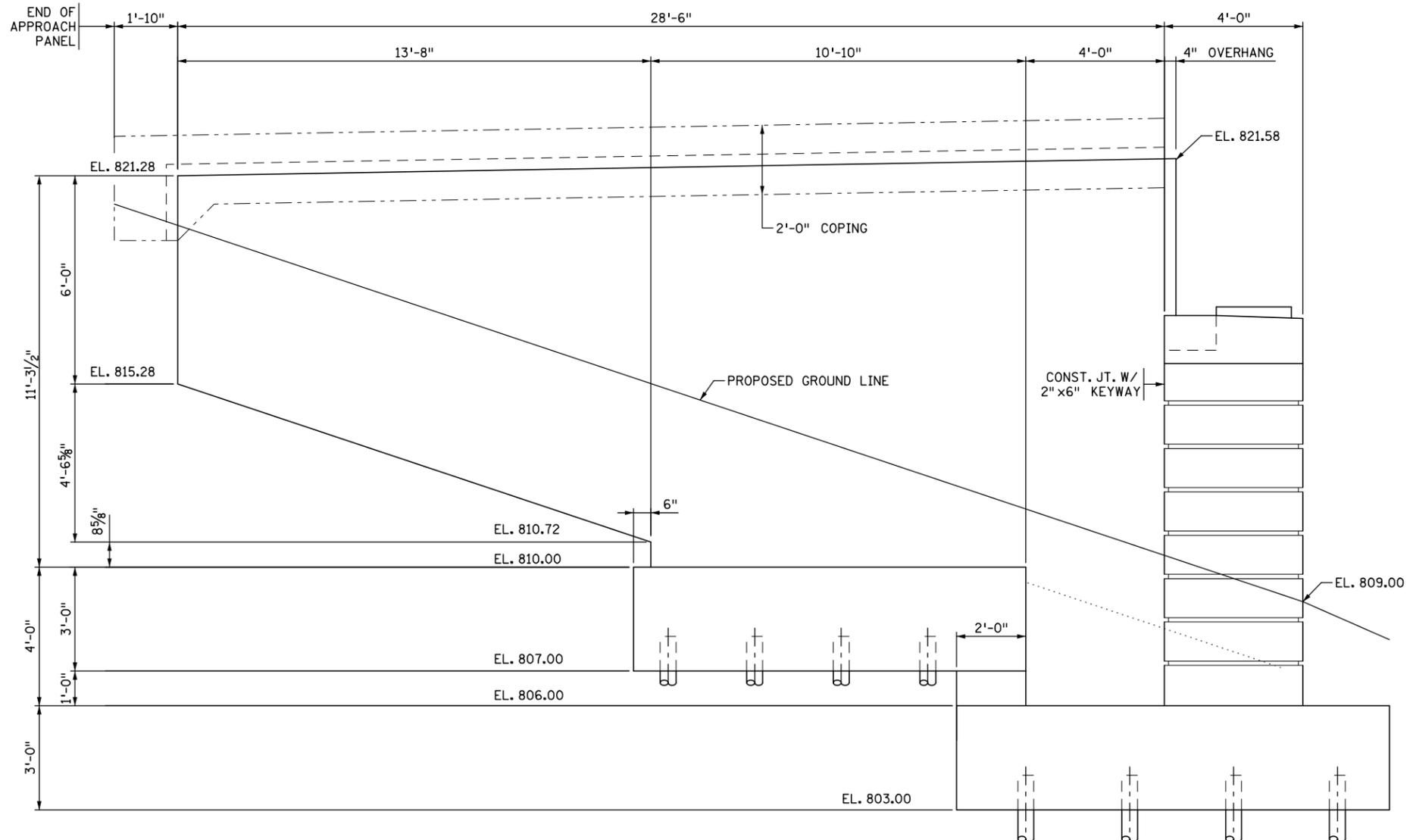
BRIDGE NO.
 27B84

DATE: 4/1/2016 TIME: 12:49:16 PM
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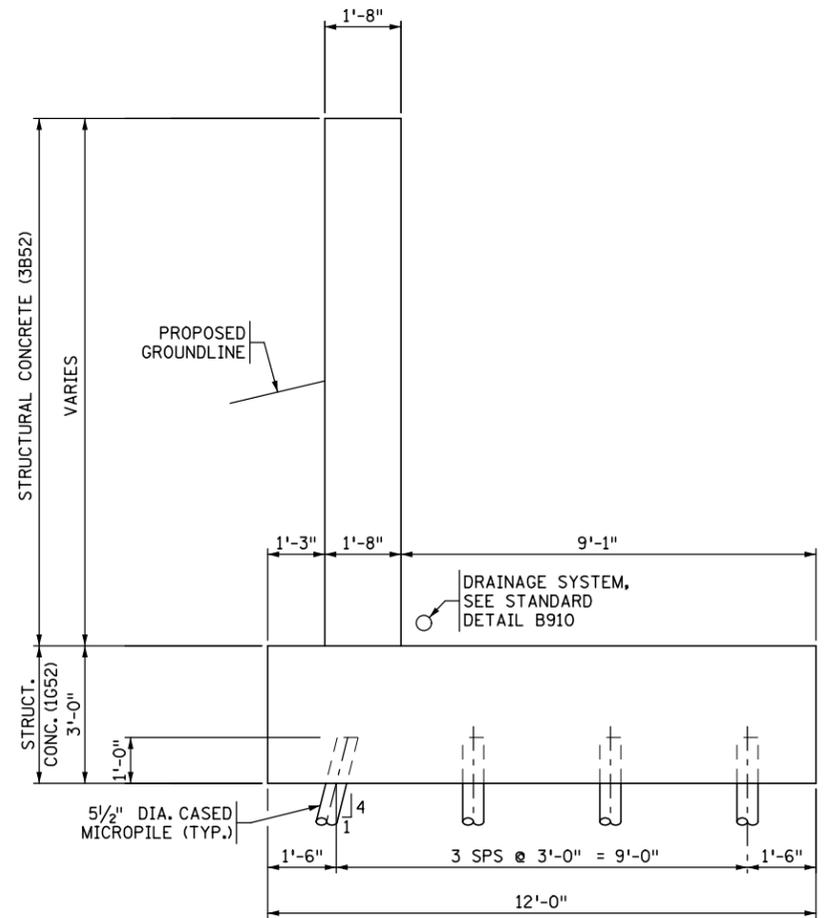


SOUTHEAST WINGWALL PLAN

NOTES:
 ① PLACE 1" POLYSTYRENE BETWEEN WINGWALL AND APPROACH PANEL.



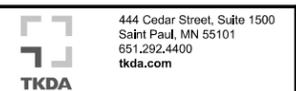
SOUTHEAST WINGWALL ELEVATION



TYPICAL SOUTHEAST WINGWALL SECTION

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:



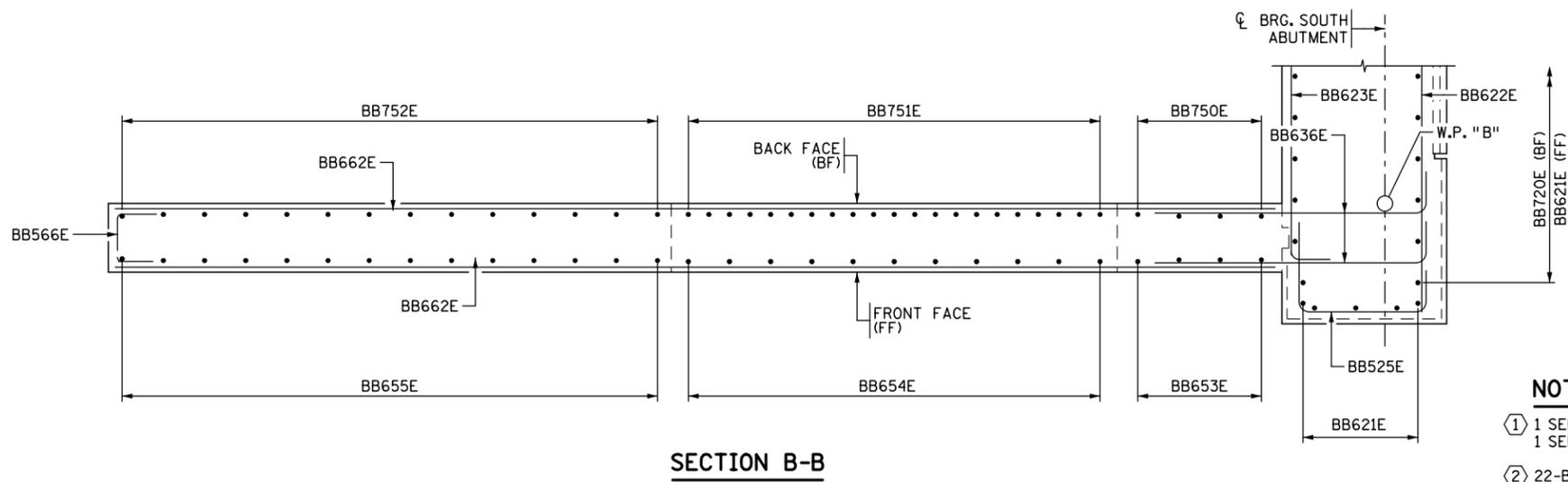
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SOUTHEAST WINGWALL PLAN & ELEVATION**

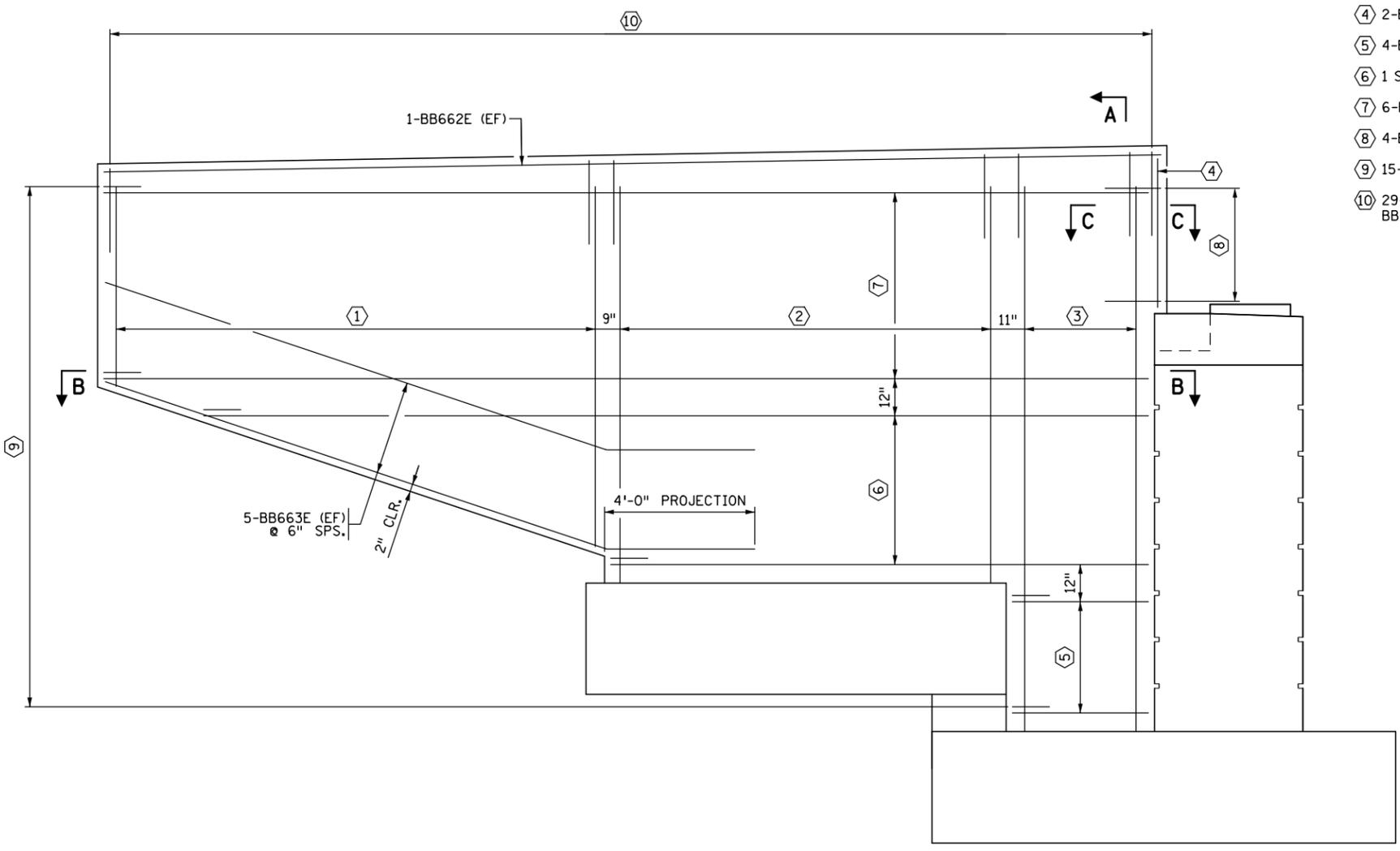
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CHK: GM	CHK: GM	
SHEET NO. 40 OF 96 SHEETS		

BRIDGE NO. **27B84**

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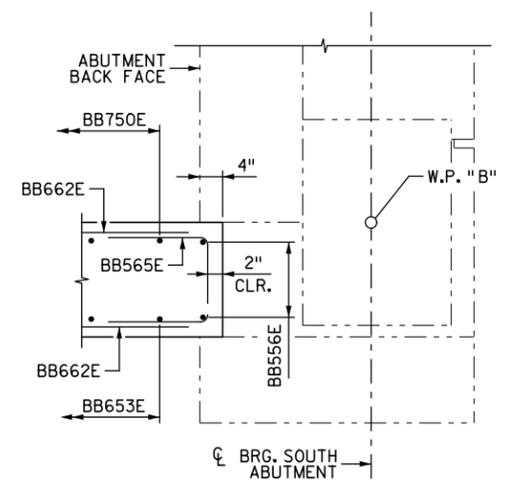
SECTION B-B



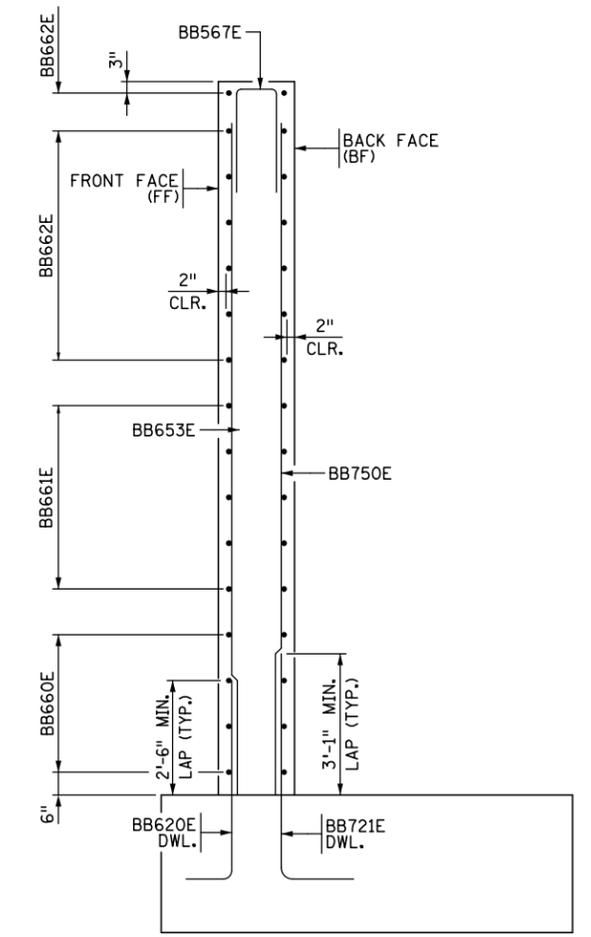
SOUTHEAST WINGWALL REINFORCEMENT
 (FOOTING REINFORCEMENT AND PILE NOT SHOWN FOR CLARITY)

NOTES:

- ① 1 SER. OF 12-BB752E (BF) @ 12" SPS. = 13'-0"
 1 SER. OF 12-BB655E (FF) @ 12" SPS. = 13'-0"
- ② 22-BB751E (BF) @ 6" SPS. = 10'-0"
 11-BB655E (FF) @ 12" MAX. SPS. = 10'-0"
- ③ 4-BB750E (BF) @ 12" SPS. = 3'-0"
 4-BB653E (FF) @ 12" SPS. = 3'-0"
- ④ 2-BB556E PLACED IN THE CORNERS OF BB565E.
- ⑤ 4-BB660E (EF) @ 12" SPS. = 3'-0".
- ⑥ 1 SER. OF 5-BB661E (EF) @ 12" SPS. = 4'-0".
- ⑦ 6-BB662E (EF) @ 12" SPS. = 5'-0".
- ⑧ 4-BB565E @ 12" SPS. = 3'-0".
- ⑨ 15-BB566E TO MATCH HORIZONTAL REINFORCEMENT.
- ⑩ 29-BB567E TO MATCH BB653E (FF), BB654E (FF), BB655E (FF) & BB556E



SECTION C-C



SECTION A-A

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SOUTHEAST WINGWALL REINFORCEMENT**

DES: MAV	DR: ADL	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 41 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:18 PM
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BILL OF REINFORCEMENT - SOUTH ABUTMENT (STAGE 3)				
BAR	NO.	LENGTH	SHAPE	LOCATION
BB701	70	13'-10"		FOOTING TRANSVERSE TOP & BOT.
BB602	24	33'-11"		FOOTING LONG. TOP & BOT.
BB703	24	13'-4"		WINGWALL FOOTING TRANS. TOP & BOT.
BB604	24	10'-10"		WINGWALL FOOTING LONG. TOP & BOT.
BB605	24	7'-6"		FOOTING STEP TIE
BB606	4	11'-6"		FOOTING STEP LONG.
BB607	24	3'-0"		STAGED CONSTRUCTION JOINT FTG. DWL.
BB710E	57	6'-2"		FOOTING DOWEL BACK FACE
BB611E	55	5'-5"		FOOTING DOWEL FRONT FACE
BB720E	57	10'-0"		STEM BACK FACE VERTICAL
BB621E	55	10'-0"		STEM FRONT FACE VERTICAL
BB622E	10	16'-11"		STEM FRONT FACE HORIZONTAL
BB623E	10	17'-0"		STEM BACK FACE HORIZONTAL
BB624E	22	16'-11"		STEM HORIZONTAL
BB525E	10	6'-4"		STEM END TIE
BB626E	2	15'-8"		STEM CAP HORIZONTAL
BB527E	2	15'-8"		STEM CAP HORIZONTAL
BB528E	3	17'-3"		STEM CAP HORIZONTAL
BB529E	5	16'-9"		STEM CAP HORIZONTAL
BB530E	3	3'-10"		STEM TOP TIE
BB531E	2	3'-8"		STEM TOP TIE
BB532E	33	4'-8"		STEM TOP TIE
BB533E	33	6'-0"		STEM TOP TIE
BB534E	1	7'-2"		STEM TOP TIE
BB635E	27	6'-0"		CONSTRUCTION JOINT DOWEL
BB636E	28	7'-7"		WINGWALL CONST. JOINT DOWEL
BB640E	27	3'-0"		STAGED CONSTRUCTION JOINT STEM DWL.
BB444E	50	4'-8"		PEDESTAL TRANSVERSE
BB445E	12	6'-7"		TYPE "A" PEDESTAL LONG.
BB446E	3	11'-7"		TYPE "A" PEDESTAL TIE
BB448E	8	5'-7"		TYPE "B" PEDESTAL LONG.
BB447E	2	9'-7"		TYPE "B" PEDESTAL TIE
BB750E	4	14'-8"		WW BACK FACE VERTICAL
BB751E	22	10'-8"		WW BACK FACE VERTICAL
BB752E	14	SER. 1		WW BACK FACE VERTICAL
BB653E	4	14'-8"		WW FRONT FACE VERTICAL
BB654E	11	10'-8"		WW FRONT FACE VERTICAL
BB655E	14	SER. 1		WW FRONT FACE VERTICAL
BB756E	2	4'-0"		WW VERTICAL
BB660E	8	3'-8"		WW HORIZONTAL
BB661E	10	SER. 2		WW HORIZONTAL
BB662E	14	28'-2"		WW HORIZONTAL
BB663E	10	18'-3"		WW HORIZONTAL
BB565E	4	4'-4"		WW END TIE
BB566E	15	3'-4"		WW END TIE
BB567E	29	5'-8"		WW TOP TIE

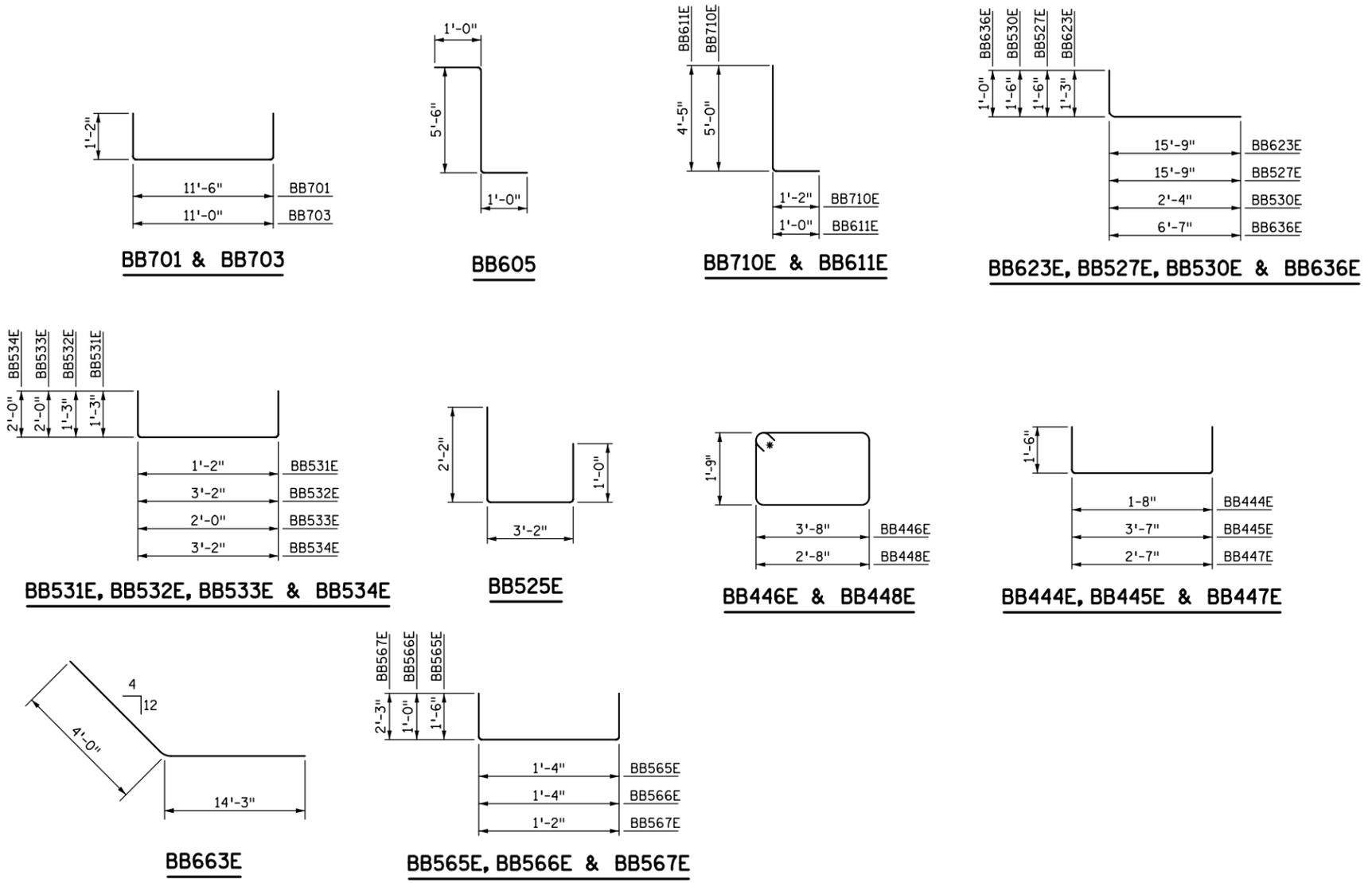
SER. 1 = 2 SERIES OF 7 BARS (5'-6" TO 9'-10")
 SER. 2 = 2 SERIES OF 5 BARS (14'-6" TO 25'-11")

NOTE:
 BENT BAR DIMENSIONS GIVEN ARE OUT-TO-OUT.
 ACTUAL BAR LENGTHS SHALL BE DETERMINED
 BASED ON THE DETAIL DIMENSIONS SHOWN IN
 THE BAR BENDING DIAGRAMS.

* DENOTES STANDARD STIRRUP HOOK.

NOTES:
 ① BAR COUPLERS AND REINFORCEMENT BARS EXTENDING
 FROM BAR COUPLERS TO BE PAID FOR AT THE UNIT
 PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-6".

BAR BENDING DIAGRAMS



NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
 SIGNED _____
 DATE: 4/1/2016 LIC. NO.:



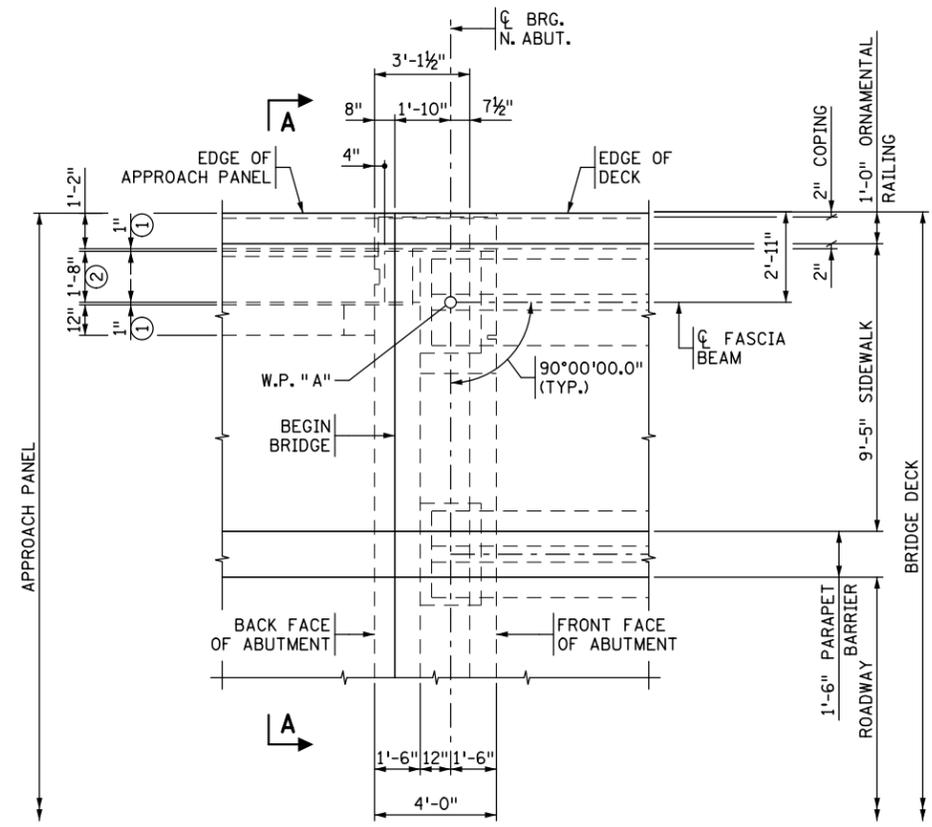
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: SOUTH ABUMTENT
 BARLIST (STAGE 3)

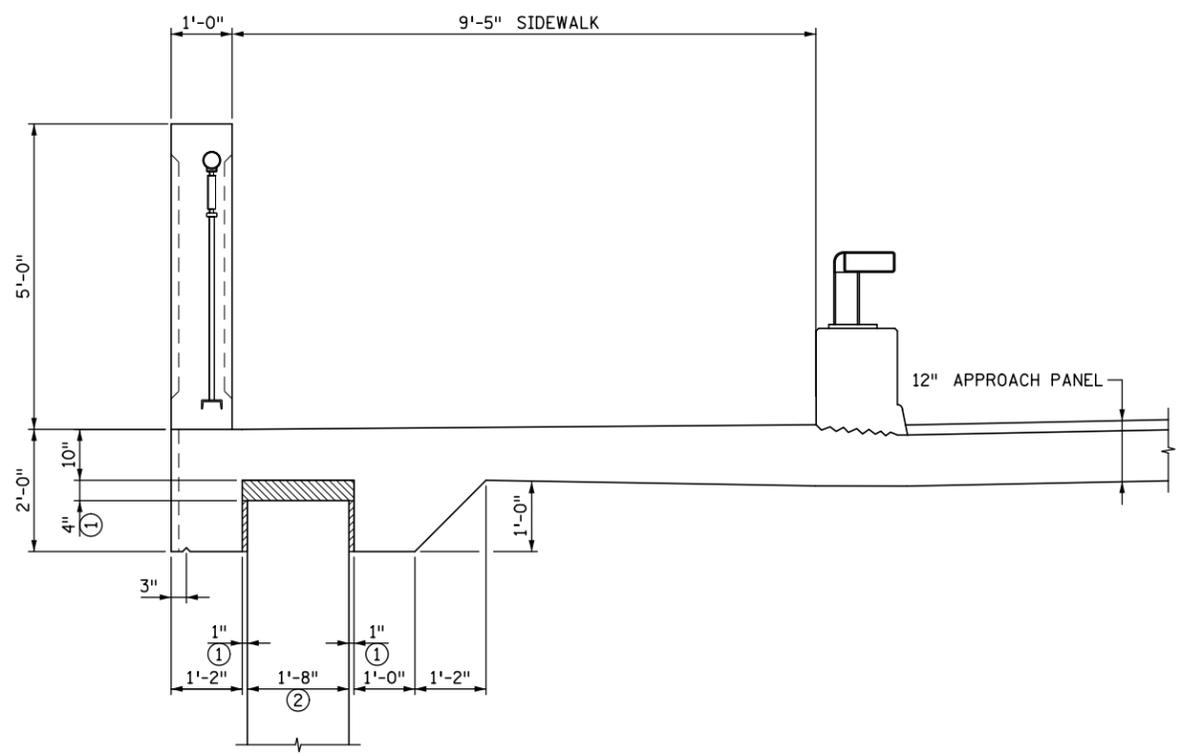
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CHK: GM	CHK: GM	
SHEET NO. 42 OF 96 SHEETS		

BRIDGE NO.
 27B84

DATE: 4/1/2016 TIME: 12:49:19 PM
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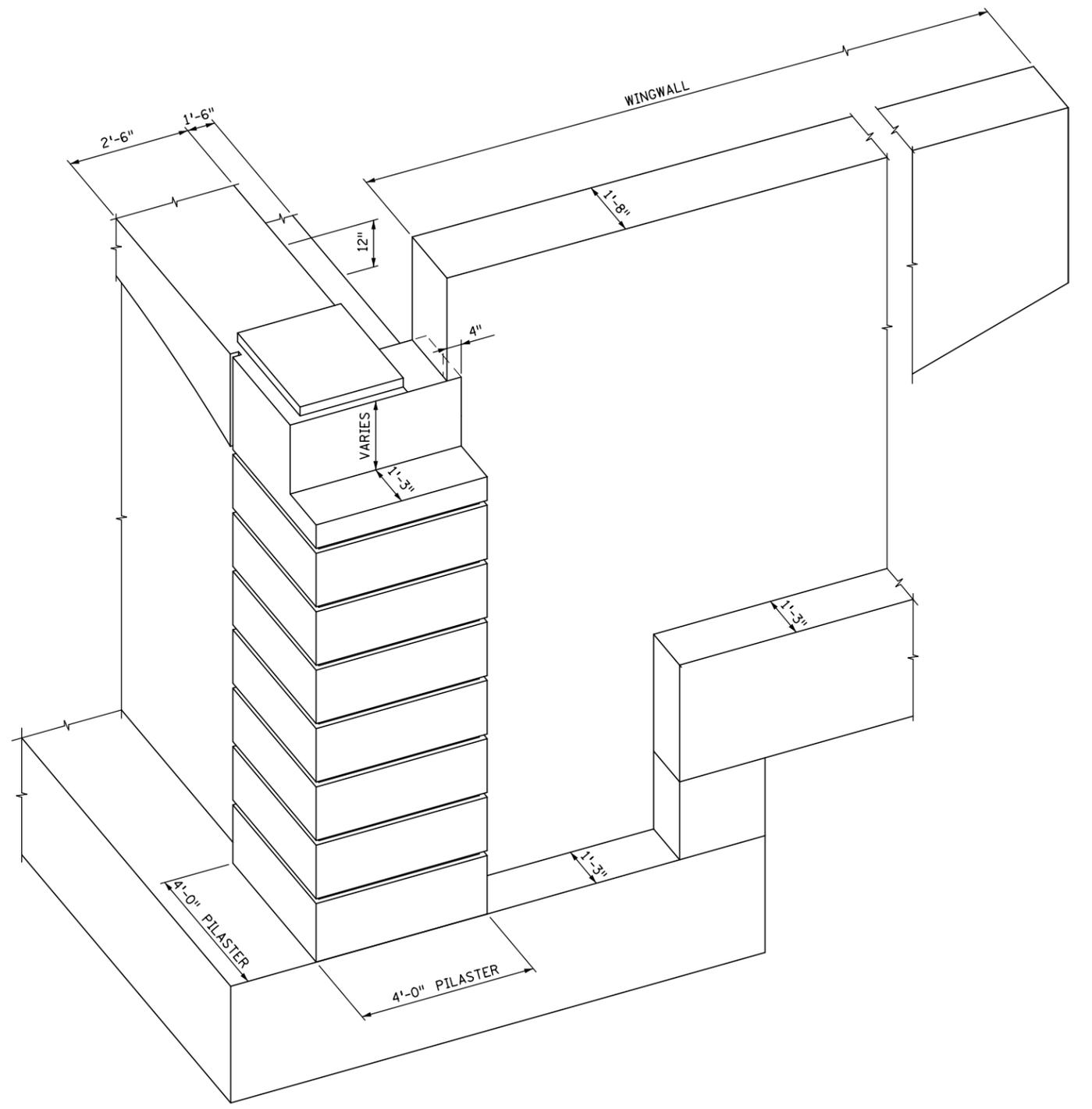


CORNER DETAIL
 (NORTHEAST CORNER SHOWN; ALL OTHERS SIMILAR)



SECTION A-A

- NOTES:**
- ① LOW DENSITY POLYSTYRENE.
 - ② CONCRETE WINGWALL.



ISOMETRIC ABUTMENT CORNER DETAIL
 (NORTHEAST CORNER SHOWN; ALL OTHERS SIMILAR)
 (SUPERSTRUCTURE DETAILS NOT SHOWN FOR CLARITY)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 DATE: 4/1/2016 LIC. NO.: _____

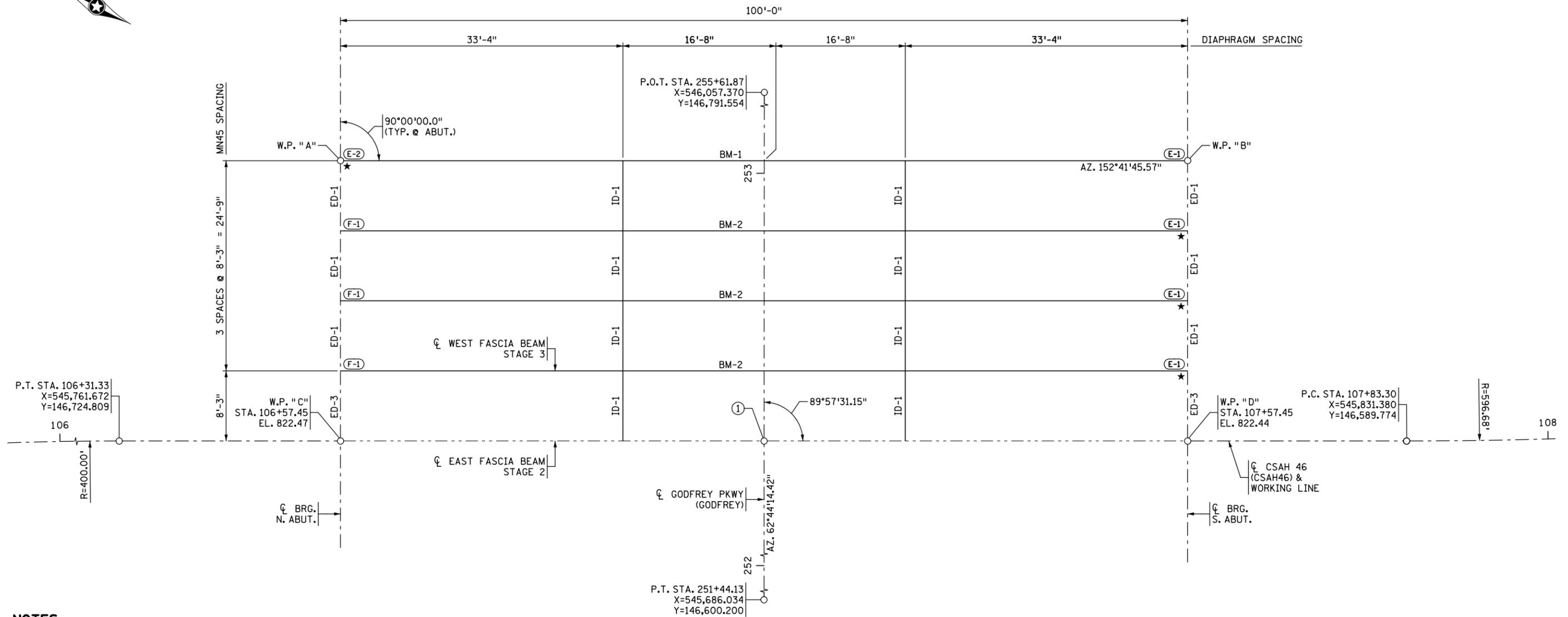


HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
CORNER DETAILS

DES: LJJ	DR: LJJ	APPROVED
CHK: MAV	CHK: MAV	
SHEET NO. 44 OF 96 SHEETS		

BRIDGE NO.
27B84



FRAMING PLAN - STAGE 3

NOTES:

- BM-X
└──┬──┘
DENOTES THE BEAM NUMBER IN THE GIVEN SPAN
- (F-1) DENOTES FIXED CURVED PLATE BEARING ASSEMBLY, TYPE 1. SEE STANDARD DETAIL B310.
- (E-1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 1. SEE STANDARD DETAIL B311.
- (E-2) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 2. SEE STANDARD DETAIL B311.
- ★ DENOTES "X" END OF BEAM
- ID-X DENOTES STEEL INTERMEDIATE DIAPHRAGM, TYPE X. SEE STANDARD DETAIL B403.
- ED-X DENOTES CONCRETE END DIAPHRAGM, TYPE X. SEE SHEET XX FOR ADDITIONAL DETAILS.
- ① CONTROL POINT
CSAH 46 (CSAH46) P.O.T. STA. 107+07.45 =
GODFREY PKWY (GODFREY) P.O.T. STA. 252+68.50
X=545,796.588; Y=146,657.170
α 89°57'31.2"

END DIAPHRAGM LENGTHS		
ID. NO.	LENGTH (℄-℄ WEB)	NO. OF DIAPHRAGMS
ED-1	8'-3"	6 THUS
ED-3	X'-XX"	2 THUS

INTERMEDIATE DIAPHRAGM LENGTHS		
ID. NO.	LENGTH (℄-℄ WEB)	NO. OF DIAPHRAGMS
ID-1	8'-3"	8 THUS

DATE: 4/1/2016 TIME: 12:49:21 PM
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NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 _____ LIC. NO.: _____
 DATE: 4/1/2016



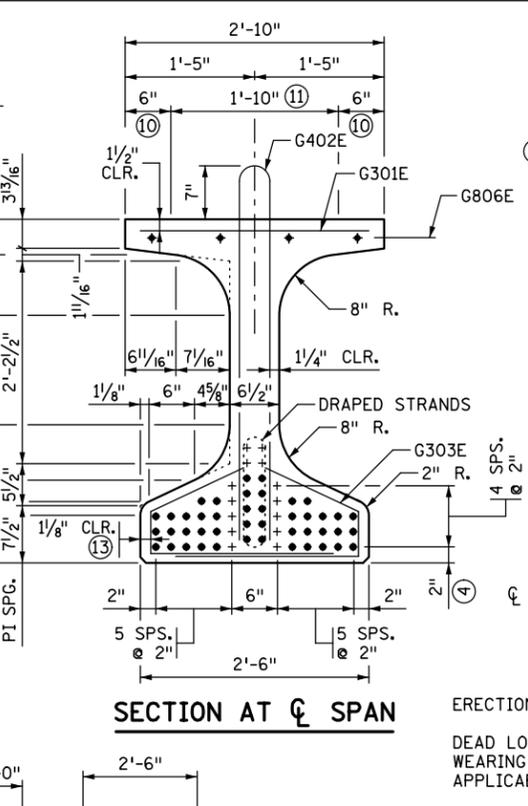
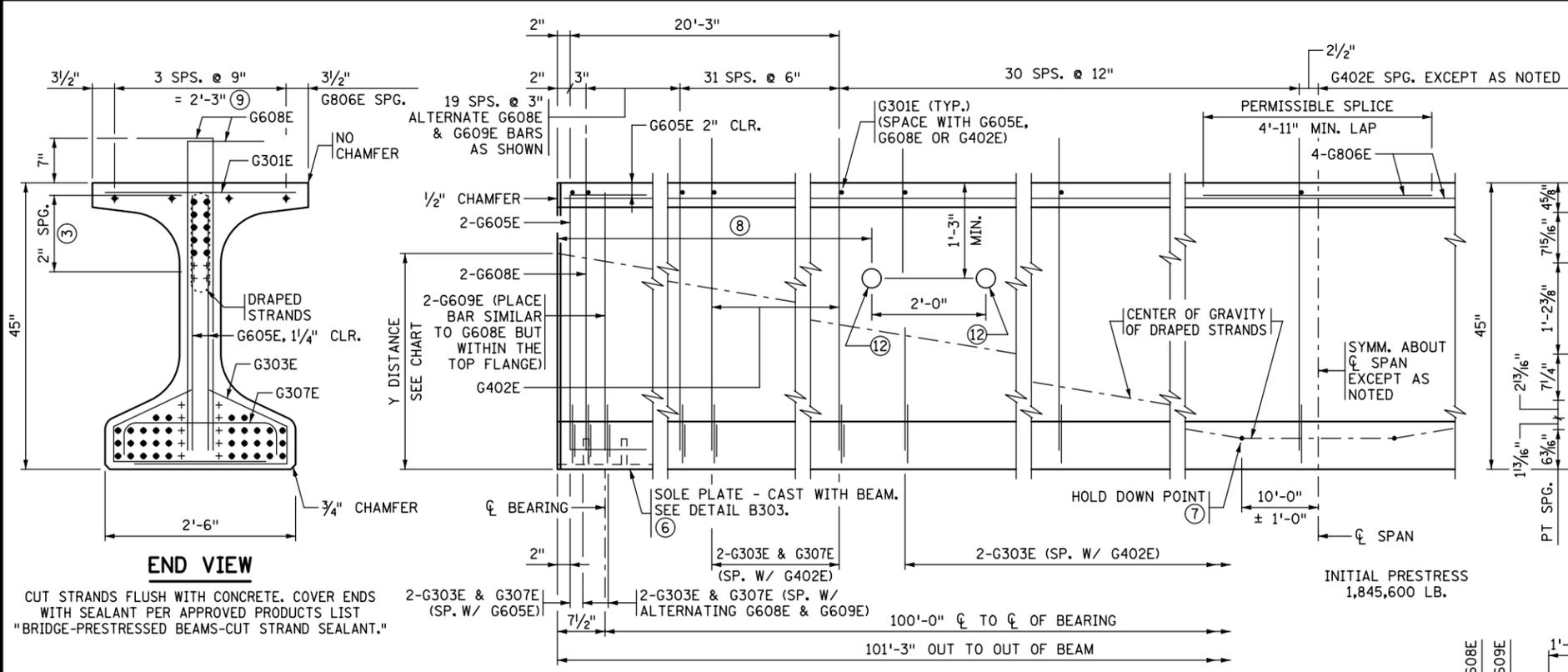
HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **FRAMING PLAN**
STAGE 3

DES: ADL	DR: ADL	APPROVED
CHK: JRM	CHK: GM	
SHEET NO. 46 OF 96 SHEETS		

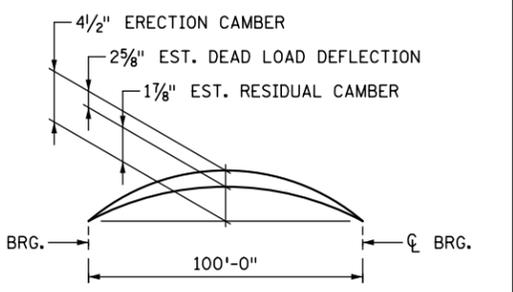
BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:22 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27B84_sup04.dgn



Y DISTANCES (INCHES)			
	NO.	CL SPAN	END
STRAIGHT STRANDS	34	4.5	
DRAPED STRANDS	10	7.0	38.0
TOTAL STRANDS	44	5.1	

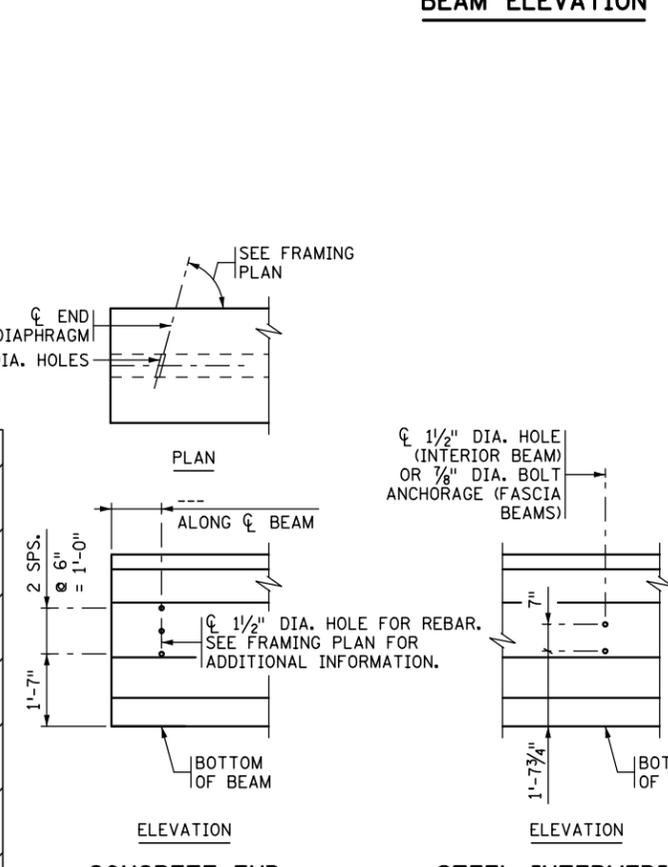
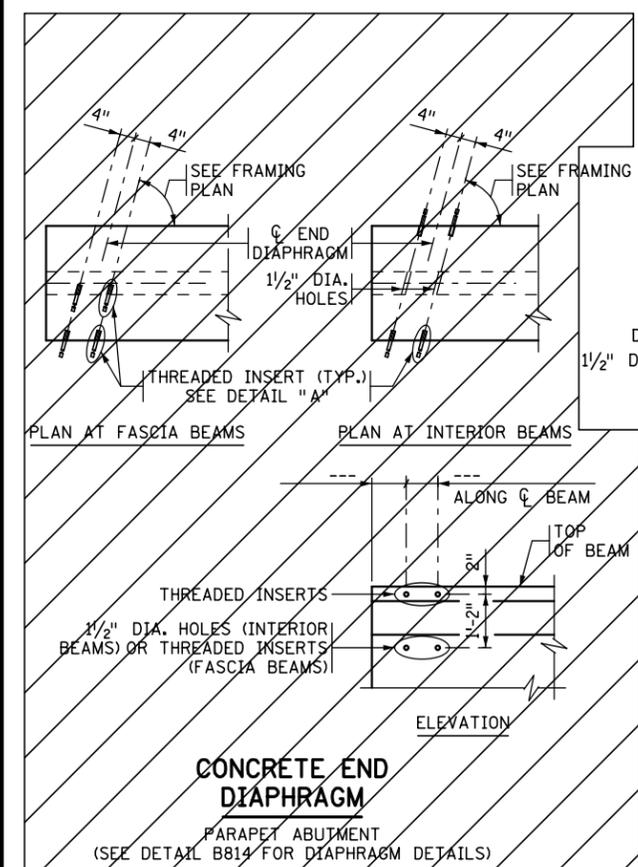
Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.
 A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



END VIEW
 CUT STRANDS FLUSH WITH CONCRETE. COVER ENDS WITH SEALANT PER APPROVED PRODUCTS LIST "BRIDGE-PRESTRESSED BEAMS-CUT STRAND SEALANT."
 2-G303E & G307E (SP. W/ G605E)
 2-G303E & G307E (SP. W/ ALTERNATING G608E & G609E)

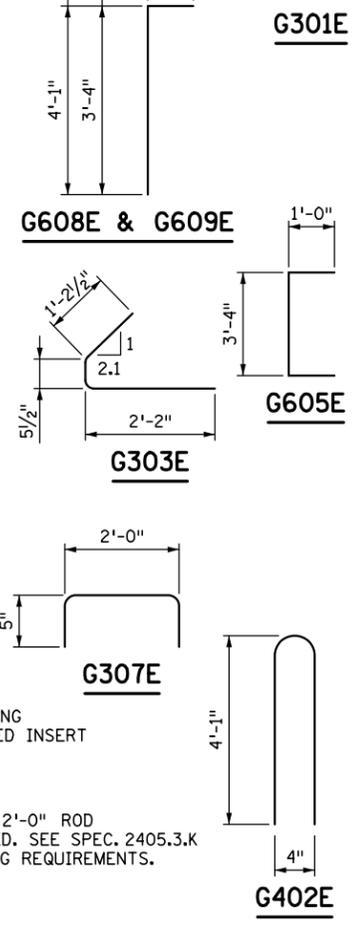
BEAM ELEVATION
 100'-0" CL TO CL OF BEARING
 101'-3" OUT TO OUT OF BEAM
 INITIAL PRESTRESS 1,845,600 LB.

SECTION AT CL SPAN
 2'-6" width
 45" height
 5 SPS. @ 2" (top)
 5 SPS. @ 2" (bottom)



CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	24.3 KSI
LONG TERM LOSSES	25.2 KSI
TOTAL LOSSES	49.5 KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
① f'cI	② f'c
7.5 KSI	9.0 KSI



GENERAL NOTES

- PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.
- MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.
- ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.
- SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.
- AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.
- APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.
- ① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.
- ② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.
- ③ DRAPED STRANDS.
- ④ STRAIGHT STRANDS.
- ⑤ USE 0.6" DIA. 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.
- ⑥ FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.
- ⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.
- ⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.
- ⑨ TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.
- ⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.
- ⑪ ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.
- ⑫ OPTIONAL: 3" MAX. DIA. SLEEVE FOR HAULING (AFTER INSTALLATION, COAT WITH APPROVED EPOXY BONDING AGENT & FILL WITH APPROVED NON-SHRINK GROUT).
- ⑬ TYP. CLR. FOR ENTIRE BOTTOM FLANGE.

REVISED: DECEMBER 02, 2015
 APPROVED: JANUARY 13, 2015
 Nancy D. Sibenberger
 STATE BRIDGE ENGINEER

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

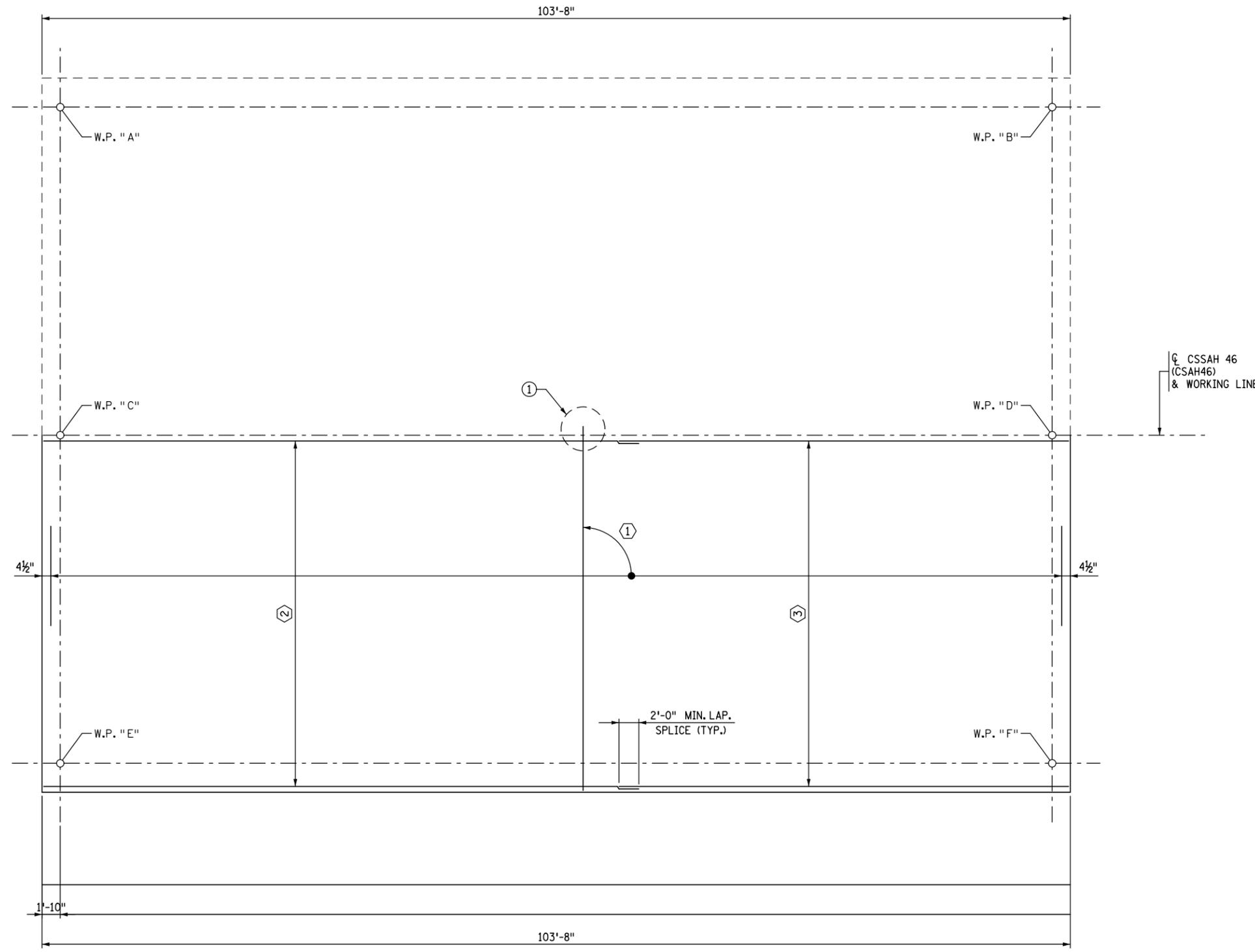
TITLE: 45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-102

DES:	DR:	APPROVED
ADL	ADL	
CHK: JRM	CHK: JRM	

SHEET NO. 47 OF 96 SHEETS

BEAMS BM-1 & BM-2
 FIG. 5-397.505
 BRIDGE NO. 27B84

DATE: 4/1/2016 TIME: 12:49:24 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_sup05.dgn



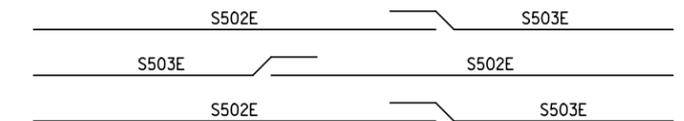
BOTTOM LAYER DECK REINFORCEMENT - STAGE 2

BAR CALL-OUTS:

- ① 178-S501E (B) SPACED @ 7" = 102'-11".
- ② 43-S502E (B) SPACED @ 10" MAX. = 34'-9". STAGGER BARS AS SHOWN IN "BAR STAGGER DETAIL OF BOTTOM LONG. REINF."
- ③ 43-S503E (B) SPACED @ 10" MAX. = 34'-9". STAGGER BARS AS SHOWN IN "BAR STAGGER DETAIL OF BOTTOM LONG. REINF."

NOTES:

- ① SEE "COUPLING DETAIL" ON "SUPERSTRUCTURE DETAILS" SHEET FOR COUPLING AT DECK CONSTRUCTION JOINT.



BAR STAGGER DETAIL OF BOTTOM LONG. REINF.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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SIGNED _____

DATE: 4/1/2016 LIC. NO.: _____

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

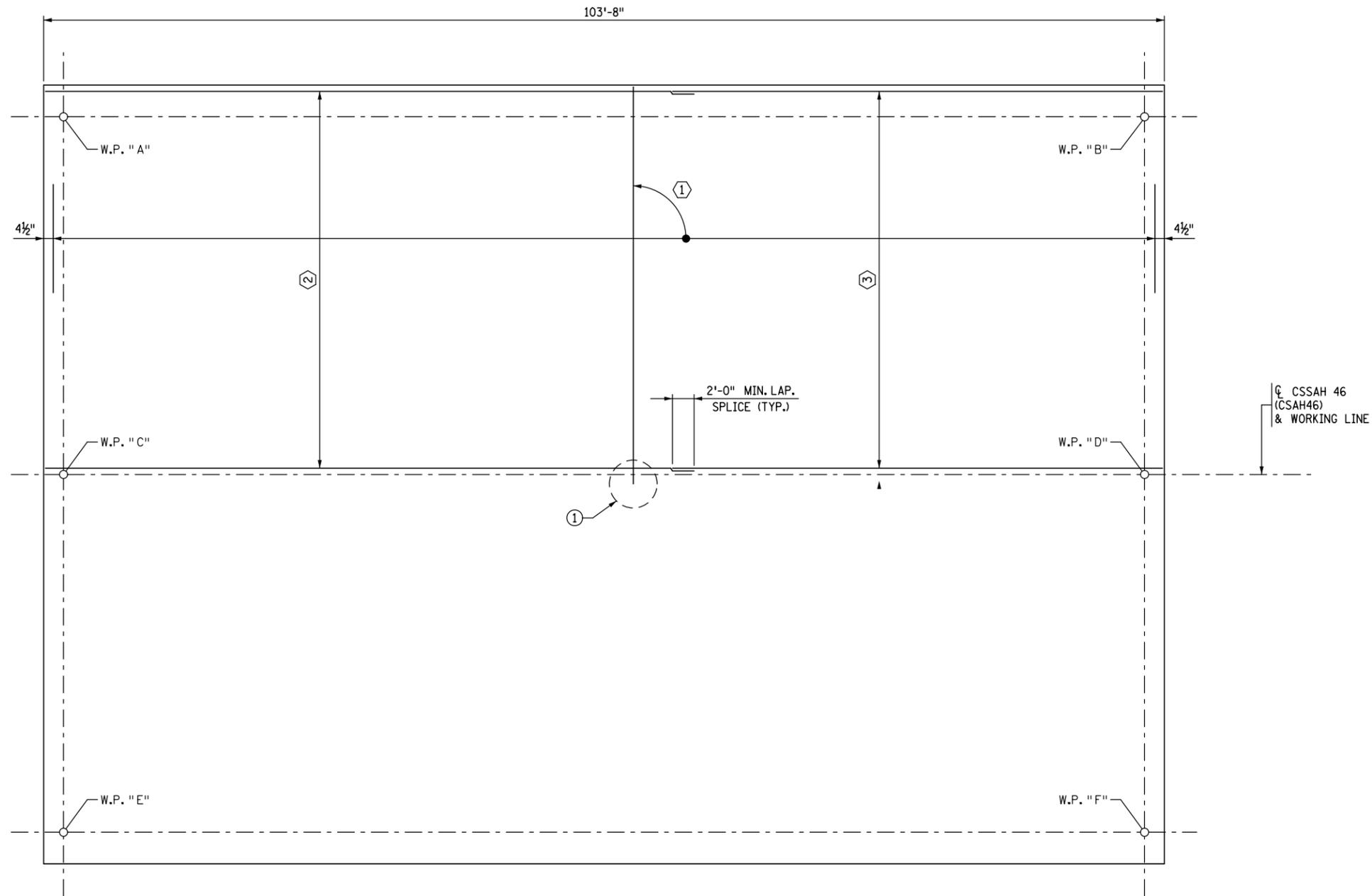
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **BOTTOM LAYER DECK REINFORCEMENT - STAGE 2**

DES: SEM	DR: SEM	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 48 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:25 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_sup06.dgn



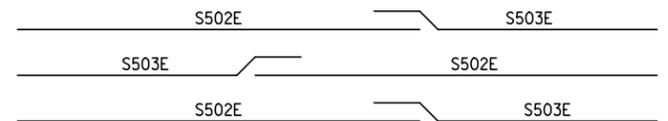
DECK BOTTOM REINFORCEMENT - STAGE 3

BAR CALL-OUTS:

- ① 178-S501E (B) SPACED @ 7" = 102'-11".
- ② 43-S502E (B) SPACED @ 10" MAX. = 34'-9". STAGGER BARS AS SHOWN IN "BAR STAGGER DETAIL OF BOTTOM LONG. REINF."
- ③ 43-S503E (B) SPACED @ 10" MAX. = 34'-9". STAGGER BARS AS SHOWN IN "BAR STAGGER DETAIL OF BOTTOM LONG. REINF."

NOTES:

- ① SEE "COUPLING DETAIL" ON "SUPERSTRUCTURE DETAILS" SHEET FOR COUPLING AT DECK CONSTRUCTION JOINT.



BAR STAGGER DETAIL OF BOTTOM LONG. REINF.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:

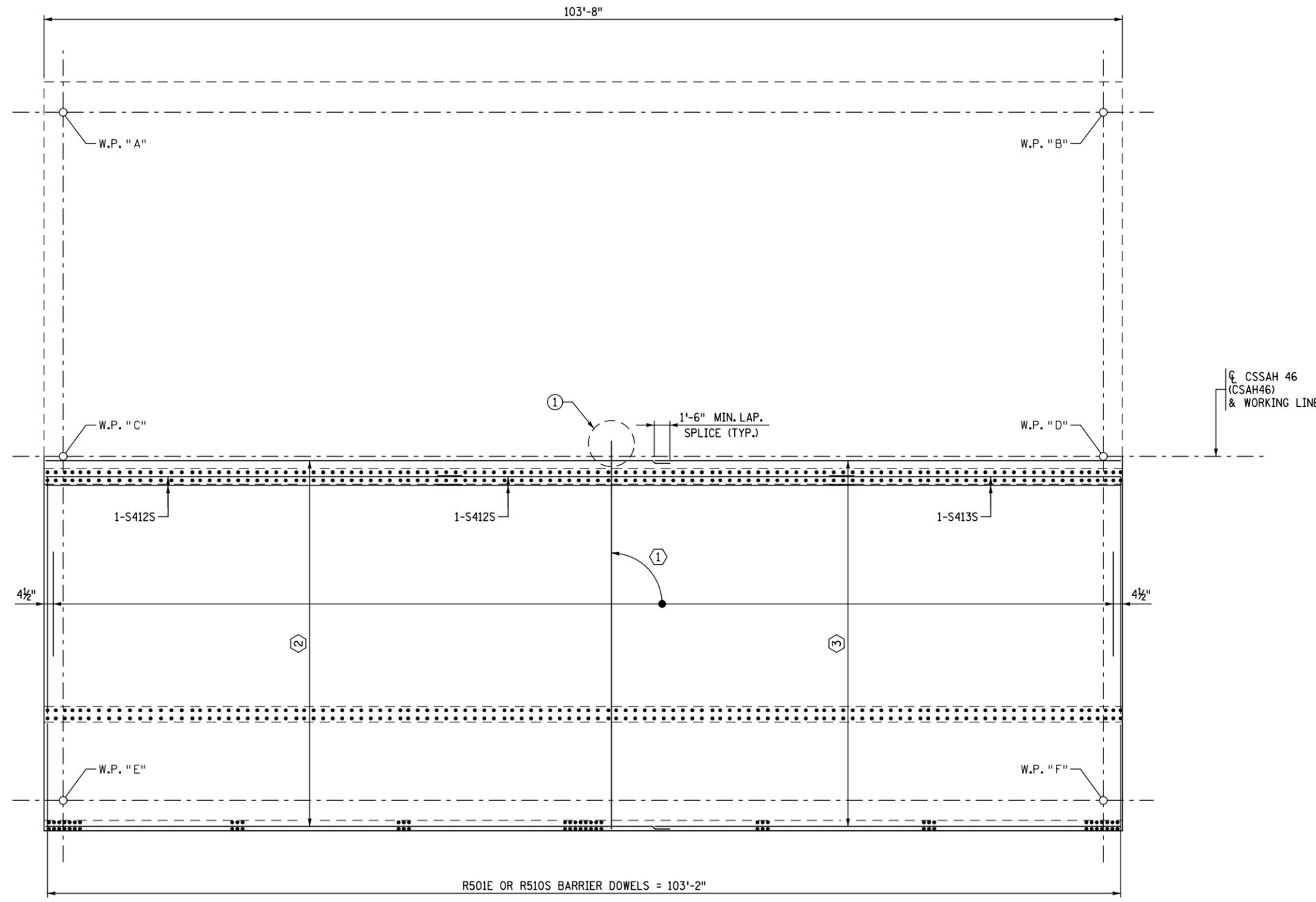


HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **BOTTOM LAYER DECK REINFORCEMENT - STAGE 3**

DES: SEM	DR: SEM	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 49 OF 96 SHEETS		

BRIDGE NO.
27B84

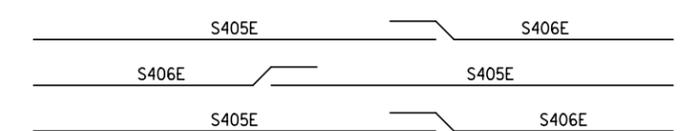


- BAR CALL-OUTS:**
- ① 248-S404E (T) SPACED @ 5" = 102'-11".
 - ② 25-S405E (T) SPACED @ 1'-6" MAX. = 35'-1". STAGGER BARS AS SHOWN IN "BAR STAGGER DETAIL OF TOP LONG. REINF."
 - ③ 25-S406E (T) SPACED @ 1'-6" MAX. = 35'-1". STAGGER BARS AS SHOWN IN "BAR STAGGER DETAIL OF TOP LONG. REINF."

- NOTES:**
- ① SEE "COUPLING DETAIL" ON "SUPERSTRUCTURE DETAILS" SHEET FOR COUPLING AT DECK CONSTRUCTION JOINT.
- SEE BARRIER SHEETS FOR BARRIER DOWEL PLACEMENT. MIN. 2" CLEARANCE REQUIRED FROM ANY EPOXY COATED DECK BARS.

DATE: 4/1/2016 TIME: 12:49:25 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_sup07.dgn

DECK TOP REINFORCEMENT - STAGE 2



BAR STAGGER DETAIL OF TOP LONG. REINF.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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SIGNED _____ DATE: 4/1/2016 LIC. NO.: _____

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Saint Paul, MN 55101
651.292.4400
tkda.com

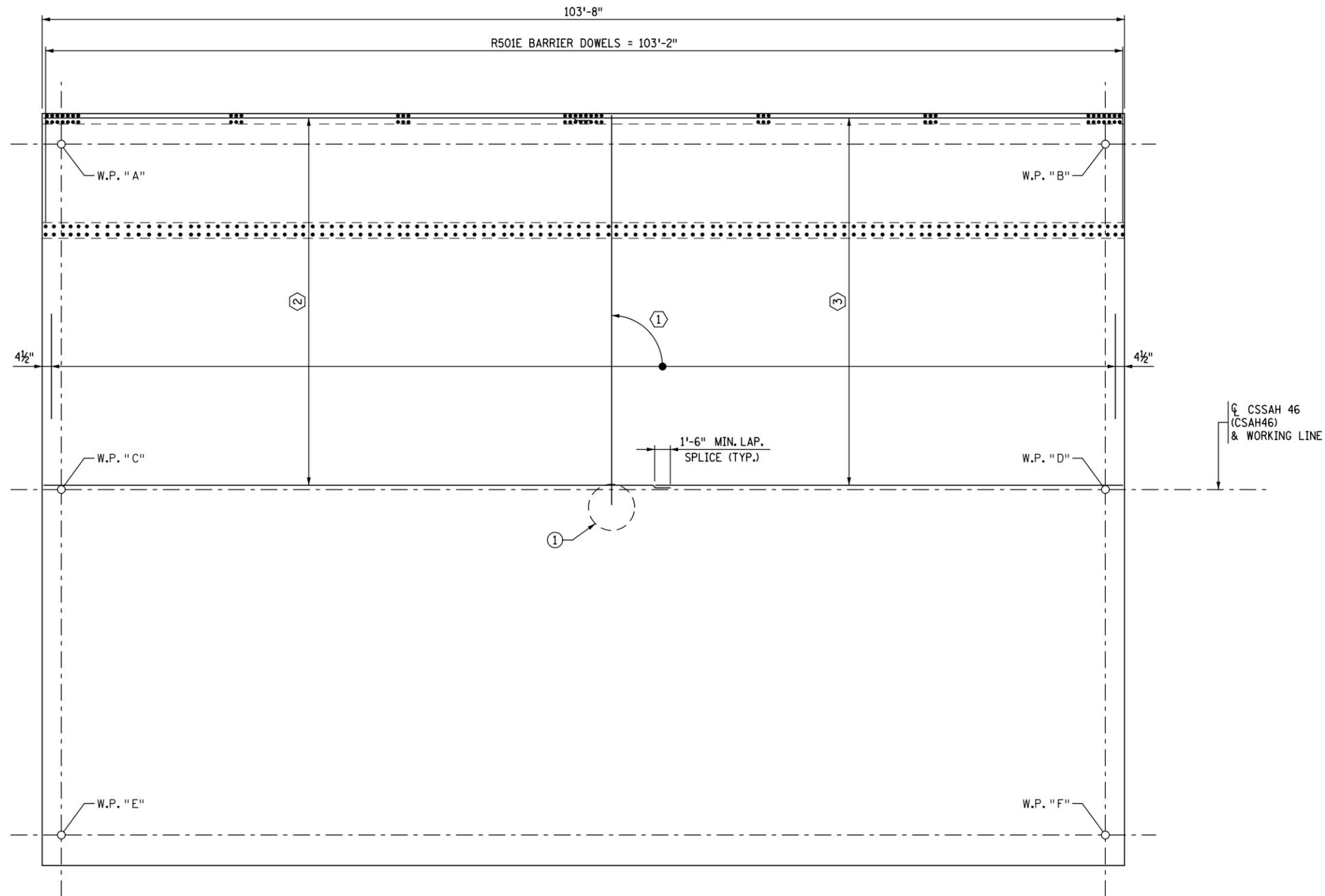
HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
S.A.P. 027-646-007

TITLE: **TOP LAYER DECK REINFORCEMENT - STAGE 2**

DES: SEM	DR: SEM	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 50 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:26 PM
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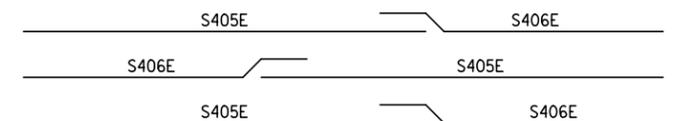
DECK TOP REINFORCEMENT - STAGE 3

BAR CALL-OUTS:

- ① 248-S404E (T) SPACED @ 5" = 102'-11".
- ② 25-S405E (T) SPACED @ 1'-6" MAX. = 35'-1". STAGGER BARS AS SHOWN IN "BAR STAGGER DETAIL OF TOP LONG. REINF."
- ③ 25-S406E (T) SPACED @ 1'-6" MAX. = 35'-1". STAGGER BARS AS SHOWN IN "BAR STAGGER DETAIL OF TOP LONG. REINF."

NOTES:

- ① SEE "COUPLING DETAIL" ON "SUPERSTRUCTURE DETAILS" SHEET FOR COUPLING AT DECK CONSTRUCTION JOINT.
- SEE BARRIER SHEETS FOR BARRIER DOWEL PLACEMENT. MIN. 2" CLEARANCE REQUIRED FROM ANY EPOXY COATED DECK BARS.



BAR STAGGER DETAIL OF TOP LONG. REINF.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.: _____

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 Saint Paul, MN 55101
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 tkda.com

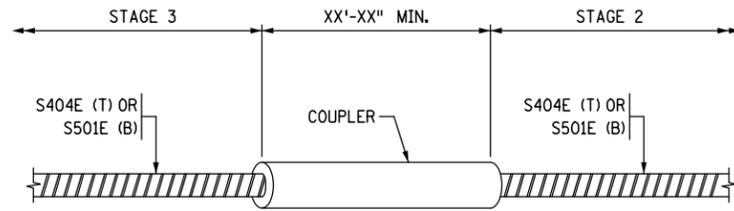
HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **TOP LAYER DECK REINFORCEMENT - STAGE 3**

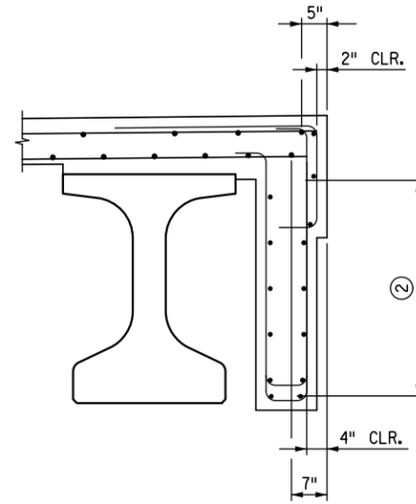
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CHK: GM	CHK: GM	
SHEET NO. 51 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:27 PM
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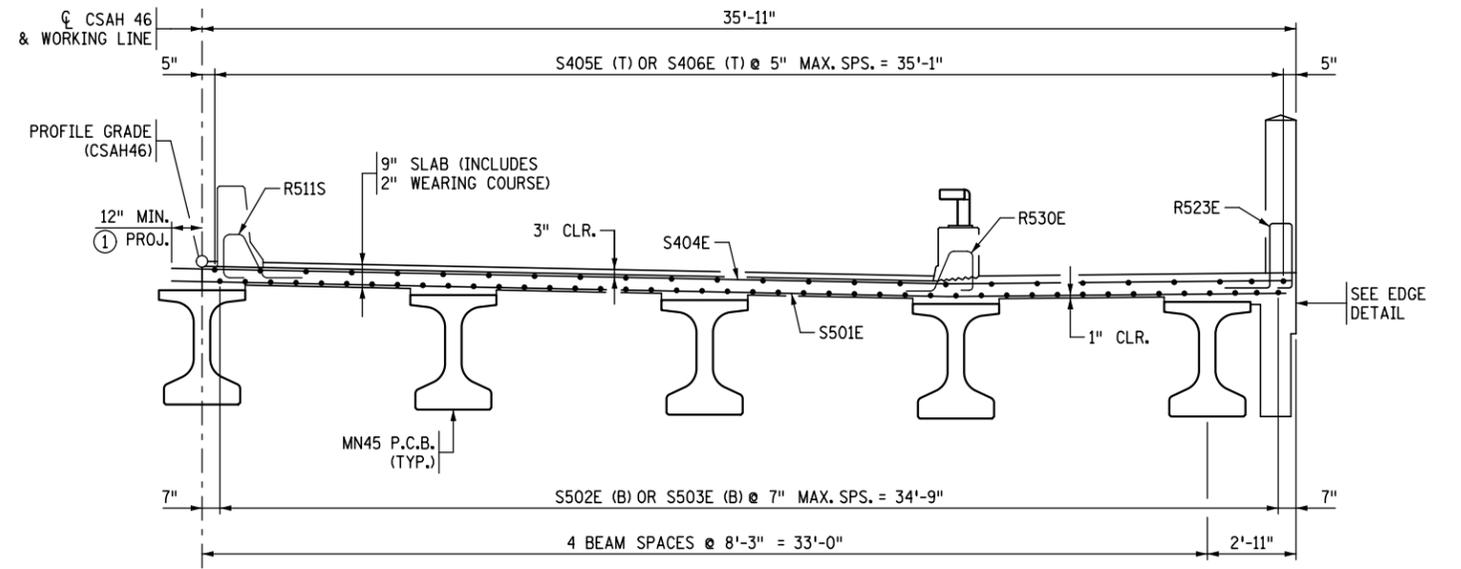


COUPLER DETAIL



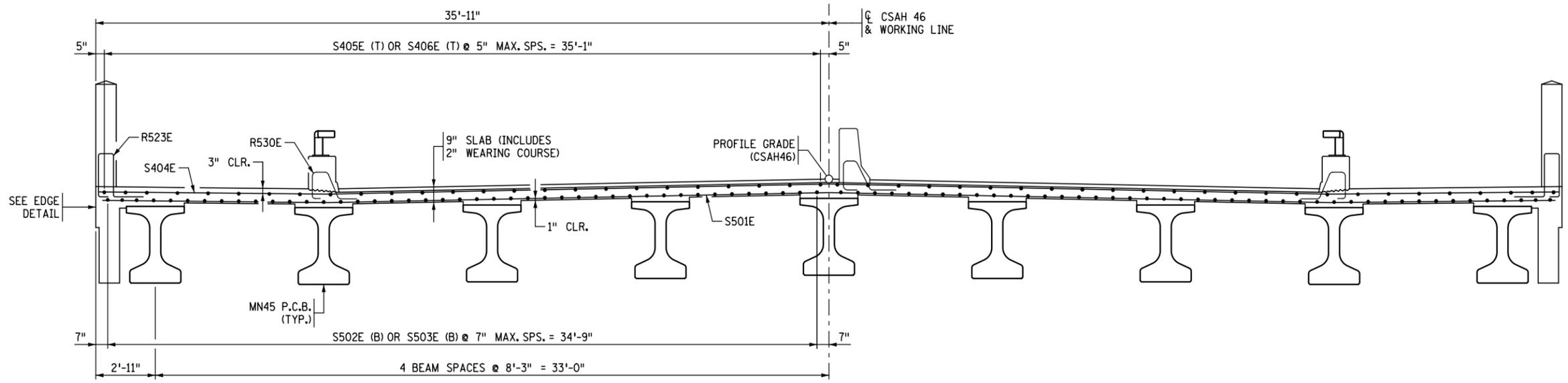
EDGE DETAIL

(WEST END SHOWN, EAST END SIMILAR)



TYPICAL REINFORCEMENT SECTION - STAGE 2

WEST END



TYPICAL REINFORCEMENT SECTION - STAGE 3

EAST END

WEST END

NOTES:

- ① SEE "COUPLER DETAIL" ON THIS SHEET.
- ② SEE "ARCH REINFORCEMENT" SHEET FOR ARCH REINFORCEMENT SPACING.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.: _____

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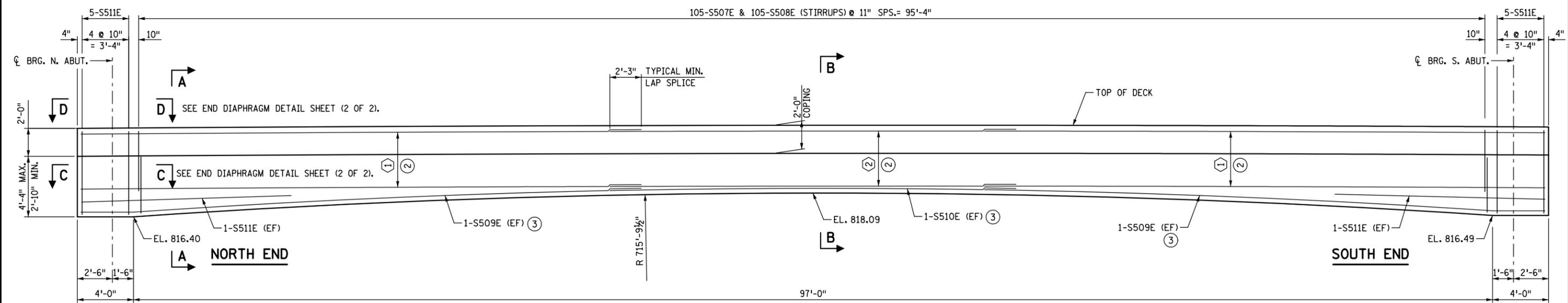
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **SUPERSTRUCTURE REINFORCEMENT DETAILS**

DES: SEM	DR: SEM	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 52 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:28 PM
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BAR CALL-OUTS:

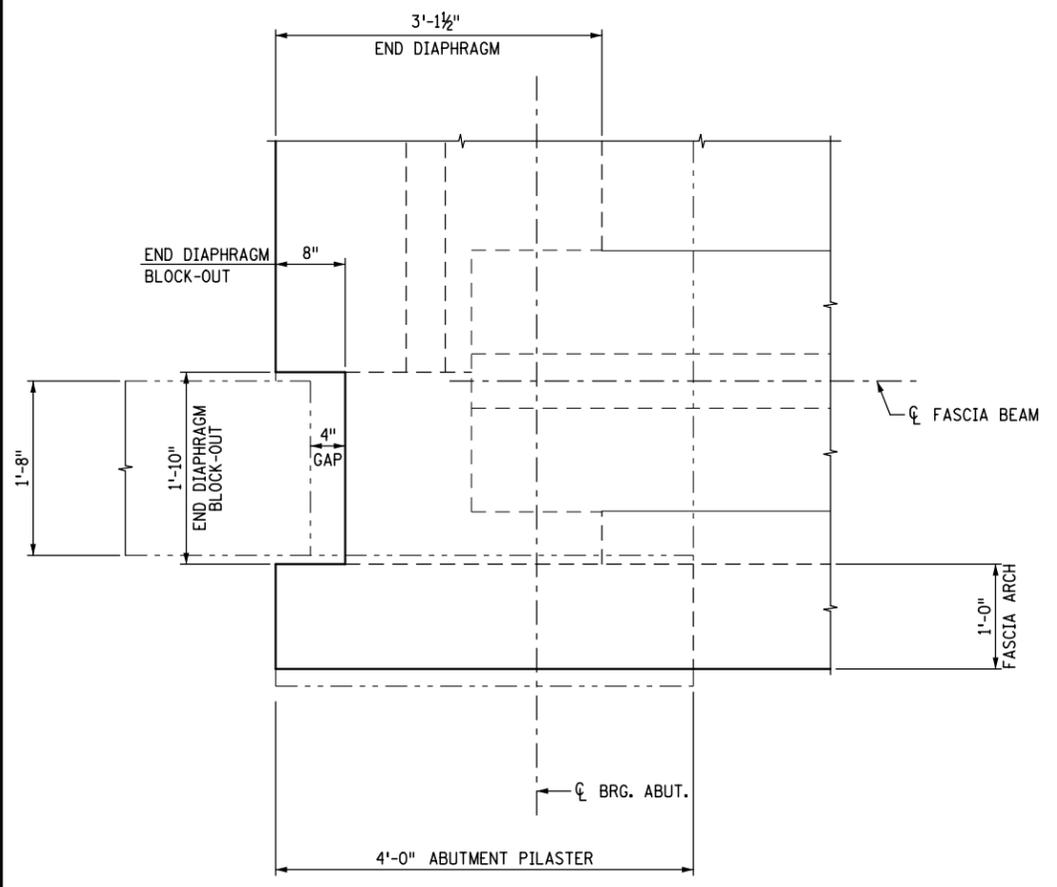
- ① 13-S509E. SEE SECTION A-A AND SECTION B-B FOR SPACING.
- ② 13-S510E. SEE SECTION A-A AND SECTION B-B FOR SPACING.

NOTES:

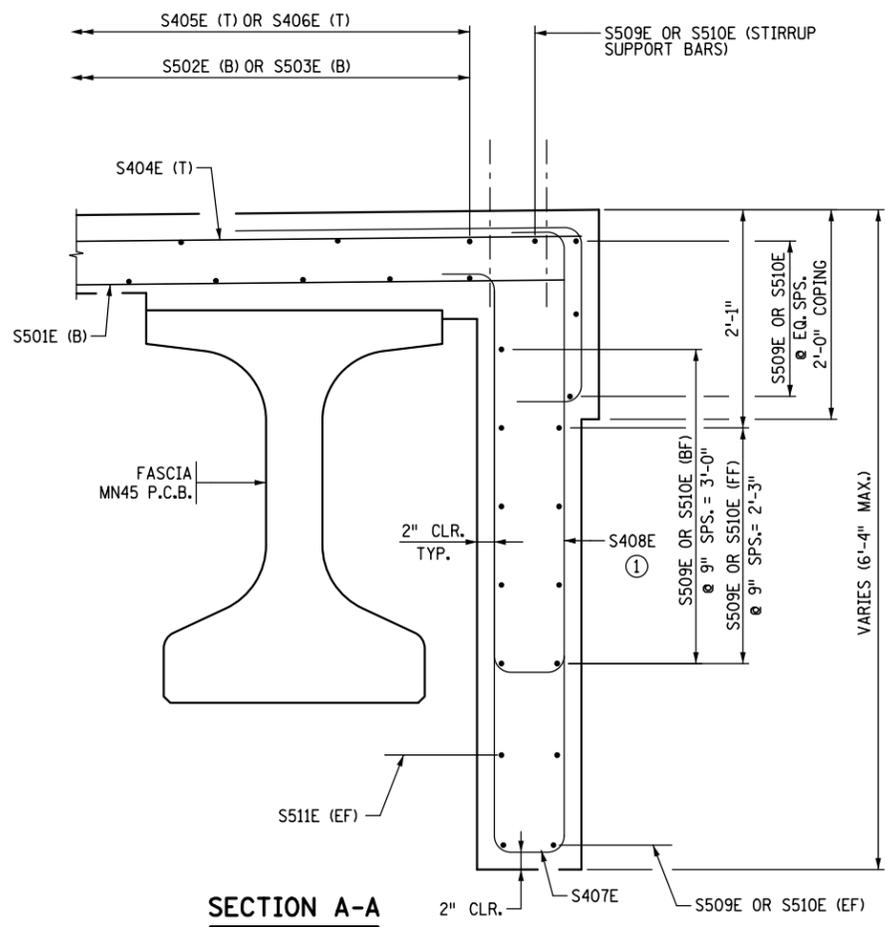
- ① HORIZONTAL STIRRUP LEGS TO REST ON LONGITUDINAL TOP AND BOTTOM REINFORCEMENT BARS AS SHOWN IN SECTIONS A-A AND B-B.
- ② LONGITUDINAL BARS PARALLEL TO DECK PROFILE.
- ③ LONGITUDINAL BARS PARALLEL TO THE INTRADOS OF THE ARCH.

ELEVATION VIEW

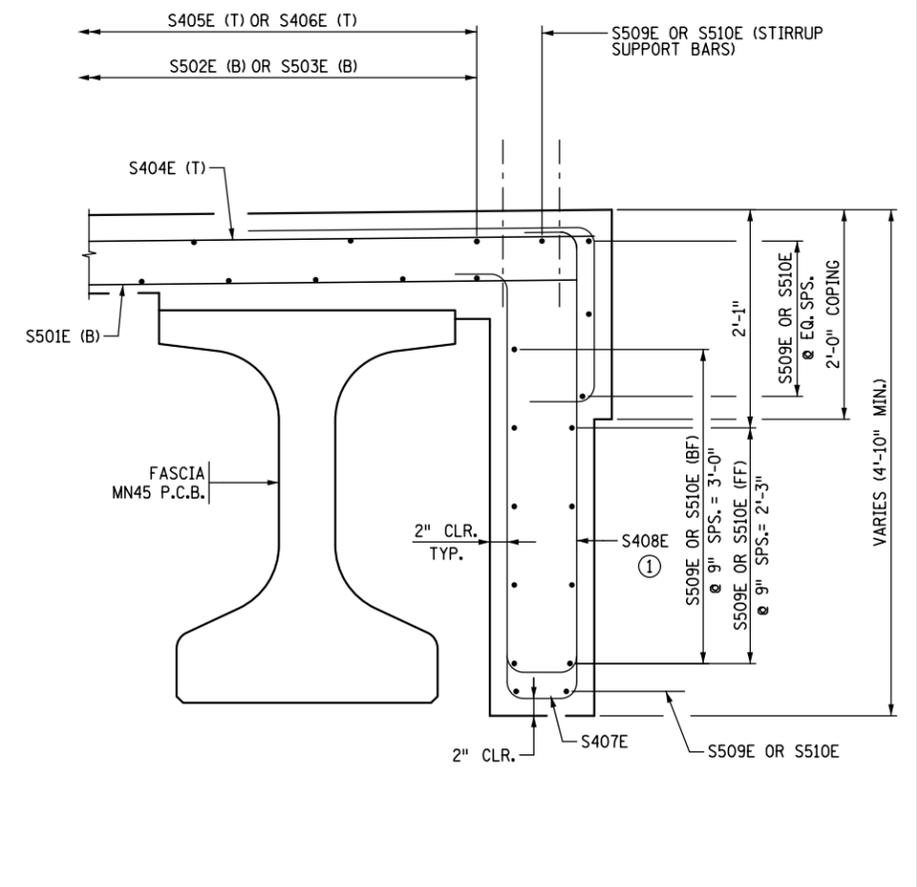
(WEST SIDE SHOWN, EAST SIDE SIMILAR)



SECTION C-C



SECTION A-A



SECTION B-B

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____

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 tkda.com

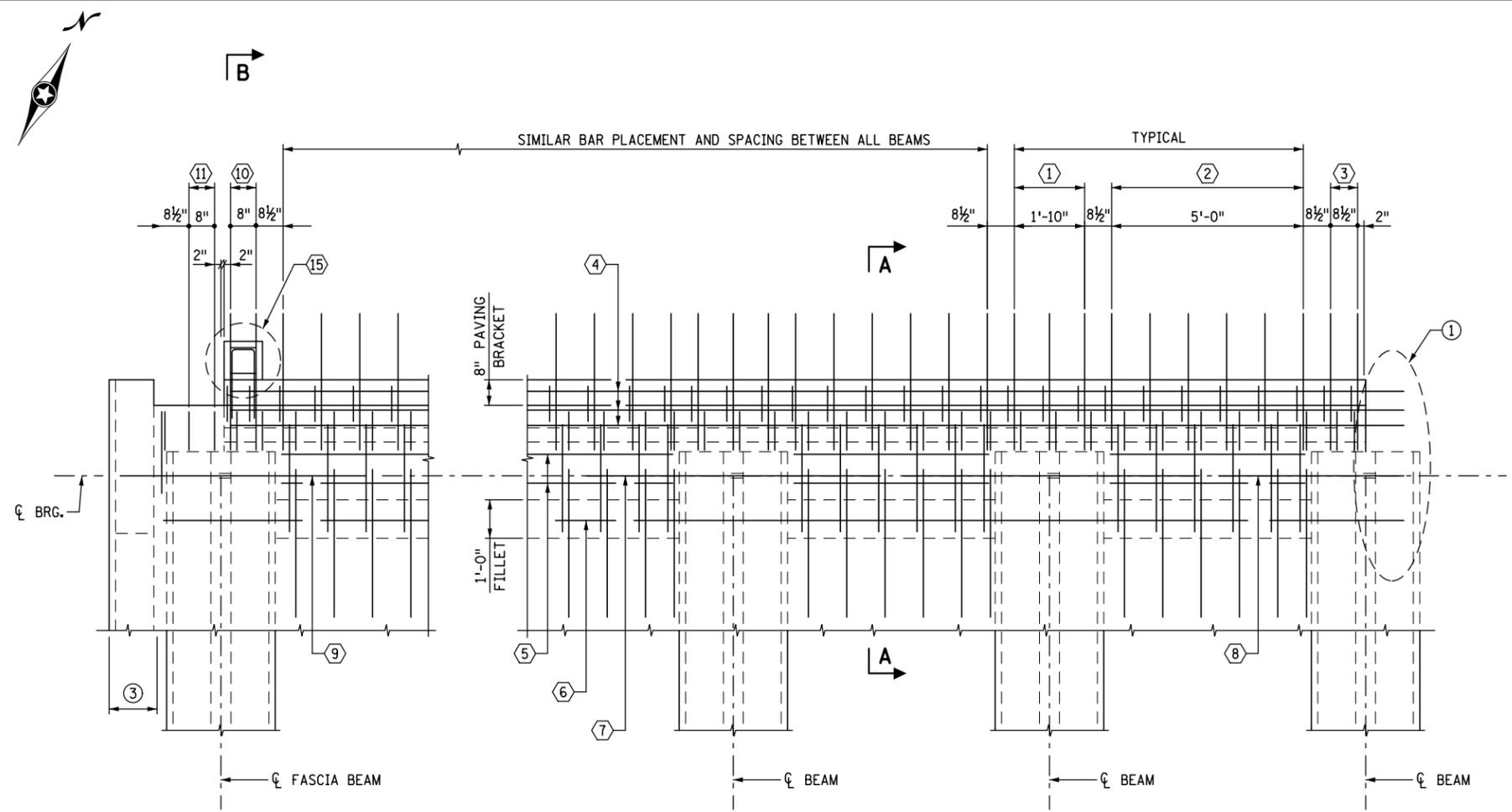
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
ARCH REINFORCEMENT

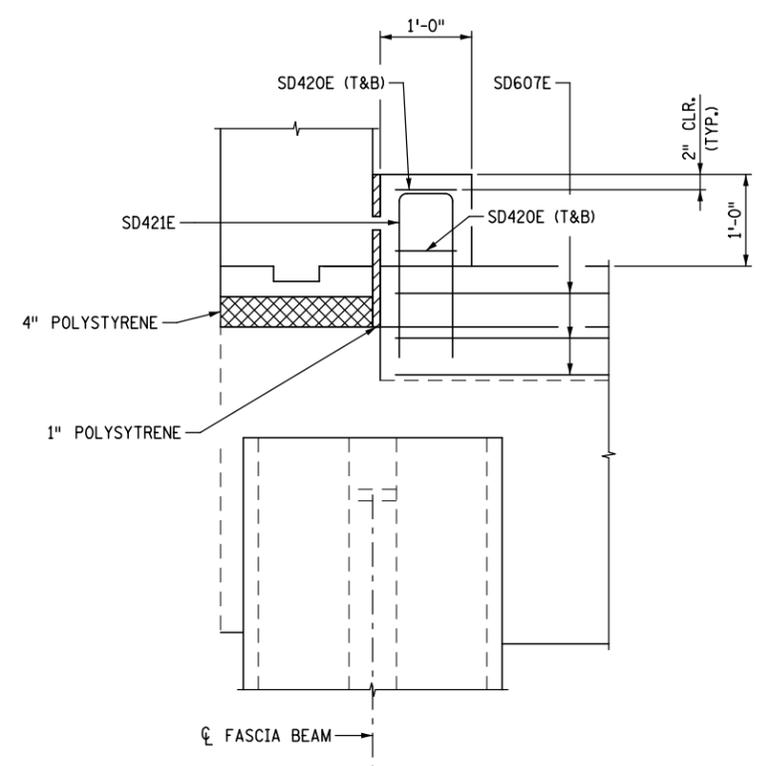
DES: SEM	DR: SEM	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 53 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:29 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_supl.dgn



PARTIAL END DIAPHRAGM PLAN



LUG DETAIL

(END DIAPHRAGM TIES NOT SHOWN FOR CLARITY)

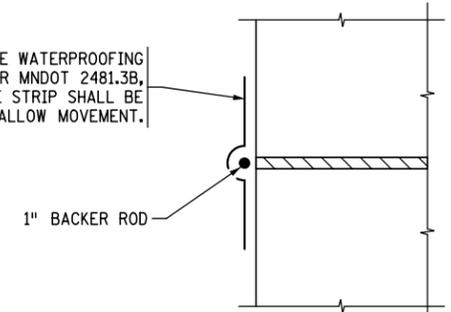
BAR CALL-OUTS:

- ① 3-SD501E, 3-SD604E & 3-SD606S @ 11" SPS. = 1'-10". TYPICAL AT THE ENDS OF EACH BEAM. SEE SECTION A-A FOR ADDITIONAL PLACEMENT DETAILS.
- ② 6-SD501E, 6-SD502E, 6-SD503E, 6-SD604E, 6-SD605E & 6-SD606S @ 12" SPS. = 5'-0". TYPICAL BETWEEN ALL BEAMS. SEE SECTION A-A FOR ADDITIONAL PLACEMENT DETAILS.
- ③ 2-SD501E, 2-SD604E & 2-SD606S SPACED AS SHOWN. SEE SECTION A-A FOR ADDITIONAL PLACEMENT DETAILS.
- ④ 11-SD607E PLACED AS SHOWN IN SECTION A-A.
- ⑤ 6-SD608E PLACED AS SHOWN IN SECTION A-A. TYPICAL BETWEEN ALL BEAMS.
- ⑥ 1-SD409E PLACED AS SHOWN IN SECTION A-A.
- ⑦ 3-SD510E PLACED THRU EACH BEAM AS SHOWN IN SECTION A-A.
- ⑧ 3-SD511E PLACED THRU BEAM AT CONSTRUCTION JOINT. SEE SECTION A-A.
- ⑨ 3-SD512E PLACED THRU FASCIA BEAM AS SHOWN IN SECTION C-C.
- ⑩ 2-SD501E, 2-SD604E & 2-SD606S SPACED AS SHOWN. SEE SECTION A-A FOR ADDITIONAL PLACEMENT DETAILS.
- ⑪ 2-SD513E & 2-SD514E (T&B) SPACED AS SHOWN. SEE SECTION B-B FOR ADDITIONAL PLACEMENT DETAILS.
- ⑫ 1-SD604E, 1-S605E, 1-SD513E & 1-SD517E (T&B) SPACED AS SHOWN. SEE SECTION C-C FOR ADDITIONAL PLACEMENT.
- ⑬ 1-SD615E & 5-SD616E SPACED AS SHOWN IN SECTION B-B.
- ⑭ 5-SD615E (EF) SPACED AS SHOWN IN SECTION C-C.
- ⑮ 1-SD420E (T&B) VERTICAL BLOCK TIE W/ 5-SD421E HORIZONTAL BLOCK TIES @ 12" MAX. SPACING. SEE "LUG DETAIL" FOR ADDITIONAL PLACEMENT DETAILS.

NOTES:

- ① 1'-0" PROJECTION. SEE "COUPLER DETAIL" ON "SUPERSTRUCTURE DETAILS" SHEET.
- ② NORTH ABUTMENT STAGE 2 IS SHOWN. NORTH ABUTMENT STAGE 3, SOUTH ABUTMENT STAGE 2 & SOUTH ABUTMENT STAGE 3 ARE SIMILAR.
- ③ SEE "ARCH REINFORCEMENT" SHEET FOR REINFORCEMENT IN PILASTER.

MEMBRANE WATERPROOFING SYSTEM PER MNDOT 2481.3B, EXCEPT THE STRIP SHALL BE 24" WIDE TO ALLOW MOVEMENT.



DETAIL "A"

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



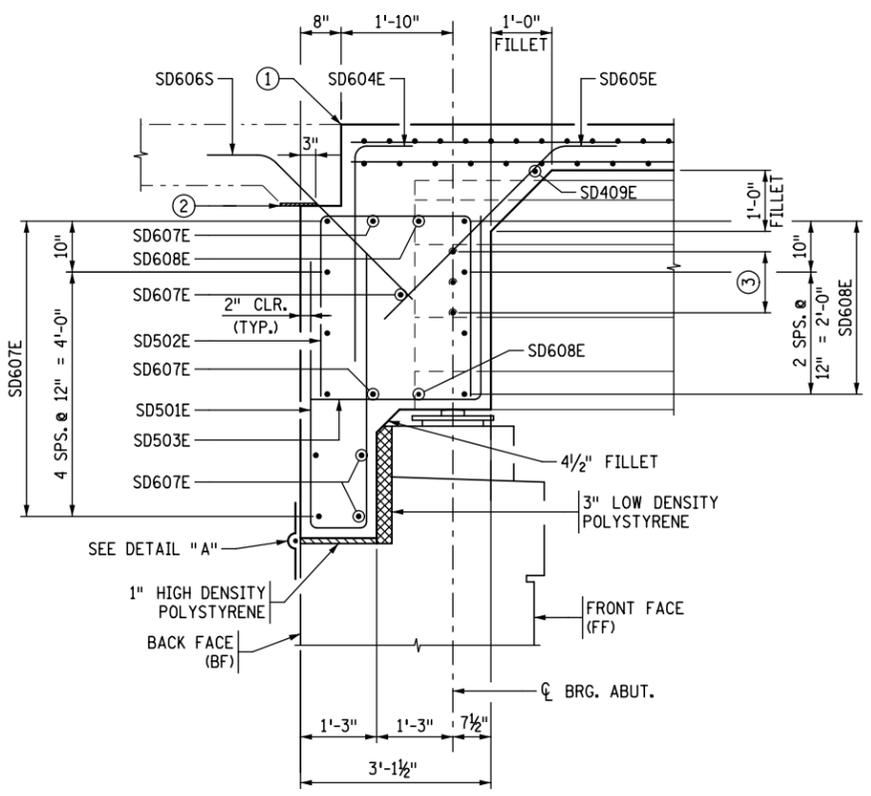
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **END DIAPHRAGM REINFORCEMENT (1 OF 2)**

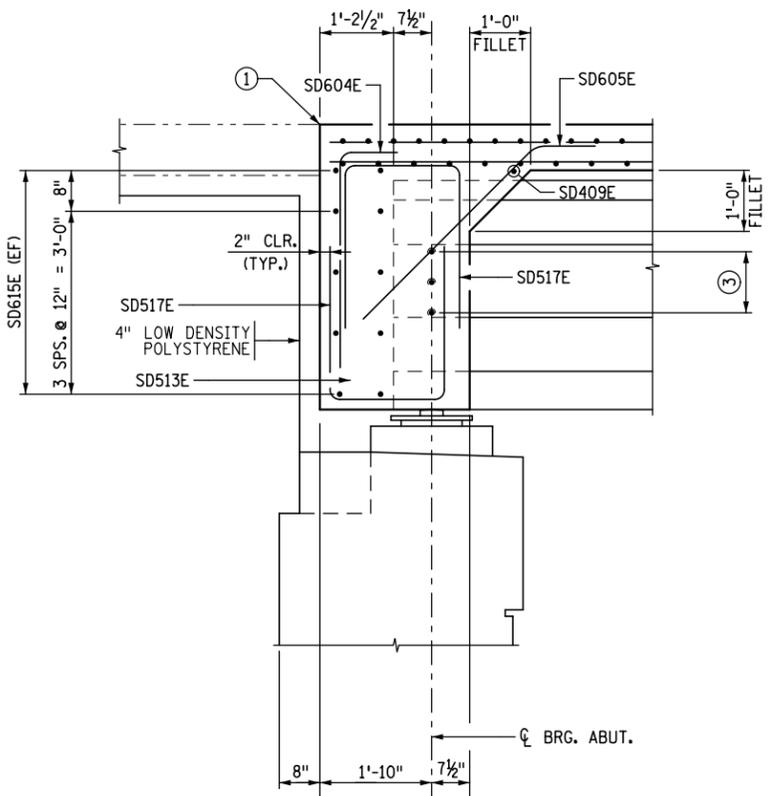
DES: SEM	DR: SEM	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 54 OF 96 SHEETS		

BRIDGE NO. **27B84**

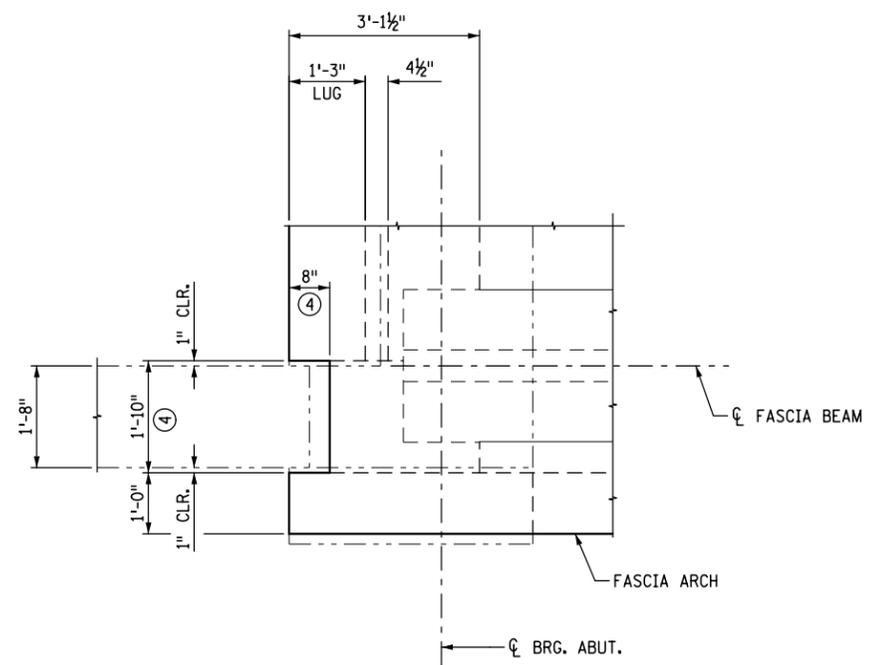
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SECTION A-A

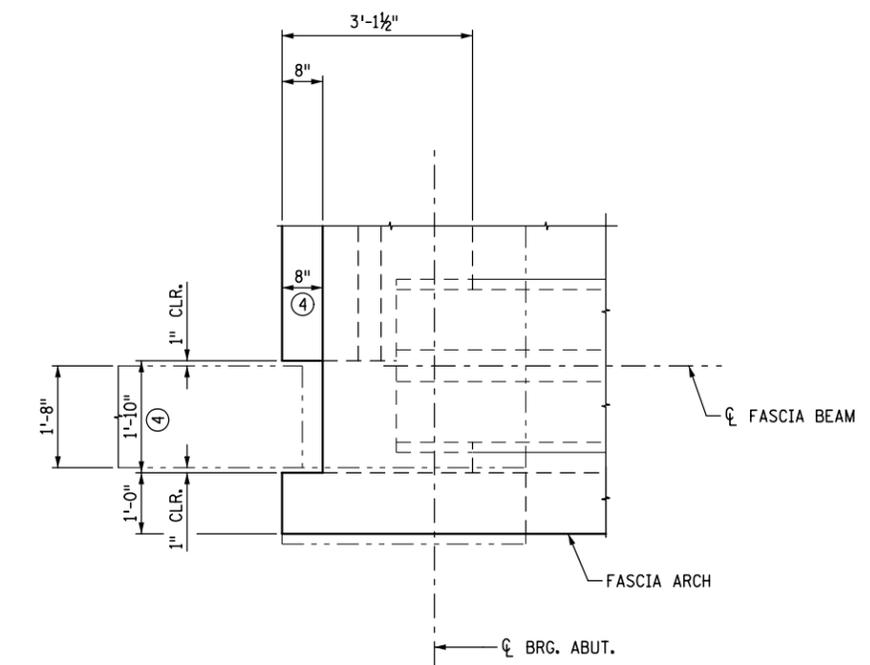


SECTION B-B



SECTION C-C

ABUTMENT AND WINGWALL OUTLINE SHOWN WITH PHANTOM LINES



SECTION D-D

ABUTMENT AND WINGWALL OUTLINE SHOWN WITH PHANTOM LINES

NOTES:

- ① SAWCUT AND SEAL AT END OF BRIDGE.
- ② 1/2" X 7" WIDE BIT, FELT.
- ③ SD510E THRU BEAM. SEE "MN45 PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-102" SHEET FOR PLACEMENT.
- ④ HORIZONTAL END DIAPHRAGM BLOCK-OUT DIMENSIONS. END DIAPHRAGM LUG AND FILLET TERMINATE AT BLOCK-OUT. REFER TO SECTION B-B FOR FURTHER INFORMATION.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



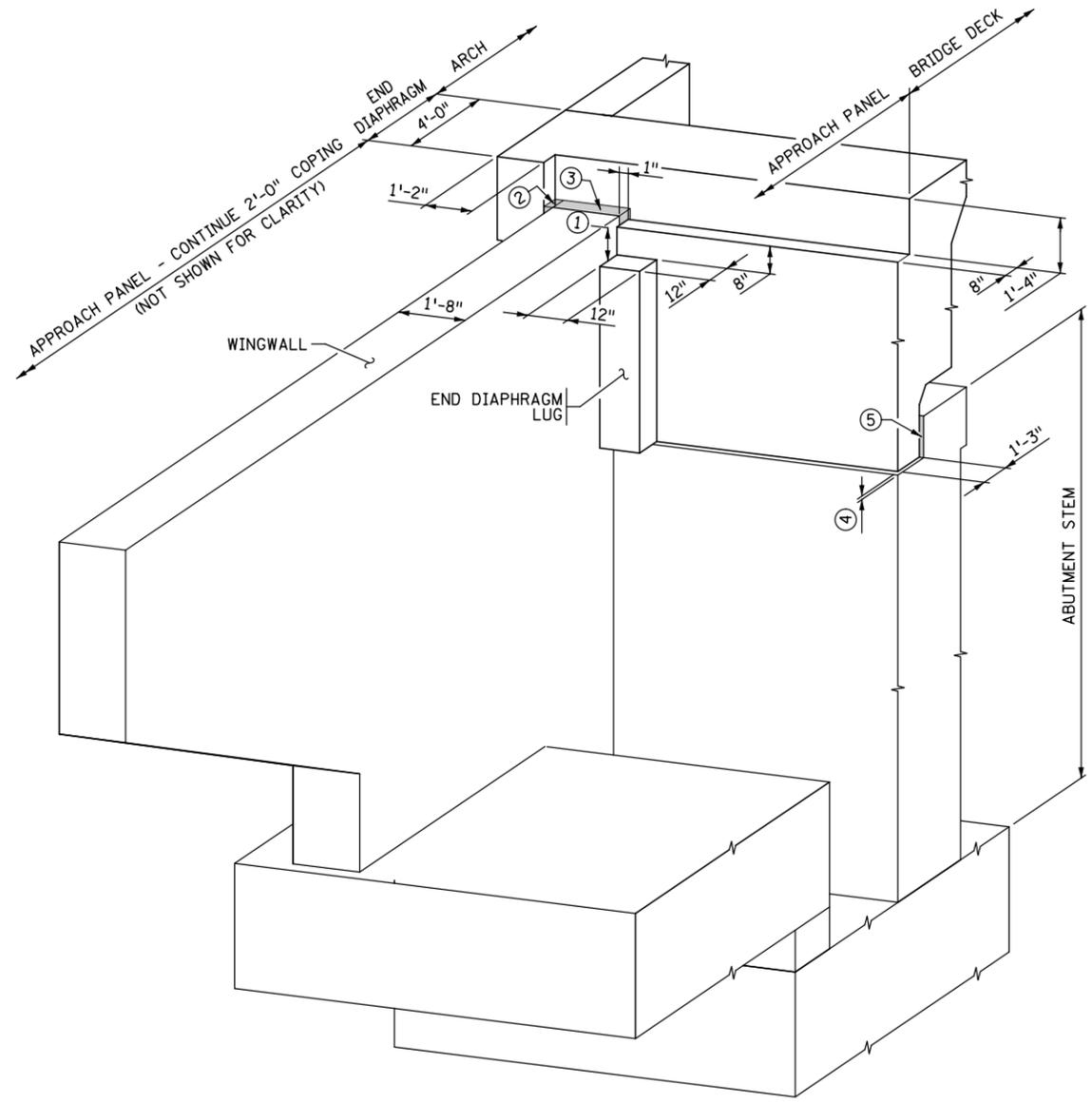
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **END DIAPHRAGM REINFORCEMENT (2 OF 2)**

DES: SEM	DR: SEM	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 55 OF 96 SHEETS		

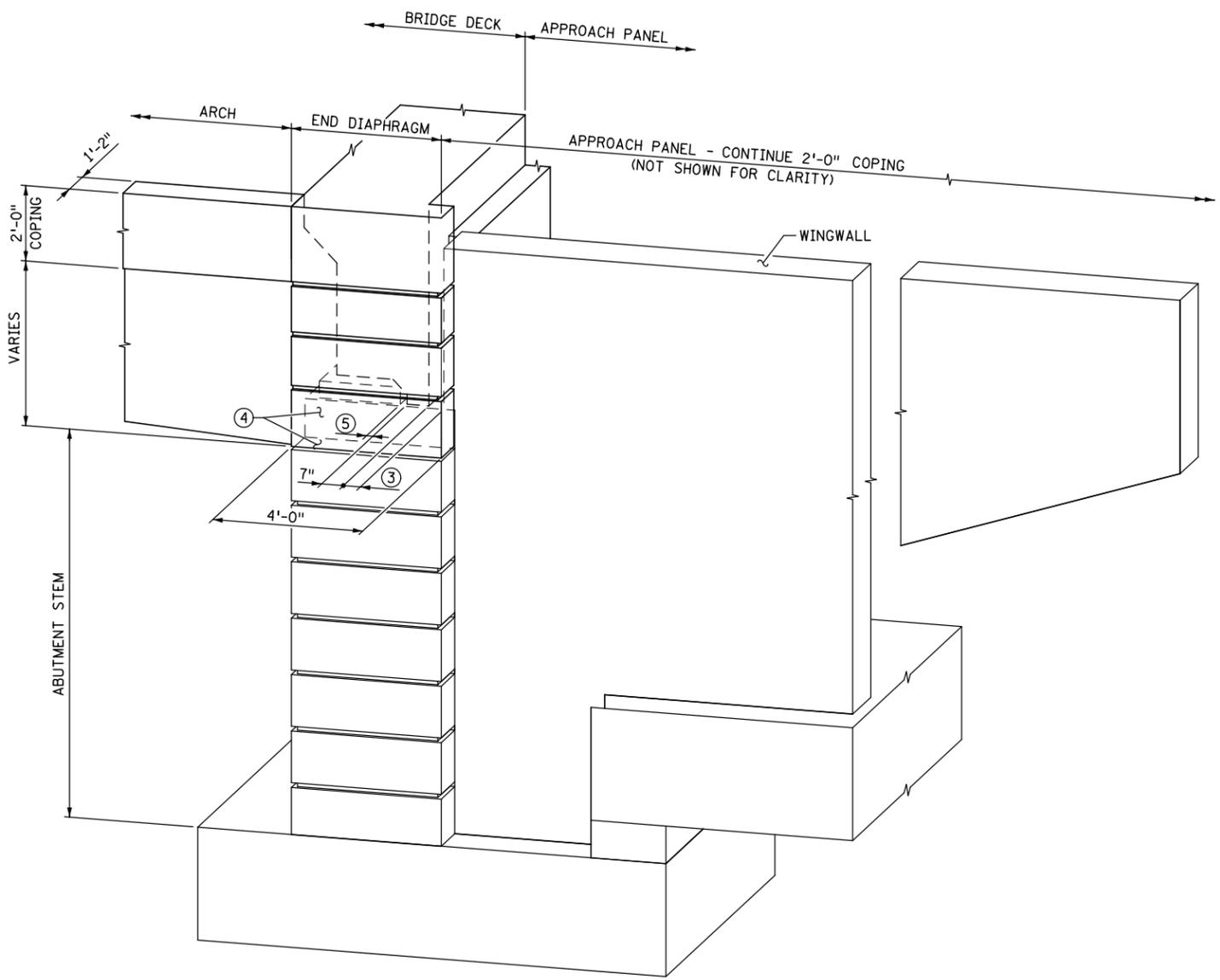
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DATE: 4/1/2016 TIME: 12:49:31 PM
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ISOMETRIC BACK FACE END DIAPHRAGM DETAIL

(NORTHEAST CORNER SHOWN; ALL OTHERS SIMILAR)



ISOMETRIC FRONT FACE END DIAPHRAGM DETAIL

(NORTHEAST CORNER SHOWN; ALL OTHERS SIMILAR)

NOTES:

- ① 10" FROM TOP OF WINGWALL TO TOP OF END DIAPHRAGM LUG.
- ② 1" LOW DENSITY POLYSTYRENE BETWEEN FRONT FACE OF WINGWALL AND INNER FACE OF END DIAPHRAGM.
- ③ 4" LOW DENSITY POLYSTYRENE BETWEEN WINGWALL AND END DIAPHRAGM.
- ④ 1" LOW DENSITY POLYSTYRENE BETWEEN ABUTMENT AND END DIAPHRAGM.
- ⑤ 3" LOW DENSITY POLYSTYRENE BETWEEN ABUTMENT AND END DIAPHRAGM.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



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 Saint Paul, MN 55101
 651.292.4400
 tkda.com

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
END DIAPHRAGM DETAILS

DES: SEM	DR: ADL	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 56 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:33 PM
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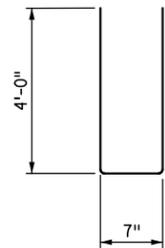
BILL OF REINFORCEMENT - BRIDGE DECK				
BAR	NO.	LENGTH	SHAPE	LOCATION
S501E	356	36'-8"	—	TRANSVERSE BOTTOM
S502E	86	60'-0"	—	LONGITUDINAL BOTTOM
S503E	86	45'-4"	—	LONGITUDINAL BOTTOM
S404E	496	37'-3"	—	TRANSVERSE TOP
S405E	50	60'-0"	—	LONGITUDINAL TOP
S406E	50	44'-10"	—	LONGITUDINAL TOP
S407E	124	8'-7"	⌊	ARCH BOTTOM TIE
S408E	248	5'-5"	⌊	ARCH STIRRUP
S509E	24	55'-1"	—	ARCH LONGITUDINAL
S410E	56	8'-6"	⌊	PILASTER VERTICAL
S411E	56	6'-8"	⌊	PILASTER HORIZONTAL TIE

NOTES:

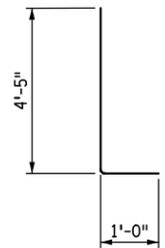
BENT BAR DIMENSIONS GIVEN ARE OUT-TO-OUT. ACTUAL BAR LENGTHS SHALL BE DETERMINED BASED ON THE DETAIL DIMENSIONS SHOWN IN THE BAR BENDING DIAGRAMS.

* DENOTES STANDARD STIRRUP HOOK.

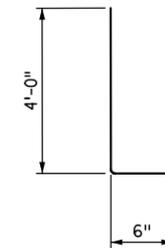
BAR BENDING DIAGRAMS



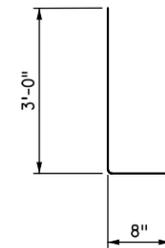
S407E



S408E

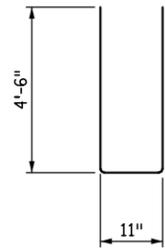


S410E

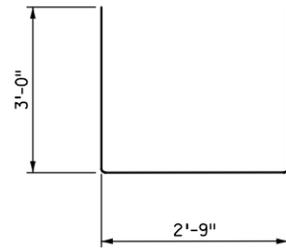


S411E

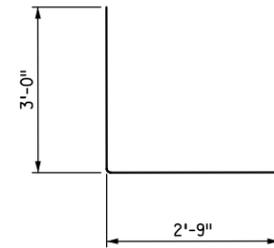
BILL OF REINFORCEMENT - END DIAPHRAGMS				
BAR	NO.	LENGTH	SHAPE	LOCATION
SD501E	148	9'-11"	⌊	VERTICAL TIE
SD502E	96	8'-9"	⌊	VERTICAL TIE
SD503E	96	5'-9"	⌊	VERTICAL TIE
SD604E	152	4'-7"	⌊	VERTICAL TIE
SD605E	100	5'-0"	⌊	VERTICAL TIE
SD606S	148	4'-1"	⌊	APPROACH PANEL TIE (STAINLESS STEEL)
SD607E	44	33'-9"	—	LONGITUDINAL
SD608E	96	5'-1"	—	LONGITUDINAL
SD409E	4	36'-7"	—	LONGITUDINAL
SD510E	36	7'-8"	—	LONGITUDINAL THRU BEAM
SD511E	12	4'-10"	—	LONGITUDINAL THRU BEAM AT CJ
SD512E	12	6'-5"	—	LONGITUDINAL THRU BEAM AT CORNER
SD513E	12	3'-3"	⌊	CORNER VERTICAL TIE
SD514E	16	8'-10"	⌊	CORNER VERTICAL TIE
SD615E	44	6'-8"	⌊	CORNER HORIZONTAL TIE
SD616E	20	6'-5"	⌊	CORNER HORIZONTAL TIE
SD517E	8	7'-1"	⌊	CORNER VERTICAL TIE
SD420E	8	7'-0"	⌊	VERTICAL BLOCK TIES
SD421E	20	4'-7"	⌊	HORIZONTAL BLOCK TIES



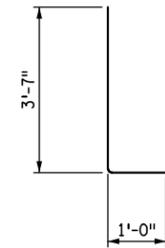
SD501E



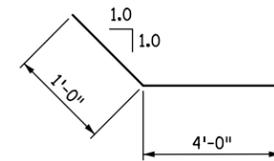
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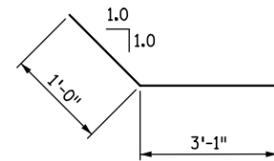
SD503E



SD604E

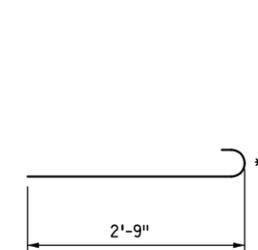


SD605E

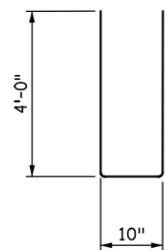


SD606S

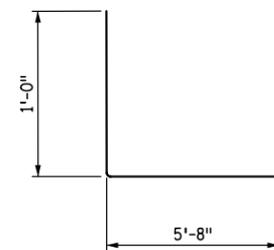
SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE				
ITEM DESCRIPTION	UNIT	STAGE 2	STAGE 3	TOTAL
TYPE P-2 BARRIER CONCRETE (3552)	LIN FT	258	248	506
TYPE F MOD., TL-4 BARRIER CONCRETE (3552)	LIN FT	336	0	336
REINFORCEMENT BARS (EPOXY COATED)	POUND	33700	33700	67,400
REINFORCEMENT BARS (STAINLESS-60 KSI)	POUND	2280	460	2,740
BRIDGE SLAB CONCRETE (3YHPC-S)	SQ FT	3724	3724	7,448
STRUCTURAL TUBE RAILING DESIGN T-1	LIN FT	252	242	494
ORNAMENTAL METAL RAILING	LIN FT	165	206	371
FIXED CURVED PLATE BEARING ASSEMBLY TYPE F-1	EACH	3	3	6
EXP. CURVED PLATE BEARING ASSEMBLY TYPE E-1	EACH	5	4	9
EXP. CURVED PLATE BEARING ASSEMBLY TYPE E-2	EACH	2	1	3
CONCRETE WEARING COURSE (3U17A) 2.0"	SQ FT	3479	4474	7,953
PRESTRESSED CONCRETE BEAMS MN45	EACH	5	4	9
DIAPHRAGMS FOR TYPE MN45 PREST BEAMS	LIN FT	66	66	132
COUPLERS (REINFORCEMENT BARS) T-4E	EACH	248	0	248
COUPLERS (REINFORCEMENT BARS) T-5E	EACH	178	0	178
BRIDGE NAME PLATE	EACH	-	-	1



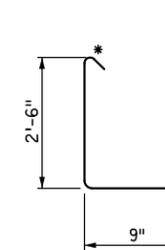
SD513E



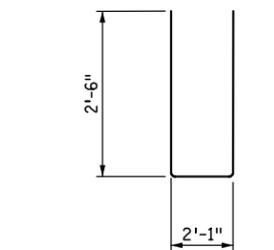
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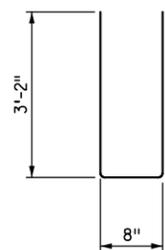
SD615E



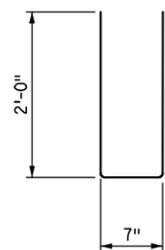
SD616E



SD517E



SD420E



SD421E

- ① INCLUDES REINFORCEMENT FOR SLAB, END DIAPHRAGMS, BARRIERS, AND ORNAMENTAL METAL RAILING CONCRETE PILASTERS. DOES NOT INCLUDE REINFORCEMENT FOR APPROACH PANELS.
- ② PAYMENT FOR BEARINGS INCLUDED IN ITEM "BEARING ASSEMBLY" PER EACH.
- ③ TO BE INCLUDED IN PRICE BID FOR TYPE F (TL-4) BARRIER CONCRETE (3552)
- ④ PAYMENT LENGTH FOR ORNAMENTAL METAL RAILING IS MEASURED BETWEEN INSIDE FACES OF CONCRETE POSTS.
- ⑤ INCLUDES 170' OF BARRIER FROM STAGE 1 CONSTRUCTION AND 166 FT. OF BARRIER FROM STAGE 2 CONSTRUCTION.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.: _____

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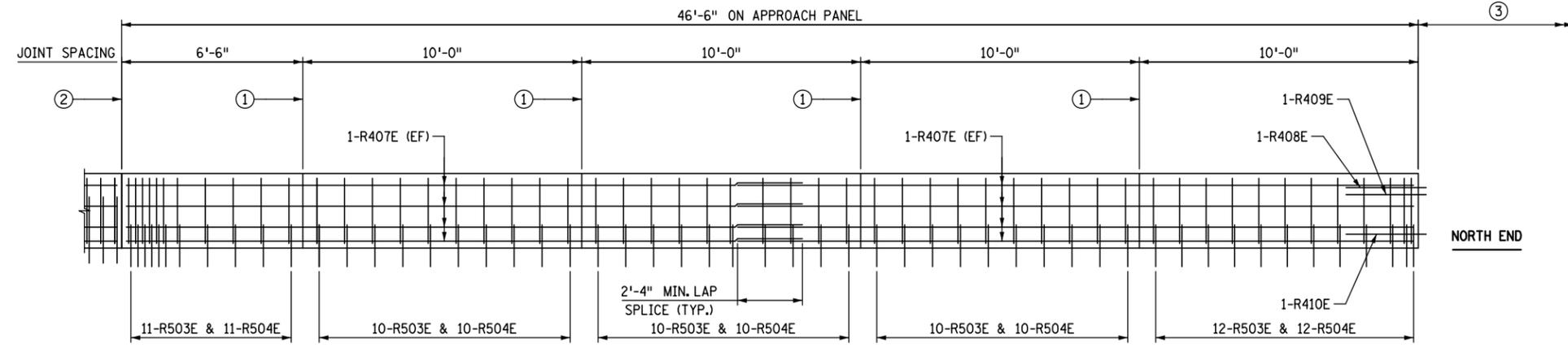
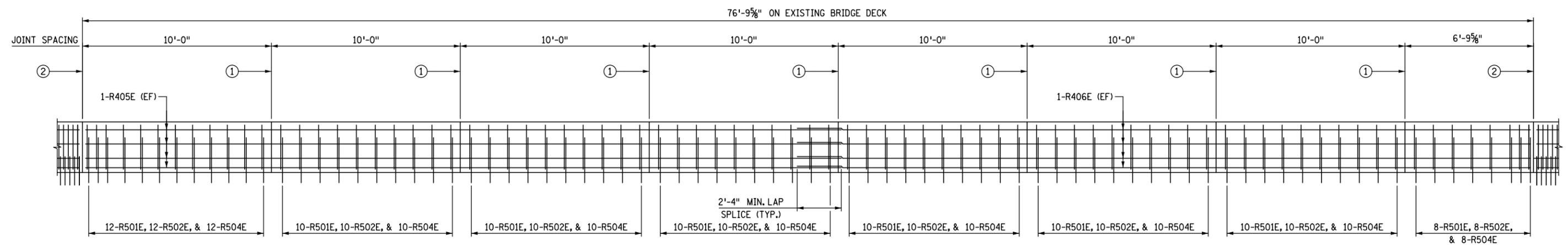
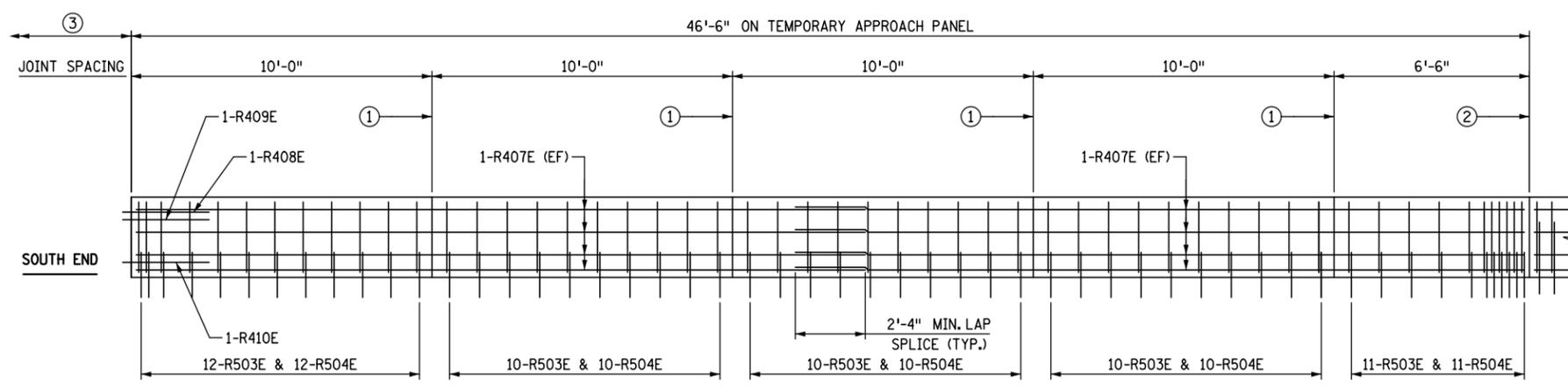
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
SUPERSTRUCUTRE BARLIST

DES: SEM	DR: SEM	APPROVED
CHK: GM	CHK: GM	
SHEET NO. 57 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:34 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27B84_ral01.dgn



- NOTES:**
- ① ϕ CONTROL JOINT, SEE SECTION D-D ON "CONCRETE BARRIER (TYPE F MOD., TL-4)" SHEET.
 - ② ϕ SAW CUT JOINT, SEE SECTION E-E ON "CONCRETE BARRIER (TYPE F MOD., TL-4)" SHEET.
 - ③ SEE ROADWAY PLANS FOR BARRIER DETAILS OFF OF APPROACH PANEL.
- FOR SPACING OF VERTICAL REINFORCEMENT REFER TO "CONCRETE BARRIER (TYPE F MOD., TL-4)" SHEET.
- BARRIER DIMENSIONS ARE ALONG GUTTERLINE.

STAGE 1 TEMPORARY C.I.P. BARRIER
(INSIDE FACE OF BARRIER SHOWN)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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SIGNED _____ DATE: 4/1/2016 LIC. NO.: _____



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651.292.4400
tkda.com

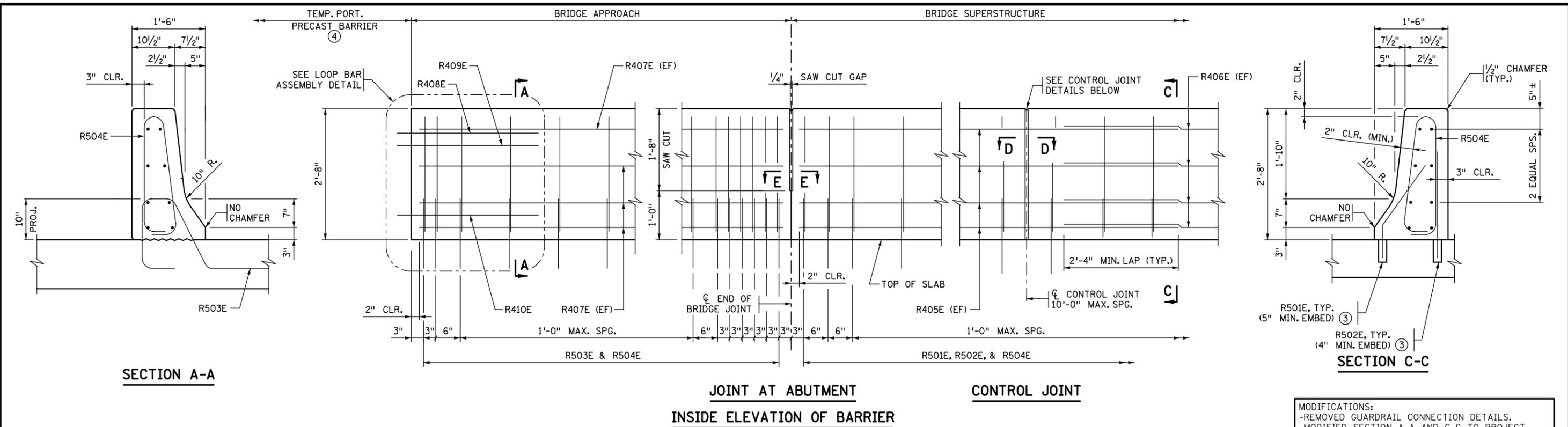
HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
S.A.P. 027-646-007

TITLE:
STAGE 1 TEMPORARY C.I.P. BARRIER ELEVATION

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 58 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:35 PM
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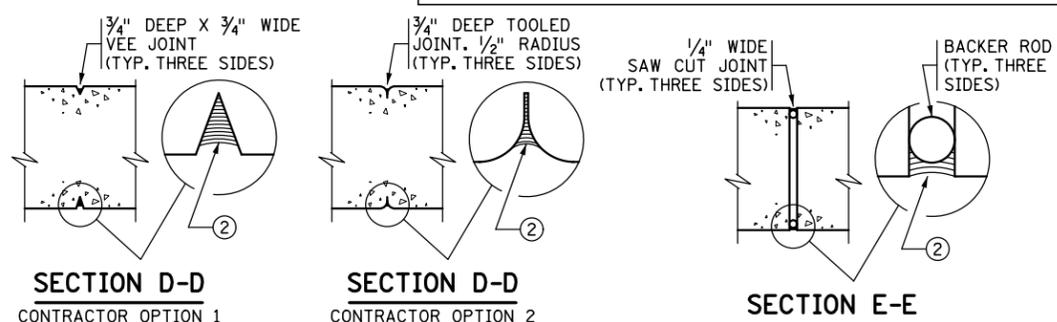


SECTION A-A

SECTION C-C

INSIDE ELEVATION OF BARRIER
 JOINT AT ABUTMENT CONTROL JOINT

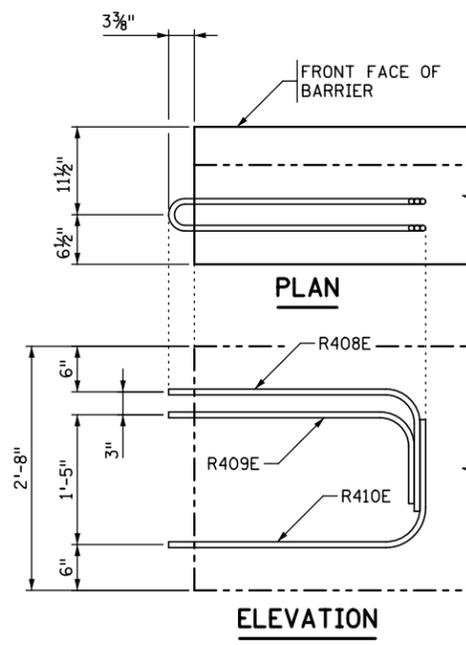
BARRIER MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350



SECTION D-D
 CONTRACTOR OPTION 1 CONTRACTOR OPTION 2
CONTROL JOINT DETAILS

WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)

SECTION E-E



PLAN

ELEVATION

LOOP BAR ASSEMBLY ④

(MAIN BARRIER REINFORCEMENT NOT SHOWN FOR CLARITY)

MODIFICATIONS:
 -REMOVED GUARDRAIL CONNECTION DETAILS.
 -MODIFIED SECTION A-A AND C-C TO PROJECT SPECIFIC DIMENSIONS.
 -MODIFIED GEOMETRY AT END OF APPROACH PANEL.
 -MOVED BILL OF REINFORCEMENT AND BAR BENDING DIAGRAMS TO SUPERSTRUCTURE BARLIST SHEET.
 -CHANGED LOCATION OF BARRIER ON BRIDGE DECK.
 -REPLACED BARS EXTENDING INTO BRIDGE DECK WITH CHEMICALLY ADHERED ANCHOR DOWELS.
 -ADDED IN LOOP BAR DETAILS.

GENERAL NOTES

- MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE FACES OF THE BARRIER.
- CONCRETE BARRIER = 439 LBS./FT. (0.109 CU. YDS./FT.)
- FINISH ALL EDGES OF BARRIER WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
- SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. SEE STAGE 1 TEMP. C.I.P. BARRIER ELEVATION SHEET FOR JOINT SPACING.
- BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

- ① NOT USED
- ② JOINT SEALANT PER MNDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- ③ ANCHOR BARS TO INPLACE DECK WITH AN APPROVED CHEMICAL ADHESIVE. R501E ULTIMATE PULLOUT STRENGTH = 31 KIPS. R502E ULTIMATE PULL-OUT STRENGTH = 5 KIPS. PROOF LOAD TEST R501E BARS TO 15.5 KIPS. NO PROOF LOAD TEST IS REQUIRED FOR R502E BARS.
- ④ FOR FURTHER DETAILS ON THE CONNECTOR PINS AND TEMPORARY PORTABLE PRECAST BARRIER, REFER TO STD. PLATE 8337C.

REVISION:
 APPROVED: JANUARY 13, 2015
Nancy Dubenberger
 STATE BRIDGE ENGINEER

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



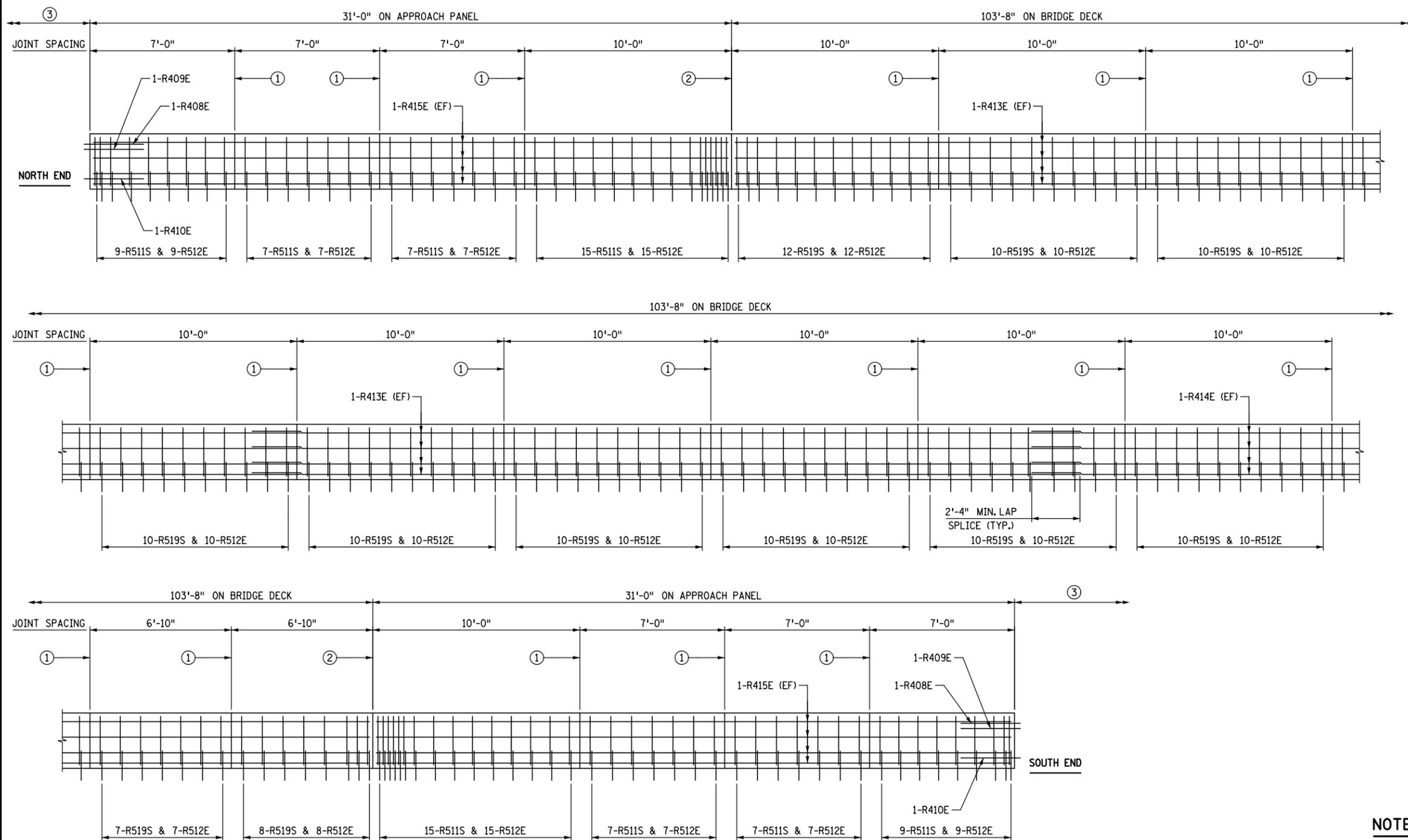
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
STAGE 1 CONCRETE BARRIER
 (TYPE F MOD., TL-4)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 59 OF 96 SHEETS		

FIG. 5-397.115(A) MOD.
 BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:36 PM
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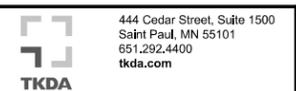
STAGE 2 TEMPORARY C.I.P. BARRIER
 (INSIDE FACE OF BARRIER SHOWN)

- NOTES:**
- ① ζ CONTROL JOINT, SEE SECTION D-D ON "CONCRETE BARRIER (TYPE F MOD., TL-4)" SHEET.
 - ② ζ SAW CUT JOINT, SEE SECTION E-E ON "CONCRETE BARRIER (TYPE F MOD., TL-4)" SHEET.
 - ③ SEE ROADWAY PLANS FOR BARRIER DETAILS OFF OF APPROACH PANEL.
- FOR SPACING OF VERTICAL REINFORCEMENT REFER TO "CONCRETE BARRIER (TYPE F MOD., TL-4)" SHEET.
- BARRIER DIMENSIONS ARE ALONG GUTTERLINE.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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SIGNED _____
 DATE: 4/1/2016 LIC. NO.: _____



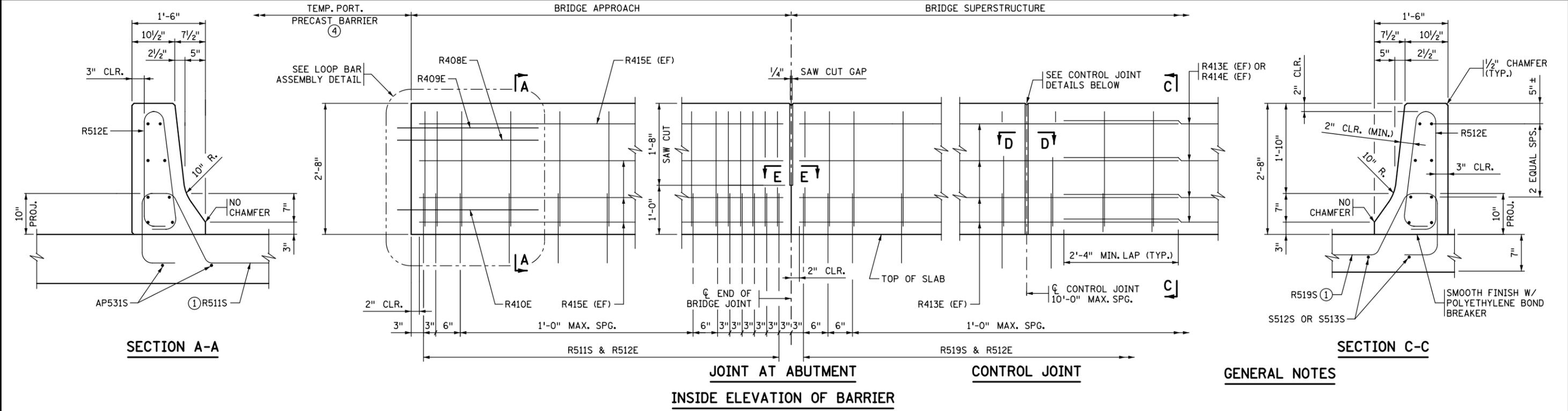
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
STAGE 2 TEMPORARY C.I.P. BARRIER ELEVATION

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 60 OF 96 SHEETS		

BRIDGE NO.
27B84

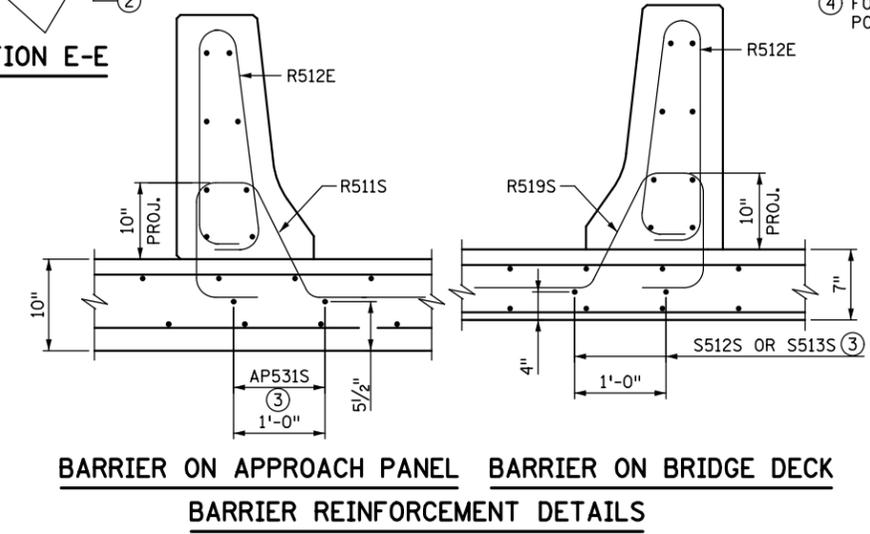
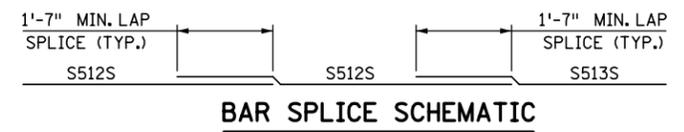
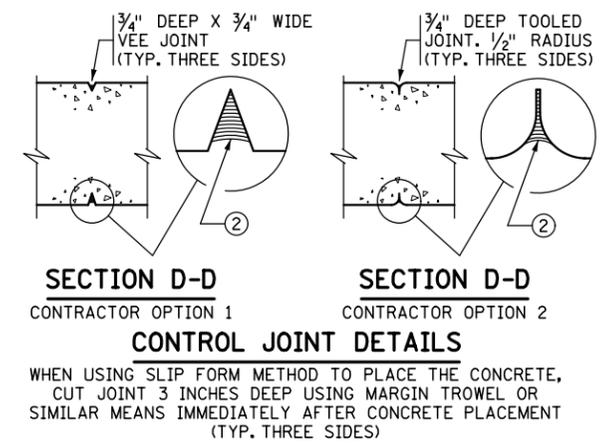
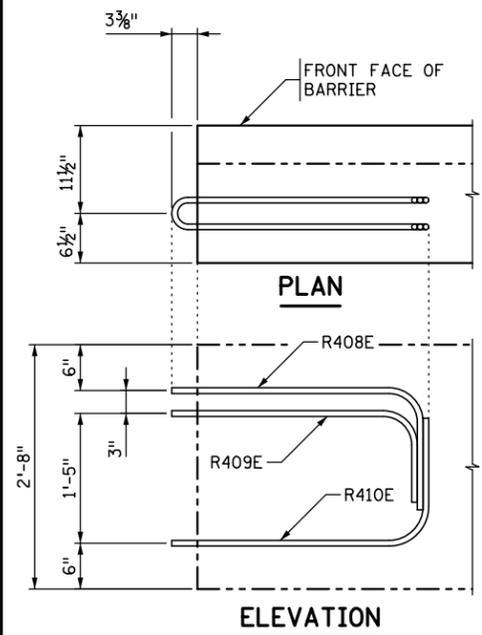
DATE: 4/1/2016 TIME: 12:49:37 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27B84_ral04.dgn



BARRIER MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350

GENERAL NOTES

- MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE FACES OF THE BARRIER.
- CONCRETE BARRIER = 439 LBS./FT. (0.109 CU. YDS./FT.)
- FINISH ALL EDGES OF BARRIER WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
- SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. SEE STAGE 2 TEMP. C.I.P. BARRIER ELEVATION SHEET FOR JOINT SPACING.
- BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
- ① PLACE BAR AS SHOWN IN "BARRIER REINFORCEMENT DETAILS". MIN. 2" CLEARANCE REQUIRED FROM ANY EPOXY COATED DECK BARS
- ② JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- ③ PLACE S512S, S513S, OR AP530S BAR WITH EACH LEG OF R511S OR R519S. FOR STAINLESS STEEL BARS PROVIDE MINIMUM 2" CLEARANCE FROM ANY EPOXY COATED DECK BARS. FOR BARS IN BRIDGE DECK, SPLICE AS SHOWN IN "BAR SPLICE SCHEMATIC".
- ④ FOR FURTHER DETAILS ON THE CONNECTOR PINS AND TEMPORARY PORTABLE PRECAST BARRIER, REFER TO STD. PLATE 8337C.



MODIFICATIONS:

- REMOVED GUARDRAIL CONNECTION DETAILS.
- MODIFIED SECTION A-A AND C-C TO PROJECT SPECIFIC DIMENSIONS.
- MODIFIED GEOMETRY AT END OF APPROACH PANEL.
- MOVED BILL OF REINFORCEMENT AND BAR BENDING DIAGRAMS TO SUPERSTRUCTURE BARLIST SHEET.
- CHANGED LOCATION OF BARRIER ON BRIDGE DECK.
- BARS EXTENDING INTO DECK CHANGED FROM EPOXY COATED TO STAINLESS STEEL.
- ADDED BARRIER REINFORCEMENT DETAILS.
- ADDED IN LOOP BAR DETAILS.

REVISION:

APPROVED: JANUARY 13, 2015

Nancy Sibenberger
STATE BRIDGE ENGINEER

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____

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651.292.4400
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TKDA

HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
S.A.P. 027-646-007

TITLE:
STAGE 2 CONCRETE BARRIER
(TYPE F, TL-4)

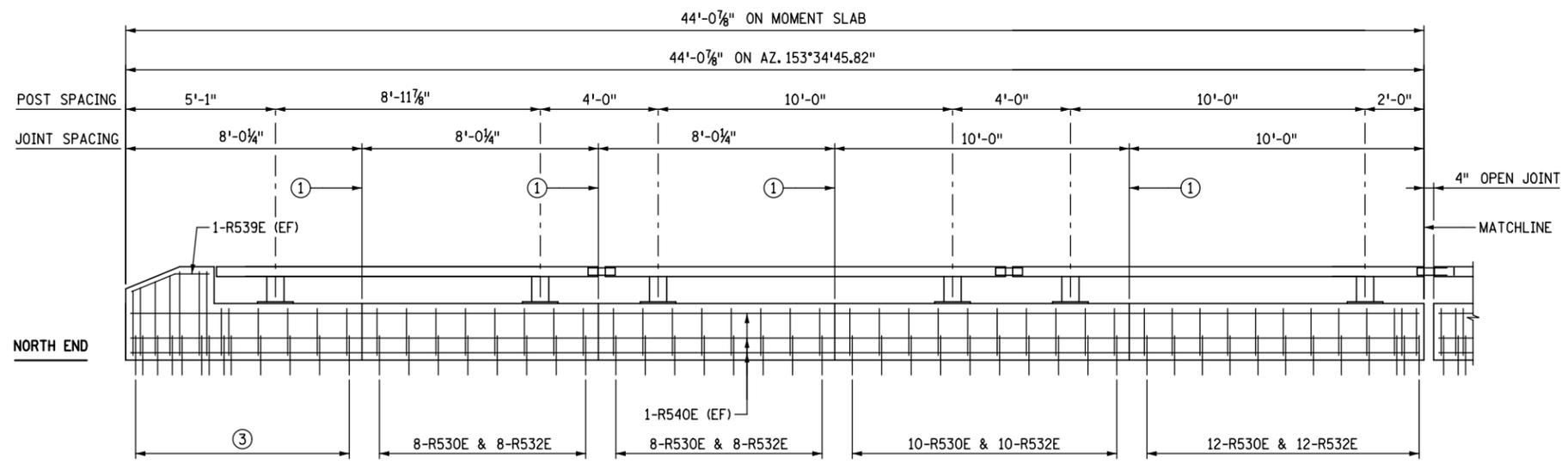
DES: HAP DR: HAP APPROVED
CHK: JRM CHK: JRM

SHEET NO. 61 OF 96 SHEETS

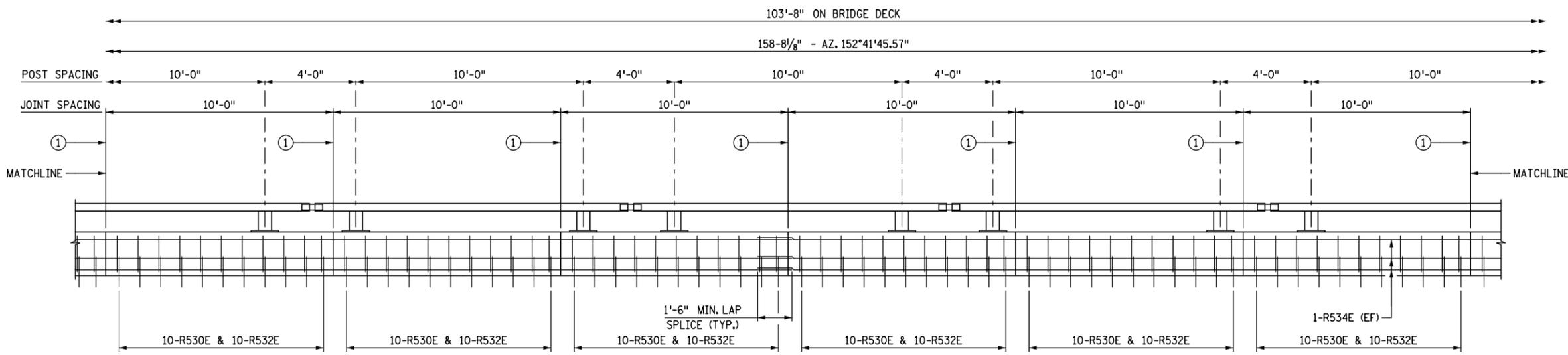
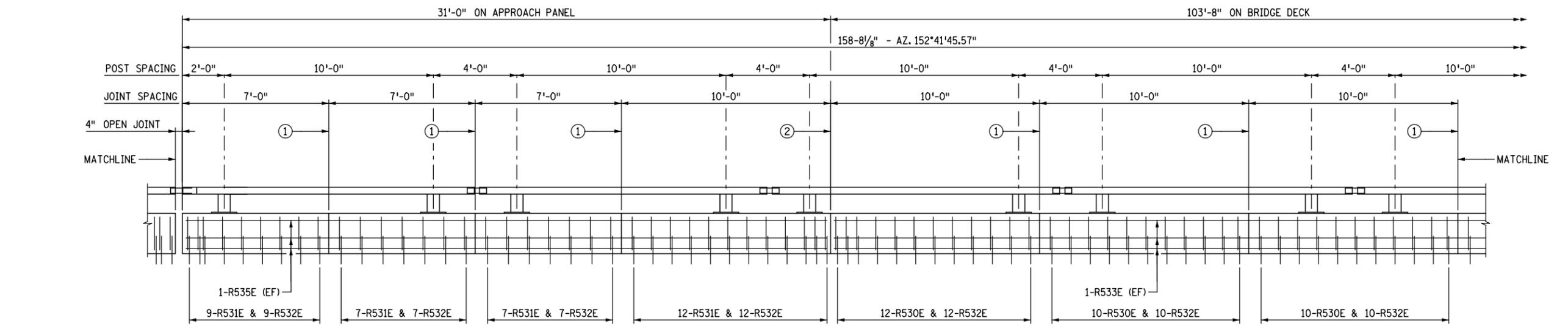
FIG. 5-397.115(A) MOD.

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:38 PM
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- NOTES:**
- ① ϕ CONTROL JOINT, SEE SECTION D-D ON "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
 - ② ϕ SAW CUT JOINT, SEE SECTION E-E ON "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
 - ③ 3-R536E, 1 SER. OF 2-R537E, 1 SER. OF 2-R538E, 13-R531E, & 6-R531E.
- FOR SPACING OF VERTICAL REINFORCEMENT REFER TO "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
- PARAPET AND STRUCTURAL TUBE RAILING POST SPACING DIMENSIONS ARE ALONG GUTTERLINE.



EAST PARAPET ELEVATION

(INSIDE FACE OF PARAPET SHOWN)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



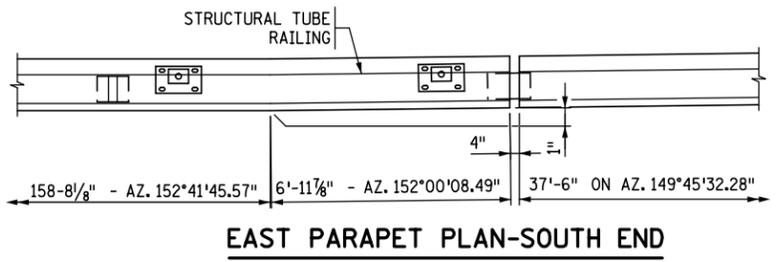
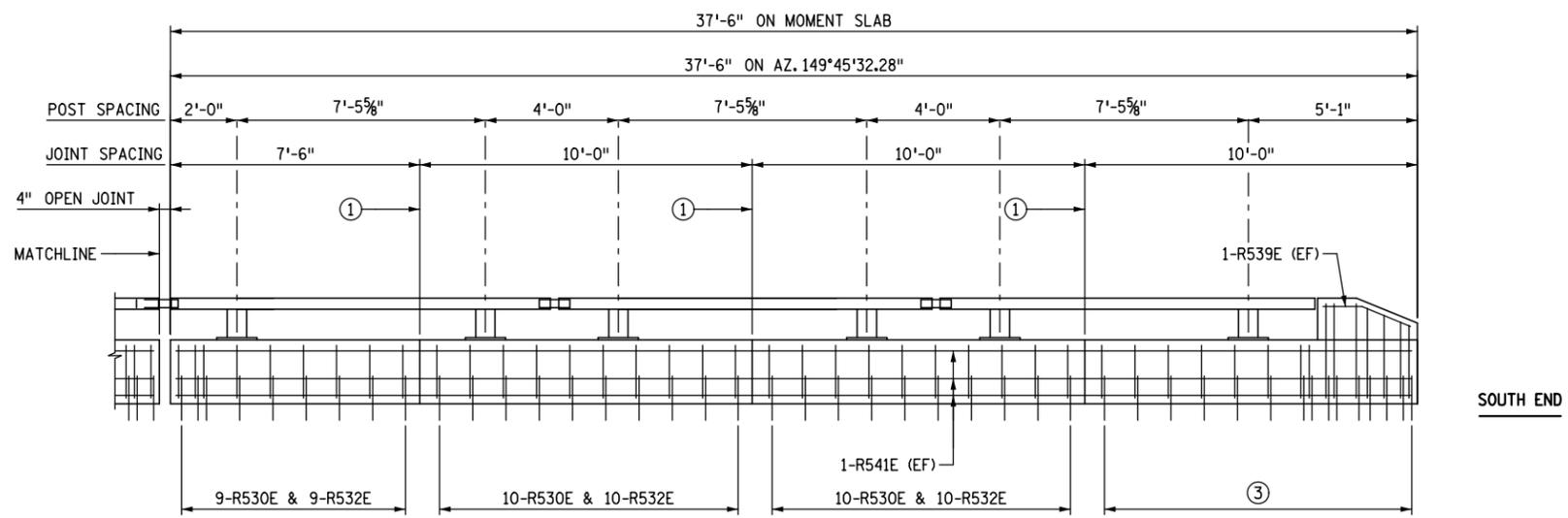
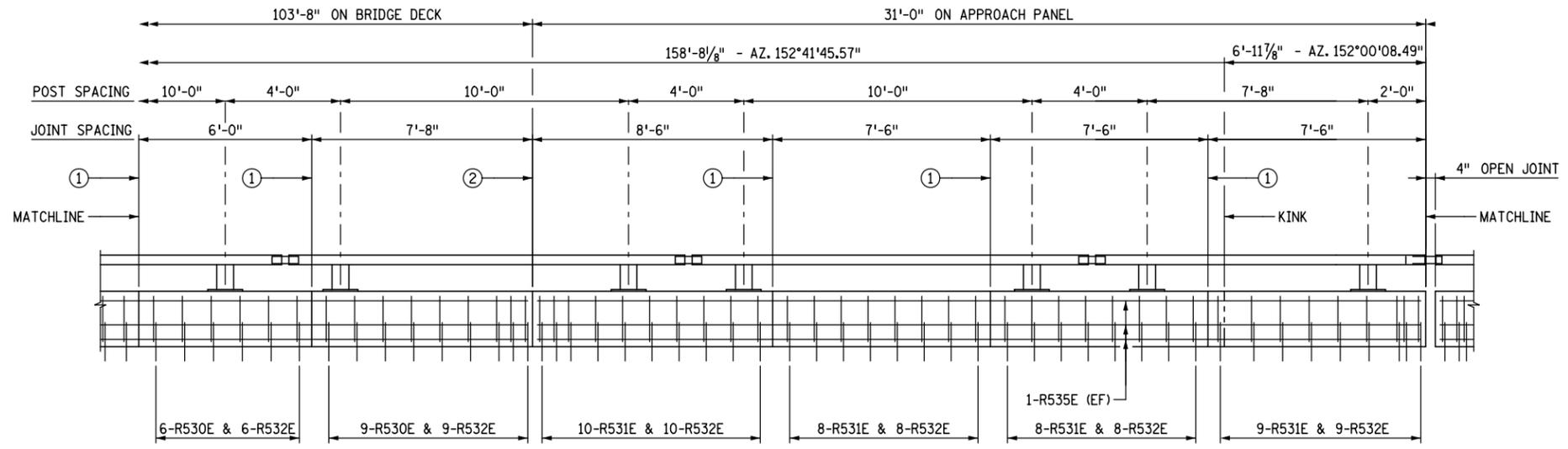
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **EAST PARAPET ELEVATION**
 (1 OF 2)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 62 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:39 PM
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EAST PARAPET ELEVATION
 (INSIDE FACE OF PARAPET SHOWN)

NOTES:

- ① $\text{\textcircled{C}}$ CONTROL JOINT, SEE SECTION D-D ON "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
 - ② $\text{\textcircled{C}}$ SAW CUT JOINT, SEE SECTION E-E ON "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
 - ③ 3-R536E, 1 SER. OF 2-R537E, 1 SER. OF 2-R538E, 15-R531E, & 8-R531E.
- FOR SPACING OF VERTICAL REINFORCEMENT REFER TO "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
- PARAPET AND STRUCTURAL TUBE RAILING POST SPACING DIMENSIONS ARE ALONG GUTTERLINE.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



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 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
EAST PARAPET ELEVATION
 (2 OF 2)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 63 OF 96 SHEETS		

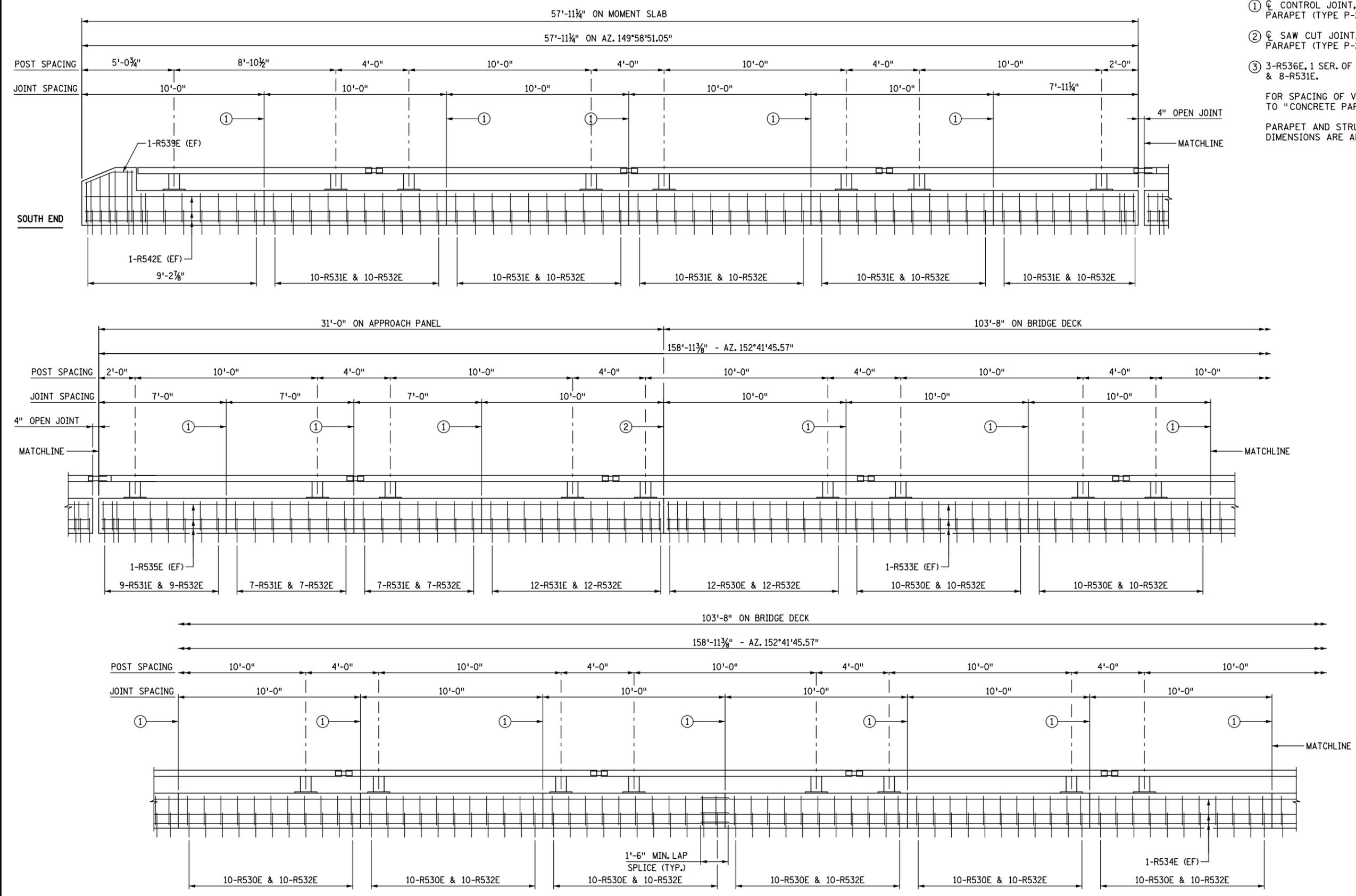
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27B84

DATE: 4/1/2016 TIME: 12:49:40 PM
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NOTES:

- ① ϕ CONTROL JOINT, SEE SECTION D-D ON "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
- ② ϕ SAW CUT JOINT, SEE SECTION E-E ON "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
- ③ 3-R536E, 1 SER. OF 2-R537E, 1 SER. OF 2-R538E, 15-R531E, & 8-R531E.

FOR SPACING OF VERTICAL REINFORCEMENT REFER TO "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
 PARAPET AND STRUCTURAL TUBE RAILING POST SPACING DIMENSIONS ARE ALONG GUTTERLINE.

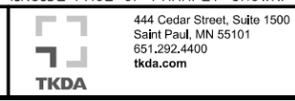


WEST PARAPET ELEVATION

(INSIDE FACE OF PARAPET SHOWN)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



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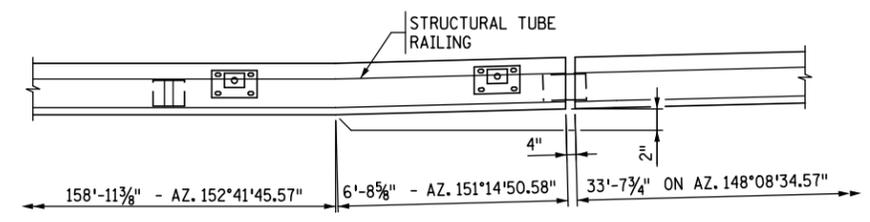
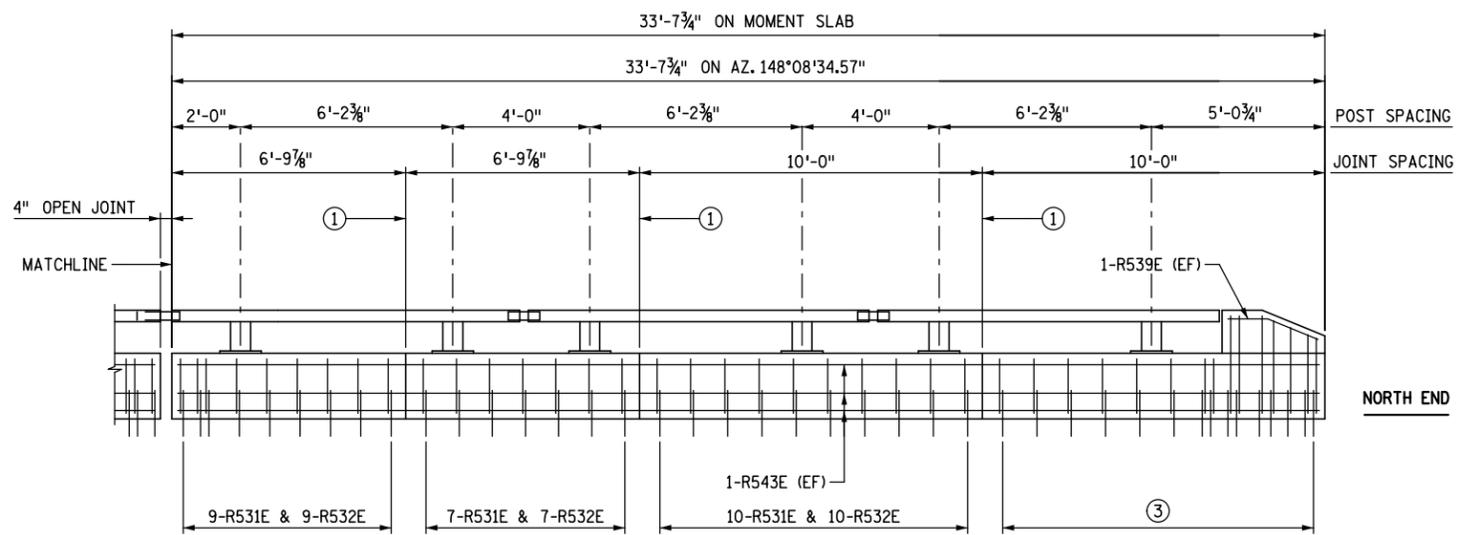
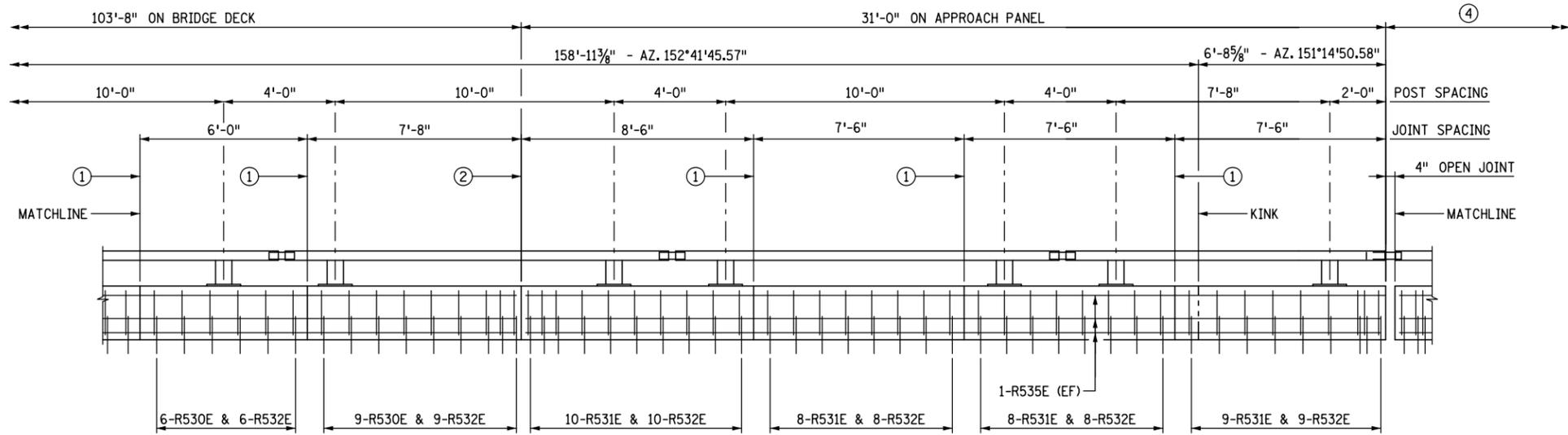
HENNEPIN COUNTY
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 S.A.P. 027-646-007

TITLE:
WEST PARAPET ELEVATION
 (1 OF 2)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 64 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:41 PM
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WEST PARAPET PLAN-NORTH SIDE

WEST PARAPET ELEVATION

(INSIDE FACE OF PARAPET SHOWN)

NOTES:

- ① ϕ CONTROL JOINT, SEE SECTION D-D ON "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
- ② ϕ SAW CUT JOINT, SEE SECTION E-E ON "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.
- ③ 3-R536E, 1 SER. OF 2-R537E, 1 SER. OF 2-R538E, 15-R531E, & 8-R531E.

FOR SPACING OF VERTICAL REINFORCEMENT REFER TO "CONCRETE PARAPET (TYPE P-2, TL-4)" SHEET.

PARAPET AND STRUCTURAL TUBE RAILING POST SPACING DIMENSIONS ARE ALONG GUTTERLINE.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 _____
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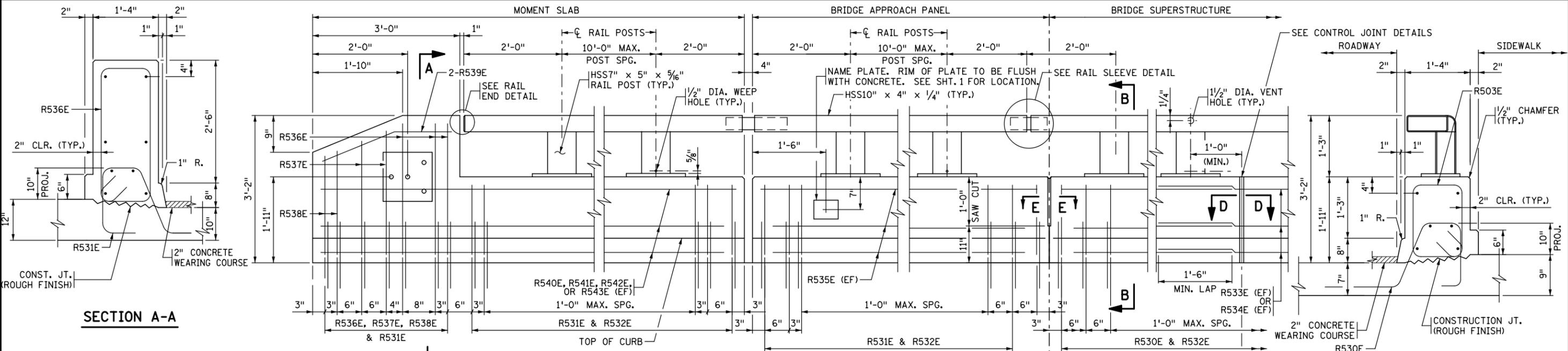
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
WEST PARAPET ELEVATION
 (2 OF 2)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 65 OF 96 SHEETS		

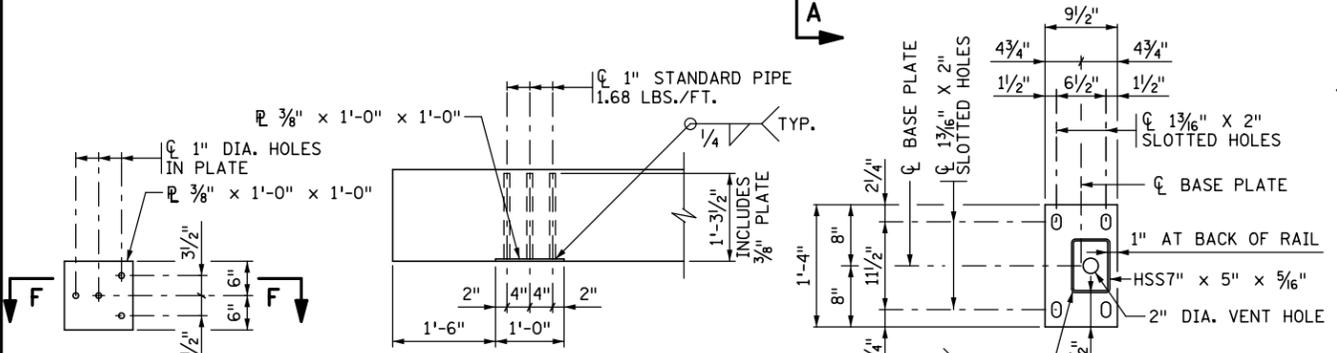
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27B84

DATE: 4/1/2016 TIME: 12:49:42 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27B84_ral09.dgn



SECTION A-A

SECTION B-B



SECTION F-F

ELEVATION

OPEN JOINT

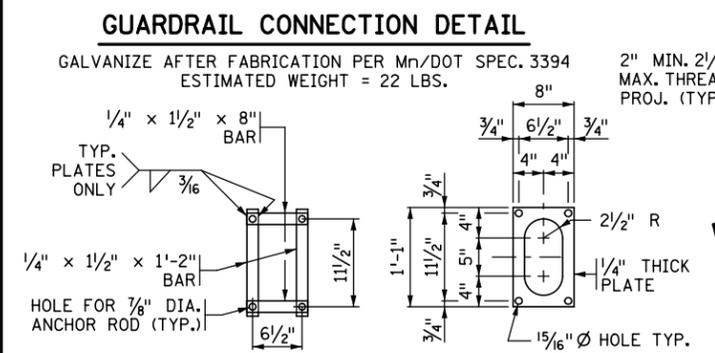
JOINT AT APPROACH PANEL

CONTROL JOINT

INSIDE ELEVATION OF RAILING

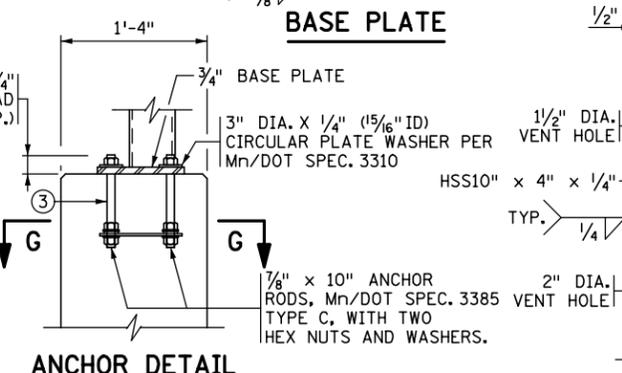
CONCRETE WEARING COURSE NOT SHOWN

RAIL MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350



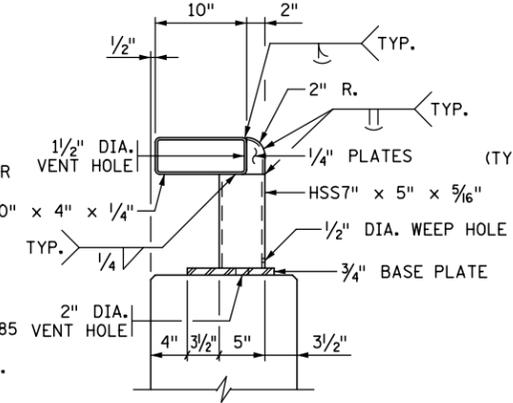
GUARDRAIL CONNECTION DETAIL

GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394 ESTIMATED WEIGHT = 22 LBS.

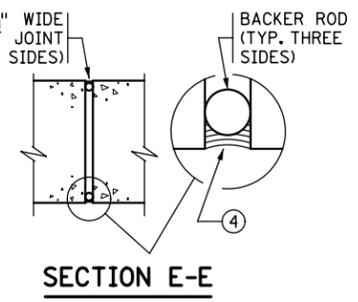


BASE PLATE

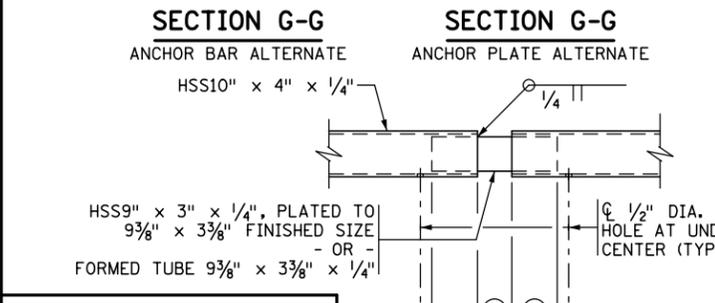
ANCHOR DETAIL



STRUCTURAL TUBE RAIL DETAIL



SECTION E-E



SECTION G-G

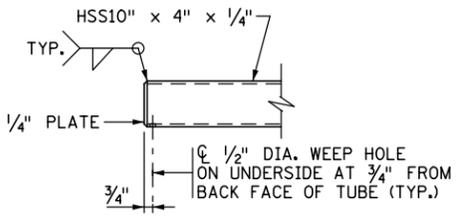
SECTION G-G

ANCHOR BAR ALTERNATE

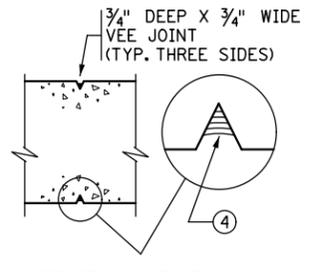
ANCHOR PLATE ALTERNATE

REVISED: 04-17-2013
 APPROVED: MARCH 30, 2010
 [Signature]
 STATE BRIDGE ENGINEER

RAIL SLEEVE DETAIL



RAIL END DETAIL



SECTION D-D

CONTROL JOINT DETAILS

MODIFICATIONS:
 -ABUT. JOINT MODIFIED FOR SEMI-INTEGRAL ABUT.
 -BARRIER ON APPROACH PANEL NOT WINGWALL.
 -ADDED SECTION E-E.
 -MOVED BILL OF REINFORCEMENT AND BAR BENDING DIAGRAMS TO SUPERSTRUCTURE BARLIST SHEET.
 -REMOVED NOTE 1 AND RENUMBERED NOTES.
 -MODIFIED SECTION B-B TO ACCOUNT FOR TRANSITION FROM A 7" DECK TO A 9" DECK.
 -MODIFIED SECTION A-A FOR BARRIER ON MOMENT SLAB.

GENERAL NOTES

- FOR PAYMENT OF "TYPE P-2 (TL-4) BARRIER CONCRETE (3Y46 OR 3Y46A)" MEASURE LENGTH OF CONCRETE BARRIER BETWEEN END FACES. CONCRETE PARAPET = 390 LBS./FT. (0.097 CU. YDS./FT.)
- FOR PAYMENT OF "STRUCTURAL TUBE RAILING DESIGN T-1" MEASURE LENGTH OF RAIL FROM END TO END OF TUBING. DO NOT DEDUCT FOR JOINTS.
- FINISH ALL EDGES OF RAIL WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
- MAX. SPACING OF CONCRETE CONTROL JOINTS SHALL BE 10 FT.
- PROVIDE CORRECT ALIGNMENT FOR ANCHORAGES BY PLACING THEM ACCURATELY AND NORMAL TO GRADE. SEE SPECIAL PROVISIONS.
- PROVIDE STRUCTURAL STEEL AND PLATE WASHERS PER Mn/DOT SPEC. 3310. PROVIDE STRUCTURAL TUBES PER A.S.T.M. A500, GRADE B AS SPECIFIED IN Mn/DOT SPEC. 3361.
- GALVANIZE BOLTS, NUTS, AND WASHERS PER Mn/DOT SPEC. 3392.
- GALVANIZE ALL OTHER STRUCTURAL STEEL PER Mn/DOT SPEC. 3394, AFTER FABRICATION.
- PROVIDE GUARDRAIL CONNECTION STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.
- GUARDRAIL CONNECTION AND NAME PLATE IS INCIDENTAL TO "TYPE P-2 (TL-4) BARRIER CONCRETE (3Y46 OR 3Y46A)".
- PRICE BID FOR "STRUCTURAL TUBE RAILING DESIGN T-1" INCLUDES ANCHORAGES AND ALL MATERIAL ABOVE TOP OF CONCRETE BARRIER.
- ALL MATERIAL IN THE CONCRETE BARRIER IS LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
- SEE SPECIAL PROVISIONS FOR PAINT REQUIREMENTS.
- CONTINUOUSLY GROUND THE METAL RAILING AS DIRECTED IN THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

- ① 1" AT RAILING JOINTS. AT EXPANSION JOINTS, MAKE 1" LARGER THAN GAP IN EXPANSION JOINTS.
- ② 5" AT RAILING JOINTS AND 8" AT EXPANSION JOINTS.
- ③ SUBSTITUTION OF CHEMICAL ANCHOR RODS FOR CAST-IN-PLACE ANCHORAGE IS NOT PERMITTED.
- ④ JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.

FIG. 5-397.157 MOD.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 S.A.P. 027-646-007

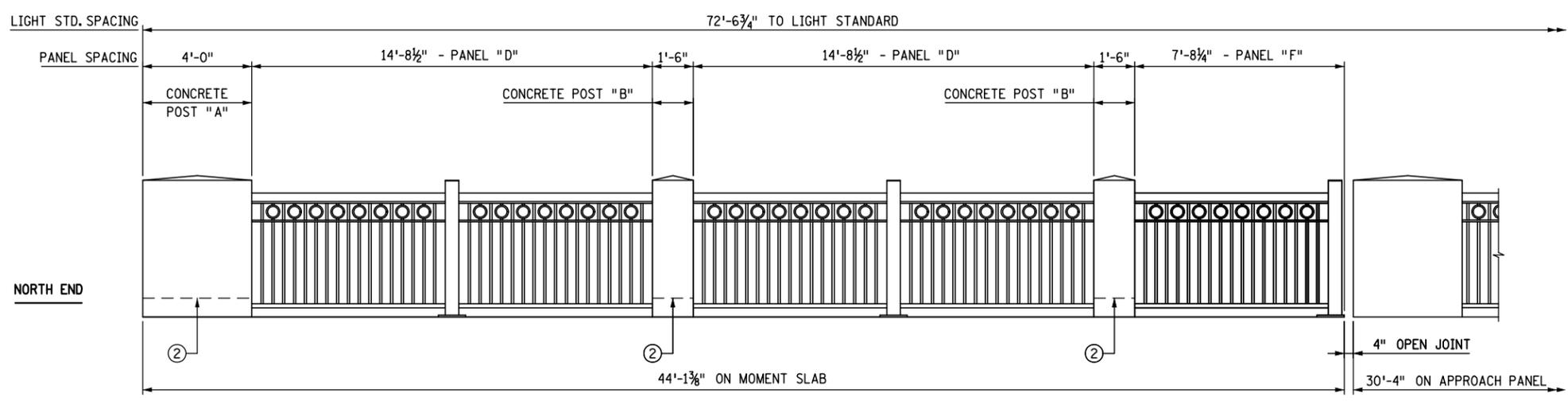
TITLE:
 STRUCTURAL TUBE RAILING (DESIGN T-1)
 AND CONCRETE PARAPET (TYPE P-2, TL-4)
 (WITH INTEGRAL END POST)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	

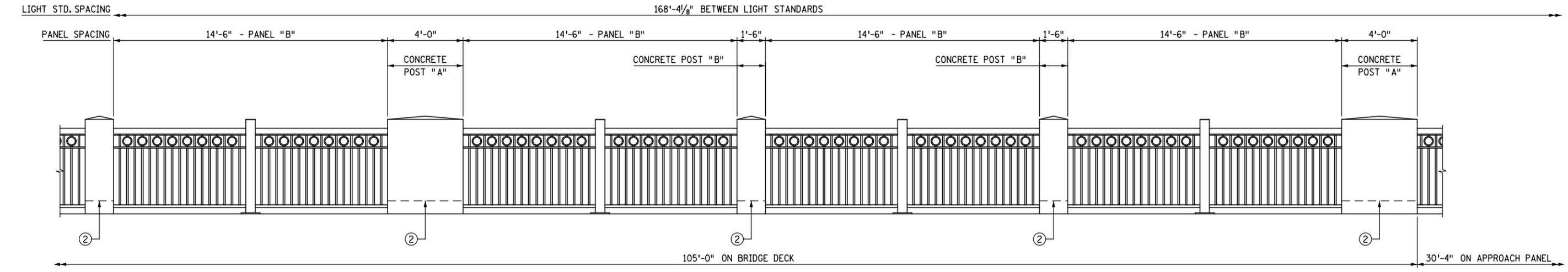
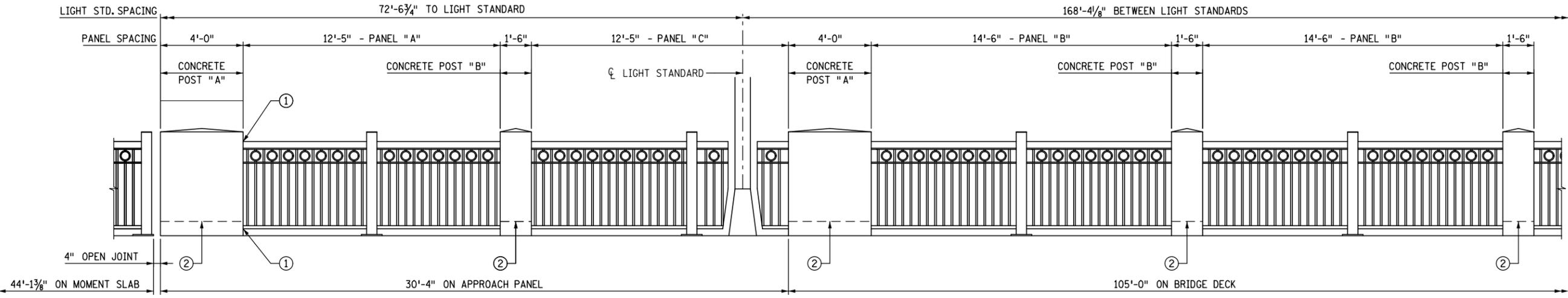
SHEET NO. 66 OF 96 SHEETS

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:43 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_rail10.dgn



- NOTES:**
- ① FOR TYP. CONNECTION OF RAILING TO CONCRETE POST, SEE DETAIL ON "ORNAMENTAL METAL RAILING DETAILS (5 OF 5)" SHEET, TYPICAL AT ALL CONCRETE POSTS.
 - ② CONTINUOUSLY GROUND ALL METAL RAILING PANELS. INSTALL GROUNDING WIRE IN ALL CONCRETE POSTS. EXTEND GROUNDING WIRE A MINIMUM OF 6" BEYOND FACE OF CONCRETE POST.
- FOR GEOMETRY OF PANEL TYPES, SEE ORNAMENTAL METAL RAILING DETAIL SHEETS 1-3 OF 5.
- FOR GEOMETRY AND REINFORCEMENT OF CONCRETE POST "A" AND "B" SEE "ORNAMENTAL METAL RAILING DETAILS (4 OF 5)" SHEET.
- RAIL POST SPACING IS MEASURED HORIZONTALLY ALONG TOP OF DECK.



EAST ORNAMENTAL METAL RAILING ELEVATION

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____

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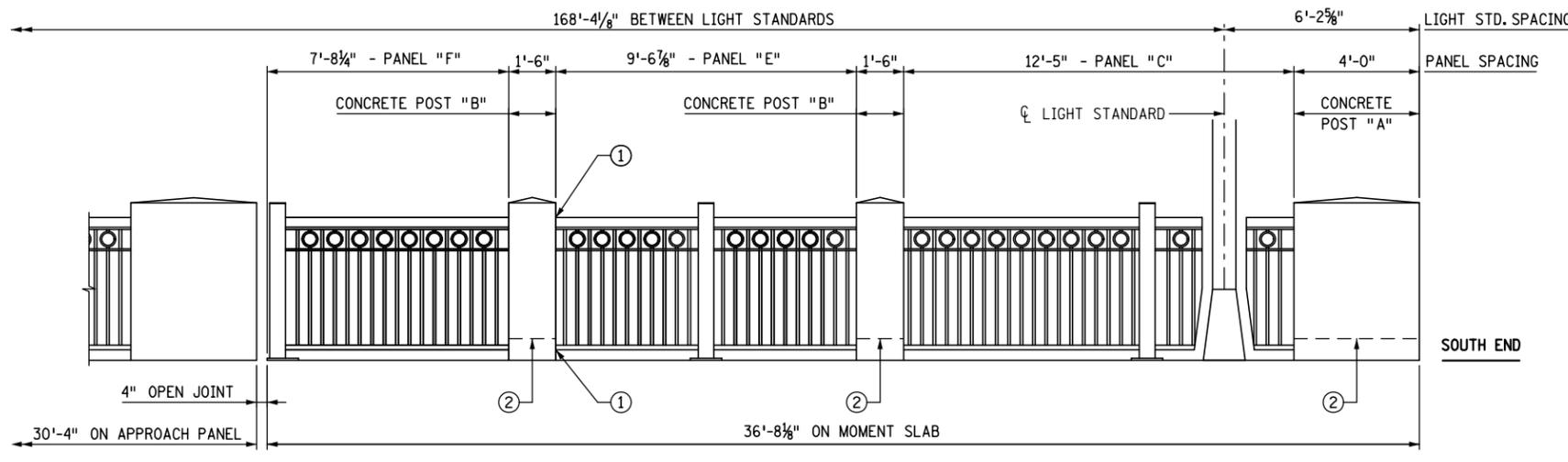
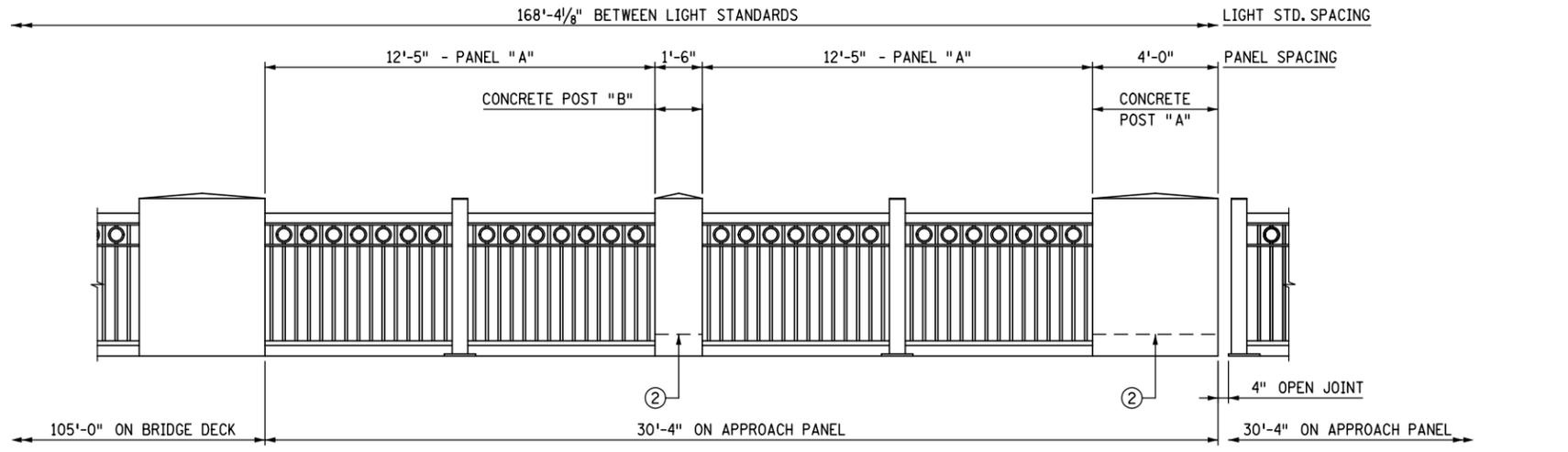
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
EAST ORNAMENTAL METAL RAILING ELEVATION (1 OF 2)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 67 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:44 PM
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EAST ORNAMENTAL METAL RAILING ELEVATION

NOTES:

- ① FOR TYP. CONNECTION OF RAILING TO CONCRETE POST, SEE DETAIL ON "ORNAMENTAL METAL RAILING DETAILS (5 OF 5)" SHEET. TYPICAL AT ALL CONCRETE POSTS.
 - ② CONTINUOUSLY GROUND ALL METAL RAILING PANELS. INSTALL GROUNDING WIRE IN ALL CONCRETE POSTS. EXTEND GROUNDING WIRE A MINIMUM OF 6" BEYOND FACE OF CONCRETE POST.
- FOR GEOMETRY OF PANEL TYPES, SEE ORNAMENTAL METAL RAILING DETAIL SHEETS 1-3 OF 5.
- FOR GEOMETRY AND REINFORCEMENT OF CONCRETE POST "A" AND "B" SEE "ORNAMENTAL METAL RAILING DETAILS (4 OF 5)" SHEET.
- RAIL POST SPACING IS MEASURED HORIZONTALLY ALONG TOP OF DECK.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



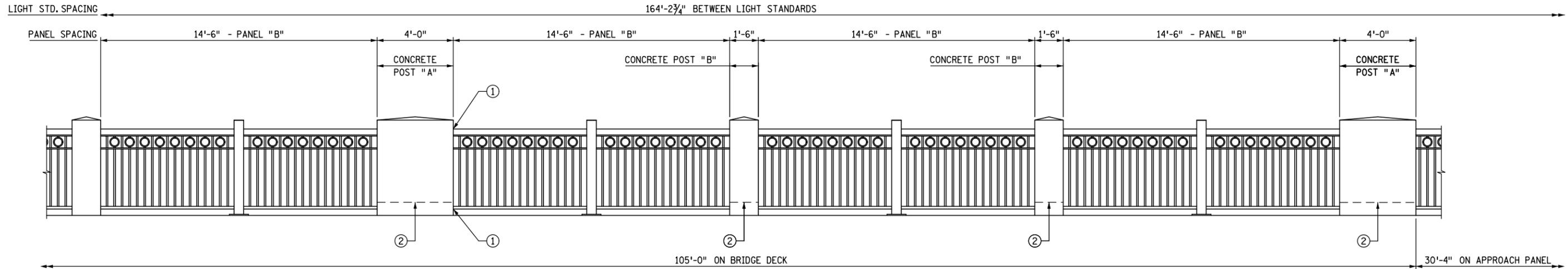
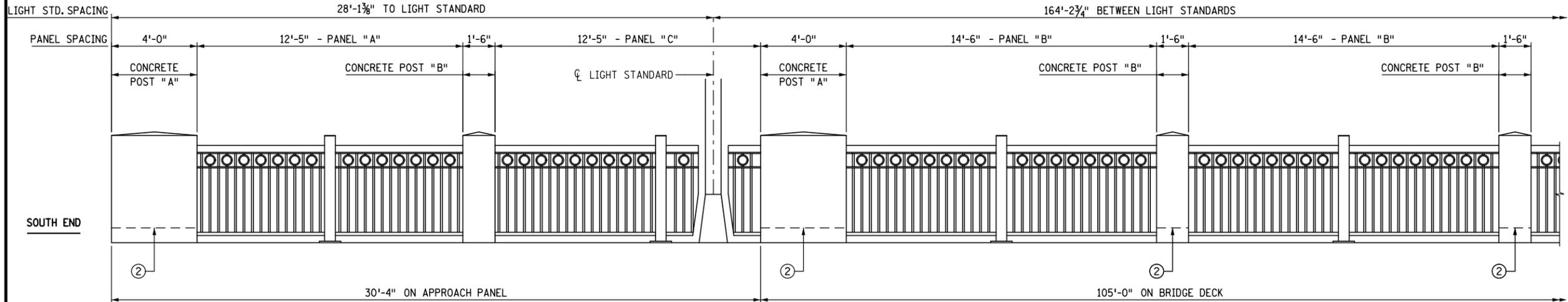
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
EAST ORNAMENTAL METAL RAILING ELEVATION (2 OF 2)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 68 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:44 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_rail2.dgn



WEST ORNAMENTAL METAL RAILING ELEVATION

NOTES:

- ① FOR TYP. CONNECTION OF RAILING TO CONCRETE POST, SEE DETAIL ON "ORNAMENTAL METAL RAILING DETAILS (5 OF 5)" SHEET. TYPICAL AT ALL CONCRETE POSTS.
- ② CONTINUOUSLY GROUND ALL METAL RAILING PANELS. INSTALL GROUNDING WIRE IN ALL CONCRETE POSTS. EXTEND GROUNDING WIRE A MINIMUM OF 6" BEYOND FACE OF CONCRETE POST.

FOR GEOMETRY OF PANEL TYPES, SEE ORNAMENTAL METAL RAILING DETAIL SHEETS 1-3 OF 5.

FOR GEOMETRY AND REINFORCEMENT OF CONCRETE POST "A" AND "B" SEE "ORNAMENTAL METAL RAILING DETAILS (4 OF 5)" SHEET.

RAIL POST SPACING IS MEASURED HORIZONTALLY ALONG TOP OF DECK.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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

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 651.292.4400
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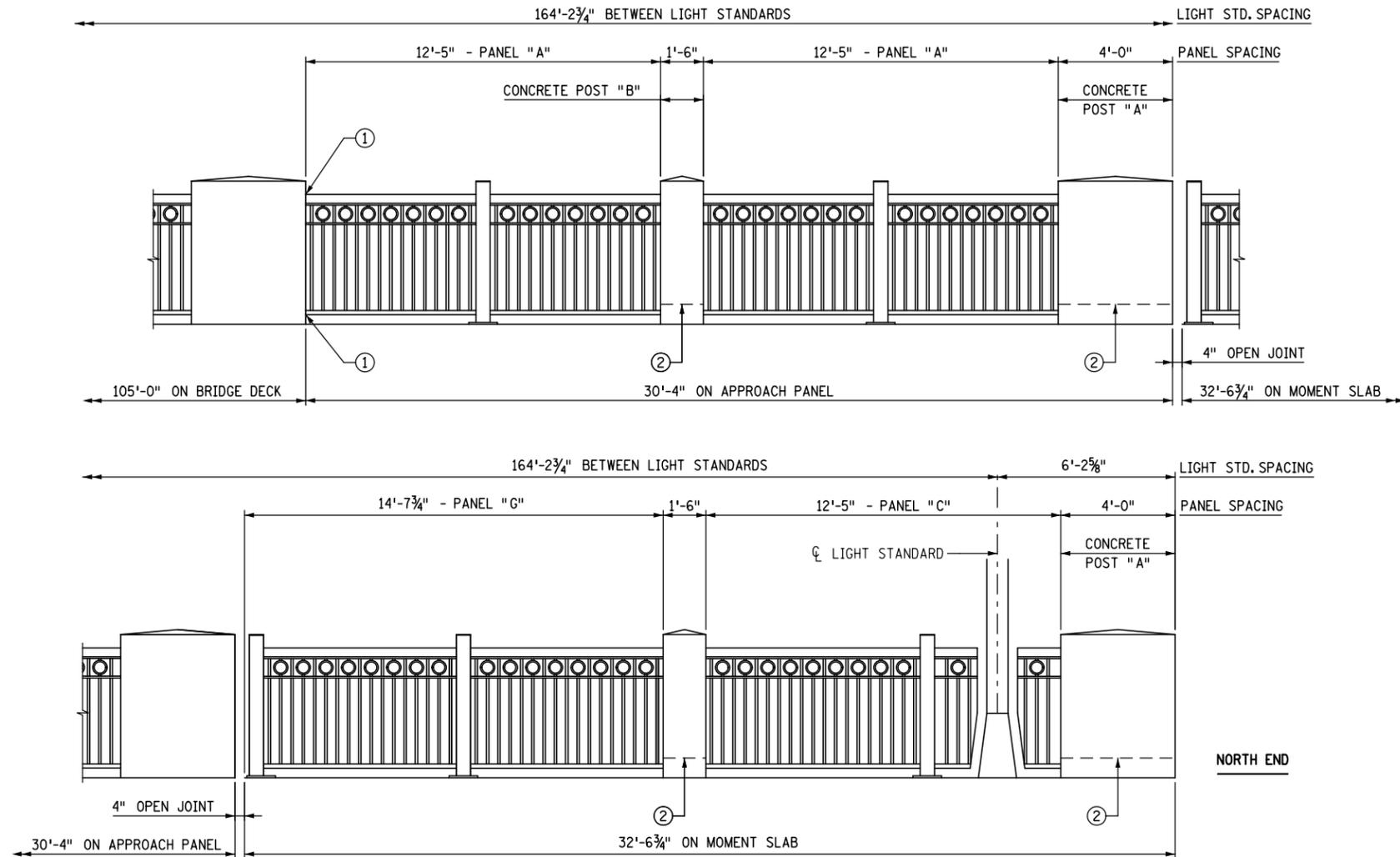
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
WEST ORNAMENTAL METAL RAILING ELEVATION (1 OF 2)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 69 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:45 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27B84_rail3.dgn



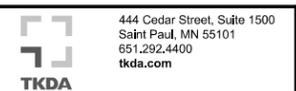
WEST ORNAMENTAL METAL RAILING ELEVATION

NOTES:

- ① FOR TYP. CONNECTION OF RAILING TO CONCRETE POST, SEE DETAIL ON "ORNAMENTAL METAL RAILING DETAILS (5 OF 5)" SHEET. TYPICAL AT ALL CONCRETE POSTS.
 - ② CONTINUOUSLY GROUND ALL METAL RAILING PANELS. INSTALL GROUNDING WIRE IN ALL CONCRETE POSTS. EXTEND GROUNDING WIRE A MINIMUM OF 6" BEYOND FACE OF CONCRETE POST.
- FOR GEOMETRY OF PANEL TYPES, SEE ORNAMENTAL METAL RAILING DETAIL SHEETS 1-3 OF 5.
- FOR GEOMETRY AND REINFORCEMENT OF CONCRETE POST "A" AND "B" SEE "ORNAMENTAL METAL RAILING DETAILS (4 OF 5)" SHEET.
- RAIL POST SPACING IS MEASURED HORIZONTALLY ALONG TOP OF DECK.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



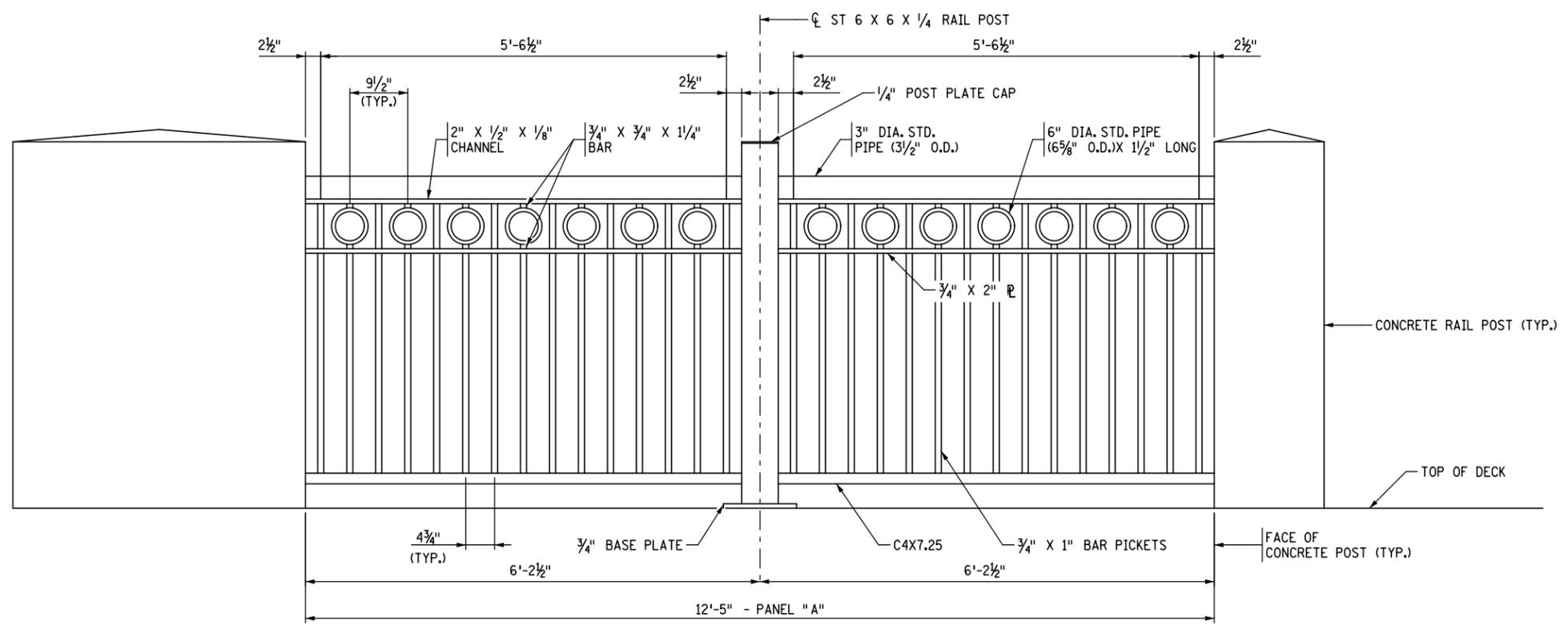
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
WEST ORNAMENTAL METAL RAILING ELEVATION (2 OF 2)

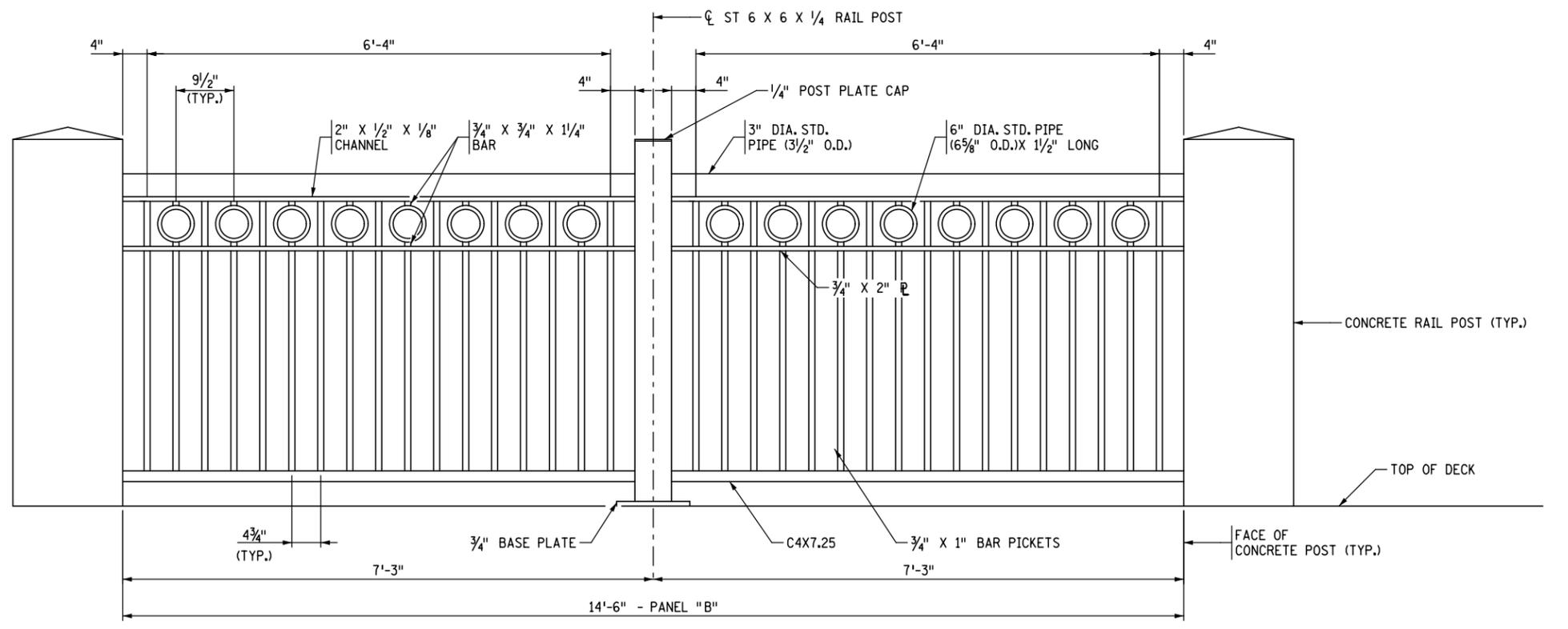
DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 70 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:46 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27B84_rail4.dgn



PANEL "A"



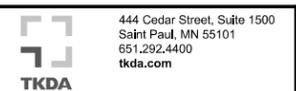
PANEL "B"

PANEL TYPES

NOTES:
 FOR RAIL POST SPACING, SEE "ORNAMENTAL METAL RAILING ELEVATION" SHEETS.
 DIMENSIONS SHOWN ARE TO ϕ OF PICKET.
 ALL DIMENSIONS GIVEN ARE IN A HORIZONTAL PLANE. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AS NEEDED BEFORE FABRICATION. NOTIFY ENGINEER OF ANY DISCREPANCIES.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



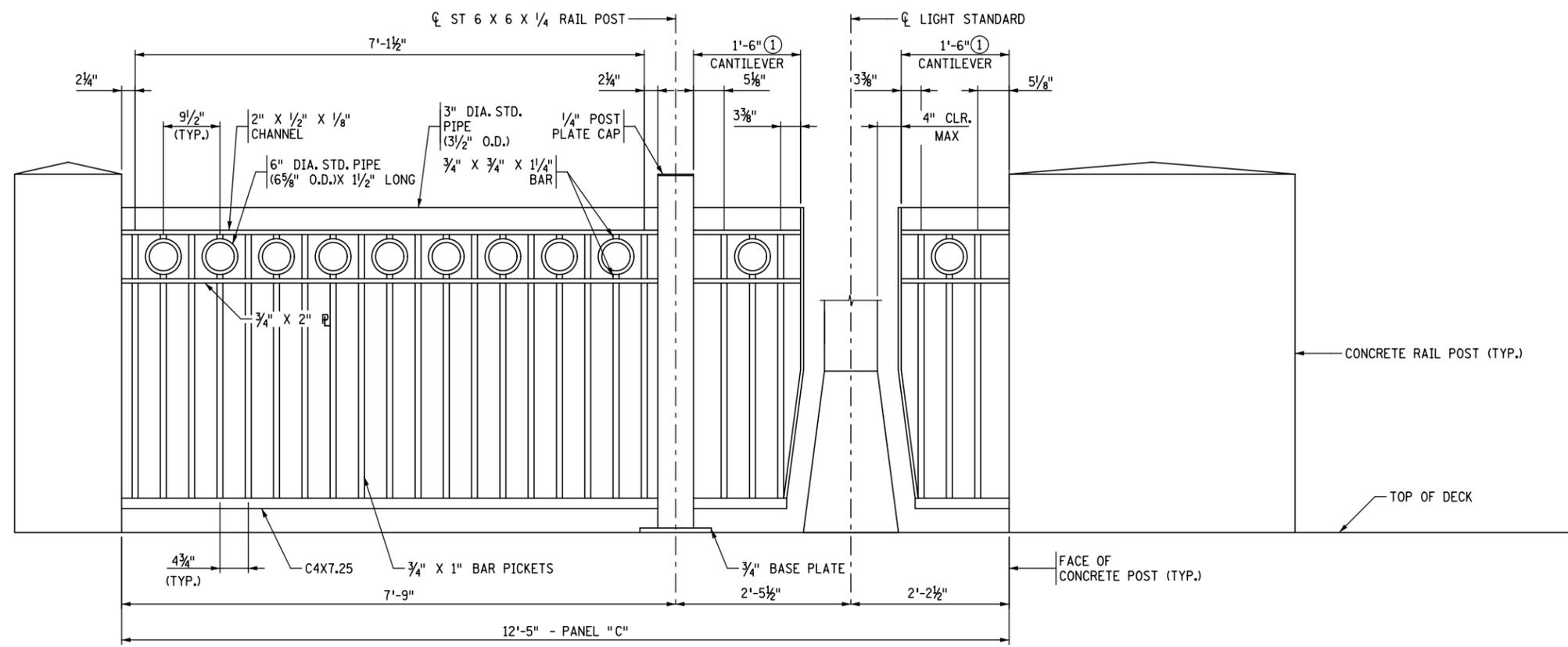
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
ORNAMENTAL METAL RAILING
 DETAILS (1 OF 5)

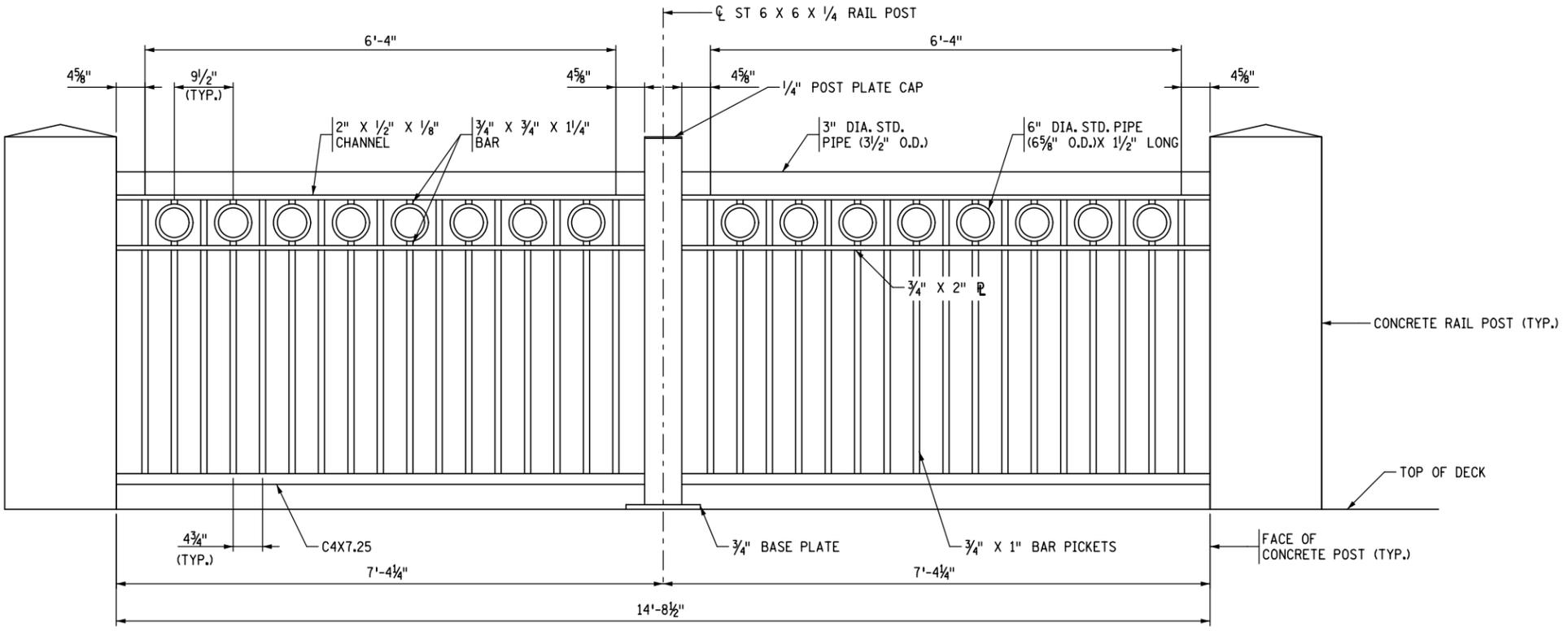
DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 71 OF 96 SHEETS		

BRIDGE NO.
27B84

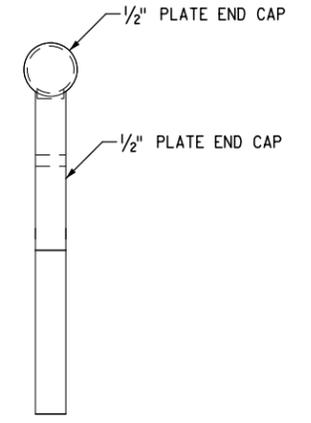
DATE: 4/1/2016 TIME: 12:49:47 PM
 FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_rail15.dgn



PANEL "C"



PANEL "D"



CANTILEVER END CAP DETAIL

NOTES:

- ① SEE "CANTILEVER END CAP DETAIL".
- FOR RAIL POST SPACING, SEE "ORNAMENTAL METAL RAILING ELEVATION" SHEETS.
- DIMENSIONS SHOWN ARE TO ϕ OF PICKET.
- ALL DIMENSIONS GIVEN ARE IN A HORIZONTAL PLANE. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AS NEEDED BEFORE FABRICATION. NOTIFY ENGINEER OF ANY DISCREPANCIES.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



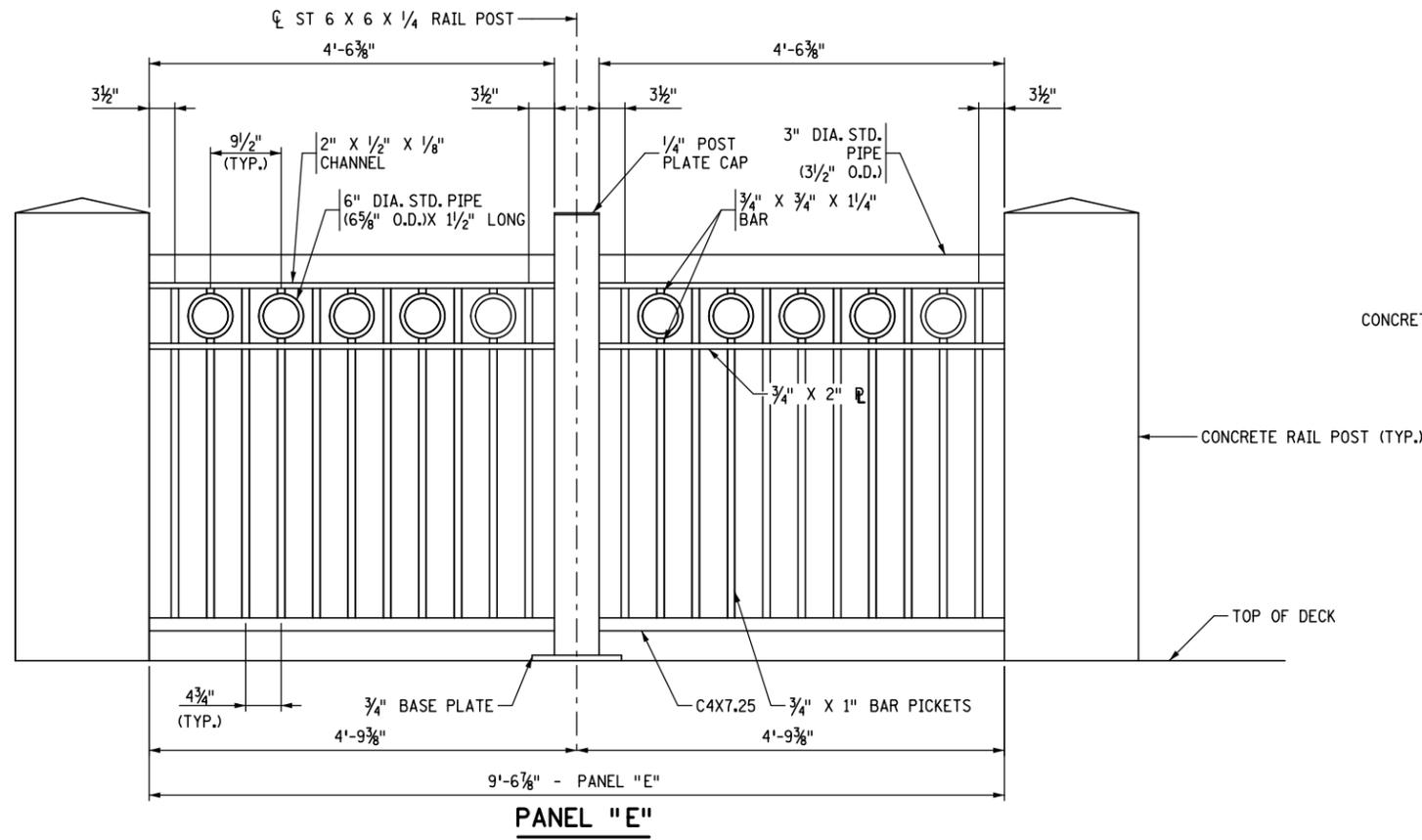
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
ORNAMENTAL METAL RAILING
 DETAILS (2 OF 5)

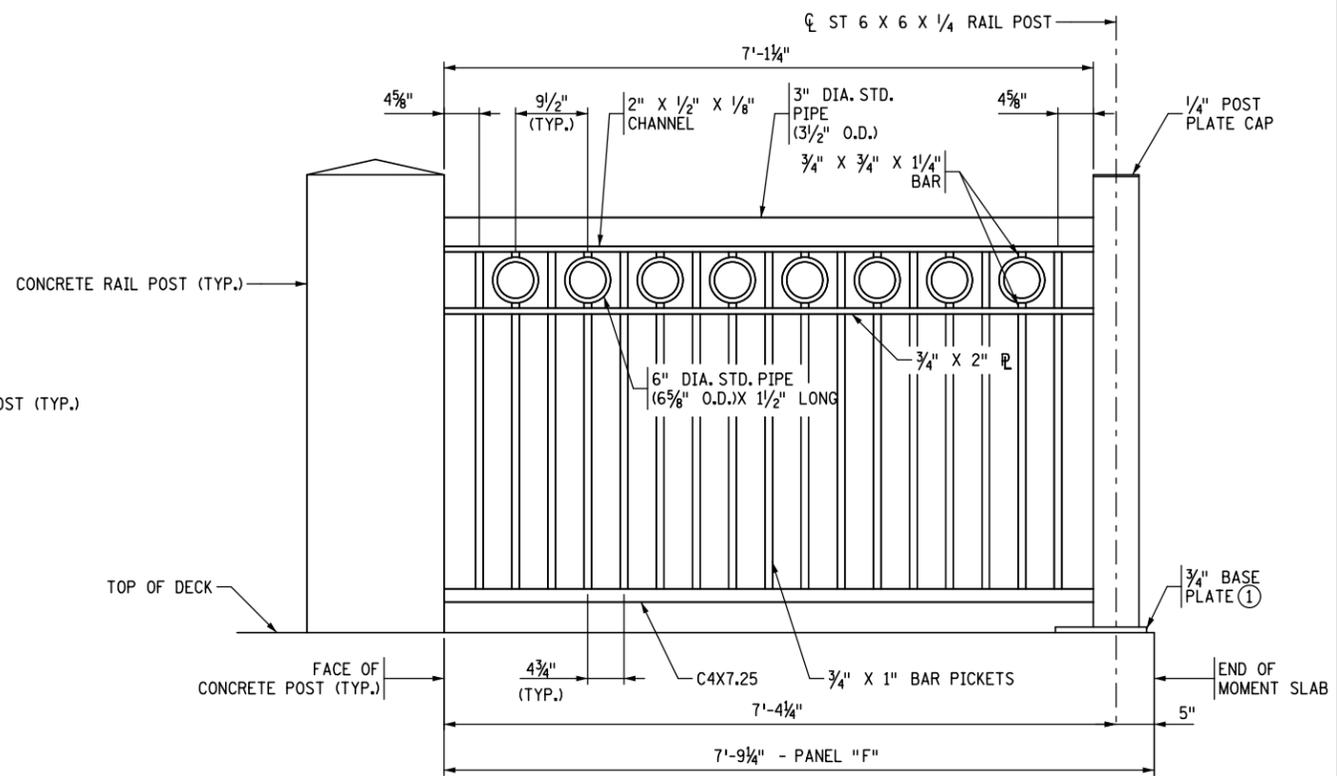
DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 72 OF 96 SHEETS		

BRIDGE NO.
27B84

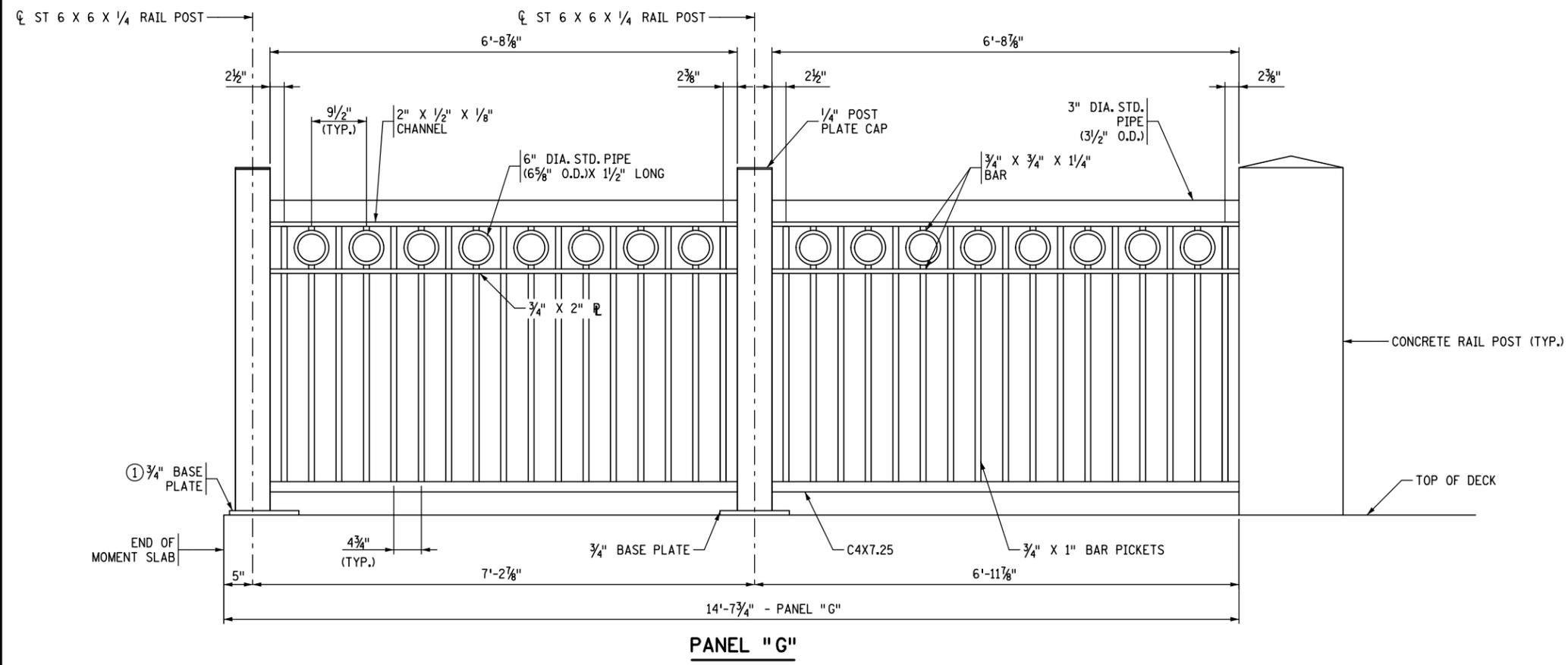
DATE: 4/1/2016 TIME: 12:49:48 PM
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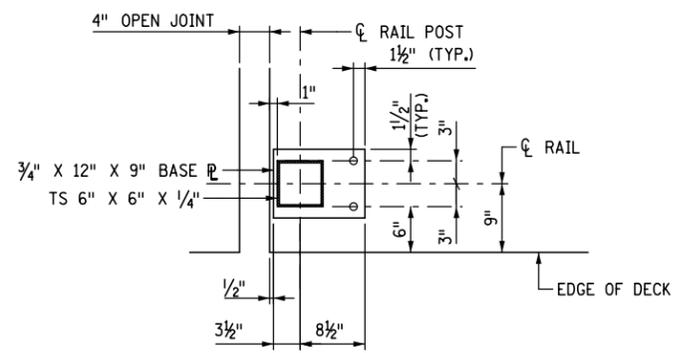
PANEL "E"



PANEL "F"



PANEL "G"



BASE PLATE AT OPEN JOINT

NOTES:

- ① SEE "BASE PLATE AT OPEN JOINT" FOR BASE PLATE CONFIGURATION AT OPEN JOINT.
- FOR RAIL POST SPACING, SEE "ORNAMENTAL METAL RAILING ELEVATION" SHEETS.
- DIMENSIONS SHOWN ARE TO ϕ OF PICKET.
- ALL DIMENSIONS GIVEN ARE IN A HORIZONTAL PLANE. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AS NEEDED BEFORE FABRICATION. NOTIFY ENGINEER OF ANY DISCREPANCIES.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



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

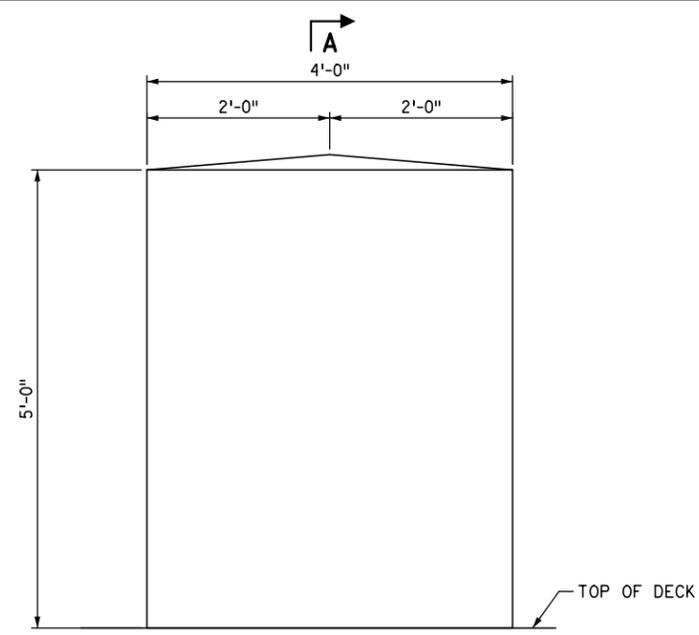
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
ORNAMENTAL METAL RAILING
 DETAILS (3 OF 5)

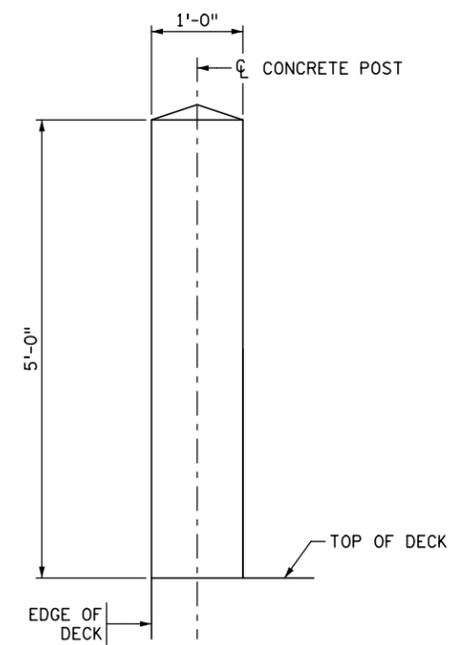
DES: HAP DR: HAP APPROVED
 CHK: JRM CHK: JRM
 SHEET NO. 73 OF 96 SHEETS

BRIDGE NO.
27B84

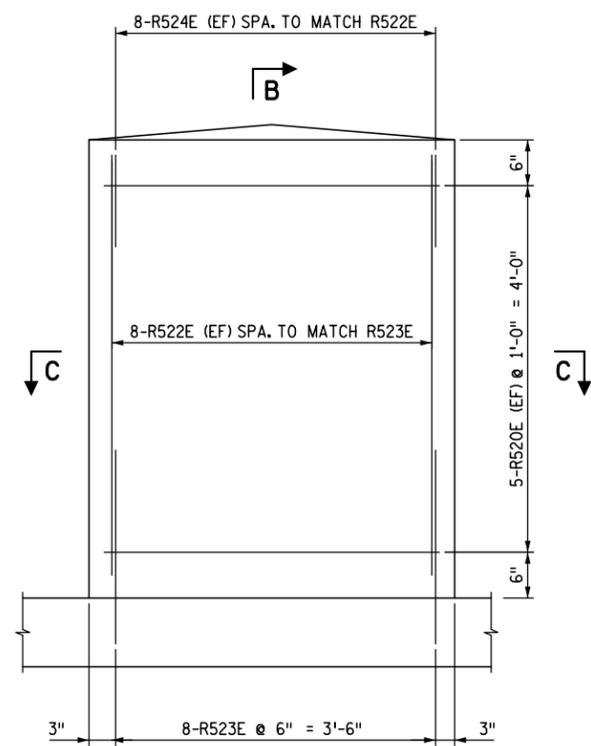
DATE: 4/1/2016 TIME: 12:49:49 PM
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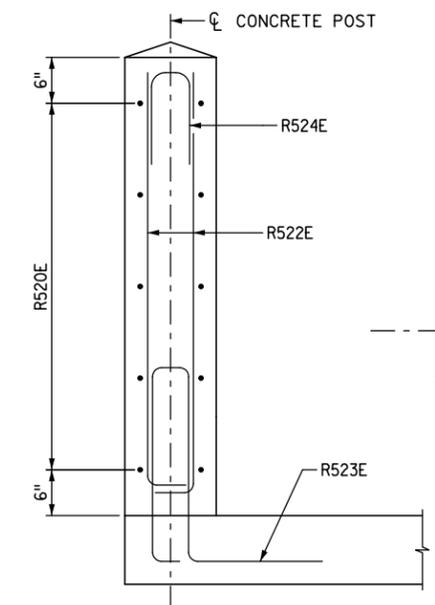
CONCRETE POST "A" ELEVATION



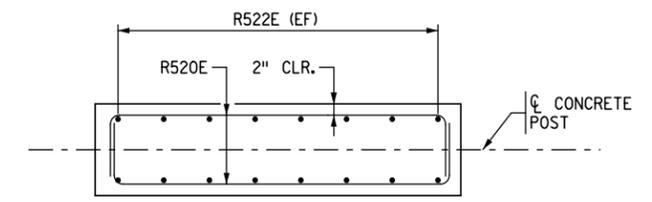
SECTION A-A



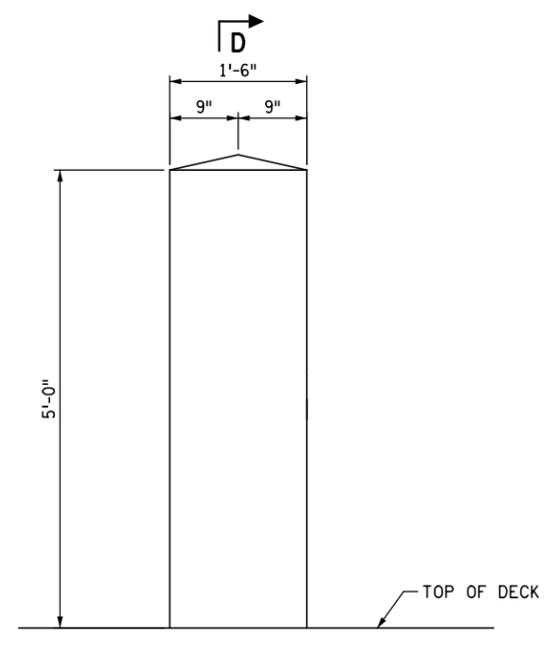
CONCRETE POST "A" REINFORCEMENT



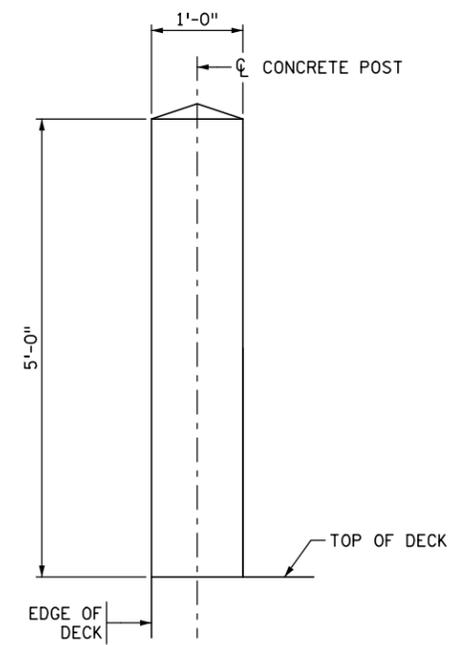
SECTION B-B



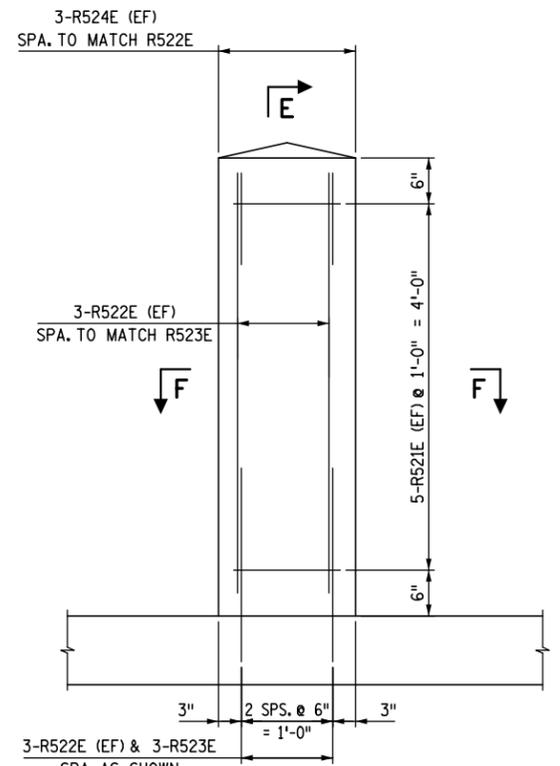
SECTION C-C



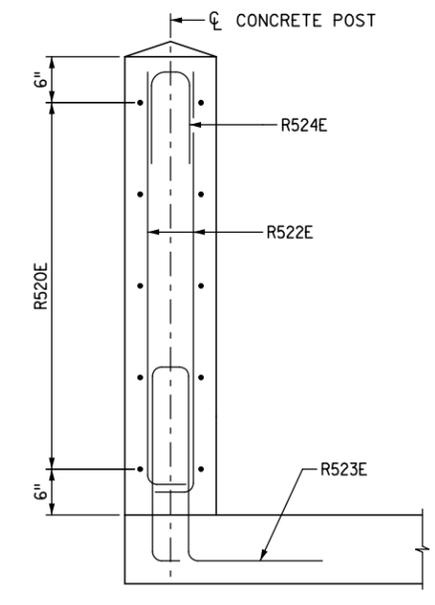
CONCRETE POST "B" ELEVATION



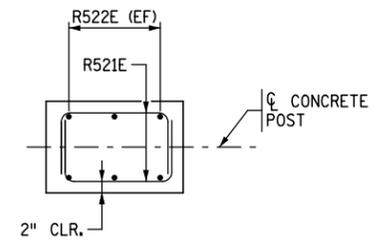
SECTION D-D



CONCRETE POST "B" REINFORCEMENT



SECTION E-E



SECTION F-F

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



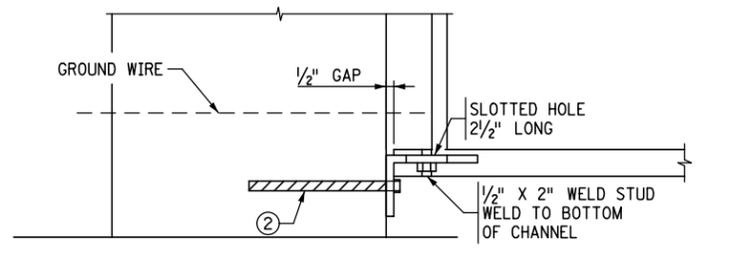
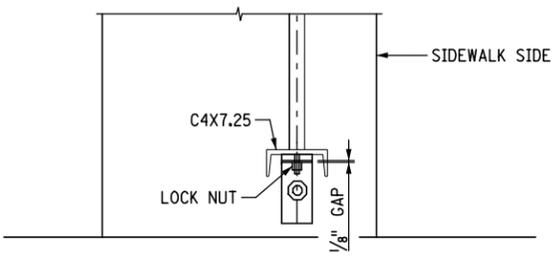
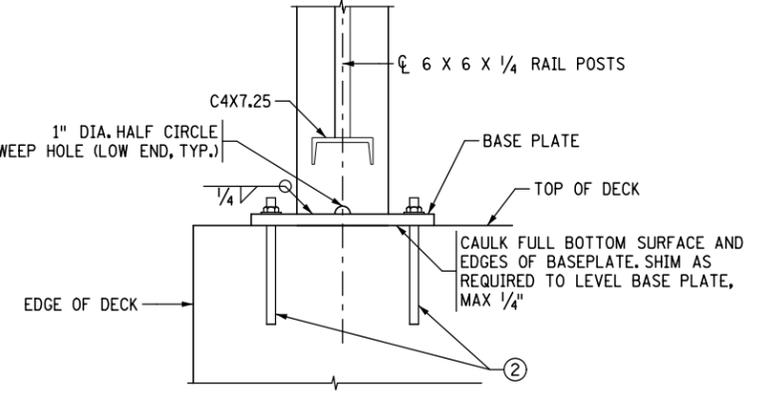
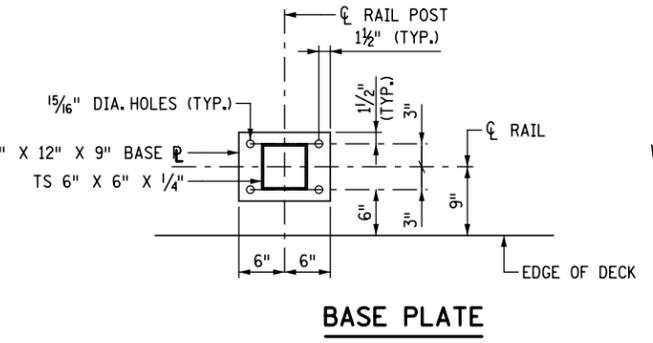
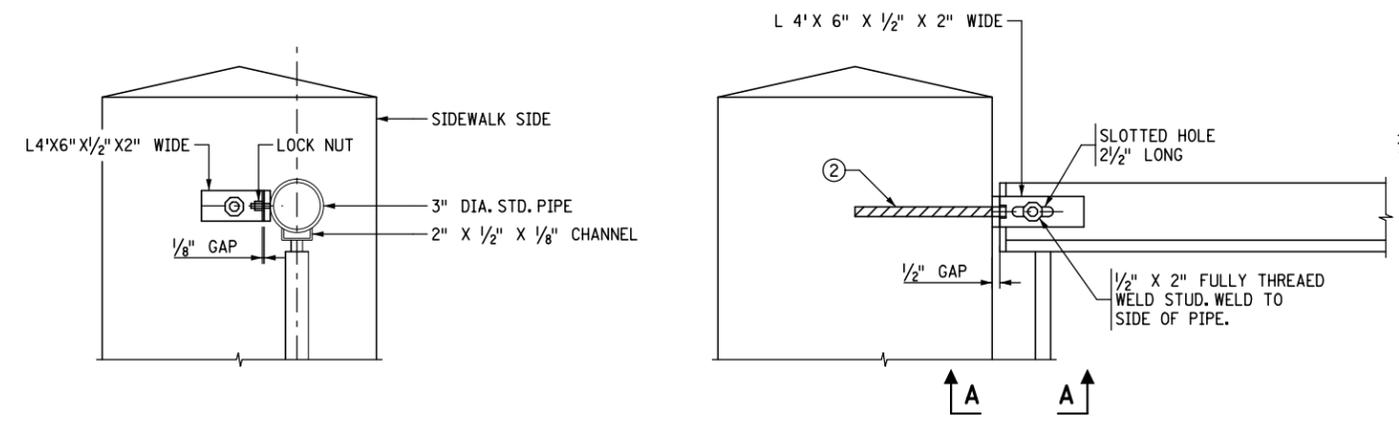
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **ORNAMENTAL METAL RAILING**
 DETAILS (4 OF 5)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 74 OF 96 SHEETS		

BRIDGE NO.
27B84

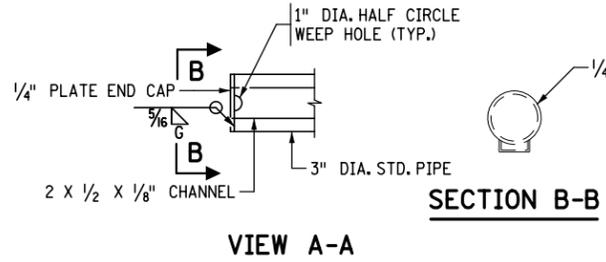
DATE: 4/1/2016 TIME: 12:49:50 PM FILENAME: k:\g-m\Hennepin\Cy\15854000\hwy-brdg\brdg\super\CBR27B84_rail18.dgn



END VIEW

ELEVATION

TYPICAL METAL RAIL POST ANCHORAGES

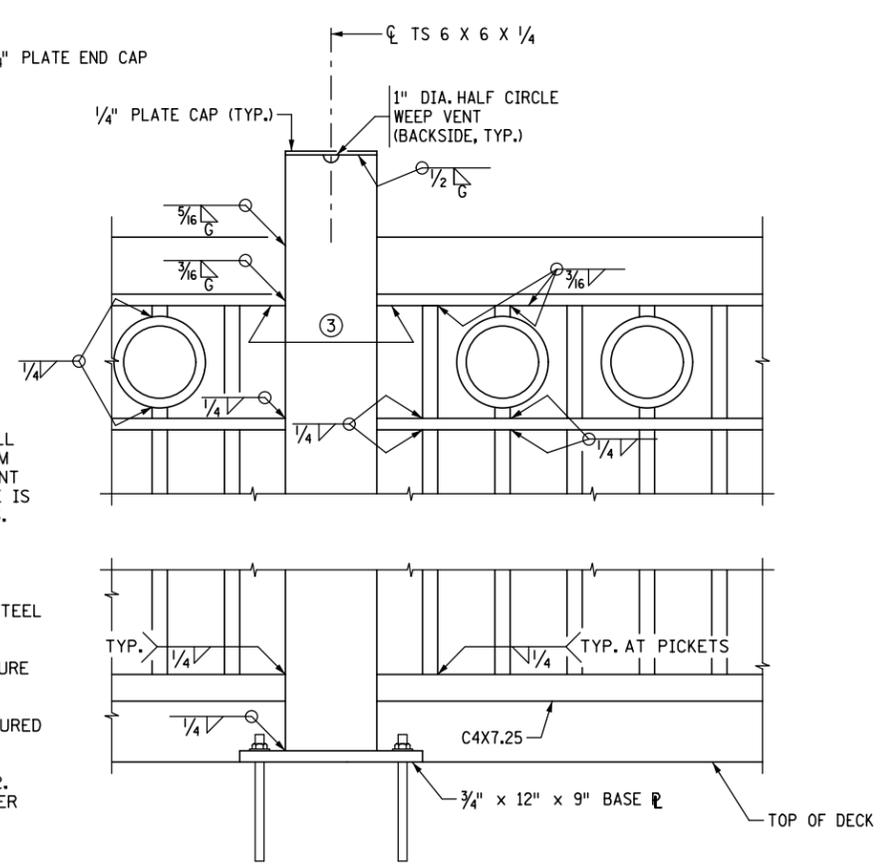


SECTION B-B

VIEW A-A

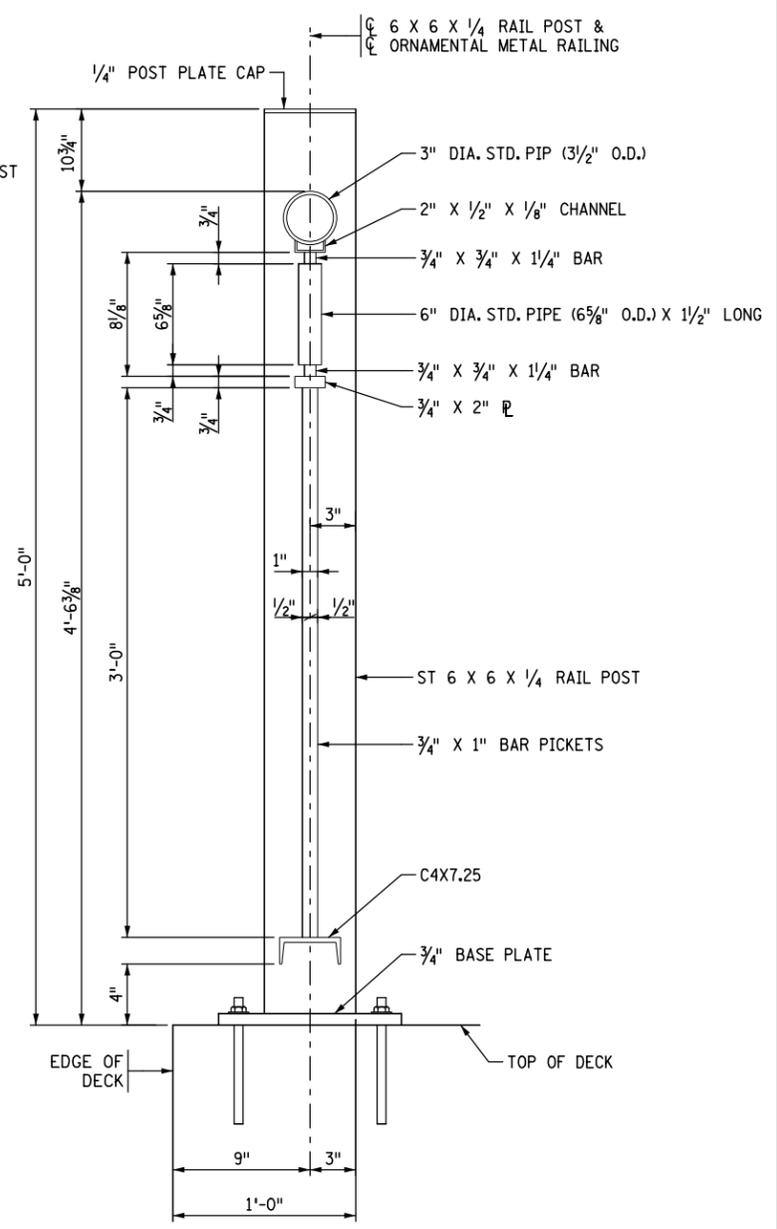
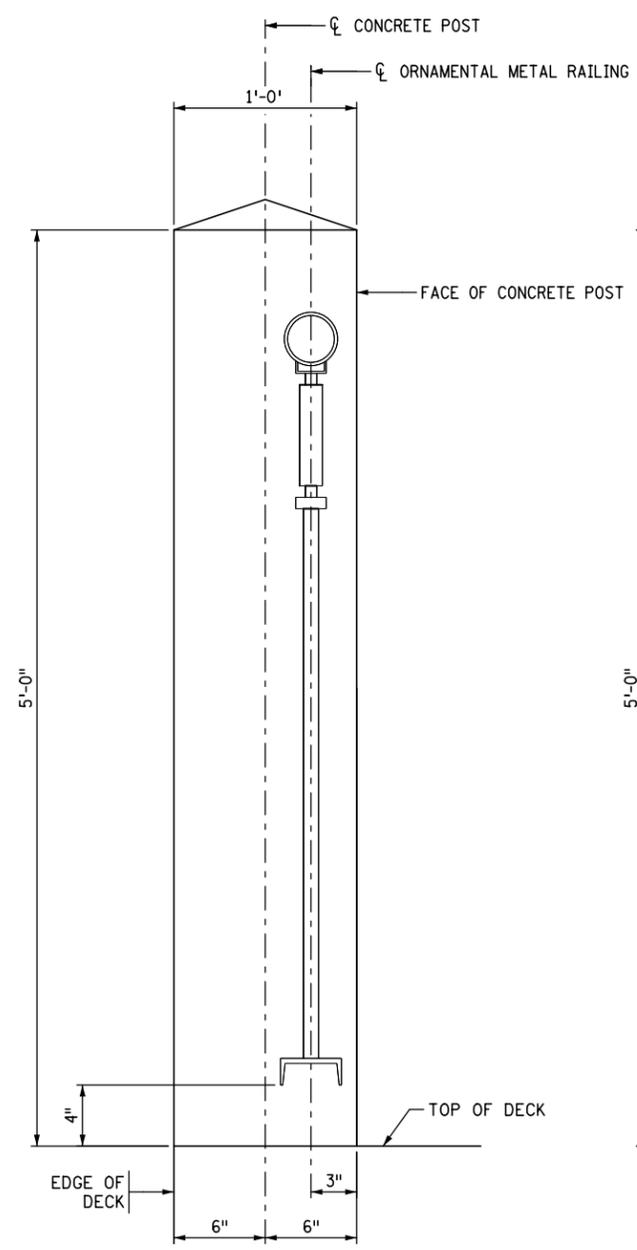
NOTES:

- ① SEE "ORNAMENTAL METAL RAILING DETAILS (2 OF 3) SHEET FOR REINFORCEMENT DETAILS AND DIMENSIONS.
 - ② ADHESIVE ANCHORAGE WITH 5/8" DIA. ANCHOR ROD PER SPEC. 3385 TYPE A WITH HEX NUT AND WASHER. PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 8" REGARDLESS OF CHARACTERISTIC STRENGTH. DRILL THROUGH REINFORCEMENT (IF ENCOUNTERED) TO ACHIEVE MINIMUM EMBEDMENT. ENSURE HEX NUT IS IN CONTACT WITH THE ADJACENT SURFACE AND TORQUE TO 60 FT-LBS UNLESS A HIGHER TORQUE IS RECOMMENDED BY THE MANUFACTURER. PROOF LOAD TO 9.6 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
 - ③ 1" DIA. WEEP HOLE THROUGH PIPE AND CHANNEL.
- PRICE BID FOR "ORNAMENTAL METAL RAILING" INCLUDES ALL STEEL SHOWN ON THIS SHEET INCLUDING ANCHORAGES.
- CONCRETE ENDPST MATERIALS ARE INCLUDED IN SUPERSTRUCTURE QTY'S. SEE ORNAMENTAL METAL RAILINGS DETAILS (2 OF 3).
- LENGTH OF ORNAMENTAL METAL RAILING FOR PAYMENT IS MEASURED BETWEEN INSIDE FACES OF CONCRETE POSTS.
- GALVANIZE BOLTS, NUTS, WASHERS, AND ANCHORS PER SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL PER SPEC. 3394 AFTER FABRICATION.
- GRINDING WILL NOT BE PERMITTED AFTER MATERIAL IS GALVANIZED.
- ORNAMENTAL METAL RAILING AND RAIL POST ANCHORAGES TO BE STRUCTURAL STEEL, SPEC. 3306.
- SEE SPECIAL PROVISIONS FOR PAINT TO BE APPLIED TO METAL RAILING.
- INSTALL RAILPOSTS AND SPINDLES VERTICAL (PLUMB).



WELD DETAIL

METAL RAILING POST



NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
S.A.P. 027-646-007

TITLE: **ORNAMENTAL METAL RAILING**
DETAILS (5 OF 5)

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 75 OF 96 SHEETS		

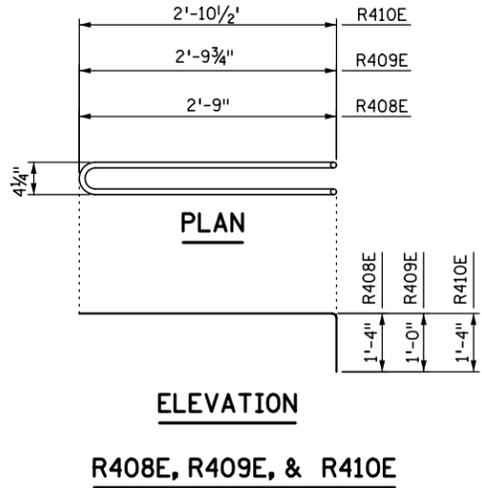
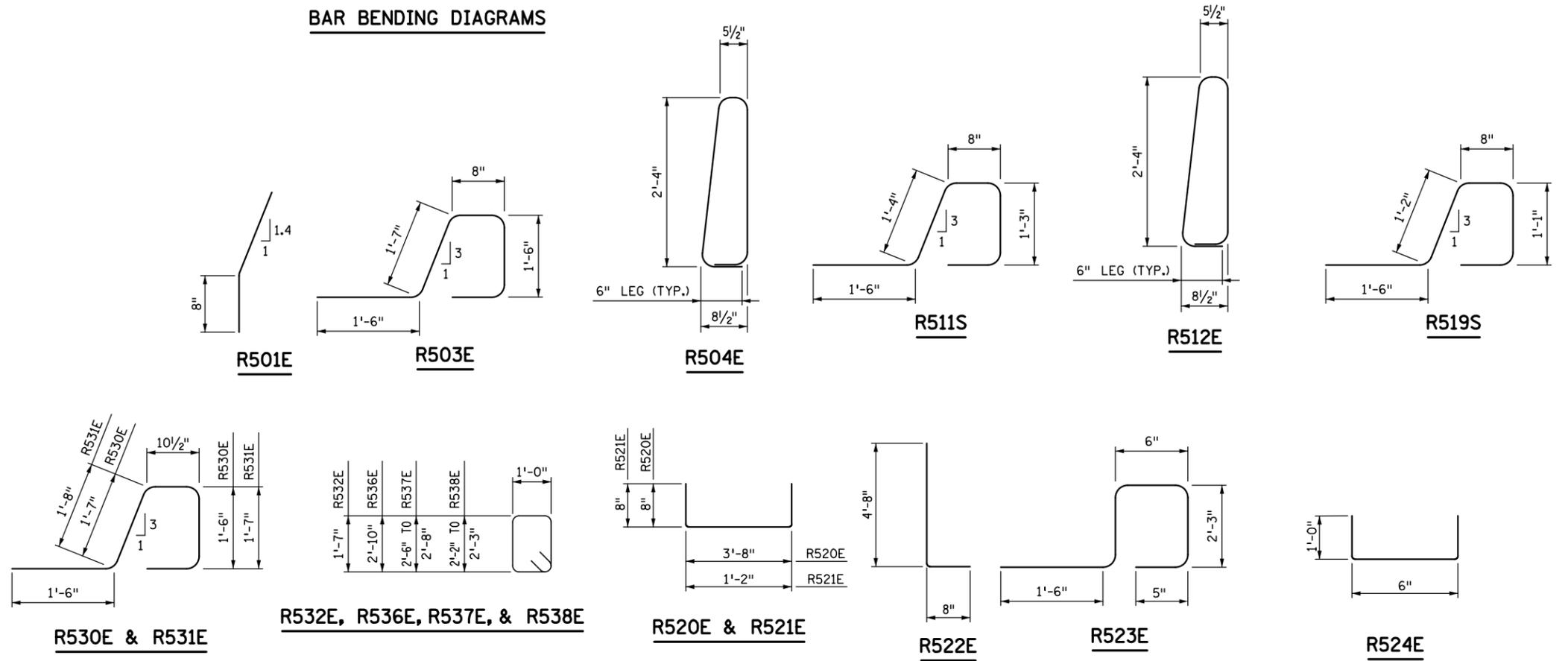
BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:51 PM
 FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_ral19.dgn

BILL OF REINFORCEMENT - BARRIERS				
BAR	NO.	LENGTH	SHAPE	LOCATION
R501E	80	2'-2"		STAGE 1 BARRIER DOWEL
R502E	80	2'-3"		STAGE 1 BARRIER DOWEL
R503E	106	5'-9"		STAGE 1 BARRIER VERTICAL
R504E	186	6'-2"		STAGE 1 BARRIER VERTICAL
R405E	8	40'-0"		STAGE 1 BARRIER LONGIT.
R406E	8	38'-10"		STAGE 1 BARRIER LONGIT.
R407E	32	24'-3"		STAGE 1 BARRIER LONGIT.
R408E	4	8'-6"		LOOP BAR (STAGE 1 & 2)
R409E	4	8'-0"		LOOP BAR (STAGE 1 & 2)
R410E	4	8'-10"		LOOP BAR (STAGE 1 & 2)
R511S	76	5'-3"		STAGE 2 BARRIER VERTICAL
R512S	183	6'-2"		STAGE 2 BARRIER VERTICAL
R413E	16	40'-0"		STAGE 2 BARRIER LONGIT.
R414E	8	28'-0"		STAGE 2 BARRIER LONGIT.
R415E	16	30'-8"		STAGE 2 BARRIER LONGIT.
R519E	107	4'-11"		STAGE 2 BARRIER VERTICAL
R520E	100	5'-0"		CONCRETE POST HORIZONRTAL
R521E	120	2'-6"		CONCRETE POST HORIZONRTAL
R522E	232	5'-4"		CONCRETE POST VERTICAL
R523E	116	6'-11"		CONCRETE POST VERTICAL
R524E	116	2'-6"		CONCRETE POST TOP TIE
R530E	214	5'-11"		PARAPET VERTICAL
R531E	140	6'-1"		PARAPET VERTICAL
R532E	354	5'-9"		PARAPET VERTICAL
R533E	12	60'-0"		PARAPET LONGITUDINAL
R534E	12	44'-10"		PARAPET LONGITUDINAL
R535E	24	30'-8"		PARAPET LONGITUDINAL
R536E	12	8'-7"		PARAPET VERTICAL
R537E	8	SER. 1		PARAPET VERTICAL
R538E	8	SER. 2		PARAPET VERTICAL
R539E	4	2'-9"		PARAPET END LONGITUDINAL
R540E	6	43'-8"		PARAPET LONGITUDINAL
R541E	6	37'-2"		PARAPET LONGITUDINAL
R542E	6	57'-7"		PARAPET LONGITUDINAL
R543E	6	33'-3"		PARAPET LONGITUDINAL

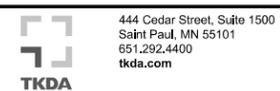
SER. 1 4 SERIES OF 2-R537E (2'-6" TO 2'-8")
 SER. 2 4 SERIES OF 2-R538E (2'-2" TO 2'-3")

BAR BENDING DIAGRAMS



NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:



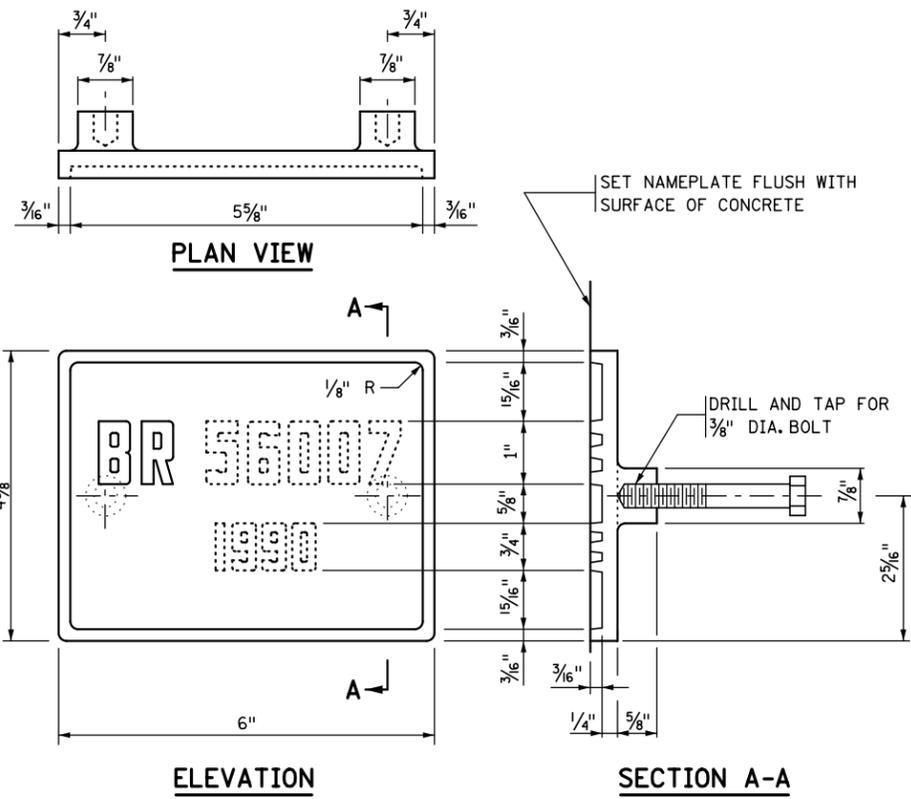
444 Cedar Street, Suite 1500
 Saint Paul, MN 55101
 651.292.4400
 tkda.com

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: BARRIER BARLIST
 DES: HAP DR: HAP APPROVED
 CHK: JRM CHK: JRM
 SHEET NO. 76 OF 96 SHEETS

BRIDGE NO.
 27B84

DATE: 4/1/2016 TIME: 12:49:52 PM
 FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\standard\CBR27B84_det01.dgn



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 27B84
 YEAR 2016



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 3/8" DIA. x 3" LONG WITH EACH PLATE.
- ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

APPROVED: NOVEMBER 22, 2002

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION

REVISION
 09-11-2014

DETAIL NO.

B101

BRIDGE NAMEPLATE
 (FOR NEW BRIDGES)

Daniel J. Wojan
 STATE BRIDGE ENGINEER

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: 4/1/2016 LIC. NO.:

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



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
STANDARD DETAILS
 B101 & B303

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION

REVISED

DETAIL NO.

SOLE PLATE
 (PRESTRESSED CONCRETE BEAMS)
 (FOR BEARINGS WITH PINTLES)

B303

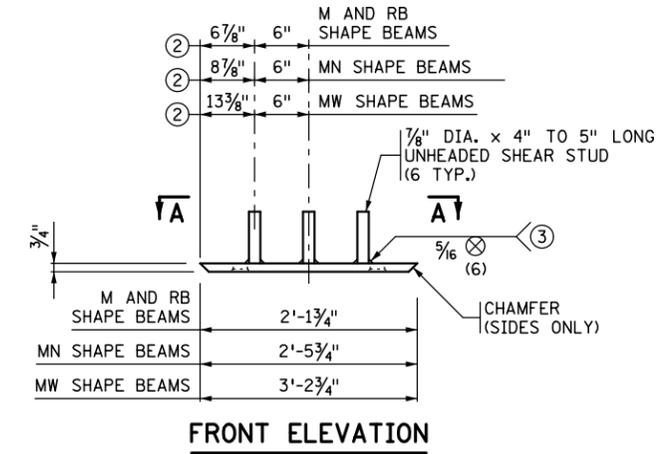
APPROVED: SEPTEMBER 22, 2011

Nancy J. Sauerberger
 STATE BRIDGE ENGINEER

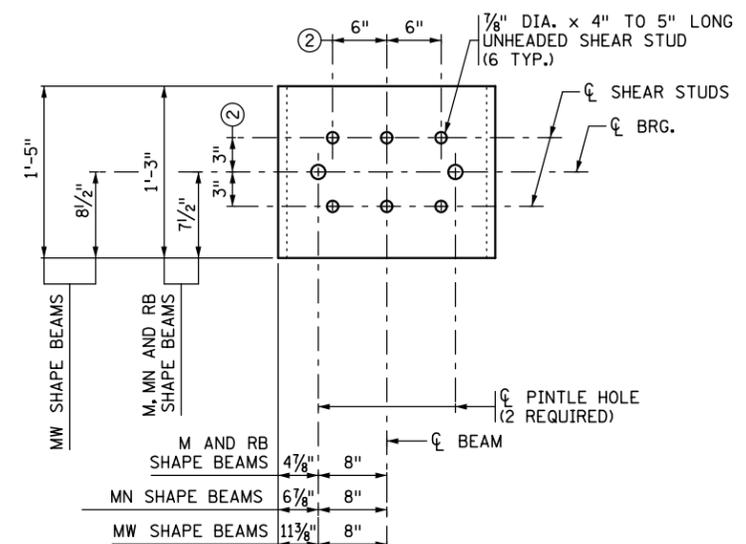
DES: LJL DR: LJL APPROVED
 CHK: GM CHK: GM

BRIDGE NO.
 27B84

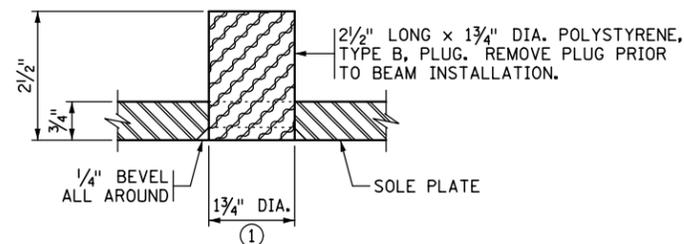
SHEET NO. 77 OF 96 SHEETS



FRONT ELEVATION



SECTION A-A

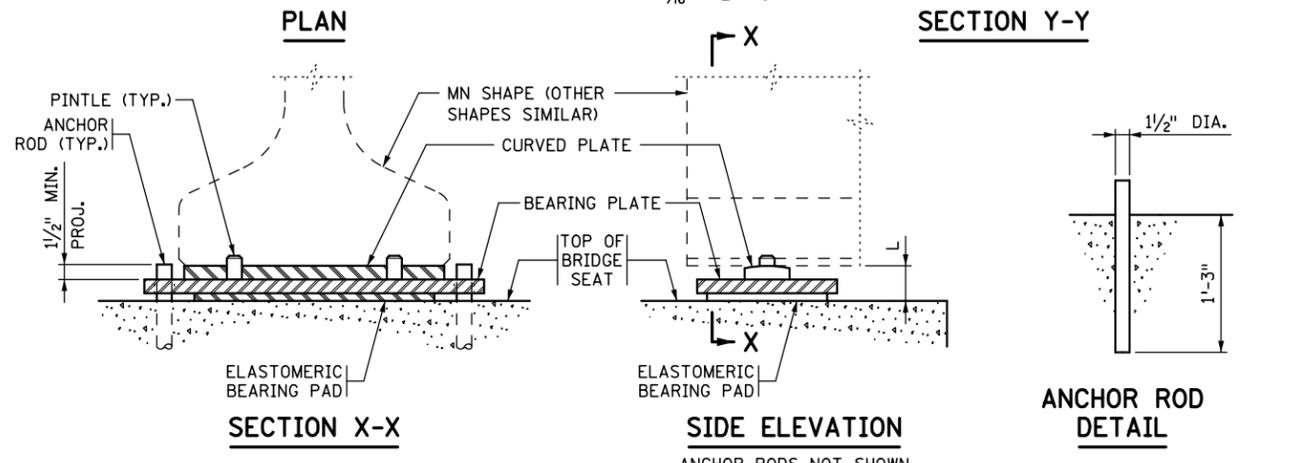
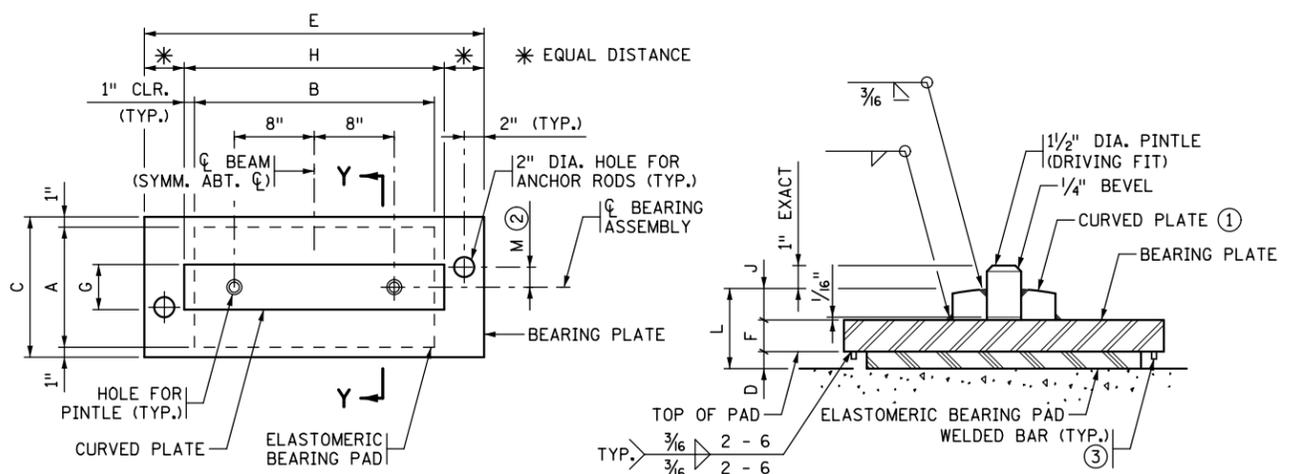


PINTLE HOLE DETAIL

NOTES:

- MATERIAL TO BE STRUCTURAL STEEL PER MNDOT SPEC. 3306.
- WELDED STUDS TO BE WELDABLE CARBON STEEL PER MNDOT SPEC. 3391.2D.
- SOLE PLATE FOR BEARING ASSEMBLY TO BE GALVANIZED PER MNDOT SPEC. 3394 AFTER FABRICATION.
- PINTLE HOLES SHALL BE FREE OF ZINC BUILD UP FROM GALVANIZING.
- SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.
- ① FOR 1 1/2" DIA. PINTLES.
- ② THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.
- ③ THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.1.

DATE: 4/1/2016 TIME: 12:49:53 PM FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\brdg\standard\CBR27B84_det02.dgn



ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ANCHOR ROD OFFSET		ASSY. HEIGHT	CURVED PLATE
			A	B	D		C	E	F	G	H	J	+/- (2)	M		
F-1	N. ABUT.	MN45	12"	24"	1/2"	8.0	14"	38"	1 1/2"	4 1/2"	26"	1 1/4"	+	0"	3 1/4"	16"

- NOTES:**
- PROVIDE ELASTOMERIC MATERIALS AND PAD CONSTRUCTION PER SPEC. 3741.
 - PROVIDE STEEL PLATES PER SPEC. 3306.
 - PROVIDE ANCHOR RODS PER SPEC. 3385, TYPE A. GALVANIZE PER SPEC. 3392.
 - PROVIDE PINTLES PER SPEC. 3309.
 - GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.
 - PAYMENT FOR BEARING ASSEMBLY INCLUDES ALL MATERIAL ON THIS DETAIL.
- THE MIN. RADIUS IS 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS IS 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.
 - "+" DENOTES OFFSET AS SHOWN. "-" DENOTES OFFSET OPPOSITE OF SHOWN.
 - 3/8" X 3/8" BAR INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. BAR LENGTH IS 2" LESS THAN ADJACENT PAD DIMENSION, CENTERED ON PAD. CENTERLINE OF BAR TO EDGE OF PAD DIMENSION = 1/2".

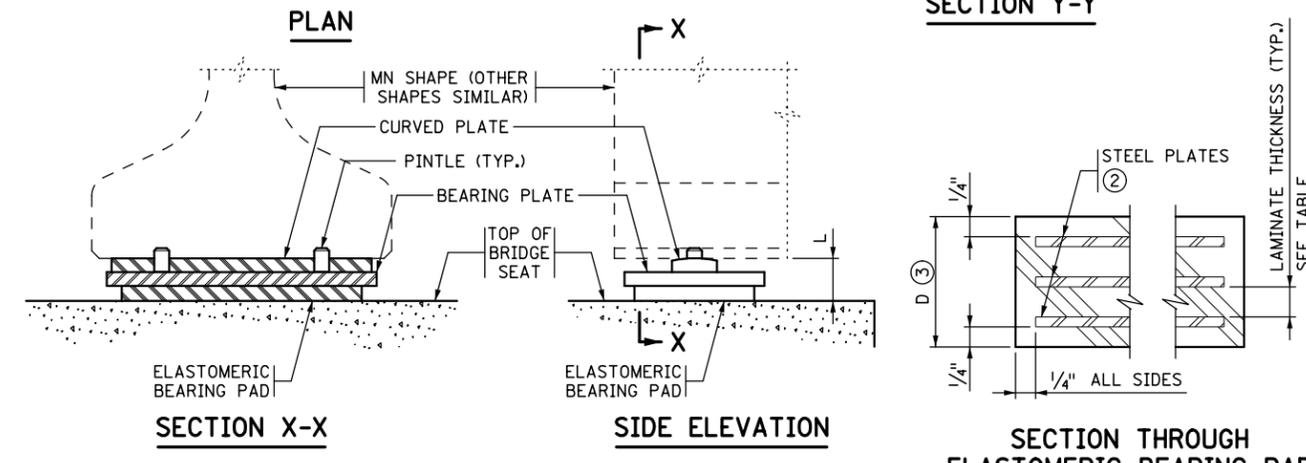
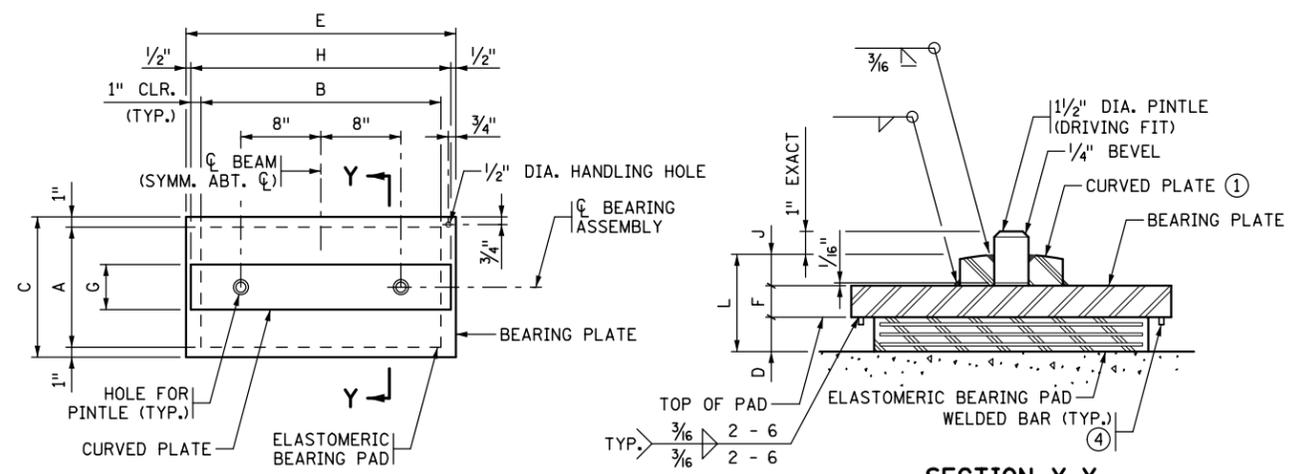
DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1 1/2" PINTLES.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 11-06-2013 11-03-2015	DETAIL NO. B310
CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (FIXED)			

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

NO. DATE BY DESCRIPTION OF REVISIONS

DATE: 4/1/2016 LIC. NO.:



ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			STEEL PLATES	LAMINATES	SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ASSY. HEIGHT	CURVED PLATE		
			A	B	D				NO.	THICK.	NO.	THICK.	C	E			F	G
E-1	S. ABUT.	MN45	12"	24"	2 1/2"	4	1/8"	3	1/2"	8.0	14"	27"	1 1/2"	4 1/2"	26"	1 1/4"	5 1/4"	16"
E-2	N. ABUT.	MN45	12"	24"	1/2"	-	1/8"	-	1/2"	8.0	14"	27"	1 1/2"	4 1/2"	26"	1 1/4"	3 1/4"	16"

- NOTES:**
- PROVIDE ELASTOMERIC MATERIALS AND PAD CONSTRUCTION PER SPEC. 3741.
 - PROVIDE STEEL PLATES PER SPEC. 3306.
 - PROVIDE PINTLES PER SPEC. 3309.
 - GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.
 - PAYMENT FOR BEARING ASSEMBLY INCLUDES ALL MATERIAL ON THIS DETAIL.
- THE MIN. RADIUS IS 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS IS 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.
 - DO NOT GALVANIZE THESE PLATES.
 - THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.
 - 3/8" X 3/8" BAR INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. BAR LENGTH IS 2" LESS THAN ADJACENT PAD DIMENSION, CENTERED ON PAD. CENTERLINE OF BAR TO EDGE OF PAD DIMENSION = 1/2".

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1 1/2" PINTLES.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 11-03-2015	DETAIL NO. B311
CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (EXPANSION)			

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

NO. DATE BY DESCRIPTION OF REVISIONS

DATE: 4/1/2016 LIC. NO.:



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Saint Paul, MN 55101
651.292.4400
tkda.com

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S.A.P. 027-646-007

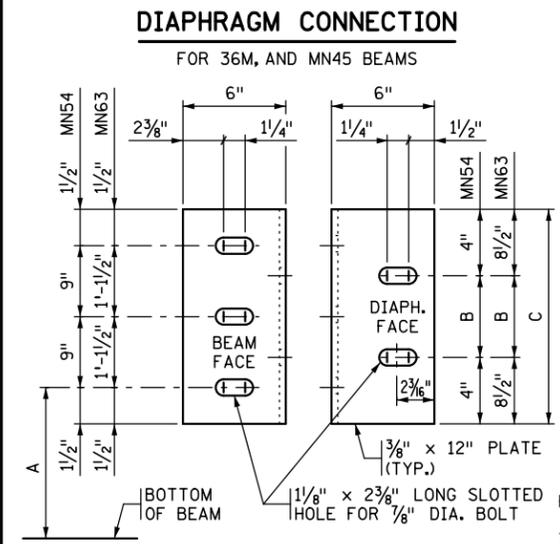
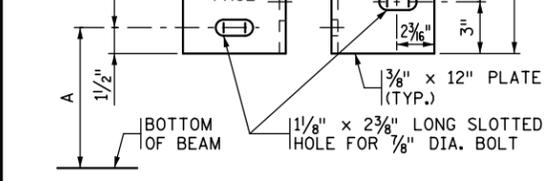
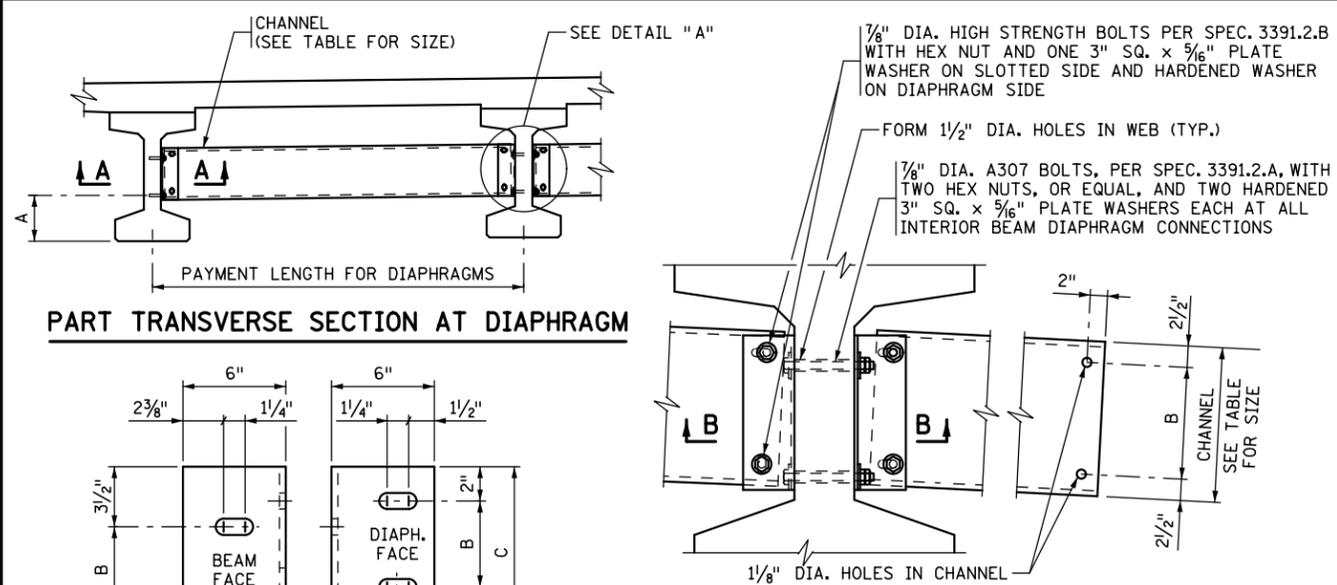
TITLE:
**STANDARD DETAILS
B310 & B311**

DES: LJJ DR: LJJ APPROVED
CHK: MAV CHK: MAV

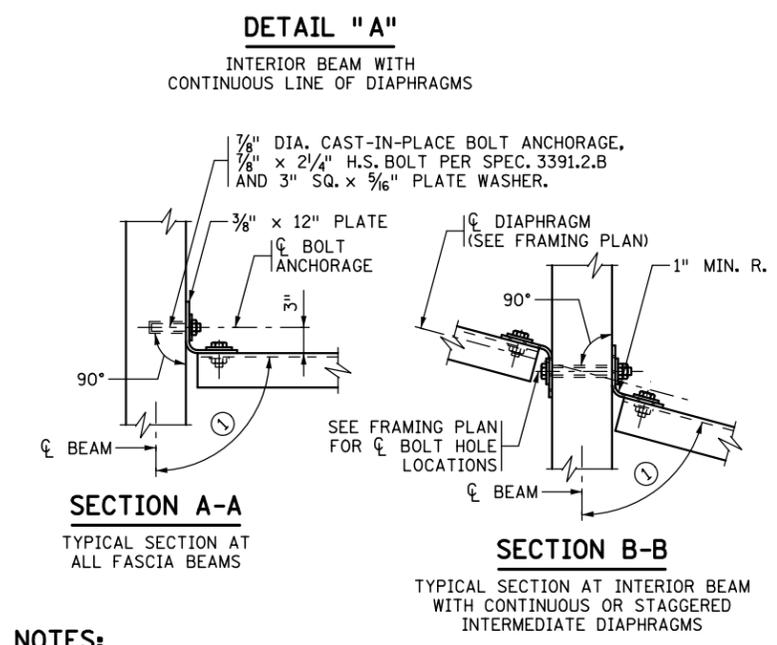
SHEET NO. 78 OF 96 SHEETS

BRIDGE NO.
27B84

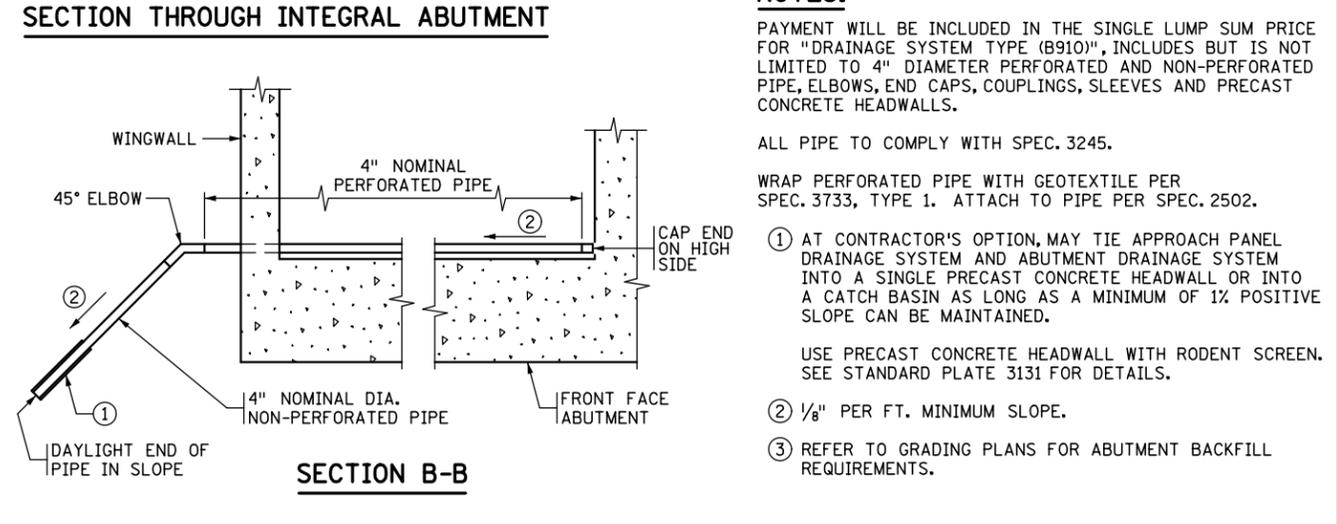
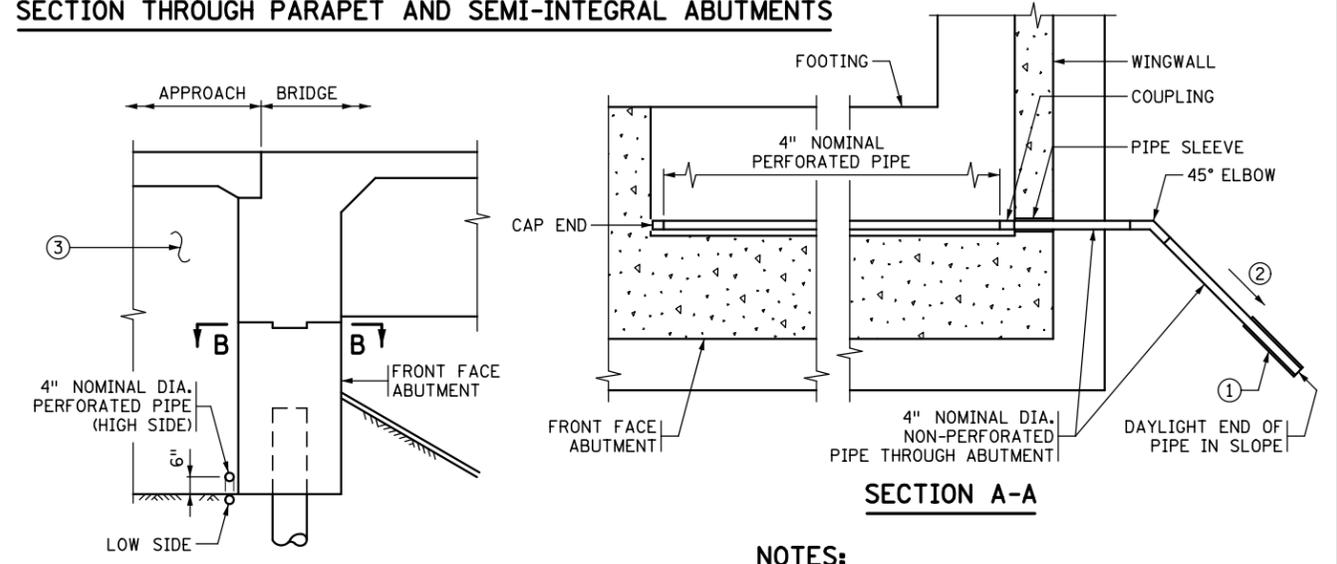
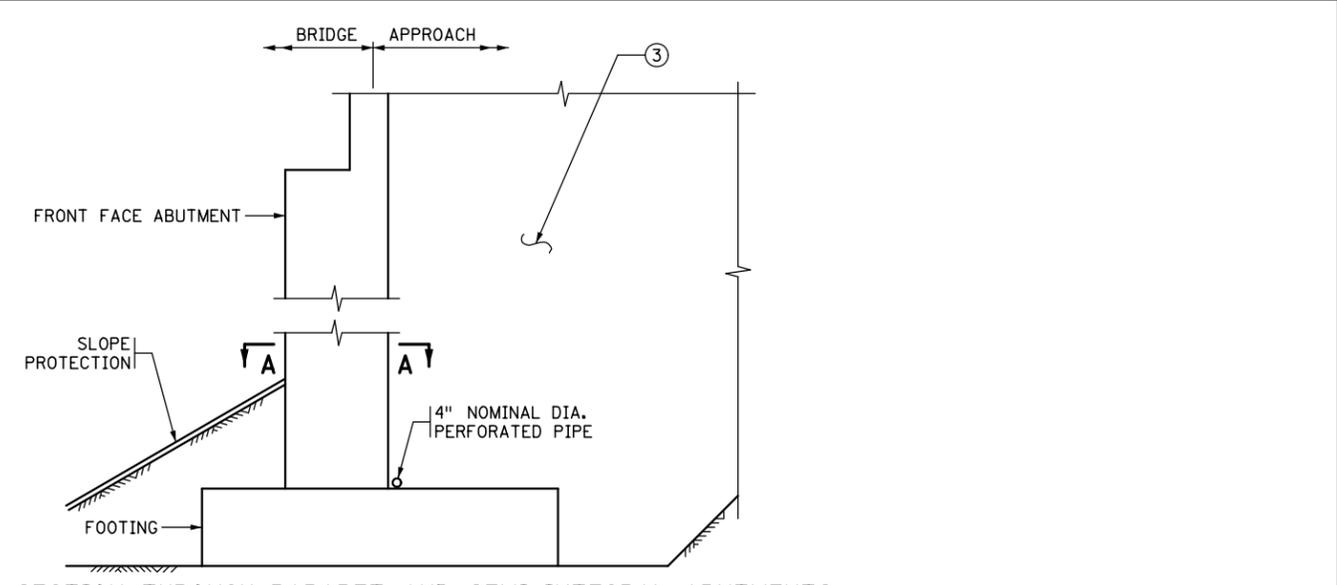
DATE: 4/1/2016 TIME: 12:49:54 PM FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\standard\CBR27B84_det03.dgn



BEAM HEIGHT	DISTANCE			CHANNEL SIZE
	A	B	C	
36M	1'-3"	7"	1'-0"	C12x20.7
MN45	1'-7 3/4"	7"	1'-0"	C12x20.7
MN54	1'-7 3/4"	1'-1"	1'-9"	MC18x42.7
MN63	1'-7 3/4"	1'-1"	2'-6"	MC18x42.7



NOTES:
 PROVIDE STEEL PER SPEC. 3306.
 INSTALL PER SPEC. 2405.3.K.
 TORQUE ALL BOLTS, INCLUDING ANCHOR BOLTS TO 80 FT.-LBS.
 SHOP BEND THE LEG OF THE 12" PLATE TO CONFORM TO THE DIAPHRAGM. A 3/8" x 6" x 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.
 INCLUDE ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, IN UNIT PRICE BID FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.
 BENT PLATES MAY BE USED IN PLACE OF CHANNELS IF THE BENT PLATES HAVE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, ARE 5/16" IN THICKNESS, AND HAVE LEGS 5" LONG.
 GALVANIZE STEEL PLATES AND SHAPES PER SPEC. 3394.
 GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.
 ① FOR SKEW ANGLES UNDER 20°, USE 90° LESS THE SKEW ANGLE.
 FOR SKEW ANGLES OVER 20°, USE 90°.



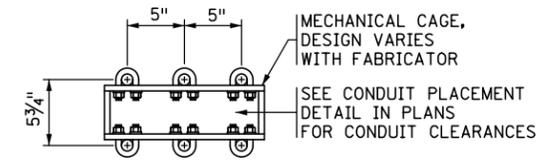
NOTES:
 PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON-PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.
 ALL PIPE TO COMPLY WITH SPEC. 3245.
 WRAP PERFORATED PIPE 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 1/8" PER FT. MINIMUM SLOPE.
 ③ REFER TO GRADING PLANS FOR ABUTMENT BACKFILL REQUIREMENTS.

APPROVED: NOVEMBER 03, 2015
 STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
 STEEL INTERMEDIATE DIAPHRAGM (FOR 36M, MN45 - MN63 PRESTRESSED CONCRETE BEAMS)
 REVISED
 DETAIL NO. B403

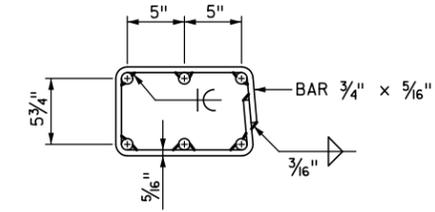
APPROVED: JANUARY 13, 2015
 STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
 DRAINAGE SYSTEM
 REVISED 12-02-2015
 DETAIL NO. B910

NO. DATE BY DESCRIPTION OF REVISIONS
 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
 DATE: 4/1/2016 LIC. NO.:
 444 Cedar Street, Suite 1500 Saint Paul, MN 55101 651.292.4400 tkda.com
 HENNEPIN COUNTY CSAH 46 OVER GODFREY PKWY S.A.P. 027-646-007
 TITLE: STANDARD DETAILS B403 & B910
 DES: LJL DR: LJL APPROVED
 CHK: GM CHK: GM
 SHEET NO. 79 OF 96 SHEETS
 BRIDGE NO. 27B84

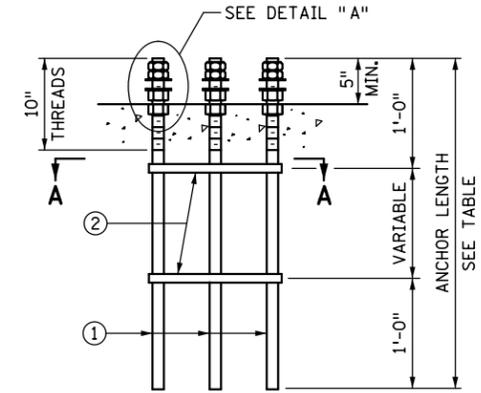
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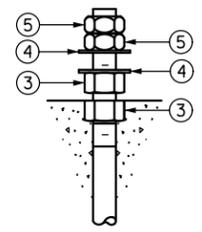
SECTION A-A
ALTERNATE MECHANICAL CAGE



SECTION A-A
ALTERNATE WELDED CAGE



ELEVATION



DETAIL "A"

STANDARD RAIL TYPES (SEE PLANS FOR TYPE)	ANCHOR LENGTH
TYPE "F" MEDIAN	3'-0"
TYPE "F" W/O CONCRETE WEARING COURSE	3'-0"
TYPE "F" W/ CONCRETE WEARING COURSE	3'-2"
TYPE "F" WITH SIDEWALK/ BRIDGE SLAB	3'-10"
TYPE "F" ON RETAINING WALL	3'-0"
CONCRETE PARAPET WITH FENCE	2'-8"

NOTES:

- ALL RODS ARE TO BE 1" NOMINAL DIA. WITH 1 - 8UNC - 2A THREADS. HEAVY HEX NUTS, JAM NUTS, AND FLAT WASHERS PER Mn/DOT SPEC. 3391.2A FOR 1" DIA. THREADED RODS. NUTS TO BE TAPPED 1/64" OVERSIZED PRIOR TO GALVANIZING, AND RETAPPED TO STANDARD SIZE AFTER GALVANIZING.
- GALVANIZE THREADED RODS, CAGES, AND NUTS AFTER FABRICATION AS PER Mn/DOT SPEC. 3392.
- TOP OF THE LOWER NUTS SHALL BE FLUSH WITH TOP OF CONCRETE RAILING.
- SUBSTITUTE MATERIALS PER Mn/DOT SPEC. 1605.
- ① THREADED RODS, STEEL AS PER Mn/DOT SPEC. 3309, 3310, OR 3385 TYPE B (6 REQUIRED).
- ② PROVIDE A MECHANICAL OR WELDED CAGE FOR ROD ALIGNMENT. STEEL AS PER Mn/DOT SPEC. 3306 (2 REQUIRED).
- ③ HEAVY HEX NUTS FOR 1" DIA. RODS (12 REQUIRED).
- ④ FLAT WASHERS FOR 1" DIA. RODS (12 REQUIRED).
- ⑤ JAM NUTS FOR 1" DIA. RODS (12 REQUIRED).

APPROVED: NOVEMBER 22, 2002

Daniel J. Morgan
STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
ANCHOR BOLT CLUSTER FOR LIGHT POLES

REVISED
10-26-2004
03-02-2005

DETAIL NO.
B950

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:

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tkda.com

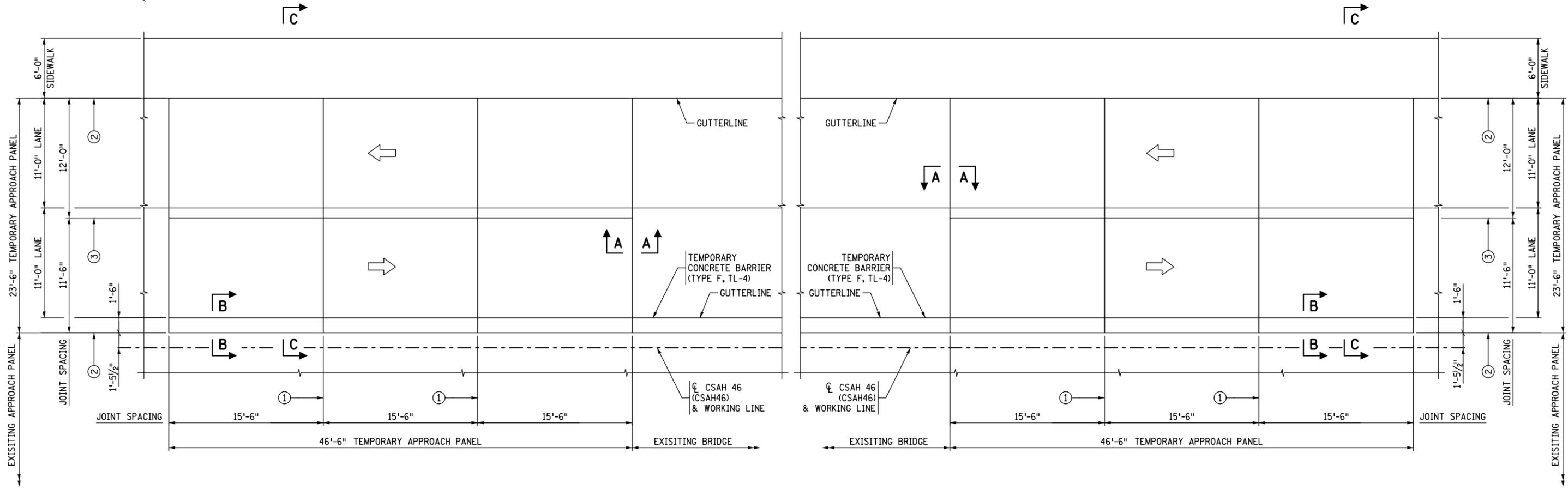
HENNEPIN COUNTY
CSAH 46 OVER GODFREY PKWY
S.A.P. 027-646-007

TITLE:
**STANDARD DETAIL
B950**

DES: LJJ DR: LJJ APPROVED
CHK: GM CHK: GM
SHEET NO. 80 OF 96 SHEETS

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:57 PM FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27\B84_app01.dgn



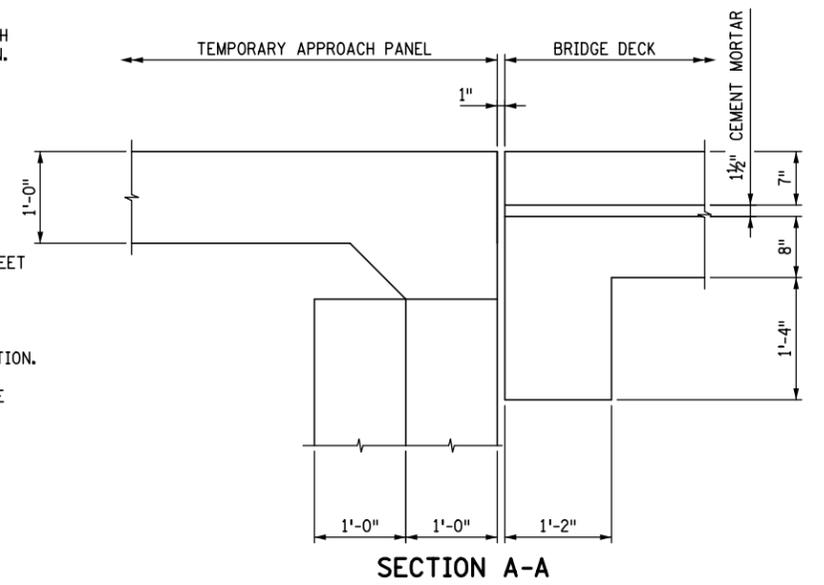
TEMPORARY APPROACH PANEL PLAN

NOTES:

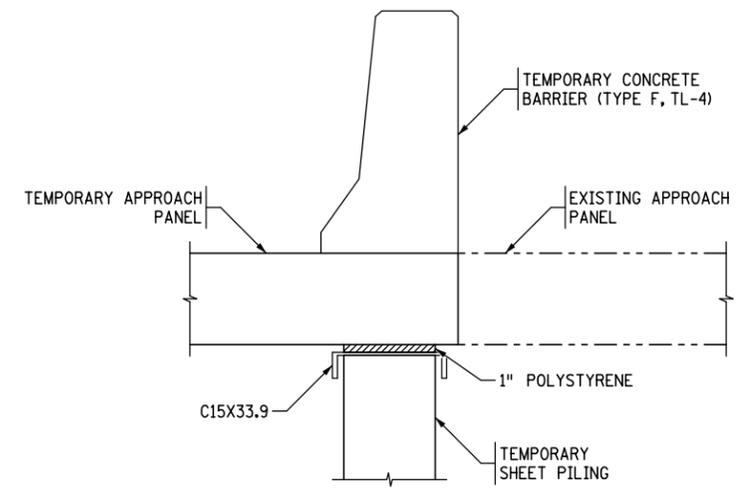
- ① C2H CONTRACTION JOINT. SEE DETAIL ON "APPROACH PANEL JOINT DETAILS" FOR ADDITIONAL INFORMATION.
- ② SAWCUT JOINT.
- ③ L1TH LONGITUDINAL JOINT. SEE DETAIL ON "APPROACH PANEL JOINT DETAILS" FOR ADDITIONAL INFORMATION.

GENERAL NOTES

MATCH EXISTING ROADWAY ELEVATIONS.
 SEE "TEMPORARY APPROACH PANEL REINFORCEMENT" SHEET FOR SECTION C-C.
 CONCRETE MIX SHALL BE 3552 FOR APPROACH PANEL.
 REFER TO MnDOT SPEC. 2406 FOR ADDITIONAL INFORMATION.
 ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN.



SECTION A-A



SECTION B-B

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:

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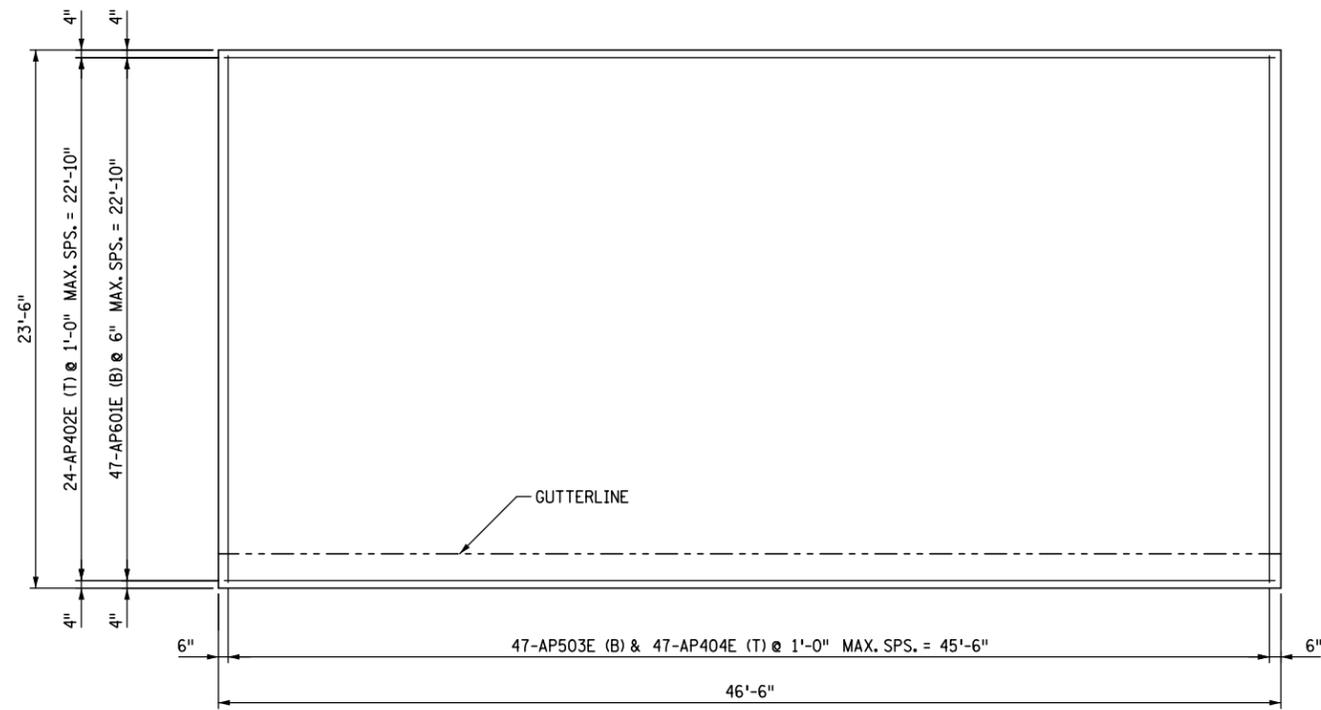
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
TEMPORARY APPROACH PANEL

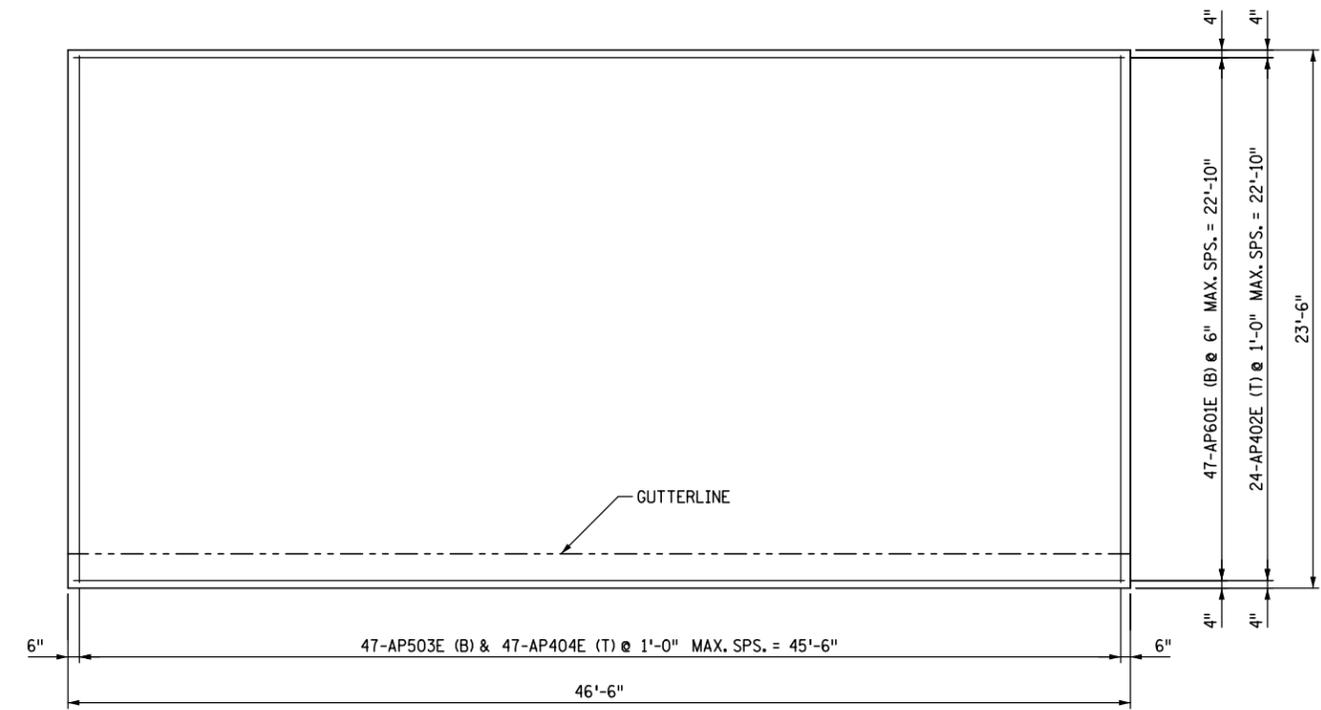
DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 81 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:57 PM
 FILENAME: K:\g-m\Hennepin\Cty\15854000\hwy-brdg\super\CBR27\B84_app02.dgn



NORTH TEMPORARY APPROACH PANEL REINFORCEMENT



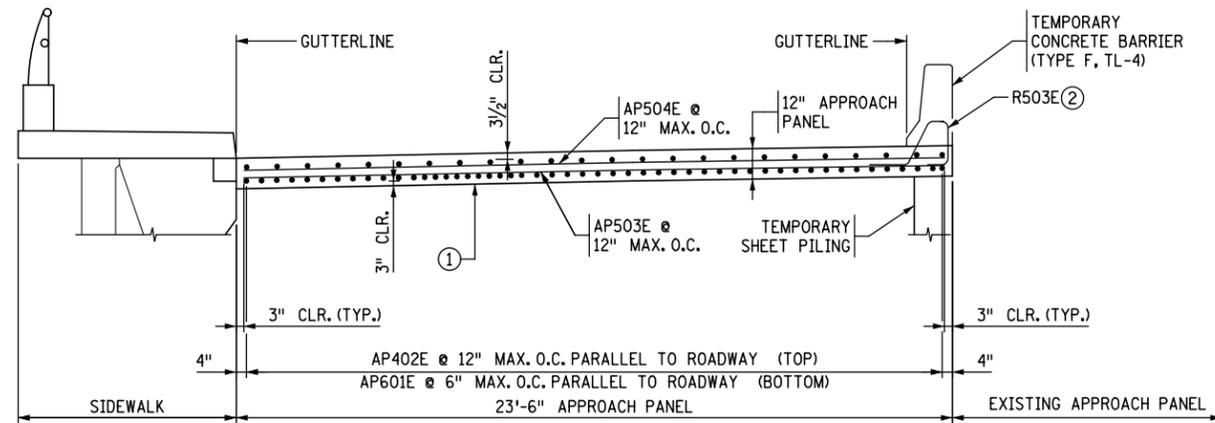
SOUTH TEMPORARY APPROACH PANEL REINFORCEMENT

NOTES:

AS PER MNDOT SPEC. 3301, USE EPOXY COATED GRADE 60 REINFORCEMENT BARS IN APPROACH PANEL.

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

- ① IF THE APPROACH PANEL IS TIED TO THE BRIDGE ABUTMENT WITH REINFORCEMENT BARS, PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF 6 MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM.
- ② 5 SPS. @ 3" = 1'-3".



TRANSVERSE SECTION C-C

FROM "TEMPORARY APPROACH PANEL LAYOUT" SHEET

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:



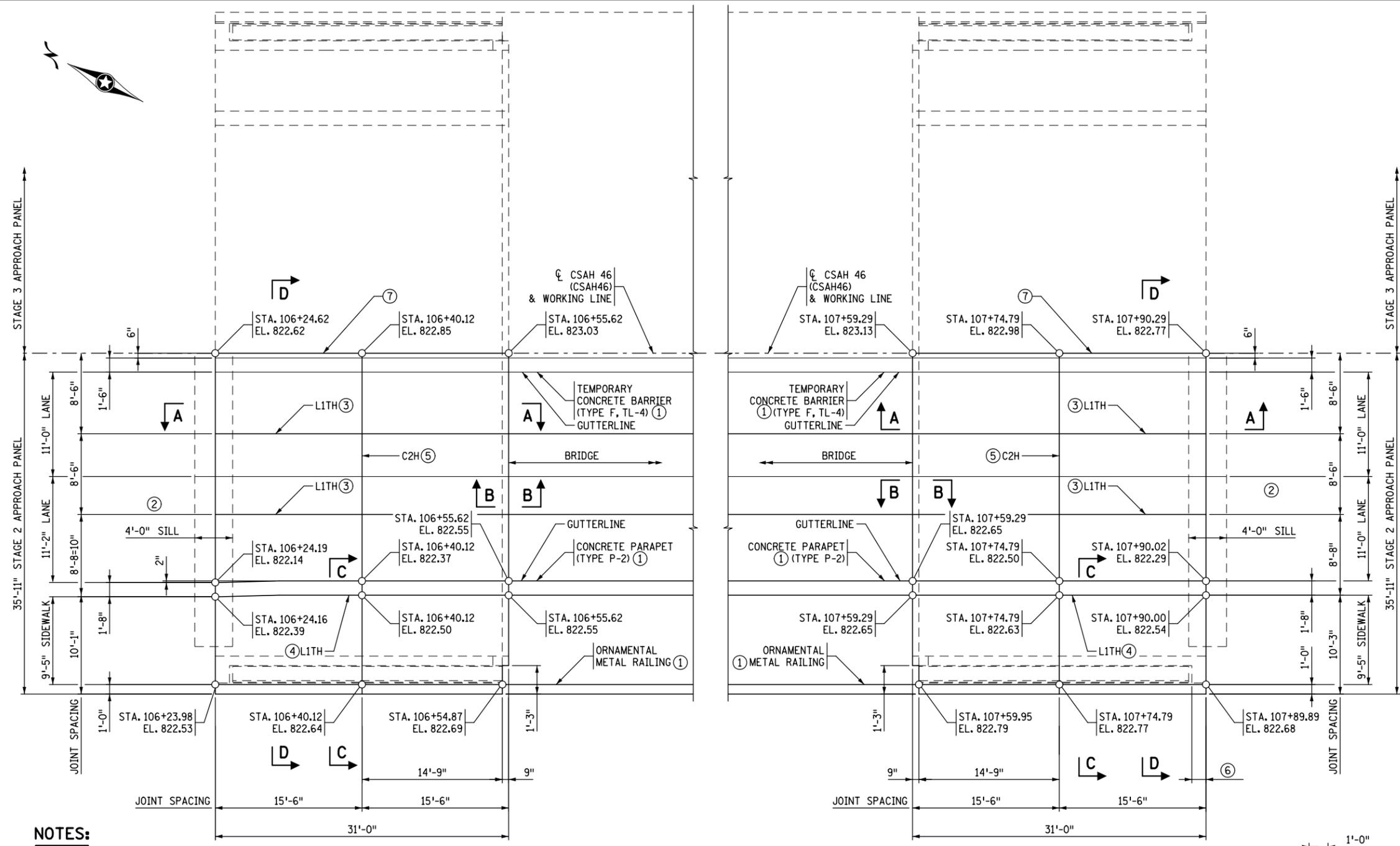
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
TEMPORARY APPROACH PANEL REINFORCEMENT

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 82 OF 96 SHEETS		

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:49:58 PM
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STAGE 2 APPROACH PANEL LAYOUT

NOTES:

- ① SEE BARRIER DETAILS.
 - ② SEE ROADWAY PLANS FOR ROADWAY DETAILS OFF OF APPROACH PANEL.
 - ③ L1TH LONGITUDINAL JOINT. SEE "BRIDGE APPROACH PANEL JOINT DETAILS" SHEET FOR ADDITIONAL DETAILS.
 - ④ L1TH LONGITUDINAL JOINT W/ MANDATORY CONSTRUCTION JOINT. SEE "BRIDGE APPROACH PANEL DETAILS" SHEET FOR REINFORCEMENT LAP LENGTH FOR STAGED CONSTRUCTION.
 - ⑤ C2H CONTRACTION JOINT. SEE "BRIDGE APPROACH PANEL DETAILS" FOR ADDITIONAL DETAILS.
- FROM THE END OF THE WINGWALL TO THE END OF THE APPROACH PANEL COPING IS 2'-0" (SEE SECTION C-C)
- BAR COUPLERS TO BE USED TO TIE THE STAGE 2 APPROACH PANEL AND STAGE 3 APPROACH PANEL TOGETHER. SEE BAR COUPLER DETAIL ON "STAGE 2 APPROACH PANEL REINFORCEMENT" SHEET.

GENERAL NOTES

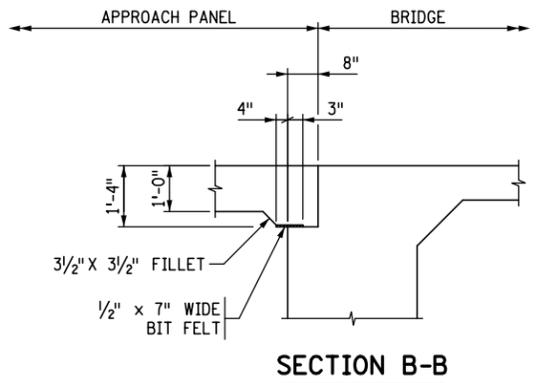
LONGITUDINAL SECTION A-A IS SHOWN ON "STAGE 2 APPROACH PANEL DETAILS" SHEET. SECTION D-D IS SHOWN ON "STAGE 2 APPROACH PANEL REINFORCEMENT" SHEET.

A CONCRETE SILL IS REQUIRED BENEATH EXPANSION JOINT TYPE E8H. EXTEND THE EXPANSION JOINT AND SILL ALONG THE FULL WIDTH OF THE TRAFFIC LANES, SHOULDERS, AND CURB. ENSURE THAT SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT. CONCRETE SILL IS INCIDENTAL TO THE APPROACH PANEL.

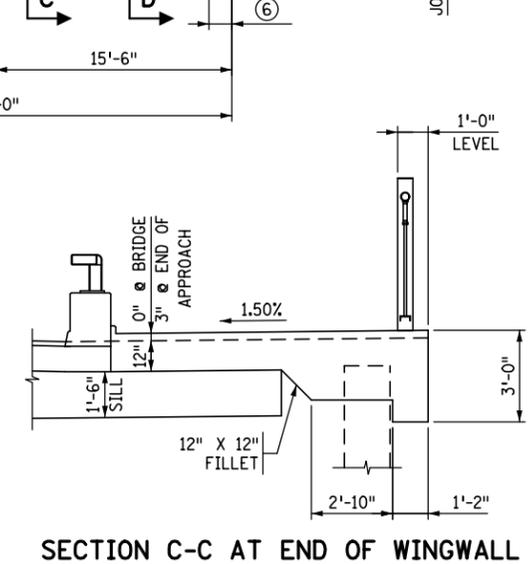
CONCRETE MIX SHALL BE 3552 FOR APPROACH PANEL AND SILL.

REFER TO MnDOT SPEC. 2406 FOR ADDITIONAL INFORMATION.

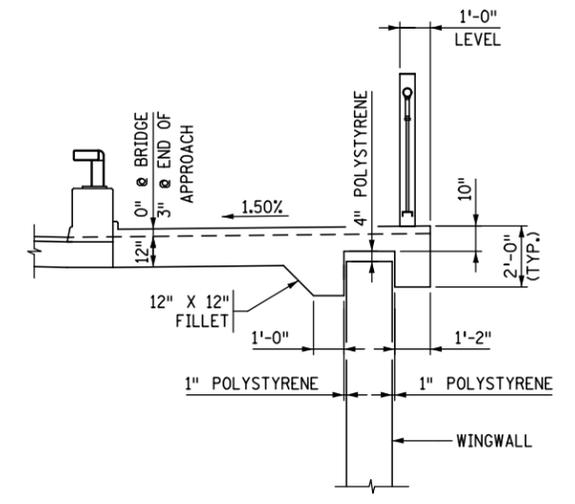
ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN.



SECTION B-B



SECTION C-C AT END OF WINGWALL



SECTION C-C AT WINGWALL

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



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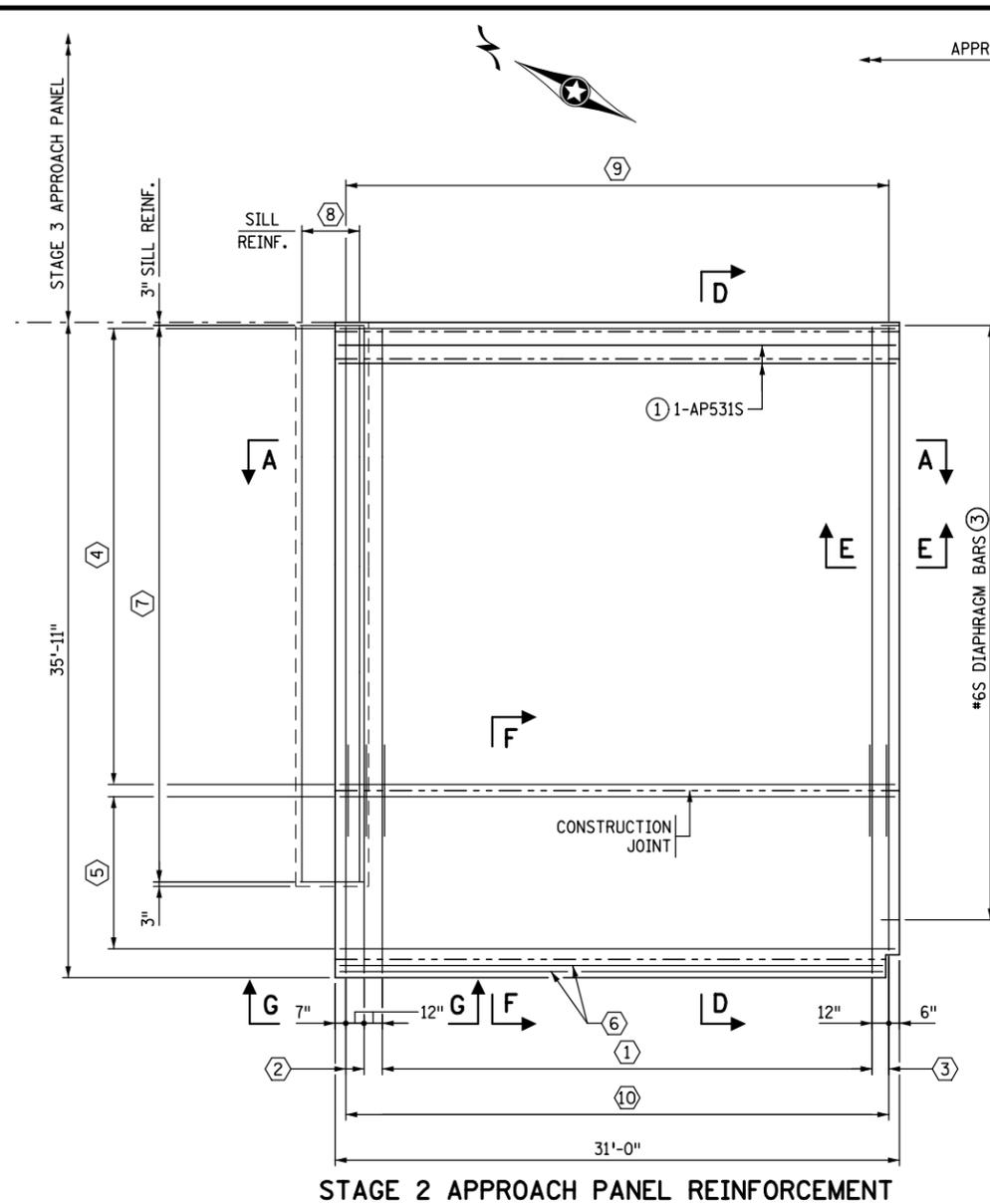
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
STAGE 2 APPROACH PANEL LAYOUT AND JOINT LAYOUT

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 83 OF 96 SHEETS		

BRIDGE NO.
27B84

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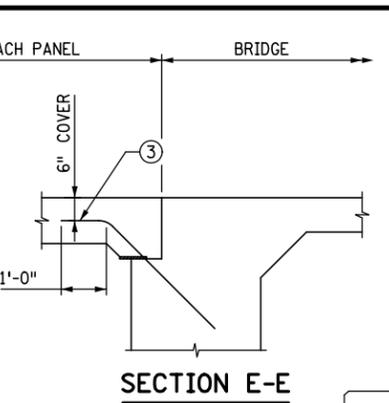
STAGE 2 APPROACH PANEL REINFORCEMENT
(NORTH APPROACH PANEL SHOWN, SOUTH APPROACH SIMILAR BY SYMMETRY)

BAR CALL-OUTS:

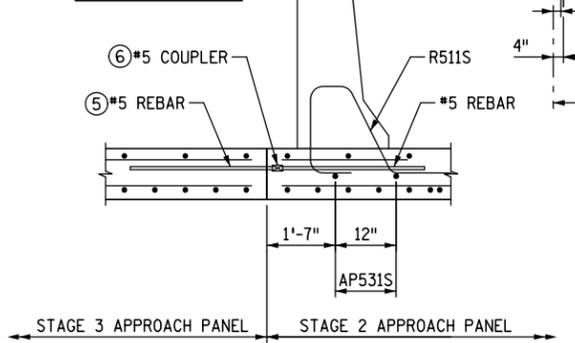
- ① 28-AP515E (B), 27-AP516E (B), 28-AP419E (T), 28-AP420E(T), 28-AP522E, & 30-AP523E @ 12" SPS. = 27'-0". SEE SECTION F-F AT WINGWALL FOR PLACEMENT DETAILS.
- ② 1-AP515E (B), 1-AP517E (B), 1-AP419E (T), 1-AP420E (T), 1-AP524E, & 1-AP525E SPACED AS SHOWN. SEE SECTION F-F AT END OF WINGWALL FOR PLACEMENT DETAILS.
- ③ 1-AP515E (B), 1-AP518E (B), 1-AP419E (T), & 1-AP421E (T) PLACED AS SHOWN.
- ④ 51-AP610E (B) & 26-AP413E (T) SPACED AS SHOWN IN SECTION D-D.
- ⑤ 17-AP610E (B) & 10-AP413E (T) SPACED AS SHOWN IN SECTION F-F AT WINGWALL.
- ⑥ 3-AP511E, 2-AP512E, & 2-AP414E (T) SPACED AS SHOWN IN SECTION F-F.
- ⑦ 22-AP426E (T&B) & 44-AP427E (PLACED IN PAIRS) @ 1'-6" MAX. SPS. = 30'-5".
- ⑧ 3-AP528E (T&B) & 2-AP429E SPACED AS SHOWN IN SECTION A-A.
- ⑨ 31-#5 REBAR COUPLERS SPACED WITH TRANSVERSE REINFORCEMENT.
- ⑩ 31-AP530E (T&B) CONSTRUCTION JOINT TIES SPACED TO MATCH TRANSVERSE REINFORCEMENT. SEE SECTION F-F FOR DETAILS.

NOTES:

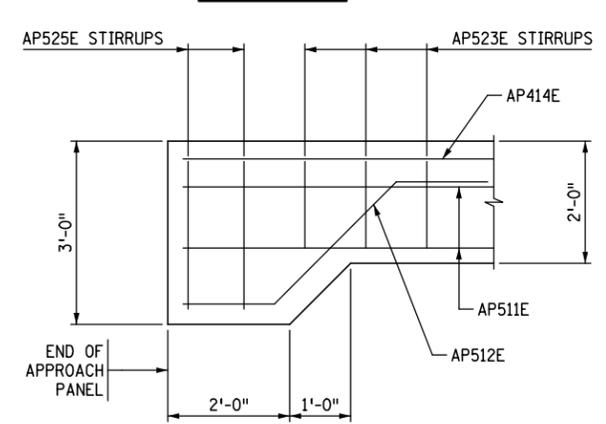
- LONGITUDINAL SECTION A-A IS SHOWN ON "STAGE 2 APPROACH PANEL DETAILS" SHEET.
- AS PER MnDOT SPEC. 3301, USE EPOXY COATED GRADE 60 REINFORCEMENT BARS IN APPROACH PANEL, AND CONCRETE SILL.
- BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH MnDOT SPEC. 3301.
- ① 2" MINIMUM CLEARANCE IS REQUIRED BETWEEN ANY STAINLESS STEEL BARRIER BARS AND ANY EPOXY COATED APPROACH PANEL BARS.
- ② APPROACH PANEL IS TIED TO THE BRIDGE ABUTMENT WITH REINFORCEMENT BARS, PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF 6 MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM.
- ③ #6S DIAPHRAGM BARS. FOR SPACING AND DETAIL, REFER TO DIAPHRAGM SHEETS.
- ④ FOR QUANTITIES AND SPACING OF BARRIER DOWELS TO BE PLACED WITH APPROACH PANEL SEE BARRIER DETAILS SHEETS.
- ⑤ PRIOR TO STAGE 3 CONSTRUCTION, REMOVE SACRIFICIAL INSERT. INSTALL #5 REBAR, PROJECTING 2'-4" MIN. BEYOND COUPLER.
- ⑥ BAR COUPLER, REBARS EXTENDING FROM COUPLER, AND SACRIFICIAL INSERTS TO BE PAID FOR AT THE UNIT PRICE BID FOR "COUPLERS (REINFORCEMENT BARS) T-5". BAR COUPLERS AND REBAR TO BE STAINLESS STEEL.



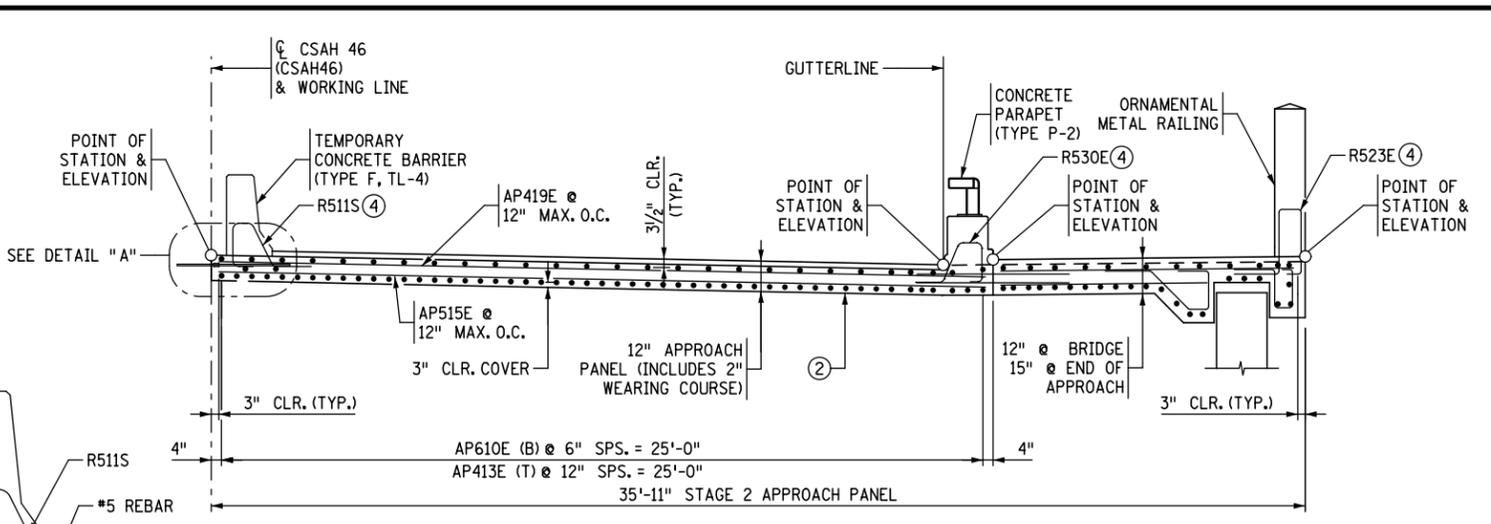
SECTION E-E



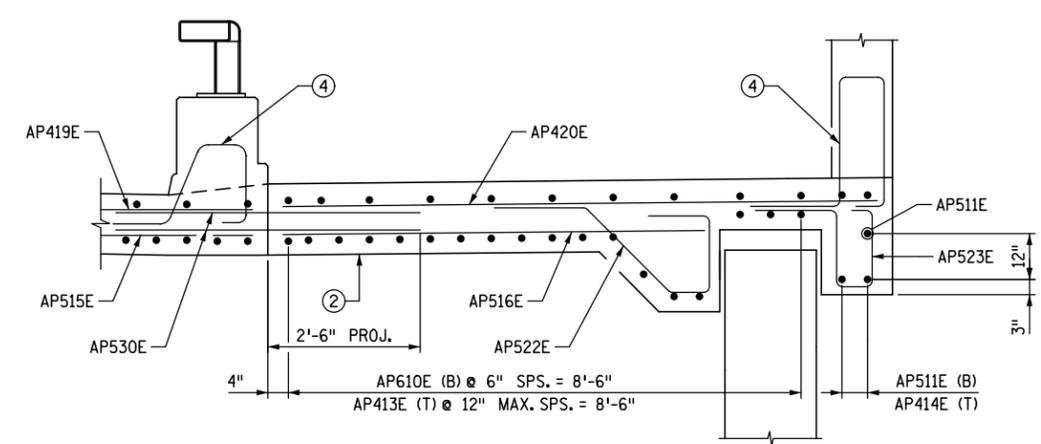
DETAIL "A"



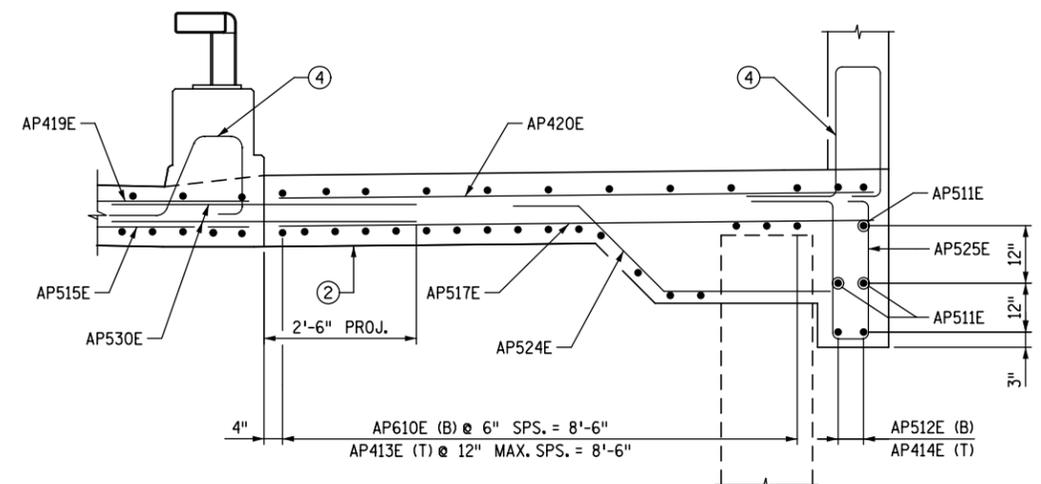
SECTION G-G



TRANSVERSE SECTION D-D



SECTION F-F AT WINGWALL



SECTION F-F AT END OF WINGWALL

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



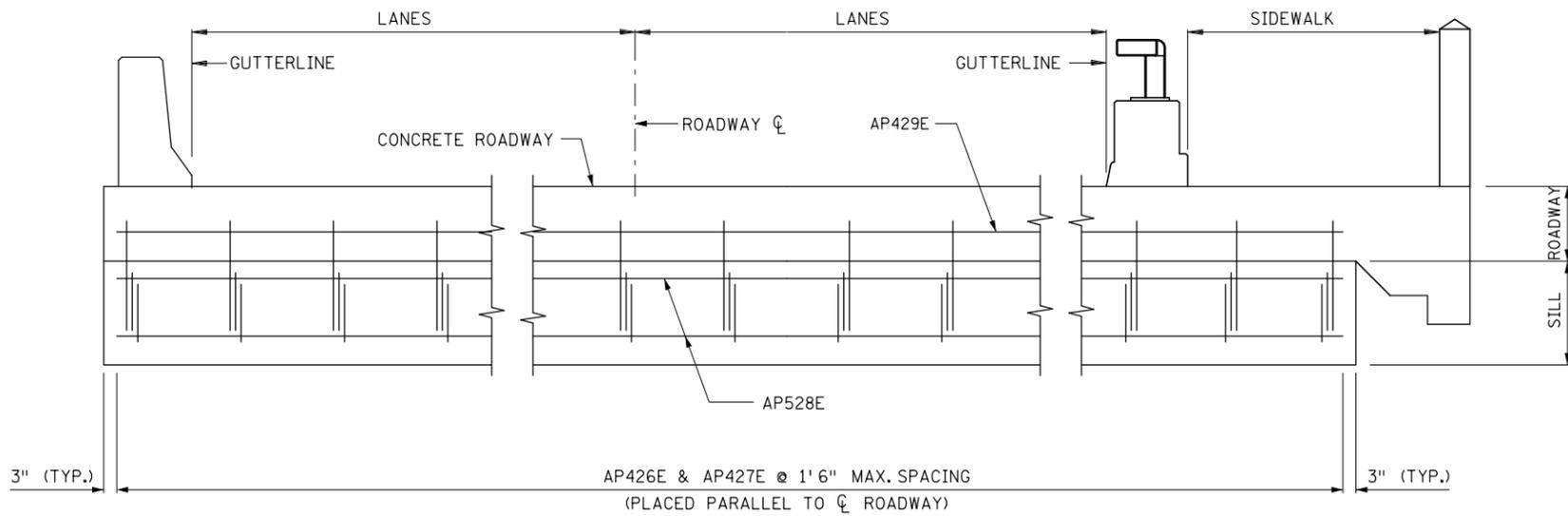
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
STAGE 2 APPROACH PANEL REINFORCEMENT

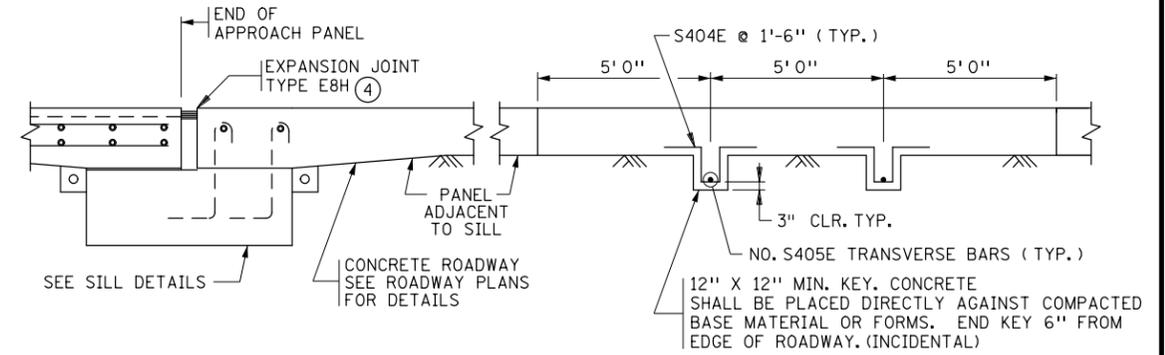
DES: HAP DR: HAP APPROVED
 CHK: JRM CHK: JRM
 SHEET NO. 84 OF 96 SHEETS

BRIDGE NO.
27B84

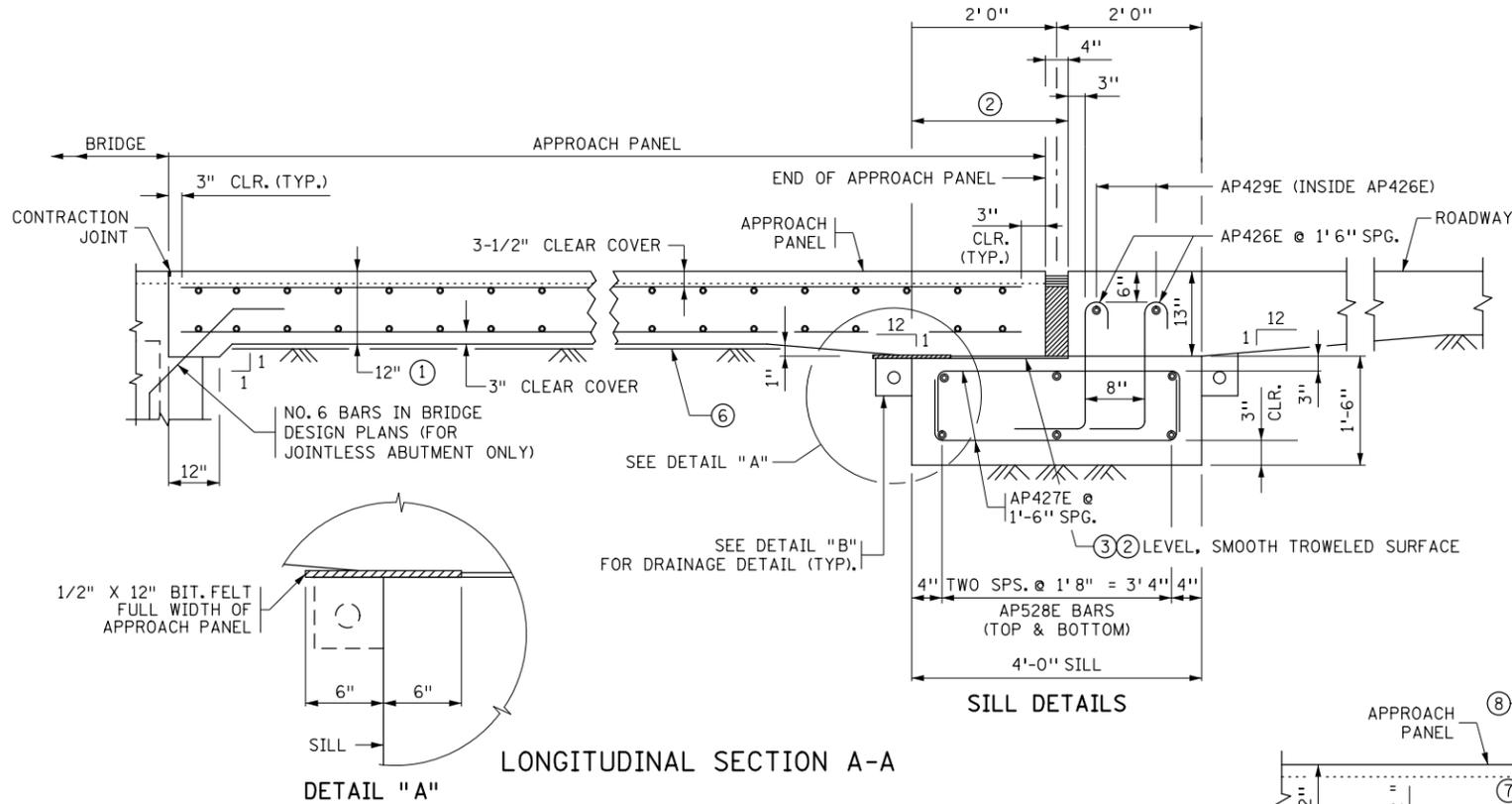
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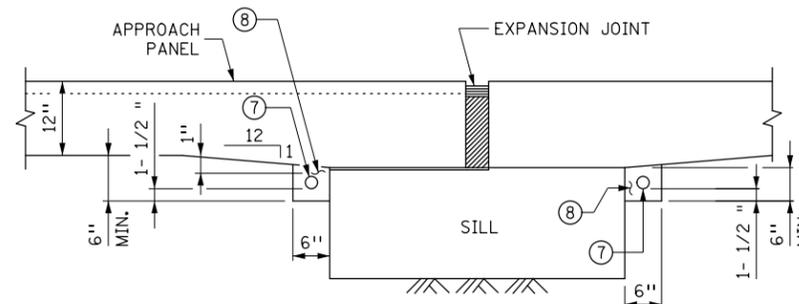
SILL ELEVATION
 (REINFORCEMENT IN PAVEMENT NOT SHOWN)



SILL & CONCRETE MAINLINE



LONGITUDINAL SECTION A-A
 DETAIL "A"



DETAIL "A"

MODIFIED:

- MODIFIED SILL ELEVATION.
- REMOVED BARLIST AND BAR BEDDING DIAGRAMS.
- ADDED DRAINAGE DETAILS AROUND SILL.
- REMOVED DETAILS IRRELEVANT TO PROJECT.

NOTES:

- AS PER MNDOT 3301, USE EPOXY COATED GRADE 60 REINFORCEMENT BARS.
- ENSURE THAT SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT.
- ① APPROACH SLAB THICKNESS IS 12" (12" MONOLITHIC OR 10" SLAB + 2" WEARING COURSE). CHECK BRIDGE PLANS FOR CONCRETE WEARING COURSE, WHICH IS INCLUDED IN BRIDGE PLAN QUANTITIES.
- ② PLACE PLASTIC SHEETING (MNDOT 3756) AS APPROVED BY THE ENGINEER TO BREAK BOND. COVER AREA SHOWN IN DETAIL. (SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM).
- ③ REQUIRED CONSTRUCTION JOINT.
- ④ DETAILS OF EXPANSION JOINT TYPE E8H ARE SHOWN ON STANDARD PLAN 5-297.229.
- ⑤ NOT USED
- ⑥ APPROACH PANEL IS TIED TO THE BRIDGE ABUTMENT WITH REINFORCEMENT BARS, PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF 6 MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM.
- ⑦ 4-INCH NOMINAL DIAMETER THERMOPLASTIC PIPE, AS PER ASTM D1785M, SCHEDULE 40. SLOPE PIPE TO DITCH. WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER SPEC. 3733. 1/8 INCH PER 12 INCH MINIMUM SLOPE. FURNISHING AND INSTALLING THE DRAIN SYSTEM IS INCIDENTAL.
- ⑧ BACKFILL WITH FINE AGGREGATE (MNDOT 3149) MODIFIED TO 0-3% PASSING A NO. 200 SIEVE (INCIDENTAL).

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____

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

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

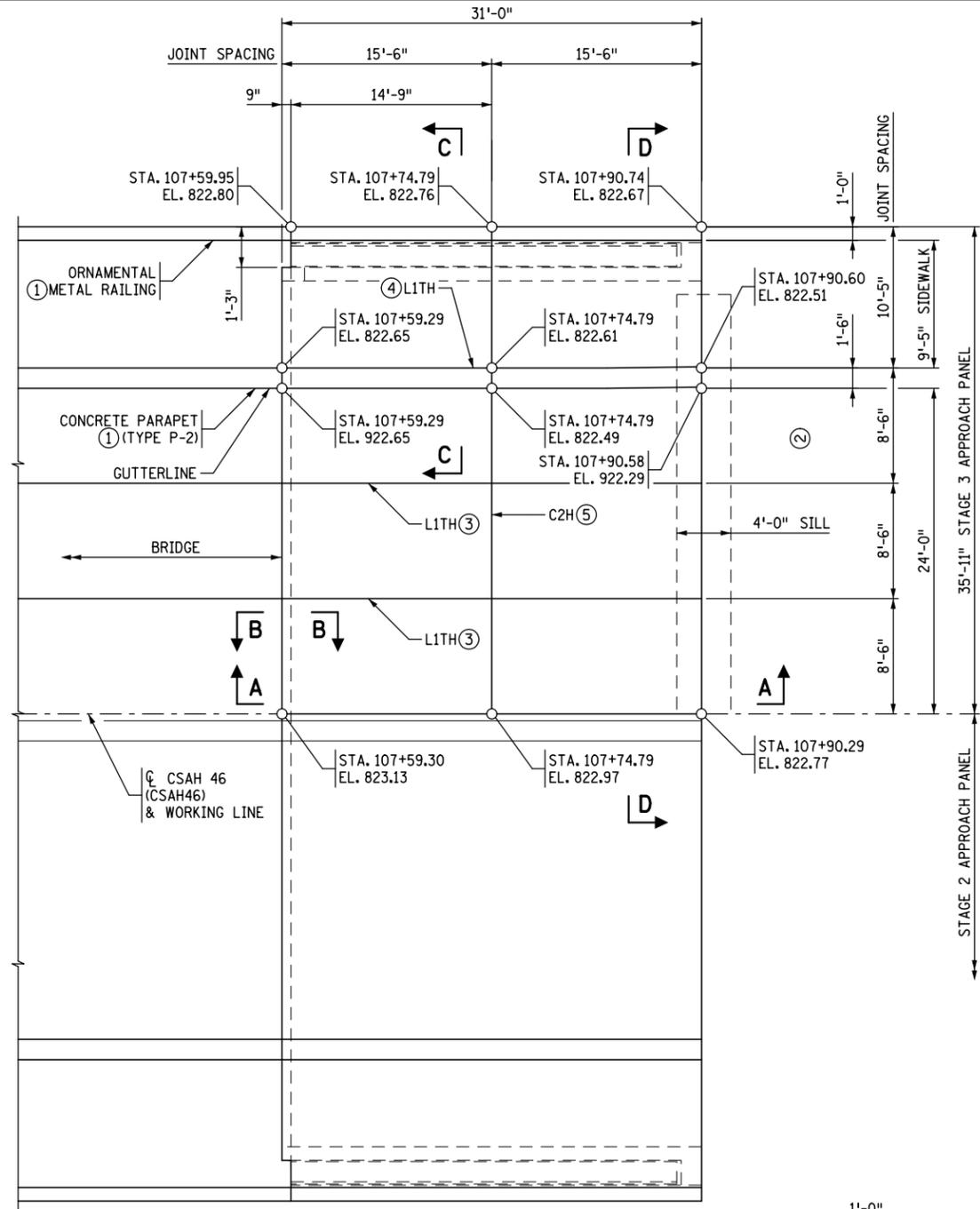
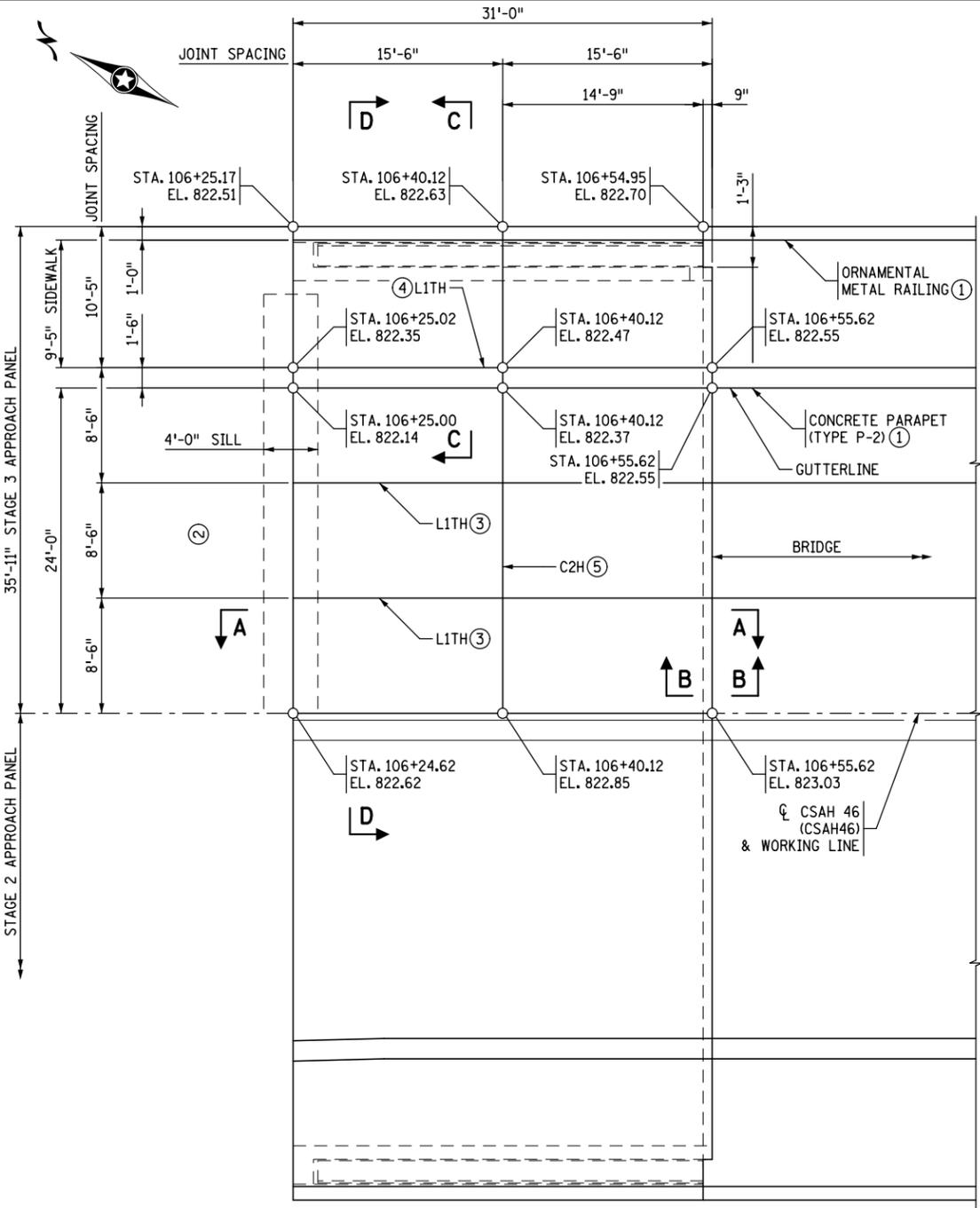
TITLE:
 STAGE 2 APPROACH PANEL
 DETAILS

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 85 OF 96 SHEETS		

STANDARD PLAN SHEET NO.
5-297.227
 REVISION DATE
 3-22-2013
 STANDARD APPROVED:
 DECEMBER 20, 2011

BRIDGE NO.
27B84

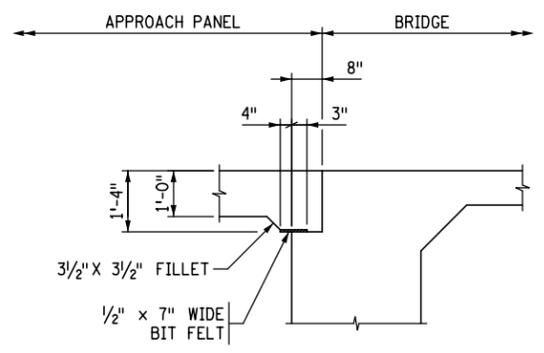
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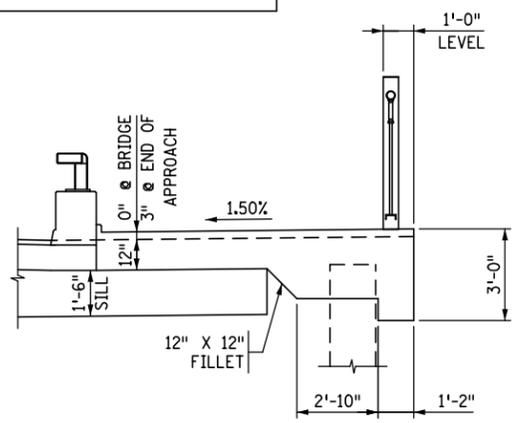
STAGE 3 APPROACH PANEL LAYOUT

GENERAL NOTES
 LONGITUDINAL SECTION A-A IS SHOWN ON "STAGE 3 APPROACH PANEL DETAILS" SHEET. SECTION D-D IS SHOWN ON "STAGE 3 APPROACH PANEL REINFORCEMENT" SHEET.
 A CONCRETE SILL IS REQUIRED BENEATH EXPANSION JOINT TYPE EBH. EXTEND THE EXPANSION JOINT AND SILL ALONG THE FULL WIDTH OF THE TRAFFIC LANES, SHOULDERS, AND CURB. ENSURE THAT SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT. CONCRETE SILL IS INCIDENTAL TO THE APPROACH PANEL.
 CONCRETE MIX SHALL BE 3352 FOR APPROACH PANEL AND SILL.
 REFER TO MnDOT SPEC. 2406 FOR ADDITIONAL INFORMATION.
 ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN.

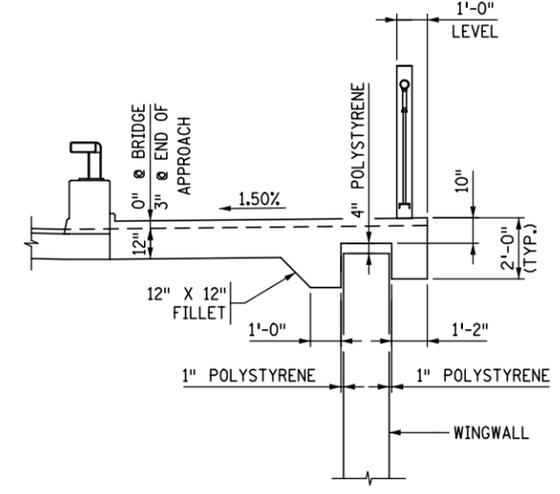
- NOTES:**
- SEE BARRIER DETAILS.
 - SEE ROADWAY PLANS FOR ROADWAY DETAILS OFF OF APPROACH PANEL.
 - L1TH LONGITUDINAL JOINT. SEE "BRIDGE APPROACH PANEL JOINT DETAILS" SHEET FOR REINFORCEMENT LAP LENGTH FOR STAGED CONSTRUCTION.
 - L1TH LONGITUDINAL JOINT W/ MANDATORY CONSTRUCTION JOINT. SEE "BRIDGE APPROACH PANEL JOINT DETAILS" SHEET FOR REINFORCEMENT LAP LENGTH FOR STAGED CONSTRUCTION.
 - C2H CONTRACTION JOINT.



SECTION B-B



SECTION C-C AT END OF WINGWALL



SECTION C-CAT WINGWALL

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:



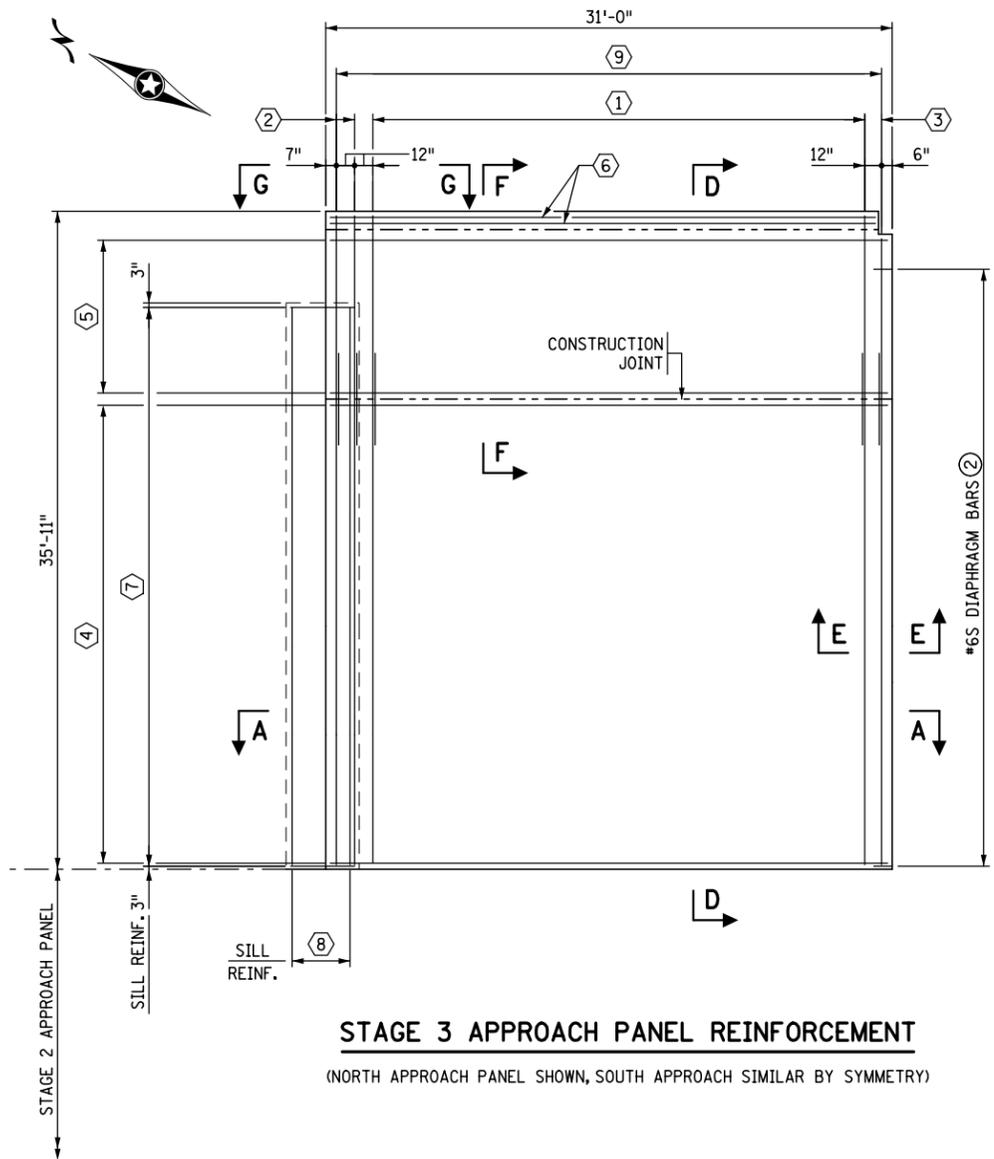
444 Cedar Street, Suite 1500
 Saint Paul, MN 55101
 651.292.4400
 tkda.com

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
 STAGE 3 APPROACH PANEL
 LAYOUT AND JOINT LAYOUT
 DES: HAP DR: HAP APPROVED
 CHK: JRM CHK: JRM
 SHEET NO. 86 OF 96 SHEETS

BRIDGE NO.
 27B84

DATE: 4/1/2016 TIME: 12:50:02 PM FILENAME: k:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27B84_app07.dgn



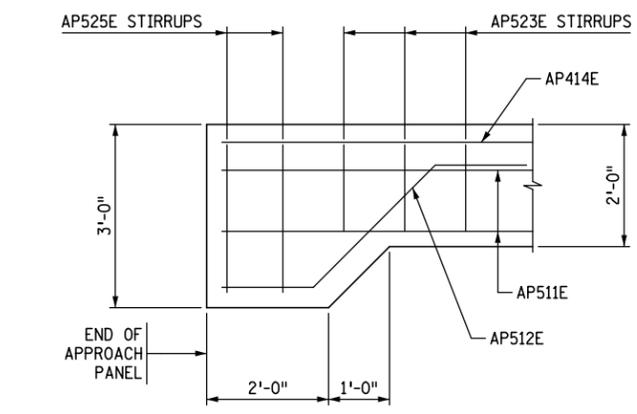
STAGE 3 APPROACH PANEL REINFORCEMENT
(NORTH APPROACH PANEL SHOWN, SOUTH APPROACH SIMILAR BY SYMMETRY)

BAR CALL-OUTS:

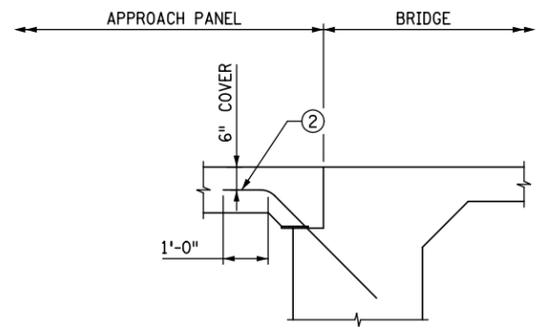
- ① 28-AP515E (B), 27-AP516E (B), 28-AP419E (T), 28-AP420E(T), 28-AP522E, & 30-AP523E @ 12" SPS. = 27'-0". SEE SECTION F-F AT WINGWALL FOR PLACEMENT DETAILS.
- ② 1-AP515E (B), 1-AP517E (B), 1-AP419E (T), 1-AP420E (T), 1-AP524E, & 1-AP525E SPACED AS SHOWN. SEE SECTION F-F AT END OF WINGWALL FOR PLACEMENT DETAILS.
- ③ 1-AP515E (B), 1-AP518E (B), 1-AP419E (T), & 1-AP421E (T) PLACED AS SHOWN.
- ④ 51-AP610E (B) & 26-AP413E (T) SPACED AS SHOWN IN SECTION D-D.
- ⑤ 17-AP610E (B) & 10-AP413E (T) SPACED AS SHOWN IN SECTION F-F AT WINGWALL.
- ⑥ 3-AP511E, 2-AP512E, & 2-AP414E (T) SPACED AS SHOWN IN SECTION F-F.
- ⑦ 22-AP426E (T&B) & 44-AP427E (PLACED IN PAIRS) @ 1'-6" MAX. SPS. = 30'-5".
- ⑧ 3-AP528E (T&B) & 2-AP429E SPACED AS SHOWN IN SECTION A-A.
- ⑨ 31-AP530E (T&B) CONSTRUCTION JOINT TIES SPACED TO MATCH TRANSVERSE REINFORCEMENT. SEE SECTION F-F FOR DETAILS.

NOTES:

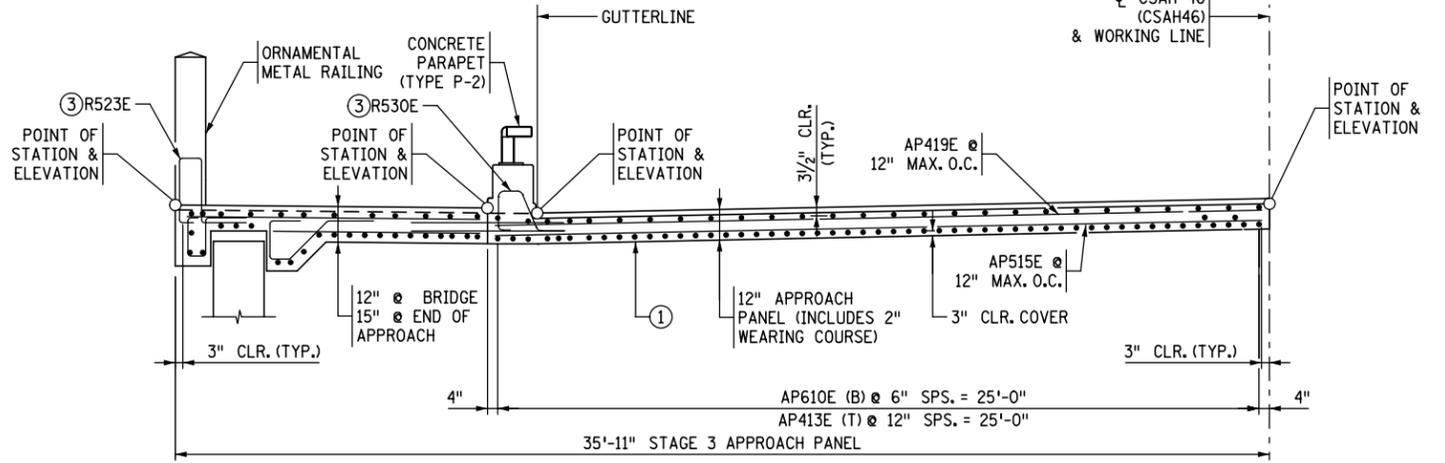
- AS PER MnDOT SPEC. 3301, USE EPOXY COATED GRADE 60 REINFORCEMENT BARS IN APPROACH PANEL AND CONCRETE SILL.
- BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH MnDOT SPEC. 3301.
- REFER TO "STAGE 2 APPROACH PANEL REINFORCEMENT" FOR BAR COUPLER DETAIL.
- ① APPROACH PANEL IS TIED TO THE BRIDGE ABUTMENT WITH REINFORCEMENT BARS, PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF 6 MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM.
- ② #6S DIAPHRAGM BARS. FOR SPACING AND DETAIL, REFER TO DIAPHRAGM SHEETS.
- ③ FOR QUANTITIES AND SPACING OF BARRIER DOWELS TO BE PLACED WITH APPROACH PANEL SEE BARRIER DETAILS SHEETS.



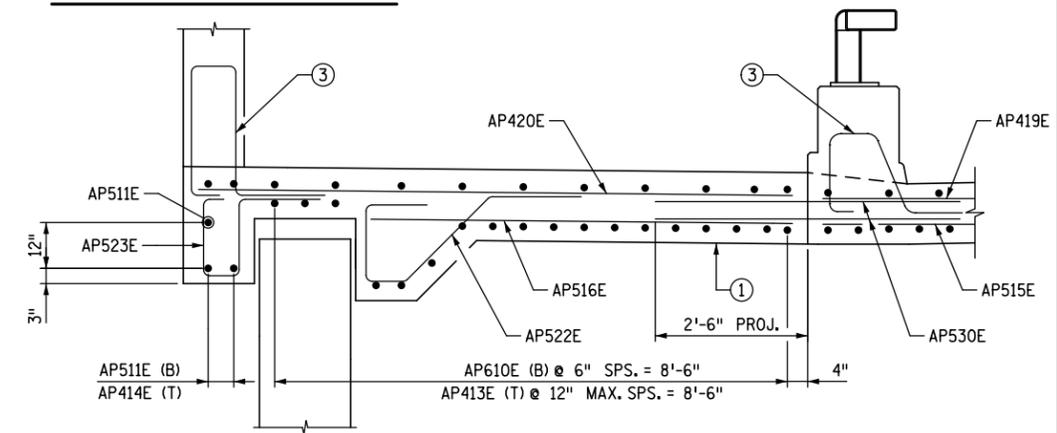
SECTION G-G



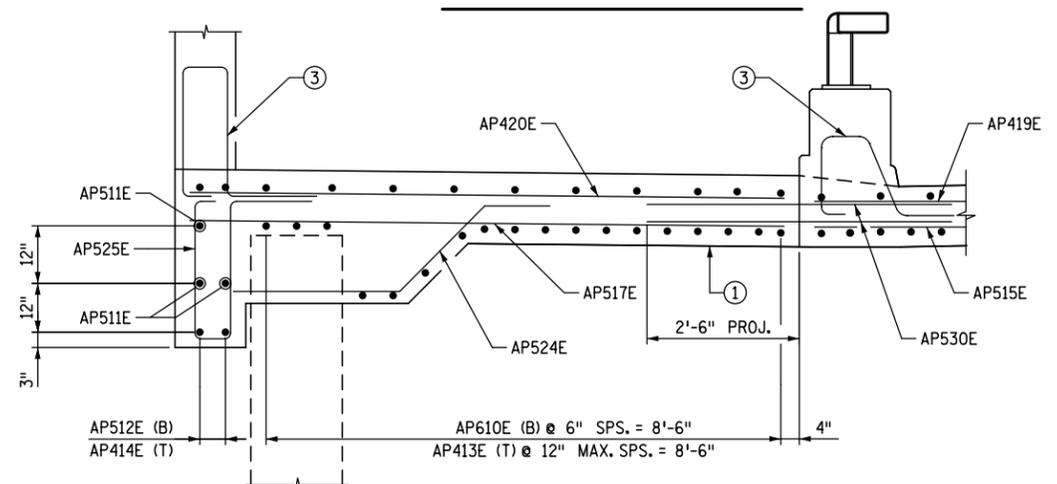
SECTION E-E



TRANSVERSE SECTION D-D



SECTION F-F AT WINGWALL



SECTION F-F AT END OF WINGWALL

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____



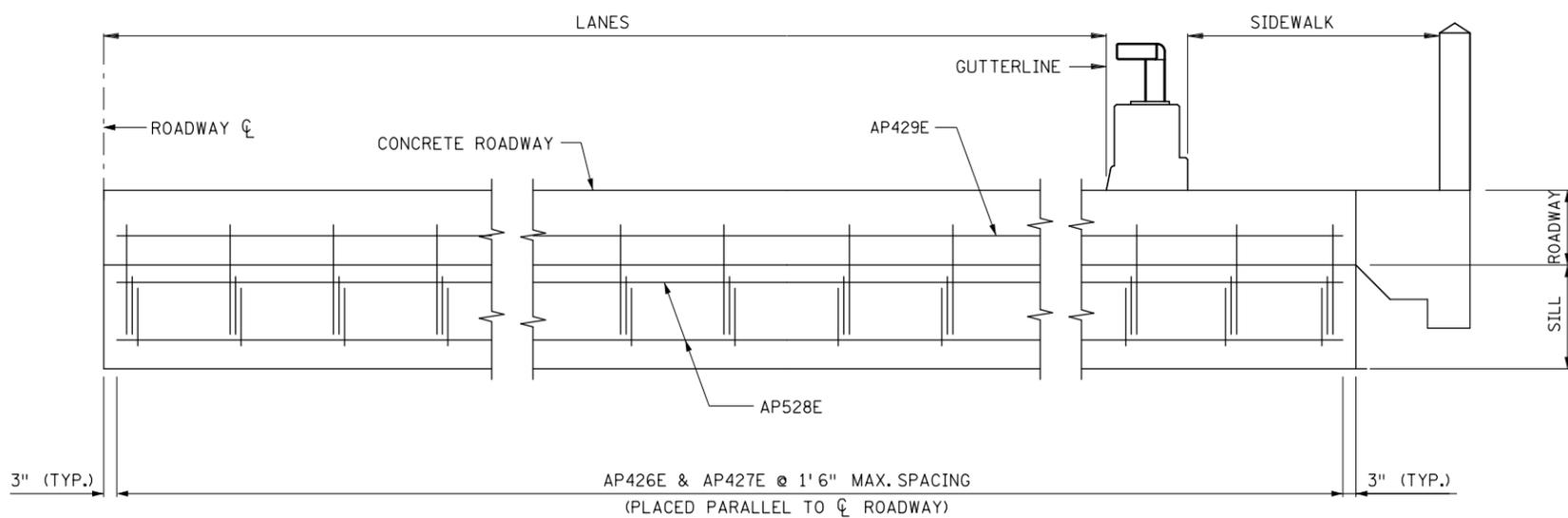
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
STAGE 3 APPROACH PANEL REINFORCEMENT

DES: HAP
 CHK: JRM
 DR: HAP
 CHK: JRM
 APPROVED
 SHEET NO. 87 OF 96 SHEETS

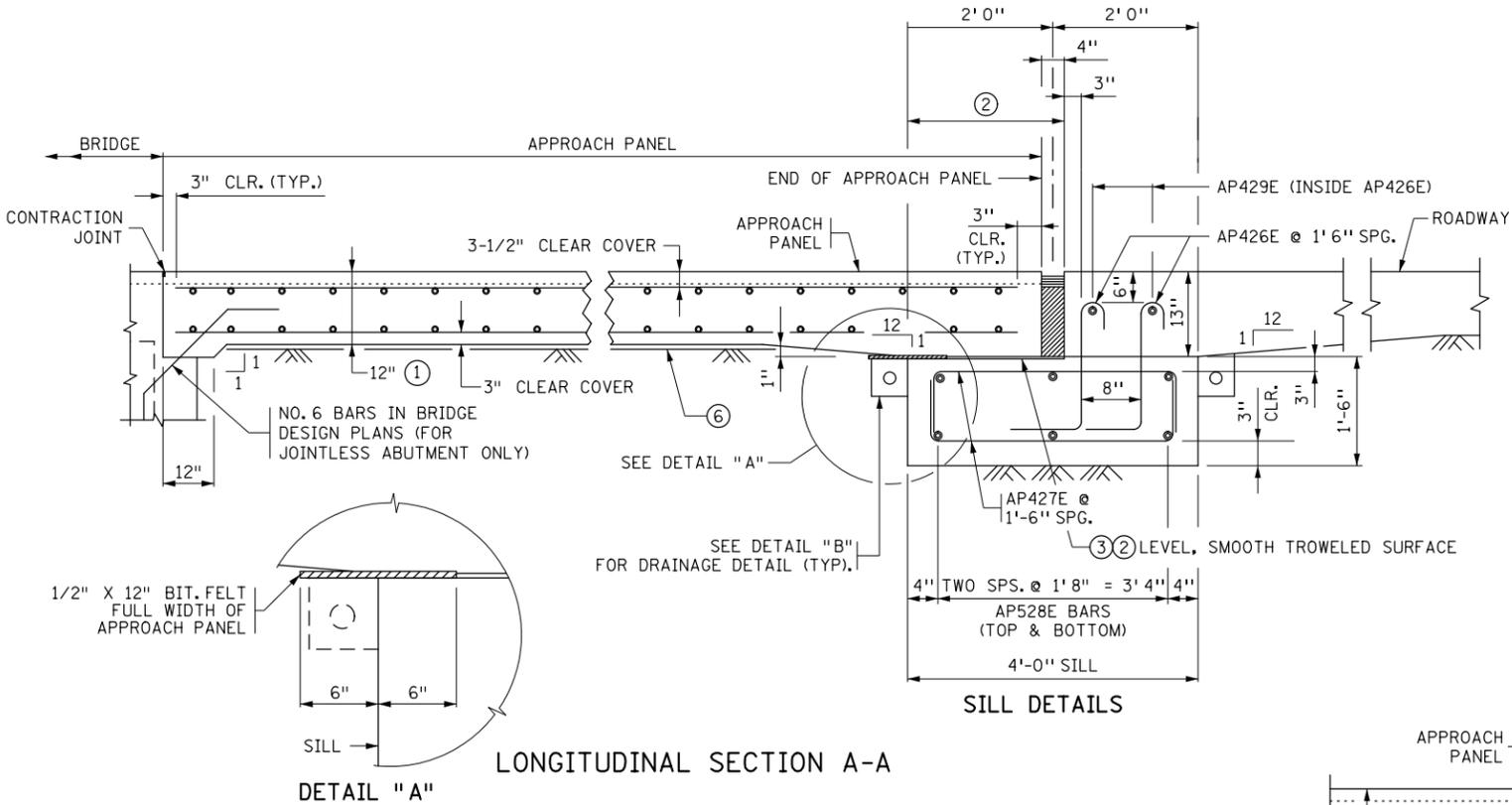
BRIDGE NO.
27B84

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SILL ELEVATION

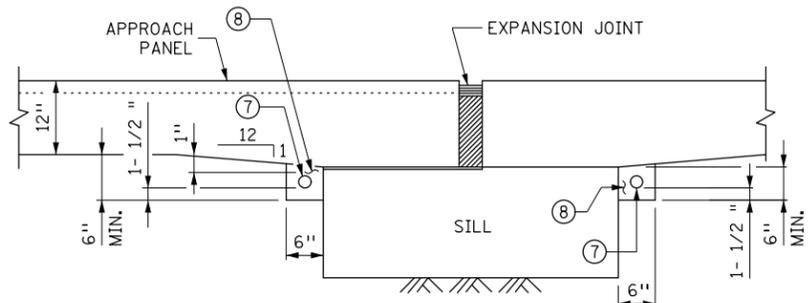
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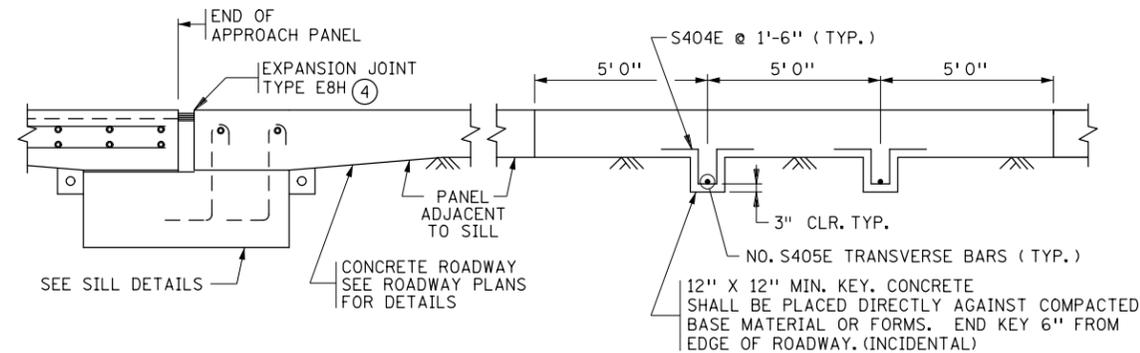
LONGITUDINAL SECTION A-A

DETAIL "A"

SILL DETAILS



DETAIL "A"



SILL & CONCRETE MAINLINE

MODIFIED:

- MODIFIED SILL ELEVATION.
- REMOVED BARLIST AND BAR BEDDING DIAGRAMS.
- ADDED DRAINAGE DETAILS AROUND SILL.
- REMOVED DETAILS IRRELEVANT TO PROJECT.

NOTES:

- AS PER MNDOT 3301, USE EPOXY COATED GRADE 60 REINFORCEMENT BARS.
- ENSURE THAT SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT.
- ① APPROACH SLAB THICKNESS IS 12" (12" MONOLITHIC OR 10" SLAB + 2" WEARING COURSE). CHECK BRIDGE PLANS FOR CONCRETE WEARING COURSE, WHICH IS INCLUDED IN BRIDGE PLAN QUANTITIES.
 - ② PLACE PLASTIC SHEETING (MNDOT 3756) AS APPROVED BY THE ENGINEER TO BREAK BOND. COVER AREA SHOWN IN DETAIL. (SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM).
 - ③ REQUIRED CONSTRUCTION JOINT.
 - ④ DETAILS OF EXPANSION JOINT TYPE E8H ARE SHOWN ON STANDARD PLAN 5-297.229.
 - ⑤ NOT USED
 - ⑥ APPROACH PANEL IS TIED TO THE BRIDGE ABUTMENT WITH REINFORCEMENT BARS, PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF 6 MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM.
 - ⑦ 4-INCH NOMINAL DIAMETER THERMOPLASTIC PIPE, AS PER ASTM D1785M, SCHEDULE 40. SLOPE PIPE TO DITCH. WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER SPEC. 3733. 1/8 INCH PER 12 INCH MINIMUM SLOPE. FURNISHING AND INSTALLING THE DRAIN SYSTEM IS INCIDENTAL.
 - ⑧ BACKFILL WITH FINE AGGREGATE (MNDOT 3149) MODIFIED TO 0-3% PASSING A NO. 200 SIEVE (INCIDENTAL).

STANDARD PLAN SHEET NO.
5-297.227

REVISION DATE
3-22-2013

STANDARD APPROVED:
DECEMBER 20, 2011

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.: _____

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 444 Cedar Street, Suite 1500
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 tkda.com

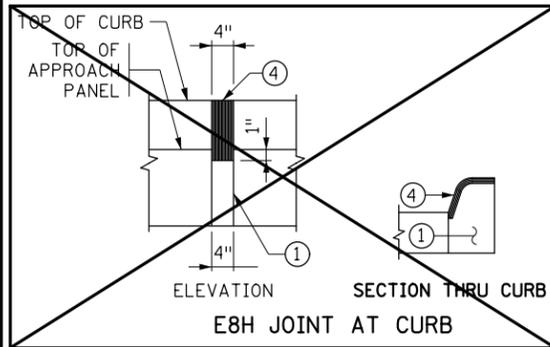
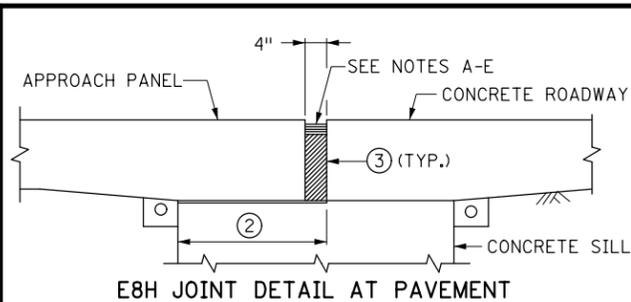
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
**STAGE 3 APPROACH PANEL
 DETAILS**

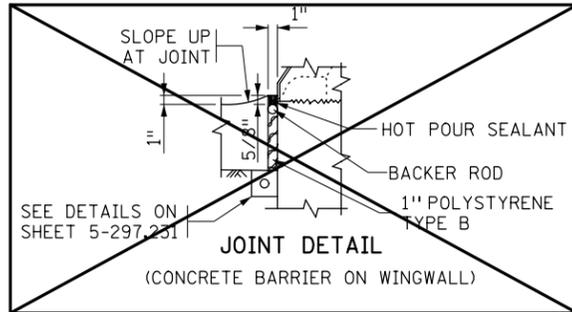
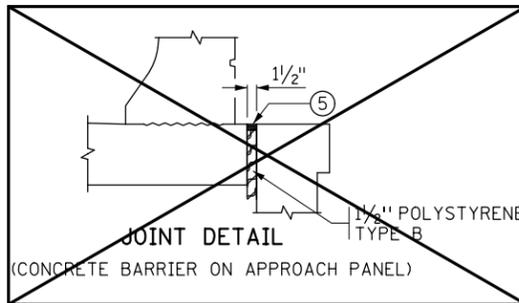
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 CHK: JRM CHK: JRM
SHEET NO. 88 OF 96 SHEETS

BRIDGE NO.
27B84

DATE: 4/1/2016 TIME: 12:50:04 PM
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EXPANSION JOINTS



E8H PRESSURE RELIEF JOINT MATERIAL INSTALLATION INSTRUCTIONS:

SEE MNDOT APPROVED/QUALIFIED PRODUCTS LIST.

FURNISH AND INSTALL JOINT MATERIAL IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE FOLLOWING:

- EXPANSION JOINT FILLER MATERIALS USED FOR A 4 INCH PRESSURE RELIEF JOINT CONSISTS OF A PREFORMED FOAM PRODUCT HAVING MINIMUM DIMENSIONS OF 4.5 INCHES IN WIDTH (MAY BE LAMINATED) AND 8 INCHES IN DEPTH, AND A MINIMUM LENGTH OF 10 FEET. WHEN THE CONCRETE DEPTH IS GREATER THAN THE DEPTH OF THE PRESSURE RELIEF MATERIAL, FILL THE VOID BELOW THE MATERIAL WITH POLYSTYRENE. FURNISH AND INSTALL THE JOINT MATERIAL UNDER COMPRESSION WITH A LUBRICANT ADHESIVE APPLIED TO THE CONCRETE CONTACT SURFACES.
- SAW OR FORM THE JOINTS 4 INCHES WIDE BY THE FULL-DEPTH OF THE PANEL. INSPECT TO ASSURE THAT THE INSIDE WALLS OF THE JOINT HAVE BEEN SANDBLASTED, ARE DRY, SMOOTH AND FREE OF DEBRIS AND LOOSE PARTICLES. APPLY TAPE TO THE TOP 1 INCH OF THE INSIDE WALLS TO PREVENT THE LUBRICANT ADHESIVE FROM CONTAMINATING THE CONCRETE BONDING SURFACES OF THE SUBSEQUENTLY PLACED HOT POUR JOINT SEALER.
- PAINT THE INSIDE WALLS OF THE JOINT WITH LUBRICANT ADHESIVE AT THE RATE OF 1 GALLON PER 50 LINEAL FEET OF JOINT.
- PINCH THE BOTTOM OF THE MATERIAL TOGETHER AND PUSH IT DOWN INTO THE JOINT. WALK THE MATERIAL DOWN INTO THE JOINT; USE A SLEDGEHAMMER AND A 2 X 4 IF NECESSARY. APPLY LUBRICANT ADHESIVE TO THE ENDS OF THE PREFORMED FOAM MATERIAL WHEN BUTTING TWO PIECES TOGETHER.
- FURNISH AND INSTALL THE FOAM RELIEF JOINT MATERIAL TO A DEPTH OF APPROXIMATELY 7/8 INCH BELOW THE FINISHED CONCRETE SURFACE. AFTER INSTALLATION, REMOVE THE TAPE AND FILL THE VOID ON TOP OF THE FOAM MATERIAL WITH APPROXIMATELY 1/2 INCH OF HOT POUR JOINT SEALER (MNDOT 3723 OR 3725) TO A LEVEL OF 3/8 INCH +/- 1/4 INCH BELOW THE FINISHED CONCRETE SURFACE. THE HOT POUR JOINT SEALER SHOULD ONLY SLIGHTLY MELT INTO THE FOAM JOINT MATERIAL (TO PREVENT EXCESSIVE MELTING OF THE JOINT MATERIAL, PLACE THE HOT POUR SEALER AT THE LOWER END OF THE TEMPERATURE SPECIFICATION). CHECK FOR CORRECT TEMPERATURE BY PLACING HOT POUR SEALER ON A SAMPLE OF WASTE FOAM MATERIAL.

EXPANSION JOINT NOTES:

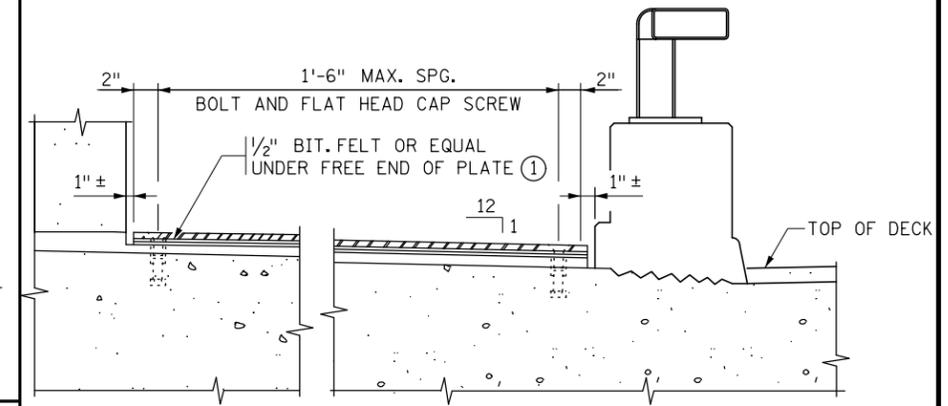
- PREFORMED JOINT FILLER MATERIAL, SPEC. 3702.
- PLACE PLASTIC SHEETING SPEC. 3756 AS APPROVED BY THE ENGINEER TO BREAK BOND. COVER AREA SHOWN IN DETAIL. SEE SILL DETAILS ON STANDARD PLAN 5-297.227.
- THE JOINT FACES SHALL BE CLEANED AND DRIED BY SANDBLASTING AND AIR BLASTING PRIOR TO SEALING THE JOINT.
- HOT POUR JOINT SEALER SPEC. 3725. TOP OF SEALER FLUSH TO 1/8 INCH BELOW TOP OF PAVEMENT SURFACE. MAKE TOP OF SEALER FOR CURB SECTION E8H JOINTS FLUSH WITH SURFACE (+ 1/8 INCH OR - 1/8 INCH).
- SEAL WITH SELF-LEVELING SILICONE PER MNDOT 3722.

SIDEWALK COVER PLATE

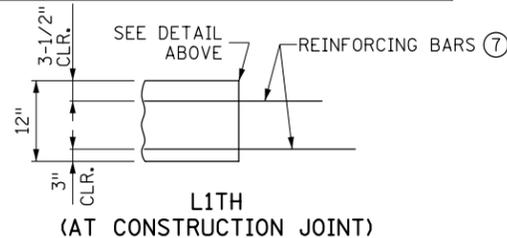
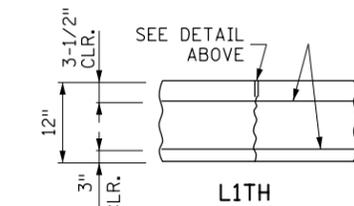
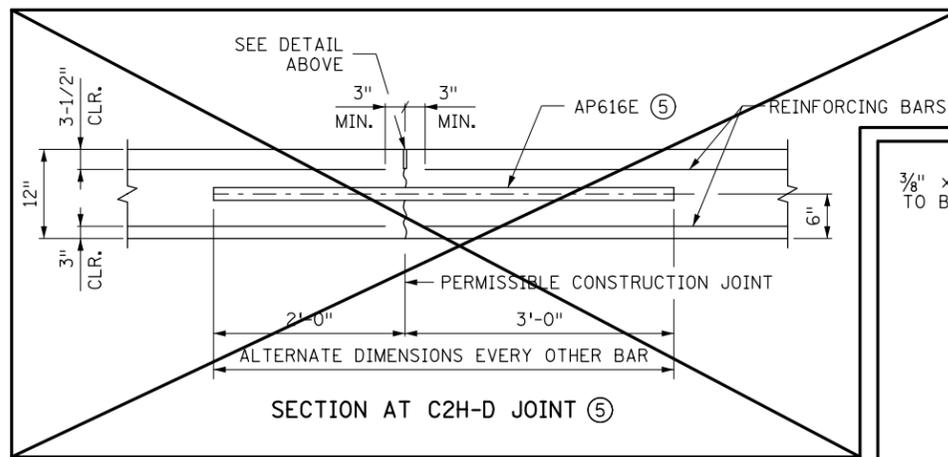
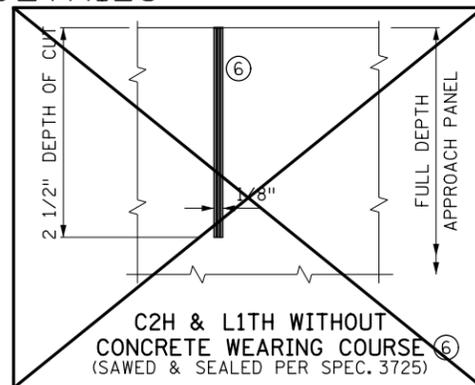
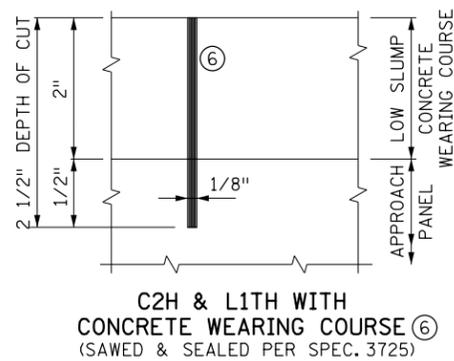
GENERAL NOTES:

- GALVANIZE STRUCTURAL STEEL AFTER FABRICATION PER Mn/DOT SPEC. 3394
- GALVANIZE FASTENERS PER Mn/DOT SPEC. 3392.
- STRUCTURAL STEEL SHALL COMPLY WITH Mn/DOT SPEC. 3306 OR Mn/DOT SPEC. 3309.
- SHOP DRAWING SUBMITTALS REQUIRED PER Mn/DOT SPEC. 2471.
- CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE.
- FURNISHING AND INSTALLING SIDEWALK COVER PLATE IS INCIDENTAL.

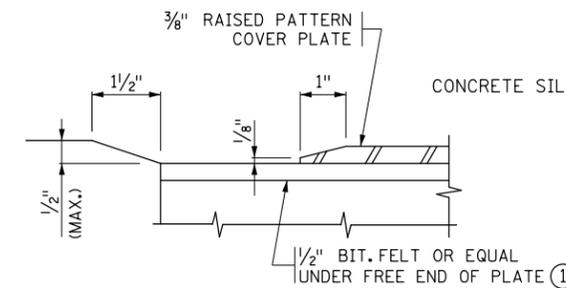
- USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.



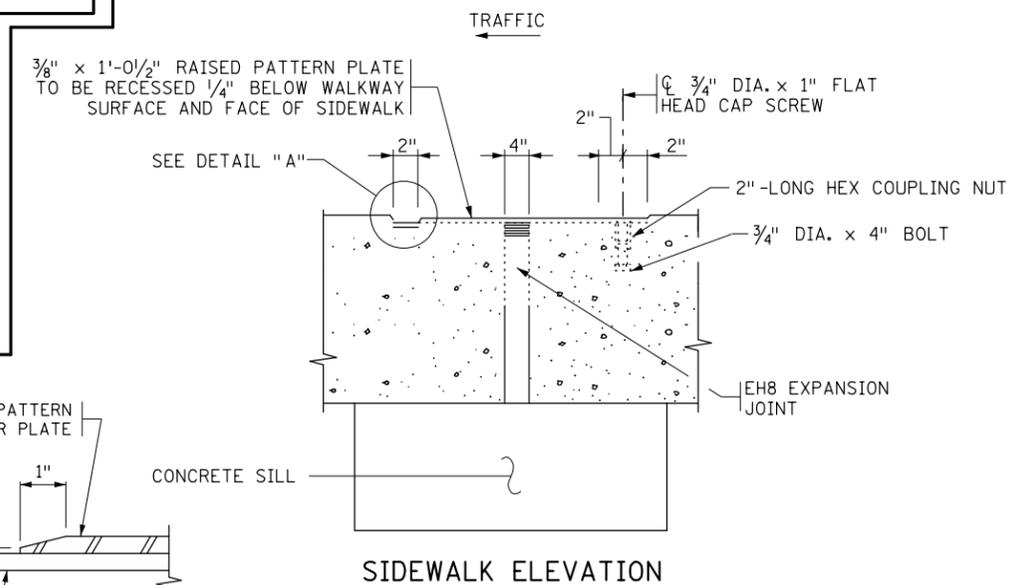
JOINT DETAILS



MODIFIED:
 -MODIFIED SECTION THROUGH SIDEWALK COVER PLATE.
 -MODIFIED SIDEWALK ELEVATION.



DETAIL "A"



STANDARD PLAN SHEET NO.
5-297.229

REVISION DATE
3-22-2013

STANDARD APPROVED:
DECEMBER 20, 2011

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 _____ LIC. NO.: _____
 DATE: 4/1/2016

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

HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
APPROACH PANEL
JOINT DETAILS

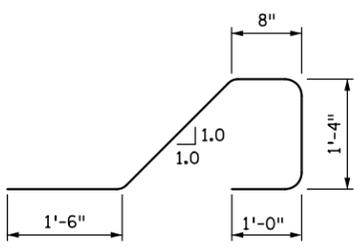
DES: HAP
 CHK: JRM
 DR: HAP
 CHK: JRM
 APPROVED
 SHEET NO. 89 OF 96 SHEETS

BRIDGE NO.
27B84

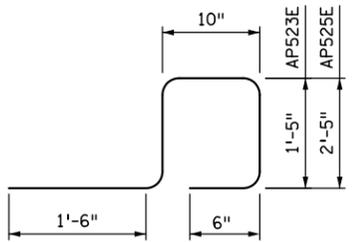
DATE: 4/1/2016 TIME: 12:50:05 PM FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\brdg\super\CBR27B84_app10.dgn

BILL OF REINFORCEMENT - APPROACH PANEL ①				
BAR	NO.	LENGTH	SHAPE	LOCATION
AP601E	94	46'-0"	—	STAGE 1 LONGITUDINAL BOTTOM
AP402E	48	46'-0"	—	STAGE 1 LONGITUDINAL TOP
AP503E	94	23'-0"	—	STAGE 1 TRANSVERSE BOTTOM
AP404E	94	23'-0"	—	STAGE 1 TRANSVERSE TOP
AP610E	272	30'-6"	—	LONGITUDINAL BOTTOM
AP511E	12	29'-10"	—	LONGITUDINAL BOTTOM
AP512E	8	5'-10"	~	LONGITUDINAL TOP
AP413E	144	30'-6"	—	LONGITUDINAL TOP
AP414E	8	29'-10"	—	LONGITUDINAL TOP
AP515E	124	25'-0"	—	TRANSVERSE BOTTOM
AP516E	112	6'-9"	—	TRANSVERSE BOTTOM
AP517E	8	9'-9"	—	TRANSVERSE BOTTOM
AP518E	4	8'-6"	—	TRANSVERSE BOTTOM
AP419E	124	25'-0"	—	TRANSVERSE TOP
AP420E	120	9'-9"	—	TRANSVERSE TOP
AP421E	4	6'-11"	—	TRANSVERSE TOP
AP522E	112	6'-5"	~	APPROACH PANEL TIE
AP523E	112	5'-8"	~	APPROACH PANEL TIE
AP524E	8	6'-10"	~	APPROACH PANEL TIE
AP525E	8	7'-8"	~	APPROACH PANEL TIE
AP426E	176	5'-6"	~	SILL VERTICAL
AP427E	176	2'-0"	~	SILL TIES
AP528E	24	30'-5"	—	SILL HORIZONTAL
AP429E	8	30'-5"	—	SILL HORIZONTAL
AP530E	248	5'-0"	—	CONSTRUCTION JOINT TIE
AP531S	4	30'-4"	—	STAGE 2 BARRIER LONGIT.

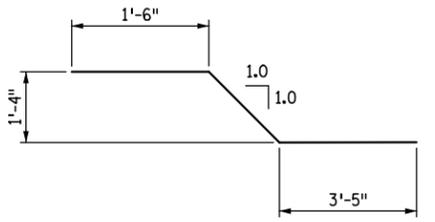
BAR BEDING DIAGRAMS



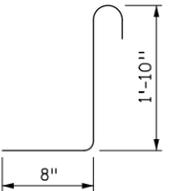
AP522E



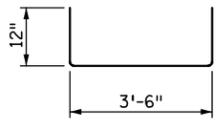
AP523E & AP525E



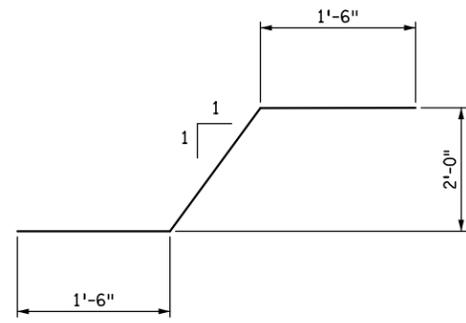
AP522E



AP427E



AP426E



AP512E

SUMMARY OF QUANTITIES FOR APPROACH PANELS				
ITEM DESCRIPTION	UNIT	STAGE 2	STAGE 3	TOTAL
TEMPORARY APPROACH PANEL	SQ YD	243	0	243
APPROACH PANEL	SQ YD	248	248	496
COUPLERS (REINFORCEMENT BARS) T-5S	EACH	62	0	62

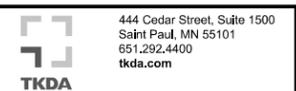
- ① PAYMENT FOR COUPLERS INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-5".
- ② TEMPORARY APPROACH PANEL CONSTRUCTED IN STAGE 1 CONSTRUCTION.

NOTES:

- ① APPROACH PANEL REINFORCEMENT IS INCIDENTAL TO "APPROACH PANEL".
- BENT BAR DIMENSIONS GIVEN ARE OUT-TO-OUT. ACTUAL BAR LENGTHS SHALL BE DETERMINED BASED ON THE DETAIL DIMENSIONS SHOWN IN THE BAR BENDING DIAGRAMS.

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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: 4/1/2016 LIC. NO.:



HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE: **APPROACH PANEL BARLIST**

DES: HAP	DR: HAP	APPROVED
CHK: JRM	CHK: JRM	
SHEET NO. 90 OF 96 SHEETS		

BRIDGE NO. **27B84**

DATE: 4/1/2016 TIME: 12:50:07 PM
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ALIGNMENT TABULATION										
POINT NUMBER OR CURVE NAME	POINT	STATION	CIRCULAR CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
			SPIRAL CURVE DATA							
ANGLE (θs)	DEGREE	ST	LT	LS						
CSAH 46										
1000	POT	100+00.00						545,212.615	146,939.284	89° 23' 22.64"
	PC	101+89.37						545,401.976	146,941.301	
CSAH46-1	PI	104+35.97	63° 18' 22.93" RT	14° 19' 26.20"	400.000'	246.594'	441.962'	545,648.556	146,943.928	PI
	CC							545,406.238	146,541.324	152° 41' 45.57"
	PT	106+31.33						545,761.672	146,724.809	
	PC	107+83.30						545,831.380	146,589.774	
CSAH46-2	PI	111+50.05	63° 09' 15.00" LT	9° 36' 08.75"	596.680'	366.751'	657.689'	545,999.619	146,263.887	PI
	CC							546,361.576	146,863.487	89° 32' 27.04"
	PT	114+40.99						546,366.358	146,266.826	
CSAH 46 WB										
1020	POT	200+00.00						545,212.338	146,965.284	89° 23' 22.64"
	PC	202+19.43						545,431.760	146,967.622	
CSAH46EB-1	PI	204+35.20	63° 18' 22.93" RT	16° 22' 12.80"	350.000'	215.770'	386.717'	545,647.518	146,969.920	PI
	CC							545,435.489	146,617.641	152° 41' 45.57"
	PT	206+06.15						545,746.494	146,778.191	
	POT	206+60.55						545,771.446	146,729.854	
GODFREY										
GODFREY-1	PC	250+00.00						545,549.780	146,555.036	80° 35' 06.62"
	PI	250+72.65	17° 50' 52.20" LT	12° 23' 00.73"	462.677'	72.651'	144.125'	545,621.453	146,566.920	PI
	CC							545,474.095	147,011.481	62° 44' 14.42"
	PT	251+44.13						545,686.034	146,600.200	
1050	POT	255+61.87						546,057.370	146,791.554	

NO.	DATE	BY	DESCRIPTION OF REVISIONS

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 SIGNED _____
 DATE: 4/1/2016 LIC. NO.:



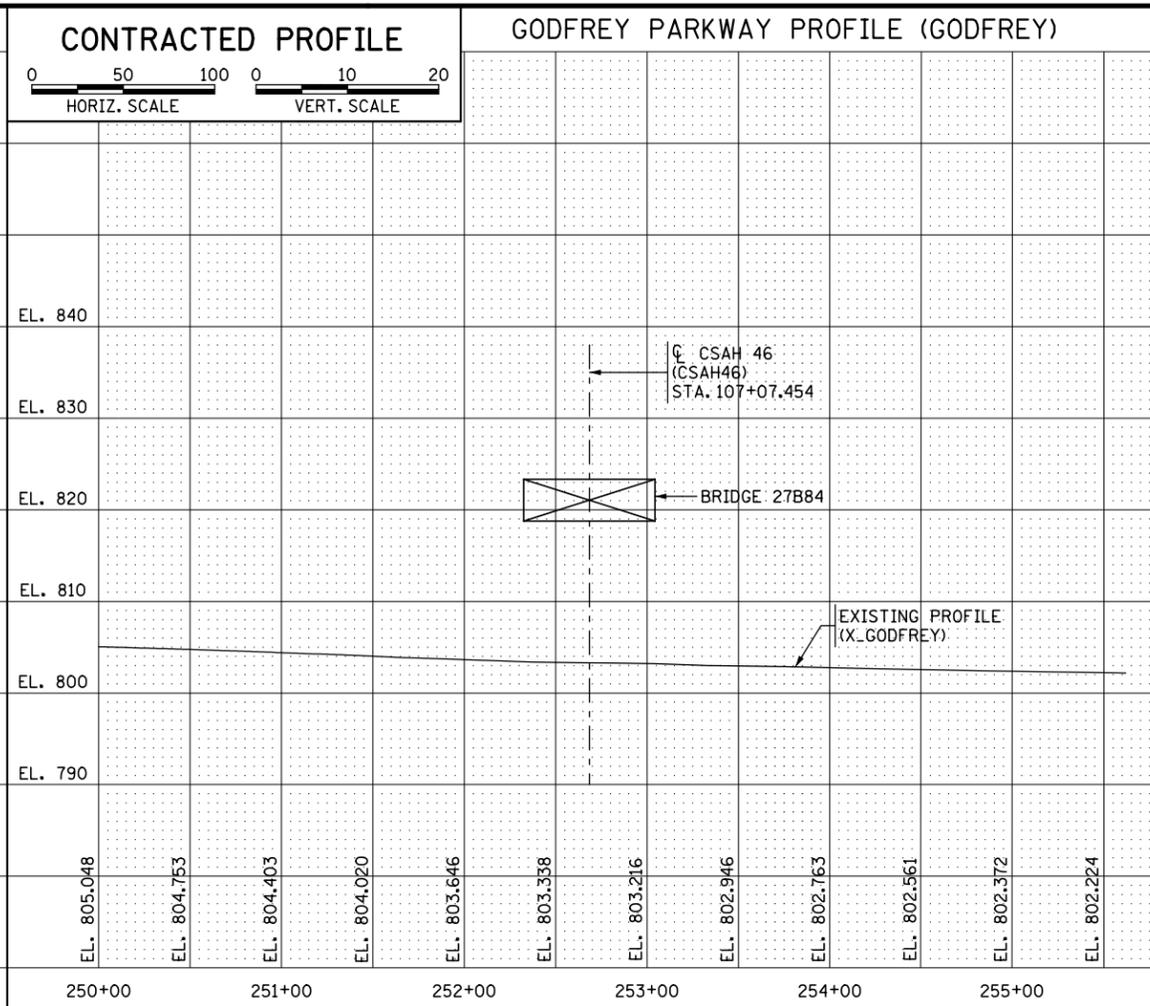
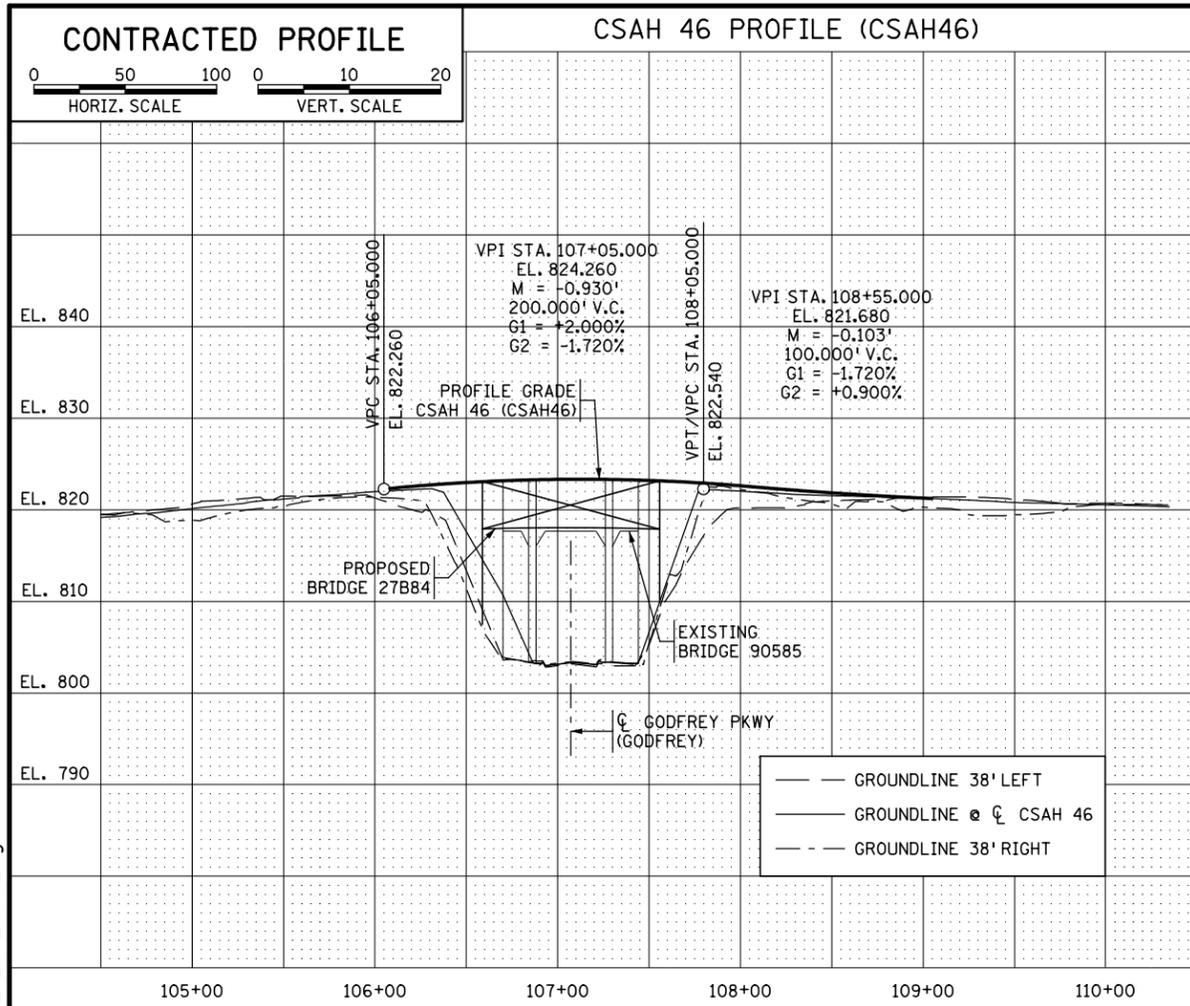
HENNEPIN COUNTY
 CSAH 46 OVER GODFREY PKWY
 S.A.P. 027-646-007

TITLE:
 ALIGNMENT TABULATION

DES: RPM	DR: LJL	APPROVED
CHK: MAV	CHK: MAV	
SHEET NO. 92 OF 96 SHEETS		

BRIDGE NO.
 27B84

DATE: 4/1/2016 TIME: 12:50:09 PM FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\genera\NCBR27B84-sur02.dgn

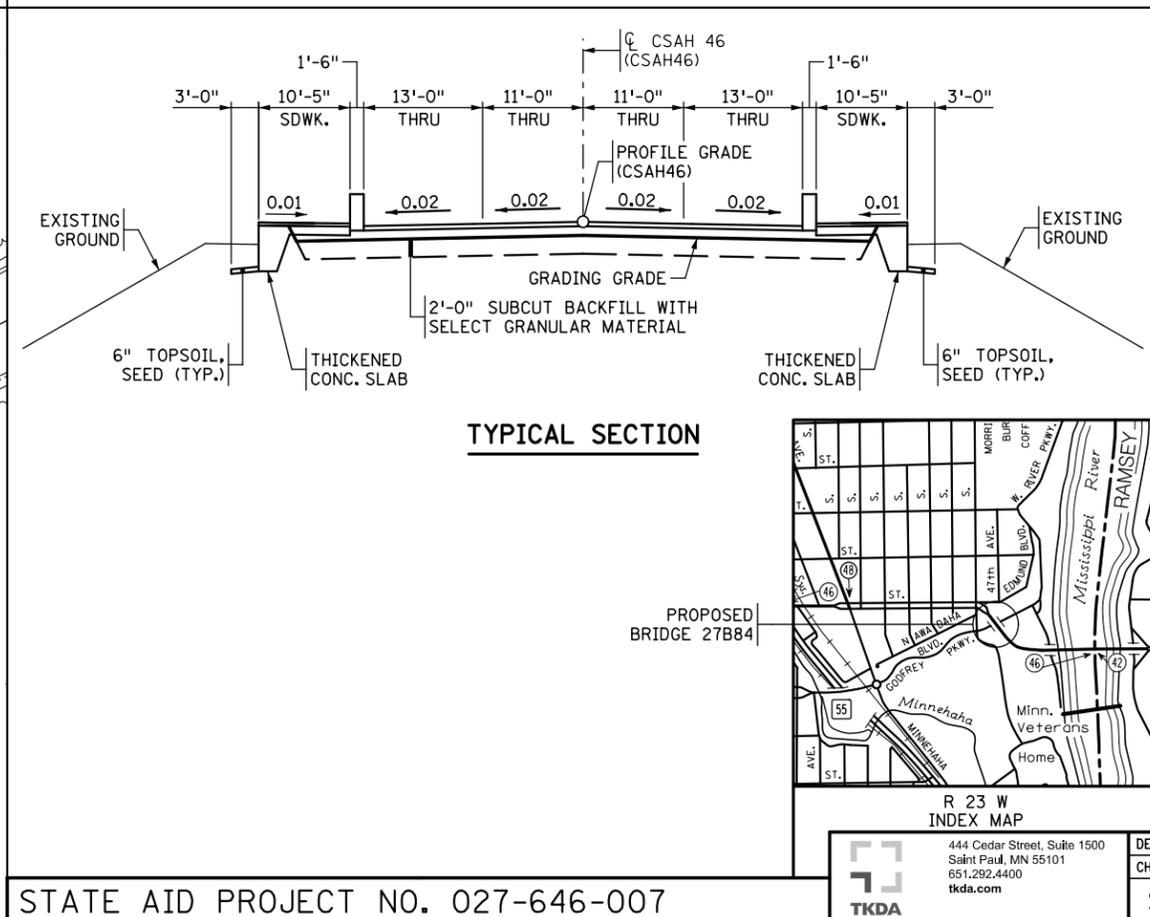
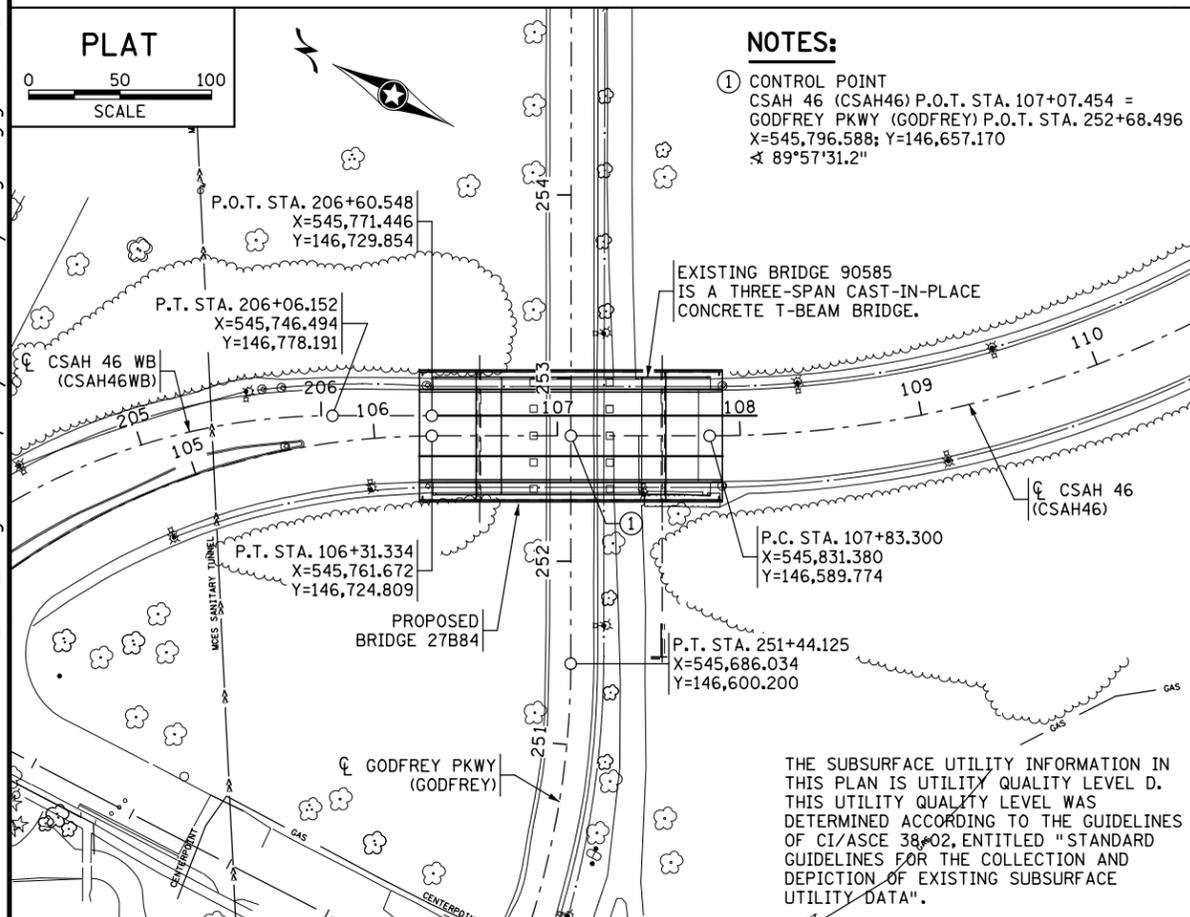


LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

- SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING.
- 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.
- APPARENT HIGHWATER ELEVATION OBTAINED FROM:
- OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEERS RECOMMENDATION
DATE: XX-XX-XX

STREAM OR DITCH DESIGNATION: XXX
DRAINAGE AREA: XXX SQ. MI.
MAX. FLOOD ON RECORD: XXX C.F.S. (XX-XX-XX)
MAXIMUM OBSERVED HIGHWATER ELEVATION: XXX.X FT.
DESIGN FLOOD (XX YR. FREQ.): XXX C.F.S.
HEADWATER ELEVATION: XXX.X FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE: X.X F.P.S.
TOTAL STAGE INCREASE: XX.X FT.
LOW MEMBER AT OR ABOVE ELEVATION: XXX.X FT.
WATERWAY AREA REQUIRED BELOW ELEV. XXX.X = XXX SQ. FT. AT RIGHT ANGLES TO CHANNEL
BASIC FLOOD (100 YR. FREQ.): XXXX C.F.S.
HEADWATER ELEVATION: XXX.X FT.
TOTAL STAGE INCREASE: X.X FT.
MEAN VELOCITY THROUGH STRUCTURE: X.X F.P.S.
FLOWLINE ELEVATION: XXX.X FT. SKEW ANGLE: XX°
ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. XXX.X (500 OR 0T YR. FREQ.)



SCOUR CONFIRMATION RECOMMENDATION
DATE: XX-XX-XX

TOTAL SCOUR AT PIER EL. XXX.XX (500 OR 0T YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM: RAIL

BENCH MARK ELEVATION: 825.438 (N.A.V.D. 88 ADJ.)

LOCATION:
IN ST. PAUL, 0.1 MILE SOUTH ALONG MINNEHAHA AVENUE FROM JUNCTION OF TRUNK HIGHWAY 55 AND TRUNK HIGHWAY 62 EAST IN ST. PAUL, AT TRUNK HIGHWAY 55 MILEPOINT 197.4, THEN 0.1 MILE SOUTHEAST ON FRONTAGE ROAD FOR LITE RAIL TRANSIT PARK AND RIDE, 20.1 FEET EAST-NORTHEAST OF BACK OF CURB, 2.7 FEET WEST-SOUTHWEST OF CHAIN LINK FENCE, 41.1 FEET NORTHWEST OF LIGHT POLE NUMBER A22, 2.4 FEET SOUTHWEST OF WITNESS POST.

MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

CSAH 46 OVER GODFREY PARKWAY
0.3 MILES WEST OF COUNTY LINE

SEC 17 T 028 N R 23 W

COUNTY: HENNEPIN

CITY: MINNEAPOLIS

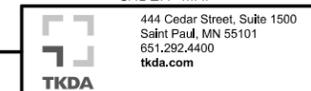
DES: LJL DR: LJL APPROVED

CHK: MAV CHK: MAV

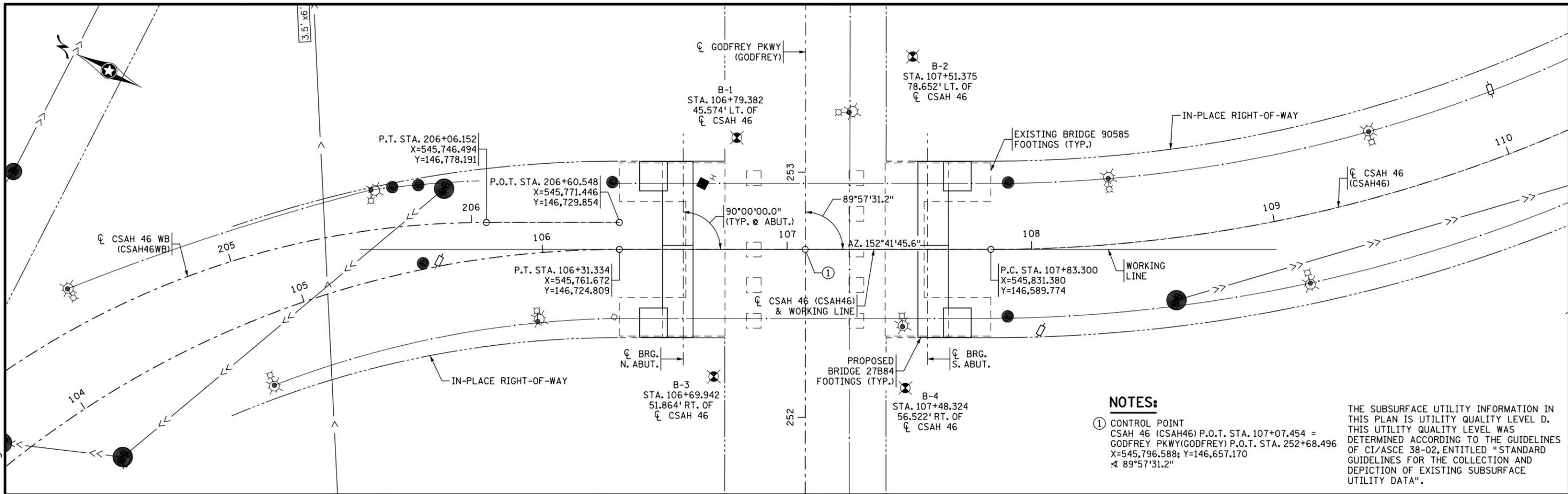
BRIDGE NO. 27B84

SHEET NO. 93 OF 96 SHEETS

STATE AID PROJECT NO. 027-646-007



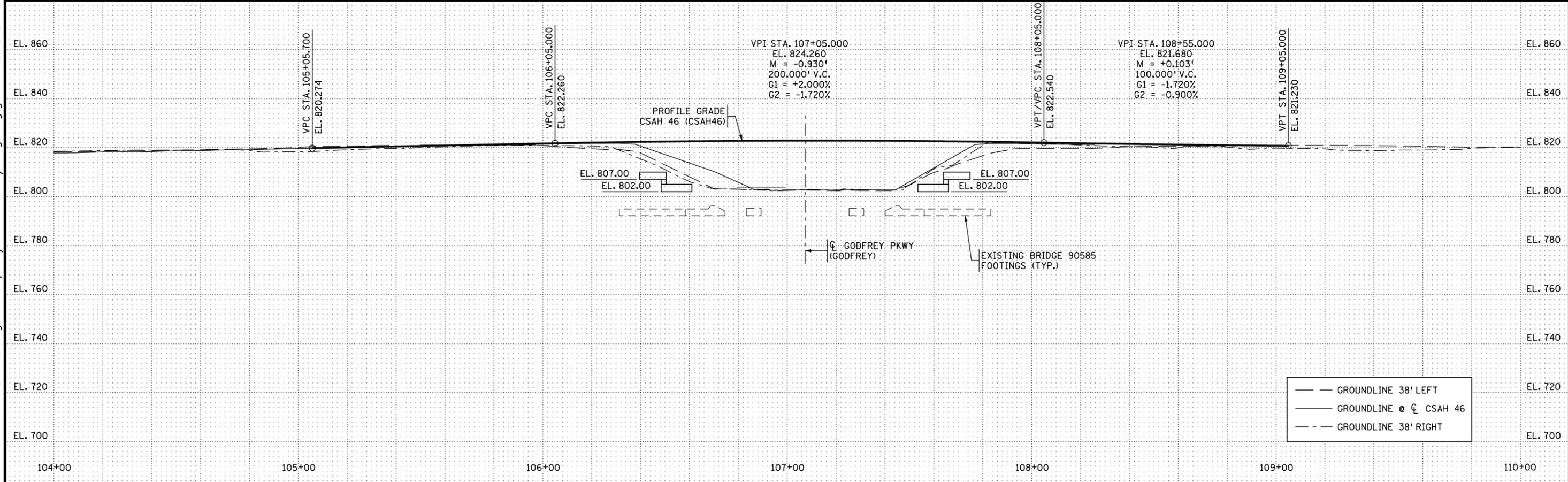
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NOTES:

① CONTROL POINT
 CSAH 46 (CSAH46) P.O.T. STA. 107+07.454 =
 GODFREY PKWY (GODFREY) P.O.T. STA. 252+68.496
 X=545,796.588; Y=146,657.170
 ∠ 89°57'31.2"

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".



	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: 4/1/2016 LIC. NO.: _____	 444 Cedar Street, Suite 1500 Saint Paul, MN 55101 651.292.4400 tkda.com	HENNEPIN COUNTY CSAH 46 OVER GODFREY PKWY S.A.P. 027-646-007	TITLE: BRIDGE SURVEY PLAN AND PROFILE	DES: LJJ CHK: MAV	DR: LJJ CHK: MAV	APPROVED _____	BRIDGE NO. 27B84	
SHEET NO. 94 OF 96 SHEETS									

DATE: 4/1/2016 TIME: 12:50:12 PM
 FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\genera\NCBR27B84_sur04.dgn
 BORING LOG 1 HENNEPIN COUNTY CSAH 46 - GODFREY BRIDGE.GPJ UNITWT.GDT 3/17/16

BORING NO. B-1									
PROJECT: Godfrey Parkway Bridge Replacement					CLIENT: TKDA, Inc.				
LOCATION: Minneapolis, MN					ARCHITECT - ENGINEER: TKDA, Inc.				
DEPTH IN FEET	SAMPLE		SOIL DESCRIPTION	N-VALUE IN BLOWS/FT.	% REC.	LABORATORY TESTS		N-VALUE IN BLOWS/FT.	% REC.
	NO.	TYPE				Qp (tsf)	RQD (%)		
SURFACE ELEVATION: 803.6 FT.									
	6	AUG	Silty Clay with trace sand, black, slightly organic (Topsoil) (CL) Frozen to 2ft						
	7	SS	Silty Fine to Medium Sand with little gravel, medium dense, brown, moist (Fill) (SM)	14	33				
5	8	SS		13	44				
	9	SS		42	22				
	10	SS	Silty Clayey Sand, medium dense, brown-black, moist to wet (Fill) (SC)	50/4"					
	Run 1	RC	Limestone, moderately weathered, very thin bedded, open fractures very close, brown (PLATTEVILLE)						
	15	Run 1	Limestone, slightly weathered, thin bedded, open fractures very close, gray with brown stains at joints (PLATTEVILLE)	97		21			
End of Boring at 15ft									
Boring advanced with hollow stem auger from 0-10ft. Auger refusal at 10ft. Boring advanced with N casing using wireline triple tube core barrel from 10 - 15ft. Boring backfilled with grout upon completion.									
Rock Coring: Run No. 1: 10-15ft, RQD = 21 (very poor)									
Water Pressure: Normal, 10-15ft									
Loss of Water: Normal, 10-15ft									
Rate of Advance: Normal, 10-15ft									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ the transition may be gradual.

WATER LEVEL OBSERVATIONS		GTE GALE-TEC ENGINEERING, INC.	BORING STARTED 2-17-16	
WL	10 ft, WD		BORING COMPLETED 2-17-16	
WL	10 ft, WD		RIG CME 75HT	FOREMAN br
CAVE IN DEPTH		DRAWN nml	JOB# 95477	

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			444 Cedar Street, Suite 1500 Saint Paul, MN 55101 651.292.4400 tkda.com	
NO.	DATE		DATE: 4/1/2016	LIC. NO.:

BORING NO. B-2									
PROJECT: Godfrey Parkway Bridge Replacement					CLIENT: TKDA, Inc.				
LOCATION: Minneapolis, MN					ARCHITECT - ENGINEER: TKDA, Inc.				
DEPTH IN FEET	SAMPLE		SOIL DESCRIPTION	N-VALUE IN BLOWS/FT.	% REC.	LABORATORY TESTS		N-VALUE IN BLOWS/FT.	% REC.
	NO.	TYPE				Qp (tsf)	RQD (%)		
SURFACE ELEVATION: 802.4 FT.									
	11	AUG	Silty Clay with trace sand, black, slightly organic (Topsoil) (CL) Frozen to 2ft						
	12	SS	Silty Clayey Fine Sand, medium dense, brown-black, moist (Fill) (SC)	14	22				
5	13	SS		8	33				
	14	SS	Silty Organic Clay, medium stiff, black (Buried Topsoil) (OL)						
	Run 1	RC	Silty Clayey Coarse Sand with little gravel, medium dense, brown, wet (SC-SM)	50/3"					
	10	Run 2		RC					
	15	Run 3		RC					
Limestone, slightly weathered, very thin to thin bedded, open fractures very close to close, gray with some brown stains at joints, (PLATTEVILLE)									
End of Boring at 18ft									
Boring advanced with hollow stem auger from 0-8ft. Auger refusal at 8ft. Boring advanced with N casing using wireline triple tube core barrel from 8 - 18ft. Boring backfilled with grout upon completion.									
Rock Coring: Run No. 1: 8-9ft, RQD = 0 (very poor) Run No. 2: 9-14ft, RQD = 38 (poor) Run No. 3: 14-18ft RQD = 83 (good)									
Water Pressure: Normal, 8-12ft, 13-16ft, 17-18ft High, 12-13ft, 16-17ft									
Loss of Water: High, 8-9ft, 16-17ft Normal, 9-16ft, 17-18ft									
Rate of Advance: Slow, 8-9ft Normal, 9-11ft, 14-16ft High, 11-13ft, 16-18ft									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ the transition may be gradual.

WATER LEVEL OBSERVATIONS		GTE GALE-TEC ENGINEERING, INC.	BORING STARTED 2-17-16	
WL	7 ft, WD		BORING COMPLETED 2-17-16	
WL	7 ft, AD		RIG CME 75HT	FOREMAN br
CAVE IN DEPTH		DRAWN nml	JOB# 95477	

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			444 Cedar Street, Suite 1500 Saint Paul, MN 55101 651.292.4400 tkda.com	
NO.	DATE		DATE: 4/1/2016	LIC. NO.:

DATE: 4/1/2016 TIME: 12:50:14 PM
 FILENAME: K:\g-m\Hennepin\15854000\hwy-brdg\genera\NCBR27B84_sur05.dgn
 BORING LOG 1 HENNEPIN COUNTY CSAH 46 - GODFREY BRIDGE.GPJ UNITWT.GDT 3/17/16

DEPTH IN FEET		SAMPLE		SOIL DESCRIPTION SURFACE ELEVATION: 803.6 FT.	N-VALUE IN BLOWS/FT.	% REC.	LABORATORY TESTS	
NO.	TYPE	Qp (tsf)	RQD (%)					
1	AUG			Silty Clay with trace sand, black, slightly organic (Topsoil) (CL) Frozen to 2ft				
2	SS			Silty Fine Sand with little gravel, medium dense, brown, moist (Fill) (SM)	12	22		
5	SS			Sandy Silty Clay, soft to medium stiff, black-brown (Fill) (SC)	14	44	0.3	
4	SS				10	67	0.5	
10	SS				50/6"			
Run 1	RC			Limestone, slightly weathered, very thin to thin bedded, open fractures very close to close, gray with some brown stains at joints, (PLATTEVILLE)	98		40	
15								
Run 2	RC				100		98	
20				End of Boring at 20ft				

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ the transition may be gradual.

WATER LEVEL OBSERVATIONS		 GALE-TEC ENGINEERING, INC.	BORING STARTED 2-16-16	
WL	10 ft, WD		BORING COMPLETED 2-16-16	
WL	10 ft, AD		RIG CME 75HT	FOREMAN br
CAVE IN DEPTH		DRAWN nml	JOB# 95477	

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		 TKDA	444 Cedar Street, Suite 1500 Saint Paul, MN 55101 651.292.4400 tkda.com	
NO.	DATE		DATE: 4/1/2016	LIC. NO.:

DEPTH IN FEET		SAMPLE		SOIL DESCRIPTION SURFACE ELEVATION: 803.5 FT.	N-VALUE IN BLOWS/FT.	% REC.	LABORATORY TESTS	
NO.	TYPE	Qp (tsf)	RQD (%)					
15	AUG			Silty Clay with trace sand, black, slightly organic (Topsoil) (CL) Frozen to 2ft				
16	SS			Silty Clayey Fine Sand with trace gravel, medium dense, brown-black, moist (Fill) (SM)	5	67		
5	SS				4	72		
17	SS							
18	SS			Peat, very soft, black (PT)				
18	SS			Clayey Silty Coarse Sand with little gravel, medium dense, brown, wet (SC-SM)	6	67	0.1	
10	Run 1			Limestone, moderately weathered, very thin bedded, open fractures very close, brown (PLATTEVILLE)			173	0
Run 2	RC			Limestone, slightly weathered, thin bedded, open fractures very close to close, gray with brown stains at joints (PLATTEVILLE)			180	9
End of Boring at 14ft								

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ the transition may be gradual.

WATER LEVEL OBSERVATIONS		 GALE-TEC ENGINEERING, INC.	BORING STARTED 2-18-16	
WL	Dry, WD		BORING COMPLETED 2-18-16	
WL	Dry, AD		RIG CME 75HT	FOREMAN br
CAVE IN DEPTH		DRAWN nml	JOB# 95477	

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		 TKDA	444 Cedar Street, Suite 1500 Saint Paul, MN 55101 651.292.4400 tkda.com	
NO.	DATE		DATE: 4/1/2016	LIC. NO.:

Notification to Council Member Andrew Johnson

Sent by email on April 15, 2016

Dear Council Member Johnson,

At the request of Hennepin County, we are submitting a Certificate of Appropriateness application to the HPC for the replacement of Hennepin County Bridge No. 90585, commonly known as the Godfrey Bridge, which carries East Forty-sixth Street (CSAH 46) over Godfrey Parkway in Minnehaha Park. The bridge is at the approach to the Intercity Bridge over the Mississippi River, more commonly known as the Ford Bridge. The hearing for the project will be at 4:30 p.m. on Tuesday, May 17, 2016. A Certificate of Appropriateness is required because the project site falls within the Minnehaha Historic District.

The Certificate of Appropriateness proposes the removal of the existing bridge. The project requires a sensitive construction approach due to a variety of existing conditions, which are outlined below.

- In May 2015, the Godfrey Bridge received a sufficiency rating of 33.4 percent, a very poor rating. The bridge has substandard railings, leaky expansion joints, and severe concrete delamination on both the substructure and the superstructure. Additionally, the bridge does not have the structural capacity to carry a potential future light-rail transit (LRT) track, a requirement for this corridor. The intensity of work necessary to reinforce the existing bridge would destroy the structure. It would also require large open-cut excavations that would threaten the surrounding landscape, including mature trees in Minnehaha Park. In January 2016, engineers from Hennepin County and TKDA met with arborists from the Minneapolis Park Board to identify significant trees that would need to be saved during the construction process. The arborists authorized the removal of only eight trees in the vicinity of the bridge. More than fifty will need to be preserved and protected, so excavation, staging, and construction will need to have as minimal an impact to the landscape as possible.
- East Forty-sixth (CSAH 46) has an average daily traffic volume of 16,200 and provides a crucial southern connection between Minneapolis and Saint Paul. The road also provides a primary route to West River Parkway and Minnehaha Park, which attracts nearly 850,000 visitors annually. A number of large events take place along the parkway, including the Twin Cities Marathon. The park board has requested that the design and construction plan allow for these events to proceed without interruption.
- The park board has also requested that the new bridge be a single-span structure to enhance public safety. The design of the existing bridge creates a dark, tunnel-like environment for pedestrians along the parkway.

Construction of the new bridge will be minimally invasive to protect the surrounding landscape, including over fifty mature trees in Minnehaha Park. The new bridge will be a concrete structure with Neoclassical designs to reflect the existing bridge's appearance; the concrete will be a uniform gray color like the existing bridge. A single span over Godfrey Parkway will create a more open design to enhance public safety. The single span will also limit the number of excavations necessary for additional footings, which could cause damage to the adjacent

parkland. An arch along the span will continue to frame distant views of Minnehaha Park and West River Parkway, an important characteristic of the landscape. Lastly, the engineers have proposed staging and construction plans that will minimize disruptions to traffic and park board programming.

If you have any questions about the project or would like to see the plans or rendering for the proposed bridge, you can contact us using the information below.

Best regards,

Jessica Berglin and Charlene Roise
Hess, Roise and Company
Historical Consultants
100 North First Street
Minneapolis, MN 55041
612.338.1987
berglin@hessroise.com and roise@hessroise.com

Notification to Melanie Majors, Executive Director of the Longfellow Community Council
Sent by email on April 15, 2016

Dear Ms. Majors,

At the request of Hennepin County, we are submitting a Certificate of Appropriateness application to the HPC for the replacement of Hennepin County Bridge No. 90585, commonly known as the Godfrey Bridge, which carries East Forty-sixth Street (CSAH 46) over Godfrey Parkway in Minnehaha Park. The bridge is at the approach to the Intercity Bridge over the Mississippi River, more commonly known as the Ford Bridge. The hearing for the project will be at 4:30 p.m. on Tuesday, May 17, 2016. A Certificate of Appropriateness is required because the project site falls within the Minnehaha Historic District.

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