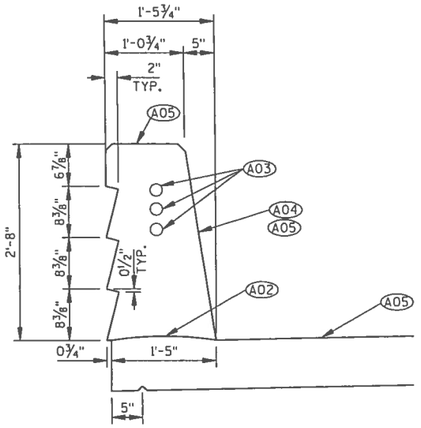
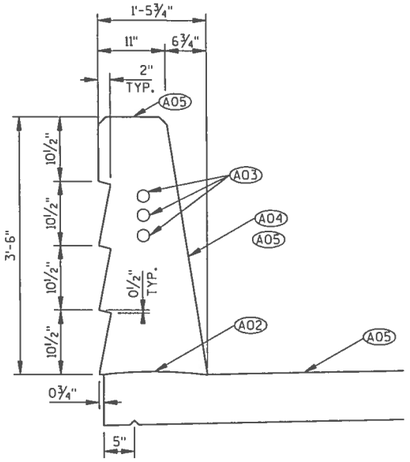
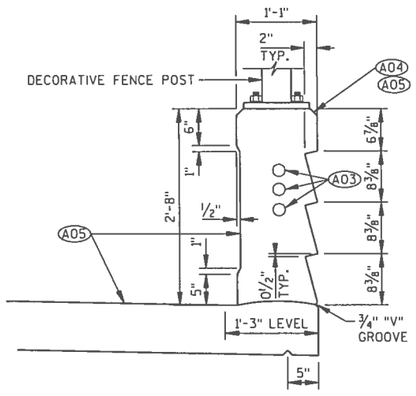


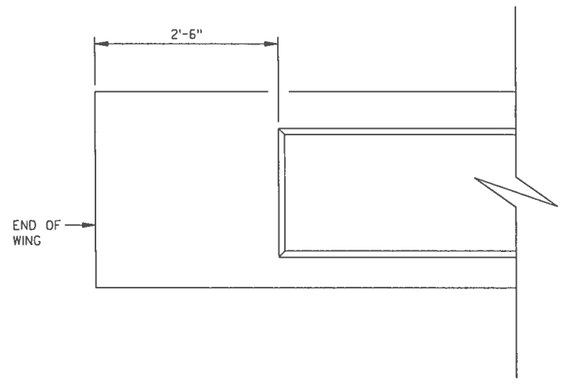
32" SINGLE SLOPE PARAPET MODIFIED



42" SINGLE SLOPE PARAPET MODIFIED



32" VERTICAL FACE PARAPET MODIFIED



ELEVATION VIEW
32" VERTICAL FACE PARAPET MODIFIED
(INSIDE FACE OF PARAPET)

DESIGNER NOTES & LEGEND

STRUCTURES TO BE STAINED ARE LABELED LEVEL 2 WITHIN THESE STANDARDS. UNSTAINED STRUCTURES ARE LABELED LEVEL 1B.

ALL OVERPASS STRUCTURES OVER MAINLINE WILL HAVE STAINING. MAINLINE STRUCTURES OVER SIDEROADS WILL BE UNSTAINED UNLESS STAINING IS REQUESTED BY A MUNICIPALITY. IT IS THE RESPONSIBILITY OF THE DESIGN TEAM TO GET A COMMITMENT FROM THE MUNICIPALITY TO STAIN MAINLINE STRUCUTURES OVER SIDEROADS.

USE NAME IN PARAPET FOR BRIDGES OVER I-39/90. NAME SHOULD BE CENTERED OVER 1ST AND 2ND LANES AS DIMENSIONED FROM THE MEDIAN.

LETTERING IS ONLY ON OUTSIDE FACE OF PARAPET.

(A01) LETTERING SHALL BE HELVETICA. 8" UPPER CASE AND 6" LOWER CASE.

(A02) HORIZONTAL CONSTRUCTION JOINT STRIKE OFF AS SHOWN AND LEAVE ROUGH

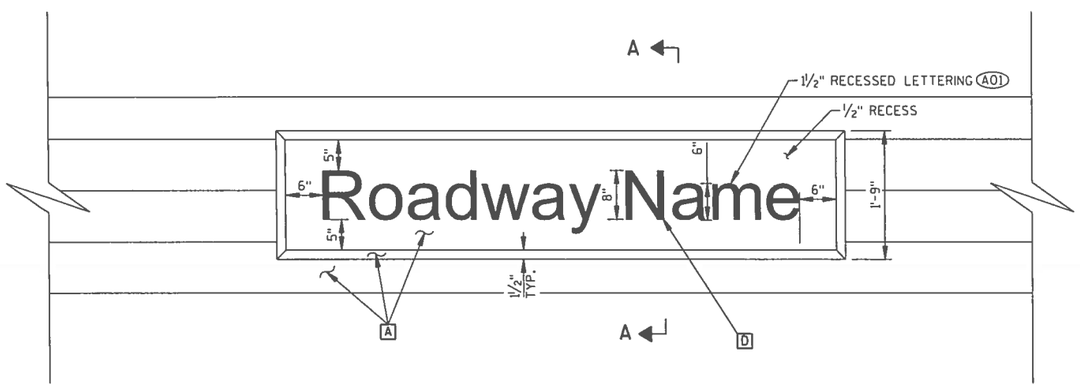
(A03) 3-2" DIA. RIGID CONDUIT TYPICAL IN ALL PARAPETS. USE NONMETALLIC CONDUIT EXCEPT AT EXPANSION FITTING AT WING WALL JOINT. AT EXPANSION FITTING USE RIGID METALLIC CONDUIT 5'-0" INTO PARAPET ON DECK SIDE.

(A04) PARAPETS ON BRIDGES THAT ARE AESTHETIC LEVEL 2 ARE TO BE STAINED FEDERAL COLOR 36642. STAIN ALL SIDES OF PARAPET.

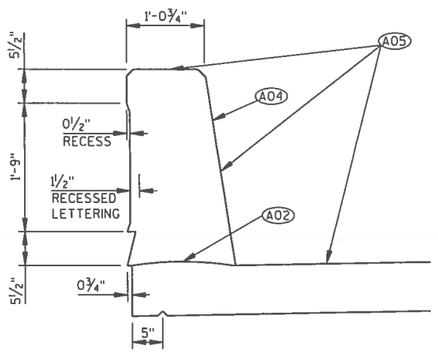
(A05) PROTECTIVE SURFACE TREATMENT SHOULD BE APPLIED TO TOP OF PARAPET AND ROADWAY FACE.

CONCRETE STAINING SCHEDULE

MARK	FEDERAL COLOR NUMBER	LOCATION
A	36642	PARAPET, EDGE OF DECK, WINGWALLS
B	30140	EXTERIOR GIRDER, REVEALS
C	30372	PIER, ABUTMENT AND WINGWALL
D	27038	ROADWAY NAME LETTERING



INDENTED TEXT
EXTERIOR FACE OF PARAPET ONLY



SECTION A-A

32SS MODIFIED
AREA = 3.20 SF
WEIGHT = .480 K/FT

42SS MODIFIED
AREA = 3.96 SF
WEIGHT = .594 K/FT

32" VERTICAL FACE MODIFIED
AREA = 2.64 SF
WEIGHT = .396 K/FT

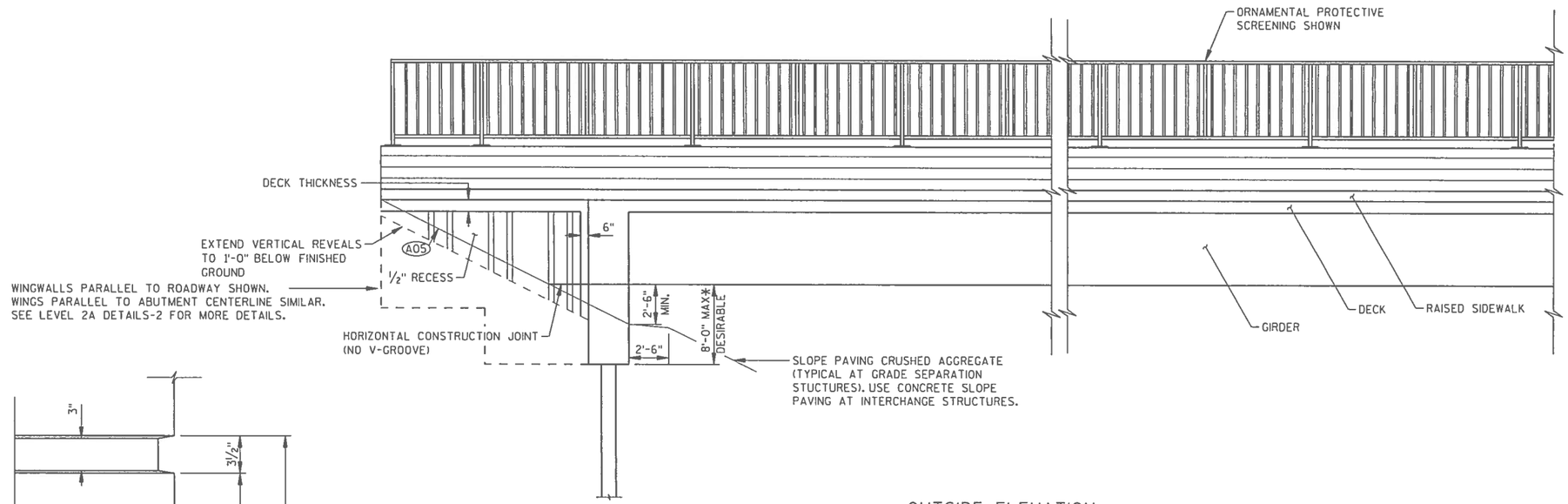
Attachment 4

DATE	REVISION	BY
7/30/2013	REVISED NOTES AND DRAWINGS	MES
2/8/2013	REVISED NOTES AND DRAWINGS	MAH

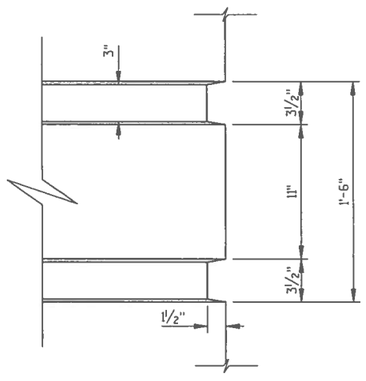
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PARAPET DETAILS

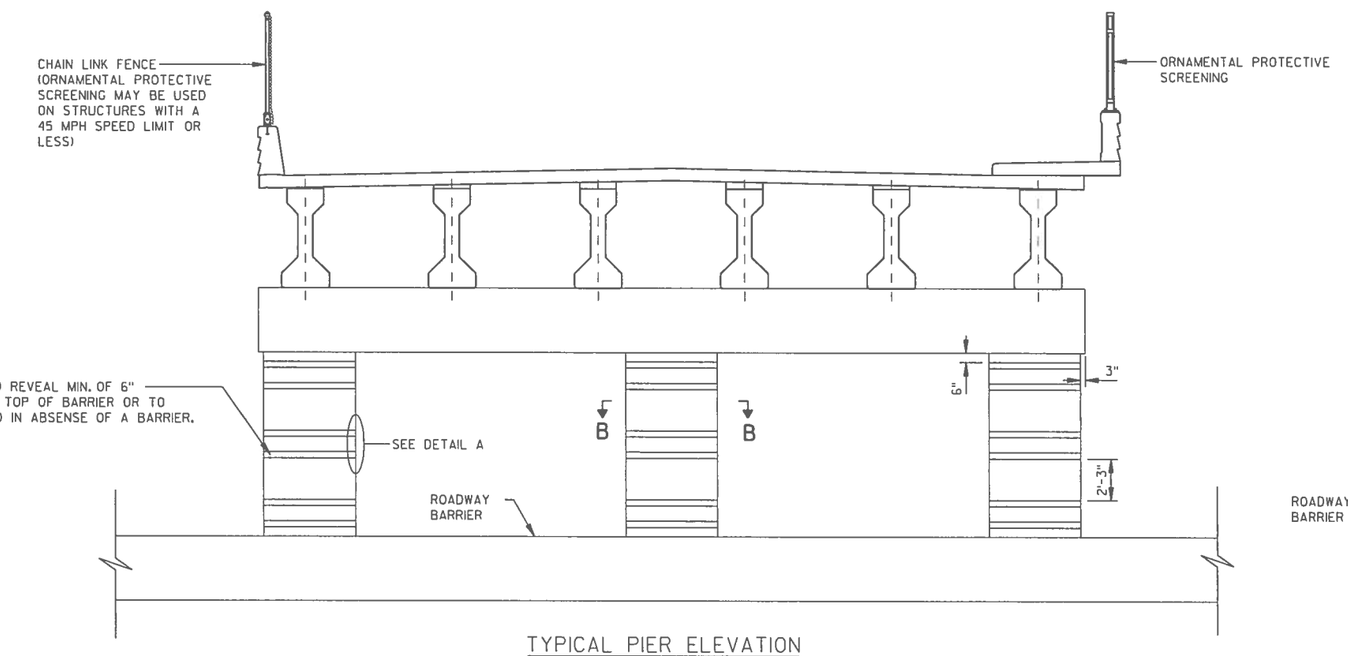
DRAWN BY MAH | PLANS CK'D. JRL



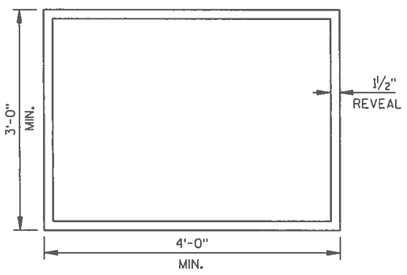
OUTSIDE ELEVATION
(SHOWING ORNAMENTAL PROTECTIVE SCREENING)



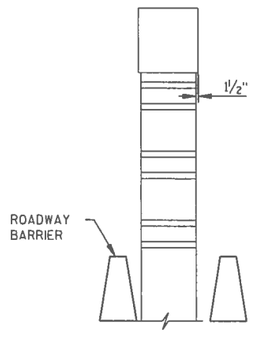
DETAIL A



TYPICAL PIER ELEVATION



SECTION B-B



PIER END VIEW

LEGEND

* MAXIMUM ABUTMENT HEIGHT CONTROLLED BY 8'-0" DESIRABLE OR 13'-0" MAXIMUM ALLOWABLE WING HEIGHT

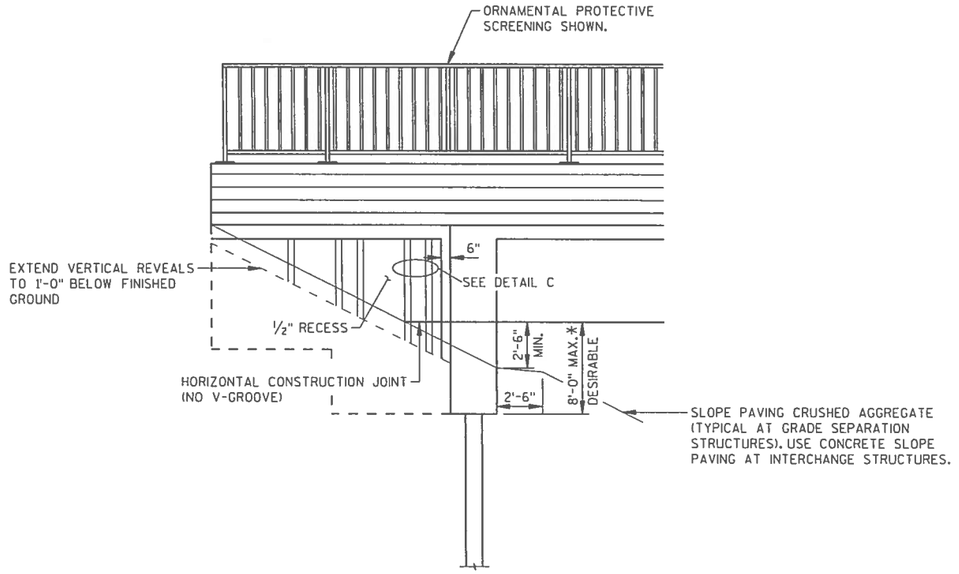
Attachment 4

DATE	REVISION	BY
7/30/2013	REVISED NOTES AND DRAWINGS	MES
2/8/2013	REVISED NOTES AND DRAWINGS	MAH

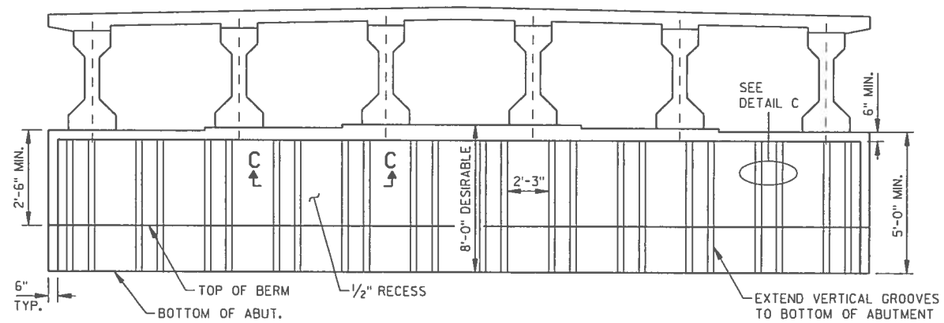
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

LEVEL 1B DETAILS-1

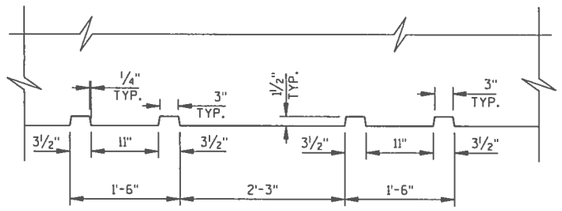
DRAWN BY MAH | PLANS CK'D. JRL



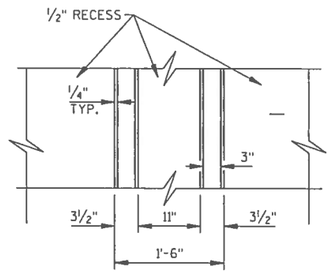
TYPICAL WINGWALL PARALLEL TO ROADWAY



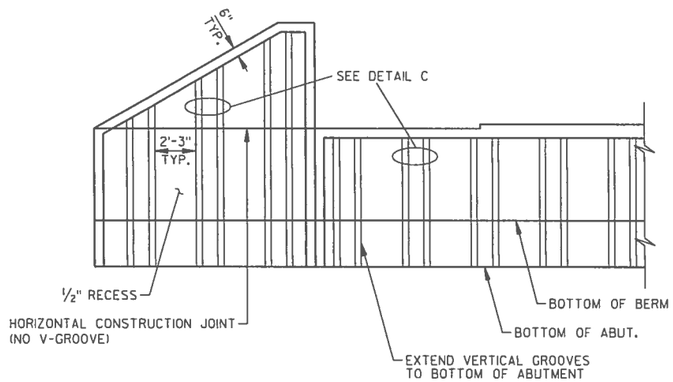
TYPICAL ABUTMENT ELEVATION VIEW
(MODIFIED A1 ABUTMENT)



SECTION C-C



DETAIL C



TYPICAL WINGWALL PARALLEL TO CENTERLINE OF ABUTMENT

LEGEND

* MAXIMUM ABUTMENT HEIGHT CONTROLLED BY 8'-0" DESIRABLE OR 13'-0" MAXIMUM ALLOWABLE WING HEIGHT

Attachment 4

DATE	REVISION	BY
7/30/2013	REVISED NOTES AND DRAWINGS	MES
2/8/2013	REVISED NOTES AND DRAWINGS	MAH

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

LEVEL 1B DETAILS-2

DRAWN BY MAH | PLANS CK'D. JRL

Attachment 5

DANE PARTNERS

MEMORANDUM

DATE: **March 29, 2019**

TO: **WisDOT Bureau of Structures**

FROM: **Dane Partners**

RE: **WisDOT ID 1007-10-02/05: IH 39/90 at USH 12/18 (Beltline) Interchange: Profile of Roadway Through the Core of the Interchange**

The IH 39/90 interchange with USH 12/18, commonly referred to as the "Beltline Interchange", is located on Madison's east side and is a connection point to numerous highways in the area. The Beltline Interchange provides a vital link for traffic movements into and out of the Madison area.

Background Project Information

In 2014, it was determined that an Environmental Impact Statement (EIS) would be completed for the Beltline Interchange. A Range of Alternatives was developed that included five "full build" alternatives that would fully address the deficiencies of the Beltline Interchange, and safety and capacity needs of the outer legs. The limits of the proposed alternatives included all of the interchange ramps, IH 39/90 between Siggelkow Road and CTH AB (Buckeye Road), and USH 12/18 between USH 51 (Stoughton Road) and Millpond Road.

In July 2016, the WisDOT Corridor Management Team (CMT) and FHWA identified through a screening process two alternatives from the Range of Alternatives to move forward to the Detailed Study Analysis phase of design (see Attachment A - Alternatives D-1, F). Both of the alternatives shifted northbound IH 39/90 approximately 400 feet to the west through the core of the interchange with the roadway being reconstructed to more closely align with southbound IH 39/90. The main difference between the alternatives was that Alternative D-1 reconfigured the proposed eastbound USH 12/18 ramp to northbound IH 39/90 as a right-side exit, while Alternative F maintained the ramp as a left-side exit.

In December 2017, WisDOT and FHWA revisited the scope of the Beltline Interchange project with consideration given to Performance-Based Practical Design in an effort to reduce impacts and enable savings in the estimated cost of the interchange. This was partially due to re-prioritization of WisDOT's Major Transportation Project program. This revised project scope provided an opportunity to improve safety and operations as it affects Interstate travel through the interchange, while utilizing the remaining life of the infrastructure.

It was at this time that all design efforts shifted away from Alternatives D-1 and F and towards developing new concepts for the revised project scope. The level of design for Alternatives D-1 and F was considered to be pre-30% since the alternatives had *only been developed to this point with enough detail for comparison purposes to identify a preferred alternative.* Had the Detailed Study Analysis continued and a preferred alternative identified, the design would have progressed to a point of optimizing either the profile of IH 39/90 or the roadways below the bridges to reduce the vertical clearances, which may have either reduced wall heights or bridge lengths.

Current Project Information

After the scope of the project was redefined, several new concepts were developed to improve IH 39/90

Attachment 5

through the core of the Beltline Interchange and satisfy the revised Purpose & Need of the project. After completion of the screening process, a preferred alternative was selected (see Attachment B).

Given that the WisDOT Bureau of Structures current standard design life of a bridge is 75 years and that the new bridges are being constructed with the project in 2021, it was decided by the CMT in November 2017 that the northbound IH 39/90 alignment and profile of *the preferred alternative would be designed to accommodate both of the Detailed Study Alternatives (D-1, F)*. Given the significant level of effort that would have been required to bring the designs of both Alternatives D-1 and F to a point that would be considered sufficient for preliminary structure plan design, the alternative profiles (as they were at the time of the change in project scope) were used in the design of the preferred alternative for the Beltline Interchange.

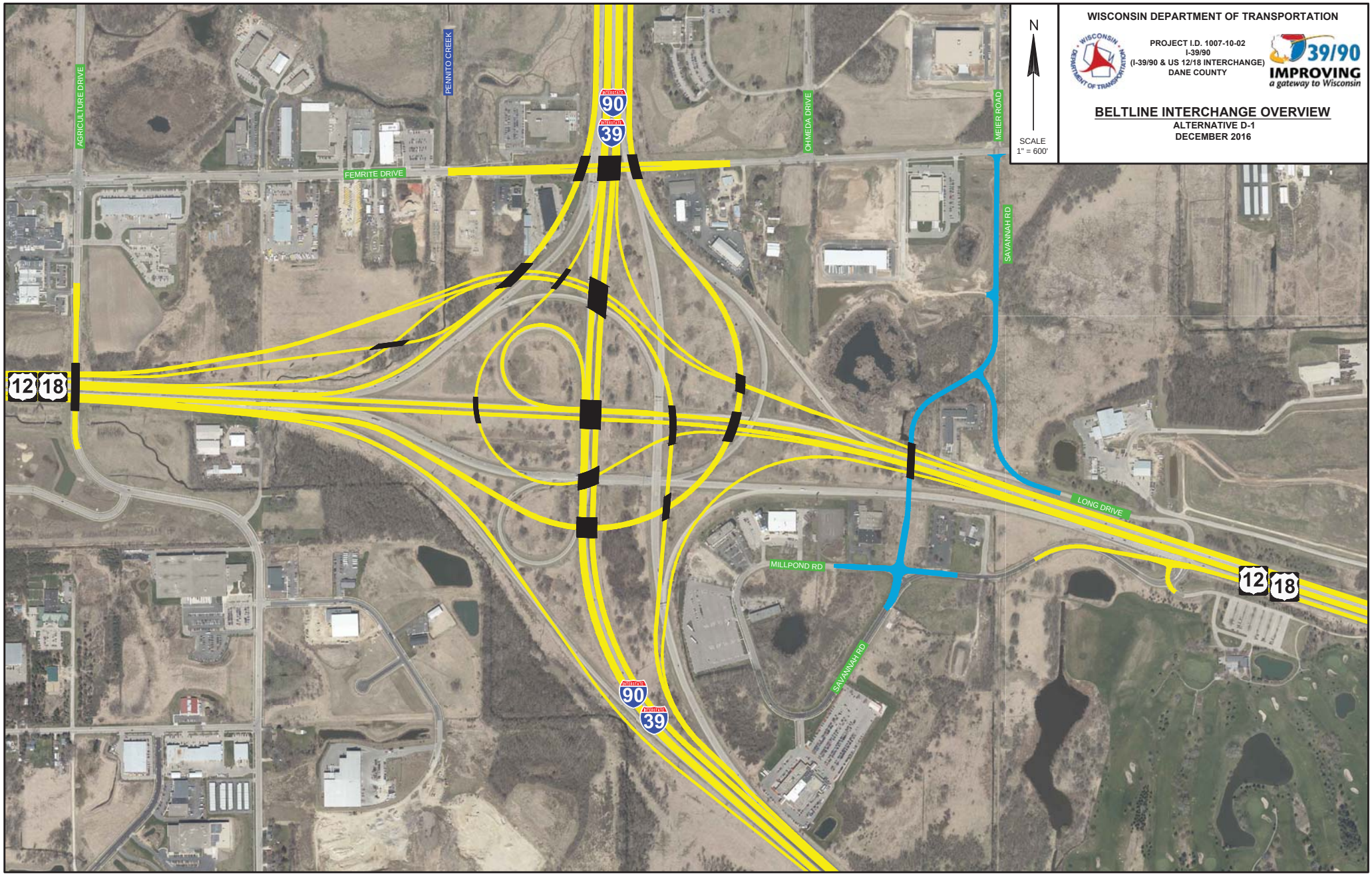
In addition, all northbound IH 39/90 bridges through the core of the Beltline Interchange will be designed and built to accommodate three lanes of traffic with 12-foot shoulders. There is one additional structure that would be required for Alternative D-1 that is not included with the preferred alternative. With this alternative, the proposed eastbound US 12/18 ramp to northbound IH 39/90 is reconfigured to be a right-side exit. Since this bridge would not span an existing roadway, it is not being constructed as part of the preferred alternative; however, the roadway profile is still being built to accommodate a bridge in this location should Alternative D-1 be built in the future.

Attachment 5

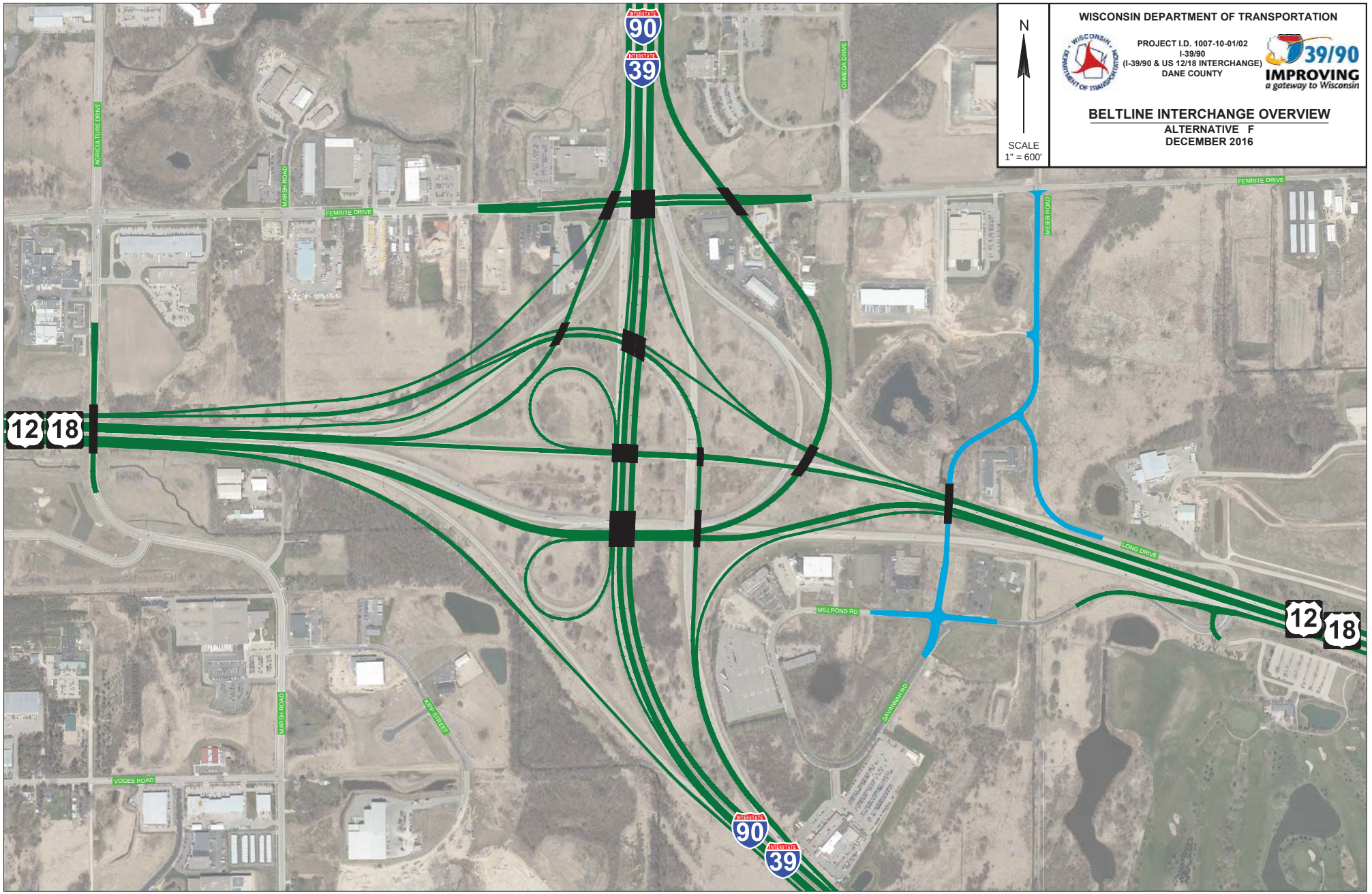
Attachment A

Alternative D-1 & F

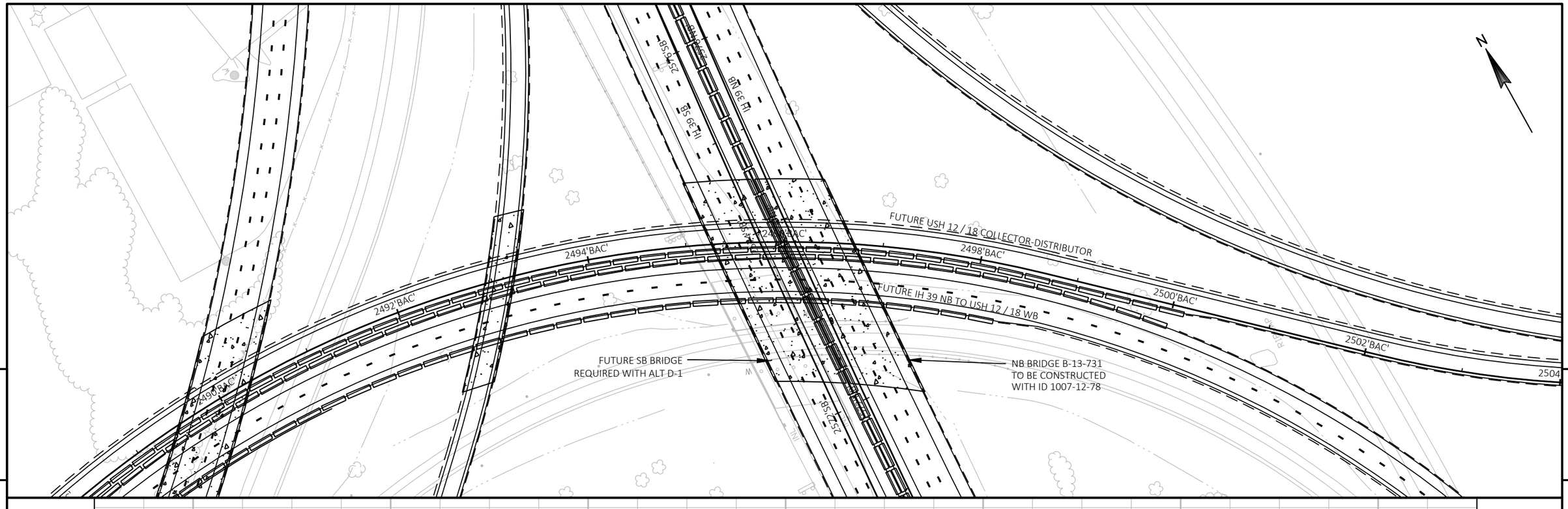
Attachment 5

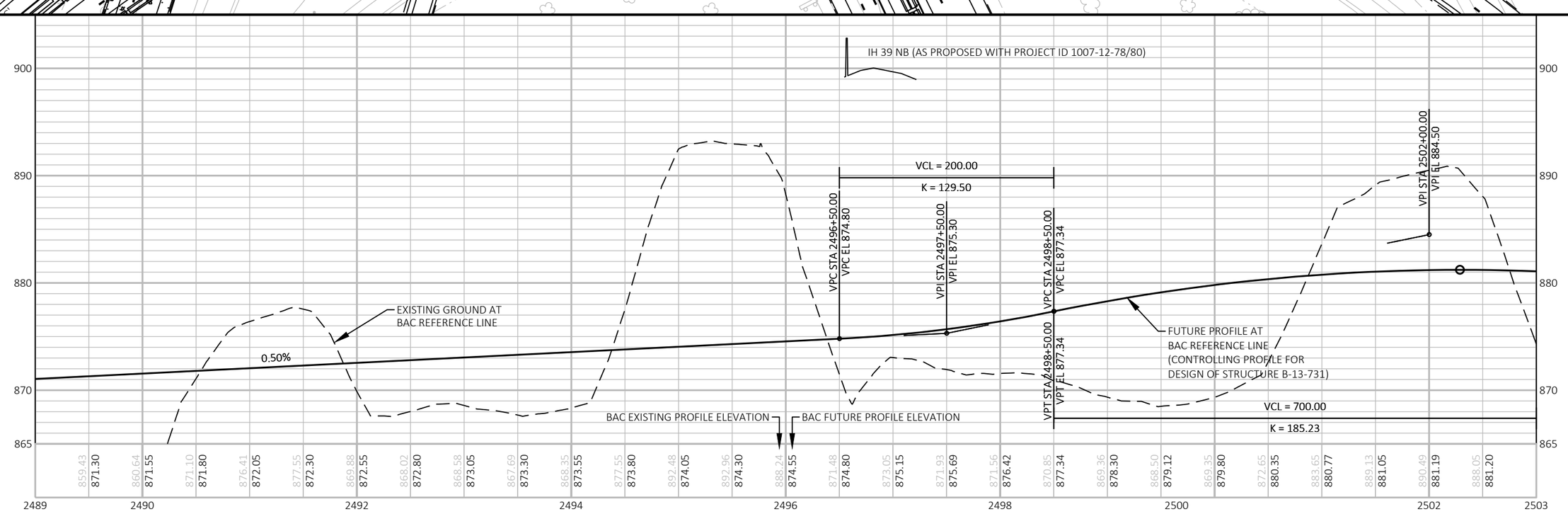


Attachment 5



Attachment 5



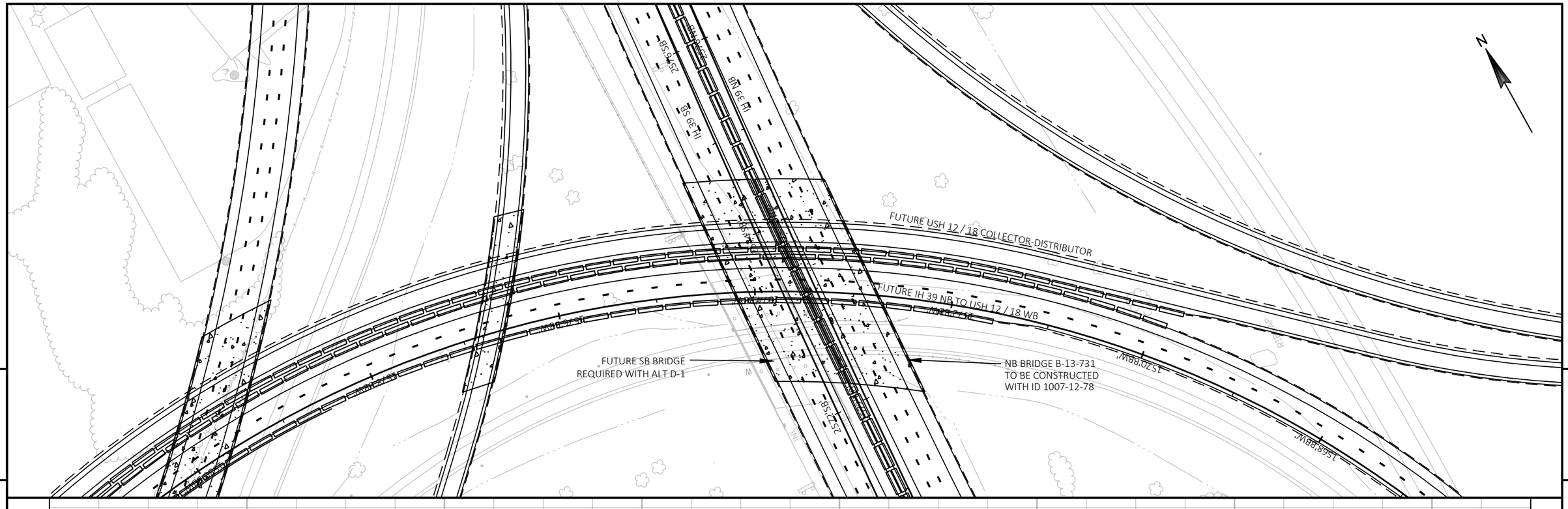


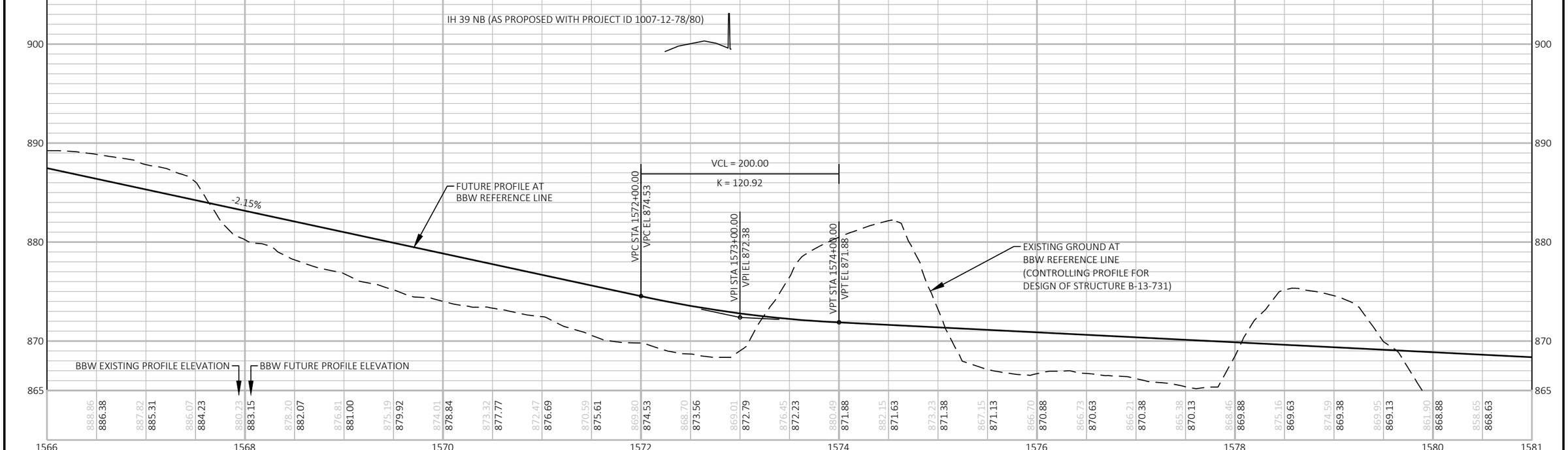
PROJECT NO: 1007-12-78	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: FUTURE ALT D-1 USH 12/18 WB COLLECTOR-DISTRIBUTOR (BAC)	SHEET	E

FILE NAME : Q:\2012 PROJECTS\2012026 - BIC\CIVIL3D\DISPLAY\050101_PP.DWG
LAYOUT NAME - 01

PLOT DATE : 5/28/2019 3:10 PM PLOT BY : PATRICK SMITH PLOT NAME : PLOT SCALE : 1 IN:100 FT

Attachment 5





PROJECT NO: 1007-12-78	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: FUTURE ALT D-1 IH 39 NB TO USH 12/18 WB (ALIGNMENT: BBW)	SHEET	E

FILE NAME : Q:\2012 PROJECTS\2012026 - BIC\CIVIL3D\DISPLAY\050101_PP.DWG
LAYOUT NAME - 02

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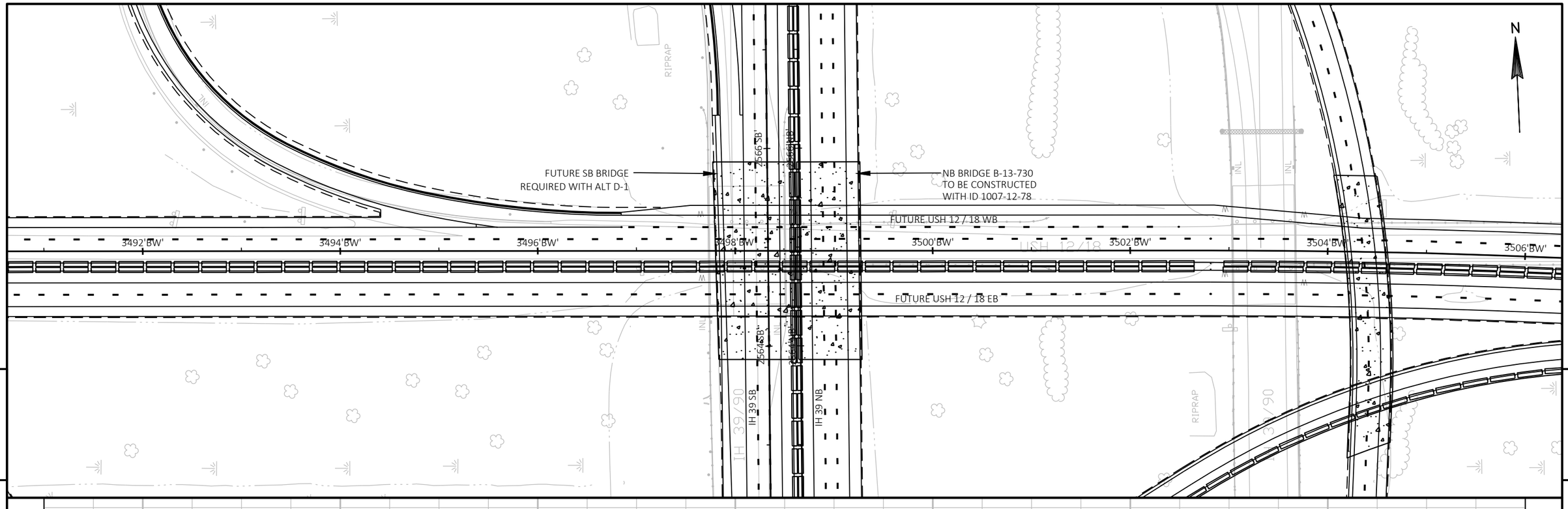
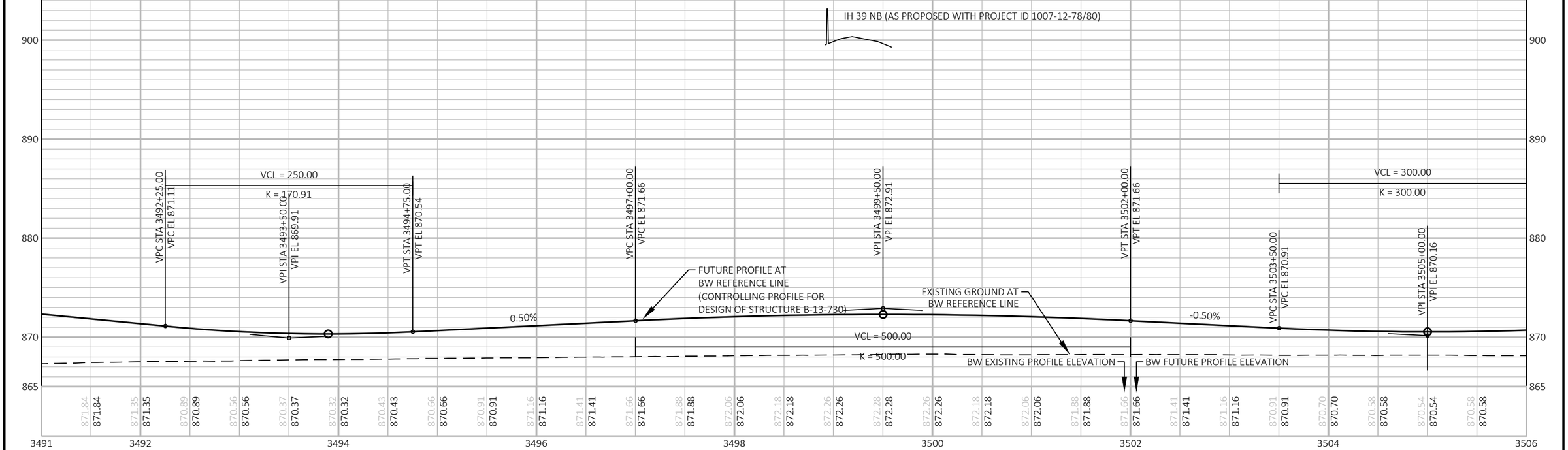
WISDOT/CADDS SHEET 44

Attachment 5





PROJECT NO: 1007-12-78	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: FUTURE ALT D-1 USH 12/18 WB (ALIGNMENT: BW)	SHEET	E

FILE NAME : Q:\2012 PROJECTS\2012026 - BIC\CIVIL3D\DISPLAY\050101_PP.DWG
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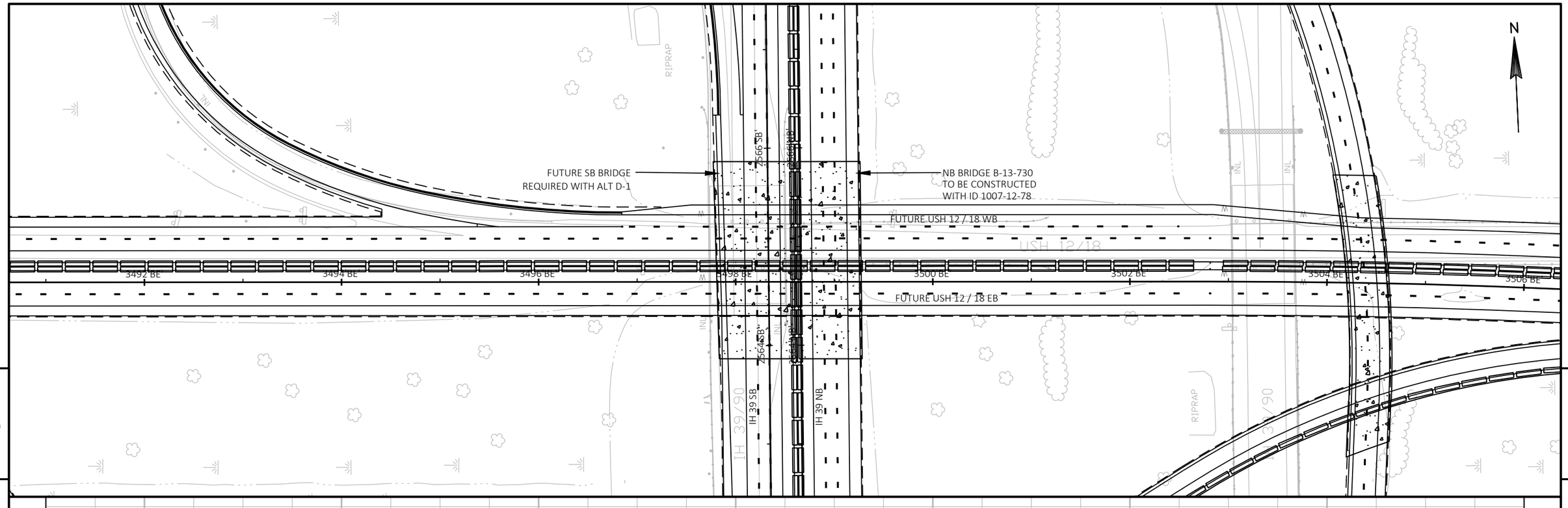
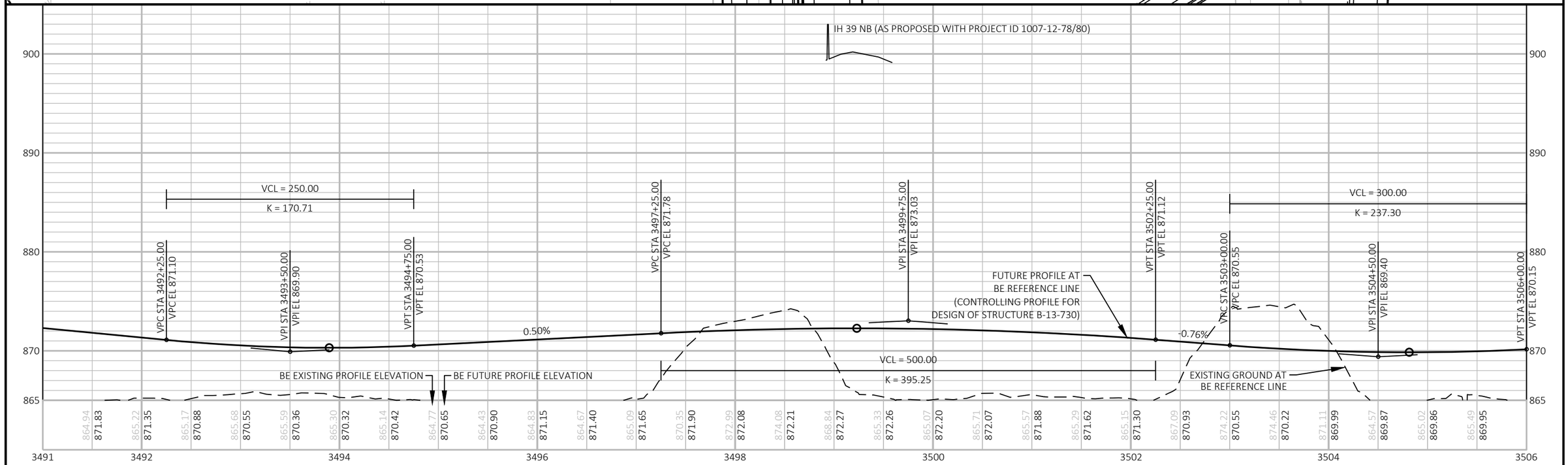
Attachment 5





PROJECT NO: 1007-12-78	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: FUTURE ALT D-1 USH 12/18 EB (ALIGNMENT: BE)	SHEET	E

FILE NAME : Q:\2012 PROJECTS\2012026 - BIC\CIVIL3D\DISPLAY\050101_PP.DWG
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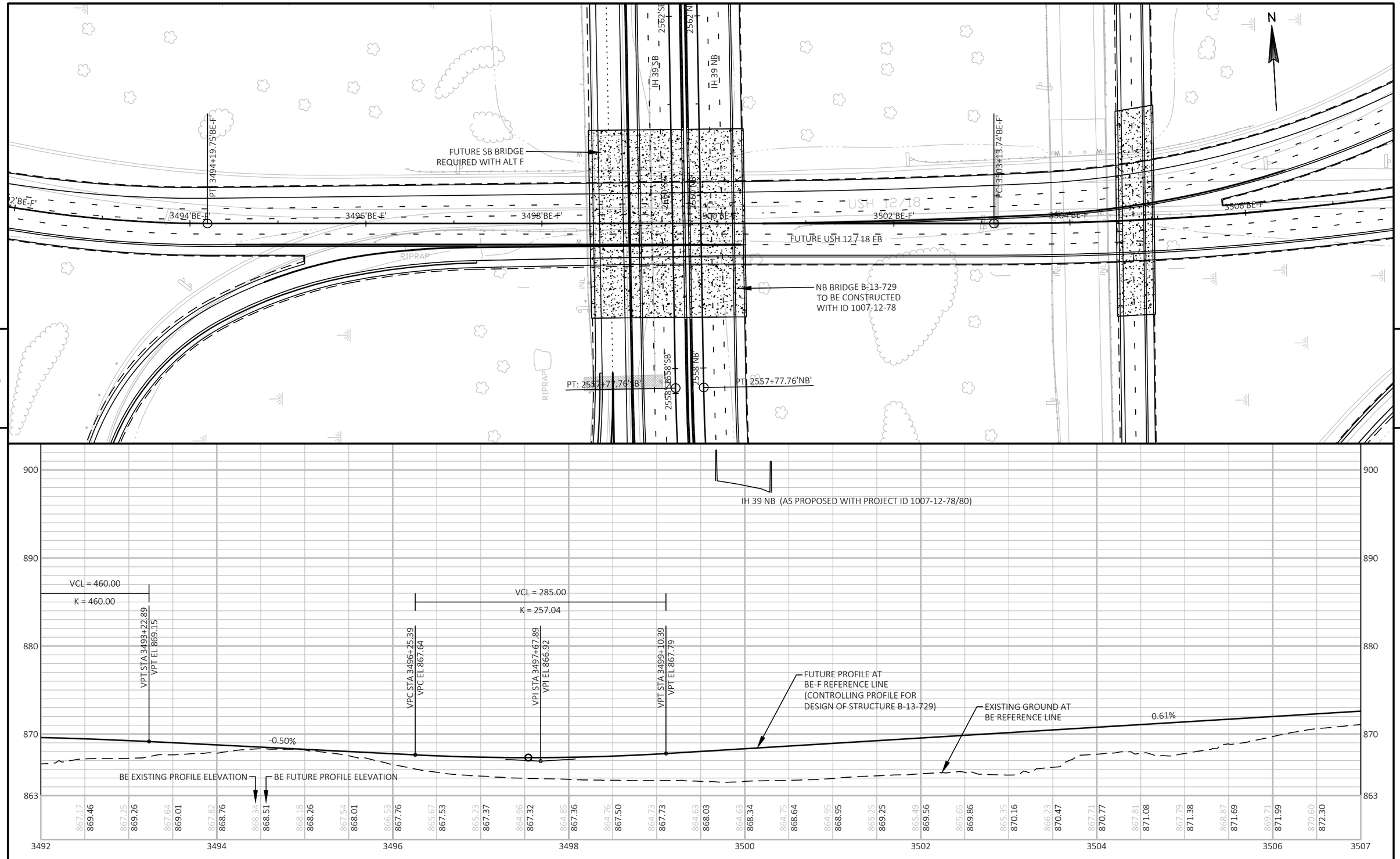
WISDOT/CADDS SHEET 44

Attachment 5



PROJECT NO: 1007-12-78	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: FUTURE ALT F USH 12/18 EB (ALIGNMENT: BE-F)	SHEET	E

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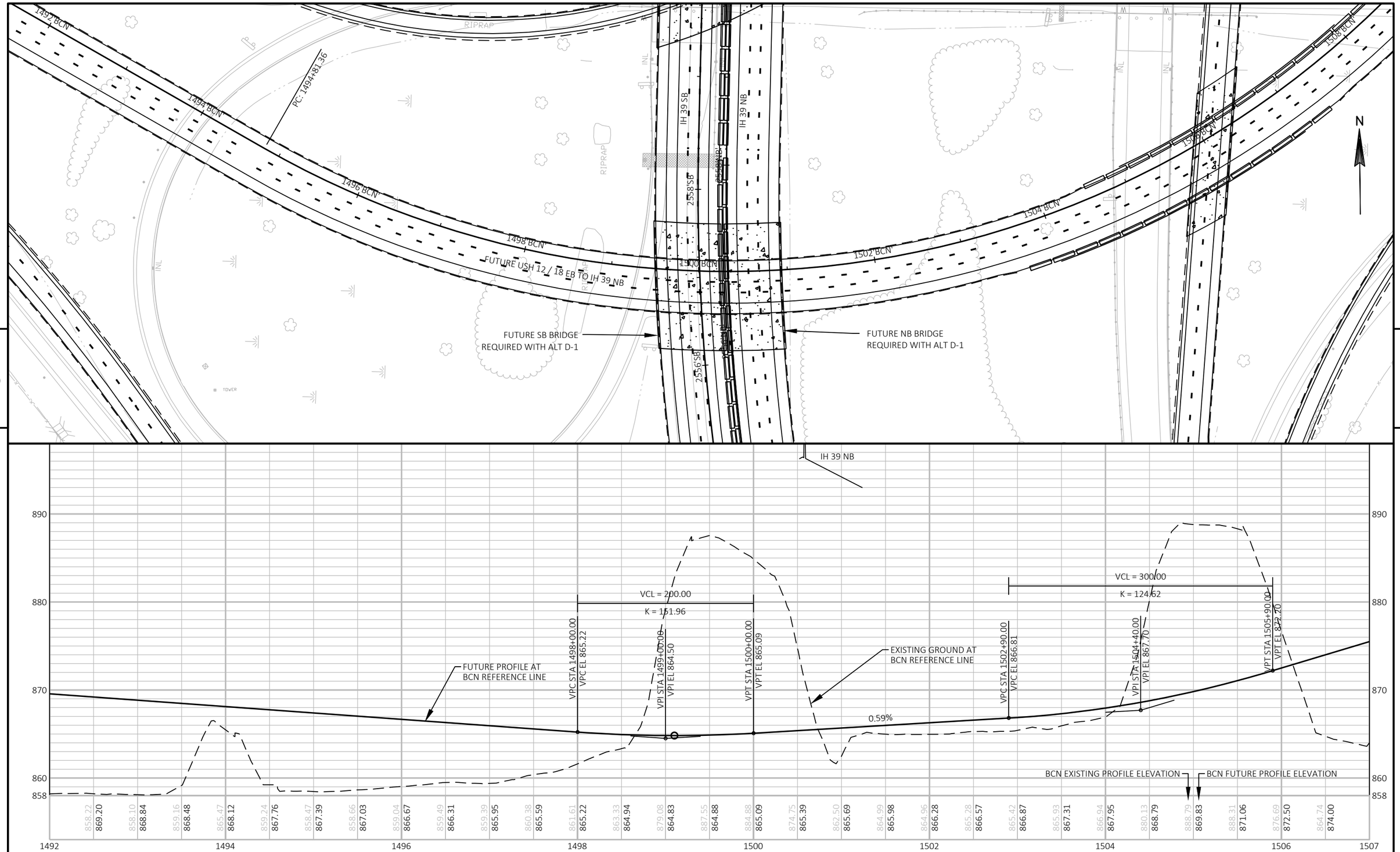
Attachment 5



5

5

PROJECT NO: 1007-12-78	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: FUTURE ALT D-1 USH 12/18 EB TO IH 39 NB (ALIGNMENT: BCN)	SHEET	E

FILE NAME : Q:\2012 PROJECTS\2012026 - BIC\CIVIL3D\DISPLAY\050101_PP.DWG
LAYOUT NAME - 05

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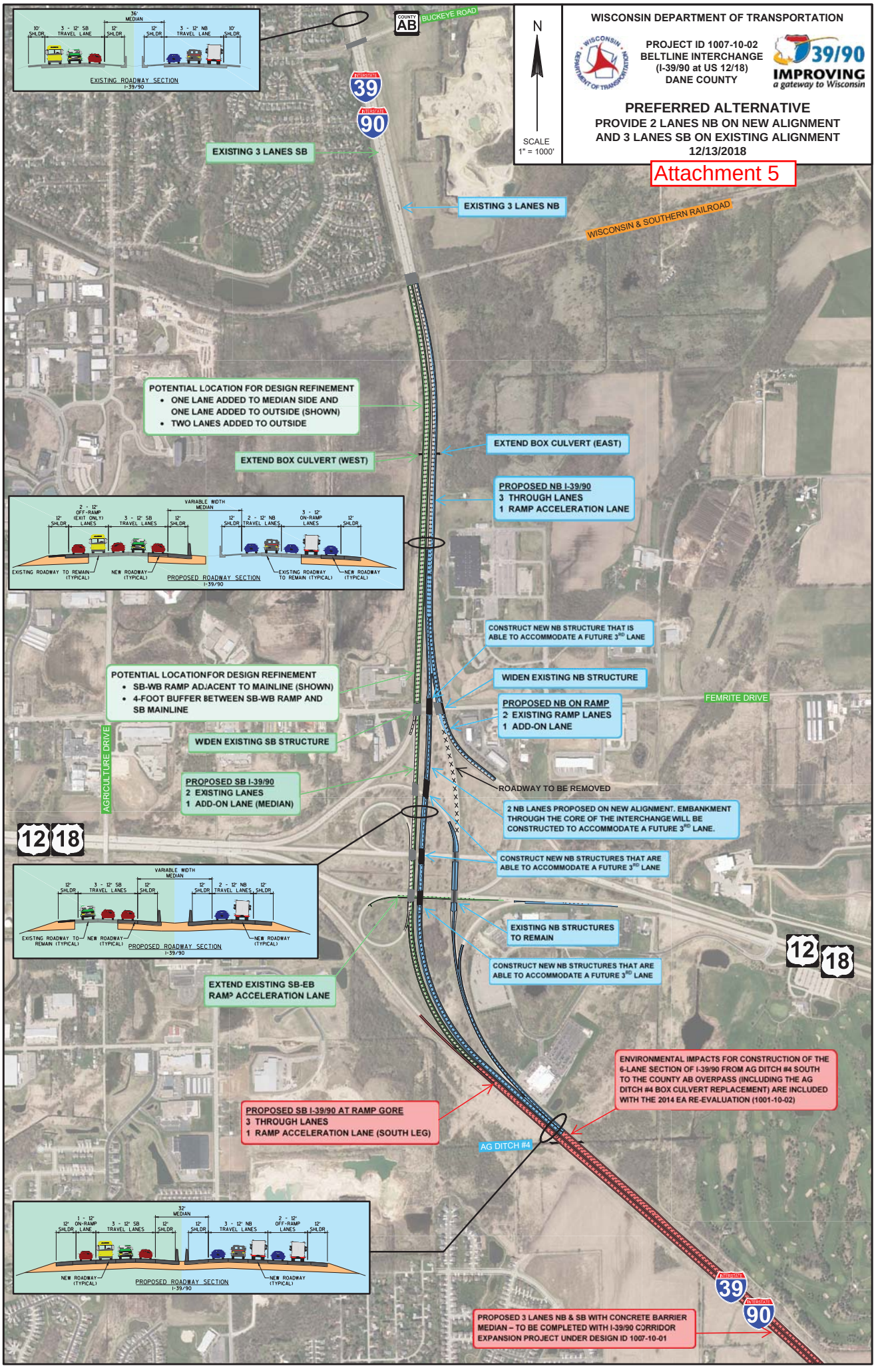
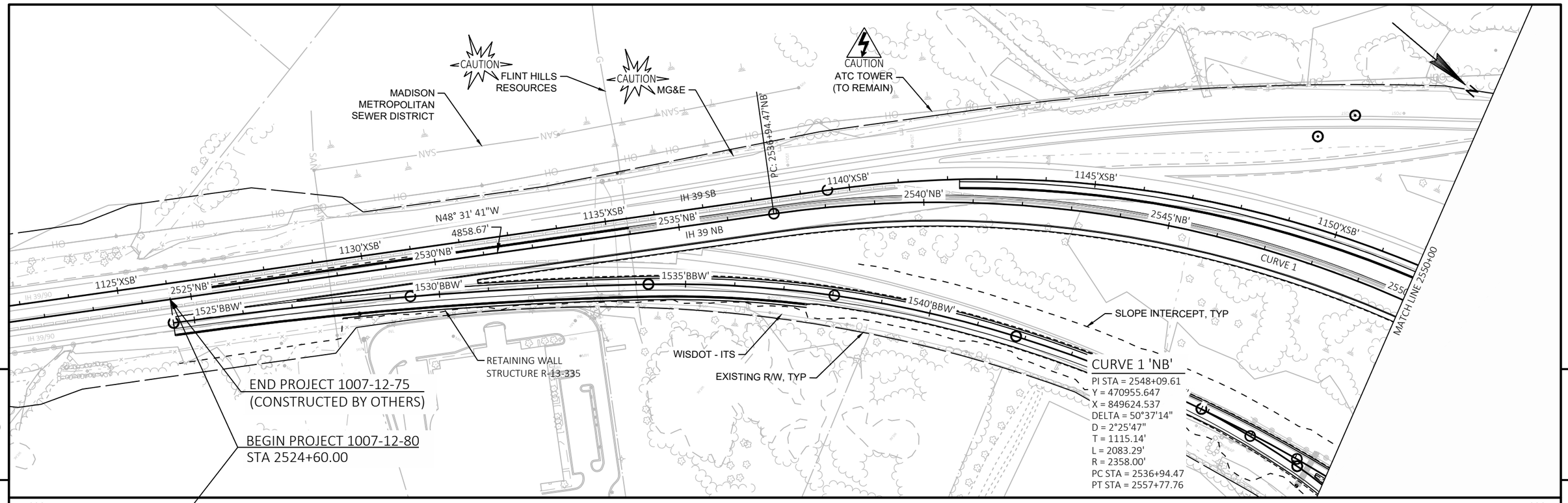
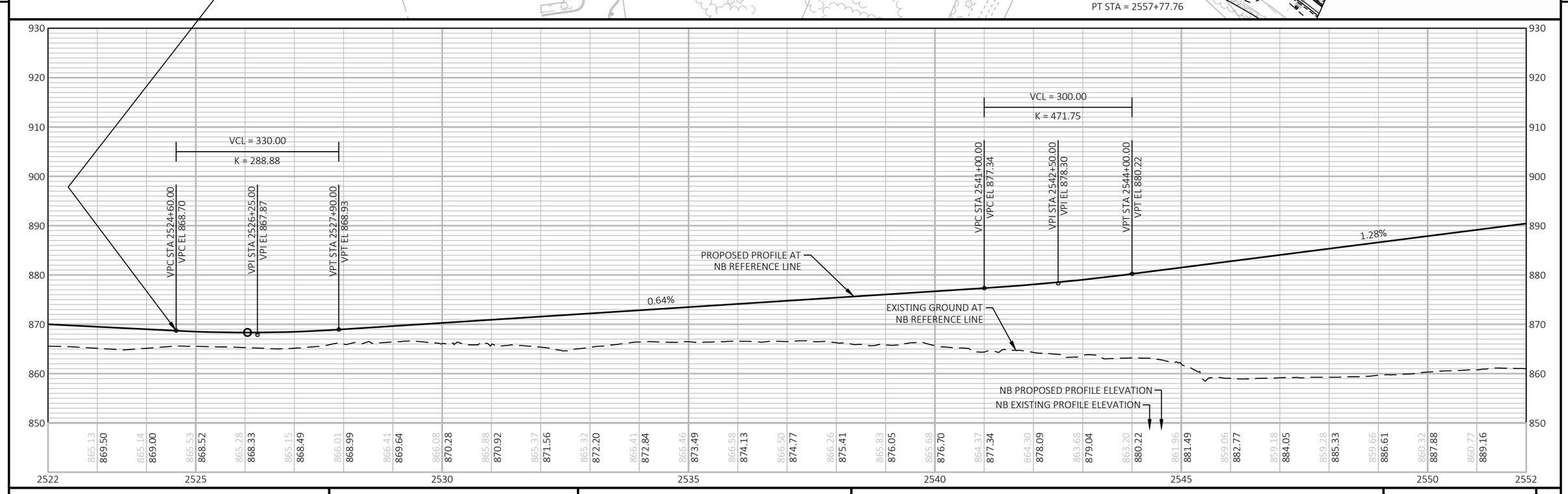
Attachment B

Preferred Alternative


WISCONSIN DEPARTMENT OF TRANSPORTATION
PROJECT ID 1007-10-02
BELTLINE INTERCHANGE
(I-39/90 at US 12/18)
DANE COUNTY
39/90 IMPROVING a gateway to Wisconsin
PREFERRED ALTERNATIVE
PROVIDE 2 LANES NB ON NEW ALIGNMENT
AND 3 LANES SB ON EXISTING ALIGNMENT
12/13/2018
Attachment 5
N
SCALE
1" = 1000'
EXISTING ROADWAY SECTION
I-39/90
COUNTY AB
BUCKEYE ROAD
INTERSTATE 39
INTERSTATE 90
EXISTING 3 LANES SB
EXISTING 3 LANES NB
WISCONSIN & SOUTHERN RAILROAD
POTENTIAL LOCATION FOR DESIGN REFINEMENT
• ONE LANE ADDED TO MEDIAN SIDE AND ONE LANE ADDED TO OUTSIDE (SHOWN)
• TWO LANES ADDED TO OUTSIDE
EXTEND BOX CULVERT (EAST)
EXTEND BOX CULVERT (WEST)
PROPOSED NB I-39/90
3 THROUGH LANES
1 RAMP ACCELERATION LANE
PROPOSED ROADWAY SECTION
I-39/90
CONSTRUCT NEW NB STRUCTURE THAT IS ABLE TO ACCOMMODATE A FUTURE 3RD LANE
WIDEN EXISTING NB STRUCTURE
POTENTIAL LOCATIONFOR DESIGN REFINEMENT
• SB-WB RAMP ADJACENT TO MAINLINE (SHOWN)
• 4-FOOT BUFFER BETWEEN SB-WB RAMP AND SB MAINLINE
PROPOSED NB ON RAMP
2 EXISTING RAMP LANES
1 ADD-ON LANE
FEMRITE DRIVE
AGRICULTURE DRIVE
WIDEN EXISTING SB STRUCTURE
PROPOSED SB I-39/90
2 EXISTING LANES
1 ADD-ON LANE (MEDIAN)
ROADWAY TO BE REMOVED
2 NB LANES PROPOSED ON NEW ALIGNMENT. EMBANKMENT THROUGH THE CORE OF THE INTERCHANGE WILL BE CONSTRUCTED TO ACCOMMODATE A FUTURE 3RD LANE.
CONSTRUCT NEW NB STRUCTURES THAT ARE ABLE TO ACCOMMODATE A FUTURE 3RD LANE
12 18
EXISTING NB STRUCTURES TO REMAIN
CONSTRUCT NEW NB STRUCTURES THAT ARE ABLE TO ACCOMMODATE A FUTURE 3RD LANE
EXTEND EXISTING SB-EB RAMP ACCELERATION LANE
ENVIRONMENTAL IMPACTS FOR CONSTRUCTION OF THE 6-LANE SECTION OF I-39/90 FROM AG DITCH #4 SOUTH TO THE COUNTY AB OVERPASS (INCLUDING THE AG DITCH #4 BOX CULVERT REPLACEMENT) ARE INCLUDED WITH THE 2014 EA RE-EVALUATION (1001-10-02)
PROPOSED SB I-39/90 AT RAMP GORE
3 THROUGH LANES
1 RAMP ACCELERATION LANE (SOUTH LEG)
AG DITCH #4
PROPOSED ROADWAY SECTION
I-39/90
PROPOSED 3 LANES NB & SB WITH CONCRETE BARRIER MEDIAN – TO BE COMPLETED WITH I-39/90 CORRIDOR EXPANSION PROJECT UNDER DESIGN ID 1007-10-01

Attachment 5



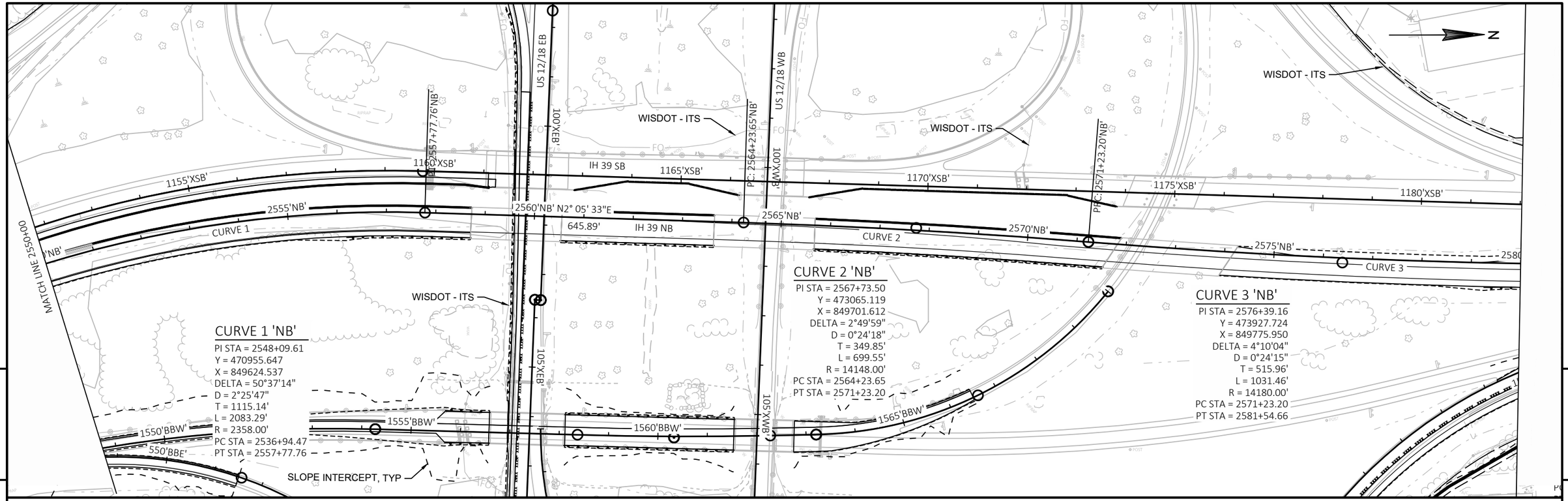


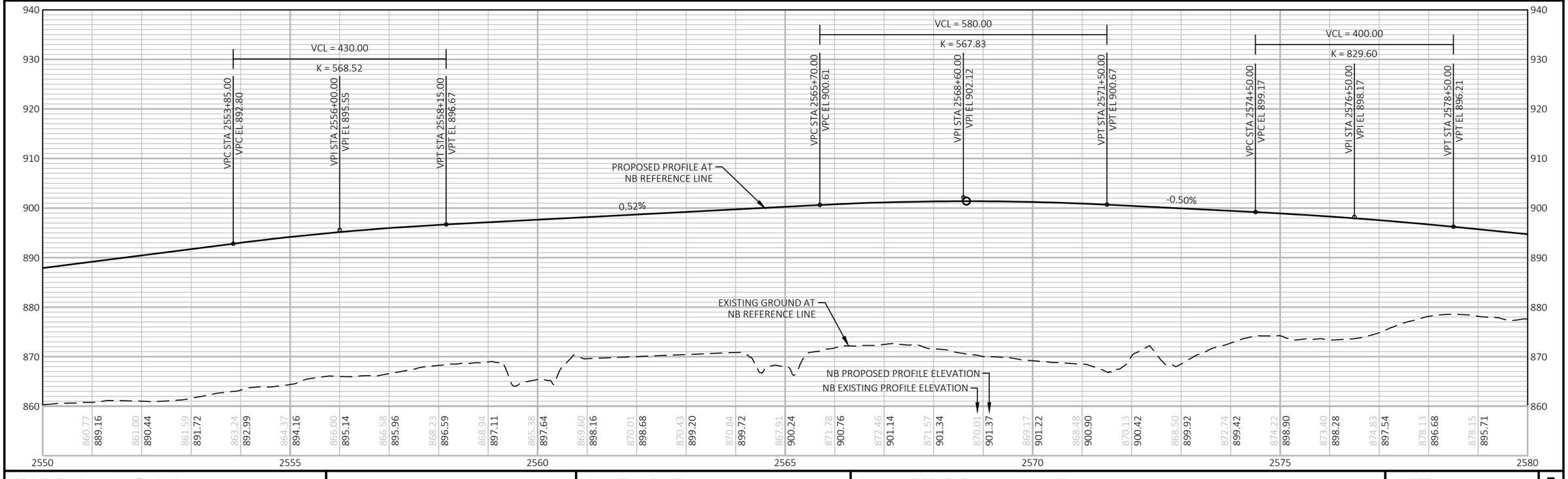
PROJECT NO: 1007-12-80	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: IH 39 NB	SHEET E

FILE NAME : P:\2019 PROJECTS\5019001 - BIC\CIVIL3D\SHEETSPLAN\10071280\0501_PP_NB.DWG
LAYOUT NAME - 1

PLOT DATE : 4/3/2019 11:38 AM PLOT BY : MATTHEW WISWELL PLOT NAME : PLOT SCALE : 1 IN:200 FT

Attachment 5





PROJECT NO: 1007-12-80	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: IH 39 NB	SHEET	E

FILE NAME : P:\2019 PROJECTS\5019001 - BIC\CIVIL3D\SHEETSPLAN\10071280\0501_PP_NB.DWG
LAYOUT NAME - 2

PLOT DATE : 4/3/2019 11:36 AM PLOT BY : MATTHEW WISWELL PLOT NAME : PLOT SCALE : 1 IN:200 FT

Attachment 5

MATCH LINE 2580+00

WISDOT - ITS
MG&E HIGH PRESSURE GAS
AT&T
FEMRITE DR
EP: 2581+54.66
WISDOT - ITS
IH 39 SB
1185'XSB'
1190'XSB'
1195'XSB'
1200'XSB'
1200'XSB'
1205'XSB'
PRC: 2590+19.48
PT: 2598+80.55
EP: 2602+00.00
MADISON METROPOLITAN SEWER DISTRICT
2595'TNB'
2600'TNB' N2° 01' 43"E
319.45'
2585'TNB'
2590'TNB'
IH 39 NB
CURVE 3
CURVE 4
CURVE 5
1590'BCN'
1585'BCN'
MG&E
SLOPE INTERCEPT, TYP
CHARTER COMMUNICATIONS
AT&T
WISDOT - ITS
PROPOSED R/W, TYP
EXISTING R/W, TYP
PROPOSED PERMANENT LIMITED EASEMENT, TYP
PROPOSED TEMPORARY LIMITED EASEMENT, TYP
MADISON METROPOLITAN SEWER DISTRICT
STA 2602+00'TNB' = STA 1201+46.58'XNB'
(SEE 'XNB' PLAN AND PROFILE SHEETS)
55'XFD'

CURVE 3 'NB'
PI STA = 2576+39.16
Y = 473927.724
X = 849775.950
DELTA = 4°10'04"
D = 0°24'15"
T = 515.96'
L = 1031.46'
R = 14180.00'
PC STA = 2571+23.20
PT STA = 2581+54.66

STA 2581+54.66 =
STA 2581+54.66'TNB'

CURVE 4 'TNB'
PI STA = 2585+87.20'TNB'
Y = 474875.983
X = 849800.493
DELTA = 3°29'29"
D = 0°24'13"
T = 432.54'
L = 864.82'
R = 14192.00'
PC STA = 2581+54.66'TNB'
PT STA = 2590+19.48'TNB'

CURVE 5 'TNB'
PI STA = 2594+50.26'TNB'
Y = 475738.331
X = 849759.318
DELTA = 4°45'44"
D = 0°33'11"
T = 430.79'
L = 861.08'
R = 10360.00'
PC STA = 2590+19.48'TNB'
PT STA = 2598+80.55'TNB'

5

5

940
930
920
910
900
890
880
870
860

PROPOSED PROFILE AT NB REFERENCE LINE
EXISTING GROUND AT NB REFERENCE LINE
EXISTING GROUND AT TNB REFERENCE LINE
PROPOSED PROFILE AT TNB REFERENCE LINE
-0.98%
-0.91%
VCL = 300.00
K = 4389.67
VPC STA 2594+50.00
VPC EL 880.73
VPI STA 2596+00.00
VPI EL 879.26
VPT STA 2597+50.00
VPT EL 877.89
STA 2602+00.00
EL 873.77
NB EXISTING PROFILE ELEVATION
NB PROPOSED PROFILE ELEVATION
TNB PROPOSED PROFILE ELEVATION
TNB EXISTING PROFILE ELEVATION

879.05	893.75			
874.43	893.01			
871.32	892.03			
883.79	891.04			
888.29	890.06			
889.42	889.08			
888.81	888.10			
887.53	887.12			
886.01	886.13			
884.66	885.15			
883.60	884.17			
882.56	883.19			
881.63	882.20			
880.75	881.22			
880.15	880.24			
879.37	879.28			
878.47	878.35			
877.46	877.43			
876.53	876.52			
875.60	875.60			
874.67	874.69			
873.77	873.77			

2580 | 2581'TNB' | 2585'TNB' | 2590'TNB' | 2595'TNB' | 2600'TNB' | 2605'TNB' | 2610'TNB'

PROJECT NO: 1007-12-80	HWY: IH 39	COUNTY: DANE	PLAN AND PROFILE: IH 39 NB	SHEET E

FILE NAME : P:\2019 PROJECTS\5019001 - BIC\CIVIL3D\SHEETSPLAN\10071280\0501_PP_NB.DWG
LAYOUT NAME - 3
PLOT DATE : 4/3/2019 11:35 AM
PLOT BY : MATTHEW WISWELL
PLOT NAME :
PLOT SCALE : 1 IN:200 FT

Attachment 6

DANE PARTNERS

MEMORANDUM

DATE: **March 29, 2019**

TO: **WisDOT Bureau of Structures**

FROM: **Dane Partners**

RE: **WisDOT ID 1007-10-02/05: IH 39/90 at USH 12/18 (Beltline) Interchange: Structure Type Selection**

Meeting to Discuss Conceptual Layout of Structures

Because of the fast-tracked nature of this project, a Working Meeting was held on January 23, 2019 with Jim Lucht (WisDOT CMT), Brandan Burger (WisDOT BOS), Mark Vesperman (WisDOT CMT) , Jeff Hanson (Dane Partners), and Chris McMahon (Dane Partners) to discuss the conceptual layouts of Structures B-13-729, B-13-730, B-13-731, and B-13-732. The purpose of the meeting was to make decisions regarding the structure type so that Preliminary Plans could be prepared more efficiently.

WisDOT BOS requested justification for the use of MSE Walls at the bridge abutments on Structures B-13-729, B-13-730, and B-13-731 when they reviewed the Preliminary Plans. The Working Meeting Notes from the January 23, 2019 meeting were forwarded to the WisDOT BOS to show what was done to justify the proposed structure layouts.

WisDOT BOS reviewed the Working Meeting Notes and requested that a more detailed justification be provided.

This is an expanded discussion of the structure types considered.

B-13-729 – IH 39/90 NB over USH 12/18 EB

When we had the Working Meeting in January 2019, the limits of the Median Retaining Wall (R-13-334) were not determined yet. It was thought that the retaining wall would extend close to the proposed bridge.

Retaining Wall R-13-334 will end at Station 2551'NB'+00.00. The end of the proposed approach slab is at Station 2558'NB'+79.05. Therefore, the wall ends approximately 775 feet away from the bridge and is not a concern.

The new structure will need to span a future interchange configuration. The future interchange will require the profiles of USH 12/18 under the bridge to be raised approximately 4 feet to allow for drainage concerns. The profile of northbound IH 39/90 also needs to be raised to provide a minimum clearance of 16'-9" over the northbound IH 39/90 ramp to westbound USH 12/18, which is located north of this bridge. The IH 39/90 profile also needs to provide a minimum clearance of 16'-9" over a future proposed ramp that will be south of this bridge (the bridge south of this location will be constructed when the future interchange is constructed). The required profile to meet the minimum clearances for these future ramps north and south of this site provides additional clearances at this bridge, especially for the existing conditions.

Therefore, the profile of northbound IH 39/90 is set. There is a 'Profile of Roadway Through the Core of the Interchange' Memo that describes this in more detail.

Because it was thought that the median wall would be in this area and possibly tie into the bridge, a single-span prestressed concrete girder bridge was proposed that would have abutments behind MSE Walls. However, this is not the case anymore. The bridge alternatives that could be considered are as follows:

Alternative 1: Single-Span 72W-Inch Prestressed Concrete Girder Bridge on Sill-Type (A1) Abutments behind MSE Walls

- This is the current proposed bridge. The bridge would be 143 feet long. The estimated cost of the bridge would be $1,165,000.
- This structure would require MSE Walls at each abutment. It is estimated that the MSE Walls would cost $390,000.
- This brings the total cost to $1,555,000.

Alternative 2: Three-Span 72W-Inch Prestressed Concrete Girder Bridge on Type A3 Abutments and Multi-Column Piers

- The bridge would be 314 feet long (spans would be 90 feet/134 feet/90 feet). The estimated cost would be $3,010,000.
- This bridge would require expansion joints at the abutments because the bridge length would be greater than 300 feet.
- This bridge would also require more maintenance in the future due to the longer span.

Alternative 3: Three-Span 72W-Inch Prestressed Concrete Girder Bridge on Sill-Type (A1) Abutments and Multi-Column Piers

- The bridge would be 230 feet long (spans would be 48 feet/134 feet/48 feet). The estimated cost would be $2,145,000.
- This bridge girders would be designed as simple spans due to the short end spans. However, it is anticipated that the design would work.
- This bridge would also require more maintenance in the future due to the longer span.

Two-Span bridges are not an option at this site because there is no room for a pier to be placed in the future typical section under the bridge for the future interchange.

Because of the significant cost savings, lower future maintenance costs, and the ability to meet the current and future geometric constraints, *Alternate 1 – Single-Span 72W-Inch Prestressed Girder Bridge on Sill-Type (A1) Abutments behind MSE Walls is the recommended alternative*.

B-13-730 – IH 39/90 NB over USH 12/18 WB

The new structure will need to span a future interchange configuration. The future interchange will require the profiles of USH 12/18 under the bridge to be raised approximately 4 feet to allow for drainage concerns. The profile of northbound IH 39/90 also needs to be raised to provide a minimum clearance of 16’-9” over the northbound IH 39/90 ramp to westbound USH 12/18, which is located north of this bridge. The IH 39/90 profile also needs to provide a minimum clearance of 16’-9” over a future proposed ramp that will be south of this bridge (the bridge south of this location will be constructed when the future interchange is constructed). The required profile to meet the minimum clearances for these future ramps north and south of this site provides additional clearances at this bridge, especially for the existing conditions.

Therefore, the profile of northbound IH 39/90 is set. There is a 'Profile of Roadway Through the Core of the Interchange' Memo that describes this in more detail.

The bridge alternatives that we considered at this site are as follows:

Alternative 1 – Single-Span 72W-Inch Prestressed Concrete Girder Bridge on Sill-Type (A1) Abutments behind MSE Walls

- This is the current proposed bridge. The bridge would be 144 feet long. The estimated cost of the bridge would be $1,185,000.
- This structure would require MSE Walls at each abutment. It is estimated that the MSE Walls would cost $325,000.
- This brings the total cost to $1,510,000.

Alternative 2 – Two-Span 54W-Inch Prestressed Concrete Girder Curved Bridge on Sill-Type (A1) Abutments and a Multi-Column Pier

- The bridge would be 214 feet long (spans would be 116 feet/98 feet). The estimated cost would be $2,095,000.
- This bridge would be curved.
- This bridge would also require more maintenance in the future due to the longer span.

Alternative 3 – Two-Span 54W-Inch Prestressed Concrete Girder Curved Bridge on Sill-Type (A1) Abutments and a Multi-Column Pier

- The bridge would be 232 feet long (spans would be 116 feet/116 feet). The estimated cost would be $2,270,000.
- This bridge would be curved.
- This bridge would also require more maintenance in the future due to the longer span.

Three-Span bridges could also be considered at this site, however based on the costs from B-13-729 discussion, they would be more expensive than the options considered.

Because of the significant cost savings, lower future maintenance costs, and ability to meet the current and future geometric constraints, and to match the structure type selected for B-13-729 which is very close, *Alternate 1 – Single-Span 72W-Inch Prestressed Girder Bridge on Sill-Type (A1) Abutments behind MSE Walls is the recommended alternative*.

B-13-731 – IH 39/90 NB over Off-Ramp to USH 12/18 WB

The new structure will need to span a future interchange configuration. The profile of northbound IH 39/90 also needs to be raised to provide a minimum clearance of 16'-9" at this bridge.

Therefore, the profile of northbound IH 39/90 is set. There is a 'Profile of Roadway Through the Core of the Interchange' Memo that describes this in more detail.

This structure has been revised because the original layout design did not work.

The bridge alternatives that we considered at this site are as follows:

Alternative 1 – Two-Span 54W-Inch Prestressed Concrete Girder Bridge on Sill-Type (A1) Abutments behind MSE Walls and a Multi-Column Pier

- This was the selected bridge back in January. However, it was determined that the design of the long span would not work.
- Therefore, this alternative needs to be eliminated.

Alternative 2 – Two-Span 54W-Inch Prestressed Concrete Girder Bridge on Sill-Type (A1) Abutments with a Multi Column Pier and with the South Abutment located behind an MSE Wall

- The bridge would be 221 feet long (spans would be 129 feet/92 feet). The estimated cost would be $2,170,000.
- This structure would require an MSE Wall at the South abutment. It is estimated that the MSE Wall would cost $410,000.
- This brings the total cost to $2,580,000.
- This bridge would be curved.

Alternative 3 – Two-Span 54W-Inch Prestressed Concrete Girder Curved Bridge on Sill-Type (A1) Abutments with a Multi Column Pier and with the South Abutment located behind an MSE Wall

- The bridge would be 258 feet long (spans would be 129 feet/129 feet). The estimated cost would be $2,525,000.
- This structure would require an MSE Wall at the South abutment. It is estimated that the MSE Wall would cost $410,000.
- This brings the total cost to $2,935,000.
- This bridge would be curved.
- This bridge would also require more maintenance in the future due to the longer span.

Alternative 4 – Three-Span 54W-Inch Prestressed Concrete Girder Curved Bridge on Sill-Type (A1) Abutments and Multi-Column Piers

- The bridge would be 287 feet long (spans would be 82 feet/123 feet/82 feet). The estimated cost would be $2,805,000.
- This bridge would be curved.
- This bridge would also require more maintenance in the future due to the longer span.

Because of the significant cost savings, lower future maintenance costs, and the ability to meet the current and future geometric constraints, *Alternate 2 – Two-Span 54W-Inch Prestressed Girder Curved Bridge on Sill-Type (A1) Abutments with a Multi-Column Pier and with the South Abutment behind an MSE Wall is the recommended alternative*.