

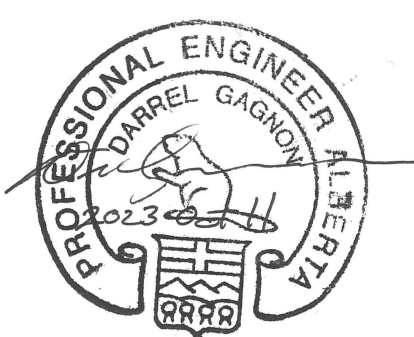
BRIDGE REHABILITATION
BANFF NATIONAL PARK, ALBERTA

KM 108.6 - HIGHWAY 93N
NIGEL CREEK BRIDGE

RECORD DRAWING

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DO NOT SCALE DRAWINGS

1	RECORD DRAWING	23/10/11
0	ISSUED FOR CONSTRUCTION	20/05/08

Revision/Revision	Description/Description	Date/Date
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Client/client
Parks Canada
Agence
L'Agence Parcs
Canada



Project title/Titre du projet
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BANFF NATIONAL PARK, ALBERTA

KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE

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Designed by/Concept par
TWB

Drawn by/Dessiné par
MACM

PWGC Project Manager/Administrateur de Projets TPSCG

PWGC, Architectural and Engineering Resources Manager/
Ressources Architectural et de Directeur d'ingénierie, TPSCG

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Drawing title/Titre du dessin

COVER SHEET,
DRAWING LIST
AND LOCATION MAP

Project No./No. du
projet

565-11

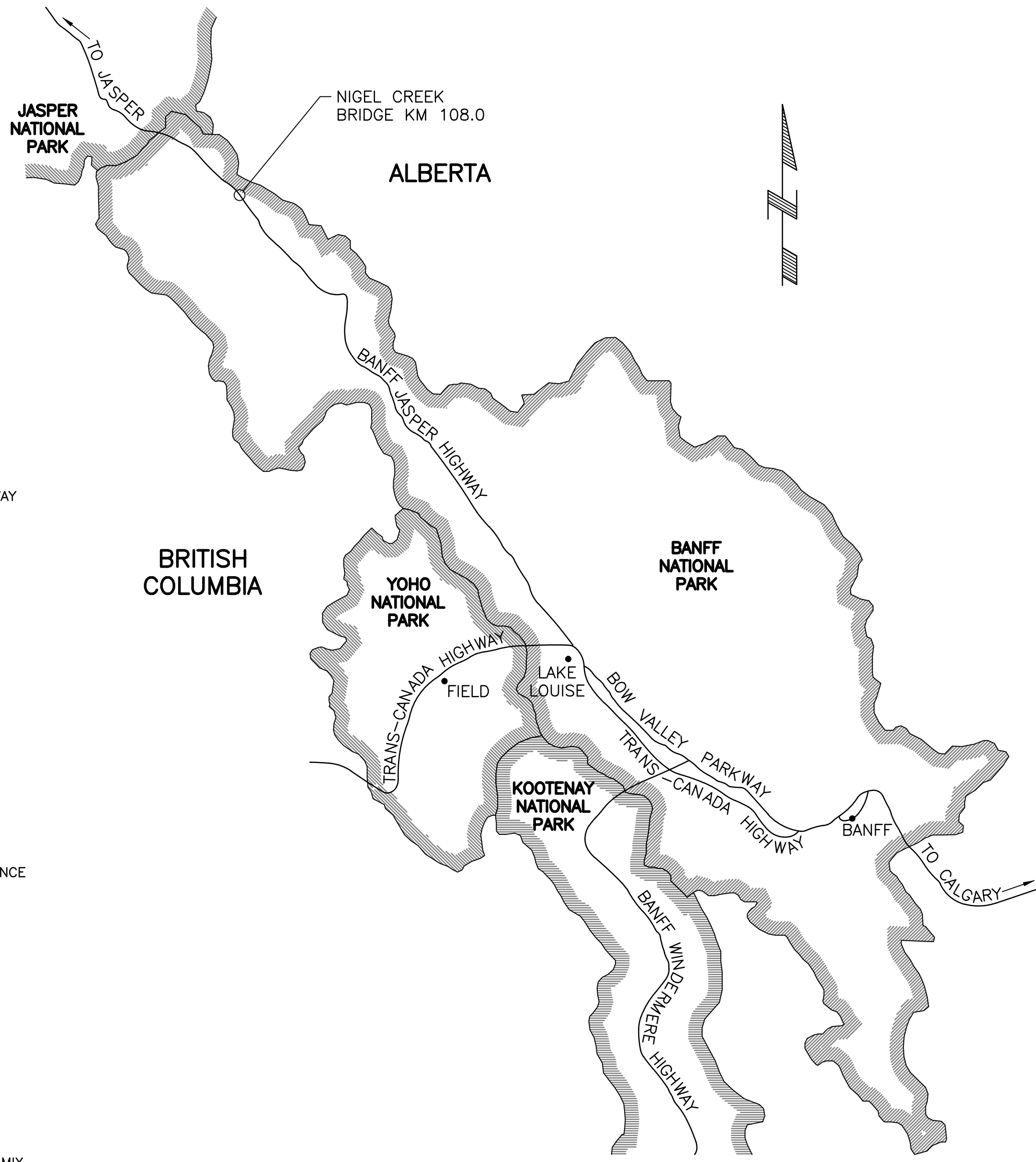
Sheet/Fauille

001

OF

Revision no./
La Révision
no.

1



LOCATION MAP

N.T.S.

DRAWING LIST:

BRIDGE DRAWINGS:

- 565-11-001 COVER SHEET, DRAWING LIST AND LOCATION MAP
- 565-11-002 GENERAL ARRANGEMENT EXISTING CONDITION
- 565-11-003 GENERAL ARRANGEMENT FINAL CONDITION
- 565-11-004 ABUTMENT MODIFICATIONS
- 565-11-005 DECK DIAPHRAGM AND PIER PYLON MODIFICATIONS
- 565-11-006 CONCRETE DECK MODIFICATIONS - SHEET 1
- 565-11-007 CONCRETE DECK MODIFICATIONS - SHEET 2
- 565-11-008 DECK JOINT MODIFICATIONS - SHEET 1
- 565-11-009 DECK JOINT MODIFICATIONS - SHEET 2
- 565-11-010 CAST-IN-PLACE BARRIER - LAYOUT AND REINFORCEMENT - SHEET 1
- 565-11-011 CAST-IN-PLACE BARRIER - LAYOUT AND REINFORCEMENT - SHEET 2
- 565-11-012 BICYCLE RAILING - SHEET 1
- 565-11-013 BICYCLE RAILING - SHEET 2

ROADWAY DRAWINGS:

DRAWING REFERENCE 2121-00203-04

- C000 COVER SHEET
- C001 LOCALITY SKETCH, DRAWING INDEX AND LEGEND
- C101 PLAN BARRIER FLARES
- C301 TYPICAL SECTIONS
- C302 BICYCLE RAILING DETAILS

REFERENCE DRAWINGS

1960 ORIGINAL DESIGN DRAWINGS, NIGEL CREEK BRIDGE BANFF-JASPER HIGHWAY
MILE 68.8 (KM 108.6), BANFF NATIONAL PARK:

- 1 OF 11 GENERAL LAYOUT
- 2 OF 11 NORTH ABUTMENT
- 3 OF 11 NORTH ABUTMENT REINFORCING
- 4 OF 11 SOUTH ABUTMENT
- 5 OF 11 SOUTH ABUTMENT STEEL REINFORCEMENT
- 6 OF 11 SKEWBACKS
- 7 OF 11 PIERS / BORE HOLES
- 8 OF 11 BEARINGS / REINFORCING STEEL SCHEDULE
- 9 OF 11 STRUCTURAL STEEL
- 10 OF 11 DECK
- 11 OF 11 STANDARD HANDRAIL

1960 ORIGINAL SHOP DRAWINGS OF NIGEL CREEK BRIDGE.

NIGEL CREEK BRIDGE 2004 REPAIRS, BANFF NATIONAL PARK, DRAWING REFERENCE
B2004R5.

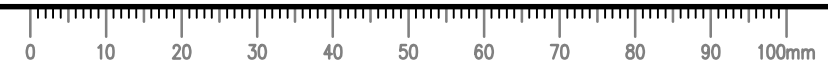
S1 NIGEL CREEK BRIDGE MISCELLANEOUS REPAIRS

2008 NIGEL CREEK BRIDGE REHABILITATION PROJECT NO. 418894 HWY 93N -
ICEFIELDS PARKWAY KM 108.6, BANFF NATIONAL PARK:

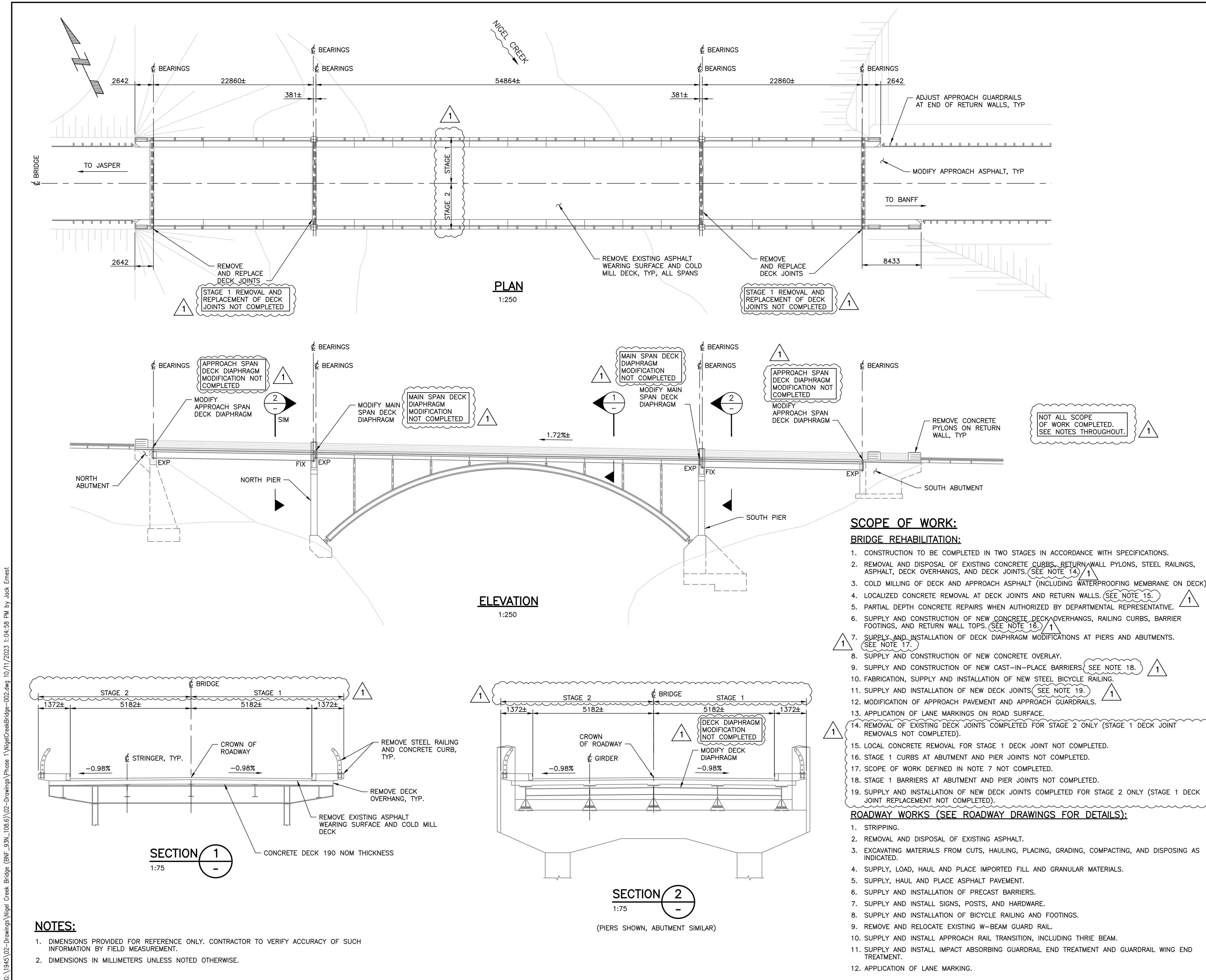
- S-100 COVER PAGE
- S-101 GENERAL NOTES
- S-102 GENERAL LAYOUT
- S-103 EXPANSION JOINT DETAILS
- S-104 APPROACH GUARDRAILS
- S-105 MISCELLANEOUS DETAILS - SHEET 1
- S-106 MISCELLANEOUS DETAILS - SHEET 2
- S-1443-98 DECK WATERPROOFING SYSTEM WITH 80mm TWO COURSE HOT-MIX
ASPHALT CONCRETE PAVEMENT
- S-1471 DEEP BEAM GUARDRAIL AT BRIDGE APPROACHES SHEET 1

2020 BARRIER FLARE - NIGEL CREEK ROADWAY CROSS SECTIONS (10 SHEETS)

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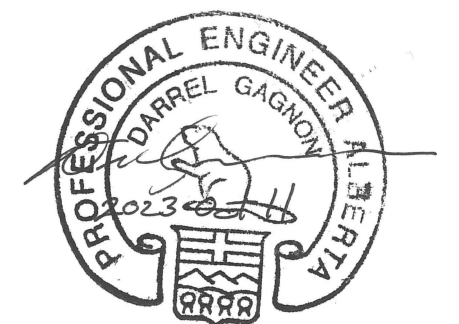
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BANFF NATIONAL PARK, ALBERTA**

**KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE**

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PWGC, Architectural and Engineering Resources Manager/
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Client/client
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**GENERAL ARRANGEMENT
EXISTING CONDITION**

Project No./No. du projet 565-11	Sheet/Fauille 002 OF	Revision no./ La Révision no. 1
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revision/	Description/Description	Date/Date

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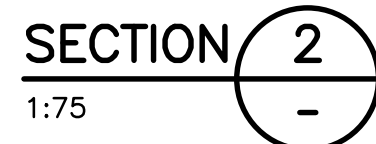
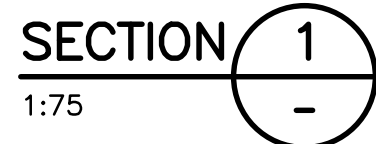
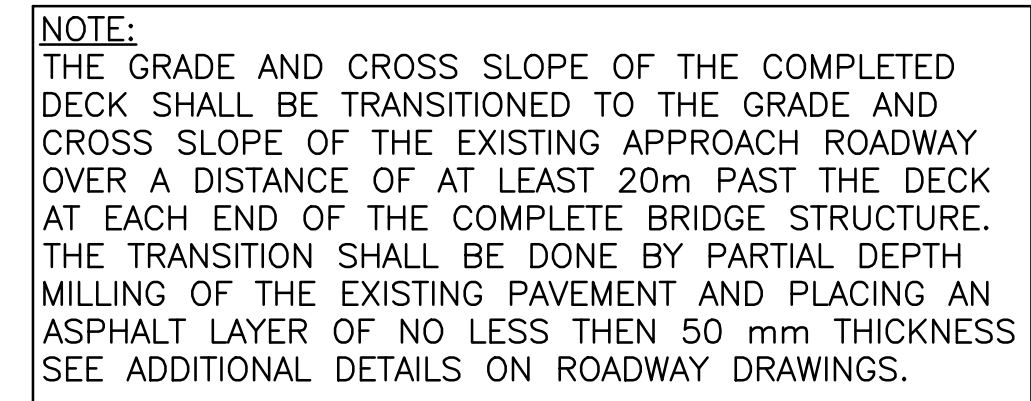
**KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE**

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GENERAL ARRANGEMENT

FINAL CONDITION

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
565-11	003 OF	1



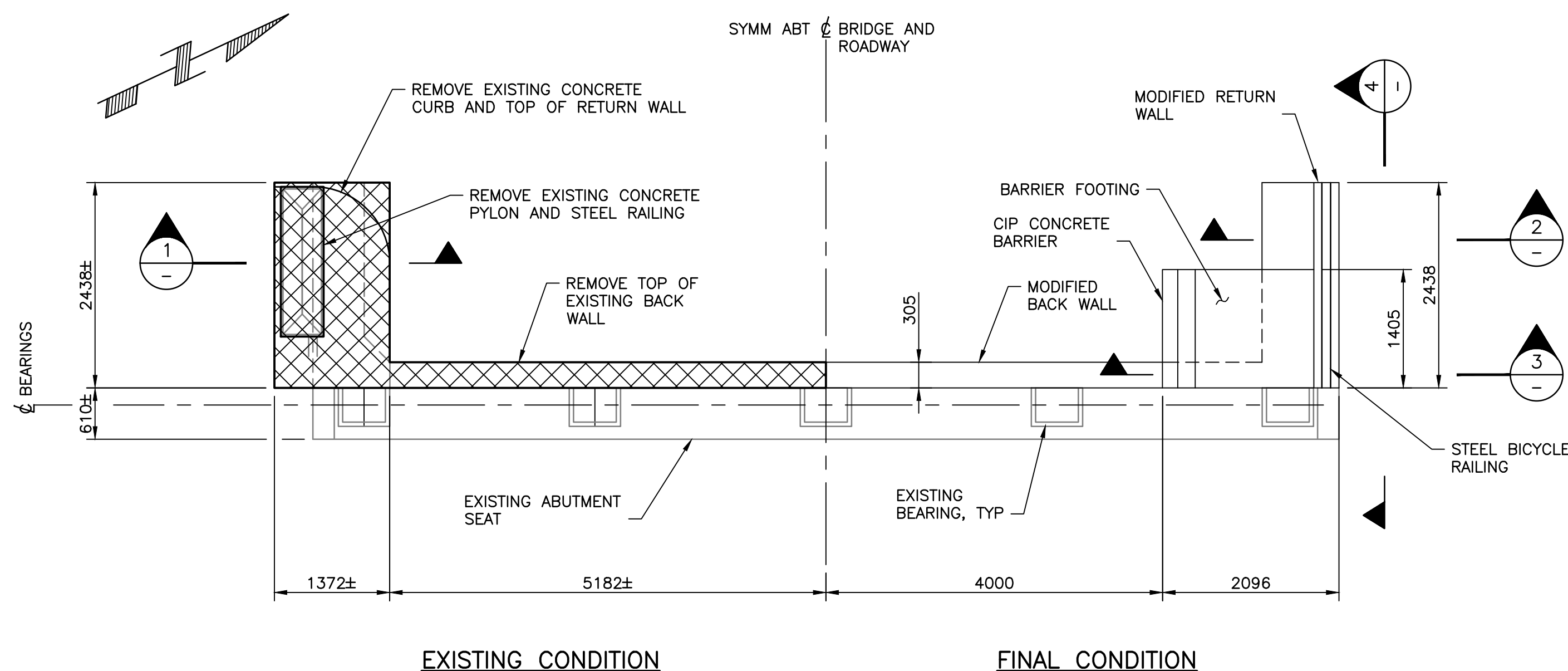
(PIERS SHOWN, ABUTMENT SIMILAR)

1. DESIGN STANDARDS: CANADIAN STANDARDS ASSOCIATION
—CAN/CSA-S6-14 – JULY 2017. DESIGN LIFE: 30 YEARS
2. DESIGN LOADS:
 - 2.1 UNIT MATERIAL WEIGHTS
 - REINFORCED CONCRETE: 24.0 kN/m³
 - STEEL: 77.0 kN/m³
 - CONCRETE BARRIER: 5.2 kN/m
 - BICYCLE RAILING: 0.50 kN/m
 - 2.2 TRAFFIC BARRIER: TL-4
 - 2.3 WIND LOADS
 - REFERENCE WIND PRESSURE $q = 455$ kPa FOR 50 YEAR RETURN PERIOD
 - 20% INCREASE OF WIND PRESSURE DUE TO POSSIBLE FUNNELING EFFECT.
 - 2.4 TEMPERATURE DATA:
 - MAXIMUM MEAN DAILY TEMPERATURE: 26°C
 - MINIMUM MEAN DAILY TEMPERATURE: -40°C
 - 2.5 SEISMIC DESIGN PARAMETERS:
 - RETURN PERIOD : 475 YEARS
 - IMPORTANCE CATEGORY : OTHER BRIDGES
 - SITE CLASS : A



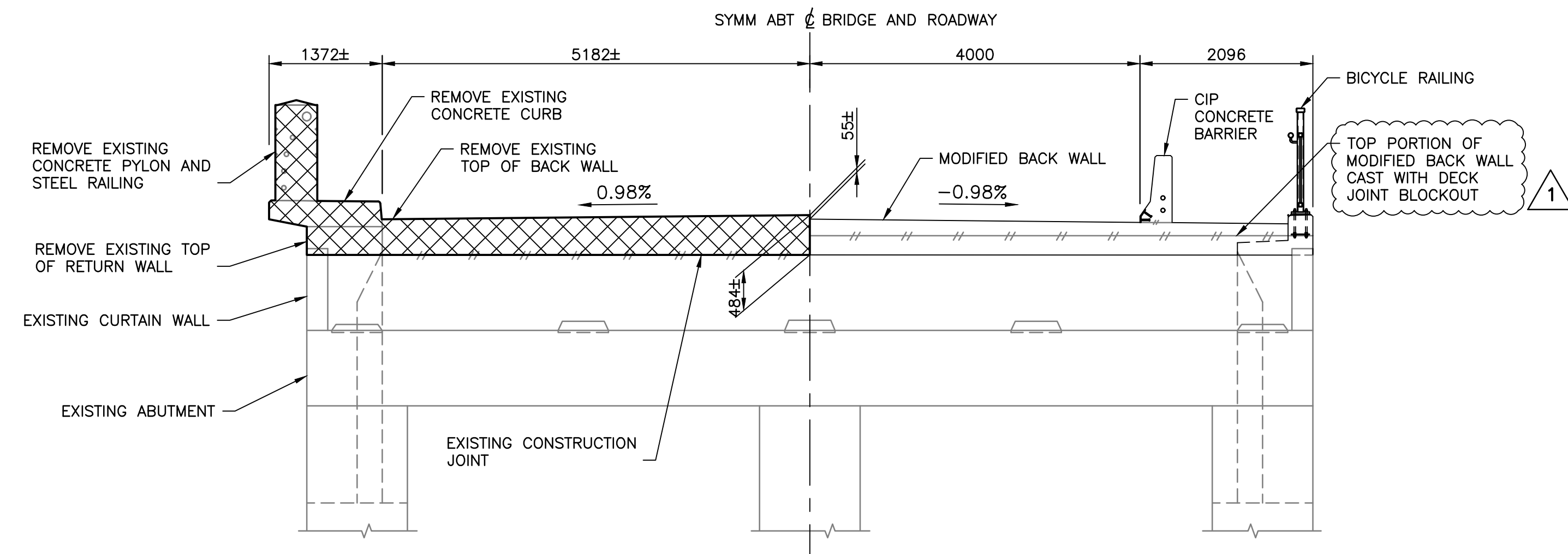
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PWSC - A1 - 841X594



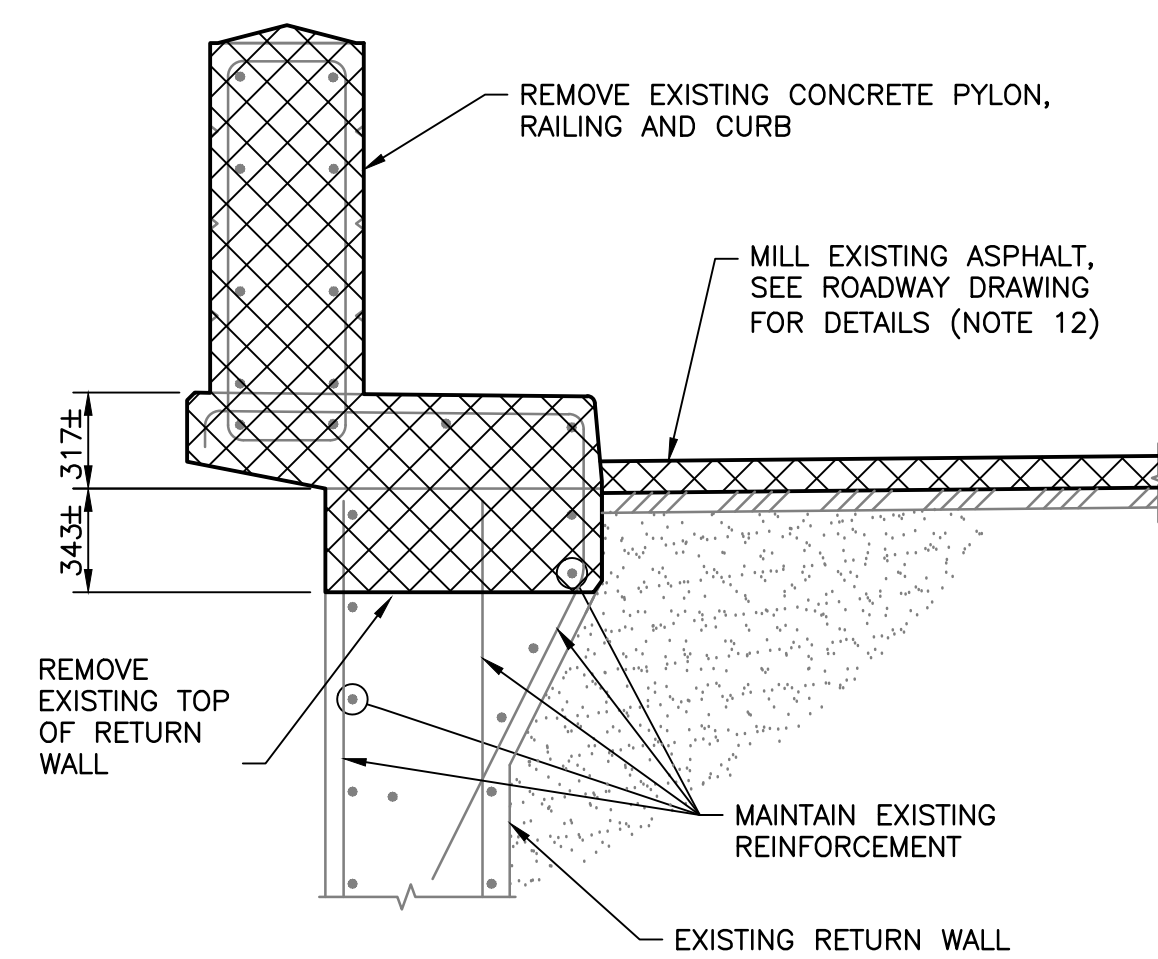
ABUTMENT PLAN

1:50
(NORTH ABUTMENT SHOWN - SOUTH ABUTMENT SIMILAR)

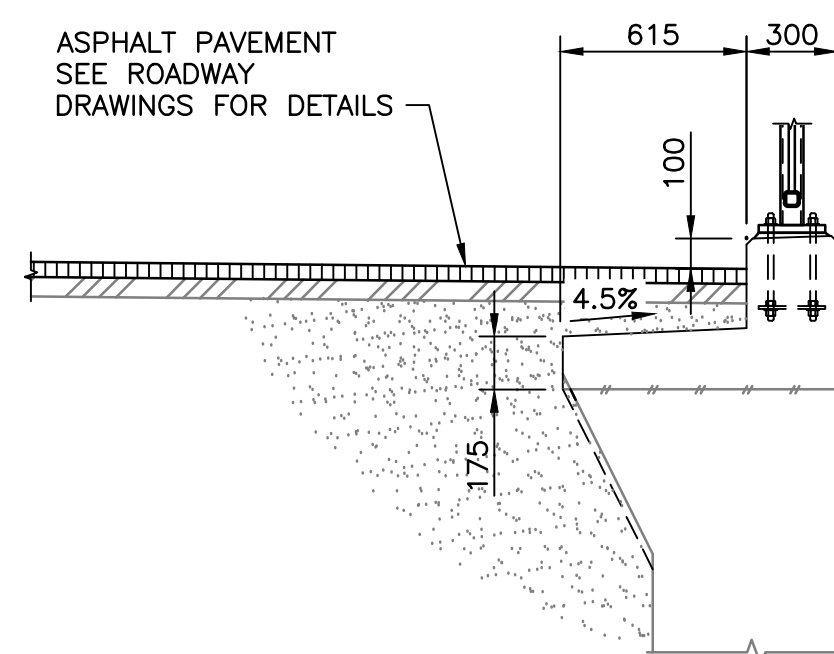


ABUTMENT ELEVATION

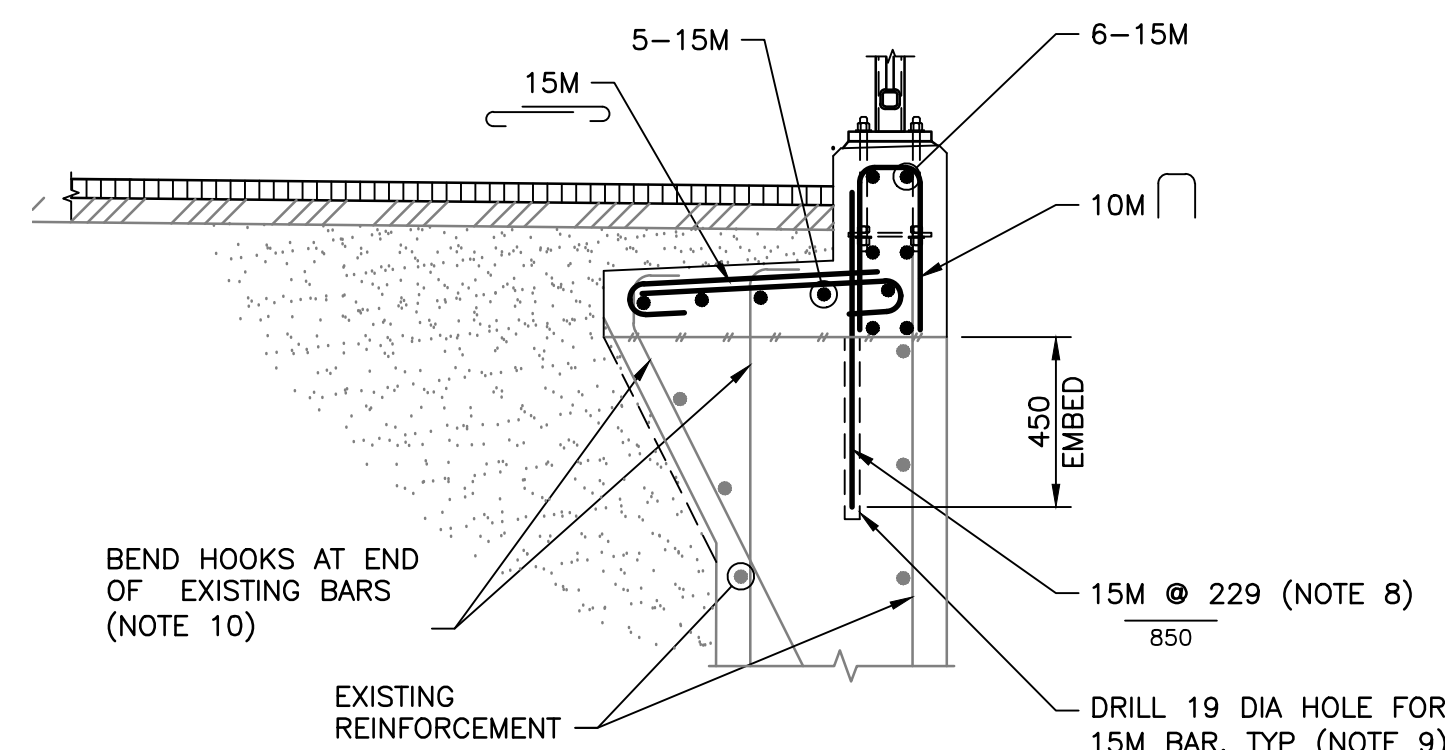
1:50
(NORTH ABUTMENT - LOOKING NORTH)



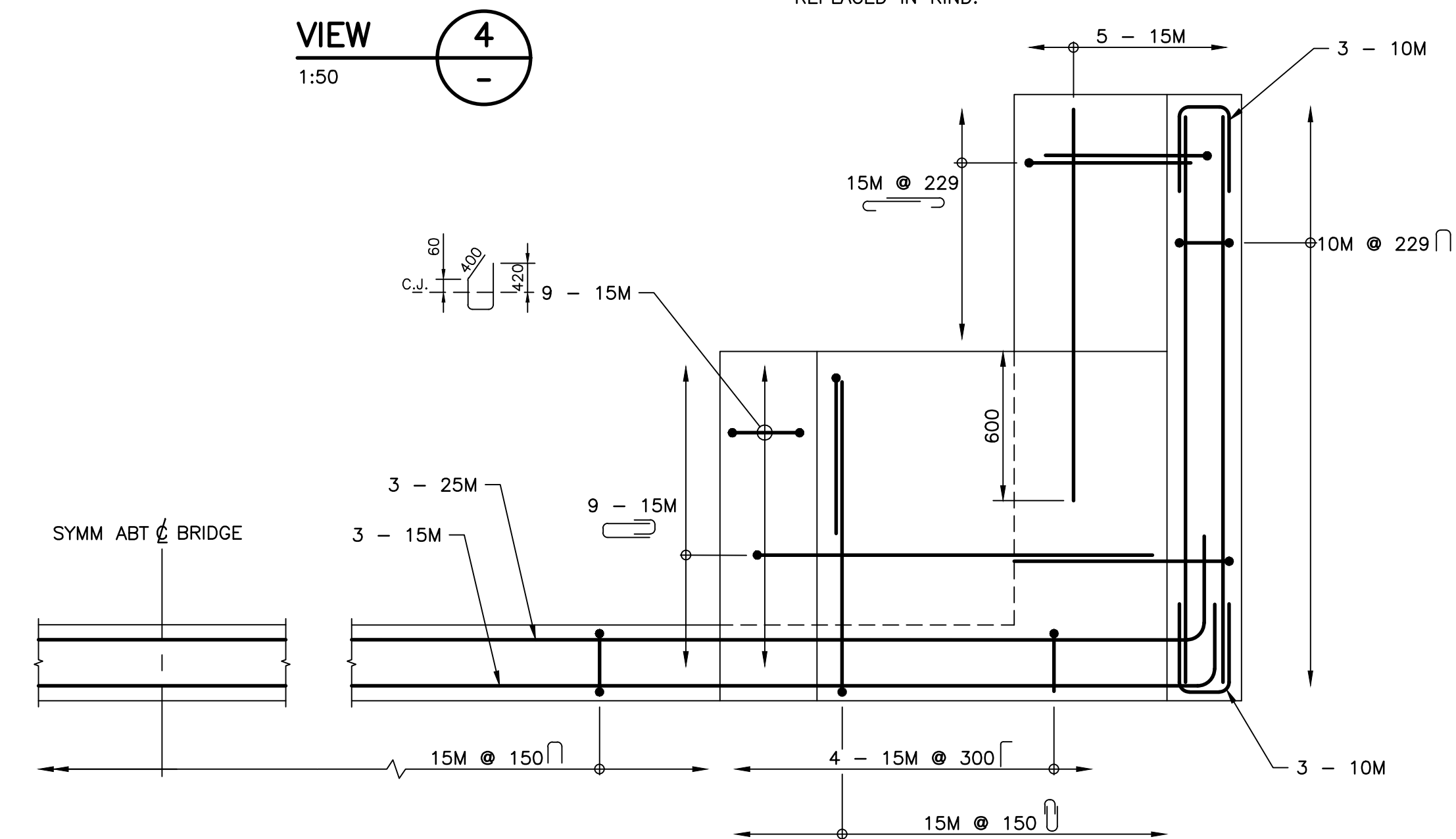
SECTION 1
1:25



SECTION 2 OUTLINE
1:25

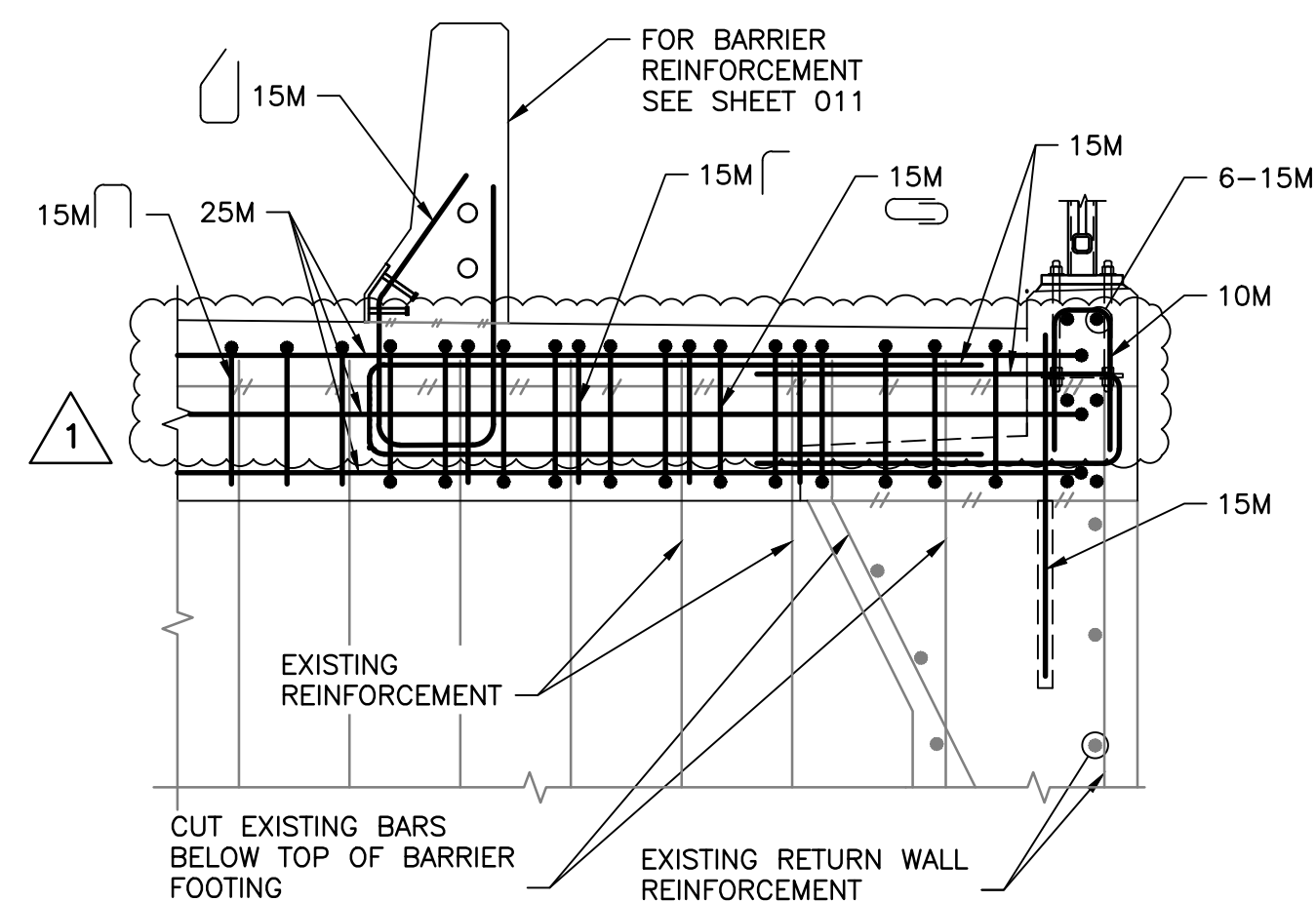


SECTION 2 REINFORCEMENT
1:20



SLAB REINFORCEMENT FINAL CONDITION PLAN

1:20
(DECK JOINT NOT SHOWN FOR CLARITY. SEE SHEET 008 FOR DETAILS.)



SECTION 3 REINFORCEMENT
1:20

LEGEND:

REMOVALS

NOTES:

- MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 45 MPa AT 28 DAYS.
- CHAMFER EXPOSED EDGES 20.
- REINFORCING STEEL: G30.18M GRADE 400W.
- MINIMUM COVER: 50 UNO.
- MINIMUM LAP UNO: 25M: 1200
15M: 600
10M: 320
USE REBAR COUPLERS FOR TRANSVERSE BARS AS REQUIRED AT STAGE 1/STAGE 2 CONSTRUCTION JOINT. REBAR COUPLERS IN ACCORDANCE WITH CSA/CAN S6-14, SECTION 8.4.4.4.
- NOT MORE THEN 50% OF REINFORCING SHALL BE SPLICED AT ONE LOCATION UNLESS NOTED OTHERWISE. LAP SPLICES SHALL BE STAGGERED BY A MINIMUM OF 1.3 TIMES THE SPLICE LENGTH.
- SAWCUT 25 DEPTH ALONG EDGE OF CONCRETE REMOVALS.
- PLACE ANCHOR DOWELS AT AND CENTERED BETWEEN EXISTING REBAR.
- DOWELS TO BE ANCHORED WITH HILTI HIT-HY200 OR APPROVED EQUIVALENT. HOLES TO BE HAMMER DRILLED.
- FIELD BENDING SHALL BE DONE CAREFULLY, COLD AND SHALL SATISFY THE MINIMUM BEND DIAMETERS OF CAN/CSA S6-14.
- CONSTRUCTION JOINTS TO BE CLEAN, FREE OF LAITANCE AND ROUGHENED TO AN AMPLITUDE OF 5 mm.
- LOCAL FULL DEPTH ASPHALT REMOVALS AND EXCAVATION ADJACENT TO RETURN WALL AS REQUIRED TO COMPLETE RETURN WALL MODIFICATIONS NOT SHOWN. ASPHALT AND FILL REMOVED TO BE REPLACED IN KIND.

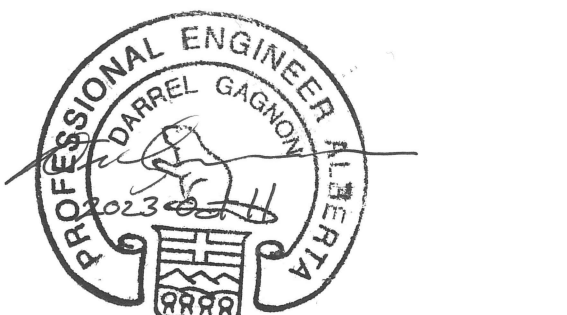
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Western Region
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ABUTMENT MODIFICATIONS

Project No./No. du projet
565-11
Sheet/Fauille
004
Revision no./La Révision no.
1

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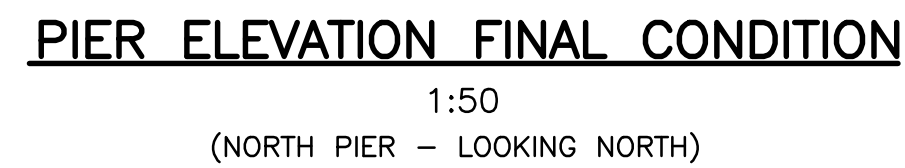
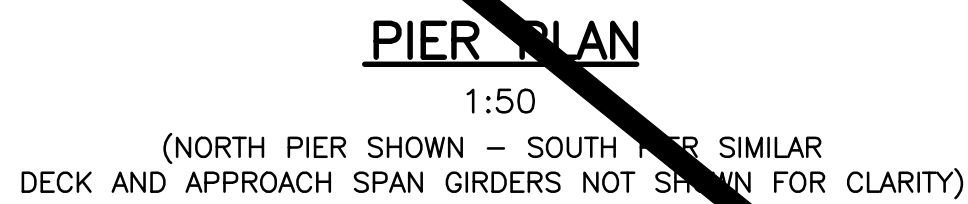
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Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no
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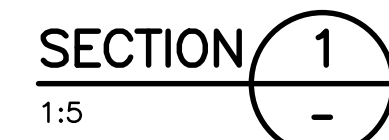
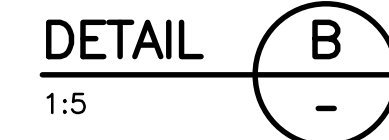


DIAPHRAGM MODIFICATION
AT PIER SHOWN,
ABUTMENT SIMILAR.

DIAPHRAGM MODIFICATION
AT PIER SHOWN,
ABUTMENT SIMILAR.

1. NEW STEEL: CAN/CSA G40.21 GRADE 350W.
2. STUDS: CSA W59 ANNEX H, TYPE B.
3. BOLTS: ASTM F3125, GRADE A325.
4. WELDING: CAN/CSA W59.
5. GALVANIZE ALL STEEL WORK AFTER FABRICATION IN ACCORDANCE WITH ASTM A123/123M.
6. BOLT THREADS SHALL BE EXCLUDED FROM SHEAR PLANE.
7. USE TURN-OF-NUT METHOD FOR TIGHTENING THE BOLTS.
8. THE FAYING SURFACE AT T-B JOINT CHANNEL FLANGE SHALL BE ZINC METALLIZED IN ACCORDANCE WITH ASTM B633. SURFACE SHALL BE BLAST CLEANED BEFORE APPLICATION. THICKNESS OF ZINC METALLIZING SHALL NOT EXCEED 16 mil.
9. FIELD WELDING IS NOT PERMITTED.
10. PLACE DIAPHRAGM MODIFICATION BEFORE PLACING NEW DECK JOINT.
11. FILL HOLES OF REMOVED RAILING PIPES IN PIER PYLONS WITH CONCRETE REPAIR MORTAR. SEAL PERIMETER OF INFILL WITH SIKAFLEX 15LM SEALING COMPOUND OF APPROVED EQUIVALENT.
12. PAINT STEEL RAILING ANCHOR ASSEMBLY IN PIER PYLON AND APPLY TWO COATS OF ZINC-RICH PAINT. PAINT COLOUR TO MATCH COLOUR OF PIER CONCRETE.

LOCATION	No. DIAPHRAGM MODIFICATION ASSEMBLIES
APPROACH SPAN – NORTH ABUTMENT	1
APPROACH SPAN – NORTH PIER	N/A
MAIN SPAN – NORTH PIER	1
MAIN SPAN – SOUTH PIER	1
APPROACH SPAN – SOUTH PIER	N/A
APPROACH SPAN – SOUTH ABUTMENT	1

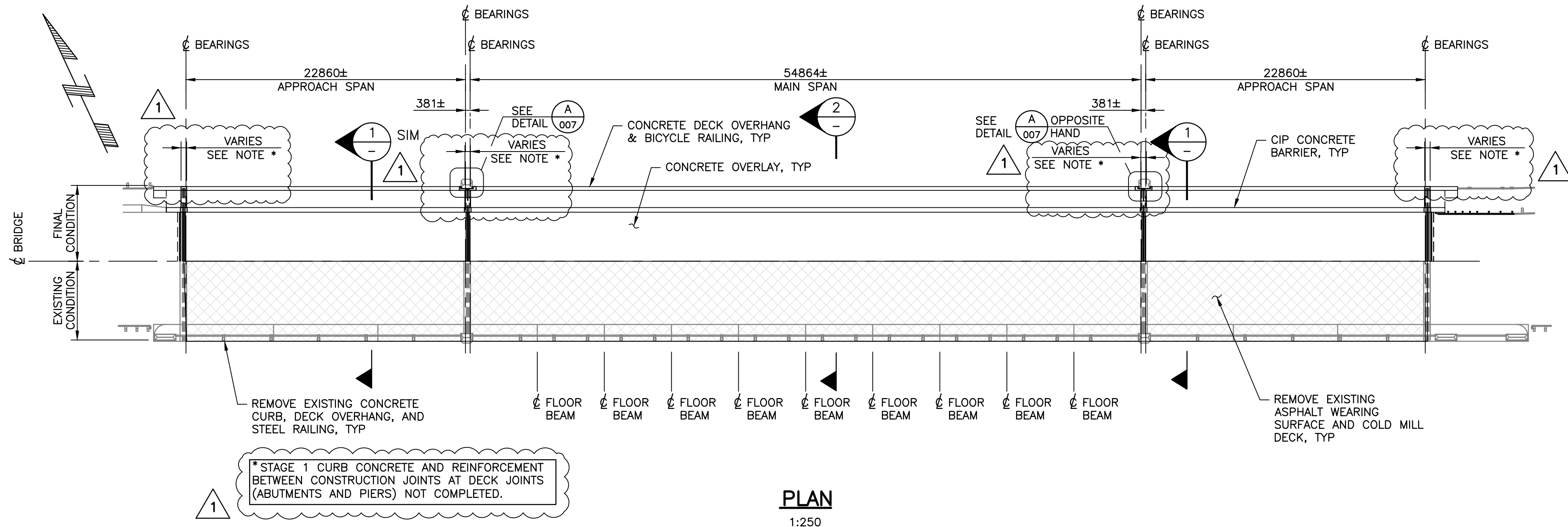


(DECK JOINT, DECK REINFORCEMENT, AND APPROACH SPAN GIRDER NOT SHOWN)

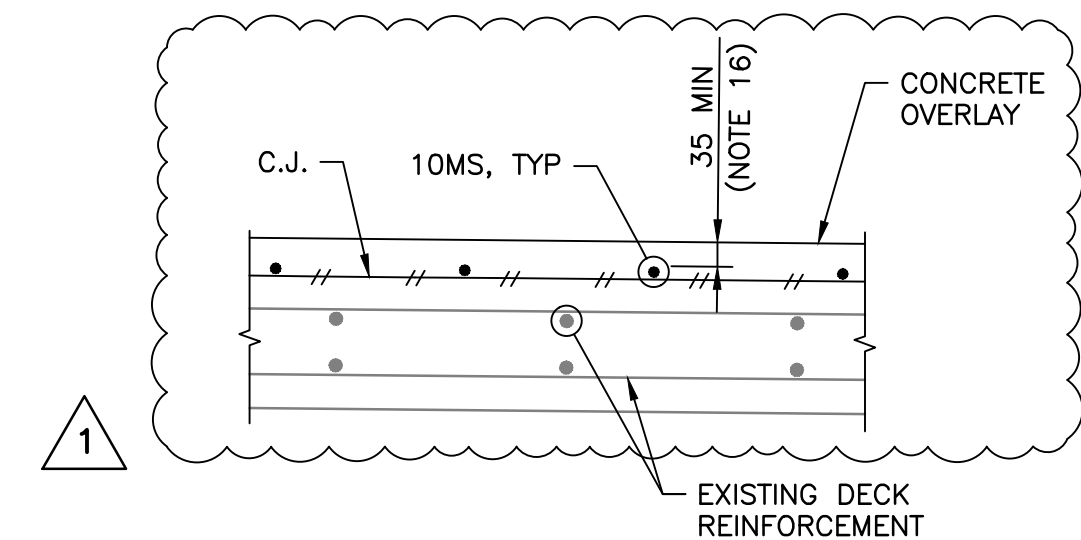


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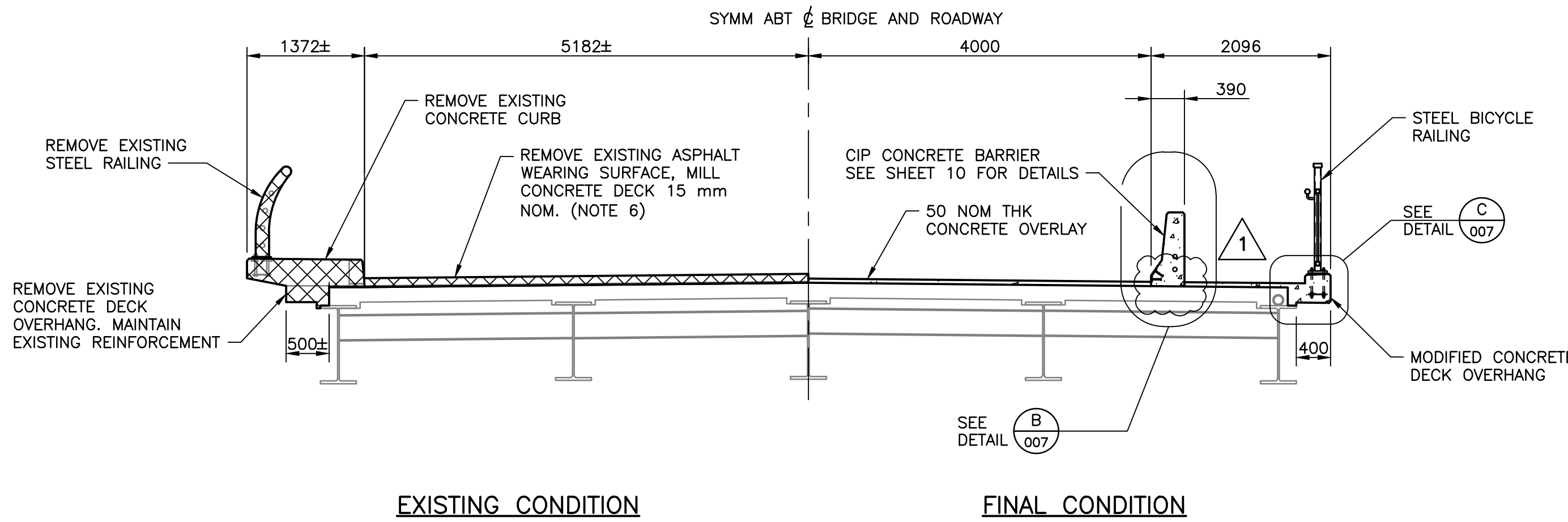
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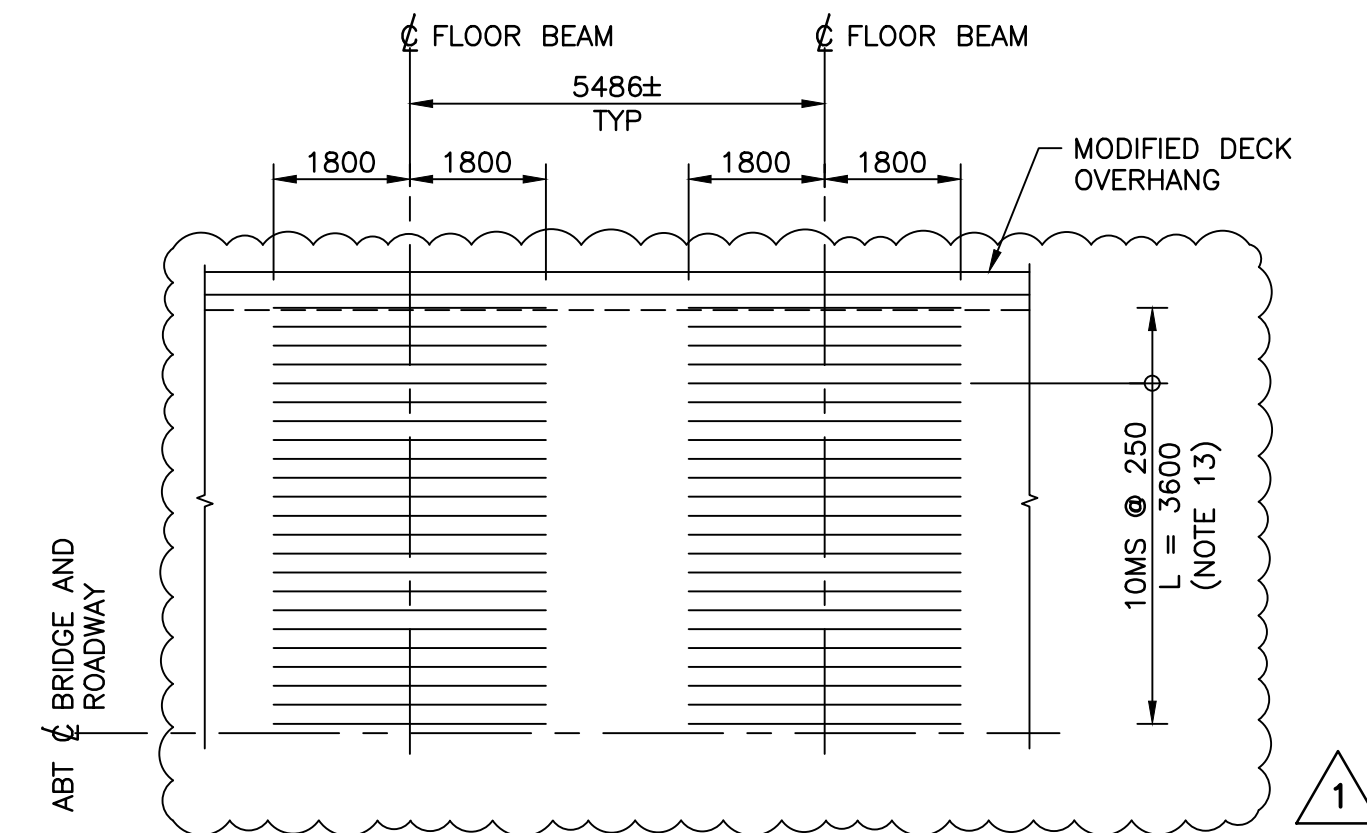
PLAN
1:250



DETAIL A REINFORCEMENT
1:10
(SEE ADDITIONAL DETAIL IN PARTIAL MAIN SPAN DECK PLAN AT FLOOR BEAMS - REINFORCEMENT DETAIL)



SECTION 1 APPROACH SPAN
1:50



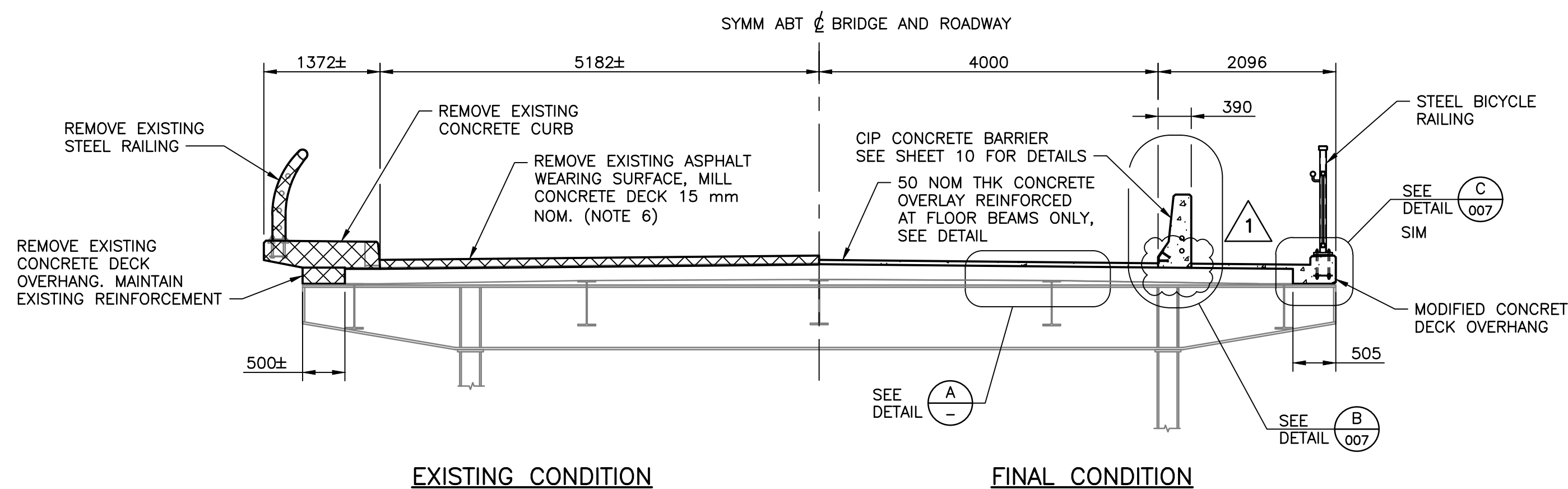
PARTIAL MAIN SPAN DECK PLAN AT FLOOR BEAMS - REINFORCEMENT
1:100
(TYPICAL AT ALL FLOOR BEAM LOCATIONS)

LEGEND:

REMOVALS

NOTES:

1. CONCRETE: 45 MPa at 28 DAYS MINIMUM.
2. CHAMFER EXPOSED EDGE 20.
3. STEEL: CAN/CSA G40.21M GRADE 350W, GALVANIZE AFTER FABRICATION.
4. REINFORCING STEEL: CAN/CSA G30.18M GRADE 400W. STAINLESS STEEL REINFORCEMENT (MARKED MS): ASTM A276 TYPE 316.
5. MINIMUM COVER: 50mm UNO.
6. USE COVER METER TO CHECK ACTUAL CONCRETE COVER BEFORE MILLING. DO NOT MILL CLOSER THAN 10mm TO TOP LAYER REINFORCEMENT.
7. MINIMUM LAP: 10M - 350 UNO. 15M - 600 UNO. LAP SLICES NOT SHOWN. STAGGER LAP SPLICES BY 1.3 TIMES THE LAP LENGTH.
8. CONSTRUCTION JOINTS TO BE CLEAN, FREE OF LAITANCE AND ROUGHENED TO AN AMPLITUDE OF 5mm.
9. REBAR SHALL BE WILLIAMS GRADE 75 ALL-THREADED REBAR OR APPROVED EQUIVALENT. BARS AND ACCESSORIES TO BE GALVANIZED.
10. REMOVE EXISTING WICK DRAIN PIPES, ROUGHEN HOLE SURFACE AND CLOSE HOLES WITH CONCRETE REPAIR MORTAR.
11. MAINTAIN EXISTING REINFORCEMENT. FILL HOLES WITH CEMENTITIOUS GROUT AFTER PLACING BARS. PLACE LOCK NUT AT CONSTRUCTION JOINT IF REQUIRED TO SECURE BAR POSITION.
12. PROVIDE SPECIFIED COVER TO BARRIER SURFACE.
13. SECURE REBAR ON TOP OF MILLED CONCRETE SURFACE.
14. PARTIAL DEPTH REPAIR AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE IN ACCORDANCE WITH SPECIFICATIONS.
15. NUTS TO BE SNUG TIGHT.
16. SPECIFIED CONCRETE COVER REFERS TO LONGITUDINAL REBAR 10MS.

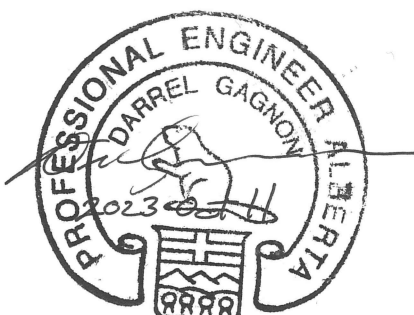


SECTION 2 MAIN SPAN
1:50

RECORD DRAWING

THE SEAL AND SIGNATURE OF THE UNDERSIGNED ON THIS DRAWING CERTIFIES THAT THE DESIGN INFORMATION CONTAINED IN THESE DRAWINGS ACCURATELY REFLECTS THE ORIGINAL DESIGN AND THE MATERIAL DESIGN CHANGES MADE DURING CONSTRUCTION THAT WERE BROUGHT TO THE UNDERSIGNED'S ATTENTION. THESE DRAWINGS ARE INTENDED TO INCORPORATE ADDENDA, CHANGE ORDERS, AND OTHER MATERIAL DESIGN CHANGES, BUT NOT NECESSARILY ALL SITE INSTRUCTIONS.

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DO NOT SCALE DRAWINGS

Revision/Revision	Description/Description	Date/Date
1	RECORD DRAWING	23/10/11
0	ISSUED FOR CONSTRUCTION	20/05/08

Client/client
Parks Canada Agency / L'Agence Parcs Canada

COWI

Project title/Titre du projet
BRIDGE REHABILITATION
BANFF NATIONAL PARK, ALBERTA

KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE

Approved by/Approuvé par
DPG

Designed by/Concept par
TWB

Drawn by/Dessiné par
MACM

PWGC Project Manager/Administrateur de Projets TPSCG

PWGC, Architectural and Engineering Resources Manager/
Ressources Architectural et de Directeur d'ingénierie, TPSCG

Client/client
PCA

Drawing title/Titre du dessin

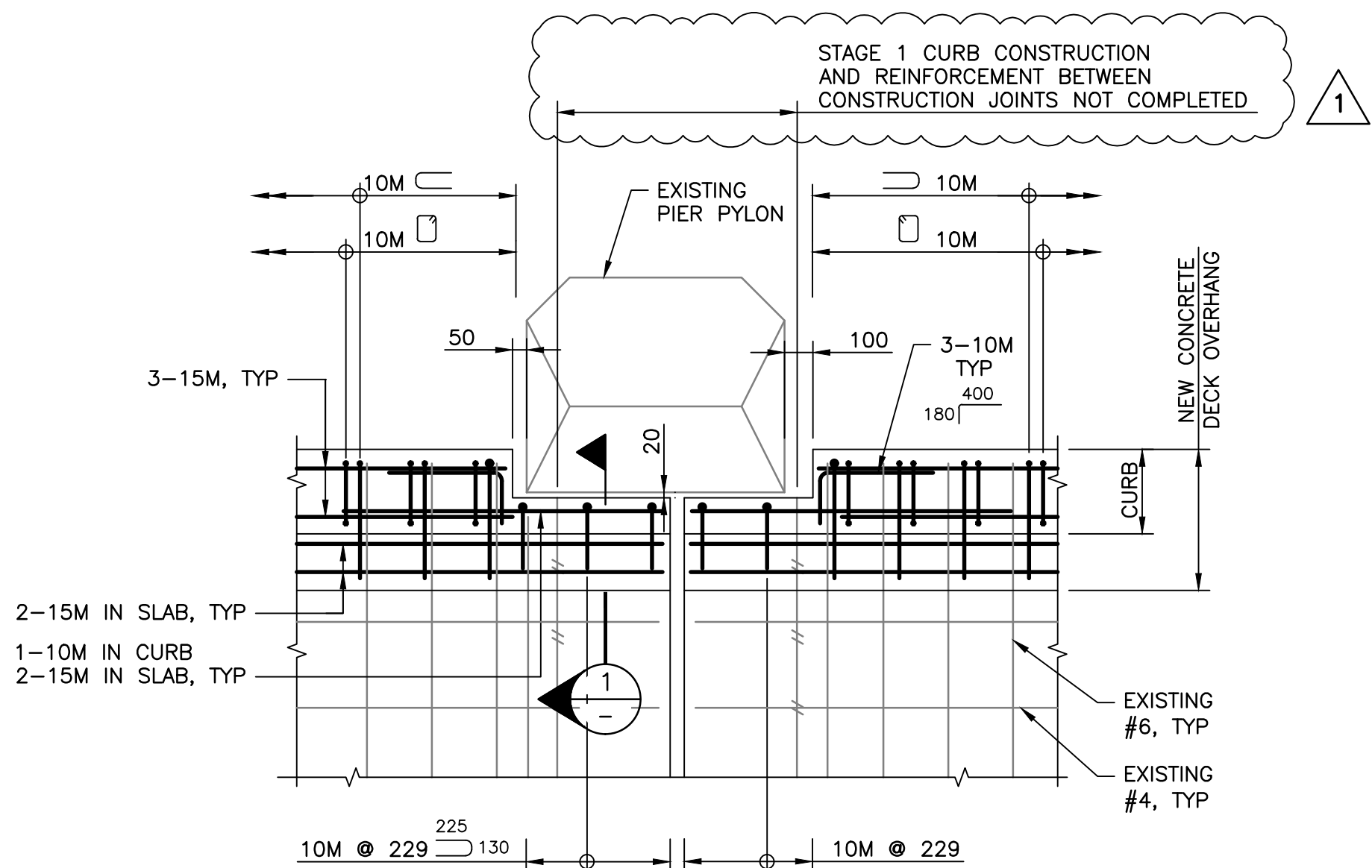
CONCRETE DECK
MODIFICATIONS
SHEET 1

Project No./No. du projet
565-11

Sheet/Fauille
006
OF

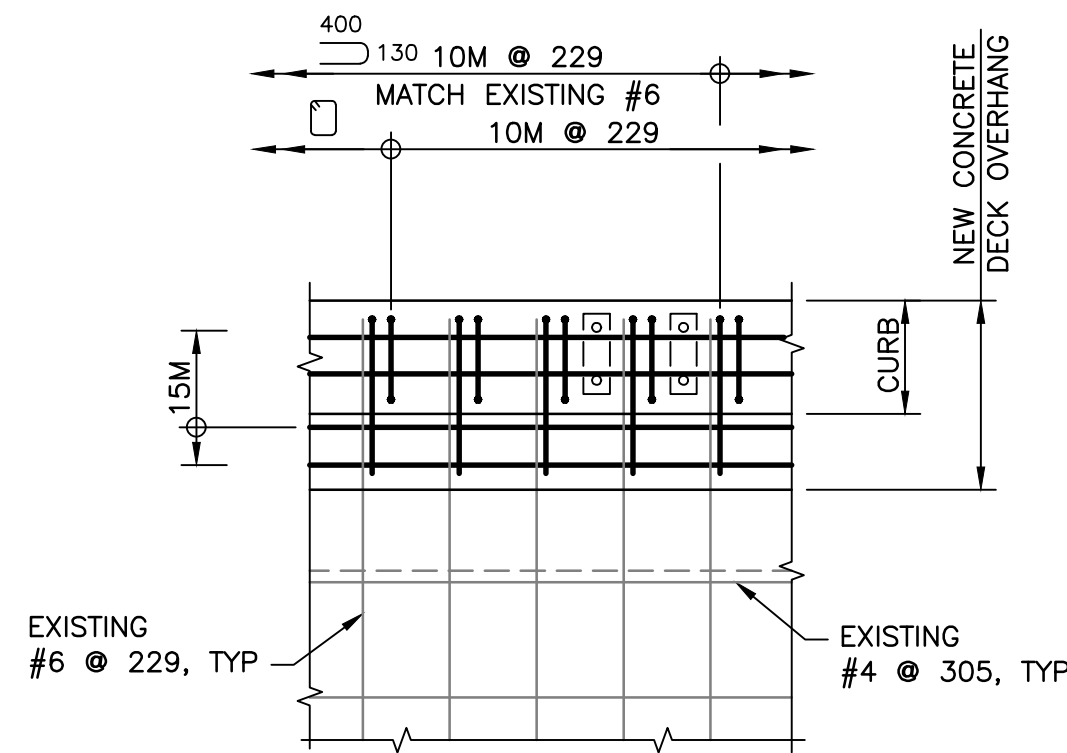
Revision no./
La Révision
no.
1

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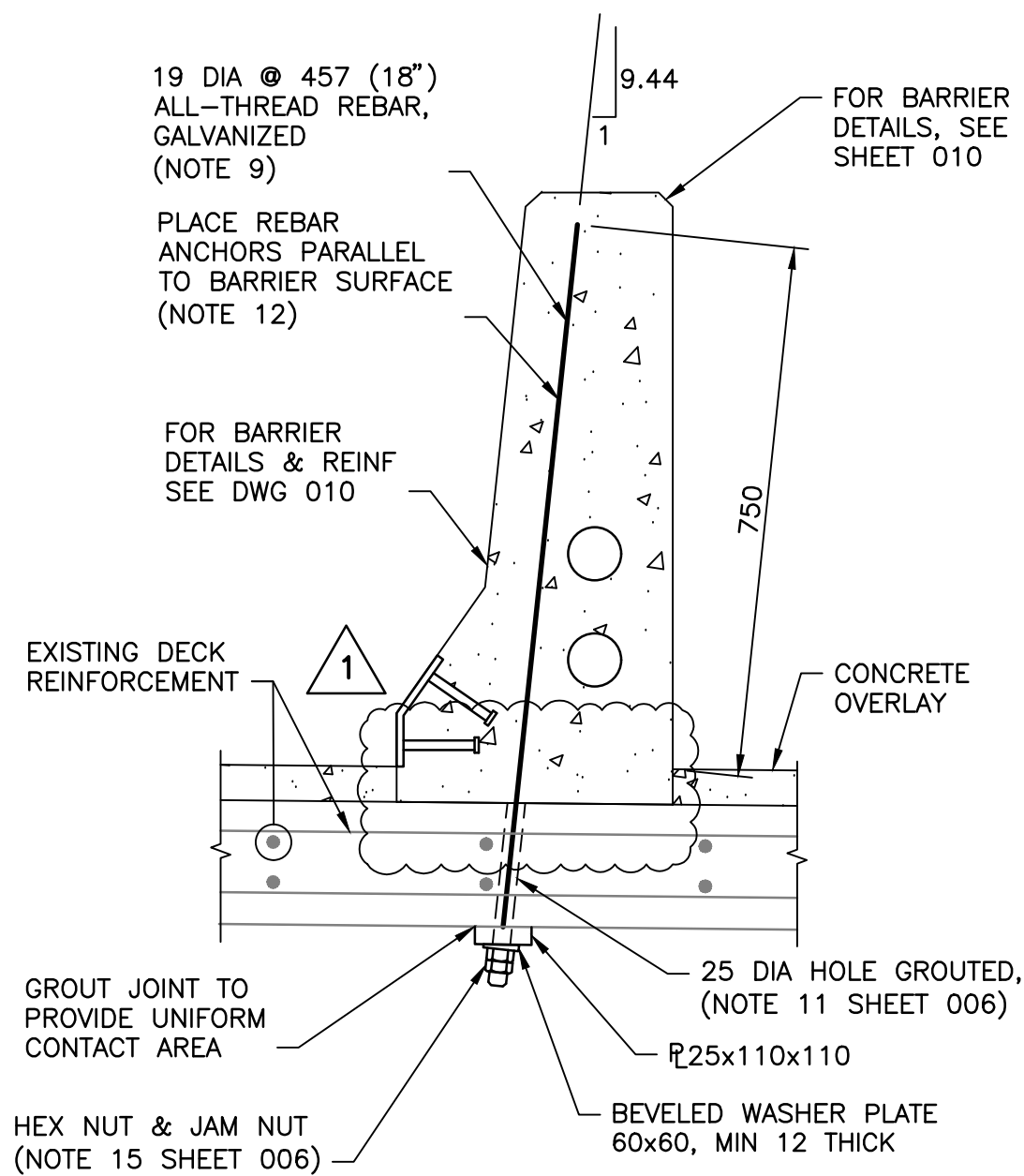
DETAIL A
1:20

NOTE: DECK JOINT BLOCK OUT REINFORCEMENT NOT SHOWN, SEE SHEET 008 AND SHEET 009 FOR DECK JOINT REINFORCEMENT

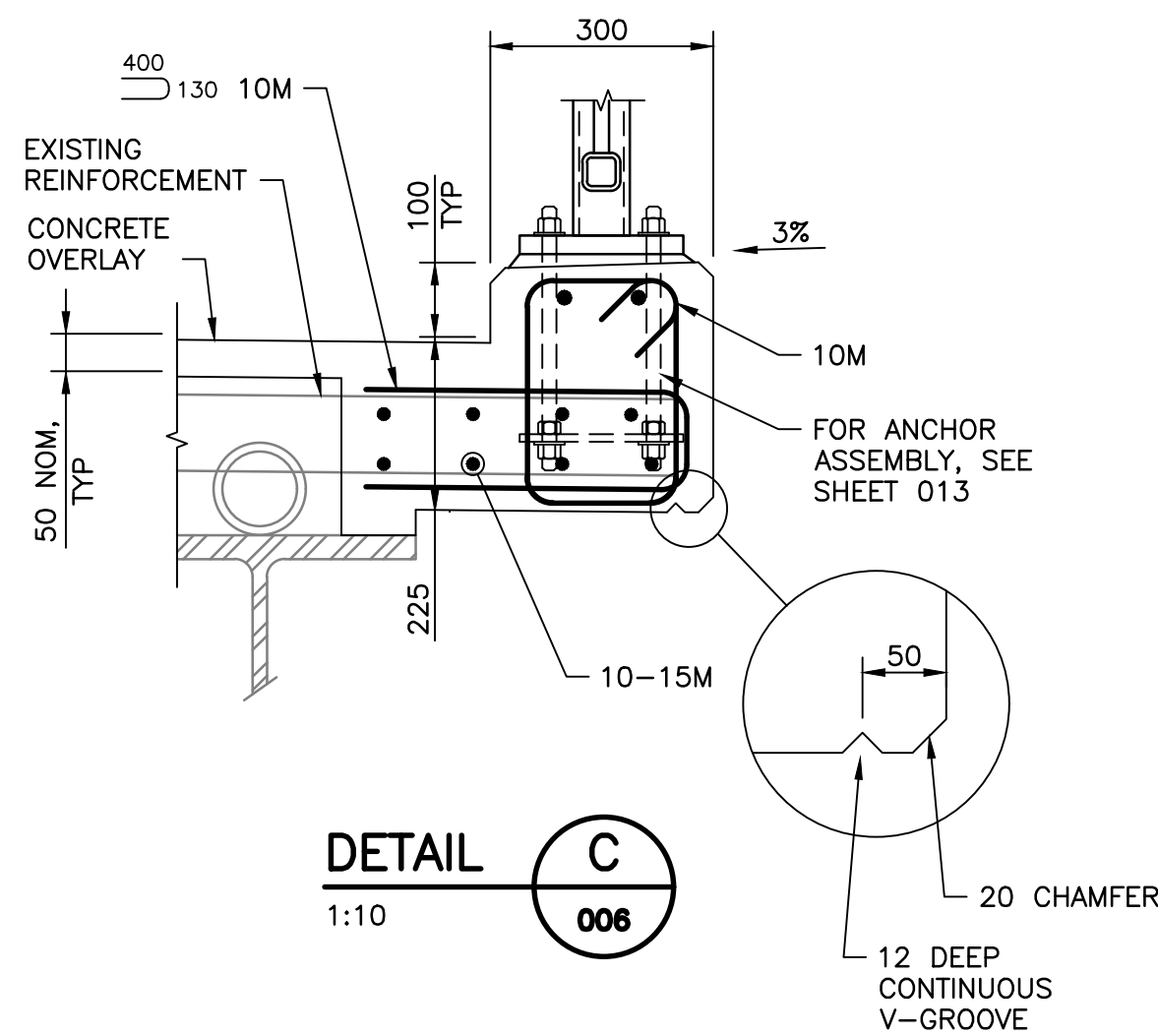


CURB REINFORCEMENT PLAN

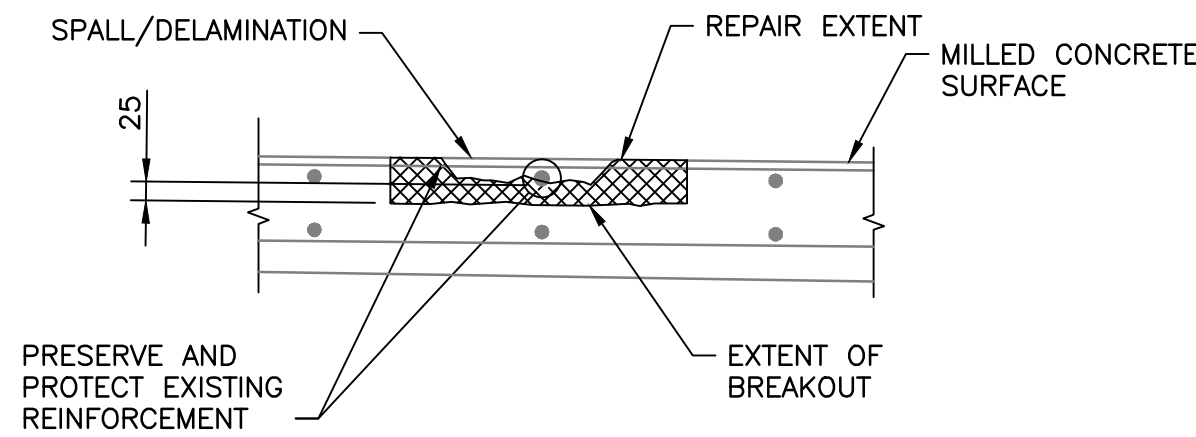
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DETAIL B
1:10

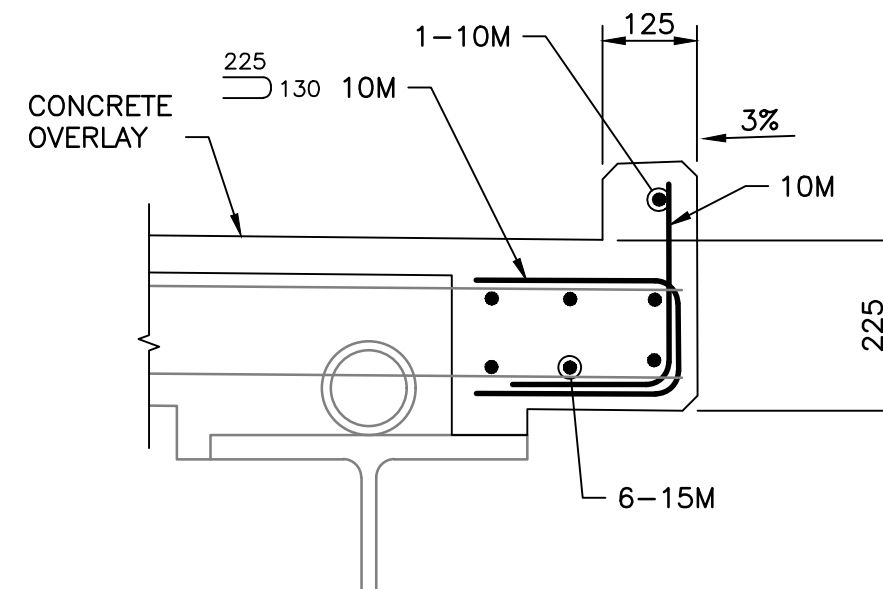


DETAIL C
1:10



PARTIAL DEPTH DECK CONCRETE REPAIR DETAIL

NTS
(NOTE 14)



SECTION 1
1:10

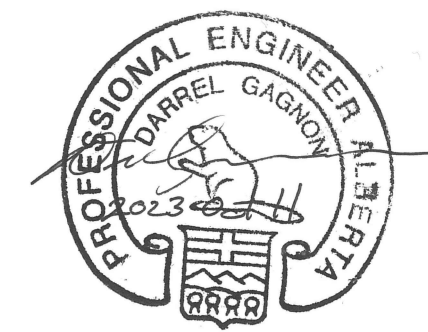
NOTES:

- WORK WITH NOTES ON SHEET 006.

RECORD DRAWING

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COWI

Project title/Titre du projet
**BRIDGE REHABILITATION
BANFF NATIONAL PARK, ALBERTA**

**KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE**

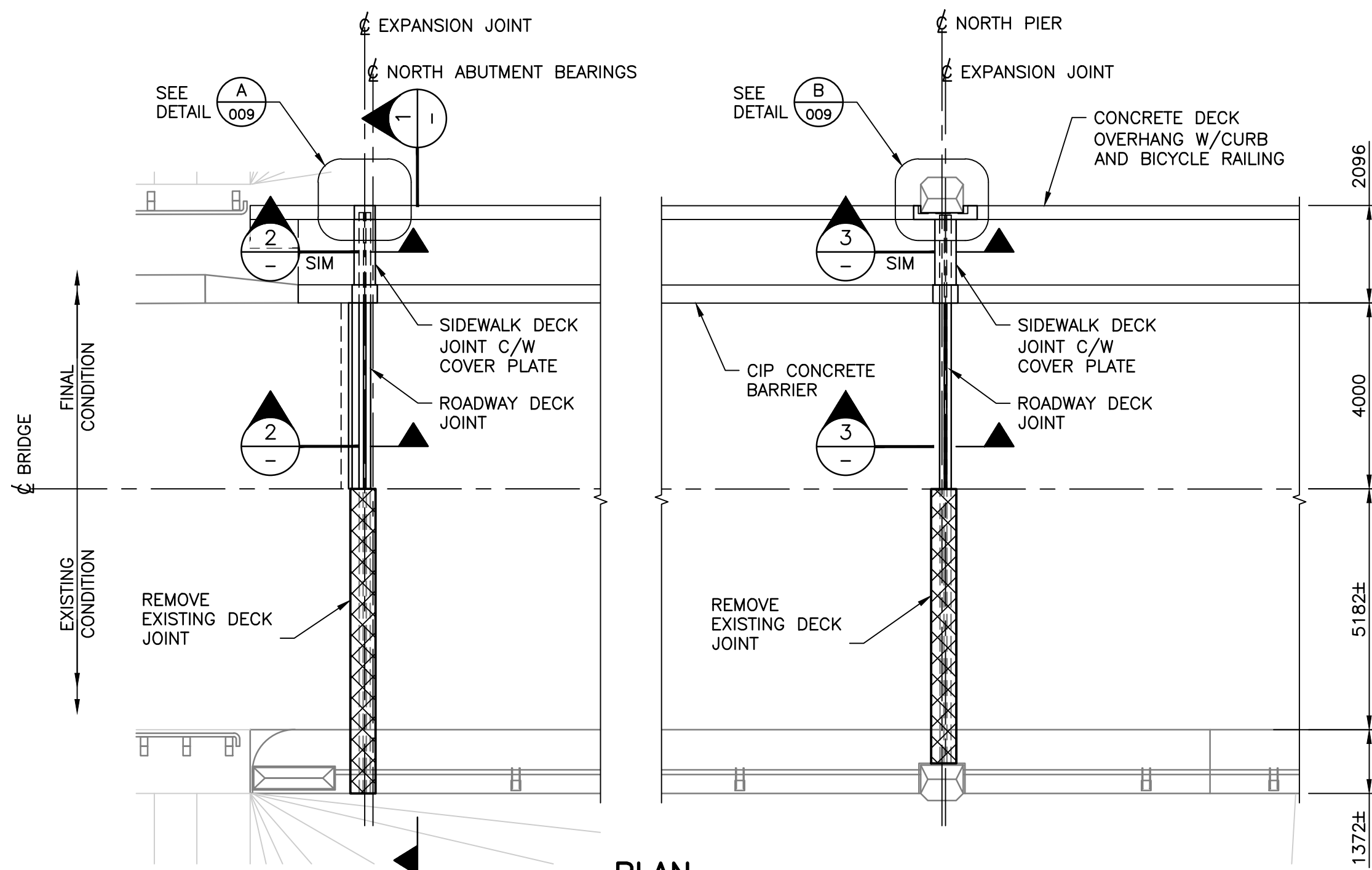
Approved by/Approuve par DPG
Designed by/Concept par TWB
Drawn by/Dessine par MACM
PWGSC Project Manager/Administrateur de Projets TPSCG
PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSCG
Client/client PCA
Drawing title/Titre du dessin

**CONCRETE DECK
MODIFICATIONS
SHEET 2**

Project No./No. du projet 565-11	Sheet/Fauille 007 OF	Revision no./ La Révision no. 1
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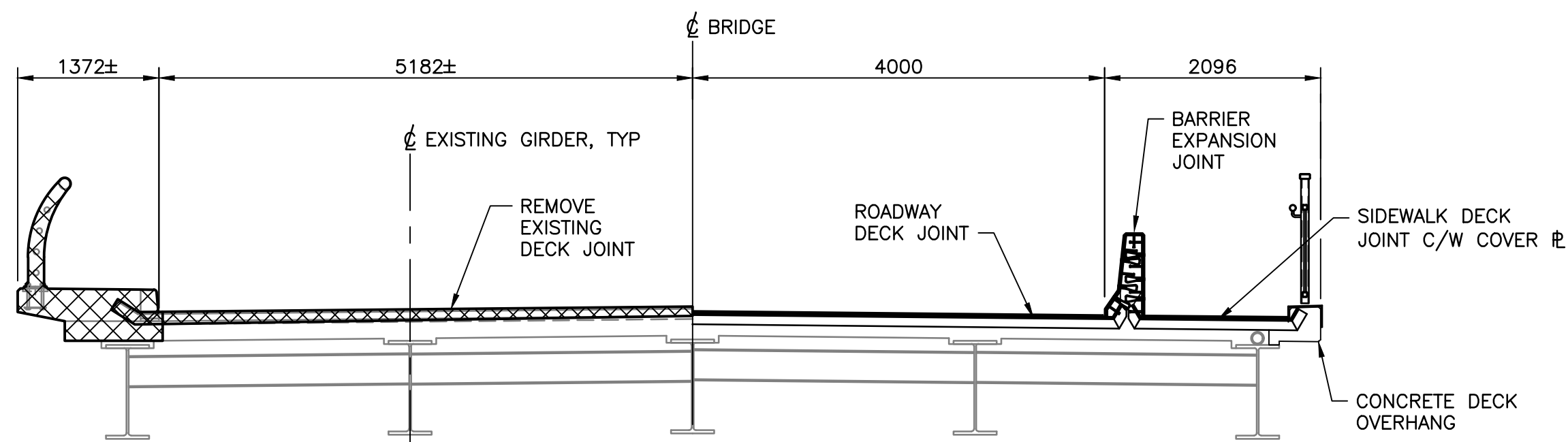
PWSC - A1 - 841X594



PLAN

1:100

(NORTH ABUTMENT AND NORTH PIER SHOWN -
SOUTH ABUTMENT AND SOUTH PIER SIMILAR)

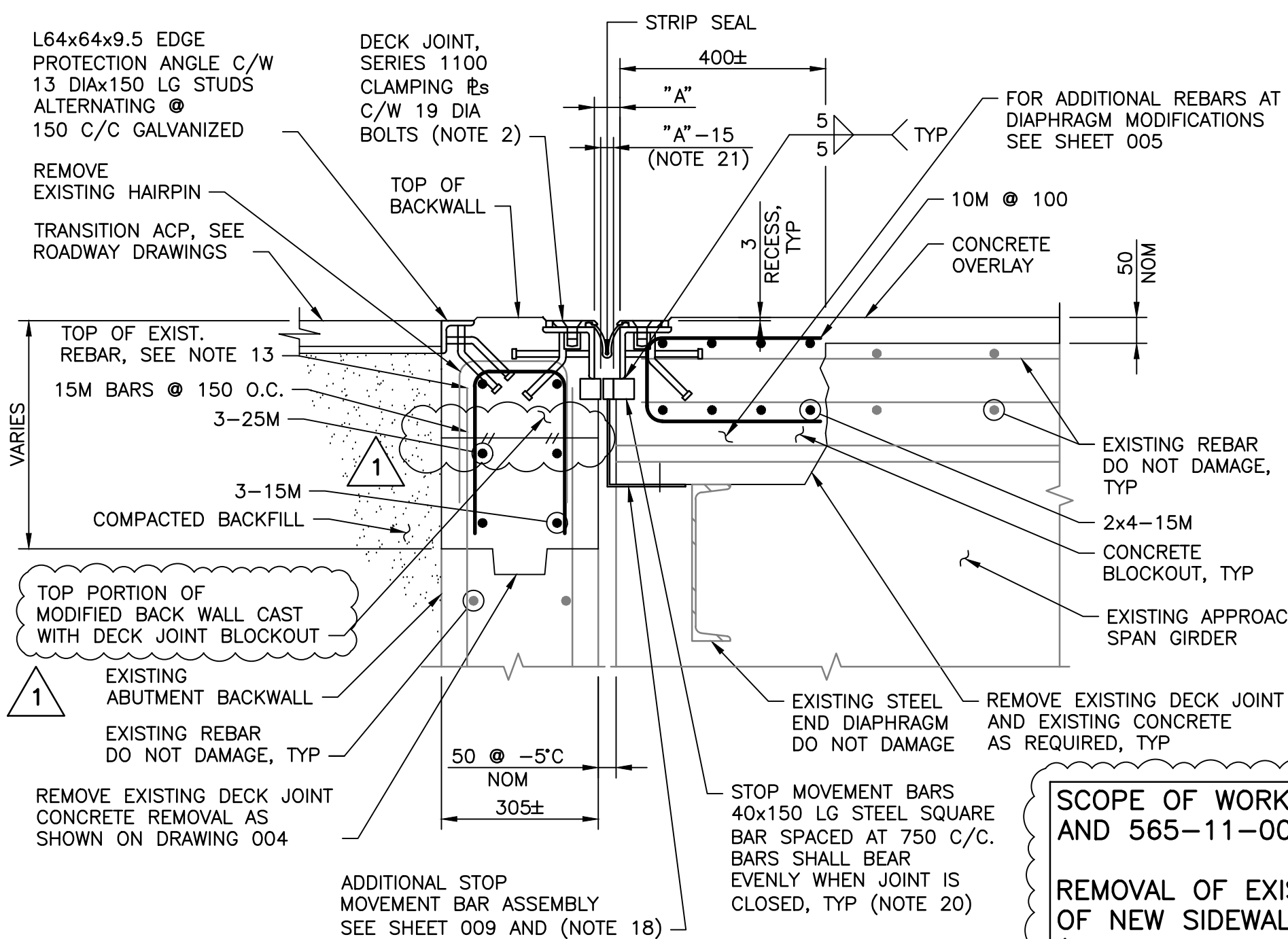


EXISTING CONDITION

FINAL CONDITION

SECTION 1

1:50

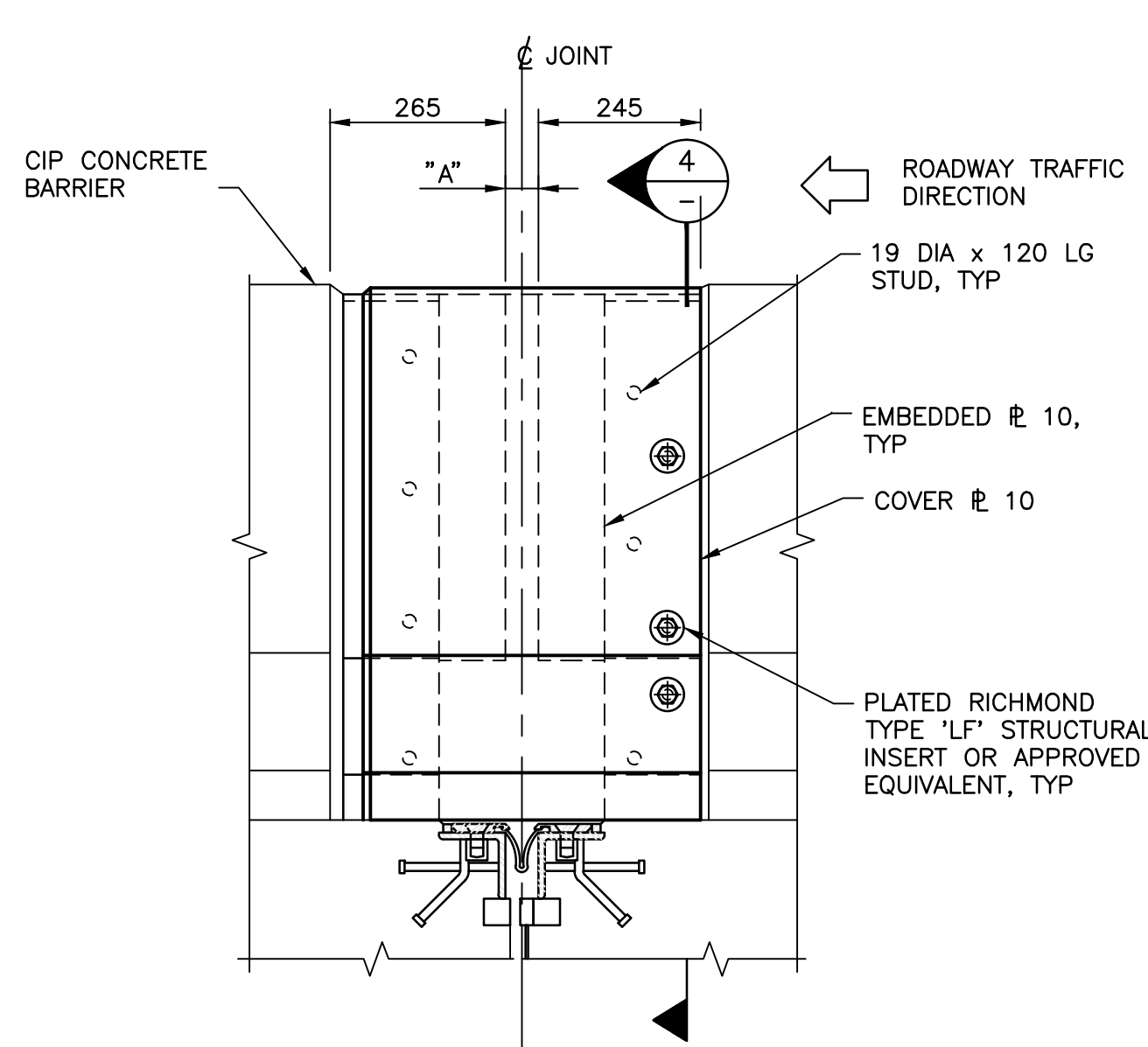


SECTION 2

1:10

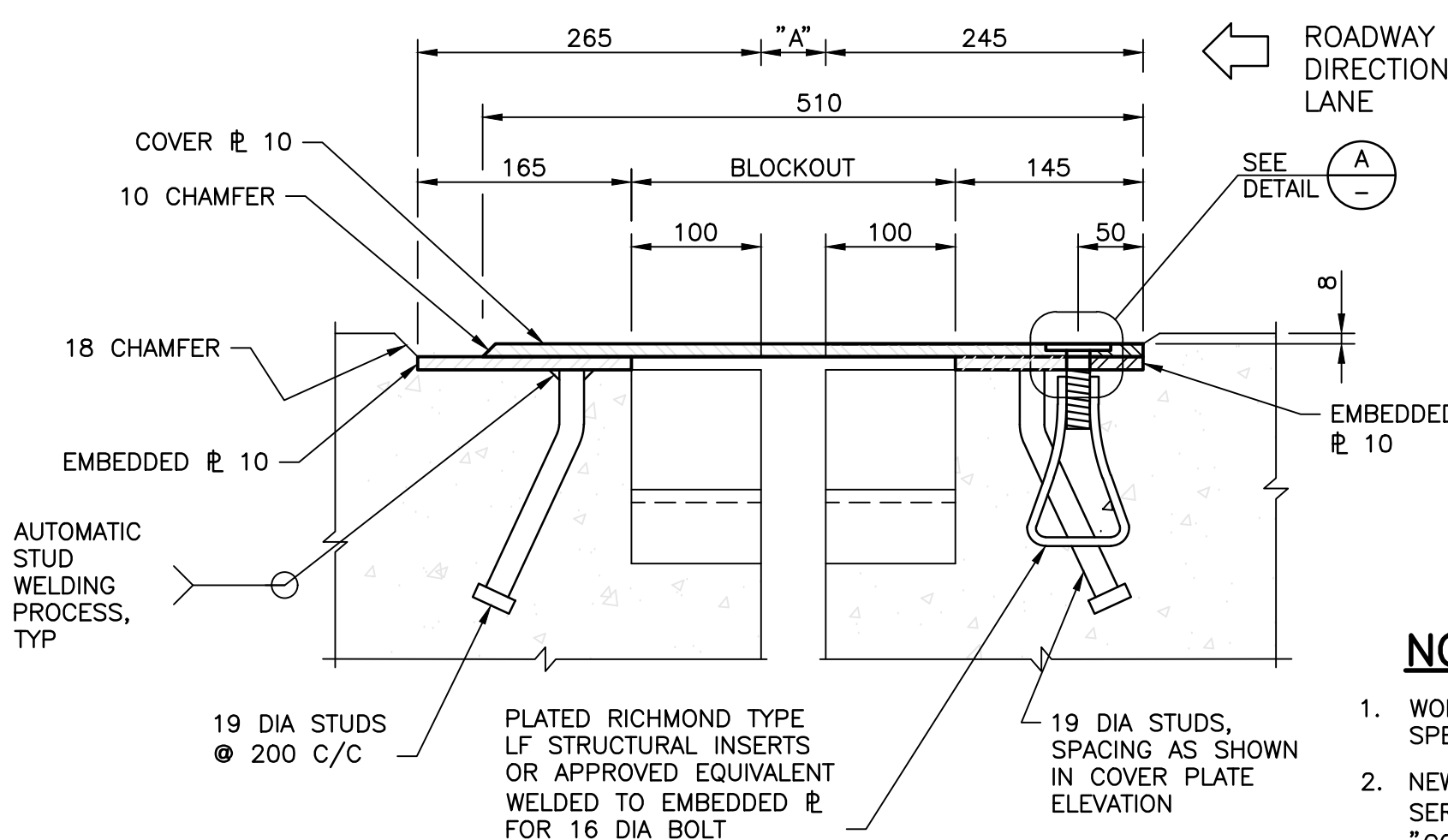
SCOPE OF WORK DEFINED ON DRAWINGS 565-11-008
AND 565-11-009 COMPLETED FOR STAGE 2 ONLY.

REMOVAL OF EXISTING DECK JOINTS AND INSTALLATION
OF NEW SIDEWALK AND ROADWAY DECK JOINTS
(INCLUDING SIDEWALK, CURB, AND BARRIER COVER
PLATES) AND EXPANSION JOINT STOP BARS FOR
STAGE 1 NOT COMPLETED.



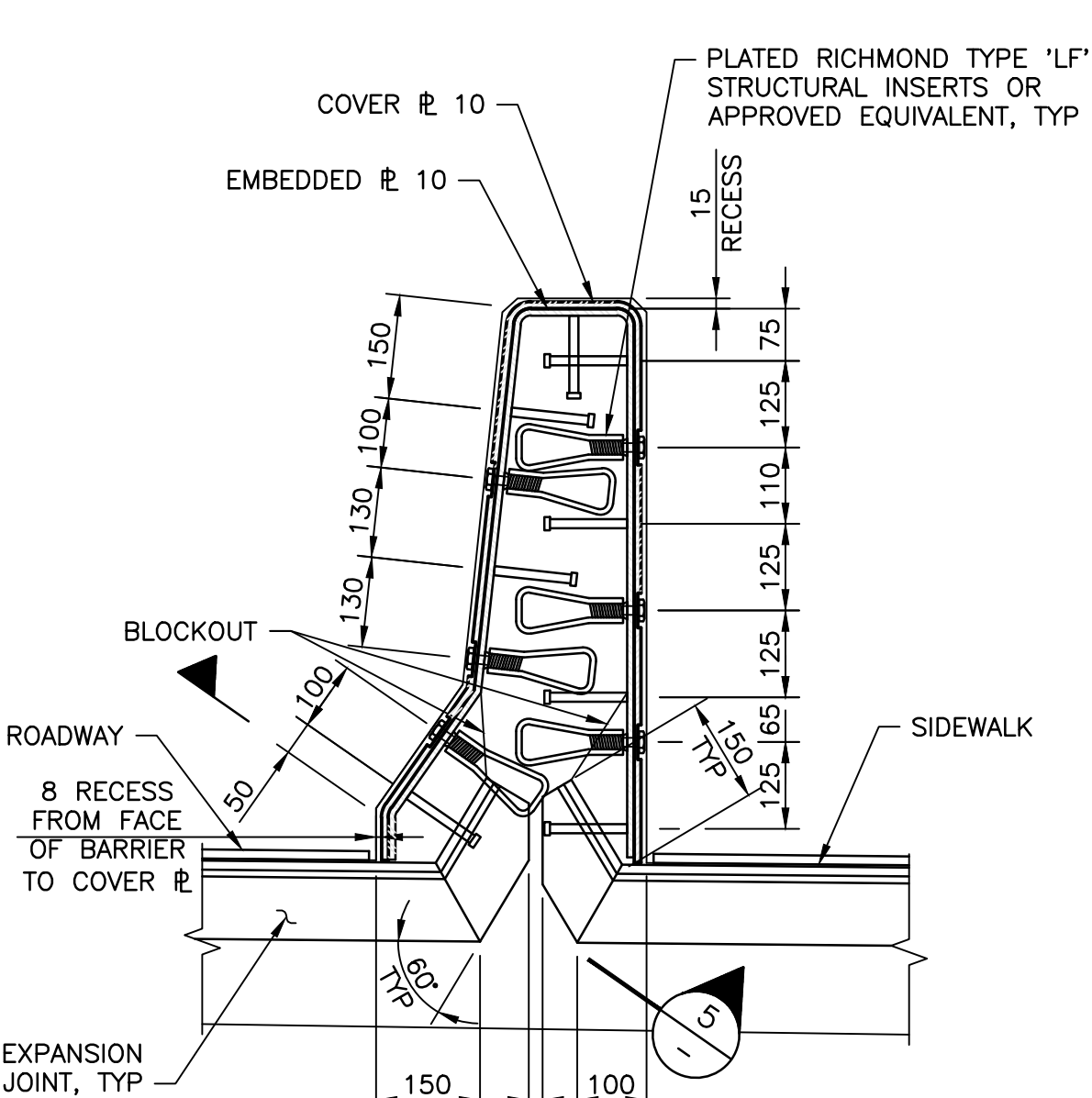
BARRIER EXPANSION JOINT
COVER PLATE - ELEVATION

1:10



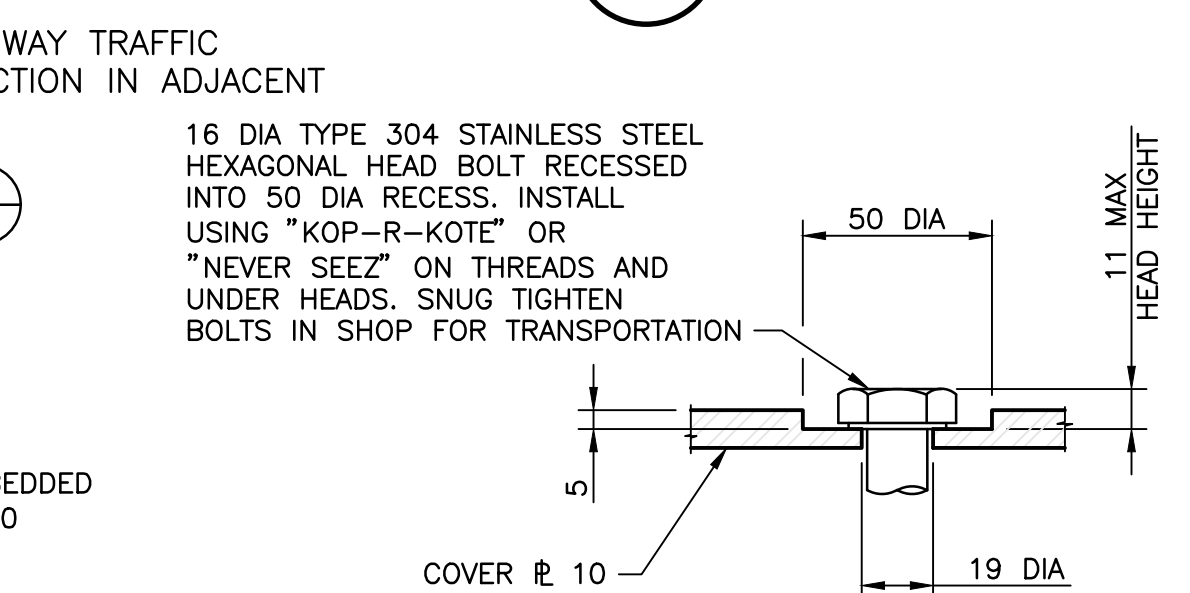
SECTION 5

1:5



SECTION 4

1:10



DETAIL A

1:2

NOTES:

- WORK TO BE COMPLETED IN TWO STAGES IN ACCORDANCE WITH SPECIFICATIONS.
- NEW ROADWAY AND SIDEWALK DECK JOINTS AT ABUTMENTS "GOODFLEX SERIES 1100 BY GOODCO Z-TECH" C/W JOINT NEOPRENE SEAL "GOODCO FL-75" OR APPROVED EQUIVALENT INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
- NEW ROADWAY AND SIDEWALK DECK JOINTS AT PIERS "GOODFLEX SERIES 1100 BY GOODCO Z-TECH" C/W JOINT NEOPRENE SEAL "GOODCO FL-125" OR APPROVED EQUIVALENT INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
- COVER PLATE FOR SIDEWALK DECK JOINTS "WABO SAFETYFLEX BY WATSON BOWMAN ACME CORP." OR APPROVED EQUIVALENT INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
- AT PIERS AND ABUTMENTS : "WABO SAFETYFLEX SFP-1000"
- NEW STEEL: CSA G40.21M GRADE 300W, GALVANIZE AFTER FABRICATION.
- STUDS: CAN/CSA W59 ANNEX H, TYPE B, GALVANIZE AFTER FABRICATION.
- WELDING: CAN/CSA W59.
- HOT DIP GALVANIZE TO ASTM A123/123M.
- MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 45MPa AT 28 DAY
- REINFORCING STEEL: CAN/CSA G30.18 GRADE 400W
- MINIMUM COVER: 50 UNO.
- MINIMUM LAP: 10M: 325mm
15M: 600mm
USE REBAR COUPLERS FOR TRANSVERSE BARS AS REQUIRED AT STAGE 1/STAGE 2 CONSTRUCTION JOINT. REBAR COUPLERS IN ACCORDANCE WITH CSA/CAN S6-14, SECTION 8.4.4.4.
- TRIM TOP OF VERTICAL BARS IF REQUIRED TO MAINTAIN CONCRETE COVER.
- CONSTRUCTION JOINTS TO BE CLEAN, FREE OF LAITANCE AND ROUGHENED TO AN AMPLITUDE OF 5mm.
- INSTALLATION GAP "A" IN ACCORDANCE WITH TABLE.
- PROVIDE 5mm GAP TO T/O CURB.
- CHAMFER EDGES OF CURB COVER PLATES 5mm.
- ADDITIONAL STOP MOVEMENT BAR ASSEMBLIES TO BE PLACED IN AREAS BETWEEN GIRDERS/STRINGERS ONLY. BARS SHALL BEAR EVENLY ON JOINT SQUARE BARS.
- CONCRETE SCREW ANCHOR TO BE FULLY REMOVABLE.
- PROVIDE 5mm RECESS OF DECK CONCRETE FASCIA IN REFERENCE TO STOP MOVEMENT BARS.
- JOINT GAP FOR STOP MOVEMENT BARS 40x150: "A"-15mm.

GAP SETTING TABLE DIMENSION "A"

TEMPERATURE (°C)	-15	-10	-5	0	5	10	15	20	25
JOINT GAP "A" AT ABUTMENT	62	60	59	58	56	55	53	52	51
JOINT GAP "A" AT PIER	65	64	62	60	59	57	55	54	52

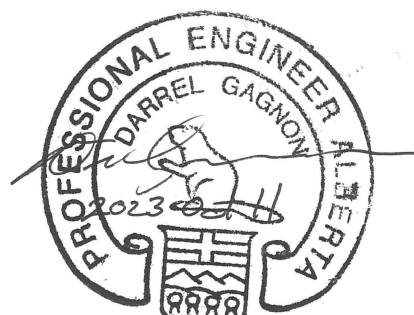
LEGEND:

REMOVALS

RECORD DRAWING

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COWI

Project title/Titre du projet
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BANFF NATIONAL PARK, ALBERTA

KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE

Approved by/Approuvé par
DPG

Designed by/Concept par
TWB

Drawn by/Dessiné par
LT

PWSC Project Manager/Administrateur de Projets TPSCG

PWSC, Architectural and Engineering Resources Manager/
Ressources Architectural et de Directeur d'ingénierie, TPSCG

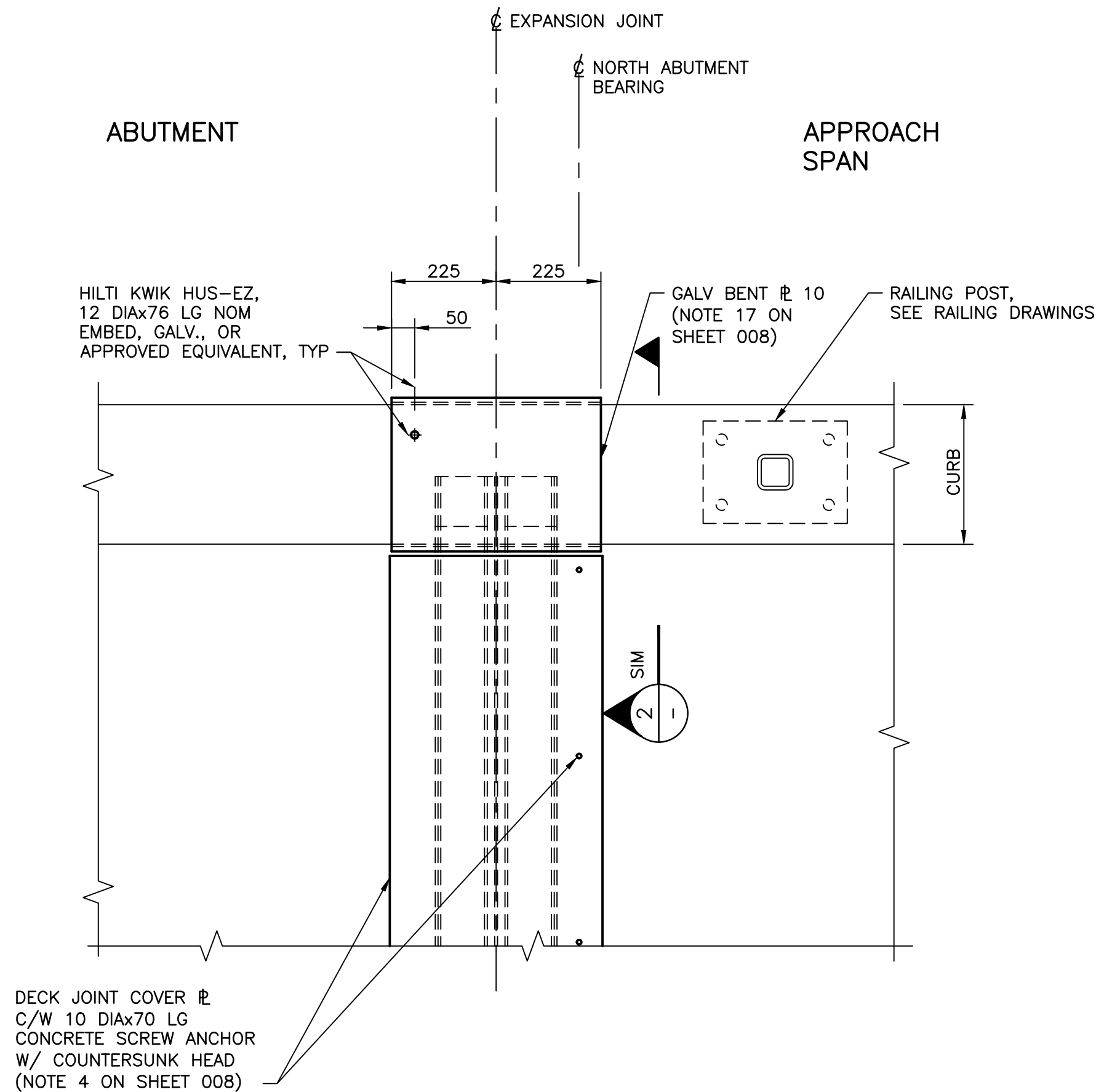
Client/Client
PCA

Drawing title/Titre du dessin

DECK JOINT MODIFICATION
SHEET 1

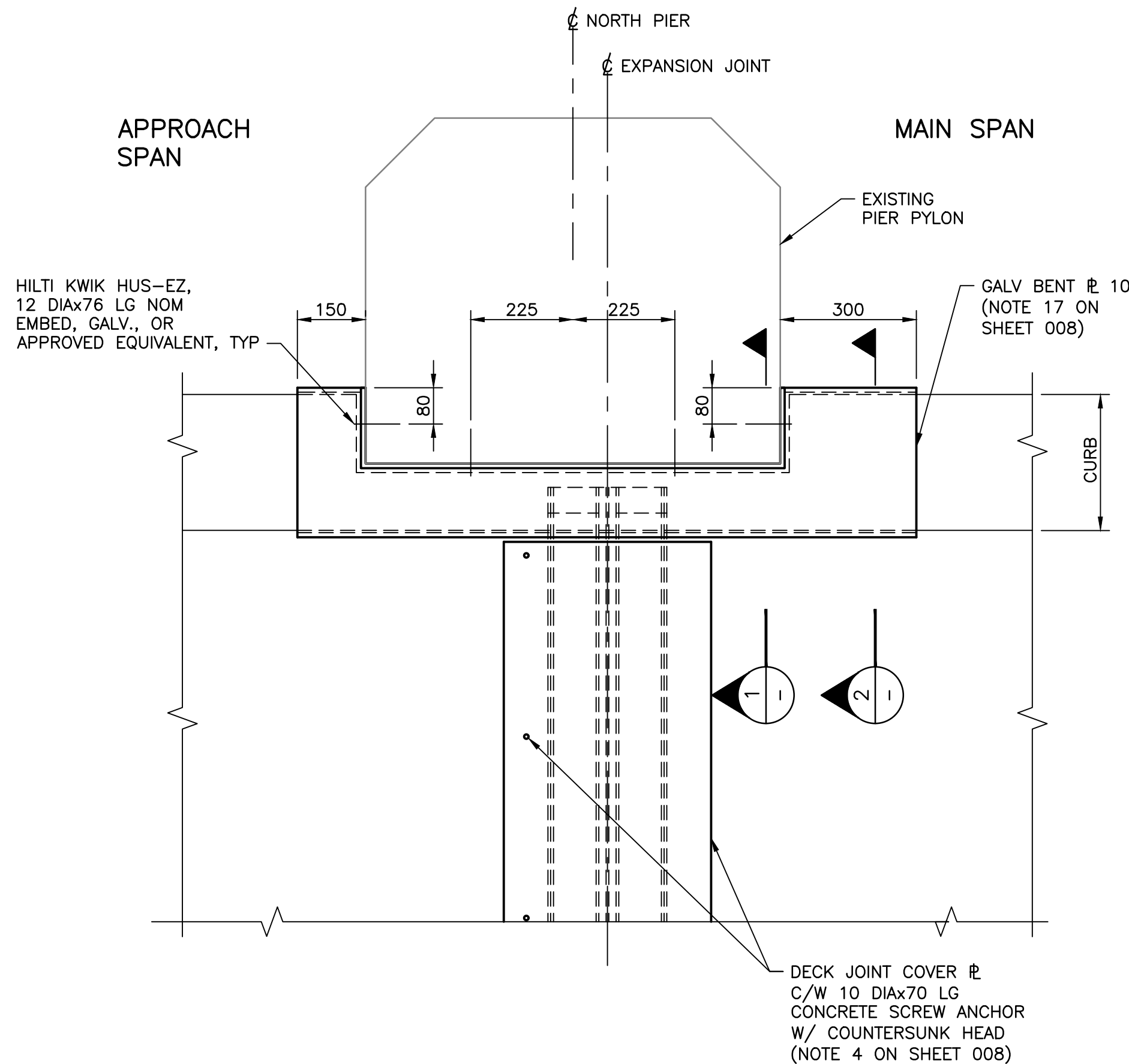
Project No./No. du projet	Sheet/Fauille	Revision no./La Révision no.
565-11	008 OF	1

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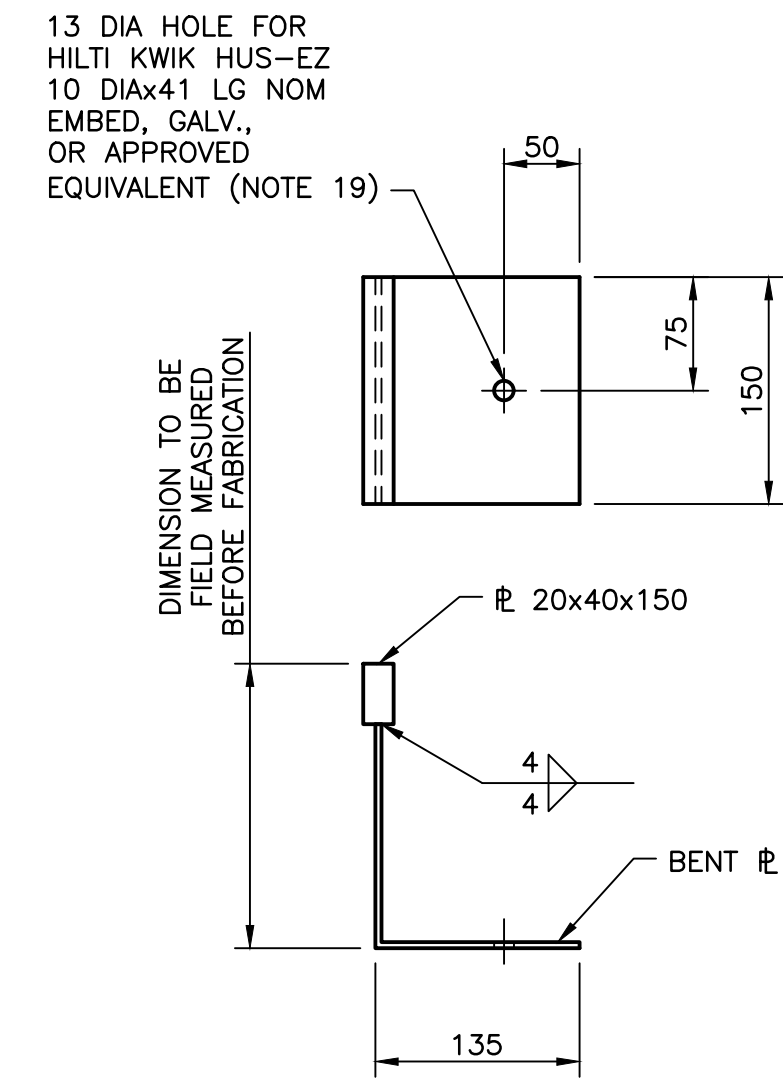
DETAIL A
1:10
008

(NORTH SIDEWALK OF NORTH ABUTMENT SHOWN. OTHER SIDEWALK ABUTMENT JOINTS SIMILAR)



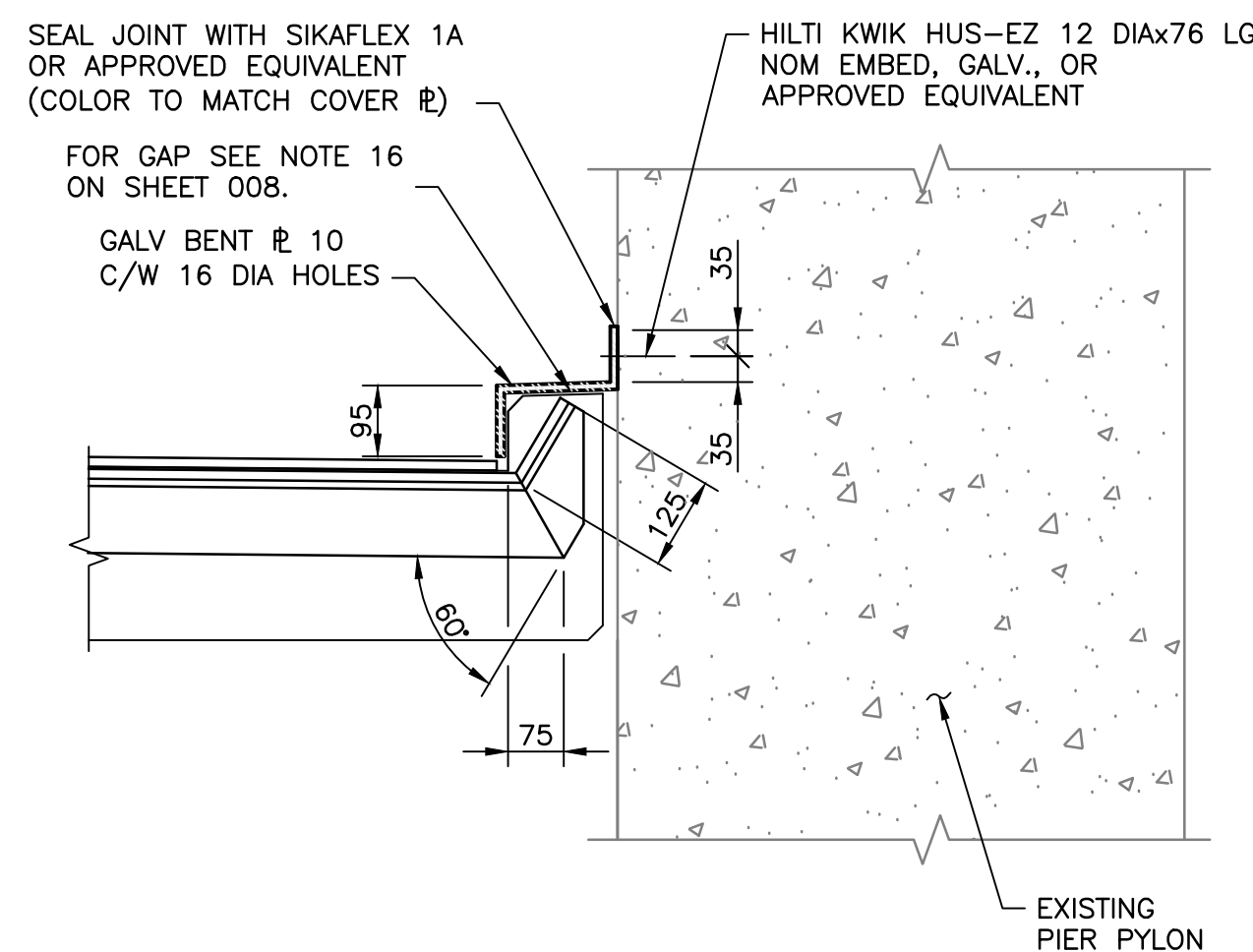
DETAIL B
1:10
008

(NORTH SIDEWALK OF NORTH PIER SHOWN. OTHER SIDEWALK PIER JOINTS SIMILAR)

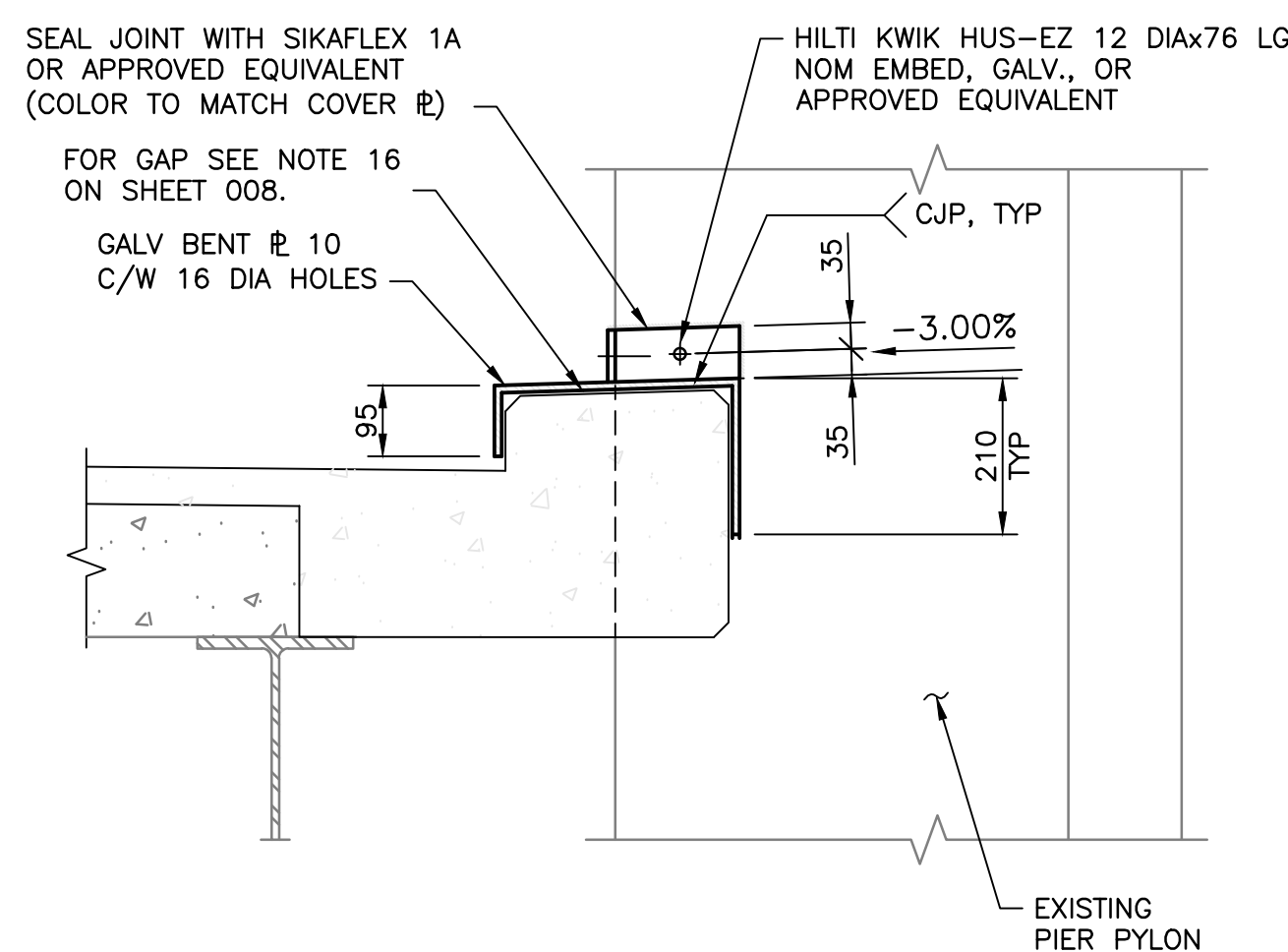


STOP MOVEMENT BAR ASSEMBLY

1:5



SECTION 1
1:10
-



SECTION 2
1:10
-

SCOPE OF WORK DEFINED ON DRAWINGS 565-11-008 AND 565-11-009 COMPLETED FOR STAGE 2 ONLY.

REMOVAL OF EXISTING DECK JOINTS AND INSTALLATION OF NEW SIDEWALK AND ROADWAY DECK JOINTS (INCLUDING SIDEWALK, CURB, AND BARRIER COVER PLATES) AND EXPANSION JOINT STOP BARS FOR STAGE 1 NOT COMPLETED.

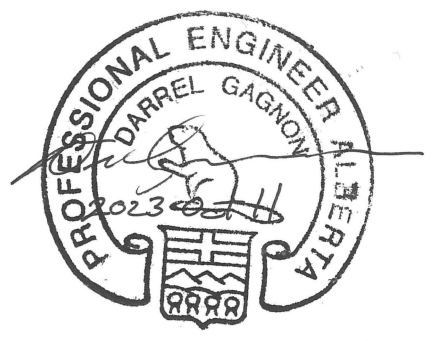
NOTES:

1. FOR NOTES, SEE SHEET 008.

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COWI

Project title/Titre du projet
BRIDGE REHABILITATION
BANFF NATIONAL PARK, ALBERTA
KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE

Approved by/Approuvé par
DPG

Designed by/Concept par
TWB

Drawn by/Dessiné par
LT

PWGSC Project Manager/Administrateur de Projets TPSCG

PWGSC, Architectural and Engineering Resources Manager/Ressources Architectural et de Directeur d'ingénierie, TPSCG

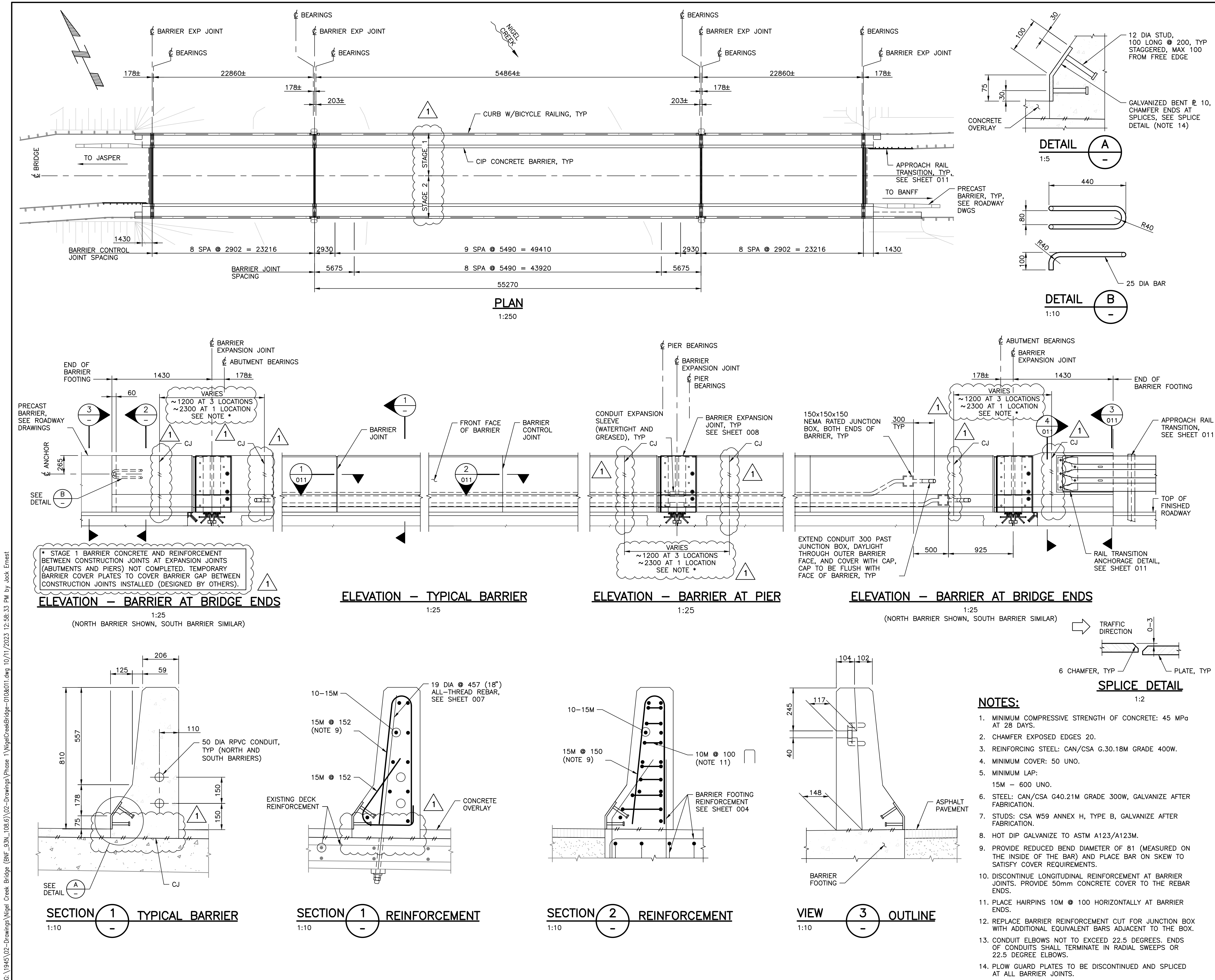
Client/client
PCA

Drawing title/Titre du dessin

DECK JOINT MODIFICATION
SHEET 2

Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
565-11	009 OF	1

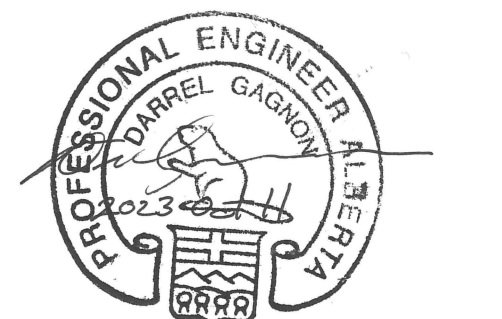
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**KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE**

Approved by/Approuvé par
DPG

Designed by/Concept par
TWB

Drawn by/Dessiné par
JAET/ILT

PWGC Project Manager/Administrateur de Projets TPSCG

PWGC, Architectural and Engineering Resources Manager/
Ressources Architectural et de Directeur d'ingénierie, TPSCG

Client/client
PCA

Drawing title/Titre du dessin

**CAST-IN-PLACE BARRIER
LAYOUT AND REINFORCEMENT
SHEET 1**

Project No./No. du projet
565-11

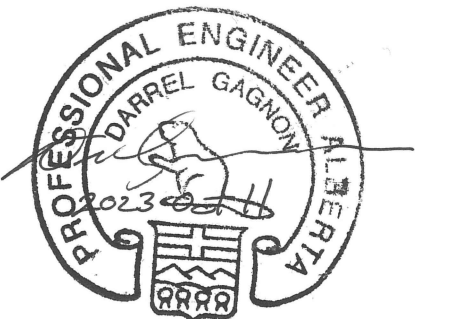
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010
OF

Revision no./
La Révision
no.
1

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BANFF NATIONAL PARK, ALBERTA**

**KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE**

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TWB

Drawn by/Dessiné par
LT

PWGC Project Manager/Administrateur de Projets TPSCG

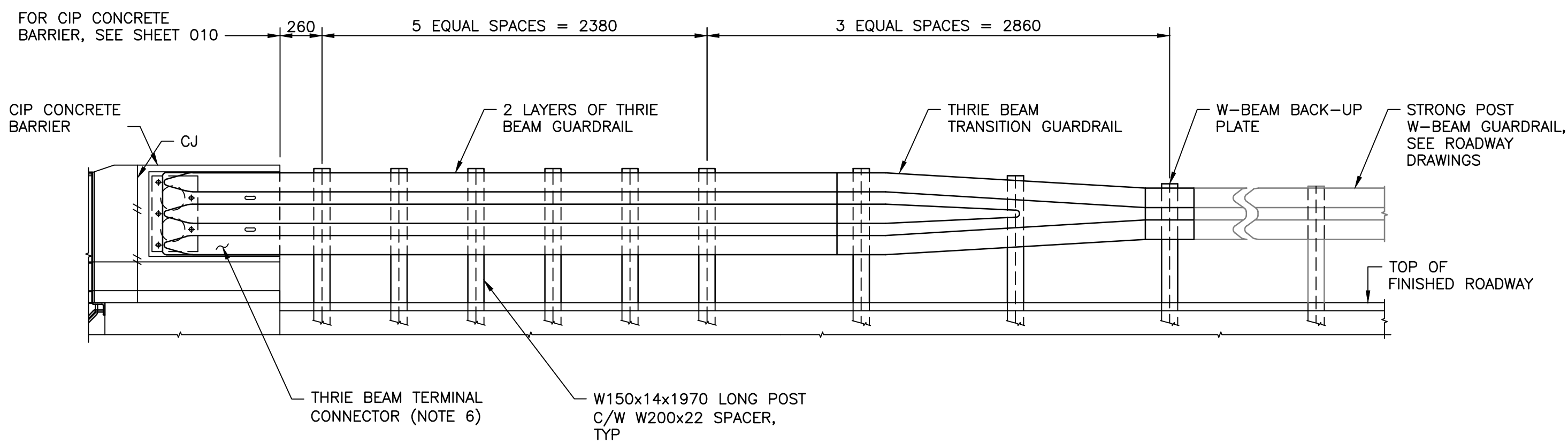
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Ressources Architectural et de Directeur d'ingénierie, TPSCG

Client/client
PCA

Drawing title/Titre du dessin

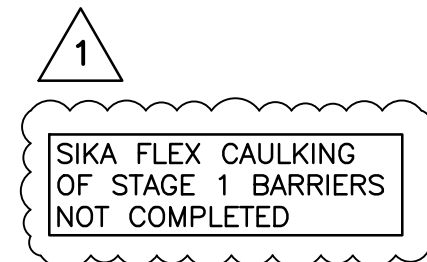
**CAST-IN-PLACE BARRIER
LAYOUT AND REINFORCEMENT
SHEET 2**

Project No./No. du projet 565-11	Sheet/Feuille 011 OF	Revision no./ La Révision no. 1
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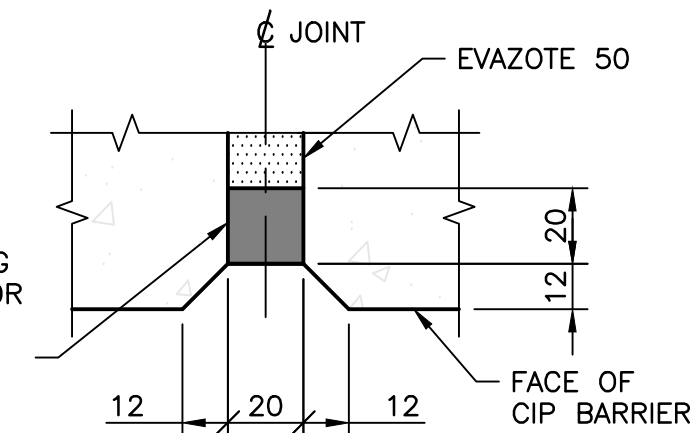


ELEVATION — APPROACH RAIL TRANSITION

1:25



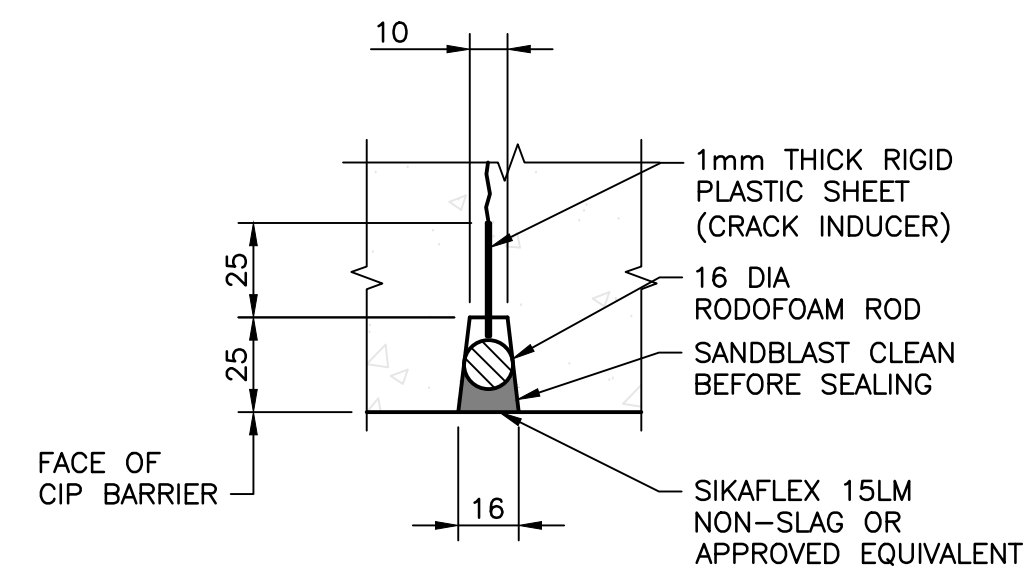
SIKAFLEX 15LM SEALING COMPOUND OR APPROVED EQUIVALENT



SECTION 1 TYPICAL BARRIER JOINT

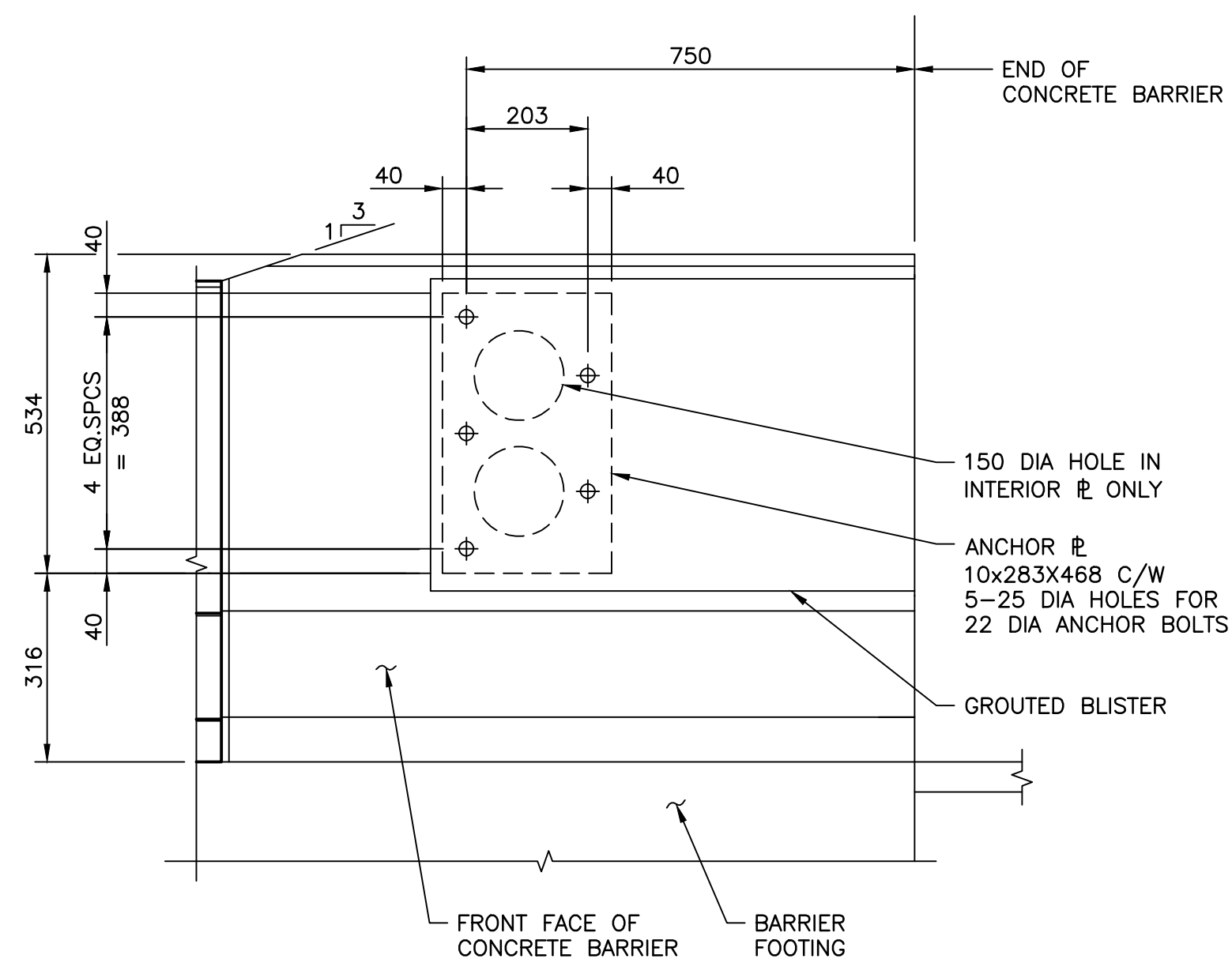
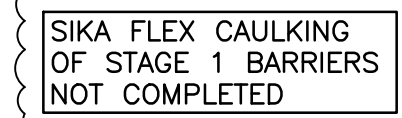
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(NOTES 10 AND 14 ON SHEET 010)



SECTION 2 TYPICAL BARRIER CONTROL JOINT

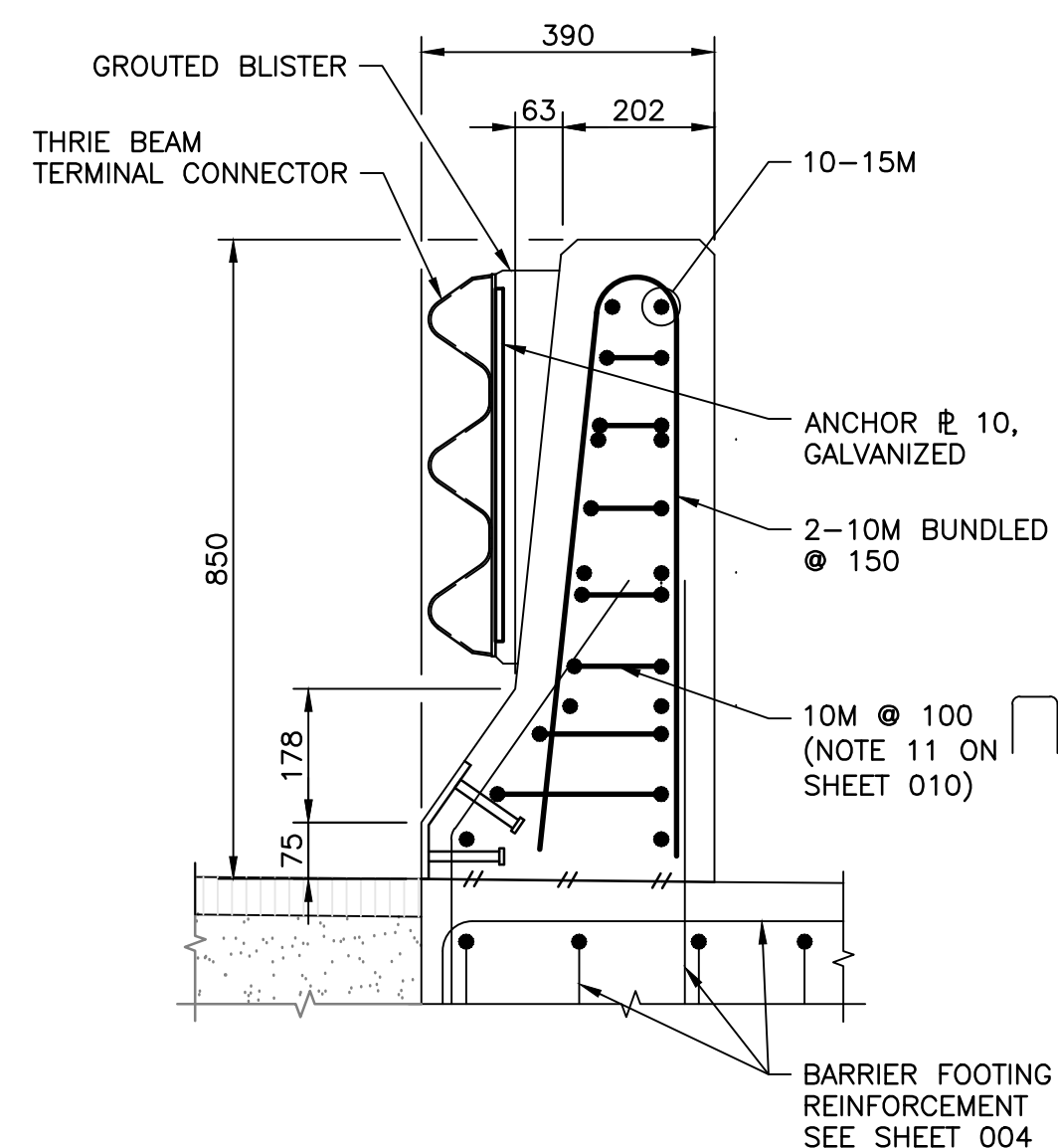
1:2



RAIL TRANSITION ANCHORAGE DETAIL

1:10

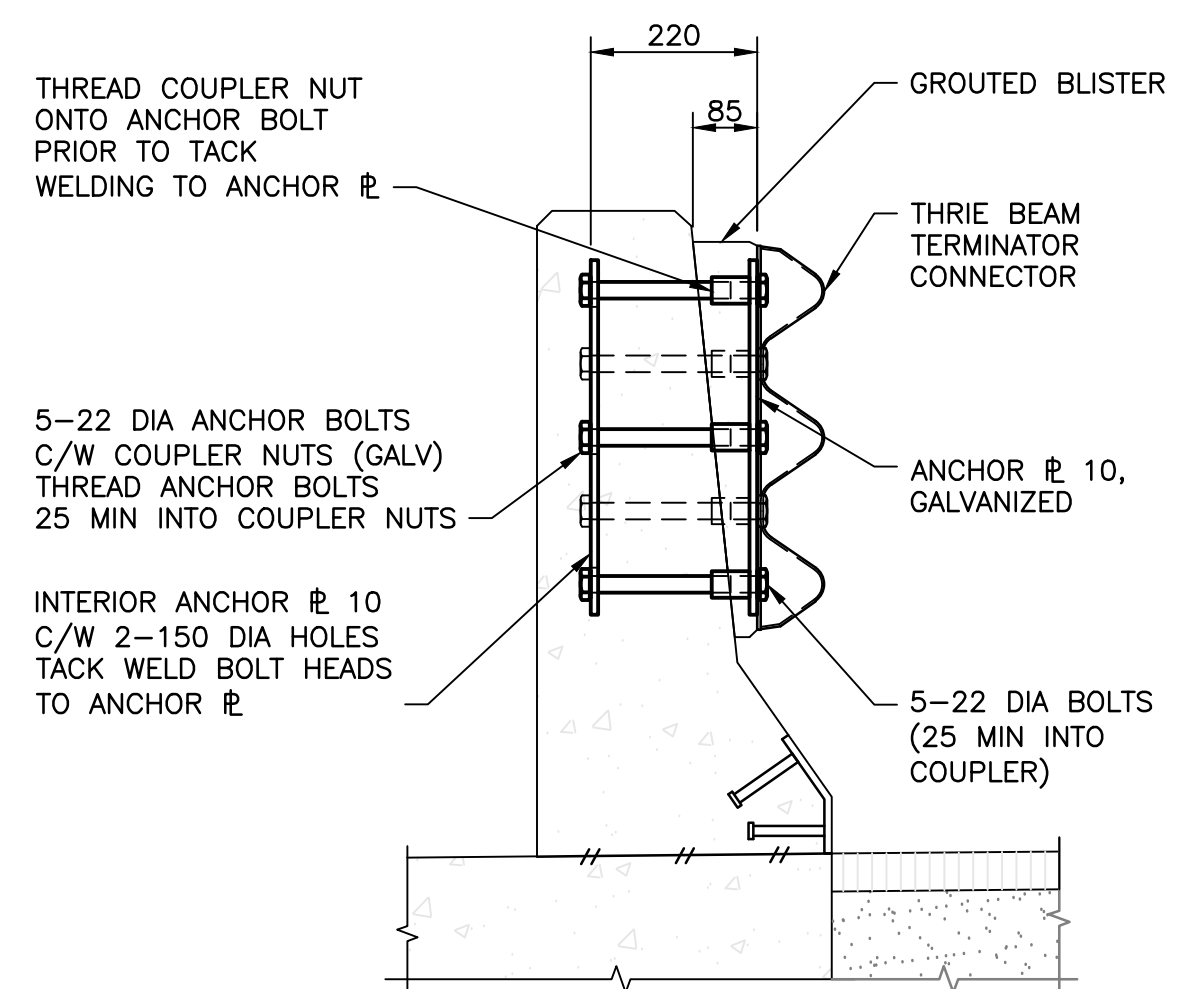
(NOTE: THRIE BEAM TERMINAL CONNECTOR NOT SHOWN FOR CLARITY)



SECTION 3

1:10

010



SECTION 4

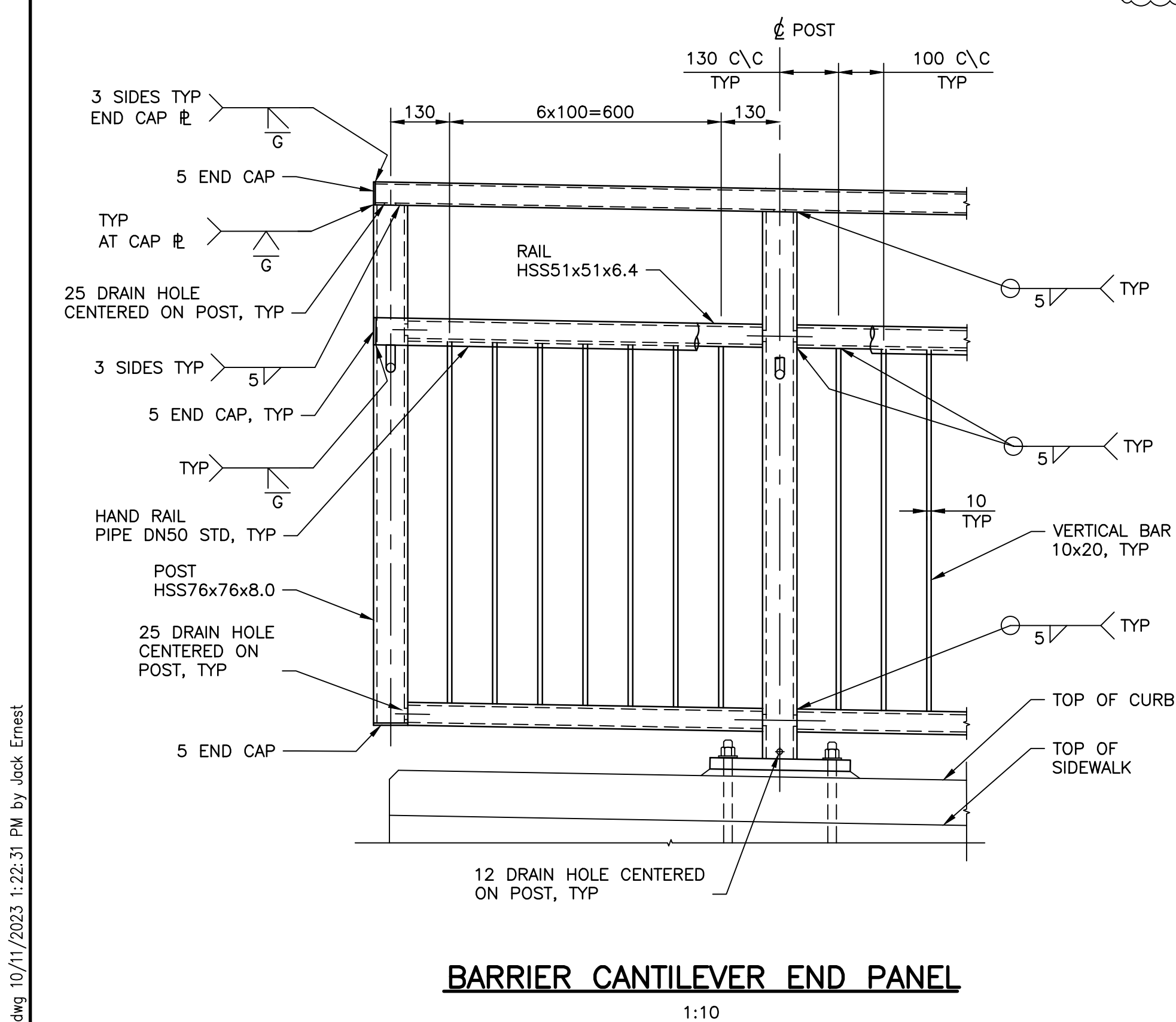
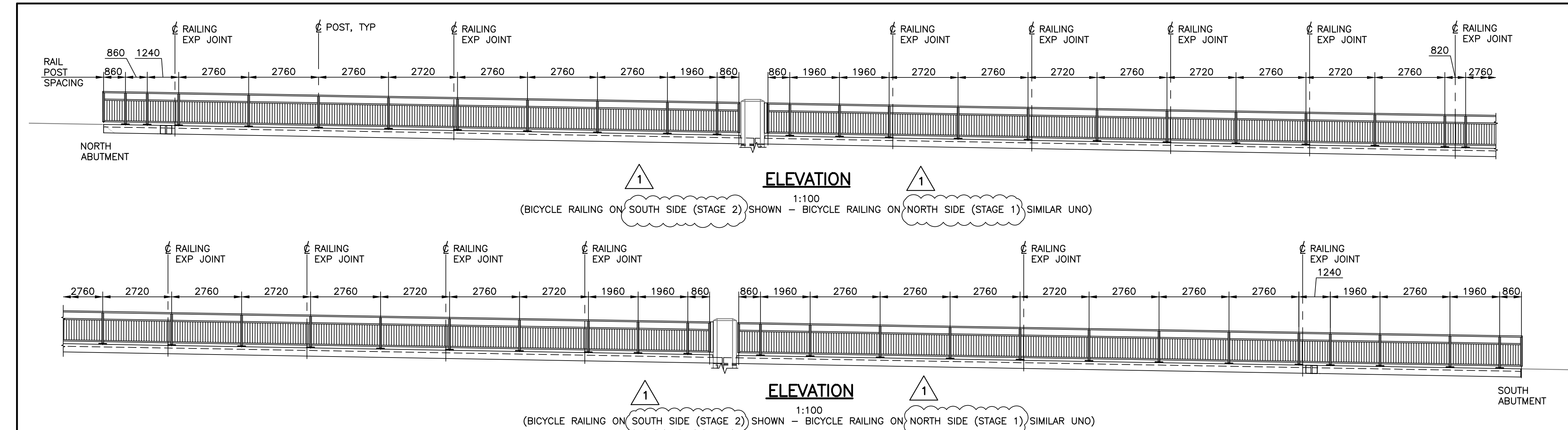
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010

NOTES:

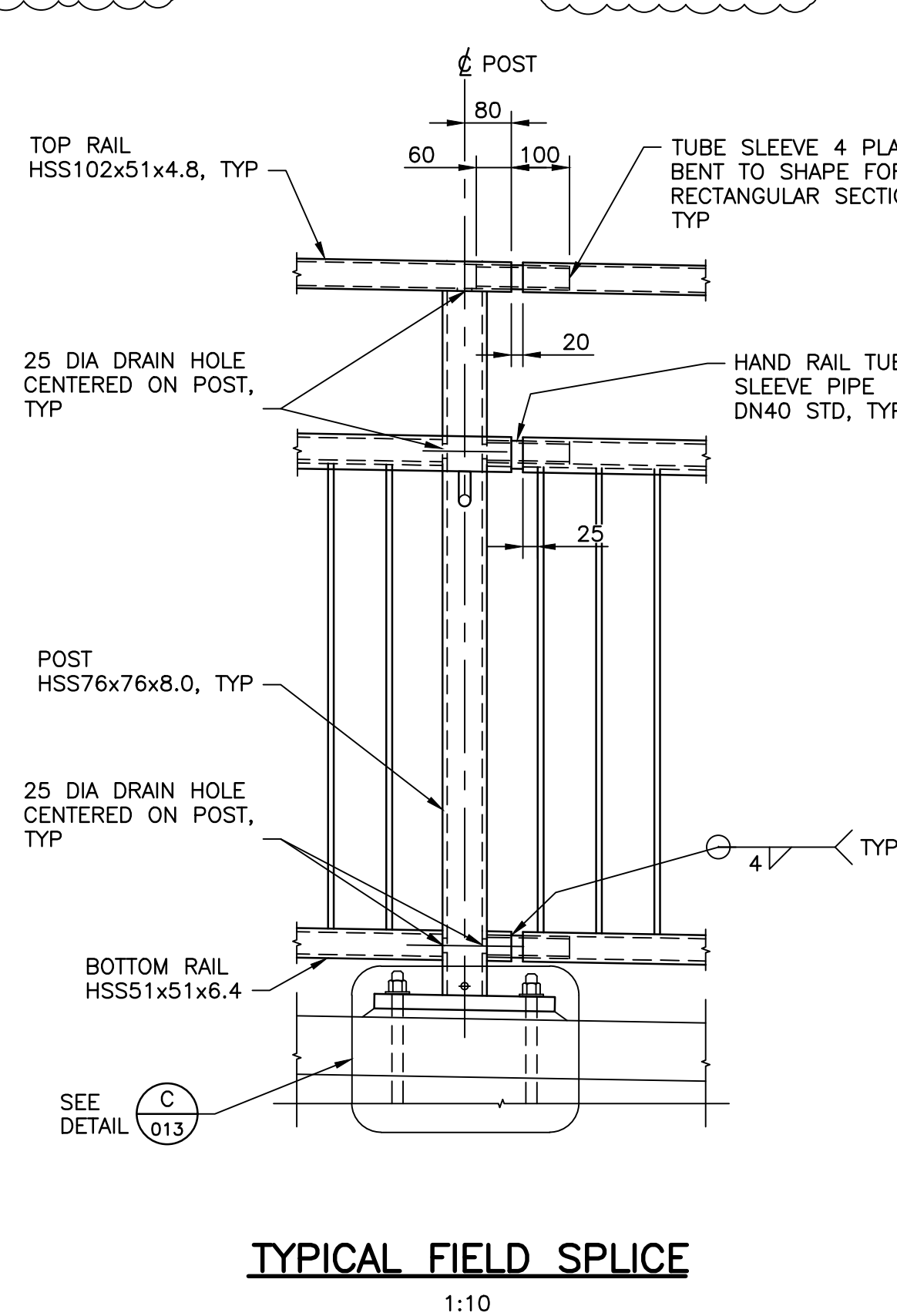
- PLATE STEEL AND STRUCTURAL SHAPES: CSA G40.21 GRADE 350W, OR ASTM A36.
- BOLTS: ASTM A307
- W-BEAM AND THRIE BEAM GUARDRAIL (INCLUDING THRIE BEAM TERMINAL CONNECTOR AND THRIE BEAM TRANSITION SECTION): 345 MPa MINIMUM YIELD STRENGTH.
- HOT-DIP GALVANIZE AFTER FABRICATION TO ASTM A123/A123M AND ASTM F2329 UNLESS NOTED OTHERWISE.
- WELDING TO CSA W59.
- BOLTS FOR THE THRIE BEAM TERMINAL CONNECTOR SHALL BE CAST-IN-PLACE.
- ALL RAIL SECTIONS TO BE LAPPED IN THE DIRECTION OF TRAFFIC.

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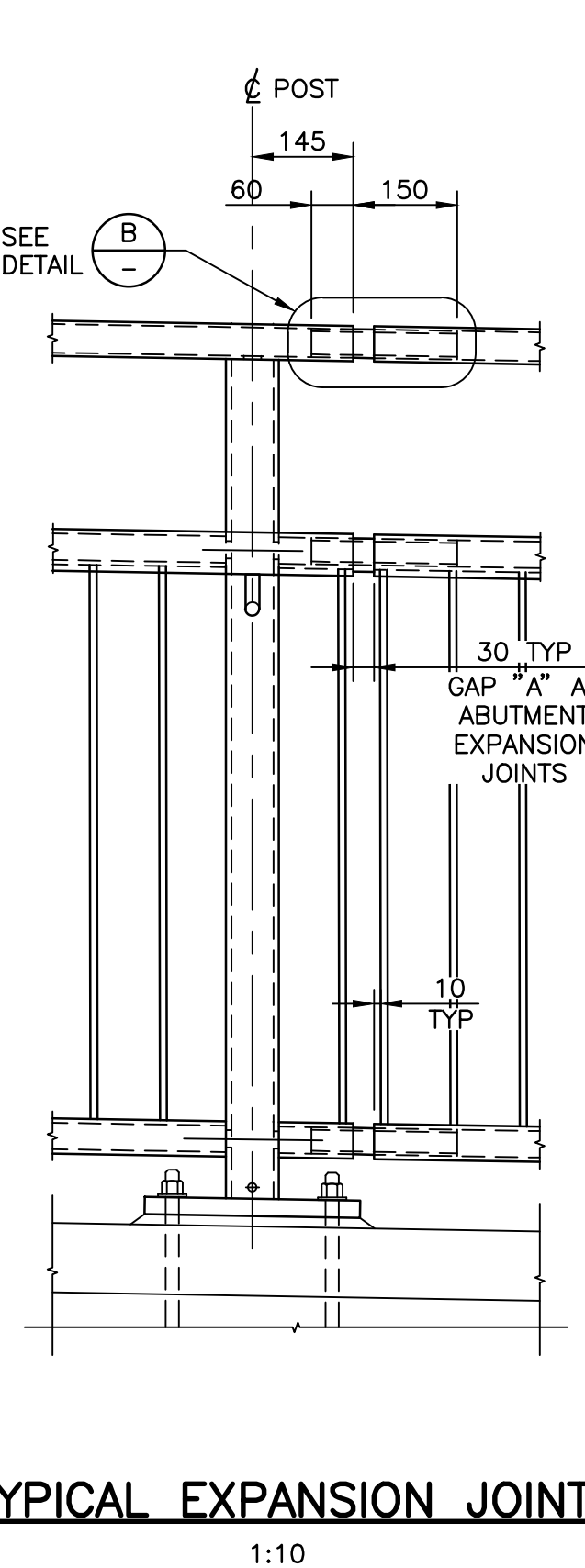
BARRIER CANTILEVER END PANEL

1:10



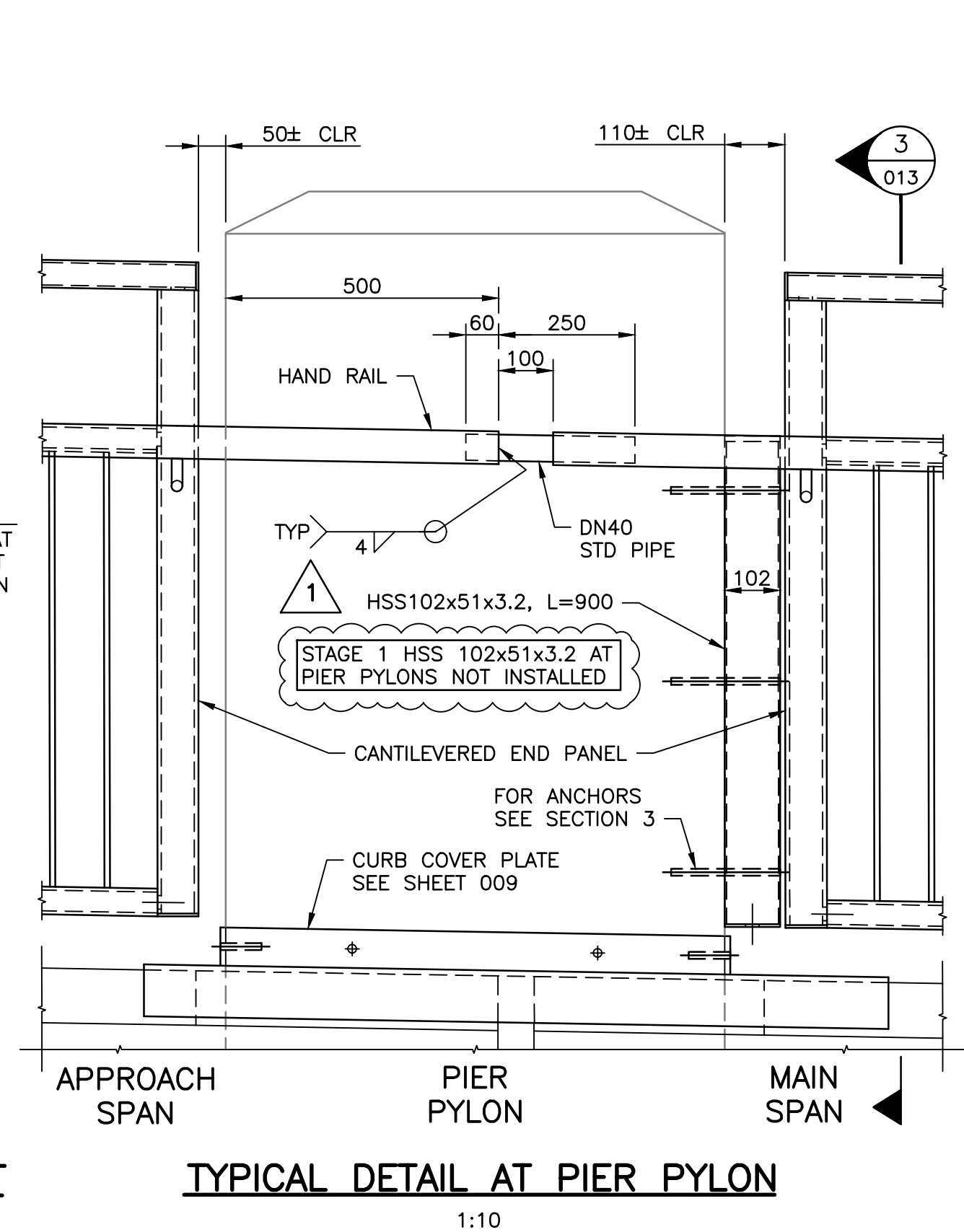
TYPICAL FIELD SPLICE

1:10



TYPICAL EXPANSION JOINT

1:10



TYPICAL DETAIL AT PIER PYLON

1:10

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. SEGMENT LENGTHS FOR RAILING ARE BASED ON ORIGINAL DESIGN DRAWINGS. CONTRACTOR TO VERIFY ACCURACY OF SUCH BY FIELD MEASUREMENTS.

FABRICATION:

1. ALL STEEL SHALL CONFORM TO CSA SPECIFICATION G40.21M GRADE 350W. HANDRAIL PIPES SHALL CONFORM TO ASTM A53, GRADE B. ANCHOR RODS SHALL CONFORM TO ASTM F1554 GRADE 10S. NUTS AND WASHERS SHALL CONFORM TO ASTM A563 AND ASTM F436 RESPECTIVELY.
2. WELDING SHALL CONFORM TO CAN/CSA W59.
3. COMPONENTS TO BE POWDER COATED SHALL BE HOT DIP GALVANIZED AFTER FABRICATION TO ASTM A123/A123M WITH SURFACE FINISH AND PREPARATION TO ASTM D7803/D7803M AND POWDER COATED IN ACCORDANCE WITH THE SPECIFICATIONS. ALL OTHER MATERIALS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123/A123M AND ASTM F2329.
4. REPAIR OF GALVANIZING SHALL BE COMPLETED AS PER ASTM A780.
5. ALL EXPOSED CUT TUBE ENDS SHALL BE GROUND SMOOTH.
6. ALL RAIL SECTIONS SHALL BE FABRICATED IN LENGTHS NOT EXCEEDING 9 m BUT WHERE POSSIBLE CONTINUOUS OVER AT LEAST 3 POSTS.
7. AT LEAST 2 POSTS ARE REQUIRED IN RAIL SECTION EITHER SIDE OF AN EXPANSION JOINT AND FIELD SPLICE.
8. ALL POSTS AND VERTICAL BARS TO BE TRUE VERTICAL.

RAILING EXPANSION JOINT:

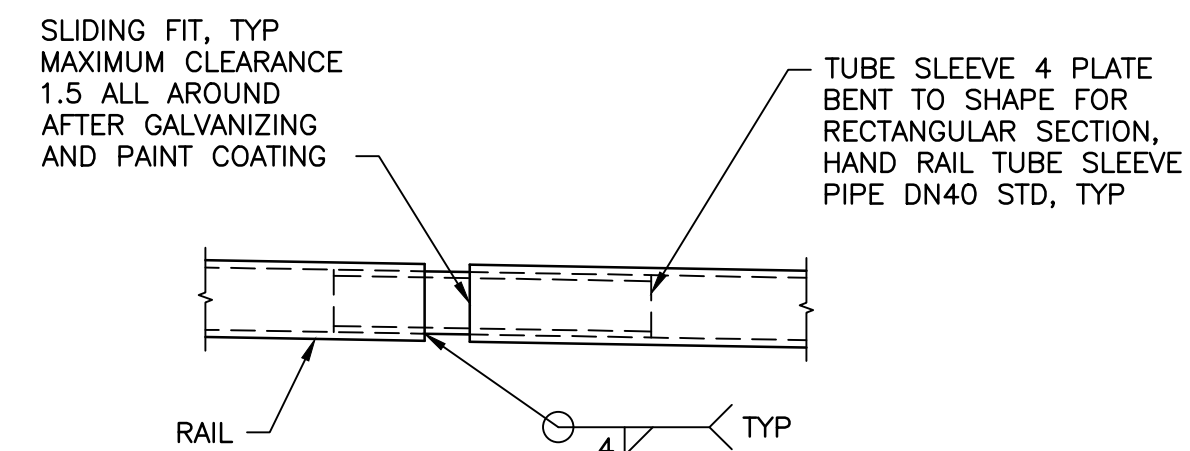
1. INSTALLATION GAP FOR ALL TYPICAL EXPANSION JOINTS TO BE 30 mm.
2. INSTALLATION GAP "A" FOR EXPANSION JOINTS AT THE ABUTMENTS IN ACCORDANCE WITH TABLE.

GAP SETTING TABLE — DIMENSION "A"

TEMPERATURE (°C)	-15	-10	-5	0	5	10	15	20	25
JOINT GAP "A" AT ABUTMENT	53	51	50	49	47	46	44	43	41

ERECTION:

1. ALL DIMENSIONS ARE MEASURED PARALLEL TO TOP OF CURB AND ALONG CENTERLINE OF ANCHOR ROD ASSEMBLIES.
2. LINE AND ELEVATION OF RAIL TO BE SET BY INSTRUMENT.



DETAIL B

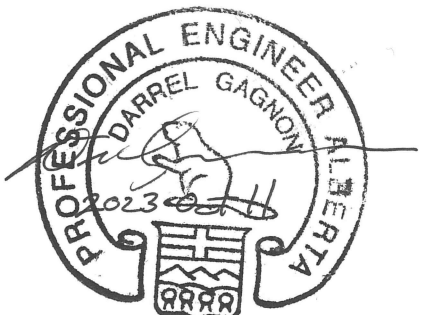
1:5

(TYPICAL FOR ALL EXPANSION JOINT RAILS, VERTICAL BARS NOT SHOWN FOR CLARITY)

RECORD DRAWING

THE SEAL AND SIGNATURE OF THE UNDERSIGNED ON THIS DRAWING CERTIFIES THAT THE DESIGN INFORMATION CONTAINED IN THESE DRAWINGS ACCURATELY REFLECTS THE ORIGINAL DESIGN AND THE MATERIAL DESIGN CHANGES MADE DURING CONSTRUCTION THAT WERE BROUGHT TO THE UNDERSIGNED'S ATTENTION. THESE DRAWINGS ARE INTENDED TO INCORPORATE ADDENDA, CHANGE ORDERS, AND OTHER MATERIAL DESIGN CHANGES, BUT NOT NECESSARILY ALL SITE INSTRUCTIONS.

THE UNDERSIGNED DOES NOT WARRANT OR GUARANTEE, NOR ACCEPT ANY RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE AS-CONSTRUCTED INFORMATION SUPPLIED BY OTHERS CONTAINED IN THESE DRAWINGS, BUT DOES, BY SEALING AND SIGNING, CERTIFY THAT THE AS-CONSTRUCTED INFORMATION, IF ACCURATE AND COMPLETE, PROVIDES AN AS-CONSTRUCTED SYSTEM WHICH SUBSTANTIALLY COMPLIES IN ALL MATERIAL RESPECTS WITH THE ORIGINAL DESIGN INTENT.



DO NOT SCALE DRAWINGS

Revision/	Description/Description	Date/Date
1	RECORD DRAWING	23/10/11
0	ISSUED FOR CONSTRUCTION	20/05/08

Client/client	Parks Canada Agency	L'Agence Parcs Canada
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COWI

Project title/Titre du projet
**BRIDGE REHABILITATION
BANFF NATIONAL PARK, ALBERTA**

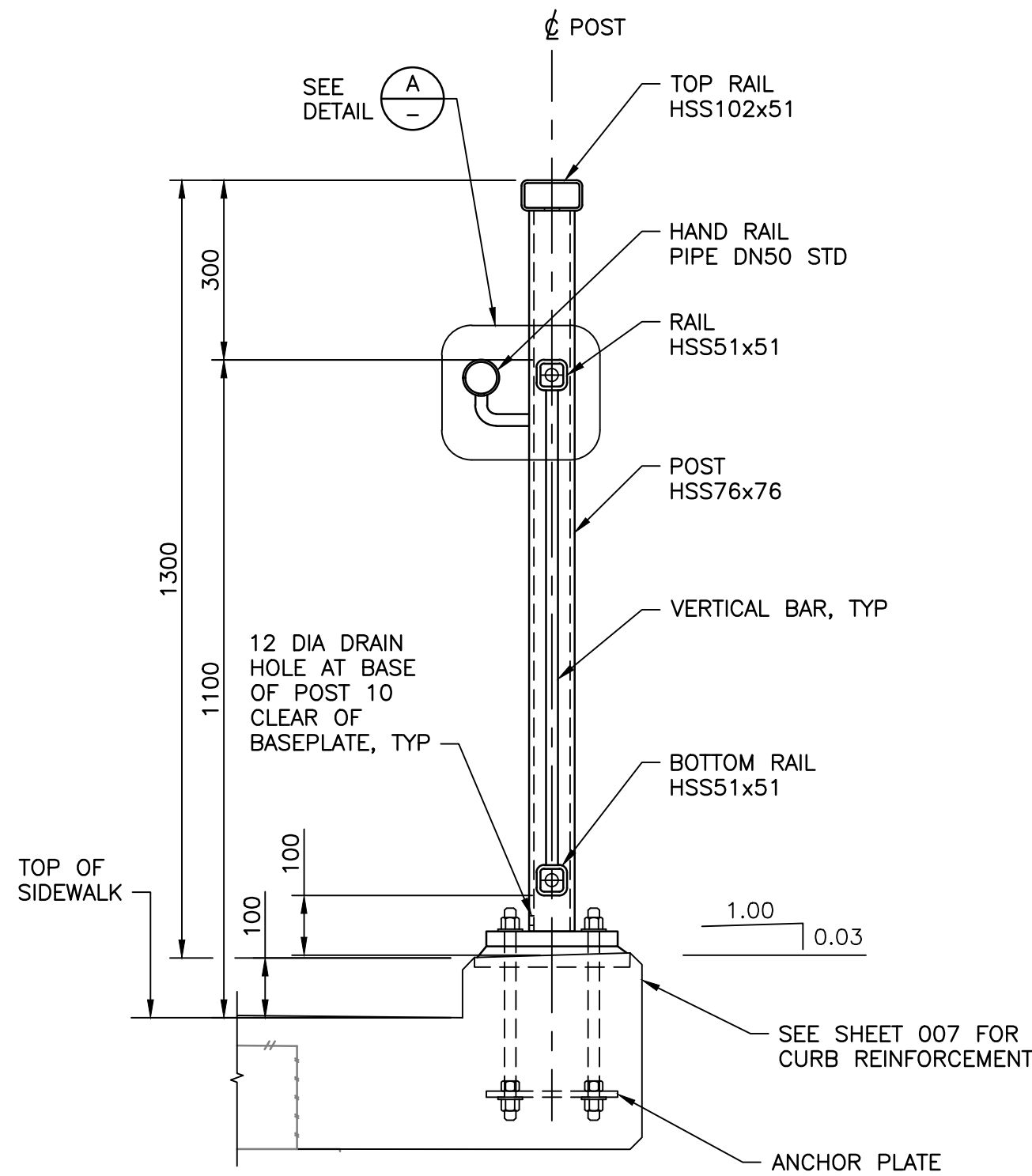
**KM 108.6 HIGHWAY 93N
NIGEL CREEK BRIDGE**

Approved by/Approuvé par DPG
Designed by/Concept par TWB
Drawn by/Dessiné par MACM
PWGC Project Manager/Administrateur de Projets TPSCG
PWGC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSCG
Client/client PCA
Drawing title/Titre du dessin

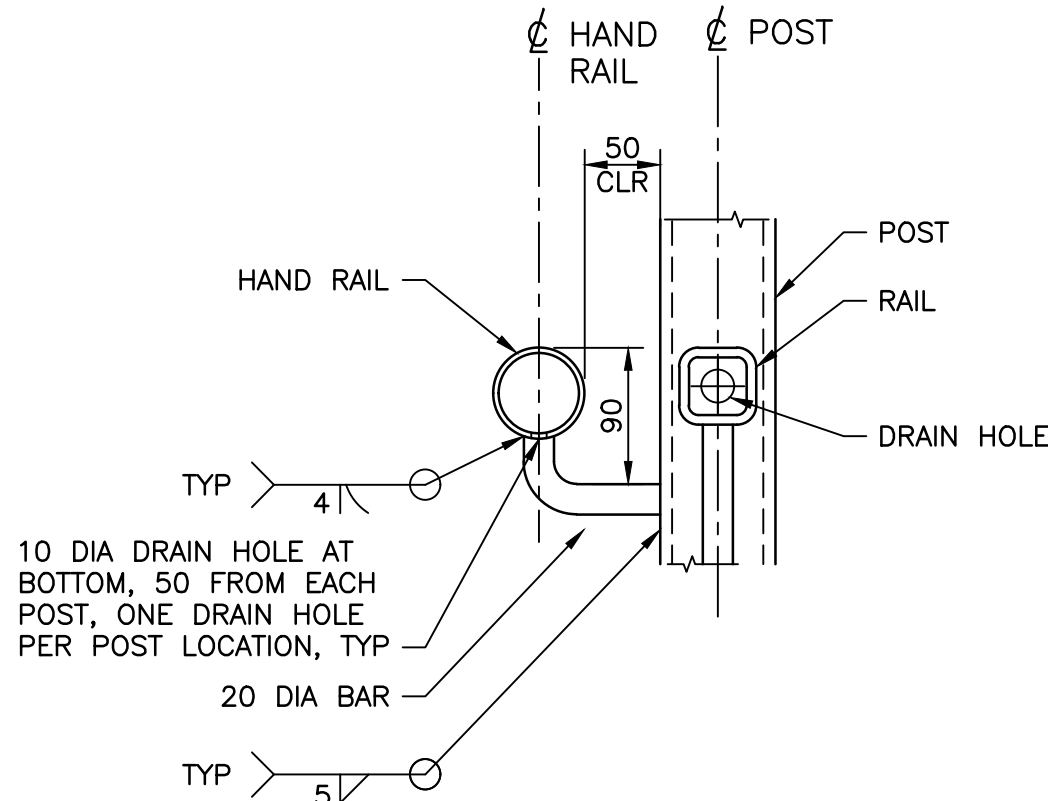
**BICYCLE RAILING
SHEET 1**

Project No./No. du projet 565-11	Sheet/Fauille 012 OF	Revision no./ La Révision no. 1
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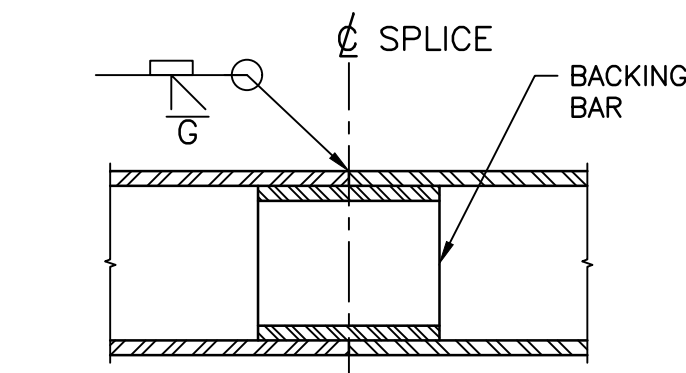
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TYPICAL SECTION
1:10

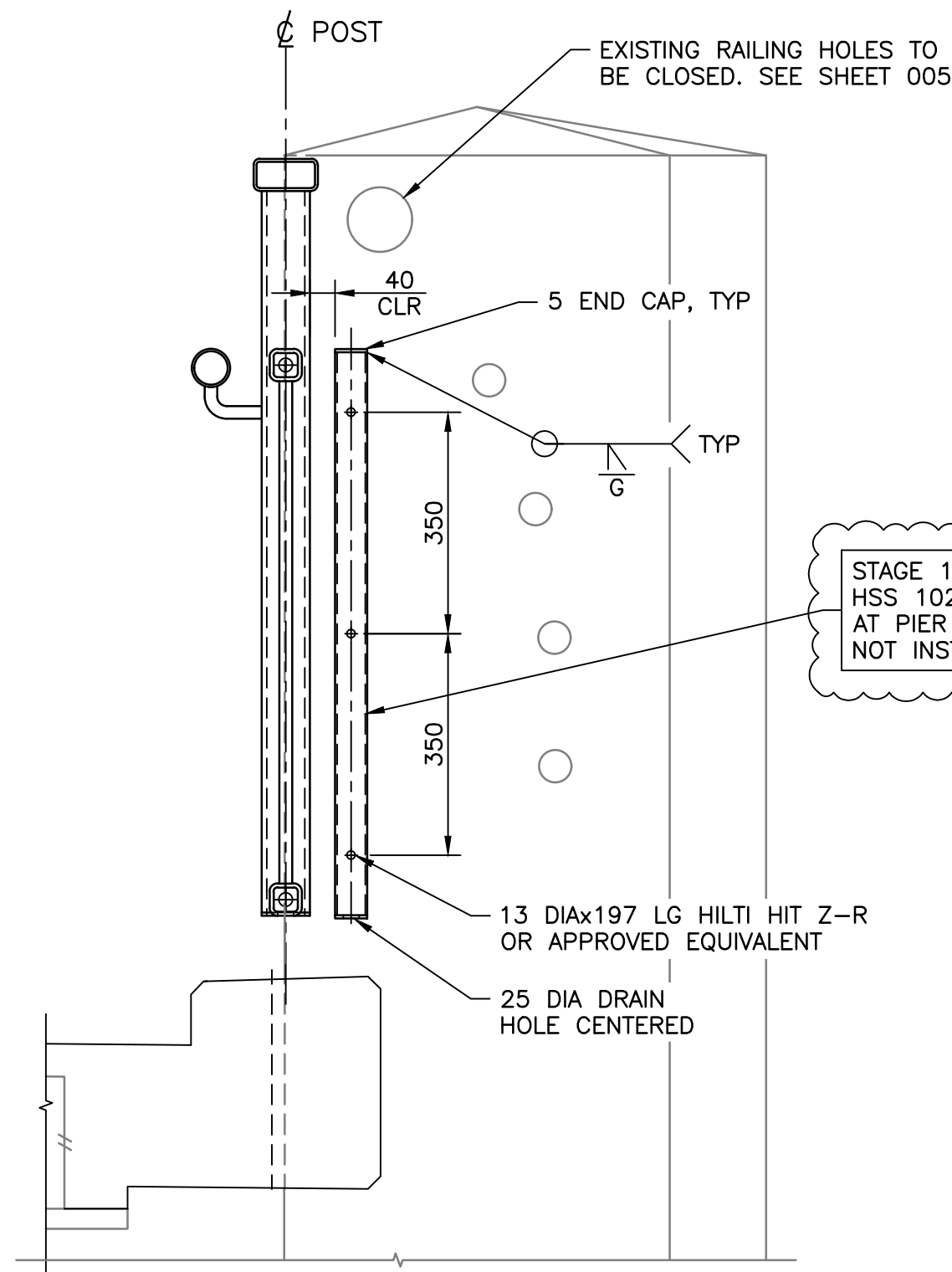


DETAIL A
1:5

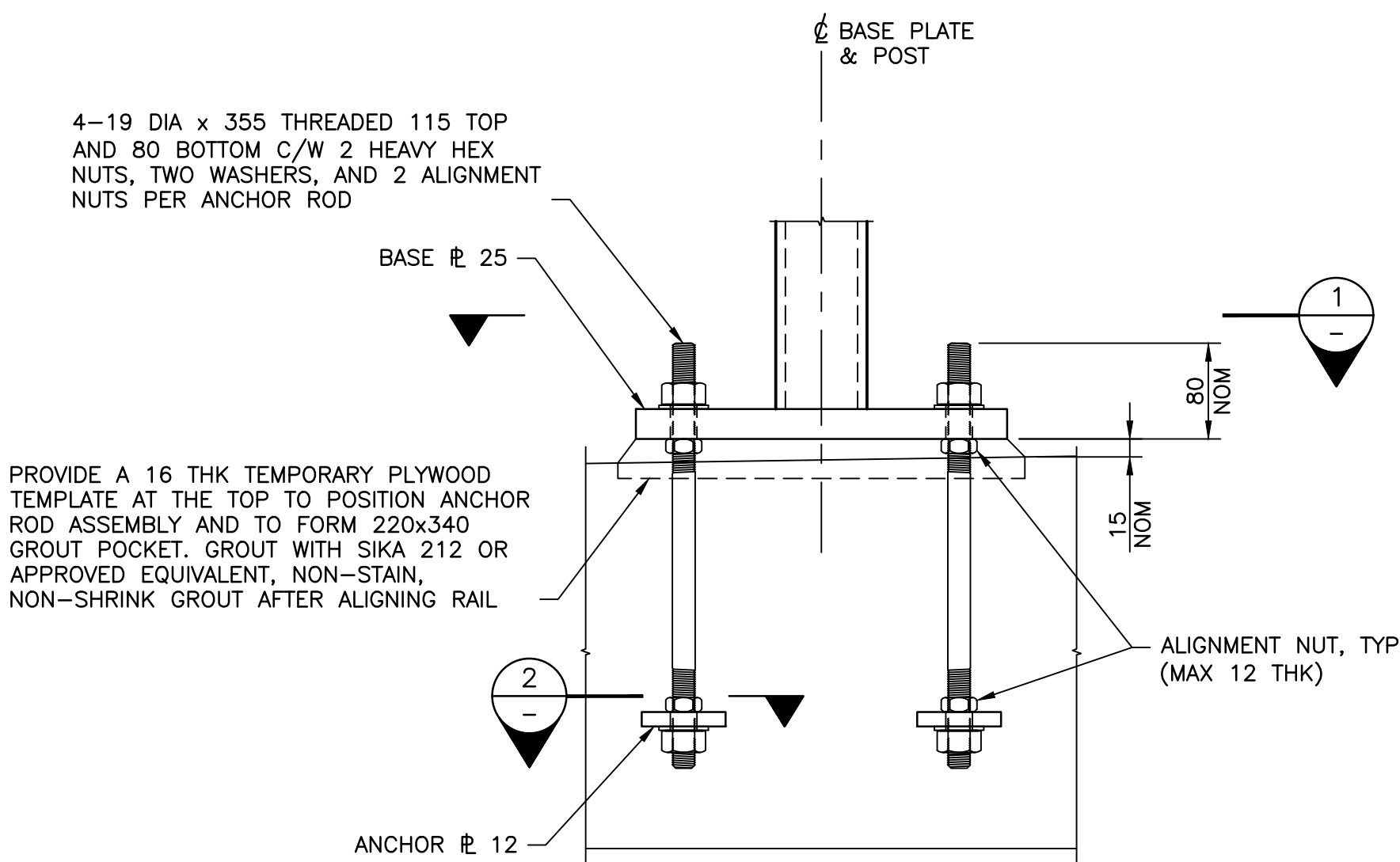


RAIL SHOP SPLICE DETAIL
NTS

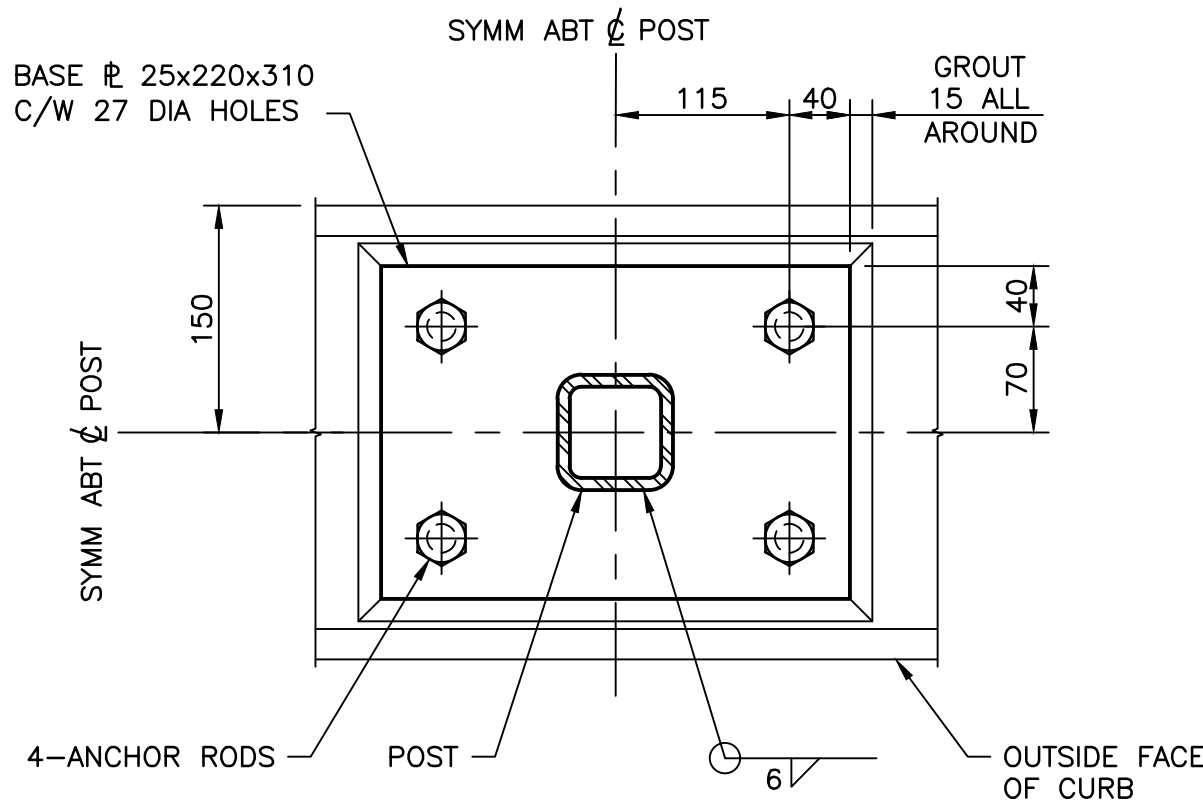
NOTE:
RAIL SHOP SPLICE IF REQUIRED
SHALL CONFORM TO THE DETAIL
AND BE CLEAR OF JOINTS AND
CONNECTIONS. NOT MORE THAN
ONE SPLICE PER TUBE SECTION



SECTION 3
1:10
(CURB COVER PLATE NOT SHOWN)

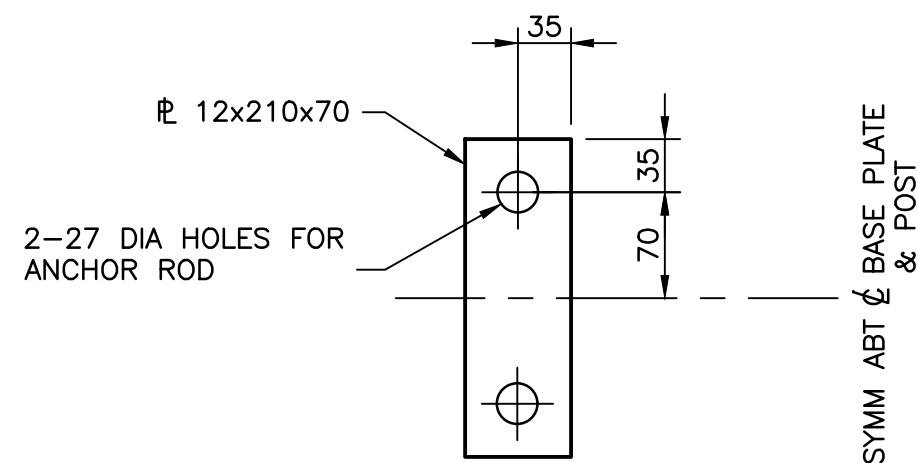


DETAIL C
1:5



SECTION 1 POST BASE PLATE
1:5

SOME BASE PLATE GROUT PADS CAST
WITHOUT CHAMFER AND TO LARGER
DIMENSIONS THAN AS SHOWN ON DRAWING



SECTION 2 ANCHOR PLATE
1:5

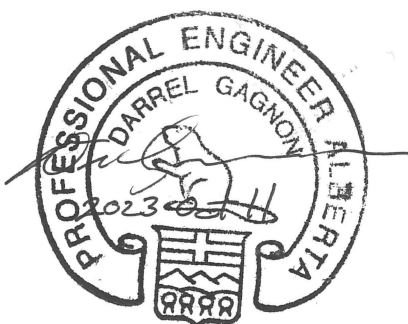
NOTES:

1. WORK WITH NOTES ON SHEET 012.

RECORD DRAWING

THE SEAL AND SIGNATURE OF THE UNDERSIGNED ON THIS DRAWING CERTIFIES THAT THE DESIGN INFORMATION CONTAINED IN THESE DRAWINGS ACCURATELY REFLECTS THE ORIGINAL DESIGN AND THE MATERIAL DESIGN CHANGES MADE DURING CONSTRUCTION THAT WERE BROUGHT TO THE UNDERSIGNED'S ATTENTION. THESE DRAWINGS ARE INTENDED TO INCORPORATE ADDENDA, CHANGE ORDERS, AND OTHER MATERIAL DESIGN CHANGES, BUT NOT NECESSARILY ALL SITE INSTRUCTIONS.

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PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSCG
Client/client PCA
Drawing title/Titre du dessin

**BICYCLE RAILING
SHEET 2**

Project No./No. du projet 565-11	Sheet/Feuille 013 OF	Revision no./ La Révision no. 1
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