

BRIDGE REHABILITATION

GLACIER NATIONAL PARK, BRITISH COLUMBIA

KM 29.3 TRANS-CANADA HIGHWAY

LOOP BROOK BRIDGE

DRAWING LIST:

- 1080-01-101

COVER SHEET – DRAWING LIST AND LOCATION MAP
- 1080-01-102

GENERAL ARRANGEMENT – EXISTING CONDITION
- 1080-01-103

GENERAL ARRANGEMENT – FINAL CONDITION
- 1080-01-104

ABUTMENT AND APPROACH MODIFICATIONS
- 1080-01-105

CONCRETE DECK SOFFIT REPAIRS
- 1080-01-106

CONCRETE DECK MODIFICATIONS
- 1080-01-107

SUGGESTED CONSTRUCTION ZONE STAGING AND
PARTIAL DEPTH DECK REPAIRS
- 1080-01-108

CAST-IN-PLACE BARRIER – LAYOUT AND REINFORCEMENT
- 1080-01-109

BICYCLE RAILING
- 1080-01-110

PRECAST BARRIERS AND SPILLWAY DETAILS

REFERENCE DRAWINGS

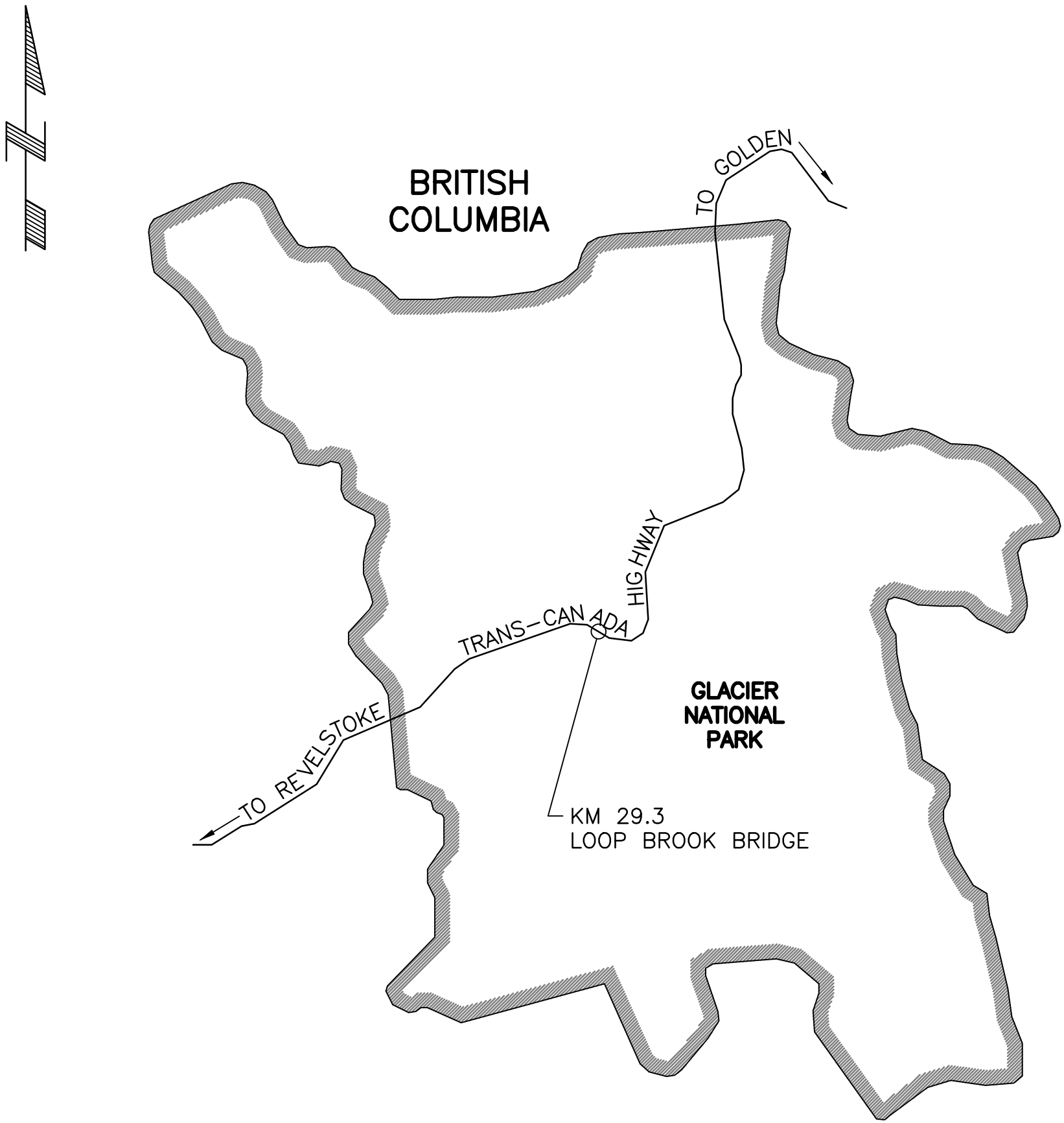
- 1958 ORIGINAL DESIGN DRAWINGS, LOOP CREEK BRIDGE T.C.H. MILE 18.3 (KM 29.3),
GLACIER NATIONAL PARK:
- 1 OF 4

PLAN & ELEVATION
- 2 OF 4

FRAME-REINFORCING
- 3 OF 4

WINGWALL, CURB & PYLON DETAILS, STEEL SCHEDULE
- 4 OF 4

STANDARD HANDRAIL DETAIL



LOCATION MAP

N.T.S.

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Project title/Titre du projet

BRIDGE REHABILITATION

GLACIER NATIONAL PARK, BRITISH COLUMBIA

KM 29.3 TRANS-CANADA HIGHWAY

LOOP BROOK BRIDGE

Approved by/Approuvé par

JUGN

Designed by/Concept par

TWB

Drawn by/Dessiné par

MICH

PWGSC Project Manager/Administrateur de Projets TFSGC

PWGSC, Architectural and Engineering Resources Manager/
Ressources Architectural et de Directeur d'Ingénierie, TFSGC

Client/client

PCA

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COVER SHEET

DRAWING LIST AND

LOCATION MAP

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1080-01	101 OF	A



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GENERAL ARRANGEMENT
EXISTING CONDITION

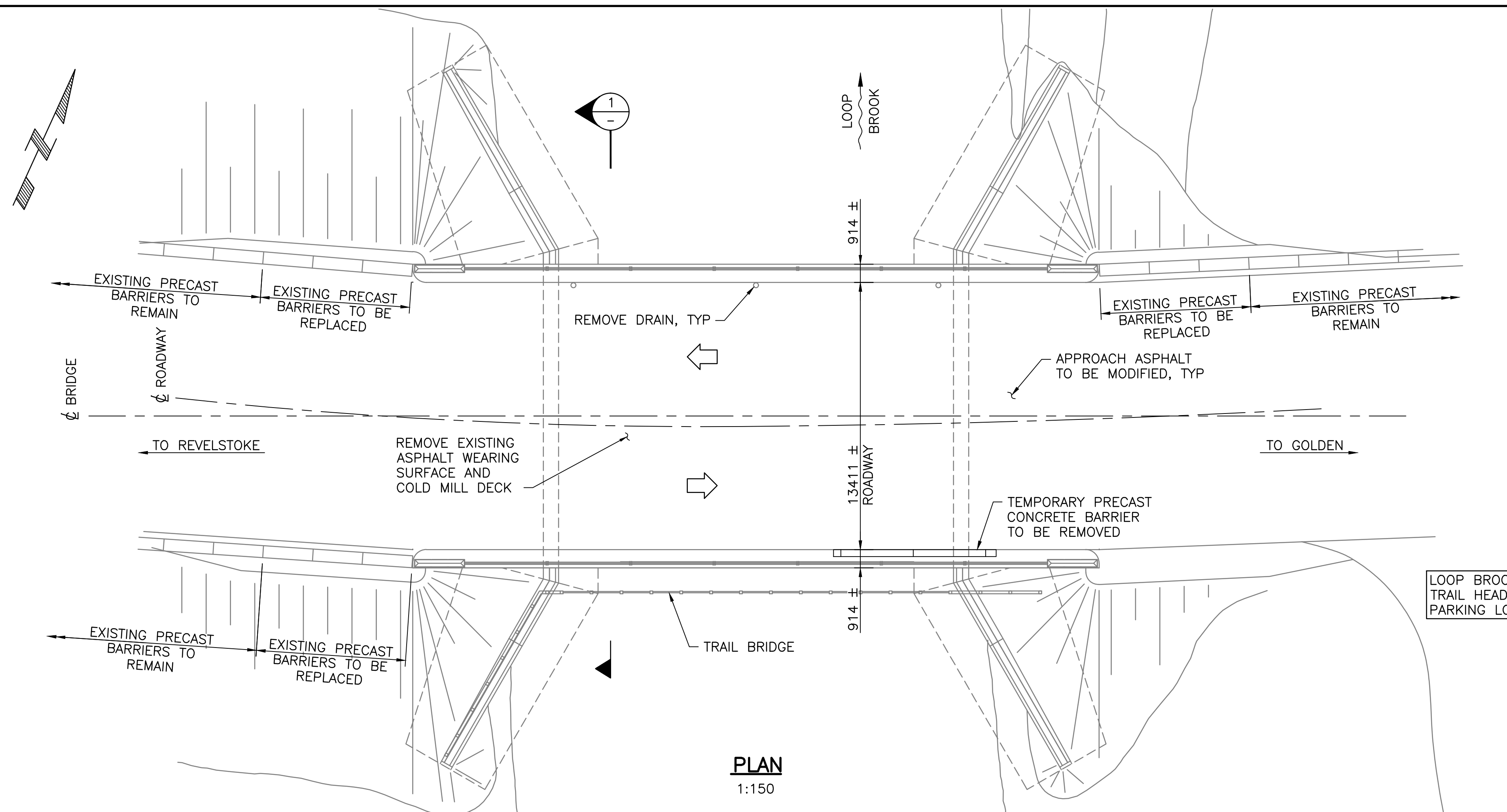
Project No./No. du projet	Sheet/Feuille 102 OF	Revision no./ La Révision no. A
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SCOPE OF WORK:

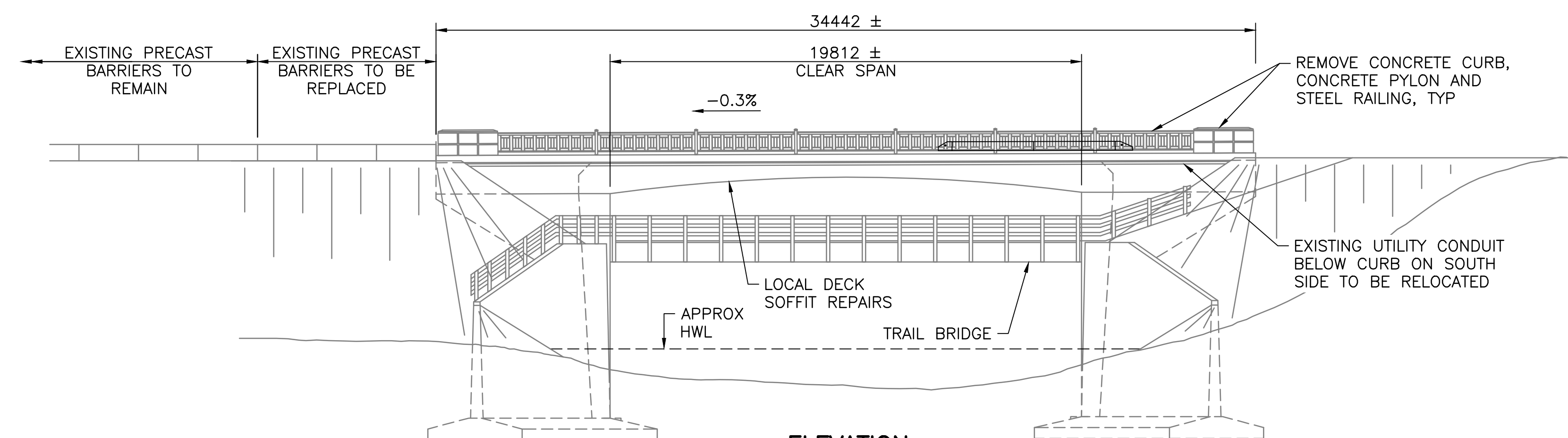
- CONSTRUCTION TO BE COMPLETED IN THREE STAGES.
- TEMPORARILY RELOCATE EXISTING UTILITIES PRIOR TO CONSTRUCTION IN ACCORDANCE WITH SPECIFICATIONS.
- REMOVE AND DISPOSE OF ASPHALT WEARING SURFACE.
- REMOVE AND DISPOSE OF EXISTING CONCRETE CURB, CONCRETE PYLON AND STEEL RAILING. REMOVE TEMPORARY PRECAST CONCRETE BARRIER ON SOUTH CURB.
- COLD MILLING OF CONCRETE DECK. CONCRETE REMOVAL AT TOP OF WINGWALLS.
- PARTIAL DEPTH DECK CONCRETE REPAIRS WHEN AUTHORIZED BY DEPARTMENTAL REPRESENTATIVE.
- REMOVE DECK DRAINS.
- SUPPLY AND CONSTRUCTION OF NEW REINFORCED CONCRETE OVERLAY AND WING WALL TOPPINGS.
- SUPPLY AND CONSTRUCTION OF NEW CAST-IN-PLACE CONCRETE BARRIERS.
- FABRICATE, SUPPLY AND INSTALL NEW BICYCLE RAILING AND CONNECTION BRACKETS.
- REPAIR DECK SOFFIT (LOCALLY). LOCATIONS AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE.
- SUPPLY AND INSTALL NEW DRIP STOPS AT DECK SOFFIT.
- MODIFY APPROACH PAVEMENT (INCLUDING ASPHALT MILLING AND NEW ASPHALT).
- SUPPLY AND INSTALL NEW PRECAST BARRIERS INCLUDING CUSTOM PRECAST BARRIERS.
- INSTALLATION OF NEW SPILLWAYS (DRAINAGE FLUMES).
- APPLY LANE MARKINGS ON NEW FINISHED ROAD SURFACE.

NOTES:

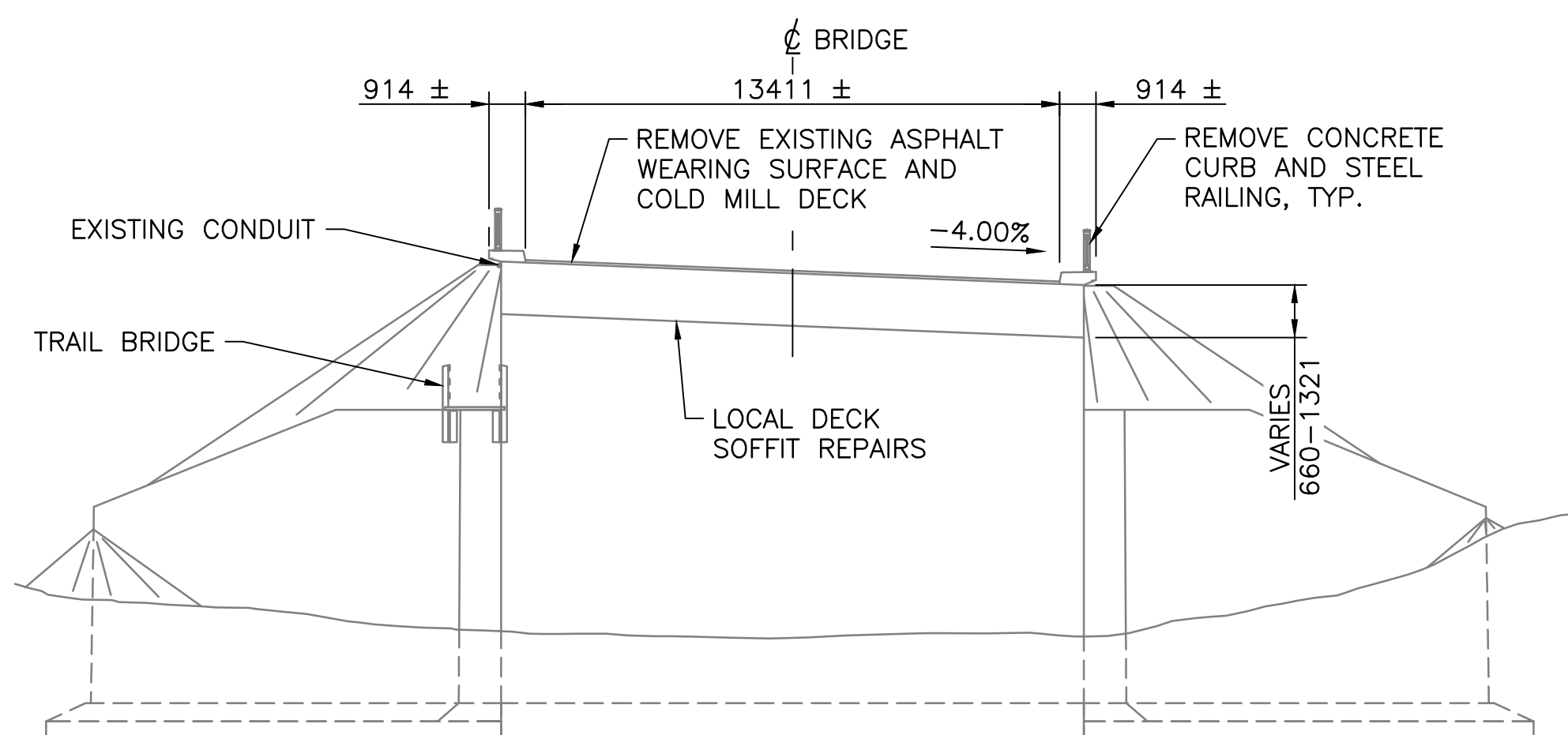
- DIMENSIONS PROVIDED FOR REFERENCE ONLY, CONTRACTOR TO VERIFY ACCURACY OF SUCH INFORMATION BY FIELD MEASUREMENTS.
- ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE.



PLAN
1:150



ELEVATION
1:150



SECTION 1
1:150

NOTE: WEST ABUTMENT SHOWN,
EAST ABUTMENT SIMILAR.

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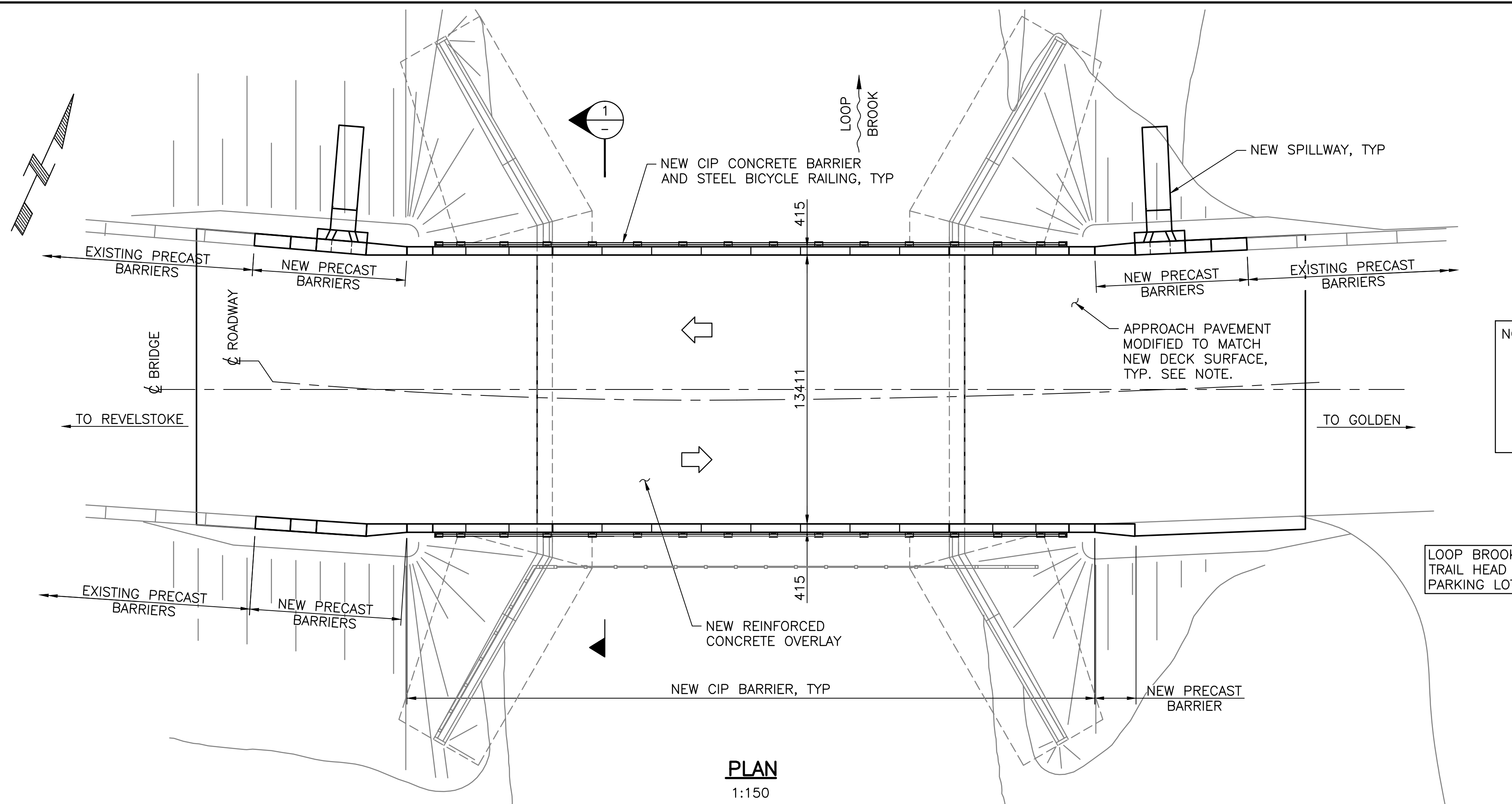
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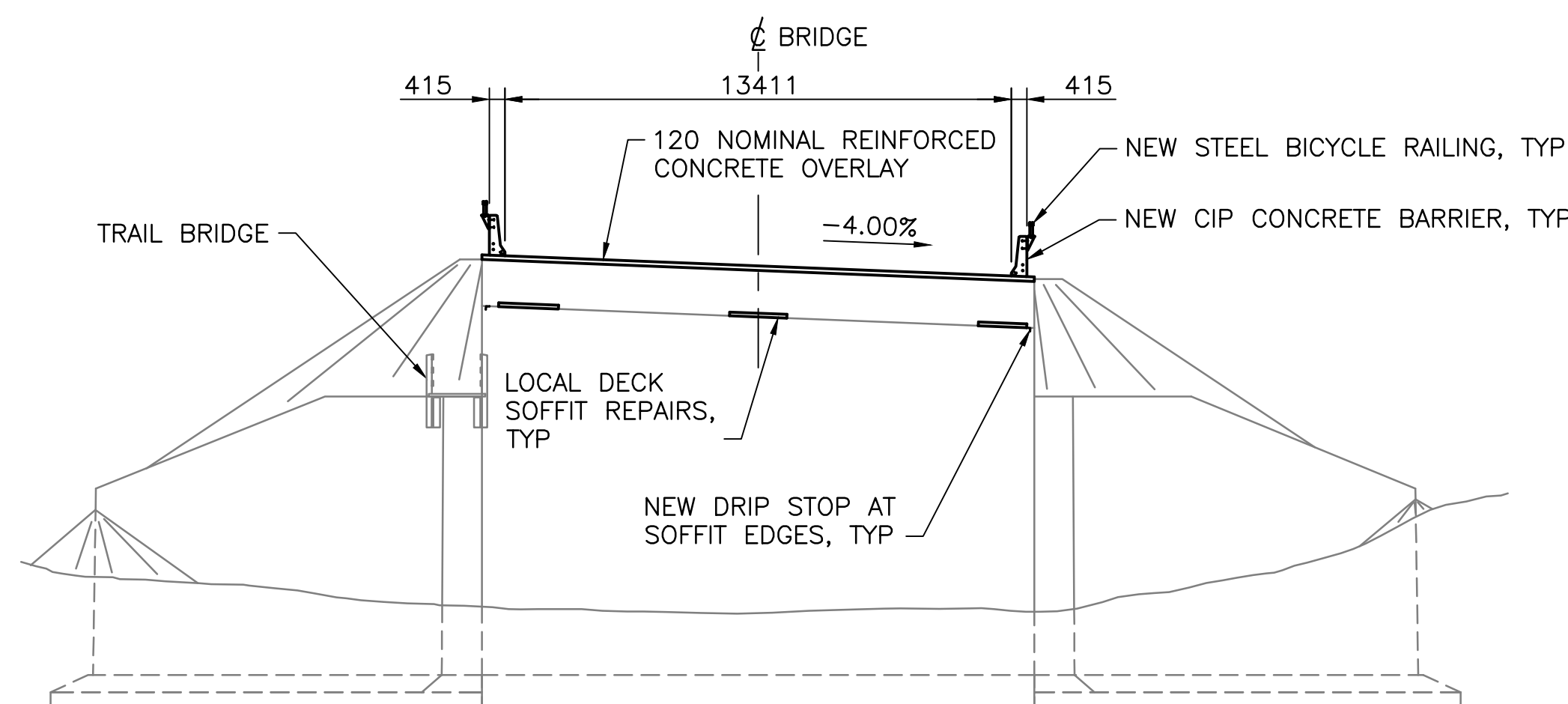
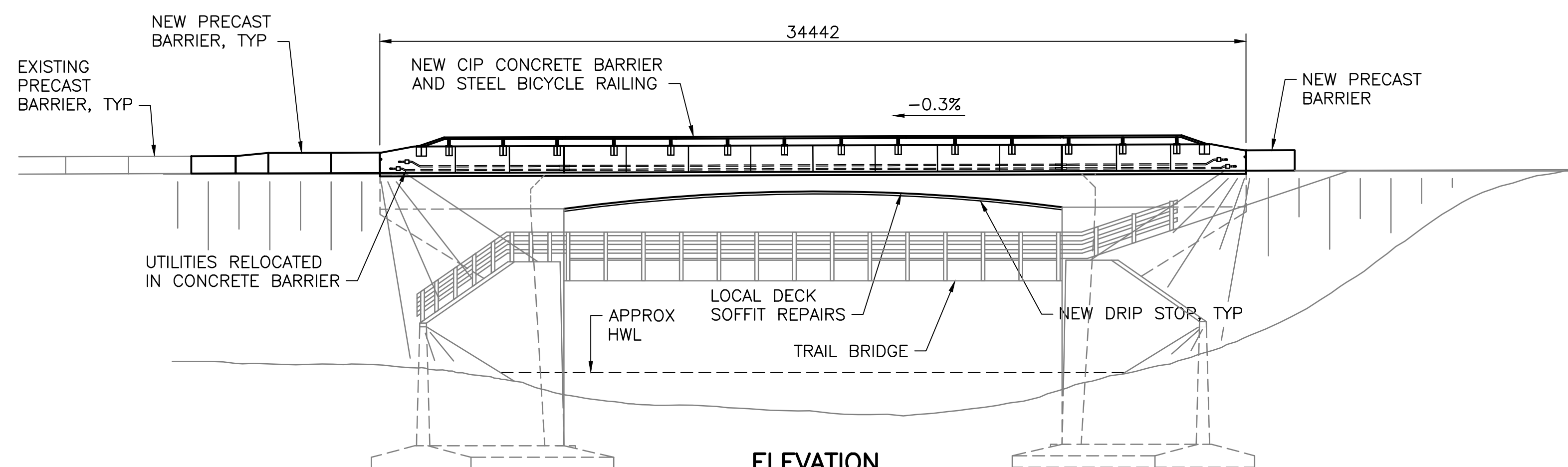
Drawing title/Titre du dessin

GENERAL ARRANGEMENT
FINAL CONDITION

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
1080-01	103 OF	A



LOOP BROOK
TRAIL HEAD
PARKING LOT



SECTION 1
1:150
NOTE: WEST ABUTMENT SHOWN,
EAST ABUTMENT SIMILAR.

DESIGN NOTES:

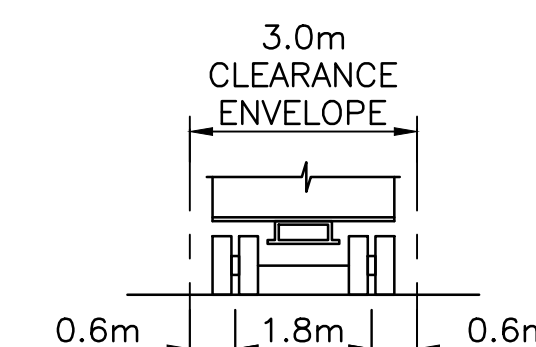
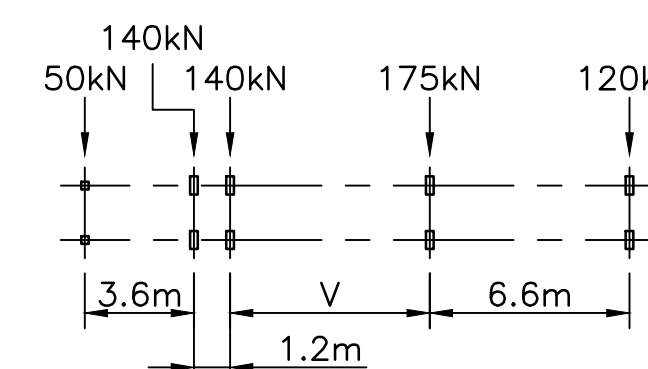
- DESIGN STANDARD: CAN/CSA-S6-14
- DESIGN LIFE: 25 YEARS
- DESIGN LOADS:

3.1 DEAD LOADS:

- REINFORCED CONCRETE: 24.0 kN/m³
- STEEL: 77.0 kN/m³
- NEW CONCRETE BARRIER: 7.1 kN/m
- STEEL BICYCLE RAILING: 0.2 kN/m

3.2 LIVE LOADS:

- VEHICLE LOADING: BCL-625



V = VARIABLE SPACING — 6.6m to 18m
INCLUSIVE. SPACING TO BE USED IS THAT WHICH
PRODUCES MAXIMUM STRESSES.

LANE LOADING AND DYNAMIC LOAD ALLOWANCE AS
PER CAN/CSA S6-14.

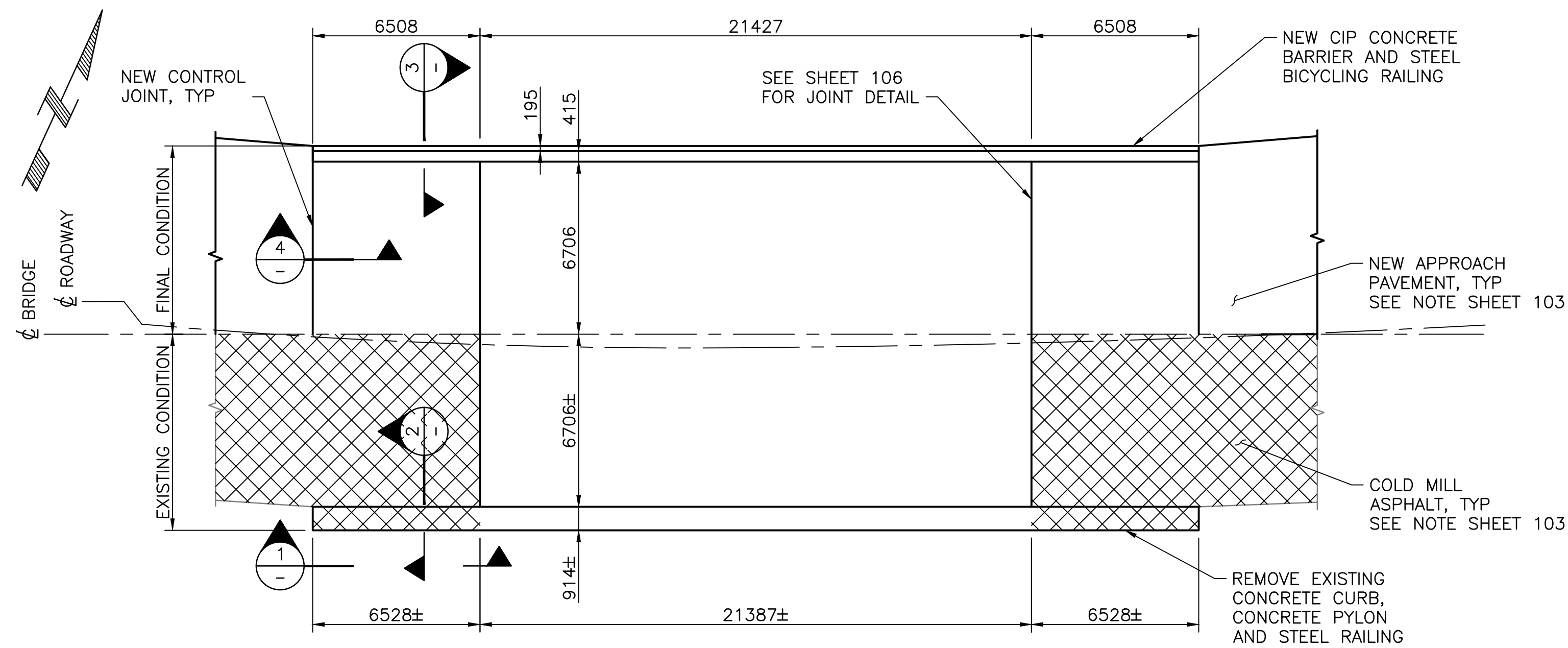
- 3.3 TRAFFIC BARRIER: TL-4



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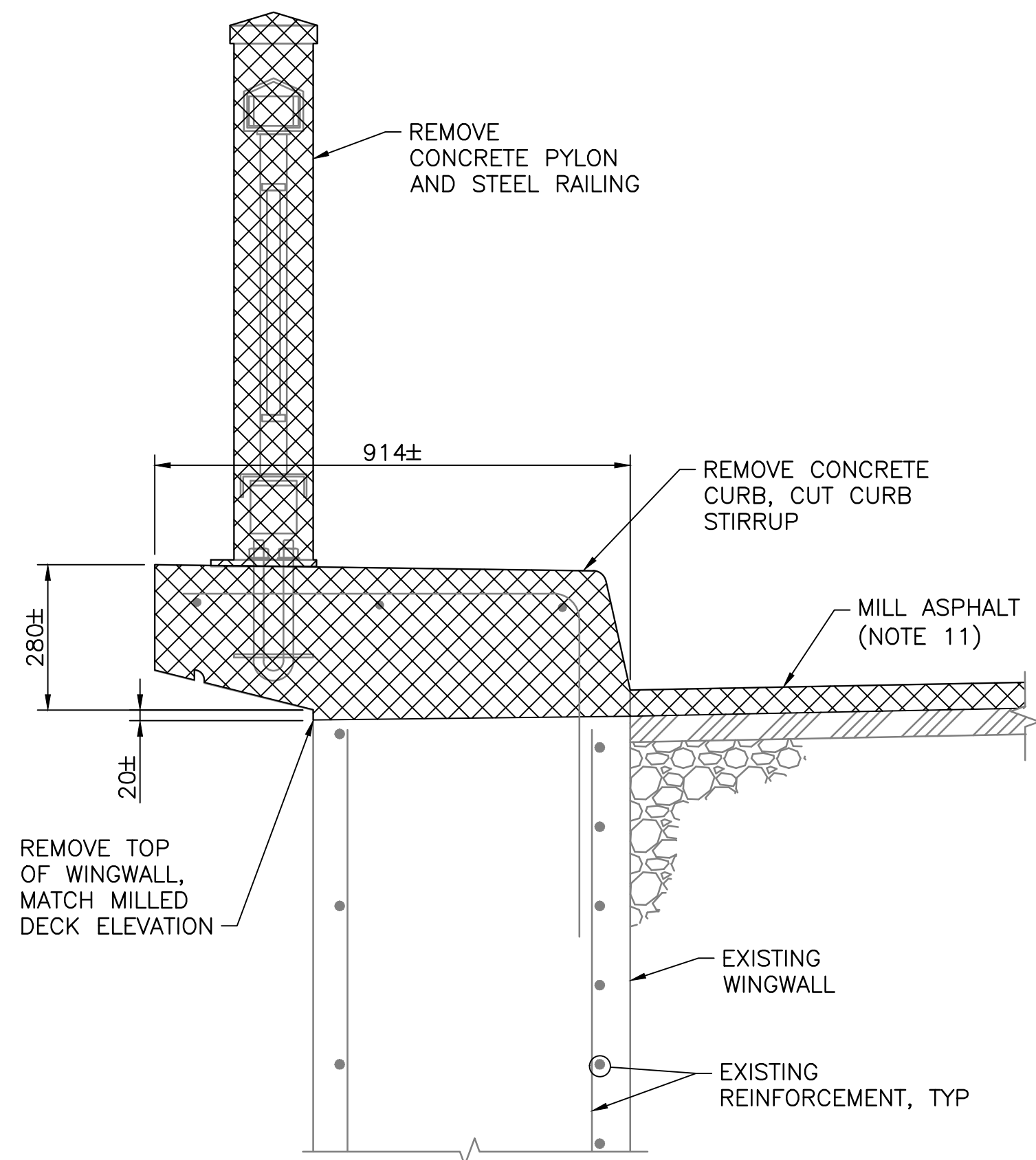
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0 10 20 30 40 50 60 70 80 90 100mm



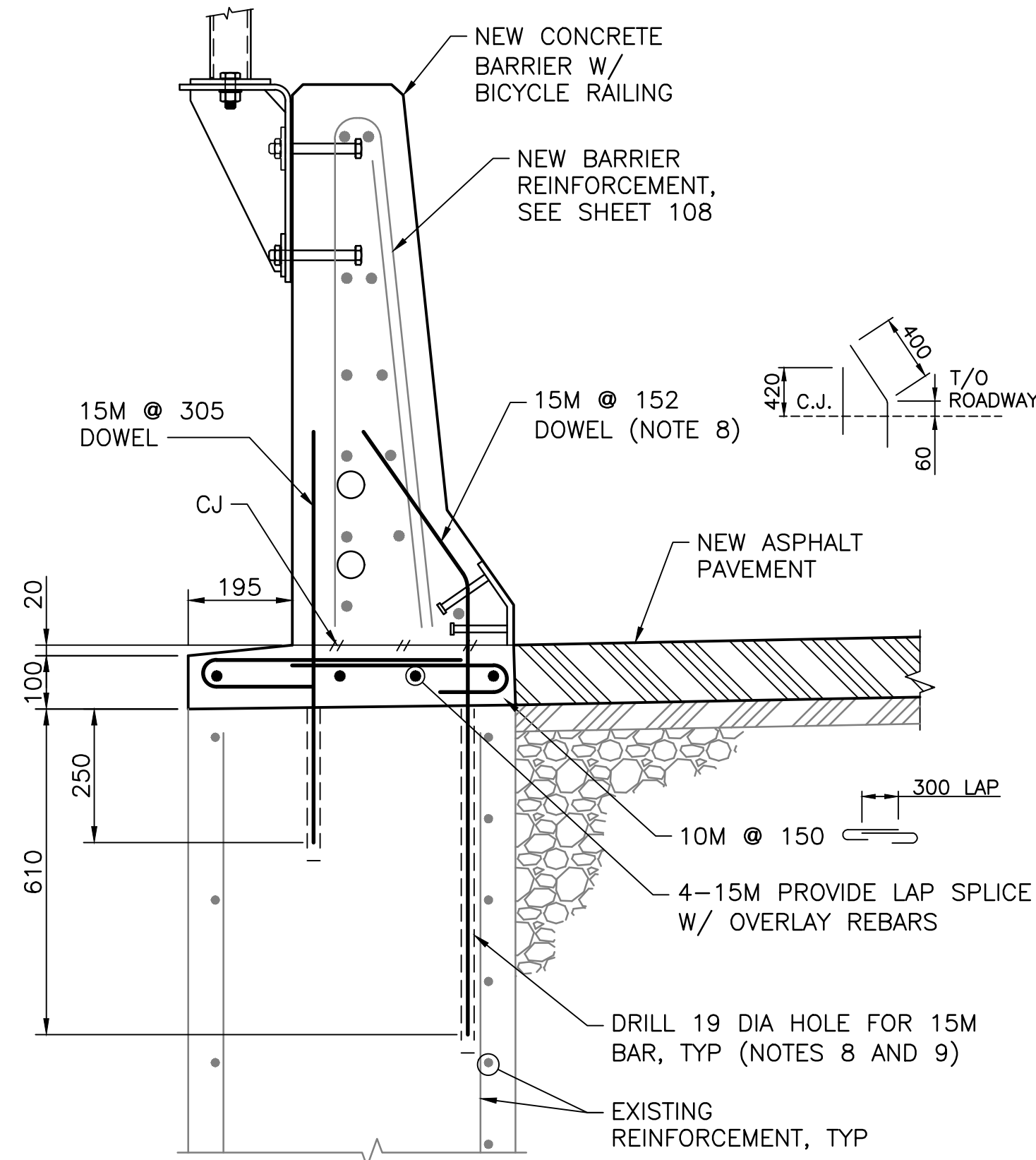
PLAN
1:150

(APPROACH BARRIERS NOT SHOWN
FOR CLARITY)



EXISTING CONDITION

SECTION 2
1:10

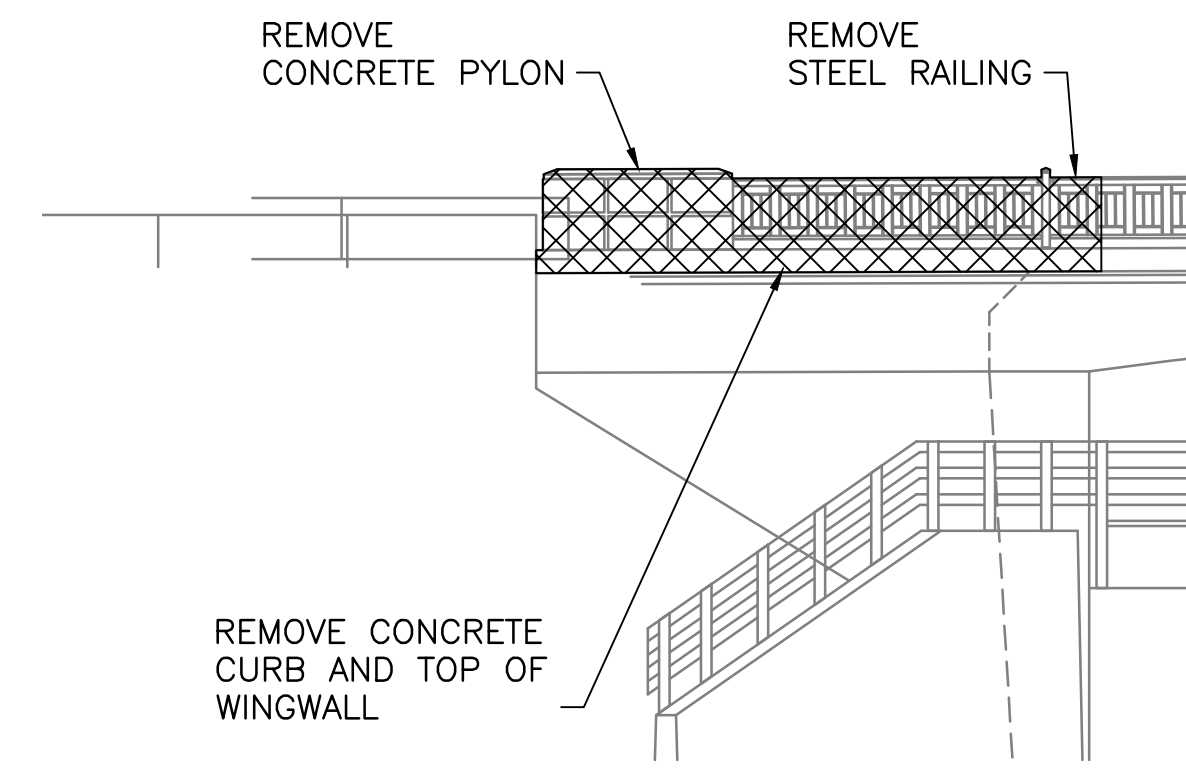


FINAL CONDITION

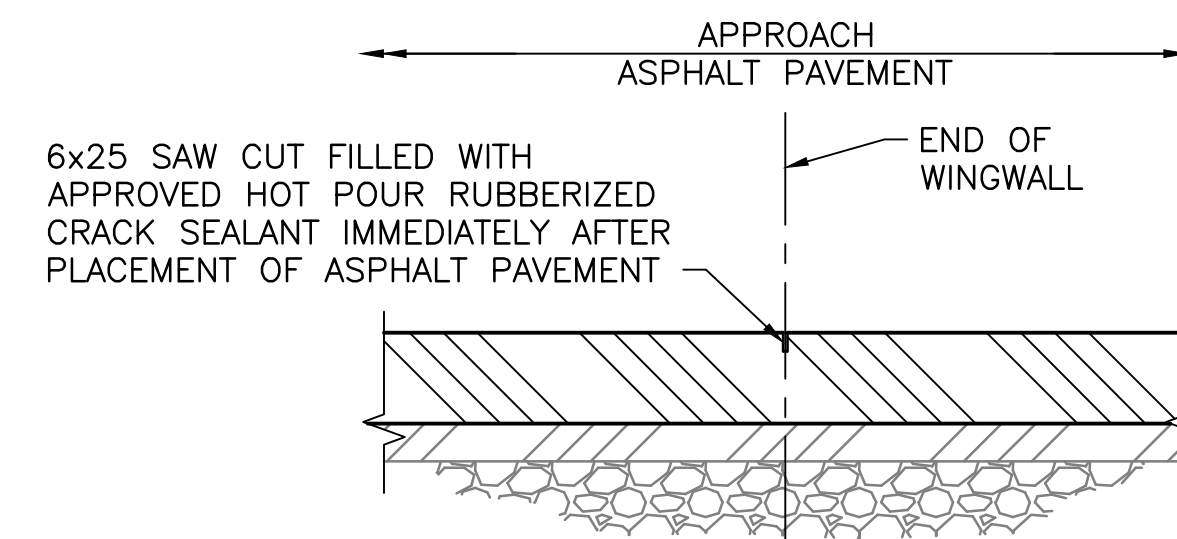
SECTION 3
1:10

LEGEND:

REMOVE



VIEW 1
1:100



CONTROL JOINT

SECTION 4
1:10

NOTES:

1. ABUTMENT AND APPROACH MODIFICATIONS TO OCCUR IN THREE STAGES IN ACCORDANCE WITH SPECIFICATIONS.
2. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 45 MPa AT 28 DAYS.
3. CHAMFER EXPOSED EDGES 20.
4. REINFORCING STEEL: CAN/CSA G30.18M GRADE 400W.
5. MINIMUM COVER: 50 UNO.
6. MINIMUM LAP: 500 UNO.
7. SAWCUT 25 DEPTH ALONG EDGE OF CONCRETE REMOVALS.
8. ANCHOR DOWELS CENTERED BETWEEN EXISTING REBARS. DO NOT DAMAGE EXISTING BARS. HOLES TO BE HAMMER DRILLED.
9. DOWELS TO BE ANCHORED WITH HILTI HIT-HY200 OR APPROVED EQUIVALENT.
10. CONSTRUCTION JOINTS TO BE CLEAN, FREE OF LAITANCE AND ROUGHENED TO A FULL AMPLITUDE OF ABOUT 5 mm.
11. LOCAL FULL DEPTH ASPHALT REMOVALS ADJACENT TO WING WALL AS REQUIRED TO COMPLETE WING WALL MODIFICATIONS NOT SHOWN. ADDITIONAL ASPHALT REMOVALS BEYOND THAT SHOWN TO BE REPLACED IN KIND.

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CDGU

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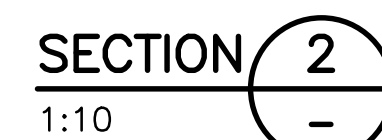
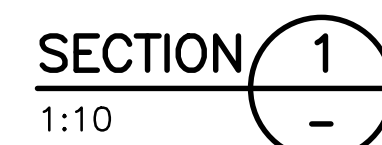
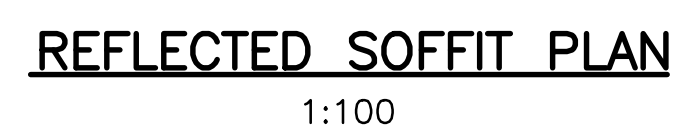
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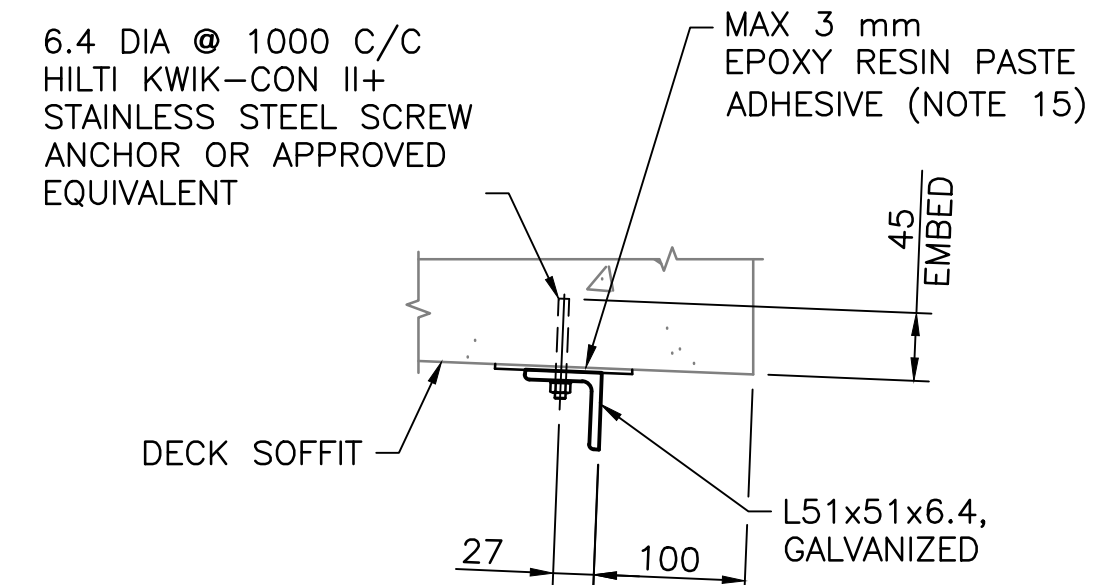
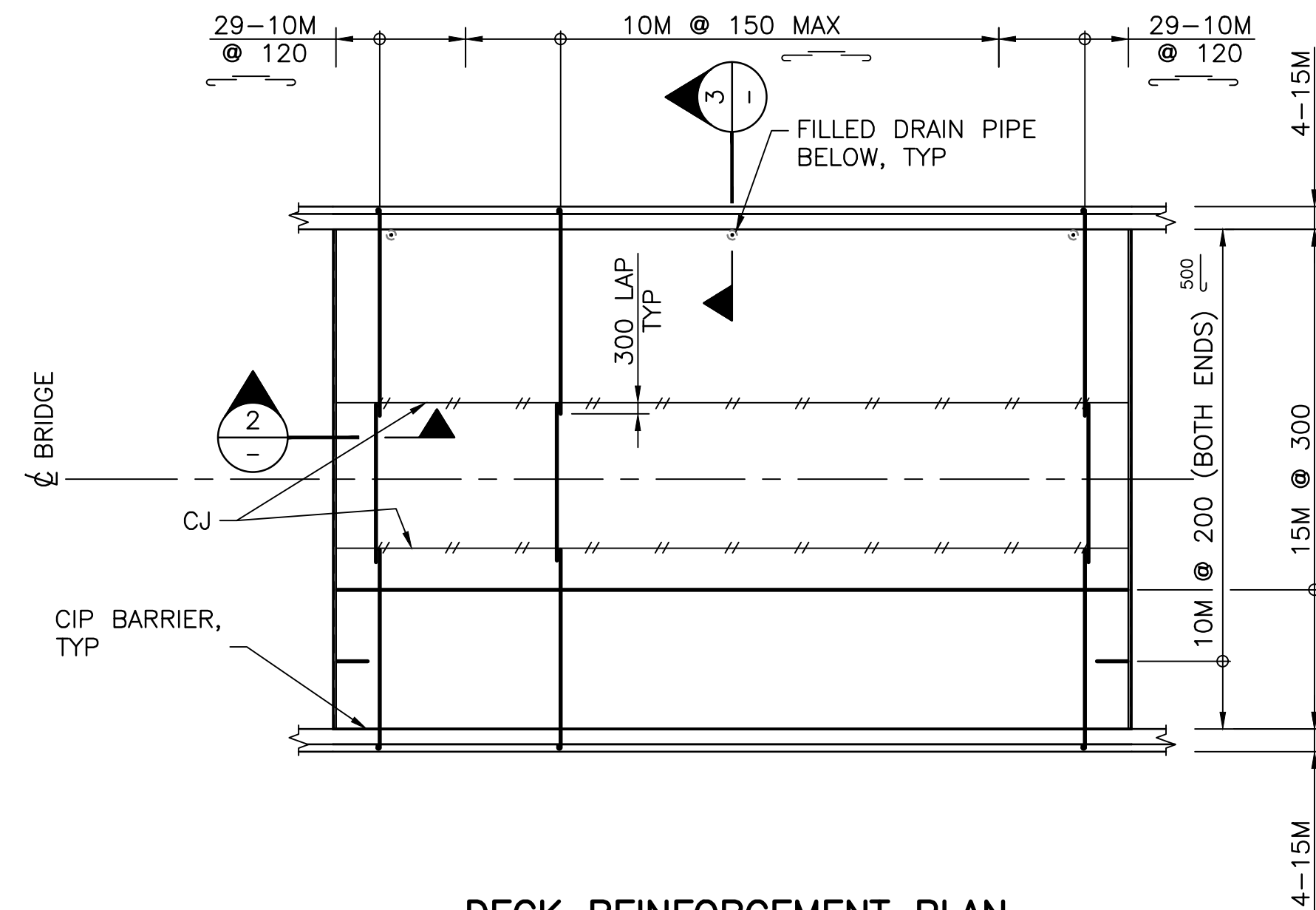
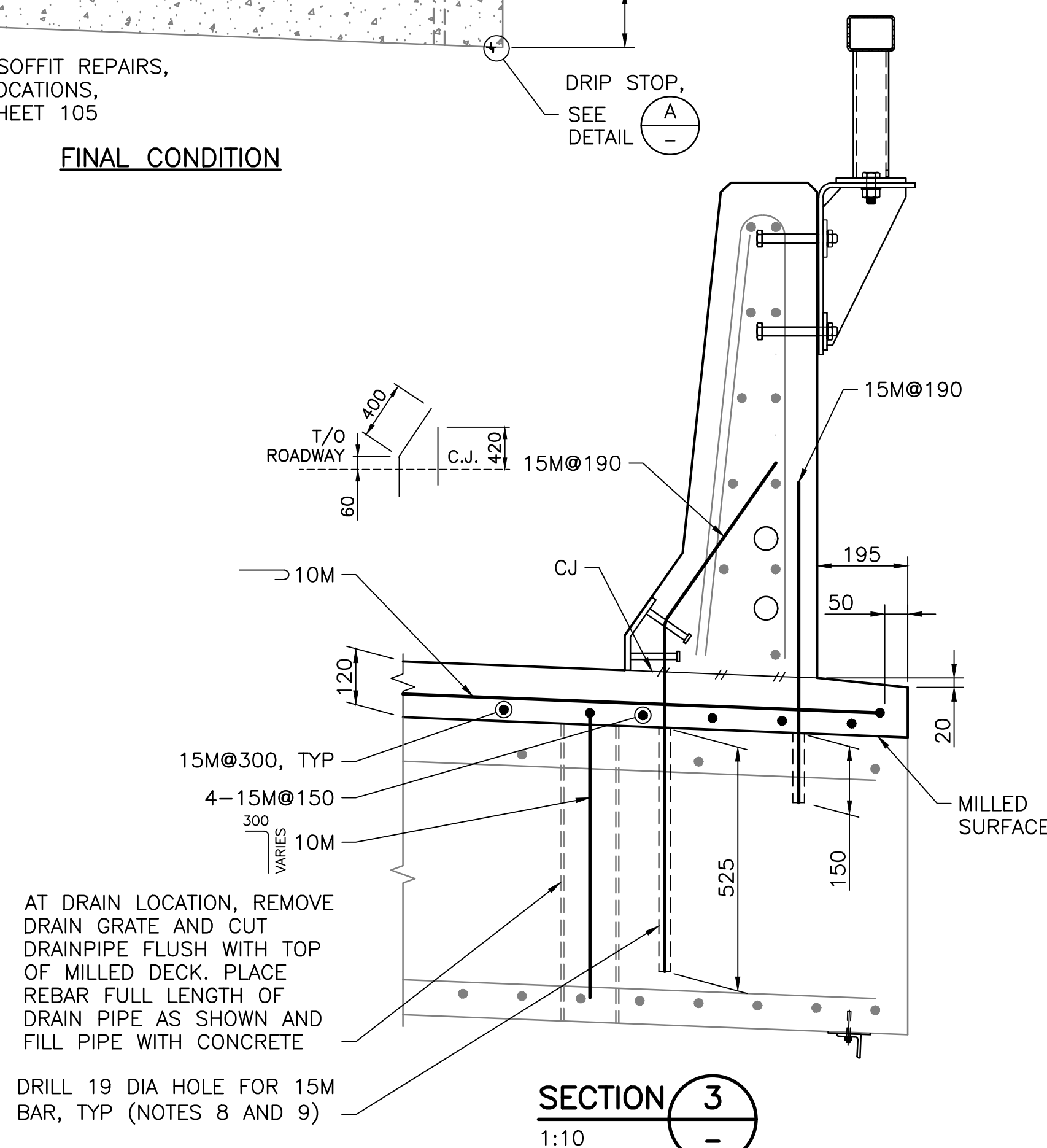
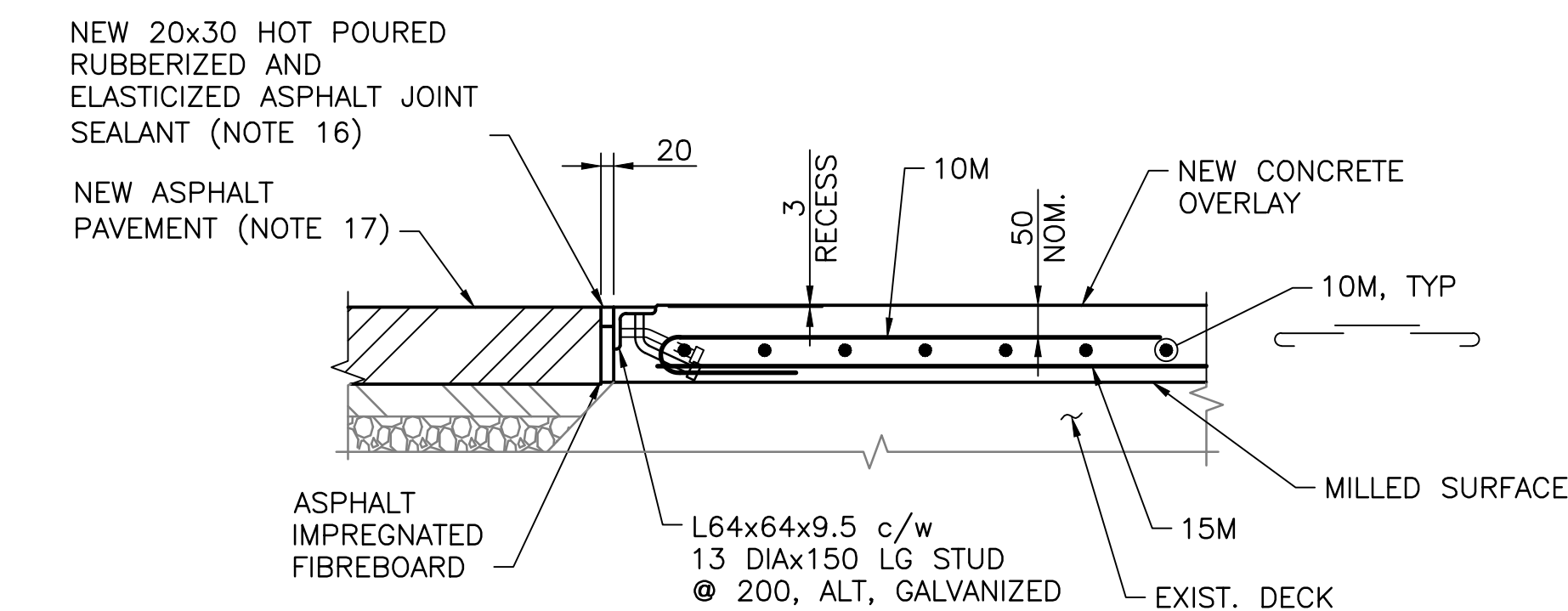
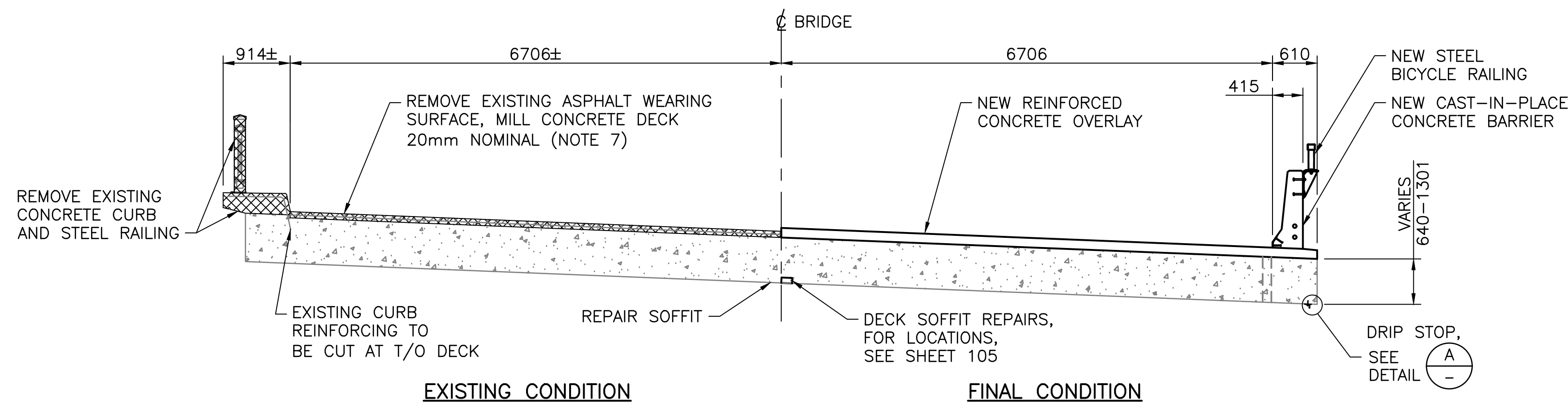
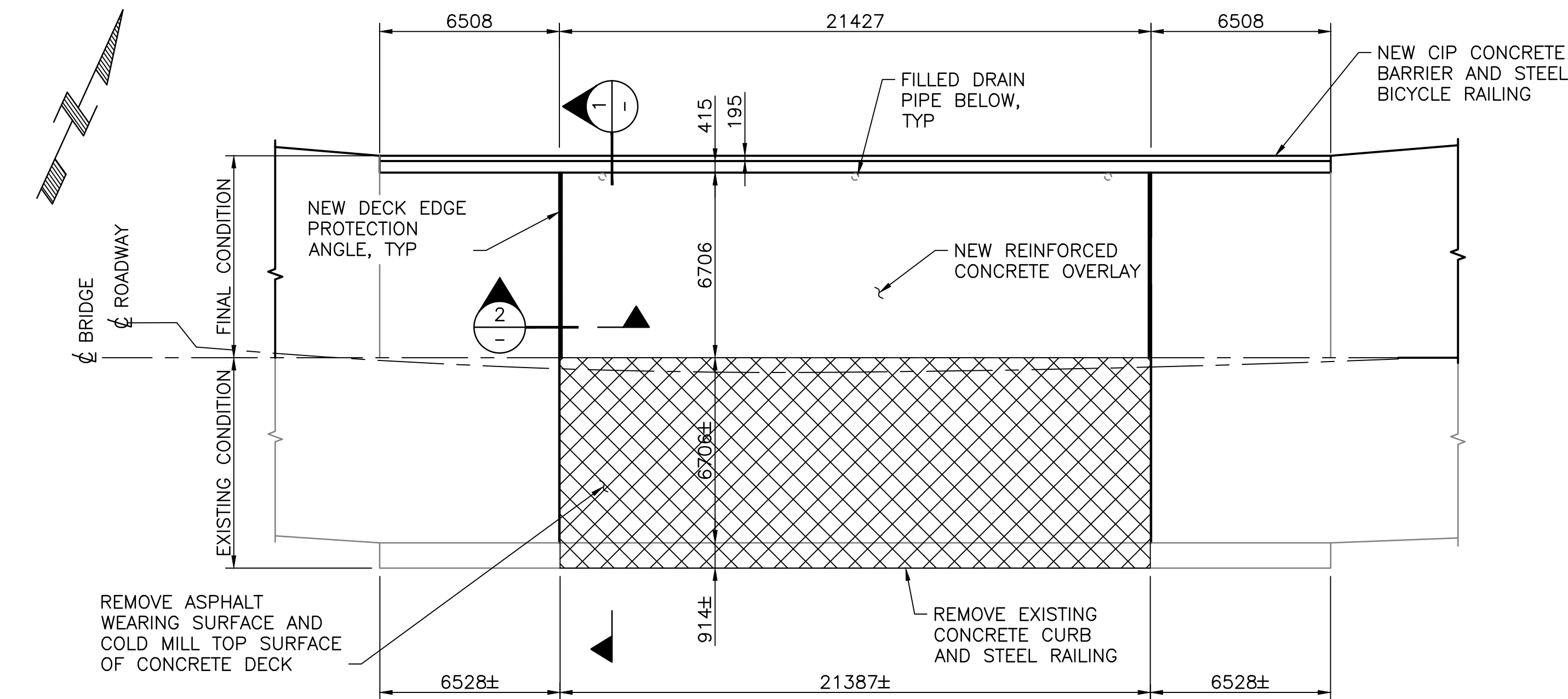
ABUTMENT AND
APPROACH MODIFICATIONS

Project No./No. du projet 1080-01	Sheet/Feuille 104 OF	Revision no./La Révision no. A
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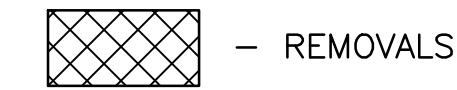


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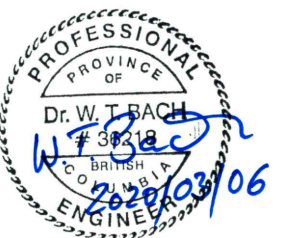


- REMOVALS

NOTES:

- DECK MODIFICATIONS TO OCCUR IN THREE STAGES IN ACCORDANCE WITH SPECIFICATIONS.
- MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 45 MPa AT 28 DAYS.
- CHAMFER EXPOSED EDGES 20.
- REINFORCING STEEL: CAN/CSA G30.18M GRADE 400W.
- MINIMUM COVER:
 - 70 TO TOP OF DECK, U.N.O.
 - 50 ALL OTHER
- MINIMUM LAP 500, UNO. NOT ALL LAP SPLICES SHOWN.
- USE COVER METER TO CHECK ACTUAL CONCRETE COVER BEFORE MILLING. DO NOT MILL CLOSER THAN 15mm TO TOP LAYER REINFORCEMENT.
- DRILL HOLES FOR BARRIER DOWELS BETWEEN EXISTING TOP REBARS IN DECK SLAB. IDENTIFY LOCATION OF BARS BEFORE DRILLING. DO NOT DAMAGE EXISTING BARS. HOLES TO BE HAMMER DRILLED.
- DOWELS TO BE ANCHORED WITH HILTI HIT-HY200 OR APPROVED EQUIVALENT.
- CONSTRUCTION JOINTS TO BE CLEAN, FREE OF LAITANCE AND ROUGHENED TO MIN AMPLITUDE 5 mm.
- STEEL: CAN/CSA G40.21 GRADE 300W, GALVANIZED AFTER FABRICATION.
- STUDS: CAN/CSA W59 ANNEX H, TYPE B, GALVANIZED AFTER FABRICATION.
- WELDING: CAN/CSA W59.
- GALVANIZE IN ACCORDANCE WITH ASTM A123/123M.
- EPOXY RESIN PASTE ADHESIVE FOR DRIP STOP SHALL BE SIKADUR 31 HI-MOD GEL OR APPROVED EQUIVALENT. INSTALL ACCORDING TO MANUFACTURER'S SPECIFICATIONS. GAP BETWEEN SOFFIT AND STEEL ANGLE MUST BE COMPLETELY SEALED.
- JOINT SEALANT SHALL BE MACSEAL 6690-2 BY MCASPHALT OR APPROVED EQUIVALENT.
- LOCAL FULL DEPTH ASPHALT REMOVAL ADJACENT TO JOINT AS REQUIRED TO INSTALL JOINT NOT SHOWN. ADDITIONAL ASPHALT REMOVALS BEYOND THAT SHOWN TO BE REPLACED IN KIND.

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GLACIER NATIONAL PARK, BRITISH COLUMBIA**

**KM 29.3 TRANS-CANADA HIGHWAY
LOOP BROOK BRIDGE**

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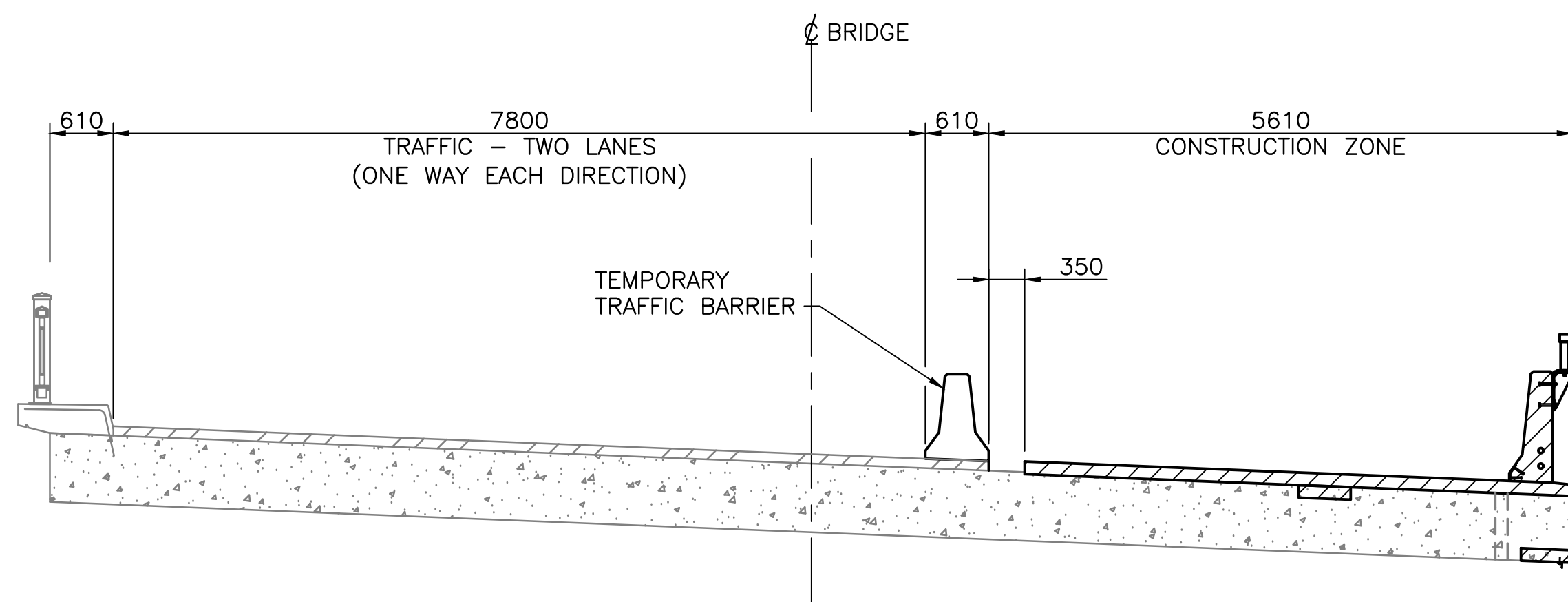
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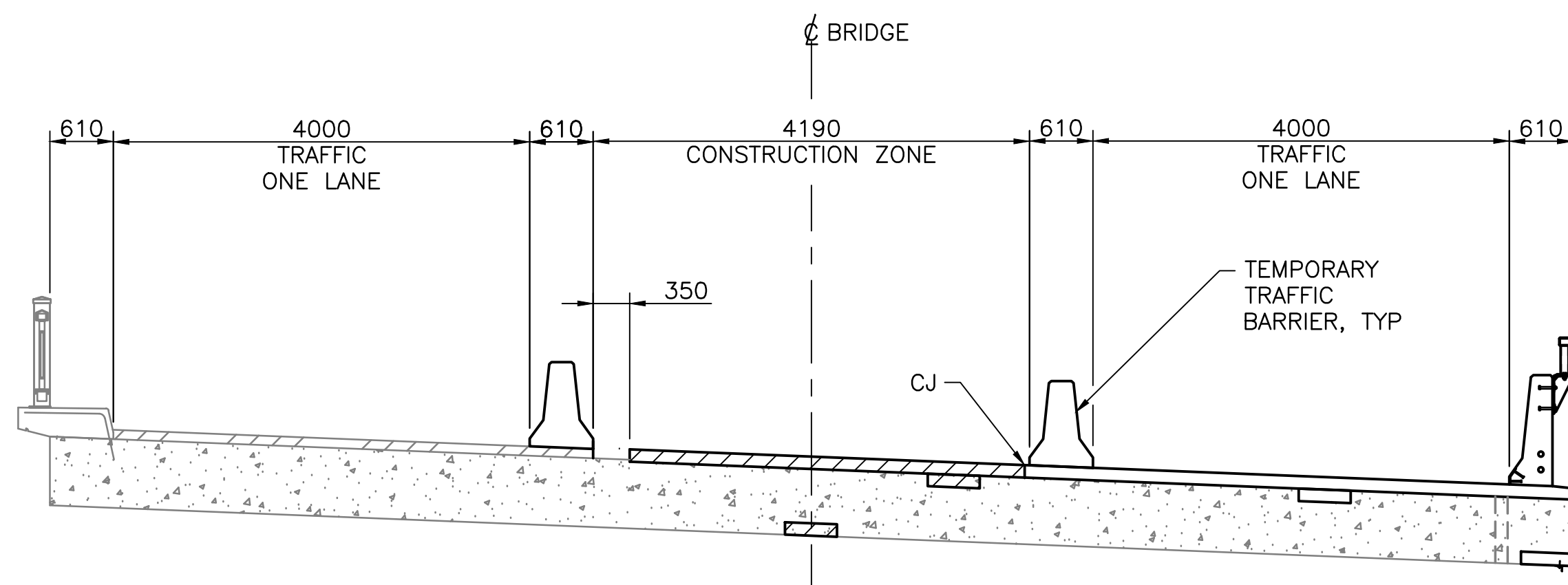
CONCRETE DECK MODIFICATIONS

Project No./No. du projet 1080-01	Sheet/Fauille 106 OF	Revision no./ La Révision no. A
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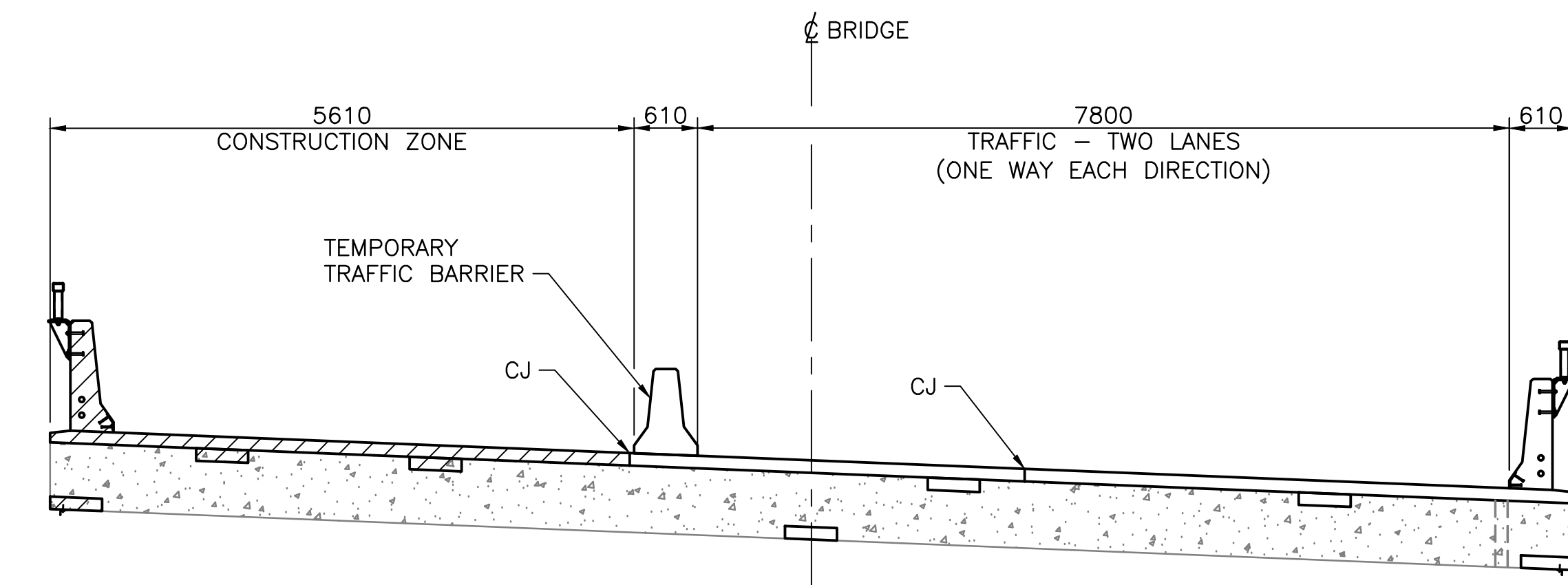
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STAGE 1



STAGE 2



STAGE 3

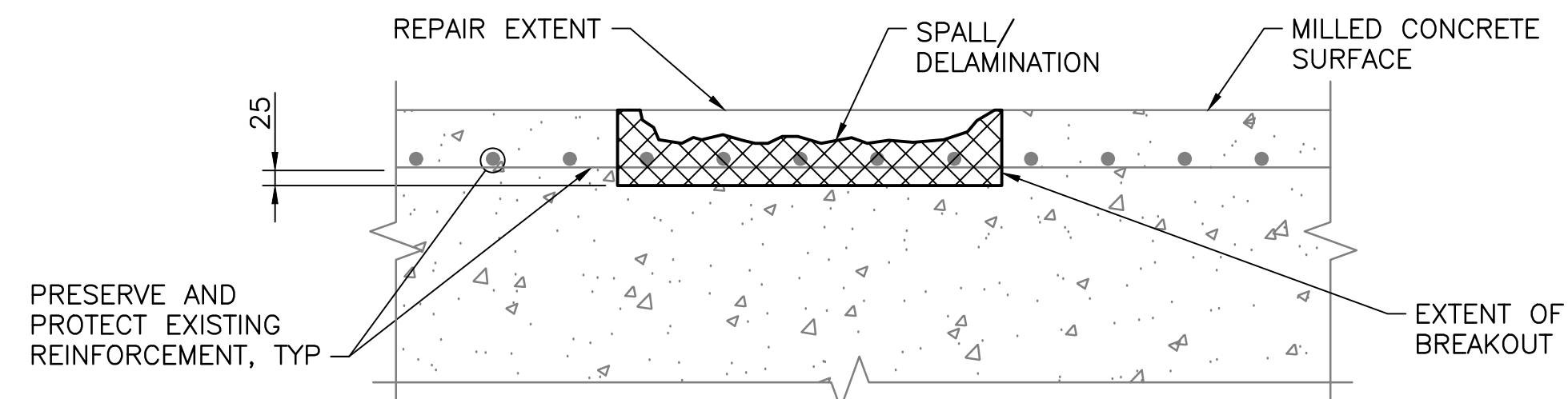
SUGGESTED CONSTRUCTION ZONE STAGING

1:50

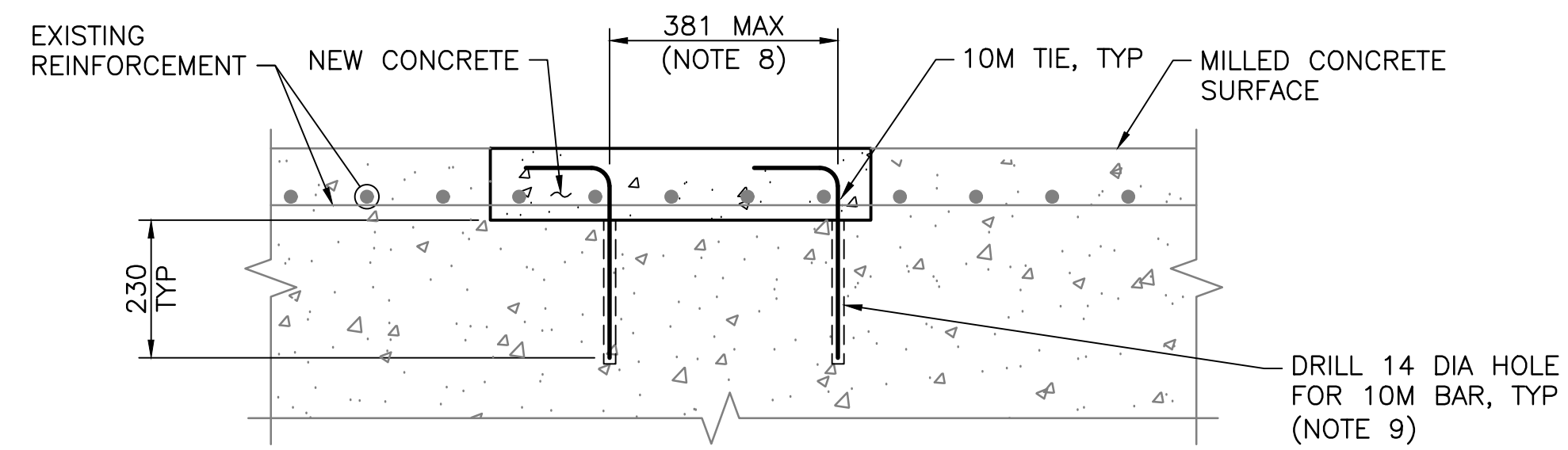
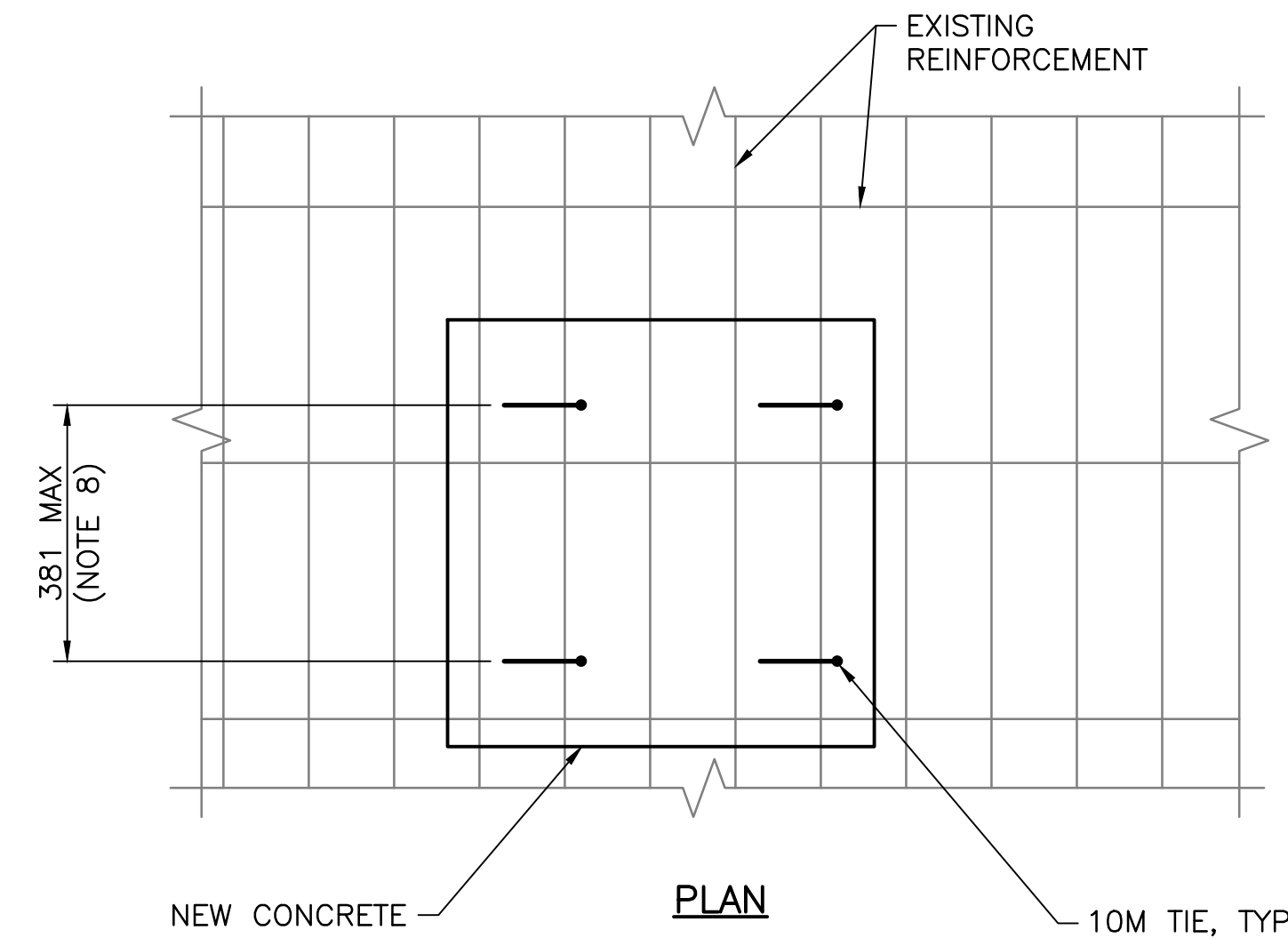
PARTIAL DEPTH DECK AND SOFFIT REPAIRS SHOWN ILLUSTRATION ONLY. REPAIR LOCATIONS TO BE DETERMINED ON-SITE. (NOTES 3, 4 AND 5)

LEGEND:

- REMOVALS
- WORK IN CONSTRUCTION ZONE
- COMPLETED STAGE



EXISTING CONDITION - AFTER MILLING OF CONCRETE DECK



FINAL CONDITION

PARTIAL DEPTH DECK CONCRETE REPAIR

1:10

DECK OVERLAY NOT SHOWN FOR CLARITY

NOTES:

- MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 45 MPa AT 28 DAYS.
- REINFORCING STEEL: CAN/CSA G30.18M, GRADE 400W.
- WITHIN EACH CONSTRUCTION ZONE, PERFORM COLD MILLING OF CONCRETE DECK AND PARTIAL DEPTH CONCRETE REPAIRS AFTER COMPLETION OF SOFFIT REPAIRS.
- PARTIAL DEPTH DECK PATCH REPAIRS AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE IN ACCORDANCE WITH SPECIFICATIONS.
- PRIOR TO START OF REMOVALS FOR PARTIAL DEPTH DECK REPAIRS, SUBMIT DRAWING INDICATING IDENTIFIED PATCH LOCATIONS TO EOR (ENGINEER OF RECORD) FOR REVIEW AND APPROVAL.
- REPAIR AREAS TO HAVE STRAIGHT EDGES ONLY AND SHALL BE RECTANGULAR IN SHAPE. SAWCUT 5mm DEEP ALONG EDGES OF CONCRETE REPAIRS. EDGES SHALL BE PLANE AND VERTICAL. DO NOT DAMAGE EXISTING REINFORCEMENT.
- REMOVE ALL UNSOUND CONCRETE IN REPAIR AREA AS SHOWN.
- PLACE AT LEAST 8-10M TIES/SQM. PROVIDE SYMMETRICAL TIE LAYOUT AS SHOWN.
- TIES TO BE ANCHORED WITH HILTI HIT HY-200 OR APPROVED EQUIVALENT. DO NOT DAMAGE EXISTING REINFORCEMENT. HOLES TO BE HAMMER DRILLED.
- CONSTRUCTION JOINT TO BE CLEAN, FREE OF LAITANCE AND ROUGHENED.

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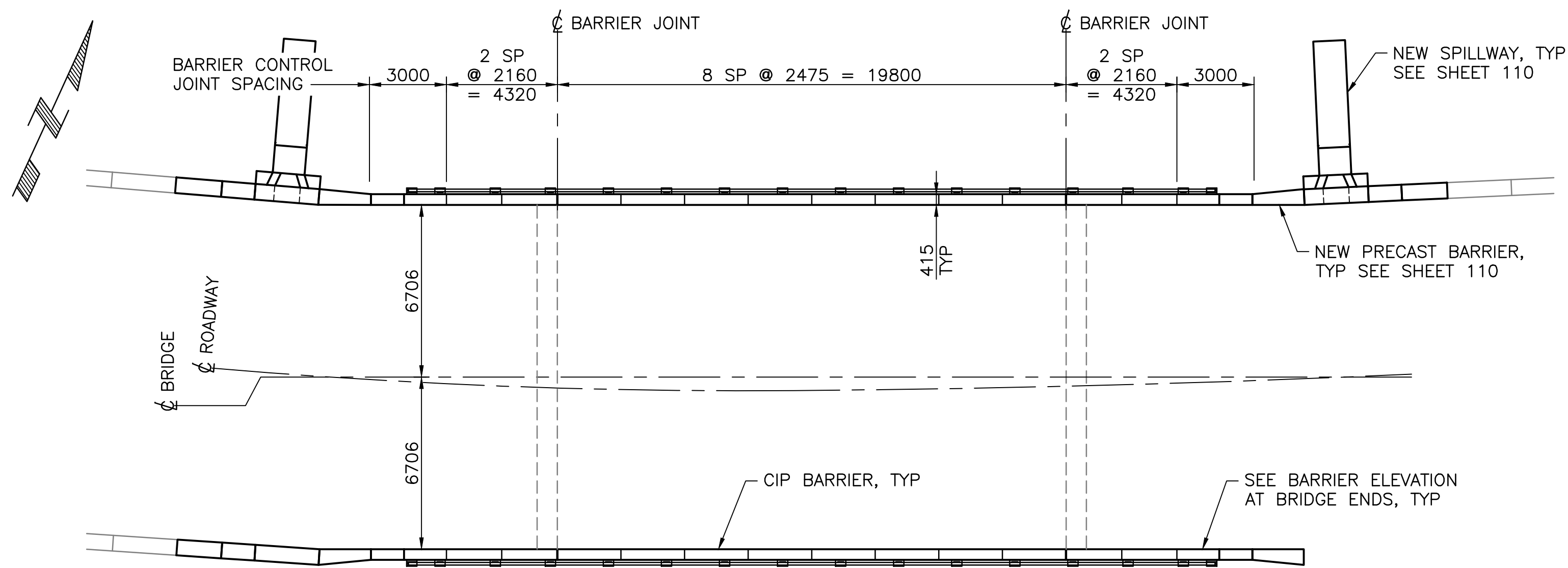
Drawing title/Titre du dessin

**SUGGESTED CONSTRUCTION ZONE
STAGING AND PARTIAL DEPTH
DECK REPAIRS**

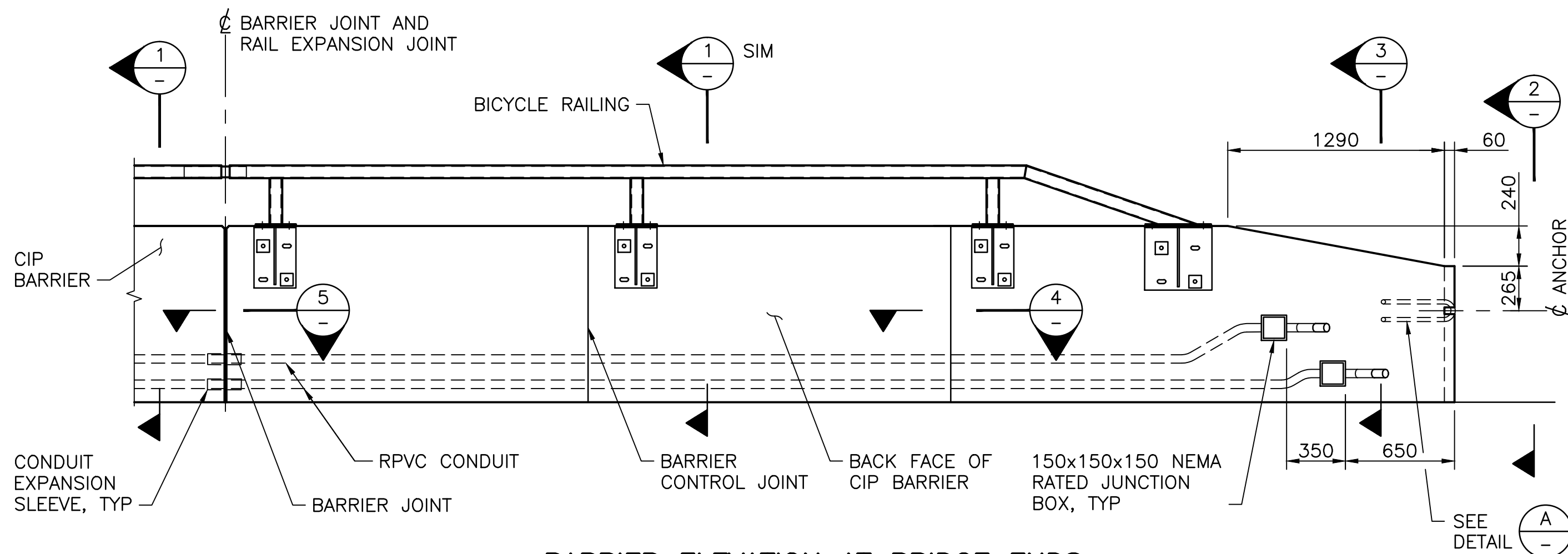
Project No./No. du projet 1080-01	Sheet/Feuille 107 OF	Revision no./La Révision no. A
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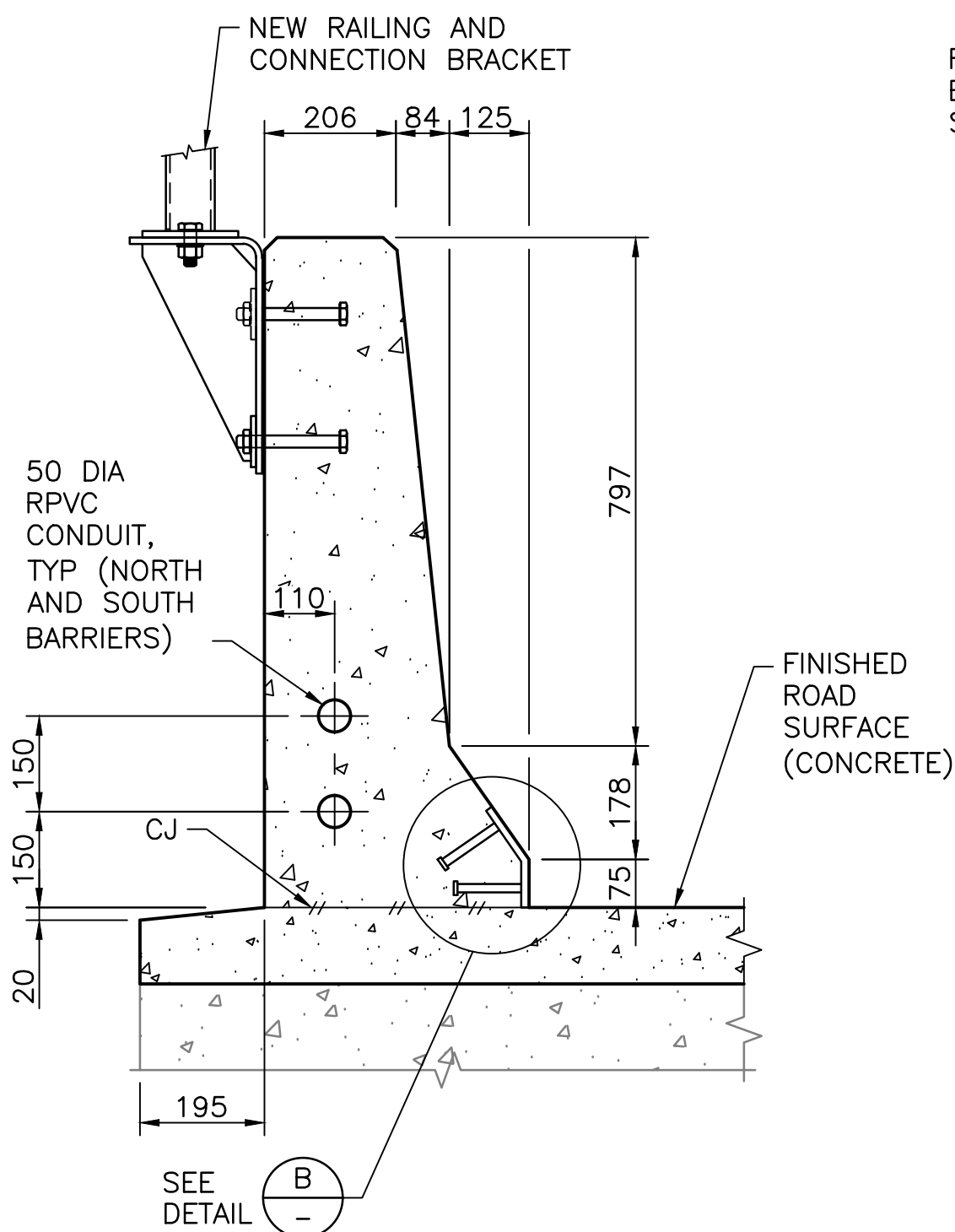
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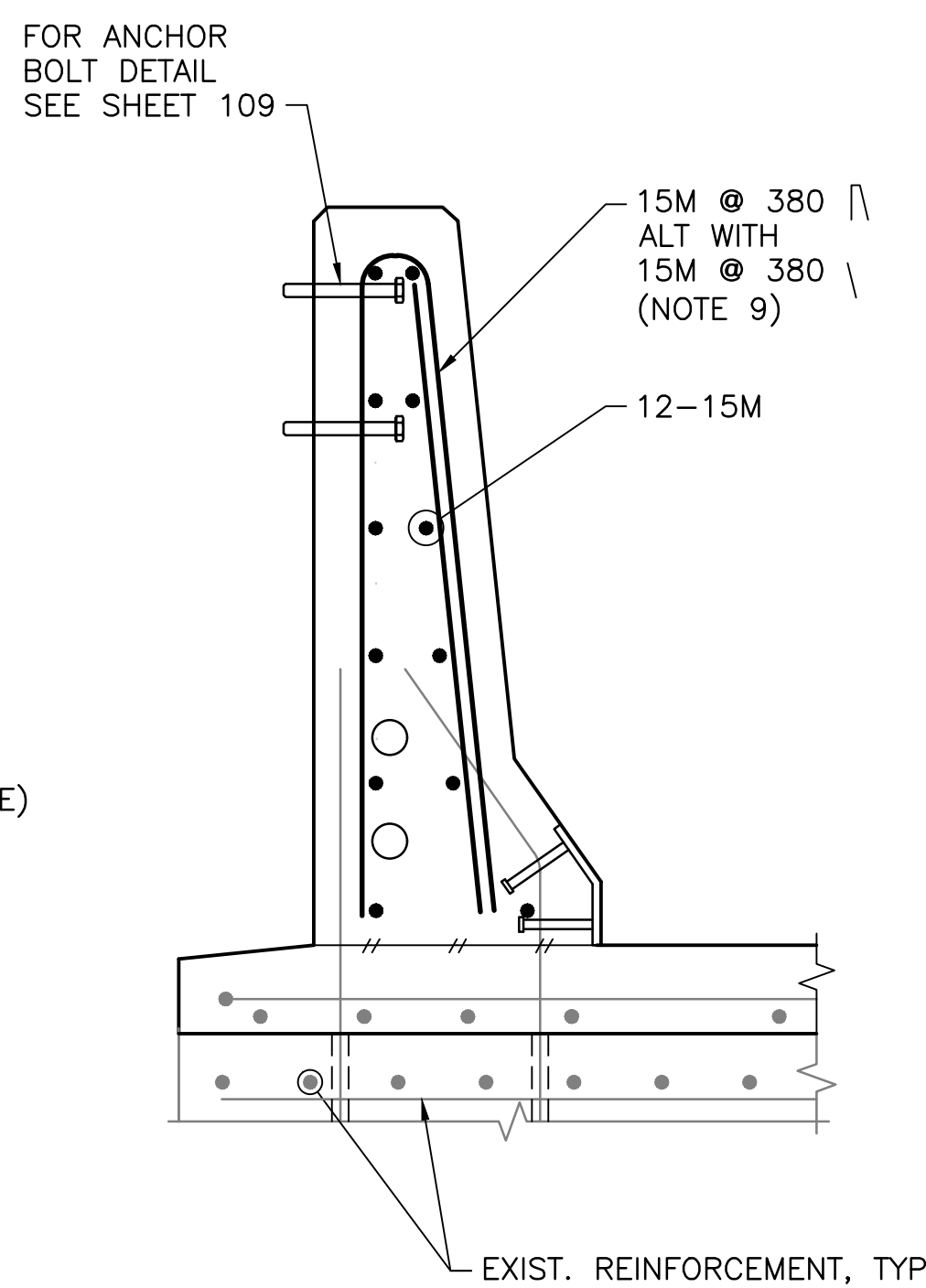
PLAN
1:150



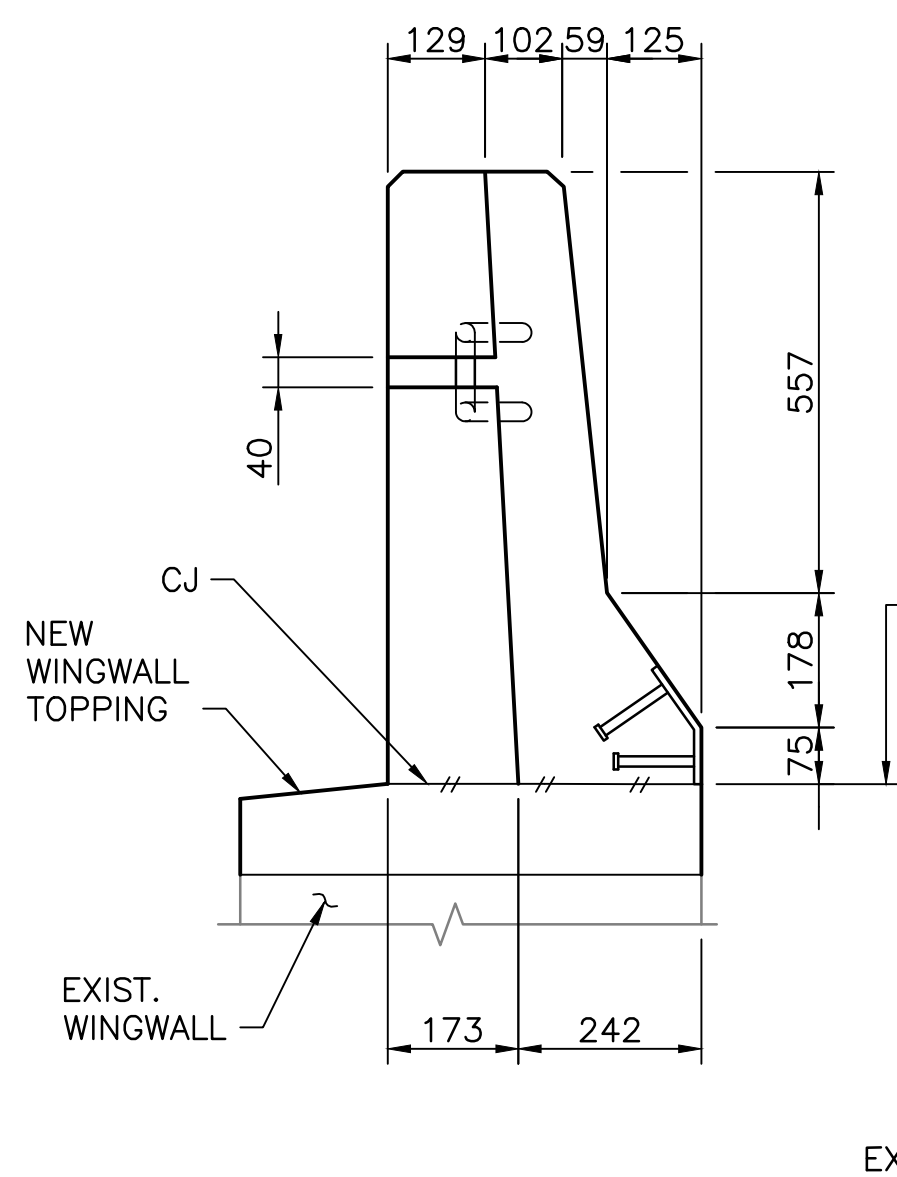
BARRIER ELEVATION AT BRIDGE ENDS
1:25



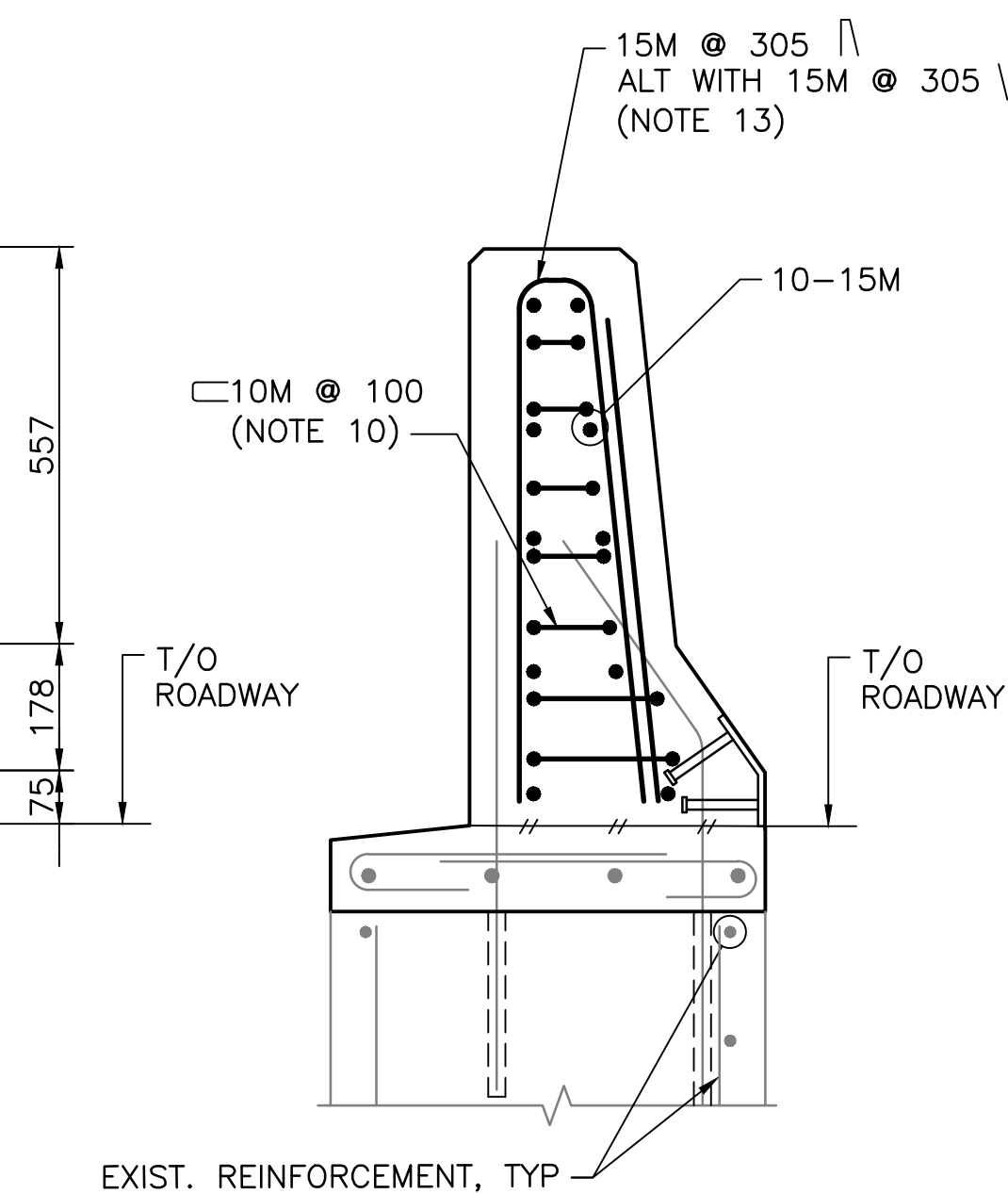
SECTION 1
1:10



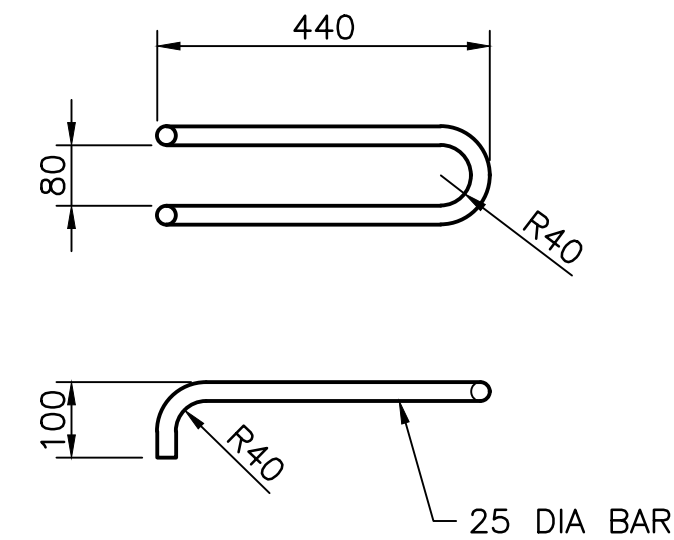
SECTION 1
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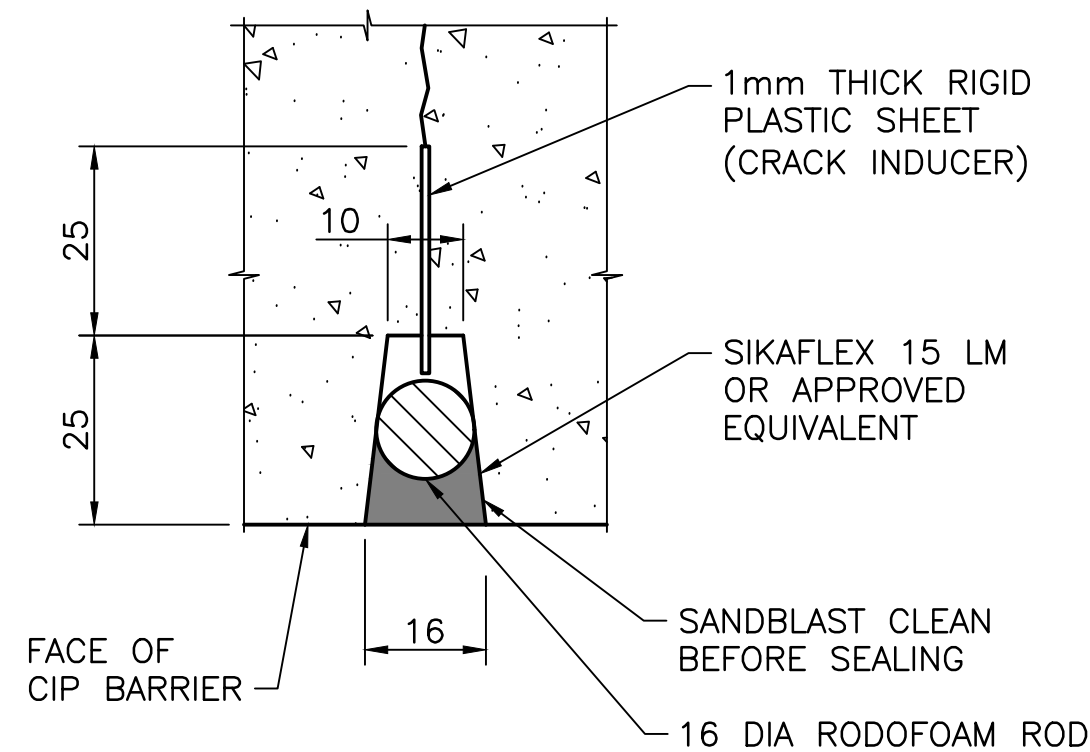
VIEW 2
1:10



SECTION 3
1:10



DETAIL A
1:10

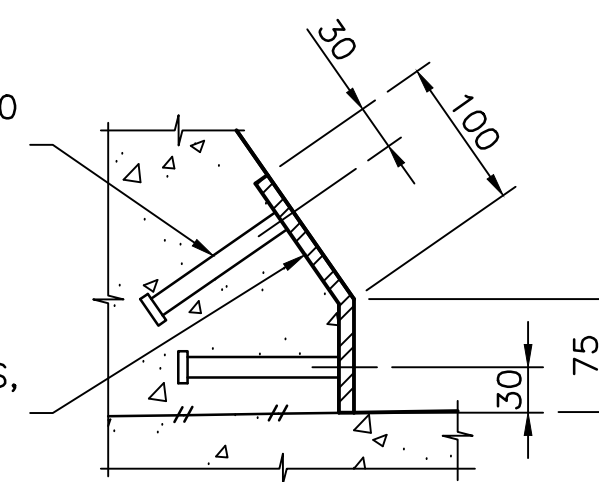


TYPICAL BARRIER CONTROL JOINT

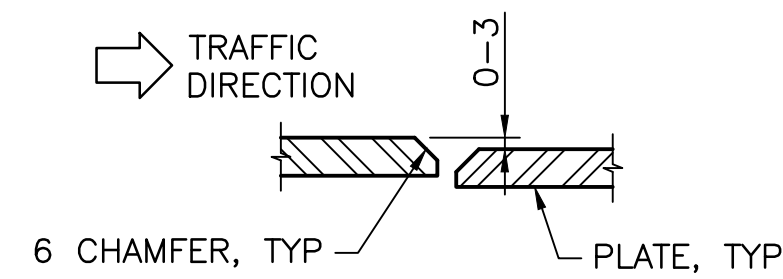
SECTION 4
1:1

12 DIA STUDS, 100 LONG @ 200, TYP, STAGGERED. MAX. 100 FROM FREE EDGE

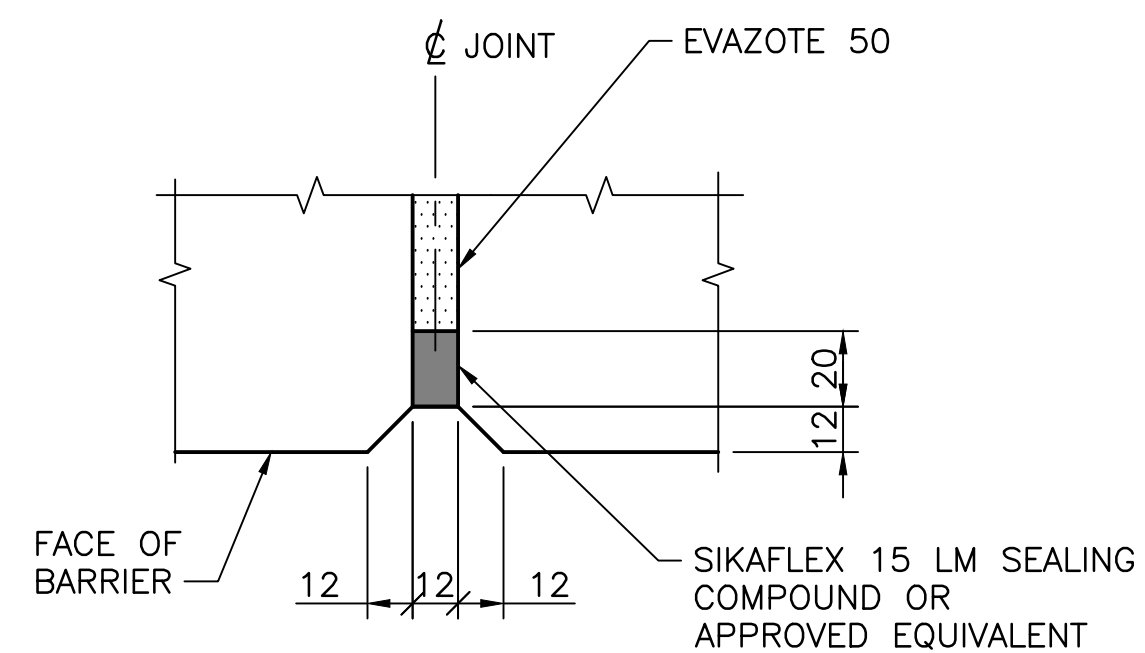
GALVANIZED BENT # 10 CHAMFER ENDS @ SPLICES, SEE SPLICE DETAIL



DETAIL B
1:5



SPLICE DETAIL
1:2



TYPICAL BARRIER JOINT

SECTION 5
1:2

NOTES:

1. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 45 MPa AT 28 DAYS.
2. CHAMFER EXPOSED EDGES 20mm UNO.
3. REINFORCING STEEL: CAN/CSA G30.18 GRADE 400W.
4. MINIMUM COVER: 50mm UNO.
5. MINIMUM REINFORCING LAP LENGTH 600mm UNO.
6. STEEL: CAN/CSA G40.21M GRADE 300W, GALVANIZE AFTER FABRICATION.
7. STUDS: CAN/CSA W59 ANNEX H, TYPE B, GALVANIZE AFTER FABRICATION.
8. HOT DIP GALVANIZE TO ASTM A123/A123M.
9. PROVIDE REDUCED BEND DIAMETER OF 81 (MEASURED ON THE INSIDE OF THE BAR) AND PLACE BAR ON SKEW TO SATISFY COVER REQUIREMENTS.
10. PLACE HAIRPINS 10M AT 100mm HORIZONTALLY AT BARRIER ENDS.
11. REPLACE BARRIER REINFORCEMENT CUT FOR JUNCTION BOX WITH ADDITIONAL EQUIVALENT BARS ADJACENT TO THE BOX.
12. CONDUIT ELBOWS NOT TO EXCEED 22.5 DEGREES. ENDS OF CONDUIT SHALL TERMINATE IN RADIAL SWEEPS OR 22.5 DEGREE ELBOWS.
13. SPACING TO MATCH STARTER BARS.

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COWI

Project title/Titre du projet
BRIDGE REHABILITATION
GLACIER NATIONAL PARK, BRITISH COLUMBIA

KM 29.3 TRANS-CANADA HIGHWAY
LOOP BROOK BRIDGE

Approved by/Approuvé par
JUGN

Designed by/Concept par
TWB

Drawn by/Dessiné par
MICH

PWGS Project Manager/Administrateur de Projets TPSCG

PWGS, Architectural and Engineering Resources Manager/
Ressources Architectural et de Directeur d'Ingénierie, TPSCG

Client/client
PCA

Drawing title/Titre du dessin

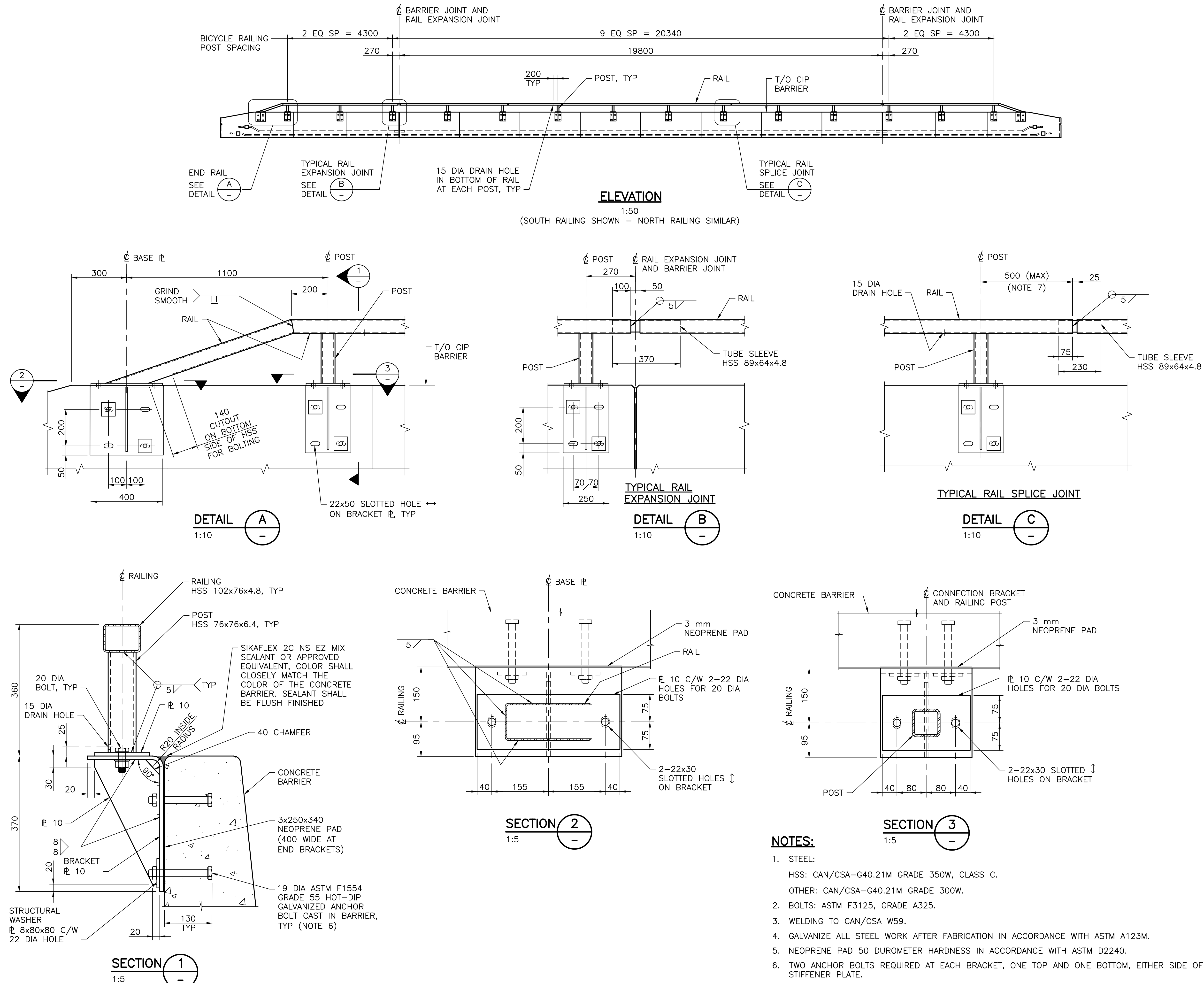
CAST-IN-PLACE BARRIER
LAYOUT AND REINFORCEMENT

Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
1080-01	108 OF	A



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A	ISSUED FOR TENDER	20/03/06

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GLACIER NATIONAL PARK, BRITISH COLUMBIA**
**KM 29.3 TRANS-CANADA HIGHWAY
LOOP BROOK BRIDGE**

Approved by/Approuvé par
JUGN

Designed by/Conçu par
TWB

Drawn by/Dessiné par
MACM

PWGSC Project Manager/Administrateur de Projets TPSCG

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

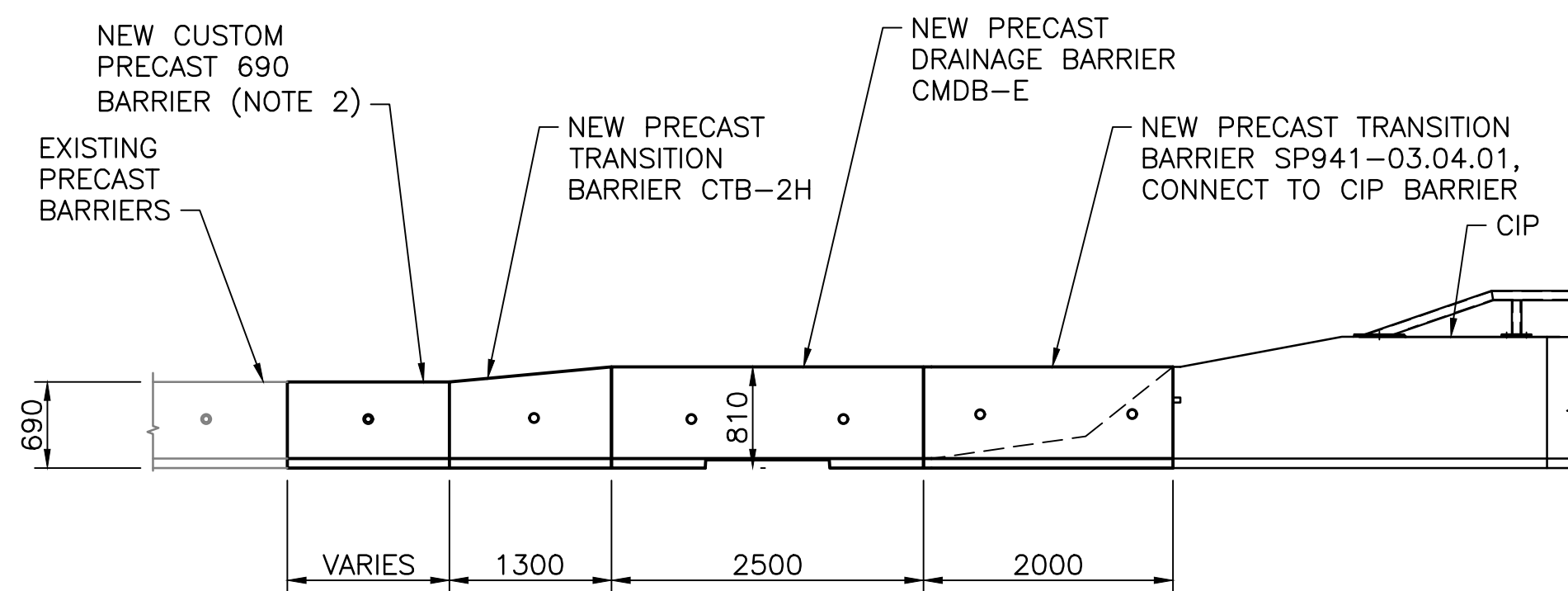
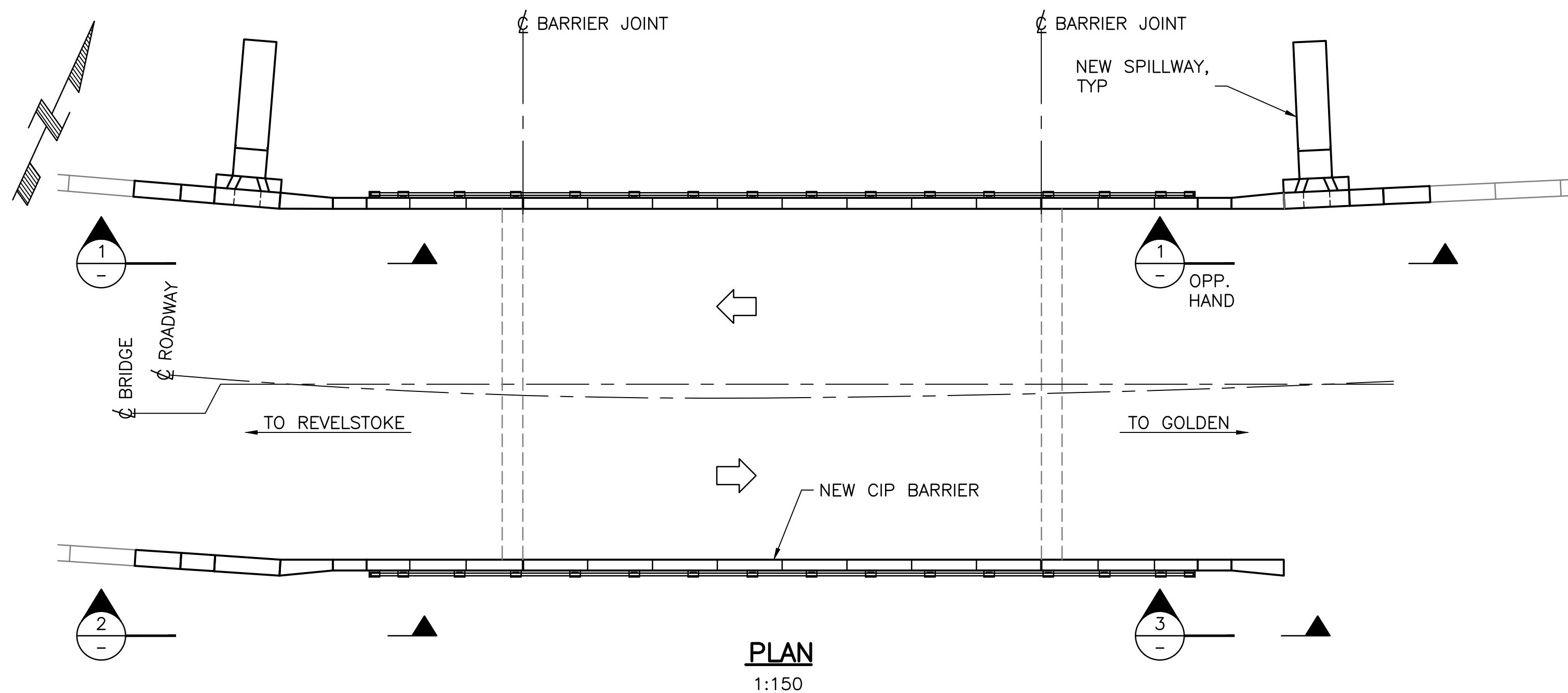
Client/client
PCA

Drawing title/Titre du dessin

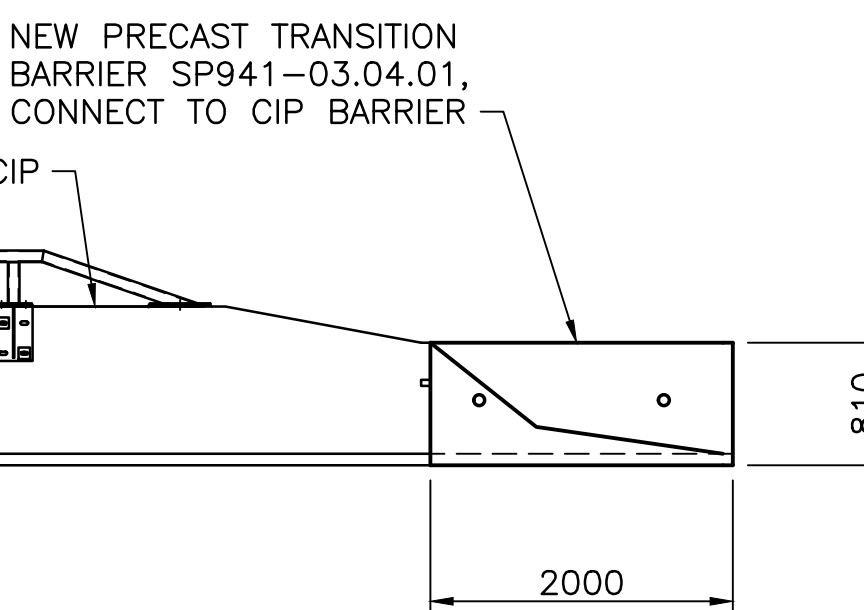
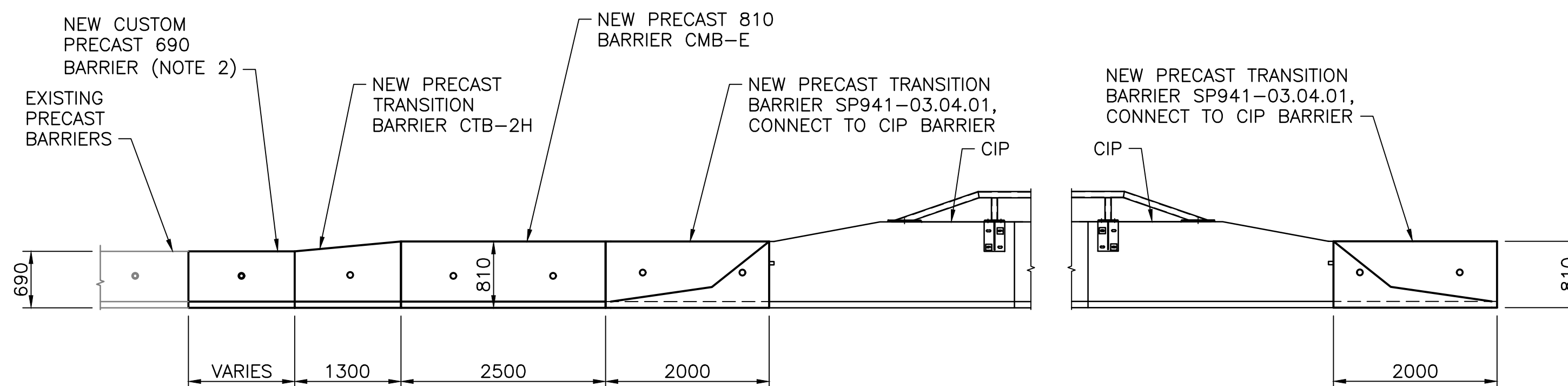
BICYCLE RAILING

Project No./No. du projet 1080-01	Sheet/Feuille 109 OF	Revision no./ La Révision no. A
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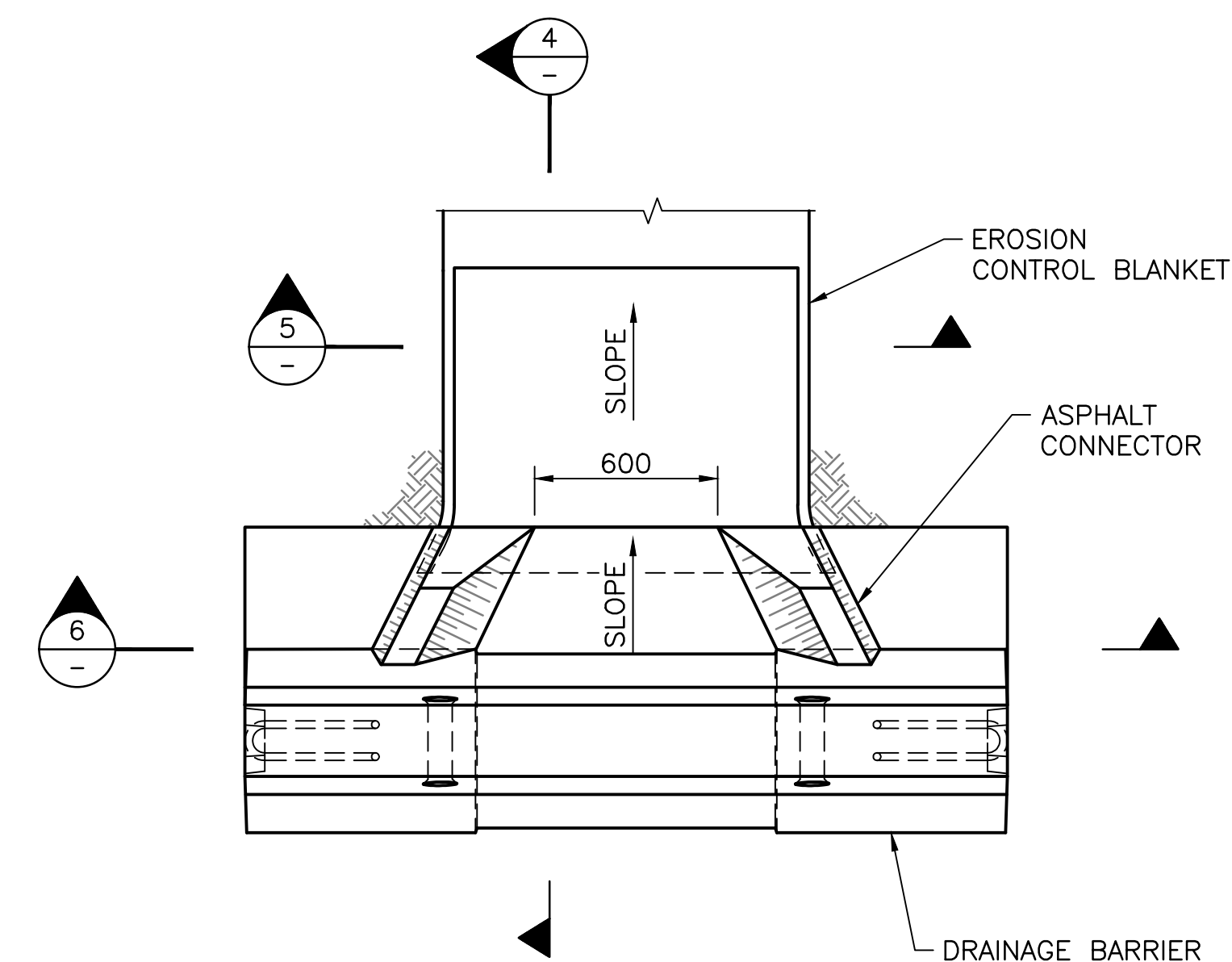


PRECAST BARRIERS	
NO. OF UNITS	DESCRIPTION
3	CUSTOM 690 PRECAST BARRIERS (EACH DIFFERENT)
3	CTB-2H
2	CMDB-E, DRAINAGE BARRIER
1	CMB-E
4	SP941-03.04.01

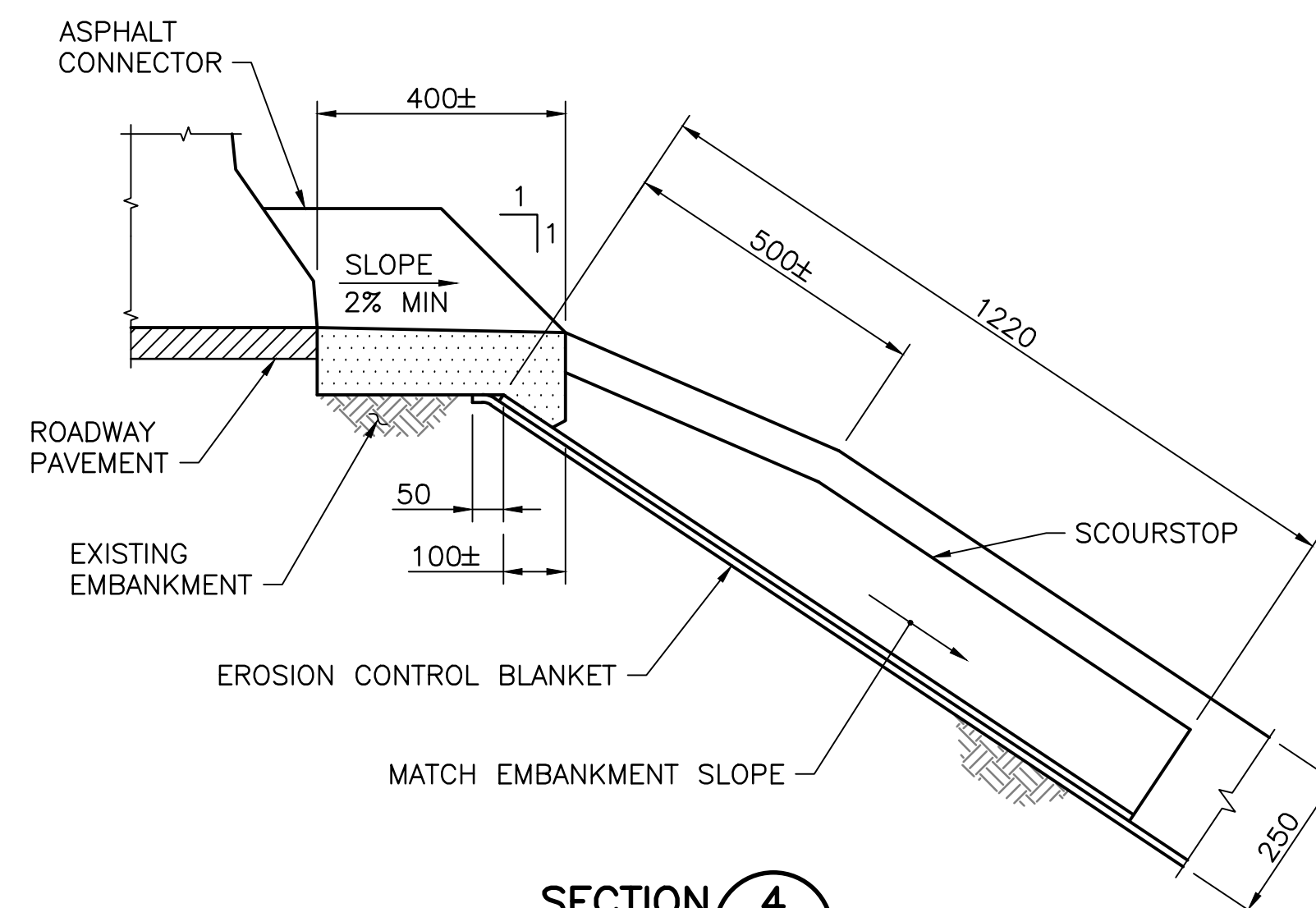


NOTES:

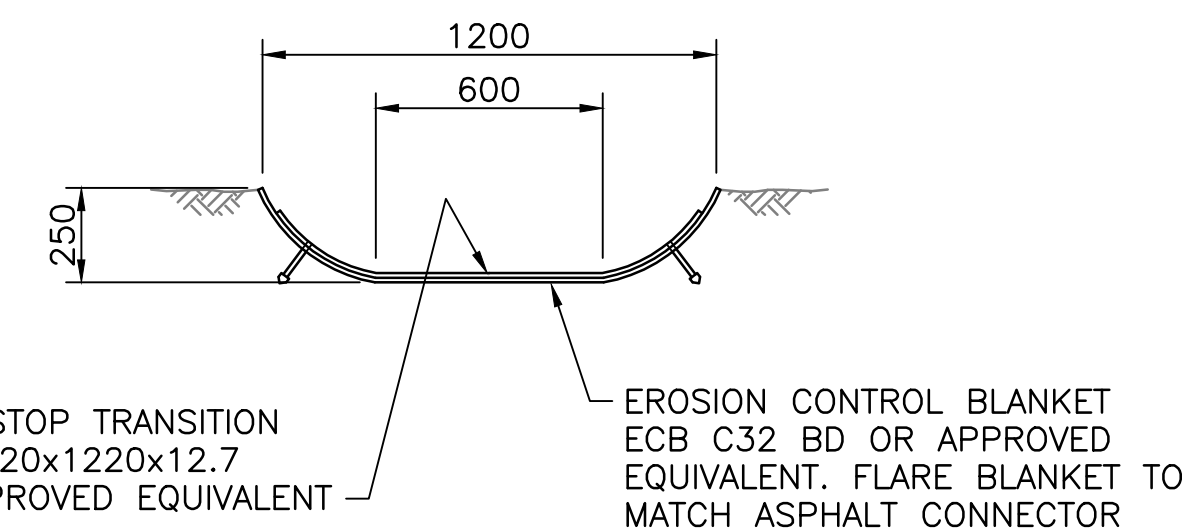
- FOR MATERIAL, QUALITY OF WORK AND OTHER DETAILS OF NEW PRECAST BARRIERS, REFER TO SECTION 941 OF BC MOT 2016 SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, WITH THE FOLLOWING EXCEPTION: SYNTHETIC FIBRE REINFORCEMENT SHALL BE ADDED TO THE PRECAST BARRIERS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- CUSTOM 690 BARRIER DETAILS TO MATCH SECTION 941 OF BC MoT 2016 SPECIFICATIONS FOR HIGHWAY CONSTRUCTION DRAWINGS SP941-01.02.01, WITH THE FOLLOWING EXCEPTIONS:
 - THE LENGTH OF THE NEW CUSTOM PRECAST 690 BARRIER TO BE FIELD MEASURED BY CONTRACTOR TO FIT. LENGTH FOR EACH CUSTOM BARRIER MAY DIFFER.
 - CONTRACTOR TO CONFIRM IN FIELD IF EYE OR HOOK CONNECTION REQUIRED FOR CONNECTION TO EXISTING PRECAST BARRIERS. AT CONNECTION TO NEW CTB-2H BARRIER, EYE CONNECTION REQUIRED.
- FIELD FIT ASPHALT CONNECTOR TOP OF EMBANKMENT TO EDGE OF ROADWAY PAVEMENT. ASPHALT CONNECTOR TO BE INSTALLED FOLLOWING BARRIER INSTALLATION.
- ANCHOR SCOURSTOP TRANSITION MAT WITH STAKES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- EXTEND EROSION CONTROL BLANKET TO BASE OF EMBANKMENT, AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE, AND STAPLED IN PLACE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



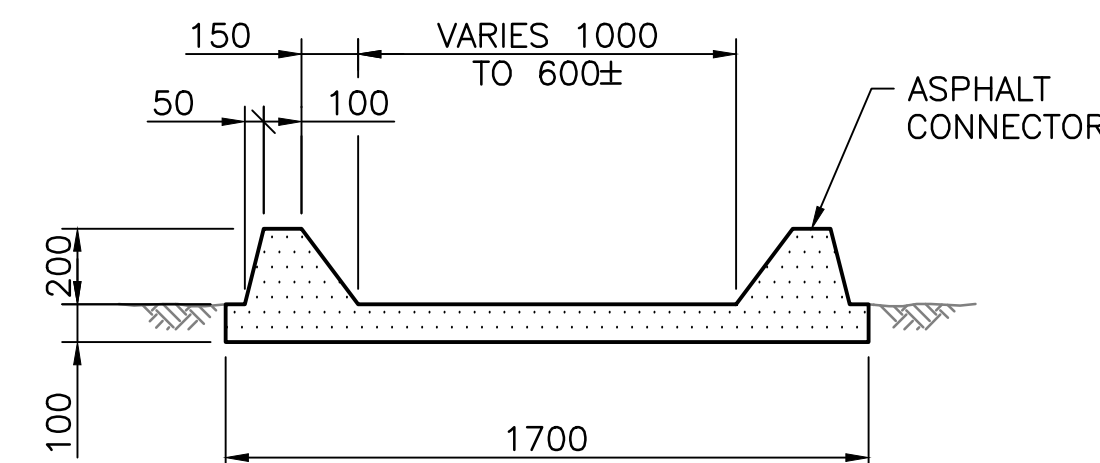
DRAINAGE BARRIER AND SPILLWAY PLAN



SECTION 4
1:10

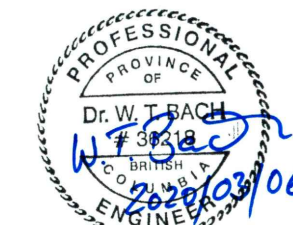


SECTION 5
1:20



SECTION 6
1:20

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PRECAST BARRIERS AND
SPILLWAY DETAILS

Project No./No. du projet 1080-01	Sheet/Feuille 110 OF	Revision no./La Révision no. A
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