

BRIDGE REHABILITATION  
KOOTENAY NATIONAL PARK, BRITISH COLUMBIA

KM 40.6 HIGHWAY 93S  
VERMILION RIVER BRIDGE

DRAWING LIST:

1343-03-001	COVER SHEET, DRAWING LIST AND LOCATION MAP
1343-03-002	GENERAL ARRANGEMENT EXISTING CONDITION
1343-03-003	GENERAL ARRANGEMENT FINAL CONDITION
1343-03-004	SUBSTRUCTURE REPAIRS AND BEARING RECOATING
1343-03-005	JUMP SPAN EXTERNAL STIRRUPS
1343-03-006	DECK MODIFICATIONS
1343-03-007	DECK JOINT REPLACEMENT 1
1343-03-008	DECK JOINT REPLACEMENT 2
1343-03-009	NEW ANCHORAGES FOR EXISTING CIP BARRIER
1343-03-010	BICYCLE RAILING

REFERENCE DRAWINGS

1957 ORIGINAL DESIGN, VERMILION RIVER BRIDGE, BANFF-WINDERMERE HIGHWAY MILE 25.9  
KOOTENAY NATIONAL PARK, DEPARTMENT OF PUBLIC WORKS CANADA

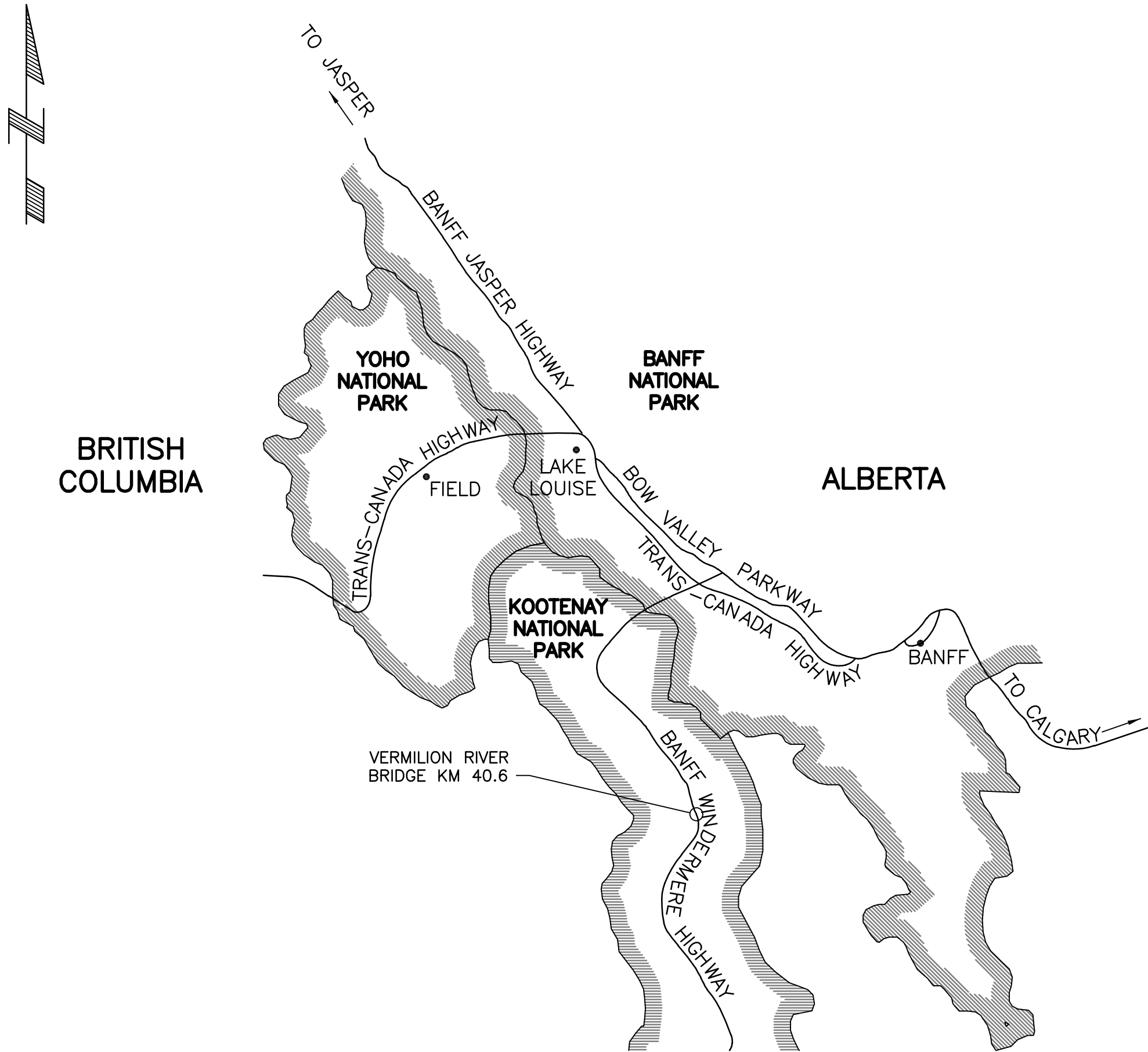
1 OF 9	PLAN AND ELEVATION
2 OF 9	WEST ABUTMENT
3 OF 9	WEST ABUTMENT STEEL REINFORCING
4 OF 9	EAST ABUTMENT
5 OF 9	EAST ABUTMENT STEEL REINFORCING
6 OF 9	PIER
7 OF 9	DECK - REINFORCED CONCRETE
8 OF 9	STANDARD HANDRAIL DETAIL
9 OF 9	STEEL SCHEDULE

1958 PRESTRESSED ALTERNATIVE, VERMILION RIVER BRIDGE, BANFF-WINDERMERE HIGHWAY MILE  
25.9, PRECAST CONCRETE LTD

-	PRESTRESSED ALTERNATIVE
-	STRINGER DETAIL
-	PRETENSIONED ALTERNATIVE DESIGN INFORMATION
-	MISCELLANEOUS DETAILS

1990 RENOVATION VERMILION RIVER BRIDGE, KM 41.23 HIGHWAY NO. 93A, KOOTENAY NATIONAL  
PARK BRITISH COLUMBIA, PUBLIC WORKS CANADA

-	COVER SHEET
1 OF 6	GENERAL LAYOUT EXISTING
2 OF 6	NEW GENERAL LAYOUT
3 OF 6	TRAFFIC CONTROL AND DECK RECONSTRUCTION DETAILS
4 OF 6	JOINT AND BEARING DETAILS
5 OF 6	PRECAST CONCRETE APPROACH BARRIER
6 OF 6	TRAFFIC BARRIER AND REINFORCEMENT SCHEDULE



LOCATION MAP

N.T.S.

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Revision/Revision	Description/Description	Date/Date
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Approved by/Approuve par  
DPG

Designed by/Concept par  
VNBB/JUGN

Drawn by/Dessine par  
JNML

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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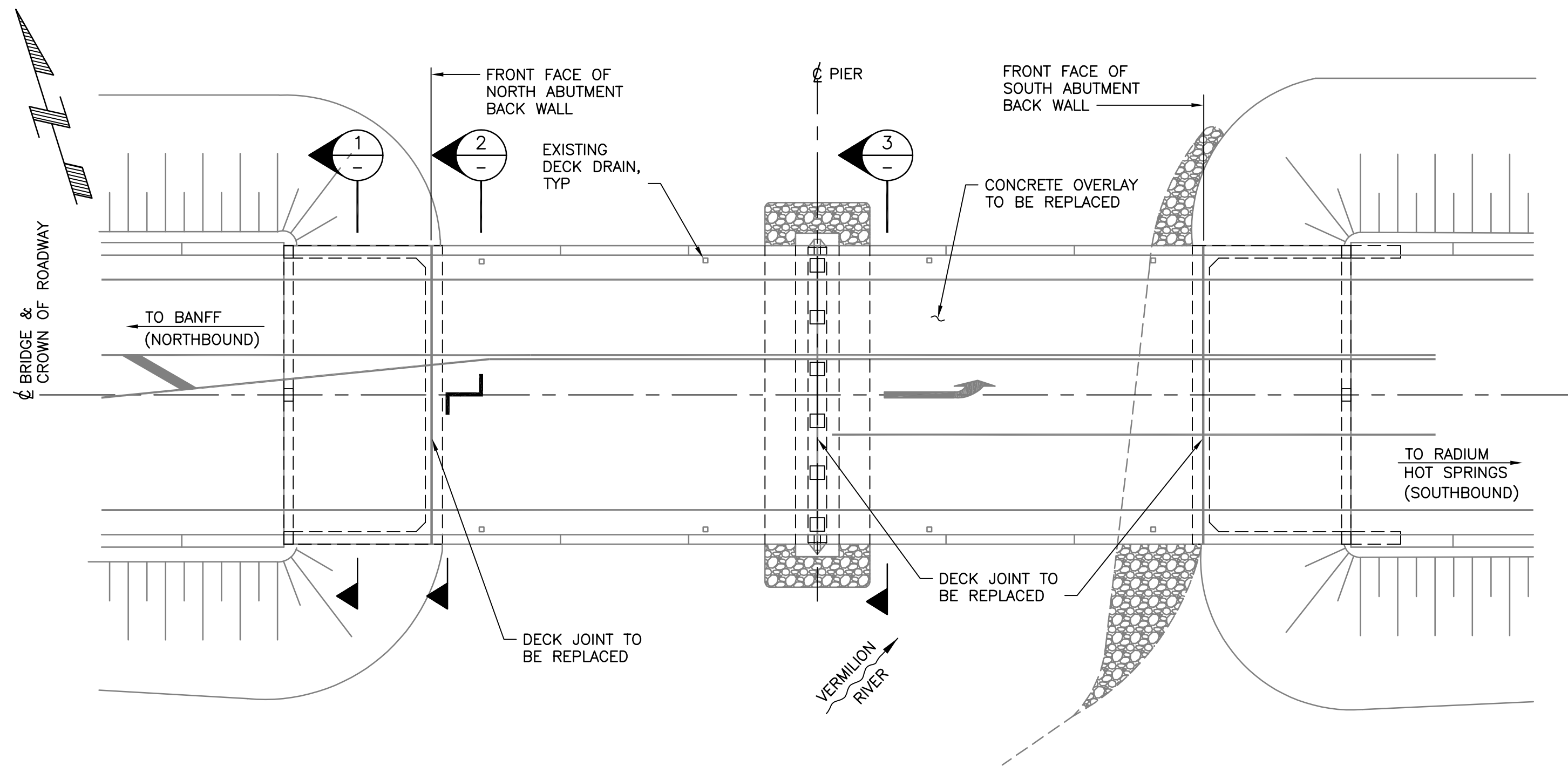
Drawing title/Titre du dessin

COVER SHEET  
DRAWING LIST AND  
LOCATION MAP

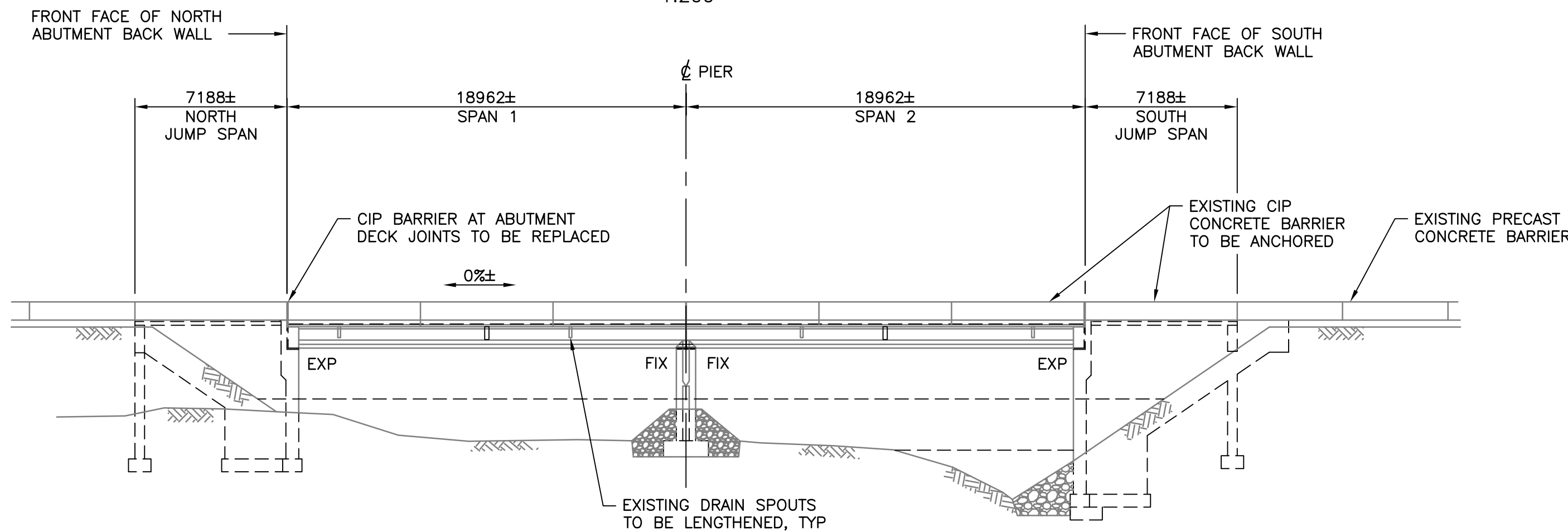
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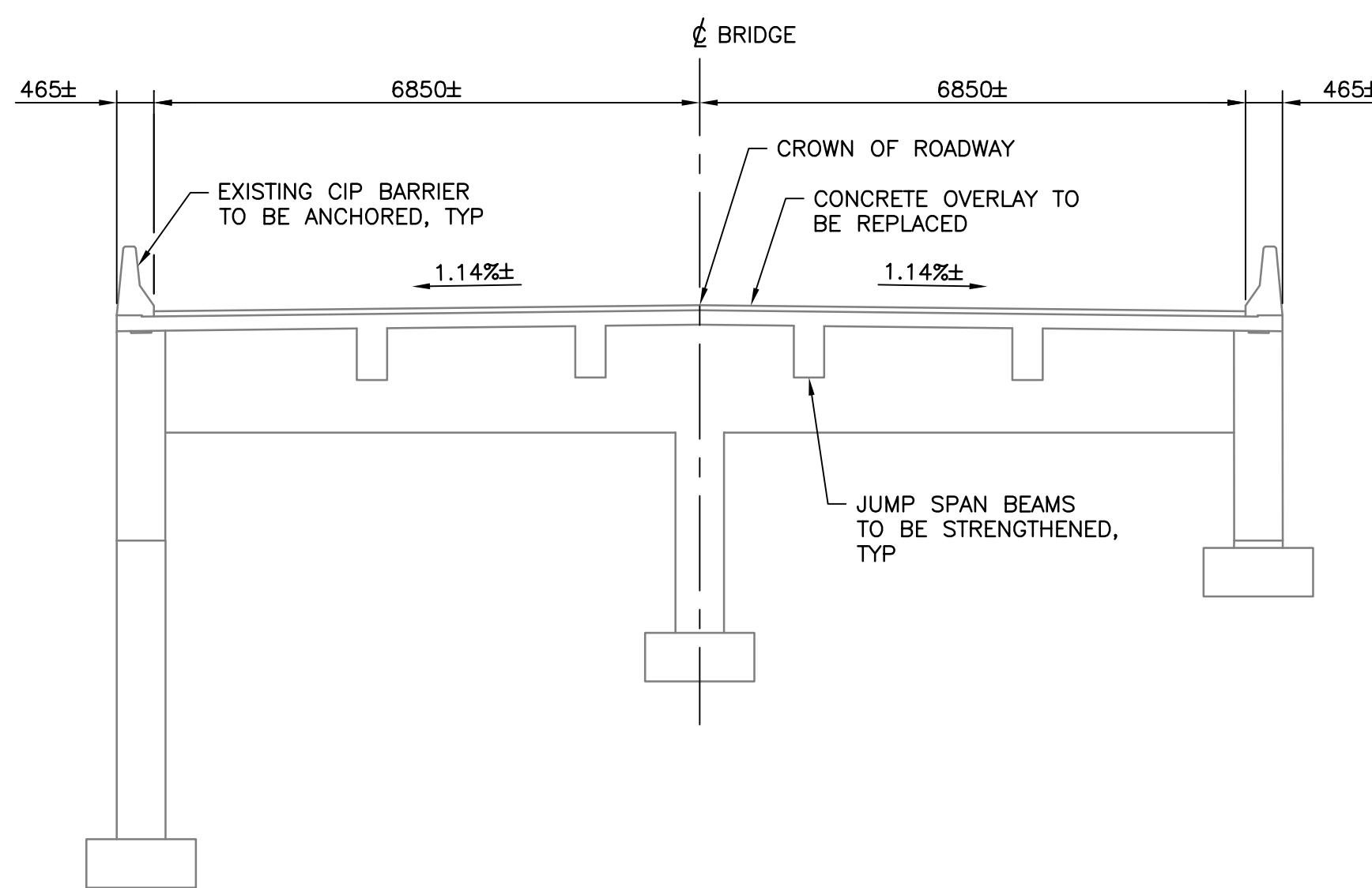
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**PLAN**  
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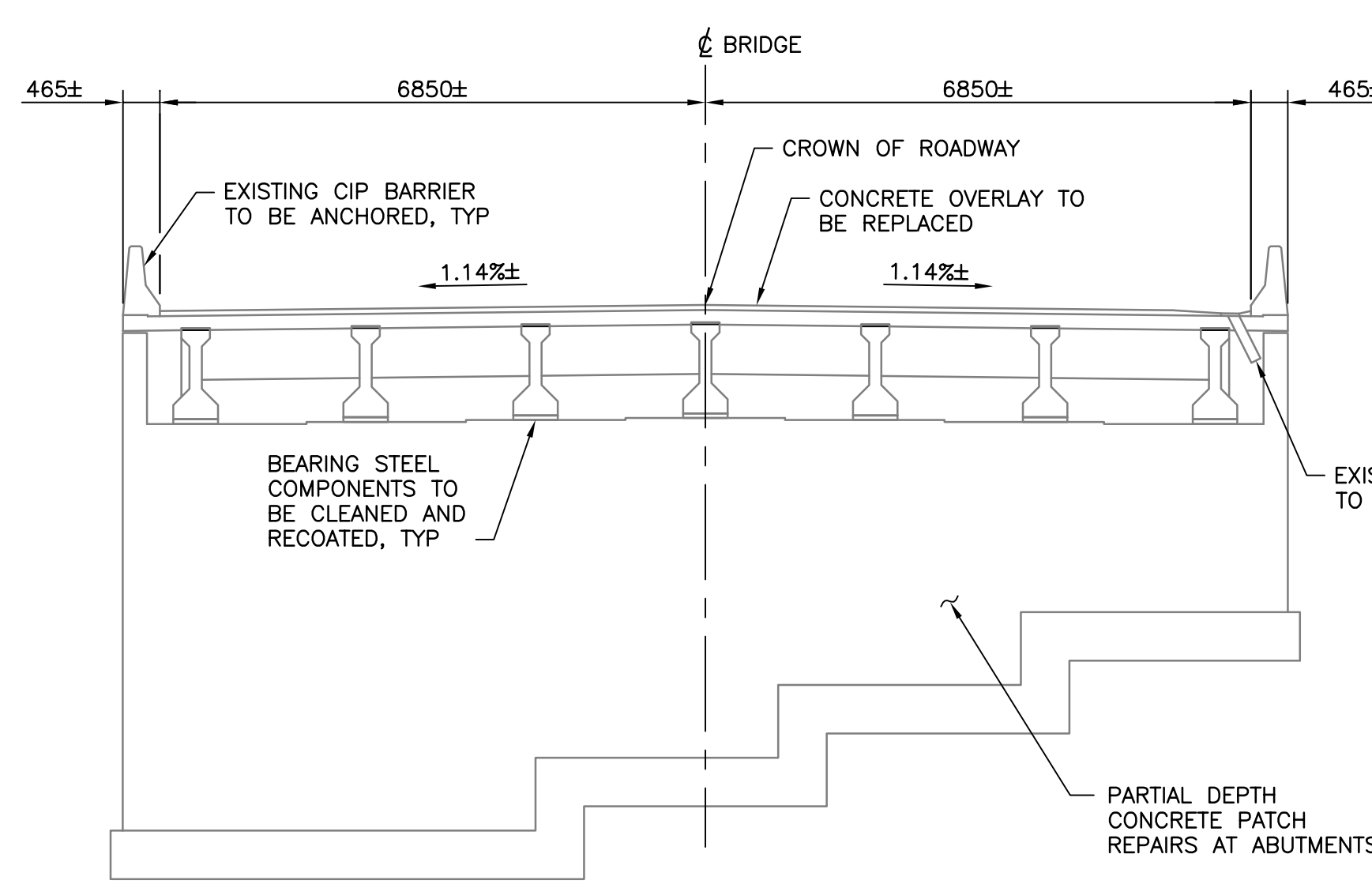


**ELEVATION**  
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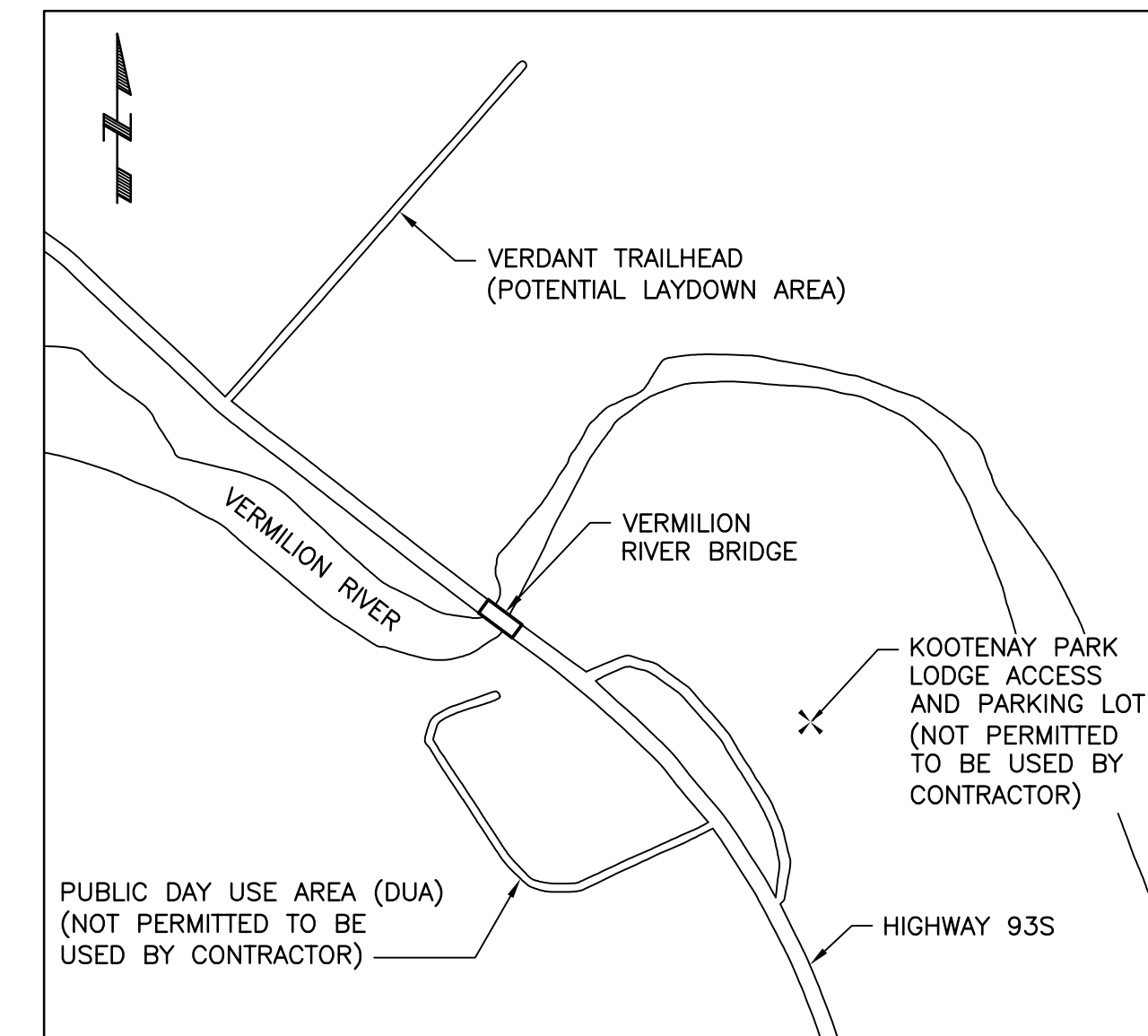
**SECTION 1**  
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(NORTH JUMP SPAN SHOWN - SOUTH JUMP SPAN SIMILAR)

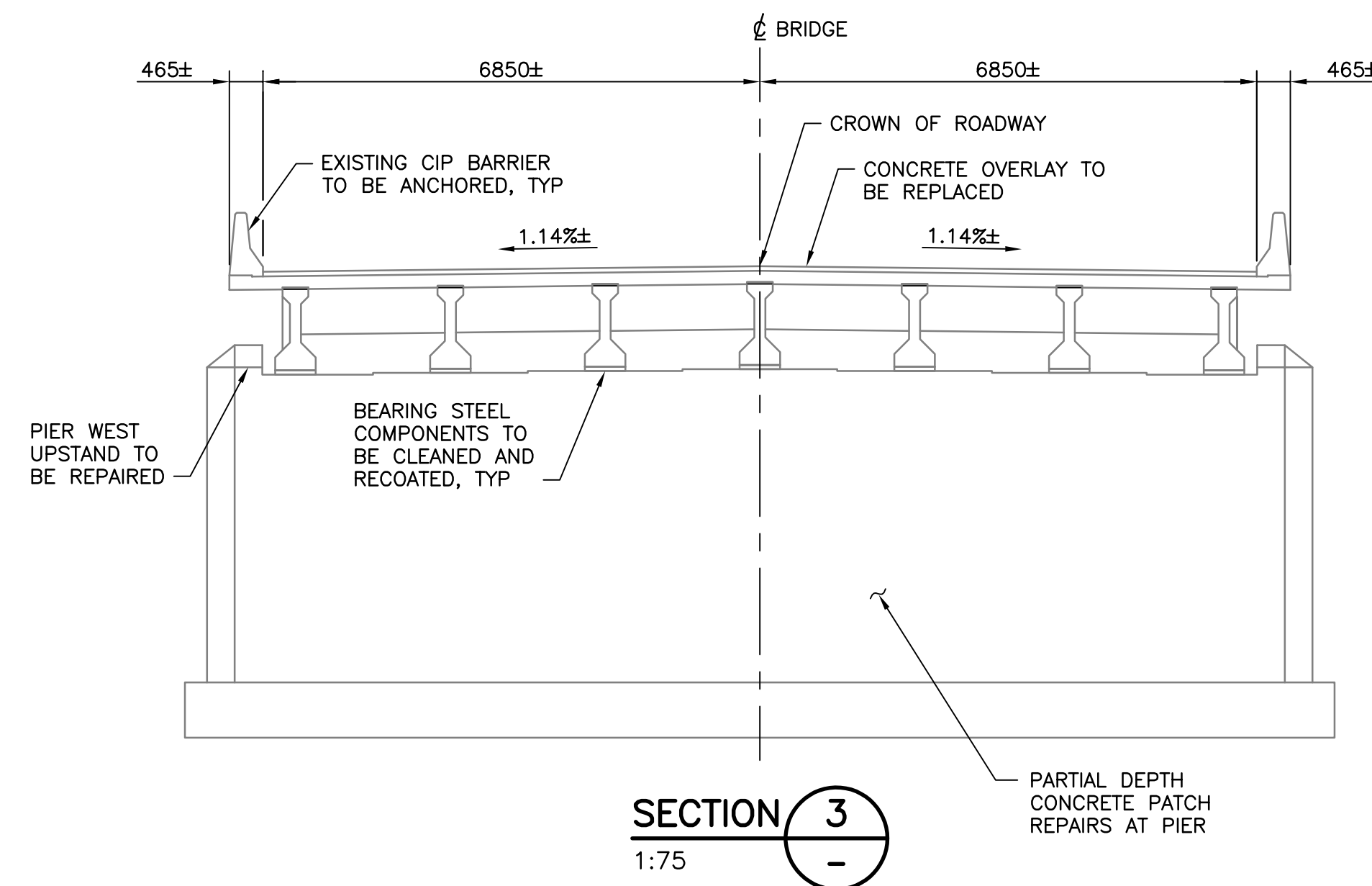


**SECTION 2**  
1:75

(NORTH ABUTMENT SHOWN - SOUTH ABUTMENT SIMILAR)



**KEY PLAN**  
NTS



**SECTION 3**  
1:75

#### NOTES:

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

#### SCOPE OF WORK:

- CONSTRUCTION TO BE COMPLETED IN THREE STAGES.
- REMOVAL AND DISPOSAL OF EXISTING CONCRETE OVERLAY AND DECK JOINTS IN THREE STAGES.
- COLD MILLING OF CONCRETE DECK IN THREE STAGES.
- PARTIAL DEPTH CONCRETE DECK PATCH REPAIRS, AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE.
- ABUTMENT AND PIER CONCRETE PATCH REPAIRS AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE.
- SURFACE PREPARATION AND APPLICATION OF COATING SYSTEM TO EXISTING STEEL COMPONENTS AT BEARINGS.
- PIER WEST UPSTAND REPAIR AS INDICATED.
- SUPPLY, FABRICATION AND INSTALLATION OF EXTERNAL STIRRUPS AT JUMP SPAN BEAMS.
- SUPPLY AND INSTALLATION OF LENGTHENED DOWNSPOUTS OF EXISTING DECK DRAINS.
- SUPPLY AND PLACEMENT OF NEW FIBRE REINFORCED CONCRETE OVERLAY.
- SUPPLY, FABRICATION AND INSTALLATION OF NEW DECK JOINTS INCLUDING REPLACEMENT OF CIP BARRIER AT ABUTMENT DECK JOINTS.
- SUPPLY, FABRICATION AND INSTALLATION OF NEW ANCHORAGES FOR EXISTING CIP BARRIER.
- SUPPLY, FABRICATION AND INSTALLATION OF NEW BICYCLE RAILING.
- APPLICATION OF LANE MARKINGS ON FINISHED ROAD SURFACE.

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Drawing title/Titre du dessin

**GENERAL ARRANGEMENT**  
**EXISTING CONDITION**

Project No./No. du projet  
**1343-03**

Sheet/Feuille  
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OF

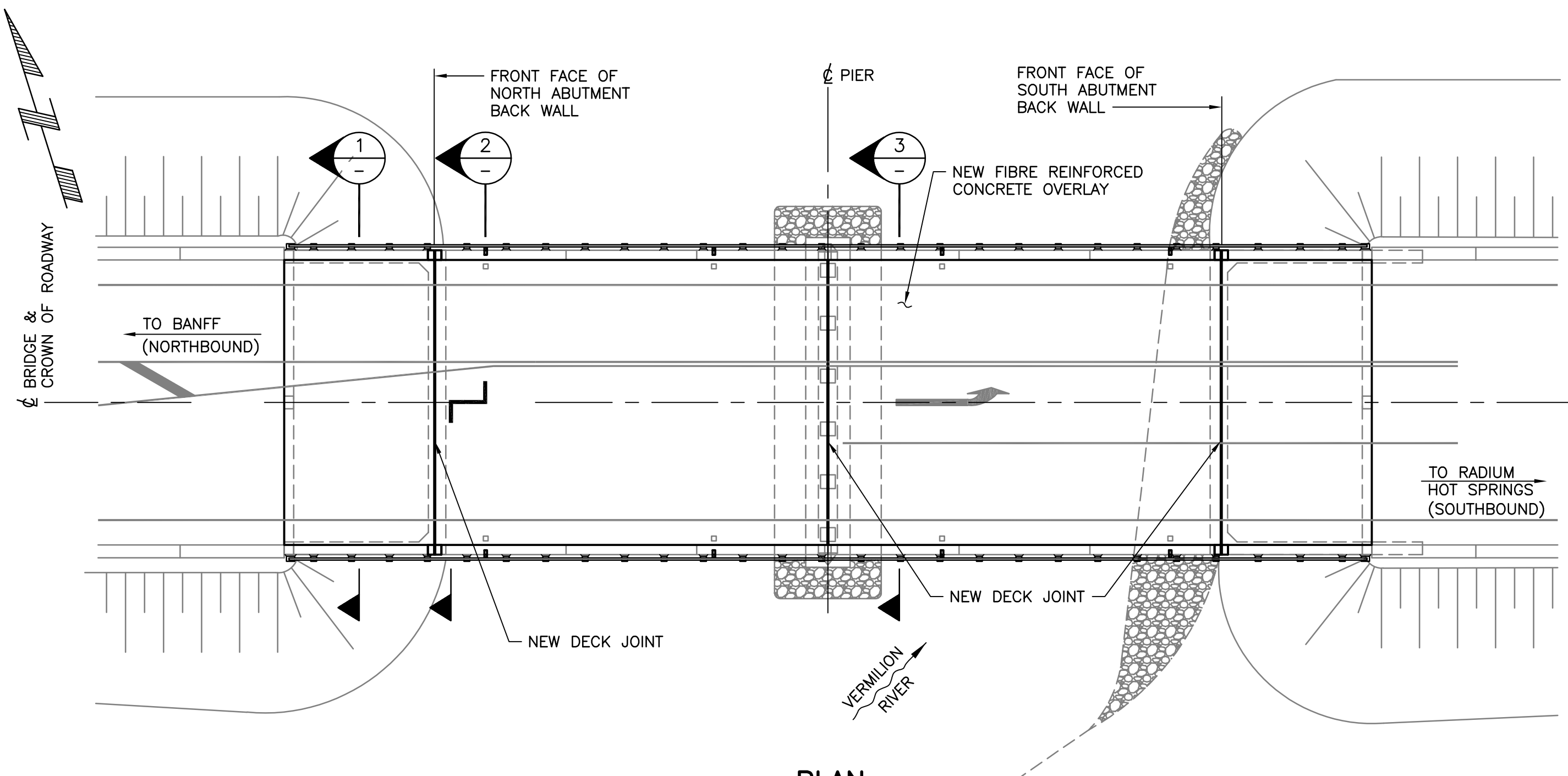
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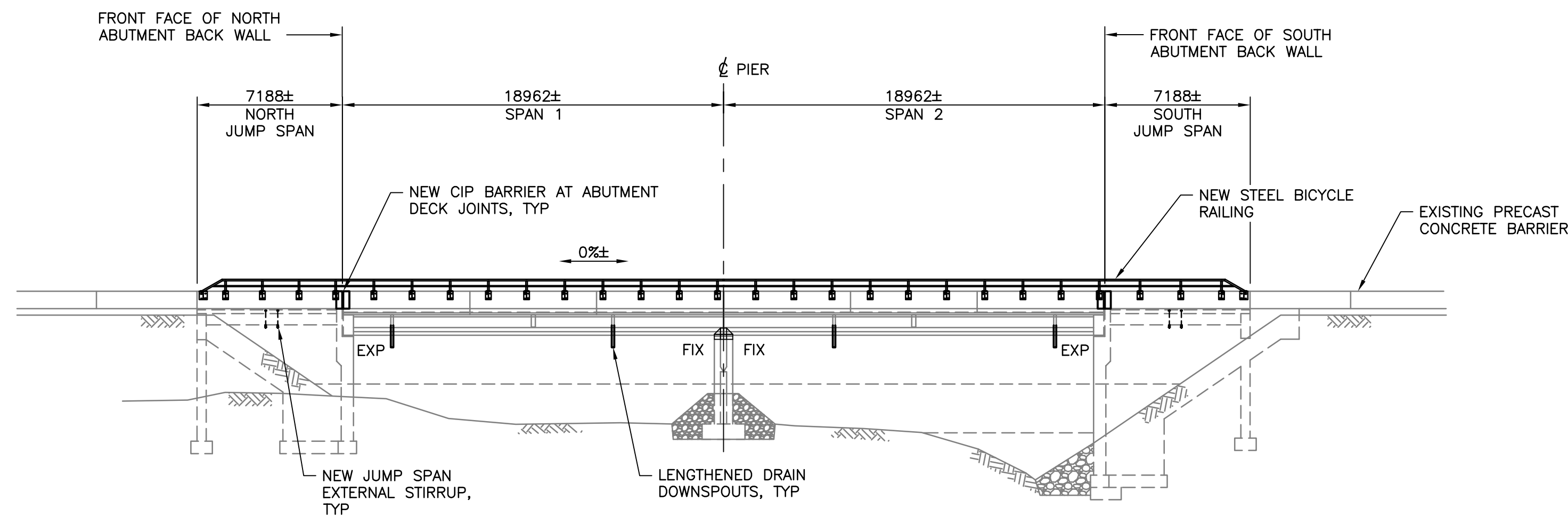


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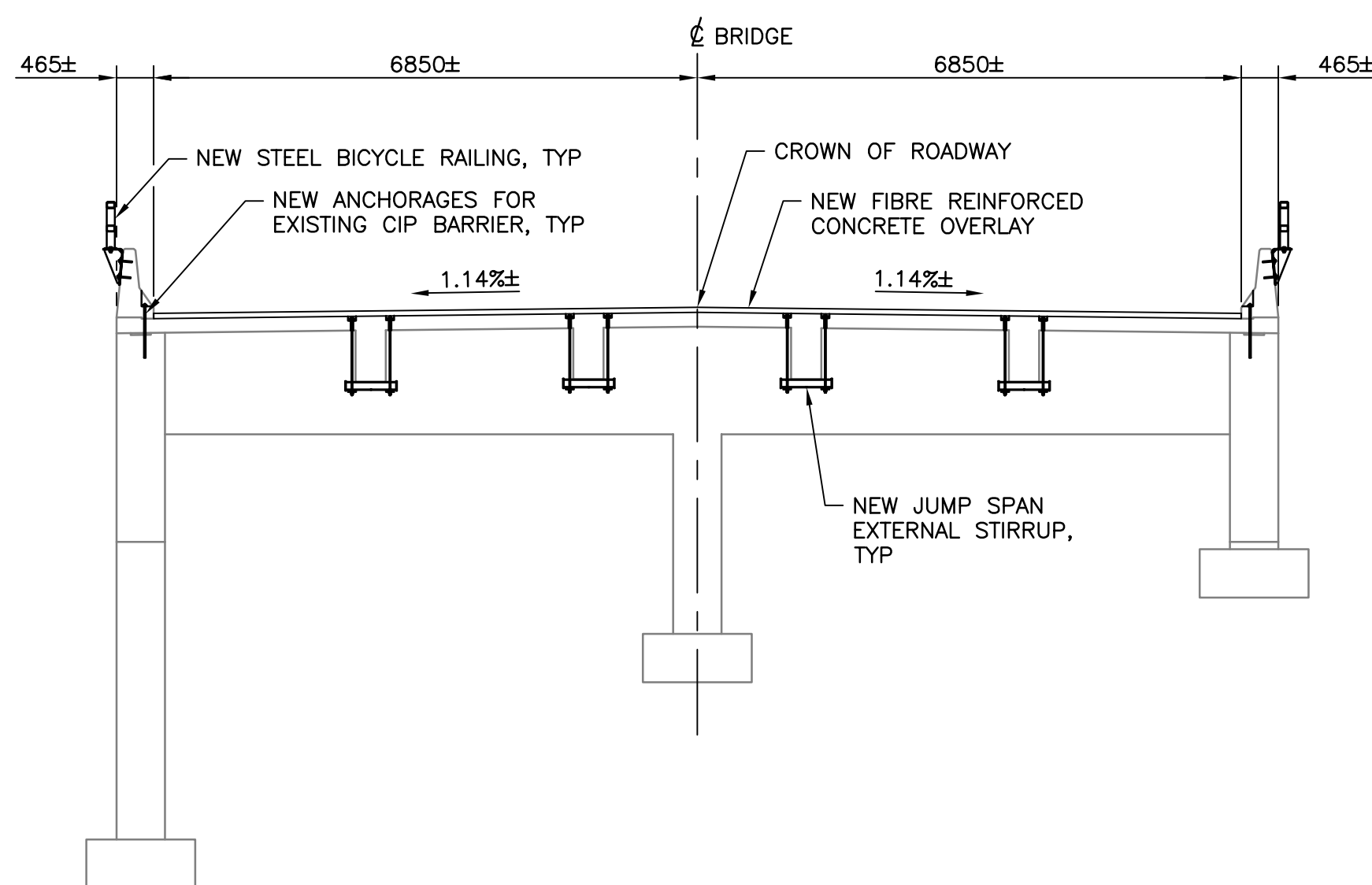
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PLAN  
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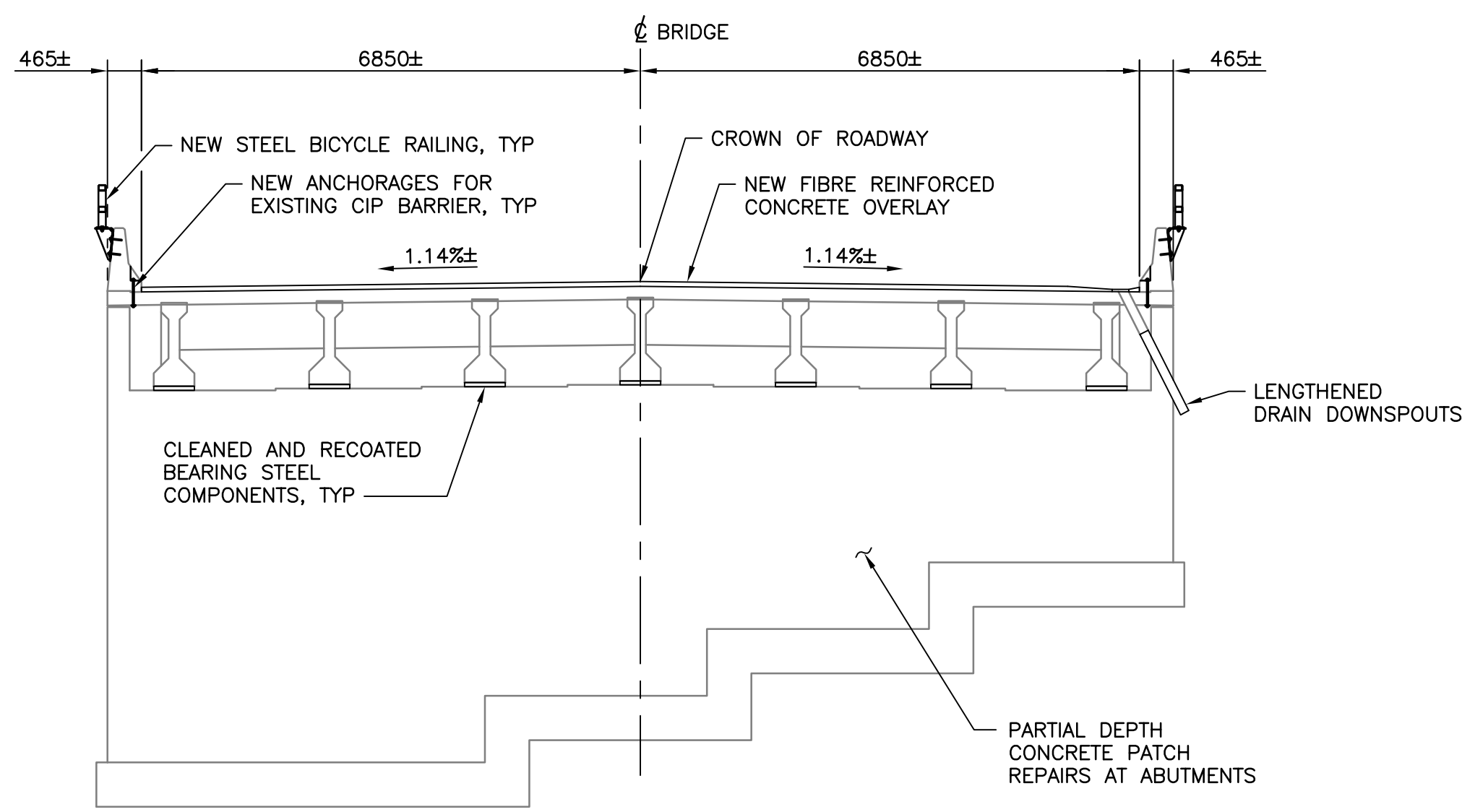


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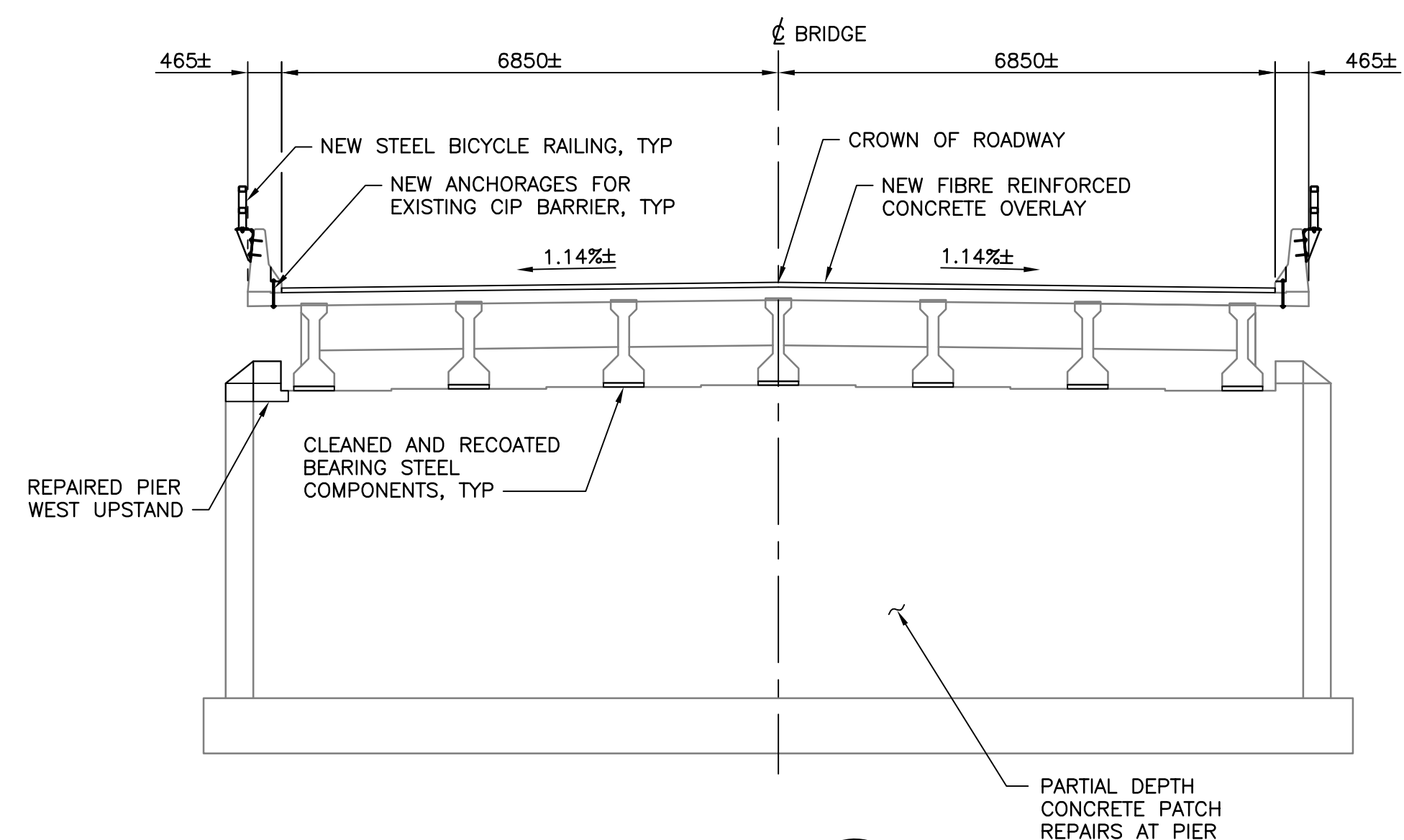
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(NORTH JUMP SPAN SHOWN - SOUTH JUMP SPAN SIMILAR)



SECTION 2  
1:75

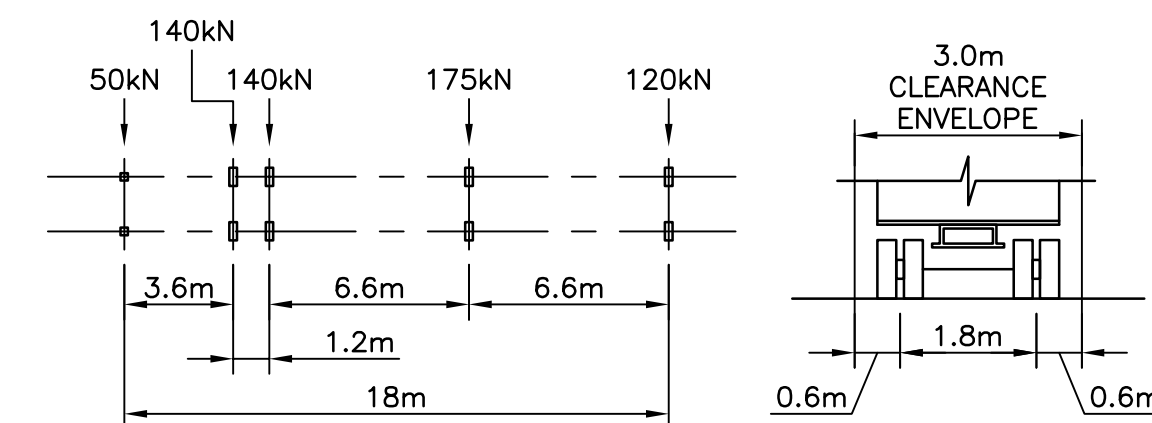
(NORTH ABUTMENT SHOWN - SOUTH ABUTMENT SIMILAR)



SECTION 3  
1:75

#### DESIGN DATA:

- DESIGN STANDARDS: CAN/CSA-S6-14
- DESIGN LIFE: 30 YEARS
- DESIGN LOADS:
  - UNIT MATERIAL WEIGHTS
    - REINFORCED CONCRETE 24.0 kN/m<sup>3</sup>
    - CONCRETE WEARING SURFACE 23.5 kN/m<sup>3</sup>
    - STEEL 77.0 kN/m<sup>3</sup>
  - LIVE LOADS
    - BCL-625 TRUCK, LANE LOADING AND DYNAMIC LOAD ALLOWANCE PER S6-14
- TEMPERATURE DATA:
  - EFFECTIVE CONSTRUCTION TEMPERATURE: 15°C
  - MAXIMUM MEAN DAILY TEMPERATURE: 26°C
  - MINIMUM MEAN DAILY TEMPERATURE: -40°C
  - ANNUAL MEAN RELATIVE HUMIDITY: 60%



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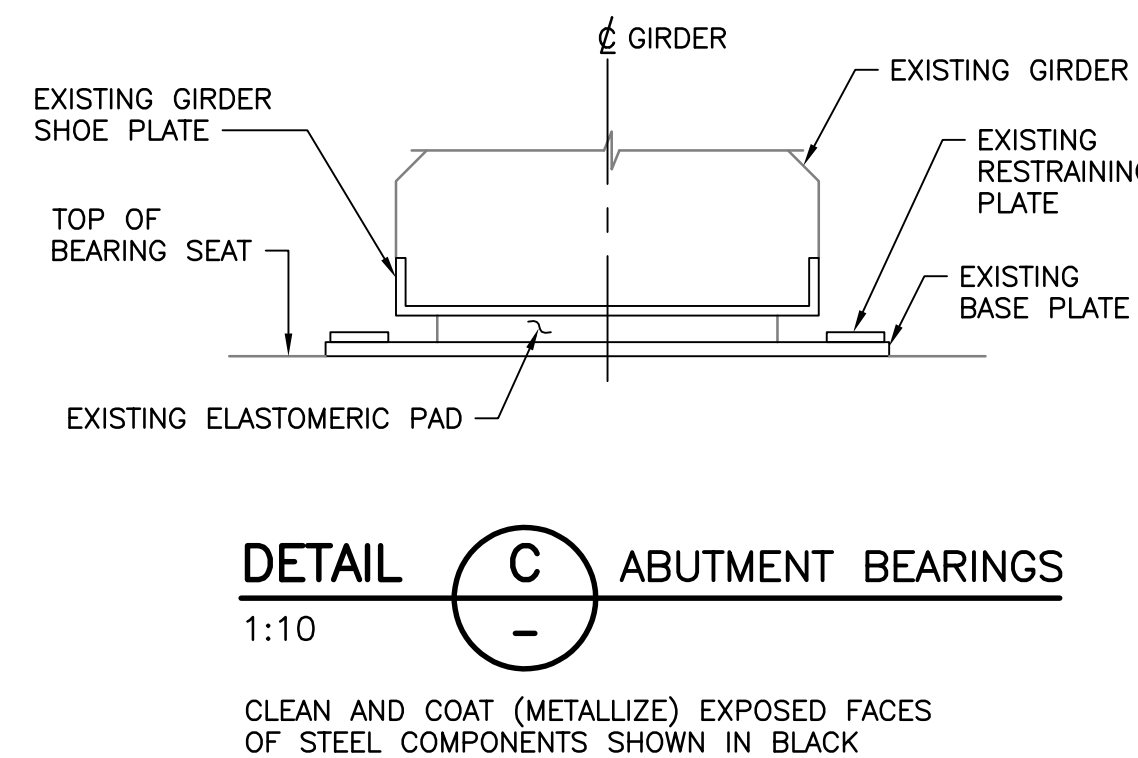
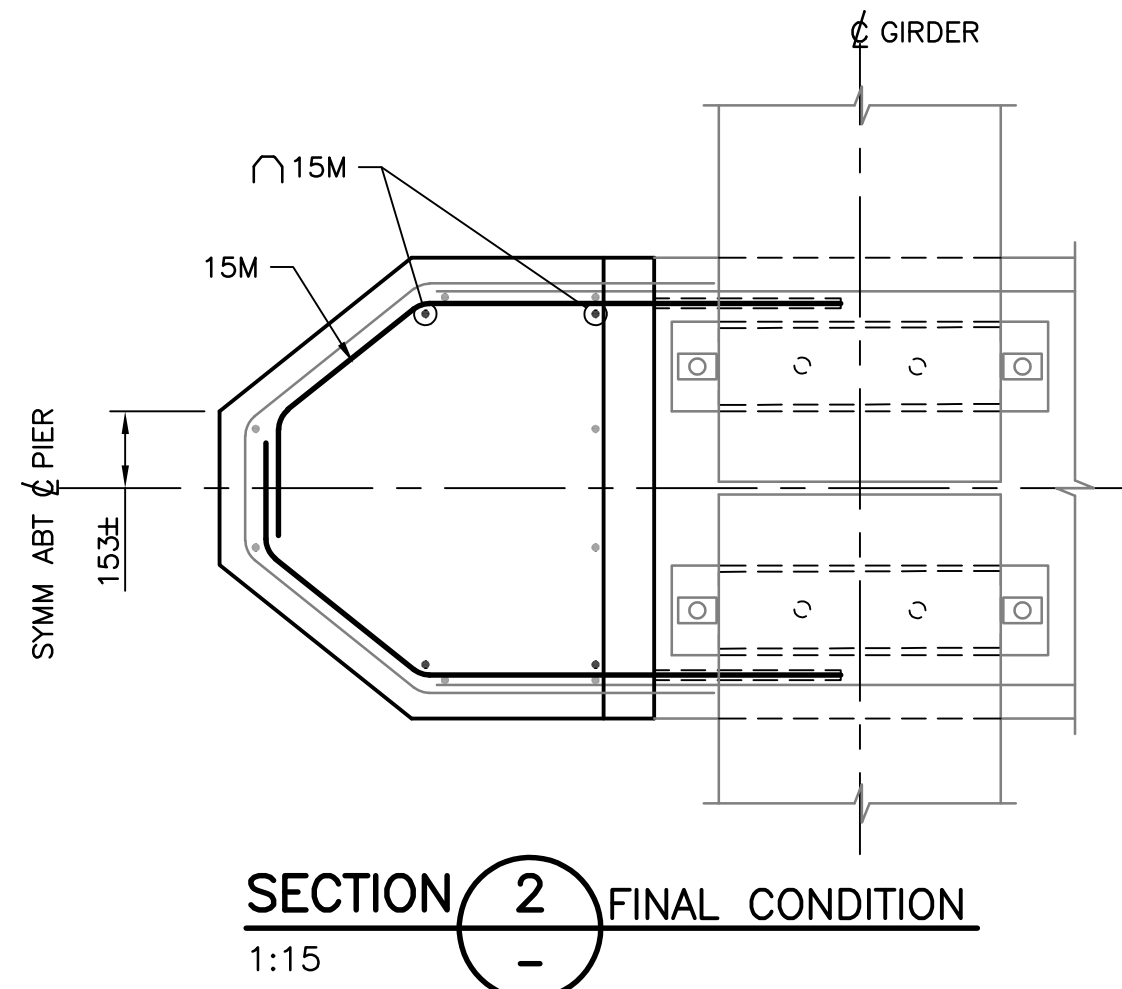
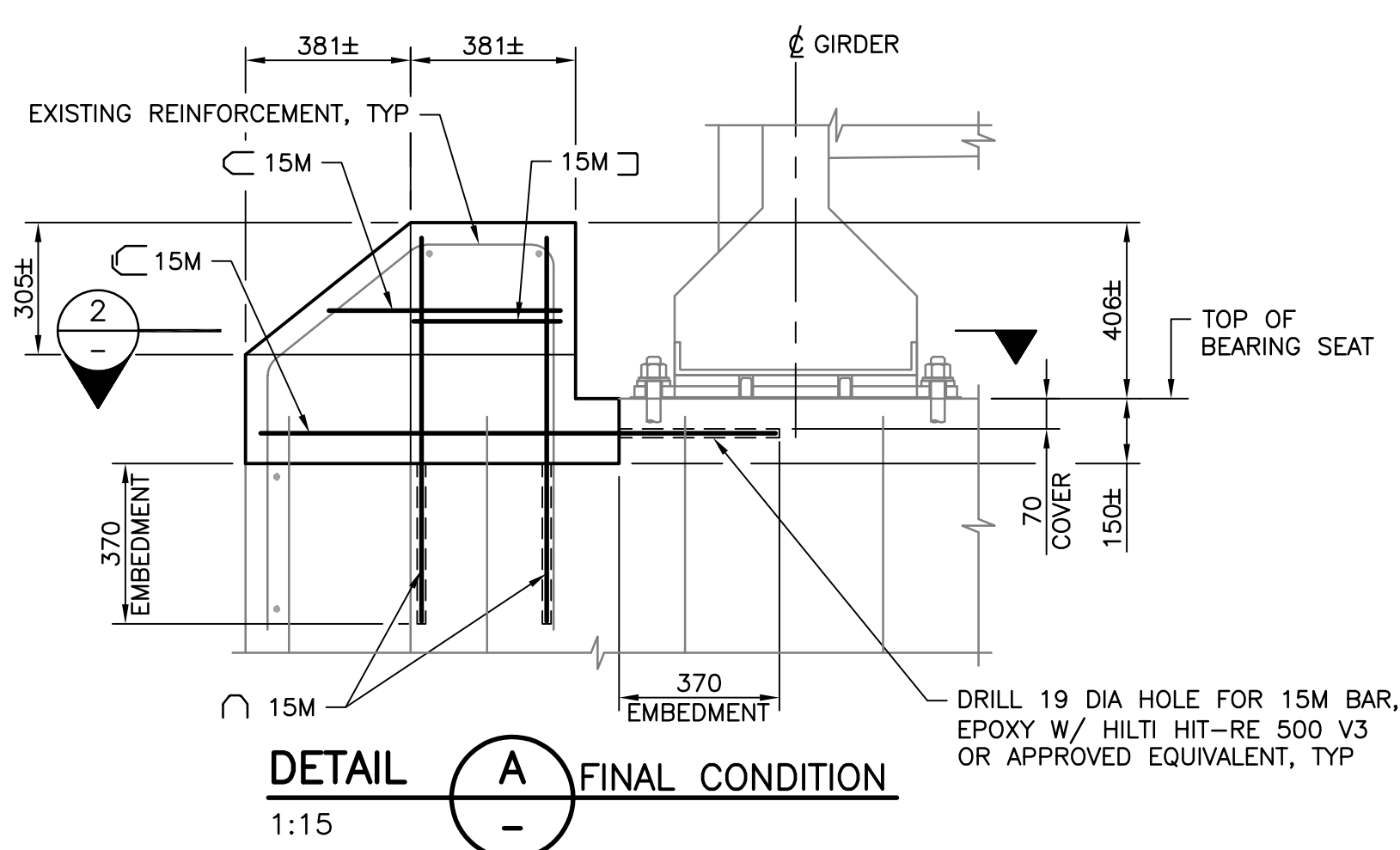
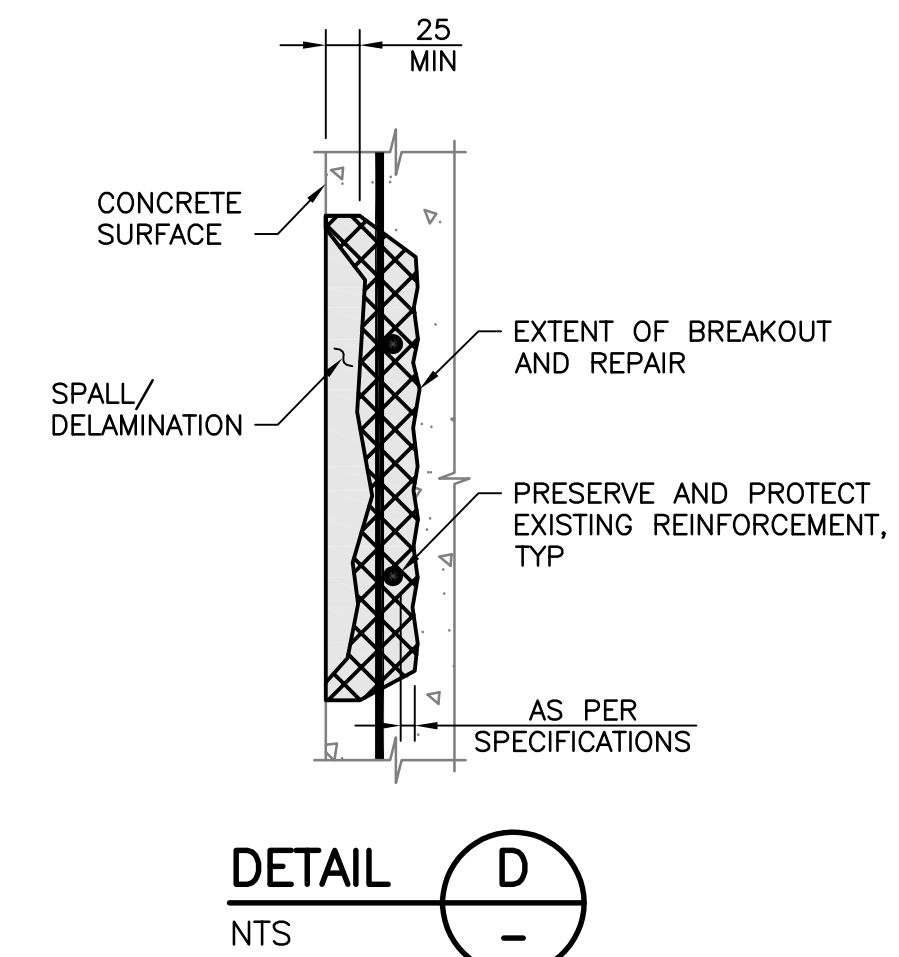
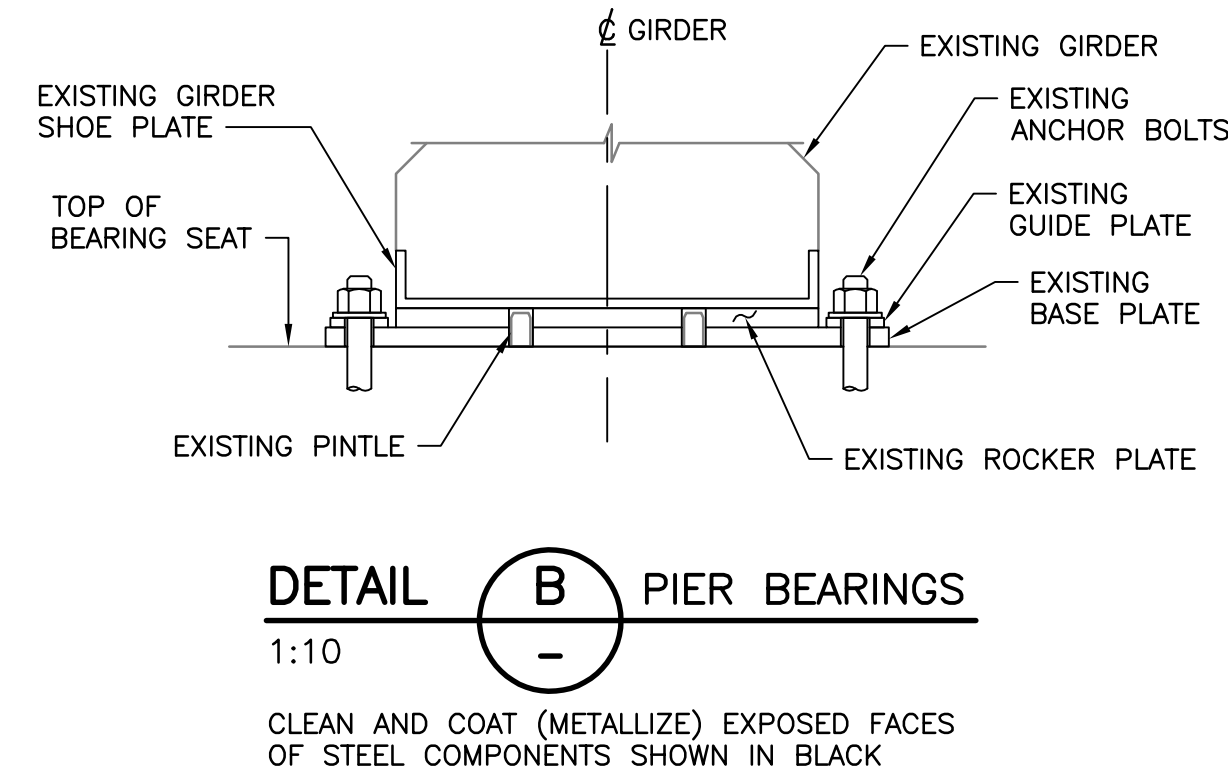
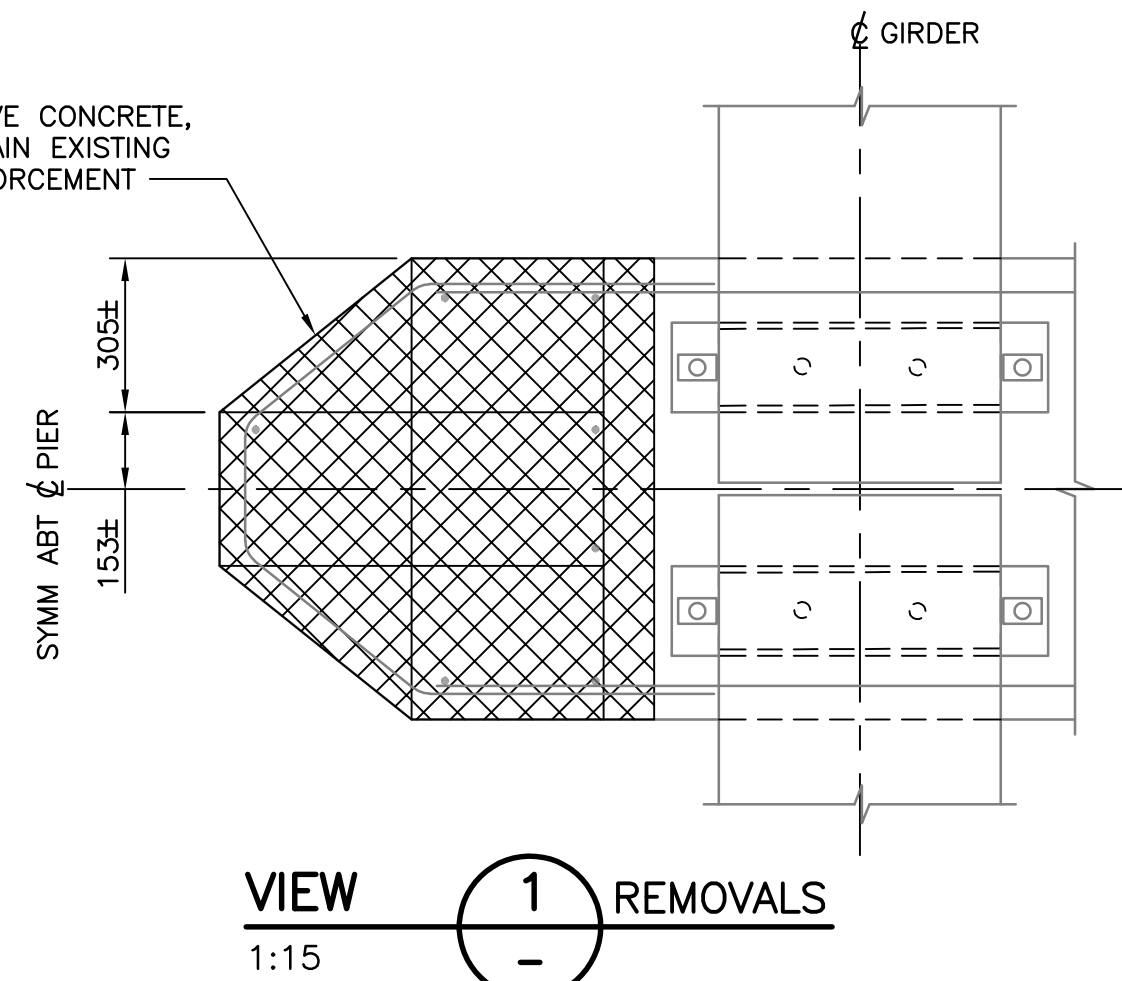
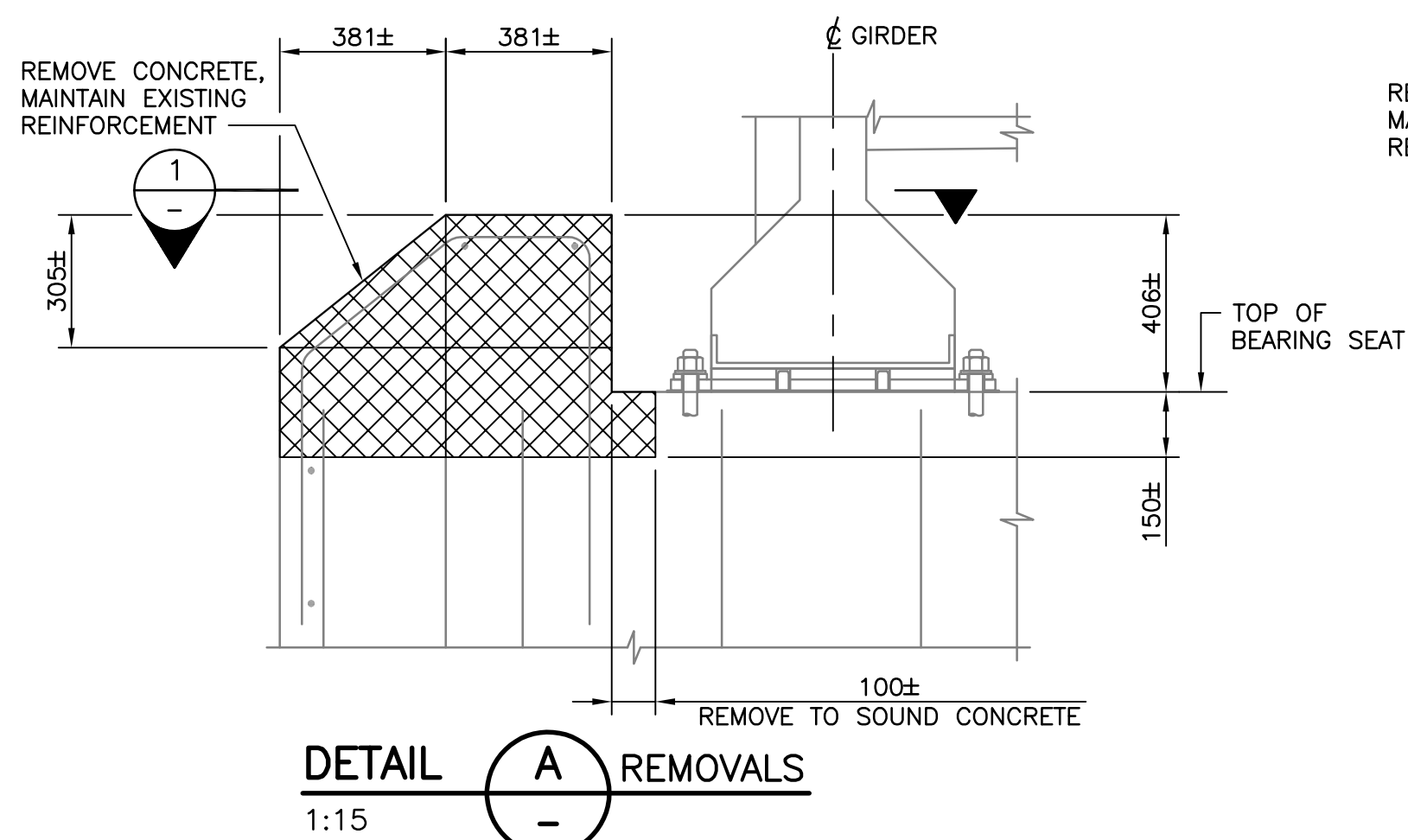
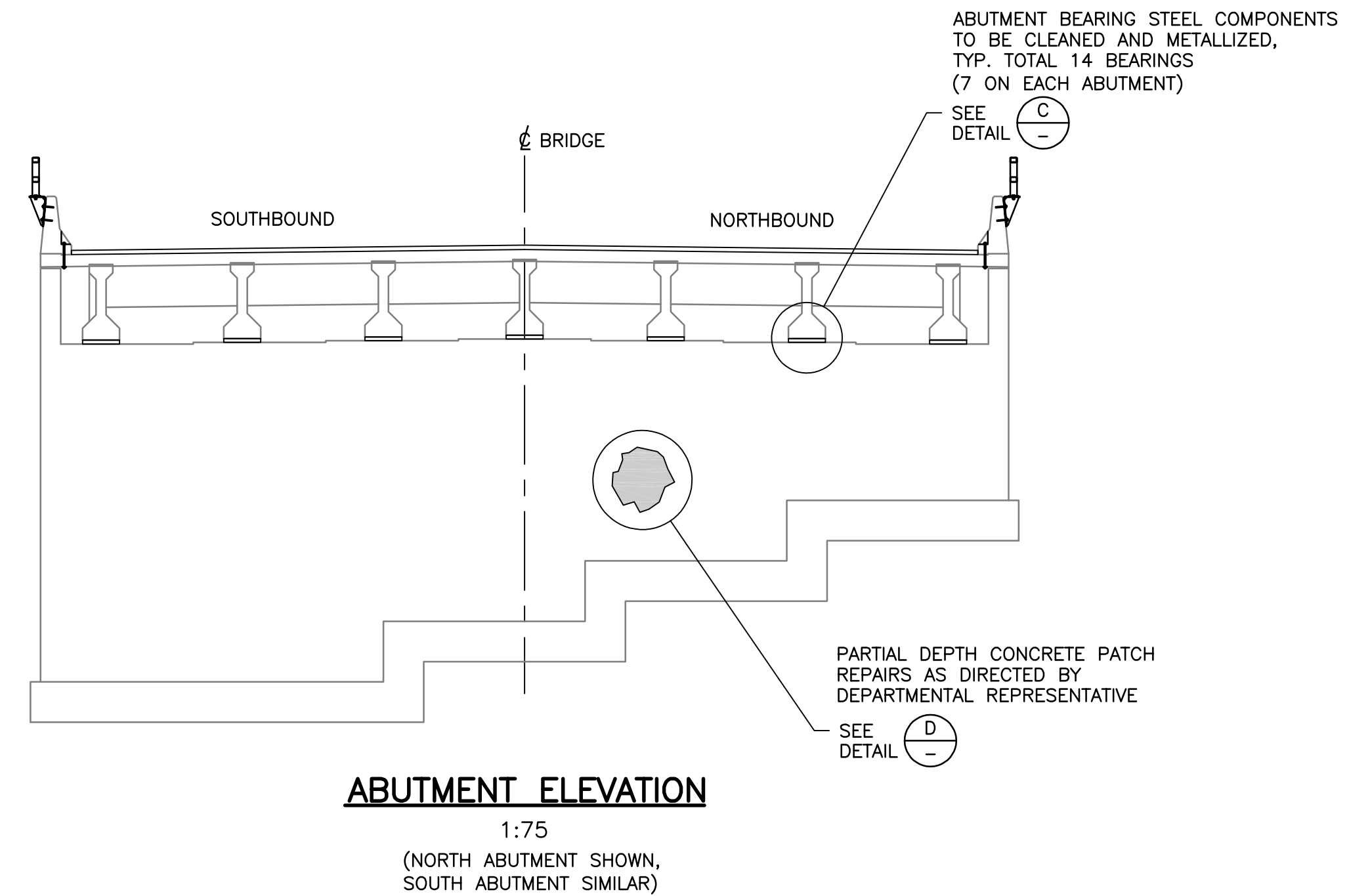
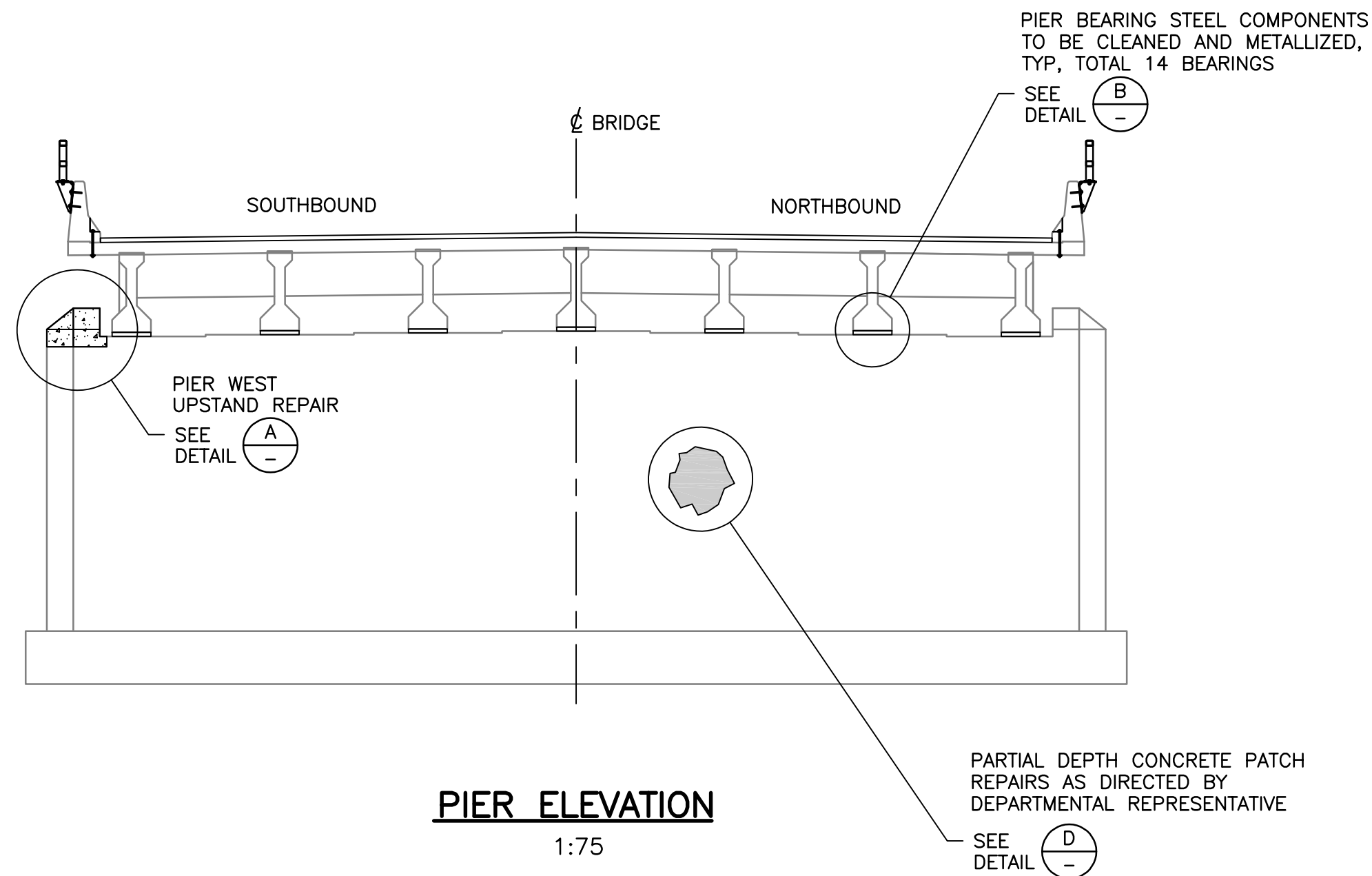
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GENERAL ARRANGEMENT  
FINAL CONDITION

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**NOTES:**

- MINIMUM COMPRESSIVE STRENGTH OF CONCRETE: 35 MPa AT 28 DAYS.
- REINFORCING STEEL: CAN/CSA G30.18M GRADE 400W.
- MINIMUM COVER: 50 UNLESS NOTED OTHERWISE.
- PATCH REPAIR MATERIAL ACCORDING TO THE SPECIFICATIONS.
- BEARING STEEL COMPONENTS SURFACE PREPARATION AND RECOATING (METALLIZING) IN ACCORDANCE WITH SPECIFICATIONS.
- DOWEL NEW REINFORCEMENT INTO EXISTING PIER CAP ACCORDING TO EPOXY MANUFACTURER'S PRINTED INSTRUCTIONS. HOLES SHALL BE HAMMER DRILLED.

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JAGN

PWGC Project Manager/Administrateur de Projets TPSC

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SUBSTRUCTURE REPAIRS AND  
BEARING RECOATING

Project No./No. du projet  
1343-03

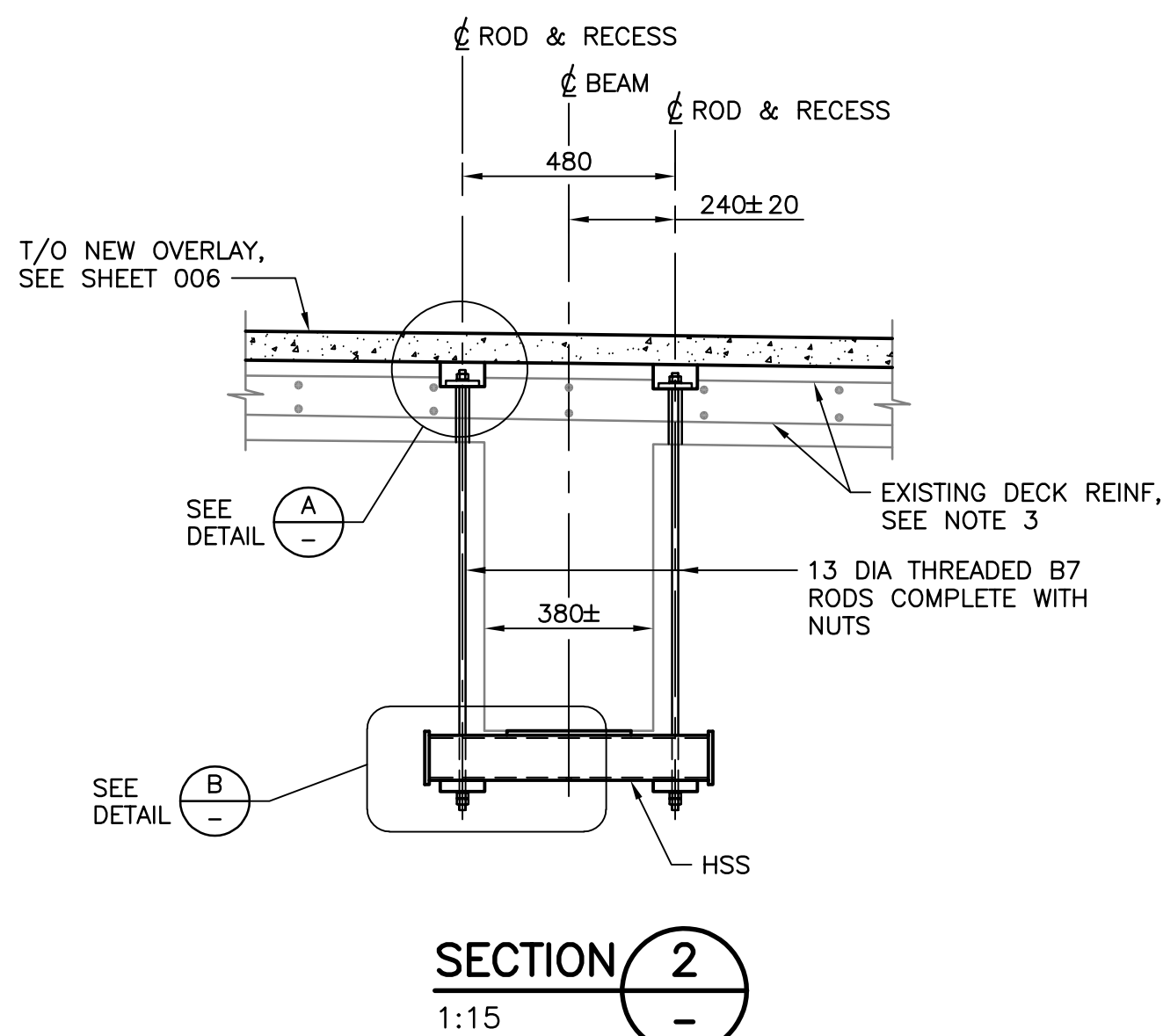
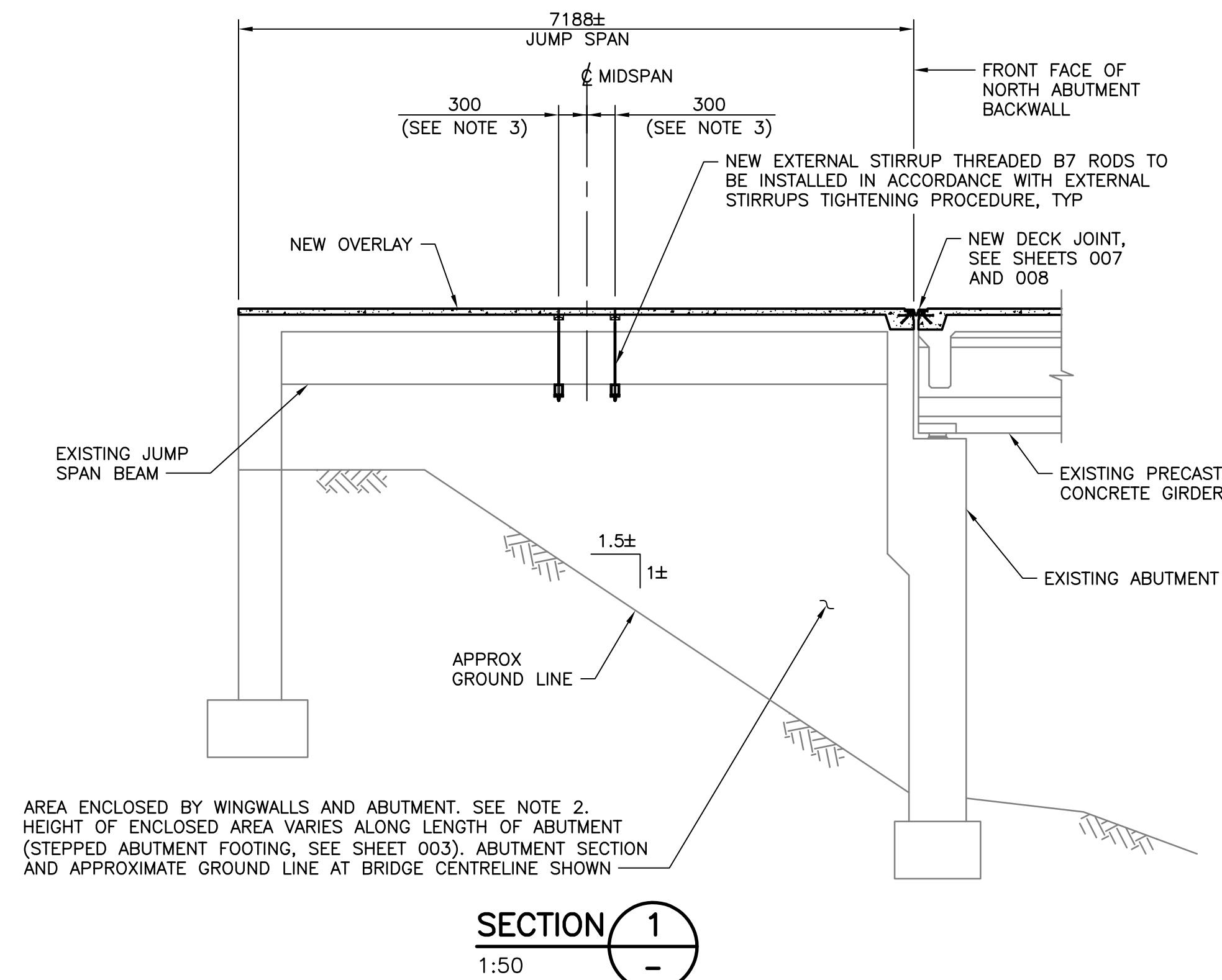
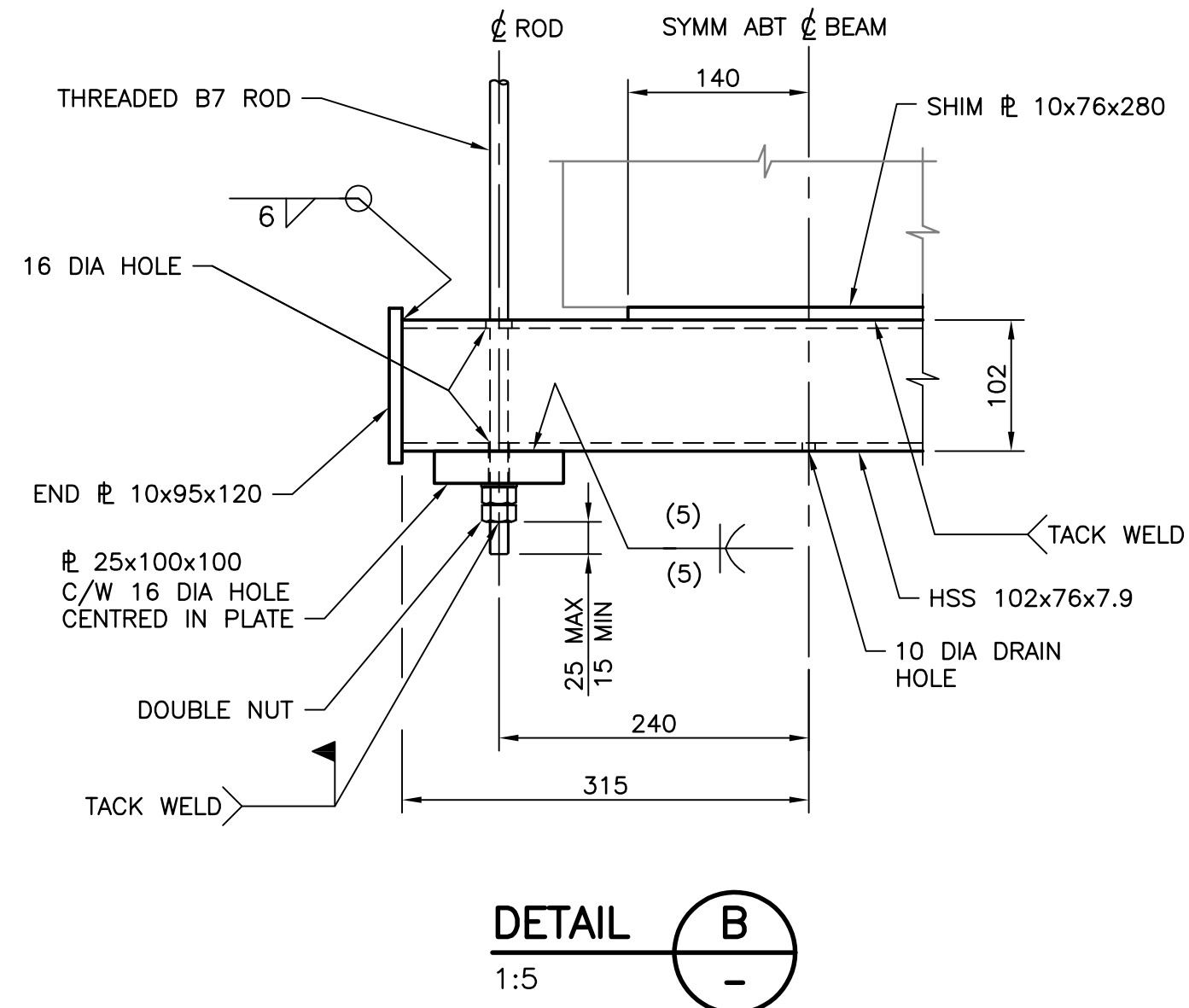
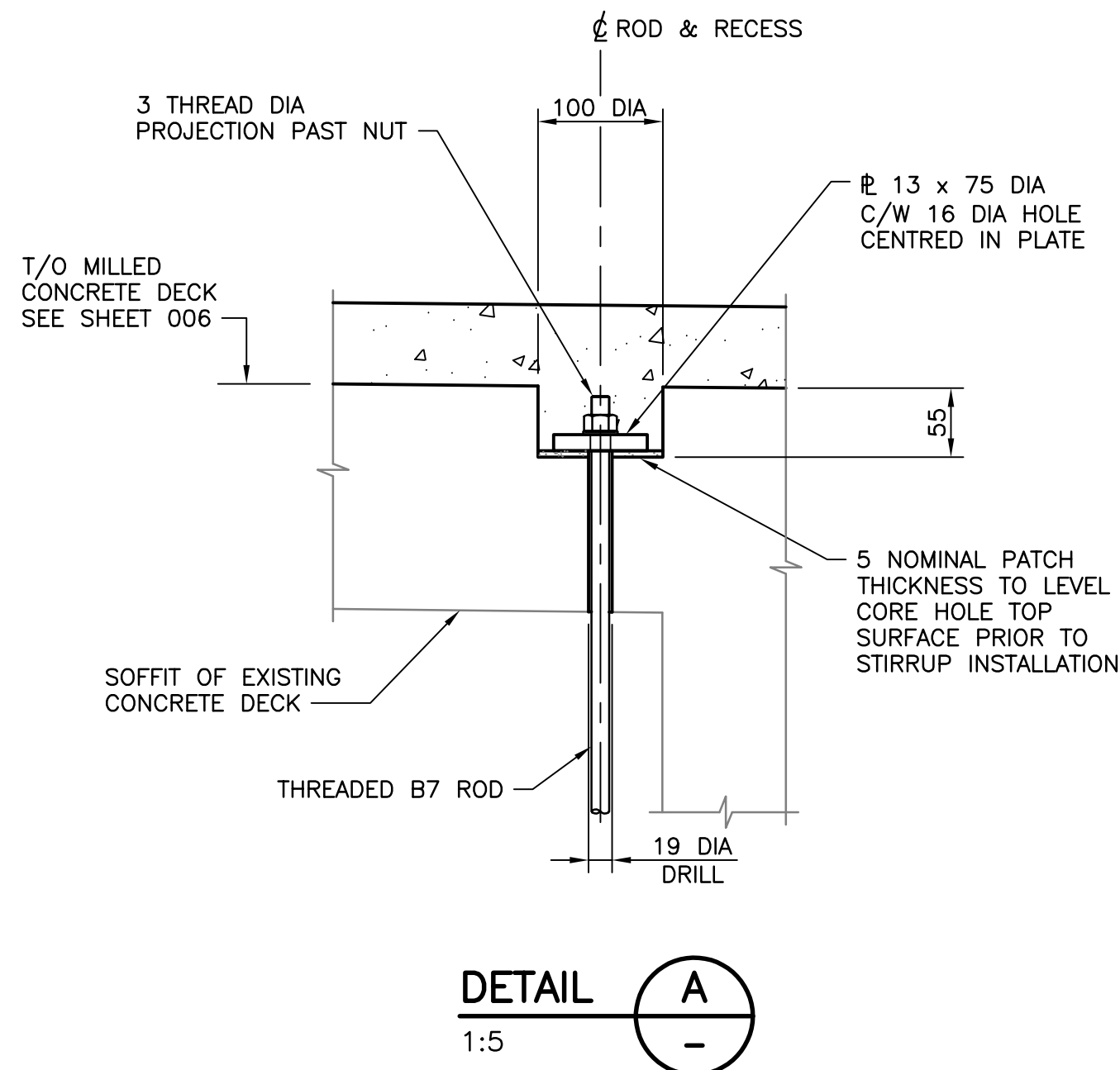
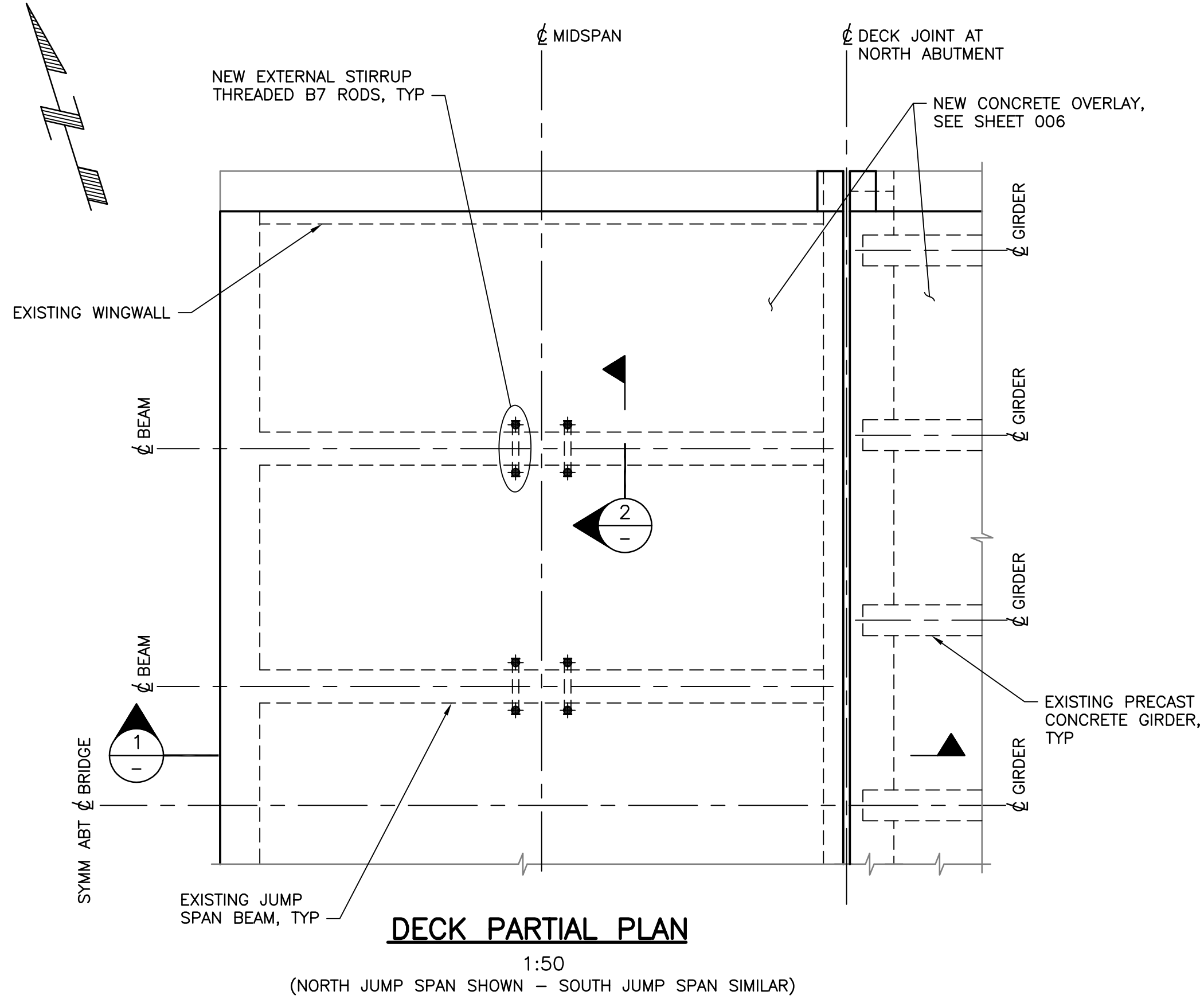
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#### EXTERNAL STIRRUP TIGHTENING PROCEDURE:

- STEP 1. INSTALL THREADED RODS WITH THE TOP END ANCHOR PLATE BEARING ON THE LEVELED SURFACE OF THE 100 DIAMETER DECK RECESS AVOIDING CLASH WITH EXISTING TRANSVERSE REINFORCEMENT.
- STEP 2. INSTALL LOWER BRACKET ON THE RODS FLUSH AGAINST THE BOTTOM OF THE BEAM. LIGHTLY GRIND THE BOTTOM OF THE BEAMS AS REQUIRED TO REMOVE HIGH POINTS, COATINGS OR DEBRIS THAT PREVENT A FLUSH FIT BETWEEN THE BEAM AND THE BRACKET.
- STEP 3. TIGHTEN THE FIRST BOTTOM NUTS WITH A SPUD WRENCH TO REMOVE SLACK IN THE ASSEMBLY AND TO MAINTAIN UNIFORM CONTACT BETWEEN THE BRACKET AND THE BOTTOM OF THE BEAM.
- STEP 4. THEN TIGHTEN EACH NUT AN ADDITIONAL FULL TURN OF THE NUT, APPLIED BY 1/2 TURN INCREMENTS ALTERNATING BETWEEN NUTS. THE TOP NUT SHALL BE RESTRAINED AGAINST ROTATION DURING TIGHTENING OF THE BOTTOM NUT.
- STEP 5. INSTALL SECOND BOTTOM NUT AGAINST FIRST NUT AND TACK WELD LOWER NUT TO THE THREADED ROD. CUT OFF EXCESS LENGTH OF THREADED RODS. REPAIR ZINC-COATING IN ACCORDANCE WITH SPECIFICATIONS.
- STEP 6. POUR FIBRE REINFORCED CONCRETE OVERLAY (SEE SHEET 006).

#### NOTES:

- EXTERNAL STIRRUP INSTALLATION TO OCCUR IN STAGES TO COORDINATE WITH OVERLAY STAGING.
- CONTRACTOR TO DETERMINE IF INSTALLATION OF EXTERNAL STIRRUPS CONSTITUTES WORKING IN CONFINED SPACES. ACCESS UNDERSIDE OF JUMP SPAN THROUGH ACCESS OPENING IN ABUTMENT BACKWALL.
- LOCATE EXISTING TRANSVERSE DECK REINFORCEMENT AND ADJUST STIRRUP LOCATIONS TO AVOID DAMAGING EXISTING TRANSVERSE REINFORCEMENT DURING CONCRETE REMOVAL.
- PATCHING BELOW PLATE IN RECESSES TO BE SELF-LEVELING, NON-SHRINK, CEMENTITIOUS TOPPING WITH A MINIMUM COMPRESSIVE STRENGTH OF 35 MPa AT 28 DAYS.
- STEEL:  
HSS: G40.21M GRADE 350W CLASS C  
OTHER: G40.21M GRADE 300W
- THREADED RODS:  
ASTM A193 GRADE B7 COMPLETE WITH NUTS TO ASTM A194.
- HOT DIP GALVANIZE ALL STEEL AFTER FABRICATION TO ASTM A123/A123M AND ASTM F2329/F2329M.
- WELDING TO CAN/CSA W59.

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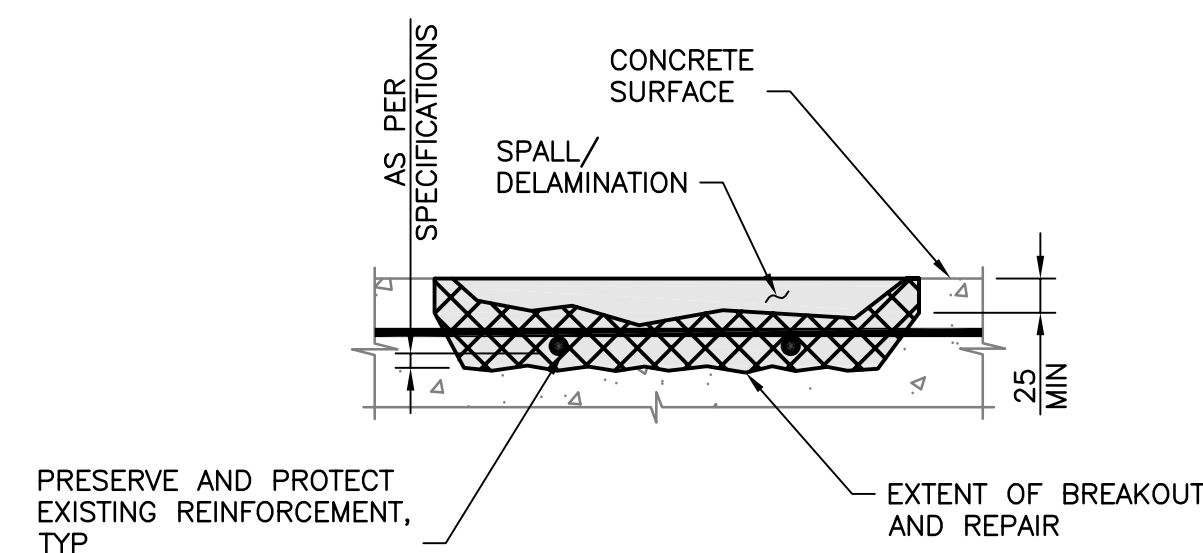
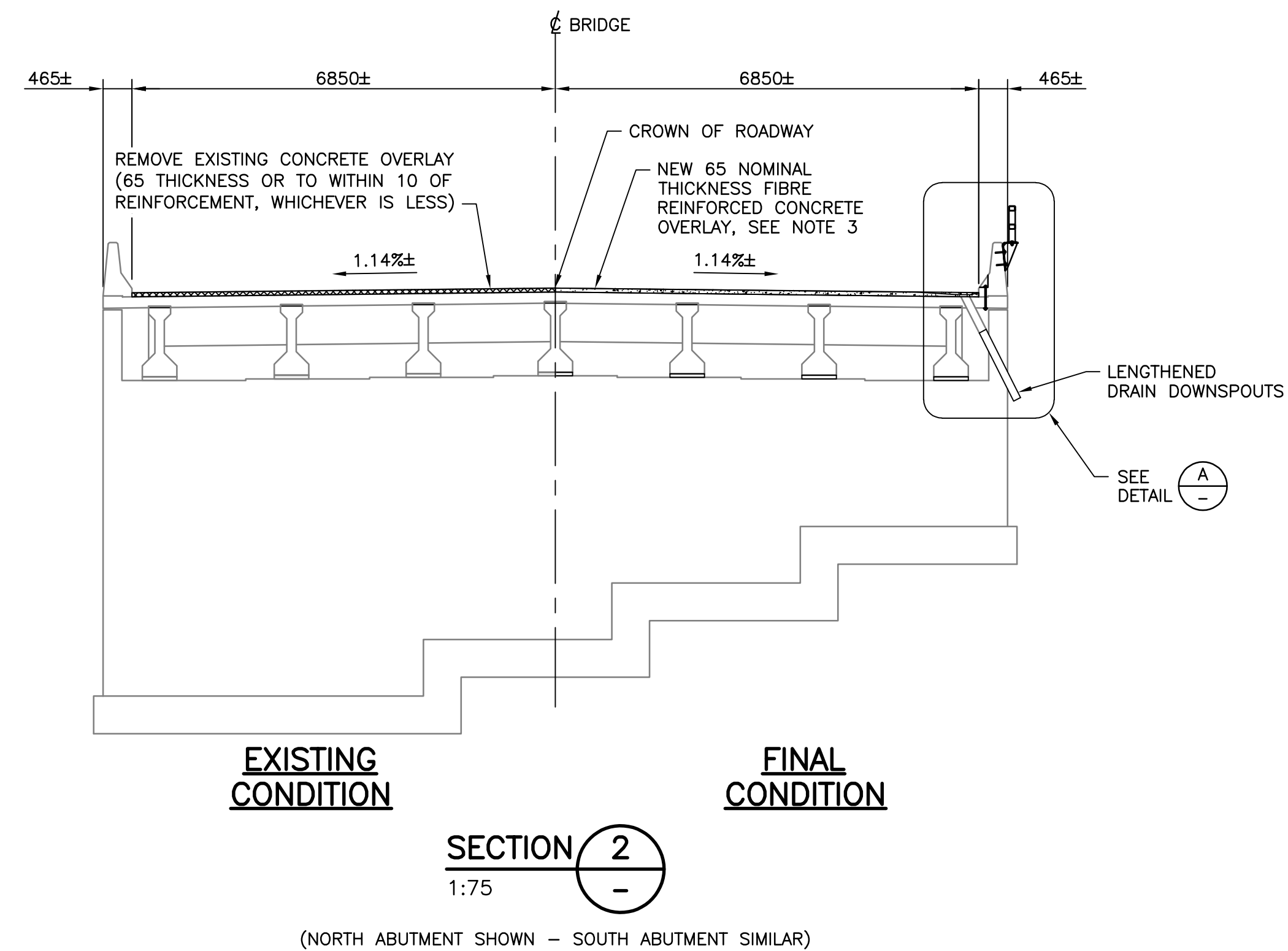
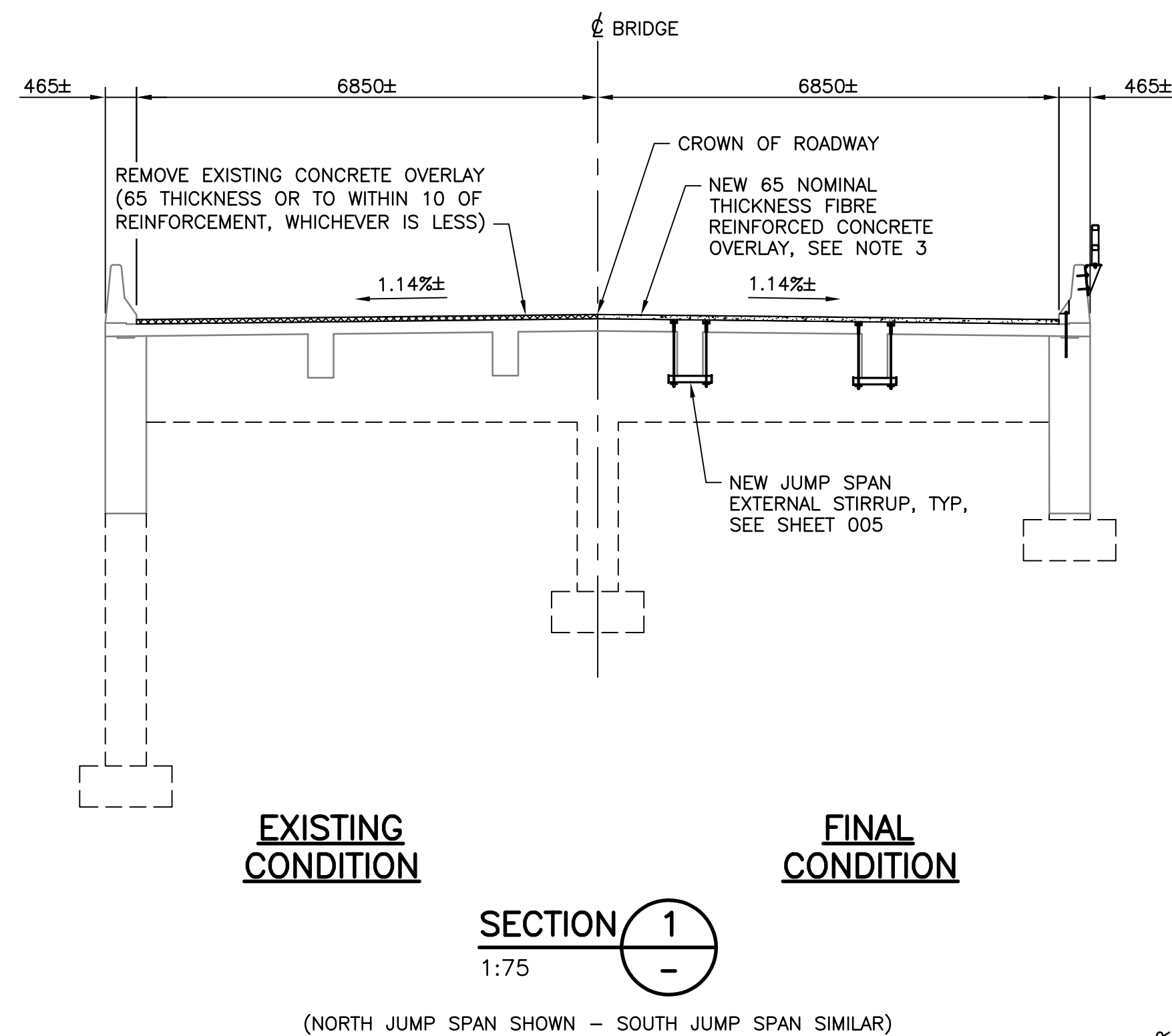
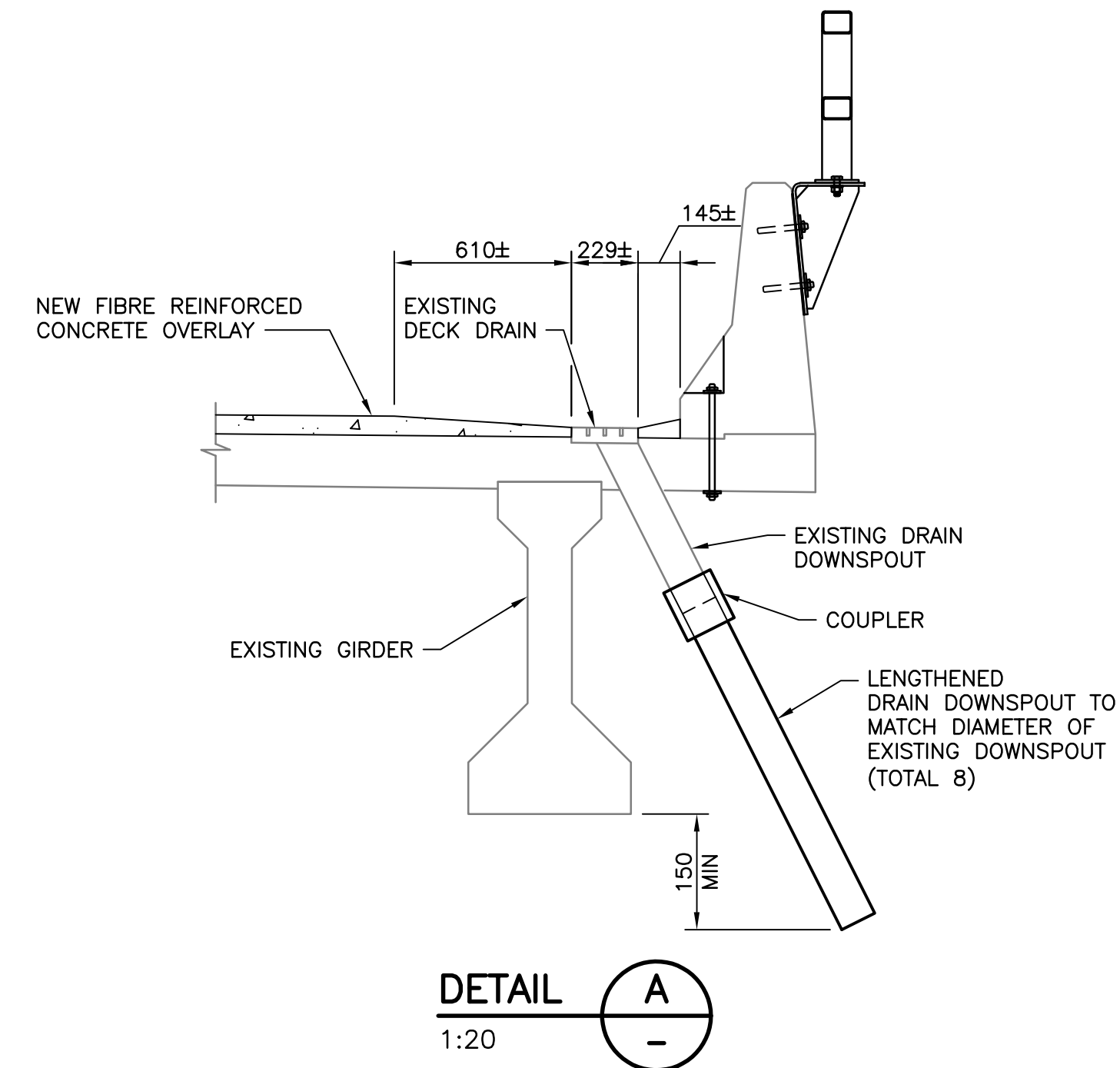
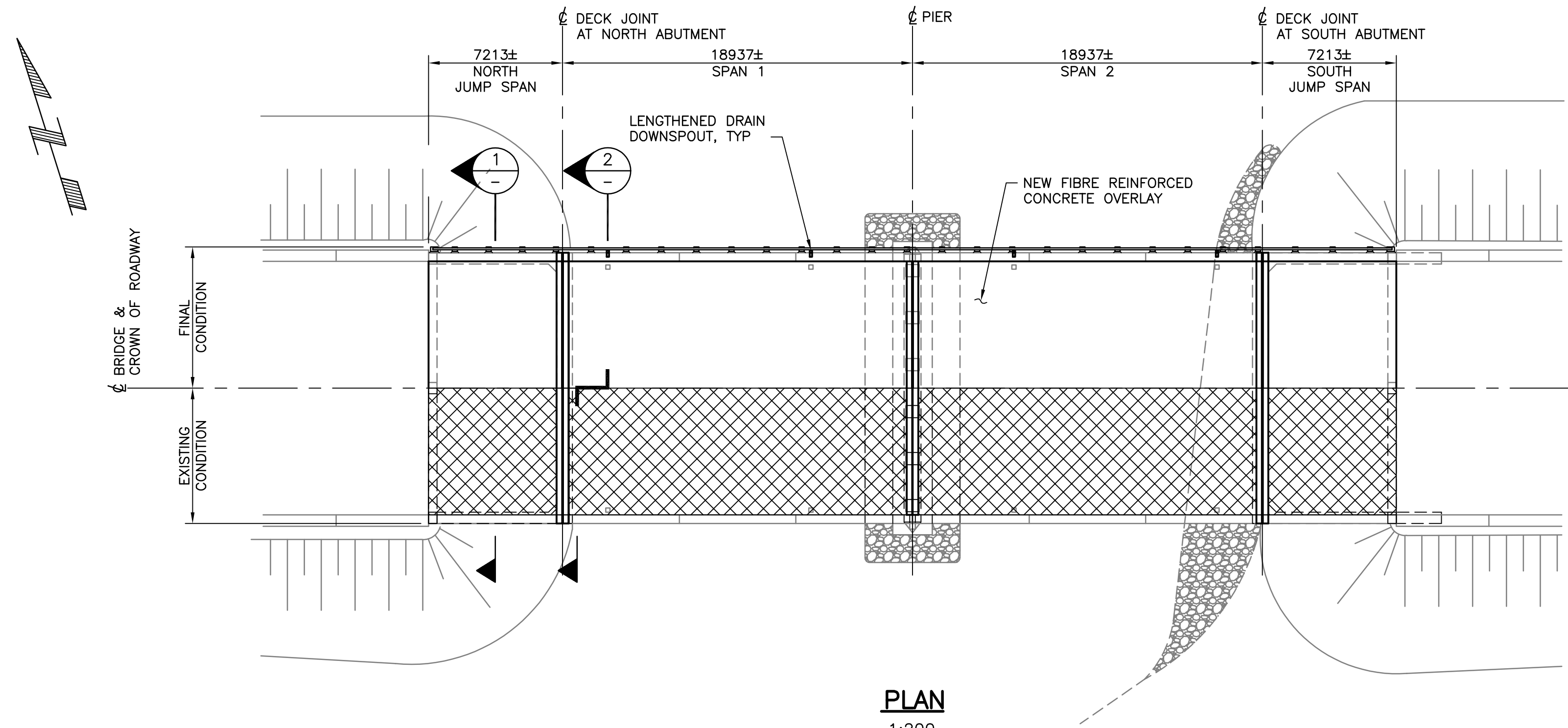
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Drawing title/Titre du dessin  
**JUMP SPAN**  
**EXTERNAL STIRRUPS**

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#### NOTES:

1. DECK MODIFICATIONS TO OCCUR IN THREE STAGES IN ACCORDANCE WITH SPECIFICATIONS.
2. MINIMUM COMPRESSIVE STRENGTH OF FIBRE REINFORCED CONCRETE: 45 MPa AT 28 DAYS.
3. MINIMUM COVER: 70 TO TOP OF SLAB. DEPARTMENTAL REPRESENTATIVE TO PROVIDE INPUT ON SETTING ELEVATIONS FOR RAILS OR HEADERS IN ACCORDANCE WITH SPECIFICATIONS.
4. STEEL:  
DRAIN DOWNSPOUT: CAN/CSA G40.21 GRADE 300W.
5. HOT DIP GALVANIZE ALL STEEL AFTER FABRICATION TO ASTM A123/A123M AND ASTM F2329/F2329M.
6. DECK PARTIAL DEPTH CONCRETE PATCH REPAIR AS DIRECTED BY DEPARTMENTAL REPRESENTATIVE IN ACCORDANCE WITH SPECIFICATIONS.

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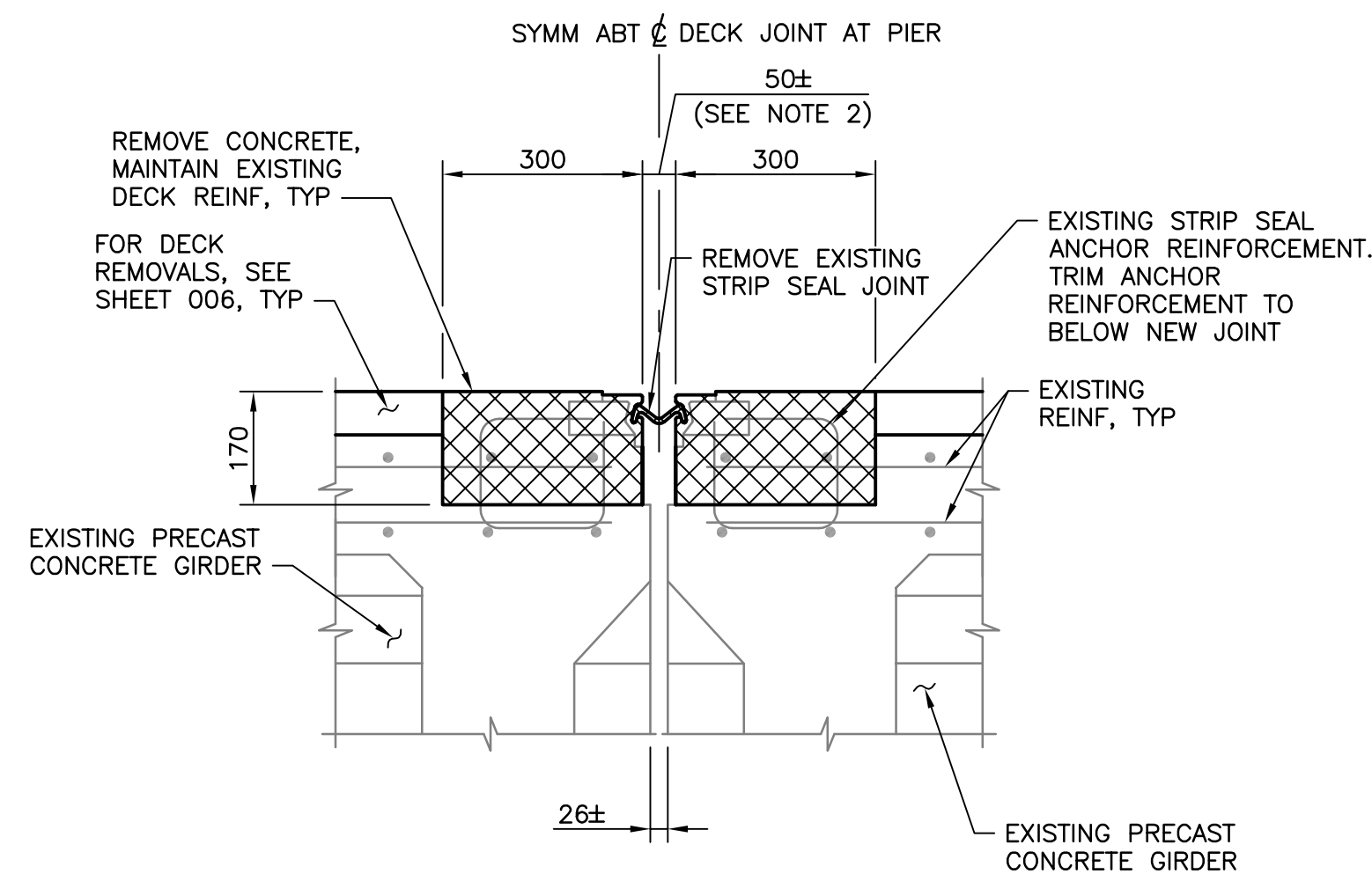
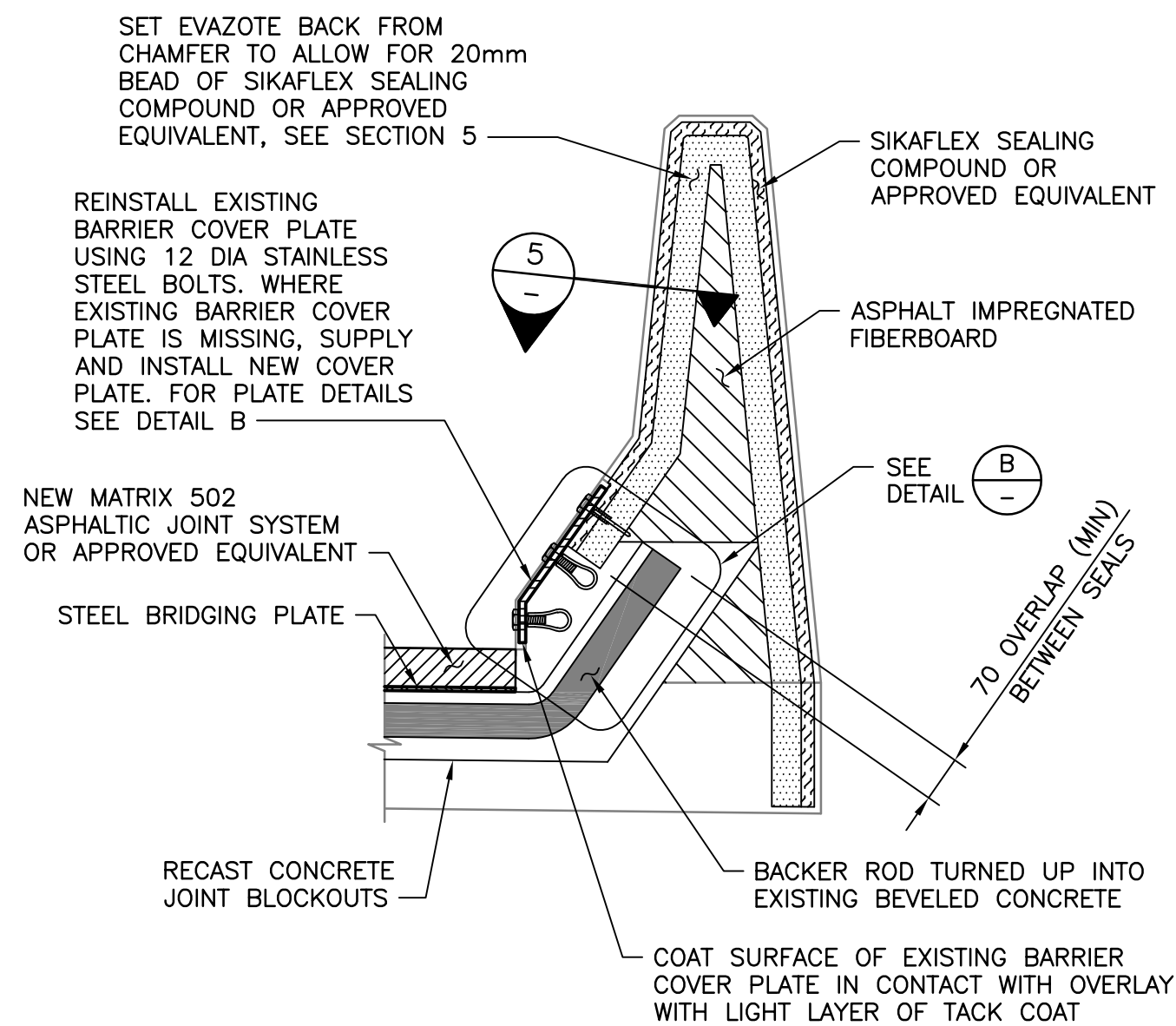
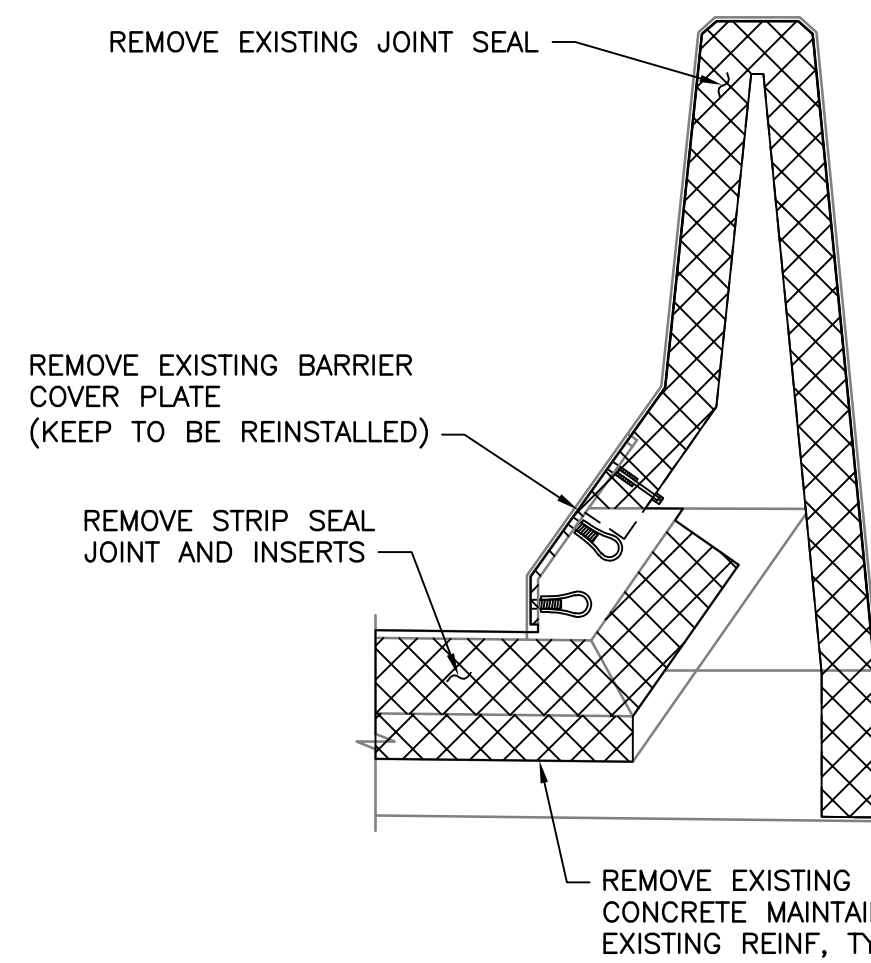
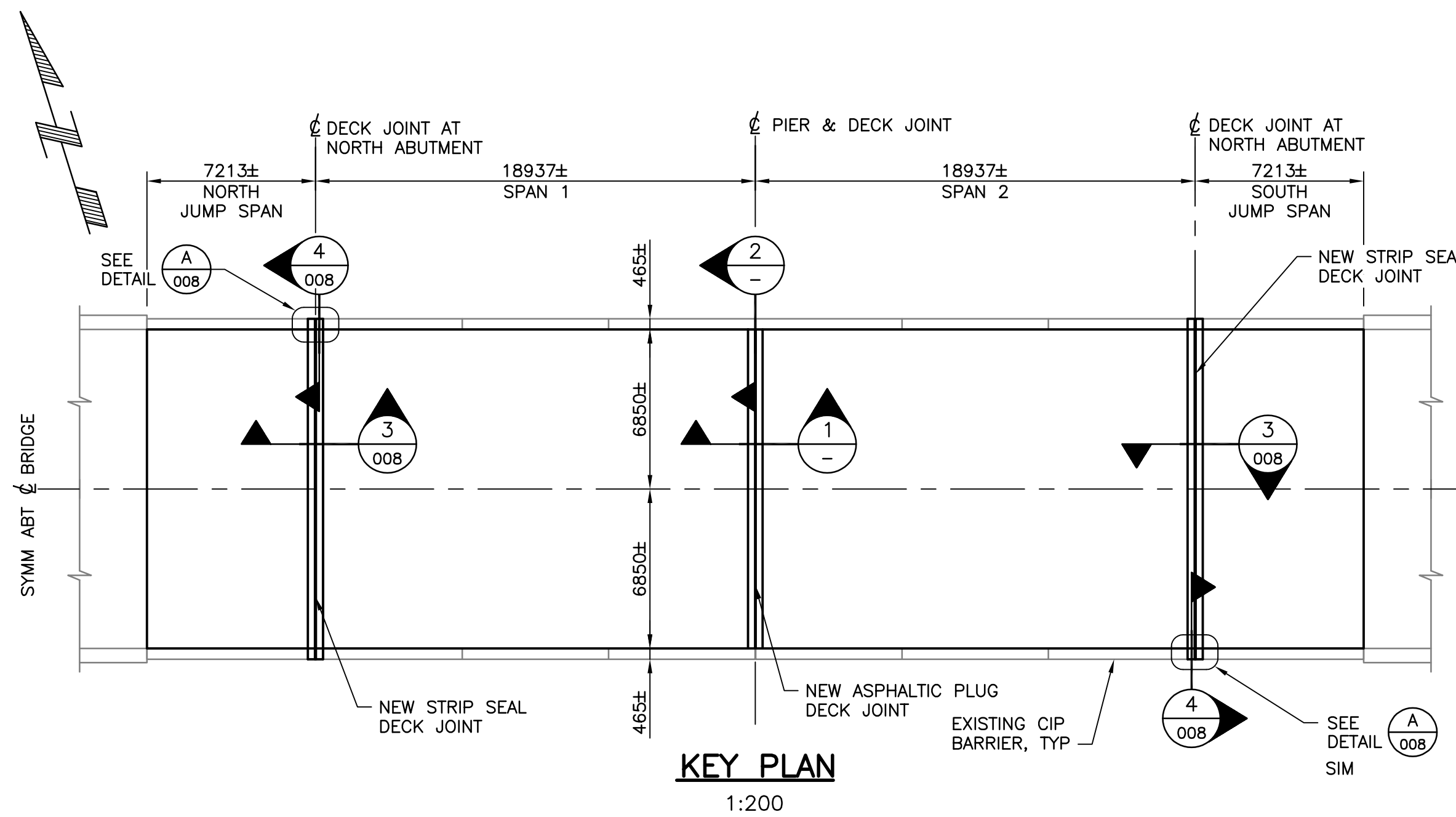
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DECK MODIFICATIONS

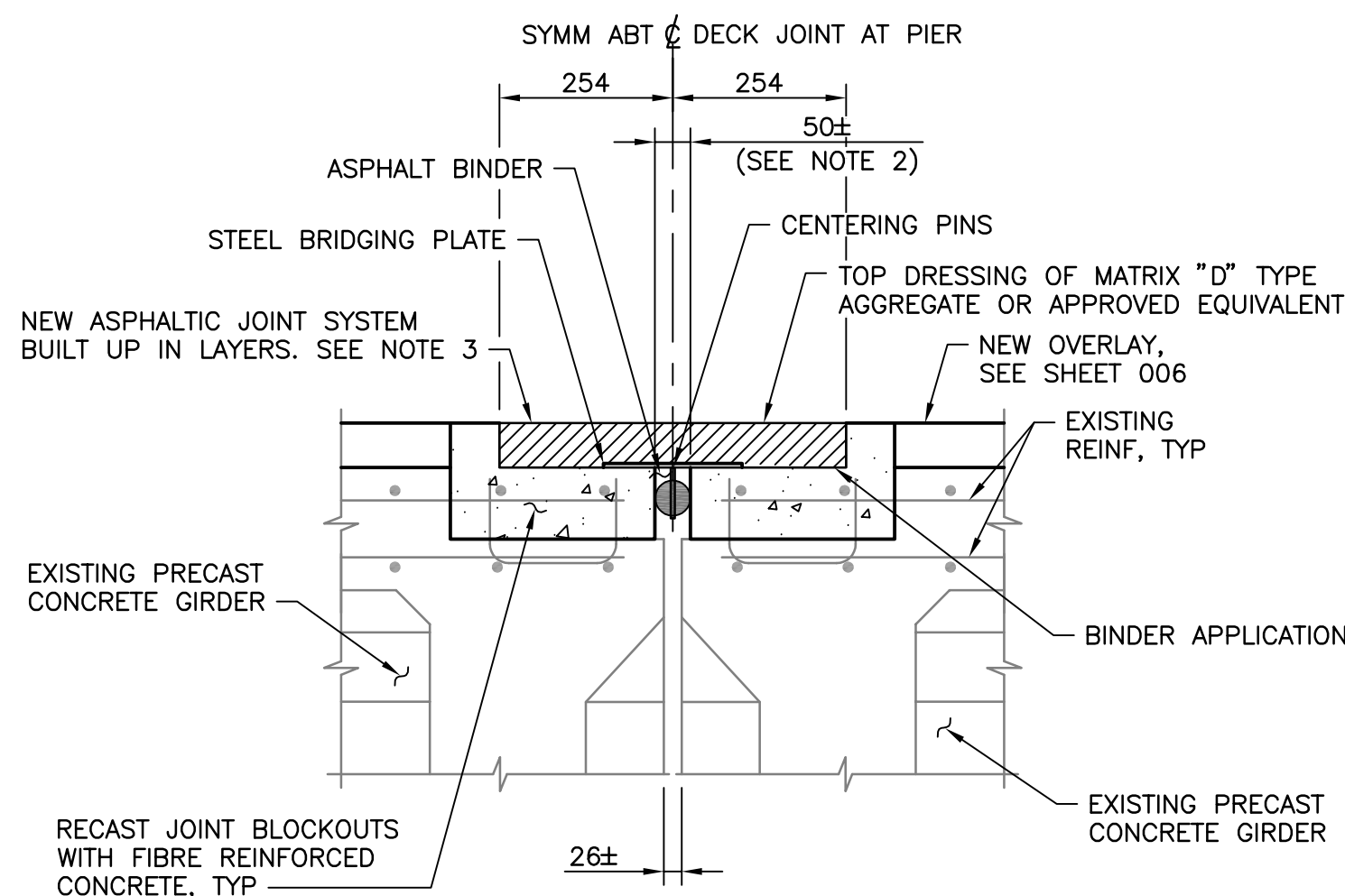
Project No./No. du projet 1343-03	Sheet/Feuille 006 OF	Revision no./ La Révision no. 0
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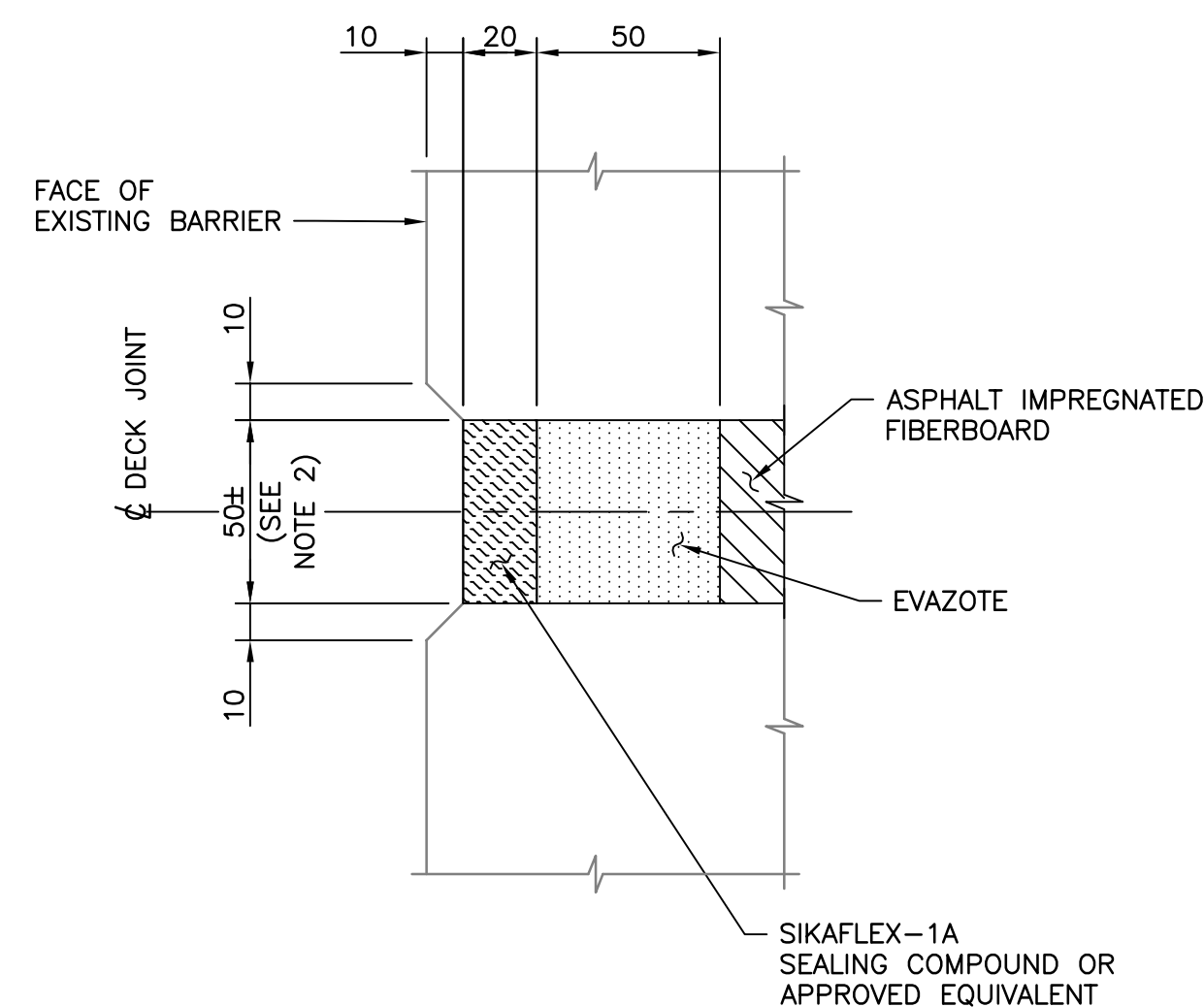
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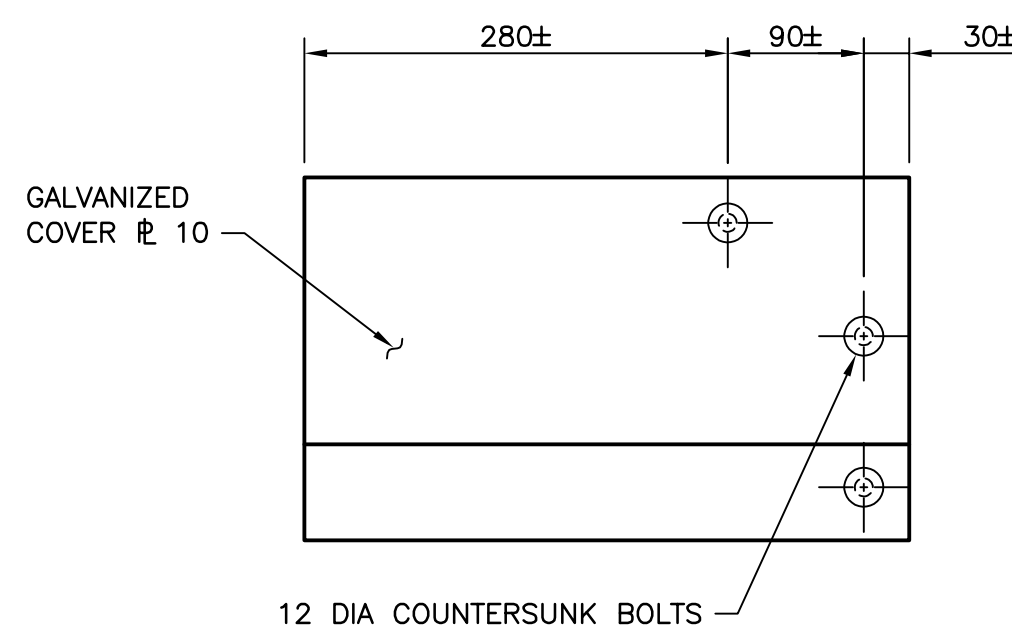
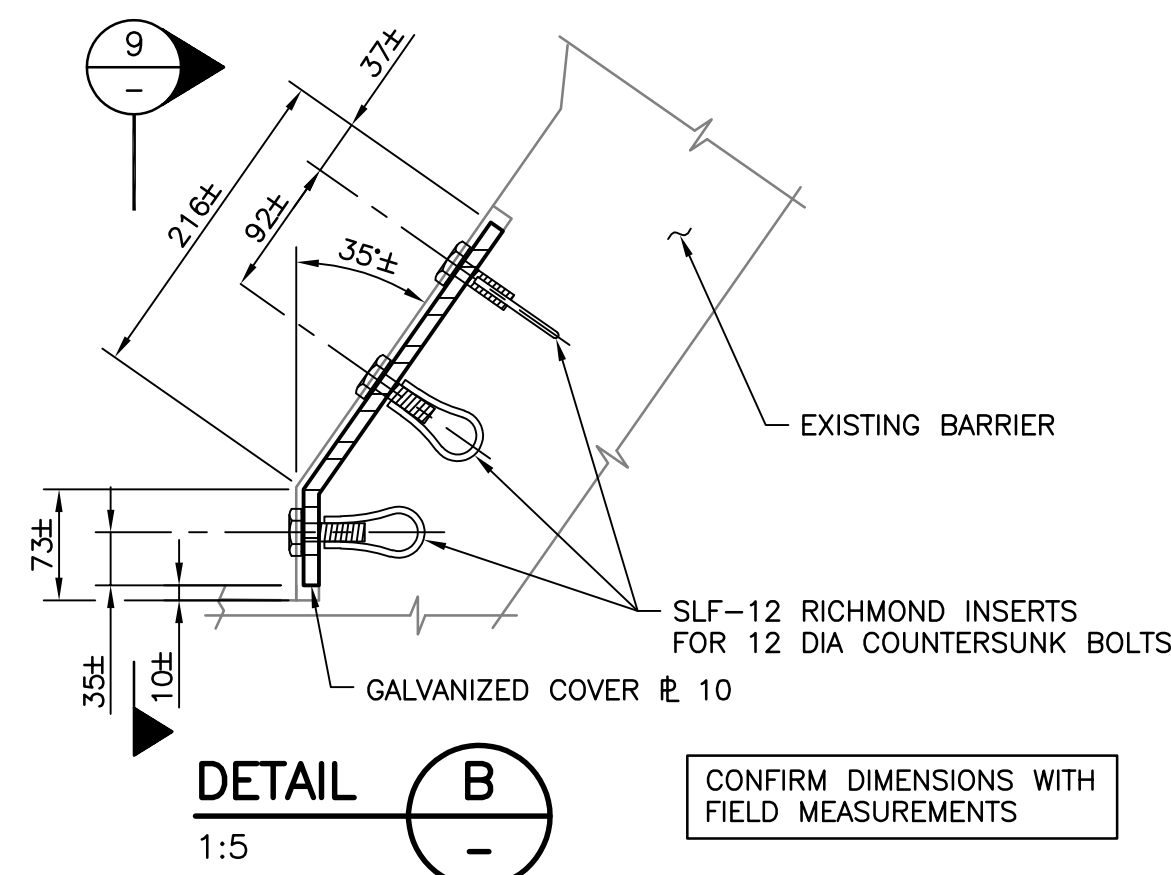
SECTION 1  
1:10  
REMOVALS  
(DIAPHRAGM REINFORCEMENT NOT SHOWN)



SECTION 1  
1:10  
FINAL CONDITION  
(DIAPHRAGM REINFORCEMENT NOT SHOWN)



SECTION 5  
1:2



#### NOTES:

- DECK JOINTS REPLACEMENT TO OCCUR IN THREE STAGES IN ACCORDANCE WITH SPECIFICATIONS.
- CONTRACTOR TO VERIFY GAP WIDTH AND PROVIDE DEPARTMENTAL REPRESENTATIVE.
- ASPHALTIC PLUG JOINT SYSTEM: CRAFCO 501 OR 502 ASPHALTIC PLUG BRIDGE JOINT SYSTEM, DS BROWN MATRIX 502 ASPHALTIC EXPANSION JOINT SYSTEM, WATSON BOWMAN ACME WABO EXPANDEX JOINT SYSTEM OR APPROVED EQUIVALENT, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- MINIMUM COMPRESSIVE STRENGTH OF FIBRE REINFORCED CONCRETE: 45 MPa AT 28 DAYS.
- STEEL: CAN/CSA G40.21 GRADE 300W.
- HOT DIP GALVANIZE ALL STEEL AFTER FABRICATION TO ASTM A123/A123M AND ASTM F2329/F2329M.
- STAINLESS STEEL BOLTS: ASTM A593.

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Revision/	Description/Description	Date/Date
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Client/client	Parks Canada Agency	L'Agence Parcs Canada
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Project title/Titre du projet  
BRIDGE REHABILITATION  
KOOTENAY NATIONAL PARK, BRITISH COLUMBIA

KM 40.6 HIGHWAY 93S  
VERMILION RIVER BRIDGE

Approved by/Approuvé par  
DPG

Designed by/Concept par  
VNBB/JUGN

Drawn by/Dessiné par  
JAGN

PWGSC Project Manager/Administrateur de Projets TPSGC

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

Client/client

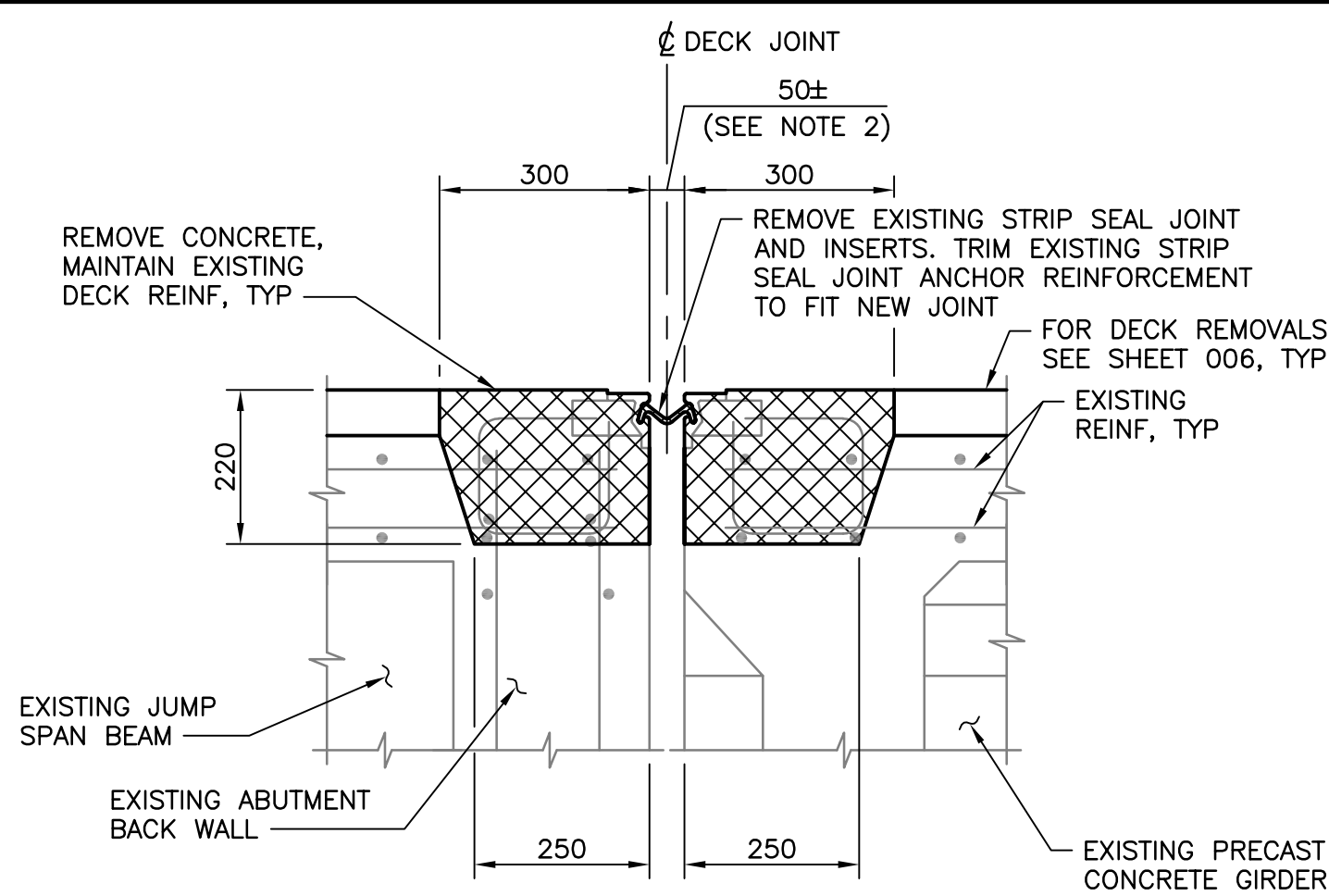
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DECK JOINT REPLACEMENT 1

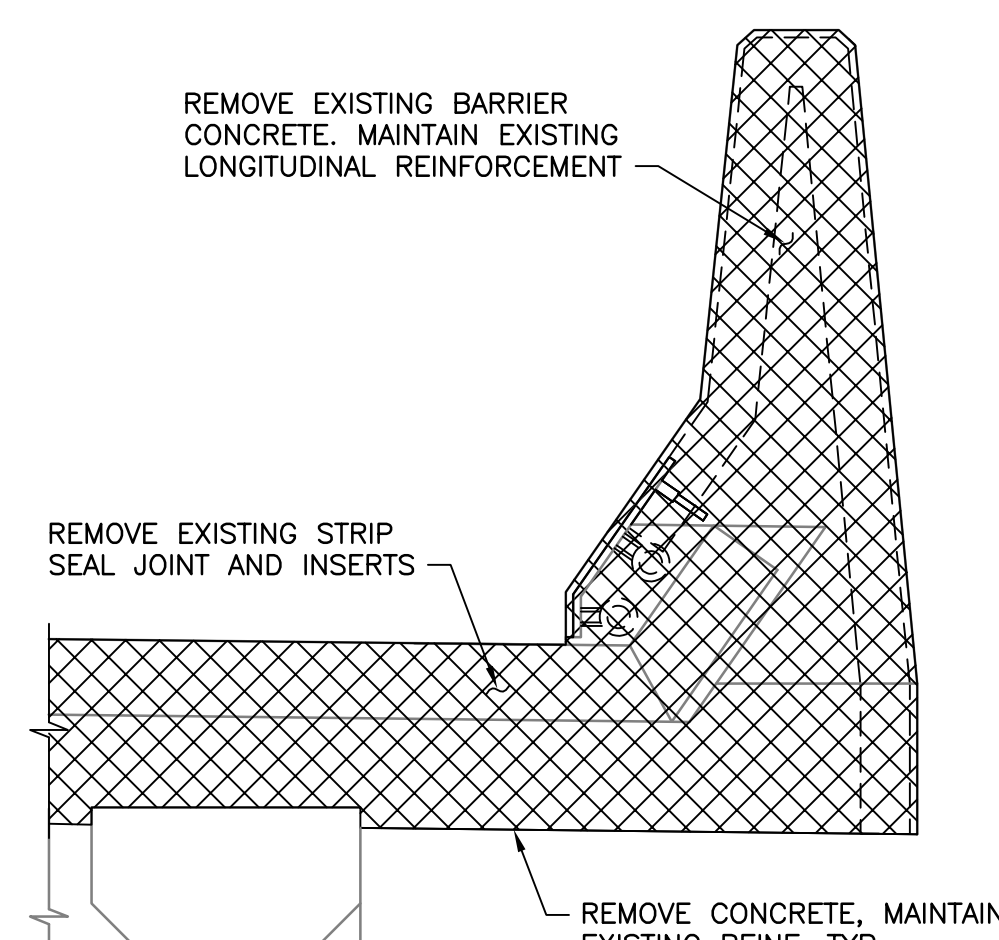
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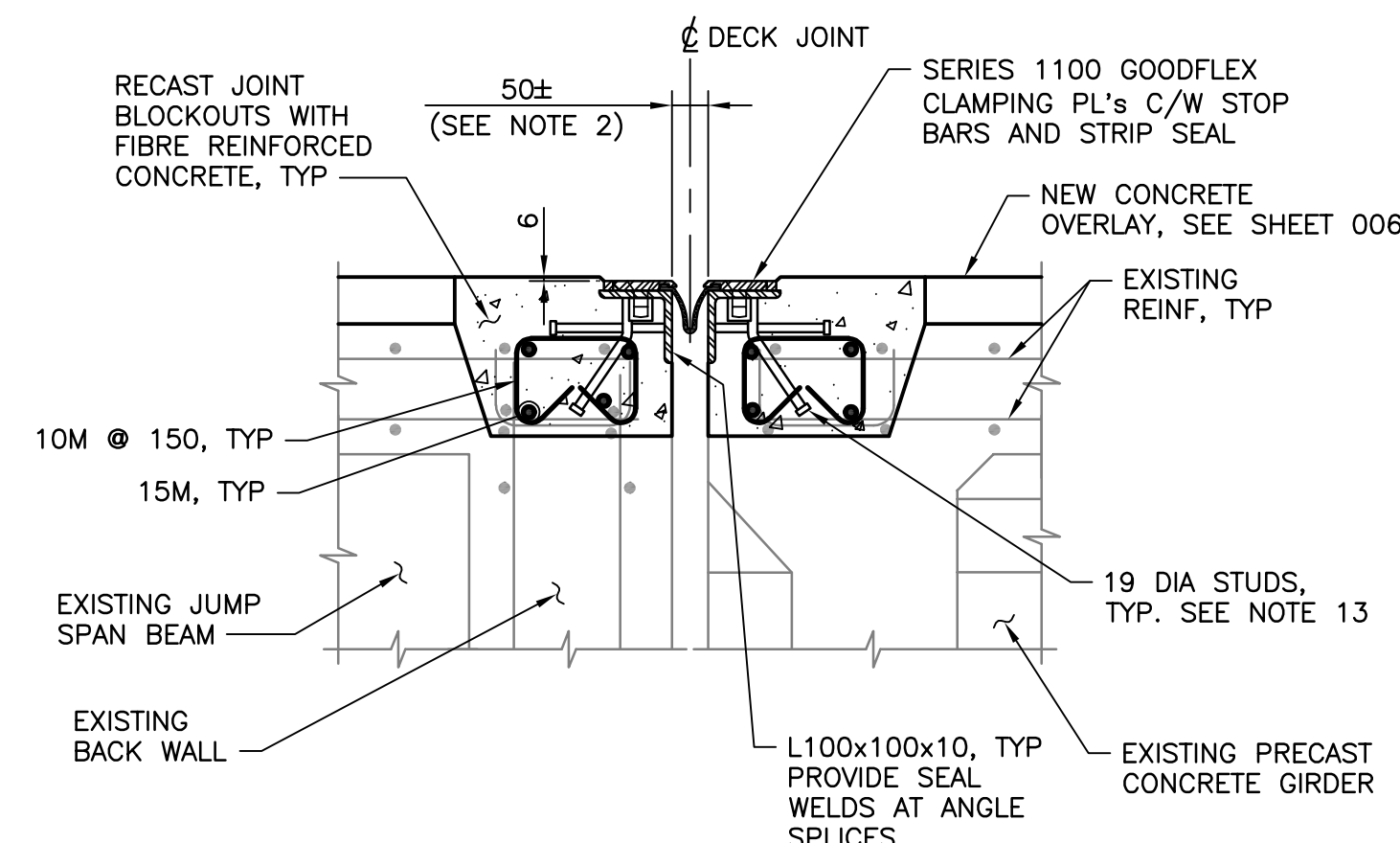
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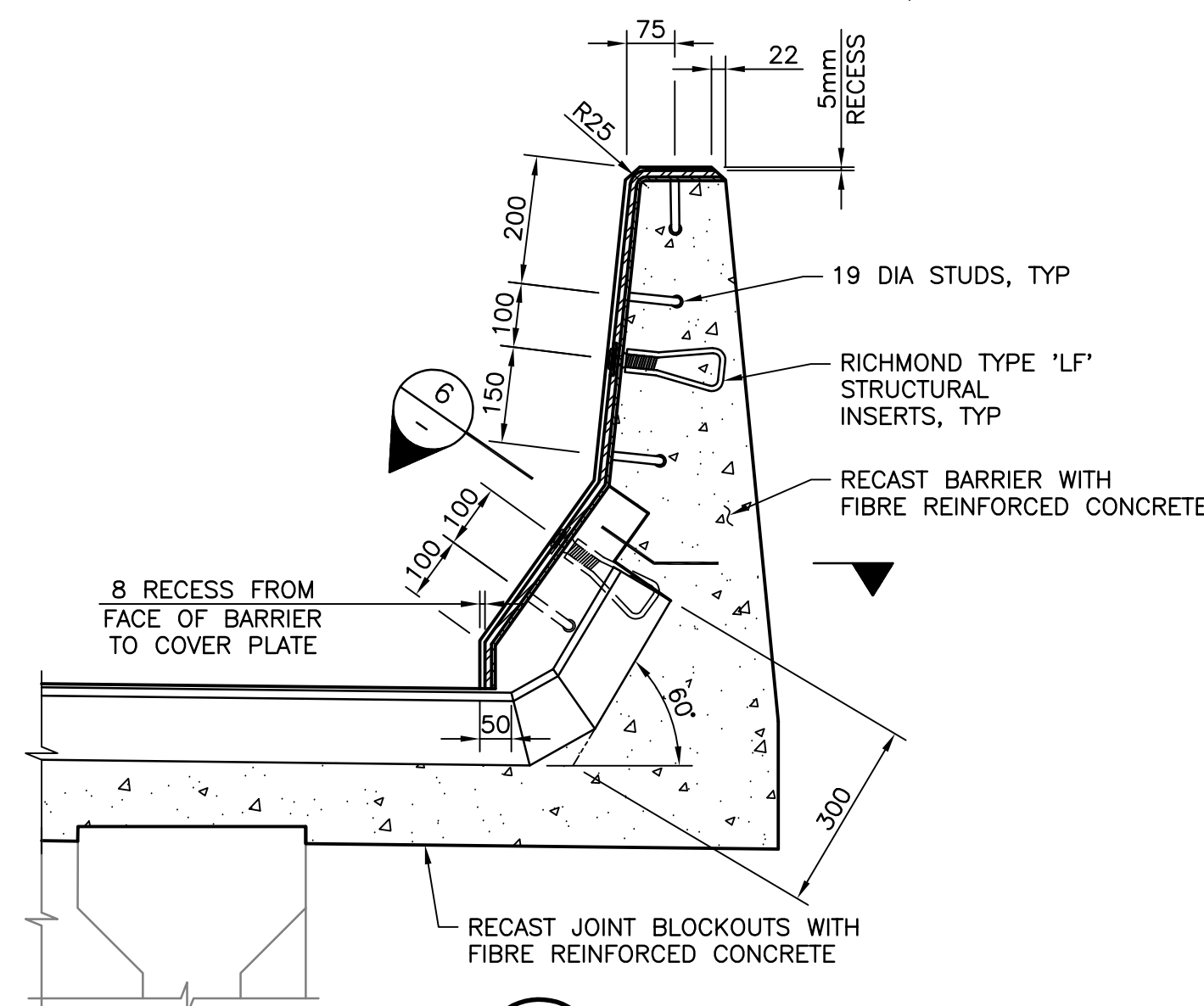
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1:10 007



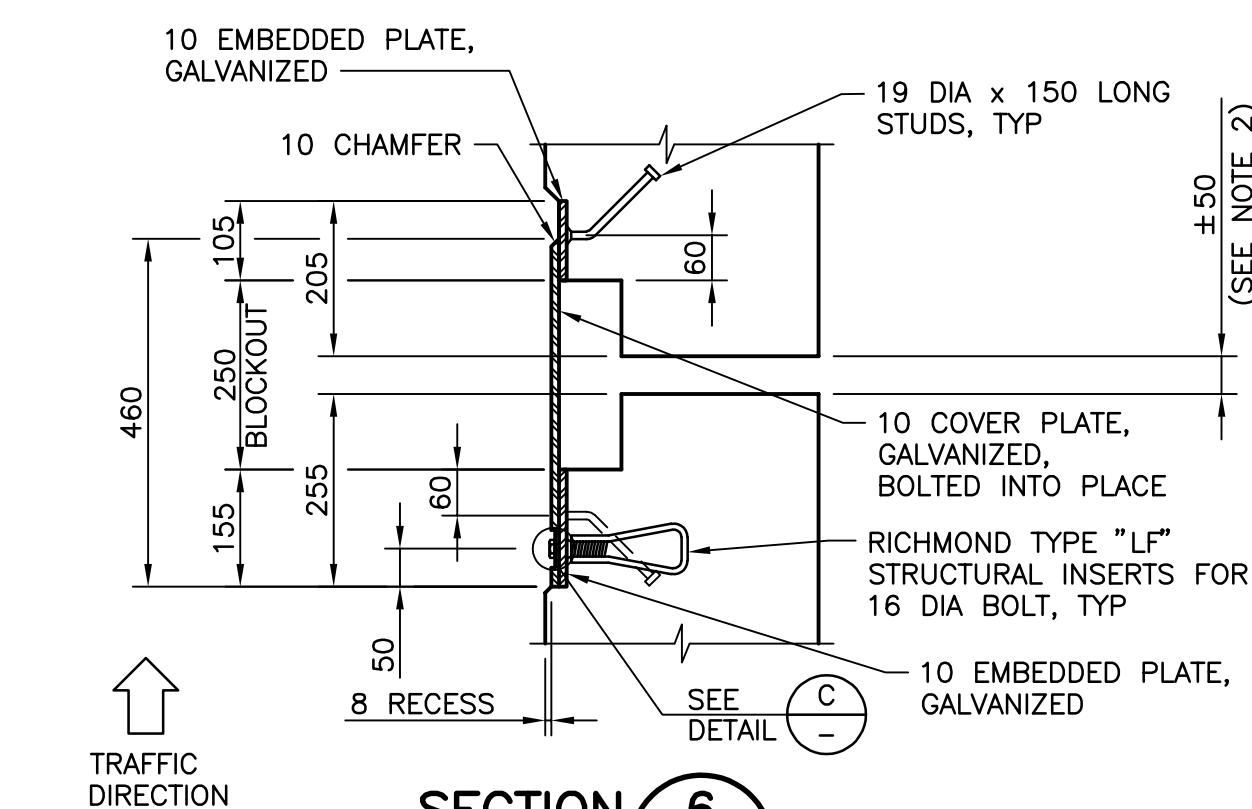
SECTION 4 REMOVALS  
1:10 007 (SECTION THROUGH MAIN SPAN DECK SHOWN)



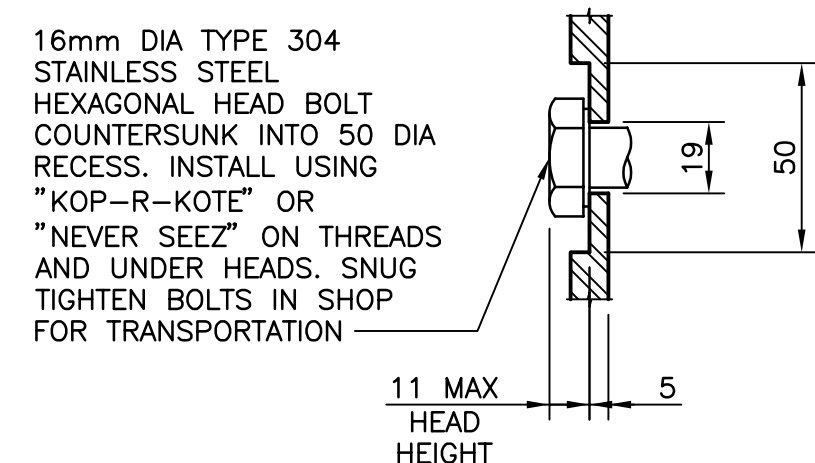
SECTION 3 FINAL CONDITION  
1:10 007



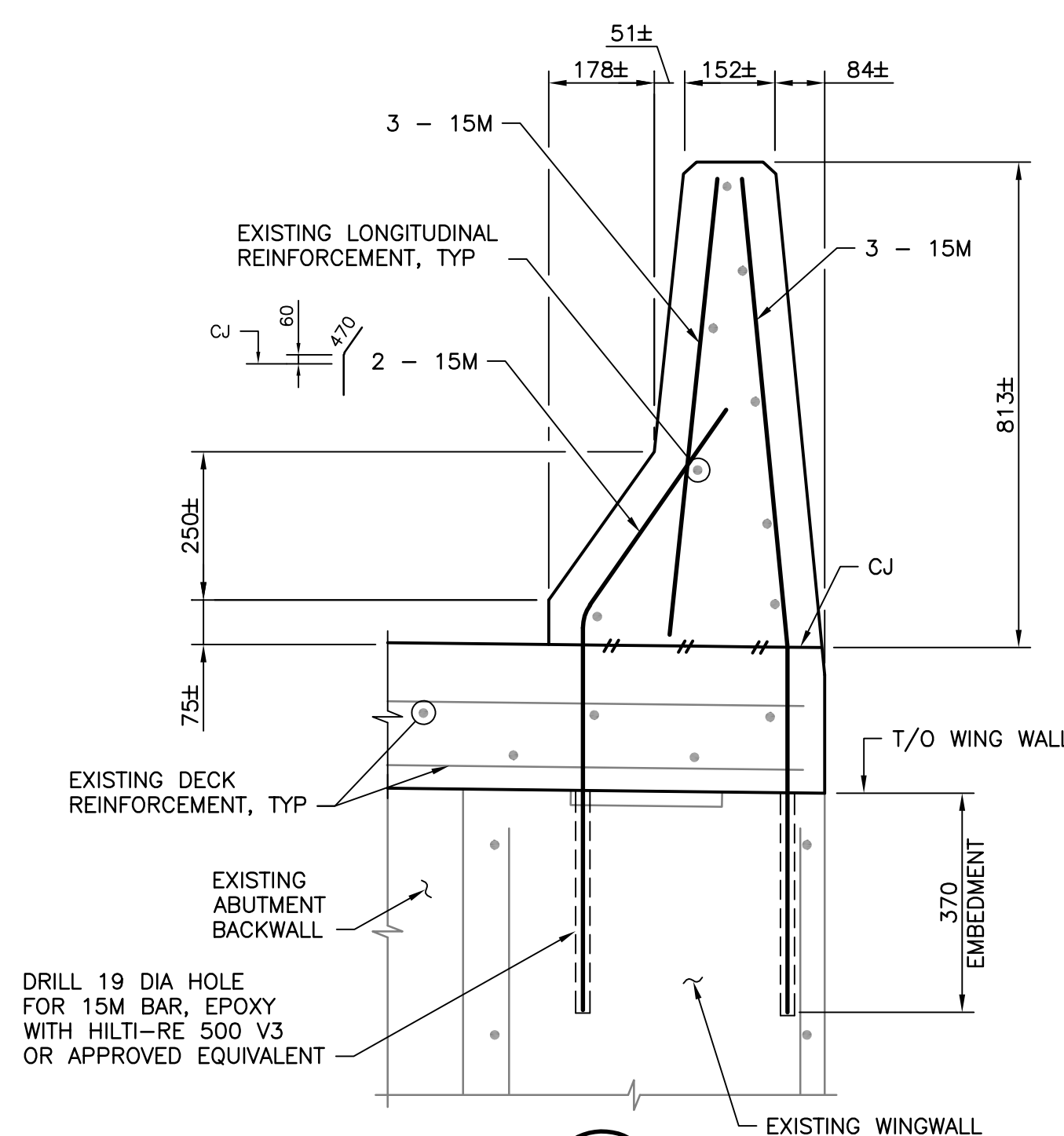
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1:10 007 (SECTION THROUGH MAIN SPAN DECK SHOWN)



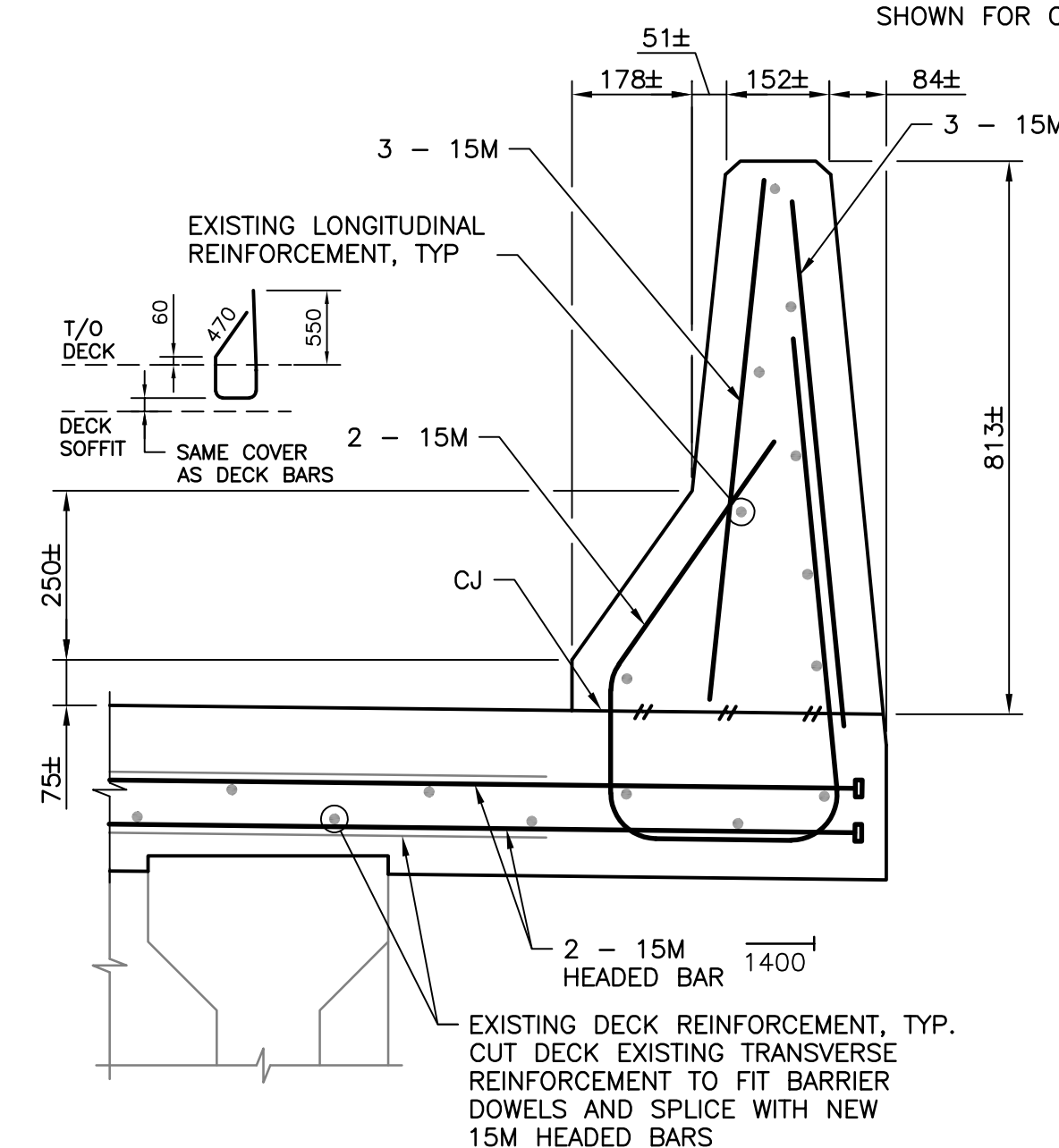
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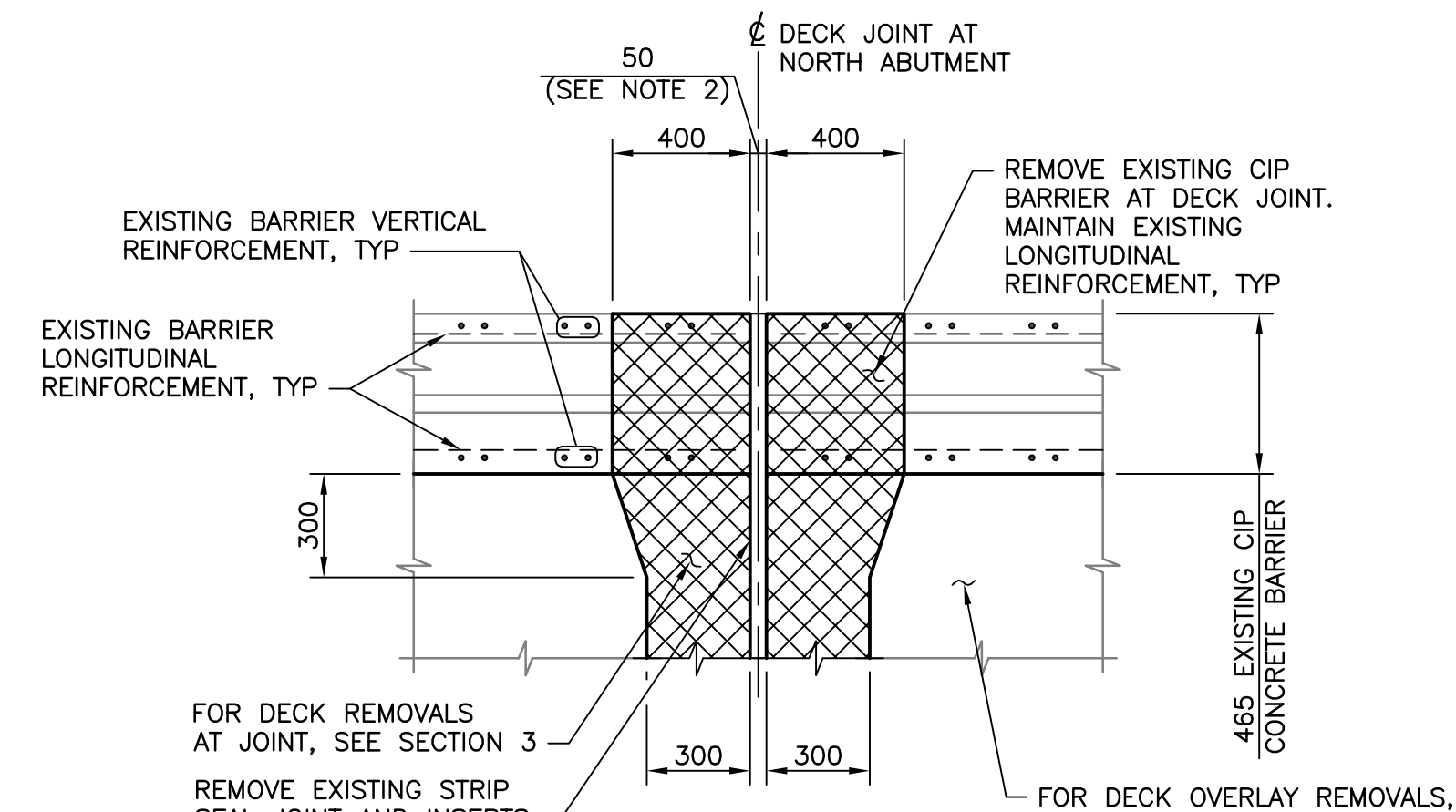
DETAIL C  
1:2 -



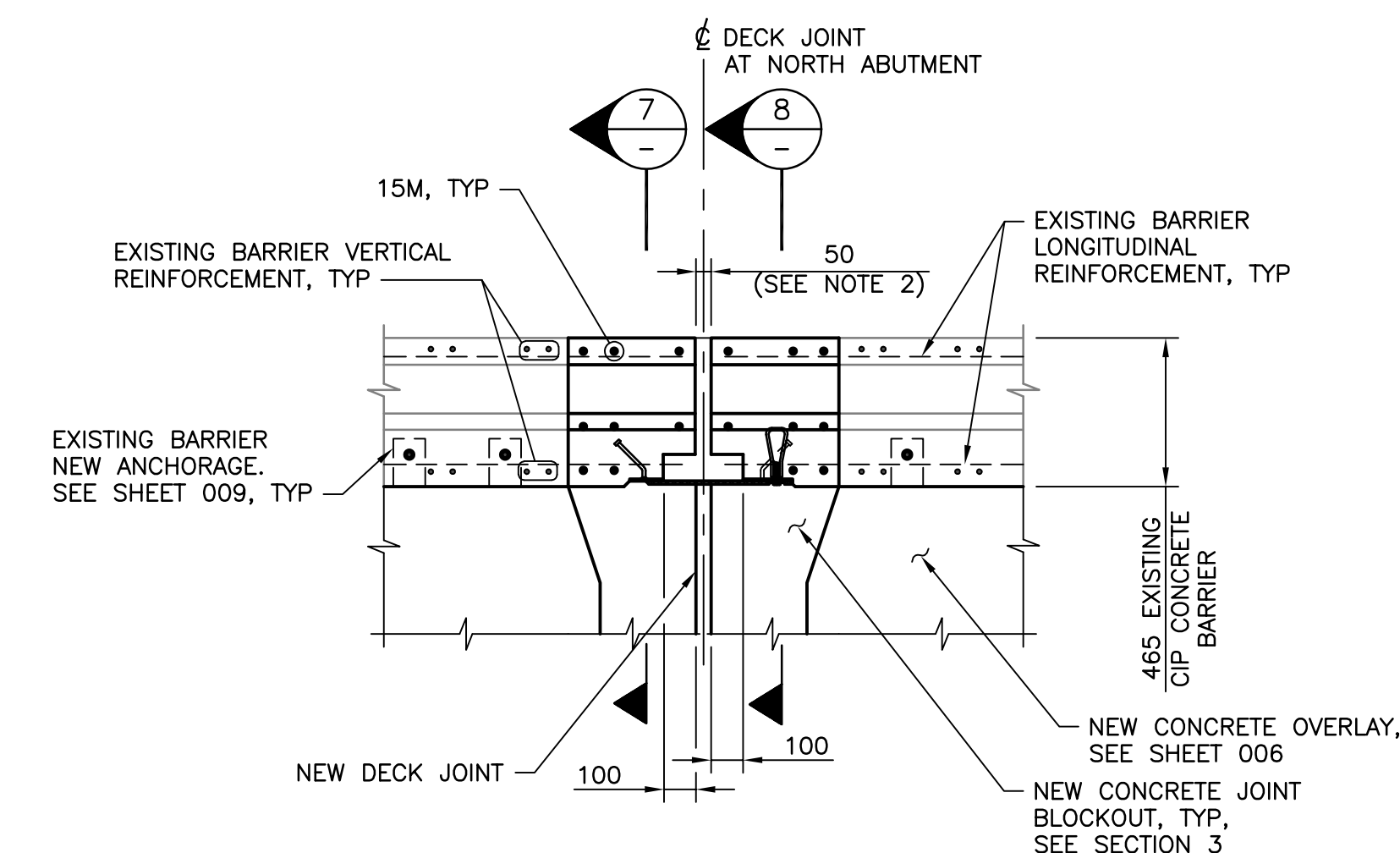
SECTION 7  
1:10 - (NEW DECK JOINTS AND COVER PLATES NOT SHOWN FOR CLARITY)



SECTION 8  
1:10 - (NEW DECK JOINTS AND COVER PLATES NOT SHOWN FOR CLARITY)



DETAIL A REMOVALS  
1:20 007



DETAIL A FINAL CONDITION  
1:20 007

(DECK JOINT DETAILS NOT SHOWN FOR CLARITY)

#### NOTES:

- DECK JOINTS REPLACEMENTS TO OCCUR IN THREE STAGES IN ACCORDANCE WITH SPECIFICATIONS.
- CONTRACTOR TO VERIFY GAP WIDTH AND PROVIDE DEPARTMENTAL REPRESENTATIVE.
- NEW DECK JOINTS "GOODFLEX SERIES 1100 BY GOODCO Z-TECH" AND NEW JOINT NEOPRENE SEAL "GOODCO FL-75" OR APPROVED EQUIVALENT, INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
- NEW CIP BARRIER SEGMENTS GEOMETRY TO MATCH EXISTING BARRIER GEOMETRY.
- MINIMUM COMPRESSIVE STRENGTH OF FIBRE REINFORCED CONCRETE: 45 MPa AT 28 DAYS.
- REINFORCING STEEL: CAN/CSA G30.18M GRADE 400W.
- HEADED BAR: CAN/CSA G30.18, GRADE 400W. HEADED BAR TO MEET REQUIREMENTS OF ACI 318 WITH HEADS TO ASTM A970, HA HEADS.
- STEEL: CAN/CSA G40.21 GRADE 300W.
- STAINLESS STEEL BOLTS: ASTM F593.
- STUDS: CAN/CSA W59 ANNEX H, TYPE B.
- MINIMUM COVER: 70 TO TOP OF SLAB  
50 ALL OTHER
- MINIMUM LAP LENGTH IS 500 UNLESS NOTED OTHERWISE.
- DOWEL NEW REINFORCEMENT INTO EXISTING WINGWALL IN ACCORDANCE WITH EPOXY MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. HOLES SHALL BE HAMMER DRILLED.

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Revision/	Description/Description	Date/Date

Client/client	Parks Canada Agency	L'Agence Parcs Canada
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**BRIDGE REHABILITATION  
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Drawing title/Titre du dessin

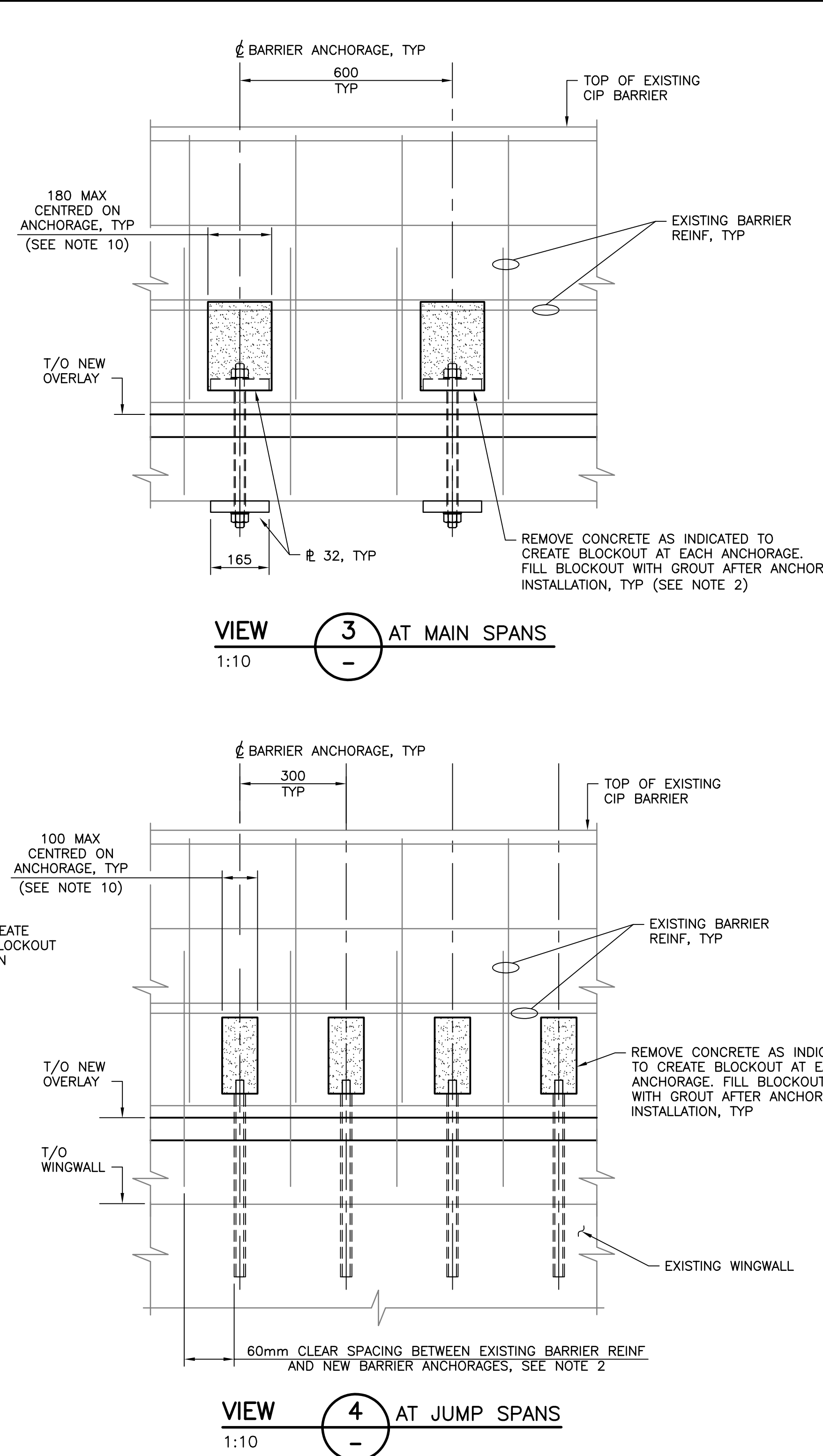
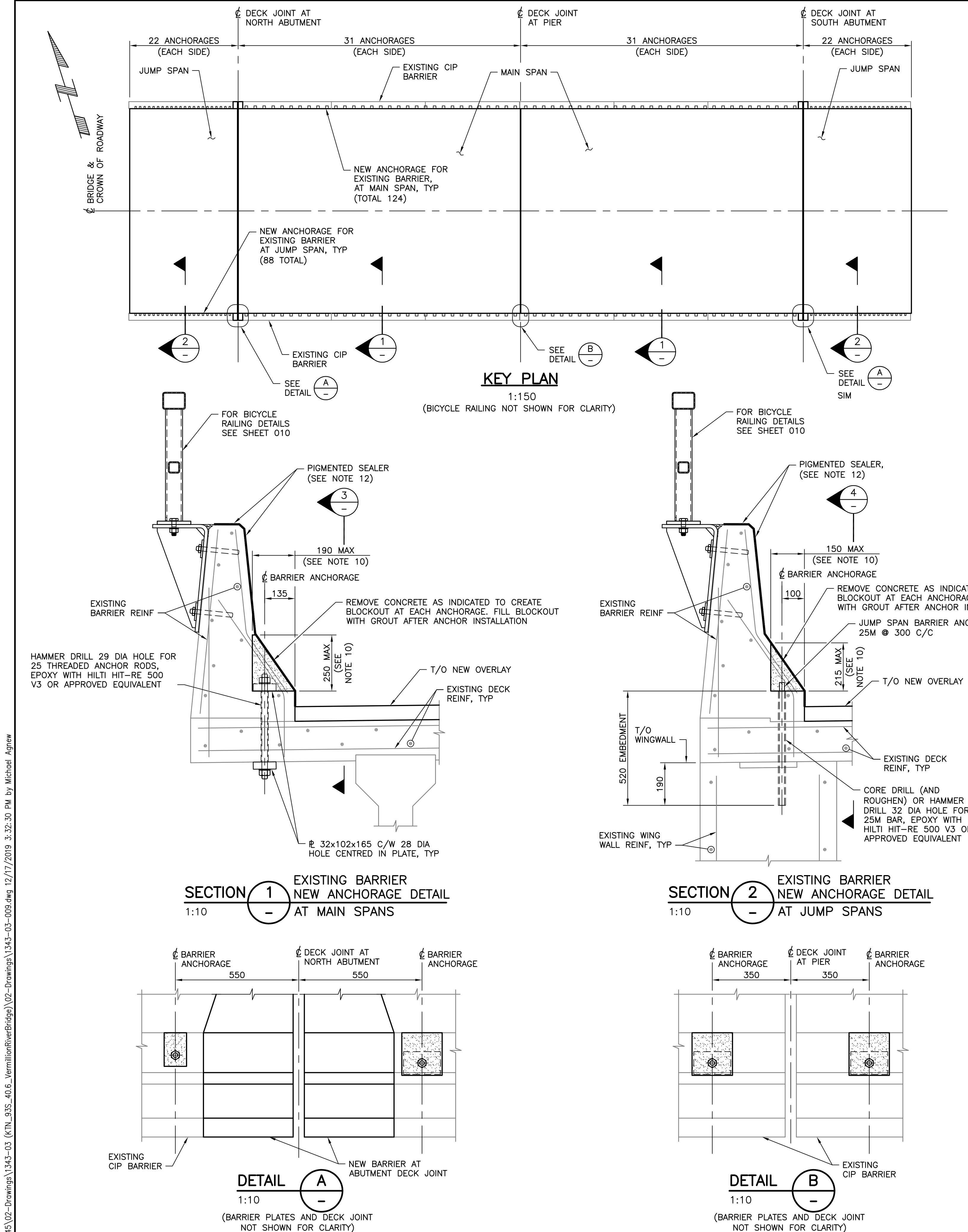
**DECK JOINT REPLACEMENT 2**

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1343-03	008 OF	0



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PWGSC - A1 - 841X594



#### NOTES:

- EXISTING CIP BARRIER ANCHORAGE INSTALLATION TO OCCUR IN STAGES IN ACCORDANCE WITH SPECIFICATIONS.
- CONTRACTOR TO LOCATE EXISTING BARRIER AND DECK REINFORCEMENT PRIOR TO REMOVING CONCRETE AS INDICATED AND DRILLING HOLES.
- REINFORCING STEEL: CAN/CSA G30.18M GRADE 400W.
- STEEL: CAN/CSA G40.21 GRADE 300.
- ANCHOR RODS: ASTM F1554 GRADE 105, INCLUDING SUPPLEMENTARY REQUIREMENT S4 FOR CHARPY IMPACT TESTING AT -29°C ACCORDING TO ASTM A673/A673M.
- NUTS AND WASHERS: ASTM A563 AND ASTM F436.
- HOT DIP GALVANIZE ALL STEEL AFTER FABRICATION TO ASTM A123/A123M AND ASTM F2329/F2329M.
- MINIMUM COVER: 50 UNLESS NOTED OTHERWISE.
- MINIMUM COMPRESSIVE STRENGTH OF SHRINKAGE COMPENSATING GROUT: 45MPa at 28 DAYS.
- REMOVE CONCRETE AS REQUIRED FOR ANCHORAGES INSTALLATION WITHIN LIMITS AS INDICATED.
- POST-INSTALLED EPOXY ANCHORAGES TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. HOLES SHALL BE DRILLED IN ACCORDANCE WITH SPECIFICATIONS.
- APPLY CONCRETE SEALER SIKAGARD COLOR A-50 LO-VOC, MASTER PROTECT HB 300SB CONCRETE SEALER OR APPROVED EQUIVALENT TO TOP AND FULL INSIDE FACE OF BARRIER, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. CONCRETE SEALER COLOUR SHALL BE A CONCRETE GREY AND SHALL BE APPROVED BY DEPARTMENTAL REPRESENTATIVE PRIOR TO APPLICATION.

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Client/client		
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NEW ANCHORAGES FOR  
EXISTING CIP BARRIER

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