

BRITISH
COLUMBIA

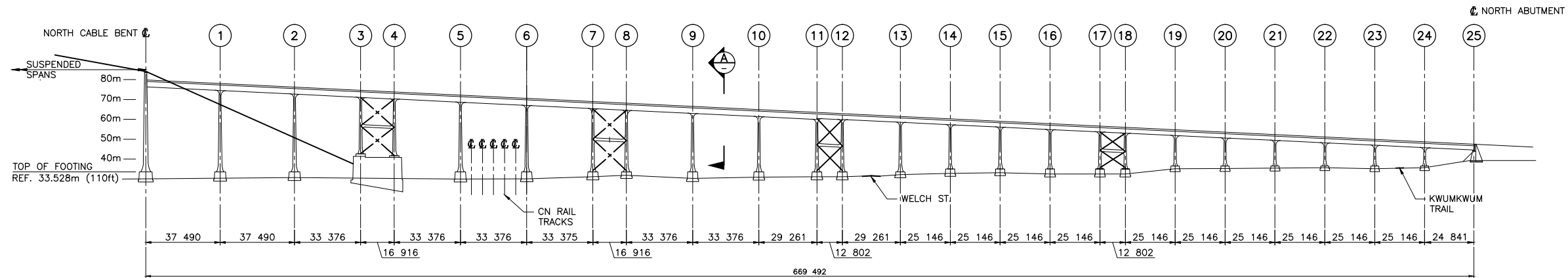
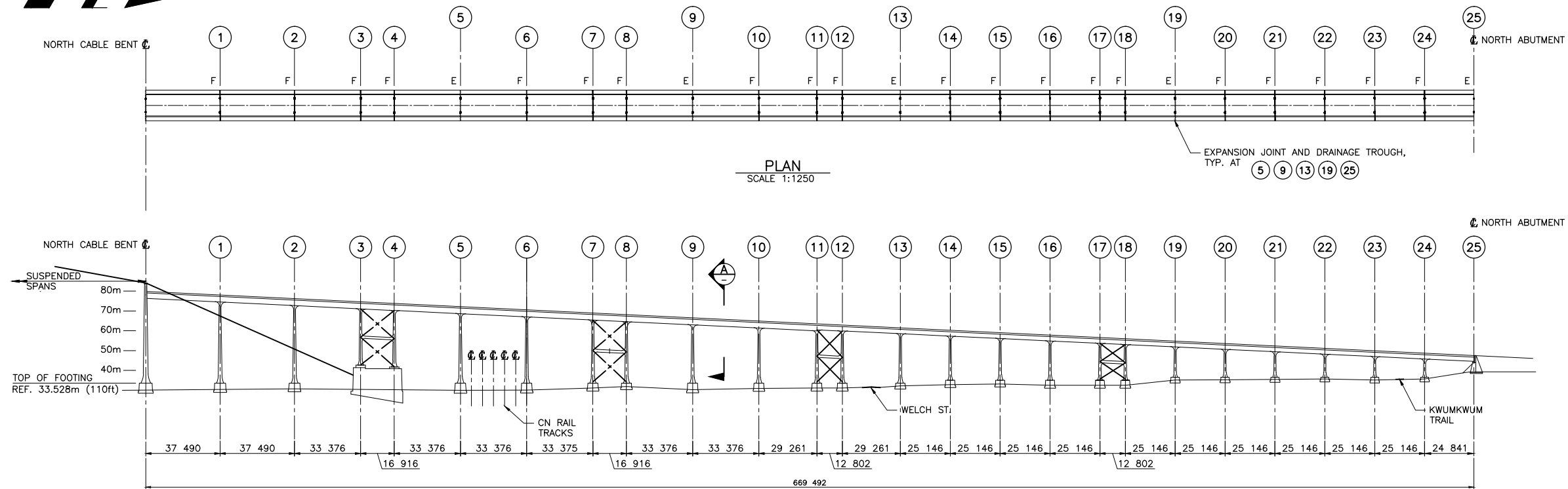
Ministry of Transportation

Bridge Project No.12268-0000

North Approach Viaduct Joint Renewal

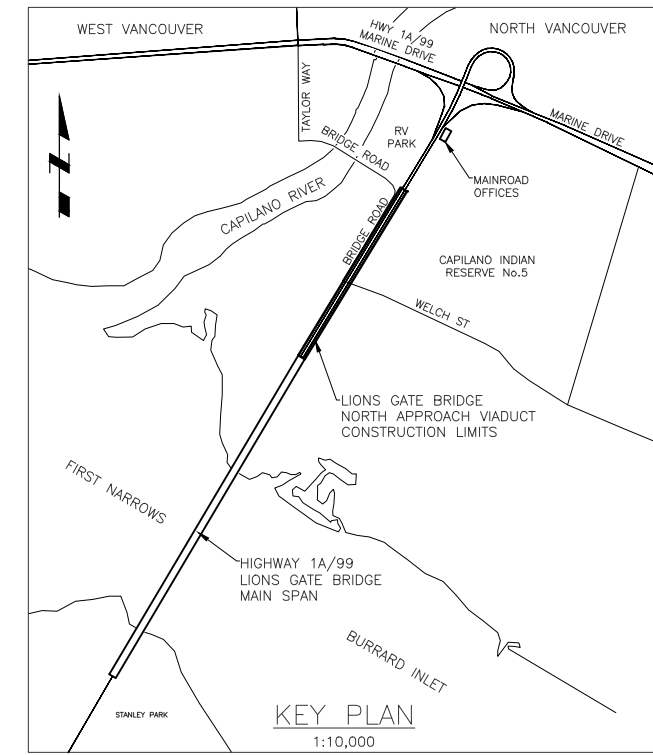
Lions Gate Bridge No. 1481V

Highway # 99



ELEVATION
SCALE 1:1250

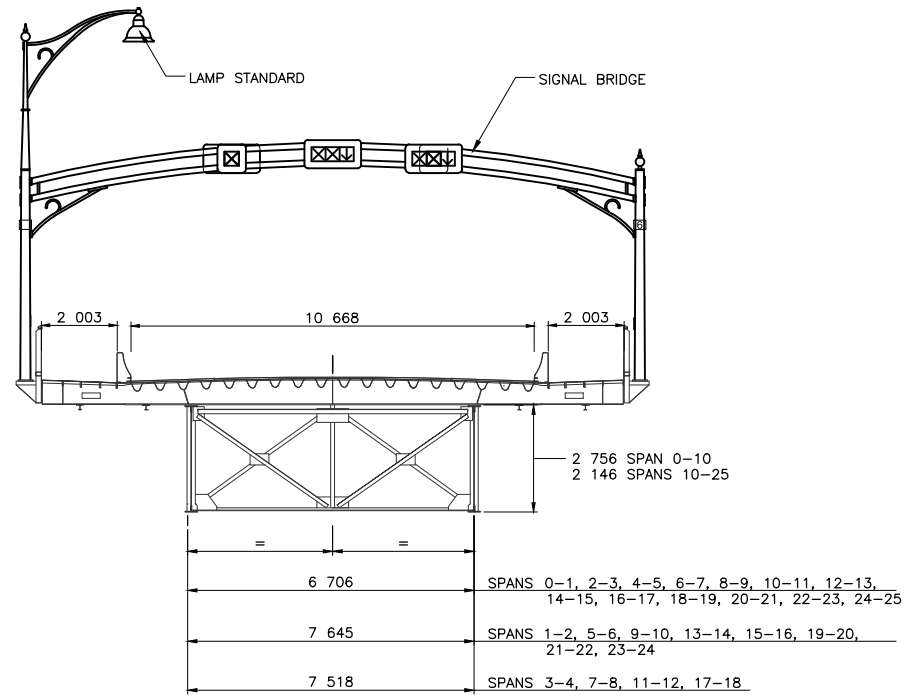
LEGEND:
F FIXED (BREATHER) JOINT
E EXPANSION JOINT



LIST OF DRAWINGS	
DWG. No.	TITLE
1481V - 601	SITE PLAN
1481V - 602	GENERAL ARRANGEMENT
1481V - 603	BEARING REPLACEMENT LAYOUT - SHEET 1
1481V - 604	BEARING REPLACEMENT LAYOUT - SHEET 2
1481V - 605	BEARING DETAILS
1481V - 606	JACKING BRACKETS AND STIFFENERS - SHEET 1
1481V - 607	JACKING BRACKETS AND STIFFENERS - SHEET 2
1481V - 608	JACKING BRACKETS AND STIFFENERS - SHEET 3
1481V - 609	TYPICAL EXPANSION JOINT DETAILS - SHEET 1
1481V - 610	TYPICAL EXPANSION JOINT DETAILS - SHEET 2
1481V - 611	ABUTMENT EXPANSION JOINT DETAILS - SHEET 1
1481V - 612	ABUTMENT EXPANSION JOINT DETAILS - SHEET 2
1481V - 613	LINK DECK DETAILS

REFERENCE DRAWINGS	
DWG. No.	TITLE
1481-501	JOINT LOCATION GENERAL ARRANGEMENT
1481-502	EXPANSION JOINT BENT #5, #9, #13 AND #19
1481-503	STAINLESS STEEL DRAINAGE TROUGH PROFILE
1481-504	EXPANSION JOINT PLATES DETAILS
1481-505	DRAINAGE TROUGH SECTIONS BENT #5, #9, #13 AND #19
1481-1376	ROADWAY EXPANSION JOINT NORTH CABLE BENT DETAILS 1
1481-1377	ROADWAY EXPANSION JOINT NORTH CABLE BENT DETAILS 2
1481-1378	ROADWAY EXPANSION JOINT NORTH CABLE BENT DETAILS 3
1481-1379	ROADWAY EXPANSION JOINT NORTH CABLE BENT DETAILS 4
1481-1600-01	NORTH VIADUCT KEY PLAN, GENERAL NOTES & DWG. INDEX
1481-1600-02	NORTH VIADUCT DESIGN CRITERIA - SH. 1 OF 2
1481-1600-03	NORTH VIADUCT DESIGN CRITERIA - SH. 2 OF 2
1481-1600-04	NORTH VIADUCT GENERAL LAYOUT
1481-1600-20	NORTH VIADUCT EXISTING DECK AS-BUILT SECTIONS
1481-1600-27	NORTH VIADUCT DECK EXPANSION & INTERMEDIATE JOINT DETAILS
1481-1501	GENERAL NOTES - SHEET 1
1481-1502	GENERAL NOTES - SHEET 2
1481-1503	GENERAL ARRANGEMENT - SHEET 1
1481-1504	GENERAL ARRANGEMENT - SHEET 2
1481-1505	TRANSVERSE GRADE BEAMS
1481-1506	PILED TRANSVERSE GRADE BEAMS - SHEET 1
1481-1507	PILED TRANSVERSE GRADE BEAMS - SHEET 2
1481-1508	LONGITUDINAL GRADE BEAMS
1481-1509	H BENT CROSS-BRACING - SHEET 1
1481-1510	H BENT CROSS-BRACING - SHEET 2
1481-1511	BENT STRENGTHENING - SHEET 1
1481-1512	BENT STRENGTHENING - SHEET 2
1481-1513	BENT STRENGTHENING - BENTS 23 AND 24
1481-1514	COLUMN STRENGTHENING - SHEET 1
1481-1515	COLUMN STRENGTHENING - SHEET 2
1481-1516	NEW DIAPHRAGM - SHEET 1
1481-1517	NEW DIAPHRAGM - SHEET 2
1481-1518	NEW DIAPHRAGM - SHEET 3
1481-1519	NEW DIAPHRAGM - SHEET 4
1481-1520	BASE PLATE MODIFICATIONS
1481-1521	TEMPORARY JACKING BRACKETS
1481-1522	NORTH ABUTMENT - CONCRETE AND STEEL DETAILS
1481-1523	CABLE BENT GIRDER RESTRAINT
1481-1524	SEISMIC RESTRAINTERS

REFERENCE DRAWINGS	
DWG. No.	TITLE
1481-20	NORTH VIADUCT DRAWING INDEX AND GENERAL NOTES
1481-21	NORTH VIADUCT EXISTING STRUCTURE - GENERAL LAYOUT
1481-22	NORTH VIADUCT TYPICAL SECTION NEW DECK SYSTEM
1481-23	NORTH VIADUCT PLAN OF SPANS BETWEEN BENTS 0 AND 4
1481-24	NORTH VIADUCT PLAN OF SPANS BETWEEN BENTS 4 AND 8
1481-29	NORTH VIADUCT TYPICAL SECTIONS
1481-30	NORTH VIADUCT SPLICES
1481-33	NORTH VIADUCT DECK JOINT
1481-34	NORTH VIADUCT DRAINAGE DETAILS 1
1481-36	NORTH VIADUCT TRAFFIC GUARD RAILS
9	NORTH VIADUCT DETAILS OF PEDESTALS 0-3-4
10	NORTH VIADUCT LAYOUT OF PEDESTALS 0-16
11	NORTH VIADUCT LAYOUT OF PEDESTALS 16-24
13	NORTH ABUTMENT GENERAL DETAILS
21	NORTH VIADUCT EXPANSION JOINTS
51	NORTH VIADUCT GENERAL LAYOUT
52	NORTH VIADUCT STRESS SHEET BENTS 1-4
53	NORTH VIADUCT STRESS SHEET BENTS 5-8
54	NORTH VIADUCT STRESS SHEET BENTS 9-12
55	NORTH VIADUCT STRESS SHEET BENTS 13-24
56	NORTH VIADUCT DETAILS BENT NO.1
57	NORTH VIADUCT DETAILS BENTS NO.3-4
58	NORTH VIADUCT DETAILS BENTS NO.17-18
59	NORTH VIADUCT DETAILS BENT NO.24
60	NORTH VIADUCT GIRDER SPANS DETAILS
61	NORTH VIADUCT 55'-6" & 42'-0" TOWER SPANS & CROSS SECTION DETAILS
62	NORTH VIADUCT STRESS SHEET FOR GIRDERS
63	NORTH VIADUCT LAMP STDS & INSP. LADDERS
64	NORTH VIADUCT SLAB DETAILS
65	NORTH VIADUCT SPECIAL SLAB DETAILS
100E	ELECTRICAL INSTALLATION
85-S139	NORTH VIADUCT REVISED EXPANSION JOINTS



SECTION A-A
SCALE 1:100

- NOTES:**
1. SURVEY BY: NOT APPLICABLE
2. DATUM: GEODETIC
3. BENCH MARK: NOT APPLICABLE
4. GEOTECHNICAL INVESTIGATION: NOT APPLICABLE

Rev	Date	Description	Init

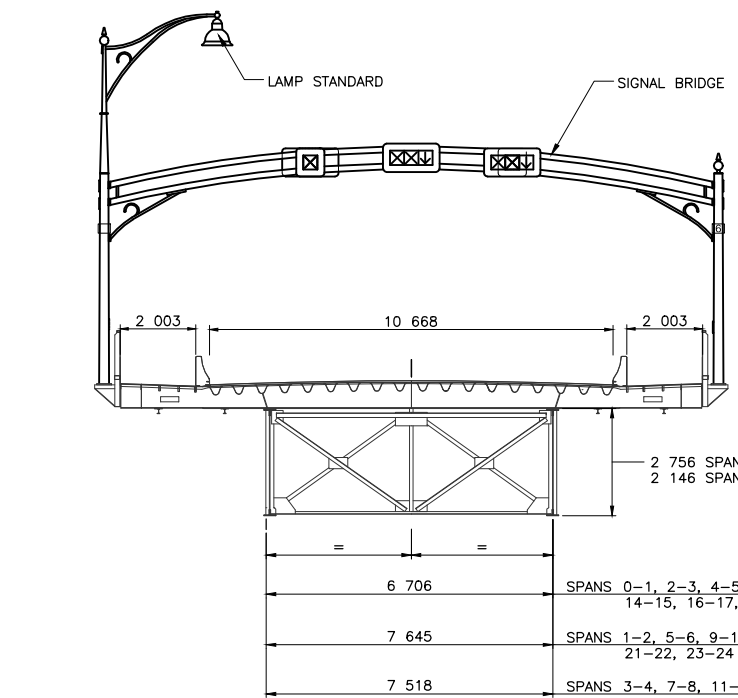
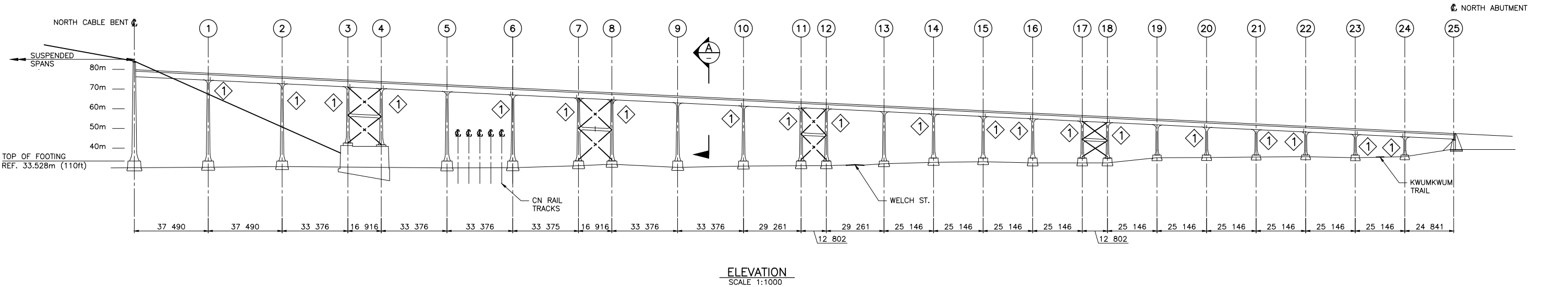
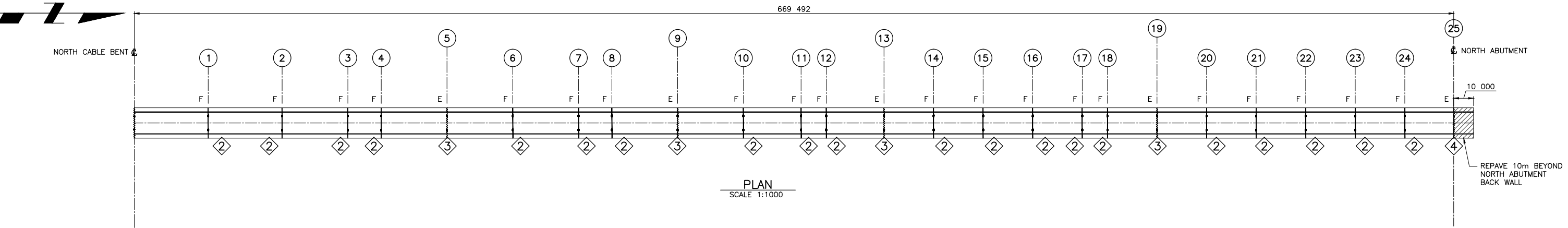
REVISIONS

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure
South Coast Region

LOWER MAINLAND DISTRICT
HIGHWAY 99
1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT
JOINT RENEWAL PROJECT
SITE PLAN

PREPARED UNDER THE DIRECTION OF		DESIGNED BY J. JIAO DATE 2013-12-12	
JACK JIAO		CHECKED BY S. COOK DATE 2013-12-12	
ENGINEER OF RECORD		DRAWN BY M. KRAMER DATE 2013-12-12	
DATE 2013-12-13		SCALE AS SHOWN	
REGIONAL MANAGER ENGINEERING	REGIONAL DIRECTOR, HIGHWAYS	REG. No.	DRAWING No.
DATE	DATE	12268-0000	1481V-601

AUTHORIZED BY	
REGIONAL MANAGER ENGINEERING	REGIONAL DIRECTOR, HIGHWAYS
DATE	DATE



GENERAL NOTES:

DESIGN CODES

1. CAN/CSA-S6-06 CANADIAN HIGHWAY BRIDGE DESIGN CODE (CHBDC)
2. BC MOT SUPPLEMENT TO CHBDC S6-06
3. CAN/CSA-S6-66 CANADIAN HIGHWAY BRIDGE DESIGN CODE (CHBDC) FOR H20-S16 DESIGN LOAD ONLY.

DESIGN LOAD

1. H20-S16 (32 688 KG G.V.W.) IN ACCORDANCE WITH CHBDC S6-66
2. WALKWAY LIVE LOAD: 1.5 KPA
3. DEAD LOAD: SELFWEIGHT OF THE BRIDGE
4. THE LANE ABOVE THE BEARINGS TO BE REPLACED SHALL BE CLOSED TO ANY TRAFFIC UNTIL THE COMPLETION OF INSTALLATION OF NEW BEARINGS.

CLIMATIC DATA

1. MAXIMUM DAILY MEAN TEMPERATURE: 28 DEGREES CELSIUS.
2. MINIMUM DAILY MEAN TEMPERATURE: -14 DEGREES CELSIUS.

CONSTRUCTION PROCEDURE

1. AS SHOWN ON THE DRAWINGS, REPLACE EXISTING STEEL BEARINGS WITH NEW VULCANIZED ELASTOMERIC BEARINGS
2. INSTALL NEW LINK DECKS
3. REPLACE EXPANSION JOINTS

EXISTING MATERIALS

1. PRIOR TO START OF WORK, ALL DIMENSIONS AND CONDITIONS SHALL BE CHECKED AND VERIFIED. ANY DISCREPANCIES OR UNSATISFACTORY CONDITIONS WHICH MAY AFFECT THE PROPER EXECUTION OF THE WORKS SHALL BE REPORTED TO THE ENGINEER.
2. ORIGINAL STRUCTURAL STEEL IS TAKEN AS $F_y = 228$ MPA AS DEFINED ON THE ORIGINAL CONSTRUCTION DRAWINGS
3. RIVETS ARE TAKEN AS $F_u = 360$ MPA AS STATED ON THE ORIGINAL CONSTRUCTION DRAWINGS
4. STRUCTURAL STEEL ADDED THROUGH THE SEISMIC RETROFIT:
HOT-ROLLED SECTIONS AND PLATES - CAN/CSA-G40.21 GRADE 300W
HSS SECTIONS - ASTM A500 CLASS C GRADE 345MPa
5. STRUCTURAL BOLTS ADDED THROUGH THE SEISMIC RETROFIT: ASTM A325 AND DETAILED AS BEARING TYPE CONNECTION WITH THREAD EXCLUDED FROM THE SHEAR PLANE

STRUCTURAL STEEL

6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS.
7. ALL NEW STEEL SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
EXPANSION JOINT NOSING PLATE AND LINK PLATES - CAN/CSA-G40.21 GRADE 350A HOT DIP GALVANIZED TO CAN/CSA G164 OR METALIZED TO CSA G189
W920 STABILIZING BEAM - ASTM A36
OTHERS - CAN/CSA-G40.21 GRADE 300W
8. ALL STRUCTURAL BOLTS SHALL BE ASTM A325 TYPE 3. ALL STRUCTURAL BOLTS SHALL BE COMPLETE WITH NUTS AND WASHERS AND SHALL BE DETAILED AS BEARING TYPE CONNECTION WITH THREAD EXCLUDED FROM THE SHEAR PLANE.
9. ALL STRUCTURAL BOLTS SHALL BE INSTALLED BY "TURN OF NUT" METHOD AS SPECIFIED IN CHBDC (S6-06)
10. ALL NEW STEEL LEFT ATTACHED TO THE EXISTING GIRDERS SHALL BE FIELD COATED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, COLOUR TO MATCH THE EXISTING (US FEDERAL SPECIFICATIONS 595 #14109, HIGH GLOSS)
11. ALL TEMPORARY NEW STEEL SHALL BE SHOP PRIMED AND SHALL BE REMOVED UPON COMPLETION OF THE WORKS.
12. ALL EXISTING SURFACES TO WHICH NEW STEEL SHALL BE ATTACHED SHALL HAVE DAMAGED OR DETERIORATED PAINT CLEANED TO SSPC-SP 3 AND FIELD TOUCH-UP COATED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. SOUND PAINT DOES NOT NEED TO BE REMOVED.
13. RIVETS, WHERE REQUIRED, SHALL BE REMOVED WITH PNEUMATIC RIVET HAMMER.
14. RIVETS WHICH ARE TEMPORARILY REMOVED SHALL BE REPLACED WITH STRUCTURAL BOLTS, SIZE OF THE BOLT TO MATCH THE SIZE OF THE HOLE.
15. HOLES LEFT IN PERMANENT STRUCTURE SHALL BE FILLED WITH STRUCTURAL BOLTS, SIZE OF THE BOLT TO MATCH THE SIZE OF THE HOLE.

WORK DESCRIPTION:

- ① NEW JACKING STIFFENER AND ELASTOMERIC BEARING
- ② NEW LINK PLATE
- ③ NEW TYPICAL EXPANSION JOINT
- ④ NEW EXPANSION JOINT AT NORTH ABUTMENT

Rev	Date	Description	Init

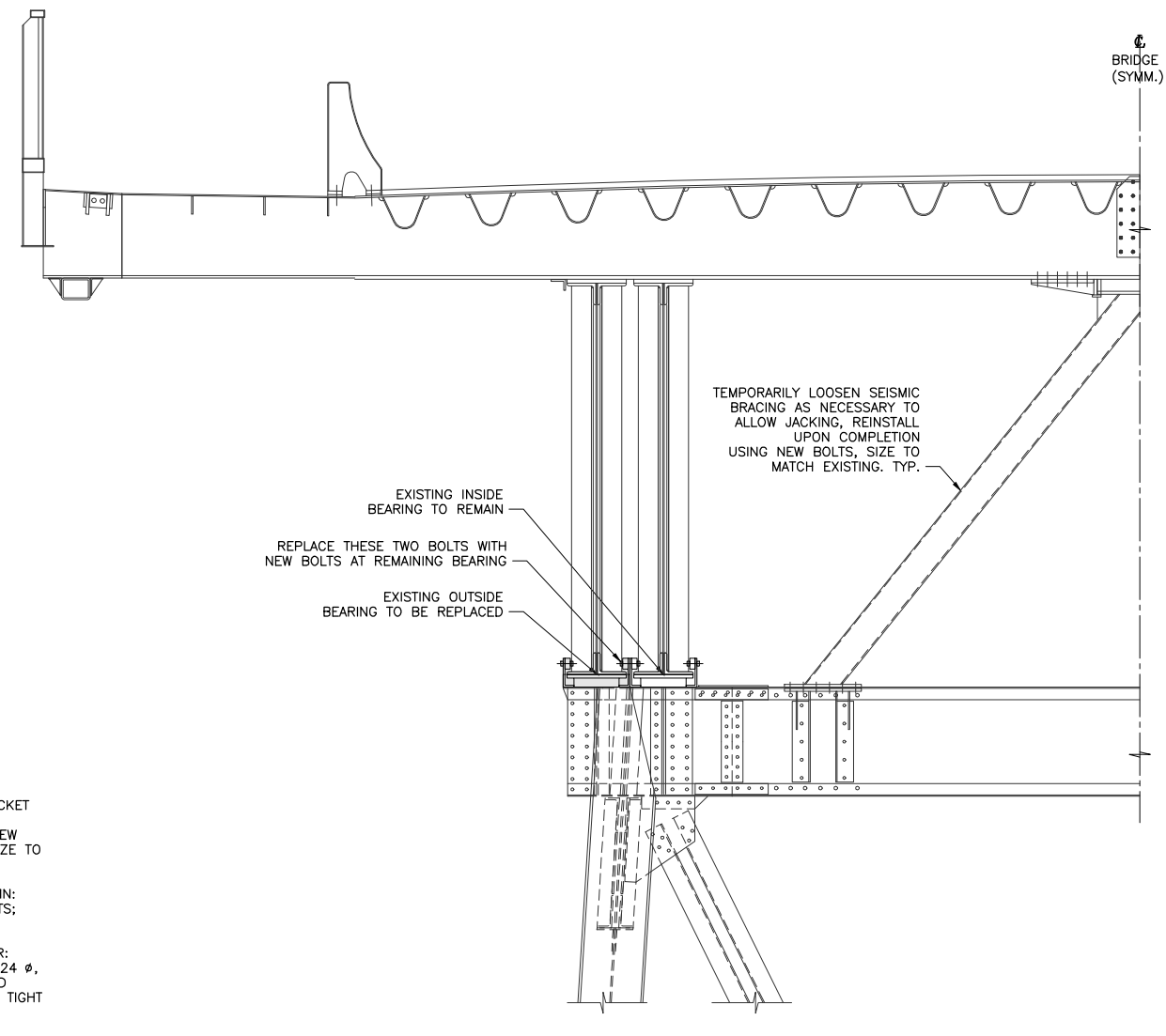
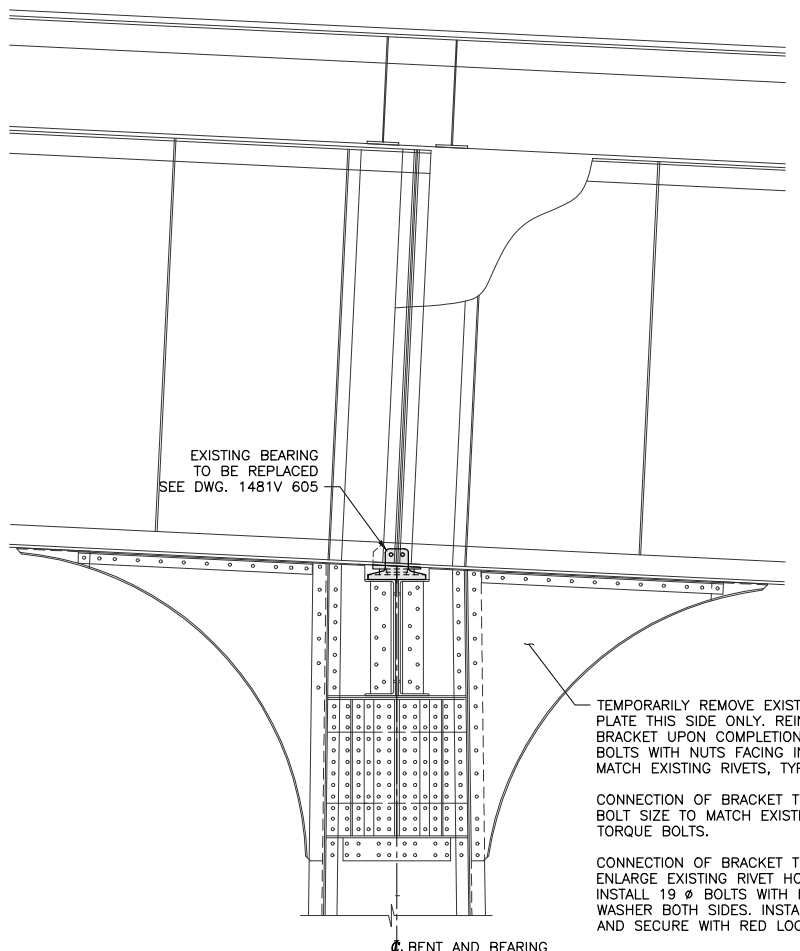
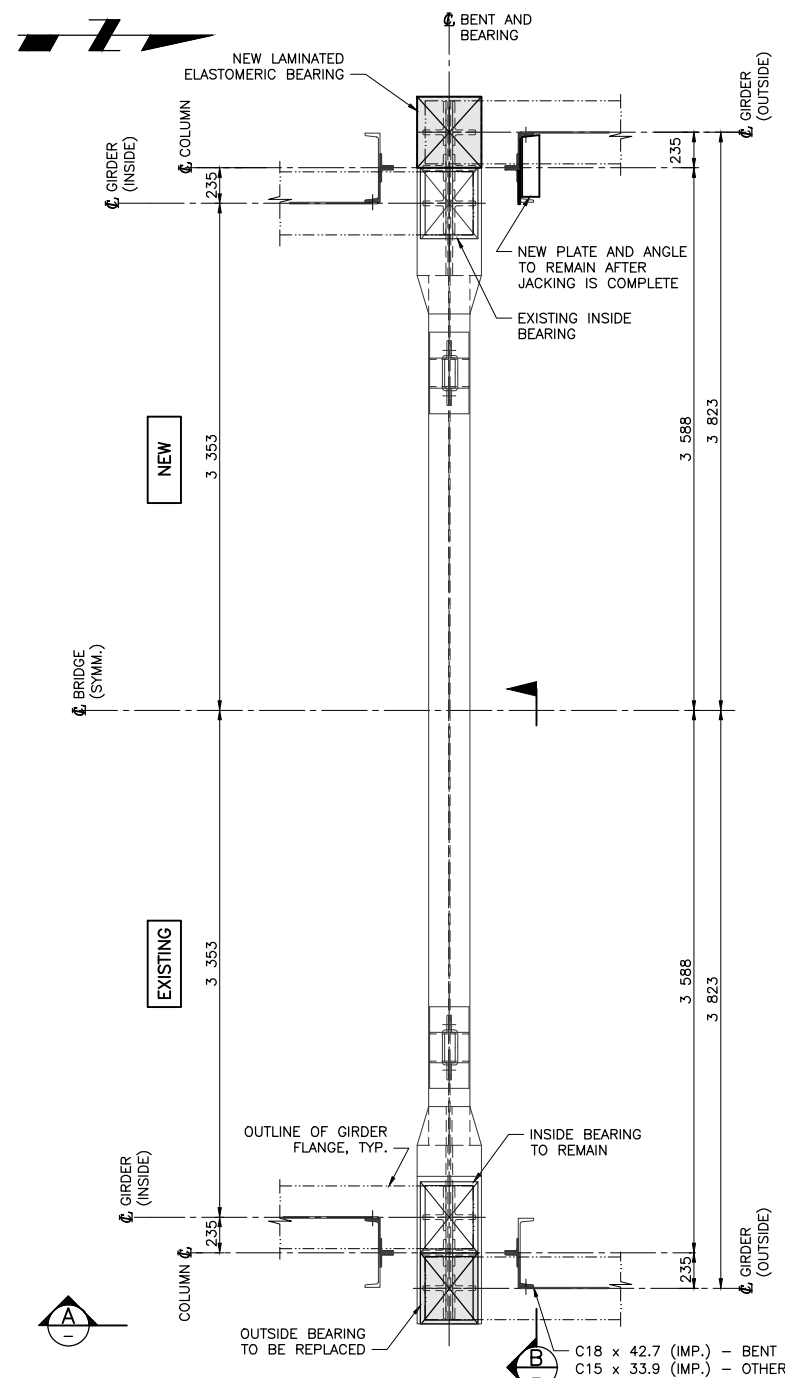
REVISIONS

BRITISH COLUMBIA

Ministry of Transportation
and Infrastructure
South Coast Region

LOWER MAINLAND DISTRICT
HIGHWAY 99
1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT
JOINT RENEWAL PROJECT
GENERAL ARRANGEMENT

PREPARED UNDER THE DIRECTION OF		DESIGNED <u>J. JIAO</u> DATE 2013-12-12	
ENGINEER OF RECORD		CHECKED <u>S. COOK</u> DATE 2013-12-12	
DATE 2013-12-13		DRAWN <u>M. KRAMER</u> DATE 2013-06-18	
FILE No.		SCALE AS SHOWN	
PROJECT No. 12268-0000		NEGATIVE No.	
REG. 1		DRAWING No. 1481V-602	



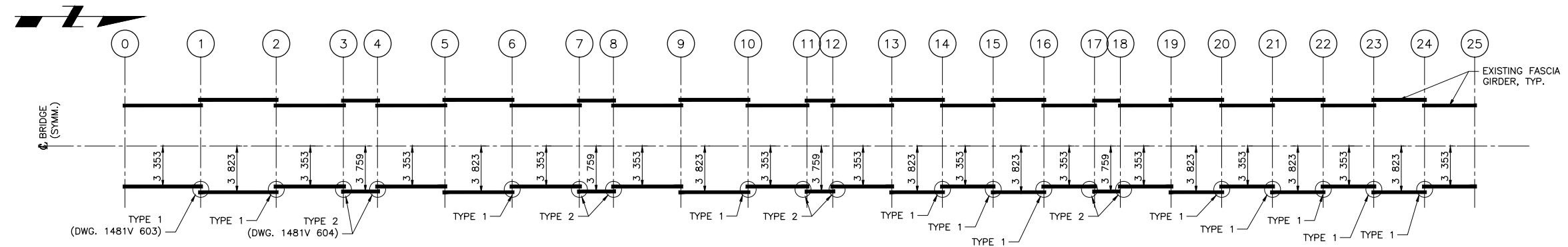
EXISTING
ELEVATION A
SCALE 1:25

EXISTING
SECTION B
SCALE 1:25

C18 x 42.7 (IMP.) - BENT 1 & 2
C15 x 33.9 (IMP.) - OTHER BENTS, TYP.

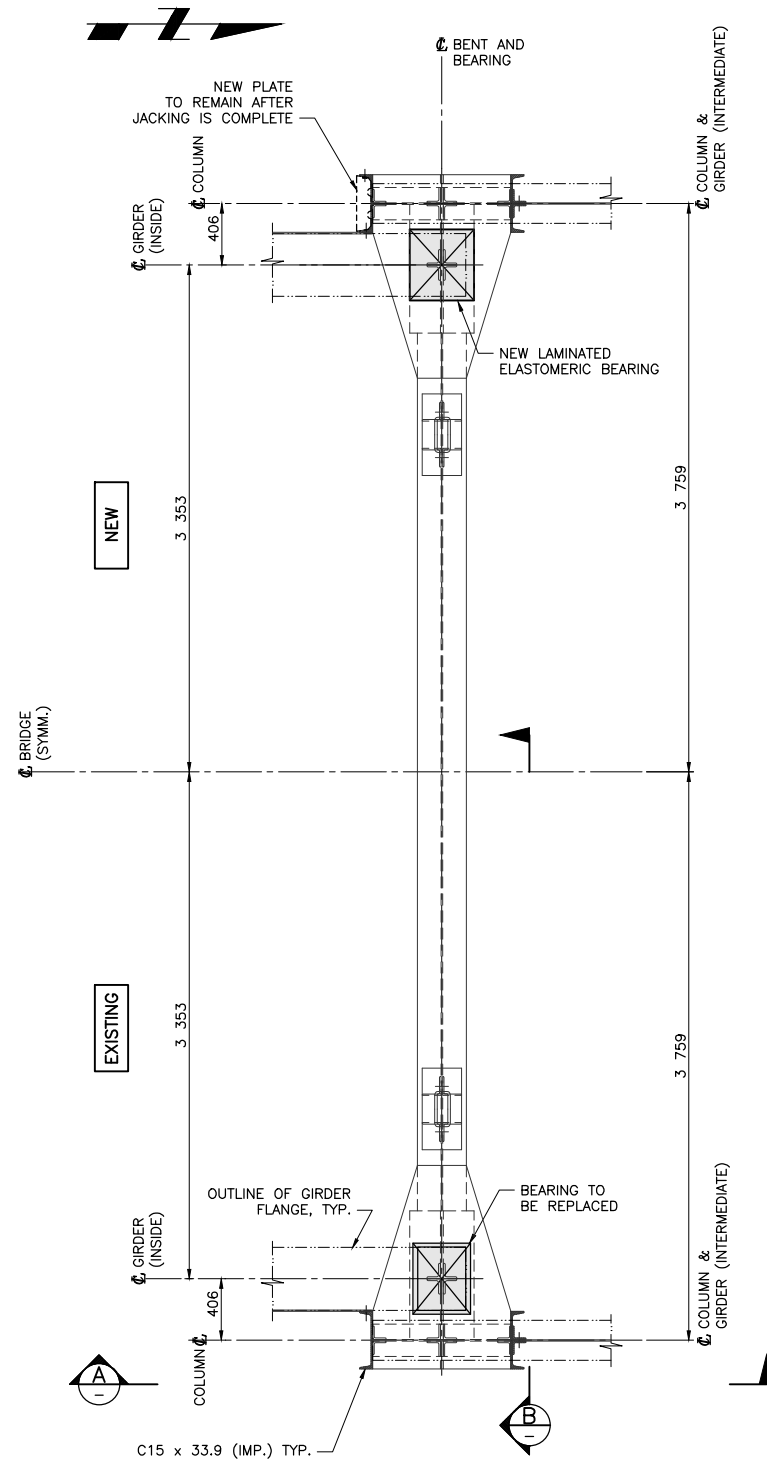
FOR BENTS (1) (2) (6) (10) (14) (15) (16) (20) (21) (22) (23) (24)

BEARING REPLACEMENT PLAN - TYPE 1
SCALE 1:25
BENT 1 SHOWN, OTHERS SIMILAR.



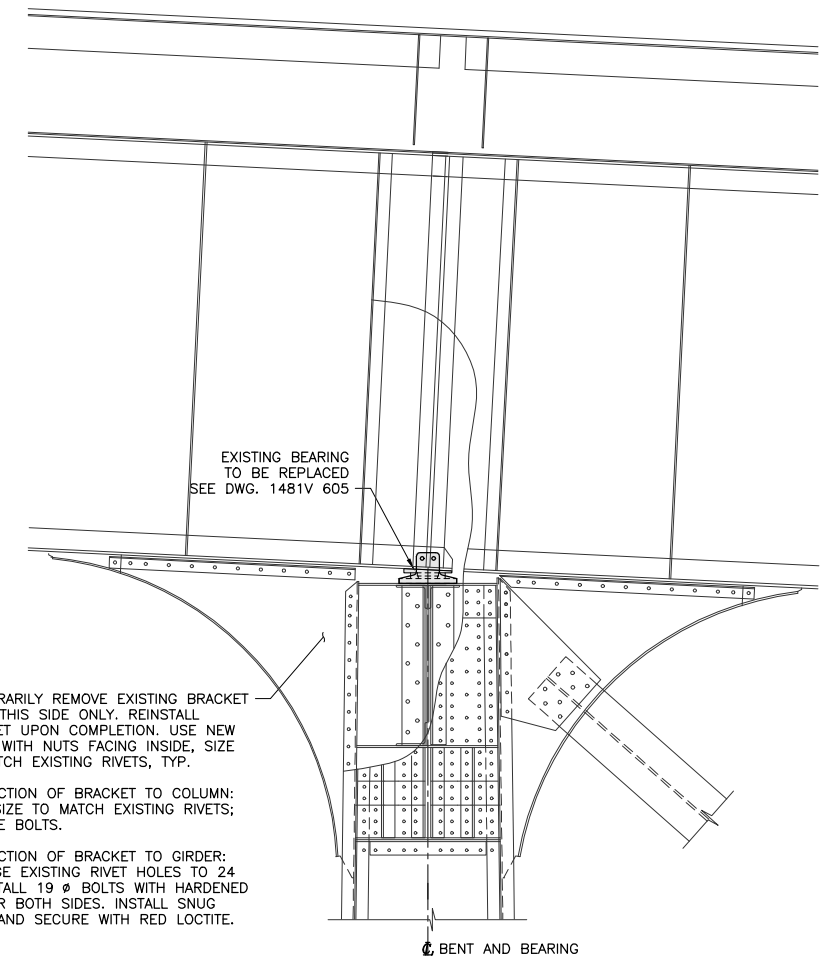
BEARING REPLACEMENT KEYPLAN
N.T.S.

amec		AE Associated Engineering	
Rev	Date	Description	Init
REVISIONS			
BRITISH COLUMBIA		Ministry of Transportation and Infrastructure South Coast Region	
LOWER MAINLAND DISTRICT HIGHWAY 99 1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT JOINT RENEWAL PROJECT			
BEARING REPLACEMENT LAYOUT - SHEET 1			
PREPARED UNDER THE DIRECTION OF JACK JIAO		DESIGNED <u>J. JIAO</u> DATE 2013-11-01 CHECKED <u>K. HABEL</u> DATE 2013-11-01 DRAWN <u>S. LIAO</u> DATE 2013-11-01	
ENGINEER OF RECORD DATE 2013-12-13		ORIGINAL SIGNED BY <u>JACK JIAO</u> P. ENG.	
FILE No.	PROJECT No. 12268-0000	REG. No. 1	DRAWING No. 1481V 603

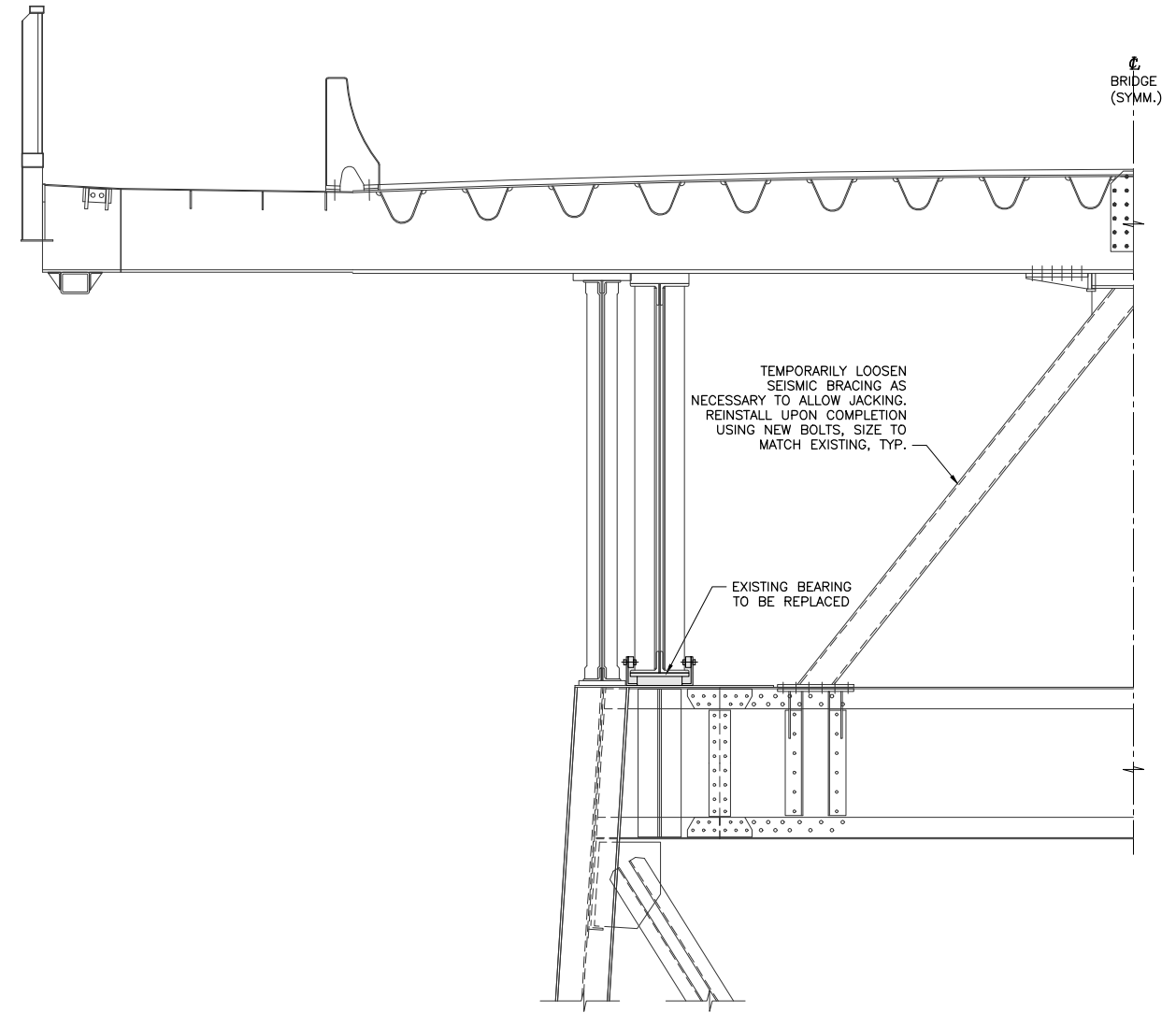


FOR BENTS (3) (4) (7) (8) (11) (12) (17) (18)

BEARING REPLACEMENT PLAN – TYPE 2
SCALE 1:25
BENT 3 SHOWN, OTHERS SIMILAR.



ELEVATION A
SCALE 1:25

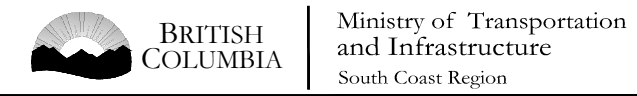


SECTION B
SCALE 1:25



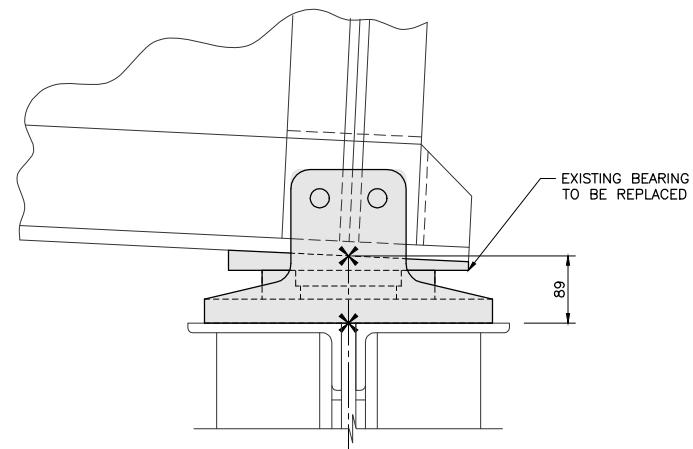
Rev	Date	Description	Init

REVISIONS



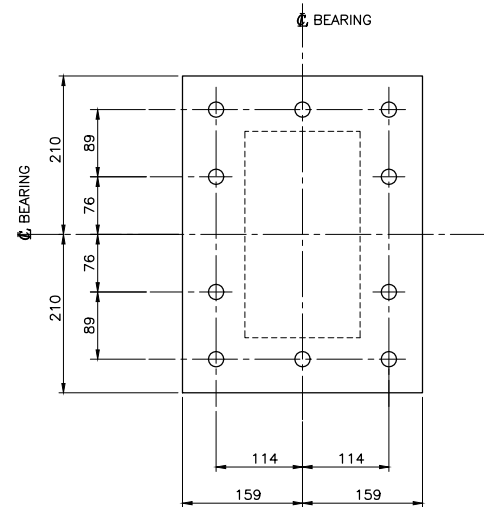
LOWER MAINLAND DISTRICT
HIGHWAY 99
1481V – LIONS GATE BRIDGE NORTH APPROACH VIADUCT
JOINT RENEWAL PROJECT
BEARING REPLACEMENT LAYOUT – SHEET 2

PREPARED UNDER THE DIRECTION OF JACK JIAO	ORIGINAL SIGNED BY JACK JIAO P. ENG.	DESIGNED J. JIAO DATE 2013-11-01 CHECKED K. HABEL DATE 2013-11-01 DRAWN S. LIAO DATE 2013-11-01	SCALE AS SHOWN NEGATIVE No.
ENGINEER OF RECORD DATE 2013-12-13 FILE No.	PROJECT No. 12268-0000	REG. No. 1	DRAWING No. 1481V 604



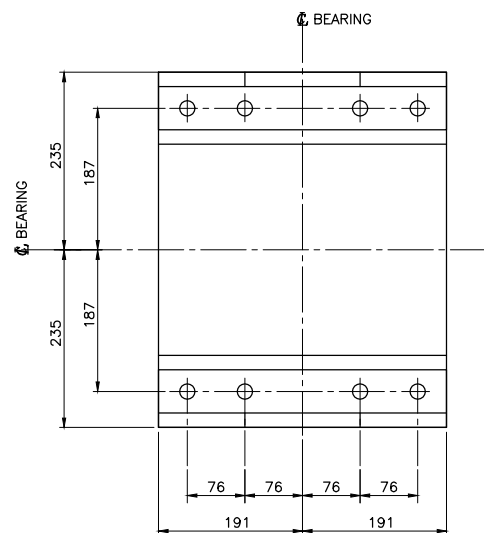
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ELEVATION
SCALE 1:5



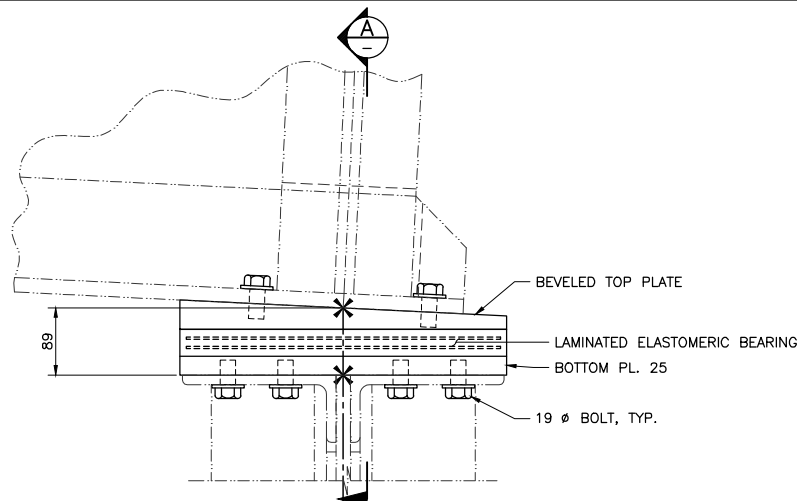
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PLAN - TOP PLATE
SCALE 1:5



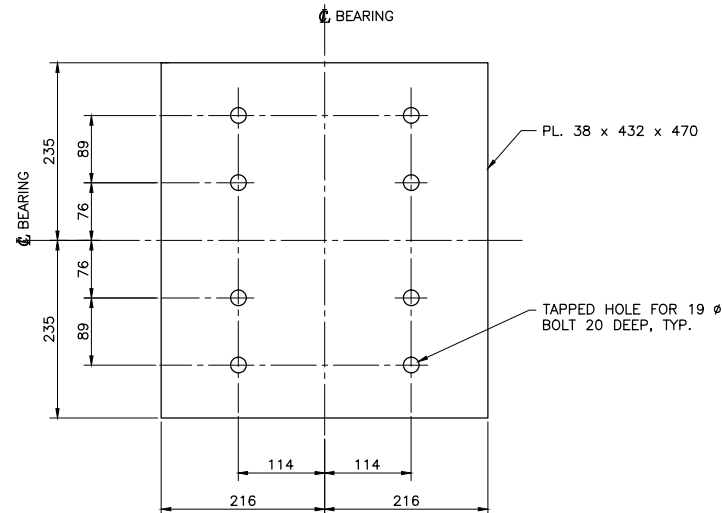
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PLAN - BOTTOM PLATE
SCALE 1:5



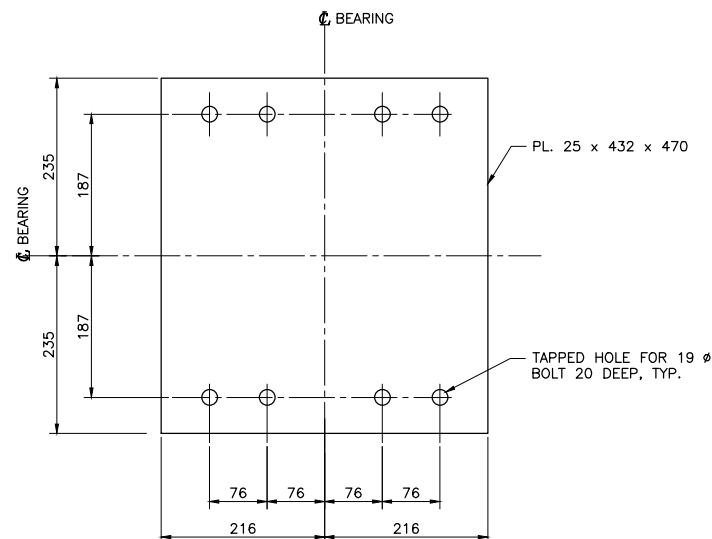
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ELEVATION
SCALE 1:5



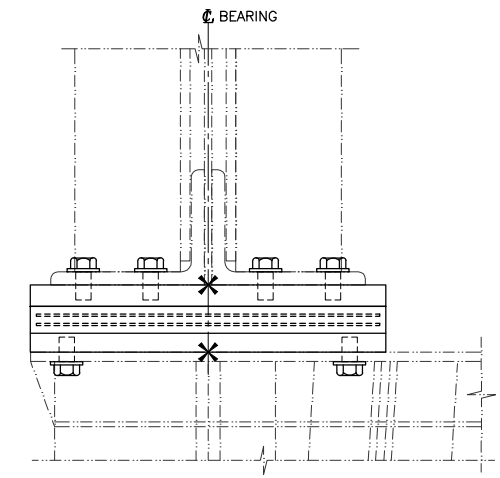
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PLAN - TOP PLATE
SCALE 1:5



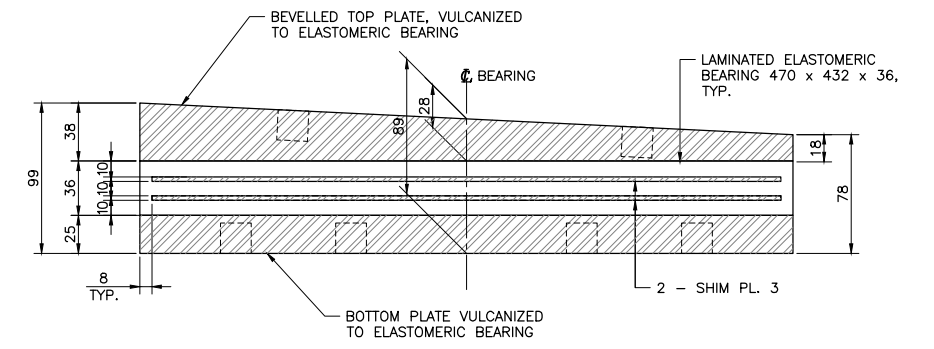
NEW

PLAN - BOTTOM PLATE
SCALE 1:5



NEW

SECTION A
SCALE 1:5



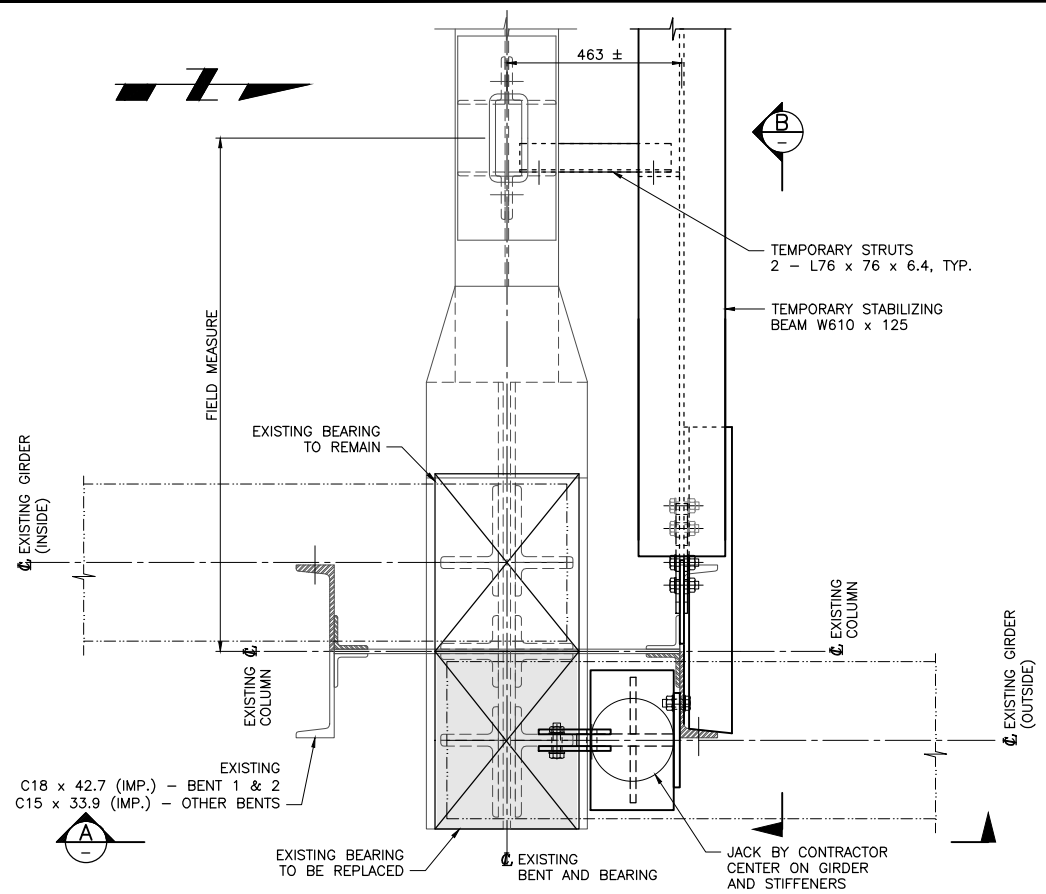
NEW

ELASTOMERIC BEARING DETAILS
SCALE 1:2.5

NOTES:

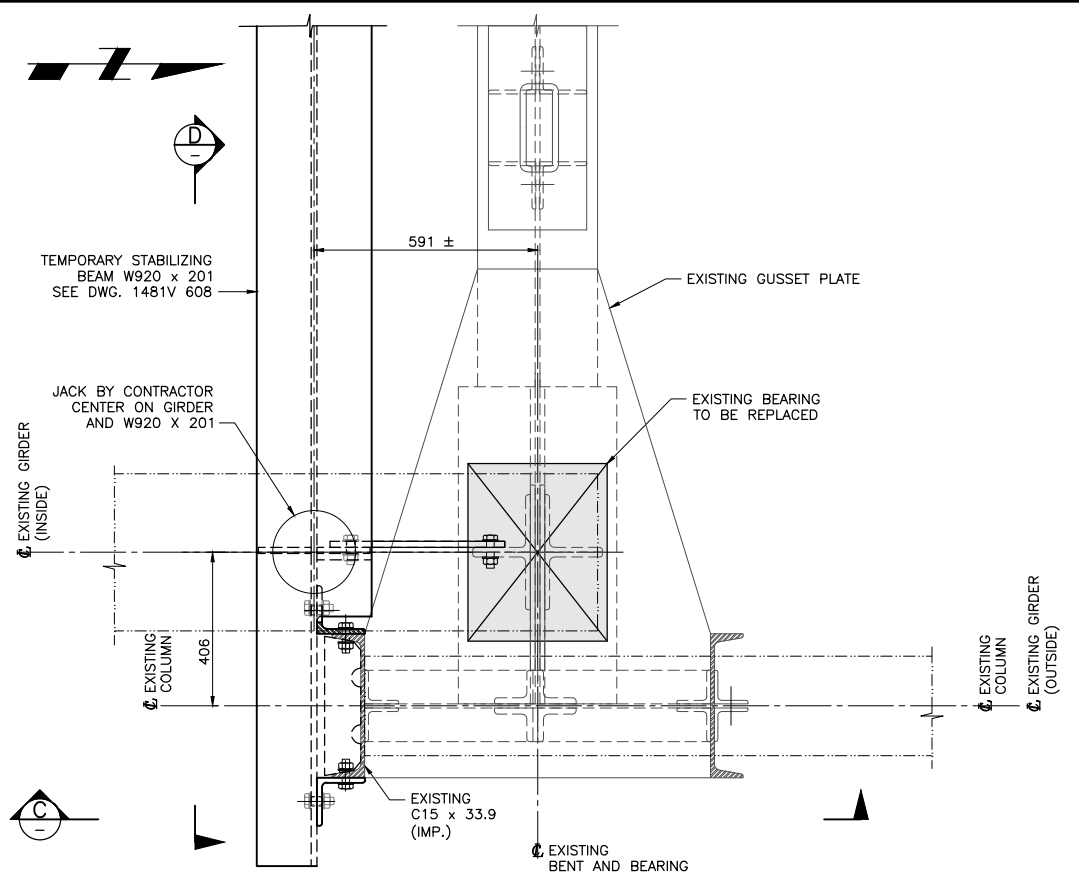
- SEE GENERAL NOTES ON DRAWING 1481V 602.
- ALL DIMENSIONS ARE TO BE CONFIRMED IN THE FIELD PRIOR TO FABRICATION.
- ALL STEEL PLATES SHALL CONFORM TO CAN/CSA-G40.21 GRADE 300W PAINTED, COLOUR TO MATCH THE EXISTING.
- BEARING SHALL CONFORM TO CAN/CSA-S6-06 AND BEARING RUBBER SHALL HAVE A DURO HARDNESS OF 60 ± 5.
- BEARING MANUFACTURING TOLERANCE:
OVERALL PLAN DIMENSION: ± 5 mm
INTERNAL ELASTOMER THICKNESS: ± 2 mm
OVERALL HEIGHT: ± 3 mm
- FILL GAPS BETWEEN BEARING PLATES AND EXISTING STRUCTURE WITH SIKADUR 31 HI-MOD EPOXY GEL OR APPROVED ALTERNATIVE, WHERE REQUIRED.

amec		AE Associated Engineering	
Rev	Date	Description	Init
REVISIONS			
		Ministry of Transportation and Infrastructure South Coast Region	
LOWER MAINLAND DISTRICT HIGHWAY 99 1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT JOINT RENEWAL PROJECT BEARING DETAILS			
PREPARED UNDER THE DIRECTION OF JACK JIAO		ORIGINAL SIGNED BY JACK JIAO, P. ENG.	DESIGNED <u>J. JIAO</u> DATE <u>2013-11-01</u> CHECKED <u>K. HABEL</u> DATE <u>2013-11-01</u> DRAWN <u>S. LIAO</u> DATE <u>2013-07-02</u> SCALE AS SHOWN NEGATIVE No.
ENGINEER OF RECORD DATE <u>2013-12-13</u> FILE No.	PROJECT No. 12268-0000	REG. No. 1	DRAWING No. 1481V 605



FOR BENTS (1) (2) (6) (10) (14) (15) (16) (20) (21) (22) (23) (24)

JACKING LAYOUT - TYPE 1
SCALE 1:10
BENT 1 EAST SHOWN, OTHERS SIMILAR

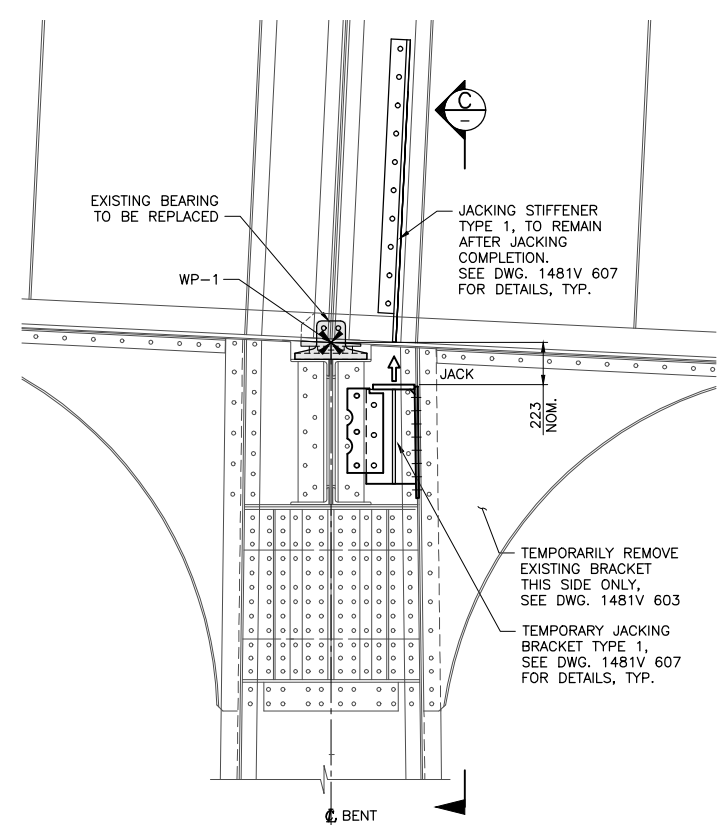


FOR BENTS (3) (4) (7) (8) (11) (12) (17) (18)

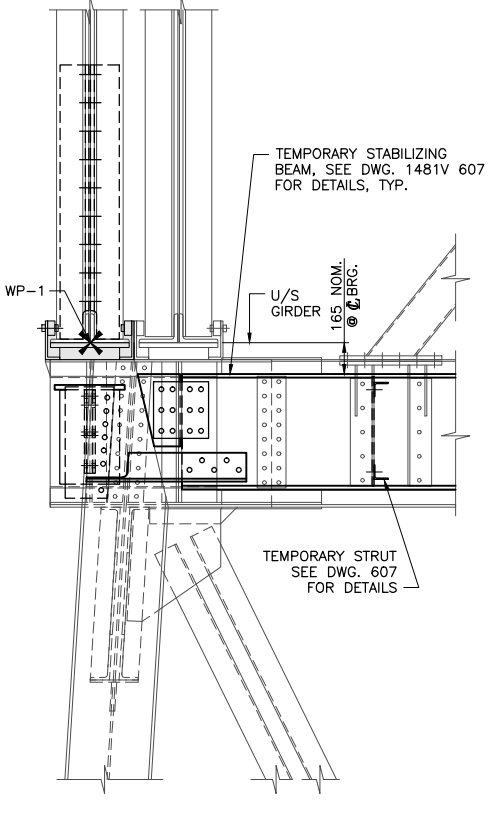
JACKING LAYOUT - TYPE 2
SCALE 1:10
BENT 3 EAST SHOWN, OTHERS SIMILAR

NOTES:

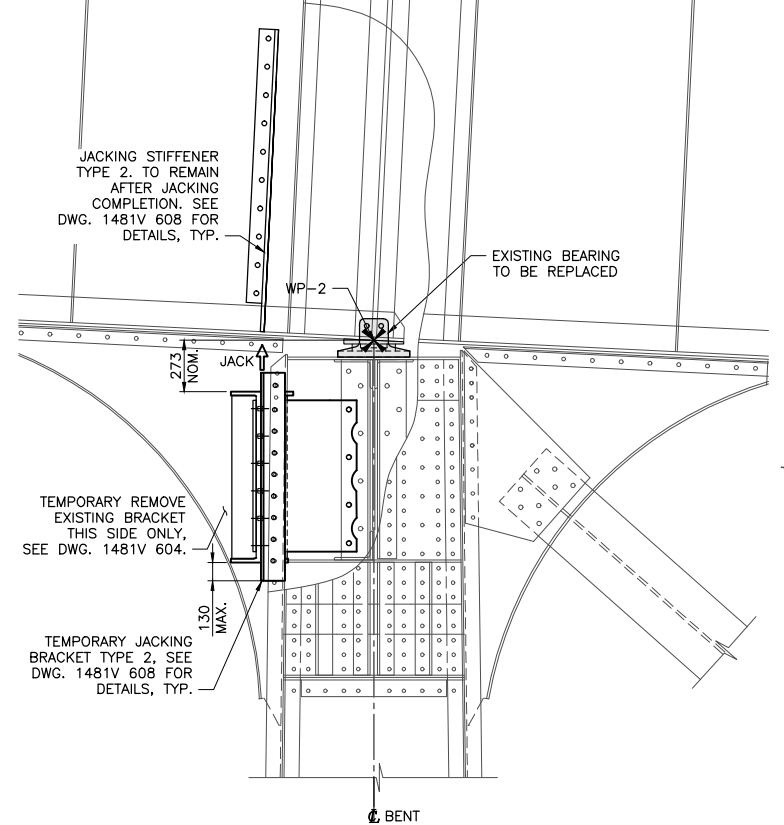
- SEE GENERAL NOTES ON DRAWING 1481V 602.
- DESIGN UNFACTORED LOAD AT EACH JACKING LOCATION: 800 kN
- BEARING REPLACEMENT AND LINK DECK INSTALLATION SHALL NOT TAKE PLACE ON ADJACENT BENTS SIMULTANEOUSLY.
- REPLACE ONE BEARING AT A TIME AT ANY BENT.
- THE OUTER LANE ABOVE THE BEARING REPLACEMENT LOCATION SHALL BE CLOSED TO ANY TRAFFIC. NO CONSTRUCTION LOADS OR VEHICLES SHALL OCCUPY THE CLOSED LANE DURING THE JACKING OPERATIONS.
- CONTRACTOR SHALL PROVIDE TEMPORARY LONGITUDINAL CONNECTION BETWEEN SPANS FROM BEGINNING OF JACKING OPERATIONS TO THE COMPLETION OF THE LINK DECK INSTALLATION. MINIMUM DESIGN FACTORED CAPACITY SHALL BE 300 kN IN EACH DIRECTION AT EACH BEARING LOCATION.
- JACKING FORCE SHALL BE APPLIED VERTICALLY - BEVEL PLATES SHALL BE USED BENEATH GIRDERS, WITH A MIN. THICKNESS OF 19 mm.
- ALL JACKS SHALL BE CENTERED UNDER GIRDER AND ON BEARING PLATES.
- STEEL GRADE:
W920 SECTION: ASTM A36.
REMAINING STEEL FOR JACKING SCHEME: CAN/CSA - G40.21 GRADE 300W.
- ALL WELDS TO BE COMPLETED IN ACCORDANCE WITH CSA W59.
- FIELD WELDERS TO BE CERTIFIED TO CSA W47.1.
- ALL BOLTS SHALL BE ASTM A325 / A325M, 22 mm ϕ , DETAILED WITH THREADS EXCLUDED FROM THE SHEAR PLANE UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE COMPLETE WITH NUTS AND WASHERS AND TORQUED BY TURN-OF-NUT METHOD. ALL 24 mm ϕ AND 24 mm x 27 mm HOLES SHOWN ON THE DRAWINGS SHALL BE FILLED WITH 22 mm ϕ BOLTS UNLESS NOTED OTHERWISE. ENLARGE ALL EXISTING HOLES THAT ARE TO RECEIVE NEW BOLTS FOR BEARING REPLACEMENT TO 24 mm ϕ UNLESS NOTED OTHERWISE. NOTIFY THE CONSULTANT OF EXISTING HOLES LARGER THAN 24 mm ϕ OR EDGE DISTANCE LESS THAN 38 mm. ALL EMPTY REMAINING HOLES IN THE STRUCTURE SHALL BE FILLED WITH BOLTS, UNLESS NOTED OTHERWISE.



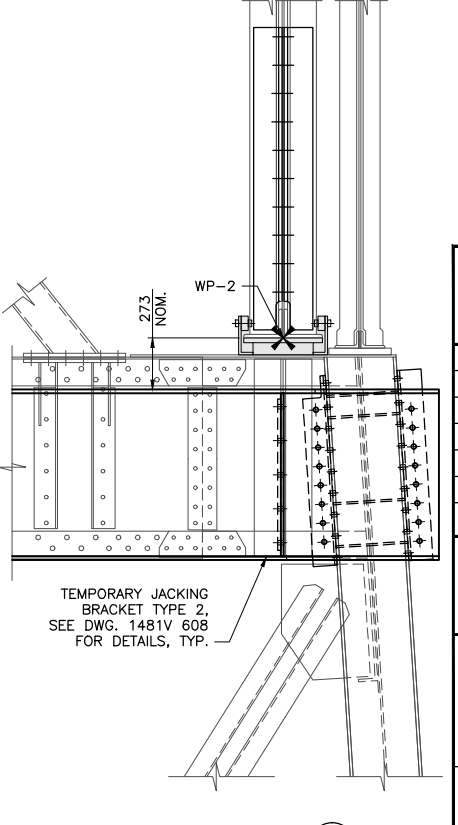
ELEVATION A
SCALE 1:20



SECTION B
SCALE 1:20



ELEVATION C
SCALE 1:20



SECTION D
SCALE 1:20

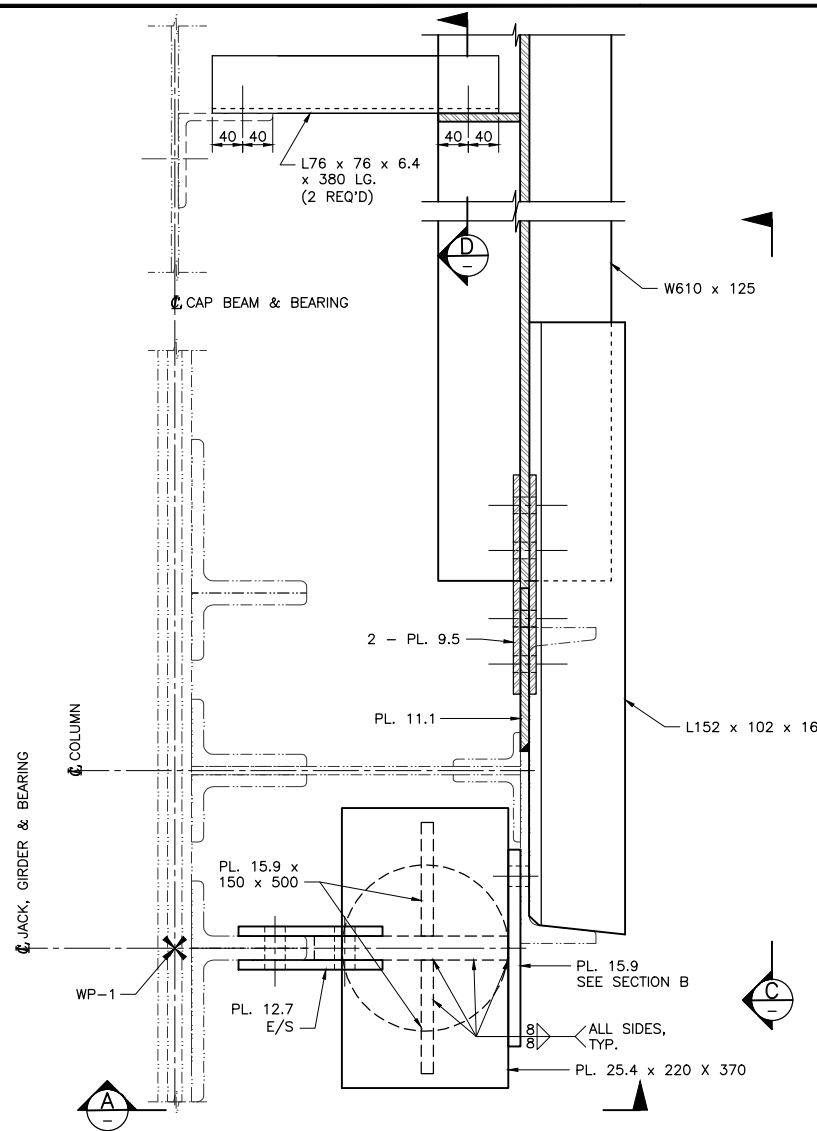
amec		AE Associated Engineering	
Rev	Date	Description	Init

REVISIONS

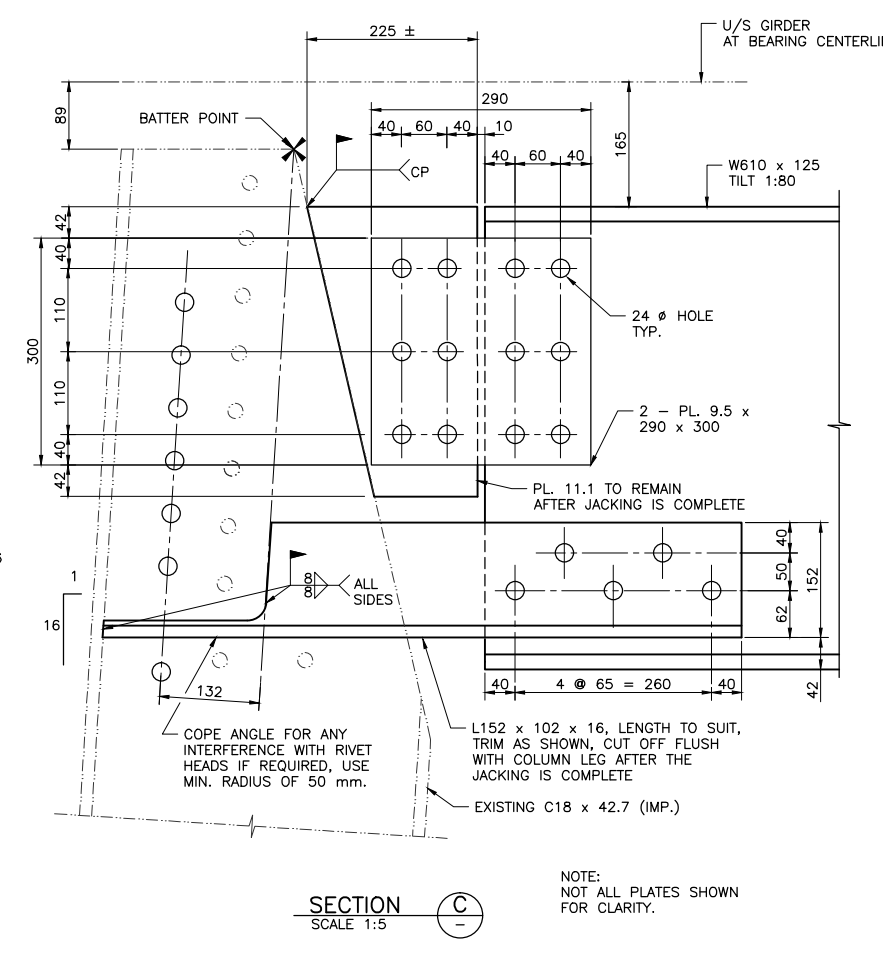
BRITISH COLUMBIA Ministry of Transportation and Infrastructure
South Coast Region

LOWER MAINLAND DISTRICT
HIGHWAY 99
1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT
JOINT RENEWAL PROJECT
JACKING BRACKETS AND STIFFENERS - SHEET 1

PREPARED UNDER THE DIRECTION OF		DESIGNED <u>J. JIAO</u> DATE <u>2013-11-01</u>	
ENGINEER OF RECORD <u>JACK JIAO</u>		ORIGINAL SIGNED BY <u>JACK JIAO</u> , P. ENG.	
DATE <u>2013-12-13</u>	FILE No.	DRAWN <u>S. LIAO</u> DATE <u>2013-11-01</u>	SCALE AS SHOWN
PROJECT No. <u>12268-0000</u>	REG. <u>1</u>	DRAWING No. <u>1481V 606</u>	NEGATIVE No.

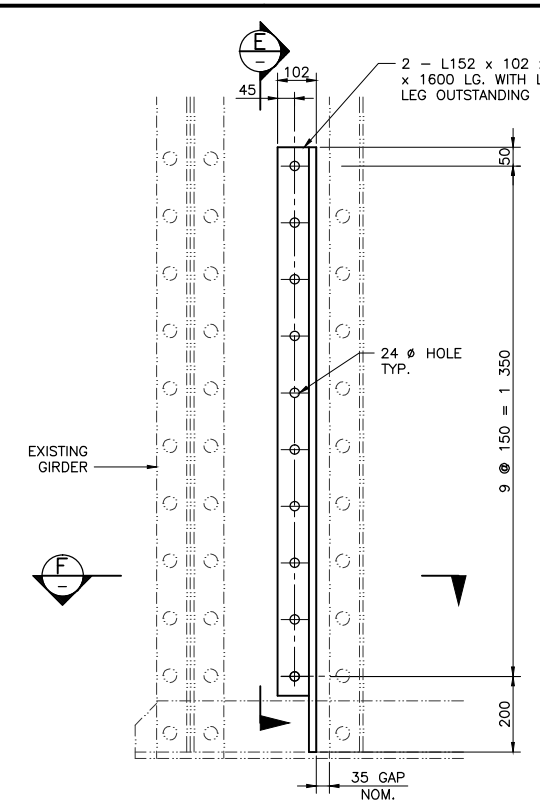


TEMPORARY JACKING BRACKET - TYPE 1
SCALE 1:5
(BENT 1 EAST SHOWN, OTHERS SIMILAR)

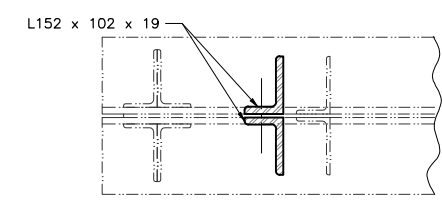


SECTION C
SCALE 1:5

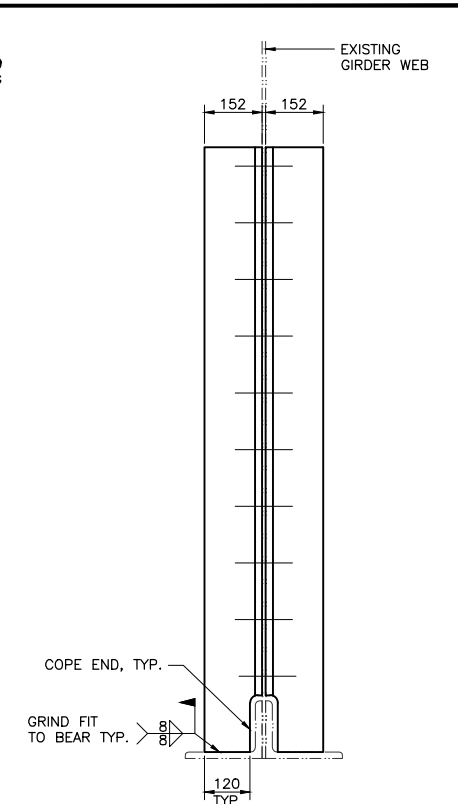
NOTE:
NOT ALL PLATES SHOWN FOR CLARITY.



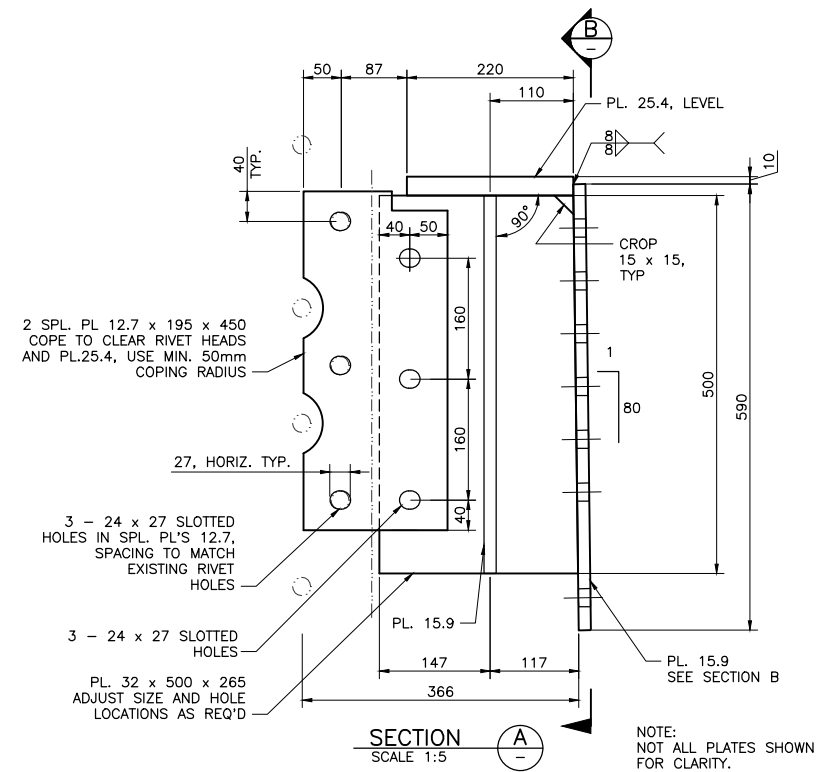
JACKING STIFFENER TYPE 1
SCALE 1:10



SECTION F
SCALE 1:10

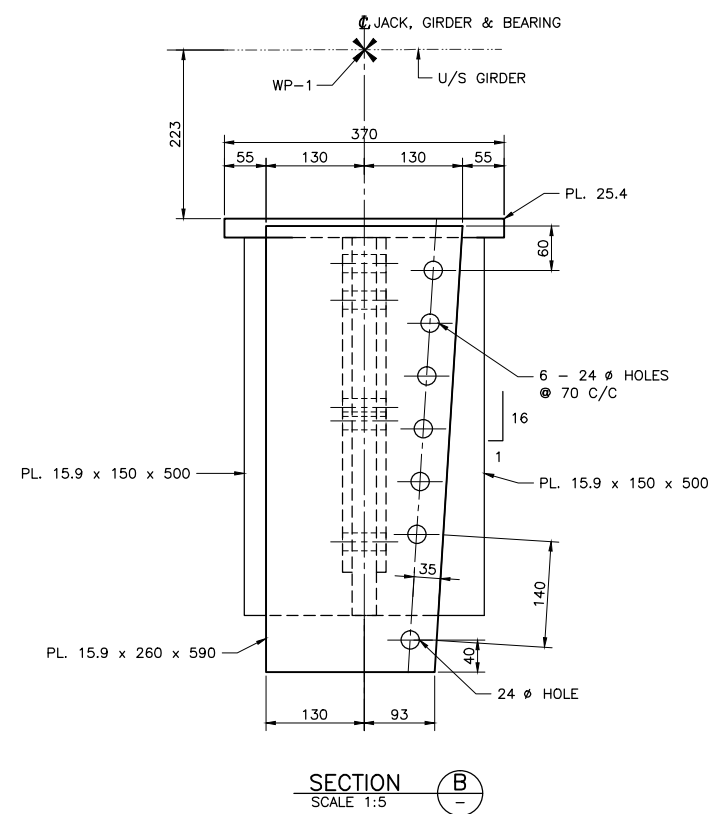


SECTION E
SCALE 1:10

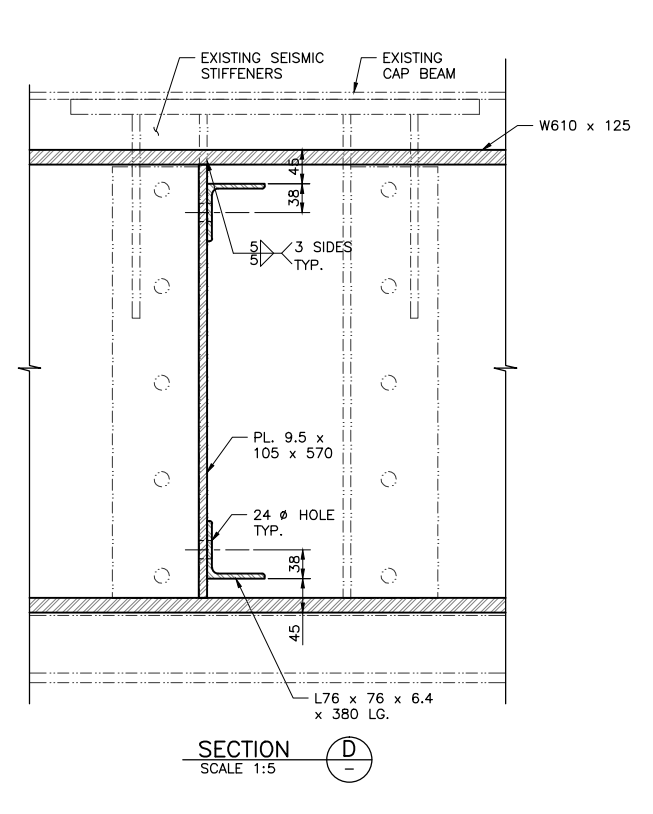


SECTION A
SCALE 1:5

NOTE:
NOT ALL PLATES SHOWN FOR CLARITY.



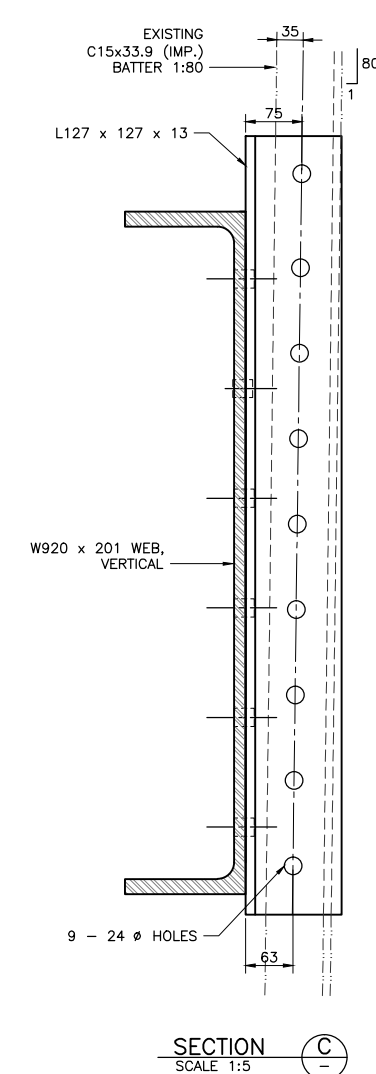
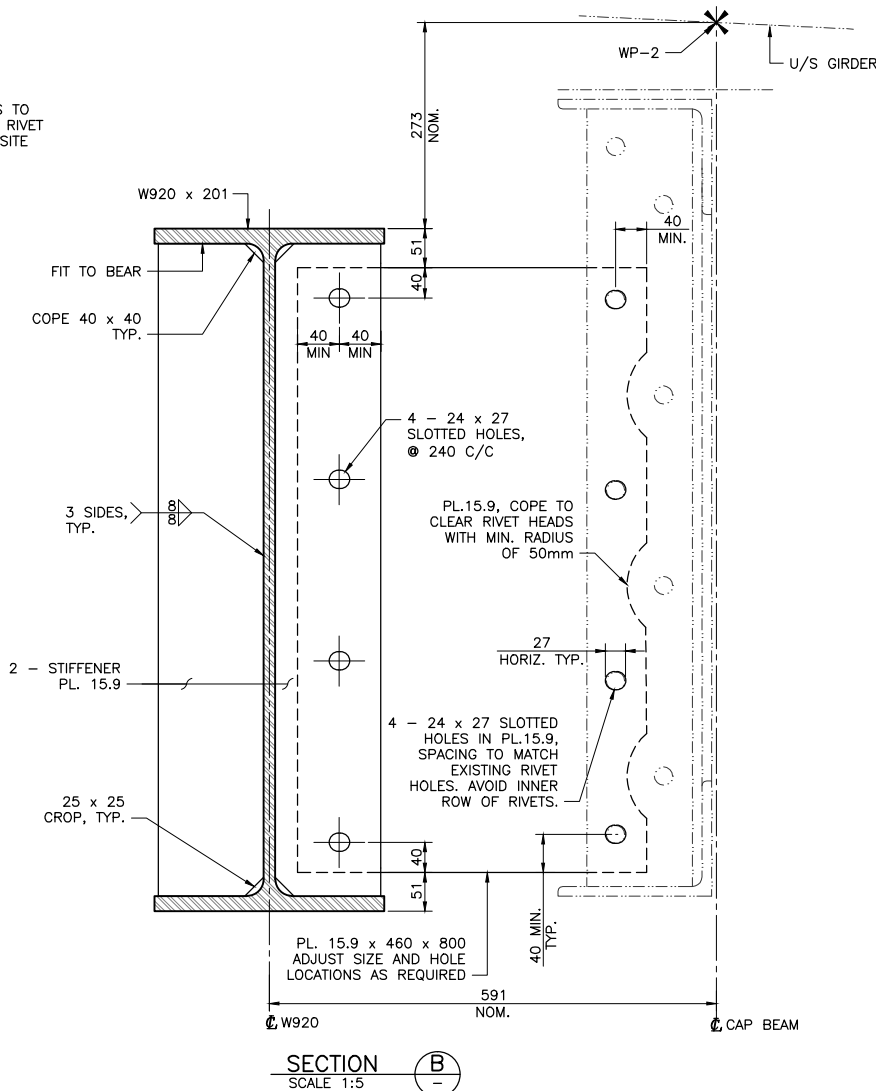
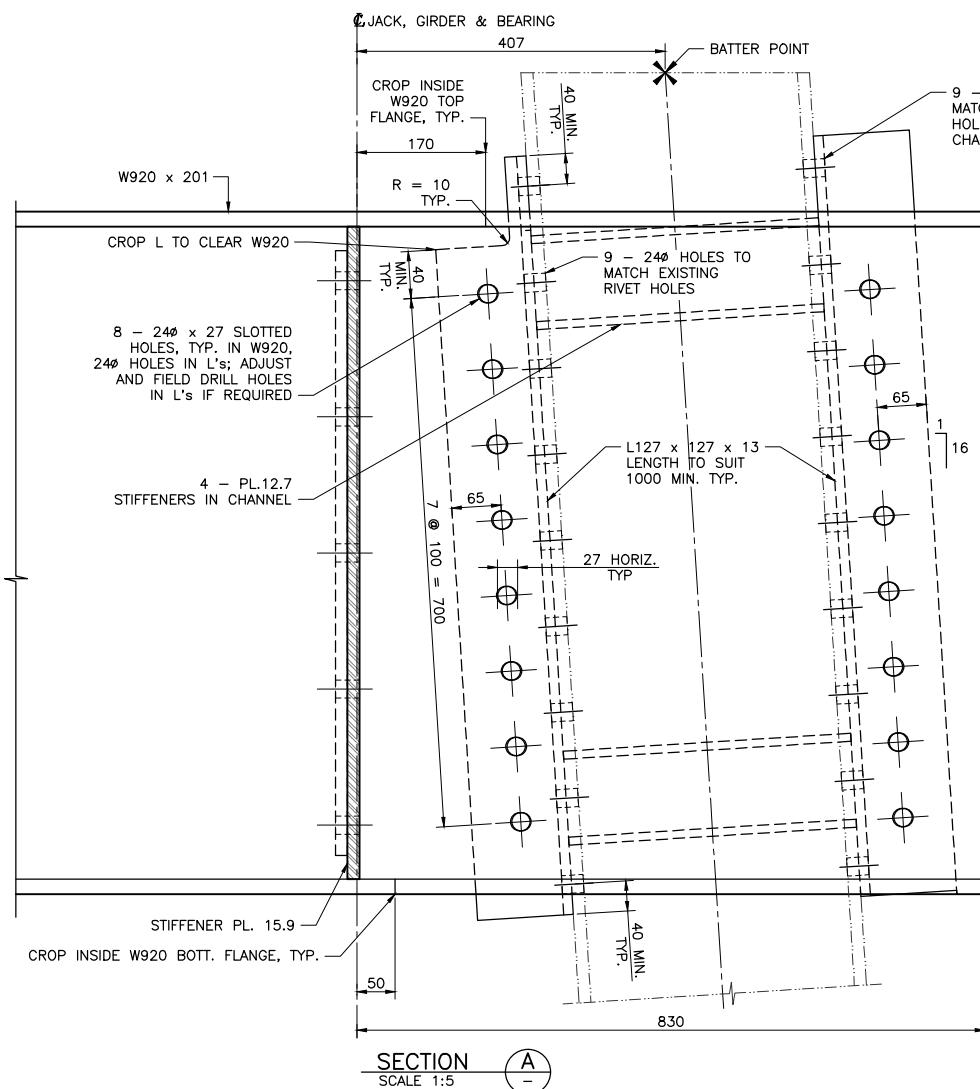
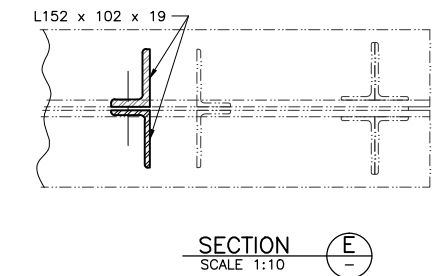
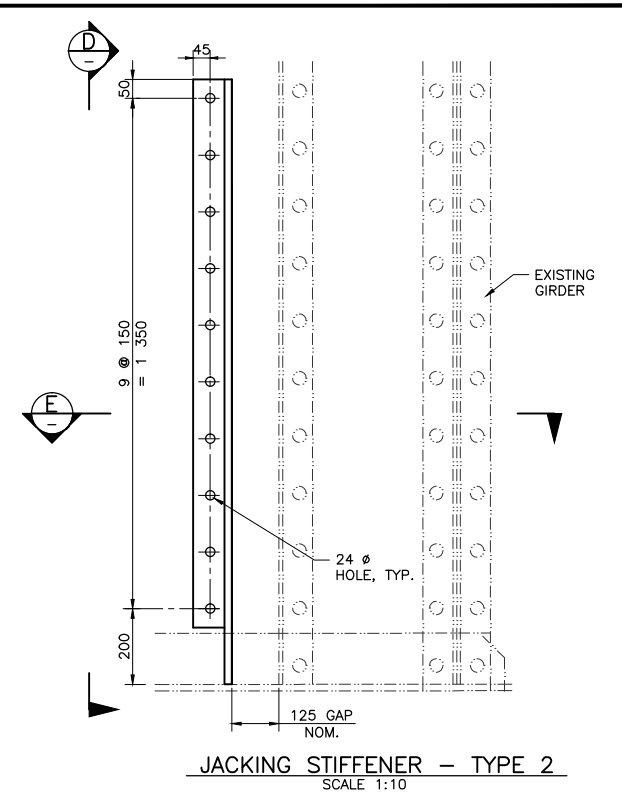
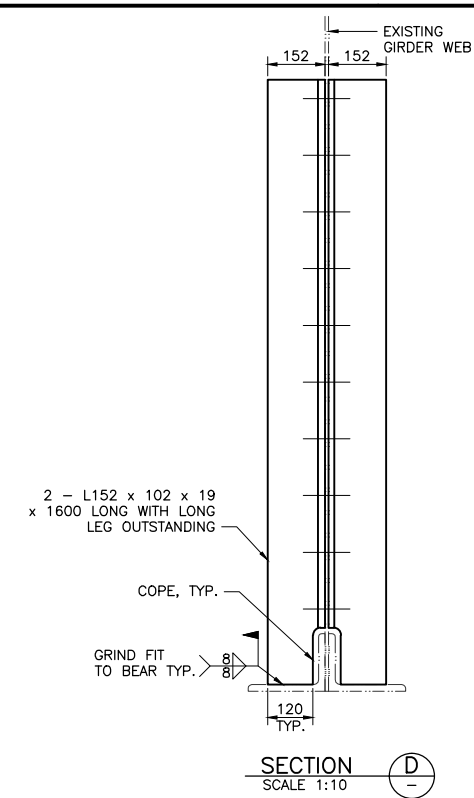
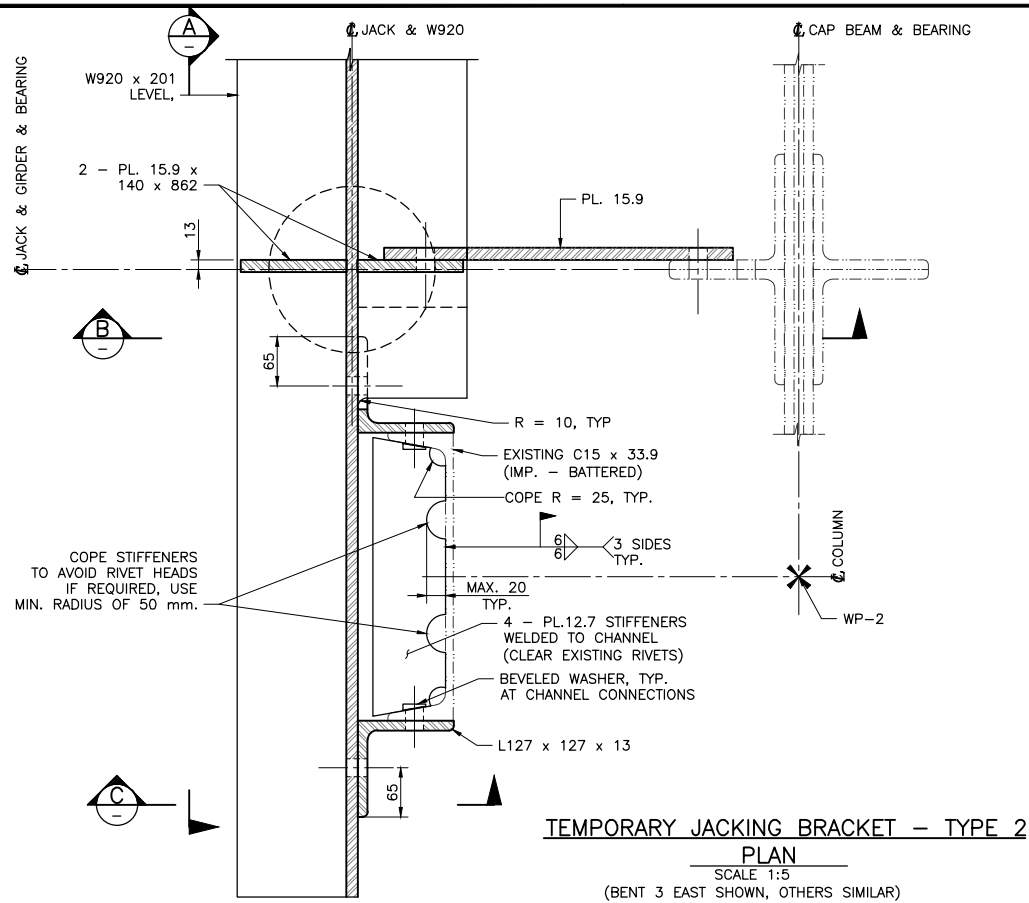
SECTION B
SCALE 1:5



SECTION D
SCALE 1:5

- NOTES:**
1. FOR NOTES SEE DRAWING 1481V 606.

Rev	Date	Description	Init
REVISIONS			
		Ministry of Transportation and Infrastructure South Coast Region	
LOWER MAINLAND DISTRICT HIGHWAY 99 1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT JOINT RENEWAL PROJECT JACKING BRACKETS AND STIFFENERS - SHEET 2			
PREPARED UNDER THE DIRECTION OF JACK JIAO		ORIGINAL SIGNED BY JACK JIAO, P. ENG.	
ENGINEER OF RECORD DATE 2013-12-13 FILE No.		DESIGNED <u>J. JIAO</u> DATE <u>2013-11-01</u> CHECKED <u>K. HABEL</u> DATE <u>2013-11-01</u> DRAWN <u>S. LAO</u> DATE <u>2013-11-01</u> SCALE AS SHOWN NEGATIVE No.	
PROJECT No. 12268-0000		REG. No. 1 DRAWING No. 1481V 607	



NOTES:
 1. FOR NOTES SEE DRAWING 1481V 606.

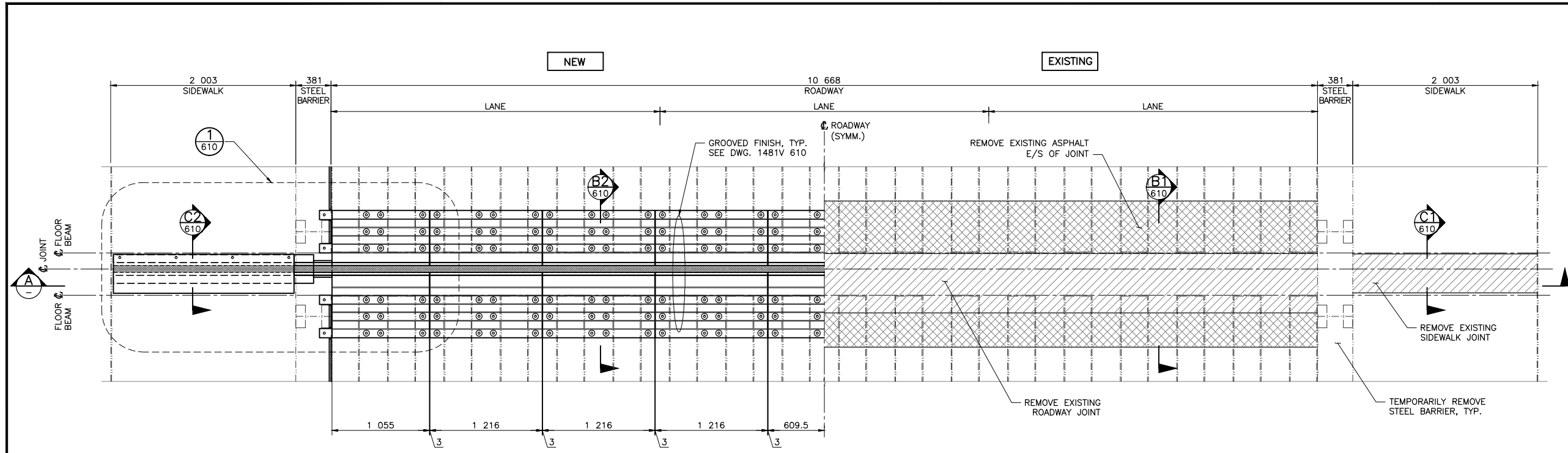
Rev		Date	Description	Init

REVISIONS

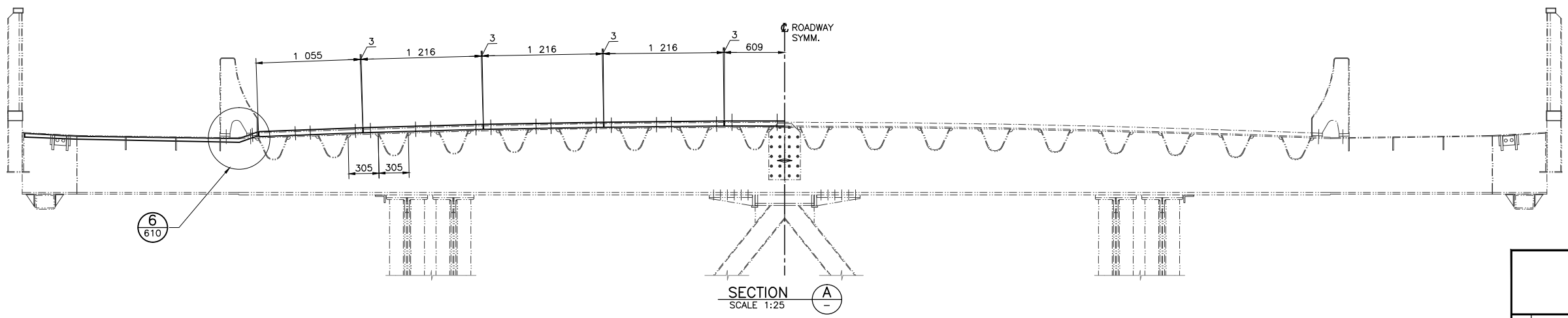
BRITISH COLUMBIA | Ministry of Transportation and Infrastructure
 South Coast Region

LOWER MAINLAND DISTRICT
 HIGHWAY 99
 1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT
 JOINT RENEWAL PROJECT
JACKING BRACKETS AND STIFFENERS - SHEET 3



PREPARED UNDER THE DIRECTION OF		DESIGNED	J. JIAO	DATE	2013-11-01
ENGINEER OF RECORD		CHECKED	K. HABEL	DATE	2013-11-01
DATE		DRAWN	S. LIAO	DATE	2013-11-01
FILE No.		PROJECT No.	REG.	DRAWING No.	
2013-12-13		12268-0000	1	1481V 608	



PLAN
SCALE 1:25
FOR JOINTS 5 9 13 19

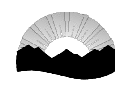


- NOTES:**
- SEE GENERAL NOTES ON DRAWING 1481V 602.
 - SIDEWALK ANTI-SKID SURFACE SHALL BE BIMAGRIP (R.S. CLARE) C/W 1MM ALUMINUM OXIDE AGGREGATE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

Rev	Date	Description	Init

REVISIONS

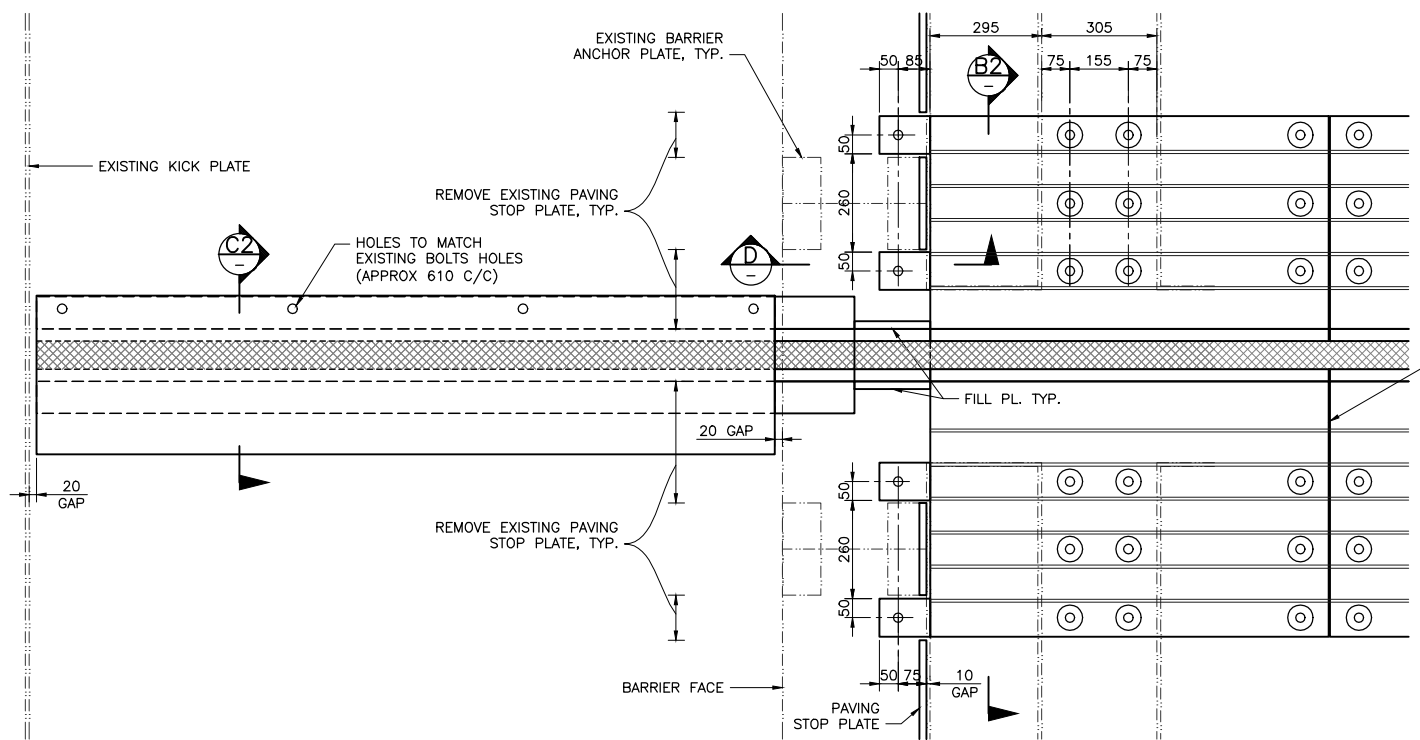


BRITISH COLUMBIA

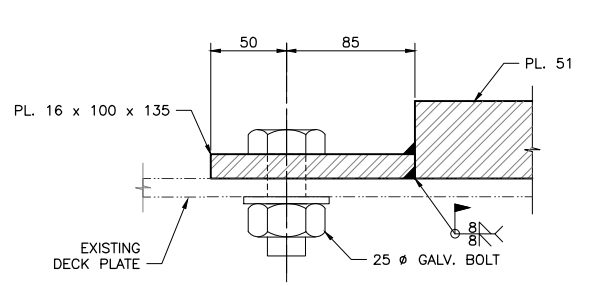
Ministry of Transportation and Infrastructure
South Coast Region

LOWER MAINLAND DISTRICT
HIGHWAY 99
1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT
JOINT RENEWAL PROJECT
TYPICAL EXPANSION JOINT DETAILS - SHEET 1

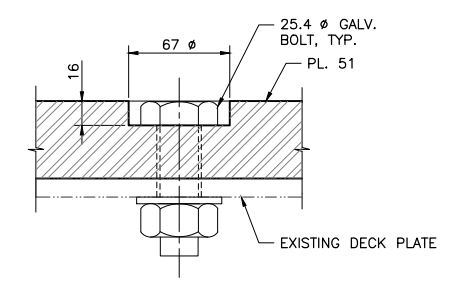
PREPARED UNDER THE DIRECTION OF		DESIGNED <u>J. JIAO</u> DATE <u>2013-11-01</u>
ENGINEER OF RECORD JACK JIAO		CHECKED <u>K. HABEL</u> DATE <u>2013-11-01</u>
DATE <u>2013-12-13</u>		DRAWN <u>S. LIAO</u> DATE <u>2013-11-01</u>
FILE No.	PROJECT No. 12268-0000	REG. 1 DRAWING No. 1481V-609



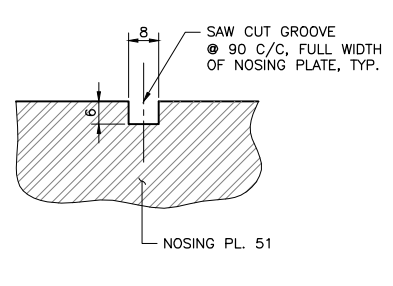
DETAIL 1
SCALE 1:10
609



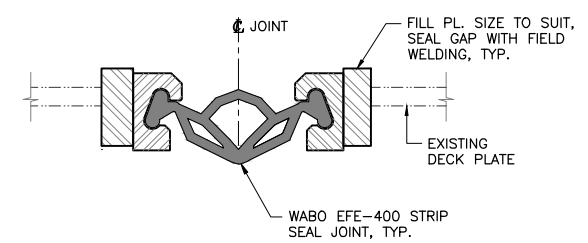
SECTION D-D
SCALE 1:2.5
612



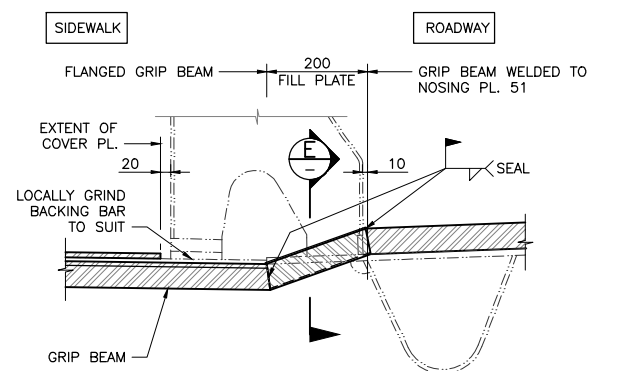
TYP. COUNTER SUNK HOLE
DETAIL 4
SCALE 1:2.5



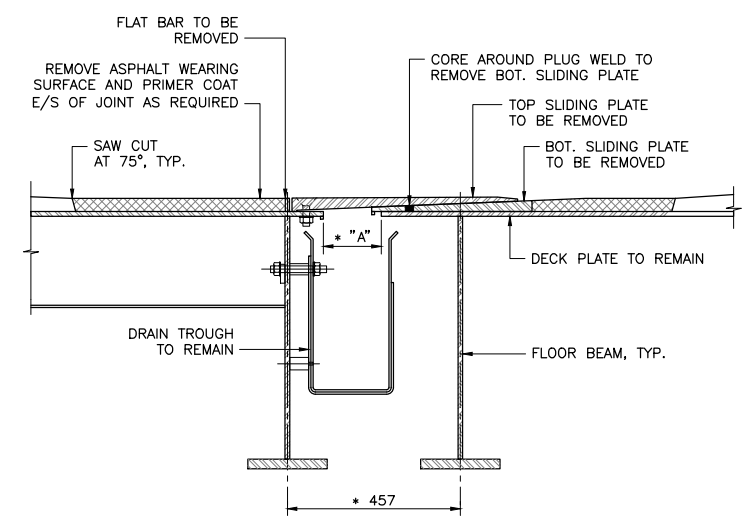
TYP. GROOVE
DETAIL 5
SCALE 1:1



SECTION E-E
SCALE 1:2.5

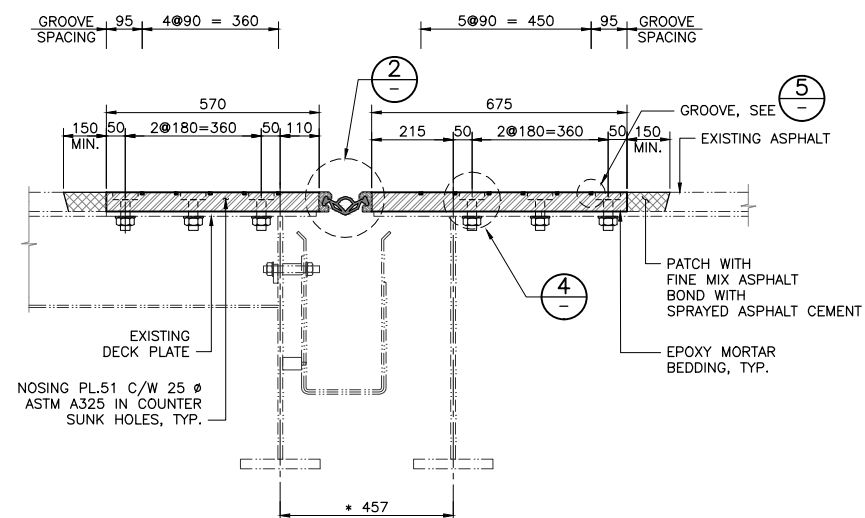


TYP. BARRIER
DETAIL 6
SCALE 1:7.5
609 611



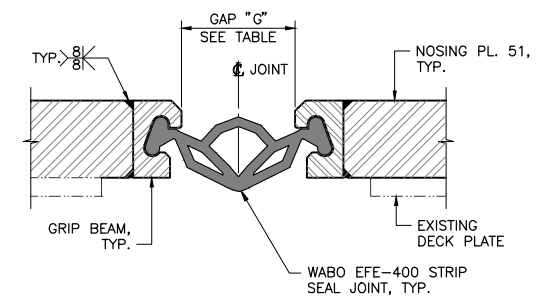
EXISTING EXPANSION JOINT ROADWAY
SECTION B1
SCALE 1:10
609

* AT 15° C:
"A" = 172 (JOINT 5)
"A" = 113 (OTHER JOINTS)



NEW EXPANSION JOINT ROADWAY
SECTION B2 B2
SCALE 1:10
609

* AT 15° C:

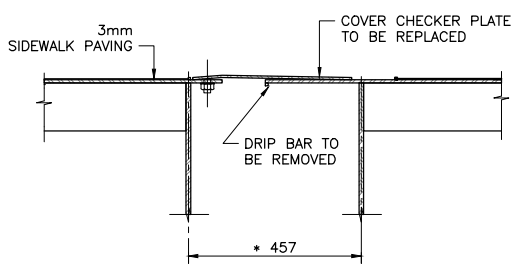


DETAIL 2
SCALE 1:2.5

JOINT GAP "G" SETTING TABLE

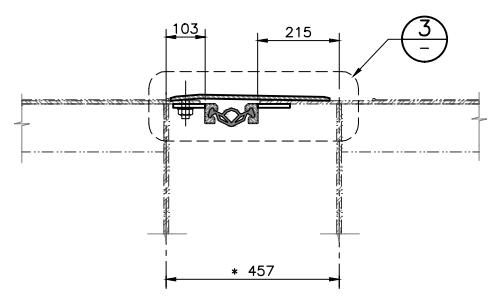
TEMPERATURE (°C)	GAP "G" (mm)
-10	102
-5	96
0	89
5	83
10	76
15	70
20	63

- NOTES:
- SEE GENERAL NOTES ON DRAWING 1481V 602.
 - SEE NOTES ON DRAWING 1484V 609.
 - ALL EXISTING EXPANSION JOINT GAPS SHALL BE FIELD CONFIRMED PRIOR TO INSTALLATION OF NEW JOINT.
 - ALL EPOXY MORTAR BEDDING SHALL BE SIKADUR 31 HI-MOD GEL INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - ALL GAPS BENEATH NOSING PLATES SHALL BE SEALED WITH FIELD WELDING.
 - ALL STEELWORK SHALL BE HOT DIP GALVANIZED TO CAN/CSA-G164 OR ZINC METALIZED TO CSA G189.
 - BOLTS SHALL BE HOT DIP GALVANIZED TO CAN/CSA G164



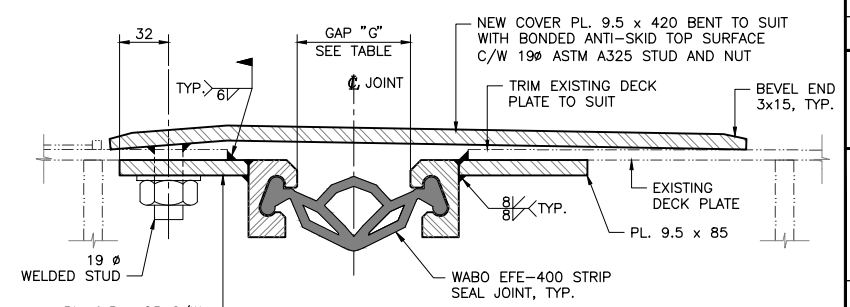
EXISTING EXPANSION JOINT SIDEWALK
SECTION C1
SCALE 1:10
609

* AT 15° C:



NEW EXPANSION JOINT SIDEWALK
SECTION C2 C2
SCALE 1:10
609

* AT 15° C:



DETAIL 3
SCALE 1:2.5
612

Rev	Date	Description	Init

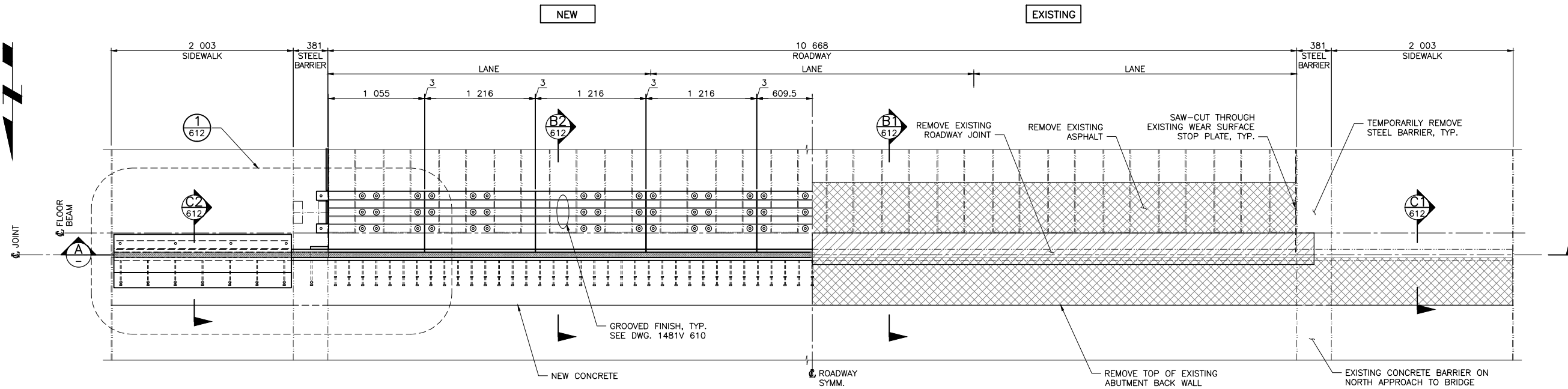
REVISIONS

Ministry of Transportation and Infrastructure
South Coast Region

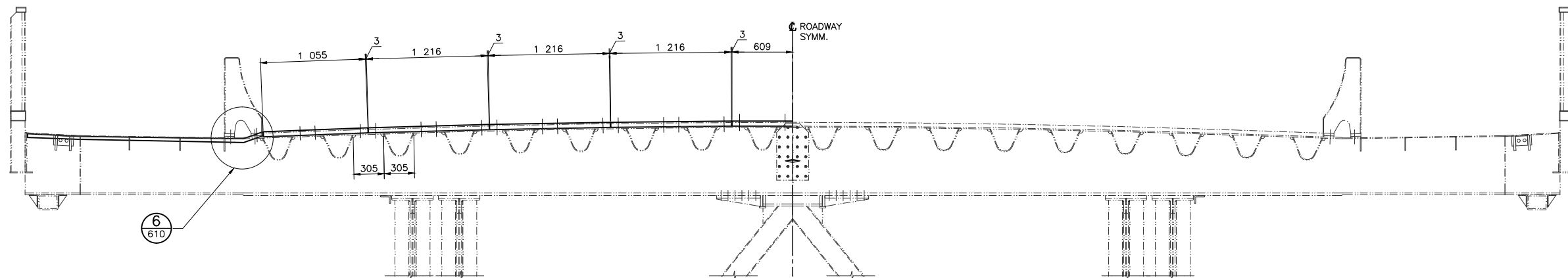
**LOWER MAINLAND DISTRICT
HIGHWAY 99
1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT
JOINT RENEWAL PROJECT**

TYPICAL EXPANSION JOINT DETAILS - SHEET 2

PREPARED UNDER THE DIRECTION OF JACK JIAO		DESIGNED <u>J. JIAO</u> DATE <u>2013-11-01</u>
ENGINEER OF RECORD JACK JIAO	CHECKED <u>K. HABEL</u> DATE <u>2013-11-01</u>	ORIGINAL SIGNED BY <u>JACK JIAO</u> P. ENG.
DATE <u>2013-12-13</u>	DRAWN <u>S. LIAO</u> DATE <u>2013-11-01</u>	SCALE AS SHOWN
FILE No.	PROJECT No. 12268-0000	REG. No. 1
		DRAWING No. 1481V-610



PLAN
SCALE 1:25
FOR JOINT (25)

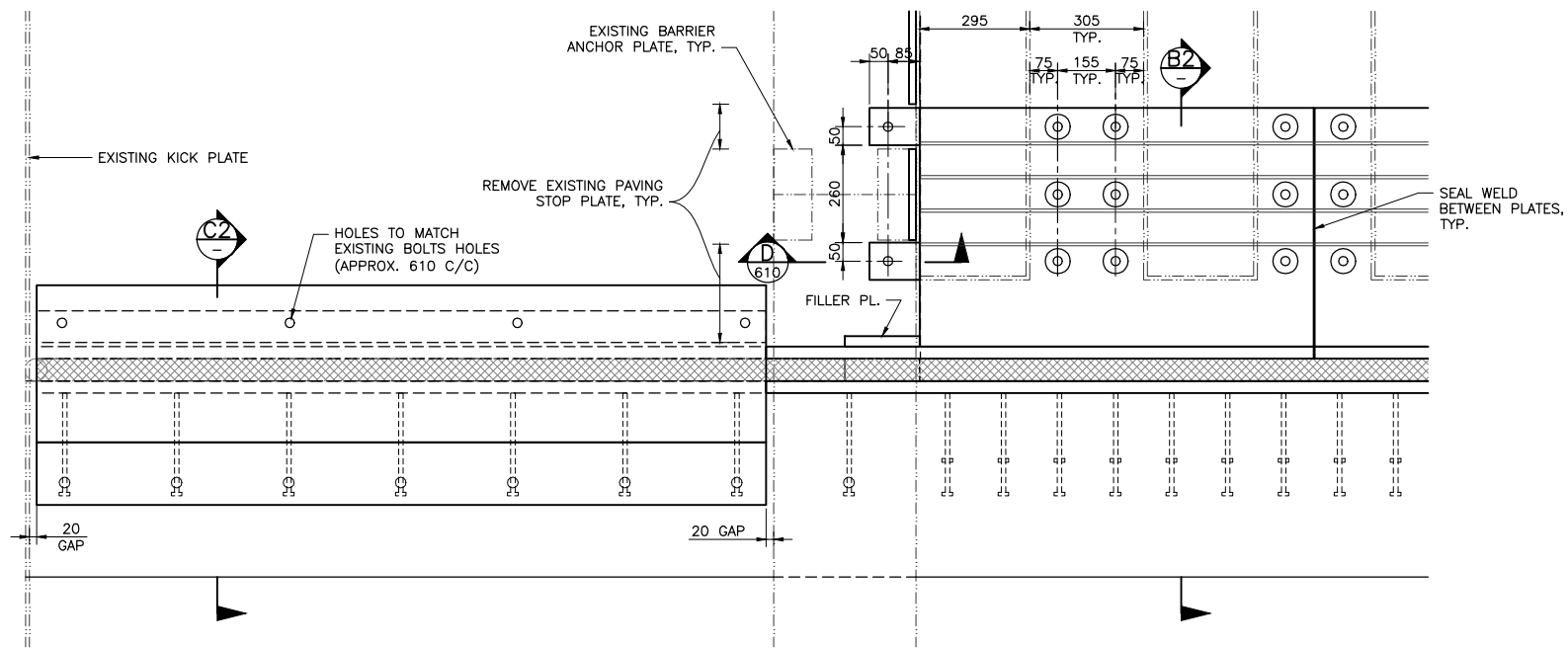


SECTION A-A
SCALE 1:25

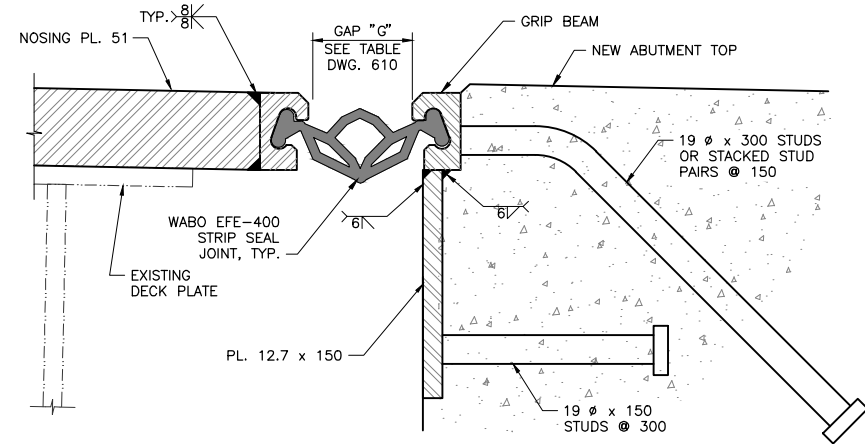
NOTES:

1. SEE GENERAL NOTES ON DRAWING 1481V 602.
2. SEE NOTES ON DRAWING 1484V 609 AND 1481V 610.
3. EXISTING CONCRETE SURFACE TO RECEIVE NEW CONCRETE OR GROUT SHALL BE CLEANED AND INTENTIONALLY ROUGHENED.
4. NEW CONCRETE SHALL HAVE 35 MPA MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS.
5. ALL REINFORCING STEEL SHALL CONFORM TO CSA G30.18 GRADE 400.
6. ALL REINFORCING STEEL SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
7. WELDING OF REINFORCING IS NOT PERMITTED.
8. CLEAR CONCRETE COVER OVER REINFORCING STEEL SHALL BE 75 MM MINIMUM.
9. MECHANICAL CONNECTIONS FOR REINFORCING BARS SHALL DEVELOP THE GREATER OF 120% SPECIFIED YIELD STRENGTH OR 110% MEAN YIELD STRENGTH OF THE BARS.

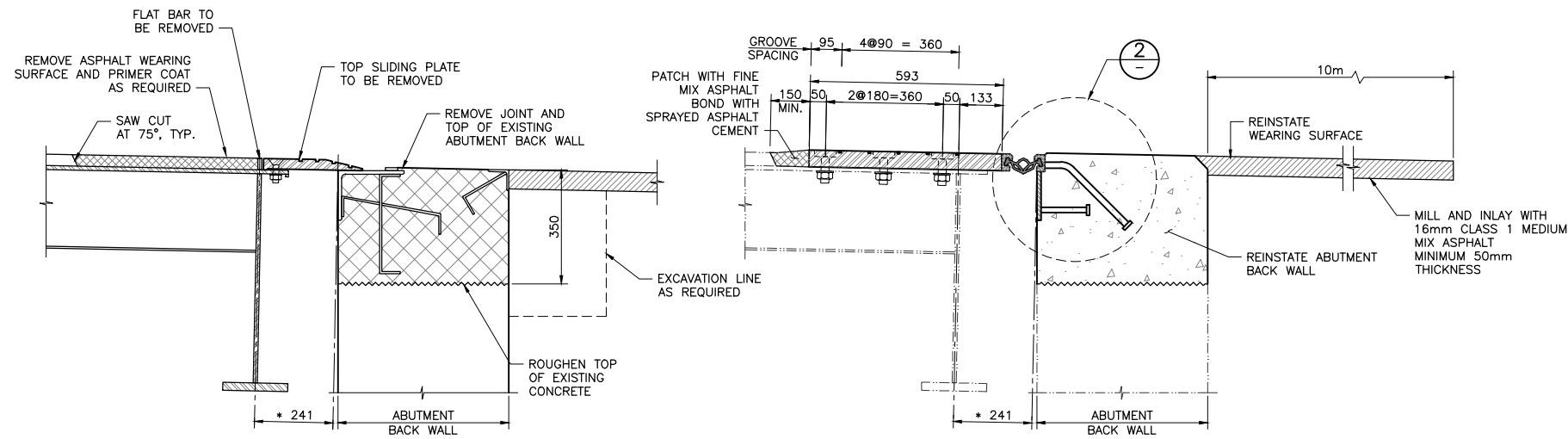
Rev	Date	Description	Init
REVISIONS			
		Ministry of Transportation and Infrastructure South Coast Region	
LOWER MAINLAND DISTRICT HIGHWAY 99 1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT JOINT RENEWAL PROJECT ABUTMENT EXPANSION JOINT DETAILS - SHEET 1			
PREPARED UNDER THE DIRECTION OF JACK JIAO ENGINEER OF RECORD DATE 2013-12-13 FILE No.		ORIGINAL SIGNED BY JACK JIAO, P. ENG. DESIGNED <u>J. JIAO</u> DATE 2013-11-01 CHECKED <u>K. HABEL</u> DATE 2013-11-01 DRAWN <u>S. LIAO</u> DATE 2013-11-01 SCALE AS SHOWN NEGATIVE No.	
PROJECT No. 12268-0000	REG. No. 1	DRAWING No. 1484V-611	



DETAIL 1
SCALE 1:10

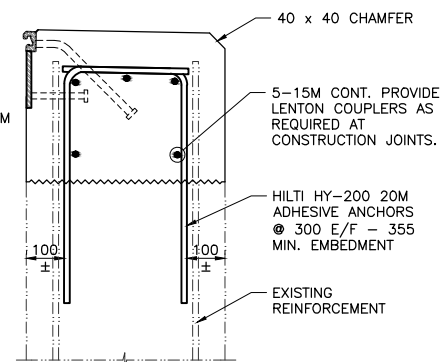


DETAIL 2
SCALE 1:2.5

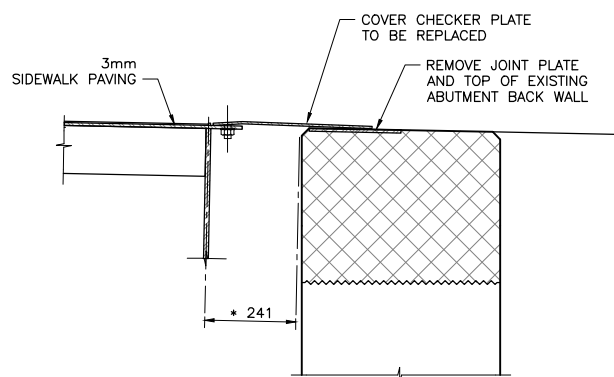


EXISTING EXPANSION JOINT @ ROADWAY
SECTION B1
SCALE 1:10
* AT 15°C

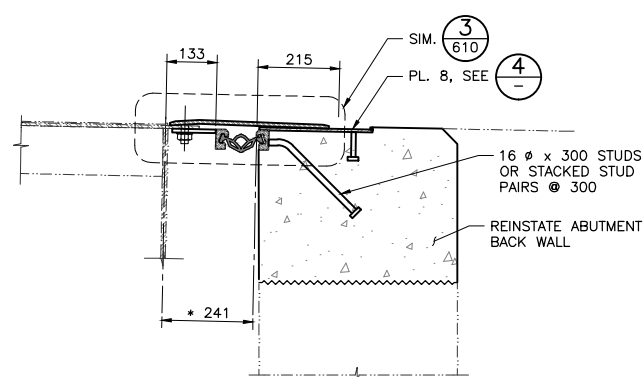
NEW EXPANSION JOINT @ ROADWAY
SECTION B2 B2
SCALE 1:10
* AT 15°C



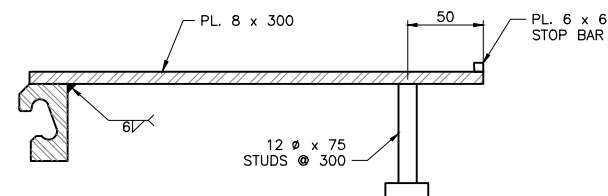
CONC. REINF. DETAIL
SCALE 1:10



EXISTING EXPANSION JOINT @ SIDEWALK
SECTION C1
SCALE 1:10
* AT 15°C



NEW EXPANSION JOINT @ SIDEWALK
SECTION C2 C2
SCALE 1:10
* AT 15°C



DETAIL 4
SCALE 1:2.5

amec **AE** Associated Engineering

Rev	Date	Description	Init

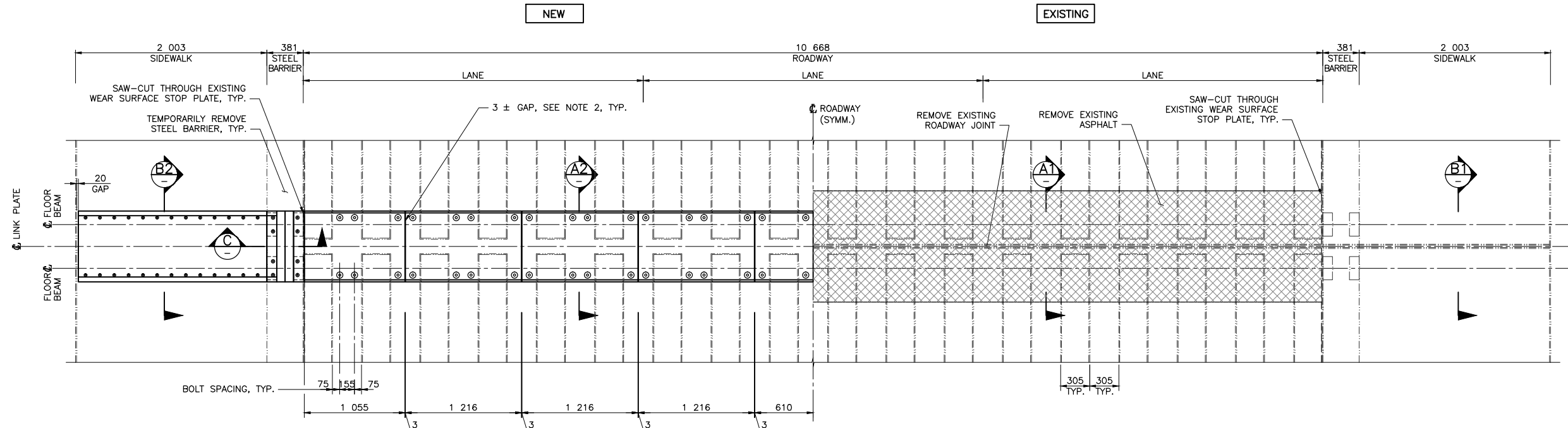
REVISIONS

BRITISH COLUMBIA Ministry of Transportation and Infrastructure
South Coast Region

LOWER MAINLAND DISTRICT
HIGHWAY 99
1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT
JOINT RENEWAL PROJECT
ABUTMENT EXPANSION JOINT DETAILS - SHEET 2

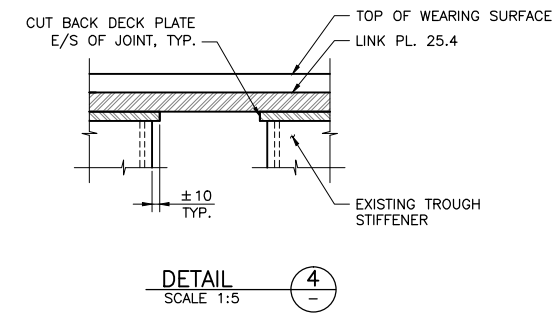
PREPARED UNDER THE DIRECTION OF
JACK JIAO
ENGINEER OF RECORD
DATE 2013-12-13
FILE No. 12268-0000

DESIGNED **J. JIAO** DATE 2013-11-01
CHECKED **K. HABEL** DATE 2013-11-01
DRAWN **S. LIAO** DATE 2013-11-01
ORIGINAL SIGNED BY JACK JIAO, P. ENG.
SCALE AS SHOWN
NEGATIVE No. 1
DRAWING No. 1481V-612

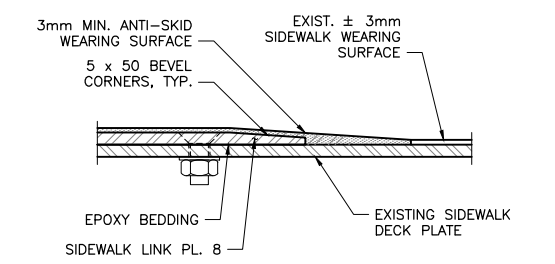


PLAN
SCALE 1:25

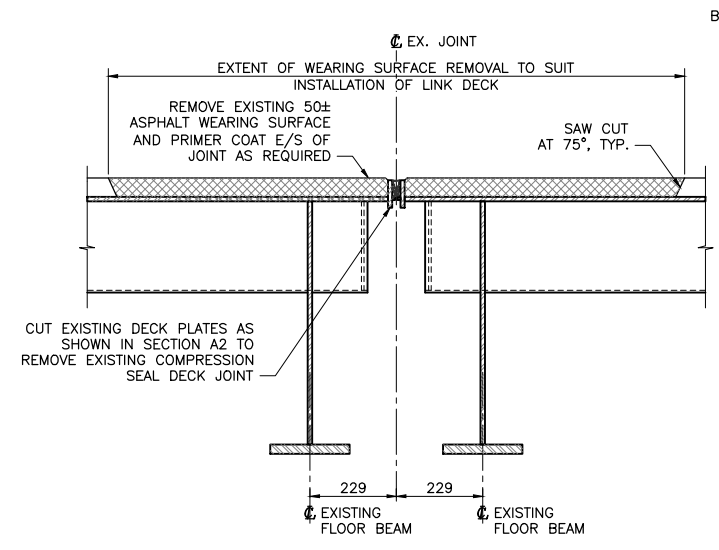
FOR JOINTS 1 2 3 4 6 7 8 10 11 12 14 15 16 17 18 20 21 22 23 24



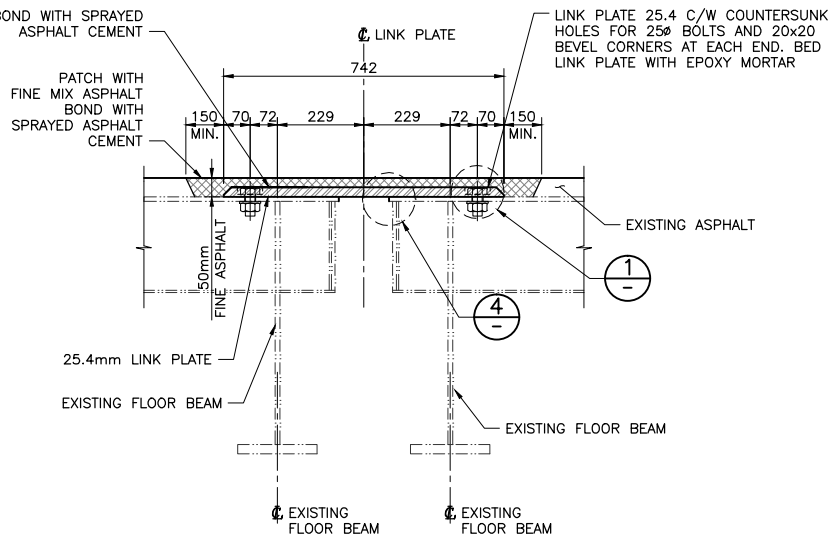
DETAIL 4
SCALE 1:5



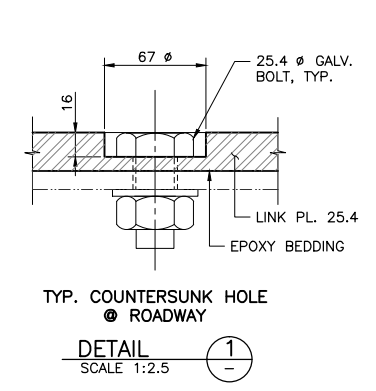
TRANSITION DETAIL
DETAIL 5
SCALE 1:2.5



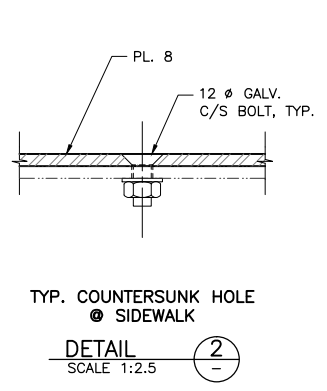
EXISTING EXPANSION JOINT @ ROADWAY
SECTION A1
SCALE 1:10



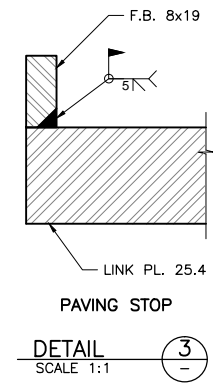
NEW LINK PLATE @ ROADWAY
SECTION A2
SCALE 1:10



TYP. COUNTERSUNK HOLE @ ROADWAY
DETAIL 1
SCALE 1:2.5



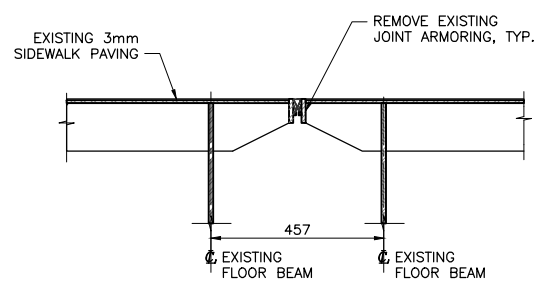
TYP. COUNTERSUNK HOLE @ SIDEWALK
DETAIL 2
SCALE 1:2.5



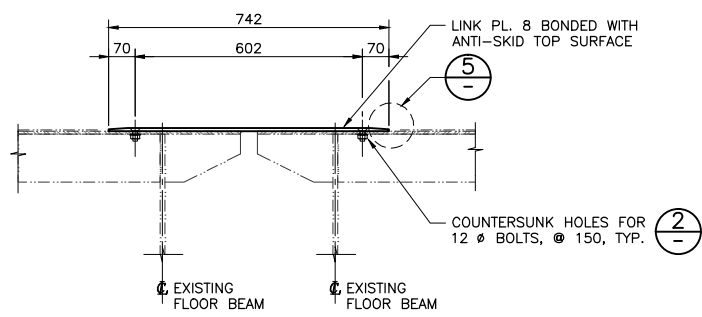
PAVING STOP
DETAIL 3
SCALE 1:1

NOTES:

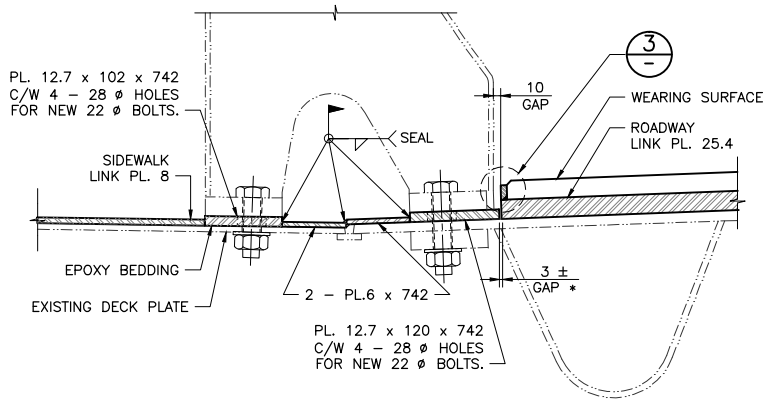
- SEE GENERAL NOTES ON DRAWING 1481V 602.
- ALL GAPS BETWEEN LINK PLATES AND BETWEEN SIDEWALK LINK PLATES SHALL BE SEALED WITH FIELD WELDING.
- ALL STEEL PLATES SHALL CONFORM TO CAN/CSA-G40.21 GRADE 300W HOT-DIP GALVANIZED IN ACCORDANCE WITH CAN/CSA-G164, OR ZINC METALIZED TO CSA G189.
- BOLTS SHALL BE HOT DIP GALVANIZED TO CAN/CSA-G164
- ALL EPOXY MORTAR BEDDING SHALL BE SIKADUR 31 HI-MOD GEL INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- ALL COUNTER-SUNK HOLES SHALL BE FILLED WITH EPOXY RESIN AFTER BOLTING.
- SIDEWALK ANTI-SKID SURFACE SHALL BE BIMAGRIP (R.S. CLARE) C/W 1MM ALUMINUM OXIDE AGGREGATE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



EXISTING EXPANSION JOINT @ SIDEWALK
SECTION B1
SCALE 1:10



NEW LINK PLATE @ SIDEWALK
SECTION B2
SCALE 1:10



TYP. @ BARRIER
SECTION C
SCALE 1:5
* SEE NOTE 2

Rev	Date	Description	Init
REVISIONS			
		Ministry of Transportation and Infrastructure South Coast Region	
LOWER MAINLAND DISTRICT HIGHWAY 99 1481V - LIONS GATE BRIDGE NORTH APPROACH VIADUCT JOINT RENEWAL PROJECT LINK DECK DETAILS			
PREPARED UNDER THE DIRECTION OF JACK JIAO		ORIGINAL SIGNED BY JACK JIAO, P. ENG.	
ENGINEER OF RECORD DATE 2013-12-13 FILE No.		DESIGNED: J. JIAO DATE 2013-11-01 CHECKED: K. HABEL DATE 2013-11-01 DRAWN: S. LIAO DATE 2013-11-01 SCALE AS SHOWN NEGATIVE No.	
PROJECT No. 12268-0000		REG. 1 DRAWING No. 1481V 613	