County of Renfrew
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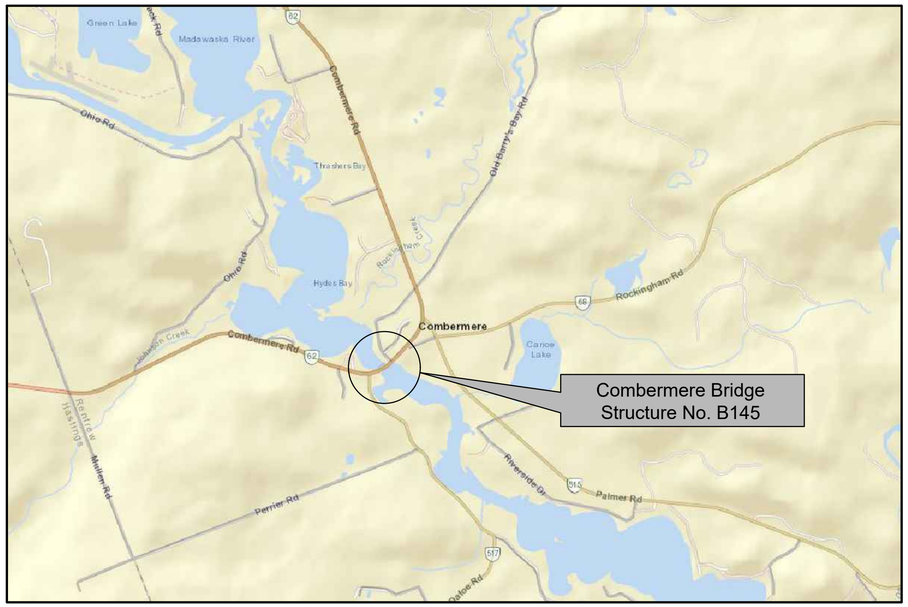
Jacobs

LEE PERKINS, MBA, C.E.T.
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

DECEMBER 2024



LIST OF DRAWINGS

REHABILITATION OF COUNTY STRUCTURE B145 (COMBERMERE BRIDGE)

ISSUED FOR TENDER

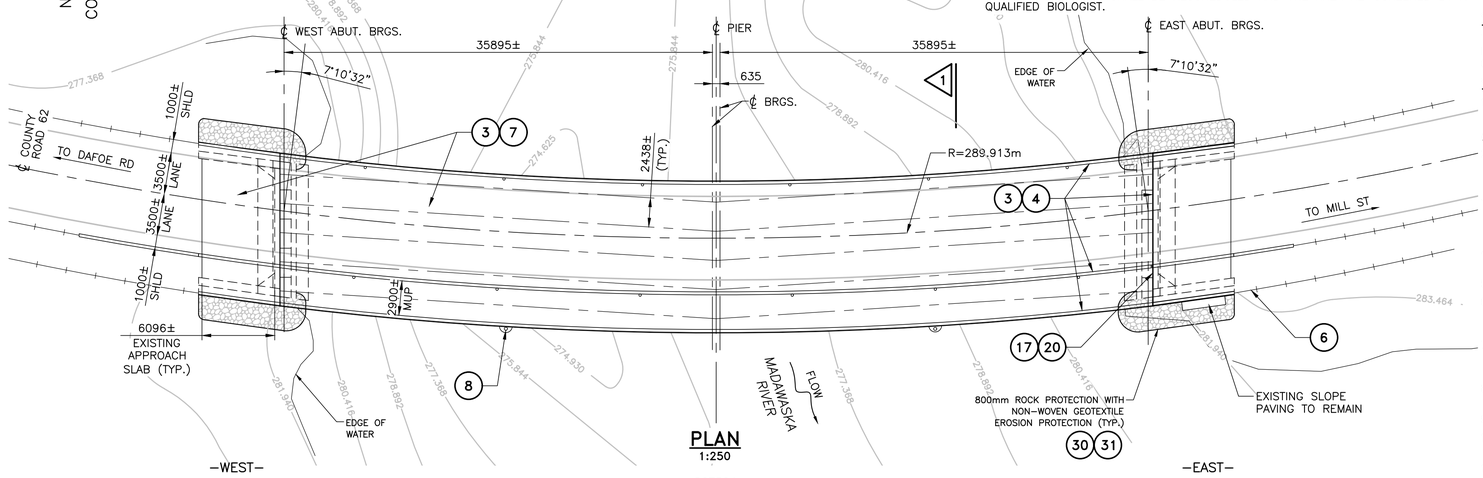
CONTRACT No. PWC-2025-46

FILE NAME: C:\pw_workdir\jacobs-americas\d0159406\CEB79500-000_Cover-Sheet-IFT-DEC24.dwg
MODIFIED: 2024-12-05 15:36

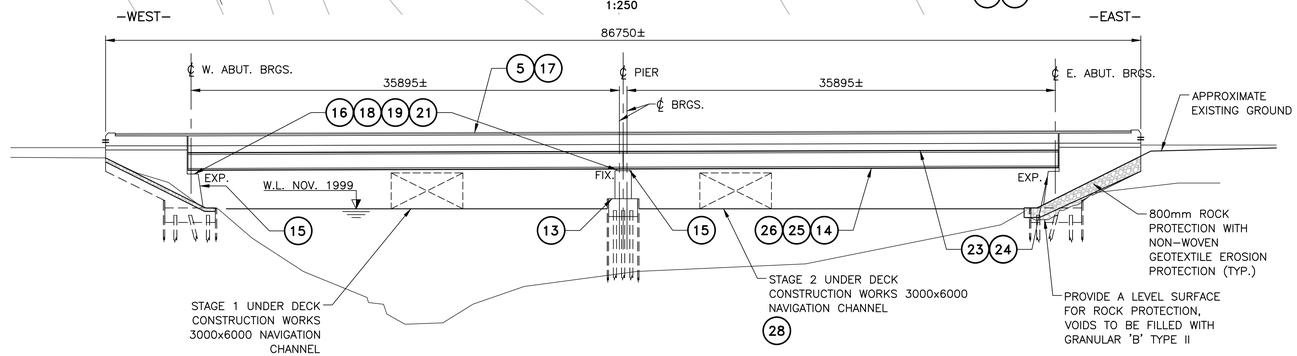
NORTH FOR CONSTRUCTION

NOTICE TO CONTRACTOR:

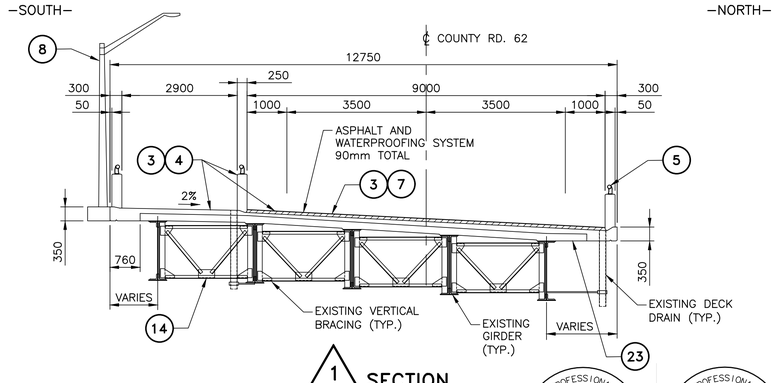
1. THE EXISTING COATING SYSTEM CONTAINS LEAD IN EXCESS OF THE ENVIRONMENTAL ABATEMENT COUNCIL OF CANADA LIMIT OF 1000PPM. FULL NEGATIVE PRESSURE ENCLOSURES ARE REQUIRED TO CONTAIN LEAD PAINT DURING REMOVAL OPERATIONS. THE CONTRACTOR SHALL ADHERE TO ONTARIO REGULATION 490/09 DESIGNATED SUBSTANCES AND ALL OTHER APPLICABLE REGULATIONS.
2. BIRD FECES ARE PRESENT ON THE SUBSTRUCTURE AND SUPERSTRUCTURE. THE CONTRACTOR SHALL DISPOSE OF FECES OFFSITE, NO FECES ARE PERMITTED TO ENTER THE WATERCOURSE.
3. PRIOR TO PLACING GRANULAR B–II AND ROCK PROTECTION, A QUALIFIED BIOLOGIST SHALL SWEEP THE AREA IMPACTED BY THE WORKS FOR TURTLES. IF TURTLES ARE PRESENT, THE WORK SHALL BE RESCHEDULED AND THE AREA RE–SCREENED BY A QUALIFIED BIOLOGIST.



PLAN
1:250



ELEVATION
1:250



1 SECTION
1:75

CONSTRUCTION NOTES

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DETAILS AND ELEVATIONS OF THE EXISTING STRUCTURE THAT ARE RELEVANT TO THE WORK SHOWN ON THE DRAWINGS PRIOR TO COMMENCEMENT OF THE WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE CONTRACT ADMINISTRATOR AND THE PROPOSED ADJUSTMENT OF THE WORK REQUIRED TO MATCH THE EXISTING STRUCTURE SHALL BE SUBMITTED FOR APPROVAL.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL TEMPORARY STRUCTURES, INCLUDING CONSTRUCTION PLATFORMS AND DEBRIS CONTAINMENT SYSTEMS.

SAWCUTS AT LIMITS OF REMOVAL SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.

ALL MATERIALS SHALL BE IN ACCORDANCE WITH MTO DESIGNATED SOURCES FOR MATERIALS (DSM).

THE CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES DURING CONSTRUCTION OPERATIONS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STABILITY AND INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.

GRANULAR MATERIAL SHALL BE COMPACTED TO A DENSITY OF 100% OF THE MAXIMUM DRY DENSITY AND ALL EARTH MATERIALS SHALL BE COMPACTED TO A DENSITY OF 95% OF THE MAXIMUM DRY DENSITY.

ALL EXPOSED CONCRETE EDGES SHALL HAVE A 20mm x 20mm CHAMFER.

ALL AREAS AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE FULLY REINSTATED TO PRE–CONSTRUCTION CONDITIONS OR BETTER TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.

THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO COMMENCEMENT OF ANY WORK ONSITE.

BACKFILL SHALL NOT BE PLACED AGAINST NEW CONCRETE UNTIL CONCRETE HAS REACHED 70% OF ITS DESIGN STRENGTH.

IN WATER WORKS SHALL ONLY BE PERMITTED BETWEEN JULY 16 AND MARCH 14.

ALL ELEVATIONS ARE TO GEODETIC DATUM.

EXISTING PLANTER BOXES SHALL BE REMOVE AND SALVAGED BY THE CONTRACTOR AT THE START OF CONSTRUCTION. ONCE CONSTRUCTION IS COMPLETE THE CONTRACTOR SHALL REINSTATE THE PLANTER BOXES WITH NEW POTTING SOIL AND NEW FLOWERS MATCHING THE SPECIES AND QUANTITY OF THE EXISTING.

ALL SURFACES OF PARAPET WALLS SHALL BE SEALED WITH TECHCRETE 2500 OR APPROVED EQUIVALENT AS DIRECTED BY THE CONTRACT ADMINISTRATOR.

LIST OF ABBREVIATIONS

N.T.S.	NOT TO SCALE	N.F.	NEAR FACE
U/S	UNDERSIDE	F.F.	FAR FACE
SHLD	SHOULDER	E.F.	EACH FACE
T/P	TOP OF PAVEMENT	E.W.	EACH WAY
W.P.	WORKING POINT	EQ. SPCD.	EQUALLY SPACED
C.J.	CONSTRUCTION JOINT		
MUP	MULTI USE PATHWAY		

(1) NUMBER IN SCOPE OF WORK (TYPICAL LOCATION SHOWN, NOT AT ALL LOCATIONS REQUIRED)

SCOPE OF WORK

THE FOLLOWING WORK SHALL BE CARRIED OUT IN STAGES AND IS NOT INTENDED TO BE AN EXHAUSTIVE LIST OF ALL ITEMS REQUIRED TO COMPLETE THE REHABILITATION WORK.

STARTUP

1. INSTALL CONSTRUCTION SIGNAGE AND EROSION AND SEDIMENT CONTROL MEASURES.

ABOVE DECK STAGED WORK

2. INSTALL TEMPORARY CONCRETE BARRIERS AND DIVERT TRAFFIC ONTO WESTBOUND LANE, CLOSING EASTBOUND LANE, FOR STAGE 1 ABOVE DECK CONSTRUCTION.
3. REMOVE ASPHALT AND WATERPROOFING TO LIMITS SHOWN, REMOVE CONCRETE IN DECK TOP, APPROACH SLABS, EXPANSION JOINT END DAMS, PARAPET WALLS, AND WINGWALLS AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
4. PERFORM CONCRETE REPAIRS, AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
5. REPAIR RAILING ON PARAPET WALL AND SEAL PARAPET WALLS.
6. WATERPROOF DECK AND PERFORM PARTIAL DEPTH REMOVALS ON COUNTY ROAD 62 AND FULL DEPTH REMOVALS ON MUP UNDER FLAGGED OPERATIONS AND COMPLETE PAVING.
7. RELOCATE TEMPORARY CONCRETE BARRIERS AND DIVERT TRAFFIC ONTO REHABILITATED HALF OF THE STRUCTURE FOR STAGE 2 ABOVE DECK CONSTRUCTION.
8. PERFORM CONCRETE REMOVALS AND REPAIRS TO LIGHT POLE BASES AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
9. REPEAT STEPS 3 TO 6 FOR STAGE 2 ABOVE DECK CONSTRUCTION.
10. REPAIR DAMAGED PORTION OF GUIDE RAIL AS DIRECTED BY CONTRACT ADMINISTRATOR AND CONTRACT DRAWINGS.
11. REMOVE TEMPORARY CONCRETE BARRIERS AND REOPEN BRIDGE TO TRAFFIC.
12. PERFORM ROADWAY LINE PAINTING.

BEARING AND EXPANSION JOINT STRIP SEAL REPLACEMENT

13. INSTALL TEMPORARY CONSTRUCTION ACCESS PLATFORM UNDER STRUCTURE AT PIER AND ABUTMENTS.
14. COMPLETE STEEL REPAIRS TO GUSSET PLATES AND BRACES AND STRENGTHEN DIAPHRAGMS AS DIRECTED BY THE CONTRACT ADMINISTRATOR AND CONTRACT DRAWINGS.
15. PERFORM CONCRETE REMOVALS AND REPAIRS AT THE PIERS AND ABUTMENTS AS DIRECTED BY THE CONTRACT ADMINISTRATOR. FREE JAMMED GIRDER FROM BALLAST WALL.
16. INSTALL ABUTMENT CORBEL AND TEMPORARY BRIDGE JACKING SYSTEMS AT PIER AND ABUTMENTS.
17. DISCONNECT RAILING ON PARAPET WALLS AND DURING A SHORT DURATION OVERNIGHT FULL ROAD CLOSURE OF COUNTY ROAD 62, REMOVE EXPANSION JOINT STRIP SEAL, JACK AND BLOCK BRIDGE, PAD APPROACHES TO BRIDGE AND REOPEN BRIDGE TO TRAFFIC.
18. REMOVE BEARINGS, PERFORM CONCRETE REPAIRS ON PIER AND ABUTMENT SEATS AS DIRECTED BY THE CONTRACT ADMINISTRATOR. UNDER STAGE 1 TRAFFIC CONTROL: REMOVE EXISTING BEARINGS AND INSTALL NEW SHOE PLATES FOR THE THREE SOUTHERN GIRDERS. UNDER STAGE 2 TRAFFIC CONTROL: REMOVE EXISTING BEARINGS AND INSTALL NEW SHOE PLATES FOR THE TWO NORTHERN GIRDERS.
19. INSTALL NEW PEDESTALS AND BEARINGS.
20. DURING A SHORT DURATION OVERNIGHT FULL ROAD CLOSURE OF COUNTY ROAD 62: JACK DOWN BRIDGE, REMOVE TEMPORARY PADDING AT APPROACHES, INSTALL NEW EXPANSION JOINT STRIP STEAL, RECONNECT PARAPET WALL RAILINGS AND REOPEN BRIDGE TO TRAFFIC.
21. REMOVE TEMPORARY BRIDGE JACKING SYSTEM AND RESTORE IMPACTED AREAS TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.

UNDER DECK STAGED WORK

22. INSTALL TEMPORARY CONSTRUCTION ACCESS PLATFORMS ON EAST SPAN FOR STAGE 1 UNDER DECK CONSTRUCTION.
23. REMOVE CONCRETE IN SOFFIT AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
24. PERFORM CONCRETE REPAIRS AND INSTALL SHEAR BLOCK AT ABUTMENTS.
25. ABRASIVELY BLAST CLEAN ALL STRUCTURAL STEEL ON EAST HALF OF BRIDGE.
26. RECOAT STRUCTURAL STEEL.
27. REMOVE TEMPORARY CONSTRUCTION ACCESS PLATFORMS ON THE EAST SPAN FOR STAGE 1 UNDER DECK CONSTRUCTION AND INSTALL CONSTRUCTION ACCESS PLATFORMS ON THE WEST SPAN FOR STAGE 2 UNDER DECK CONSTRUCTION.
28. REPEAT STEPS 23 TO 26 FOR STAGE 2 BELOW DECK CONSTRUCTION.
29. REMOVE TEMPORARY CONSTRUCTION ACCESS PLATFORMS ON THE WEST SPAN FROM STAGE 2 UNDER DECK CONSTRUCTION.

CLOSEOUT

30. PLACE GRANULAR B TYPE–II AND ROCK PROTECTION AT ABUTMENTS. PLACE GRANULAR B–II UNDER APPROACH SLAB TO FILL IN VOID.
31. RESTORE ALL AREAS AFFECTED BY CONSTRUCTION ACTIVITIES TO PRE–CONSTRUCTION CONDITIONS.
32. REMOVE CONSTRUCTION SIGNAGE AND TEMPORARY TRAFFIC CONTROLS.
33. REINSTATE PLANTER BOXES WITH NEW POTTING SOIL AND FLOWERS.

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

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COMBERMERE BRIDGE REHABILITATION	SHEET 1
GENERAL ARRANGEMENT	CONTRACT NO. PWC–2025–46

Jacobs

GENERAL NOTES

1. DESIGN CODE

CANADIAN HIGHWAY BRIDGE DESIGN CODE (CAN/CSA S6–19)

2. CLASS OF CONCRETE

CLASS OF CONCRETE SHALL BE 30 MPa, CLASS C1

GROUT FOR GROUT PADS SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 30MPa., UNLESS OTHERWISE SPECIFIED.

3. CLEAR COVER TO REINFORCING STEEL

DECK	TOP	70 ±20
	BOTTOM	40 ±10
REMAINDER – UNLESS OTHERWISE NOTED		70 ±20

4. CONCRETE SLUMP

DECK AND APPROACH SLABS:	100 ±20
CURBS AND PARAPET WALLS:	80 ±20
SOFFIT REPAIRS (PUMPING):	120 ±20
REMAINDER – UNLESS OTHERWISE NOTED	100 ±20

OVERHEAD PATCHES WITH AN AREA GREATER THAN 400mm x 400mm SHALL BE FORMED AND PUMPED.

REPAIRS AND PATCHES WITH AN AREA LESS THAN 400mm x 400mm SHALL HAVE A SLUMP MEETING THE REQUIREMENTS OF THE MANUFACTURERS RECOMMENDATIONS. CONCRETE PRODUCT SHALL BE FROM THE MINISTRY'S (MTO) LIST OF CONCRETE PATCHING MATERIALS.

5. REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400W.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES FOR REINFORCING STEEL BARS SHALL BE CLASS B.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12–1, UNLESS INDICATED OTHERWISE.

6. STRUCTURAL STEEL

ALL STRUCTURAL STEEL SHALL CONFORM TO CSA STANDARD CAN/CSA G40.20/G40.21 GRADE 350W. ROLLED SECTIONS SHALL CONFORM TO CSA STANDARD CAN/CSA G40.20/G40.21 OR ASTM SPECIFICATIONS A588.

BOLTS ON COATED STEEL SHALL BE GALVANIZED ASTM A325M TYPE 1, M22, UNLESS NOTED OTHERWISE. BOLT THREADS SHALL BE EXCLUDED FROM THE SHEAR PLANES.

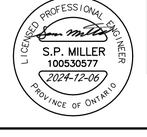
UNLESS OTHERWISE NOTED THE MINIMUM FILLET WELD SHALL BE AS FOLLOWS:

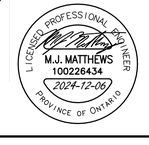
MATERIAL THICKNESS OF THICKER PART JOINED (mm)	MINIMUM SIZE OF SINGLE PASS FILLET WELD (mm)
TO 12 INCLUSIVE	5
OVER 12 TO 20	6
OVER 20 TO 40	8
OVER 40 TO 60	10
OVER 60 TO 120	12

ALL STRUCTURAL STEEL SURFACE, INCLUDING DIAPHRAGMS, BUT EXCLUDING SURFACES IN CONTACT WITH CONCRETE AND THE CONTACT SURFACES OF BOLTED JOINTS, SHALL BE ABRASIVELY BLAST CLEANED AND COATED. THE COLOUR OF THE TOPCOAT SHALL BE A GREY COLOUR THAT MATCHES THE COLOUR OF THE EXISTING PAINT. NEW ABUTMENT CORBELS TOP COAT COLOUR SHALL BE A GREY COLOUR THAT MATCHES THE COLOUR OF THE ABUTMENTS. THE COATING SYSTEM SHALL CONSIST OF A PRIMER COAT, ONE (1) INTERMEDIATE COAT AND ONE (1) TOP COAT. A COLOUR SAMPLE 400mm X 400mm SHALL BE PROVIDED TO THE CONTRACT ADMINISTRATOR TWO (2) WEEKS PRIOR TO COATING OPERATIONS COMMENCING FOR COLOUR APPROVAL.

APPLICABLE STANDARD DRAWINGS

OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3419.100	BARRIERS AND RAILINGS, STEEL BEAM GUIDE RAIL AND CHANNEL ANCHORAGE





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2	OCT/24	ISSUED FOR TENDER	
1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL	
NO.	DATE	DESCRIPTION	

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DWG	46D2501	DATE	NOV 2024				

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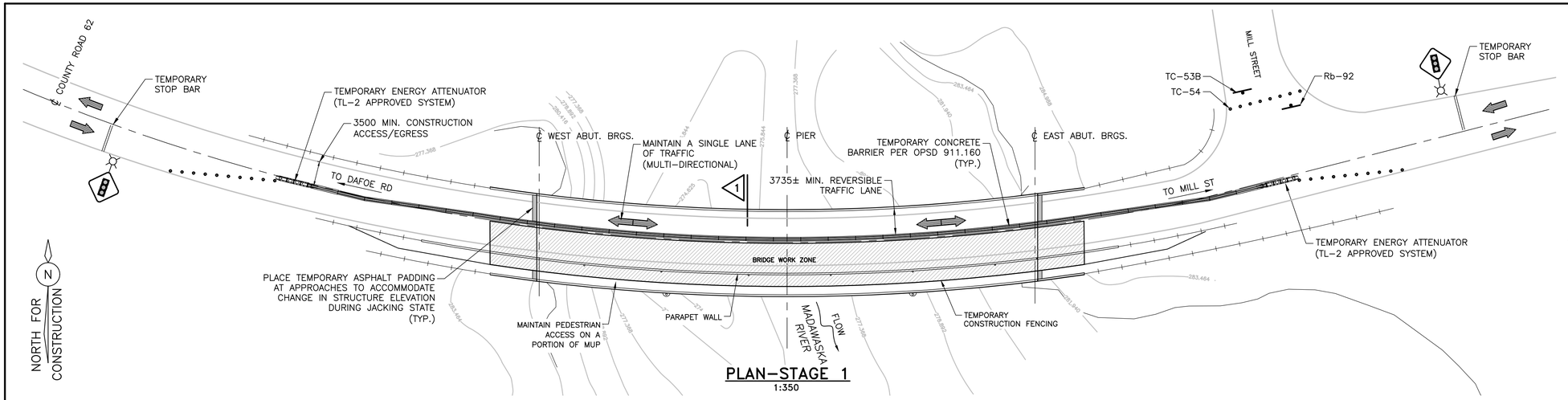

PLAN–STAGE 1
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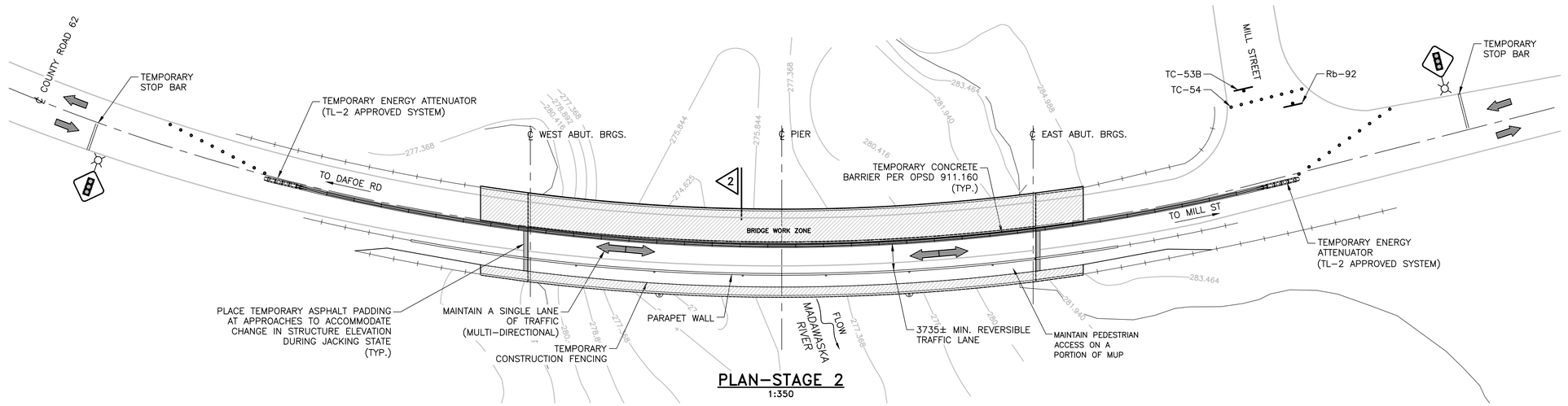

PLAN–STAGE 2
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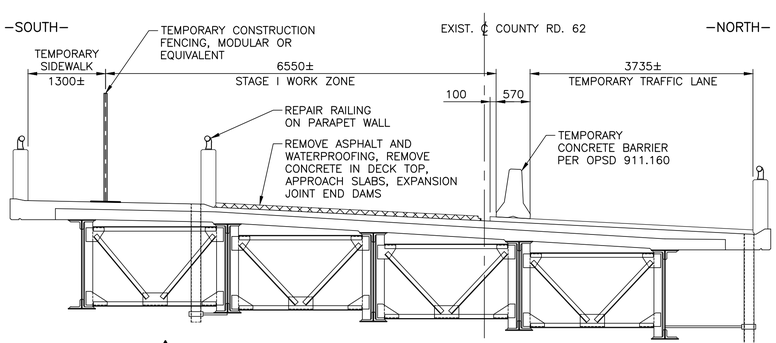

1 SECTION–STAGE 1 REMOVAL/CONSTRUCTION
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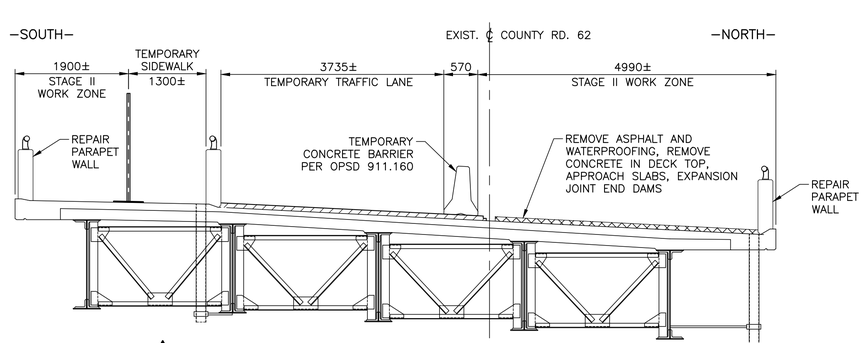

2 SECTION–STAGE 2 REMOVAL/CONSTRUCTION
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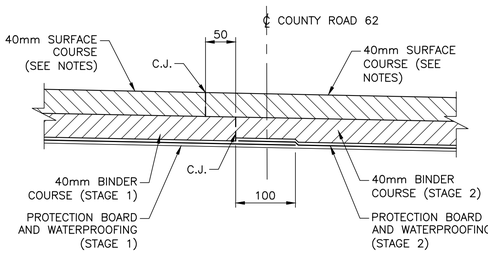

TYPICAL ASPHALT AND WATERPROOFING SYSTEM LAP
1:5

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COMBERMERE BRIDGE REHABILITATION

SHEET 2

CONSTRUCTION STAGING

CONTRACT NO. PWC-2025-46

Jacobs

NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DETOUR DRAWINGS AND GENERAL ARRANGEMENT.
2. THIS DRAWING SHALL FORM PART OF THE CONTRACTORS TRAFFIC MANAGEMENT PLAN. NOT ALL CONSTRUCTION SIGNAGE IS SHOWN. SEE SPECIFICATION FOR TRAFFIC MANAGEMENT REQUIREMENTS.
3. ALL CONSTRUCTION SIGNAGE TO BE SUPPLIED, INSTALLED, MAINTAINED AND REMOVED BY THE CONTRACTOR. SIGNAGE SHALL CONFORM WITH THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 7 – TEMPORARY CONDITIONS.
4. TRAFFIC THROUGH CONSTRUCTION ZONE TO BE PRIMARILY CONTROLLED BY TEMPORARY TRAFFIC SIGNALS. THE CONTRACTOR IS RESPONSIBLE FOR THE SUPPLY AND PLACEMENT OF THE TEMPORARY TRAFFIC SIGNAL INCLUDING THE OPERATIONAL TIMING AND RATE REQUIREMENTS TO MEET SITE CONDITIONS. TEMPORARY TRAFFIC SIGNAL SHALL BE PLACED IN A SECURE LOCATION AND PROTECTION PROVIDE AS MAYBE REQUIRED.
5. THE CONTRACTOR SHALL MAINTAIN ONE LANE OF TRAFFIC AT ALL TIME DURING CONSTRUCTION EXCEPT AS NOTED FOR JACKING AND BEARING REPLACEMENT.
6. THE CONTRACTOR SHALL MAINTAIN SAFE PEDESTRIAN ACCESS ACROSS THE STRUCTURE AT ALL TIMES.
7. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN 1V:40H TEMPORARY ASPHALT RAMP BETWEEN CONSTRUCTION STAGES AND PRIOR TO REPLACEMENT OF THE SURFACE COURSE AS REQUIRED UNTIL FINAL PAVING IS COMPLETE.
8. SAWCUTTING OF ASPHALT PAVEMENT AT LIMITS OF STAGE 1 REMOVALS SHALL BE COMPLETED IN SUCH A MANNER TO ENSURE THE TOP OF DECK CONCRETE IS NOT DAMAGED.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ADVANCE NOTICE SIGNS SPECIFYING THE DATES AND TIMES FOR THE NIGHT TIME CLOSURES OF COMBERMERE ROAD FOR JACKING OPERATIONS.

LICENSED PROFESSIONAL ENGINEER
S.P. MILLER
100530577
2024-12-06
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
M.J. MATTHEWS
100226434
2024-12-06
PROVINCE OF ONTARIO

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS			
3	DEC/24	RE-ISSUED FOR TENDER	
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1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL	
NO.	DATE	DESCRIPTION	

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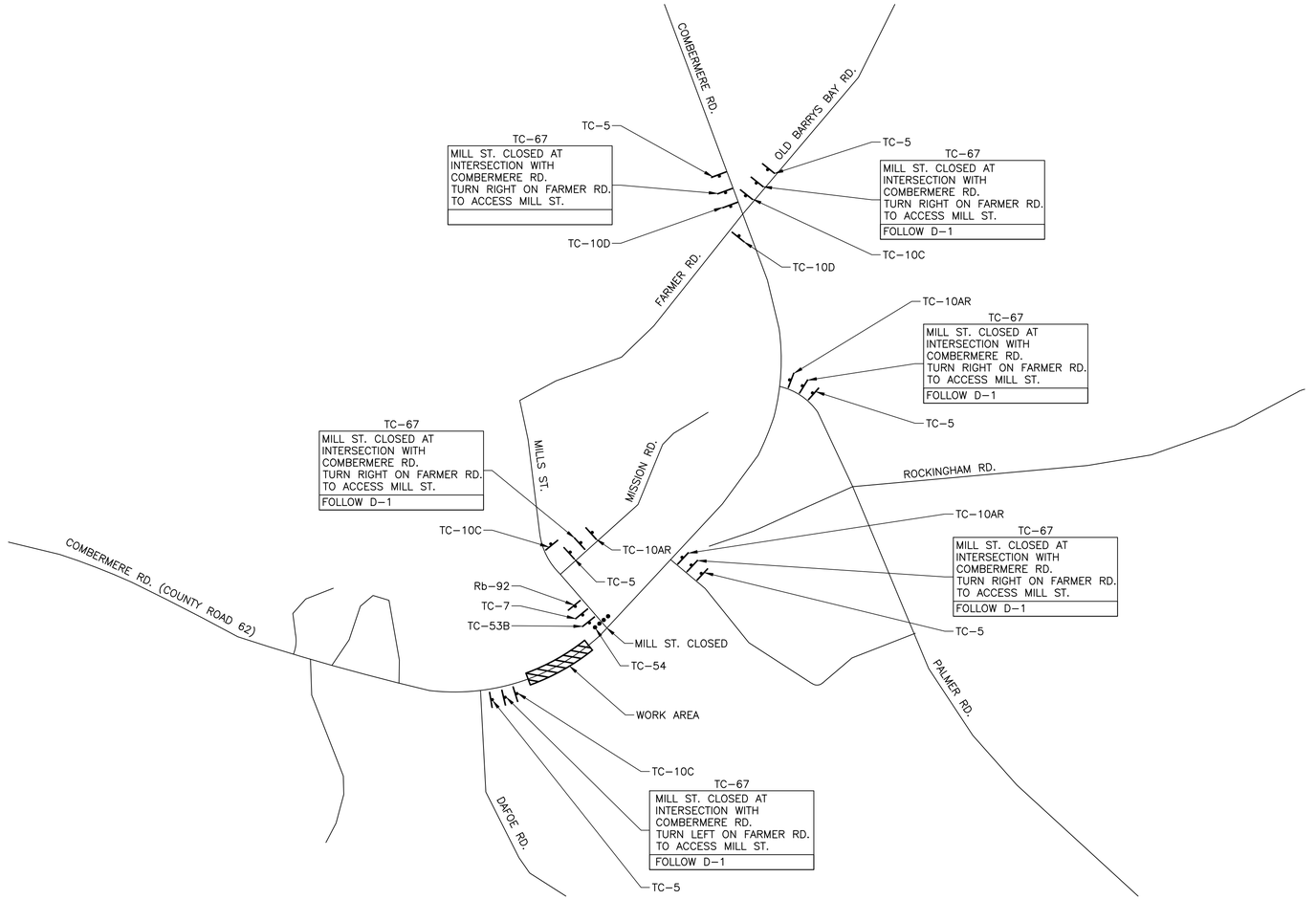

TRAFFIC DETOUR

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COMBERMERE BRIDGE REHABILITATION	SHEET 3
TRAFFIC DETOUR	CONTRACT NO. PWC-2025-46

Jacobs

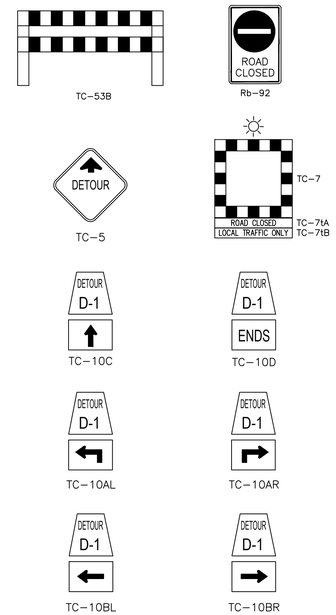
NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING No. 1, GENERAL ARRANGEMENT.
2. FOR GENERAL NOTES SEE DRAWING No. 1, GENERAL ARRANGEMENT
3. ALL DETOUR ROUTES AND SIGNS TO BE COORDINATED WITH THE COUNTY AND LOCAL MUNICIPALITY.
4. ALL DETOUR ROUTE SIGNING SHALL BE IN ACCORDANCE WITH OTM BOOK 7.
5. TC-64 SIGNS TO BE INSTALLED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
6. "USE D-#" TABS TO BE ADDED TO TC-67 SIGNS ONCE THE ROAD CLOSURE COMMENCES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL RESIDENTIAL PROPERTIES DURING CONSTRUCTION. WHEN ACCESS IS NOT POSSIBLE DUE TO SHORT DURATION WORKS AND/OR OPERATIONS, THE CONTRACTOR SHALL COORDINATE THE TIMING OF THE WORK WITH THE AFFECTED PROPERTY OWNER(S).

LEGEND

ROAD CLOSURE

DETOUR ROUTE



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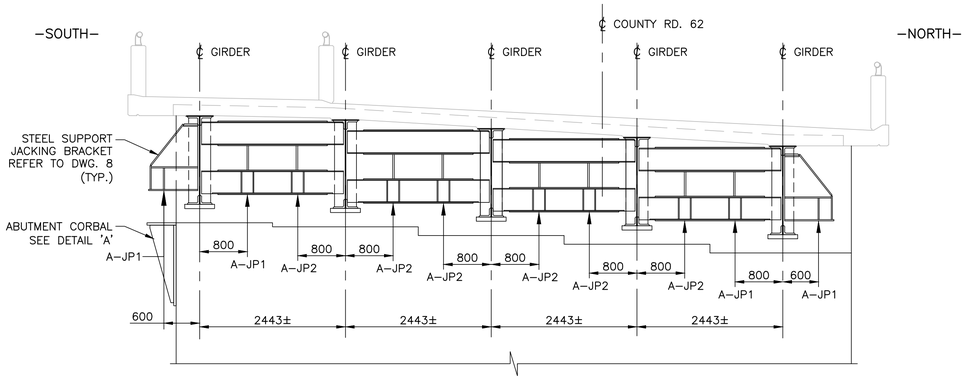
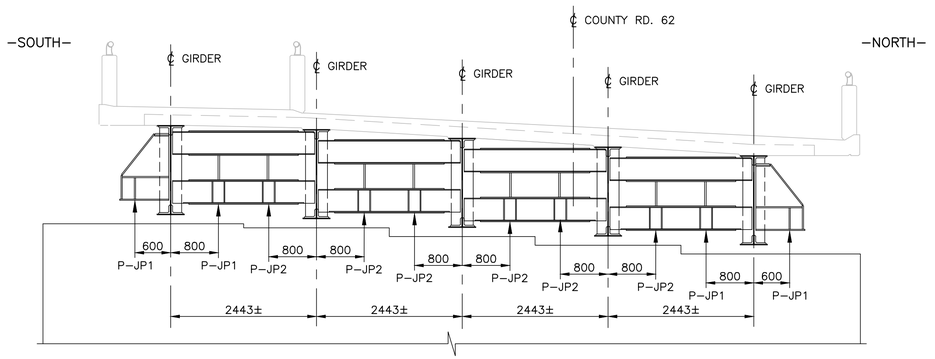


ELEVATION – JACKING LOCATION AT ABUTMENTS

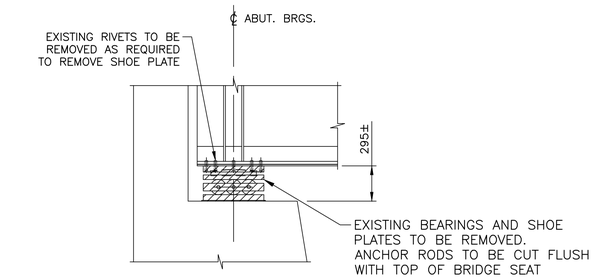
WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR

1:50



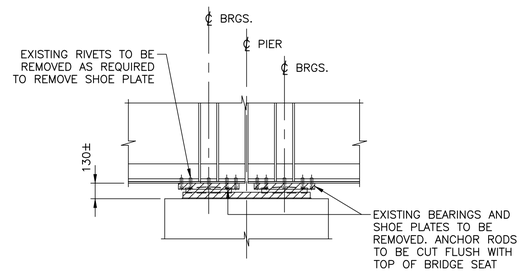
ELEVATION – JACKING LOCATION AT PIER

1:50



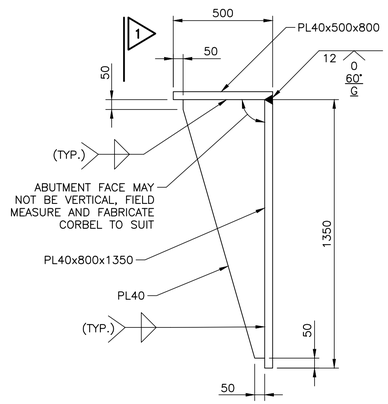
EXISTING BEARING REMOVAL AT ABUTMENT

1:25



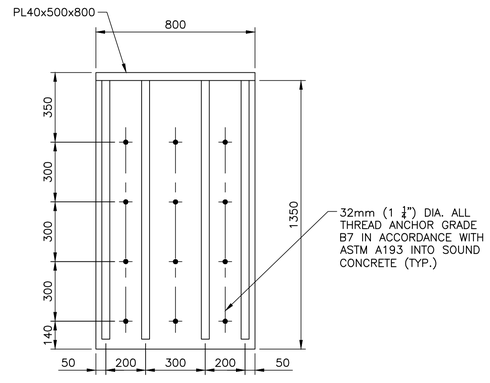
EXISTING BEARING REMOVAL AT PIER

1:25



A ABUTMENT CORBEL DETAIL

1:15



1 SECTION

1:15

ABUTMENT CORBEL CONSTRUCTION NOTES:

1. ANCHOR RODS SHALL MEET ASTM A193 GRADE B7.
2. ANCHOR ROD EMBEDMENT SHALL BE 635mm MIN.
3. ANCHOR ROD HOLE DIAMETER SHALL BE 35mm MIN.
4. CORED HOLES SHALL BE CLEANED AND PREPARED IN ACCORDANCE WITH THE EPOXY MANUFACTURES SPECIFICATIONS PRIOR TO EPOXY PLACEMENT. CONTRACTOR SHALL LOCATE THE EXISTING REINFORCING PRIOR TO CORING. CORBEL LOCATION SHALL BE ADJUSTED AS DIRECTED BY THE CONTRACT ADMINISTRATOR TO AVOID EXISTING REINFORCING.
5. DOWEL EPOXY SHALL BE HILTI HIT–RE 500 V3 EPOXY OR APPROVED EQUIVALENT.
6. ALL ANCHOR RODS SHALL BE PULL TESTED TO 300kN FOR ONE (1) MINUTE WITH NO DISPLACEMENT.
7. SIKATOP 123 PLUS OR APPROVED EQUIVALENT SHALL BE PLACED BETWEEN THE ABUTMENT AND THE CORBEL TO FILL ANY GAPS. SNUG TIGHTEN ANCHOR ROD NUTS AND ALLOW SIKATOP 123 PLUS TO FULLY CURE BEFORE FULLY TIGHTENING ANCHOR ROD NUTS AN ADDITIONAL (1/3) TURN.

JACKING LOAD 2 x UNFACTORED DEAD LOAD	
LOCATION	FORCE (kN)
A–JP1	800
A–JP2	700
P–JP1	900
P–JP2	800

FACTORED LOAD DURING BLOCKED STATE	
LOCATION	FORCE (kN)
A–JP1	1300
A–JP2	1000
P–JP1	1600
P–JP2	1200

NOTE: JACKING LOADS ARE PROVIDED FOR EXISTING BRIDGE CONFIGURATION WITH STRENGTHENED DIAPHRAGMS.

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

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COMBERMERE BRIDGE REHABILITATION

SHEET 4

JACKING DETAILS AND EXISTING BEARING REMOVAL

CONTRACT NO. PWC–2025–46

Jacobs

NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWINGS No. 8.
2. FOR GENERAL NOTES REFER TO DRAWING 1.
3. FOR STRUCTURAL STEEL NOTES SEE DRAWINGS 6 & 7.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, INSTALLATION AND REMOVAL OF TEMPORARY JACKING SUPPORTS.
5. NO SCAFFOLDING IS PERMITTED ON THE BRIDGE SUPERSTRUCTURE DURING JACKING OR WHILE THE STRUCTURE IS JACKED AND BLOCKED.
6. LIVE LOAD IS NOT PERMITTED DIRECTLY ABOVE THE GIRDER DURING REMOVAL AND REPLACEMENT OF SHOE PLATES.
7. EXISTING ANCHOR RODS SHALL BE CUT PRIOR TO JACKING.
8. EXPANSION JOINTS SEALS SHALL BE REMOVED PRIOR TO JACKING.
9. THE RAILING SHALL BE DISCONNECTED PRIOR TO JACKING.
10. MUP EXPANSION JOINT COVER PLATE SHALL BE DISCONNECTED PRIOR TO JACKING.
11. GIRDERS JAMMED AGAINST BALLAST WALL SHALL BE FREED BY CHIPPING CONCRETE ON THE BALLAST WALLS AS DIRECTED BY THE CONTRACT ADMINISTRATOR PRIOR TO BRIDGE JACKING.
12. RIVETS FASTEN BOTTOM FLANGE OF GIRDER TO SHOE PLATE, RIVETS SHALL BE CUT OFF EACH GIRDER END TO FACILITATE REMOVAL OF EXISTING SHOE PLATES. NEW M24 BOLTS SHALL BE INSTALLED IN HOLES IN BOTTOM FLANGE LEFT FROM RIVETS WITH NUTS FACING UP.
13. STEEL PLATE IS REQUIRED TO DISTRIBUTE JACKING LOAD AND LOADS DURING THE BLOCKED STATE ONTO THE STRENGTHENED DIAPHRAGMS AND STEEL SUPPORT JACKING BRACKETS.
14. EXISTING UNDERSIDE OF GIRDER ELEVATIONS SHALL BE MAINTAINED. THE CONTRACTOR SHALL ADJUST PEDESTAL HEIGHTS TO COMPENSATE FOR BEARING COMPRESSION.
15. ALL DIAPHRAGMS SHALL REMAIN FULLY IN PLACE DURING BRIDGE JACKING/BLOCKED STATE.
16. JACKING IS NOT PERMITTED UNTIL DIAPHRAGMS ARE STRENGTHENED.
17. ASPHALT PADDING SHALL BE PROVIDED OVER EXPANSION JOINTS WHILE THE BRIDGE IS IN THE BLOCKED STATE PRIOR TO REOPENING TO TRAFFIC.
18. ASPHALT PADDING SHALL BE REMOVED FROM THE BRIDGE AFTER THE BRIDGE IS JACKED DOWN ONTO THE NEW BEARINGS PRIOR TO RESTORING TRAFFIC OVER THE BRIDGE.
19. THE BRIDGE SHALL BE JACKED ON THE STRENGTHENED DIAPHRAGMS AND STEEL SUPPORT JACKING BRACKETS AT THE LOCATIONS INDICATED ON THE CONTRACT DRAWINGS (10 JACKS AT EACH ABUTMENT AND 20 JACKS AT THE PIER).
20. THE MAXIMUM LIFT HEIGHT IS 25mm. THE DIFFERENTIAL DISPLACEMENT BETWEEN ALL JACKS SHALL NOT EXCEED ±1.5mm. DIFFERENTIAL DISPLACEMENT BETWEEN ADJACENT JACKS TRANSVERSELY SHALL NOT EXCEED ±1mm. DIFFERENTIAL DISPLACEMENT BETWEEN ADJACENT JACKS LONGITUDINALLY AT THE PIER SHALL NOT EXCEED ±1mm.
21. ALL TEMPORARY BLOCKING SHALL CONSIST OF STEEL PLATE AND OR STEEL SHIMS AND SHALL BE WELDED TOGETHER DURING THE BLOCKED STATE WHEN THE BRIDGE IS OPEN TO LIVE TRAFFIC.
22. TEMPORARY LONGITUDINAL AND TRANSVERSE RESTRAINT SHALL BE PROVIDED WHEN THE BRIDGE IS BLOCKED AND OPEN TO LIVE TRAFFIC.
23. EACH JACK SHALL BE FITTED WITH A PRESSURE GAUGE AND A SHUTOFF VALVE.
24. ALL JACKS SHALL BE FITTED WITH LOCKING COLLARS.
25. LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT) SENSORS WITH A TOLERANCE OF ±0.10mm SHALL BE FITTED BETWEEN THE SUBSTRUCTURE AND SUPERSTRUCTURE AT EACH JACKING POINT TO MEASURE THE VERTICAL DISPLACEMENT BETWEEN THE SUPERSTRUCTURE AND SUBSTRUCTURE DURING JACKING OPERATIONS. DATA SHALL BE RECORDED AT 1 SECOND INTERVALS MINIMUM AND SHALL BE PROVIDED TO THE CONTRACT ADMINISTRATOR IN EXCEL FORMAT WITHIN 24 HOURS OF ANY JACKING OPERATIONS. DURING JACKING OPERATIONS ACCESS TO DISPLACEMENT DATA SHALL BE PROVIDED TO THE CONTRACT ADMINISTRATOR IMMEDIATELY UPON REQUEST IN REAL TIME DIGITAL FORMAT.
26. PL50x300x300 STEEL PLATE SHALL BE PROVIDED BETWEEN JACKS AND SUPERSTRUCTURE TO DISTRIBUTE LOAD ONTO THE STRENGTHENED DIAPHRAGMS AND STEEL SUPPORT JACKING BRACKETS.
27. EXTERIOR STEEL SUPPORTS MOUNTED TO THE OUTSIDE OF THE EXTERIOR GIRDERS (2 AT EACH ABUTMENT, 4 AT THE PIER) SHALL BE REMOVED AFTER THE JACKING PROCEDURES HAVE BEEN COMPLETED AND SHALL BE DISPOSED OF OFF SITE BY THE CONTRACTOR.
28. NEW BOLTS SHALL BE INSTALLED IN THE OPEN HOLES REMAINING AFTER REMOVAL OF THE STEEL SUPPORTS.
29. WHERE WELDS ARE PRESENT BETWEEN EXISTING SHOE PLATES AND GIRDERS THEY SHALL BE CUT TO FACILITATE EXISTING SHOE PLATE REMOVAL. TORCH CUTTING IS NOT PERMITTED.

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REVISIONS

NO.	DATE	DESCRIPTION
3	DEC/24	RE–ISSUED FOR TENDER
2	OCT/24	ISSUED FOR TENDER
1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL

DESIGN	SPM	CHK	MJM	CODE	S6–19	LOAD	CL–625–ONT
DRAWN	ME	CHK	SPM	SITE	620259	STRUCT	B145
DWG	46D2504	DATE	OCT 2024				

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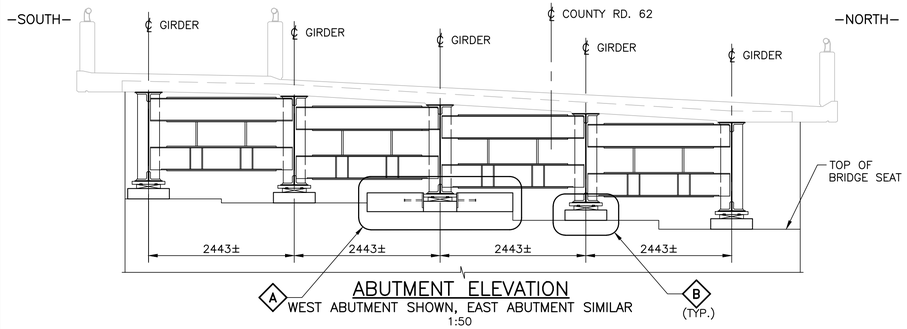
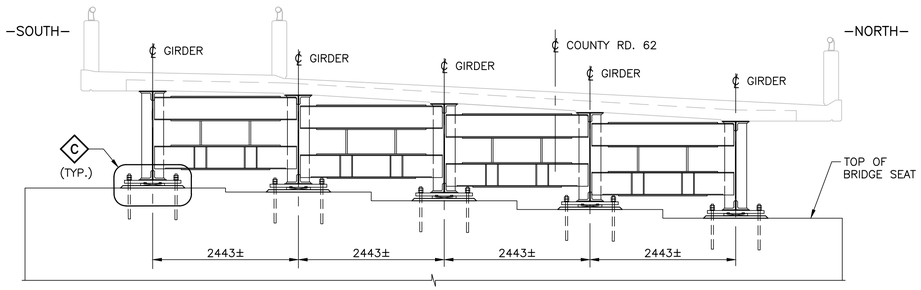
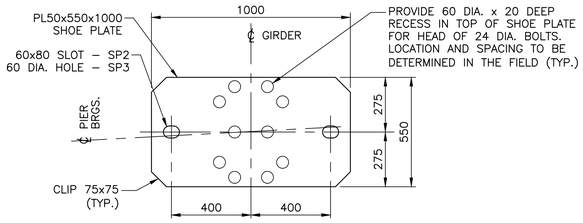


ABUTMENT ELEVATION
WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR
1:50

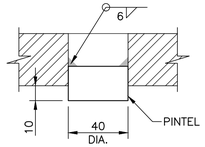


PIER ELEVATION
1:50



SHOE PLATE SP2 – PL50x550x1000
(8 REQUIRED AT PIER)

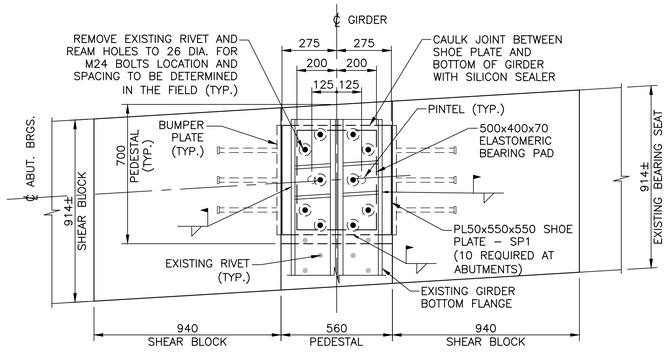
SHOE PLATE SP3 – PL50x550x1000
(2 REQUIRED AT CENTER GIRDER AT PIER ONLY)
1:15



PINTEL DETAIL
1:2

BEARING DATA	WEST ABUTMENT	PIER (WEST BRGS)	PIER (EAST BRGS)	EAST ABUTMENT
DEAD LOAD (kN) – SLS	550	650	650	550
TOTAL LOAD (kN) – SLS	1000	1250	1250	1000
DEAD LOAD (kN) – ULS	750	850	850	750
TOTAL LOAD (kN) – ULS	1450	1900	1900	1450
MOVEMENT (mm)	20	2	2	20
MAXIMUM SHEAR RATE (kN/mm)	4.14	7.74	7.74	4.14
MINIMUM SHEAR RATE (kN/mm)	2.79	5.23	5.23	2.79
BEARING SIZE (mm)	500x400x70	500x400x40	500x400x40	500x400x70
NUMBER REQUIRED	5	5	5	5
BEARING TYPE	MULTI–DIRECTIONAL LAMINATED ELASTOMERIC	MULTI–DIRECTIONAL LAMINATED ELASTOMERIC	MULTI–DIRECTIONAL LAMINATED ELASTOMERIC	MULTI–DIRECTIONAL LAMINATED ELASTOMERIC

* THE SHEAR RATES PROVIDED ARE MAXIMUM AND MINIMUM ALLOWABLE STIFFNESS THAT CORRESPOND TO TEMPERATURES OF –25°C AND 20°C, RESPECTIVELY, AND AN AVERAGE HARDNESS OF 55 DUROMETER.



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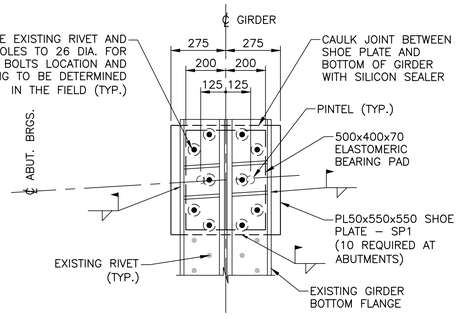

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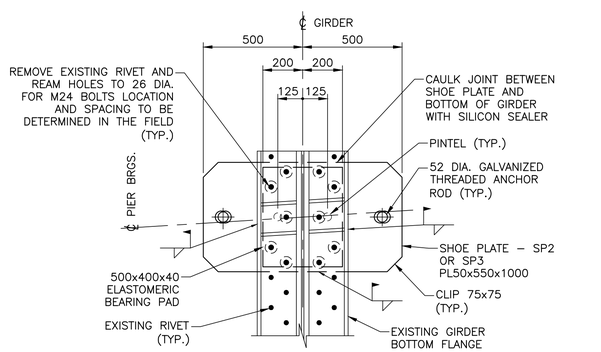

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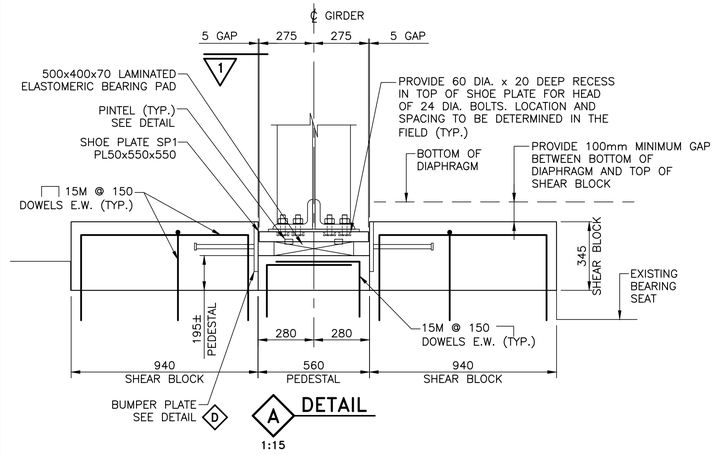

A DETAIL
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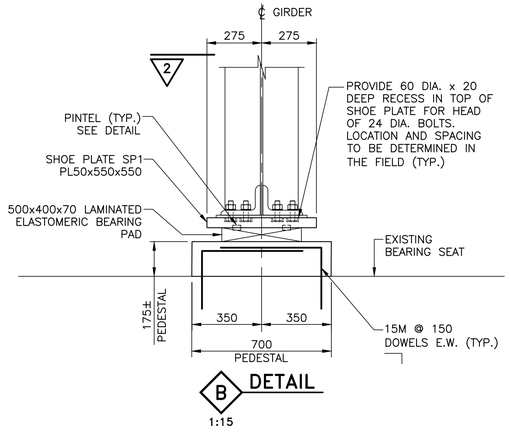

B DETAIL
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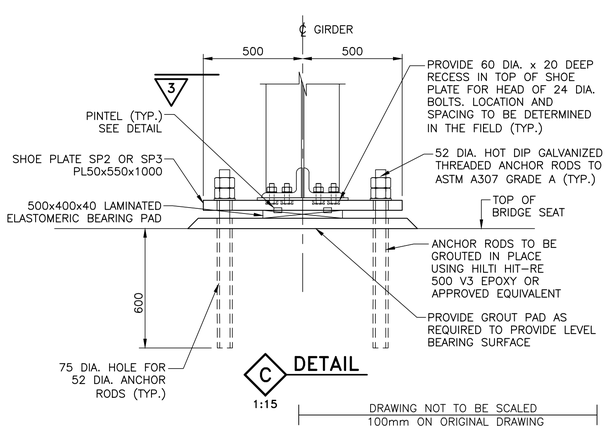

C DETAIL
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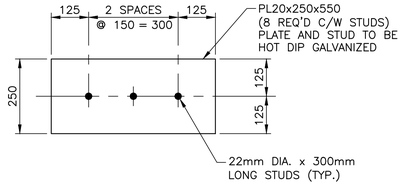
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING



D BUMPER PLATE DETAIL
1:10

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COMBERMERE BRIDGE REHABILITATION

SHEET 5

BEARING REPLACEMENT DETAILS

CONTRACT NO. PWC–2025–46

Jacobs

NOTES:

1. DOWEL EMBEDMENT SHALL BE 200 mm MIN. FOR PEDESTAL AND SHEAR BLOCKS.
2. SHEAR BLOCKS AT ABUTMENTS SHALL BE CONSTRUCTED AFTER BEARING REPLACEMENT.
3. NOTICE TO CONTRACTOR: INSTALLATION OF DOWELS FOR SHEAR BLOCK, DOWELS FOR PEDESTALS AND NEW ANCHOR RODS MAY BE IMPRACTICAL FOLLOWING STRENGTHENING OF THE DIAPHRAGMS. CONTRACTOR SHALL DRILL DOWEL AND ANCHOR ROD HOLES PRIOR TO DIAPHRAGM STRENGTHENING OPERATIONS.
4. NEW ANCHOR RODS AT PIER MAY CONFLICT WITH EXISTING ANCHOR RODS. CONTRACTOR TO VERIFY ONSITE PRIOR TO FABRICATION OF NEW SHOE PLATES. IF A CONFLICT IS PRESENT, THE CONTRACT ADMINISTRATOR SHALL BE NOTIFIED IMMEDIATELY AND WILL DIRECT THE CONTRACTOR HOW TO MODIFY THE SHOE PLATES.
5. AT LOCATIONS WHERE PINTLES CONFLICT WITH COUNTERSUNK HOLES IN SHOE PLATE, THE LOCATION OF THE PINTLES SHALL BE ADJUSTED.
6. RIVETS AND WELDS FASTEN BOTTOM FLANGE OF GIRDER TO SHOE PLATE. RIVETS SHALL BE CUT OFF EACH GIRDER END TO FACILITATE REMOVAL OF EXISTING SHOE PLATES. NEW M24 BOLTS SHALL BE INSTALLED IN HOLES IN BOTTOM FLANGE LEFT FROM RIVETS WITH NUTS FACING UP.
7. ANCHOR ROD NUTS SHALL BE SNUG TIGHT TO THE SHOE PLATE, JAMB NUTS SHALL BE TURNED AN ADDITIONAL 1/3 TURN FROM SNUG TIGHT.
8. THE CONTRACTOR SHALL PROTECT THE BEARINGS FROM OVERHEATING AND CONTACT WITH WELD SPLATTER DURING WELDING OPERATIONS.
9. SILICON SEALER SHALL BE SIKAFLEX–1A AS MANUFACTURED BY SIKA OR APPROVED EQUIVALENT. THE SEALER SHALL BE APPLIED AFTER THE SHOE PLATES HAVE BEEN WELDED TO THE UNDERSIDE OF THE GIRDERS, AND AFTER ABRASIVE BLAST CLEANING OF THE STRUCTURAL STEEL IN THE AREA OF COATING.
10. GROUT FOR GROUT PADS SHALL BE SIKAGROUT–212 HP AS MANUFACTURED BY SIKA OR APPROVED EQUIVALENT.

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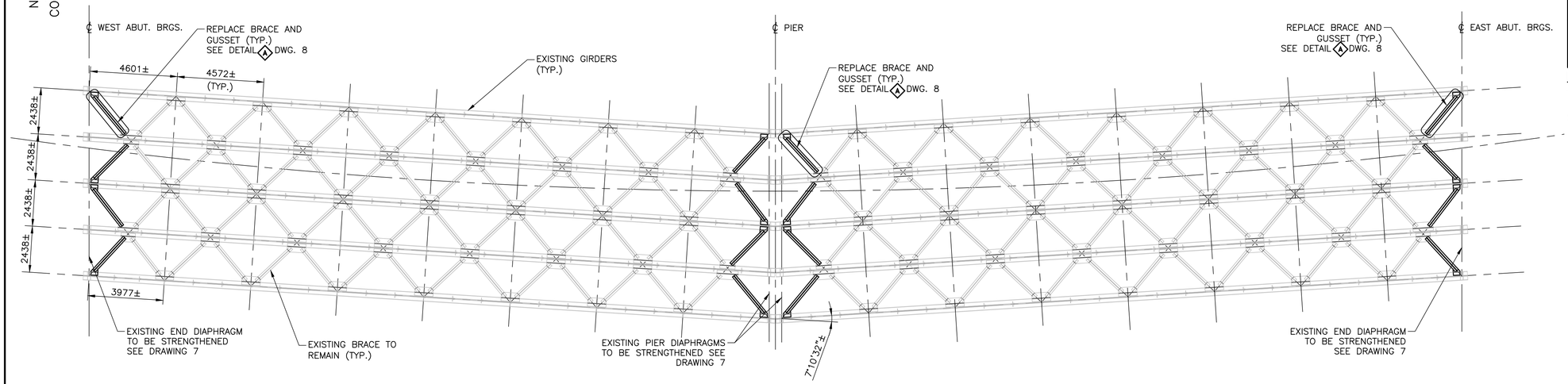
REVISIONS			
3	DEC/24	RE–ISSUED FOR TENDER	
2	OCT/24	ISSUED FOR TENDER	
1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL	
NO.	DATE	DESCRIPTION	

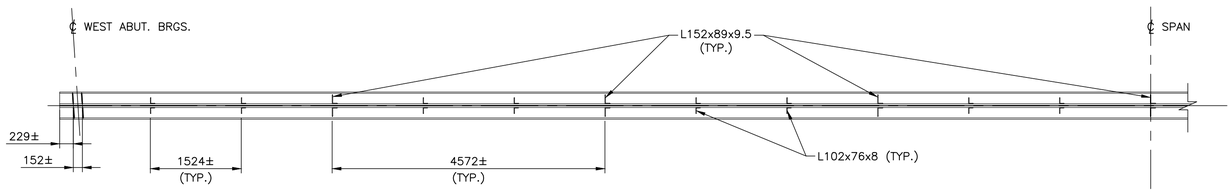
DESIGN	SPM	CHK	MJM	CODE	S6–19	LOAD	CL–625–ONT
DRAWN	TJN	CHK	SPM	SITE	620259	STRUCT	B145
DATE	OCT 2024	DWG	46D2505				

FILE NAME: C:\pw_workdir\jacobs-americas\d0159406\CE879500-005_Bearing-Replacement-Details.dwg
MODIFIED: 2024-12-06 09:20

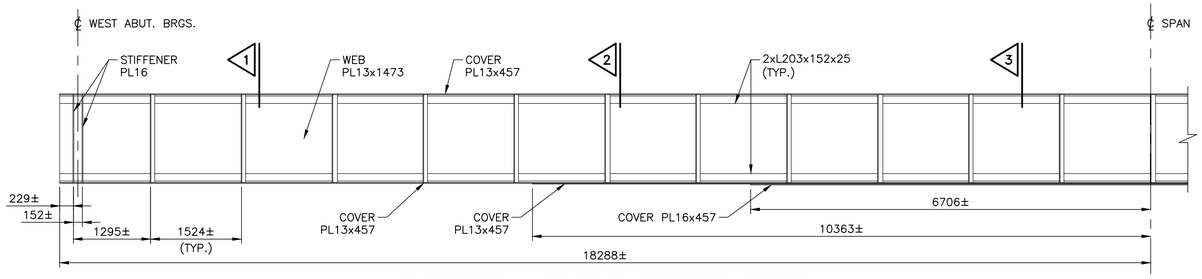
NORTH FOR CONSTRUCTION



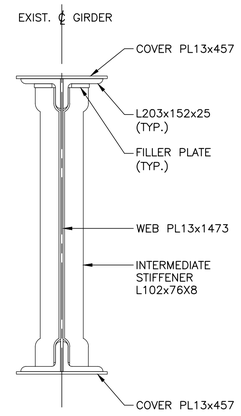
PLAN – EXISTING GIRDER LAYOUT
1:125



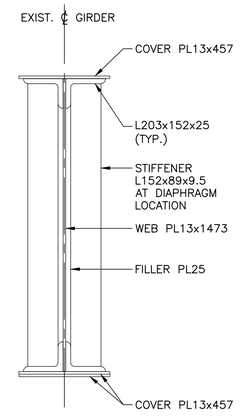
PLAN – PARTIAL EXISTING GIRDER
(FOR REFERENCE PURPOSES)
1:50



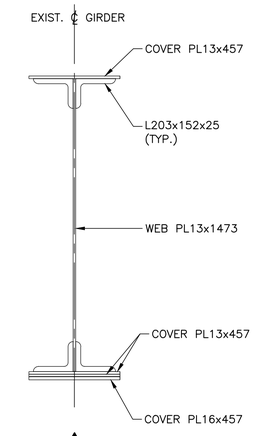
ELEVATION – PARTIAL EXISTING GIRDER
(FOR REFERENCE PURPOSES)
1:50



1 SECTION
1:15



2 SECTION
1:15



3 SECTION
1:15

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COMBERMERE BRIDGE REHABILITATION

SHEET 6

STEEL DETAILS I

CONTRACT NO. PWC–2025–46

Jacobs

NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING No. 1, 4, 7 AND 8.
2. FOR GENERAL NOTES SEE DRAWING No. 1, GENERAL ARRANGEMENT.

REVISIONS		
3	DEC/24	RE–ISSUED FOR TENDER
2	OCT/24	ISSUED FOR TENDER
1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL
NO.	DATE	DESCRIPTION

DESIGN	SPM	CHK	MJM	CODE	S6–19	LOAD	CL–625–ONT	DATE	OCT 2024
DRAWN	ME	CHK	SPM	SITE	620259	STRUCT	B145	DWG	46D2506

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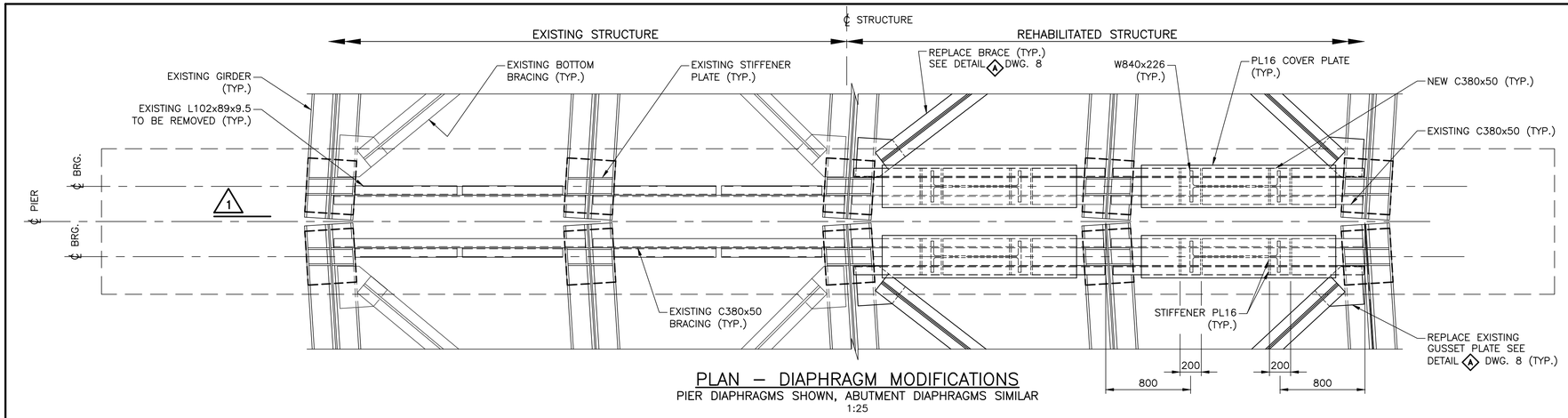
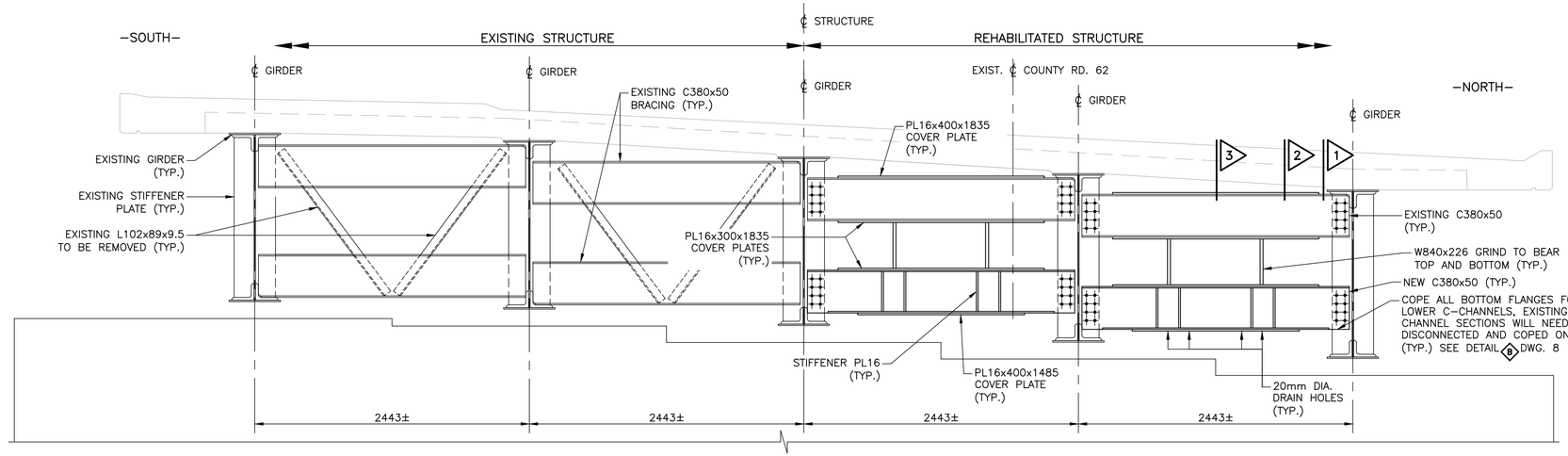
MODIFIED: 2024-12-06 09:24



PLAN – DIAPHRAGM MODIFICATIONS

PIER DIAPHRAGMS SHOWN, ABUTMENT DIAPHRAGMS SIMILAR

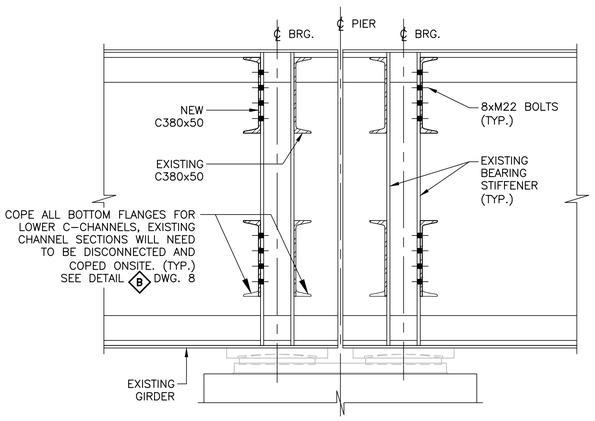
1:25



ELEVATION – DIAPHRAGM MODIFICATIONS

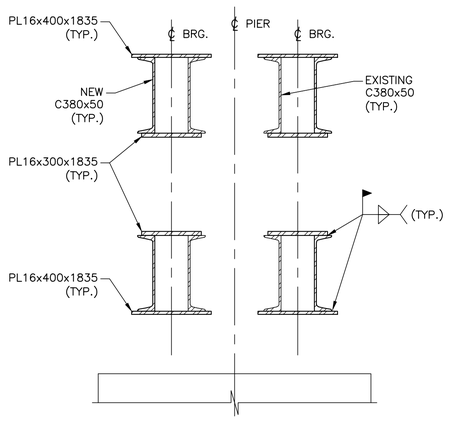
PIER DIAPHRAGMS SHOWN, ABUTMENT DIAPHRAGMS SIMILAR

1:25



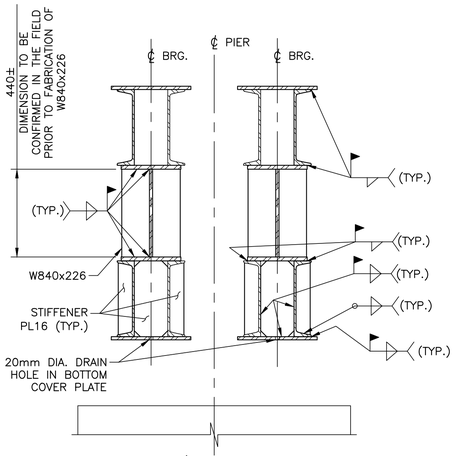
1 SECTION

1:15



2 SECTION

1:15



3 SECTION

1:15

DRAWING NOT TO BE SCALED
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COMBERMERE BRIDGE REHABILITATION

SHEET 7

STEEL DETAILS II

CONTRACT NO. PWC–2025–46

Jacobs

NOTES:

1. ALL BOTTOM BRACING AND GUSSET PLATES IDENTIFIED FOR REPLACEMENT SHALL BE REPLACED PRIOR TO DIAPHRAGM EMPLACEMENT. AT NO TIME SHALL TWO BRACES BE DISCONNECTED FROM THE STRUCTURE AT ONE TIME.
2. TEMPORARY BOTTOM LATERAL BRACING SHALL BE INSTALLED TO FULLY BRACE THE GIRDERS ENDS DURING GUSSET PLATE AND BRACING REPLACEMENT.
3. AT NO TIME SHALL TWO DIAPHRAGMS BE DISCONNECTED FROM THE STRUCTURE.
4. TEMPORARY BRACING SHALL BE INSTALLED TO FULLY BRACE THE GIRDERS ENDS AT THE PIER AND ABUTMENT DURING DIAPHRAGM STRENGTHENING.
5. EXISTING GIRDER END DIAPHRAGMS AT THE PIER AND ABUTMENT SHALL BE SANDBLASTED PRIOR TO DIAPHRAGM STRENGTHENING.
6. NEW C–CHANNEL SECTIONS BOLTED TO BEARING STIFFENERS SHALL BE INSTALLED AT THE SAME ELEVATION AS THE EXISTING ADJACENT STIFFENERS. W840X226 SECTION LENGTHS VARY FROM DIAPHRAGM TO DIAPHRAGM, CONTRACTOR TO FIELD MEASURE AND FABRICATE SECTIONS TO SUITE.
7. ENCLOSED PORTION OF STRENGTHENED DIAPHRAGMS SHALL BE SAND BLASTED AND COATED IN THE FIELD PRIOR TO WELDING ON COVER PLATES.
8. ALL EXISTING RIVETS REMOVED SHALL BE REPLACED WITH M22 BOLTS. EXISTING HOLES MAY BE DRILLED TO A DIAMETER OF 24 MM IF BOLTS DO NOT FIT.
9. TOP FLANGES OF BRACES MAY BE CLIPPED TO CLEAR STRENGTHENED DIAPHRAGMS.
10. EXISTING AND NEW CHANNELS AT ABUTMENTS SHALL BE RAISED WHERE REQUIRED TO PROVIDE A MINIMUM OF 100mm CLEARANCE TO TOP OF SHEAR BLOCKS.
11. EXISTING CHANNELS SHALL BE RAISED IN A MANNER THAT UTILIZES THE EXISTING BOLT HOLES IN THE BEARING STIFFENERS. NEW BOLT HOLES SHALL BE DRILLED IN THE BEARING STIFFENERS TO MAINTAIN THE EXISTING NUMBER OF BOLTS AT EACH CONNECTION.
12. EXISTING CHANNELS THAT REQUIRE FLANGE COPING IN THE FIELD MAY BE COPED USING TORCH CUT AND GROUND SMOOTH TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR. CHANNEL WEBS AND OTHER COMPONENTS OF THE STRUCTURE SHALL NOT BE COMPROMISED DURING THE WORK.

LICENCED PROFESSIONAL ENGINEER
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2024-12-06
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LICENCED PROFESSIONAL ENGINEER
M.J. MATTHEWS
100226434
2024-12-06
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REVISIONS		
3	DEC/24	RE–ISSUED FOR TENDER
2	OCT/24	ISSUED FOR TENDER
1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL
NO.	DATE	DESCRIPTION

DESIGN SPM	CHK MJM	CODE S6–19	LOAD CL–625–ONT	DATE OCT 2024	
DRAWN ME	CHK SPM	SITE 620259	STRUCT B145	DWG	46D2507

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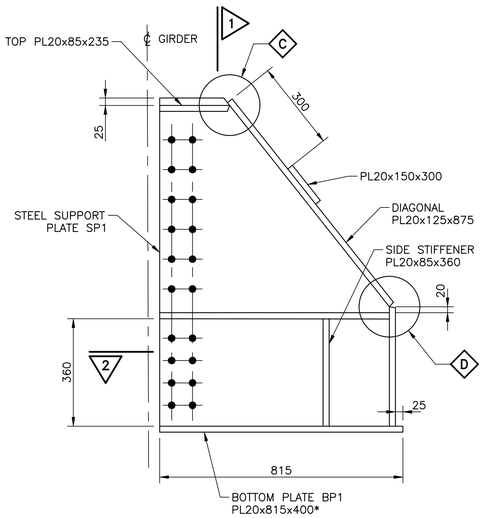
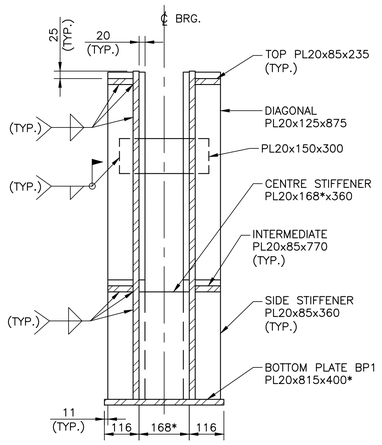


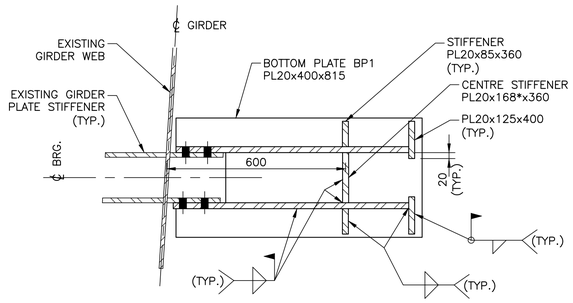
STEEL SUPPORT JACKING BRACKET DETAIL

* DIMENSION TO BE VERIFIED IN THE FIELD
1:10



1 SECTION

1:10 * DIMENSION TO BE VERIFIED IN THE FIELD



2 SECTION

1:10 * DIMENSION TO BE VERIFIED IN THE FIELD

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COMBERMERE BRIDGE REHABILITATION	SHEET 8
STEEL DETAILS III	CONTRACT NO. PWC-2025-46

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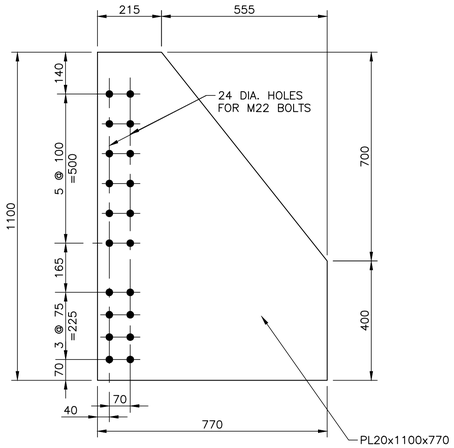
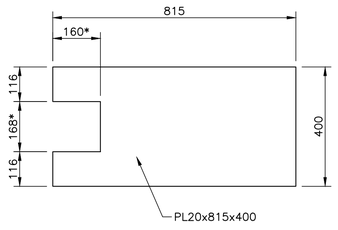
NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWINGS No. 4, 6 AND 7.
2. FOR GENERAL NOTES SEE DRAWING No. 1, GENERAL ARRANGEMENT.
3. STEEL SUPPORT JACKING BRACKET SHALL BE CONNECTED TO BEARING STIFFENERS USING ASTM A490M TYPE 1, M22 BOLTS. THREADS TO BE EXCLUDED FROM THE SHEAR PLANE.



STEEL SUPPORT PLATE SP1

1:10



BOTTOM PLATE BP1

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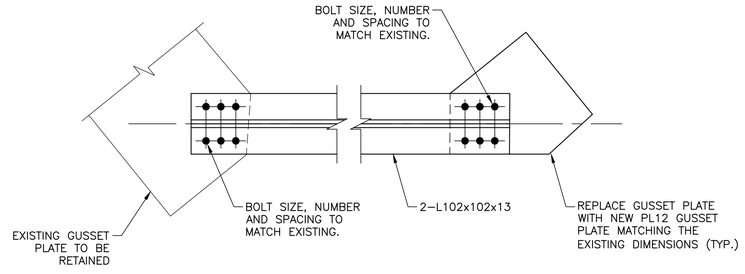
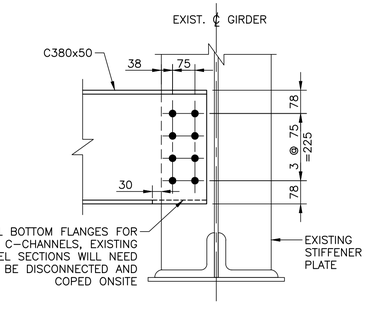


A DETAIL

DWG. 6 AND 7
1:10



B DETAIL

DWG. 7
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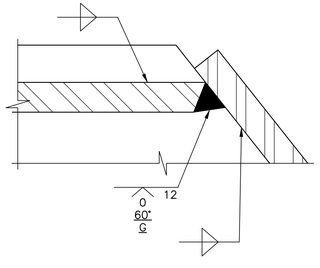
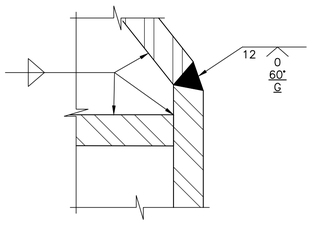


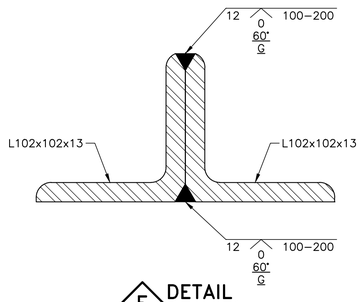
C DETAIL

1:2



D DETAIL

1:2



E DETAIL

1:2

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DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS		
3	DEC/24	RE–ISSUED FOR TENDER
2	OCT/24	ISSUED FOR TENDER
1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL
NO.	DATE	DESCRIPTION

DESIGN SPM	CHK MJM	CODE S6–19	LOAD CL–625–ONT	DATE OCT 2024	
DRAWN ME	CHK SPM	SITE 620259	STRUCT B145	DWG	46D2508

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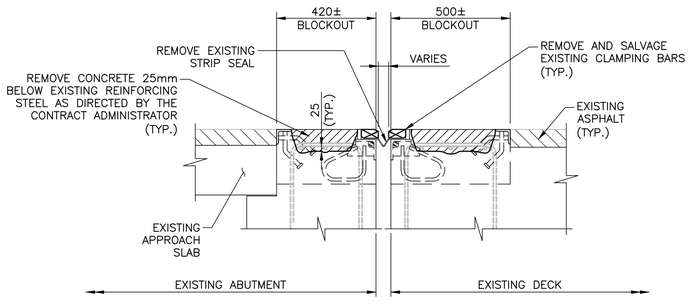
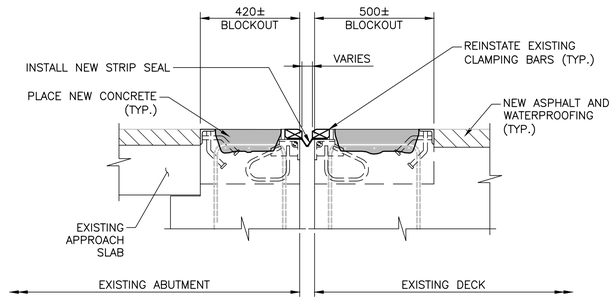


EXISTING DECK EXPANSION JOINT

1:15



REHABILITATED DECK EXPANSION JOINT

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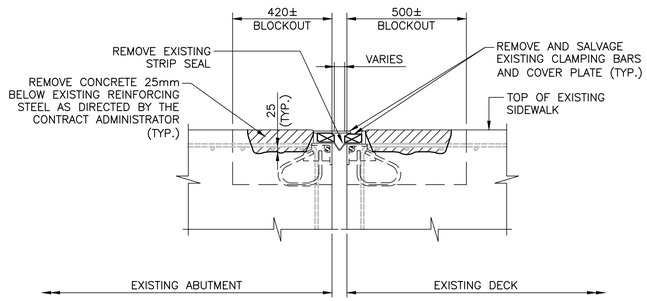

EXISTING MUP EXPANSION JOINT

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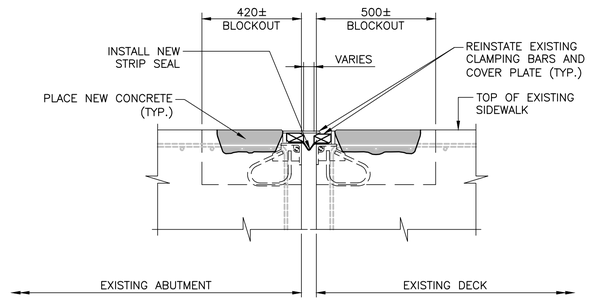

REHABILITATED MUP EXPANSION JOINT

1:15

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COMBERMERE BRIDGE REHABILITATION	SHEET 9
EXISTING JOINT REHABILITATION	CONTRACT NO. PWC-2025-46

Jacobs

EXPANSION JOINT REPAIR NOTES:

1. CONCRETE IN THE EXPANSION JOINT END DAMS SHALL BE REMOVED AS DIRECTED BY THE CONTRACT ADMINISTRATOR. RETAIN PARTIALLY EXPOSED REINFORCING BARS IN GOOD CONDITION. THE CONTRACT ADMINISTRATOR SHALL DIRECT THE CONTRACTOR REGARDING WHICH REINFORCING BARS SHALL BE REMOVED.
2. EXPOSED REINFORCING STEEL AND ARMOURING SHALL BE ABRASIVELY BLAST CLEANED WITH THE AREAS OF CONCRETE REMOVALS.
3. ELASTOMERIC CONCRETE SHALL BE PLACED IN THE CONCRETE END DAMS. CONCRETE SHALL BE WABO CRETE II SUPPLIED BY WATSON BOWMAN ACME A SIKA COMPANY OR APPROVED EQUIVALENT. CONCRETE BONDING AGENTS AS PER MANUFACTURERS REQUIREMENTS SHALL BE INSTALLED PRIOR TO PLACEMENT OF CONCRETE.
4. A NEW CONTINUOUS JOINT STRIP SEAL MATCHING THE PROFILE OF THE EXISTING SHALL BE INSTALLED FOLLOWING ALL OTHER EXPANSION JOINT REPAIRS. ALL ARMOURING HOLD DOWN BOLTS SHALL BE REPLACED WITH NEW HOLD DOWN BOLTS. SOME OF THE EXISTING HOLD DOWN BOLTS ARE DAMAGED (DEGREE OF DAMAGE VARIES FROM BENT BOLTS TO COMPLETELY SHEARED OFF), THE CONTRACTOR SHALL EXTRACT ALL DAMAGED OR SHEAR OFF BOLTS. DAMAGED THREADED HOLES SHALL BE RE-TAPED.
5. M20 COATED HOLD-DOWN BOLTS SHALL HAVE A TENSION OF 125kN AND BE IN ACCORDANCE WITH ASTM A325M OR ASTM F835M.
6. M16 COATED FLAT HEAD COUNTERSUNK SOCKET BOLTS SHALL HAVE A TENSION OF 91kN AND BE IN ACCORDANCE WITH ASTM F835M.
7. SEALS SHALL BE PREFORMED NEOPRENE SEALS IN ACCORDANCE WITH OPSS-1210 AND SHALL BE INSTALLED IN ONE CONTINUOUS PIECE. SEALS SHALL NOT BE BENT MORE THAN 30° AT ANY ONE LOCATION. SEALS SHALL HAVE A MINIMUM THICKNESS OF 5mm OR AS PER DSM.
8. ALL STEEL SURFACES IN CONTACT WITH NEOPRENE SEAL SHALL BE CLEANED PRIOR TO INSTALLATION OF THE SEAL AND PROTECTED DURING PLACEMENT OF CONCRETE.
9. FOR SKEWED STRUCTURE, DETAILS SHALL BE ADJUSTED TO SUIT GEOMETRY OF THE STRUCTURE.
10. BOLT THREADS AND UNDERSIDE OF HEADS SHALL BE LIBERALLY COATED WITH ANTISEIZE COMPOUND MEETING U.S. MILITARY SPECIFICATION MIL-A-907D JUST PRIOR TO SEAL INSTALLATION.

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2024-12-06
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DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS		
3	DEC/24	RE-ISSUED FOR TENDER
2	OCT/24	ISSUED FOR TENDER
1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL
NO.	DATE	DESCRIPTION

DESIGN	SPM	CHK	MJM	CODE	S6-19	LOAD	CL-625-ONT	DATE	OCT 2024
DRAWN	ME	CHK	SPM	SITE	620259	STRUCT	B145	DWG	46D2509

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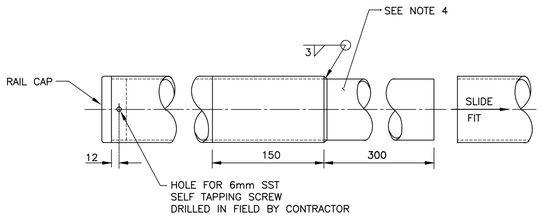
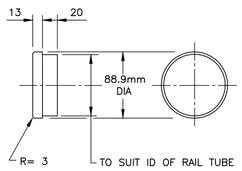
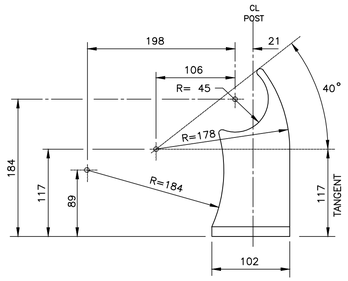


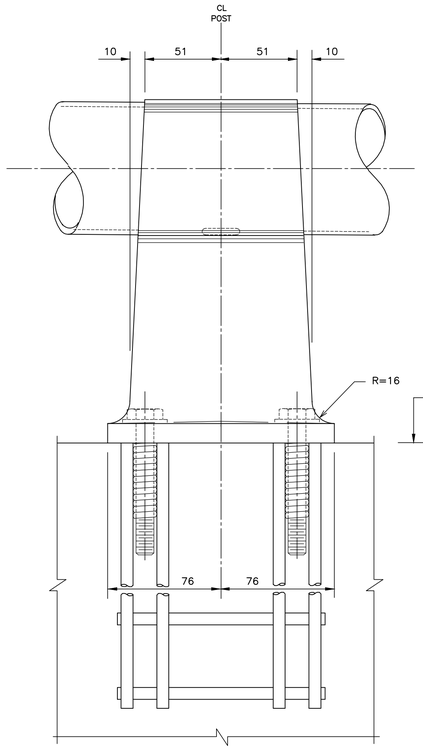
EXPANSION JOINT DETAIL



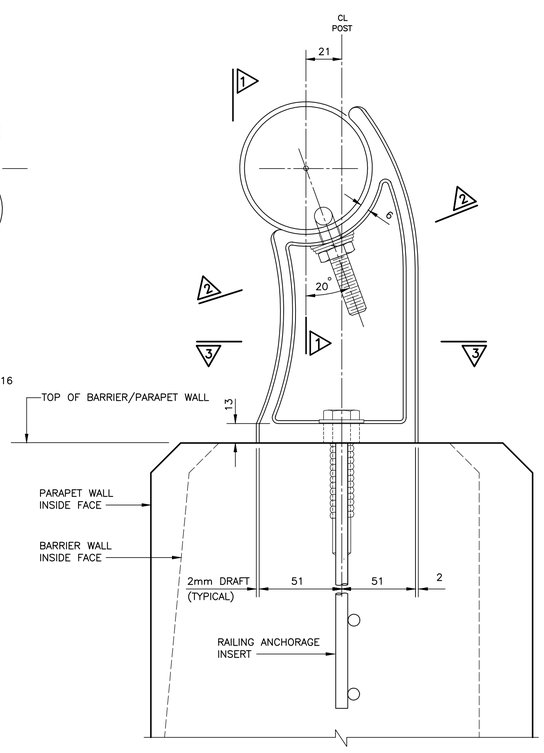
RAIL CAP



POST DETAILS



TYPICAL POST ELEVATION



TYPICAL CROSS SECTION

CONSTRUCTION NOTES:

MULTIPLE RAILING POSTS AND ANCHORAGES INTO THE REINFORCED CONCRETE PARAPET WALLS ARE DAMAGED AND REQUIRE REPLACEMENT. THE CONTRACT ADMINISTRATOR WILL IDENTIFY RAILING POSTS AND ASSOCIATED HARDWARE FOR REPLACEMENT. REPLACEMENT PROCEDURES WILL FOLLOW ONE OF THE FOLLOWING PROCEDURES: TYPE I OR TYPE II.

TYPE I:

REPLACEMENT PROCEDURE FOR RAILING POSTS WITH NO DAMAGE TO 2–12.7mm DIA x 75mm HIGH STRENGTH ANCHOR BOLTS.

1. ANCHOR BOLTS FASTENING THE RAILING POST INTO THE CONCRETE PARAPET WALL SHALL BE UNDONE AND THE HARDWARE (ANCHOR BOLTS AND L–BOLT BETWEEN RAIL AND RAILING POST) SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE.
2. EXISTING GROUT SHALL BE REMOVED TO THE LEVEL OF THE TOP OF PARAPET WALL OR SOUND CONCRETE.
3. GROUT SHALL BE PLACE BETWEEN THE TOP OF PARAPET WALL AND UNDERSIDE OF THE RAILING POST BASE AS REQUIRED TO FORM A LEVEL SURFACE FOR THE RAILING POST.
4. NEW ANCHOR BOLTS, L–BOLTS AND RAILING POSTS SHALL BE INSTALLED IN ACCORDANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS.

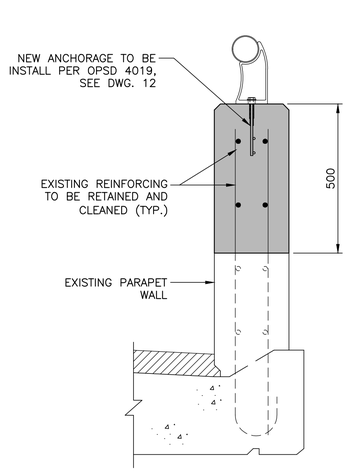
TYPE II:

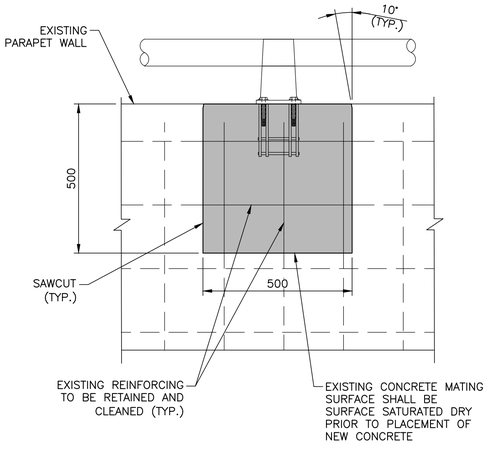
REPLACEMENT PROCEDURE FOR RAILING POSTS WITH DAMAGE TO 2–12.7mm DIA x 75mm HIGH STRENGTH ANCHOR BOLTS.

1. A 500mm x 500mm x FULL DEPTH THICKNESS OF THE PARAPET WALL CENTERED ON THE RAILING POST ANCHOR BOLTS SHALL BE REMOVED (ALONG WITH THE RAILING POST ANCHORAGE ASSEMBLY INCLUDING BOLTS FASTENING THE RAILING POST INTO THE CONCRETE PARAPET WALL, AND L–BOLT BETWEEN RAIL AND RAILING POST) AND SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE.
2. A NEW ANCHORAGE ASSEMBLY SHALL BE INSTALLED IN ACCORDANCE WITH OPSD 4019.000 AND CONCRETE SHALL BE PLACED.
3. GROUT SHALL BE PLACE BETWEEN THE TOP OF PARAPET WALL AND UNDERSIDE OF THE RAILING POST BASE AS REQUIRED TO FORM A LEVEL SURFACE FOR THE RAILING POST.
4. NEW ANCHOR BOLTS, L–BOLTS AND RAILING POSTS SHALL BE INSTALLED IN ACCORDANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS.

MULTIPLE RAILING SECTIONS ARE DAMAGED AND REQUIRE REPLACEMENT. THE CONTRACT ADMINISTRATOR WILL IDENTIFY RAILING SECTIONS THAT REQUIRE REPLACEMENT.

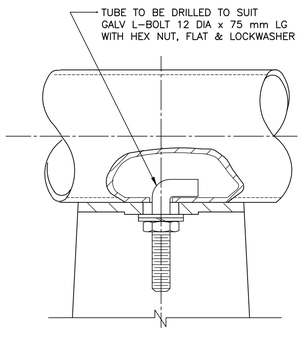
1. EXISTING RAILING SECTIONS IDENTIFIED BY THE CONTRACT ADMINISTRATOR FOR REPLACEMENT SHALL BE DISPOSED OFF SITE BY THE CONTRACTOR.
2. NEW RAILING SECTIONS MATCHING THE LENGTH OF THE REMOVED SECTIONS SHALL BE INSTALLED AFTER THE RAILING POST REPAIRS/REPLACEMENTS ARE COMPLETE.

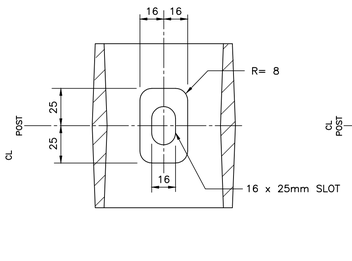


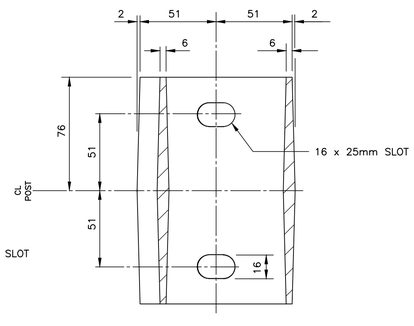


TYPICAL FULL DEPTH REPAIR DETAIL FOR RAILING POST REPLACEMENT TYPE II REPAIR

N.T.S.







DRAWING NOT TO BE SCALED
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COMBERMERE BRIDGE REHABILITATION

SHEET 10

EXISTING RAILING DETAILS AND REHABILITATION

CONTRACT NO. PWC–2025–46

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NOTES:

1. RAIL ELEMENTS SHALL BE STRUCTURAL TUBING SUPPLIED IN ACCORDANCE WITH CSA G40.21–M92 GRADE 350.
2. STEEL IN POSTS SHALL BE CAST STEEL SUPPLIED IN ACCORDANCE WITH ASTM A27–60 GRADE 65–35.
3. RAIL SHALL BE SUPPLIED WITH SPLICE IN LENGTHS OF 6980mm (EXCLUDING SPLICE) EXCEPT AS NOTED.
4. GALVANIZED RAIL TUBING MATING SURFACES TO HAVE A 2 ±0.5mm GAP ALL AROUND TO ENSURE A SLIDE FIT.
5. POSTS AND RAILS SHALL BE GALVANIZED IN ACCORDANCE WITH CSA G164–M. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION.
6. ELECTRODES SHALL BE A LOW HYDROGEN SPECIFICATION E7015, E7016 OR E7018.
7. POST AND ANCHORAGE TO INCLUDE ALL BOLTS AND WASHERS.
8. END CAP TO INCLUDE SST SELF TAPPING FASTENERS.
9. L–BOLT, NUT AND WASHERS FOR FASTENING STEEL TUBING TO POSTS SHALL BE GALVANIZED (CSA G164–M).
10. ALTERNATE RAIL CAPS MAY BE USED WITH APPROVAL OF ENGINEER.
11. RAIL SHALL BE PRE–BENT TO FOLLOW ROAD CURVATURE WHERE RADIUS IS LESS THAN 150m.
12. RAIL POSTS SHALL BE SET PERPENDICULAR TO GRADE.
13. WHERE LAYOUT OF POSTS IS NOT SHOWN, POST LOCATION SHALL BE DETERMINED BY THE CONTRACTOR.
14. RAIL MAY BE CUT AS REQUIRED IN FIELD WITH PIPE CUTTERS. CUT TO BE SURFACE TREATED WITH ZINC RICH PAINT.
15. WHEN CONNECTING TO EXISTING RAILING, RAIL MUST BE MADE CONTINUOUS AND POST SPACING DETERMINED WITH REFERENCE TO EXISTING POSTS.
16. ALTERNATIVE ALUMINUM RAIL AND POST DESIGNS WILL BE PERMITTED SUBJECT TO PRIOR APPROVAL BY CONTRACT ADMINISTRATOR. THE RAIL SHALL BE 6061 ALLOY T–6 HEAT TREATED. WHEN AN EXTRUDED POST IS USED, THE ALLOY AND HEAT TREATMENT SHALL BE THE SAME AS SPECIFIED FOR THE RAIL. ALUMINUM DESIGNS SHALL BE EQUIVALENT IN STRENGTH TO THE DESIGN SHOWN ON THIS DRAWING, WITH A CONFIGURATION TO PERMIT COMPLETE INTERCHANGEABILITY WITH GALVANIZED STEEL POSTS AND RAILS.
17. SPLICING OF RAIL TUBES MAY BE DONE BY WELDING ON OF SPLICE PIECE OR BY SWEDGING OF RAIL END.
18. RAILING ANCHORAGE INSERT TO BE PLACED PRIOR TO CONCRETING.

APPLICABLE STANDARD DRAWINGS

OPSD–4019.000 SINGLE RAIL ANCHORAGE INSERTS

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REVISIONS			
3	DEC/24	RE–ISSUED FOR TENDER	
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1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL	
NO.	DATE	DESCRIPTION	

DESIGN	SPM	CHK MJM	CODE S6–19	LOAD CL–625–ONT	DATE OCT 2024		
DRAWN	ME	CHK SPM	SITE 620259	STRUCT B145	DWG	46D2510	

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MODIFIED: 2024-12-06 09:53

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COMBERMERE BRIDGE REHABILITATION	SHEET 11
ROADWAY REMOVALS AND NEW CONSTRUCTION	CONTRACT NO. PWC-2025-46

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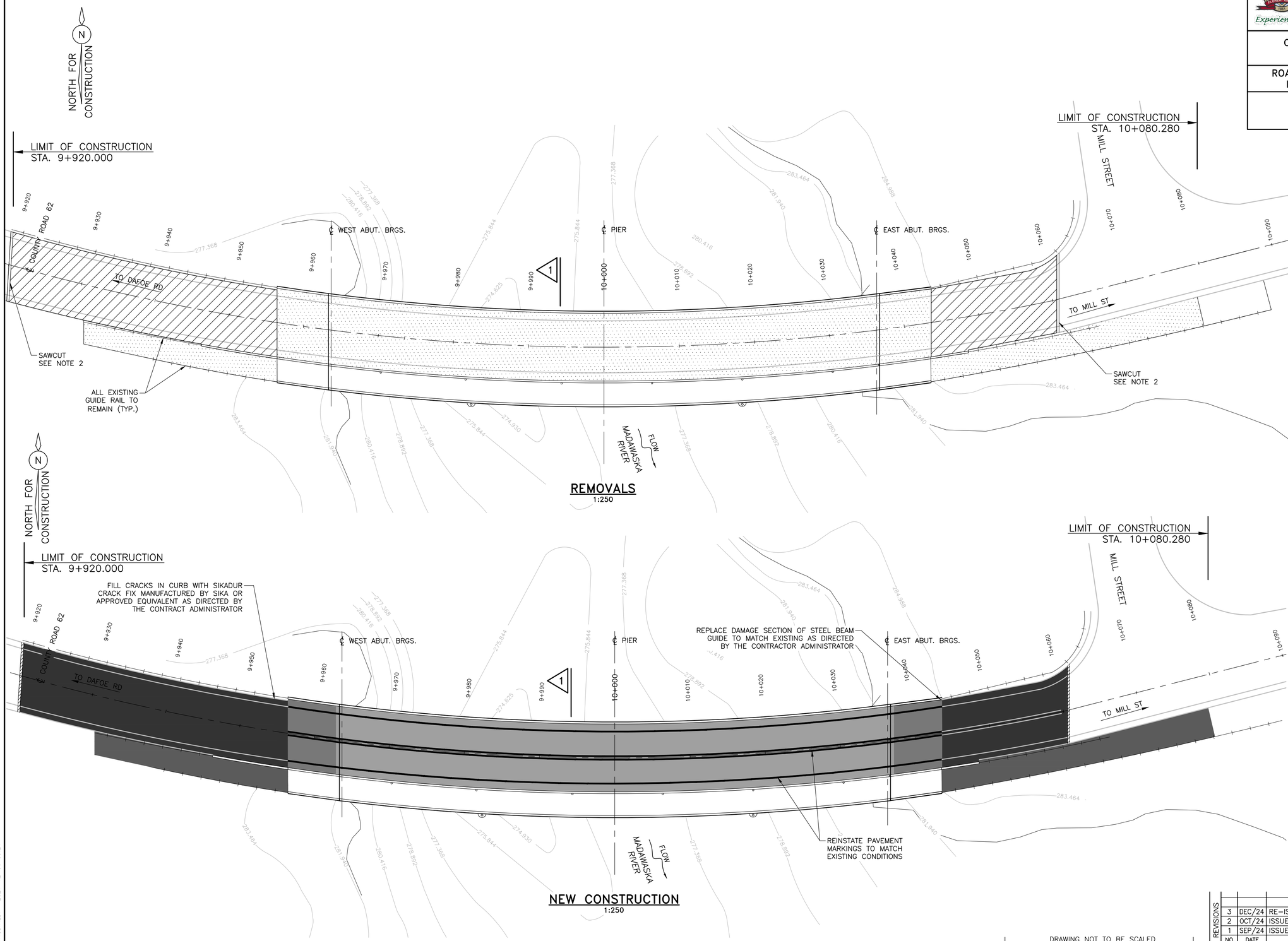

NOTES:

1. CONTRACTOR TO PROTECT ALL EXISTING SIGNAGE FROM DAMAGE WITHIN CONTRACT LIMITS, AND SALVAGE, STORE AND REINSTATE EXISTING SIGNAGE WHERE REQUIRED.
2. MILL 50mm DEEP x 300mm WIDE ASPHALT KEY AT LIMITS OF ASPHALT REMOVAL.
3. CONTRACTOR TO REGRADE AND PLACE ADDITIONAL GRANULAR MATERIAL ALONG THE DISTURBED SHOULDERS AS REQUIRED.
4. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS No. 1 AND 2.
5. THE CONTRACTOR SHALL REINSTATE ALL DISTURBED AREAS WITH 100mm TOPSOIL, SEED AND MULCH.
6. EXISTING DECK DRAINS SHALL REMAIN OPEN AND THE CONTRACTOR SHALL ADJUST THE ASPHALT PAVING AS REQUIRED AT THE DECK DRAIN LOCATIONS TO ENSURE POSITIVE FLOW.
7. PLACE A YELLOW PAVEMENT MARKING, 100mm WIDE x 300mm LONG, ORIENTED TRANSVERSELY TO THE BRIDGE ALIGNMENT, AT EACH DECK DRAIN LOCATION, AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
8. CRACKS IN CURBS SHALL BE CLEANED AND PREPARED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS PRIOR TO FILLING WITH SIKA DUR CRACK FIX.
9. A PORTION OF THE EXISTING APPROACH SLABS AND CONCRETE SLOPE PAVING ARE UNDERMINED. THE CONTRACTOR SHALL FILL THE VOID FROM ACCESSIBLE AREAS WITH GRANULAR B TYPE II PRIOR TO PLACING RIP-RAP SLOPE PROTECTION.
10. EXISTING DECK DRAINS SHALL BE MAINTAINED. ASPHALT SHALL BE COMPACTED AT A 1:1 AROUND DECK DRAINS.

REMOVALS

- PARTIAL DEPTH ASPHALT REMOVAL 100mm
- FULL DEPTH ASPHALT REMOVAL

NEW CONSTRUCTION

- APPROACH SLAB ASPHALT
  -50mm HL3
  -40mm HL3
- BRIDGE DECK ASPHALT
  -40mm HL3
  -40mm HL3
  (90mm W/WATERPROOFING)
- MUP
  -50mm HL3
  -50mm HL3
- COUNTY ROAD 62
  -50mm HL3
  -50mm HL3
- COUNTY ROAD 62
  -50mm HL3

L.I. CERSED PROFESSIONAL ENGINEER
S.P. MILLER
100530577
2024-12-06
PROVINCE OF ONTARIO

L.I. CERSED PROFESSIONAL ENGINEER
M.J. MATTHEWS
100226434
2024-12-06
PROVINCE OF ONTARIO

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS		
3	DEC/24	RE-ISSUED FOR TENDER
2	OCT/24	ISSUED FOR TENDER
1	SEP/24	ISSUED FOR ENVIRONMENTAL APPROVAL
NO.	DATE	DESCRIPTION

DESIGN SPM	CHK MJM	CODE S6-19	LOAD CL-625-ONT	DATE OCT 2024	
DRAWN ME	CHK SPM	SITE 620259	STRUCT B145	DWG 46D2511	

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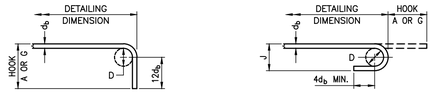


STANDARD 90° HOOK

STANDARD 180° HOOK

MINIMUM BENDING PIN DIAMETER, D, mm

BAR SIZE	STEEL GRADE	
	400R (2)	400W OR 500W
10M	70	60
15M	100	90
20M	120	100
25M	150	150
30M	250	200
35M	300	250
45M	450 (1)	400
55M	600 (1)	550

(1) Special fabrication is required for bends exceeding 90° for bars of these sizes and grade.
(2) For stainless steel, with Fy = 500, the same D as for 400R.

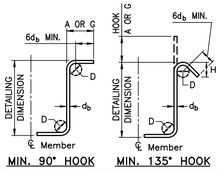
STANDARD HOOK DIMENSIONS

BAR SIZE	90° HOOKS		180° HOOKS			
	A OR G (mm)		A OR G (mm)		J (mm)	
	400R	400W OR 500W	400R	400W OR 500W	400R	400W OR 500W
10M	180	180	140	130	90	80
15M	260	250	180	170	130	120
20M	310	300	220	200	160	140
25M	400	400	280	280	200	200
30M	510	490	400	350	310	260
35M	610	590	480	430	370	320
45M	790	770	680	630	540	490
55M	1030	1010	900	850	710	660

NOTE: All Hook Dimensions are according to the CHBDC–2019.

MINIMUM STIRRUP AND TIE HOOK DIMENSIONS

BAR SIZE	BAR DIAM. d_b(mm)	PIN DIAM. D(mm)	90° A OR G (mm)	135° A OR G (mm)	135° H (approx.) (mm)
10M	11.3	45	100	100	70
15M	16.0	65	140	140	100
20M	19.5	100	190	190	115
25M	25.2	150	280		



MIN. 90° HOOK

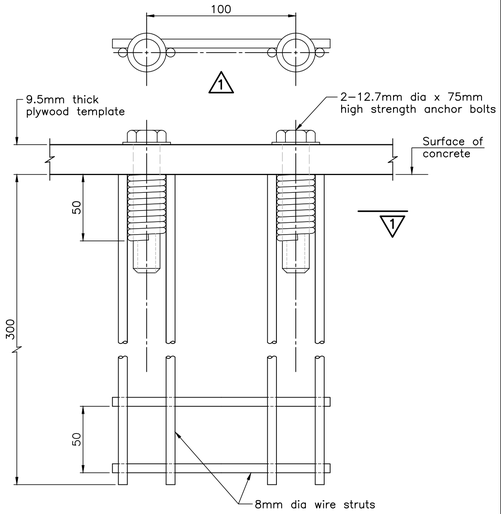
MIN. 135° HOOK

HOOK DIMENSIONS FOR REINFORCING STEEL BARS

Ontario Ministry of Transportation

SS112–1

Date OCTOBER 2022 | Rev –



ELEVATION

NOTES:

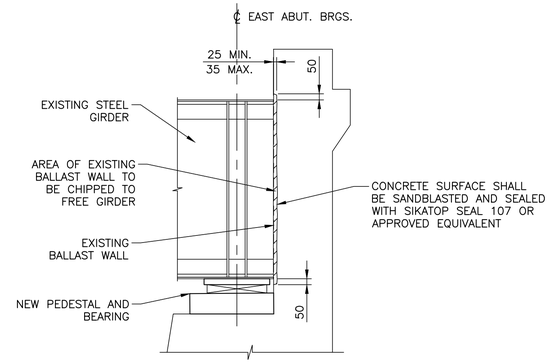
A Anchorage strut assembly shall be SAE 1030 steel. Coils shall be SAE 1018 steel.
B Steel hex bolts and hardened steel washers shall be according to ASTM Specification A325.
C All welding shall be according to CSA Standard W59–M1989.
D The complete anchorage assembly including bolts, nuts and washers shall be hot dip galvanized according to CSA Standard G164–M92.
E Bolts are to be given a liberal coating of white non–staining grease.
F A plywood setting template shall be provided for accurate positioning of anchorage within the concrete form.
G All dimensions are in millimetres or metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | 1996 09 15 | Rev

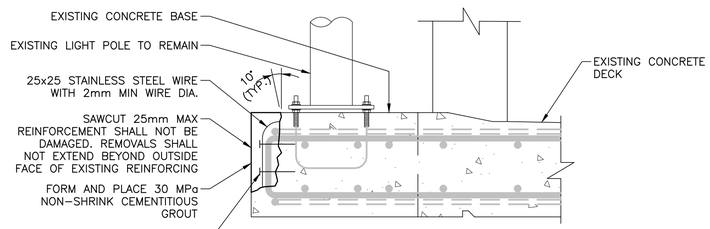
SINGLE RAIL ANCHORAGE INSERTS

Date

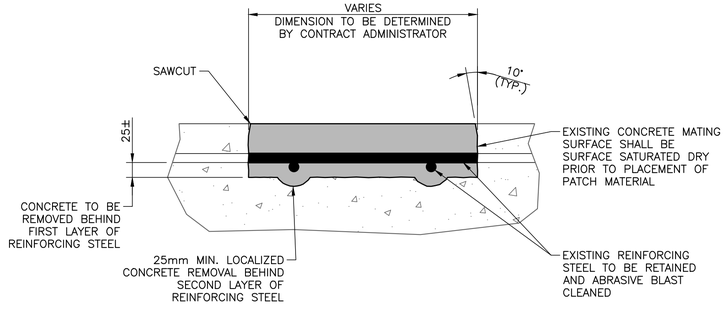
OPSD – 4019.000



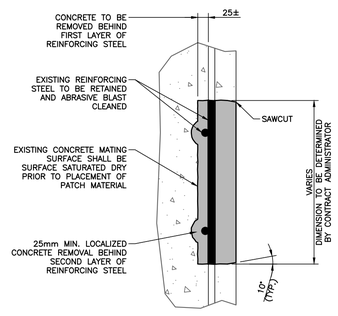
JAMMED GIRDER DETAIL
1:25



LIGHT POLE BASE REPAIR DETAIL
1:10



TYPICAL REPAIR DETAIL, UNFORMED SURFACES
N.T.S.



TYPICAL REPAIR DETAIL, FORMED SURFACES
N.T.S.

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COMBERMERE BRIDGE REHABILITATION | SHEET 12

STANDARD DETAILS | CONTRACT NO. PWC–2025–46

Jacobs

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DRAWN ME	CHK SPM	SITE 620259	STRUCT B145	DWG	46D2512

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