

CONTRACT DRAWINGS

CONTRACT NO. 2020-4006

BOOK 1 OF 1

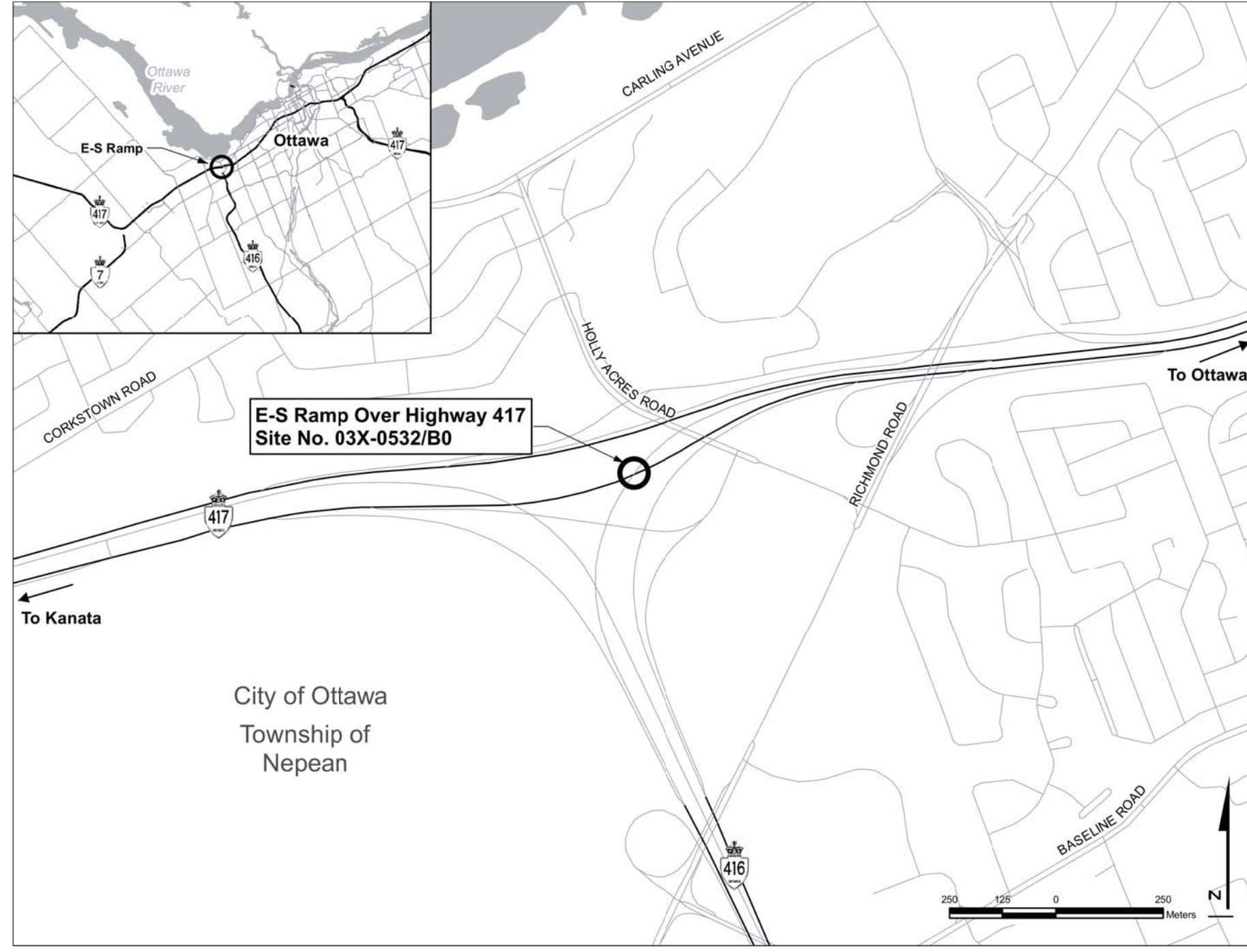
EASTERN REGION

Ministry Of Transportation



CAD FILE LOCATION AND NAME: K:\02-Documents\2015\03X-15-7125 - MTD ER - Structural Retainer (Area A & B)\15-7125-13 - Highway 417 Bearings\10 CAD\03 - Contract Drawings\03X-15-7125-13_001key.dwg
 MODIFIED: 1/14/2020 12:41:17 PM BY: S.MALLORY
 DATE PLOTTED: 1/14/2020 1:26:52 PM

PH-D-302 89-10
 MINISTRY OF TRANSPORTATION, ONTARIO



E-S Ramp Over Highway 417
 Site No. 03X-0532/B0

KEY PLAN

WP No 4020-19-01 Contract No 2020-4006
 GWP No 4007-19-00

Work of GRADING, STRUCTURE REHABILITATION

Hwy No 417 Region EASTERN

Location E-S RAMP OVER HIGHWAY 417 (SITE 03X-0532/B0)

Length 0.1 km.

Reference Plans BC52-416-01
 BC52-417-2A

Date _____ P. Eng.
 Manager, Engineering

Date _____
 Regional Director

Ministry of Transportation



CITY OF OTTAWA
GEOGRAPHIC TOWNSHIP OF NEPEAN
SITE NO. 03X-0532/B0

METRIC



PLATE No
CONT 2020-4006
GWP 4007-19-00

HIGHWAY 417
STAGING PLAN



SHEET
1

McINTOSH PERRY

- LEGEND:**
- TC-54 (18m C/C MAX)
 - TEMPORARY CONSTRUCTION BARRIER (TCB) CATEGORY I
 - ENERGY ATTENUATOR (EAT)
 - ⇨ TRAFFIC FLOW

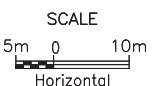
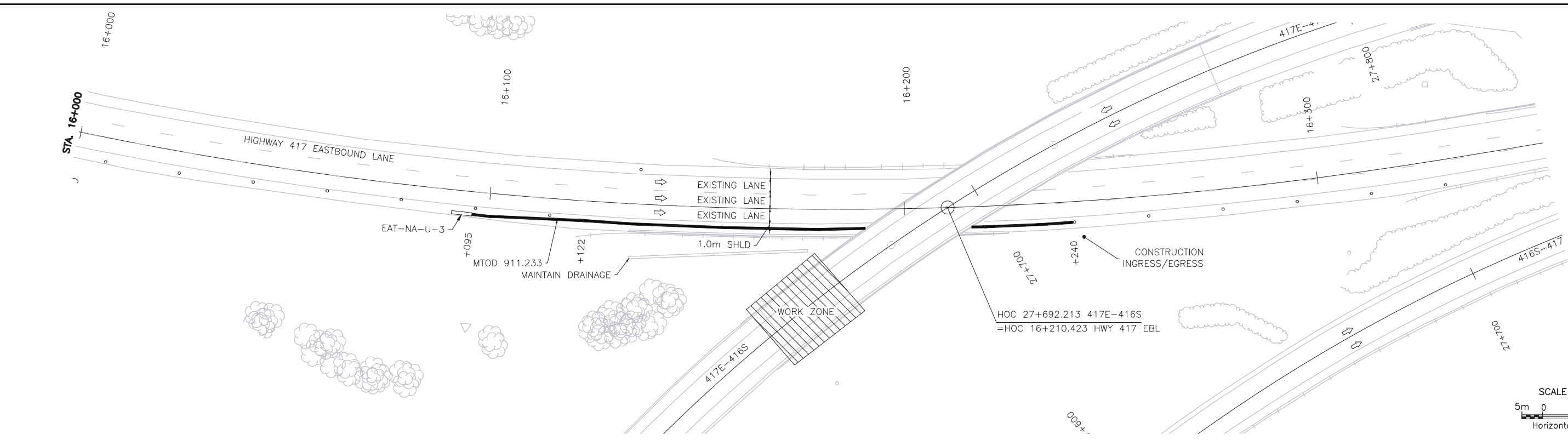
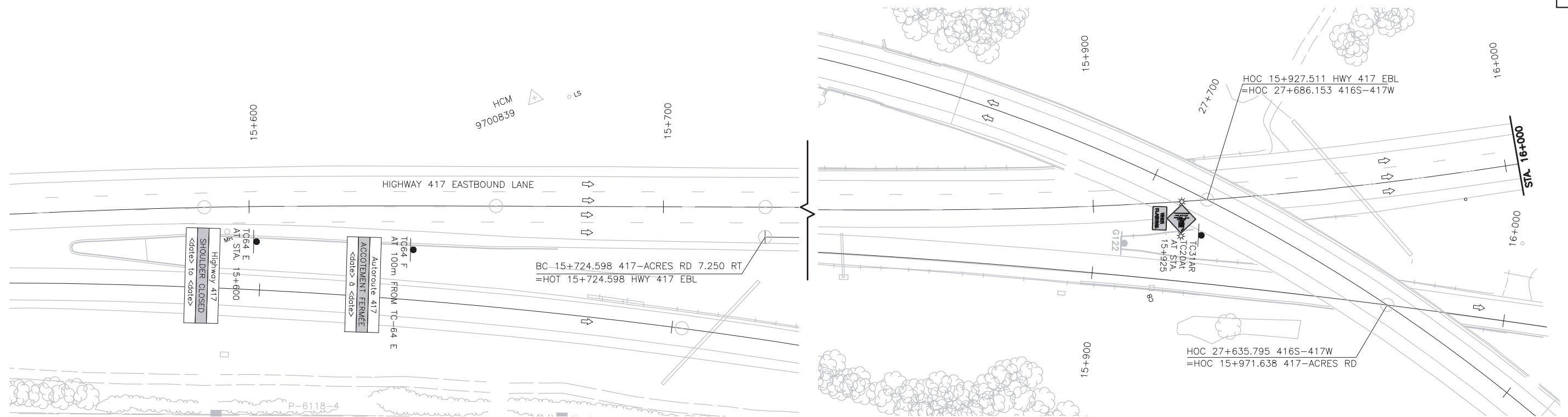
TC64 E	TC64 F
Highway 417	Autoroute 417
SHOULDER CLOSED	ACCOTEMENT FERMÉE
<date> to <date>	<date> à <date>

300X2400 PLYWOOD TABS, GROUND MOUNTED ON TIMBER POSTS 200mm LETTERS, CENTERED ON TABS.

TO BE PLACED A MIN. OF ONE WEEK PRIOR TO THE SHOULDER CLOSURE

- NOTES:**
1. STAGING DRAWINGS TO BE READ IN CONJUNCTION WITH STRUCTURAL DRAWINGS, ONTARIO TRAFFIC MANUAL (OTM) BOOK 7A (TEMPORARY CONDITIONS).
 2. CONSTRUCTION INGRESS AND EGRESS TO BE CLOSED BY TC-54 WHEN NOT IN USE.
 3. LOCATION OF CONTRACT INFORMATION SIGN TO BE SPECIFIED BY CONTRACT ADMINISTRATOR.
 4. CONTRACTOR TO VERIFY PLACEMENT OF TEMPORARY SIGNS WITH THE CONTRACT ADMINISTRATOR PRIOR TO CONSTRUCTION.

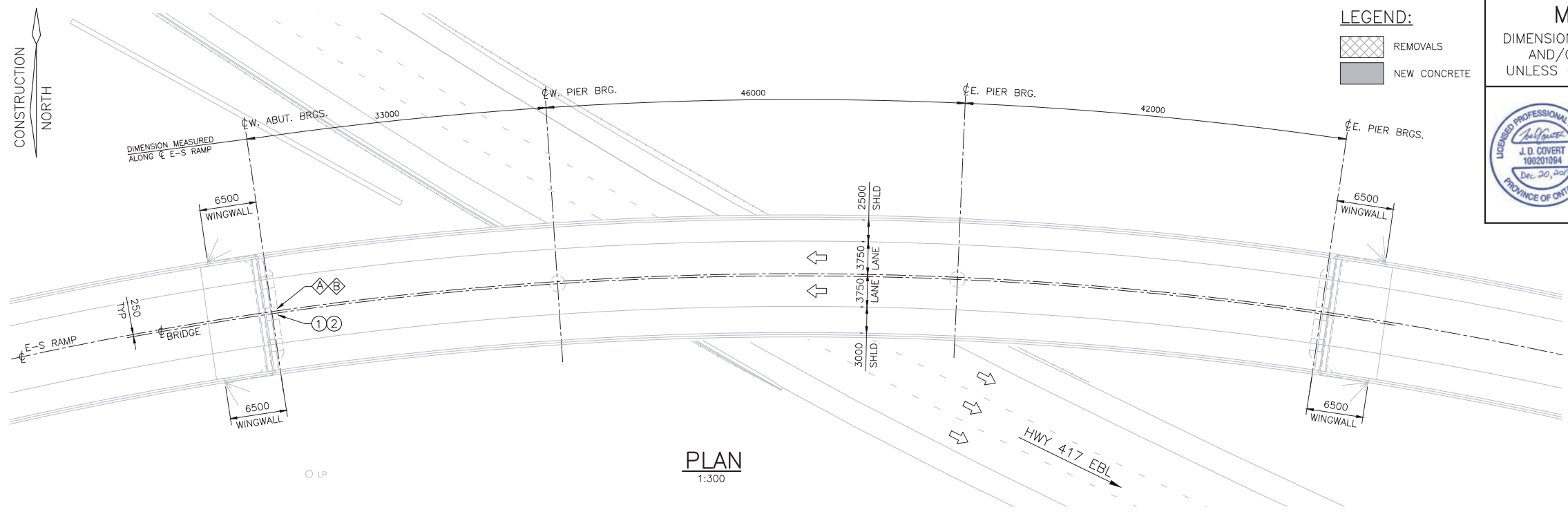
CONTRACT INFORMATION SIGN				
SIGN NUMBER	MESSAGE DETAILS	MIN. SIGN HEIGHT	MAX. SIGN HEIGHT	MAX. SIGN WIDTH
*	*	900mm*	1500mm*	2400mm
* FINAL SIGN NUMBER, MESSAGE DETAILS, AND SIGN HEIGHT TO BE SUPPLIED BY OWNER AFTER CONTRACT AWARD.				



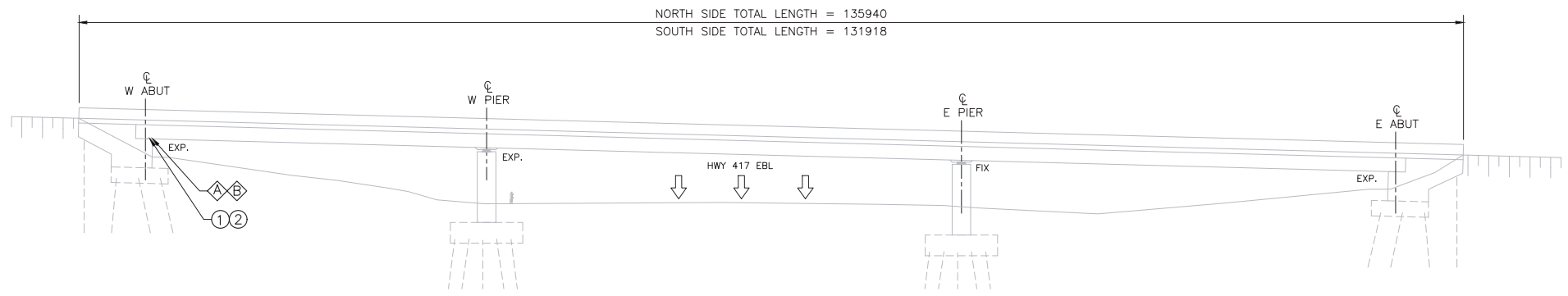
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CAD FILE LOCATION AND NAME: m:\02-documents\2015\0m--15-7125 -- mto er -- structural retainer (area a & b)\15-7125-13 -- highway 417 bearings\OKM-15-7125-13-001GA.dwg
 MODIFIED: 1/7/2020 10:04:31 AM BY: K.MARTIN
 DATE PLOTTED: 1/7/2020 10:08:53 AM BY: KYLE MARTIN

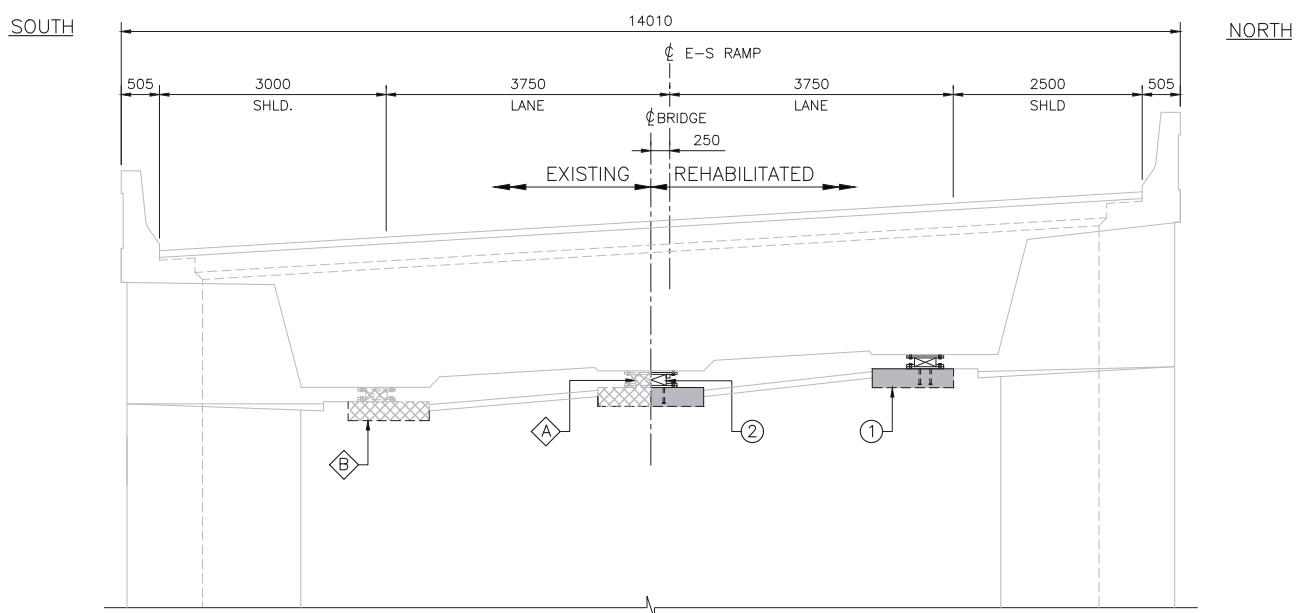
PR-D-707 BR-05
 MINISTRY OF TRANSPORTATION, ONTARIO



PLAN
1:300



ELEVATION
1:300



WEST ABUTMENT
1:50

LEGEND:
 REMOVALS
 NEW CONCRETE

METRIC DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN		CONT. No. 2020-4006 WP No. 4020-19-01	 SHEET 2
 		HIGHWAY 417 E. TO S. RAMP OVER 417 EBL REHABILITATION GENERAL ARRANGEMENT	
McINTOSH PERRY			

- GENERAL NOTES:**
- CLASS OF CONCRETE**
ALL CONCRETE (UNLESS OTHERWISE NOTED) 30 MPa
 - CLEAR COVER TO REINFORCING STEEL**
CLEAR COVER TO REINFORCING STEEL 70 ± 20 (UNLESS OTHERWISE NOTED)
 - REINFORCING STEEL**
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
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.
 - CONSTRUCTION NOTES:**
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR BEFORE PROCEEDING WITH THE REPAIR WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
TYPICAL AREAS OF REPAIR ARE INDICATED ON DRAWINGS. ACTUAL LOCATIONS AND EXTENT OF REMOVAL SHALL BE DETERMINED ON SITE BY THE CONTRACT ADMINISTRATOR.
EXISTING REINFORCING STEEL WHICH IS EXPOSED DURING CONCRETE REMOVALS AND WHICH IS TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
THE CONTRACTOR IS FULLY RESPONSIBLE FOR ADEQUATE PROTECTION OF ALL UTILITIES, SERVICES, ROADWAYS, ETC. DURING CONSTRUCTION.
ANY DAMAGE DURING CONSTRUCTION TO THE EXISTING STRUCTURE, UTILITIES AND ADJACENT PROPERTIES NOT DESIGNATED FOR REPAIR SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR AND AT NO COST TO THE OWNER.
ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.
 - LIST OF DRAWINGS**
R1-1 GENERAL ARRANGEMENT
R1-2 JACKING DETAILS
R1-3 REMOVALS LAYOUT & DETAILS
R1-4 RECONSTRUCTION LAYOUT & DETAILS
R1-5 BEARING LAYOUT & DETAILS

SCOPE OF REHABILITATION WORK:

THE GENERAL SCOPE OF THE REHABILITATION WORK OUTLINED BELOW AND DESIGNATED ON THIS DRAWING SHALL BE CONSIDERED SIMILAR AT EACH SIDE OF THE CENTRELINE OF THE BRIDGE, UNLESS NOTED OTHERWISE. THIS IS NOT MEANT TO BE AN EXHAUSTIVE LIST OR INDICATE THE ORDER IN WHICH OPERATIONS SHOULD TAKE PLACE.

REMOVALS:

- REMOVE WEST ABUTMENT BEARINGS
- REMOVE CONCRETE AND BEARING ANCHORAGE AT BEARING LOCATIONS

NEW CONSTRUCTION:

- RECONSTRUCT WEST ABUTMENT AT BEARING LOCATIONS
- INSTALL NEW WEST ABUTMENT BEARINGS

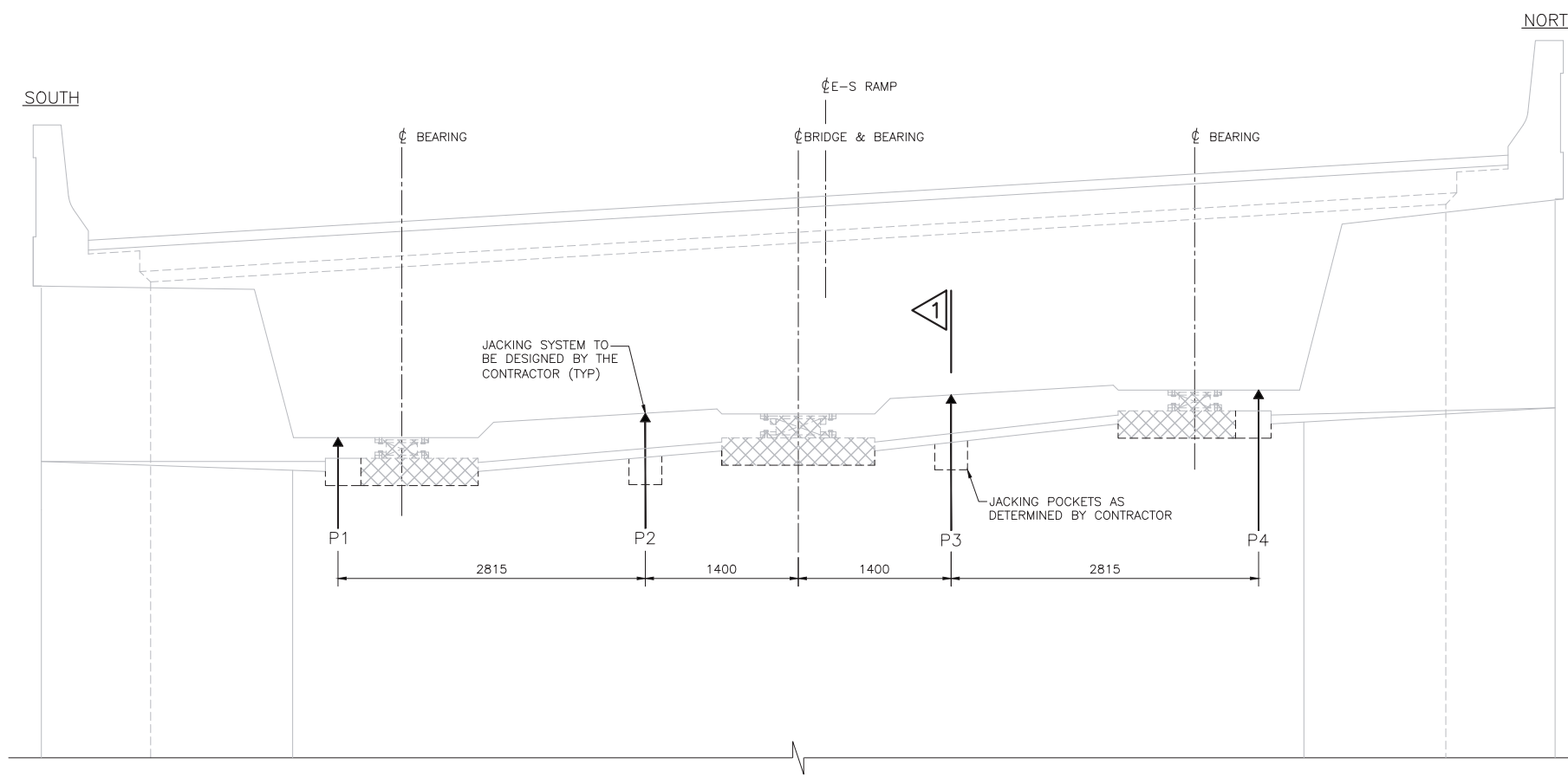
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	REV	DESCRIPTION

DESIGN	JC	CHK	AS	CODE	CHBDC S6-14	LOAD	CL-625 ONT	DATE	JAN/20
DRAWN	KM	CHK	JC	SITE	03x-0532/80	STRUCT	SCHEME	DWG	R1-1

CAD FILE LOCATION AND NAME: m:\02-documents\2015\0m-15-7125 - mto er - structural retainer (area a & b)\15-7125-13 - highway 417 bearings\10 CAD\03 - contract drawings\OKM-15-7125-13-002B.dwg
 MODIFIED: 1/7/2020 10:04:26 AM BY: K.MARTIN
 DATE PLOTTED: 1/7/2020 10:08:56 AM BY: KYLE MARTIN

PR-D-707 88-05
 MINISTRY OF TRANSPORTATION, ONTARIO



LEGEND:
 REMOVALS

METRIC DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN		CONT. No. 2020-4006 WP No. 4020-19-01	
		HIGHWAY 417 E. TO S. RAMP OVER 417 EBL REHABILITATION	SHEET 3
		JACKING DETAIL	
McINTOSH PERRY			

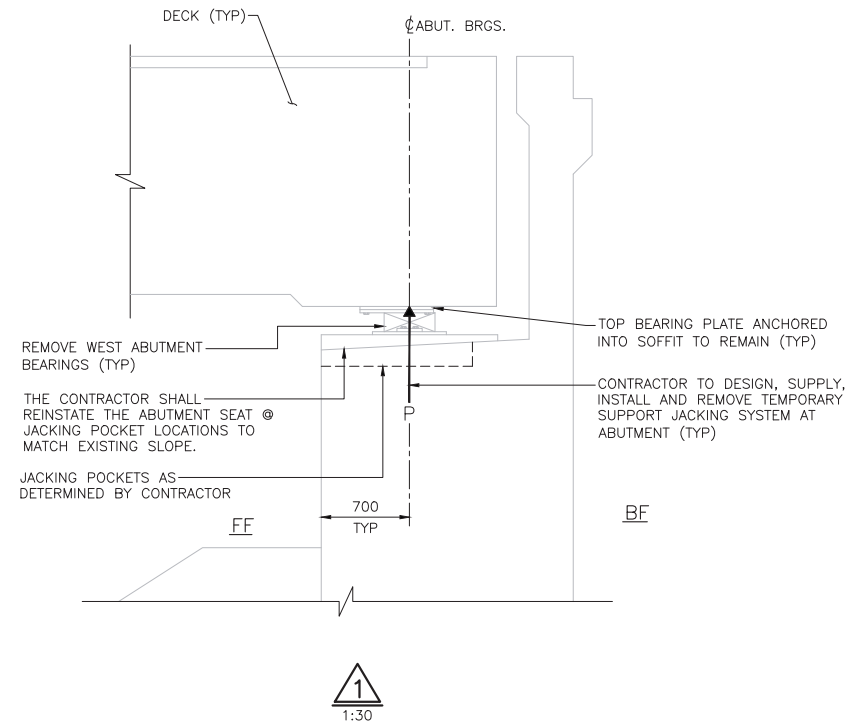
- CONSTRUCTION NOTES:**
- JACKING SUPPORT SYSTEM SHOWN ON THE DRAWINGS IS SCHEMATIC ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF JACKING SUPPORT SYSTEM AND SHALL SUBMIT DETAIL SHOP DRAWINGS ALONG WITH DESIGN CALCULATIONS AND PROCEDURES TO THE CONTRACT ADMINISTRATOR. ALL THE DRAWINGS SHALL BE STAMPED BY AN ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
 - JACKING EQUIPMENT AND PROCEDURES OUTLINED IN THE CONTRACTOR'S SHOP DRAWINGS SHALL BE CERTIFIED IN THE FIELD BY THE ENGINEER RESPONSIBLE FOR THOSE DRAWINGS.
 - THE CONTRACTOR SHALL SITE MEASURE THE EXISTING STRUCTURE AT SUPPORT LOCATIONS TO ENSURE PROPER FIT.
 - TRAFFIC SHALL NOT BE ALLOWED ON THE STRUCTURE DURING JACKING OPERATIONS.
 - THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS OF BEARING ASSEMBLY, DECK JOINTS, STRUCTURE, UTILITIES AND ALL OTHER RELEVANT FEATURES TO ENSURE THE SUPERSTRUCTURE IS FREE TO LIFT. REMOVE DEBRIS AND CLEAR GAPS PRIOR TO JACKING.
 - THE DECK SHALL BE JACKED UP SIMULTANEOUSLY ACROSS THE ENTIRE WIDTH. JACKING MEASUREMENTS SHALL BE RECORDED AND SUPPLIED TO THE CONTRACT ADMINISTRATOR.
 - THE DECK SHALL BE JACKED UP SUFFICIENTLY TO REMOVE PRESSURE ON THE EXISTING BEARINGS AND FACILITATE THEIR REMOVAL. MAXIMUM LIFT OF 12mm PERMITTED DURING JACKING AND SUBSEQUENT TEMPORARY SUPPORT.
 - THE SPECIFIED JACKING LOADS ARE APPROXIMATE, AND REPRESENT THE ANTICIPATED REACTIONS DURING THE JACKING PROCESS. THE CONTRACTOR SHALL SUPPLY JACKING CAPACITY OF AT LEAST 200% OF THE THEORETICAL JACKING REACTIONS INDICATED.
 - THE SPECIFIED TEMPORARY SUPPORT LOADS ARE APPROXIMATE, AND REPRESENT THE ANTICIPATED REACTIONS WHILE THE BRIDGE IS ON TEMPORARY SUPPORTS. TRAFFIC CONDITIONS AND RESTRICTIONS DURING THIS TIME SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
 - THE CONTRACTOR SHALL IMMEDIATELY STOP JACKING OPERATIONS IF APPLIED LOADS REACH 200% OF THE SPECIFIED JACKING PERMANENT LOADS, OR IF UNEXPECTED OR DETRIMENTAL STRUCTURAL EFFECTS ARE OBSERVED AT ANY TIME. THE CONTRACTOR SHALL LOWER THE BRIDGE BACK DOWN, INFORM THE CONTRACT ADMINISTRATOR, AND STOP JACKING OPERATIONS UNTIL FURTHER DIRECTION IS PROVIDED BY THE DESIGN ENGINEER AND OWNER.
 - ALL JACKING SURFACES SHALL BE LEVEL.
 - THE CONTRACTOR SHALL PROVIDE LATERAL RESTRAINTS CAPABLE OF RESISTING A LOAD OF NO LESS THAN 10% OF VERTICAL JACKING REACTIONS DURING REPLACEMENT OF THE BEARINGS. LATERAL RESTRAINTS SHALL BE INSTALLED PRIOR TO REMOVAL OF EXISTING BEARINGS AND REMAIN IN PLACE UNTIL NEW BEARINGS ARE INSTALLED.
 - THE CONTRACTOR SHALL USE SELF LOCKING JACKS AND SHALL BE RESPONSIBLE FOR THE STRENGTH AND STABILITY OF ALL JACKING AND TEMPORARY SUPPORT COMPONENTS FOR THE ENTIRE DURATION THEY ARE IN USE.

TEMPORARY JACKING SUPPORT – ELEVATION (WEST ABUTMENT SHOWN)
 1:30

TYPICAL JACKING & TEMPORARY SUPPORT LOADS	P1 (kN)	P2 (kN)	P3 (kN)	P4 (kN)
PERMANENT LOAD – SLS	1100	1200	1300	1700
LIVE LOAD – SLS	0	0	0	0
TOTAL TEMP SUPPORT LOAD – ULS	2550	1710	1800	2875

CONSTRUCTION SEQUENCE FOR BEARING REPLACEMENT:

- INSTALL TEMPORARY JACKING SUPPORT SYSTEM AND JACK AT WEST ABUTMENT.
- REMOVE PORTION OF CONCRETE BEARING PEDESTAL AND EXISTING POT BEARING ASSEMBLIES WITH THE EXCEPTION OF THE UPPER BEARING PLATES EMBEDDED IN SOFFIT.
- THE REMAINING EXISTING TOP PLATE EMBEDDED IN SOFFIT SHALL BE CLEANED USING BRUSH-OFF BLAST CLEANING ACCORDING TO THE REQUIREMENTS OF SSPC-SP 7.
- ABRASIVE BLAST CLEAN EXISTING REINFORCING AND INSTALL ADDITIONAL REINFORCING IN BEARING PEDESTAL.
- RECONSTRUCT BEARING PEDESTAL TO MATCH THE EXISTING ELEVATION.
- INSTALL NEW UNI-DIRECTIONAL AND MULTI-DIRECTIONAL BEARINGS.
- THE REMAINING EXISTING UPPER BEARING PLATE EMBEDDED IN THE SOFFIT SHALL BE PAINTED BEYOND THE NEW BEARING. PAINT COATING SYSTEM SHALL BE IN ACCORDANCE WITH TABLE 2 OF OPSS 911. THE CONTRACTOR SHALL PROVIDE PROTECTION TO ALL COMPONENTS WHICH ARE NOT TO BE PAINTED.
- WHEN THE CONCRETE IN THE BEARING SEATS HAS ATTAINED A COMPRESSIVE STRENGTH OF 25MPa, TRANSFER THE LOAD TO THE BEARINGS.
- REMOVE JACKS AND TEMPORARY SUPPORT SYSTEM.



1
 1:30

DRAWING NOT TO BE SCALED
 100mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	REV	DESCRIPTION

DESIGN	JC	CHK	AS	CODE	CHBDC S6-14	LOAD	CL-625 ONT	DATE	JAN/20
DRAWN	KM	CHK	JC	SITE	03x-0532/80	STRUCT	SCHEME	DWG	R1-2

CONSTRUCTION

NORTH

LEGEND:

NEW CONCRETE

METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

CONT. No. 2020-4006
WP No. 4020-19-01



HIGHWAY 417
E. TO S. RAMP OVER 417 EBL
REHABILITATION
RECONSTRUCTION LAYOUT &
DETAILS

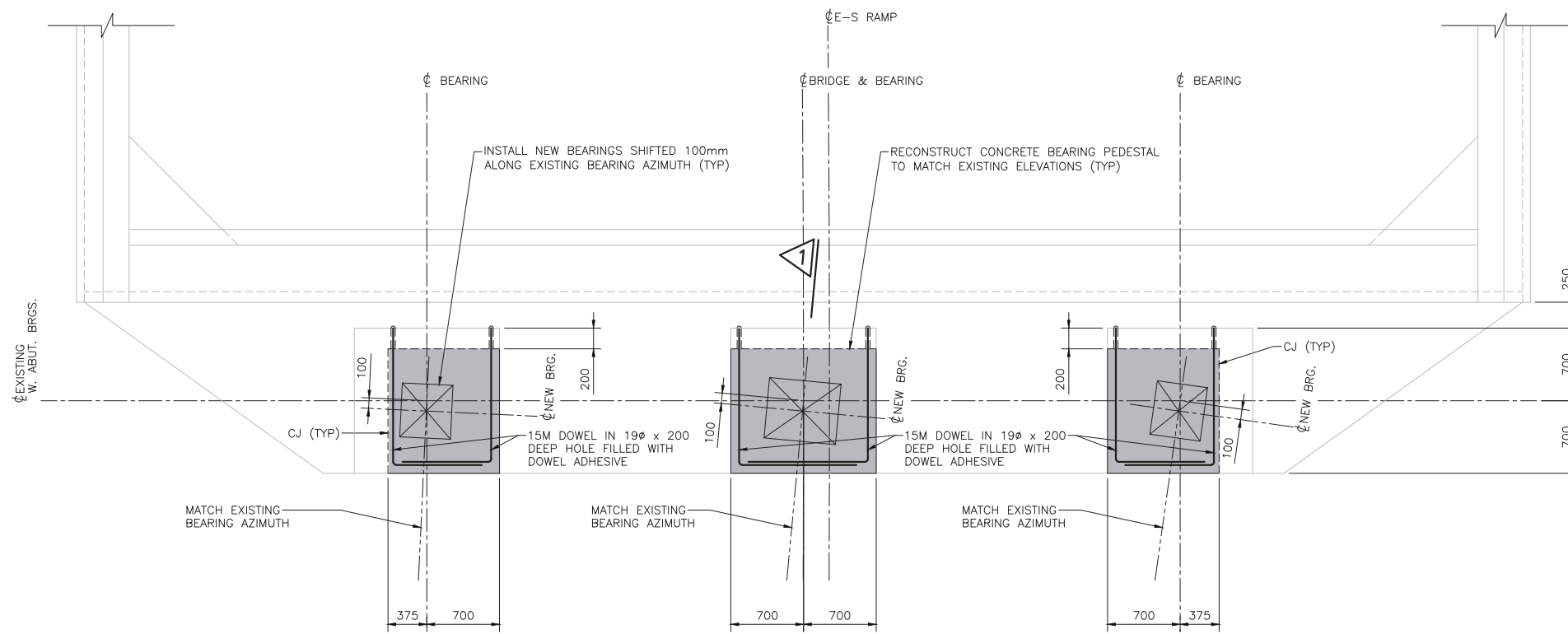
SHEET

5

McINTOSH PERRY

CONSTRUCTION NOTES:

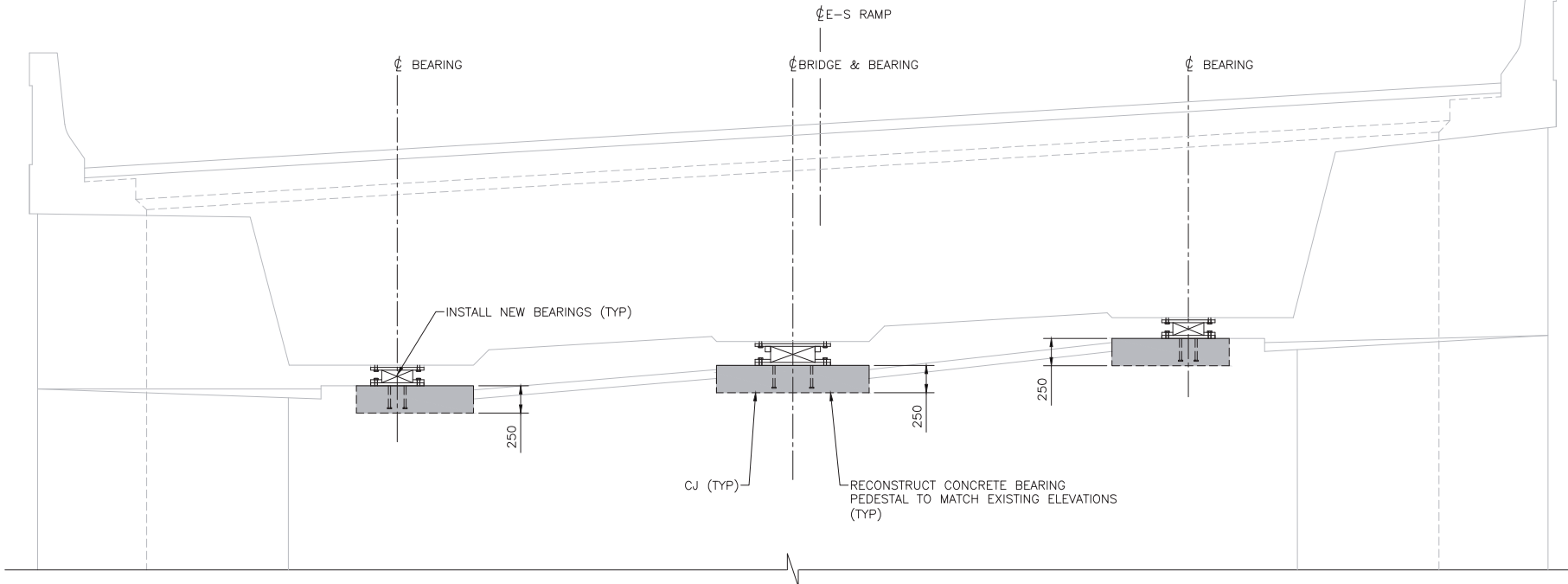
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.



PLAN - WEST ABUTMENT

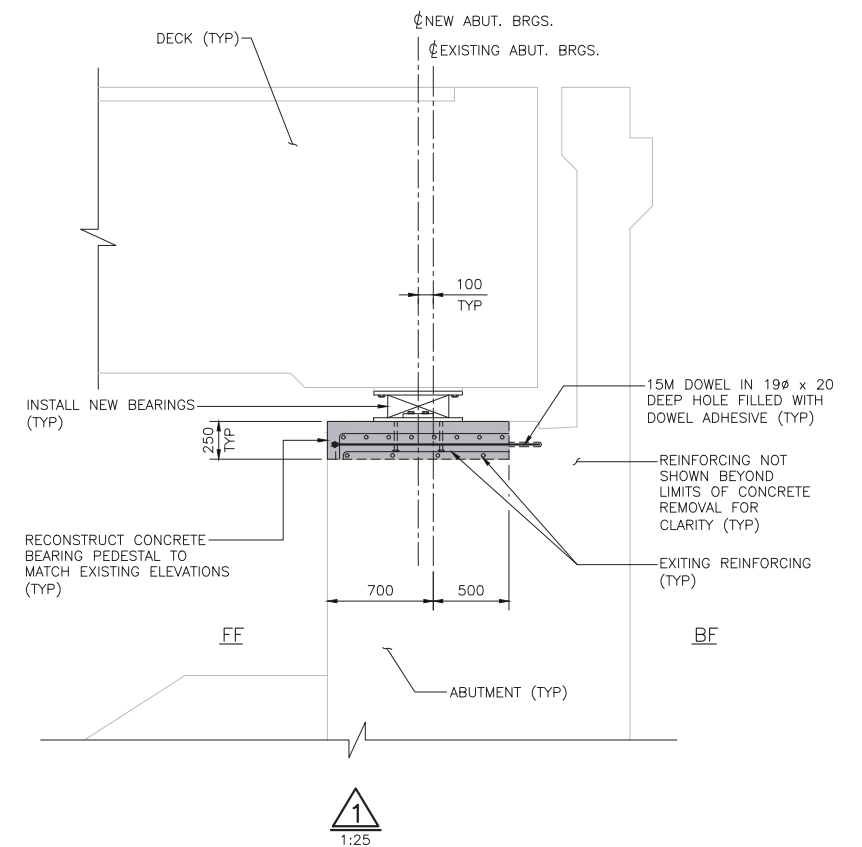
1:30

SOUTH



ELEVATION - WEST ABUTMENT

1:30



1
1:25

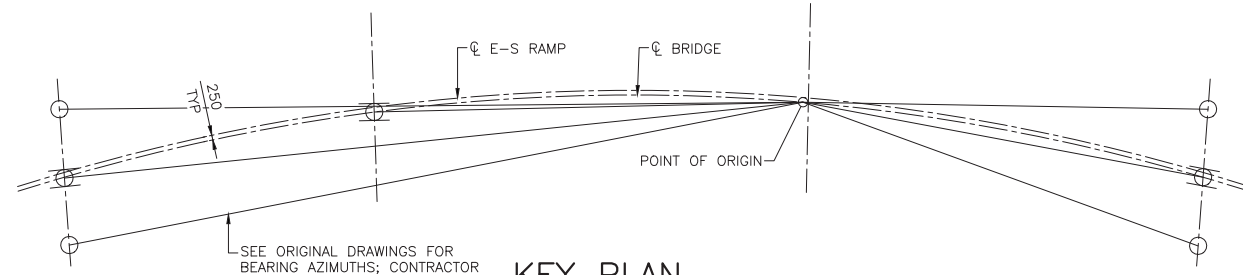
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100mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	REV	DESCRIPTION
DESIGN	JC	CHK	AS	CODE CHBDC S6-14 LOAD CL-625 ONT DATE JAN/20
DRAWN	KM	CHK	JC	SITE 03X-0532/B0 STRUCT SCHEME DWG R1-4

MINISTRY OF TRANSPORTATION, ONTARIO
PR-D-707
88-05

CAD FILE LOCATION AND NAME: m:\02-documents\2015\0m-15-7125 - mto er - structural retainer (area a & b)\15-7125-13 - highway 417 bearings\01 CAD\03 - contract drawings\OKM-15-7125-13-006BR.dwg
 MODIFIED: 1/7/2020 10:04:15 AM BY: K.MARTIN
 DATE PLOTTED: 1/7/2020 10:09:06 AM BY: KYLE MARTIN

PR-D-707 BR-05
 MINISTRY OF TRANSPORTATION, ONTARIO



KEY PLAN
N.T.S.

- LEGEND:**
- UNI-DIRECTIONAL BEARING
 - MULTI-DIRECTIONAL BEARING

<p>METRIC DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN</p>	<p>CONT. No. 2020-4006 WP No. 4020-19-01</p>			<p>HIGHWAY 417 E. TO S. RAMP OVER 417 EBL REHABILITATION</p>	<p>SHEET 6</p>
<p>BEARING LAYOUT & DETAILS</p>				<p>McINTOSH PERRY</p>	

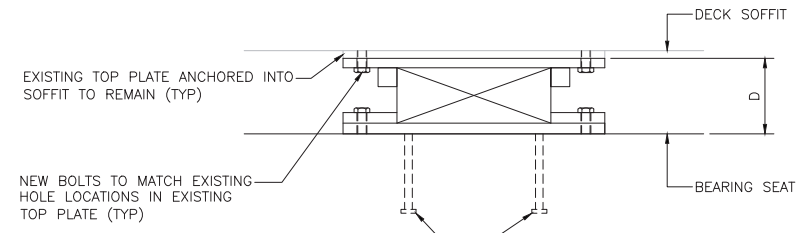
CONSTRUCTION NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.

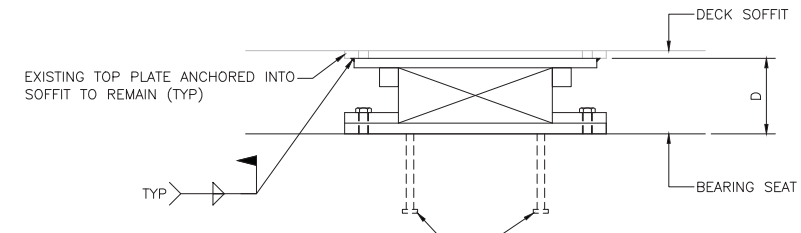
BEARING NOTES:

1. NEW BEARINGS SHALL BE ROTATIONAL BEARINGS AS LISTED IN D.S.M. LIST #9.15.71 UNDER THE HEADING "BEARINGS BRIDGE ROTATIONAL".
2. THE APPROXIMATE TOTAL HEIGHT OF THE BEARING 'D', ARE GIVEN IN THE ROTATIONAL BEARING DESIGN DATA TABLE.
3. THE CONTRACTOR SHALL MEASURE THE ACTUAL BEARING HEIGHT 'D' AT THE WEST ABUTMENTS PRIOR TO FABRICATION OF BEARINGS TO ENSURE PROPER FIT.
4. THE CONTRACTOR SHALL ADJUST THE BEARING COMPONENTS TO SUIT ACTUAL BEARING HEIGHT 'D'. CONTRACTOR SHALL SET ELEVATION SUCH THAT WHEN THE DECK IS LOWERED ONTO THE NEW BEARINGS THE DECK SOFFIT IS AT ITS ORIGINAL LOCATION.
5. THE CONTRACTOR SHALL MATCH EXISTING BEARING ORIENTATION.
6. THE NEW BEARING SIZE TO BE DESIGNED TO SUIT THE EXISTING TOP PLATE.
7. THE CONTRACTOR SHALL ESTABLISH THE BEARING SIZE SUCH THAT CONTACT PRESSURE UNDER PERMANENT LOADS AT SLS IS NOT LESS THAN 25MPa.
8. THE CONTRACTOR SHALL ENSURE THE STABILITY OF ALL COMPONENTS DURING REMOVAL OPERATIONS.
9. ALL WELDING SHALL CONFORM TO THE LATEST CSA STANDARD W59-M AND W47.1.
10. UNLESS OTHERWISE NOTED, THE MINIMUM FILLET WELD SHALL BE AS FOLLOWS:

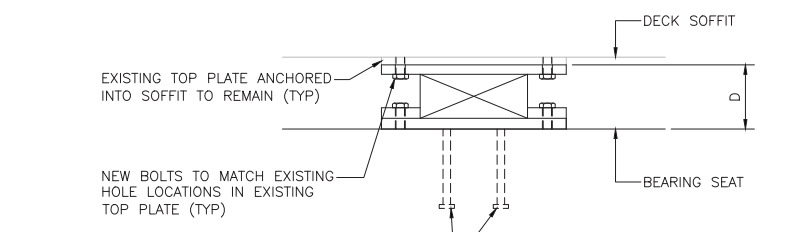
MATERIAL THICKNESS OF THICKER PART JOINED (mm)	MINIMUM SIZE OF SINGLE PASS FILLET WELD (mm)
TO 12 INCLUSIVE	5
OVER 12 TO 20	6
OVER 20 TO 40	8
OVER 40 TO 60	10
OVER 60 TO 120	12



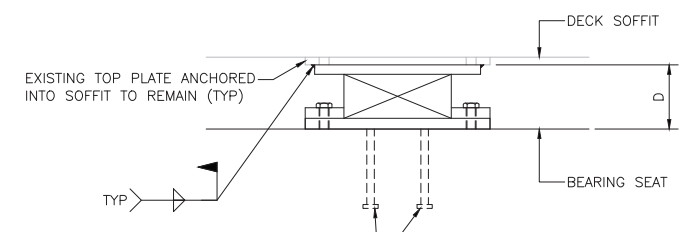
UNI-DIRECTIONAL BEARING (BOLTED OPTION)
N.T.S.



ALTERNATIVE UNI-DIRECTIONAL BEARING (WELDED OPTION)
N.T.S.



MULTI-DIRECTIONAL BEARING (BOLTED OPTION)
N.T.S.



ALTERNATIVE MULTI-DIRECTIONAL BEARING (WELDED OPTION)
N.T.S.

ROTATIONAL BEARING DESIGN TABLE

LOCATION		COMBINATION	AXIAL LOAD (kN)	MAX HORIZ LOAD (kN)		MAX ROTATION (°)		MAX TRANSLATION (mm)	
				LONGIT.	TRANS.	ABOUT HORIZ. AXIS	ABOUT VERT. AXIS	LONGIT.	TRANS.
EXTERIOR - WEST ABUTMENT (At CL BRIDGE)	SERVICEABILITY	PERMANENT	2250	-	-	±1.0	±1.0	±120	±10
		PERMANENT + TRANSITORY MAX.	3000	-	-				
		PERMANENT + TRANSITORY MIN.	1000	-	-				
		PERMANENT	2600	-	-				
		PERMANENT + TRANSITORY MAX.	4000	-	-				
		PERMANENT + TRANSITORY MIN.	250	-	-				
	ULTIMATE	PERMANENT + EXCEPTIONAL MAX.	-	-	-	±1.0	±1.0	--	--
		PERMANENT + EXCEPTIONAL MIN.	-	-	-				

ROTATIONAL BEARING DESIGN TABLE

LOCATION		COMBINATION	AXIAL LOAD (kN)	MAX HORIZ LOAD (kN)		MAX ROTATION (°)		MAX TRANSLATION (mm)	
				LONGIT.	TRANS.	ABOUT HORIZ. AXIS	ABOUT VERT. AXIS	LONGIT.	TRANS.
INTERIOR - WEST ABUTMENT (At CL BRIDGE)	SERVICEABILITY	PERMANENT	1600	-	-	±1.0	±1.0	±120	--
		PERMANENT + TRANSITORY MAX.	1900	-	80				
		PERMANENT + TRANSITORY MIN.	1550	-	80				
		PERMANENT	1800	-	-				
		PERMANENT + TRANSITORY MAX.	2400	-	104				
		PERMANENT + TRANSITORY MIN.	1200	-	104				
	ULTIMATE	PERMANENT + EXCEPTIONAL MAX.	1920	-	552	±1.0	±1.0	--	--
		PERMANENT + EXCEPTIONAL MIN.	1280	-	552				

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	REV	DESCRIPTION

DESIGN JC	CHK AS	CODE CHBDC S6-14	LOAD CL-625 ONT	DATE NOV/19
DRAWN KM	CHK JC	SITE 03X-0532/80	STRUCT	SCHEME DWG R1-5