

CONTRACT DRAWINGS AND QUANTITY SHEETS
CONTRACT NO. 2007-5197
BOOK 1 OF 1

DAVID O'TOOLE

ASSISTANT DEPUTY MINISTER
POLICY, PLANNING AND STANDARDS

BRUCE McCUAIG

ASSISTANT DEPUTY MINISTER
PROVINCIAL HIGHWAYS MANAGEMENT

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CHIEF ENGINEER
ENGINEERING STANDARDS BRANCH

OSMO RAMAKKO, P.ENG.

REGIONAL DIRECTOR
NORTHEASTERN REGION



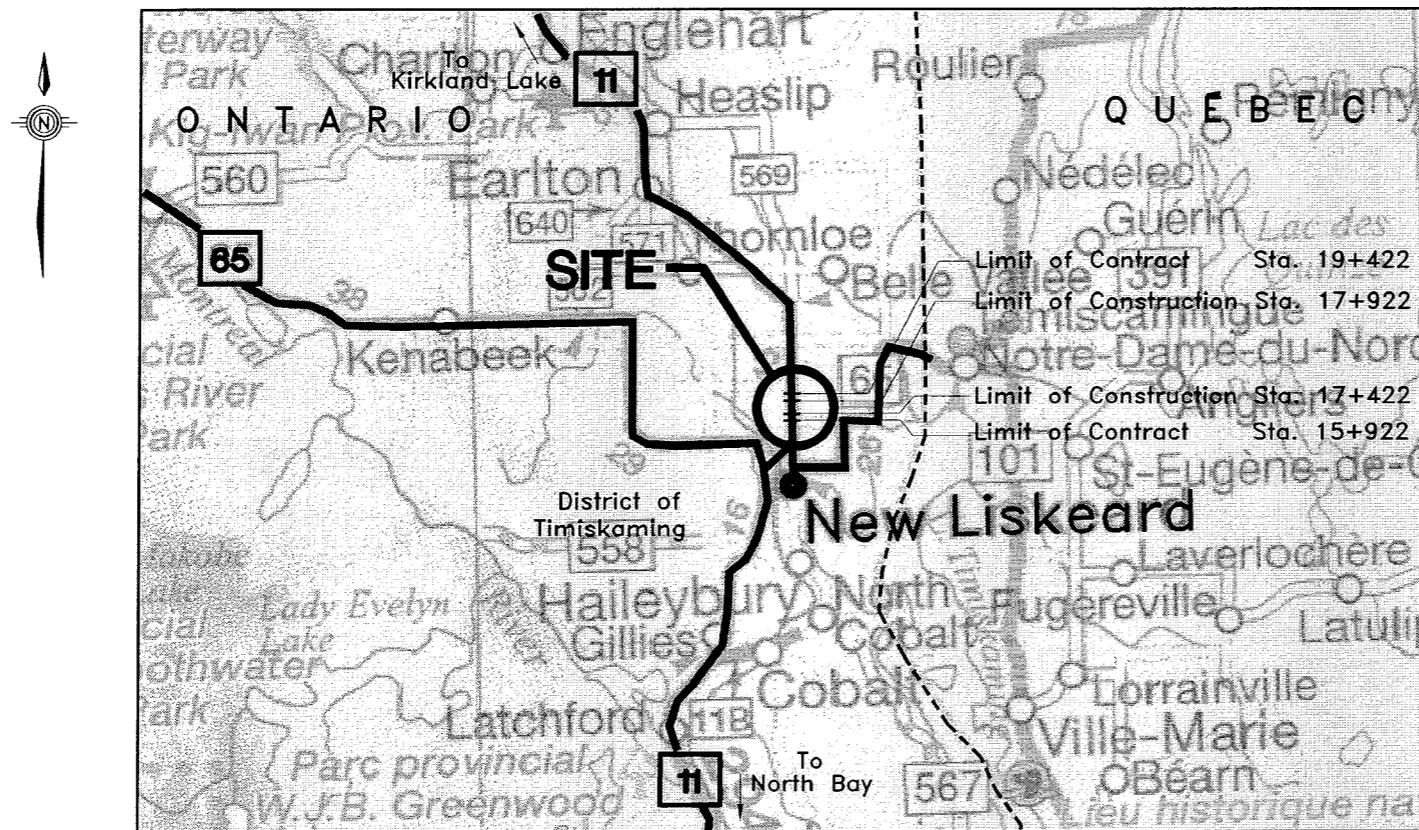
Ministry
of
Transportation

INDEX

W.P. No. 5134-05-00

Contract No. 2007-5197

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KEY PLAN

N.T.S.



Ontario

Ministry
of
Transportation

GWP No. 5134-05-00 Contract No. 2007-5197

Work of CULVERT REHABILITATION, SITE 47-273

Hwy No. 11 Area NEW LISKEARD

Location CALAMITY GULCH CULVERT

HIGHWAY 11, 2.85km NORTH OF HIGHWAY 65 N. JUNCTION

Length of contract 3.5 km.

Length of construction 0.5 km.

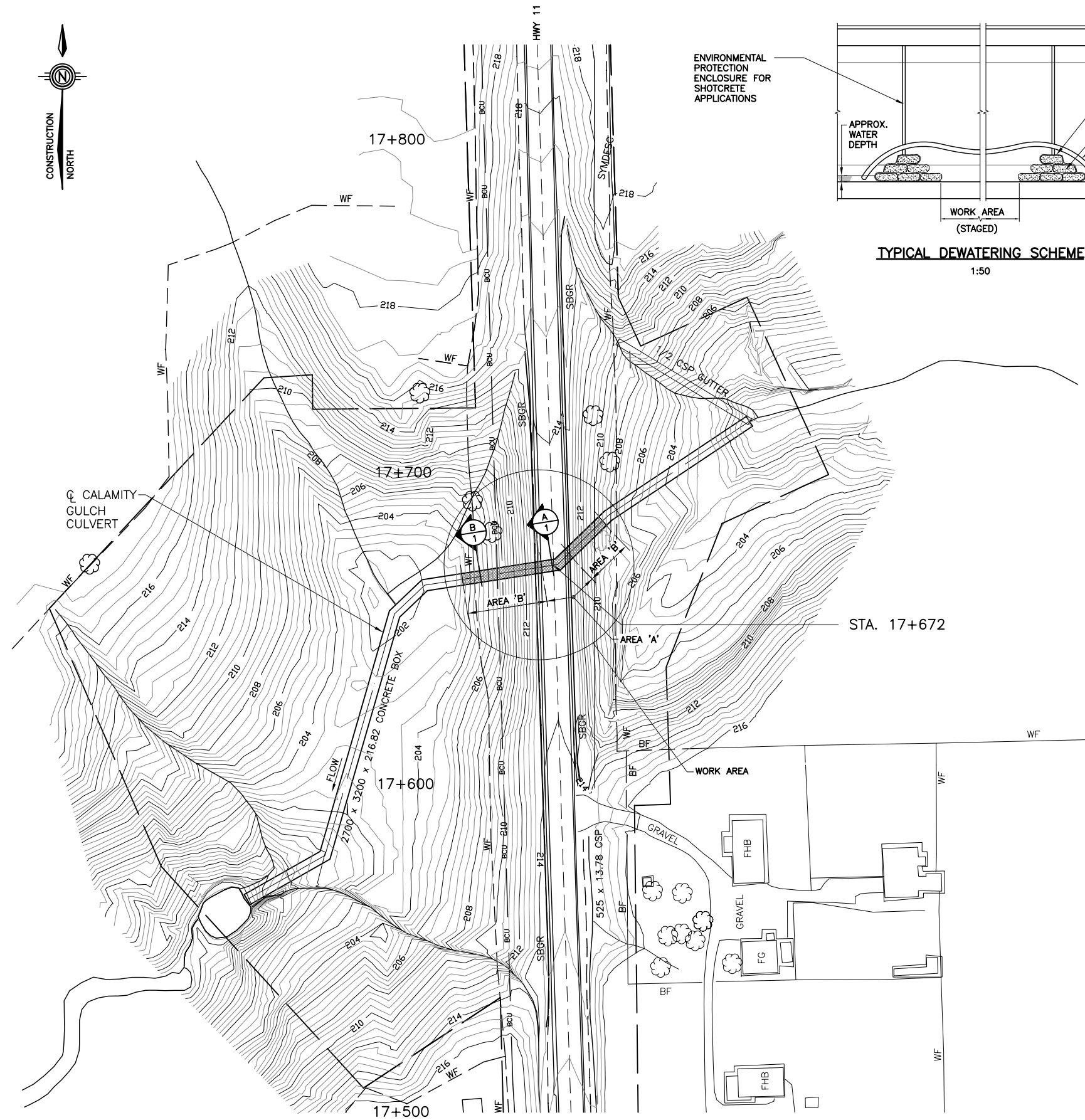
Reference Plans

30 Mar 07
Date

Manager, Engineering, P. Eng.

30-MAR-07
Date

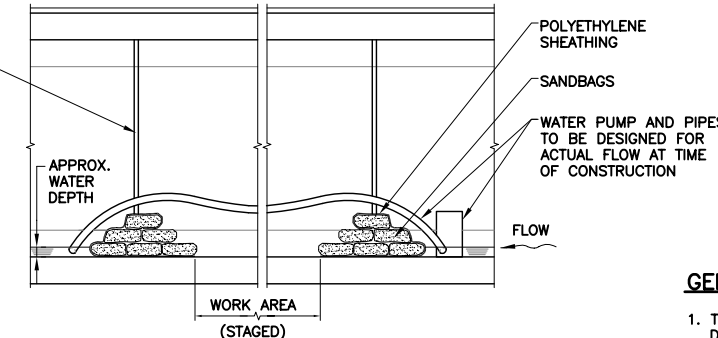
Regional Director



PLAN
1:750

CONSTRUCTION LIMITS STA. 17+422 TO STA. 17+922
CONTRACT LIMITS STA. 15+922 TO STA. 19+422

ENVIRONMENTAL
PROTECTION
ENCLOSURE FOR
SHOTCRETE
APPLICATIONS



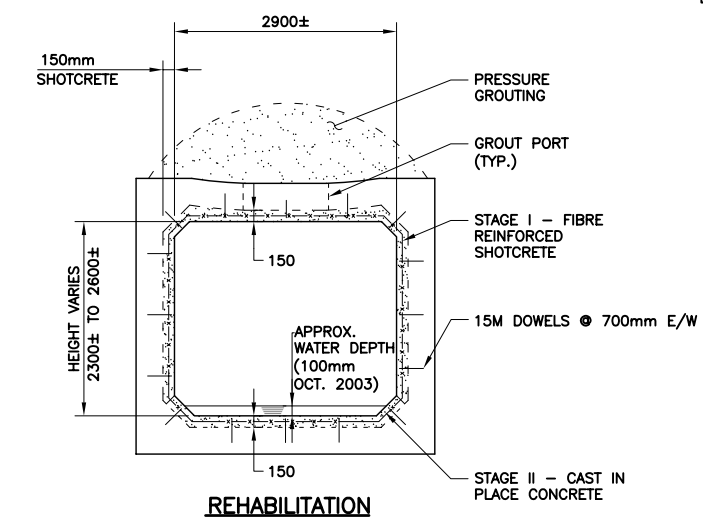
TYPICAL DEWATERING SCHEME
1:50

GENERAL NOTES:

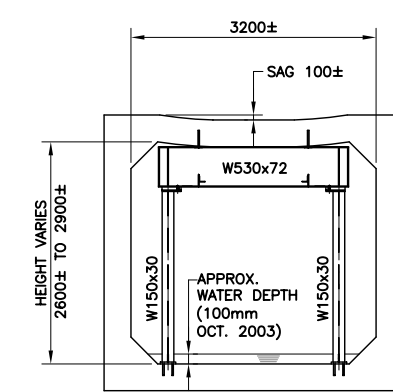
1. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ENVIRONMENTAL PROTECTION, DEWATERING AND STAGING.
2. WATER LEVEL INDICATED ON CONTRACT DRAWINGS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL MAKE HIS OWN ESTIMATE OF ANTICIPATED WATER LEVELS DURING CONSTRUCTION PERIOD.
3. CLASS OF CAST IN PLACE CONCRETE - 30 MPa
4. CLASS OF FIBRE REINFORCED SHOTCRETE - 40 MPa USING HIGH EARLY CEMENT.
5. GROUT USED FOR PRESSURE GROUTING SHALL BE MS WATER CUT-OFF GROUT BY KING OR APPROVED EQUAL.
6. REINFORCING STEEL TO BE GRADE 400.
7. CLEAR COVER TO REINFORCING STEEL TO BE 70±20mm.
8. UNLESS SHOWN OTHERWISE, LAP SPLICES TO BE CLASS B. BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS. ALL HOOKS SHALL BE IN ACCORDANCE WITH CHBDC 2000.
9. ALL STRUCTURAL STEEL SHALL BE GRADE 350W AS PER CSA G40.21-M92.
10. ALL CONCRETE TO BE PLACED IN THE DRY.

SCOPE OF WORK:

1. INSTALLATION OF ENVIRONMENTAL PROTECTION AND DEWATERING.
2. CLEANING OF EXISTING FAILURE ZONE
3. SURFACE PREPARATION AND PLACEMENT OF CONCRETE IN FAILURE ZONE
4. DRILLING GROUT PORTS
5. PRESSURE GROUTING
6. INSTALLATION OF NEW TEMPORARY INDIVIDUAL SHORES
7. REMOVAL OF PREVIOUSLY INSTALLED STEEL SUPPORTS
8. INSTALLATION OF DOWELS INTO EXISTING CONCRETE
9. ABRASIVE BLAST CLEANING OF EXISTING CONCRETE
10. PLACEMENT OF REINFORCEMENT
11. SHOTCRETING OF WALLS AND CEILING
12. REMOVAL OF CONCRETE AT UPSTREAM END
13. REMOVAL OF INDIVIDUAL SHORES AND LOCAL REPAIRS
14. PLACEMENT OF CONCRETE IN FLOOR SLAB.
15. REMOVAL OF ENVIRONMENTAL PROTECTION AND DEWATERING SCHEME.

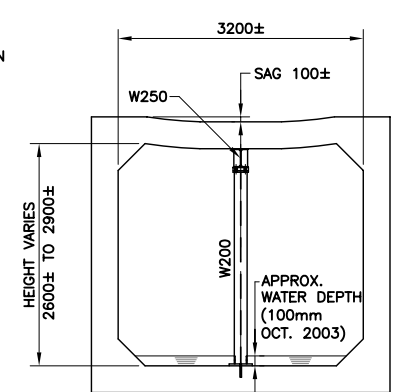


REHABILITATION



SECTION A
1:50

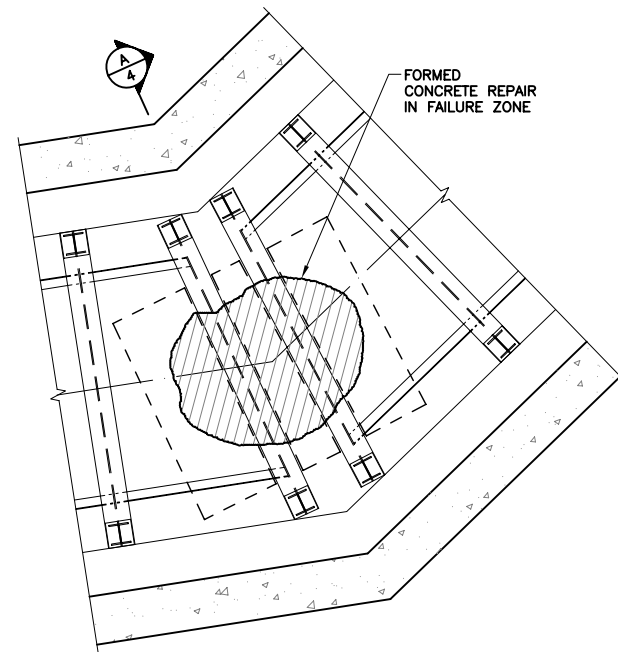
EXISTING STEEL SUPPORTS - AREA 'A'



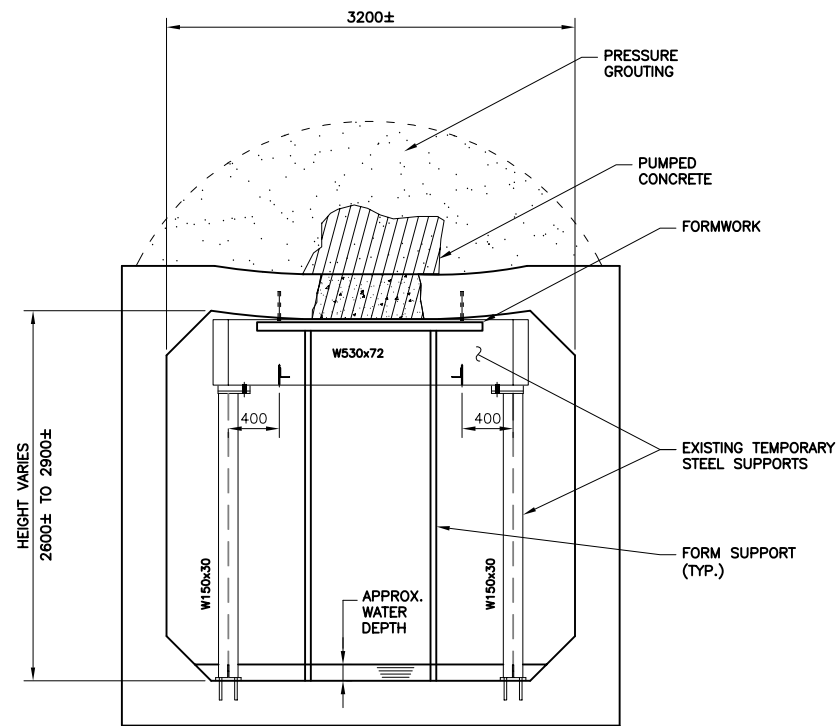
SECTION B
1:50

EXISTING STEEL SUPPORTS - AREA 'B'

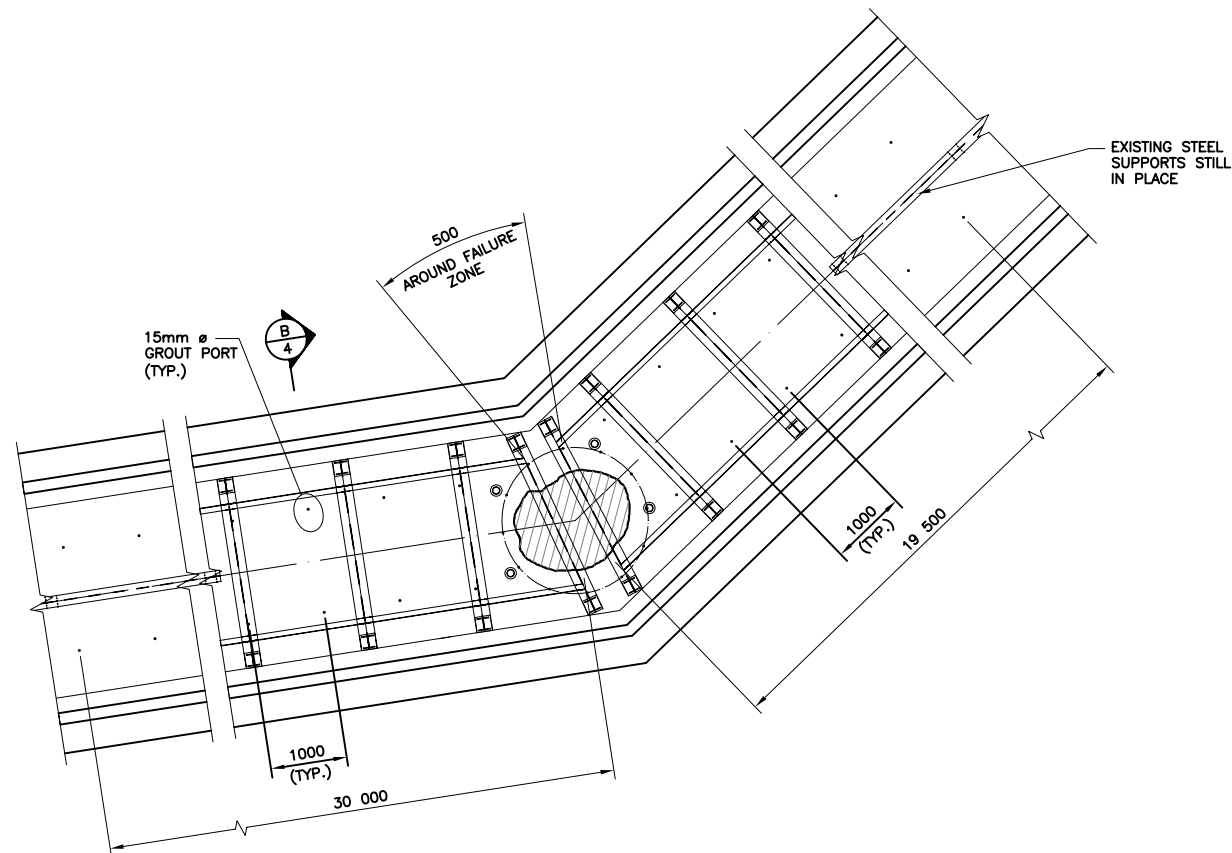
REVISIONS						
DATE	BY	DESCRIPTION				
DESIGN	J.P.	CHK	J.E.M.	CODE	CHBDC-2000/LOAD CLASS A	DATE MAR. 2007
DRAWN	M.P.	CHK	J.P.	SITE	47-273	STRUCT SCHEME DWG. 1



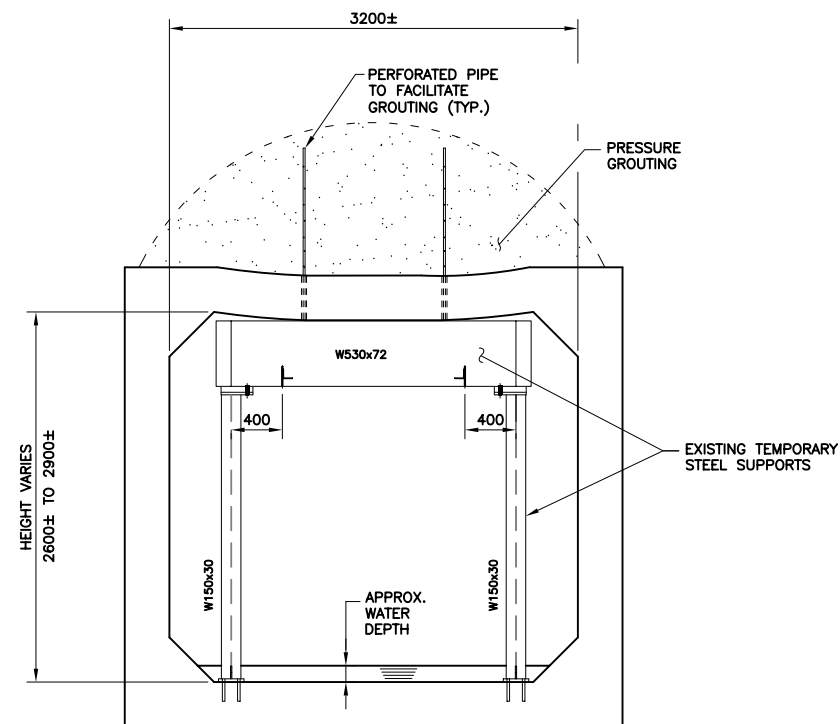
ROOF AREA REPAIRS
1:30



SECTION A-A (FORMWORK)
1:30

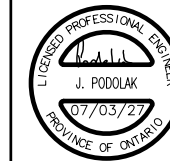


LAYOUT OF GROUT PORTS
1:50



SECTION B-B
1:30

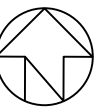
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN



CONT No 2007-5197
WP No 5134-05-00

CALAMITY GULCH CULVERT

PRESSURE GROUTING



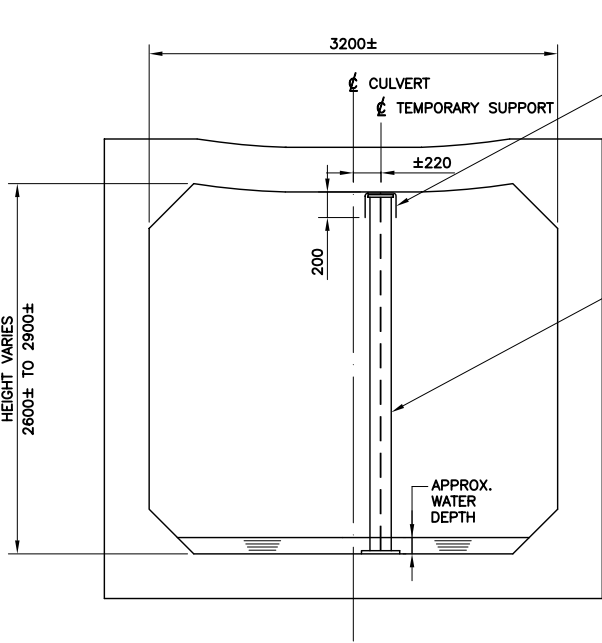
SHEET

4

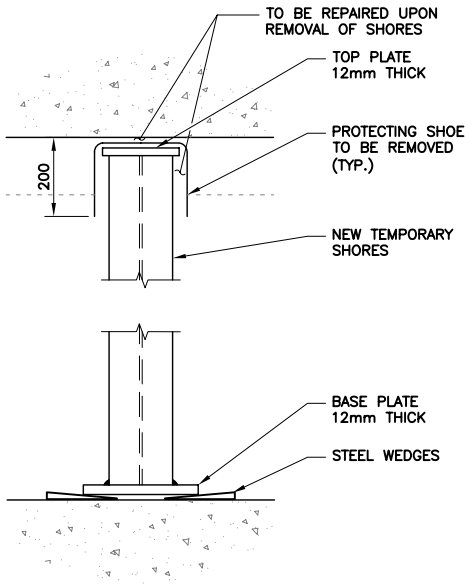
NOTES:

1. CONCRETE IN THE FAILURE ZONE SHALL BE PLACED BY PUMPING INTO FORMS DESIGNED BY THE CONTRACTOR.
2. CLASS OF PUMPED CONCRETE - 30 MPa
3. MATERIAL TO BE USED FOR PRESSURE GROUTING SHALL BE SUPERFINE PORTLAND CEMENT GROUT MS WATER CUT-OFF GROUT BY KING OR APPROVED EQUAL.
4. GROUTING SHALL BE PERFORMED FROM INSIDE THE CULVERT THROUGH 15mm DIA. PORTS SPACED AT 1m.
5. AT THE COMMENCEMENT OF THE GROUTING OPERATION, REFUSAL CRITERIA BASED ON MAXIMUM PRESSURE AND MINIMUM GROUT SHALL BE ESTABLISHED AS A PERFORMANCE SPECIFICATION FOR THE REMAINDER OF THE WORK.
6. THE GROUTING PROCEDURE SHALL ENSURE THAT ALL VOIDS ABOVE THE CULVERT CEILING ARE COMPLETELY FILLED.
7. ENVIRONMENTAL PROTECTION SCHEME TO BE IN PLACE PRIOR TO COMMENCEMENT OF CONCRETE PLACING OR PRESSURE GROUTING. NO DEBRIS OR EFFLUENT SHALL BE ALLOWED TO ENTER CREEK WATERWAY.

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	J.P.	CHK J.E.M.	CODE CHBDC-2000/LOAD CLASS A/DATE MAR. 2007
DRAWN	M.P.	CHK J.P.	SITE 47-273 STRUCT SCHEME DWG. 4



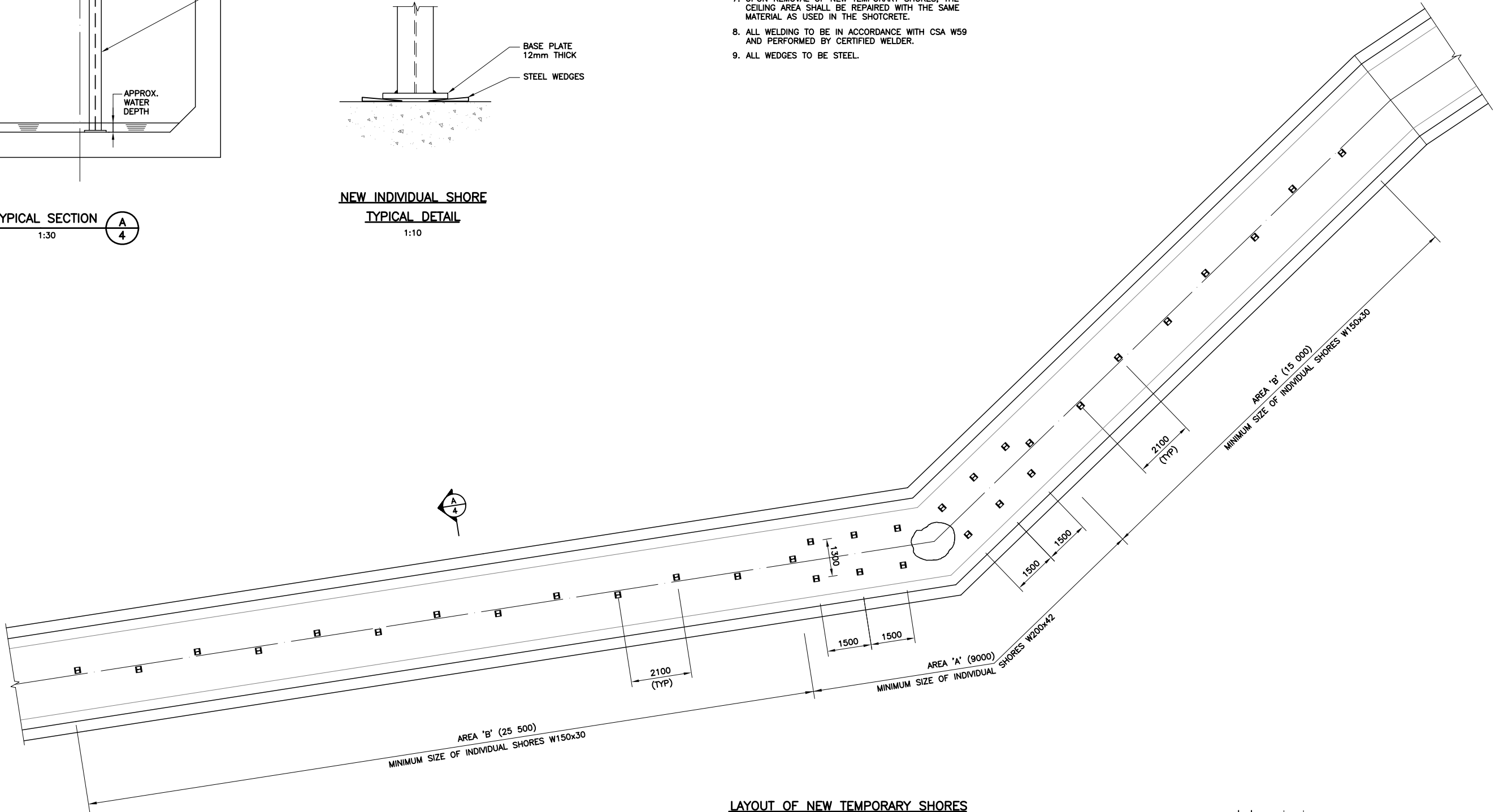
TYPICAL SECTION A-4
1:30



NEW INDIVIDUAL SHORE
TYPICAL DETAIL
1:10

- NOTES:**
1. PRESSURE GROUTING TO BE COMPLETED PRIOR TO INSTALLATION OF NEW TEMPORARY STEEL SHORES.
 2. NEW STEEL SHORES SHALL BE FABRICATED BASED ON FIELD MEASUREMENTS AT EACH LOCATION.
 3. NEW STEEL SHORES CAN BE FABRICATED FROM SECTIONS USED FOR EXISTING SUPPORTS.
 4. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF NEW STEEL SHORES AND SPACING SEQUENCE TO CONTRACT ADMINISTRATOR FOR REVIEW.
 5. NEW TEMPORARY SUPPORTS SHALL BE INSTALLED SO AS NOT TO INTERFERE WITH EXISTING STEEL SUPPORTS. EXISTING STEEL SUPPORTS SHALL NOT BE REMOVED UNTIL NEW STEEL SHORES ARE IN PLACE IN THE SAME AREA WITHIN A MINIMUM OF 2100mm.
 6. NEW TEMPORARY SHORES CAN BE REMOVED WHEN THE SHOTCRETE REACHES STRENGTH OF 35 MPa
 7. UPON REMOVAL OF NEW TEMPORARY SHORES, THE CEILING AREA SHALL BE REPAIRED WITH THE SAME MATERIAL AS USED IN THE SHOTCRETE.
 8. ALL WELDING TO BE IN ACCORDANCE WITH CSA W59 AND PERFORMED BY CERTIFIED WELDER.
 9. ALL WEDGES TO BE STEEL.

<p>METRIC</p> <p>DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN</p>		<p>CONT No 2007-5197</p> <p>WP No 5134-05-00</p>	
<p>CALAMITY GULCH CULVERT</p> <p>NEW TEMPORARY SHORING</p>		<p>SHEET 5</p>	
<p>PROVINCE OF ONTARIO</p> <p>J. PODOLAK</p> <p>07/03/27</p>		<p>PROVINCE OF ONTARIO</p> <p>J.E. MARSON</p> <p>07/03/27</p>	
<p>HP</p> <p>ENGINEERING CONSULTANTS INC.</p>			

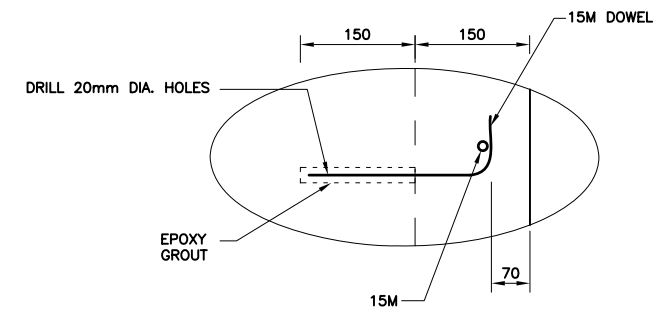


LAYOUT OF NEW TEMPORARY SHORES
1:75

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	J.P.	CHK J.E.M.	CODE CHBDC-2000/LOAD CLASS A/DATE MAR. 2007
DRAWN	M.P.	CHK J.P.	SITE 47-273 STRUCT SCHEME DWG. 5

DIMENSIONS ARE IN METRES
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UNLESS OTHERWISE SHOWN

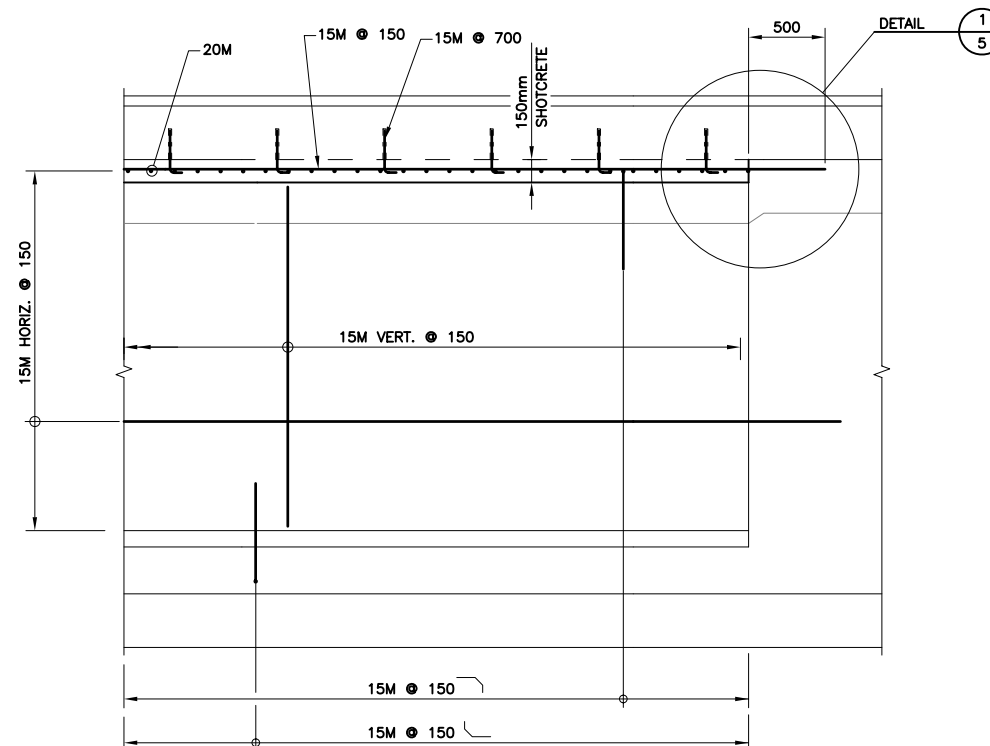
HEET



1:50

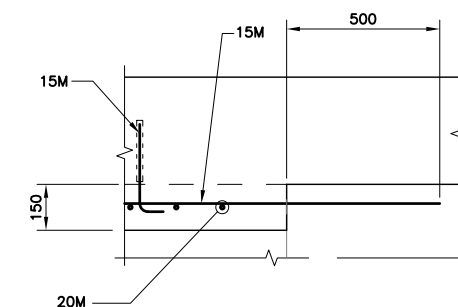
DETAIL 2
5

1. THE FIBER REINFORCED SHOTCRETE SHALL BE OF TYPE HIGH EARLY STRENGTH WITH STEEL FIBRES.
2. THE FIBER REINFORCED SHOTCRETE SHALL HAVE A NOMINAL MINIMUM 28 DAY STRENGTH OF 40 MPa.
3. THE SHOTCRETE MIX SHALL BE SUPPLIED PRE-BAGGED.
4. THE STEEL FIBRE SHALL HAVE MINIMUM LENGTH 25mm AND CONFIRM TO ASTM - A 820 GRADE 800 MPa.
5. ALL REINFORCEMENT SHALL BE DEFORMED BARS CONFORMING TO CSA-G30-18 GRADE 400
6. MINIMUM REINFORCEMENT COVER SHALL BE 70mm \pm 20.
7. CONTRACTOR TO INSTALL COMPLETE ENVIRONMENTAL PROTECTION ENCLOSURE PRIOR TO SHOTCRETE APPLICATION IN EACH STAGING AREA. SHOP DRAWINGS TO BE SUBMITTED TO CONTRACT ADMINISTRATOR PRIOR TO ANY SHOTCRETE WORK. SHOP DRAWING TO DETAIL DEWATERING ENVIRONMENTAL PROTECTION AND STAGING DETAILS.



SECTION 1:25 A
5

SECTION 1:25 **B**
5



DETAIL 1:10

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METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN

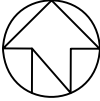
LICENSED PROFESSIONAL ENGINEER
J. PODOLAK
07/03/27
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
J.E. MARSON
07/03/27
PROVINCE OF ONTARIO

CONT No 2007-5197
WP No 5134-05-00

CALAMITY GULCH CULVERT
REPAIRS - STAGE II





SHEET
7

NOTES:
1. CAST IN PLACE CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 30MPa.

The drawing includes several views of the culvert structure:

- SECTION A-6** (1:25): A cross-section of the culvert showing the bottom slab, 15M dowels at 700 E/W, and the location of Stage I and Stage II repairs. Stage II is below the water level.
- SECTION B-6** (1:25): A longitudinal section showing the 15M horizontal reinforcement, 150mm cast in place concrete, and 15M dowels. It includes a detail of a 15M dowel.
- UPSTREAM END TREATMENT BOTTOM SLAB ONLY - REMOVALS** (1:20): A detail showing the removal of existing concrete from the bottom slab, with a minimum depth of 100mm and a width of ±667mm.
- UPSTREAM END TREATMENT BOTTOM SLAB ONLY - REPAIRS** (1:20): A detail showing the repair of the bottom slab using 150mm shotcrete and galvanized mesh (152x152 MW9.1x MW9.1), with a minimum depth of 100mm and a width of ±1000mm.
- PLAN (PROPOSED)** (1:75): A plan view of the culvert showing the concrete repair areas. Area 'A' is a concrete repair of ±9000, and Area 'B' is a concrete repair of 25 500. The plan also shows the 150mm cast in place concrete and the 15M dowels.
- TYPICAL CONSTRUCTION JOINT** (DETAIL 1-6, N.T.S.): A detail of a construction joint showing the 15M dowels and the 150mm cast in place concrete.

REVISIONS		DATE	BY	DESCRIPTION
DESIGN	J.P.	CHK J.E.M.	CODE CHBDC-2000	LOAD CLASS A
DRAWN	M.P.	CHK J.P.	SITE 47-273	STRUCT SCHEME
				DWG. 7

SHEET
8

Contract No. 2007-5197

[illegible]

Remarks:	CHKD. _____ APPR. _____ DATE _____
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Site No: 47-273
Drawing No:

W.P. No. 5134-05-00
Contract No. 2007-5197

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