

CONTRACT DRAWINGS

CONTRACT NO. 2006-6010

MIKE GOODALE
ASSISTANT DEPUTY MINISTER
OPERATIONS

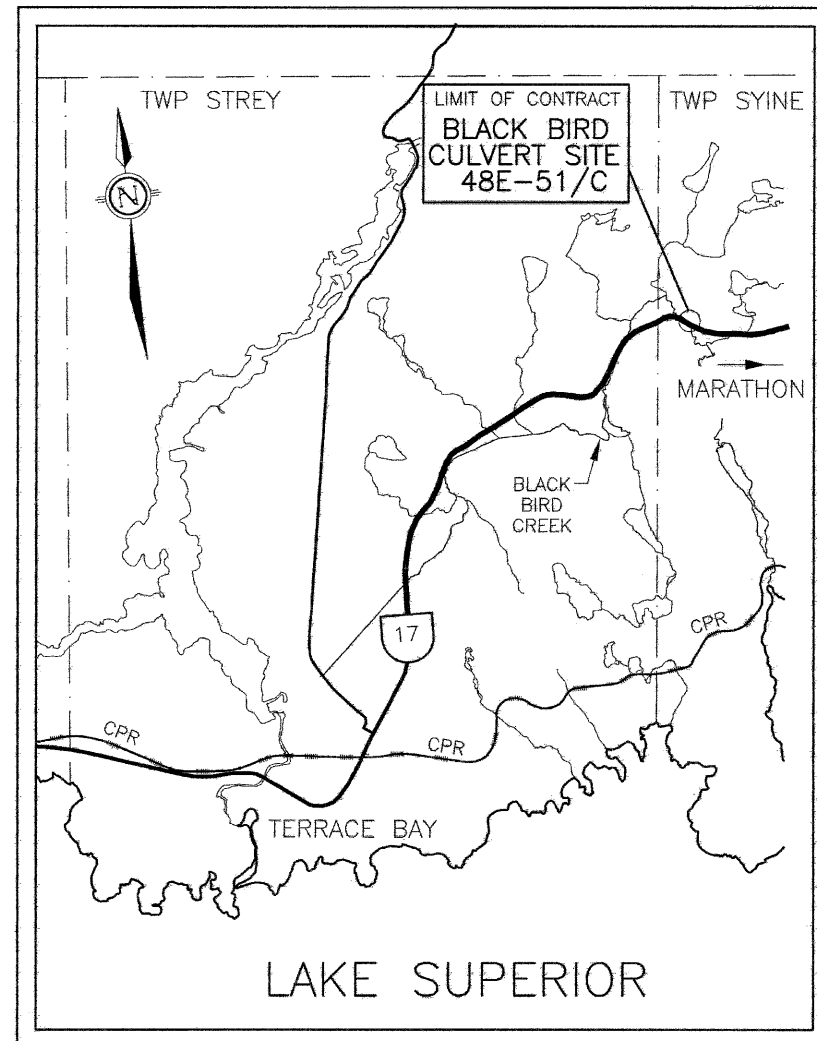
BRUCE McQUAIG
ASSISTANT DEPUTY MINISTER
POLICY, PLANNING AND STANDARDS

LARRY LAMBERT
REGIONAL DIRECTOR

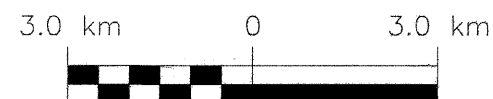
GERALD T.P. CHAPUT, P. ENG.
CHIEF ENGINEER
ENGINEERING STANDARDS BRANCH

Ministry of Transportation





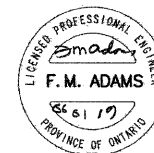
KEY PLAN

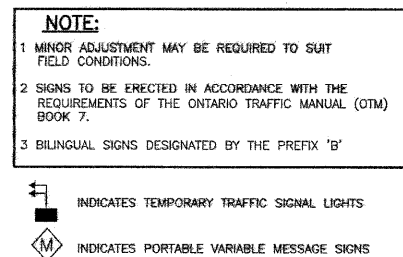


462-00-00
 GWP No 462-00-01 Contract No 2006-6010
 Work of Grading, Paving and Culvert Repair
 Hwy No 17 District No Thunder Bay
 Location 9.7 km East of Terrace Bay East Limits
 Length 1.0 km.
 Reference Plans

Jan 20, 2006 Date
 P. Eng.
 A/ Manager, Engineering
 Jan 20/06. Date
 Regional Director

Ministry of Transportation





SHEET
1

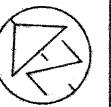


DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REV	REVISIONS			DESCRIPTION							
	DESIGN	FMA	CHK	CODE	CHBDC	00	LOAD	CL625	ONT	DATE	JAN/06
1	DRAWN	DCR	CHK	SITE	48F	-51	CI	STRUCT	SCHEME	JWG	

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

CONT No 2006-6010
WP No 462-00-00



BLACK BIRD CREEK
TEMPORARY ASPHALT, EROSION
CONTROL AND GRADING DETAILS

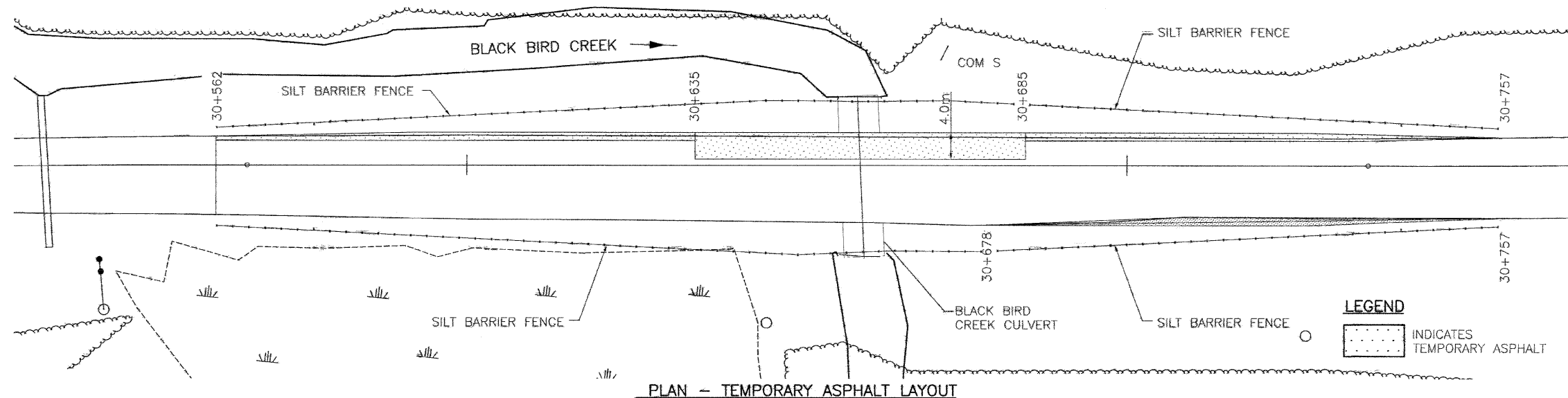
SHEET

2

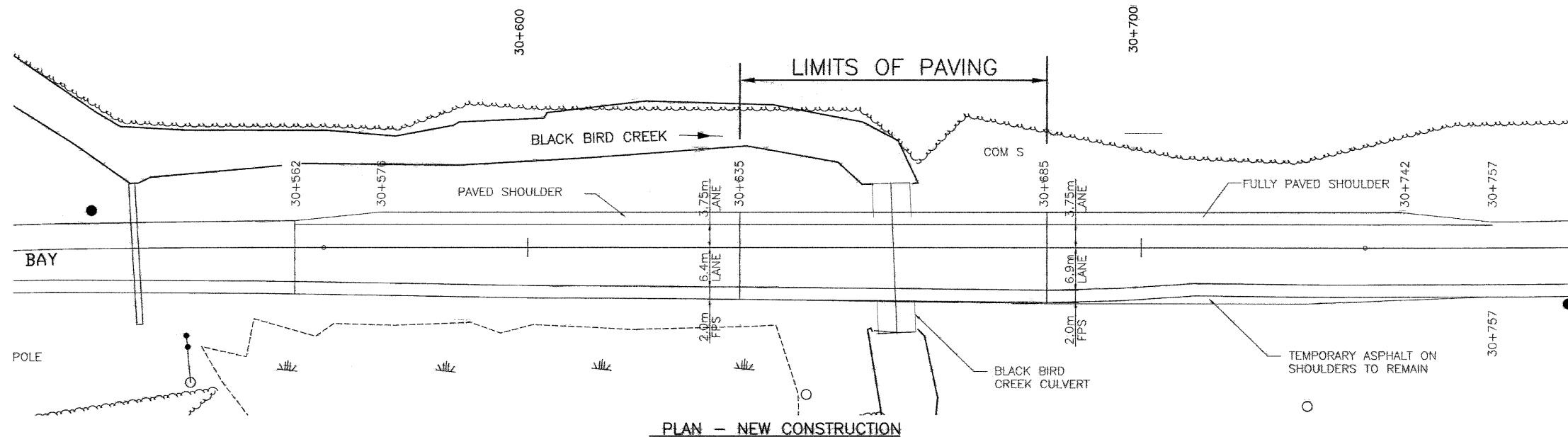
cookengineering
Thunder Bay, Ontario

NOTES:

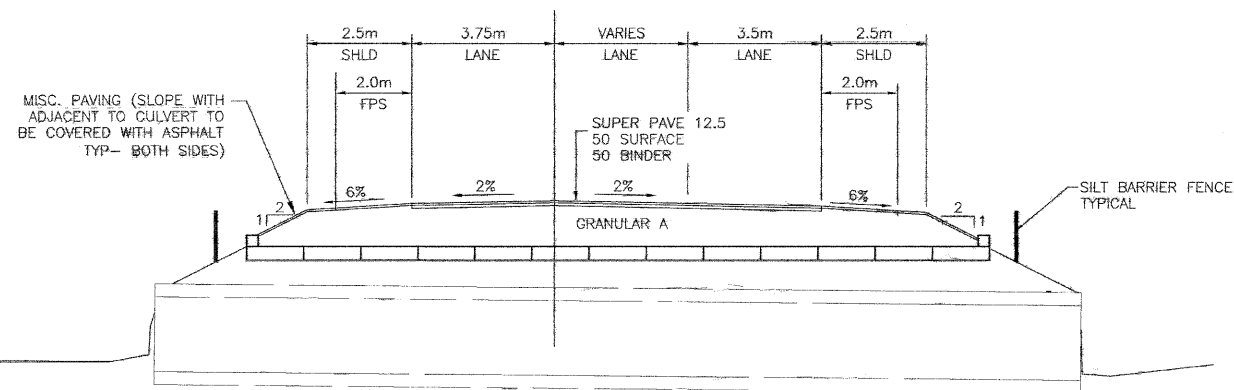
1. THE GRANULAR A GRADE SHALL BE 50mm BELOW TOP OF EXISTING ASPHALT PRIOR TO TEMPORARY PAVING. GRANULAR A SHOULDERS SHALL BE REINSTATED PRIOR TO TRAFFIC BEING SWITCHED TO STAGE 2 CONSTRUCTION. CROSSFALL ON THE TEMPORARY ASPHALT TO MATCH THE CROSSFALL OF THE EXISTING ASPHALT LANE. THE EXISTING GRANULAR A SHOULDER SHALL BE GRADED TO ALLOW FOR 50mm OF TEMPORARY ASPHALT.
2. THE GRANULAR A GRADE, PRIOR TO SUPERPAVE, SHALL BE PLACED TO 100mm BELOW EXISTING ASPHALT. THE CROSS FALL ON GRANULAR A SHALL BE ADJUSTED TO MATCH CROSS FALL ON THE EXISTING ASPHALT.
3. THE CONTRACTOR SHALL CHECK THE GRANULAR A GRADE AT STATION 30+600 PRIOR TO PAVING. THE GRADE SHALL BE SET AS TO ALLOW FOR NO SAG OR HUMP AT THE CULVERT LOCATION.



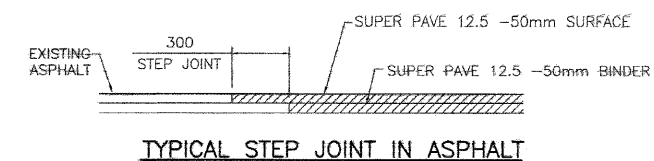
PLAN - TEMPORARY ASPHALT LAYOUT



PLAN - NEW CONSTRUCTION



TYPICAL SECTION AT CULVERT



TYPICAL STEP JOINT IN ASPHALT

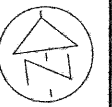


DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS		DESCRIPTION			
DESIGN	FMA	CHK	CODE CHBDC-00	LOAD	DATE OCT 05
DRAWN	DCR	CHK	SITE 48E-51C	STRUCT	SCHEME DWG 1

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

DIST 61 HWY 17
CONT No 2006-6010
WP No 462-00-00



BLACK BIRD CREEK
CULVERT REPAIR
GENERAL ARRANGEMENT

SHEET
3



CLASS OF CONCRETE

ALL PRECAST CONCRETE..... 40 MPa

CLEAR COVER TO REINFORCEMENT

PRECAST CONCRETE..... 50±10 U.N.O.

REINFORCING STEEL

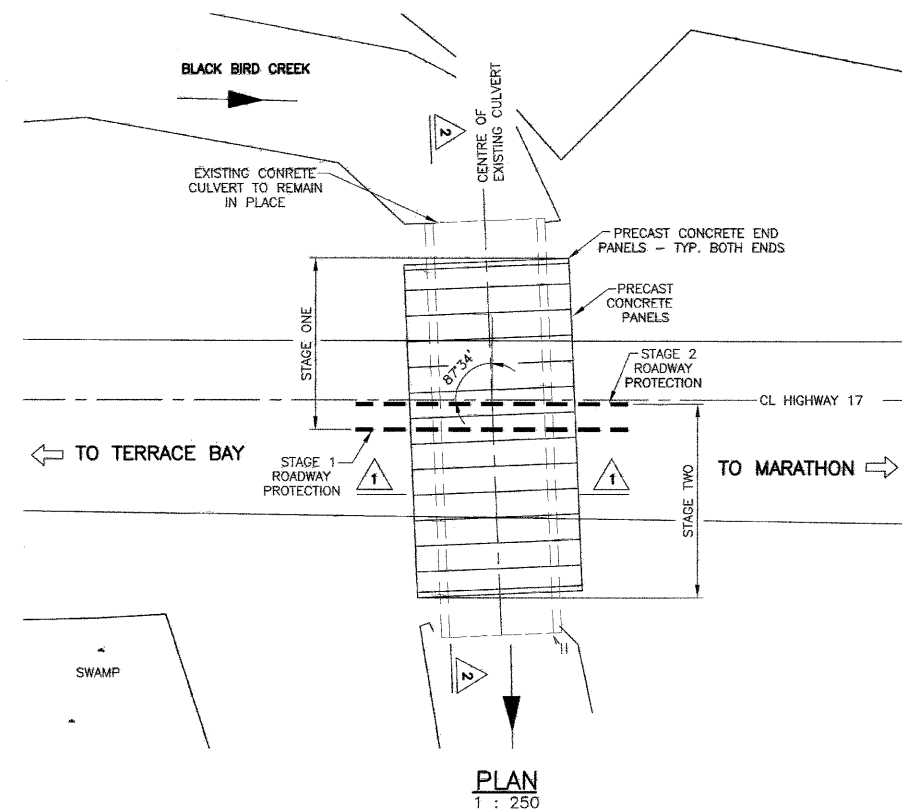
1. REINFORCING STEEL SHALL BE GRADE 400
2. UNLESS SHOWN OTHERWISE, LAP LENGTHS NOT INDICATED ON THE CONTRACT DRAWINGS SHALL BE CLASS 'B'.

CONSTRUCTION NOTES

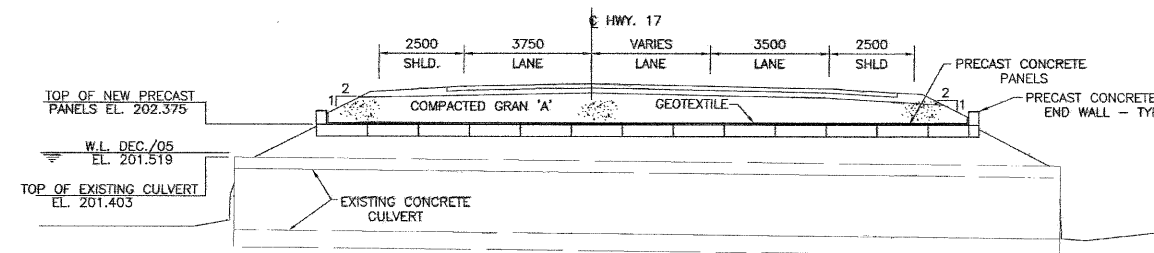
1. THE CONSTRUCTION SHALL BE COMPLETED IN STAGES.
2. THE PRECAST CONCRETE PANELS SHALL BE PRESTRESSED MEMBERS.
3. CONCRETE END WALLS SHALL BE PRECAST.
4. ROADWAY PROTECTION SHALL BE PERFORMANCE LEVEL 2.
5. ACCESS TO THE WORK AREA IS LIMITED TO THE EXISTING ROADBED AREA BEHIND THE TEMPORARY CONCRETE BARRIERS. THE CONTRACTOR IS NOT PERMITTED TO WIDEN ROADWAY FOR CONSTRUCTION EQUIPMENT.

LIST OF DRAWINGS

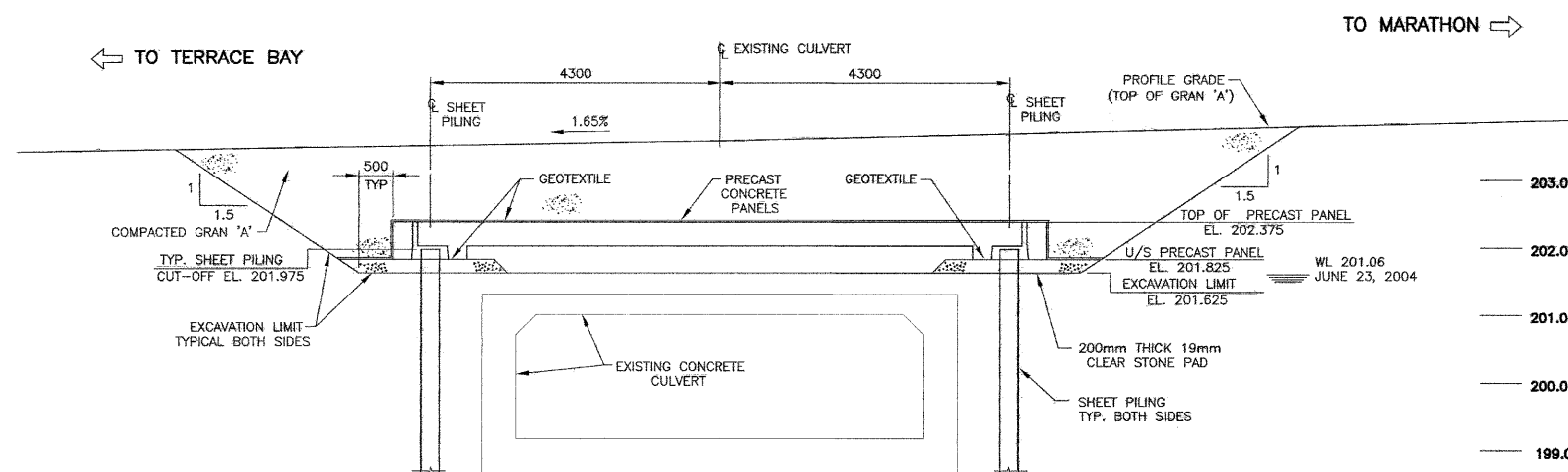
1. GENERAL ARRANGEMENT
2. BOREHOLE LOCATIONS & SOIL STRATA
3. CONSTRUCTION STAGING
4. SHEET PILING LAYOUT
5. PRESTRESSED CONC. MEMBERS
6. PRECAST CONCRETE END WALLS



PLAN
1 : 250



2-2 LONGITUDINAL CROSS-SECTION
1 : 100



1-1 TYPICAL CROSS-SECTION
1 : 50



DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS		DESCRIPTION
DESIGN BWR	CHK KWS	CODE CHBDC-00 LOAD CL625-001 DATE JAN/06
DRAWN BWR	CHK DCR	SITE 48E-51/CSTRUCT SCHEME DWG 1


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

CONT No 2006-6010
WP No 462-00-00

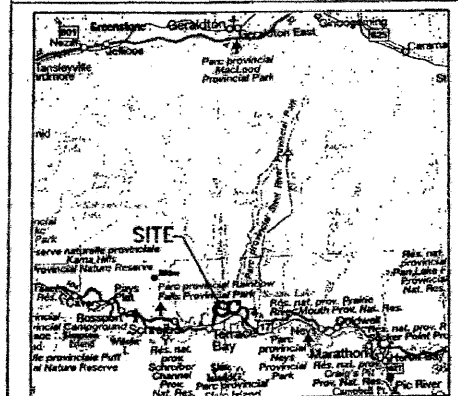
BLACK BIRD CREEK CULVERT REPAIR	SHEET 4
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Thunder Bay, Ontario









THURBER ENGINEERING LTD.



KEYPLAN


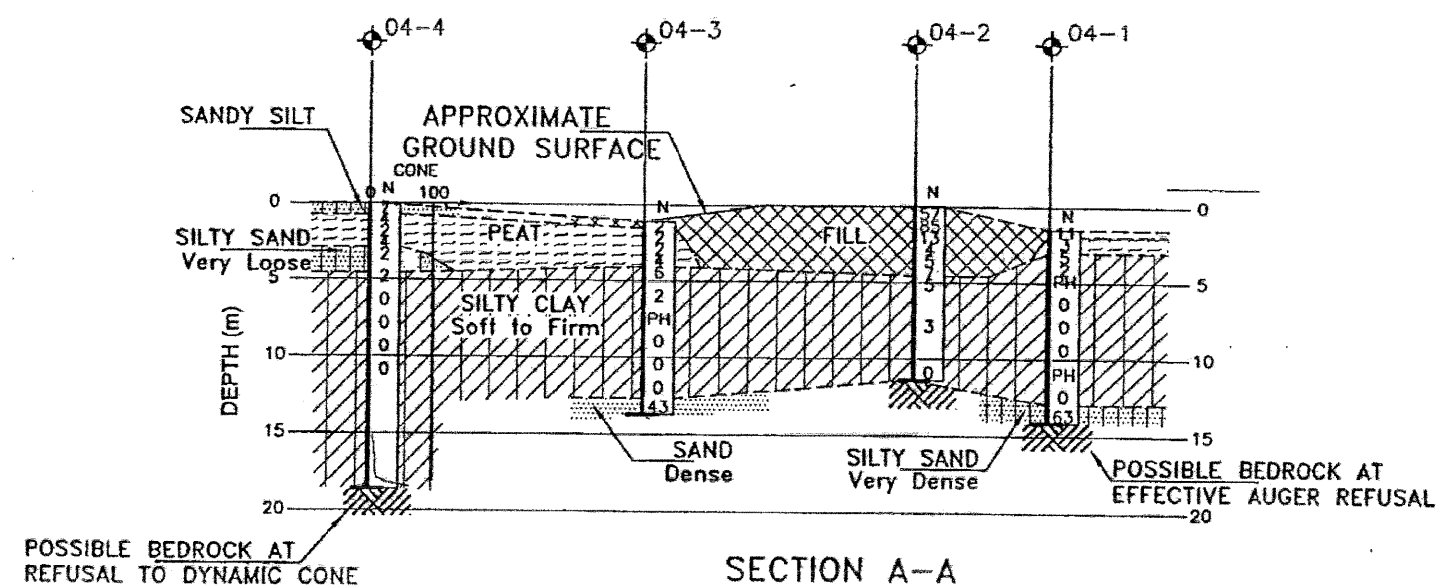
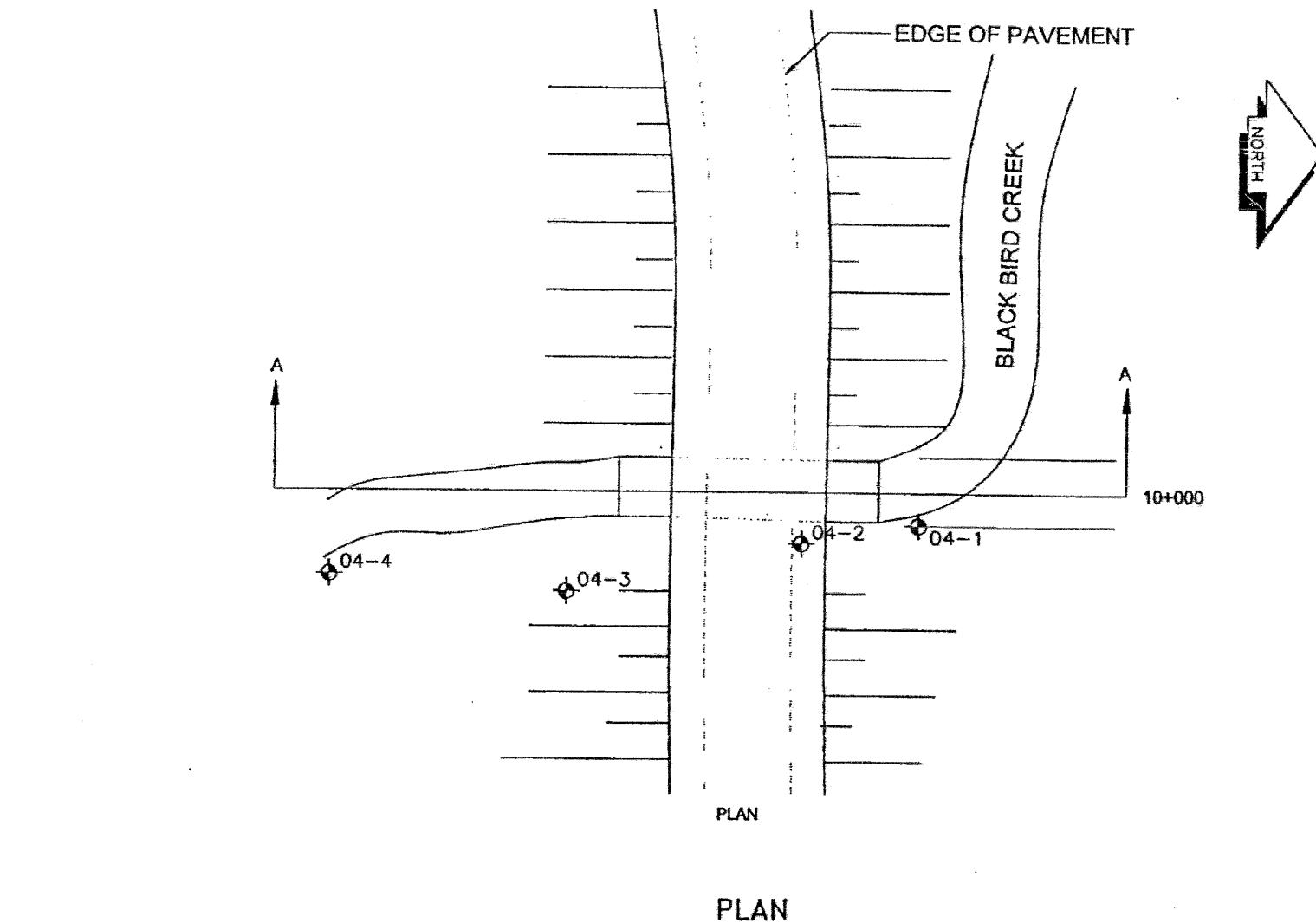
LEGEND

- | | |
|---|---------------------------------------|
|  | BoreHole & Cone |
|  | Dynamic Cone Penetration Test (cone) |
|  | BoreHole |
| N | Blows /0.3m (Std Pen Test, 475J/blow) |
| CONE | Blows /0.3m (60° Cone, 475J/blow) |
| PH | Pushed Hydraulically |
|  | WL |
|  | Head Artesian Water |
|  | Piezometer |
| 90% | Rock Quality Designation (ROD) |

[illegible]

NOTE

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are interpreted.



HOR: NTS
VRT: 1:250

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS									
	FEB 05	AEG	ISSUED AS DRAFT FOR REVIEW						
			DESCRIPTION						
	DESIGN AEG	CHK	PKC	CODE	CHBDC-00	LOAD	CLB25-00T	DATE	FEB. 2005
	DRAWN HS	CHK	AFG	SITE	485-51/C	STRUCT.	SCHEMF	HWG	

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

CONT No 2006-6010
WP No 462-00-00

BLACK BIRD CREEK
CULVERT REPAIR
CONSTRUCTION STAGING



SHEET

5



CONSTRUCTION SEQUENCE

STAGE 1 CONSTRUCTION

1. ERECT TEMPORARY CONCRETE BARRIER, PORTABLE SIGNALS AND TRAFFIC SIGNS AND DIRECT TRAFFIC TO THE SOUTH SIDE OF ROADWAY.
2. INSTALL ROADWAY PROTECTION FOR STAGE 1 CONSTRUCTION.
3. EXCAVATE TO THE CONSTRUCTION LIMITS.
4. INSTALL THE SHEET PILING AND PLACE CRUSHED STONE WITH GEOTEXTILE.
5. INSTALL PRECAST CONCRETE PANELS AND END CURB.
6. FILL THE SHEET PILING INSTALLATION KEYS AND ACCESS GROUT HOLES IN THE PANELS WITH GROUT.
7. INSTALL ROADWAY PROTECTION FOR STAGE 2 PRIOR TO BACKFILLING STAGE 1.
8. GROUT SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 30 MPa. PRIOR TO BACKFILLING.
9. PLACE GEOTEXTILE AND BACKFILL EXCAVATION WITH GRAN 'A'.
10. PLACE TEMPORARY ASPHALT AND TEMPORARY ASPHALT MARKINGS.

STAGE 2 CONSTRUCTION

1. RE-LOCATE THE TEMPORARY CONCRETE BARRIERS, CONSTRUCTION SIGNS AND DIVERT TRAFFIC TO THE NORTH LANE.
2. EXCAVATE TO THE CONSTRUCTION LIMITS.
3. INSTALL OF THE SHEET PILING AND PLACE CRUSHED STONE WITH GEOTEXTILE.
4. INSTALL PRECAST CONCRETE PANELS AND END CURB.
5. FILL THE SHEET PILING INSTALLATION KEYS AND ACCESS GROUT HOLES IN THE PANELS.
6. GROUT SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 30 MPa. PRIOR TO BACKFILLING.
7. PLACE GEOTEXTILE AND BACKFILL WITH GRAN 'A'.
8. REMOVE ROADWAY PROTECTION.

STAGE 3 CONSTRUCTION

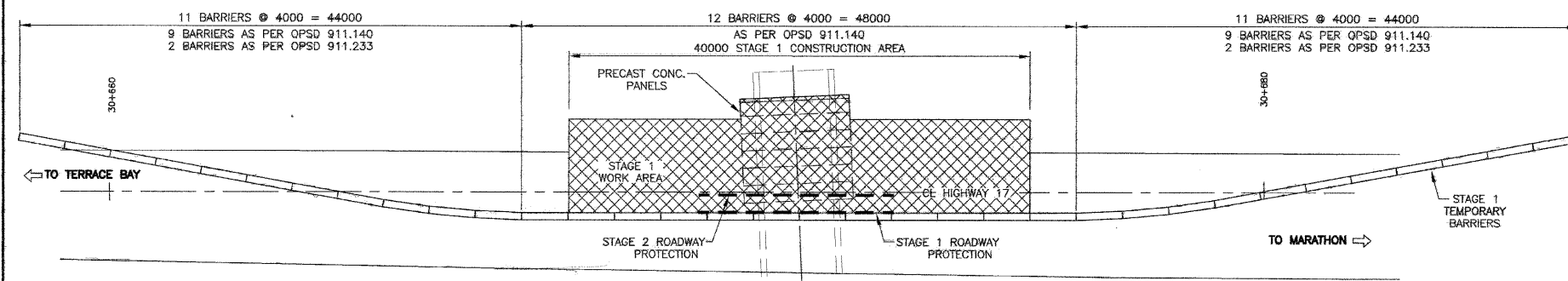
1. REMOVE THE TEMPORARY CONCRETE BARRIERS, TEMPORARY ASPHALT, TEMPORARY ASPHALT MARKINGS, ASPHALT TO THE PAVING LIMITS, REINSTALL PERMANENT PAVEMENT MARKINGS, COMPLETE GRADING AND PAVE BINDER AND SURFACE COURSES OF ASPHALT.

APPLICABLE STANDARD DRAWINGS

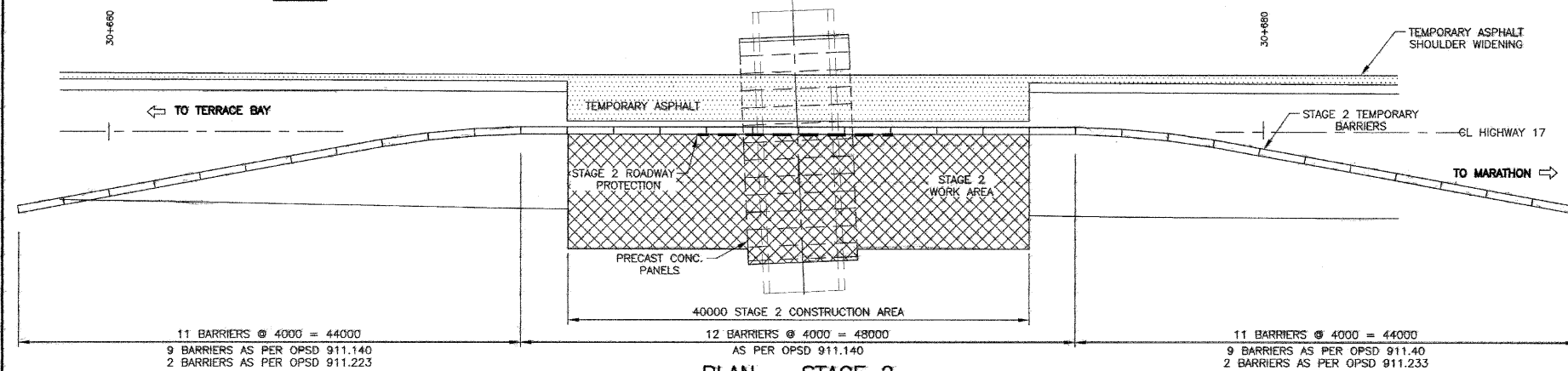
OPSD 911.140 - GUIDE RAIL SYSTEM, CONCRETE BARRIER PRECAST I-LOCK CONNECTION INSTALLATION TEMPORARY AND PERMANENT

OPSD - 911.232 - GUIDE RAIL SYSTEM, CONCRETE BARRIER PRECAST TEMPORARY END TREATMENT INSTALLATION TEMPORARY AND PERMANENT

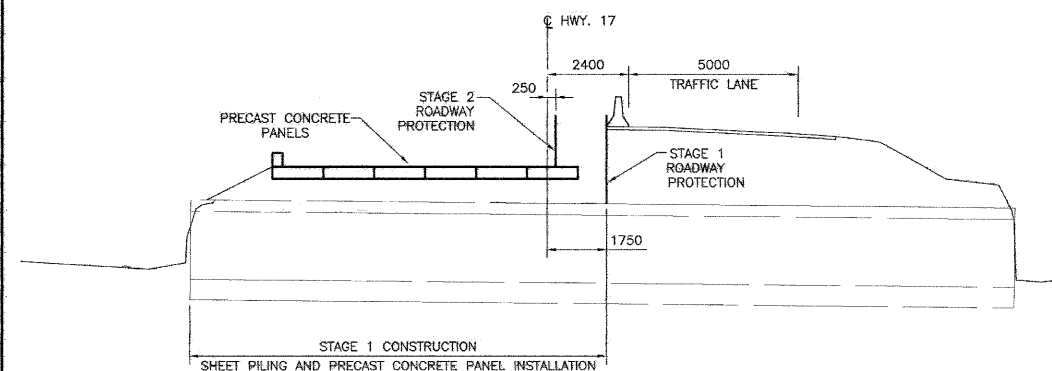
OPSD - 911.233 - GUIDE RAIL SYSTEM, CONCRETE BARRIER PRECAST TEMPORARY END SECTION INSTALLATION



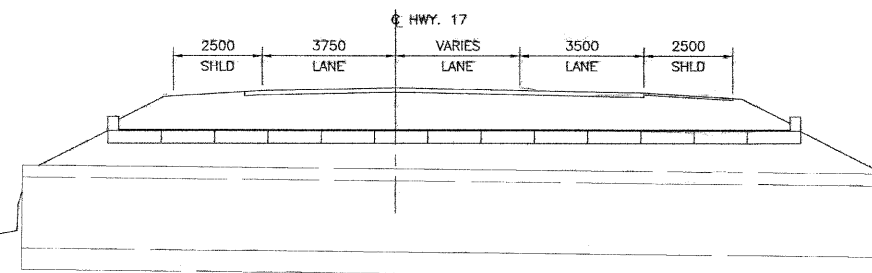
PLAN - STAGE 1



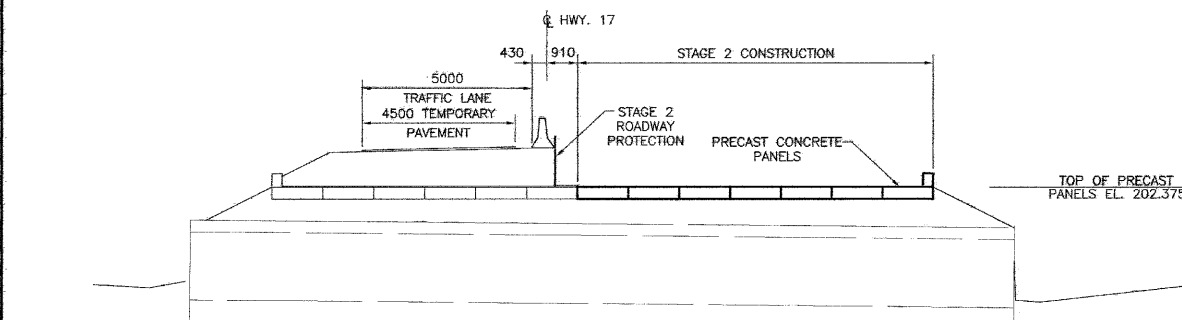
PLAN - STAGE 2



STAGE 1



STAGE 3



STAGE 2



DRAWING NOT TO BE SCALED
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REVISIONS		DESCRIPTION	
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DRAWN BWR	CHK DCR	SITE 48E-51/CSTRUCT	SCHEME DWG 3

METRIC
DIMENSIONS ARE IN METRES
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CONT No 2006-6010
WP No 462-00-00

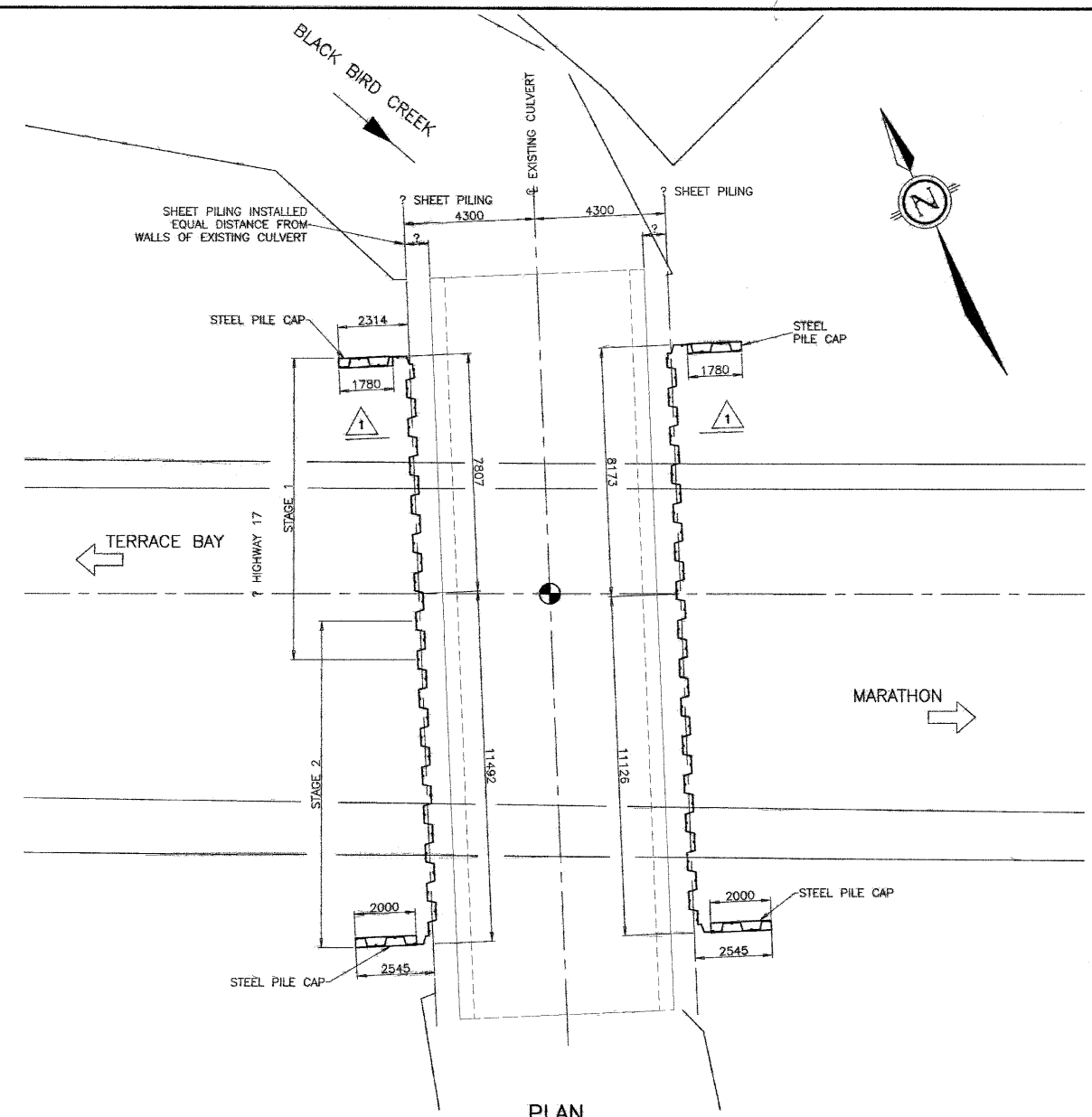
BLACK BIRD CREEK CULVERT
CULVERT REPAIR
SHEET PILING LAYOUT
AND DETAILS

SHEET
6

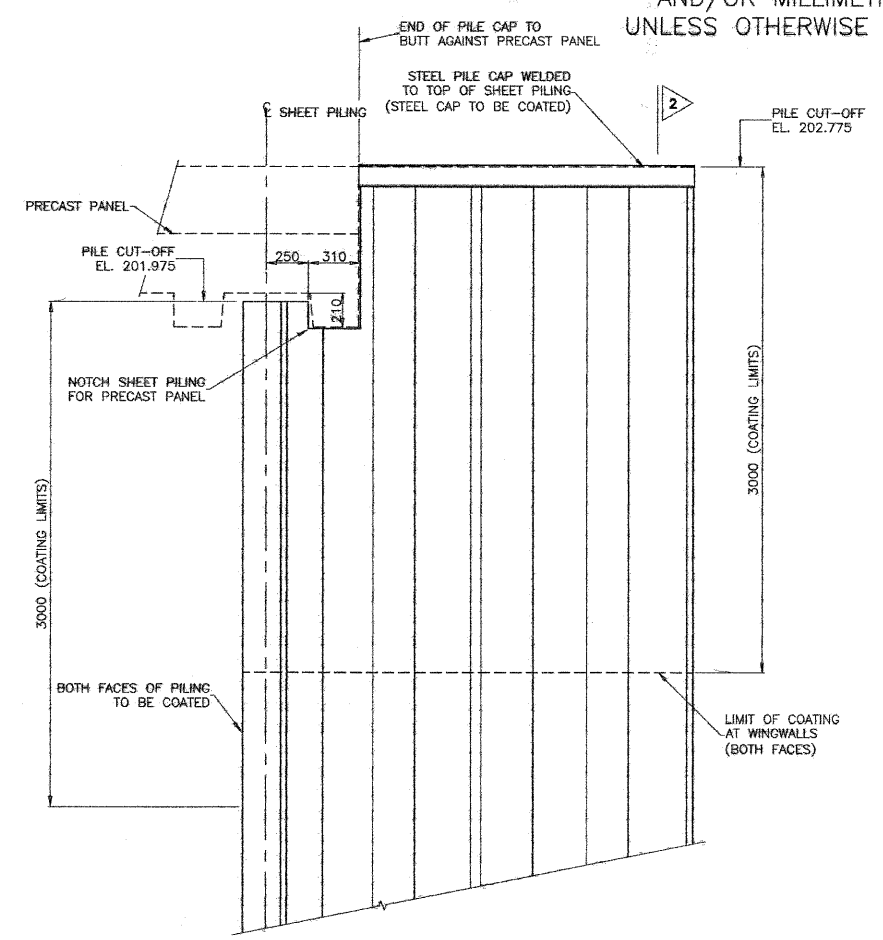


PILING NOTES

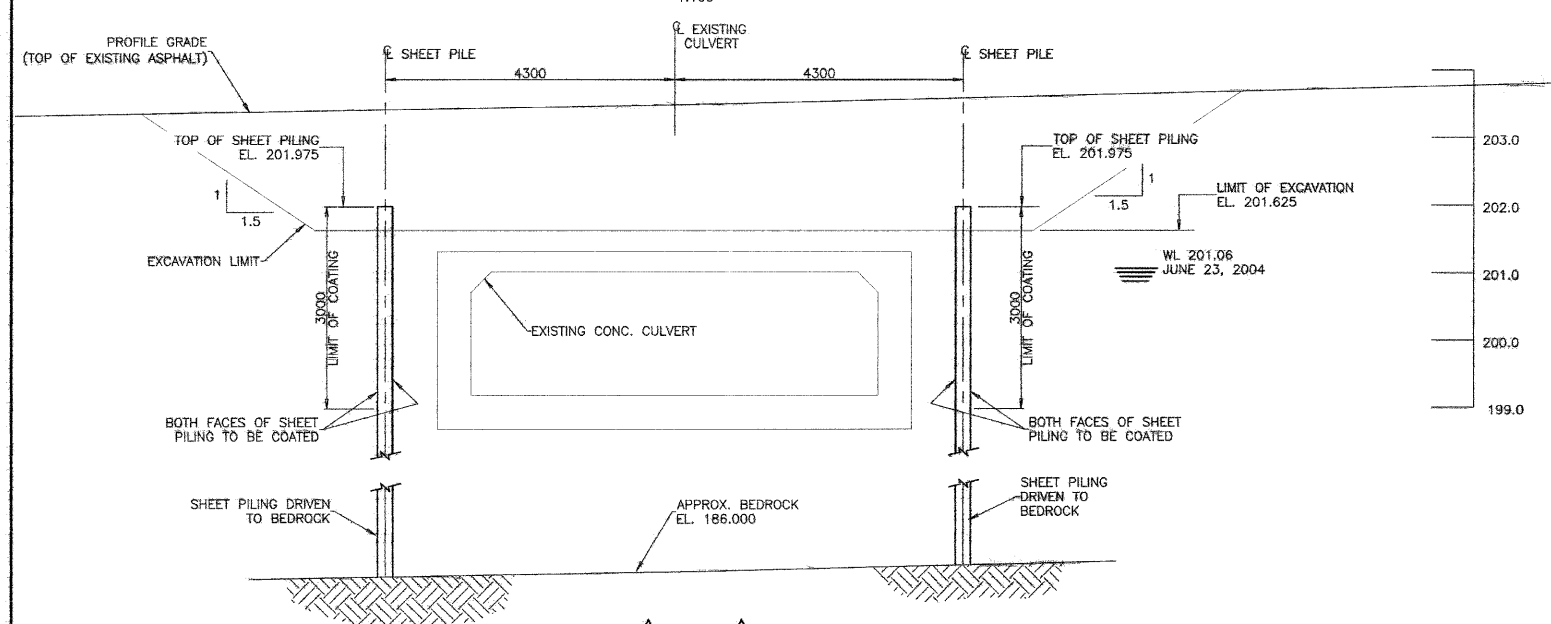
- 1 STEEL SHEET PILING AND PILE CAP SHALL BE CANADIAN METAL ROLLING MILLS 'EZ' SERIES SECTION EZ95 OR APPROVED ALTERNATE
- 2 SHEET PILING SECTION MODULUS = 1310 cm³/m (MIN)
- 3 STEEL TO BE IN ACCORDANCE WITH CSA G40.21 GRADE 300W
- 4 SHEET PILING TO BE IN ACCORDANCE WITH ASTM A328
- 5 WELDING SHALL CONFORM TO CSA STANDARD W59 AND SHALL BE CARRIED OUT BY A WELDER QUALIFIED UNDER CSA STANDARD W47
- 6 THE SHEET PILING LAYOUT SHALL BE PARALLEL TO THE EXISTING CONCRETE CULVERT WALLS
- 7 COATING FOR SHEET PILING SHALL BE AS PER DSM 9.20.30



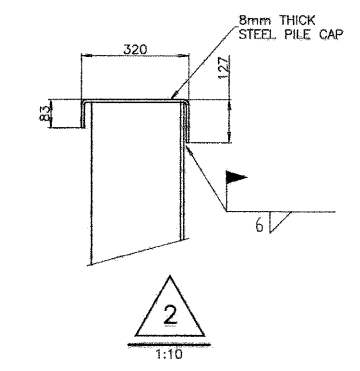
PLAN
1:100



TYPICAL WINGWALL ELEVATION
1:20



1-1
1:50



DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS					DESCRIPTION	
DESIGN	PAS	CHK	KWS	CODE	CHBDC-00	LOAD CL-625-ONT
DRAWN	LNP	CHK	PAS	SITE	48E-51/C	STRUCT
					SCHEME	DWG 4

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

CONT No 2006-6010
WP No 462-00-00

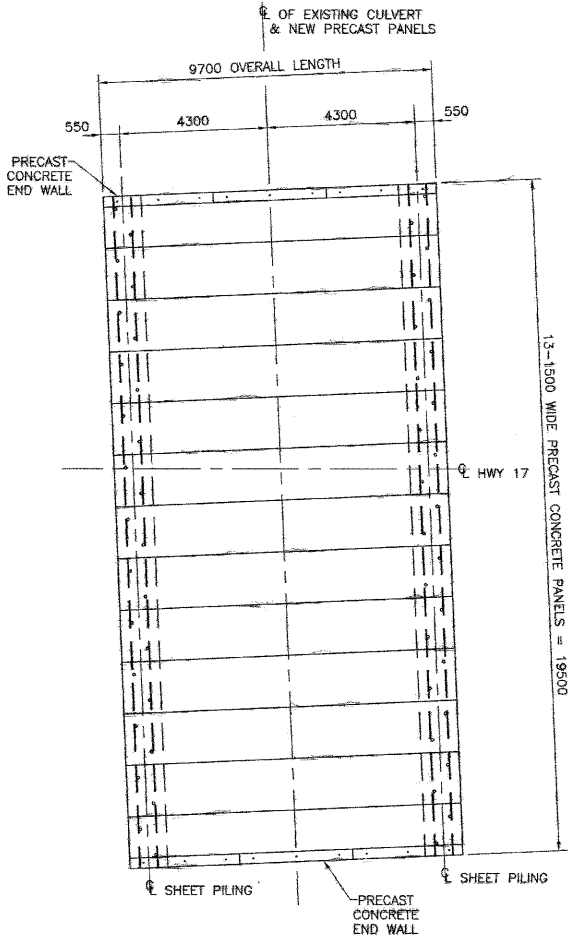
BLACK BIRD CREEK
CULVERT REPAIR
PRESTRESSED CONC. MEMBERS

SHEET
7

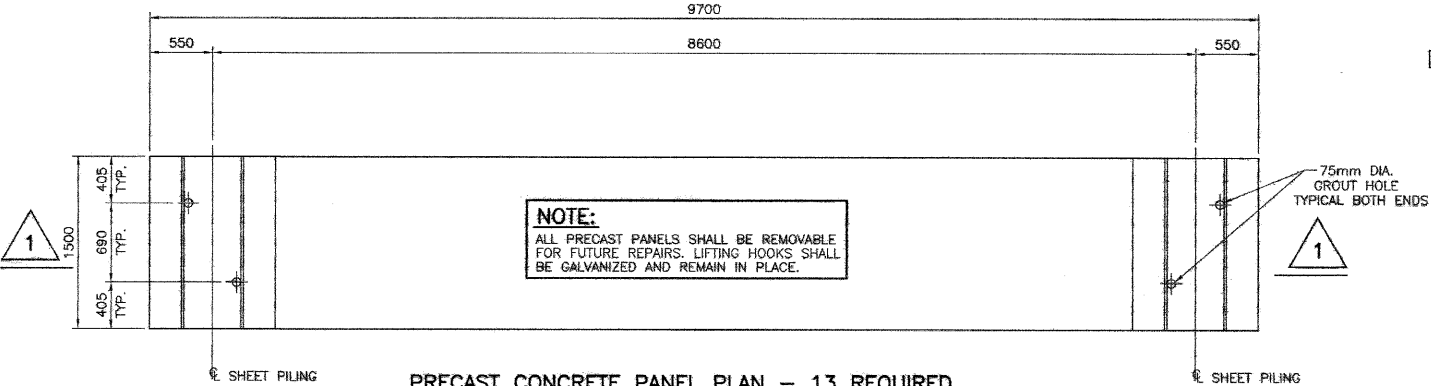
cookengineering
Thunder Bay, Ontario

NOTES

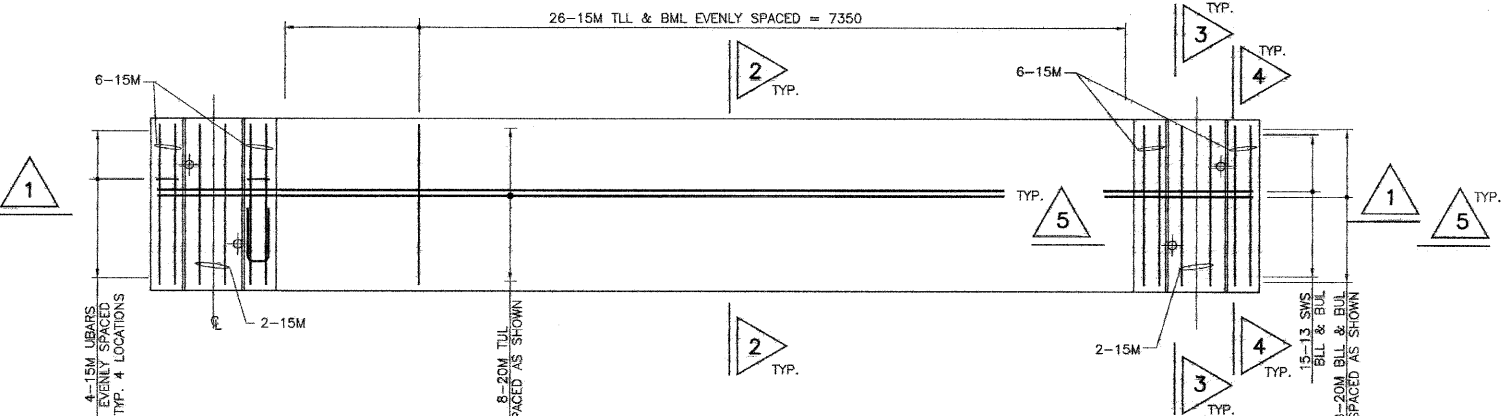
1. PRESTRESSING STEEL SHALL BE LOW-RELAXATION SEVEN WIRE STRANDS (SWS), SIZE DESIGNATION 13, GRADE 1860.
2. MINIMUM BREAKING STRENGTH OF STRAND 184 kN.
3. JACKING FORCE PER STRAND 132 kN.
4. FORCE PER STRAND AFTER ALL LOSSES 123 kN.
5. THE ELAPSED TIME INTERVAL BETWEEN JACKING OF STRANDS AND TRANSFER SHALL NOT BE LESS THAN 15 HOURS.
6. CLASS OF CONCRETE 40 MPa.
7. CONCRETE STRENGTH AT TRANSFER 28 MPa.
8. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CAN/CSA STANDARD G30.18-M92.



PRESTRESSED/PRECAST CONCRETE PANEL LAYOUT
1 : 100

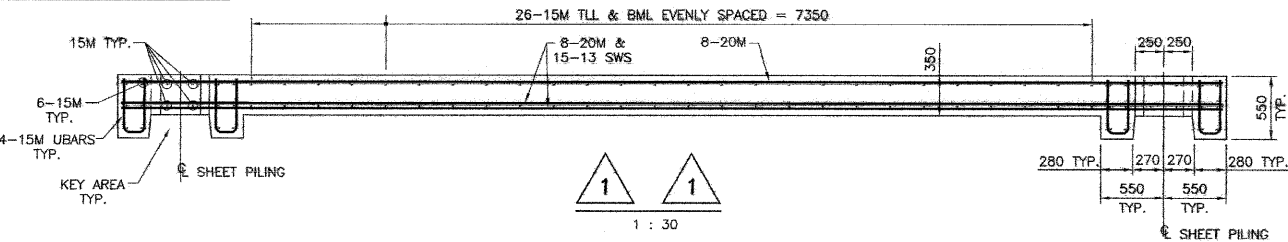


PRECAST CONCRETE PANEL PLAN - 13 REQUIRED
1 : 30

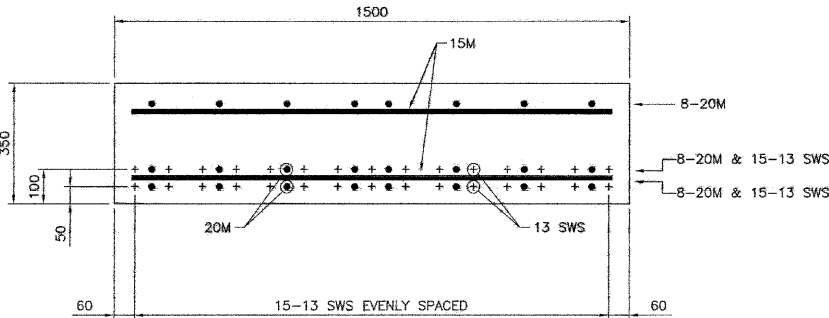


LEGEND
TUL - TOP UPPER LAYER
TLL - TOP LOWER LAYER
BUL - BOTTOM UPPER LAYER
BML - BOTTOM MIDDLE LAYER
BL - BOTTOM LOWER LAYER

PRECAST CONCRETE PANEL - REINFORCING STEEL LAYOUT
1 : 30

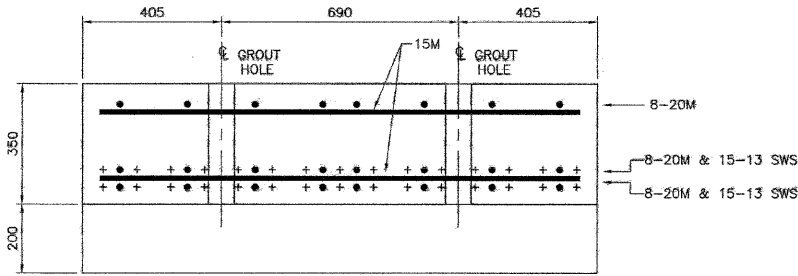


1 : 30

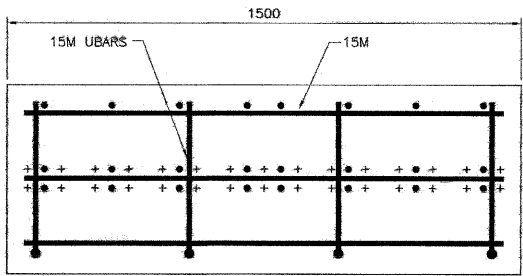


2 : 10

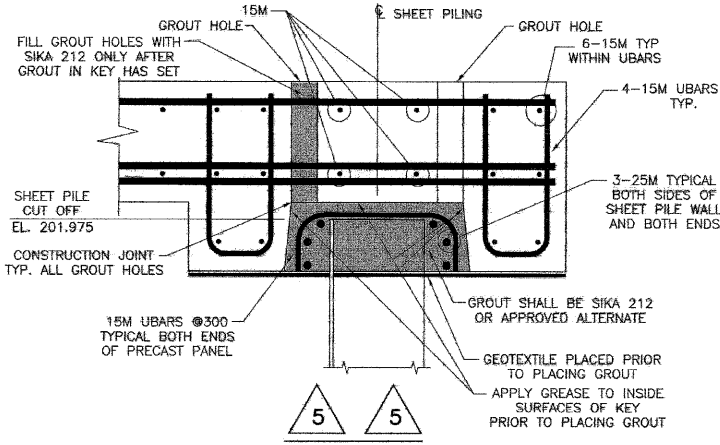
NOTE
+ INDICATES 13 SWS (TYP.)



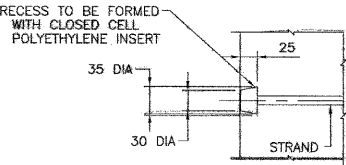
3 : 10



4 : 10



5 : 10



AFTER TRANSFER:
INSERT TO BE REMOVED AND STRAND TO BE CUT BACK TO 25mm FROM END OF PANEL USING AN OXYGEN FED HOLLOW STEMMED THERMIC LANCE. RECESS TO BE CLEANED AND FILLED WITH NON-SHRINK GROUT.

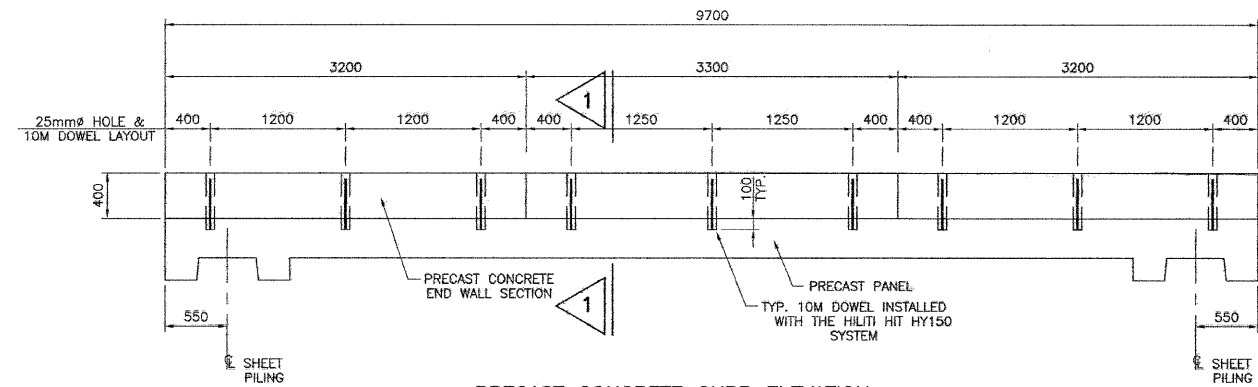
TYPICAL STRAND TREATMENT
NTS

PROFESSIONAL ENGINEER
P.A. SCALZO
JAN 19/06
PROVINCE OF ONTARIO

PROFESSIONAL ENGINEER
K.W. SIMBEYA
JAN 19/06
PROVINCE OF ONTARIO

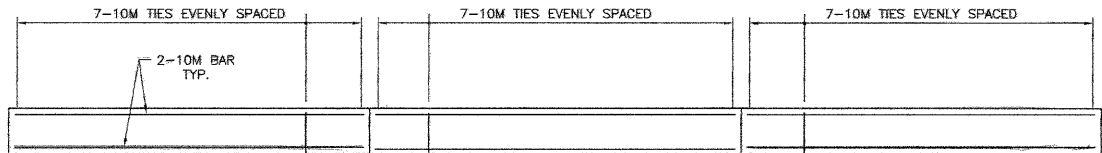
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100 mm ON ORIGINAL DRAWING

REVISIONS	DESCRIPTION
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DRAWN BWR	CHK DCR SITE 48E-51/STRUCT SCHEME DWG 5



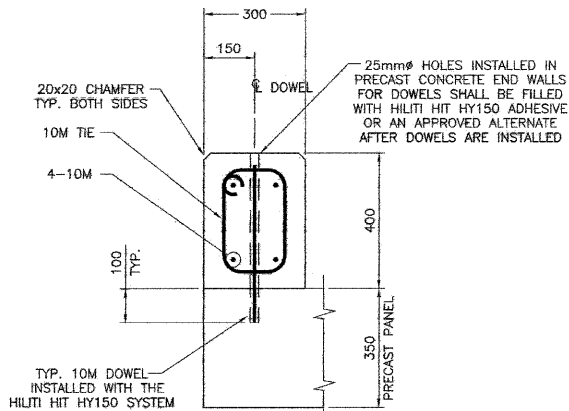
PRECAST CONCRETE CURB ELEVATION

1 : 30
NOTE: 2 REQUIRED



PRECAST CONCRETE END PANELS - REINFORCING STEEL ELEVATION

1 : 30



1 : 10

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

CONT No 2006-6010
WP No 462-00-00

BLACK BIRD CREEK
CULVERT REPAIR
PRECAST CONCRETE END WALLS

SHEET
8

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Thunder Bay, Ontario



DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DESCRIPTION
DESIGN BWR	CHK KWS CODE CHBDC-00 LOAD CL625-ONT DATE JAN/06
DRAWN BWR	CHK DCR SITE 48E-51/CSTRUCT SCHEME DWG 6