

CONTRACT DRAWINGS

CONTRACT NO. 2007-2265

BOOK 1 of 1

DAVID O'TOOLE

**ASSISTANT DEPUTY MINISTER
POLICY AND PLANNING**

BRUCE McCUAIG

**ASSISTANT DEPUTY MINISTER
PROVINCIAL HIGHWAYS MANAGEMENT**

ROGER HANMER, P. ENG.

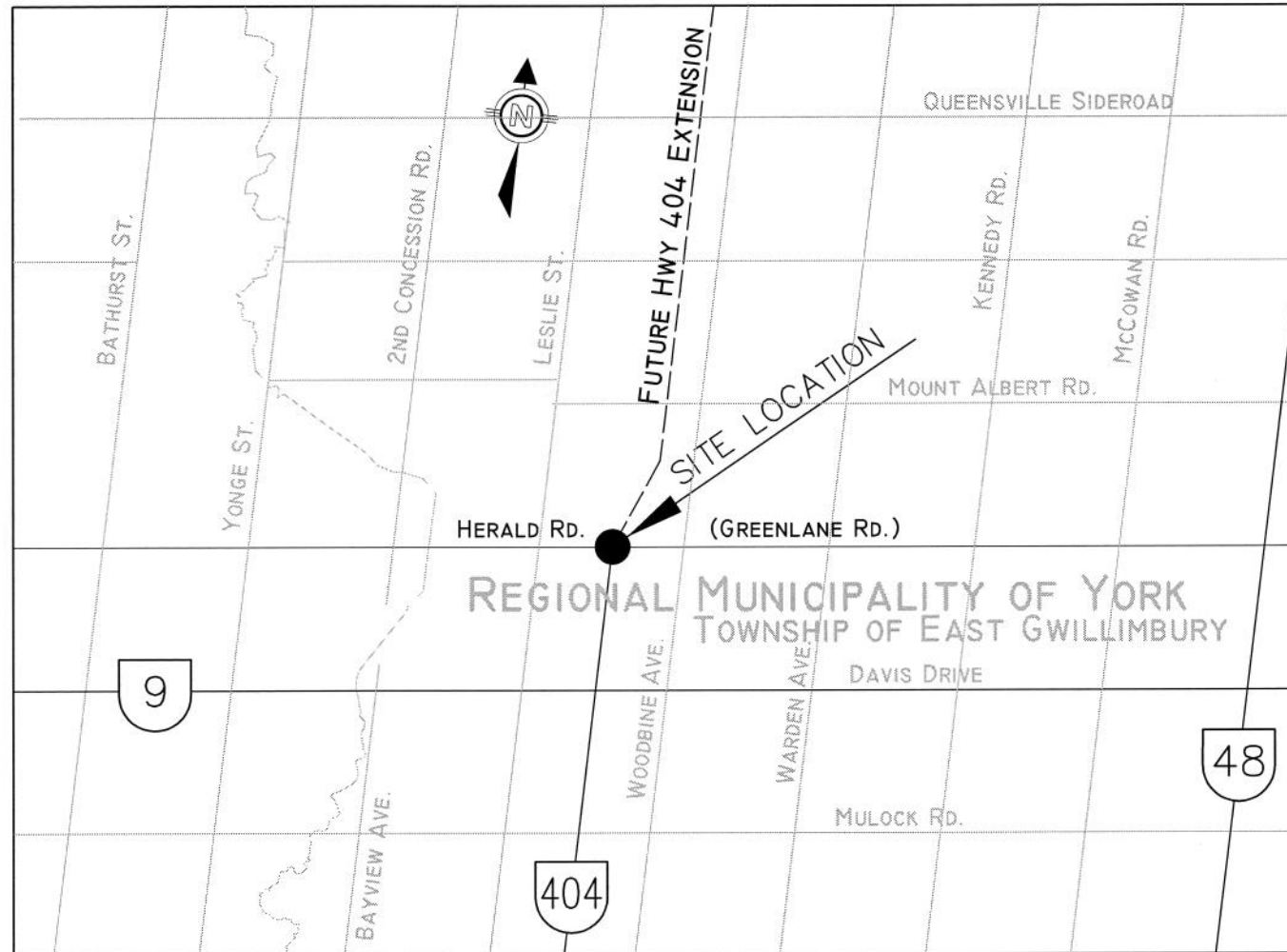
**REGIONAL DIRECTOR
CENTRAL REGION**

GERALD T. P. CHAPUT, P.ENG.

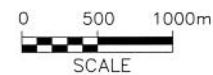
**CHIEF ENGINEER
ENGINEERING STANDARDS BRANCH**

Ministry of Transportation





Key Plan



WP No 2105-05-00 Contract No 2007-2265
Work of ADVANCED N/B STRUCTURE AND GRADING

Hwy No 404 CENTRAL REGION
Location REGIONAL MUNICIPALITY OF YORK
HWY 404/HERALD (GREENLANE) RD. INTERCHANGE

Length 0.5 km.

Mar 21/07
Date
P. Eng.
Manager, Engineering

2007 03 26
Date
P. Eng.
Regional Director

INDEX

W.P. No. 2105-05-00

Contract No. 2007-2265

Sheet No.	Description
	BOOK 1 - GRADING (Book 1 of 1)
	TITLE SHEET
	KEY PLAN
1 - 2	ALIGNMENT DETAILS
3 - 4	STAGING DRAWING SHEETS
5	REMOVAL DRAWING SHEETS
6	CONSTRUCTION DRAWING SHEETS
7	PROFILE DRAWING SHEET
8 - 9	TYPICAL DRAWING SHEETS
10	EXCAVATION AND GRANULAR BACKFILL DETAILS FOR RSS WAL
11 - 12	PAVEMENT MARKING DRAWINGS
	STRUCTURAL
13	GENERAL ARRANGEMENT
14	BOREHOLE LOCATION AND SOIL STRATA
15	ABUTMENT PILE LAYOUT AND DETAILS
16	ABUTMENT DETAILS
17	WINGWALL DATAILS
18	PRESTRESSED GIRDER AND BEARING DETAILS
19	DECK DETAILS AND REINFORCING
20	BARRIER WALL W/O RAILING - PERFORMANCE LEVEL 3
21	PILE DRIVING CONTROL
22	SPLICE & DRIVING SHOE DETAILS FOR STEEL H-PILES
23	STANDARD DETAILS
24	ELECTRICAL EMBEDDED WORK
	BOOK 2 - QUANTITY SHEETS (Book 1 of 1)

[illegible]

METRIC

PLATE No 200-404/HV2-0
CONT No 2007-2265
WP No 2105-05-00



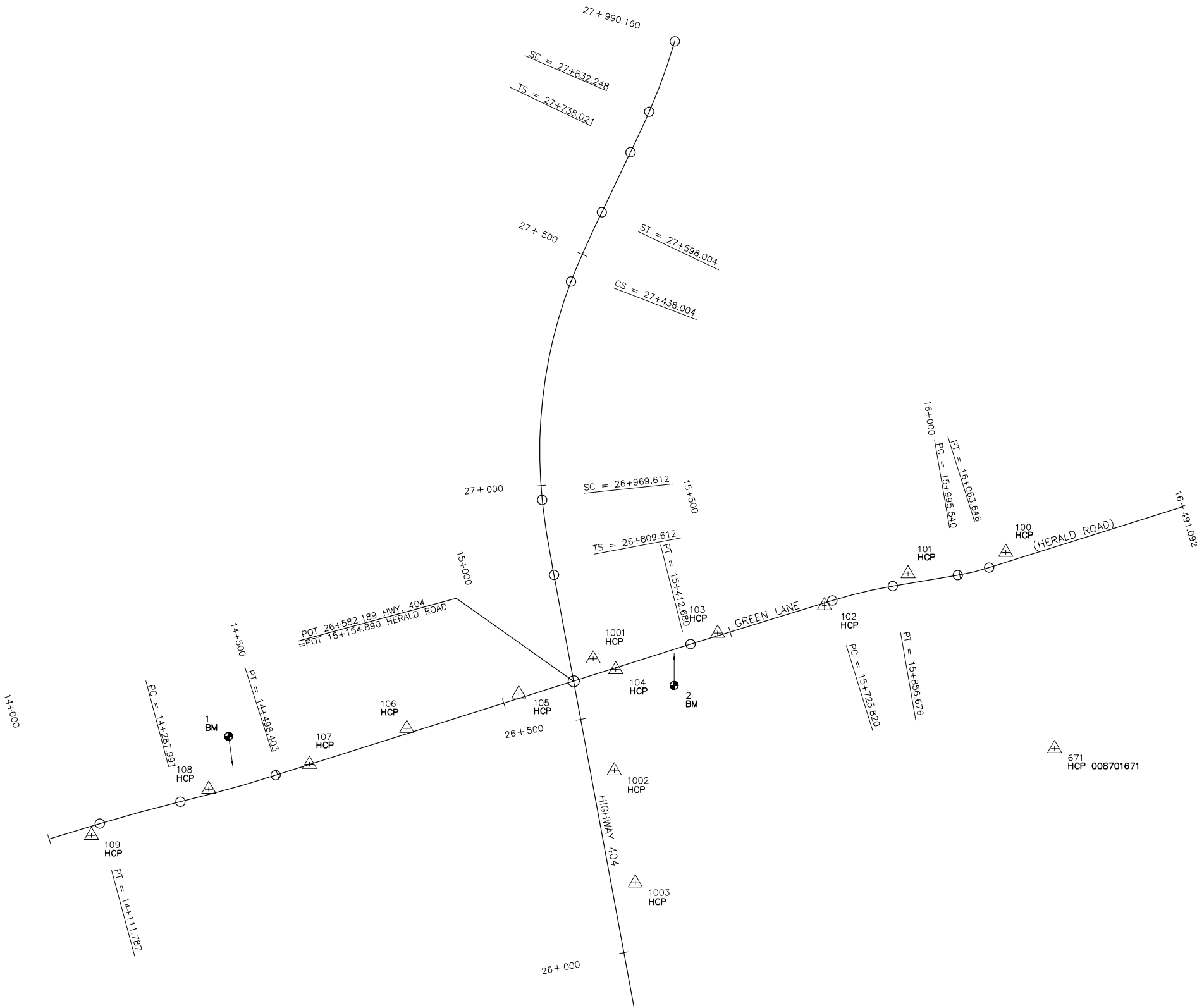
SHEET
1

H&V ALIGNMENT DATA
STA 26+000 TO STA 27+990.160
Survey NOVEMBER 1999 Revised



McCORMICK RANKIN
CORPORATION

NAVD 29/78 ADJ
NAD 83 MTM ADJ



METRIC

NAVD 29/78 ADJ
NAD 83 MTM ADJ

PLATE No 200-404/HV3-0

CONT No 2007-2265
WP 2105-05-00

HOR.& VERT. DATA

Survey NOVEMBER 1999 Revised

MRC

McCORMICK RANKIN CORPORATION

SHEET 2

HORIZONTAL & VERTICAL CONTROL POINTS
3 DEGREE MTM NAD 83

Point #	Northing	Easting	Elevation	Station	Offset	Description
1009	4881003.21	311239.98	286.33	24+549.82	77.78	HCP
1008	4881379.83	311149.77	285.33	24+936.43	43.26	HCP
1007	4881523.59	311134.62	282.73	25+084.08	41.53	HCP
1010	4881621.53	311139.18	277.87	25+184.10	49.15	HCP
1006	4881860.31	311142.99	283.42	25+423.72	49.02	HCP
1005	4882099.59	311132.21	283.96	25+657.84	48.93	HCP
1004	4882342.51	311094.11	287.82	25+899.80	48.93	HCP
1003	4882579.49	311050.10	295.91	26+140.84	49.25	HCP
671	4882862.63	311933.72	292.34	26+256.66	969.87	HCP 008701671
1002	4882815.70	311005.80	296.59	26+381.17	49.14	HCP
109	4882679.78	309904.19	266.12	26+450.13	-1058.66	HCP
108	4882776.84	310151.51	266.50	26+500.06	-797.72	HCP
107	4882829.53	310363.54	273.39	26+512.87	-579.60	HCP
1	4882822 ±	310202 ±	269.77	26+535 ±	-739 ±	BM 1-19-96
106	4882905.05	310568.60	280.45	26+549.39	-364.16	HCP
105	4882977.73	310804.76	290.66	26+577.40	-118.67	HCP
104	4883029.00	311008.98	294.85	26+590.24	91.49	HCP
2	4883062 ±	311131 ±	291.91	26+600 ±	218 ±	BM 2-19-96
1001	4883051.67	310961.33	292.71	26+621.29	48.82	HCP
103	4883105.76	311223.67	287.88	26+626.22	316.63	HCP
102	4883163.86	311448.78	281.66	26+641.93	548.60	HCP
101	4883230.92	311624.86	281.04	26+675.47	734.00	HCP
100	4883276.18	311830.85	276.51	26+682.08	944.80	HCP
234	4883533.14	312645.12	287.79	27+834.21	1705.22	HCP 008691234

NOTE: BENCHMARK LOCATIONS ARE APPROXIMATE AND ARE ESTIMATED BASED ON MTO BASEMAPPING AND MONUMENT DESCRIPTIONS
ALL STATION AND OFFSET VALUES ARE BASED ON THE HIGHWAY 404 CENTERLINE ALIGNMENT

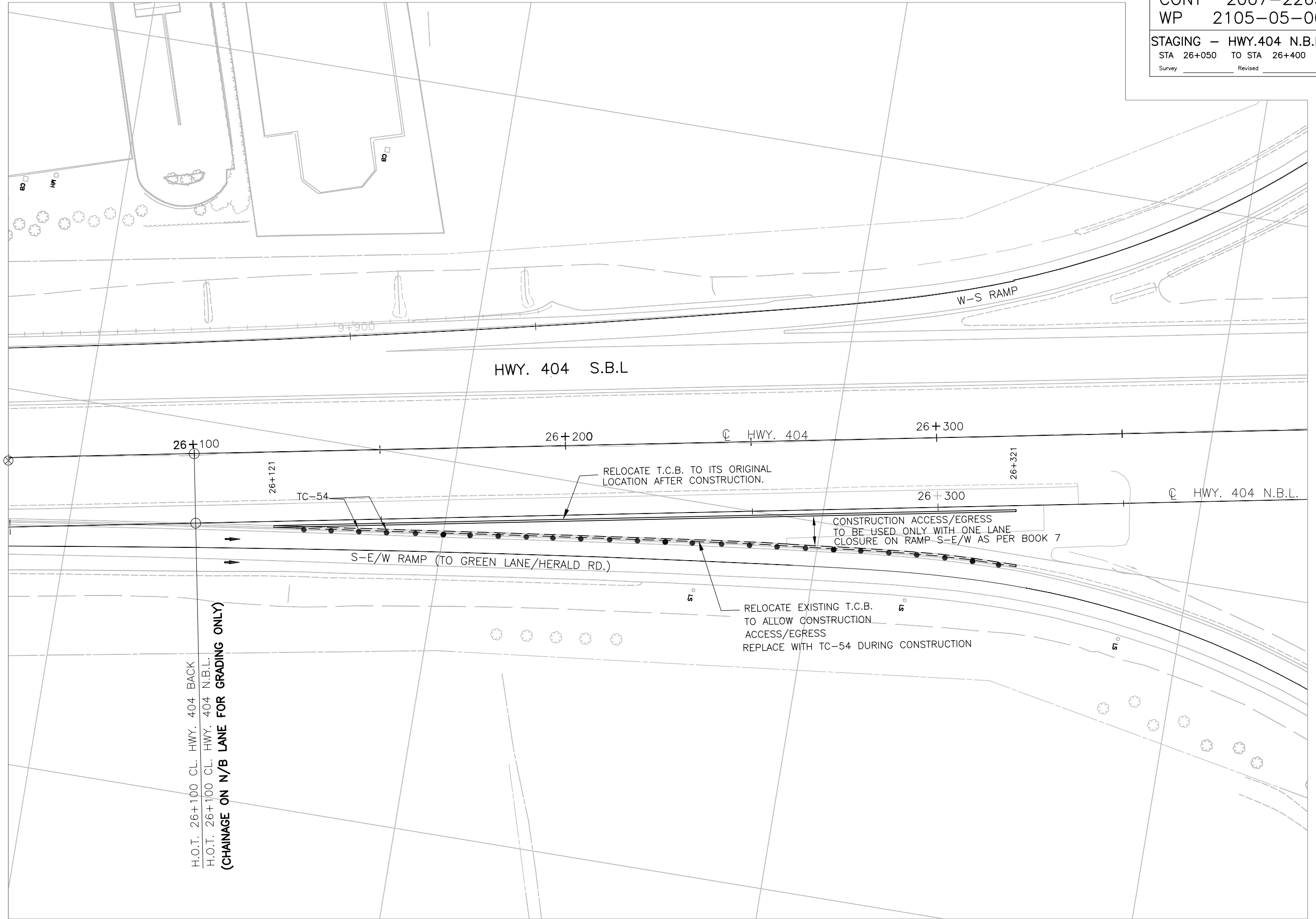


PLATE No
CONT 2007-2265
WP 2105-05-00
STAGING - HWY.404 N.B.L.
STA 26+050 TO STA 26+400
Survey _____ Revised _____

SHEET
3

SCALE
2.5m 0 5.0m
Horizontal

METRIC

PLATE No

CONT 2007-2265

WP 2105-05-00

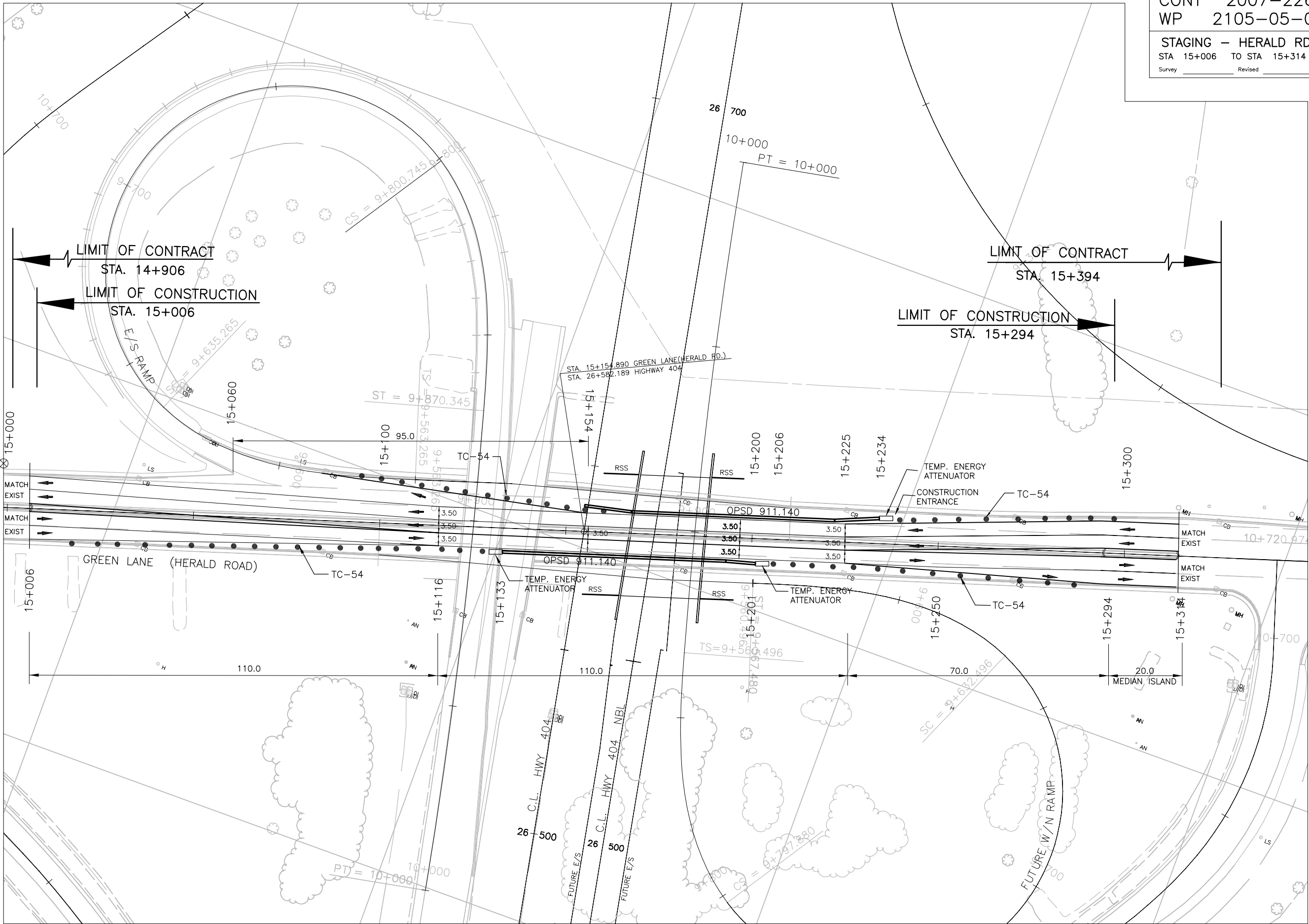
STAGING - HERALD RD.

STA 15+006 TO STA 15+314

Survey Revised



SHEET
4

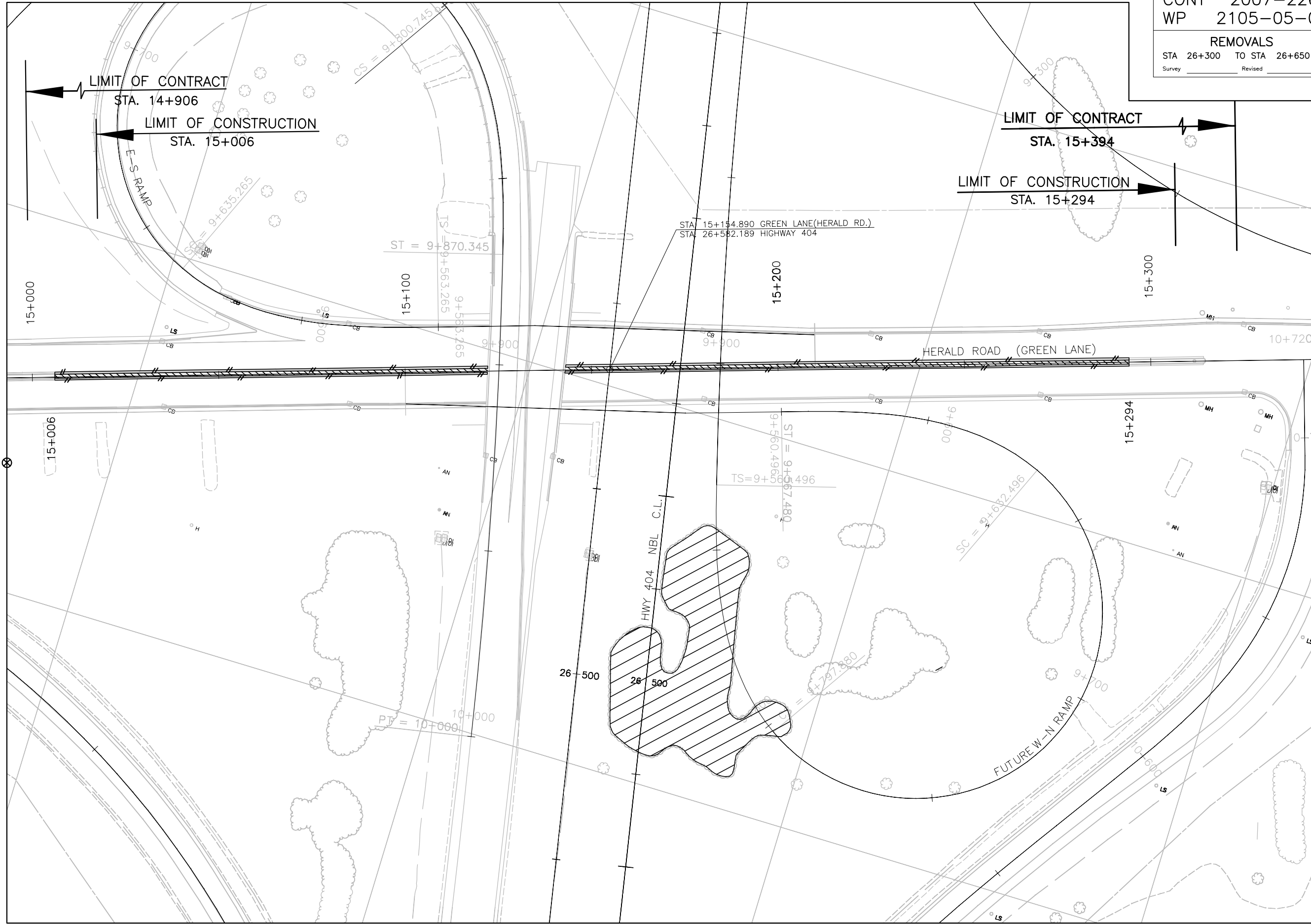


SCALE
Horizontal

DRAWING NAME: W:\CR\Eng\PA&D\Y&S\Projects\WO_04-20024\dwg\removals.dwg
CREATED: 2005/03/15 16:05:22

MINISTRY OF TRANSPORTATION, ONTARIO

88-05

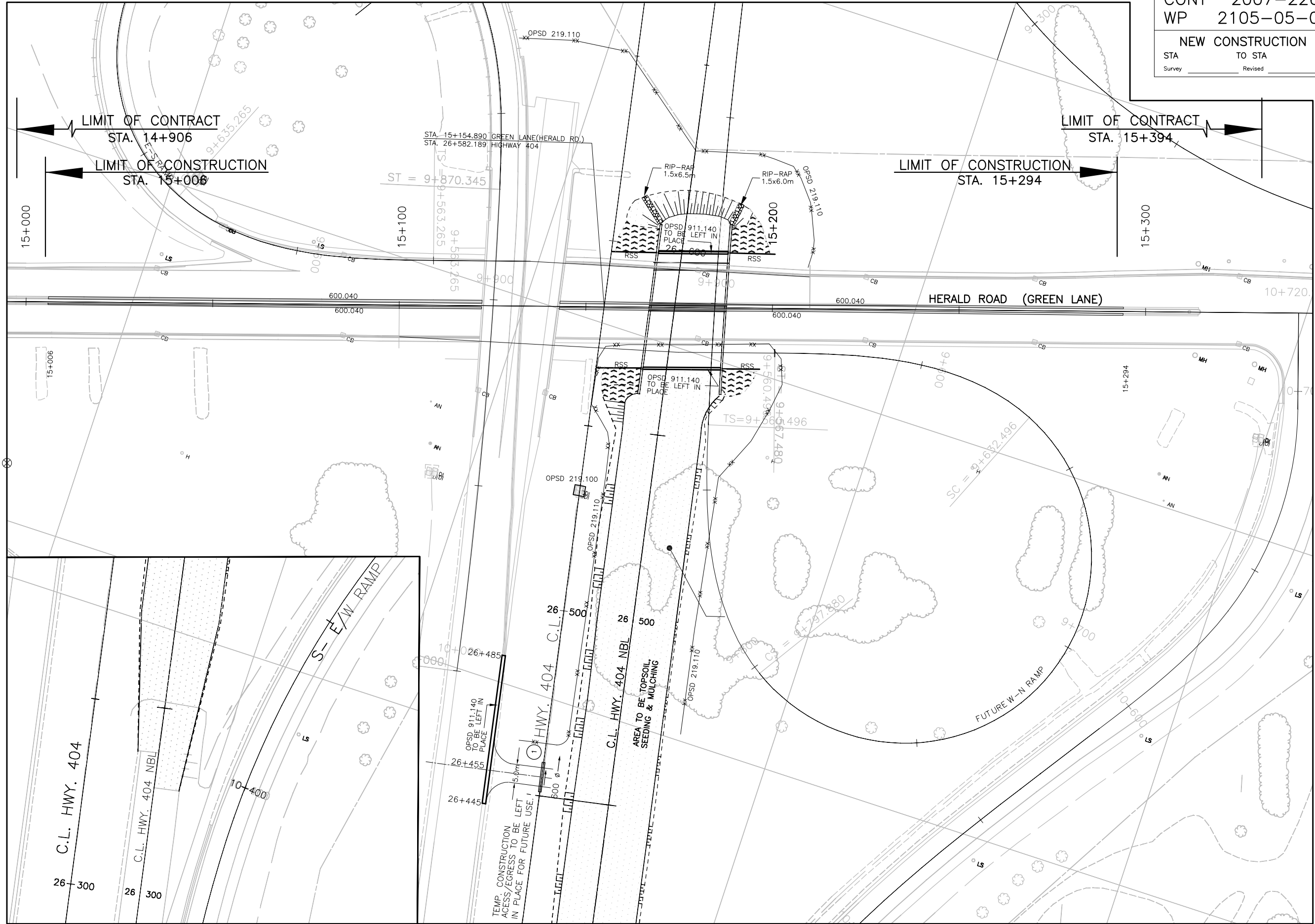


METRIC

PLATE No	CONT 2007-2265
WP	2105-05-00
REMOVALS	
STA 26+300	TO STA 26+650
Survey	Revised

SHEET
5

SCALE
2.5m 0 5m
Horizontal

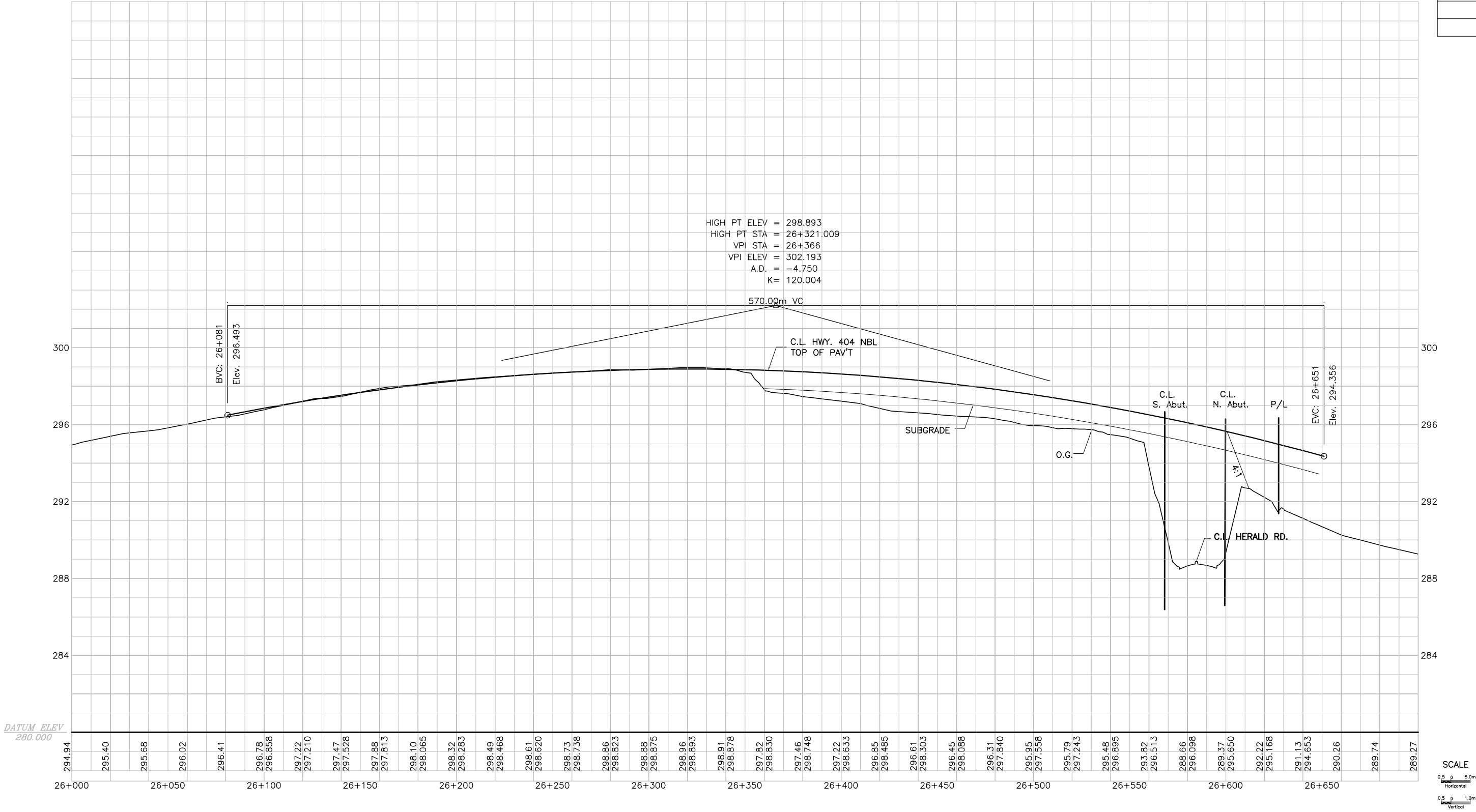


METRIC

PLATE No	CONT 2007-2265
WP	2105-05-00
NEW CONSTRUCTION	
STA	TO STA
Survey	Revised

SHEET
6

SCALE
2.5m 0 5.0m
Horizontal

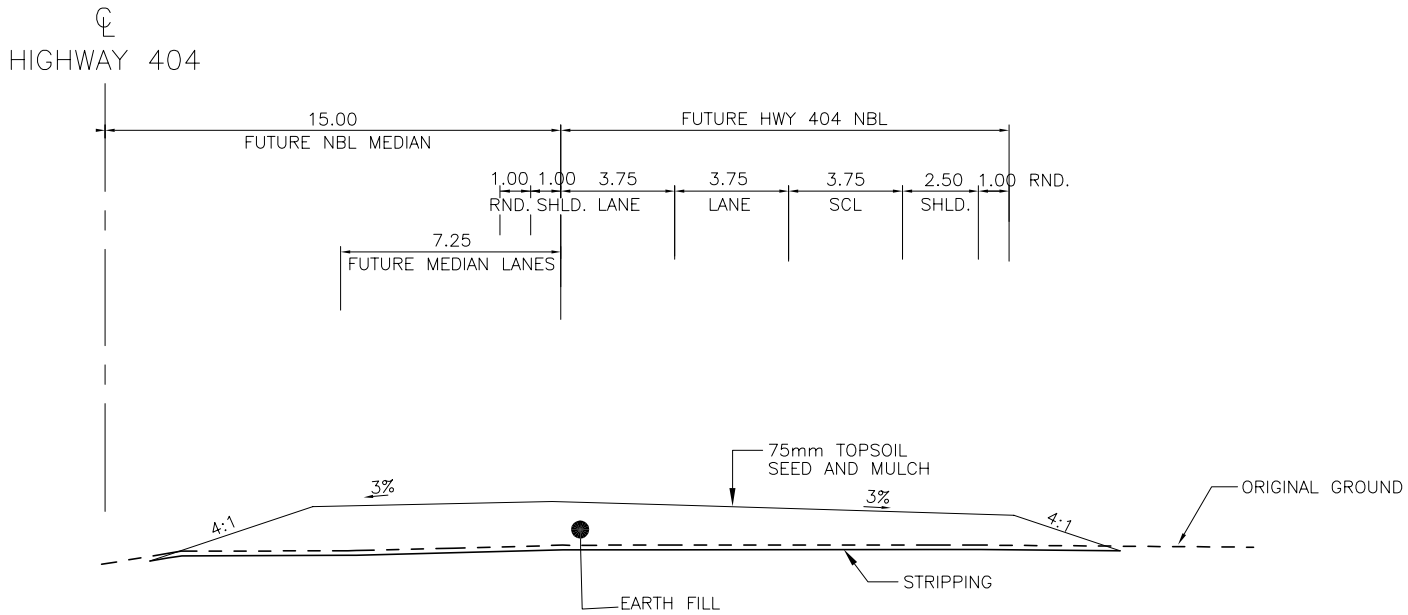


METRIC

PLATE No
CONT No 2007-2265
WP No 2105-05-00

TYPICAL SECTIONS
Survey Revised

SHEET
8



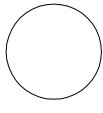
HIGHWAY 404 – TANGENT SECTION

STA. 26+330 TO 26+630 ±

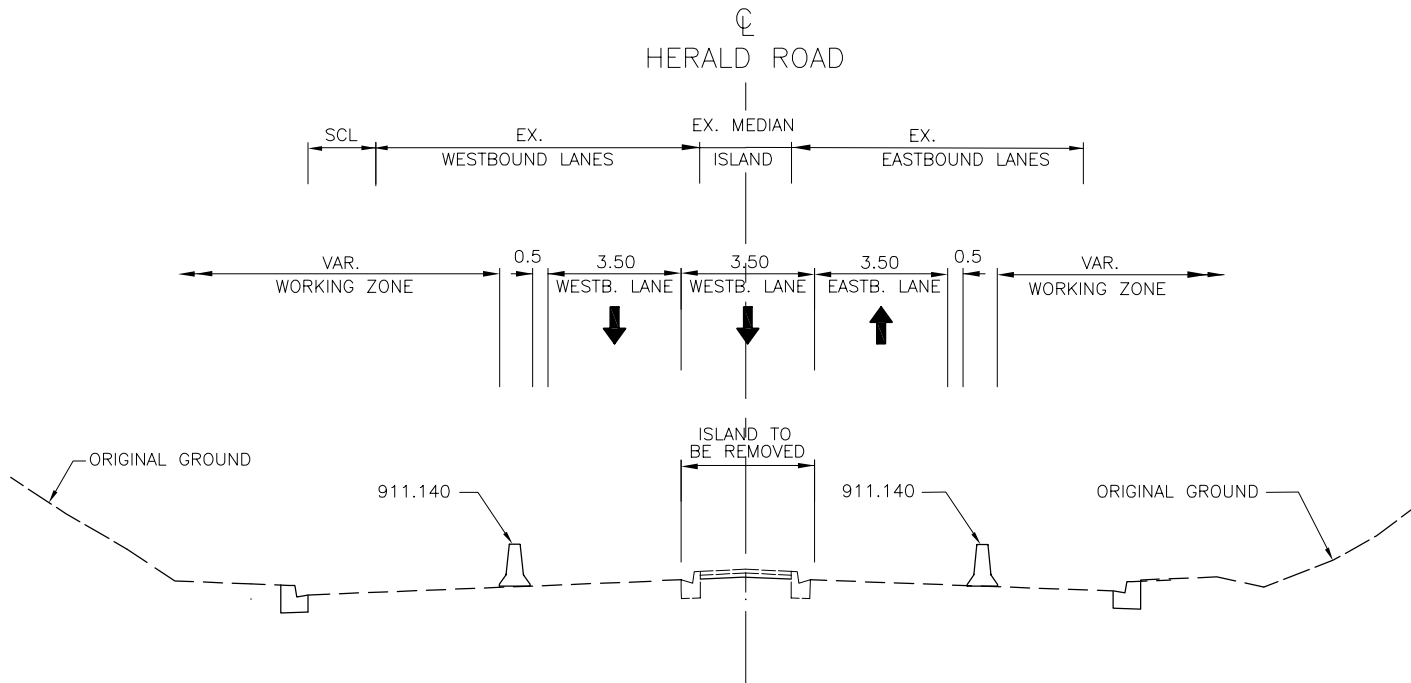
NTS

METRIC

PLATE No
CONT No 2007-2265
WP No 2105-05-00



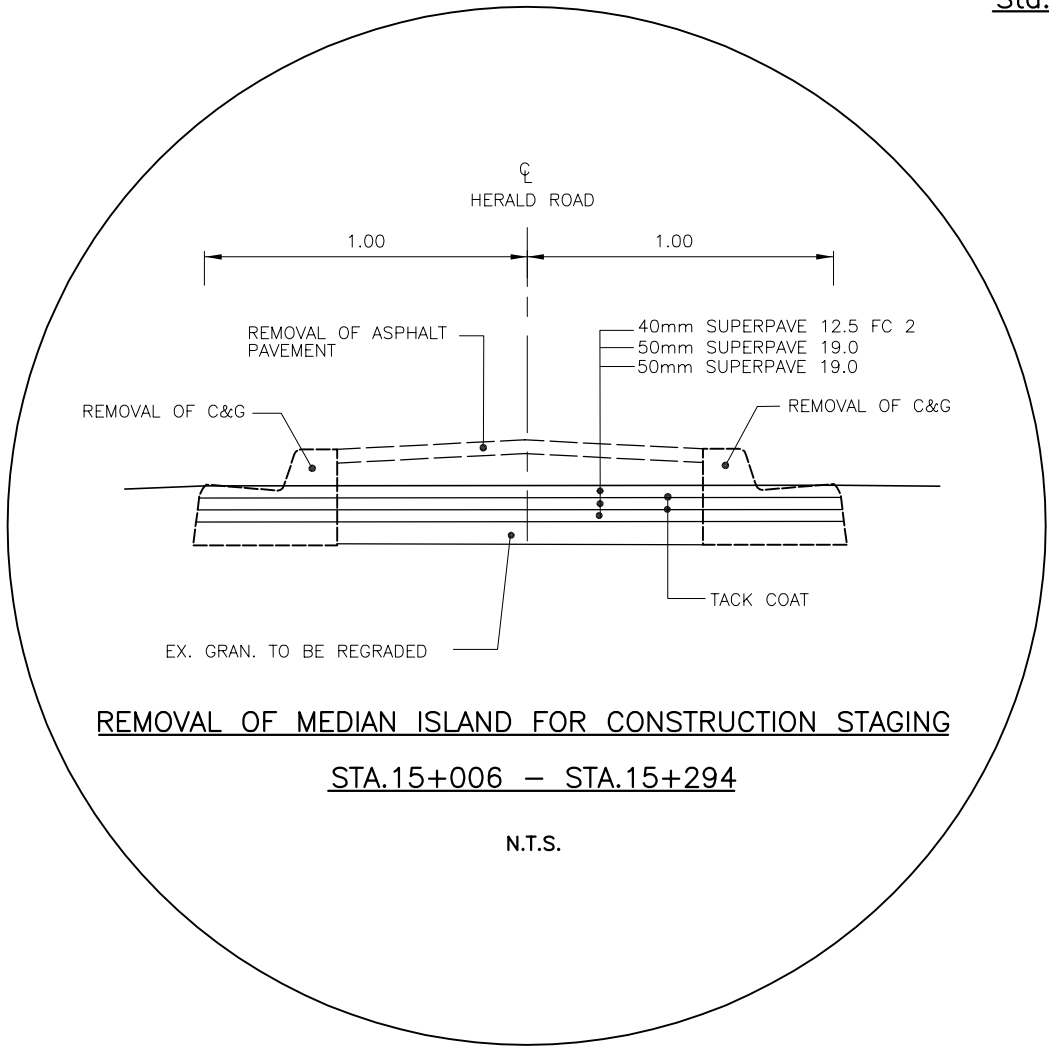
TYPICAL SECTIONS
Survey _____ Revised _____
SHEET
9



HERALD ROAD – CONSTRUCTION STAGING

Sta. 15+006 – Sta. 15+294

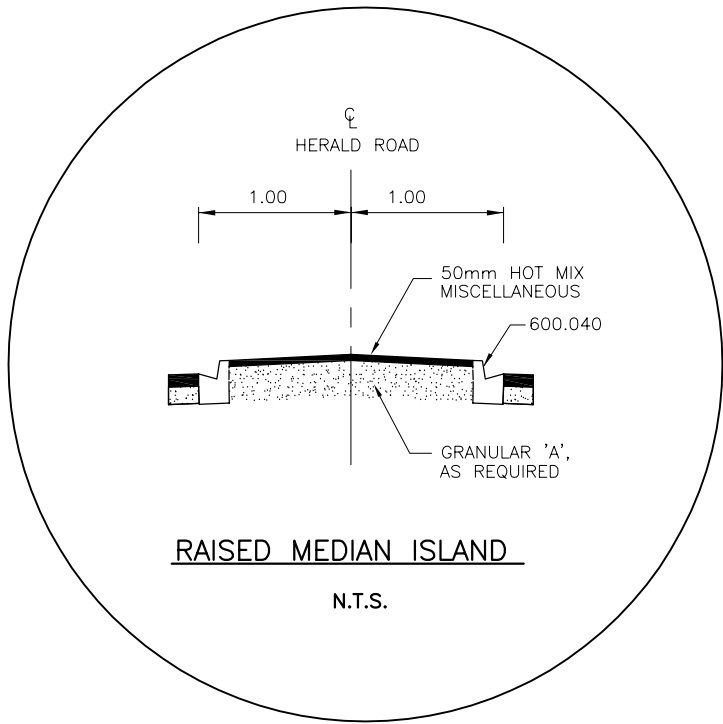
N.T.S.



REMOVAL OF MEDIAN ISLAND FOR CONSTRUCTION STAGING

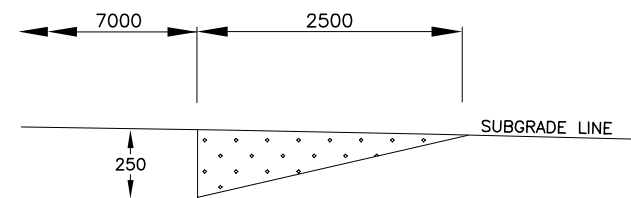
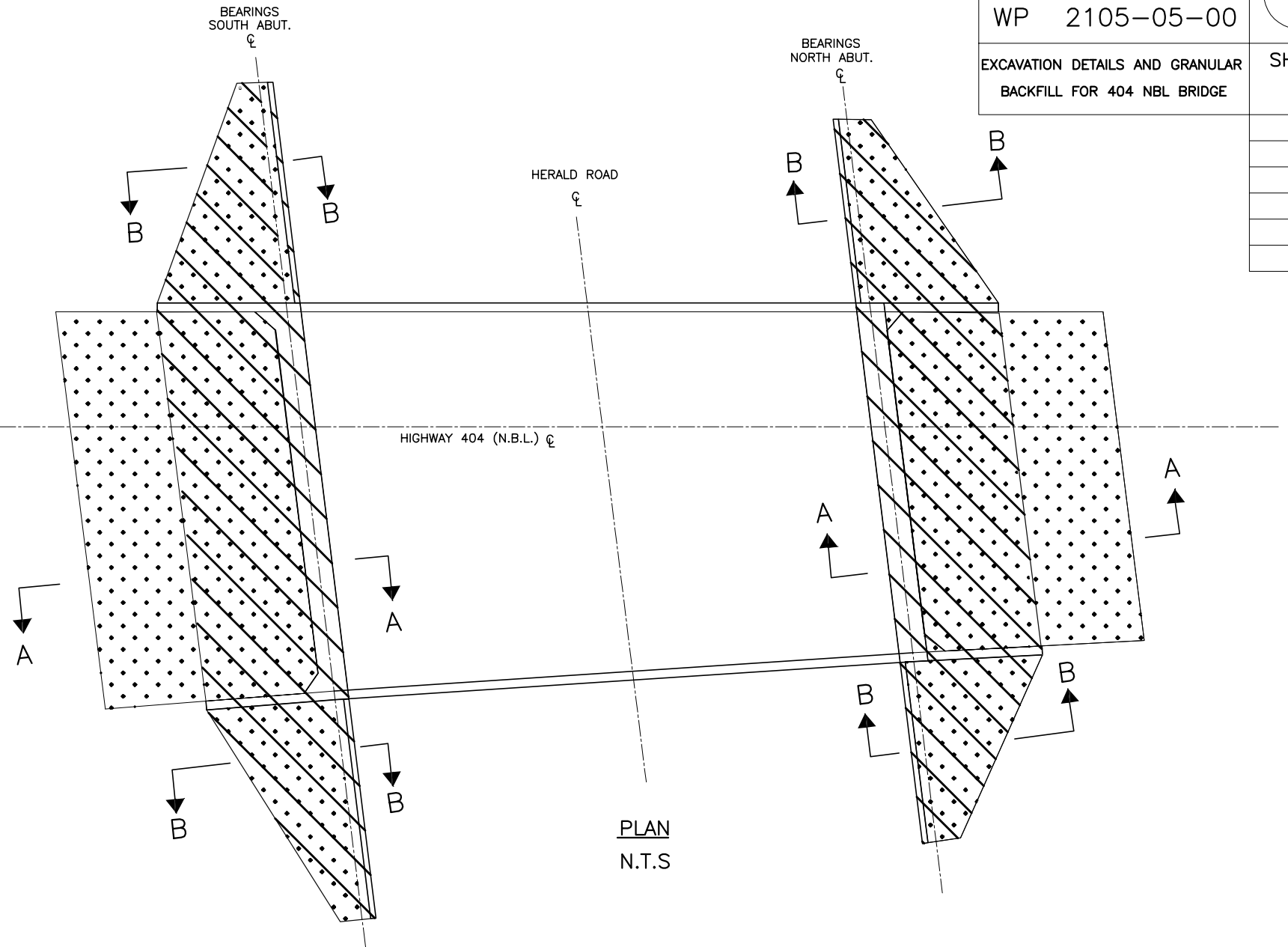
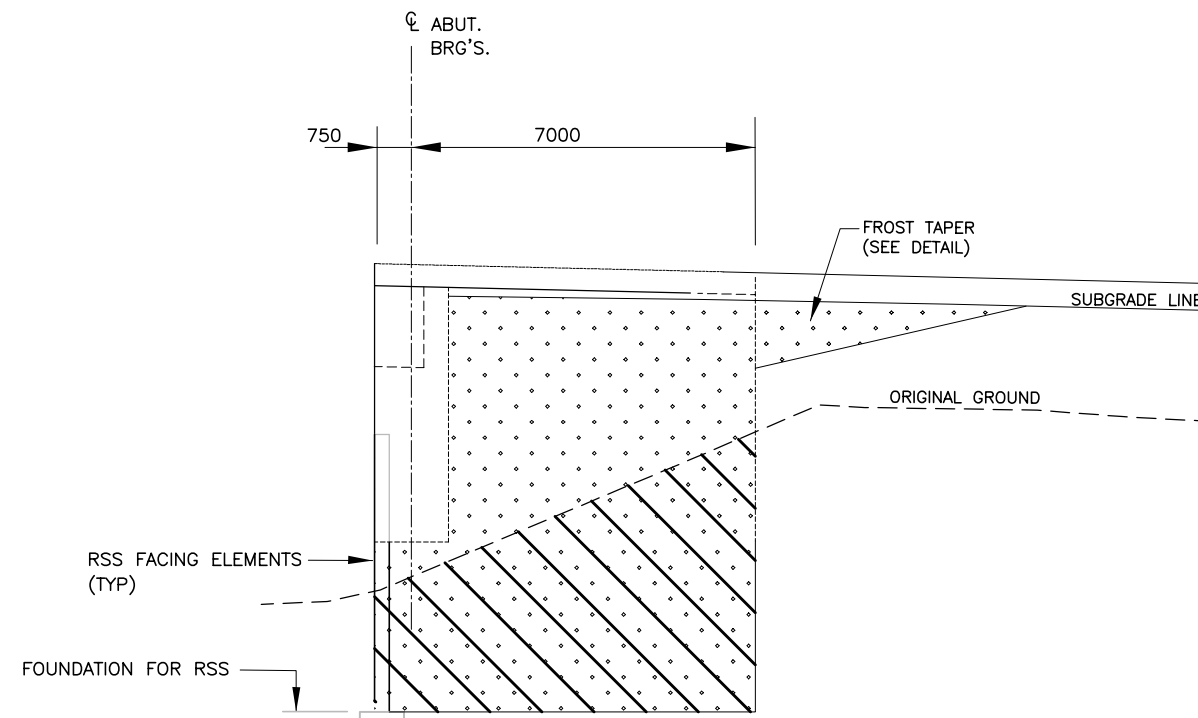
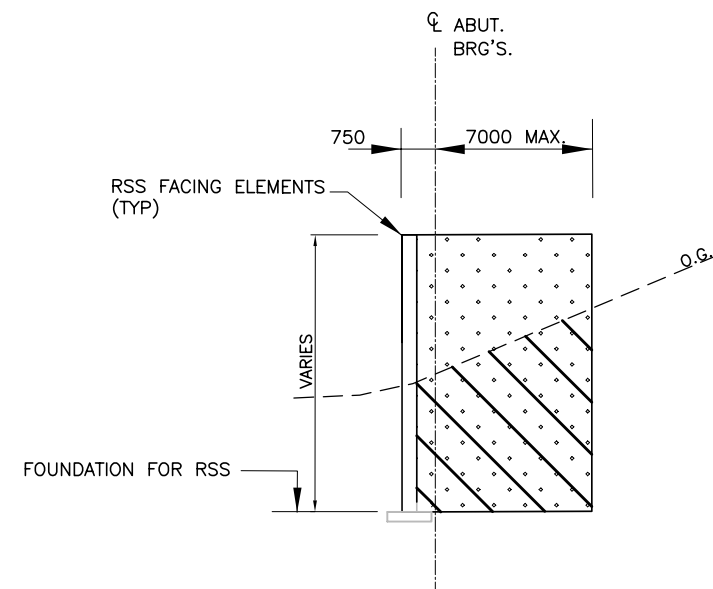
STA.15+006 – STA.15+294

N.T.S.



RAISED MEDIAN ISLAND

N.T.S.



LEGEND:

- BACKFILL FOR RSS AND STRUCTURE
- EXCAVATION FOR STRUCTURE

METRIC

CONT 2007-2265
WP 2105-05-00

EXCAVATION DETAILS AND GRANULAR
BACKFILL FOR 404 NBL BRIDGE

SHEET
10

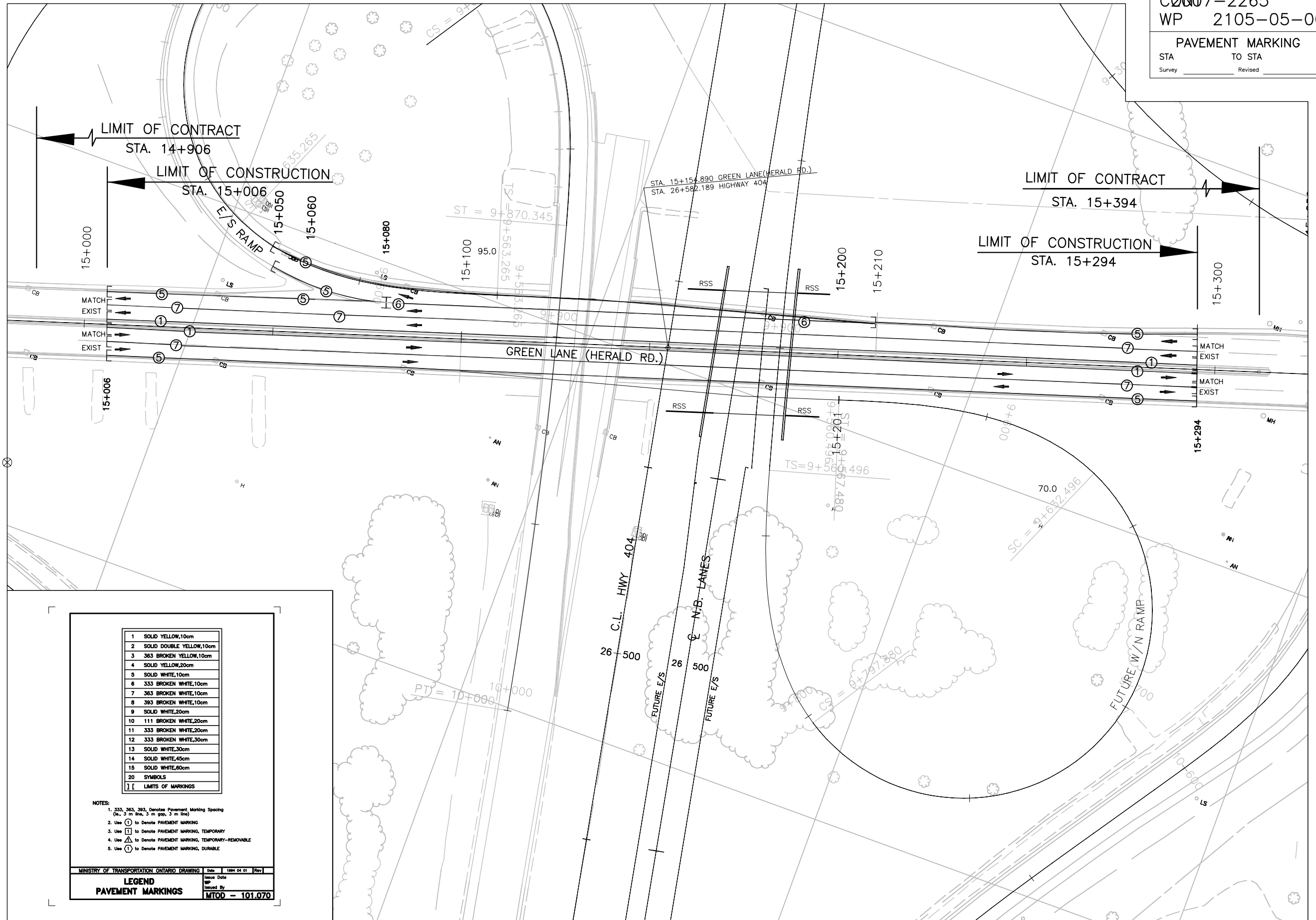
METRIC

PLATE No
C0007-2265
WP 2105-05-00

PAVEMENT MARKING
STA TO STA
Survey Revised



SHEET
11



1	SOLID YELLOW,10cm
2	SOLID DOUBLE YELLOW,10cm
3	363 BROKEN YELLOW,10cm
4	SOLID YELLOW,20cm
5	SOLID WHITE,10cm
6	333 BROKEN WHITE,10cm
7	363 BROKEN WHITE,10cm
8	393 BROKEN WHITE,10cm
9	SOLID WHITE,20cm
10	111 BROKEN WHITE,20cm
11	333 BROKEN WHITE,20cm
12	333 BROKEN WHITE,30cm
13	SOLID WHITE,30cm
14	SOLID WHITE,45cm
15	SOLID WHITE,60cm
20	SYMBOLS
1	LIMITS OF MARKINGS

- NOTES:
1. 333, 363, 393, Denote Pavement Marking Spacing (in., 3 m line, 3 m gap, 3 m line)
 2. Use ① to Denote PAVEMENT MARKING
 3. Use □ to Denote PAVEMENT MARKING, TEMPORARY
 4. Use △ to Denote PAVEMENT MARKING, TEMPORARY-REMOVABLE
 5. Use ② to Denote PAVEMENT MARKING, DURABLE

MINISTRY OF TRANSPORTATION ONTARIO DRAWING
LEGEND
PAVEMENT MARKINGS
Date 1995 04 01 Rev
Issue Date
WPD
Issued By
MTOD - 101.070

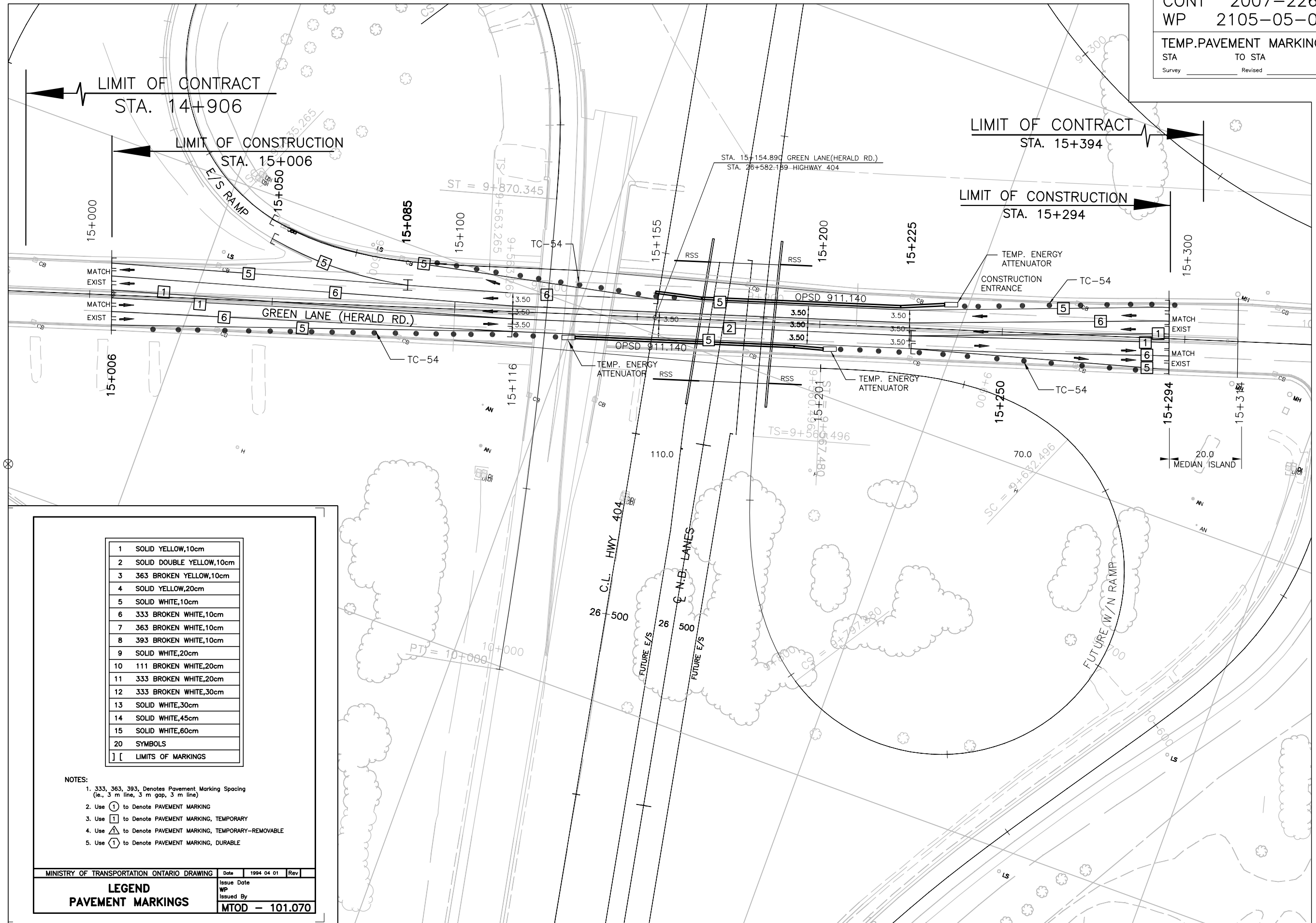
SCALE
5m 0 10m
Horizontal

88-05
MINISTRY OF TRANSPORTATION, ONTARIO
DRAWING NAME: TEMP. PAVEMENT MARKING.dwg
CREATED: 2006/01/11 14:47:01
MODIFIED:

METRIC

PLATE No
CONT 2007-2265
WP 2105-05-00
TEMP.PAVEMENT MARKING
STA TO STA
Survey Revised

SHEET
12

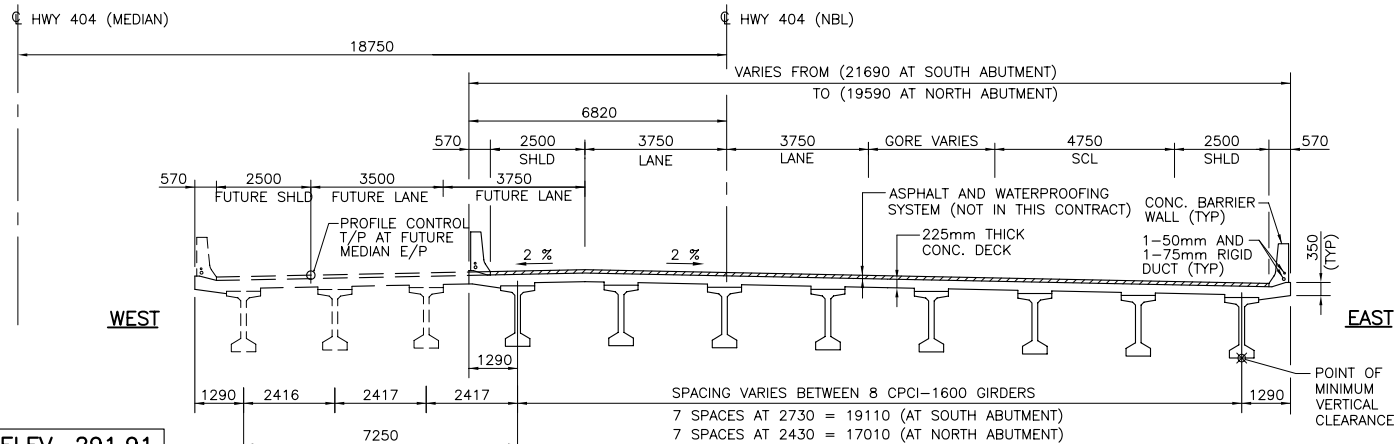
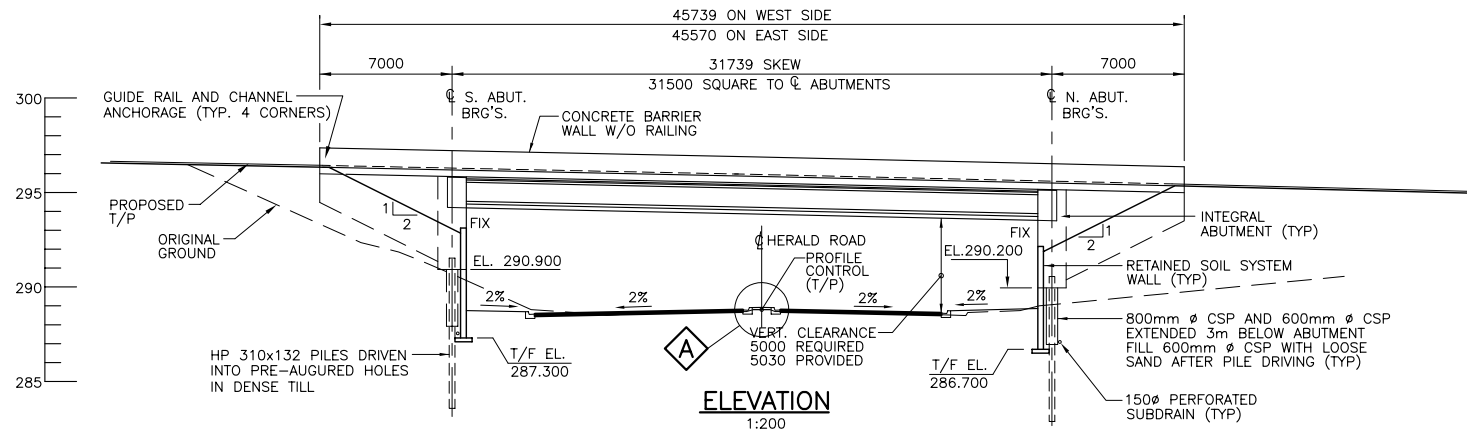
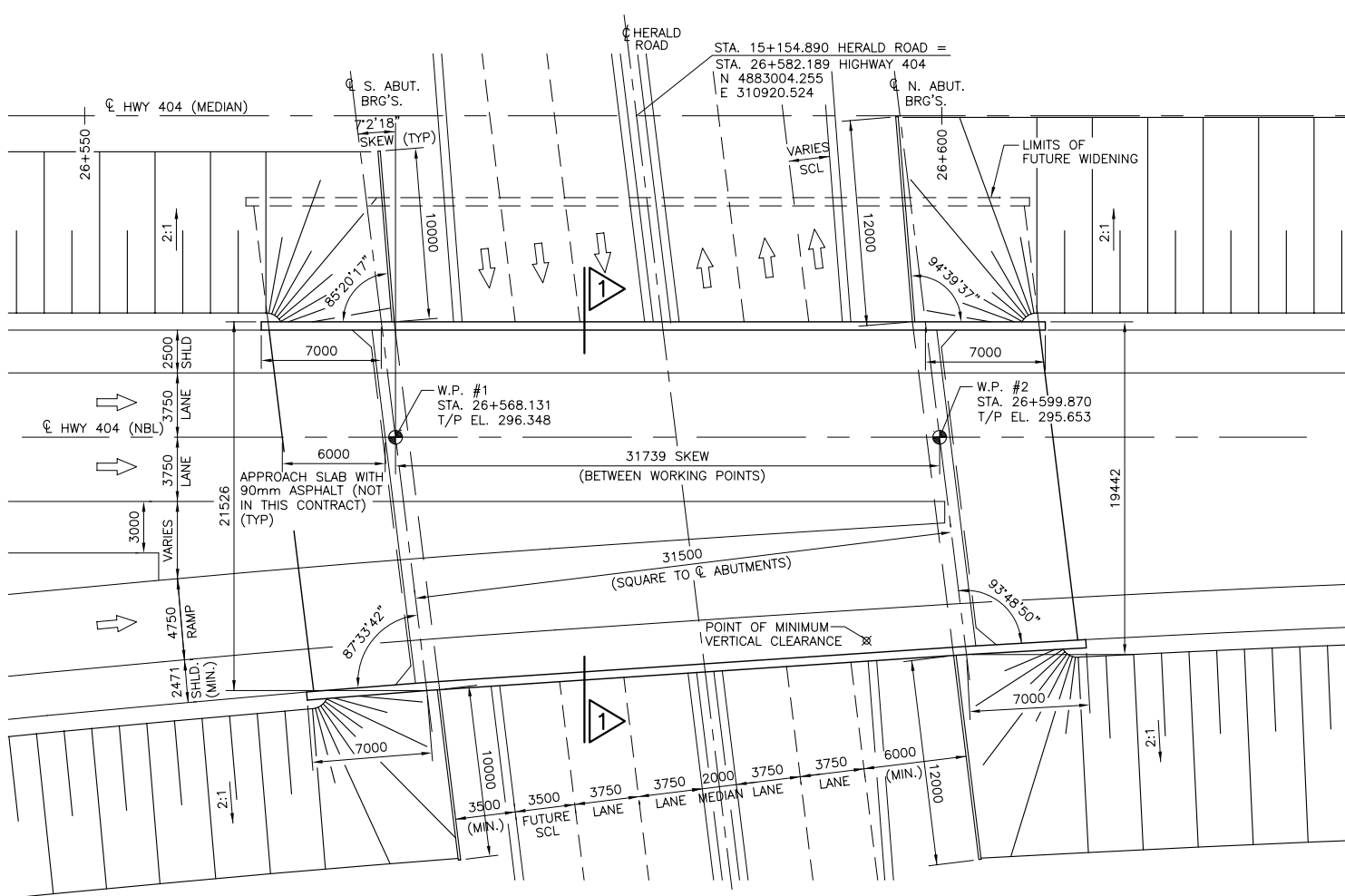


1	SOLID YELLOW,10cm
2	SOLID DOUBLE YELLOW,10cm
3	363 BROKEN YELLOW,10cm
4	SOLID YELLOW,20cm
5	SOLID WHITE,10cm
6	333 BROKEN WHITE,10cm
7	363 BROKEN WHITE,10cm
8	393 BROKEN WHITE,10cm
9	SOLID WHITE,20cm
10	111 BROKEN WHITE,20cm
11	333 BROKEN WHITE,20cm
12	333 BROKEN WHITE,30cm
13	SOLID WHITE,30cm
14	SOLID WHITE,45cm
15	SOLID WHITE,60cm
20	SYMBOLS
] [LIMITS OF MARKINGS	

- NOTES:
- 333, 363, 393, Denotes Pavement Marking Spacing (ie., 3 m line, 3 m gap, 3 m line)
 - Use ① to Denote PAVEMENT MARKING
 - Use ① to Denote PAVEMENT MARKING, TEMPORARY
 - Use △ to Denote PAVEMENT MARKING, TEMPORARY-REMOVABLE
 - Use ① to Denote PAVEMENT MARKING, DURABLE

MINISTRY OF TRANSPORTATION ONTARIO DRAWING	Date	1994 04 01	Rev
LEGEND PAVEMENT MARKINGS	Issue Date		
	WP		
	Issued By	MTOD - 101.070	

SCALE
5m 0 10m
Horizontal

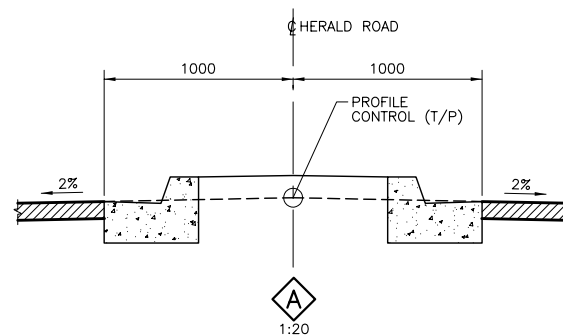
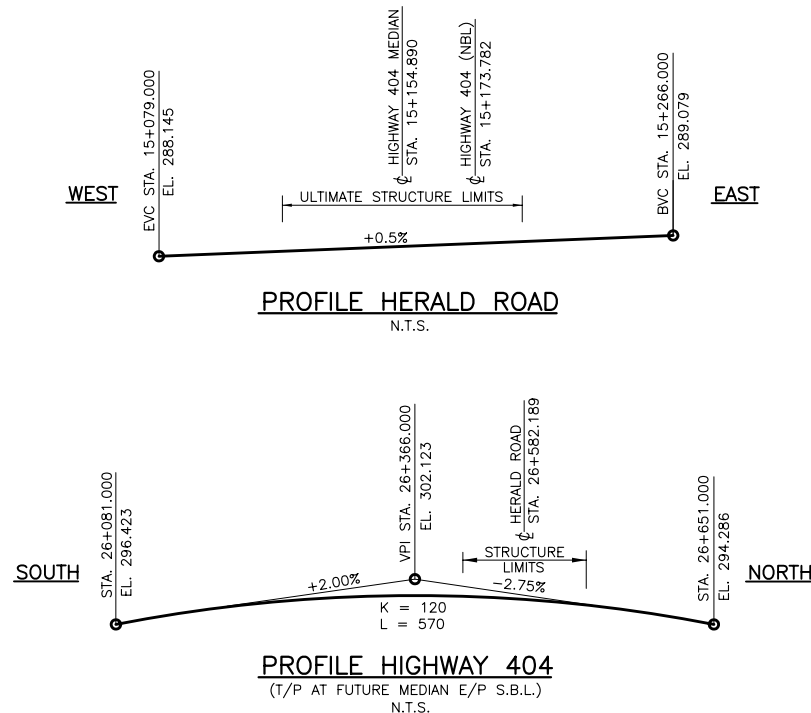


BM ELEV. 291.91
STA. 26+600 ±
N 4883062 ±
E 311131 ±

1
1:100

APPROACH SLAB,
WATERPROOFING AND
PAVING NOT PART OF
THIS CONTRACT

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



DIST
CONT No 2007-2265
WP No 2105-05-00

HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS
GENERAL ARRANGEMENT

SHEET
13

MRC
McCORMICK RANKIN
CORPORATION

GENERAL NOTES:

CLASS OF CONCRETE

PRECAST GIRDERS 50 MPa
ALL CONCRETE UNLESS OTHERWISE NOTED 35 MPa

CLEAR COVER TO REINFORCING STEEL

BOTTOM OF ABUTMENTS 100 ± 25
DECK
TOP 70 ± 20
BOTTOM 40 ± 10
REMAINDER UNLESS OTHERWISE NOTED 70 ± 20

REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400 UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 420 MPa.

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

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 DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.

RETAINED SOIL SYSTEM

RSS WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:

APPLICATION: FALSE ABUTMENT
PERFORMANCE: HIGH
APPEARANCE: HIGH

THE SUPPLIED RSS SYSTEM SHALL MATCH, IN COLOUR, APPEARANCE AND FINISH, THAT OF THE EXISTING SOUTHBOUND LANES STRUCTURE.

CONSTRUCTION NOTES

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

NO BACKFILL SHALL BE PLACED BEHIND ABUTMENTS UNTIL DECK CONCRETE HAS REACHED 70% OF ITS SPECIFIED STRENGTH.

BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.

ALL ELEVATIONS ARE TO GEODETIC DATUM.

LIST OF ABBREVIATIONS

W.P. - DENOTES WORKING POINT
E/P - DENOTES EDGE OF PAVEMENT
T/P - DENOTES TOP OF PAVEMENT
N.B.L. - DENOTES NORTHBOUND LANE
S.B.L. - DENOTES SOUTHBOUND LANE
N.T.S. - DENOTES NOT TO SCALE

LIST OF DRAWINGS

- GENERAL ARRANGEMENT
- BOREHOLE LOCATION AND SOIL STRATA
- ABUTMENT PILE LAYOUT AND DETAILS
- ABUTMENT DETAILS
- WINGWALL DETAILS
- PRESTRESSED GIRDER AND BEARING DETAILS
- DECK DETAILS AND REINFORCING
- BARRIER WALL W/O RAILING - PERFORMANCE LEVEL 3
- PILE DRIVING CONTROL
- SPLICE & DRIVING SHOE DETAILS FOR STEEL H-PILES
- STANDARD DETAILS
- ELECTRICAL EMBEDDED WORK

APPLICABLE STANDARD DRAWINGS

OPSD 4010.0000 GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 4601.0000 LOCATION OF SITE NUMBER AND DATE FIGURES



DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS	DESCRIPTION
DESIGN NSKD	CHK RSS
DRAWN KGP	CHK NSKD
CODE	CHBDC-00
CL	CL
DATE	JUNE, 2005
DWG	1

DIST 6 HWY 404
CONT No. 2007-2265
WP No. 2105-05-00

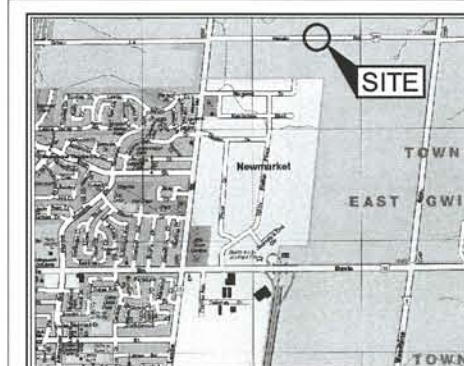
HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS
BOREHOLE LOCATIONS & SOIL STRATA



SHEET
14



Golder Associates Ltd.
MISSISSAUGA, ONTARIO, CANADA



KEY PLAN

LEGEND

- Borehole - Current Golder Associates Ltd. Investigation
- Seal
- Piezometer
- N Blows/0.3m (Std. Pen. Test, 475 j/blow)
- WL in piezometer on January, 4/00
- WL upon completion of drilling

No.	ELEVATION	LOCATION	
		NORTHING	EASTING
8	293.05	4883020.38	310922.15
9	293.50	4883028.58	310947.99
10	294.43	4882989.63	310927.84
11	294.56	4882988.59	310955.79
12	295.33	4882974.19	310945.28
13	292.07	4883044.82	310932.00
14	294.58	4883020.24	310970.72

NOTES

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REFERENCE

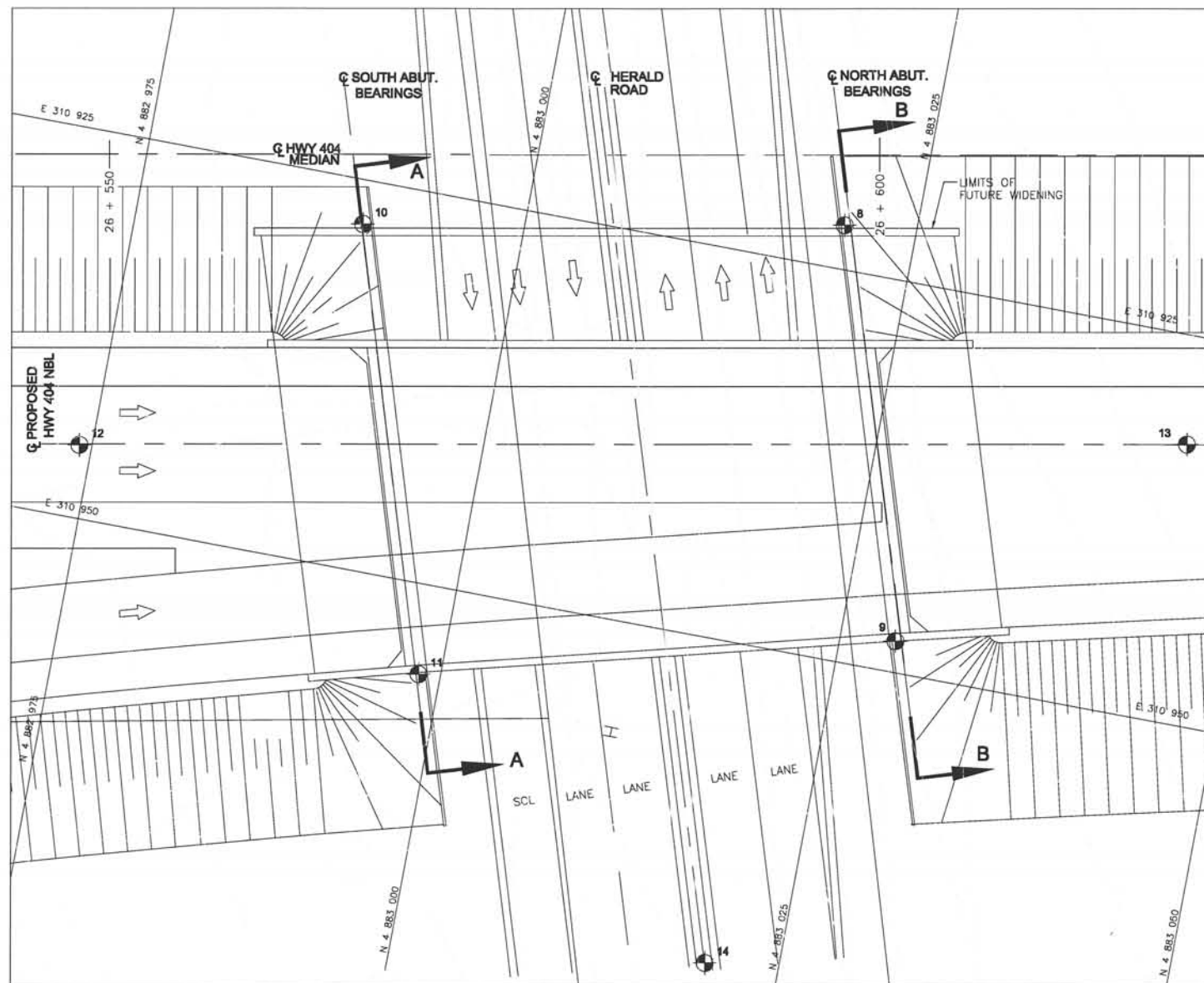
This drawing was created from digital file "S320D-01.dwg" titled "HIGHWAY 404 N.B.L. HERALD ROAD OVERPASS" provided by McCormick Rankin Corp.

NO.	DATE	BY	REVISION
1	00/01/05	AMP	FINAL

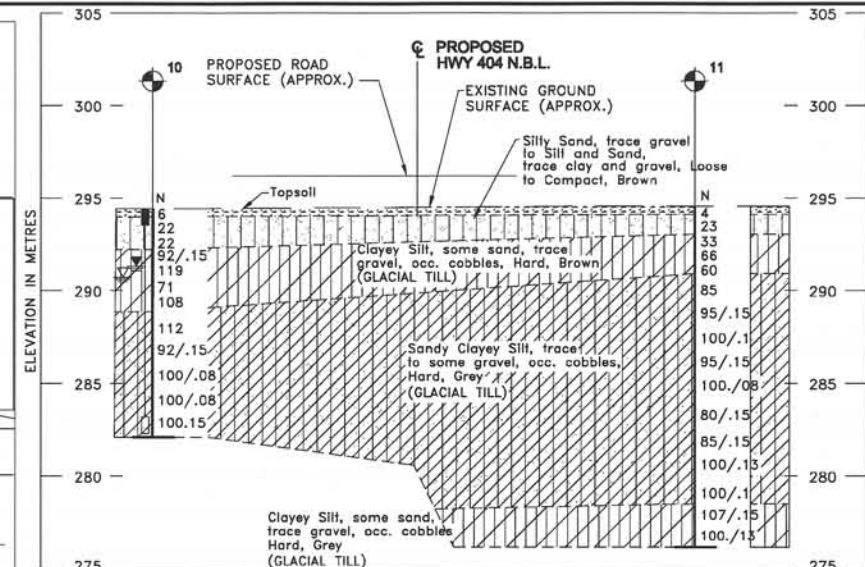
Geocres No.

HWY. No.	404	PROJECT NO.:	991-1162A	DIST.	6
SUBM'D.	DKB	CHKD:	AMP	DATE:	1999 12 01
DRAWN:	JFC	CHKD:	DKB	APPD.	
				DWG.	2

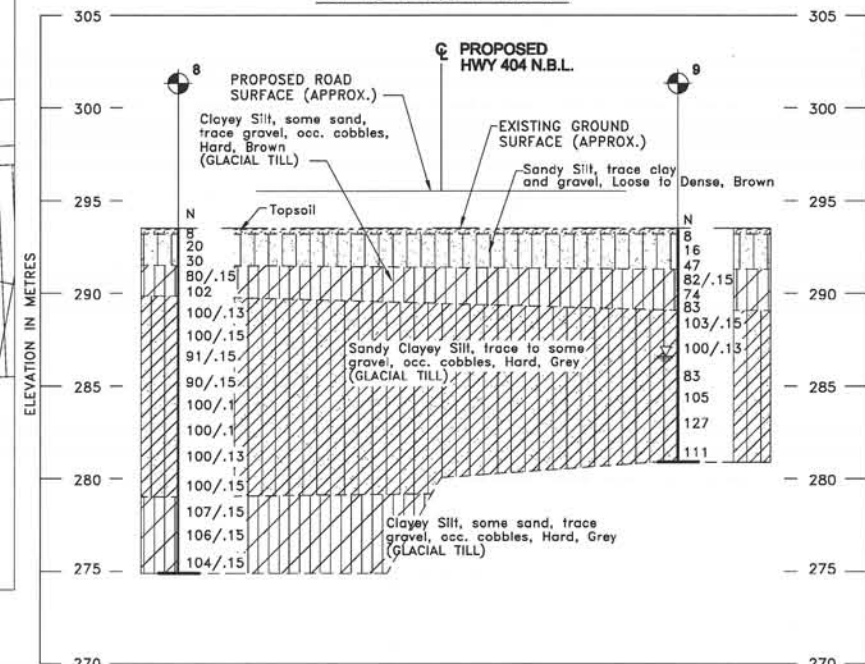
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN



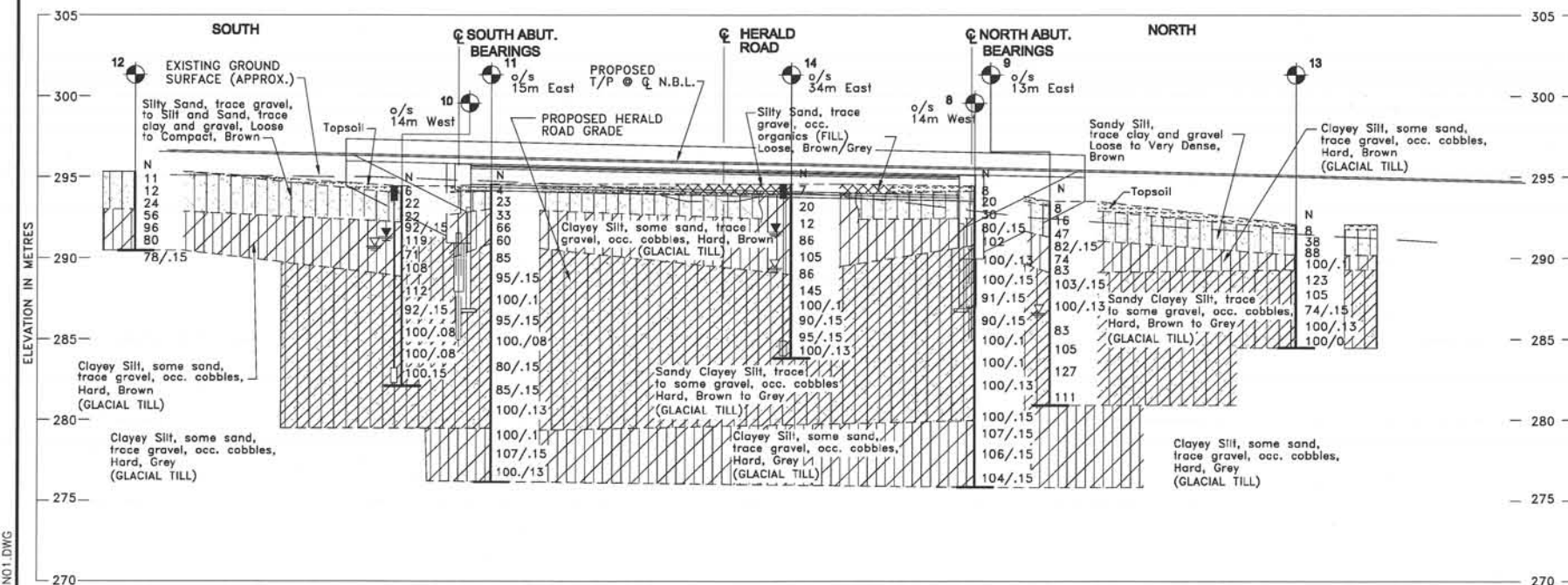
PLAN



SECTION A-A



SECTION B-B



PROFILE ALONG HWY 404 N.B.L.

01162N01.DWG

1" = 1" IMP. (1:200 MS)



DIST
CONT No 2007-2265
WP No 2105-05-00

HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS
ABUTMENT PILE
LAYOUT AND DETAILS

SHEET
15



McCORMICK RANKIN
CORPORATION

NOTES:

1. PILES TO BE HP310 x 132 STEEL "H" PILES WITH DRIVING SHOES.
2. PILE SPACINGS ARE MEASURED AT THE UNDERSIDE OF ABUTMENT.
3. PILE LENGTHS SHOWN ARE THEORETICAL LENGTHS BELOW CUT-OFF AND ARE BASED ON ESTIMATED TIP ELEVATIONS. FINAL LENGTHS AND TIP ELEVATIONS SHALL BE DETERMINED ON SITE FROM PILE DRIVING RECORDS (SEE NOTE 6).
4. WELDING SHALL CONFORM TO CSA STANDARD WS9 AND SHALL BE DONE BY A WELDER QUALIFIED UNDER CSA STANDARD W47.
5. PILES TO BE DRIVEN IN ACCORDANCE WITH SS103-11 USING AN ULTIMATE CAPACITY OF 3200 kN PER PILE.
6. READ THIS DRAWING IN CONJUNCTION WITH DWG. 4.

CONSTRUCTION SEQUENCE:

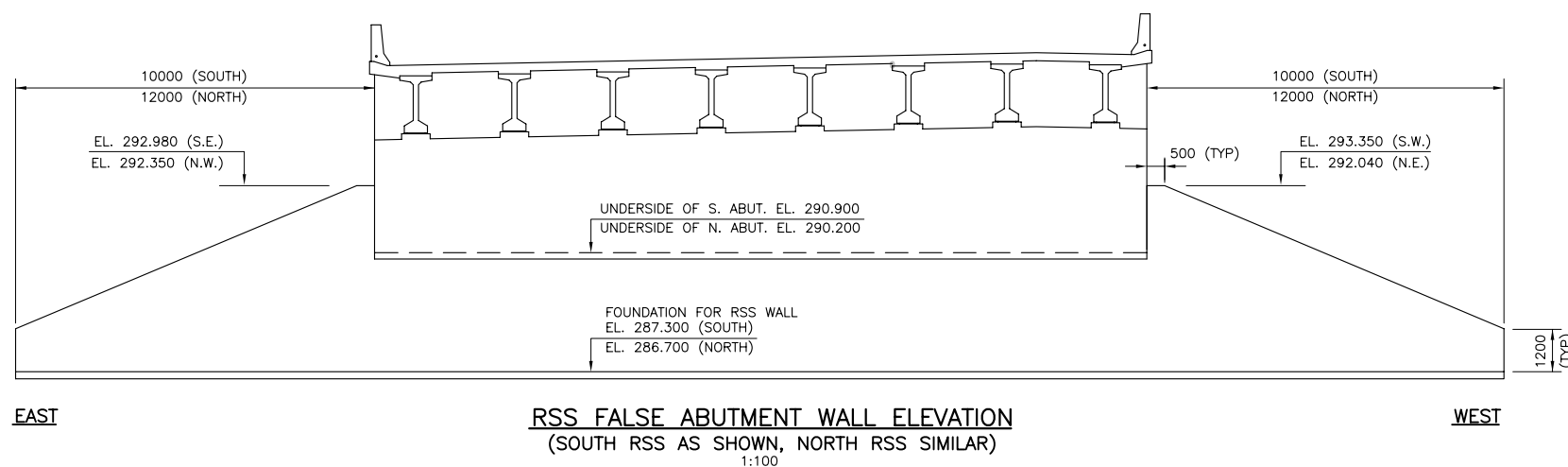
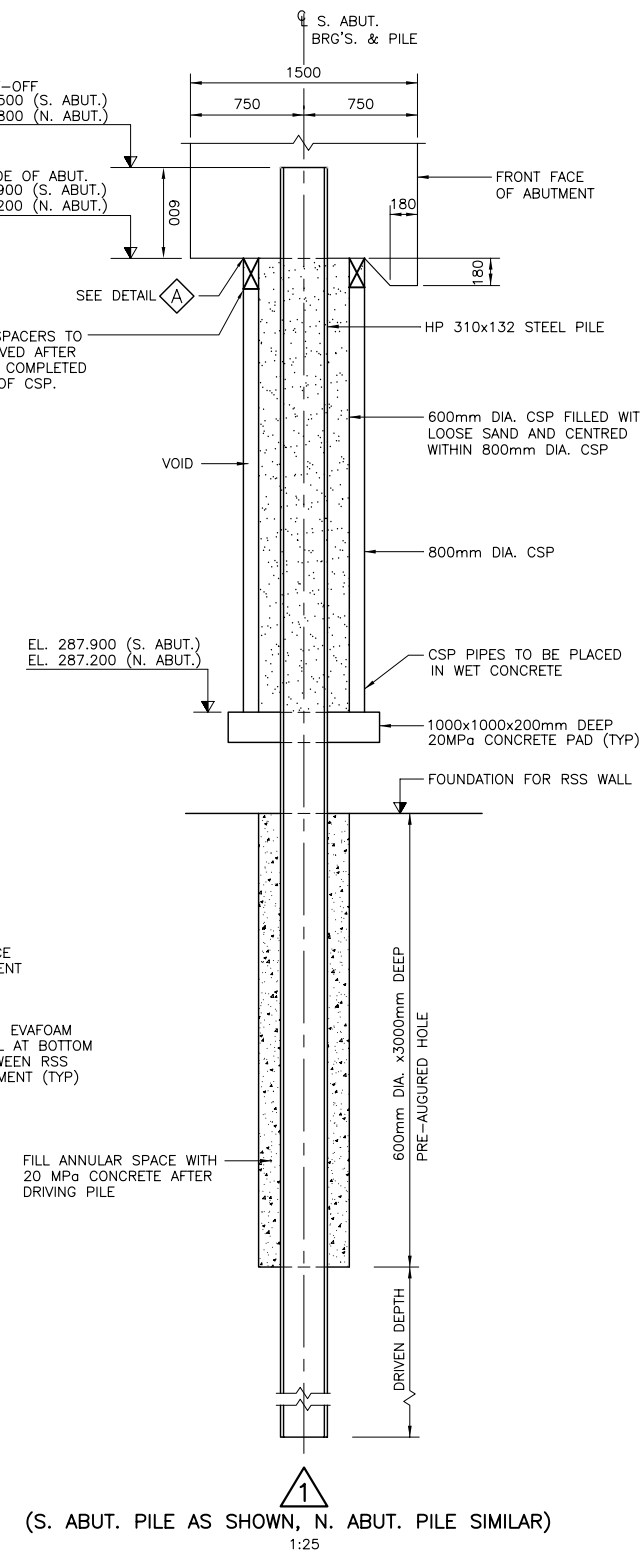
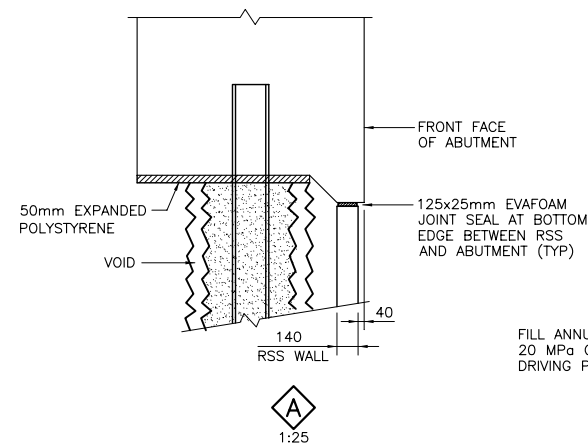
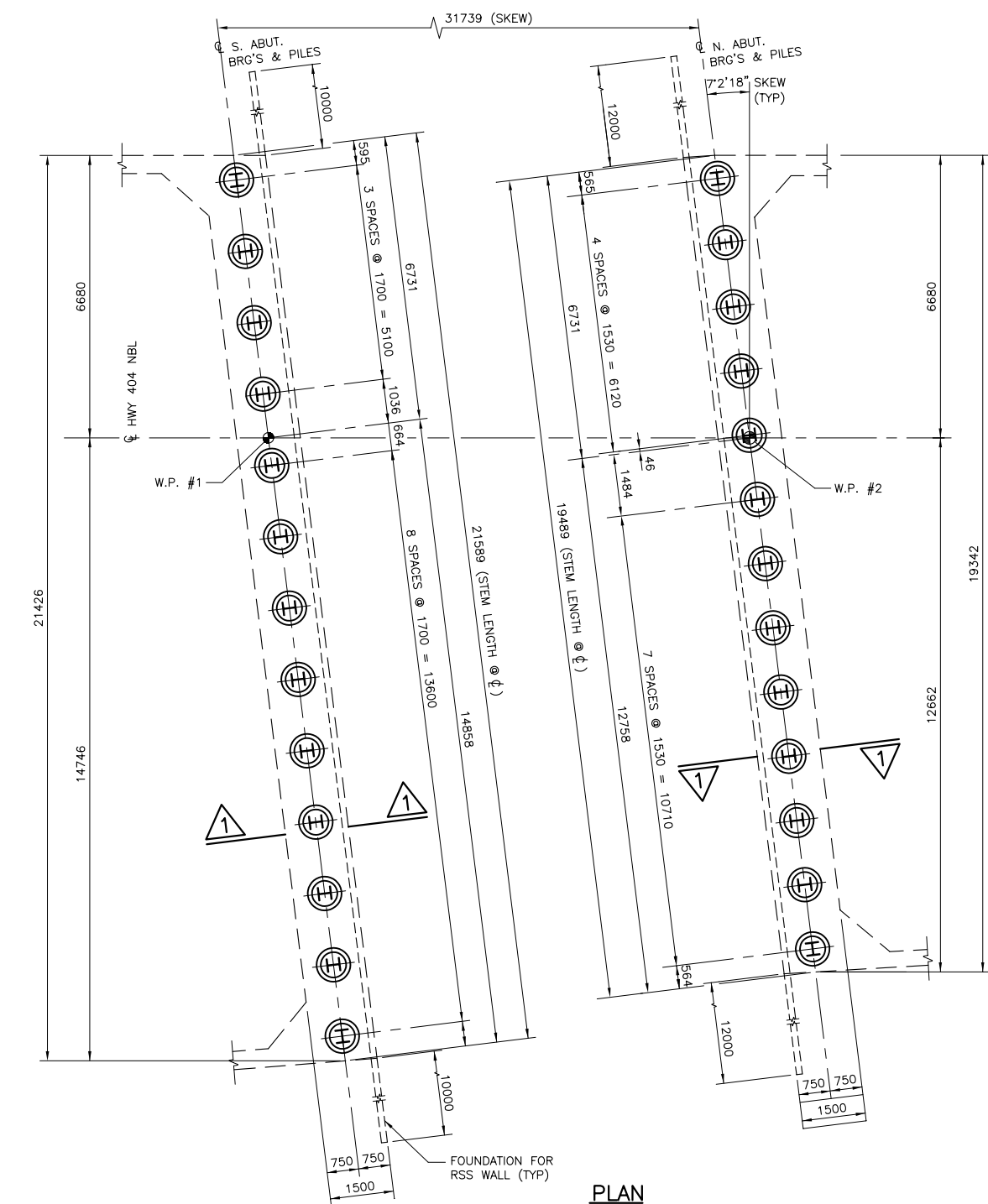
1. EXCAVATE FOR RSS WALLS.
2. AUGER 600mm DIA. HOLES 3000mm DEEP
3. DRIVE PILES
4. CONSTRUCT RETAINED SOIL SYSTEM WALLS.
5. BACKFILL TO BOTTOM OF CONCRETE PADS AT PILES.
6. CONSTRUCT PADS AND PLACE CSP PIPES ON WET CONCRETE WITH SPACERS.
7. FILL 600mm DIA. CSP PIPES WITH LOOSE SAND, COVER TOP UNTIL START OF ABUTMENT CONSTRUCTION.
8. BACKFILL WITH GRANULAR TO UNDERSIDE OF ABUTMENT.
9. REMOVE PILE COVERS AND CONSTRUCT ABUTMENTS TO UNDERSIDE OF BEARING PAD.

LOCATION	NO. REQUIRED	LENGTH (mm)	BATTER
N. ABUTMENT	13	7600	VERTICAL
S. ABUTMENT	13	7600	VERTICAL

PILE DESIGN DATA FOR HP 310x132

CAPACITY AT ULS = 1600 kN

WP	STATION ALONG C HWY. 404 MEDIAN PROFILE CONTROL	CO-ORDINATES	
		NORTHING	EASTING
1	26 + 568.131	4 882 993.885	310 941.53
2	26 + 599.870	4 883 025.082	310 935.70



DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

APPLICABLE STANDARD DRAWINGS

SS103-11 PILE DRIVING CONTROL
SS103-12 SPLICE AND DRIVING SHOE DETAILS FOR STEEL H-PILES

REVISIONS							
DESCRIPTION							
DESIGN NSKD	CHK RSS	CODE	CHBCC-00	CL	625-ONT	DATE	JUNE, 2005
DRAWN DPV	CHK NSKD	SITE	37-1505N			DWG	3

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

DIST
CONT No 2007-2265
WP No 2105-05-00

HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS
ABUTMENT DETAILS



SHEET
16



McCORMICK RANKIN
CORPORATION

NOTES:

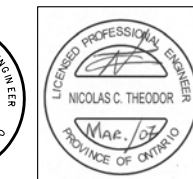
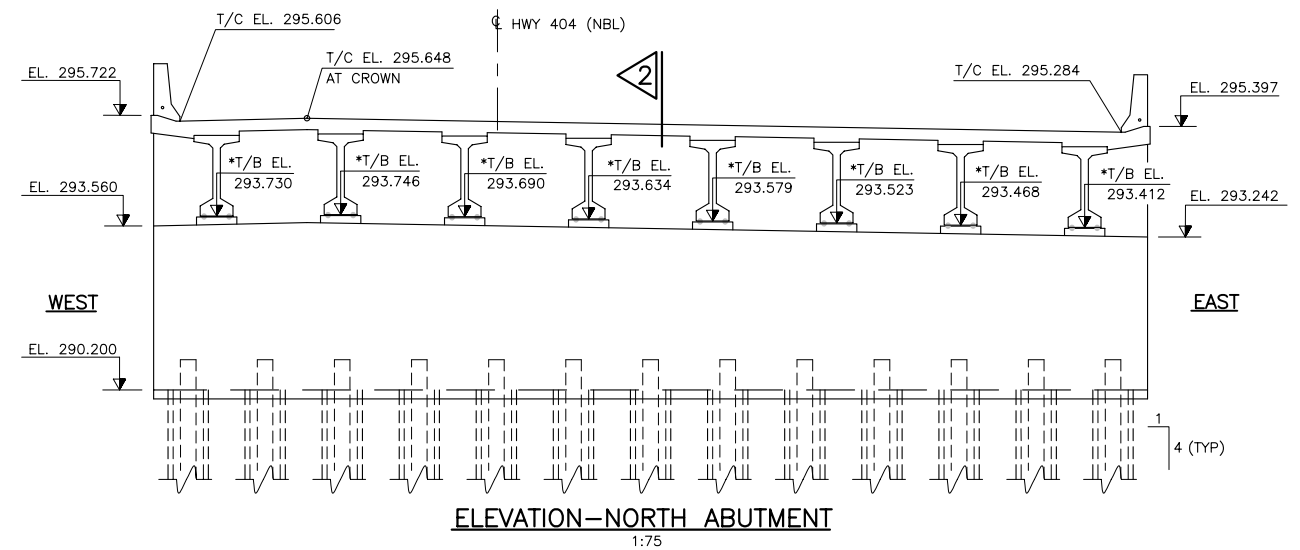
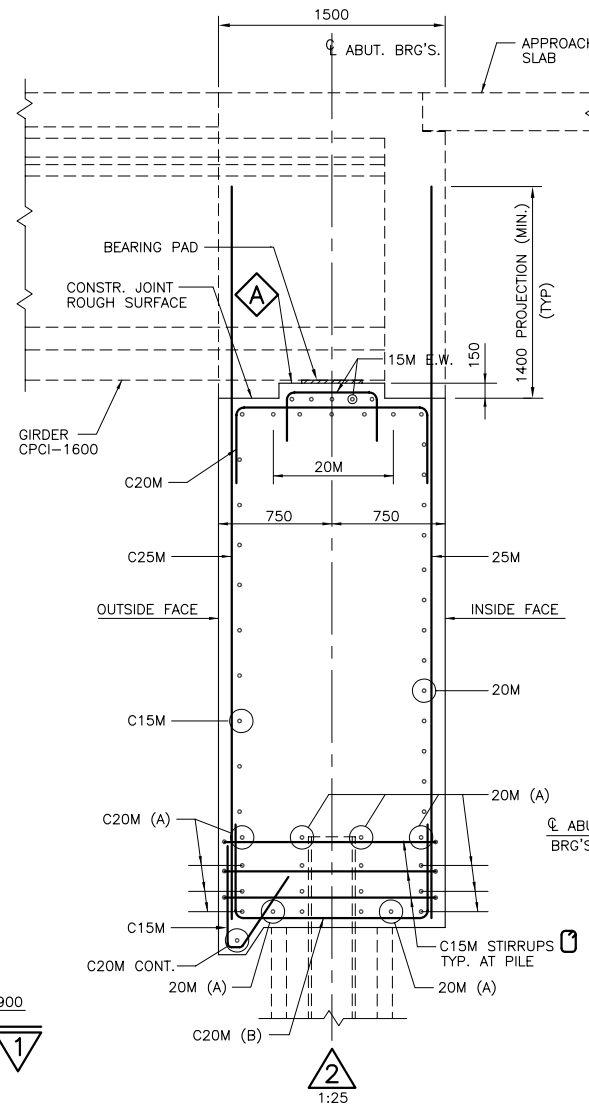
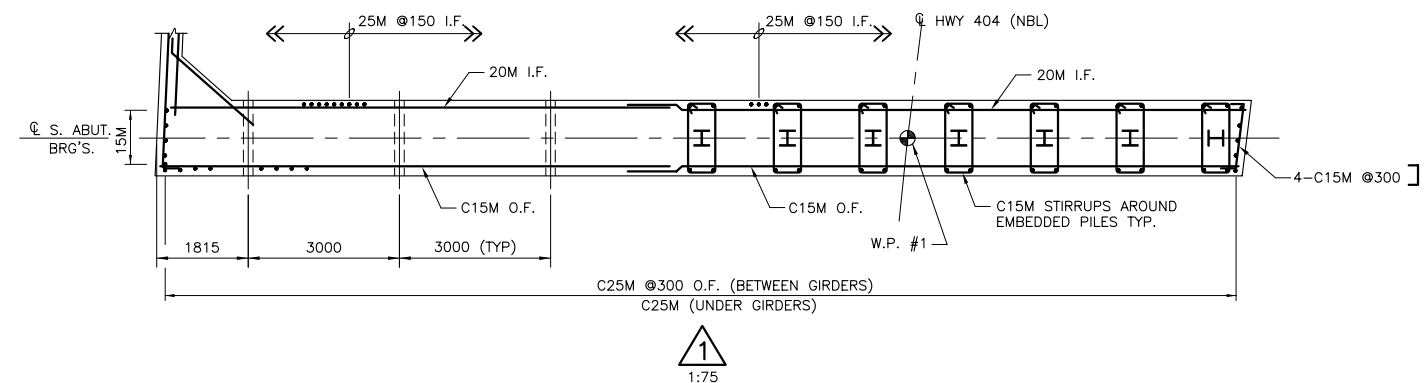
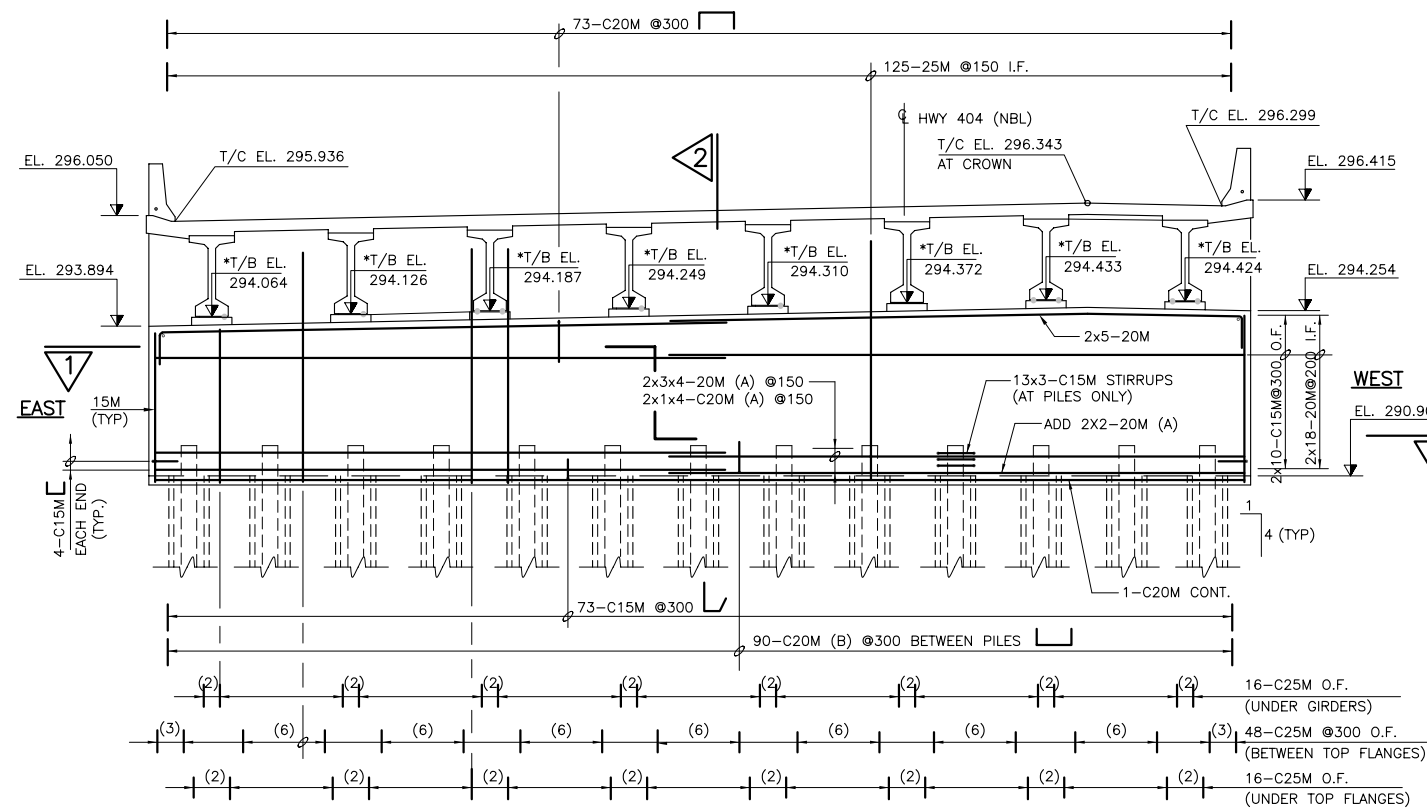
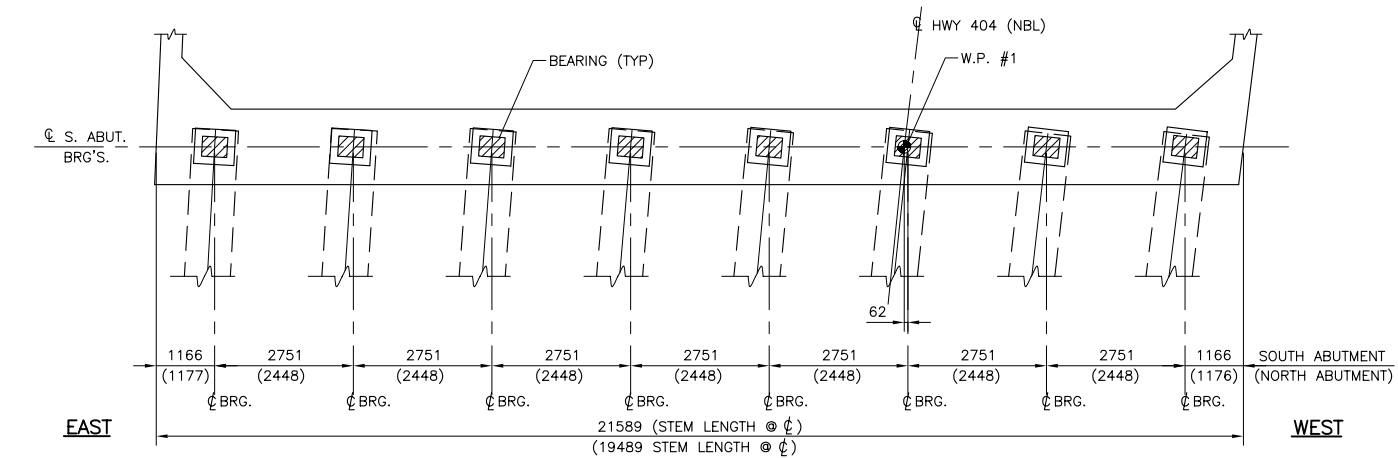
1. FOR BEARING DESIGN DATA SEE DWG. 6
2. * SEE CONSTRUCTION NOTES ON DWG. 1
3. READ THIS DRAWING IN CONJUNCTION WITH DWG'S. 3 AND 5

LIST OF ABBREVIATIONS

- O.F. DENOTES OUTSIDE FACE
- I.F. DENOTES INSIDE FACE
- T/B DENOTES TOP OF BEARING
- T/C DENOTES TOP OF CONCRETE
- W.P. DENOTES WORKING POINT
(FOR WORKING POINT DATA SEE DWG. 3)
- RSS DENOTES RETAINED SOIL SYSTEM

CONSTRUCTION SEQUENCE:

1. ABUTMENTS SHALL BE CONSTRUCTED FIRST TO BEARING SEAT ELEVATION.
2. CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS TO PROVIDE STABILITY DURING CONSTRUCTION.
3. ERECT THE GIRDERS. SURFACES OF THE GIRDER EMBEDDED IN THE ABUTMENT SHALL BE ABRASIVE BLAST CLEANED.
4. THE TOP SECTION OF THE ABUTMENTS ABOVE THE BEARING SEAT ELEVATION SHALL TO BE CAST IN THE SAME POUR AS AS CONCRETE SLAB AND SHOULD BE VIBRATED THOROUGHLY.
5. FORMWORK AND LATERAL BRACING FOR ABUTMENTS AND WINGWALLS SHALL NOT BE REMOVED UNTIL DECK CONCRETE HAS REACHED 25MPa STRENGTH.
6. STABILITY AND THE INTEGRITY OF THE STRUCTURE SHALL BE MAINTAINED AT ALL STAGES OF THE CONSTRUCTION.



DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

APPLICABLE STANDARD DRAWINGS

3501.0000 MINIMUM GRANULAR BACKFILL REQUIREMENTS-ABUTMENTS
(INTEGRAL ABUTMENT)

REVISIONS	DESCRIPTION
DESIGN NSKD	CHK RSS
DRAWN DPV	CHK NSKD
CODE	CHBDC-00
CL	625-ONT
DATE	JUNE, 2005
DWG	4

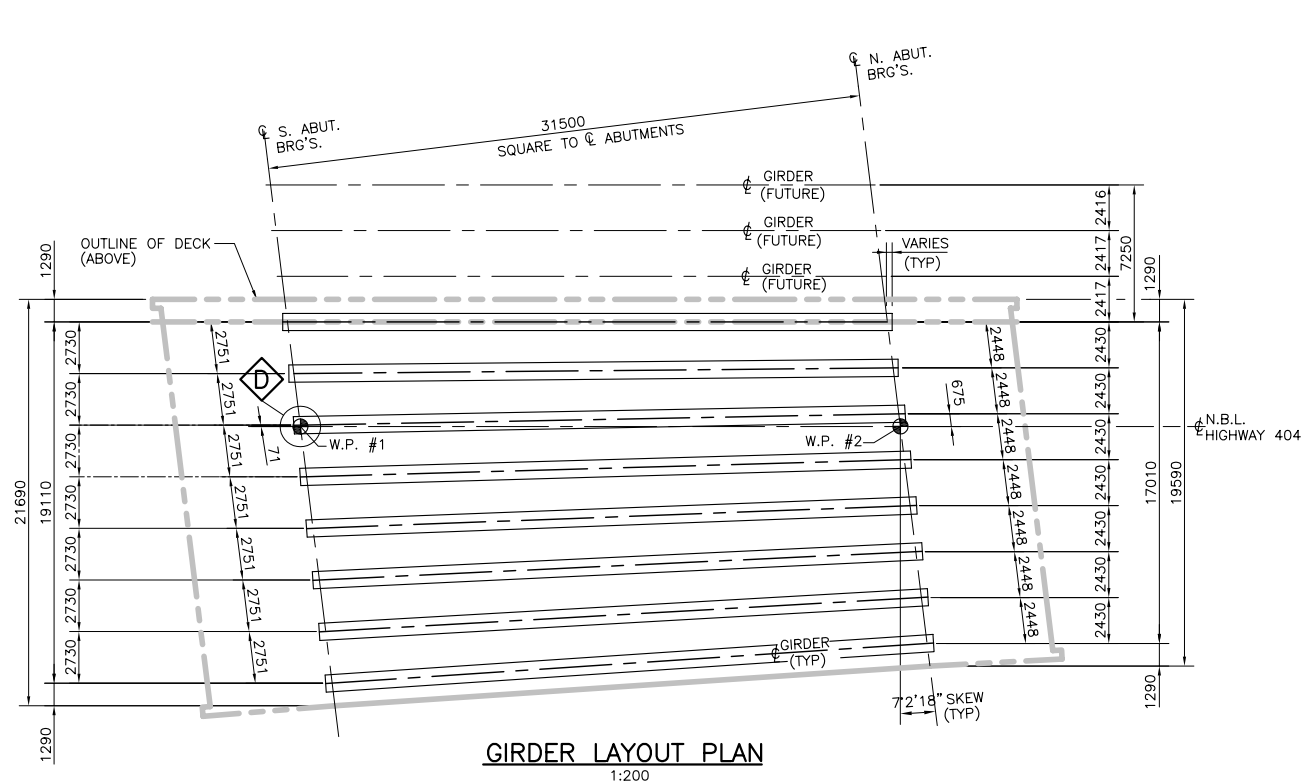
HEET
17



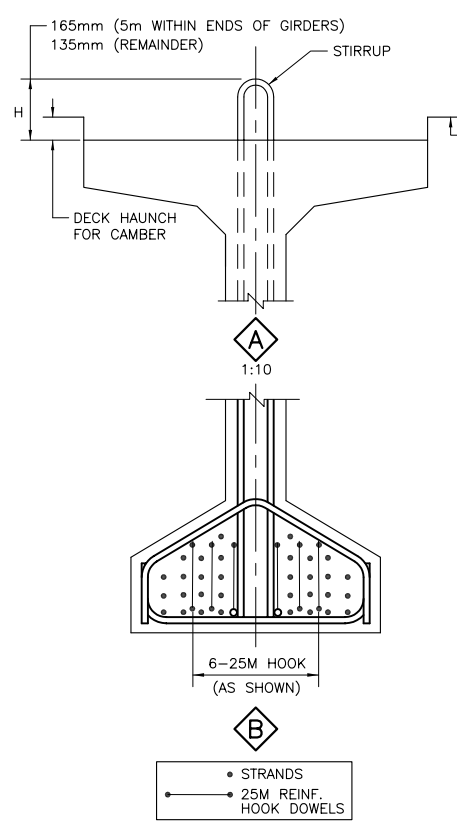
REVISIONS						
DESCRIPTION						
DESIGN NSKD	CHK RSS	CODE	CHBC-00	CL	625-ONT	DATE JUNE, 2005
DRAWN DPV	CHK NSKD	SITE	37-1505N			DWG 5

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

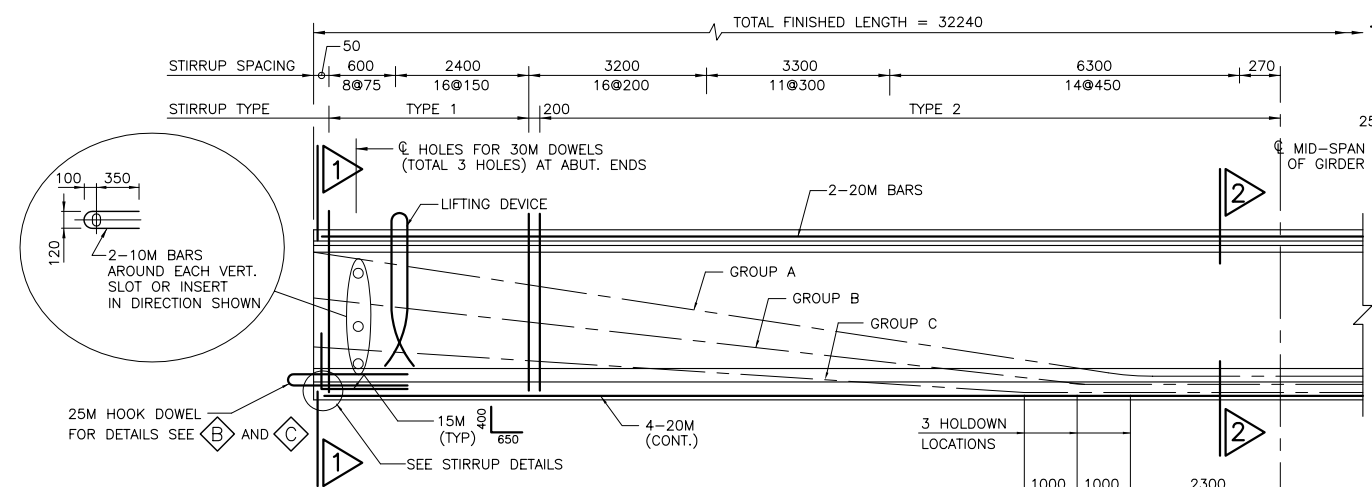
18-21050500_Girders-Brgs.DWG
1999/10/26
2007/03/13
11:42:50
DRAFTING NAME:
CREATED:
MODIFIED:



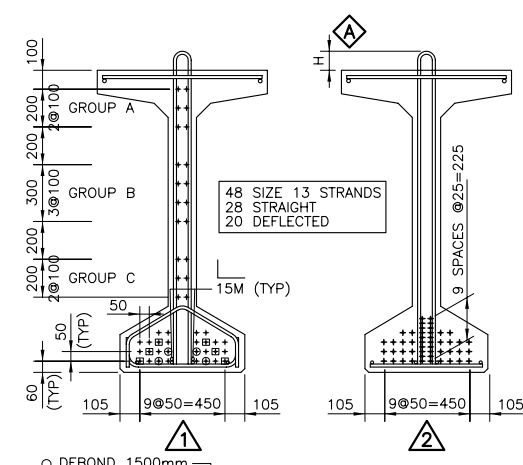
GIRDER LAYOUT PLAN
1:200



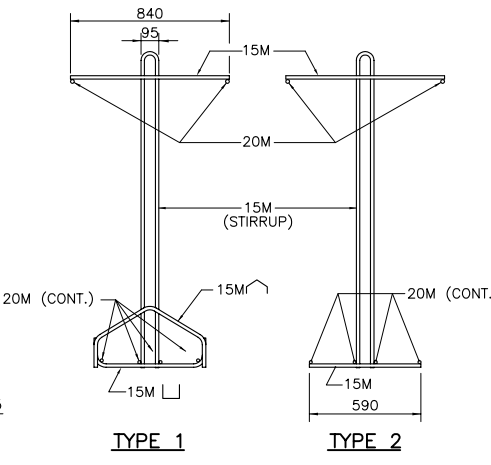
DOWEL DETAIL AT ABUT. END
1:10



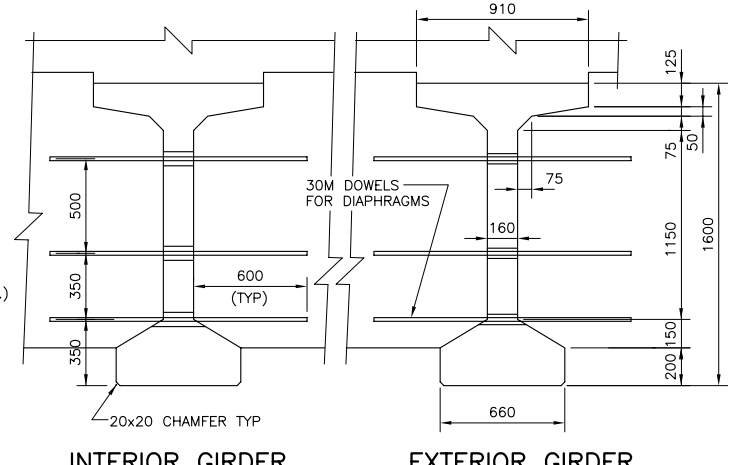
HALF ELEVATION
1:30



GIRDER "A"
(46 STRANDS)
1:20



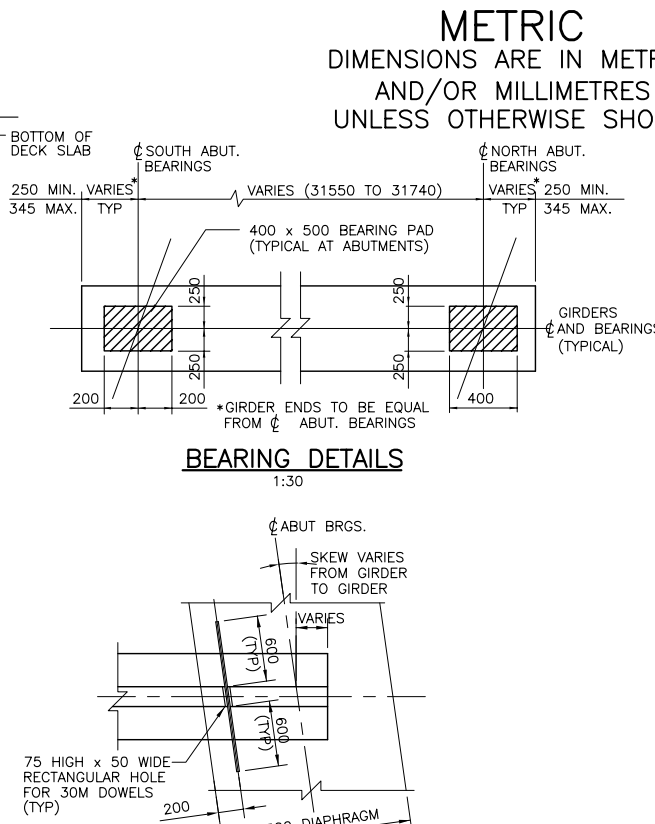
STIRRUP DETAILS
1:20



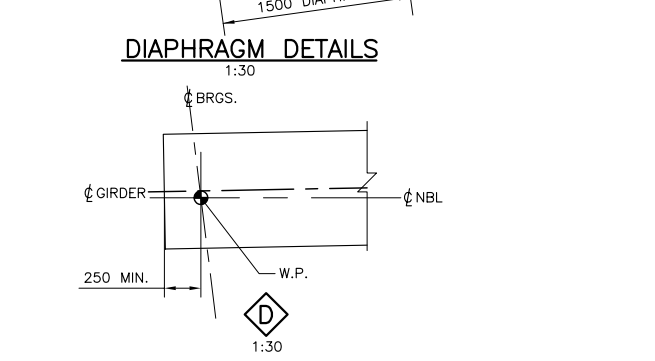
INTERIOR GIRDER
1:20

EXTERIOR GIRDER
1:20

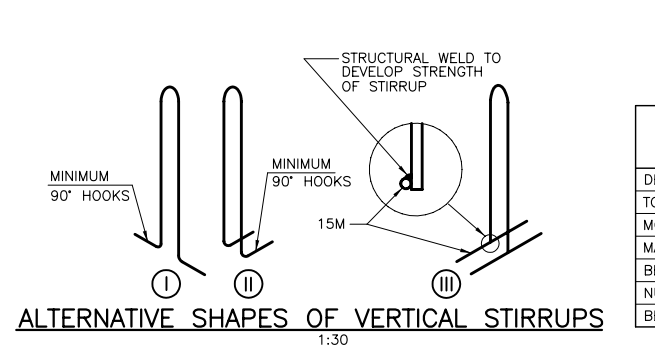
CPCI 1600



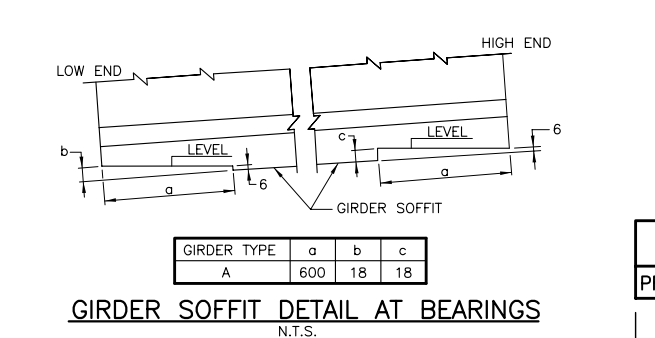
BEARING DETAILS
1:30



DIAPHRAGM DETAILS
1:30



ALTERNATIVE SHAPES OF VERTICAL STIRRUPS
1:30



GIRDER SOFFIT DETAIL AT BEARINGS
N.T.S.

GIRDER TYPE	a	b	c
A	600	18	18

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

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

DIST
CONT No 2007-2265
WP No 2105-05-00

HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS
PRESTRESSED GIRDER AND
BEARING DETAILS

MCCORMICK RANKIN
CORPORATION

- NOTES
1. PRESTRESSING STEEL SHALL BE LOW-RELAXATION SEVEN WIRE STRANDS, SIZE DESIGNATION 13, GRADE 1860.
 2. MINIMUM BREAKING STRENGTH OF STRAND 183.7 kN.
 3. JACKING FORCE PER STRAND 143.3 kN.
 4. FORCE PER STRAND AFTER ALL LOSSES 110.3 kN.
 5. THE ELAPSED TIME INTERVAL BETWEEN JACKING OF STRANDS AND TRANSFER SHALL NOT BE LESS THAN 15 HOURS.
 6. PRESTRESSING STRANDS SHALL BE SPACED VERTICALLY AT A MINIMUM OF 150mm IN THE VICINITY OF RECTANGULAR HOLES OR INSERTS FOR 20M DOWELS.
 7. THE VERTICAL SPACING OF PRESTRESSING STRANDS IN THE WEB BETWEEN LOCATIONS OF HOLD-DOWN POINTS SHOWN ON THIS DRAWING MAY BE INCREASED TO SUIT THE FABRICATOR'S HARDWARE CAPABILITIES TO A MAXIMUM OF 50 mm. IF THE SPECIFIED STRAND SPACING IS CHANGED, THE FABRICATOR SHALL BE RESPONSIBLE FOR ADJUSTING THE NUMBER OF STRANDS TO ENSURE THAT THE SAME FORCE EFFECT IS PRODUCED AS REQUIRED BY THE DESIGN.
 8. CLASS OF CONCRETE 50 MPa.
 9. CONCRETE STRENGTH AT TRANSFER 37 MPa.
 10. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CAN/CSA STANDARD G30.18-M92.
 11. CLEAR COVER TO REINFORCING STEEL 30 +10mm/-5mm.
 12. REINFORCING STEEL WITH A CLEAR COVER OF LESS THAN 125mm AND LOCATED WITHIN 3000mm FROM THE GIRDER ENDS AT EXPANSION JOINT SHALL BE EPOXY COATED.
 13. FOR BRIDGES ON GRADES EXCEEDING 3%, THE ENDS OF GIRDERS SHALL BE CAST SO THAT THEY ARE VERTICAL WHEN ERECTED.
 14. AT ENDS OF GIRDERS WHICH ARE NOT TO BE ENCASED IN CONCRETE, STRAND ENDS SHALL BE RECESSED AND GROUTED, AND GIRDER END FACE SHALL BE PAINTED WITH TWO COATS OF ASPHALTIC PAINT.
 15. DOWEL INSERTS SHALL BE ZINC PLATED OR GALVANIZED IN ACCORDANCE WITH CSA STANDARD G164-M92.
 16. DOWEL INSERTS SHALL BE CAPABLE OF DEVELOPING A FORCE IN TENSION OF 20 kN AT SERVICEABILITY LIMIT STATES LOADING.
 17. FOR THE DIAPHRAGMS, THE PRECASTER WILL SUPPLY THE THREADED INSERTS AND THE MATCHING DIAPHRAGM DOWELS FOR THE EXTERIOR GIRDERS ONLY.
 18. 20M DEFORMED BAR DOWELS FOR EXTERIOR GIRDERS SHALL BE THREADED AT ONE END TO MATCH INSERTS.
 19. IF ANCHORED EMBEDDED STEEL BEARING PLATES ARE REQUIRED AT GIRDER ENDS, THEY SHALL HAVE A THICKNESS OF 20mm. THEY SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH CSA STANDARD G164-M92. ALL DAMAGED GALVANIZED SURFACES SHALL BE COATED WITH TWO COATS OF ZINC-RICH PAINT.
 20. FOR DETAILS OF POSITIVE MOMENT CONNECTION APPLICABLE TO CONTINUOUS GIRDER SEE OPSD-3701.0000.

BEARING DATA	REQUIREMENTS AT SERVICEABILITY LIMIT STATES LOADING
	ABUTMENTS
DEAD LOAD (kN)	550
TOTAL LOAD (kN)	---
MOVEMENT (mm)	---
MAXIMUM SHEAR RATE (kN/mm)	---
BEARING SIZE (mm)	400 x 500 x 20
NUMBER REQUIRED	16
BEARING TYPE	ELASTOMERIC (NATURAL RUBBER)



MODIFIED
SS107-4
STANDARD DRAWING
DECEMBER 2003
PRESTRESSED GIRDERS AND BEARINGS (CPCI 1600)

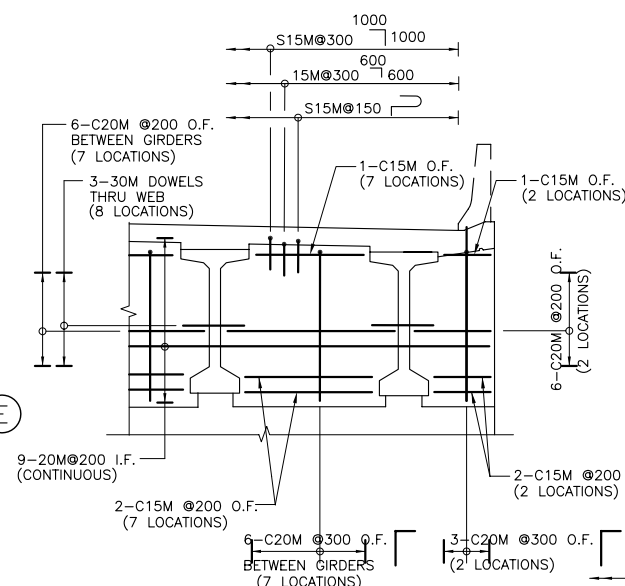
REVISIONS	DESCRIPTION
DESIGN NSKD	CHK RSS
DRAWN DPV	CHK NSKD
CODE CHBDC-00	CL 625-ONT
DATE JUNE, 2005	DWG 6



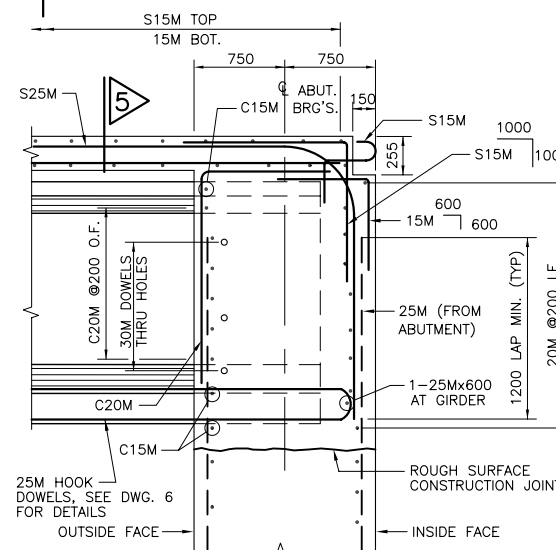
NOTES:

1. SCREEN ELEVATIONS ARE TOP OF CONCRETE.
2. DIAPHRAGMS TO BE CAST IN THE SAME POUR AS THE CONCRETE SLAB AND VIBRATED THOROUGHLY.
3. SCREEN ELEVATIONS INCLUDE ALLOWANCE FOR VERTICAL CURVE AND DEFLECTIONS DUE TO WEIGHT OF SLAB AND SUPER-IMPOSED DEAD LOAD.
4. CONCRETE IN DECK SLAB SHALL BE RETARDED FOR THE DURATION OF THE POUR USING A TYPE Rx RETARDER.
5. CONCRETE IN BARRIER WALLS SHALL NOT BE PLACED UNTIL ALL CONCRETE IN DECK SLAB HAS REACHED A STRENGTH OF 20MPa.
6. COLOUR AND TEXTURE OF EXPOSED FACES OF DIAPHRAGM AND GIRDER'S SHALL MATCH.
7. READ THIS DRAWING IN CONJUNCTION WITH DWG'S. 5, 6 AND 8.

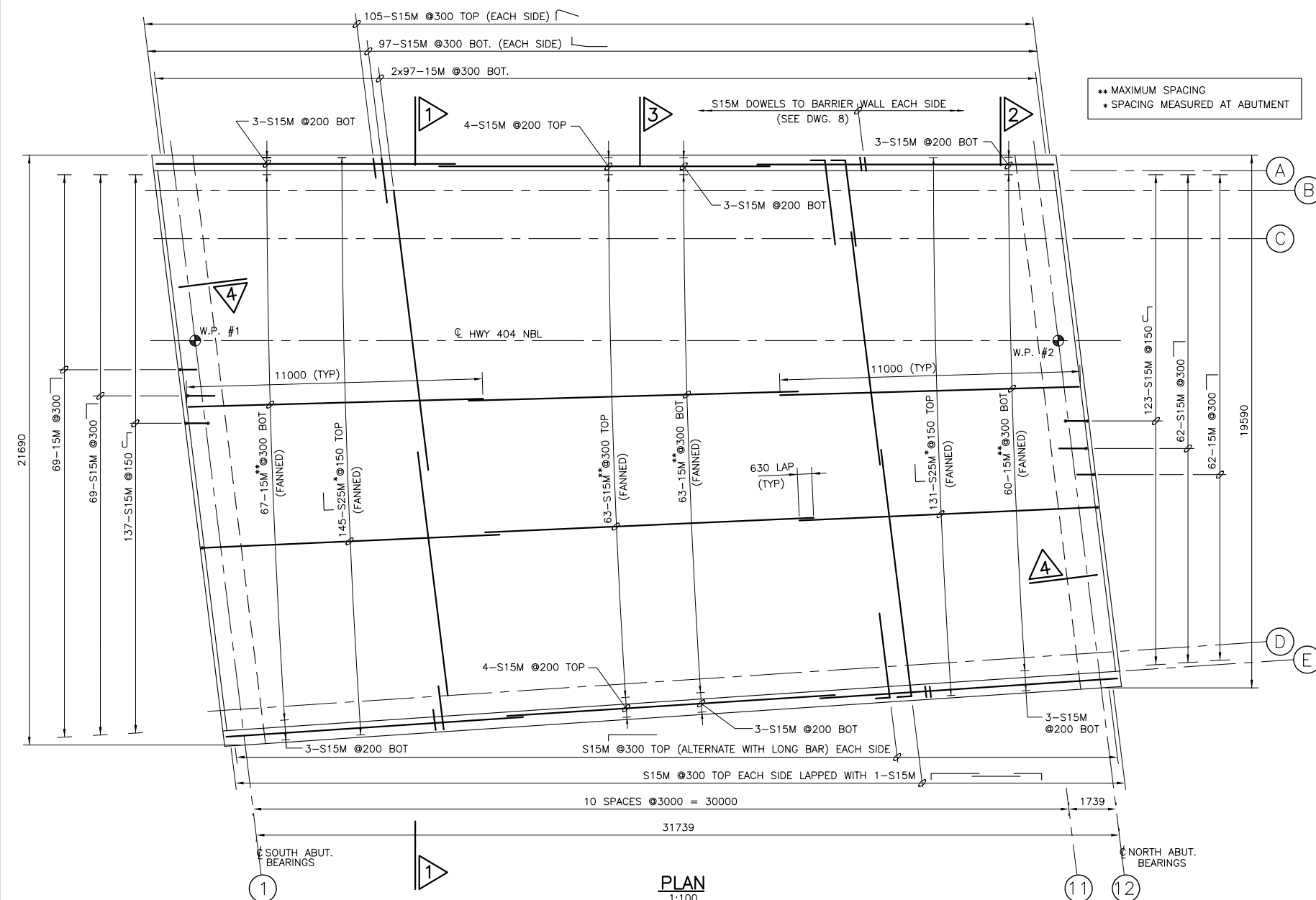
		POINTS	SCREED ELEVATION TOP OF CONCRETE				
			(A)	(B)	(C)	(D)	(E)
S. ABUT.	1	296.299	296.312	296.343	295.952	295.937	
	2	296.252	296.265	296.296	295.909	295.898	
	3	296.198	296.211	296.242	295.859	295.848	
	4	296.144	296.156	296.187	295.809	295.797	
	5	296.085	296.097	296.128	295.753	295.737	
	6	296.023	296.035	296.066	295.695	295.676	
	7	295.956	295.969	295.999	295.632	295.611	
	8	295.886	295.898	295.929	295.566	295.544	
	9	295.811	295.824	295.854	295.496	295.477	
	10	295.734	295.747	295.777	295.423	295.404	
O.F.	11	295.656	295.668	295.699	295.348	295.333	
	12	295.606	295.618	295.648	295.300	295.282	
N. ABUT.							



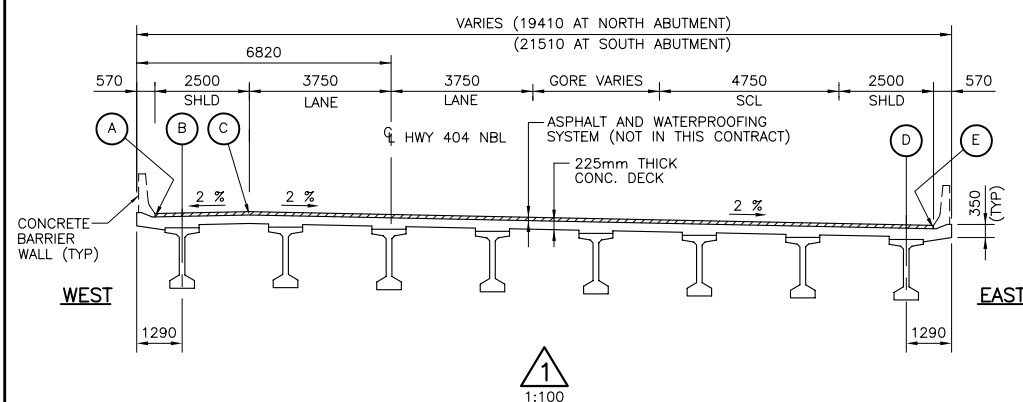

 (AT ABUTMENT DIAPHRAGM)



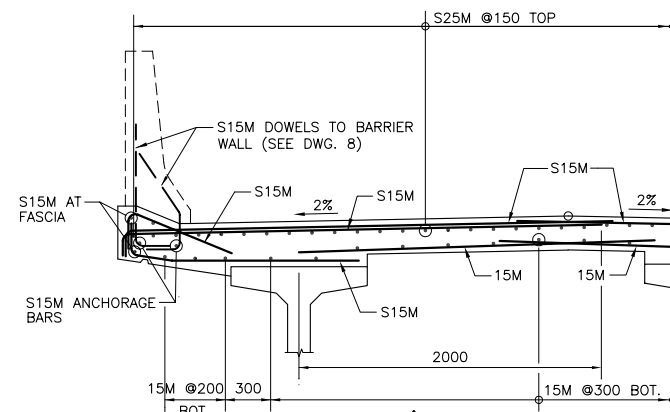
(N. DECK END AS SHOWN, S. DECK END SIMILAR)



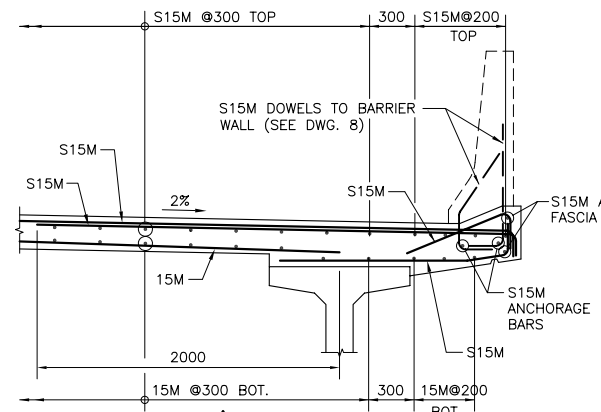
PLAN
1:100



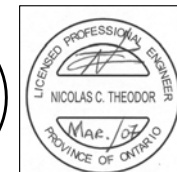
1
1:100



(AT ABUTMENTS)



(AT MID-SPAN)
1:25

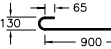
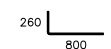
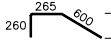
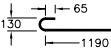
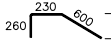
EAST

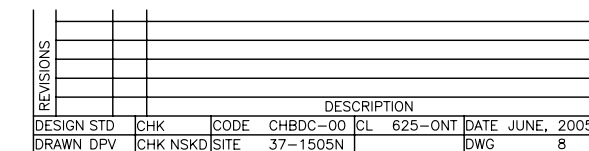
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

APPLICABLE STANDARD DRAWINGS

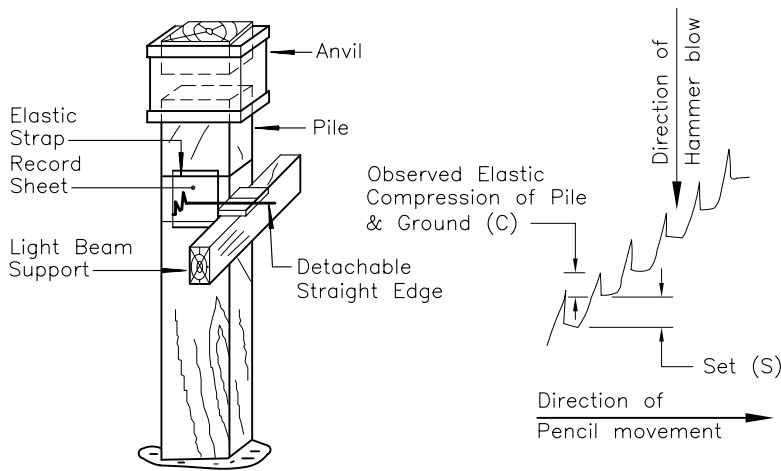
OPSD 3904.0400	DRIP DETAIL
OPSD 3922.0100	SUPPORTS FOR REINFORCING STEEL, FOR SLAB DEPTH 300 mm OR LESS
OPSD 3930.0100	METHOD OF OBTAINING SCREED ELEVATIONS FOR PRECAST CONCRETE GIRDERS
OPSD 4670.000	TYPICAL JOINT DETAILS

REVISIONS							
DESCRIPTION							
DESIGN NSKD	CHK RSS	CODE	CHBDC-00	CL	625-ONT	DATE	JUNE, 200
DRAWN DPV	CHK NSKD	SITE	37-1505N			DWG	7

BAR MARK	SIZE	SHAPE
①	S15M	
②	S15M	
③	S15M	
④	S15M	
⑤	S15M	
⑥	S15M	STRAIGHT
⑦	S15M	STRAIGHT



CREATED: 1997/03/26
MODIFIED:



FIELD MEASUREMENT TECHNIQUE
DURING PILE DRIVING

HAMMERS*		
TYPE	MASS OF RAM W (Kilograms)	RATED ENERGY E (Joules/blow)
9B3	726	12419
10B3	1361	16948
50C	2268	20337
11B3	2268	26005
D12	1250	30506
B225	1360	39300
LB520	2300	40675
B300	1700	46100
D22	2200	53826
B400	2268	62400
D22-02	2200	67000
D22-13	2200	67000
D30-02	3000	91000
D30-13	3000	91000
B500	3129	107100
D36-02	3600	115000
D36-13	3600	115000

NOTE:

Ram may also be referred to as Piston

* See General Notes 5) and 6).

METHOD OF APPLYING THE HILEY FORMULA

The Hiley Formula for:

(a) Double-acting, differential-acting Steam and Diesel Hammers,

$$R = \frac{n e_f E}{S + C/2} \quad \begin{array}{l} e_f = 0.6 \text{ to } 0.8 \text{ for steam hammers} \\ e_f = 1.0 \text{ for diesel hammers} \end{array}$$

(b) Drop Hammers and single-acting Steam Hammers,

$$R = \frac{n e_f WgH}{S + C/2} \quad \begin{array}{l} e_f = 0.75 \text{ for drop hammers} \\ H = \text{height of free fall of mass in metres} \end{array}$$

Where R = Ultimate pile resistance in kilonewtons
 S = Measured penetration of pile per hammer blow in millimetres
 C = Measured rebound of pile per hammer blow in millimetres
 E = Rated Energy of hammer blow in joules
 e_f = efficiency based on manufacturer's gross rated energy (typ. 0.6 to 0.8)
 n = efficiency of blow
 e = coefficient of restitution
 g = 9.80665 m/s²
 $n = \frac{W + Pe^2}{W + P}$
where e = 0.32 for steel (or e = 0.55. See Note 1 below.)
= 0.25 for timber
 P = Mass of pile + anvil or helmet in kilograms (See Note 2 below)
 W = Mass of ram (piston) in kilograms

NOTE 1:

It is assumed that piles are driven with a pile cushion. Where Steel
H-Piles are driven without a cushion, the ultimate pile capacity R should be
calculated assuming a coefficient of Restitution e = 0.55.

NOTE 2:

Assume mass of anvil = 600 kg unless otherwise noted.

NOTE 3:

The resulting Ultimate Pile Resistance, R , as calculated by Hiley Formula must
exceed the Ultimate Geotechnical Resistance given in the Pile Driving Notes
on the Contract Drawings.

EXAMPLE FOR DIESEL HAMMERS

Given: Pile HP 310x110, length = 50m
Mass of anvil = 600 kg
Pile driven without a cushion
Hammer is Delmag D22-13
From the Pile Driving Notes on the Contract Drawings,
Ultimate Geotechnical Resistance = 3000 kN

Observations: measured penetration = S = 5mm
measured rebound = C = 10mm

Hiley Formula Calculations

$$P = 50(110) + 600 = 6100 \text{ kg}$$
$$W = 2200 \text{ kg} \quad e = 0.55$$
$$n = \frac{W + Pe^2}{W + P} = \frac{2200 + 6100(0.55)^2}{2200 + 6100} = 0.49$$

E = 67,000 Joules/blow

$$R = \frac{n e_f E}{S + C/2} = \frac{0.49(1.0)(67,000)}{5 + (10/2)} = \underline{3283 \text{ kN}} > 3000 \text{ kN} \quad \text{O.K.}$$

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

DIST

CONT No 2007-2265

WP No 2105-05-00

HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS

PILE DRIVING CONTROL



SHEET

21



Ministry of Transportation
Engineering Standards Branch
Bridge Office

GENERAL NOTES

- THIS STANDARD DRAWING IS FOR THE CONTROL OF PILE INSTALLATIONS BY VALIDATING DESIGN ASSUMPTIONS.
- THE HILEY FORMULA SHALL BE USED TO CONFIRM PILE RESISTANCE FOR FRICTION-TYPE PILES IN NON-COHESIVE SOILS. FOR USE IN COHESIVE SOILS, THE GEOTECHNICAL ENGINEER WILL HAVE TO BE CONSULTED.
- DURING PILE DRIVING, THE HAMMER HAS TO REBOUND ENOUGH TO MAINTAIN ITS ENERGY PER BLOW. ACCORDINGLY, THE SOIL MUST PROVIDE SUFFICIENT REBOUND FOR THE HILEY FORMULA TO BE EFFECTIVE.
- IF THE ULTIMATE PILE RESISTANCE, AS CALCULATED BY THE HILEY FORMULA, IS NOT REACHED WHEN REFERENCED TO A PRESCRIBED PILE TIP ELEVATION OR RANGE OF ELEVATIONS, THE ADVICE AND RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER SHALL BE SOUGHT.
- THE CONTRACTOR SHALL SUBMIT THE PERTINENT HAMMER PROPERTIES, AS REQUIRED BY OPSS 903.
- THE TABLE OF HAMMERS GIVEN ON THIS STANDARD DRAWING CAN BE USED FOR COMPARING THE SUBMITTED HAMMER PROPERTIES. IT IS APPROXIMATE AND MAY NOT INCLUDE ALL HAMMERS. REFERENCE SHALL BE MADE TO INTERNET WEB SITES FOR HAMMERS TO CHECK CONTRACTOR SUBMISSIONS.
- WHEN APPLYING THE HILEY FORMULA, THE HAMMER SHALL BE OPERATED AT FULL CAPACITY.

EXAMPLE FOR DROP HAMMERS

Given: Timber Pile: length = 15m, density = 641 kg/m³
butt dia. = 0.36m, tip dia. = 0.20m
Mass of Helmet = 300 kg
Mass of Hammer = 2268 kg = W
Fall of Hammer = 1.0 metre = H
 e = 0.25
From Pile Driving Notes on Contract Drawings,
Ultimate Geotechnical Resistance = 750 kN

Observations: measured penetration = S = 5mm
measured rebound = C = 20mm

Hiley Formula Calculations

$$P = (15 \times \frac{\pi}{4} (\frac{0.36 + 0.20}{2})^2 \times 641) + 300 = 892 \text{ kg}$$

e_f = 0.75

W = 2268 kg

$$n = \frac{W + Pe^2}{W + P} = \frac{2268 + 892(0.25)^2}{2268 + 892} = 0.74$$

$$R = \frac{n e_f WgH}{S + C/2} = \frac{0.74(0.75)(2268)(9.806)(1.0)}{5 + (20/2)} = \underline{823 \text{ kN}} > 750 \text{ kN} \quad \text{O.K.}$$

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

STANDARD DRAWING JUNE 2002		SS103-11
PILE DRIVING CONTROL		

REVISIONS		DESCRIPTION			
DESIGN	STD	CHK	CODE	CHBDC-00 CL 625-ONT	DATE JUNE, 2005
DRAWN	STD	CHK	NCT	SITE 37-1505N	DWG 9

10-4219800_Splice-DrivingShoe.DWG
1997/07/30
16:07:58
2005/11/18
MODIFIED:
CREATED:
DRAWING NAME:
CREATED:

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

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

DIST
CONT No 2007-2265
WP No 2105-05-00



HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS
SPlice AND DRIVING SHOE
DETAILS FOR STEEL H-PILES

SHEET
22

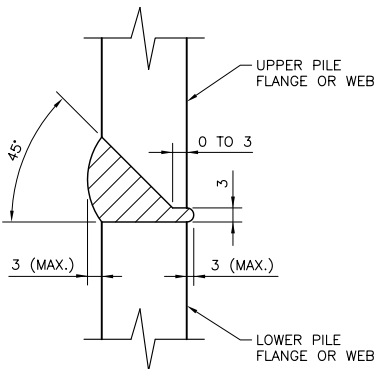
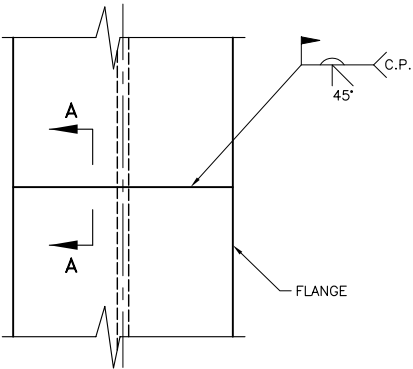
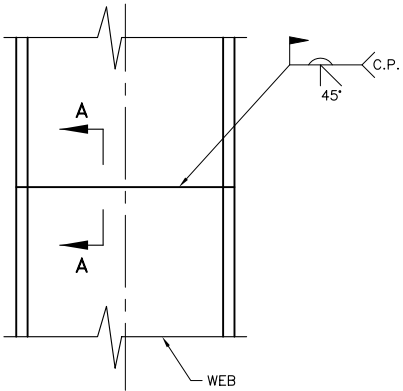
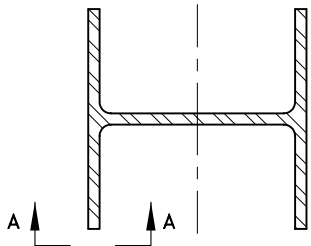


Ministry of Transportation
Engineering Standards Branch
Bridge Office

SPLICE AND DRIVING SHOE
DETAILS FOR STEEL H-PILES

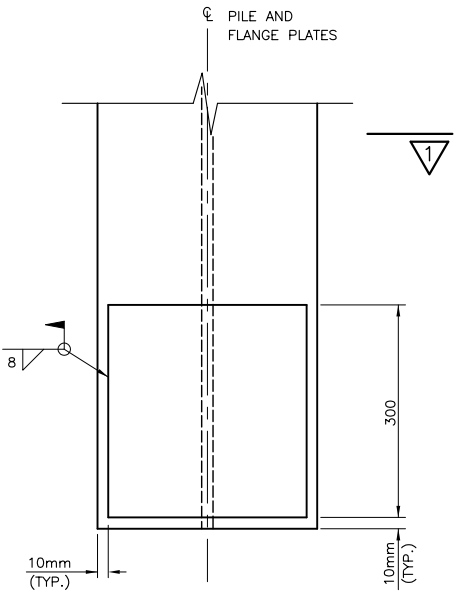
GENERAL NOTES:

1. PILE ENDS TO BE SPLICED SHALL BE CUT SQUARE PERPENDICULAR TO CENTRELINE OF PILE.
2. FLANGE AND SPLICE PLATES SHALL BE ACCORDING TO CSA G40.20/G40.21-98 GRADE 300W.
3. WELDING SHALL BE ACCORDING TO CSA-W59M.
4. THIS STANDARD APPLIES TO H-PILE SIZES HP310x79, HP310x110, AND HP310x132.
5. HANDLING HOLES SHALL ONLY BE MADE IN THE PORTION OF THE PILE TO BE CUT OFF OR IN THE PORTION OF THE PILE IN THE CONCRETE PILE CAP.

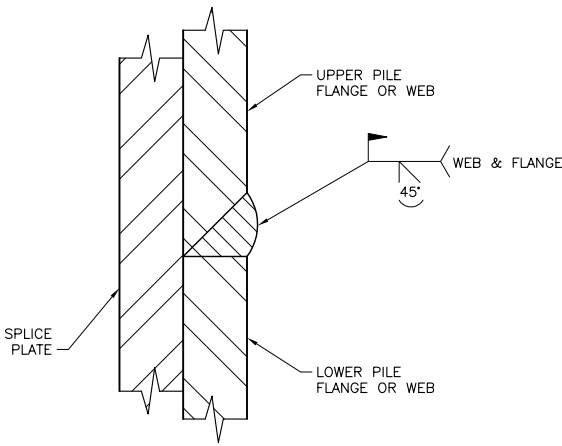
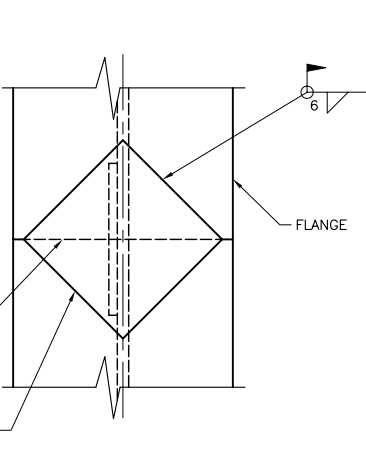
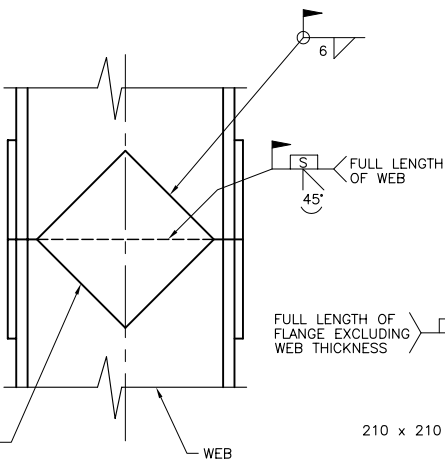
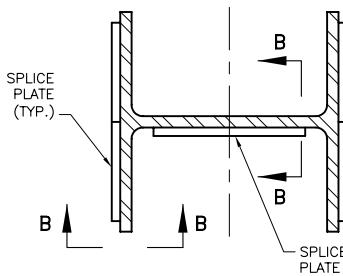


H-PILE SPLICE - ALTERNATE 1

SECTION A-A
100% BUTT WELDED PILE SPLICE

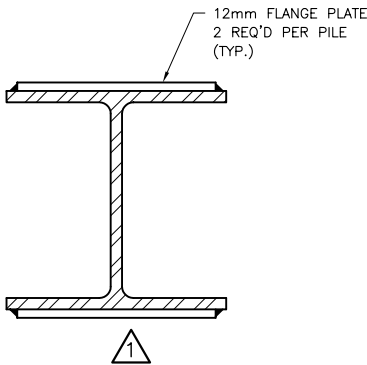


ELEVATION



H-PILE SPLICE - ALTERNATE 2

SECTION B-B
100% BUTT WELDED PILE SPLICE



PILE DRIVING SHOES

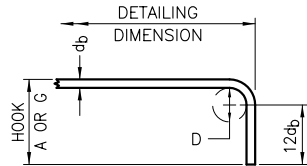
NOTES:

1. SPLICE PLATES FOR FLANGES AND WEB SHALL BE WELDED TO THE UPPER PILE BEFORE POSITIONING.
2. THE UPPER PILE SHALL BE POSITIONED ON AND THE SPLICE PLATES WELDED TO THE LOWER PILE: BUTT WELDS SHALL THEN BE MADE.

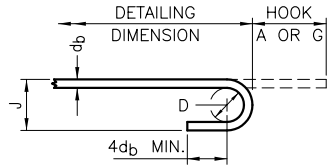
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

STANDARD DRAWING DECEMBER 2003	SS103-12
SPlice AND DRIVING SHOE DETAILS FOR STEEL H-PILES	

REVISIONS		DESCRIPTION	
DESIGN	STD	CHK	CODE
DRAWN	STD	CHK	NCT
SITE		DATE	
37-1505N		JUNE, 2005	
DWG		10	



STANDARD 90° HOOK



STANDARD 180° HOOK

MINIMUM BENDING PIN DIAMETER, D, mm

BAR SIZE	STEEL GRADE	
	400R ⁽²⁾	400W
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 = 420, use the same D as for 400R.

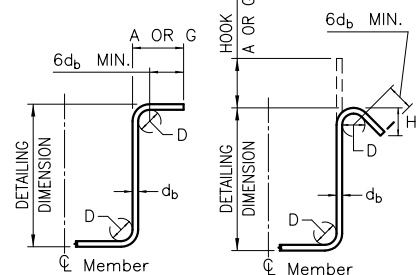
STANDARD HOOK DIMENSIONS

BAR SIZE	90° HOOKS		180° HOOKS			
	A OR G (mm)		A OR G (mm)		J (mm)	
	400R	400W	400R	400W	400R	400W
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-2000.

MINIMUM STIRRUP AND TIE HOOK DIMENSIONS

BAR SIZE	BAR DIAM. db (mm)	PIN DIAM. D (mm)	90°	135°	
			A OR G (mm)	A OR G (mm)	H (approx.) (mm)
10M	11.3	45	100	100	70
15M	16.0	65	140	140	100
20M	19.5	80	180	175	115
25M	25.2	100	230		

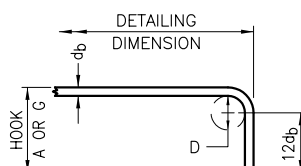


MIN. 90° HOOK MIN. 135° HOOK

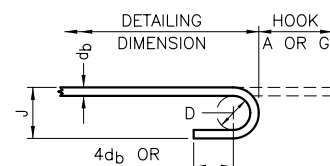
HOOK DIMENSIONS
FOR UNCOATED BARS

Date JUNE 2002 Rev

SS12-1



STANDARD 90° HOOK



STANDARD 180° HOOK

MINIMUM BENDING PIN DIAMETER, D, mm

BAR SIZE	STEEL GRADE
	400
10M	80
15M	120
20M	160
25M	200
30M	240
35M	350
45M	450
55M	550

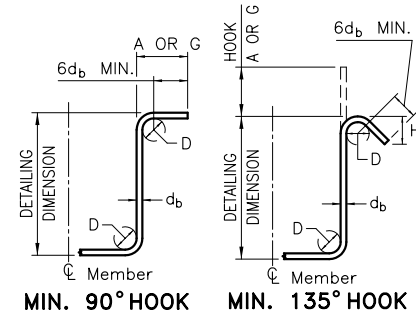
STANDARD HOOK DIMENSIONS

BAR SIZE	90° HOOKS	180° HOOKS	
	A OR G (mm)	A OR G (mm)	J (mm)
10M	190	210 *	110 *
15M	270	260 *	160 *
20M	330	300 *	200
25M	430	330	250
30M	510	460 *	300
35M	640	700 *	430 *
45M	790	850 *	540
55M	1010	1050 *	680 *

NOTE: Tabulated values for Standard Hook Dimensions are the larger of calculated (according to CHBDC-2000) and Reinforcing Steel Institute of Canada (RSIC) requirements. Value marked by '*' indicate RSIC recommended minimum.

MINIMUM STIRRUP AND TIE HOOK DIMENSIONS

BAR SIZE	BAR DIAM. db (mm)	PIN DIAM. D (mm)	90°	135°	
			A OR G (mm)	A OR G (mm)	H (approx.) (mm)
10M	11.3	90	180	190	120
15M	16.0	130	190	220	130
20M	19.5	160	230	260	150
25M	25.2	200	280		



MIN. 90° HOOK MIN. 135° HOOK

NOTE: Value marked by '**' indicates RSIC recommended minimum, based on the average of 90° and 180° hooks.

HOOK DIMENSIONS
FOR COATED BARS

Date JUNE 2002 Rev

SS12-2

DIST
CONT No 2007-2265
WP No 2105-05-00



HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS
STANDARD DETAILS

SHEET
23

Ontario Ministry of Transportation
Engineering Standards Branch
Bridge Office

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

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS		DESCRIPTION			
DESIGN	STD	CHK	CODE	CHBDC-00 CL 625-ONT	DATE JUNE, 2005
DRAWN	STD	CHK	NCT	SITE 37-1505N	DWG 11

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

DIST 6
CONT No 2007-2265
WP No 2105-05-00



HIGHWAY 404 N.B.L.
HERALD ROAD OVERPASS

SHEET

24

ELECTRICAL EMBEDDED I



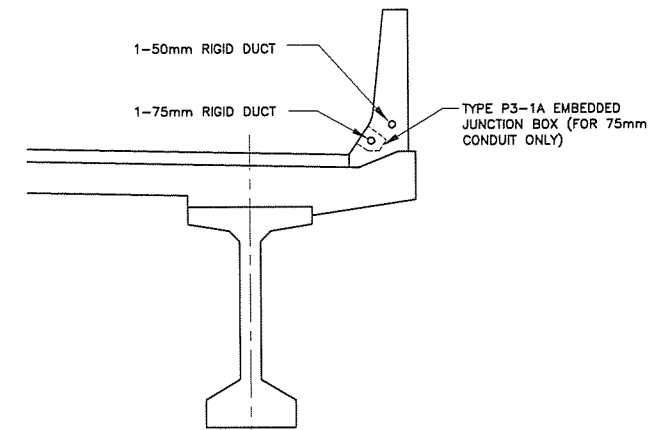
McCORMICK RANKIN
CORPORATION

NOTES:

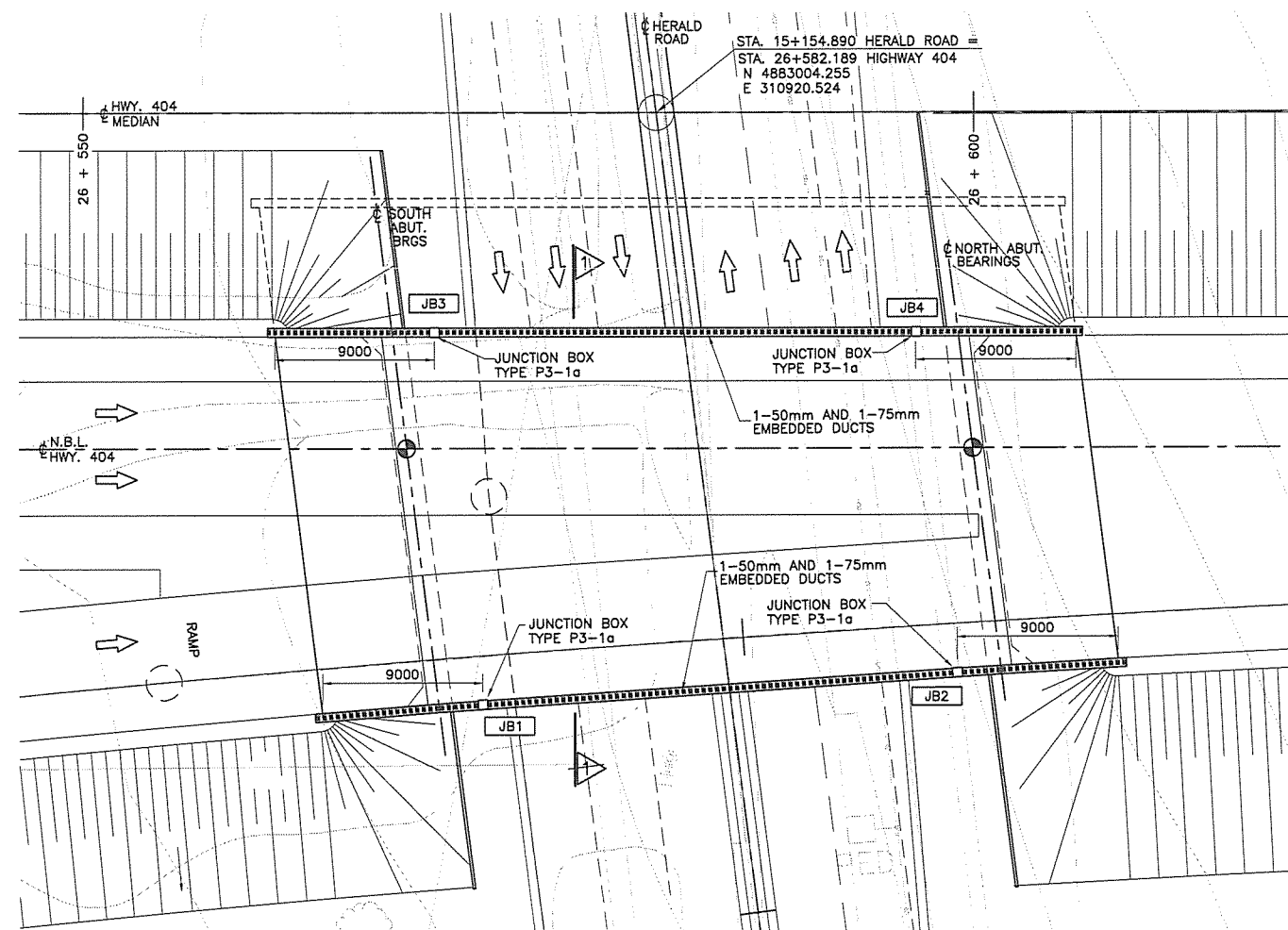
1. EXPANSION AND DEFLECTION FITTING ASSEMBLY SHOWN ON
OPSD 2302.040 IS NOT REQUIRED DUE TO INTEGRAL ABUTMENT
CONSTRUCTION.

LEGEND:

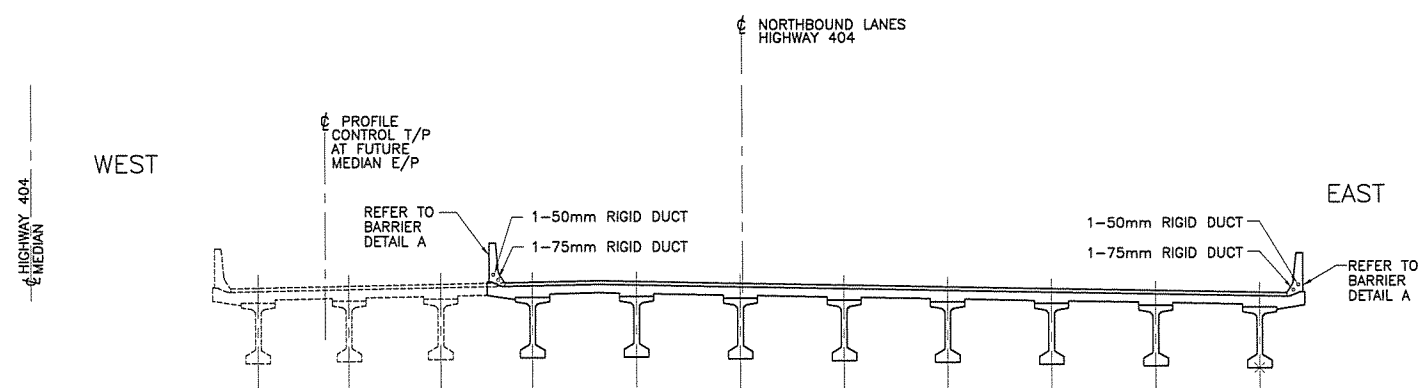
- 50mm RIGID DUCT
□ RIGID PVC JUNCTION BOX



BARRIER DETAIL A
1 : 50



PLAN
1 : 200



1
1 : 100

APPLICABLE STANDARD DRAWINGS

- OPSD 2302.010 EMBEDDED WORK FOR RIGID PVC JUNCTION
BOX, TYPE P3-1a
OPSD 2302.040 EMBEDDED WORK IN STRUCTURE
(NOTE 1)



DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

REVISIONS		DESCRIPTION			
DESIGN	DPM	CHK	CODE	OHBD	DATE
DRAWN	NFG	CHK	DPM	SITE	SCHEME
					DWG
					11