

GEOLOGY KEY

F FILL (UNDIFFERENTIATED)
 UNDIFFERENTIATED FILL CAN BE UNCONTROLLED OR ENGINEERED FILL MATERIAL OF VARYING COMPOSITION AND GRADE WHICH IS SPATIALLY DISCONTINUOUS. GENERALLY COMPRISING LOCALLY SOURCED SOFT TO VERY STIFF COHESIVE AND / OR LOOSE TO MEDIUM DENSE GRANULAR MATERIALS.

TA ALLUVIUM (UNDIFFERENTIATED)
 INTER-BEDDED SEQUENCE OF UNCONSOLIDATED SANDS, SILTS, CLAYS, AND PEAT DEPOSITED BY WATER. CHARACTERIZED AS SOFT TO VERY STIFF / LOOSE TO MEDIUM DENSE SOILS (AGE UNDIFFERENTIATED).

PC PLEISTOCENE COLLUVIUM
 POORLY CONSOLIDATED DEPOSIT WHICH HAS BEEN TRANSPORTED DOWNSLOPE AND CHARACTERIZED BY ANGULAR TO SUB-ROUNDED CLASTS IN A FINE-GRAINED MATRIX (INFERRED PLEISTOCENE AGE).

QC COLLUVIUM (UNDIFFERENTIATED)
 UNCONSOLIDATED DEPOSIT WHICH HAS BEEN TRANSPORTED DOWNSLOPE AND CHARACTERIZED BY ANGULAR TO SUB-ROUNDED CLASTS IN A FINE GRAINED MATRIX (AGE UNDIFFERENTIATED).

DACITE

DAS2	RESIDUAL / COMPLETELY WEATHERED DACITE SOILS	MODELLED AS DA UNDIFFERENTIATED DACITE
DAS1	HIGHLY WEATHERED DACITE (MIXED SOIL AND ROCK)	
DAR2	MODERATELY WEATHERED DACITE	
DAR1	SLIGHTLY TO UNWEATHERED DACITE	

TAURIKURA SUBGROUP DACITE (COROMANDEL GROUP). DACITE DOMES AND VENT-FILLING VRECCIA, LOCALLY ALTERED TO HALLOYSTIC

NORTHLAND ALLOCHTHON

NAS2	RESIDUAL NORTHLAND ALLOCHTHON	MODELLED AS NA UNDIFFERENTIATED ALLOCHTHON IN ZONE 1
NAS1	COMPLETELY WEATHERED NORTHLAND ALLOCHTHON	
NAD	DEGRADED NORTHLAND ALLOCHTHON (HW-MW)	
NAR	UNWEATHERED NORTHLAND ALLOCHTHON (SW-UW)	

UNDIFFERENTIATED COMPLEX ASSEMBLAGE OF CLAY-RICH CALCAREOUS AND NON-CALCAREOUS MUDSTONES, SILTSTONES AND SANDSTONES.

PAKIRI

P	PS2	RESIDUALLY TO COMPLETELY WEATHERED PAKIRI FORMATION
P	PS1	HIGHLY WEATHERED PAKIRI FORMATION (MIXED SOIL & ROCK)
P	PR2	MODERATELY WEATHERED PAKIRI FORMATION (MW)
P	PR1	UNWEATHERED PAKIRI FORMATION (SW-UW)

PAKIRI FORMATION OF WARKWORTH SUBGROUP (WAITEMATA GROUP). ALTERNATING THICK-BEDDING, VOLCANIC-RICH, GRADED SANDSTONE AND SILTSTONE.

RUARANGI

	RS2	RESIDUALLY TO COMPLETELY WEATHERED RUARANGI FORMATION
	RS1	HIGHLY WEATHERED RUARANGI FORMATION (MIXED SOIL & ROCK)
	RR2	MODERATELY WEATHERED RUARANGI FORMATION (MW)
	RR1	UNWEATHERED RUARANGI FORMATION (SW-UW)

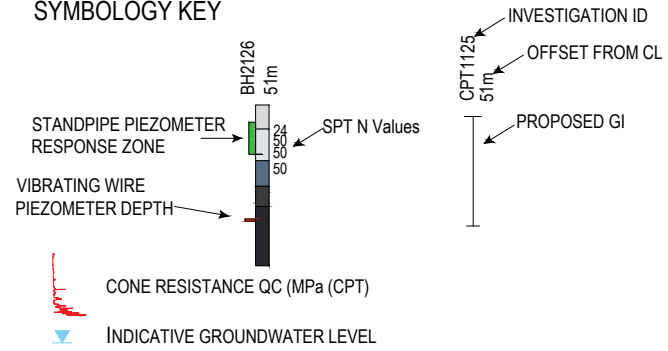
RUARANGI FORMATION OF BREAM SUBGROUP (WAITEMATA GROUP). LAMINATED TO THIN-BEDDED, CALCAREOUS SILTSTONE WITH RARE, INTERBEDDED SHELLY SANDSTONE.

WAIPAPA

	WPS2	RESIDUALLY TO COMPLETELY WEATHERED GREYWACKE
	WPS1	HIGHLY WEATHERED GREYWACKE (MIXED SOIL & ROCK)
	WPR2	MODERATELY WEATHERED GREYWACKE (MW)
	WPR1	UNWEATHERED GREYWACKE (SW-UW)

WAIPAPA GROUP SANDSTONE AND SILTSTONE (WAIPAPA COMPOSITE TERRANE). MASSIVE TO THIN BEDDED, LITHIC VOLCANICLASTIC METASANDSTONE AND ARGILLITE, WITH TECTONICALLY ENCLOSED BASALT, CHERT AND SILICEOUS ARGILLITE.

SYMBOLOLOGY KEY



- BOREHOLE - COMPLETED (12 / 12 / 2025)
- CONE PENETRATION TEST - COMPLETED (12 / 12 / 2025)
- TEST PIT - COMPLETED (12 / 12 / 2025)
- BOREHOLE - PROPOSED
- CONE PENETRATION TEST - PROPOSED
- TEST PIT - PROPOSED

GENERAL NOTES

ALIGNMENT:
 10722-PTA-2B0-RD-M3M-0000_CONSENT_DESIGN_20251124

BH GEOLOGY:
 ONLY SHOWN FOR HOLES COMPLETED BY 12/12/25.

WEATHERING GRADES (NZGS, 2005)

RESIDUAL SOIL
 ROCK IS COMPLETELY CHANGED TO A SOIL WITH THE ORIGINAL FABRIC DESTROYED.

COMPLETELY WEATHERED
 ORIGINAL ROCK STRENGTH IS LOST AND THE ROCK MASS CHANGED TO A SOIL WITH SOME ROCK FABRIC PRESERVED.

HIGHLY WEATHERED
 MOST OF THE ORIGINAL ROCK MASS STRENGTH IS LOST. MATERIAL IS DISCOLOURED AND MORE THAN HALF THE MASS IS CHANGED TO A SOIL.

MODERATELY WEATHERED
 THE ROCK MASS IS SIGNIFICANTLY WEAKER THAN THE FRESH ROCK AND PART OF THE ROCK MASS MAY HAVE BEEN CHANGED TO A SOIL.

SLIGHTLY WEATHERED
 THE ROCK MASS IS NOT SIGNIFICANTLY WEAKER THAN WHEN UNWEATHERED.

UNWEATHERED
 ROCK MASS SHOWS NO LOSS OF STRENGTH, DISCOLOURATION OR OTHER EFFECTS DUE TO WEATHERING.

DEGRADED
 SPECIFIC TO NORTHERN ALLOCHTHON MATERIAL; DEGRADED ROCK ZONE IS SIGNIFICANTLY FRACTURED AND SLICKENSIDED. MAY BE WEATHERED OR SLIGHTLY WEATHERED.

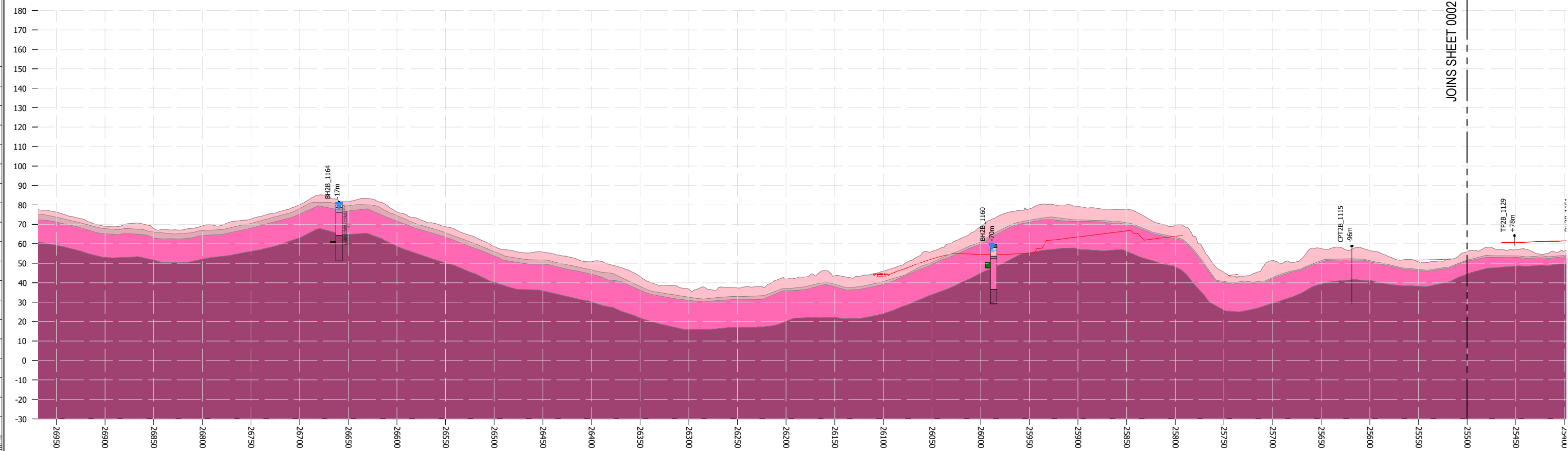
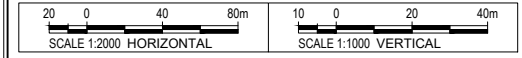
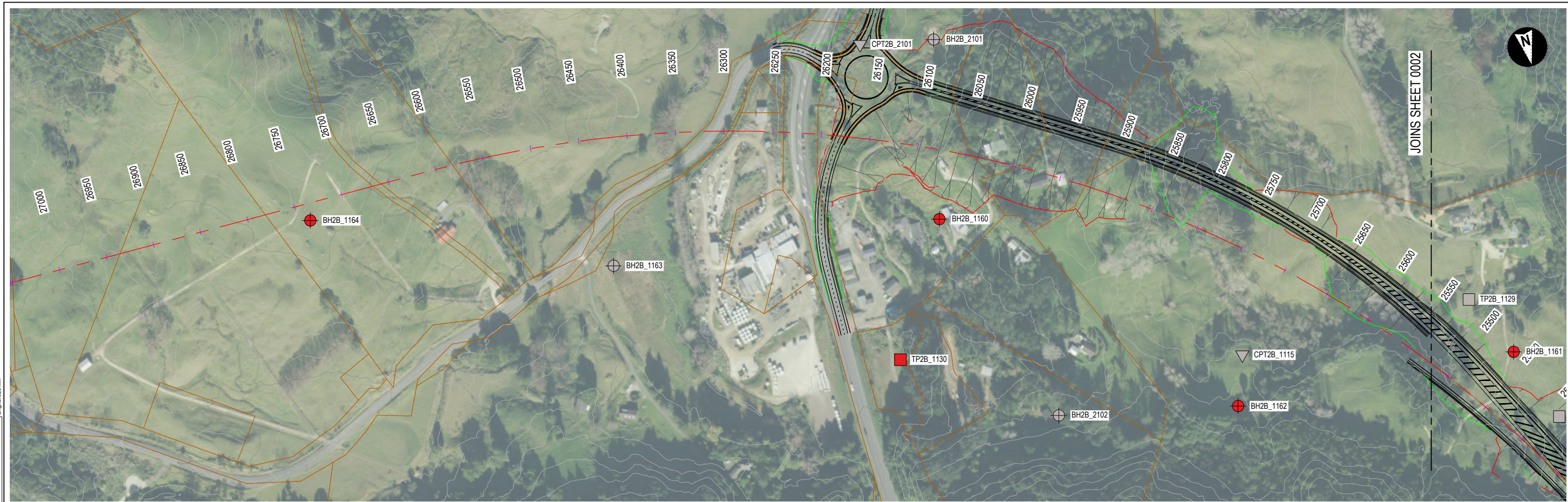
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Northland Corridor Roads of National Significance

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B	27.03.26	CONSENT DESIGN FOR LODGEMENT	R.D

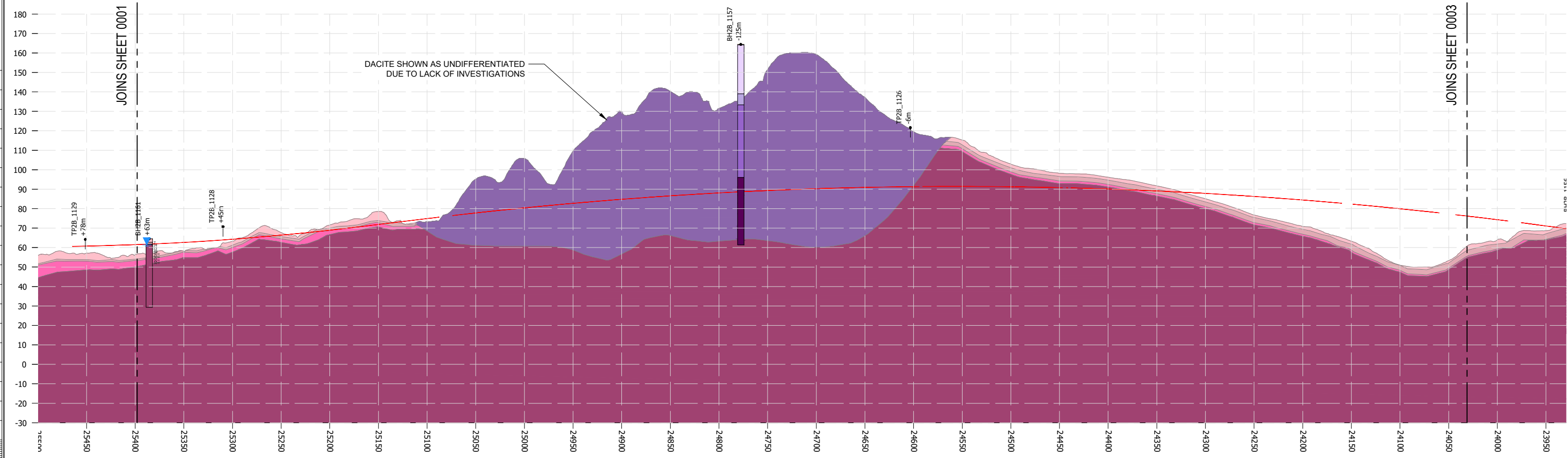
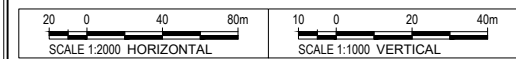
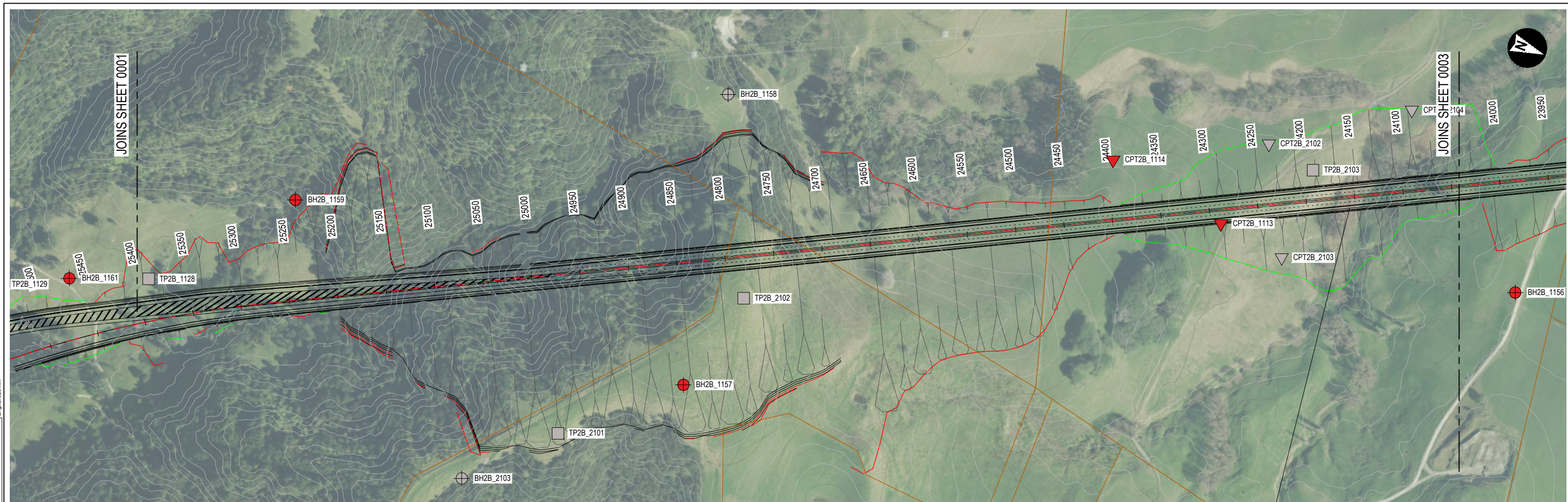
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APPROVED	
R.DUPLLOY	
APPROVED BY	DATE
R.DUPLLOY	27.03.26

PROJECT LEAD	DATE
T.IRELAND	27.03.26

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
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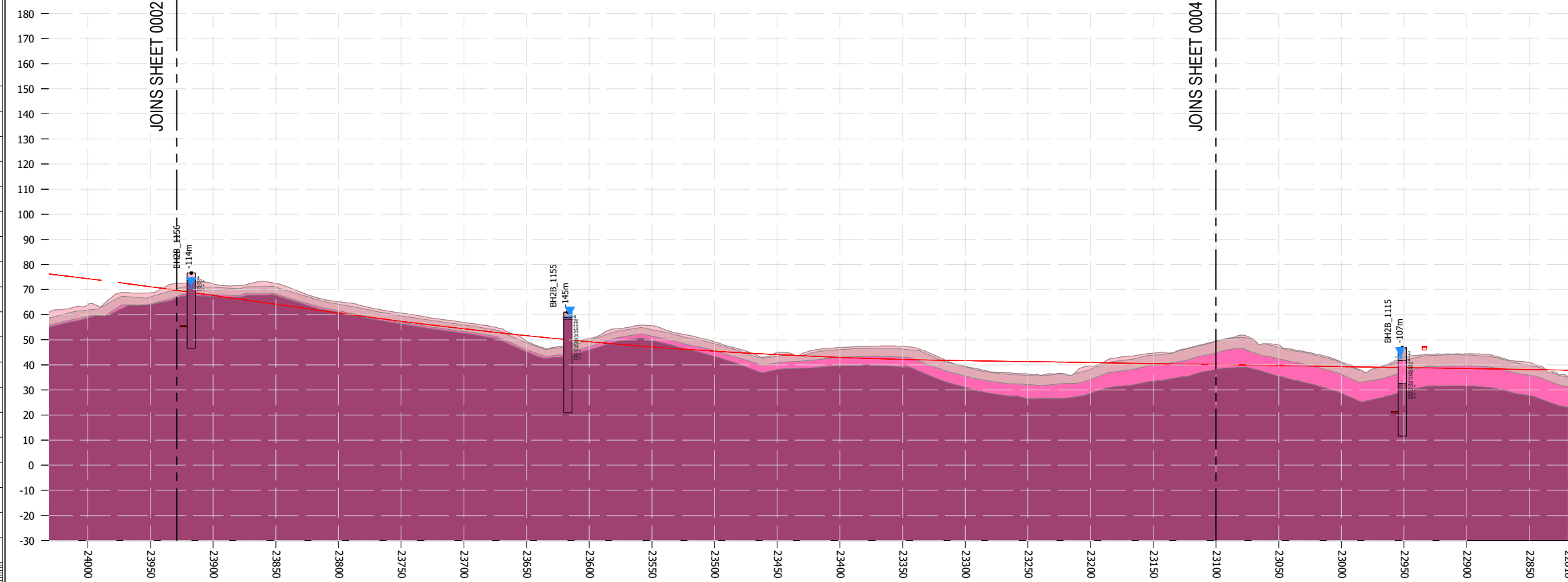
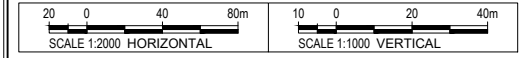
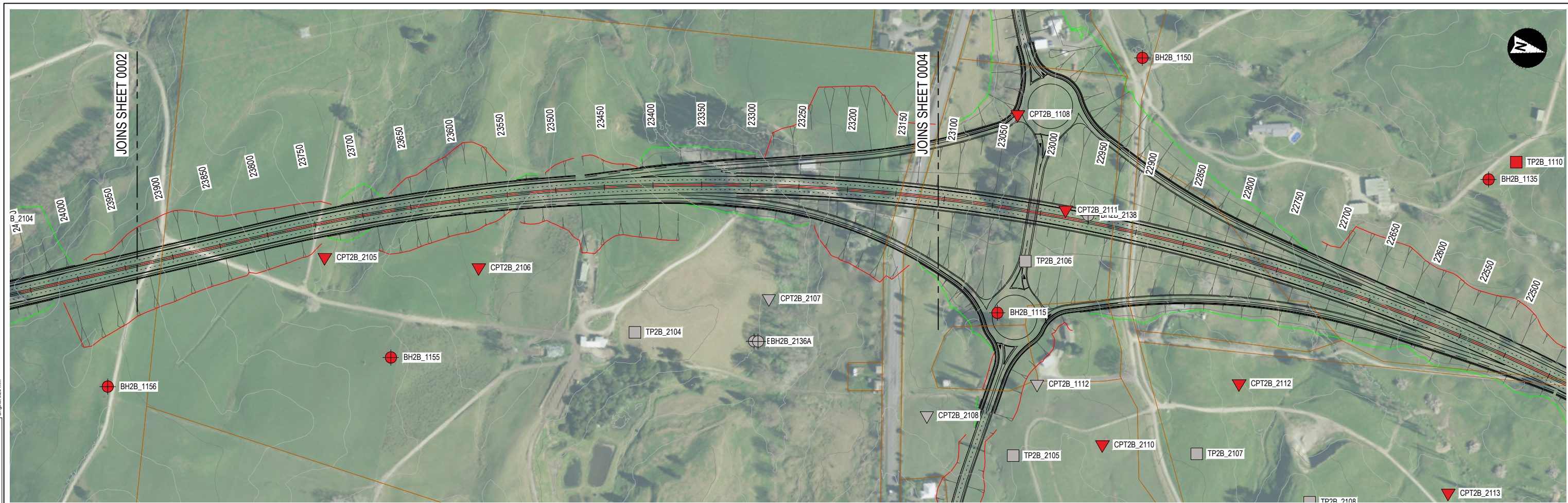
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	R.DUPLOUY	
	APPROVED BY	DATE
	R.DUPLOUY	27.03.26

APPROVED	STATUS	TITLE
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PROJECT INFORMATION
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NZ TRANSPORT AGENCY
WAKA KOTAHU

Northland Corridor

Roads of National Significance

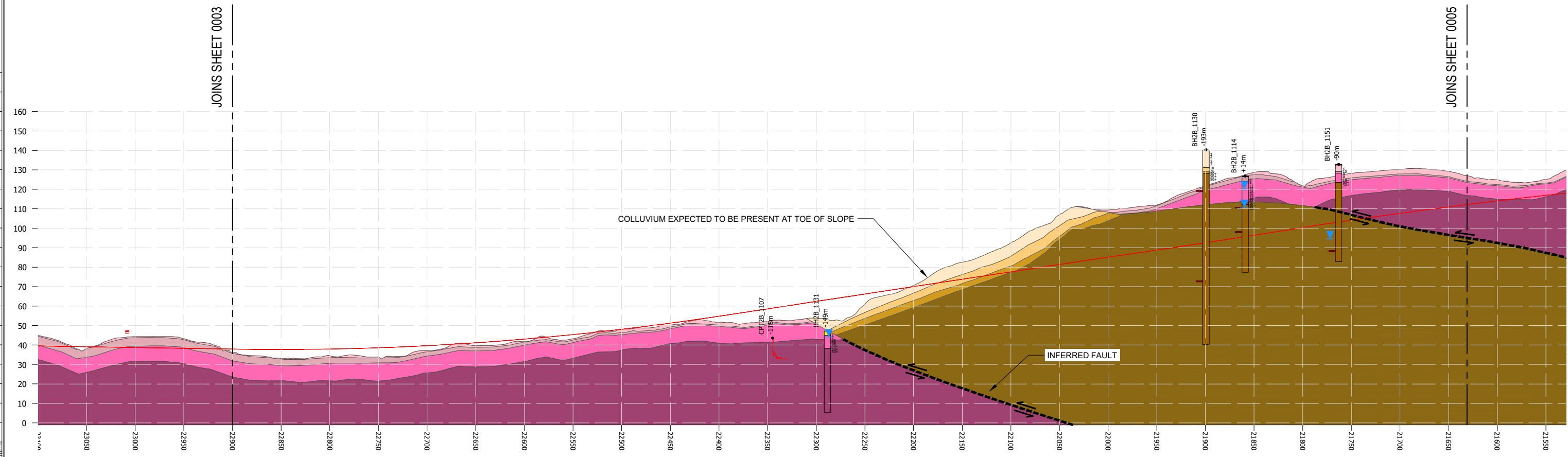
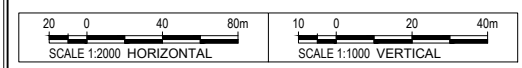
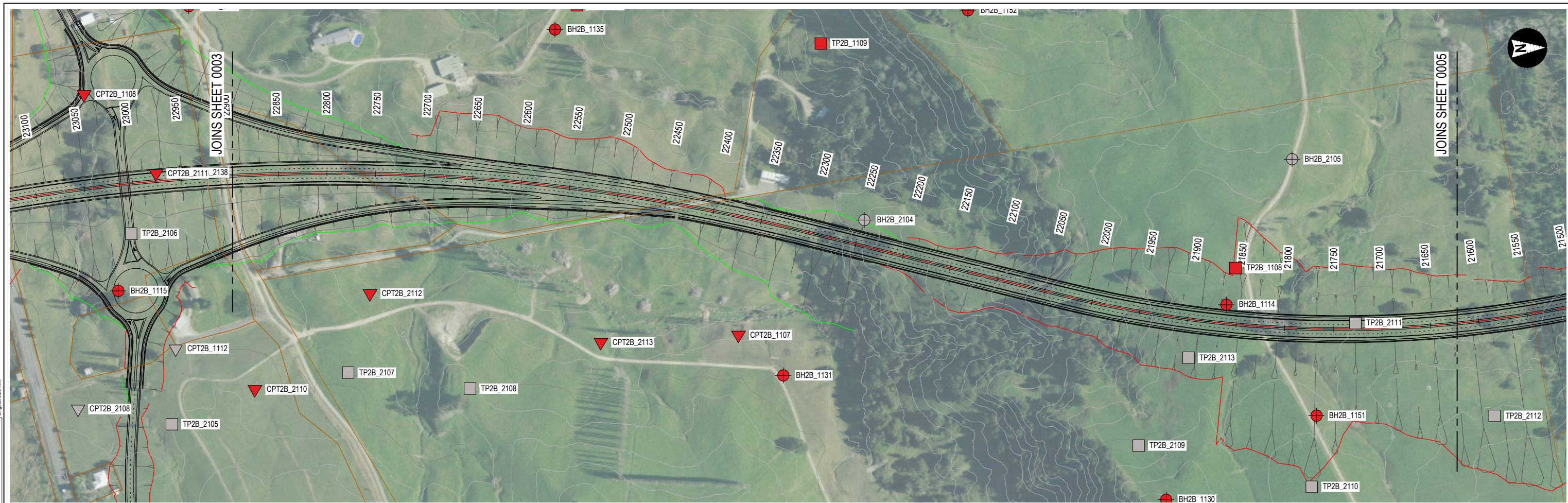
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APPROVED	
R.DUPLLOY	
APPROVED BY	DATE
R.DUPLLOY	27.03.26

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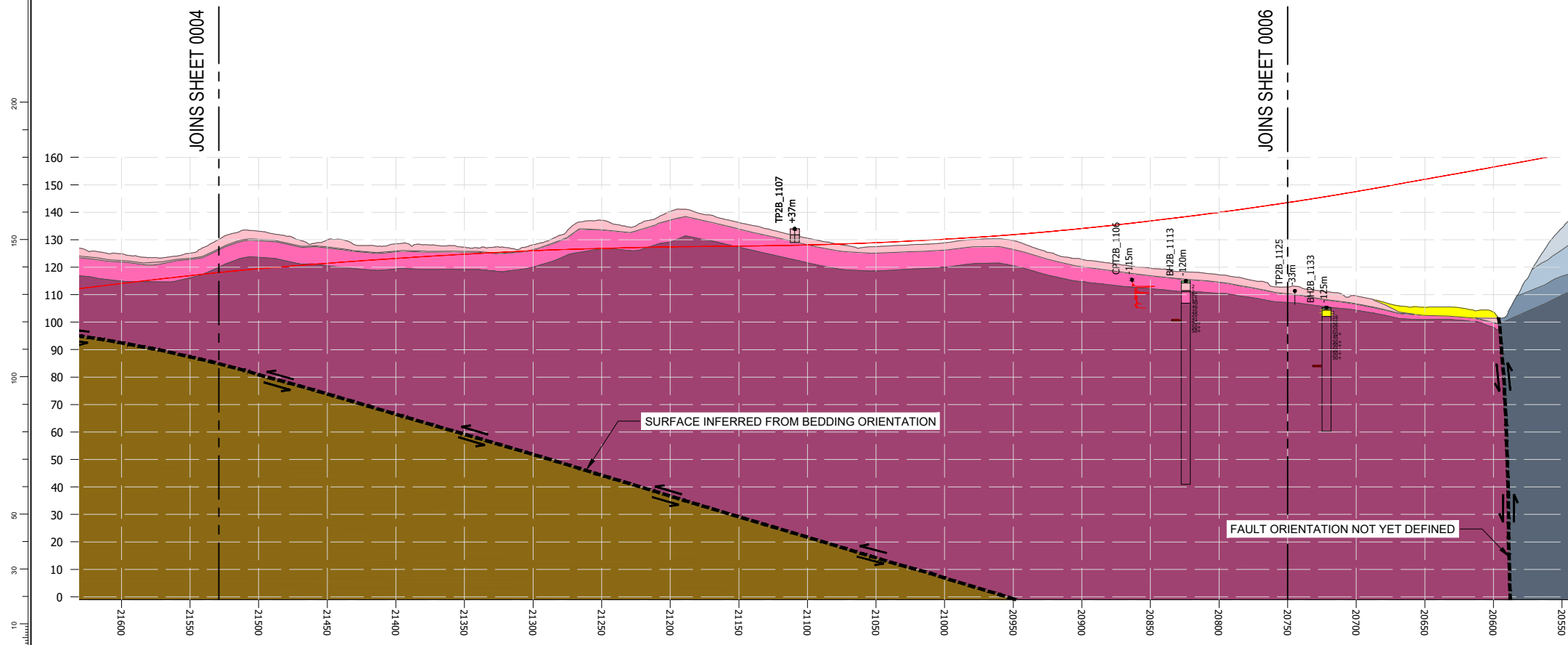
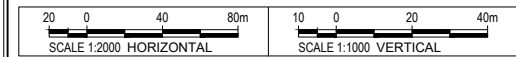
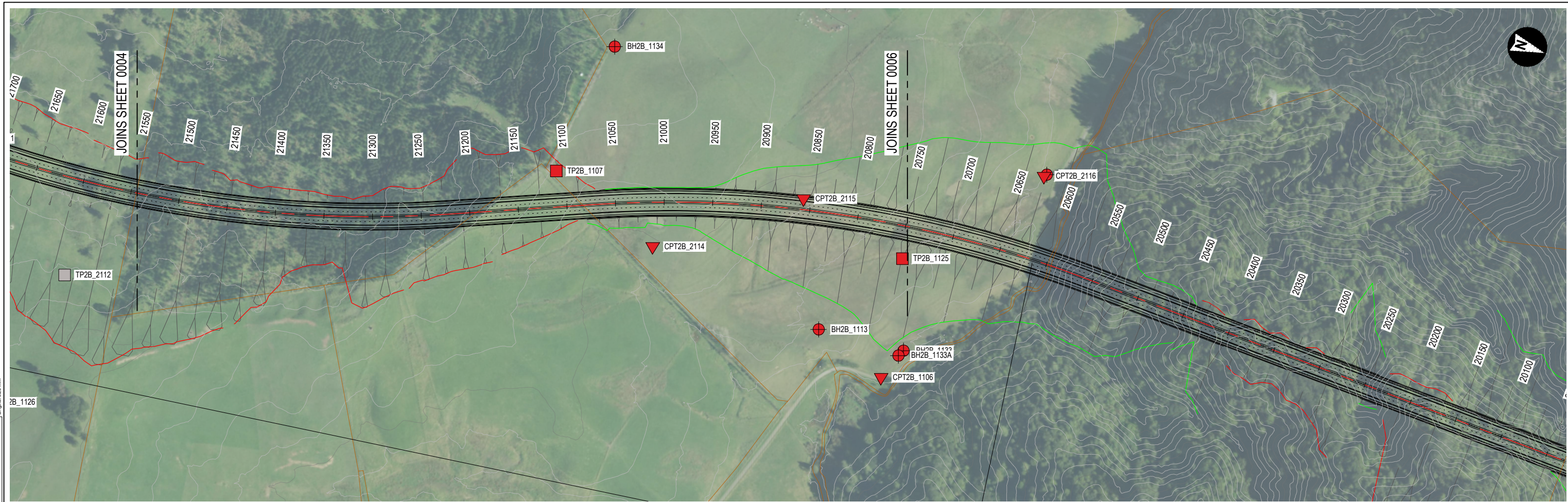
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B	27.03.26	CONSENT DESIGN FOR LODGEMENT

APPROVED	STATUS
R.D	CONSENT DESIGN
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	<i>R.DUPLOUY</i>
	APPROVED BY
	DATE
	R.DUPLOUY 27.03.26

DRAWN	DATE
J.BOOM	27.03.26
DRG CHECK	DATE
V.HOOKER	27.03.26
DESIGN	DATE
A.HUN	27.03.26
VERIFIED	DATE
S.GRIEVE	27.03.26
PROJECT LEAD	DATE
T.IRELAND	27.03.26

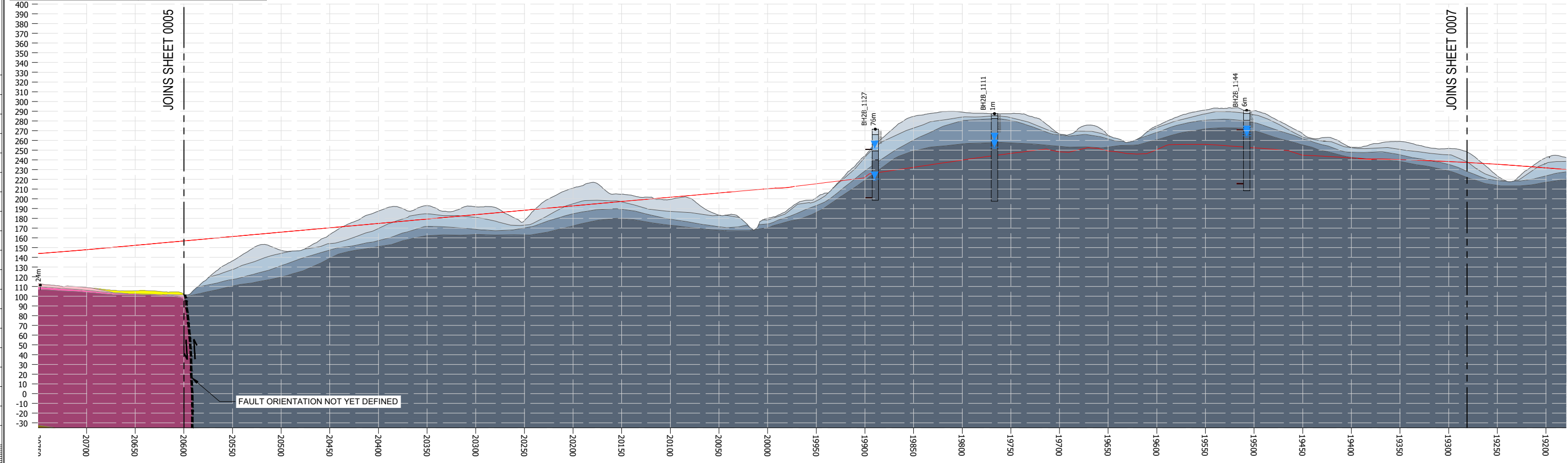
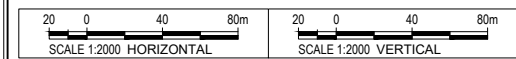
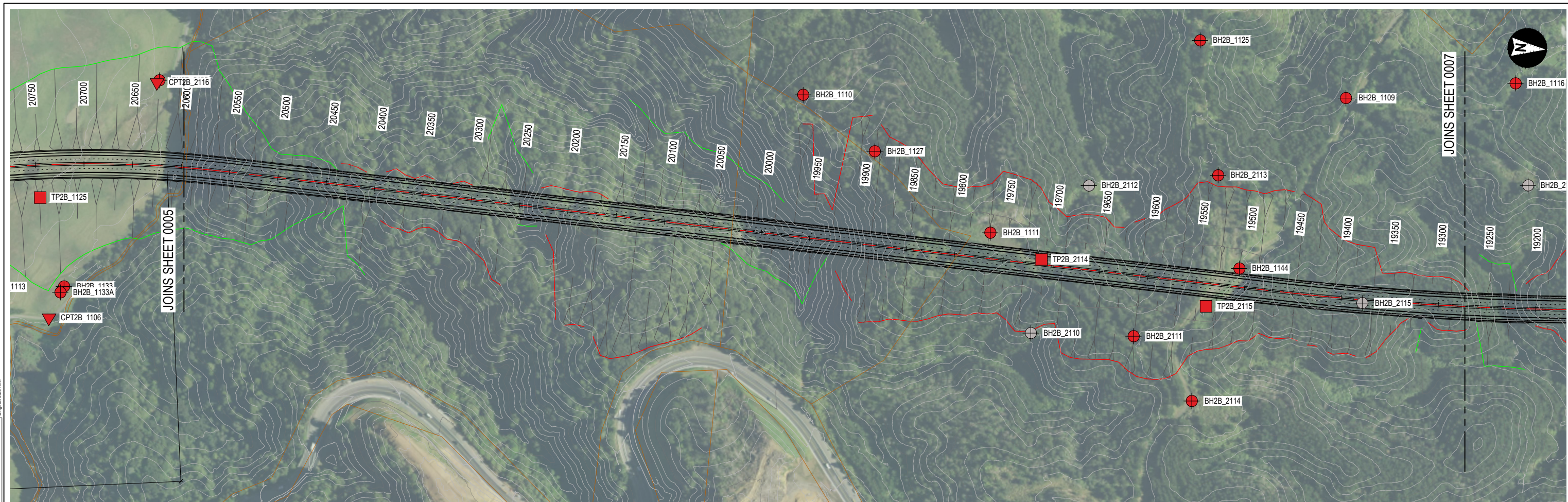
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**BRYNDERWYN HILLS SECTION
GEOLOGY LONG SECTION ZONE 3-2
EARTHWORKS MODEL 1.1**

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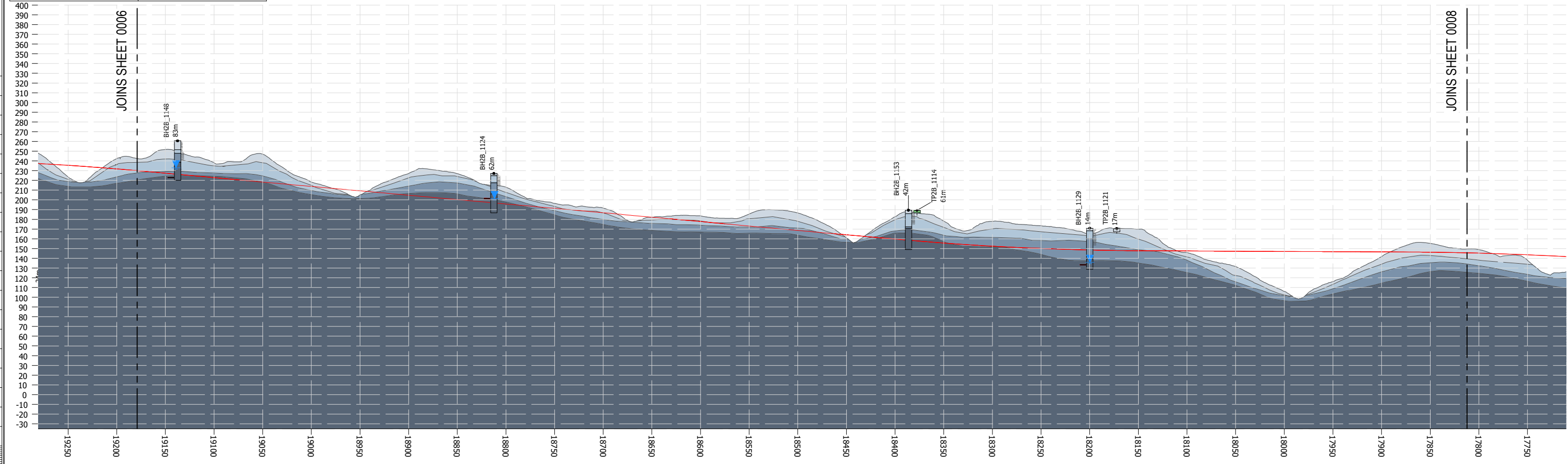
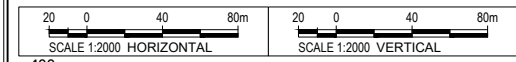
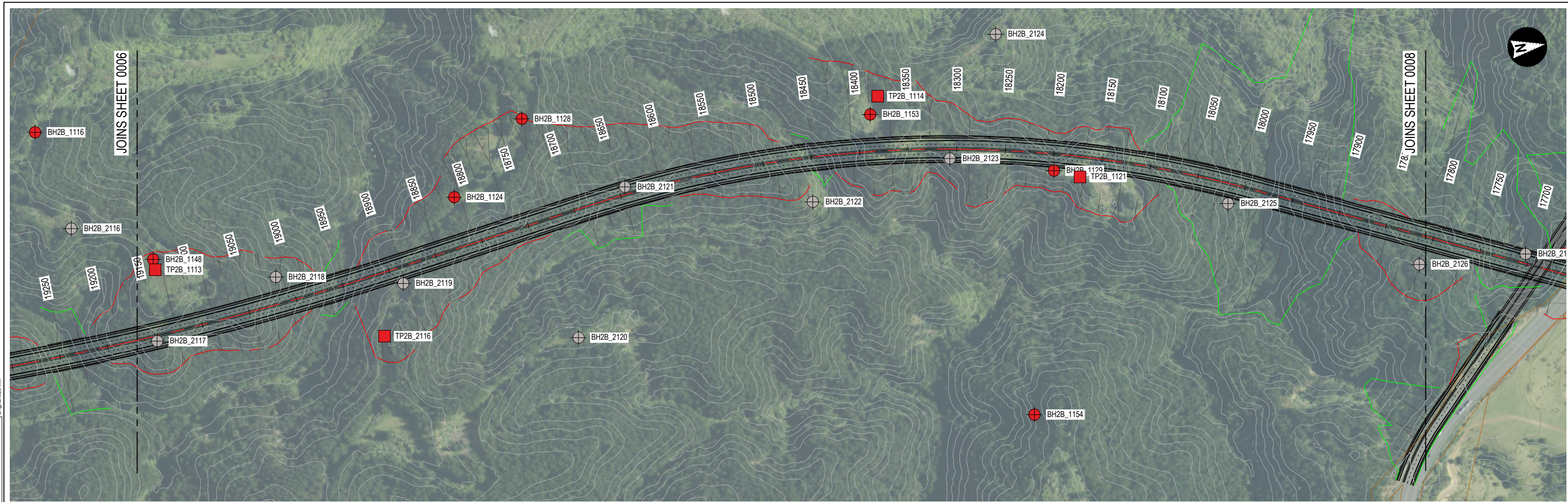


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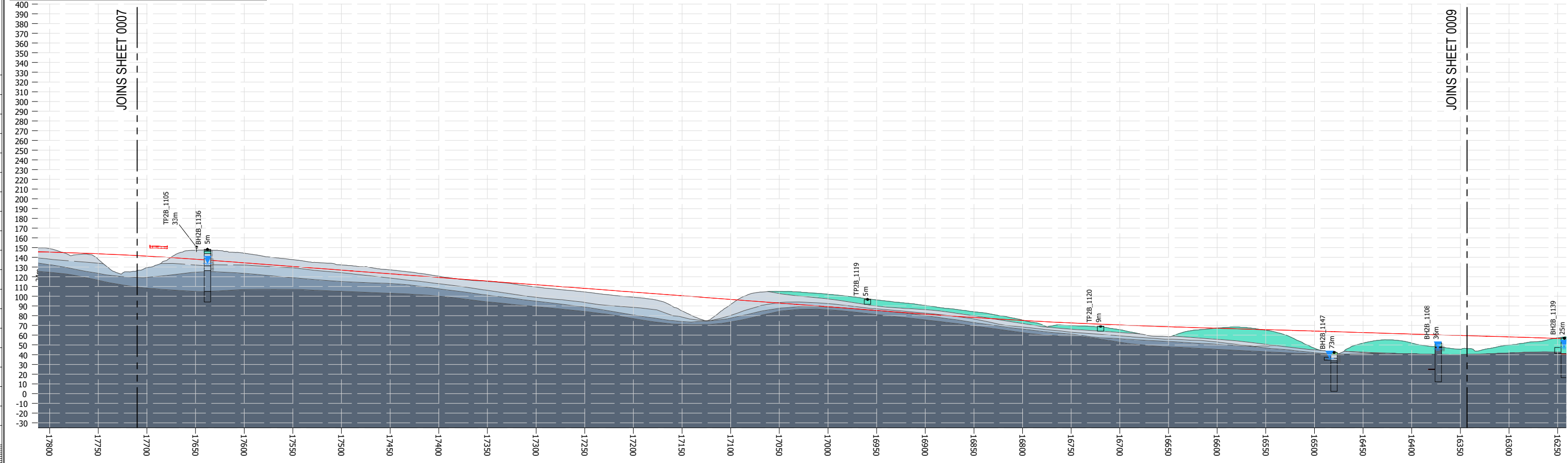
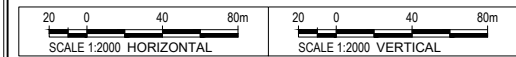
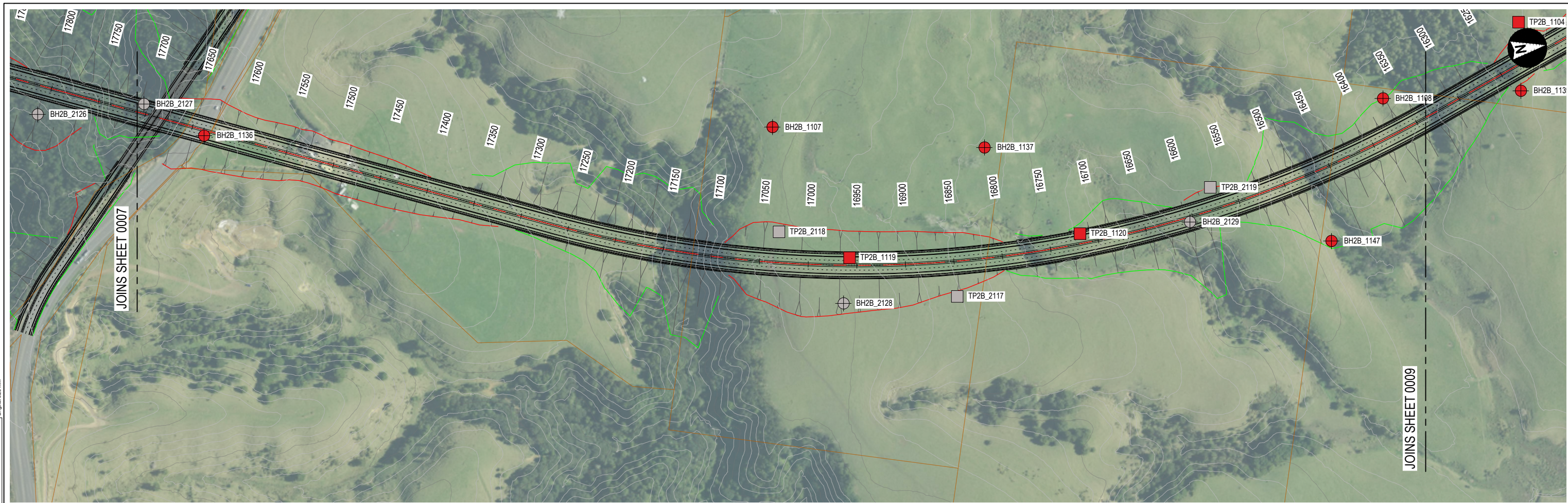
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									R.DUPLOOY			27.03.26						

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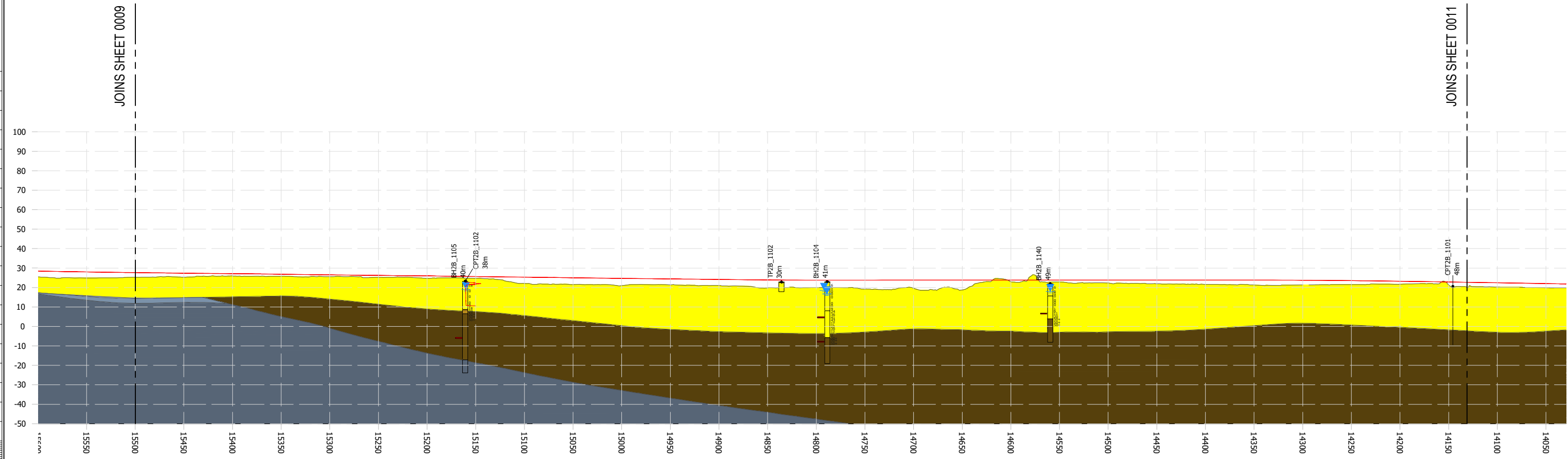
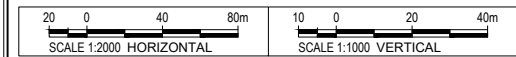
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APPROVED	
R.DUPLOUY	
APPROVED BY	DATE
R.DUPLOUY	27.03.26

PROJECT LEAD	DATE
T.IRELAND	27.03.26

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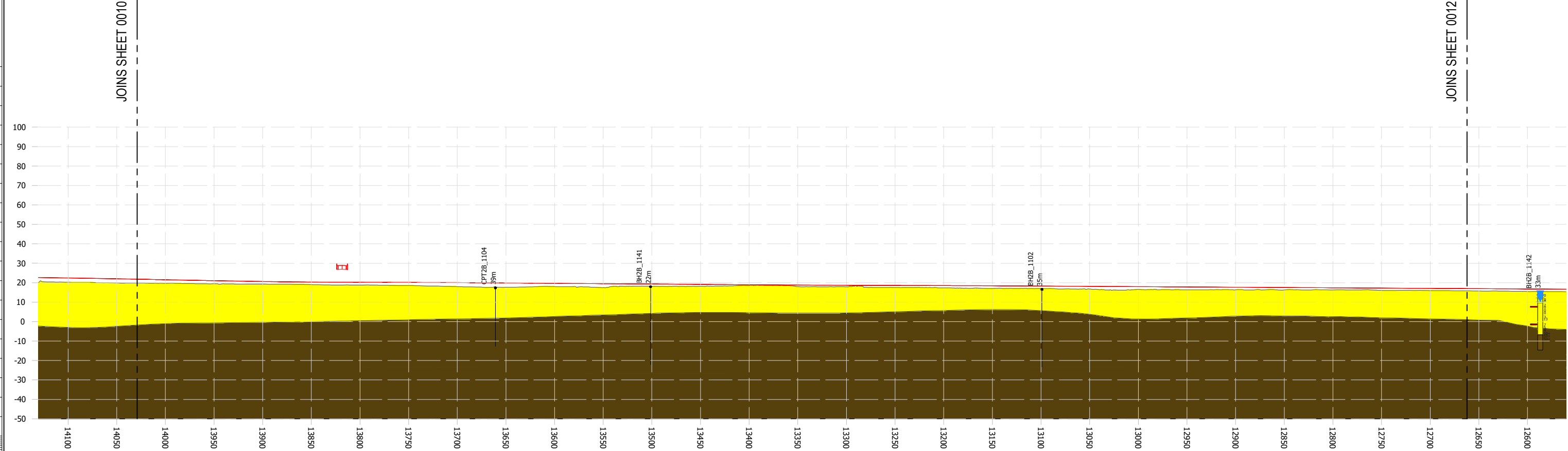
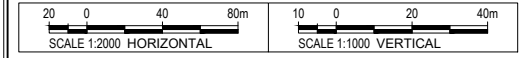
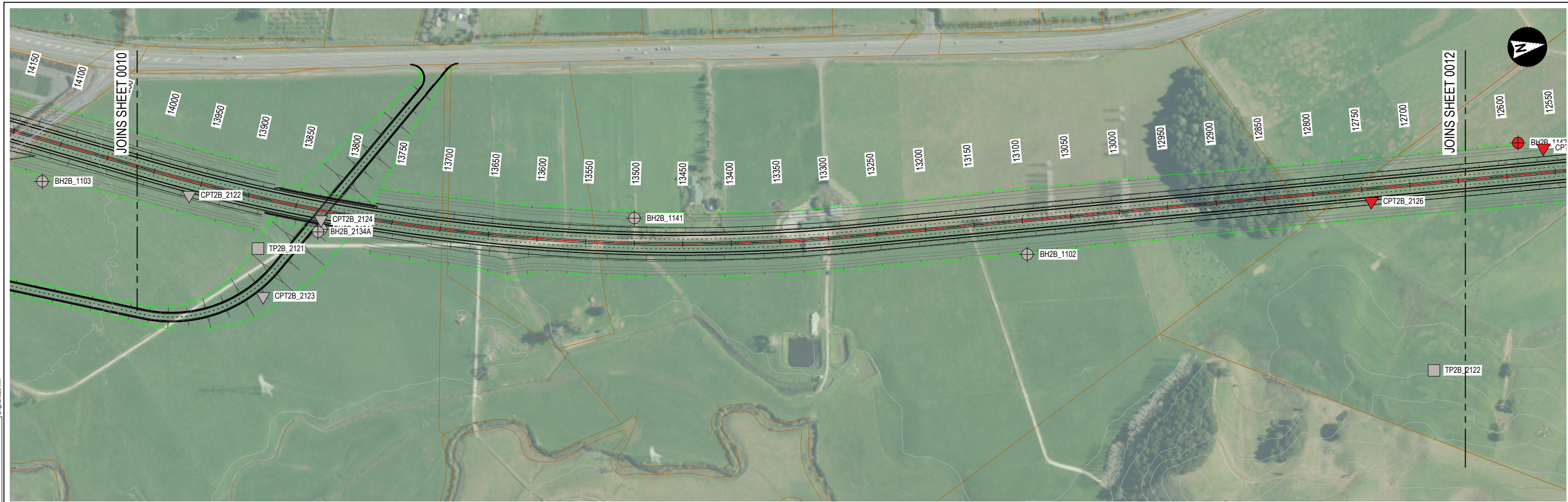
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PROJECT			REVISION DETAILS			APPROVED			STATUS			TITLE				PROJECT INFORMATION			
ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY			REV	DATE	REVISION DETAILS	APPROVED			CONSENT DESIGN			BRYNDERWYN HILLS SECTION GEOLOGY LONG SECTION ZONE 1-1 EARTHWORKS MODEL 1.1				NORTHLAND CORRIDOR			
			A	18.02.26	CONSENT DESIGN FOR CLIENT REVIEW	R.D			DRAWN			DOCUMENT CODE				10722-PTA-2B0-GL-DRG-0760			
			B	27.03.26	CONSENT DESIGN FOR LODGEMENT	R.D			DRG CHECK			SCALE				AS SHOWN			
									DESIGN			SIZE				A1			
									VERIFIED			REFERENCE No.				GL 0760			
									PROJECT LEAD			REV				B			
									T.IRELAND			DATE				27.03.26			

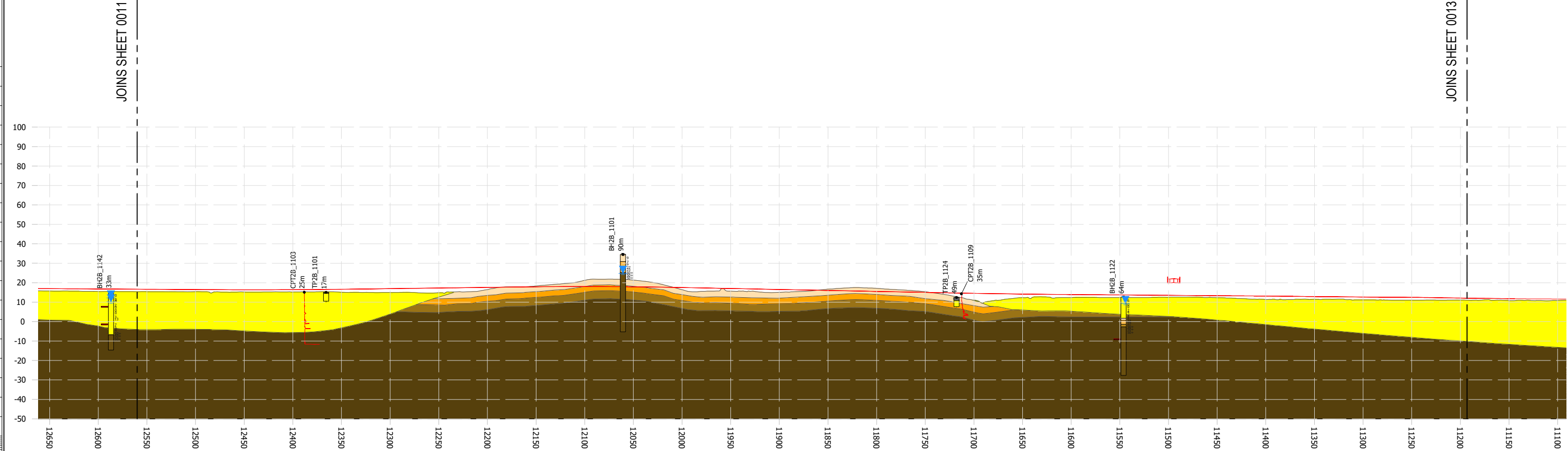
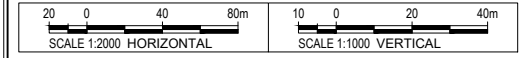
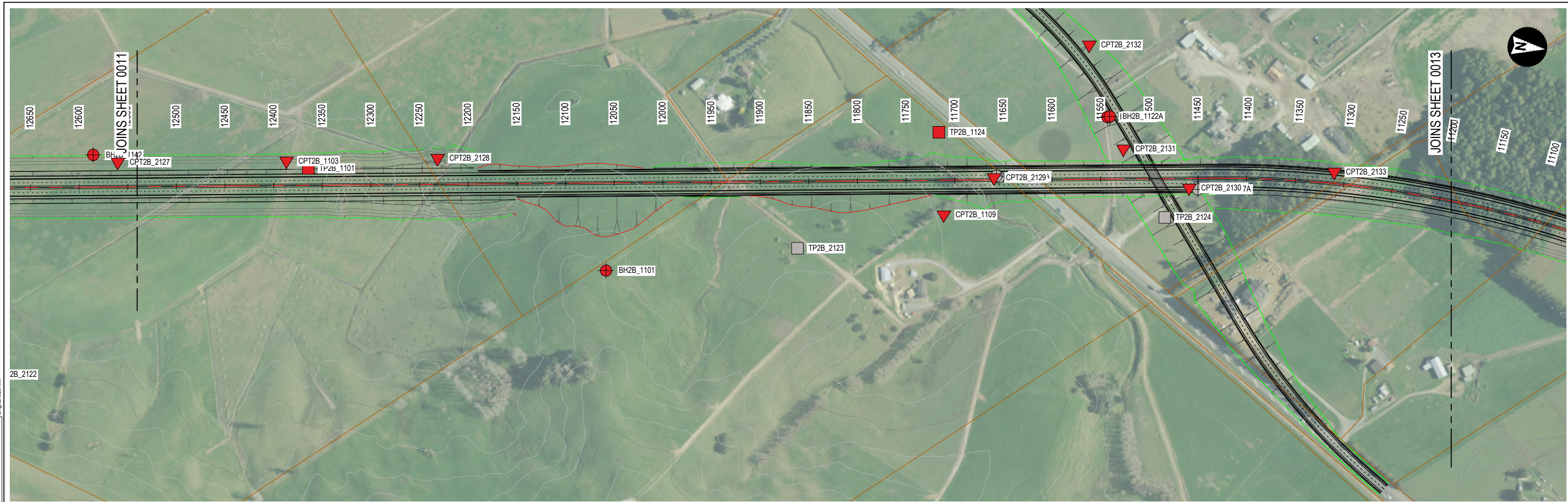
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Plot Date: 3/27/2026 9:24 am | Plotted By: Deepak Chokkalingam | Original File: C:\P\W\WSP-AUS-19\04\5\889\10722-PTA-2B0-GL-DRG-0760.DWG | Tab: [A]



PROJECT			APPROVED			STATUS			TITLE				PROJECT INFORMATION						
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			A	18.02.26	CONSENT DESIGN FOR CLIENT REVIEW	R.D			APPROVED			DOCUMENT CODE							
			B	27.03.26	CONSENT DESIGN FOR LODGEMENT	R.D			R.DUPLOOY			10722-PTA-2B0-GL-DRG-0761							
						DRAWN			APPROVED BY			SCALE		SIZE		REFERENCE No.		REV	
						J.BOOM			R.DUPLOOY			AS SHOWN		A1		GL 0761		B	
						27.03.26			DATE										
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PROJECT INFORMATION

ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY

REV	DATE	REVISION DETAILS	APPROVED
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B	27.03.26	CONSENT DESIGN FOR LODGEMENT	R.D

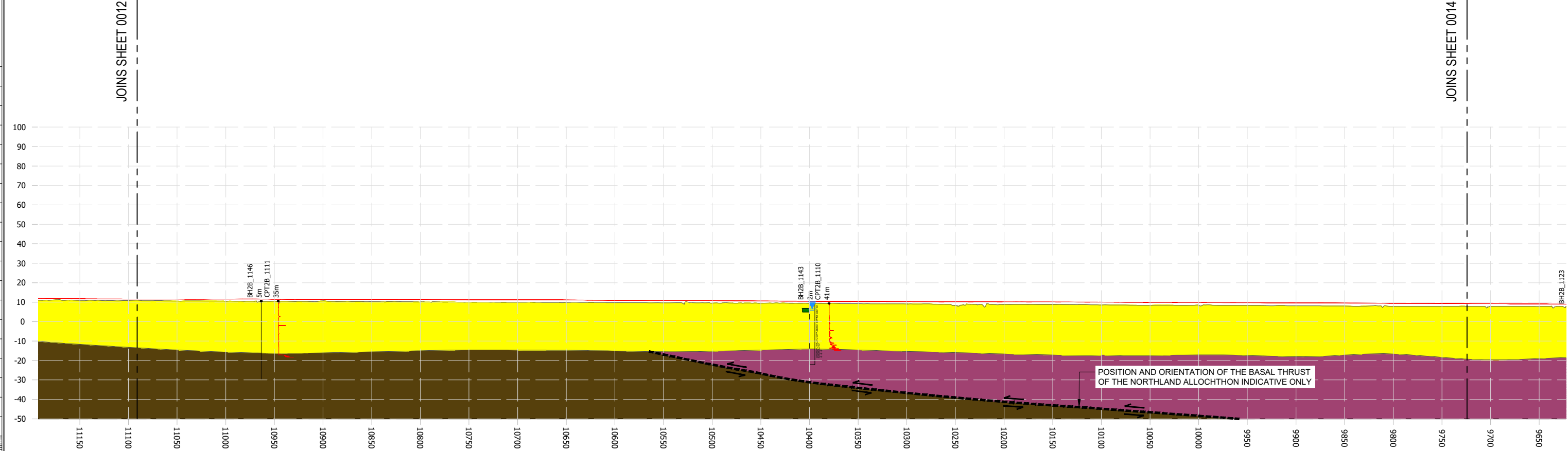
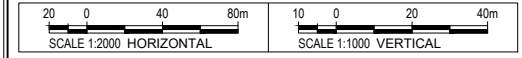
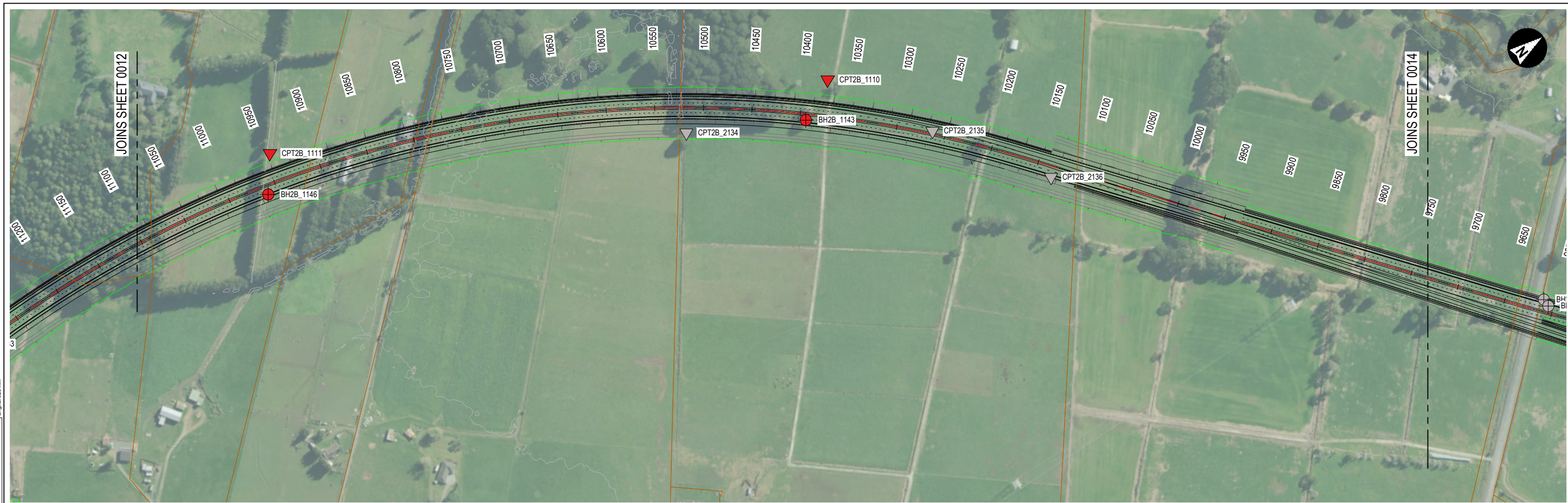
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APPROVED	
R.DUPLOOY	
APPROVED BY	DATE
R.DUPLOOY	27.03.26

STATUS	DATE
APPROVED	27.03.26
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STATUS	DATE
APPROVED	27.03.26
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APPROVED	27.03.26

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
DOCUMENT CODE			
10722-PTA-2B0-GL-DRG-0762			
SCALE	SIZE	REFERENCE No.	REV
AS SHOWN	A1	GL 0762	B

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PROJECT INFORMATION

ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY

REV	DATE	REVISION DETAILS
A	18.02.26	CONSENT DESIGN FOR CLIENT REVIEW
B	27.03.26	CONSENT DESIGN FOR LODGEMENT

APPROVED	STATUS	TITLE
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R.D	APPROVED	
	R.DUPLOOY	
	APPROVED BY	DATE
	R.DUPLOOY	27.03.26

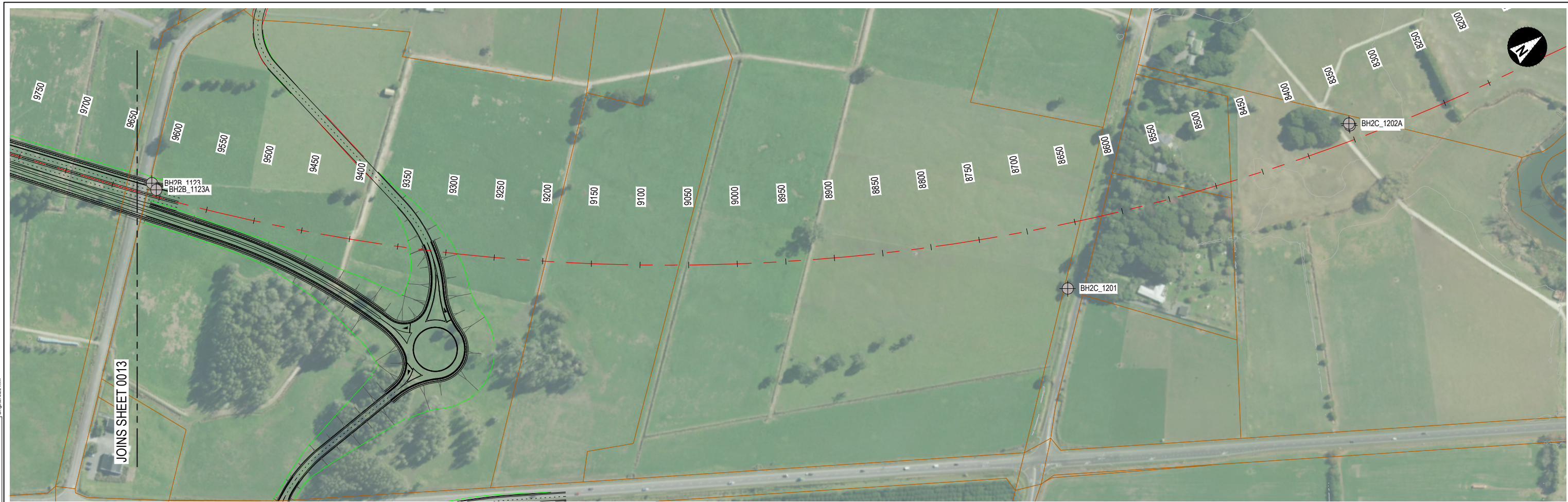
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R.DUPLOOY	27.03.26

APPROVED	DATE
R.DUPLOOY	27.03.26

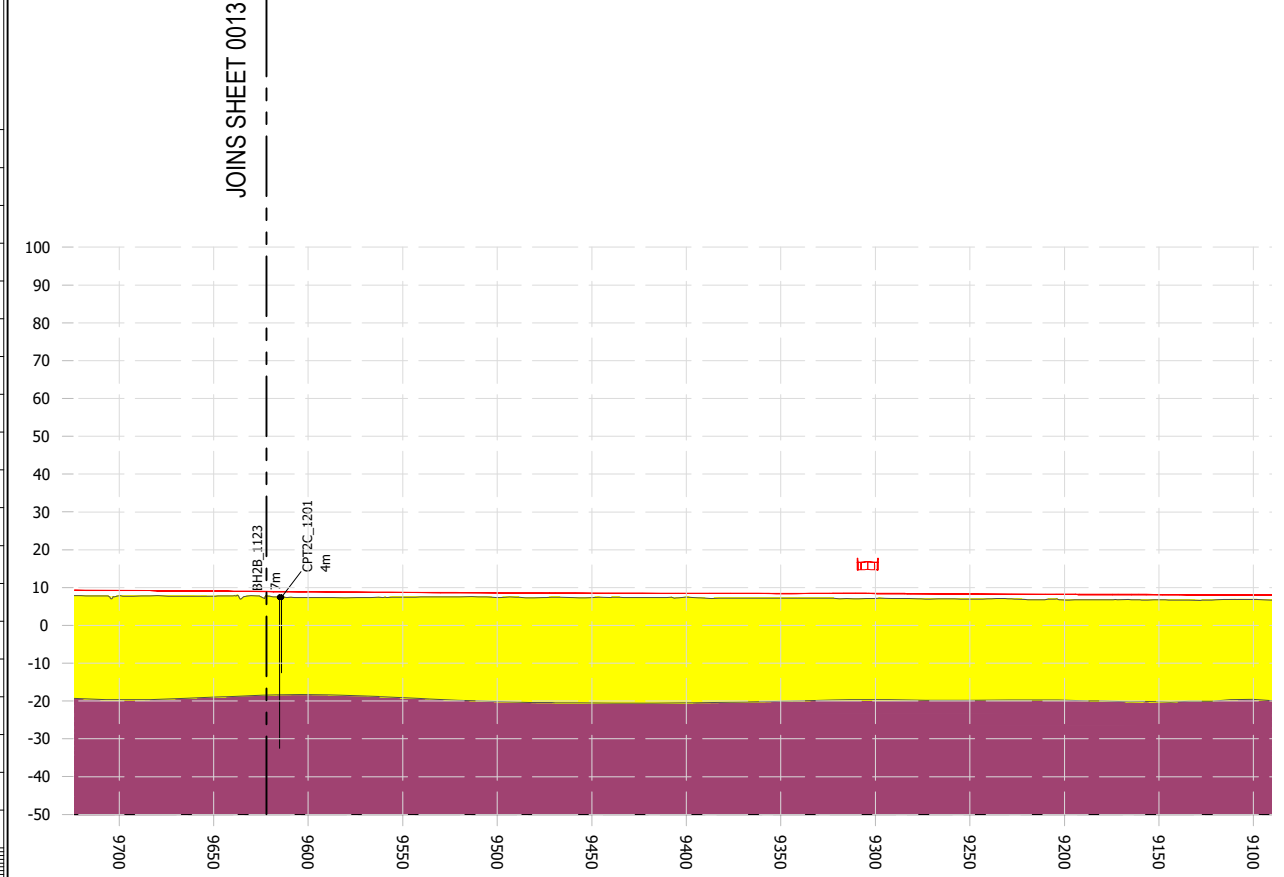
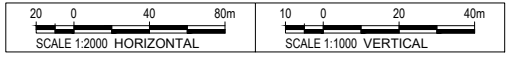
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ORIGINAL IN COLOUR DETAIL MAY BE LOST IF COPIED

Plot Date: 3/27/2026 9:24 am | Plotted By: Deepak Chokkalingam | Original File: C:\P\W\WSP-AUS-19\04\5\888\10722-PTA-2B0-GL-DRG-0763.DWG | Tab: [A]



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Original size mm



PROJECT INFORMATION

ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY

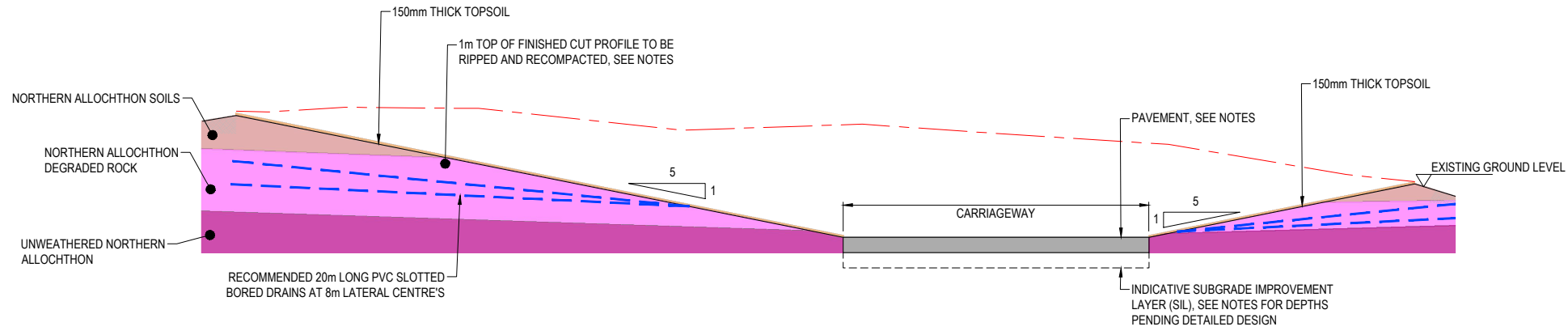
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B	27.03.26	CONSENT DESIGN FOR LODGEMENT	R.D

STATUS	TITLE
CONSENT DESIGN	BRYNDERWYN HILLS SECTION GEOLOGY LONG SECTION ZONE 1-5 EARTHWORKS MODEL 1.1
APPROVED	
R.DUPLOOY	
APPROVED BY	DATE
R.DUPLOOY	27.03.26

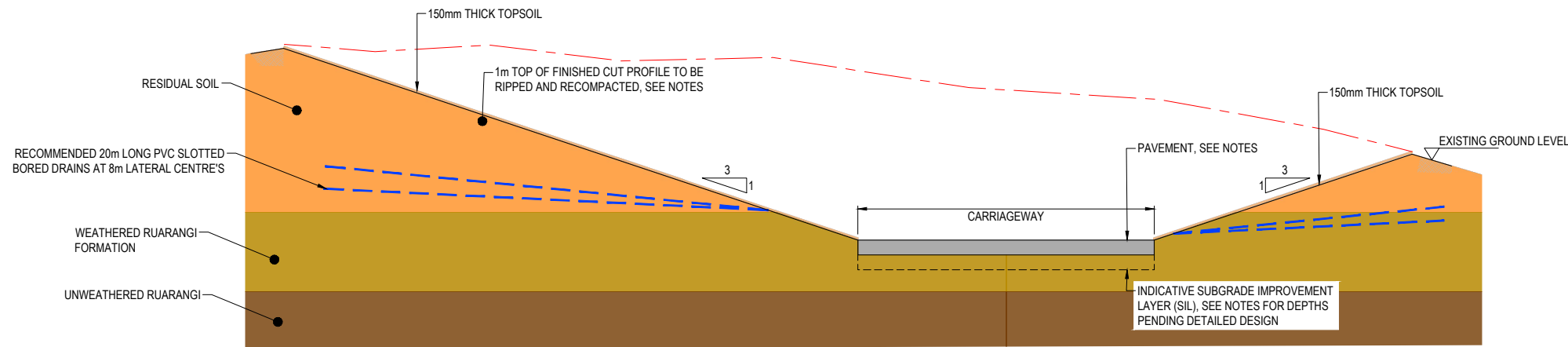
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APPROVED	
R.DUPLOOY	
APPROVED BY	DATE
R.DUPLOOY	27.03.26

PROJECT INFORMATION
NORTHLAND CORRIDOR
DOCUMENT CODE
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SCALE
AS SHOWN
SIZE
A1
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GL 0764
REV
B

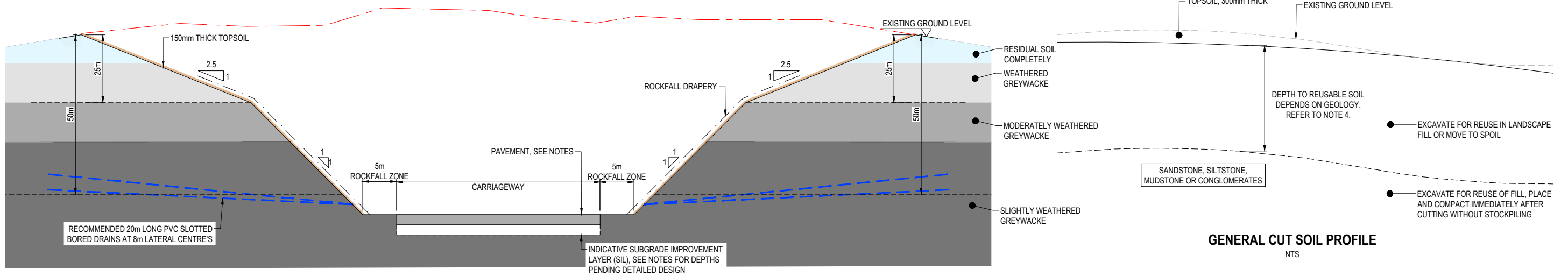
ORIGINAL IN COLOUR DETAIL MAY BE LOST IF COPIED



CUT FACE IN NORTHLAND ALLOCHTHON OR ALLUVIUM
NTS



CUT FACE IN RUARANGI GROUP
NTS



CUT FACE IN WAIPAPA GROUP AND BRYNS ONL
NTS

GENERAL CUT SOIL PROFILE
NTS

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
 2. SUBSURFACE SOIL/ROCK PROFILE INDICATIVE ONLY.
 3. SURFACE CHANNELS AND DRAINAGE CONNECTION ON SLOPES SHALL BE DESIGNED AND PROVIDED IN DETAILED DESIGN AND CONSTRUCTION STAGES.
 4. RIPPING AND RECOMPACTION IS TO EXTEND THE ENTIRE SLOPE FACE.
 5. SEE PAVEMENT DRAWINGS FOR PAVEMENT DETAILS INDICATIVELY TAKEN FROM RoNs STANDARD DESIGNS.
 6. INDICATIVE SIL DEPTHS BELOW BASED ON GEOLOGY WHERE NOT SPECIFIED SIL = 0.3m:
- ALLOCHTHON (NON CALCAREOUS) - 0.75m
- DACITE = 0.5m
 6. BORED DRAINS OR COUNTERFORT DRAINS CAN BE INTERCHANGEABLE DEPENDING ON THE NEED FOR GROUND WATER CONTROL PENDING GROUND INVESTIGATIONS AND DETAILED DESIGN.
 7. IT IS ASSUMED THAT DRAINS WILL DISCHARGE INTO CARRIAGEWAY SURFACE DRAINAGE.
 8. DRAIN OUTLETS WILL BE POSITIONED UP THE SLOPE SUCH THAT OUTLETS CAN BE MAINTAINED i.e. NO MORE THAN APPROXIMATELY 1.5m FROM THE SLOPE BASE.
 9. PLANTING REQUIREMENTS ARE TO BE CONFIRMED. SLOPES HAVE ALLOWED FOR 150mm THICK TOPSOIL HOWEVER THIS MAY NOT BE REQUIRED IF PLANTING IS NOT REQUIRED.
 10. GROUNDWATER IS LIKELY TO BE ENCOUNTERED DURING EARTHWORKS AND MAY COMPRISE PERCHED/SHALLOW GROUNDWATER, ARTESIAN PRESSURISED SYSTEMS AT DEPTH OR ENCOUNTER SPRINGS. MITIGATION MEASURES INDICATIVELY COMPRISE DRAINAGE AS SHOWN ON THE DRAWINGS HOWEVER THESE WILL BE DEVELOPED PENDING DESIGN AND GROUND INVESTIGATIONS.
 11. COMBINED ROCKFALL CATCH DITCH AND SWALE IS SHOWN INDICATIVELY ON DRAWINGS, ACTUAL DIMENSIONS AND NEED OF ADDITIONAL FENCING IS PENDING DESIGN.
 12. SPRINGS ENCOUNTERED DURING EARTHWORKS ARE TO BE COLLECTED AND CONVEYED TO ROAD SIDE SWALES BY EITHER PIPING OR DRAINAGE DITCHES THAT EXTEND DOWN THE SLOPE FACE. DRAINAGE DITCHES DEPENDING ON ENCOUNTERED GROUNDWATER VELOCITIES MAY REQUIRE SHOTCRETING AND/OR ROCK LINING TO PREVENT LONG TERM EROSION.
 13. DEEPLY WEATHERED SEEMS MAY BE ENCOUNTERED DURING CUT EARTHWORKS AND EXPOSE MATERIAL PRONE TO EROSION, PROVISION WILL BE MADE TO SHOTCRETE THESE SEEMS TO PREVENT LONG TERM EROSION.

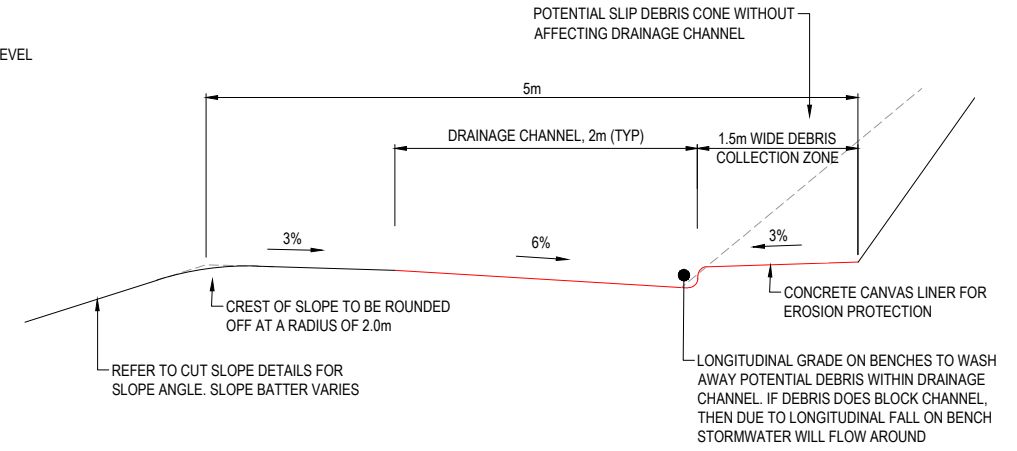
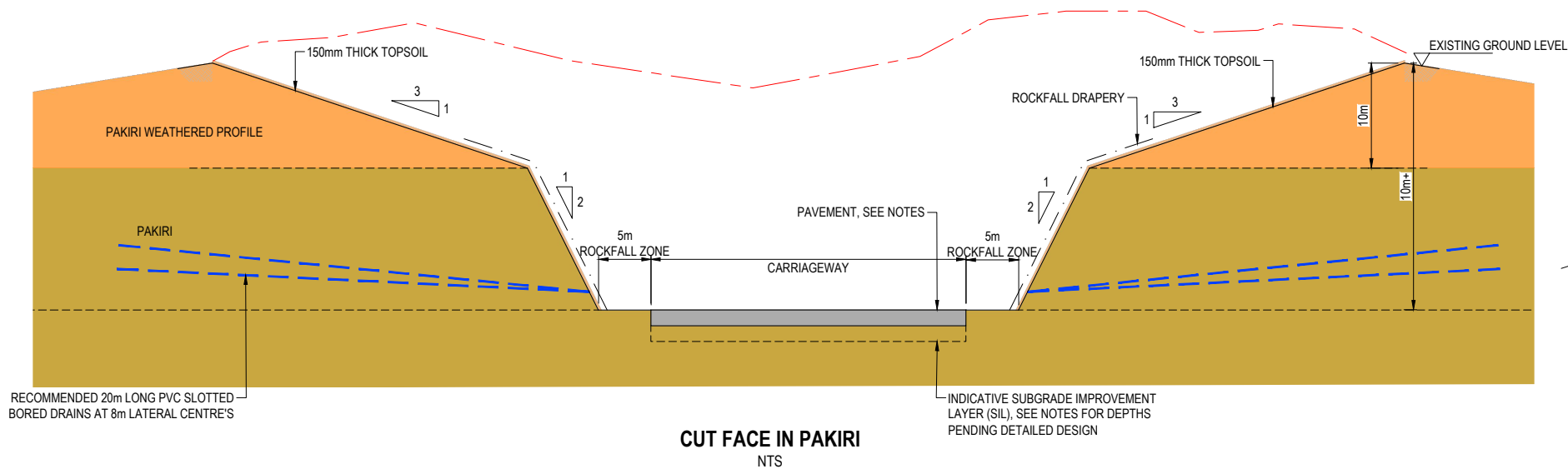
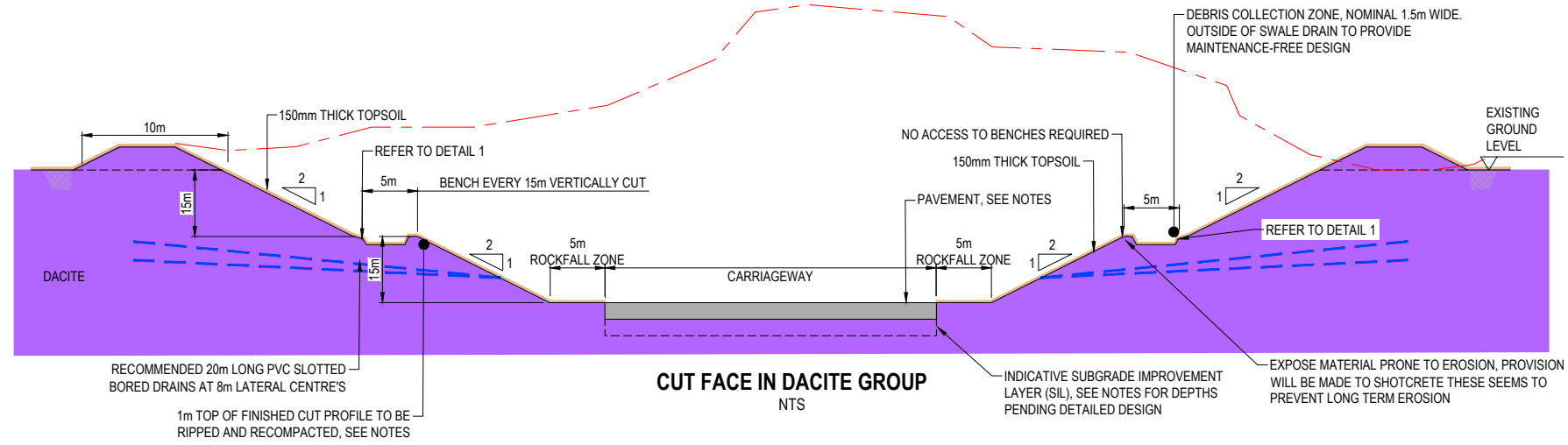
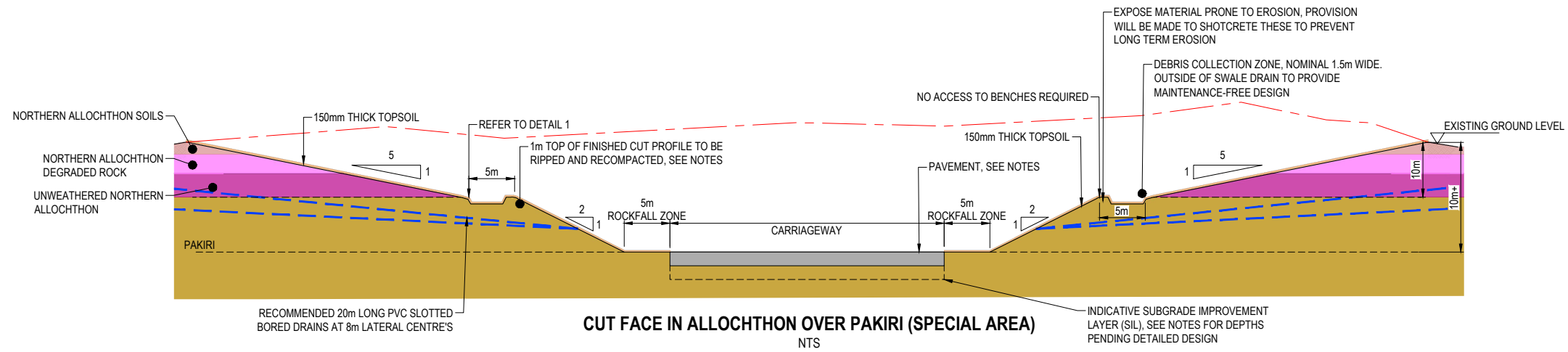
NOTES FOR REUSABILITY OF SOILS:

1. REQUIRES DRYING.
2. IF SOIL IS TOO WET, THEN CUT TO WASTE.
3. SOILS MAY REQUIRE CONDITIONING.
4. DEPTH OF REUSABLE SOIL (m_{bg})
NORTHLAND ALLOCHTHON: 2m
PAKIRI: 7.5m
WAIPAPA: 2m
RUARANGI & DACITE: UNSUITABLE

300 Original size mm
200
150
100
50
0

Plot Date: 3/27/2026 8:38 am | Plotted By: Deepak Chokkalingam | Original File: C:\P\W\WSP-AUS-19\045\308\10722-PTA-2B0-GO-DRG-0071.DWG | Tac: A

PROJECT				REV			APPROVED			STATUS			TITLE				PROJECT INFORMATION							
ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY				A	18.02.26	CONSENT DESIGN FOR CLIENT REVIEW			R.D	DRAWN	D.CHOKKALINGAM	27.03.26	BRYNDERWYN HILLS SECTION TYPICAL DETAILS CUT SLOPES SHEET 1				NORTHLAND CORRIDOR							
NZ TRANSPORT AGENCY WAKA KOTAHU Northland Corridor Roads of National Significance				B	27.03.26	CONSENT DESIGN FOR LODGEMENT			R.D	DRG CHECK	S.GREANEY	27.03.26									DOCUMENT CODE			
COORDINATE SYSTEM: NZTM 2B00, VERTICAL DATUM: NZVD2016										DESIGN	K.KISHORE	27.03.26									10722-PTA-2B0-GO-DRG-0071			
ORIGINAL IN COLOUR DETAIL MAY BE LOST IF COPIED										VERIFIED	S.GRIEVE	27.03.26	APPROVED BY		DATE		SCALE	SIZE	REFERENCE No.	REV				
										PROJECT LEAD	T.IRELAND	27.03.26	R.DUPLOOY		27.03.26		NA	A1	GO-0071	B				



- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
 - SUBSURFACE SOIL/ROCK PROFILE INDICATIVE ONLY.
 - SURFACE CHANNELS AND DRAINAGE CONNECTION ON SLOPES SHALL BE DESIGNED AND PROVIDED IN DETAILED DESIGN AND CONSTRUCTION STAGES.
 - RIPPING AND RECOMPACTION IS TO EXTEND THE ENTIRE SLOPE FACE.
 - SEE PAVEMENT DRAWINGS FOR PAVEMENT DETAILS INDICATIVELY TAKEN FROM RoNs STANDARD DESIGNS.
 - INDICATIVE SIL DEPTHS BELOW BASED ON GEOLOGY WHERE NOT SPECIFIED SIL = 0.3m:
 - ALLOCHTHON (NON CALCAREOUS) - 0.75m
 - DACITE = 0.5m
 - ALLUVIUM - FILL EMBANKMENTS GENERALLY PROPOSED IN THIS AREA. SIL ASSUMED PART OF EMBANKMENT FILL.
 - NO CUTS EXTEND INTO ALLUVIUM TO REQUIRE SIL.
 - BORED DRAINS OR COUNTERFORT DRAINS CAN BE INTERCHANGEABLE DEPENDING ON THE NEED FOR GROUND WATER CONTROL PENDING GROUND INVESTIGATIONS AND DETAILED DESIGN.
 - IT IS ASSUMED THAT DRAINS WILL DISCHARGE INTO CARRIAGEWAY SURFACE DRAINAGE.
 - DRAIN OUTLETS WILL BE POSITIONED UP THE SLOPE SUCH THAT OUTLETS CAN BE MAINTAINED i.e. NO MORE THAN APPROXIMATELY 1.5m FROM THE SLOPE BASE.
 - PLANTING REQUIREMENTS ARE TO BE CONFIRMED, SLOPES HAVE ALLOWED FOR 150mm THICK TOPSOIL HOWEVER THIS MAY NOT BE REQUIRED IF PLANTING IS NOT REQUIRED.
 - GROUNDWATER IS LIKELY TO BE ENCOUNTERED DURING EARTHWORKS AND MAY COMPRISE PERCHED/SHALLOW GROUNDWATER, ARTESIAN PRESSURISED SYSTEMS AT DEPTH OR ENCOUNTER SPRINGS. MITIGATION MEASURES INDICATIVELY COMPRISE DRAINAGE AS SHOWN ON THE DRAWINGS HOWEVER THESE WILL BE DEVELOPED PENDING DESIGN AND GROUND INVESTIGATIONS.
 - COMBINED ROCKFALL CATCH DITCH AND SWALE IS SHOWN INDICATIVELY ON DRAWINGS, ACTUAL DIMENSIONS AND NEED OF ADDITIONAL FENCING IS PENDING DESIGN.
 - SPRINGS ENCOUNTERED DURING EARTHWORKS ARE TO BE COLLECTED AND CONVEYED TO ROAD SIDE SWALES BY EITHER PIPING OR DRAINAGE DITCHES THAT EXTEND DOWN THE SLOPE FACE. DRAINAGE DITCHES DEPENDING ON ENCOUNTERED GROUNDWATER VELOCITIES MAY REQUIRE SHOTCRETING AND/OR ROCK LINING TO PREVENT LONG TERM EROSION.
 - DEEPLY WEATHERED SEEMS MAY BE ENCOUNTERED DURING CUT EARTHWORKS AND EXPOSE MATERIAL PRONE TO EROSION, PROVISION WILL BE MADE TO SHOTCRETE THESE SEEMS TO PREVENT LONG TERM EROSION.

1 BENCH AND SWALE DRAIN DETAIL
NTS

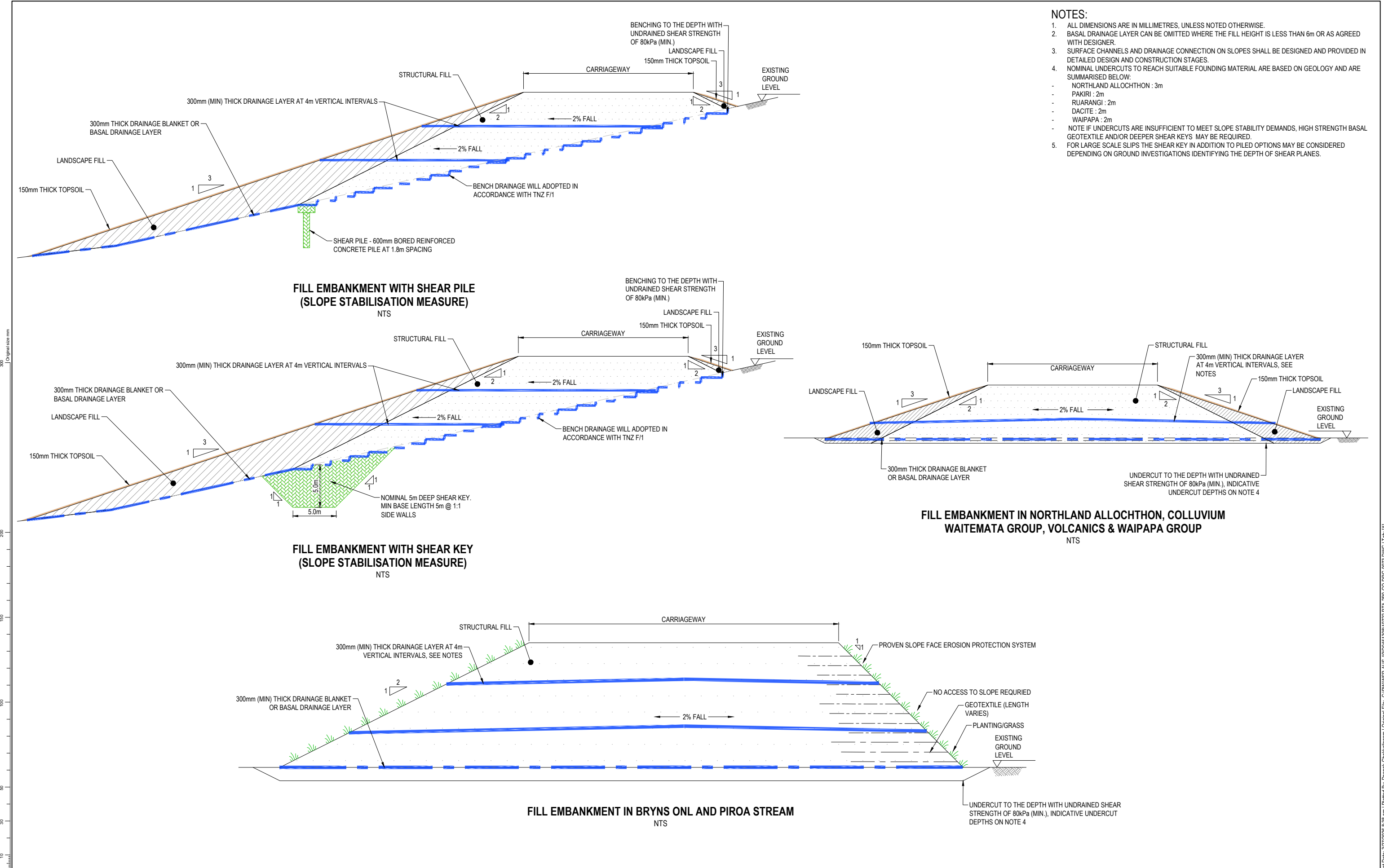
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ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY				A	18.02.26	CONSENT DESIGN FOR CLIENT REVIEW			R.D	DRAWN			BRYNDERWYN HILLS SECTION				NORTHLAND CORRIDOR			
				B	27.03.26	CONSENT DESIGN FOR LODGEMENT			R.D	DRG CHECK			TYPICAL DETAILS				DOCUMENT CODE			
										DESIGN			CUT SLOPES				10722-PTA-2B0-GO-DRG-0072			
										VERIFIED			SHEET 2				SCALE			
										PROJECT LEAD							SIZE			
																	REFERENCE No.			
																	REV			
																	NA			
																	A1			
																	GO-0072			
																	B			

NZ TRANSPORT AGENCY
WAKA KOTAHU

Northland Corridor
Roads of National Significance

COORDINATE SYSTEM: NZTM 2B00, VERTICAL DATUM: NZVD2016
ORIGINAL IN COLOUR DETAIL MAY BE LOST IF COPIED

Plot Date: 3/27/2026 8:38 am | Plotted By: Deepak Chokkalingam | Original File: C:\P\W\WSP-AUS-190045\308\10722-PTA-2B0-GO-DRG-0072.DWG | Tac: A



- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
 2. BASAL DRAINAGE LAYER CAN BE OMITTED WHERE THE FILL HEIGHT IS LESS THAN 6m OR AS AGREED WITH DESIGNER.
 3. SURFACE CHANNELS AND DRAINAGE CONNECTION ON SLOPES SHALL BE DESIGNED AND PROVIDED IN DETAILED DESIGN AND CONSTRUCTION STAGES.
 4. NOMINAL UNDERCUTS TO REACH SUITABLE FOUNDING MATERIAL ARE BASED ON GEOLOGY AND ARE SUMMARISED BELOW:
 - NORTHLAND ALLOCHTHON : 3m
 - PAKIRI : 2m
 - RUARANGI : 2m
 - DACITE : 2m
 - WAIPAPA : 2m
 5. NOTE IF UNDERCUTS ARE INSUFFICIENT TO MEET SLOPE STABILITY DEMANDS, HIGH STRENGTH BASAL GEOTEXTILE AND/OR DEEPER SHEAR KEYS MAY BE REQUIRED. FOR LARGE SCALE SLIPS THE SHEAR KEY IN ADDITION TO PILED OPTIONS MAY BE CONSIDERED DEPENDING ON GROUND INVESTIGATIONS IDENTIFYING THE DEPTH OF SHEAR PLANES.

Original size mm
300
200
150
100
50
10
0

Plot Date: 3/27/2026 8:38 am | Plotted By: Deepak Chokkalingam | Original File: C:\P\W\WSP-AUS-19\04\51308\10722-PTA-2B0-GO-DRG-0073.DWG | Tac: A

PROJECT
ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY



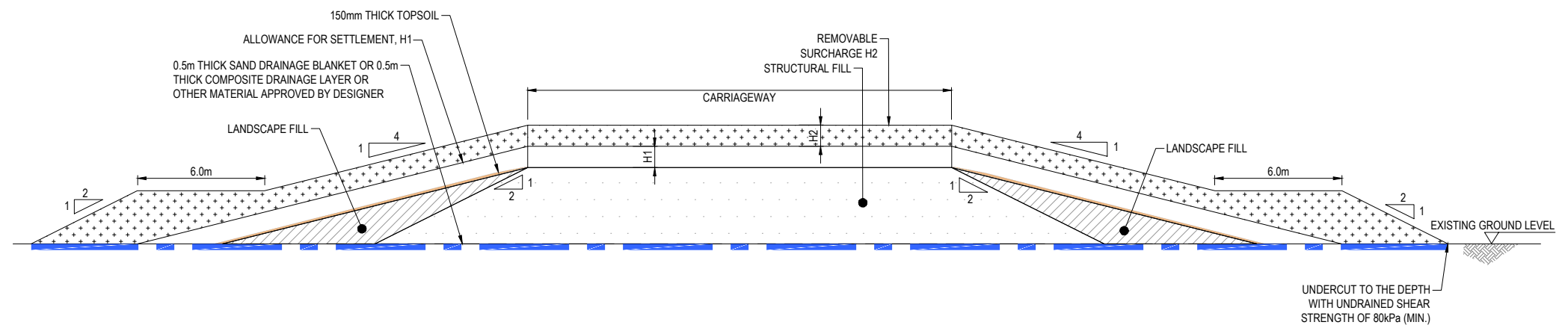
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B	27.03.26	CONSENT DESIGN FOR LODGEMENT

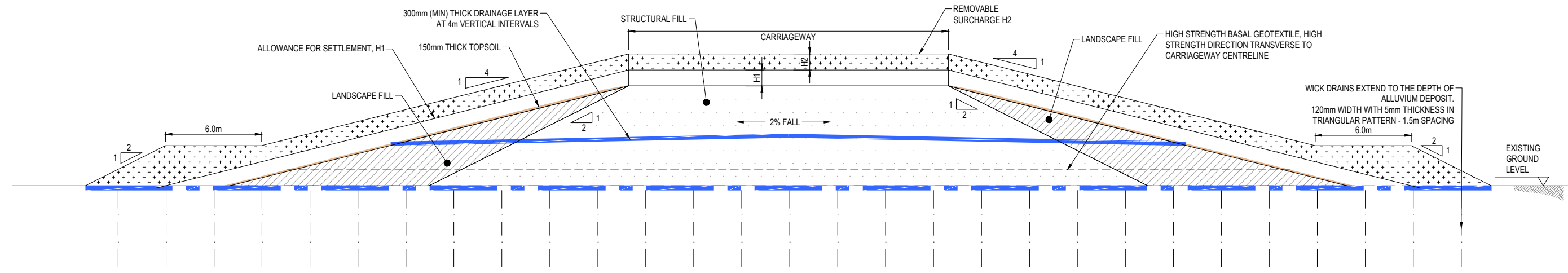
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R.D	APPROVED R.DUPLLOY	
	APPROVED BY	DATE
	R.DUPLLOY	27.03.26

APPROVED	DATE
R.DUPLLOY	27.03.26

PROJECT INFORMATION			
NORTHLAND CORRIDOR			
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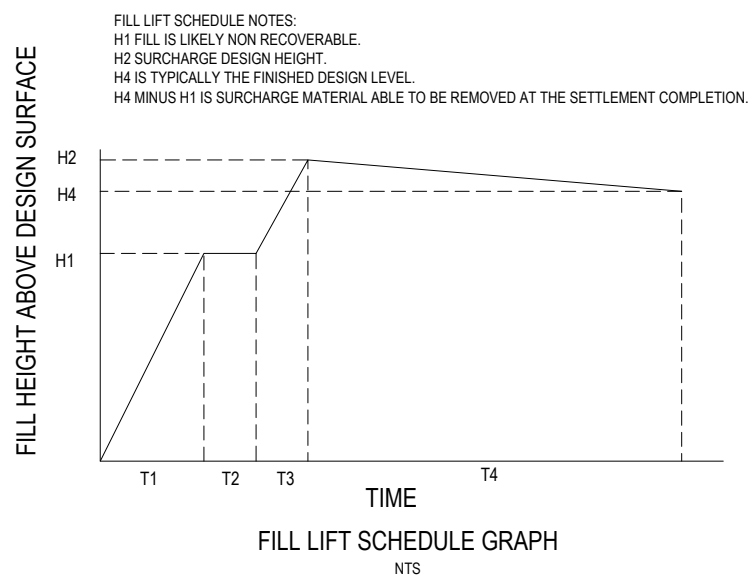


FILL EMBANKMENT ON ALLUVIUM WITH LESS THAN 3m OF FILL
NTS



FILL EMBANKMENT ON ALLUVIUM MORE THAN 3m OF FILL
NTS

SECTION A
GO-0024



INDICATIVE FILL SCHEDULE (PENDING GROUND INVESTIGATIONS AND SUBSEQUENT DESIGN STAGES)
(REFER TO FILL LIFT SCHEDULE GRAPH)

EMBANKMENT FOUNDING GEOLOGY	H1	T1 & T3	H2	T2	T4
PLEISTOCENE AGE ALLUVIAL DEPOSITS	NOMINALLY 0.5m TO 1.0m ABOVE FINISHED DESIGN LEVEL	NOMINAL FILL RATE OF 1m/WEEK	NOMINALLY UP TO 1.5m	TBC	UP TO 1YEAR
HOLOCENE AGE ALLUVIAL DEPOSITS	NOMINALLY 0.5m TO 1.0m ABOVE FINISHED DESIGN LEVEL	NOMINAL FILL RATE OF 0.5m/WEEK TO 1.0m/WEEK	NOMINALLY UP TO 1.5m	TBC	UP TO 1.5YEARS
NOTE	THE FILL SCHEDULE IS INDICATIVE ONLY AND WILL BE CONFIRMED PENDING GROUND INVESTIGATIONS AND SUBSEQUENT DESIGN STAGES.				

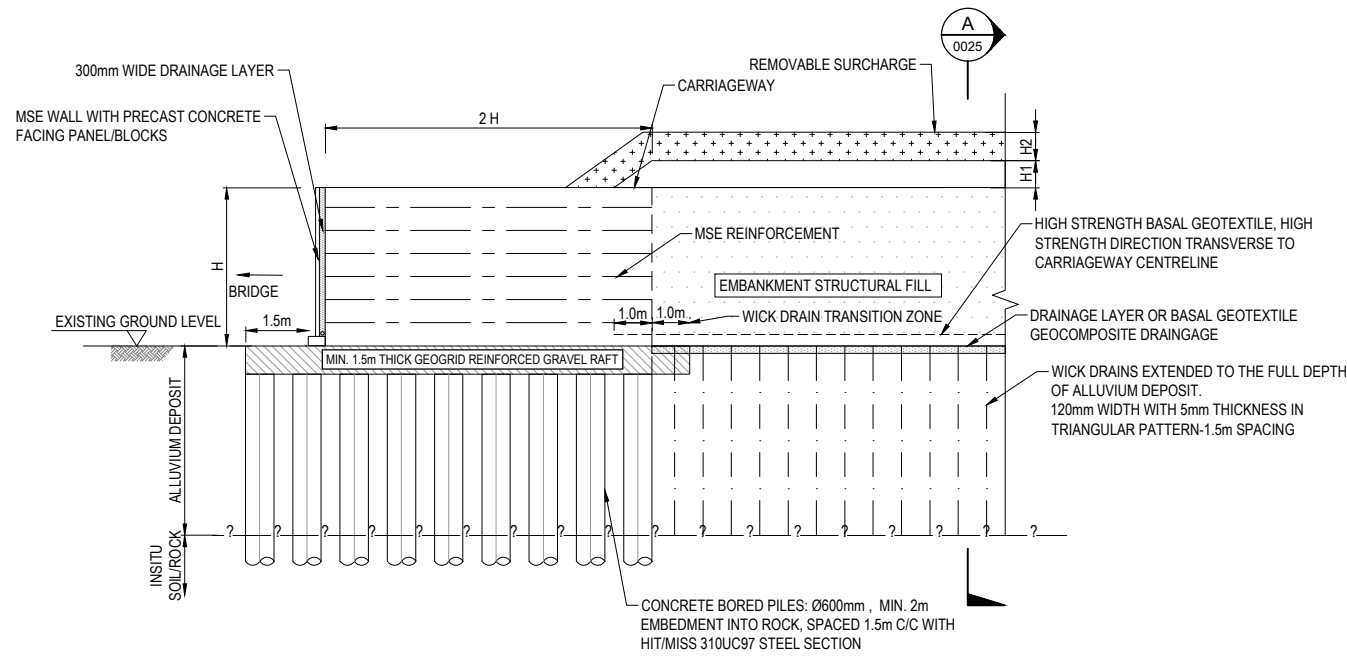
- NOTES:**
- DO NOT SCALE OFF THIS DRAWING.
 - FILL IS TO BE PLACED TO DESIGN HEIGHTS. FILL HEIGHTS ALLOW FOR SOME SETTLEMENT COMPENSATION FILL. ALL SETTLEMENT ALLOWANCE AND SURCHARGE HEIGHTS ARE BASED ON MEETING FINISHED DESIGN LEVELS. IT IS ANTICIPATED THAT SOME SETTLEMENT WILL OCCUR WHILE FILL IS PLACED DURING CONSTRUCTION OF THE EMBANKMENT AND SURCHARGE.
 - FINAL LEVEL OF SETTLEMENT ALLOWANCE TO BE CONFIRMED BY ENGINEER DURING CONSTRUCTION BASED ON SETTLEMENT DATA.
- EXCAVATION AND FOUNDATION REQUIREMENTS**
- NOMINAL UNDERCUTS BASED ON GEOLOGY ARE SUMMARISED BELOW (PENDING GROUND INVESTIGATIONS):
 - ALLUVIUM (<3m FILL) - 1m
 - ALLUVIUM (>3m FILL) WILL REQUIRE MINIMAL UNDERCUT TO ALLOW PROGRESSION OF WICKDRAINS, UNDERCUT IS ASSUMED TO ONLY BE REQUIRED FOR CONSTRUCTION OF A WORKING PLATFORM.
- H1 AND H2 MATERIAL REQUIREMENTS**
- MATERIAL UP TO H1 TO COMPRISE STRUCTURAL FILL AND WILL LIKELY BE NON RECOVERABLE.
 - H2 CAN COMPRISE STRUCTURAL FILL AND/OR LANDSCAPE FILL AND WILL BE RECOVERABLE.
 - WHERE POSSIBLE LANDSCAPE FILL TO BE USED AS PREFERRED H2 MATERIAL.
 - LANDSCAPE FILL AND TOP SOIL ARE NOT TO BE BLENDED WITH STRUCTURAL FILL.
 - LANDSCAPE FILL AND TOP SOIL FILL ARE NOT TO CONTAMINATE STRUCTURAL FILL.
 - WERE LANDSCAPE FILL IS USED AS H2, SAFE SLOPE BATTERS ARE TO BE CONFIRMED ON SITE. WHERE FLATTER SLOPE BATTERS ARE NOT PERMISSIBLE DUE TO BOUNDARY CONSTRAINTS THE TEMPORARY RETAINING WALLS MAY BE REQUIRED.

PROJECT ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY 			REV A 18.02.26 CONSENT DESIGN FOR CLIENT REVIEW B 27.03.26 CONSENT DESIGN FOR LODGEMENT			APPROVED R.D. R.D.			STATUS DRAWN D.CHOKKALINGAM 27.03.26 DRG CHECK S.GREANEY 27.03.26 DESIGN K.KISHORE 27.03.26 VERIFIED S.GRIEVE 27.03.26 PROJECT LEAD T.IRELAND 27.03.26			TITLE BRYNDERWYN HILLS SECTION TYPICAL DETAILS ALLUVIAL FILL EMBANKMENTS (HEIGHT <3M AND HEIGHT >3M)			PROJECT INFORMATION NORTHLAND CORRIDOR DOCUMENT CODE 10722-PTA-2B0-GO-DRG-0074 SCALE NA SIZE A1 REFERENCE No. GO-0074 REV B		
COORDINATE SYSTEM: NZTM 2B00, VERTICAL DATUM: NZVD2016 ORIGINAL IN COLOUR DETAIL MAY BE LOST IF COPIED																	

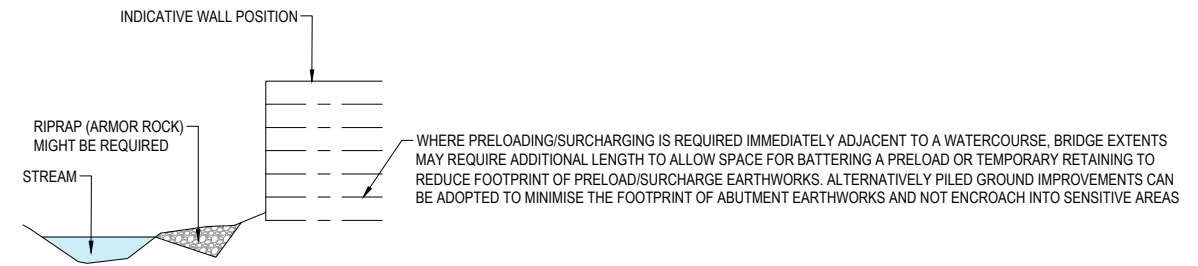
Plot Date: 3/27/2026 8:38 am | Plotted By: Deepak Chokkalingam | Original File: C:\P\W\NSP-AUS-19\045\308\10722-PTA-2B0-GO-DRG-0074.DWG | Tab: [A]

NOTES:

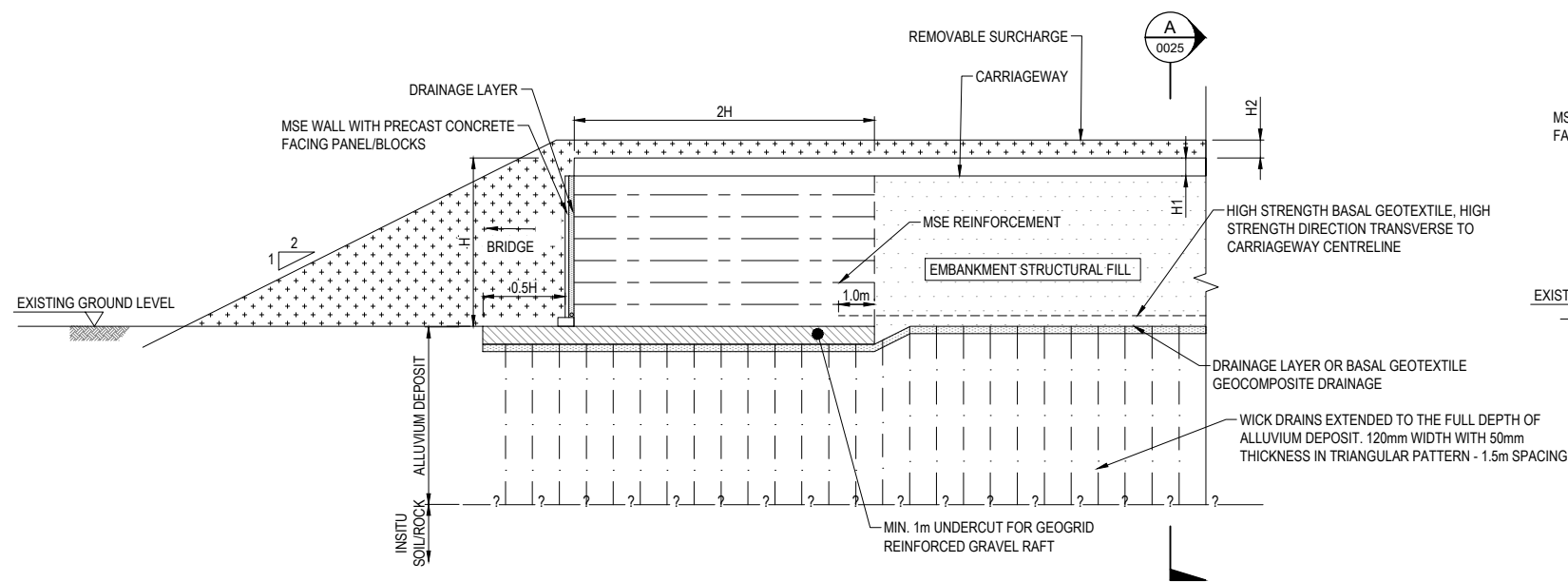
1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
2. BASAL DRAINAGE LAYER CAN BE OMITTED WHERE THE FILL HEIGHT IS LESS THAN 3m OR AS AGREED WITH DESIGNER.
3. SURFACE CHANNELS AND DRAINAGE CONNECTION ON SLOPES SHALL BE DESIGNED AND PROVIDED IN DETAILED DESIGN AND CONSTRUCTION STAGES.
4. WHEN ABUTMENT IS IMMEDIATELY ADJACENT TO A WATERWAY, EROSION PROTECTION MAY BE REQUIRED COMPRISING RIP RAP OR SIMILAR AS SHOWN IN THE INDICATIVE SCOUR PROTECTION AT TOE OF WALL DETAIL.
5. WORKING PLATFORMS ARE NOMINALLY ALLOWED FOR TO COMPENSATE FOR TOP SOIL STRIPPING AND TO PROVIDE A SUITABLE PLATFORM TO ALLOW FILLING EARTHWORKS TO COMMENCE. THIS PLATFORM MAY NOT BE REQUIRED WHERE THE NATURAL SUBGRADE IS SUITABLE TO TRACK PLANT.
6. GROUND IMPROVEMENT ARRANGEMENT IS TO BE CONFIRMED PENDING GROUND INVESTIGATIONS AND DETAILED DESIGN.
7. SEE GO-0025 FOR H1/H2 DETAILS AND THE DURATIONS OF PRELOADING/SURCHARGING (T1 TO T4) BASED ON ANTICIPATED GEOLOGY.
8. WHERE WICK DRAINS UNDERLAY THE BRIDGE ABUTMENT RETAINING IT IS ASSUMED THAT THE BRIDGE/RETAINING WILL BE CONSTRUCTED AT THE COMPLETION OF SETTLEMENT AS INDICATED IN THE FILL SCHEDULES ON GO-0025.
9. TEMPORARY RETAINING MAY BE CONSIDERED IF THERE IS INSUFFICIENT SPACE TO BATTER PRELOADS/SURCHARGES.
10. AS AN ALTERNATE TO ABUTMENT RETAINING SPILL THROUGH ABUTMENTS COULD BE CONSIDERED PROVIDED BRIDGE EXTENTS ALLOW FOR SPACE TO BATTER.



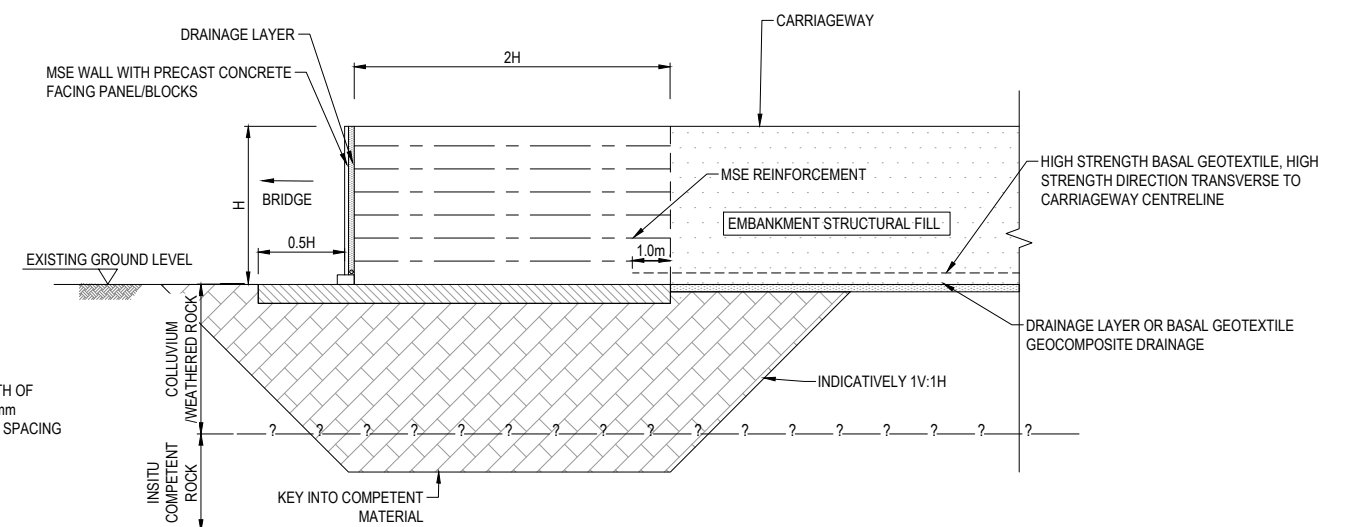
PILE GROUND IMPROVEMENT FOR BRIDGE ABUTMENT
NTS



INDICATIVE SCOUR PROTECTION AT TOE OF WALL
NTS



GROUND IMPROVEMENT FOR BRIDGE ABUTMENT
NTS

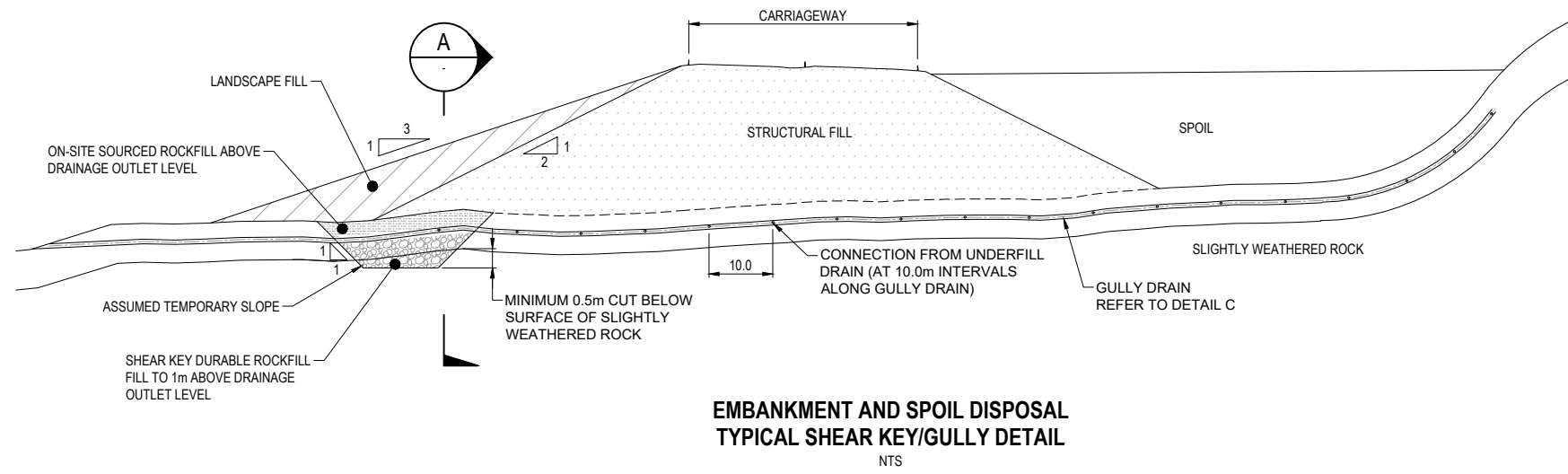


DIG AND REPLACE/SHEAR KEY GROUND IMPROVEMENT FOR BRIDGE ABUTMENT
NTS

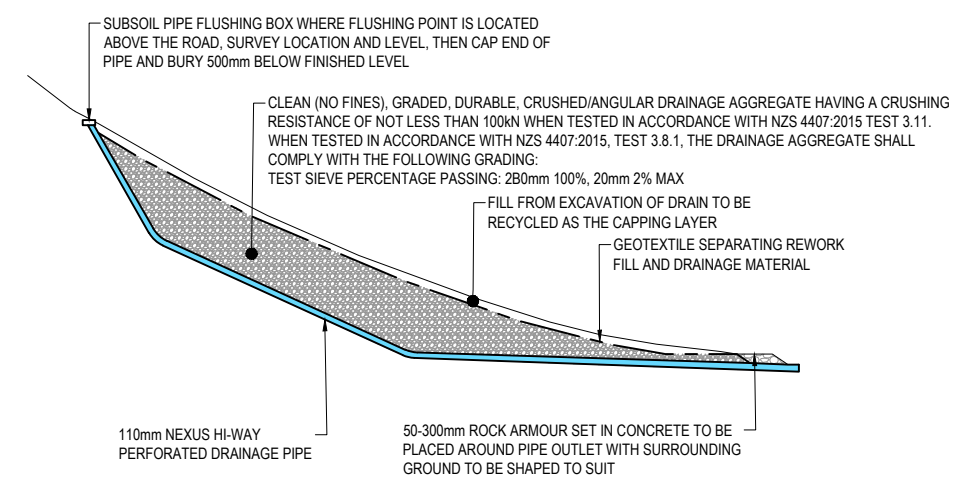
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ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY				REV	DATE	REVISION DETAILS	R.D	DRAWN	D.CHOKKALINGAM	27.03.26	CONSENT DESIGN		BRYNDERWYN HILLS SECTION TYPICAL DETAILS BRIDGE ABUTMENTS		NORTHLAND CORRIDOR			
NZ TRANSPORT AGENCY WAKA KOTAHU Northland Corridor Roads of National Significance				A	18.02.26	CONSENT DESIGN FOR CLIENT REVIEW	R.D	DRG CHECK	S.GREANEY	27.03.26								
COORDINATE SYSTEM: NZTM 2B00, VERTICAL DATUM: NZVD2016				B	27.03.26	CONSENT DESIGN FOR LODGEMENT		DESIGN	K.KISHORE	27.03.26	R.DUPLLOY		10722-PTA-2B0-GO-DRG-0075		SCALE	SIZE	REFERENCE No.	REV
ORIGINAL IN COLOUR DETAIL MAY BE LOST IF COPIED								VERIFIED	S.GRIEVE	27.03.26	APPROVED BY		DATE	NA	A1	GO-0075	B	
								PROJECT LEAD	T.IRELAND	27.03.26	R.DUPLLOY		27.03.26					

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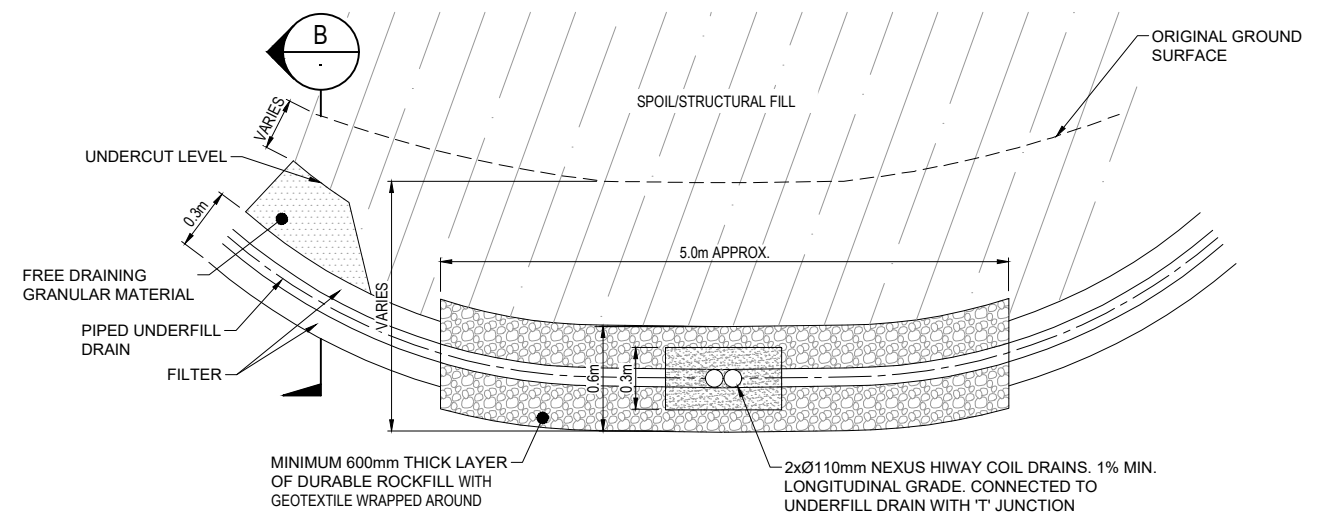
- NOTES:**
1. DRAIN PIPES TO BE INSERTED AT A 10° ANGLE.
 2. DRAIN ENDS TO BE TEMPORARILY COVERED DURING SHOTCRETING.
 3. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
 4. SURFACE CHANNELS AND DRAINAGE CONNECTION ON SLOPES SHALL BE DESIGNED AND PROVIDED IN DETAILED DESIGN AND CONSTRUCTION STAGES.



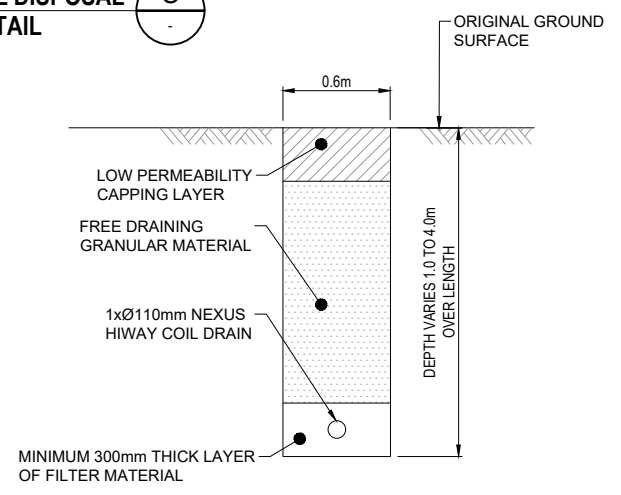
EMBAKMENT AND SPOIL DISPOSAL TYPICAL SHEAR KEY/GULLY DETAIL
NTS



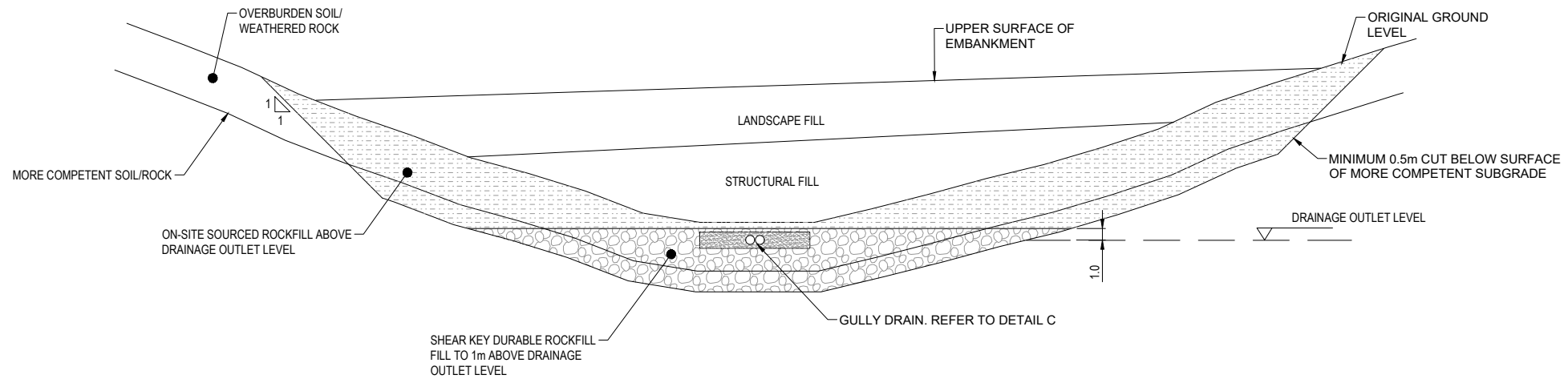
COUNTERFORT DRAIN DETAIL
NTS



EMBAKMENT AND SPOIL DISPOSAL GULLY DRAIN DETAIL
NTS



EMBAKMENT AND SPOIL DISPOSAL PIPED UNDERFILL DRAIN DETAIL
NTS



EMBAKMENT AND SPOIL DISPOSAL TYPICAL SHEAR KEY/GULLY DETAIL
NTS

Original size mm
300
200
150
100
50
10
0

PROJECT				REVISION DETAILS			APPROVED			STATUS			TITLE				PROJECT INFORMATION			
ALL INFORMATION SHOWN IS SUBJECT TO FINAL DESIGN AND THE DETAILS MAY CHANGE. AREAS AND MEASUREMENTS ARE SUBJECT TO SURVEY				A	18.02.26	CONSENT DESIGN FOR CLIENT REVIEW			R.D	DRAWN			BRYNDERWYN HILLS SECTION				NORTHLAND CORRIDOR			
NZ TRANSPORT AGENCY WAKA KOTAHĪ Northland Corridor Roads of National Significance				B	27.03.26	CONSENT DESIGN FOR LODGEMENT			R.D	DRG CHECK			TYPICAL DETAILS				DOCUMENT CODE			
COORDINATE SYSTEM: NZTM 2B00, VERTICAL DATUM: NZVD2016											DESIGN			10722-PTA-2B0-GO-DRG-0076						
ORIGINAL IN COLOUR DETAIL MAY BE LOST IF COPIED											VERIFIED			SCALE						
											PROJECT LEAD			SIZE						
											T.IRELAND			REFERENCE No.						
											R.DUPLLOY			REV						
											APPROVED BY			GO-0076						
											DATE			B						
											27.03.26									

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