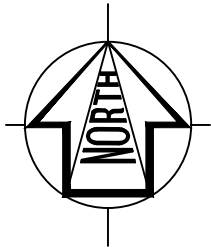
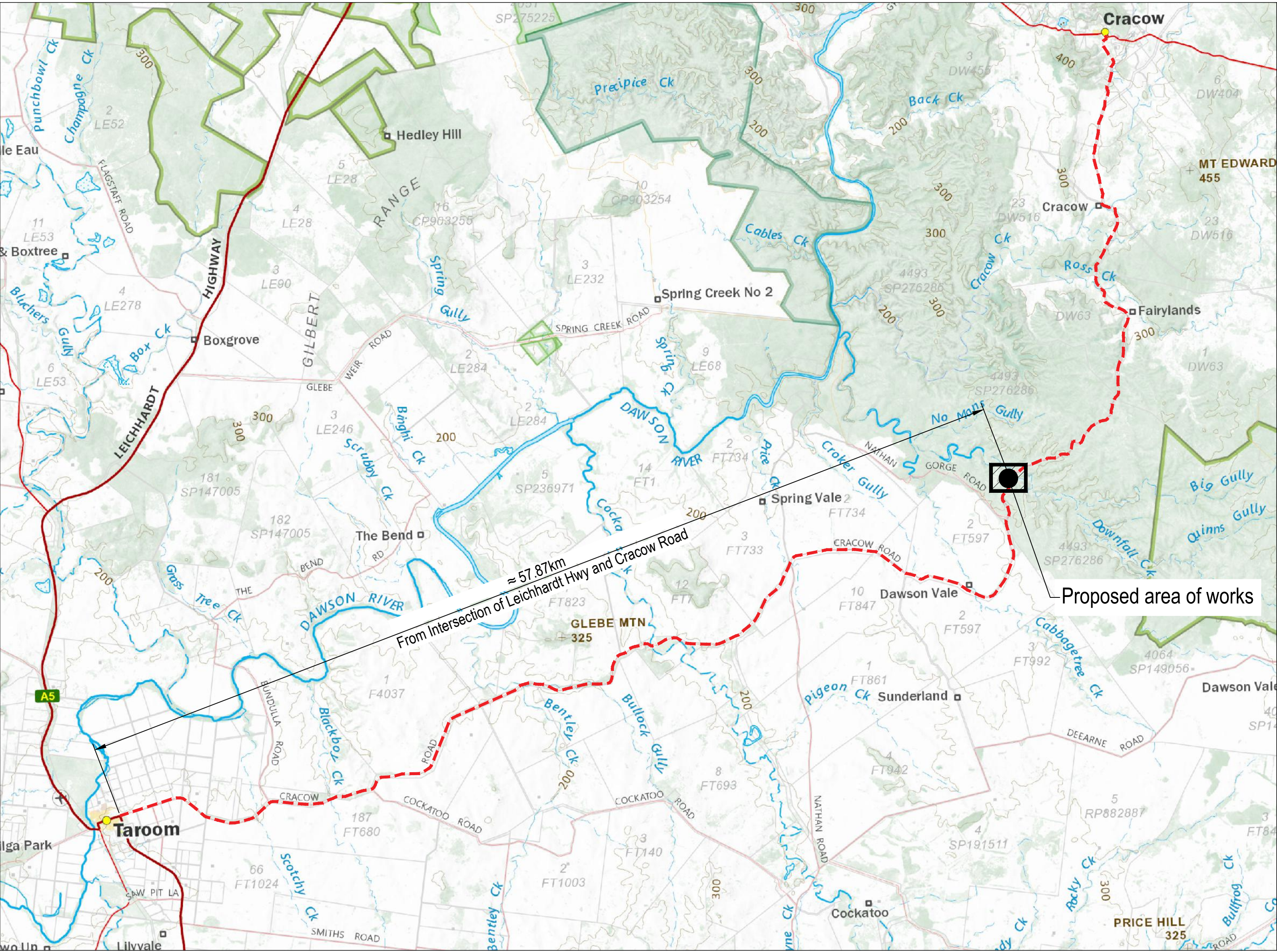


CRACOW ROAD, DOWNFALL CREEK
RANGE AND FLOODWAY UPGRADE



LOCALITY PLAN
(Not to scale)

Sheet List Table

Sheet Number	Revision	Sheet Title
001	B	Project Cover Sheet
300	A	Survey Control and Services Plan
301	B	Survey Control and Services Plan
400	A	Roadworks and Setout Plan Sheet 1
401	A	Roadworks and Setout Plan Sheet 2
500	A	Pavement Plan Sheet 1
501	A	Pavement Plan Sheet 2
600	A	Longitudinal Section Sheet 1
601	A	Longitudinal Section Sheet 2
602	A	Longitudinal Section Sheet 3

Sheet List Table

Sheet Number	Revision	Sheet Title
700	A	Typical Cross Sections
800	A	Annotated Cross Sections Sheet 1
801	A	Annotated Cross Sections Sheet 2
802	A	Annotated Cross Sections Sheet 3
803	A	Annotated Cross Sections Sheet 4
804	A	Annotated Cross Sections Sheet 5
805	A	Annotated Cross Sections Sheet 6
806	A	Annotated Cross Sections Sheet 7
807	A	Annotated Cross Sections Sheet 8
808	A	Annotated Cross Sections Sheet 9

Sheet List Table

Sheet Number	Revision	Sheet Title
1000	A	Supplementary Signs and Linemarking Details
1200	A	Floodway Details
1600	A	Limit of Clearing Plan Sheet 1
1601	A	Limit of Clearing Plan Sheet 2
1700	A	Temporary Erosion and Sediment Control Sheet 1
1701	A	Temporary Erosion and Sediment Control Sheet 2
1702	A	Temporary Erosion and Sediment Control Sheet 3
1703	A	Temporary Erosion and Sediment Control Sheet 4

STANDARD DRAWINGS:		
ROADWORKS		
Dwg.	Rev.	Description
CMDG-R-081	E	SIGN LOCATION AND INSTALLATION DETAILS
CMDG-R-094	B	FLOODWAY - BED LEVEL CROSSING
DEPARTMENT OF TRANSPORT AND MAIN ROADS - STANDARD DRAWINGS:		
ROAD FURNITURE		
1170	D	Flood Depth Indicators - Installation
SIGNS AND GUIDE POSTS		
1356	F	Road Edge Guide Posts - Timber and Tubular Steel Post and Installation Details
GENERAL EARTHWORKS AND PROPERTY ACCESS		
1178	E	Diversion of Water from Roadway and Table Drains

Last Modified :- Nov 17, 2023 - 2:29pm
XREFS :- X_CRC_BSC_TITLE.dwg

B	Updated Sheet List Table		TP	Nov 23
A	Issued For Construction			
20.01	Revisions/Descriptions	Drawn	Approved	Date

Scales

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Client

Title

CRACOW ROAD UPGRADE (Ch. 57877m - 58640m)
DOWNFALL CREEK FLOODWAY AND RANGE SECTION
PROJECT COVER SHEET

Job No.

CRC00269

Drawing No.

001

Revision

B

Series No.

01 of 28

Drawn

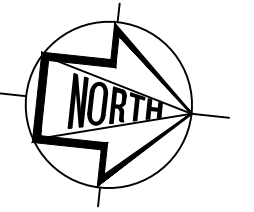
B Doherty

Designed

B Doherty

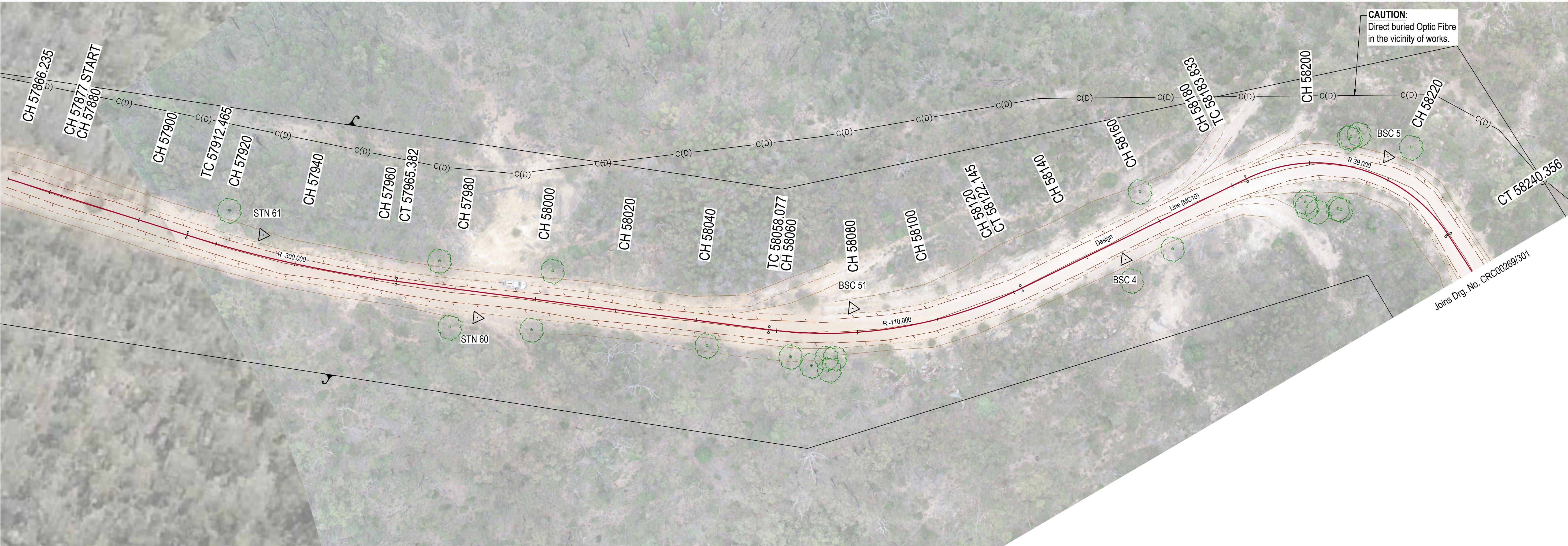
ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
Civil	T Penrose		24807	June 2023



CRACOW

ROAD



PLAN
Scale A

ENGINEERING SURVEY CONTROL

STATION	EASTING	NORTHING	LEVEL	REMARKS
STN 61	223602.619	7177307.886	287.911	Star Picket
STN 60	223617.355	7177362.576	285.609	Star Picket
BSC 51	223605.261	7177454.456	277.198	
BSC 4	223586.186	7177520.057	269.822	
BSC 5	223554.166	7177581.811	263.231	

WARNING!

BEWARE OF UNDERGROUND SERVICES

The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied. Ensure all services are accurately located prior to commencement of work.

XREFS - X_CRC_BSC_TITLE.dwg : X_SURVEY.dwg : X_CONTROL.dwg : X_IMAGE.dwg

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A	Issued For Construction				
20.01	Revisions/Descriptions	Drawn	Approved	Date	

Scales

0510152025

Scale A1:500

Dimensions shown in metres except where shown otherwise

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Client

Title

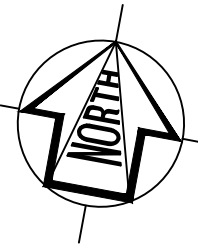
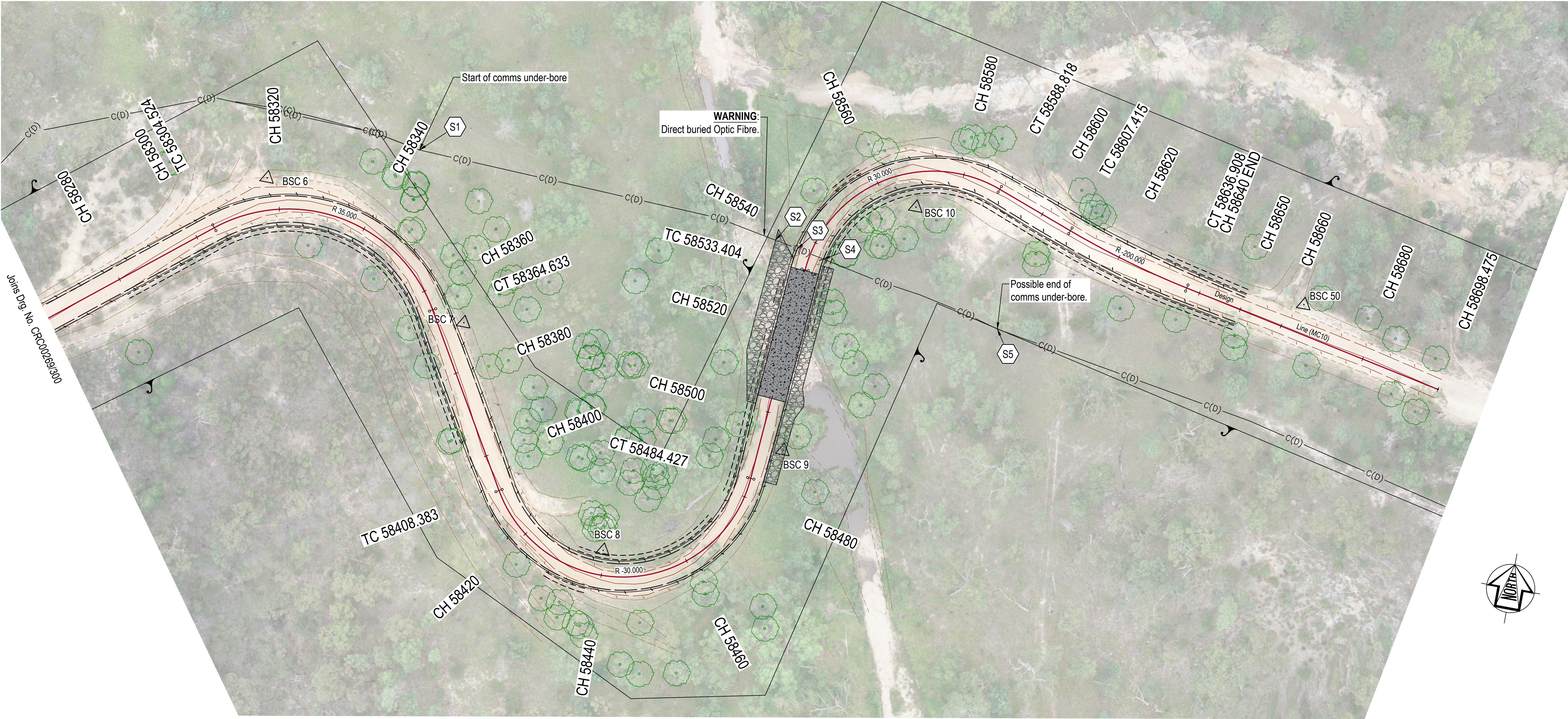
CRACOW ROAD UPGRADE (Ch. 57877m - 58640m)
DOWNFALL CREEK FLOODWAY AND RANGE SECTION
SURVEY CONTROL AND SERVICES SHEET 1

Drawn B Doherty	ENGINEERING CERTIFICATION (RPEQ)				
	ENG. AREA Civil	NAME T Penrose	SIGNATURE 	NO. 24807	DATE June 2023
Designed B Doherty					

Job No.	CRC00269
Drawing No.	300
Revision	A
Series No.	02 of 28

CRACOW

ROAD



PLAN

Scale A

SERVICES LOCATION TABLE

POINT No.	APPROX. EXISTING DEPTH	RL @ TOP OF SERVICE	RL @ BOTTOM OF EXCAVATION	COVER FROM BOT. OF BOX	METHOD USED FOR LOCATION	TYPE OF SERVICE
S1	1.400	248.200	N/A	N/A	Transponder wand	Comms - Direct Buried Optic Fibre (under-bored at floodway)
S2	3.885	234.280	237.427	3.147	Trace wire/rodded Conduit	Comms - Direct Buried Optic Fibre (under-bored at floodway)
S3	4.245	234.979	239.424	4.445	Trace wire/rodded Conduit	Comms - Direct Buried Optic Fibre (under-bored at floodway)
S4	4.369	235.261	239.368	4.107	Trace wire/rodded Conduit	Comms - Direct Buried Optic Fibre (under-bored at floodway)
S5	0.490	Not recorded	N/A	N/A	Transponder wand	Comms - Direct Buried Optic Fibre (under-bored at floodway)

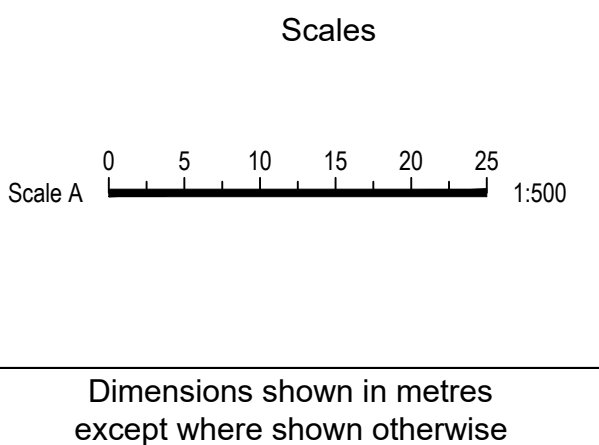
ENGINEERING SURVEY CONTROL

STATION	EASTING	NORTHING	LEVEL	REMARKS
BSC 6	223631.396	7177652.325	254.273	
BSC 7	223681.283	7177628.049	249.654	
BSC 8	223721.772	7177582.901	247.015	
BSC 9	223757.870	7177612.614	240.239	
BSC 10	223777.535	7177672.481	244.311	
BSC 50	223868.225	7177666.654	246.764	

WARNING!

BEWARE OF UNDERGROUND SERVICES
The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied. Ensure all services are accurately located prior to commencement of work.

B	Updated Service Location Table	BD	TP	Nov 23
A	Issued For Construction			
20.01	Revisions/Descriptions	Drawn	Approved	Date

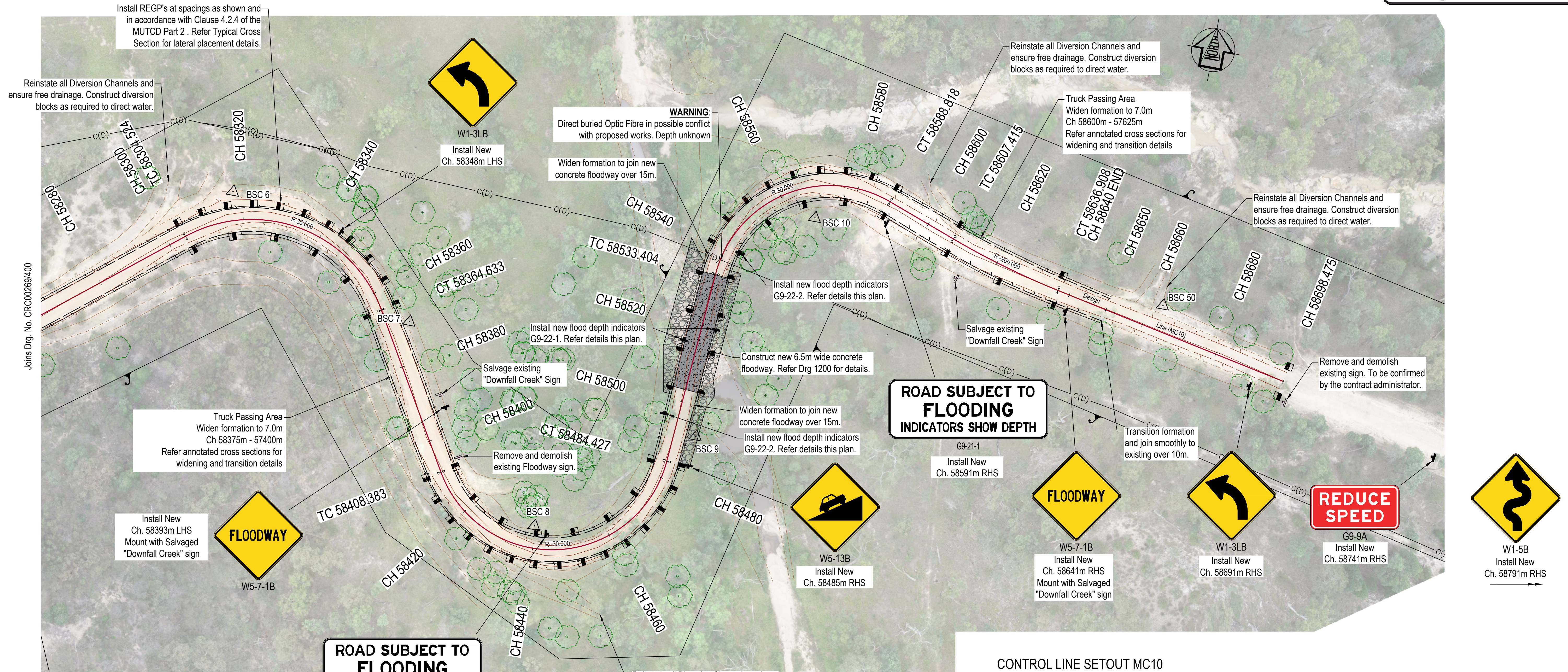


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Client
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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION SURVEY CONTROL AND SERVICES SHEET 2				Job No.	CRC00269
Drawn B Doherty				Drawing No.	301
ENGINEERING CERTIFICATION (RPEQ)				Revision	B
Designed B Doherty	ENG. AREA	NAME	SIGNATURE	NO.	DATE
	Civil	T Penrose		24807	June 2023
				Series No.	03 of 28

Job No.	CRC00269
Drawing No.	400
Revision	A
Series No.	04 of 28



CONTROL LINE SETOUT MC10

POINT	CHAINAGE	EASTING	NORTHING	LEVEL		RADIUS	A.LENGTH	DEFL.ANGLE
TC	58304.524	223621.622	7177639.012	255.631	51°00'00.00"	R = 35.000	60.109	98°24'00.00"
IP 5	58334.578	223653.134	7177664.529	252.775				
CT	58364.633	223673.775	7177629.628	250.337	149°24'00.00"			
TC	58408.383	223696.045	7177591.970	248.506	149°24'00.00"	R = -30.000	38.022	72°37'00.00"
IP 6	58427.394	223707.266	7177572.996	247.337				
CT	58446.405	223728.726	7177578.036	245.565	76°47'00.00"			
IP 7	58465.416	223750.187	7177583.076	243.390		R = -30.000	38.022	72°37'00.00"
CT	58484.427	223751.788	7177605.062	241.179	4°09'60.00"			
TC	58533.404	223755.347	7177653.909	238.966	4°09'60.00"			
IP 8	58561.111	223758.231	7177693.495	243.086		R = 30.000	55.414	105°50'00.00"
CT	58588.818	223795.528	7177679.920	244.741	110°00'00.00"			
TC	58607.415	223813.004	7177673.560	245.299	110°00'00.00"			
IP 9	58622.162	223826.886	7177668.507	245.742		R = -200.000	29.493	8°26'57.10"
CT	58636.908	223841.360	7177665.549	246.184	101°33'02.90"			
END	58640.000	223844.389	7177664.929	246.277				
IP 10	58698.475	223901.680	7177653.221	248.031	101°33'02.90"			

PLAN

Scale A

⚠ WARNING!

BEWARE OF UNDERGROUND SERVICES

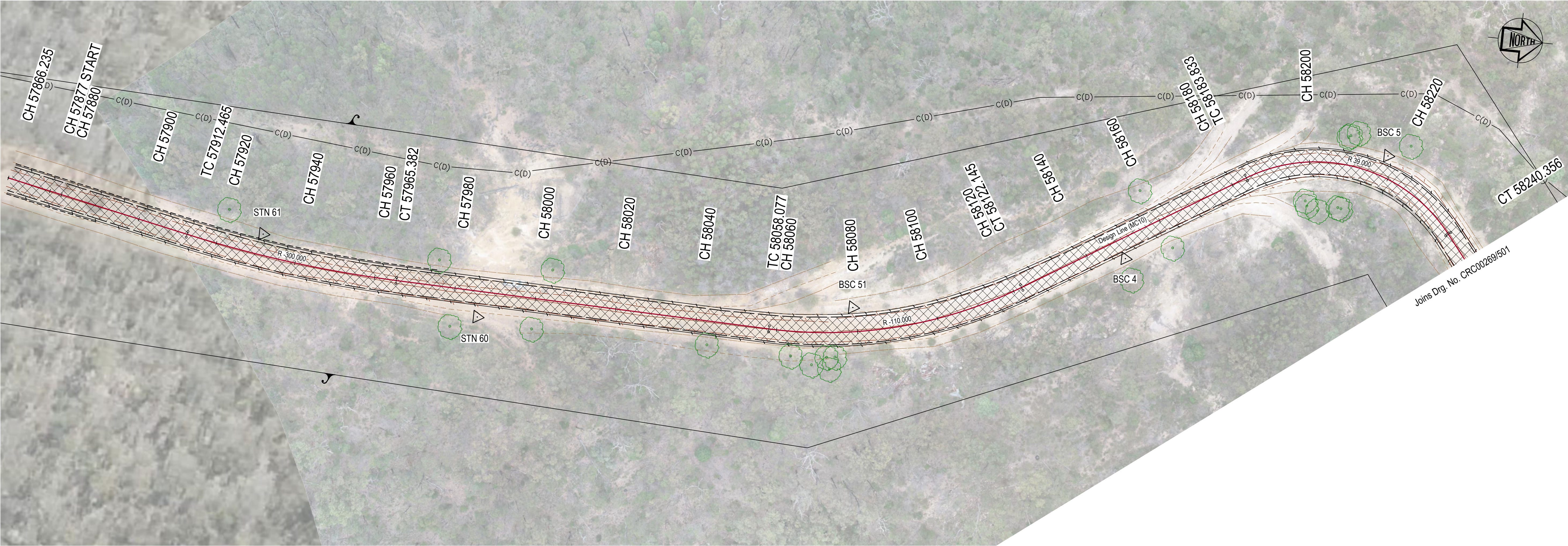
The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied. Ensure all services are accurately located prior to commencement of work.

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CRACOW

ROAD



PLAN
Scale A

LEGEND

New pavement to be constructed. Refer Pavement Type 1 Details.

PAVEMENT TYPE 1 DETAILS

New pavement to be constructed
125mm Overlay, Full width,
Local borrow pit material**
Design Subgrade CBR 15 (soaked)
125mm Total thickness

**
UNSEALED PAVEMENT SPECIFICATION
(Lower Order Roads Design Guide)

Local borrow pit material to satisfy the following specifications

Grading Coefficient (Gc): 16 - 34
Shrinkage Product (Sp): 100 - 240
WPI: < 1200
PI: ≥ 7%
Passing 0.075mm Sieve: ≥ 14%

WARNING!
BEWARE OF UNDERGROUND SERVICES
The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied. Ensure all services are accurately located prior to commencement of work.

All works to be carried out in accordance with the relevant CMDG Construction Specifications.

PAVEMENT DESIGN
(Lower Order Roads Design Guide)

Design Period: 20 Years
Design Traffic: 5.1 x 10⁴ DESA
Design Subgrade CBR: 15 (Soaked)

XREFS - X_CRC_BSC_TITLE.dwg : X_CONTROL.dwg : X_DESIGN.dwg : X_SURVEY.dwg : X_HATCH.dwg : X_IMAGE.dwg
Last Modified :- Nov 17, 2023 - 2:30pm

A	Issued For Construction			
20.01	Revisions/Descriptions	Drawn	Approved	Date

Scales
0 5 10 15 20 25
Scale A 1:500

Dimensions shown in metres
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Client

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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION PAVEMENT PLAN SHEET 1					Job No.	CRC00269
Drawn B Doherty					Drawing No.	500
Designed B Doherty	ENGINEERING CERTIFICATION (RPEQ)				Revision	A
	ENG. AREA	NAME	SIGNATURE	NO. DATE	Series No.	06 of 28
	Civil	T Penrose		24807 June 2023		



LEGEND



New pavement to be constructed. Refer Pavement Type 1 Details.



New pavement to be constructed. Refer Pavement Type 2 Details.

PAVEMENT TYPE 1 DETAILS



☒ New pavement to be constructed

125mm Overlay, Full width,
Local borrow pit material**

Design Subgrade CBR 15 (soaked)

125mm Total thickness

PAVEMENT TYPE 2 DETAILS



 New pavement to be constructed

150mm Cement Stabilised Base, Full Width,

Local borrow pit material**

Insitu stabilised, GB cement, estimated 3.0% by mass

Design Subgrade CBR 15 (soaked)

150mm Total thickness

PLAN

Scale A

PAVEMENT DESIGN
(Lower Order Roads Design Guide)

Design Period:	20 Years
Design Traffic:	5.1×10^4 DESA
Design Subgrade CBR:	15 (Soaked)

UNSEALED PAVEMENT SPECIFICATION (Lower Order Roads Design Guide)

Local borrow pit material to satisfy the following specifications

Grading Coefficient (Gc):	16 - 34
Shrinkage Product (Sp):	100 - 240
WPI:	< 1200
PI:	> 7%
Passing 0.075mm Sieve:	> 14%

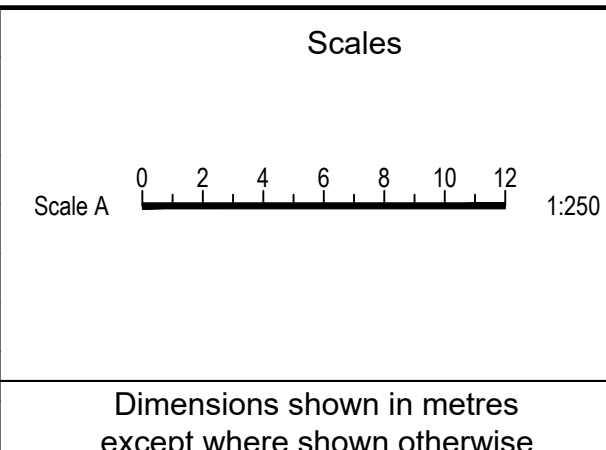
「WARNING!」

BEWARE OF UNDERGROUND SERVICES

The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied. Ensure all services are accurately located prior to commencement of work.

All works to be carried out in accordance with the relevant CMDG Construction Specifications.

A	Issued For Construction			
20.01	Revisions/Descriptions	Drawn	Approved	Date



Title	CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION PAVEMENT PLAN SHEET 1					Job No.	CRC00269
						Drawing No.	501
Drawn	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
B Doherty	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Designed	Civil	T Penrose		24807	June 2023	Series No.	07 of 28
B Doherty							

XREFS - X_CRC_BSC_TITLE.dwg - X_MC10_LS_02.dwg

Last Modified :- Nov 17, 2023 - 2:30pm

WARNING!

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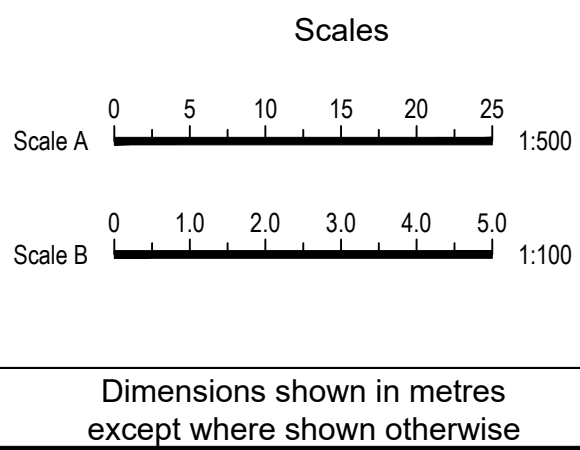
Horizontal Curve Data

Vertical Curve Length (m)
Vertical Curve Radius (m)
Vertical Geometry Grade (%)
Vertical Grade Length (m)
DATUM R.L.232.000

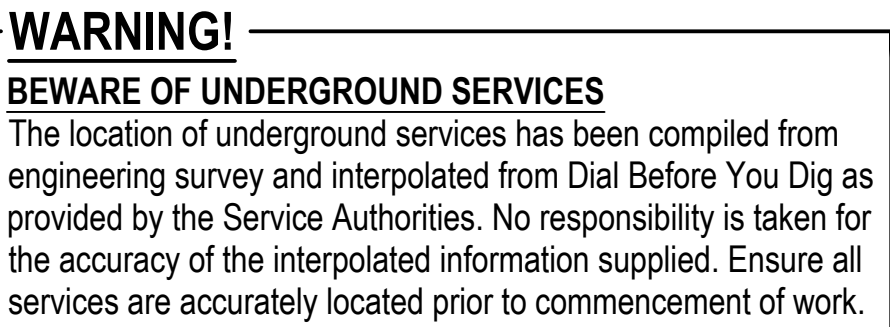
DESIGN LINE LEVELS	262.262	261.963		260.982	260.949	260.239	260.100	259.250		258.400		257.550		256.720		255.970	255.631	255.518	255.207		254.304	253.678	253.479	253.248	252.249			251.379		250.637	250.337	250.024	249.850	249.538	249.296	249.172			248.832	248.785	248.506	248.430	247.863		247.130		246.229		245.165	245.163	244.012		242.863			241.710	241.179	240.510	239.310	238.535	238.235	238.175	238.175	238.175	238.490	238.737	238.966	239.955		241.455	242.607	242.939	244.000	244.386																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
EXISTING SURFACE LEVELS	262.120	261.812		260.835	260.802	260.064	259.930	259.033		258.219		257.386		256.544		255.803	255.484	255.378	255.074		254.164	253.462	253.259	253.066	252.107			251.237		250.524	250.223	249.850	249.384	249.135	249.023			248.638	248.580	248.215	248.116	247.523		246.815		245.851		244.675	244.673	243.624		242.603			241.513	241.021	240.420	239.315	238.736	238.466	238.322	238.198	238.175	238.685	238.839	238.997	239.836		241.352	242.453	242.763	243.735	244.171																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
CUT / FILL DEPTHS	0.142	0.142		0.147	0.147	0.175	0.17	0.217		0.181		0.164		0.176		0.167	0.146	0.14	0.132		0.14	0.216	0.221	0.192	0.142			0.142		0.113	0.114	0.173	0.155	0.162	0.15			0.194	0.205	0.291	0.314	0.34		0.315		0.379		0.49	0.49	0.389		0.26		0.197	0.158	0.09	-0.005	-0.201	-0.231	-0.147	-0.023	-0.14	-0.195	-0.102	-0.031	0.119	0.103	0.154	0.176	0.265	0.215																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
DESIGN CHAINAGE	58227.000	58230.000	58240.000	58240.356	58246.365	58250.000	58260.000	58270.000	58280.000	58290.000	58300.000	58304.524	58306.024	58310.000	58320.000	58326.024	58327.850	58330.000	58340.000	58350.000	58360.000	58364.633	58370.000	58380.000	58386.350	58390.000	58400.000	58401.382	58408.383	58410.000	58420.000	58430.000	58440.000	58449.982	58450.000	58460.000	58470.000	58480.000	58484.427	58490.000	58500.000	58506.458	58510.000	58512.458	58520.000	58524.383	58530.000	58531.883	58533.404	58540.000	58550.000	58557.683	58560.000	58570.000	58577.000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
SUPER ELEVATION	LHS 6% RHS -6%		RHS -4%		LHS and RHS -4%		RHS -4%		LHS 8%		RHS -4%		LHS and RHS -4%		RHS -4%		LHS 4%		LHS and RHS -4%		RHS 5%		LHS -5%		RHS 1%		LHS -1%		RHS 1%		RHS -5%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

LONGITUDINAL SECTION

Horizontal Scale A, Vertical Scale B

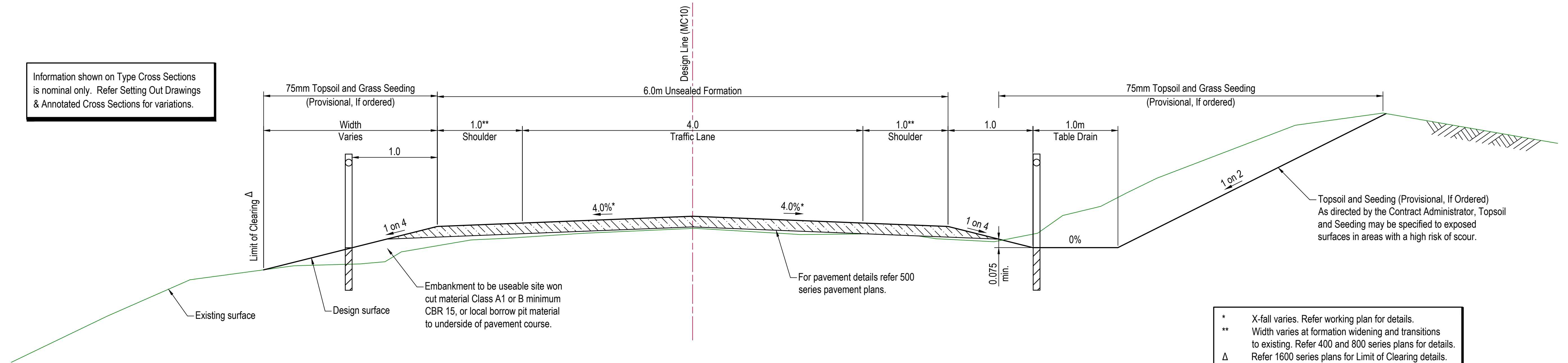


Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION LONGITUDINAL SECTION SHEET 2				Job No.	CRC00269
Drawn B Doherty				Drawing No.	601
ENGINEERING CERTIFICATION (RPEQ)				Revision	A
Designed B Doherty	ENG. AREA Civil	NAME T Penrose	SIGNATURE 	NO. 24807	DATE June 2023
				Series No.	09 of 28

[illegible]

					Scales 0 5 10 15 20 25 1:500 Scale A 0 1.0 2.0 3.0 4.0 5.0 1:100 Scale B		 quality people client focused solution driven 245 Mary Street, GYMPIE, QLD, 4570 ABN 73 617 924 437 Ph: 0477 322 555		Client  Banana SHIRE SHIRE OF OPPORTUNITY COPYRIGHT The contents and information contained in this document are the copyright of CRC. This drawing may not be used, copied or reproduced in whole or part for any purpose other than the consent by which it is supplied by CRC.		Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION LONGITUDINAL SECTION SHEET 3					Job No. CRC00269	Drawing No. 602														
									Drawn B Doherty			ENGINEERING CERTIFICATION (RPEQ) <table><tr><th>ENG. AREA</th><th>NAME</th><th>SIGNATURE</th><th>NO.</th><th>DATE</th></tr><tr><td>Civil</td><td>T Penrose</td><td></td><td>24807</td><td>June 2023</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>			ENG. AREA	NAME	SIGNATURE	NO.	DATE	Civil	T Penrose		24807	June 2023						Revision A	
ENG. AREA	NAME	SIGNATURE	NO.	DATE																											
Civil	T Penrose		24807	June 2023																											
A Issued For Construction									Designed B Doherty						Series No. 10 of 28																
20.01		Revisions/Descriptions			Drawn	Approved	Date	Dimensions shown in metres except where shown otherwise																							

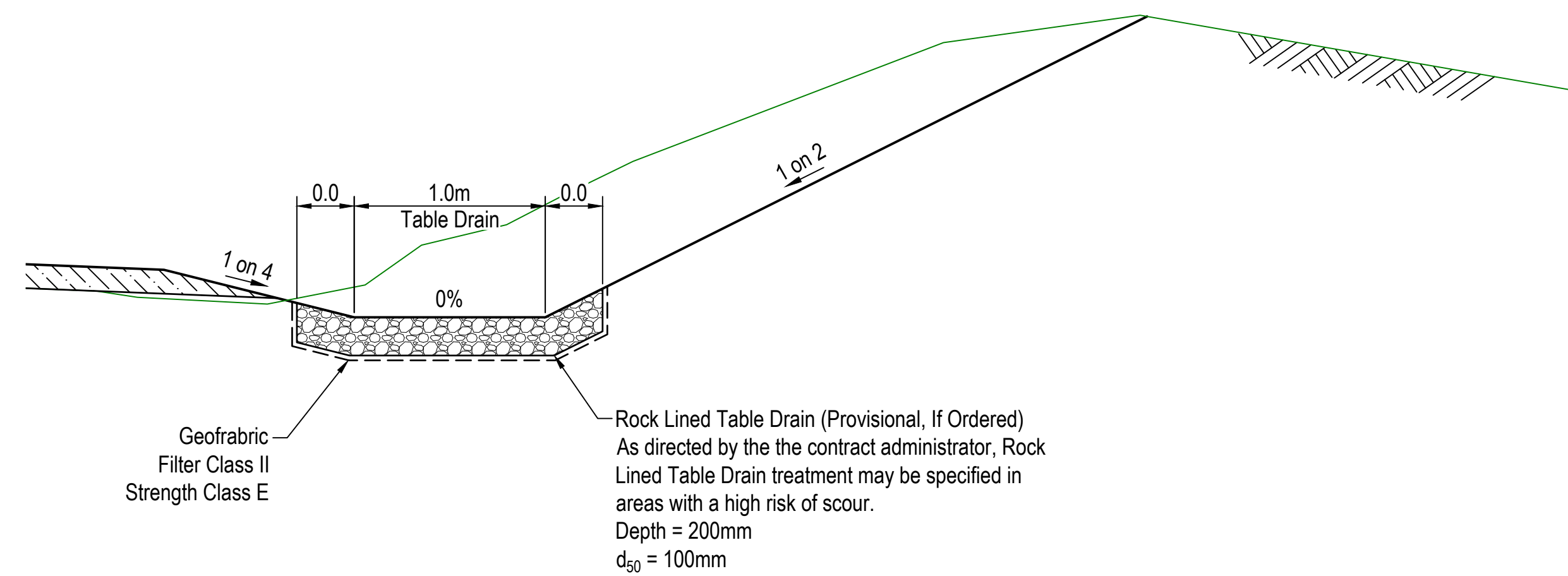
Information shown on Type Cross Sections is nominal only. Refer Setting Out Drawings & Annotated Cross Sections for variations.



* X-fall varies. Refer working plan for details.
** Width varies at formation widening and transitions to existing. Refer 400 and 800 series plans for details.
Δ Refer 1600 series plans for Limit of Clearing details.

TYPICAL CROSS SECTION A

Ch. START - END (MC10)
(Excluding Floodway)
Not to Scale



ROCK LINED TABLE DRAIN

Not to Scale

WARNING!
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XREFS - X_CRC_BSC_TITLE.dwg

Last Modified :- Nov 17, 2023 - 2:30pm

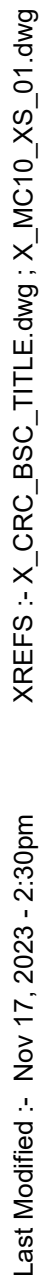
A	Issued For Construction			
20.01	Revisions/Descriptions	Drawn	Approved	Date

Scales
Dimensions shown in metres except where shown otherwise

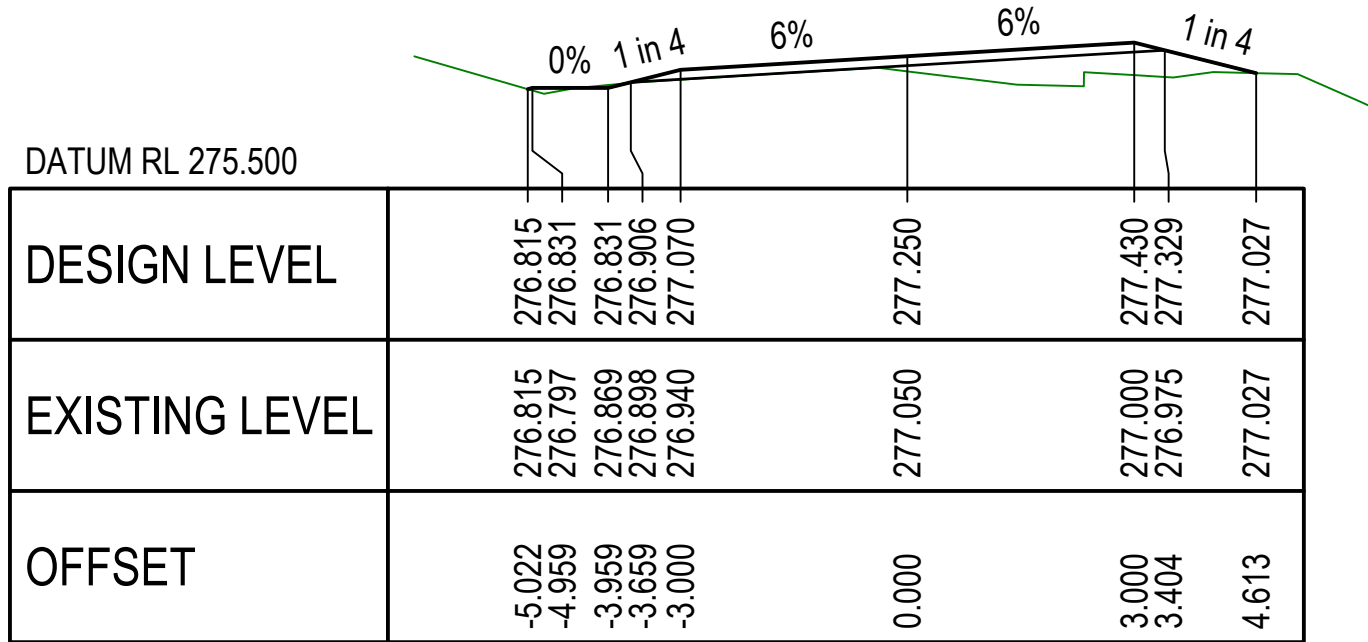
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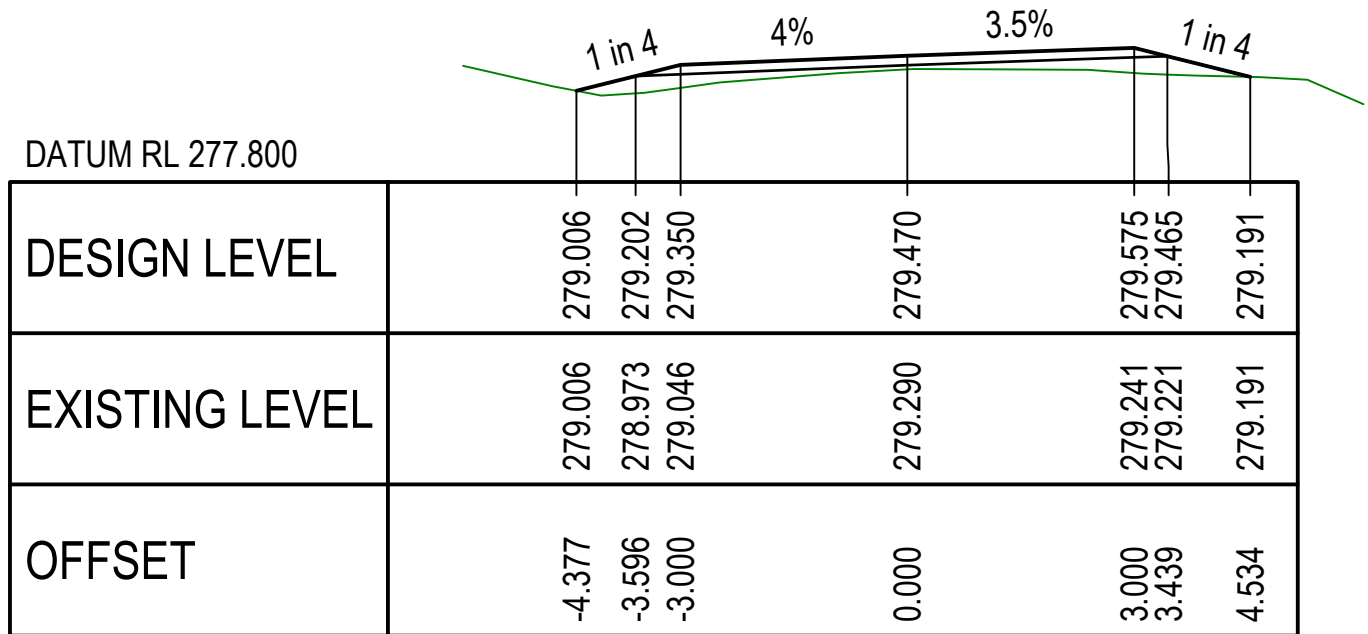
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						Drawing No.	700
Drawn B Doherty	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
Designed B Doherty	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
	Civil	T Penrose		24807	June 2023	Series No.	11 of 28



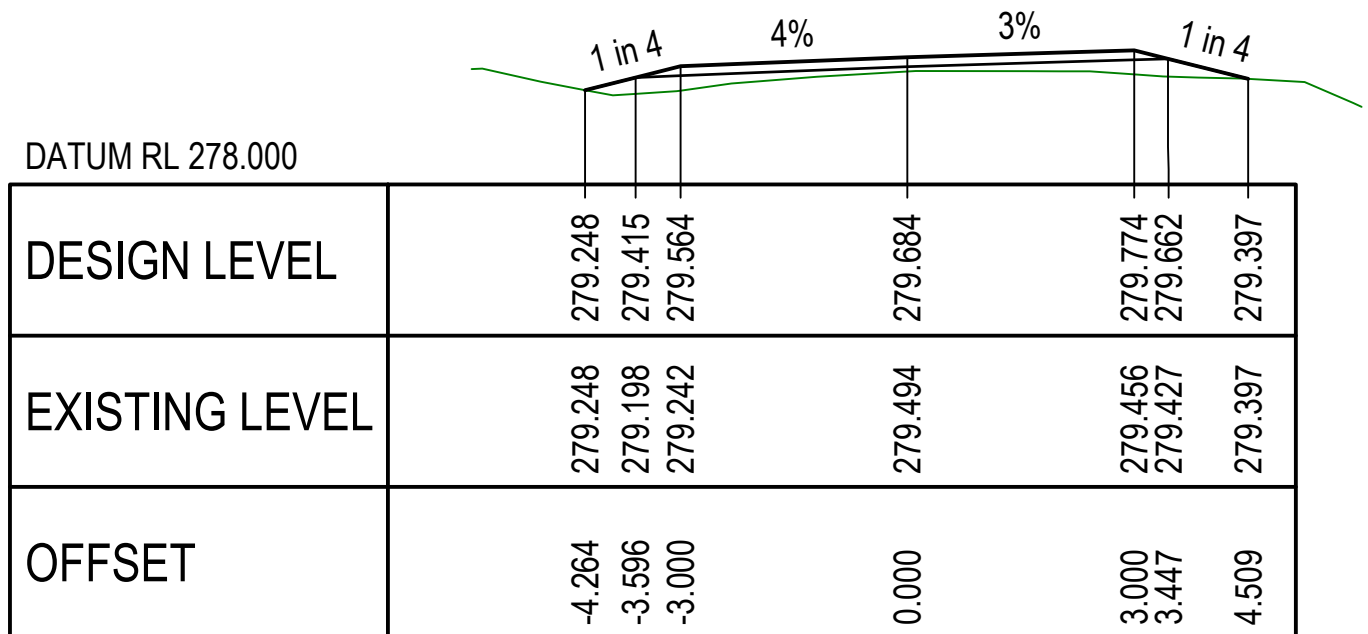
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															Drawing No. 800																			
A Issued For Construction															Revision A																			
20.01 Revisions/Descriptions					Drawn	Approved	Date	Dimensions shown in metres except where shown otherwise					Series No. 12 of 28																					
										245 Mary Street, GYMPIE, QLD, 4570 ABN 73 617 924 437 Ph: 0477 322 555					COPYRIGHT The contents and information contained in this document are the copyright of CRC. This drawing may not be used, copied or reproduced in whole or part for any purpose other than the consent by which it is supplied by CRC.					Drawn B Doherty ENGINEERING CERTIFICATION (RPEQ) <table><tr><td>ENG. AREA</td><td>NAME</td><td>SIGNATURE</td><td>NO.</td><td>DATE</td></tr><tr><td>Civil</td><td>T Penrose</td><td></td><td>24807</td><td>June 2023</td></tr></table>					ENG. AREA	NAME	SIGNATURE	NO.	DATE	Civil	T Penrose		24807	June 2023
ENG. AREA	NAME	SIGNATURE	NO.	DATE																														
Civil	T Penrose		24807	June 2023																														
															Designed B Doherty																			



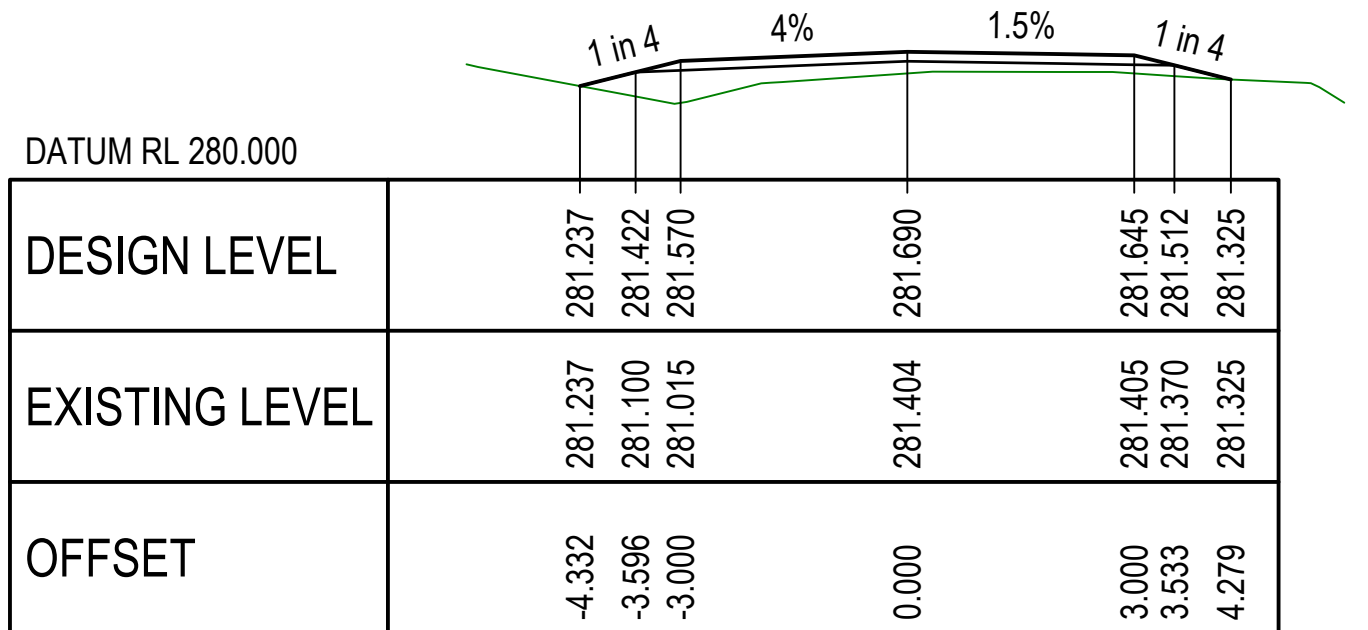
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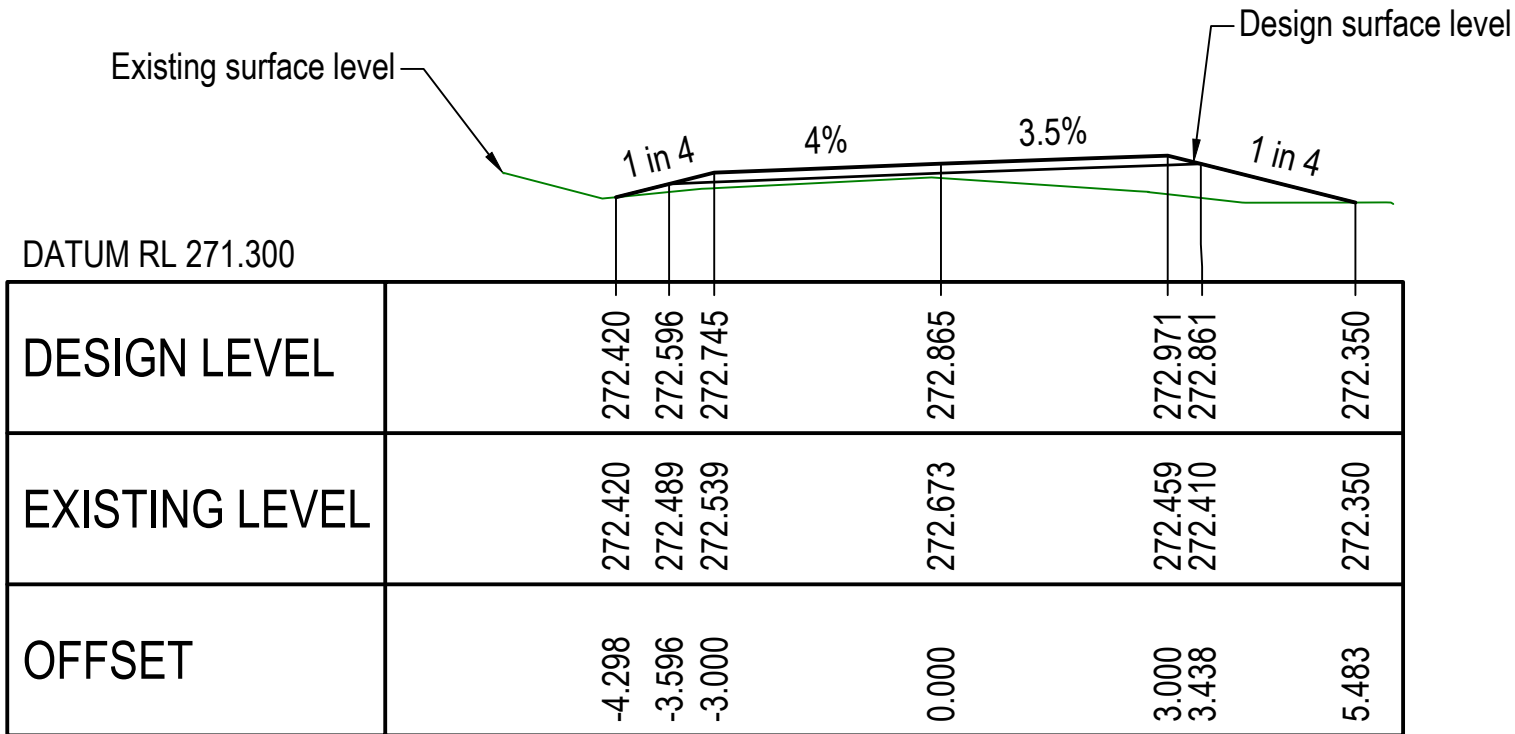
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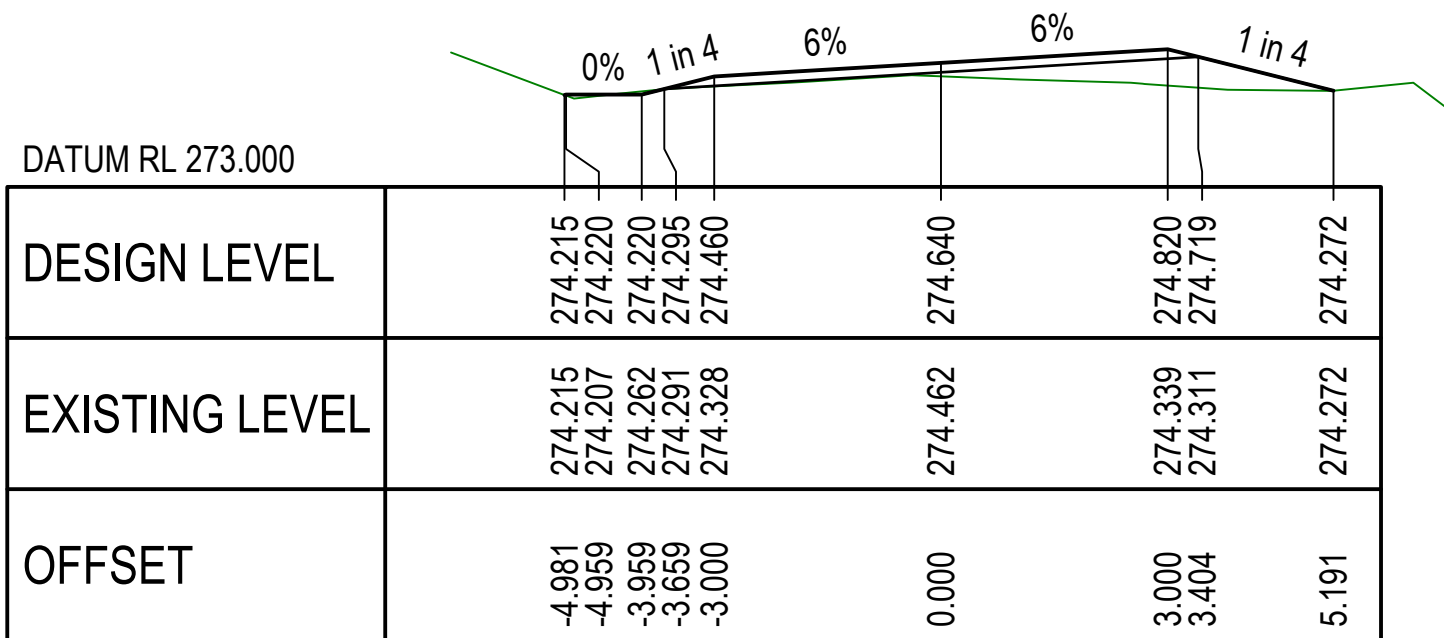
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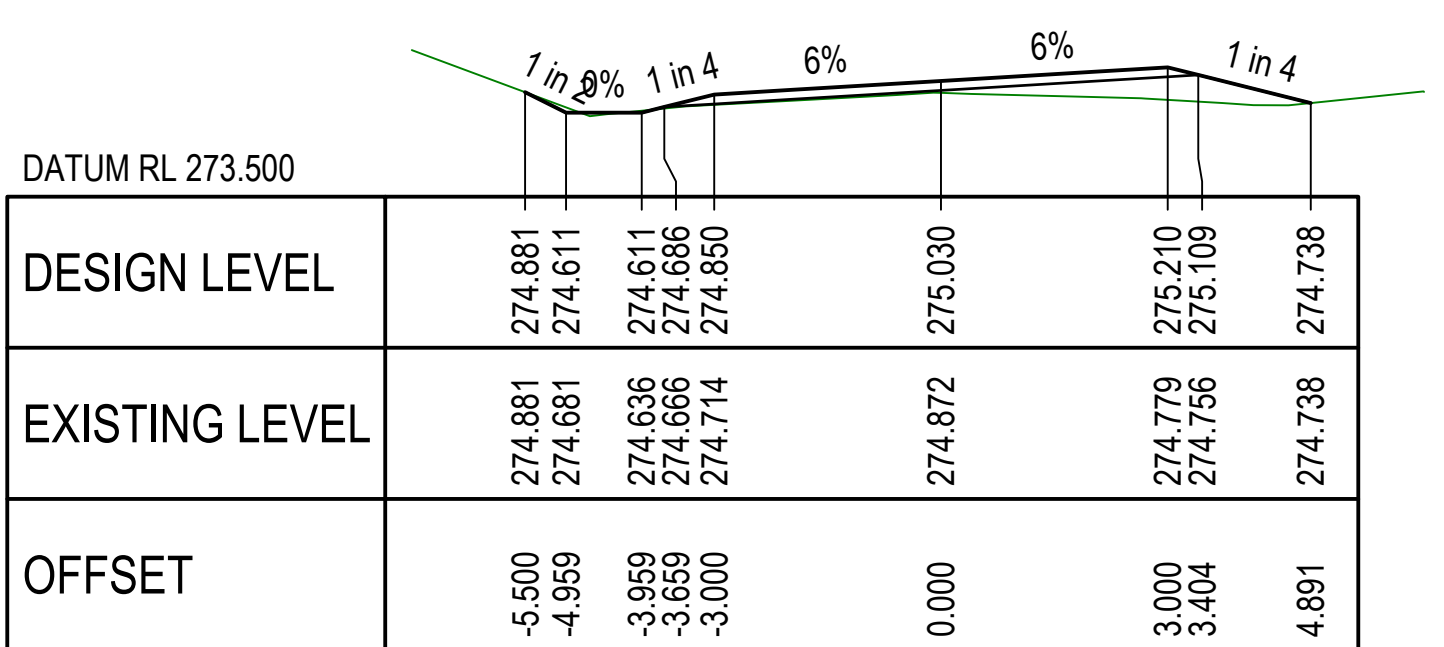
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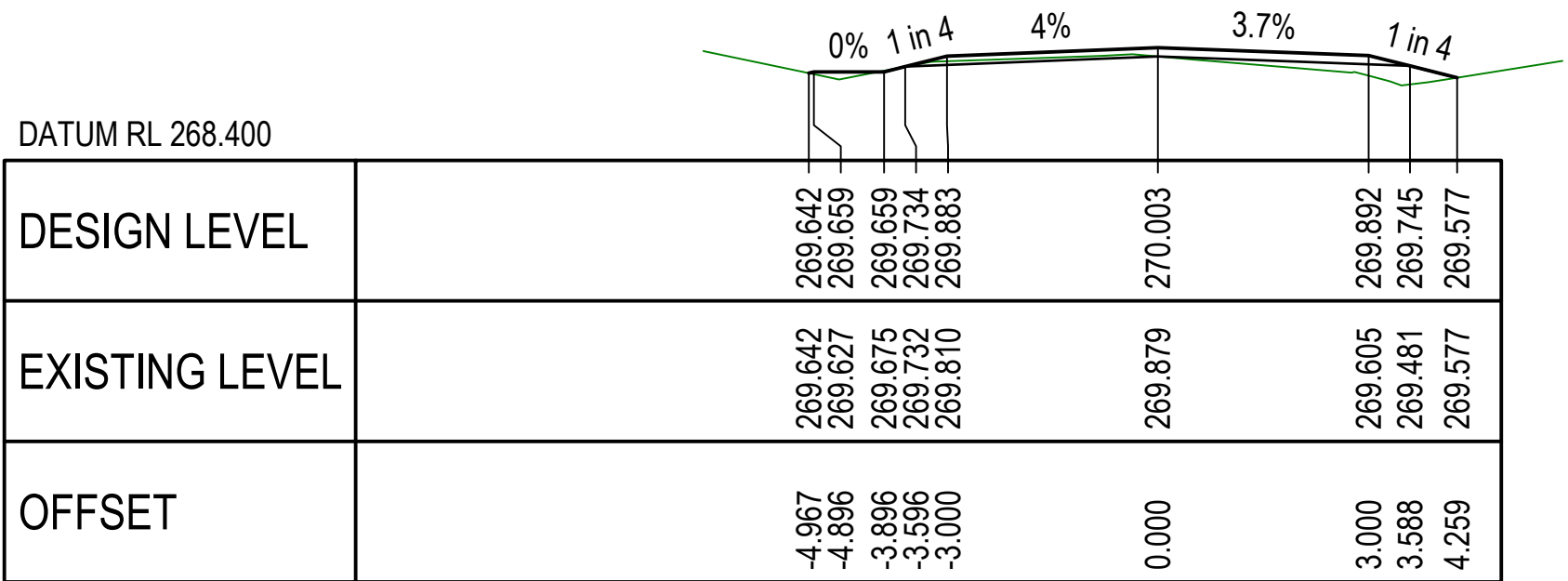
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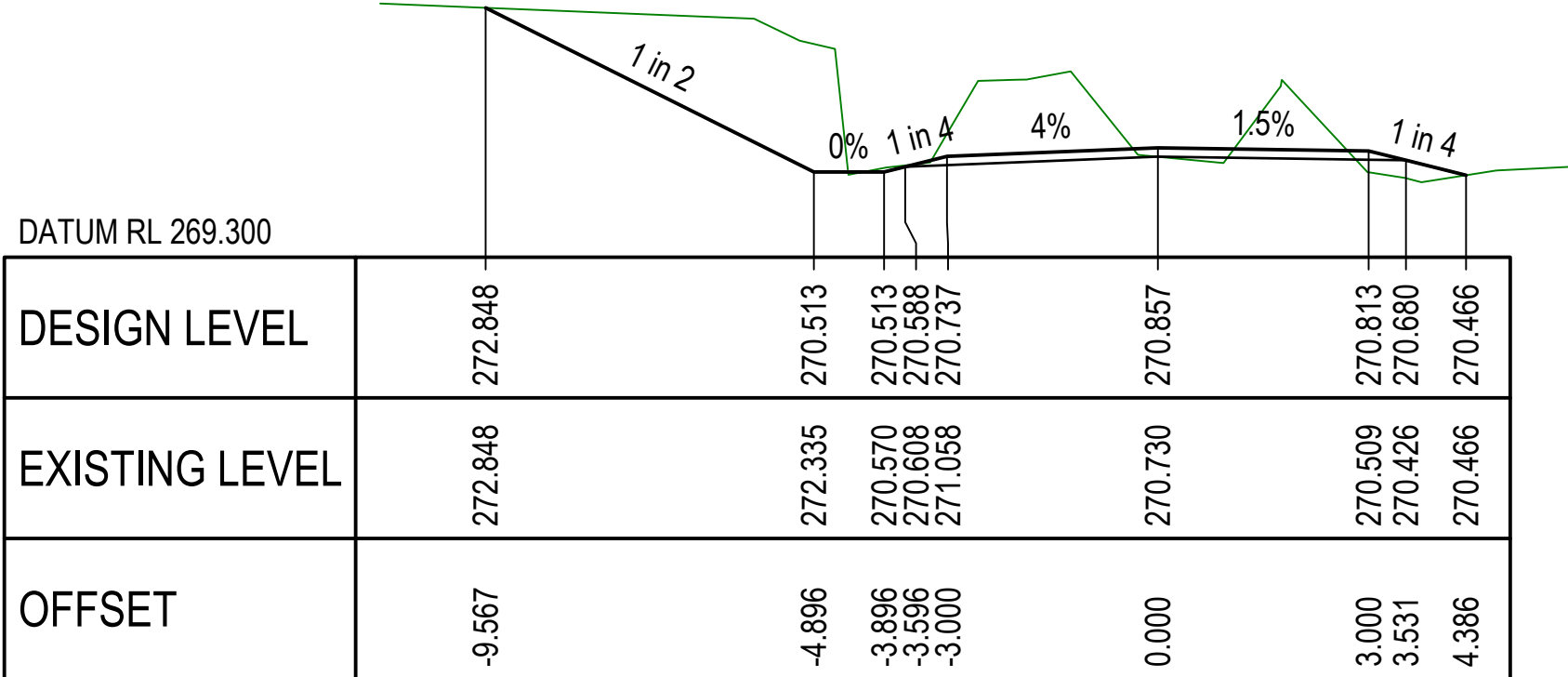
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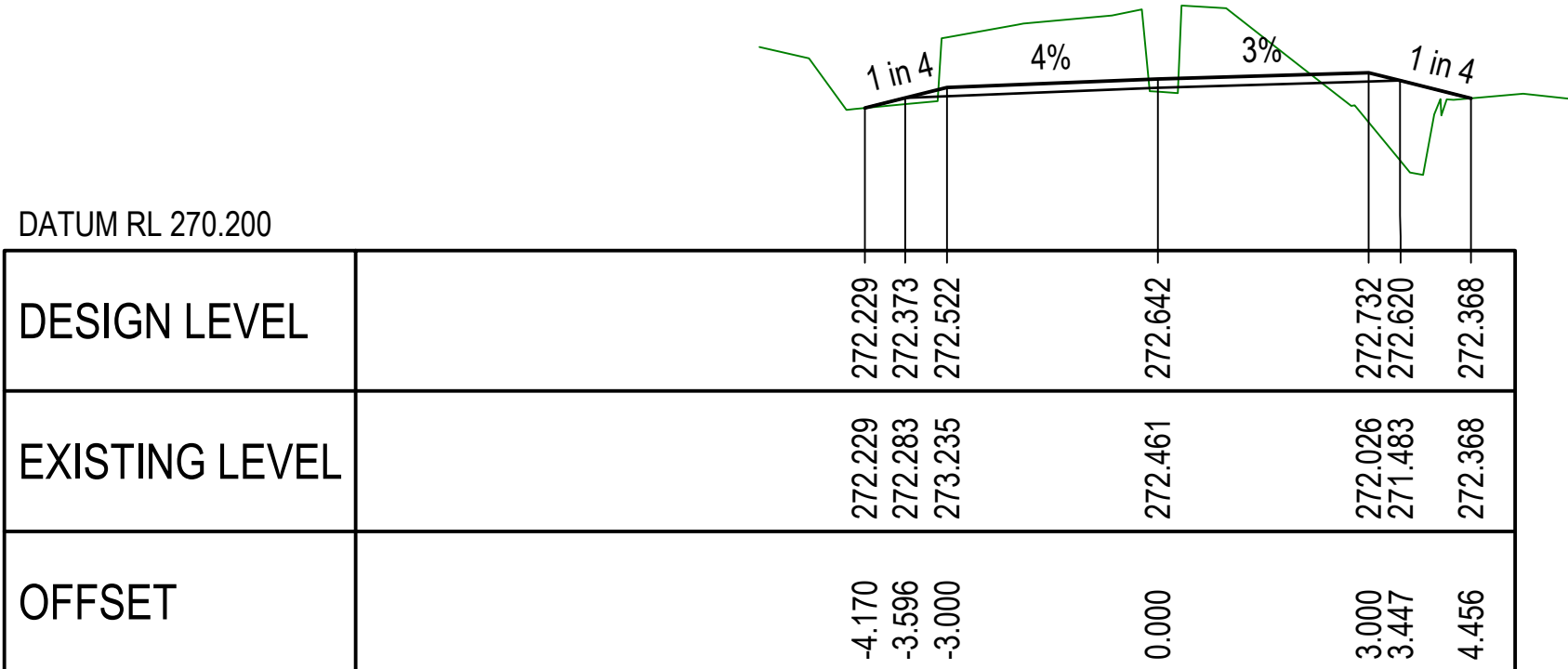
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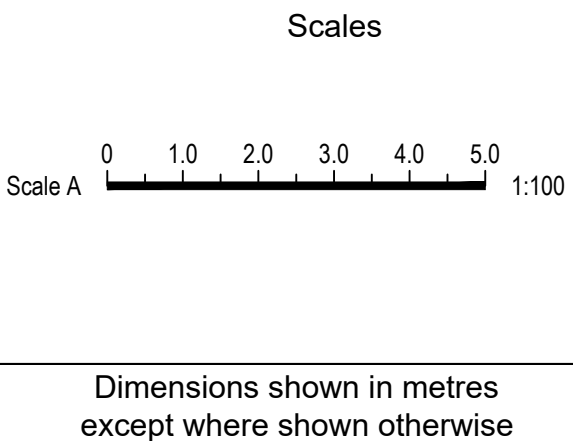


CH. 58122.145

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CROSS SECTIONS

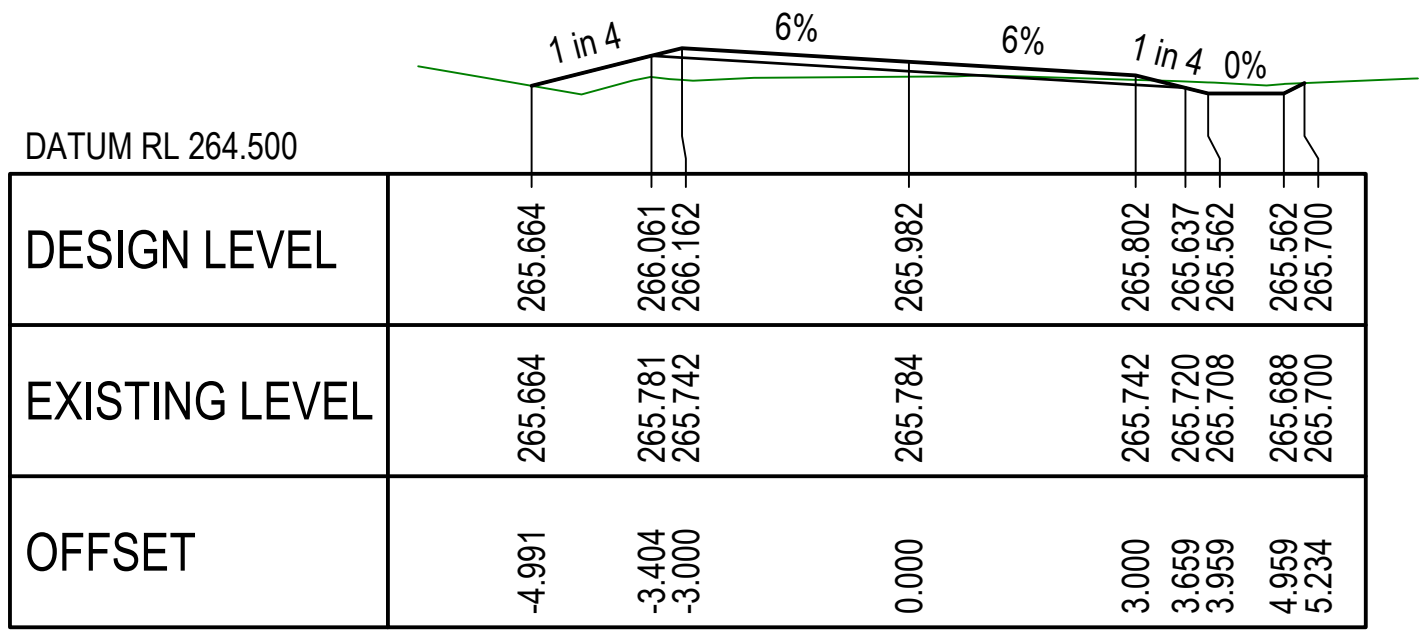
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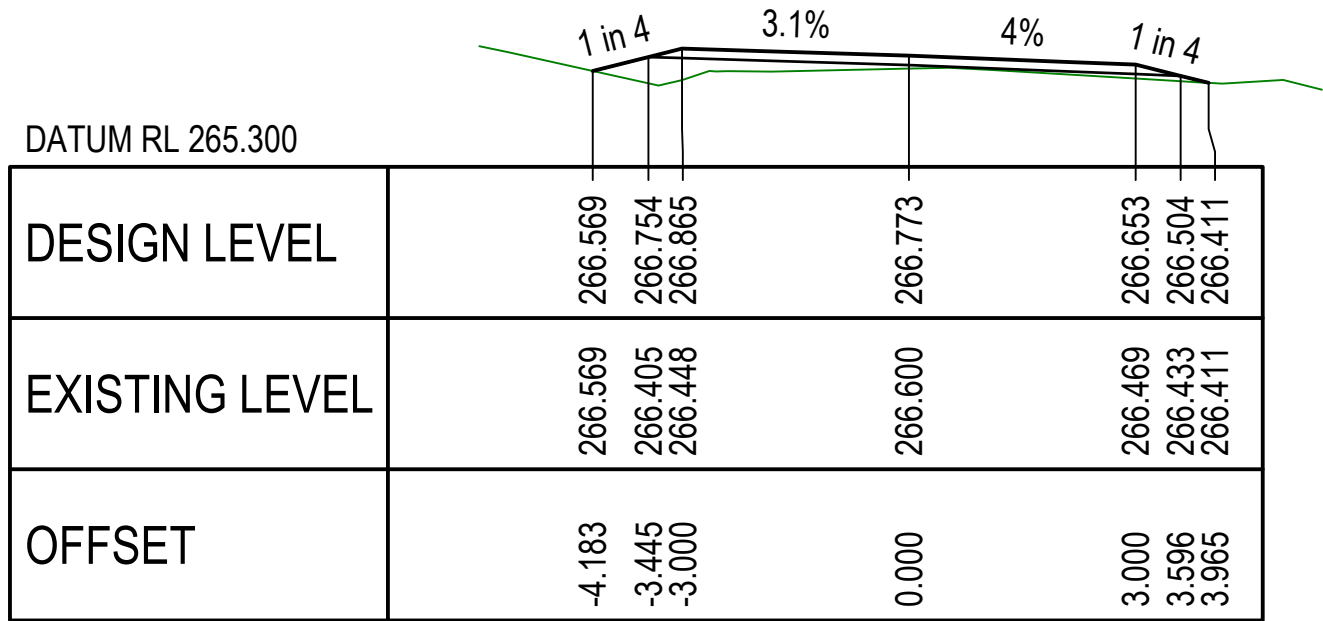
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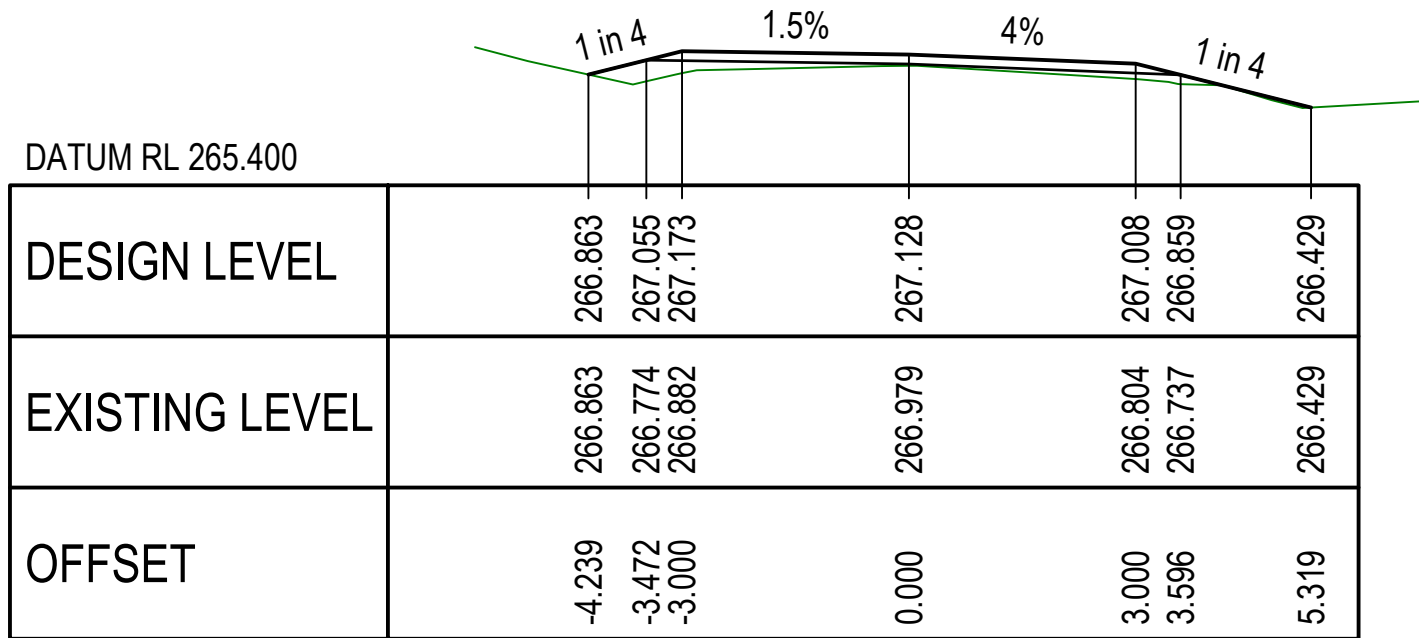
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Drawn B Doherty				Drawing No.	801
Designed B Doherty				Revision	A
ENGINEERING CERTIFICATION (RPEQ)				Series No.	13 of 28
ENG. AREA	NAME	SIGNATURE	NO.	DATE	
Civil	T Penrose		24807	June 2023	



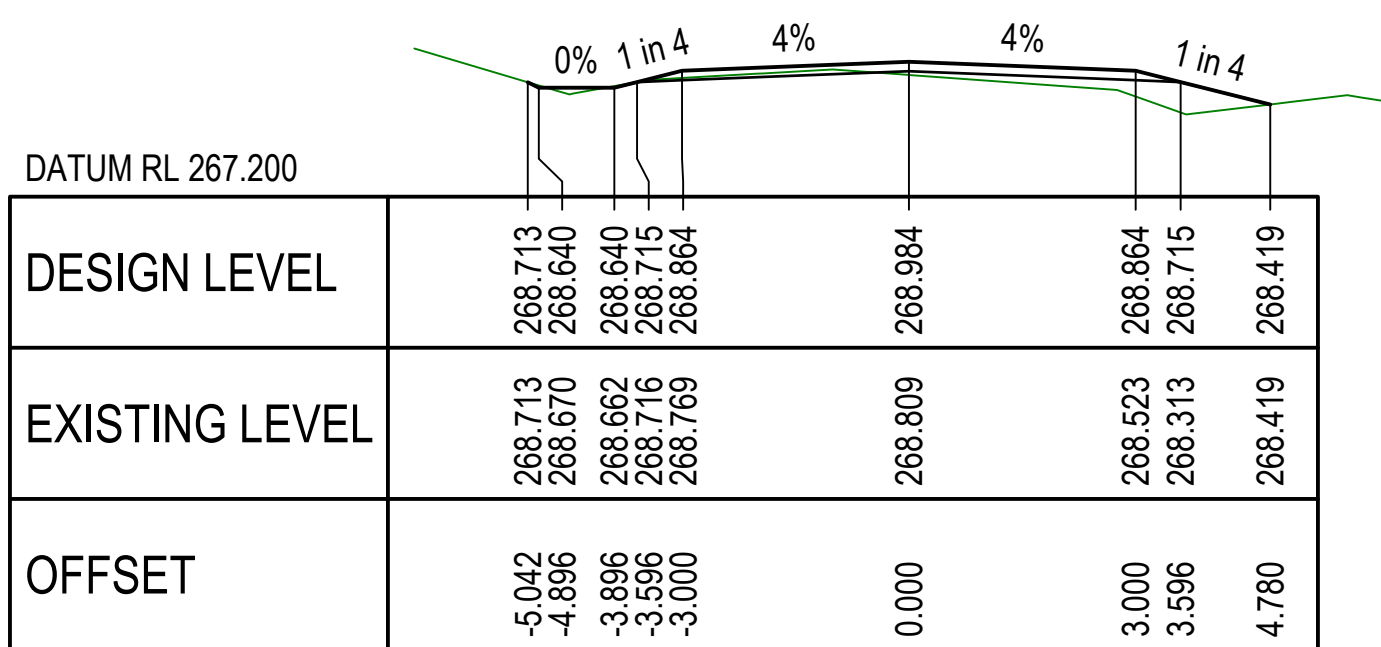
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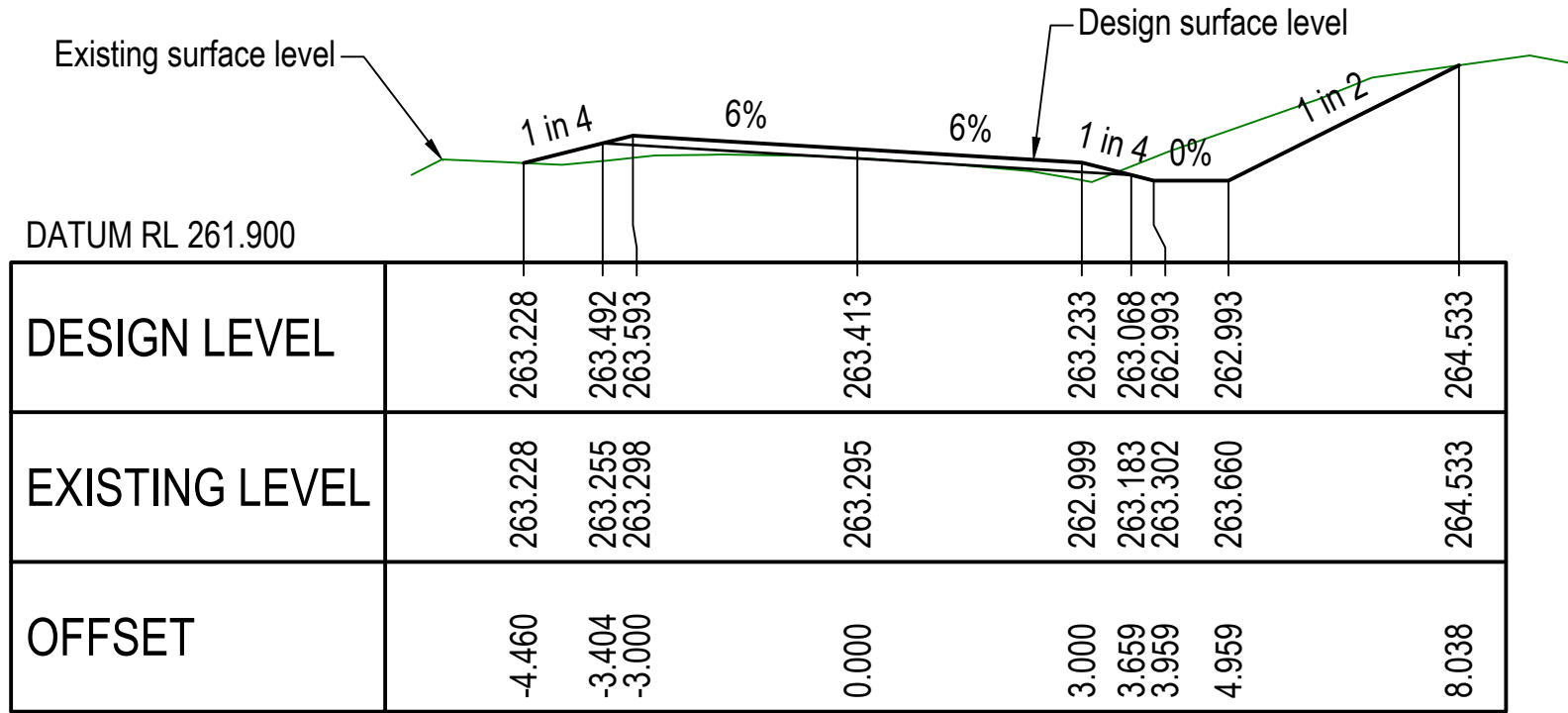
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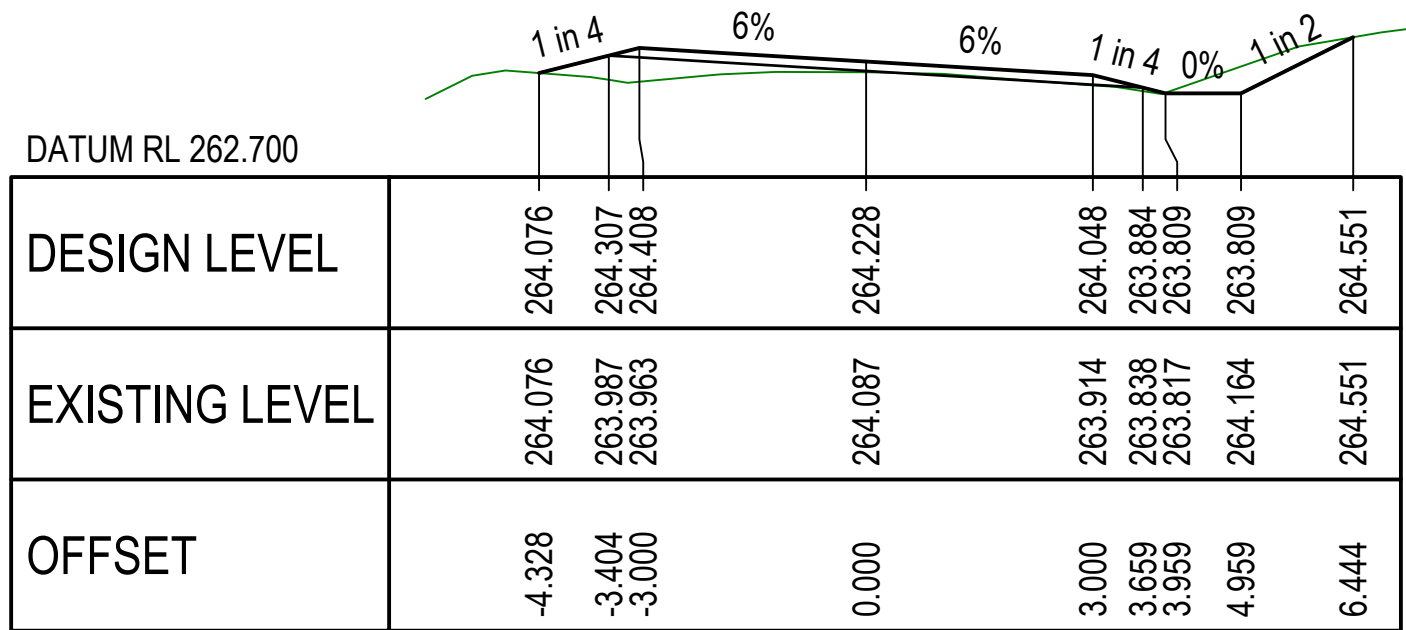
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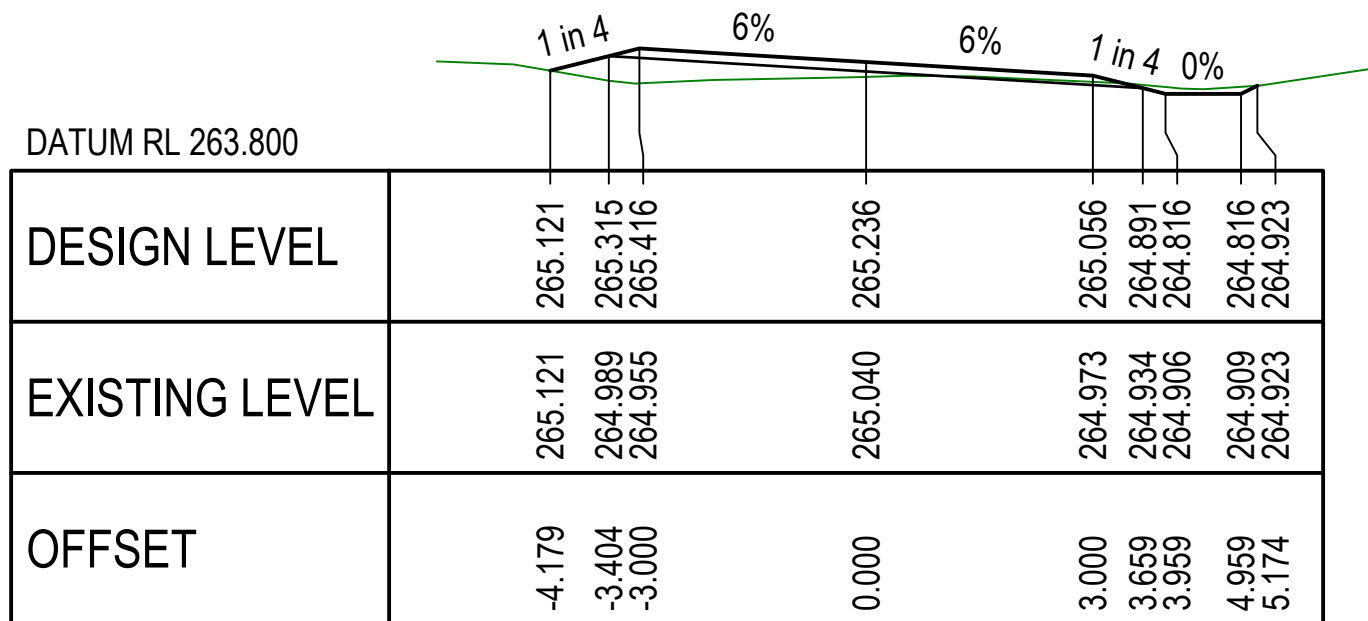
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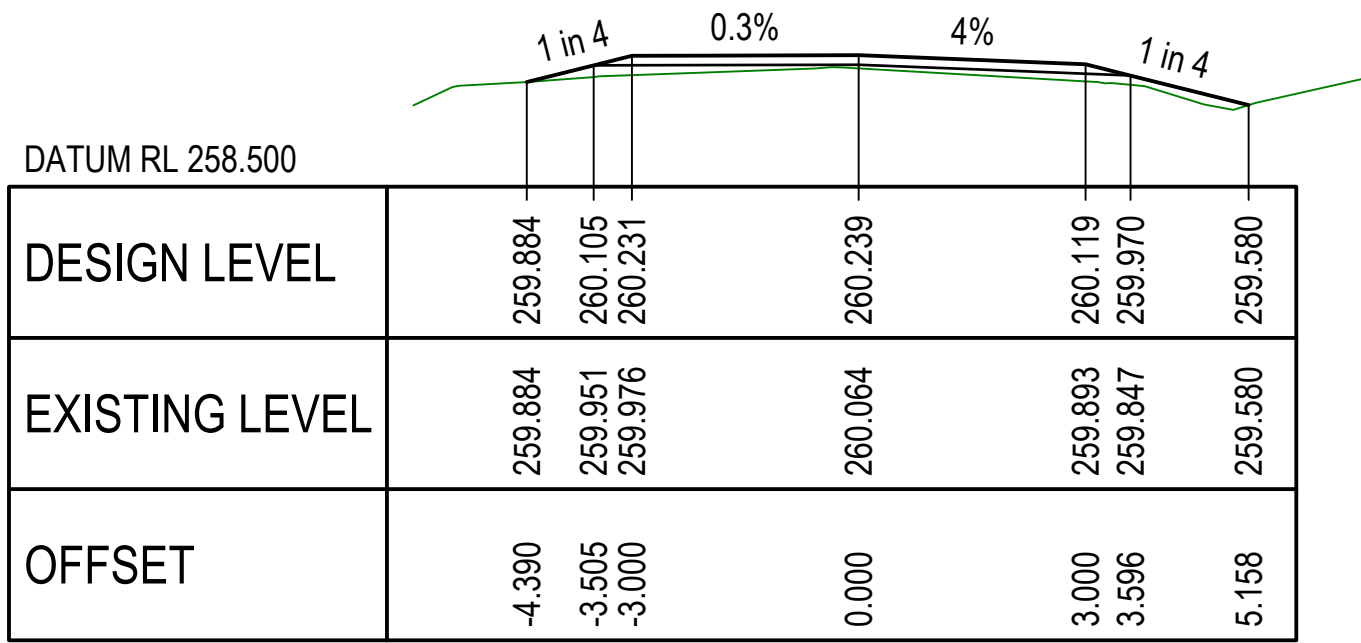
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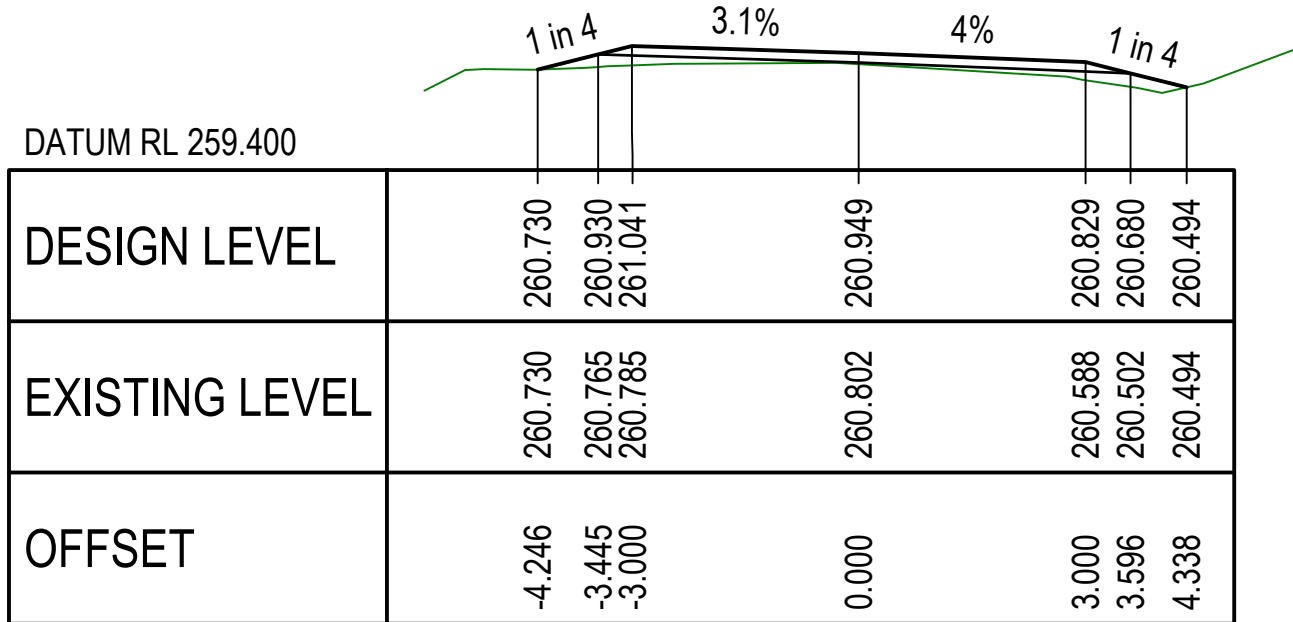
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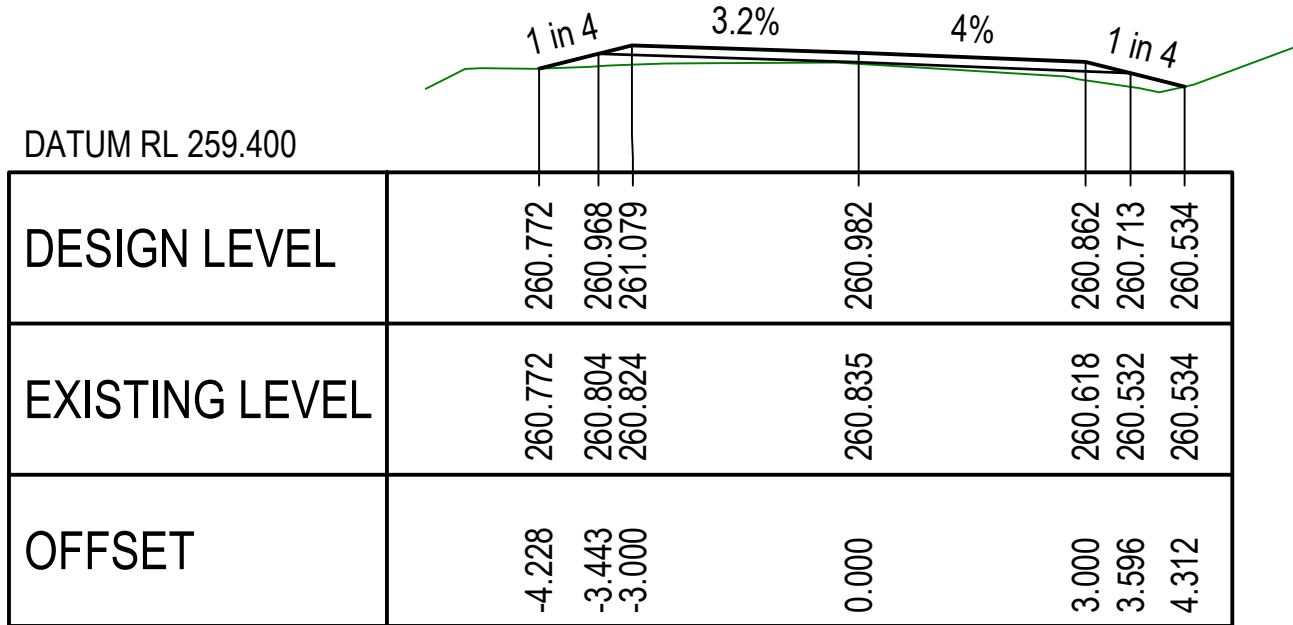
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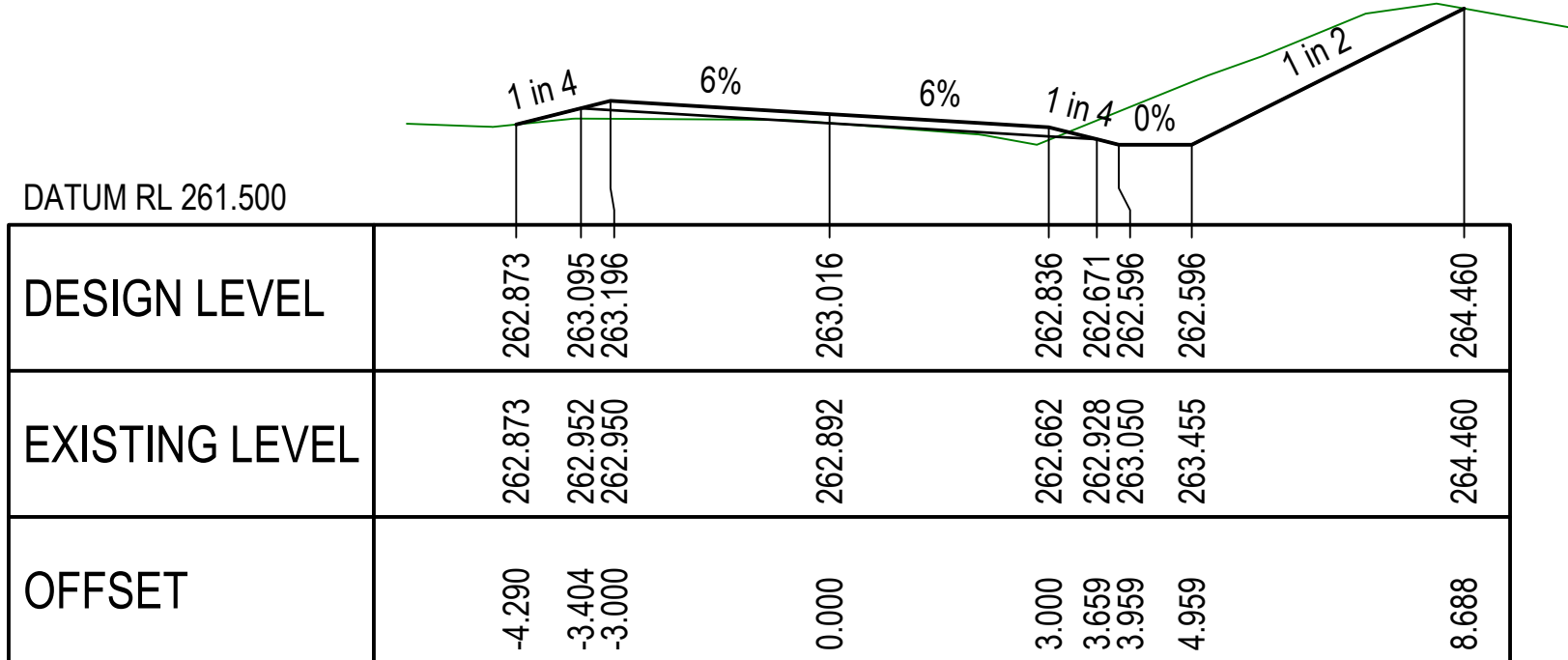
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CH. 58240.000

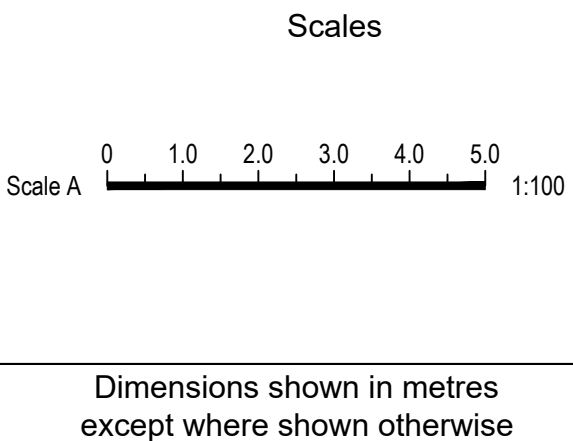


CH. 58220.000

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CROSS SECTIONS

Scale A



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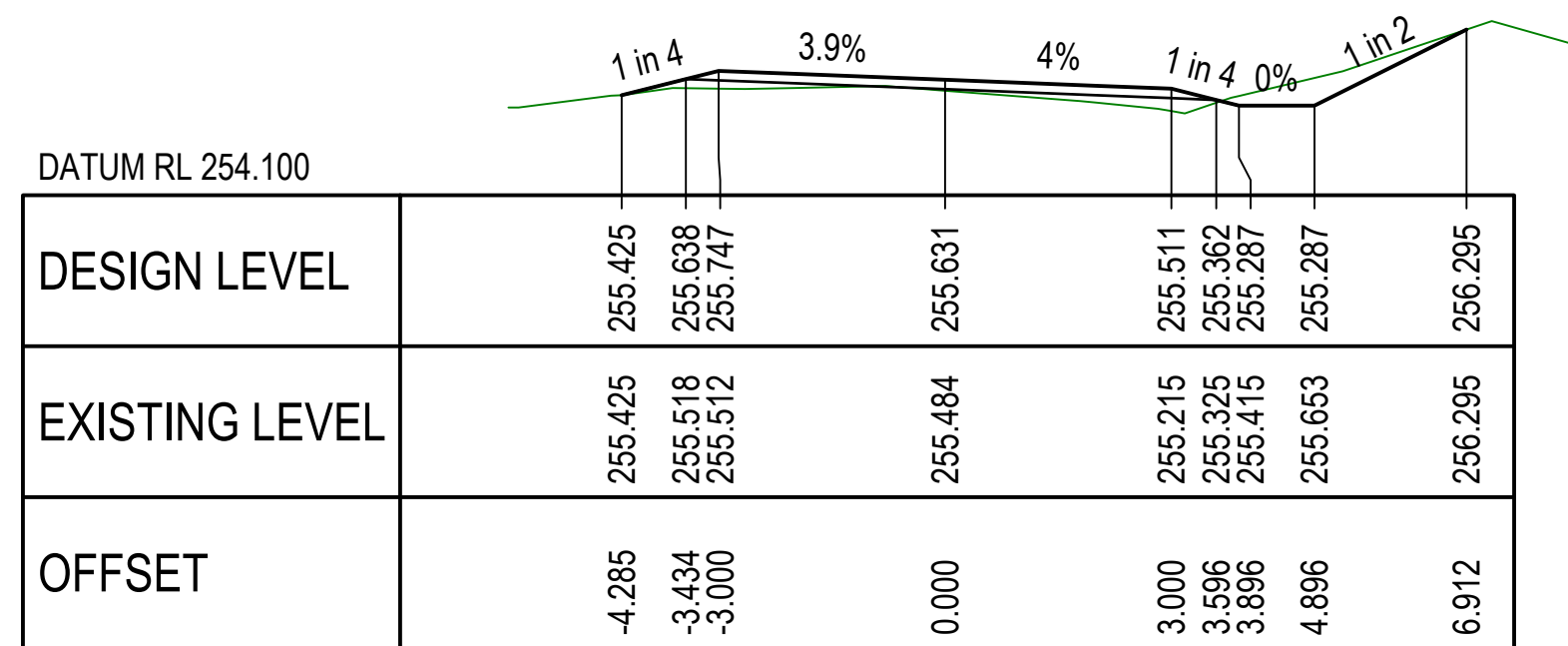
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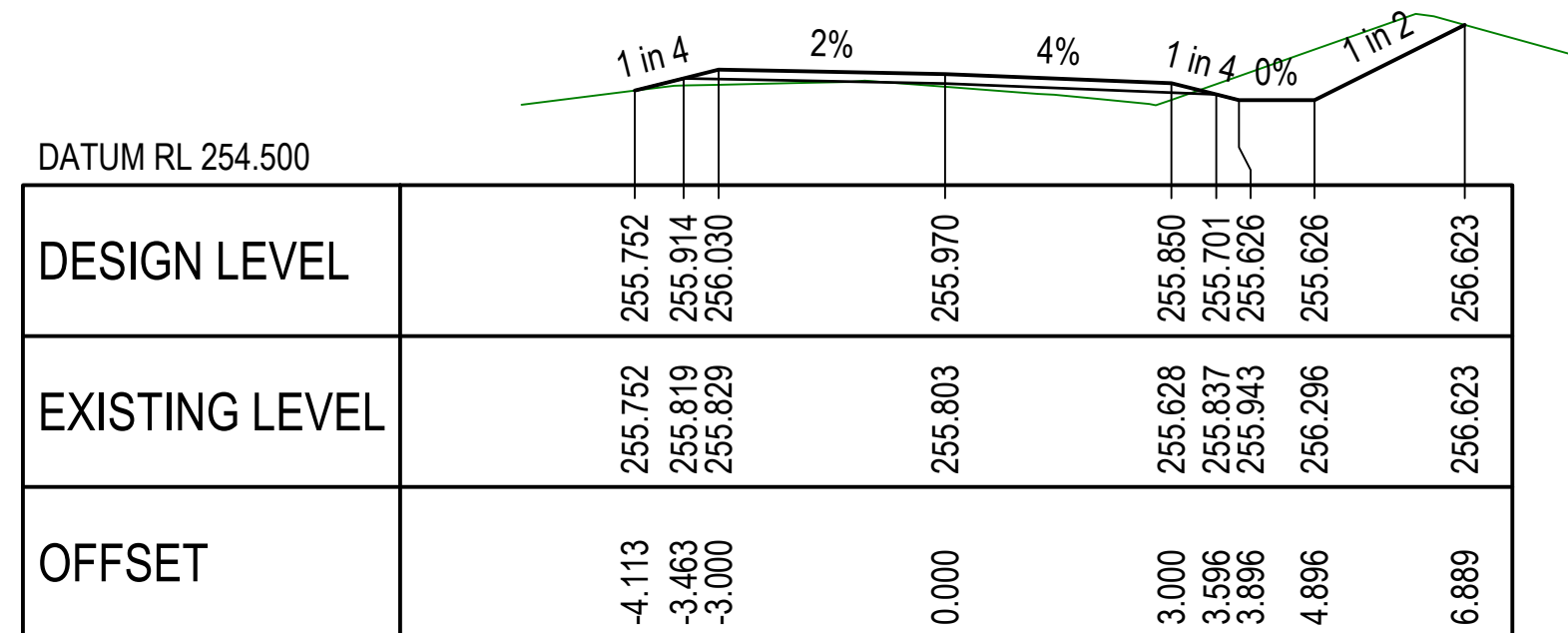
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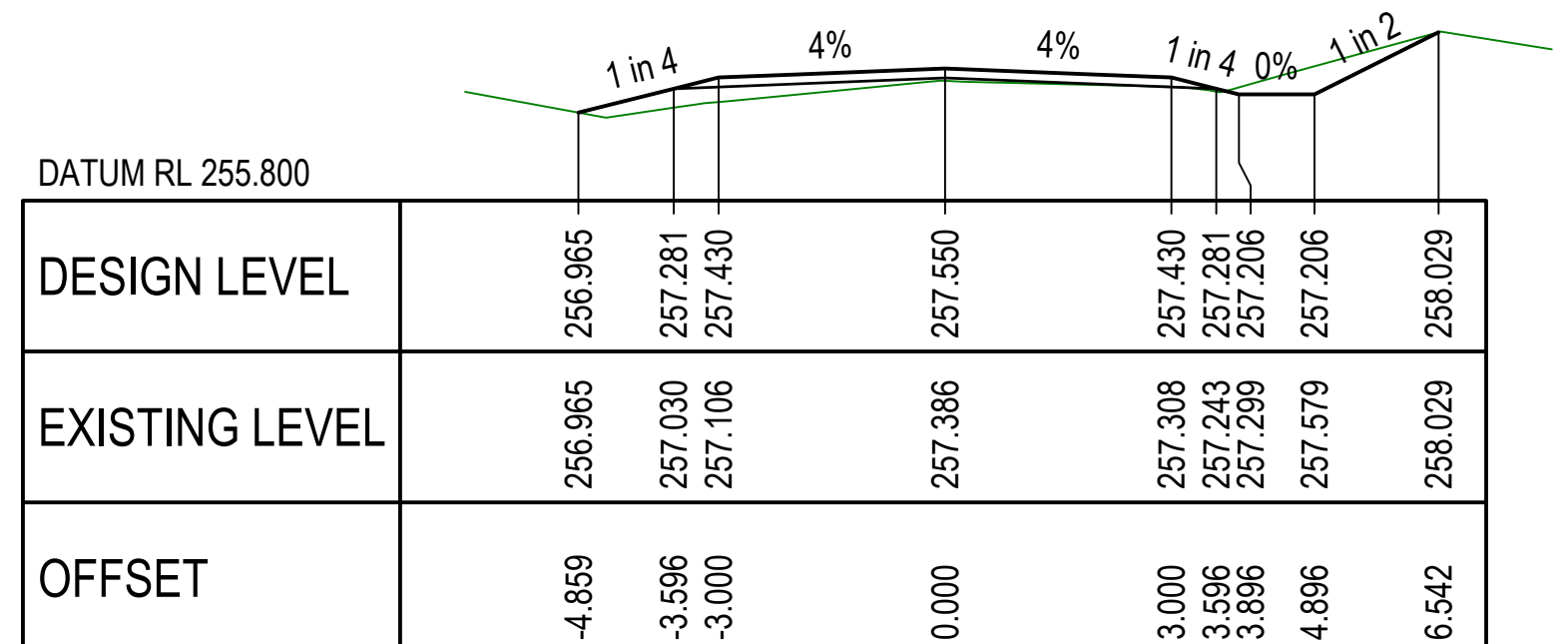
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Drawn B Doherty					Drawing No.	802
Designed B Doherty					Revision	A
					Series No.	14 of 28



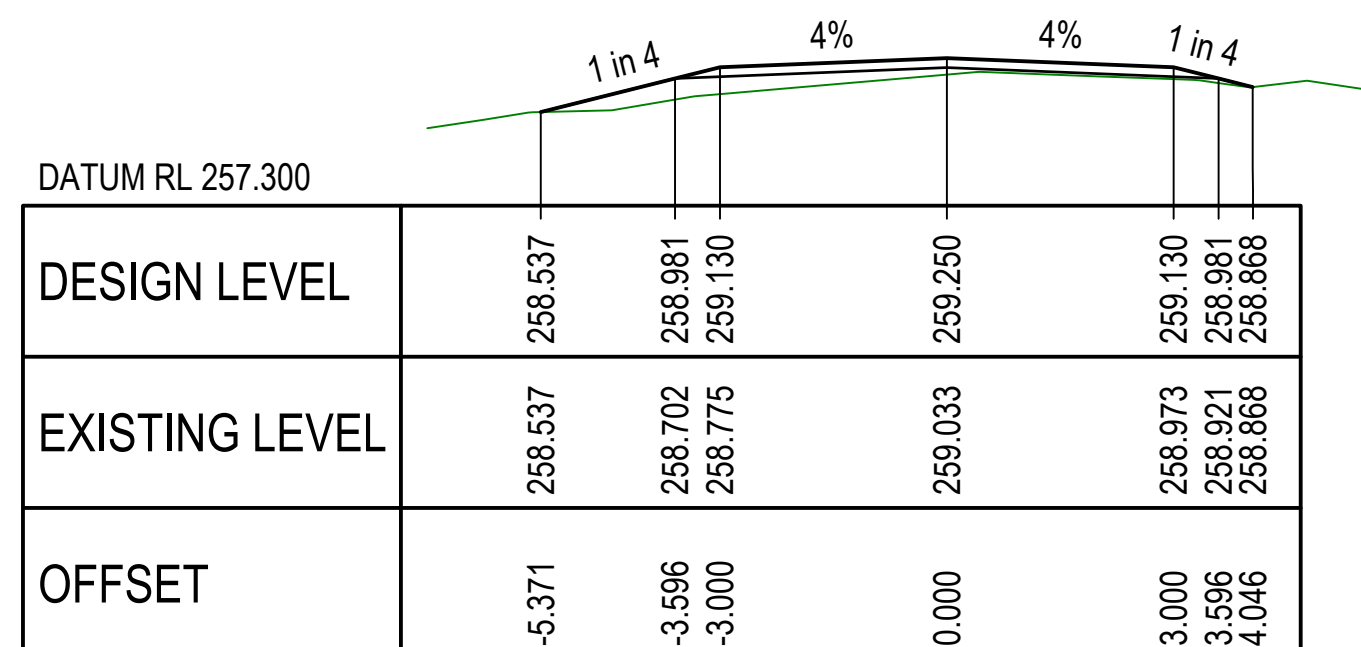
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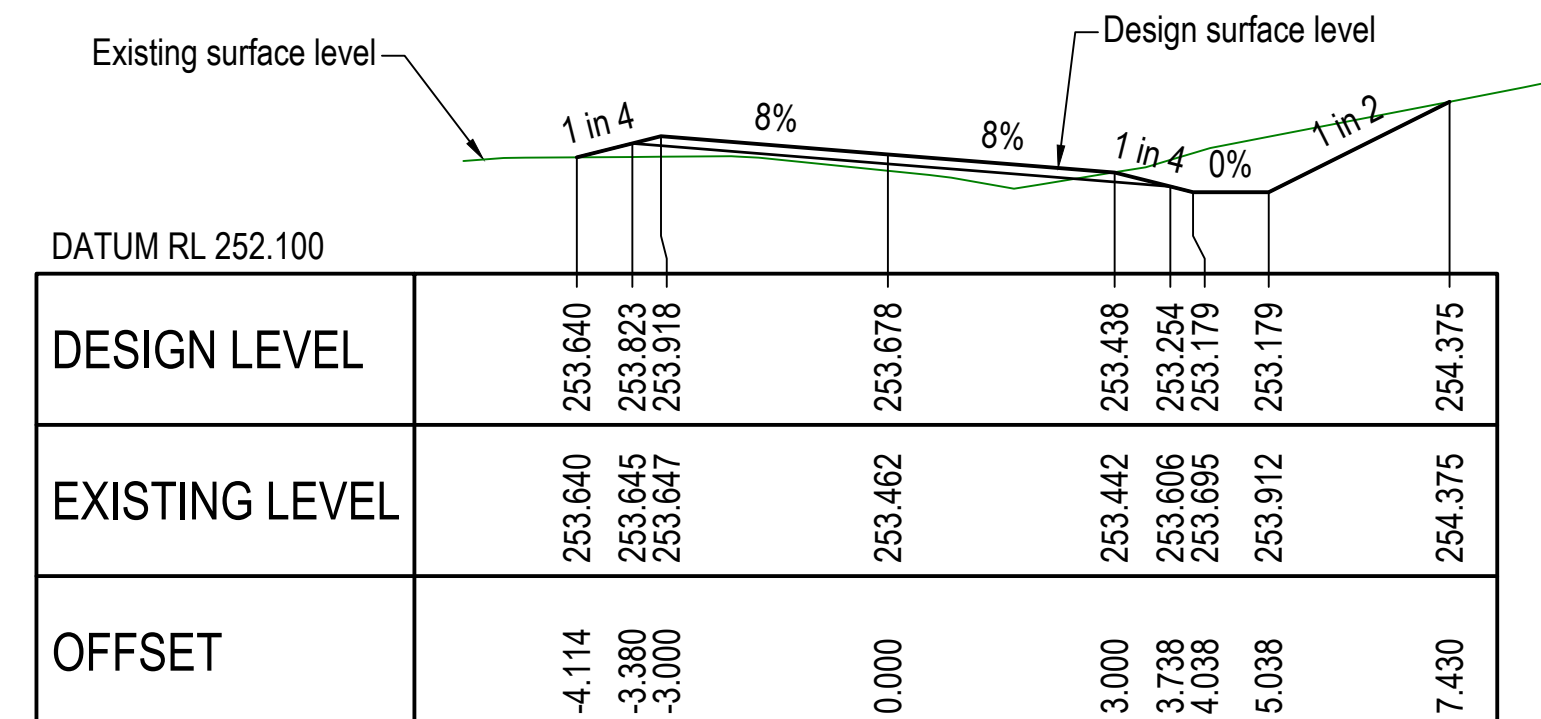
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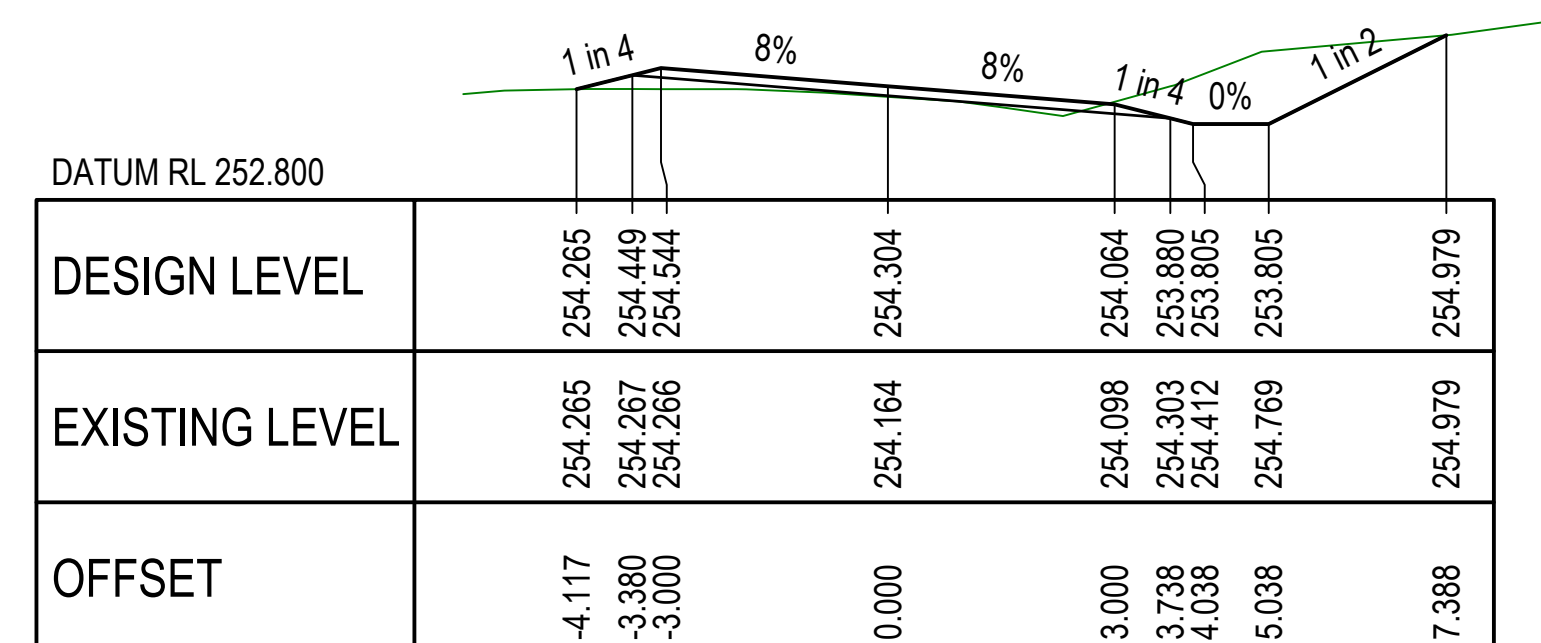
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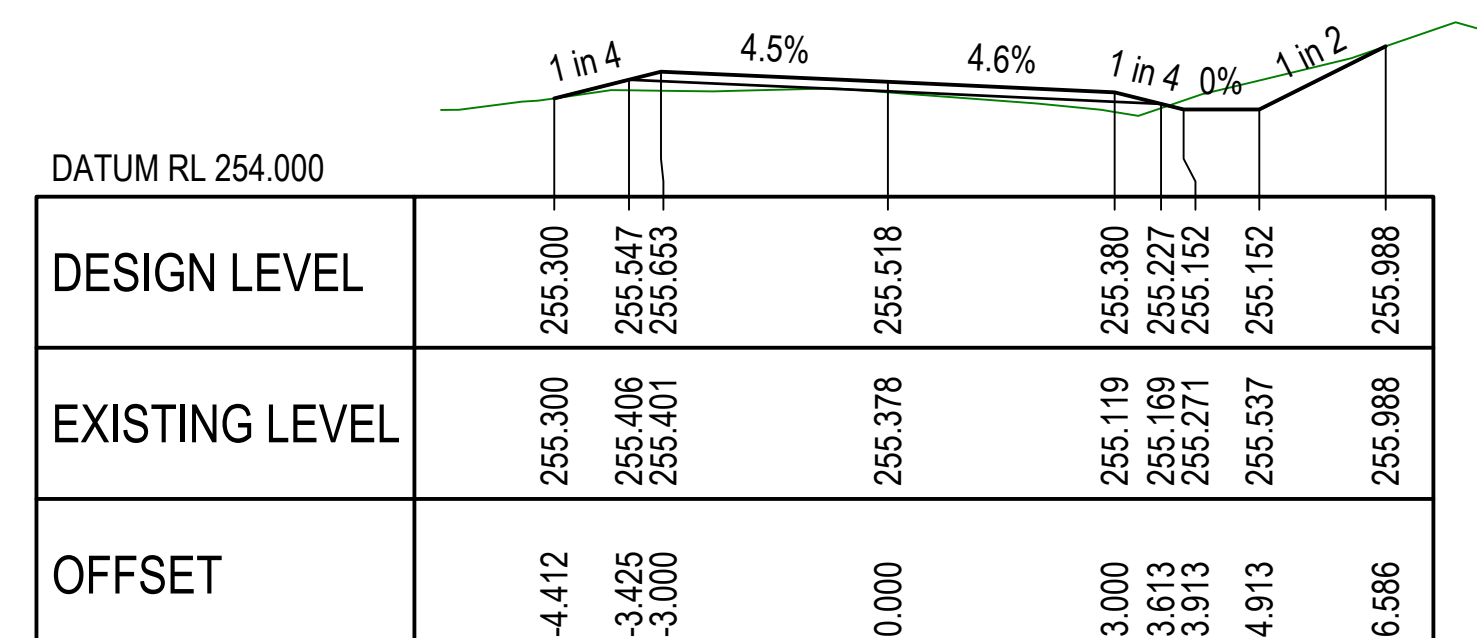
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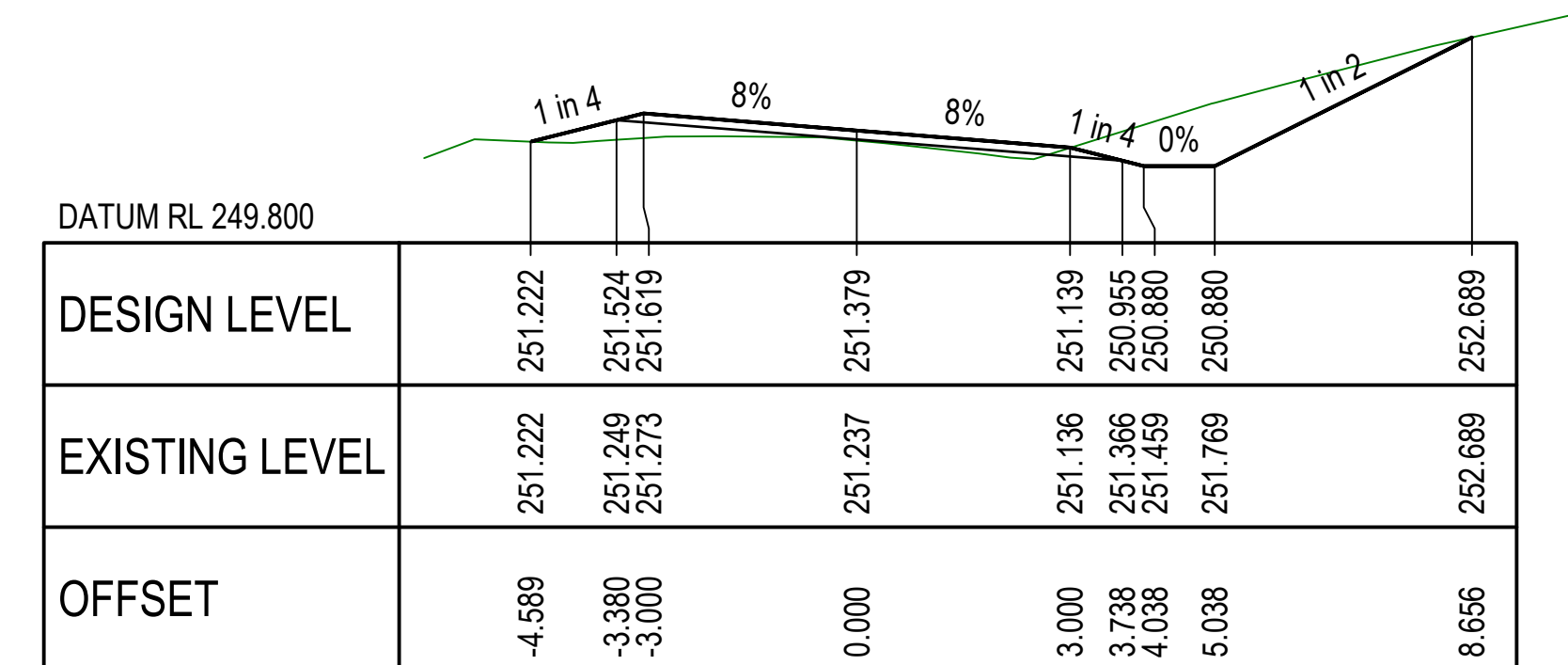
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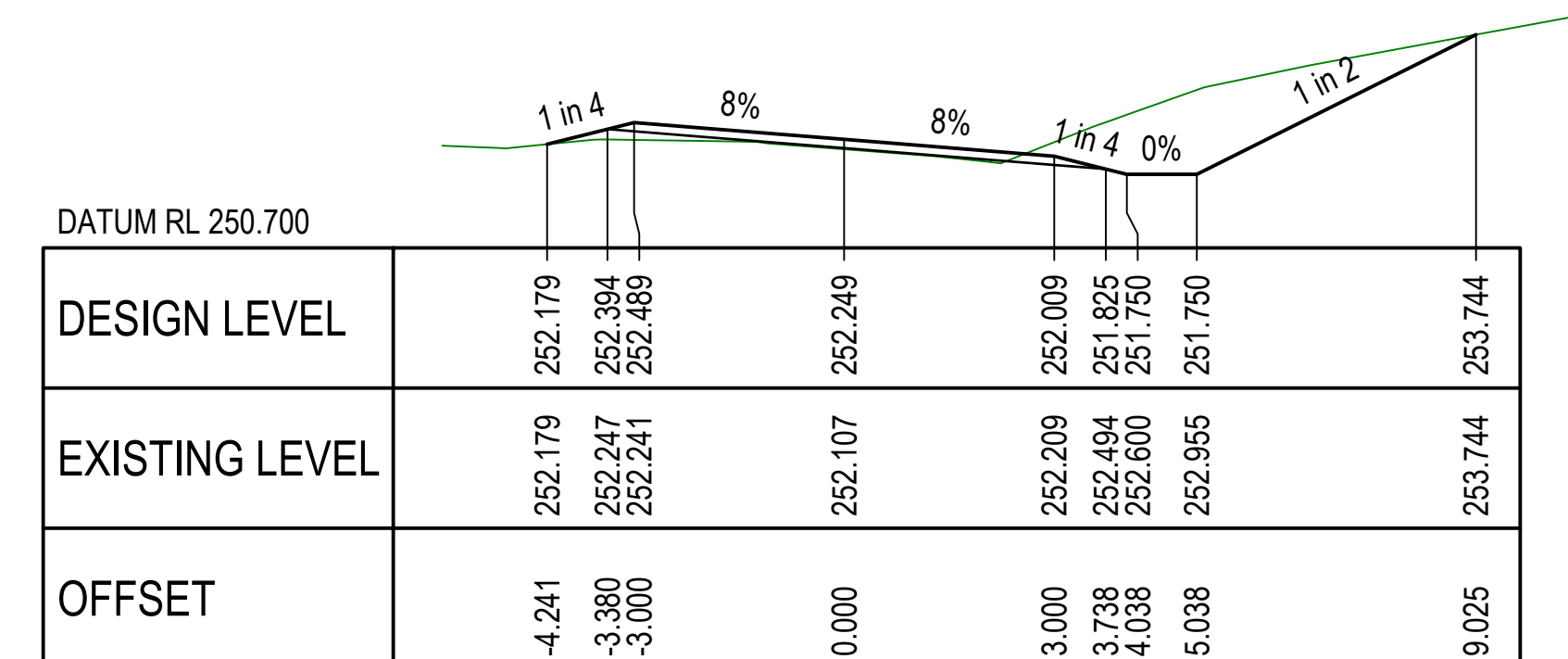
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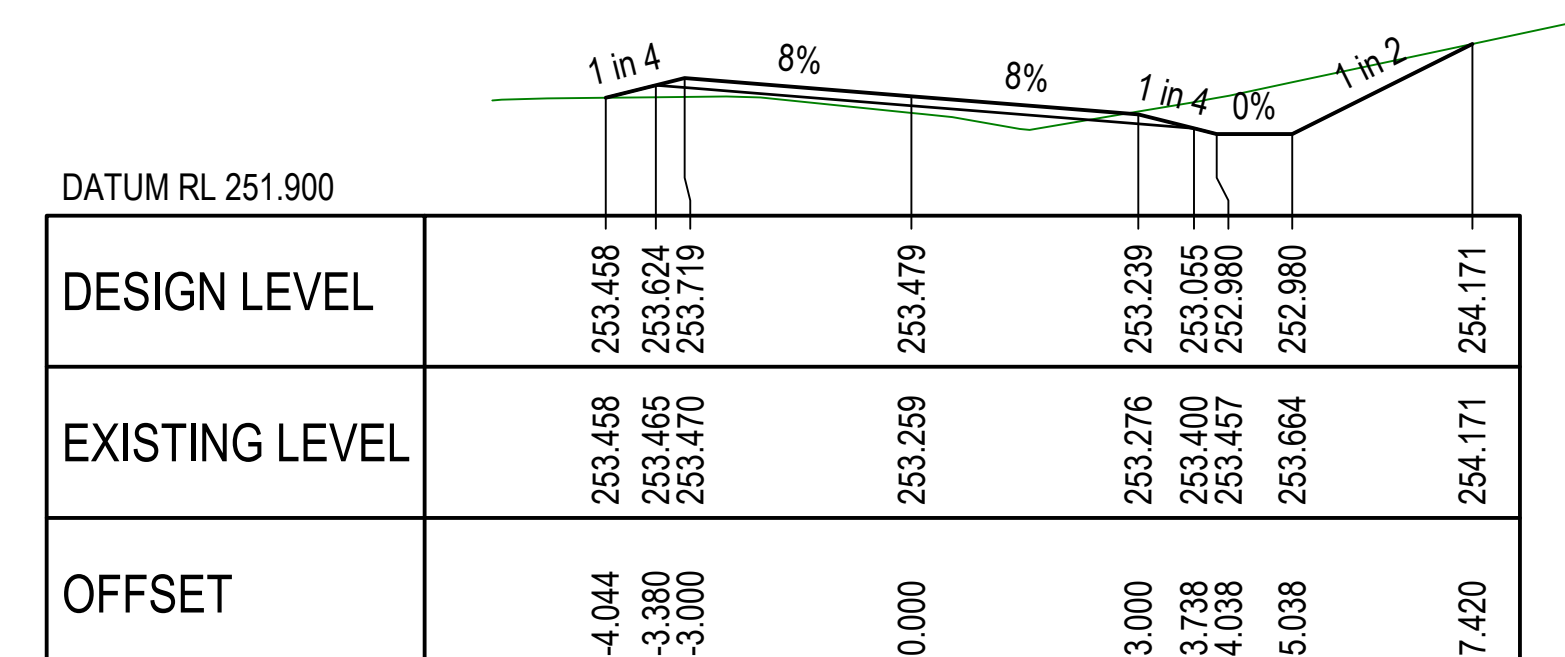
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CH. 58350.000



CH. 58340.000



CH. 58327.850

WARNING!

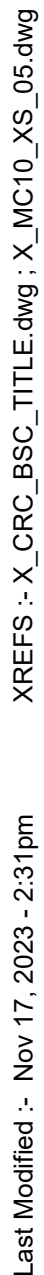
BEWARE OF UNDERGROUND SERVICES

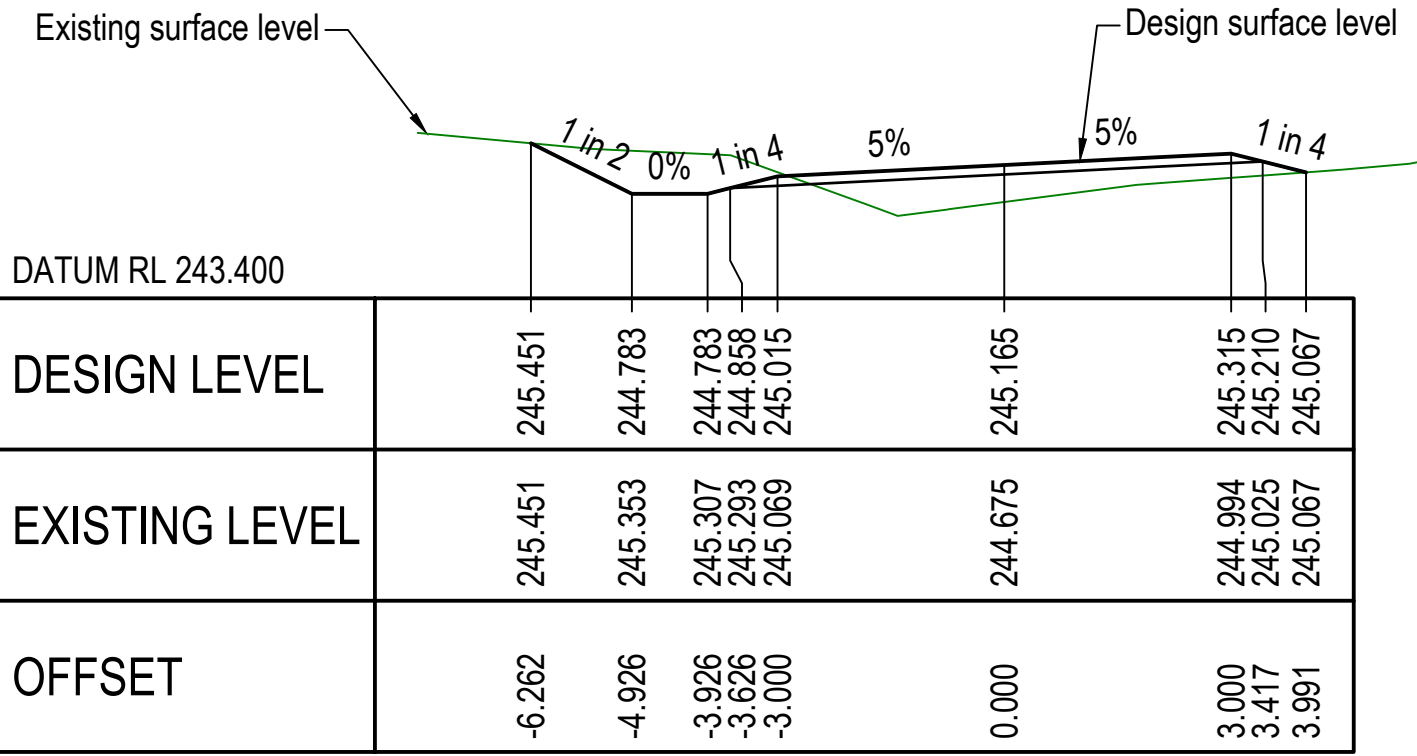
The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied. Ensure all services are accurately located prior to commencement of work.

CROSS SECTIONS

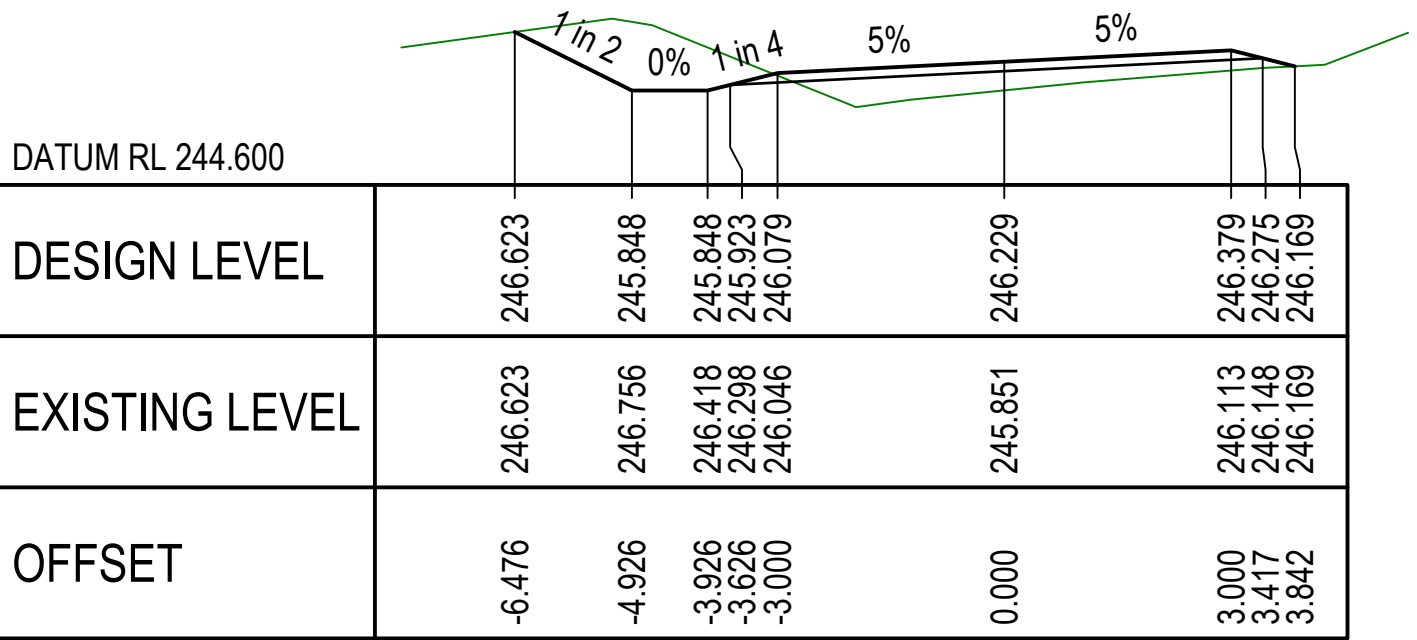
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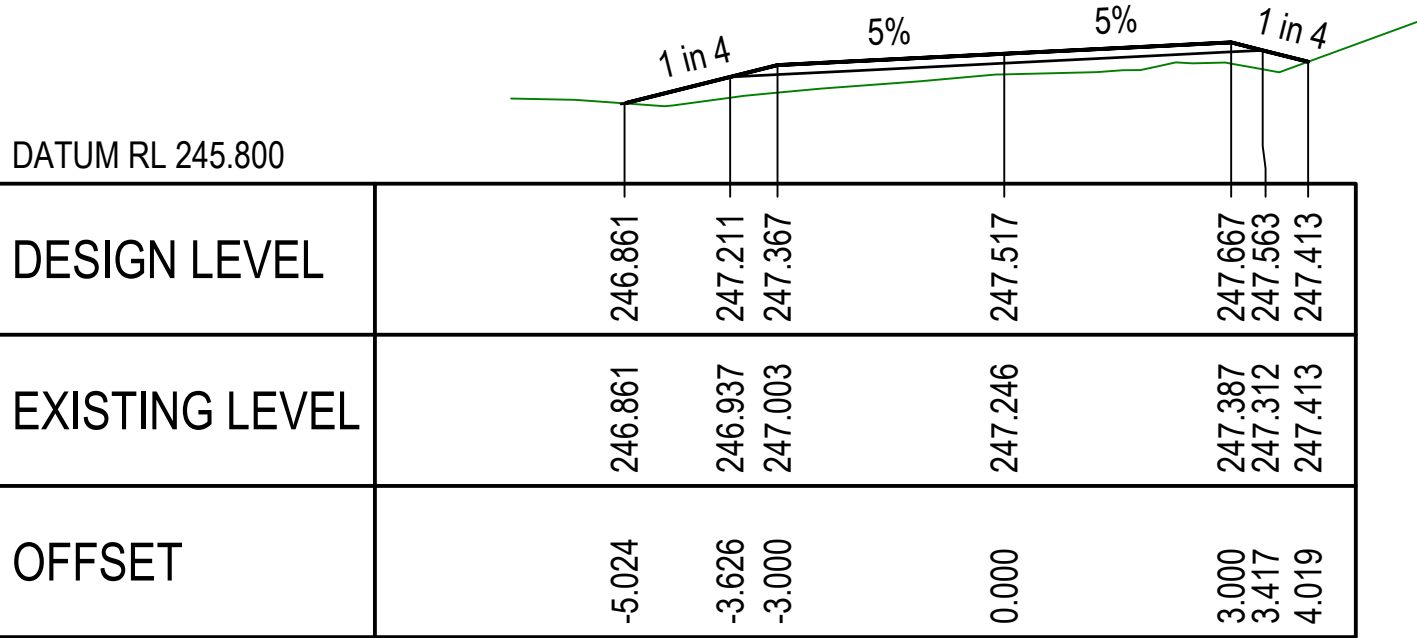
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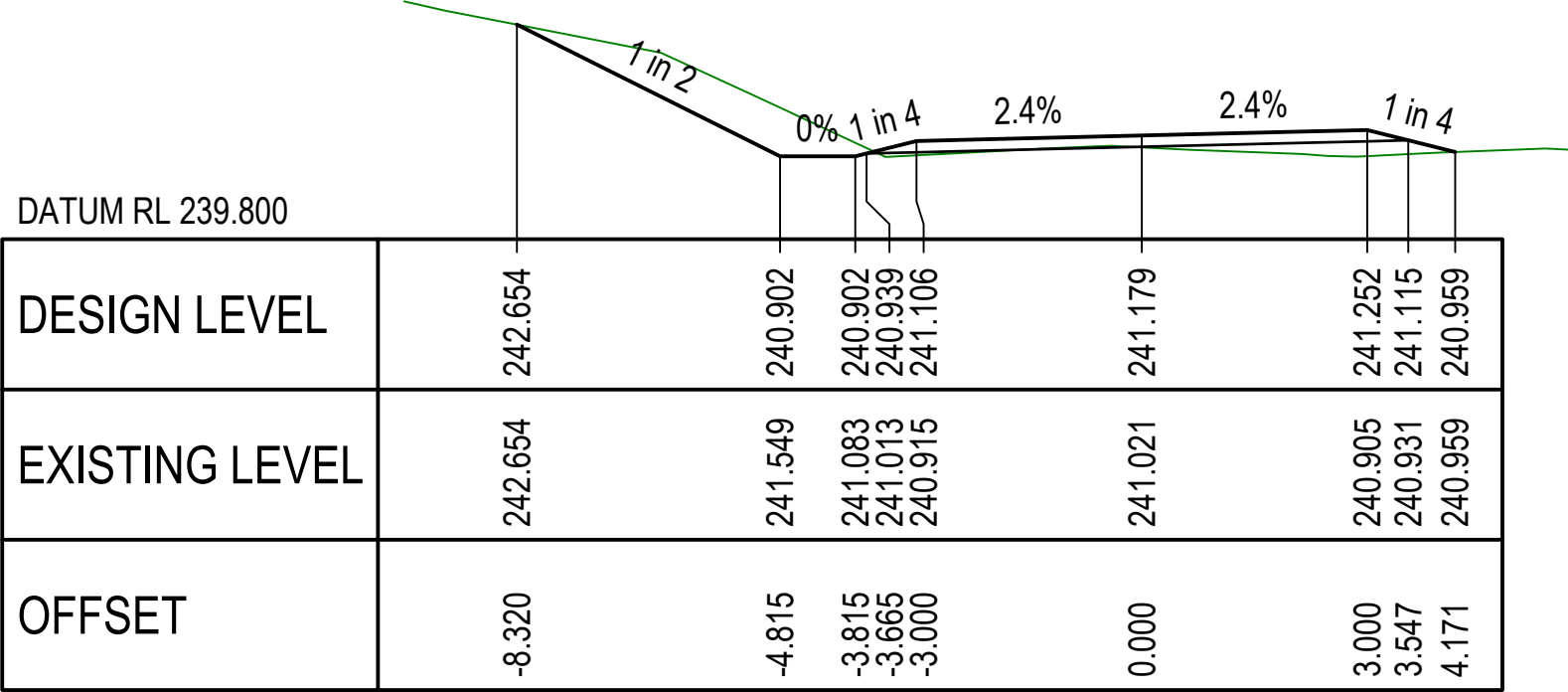
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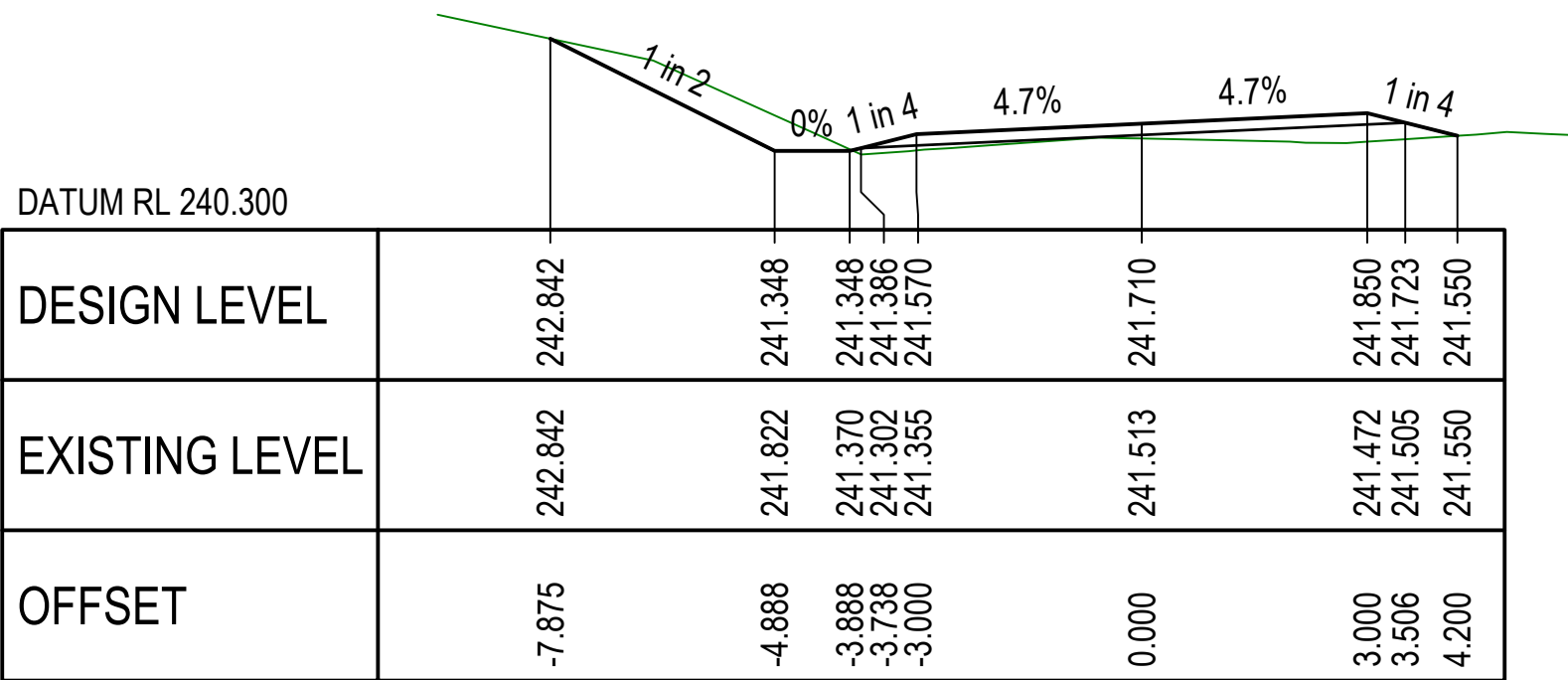
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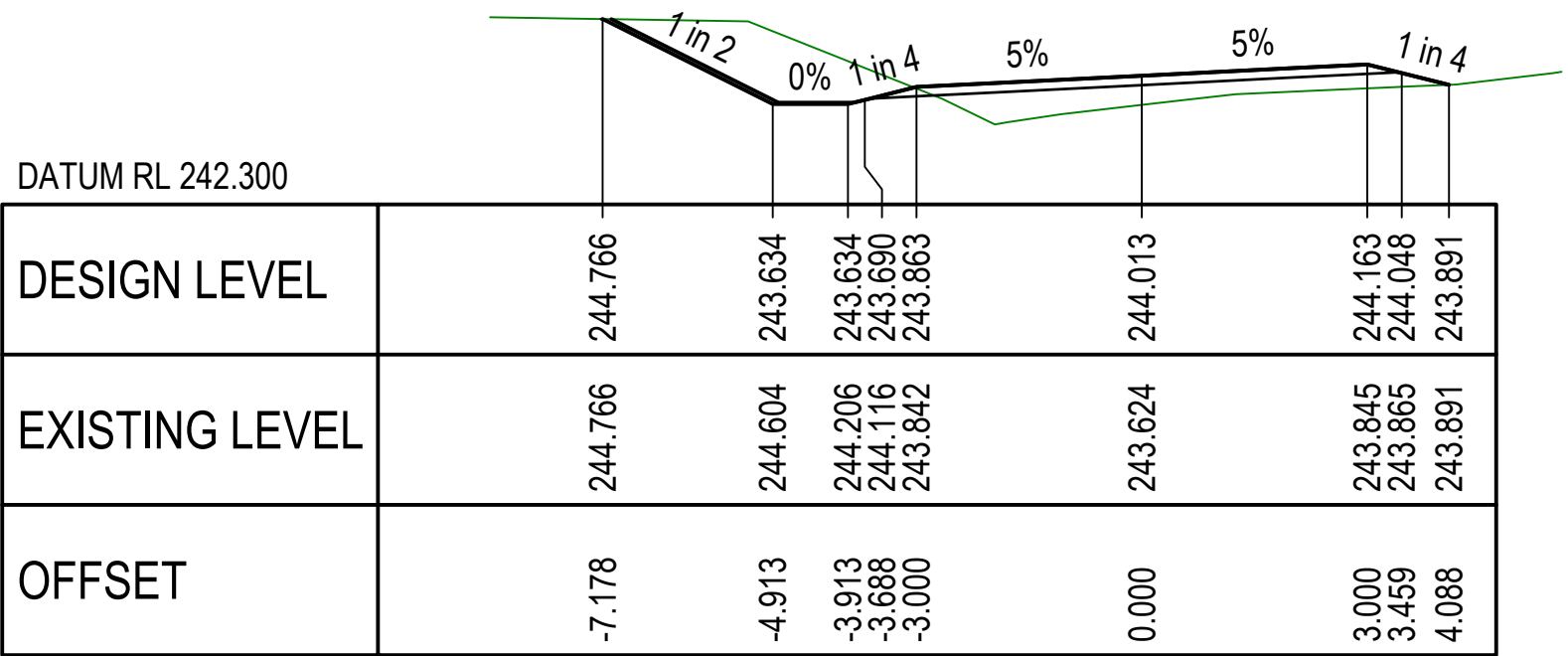
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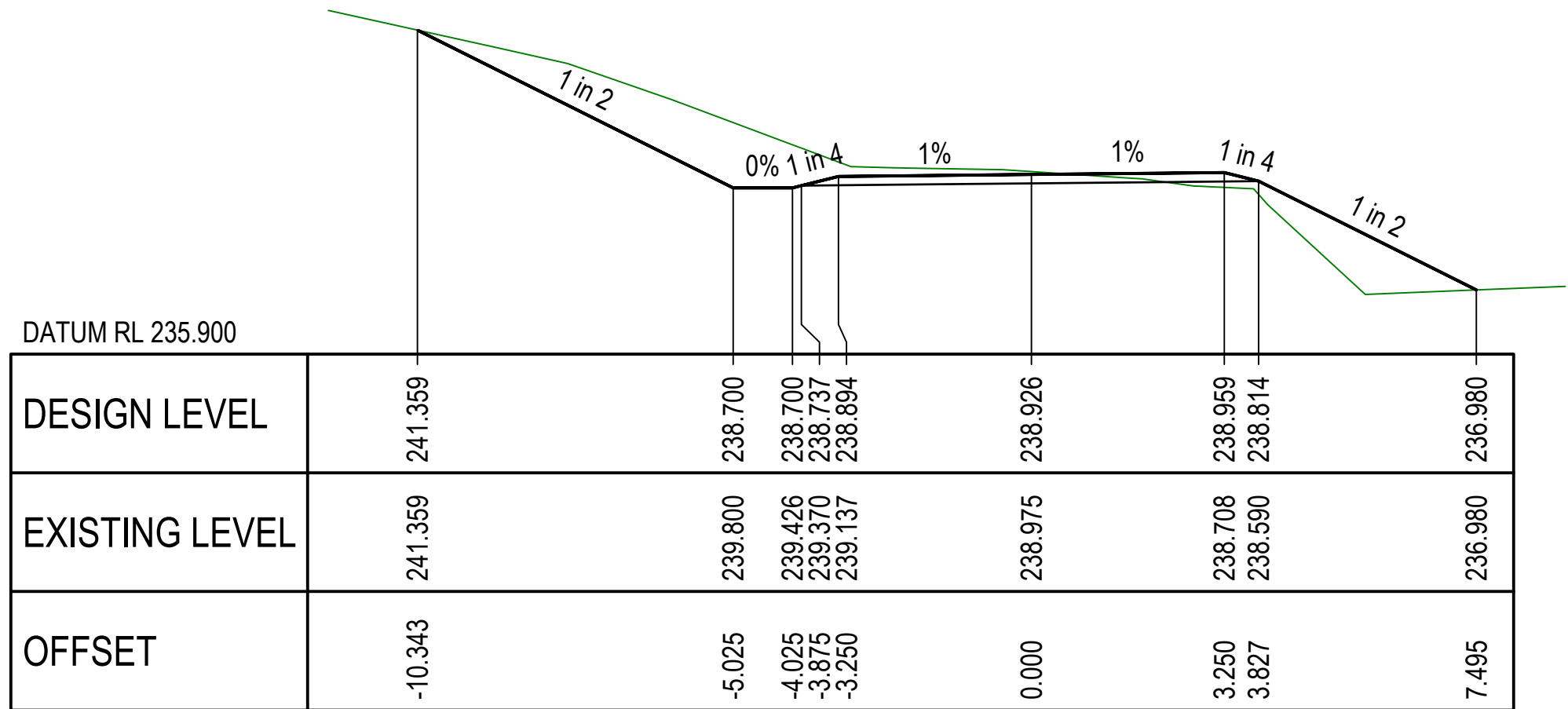
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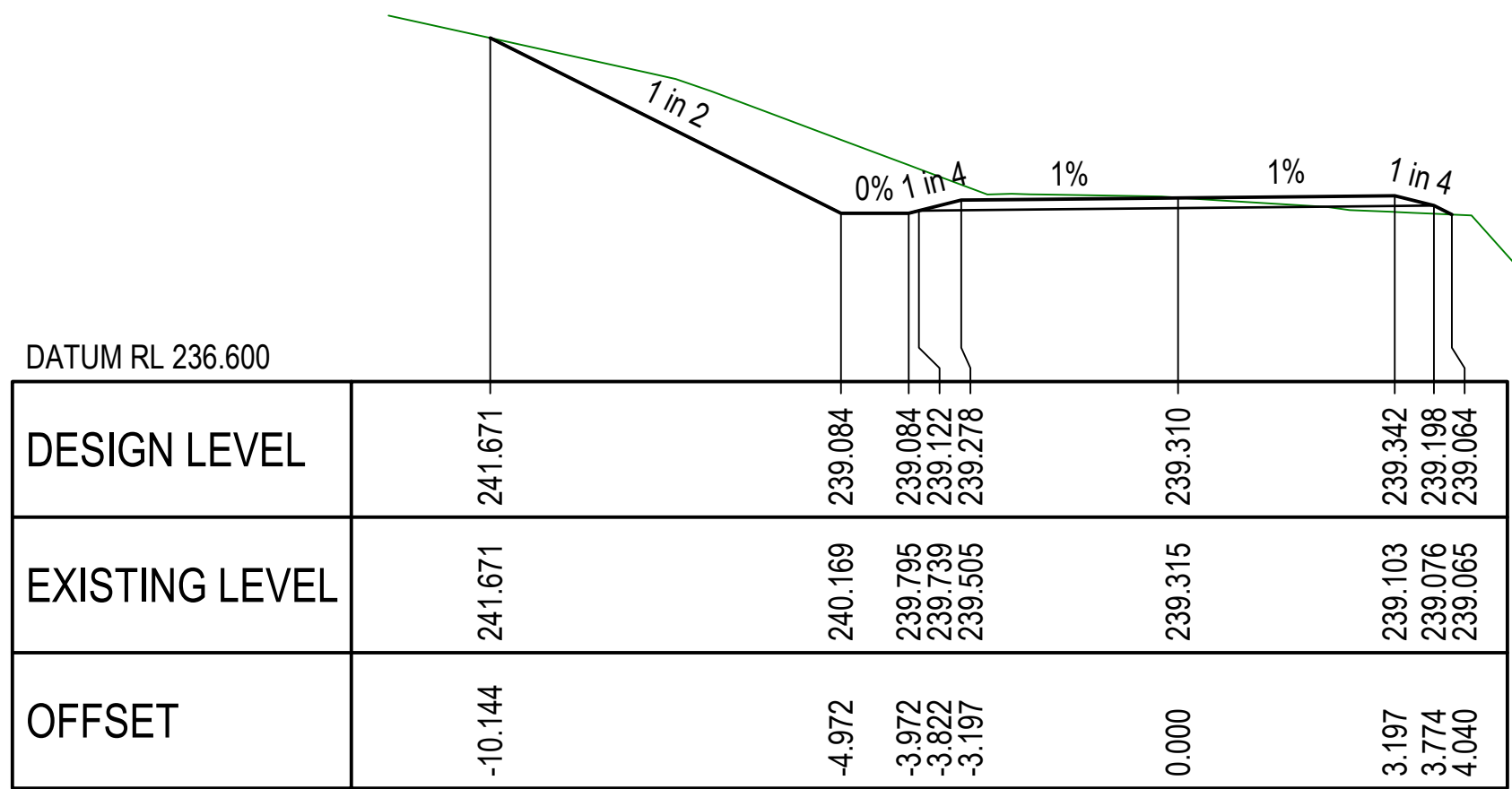
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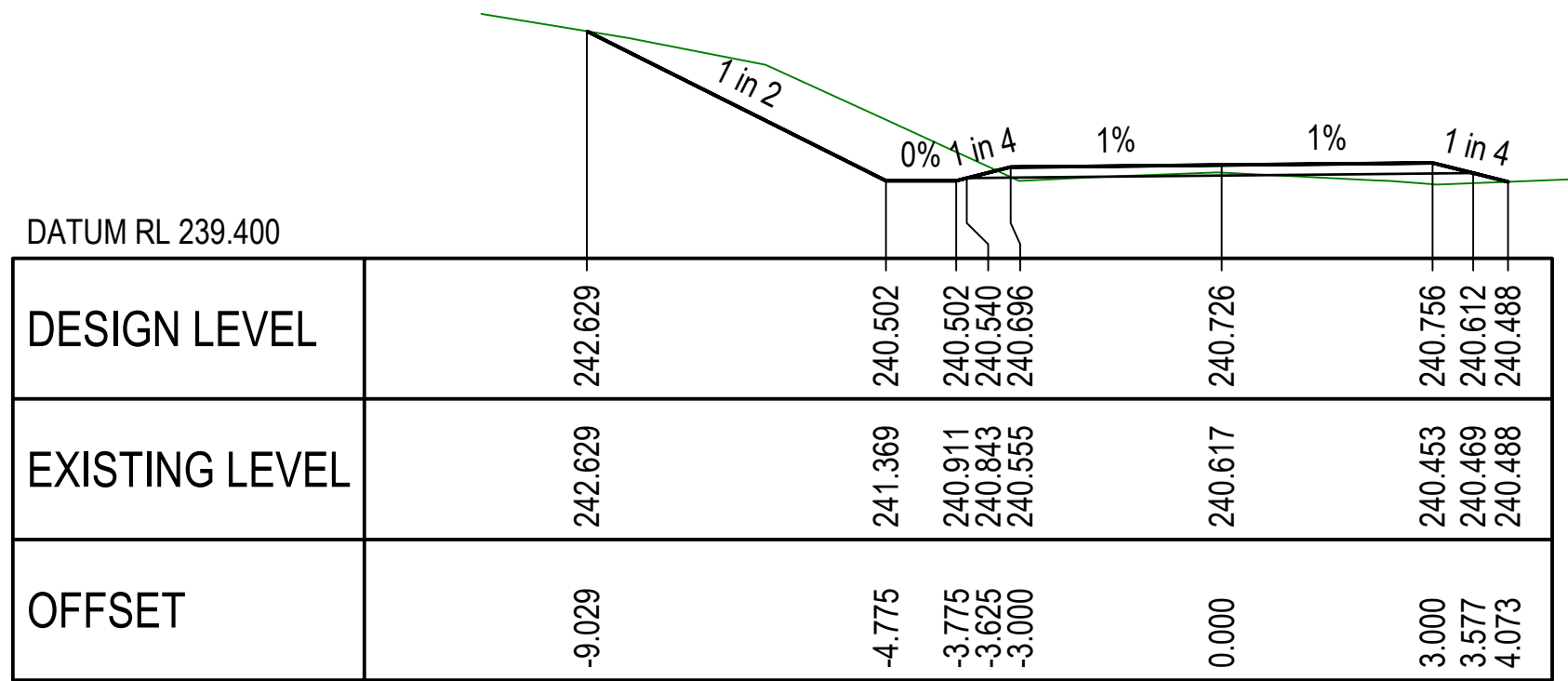
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CH. 58500.000

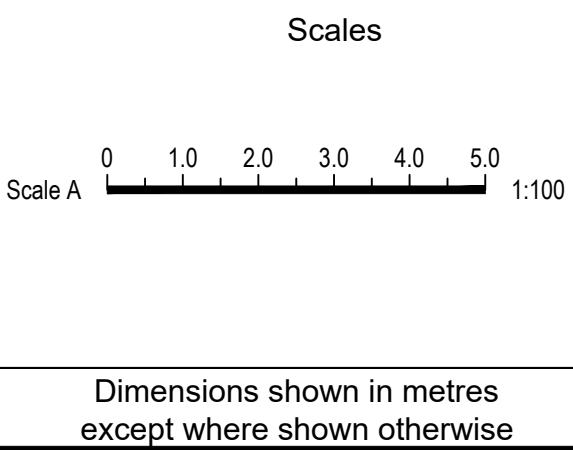


CH. 58488.200

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CROSS SECTIONS

Scale A



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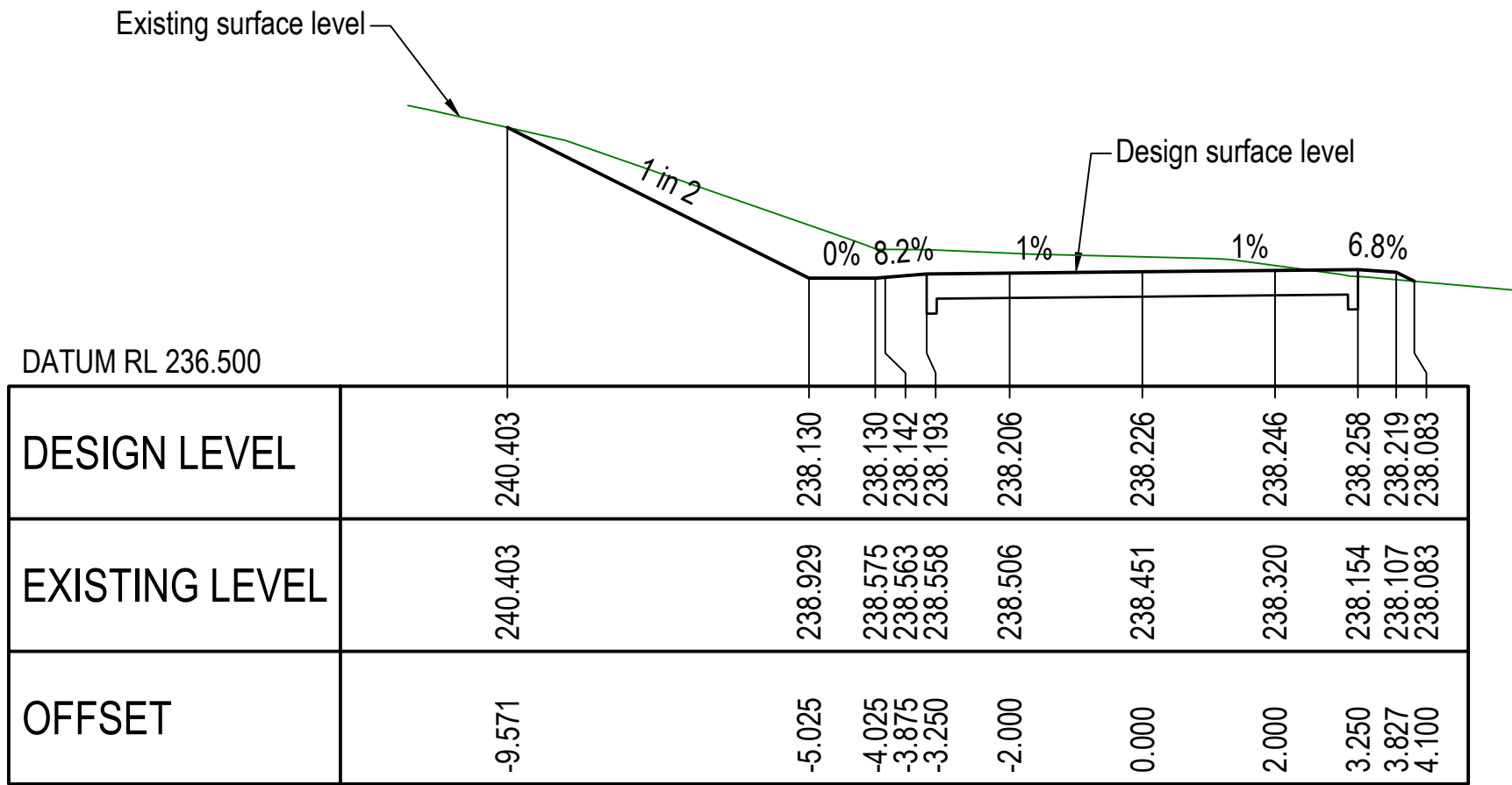
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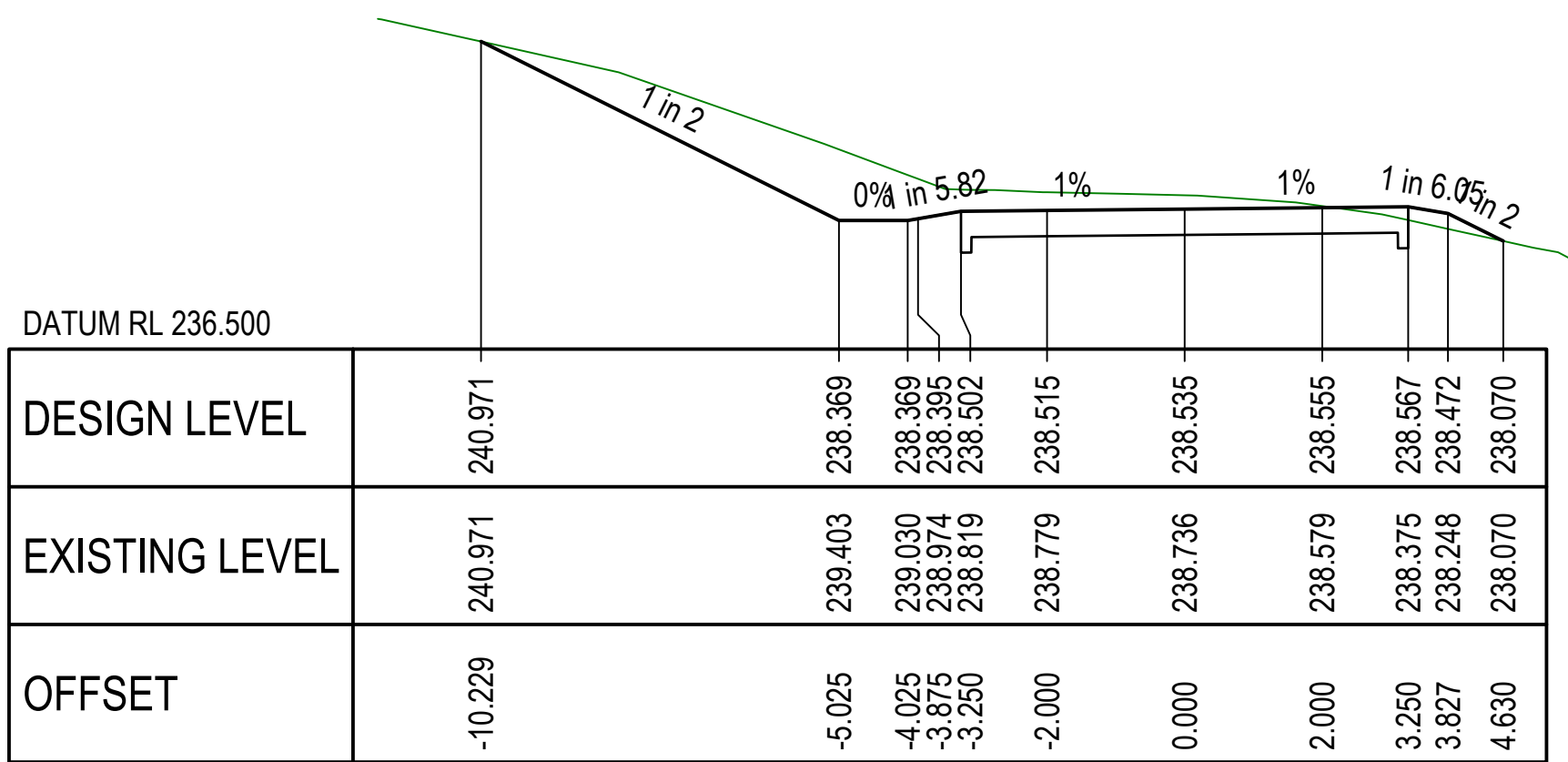
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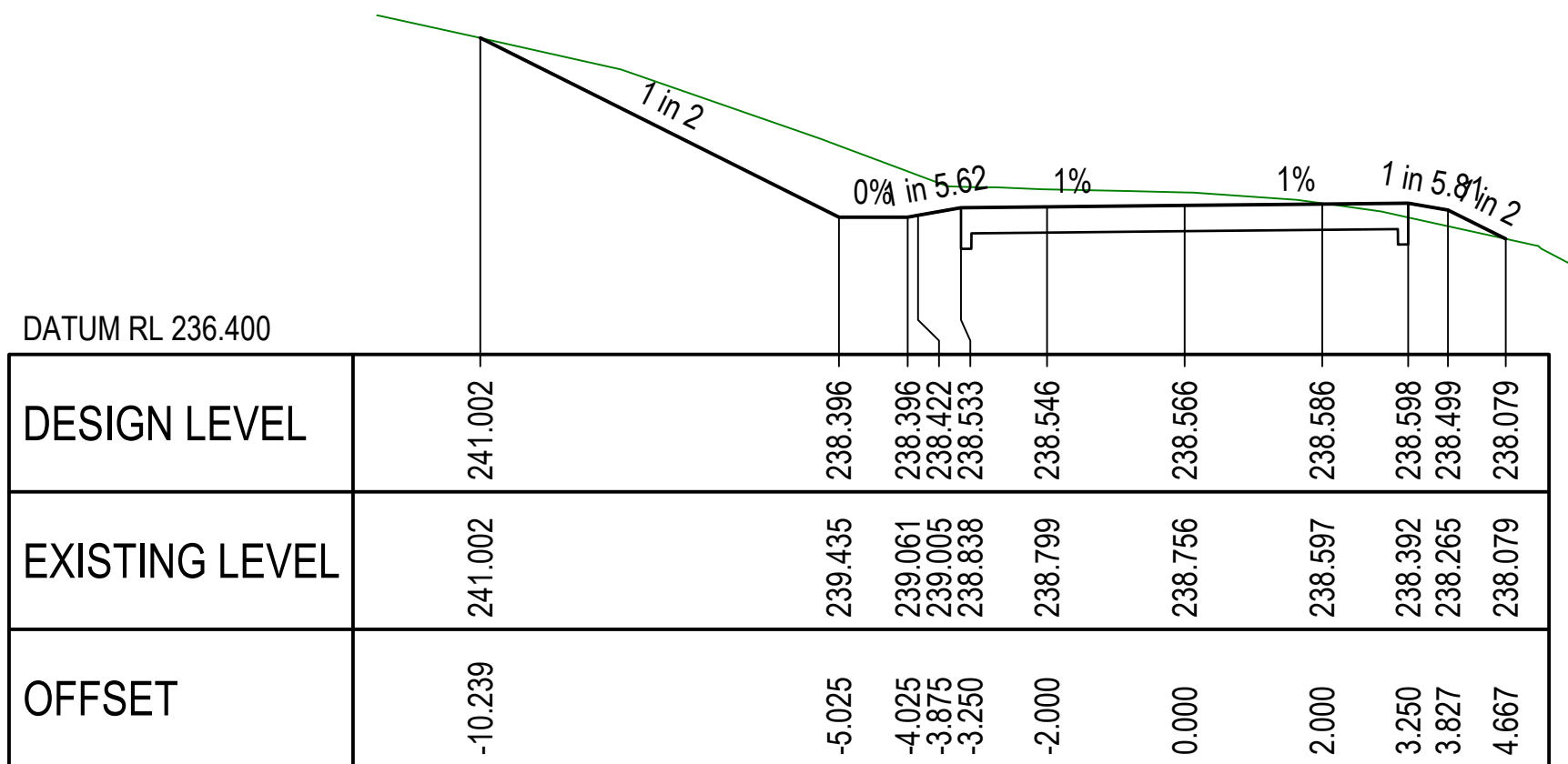
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Drawn B Doherty					Drawing No.	805
ENGINEERING CERTIFICATION (RPEQ)					Revision	A
Designed B Doherty	ENG. AREA	NAME	SIGNATURE	NO.	DATE	Series No.
	Civil	T Penrose		24807	June 2023	
						17 of 28



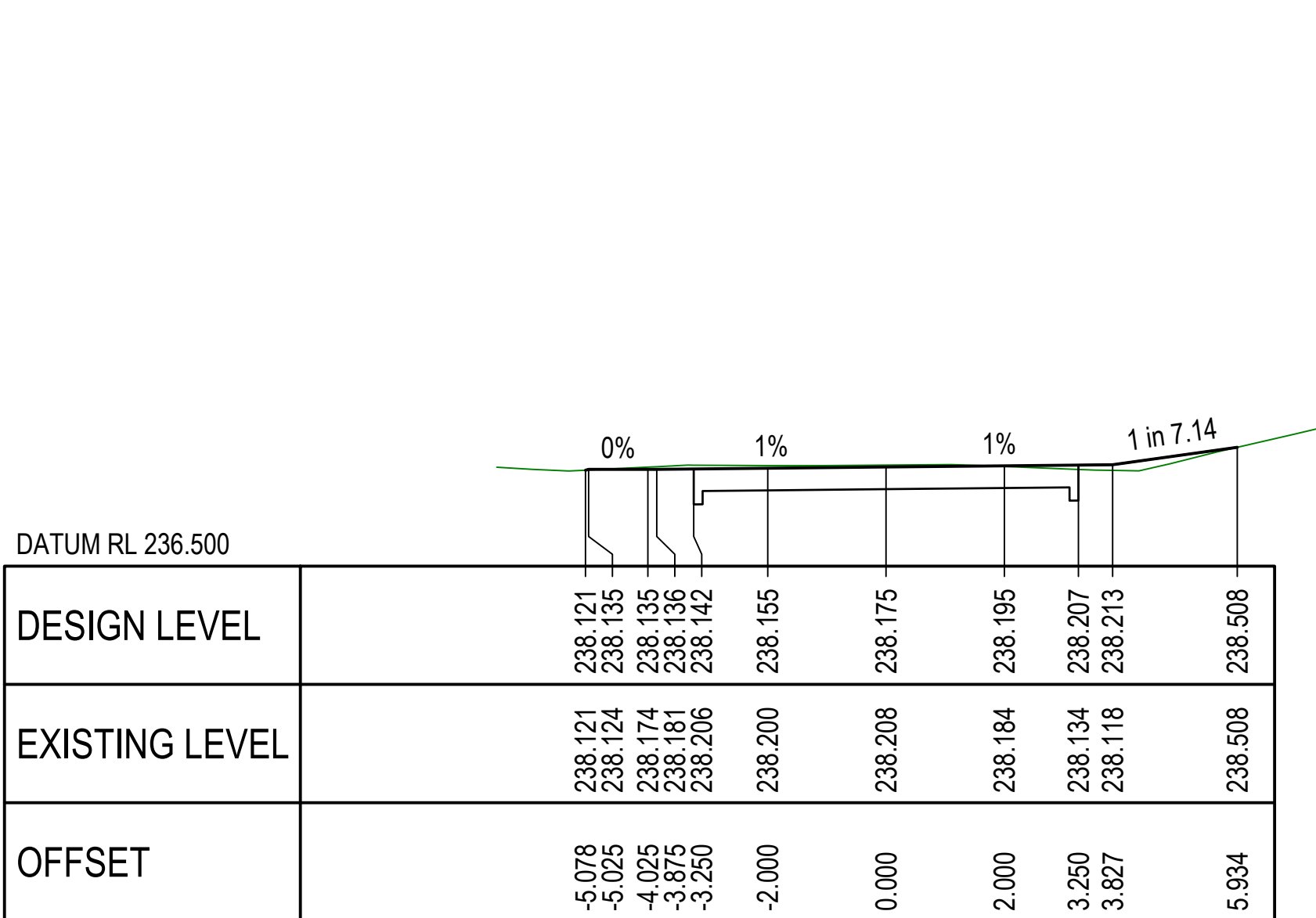
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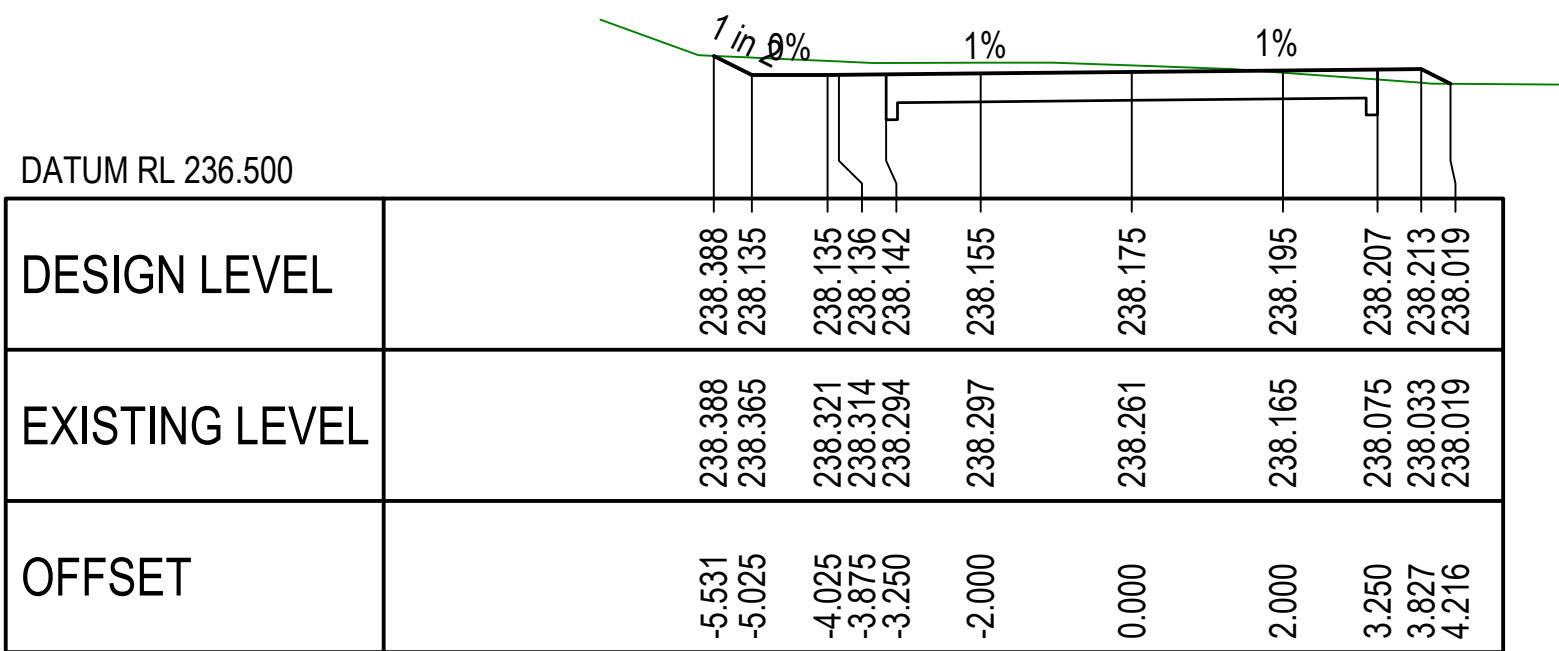
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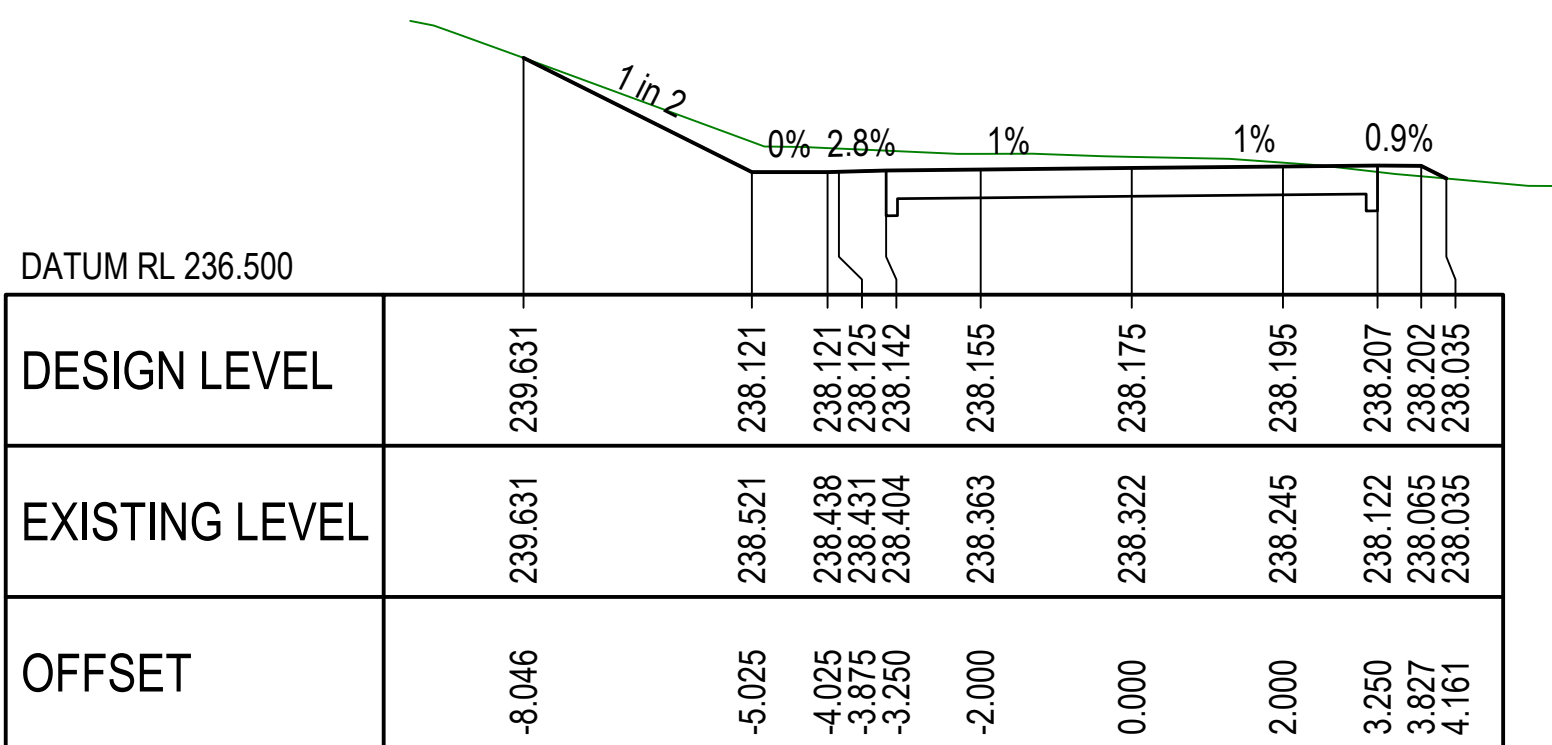
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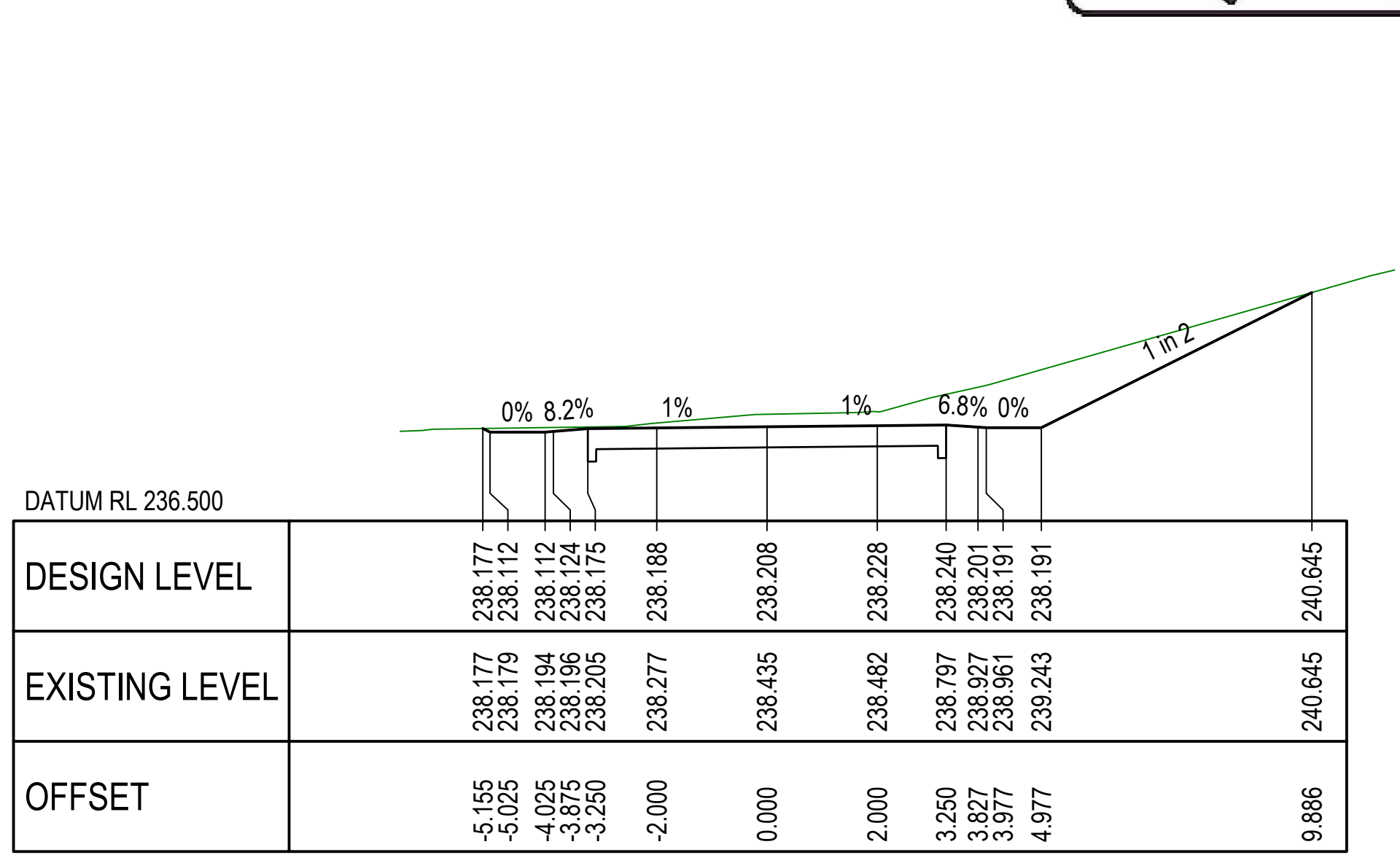
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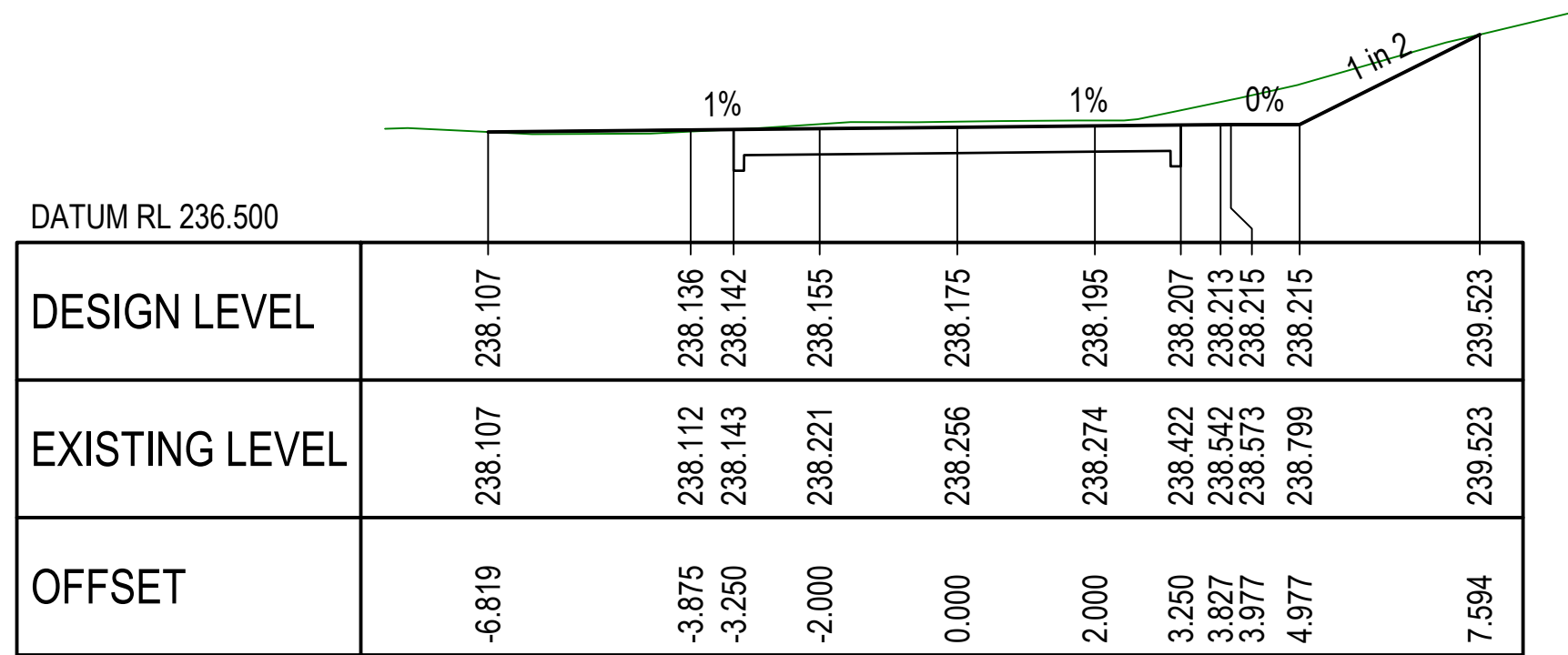
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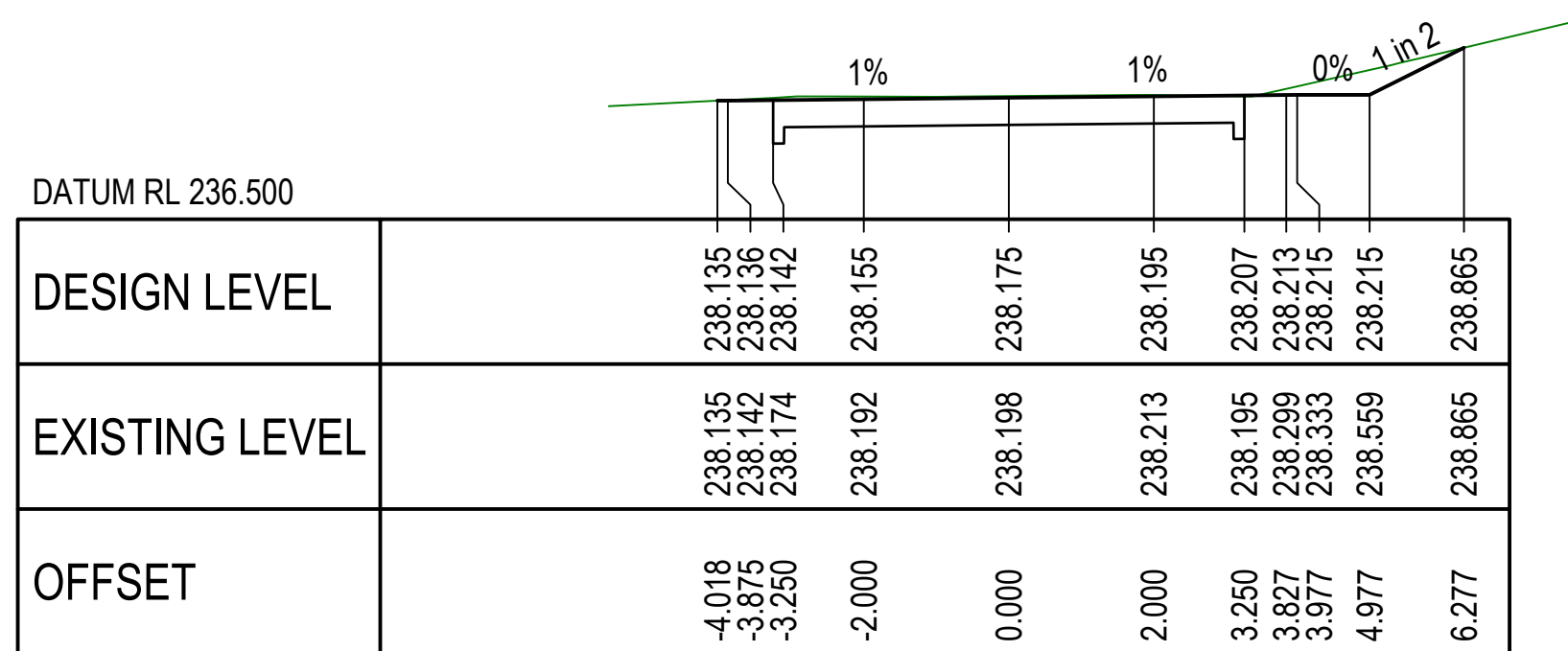
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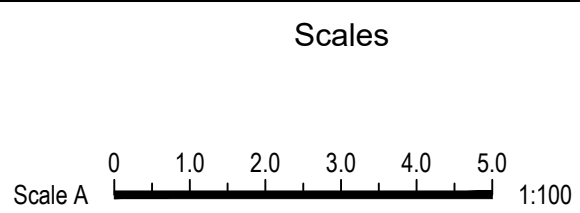


CH. 58520.000

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CROSS SECTIONS

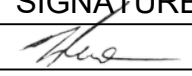
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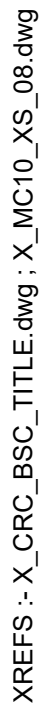


Dimensions shown in metres
except where shown otherwise

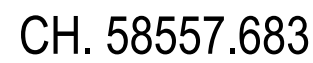
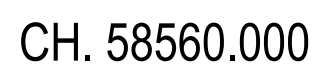
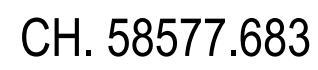
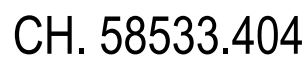
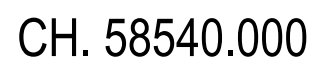
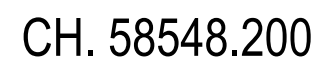
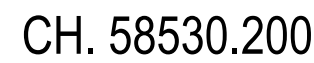
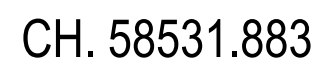
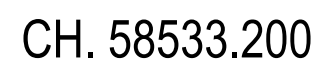
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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION ANNOTATED CROSS SECTIONS SHEET 7					Job No.	CRC00269
					Drawing No.	806
Drawn B Doherty	ENGINEERING CERTIFICATION (RPEQ)				Revision	A
	ENG. AREA	NAME	SIGNATURE	NO.	DATE	Series No.
Designed B Doherty	Civil	T Penrose		24807	June 2023	



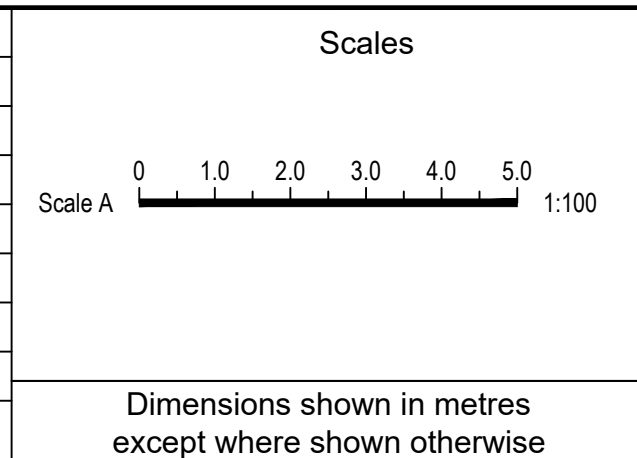
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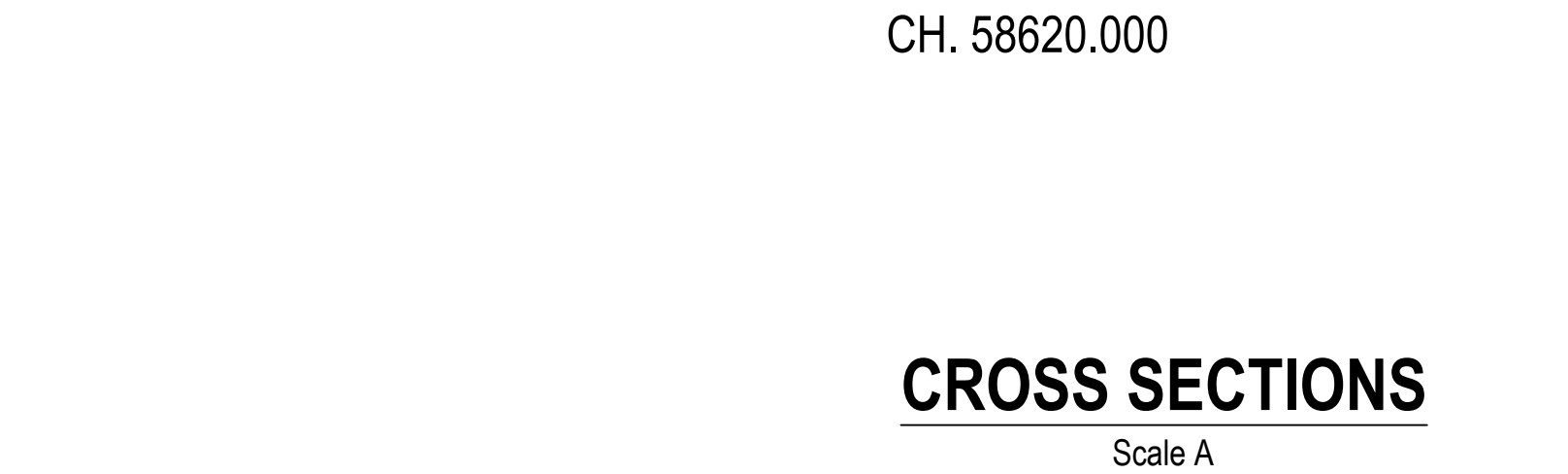
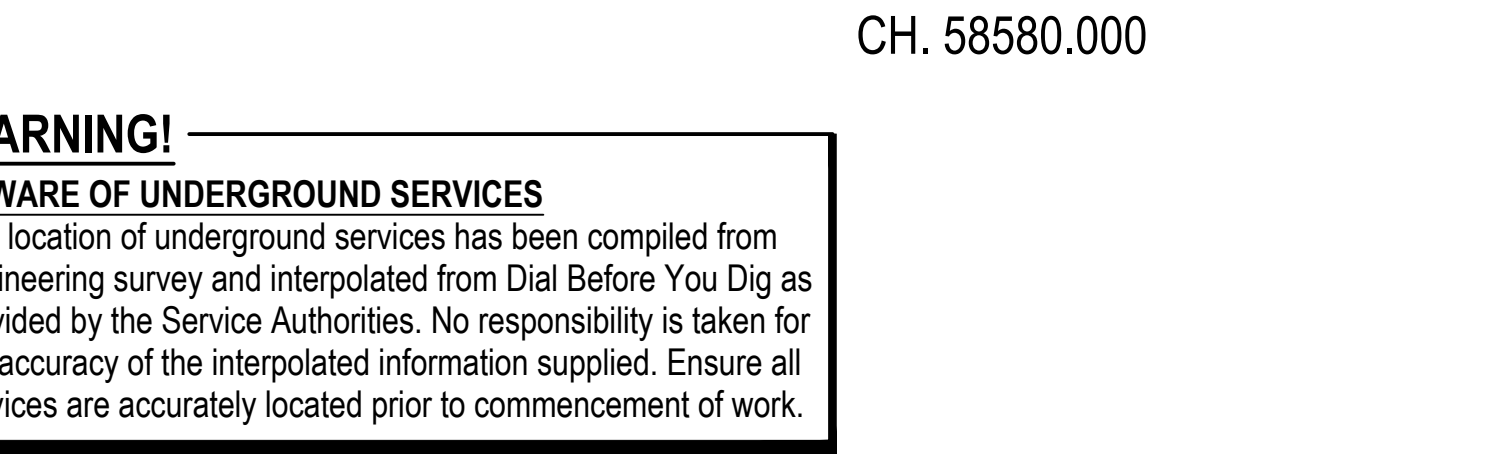
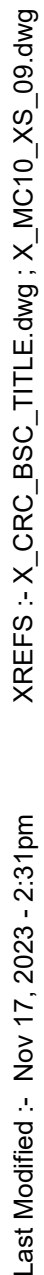
CROSS SECTIONS

Scale A

A	Issued For Construction			
20.01	Revisions/Descriptions	Drawn	Approved	Date



Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION ANNOTATED CROSS SECTIONS SHEET 8						Job No.	CRC00269
						Drawing No.	807
Drawn	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
B Doherty	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Designed	Civil	T Penrose		24807	June 2023	Series No.	19 of 28
	B Doherty						

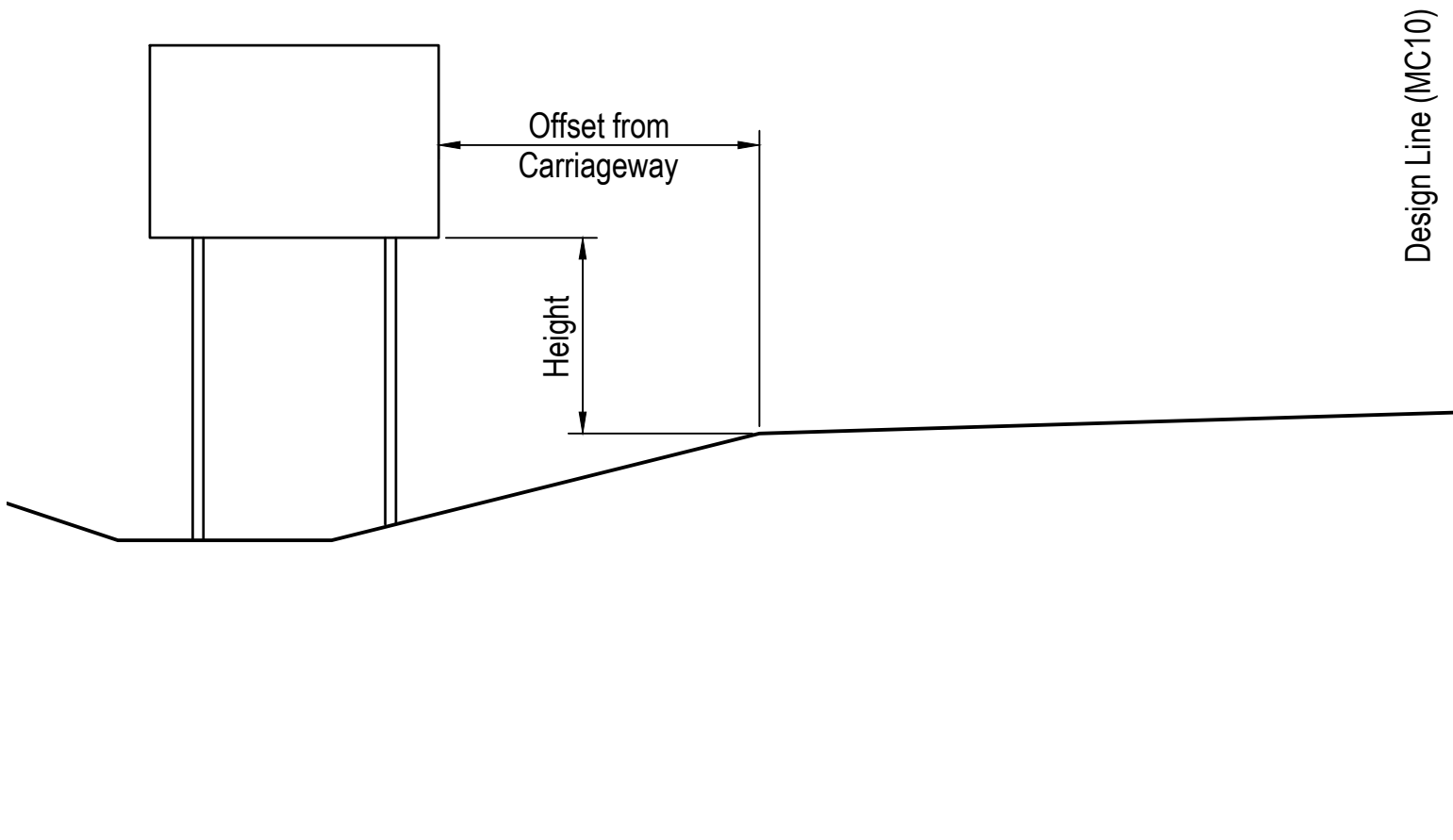


Scale A

[illegible]

SIGN SCHEDULE

CHAINAGE (M)	POSITION	SIGN DESCRIPTION	SIGN TYPE	WORK DESCRIPTION	SIGN DETAILS					STIFFENER DETAILS				NEW SUPPORT DETAILS						NEW FOOTING DETAILS			
					WIDTH (mm)	HEIGHT (mm)	AREA (m²)	OFFSET FROM CARRIAGEWAY (mm)	HEIGHT ABOVE CARRIAGEWAY (mm)	TYPE	No.	SPACING (mm)	No. OF BRACKETS	No.	SPACING (mm)	DIMENSION (mm) NB	MATERIAL	POST LENGTH 1 (mm)	POST LENGTH 2 (mm)	SLEEVE LENGTH (mm)	SLEEVE SIZE (mm)	DIA. (mm)	DEPTH (mm)
57840	LHS	Guide, Traffic Instruction	G9-9A	Install New	1500	750	1.125	2000	1500	1	3	350	6	2	1200	50	Signfix Sign Support (or equivalent)	6500 (C.T.S.)	6500 (C.T.S.)	As per manufactures specifications		300	750
57900	LHS	Warning, curve	W1-5B	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
57950	LHS	Warning, steep descent	W5-12B	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58000	LHS	Warning, curve	W1-3LB	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58120	LHS	Warning, curve	W1-3RB	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58240	LHS	Warning, curve	W1-3RB	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58348	LHS	Warning, curve	W1-3LB	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58393	LHS	Warning, floodway	W5-7-1B	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58443	LHS	Guide, "Road Subject to Flooding"	G9-21-1	Install New	2150	800	1.7200	2000	1500	1	3	350	6	2	1500	60.3	C350	3500 C.T.S	3500 C.T.S	-	-	300	750
58485	RHS	Warning, steep incline	W5-13B	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58493.131	LHS	Guide, Flood depth marker	G9-22-2	Install New	Refer Details in DTMR Std Drg 1170 - Flood Depth Indicators - Installation																		
58515	LHS	Guide, Flood depth marker	G9-22-1	Install New																			
58520	RHS	Guide, Flood depth marker	G9-22-1	Install New																			
58541.2000	RHS	Guide, Flood depth marker	G9-22-2	Install New																			
58591	RHS	Guide, "Road Subject to Flooding"	G9-21-1	Install New	2150	800	1.7200	2000	1500	1	3	350	6	2	1500	60.3	C350	3500 C.T.S	3500 C.T.S	-	-	300	750
58641	RHS	Warning, floodway	W5-7-1B	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58691	RHS	Warning, curve	W1-3LB	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750
58741	RHS	Guide, Traffic Instruction	G9-9A	Install New	1500	750	1.125	2000	1500	1	3	350	6	2	1200	50	Signfix Sign Support (or equivalent)	6500 (C.T.S.)	6500 (C.T.S.)	As per manufactures specifications		300	750
58791	RHS	Warning, curve	W1-5B	Install New	750	750	0.56	2000	1500	1	0	0	0	1	-	50	C350LO	3500	-	-	-	300	750



SIGN SETOUT

PAVEMENT MARKING TYPES

No.	TYPE	EXAMPLE	WIDTH	DESCRIPTION
LONGITUDINAL LINES				
C	Barrier Line (Single)		100mm	Continuous

XREFS - X_CRC_BSC_TITLE.dwg

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20.01	Revisions/Descriptions	Drawn	Approved	Date

Scales	
Dimensions shown in metres except where shown otherwise	



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Client

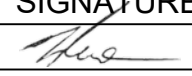


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Title

CRACOW ROAD UPGRADE (Ch. 57877m - 58640m)
DOWNFALL CREEK FLOODWAY AND RANGE SECTION
SUPPLEMENTARY SIGNS AND LINEMARKING DETAILS

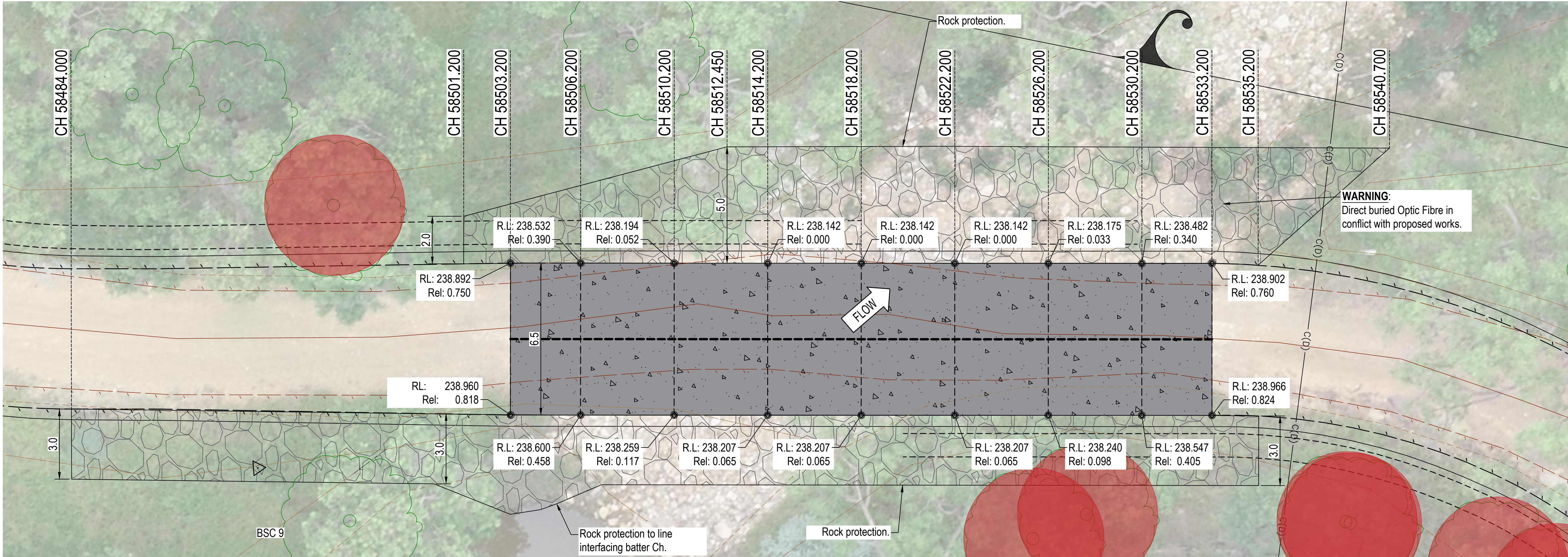
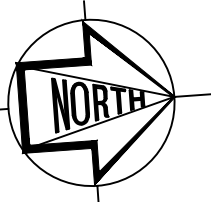
Drawn	ENGINEERING CERTIFICATION (RPEQ)				
B Doherty	ENG. AREA	NAME	SIGNATURE	NO.	DATE
Designed	Civil	T Penrose		24807	June 2023
B Doherty					

Job No.	CRC00269
Drawing No.	1000
Revision	A
Series No.	22 of 28

Refer 400 series drawings for sign details.

CRACOW

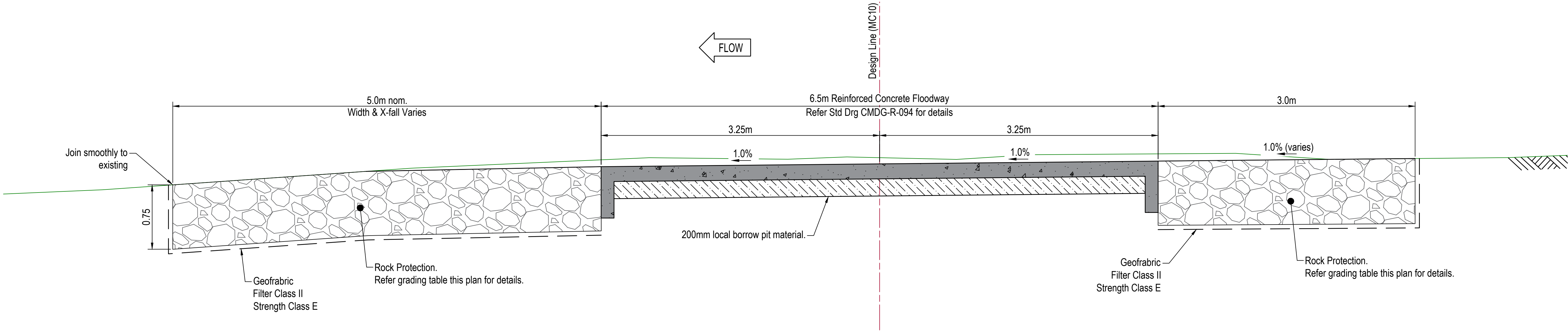
ROAD



LEGEND

- ⊙ R.L: Reduced Level AHD
Rel: Height relative to lowest point on floodway
- - Tree to be removed

PLAN



ROCK PROTECTION GRADING DETAILS

Rock Size (m)	Rock Mass (kg)	Percentage of rock larger than.
0.55	250	0%
0.40	100	50%
0.20	10	90%

TYPICAL CROSS SECTION B

Chge 58503.200 - 58533.200 (MC10 - Floodway)
Not to Scale

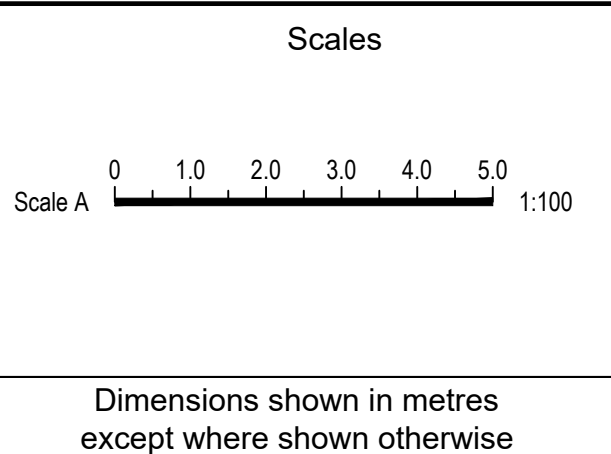
WARNING!

BEWARE OF UNDERGROUND SERVICES
The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied. Ensure all services are accurately located prior to commencement of work.

XREFS - X_CRC_BSC_TITLE.dwg : X_CONTROL.dwg : X_DESIGN.dwg : X_HATCH.dwg : X_SURVEY.dwg : X_IMAGE.dwg

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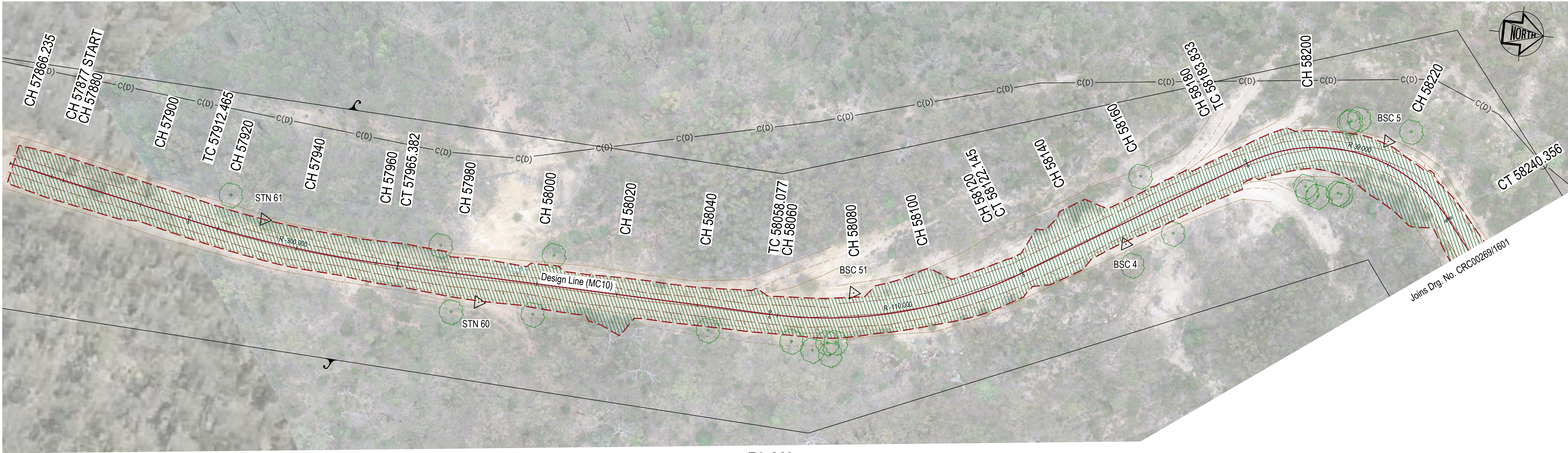
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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION FLOODWAY DETAILS					Job No.	CRC00269
Drawn B Doherty					Drawing No.	1200
Designed B Doherty					Revision	A
					Series No.	23 of 28
ENGINEERING CERTIFICATION (RPEQ)						
ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Civil	T Penrose		24807	June 2023		

CRACOW

ROAD



PLAN

DESIGN LINE MC10

CHAINAGE	OFFSET LHS	OFFSET RHS
57870.000	5.147	5.025
57880.000	5.722	5.265
57890.000	5.603	5.128
57900.000	5.535	3.981
57910.000	5.464	4.285
57920.000	5.247	4.450
57930.000	5.146	4.643
57940.000	5.157	4.758
57950.000	5.314	4.473
57960.000	5.438	4.756

DESIGN LINE MC10

CHAINAGE	OFFSET LHS	OFFSET RHS
57970.000	5.412	4.938
57980.000	4.009	5.321
57990.000	4.241	5.193
58000.000	4.927	4.785
58010.000	3.910	4.422
58020.000	4.204	4.200
58030.000	4.253	3.916
58040.000	4.332	4.279
58050.000	4.969	4.481
58060.000	4.377	4.534

DESIGN LINE MC10

CHAINAGE	OFFSET LHS	OFFSET RHS
58070.000	4.357	4.842
58080.000	5.022	4.613
58090.000	5.742	4.545
58100.000	5.500	4.891
58110.000	5.060	5.524
58120.000	4.298	5.483
58130.000	7.898	5.733
58140.000	9.567	4.386
58150.000	4.960	4.298
58160.000	5.042	4.780

DESIGN LINE MC10

CHAINAGE	OFFSET LHS	OFFSET RHS
58170.000	5.115	4.681
58180.000	4.239	5.319
58190.000	4.707	5.163
58200.000	4.179	5.174
58210.000	4.375	6.585
58220.000	4.290	8.688
58230.000	4.727	8.854
58240.000	4.228	4.312
58250.000	4.517	5.326

LEGEND

-  - Tree to be removed
-  - Limit of clearing

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20.01	Revisions/Descriptions	Drawn	Approved	Date

Scales
Dimensions shown in metres except where shown otherwise



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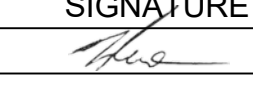
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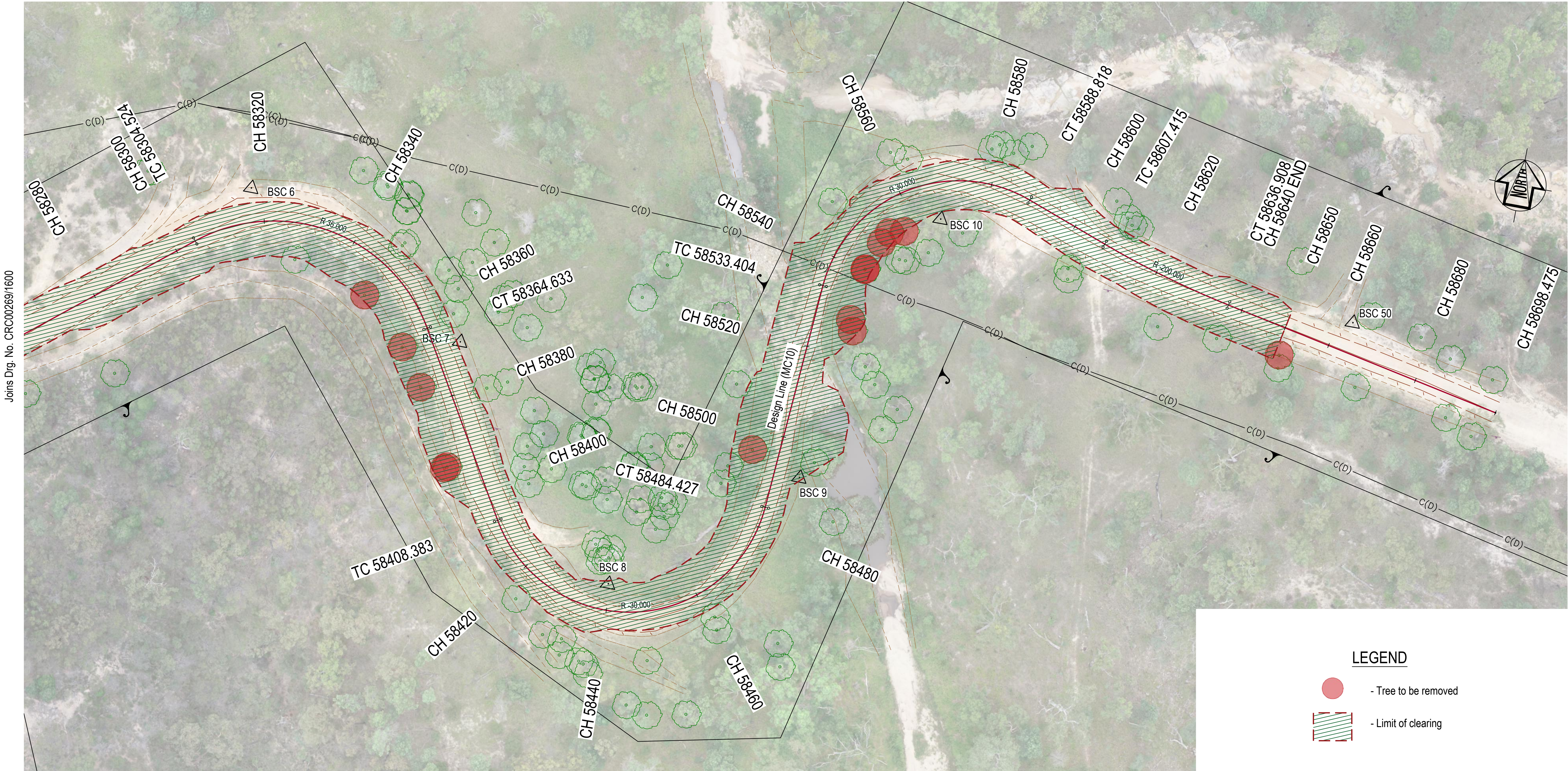
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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION LIMIT OF CLEARING PLAN SHEET 1					Job No.	CRC00269
					Drawing No.	1600
Drawn B Doherty	ENGINEERING CERTIFICATION (RPEQ)					Revision A
	ENG. AREA Civil	NAME T Penrose	SIGNATURE 	NO. 24807	DATE June 2023	Series No. 24 of 28

CRACOW

ROAD



LEGEND

- Tree to be removed
- Limit of clearing

CONTROL LINE MC10

CHAINAGE	OFFSET LHS	OFFSET RHS
58260.000	5.371	4.046
58270.000	5.551	4.070
58280.000	4.859	6.542
58290.000	5.045	6.320
58300.000	4.113	6.889
58310.000	4.131	7.037
58320.000	4.117	7.388
58330.000	3.939	7.522
58340.000	4.241	9.025
58350.000	4.589	8.656
58360.000	5.050	8.841
58370.000	4.952	9.180
58380.000	5.216	8.341

CONTROL LINE MC10

CHAINAGE	OFFSET LHS	OFFSET RHS
58390.000	5.906	9.335
58400.000	5.184	4.587
58410.000	5.514	4.423
58420.000	5.608	4.059
58430.000	4.488	4.861
58440.000	6.476	3.842
58450.000	6.266	3.991
58460.000	7.197	4.088
58470.000	7.272	4.230
58480.000	7.945	4.200
58490.000	9.413	4.075
58500.000	10.267	13.156
58510.000	9.729	8.451

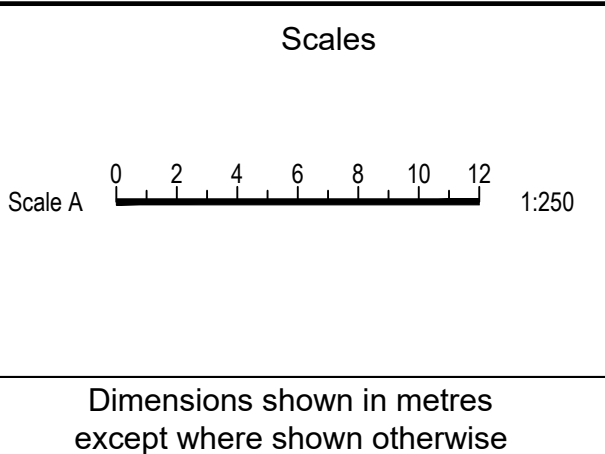
CONTROL LINE MC10

CHAINAGE	OFFSET LHS	OFFSET RHS
58520.000	4.018	6.378
58530.000	5.798	10.358
58540.000	6.807	8.456
58550.000	3.727	8.335
58560.000	3.899	7.392
58570.000	4.392	6.157
58580.000	5.509	5.702
58590.000	4.534	5.362
58600.000	6.112	6.070
58610.000	4.464	6.153
58620.000	4.441	6.477
58630.000	5.858	6.821
58640.000	5.792	7.026

WARNING!

BEWARE OF UNDERGROUND SERVICES
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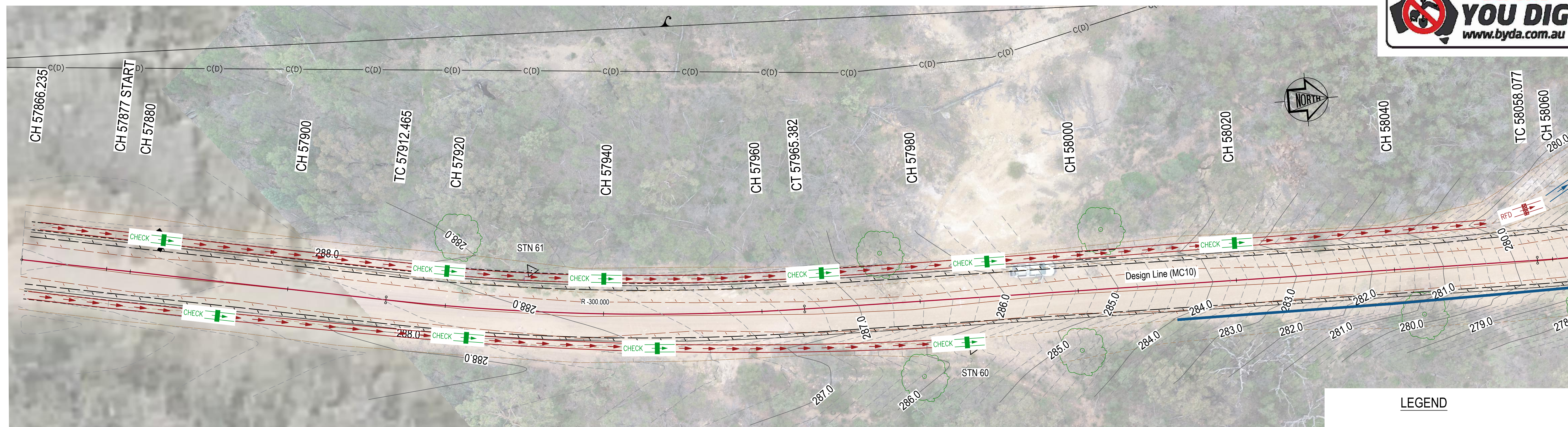
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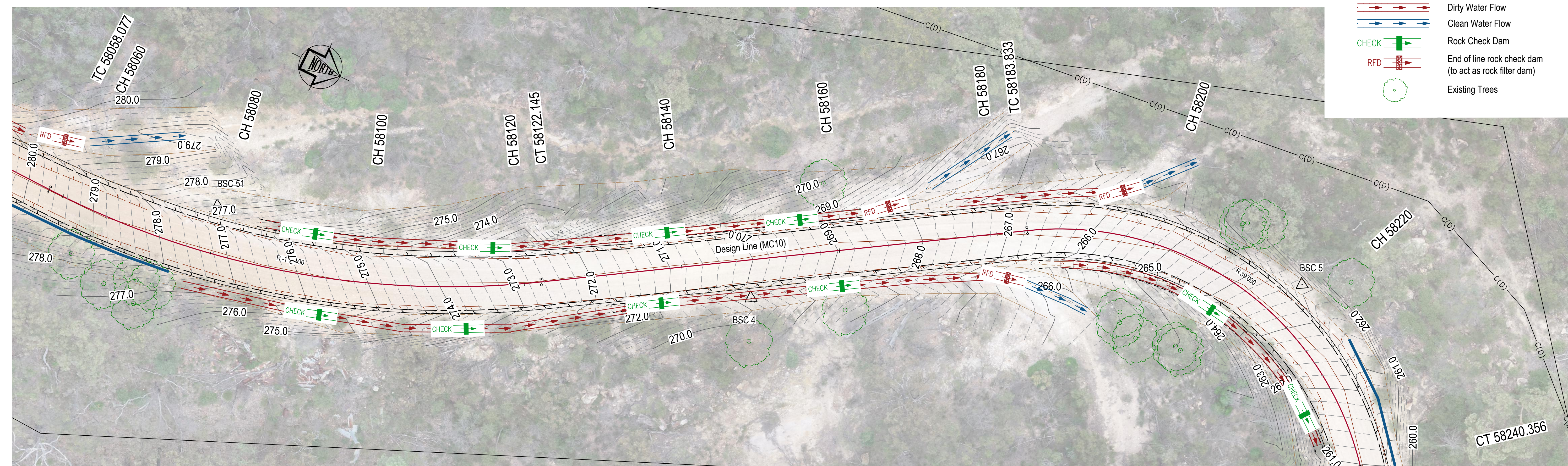
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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION LIMIT OF CLEARING PLAN SHEET 2				Job No.	CRC00269
				Drawing No.	1601
Drawn B Doherty	ENGINEERING CERTIFICATION (RPEQ)				Revision A
	ENG. AREA Civil	NAME T Penrose	SIGNATURE 	NO. 24807	DATE June 2023
Designed B Doherty					Series No. 25 of 28



PLAN



PLAN

Joins Drq. No. CRC00269/1701

[illegible]



LEGEND

- Diversion Bank
- (SF) Silt Fence
- Geo Log
- Dirty Water Flow
- Clean Water Flow
- Rock Check Dam
- End of line rock check dam (to act as rock filter dam)
- Existing Trees

PLAN

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Scales

Scale A 1:250

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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION TEMPORARY EROSION AND SEDIMENT CONTROL SHEET 2				
Drawn B Doherty	ENGINEERING CERTIFICATION (RPEQ)			
	ENG. AREA Civil	NAME P Meredith	SIGNATURE	NO. 15268
Designed T Penrose				DATE June 2023

Job No.	CRC00269
Drawing No.	1701
Revision	A
Series No.	27 of 28

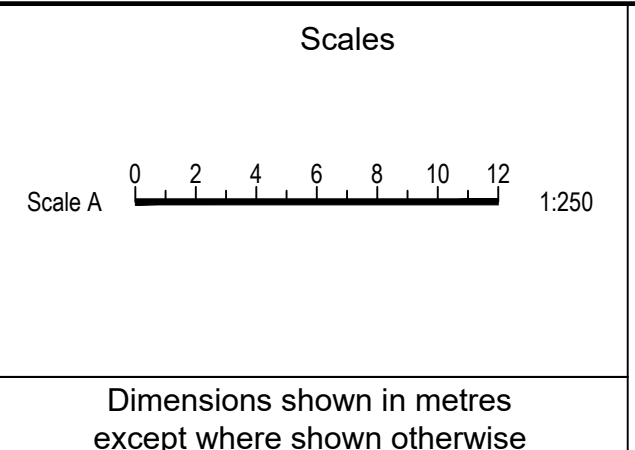
Joins Drg. No. CRC00269/1702



LEGEND

- Diversion Bank
- Silt Fence (SF)
- Geo Log
- Dirty Water Flow
- Clean Water Flow
- Rock Check Dam
- End of line rock check dam (to act as rock filter dam)
- Existing Trees

PLAN



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Client

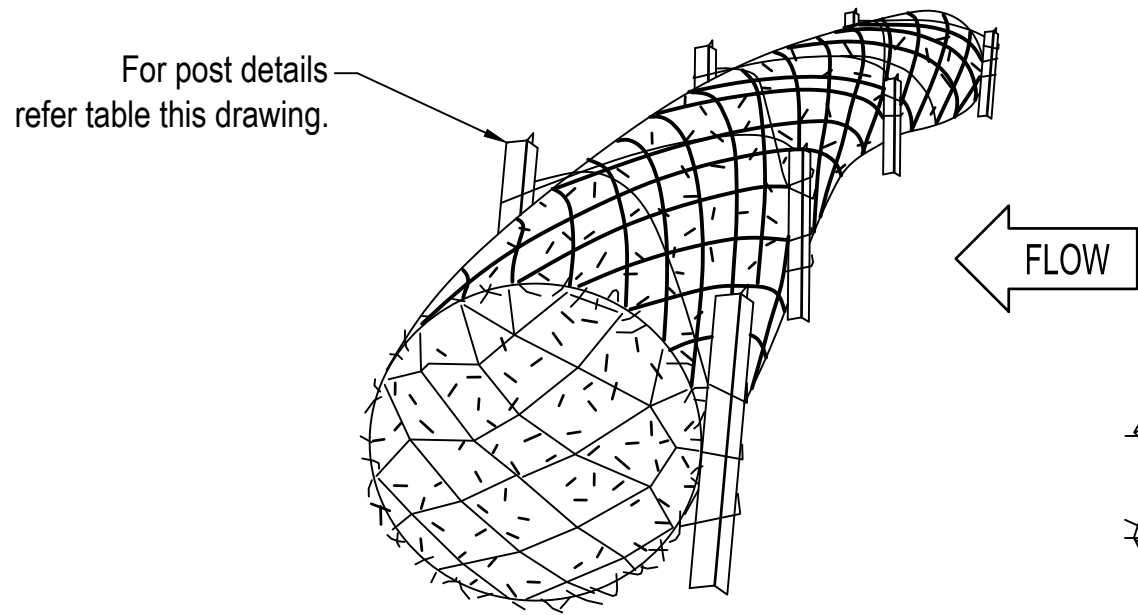
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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION TEMPORARY EROSION AND SEDIMENT CONTROL SHEET 3					Job No.	CRC00269
Drawn B Doherty					Drawing No.	1702
Designed T Penrose					Revision	A
ENGINEERING CERTIFICATION (RPEQ)					Series No.	28 of 28
ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Civil	P Meredith		15268	June 2023		

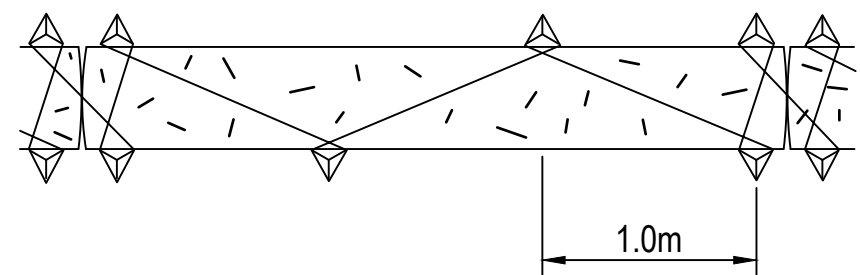
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TYPICAL ANCHORAGE OF GEO LOG

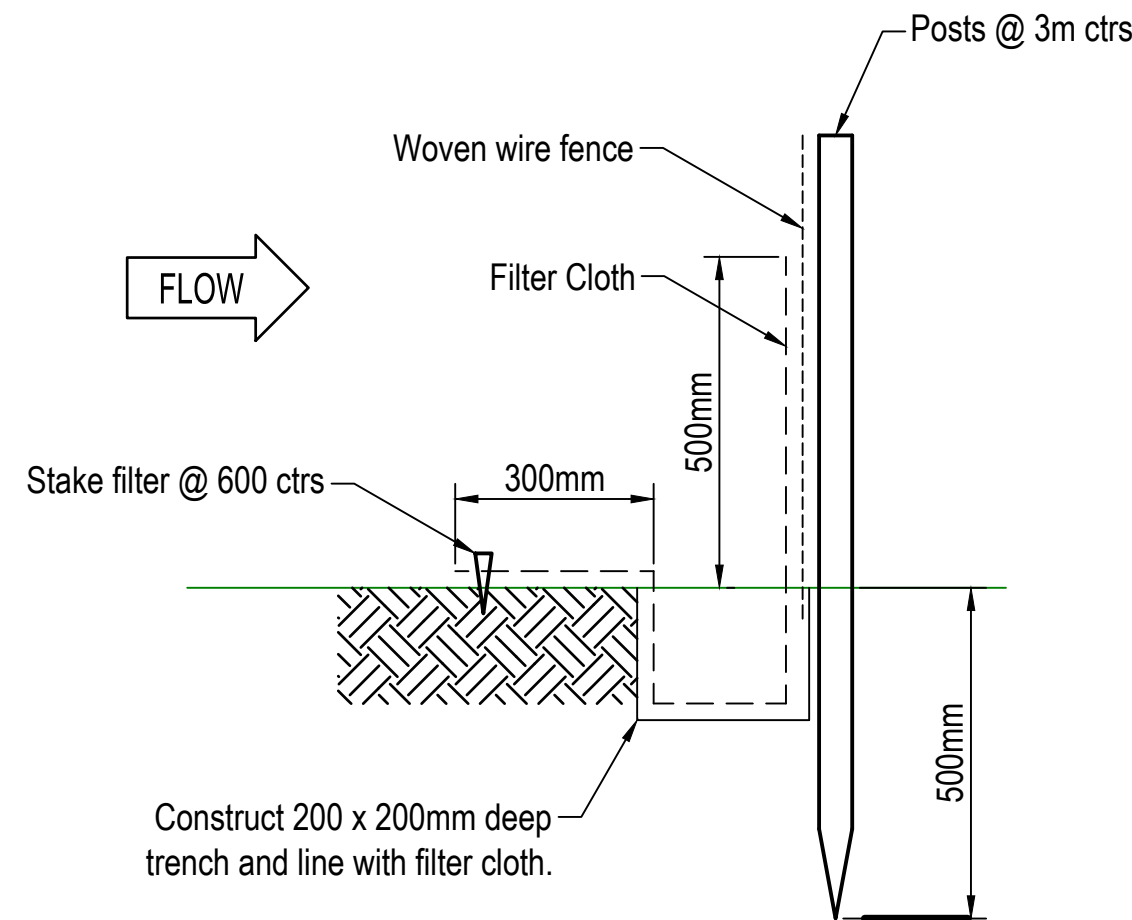
Geo Log to be installed in accordance with IECA
Sediment and Erosion Control Design Fact
Sheets - Instream Practices



PLAN GEO-LOG STAKING METHOD

MATERIALS

MATERIAL	TYPE
Posts (either)	1.5kg/m (min) Steel Star Picket or 1500mm ² (min) Hardwood or 2500mm ² (min) Softwood
Fence	Woven wire 14 gauge 150mm max aperture Filter as specified
Filter Cloth	(terram 100, polyfelt ts500, Bidim u24 or equivalent)
Prefabricated Unit	Geofab, envirofence or approved equivalent



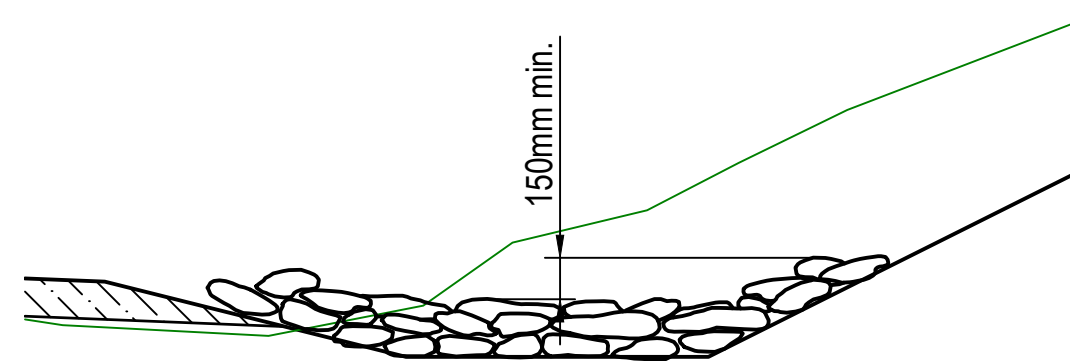
SILT FENCE N.T.S.

Erection Notes

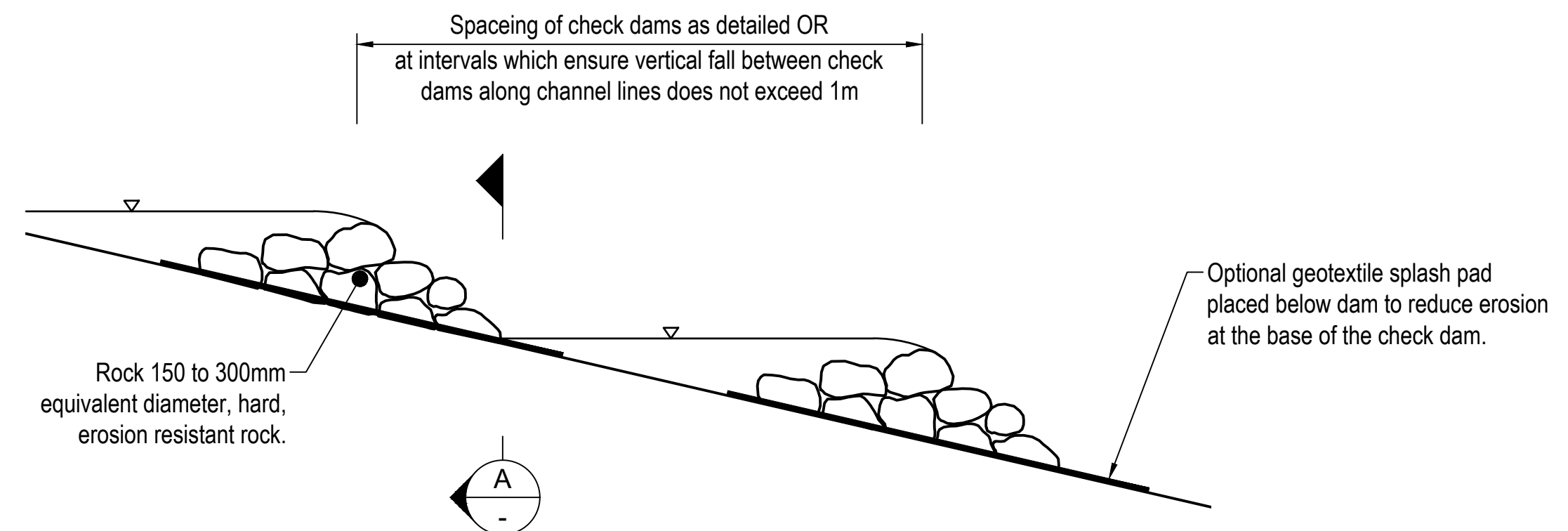
Woven fence to be fastened securely to fence posts with wire ties or staples. Filter cloth to be fastened securely to woven wire fence with tees spaced every 600mm at top of mid section. When two sections of filter cloth adjoin each other they shall be overlapped by 150mm and folded and material removed when bulging of fence occurs.

LEGEND

	Diversion Bank
	Silt Fence
	Geo Log
	Dirty Water Flow
	Clean Water Flow
	Rock Check Dam
	End of line rock check dam (to act as rock filter dam)
	Existing Trees



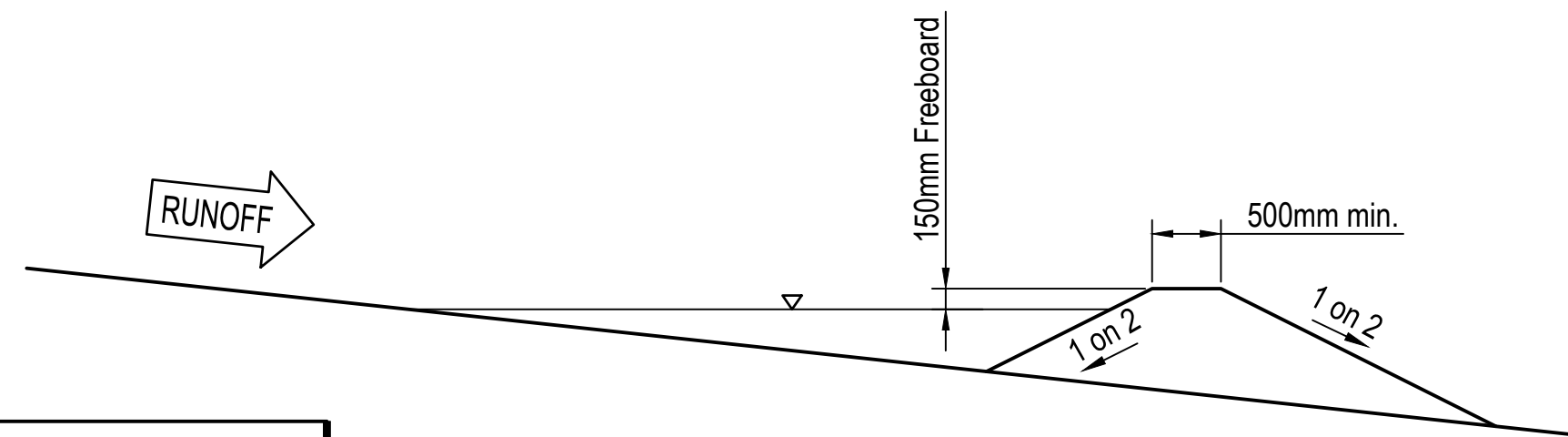
SECTION A



ROCK CHECK DAM

Notes

- Design and construction of all sediment management devices is the contractors responsibility and shall be completed and effective prior to:
 - Stripping of topsoil and grass.
 - Bulk earthworks to the site.
 - Service installations.
- All sediment management devices are to remain in place until notice from the Contract Administrator
- Both temporary and permanent sediment management devices shall be maintained at a suitable level/condition throughout construction. Sediment fences are to be cleaned out when capacity is reduced by 30%.
- If erosion and sediment control devices have been found to be deficient or failed in service, due to unforeseen circumstances, corrective action is to be undertaken immediately which may include amendments/additions to the original approved erosion control plans. such additions or amendments are to be approved by the Contract Administrator.
- All erosion and sediment control devices are to be inspected at least weekly, before and after rainfall events. Any damage or excess erosion/sediment is to be repaired/managed as required to maintain control devices.
- Devices shown on the drawings shall not necessarily be limited to the locations shown. Additional devices may be required as directed by Contract Administrator.
- Rock check dams to be installed per detail this drawing in drainage channels with slopes greater than 2%. Spacing of check dams to be at every 1.0m vertical drop in drainage channel.
- Contract Administrator to order installation of topsoil and grass seeding to disturbed areas.
- The contractor shall ensure all turfed and/or seeded areas are regularly watered to ensure vegetation is maintained until there is 80% coverage.
- Stockpiles shall be protected from erosion and sediment loss by:
 - The installation of diversion works on the upstream side.
 - The use of silt fences or other approved controls on the downstream side.
 - Compaction.
 - Re-vegetation if left exposed for longer than 30 days



A minimum freeboard of 300mm is recommended for non-vegetated earth embankments.

DIVERSION BANK

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SHIRE OF OPPORTUNITY
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Title CRACOW ROAD UPGRADE (Ch. 57877m - 58640m) DOWNFALL CREEK FLOODWAY AND RANGE SECTION TEMPORARY EROSION AND SEDIMENT CONTROL SHEET 4					Job No.	CRC00269
Drawn B Doherty					Drawing No.	1703
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Designed T Penrose					Series No.	29 of 28
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Cracow Road

Safety in Design

Client: Banana Shire Council

16/02/2023

Document Control

Document History

Date	Version	Name	Position	Action (Review/endorse/approve)
17/02/2023	0.1	Bryan Doherty	Senior Designer (Civil)	Draft for internal review

Certification

Date	Name	Position	Signature
16/02/2023	B. Doherty	Senior Designer	
16/02/2023	T. Penrose	RPEQ	

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1. Purpose of this Document

The purpose of this document is to identify and control project specific risks, where possible, in the civil design phase to ensure the safety of constructors, maintenance providers and end users. All risks identified as part of the design are documented in this report and provided for appropriate risk management in future phases. Risks unable to be closed out in the design phase are documented in the report and communicated to the Client, for action in the construction and or later phases. This document has been produced to provide support to the design undertaken for Cracow Road, Downfall Creek Floodway and Range upgrade.

2. Project Scope and Objectives

Scope of works for this project include,

- Pavement widening and overlay
- Geometric improvements
- Floodway reconstruction
- Signage and road edge guideposts.
- Removal of large trees

3. Safe Design

Safe design begins from the outset or planning phase of a project and is further refined in the concept and development phases. Safe design covers the:

- Design of a project or a component of a project and its intended purpose or future use
- Materials being used
- Possible methods of construction, maintenance, and operation of the product, and
- Legislation, codes of practice and standards that need to be complied with.

Safe design is a collaborative effort between all parties involved throughout the lifecycle of the project and where possible should eliminate or minimize the risk of project lifecycle occupational health and safety hazards as early as practical. It also encompasses the management and documentation of remaining risks so all parties involved can understand and be aware of all risks identified in the design phase of the project lifecycle.

Safe design consists of a balance between cost, functionality, and aesthetics; without compromise to the health and safety of those who will construct, use, and maintain the product and community expectations. While not all risks can be eliminated or it be cost effective to remove all risks, Safe Design principles in the planning phase should aim to:

- Prevent injury and disease
- Improve useability of products, systems, and facilities
- Improve productivity in all phases
- Reduce operation costs
- Better predict and manage production and operational costs over the lifecycle of a product
- Comply with legislation, and
- Incorporate innovative design which fosters safer design practices and demands new thinking.

4. Duty of Care/Disclaimer

This document is not intended to be a standalone document, it should be read in conjunction with the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011*. The Act and Regulation applies to all phases of a project lifecycle from concept, through design, construction, maintenance, and decommissioning and provides that all risks to health and safety be eliminated, so far as is practical or minimised so far as is reasonably practical where they cannot be eliminated. To properly manage exposure to a risk, a person must:

- Identify hazards
- Assess risks that may result because of the hazards
- Identify appropriate control measures to eliminate or minimise the level of risk
- Implement control measures, and
- Monitor and review the effectiveness of control measures.

To comply with the above, assumptions are made during the assessment as to what construction and maintenance practices may be adopted which may differ from actual methods adopted by those undertaking the works. Use of this document does not remove any obligation of any party involved, either during or after this document is published. A duty of care applies to all parties during subsequent phases and it is incumbent on those involved to further assess risks and hazards include:

- the client
- project managers
- constructor
- maintenance personnel
- users
- visitors
- demolishers, and
- disposers.

Further Safety advice, hazard identification, risk assessment or control measures may indicate other risks associated with the project that have not been identified in the document. Reference is made to the principle of what is considered 'reasonably practical' regarding the extent of Safe Design achievable by the designers.

Use of this document does not remove the obligation of the client, constructor end user or other parties during the lifecycle of the project.

Any party who has read this document and disagrees with the assessment or requires clarification of an item should contact the Project Designer at their earliest opportunity.

5. Risk Management

Table 1 – Methods of controlling risk in order of preference

Method	
Elimination	Remove the risk by modifying the design
Substitution	Remove or reduce the risk by modifying the design
Isolation	Physically separate the hazard
Engineered Control	Using <i>Design Safety</i> measure to reduce risks
Administration	Using formal process to reduce the risk
PPE	Ensure appropriate Personal Protective Equipment is used or worn.

The Risk Assessment Matrix is intended to assist our designers in:

- Fulfilling their obligations under the Work Health and Safety Act 2011.
- Achieving safe, economical and efficient constructions for our clients.
- Consulting and communicating with all parties involved in a project (designers, client, end-users, constructors etc.) to establish the hazards and risks identified during the design phase associated with the construction, operation, maintenance and decommissioning of a project.
- Consulting and communicating with all parties involved in a project on the controls that have or are required to mitigate these risks. This is not an exhaustive list and all parties should therefore undertake a thorough review of this document to satisfy themselves that it accurately reflects the intended purpose.
- Consulting and communicating to all parties the controls adopted to mitigate these risks and any residual risks that are considered present during construction, operation, maintenance and decommission that may need continual monitoring to achieve a safe working environment.

6. Appendix A – Safe Design Risk Register

Safety in Design Register													
Cracow Road, Downfall Creek Floodway and Range Upgrade													
Hazards							Controls				Action		
No.	Project Phase	Risk Description	Consequence Description	Raw Risk (no controls)			Mitigation Strategy / Control Measures	Residual Risk		Risk Rating	Responsibility	By When	Comments / Notes
				Likelihood	Consequence	Risk Rating		Likelihood	Consequence				
				1. Very Unlikely 2. Unlikely 3. Possible 4. Likely 5. Almost Certain	A. Minor B. Major C. Severe D. Critical E. Catastrophic			1. Very Unlikely 2. Unlikely 3. Possible 4. Likely 5. Almost Certain	A. Minor B. Major C. Severe D. Critical E. Catastrophic				
1	Pre-Design	Insufficient/inaccurate data collection. (e.g. GIS, Traffic Data, LIDAR, Aerial photography)	Risk results in inadequate or substandard design that could lead to potential safety risk to travelling public, Constructors and maintenance workers.	4	D	Significant	Project is adequately scoped, discussed and documented during pre-detailed design phases to ensure data collection is appropriate. Detailed survey has been supplied for this project	1	C	Low	Designer/ Principal	Detailed Design	Residual risk with Principal
2	Pre-Design	Poor Scoping/Client brief on project requirements.	Risk results in inadequate design that could lead to potential safety risk. EDD, design exceptions, funding constraints.	4	D	Significant	Risks identified and accepted by Client. Mitigating treatments incorporated into design to the available funding.	2	B	Negligible	Designer/ Principal	Detailed Design	Residual risk with Principal Client decisions recorded within Design Decision Register.
1	Design	Errors and omissions in design.	Errors/omissions in design resulting in inadequate or substandard design that could lead to potential safety risk to travelling public. Constructor, maintenance – workers	3	E	Extreme	Design has been carried out in accordance with quality management procedures to avoid potential for errors in design. Design has been carried out in accordance with Australian Standards and quality management procedures in line with scope and deliverables to avoid potential for errors in design.	1	D	Moderate	Designer/ Principal	Detailed Design	Residual risk with Principal
2	Design	Design methodology poorly considers construction practices leading to potential safety risks for both construction workplace and the travelling public.	E.g. Traffic management, working near overhead power lines, lifting, trenching, site access, materials storage and handling (Asbestos identified within site), working close to travelling public due to corridor restrictions.	4	E	Extreme	Design incorporates learnings from previous projects and include recommendations from industry experts on appropriate site treatments in the design.	2	C	Low	Designer/ Principal	Detailed Design	Residual Risk transferred to Contractor.
3	Design	Project exceeds budget	Identified safety issues will not be addressed leading to an unsafe environment for the travelling public.	3	D	Significant	NBRC to prepare contingency plans to reduce project cost to within budget constraints.	2	D	Moderate	NBRC	Detailed Design	Residual risk with Principal
4	Design	Hazards in designated clear zones and road corridor.	Poor Scoping of project requirements resulting in inadequate design that could lead to potential safety risk to travelling public, constructor, maintenance. Impact of errant vehicle resulting in injury or death.	3	E	Extreme	Risks identified and accepted by NBRC. Mitigating treatments have been incorporated into the design. Hazard Treatment Evaluation undertaken in accordance with Austroads and the information available at the time of detailed design.	2	D	Moderate	Designer/ Principal	Detailed Design	Residual risk with Principal
5	Design	Inadequate treatment of private entrance or turnout design.	This could lead to potential safety risk to travelling public. SISD, ASD, angles, vertical clearance, appropriate layout, design vehicle.	3	D	Significant	Private entrances and turnouts to be designed in accordance with NBRC standard drawing and incorporating validated road function, traffic volumes and usage. Key stakeholder consultation, EDD/Design Exceptions.	1	D	Moderate	Designer/ Principal	Detailed Design	Residual Risk with Principal
6	Design	Services not identified during design.	This could lead to the potential safety risk of constructors and/or closure of key services to the general public.	4	D	Significant	• Contact DBYD and other relevant authorities to identify existing services (DBYD received 17/02/23). • Designers have noted known services on drawings. • Carry out field inspection to confirm and identify any potential service related issues e.g. potholing and locating activities. • Contractor to complete service locations to verify existing infrastructure.	2	D	Moderate	Designer/ Principal	Detailed Design	Residual Risk with Principal and Contractor
1	Construction	Drainage during construction	Poor drainage during construction affecting pavements/traffic/etc	3	B	Low	Maintain flow paths during construction where practical. Make pumping equipment available if required.	2	A	Negligible	Contractor	Construction	Residual risk with Principal and contractor
2	Construction	Exposure to asbestos	Existing abandoned conduits/pits/culverts may be present which could be exposed during construction.	3	D	Significant	Details of existing services/culverts where known have been provided. Contractor to undertake appropriate investigations as required.	1	D	Moderate	Contractor	Construction	Residual risk with Principal and Contractor It is unknown if any asbestos infrastructure is located within the project limit.
3	Construction	Deep excavation of trenches	Trench collapse injuries	2	E	Significant	Depth of culverts to be minimised where possible. Contractor to employ appropriate temporary work measures.	1	E	Moderate	Contractor	Construction	Residual risk with Principal and contractor
4	Construction	Design changes made by Contractor or Administrator following design completion	Design changes do not meet safety requirements.	3	C	Moderate	Contractor / Administrator to advise the Designer or any proposed design changes. Follow RFI process.	1	C	Low	NBRC	Construction	Residual risk with Principal and contractor
5	Construction	Working in vicinity of High Voltage Ergon power lines, both overhead and underground.	Death or serious injury	2	E	Significant	Contractor to identify all services and have construction procedures for working near HV services.	2	E	Significant	Contractor	Construction	Constructors shall conduct their own DBYD and verify all utilities on site prior to commencing any roadworks.
6	Construction	The risk of traffic not being managed adequately.	Traffic chaos, delays and accidents caused by lack of controls.	4	E	Extreme	Designer has nominated traffic volumes in design documentation. It is noted that the traffic volumes are low. Contractor to engage a suitably qualified traffic manager to implement traffic management controls considering road function; traffic volumes; constructability and road users.	2	E	Significant	Contractor	Construction	Residual Risk with Principal and Contractor
7	Construction	Working on top of high and steep embankments	Injury due to personnel fall or overturning construction plant	5	E	Extreme	Consider construction methodology prior to implementation.	4	D	Significant	Contractor	Construction	Residual risk with Principal and contractor
8	Construction	Lighting levels during construction.	Inadequate lighting of conflict points during construction resulting in confusion/collisions	3	B	Low	Temporary standalone LED lighting, if required.	2	B	Negligible	NBRC	Construction	Residual risk with Principal and contractor
9	Construction	Disruption / damage to existing services	Constructors may damage existing services during construction. Service may/may not have been shown on design plans.	3	D	Significant	Constructors to conduct dial before you dig and no work shall be carried out over utility or within 3m of services without prior notification to the appropriate service authorities. Contractor to complete service locations to verify existing infrastructure. Appropriate demarcations and planning by contractor to highlight any locations where work activities are undertaking in the vicinity of existing services.	2	D	Moderate	Contractor	Construction	Constructors shall conduct their own DBYD and verify all utilities on site prior to commencing any roadworks or excavations.
10	Construction	Unexpected weather events resulting in potential injury to construction personnel and/or travelling public	Sudden weather events resulting in the need to evacuate the site.	3	D	Significant	Constructor to consider location, likely duration and characteristics of project to determine likelihood of event and consider project specific mitigation strategies via risk management.	3	C	Moderate	Contractor	Construction	Residual Risk with Principal and Contractor
11	Construction	Unearthing unexpected soil types e.g. acid sulphate soil, sodic soils or contaminated soil from rail reserves. resulting in potential safety risk to construction personnel and general public.	This results in potential safety risk to construction personnel and general public.	3	D	Significant	• Design to consider location and likelihood of encountering specific soil type. • Site inspection and/or geotechnical investigation to confirm presence of soils requiring specific treatment. • Include comments in “notes to contract administrators” advising of potential for presence of hazardous materials. • Experienced construction staff that can recognise potential hazards	3	C	Moderate	Contractor	Construction	Residual Risk with Principal and Contractor
12	Construction	Incorrect or unsuitable surface treatment either temporary or permanent resulting in potential safety risk to the travelling public. e.g. line marking removal, appropriate seal design	This results in potential safety risk to construction personnel and general public.	3	E	Extreme	Constructor to consider road function, traffic volumes, location and seasonal conditions to propose suitable surface treatment.	2	E	Significant	Contractor	Construction	Residual Risk with Principal and Contractor
1	Maintenance	Final product leads to potential safety issues with maintenance activities.	Personel cannot undertake maintainance activities safely due to the proposed design.	3	C	Moderate	Design to consider maintenance requirements including provision of safe environment to facilitate maintenance activities including safe ingress and egress and clear work area. E.g. batter slopes, under bridge inspections, gardens in medium strips, allowance for access tracks etc.	1	E	Moderate	Balonne Shire Council	Ongoing	Residual risk with Principal
2	Maintenance	Inadequate as constructed information.	Existing conditions not accurately reflected.	4	E	Extreme	Adequate handover to maintenance provider.	1	D	Moderate	Balonne Shire Council	Ongoing	Residual risk with Principal
1	Finalisation	Applying all the appropriate standards.	This could result in an unsafe design.	2	E	Significant	Conduct a road safety audit and action any outstanding issues.	1	D	Moderate	Designer	Ongoing	Residual risk with Principal

