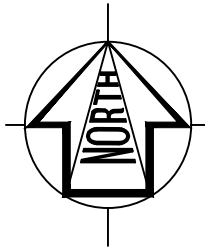
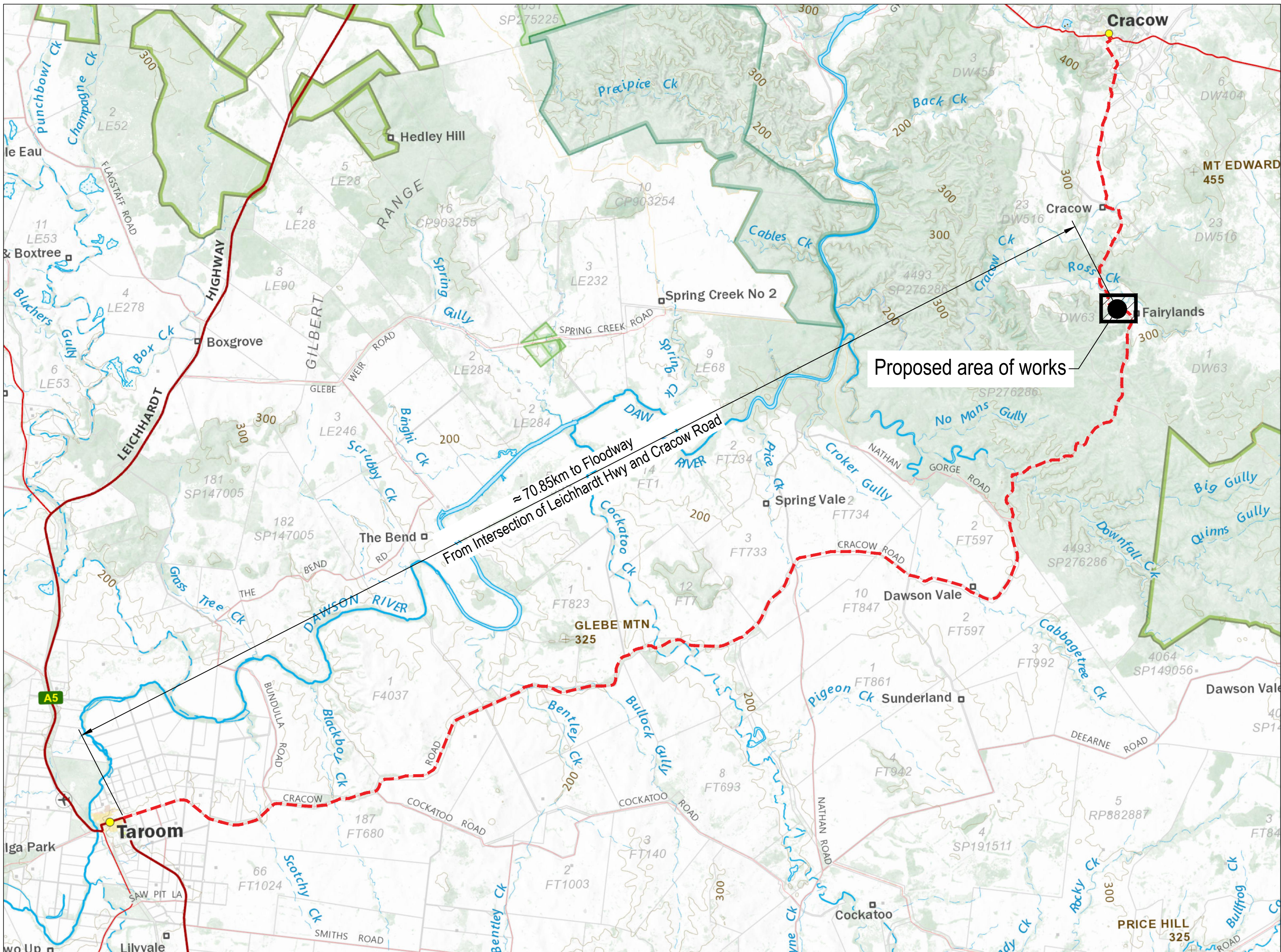


CRACOW ROAD, SITE 5, CHRISTMAS CREEK FLOODWAY

ROAD AND FLOODWAY UPGRADE



LOCALITY PLAN
(Not to scale)

DRAWING INDEX

Drawing Number	Date	Drawing Description
001	Oct-23	Project Cover Sheet
002	Oct-23	General Notes
300	Oct-23	Survey Control and Services Plan
400	Oct-23	Roadworks and Setout Plan Sheet 1
500	Oct-23	Pavement Plan
600	Oct-23	Longitudinal Section Sheet 1
700	Oct-23	Typical Cross Sections sheet 1
800	Oct-23	Annotated Cross Sections Sheet 1

DRAWING INDEX

Drawing Number	Date	Drawing Description
801	Oct-23	Annotated Cross Sections Sheet 2
802	Oct-23	Annotated Cross Sections Sheet 3
803	Oct-23	Annotated Cross Sections Sheet 4
1000	Oct-23	Supplementary Signs and Linemarking Details
1200	Oct-23	Floodway Details
1600	Oct-23	Limit of Clearing Plan
1700	Oct-23	Temporary Erosion and Sediment Control Sheet 1
1701	Oct-23	Temporary Erosion and Sediment Control Sheet 2

STANDARD DRAWINGS:	
ROADWORKS	
Dwg.	Rev. Description
CMDG-R-081	E Signs 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	
GENERAL EARTHWORKS AND PROPERTY ACCESS	
1178	E Diversion of Water from Roadway and Table Drains

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Title						Job No.	CRC00289
CRACOW ROAD UPGRADE (Ch. 70740m - 71055m)						Drawing No.	001
SITE 5 - CHRISTMAS CREEK FLOODWAY						Revision	A
PROJECT COVER SHEET						Series No.	1 of 16
Drawn	ENGINEERING CERTIFICATION (RPEQ)						
	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
S Lugo Munoz	Civil	T Penrose		24087	26/10/23		
Designed							
B Doherty							



SAFETY IN DESIGN NOTES:

1. Potential safety hazards identified by the Designer have been assessed for this project in accordance with Safe Design of Structures - Code of Practices by Safe Work Australia, 2012. Refer to the ***Safety In Design Report*** for the potential safety hazards.
2. Disclaimer: It must be acknowledged that new and/or different risks may become apparent during each project phase. The designer has ensured, so far as reasonably practicable, that the structure/municipal work is designed to minimise risk to the health and safety of persons involved in construction or use related activities. Further, in Appendix A - Safety in Design Risk Register of the ***Safety In Design Report***, assumptions may have been made within the different project phases as to how the project and/or project elements will be constructed and maintained. This may differ from the end methods adopted.
3. Any person who undertakes alterations, variations or modifications to these design drawings, without consultation and approval from the original or subsequent designer, will assume the duties of a designer and will be held responsible for the safety in design for this project.
4. All works must comply with W.H. & S. Act, 2011.

GENERAL NOTES:

1. Works shall be undertaken generally in accordance with the relevant CMDG construction specifications except where specific DTMR specification requirements are detailed within these Project specific Drawings. The most current version shall be adopted, unless noted otherwise.
2. Works to be measured in accordance with project specific *Supplementary Specification for Measurement and Work Operations for Work Items*.
3. If any archaeological or cultural material is exposed on the work site all works shall cease. The D.E.H.P., Aboriginal Land Council and I.C.C. are to be notified.
4. All works are to comply with the requirements of the Environmental Protection Act, 1994.
5. Disposal/movement of material in areas of Red Imported Fire Ants are to comply with the D.A.F.F. regulations. Refer the Department's website: www.daff.qld.gov.au/fireants for the current information.
6. Prior to commencement of work a Risk Management Plan to minimise the chance of spreading Fire Ants is to be completed.
7. The positions shown on drawings for public utilities services are based on the B.Y.D.A. information supplied at time of design and are indicative only. Prior to construction the current Service Authority information is to be obtained from B.Y.D.A. (website: www.byda.com.au). The position and depth of each service is to be verified by the relevant Service Authority on site before the start of any construction.
8. Where these drawings make reference to the Administrator or Contract Administrator it shall mean the Superintendent managing the works.
9. Prior to commencement of work contact the Superintendent if any PSM's are in the vicinity of the work site.
10. **Order of Precedence of Documents, Ambiguities or Discrepancies** - The following order of precedence shall apply where there is any ambiguity, discrepancy or inconsistency between the design documents comprising the Contract, with the higher in the list having a higher priority:
 - a. These Project Specific Drawings
 - b. Technical Specifications
 - c. Standard Drawings

The several documents forming the Contract are to be taken as mutually explanatory of one another. If either party discovers any ambiguity or discrepancy in any document prepared for the purpose of executing the Work Under the Contract, that party shall notify the Superintendent in writing of the ambiguity or discrepancy as soon as possible. The Scheme Drawings listed on the Project Cover Sheet are to be read as a whole and not in isolation. Any isolated drawing separated from the control set will be considered voided and is not to be used.

All drawings are to be read in conjunction with the project's specification and all relevant Standard Drawings.

All drawings are to be read in conjunction with the Abbreviation Table shown.

Materials and workmanship - Where materials, material components, workmanship and procedures are not specifically described by the Contract, they shall be in accordance with the relevant Australian Standard. Where no Australian Standard is available, other specifications shall be used in the following order of priority:

- a. manufacturer's recommendations, and
 - b. accepted industry standards.
- At a minimum materials and workmanship shall be the best of their respective kinds and fit for the purpose for which they are intended.
- Any product trade names have been used to establish a quality requirement. Written approval to be obtained prior to using any substitutions.
15. Dimensions / Levels - All levels and setout points shall be confirmed on site by a registered surveyor prior to construction. The Contractor shall seek clarification from the Superintendent for any discrepancy prior to proceeding with works. Dimensions shall not be scaled from drawings.
 16. Set Out of Individual Installations - The Contractor shall set out an installation as shown on the Drawings in sufficient detail to identify the location, length and levels of the proposed installation. Once the initial set out is complete the Superintendent will determine the design appropriateness of the set out with regard to the actual site conditions. The Superintendent may direct amendments to the set-out details. Payment for such amendments will be made at appropriate rates in the Schedule of Rates or, where such rates are not deemed by the Superintendent to be appropriate, as determined by the Superintendent. Installations to be set out in accordance with the above requirements include:
 - a. drainage pipes, culverts, slabs and structures
 - b. landscaping
 - c. traffic control
 17. Existing Services - Locate service prior to commencing works. Services are shown on these drawings for information only. No responsibility is taken for the accuracy or completeness of the information supplied. Take care to protect services from damage, and report any hits or damage to the service authority immediately.

EROSION AND SEDIMENT CONTROL NOTES:

1. During construction all necessary precautions shall be taken to control erosion and downstream sedimentation. Monitor the prevailing weather conditions and protect any downstream construction and gully inlets.
2. All sediment control devices, sediment fences, check dams, straw bales, stone traps and entry/exit sediment traps are to be in accordance with the E&SC plans within these project drawings or amended as required by the Contractor's suitably qualified professional.

EARTHWORK NOTES:

1. All unsuitable material is to be stripped prior to placement of structural fill.
2. All unsuitable material is to be removed in accordance with the specification or as directed by the Superintendent.
3. All contaminated soil to be removed in accordance with the specification or as directed by the Superintendent.
4. Earthwork quantities include existing road pavement excavated where applicable.
5. Earthwork quantities include unsuitable and or contaminated material except where noted otherwise.
6. Earthwork quantities in cut are bank (nett) volumes and in fill are compacted volumes.
7. Class A1 or B material to comply with the requirements of TMR MRTS04, and specific requirements within these project drawings.

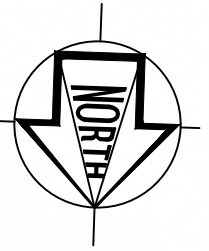
LINEMARKING NOTES:

1. All linemarking, signs and traffic devices shall comply with the M.U.T.C.D. - current edition.
2. Ensure that signage has clear sight distance, otherwise adjust location accordingly.
3. Superseded linemarking and signage to be removed.

SERVICE ADJUSTMENT NOTES:

1. Service Authority infrastructure adjustments are to be performed by contractors approved by the relevant service authority.

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PLAN
Scale: 1:500

LEGEND

403 (C) - Survey Mark and Label

ENGINEERING SURVEY CONTROL

STATION	EASTING	NORTHING	LEVEL	REMARKS
501	229138.309	7185809.162	285.133	PBMK
502	229016.276	7185875.236	280.874	PBMK
503	228928.204	7185867.787	284.292	PBMK
504	228775.311	7185912.439	288.972	PBMK

PERMANENT SURVEY MARKS

PSM	EASTING	NORTHING	LEVEL	LOCATION
PM153060	229326.704	7183818.420	311.390	PPMK - Approx. 3.78 km South

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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Scale A 0 5 10 15 20 25 1:500

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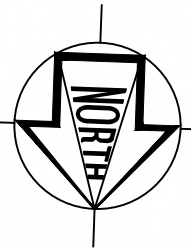
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SHIRE**
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Title CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY SURVEY CONTROL AND SERVICES PLAN					Job No.	CRC00289
Drawn S Lugo Munoz					Drawing No.	300
Designed B Doherty					Revision	A
ENGINEERING CERTIFICATION (RPEQ)					Series No.	3 of 16
ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Civil	T Penrose		24087	26/10/23		



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PLAN
Scale: 1:500

LEGEND

- New pavement to be constructed. Refer Pavement Type 1 Details.
- New pavement to be constructed. Refer Pavement Type 2 Details.
- New concrete floodway to be constructed. Refer Standard Drawing CMDG-R-094

PAVEMENT TYPE 1 DETAILS

- New pavement to be constructed
200mm Overlay, Full width,
Imported Unsealed Pavement Material **
Design Subgrade CBR 3 (soaked)
200mm Total thickness

PAVEMENT TYPE 2 DETAILS

- New pavement to be constructed
(Ch. 70796.000 - 70836.000m & Ch. 70864.000 - 70924.000m)
200mm Stabilised Base, Full Width,
Imported Unsealed Pavement Material **
Insitu stabilised, GB binder (Cement/Fly Ash)
Target UCS value 1 - 2 MPa at 7 Days. Contractor to
undertake additive testing to confirm percentage of stabilising agent
by mass. A nominal 3% by mass used for estimating purposes only.
Design Subgrade CBR 3 (soaked)
200mm Total thickness

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: 3 (Soaked)

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

Imported Unsealed Pavement Material to satisfy
the following specifications

Grading Coefficient (Gc): 16 - 34
Shrinkage Product (Sp): 100 - 240
WPI: < 1200
PI: > 7%
Passing 0.075mm Sieve: ≥ 15%

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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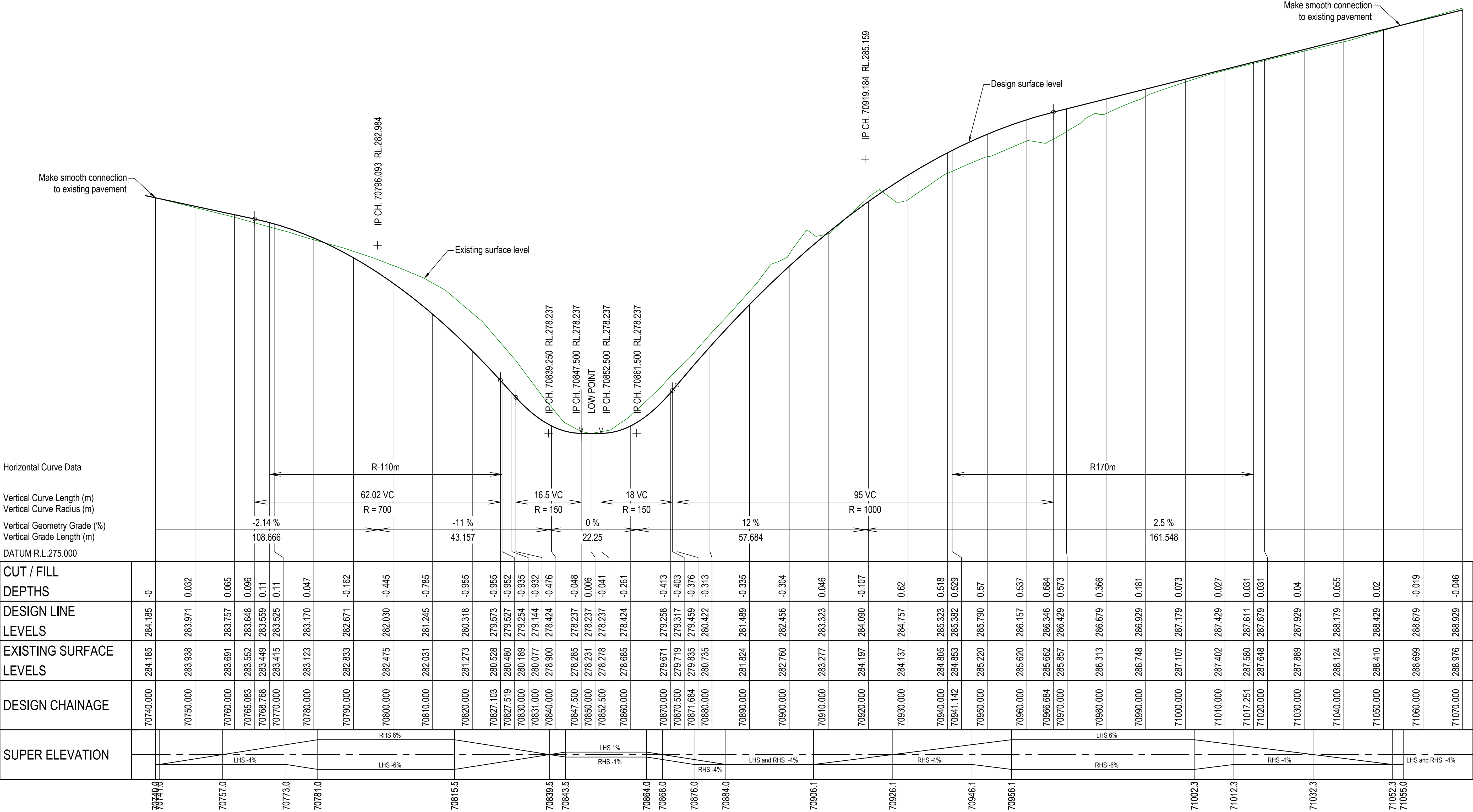
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Title CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY PAVEMENT PLAN					Job No.	CRC00289	
					Drawing No.	500	
Drawn	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
S Lugo Munoz	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Designed	Civil	T Penrose		24087	26/10/23	Series No.	5 of 16
	B Doherty						

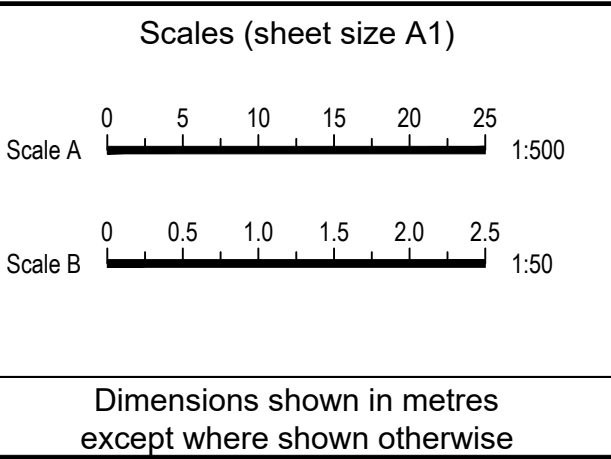
WARNING!
BEWARE OF UNDERGROUND SERVICES
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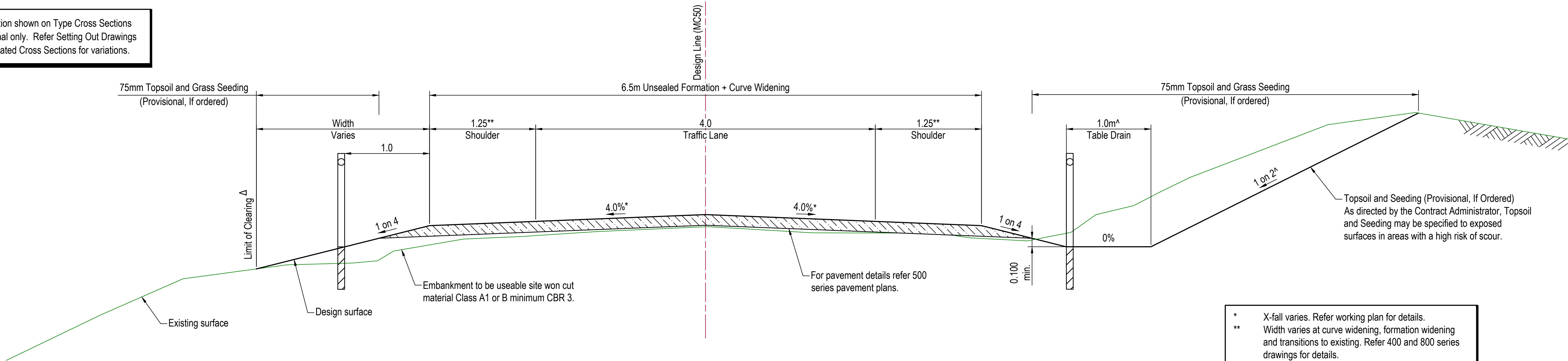
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Title CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY LONGITUDINAL SECTION						Job No.	CRC00289
						Drawing No.	600
Drawn S Lugo Munoz	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Designed B Doherty	Civil	T Penrose		24087	26/10/23	Series No.	6 of 16

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.



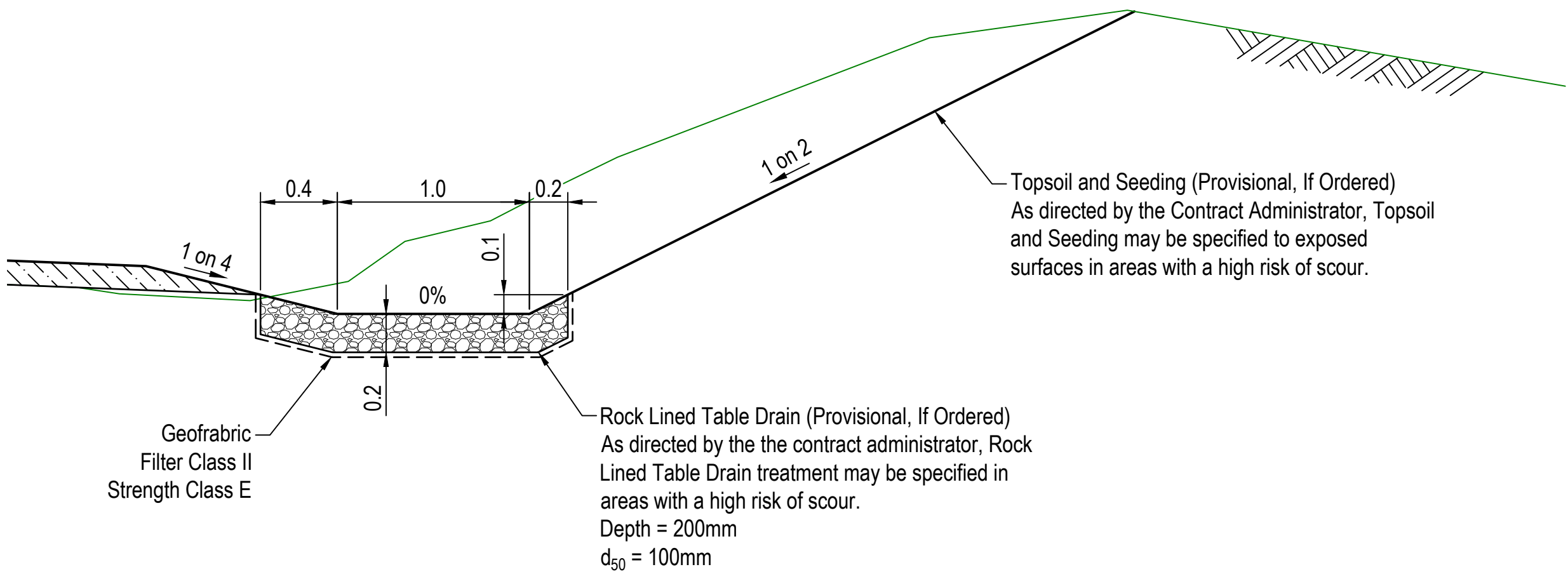
Information shown on Type Cross Sections is nominal only. Refer Setting Out Drawings & Annotated Cross Sections for variations.



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

TYPICAL CROSS SECTION A

Ch. START - END (MC50)
(Excluding Floodway)
Not to Scale



ROCK LINED TABLE DRAIN

Not to Scale

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Scales (sheet size A1)
Dimensions shown in metres except where shown otherwise


quality people client focused solution driven

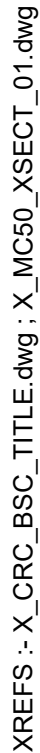
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ABN 73 617 924 437 Ph: 0477 322 555

Client

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Title CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY TYPICAL CROSS SECTIONS						Job No.	CRC00289
						Drawing No.	700
Drawn	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
S Lugo Munoz	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Designed	Civil	T Penrose		24087	26/10/23	Series No.	7 of 16
	B Doherty						



The diagram illustrates a cross-section of a road profile. A green line represents the 'Design surface level', and a black line represents the 'Existing level'. The profile starts with a 1 in 20% grade, followed by a 1 in 4 grade, then a 5.8% grade, another 5.8% grade, and finally a 1 in 4 grade. The vertical curve is defined by points with elevations: 283.069, 282.566, 282.566, 282.566, 282.566, 282.926, 283.170, 283.357, 283.194, and 282.815. The datum is RL 281.500. The table below provides the design level, existing level, and offset for each station.

	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9	Station 10
DESIGN LEVEL	283.069	282.566	282.566	282.566	282.566	282.926	283.170	283.357	283.194	282.815
EXISTING LEVEL	283.069	283.092	282.997	282.964	282.943	283.123	283.123	282.707	282.753	282.815
OFFSET	-7.678	-6.672	-5.672	-5.272	-4.231	0.000	0.000	3.250	3.902	5.417

Existing surface level

DATUM RL 281.700

1 in 30, 1 in 4, 4%, 4%, 1 in 4

	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8
DESIGN LEVEL	283.256	282.933	282.933	283.033	283.271	283.434	283.564	282.935
EXISTING LEVEL	283.256	283.338	283.288	283.226	283.170	283.335	282.782	282.935
OFFSET	-7.054	-6.409	-5.409	-5.009	-4.066	0.000	3.250	5.766

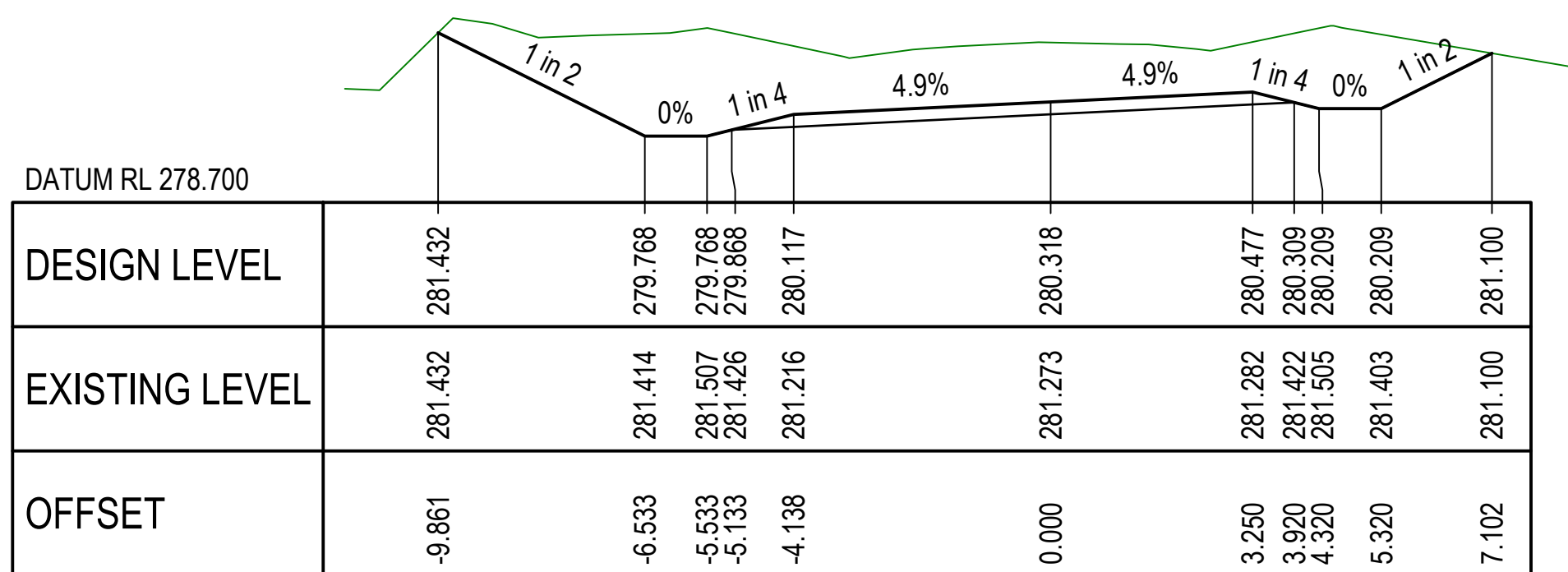
	Station 1+00	Station 1+25	Station 1+50	Station 1+75	Station 2+00	Station 2+25	Station 2+50	Station 2+75	Station 3+00
DESIGN LEVEL	283.250	283.269	283.569	283.607	283.757	283.781	283.587	283.304	
EXISTING LEVEL	283.250	283.324	283.371	283.483	283.691	283.320	283.257	283.304	
OFFSET	-5.705	-5.084	-4.684	-3.731	0.000	3.250	4.027	5.157	

	Station 1+00	Station 1+25	Station 1+50	Station 1+75	Station 2+00	Station 2+25	Station 2+50	Station 2+75	Station 3+00
DESIGN LEVEL	283.952	283.994	283.967	284.055	284.185	284.055	283.884	283.865	283.889
EXISTING LEVEL	283.952	283.994	283.987	284.062	284.185	283.922	283.884	283.885	283.889
OFFSET	-5.603	-4.603	-4.203	-3.250	0.000	3.250	4.203	4.603	5.603

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.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
DESIGN LEVEL	282.419		281.411	281.411	281.511	281.775		282.030			282.225	282.063	281.963	281.963	282.218			
EXISTING LEVEL	282.419		282.187	282.221	282.310	282.251		282.475			282.114	282.131	282.153	282.227	282.218			
OFFSET	-8.720		-6.705	-5.705	-5.305	-4.250		0.000			3.250	3.896	4.296	5.296	5.806			

	Station 1+00	Station 1+10	Station 1+20	Station 1+30	Station 1+40	Station 1+50	Station 1+60	Station 1+70	Station 1+80	Station 1+90	Station 2+00
DESIGN LEVEL	283.039	282.508	282.508	282.608	282.871	283.126		283.321	283.160	282.800	
EXISTING LEVEL	283.039	283.059	282.964	282.930	282.908	283.095		282.704	282.749	282.800	
OFFSET	-7.767	-6.705	-5.705	-5.305	-4.250	0.000		3.250	3.896	5.335	

	Station	Elevation	Offset
DATUM RL 276.800			
DESIGN LEVEL	279.094	279.094	-7.513
	278.254	278.254	-5.834
	278.254	278.254	-4.834
	278.313	278.313	-4.434
	278.429	278.429	-3.638
	278.424	278.424	0.000
	278.421	278.421	3.250
	278.297	278.297	4.054
	278.235	278.235	4.454
	278.235	278.235	5.454
	279.259	279.259	7.501
	279.233	279.233	7.978

	1	2	3	4	5	6	7	8	9	10	
DESIGN LEVEL	279.131	278.259	278.259	278.323	278.450	278.450	278.450	278.450	278.318	278.251	279.355
EXISTING LEVEL	279.131	279.669	279.509	279.446	279.271	278.959	278.859	278.913	278.988	279.185	279.355
OFFSET	-7.594	-5.850	-4.850	-4.450	-3.650	0.000	3.250	4.050	4.450	5.450	7.657

Profile view of a road section. The vertical axis represents elevation in feet, with a datum of RL 277.000. The horizontal axis represents the road width. The profile shows a series of elevations and offsets. The elevations are: 279.410, 278.338, 278.338, 278.438, 278.645, 278.678, 278.706, 278.513, 278.413, 278.413, and 279.813. The offsets are: -8.111, -5.967, -4.967, -4.567, -3.738, 0.000, 3.250, 4.023, 4.423, 5.423, and 8.223. The profile includes a green line representing the road surface and a black line representing the existing ground. Slopes are indicated as 1 in 2, 0%, 1 in 4, 0.9%, 0.9%, 1 in 4, 0%, and 1 in 2.

Design Level	Existing Level	Offset
279.410	279.410	-8.111
278.338	280.113	-5.967
278.338	279.998	-4.967
278.438	279.925	-4.567
278.645	279.660	-3.738
278.678	279.403	0.000
278.706	279.299	3.250
278.513	279.448	4.023
278.413	279.526	4.423
278.413	279.765	5.423
279.813	279.813	8.223

Scale A

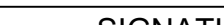


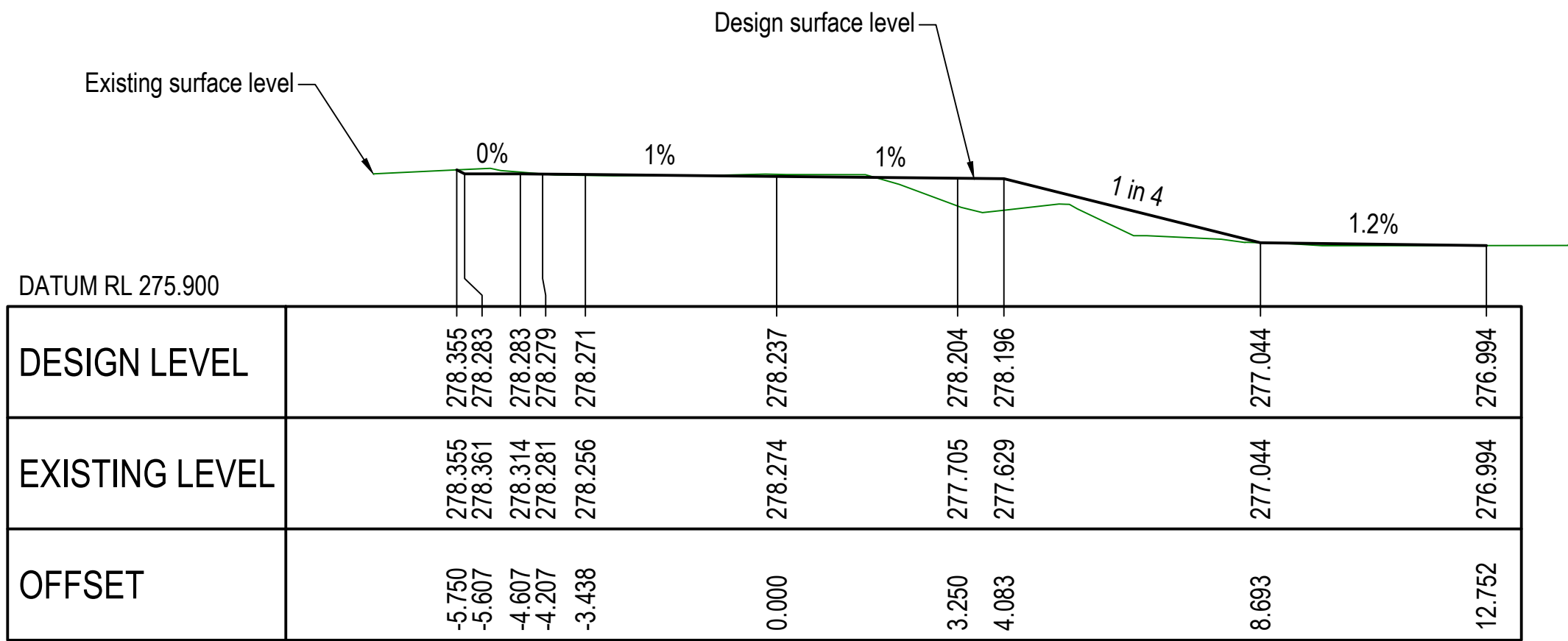
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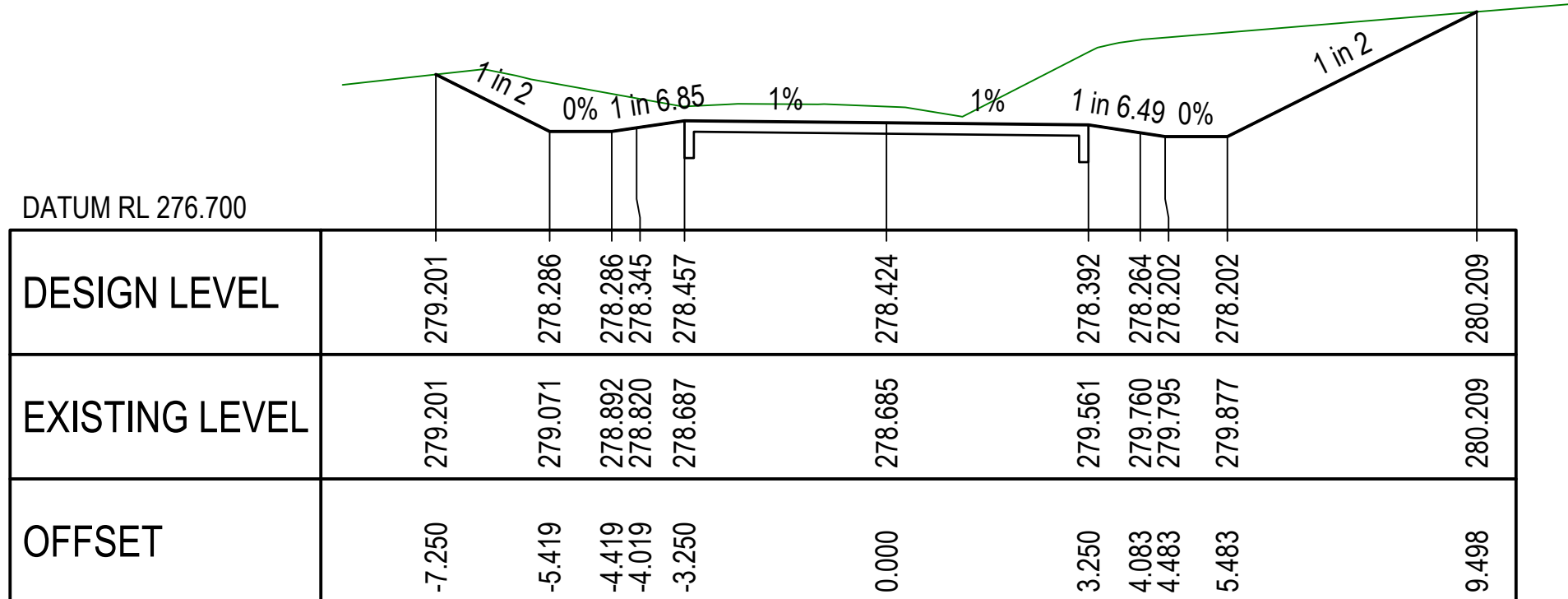
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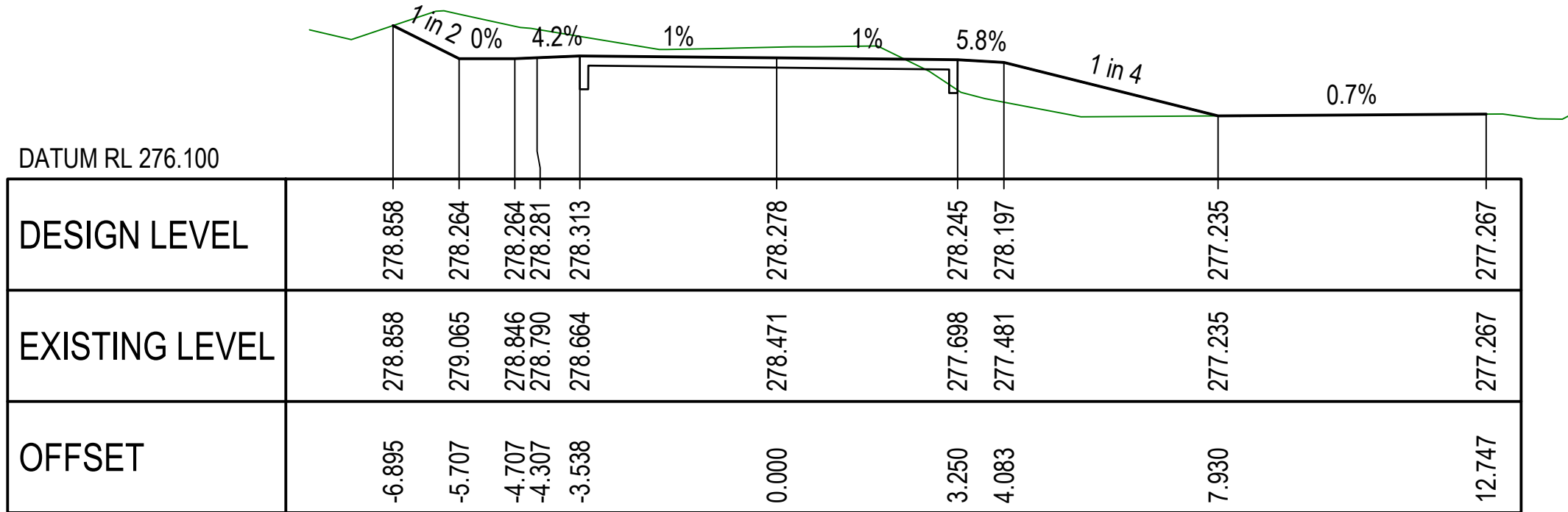
CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY ANNOTATED CROSS SECTIONS SHEET 1						Job No.	CRC00289
						Drawing No.	800
Drawn	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
S Lugo Munoz	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Designed	Civil	T Penrose		24087	26/10/23	Series No.	8 of 16
B Doherty							



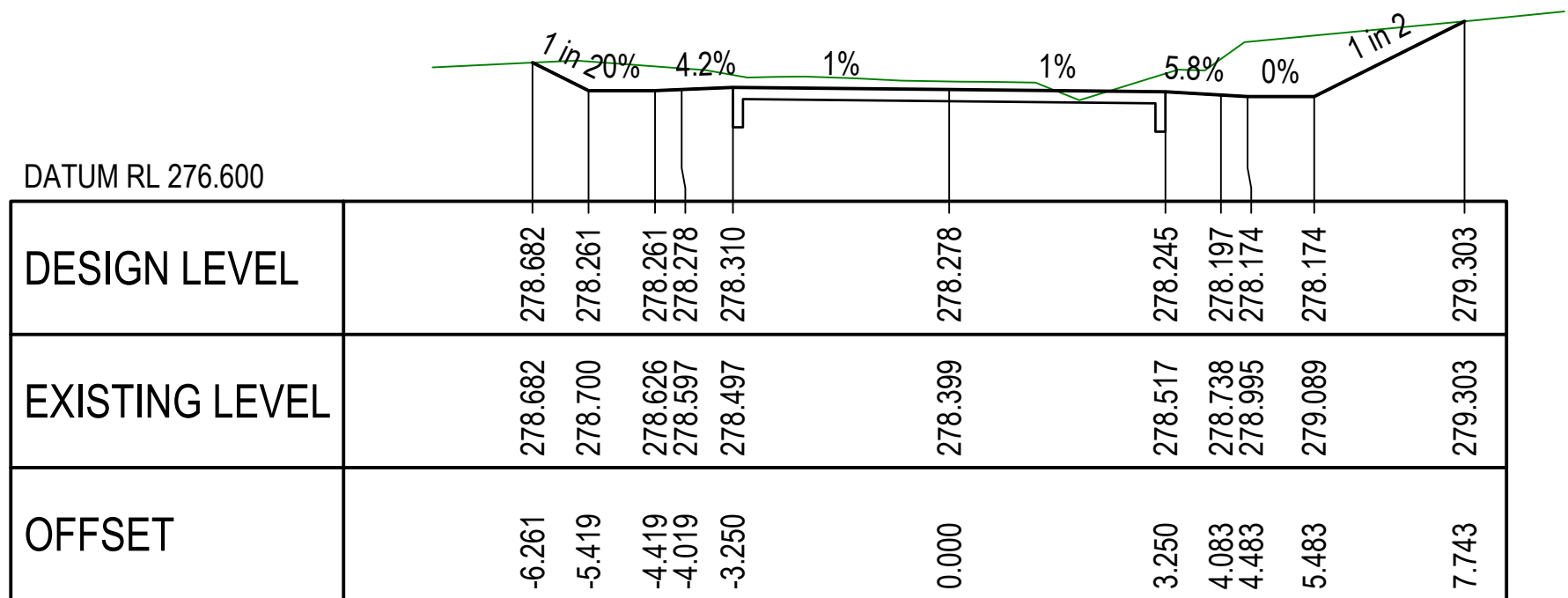
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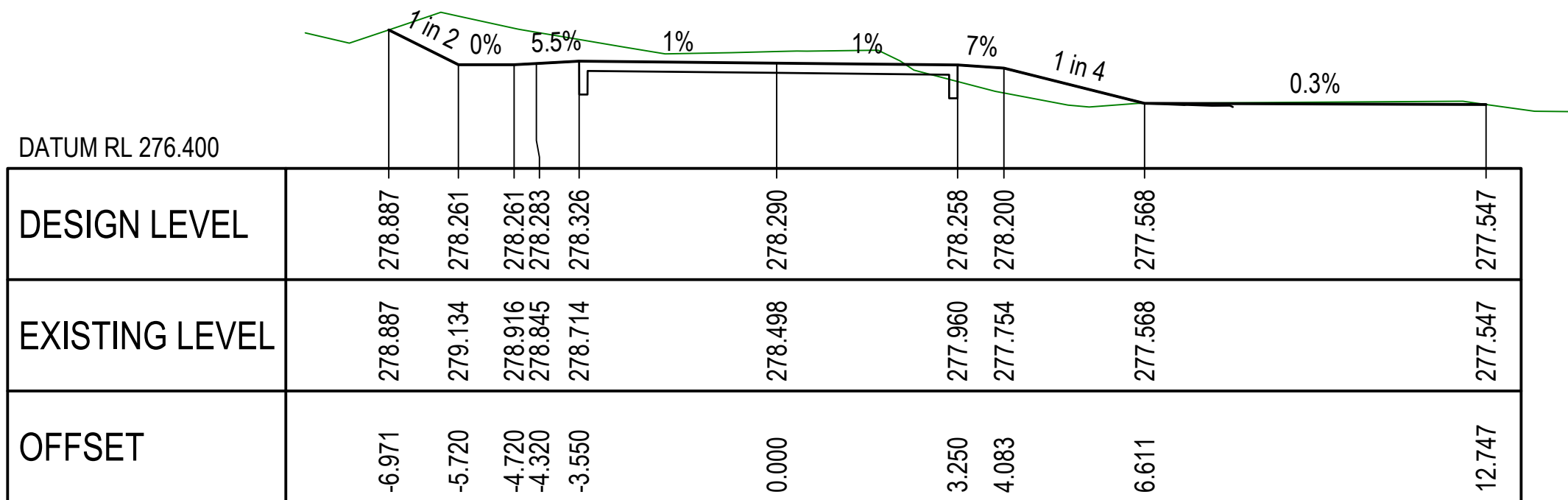
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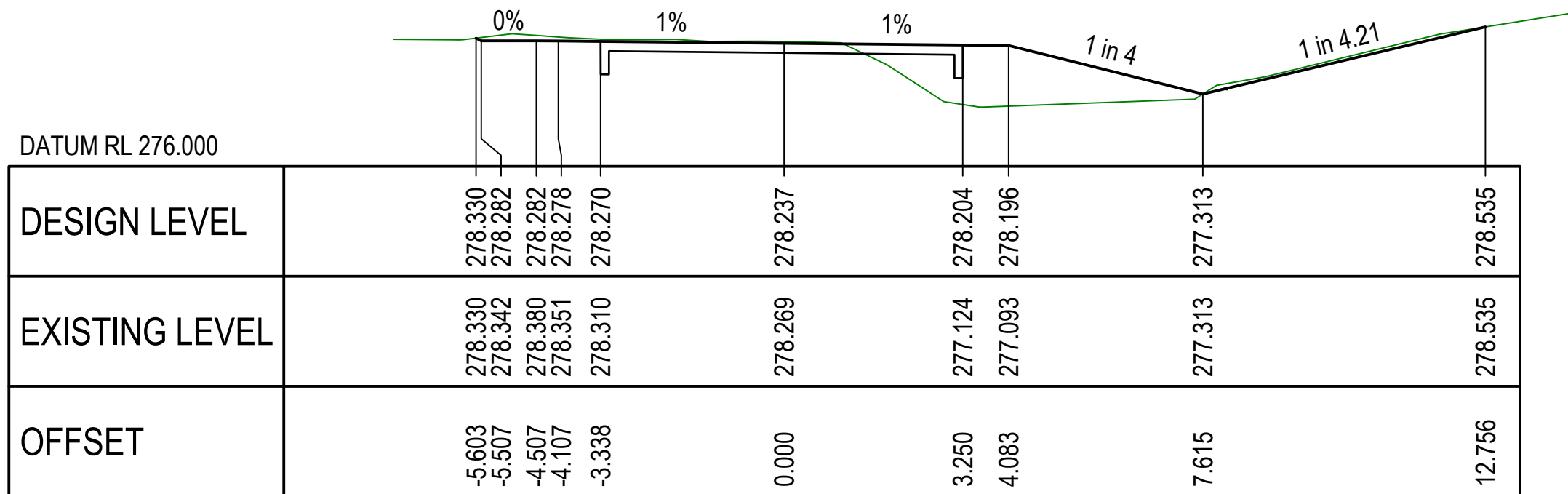
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CH. 70856.000



CH. 70843.500

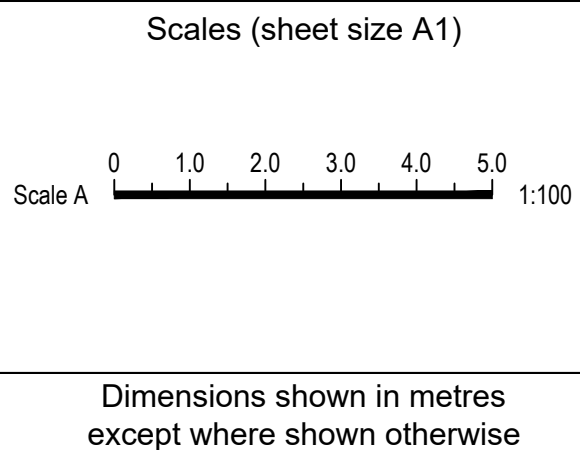



CH. 70852.000

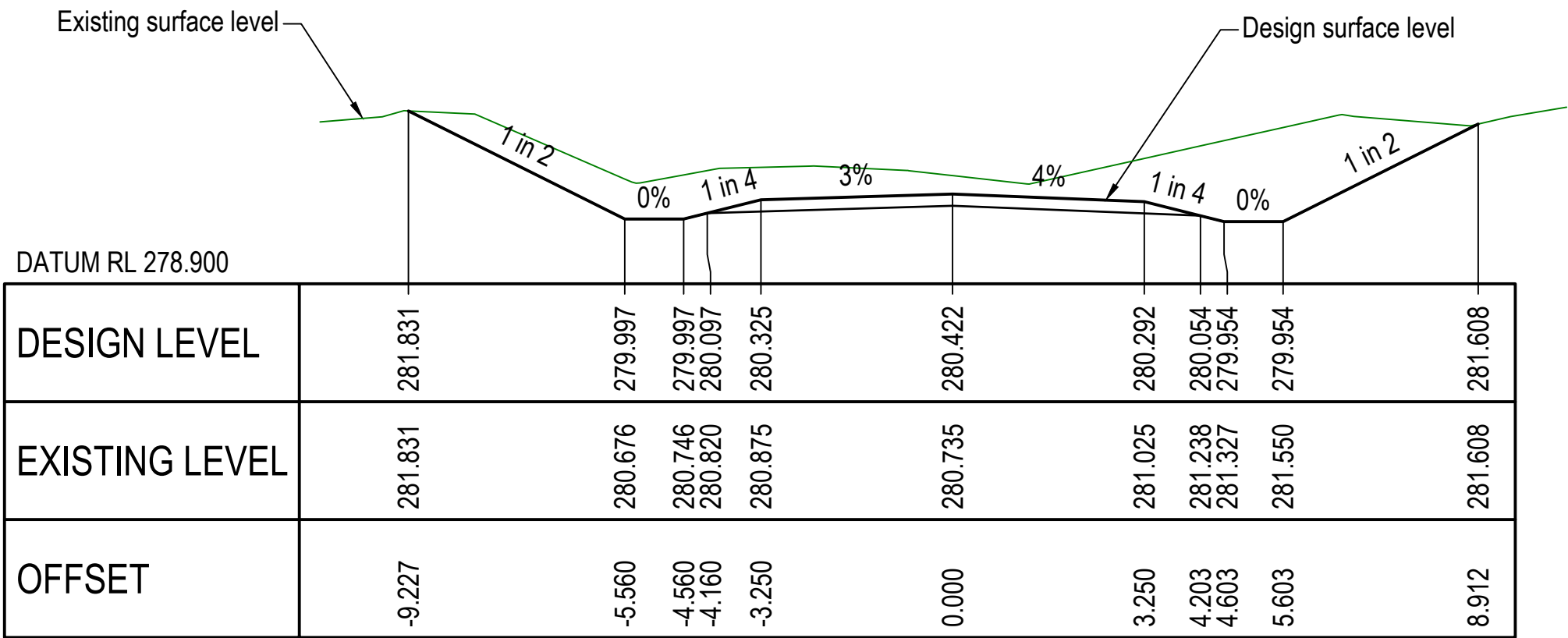
WARNING!
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The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied.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

CROSS SECTIONS

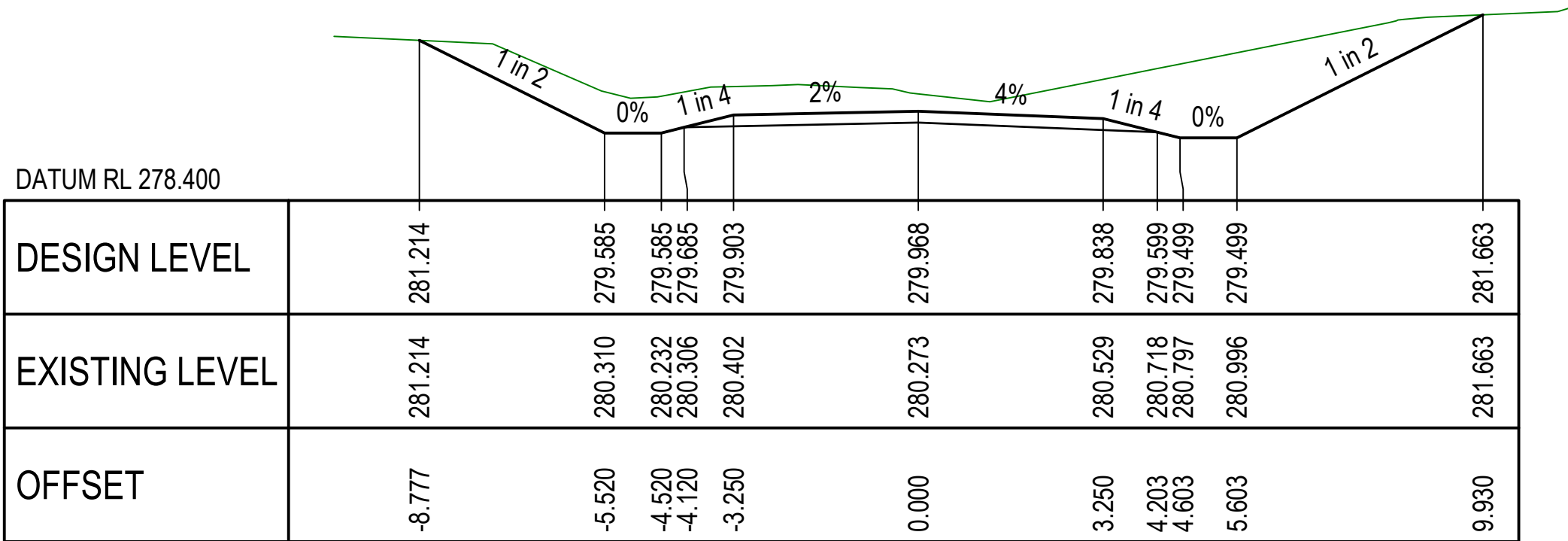
Scale A



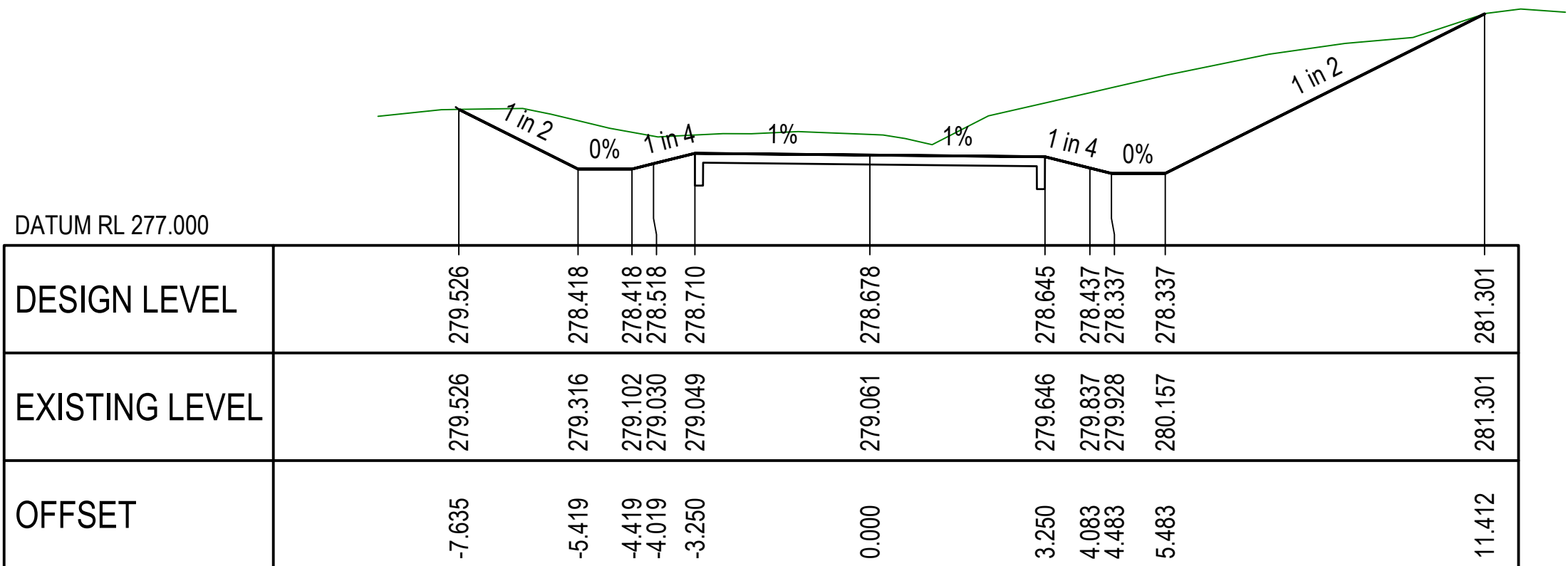
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						Drawing No.	801
Drawn	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
S Lugo Munoz	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Designed	Civil	T Penrose		24087	26/10/23	Series No.	9 of 16
	B Doherty						



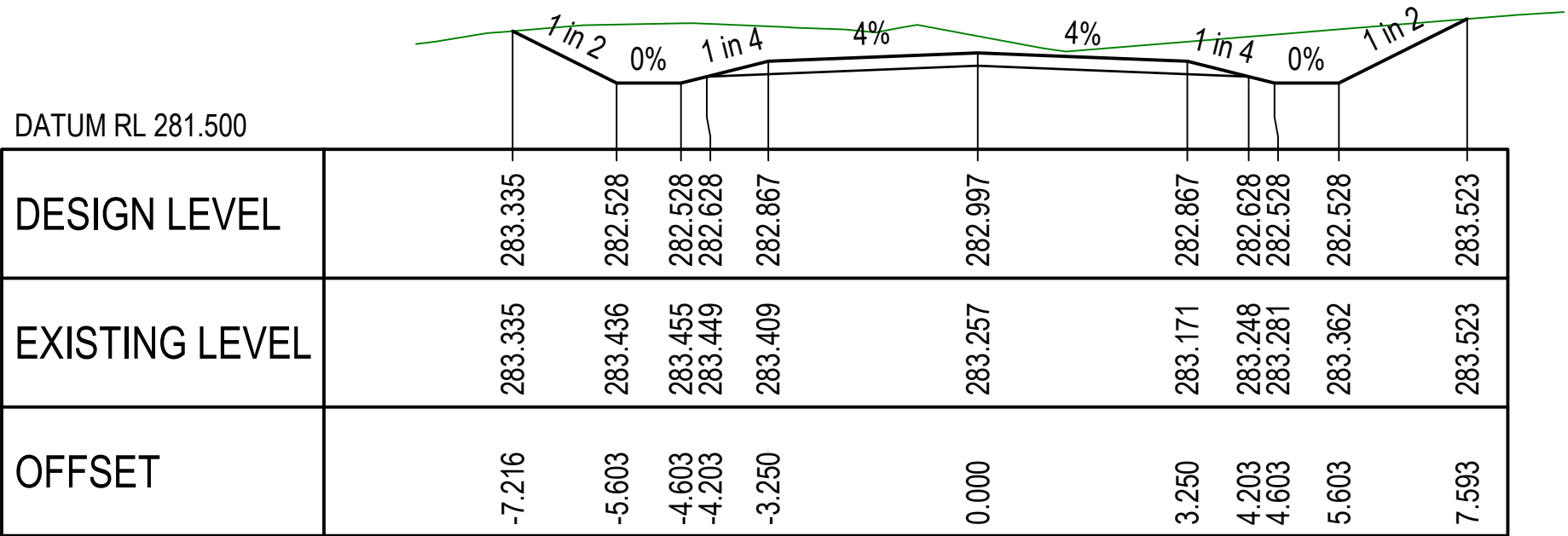
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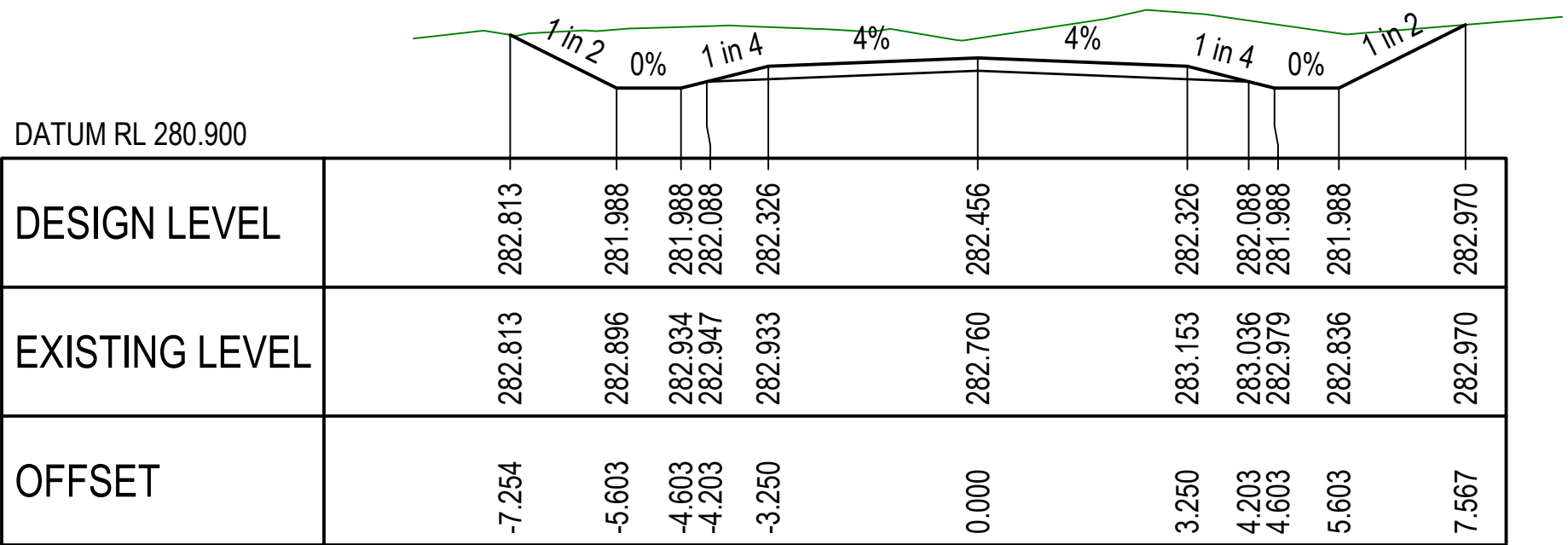
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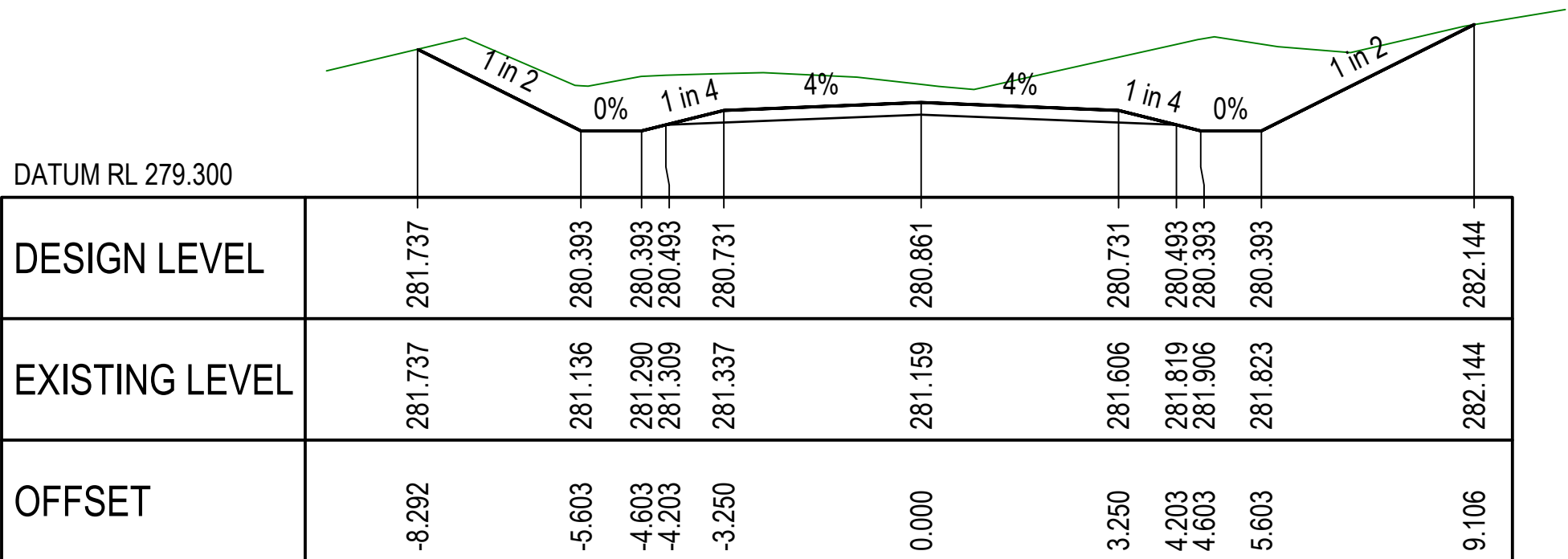
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CH. 70906.100



CH. 70900.000

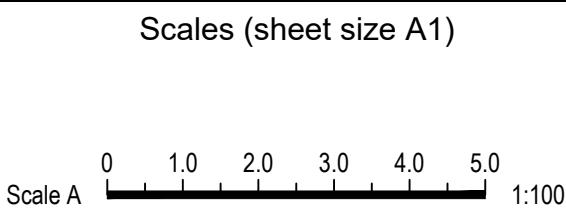


CH. 70884.000

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CROSS SECTIONS

Scale A



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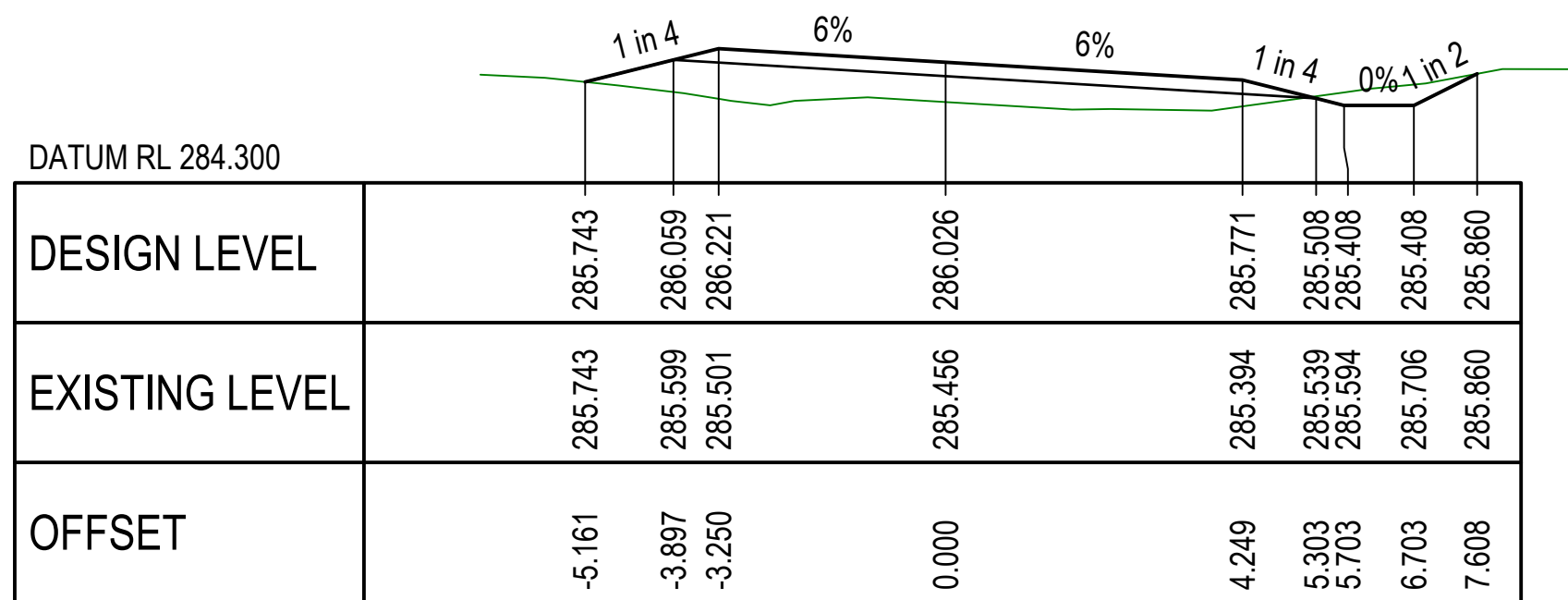
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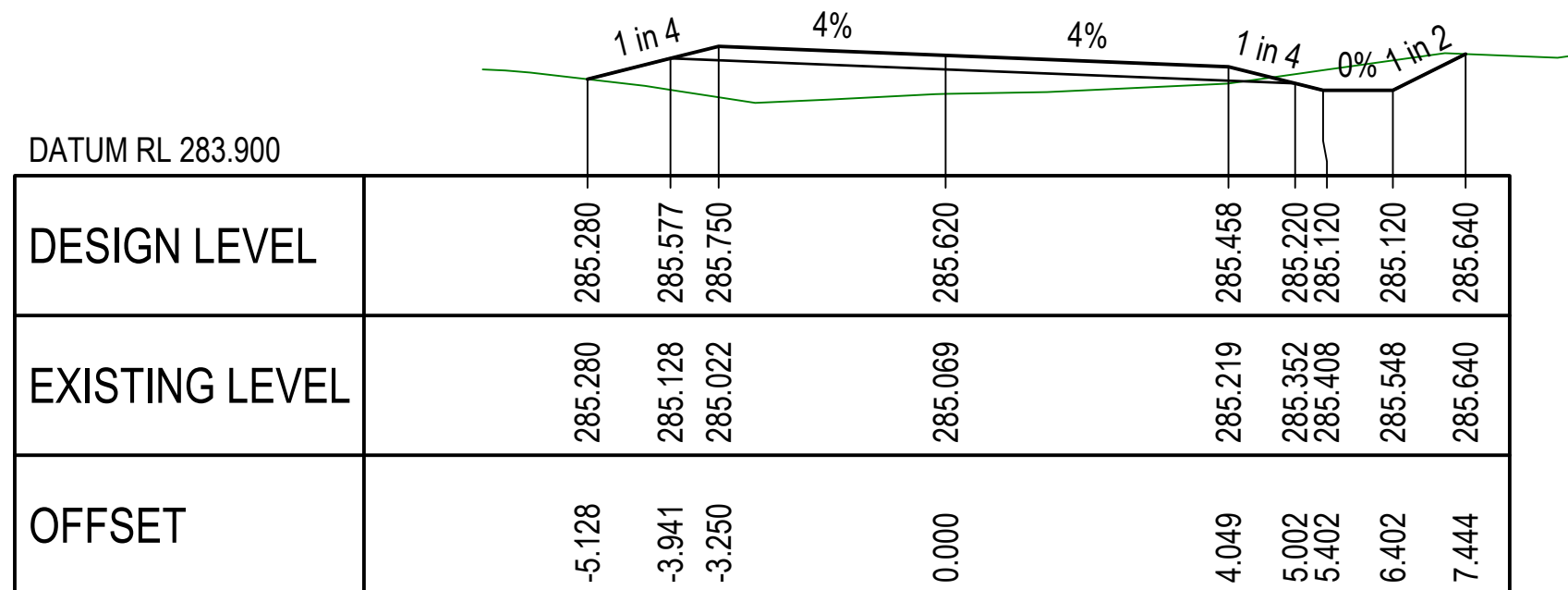
Title CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY ANNOTATED CROSS SECTIONS SHEET 3					Job No.	CRC00289
Drawn S Lugo Munoz					Drawing No.	802
Designed B Doherty					Revision	A
					Series No.	10 of 16

BEWARE OF UNDERGROUND SERVICES

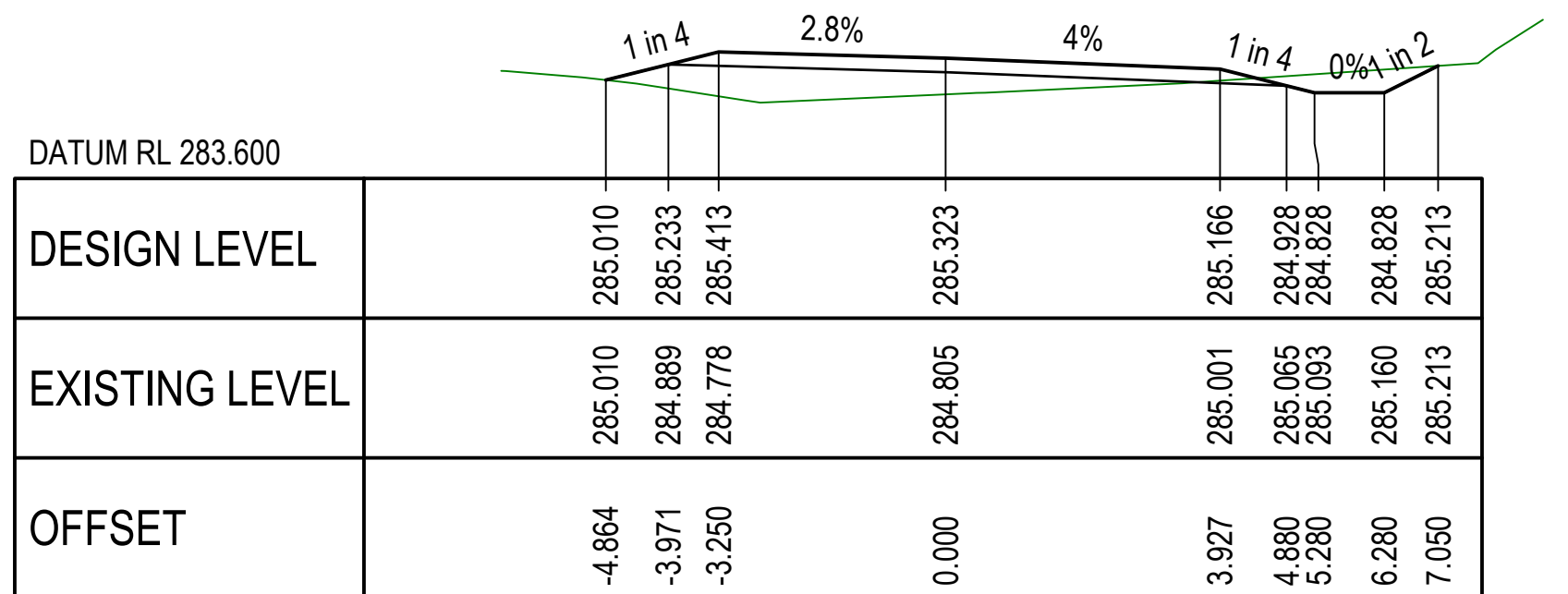
The location of underground services has been compiled from engineering survey and interpolated from Dial Before You Dig as provided by the Service Authorities. No responsibility is taken for the accuracy of the interpolated information supplied. Ensure all services are accurately located prior to commencement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



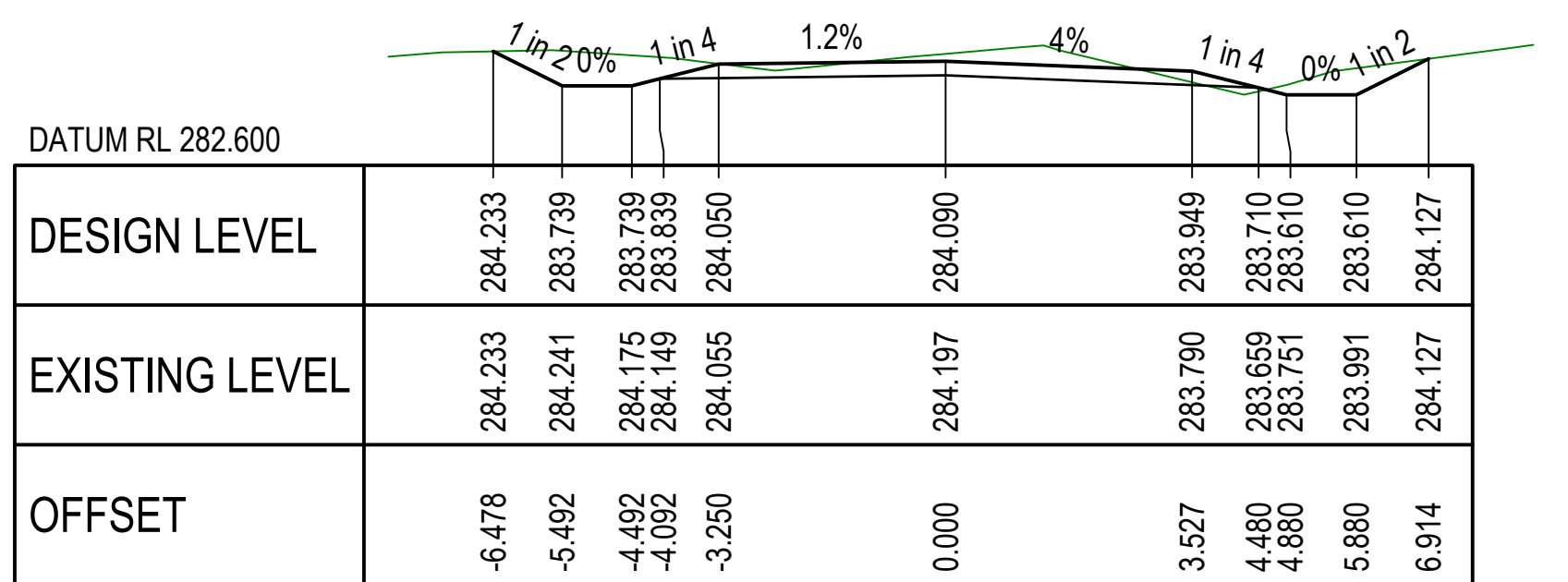
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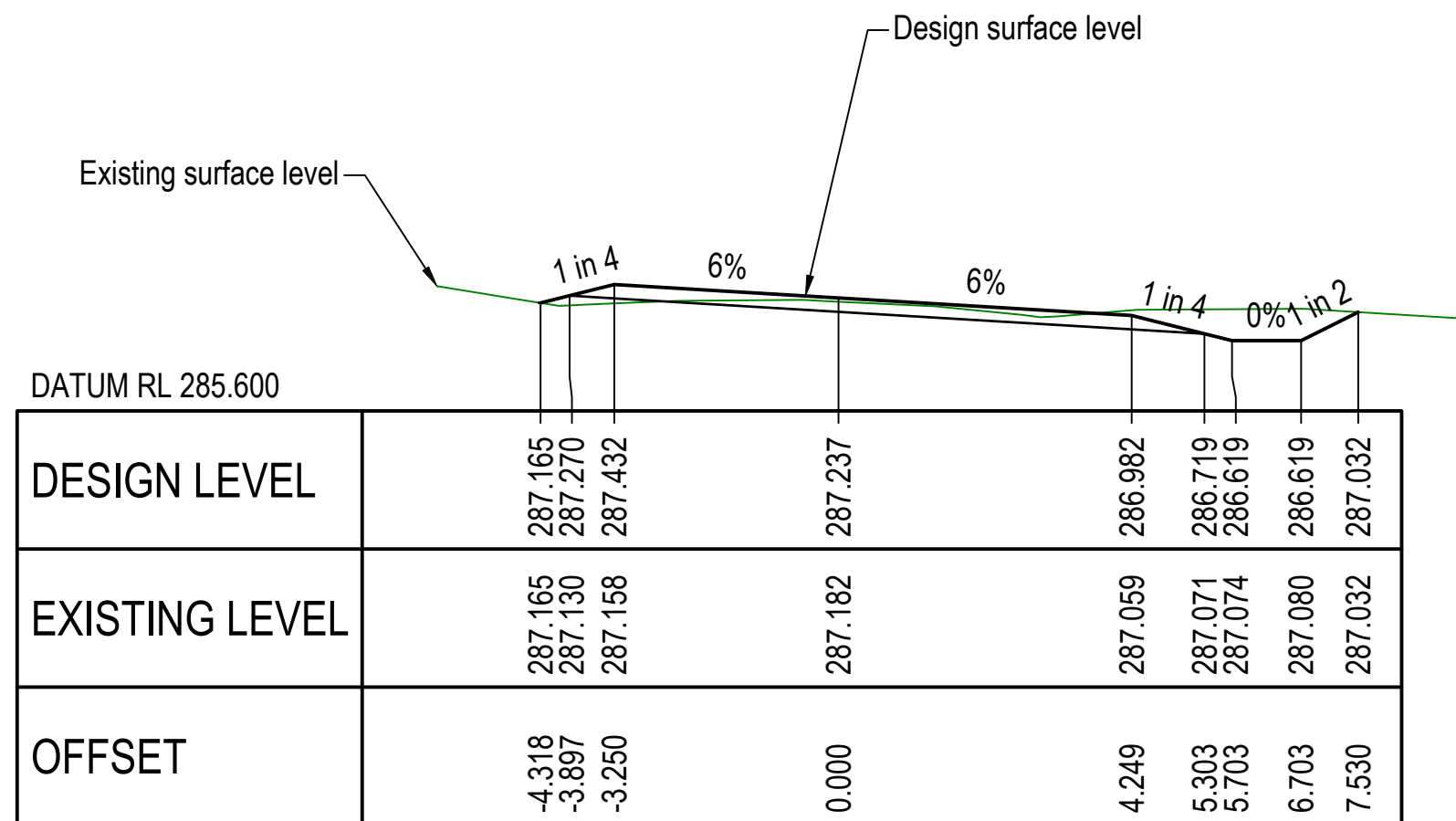
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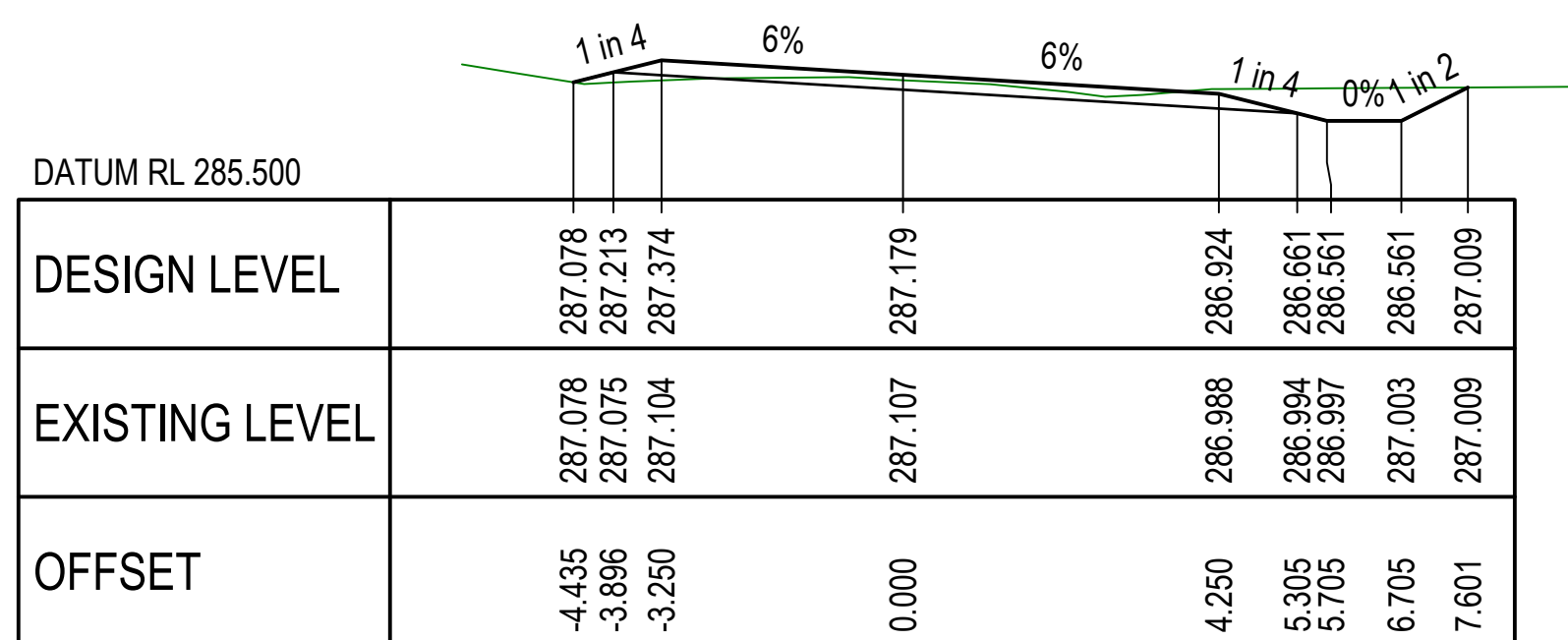
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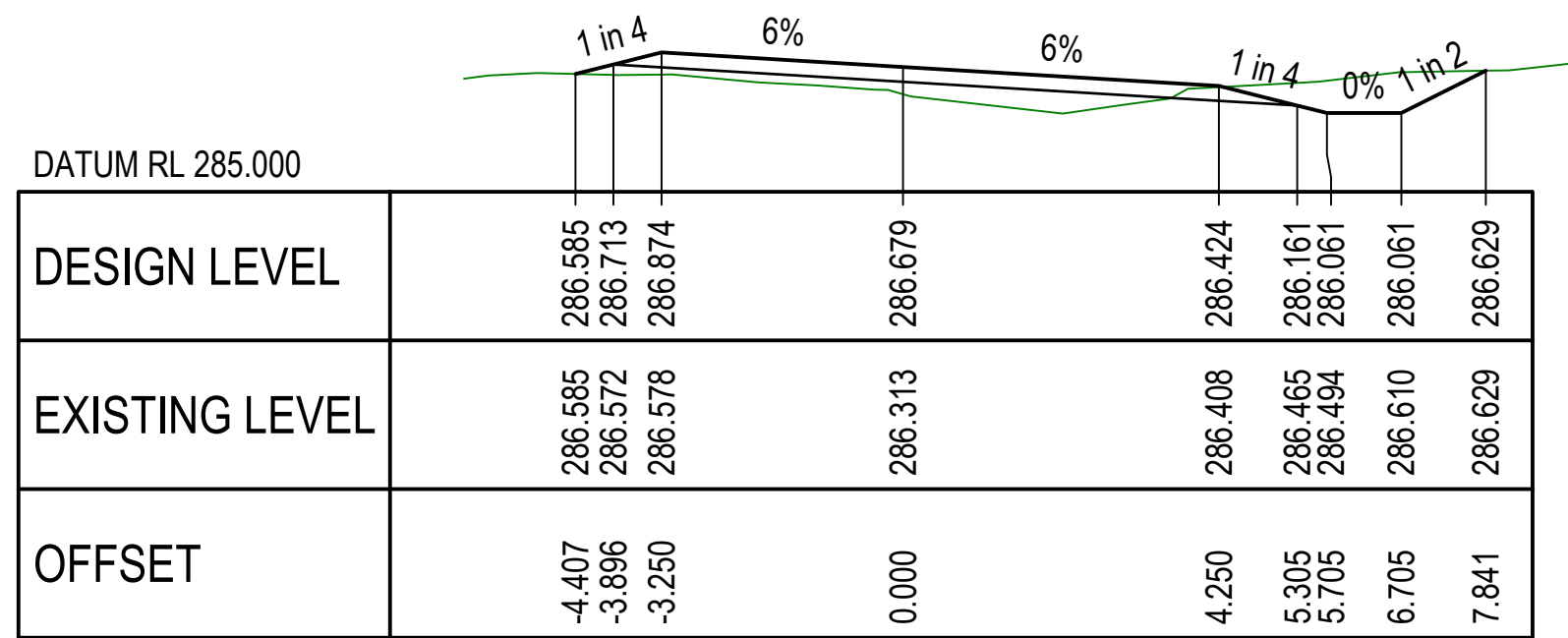
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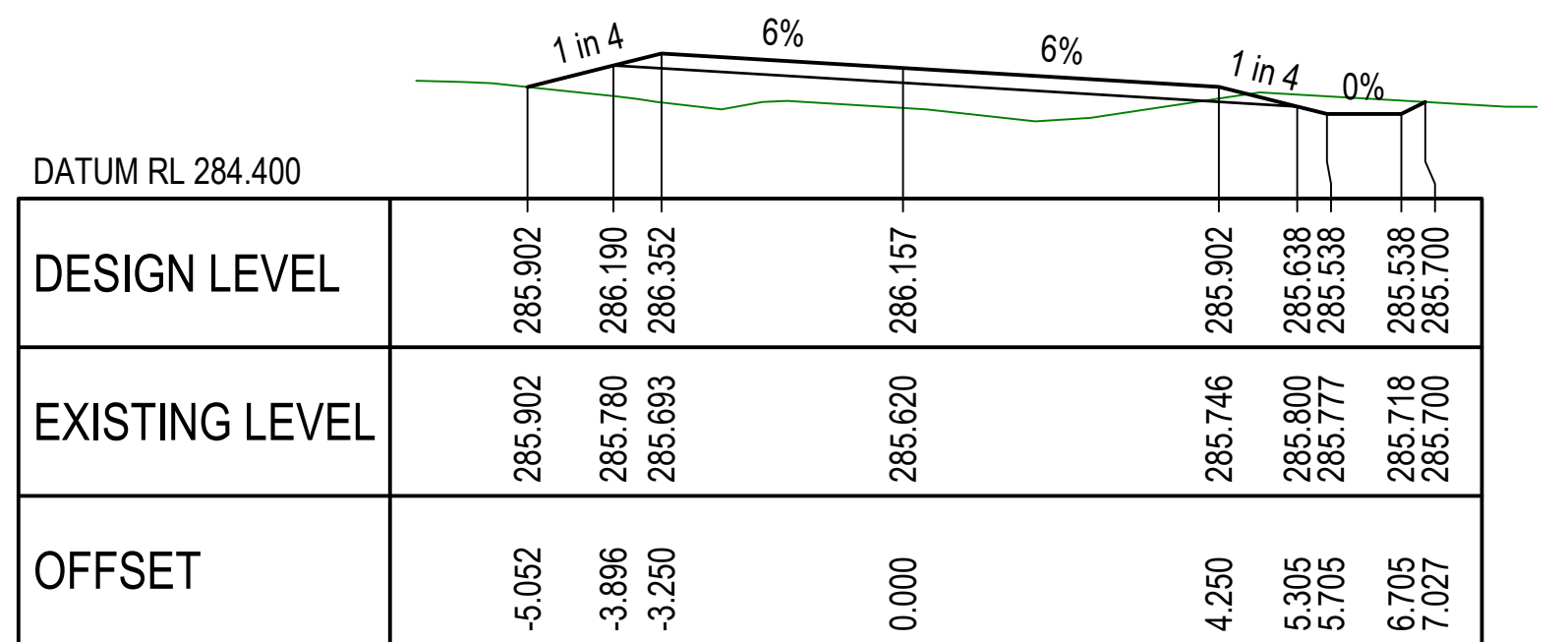
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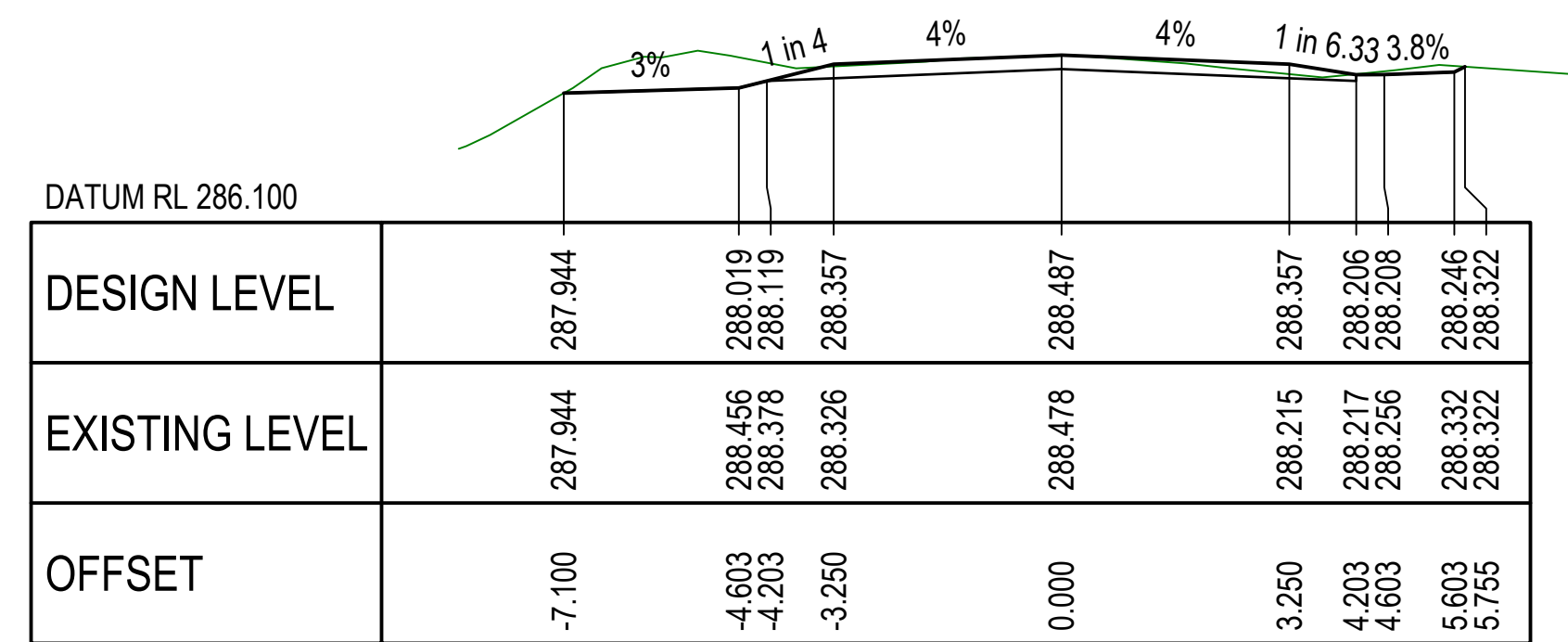
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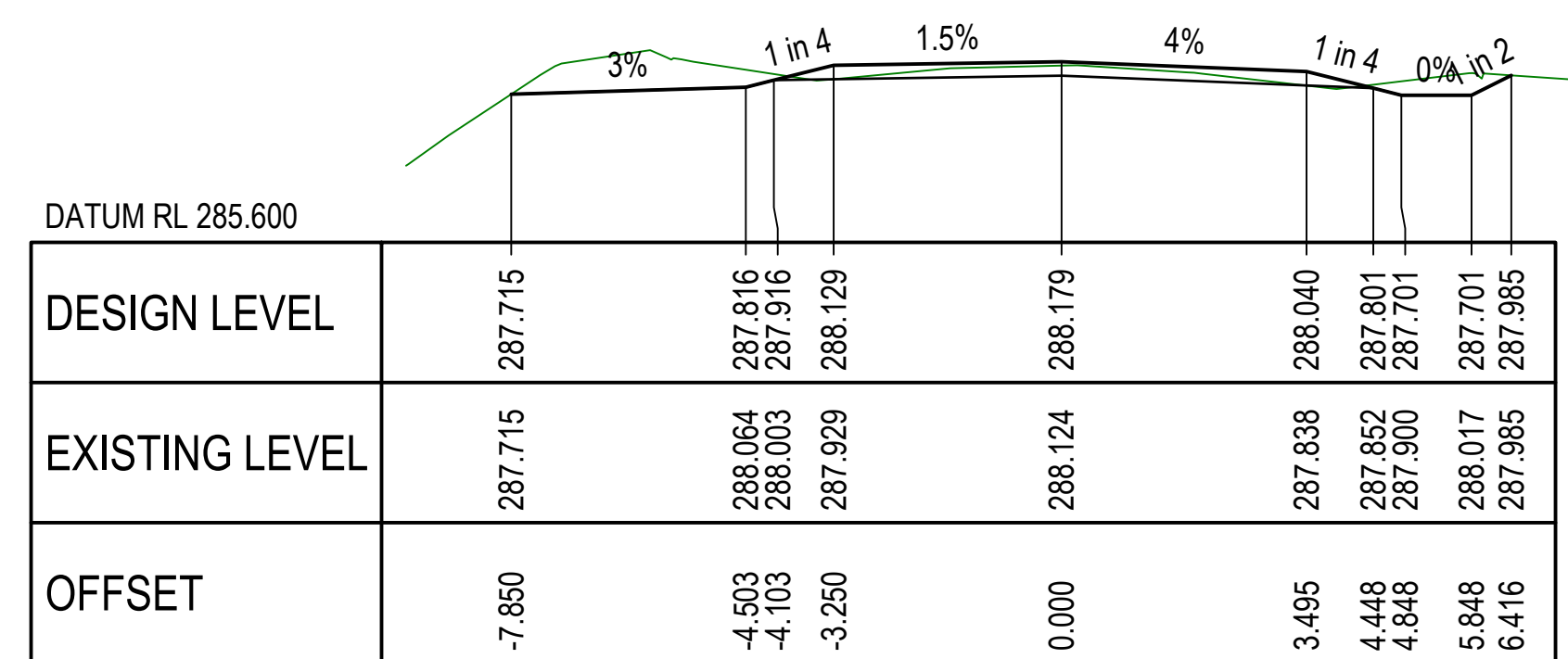
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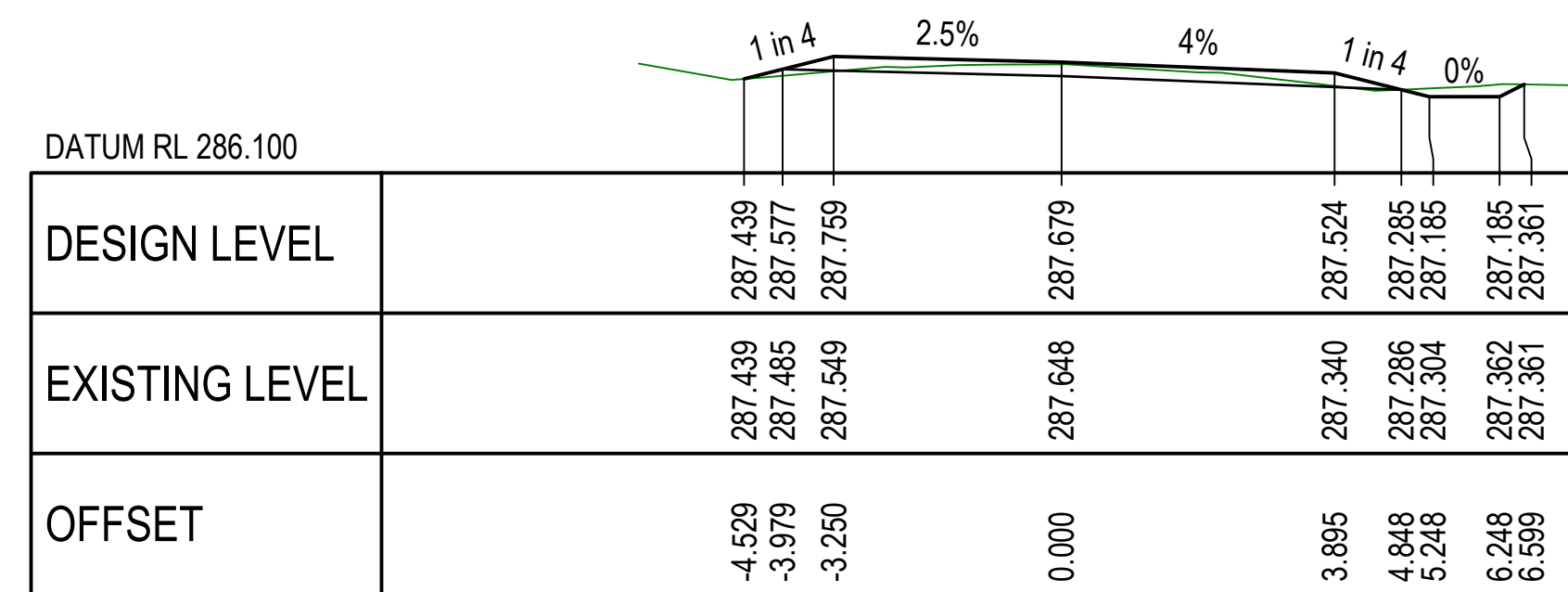
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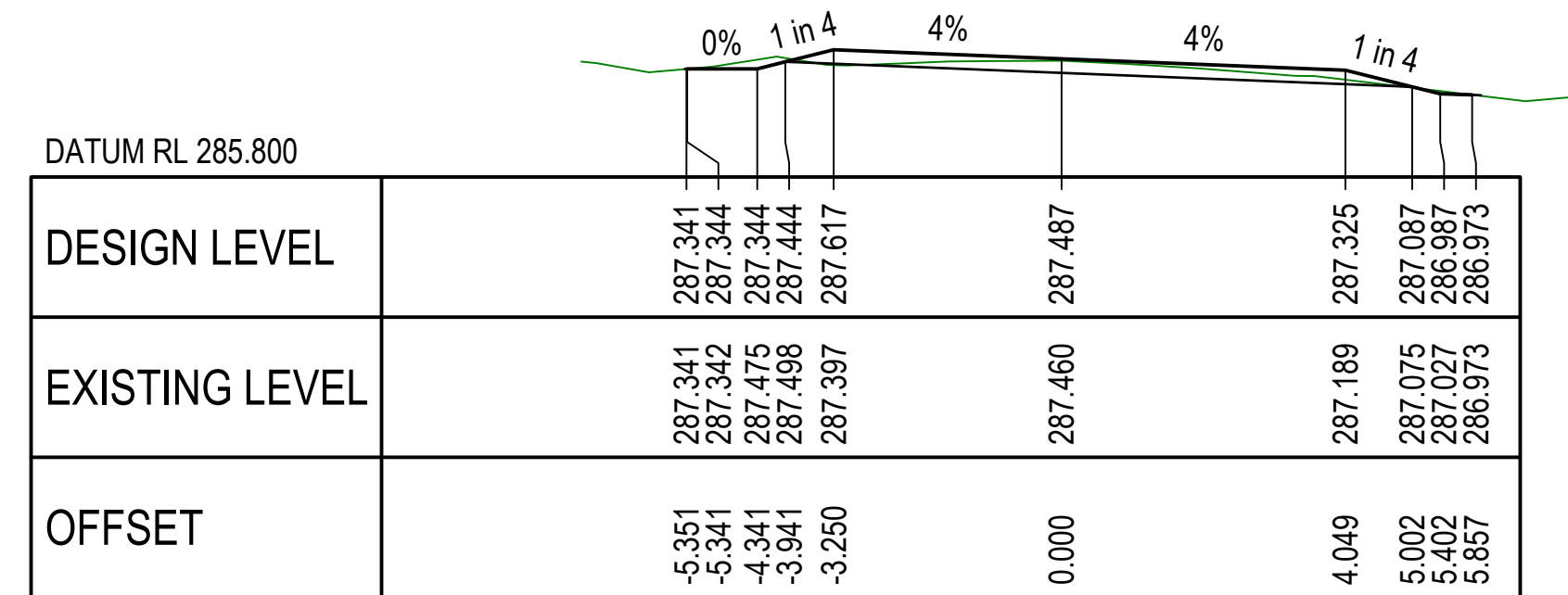
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CH. 71040.000



CH. 71020.000




CH. 71012.300



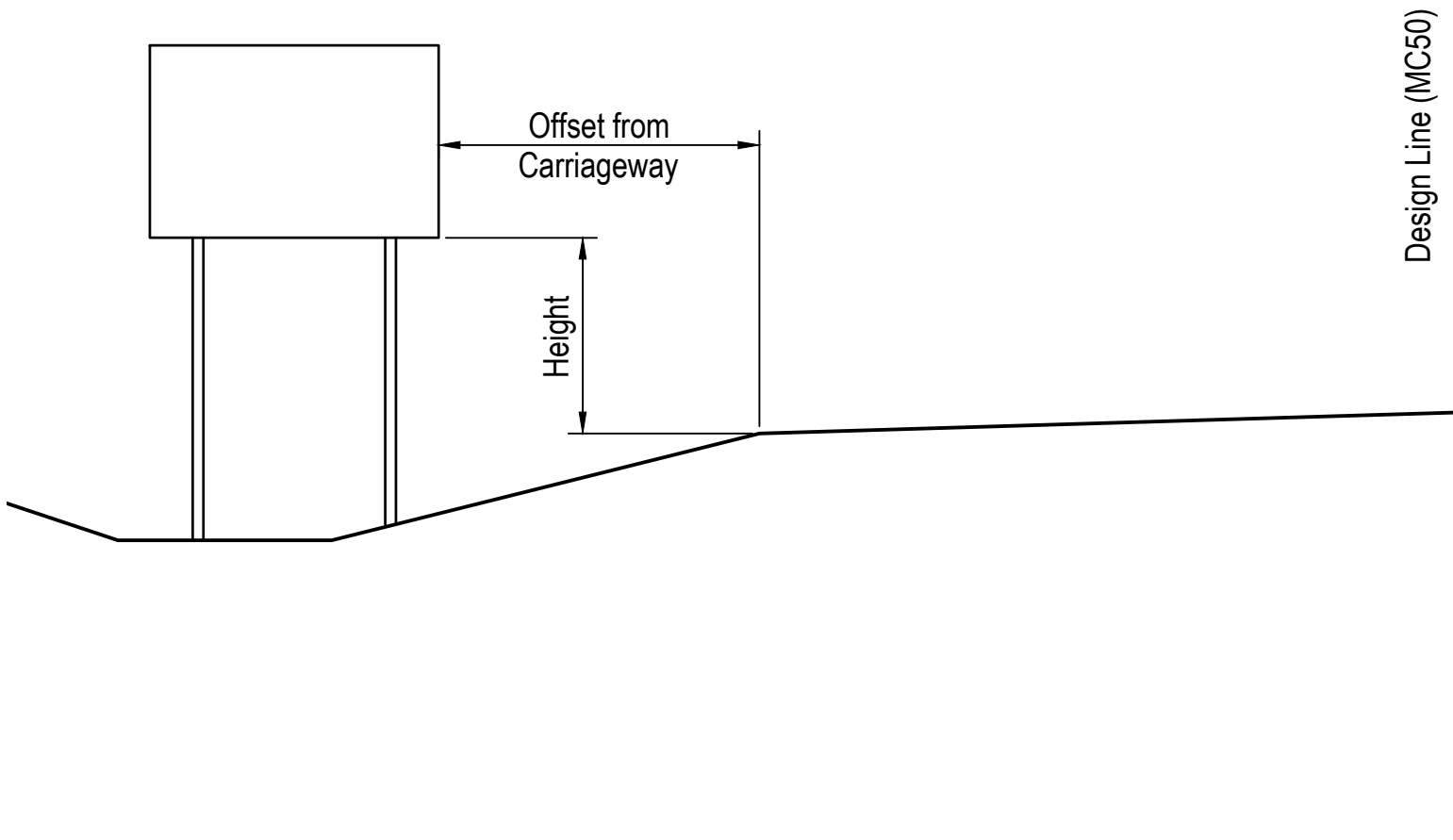
						<p>Scales (sheet size A1)</p>
A	Issued for Construction					
20.01	Revisions/Descriptions		Drawn	Approved	Date	<p>Dimensions shown in metres except where shown otherwise</p>



CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY ANNOTATED CROSS SECTIONS SHEET 4						Job No.	CRC00289
						Drawing No.	803
Drawn	ENGINEERING CERTIFICATION (RPEQ)					Revision	A
S Lugo Munoz	ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Designed	Civil	T Penrose		24087	26/10/23	Series No.	11 of 16
B Doherty							


SIGN SCHEDULE

CHAINAGE (M)	POSITION	SIGN DESCRIPTION	SIGN TYPE	WORK DESCRIPTION	SIGN DETAILS					STIFFENER DETAILS				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	TYPE	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)
70627	LHS	Guide, Traffic Instruction	G9-9A	Install New	1500	750	1.125	2000	1500	1	3	350	6	Aluminum Extrusion	2	1200	50	Signfix Sign Support (or equivalent)	6500 (C.T.S.)	6500 (C.T.S.)	As per manufactures specifications		300	750
70677	LHS	Warning, Reverse Curve	W1-4LB	Install New	750	750	0.56	2000	1500	1	0	0	0	CHS Steel	1	-	50	C350	3500 C.T.S	-	-	-	300	750
70713	LHS	Warning, floodway & Guide, 'CHRISTMAS CK'	W5-7-1B & G6-2	Install New	750	750	0.56	2000	1500	1	0	0	0	CHS Steel	1	-	50	C350	3500 C.T.S	-	-	-	300	750
70788	LHS	Guide, "Road Subject to Flooding"	G9-21-1	Install New	2150	800	1.7200	2000	1500	1	3	350	6	CHS Steel	2	1500	50	C350	3500 C.T.S	3500 C.T.S	-	-	300	300
70848	LHS	Guide, Flood depth marker	G9-22-1A	Install New	Refer Details in DTMR Std Drg 1170 - Flood Depth Indicators - Installation																			
70852	RHS	Guide, Flood depth marker	G9-22-1A	Install New																				
70900	RHS	Guide, "Road Subject to Flooding"	G9-21-1	Install New	2150	800	1.7200	2000	1500	1	3	350	6	CHS Steel	2	1500	50	C350	3500 C.T.S	3500 C.T.S	-	-	300	300
70985	RHS	Warning, floodway & Guide, 'CHRISTMAS CK'	W5-7-1B & G6-2	Install New	750	750	0.56	2000	1500	1	0	0	0	CHS Steel	1	-	50	C350	3500 C.T.S	-	-	-	300	750
71078	RHS	Warning, Reverse Curve	W1-4LB	Install New	750	750	0.56	2000	1500	1	0	0	0	CHS Steel	1	-	50	C350	3500 C.T.S	-	-	-	300	750
71128	RHS	Guide, Traffic Instruction	G9-9A	Install New	1500	750	1.125	2000	1500	1	3	350	6	Aluminum Extrusion	2	1200	50	Signfix Sign Support (or equivalent)	6500 (C.T.S.)	6500 (C.T.S.)	As per manufactures specifications		300	750



SIGN SETOUT

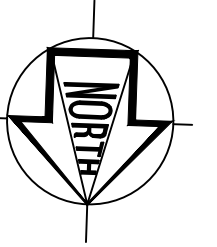
PAVEMENT MARKING TYPES

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

XREFS - X_CRC_BSC_TITLE.dwg

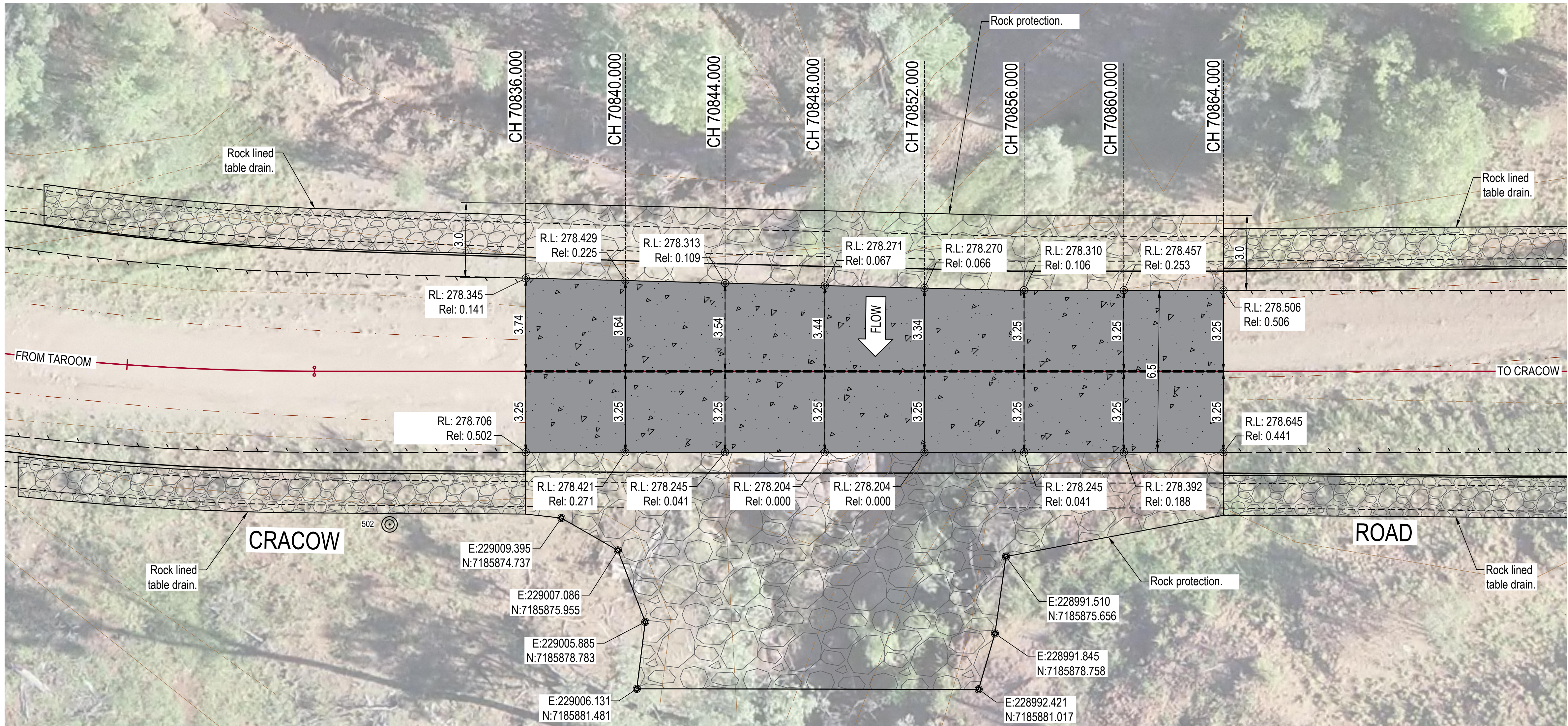
Last Modified :- Oct 30, 2023 - 9:42am

Refer 400 series drawings for sign details.



LEGEND

R.L.: Reduced Level AHD
Rel: Height relative to lowest point on floodway

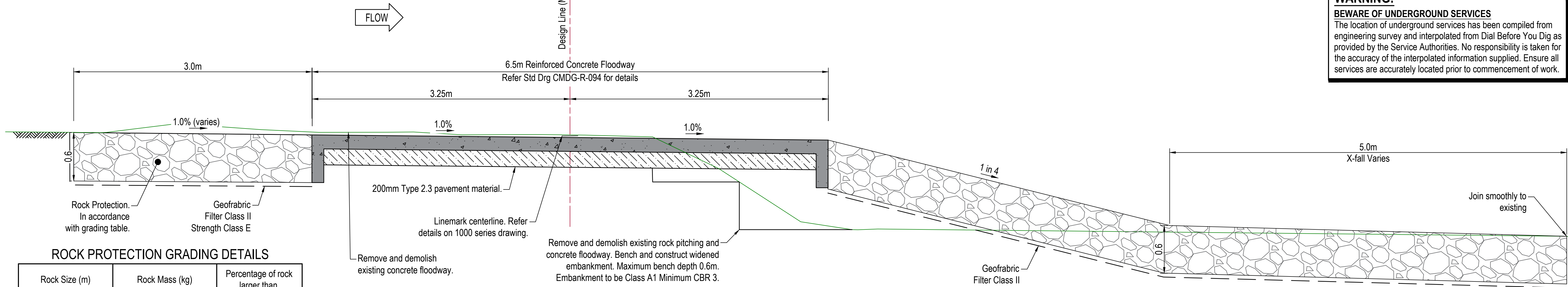


PLAN

Scale: 1:100

WARNING!

BEWARE OF UNDERGROUND SERVICES
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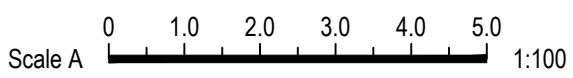
TYPICAL CROSS SECTION B

Chge 70836.000 - 70864.000 (MC50 - Floodway)
Not to Scale

ROCK PROTECTION GRADING DETAILS

Rock Size (m)	Rock Mass (kg)	Percentage of rock larger than.
0.40	100.0	0%
0.30	35.0	50%
0.15	2.5	90%

Scales (sheet size A1)



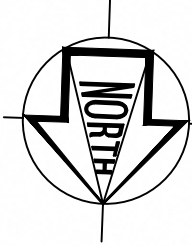
Dimensions shown in metres
except where shown otherwise



Title
CRACOW ROAD UPGRADE (Ch. 70740m - 71055m)
SITE 5 - CHRISTMAS CREEK FLOODWAY
FLOODWAY DETAILS

Drawn S Lugo Munoz	ENGINEERING CERTIFICATION (RPEQ)				
	ENG. AREA	NAME	SIGNATURE	NO.	DATE
Designed B Doherty	Civil	T Penrose		24087	26/10/23

Job No.	CRC00289
Drawing No.	1200
Revision	A
Series No.	13 of 16



PLAN

Scale: 1:500

DESIGN LINE MC50

CHAINAGE	OFFSET LHS	OFFSET RHS
70740	5.603	5.603
70750	5.951	4.565
70760	5.705	5.157
70770	6.824	5.659
70780	7.678	5.417
70790	8.289	4.378
70800	8.720	5.806
70810	9.170	6.737
70820	9.861	7.102
70830	8.941	8.571
70840	7.513	7.501




DESIGN LINE MC50

CHAINAGE	OFFSET LHS	OFFSET RHS
70850	4.801	8.447
70860	7.250	9.498
70870	8.175	10.943
70880	9.227	8.912
70890	7.212	9.182
70900	7.254	7.567
70910	6.998	7.524
70920	6.478	6.914
70930	5.815	7.702
70940	4.864	7.050
70950	5.228	5.734

DESIGN LINE MC50

CHAINAGE	OFFSET LHS	OFFSET RHS
70960	5.052	7.027
70970	4.619	6.020
70980	4.407	7.841
70990	4.424	7.394
71000	4.435	7.601
71010	5.437	7.577
71020	4.529	6.599
71030	7.740	7.636
71040	7.850	6.416
71050	7.240	5.928

LEGEND

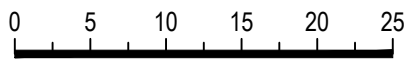
-  - Tree to be removed
-  - Limit of clearing
- 500  - Survey Mark and Label

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


Last Modified :- Oct 30, 2023 - 9:42am

A	Issued for Construction			
20.01	Revisions/Descriptions	Drawn	Approved	Date

Scales (sheet size A1)


Scale A  1:500

Dimensions shown in metres
except where shown otherwise



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quality people client focused solution driven

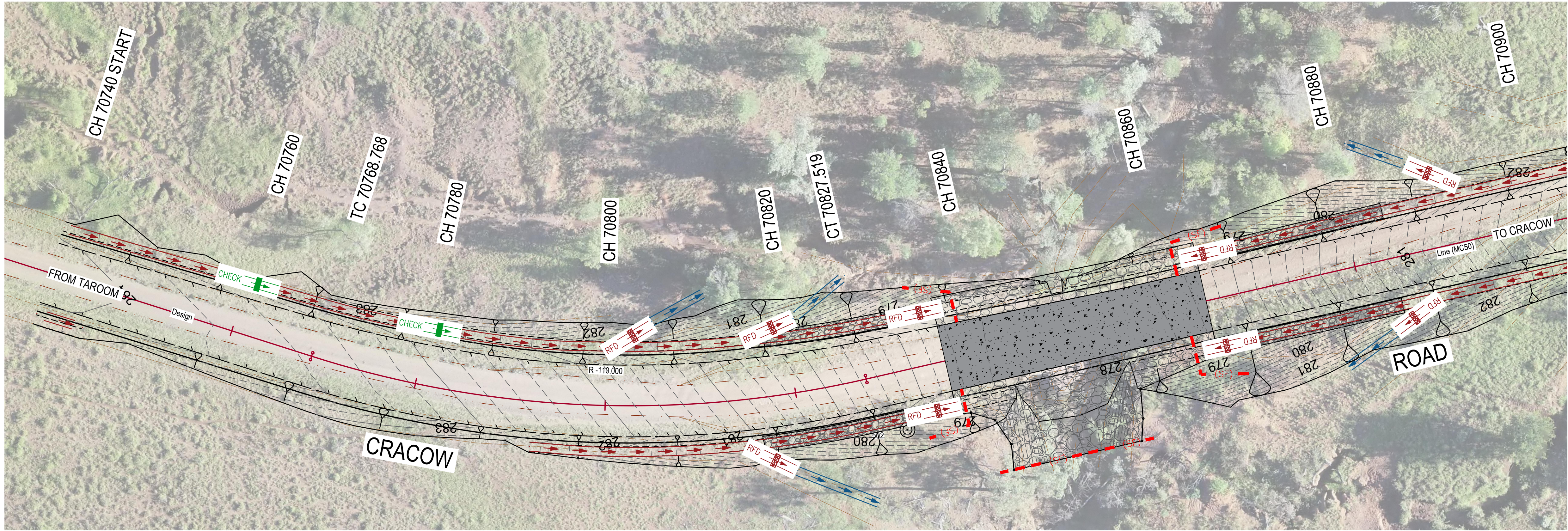
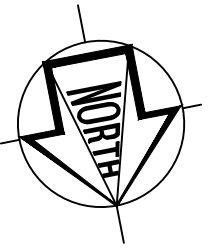
245 Mary Street, GYMPIE, QLD, 4570
ABN 73 617 924 437 Ph: 0477 322 555



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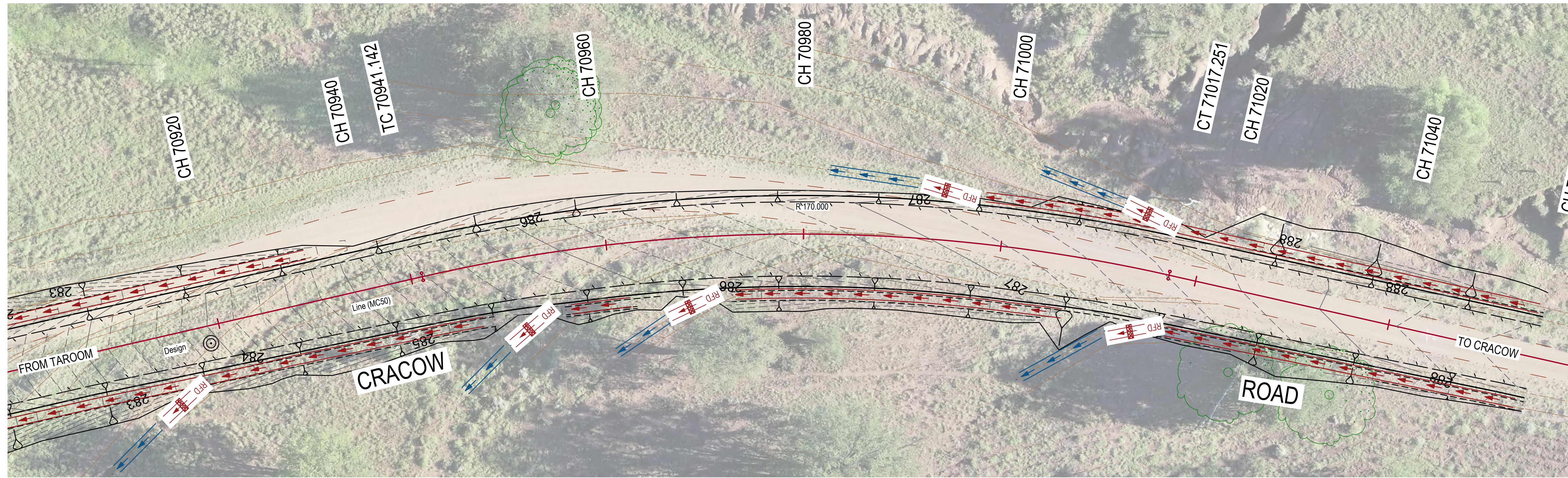
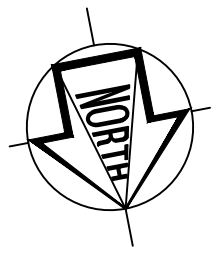
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Title CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY LIMIT OF CLEARING PLAN					Job No.	CRC00289
					Drawing No.	1600
Drawn S Lugo Munoz	ENGINEERING CERTIFICATION (RPEQ)				Revision	A
Designed B Doherty	ENG. AREA Civil	NAME T Penrose	SIGNATURE 	NO. 24087	DATE 26/10/23	Series No. 14 of 16



PLAN

Scale: 1:250



PLAN

Scale: 1:250

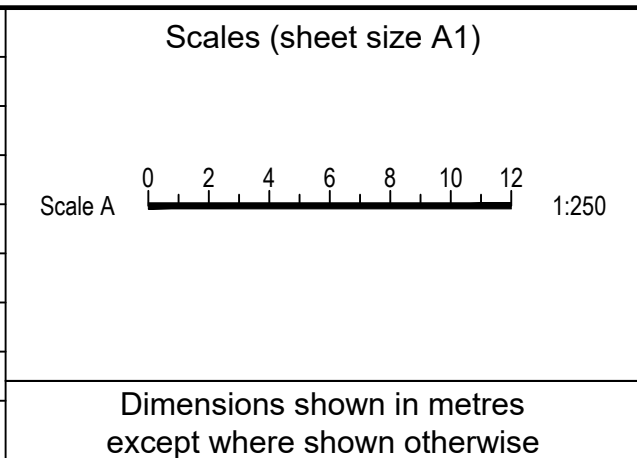
LEGEND


- 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
- Survey Mark and Label 403

XREFS - X_CRC_BSC_TITLE.dwg : X_DESIGN.dwg : X_SURVEY.dwg : X_CONTROL.dwg : X_CONTOURS.dwg : X_ENS.dwg : X_IMAGE.dwg : X_HATCH.dwg : X_DESIGN_TADPOLES.dwg


Last Modified :- Oct 30, 2023 - 9:43am

A	Issued for Construction			
20.01	Revisions/Descriptions	Drawn	Approved	Date





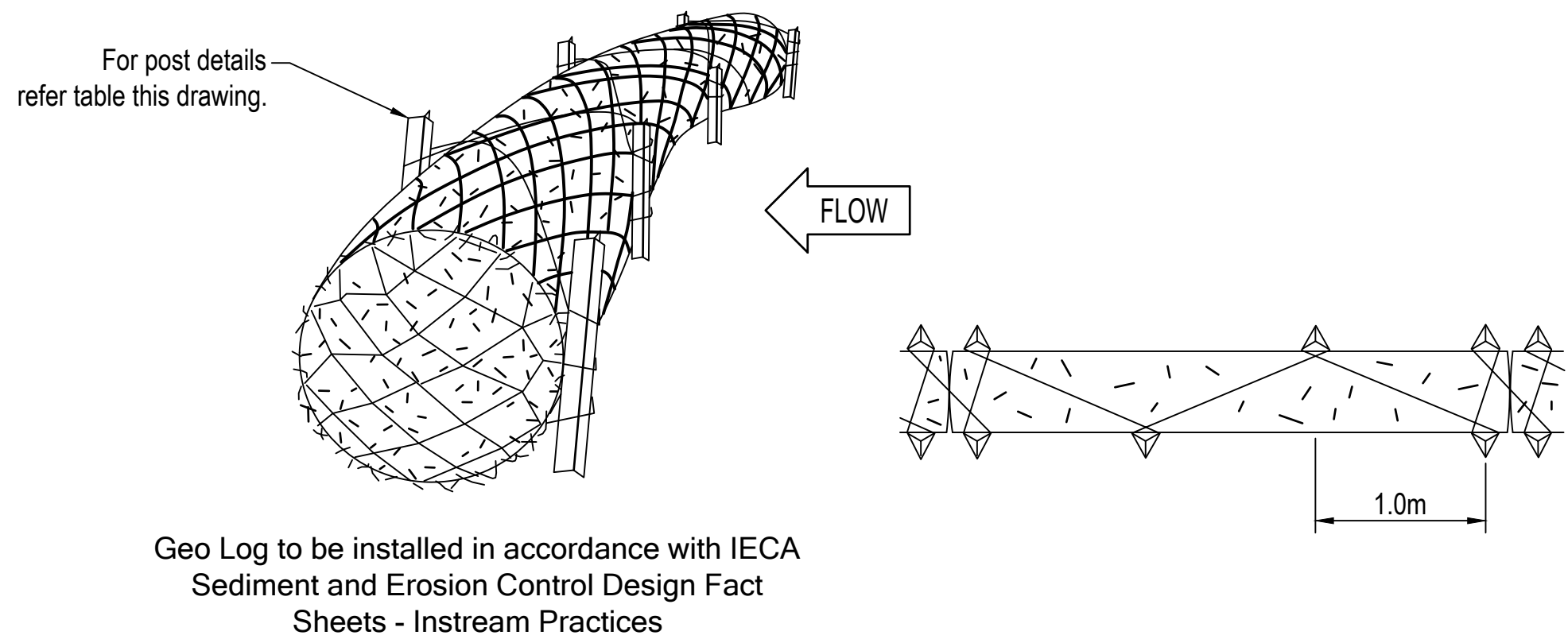
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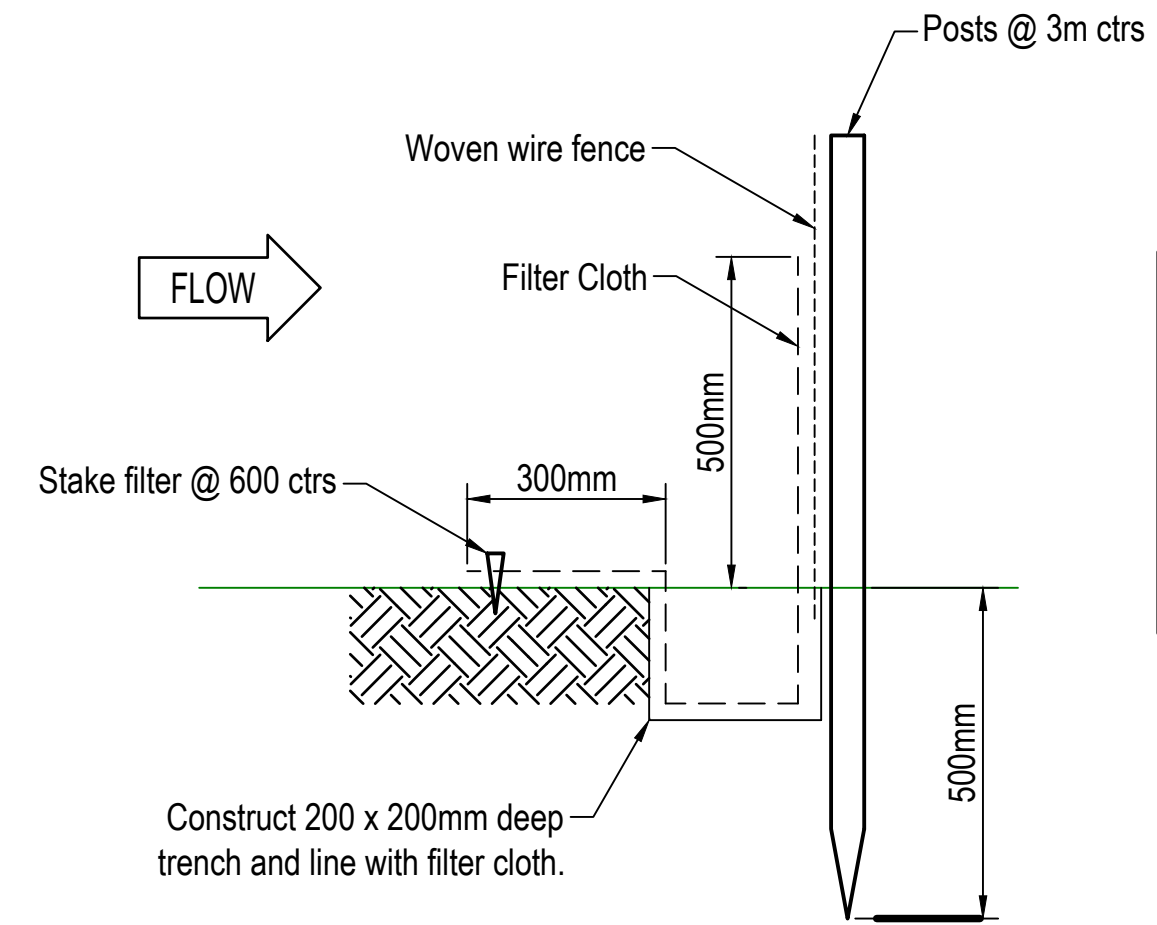
Title CRACOW ROAD UPGRADE (Ch. 70740m - 71055m) SITE 5 - CHRISTMAS CREEK FLOODWAY TEMPORARY EROSION AND SEDIMENT CONTROL SHEET 1					Job No.	CRC00289
Drawn S Lugo Munoz					Drawing No.	1700
Designed B Doherty					Revision	A
ENGINEERING CERTIFICATION (RPEQ)					Series No.	15 of 16
ENG. AREA	NAME	SIGNATURE	NO.	DATE		
Civil	P Meredith		15268			



N.T.S

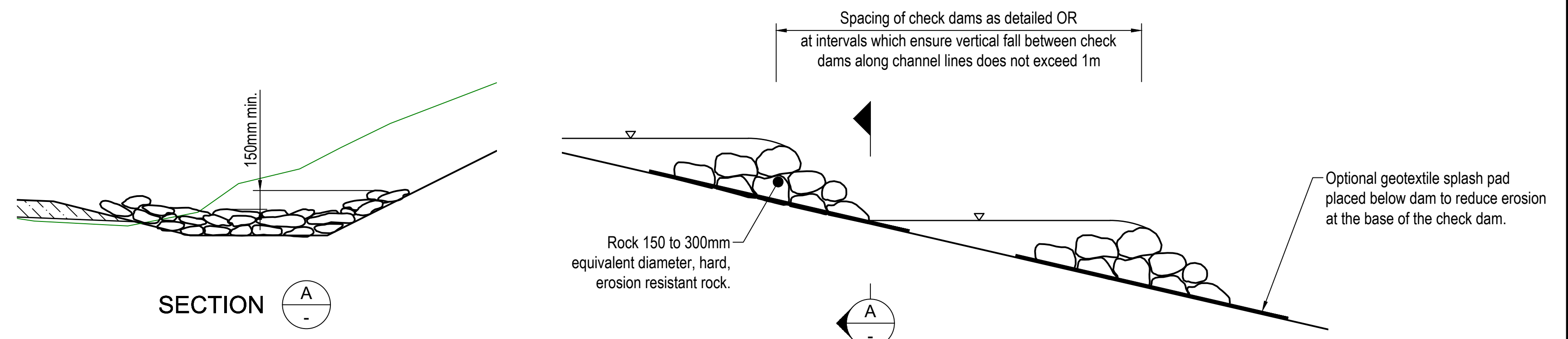
Diversion Bank
 (SF) Silt Fence
 Geo Log
 Dirty Water Flow
 Clean Water Flow
 CHECK Rock Check Dam
 RFD End of line rock check dam
 (to act as rock filter dam)
 Existing Trees

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 Cloth	Filter as specified (terram 100, polyfelt ts500, Bidim u24 or equivalent)
Prefabricated Unit	Geofab, envirofence or approved equivalent



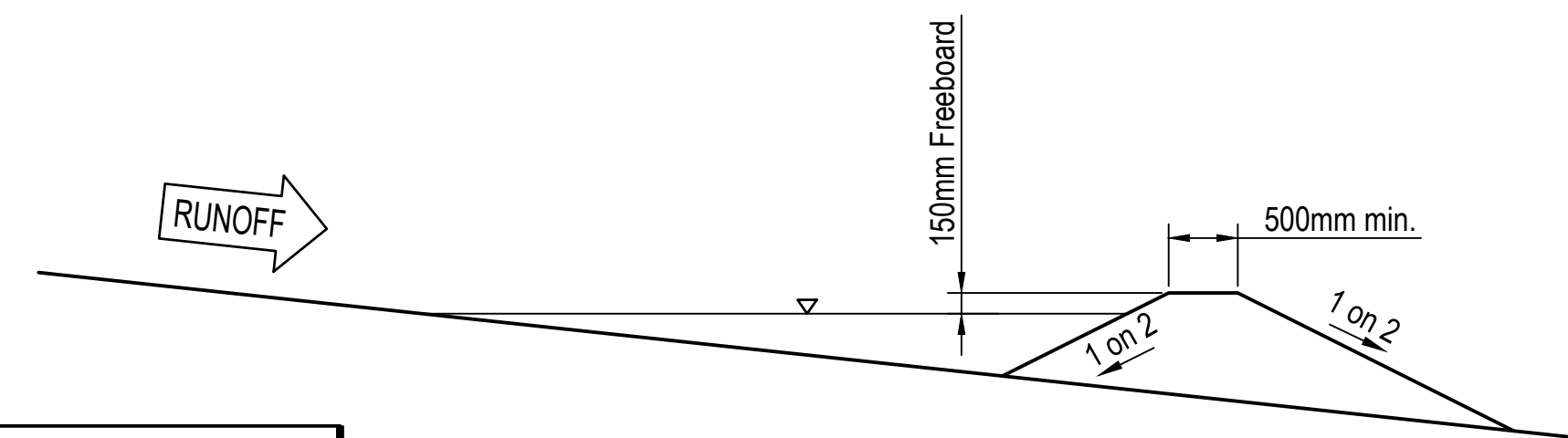
N.T.S

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 teils 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.



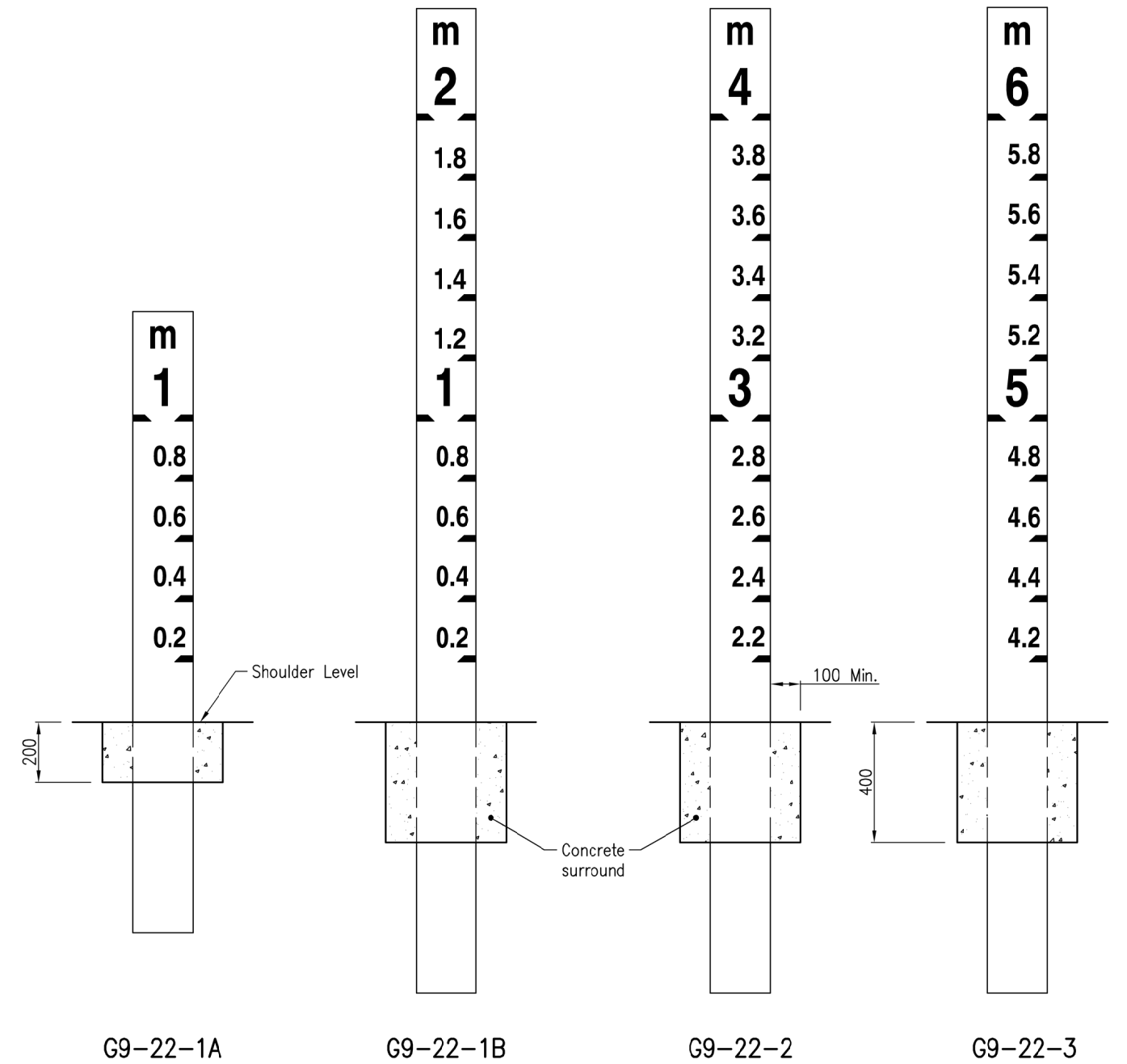
N.T.S

1. Design and construction of all sediment management devices is the contractors responsibility and shall be completed and effective prior to:
 - (i) Stripping of topsoil and grass.
 - (ii) Bulk earthworks to the site.
 - (iii) Service installations.
2. All sediment management devices are to remain in place until notice from the Contract Administrator
3. 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%.
4. 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.
5. 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.
6. Devices shown on the drawings shall not necessarily be limited to the locations shown.
Additional devices may be required as directed by Contract Administrator.
7. 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.
8. Contract Administrator to order installation of topsoil and grass seeding to disturbed areas.
9. The contractor shall ensure all turfed and/or seeded areas are regularly watered to ensure vegetation is maintained until there is 80% coverage.
10. 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.

N.T.S



NOTES:

FLOOD DEPTH INDICATORS:

1. To be located at the chainages specified or as directed by the Superintendent.
 2. Zero mark to be set at the lowest pavement level on the section of road subject to flooding.
 3. G9-22-2 and G9-22-3 indicators to be erected on progressively higher ground where flood depths are in excess of 1.5m or 3.5m respectively.
 4. To conform with the details as shown in the MUTCD.
- CONCRETE SURROUND:
5. To be class N20/20 and provide 100mm minimum cover all round.
 6. Dimensions are in millimetres unless shown otherwise.



ASSOCIATED DEPARTMENTAL DOCUMENTS:

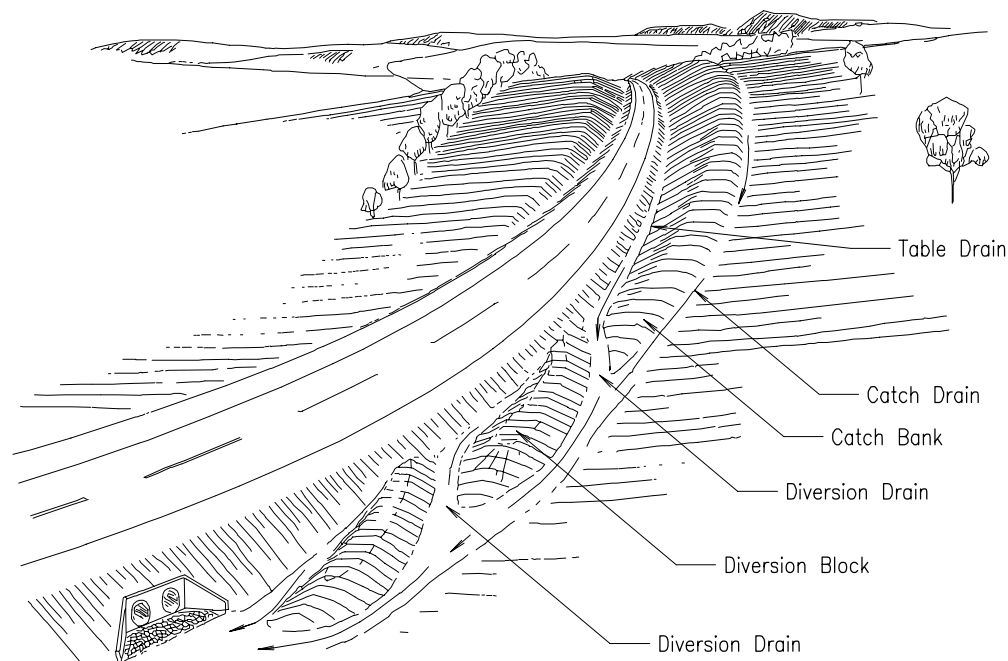
Standard Drawings
Specifications
Manual of Uniform Traffic Control Devices Part 2 (MUTCD)

REFERENCED DOCUMENTS:

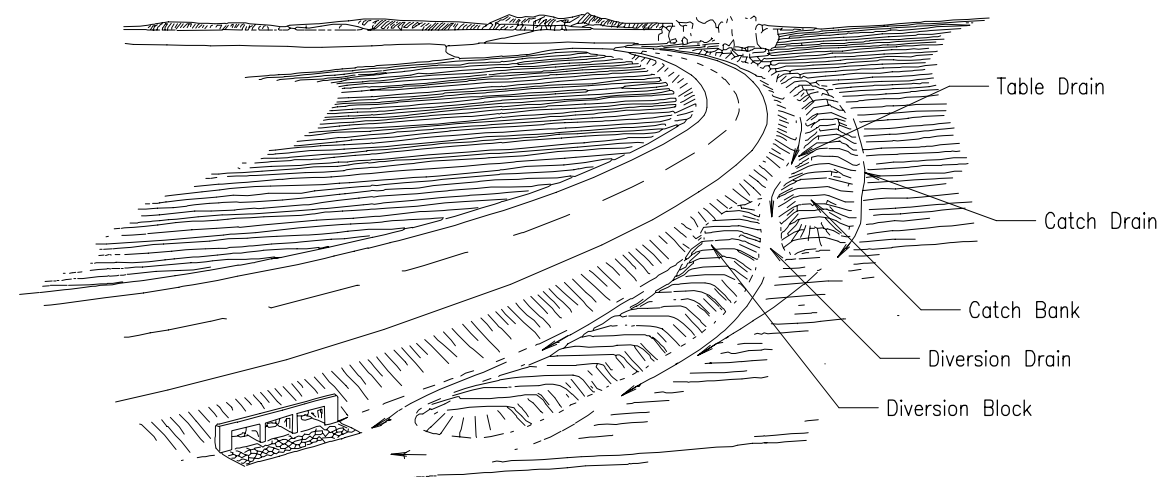
Departmental Specifications:
MRTS14 Road Furniture
MRTS70 Concrete

Australian Standards:
AS1743 Road Signs – Specifications

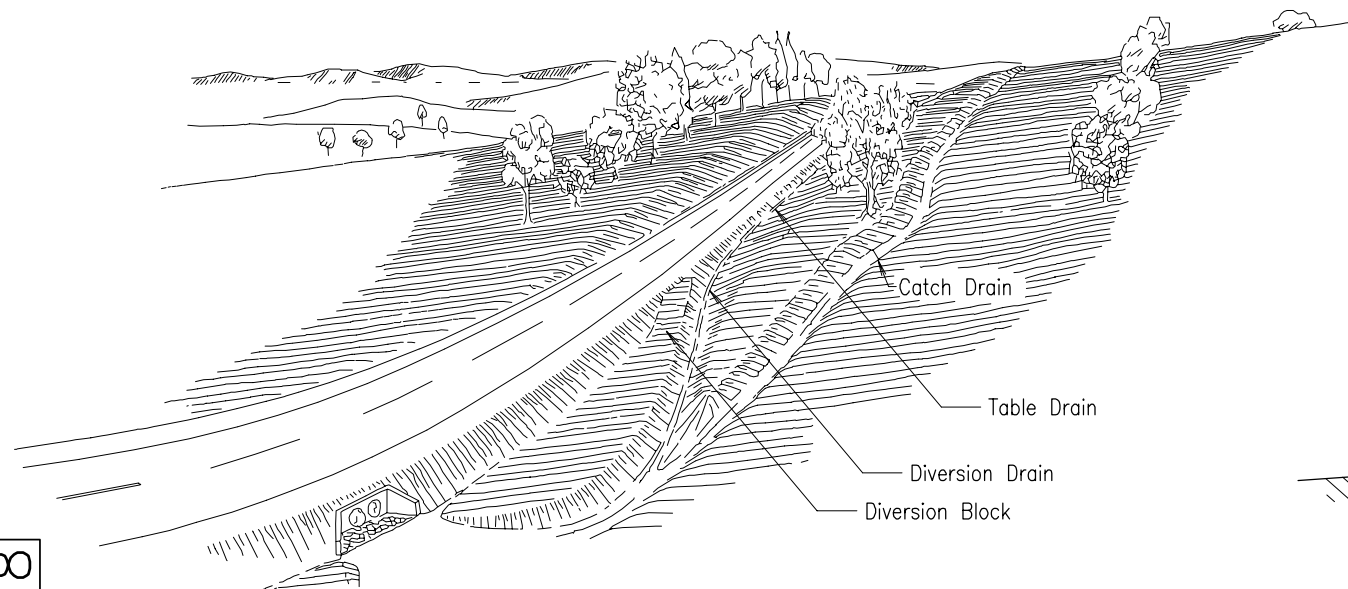
Department of Transport and Main Roads					
FLOOD DEPTH INDICATORS		© The State of Queensland (Department of Transport and Main Roads) 2022 http://creativecommons.org/licenses/by/4.0/			
INSTALLATION		A3	Standard Drawing No		
		Not to Scale	1170		
		Date 11/2022			
A	B	C	D		



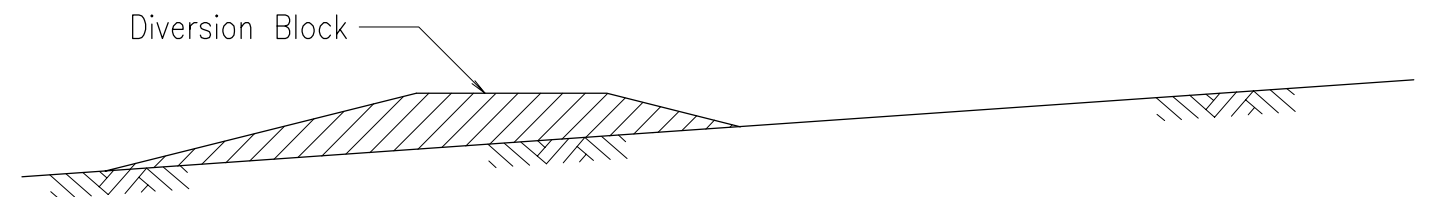
CATCH BANK ON
EARTHWORKS SECTIONS



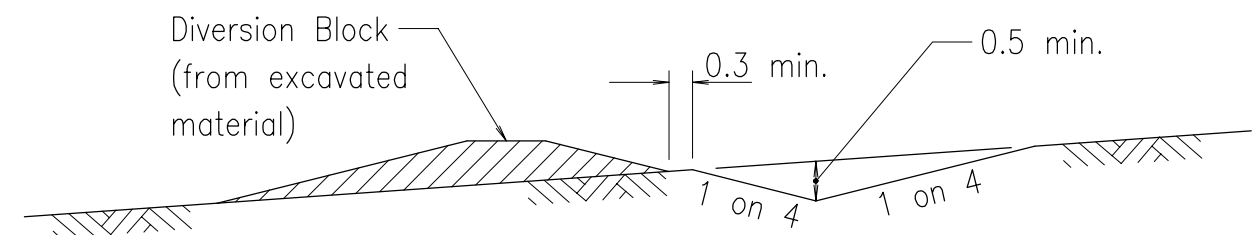
CATCH BANK ON
LOW FORMATION SECTIONS



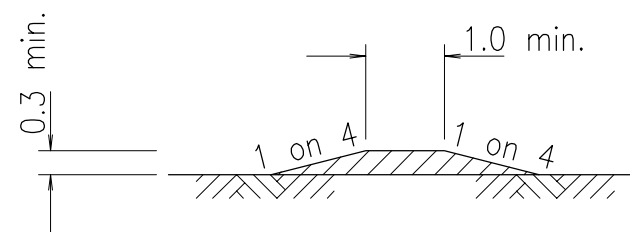
CATCH DRAINS ON
EARTHWORKS SECTIONS



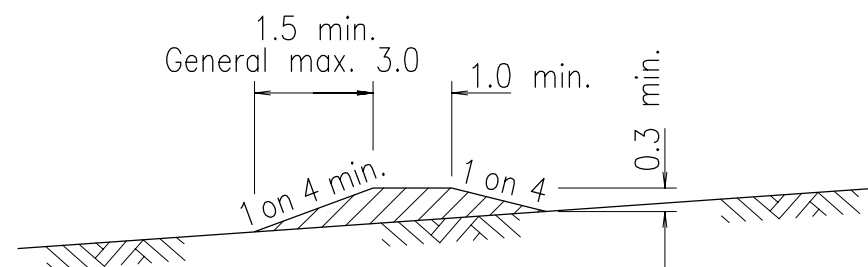
DIVERSION DRAIN IN ERODIBLE SOILS



DIVERSION DRAIN IN NON-ERODIBLE SOILS



DIVERSION BLOCK



CATCH BANK

NOTES:


1. DIVERSION DRAINS, unless shown otherwise in the scheme documents, shall be constructed at culverts and at intervals not exceeding 120m on grades up to 2%, 60m on grades 2% to 4%, 30m on grades 4% to 8% and 15m on grades over 8% (except in cuttings). They shall have a cross sectional area at least equal to the cross sectional area of the table drains carrying water to them.
2. ERODIBLE SOILS have sodic and/or dispersive characteristics. Soil testing is required prior to design.
3. DRAINAGE INTO PRIVATE PROPERTIES, with the cooperation of property owners, is to be discharged into contour banks and behind diversion banks to dams where possible.
4. DIMENSIONS are in metres unless shown otherwise.

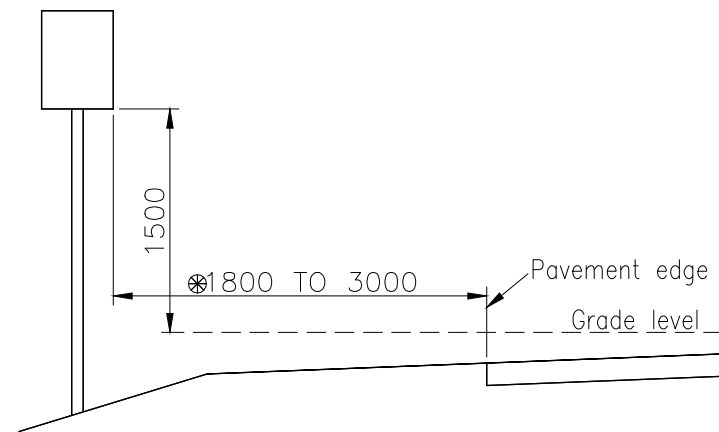
ASSOCIATED DOCUMENTS:

Department of Main Roads Manual of Standard Drawings Roads
Department of Main Roads Manual of Standard Specifications Roads
Department of Main Roads Road Drainage Design Manual

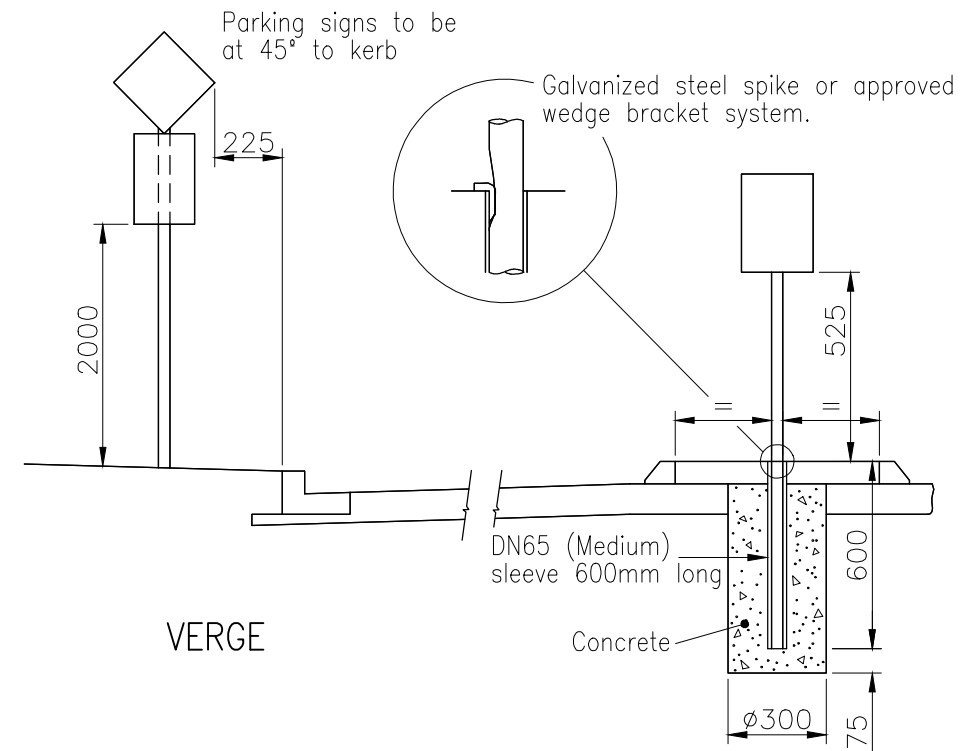
REFERENCED DOCUMENTS:

Standard Drawings:
1045 Revegetation Treatment of Cut Batters
Standard Specifications:
General Earthworks

DIVERSION OF WATER		 Queensland Government Department of Main Roads	
DIVERSION OF WATER FROM ROADWAY AND TABLE DRAINS		Size A3	Drawing No
		Scales as shown	1178 Date 10/03
		A	B C D E



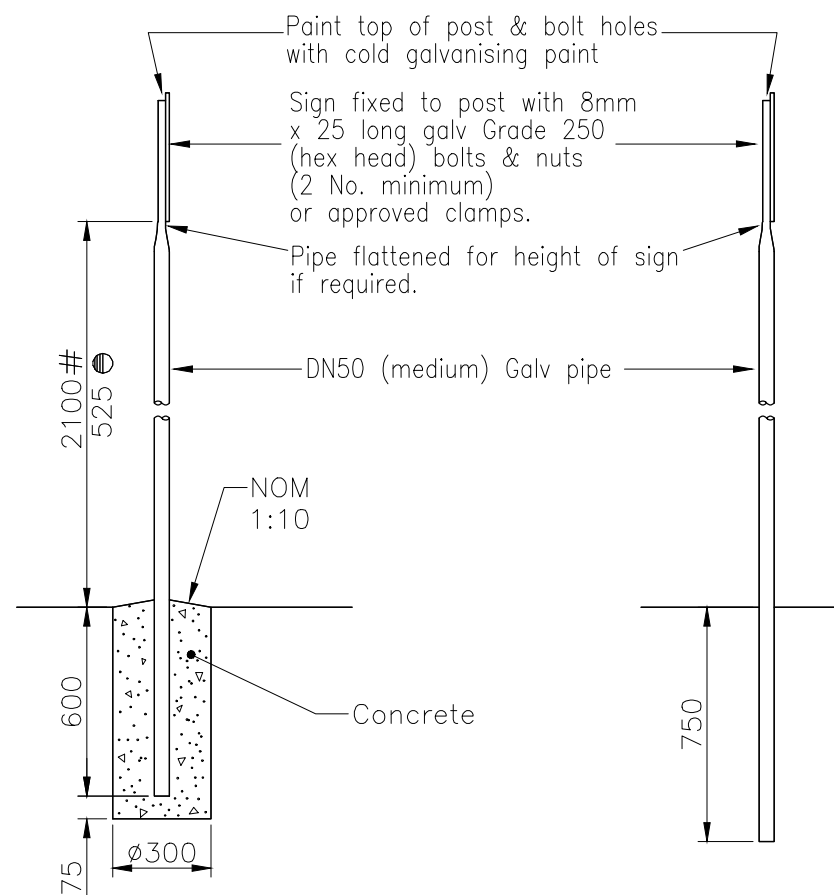
LOCATION OF SIGNS – RURAL ROADS



VERGE

MEDIAN

LOCATION OF SIGNS – STREETS



STREETS

RURAL ROADS

NOTES:

1. All signs to be reflectorised Class 1 to AS1743 unless noted otherwise.
2. Size & sign type has been included in the schedule and/or in the project drawings. Special standards are to be provided at large signs when indicated in the project drawings.
3. All signs are to be approved by the Superintendent prior to erection.
4. Where signs are to be erected in streets where footpaths are not constructed to permanent levels the Rural Roads type base shall be adopted.
5. Signs shall be out of aluminium or aluminium alloy not less than 2mm thick to AS 2848.
6. The DN65 sleeve and spike shall only be used on medians.
7. All pipes to be galvanised. Steel pipe to AS 1074. Galvanising to AS/NZS 4680.
8. Concrete N25 in accordance with AS 1379 and AS 3600.
9. Hexagonal head bolts to AS 1111.
Nuts to AS 1112.
Washers to AS 1237.
Galvanizing to AS 1214.
10. All dimensions in millimetres.
11. Sleeve to be provided as directed by Council

LEGEND

on footpaths

⊗ As directed by the Superintendent

⊙ on medians

APPLICABILITY TABLE

Council	BSC	CHRC	GRC	IRC	LSC	MRC	RRC
Applicable	Yes	Yes	Yes	Yes	Yes	Yes	Yes

REVISIONS	DATE
E IRC ADDED	12/2016
D GRC AND LSC ADDED	09/2014
C MRC ADDED	04/2011
B NOTE 11 ADDED	07/2010
A POST AMALGAMATION REVIEW	01/2010

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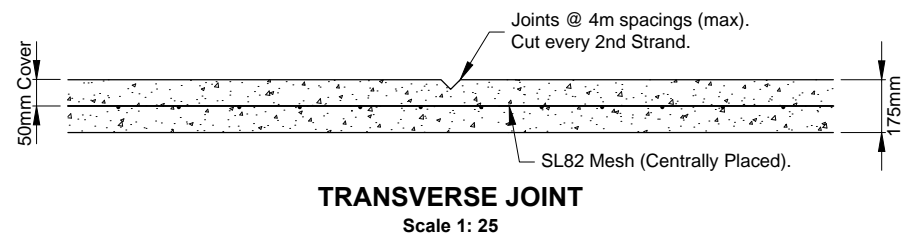
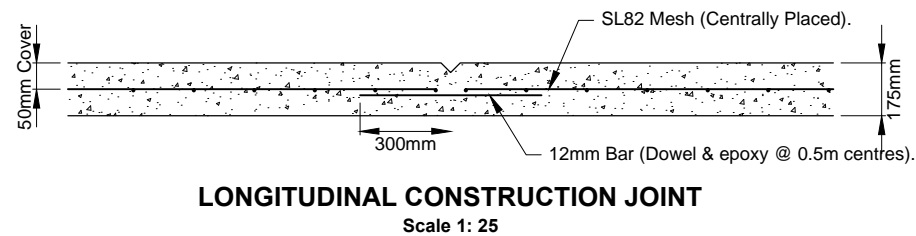
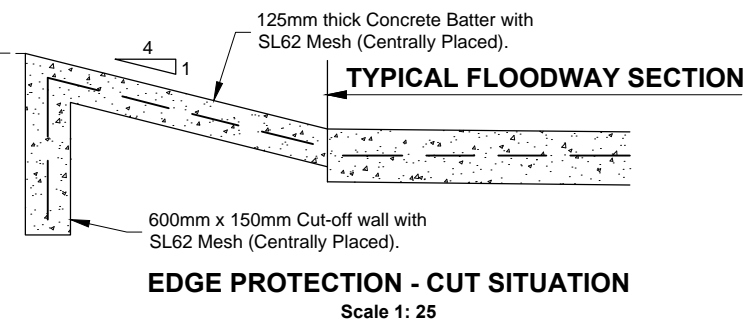
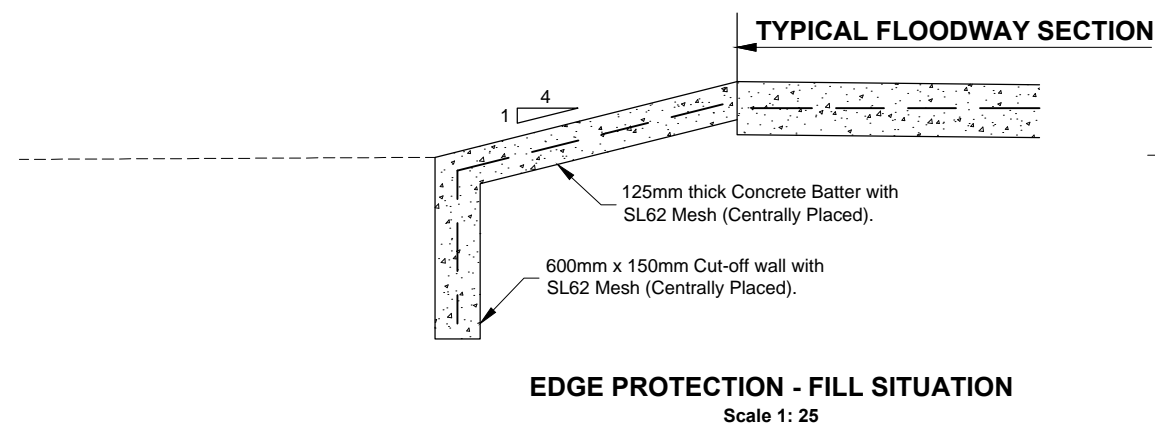
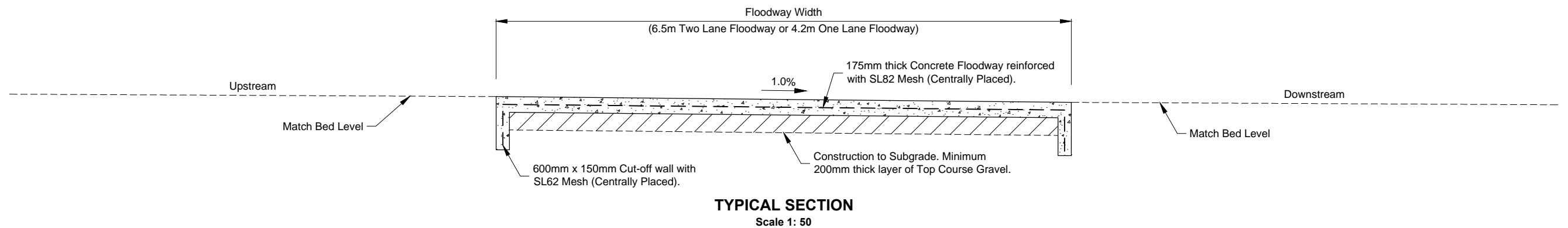
Capricorn Municipal Development Guidelines

Incorporating:

Banana Shire Council (BSC)
Central Highlands Regional Council (CHRC)
Gladstone Regional Council (GRC)
Isaac Regional Council (IRC)
Livingstone Shire Council (LSC)
Maranoa Regional Council (MRC)
Rockhampton Regional Council (RRC)

SIGN LOCATION AND INSTALLATION DETAILS

ROADS
STANDARD DRAWING
CMDG-R-081
REV. A B C D E



NOTES:

1. Provide Transverse joints at 4.0m spacings.
2. Provide longitudinal joints at centreline for two-lane floodway.
3. Provide longitudinal joints at shoulder where edge-protection is required.
4. Concrete strength to be 32 MPa.
5. Lap Reinforcement fabric 250mm.
6. Floodway signage to be installed in accordance with MUTCD (Part 2, Figure 4.27).
7. Delineation to be installed on floodway shoulder at maximum 5m centres and spaced evenly to suit floodway length. Delineation to be installed at centreline of two-lane floodway.
8. Floodway depth markers to be installed at lowest point on floodway aligned to downstream side.

WATERWAY BARRIER WORKS - COMPLIANCE NOTES:

1. Floodway site to be checked on Queensland Government Spatial Data Layer "Queensland Waterways for Waterway Barrier Works" to determine if assessable or self-assessable codes apply.
2. The lowest level of the floodway must be installed at the level of lowest point of the natural stream bed (Within the footprint of the crossing.)
3. There must be a height difference of at least 100mm from the lowest point of the crossing to the edges of the low flow section of the crossing.
4. The level of the remainder of the crossing must be no higher than the lowest point of the natural stream bed outside of the low flow channel.
5. Refer to *Code for self-assessable development, Minor waterway barrier works, Part 4: Bed level crossings* for more information and alternative treatments.

APPLICABILITY TABLE							
Council	BSC	CHRC	GRC	IRC	LSC	MRC	RRC
Applicable	Yes	Yes	Yes	No	Yes	Yes	Yes
Applicable DWG	CMDG-R-094A						

REVISIONS		DATE
B	IRC ADDED	12/2016
A	ORIGINAL ISSUE	04/2016

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Isaac Regional Council (IRC)

Livingstone Shire Council (LSC)
Maranoa Regional Council (MRC)
Rockhampton Regional Council (RRC)

FLOODWAY – BED LEVEL CROSSING

ROADS				
STANDARD DRAWING				
CMDG-R-094				
REV.	A	B		



Cracow Road – Site 5

Christmas Creek Floodway

Safety in Design

Client: Banana Shire Council


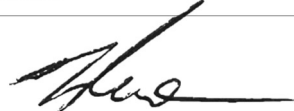
27/10/2023

Document Control

Document History

Date	Version	Name	Position	Action (Review/endorse/approve)
26/07/2023	0.1	Bryan Doherty	Senior Designer (Civil)	Draft for internal review
25/09/2023	0.2	Bryan Doherty	Senior Designer (Civil)	Draft for council review
27/10/2023	1.0	Bryan Doherty	Senior Designer (Civil)	Final

Certification

Date	Name	Position	Signature
27/10/2023	B. Doherty	Senior Designer	
27/10/2023	T. Penrose	RPEQ	

Contents

Document Control	1
Document History	1
Certification	1
Contents.....	1
1. Purpose of this Document	2
2. Project Scope and Objectives.....	2
3. Safe Design.....	2
4. Duty of Care/Disclaimer	3
5. Risk Management	4
6. Appendix A – Safe Design Risk Register	5

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, Site 5, Christmas Creek Floodway.

2. Project Scope and Objectives

Scope of works for this project include,

- Pavement widening and overlay and stabilized floodway approaches.
- Geometric improvements.
- Floodway reconstruction and protective works
- Signage and road edge guideposts.

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, Site 5, Christmas Creek Floodway 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	BSC to prepare contingency plans to reduce project cost to within budget constraints.	2	D	Moderate	BSC	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 BSC. 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 BSC 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	<ul style="list-style-type: none">• 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.• Locating activities have been carried out as part of the design phase.• Contractor to complete service locations to verify no existing infrastructure is present within the works footprint.	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.	2	D	Moderate	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	BSC	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.	1	E	Moderate	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.	2	E	Significant	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.	1	E	Moderate	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	3	E	Extreme	Consider construction methodology prior to implementation.	2	D	Moderate	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	2	B	Negligible	Temporary standalone LED lighting, if required.	1	B	Negligible	BSC	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.	4	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	D	Significant	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	<ul style="list-style-type: none">• 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	D	Significant	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	BSC	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	BSC	Ongoing	Residual risk with Principal
1	Finalisation	Not applying all the appropriate standards.	This could result in an unsafe design.	3	D	Significant	Carry out appropriate design reviews and RPEQ approvals	1	D	Moderate	Designer	Ongoing	Residual risk with Principal

