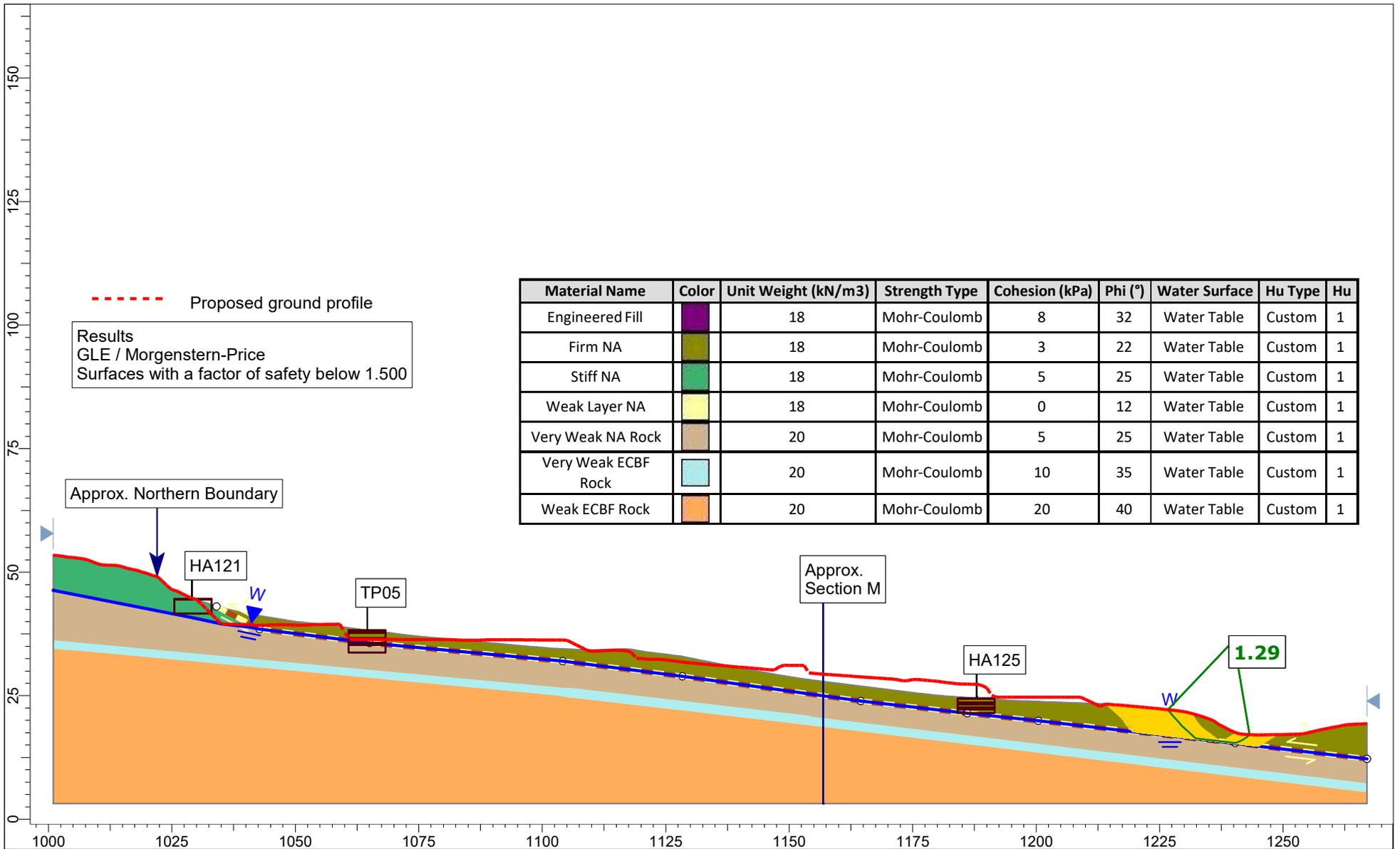


Appendix F

Slope Stability Analysis

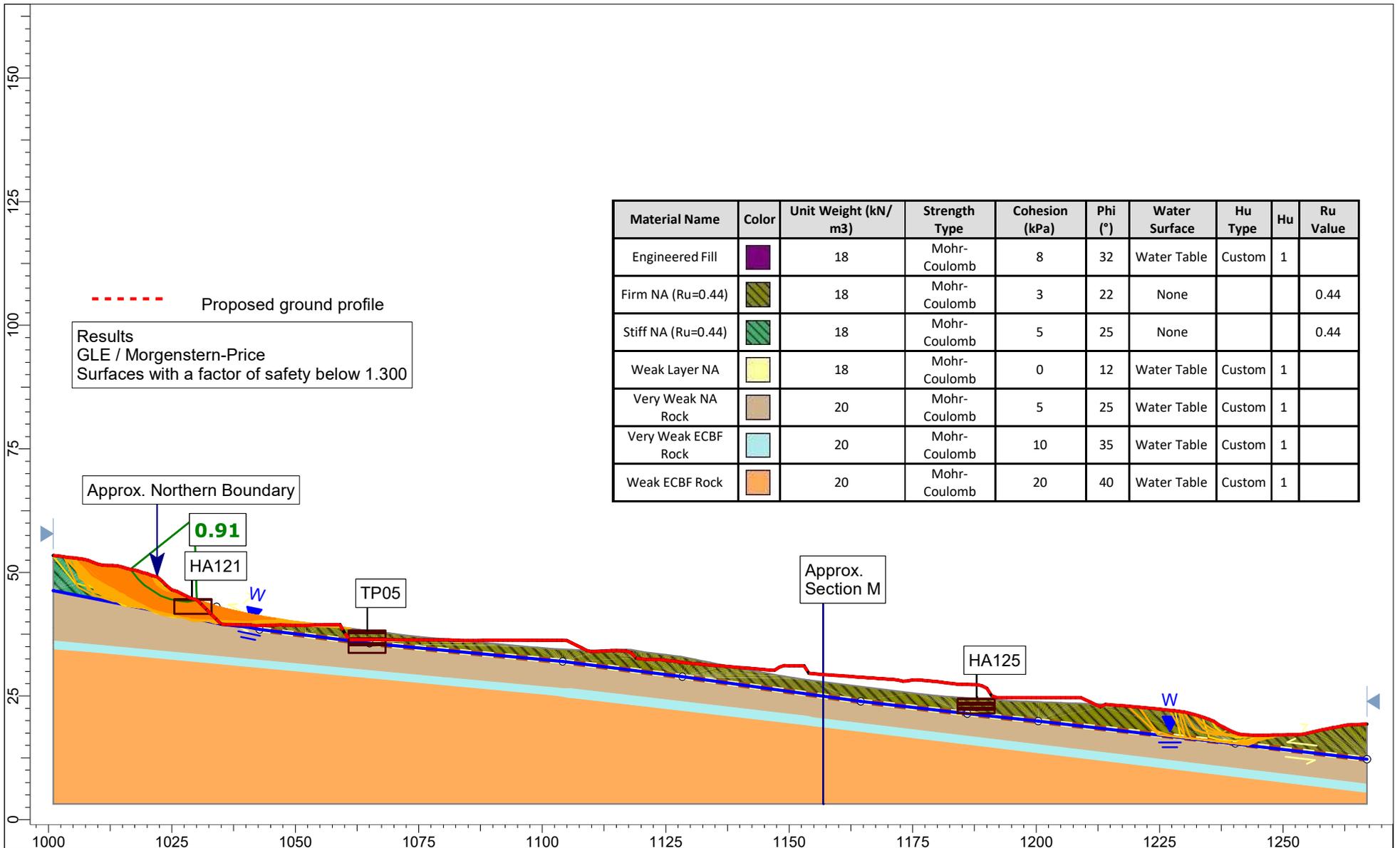


Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill	Dark Purple	18	Mohr-Coulomb	8	32	Water Table	Custom	1
Firm NA	Dark Green	18	Mohr-Coulomb	3	22	Water Table	Custom	1
Stiff NA	Medium Green	18	Mohr-Coulomb	5	25	Water Table	Custom	1
Weak Layer NA	Light Green	18	Mohr-Coulomb	0	12	Water Table	Custom	1
Very Weak NA Rock	Tan	20	Mohr-Coulomb	5	25	Water Table	Custom	1
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section A	Scenario	Normal (Measured GW)
Drawn By	AB	Company	Riley Consultants Ltd
Date	11/12/2024, 1:30:46 pm	File Name	Section A - Proposed GL.slmd

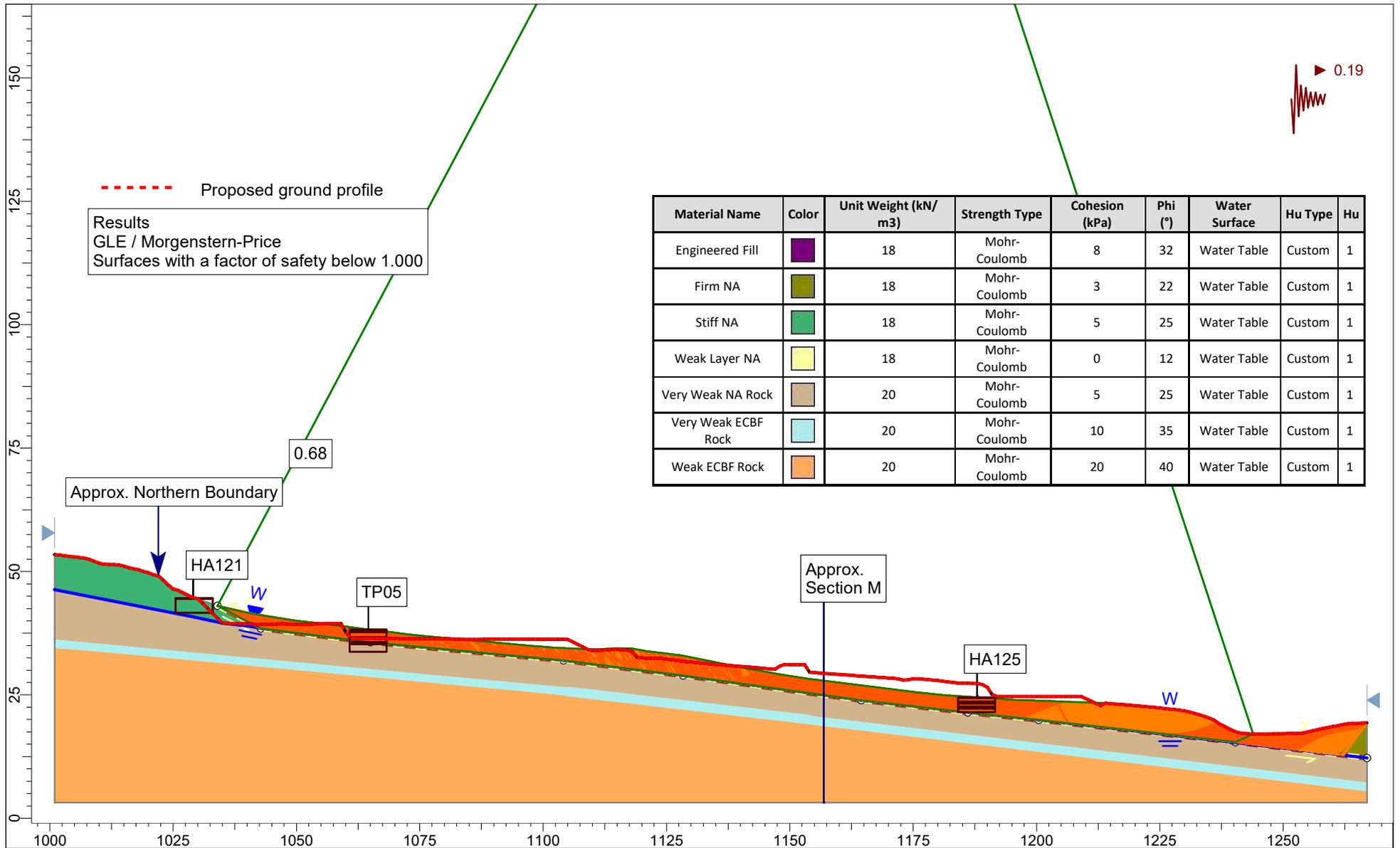


Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Firm NA (Ru=0.44)		18	Mohr-Coulomb	3	22	None			0.44
Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	25	None			0.44
Weak Layer NA		18	Mohr-Coulomb	0	12	Water Table	Custom	1	
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section A	Scenario	Extreme (Worst Credible)
Drawn By	AB	Company	Riley Consultants Ltd
Date	11/12/2024, 1:30:46 pm	File Name	Section A - Proposed GL.slmd

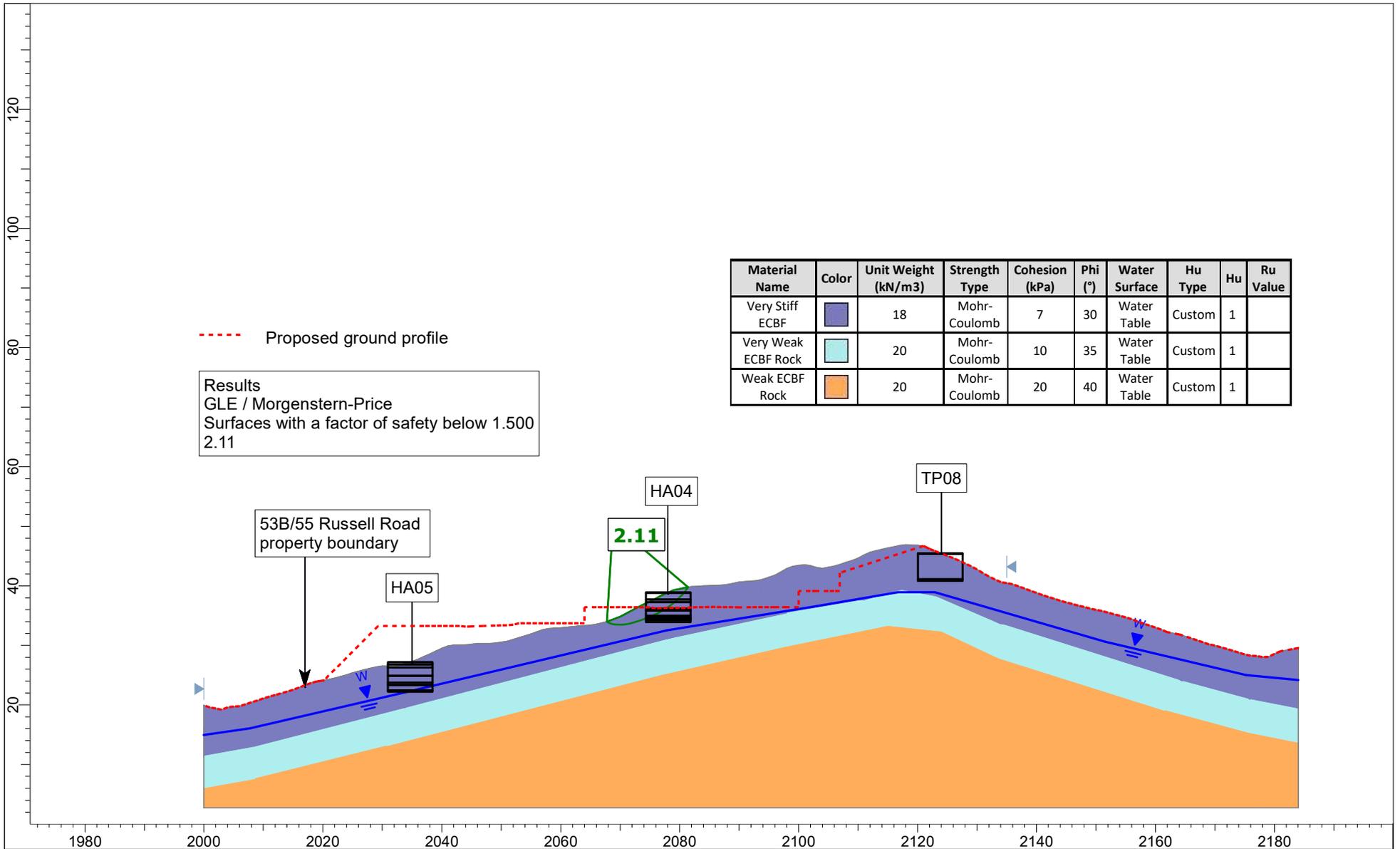


Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000

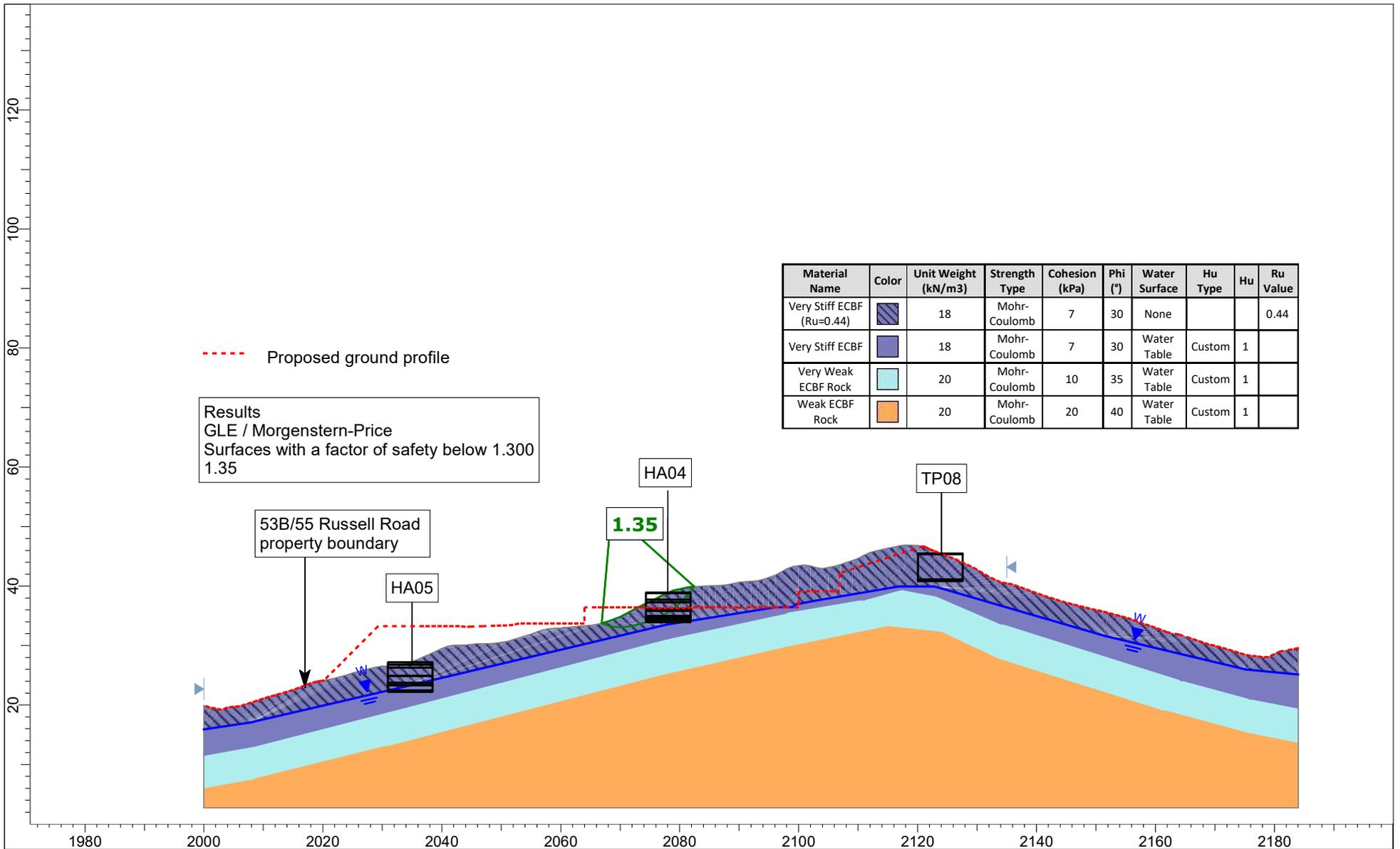
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	Water Table	Custom	1
Firm NA	Olive Green	18	Mohr-Coulomb	3	22	Water Table	Custom	1
Stiff NA	Green	18	Mohr-Coulomb	5	25	Water Table	Custom	1
Weak Layer NA	Yellow	18	Mohr-Coulomb	0	12	Water Table	Custom	1
Very Weak NA Rock	Brown	20	Mohr-Coulomb	5	25	Water Table	Custom	1
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section A	Scenario	Seismic (0.19g)
Drawn By	AB	Company	Riley Consultants Ltd
Date	11/12/2024, 1:30:46 pm	File Name	Section A - Proposed GL.slmd



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section B	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	File Name	Section B - Proposed GL.slmd

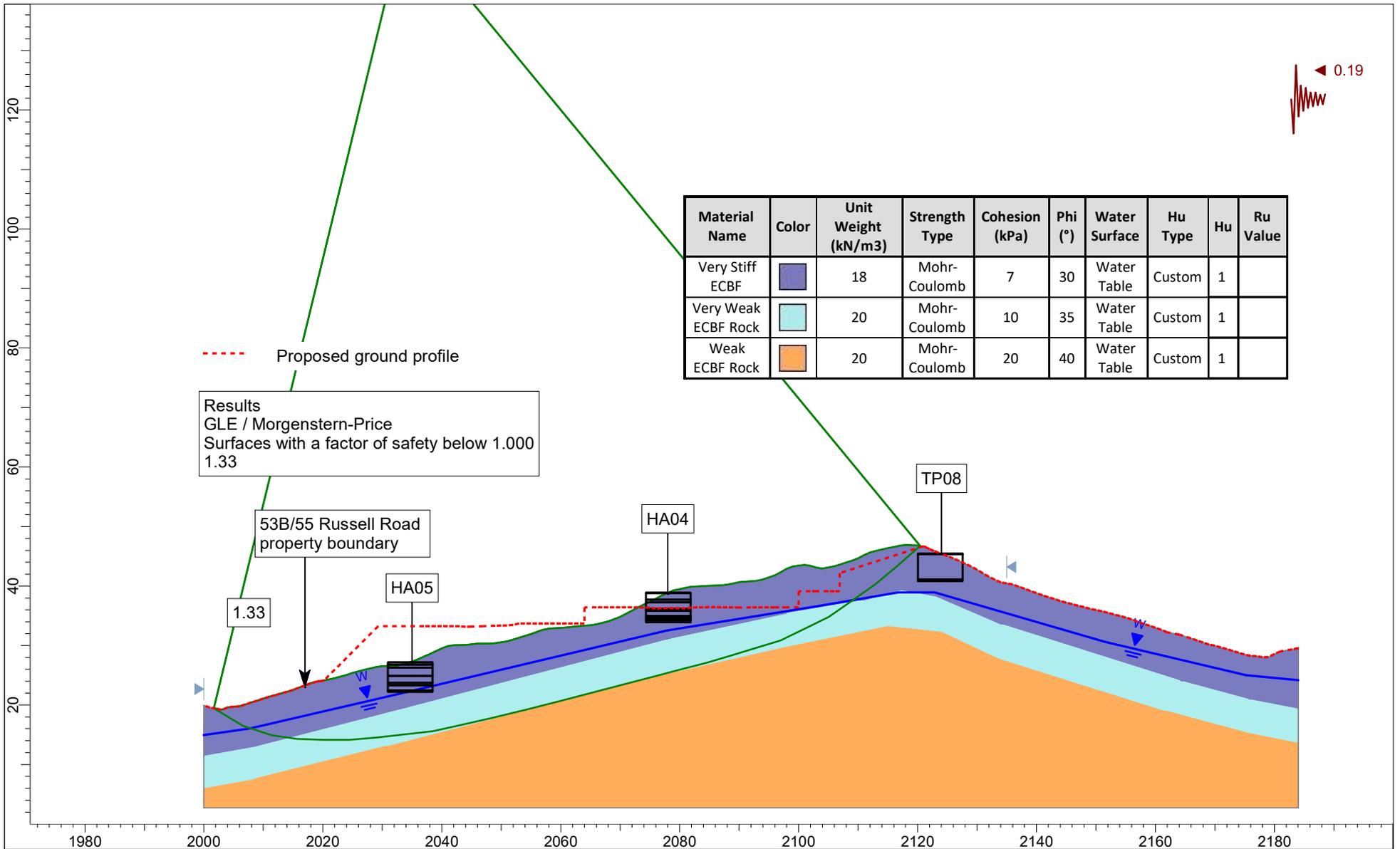


Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
1.35



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section B	Scenario	Extreme (Worst Credible GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	File Name	Section B - Proposed GL.slmd



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
1.33

53B/55 Russell Road
property boundary

HA05

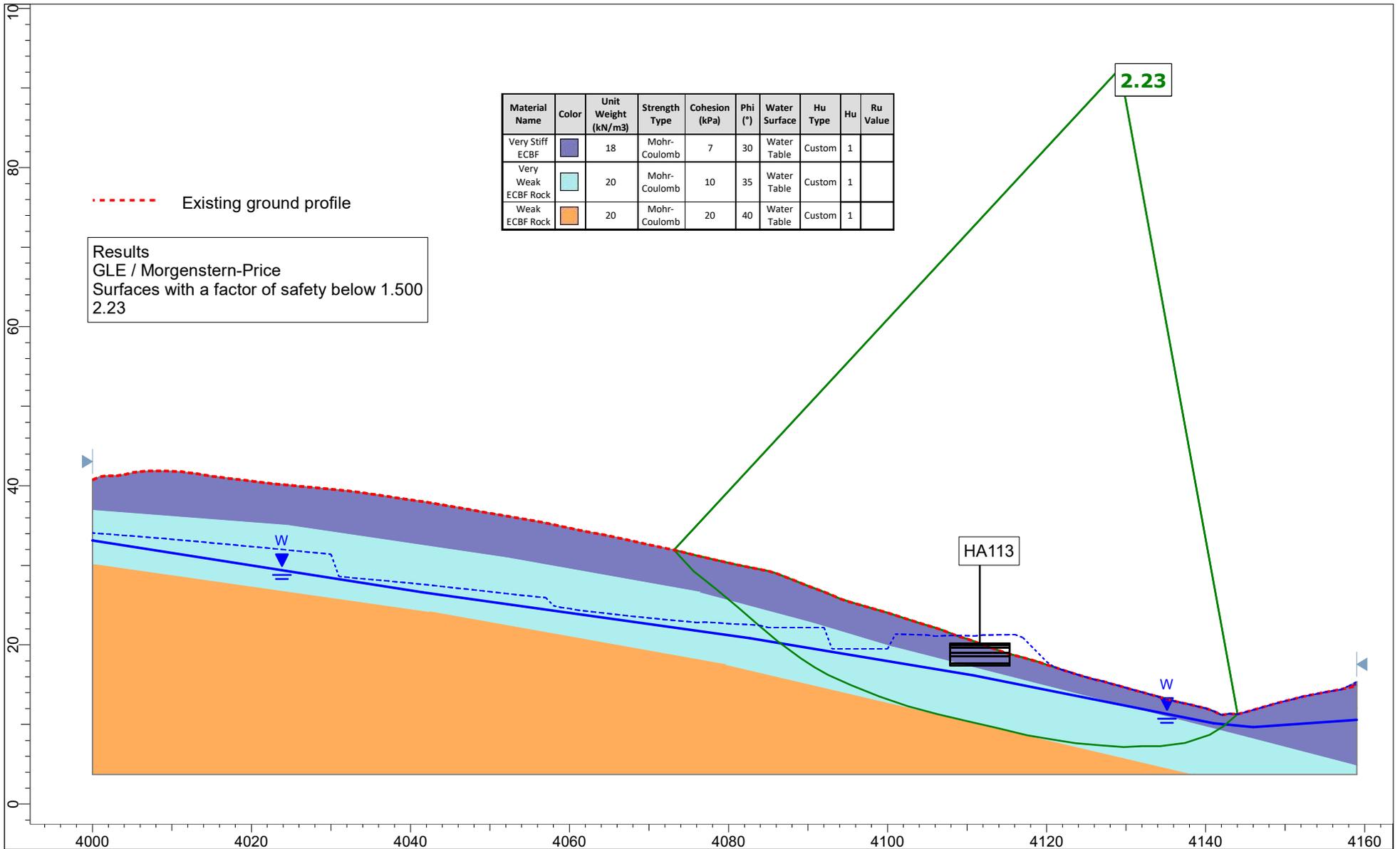
HA04

TP08

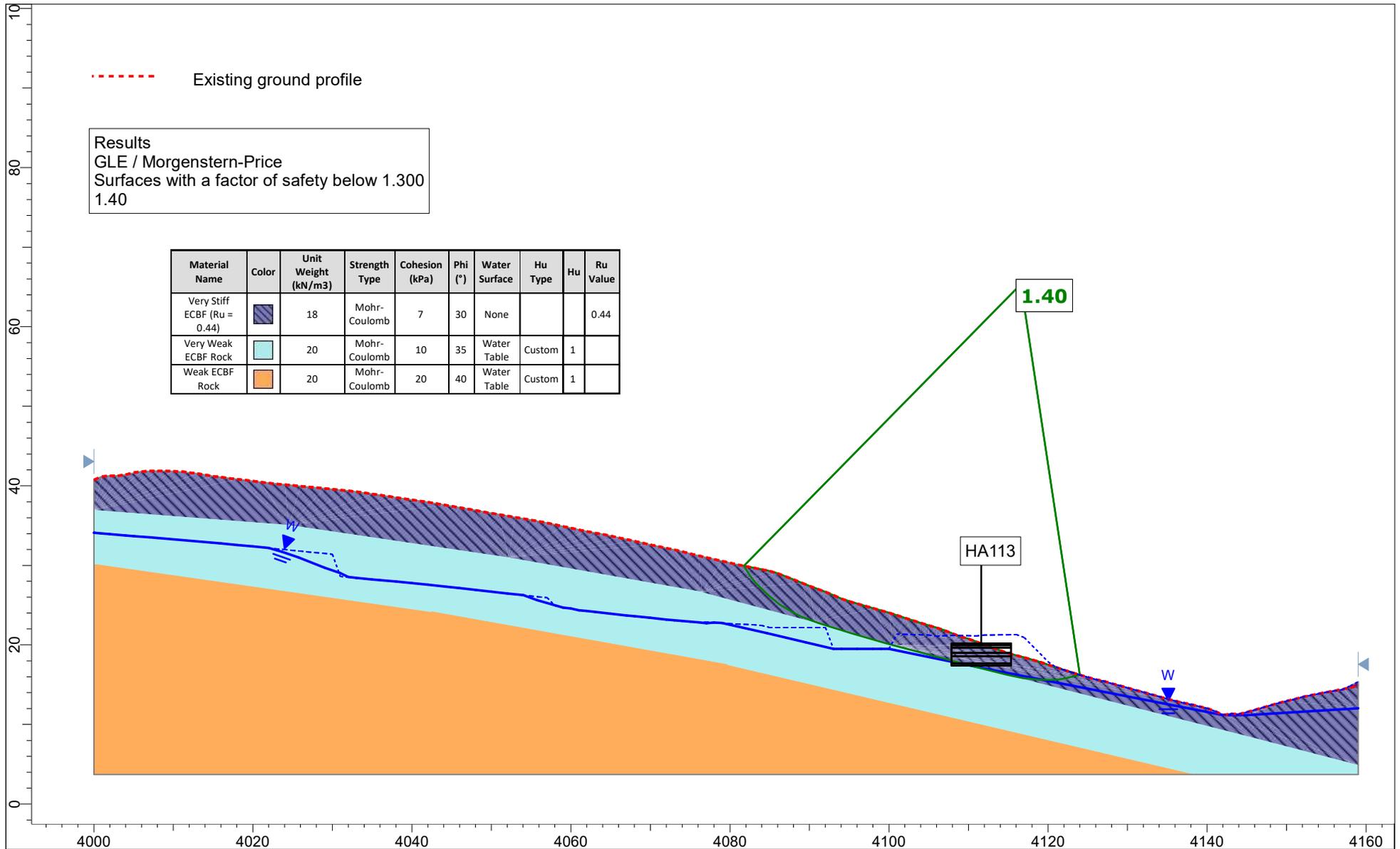
1.33



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section B	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	File Name	Section B - Proposed GL.slmd



Project	240065 - Russell Road, Wainui - Stage 1		
Group	Existing GL Section D	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 4:26:19 pm	File Name	Section D - Proposed GL.slmd



Existing ground profile

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
1.40

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Very Stiff ECBF (Ru = 0.44)		18	Mohr-Coulomb	7	30	None			0.44
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

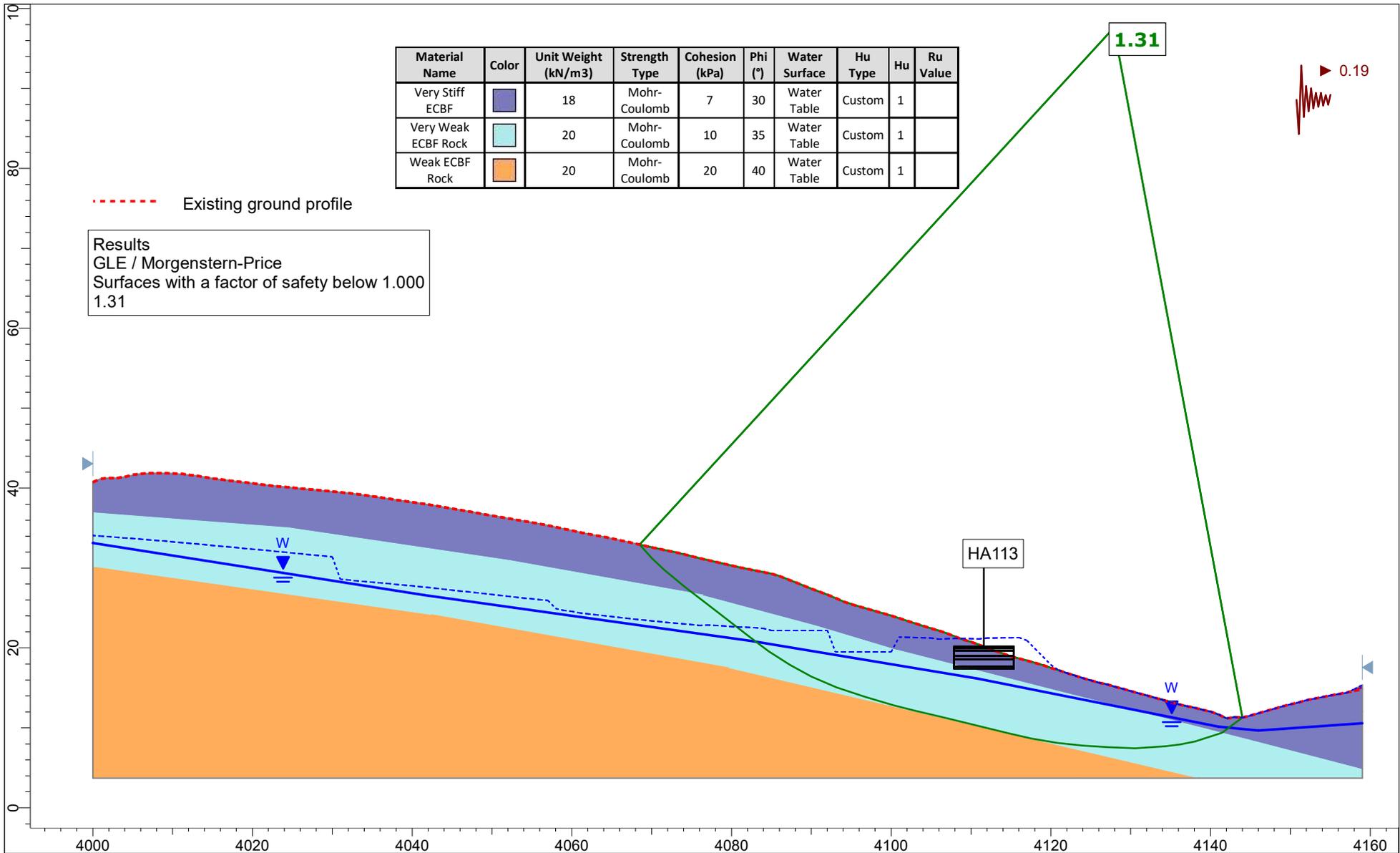
1.40

HA113

W

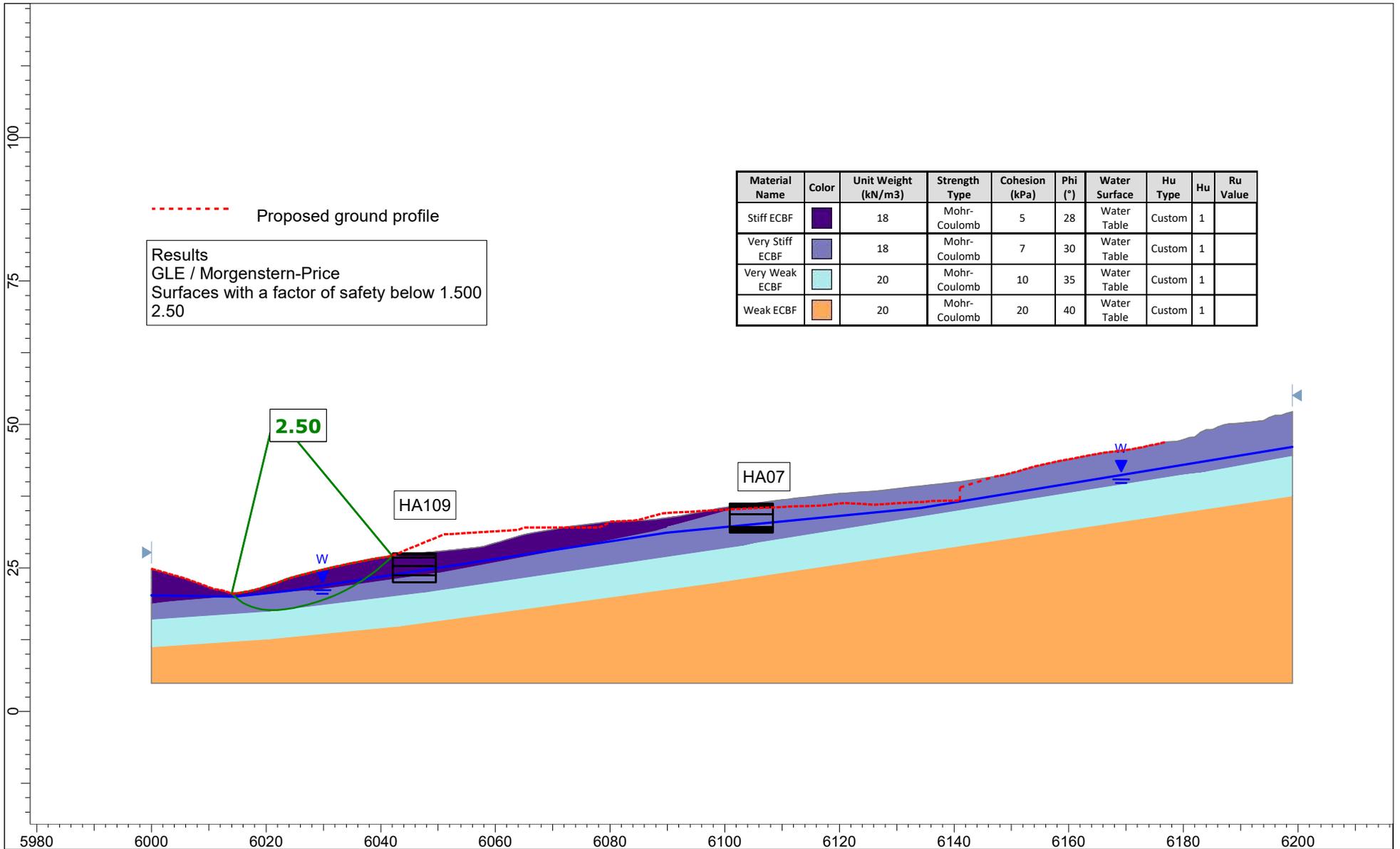


Project	240065 - Russell Road, Wainui - Stage 1		
Group	Existing GL Section D	Scenario	Extreme (Worst Credible GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 4:26:19 pm	File Name	Section D - Proposed GL.slmd



SLIDEINTERPRET 9.029

Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section D	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 4:26:19 pm	File Name	Section D - Proposed GL.slmd



..... Proposed ground profile

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
2.50

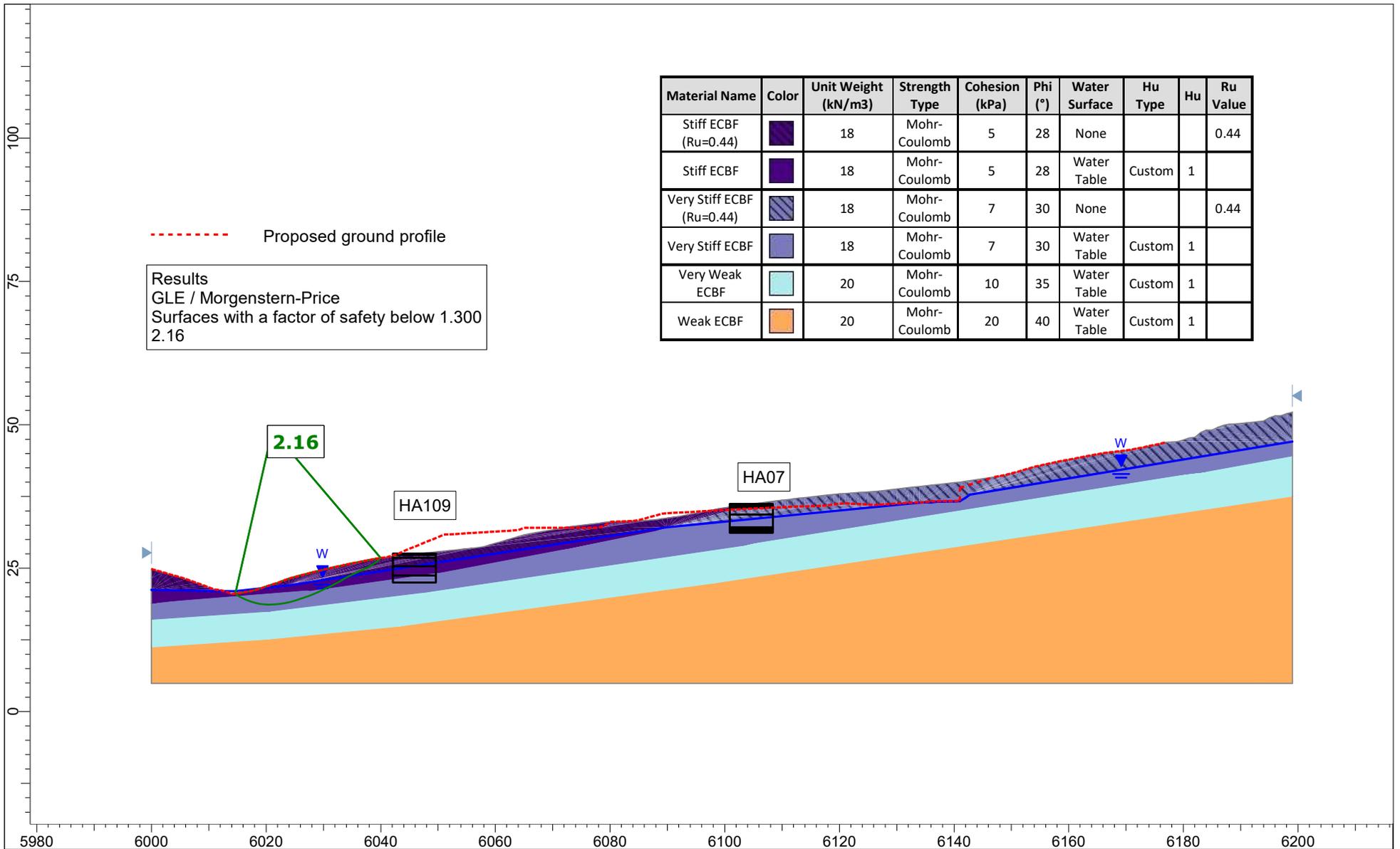
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF	Medium Purple	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

2.50

HA109

HA07

	Project		240065 - Russell Road, Wainui - Stage 1		
	Group		Existing GL Section F	Scenario	Normal (Measured GW)
	Drawn By		RS	Company	Riley Consultants Ltd
	Date		13/12/2024, 8:15:35 am	File Name	Section F - Proposed GL.sldm



Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
2.16

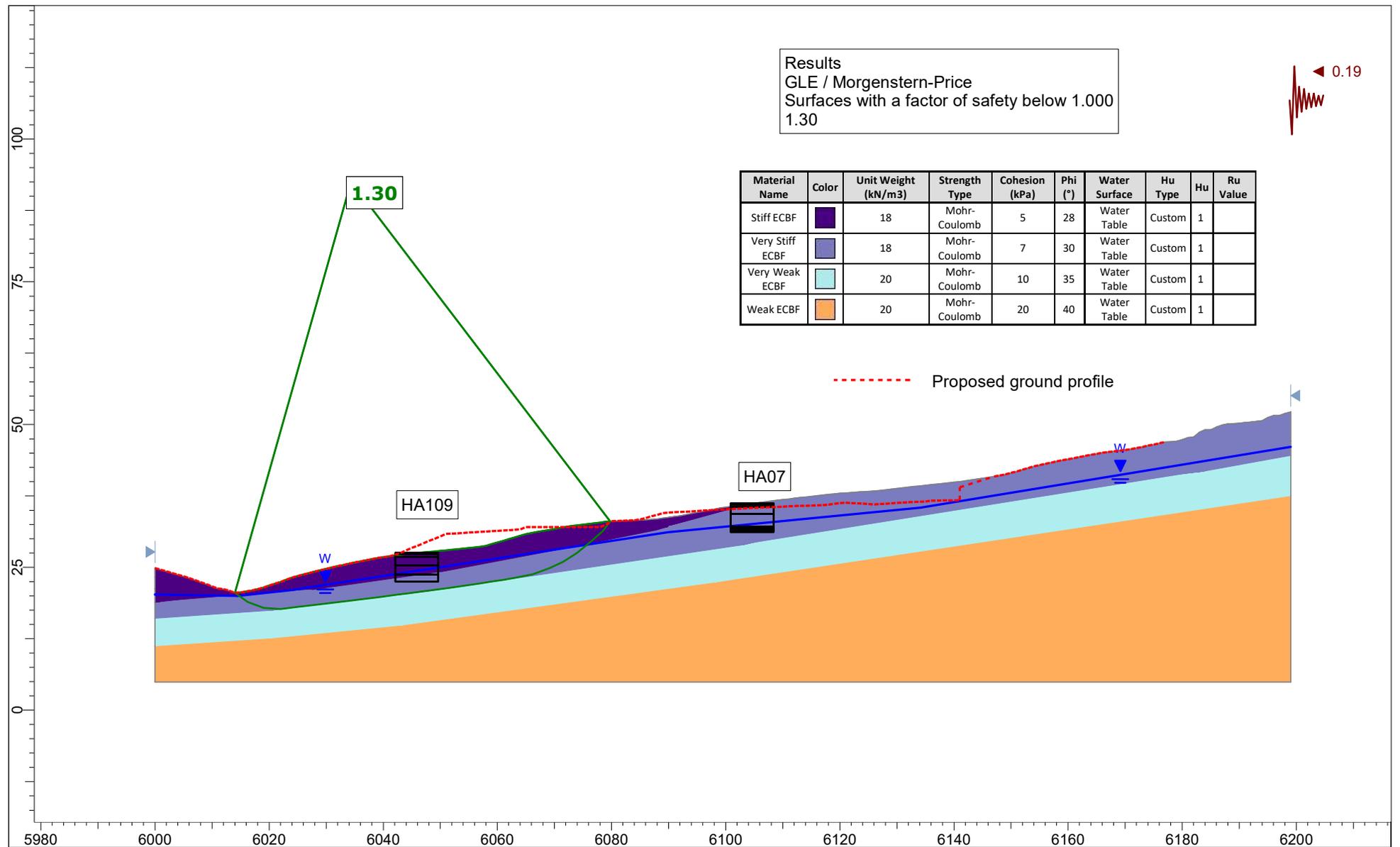
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Stiff ECFB (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Stiff ECFB		18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECFB (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECFB		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECFB		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECFB		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

	Project		240065 - Russell Road, Wainui - Stage 1		
	Group		Existing GL Section F	Scenario	Extreme (Worst Credible GW)
	Drawn By		RS	Company	Riley Consultants Ltd
	Date		13/12/2024, 8:15:35 am	File Name	Section F - Proposed GL.slmd

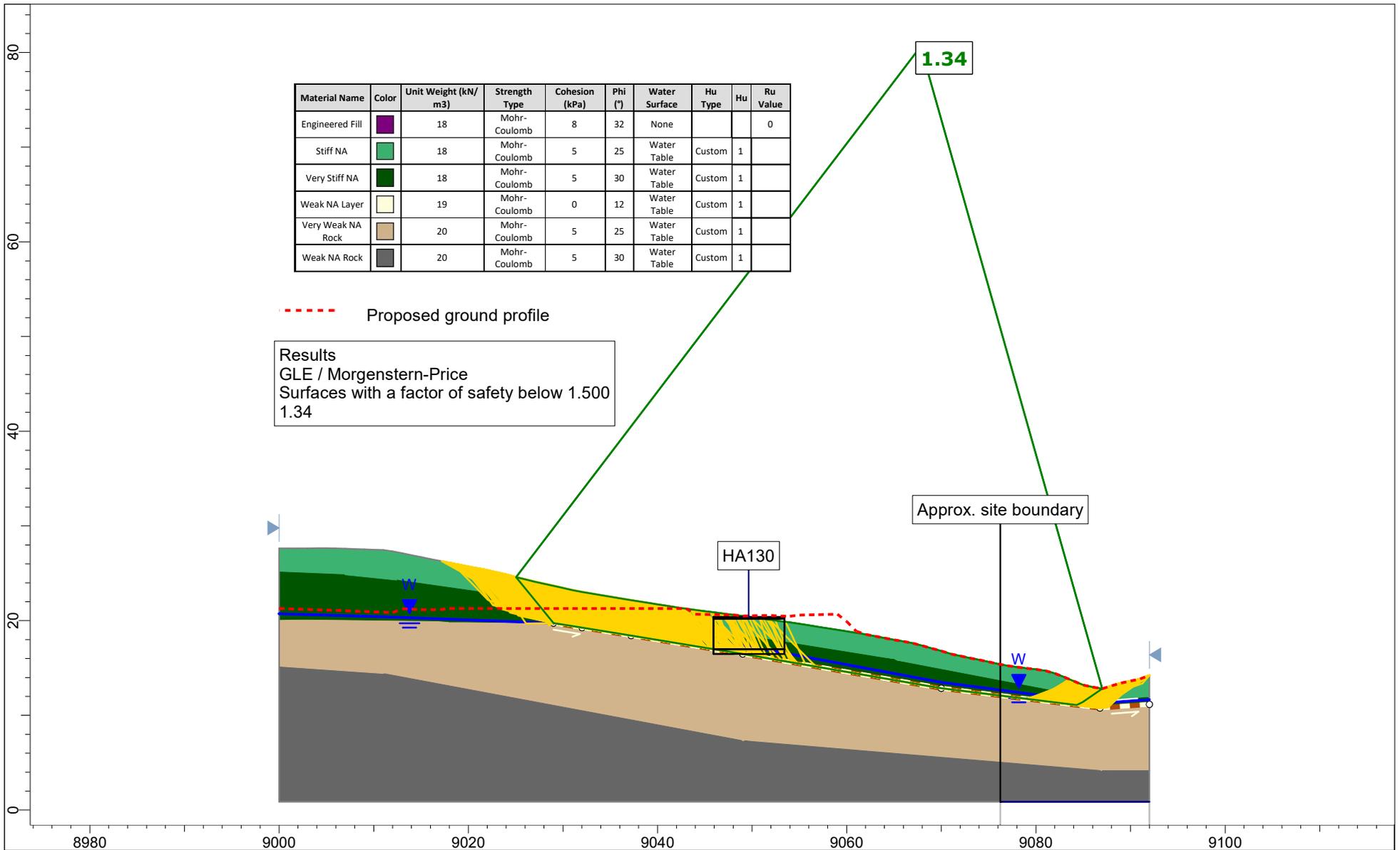
Results
 GLE / Morgenstern-Price
 Surfaces with a factor of safety below 1.000
 1.30



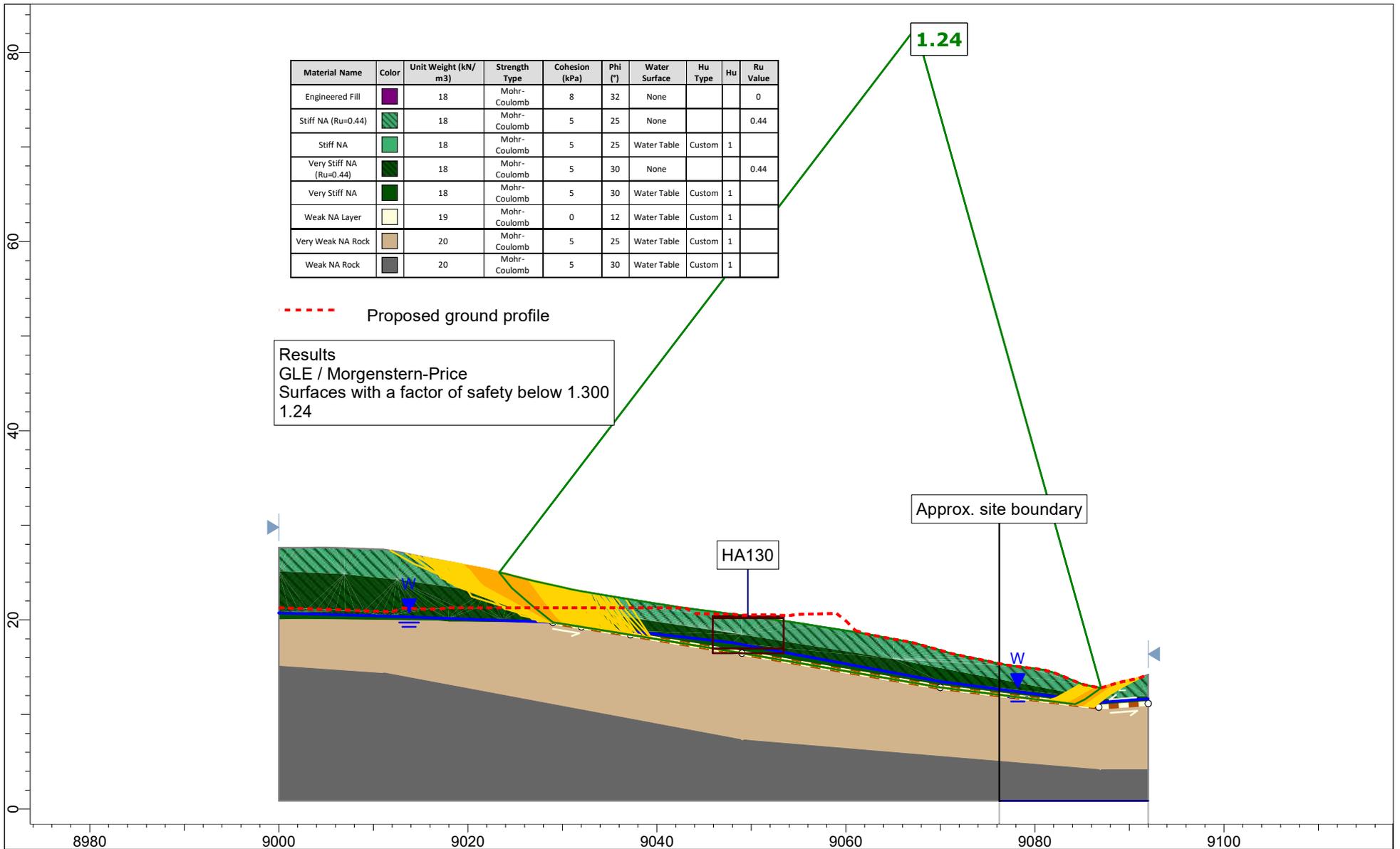
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF	Medium Purple	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	



	Project		240065 - Russell Road, Wainui - Stage 1	
	Group		Existing GL Section F	
	Scenario		Seismic (0.19g)	
	Company		Riley Consultants Ltd	
Drawn By		RS		
Date		13/12/2024, 8:15:35 am		
File Name		Section F - Proposed GL.sldm		



	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1	
	<i>Group</i> Existing GL Section I	<i>Scenario</i> Normal (Measured GW)
	<i>Drawn By</i> ADT	<i>Company</i> Riley Consultants Ltd
	<i>Date</i> 15/01/2025	<i>File Name</i> Section I - Proposed GL.slm



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	[Purple]	18	Mohr-Coulomb	8	32	None			0
Stiff NA (Ru=0.44)	[Green with diagonal lines]	18	Mohr-Coulomb	5	25	None			0.44
Stiff NA	[Light Green]	18	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)	[Dark Green]	18	Mohr-Coulomb	5	30	None			0.44
Very Stiff NA	[Dark Green]	18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Weak NA Layer	[Light Yellow]	19	Mohr-Coulomb	0	12	Water Table	Custom	1	
Very Weak NA Rock	[Brown]	20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Weak NA Rock	[Grey]	20	Mohr-Coulomb	5	30	Water Table	Custom	1	

----- Proposed ground profile

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
1.24

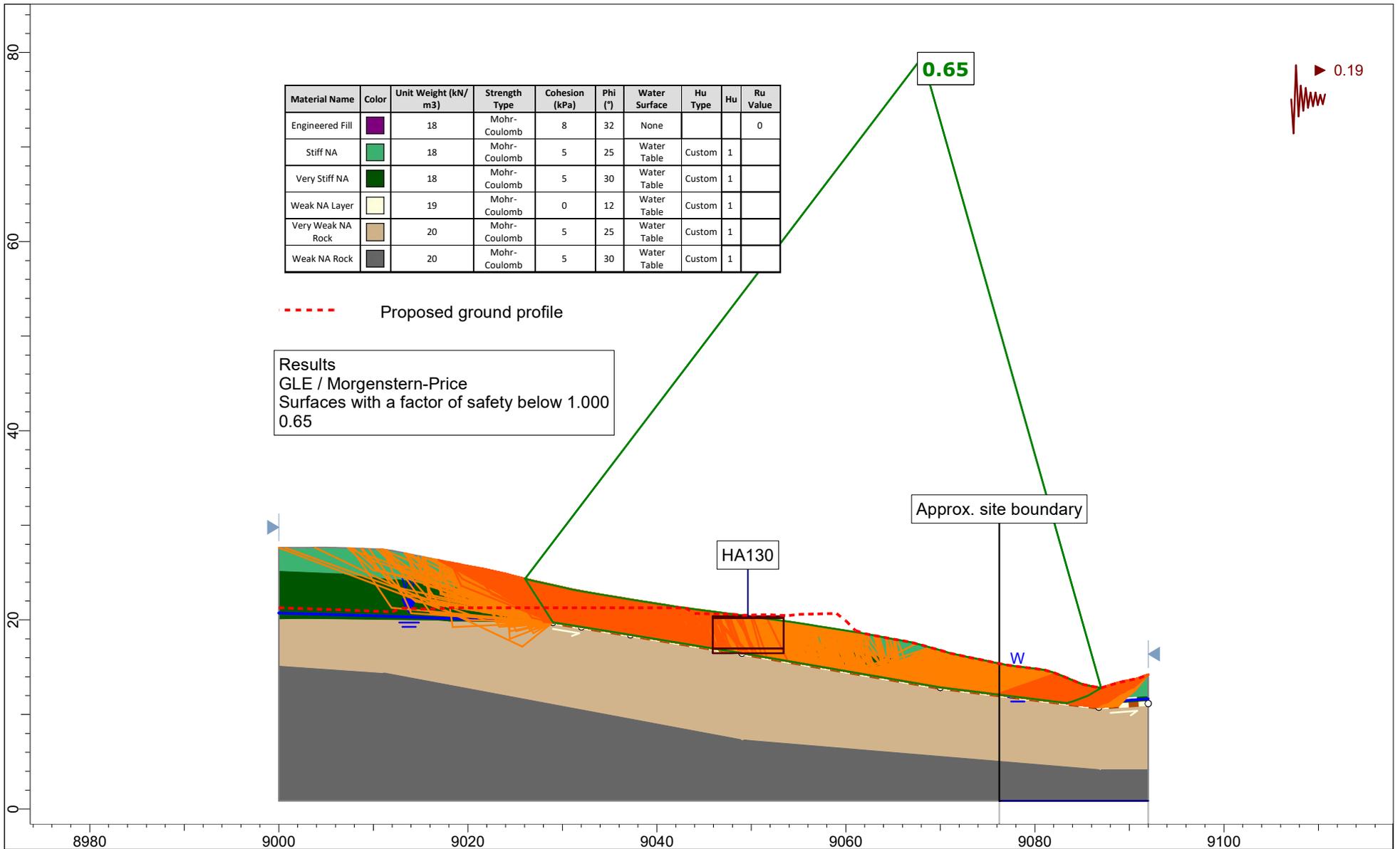
1.24

Approx. site boundary

HA130

W

	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Existing GL Section I	Scenario	Extreme (Worst Credible GW)
	Drawn By	ADT	Company	Riley Consultants Ltd
	Date	15/01/2025	File Name	Section I - Proposed GL.sldm



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	■	18	Mohr-Coulomb	8	32	None			0
Stiff NA	■	18	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff NA	■	18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Weak NA Layer	■	19	Mohr-Coulomb	0	12	Water Table	Custom	1	
Very Weak NA Rock	■	20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Weak NA Rock	■	20	Mohr-Coulomb	5	30	Water Table	Custom	1	

----- Proposed ground profile

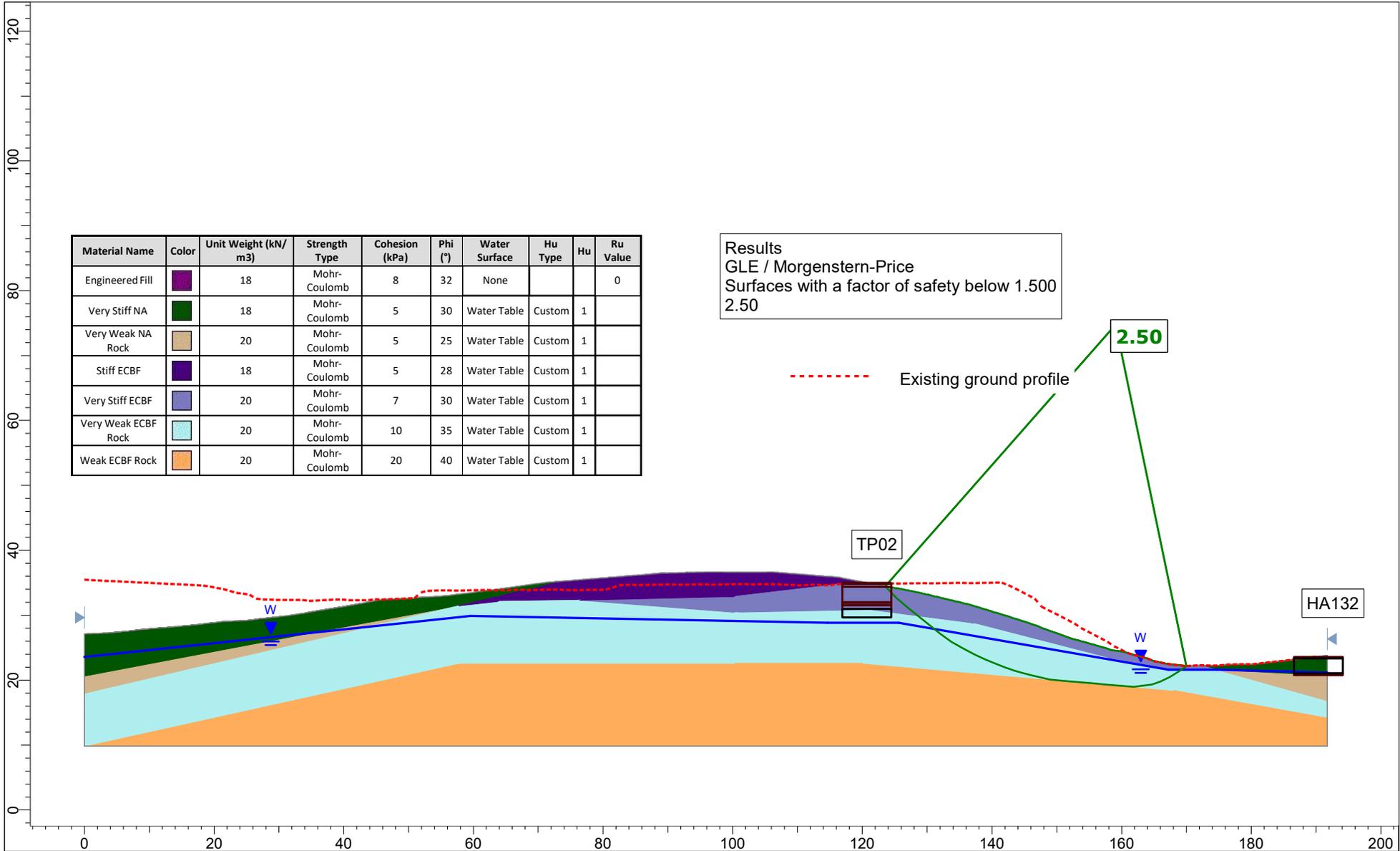
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.65

Approx. site boundary

HA130

W

	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Existing GL Section I	Scenario	Seismic (0.19g)
	Drawn By	ADT	Company	Riley Consultants Ltd
	Date	15/01/2025	File Name	Section I - Proposed GL.slmd

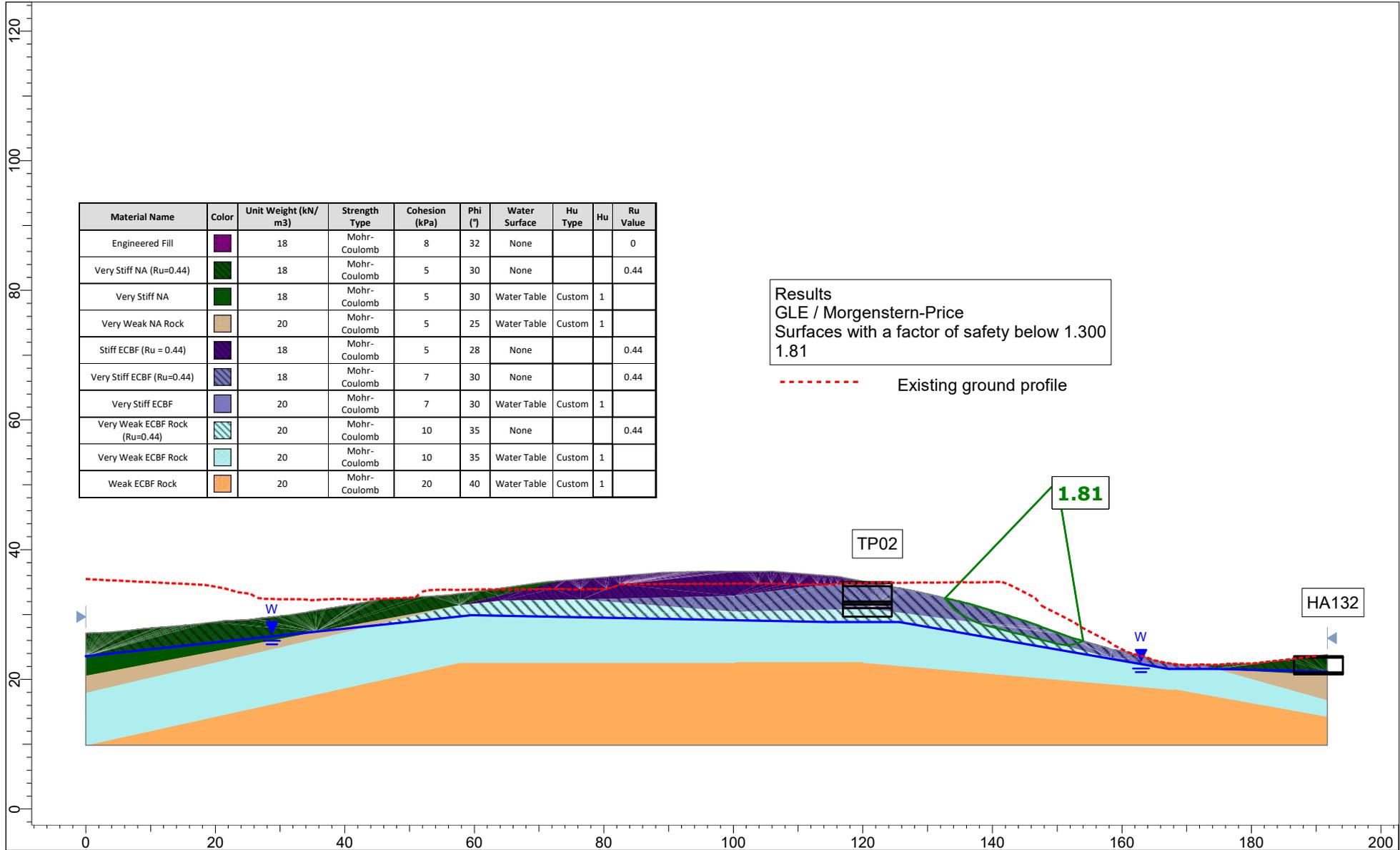


Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
2.50

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Dark Purple	18	Mohr-Coulomb	8	32	None			0
Very Stiff NA	Dark Green	18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Weak NA Rock	Light Brown	20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF	Medium Purple	20	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section H	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	20/12/2024	File Name	Section H - Proposed GL.slmd



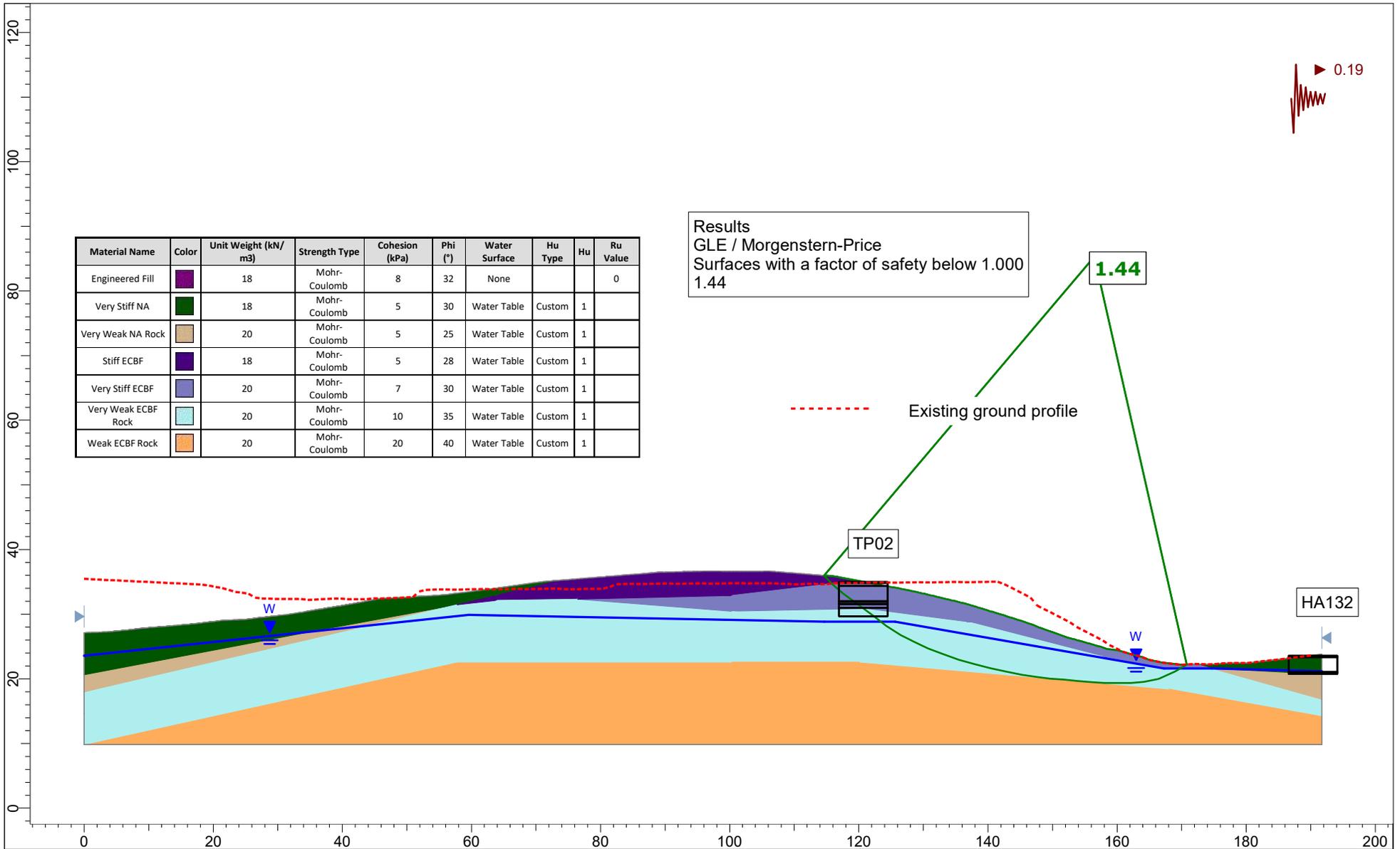
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Dark Purple	18	Mohr-Coulomb	8	32	None			0
Very Stiff NA (Ru=0.44)	Dark Green	18	Mohr-Coulomb	5	30	None			0.44
Very Stiff NA	Light Green	18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Weak NA Rock	Light Brown	20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Stiff ECBF (Ru = 0.44)	Dark Blue	18	Mohr-Coulomb	5	28	None			0.44
Very Stiff ECBF (Ru=0.44)	Dark Blue with Diagonal Lines	18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF	Light Blue	20	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock (Ru=0.44)	Light Blue with Diagonal Lines	20	Mohr-Coulomb	10	35	None			0.44
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
1.81

----- Existing ground profile



Project	240065 - Russell Road, Wainui - Stage 1		
Group	Existing GL Section H	Scenario	Extreme (Worst Credible GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	20/12/2024	File Name	Section H - Proposed GL.slm

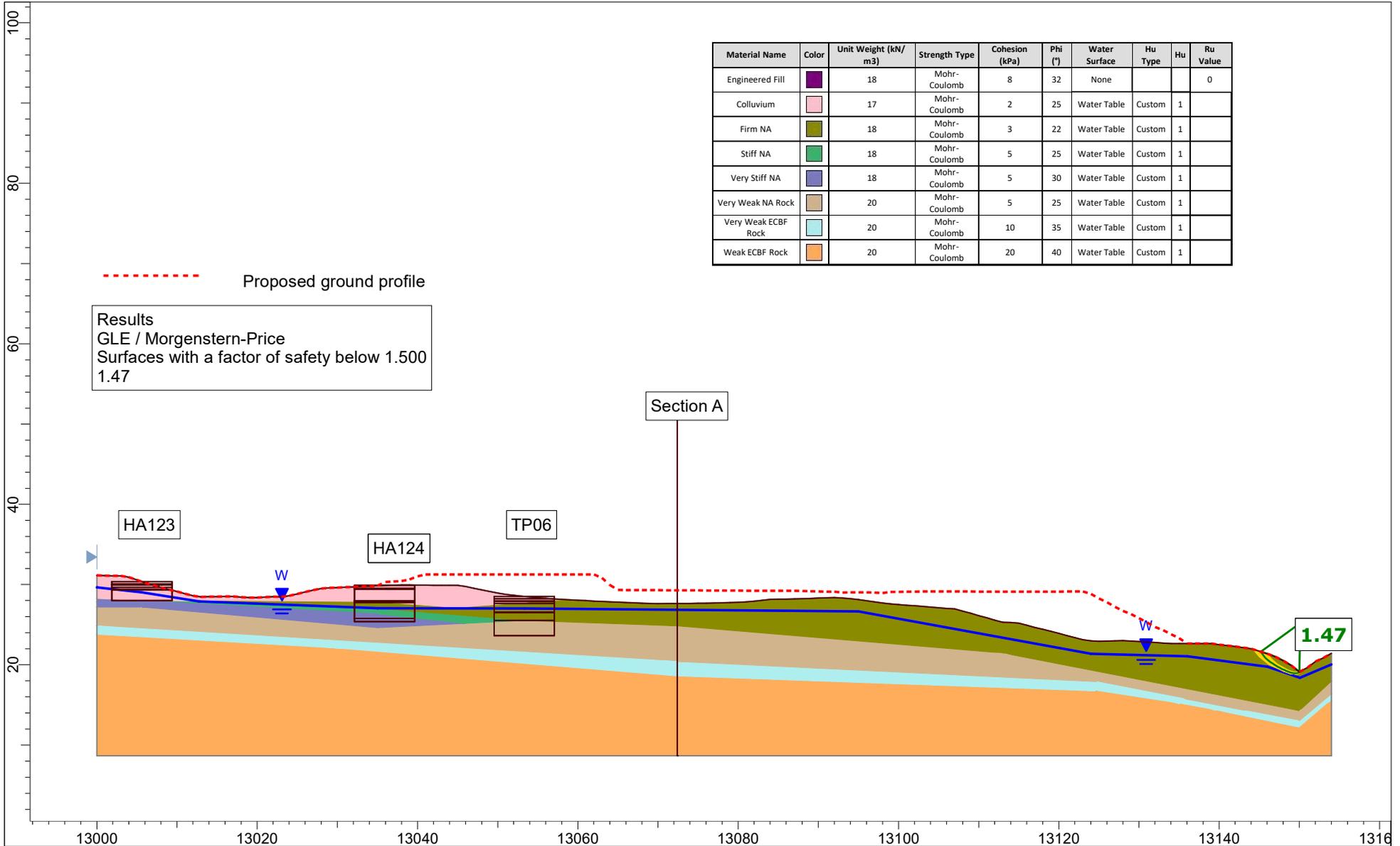


Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Green	18	Mohr-Coulomb	8	32	None			0
Very Stiff NA	Dark Green	18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Weak NA Rock	Light Green	20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Stiff ECBF	Dark Blue	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF	Medium Blue	20	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
1.44



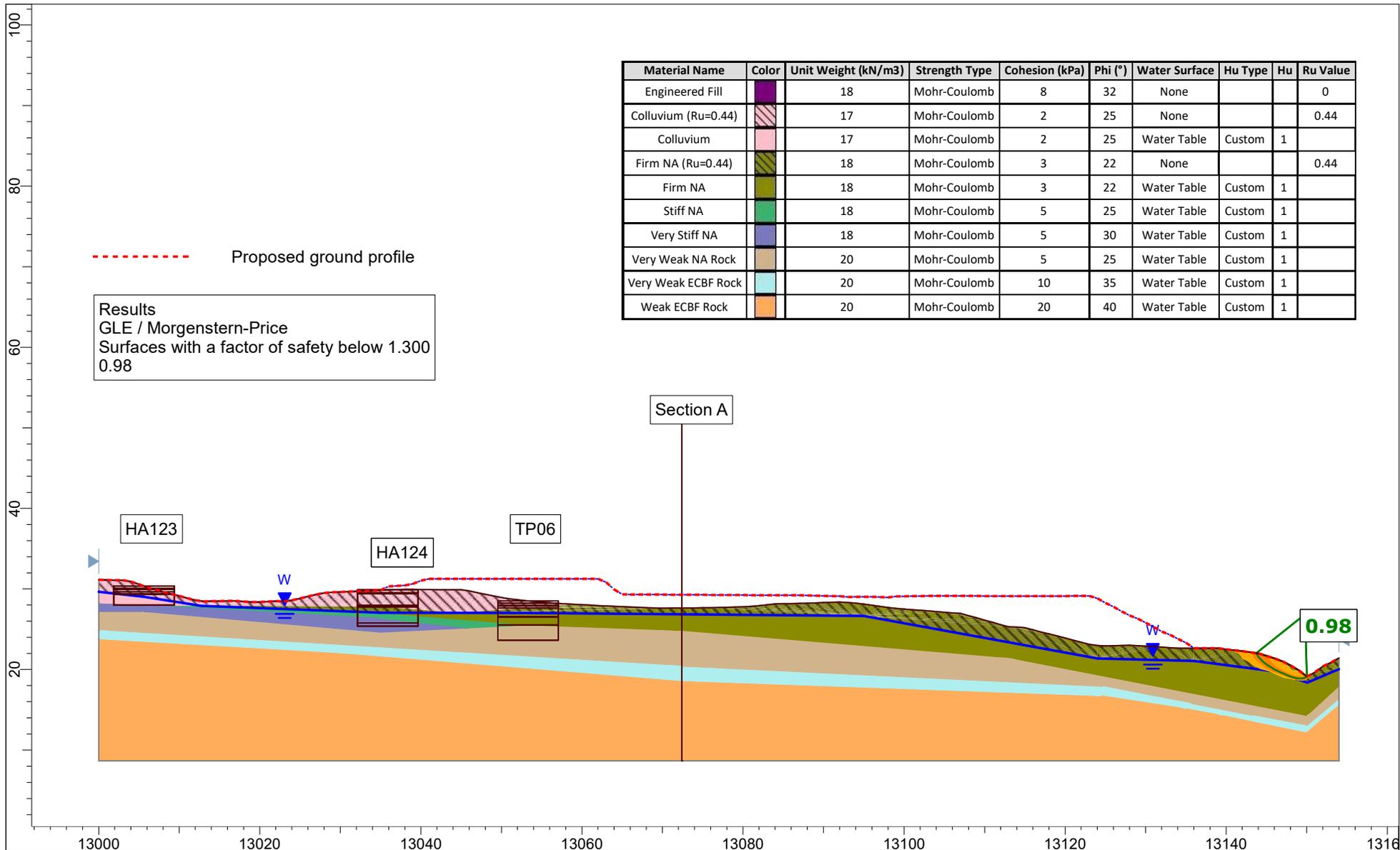
Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section H	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	20/12/2024	File Name	Section H - Proposed GL.slm



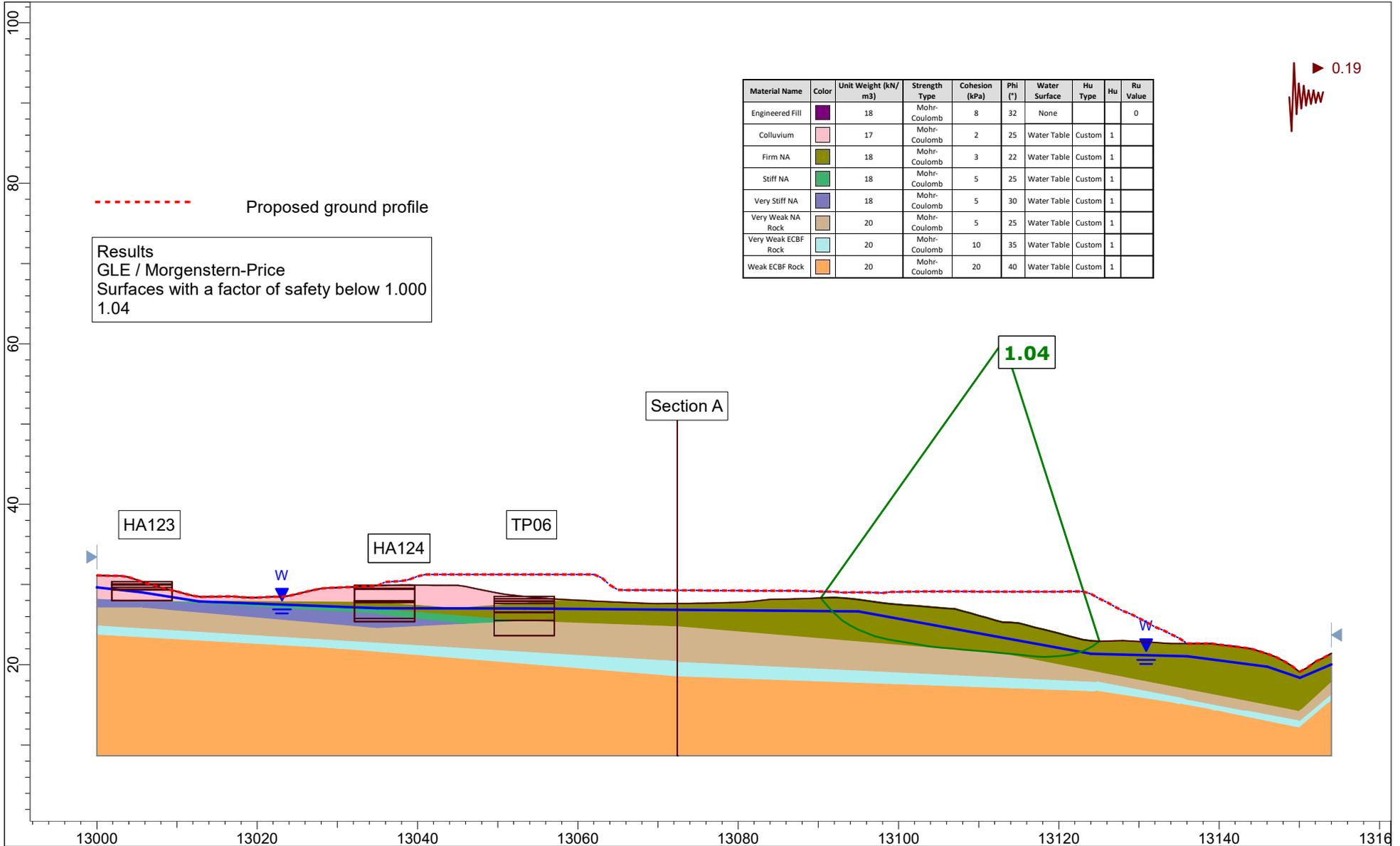
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	[Purple]	18	Mohr-Coulomb	8	32	None			0
Colluvium	[Pink]	17	Mohr-Coulomb	2	25	Water Table	Custom	1	
Firm NA	[Olive]	18	Mohr-Coulomb	3	22	Water Table	Custom	1	
Stiff NA	[Green]	18	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff NA	[Blue-Gray]	18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Weak NA Rock	[Brown]	20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Weak ECBF Rock	[Cyan]	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock	[Orange]	20	Mohr-Coulomb	20	40	Water Table	Custom	1	



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section M	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	20/12/2024	File Name	Section M - Proposed GL.slm



	Project		240065 - Russell Road, Wainui - Stage 1	
	Group		Existing GL Section M	Scenario
	Drawn By		RS	Company
	Date		20/12/2024	File Name
				Extreme (Worst Credible GW)
				Riley Consultants Ltd
				Section M - Proposed GL.slm



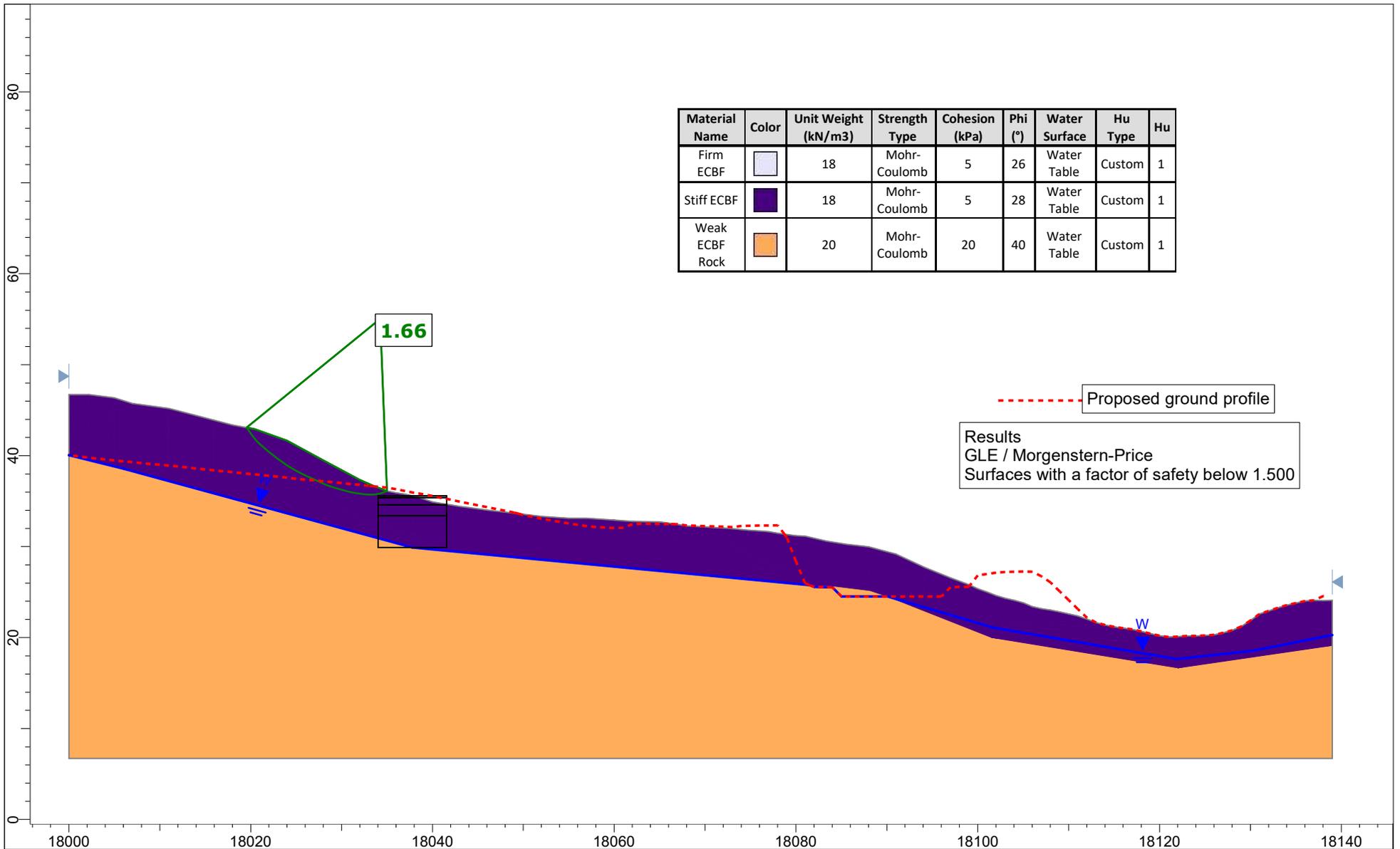
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
1.04

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Dark Purple	18	Mohr-Coulomb	8	32	None			0
Colluvium	Pink	17	Mohr-Coulomb	2	25	Water Table	Custom	1	
Firm NA	Olive Green	18	Mohr-Coulomb	3	22	Water Table	Custom	1	
Stiff NA	Green	18	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff NA	Blue-Gray	18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Weak NA Rock	Tan	20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Weak ECBF Rock	Cyan	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

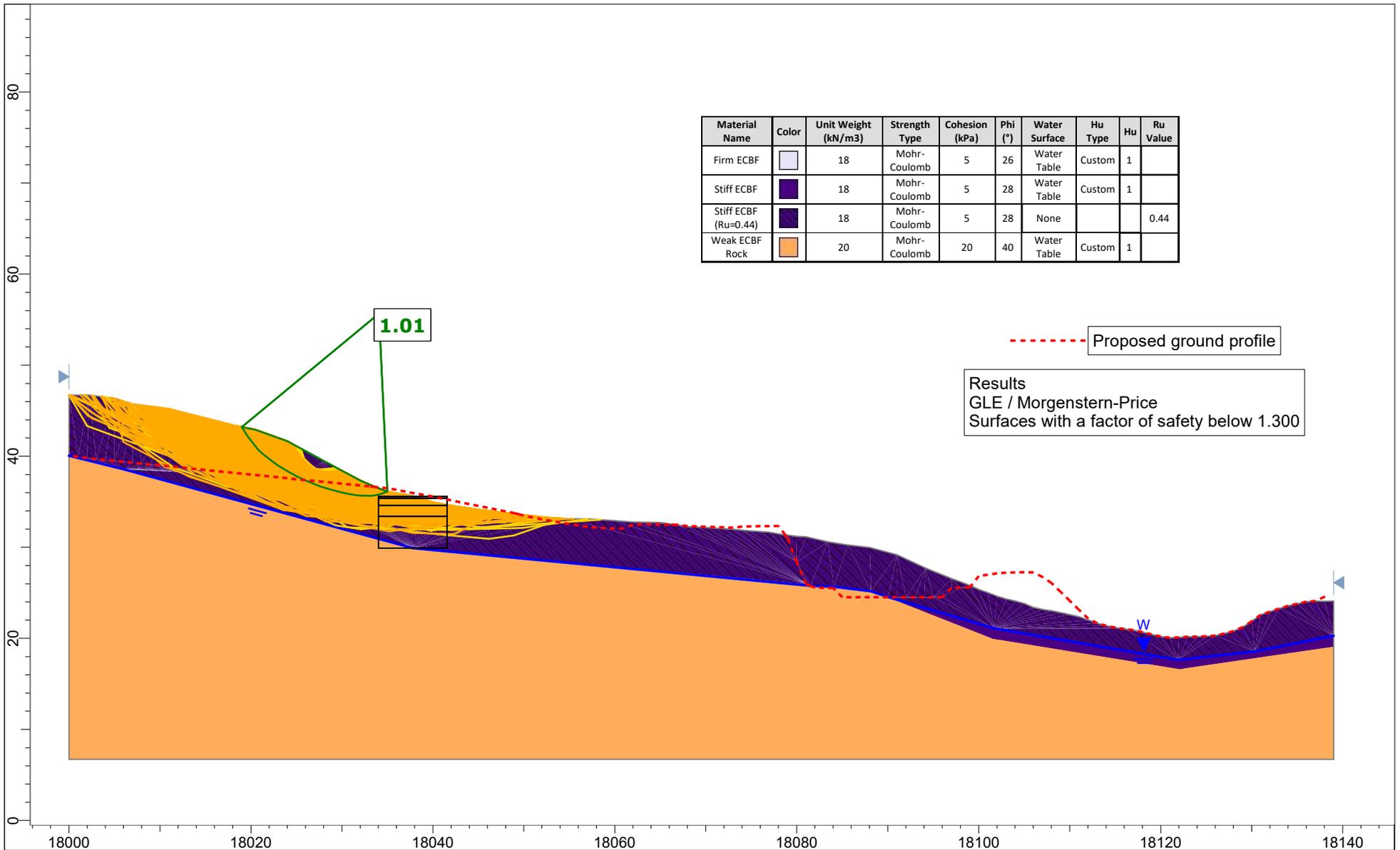
0.19



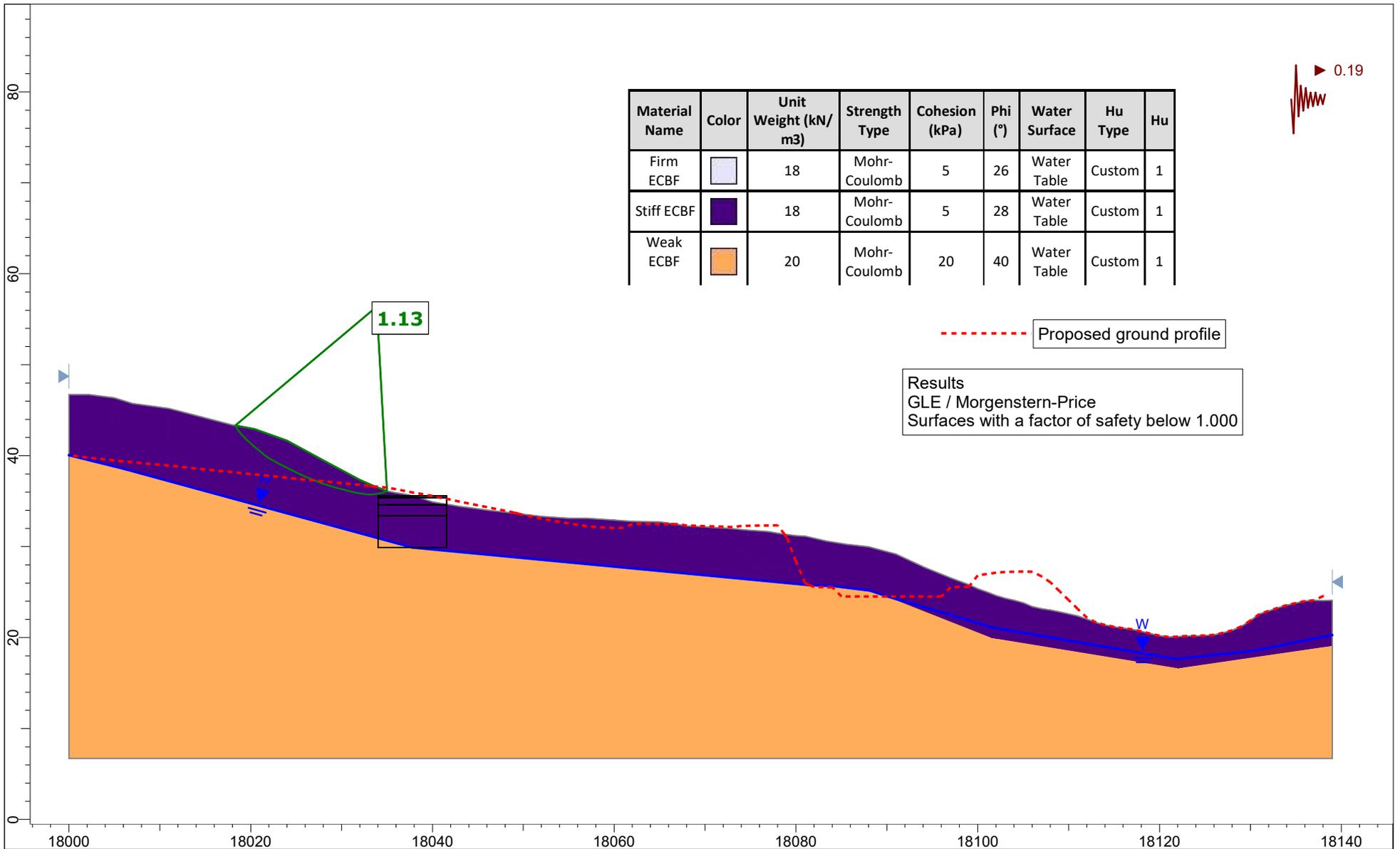
Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section M	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	20/12/2024	File Name	Section M - Proposed GL.slm



<i>Project</i>		240065 - Russell Road, Wainui - Stage 2	
<i>Group</i>	Section R Existing GL (L-R)	<i>Scenario</i>	Normal (Measured GW)
<i>Drawn By</i>	RS	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	10/12/2024	<i>File Name</i>	Section R - June 2025.slm



	Project		240065 - Russell Road, Wainui - Stage 2	
	Group		Section R Existing GL (L-R)	Scenario
	Drawn By		RS	Company
	Date		10/12/2024	File Name
				Section R - June 2025.sldm



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Firm ECBF		18	Mohr-Coulomb	5	26	Water Table	Custom	1
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1
Weak ECBF		20	Mohr-Coulomb	20	40	Water Table	Custom	1

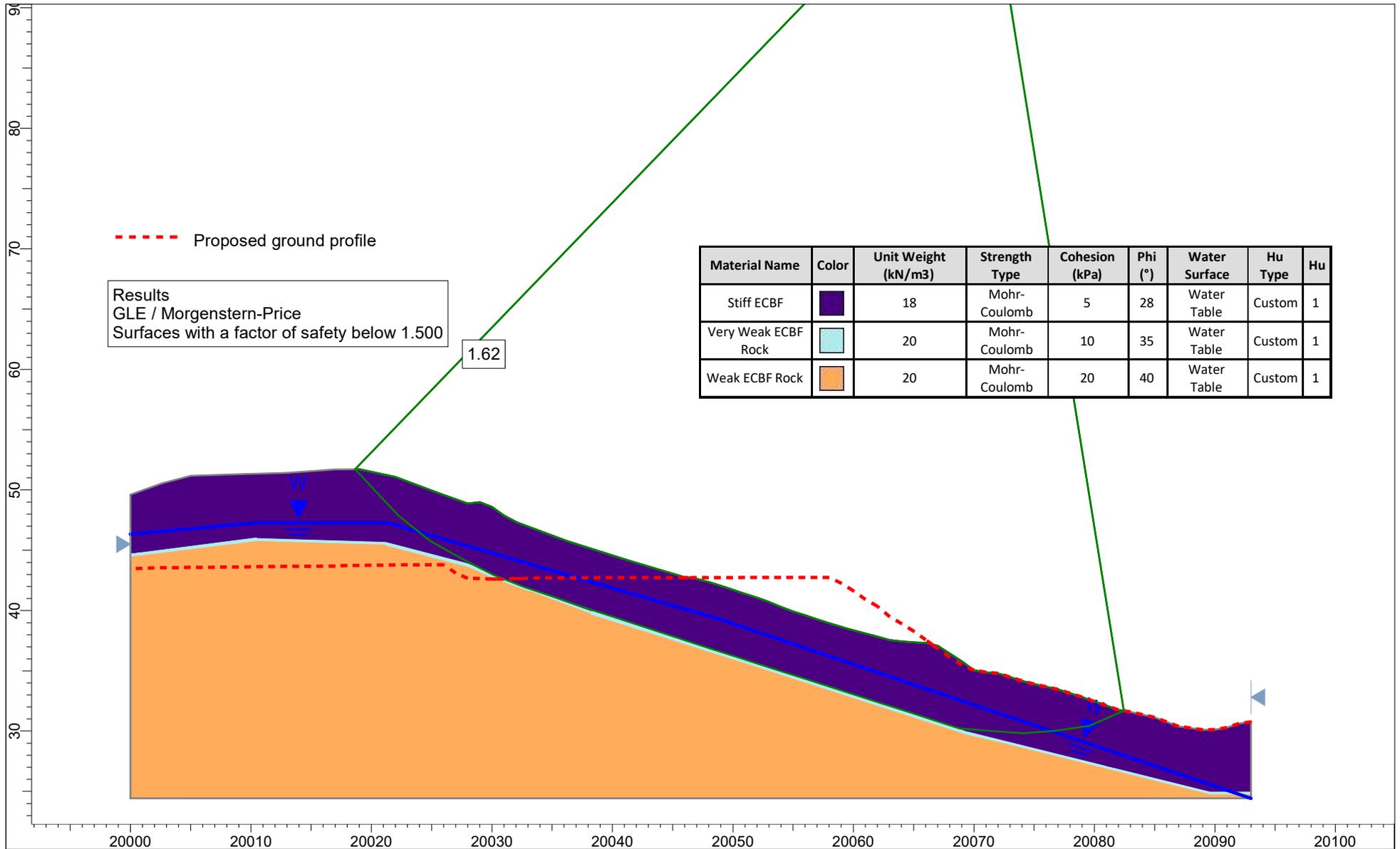
- - - - - Proposed ground profile
Results
 GLE / Morgenstern-Price
 Surfaces with a factor of safety below 1.000

1.13

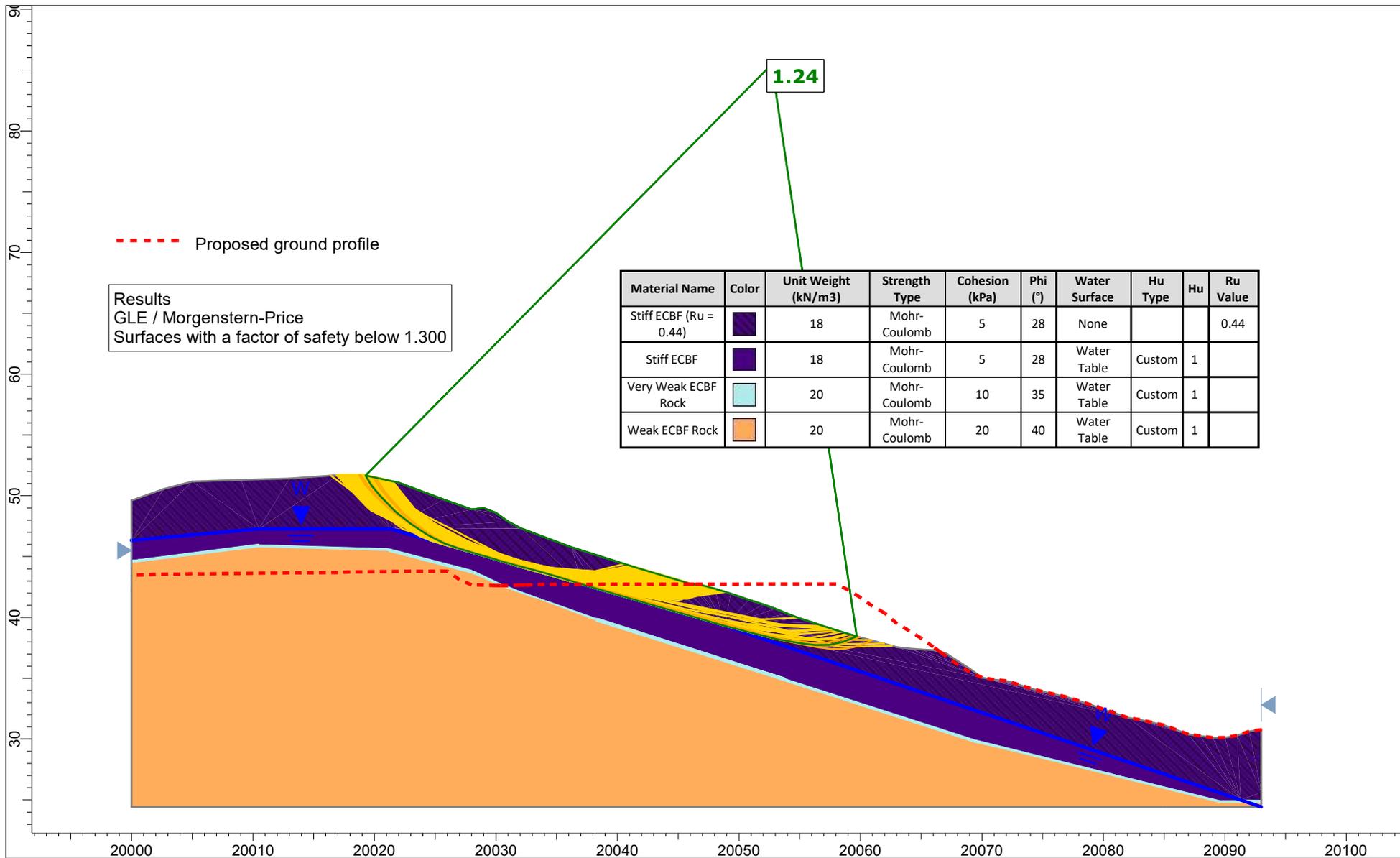
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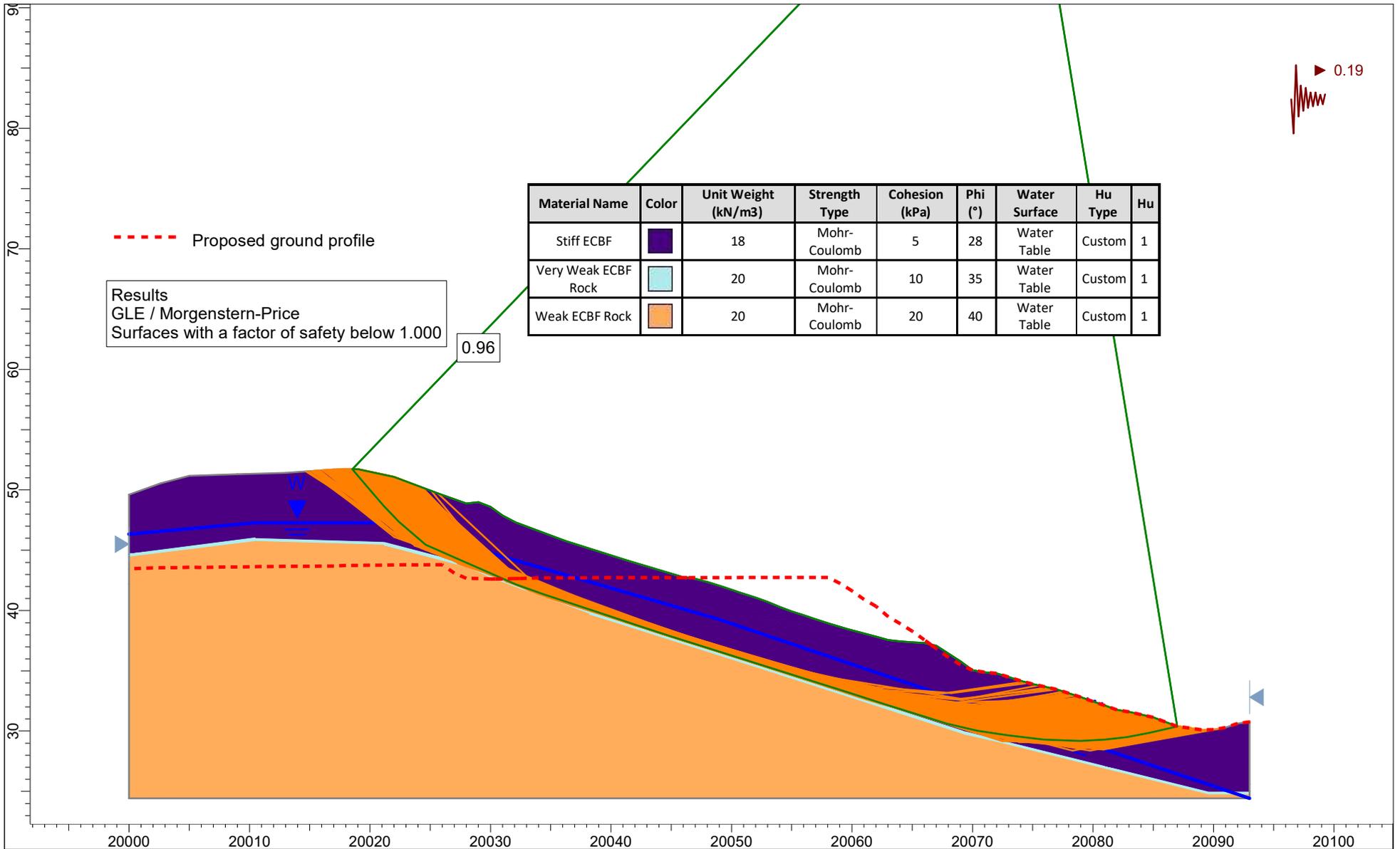
<i>Project</i>		240065 - Russell Road, Wainui - Stage 2	
<i>Group</i>	Section R Existing GL (L-R)	<i>Scenario</i>	Seismic (0.19g)
<i>Drawn By</i>	RS	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	10/12/2024	<i>File Name</i>	Section R - June 2025.sldm



<i>Project</i>		240065 - Russell Road, Wainui - Stage 2	
<i>Group</i>	Proposed GL Section T	<i>Scenario</i>	Normal (Measured GW)
<i>Drawn By</i>	RS	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	10/12/2024	<i>File Name</i>	Section T - June 2025.sldm



Project		240065 - Russell Road, Wainui - Stage 2	
Group	Proposed GL Section T	Scenario	Extreme (Worst Credible GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section T - June 2025.sldm



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1

--- Proposed ground profile

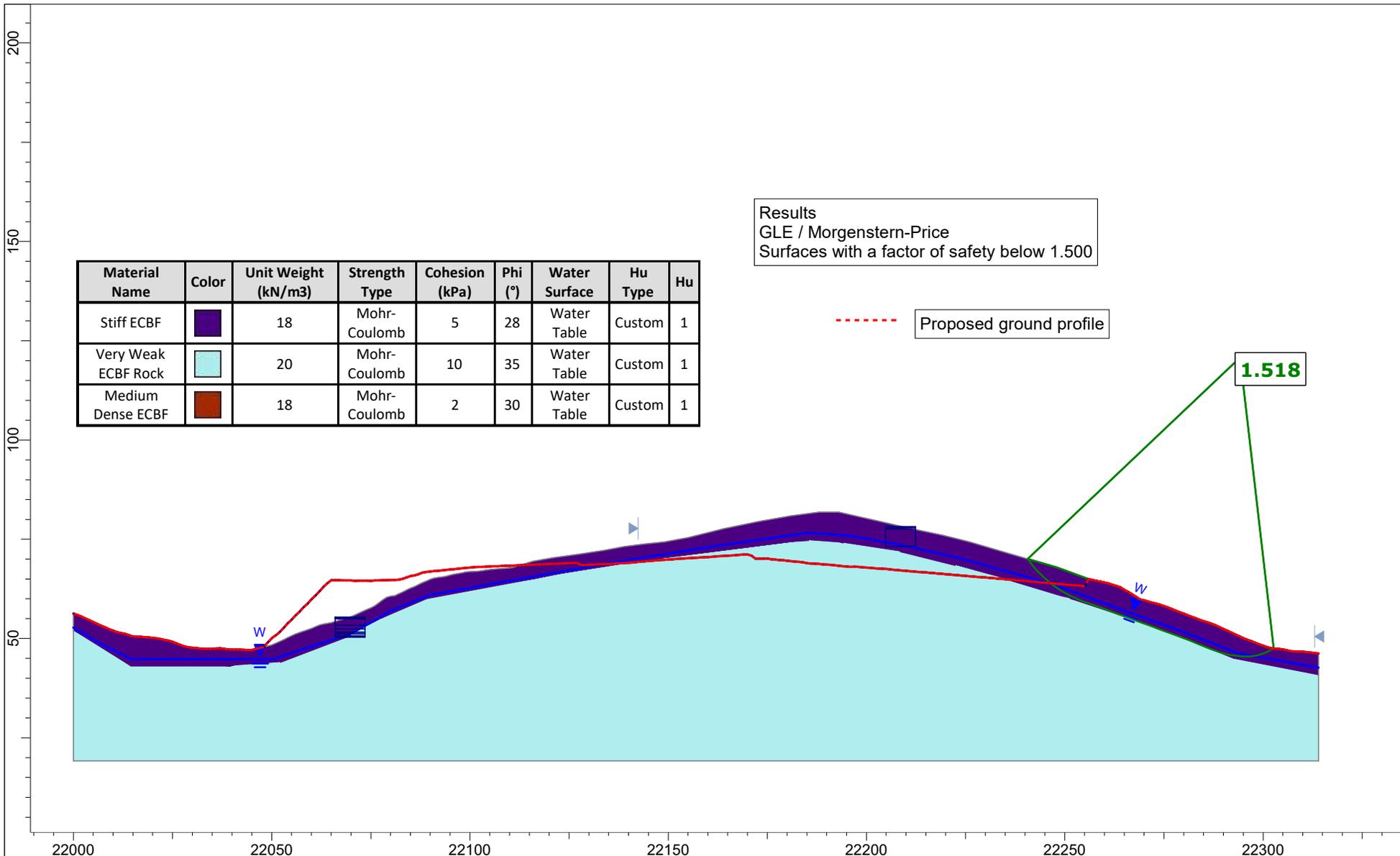
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000

0.96

0.19



Project		240065 - Russell Road, Wainui - Stage 2	
Group	Proposed GL Section T	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section T - June 2025.sldm



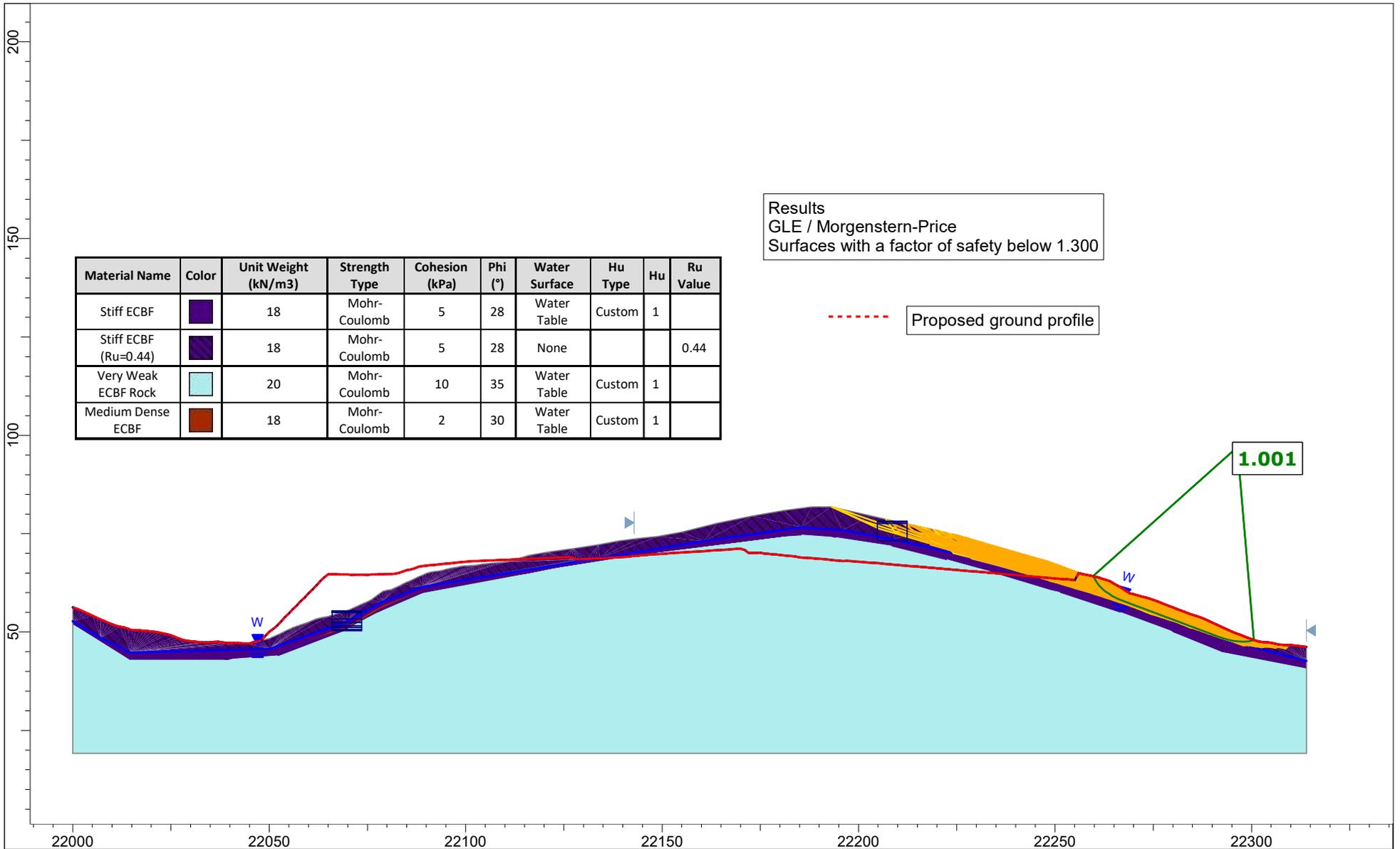
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Stiff ECBF	■	18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Weak ECBF Rock	■	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Medium Dense ECBF	■	18	Mohr-Coulomb	2	30	Water Table	Custom	1

Proposed ground profile

1.518

	Project		240065 - Russell Road, Wainui - Stage 2	
	Group		Section V - Existing GL (L-R)	Scenario
	Drawn By		JJW	Company
	Date		10/12/2024	File Name
			Normal (Measured GW)	
			Riley Consultants Ltd	
			Section V - June 2025.slm	



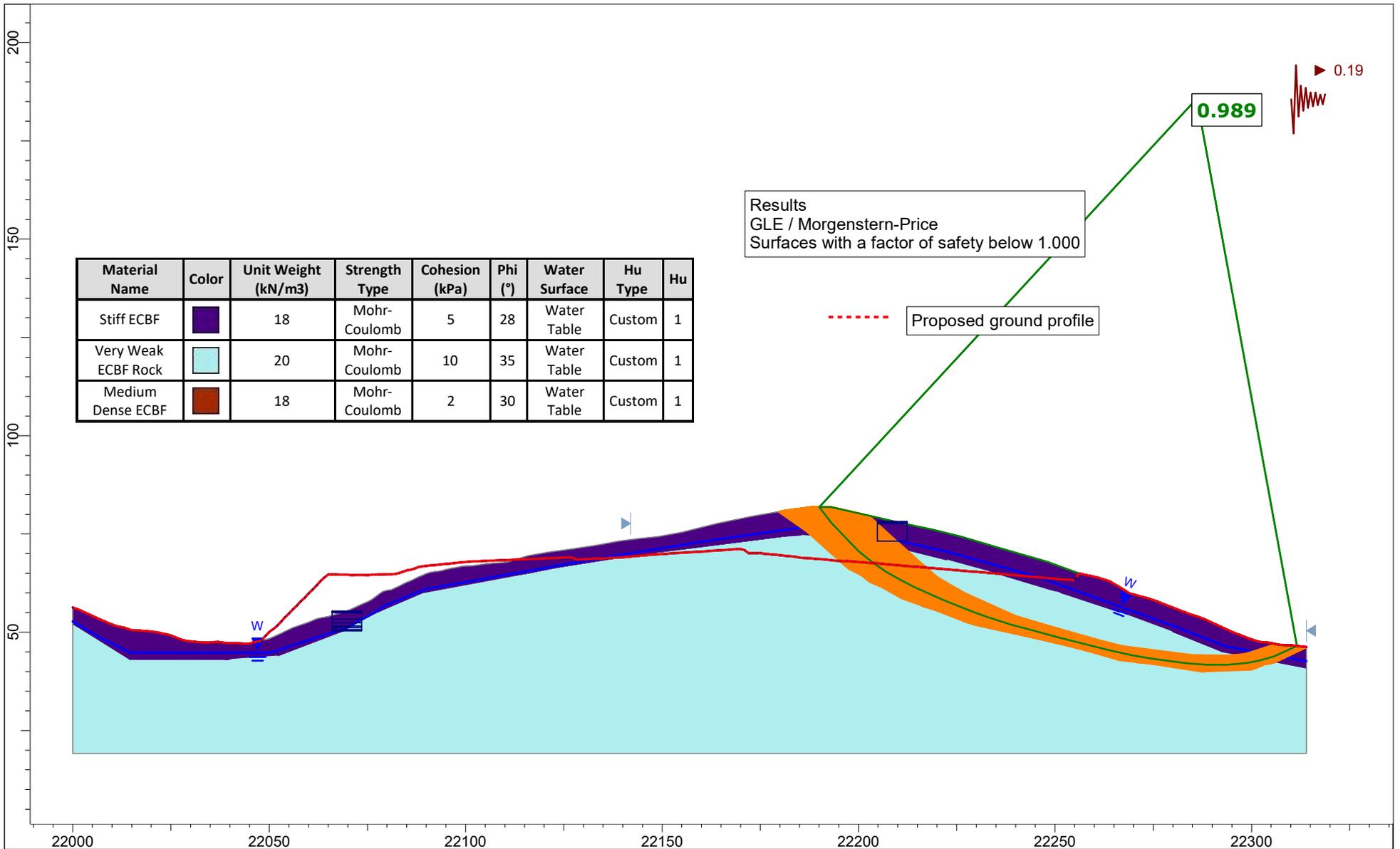
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300

Proposed ground profile

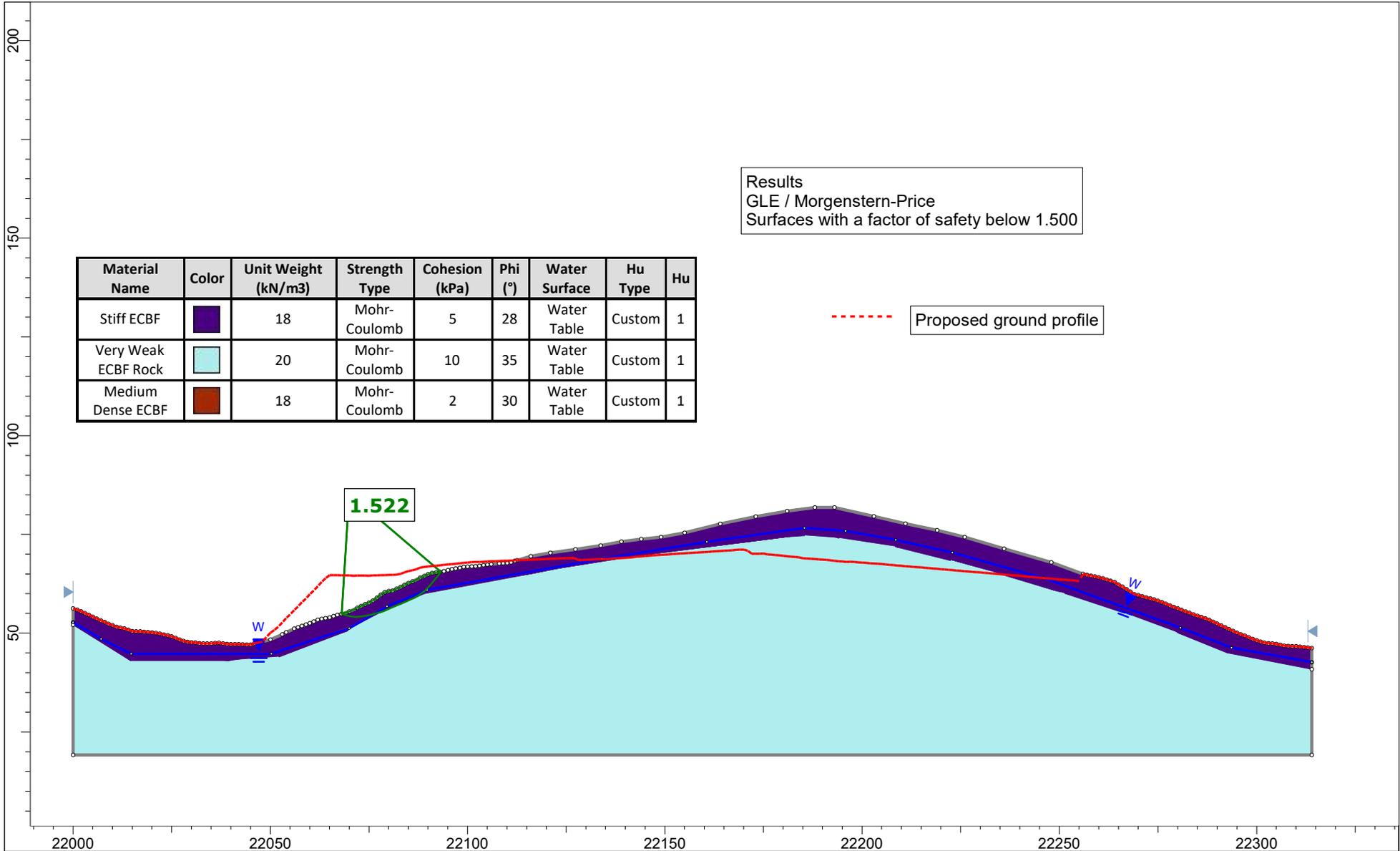
1.001

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)	Dark Purple	18	Mohr-Coulomb	5	28	None			0.44
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Medium Dense ECBF	Brown	18	Mohr-Coulomb	2	30	Water Table	Custom	1	

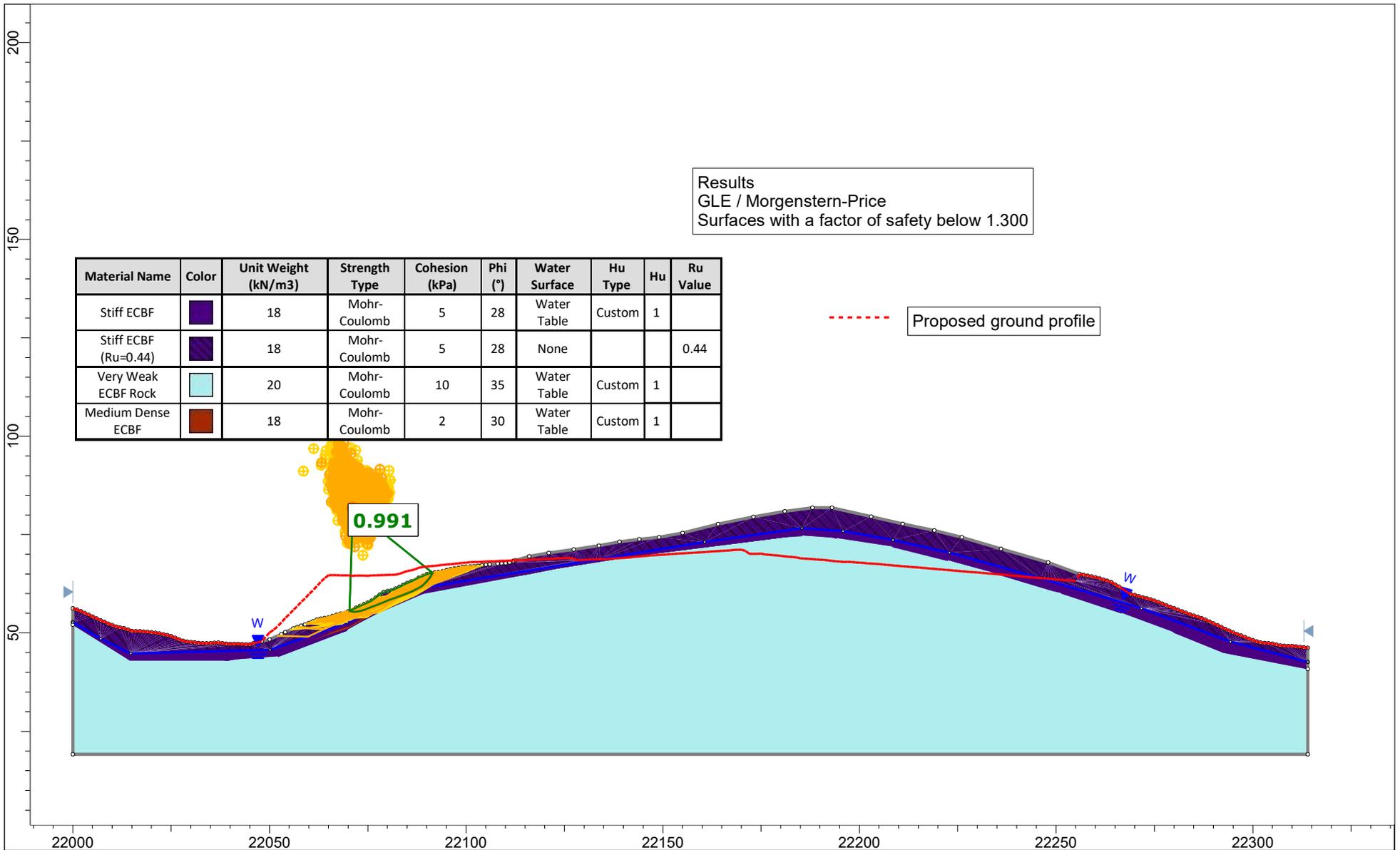
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	Group		Section V - Existing GL (L-R)	Scenario
	Drawn By		JJW	Company
	Date		10/12/2024	File Name
			Extreme (Worst Case GW)	Riley Consultants Ltd
			Section V - June 2025.slm	



<i>Project</i>		240065 - Russell Road, Wainui - Stage 2	
<i>Group</i>		Section V - Existing GL (L-R)	<i>Scenario</i>
<i>Drawn By</i>		JJW	<i>Company</i>
<i>Date</i>		10/12/2024	<i>File Name</i>
			Section V - June 2025.slm



Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section V - Existing GL (R-L)	Scenario	Normal (Measured GW)
Drawn By	JJW	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section V - June 2025.slm



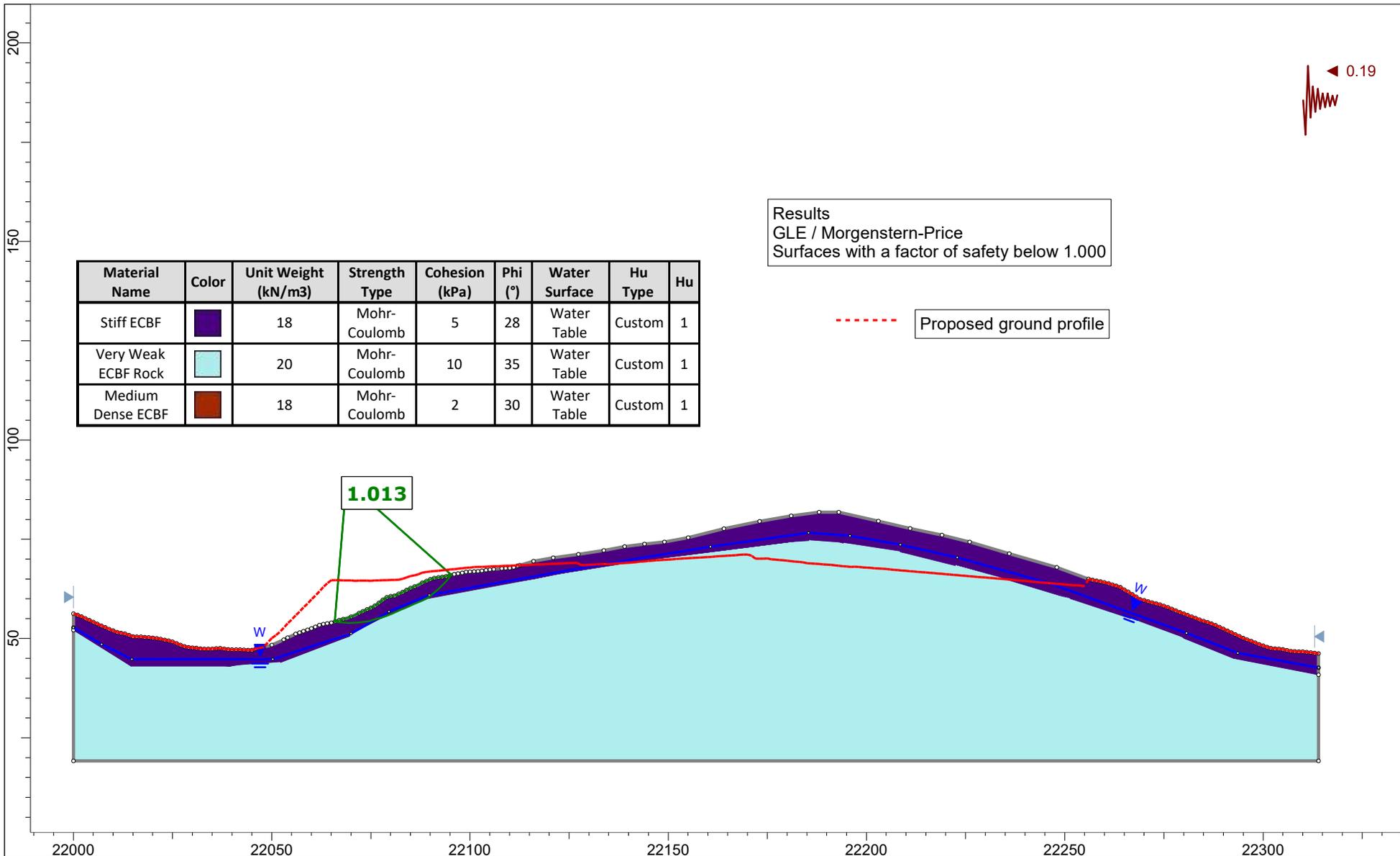
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)	Dark Purple	18	Mohr-Coulomb	5	28	None			0.44
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Medium Dense ECBF	Brown	18	Mohr-Coulomb	2	30	Water Table	Custom	1	

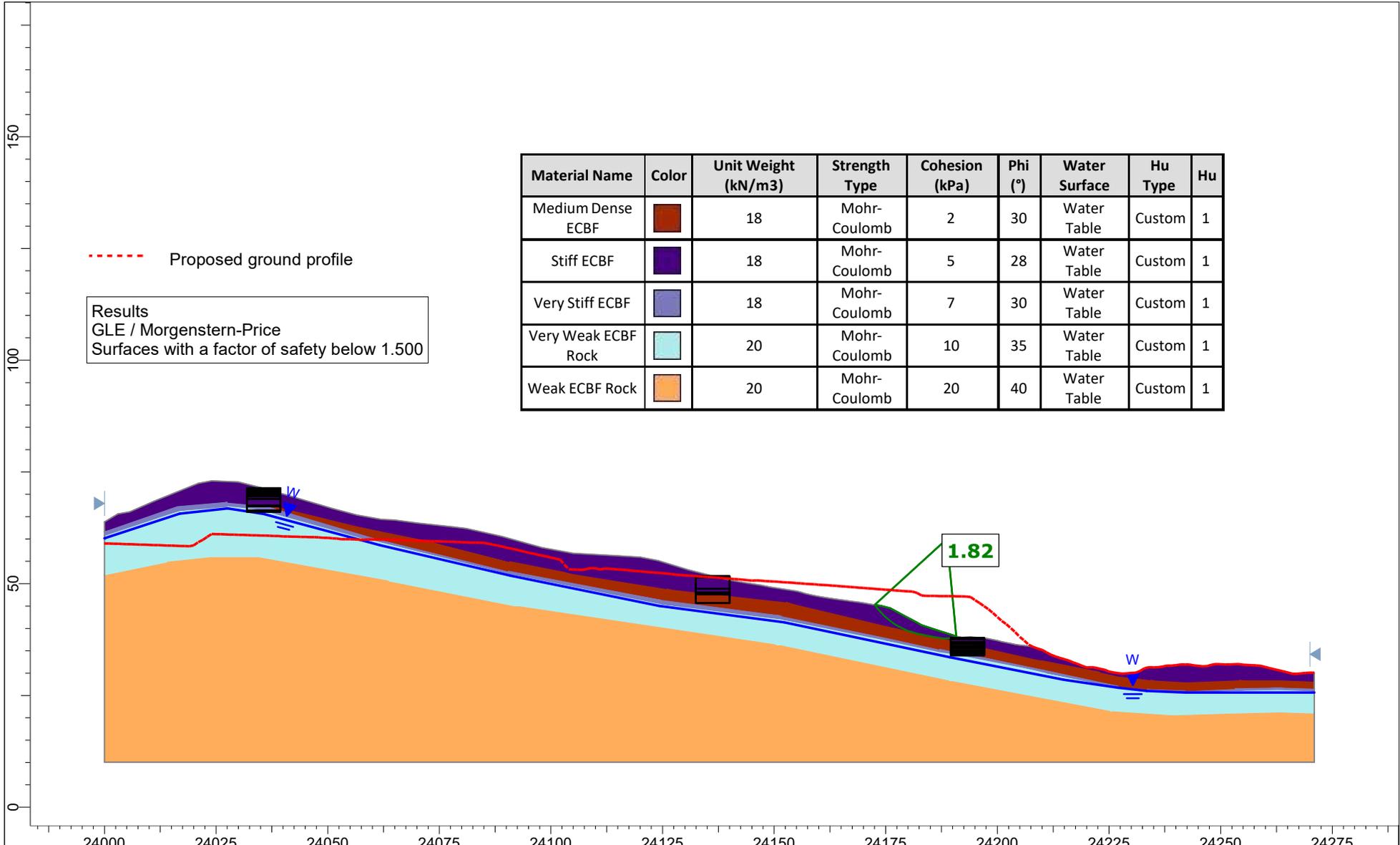
----- Proposed ground profile

0.991

	Project		240065 - Russell Road, Wainui - Stage 2	
	Group		Section V - Existing GL (R-L)	Scenario
	Drawn By		JJW	Company
	Date		10/12/2024	File Name
			Extreme (Worst Case GW)	
			Riley Consultants Ltd	
			Section V - June 2025.slm	



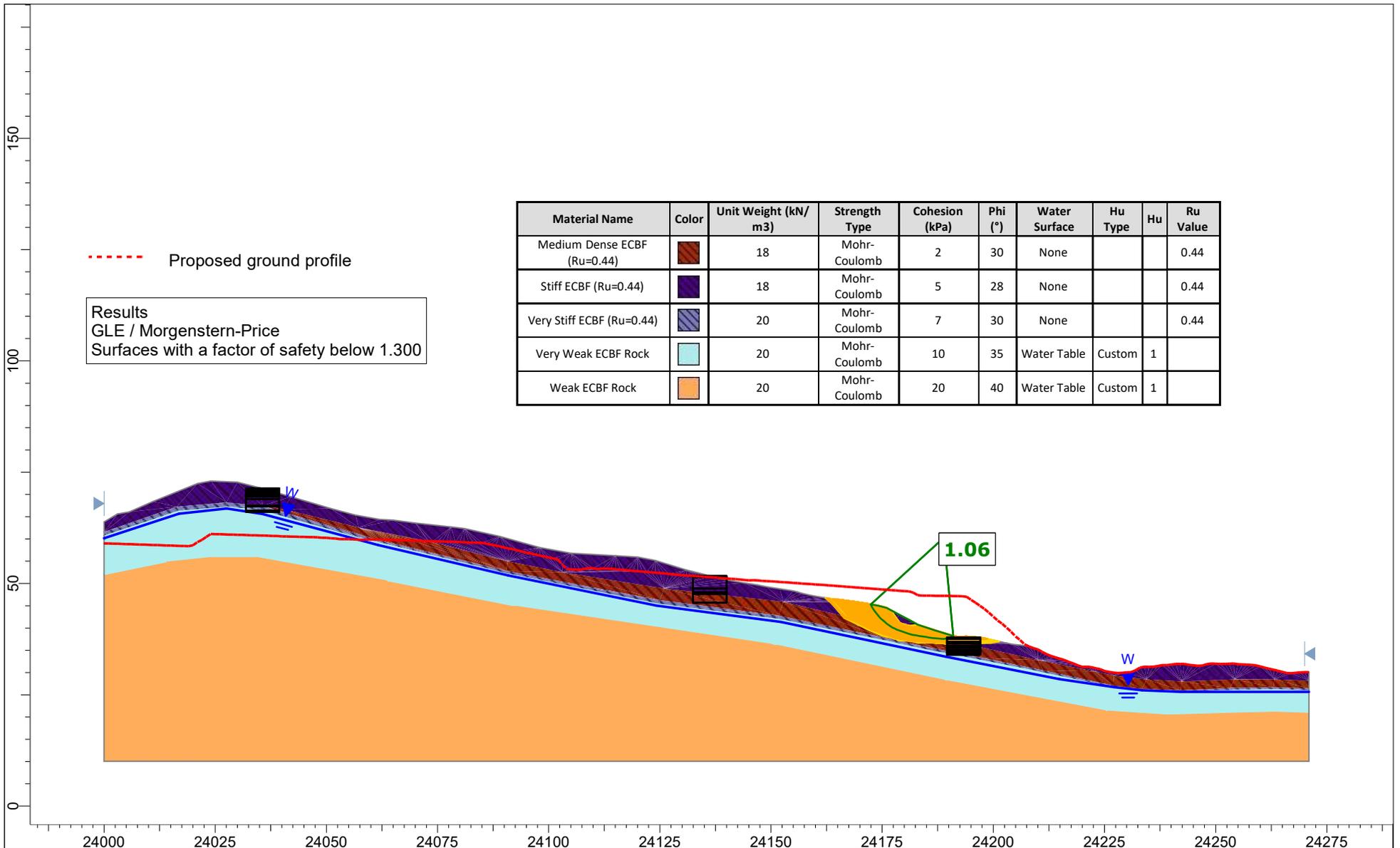
	Project 240065 - Russell Road, Wainui - Stage 2	
	Group Section V - Existing GL (R-L)	Scenario Seismic (0.19g)
	Drawn By JJW	Company Riley Consultants Ltd
	Date 10/12/2024	File Name Section V - June 2025.slm



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Medium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1



Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section X - Existing GL	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section X - June 2025.sldm



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Very Stiff ECBF (Ru=0.44)		20	Mohr-Coulomb	7	30	None			0.44
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	



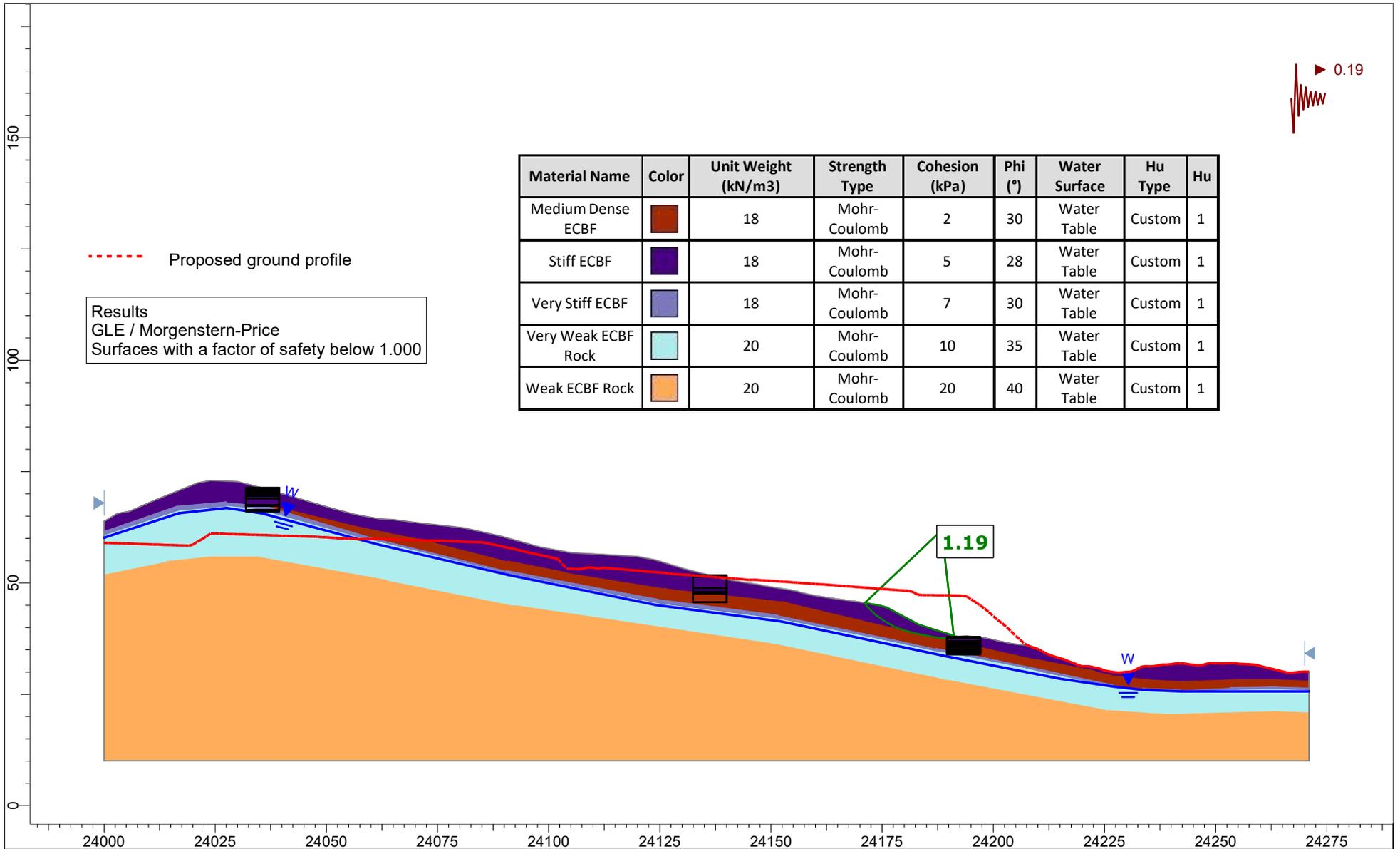
<i>Project</i>		240065 - Russell Road, Wainui - Stage 2	
<i>Group</i>	Section X - Existing GL	<i>Scenario</i>	Extreme (Worst Credible GW)
<i>Drawn By</i>	RS	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	10/12/2024	<i>File Name</i>	Section X - June 2025.sldm



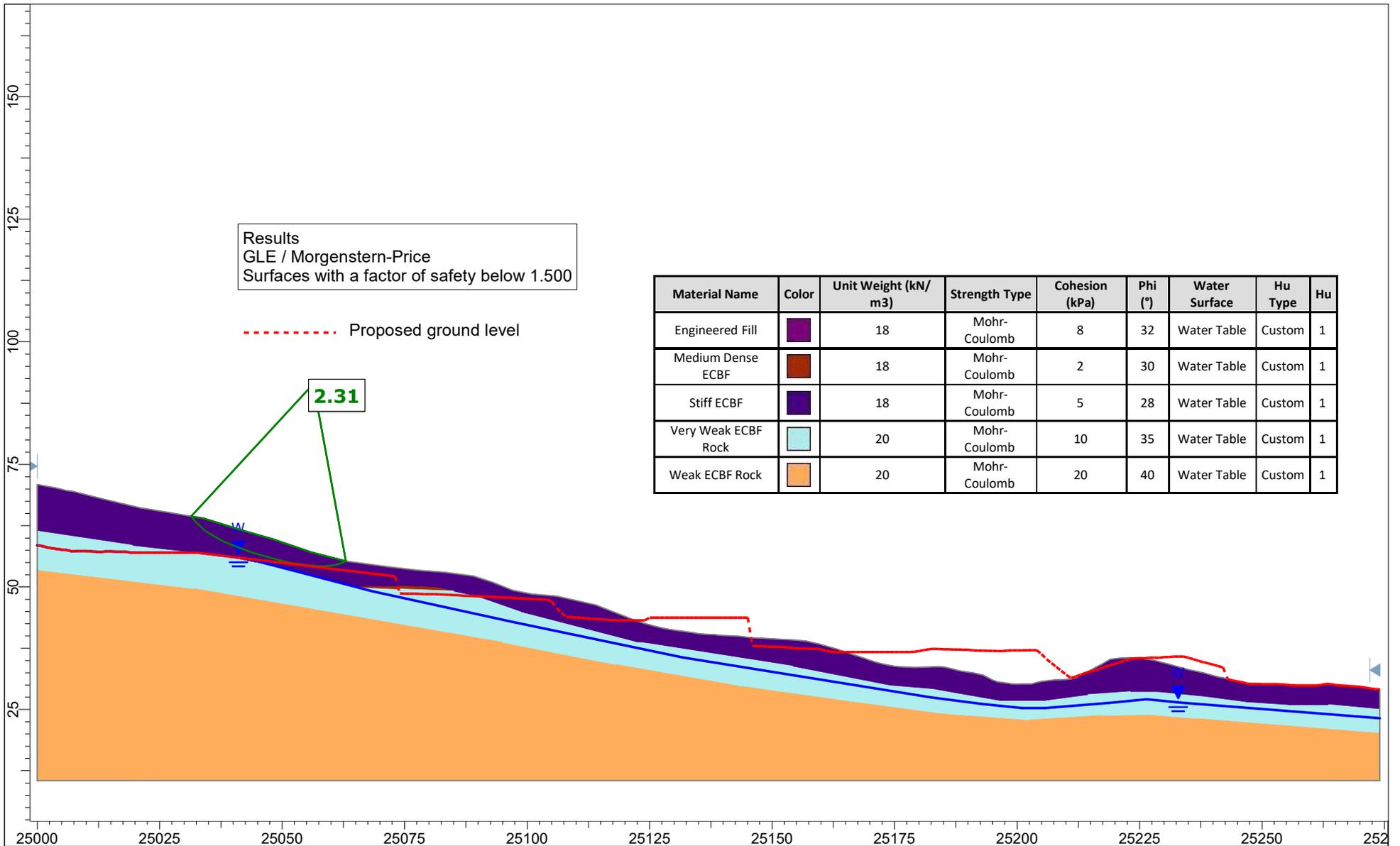
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Medium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1

Proposed ground profile

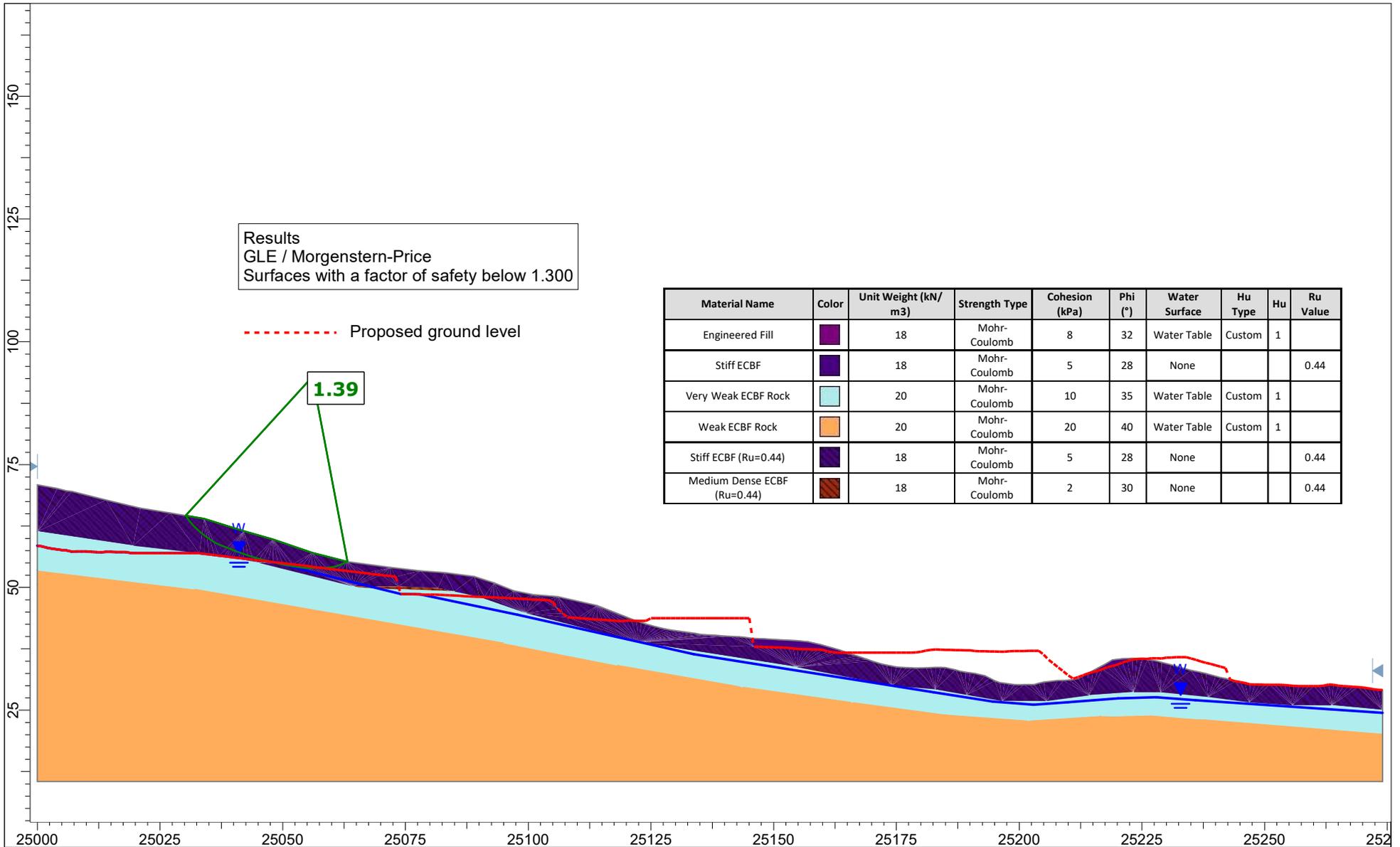
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000



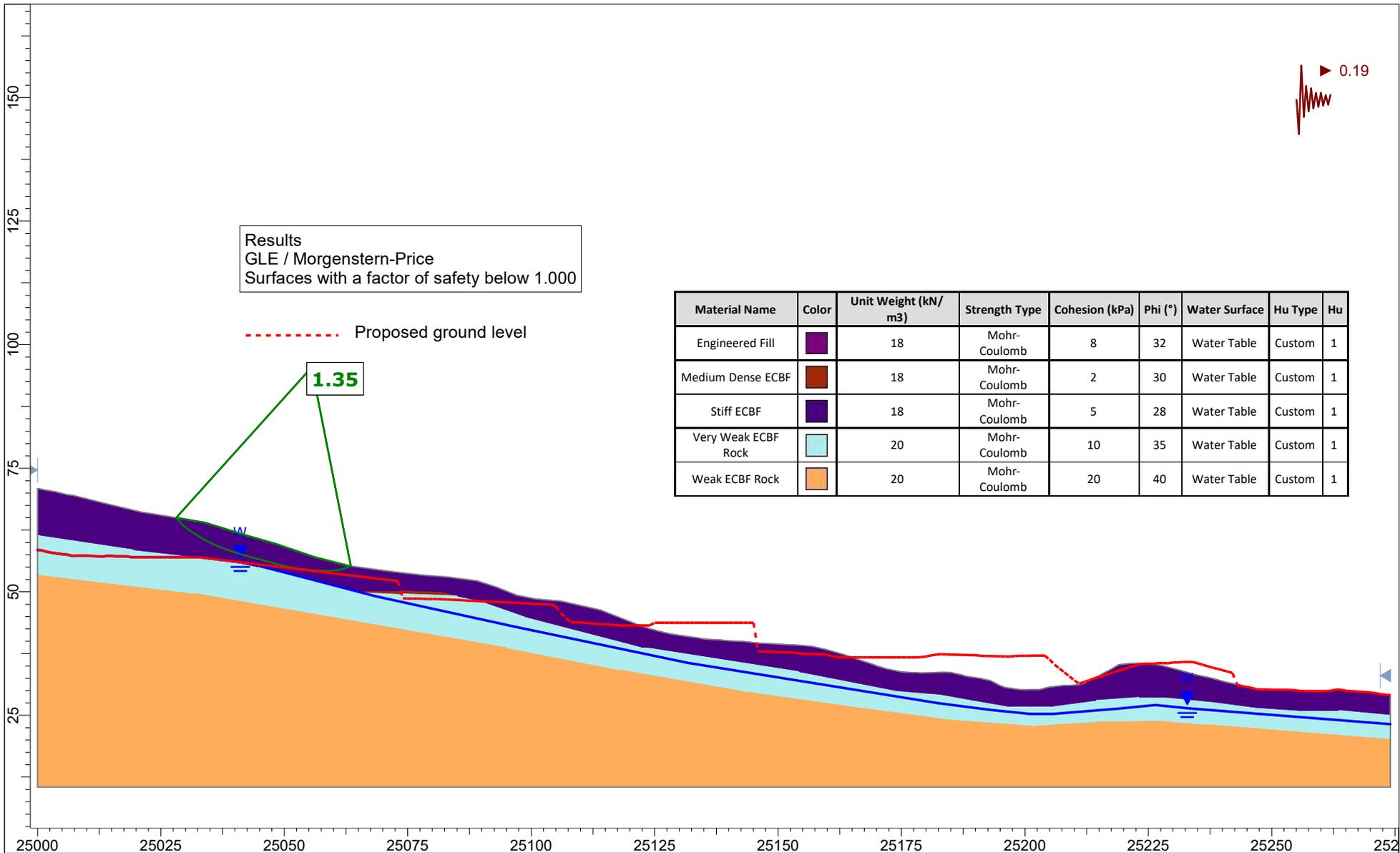
Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section X - Existing GL	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section X - June 2025.sldm



<i>Project</i>		240065 - Russell Road, Wainui - Stage 2	
<i>Group</i>	Section Y - Existing GL	<i>Scenario</i>	Normal (Measured GW)
<i>Drawn By</i>	RS	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	10/12/2024	<i>File Name</i>	Section Y - June 2025.sldm



<i>Project</i>		240065 - Russell Road, Wainui - Stage 2	
<i>Group</i>	Section Y - Existing GL	<i>Scenario</i>	Extreme (Worst Case GW)
<i>Drawn By</i>	RS	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	10/12/2024	<i>File Name</i>	Section Y - June 2025.sldm



Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000

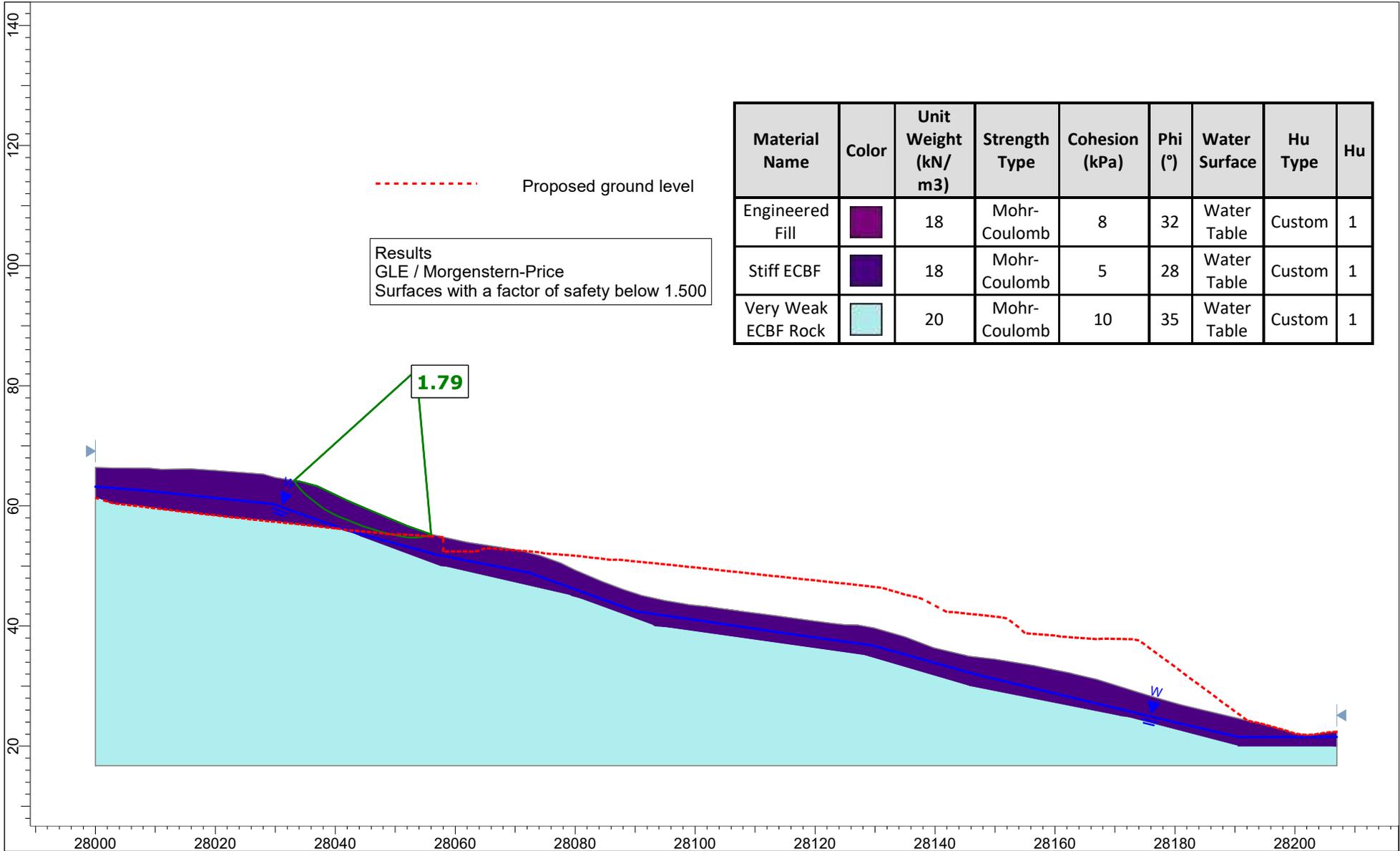
----- Proposed ground level

1.35

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill	Dark Purple	18	Mohr-Coulomb	8	32	Water Table	Custom	1
Medium Dense ECBF	Brown	18	Mohr-Coulomb	2	30	Water Table	Custom	1
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1



Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section Y - Existing GL	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section Y - June 2025.sldm

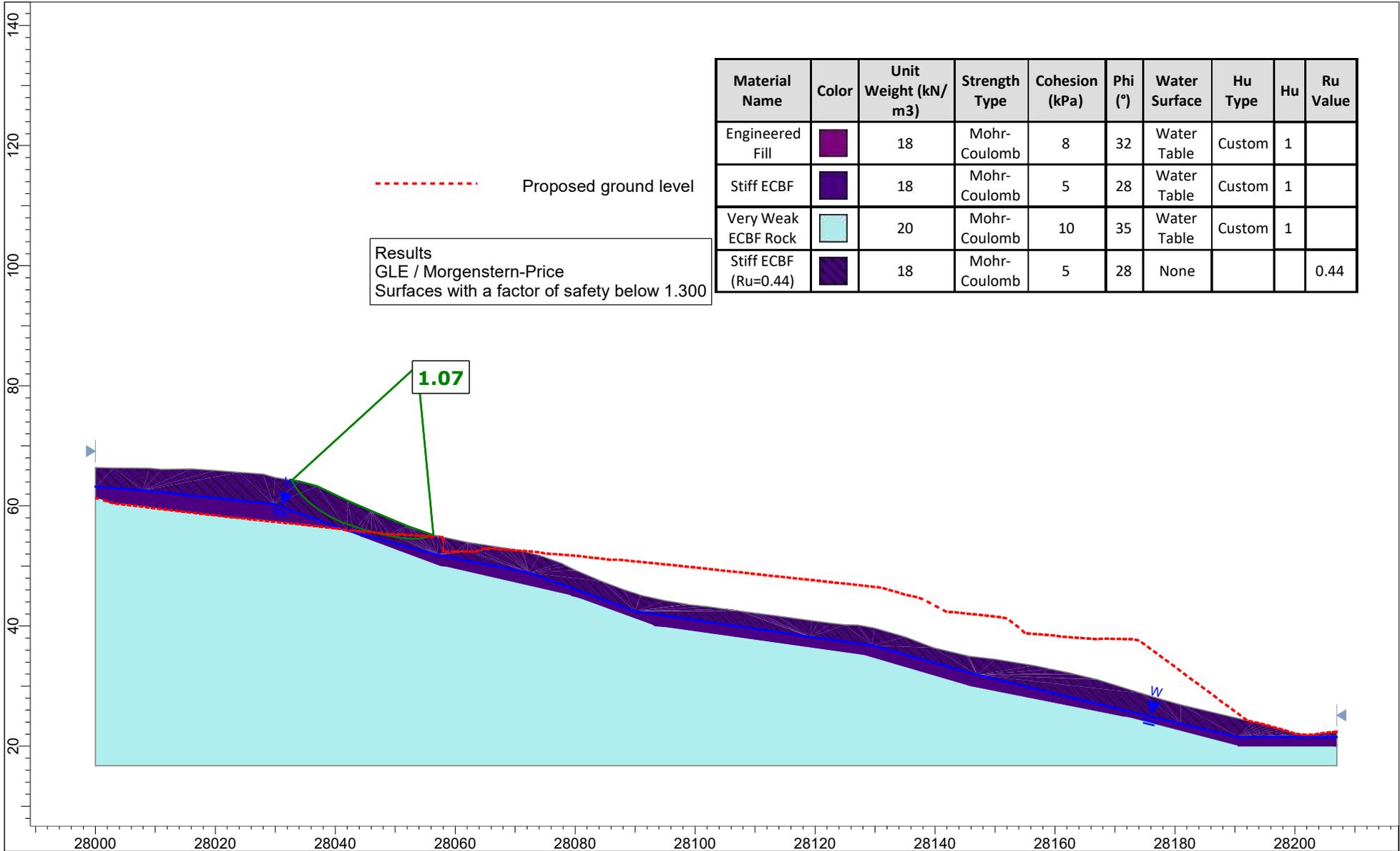


Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500

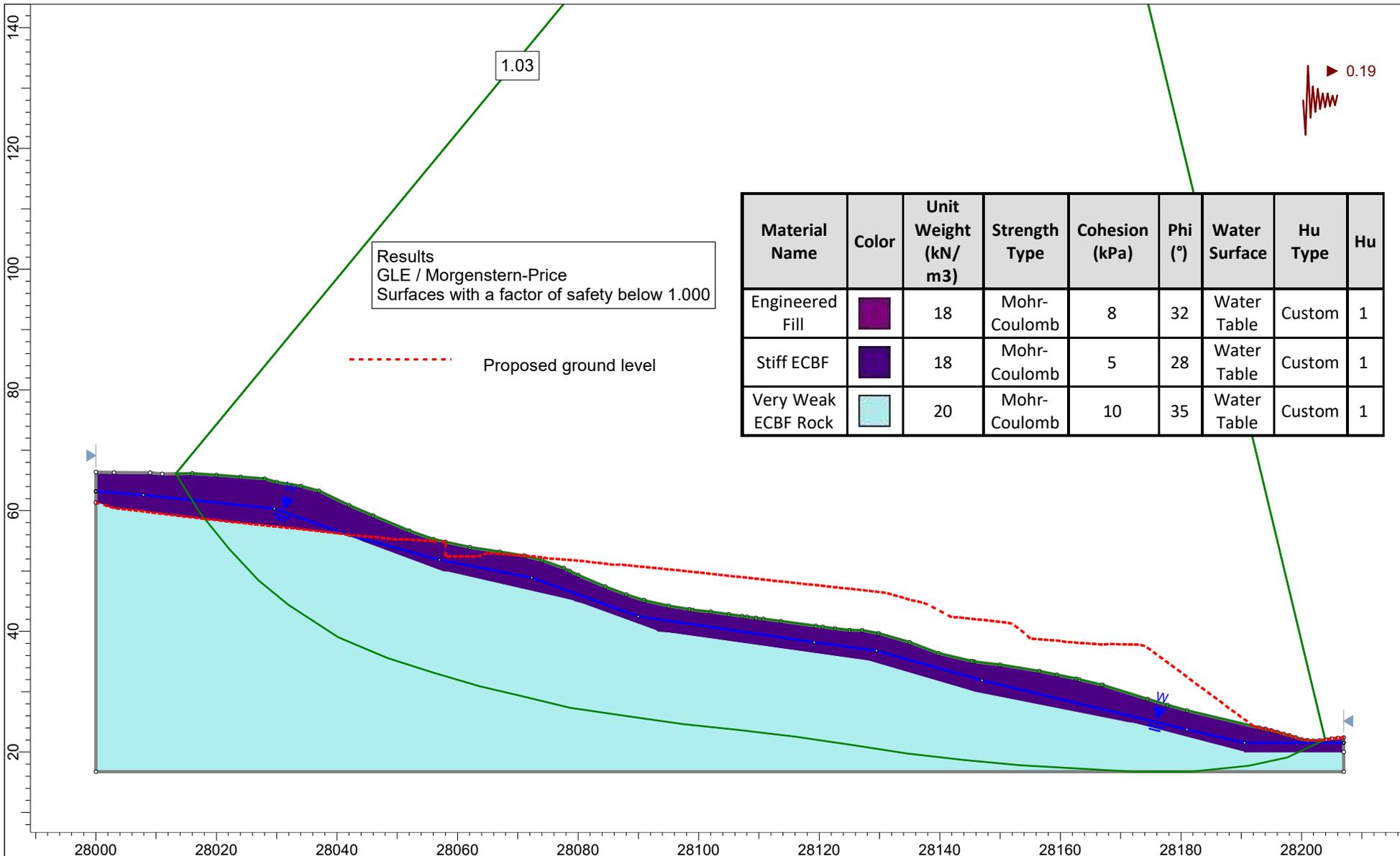
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1



Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section AB - Existing GL	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section AB - June 2025.slmd



	Project		240065 - Russell Road, Wainui - Stage 2	
	Group	Section AB - Existing GL	Scenario	Extreme (Worst Credible GW)
	Drawn By	RS	Company	Riley Consultants Ltd
	Date	10/12/2024	File Name	Section AB - June 2025.slm



Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000

----- Proposed ground level

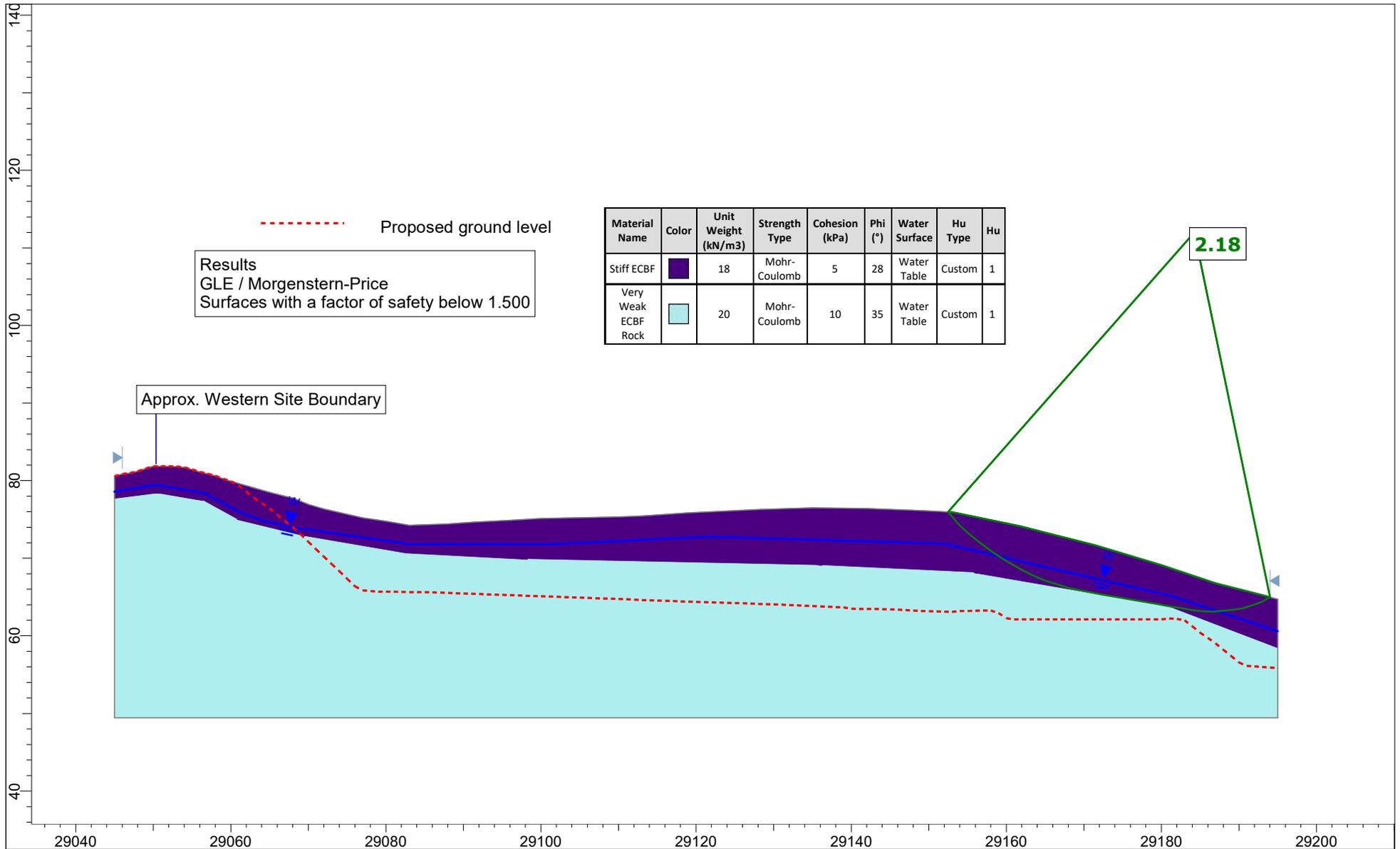
1.03

0.19

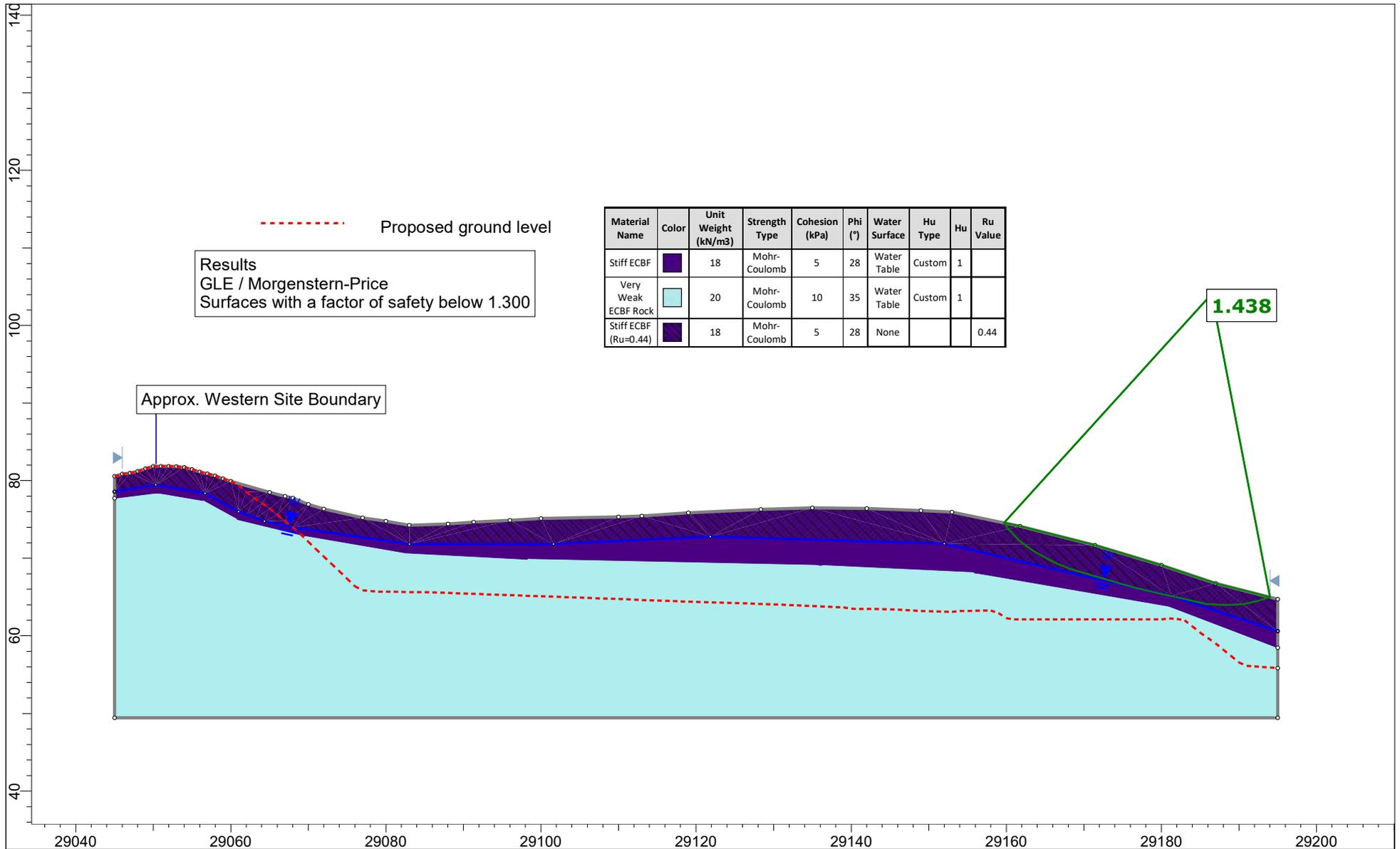
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1



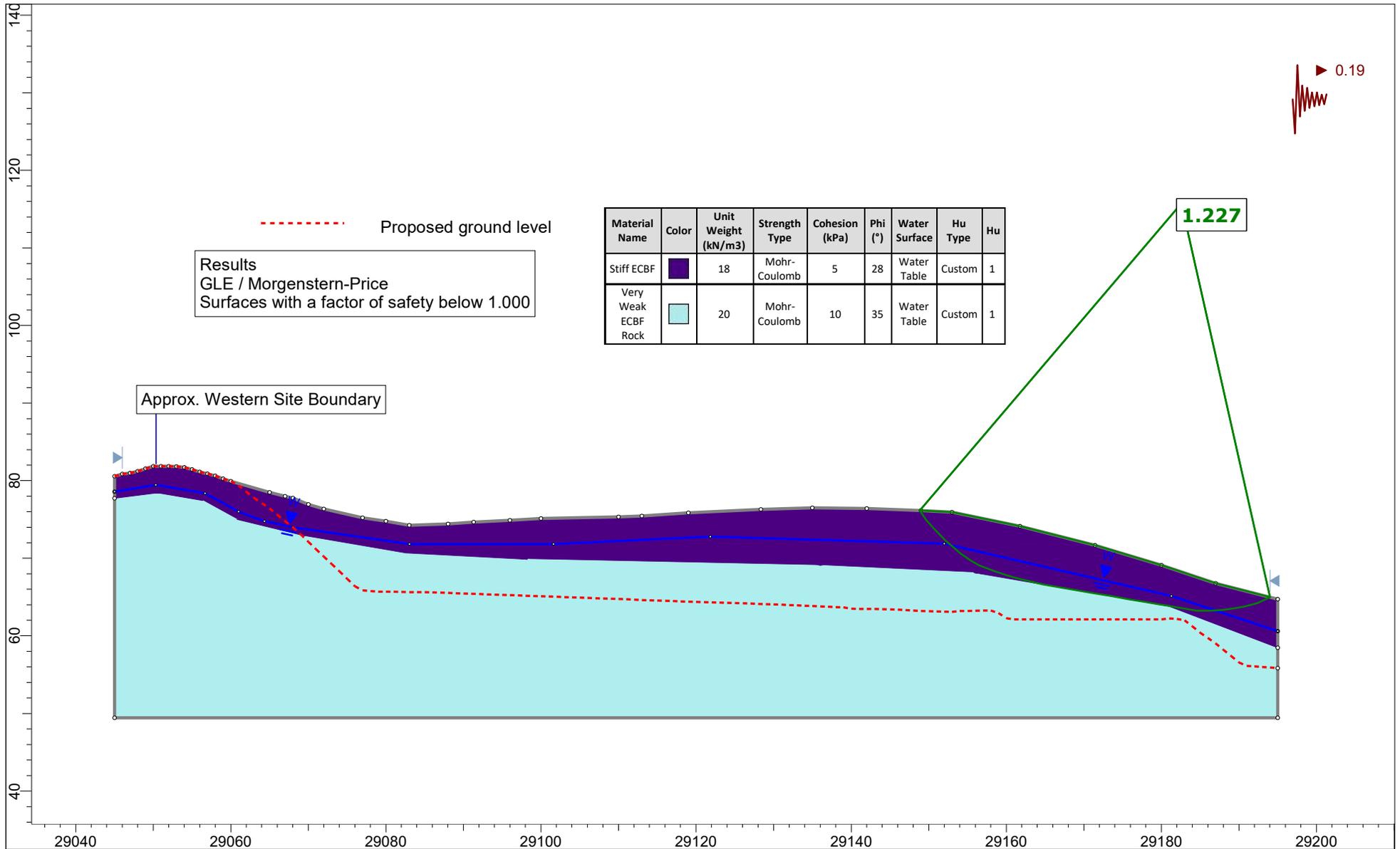
Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section AB - Existing GL	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section AB - June 2025.slm



Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section AC - Existing GL	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section AC - June 2025.slmd



Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section AC - Existing GL	Scenario	Extreme (Worst Credible GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section AC - June 2025.slmd



Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Weak ECBF	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Rock								

Approx. Western Site Boundary

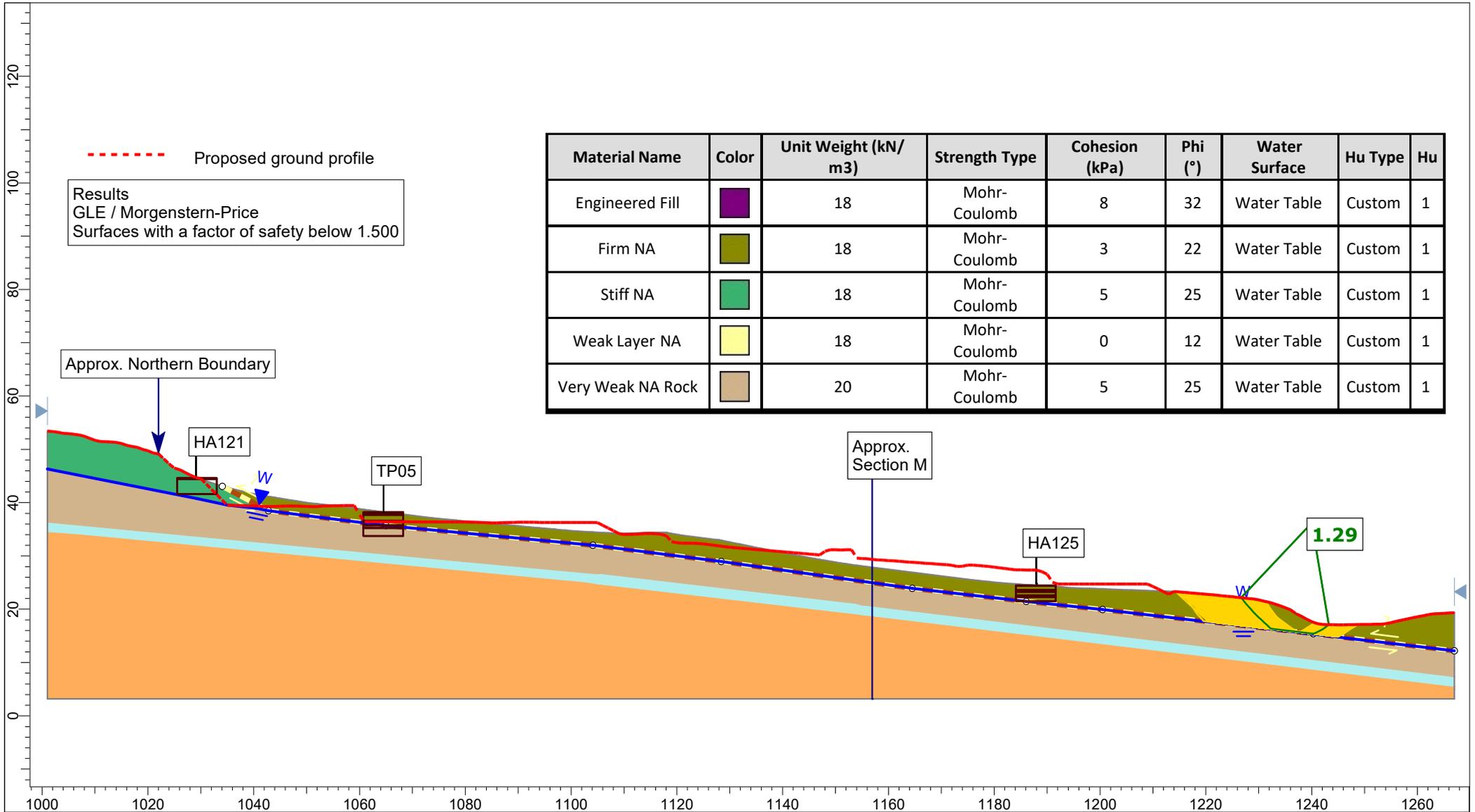
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0.19

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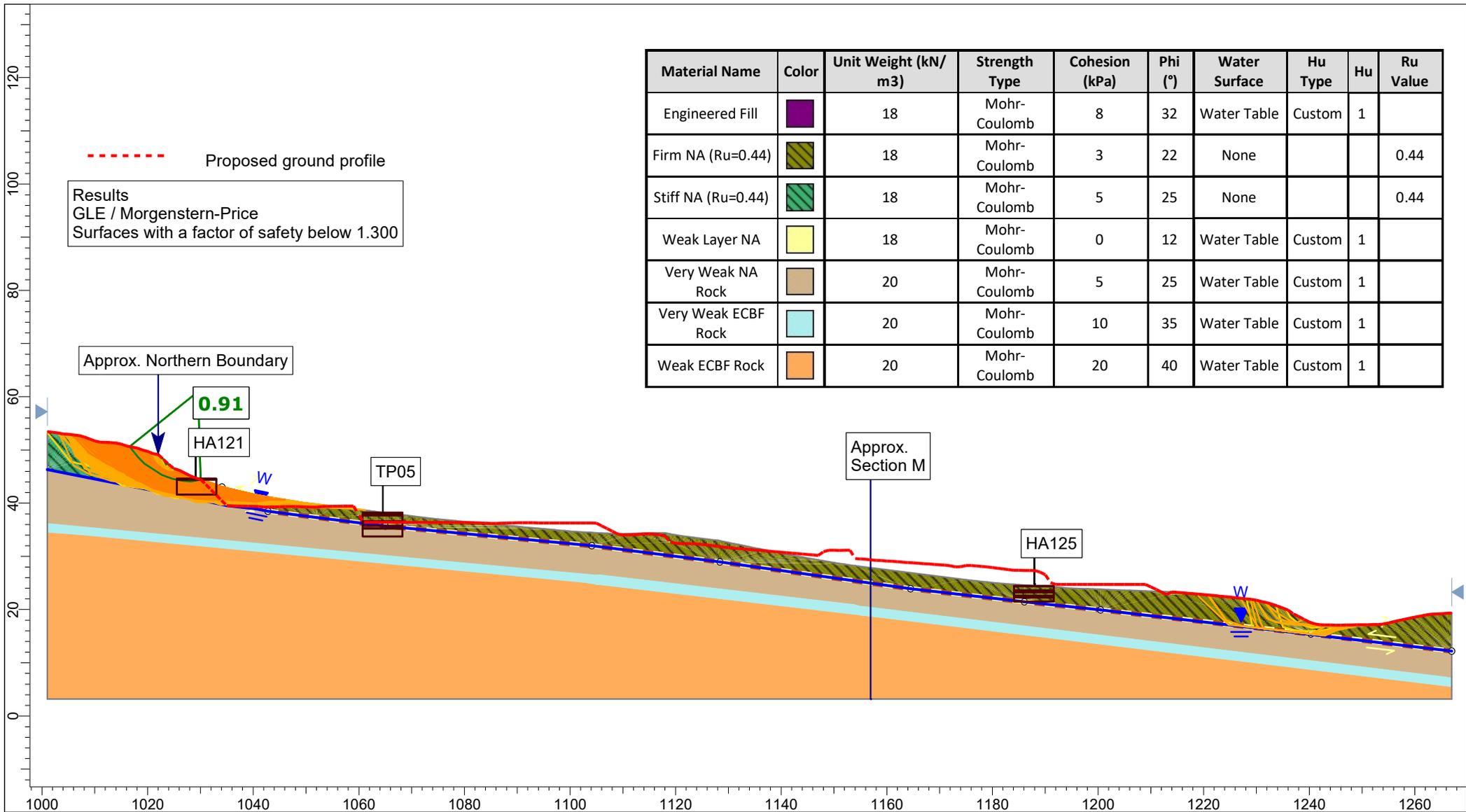


Project		240065 - Russell Road, Wainui - Stage 2	
Group	Section AC - Existing GL	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section AC - June 2025.slm



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Firm NA		18	Mohr-Coulomb	3	22	Water Table	Custom	1
Stiff NA		18	Mohr-Coulomb	5	25	Water Table	Custom	1
Weak Layer NA		18	Mohr-Coulomb	0	12	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1

	Project		240065 - Russell Road, Wainui - Stage 1	
	Group		Existing GL Section A	Scenario
	Drawn By		AB	Company
	Date		11/12/2024, 1:30:46 pm	File Name
				Normal (Measured GW)
				Riley Consultants Ltd
				Section A (AB).slmd



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Firm NA (Ru=0.44)		18	Mohr-Coulomb	3	22	None			0.44
Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	25	None			0.44
Weak Layer NA		18	Mohr-Coulomb	0	12	Water Table	Custom	1	
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300

Approx. Northern Boundary

0.91

HA121

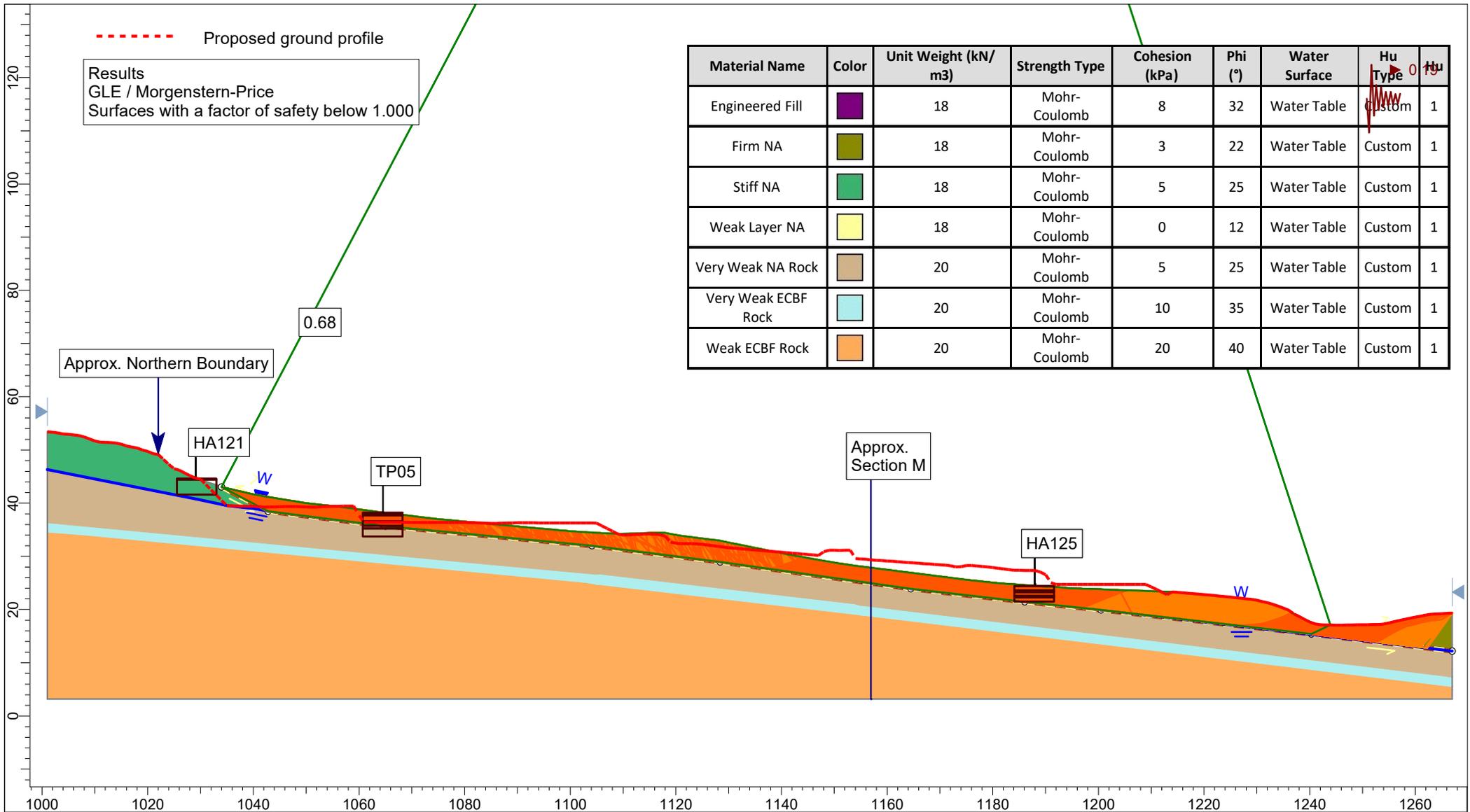
TP05

Approx. Section M

HA125



Project	240065 - Russell Road, Wainui - Stage 1		
Group	Existing GL Section A	Scenario	Extreme (Worst Credible)
Drawn By	AB	Company	Riley Consultants Ltd
Date	11/12/2024, 1:30:46 pm	File Name	Section A (AB).slmd



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	Water Table	Custom	1
Firm NA	Olive Green	18	Mohr-Coulomb	3	22	Water Table	Custom	1
Stiff NA	Green	18	Mohr-Coulomb	5	25	Water Table	Custom	1
Weak Layer NA	Yellow	18	Mohr-Coulomb	0	12	Water Table	Custom	1
Very Weak NA Rock	Brown	20	Mohr-Coulomb	5	25	Water Table	Custom	1
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1



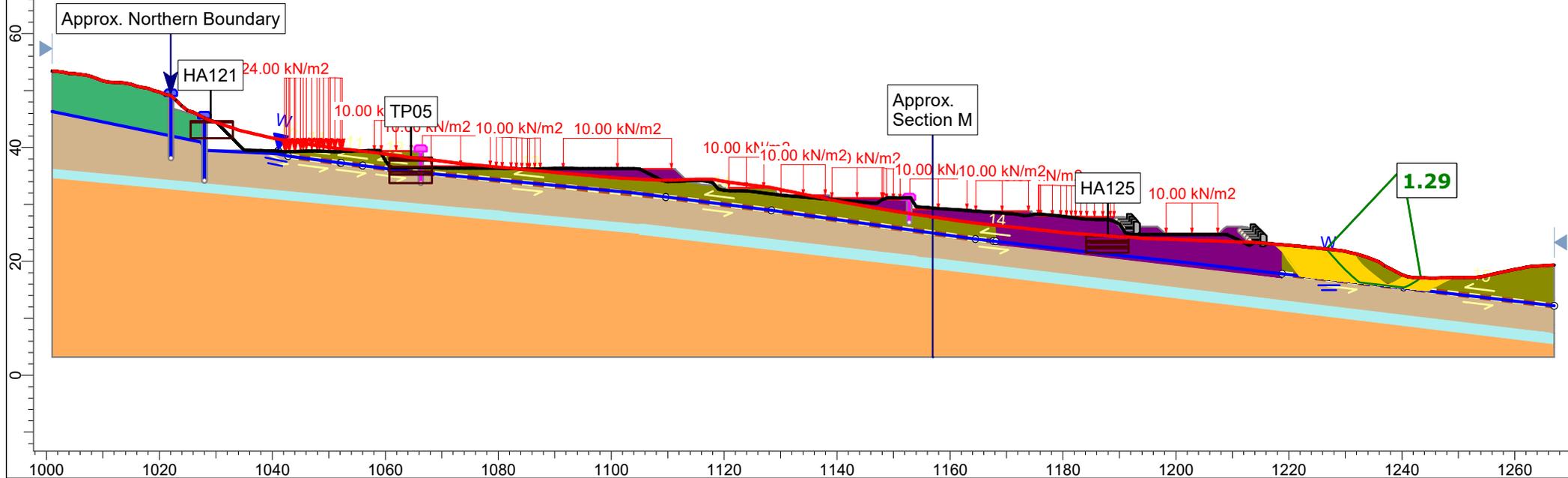
Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section A	Scenario	Seismic (0.19g)
Drawn By	AB	Company	Riley Consultants Ltd
Date	11/12/2024, 1:30:46 pm	File Name	Section A (AB).slmd

Geogrid	Geosynthetic	None (Method A)	No	Angle & Adhesion	5	21	Linear			Reinforcement	Slope Face	100	20	Constant	20
300 SED Timber Retaining Wall	Pile/Micro Pile	Active (Method A)	1.5					Shear	66	Parallel to surface					

--- Existing ground profile

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500

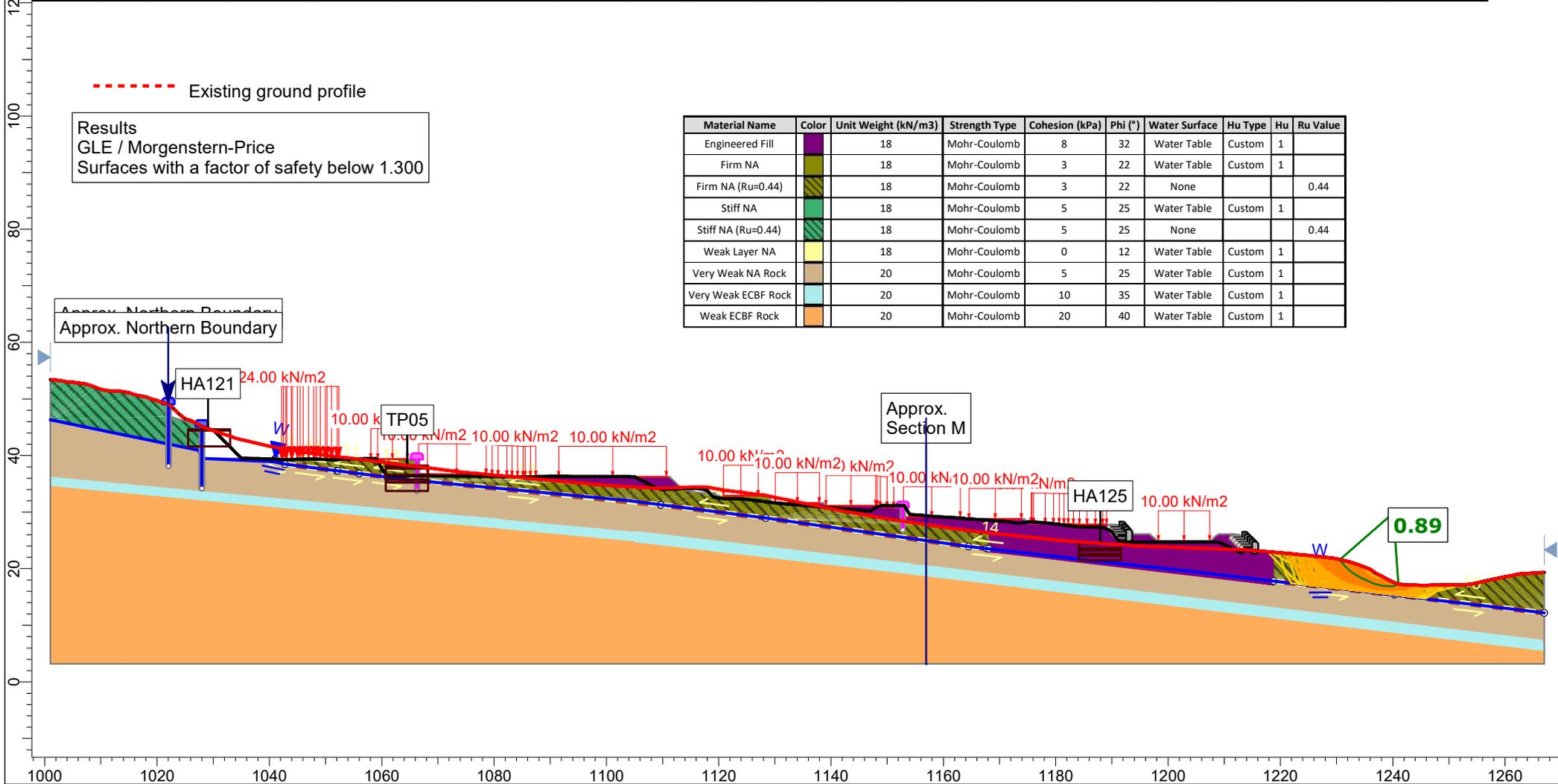
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill	Dark Purple	18	Mohr-Coulomb	8	32	Water Table	Custom	1
Firm NA	Dark Green	18	Mohr-Coulomb	3	22	Water Table	Custom	1
Stiff NA	Light Green	18	Mohr-Coulomb	5	25	Water Table	Custom	1
Weak Layer NA	Yellow	18	Mohr-Coulomb	0	12	Water Table	Custom	1
Very Weak NA Rock	Brown	20	Mohr-Coulomb	5	25	Water Table	Custom	1
Very Weak ECBF Rock	Cyan	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1



SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section A Proposed GL, Remedials, Loads	Scenario	Normal (Measured GW)
Drawn By	AB	Company	Riley Consultants Ltd
Date	11/12/2024, 1:30:46 pm	File Name	Section A (AB).slmd

00 SED			(Method A)			Adhesion					Reinforcement						
Timber		Pile/Micro	Active	1.5					Shear	66	Parallel to						
lining Wall		Pile	(Method A)								surface						



Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Firm NA		18	Mohr-Coulomb	3	22	Water Table	Custom	1	
Firm NA (Ru=0.44)		18	Mohr-Coulomb	3	22	None			0.44
Stiff NA		18	Mohr-Coulomb	5	25	Water Table	Custom	1	
Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	25	None			0.44
Weak Layer NA		18	Mohr-Coulomb	0	12	Water Table	Custom	1	
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	



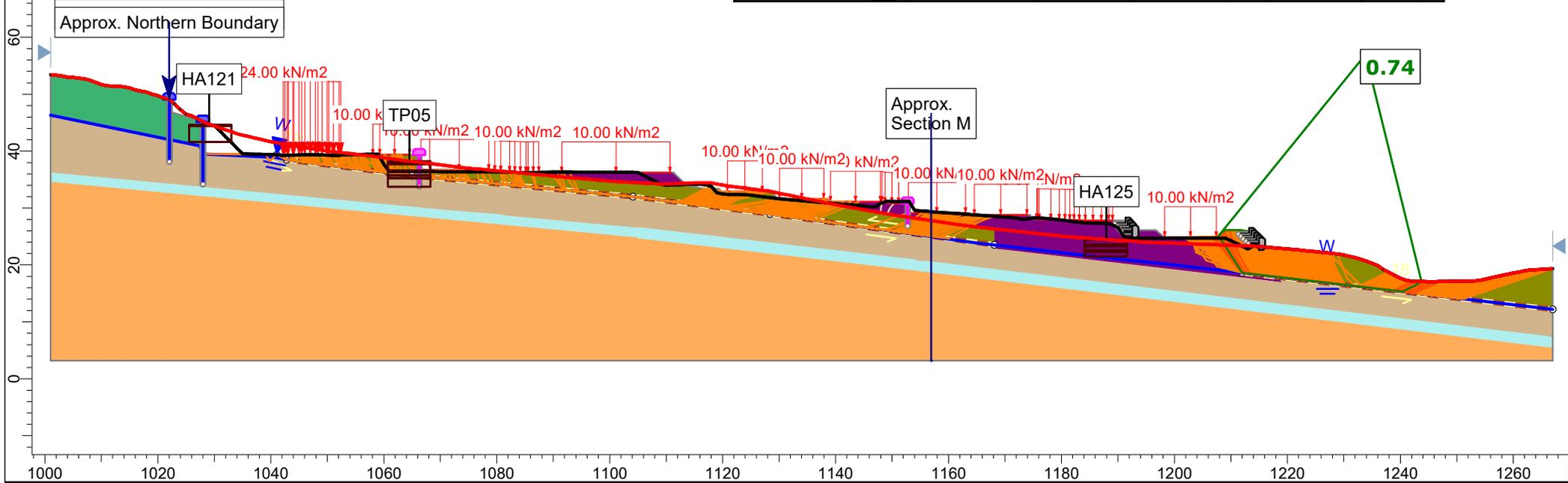
<i>Project</i>	240065 - Russell Road, Wainui - Stage 1	
<i>Group</i>	Section A Proposed GL, Remedials, Loads	<i>Scenario</i>
<i>Drawn By</i>	AB	<i>Company</i>
<i>Date</i>	11/12/2024, 1:30:46 pm	<i>File Name</i>
		Section A (AB).slmd

Geogrid	Geosynthetic	(Method A)	No	Angle & Adhesion	5	21	Linear	Reinforcement	Slope Face	100	20	Constant	20
300 SED Timber Retaining Wall	Pile/Micro Pile	Active (Method A)	1.5				Shear	66	Parallel to surface				0.19
Timber	Pile	(Method A)	1.5				Shear	66	surface				

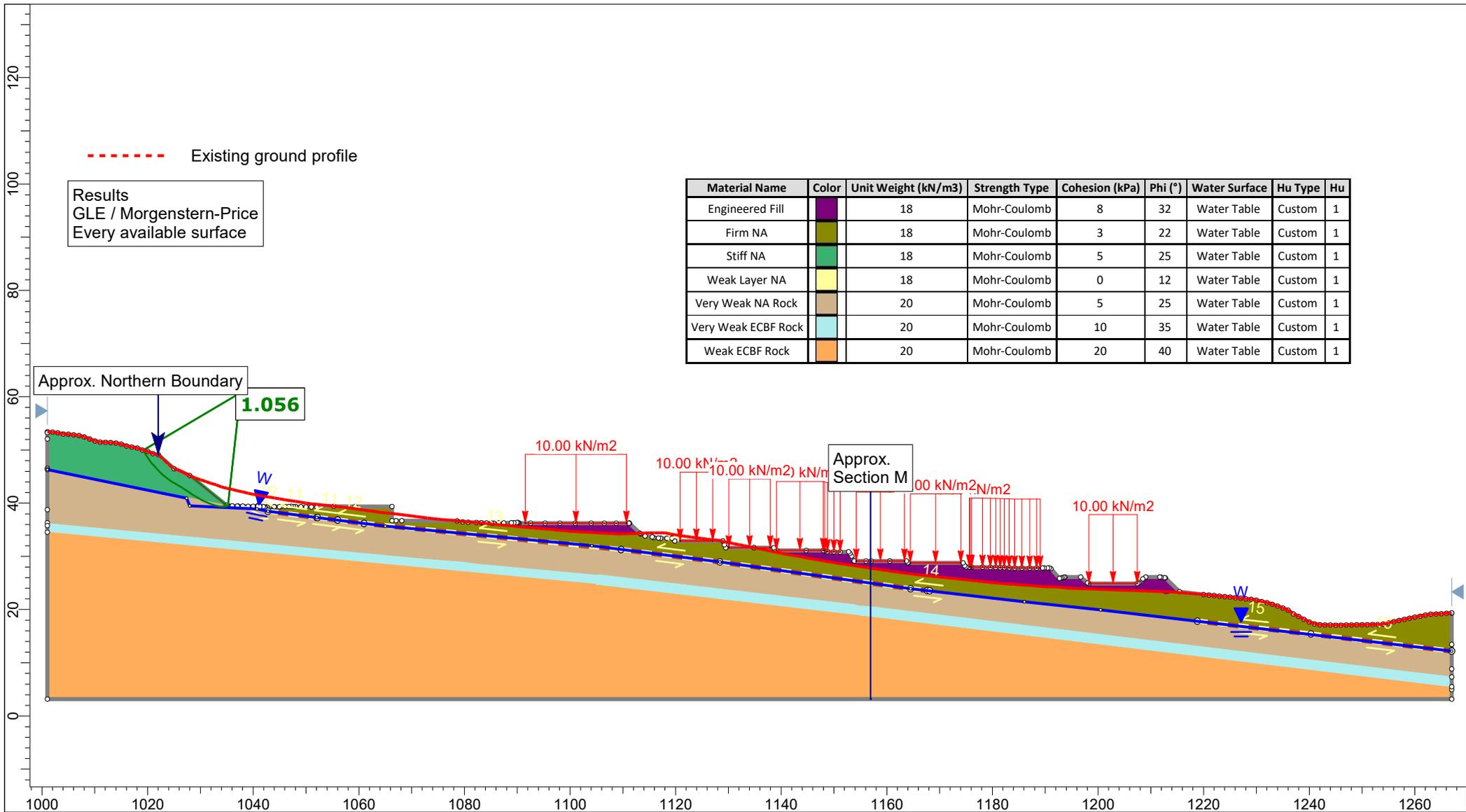
----- Existing ground profile

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Firm NA		18	Mohr-Coulomb	3	22	Water Table	Custom	1
Stiff NA		18	Mohr-Coulomb	5	25	Water Table	Custom	1
Weak Layer NA		18	Mohr-Coulomb	0	12	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1

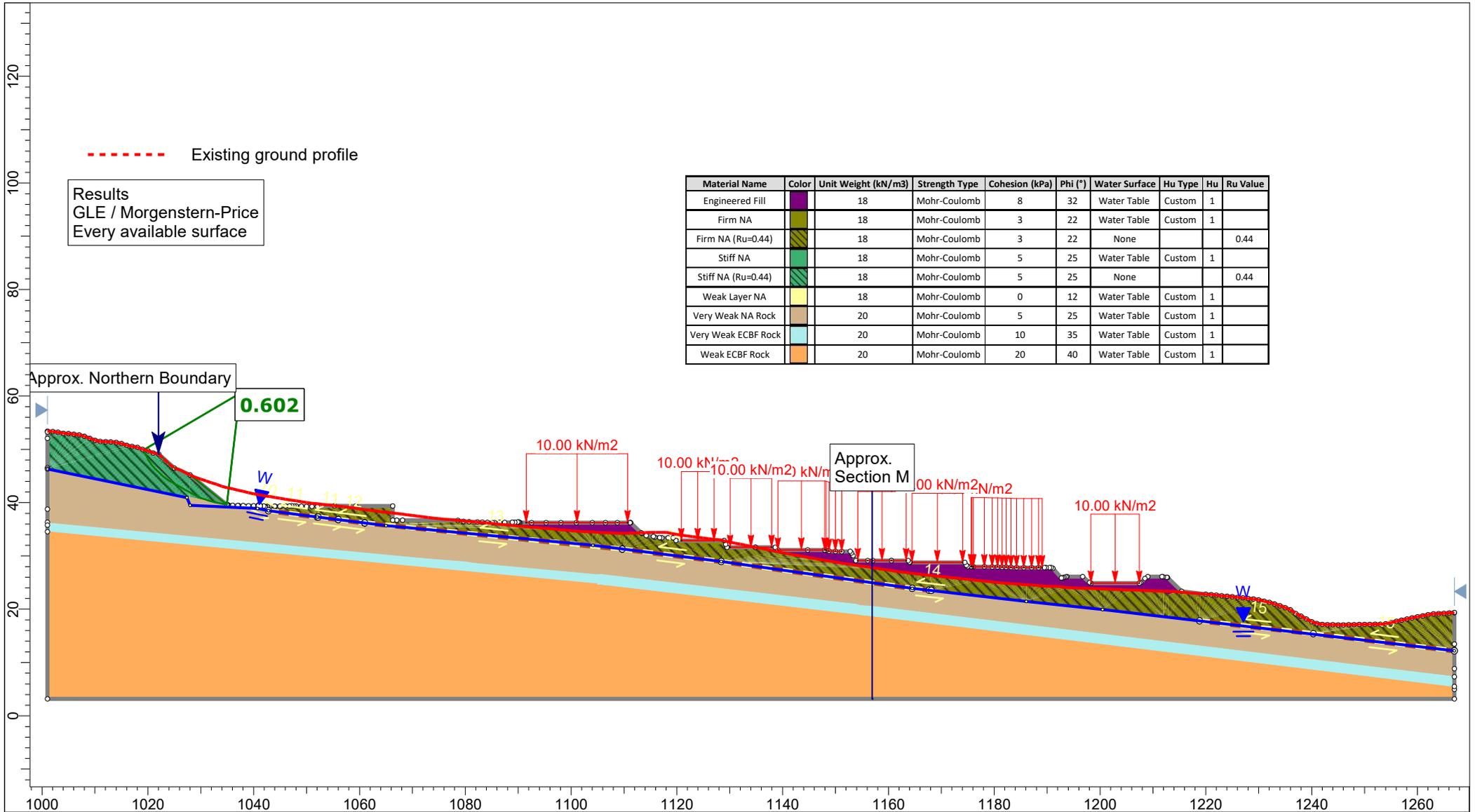


	Project	240065 - Russell Road, Wainui - Stage 1	
	Group	Section A Proposed GL, Remedials, Loads	Scenario Seismic (0.19g)
	Drawn By	AB	Company Riley Consultants Ltd
	Date	11/12/2024, 1:30:46 pm	File Name Section A (AB).slmd



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	Water Table	Custom	1
Firm NA	Green	18	Mohr-Coulomb	3	22	Water Table	Custom	1
Stiff NA	Light Green	18	Mohr-Coulomb	5	25	Water Table	Custom	1
Weak Layer NA	Yellow	18	Mohr-Coulomb	0	12	Water Table	Custom	1
Very Weak NA Rock	Brown	20	Mohr-Coulomb	5	25	Water Table	Custom	1
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1

	Project		240065 - Russell Road, Wainui - Stage 1	
	Group		Section A Proposed GL	Scenario
	Drawn By		AB	Company
	Date		11/12/2024, 1:30:46 pm	File Name
			Normal (Measured GW)	
			Riley Consultants Ltd	
			Section A (AB).slmd	

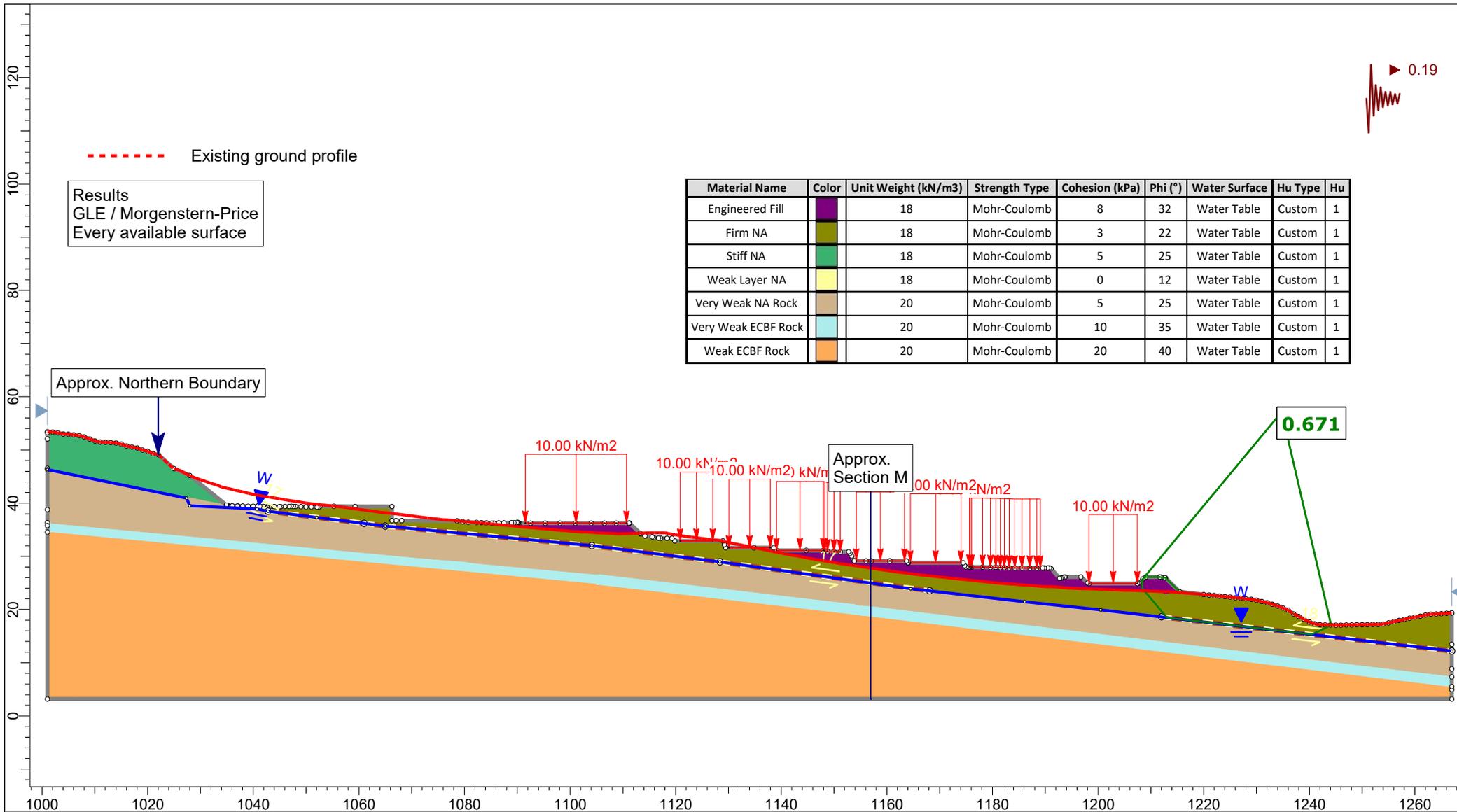


Results
GLE / Morgenstern-Price
Every available surface

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Firm NA		18	Mohr-Coulomb	3	22	Water Table	Custom	1	
Firm NA (Ru=0.44)		18	Mohr-Coulomb	3	22	None			0.44
Stiff NA		18	Mohr-Coulomb	5	25	Water Table	Custom	1	
Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	25	None			0.44
Weak Layer NA		18	Mohr-Coulomb	0	12	Water Table	Custom	1	
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	



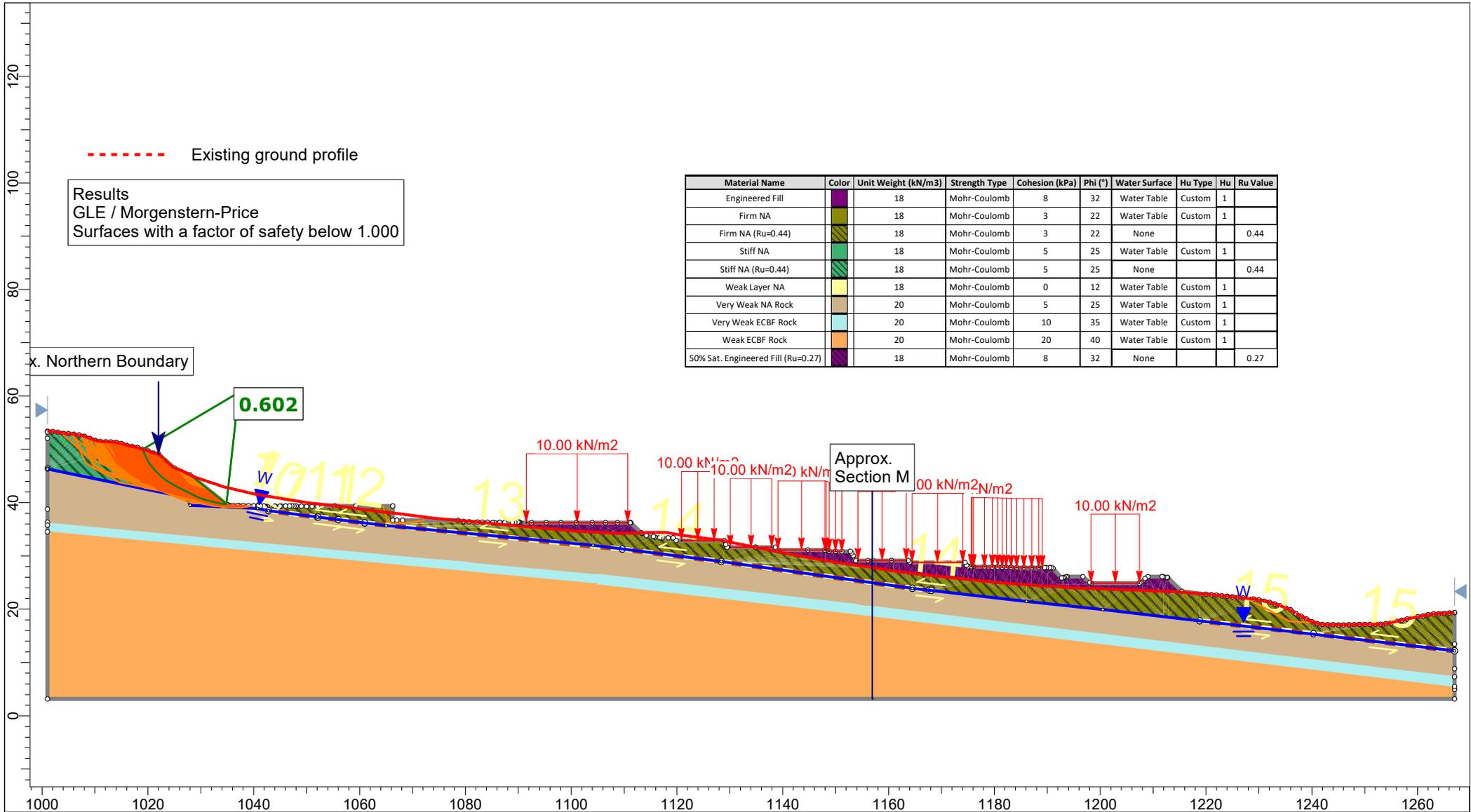
Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section A Proposed GL	Scenario	Extreme (Worst Credible)
Drawn By	AB	Company	Riley Consultants Ltd
Date	11/12/2024, 1:30:46 pm	File Name	Section A (AB).slmd



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	Water Table	Custom	1
Firm NA	Green	18	Mohr-Coulomb	3	22	Water Table	Custom	1
Stiff NA	Yellow	18	Mohr-Coulomb	5	25	Water Table	Custom	1
Weak Layer NA	Brown	18	Mohr-Coulomb	0	12	Water Table	Custom	1
Very Weak NA Rock	Light Blue	20	Mohr-Coulomb	5	25	Water Table	Custom	1
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1



Project		240065 - Russell Road, Wainui - Stage 1	
Group	Section A Proposed GL	Scenario	Seismic (0.19g)
Drawn By	AB	Company	Riley Consultants Ltd
Date	11/12/2024, 1:30:46 pm	File Name	Section A (AB).slmd



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Firm NA		18	Mohr-Coulomb	3	22	Water Table	Custom	1	
Firm NA (Ru=0.44)		18	Mohr-Coulomb	3	22	None			0.44
Stiff NA		18	Mohr-Coulomb	5	25	Water Table	Custom	1	
Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	25	None			0.44
Weak Layer NA		18	Mohr-Coulomb	0	12	Water Table	Custom	1	
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	
50% Sat. Engineered Fill (Ru=0.27)		18	Mohr-Coulomb	8	32	None			0.27

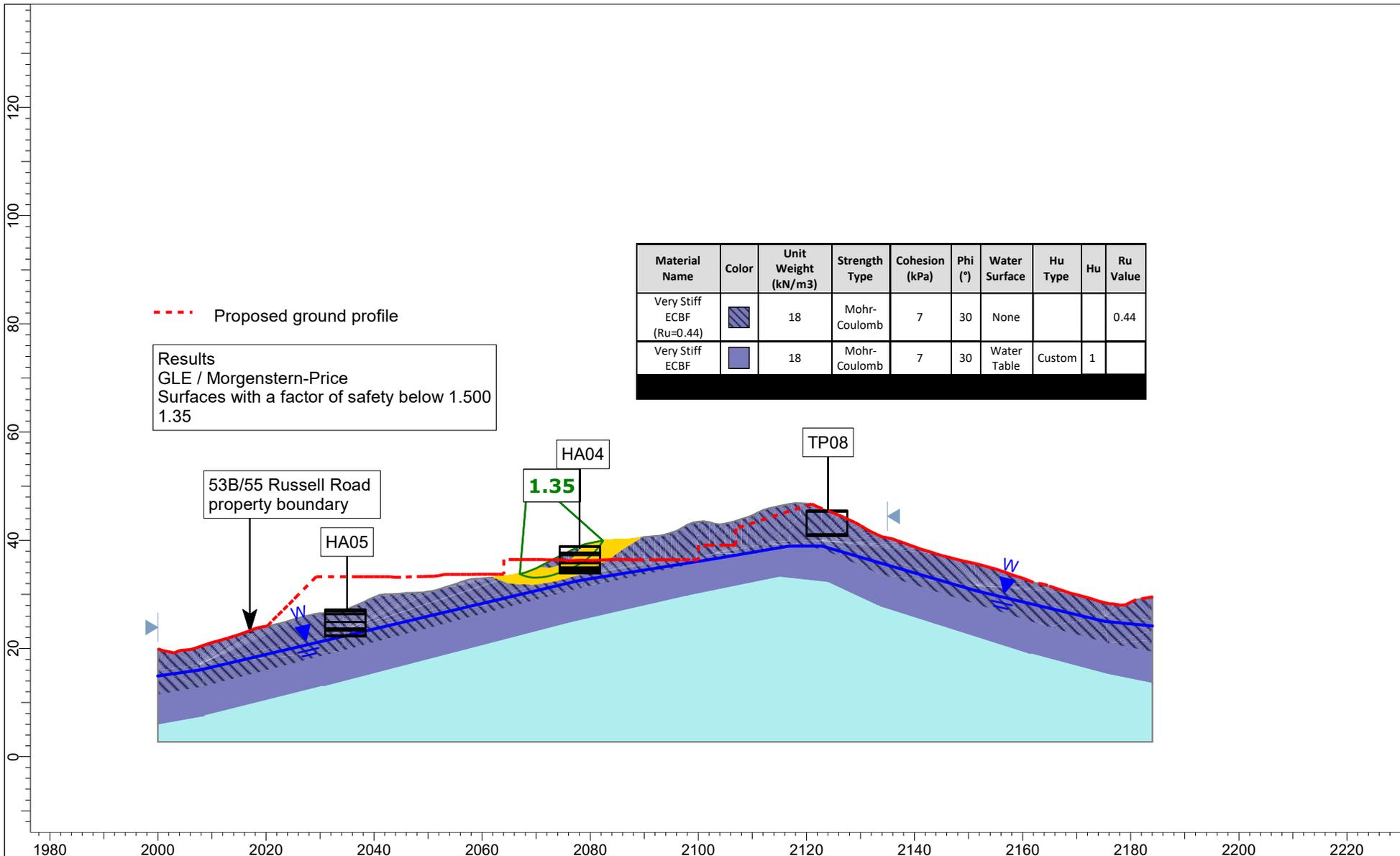
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000

x. Northern Boundary

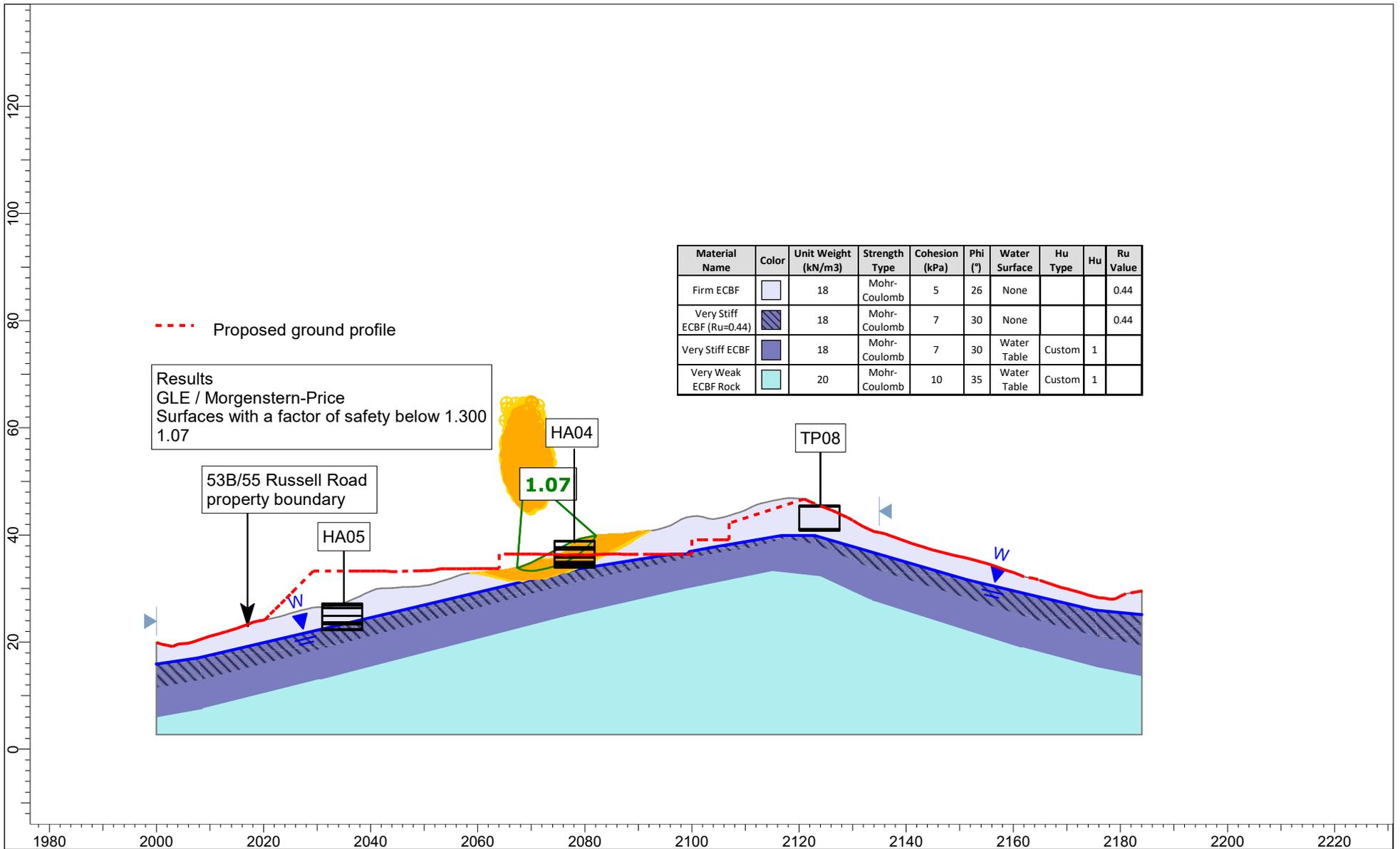
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Approx. Section M

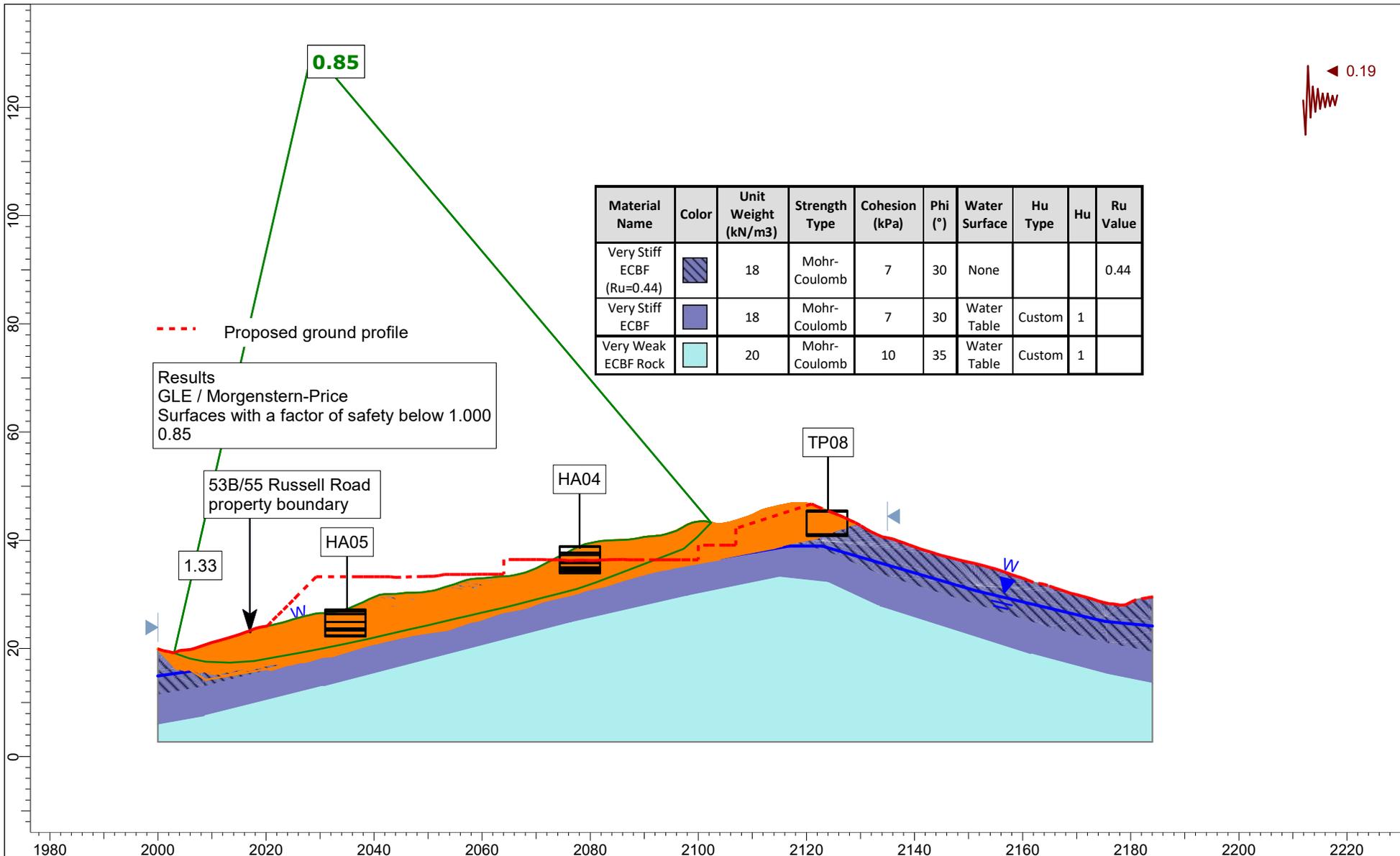
	Project	240065 - Russell Road, Wainui - Stage 1	
	Group	Section A Proposed GL	Scenario Extreme (50% Fill Saturation)
	Drawn By	AB	Company Riley Consultants Ltd
	Date	11/12/2024, 1:30:46 pm	File Name Section A (AB).slmd



Project	240065 - Russell Road, Wainui - Stage 1		
Group	Existing GL Section B	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	File Name	Section B.sldm



	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Existing GL Section B	Scenario	Extreme (Worst Credible GW)
	Drawn By	RS	Company	Riley Consultants Ltd
	Date	12/12/2024, 8:28:52 am	File Name	Section B.sldm



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.85

53B/55 Russell Road
property boundary

1.33

HA05

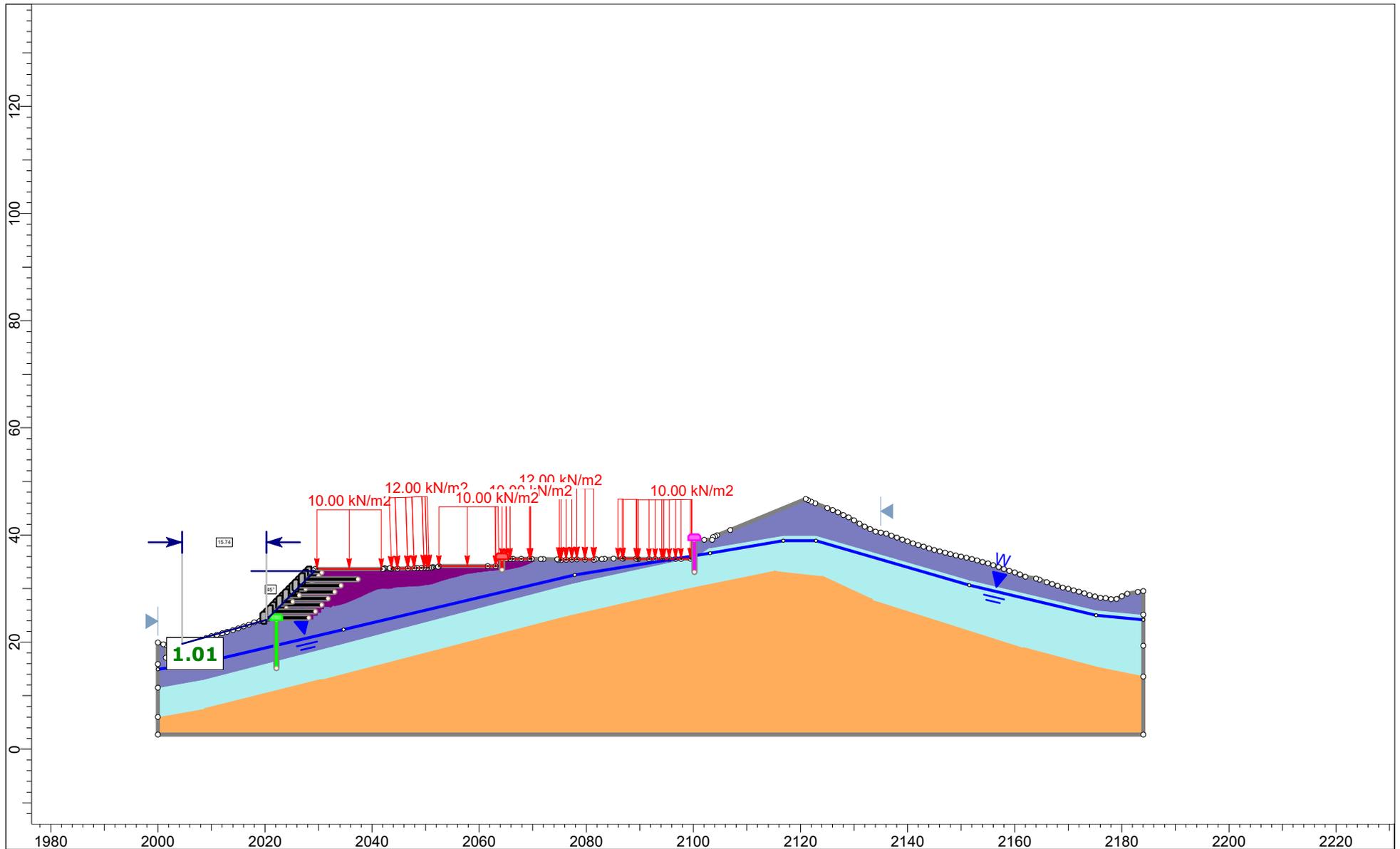
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TP08

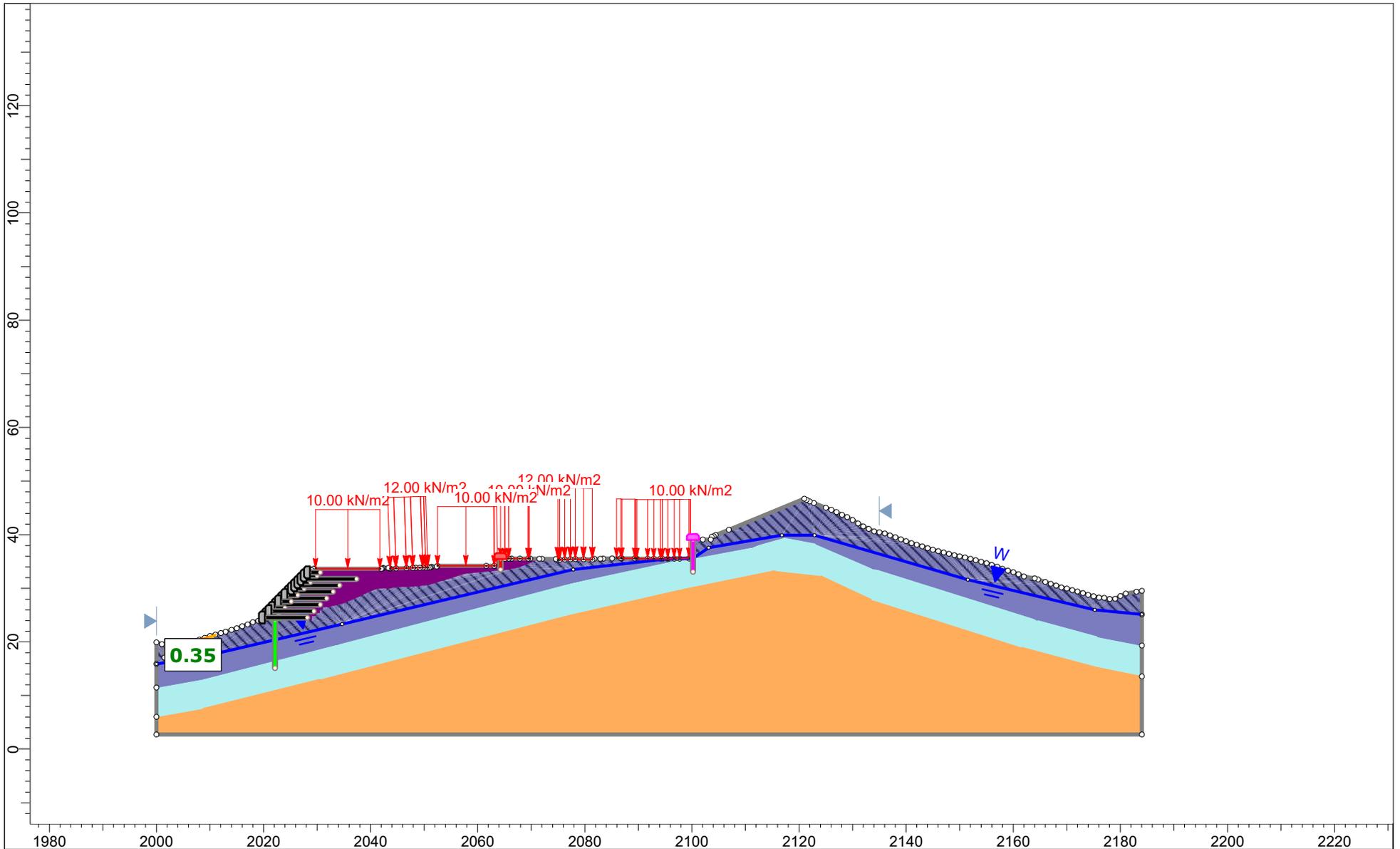
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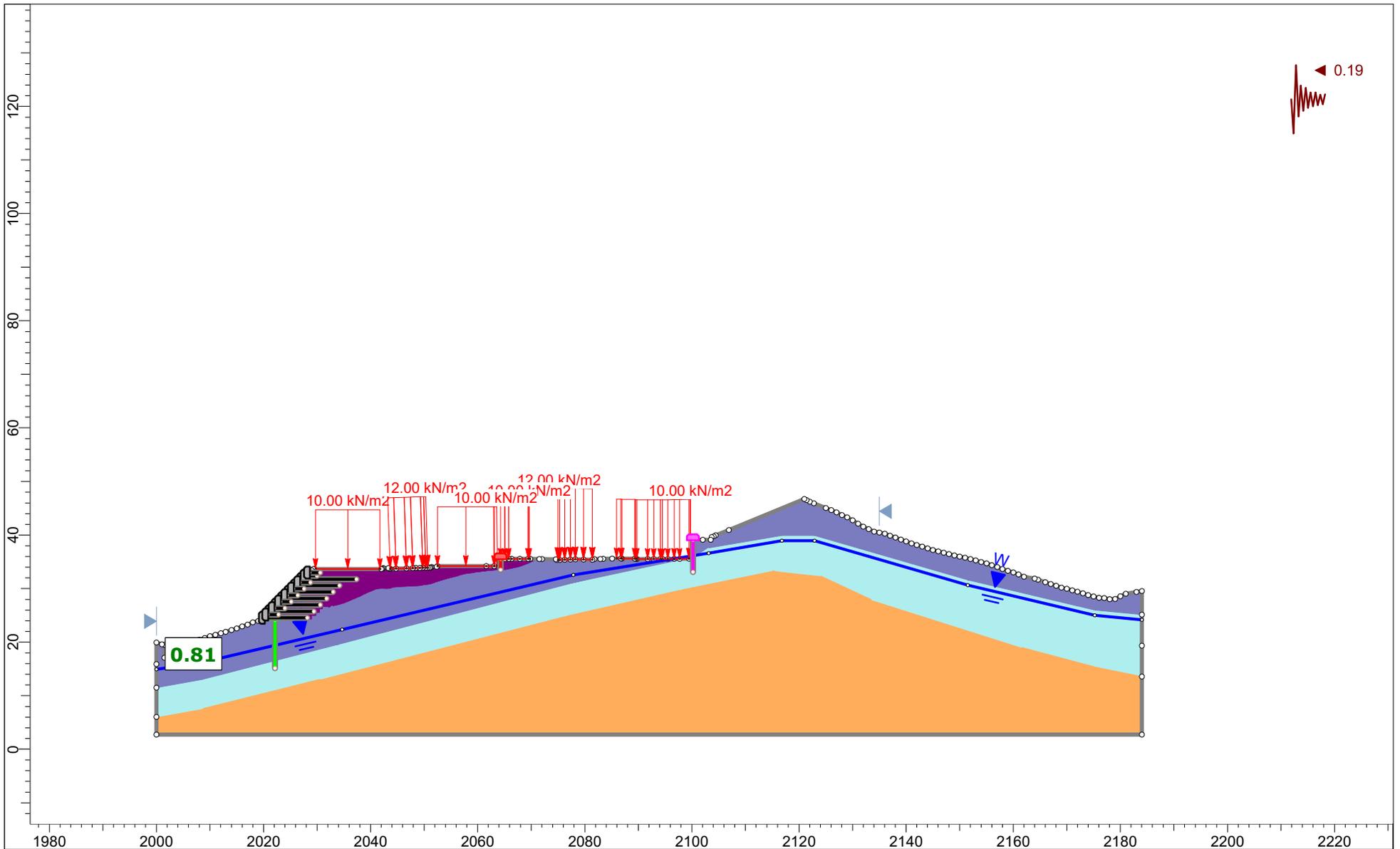
Project		240065 - Russell Road, Wainui - Stage 1	
Group	Existing GL Section B	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	File Name	Section B.sldm



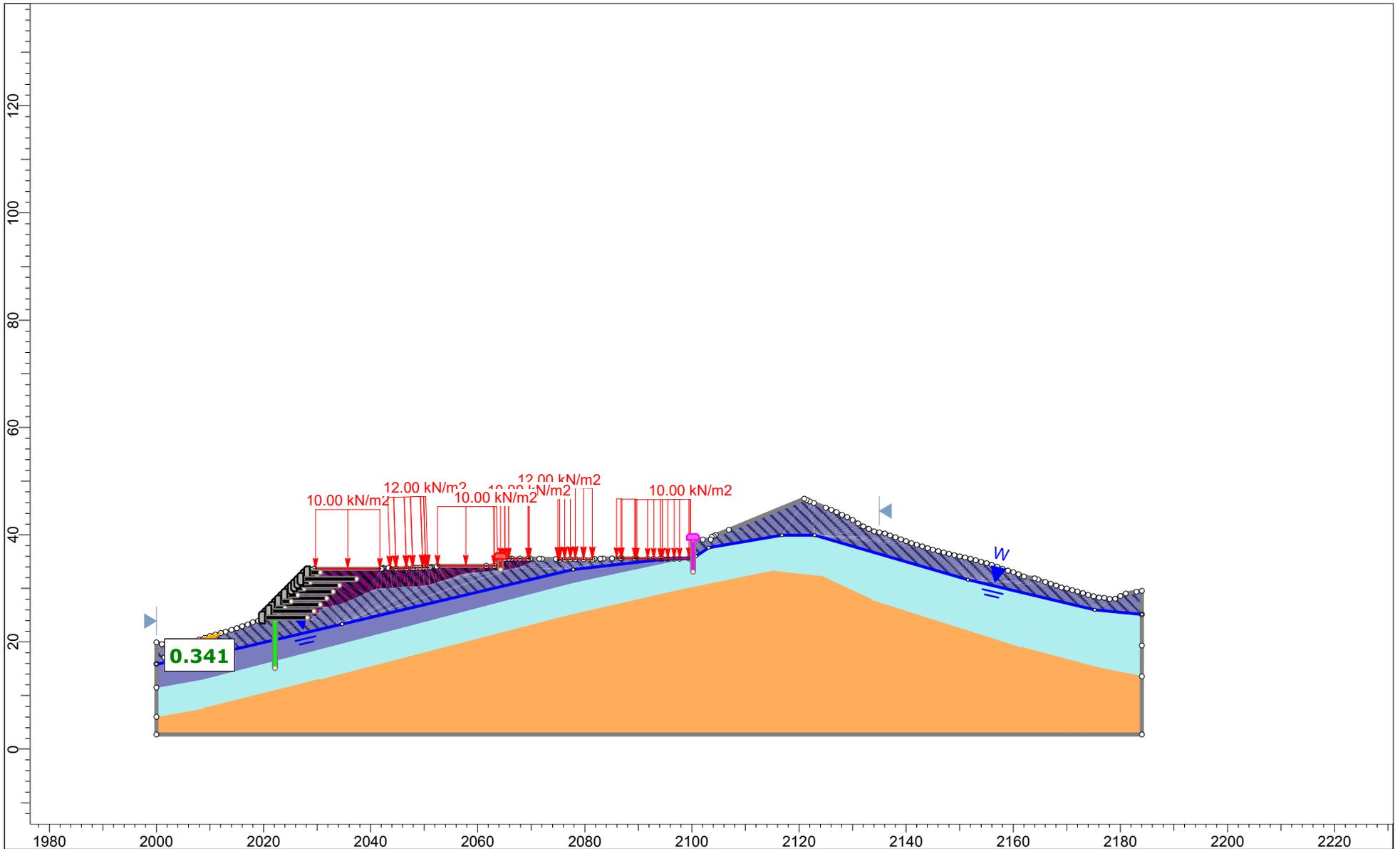
	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1	
	<i>Group</i> Section B - erosion & remedial	<i>Scenario</i> Normal (Measured GW)
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd
	<i>Date</i> 12/12/2024, 8:28:52 am	<i>File Name</i> Section B.slm



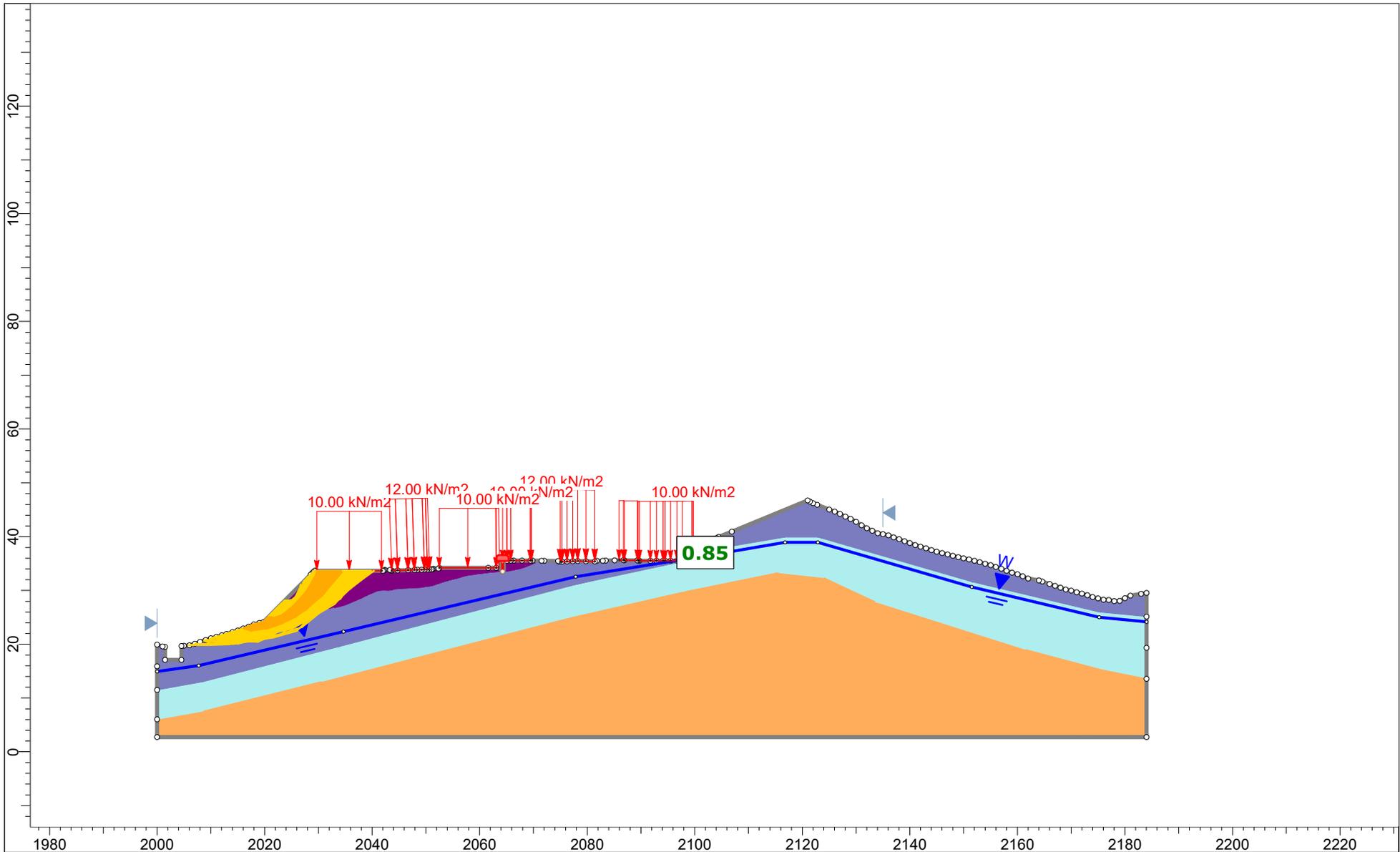
	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1	
	<i>Group</i> Section B - erosion & remedial	<i>Scenario</i> Extreme (Worst Credible GW)
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd
	<i>Date</i> 12/12/2024, 8:28:52 am	<i>File Name</i> Section B.sldm



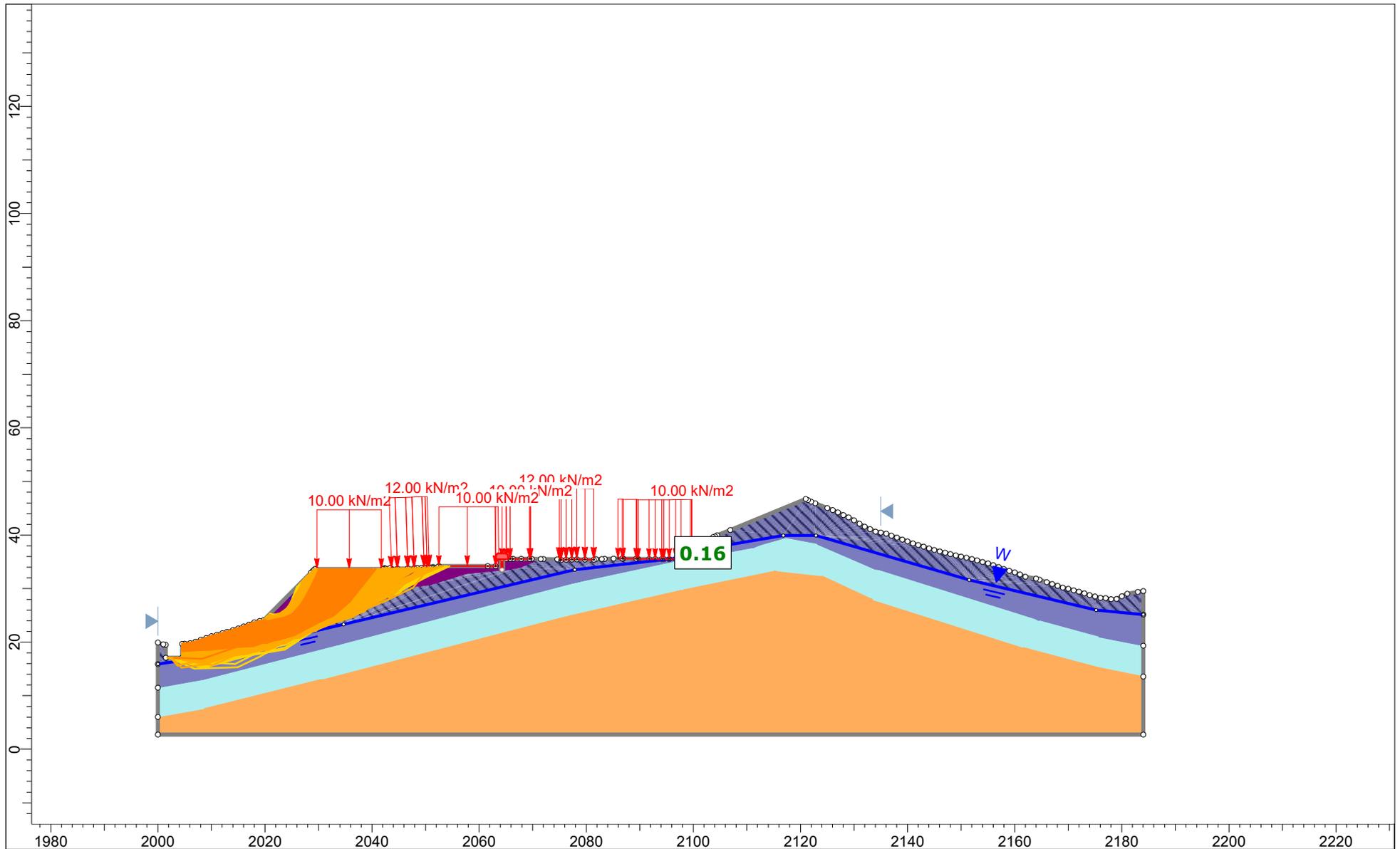
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	<i>Group</i> Section B - erosion & remedial	<i>Scenario</i> Seismic (0.19g)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 12/12/2024, 8:28:52 am	<i>File Name</i> Section B.sldm	



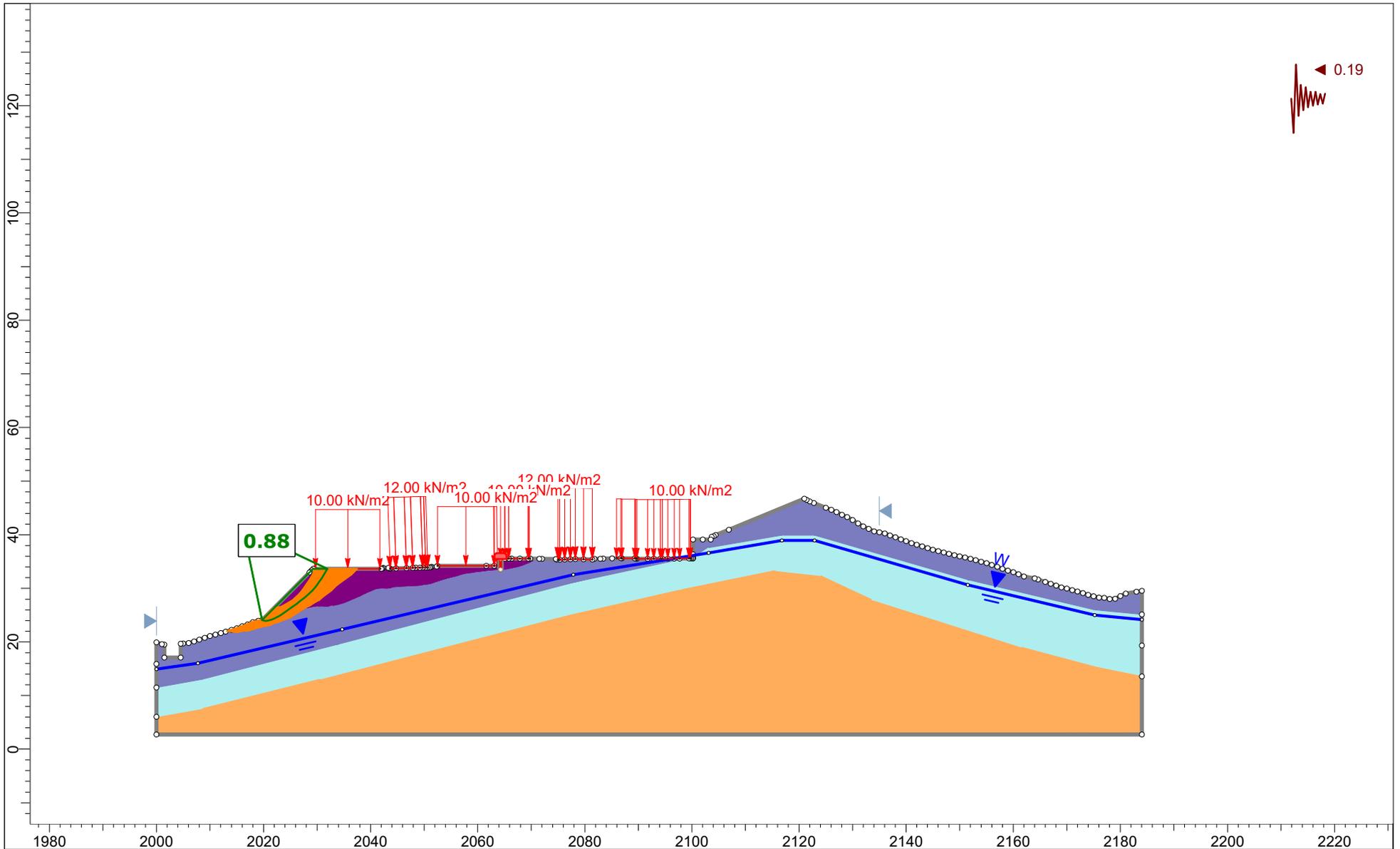
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	Group		Section B - erosion & remedial	Scenario	Extreme (50% fill saturation)
	Drawn By		RS	Company	Riley Consultants Ltd
	Date		12/12/2024, 8:28:52 am	File Name	Section B.sldm



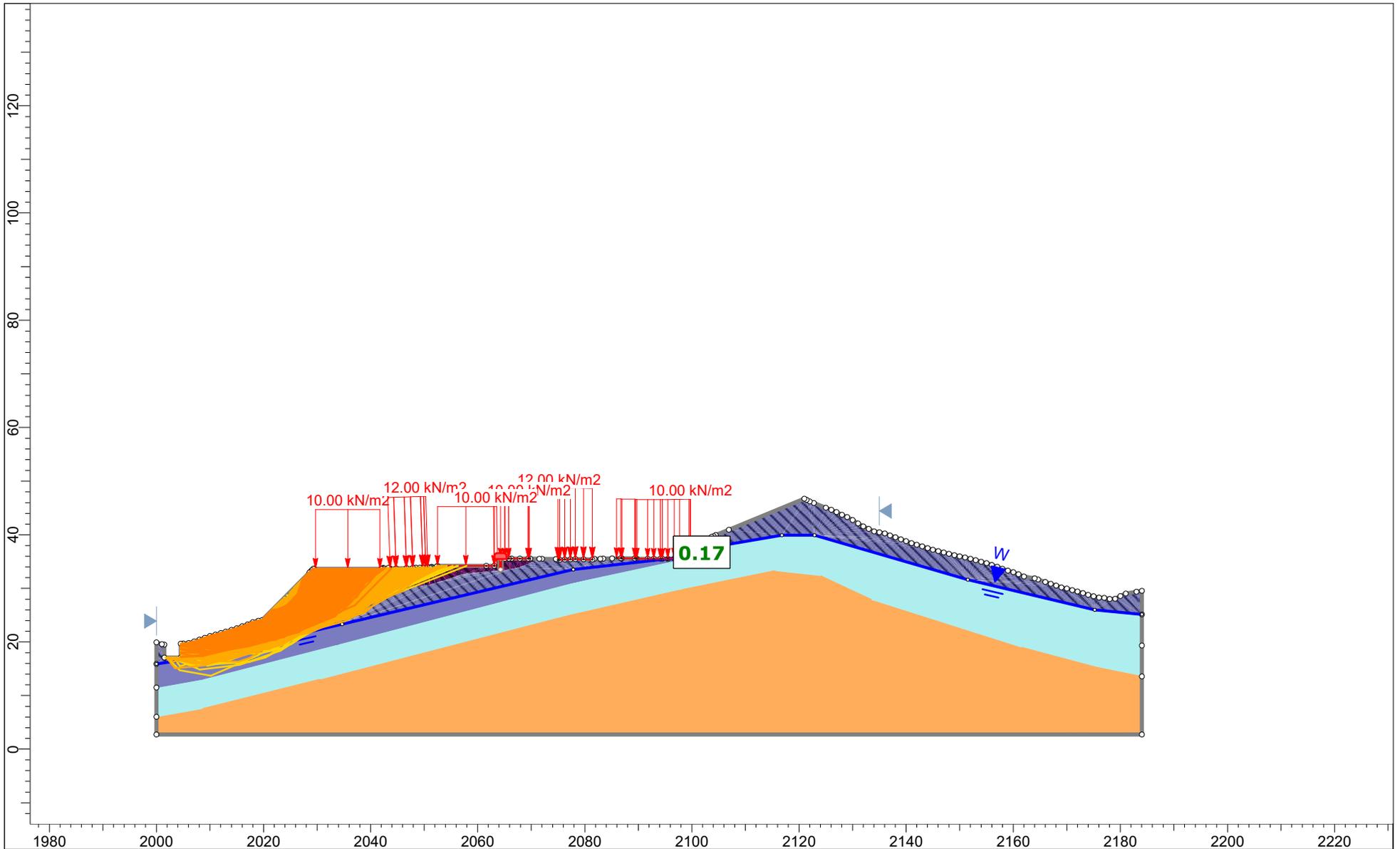
	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1	
	<i>Group</i> Section B - Proposed GL	<i>Scenario</i> Normal (Measured GW)
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd
	<i>Date</i> 12/12/2024, 8:28:52 am	<i>File Name</i> Section B.slm



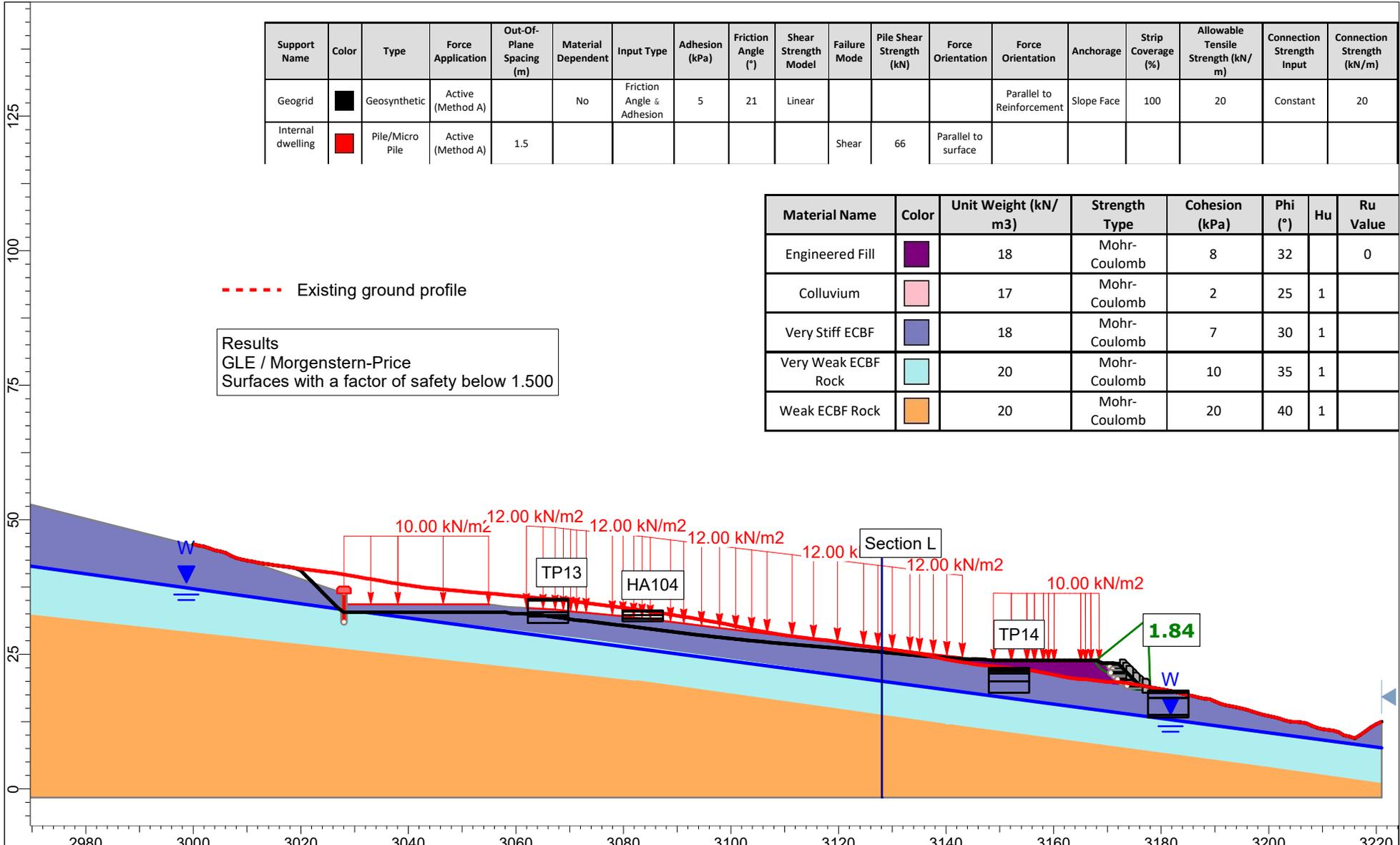
	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Section B - Proposed GL	Scenario	Extreme (Worst Credible GW)
	Drawn By	RS	Company	Riley Consultants Ltd
	Date	12/12/2024, 8:28:52 am	File Name	Section B.slm



	Project		
	240065 - Russell Road, Wainui - Stage 1		
	Group	Section B - Proposed GL	Scenario
	Drawn By	RS	Company
Date	12/12/2024, 8:28:52 am	File Name	Section B.sldm



	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1		
	<i>Group</i> Section B - Proposed GL	<i>Scenario</i> Extreme (50% fill saturation)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 12/12/2024, 8:28:52 am	<i>File Name</i> Section B.sldm	



Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Internal dwelling	Red	Pile/Micro Pile	Active (Method A)	1.5						Shear	66	Parallel to surface						

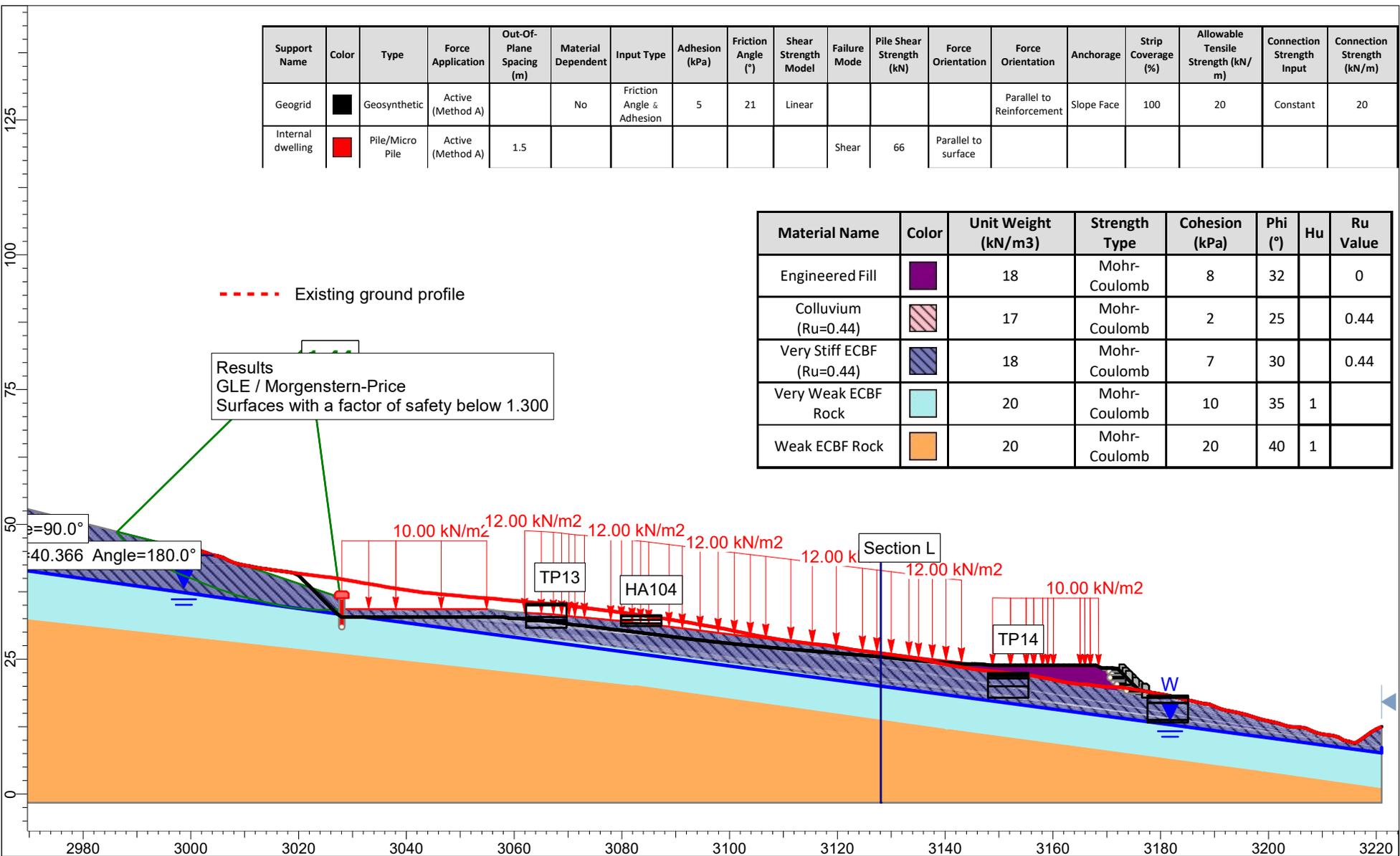
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Hu	Ru Value
Engineered Fill	Purple	18	Mohr-Coulomb	8	32		0
Colluvium	Pink	17	Mohr-Coulomb	2	25	1	
Very Stiff ECBF	Blue	18	Mohr-Coulomb	7	30	1	
Very Weak ECBF Rock	Cyan	20	Mohr-Coulomb	10	35	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	1	



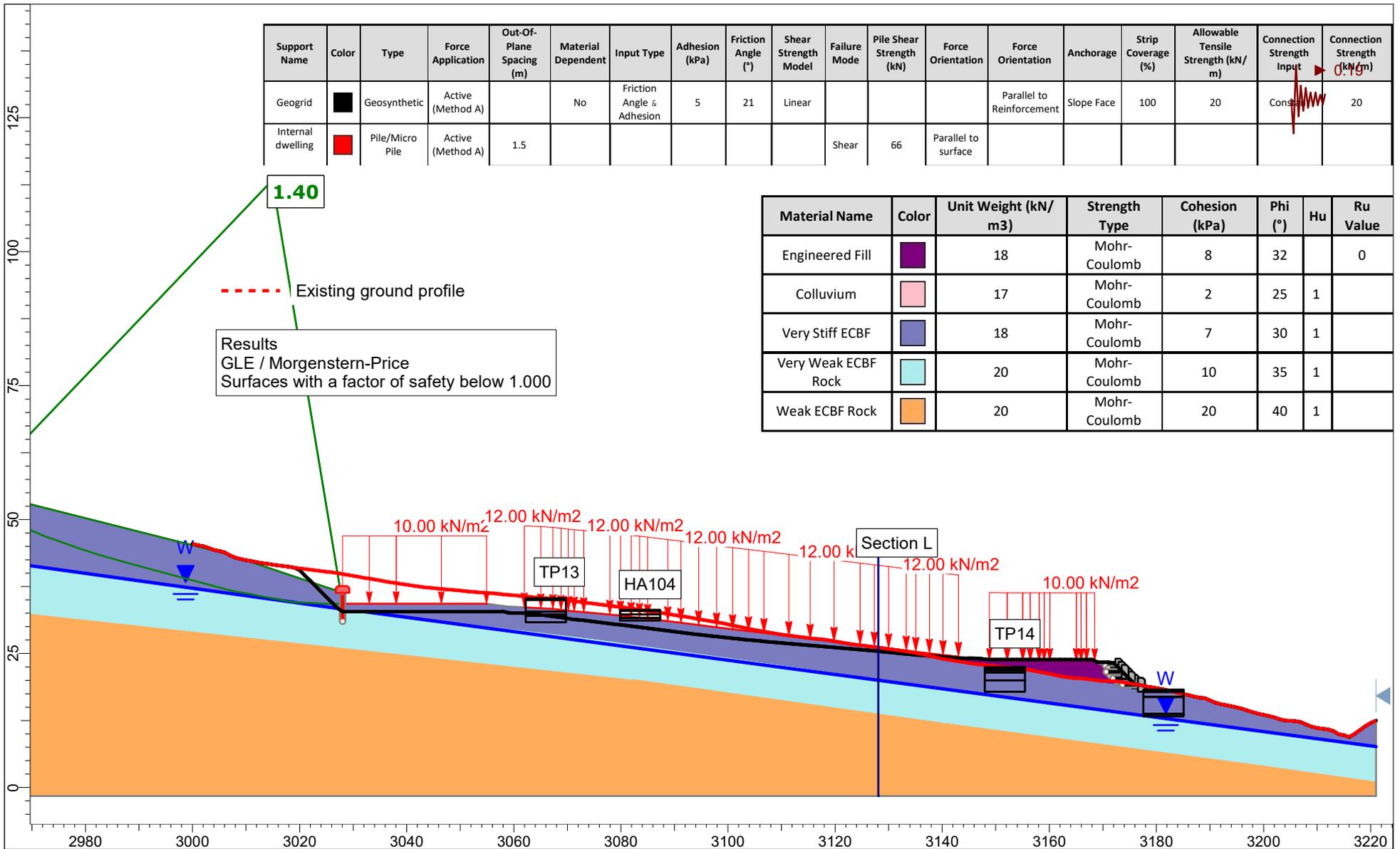
Project		240065 - Russell Road, Wainui - Stage 1	
Group	Proposed GL Section C - Remedials (fill)	Scenario	Normal (Measured GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section C.sldm

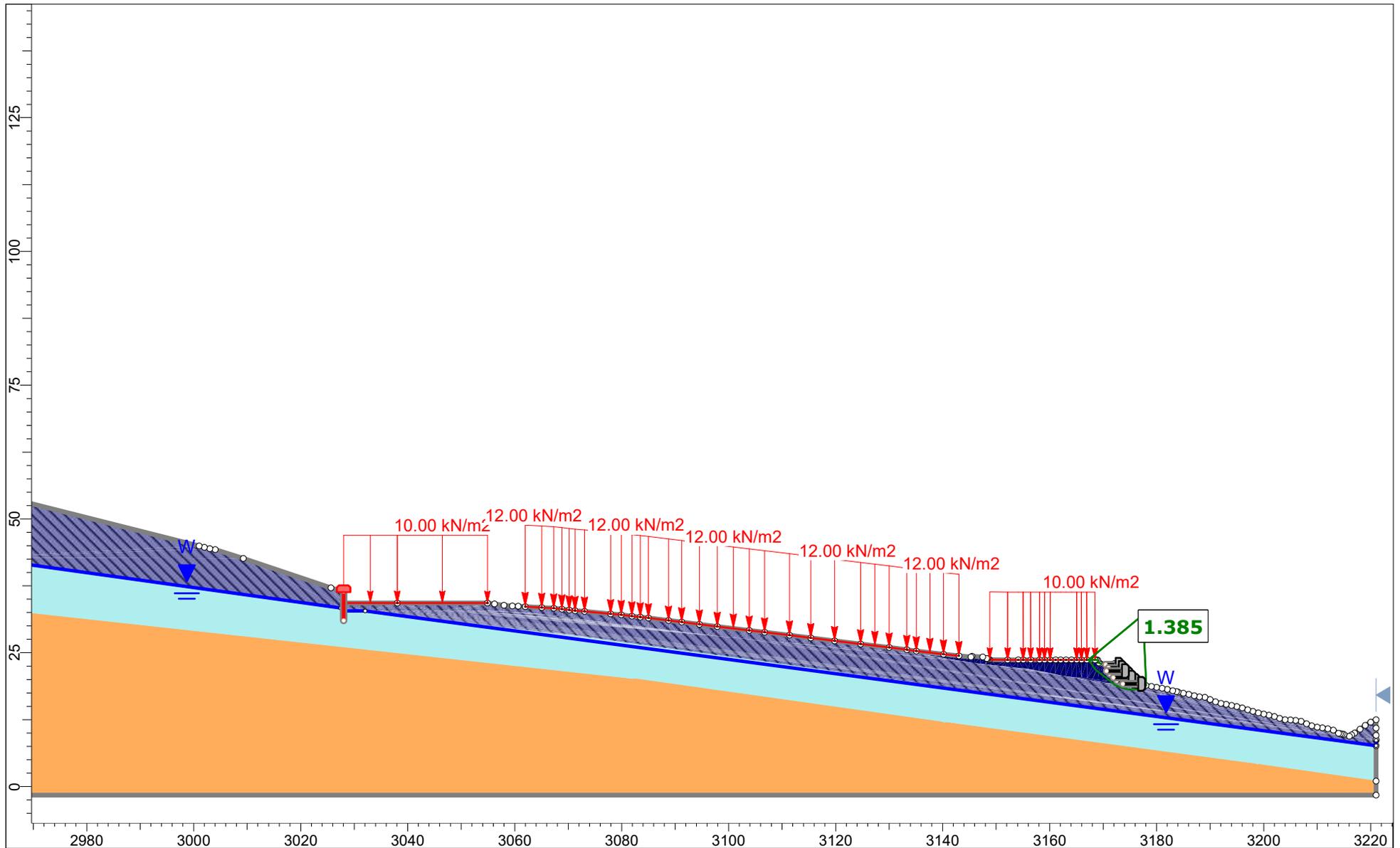
Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Internal dwelling	Red	Pile/Micro Pile	Active (Method A)	1.5						Shear	66	Parallel to surface						

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Hu	Ru Value
Engineered Fill	Purple	18	Mohr-Coulomb	8	32		0
Colluvium (Ru=0.44)	Diagonal Hatching	17	Mohr-Coulomb	2	25		0.44
Very Stiff ECBF (Ru=0.44)	Blue Diagonal Hatching	18	Mohr-Coulomb	7	30		0.44
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	1	



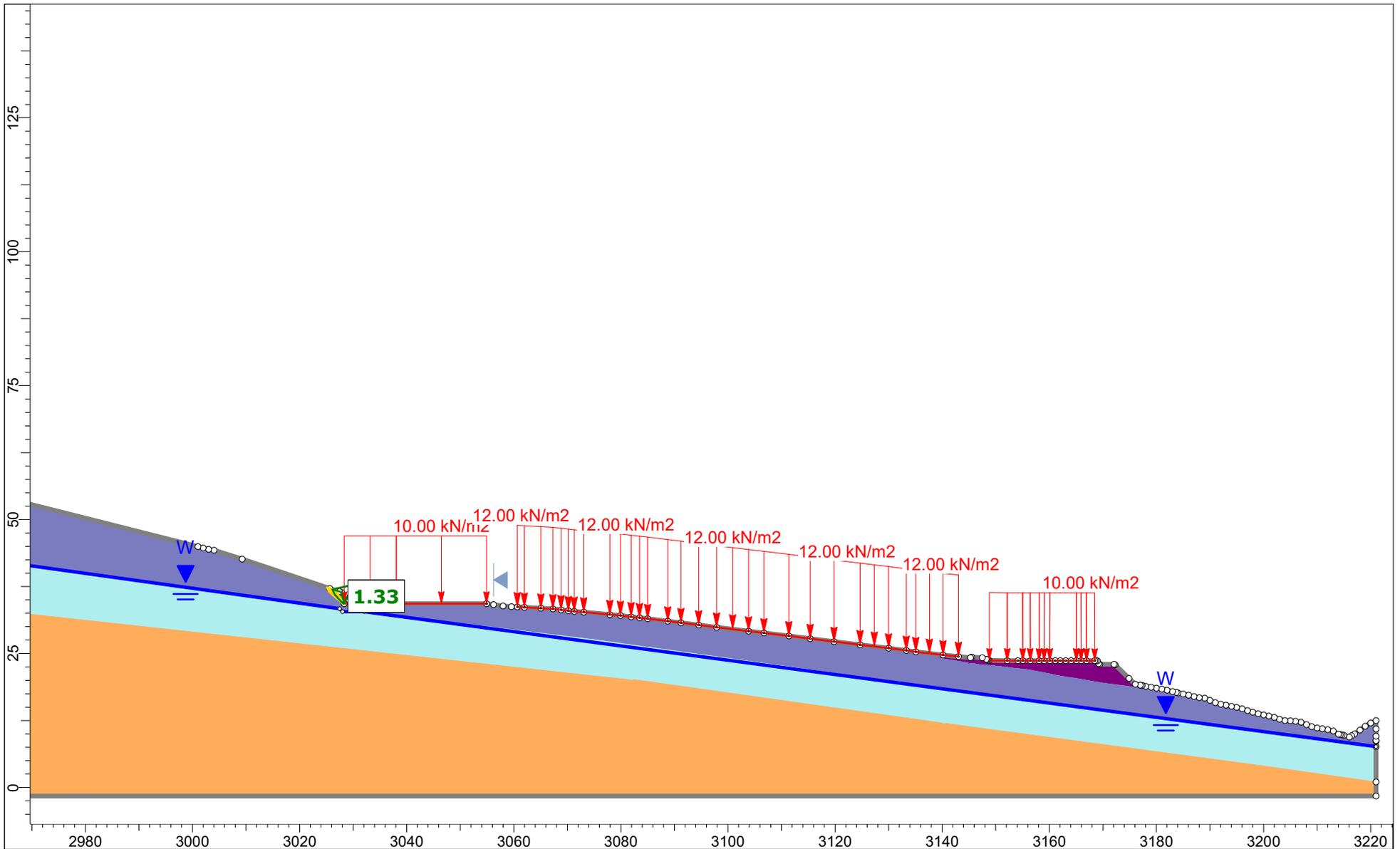
	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Proposed GL Section C - Remedials (fill)	Scenario	Extreme (Worst Credible GW)
	Drawn By	RS	Company	Riley Consultants Ltd
	Date	10/12/2024	File Name	Section C.sldm



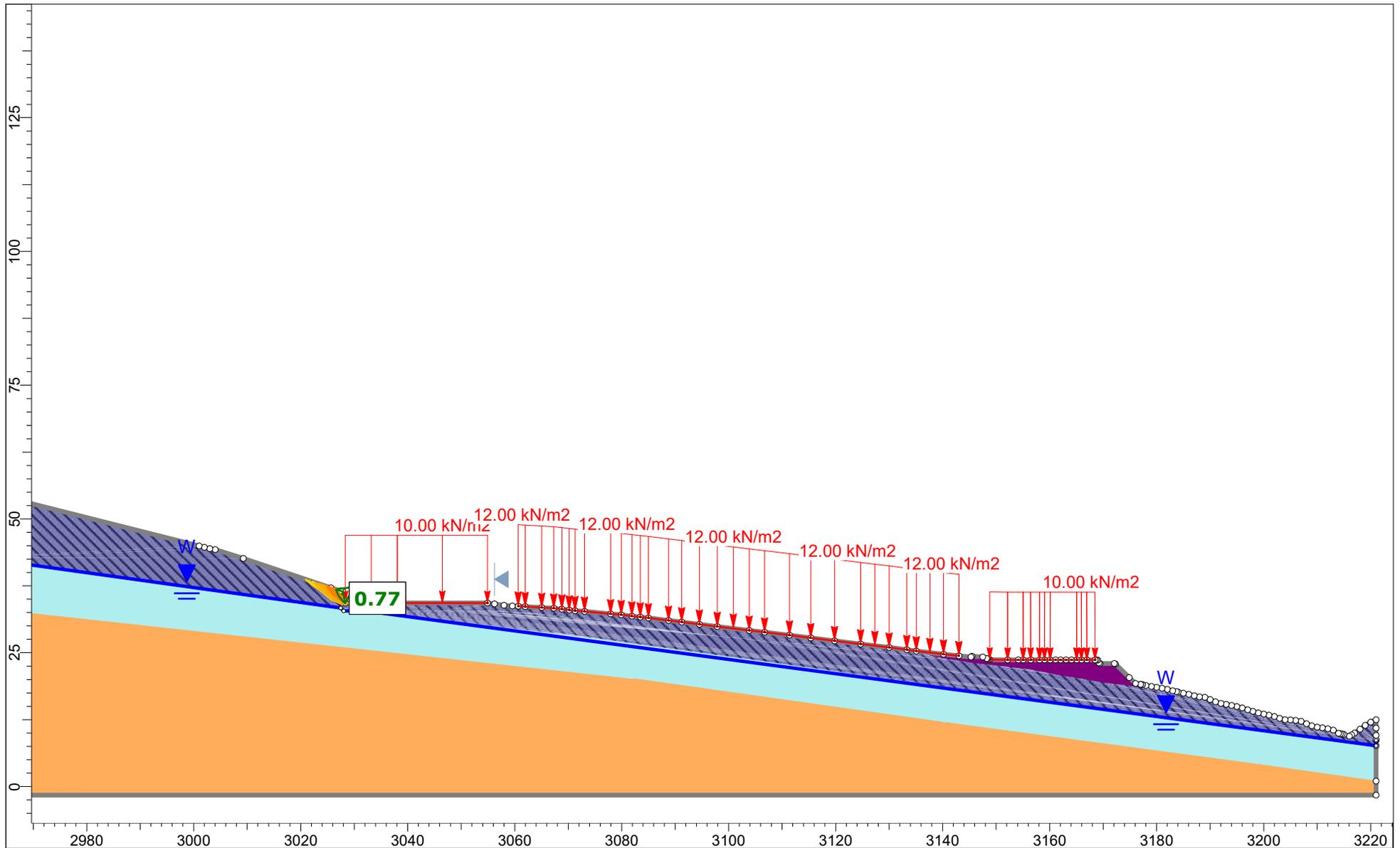


SLIDEINTERPRET 9.028

<i>Project</i>	240065 - Russell Road, Wainui - Stage 1	
<i>Group</i>	Proposed GL Section C - Remedials (fill)	<i>Scenario</i> Extreme (50% saturated fill)
<i>Drawn By</i>	RS	<i>Company</i> Riley Consultants Ltd
<i>Date</i>	10/12/2024	<i>File Name</i> Section C.sldm

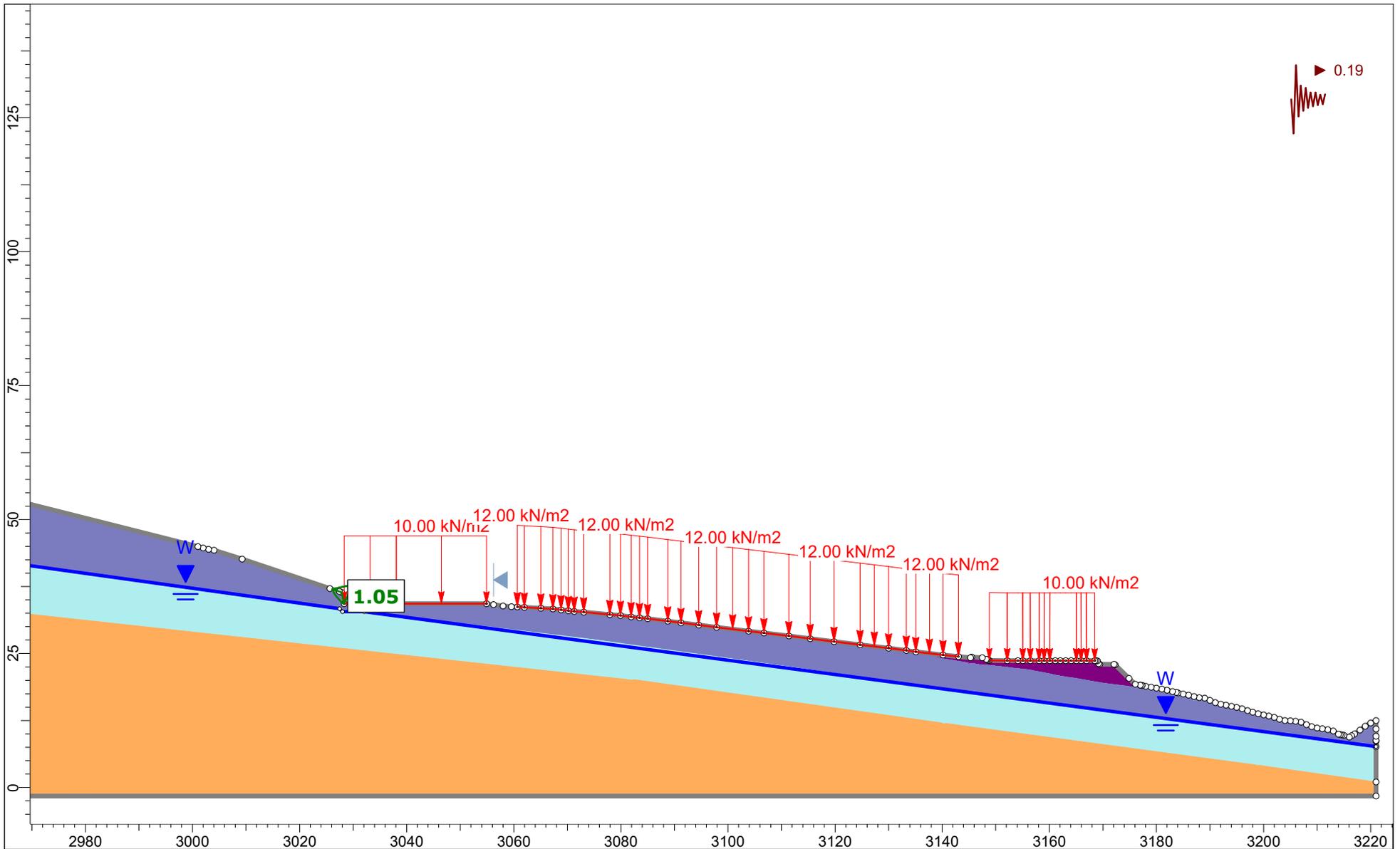


	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1	
	<i>Group</i> Proposed GL Section C	<i>Scenario</i> Normal (Measured GW)
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd
	<i>Date</i> 10/12/2024	<i>File Name</i> Section C.slm



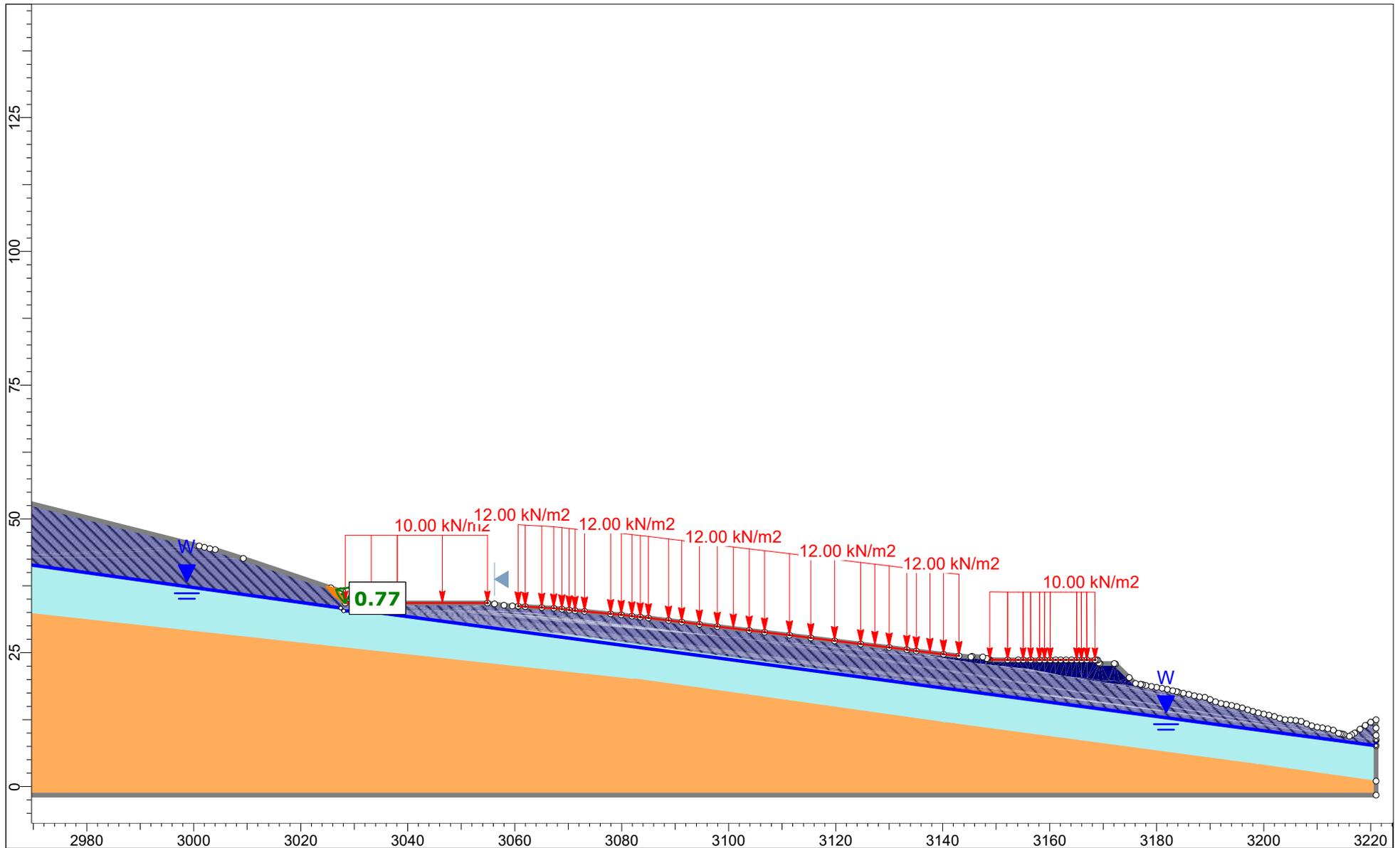
SLIDEINTERPRET 9.028

<i>Project</i>	240065 - Russell Road, Wainui - Stage 1		
<i>Group</i>	Proposed GL Section C	<i>Scenario</i>	Extreme (Worst Credible GW)
<i>Drawn By</i>	RS	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	10/12/2024	<i>File Name</i>	Section C.sldm



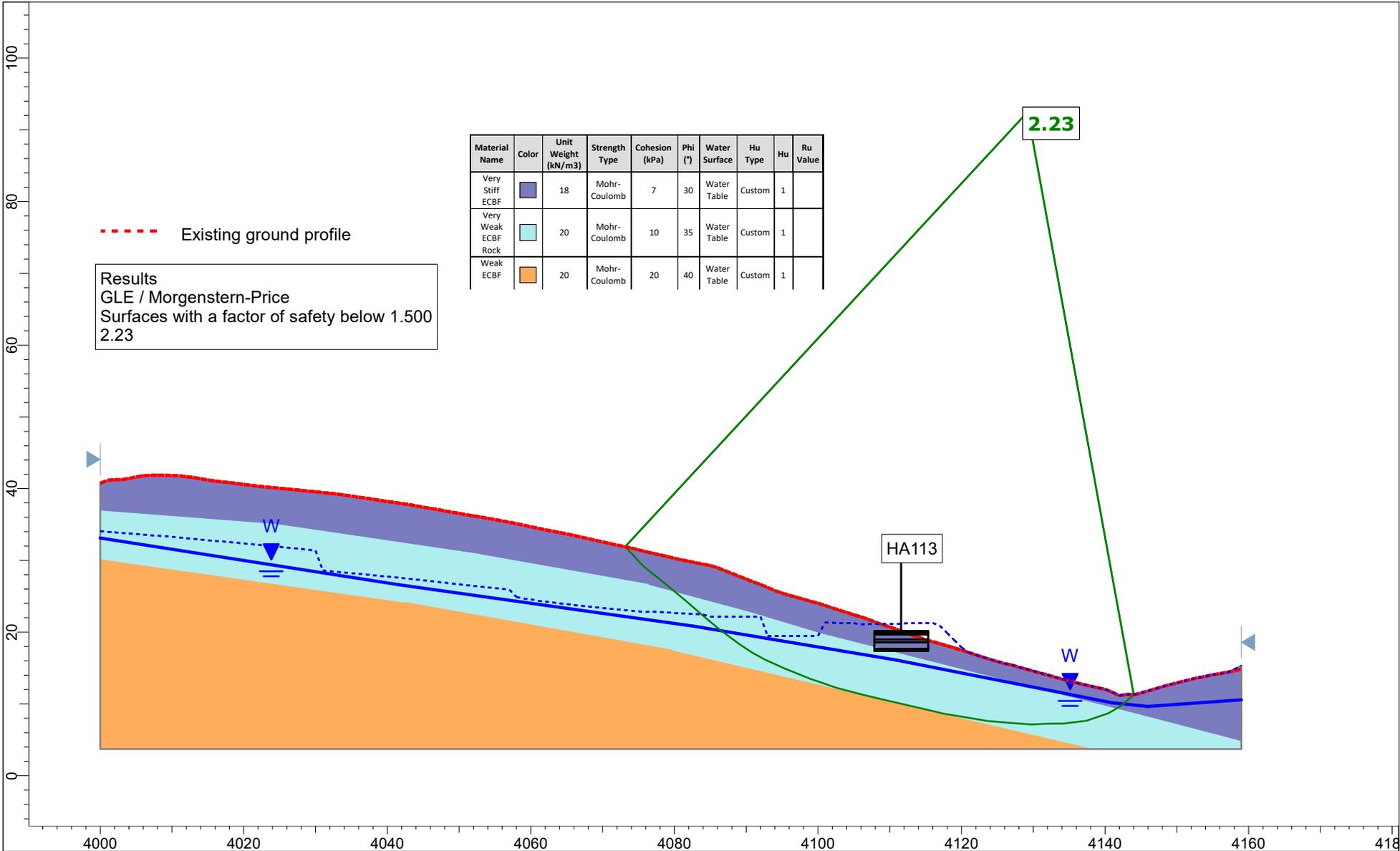
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section C	Scenario	Seismic (0.19g)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section C.slm

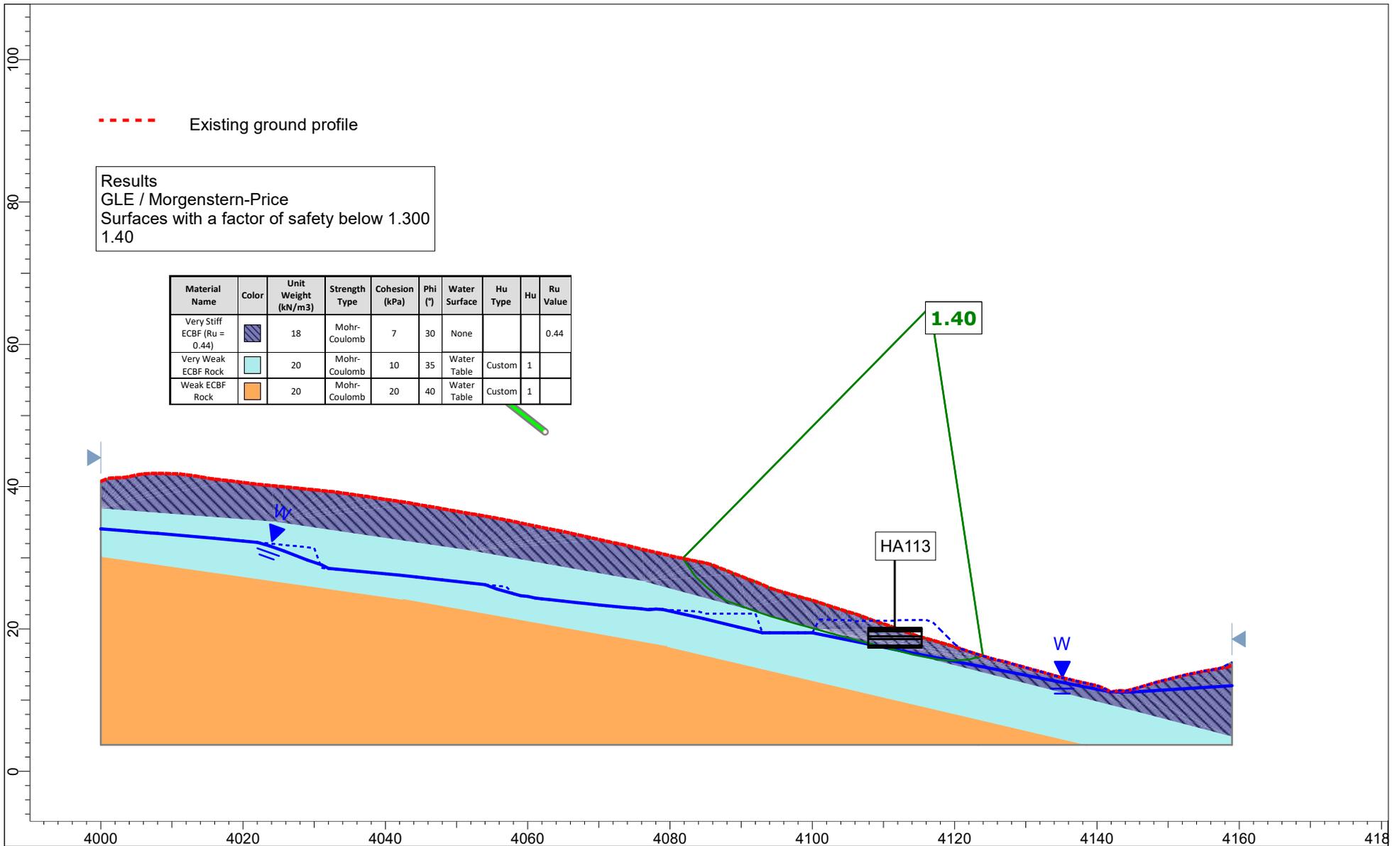


SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section C	Scenario	Extreme (50% saturated fill)
Drawn By	RS	Company	Riley Consultants Ltd
Date	10/12/2024	File Name	Section C.sldm



	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Existing GL Section D	Scenario	Normal (Measured GW)
	Drawn By	RS	Company	Riley Consultants Ltd
	Date	12/12/2024, 4:26:19 pm	File Name	Section D.sldm



Existing ground profile

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
1.40

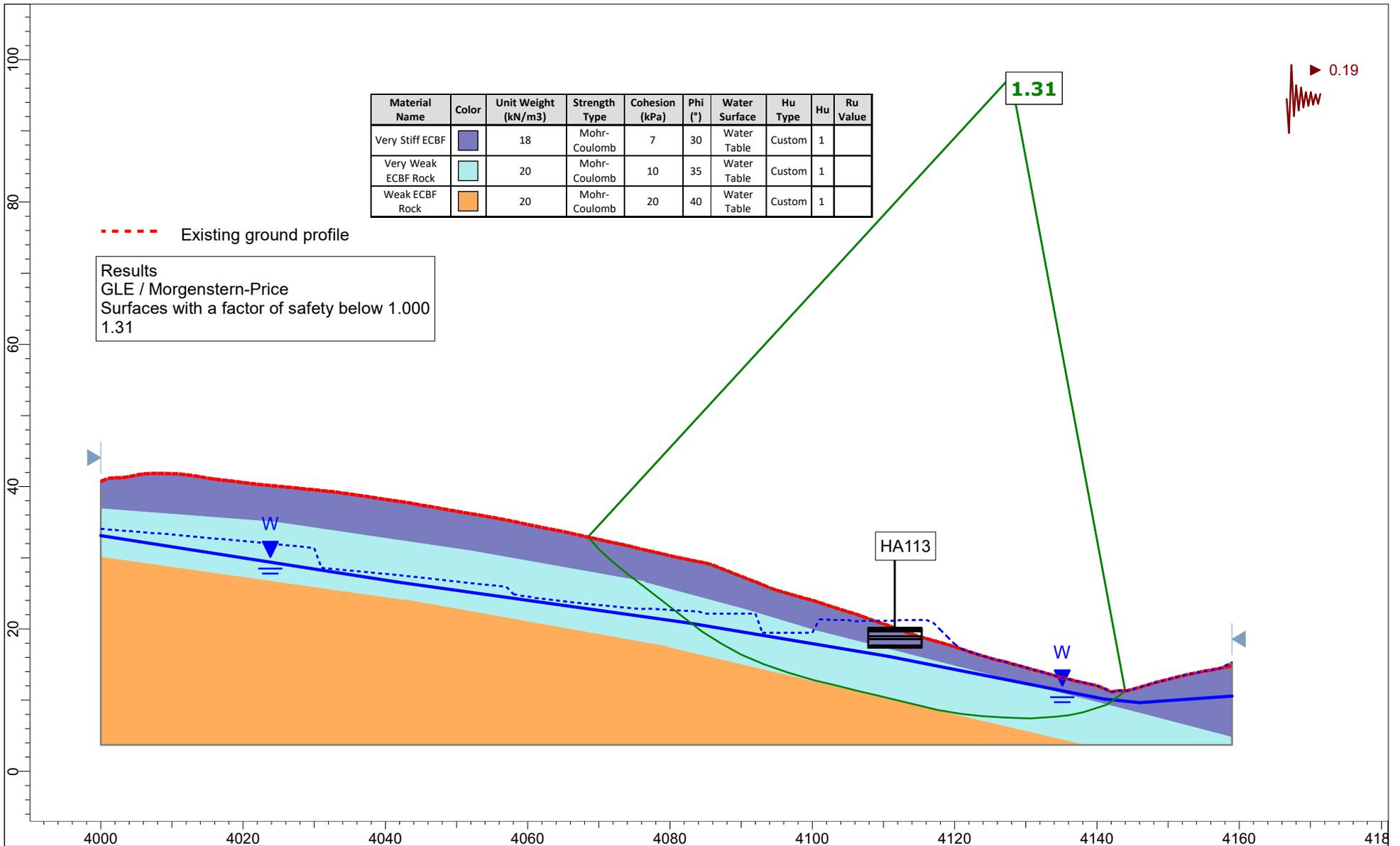
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Very Stiff ECBF (Ru = 0.44)		18	Mohr-Coulomb	7	30	None			0.44
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

1.40

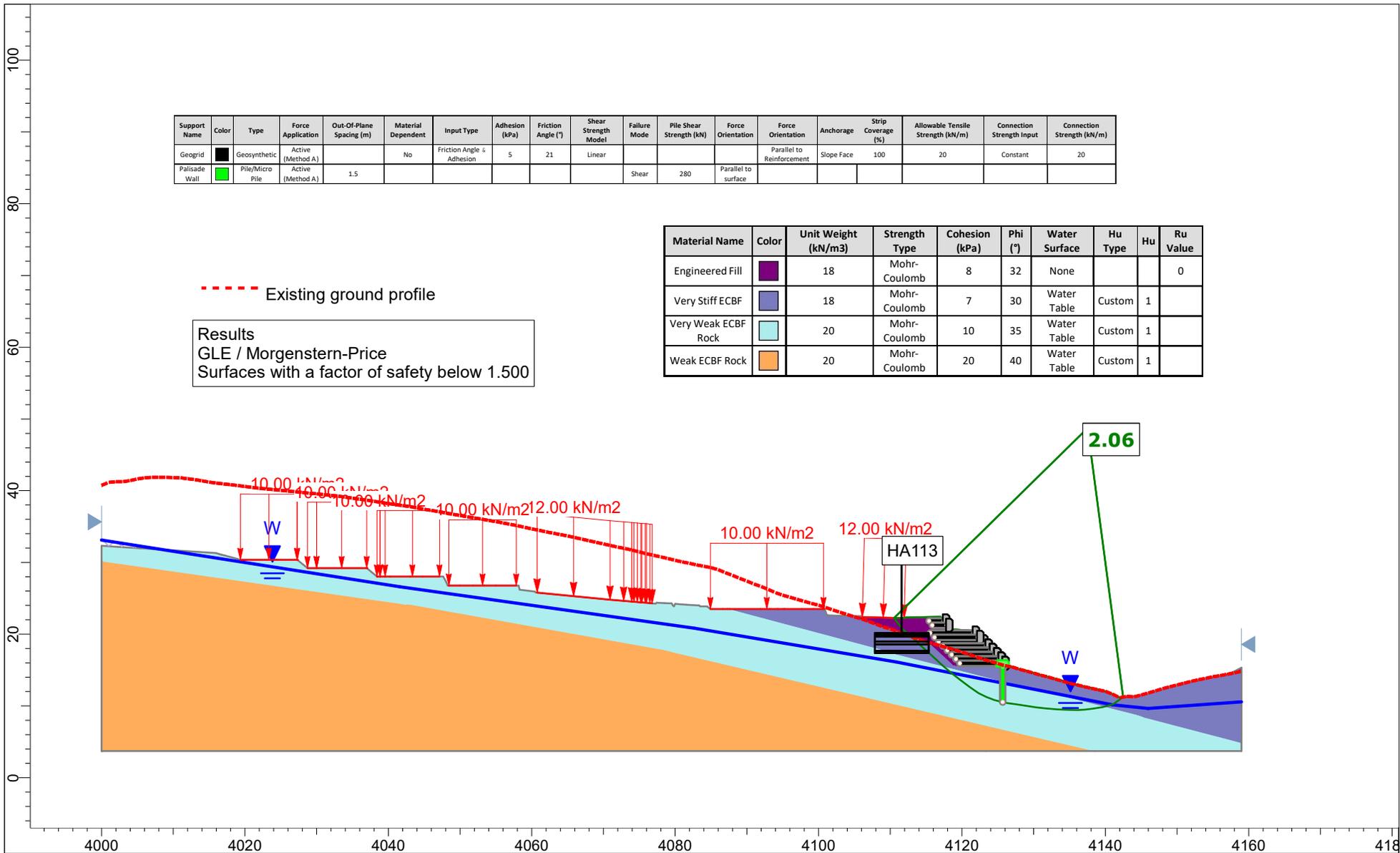
HA113



Project	240065 - Russell Road, Wainui - Stage 1		
Group	Existing GL Section D	Scenario	Extreme (Worst Credible GW)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 4:26:19 pm	File Name	Section D.sldm



	Project		240065 - Russell Road, Wainui - Stage 1	
	Group		Existing GL Section D	Scenario Seismic (0.19g)
	Drawn By		RS	Company Riley Consultants Ltd
	Date		12/12/2024, 4:26:19 pm	File Name Section D.sldm

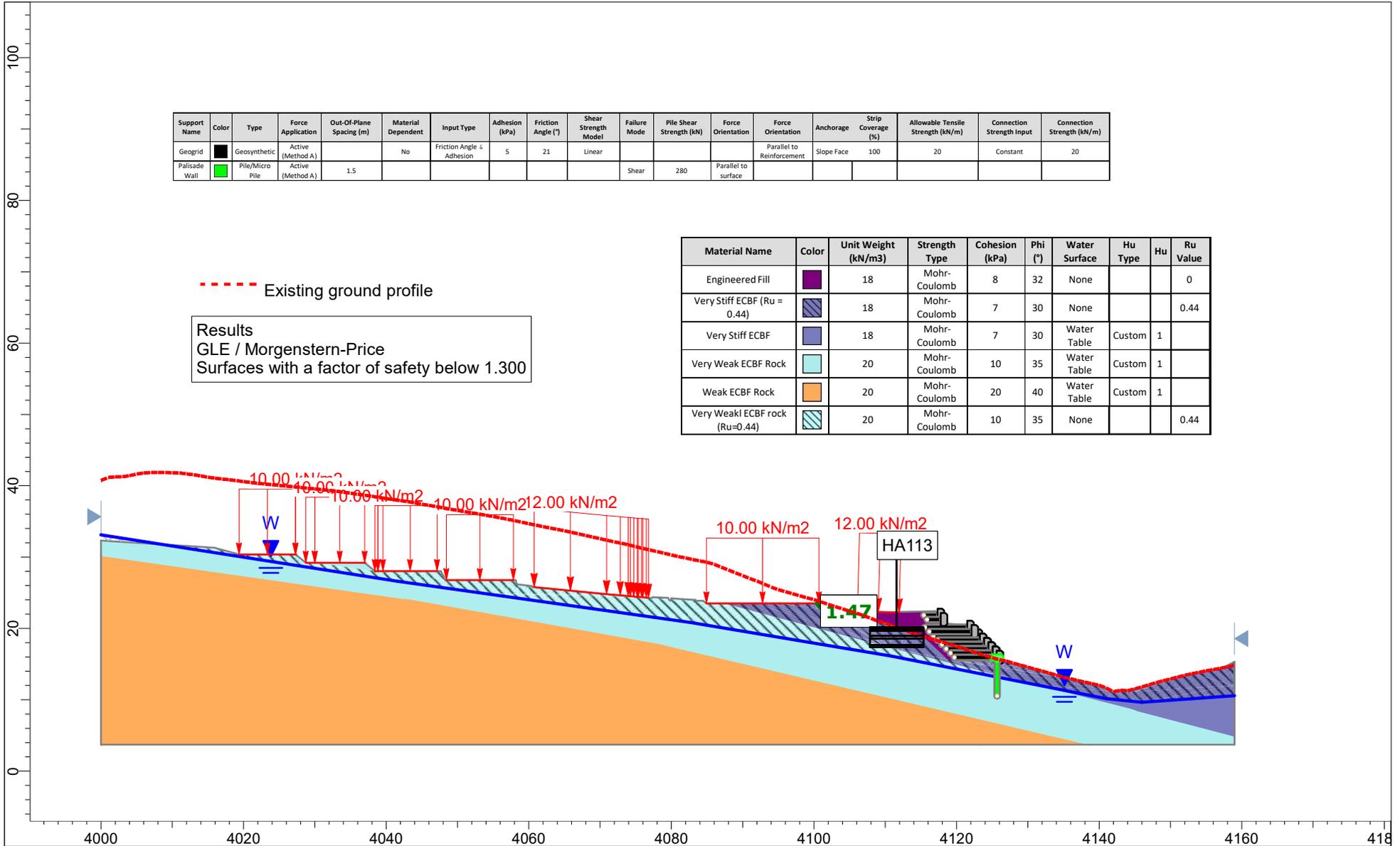


Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear			Parallel to Reinforcement		Slope Face	100	20	Constant	20
Palisade Wall	Green	Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	None			0
Very Stiff ECFB	Dark Purple	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECFB Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECFB Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500

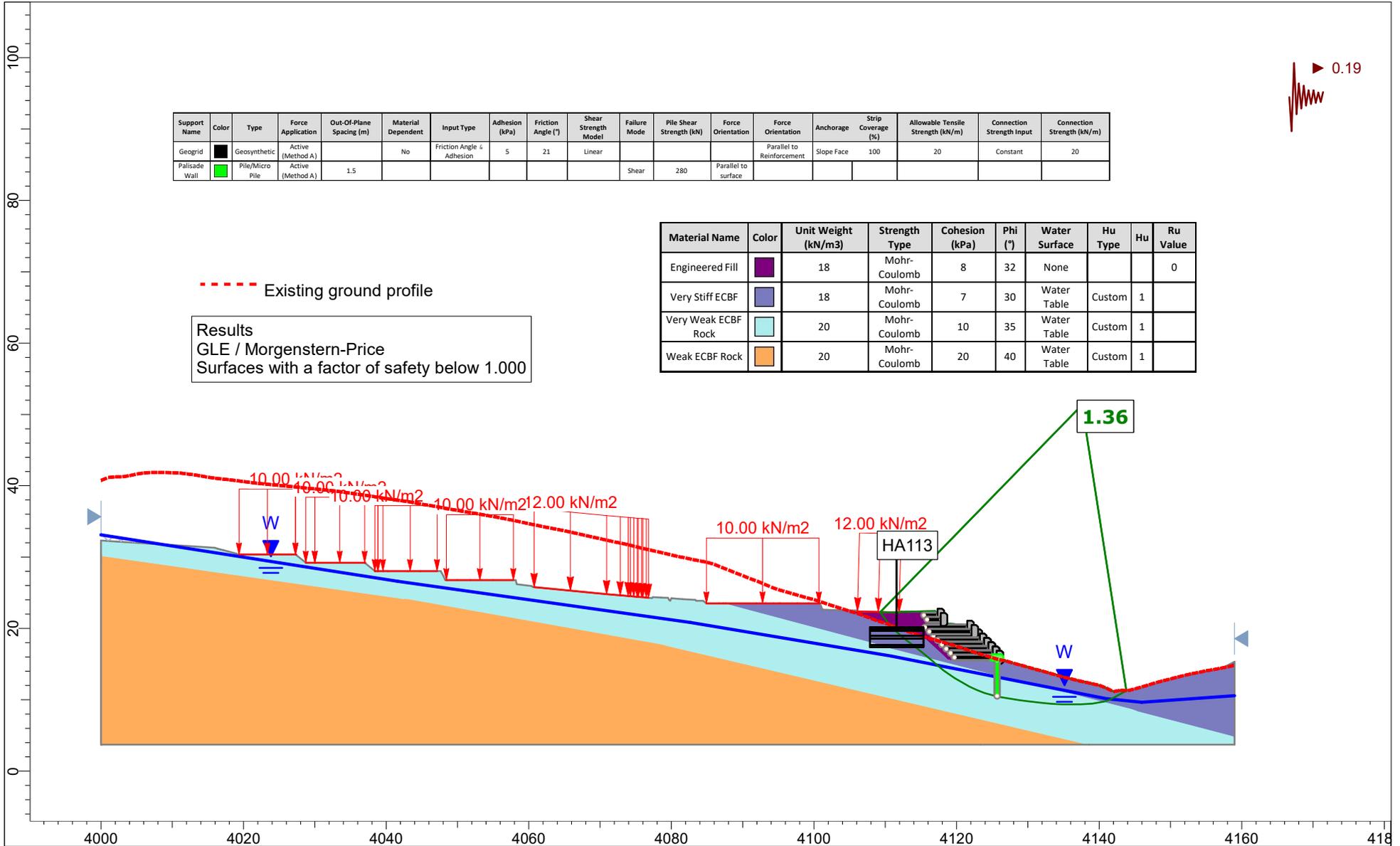
	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Section D - Proposed GL, Remedials, Loads	Scenario	Normal (Measured GW)
	Drawn By	RS	Company	Riley Consultants Ltd
	Date	12/12/2024, 4:26:19 pm	File Name	Section D.sldm



Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Palisade Wall	Green	Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	None			0
Very Stiff ECBF (Ru = 0.44)	Dark Blue	18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF	Blue	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	
Very Weak ECBF rock (Ru=0.44)	Light Blue with Diagonal Lines	20	Mohr-Coulomb	10	35	None			0.44

	Project	240065 - Russell Road, Wainui - Stage 1		
	Group	Section D - Proposed GL, Remedials, Loads	Scenario	Extreme (Worst Credible GW)
	Drawn By	RS	Company	Riley Consultants Ltd
	Date	12/12/2024, 4:26:19 pm	File Name	Section D.sldm
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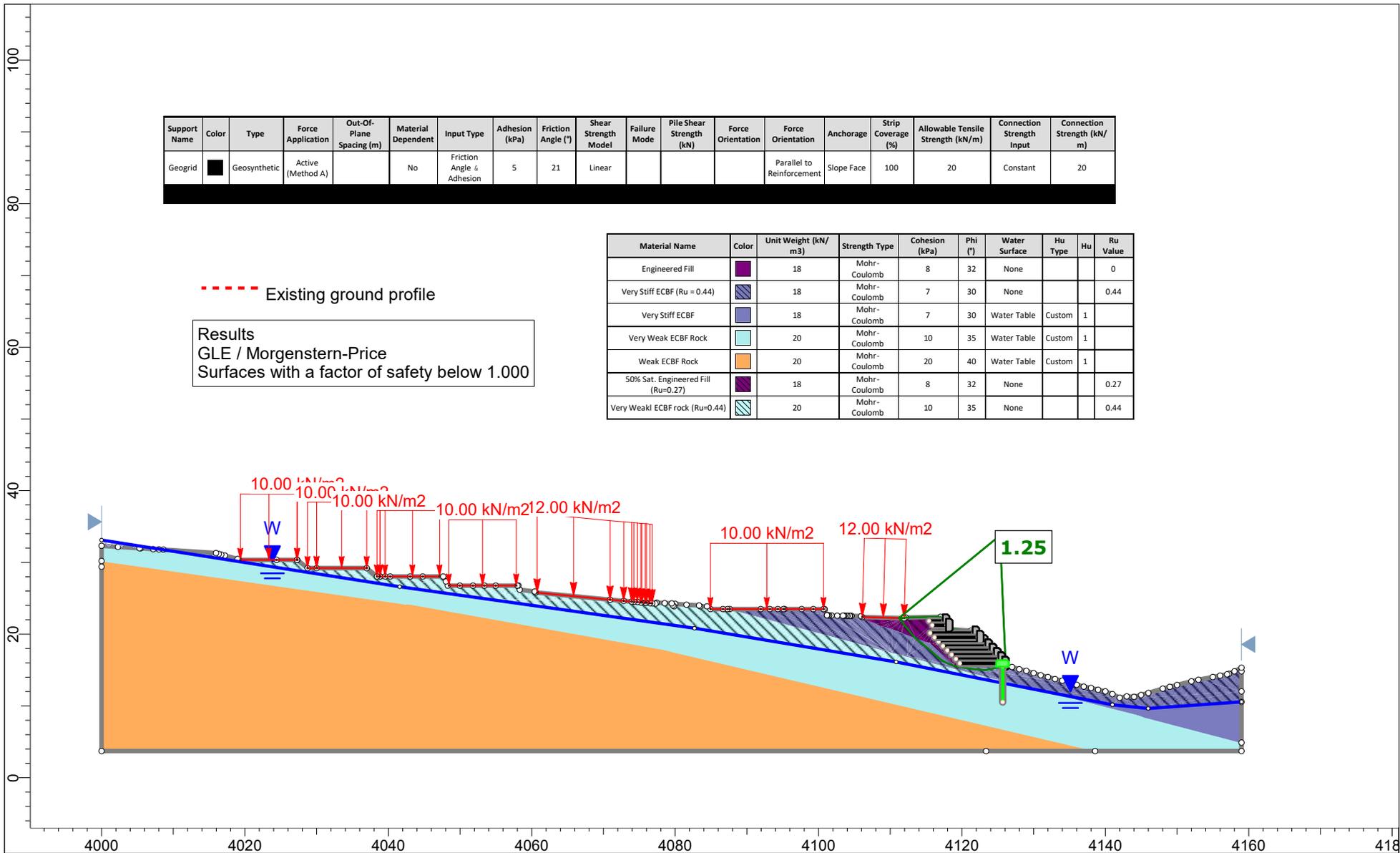


Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear			Parallel to Reinforcement		Slope Face	100	20	Constant	20
Palisade Wall	Green	Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	None			0
Very Stiff ECBF	Blue	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000

	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Section D - Proposed GL, Remedials, Loads	Scenario	Seismic (0.19g)
	Drawn By	RS	Company	Riley Consultants Ltd
	Date	12/12/2024, 4:26:19 pm	File Name	Section D.sldm

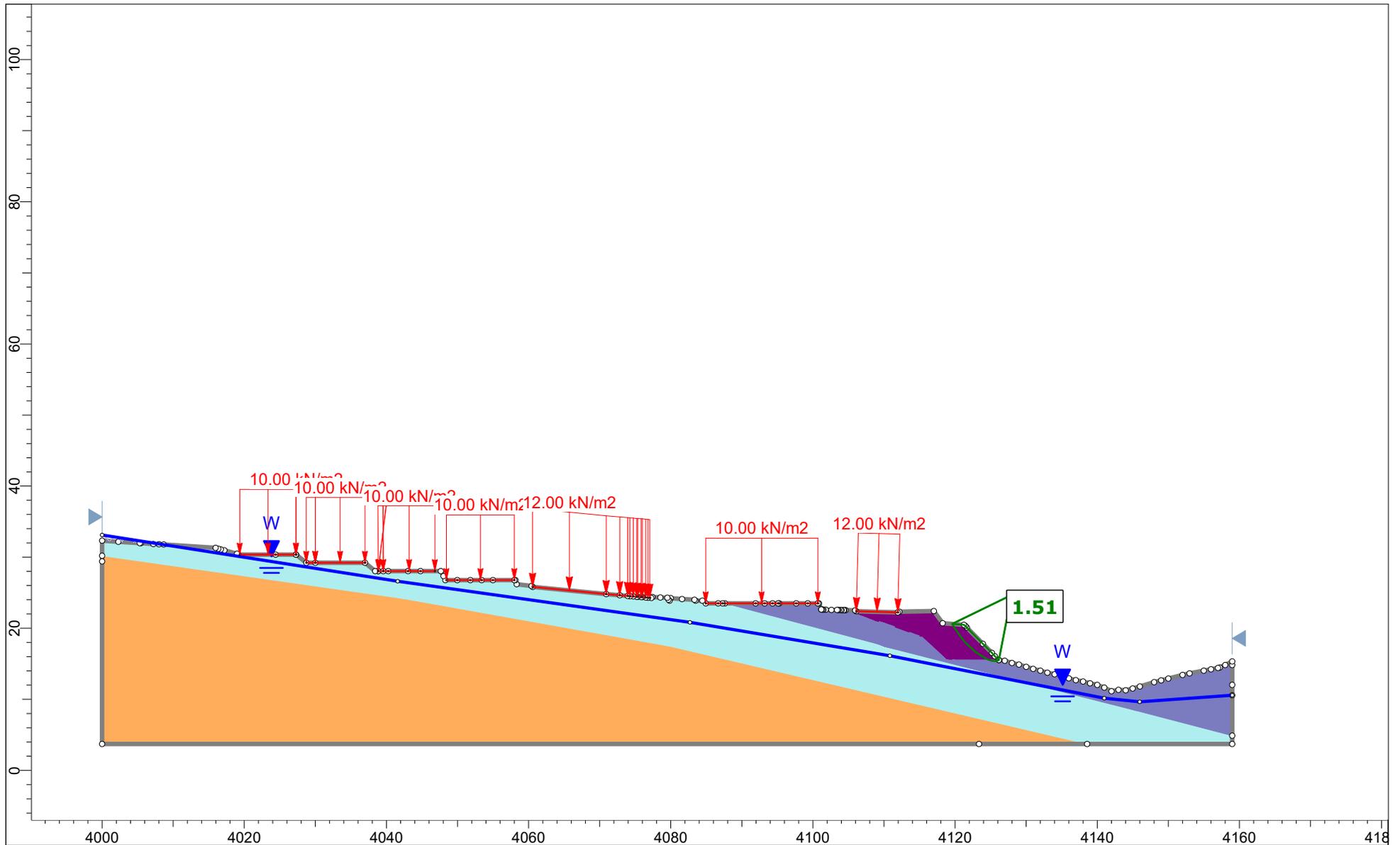


Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20

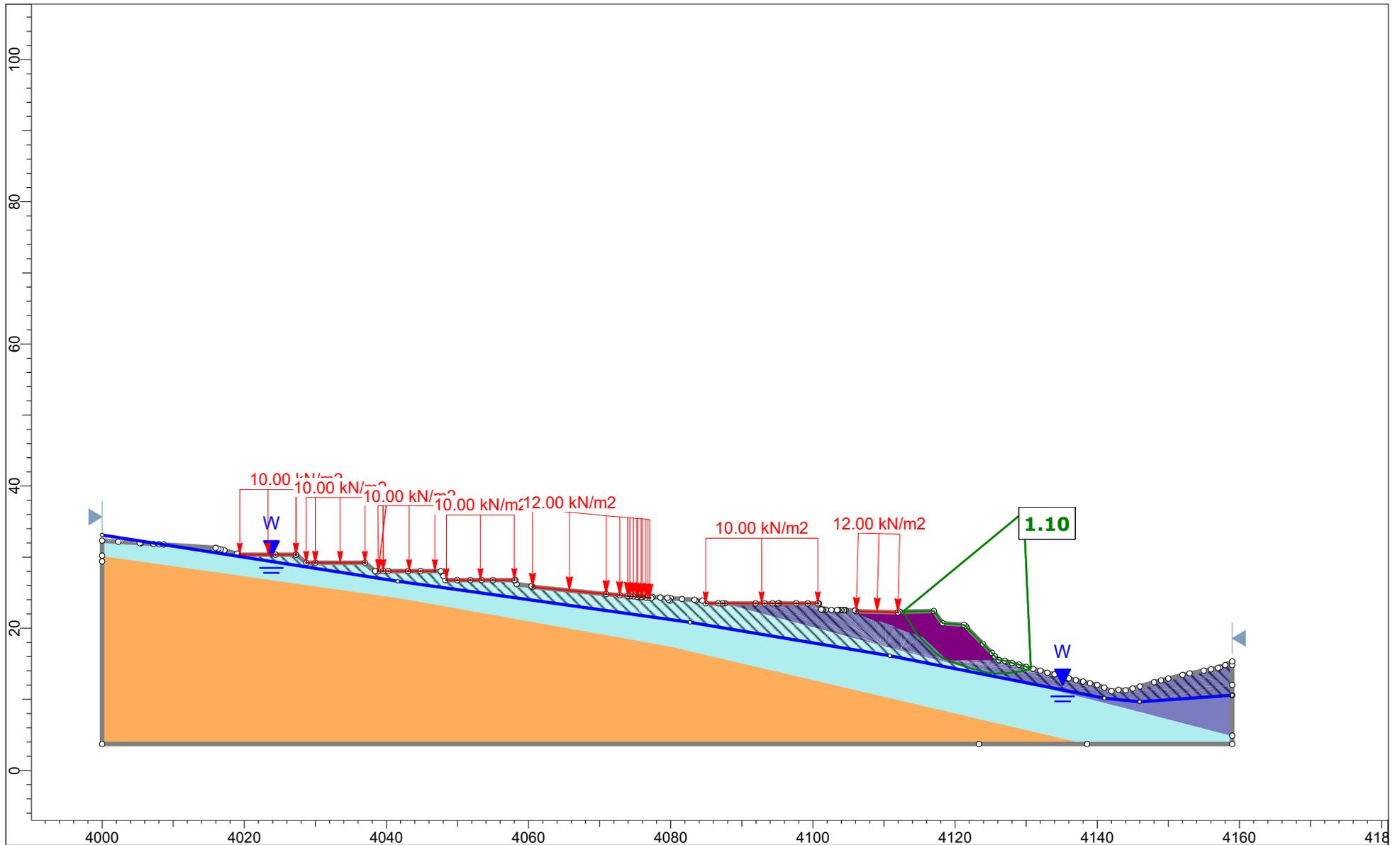
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	None			0
Very Stiff ECBF (Ru = 0.44)	Blue-hatched	18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF	Blue	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	
50% Sat. Engineered Fill (Ru=0.27)	Purple-hatched	18	Mohr-Coulomb	8	32	None			0.27
Very Weak ECBF rock (Ru=0.44)	Blue-hatched	20	Mohr-Coulomb	10	35	None			0.44



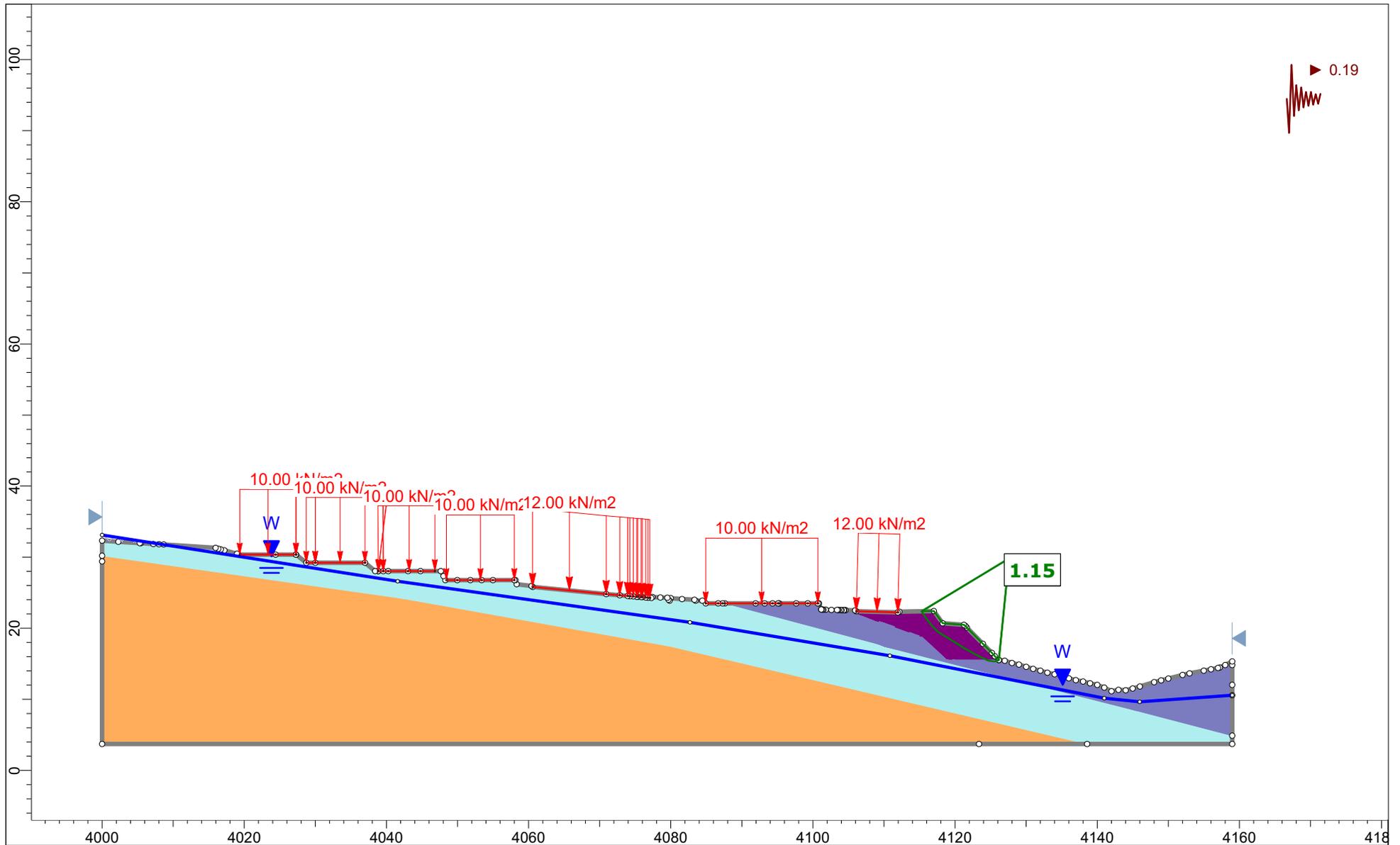
Project		240065 - Russell Road, Wainui - Stage 1	
Group	Section D - Proposed GL, Remedials, Loads	Scenario	Extreme (50% Fill Saturation)
Drawn By	RS	Company	Riley Consultants Ltd
Date	12/12/2024, 4:26:19 pm	File Name	Section D.slm



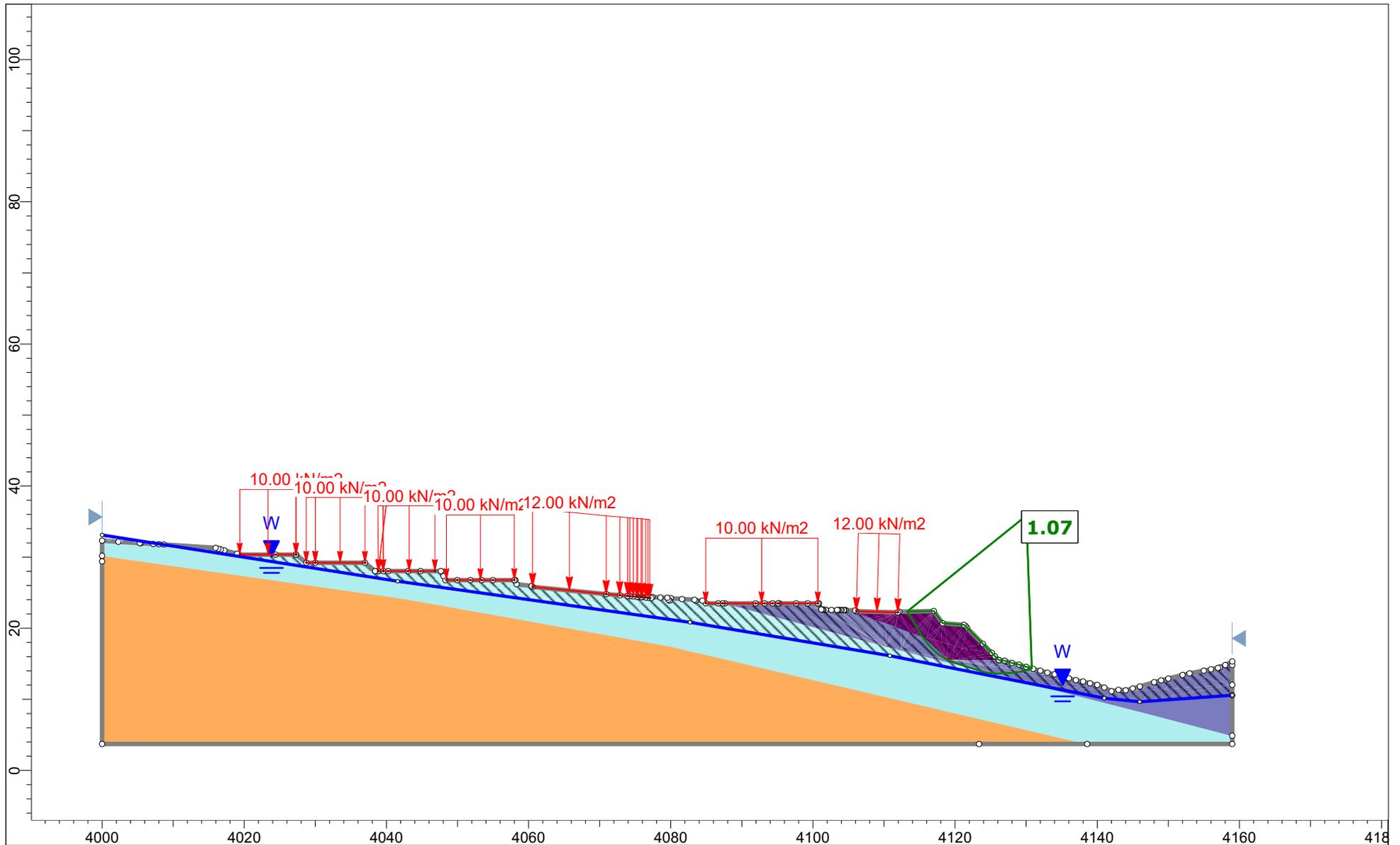
	Project 240065 - Russell Road, Wainui - Stage 1		
	Group Section D - Proposed GL	Scenario Normal (Measured GW)	
	Drawn By RS	Company Riley Consultants Ltd	
	Date 12/12/2024, 4:26:19 pm	File Name Section D.slm	



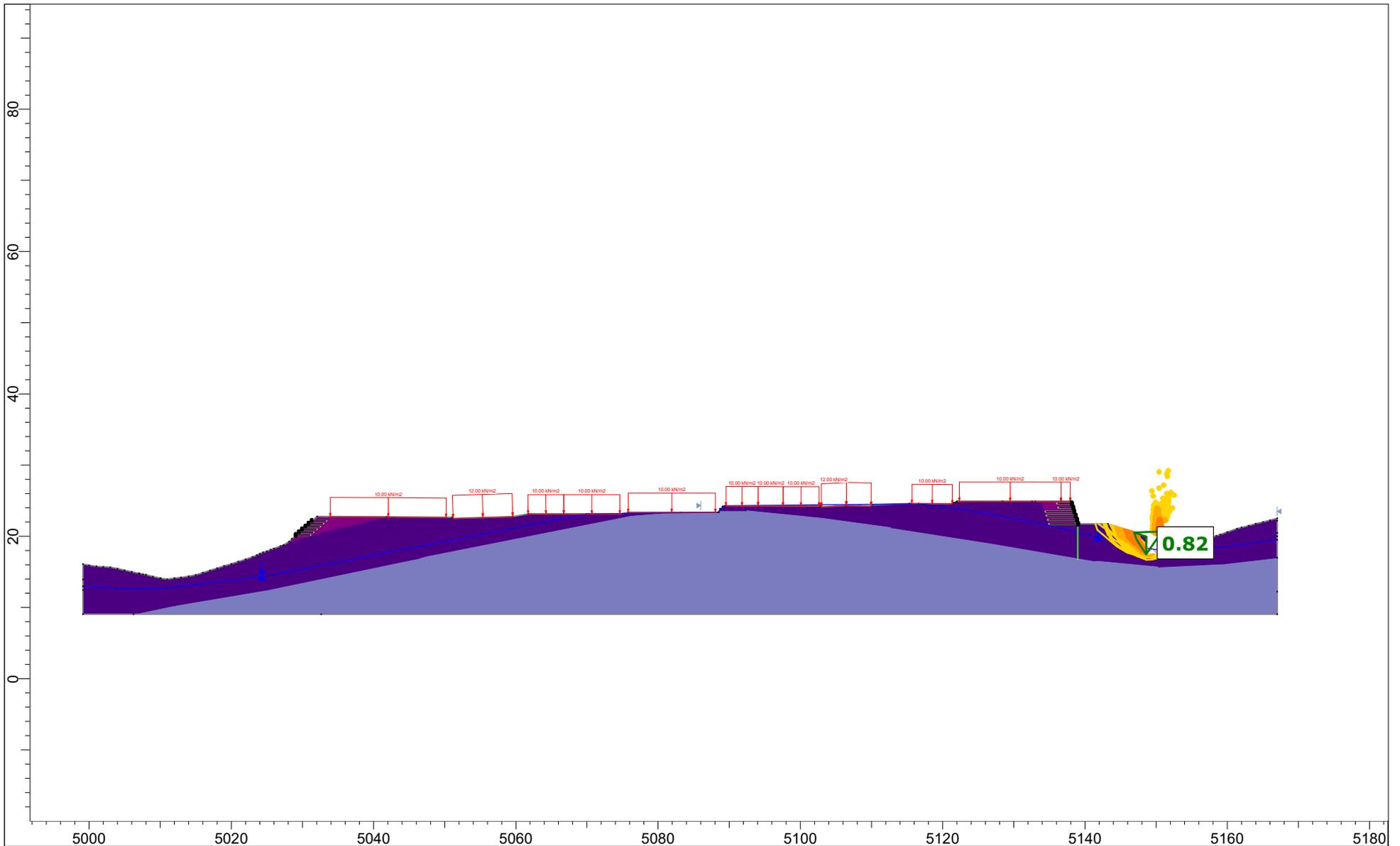
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	Group		Section D - Proposed GL		Scenario		Extreme (Worst Credible GW)
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	Date		12/12/2024, 4:26:19 pm		File Name		Section D.sldm



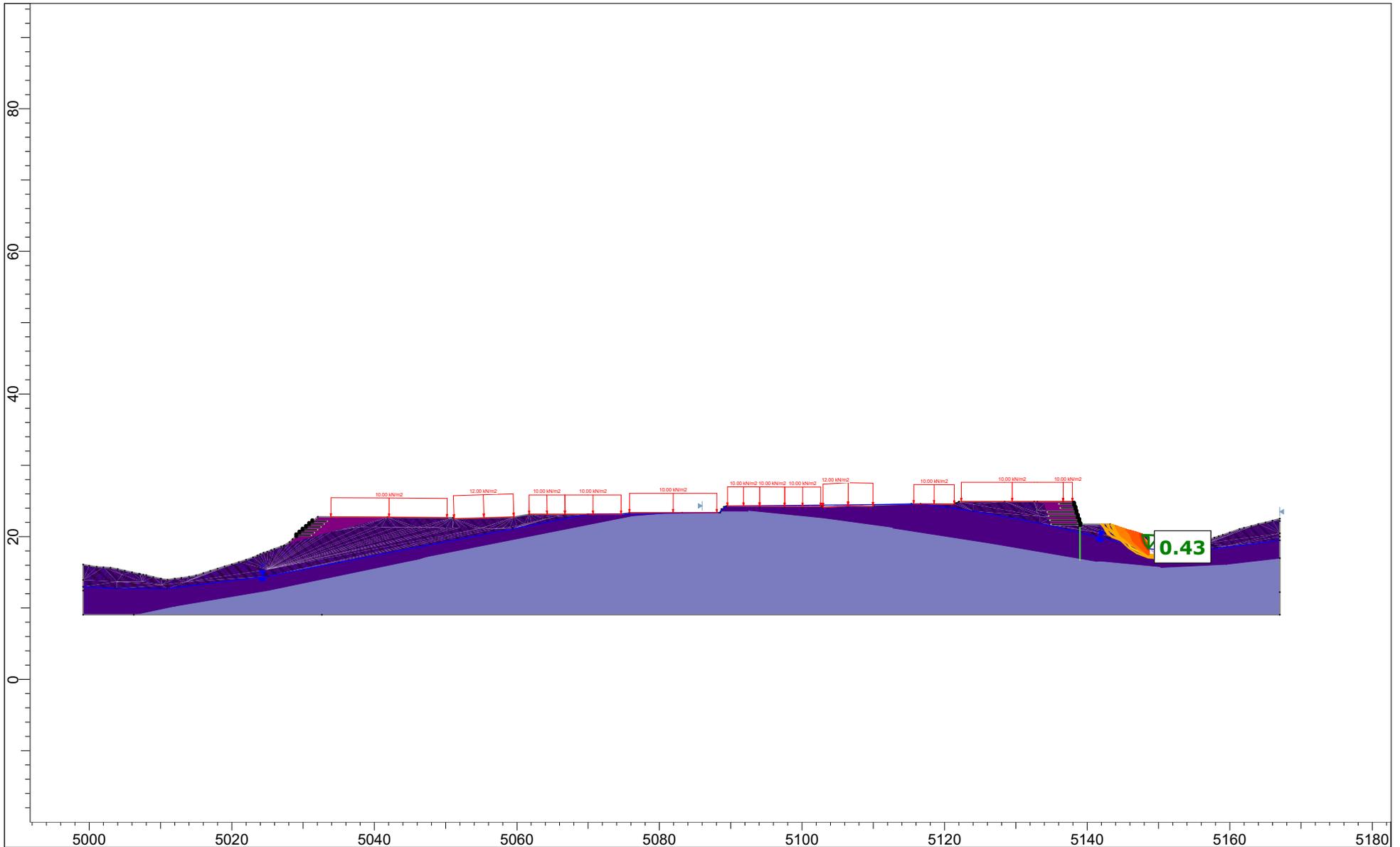
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	<i>Group</i> Section D - Proposed GL	<i>Scenario</i> Seismic (0.19g)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 12/12/2024, 4:26:19 pm	<i>File Name</i> Section D.sldm	



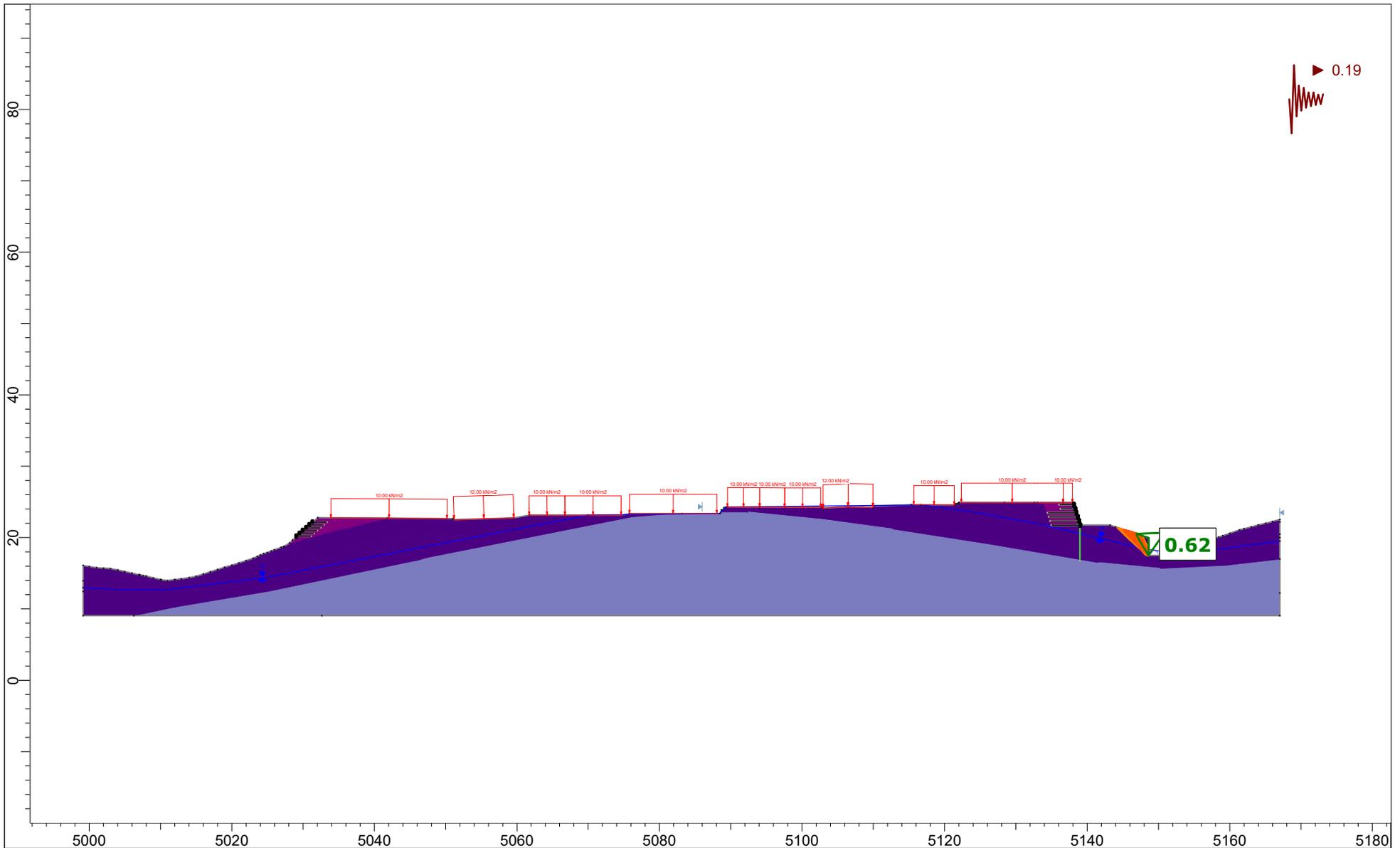
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	Group		Section D - Proposed GL		Scenario		Extreme (50% Fill Saturation)
	Drawn By		RS		Company		Riley Consultants Ltd
	Date		12/12/2024, 4:26:19 pm		File Name		Section D.sldm



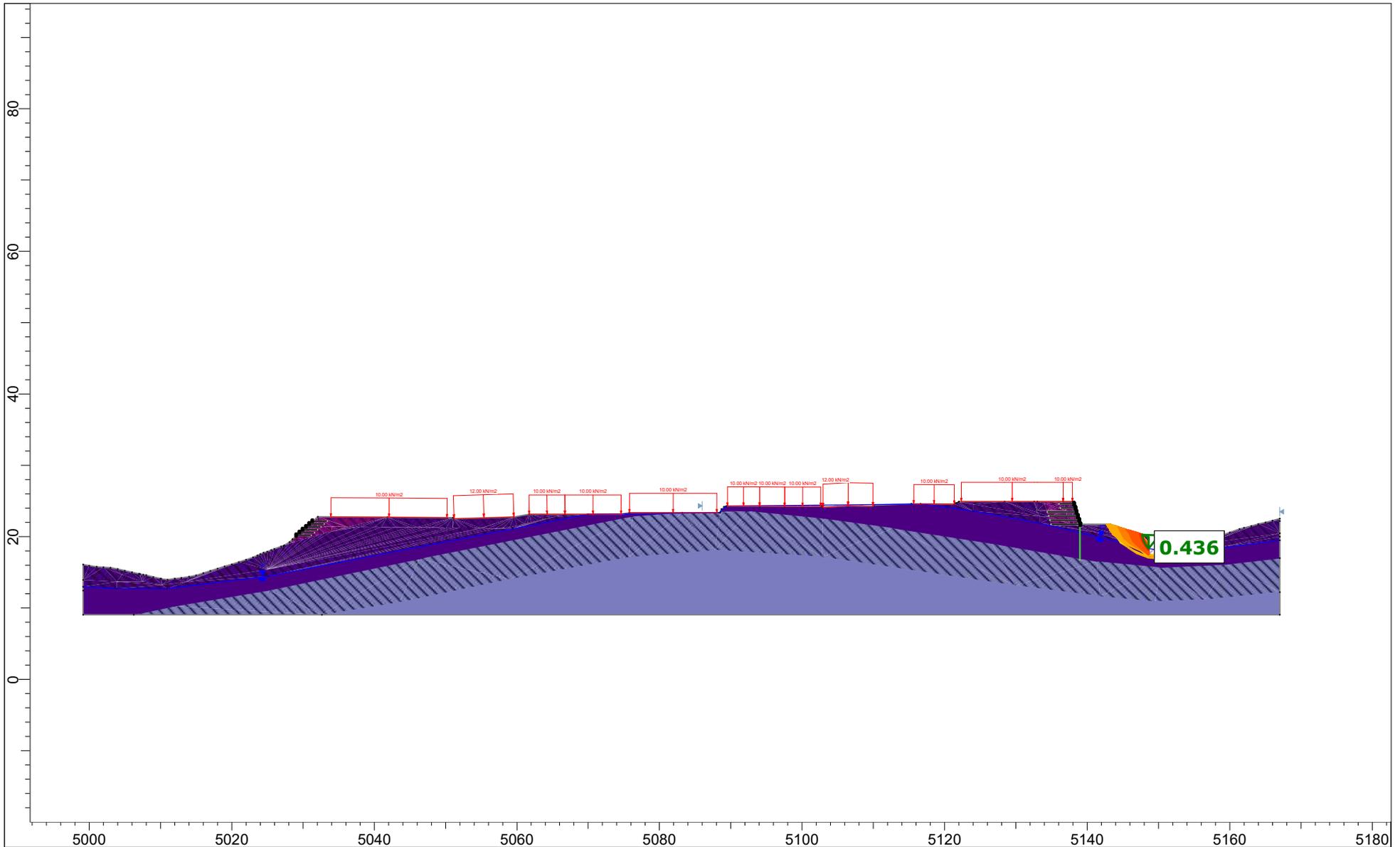
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	<i>Group</i> Section E - erosion & remedials (L-R)	<i>Scenario</i> Normal (Measured GW)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm	



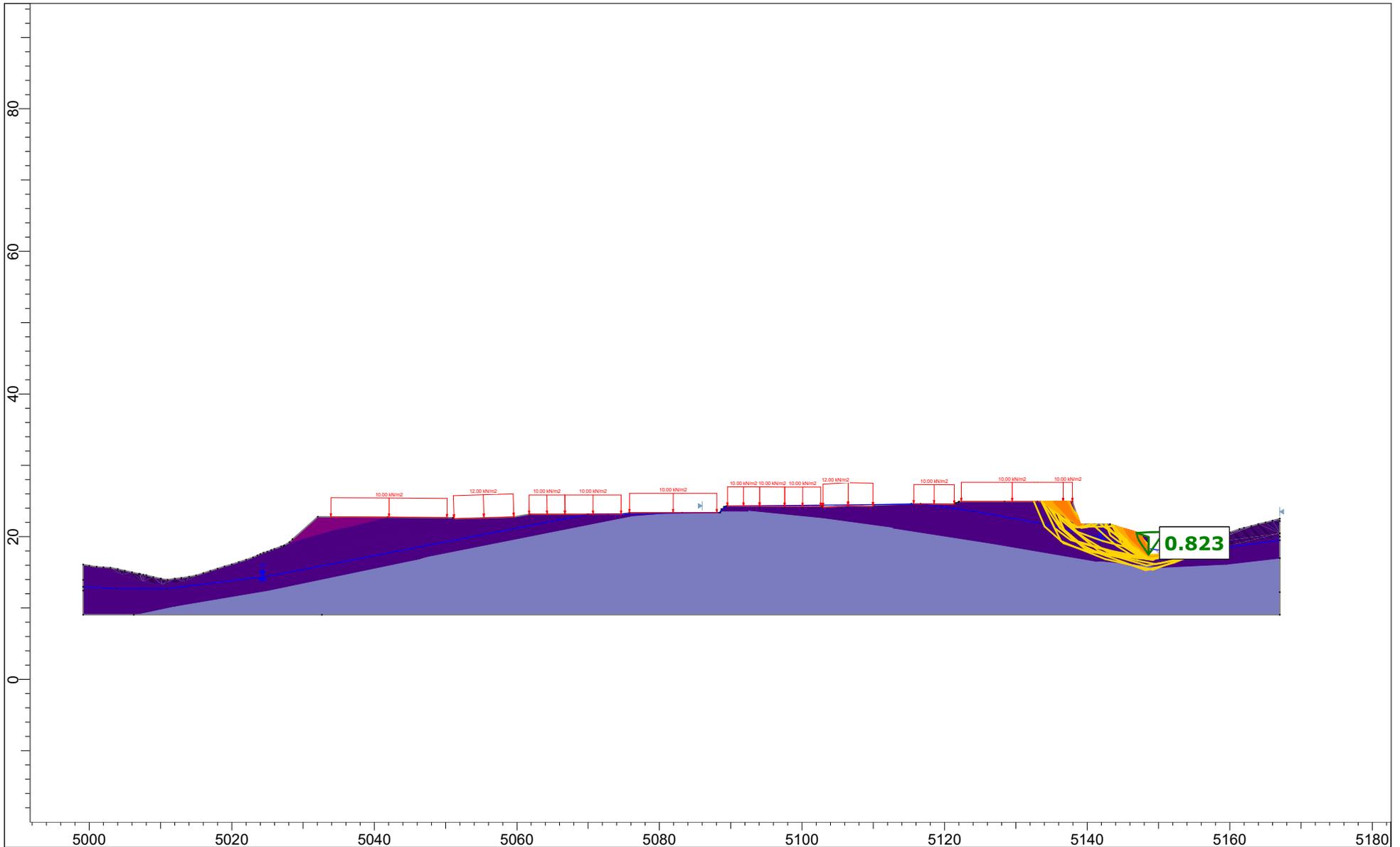
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	<i>Group</i> Section E - erosion & remedials (L-R)	<i>Scenario</i> Extreme (Worst Credible GW)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm	



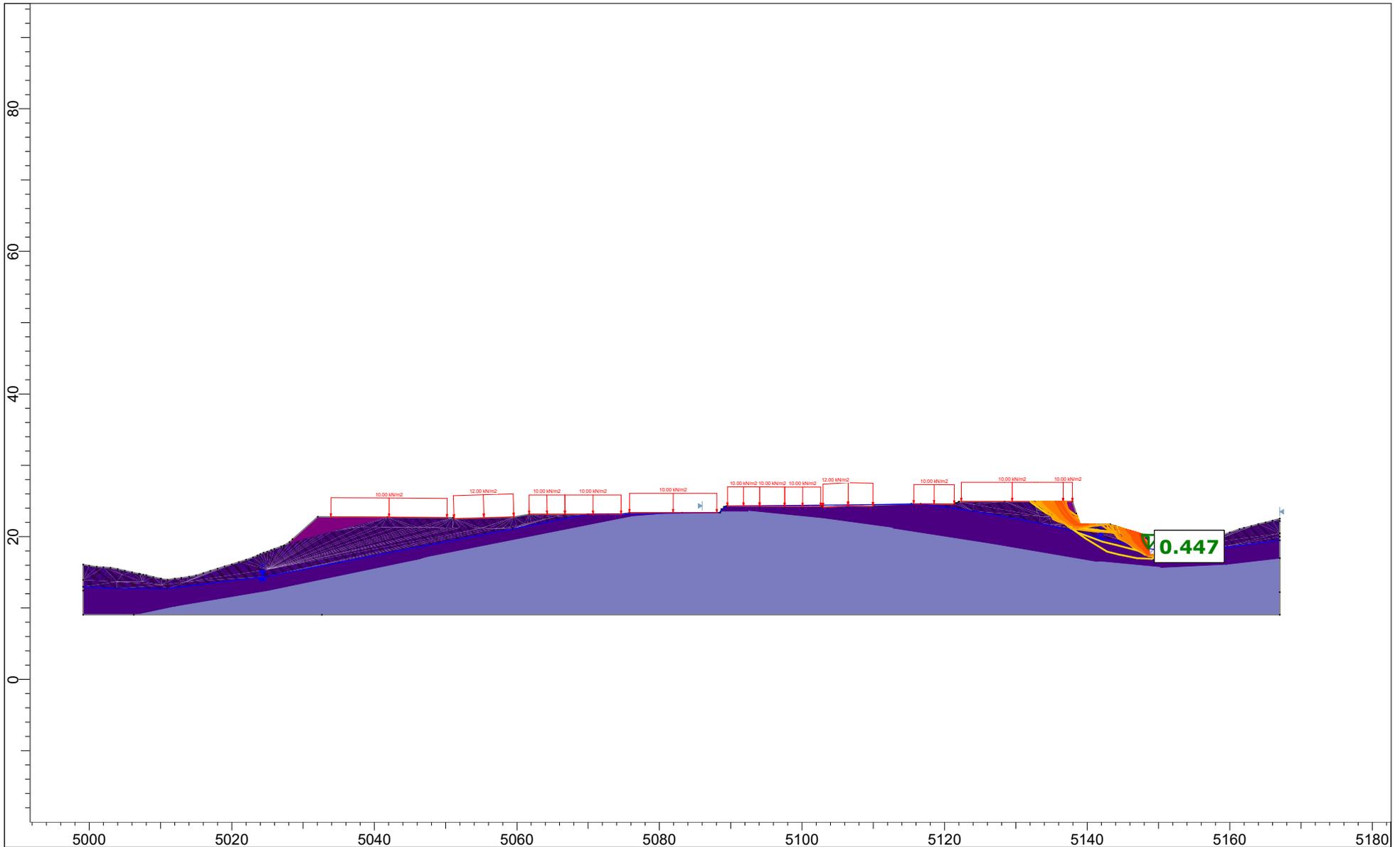
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	<i>Group</i> Section E - erosion & remedials (L-R)	<i>Scenario</i> Seismic (0.19g)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.slmd	



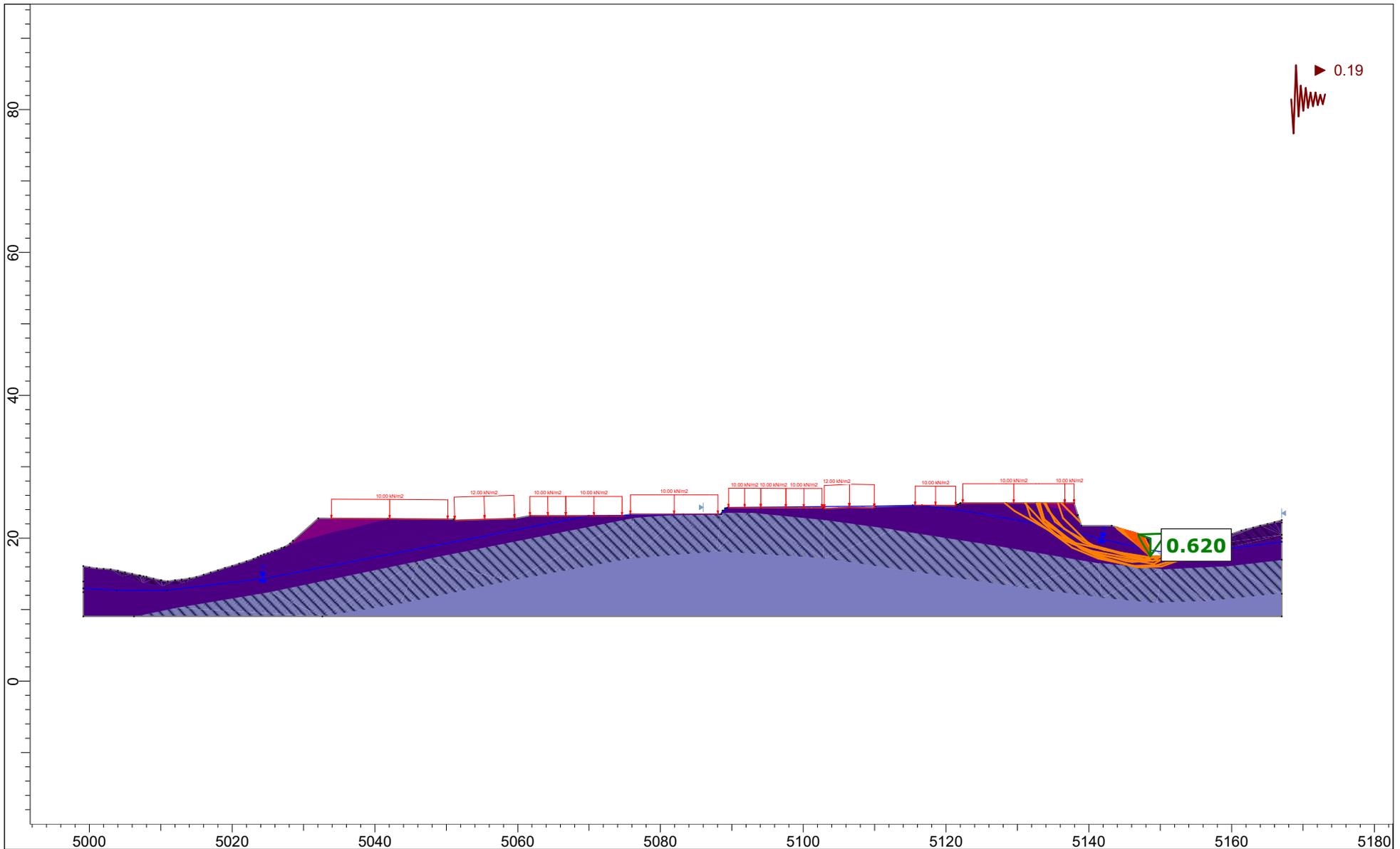
	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1		
	<i>Group</i> Section E - erosion & remedials (L-R)	<i>Scenario</i> Extreme (50% fill saturation)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm	



	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1	
	<i>Group</i> Section E - proposed GL (L-R)	<i>Scenario</i> Normal (Measured GW)
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm

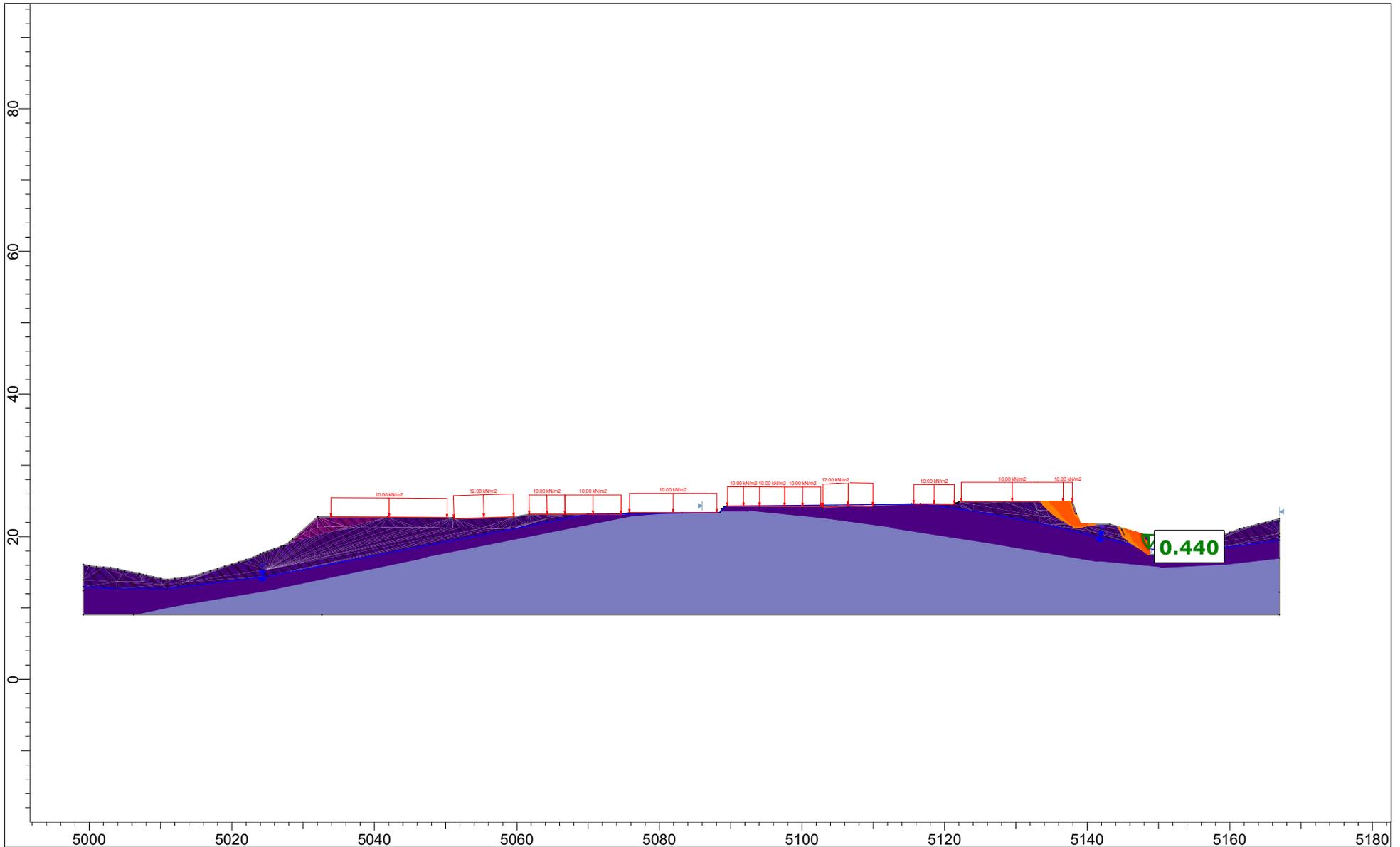


	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1		
	<i>Group</i> Section E - proposed GL (L-R)	<i>Scenario</i> Extreme (Worst Credible GW)	
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	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm	

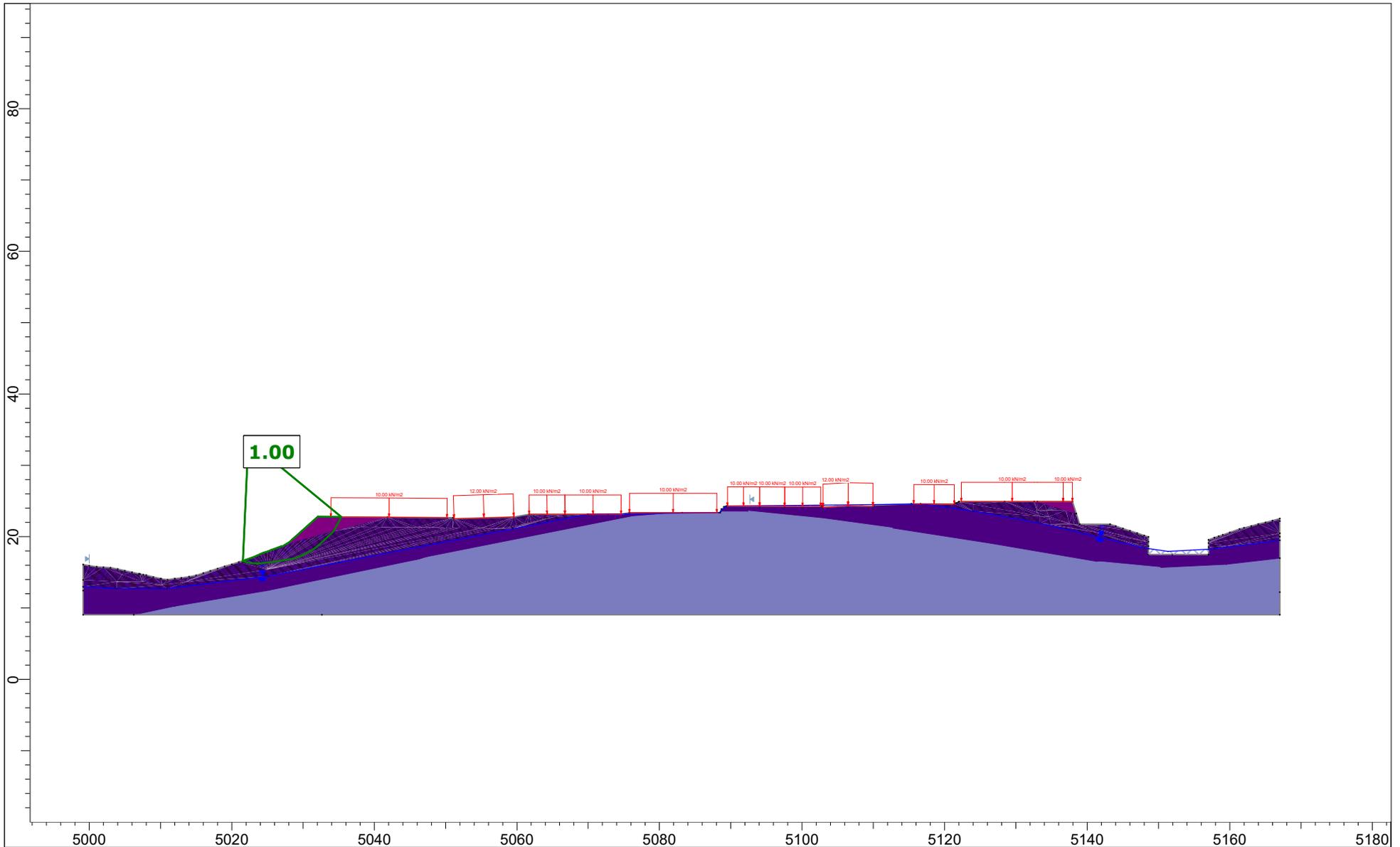


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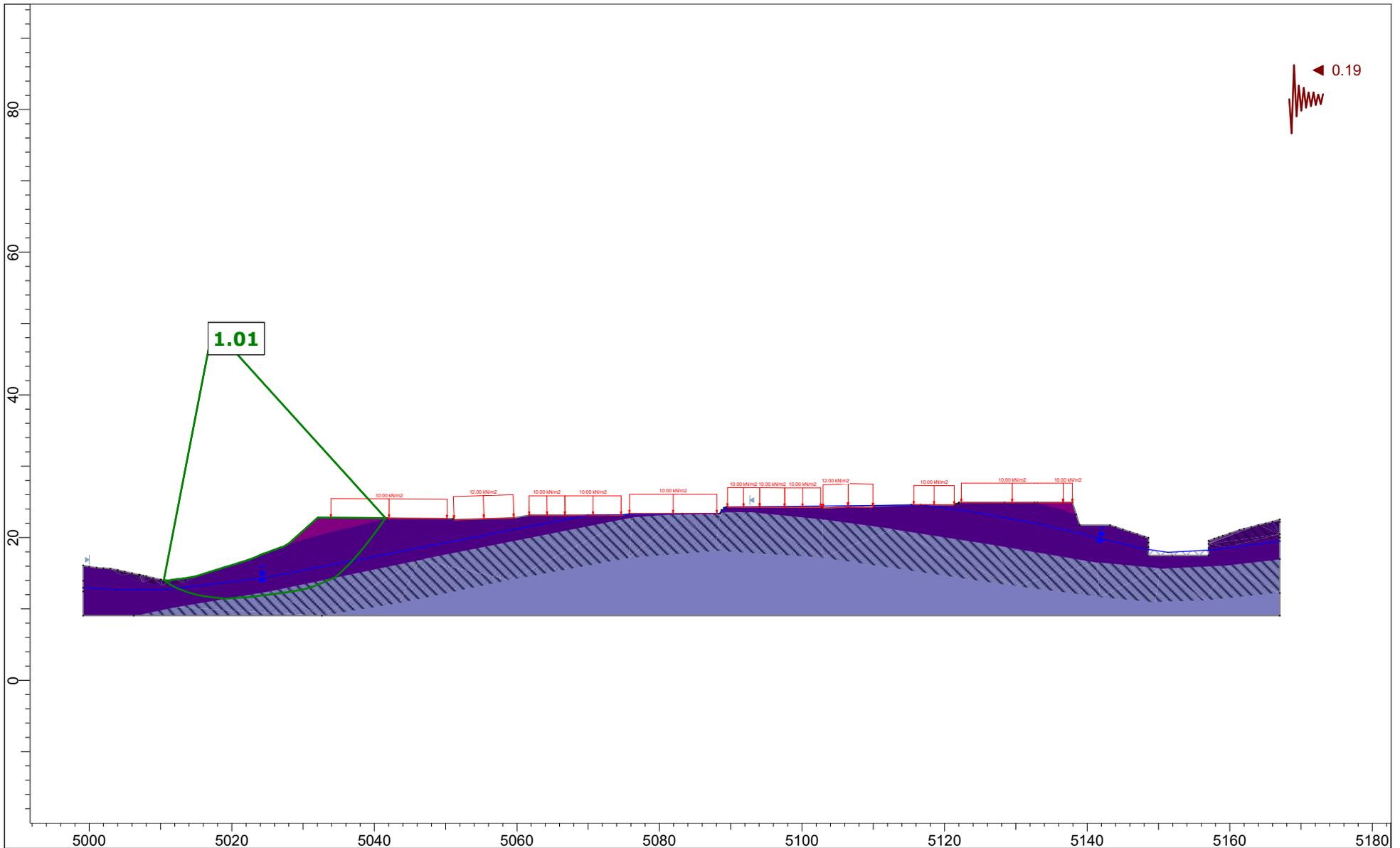
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<i>Group</i>	Section E - proposed GL (L-R)	<i>Scenario</i>	Seismic (0.19g)
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<i>Date</i>	13/12/2024	<i>File Name</i>	Section E.sldm



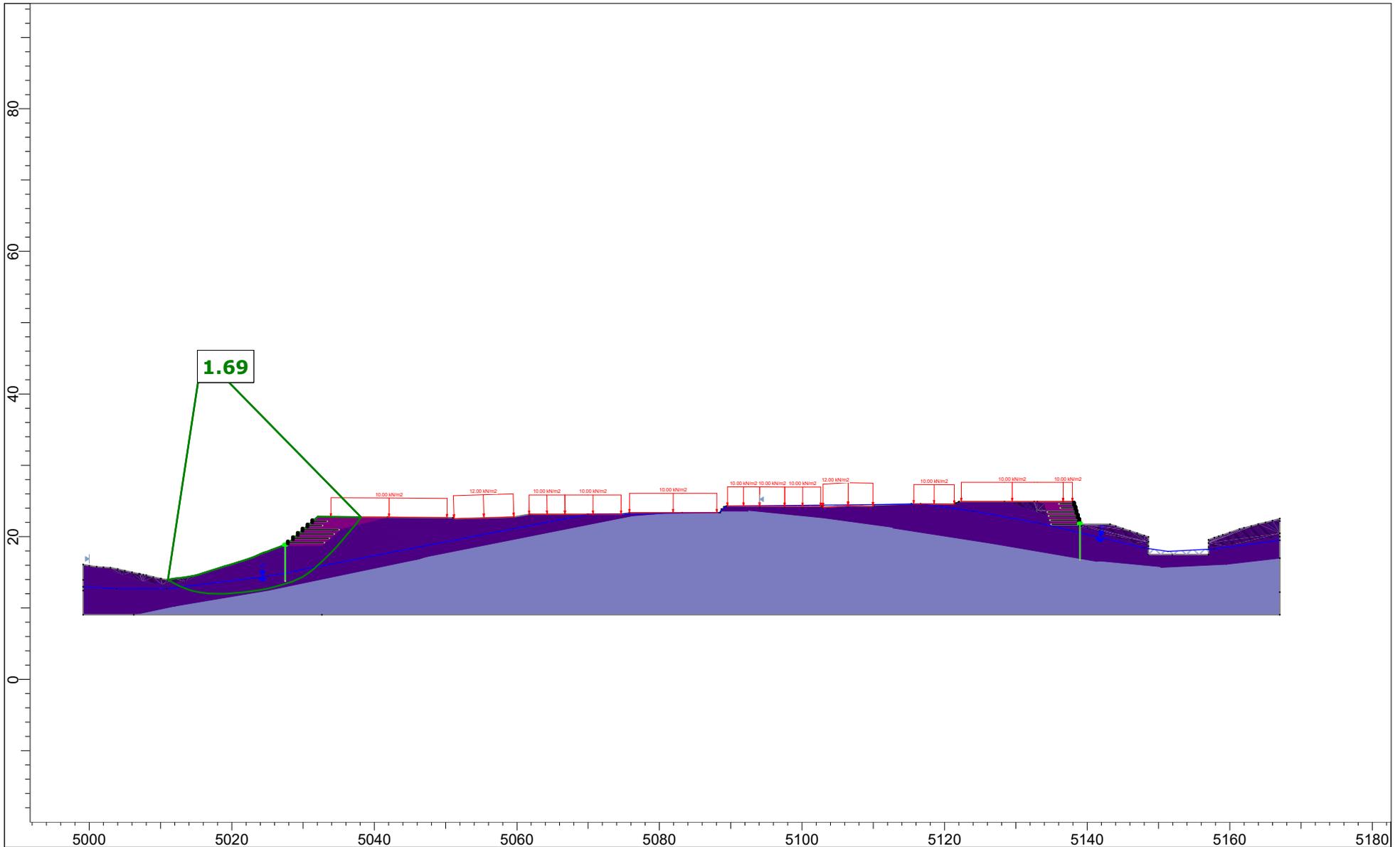
<i>Project</i>	240065 - Russell Road, Wainui - Stage 1		
<i>Group</i>	Section E - proposed GL (L-R)	<i>Scenario</i>	Extreme (50% fill saturation)
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<i>Date</i>	13/12/2024	<i>File Name</i>	Section E.sldm



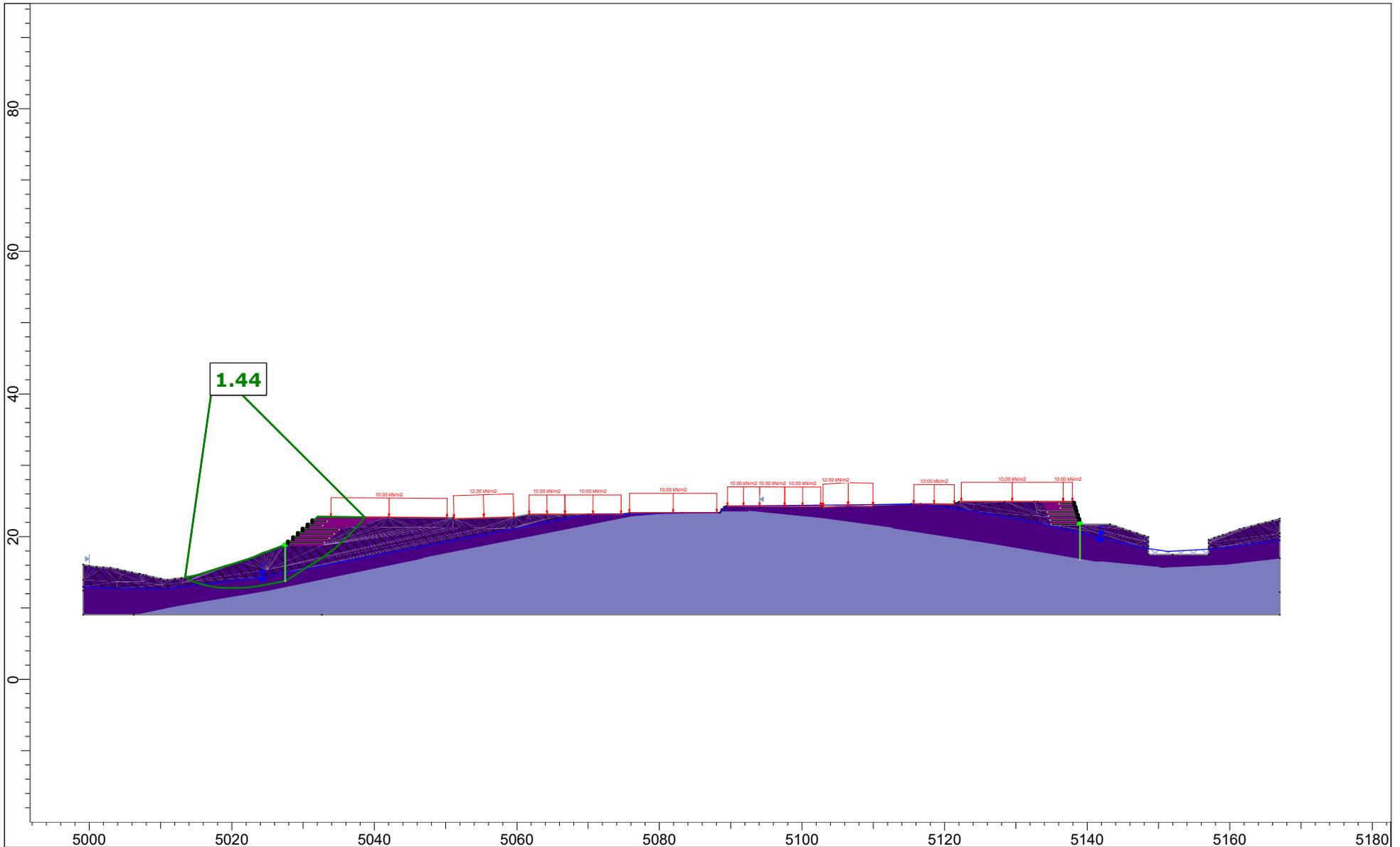
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	<i>Group</i> Section E - proposed GL (R-L)	<i>Scenario</i> Extreme (Worst Credible GW)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm	



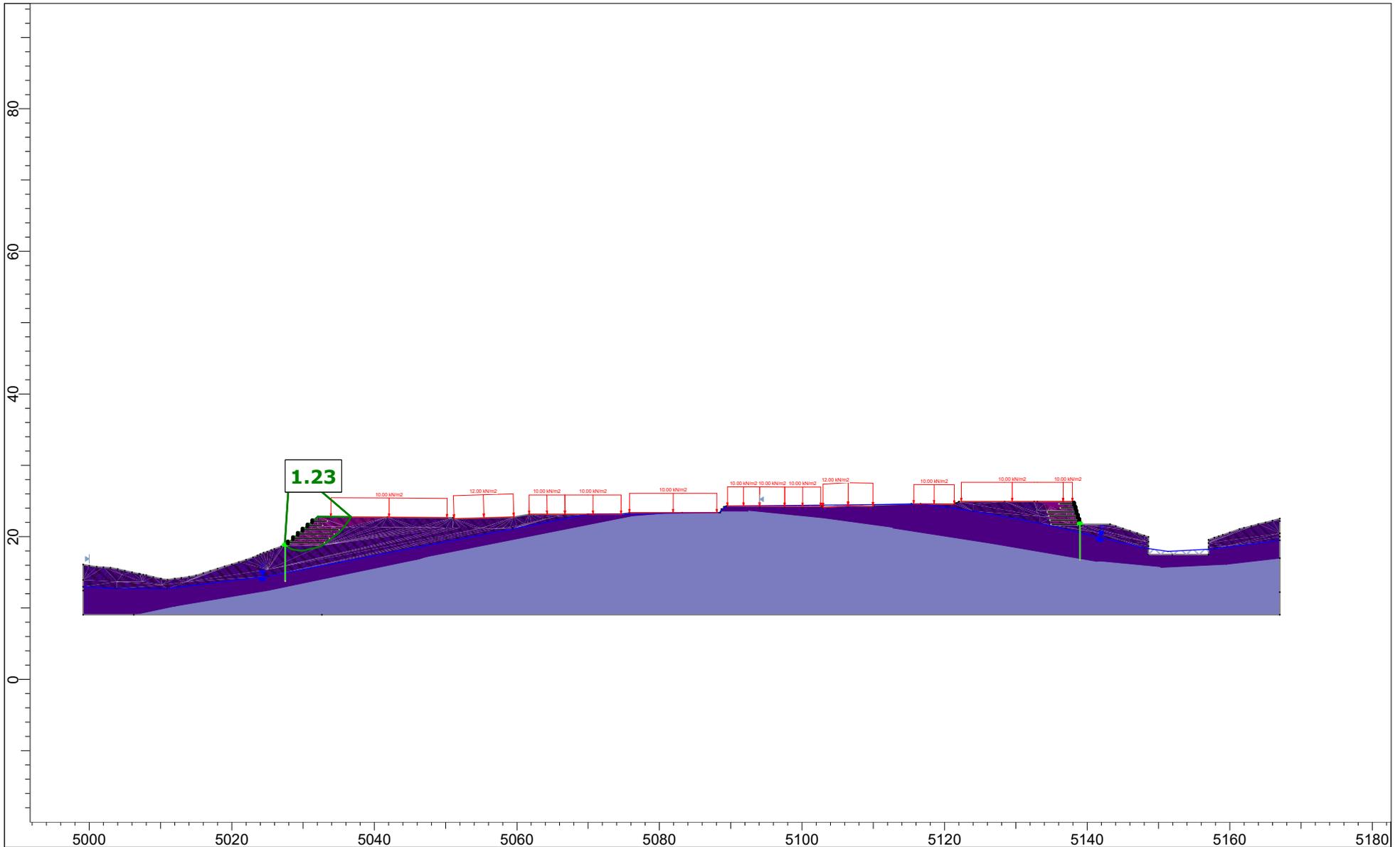
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	<i>Group</i> Section E - proposed GL (R-L)	<i>Scenario</i> Seismic (0.19g)	
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	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm	



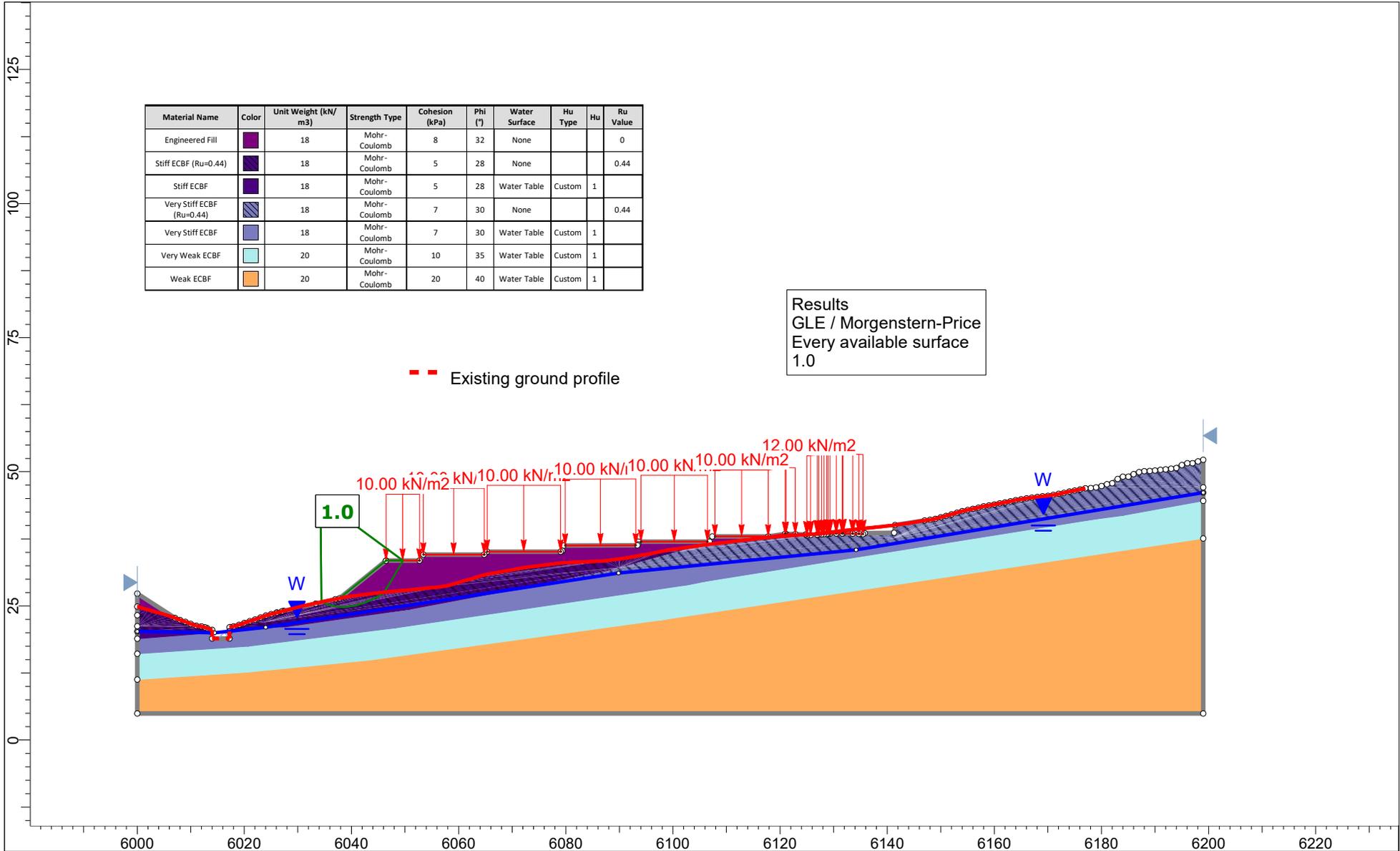
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	<i>Group</i> Section E - erosion & remedials (R-L)	<i>Scenario</i> Normal (Measured GW)
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm



	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1		
	<i>Group</i> Section E - erosion & remedials (R-L)	<i>Scenario</i> Extreme (Worst Credible GW)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm	



	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1		
	<i>Group</i> Section E - erosion & remedials (R-L)	<i>Scenario</i> Extreme (50% fill saturation)	
	<i>Drawn By</i> RS	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 13/12/2024	<i>File Name</i> Section E.sldm	



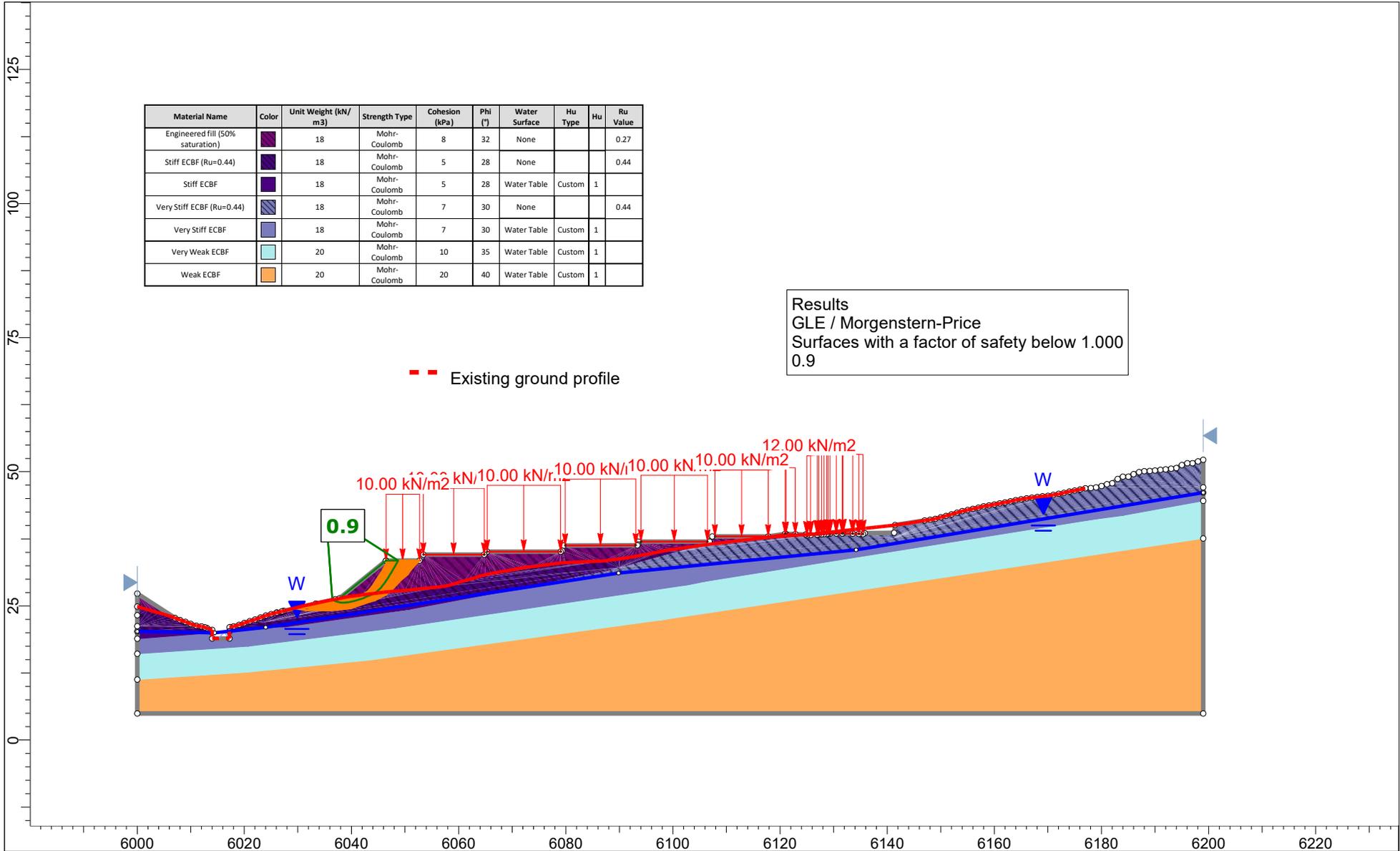
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Dark Blue	18	Mohr-Coulomb	8	32	None			0
Stiff ECBF (Ru=0.44)	Dark Purple	18	Mohr-Coulomb	5	28	None			0.44
Stiff ECBF	Dark Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF (Ru=0.44)	Light Purple	18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF	Light Purple	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Every available surface
1.0

--- Existing ground profile



Project		240065 - Russell Road, Waunui	
Group	Section F - Proposed GL	Scenario	Extreme (Worst Credible GW)
Drawn By	AB	Company	Riley Consultants Ltd
Date	19/12/2025	File Name	Section F (AB).slmd

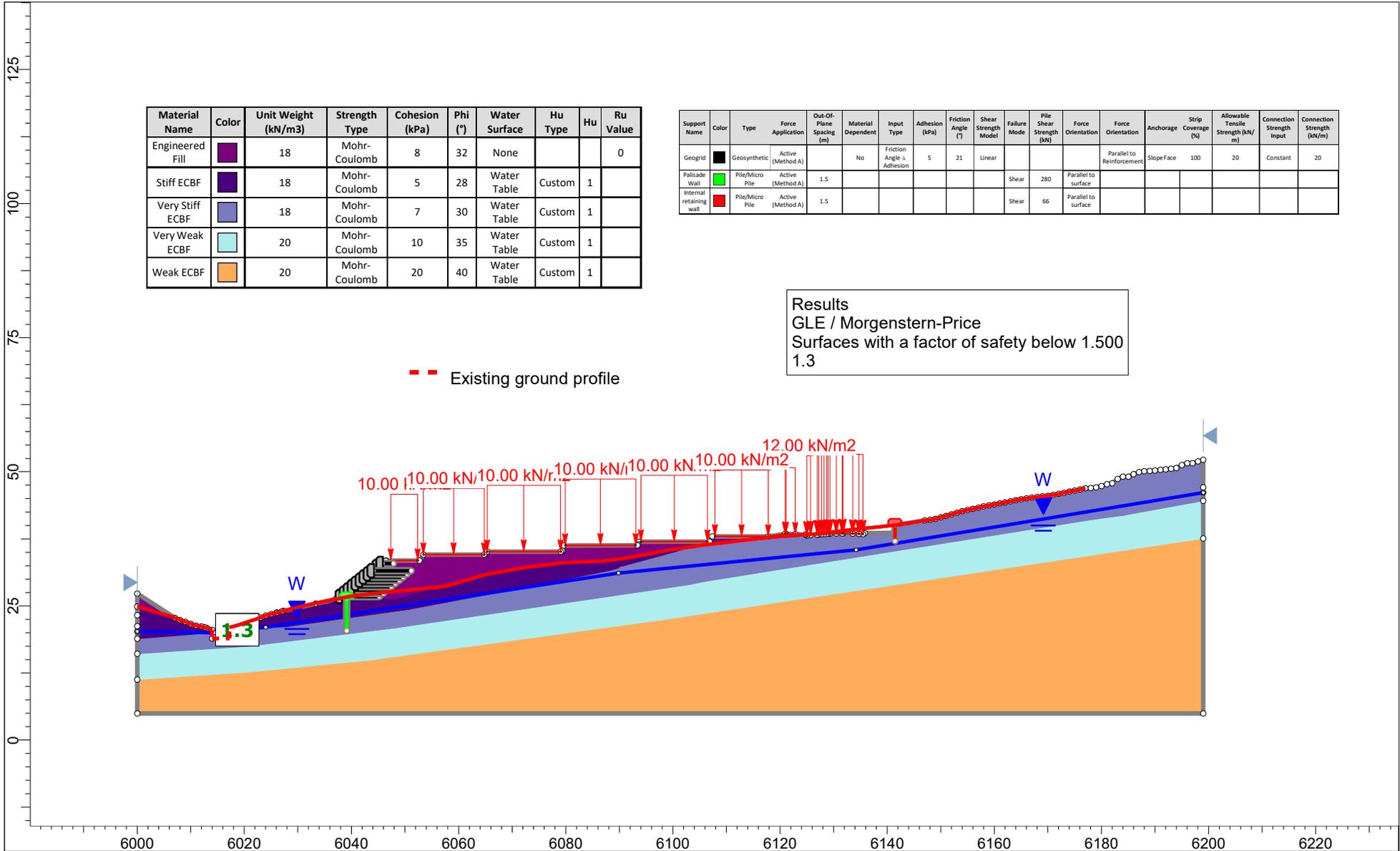


Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered fill (50% saturation)	Dark Purple	18	Mohr-Coulomb	8	32	None			0.27
Stiff ECBF (Ru=0.44)	Dark Purple	18	Mohr-Coulomb	5	28	None			0.44
Stiff ECBF	Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF (Ru=0.44)	Dark Blue	18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF	Dark Blue	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF	Light Blue	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.9

--- Existing ground profile

	Project		240065 - Russell Road, Waunui	
	Group		Section F - Proposed GL	Scenario
	Drawn By		AB	Company
	Date		19/12/2025	File Name
			Extreme (50% saturated fill)	Riley Consultants Ltd
				Section F (AB).slmd



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill	Dark Purple	18	Mohr-Coulomb	8	32	None			0
Stiff ECBF	Purple	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF	Blue-Purple	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF	Cyan	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF	Orange	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

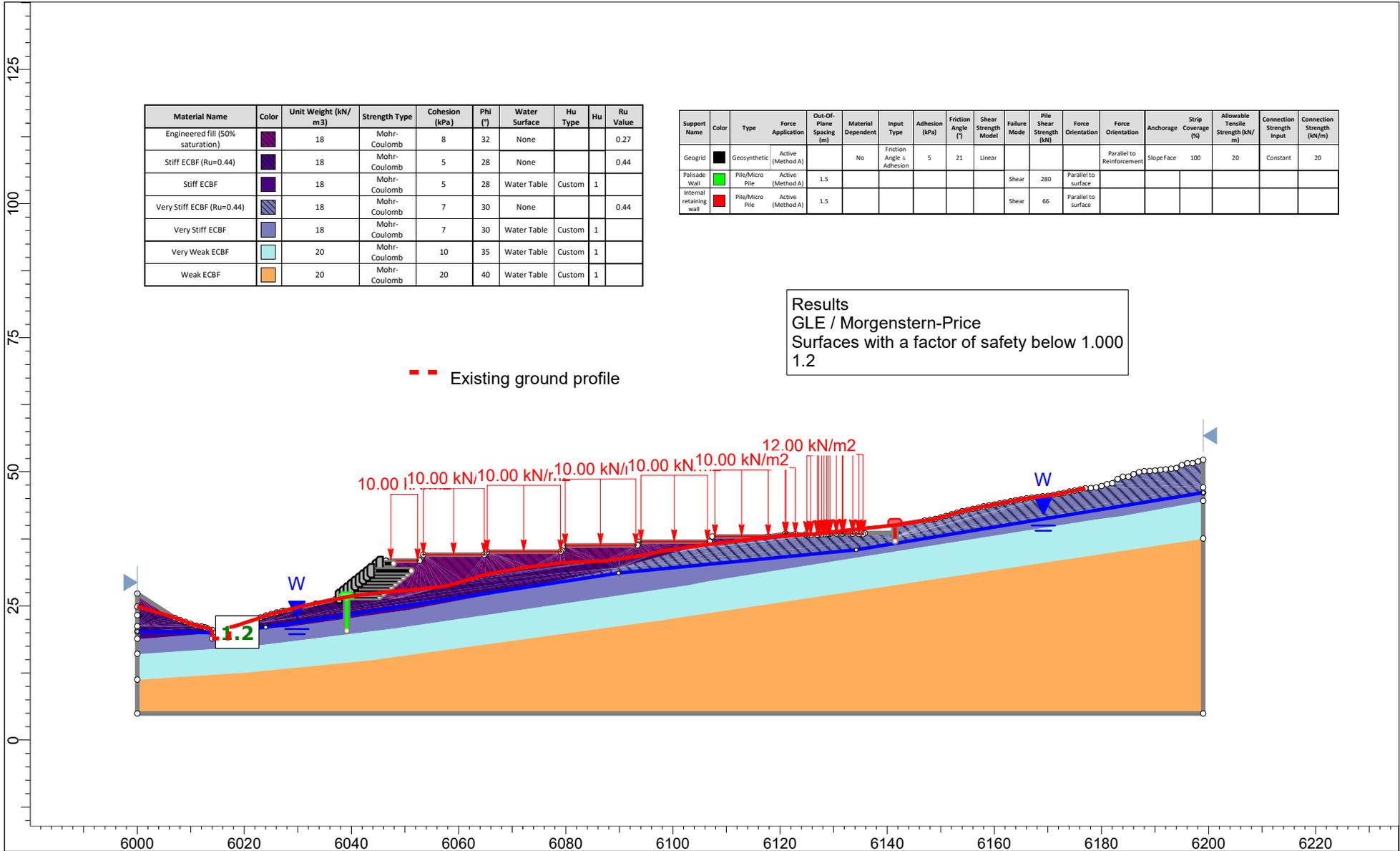
Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear			Parallel to Reinforcement	Slope Face	100	20	Constant	20	
Palisade Wall	Green	Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						
Internal retaining wall	Red	Pile/Micro Pile	Active (Method A)	1.5						Shear	66	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
1.3

--- Existing ground profile



Project		240065 - Russell Road, Waunui	
Group	Section F - Proposed GL & remedials	Scenario	Normal (Measured GW)
Drawn By	AB	Company	Riley Consultants Ltd
Date	19/12/2025	File Name	Section F (AB).slmd



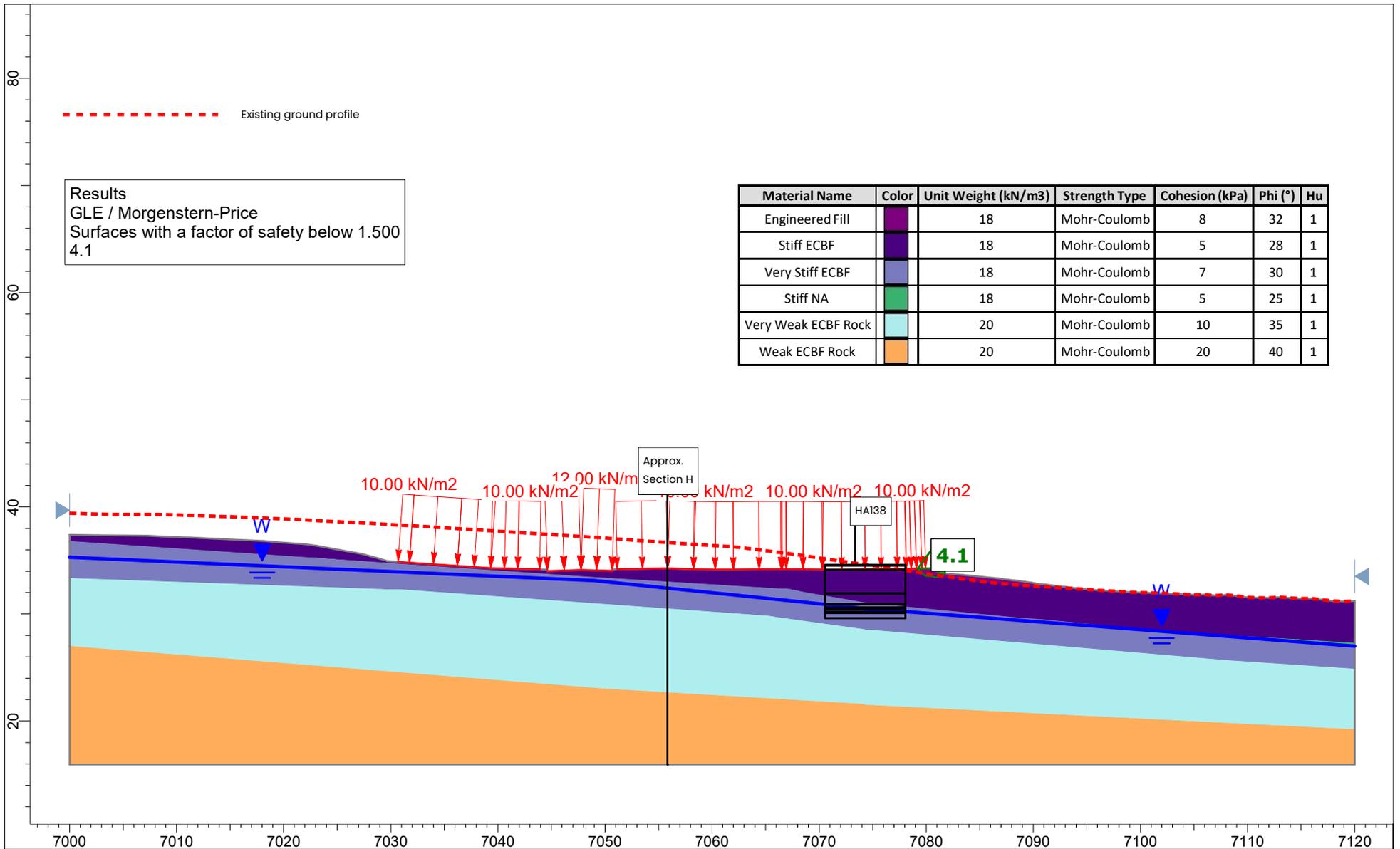
Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered fill (50% saturation)	[Purple]	18	Mohr-Coulomb	8	32	None			0.27
Stiff ECBF (Ru=0.44)	[Purple]	18	Mohr-Coulomb	5	28	None			0.44
Stiff ECBF	[Purple]	18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF (Ru=0.44)	[Purple]	18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF	[Purple]	18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak ECBF	[Light Blue]	20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Weak ECBF	[Orange]	20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	[Black]	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear			Parallel to Reinforcement	Slope Face	100	20	Constant	20	
Palisade Wall	[Green]	Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						
Internal retaining wall	[Red]	Pile/Micro Pile	Active (Method A)	1.5						Shear	66	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
1.2

--- Existing ground profile

	Project		240065 - Russell Road, Waunui	
	Group	Section F - Proposed GL & remedials	Scenario	Extreme (50% saturated fill)
	Drawn By	AB	Company	Riley Consultants Ltd
	Date	19/12/2025	File Name	Section F (AB).slmd

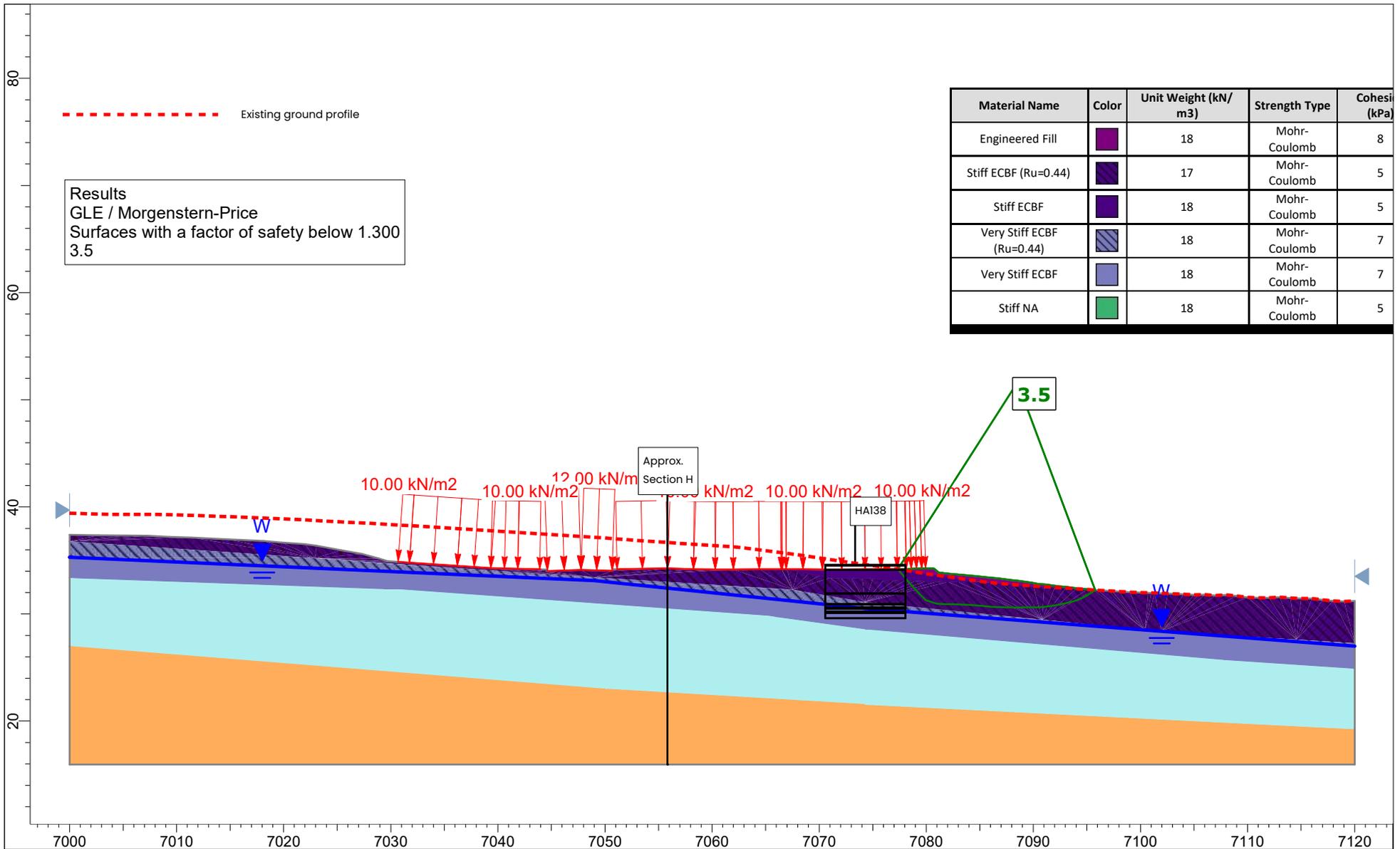


Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
4.1

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Hu
Engineered Fill	Dark Purple	18	Mohr-Coulomb	8	32	1
Stiff ECBF	Purple	18	Mohr-Coulomb	5	28	1
Very Stiff ECBF	Dark Blue	18	Mohr-Coulomb	7	30	1
Stiff NA	Green	18	Mohr-Coulomb	5	25	1
Very Weak ECBF Rock	Light Blue	20	Mohr-Coulomb	10	35	1
Weak ECBF Rock	Orange	20	Mohr-Coulomb	20	40	1



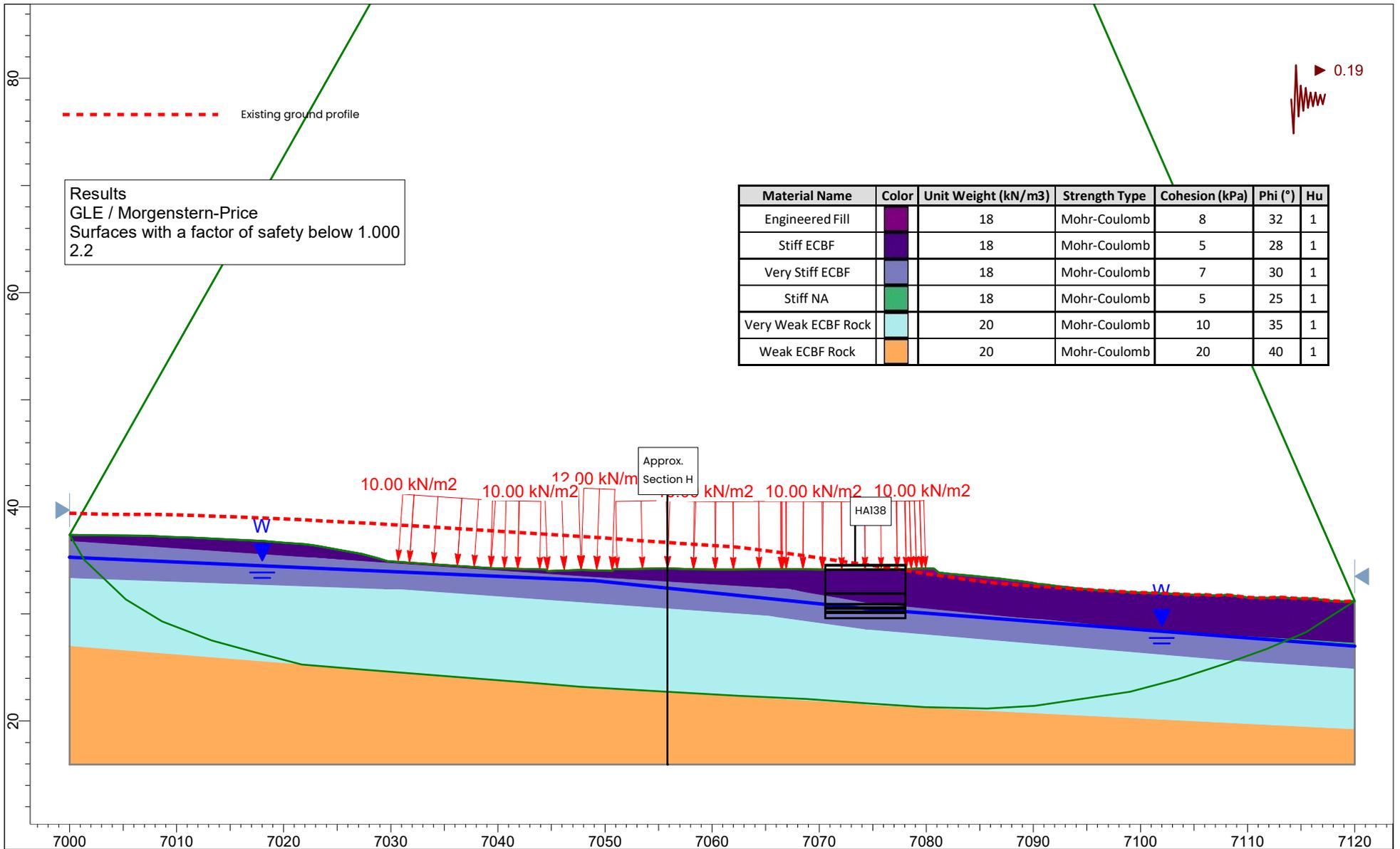
<i>Project</i>	240065 - Russell Road, Wainui - Stage 1	
<i>Group</i>	Section G - Proposed GL	<i>Scenario</i>
<i>Drawn By</i>	LKB	<i>Company</i>
<i>Date</i>	15/01/2025	<i>File Name</i>
		Section G.sldm



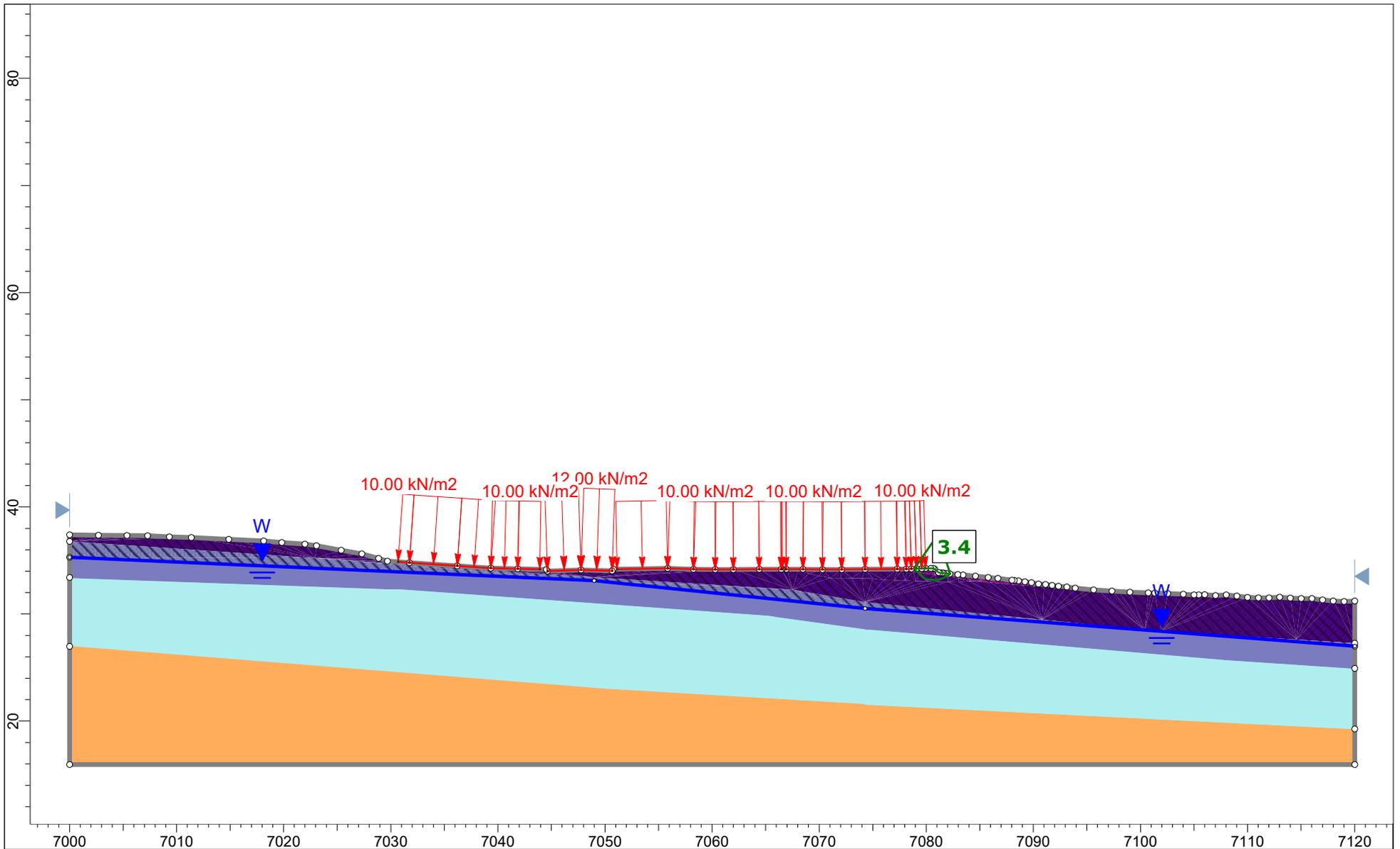
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
3.5

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesi (kPa)
Engineered Fill		18	Mohr-Coulomb	8
Stiff ECBF (Ru=0.44)		17	Mohr-Coulomb	5
Stiff ECBF		18	Mohr-Coulomb	5
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7
Very Stiff ECBF		18	Mohr-Coulomb	7
Stiff NA		18	Mohr-Coulomb	5

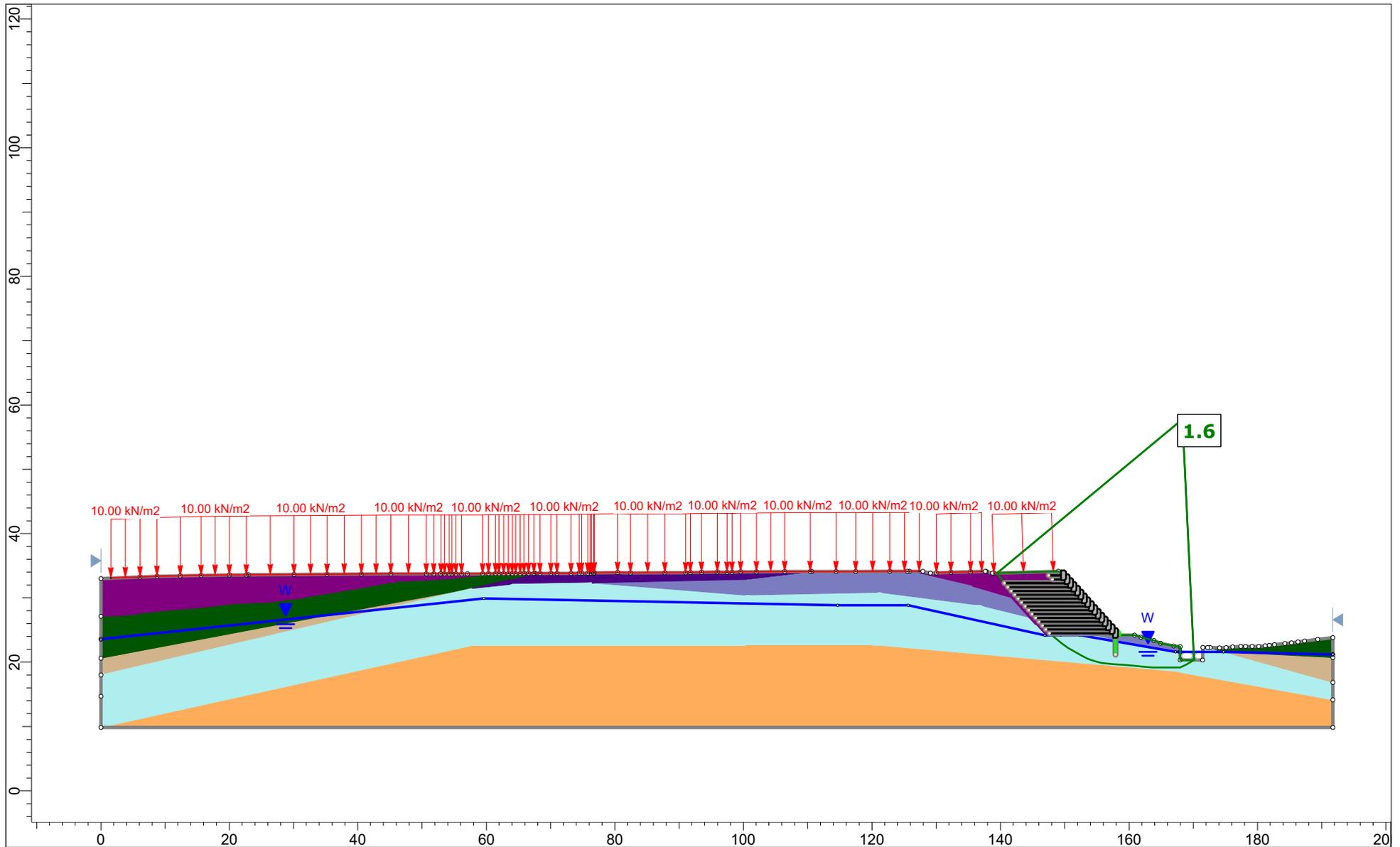
	Project			240065 - Russell Road, Wainui - Stage 1		
	Group		Section G - Proposed GL		Scenario	Extreme (Worst Credible)
	Drawn By		LKB		Company	Riley Consultants Ltd
	Date		15/01/2025		File Name	Section G.sldm
	SLIDEINTERPRET 9.028					



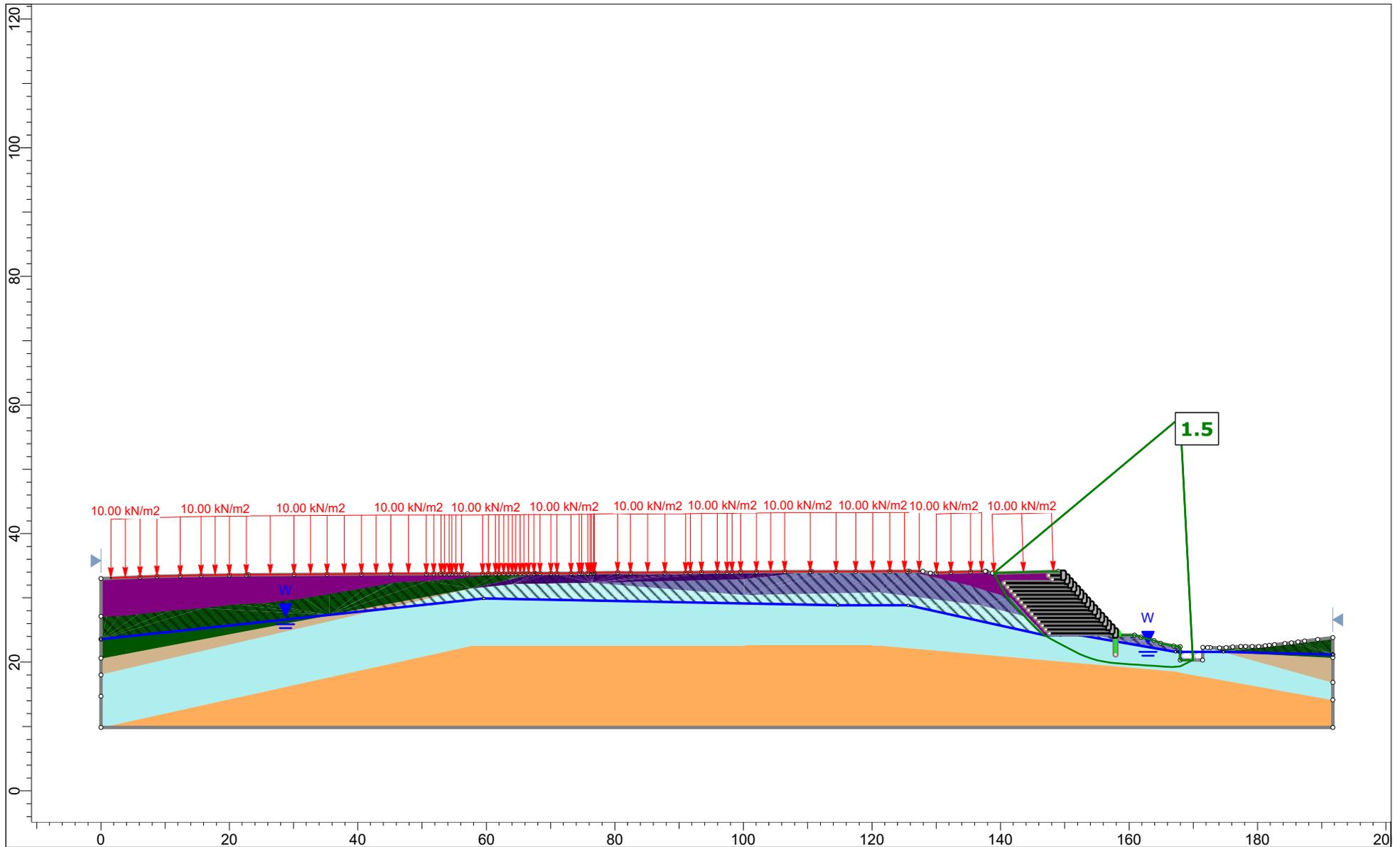
	Project		240065 - Russell Road, Wainui - Stage 1	
	Group	Section G - Proposed GL	Scenario	Seismic (0.19g)
	Drawn By	LKB	Company	Riley Consultants Ltd
	Date	15/01/2025	File Name	Section G.sldm



	<i>Project</i> 240065 - Russell Road, Wainui - Stage 1		
	<i>Group</i> Section G - Proposed GL	<i>Scenario</i> Extreme (50% fill saturation)	
	<i>Drawn By</i> LKB	<i>Company</i> Riley Consultants Ltd	
	<i>Date</i> 15/01/2025	<i>File Name</i> Section G.sldm	

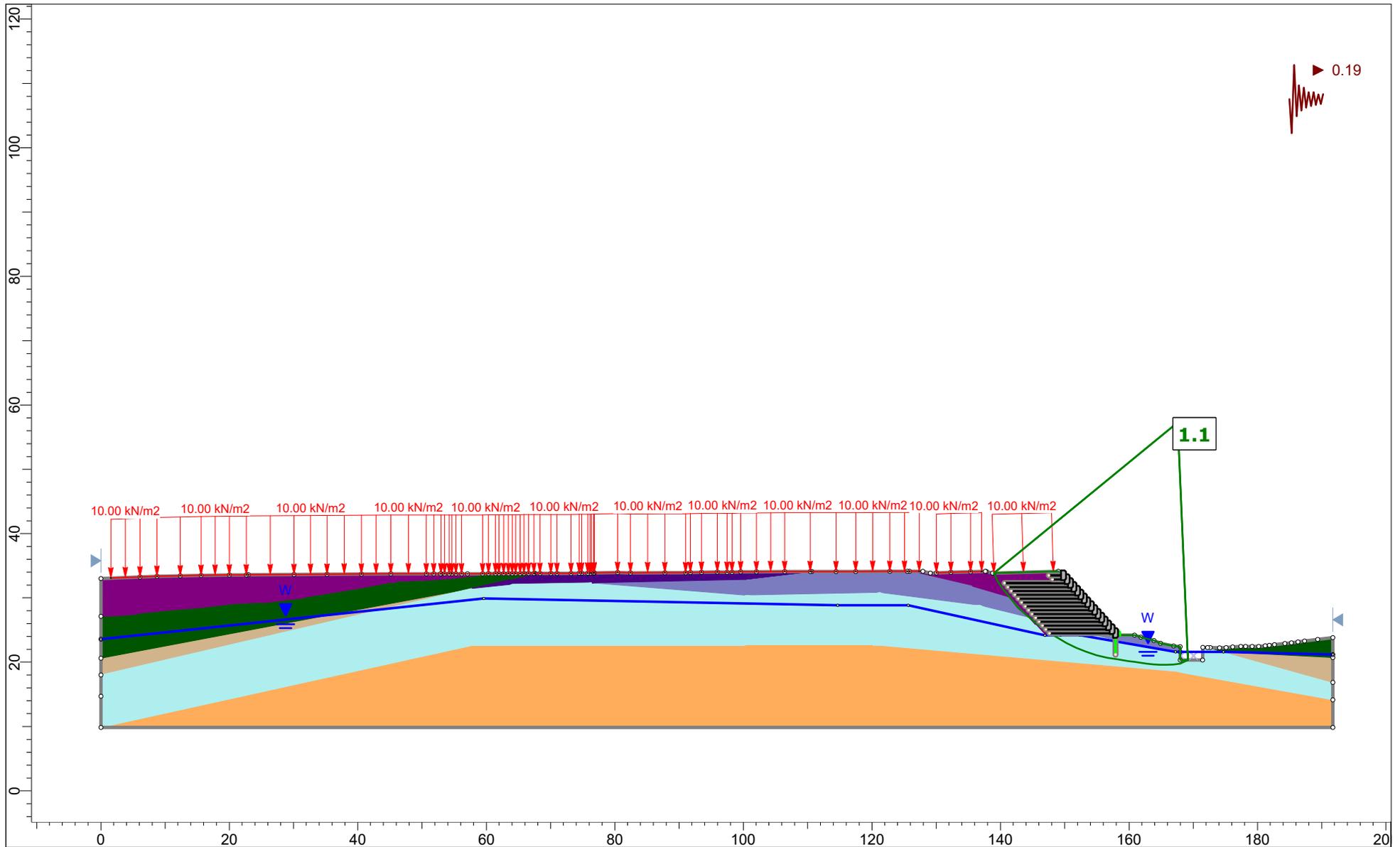


<i>Project</i>	240065 - Russell Road, Waunui		
<i>Group</i>	Section H - proposed GL & remedials	<i>Scenario</i>	Normal (Measured GW)
<i>Drawn By</i>	LKB	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	19/12/2025	<i>File Name</i>	Section H.sldm

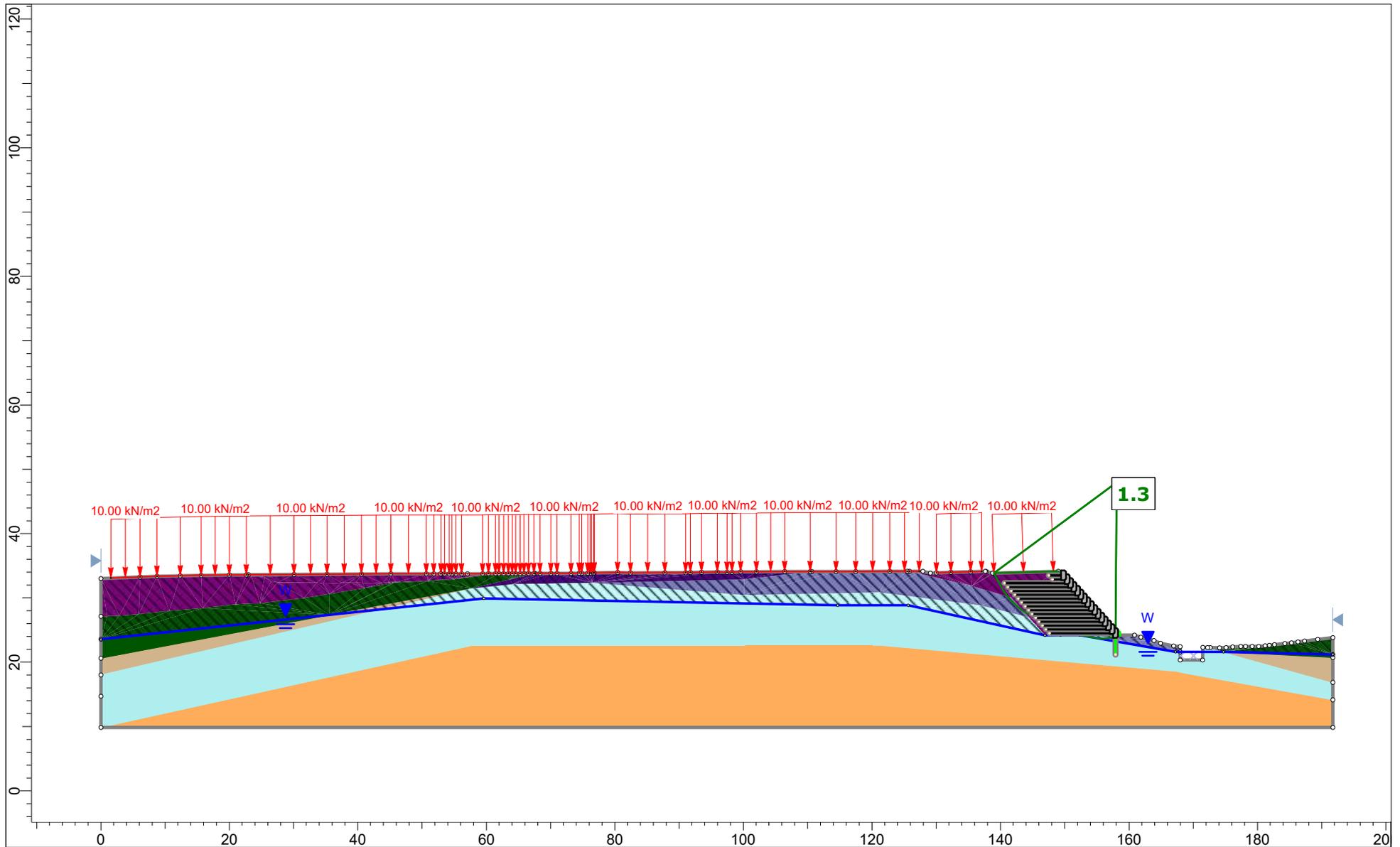


SLIDEINTERPRET 9.038

<i>Project</i>	240065 - Russell Road, Waunui		
<i>Group</i>	Section H - proposed GL & remedials	<i>Scenario</i>	Extreme (Worst Credible GW)
<i>Drawn By</i>	LKB	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	19/12/2025	<i>File Name</i>	Section H.sldm

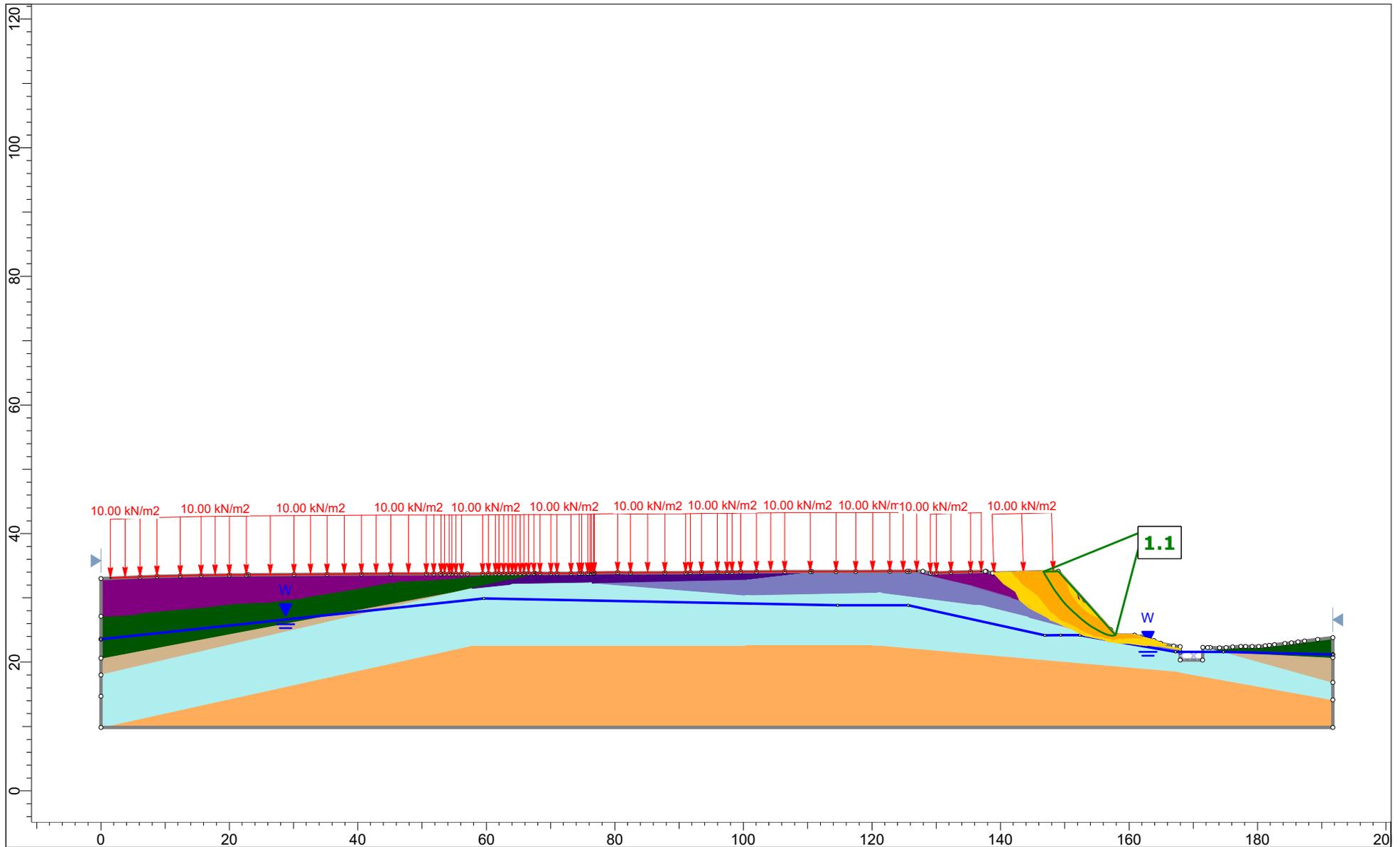


<i>Project</i>	240065 - Russell Road, Waunui		
<i>Group</i>	Section H - proposed GL & remedials	<i>Scenario</i>	Seismic (0.19g)
<i>Drawn By</i>	LKB	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	19/12/2025	<i>File Name</i>	Section H.sldm



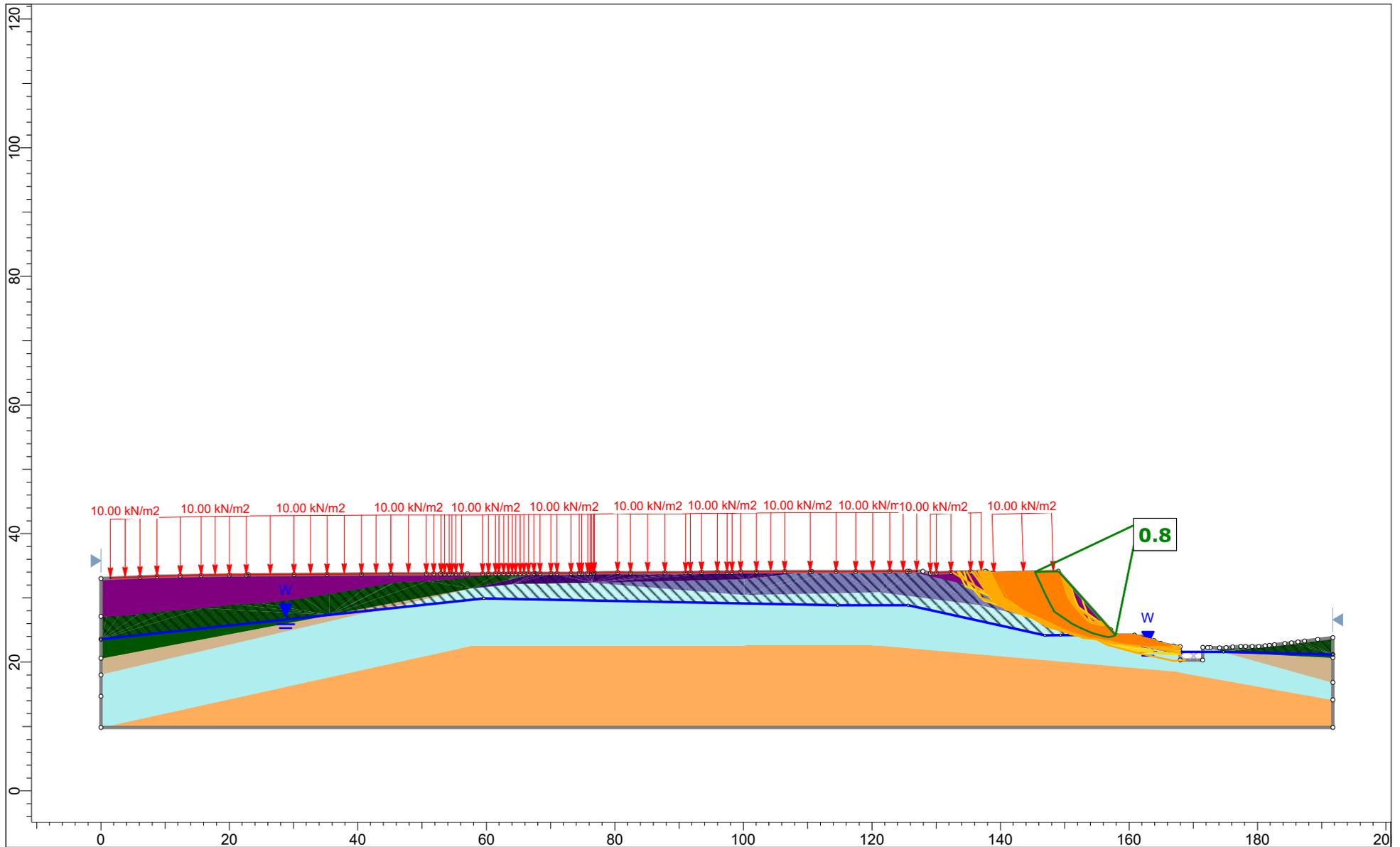
SLIDEINTERPRET 9.038

<i>Project</i>	240065 - Russell Road, Waunui		
<i>Group</i>	Section H - proposed GL & remedials	<i>Scenario</i>	Extreme (50% Fill Saturation)
<i>Drawn By</i>	LKB	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	19/12/2025	<i>File Name</i>	Section H.sldm



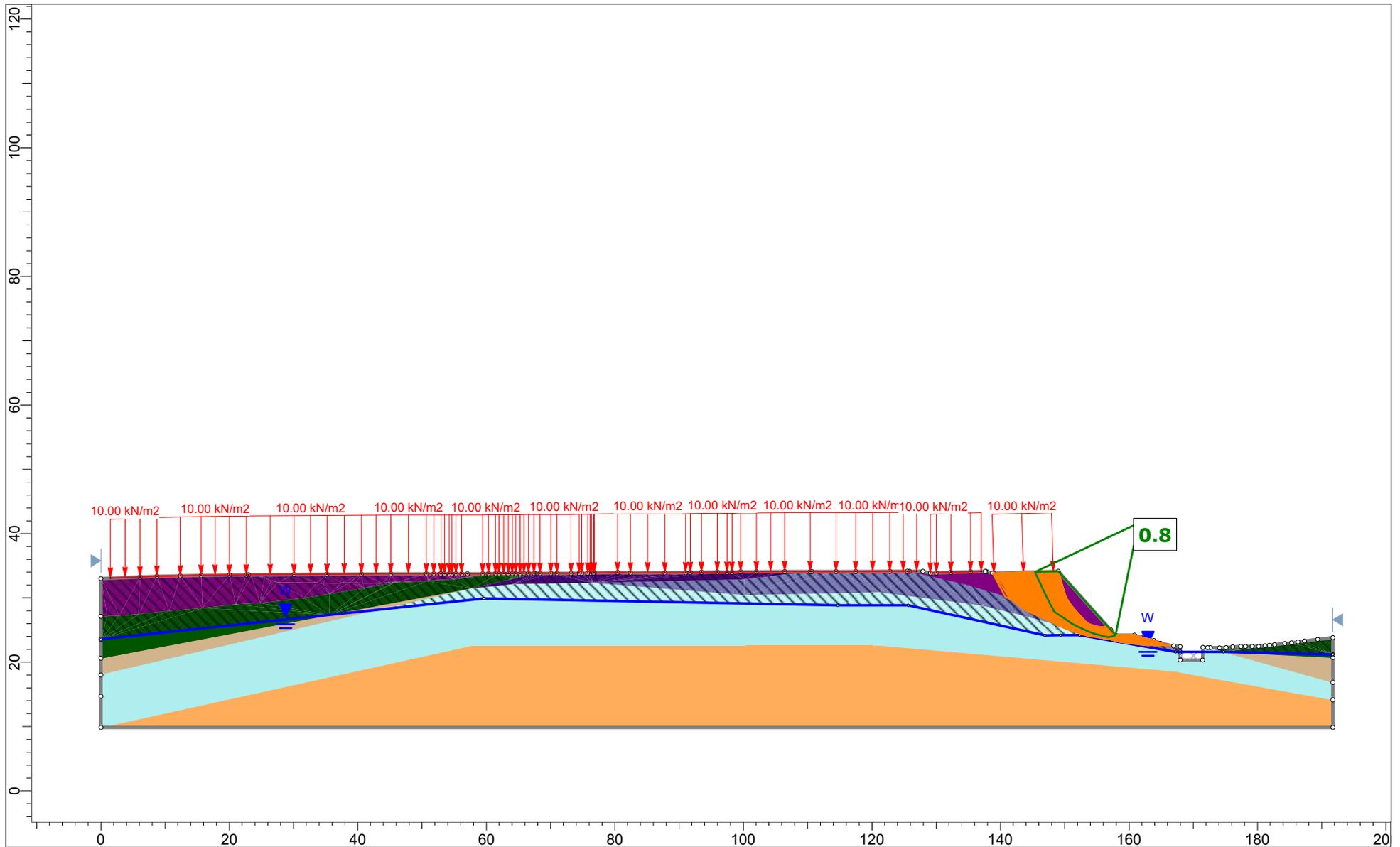
SLIDEINTERPRET 9.038

<i>Project</i>	240065 - Russell Road, Waunui		
<i>Group</i>	Section H - proposed GL	<i>Scenario</i>	Normal (Measured GW)
<i>Drawn By</i>	LKB	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	19/12/2025	<i>File Name</i>	Section H.sldm



SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section H - proposed GL	Scenario	Extreme (Worst Credible GW)
Drawn By	LKB	Company	Riley Consultants Ltd
Date	19/12/2025	File Name	Section H.sldm



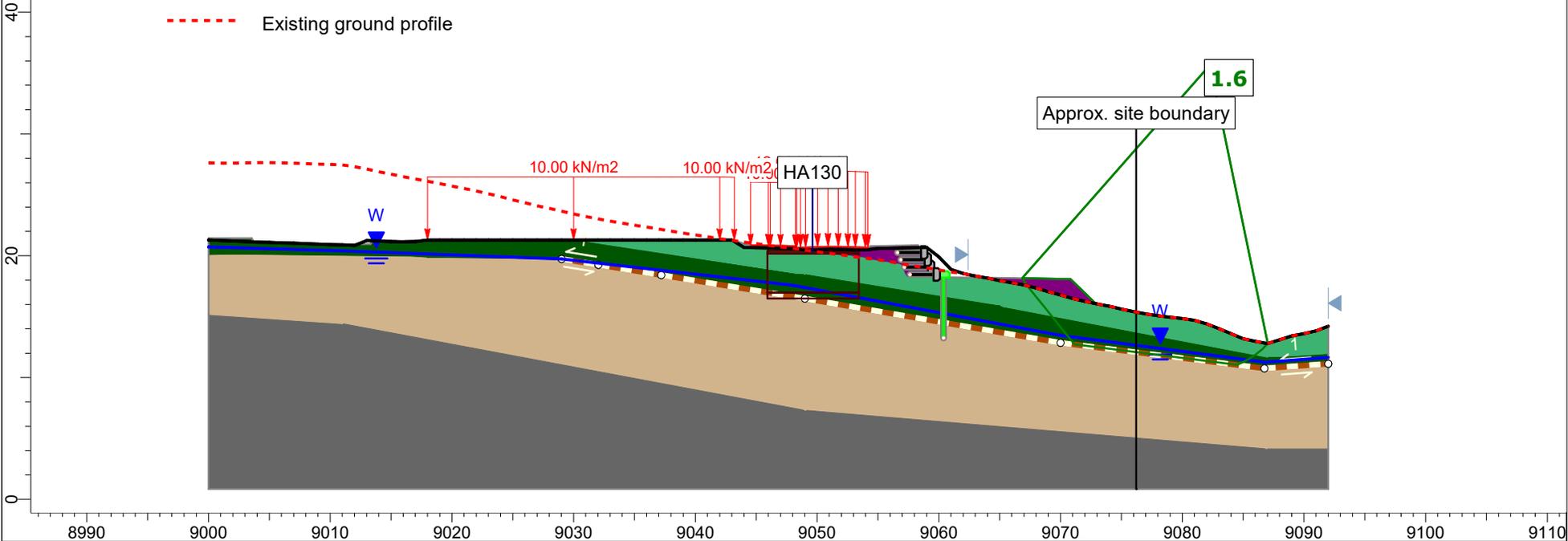
SLIDEINTERPRET 9.038

<i>Project</i>	240065 - Russell Road, Waunui		
<i>Group</i>	Section H - proposed GL	<i>Scenario</i>	Extreme (50% Fill Saturation)
<i>Drawn By</i>	LKB	<i>Company</i>	Riley Consultants Ltd
<i>Date</i>	19/12/2025	<i>File Name</i>	Section H.sldm

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Palisade Wall	Green	Pile/Micro Pile	Active (Method A)	1.5						Shear	185	Parallel to surface						

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Ru Value
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	None	0
Stiff NA	Green	18	Mohr-Coulomb	5	25	None	0
Very Stiff NA	Dark Green	18	Mohr-Coulomb	5	30	None	0
Weak NA Layer	Yellow	19	Mohr-Coulomb	0	12	None	0
Very Weak NA Rock	Brown	20	Mohr-Coulomb	5	25	None	0
Weak NA Rock	Grey	20	Mohr-Coulomb	5	30	None	0

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500

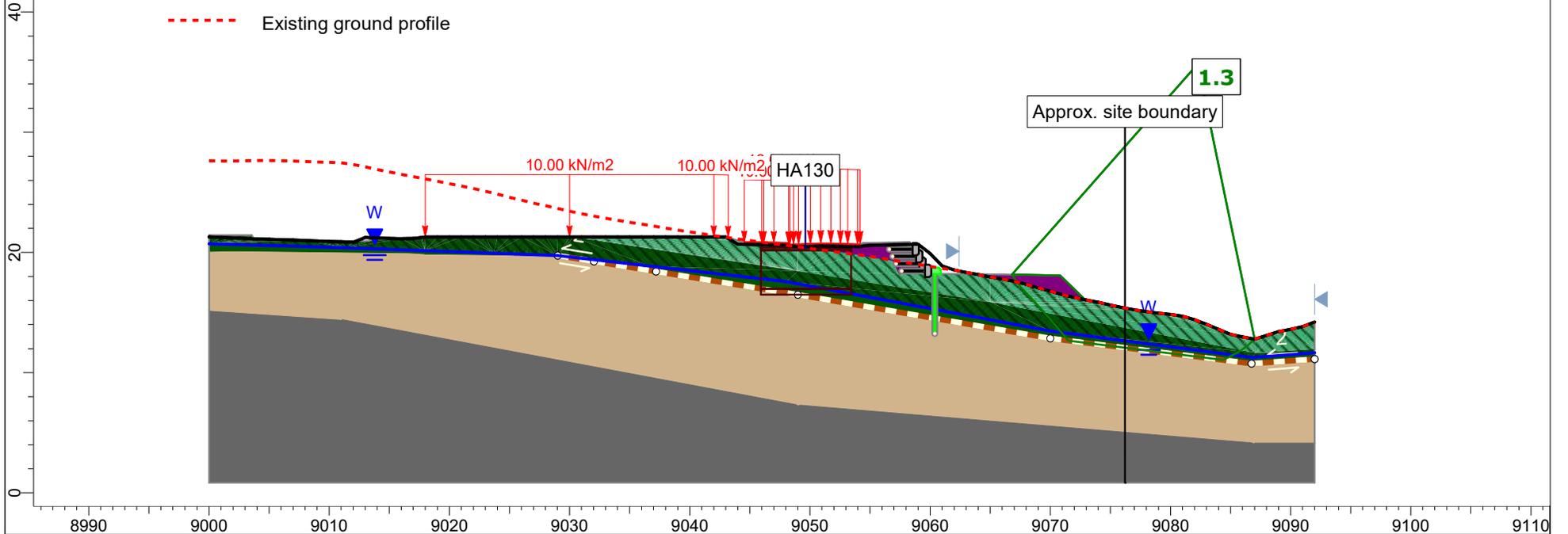


	Project		240065 - Russell Road, Waunui	
	Group	Scenario I - Proposed GL & Remedials	Scenario	Normal (Measured GW)
	Drawn By	LKB	Company	Riley Consultants Ltd
	Date	19/12/2025	File Name	Section I.sldm

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Allowable Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid	Black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Palisade Wall	Green	Pile/Micro Pile	Active (Method A)	1.5						Shear	185	Parallel to surface						

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Ru Value
Engineered Fill	Purple	18	Mohr-Coulomb	8	32	None	0
Stiff NA (Ru=0.44)	Green diagonal	18	Mohr-Coulomb	5	25	None	0.44
Very Stiff NA (Ru=0.44)	Dark Green diagonal	18	Mohr-Coulomb	5	30	None	0.44
Very Stiff NA	Dark Green	18	Mohr-Coulomb	5	30	None	0
Weak NA Layer	Light Green	19	Mohr-Coulomb	0	12	None	0
Very Weak NA Rock	Light Brown	20	Mohr-Coulomb	5	25	None	0
Weak NA Rock	Dark Grey	20	Mohr-Coulomb	5	30	None	0

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300



	Project		240065 - Russell Road, Waunui	
	Group		Scenario I - Proposed GL & Remedials	Scenario
	Drawn By		LKB	Company
	Date		19/12/2025	File Name
			Extreme (Worst Credible GW)	
			Riley Consultants Ltd	
			Section I.sldm	

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Ru Value
Engineered Fill	Blue	18	Mohr-Coulomb	8	32	None	0
Stiff NA	Green	18	Mohr-Coulomb	5	25	None	0
Very Stiff NA	Dark Green	18	Mohr-Coulomb	5	30	None	0
Weak NA Layer	Light Green	19	Mohr-Coulomb	0	12	None	0
Very Weak NA Rock	Orange	20	Mohr-Coulomb	5	25	None	0
Weak NA Rock	Grey	20	Mohr-Coulomb	5	30	None	0

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.9

60

40

20

0

Existing ground profile

0.9

Approx. site boundary

10.00 kN/m2

10.00 kN/m2

HA130

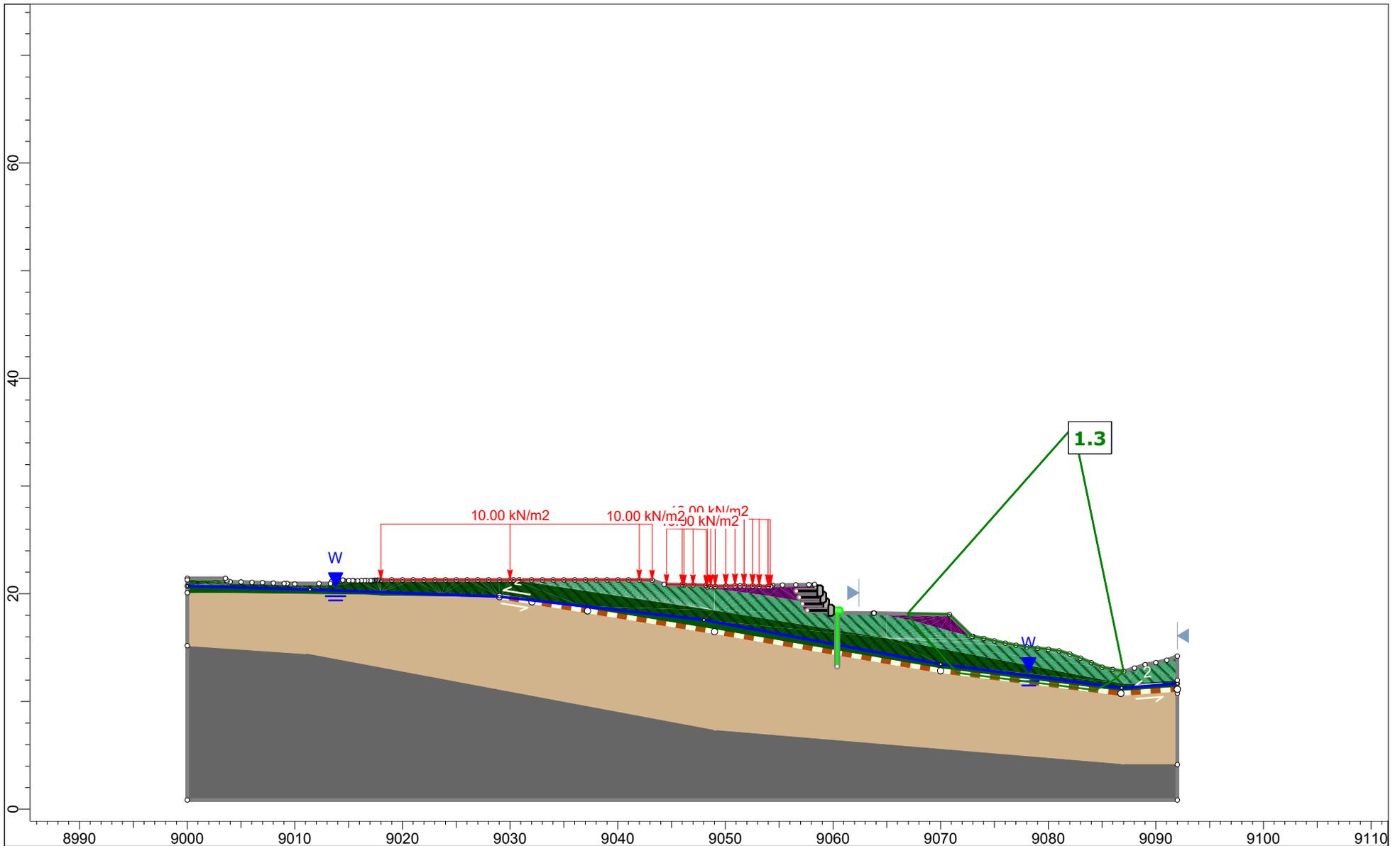
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W

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Project	240065 - Russell Road, Waunui		
Group	Scenario I - Proposed GL & Remedials	Scenario	Seismic (0.19g)
Drawn By	LKB	Company	Riley Consultants Ltd
Date	19/12/2025	File Name	Section I.slmd



	<i>Project</i> 240065 - Russell Road, Waunui		
	<i>Group</i> Scenario I - Proposed GL & Remedials		<i>Scenario</i> Extreme (50% saturation)
	<i>Drawn By</i> LKB		<i>Company</i> Riley Consultants Ltd
	<i>Date</i> 19/12/2025		<i>File Name</i> Section I.slm