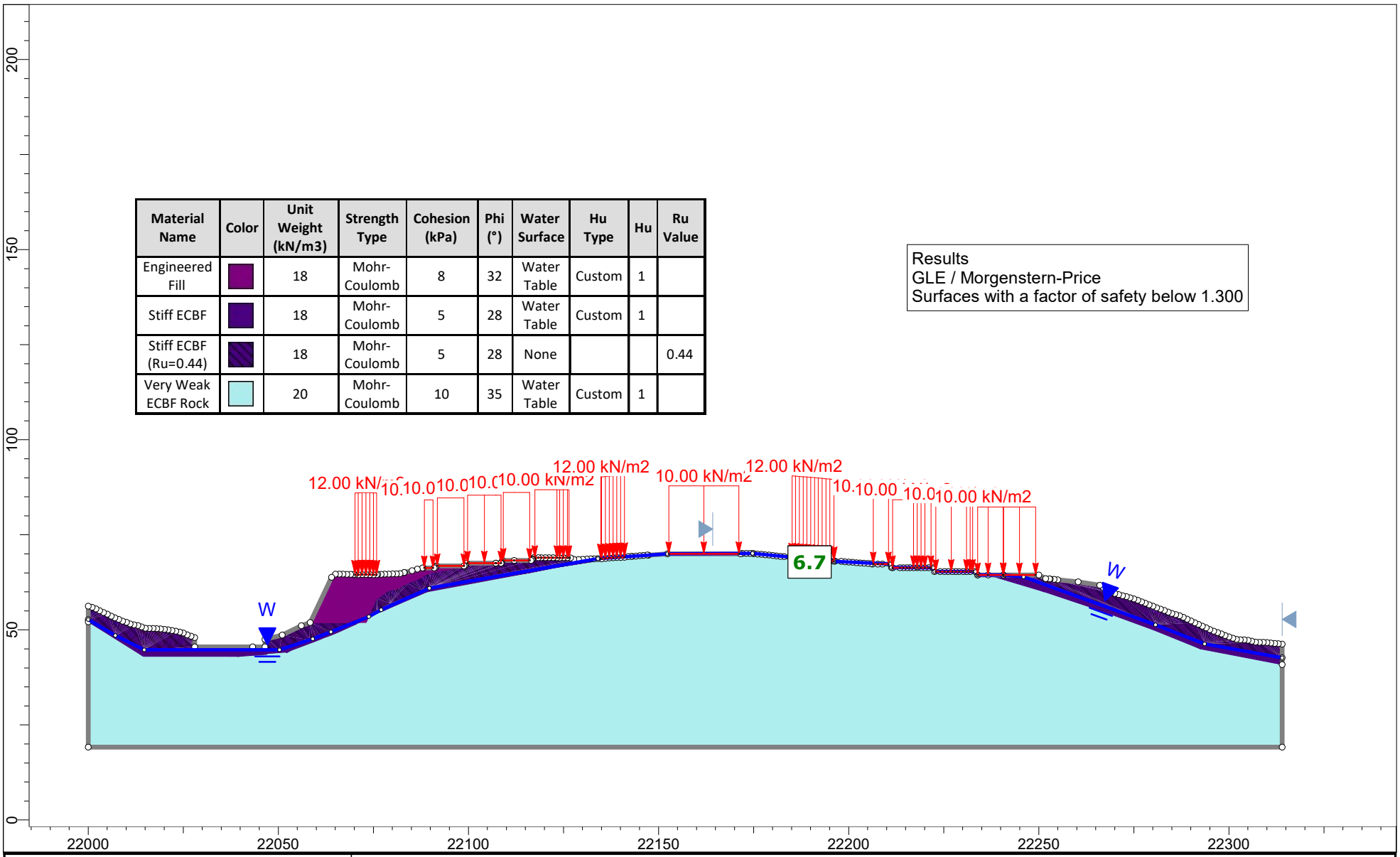
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	

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

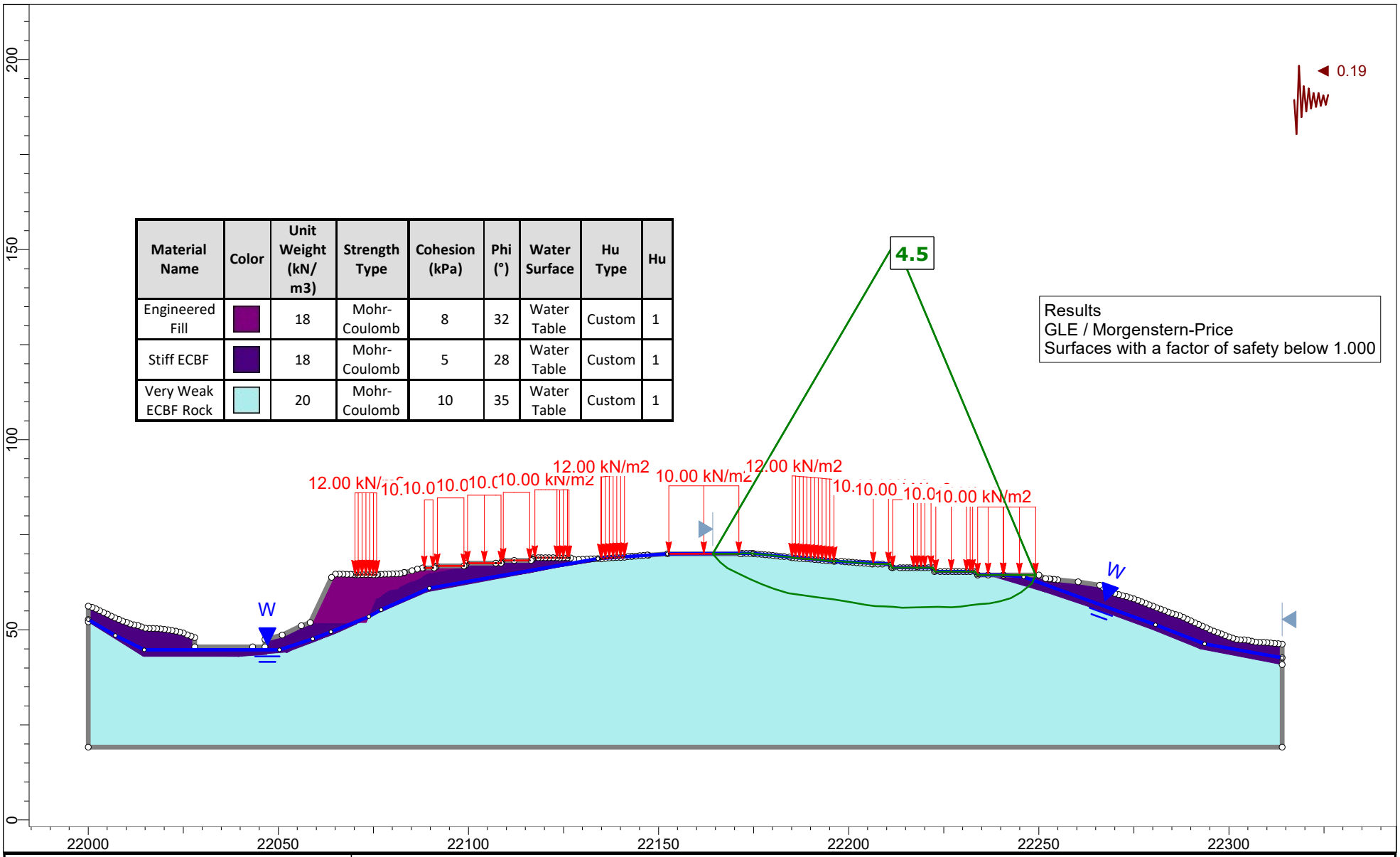


RILEY

SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section V - Proposed GL (L-R)	Scenario	Extreme (Worst Case GW)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section V.slmd

Material Name	Color	Unit Weight (kN/m3)	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



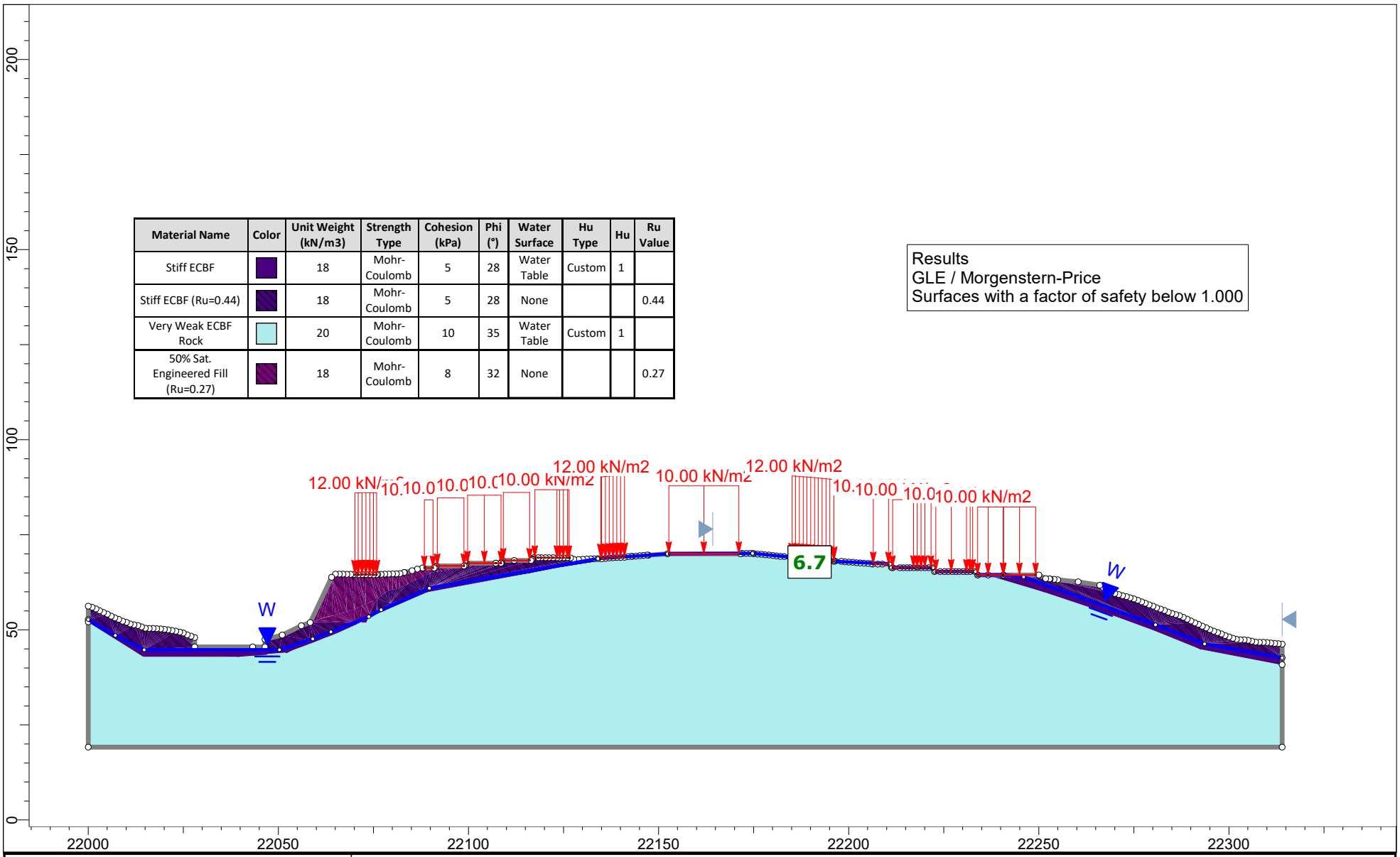
RILEY

SLIDEINTERPRET 9.038

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

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



RILEY

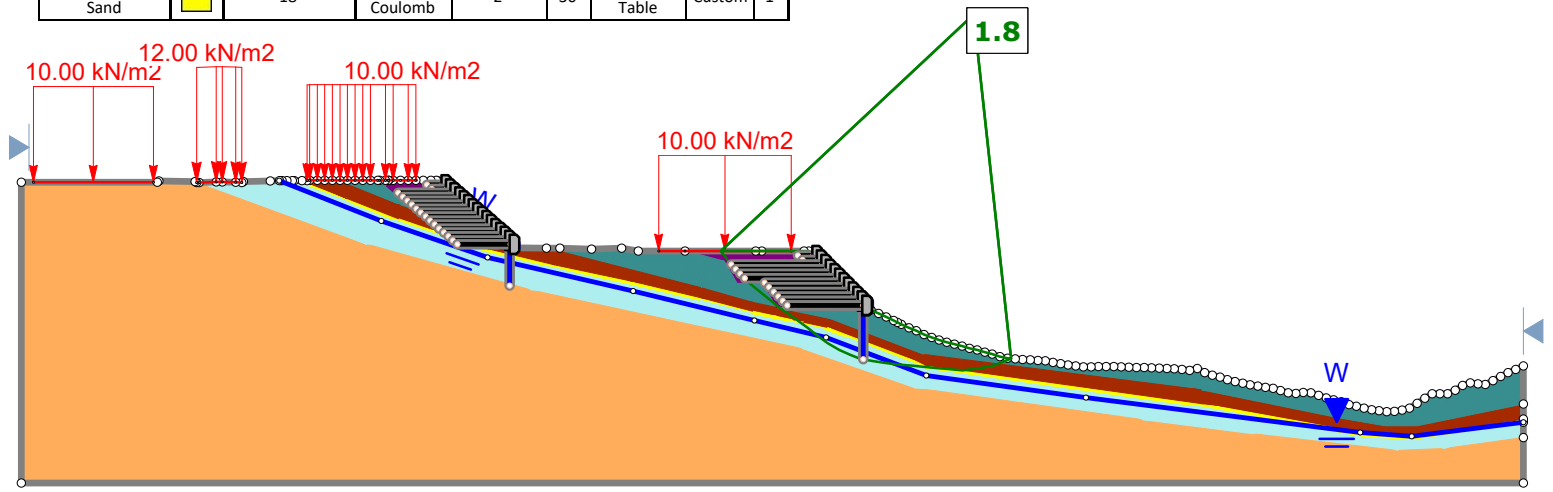
SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section V - Proposed GL (L-R)	Scenario	Extreme (50% Fill Saturation)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section V.slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	600	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle &	5	21	Linear				Parallel to Reinforcement	Slope Face	100	23	Constant	23

Material Name	Color	Unit Weight (kN/m3)	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 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
Medium Dense Sand		18	Mohr-Coulomb	2	30	Water Table	Custom	1

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



150
125
100
75
50
25

22980 23000 23020 23040 23060 23080 23100 23120 23140 23160 23180 23200 23220

RILEY

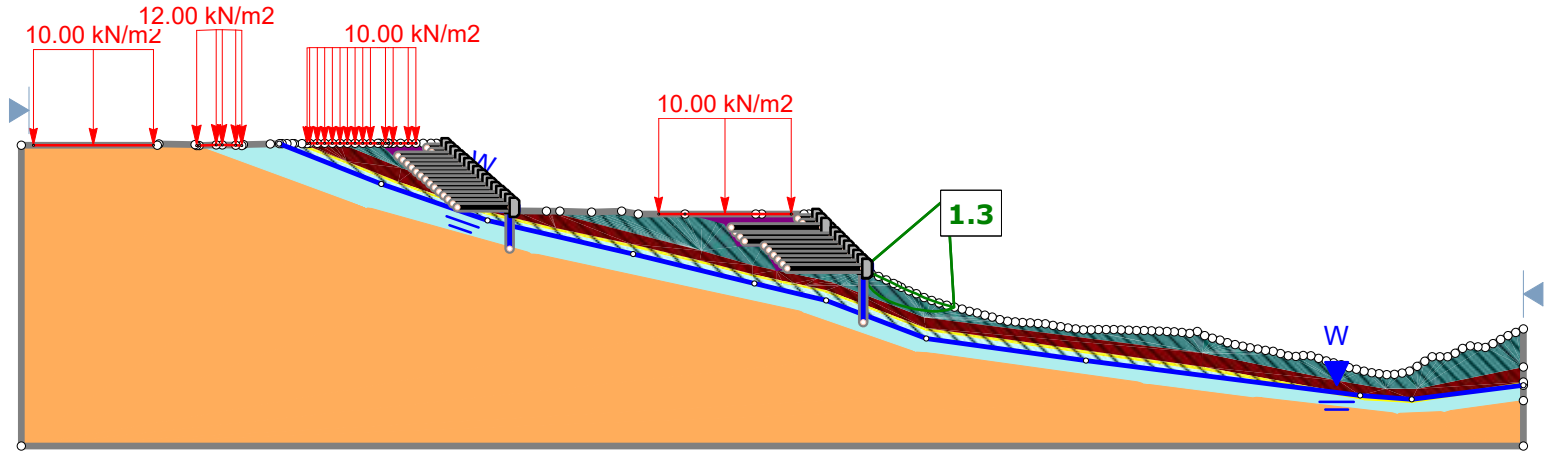
SLIDEINTERPRET 9.038

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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	600	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle &	5	21	Linear				Parallel to Reinforcement	Slope Face	100	23	Constant	23

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	
Stiff ECBF		18	Mohr-Coulomb	5	28	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	
Medium Dense Sand		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44

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



150
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22980 23000 23020 23040 23060 23080 23100 23120 23140 23160 23180 23200 23220

RILEY

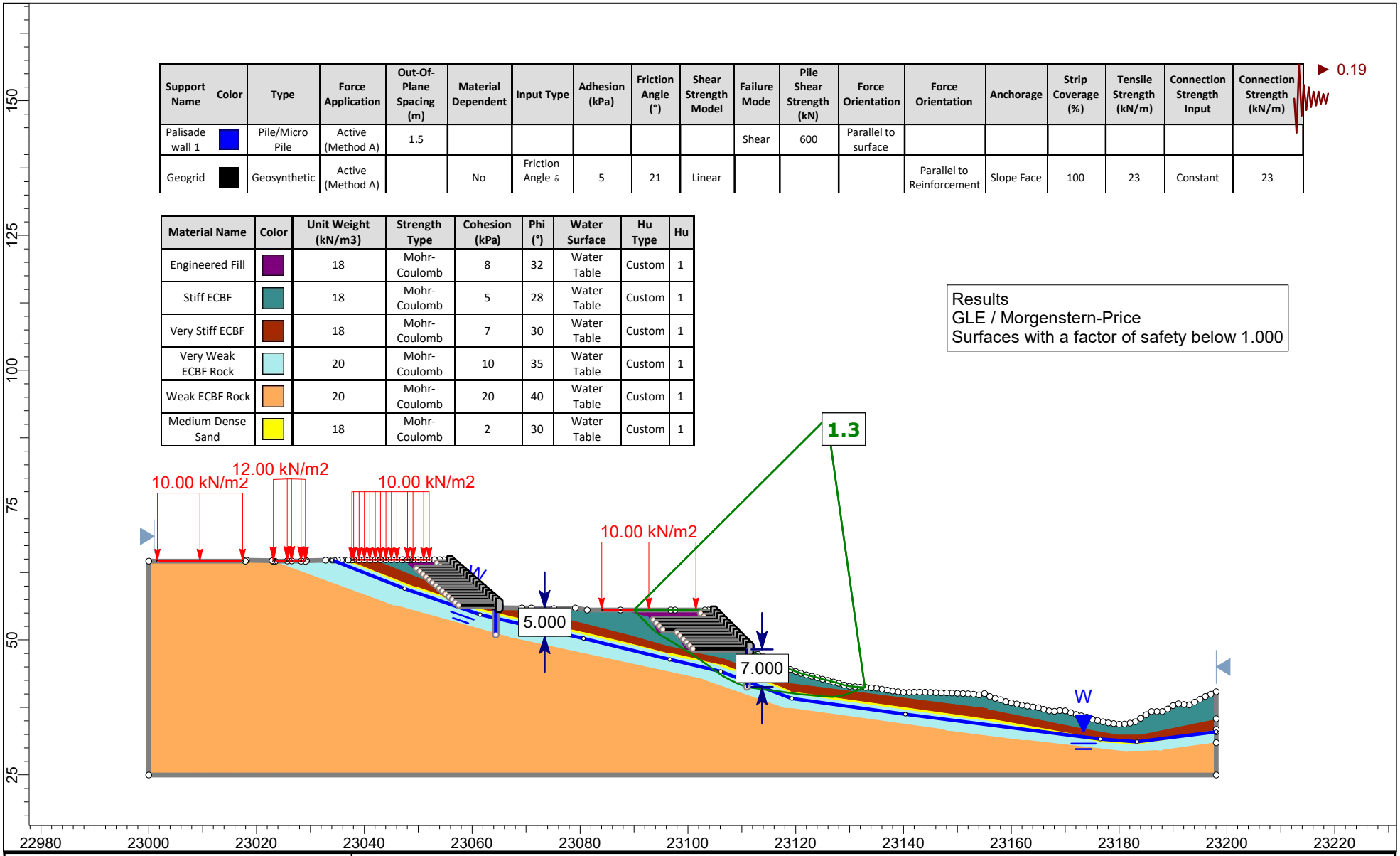
SLIDEINTERPRET 9.038

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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	600	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle &	5	21	Linear				Parallel to Reinforcement	Slope Face	100	23	Constant	23

Material Name	Color	Unit Weight (kN/m3)	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 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
Medium Dense Sand		18	Mohr-Coulomb	2	30	Water Table	Custom	1

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



RILEY

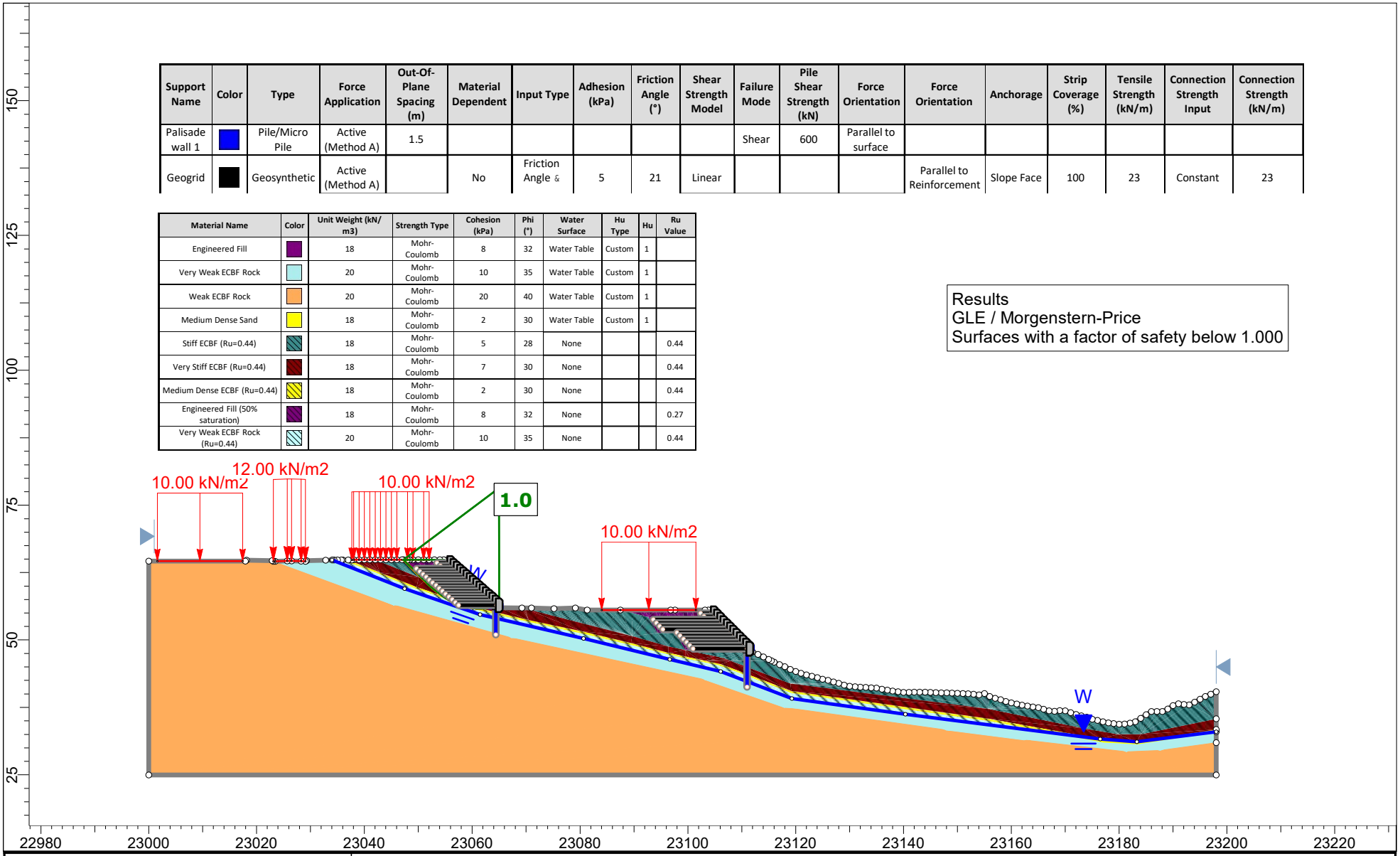
SLIDEINTERPRET 9.038

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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	600	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle &	5	21	Linear				Parallel to Reinforcement	Slope Face	100	23	Constant	23

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	
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	
Medium Dense Sand		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Engineered Fill (50% saturation)		18	Mohr-Coulomb	8	32	None			0.27
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44

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



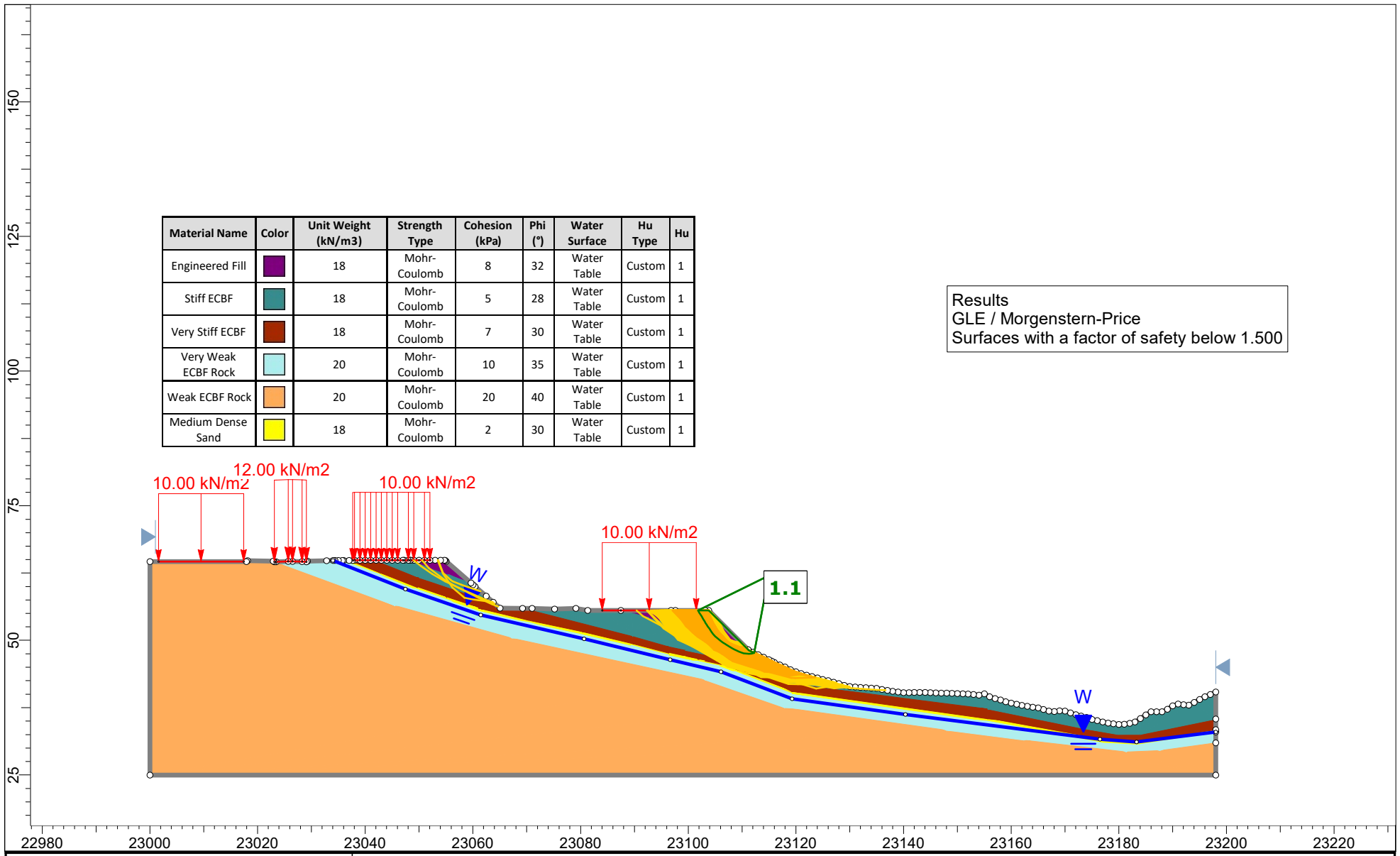
RILEY

SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section W - Proposed GL & Remedials	Scenario	Extreme (50% fill saturation)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section W.slmd

Material Name	Color	Unit Weight (kN/m3)	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 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
Medium Dense Sand		18	Mohr-Coulomb	2	30	Water Table	Custom	1

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



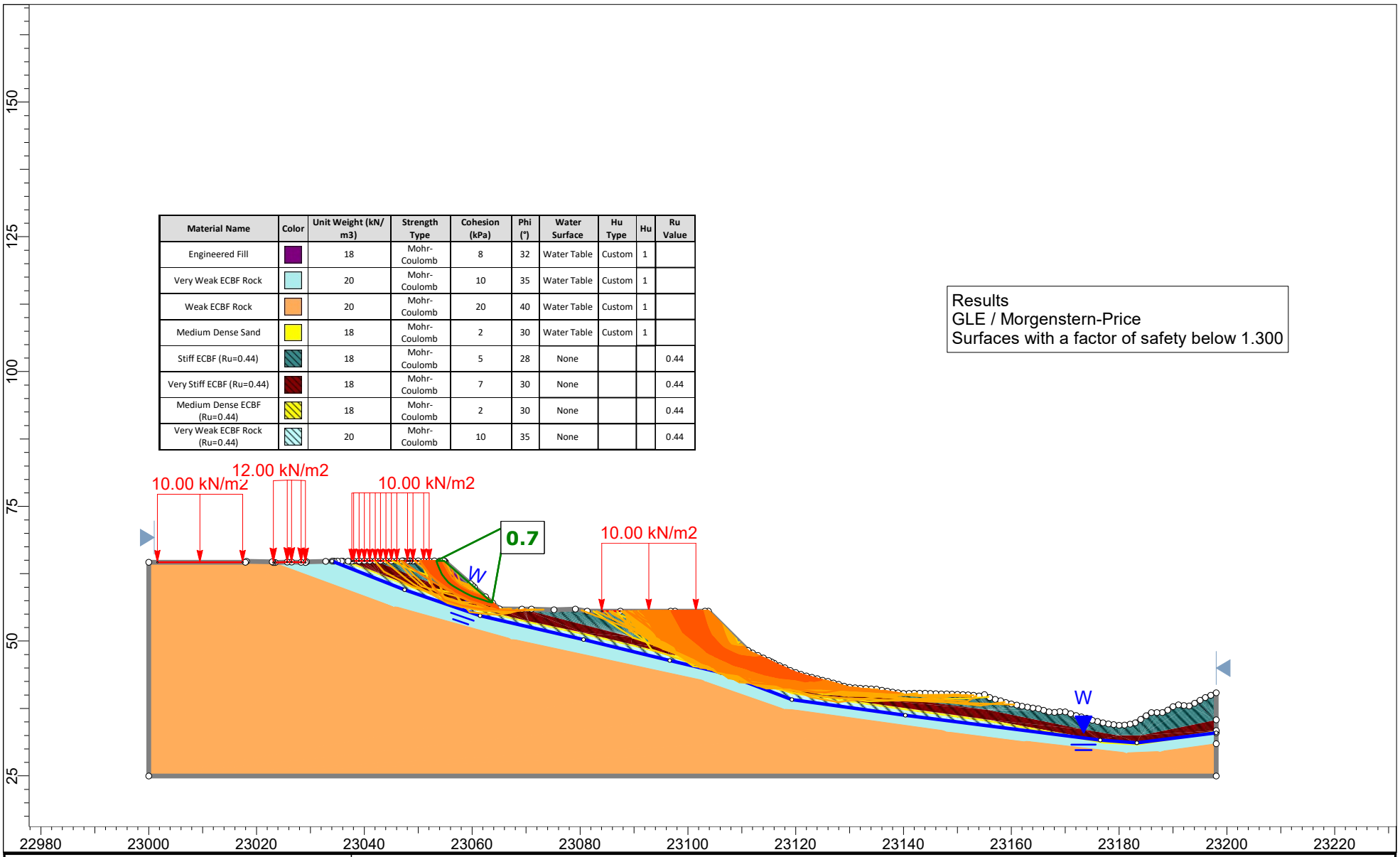
RILEY

SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section W - Proposed GL	*Scenario*	Normal (Measured GW)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section W.slmd

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	
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	
Medium Dense Sand		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44

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

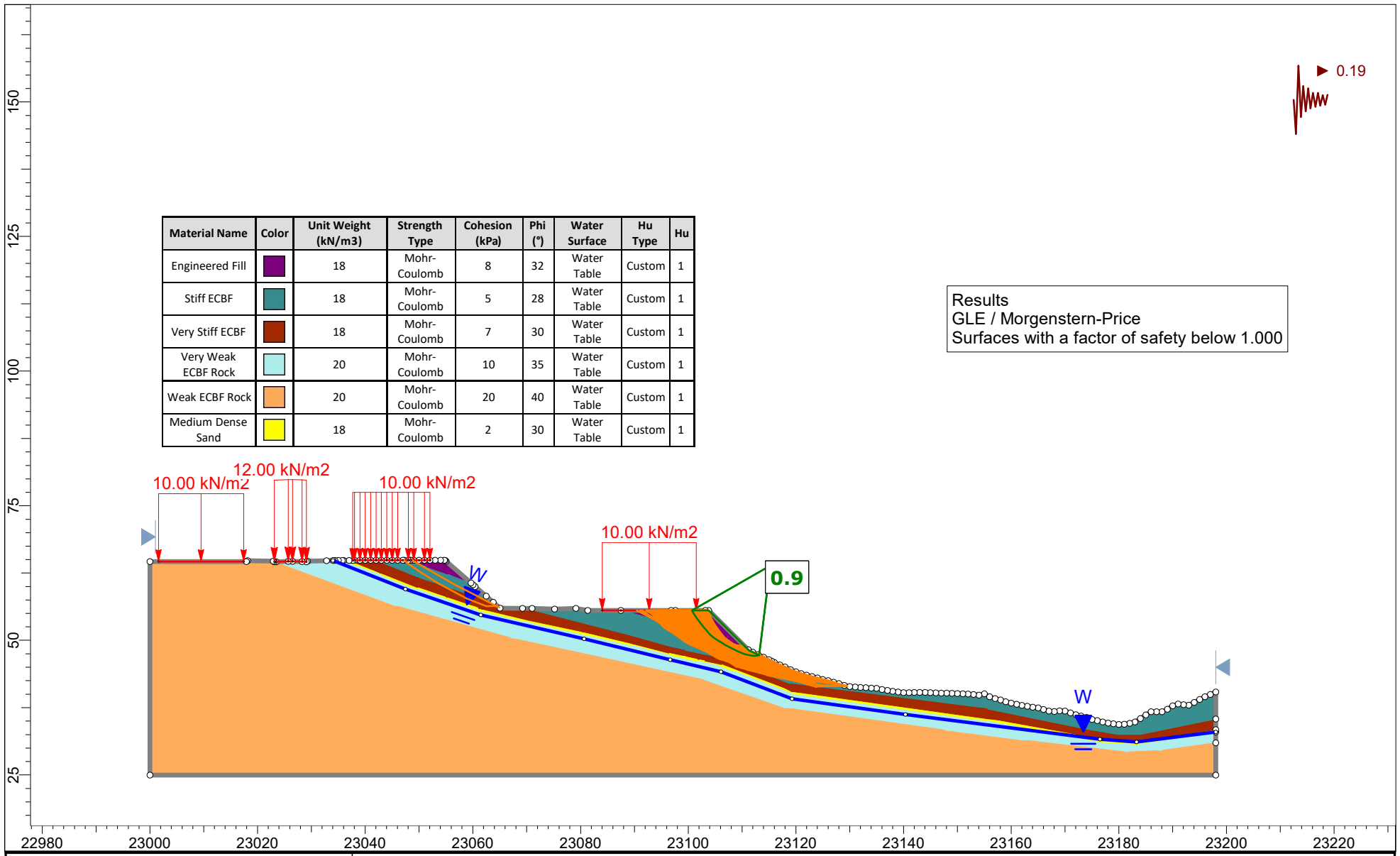


RILEY

SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section W - Proposed GL	*Scenario*	Extreme (Worst Case GW)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section W.slmd

Material Name	Color	Unit Weight (kN/m3)	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 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
Medium Dense Sand		18	Mohr-Coulomb	2	30	Water Table	Custom	1



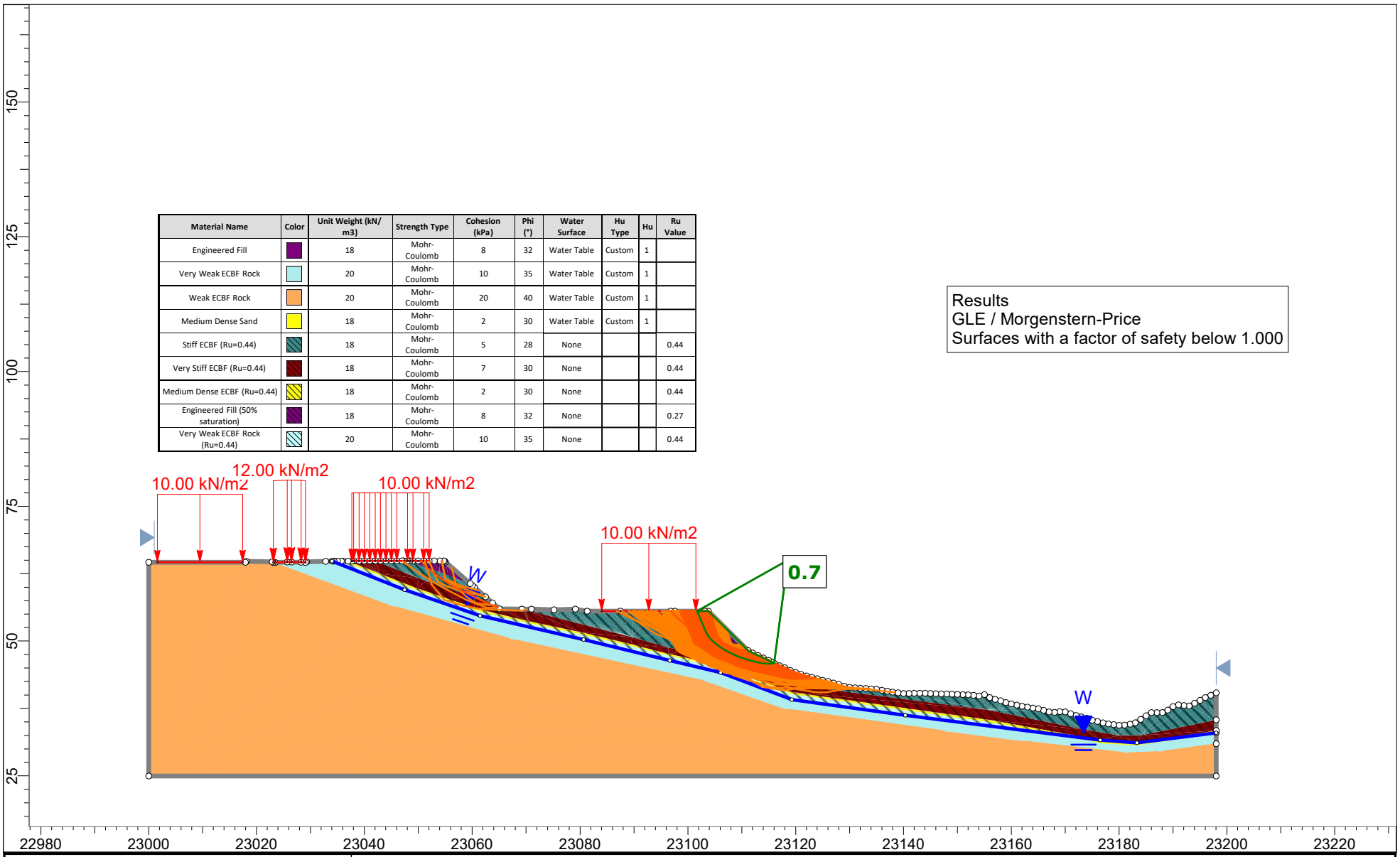
RILEY

SLIDEINTERPRET 9.038

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

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	
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	
Medium Dense Sand		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Engineered Fill (50% saturation)		18	Mohr-Coulomb	8	32	None			0.27
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44

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



RILEY

SLIDEINTERPRET 9.038

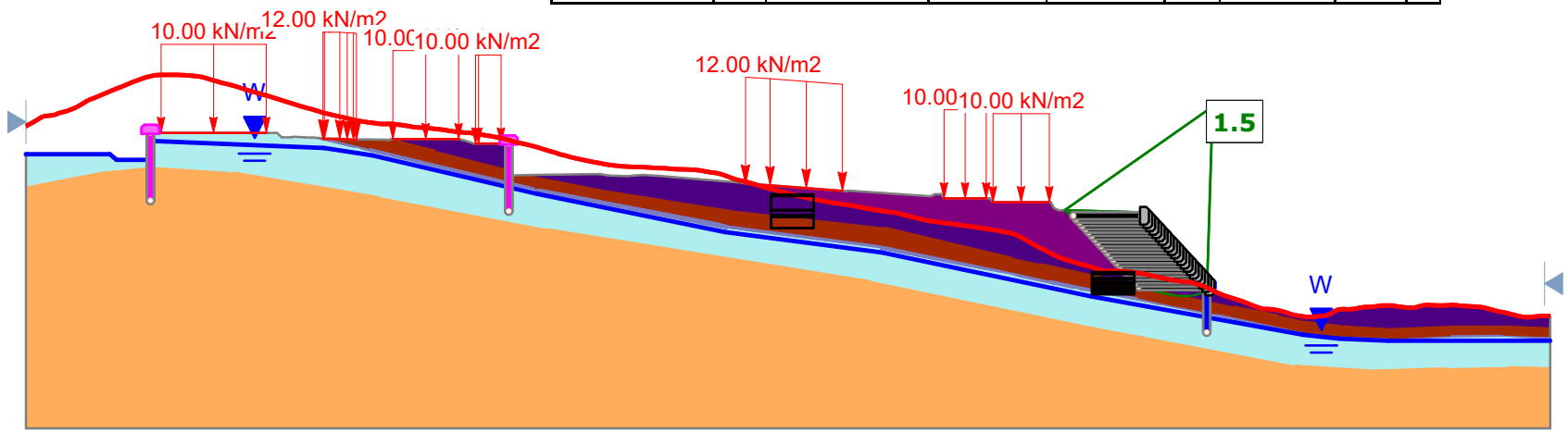
Project	240065 - Russell Road, Waunui		
Group	Section W - Proposed GL	*Scenario*	Extreme (50% fill saturation)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section W.slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	600	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	23	Constant	23
Retaining Wall		Pile/Micro Pile	Active (Method A)	1.5						Shear	120	Parallel to surface						

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
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

Existing ground profile

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



150
100
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0

24000 24025 24050 24075 24100 24125 24150 24175 24200 24225 24250 24275

RILEY

SLIDEINTERPRET 9.038

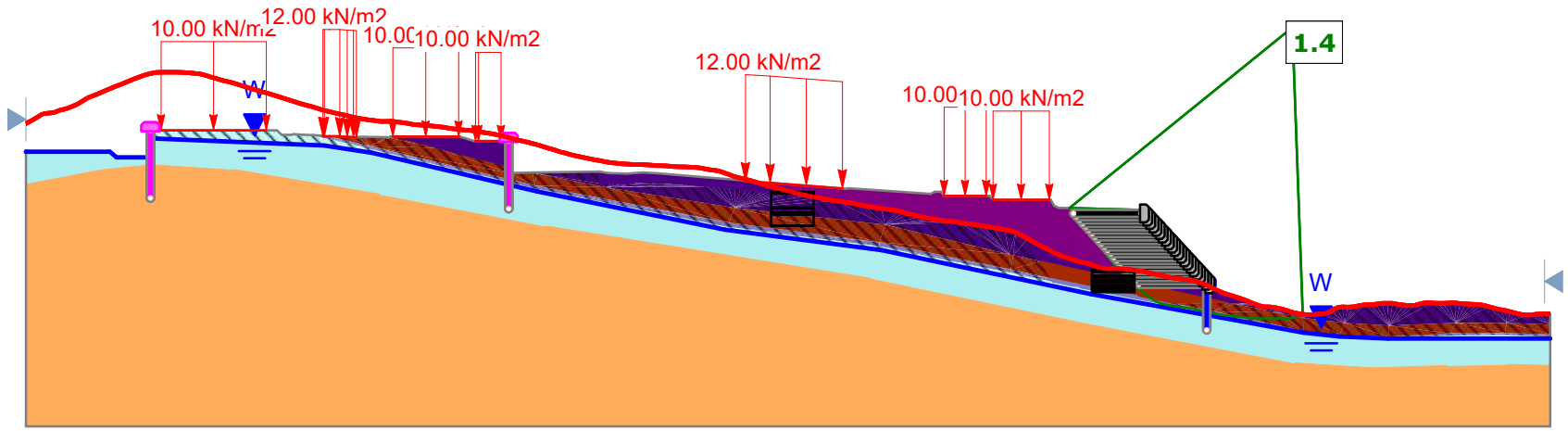
Project	240065 - Russell Road, Waunui		
Group	Section X - Proposed GL & remedials	*Scenario*	Normal (Measured GW)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section X.slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	600	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	23	Constant	23
Retaining Wall		Pile/Micro Pile	Active (Method A)	1.5						Shear	120	Parallel to surface						

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	
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Medium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF (Ru=0.44)		20	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	
Very Weak ECBF Rock (Ru = 0.44)		20	Mohr-Coulomb	10	35	None			0.44

Existing ground profile

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



150
100
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0

24000 24025 24050 24075 24100 24125 24150 24175 24200 24225 24250 24275

RILEY

SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section X - Proposed GL & remedials	*Scenario*	Extreme (Worst Credible GW)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section X.slmd

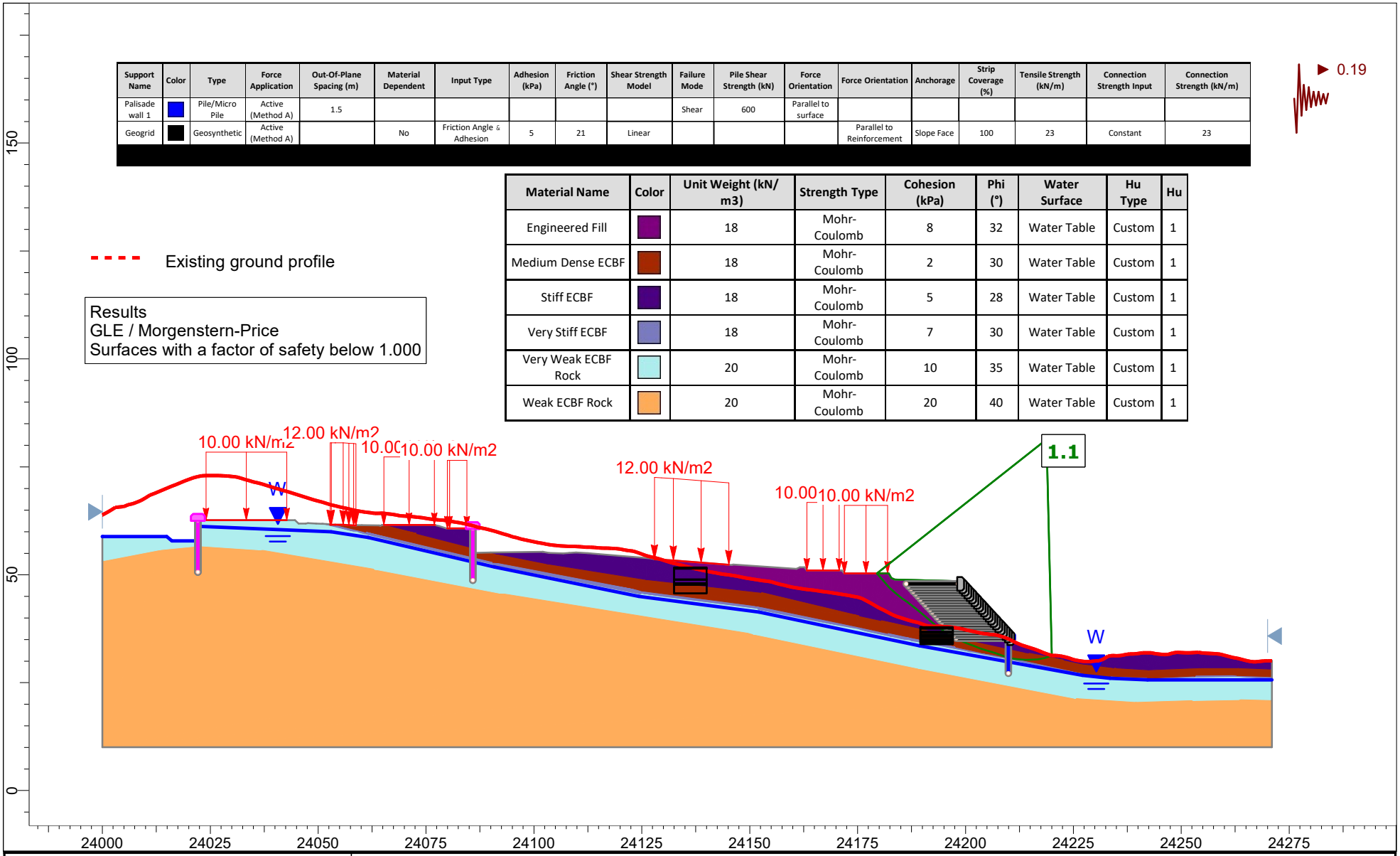
Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	600	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	23	Constant	23

▶ 0.19

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
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

Existing ground profile

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



RILEY

SLIDEINTERPRET 9.038

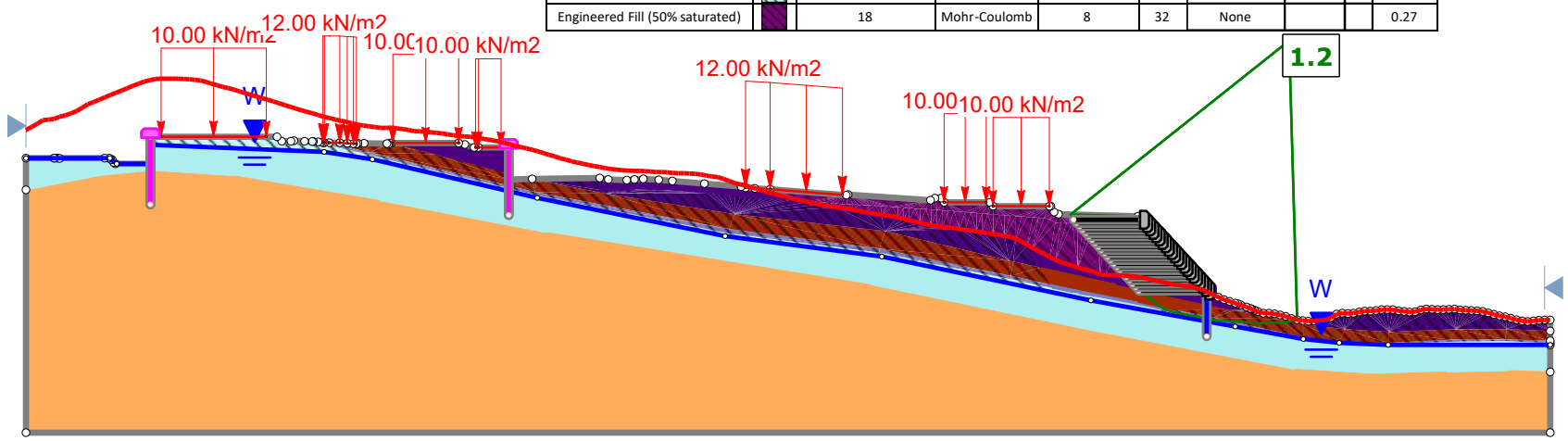
Project	240065 - Russell Road, Waunui		
Group	Section X - Proposed GL & remedials	Scenario	Seismic (0.19g)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section X.slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	600	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	23	Constant	23
Retaining Wall		Pile/Micro Pile	Active (Method A)	1.5						Shear	120	Parallel to surface						

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	
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Medium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Stiff ECBF (Ru=0.44)		20	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	
Very Weak ECBF Rock (Ru = 0.44)		20	Mohr-Coulomb	10	35	None			0.44
Engineered Fill (50% saturated)		18	Mohr-Coulomb	8	32	None			0.27

Existing ground profile

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



150
100
50
0

24000 24025 24050 24075 24100 24125 24150 24175 24200 24225 24250 24275

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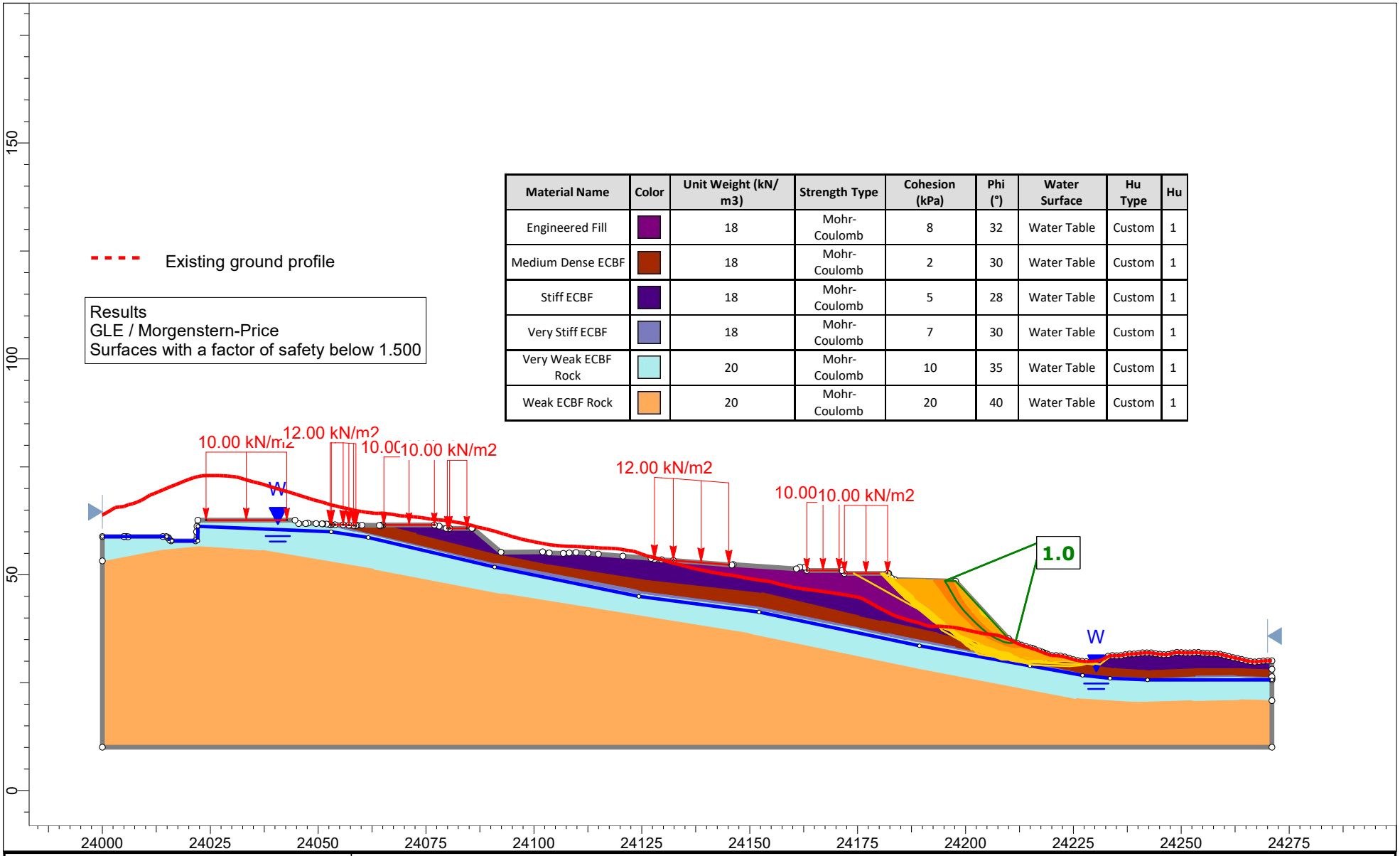
SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section X - Proposed GL & remedials	*Scenario*	Extreme (50% fill saturation)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section X.slmd

Existing ground profile

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

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
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



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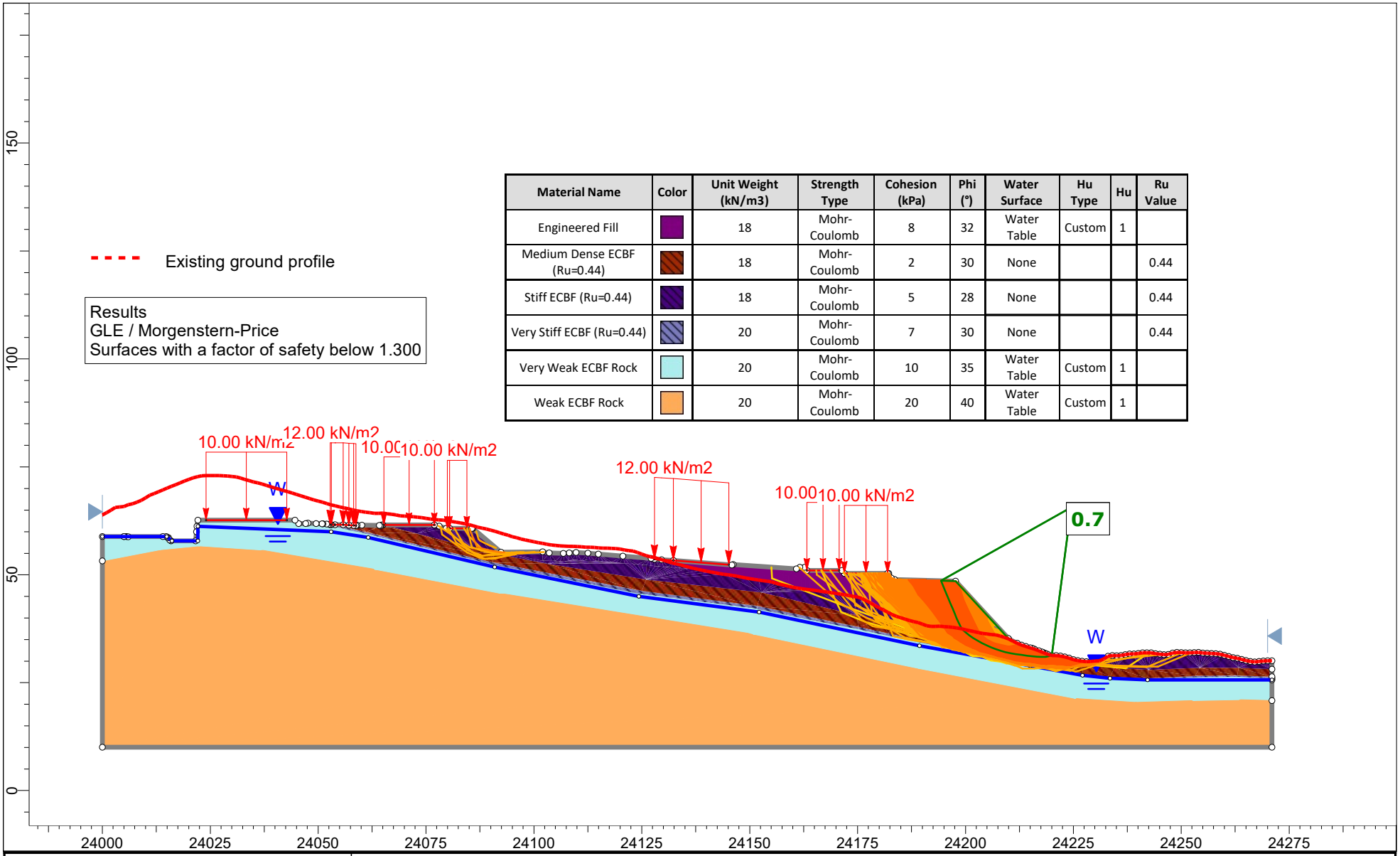
SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section X - Proposed GL	Scenario	Normal (Measured GW)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section X.slmd

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	
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	

Existing ground profile

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



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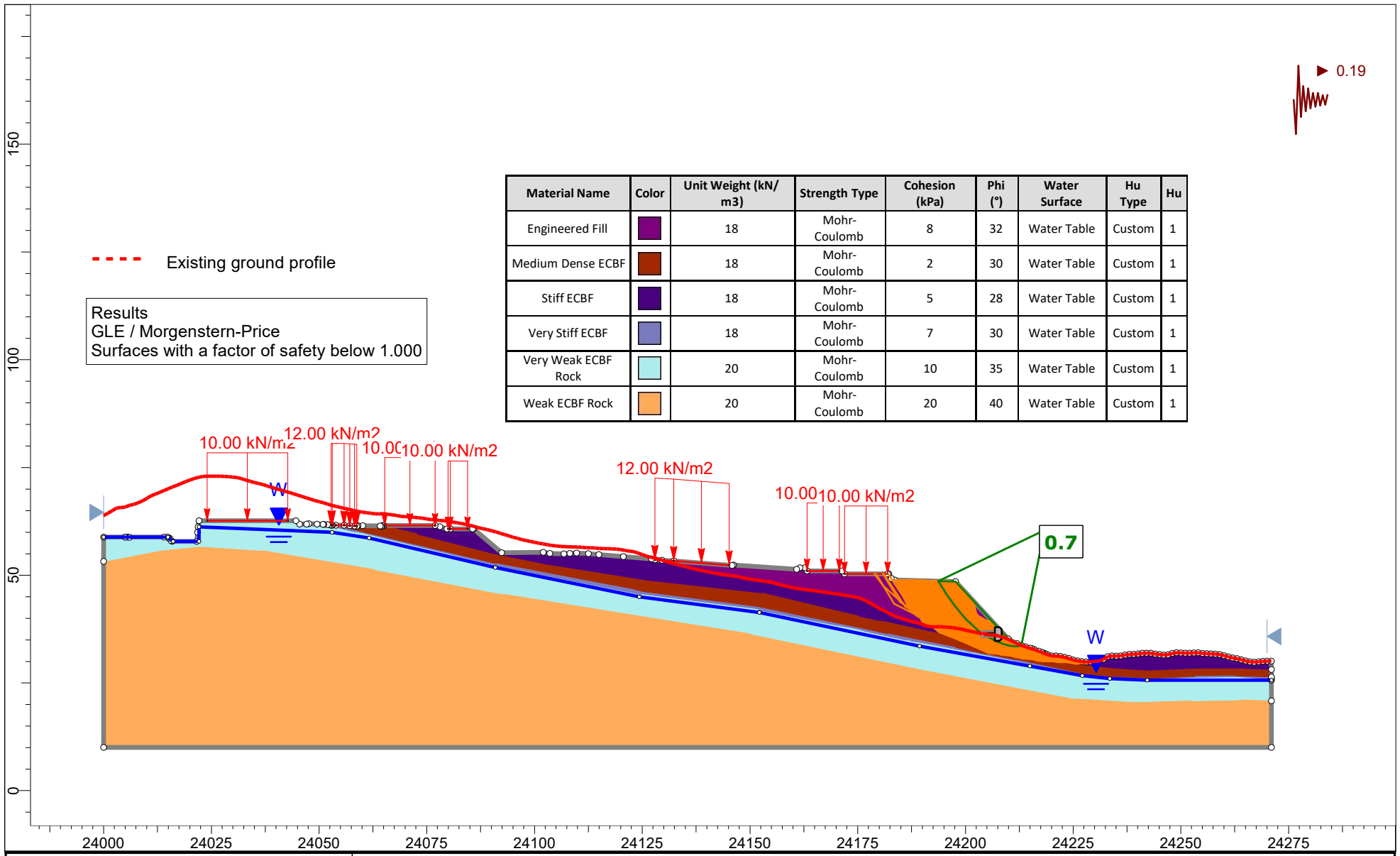
SLIDEINTERPRET 9.038

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



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
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

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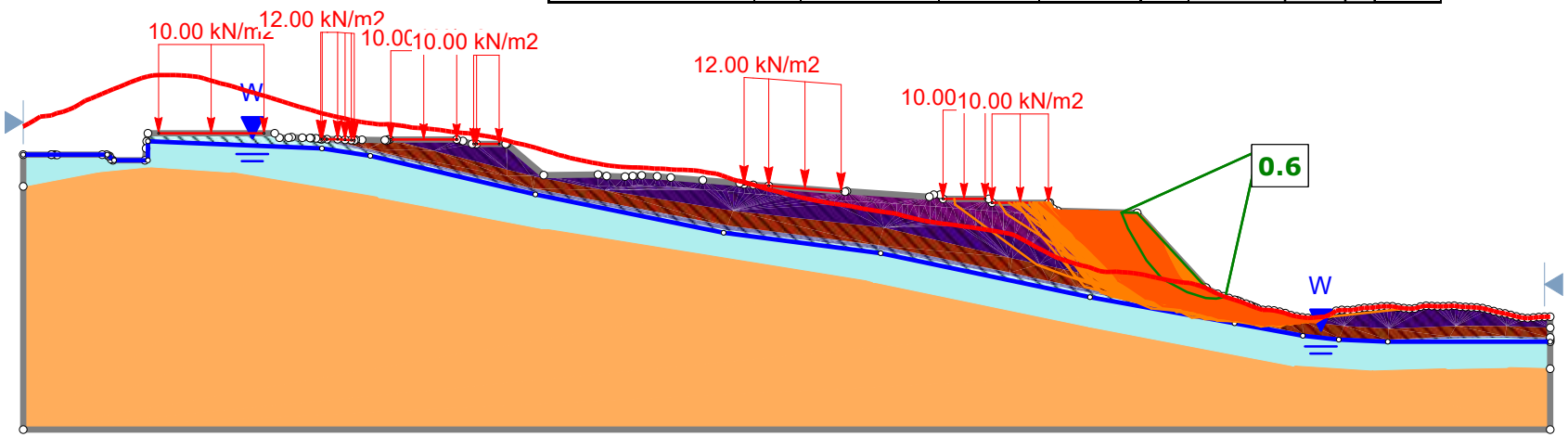
SLIDEINTERPRET 9.038

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

Existing ground profile

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

Material Name	Color	Unit Weight (kN/m3)	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	
Very Weak ECBF Rock (Ru = 0.44)		20	Mohr-Coulomb	10	35	None			0.44
Engineered Fill (50% saturated)		18	Mohr-Coulomb	8	32	None			0.27



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SLIDEINTERPRET 9.038

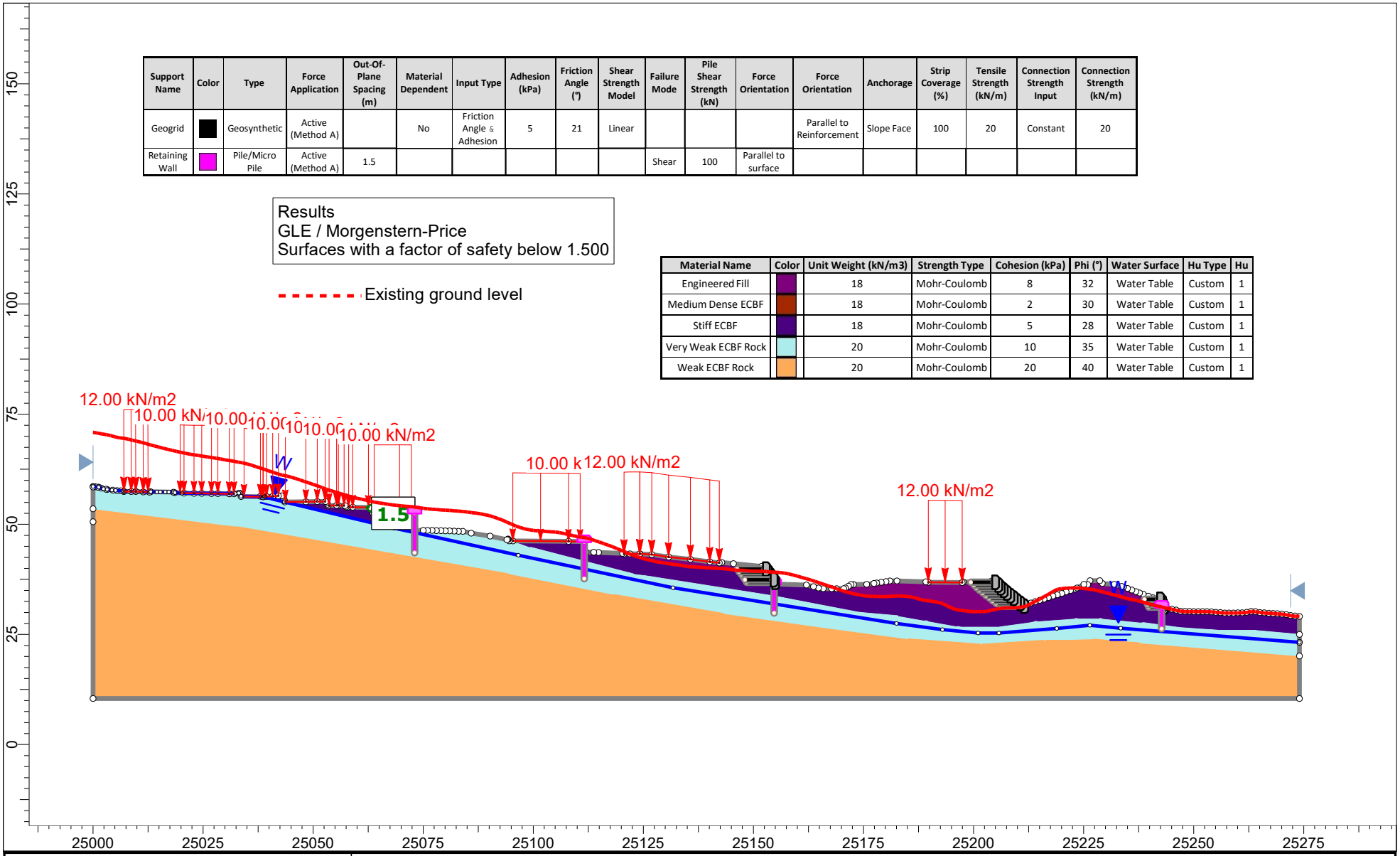
Project	240065 - Russell Road, Waunui		
Group	Section X - Proposed GL	Scenario	Extreme (50% fill saturation)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section X.slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Retaining Wall		Pile/Micro Pile	Active (Method A)	1.5						Shear	100	Parallel to surface						

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

Existing ground level

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Medium Dense ECBF		18	Mohr-Coulomb	2	30	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
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1



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SLIDEINTERPRET 9.038

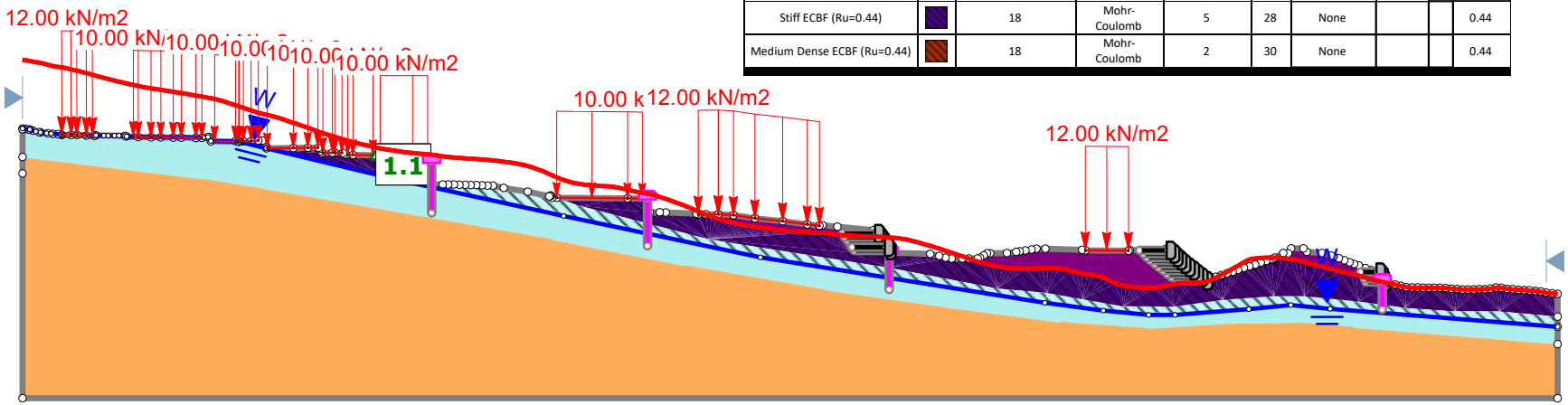
Project	240065 - Russell Road, Waunui		
Group	Section Y - Proposed GL & Remedials	*Scenario*	Normal (Measured GW)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section Y.slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Retaining Wall		Pile/Micro Pile	Active (Method A)	1.5						Shear	100	Parallel to surface						

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

Existing ground level

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	
Stiff ECBF		18	Mohr-Coulomb	5	28	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	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44



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SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section Y - Proposed GL & Remedials	*Scenario*	Extreme (Worst Case GW)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section Y.slmd

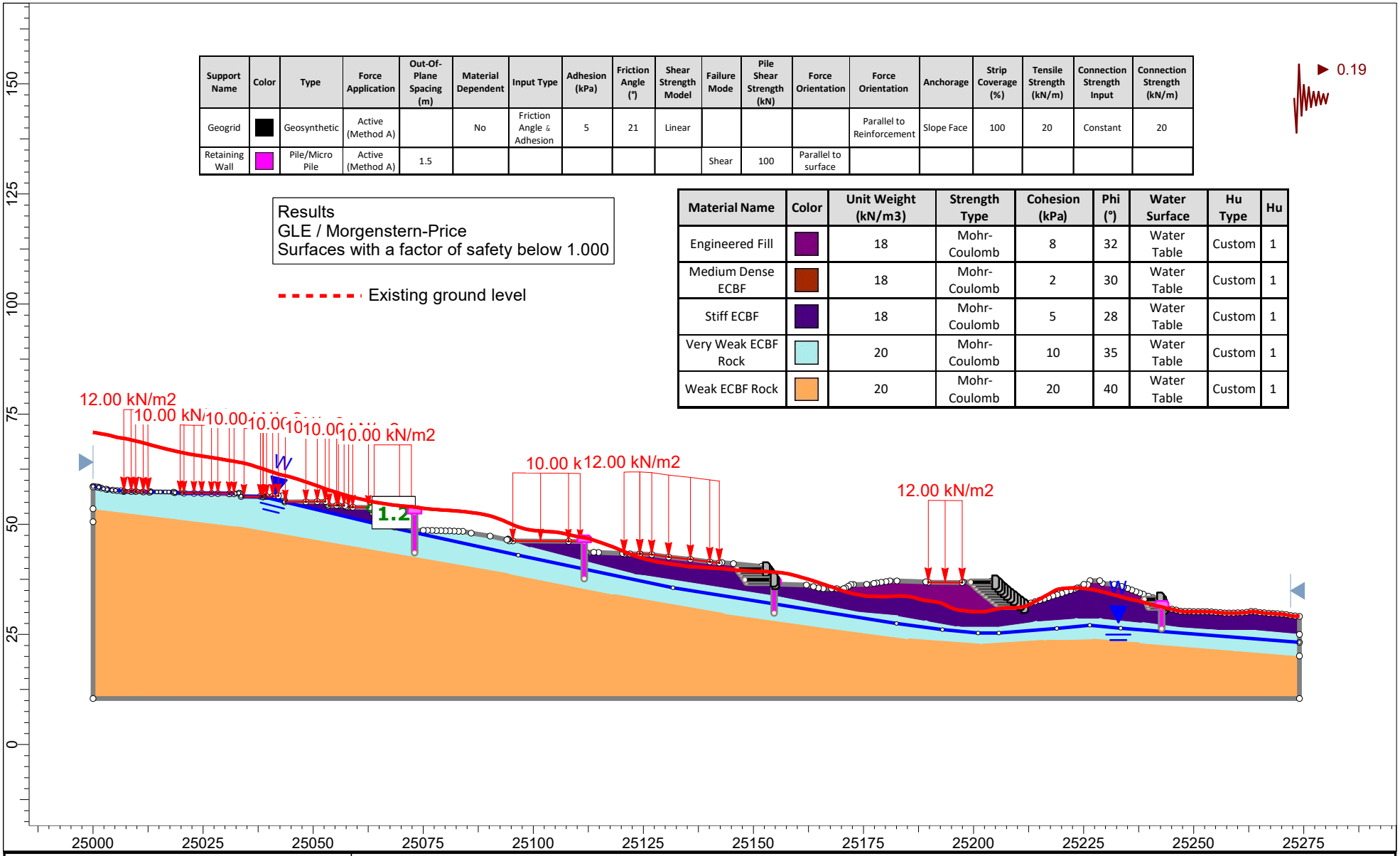
Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Material Dependent	Input Type	Adhesion (kPa)	Friction Angle (°)	Shear Strength Model	Failure Mode	Pile Shear Strength (kN)	Force Orientation	Force Orientation	Anchorage	Strip Coverage (%)	Tensile Strength (kN/m)	Connection Strength Input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

▶ 0.19

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

Existing ground level

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Medium Dense ECBF		18	Mohr-Coulomb	2	30	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
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1



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SLIDEINTERPRET 9.038

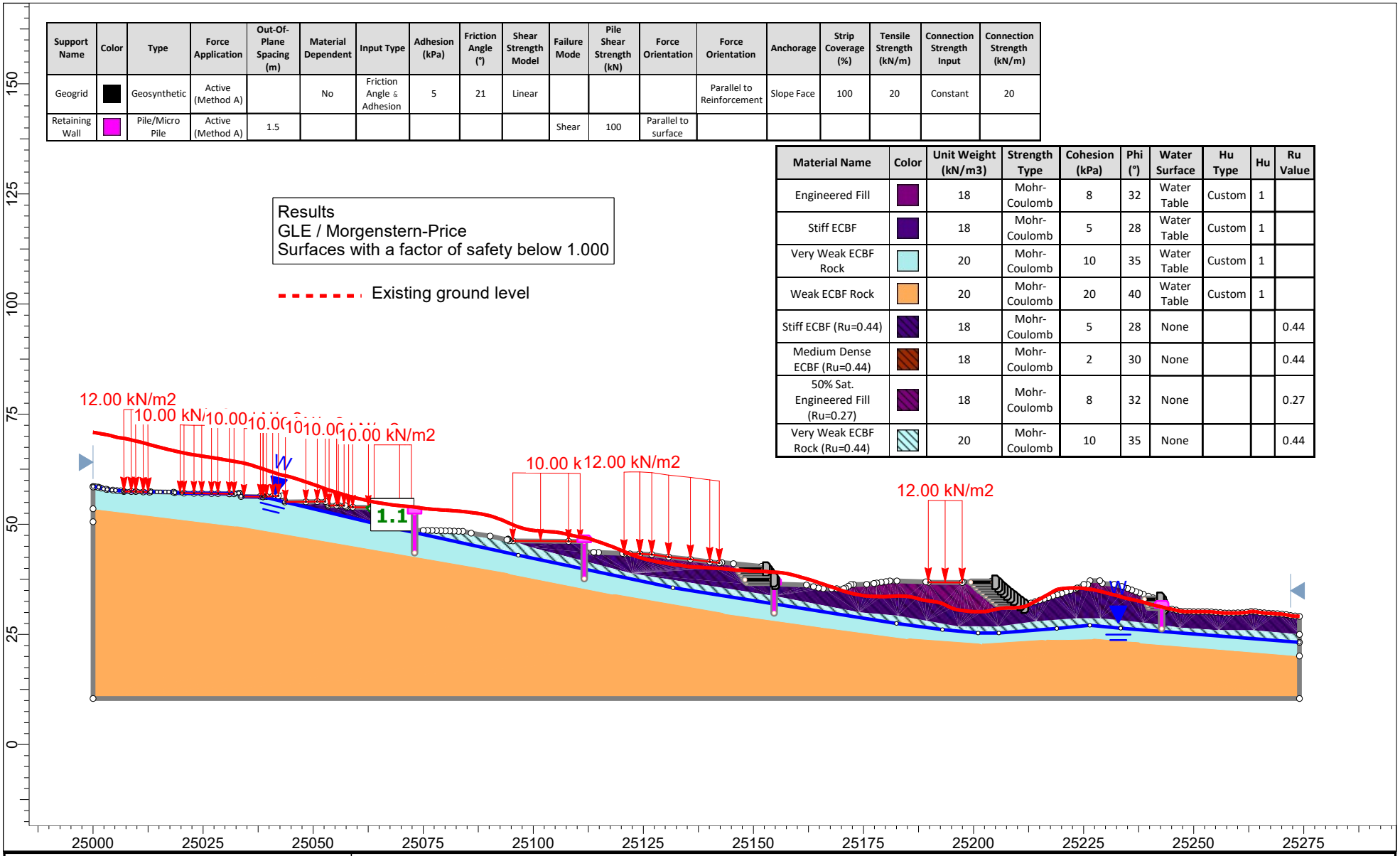
Project	240065 - Russell Road, Waunui		
Group	Section Y - Proposed GL & Remedials	*Scenario*	Seismic (0.19g)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section Y.slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Retaining Wall		Pile/Micro Pile	Active (Method A)	1.5						Shear	100	Parallel to surface						

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	
Stiff ECBF		18	Mohr-Coulomb	5	28	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	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
50% Sat. Engineered Fill (Ru=0.27)		18	Mohr-Coulomb	8	32	None			0.27
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44

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

Existing ground level



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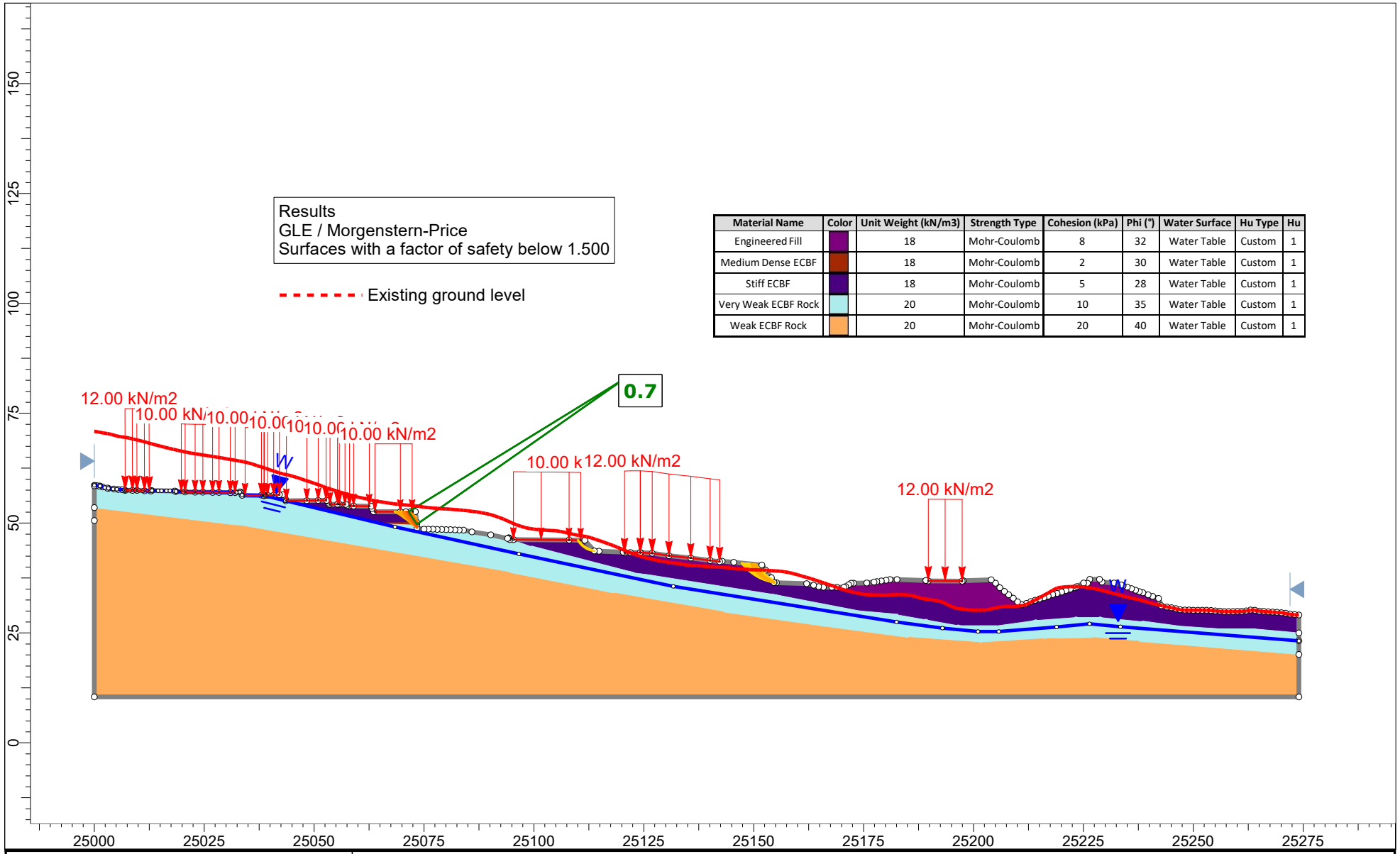
SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section Y - Proposed GL & Remedials	Scenario	Extreme (50% Fill Saturation)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section Y.slmd

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

Existing ground level

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Medium Dense ECBF		18	Mohr-Coulomb	2	30	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
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1



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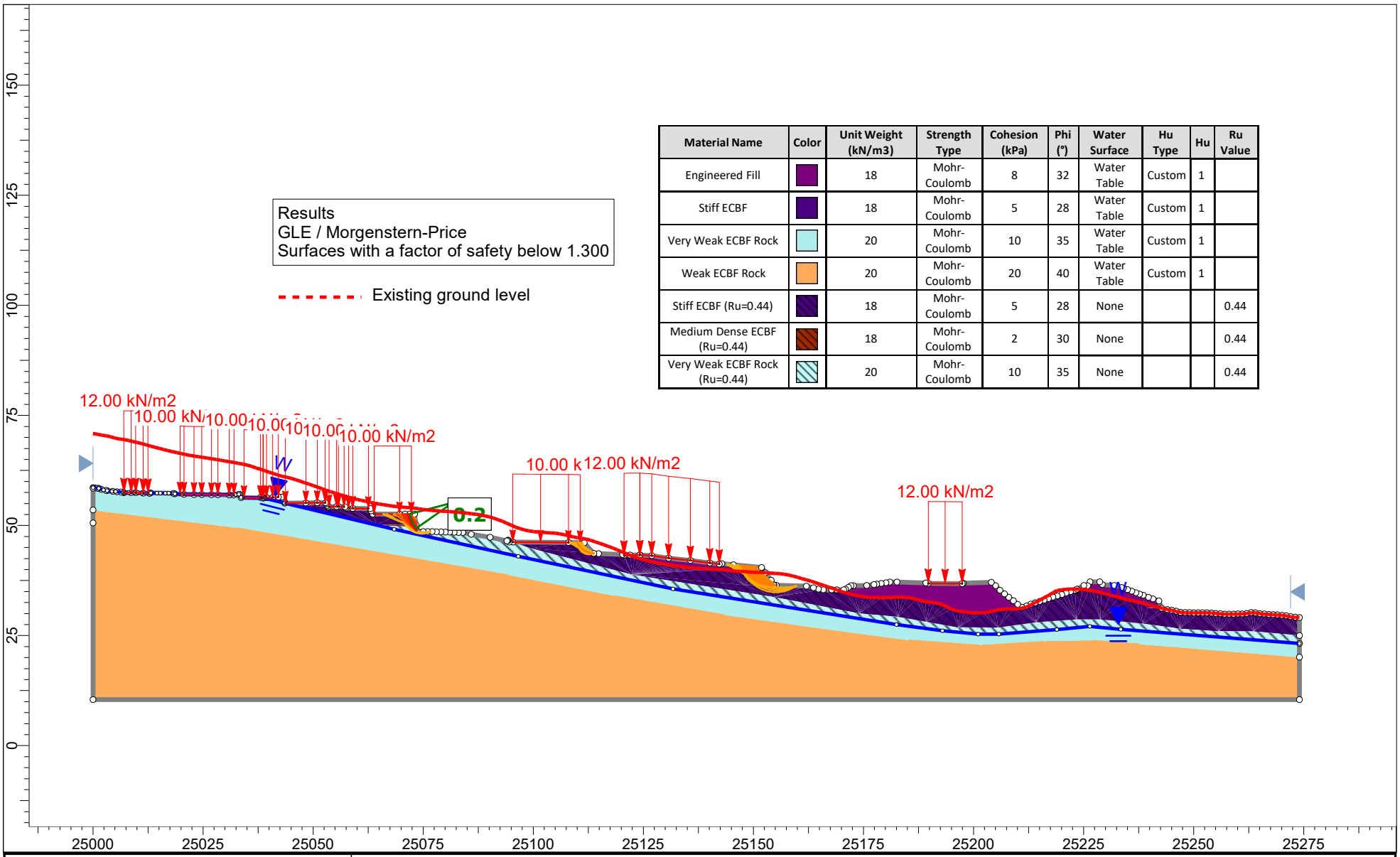
SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section Y - Proposed GL	*Scenario*	Normal (Measured GW)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section Y.slmd

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	
Stiff ECBF		18	Mohr-Coulomb	5	28	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	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44

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

Existing ground level



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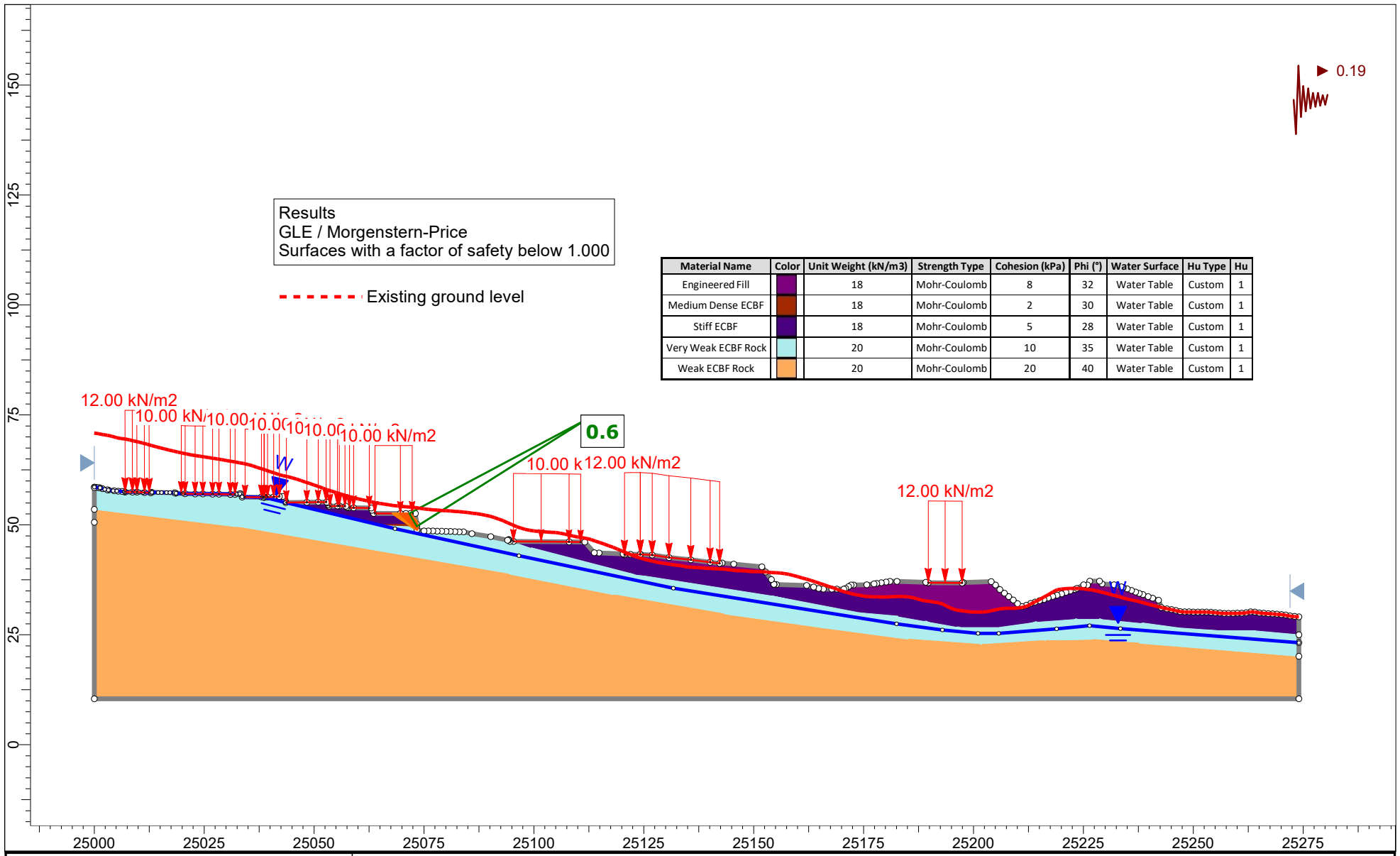
SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section Y - Proposed GL	*Scenario*	Extreme (Worst Case GW)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section Y.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Medium Dense ECBF		18	Mohr-Coulomb	2	30	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
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1

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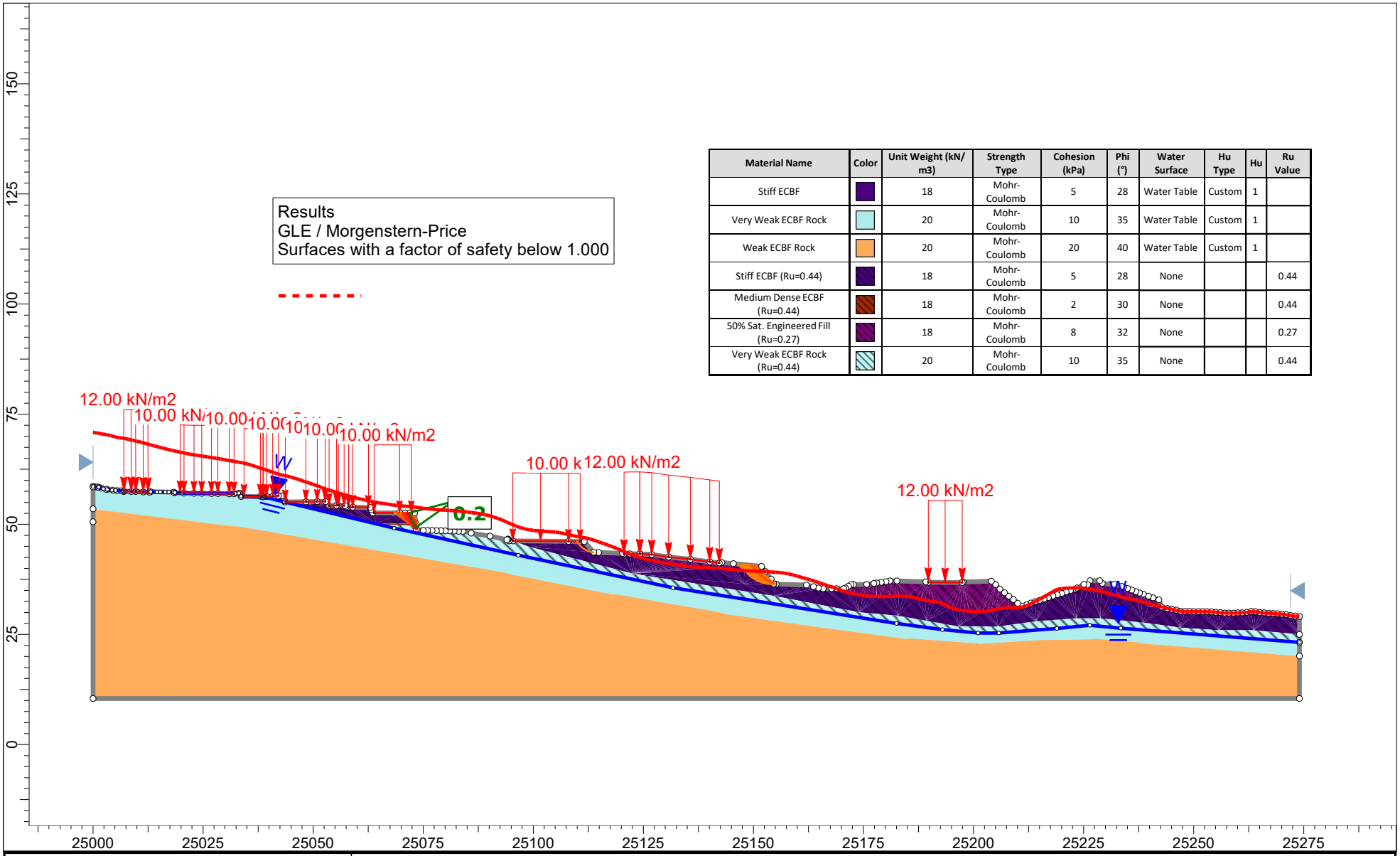
SLIDEINTERPRET 9.038

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

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

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Stiff ECBF		18	Mohr-Coulomb	5	28	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	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
50% Sat. Engineered Fill (Ru=0.27)		18	Mohr-Coulomb	8	32	None			0.27
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44



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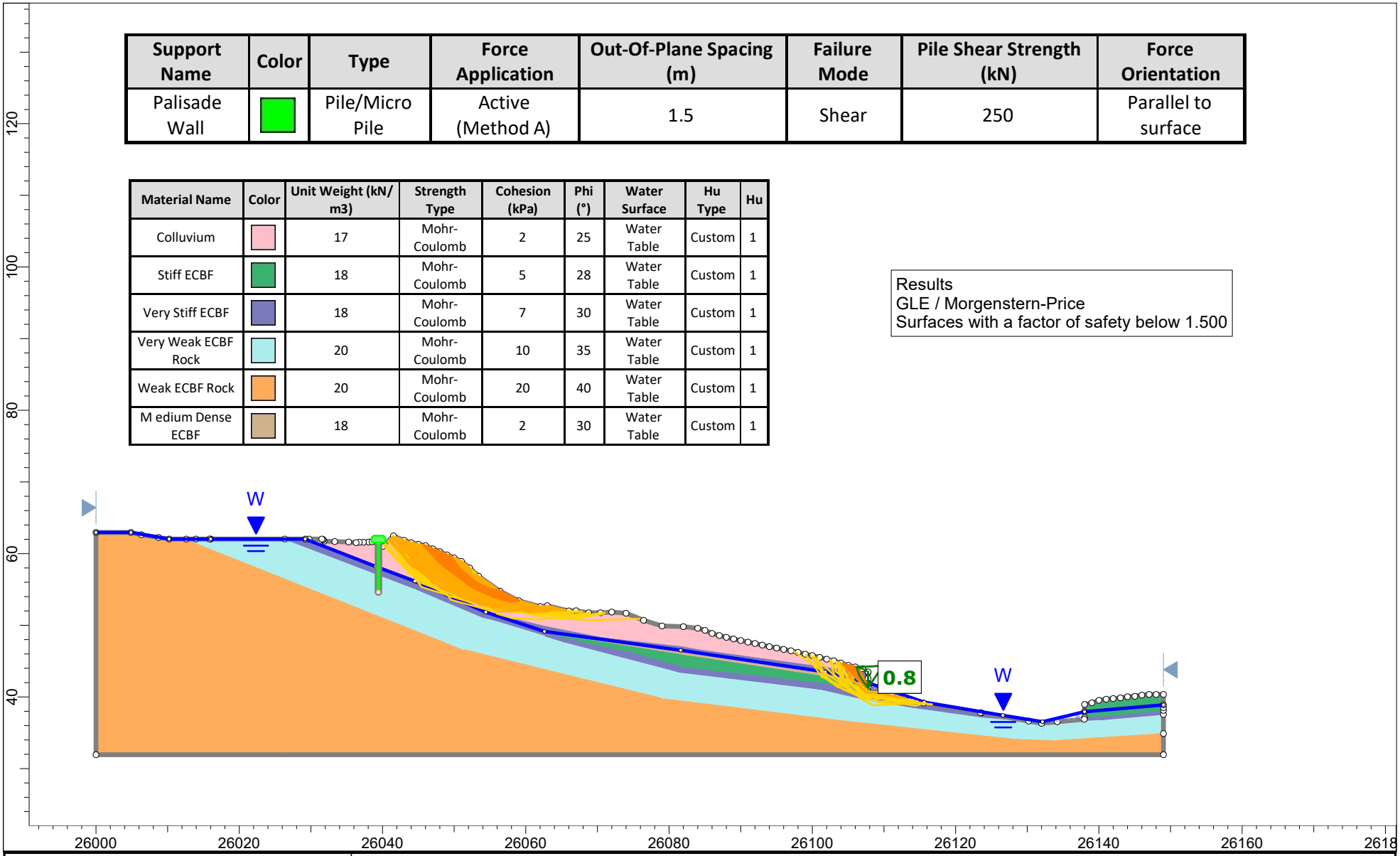
SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section Y - Proposed GL	*Scenario*	Extreme (50% Fill Saturation)
Drawn By	LKB	*Company*	Riley Consulants Ltd
Date	19/12/2025	*File Name*	Section Y.slmd

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Failure Mode	Pile Shear Strength (kN)	Force Orientation
Palisade Wall		Pile/Micro Pile	Active (Method A)	1.5	Shear	250	Parallel to surface

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Colluvium		17	Mohr-Coulomb	2	25	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
M edium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1

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



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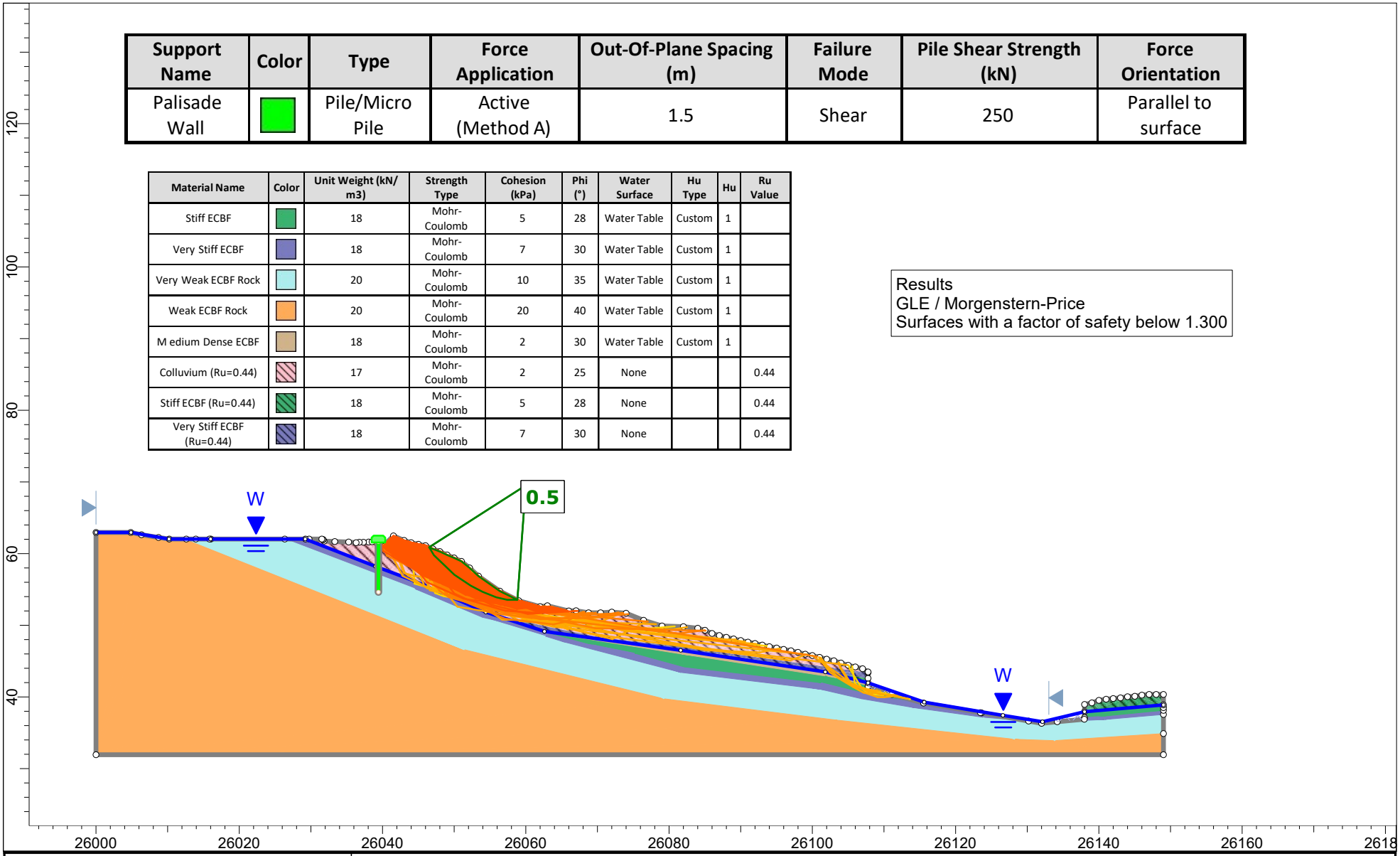
SLIDEINTERPRET 9.038

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

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Failure Mode	Pile Shear Strength (kN)	Force Orientation
Palisade Wall		Pile/Micro Pile	Active (Method A)	1.5	Shear	250	Parallel to surface

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
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	
M edium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44

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



RILEY

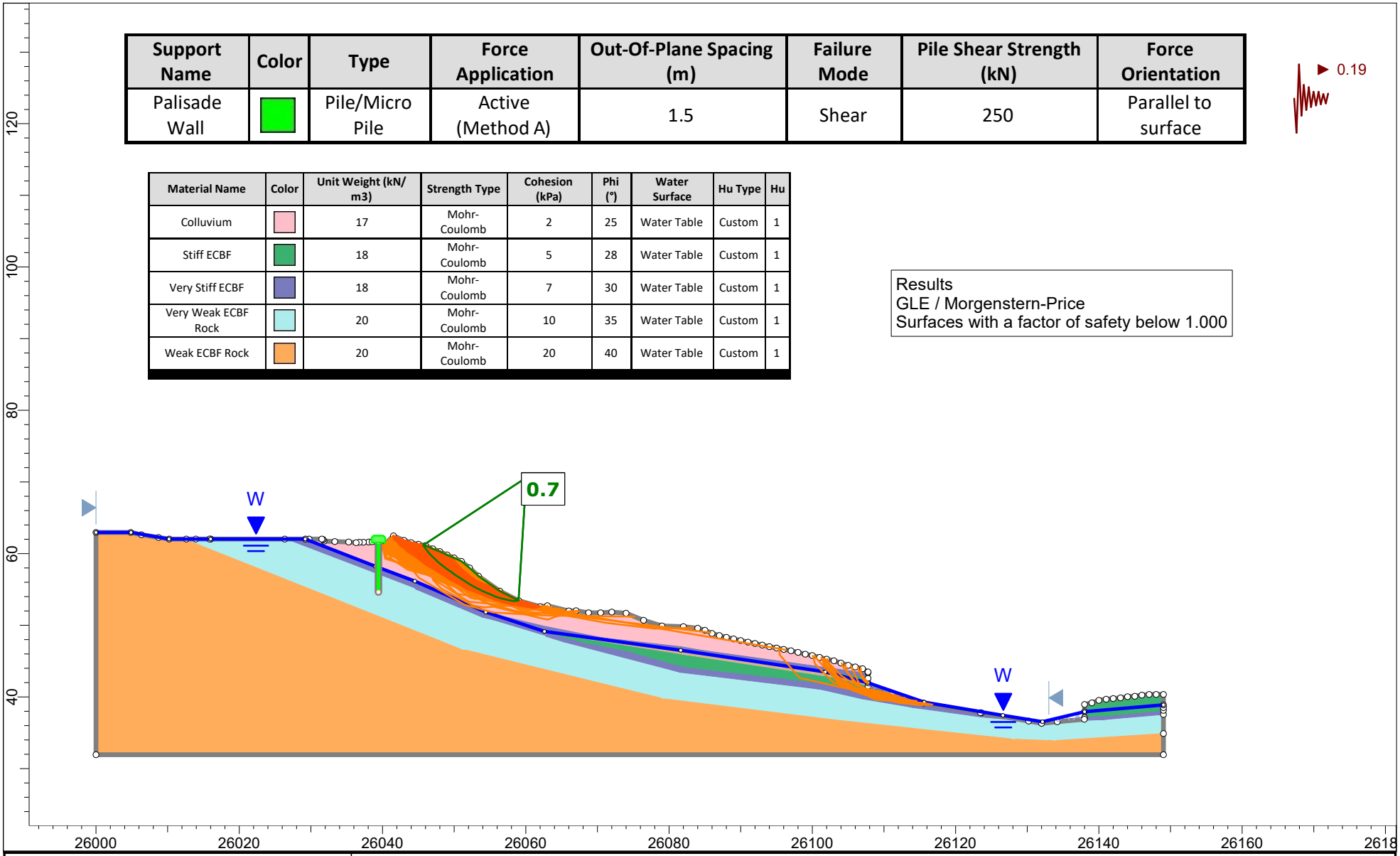
SLIDEINTERPRET 9.038

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

Support Name	Color	Type	Force Application	Out-Of-Plane Spacing (m)	Failure Mode	Pile Shear Strength (kN)	Force Orientation
Palisade Wall		Pile/Micro Pile	Active (Method A)	1.5	Shear	250	Parallel to surface

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Colluvium		17	Mohr-Coulomb	2	25	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

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



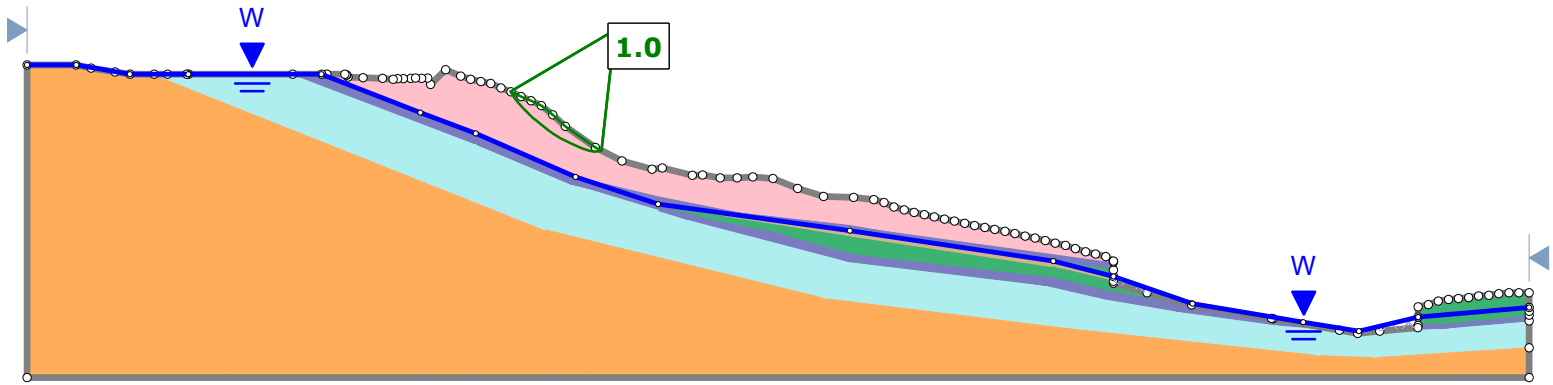
RILEY

SLIDEINTERPRET 9.038

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

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Colluvium		17	Mohr-Coulomb	2	25	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
M edium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1

Results
GLE / Morgenstern-Price
Every available surface



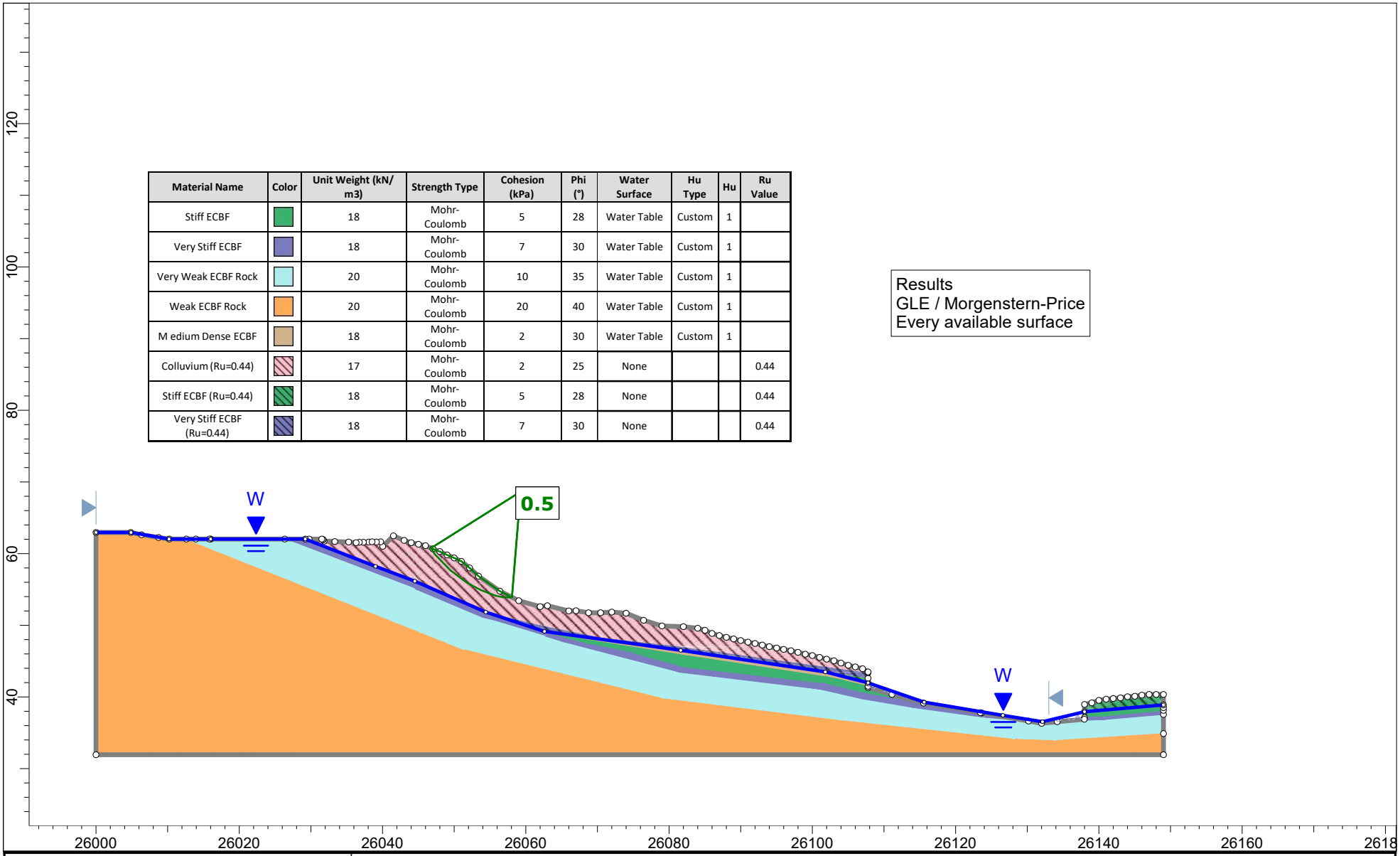
RILEY

SLIDEINTERPRET 9.038

Project	240065 - Russell Road, Waunui		
Group	Section Z - Proposed GL	Scenario	Normal (Measured GW)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section Z.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
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	
M edium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44

Results
GLE / Morgenstern-Price
Every available surface



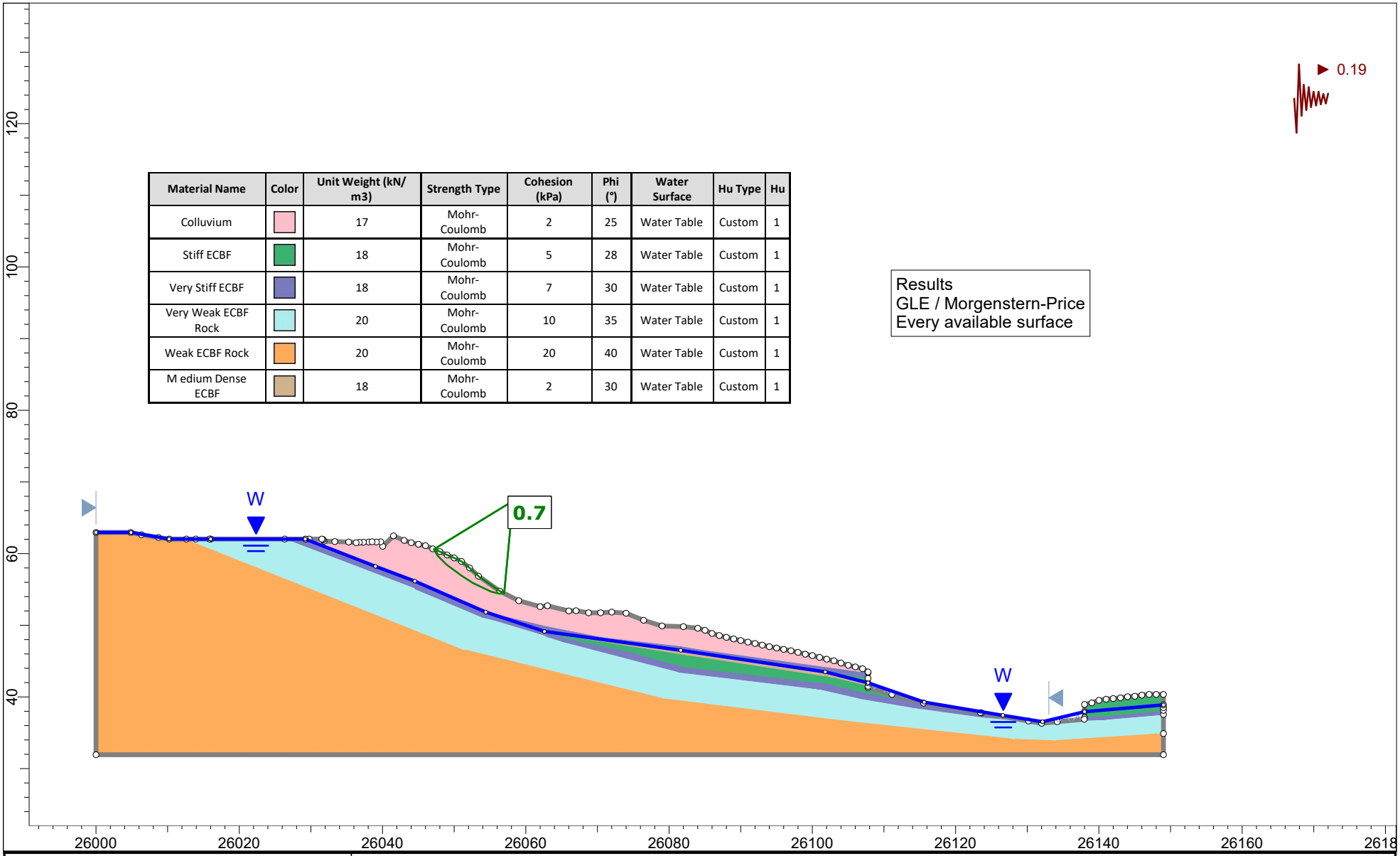
RILEY

SLIDEINTERPRET 9.038

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

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Colluvium		17	Mohr-Coulomb	2	25	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
M edium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1

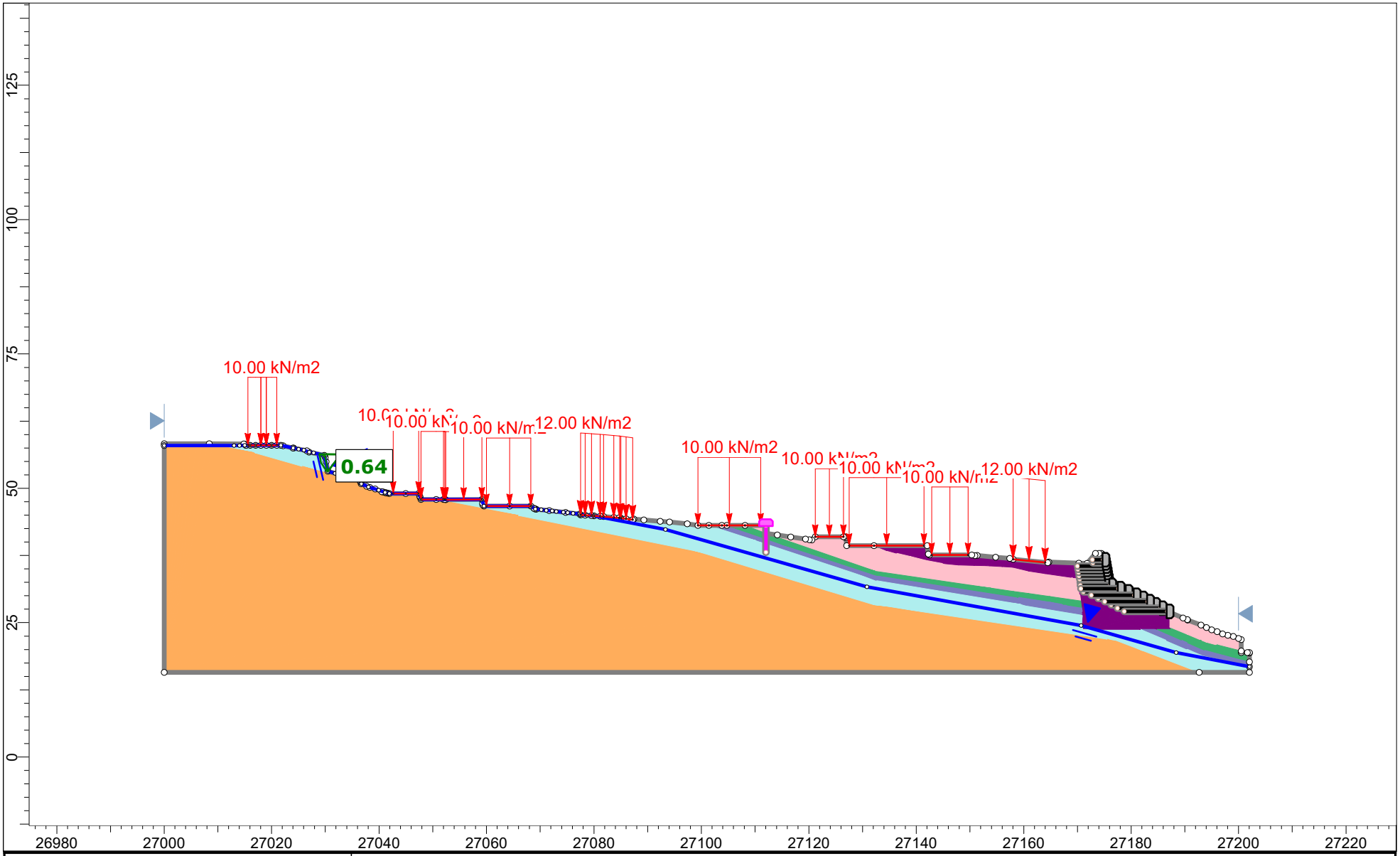
Results
GLE / Morgenstern-Price
Every available surface



RILEY

SLIDEINTERPRET 9.038

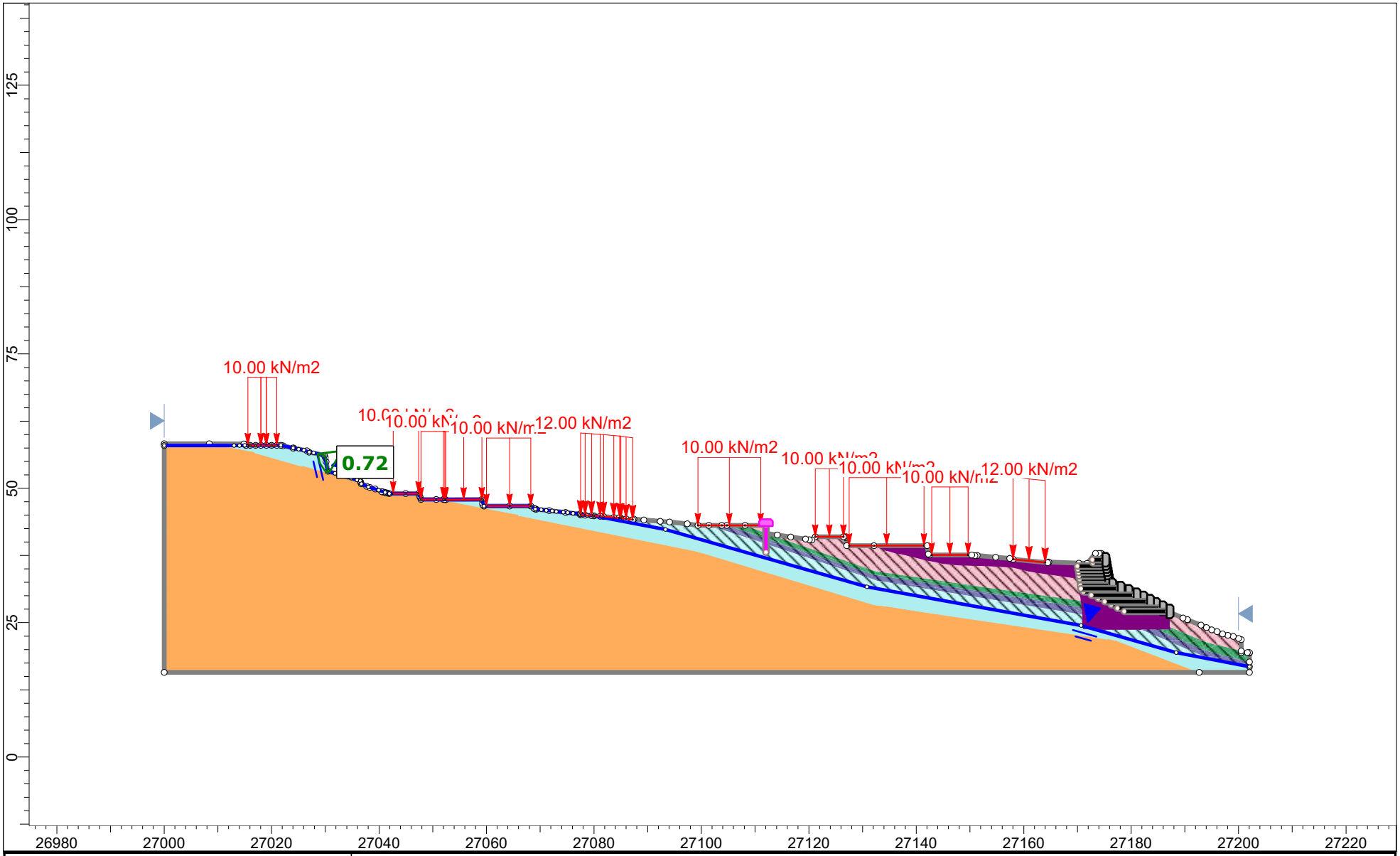
Project	240065 - Russell Road, Waunui		
Group	Section Z - Proposed GL	Scenario	Seismic (0.19g)
Drawn By	LKB	Company	Riley Consulants Ltd
Date	19/12/2025	File Name	Section Z.slmd



RILEY

SLIDEINTERPRET 9.028

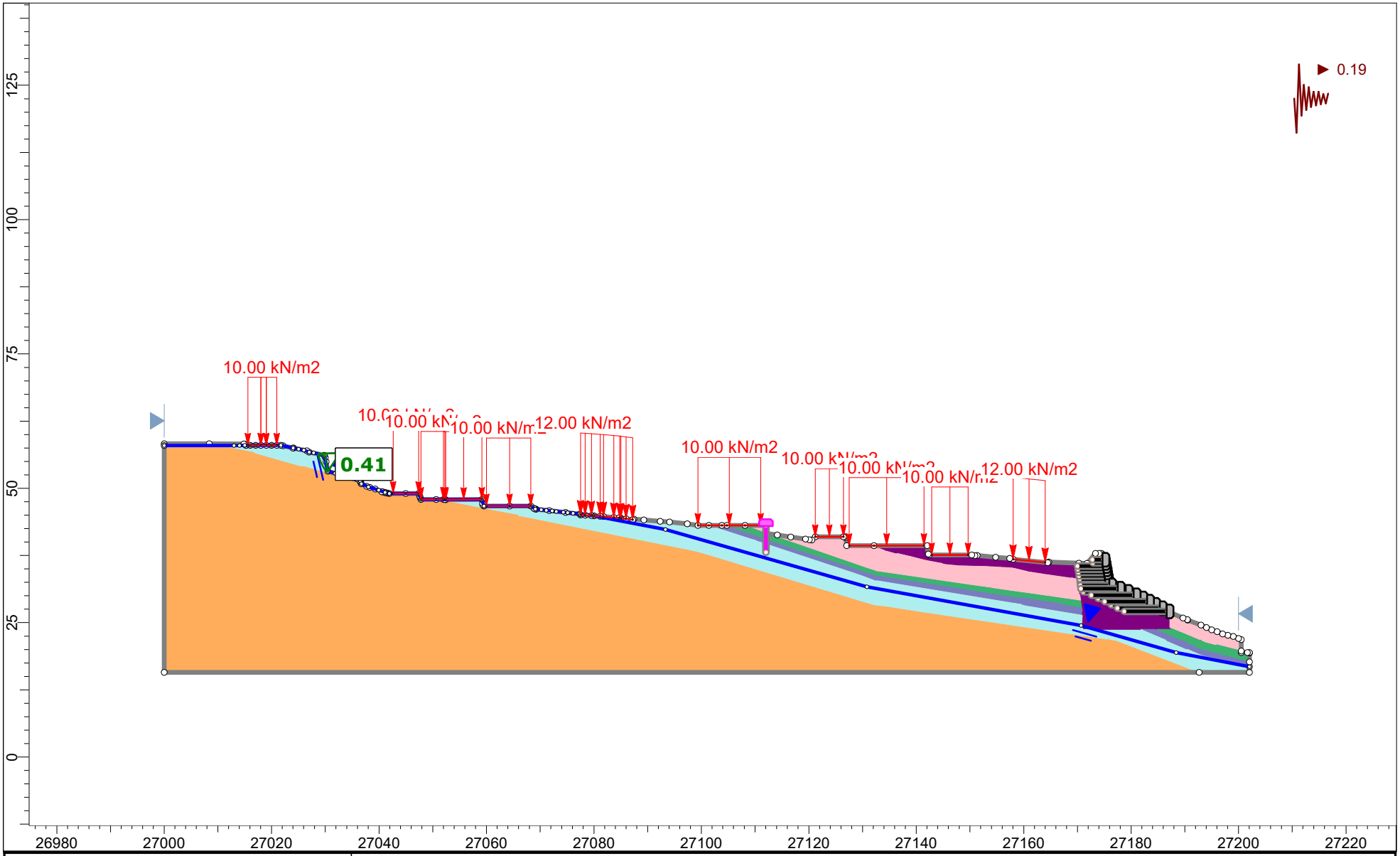
Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AA - erosion & remedials	*Scenario*	Normal (Measured GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AA.slmd



RILEY

SLIDEINTERPRET 9.028

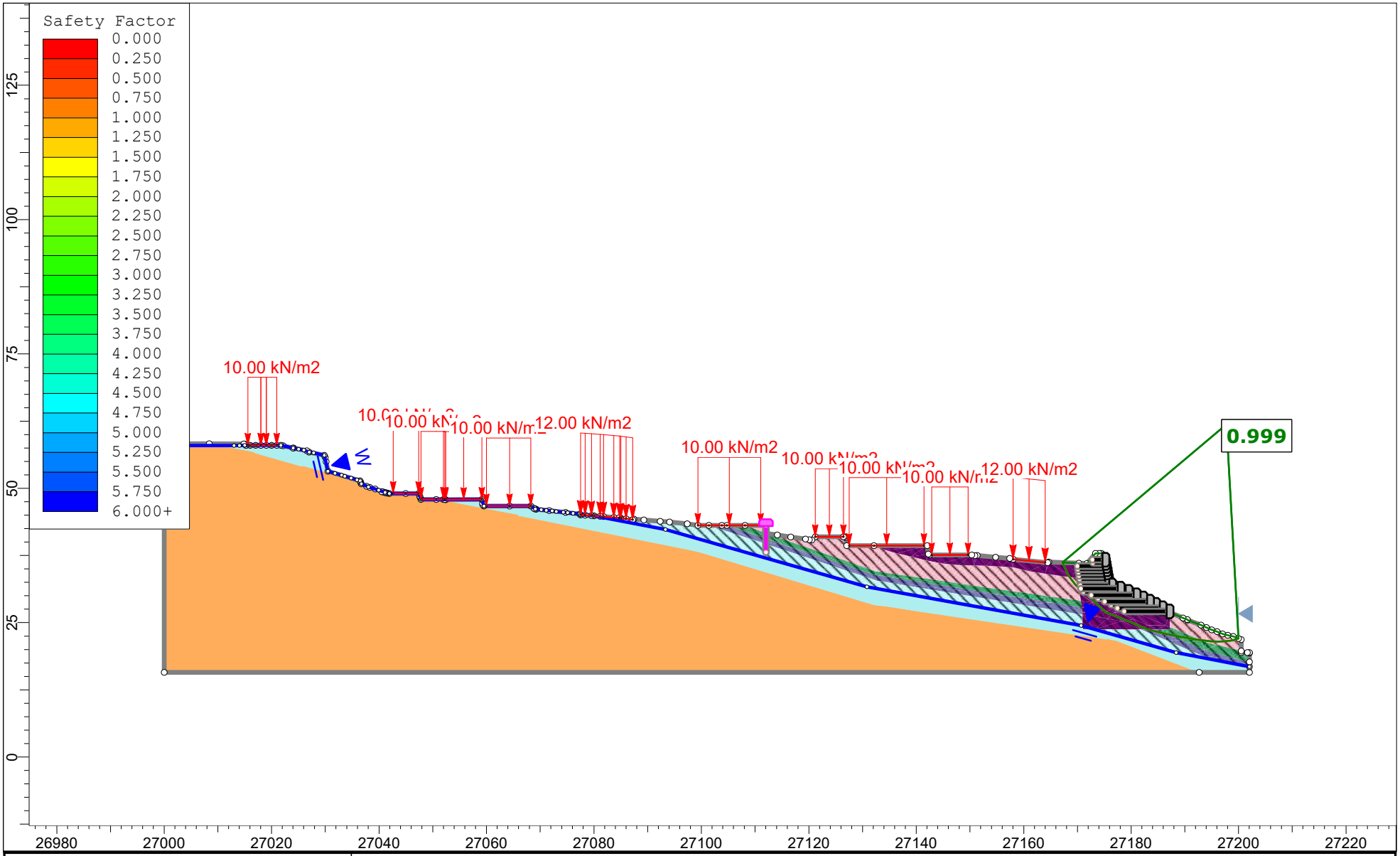
Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AA - erosion & remedials	*Scenario*	Extreme (Worst Credible GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AA.slmd



RILEY

SLIDEINTERPRET 9.028

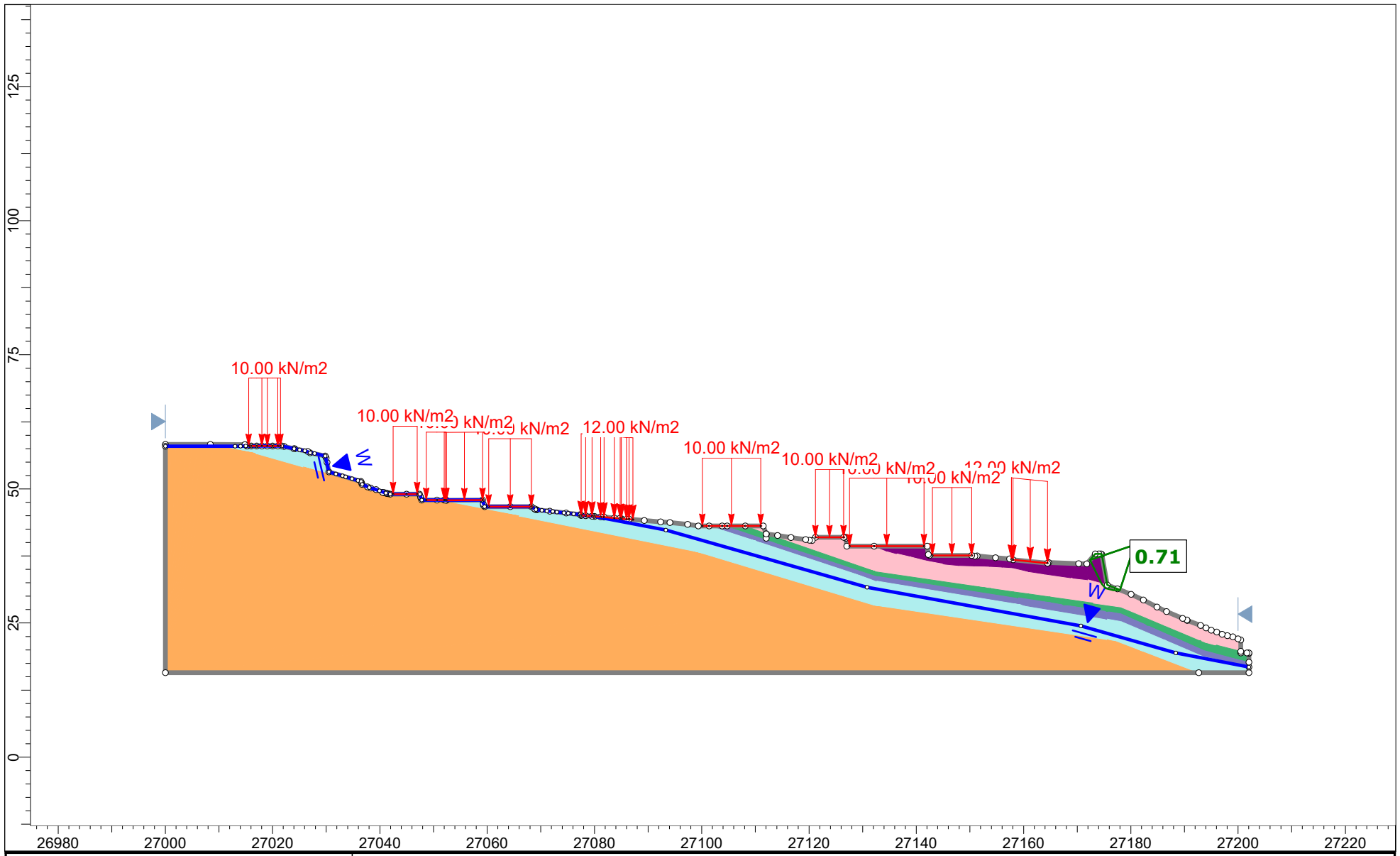
Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AA - erosion & remedials	*Scenario*	Seismic (0.19g)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AA.slmd



RILEY

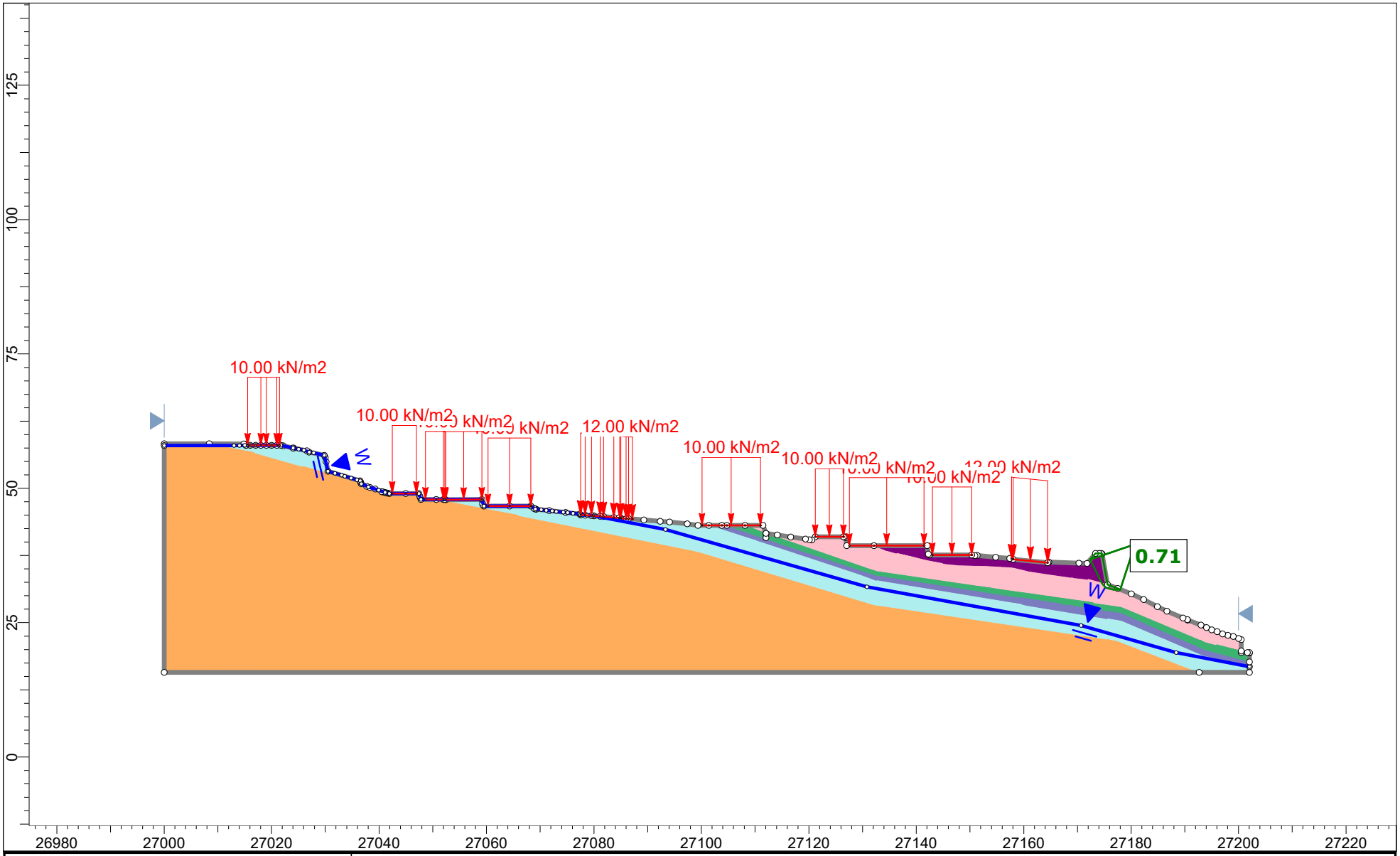
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AA - erosion & remedials	*Scenario*	Extreme (50% fill saturation)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AA.slmd



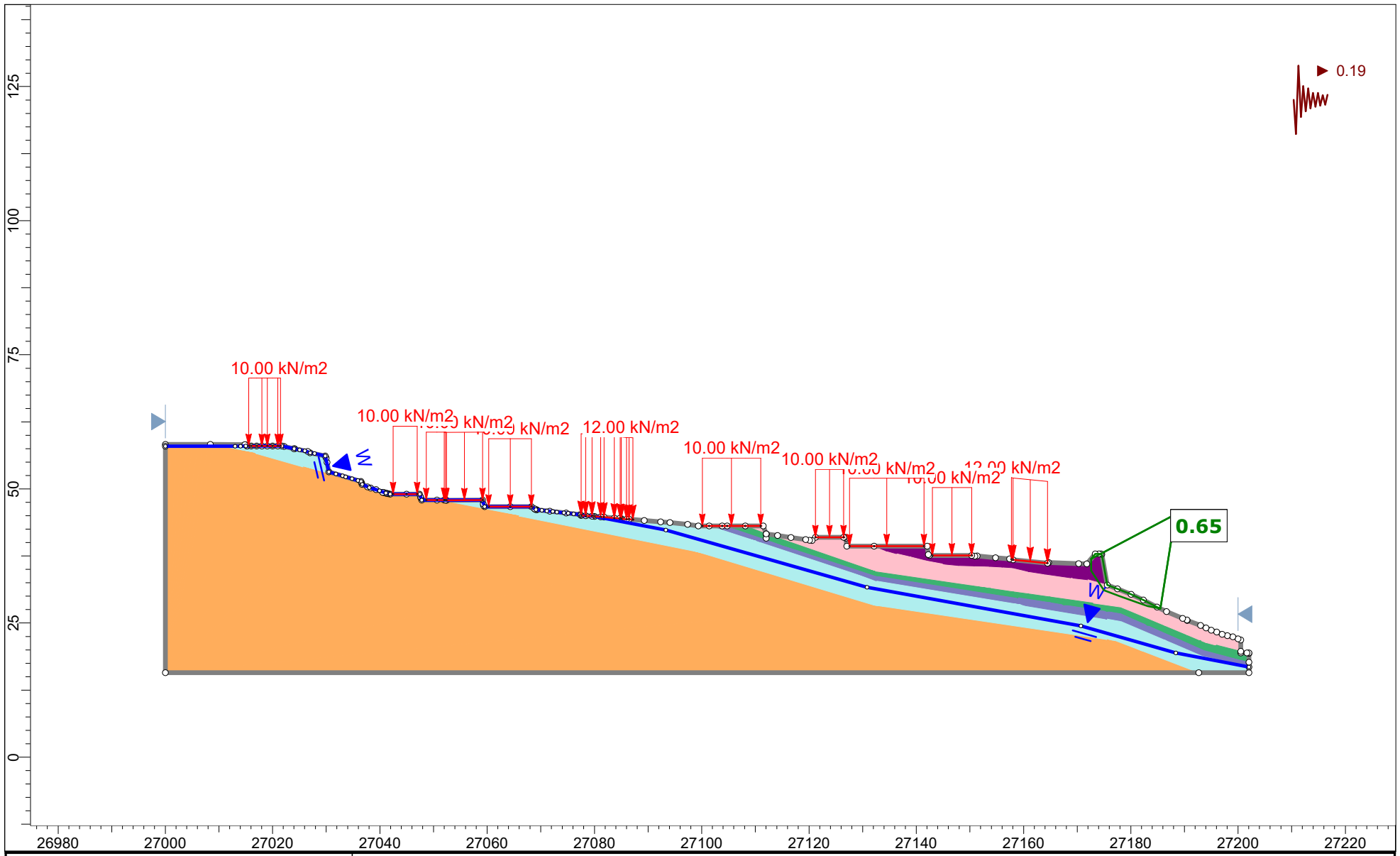
RILEY	*Project*	240065 - Russell Road, Wainui - Stage 1	
	Group	Section AA - Proposed GL	*Scenario* Normal (Measured GW)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AA.slmd

SLIDEINTERPRET 9.028



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 1	
	Group	Section AA - Proposed GL	*Scenario* Extreme (Worst Credible GW)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AA.slmd

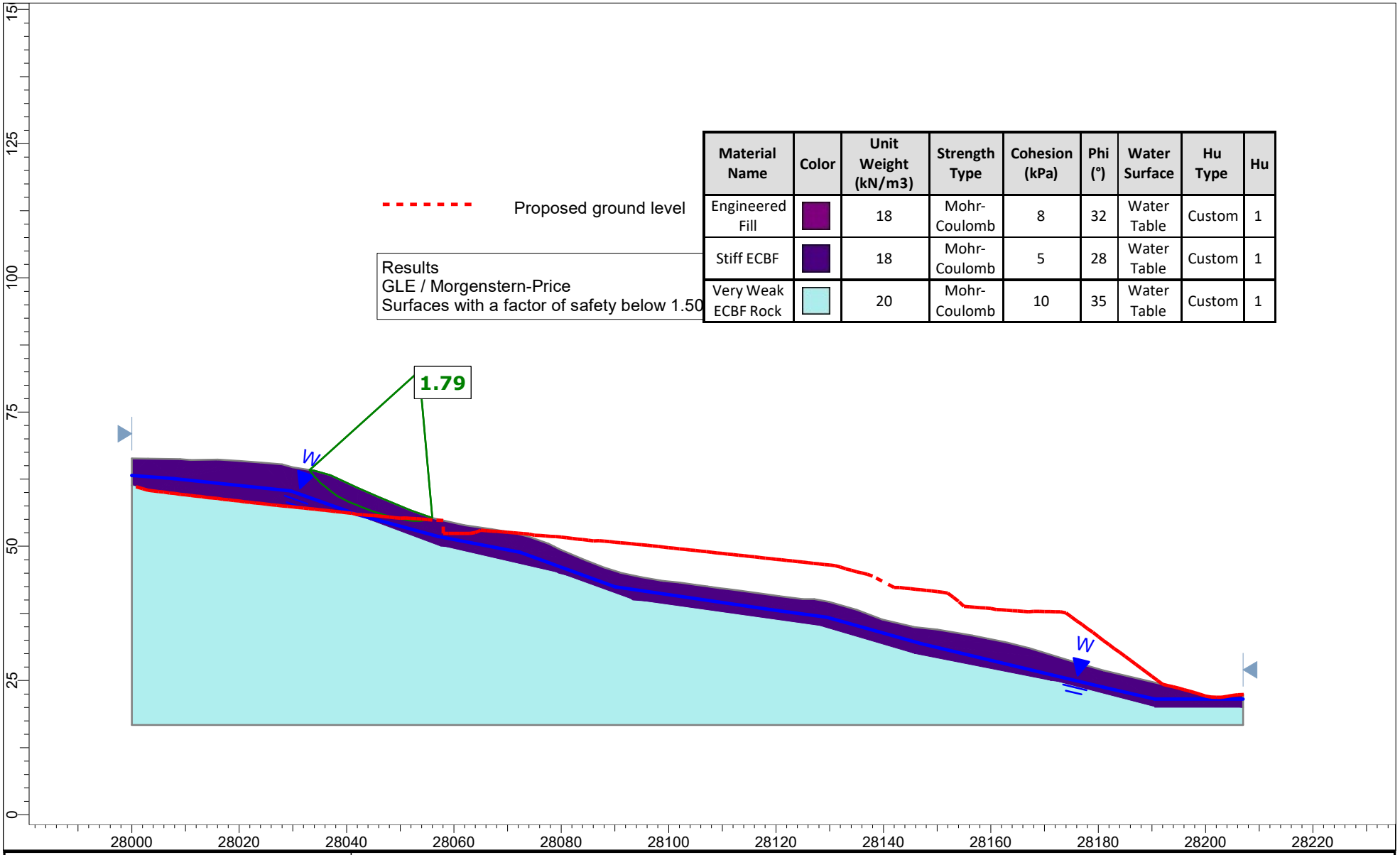
SLIDEINTERPRET 9.028



RILEY

SLIDEINTERPRET 9.028

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



Material Name	Color	Unit Weight (kN/m3)	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

RILEY

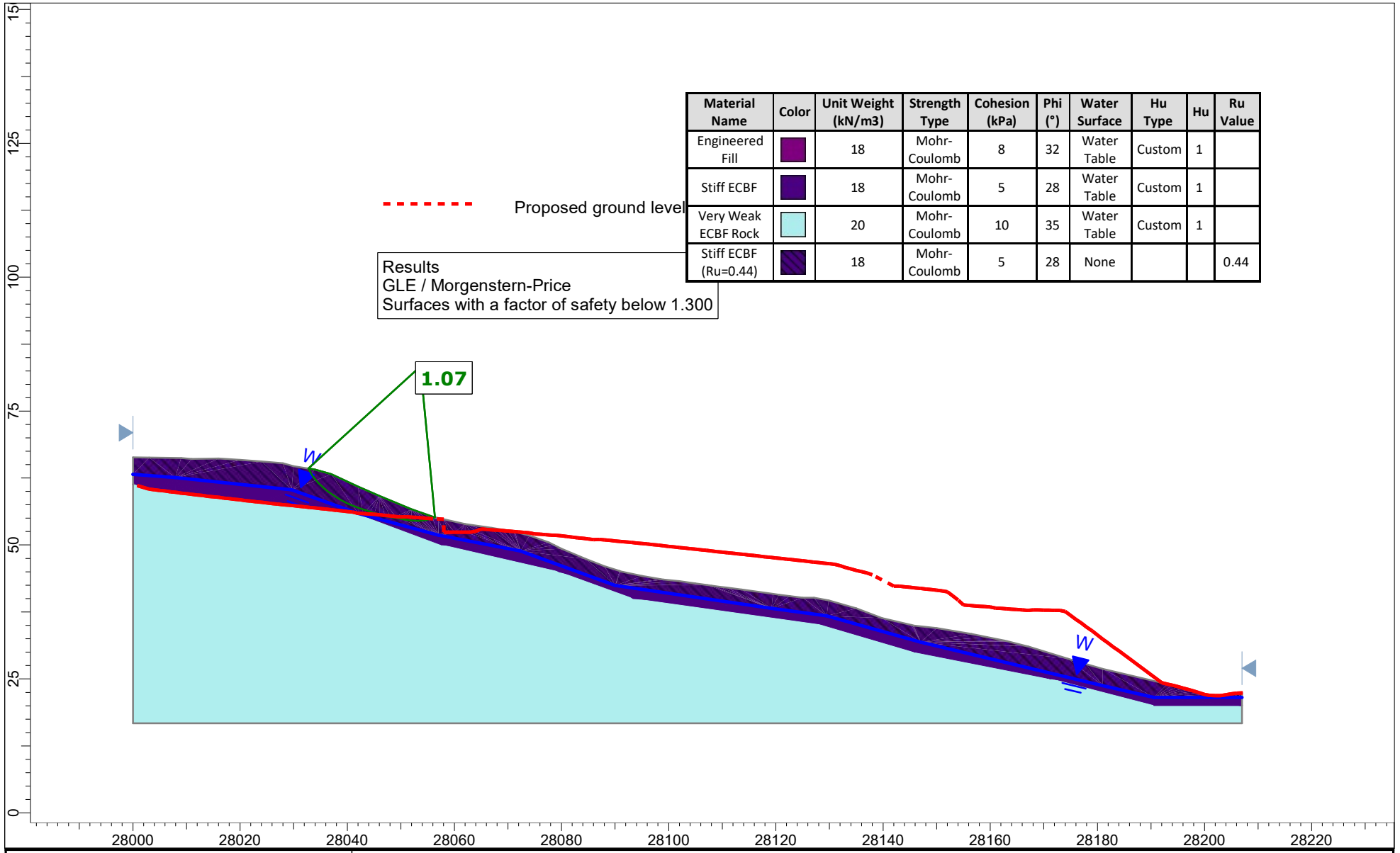
SLIDEINTERPRET 9.028

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

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	
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44

Proposed ground level

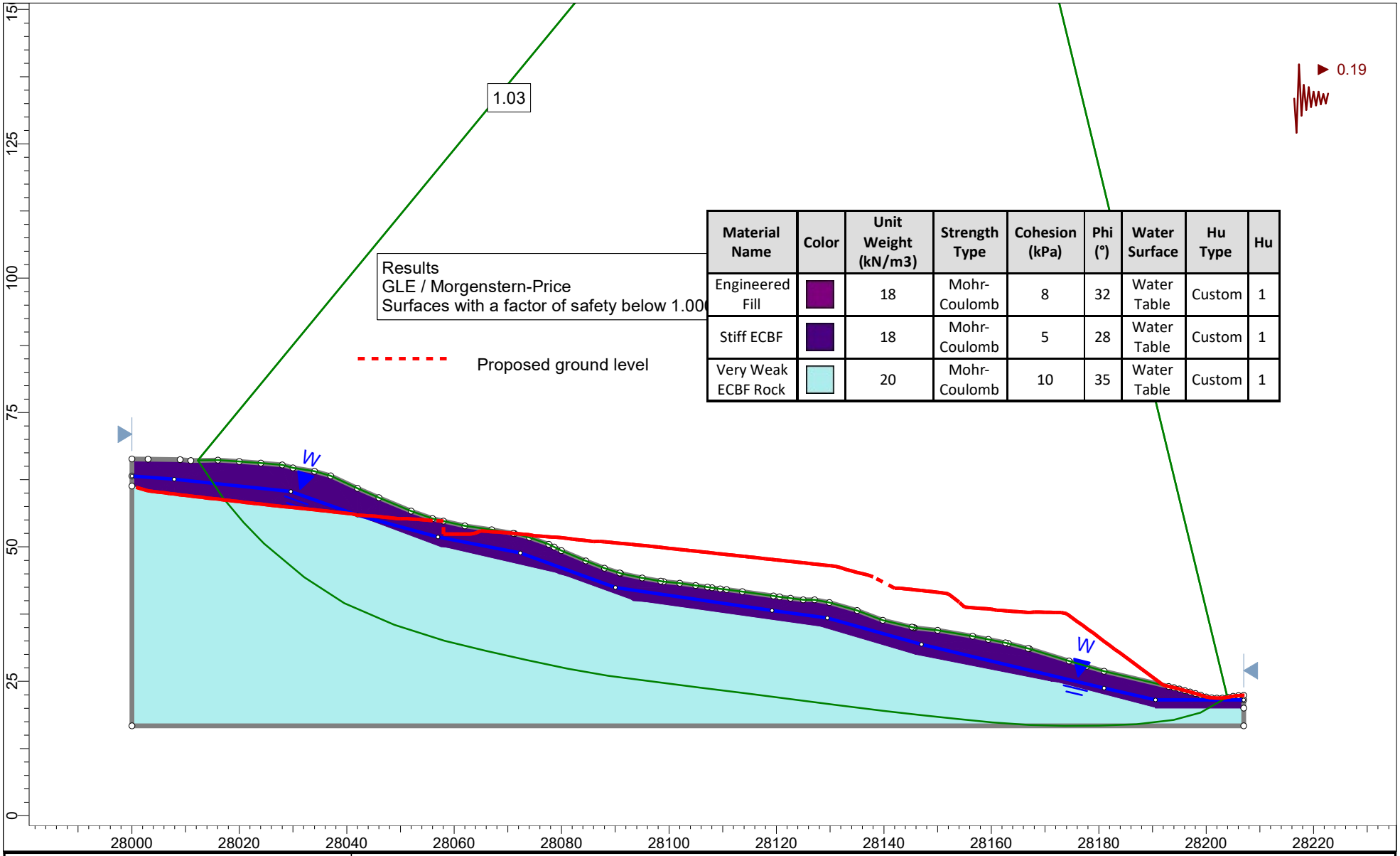
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300



RILEY

SLIDEINTERPRET 9.028

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

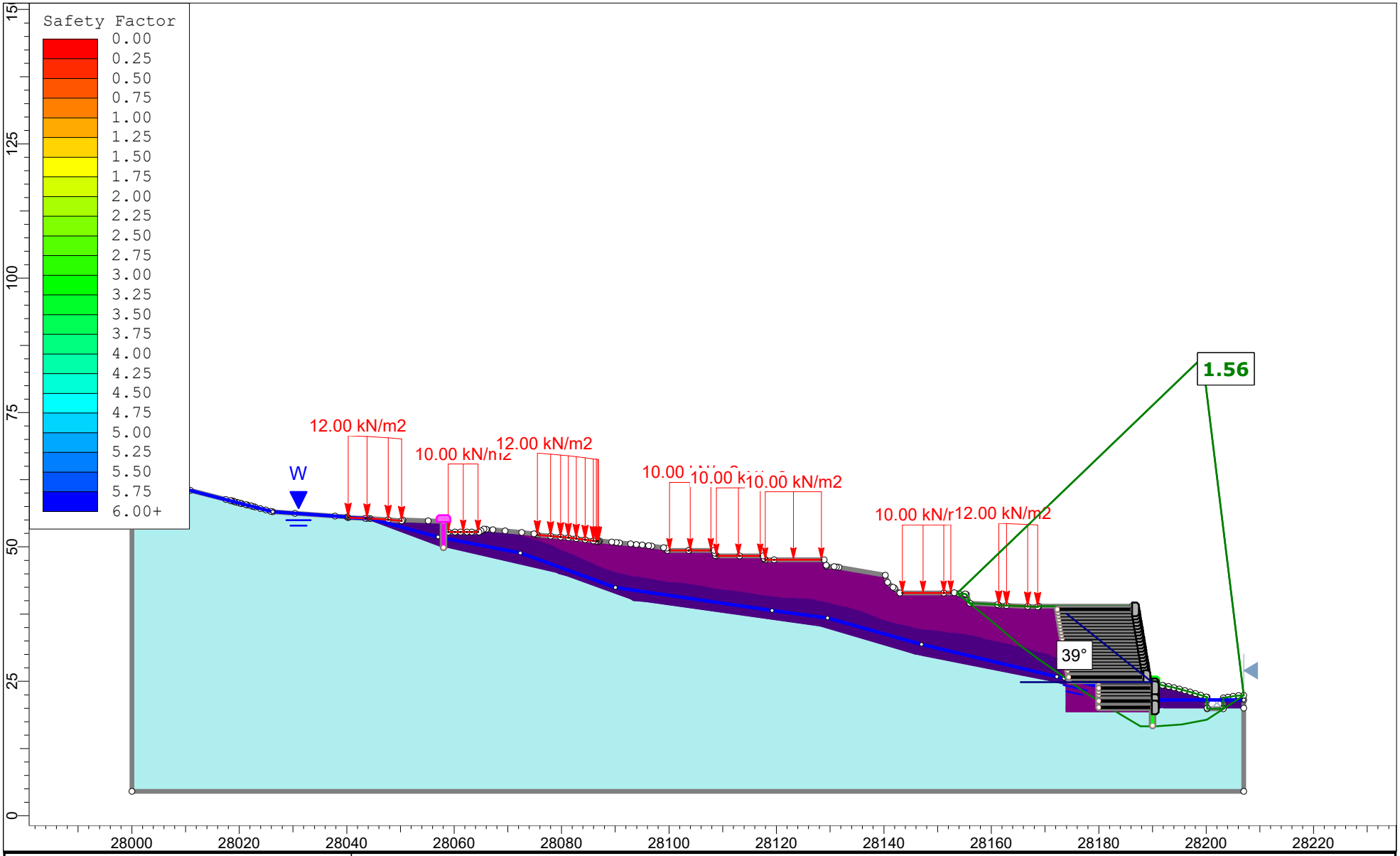


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1

RILEY

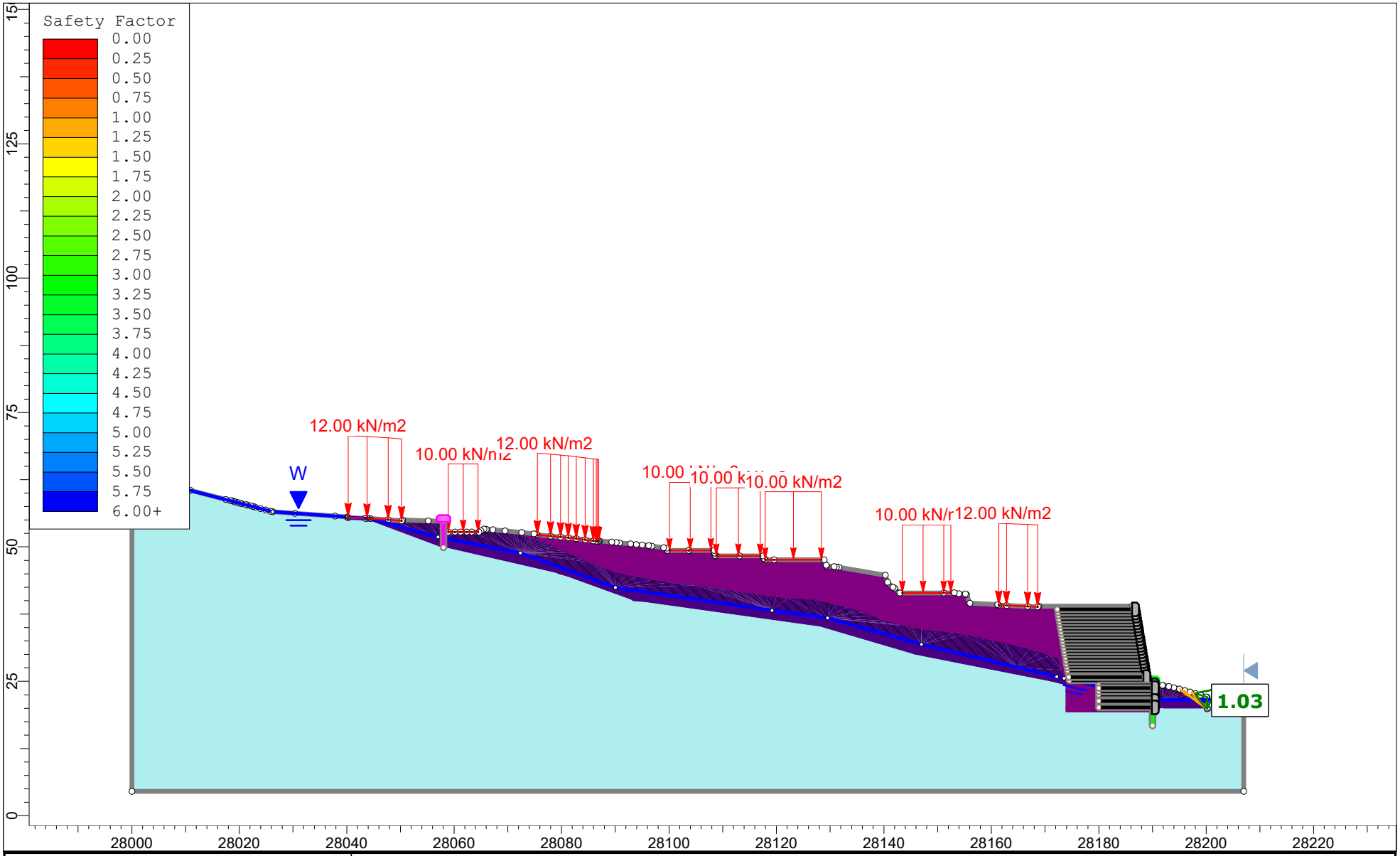
SLIDEINTERPRET 9.028

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



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AB - erosion & remedials	*Scenario* Normal (Measured GW)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AB.slmd

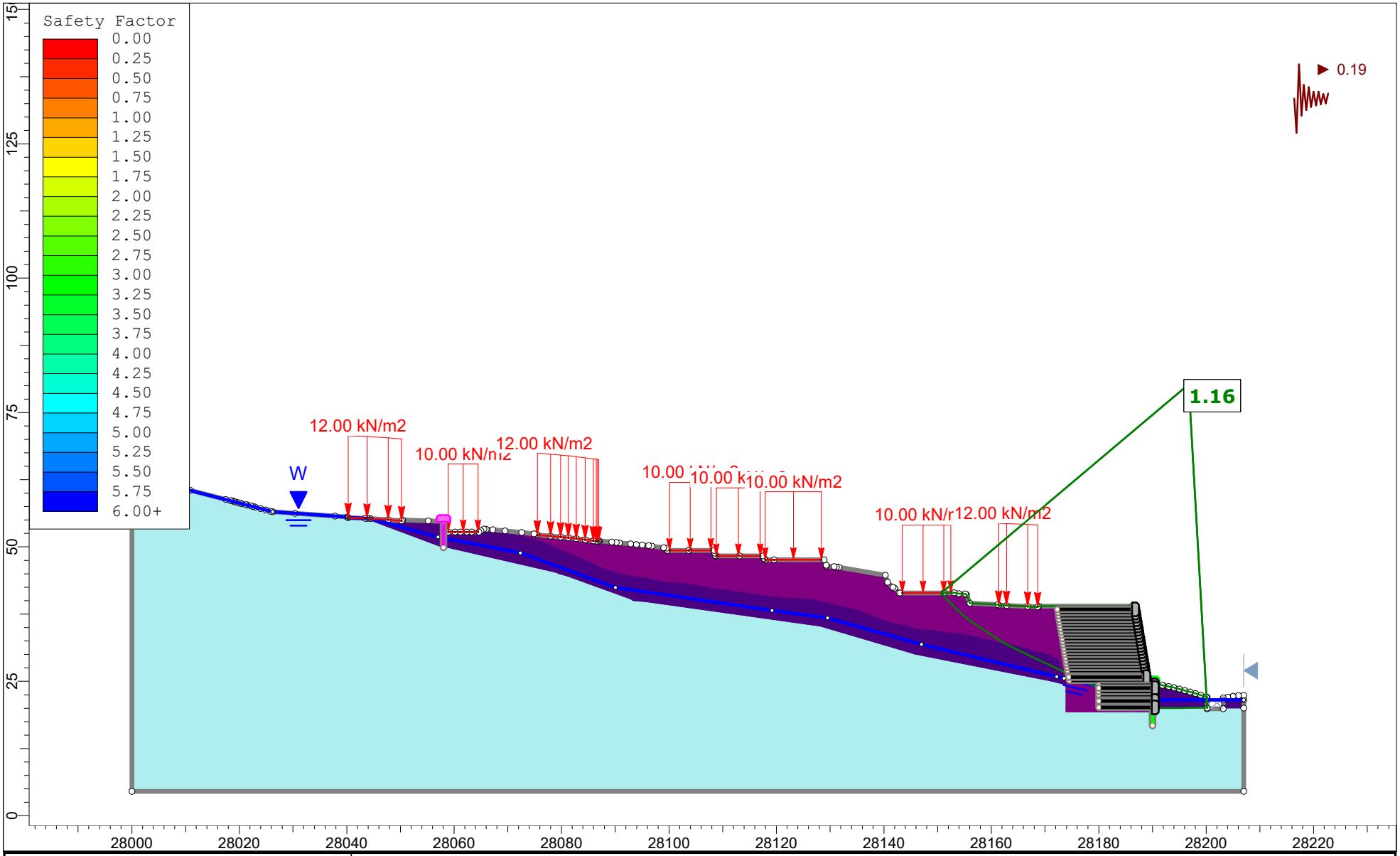
SLIDEINTERPRET 9.028



RILEY

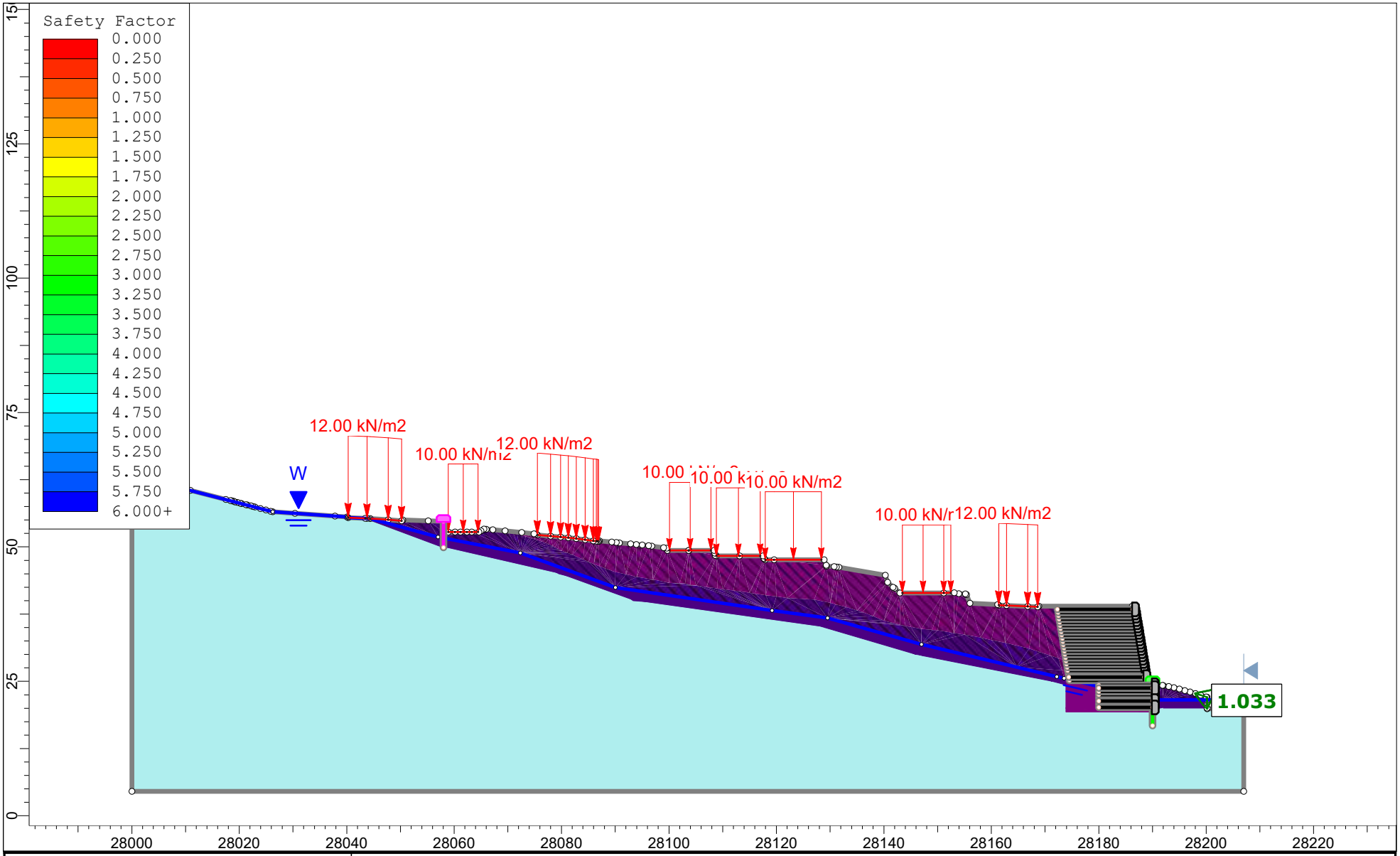
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AB - erosion & remedials	*Scenario*	Extreme (Worst Credible GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AB.slmd



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AB - erosion & remedials	*Scenario* Seismic (0.19g)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AB.slmd

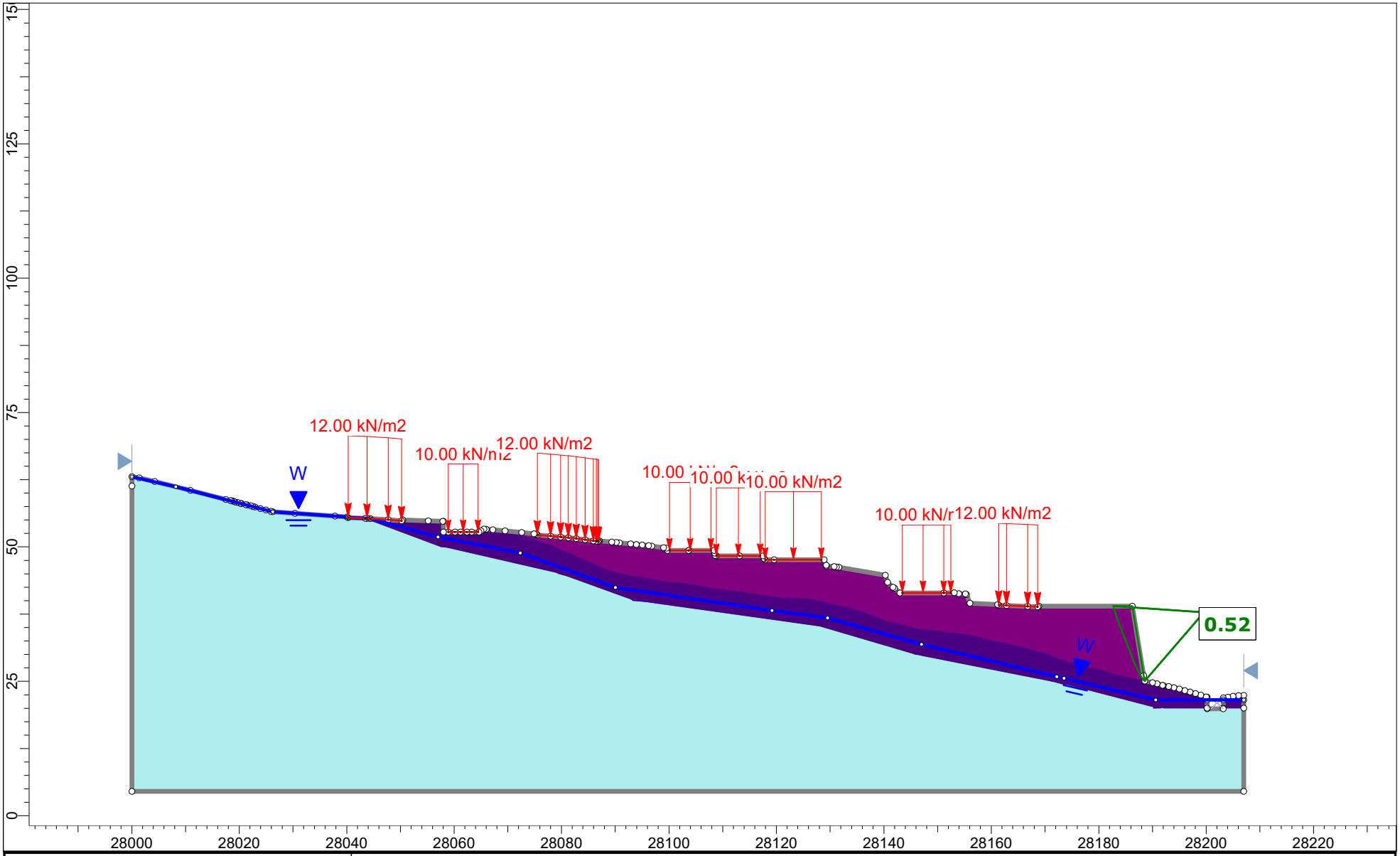
SLIDEINTERPRET 9.028



RILEY

SLIDEINTERPRET 9.028

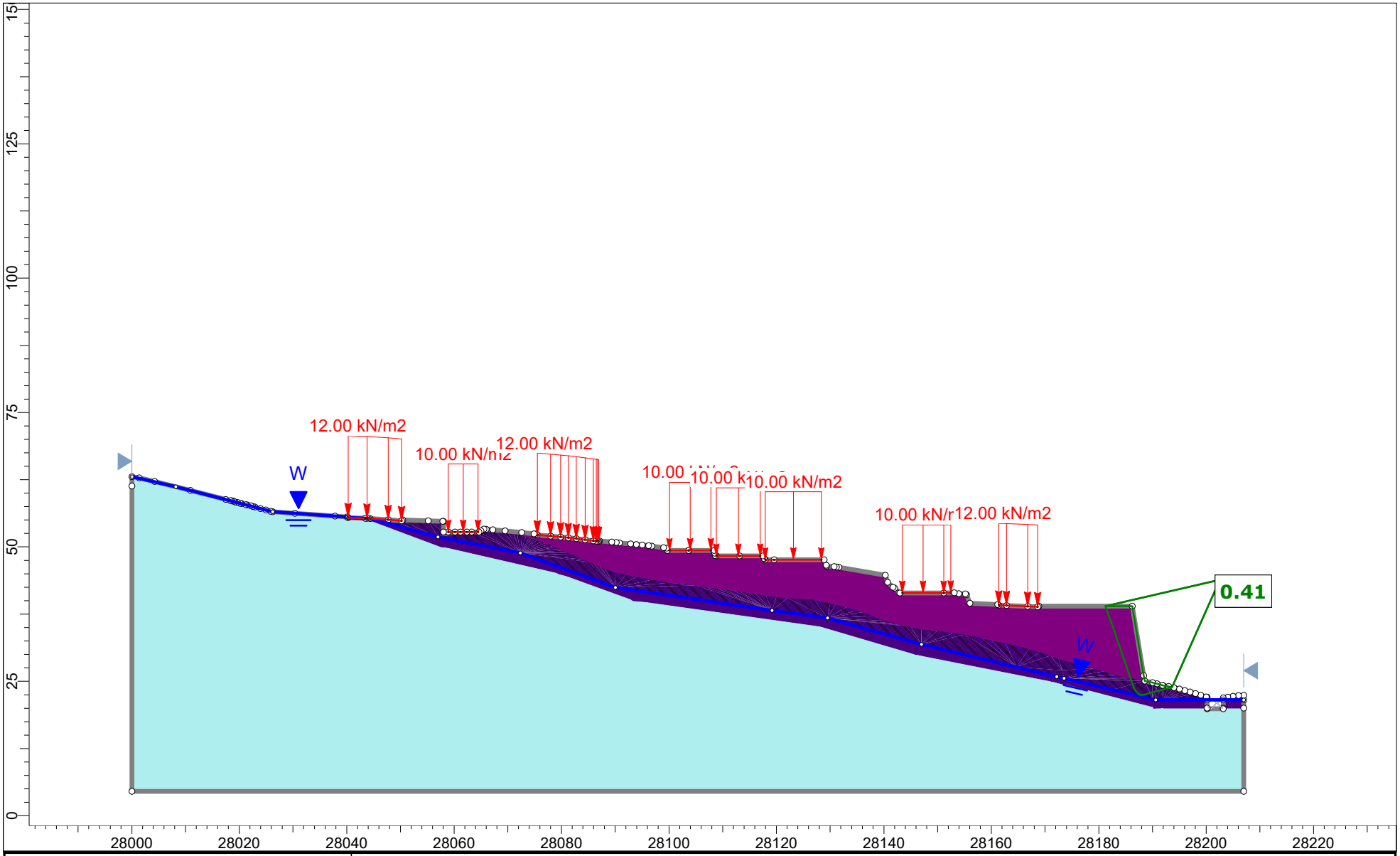
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AB - erosion & remedials	*Scenario*	Extreme (50% fill saturation)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AB.slmd



RILEY

SLIDEINTERPRET 9.028

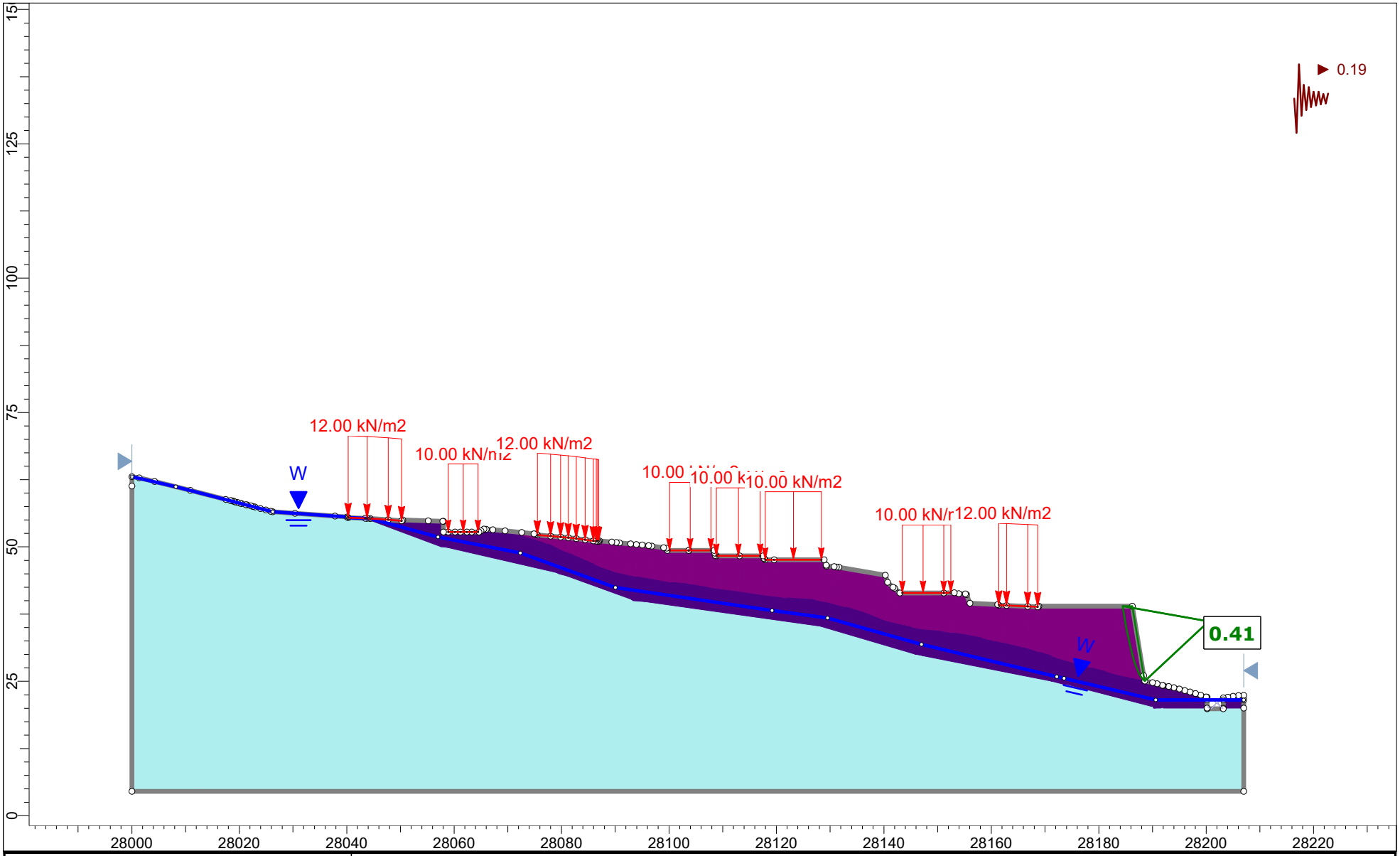
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AB - Proposed GL	*Scenario*	Normal (Measured GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AB.slmd



RILEY

SLIDEINTERPRET 9.028

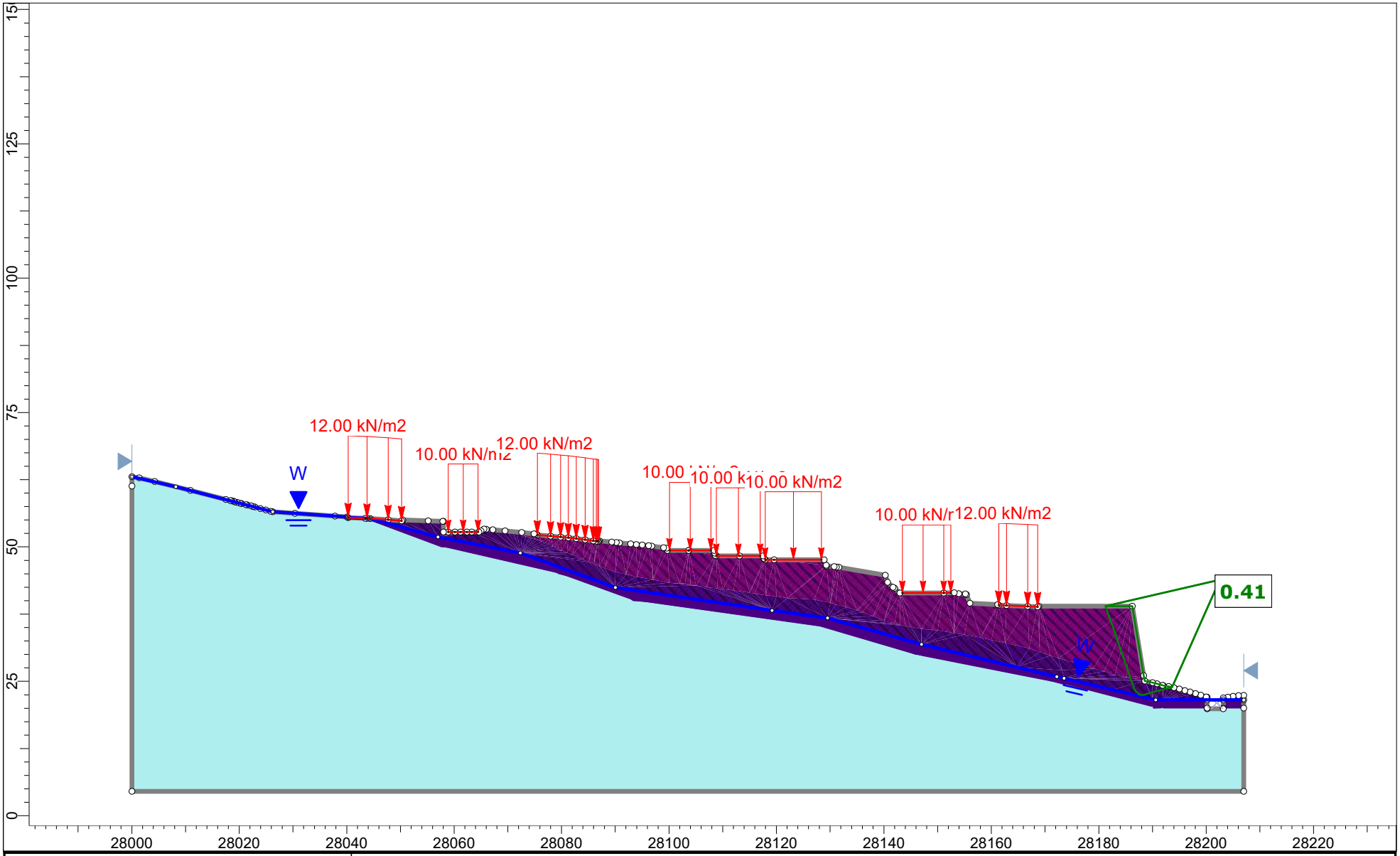
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AB - Proposed GL	*Scenario*	Extreme (Worst Credible GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AB.slmd



RILEY

SLIDEINTERPRET 9.028

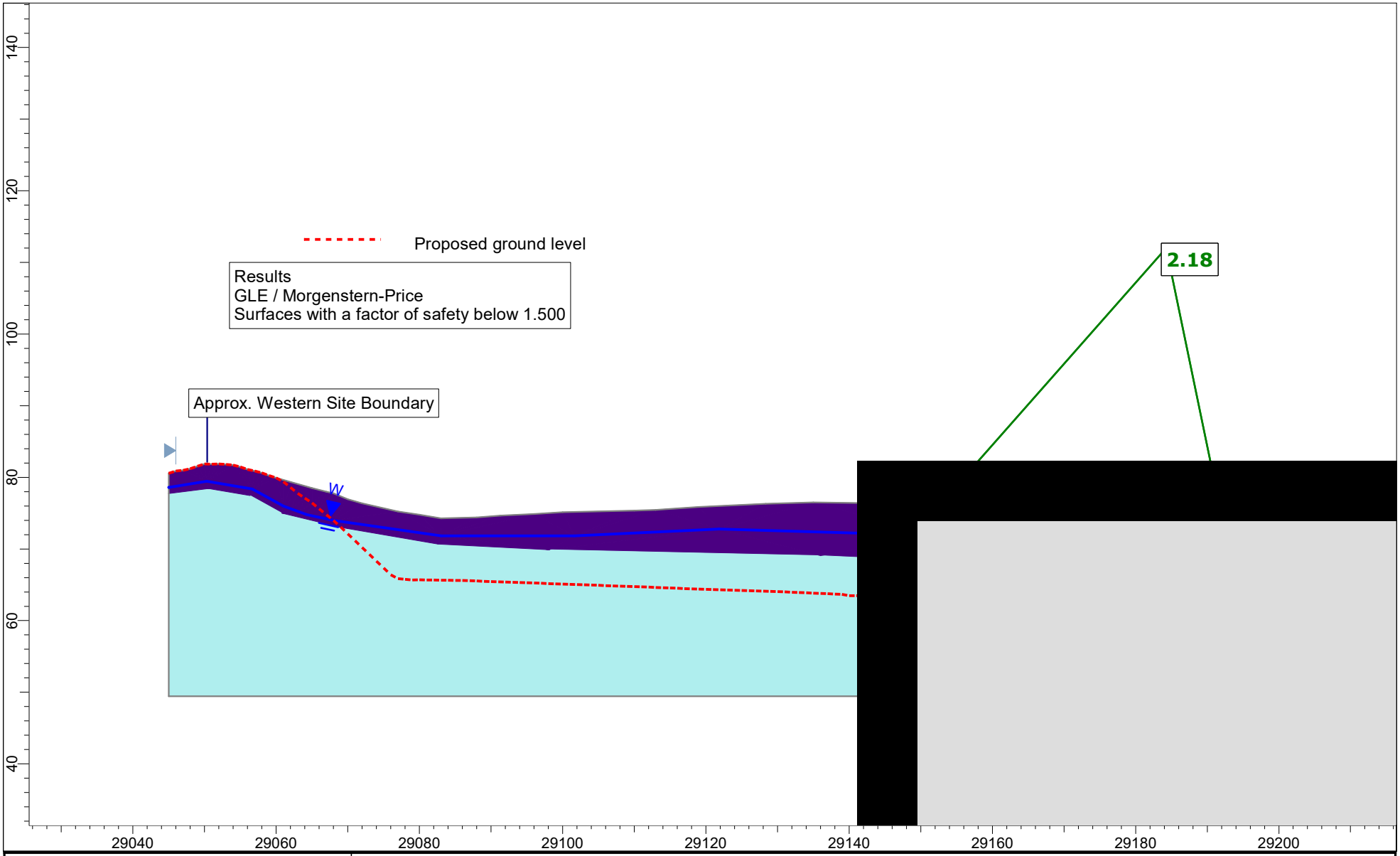
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AB - Proposed GL	*Scenario*	Seismic (0.19g)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AB.slmd



RILEY

SLIDEINTERPRET 9.028

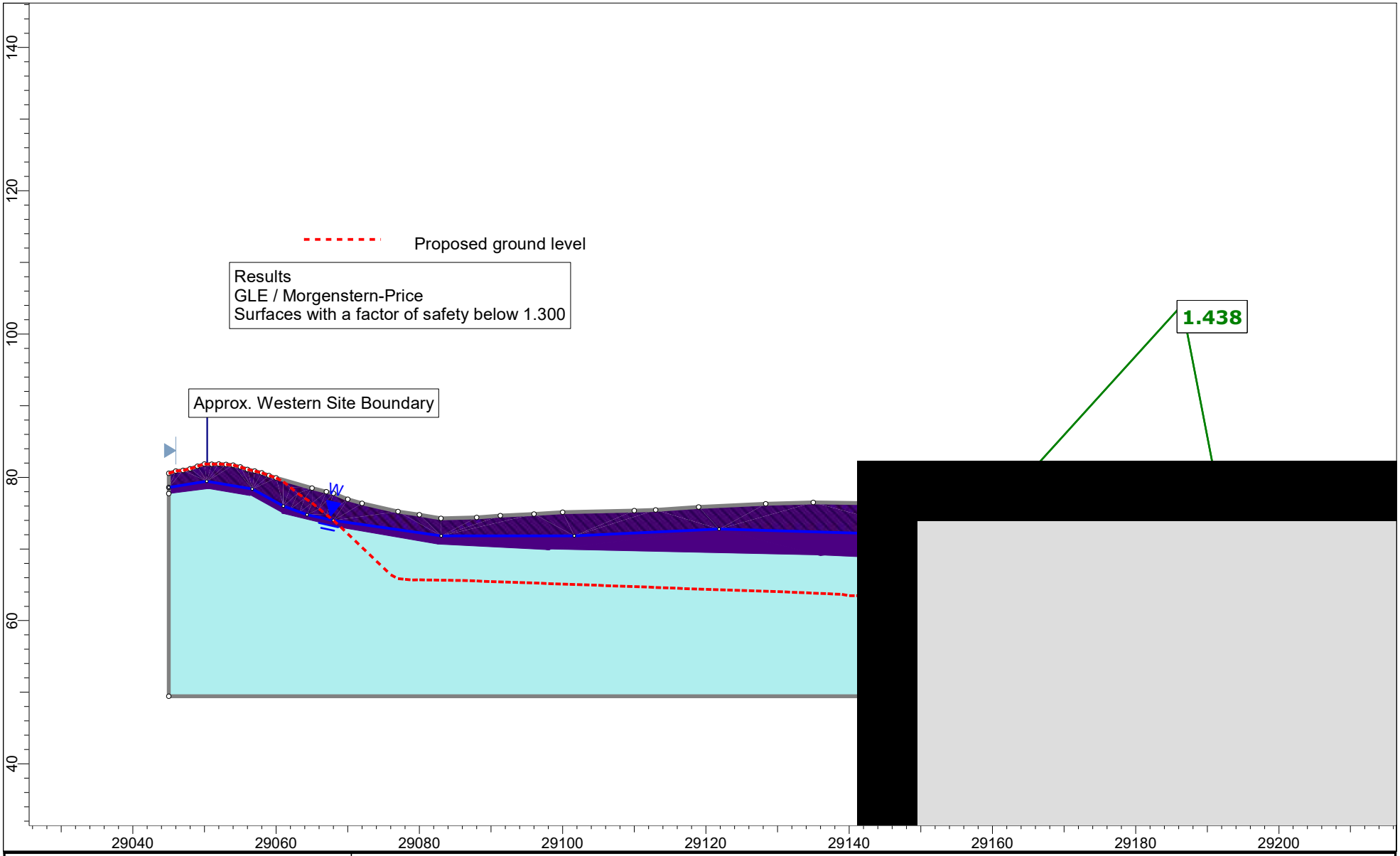
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AB - Proposed GL	*Scenario*	Extreme (50% fill saturation)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AB.slmd



RILEY

SLIDEINTERPRET 9.028

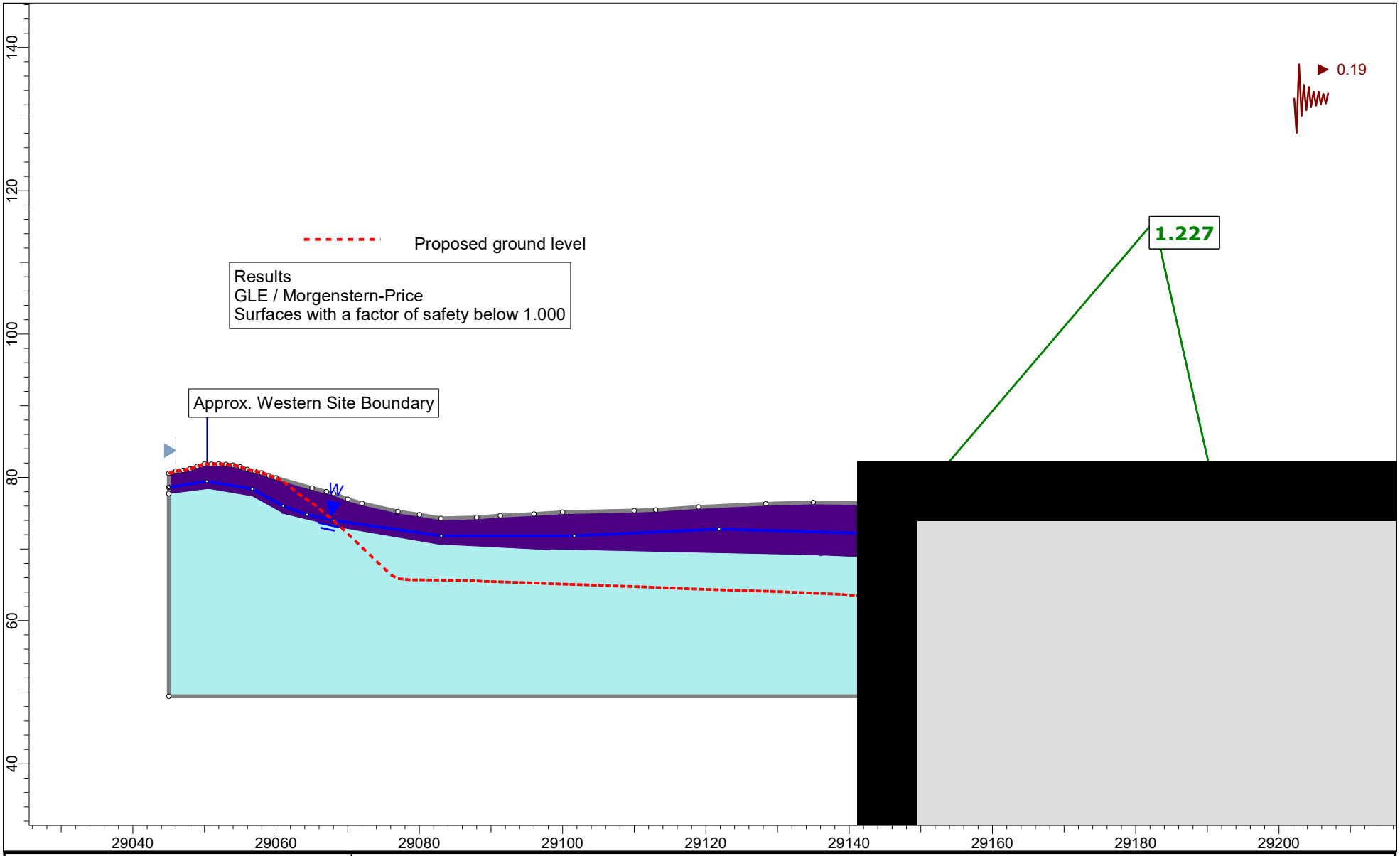
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AC - Existing GL	*Scenario*	Normal (Measured GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AC.slmd



RILEY

SLIDEINTERPRET 9.028

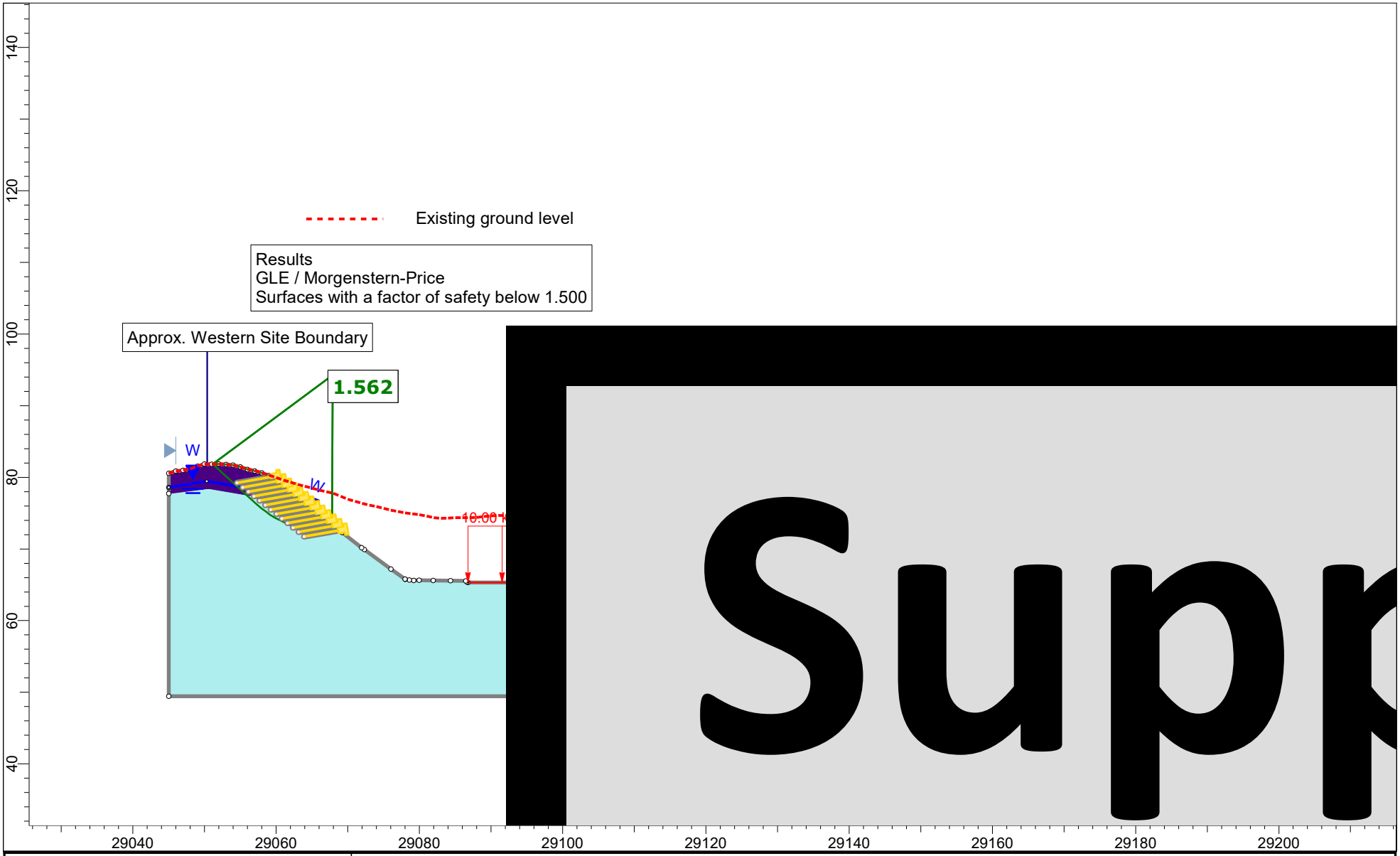
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AC - Existing GL	*Scenario*	Extreme (Worst Credible GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AC.slmd



RILEY

SLIDEINTERPRET 9.028

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

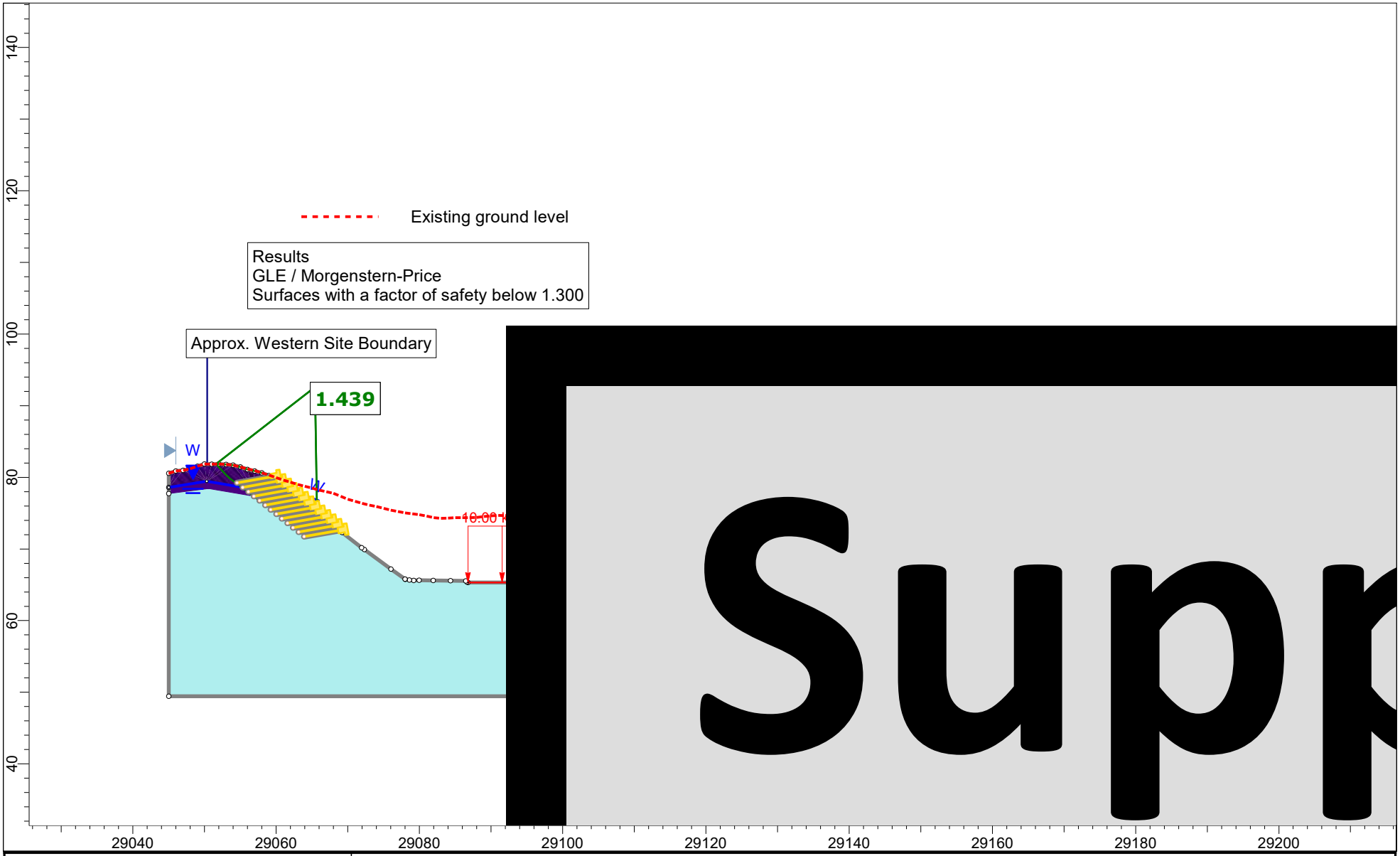


Supp

RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AC - Proposed GL, Remedials, Loads	*Scenario*	Normal (Measured GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AC.slmd

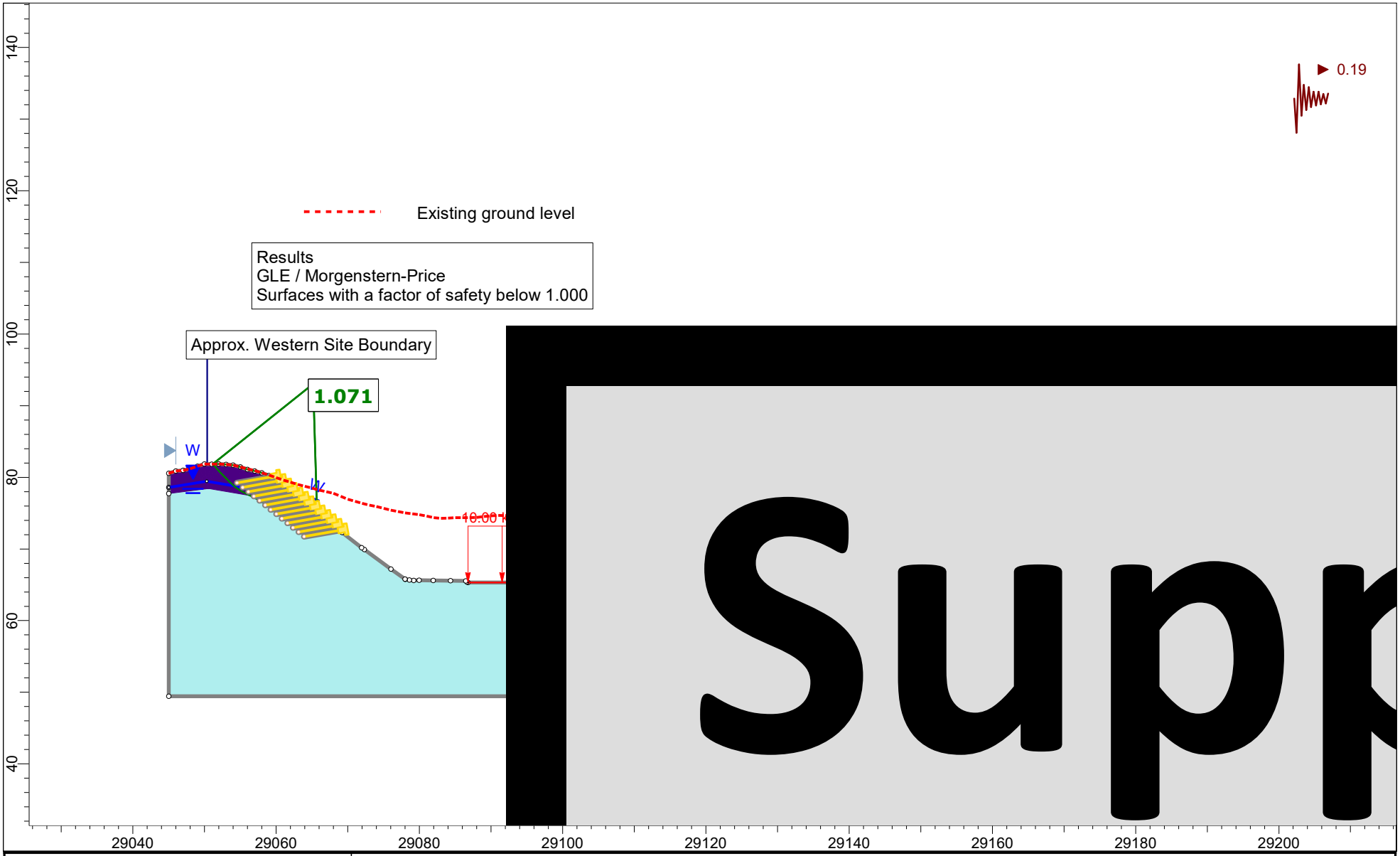


Supp

RILEY

SLIDEINTERPRET 9.028

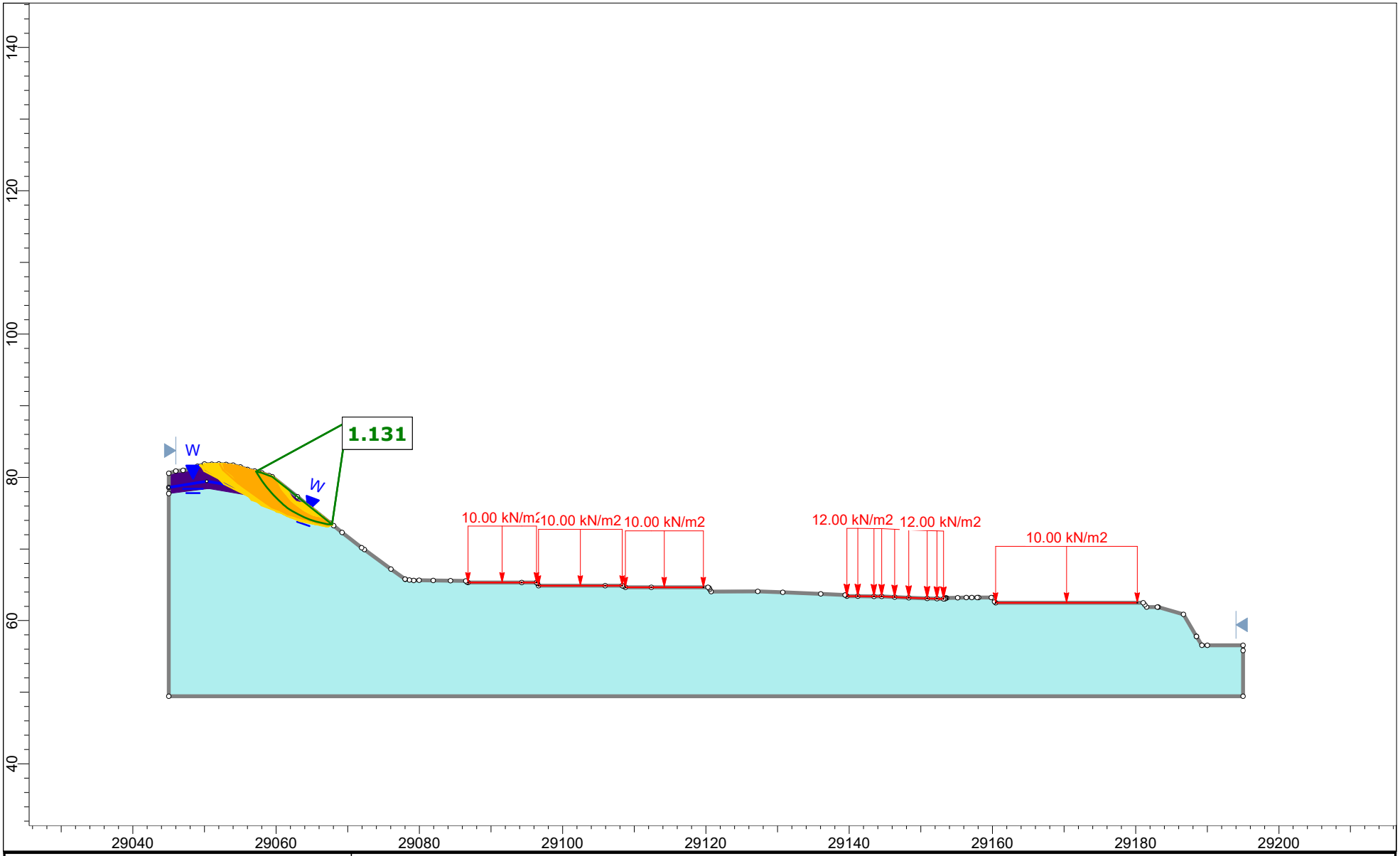
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AC - Proposed GL, Remedials, Loads	*Scenario*	Extreme (Worst Credible GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AC.slmd



RILEY

SLIDEINTERPRET 9.028

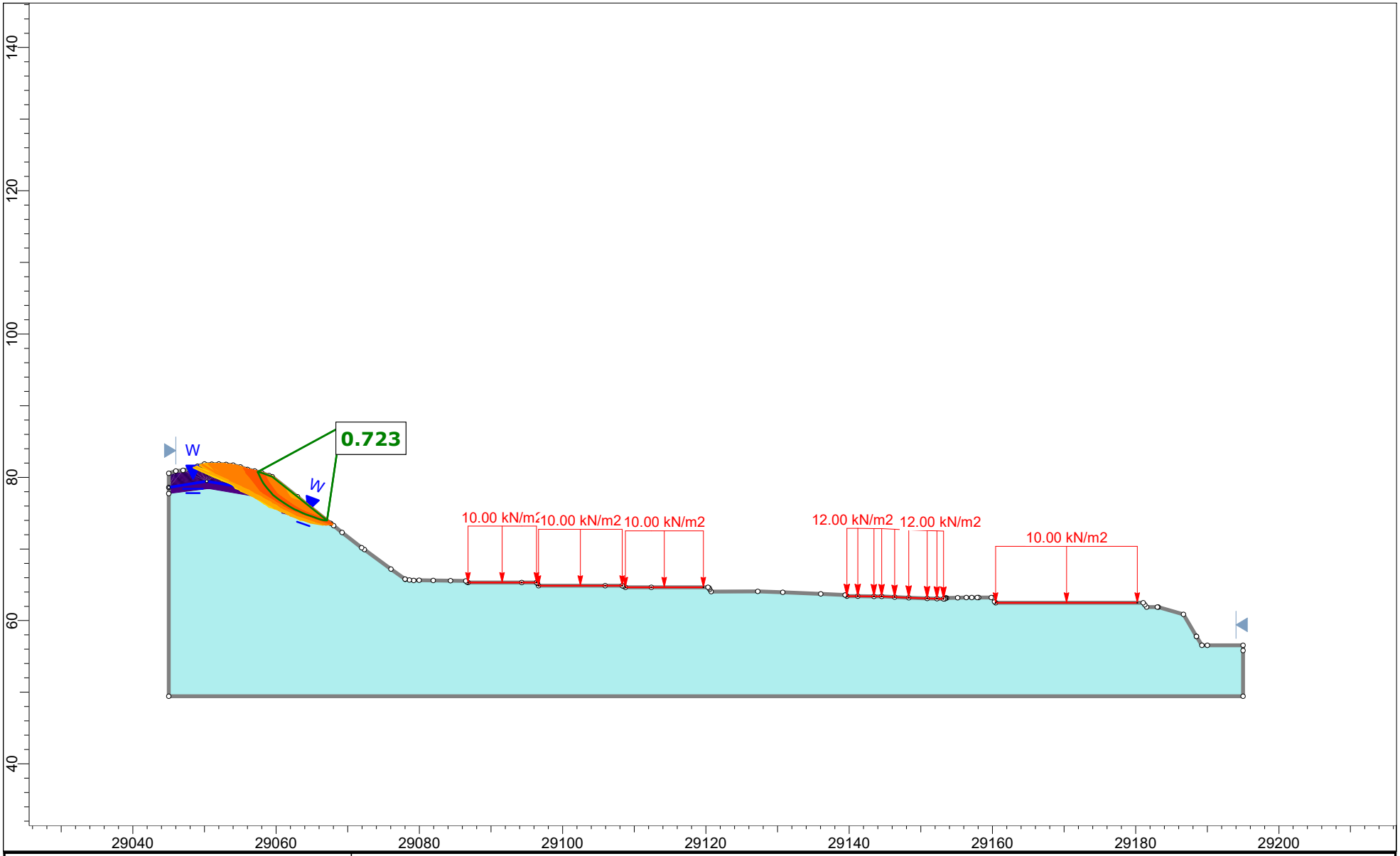
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AC - Proposed GL, Remedials, Loads	*Scenario*	Seismic (0.19g)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AC.slmd



RILEY

SLIDEINTERPRET 9.028

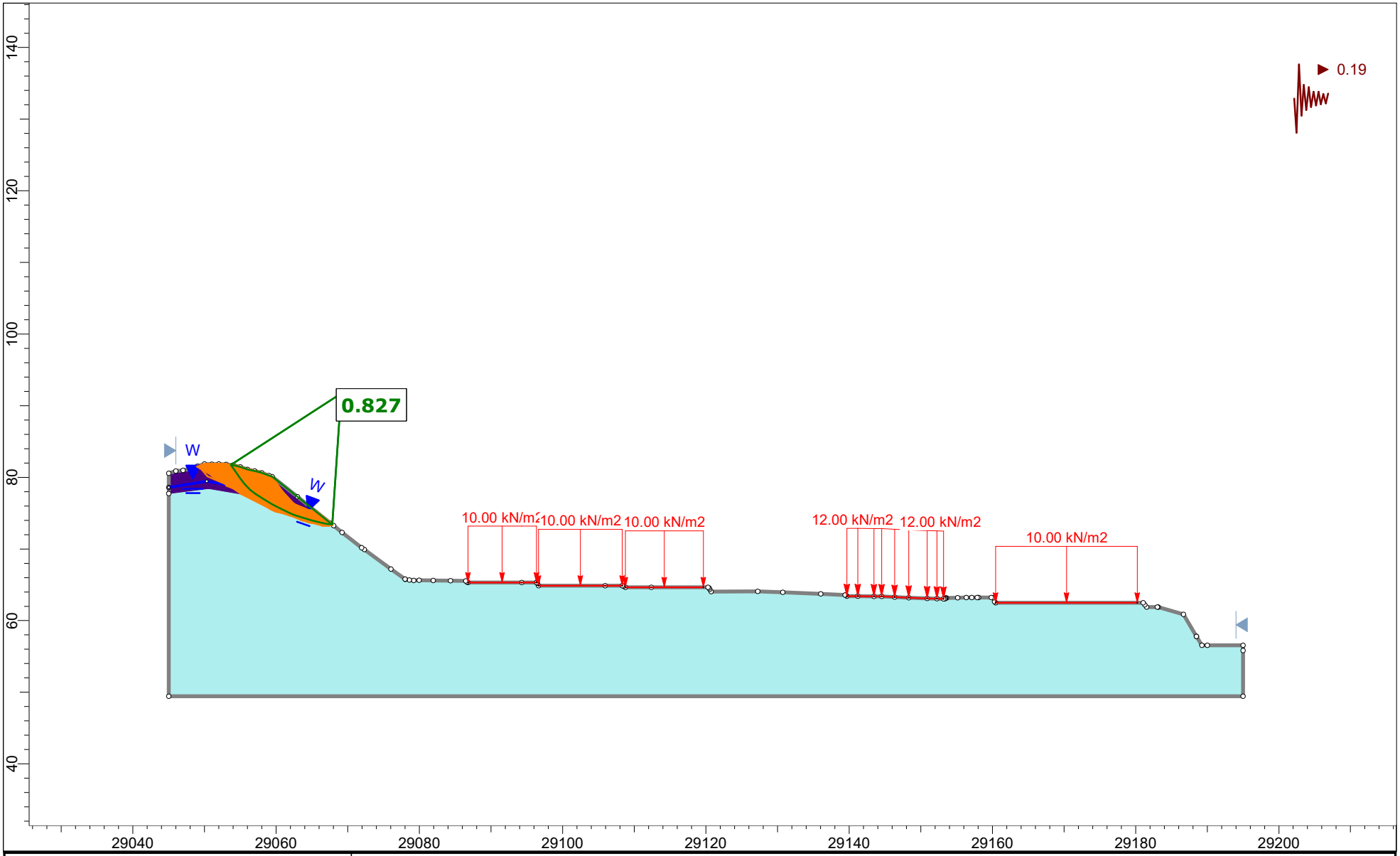
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AC - Proposed GL	*Scenario*	Normal (Measured GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AC.slmd



RILEY

SLIDEINTERPRET 9.028

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



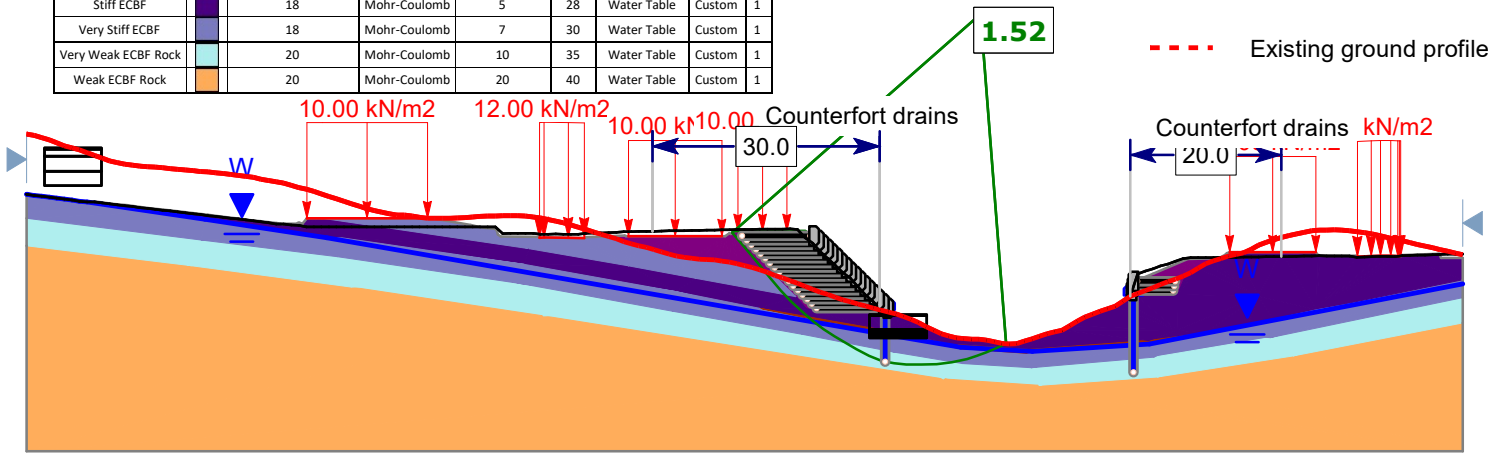
RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AC - Proposed GL	*Scenario* Seismic (0.19g)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AC.slmd

SLIDEINTERPRET 9.028

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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	480	Parallel to surface						
Geogrid		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/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
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



RILEY

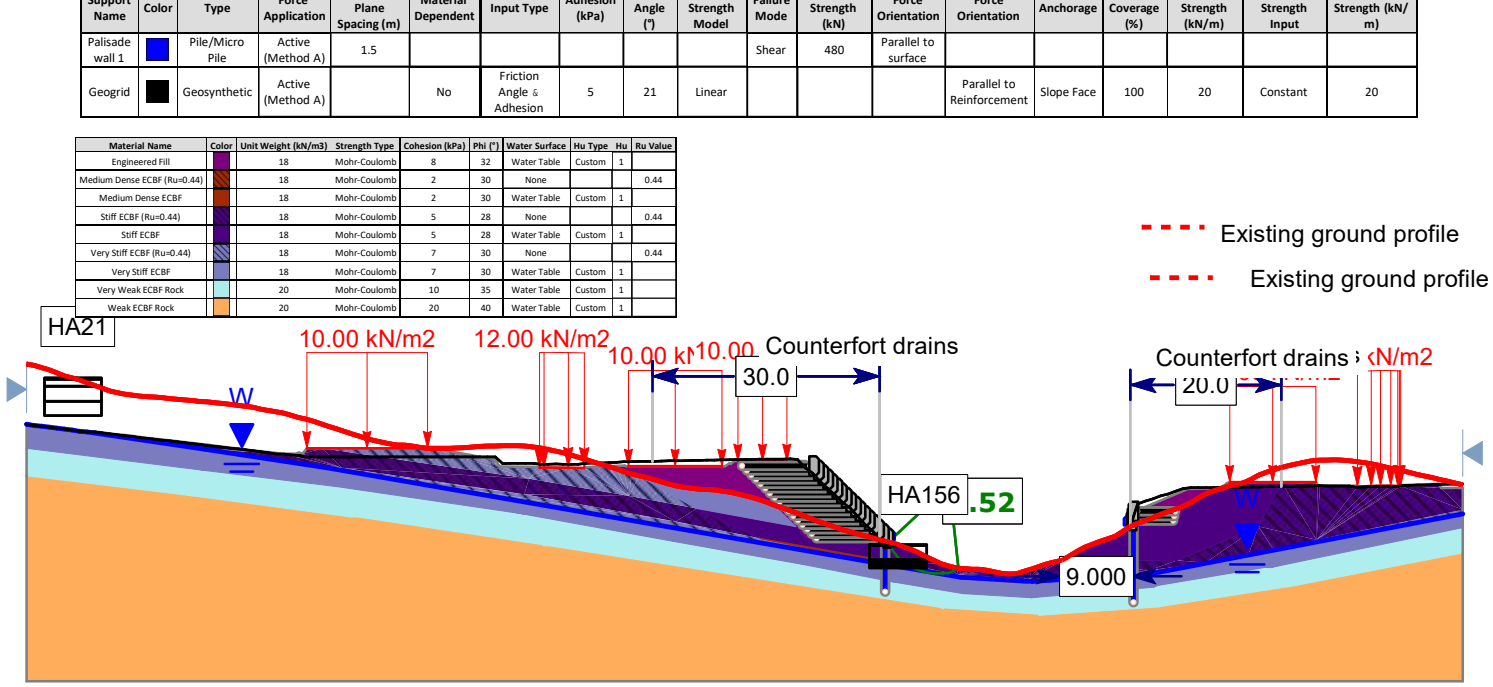
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL, Remedials, Loads (L-R)	*Scenario*	Normal (Measured GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd

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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	480	Parallel to surface						
Geogrid		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/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Medium Dense ECBF (Ru=0.44)		18	Mohr-Coulomb	2	30	None			0.44
Medium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1	
Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	5	28	None			0.44
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1	
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	



150
125
100
75
50
25

29980 30000 30020 30040 30060 30080 30100 30120 30140 30160 30180 30200

RILEY

SLIDEINTERPRET 9.028

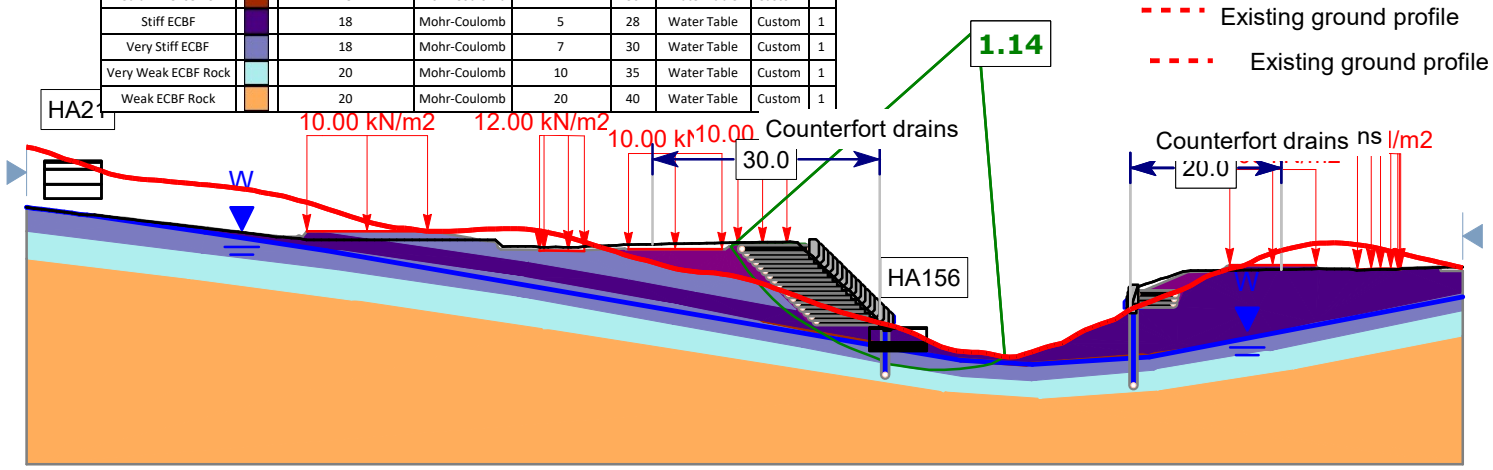
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL, Remedials, Loads (L-R)	*Scenario*	Extreme (Worst Credible GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd

▶ 0.19

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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Palisade wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	480	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20

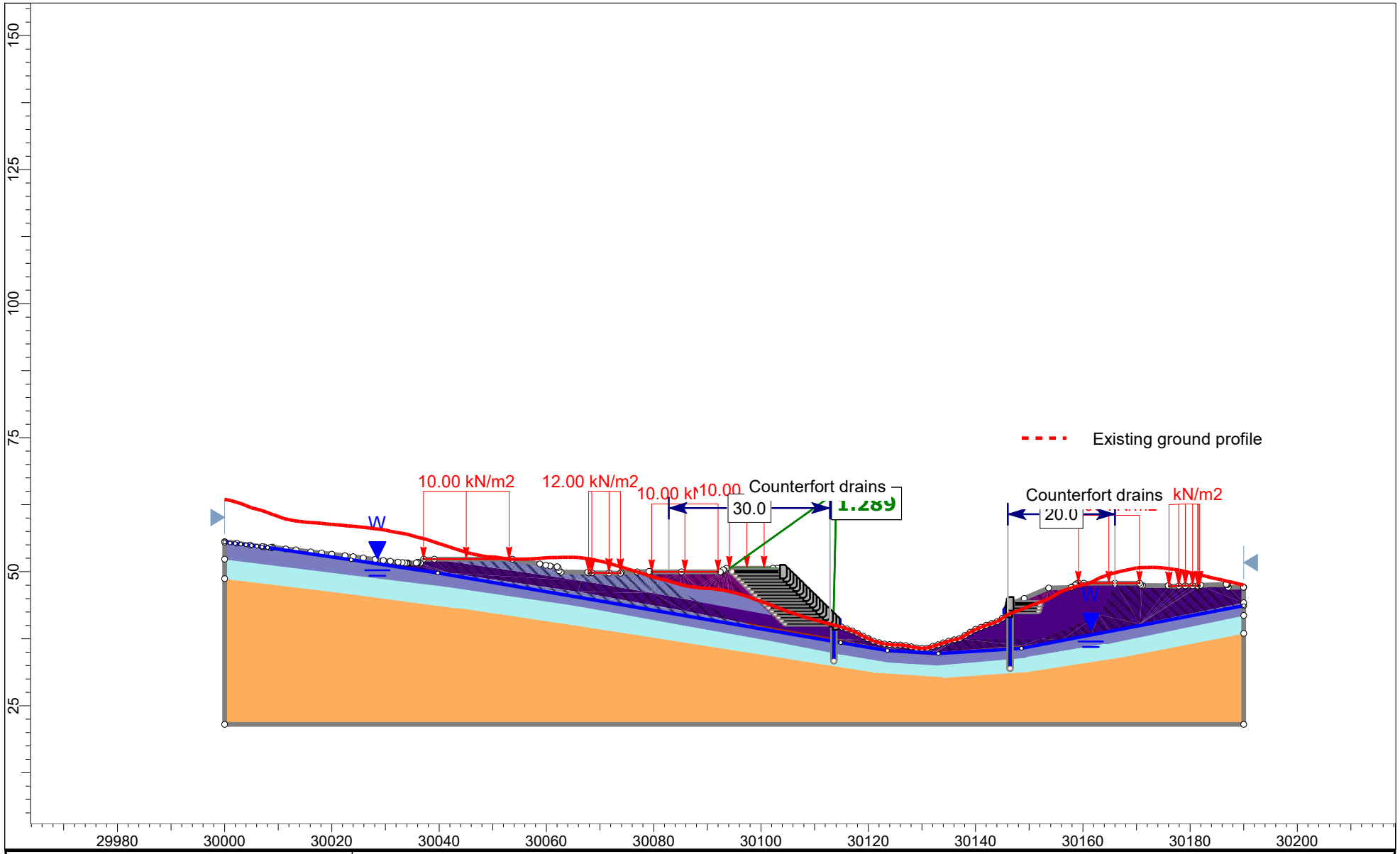
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Medium Dense ECBF		18	Mohr-Coulomb	2	30	Water Table	Custom	1
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1
Very Stiff ECBF		18	Mohr-Coulomb	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



RILEY

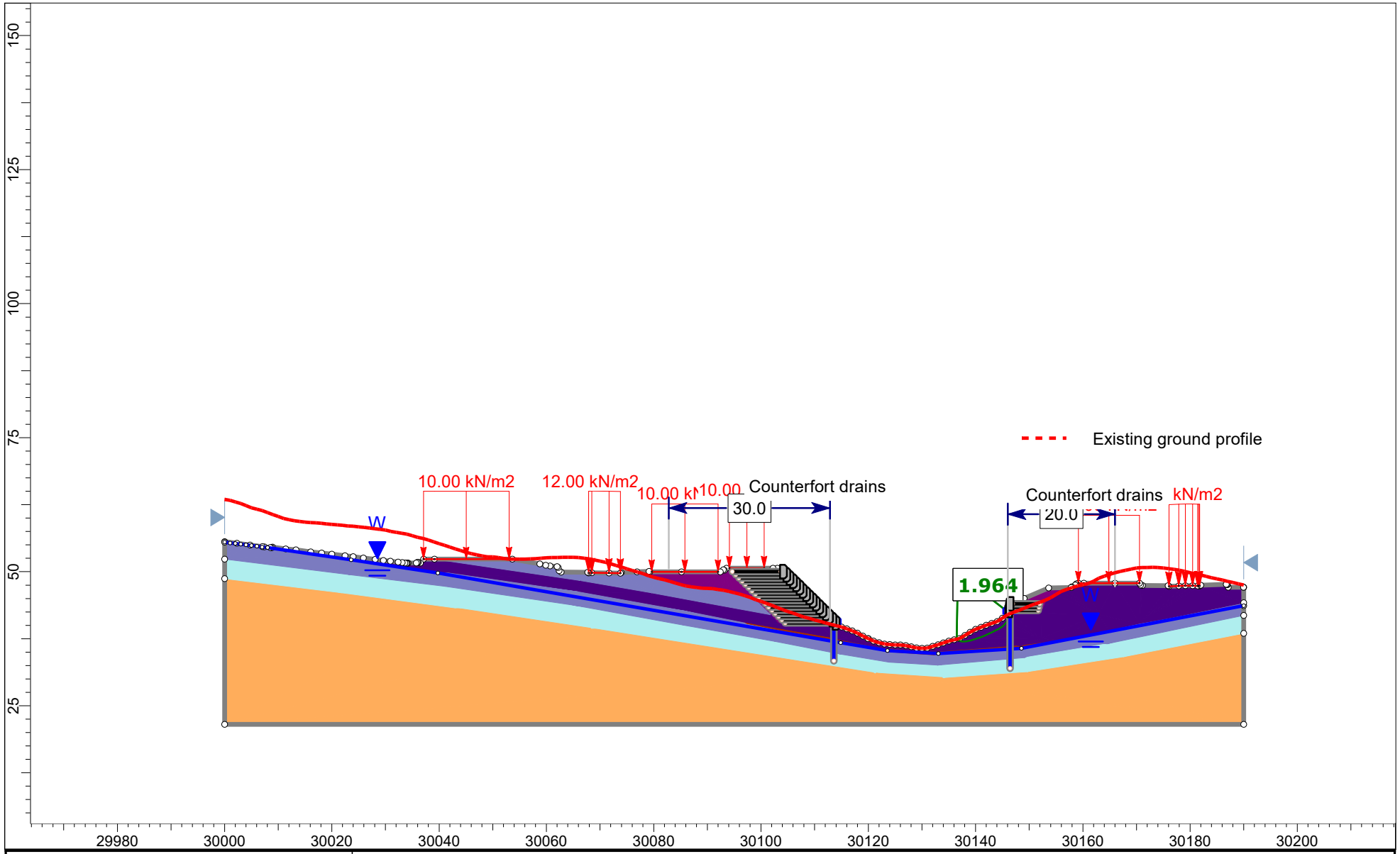
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL, Remedials, Loads (L-R)	*Scenario*	Seismic (0.19g)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd



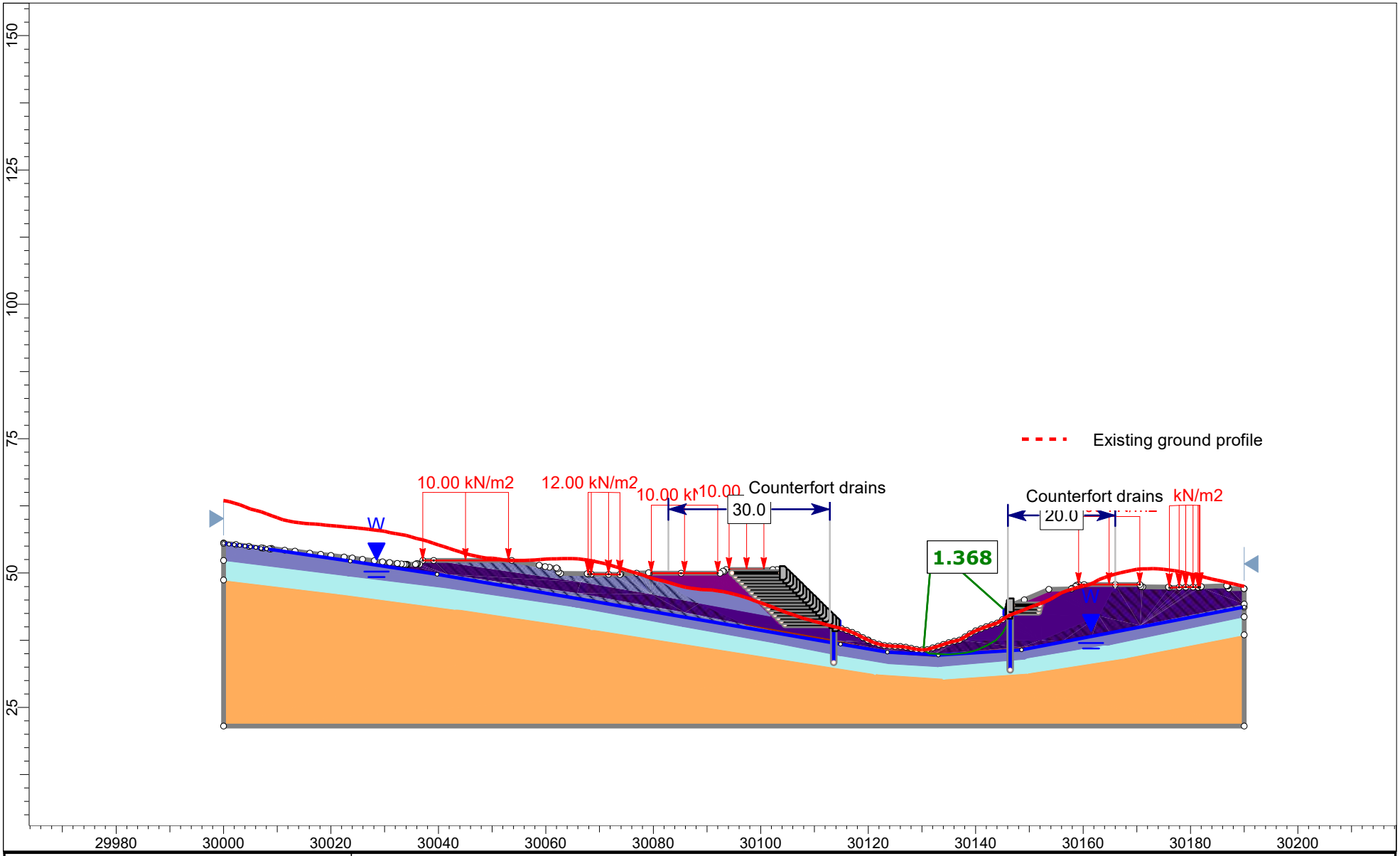
RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AD Proposed GL, Remedials, Loads (L-R)	*Scenario* Extreme (50% saturation)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AD.slmd

SLIDEINTERPRET 9.028

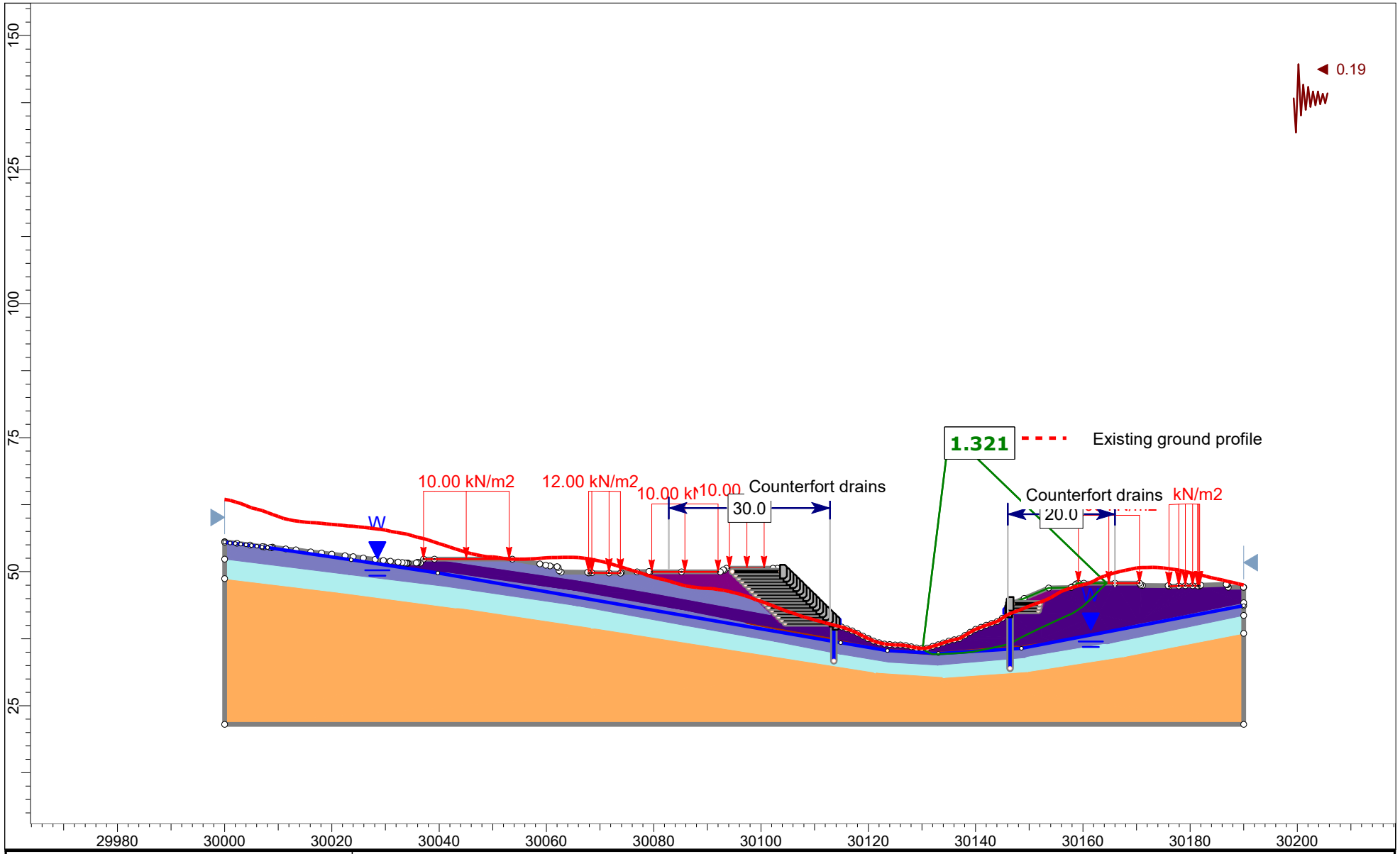


RILEY	Project	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AD Proposed GL, Remedials, Loads (R-L)	Scenario: Normal (Measured GW)
	Drawn By	RS	Company: Riley Consulants Ltd
	Date	10/12/2024	File Name: Section AD.slmd

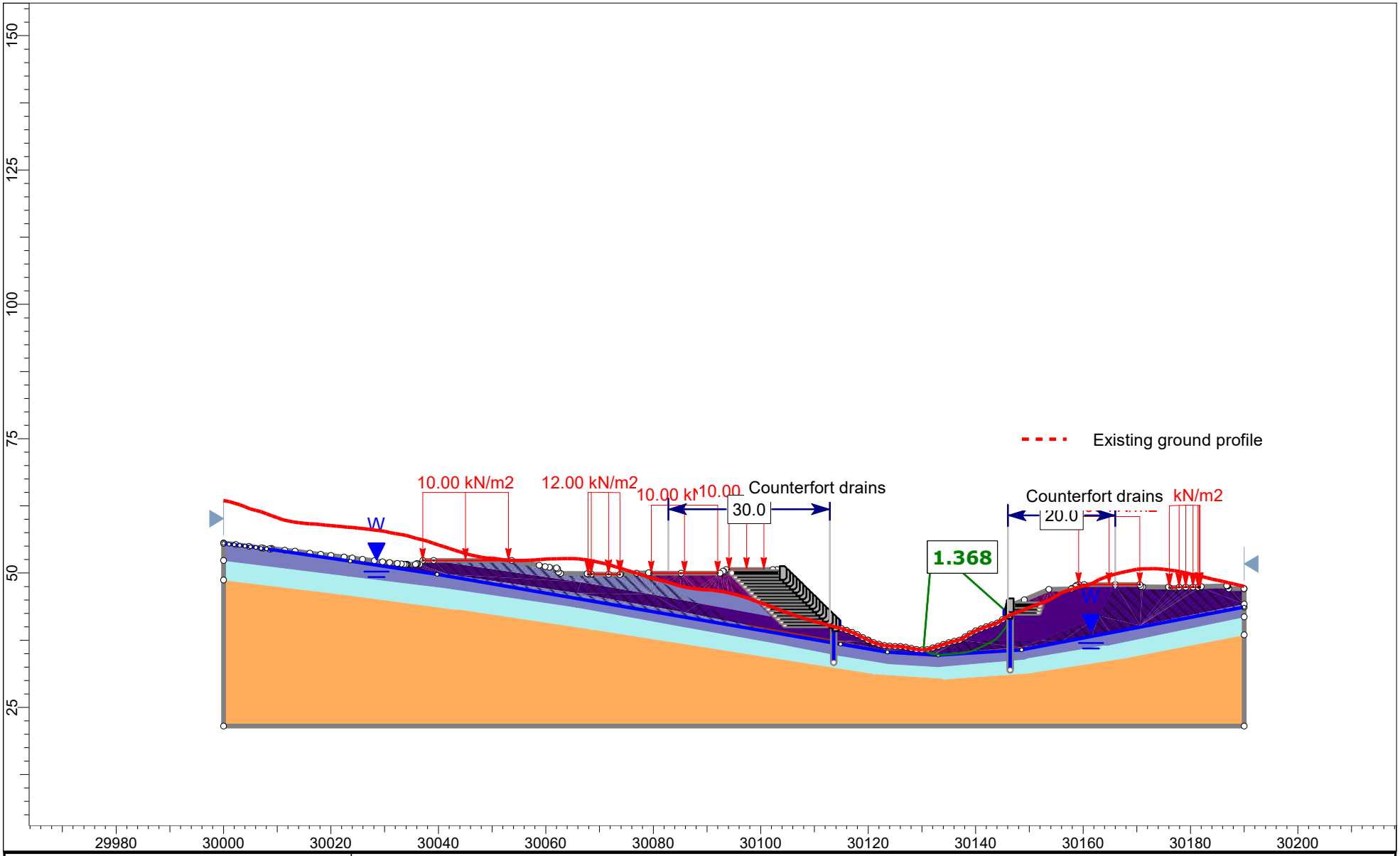
SLIDEINTERPRET 9.028



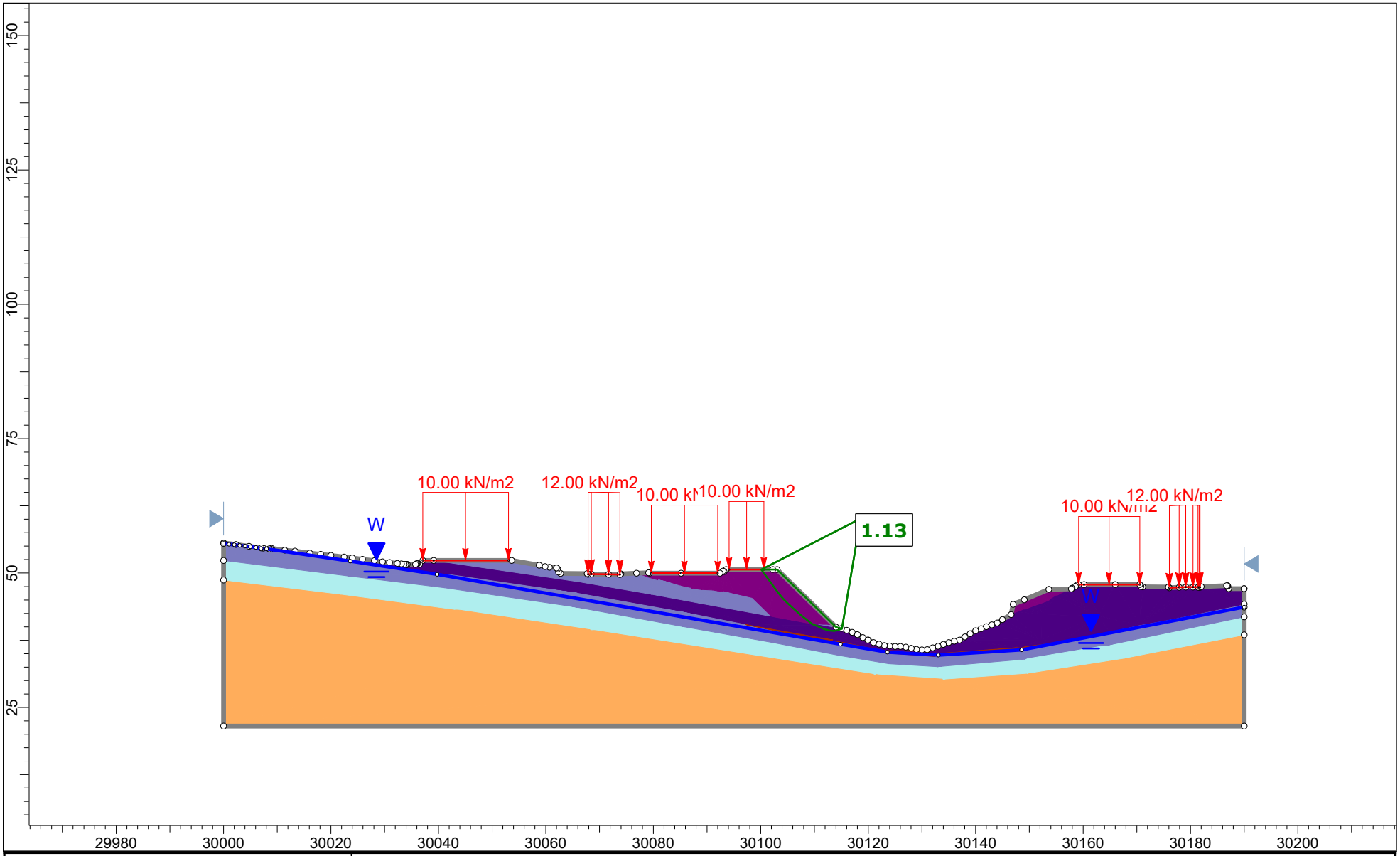
RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AD Proposed GL, Remedials, Loads (R-L)	*Scenario* Extreme (Worst Credible GW)
	Drawn By	RS	*Company* Riley Consulants Ltd
SLIDEINTERPRET 9.028	*Date*	10/12/2024	*File Name* Section AD.slmd



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AD Proposed GL, Remedials, Loads (R-L)	*Scenario* Seismic (0.19g)
	Drawn By	RS	*Company* Riley Consulants Ltd
SLIDEINTERPRET 9.028	*Date*	10/12/2024	*File Name* Section AD.slmd



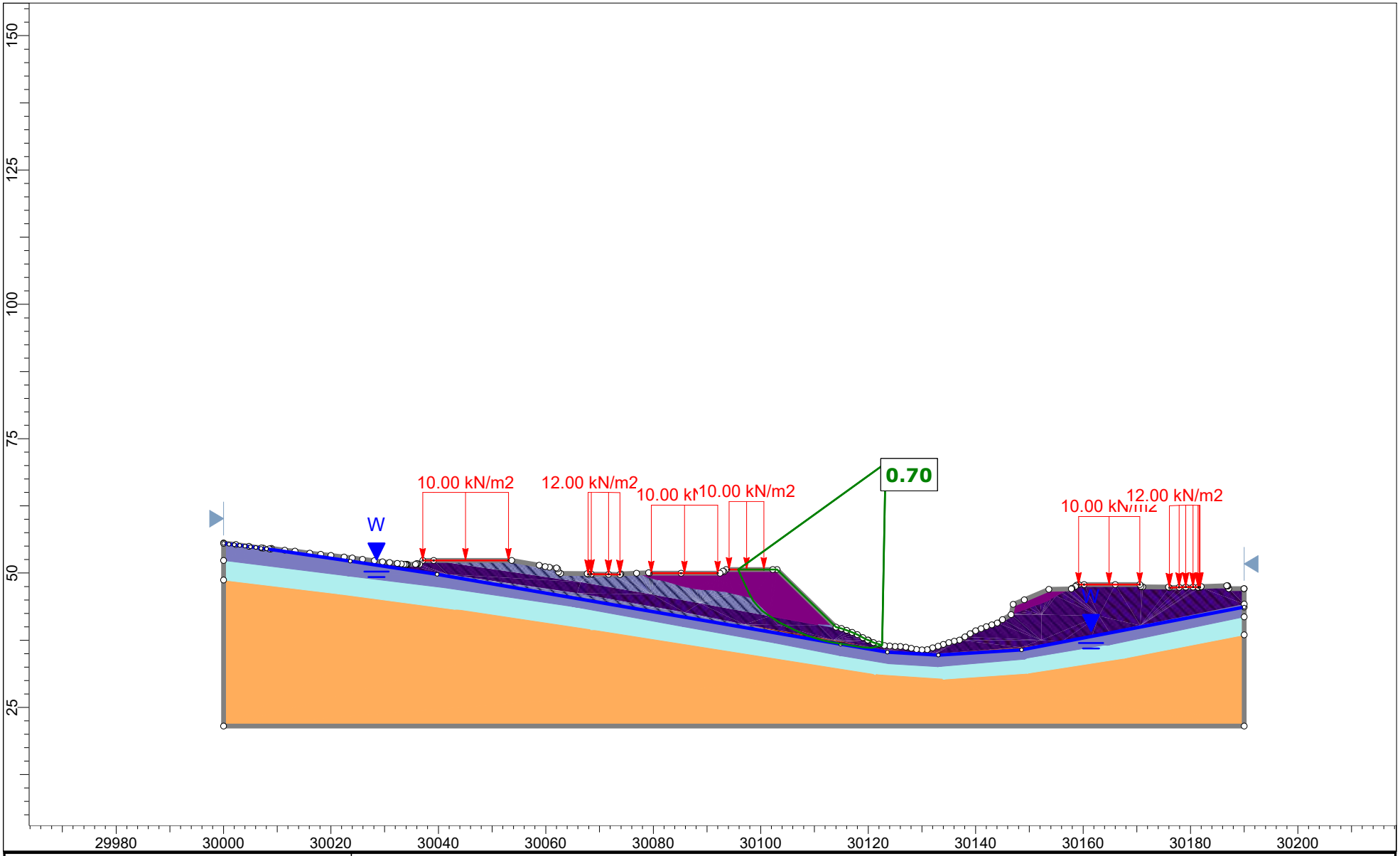
RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AD Proposed GL, Remedials, Loads (R-L)	*Scenario* Extreme (50% saturation)
	Drawn By	RS	*Company* Riley Consulants Ltd
SLIDEINTERPRET 9.028	*Date*	10/12/2024	*File Name* Section AD.slmd



RILEY

SLIDEINTERPRET 9.028

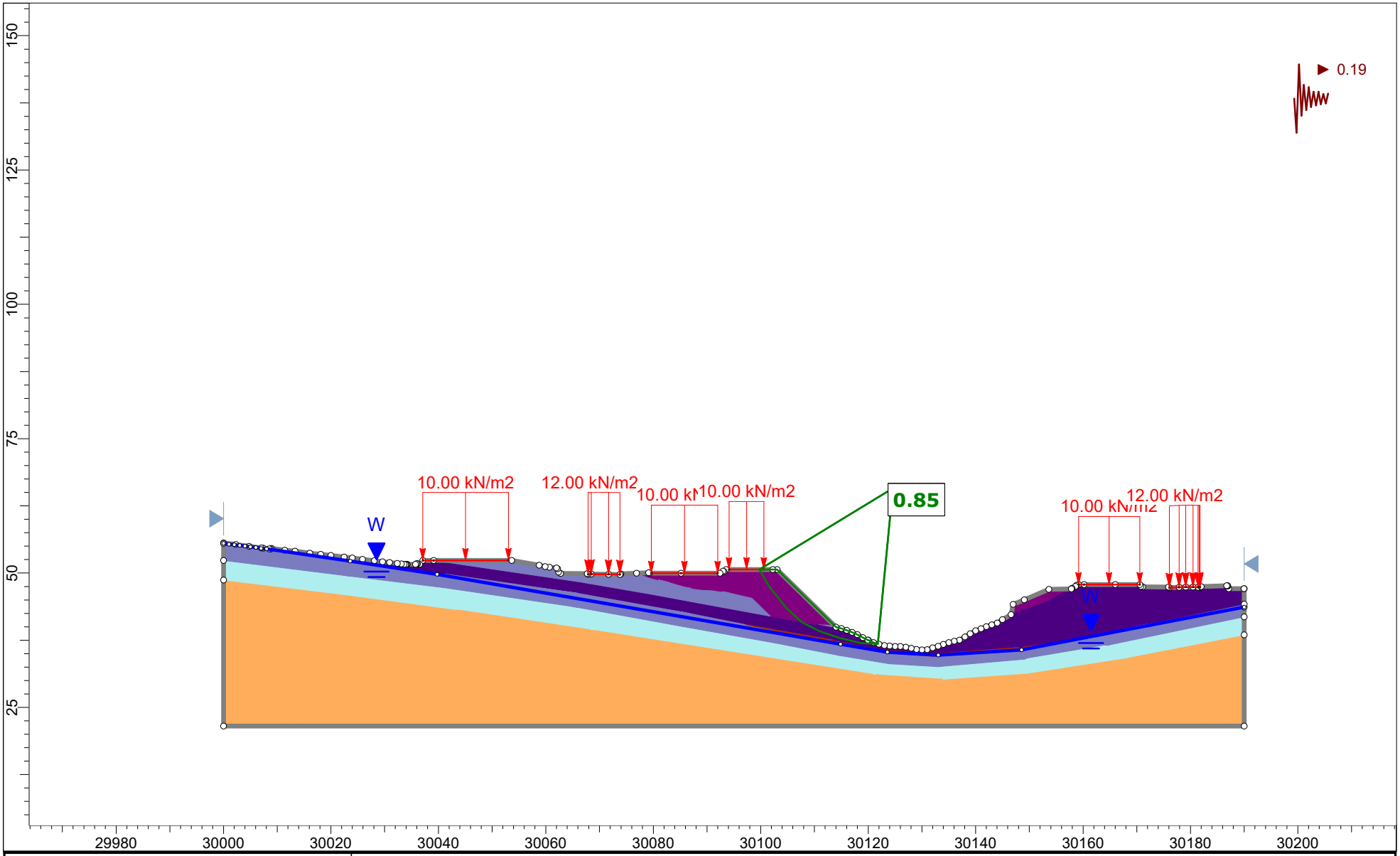
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL (L-R)	*Scenario*	Normal (Measured GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd



RILEY

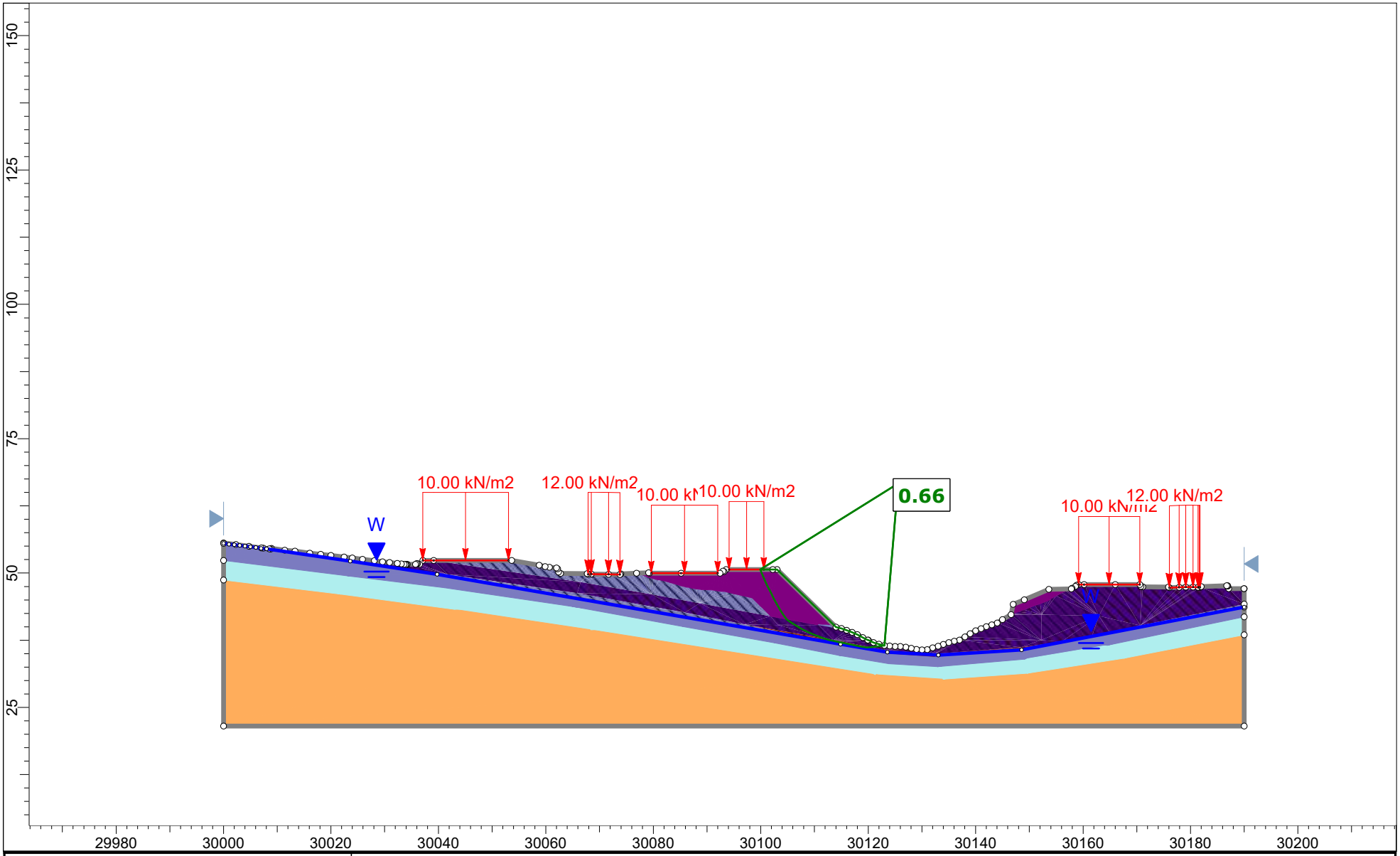
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL (L-R)	*Scenario*	Extreme (Worst Credible GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AD Proposed GL (L-R)	*Scenario* Seismic (0.19g)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AD.slmd

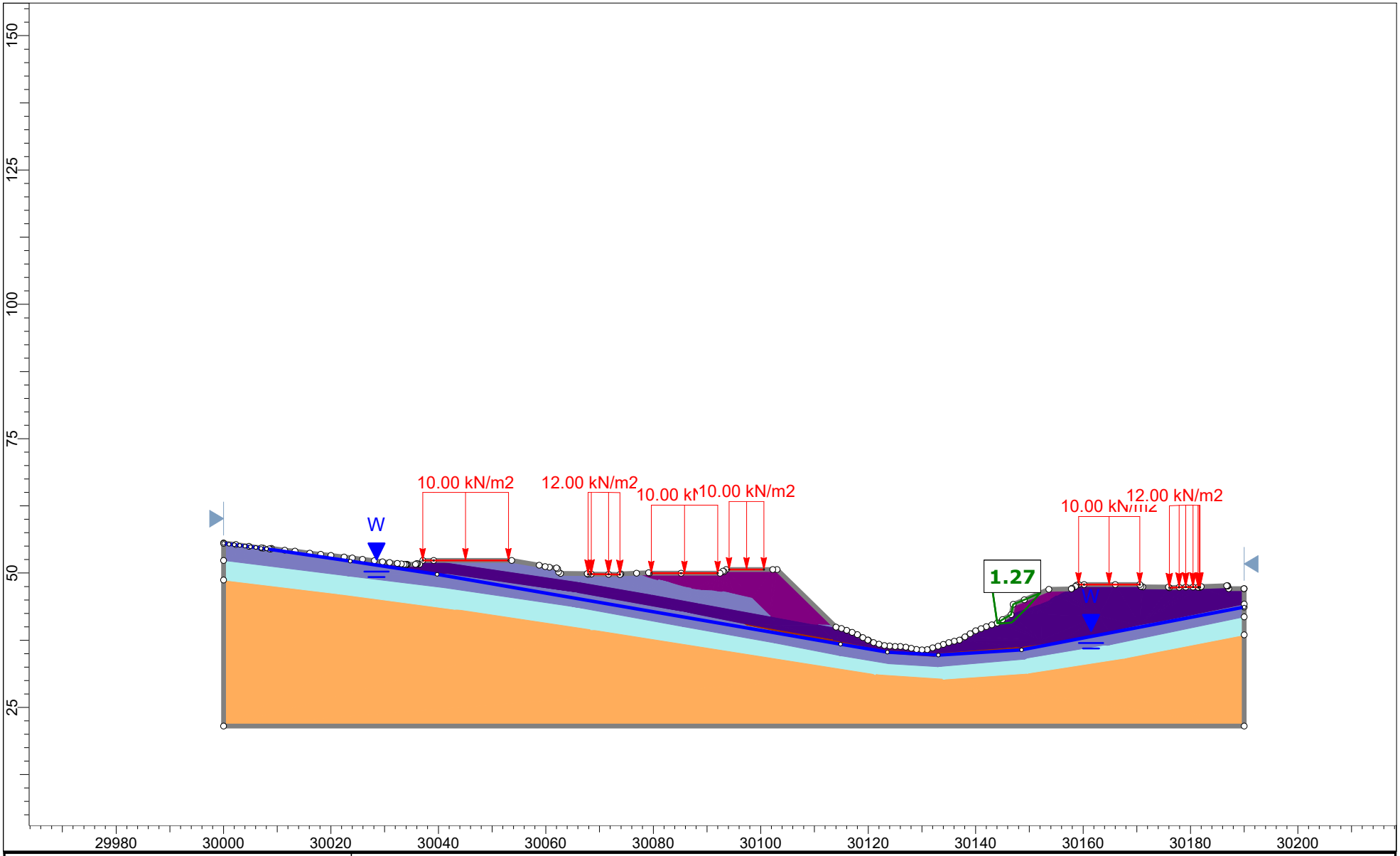
SLIDEINTERPRET 9.028



RILEY

SLIDEINTERPRET 9.028

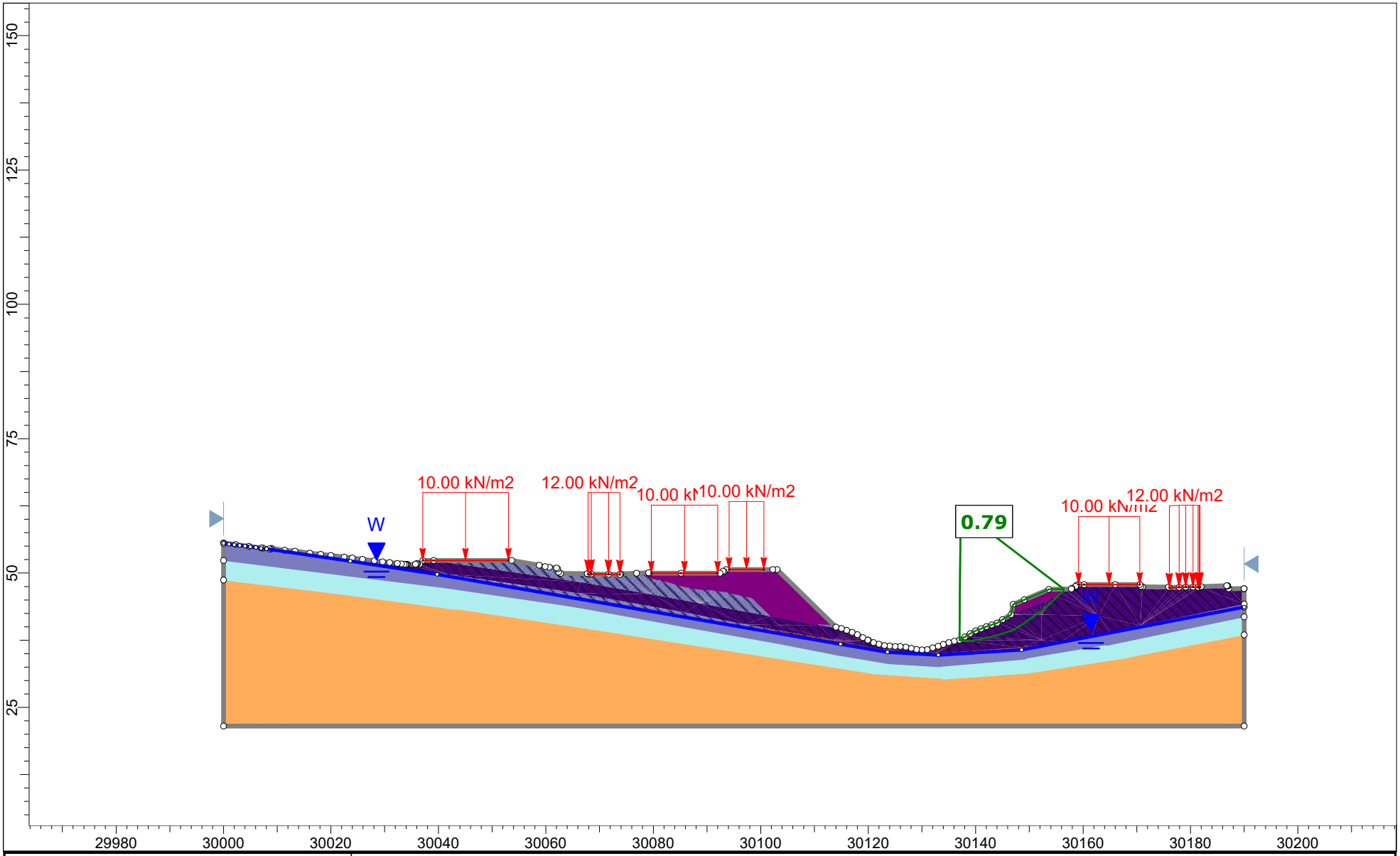
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL (L-R)	*Scenario*	Extreme (50% saturation)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd



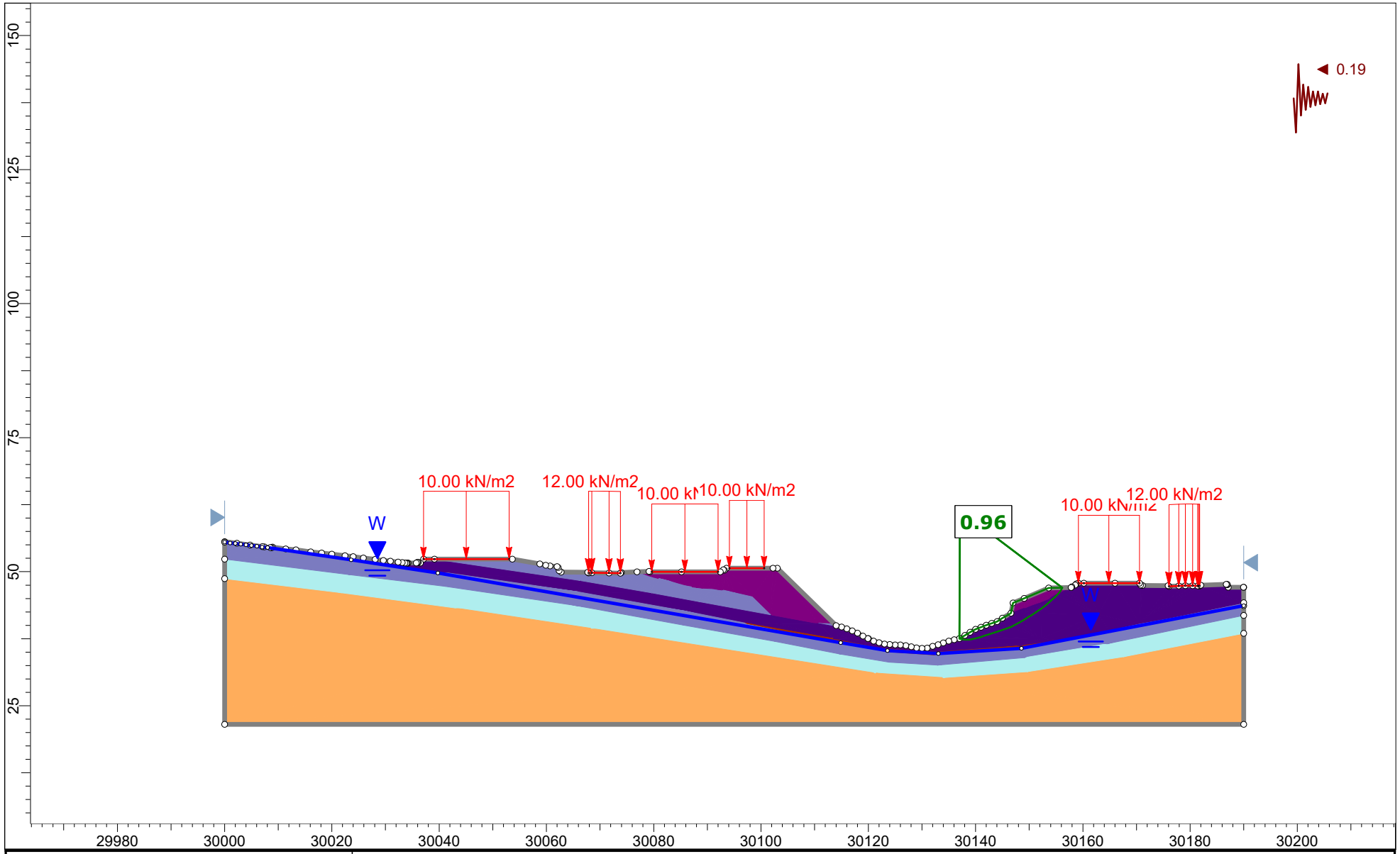
RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL (R-L)	*Scenario*	Normal (Measured GW)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd



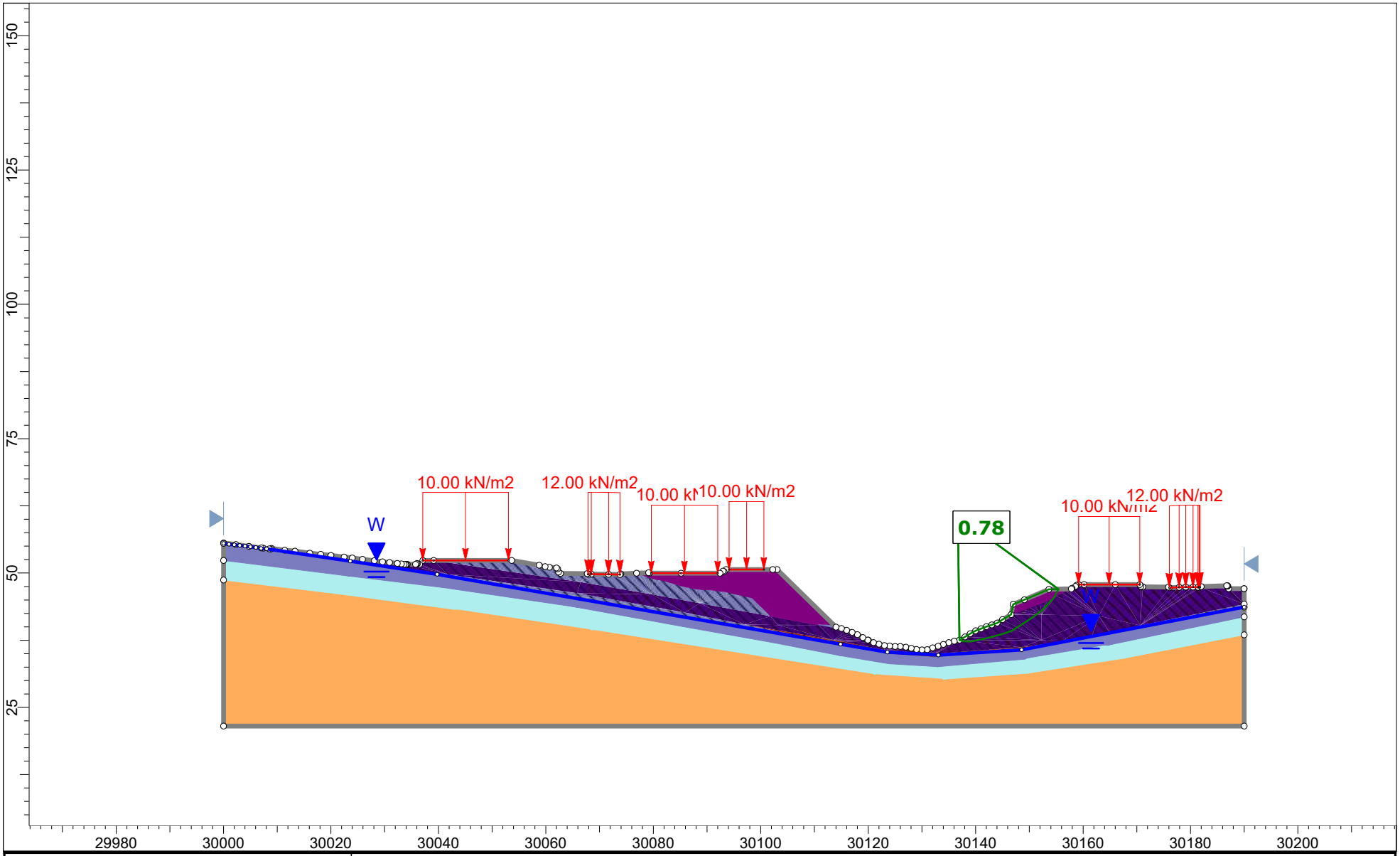
RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AD Proposed GL (R-L)	*Scenario* Extreme (Worst Credible GW)
	Drawn By	RS	*Company* Riley Consulants Ltd
SLIDEINTERPRET 9.028	*Date*	10/12/2024	*File Name* Section AD.slmd



RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL (R-L)	*Scenario*	Seismic (0.19g)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd



RILEY

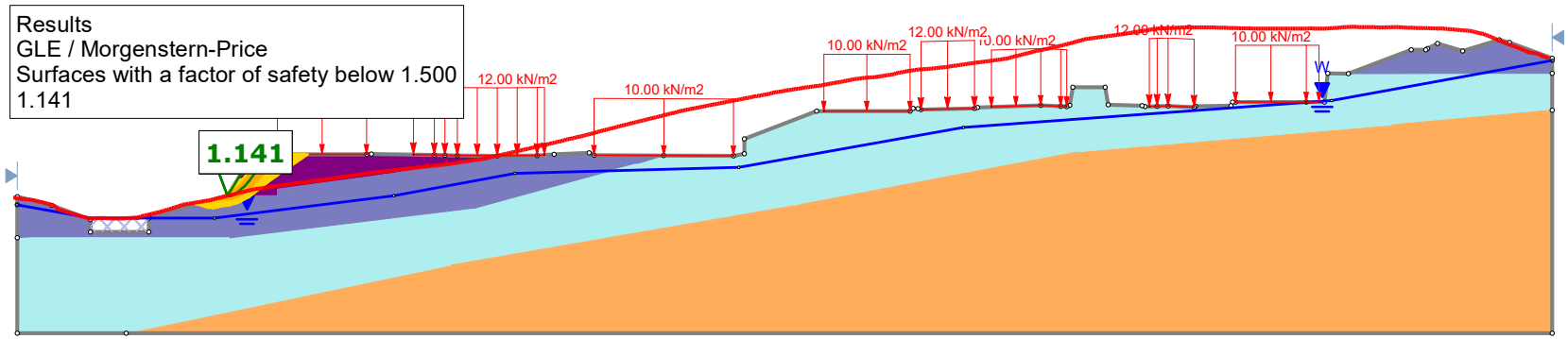
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AD Proposed GL (R-L)	*Scenario*	Extreme (50% saturation)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AD.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	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

Existing ground profile

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
1.141



100
75
50
25
0
-25

0 20 40 60 80 100 120 140 160 180 200 220

RILEY

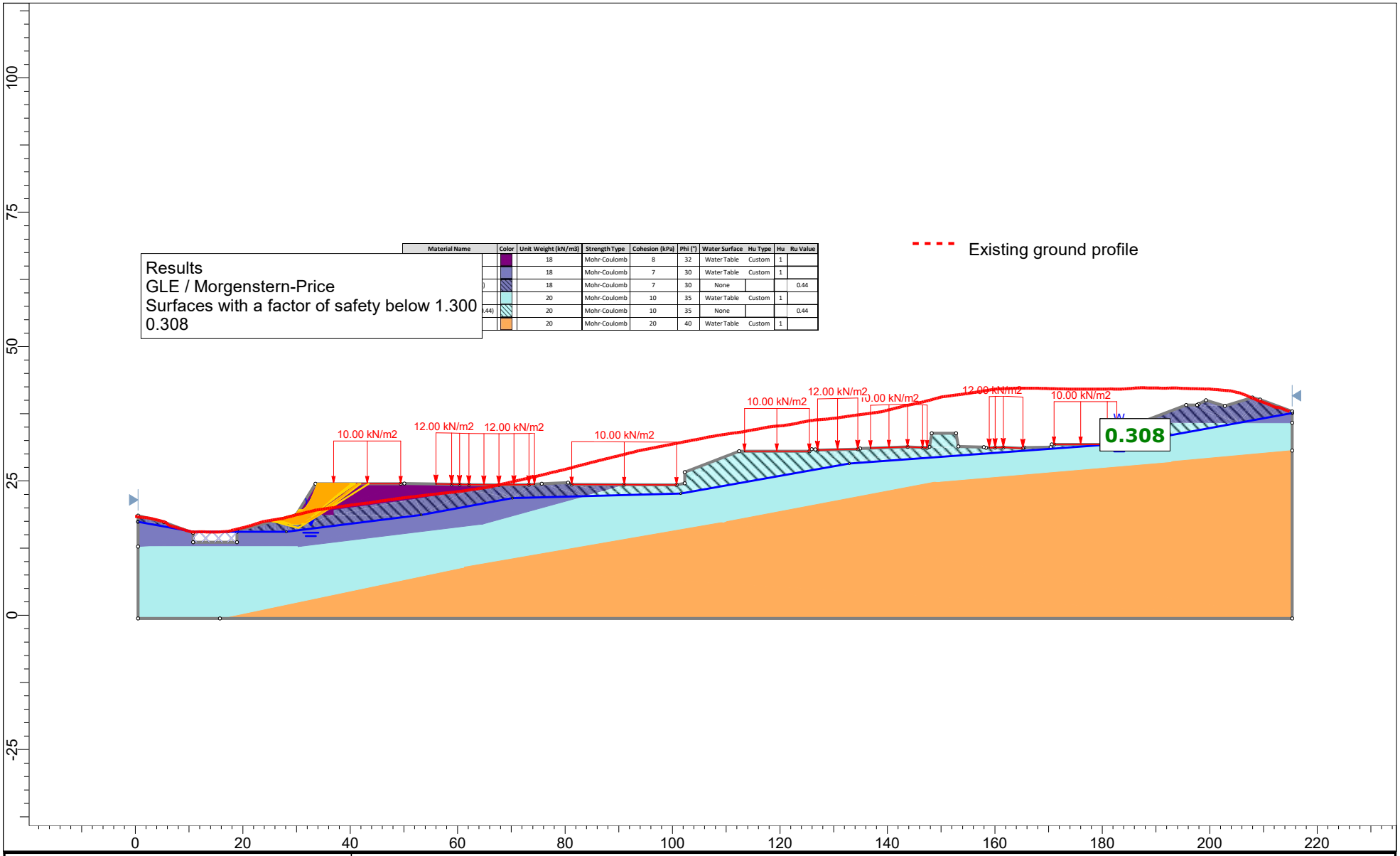
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui		
Group	Proposed GL - Section AE	*Scenario*	Normal GW
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	3/11/2025	*File Name*	Section AE (AB).slmd

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
0.308

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
		18	Mohr-Coulomb	7	30	None			0.44
		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
		20	Mohr-Coulomb	10	35	None			0.44
		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

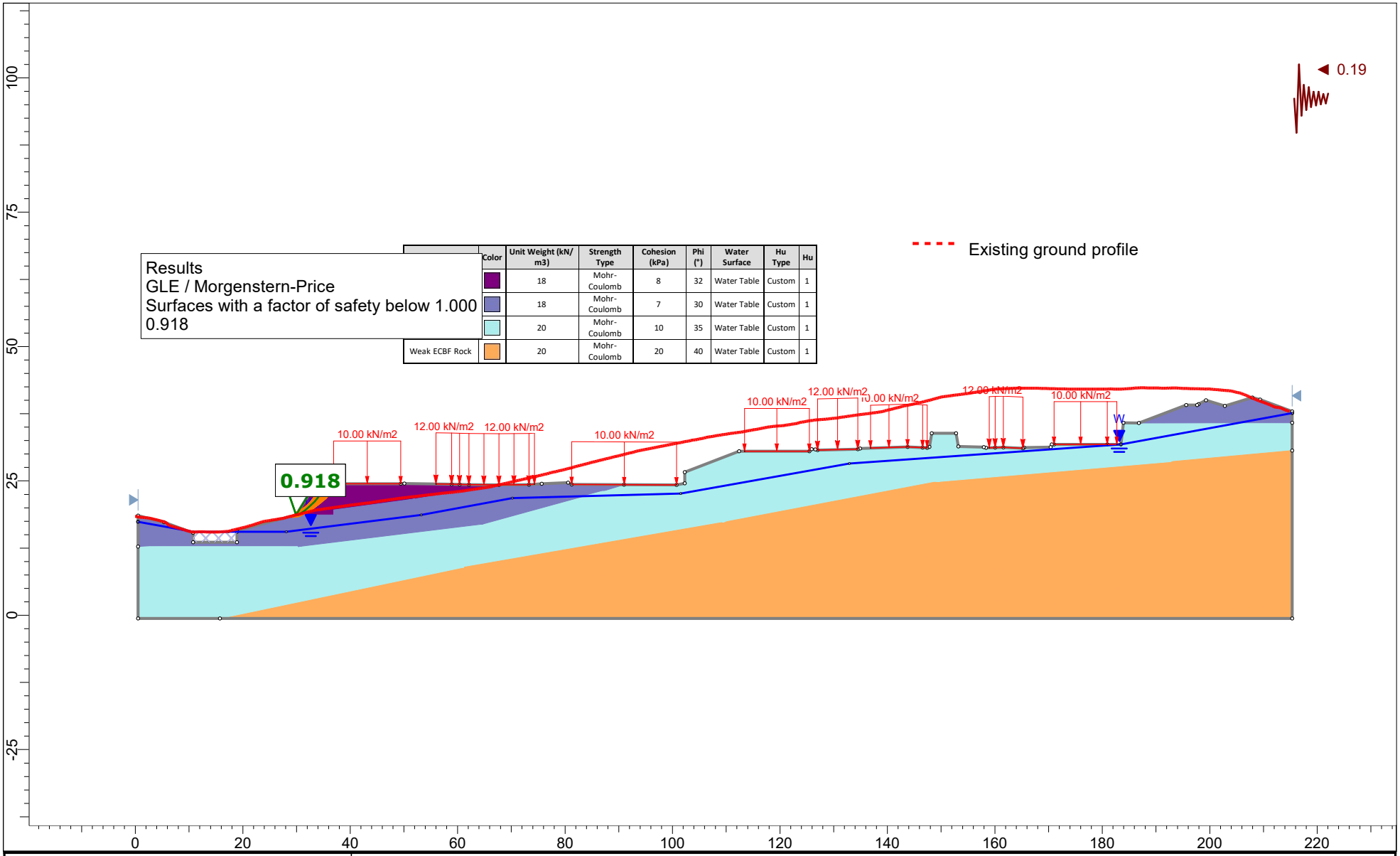
Existing ground profile



RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui		
Group	Proposed GL - Section AE	*Scenario*	Worst credible GW
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	3/11/2025	*File Name*	Section AE (AB).slmd



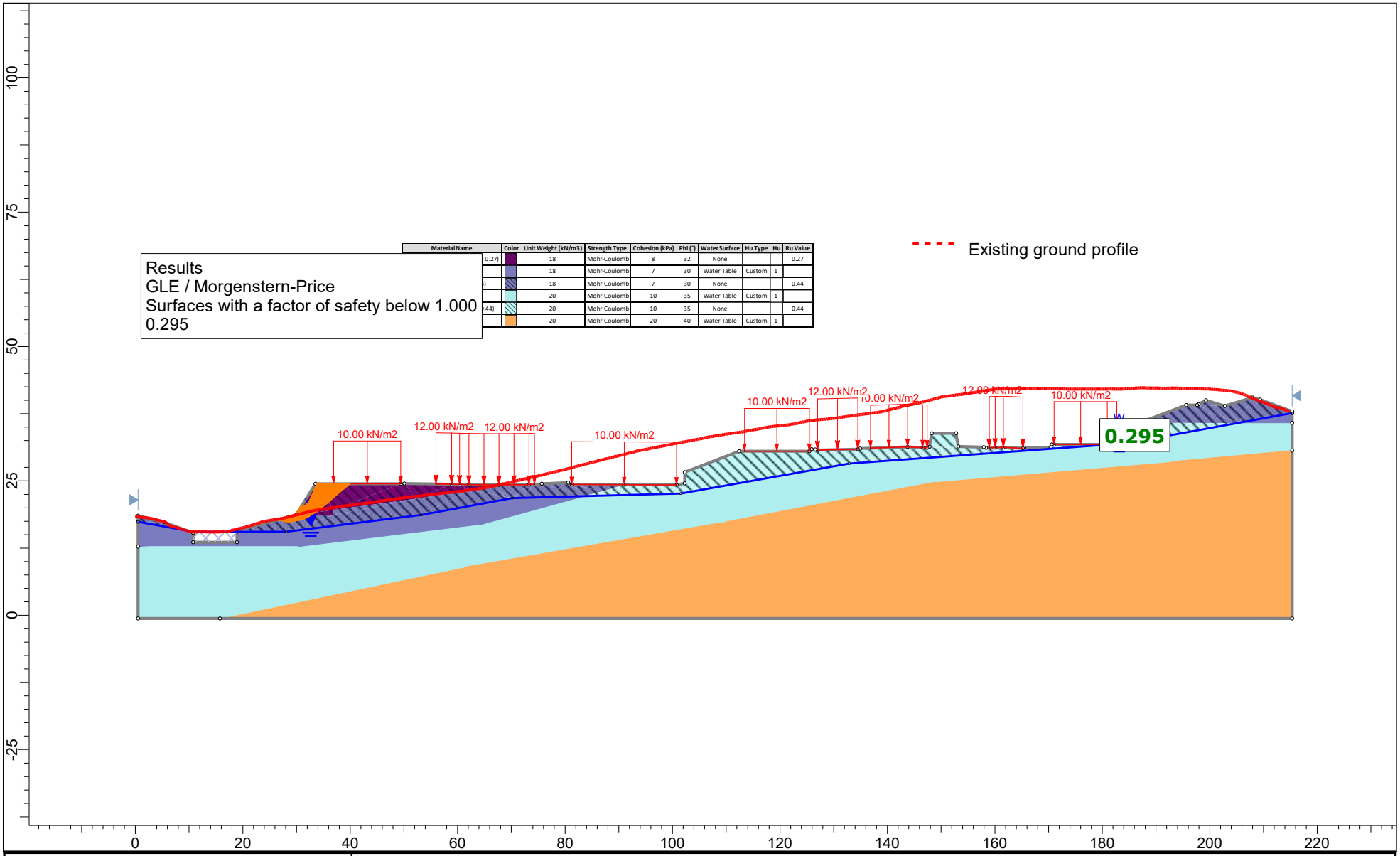
RILEY	*Project*	240065 - Russell Road, Wainui	
	Group	Proposed GL - Section AE	*Scenario* Seismic (0.19g)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	3/11/2025	*File Name* Section AE (AB).slmd

SLIDEINTERPRET 9.028

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.295

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
		18	Mohr-Coulomb	8	32	None			0.27
		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
		18	Mohr-Coulomb	7	30	None			0.44
		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
		20	Mohr-Coulomb	10	35	None			0.44
		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Existing ground profile



RILEY

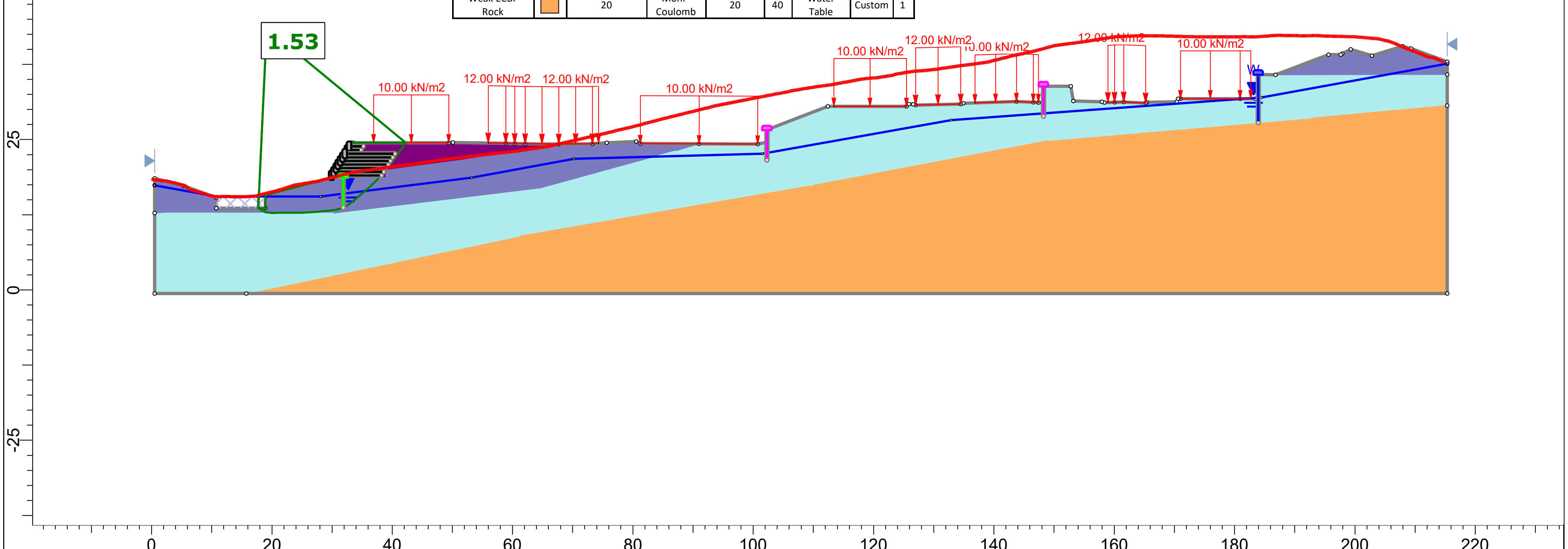
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui		
Group	Proposed GL - Section AE	*Scenario*	50% fill saturation
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	3/11/2025	*File Name*	Section AE (AB).slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
310UC137 Shear Piles	green	Pile/Micro Pile	Active (Method A)	1						Shear	640	Parallel to surface						
Geogrid	black	Geosynthetic	Active (Method A)		No	Friction Angle & Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Retaining Wall 1	blue	Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						
Retaining Wall 2	magenta	Pile/Micro Pile	Active (Method A)	1.5						Shear	100	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
1.53

aterial Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
ngineered Fill	purple	18	Mohr-Coulomb	8	32	Water Table	Custom	1
ery Stiff ECBF	lavender	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



RILEY

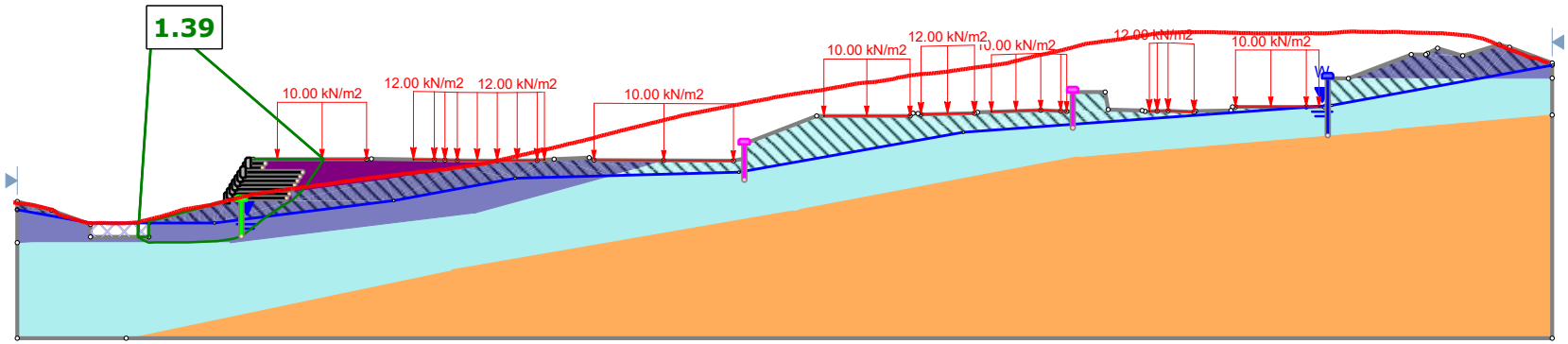
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui		
Group	Proposed GL - Section AE - Remedials & erosion	*Scenario*	Normal GW
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	3/11/2025	*File Name*	Section AE (AB).slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
310UC137 Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	640	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Retaining Wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						
Retaining Wall 2		Pile/Micro Pile	Active (Method A)	1.5						Shear	100	Parallel to surface						

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
		18	Mohr-Coulomb	7	30	None			0.44
		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
		20	Mohr-Coulomb	10	35	None			0.44
		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
1.39



Existing ground profile

100
75
50
25
0
-25
0
20
40
60
80
100
120
140
160
180
200
220

RILEY

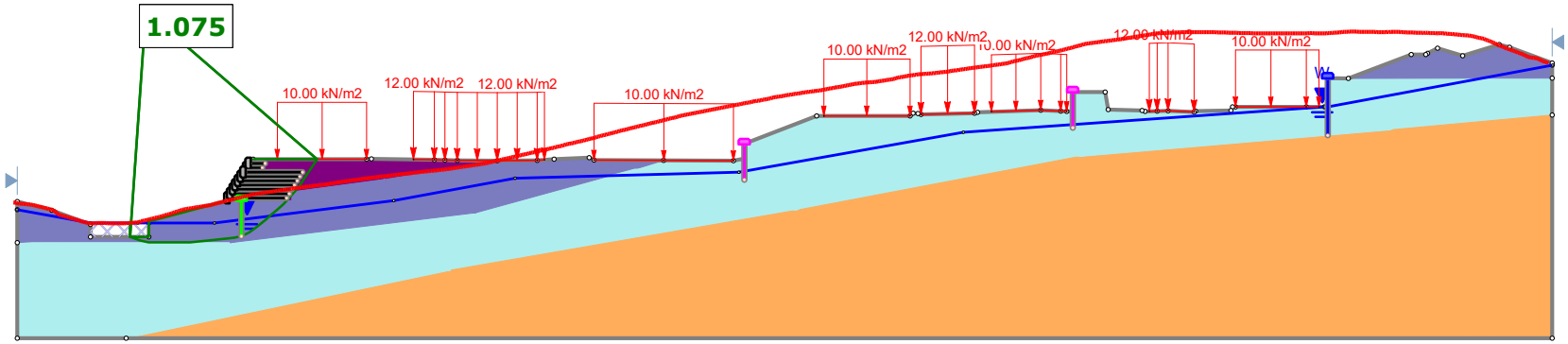
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui		
Group	Proposed GL - Section AE - Remedials & erosion	*Scenario*	Worst credible GW
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	3/11/2025	*File Name*	Section AE (AB).slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
310UC137 Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	640	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Retaining Wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						
Retaining Wall 2		Pile/Micro Pile	Active (Method A)	1.5						Shear	100	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
1.075

	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
		18	Mohr-Coulomb	8	32	Water Table	Custom	1
		18	Mohr-Coulomb	7	30	Water Table	Custom	1
		20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1



Existing ground profile

0.19

100
75
50
25
0
-25

0 20 40 60 80 100 120 140 160 180 200 220

RILEY

SLIDEINTERPRET 9.028

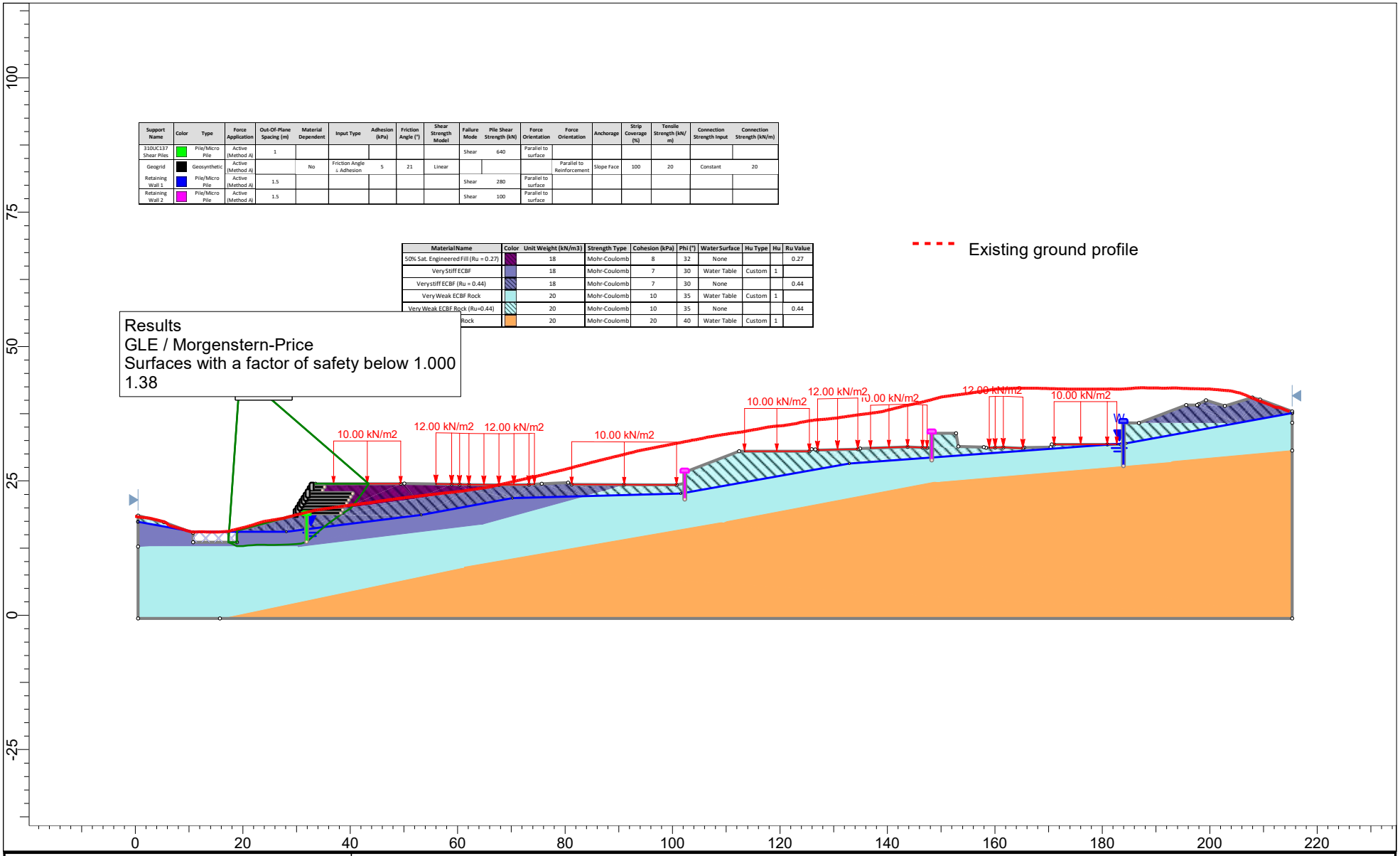
Project	240065 - Russell Road, Wainui		
Group	Proposed GL - Section AE - Remedials & erosion	*Scenario*	Seismic (0.19g)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	3/11/2025	*File Name*	Section AE (AB).slmd

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
310UC137 Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	640	Parallel to surface						
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Retaining Wall 1		Pile/Micro Pile	Active (Method A)	1.5						Shear	280	Parallel to surface						
Retaining Wall 2		Pile/Micro Pile	Active (Method A)	1.5						Shear	100	Parallel to surface						

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
50% Sat. Engineered Fill (Ru = 0.27)		18	Mohr-Coulomb	8	32	None			0.27
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1	

Existing ground profile

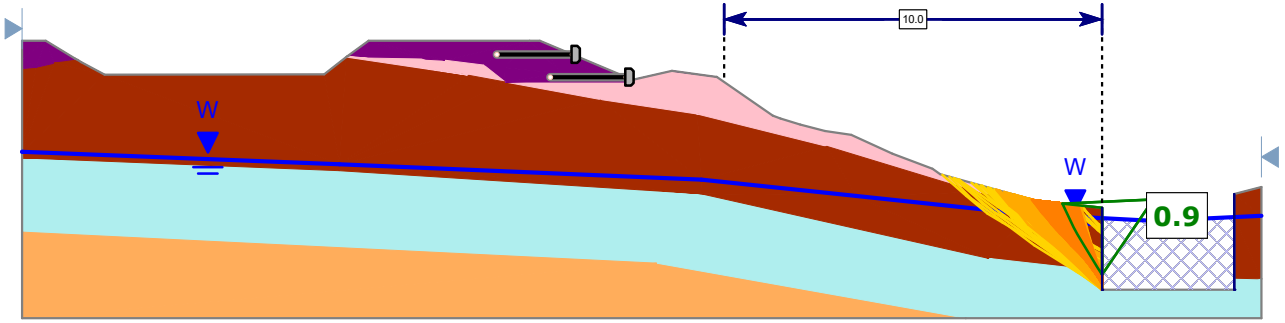
Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
1.38



RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui		
Group	Proposed GL - Section AE - Remedials & erosion	*Scenario*	50% fill saturation
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	3/11/2025	*File Name*	Section AE (AB).slmd



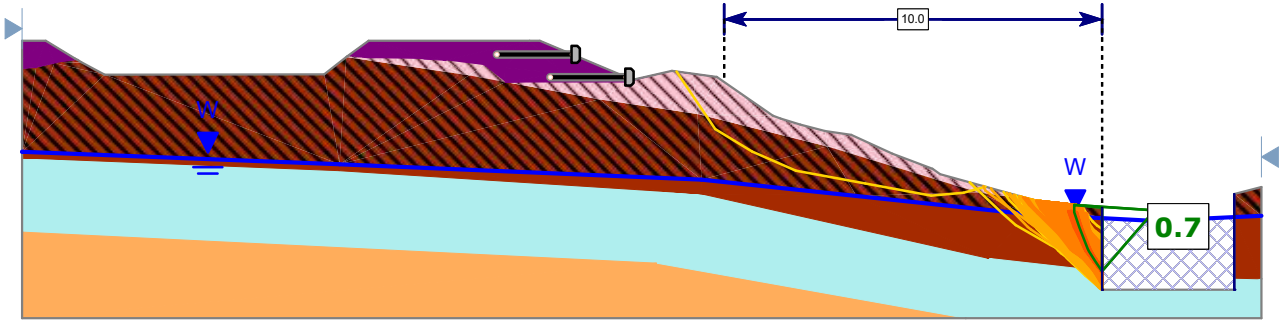
60
55
50
45
40
35

-5 0 5 10 15 20 25 30 35 40

RILEY

SLIDEINTERPRET 9.028

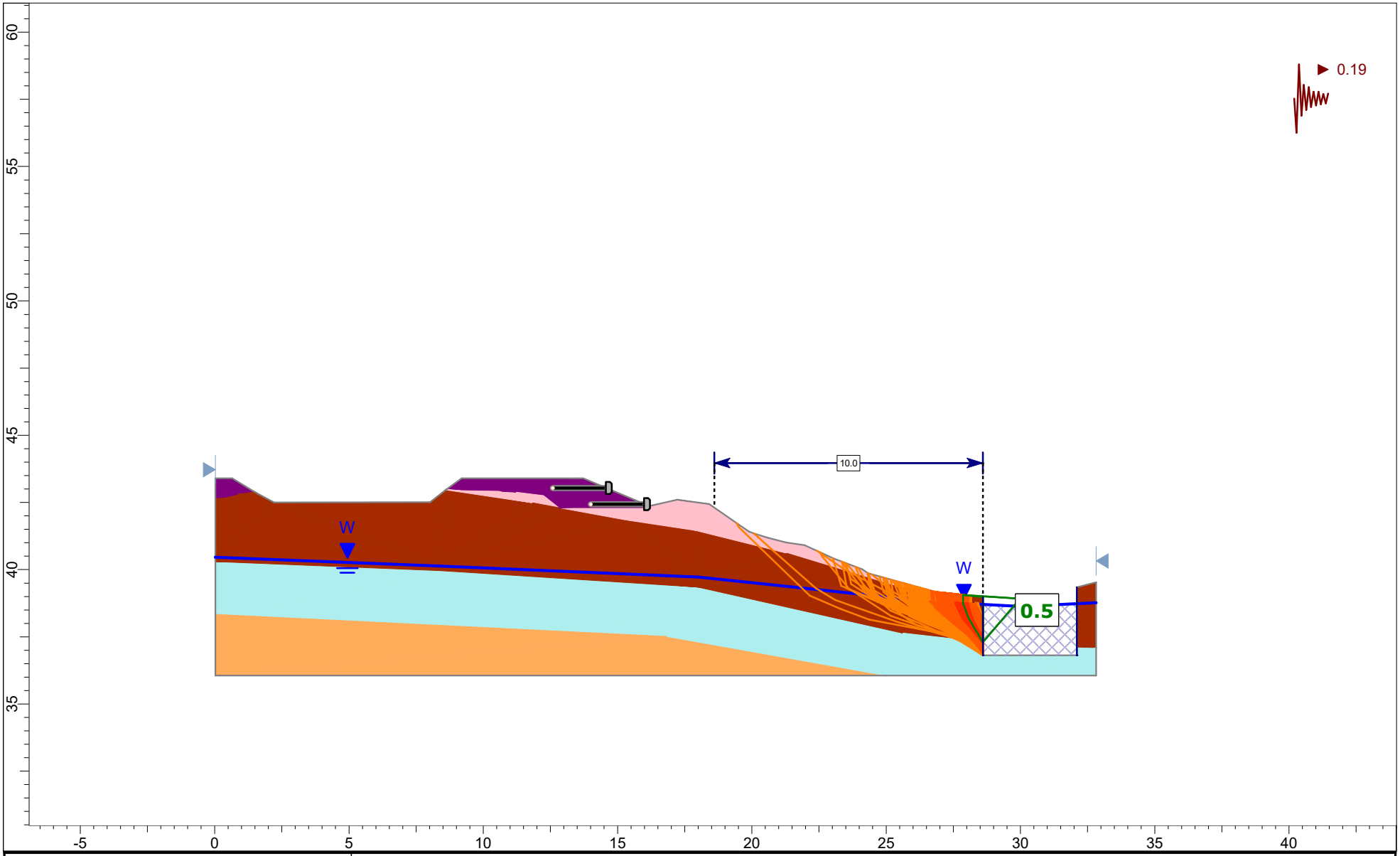
Project	Slide2 - An Interactive Slope Stability Program		
Group	Erosion & Proposed Remedials - Section AF	*Scenario*	Normal GW
Drawn By		*Company*	
Date	4/11/2025, 10:02:12 am	*File Name*	Section AF 2.0.slmd



RILEY

SLIDEINTERPRET 9.028

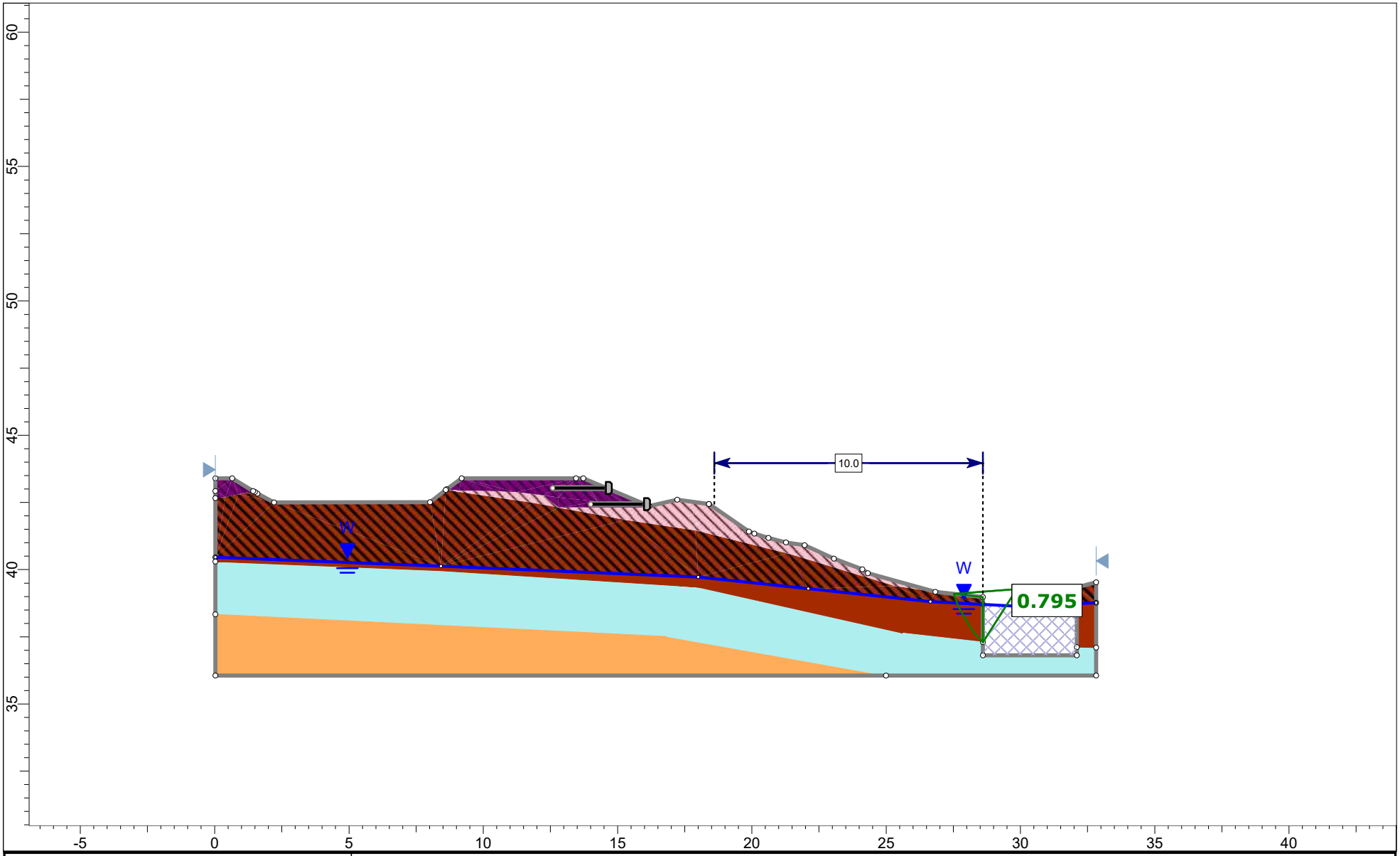
Project	Slide2 - An Interactive Slope Stability Program		
Group	Erosion & Proposed Remedials - Section AF	*Scenario*	Worst Credible GW
Drawn By		*Company*	
Date	4/11/2025, 10:02:12 am	*File Name*	Section AF 2.0.slmd



RILEY

SLIDEINTERPRET 9.028

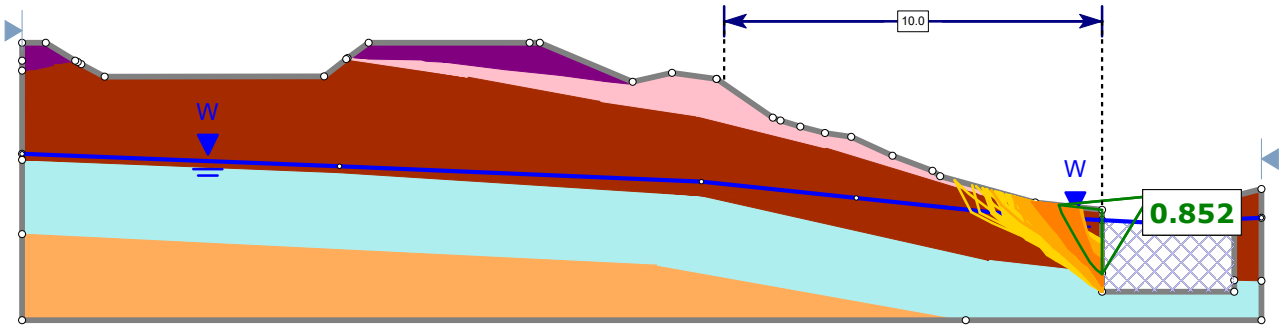
Project	Slide2 - An Interactive Slope Stability Program		
Group	Erosion & Proposed Remedials - Section AF	*Scenario*	Seismic (0.19g)
Drawn By		*Company*	
Date	4/11/2025, 10:02:12 am	*File Name*	Section AF 2.0.slmd



RILEY

SLIDEINTERPRET 9.028

Project	Slide2 - An Interactive Slope Stability Program		
Group	Erosion & Proposed Remedials - Section AF	*Scenario*	Worst Credible GW (50% fill saturation)
Drawn By		*Company*	
Date	4/11/2025, 10:02:12 am	*File Name*	Section AF 2.0.slmd



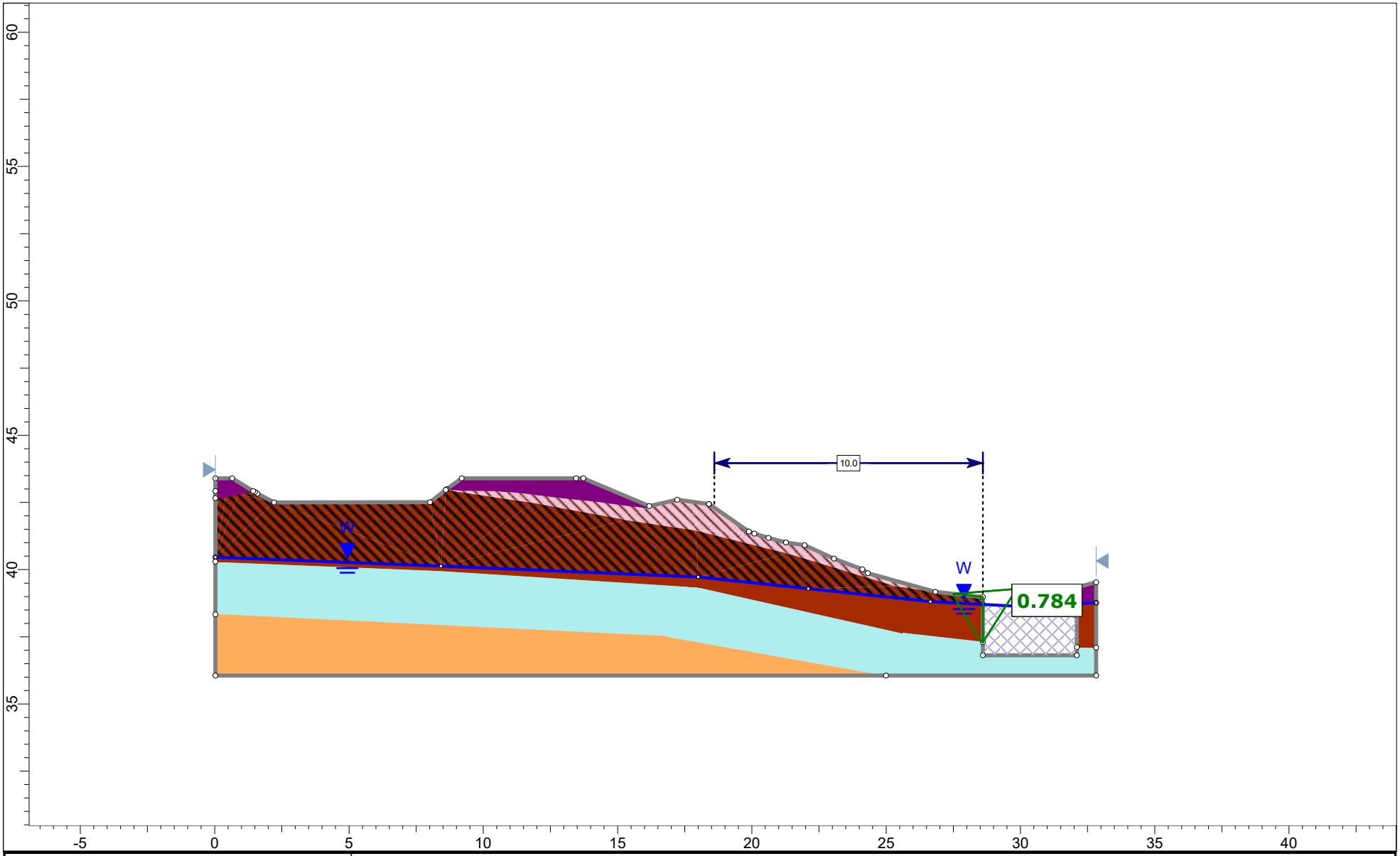
60
55
50
45
40
35

-5 0 5 10 15 20 25 30 35 40

RILEY

SLIDEINTERPRET 9.028

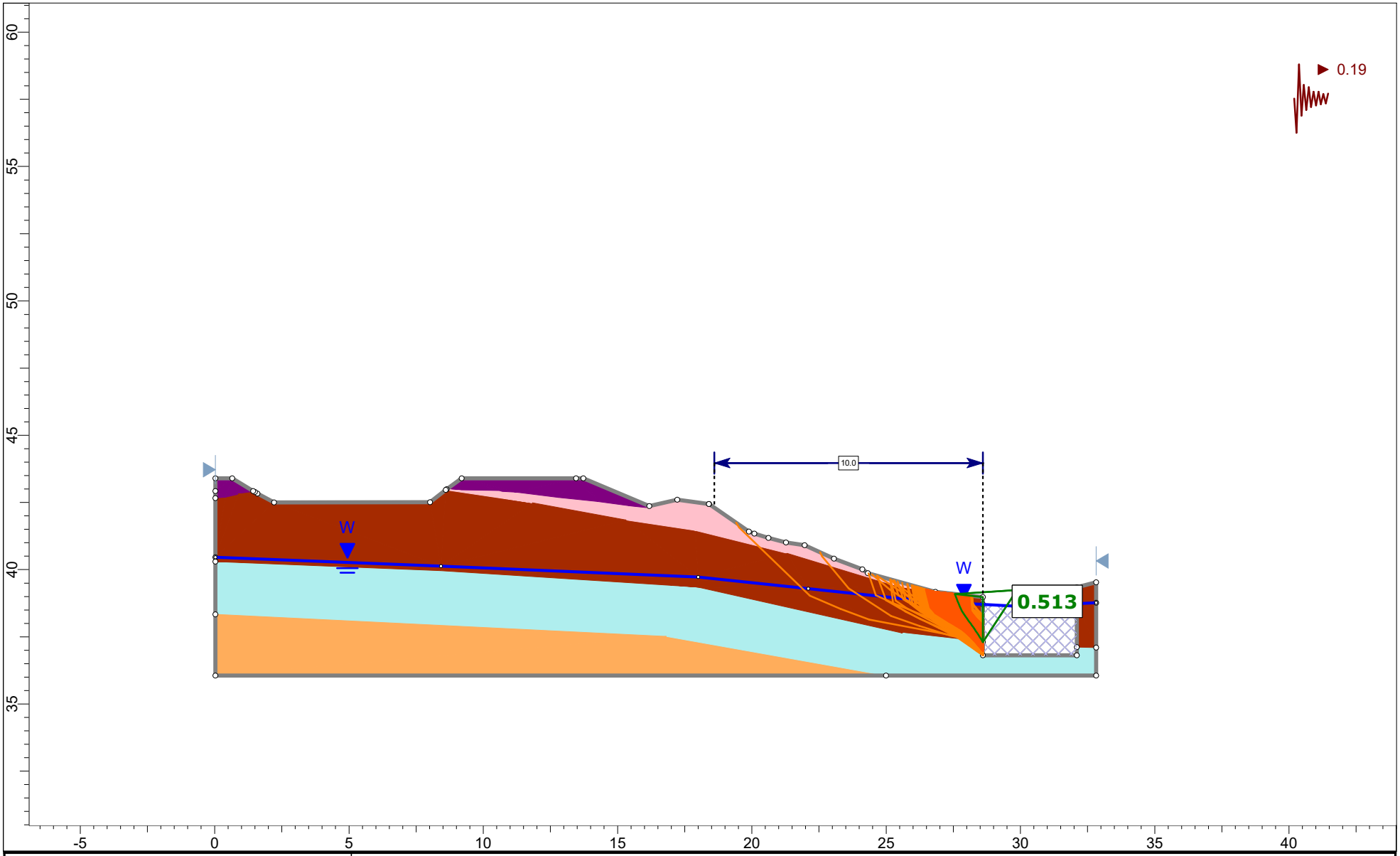
Project	Slide2 - An Interactive Slope Stability Program		
Group	Proposed GL - Section AF	*Scenario*	Normal GW
Drawn By		*Company*	
Date	4/11/2025, 10:02:12 am	*File Name*	Section AF 2.0.slmd



RILEY

SLIDEINTERPRET 9.028

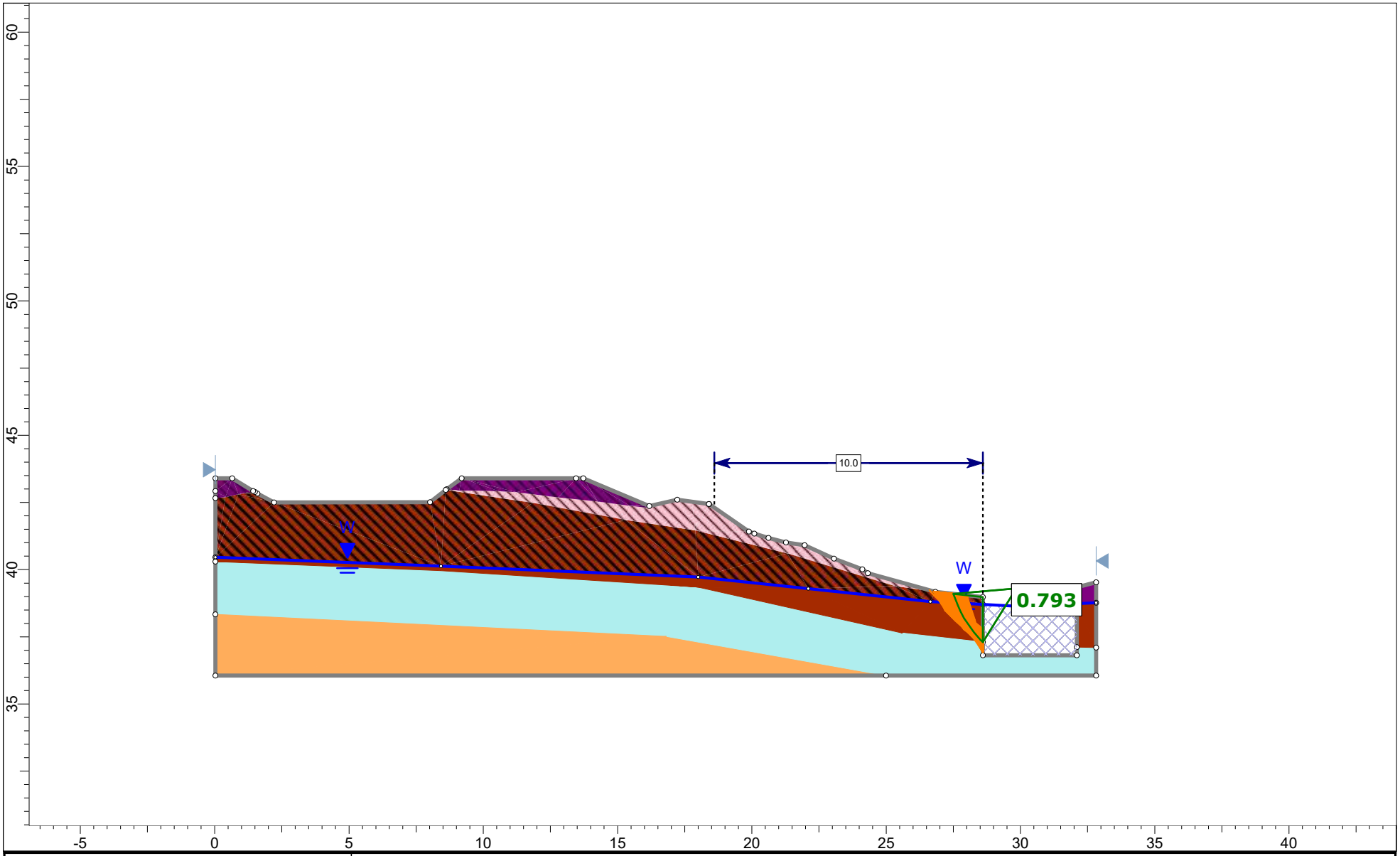
Project	Slide2 - An Interactive Slope Stability Program		
Group	Proposed GL - Section AF	*Scenario*	Worst Credible GW
Drawn By		*Company*	
Date	4/11/2025, 10:02:12 am	*File Name*	Section AF 2.0.slmd



RILEY

SLIDEINTERPRET 9.028

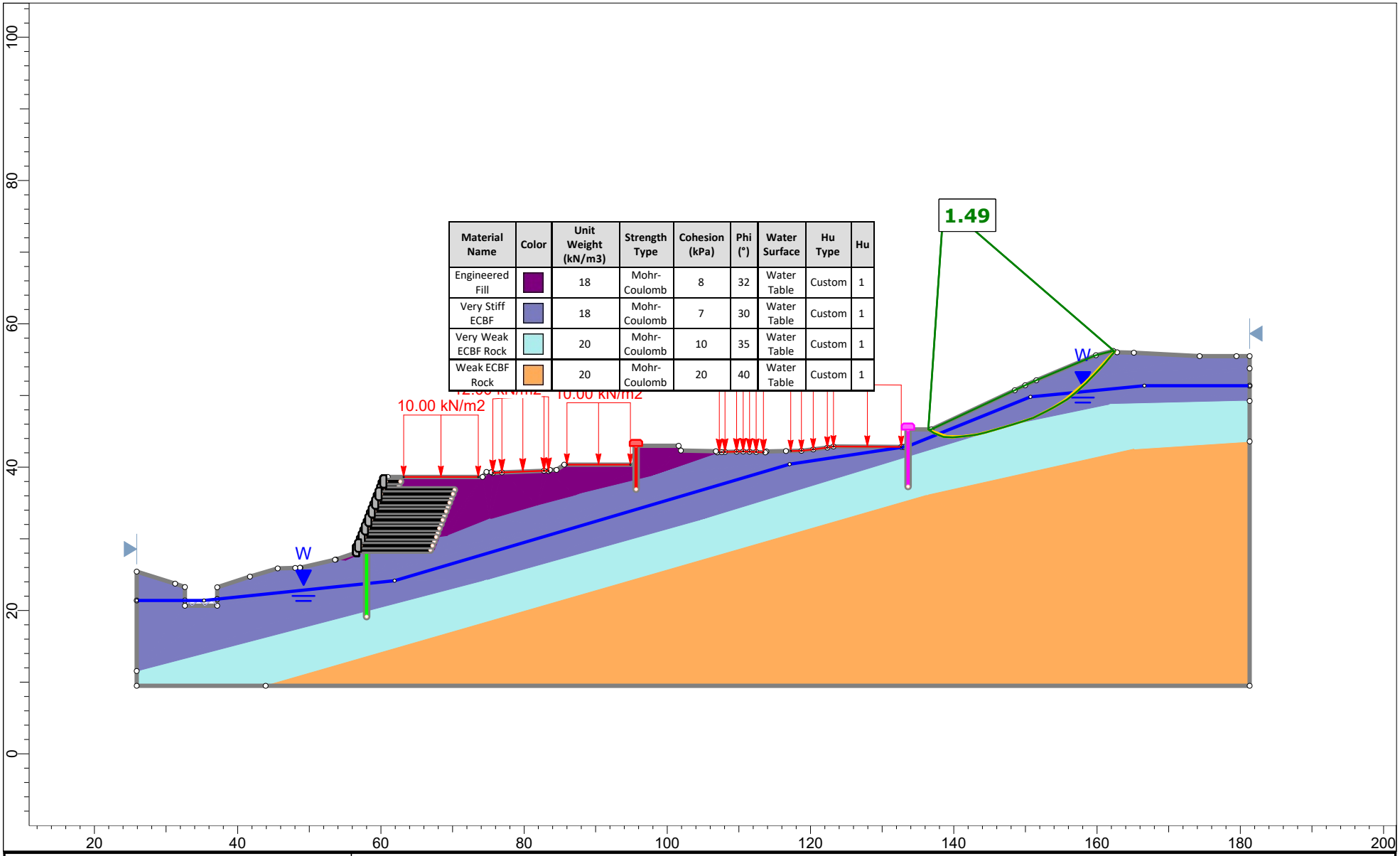
Project	Slide2 - An Interactive Slope Stability Program		
Group	Proposed GL - Section AF	*Scenario*	Seismic (0.19g)
Drawn By		*Company*	
Date	4/11/2025, 10:02:12 am	*File Name*	Section AF 2.0.slmd



RILEY

SLIDEINTERPRET 9.028

Project	Slide2 - An Interactive Slope Stability Program		
Group	Proposed GL - Section AF	*Scenario*	Worst Credible GW (50% fill saturation)
Drawn By		*Company*	
Date	4/11/2025, 10:02:12 am	*File Name*	Section AF 2.0.slmd



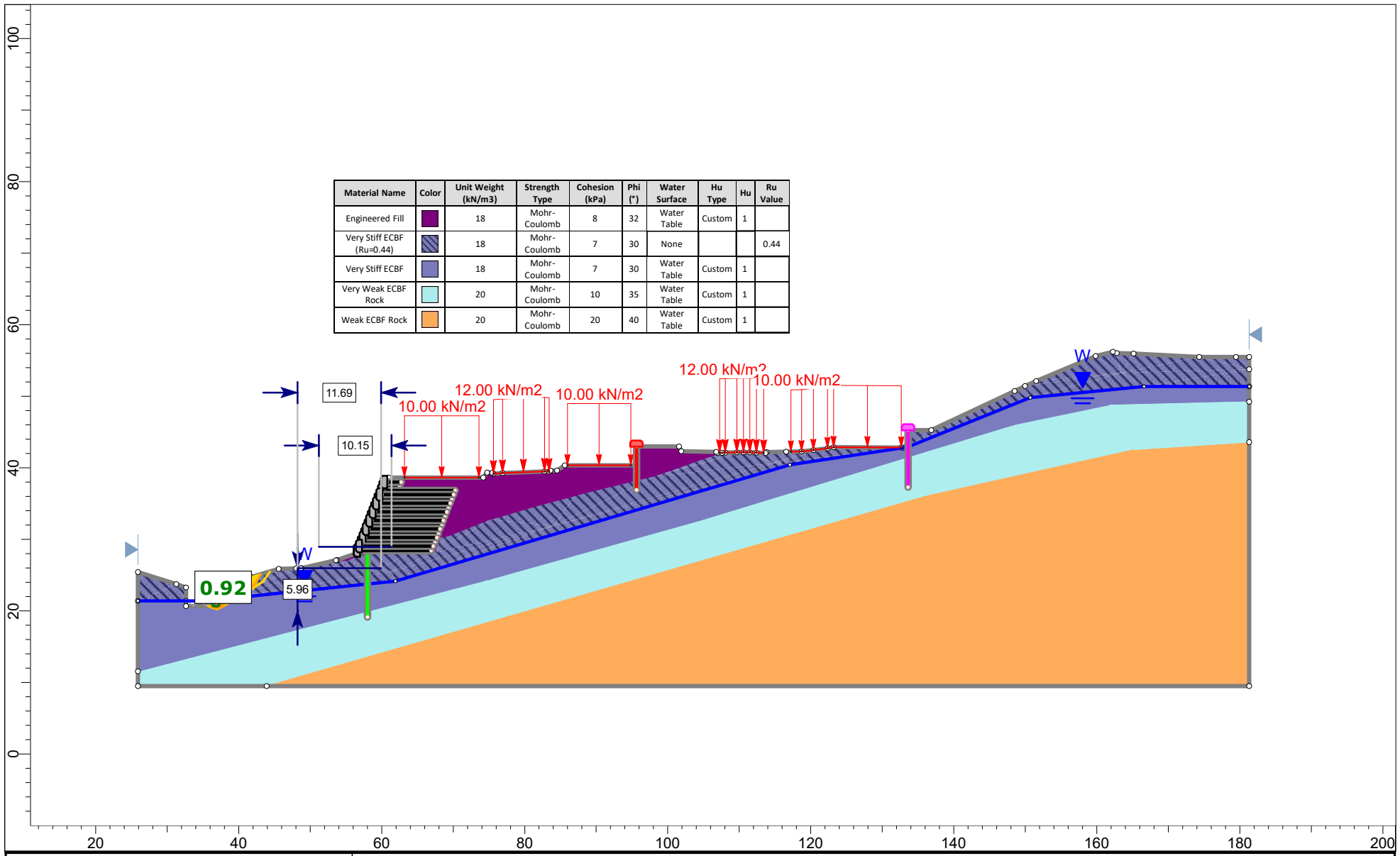
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1
Weak ECBF Rock		20	Mohr-Coulomb	20	40	Water Table	Custom	1

RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AG - design, erosion	*Scenario*	Normal
Drawn By	RS	*Company*	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	*File Name*	Section AG.slmd

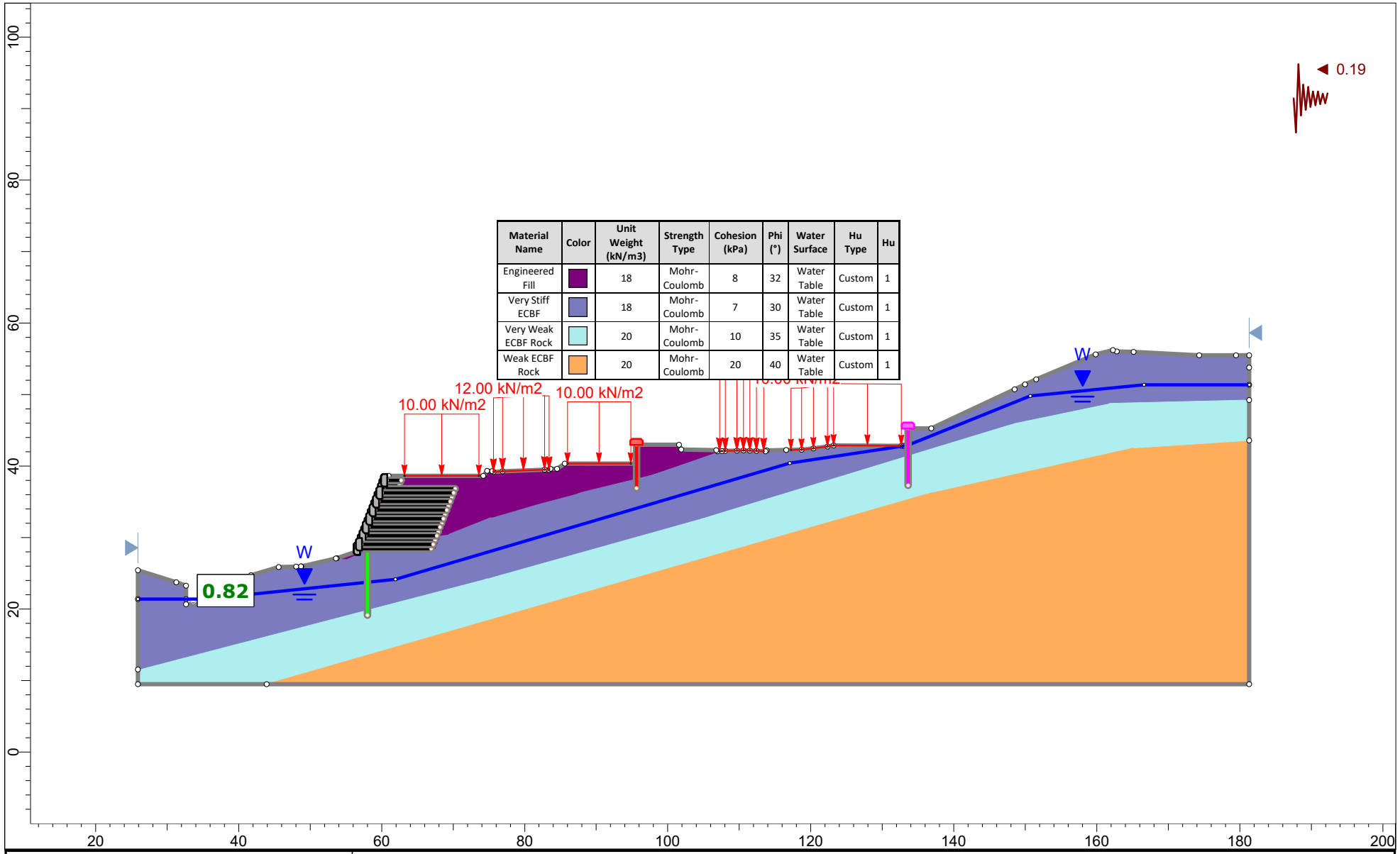
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Very Stiff ECBF (Ru=0.44)		18	Mohr-Coulomb	7	30	None			0.44
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
Very Weak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



RILEY

SLIDEINTERPRET 9.028

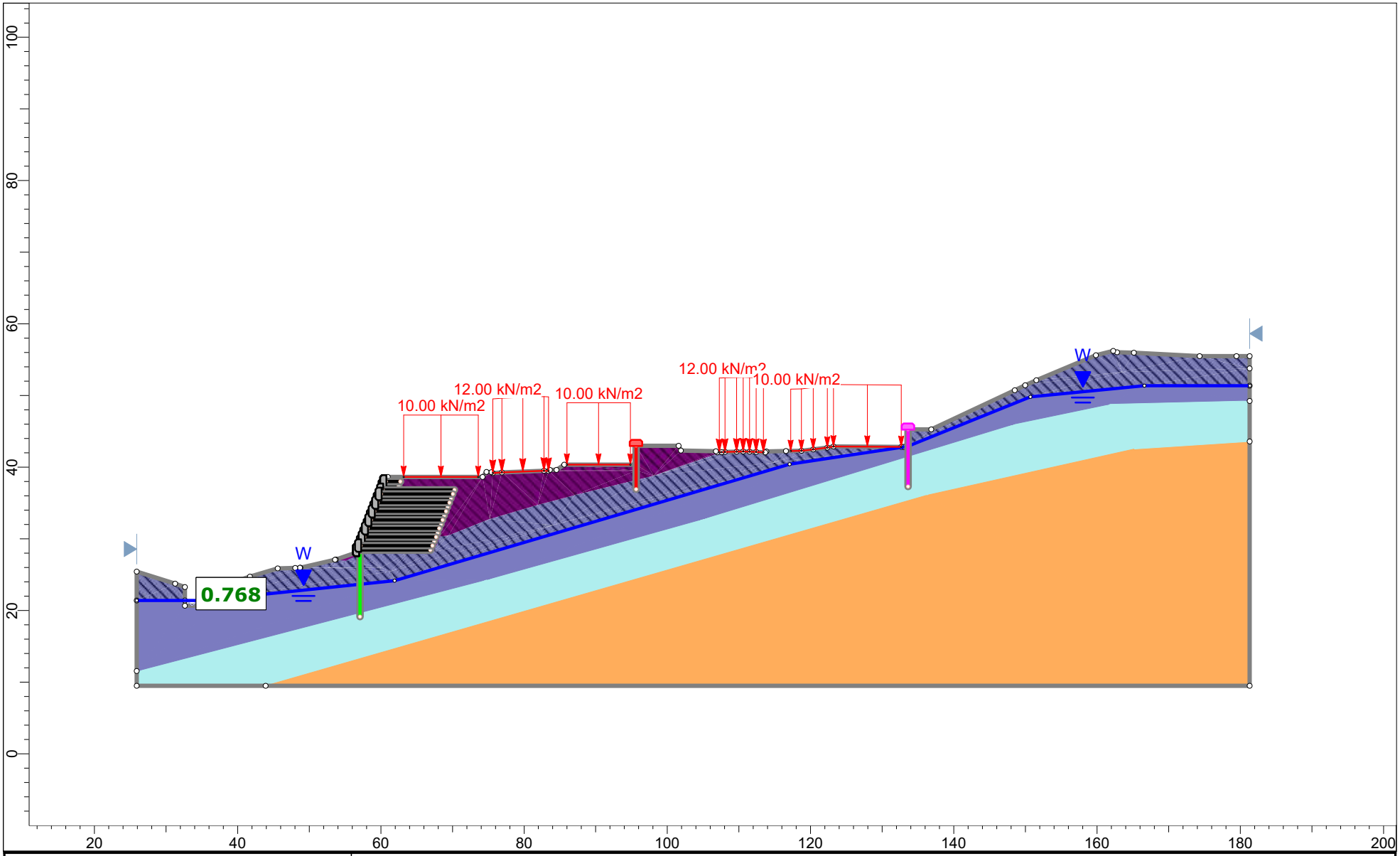
Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AG - design, erosion	*Scenario*	Worst Credible GW
Drawn By	RS	*Company*	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	*File Name*	Section AG.slmd



RILEY

SLIDEINTERPRET 9.028

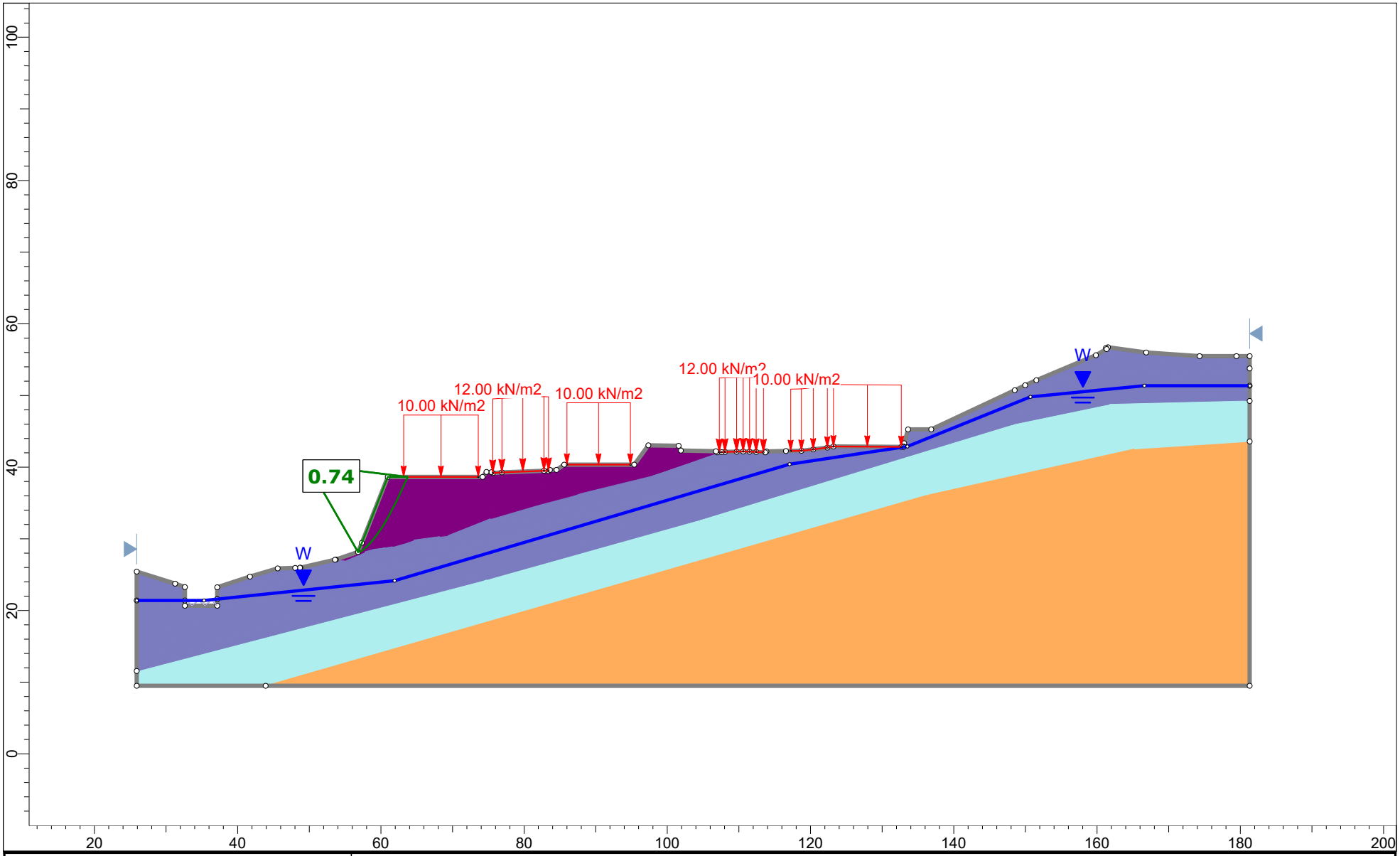
Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AG - design, erosion	*Scenario*	Seismic (0.19g)
Drawn By	RS	*Company*	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	*File Name*	Section AG.slmd



RILEY

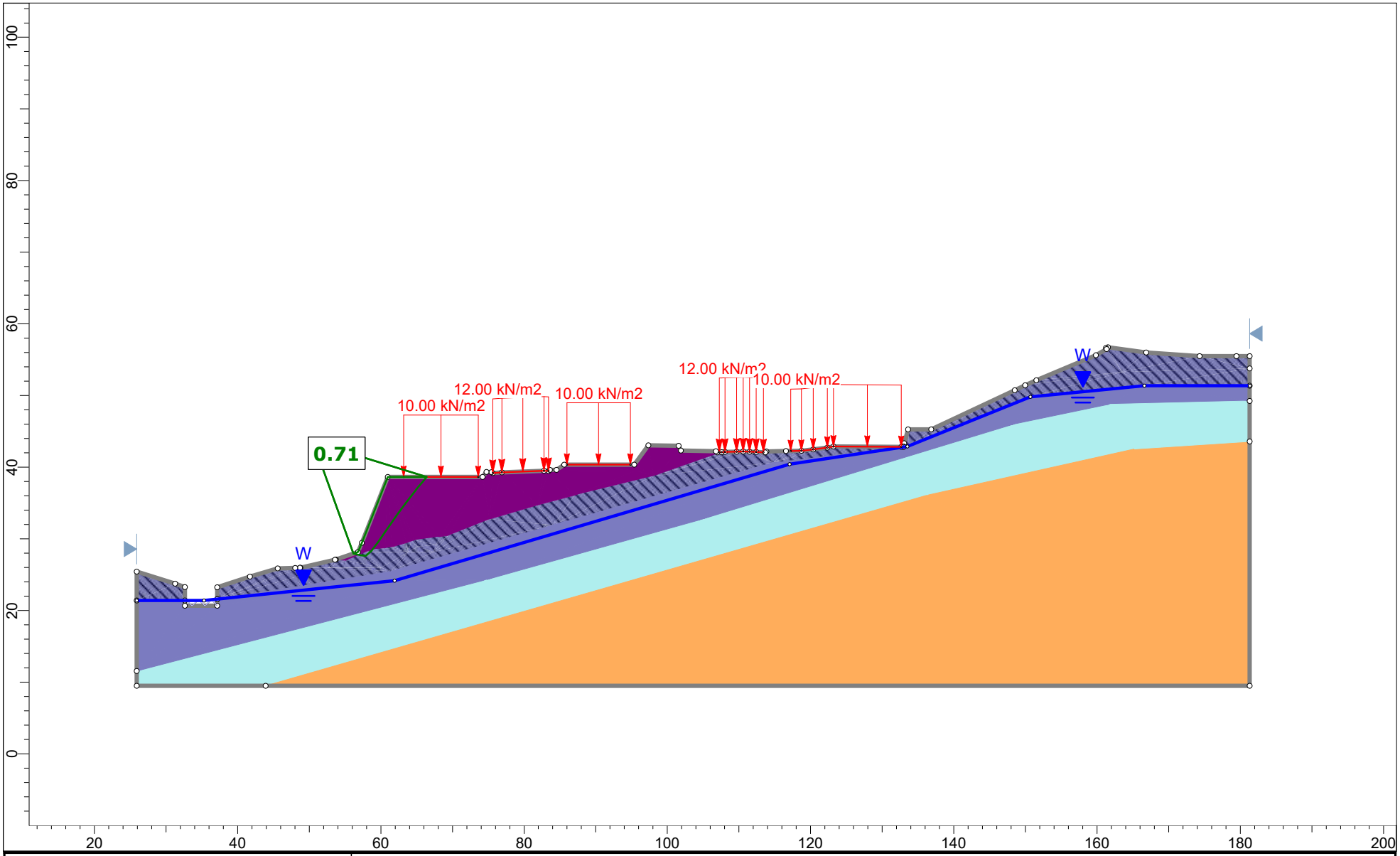
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AG - design, erosion	*Scenario*	50% fill saturation
Drawn By	RS	*Company*	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	*File Name*	Section AG.slmd



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 1	
	Group	Section AG - Proposed GL	*Scenario* Normal
	Drawn By	RS	*Company* Riley Consultants Ltd
	Date	12/12/2024, 8:28:52 am	*File Name* Section AG.slmd

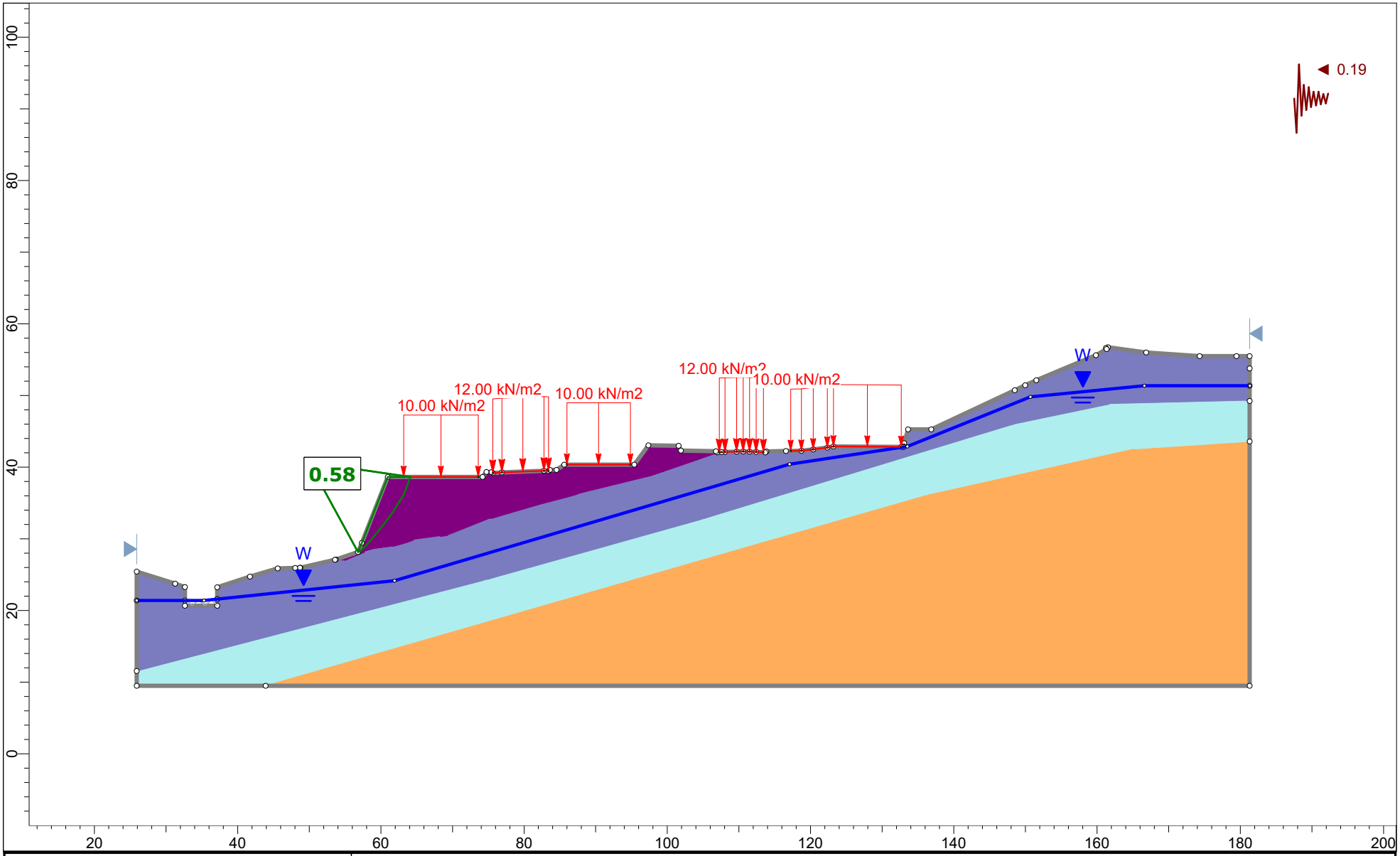
SLIDEINTERPRET 9.028



RILEY

SLIDEINTERPRET 9.028

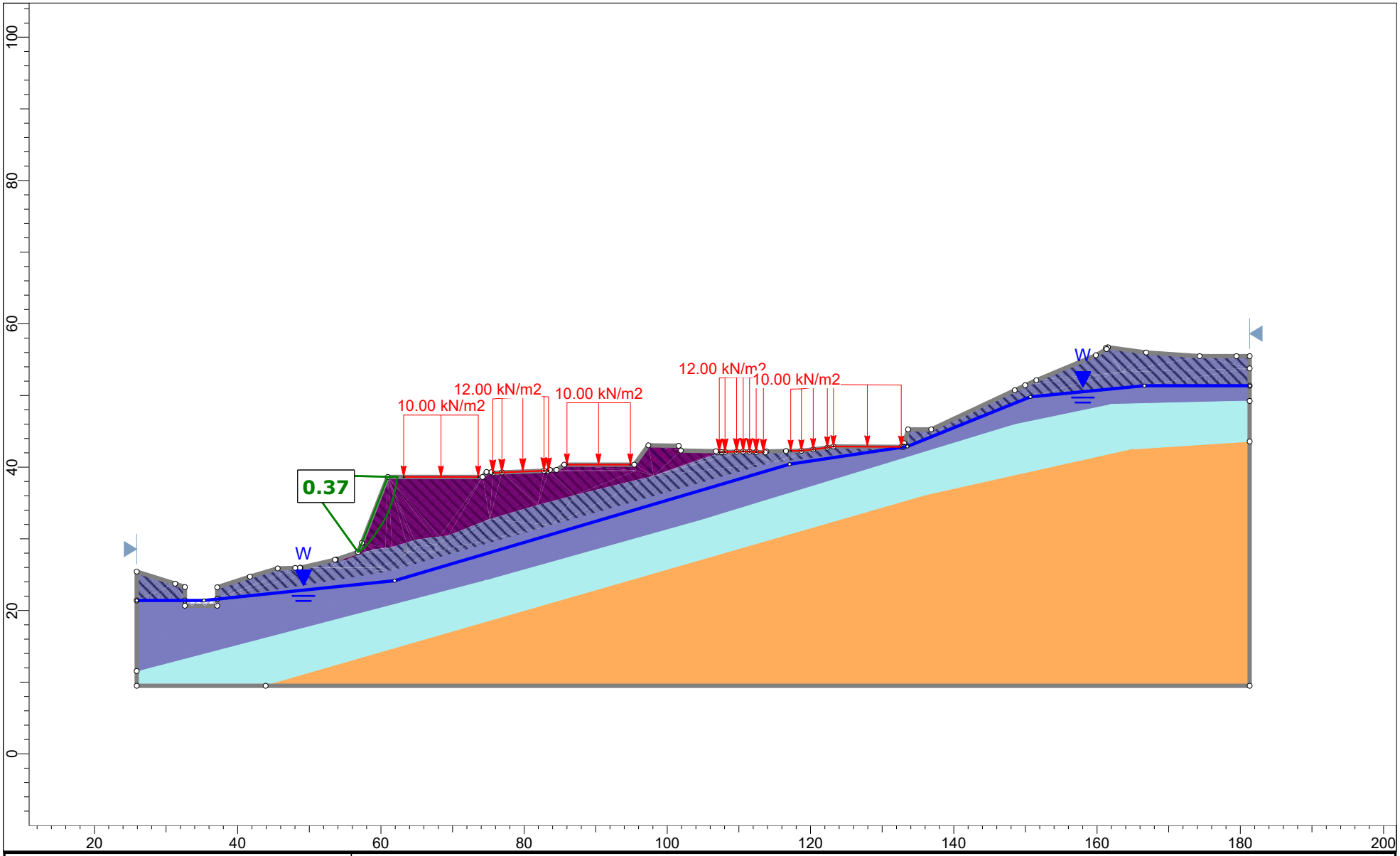
Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AG - Proposed GL	*Scenario*	Worst Credible GW
Drawn By	RS	*Company*	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	*File Name*	Section AG.slmd



RILEY

SLIDEINTERPRET 9.028

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

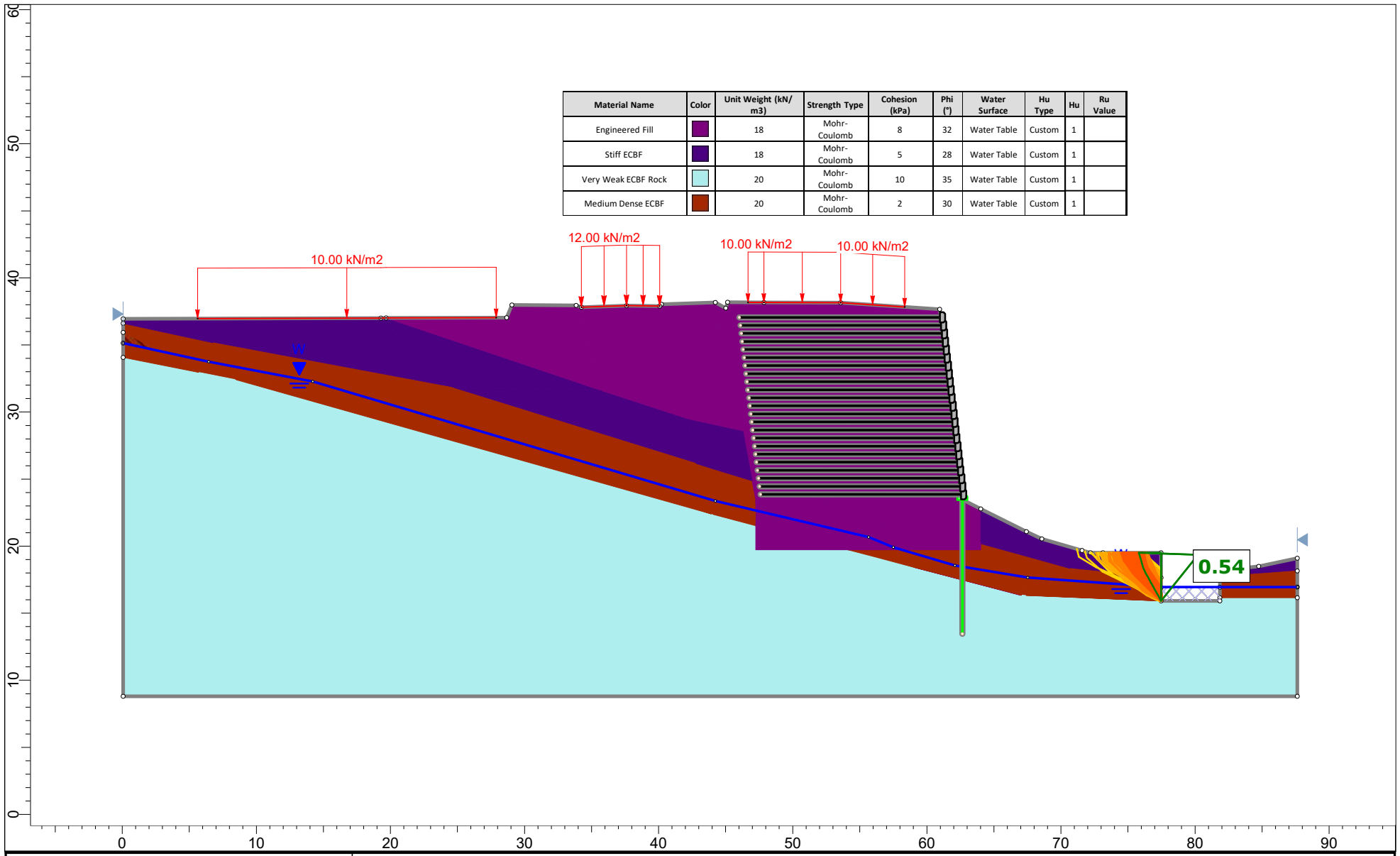


RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Section AG - Proposed GL	*Scenario*	50% fill saturation
Drawn By	RS	*Company*	Riley Consultants Ltd
Date	12/12/2024, 8:28:52 am	*File Name*	Section AG.slmd

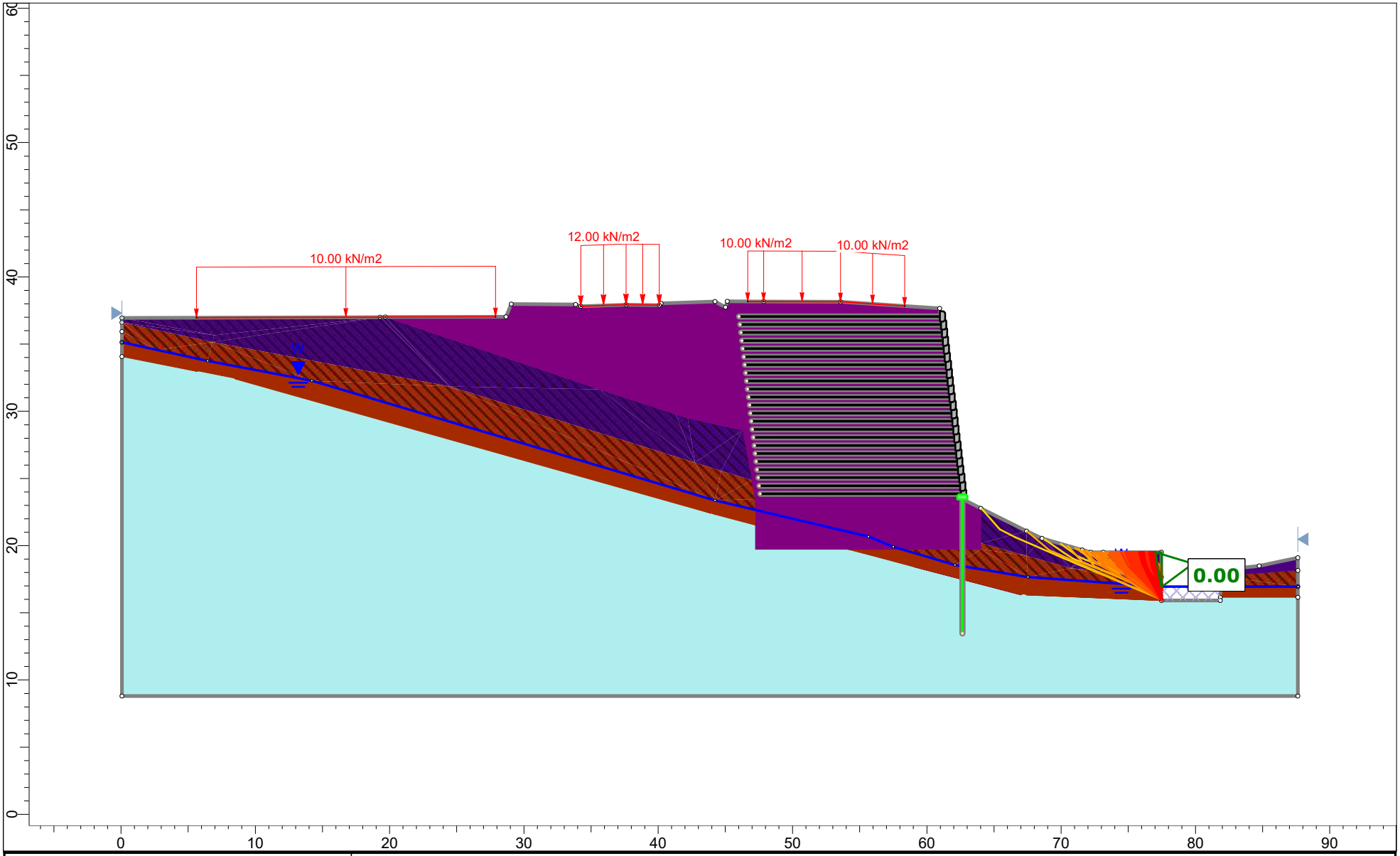
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Medium Dense ECBF		20	Mohr-Coulomb	2	30	Water Table	Custom	1	



RILEY

SLIDEINTERPRET 9.028

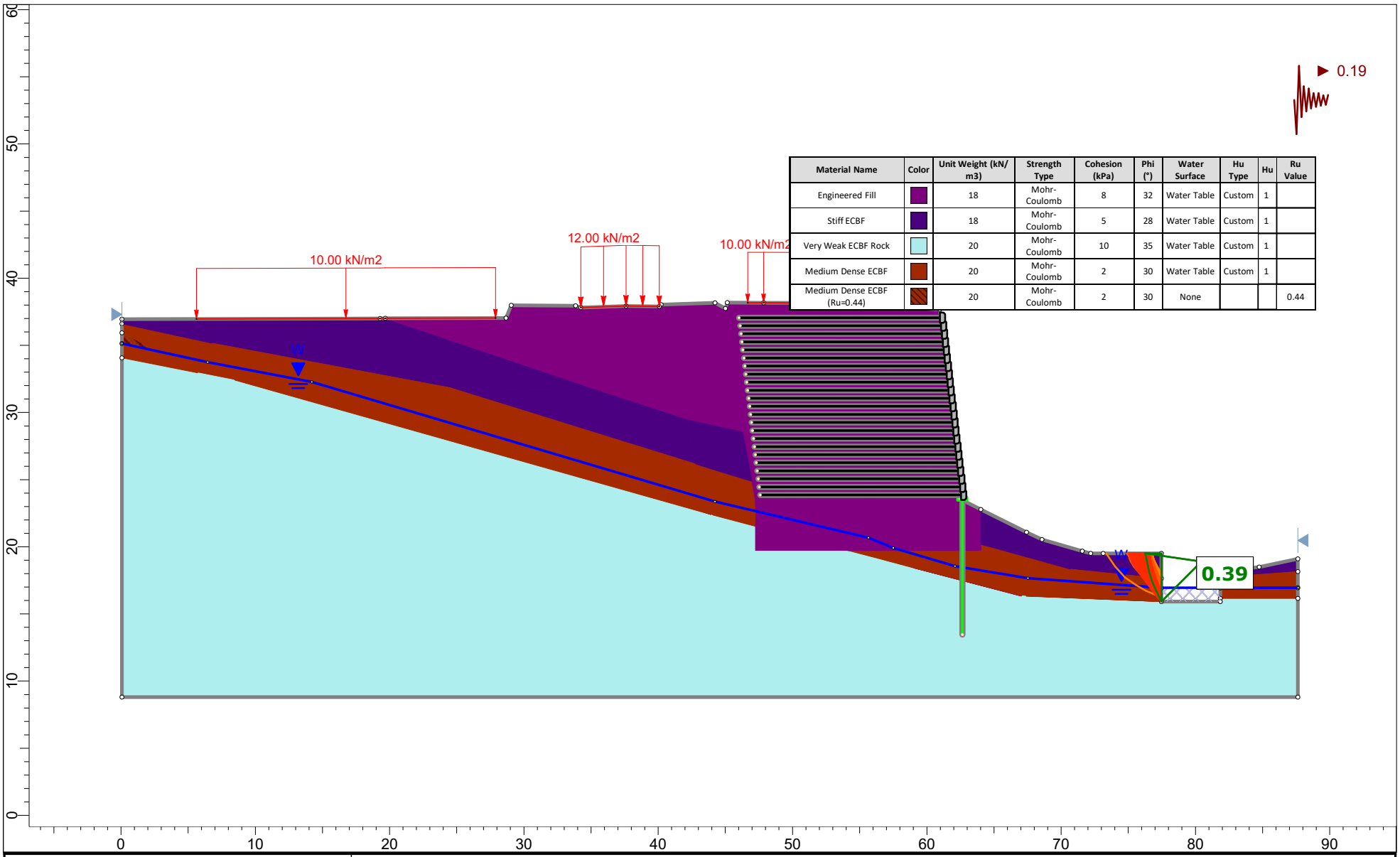
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AH - design, erosion offset and remedials	*Scenario*	Normal
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AH.slmd



RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AH - design, erosion offset and remedials	*Scenario*	Worst Credible GW
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AH.slmd

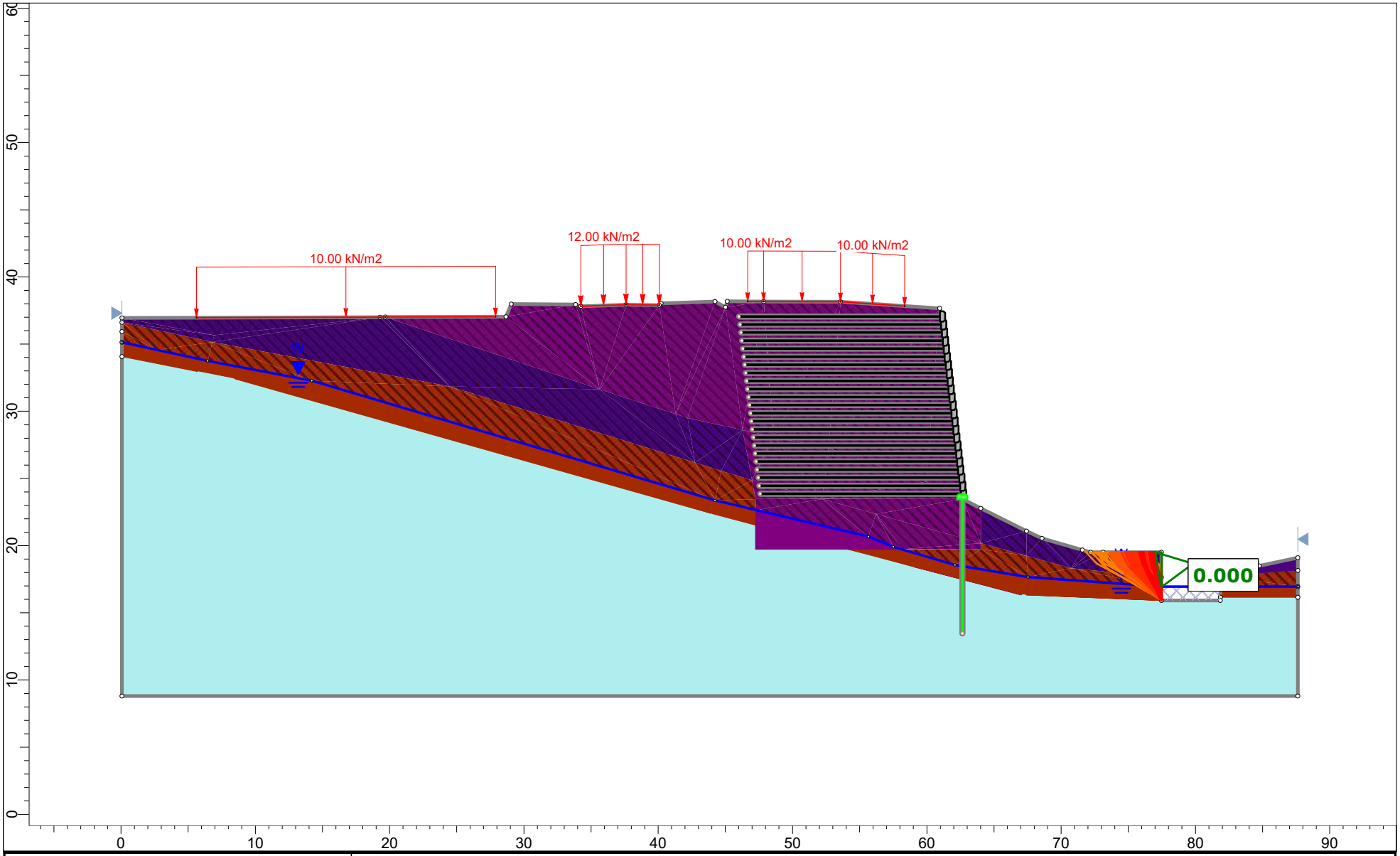


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1	
Stiff ECBF		18	Mohr-Coulomb	5	28	Water Table	Custom	1	
Very Weak ECBF Rock		20	Mohr-Coulomb	10	35	Water Table	Custom	1	
Medium Dense ECBF		20	Mohr-Coulomb	2	30	Water Table	Custom	1	
Medium Dense ECBF (Ru=0.44)		20	Mohr-Coulomb	2	30	None			0.44

RILEY

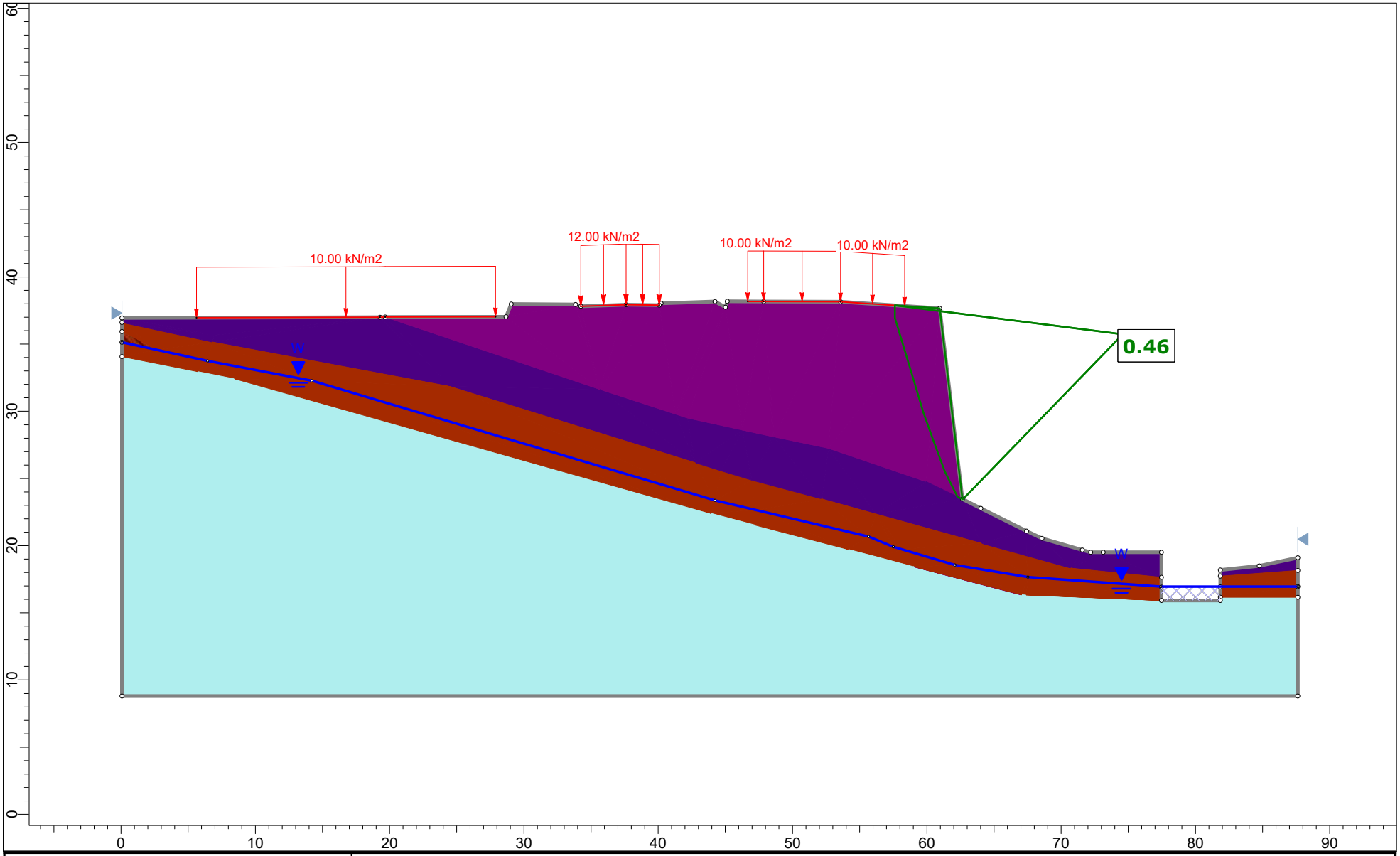
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AH - design, erosion offset and remedials	*Scenario*	Seismic (0.19g)
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AH.slmd



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AH - design, erosion offset and remedials	*Scenario* Worst Credible GW (50% fill saturation)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AH.slmd

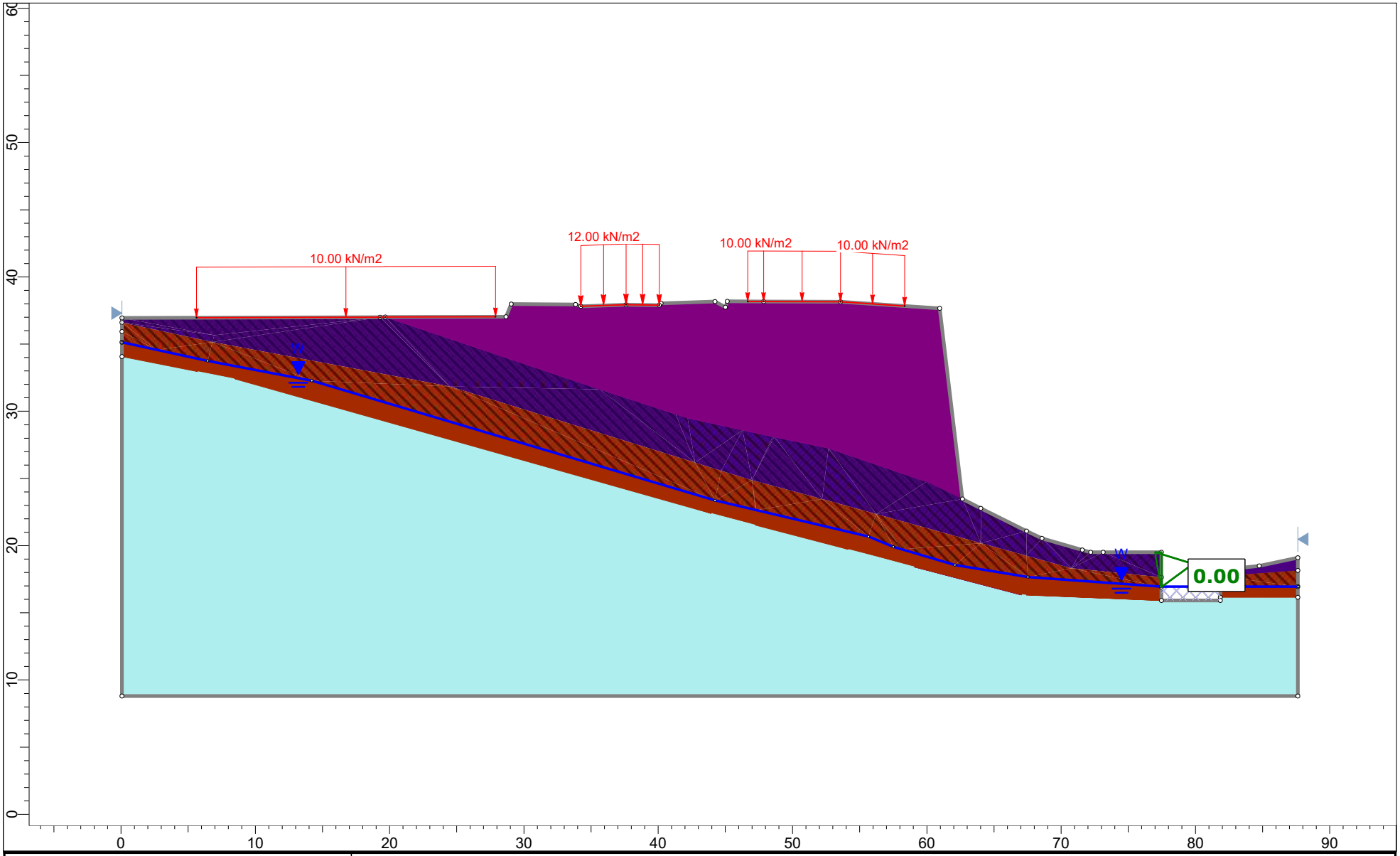
SLIDEINTERPRET 9.028



RILEY

SLIDEINTERPRET 9.028

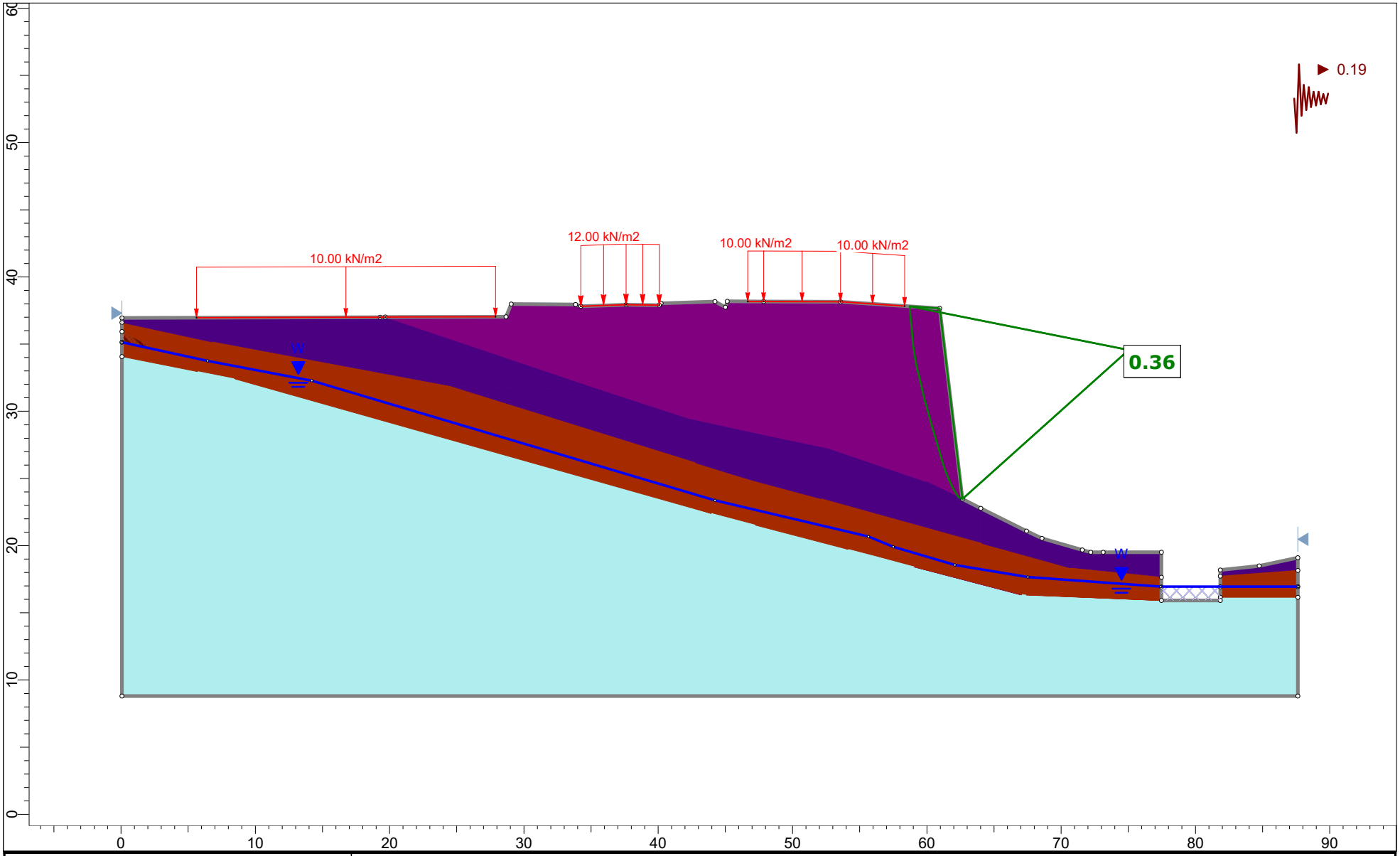
Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AH - Proposed GL	*Scenario*	Normal
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AH.slmd



RILEY

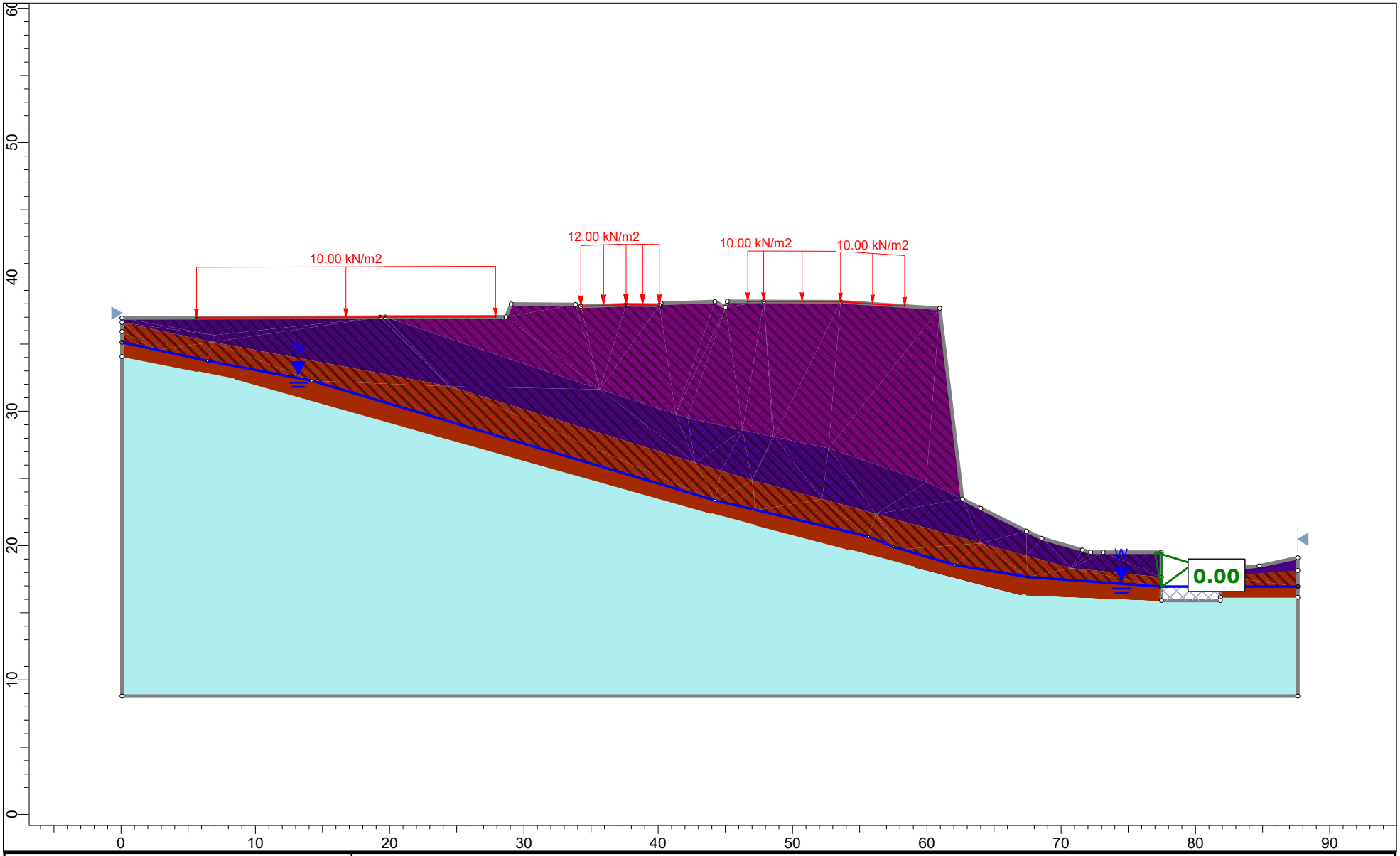
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 2		
Group	Section AH - Proposed GL	*Scenario*	Worst Credible GW
Drawn By	RS	*Company*	Riley Consulants Ltd
Date	10/12/2024	*File Name*	Section AH.slmd



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AH - Proposed GL	*Scenario* Seismic (0.19g)
	Drawn By	RS	*Company* Riley Consulants Ltd
	Date	10/12/2024	*File Name* Section AH.slmd

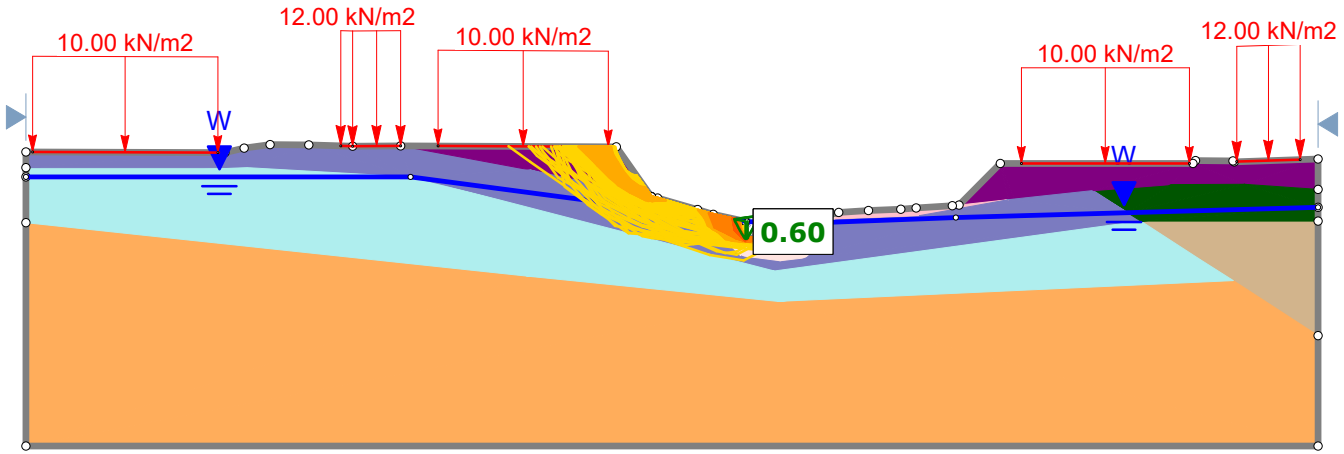
SLIDEINTERPRET 9.028



RILEY	*Project*	240065 - Russell Road, Wainui - Stage 2	
	Group	Section AH - Proposed GL	*Scenario* Worst Credible GW (50% fill saturation)
	Drawn By	RS	*Company* Riley Consulants Ltd
SLIDEINTERPRET 9.028	*Date*	10/12/2024	*File Name* Section AH.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1
Colluvium		17	Mohr-Coulomb	2	25	Water Table	Custom	1
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	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

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
0.60



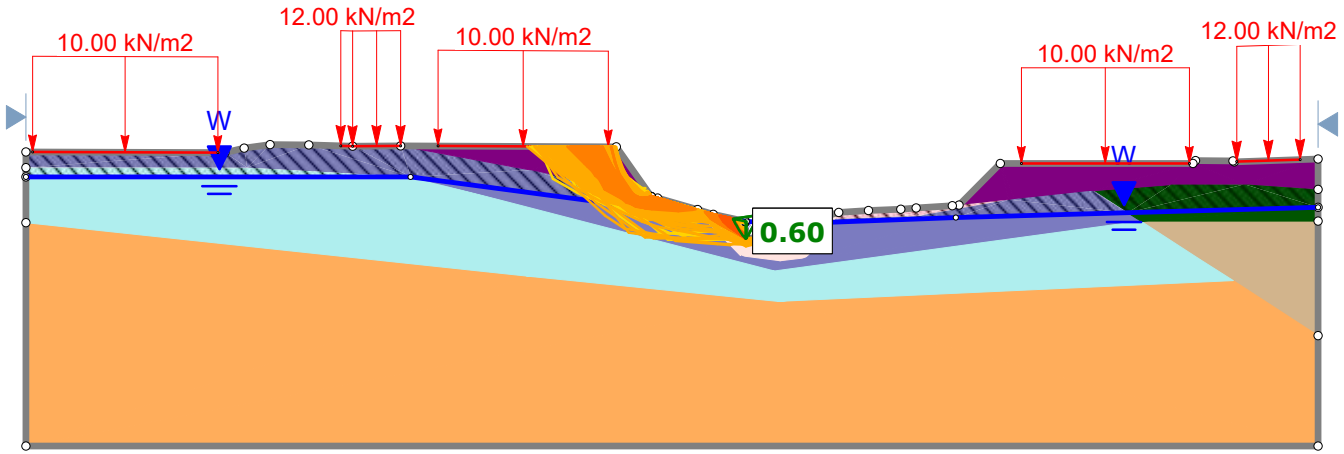
RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (L-R)	*Scenario*	Normal (Measured GW)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

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	
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1	
Gully mullock (Ru=0.44)		17	Mohr-Coulomb	2	22	None			0.44
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	30	None			0.44
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
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
0.60



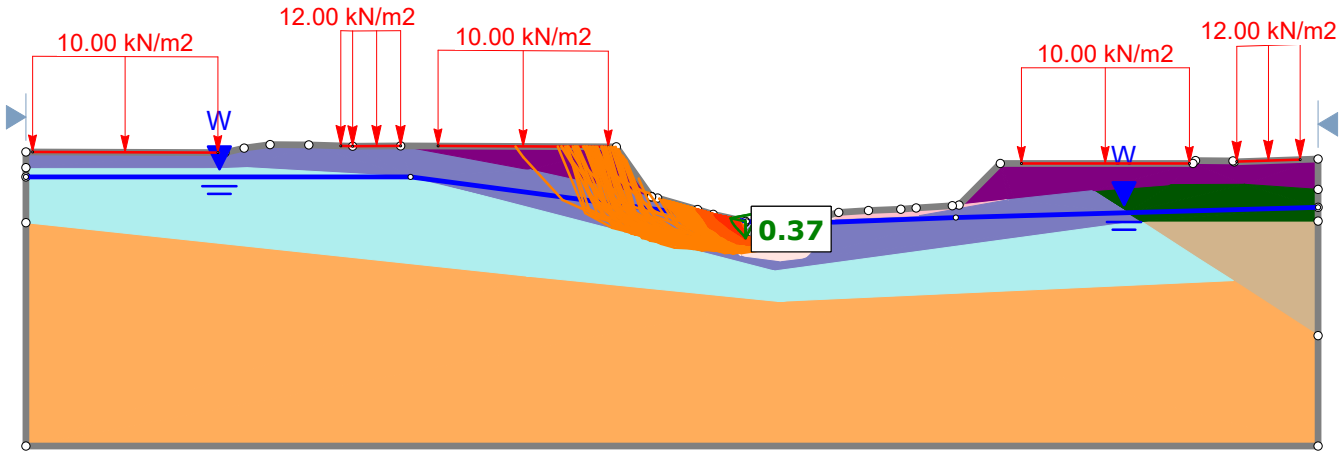
RILEY

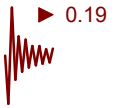
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (L-R)	*Scenario*	Extreme (Worst Credible GW)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1
Colluvium		17	Mohr-Coulomb	2	25	Water Table	Custom	1
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	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

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.37





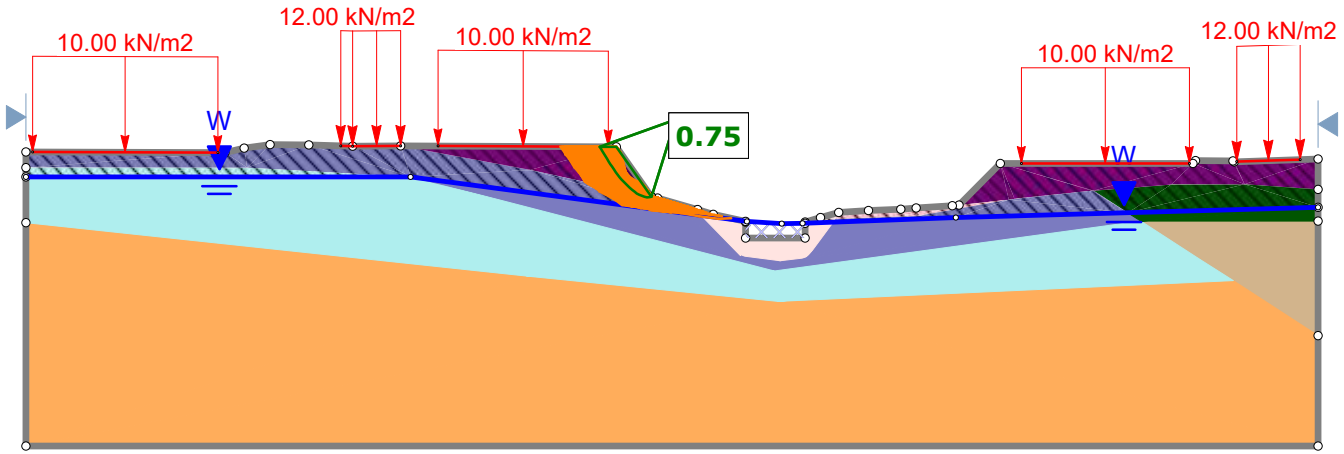
RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (L-R)	*Scenario*	Seismic (0.19g)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered fill (50% saturation) (Ru=0.27)		18	Mohr-Coulomb	8	32	None			0.27
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1	
Gully mullock (Ru=0.44)		17	Mohr-Coulomb	2	22	None			0.44
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	30	None			0.44
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
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
0.75



RILEY

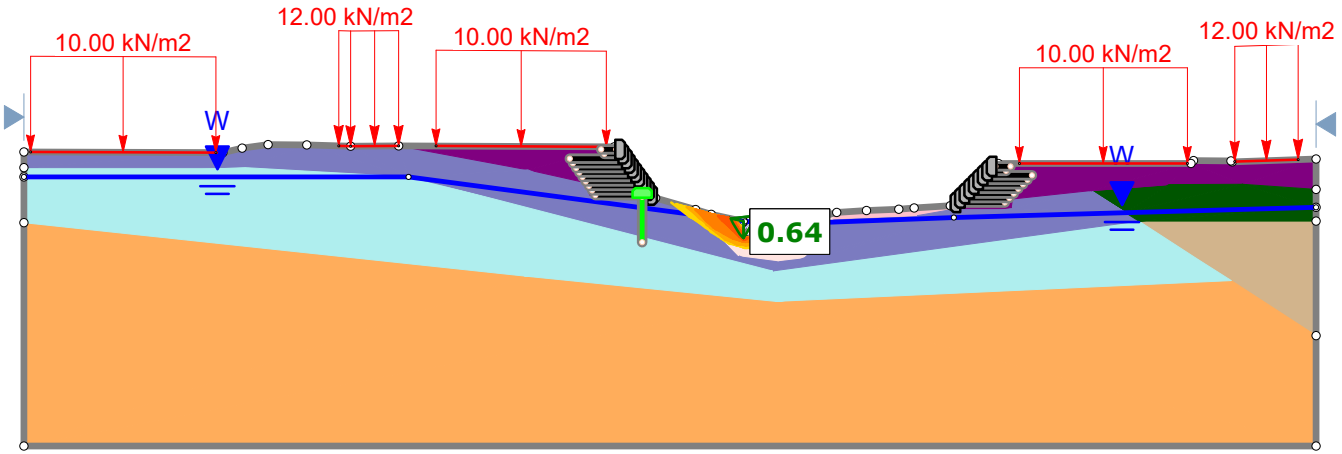
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (L-R)	*Scenario*	Extreme (50% saturated fill)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1
Colluvium		17	Mohr-Coulomb	2	25	Water Table	Custom	1
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	240	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
0.64



RILEY

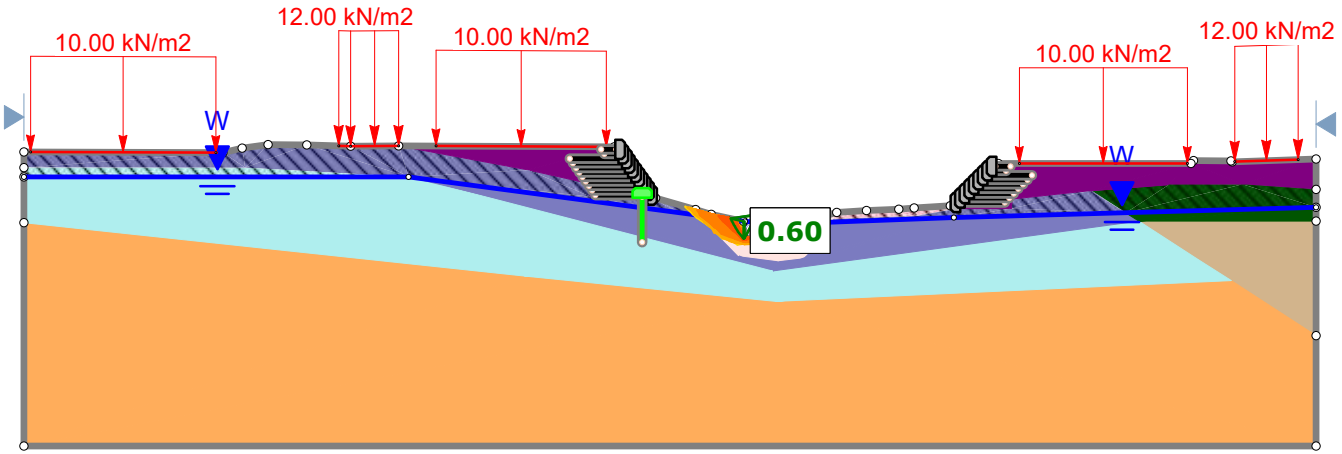
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (L-R) - Erosion & Remedial	*Scenario*	Normal (Measured GW)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

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	
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1	
Gully mullock (Ru=0.44)		17	Mohr-Coulomb	2	22	None			0.44
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	30	None			0.44
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
Weak ECBF Rock		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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	240	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
0.60



RILEY

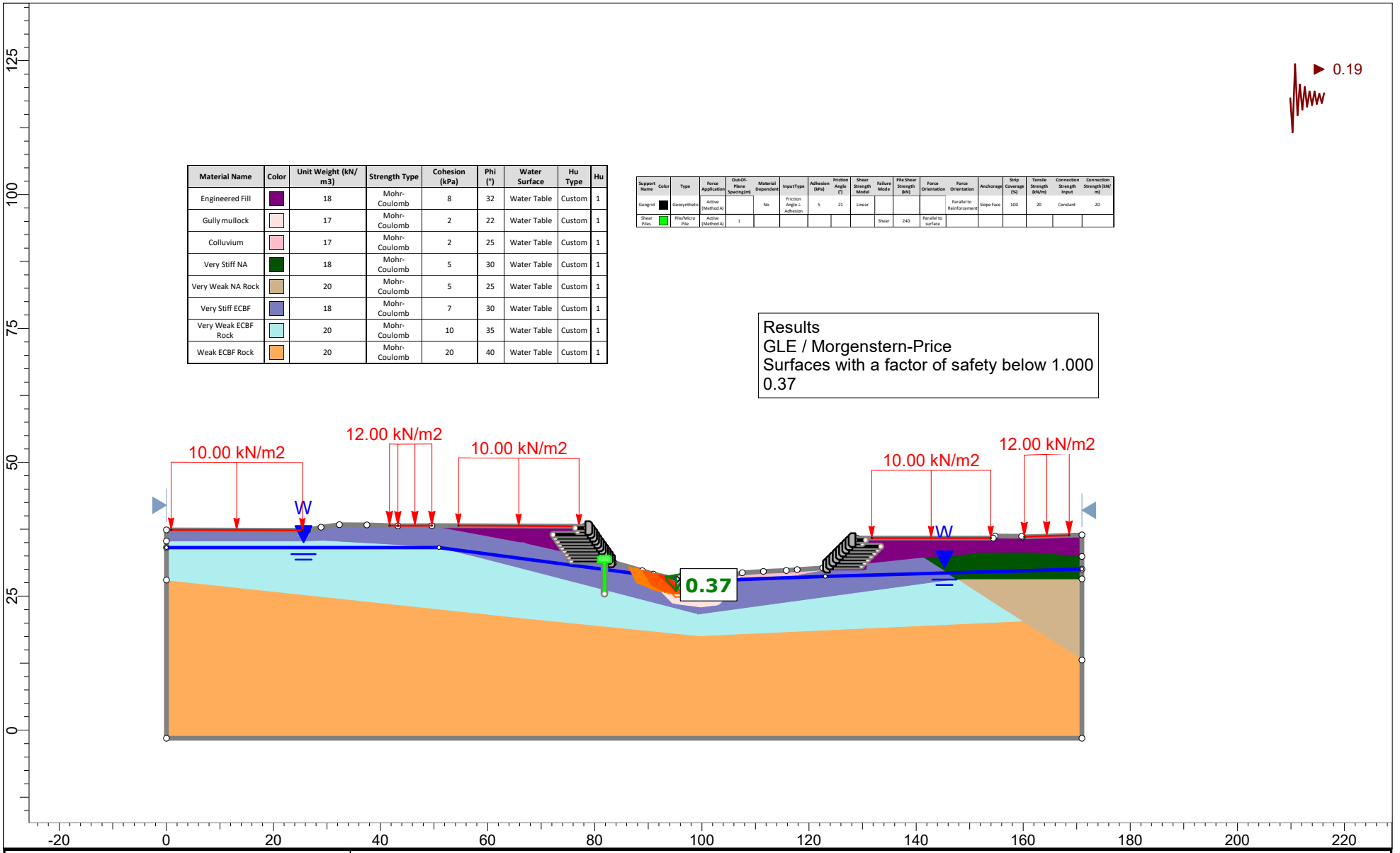
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (L-R) - Erosion & Remedial	*Scenario*	Extreme (Worst Credible GW)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1
Colluvium		17	Mohr-Coulomb	2	25	Water Table	Custom	1
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	240	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.37



RILEY

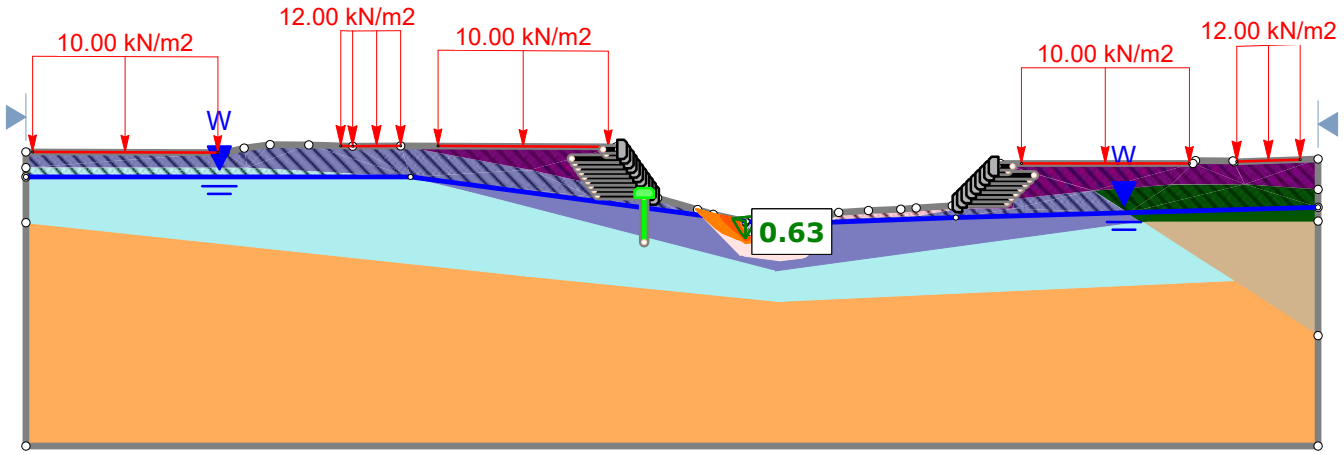
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (L-R) - Erosion & Remedial	*Scenario*	Seismic (0.19g)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

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	
Engineered fill (50% saturation) (Ru=0.27)		18	Mohr-Coulomb	8	32	None			0.27
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1	
Gully mullock (Ru=0.44)		17	Mohr-Coulomb	2	22	None			0.44
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	30	None			0.44
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
Weak ECBF Rock		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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	240	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.63



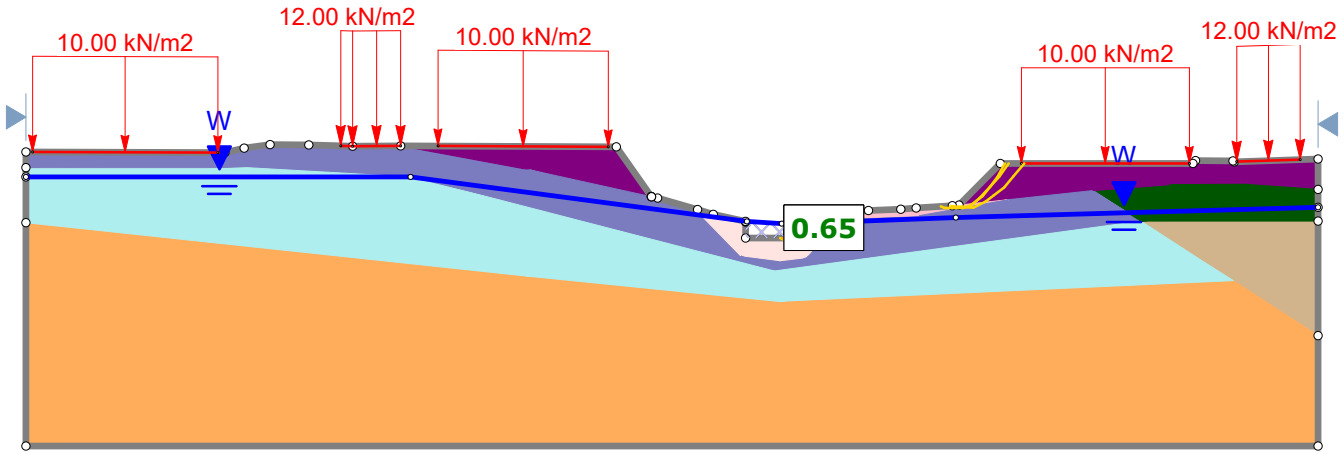
RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (L-R) - Erosion & Remedial	*Scenario*	Extreme (50% saturated fill)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1
Colluvium		17	Mohr-Coulomb	2	25	Water Table	Custom	1
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	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

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
0.65



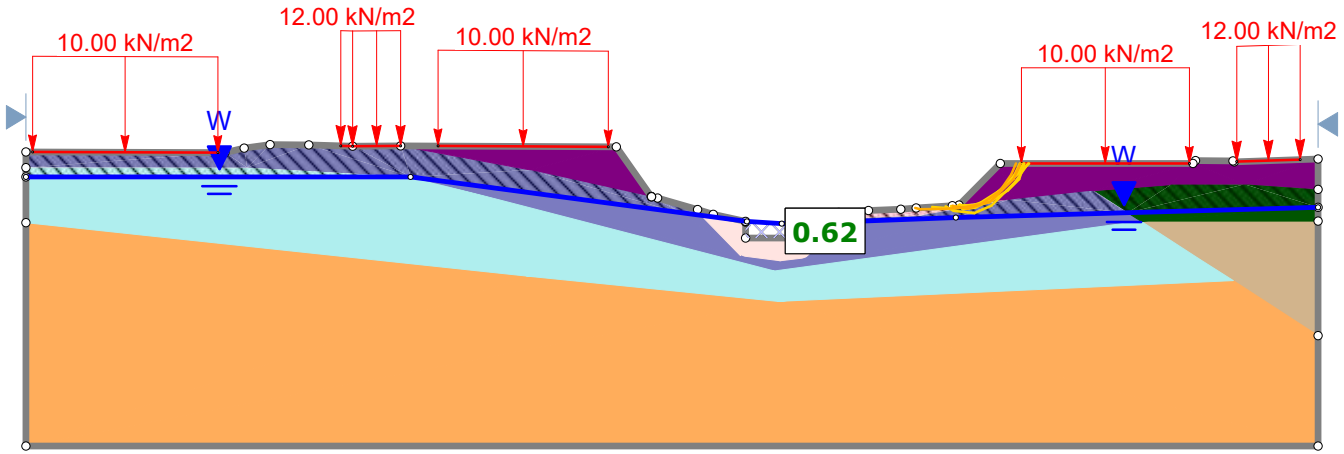
RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (R-L)	*Scenario*	Normal (Measured GW)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

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	
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1	
Gully mullock (Ru=0.44)		17	Mohr-Coulomb	2	22	None			0.44
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	30	None			0.44
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
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
0.62



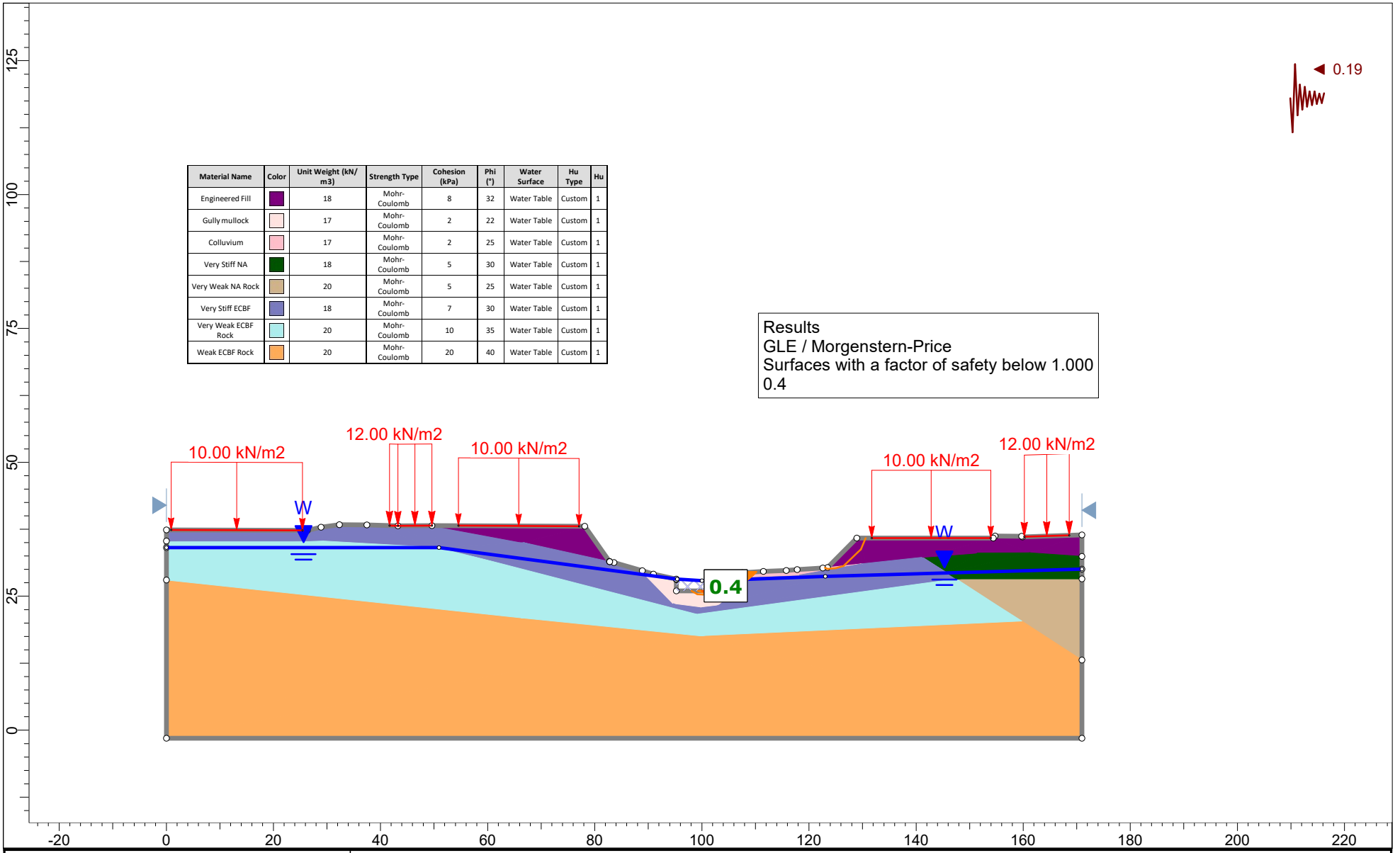
RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (R-L)	*Scenario*	Extreme (Worst Credible GW)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1
Colluvium		17	Mohr-Coulomb	2	25	Water Table	Custom	1
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	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

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.4



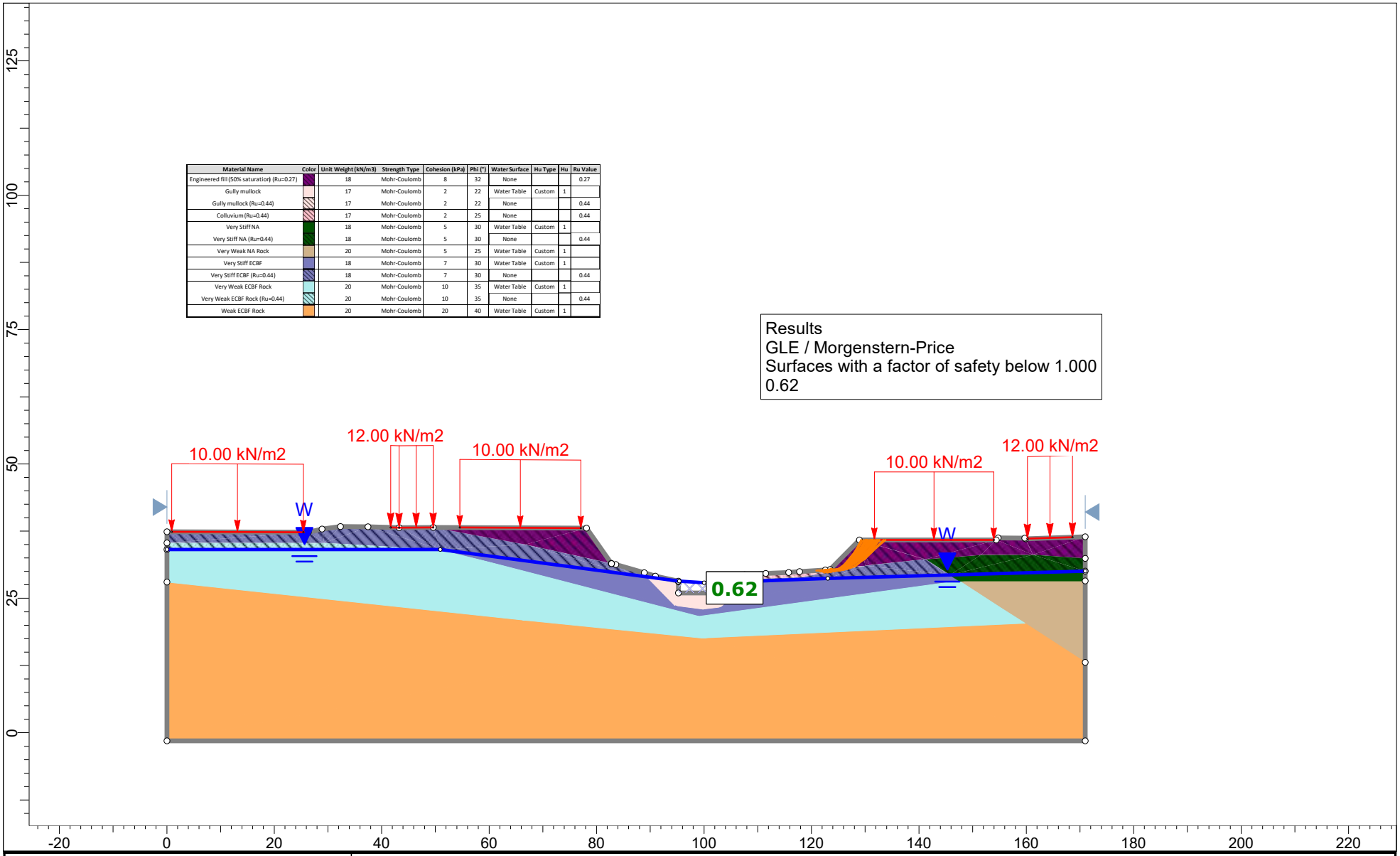
RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (R-L)	*Scenario*	Seismic (0.19g)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Engineered fill (50% saturation) (Ru=0.27)		18	Mohr-Coulomb	8	32	None			0.27
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1	
Gully mullock (Ru=0.44)		17	Mohr-Coulomb	2	22	None			0.44
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	30	None			0.44
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
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
0.62



RILEY

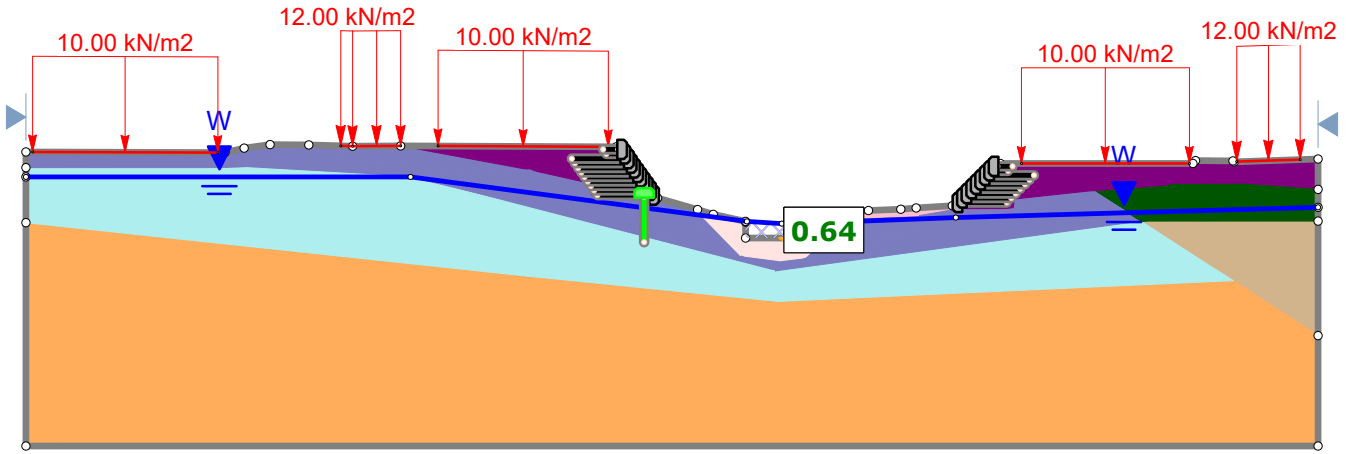
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (R-L)	*Scenario*	Extreme (50% saturated fill)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1
Colluvium		17	Mohr-Coulomb	2	25	Water Table	Custom	1
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	240	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.500
0.64



RILEY

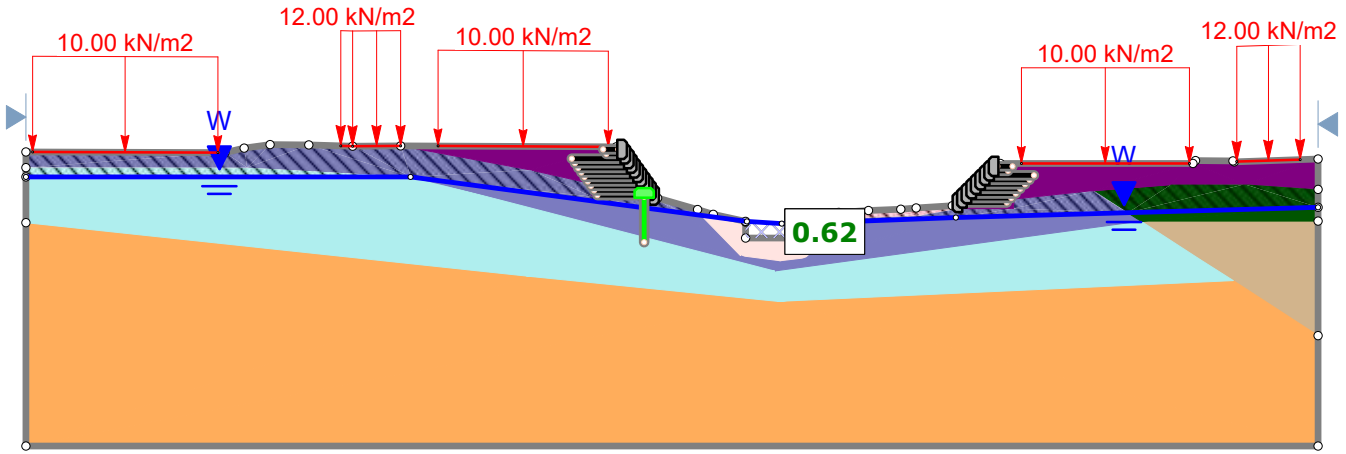
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (R-L) - Erosion & Remedial	*Scenario*	Normal (Measured GW)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

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	
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1	
Gully mullock (Ru=0.44)		17	Mohr-Coulomb	2	22	None			0.44
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	30	None			0.44
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
Weak ECBF Rock		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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle = Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	240	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.300
0.62



RILEY

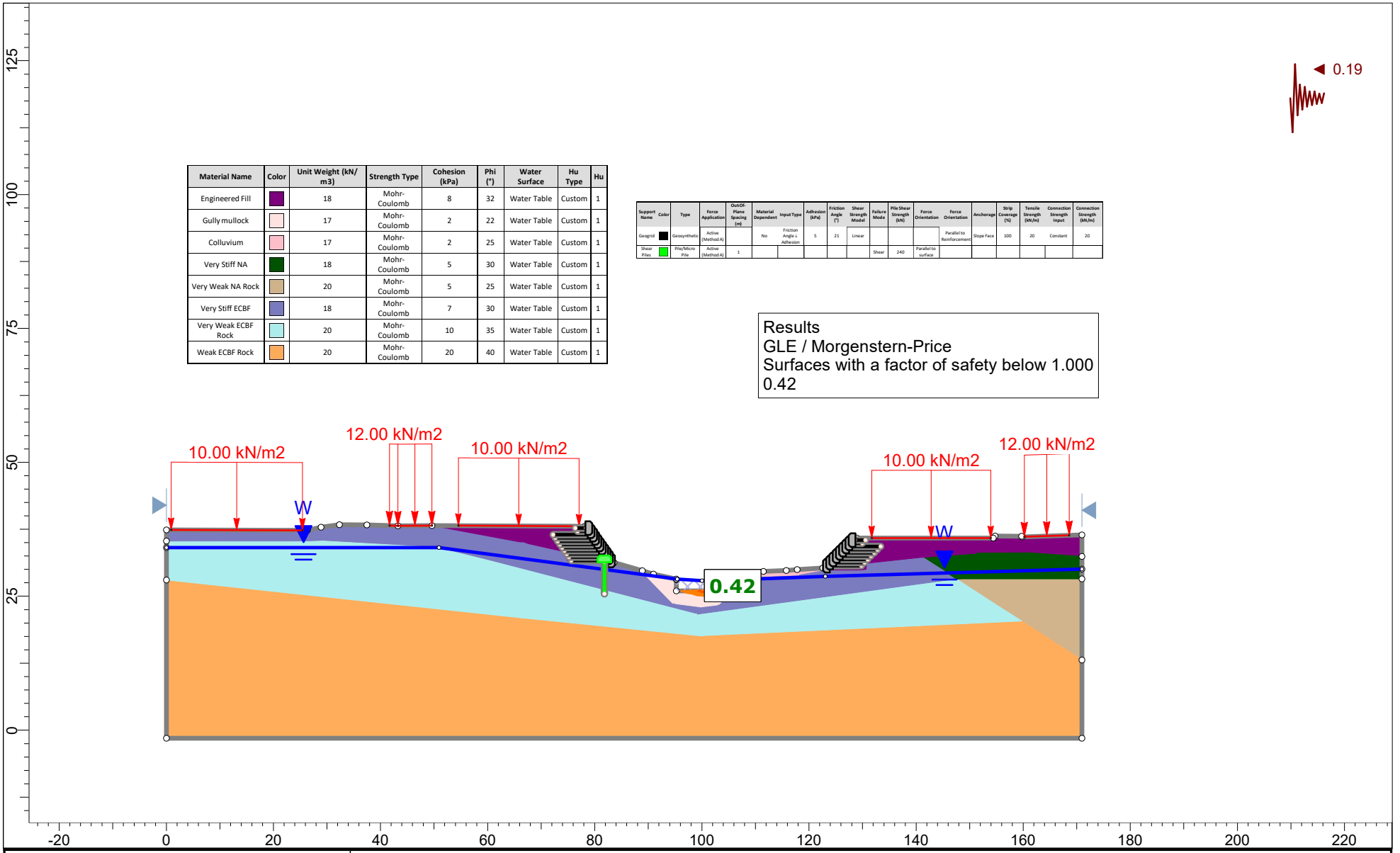
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (R-L) - Erosion & Remedial	*Scenario*	Extreme (Worst Credible GW)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu
Engineered Fill		18	Mohr-Coulomb	8	32	Water Table	Custom	1
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1
Colluvium		17	Mohr-Coulomb	2	25	Water Table	Custom	1
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1
Very Weak NA Rock		20	Mohr-Coulomb	5	25	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

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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	240	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.42



RILEY

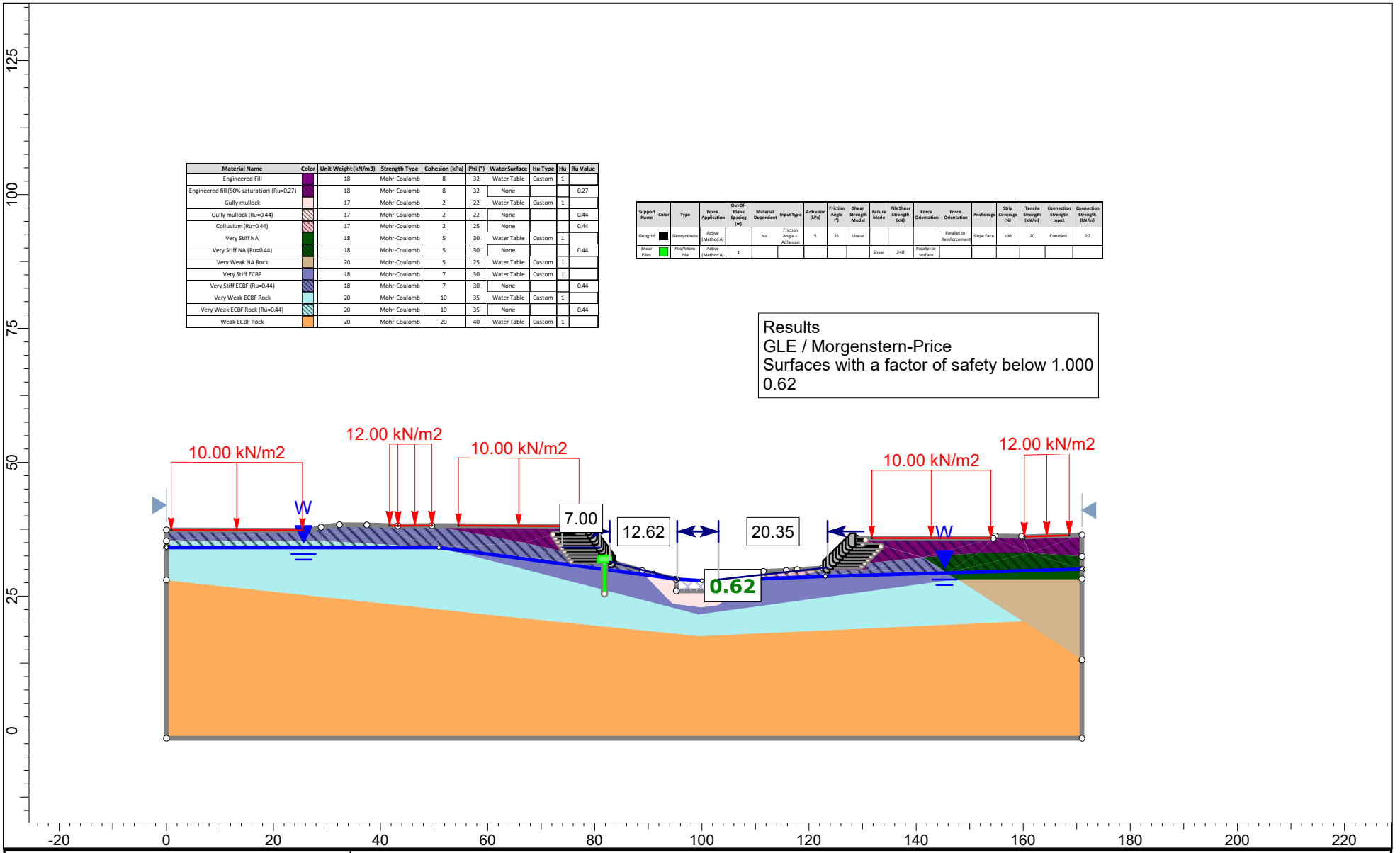
SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (R-L) - Erosion & Remedial	*Scenario*	Seismic (0.19g)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

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	
Engineered fill (50% saturation) (Ru=0.27)		18	Mohr-Coulomb	8	32	None			0.27
Gully mullock		17	Mohr-Coulomb	2	22	Water Table	Custom	1	
Gully mullock (Ru=0.44)		17	Mohr-Coulomb	2	22	None			0.44
Colluvium (Ru=0.44)		17	Mohr-Coulomb	2	25	None			0.44
Very Stiff NA		18	Mohr-Coulomb	5	30	Water Table	Custom	1	
Very Stiff NA (Ru=0.44)		18	Mohr-Coulomb	5	30	None			0.44
Very Weak NA Rock		20	Mohr-Coulomb	5	25	Water Table	Custom	1	
Very Stiff ECBF		18	Mohr-Coulomb	7	30	Water Table	Custom	1	
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	
Very Weak ECBF Rock (Ru=0.44)		20	Mohr-Coulomb	10	35	None			0.44
Weak ECBF Rock		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 (%)	Tensile Strength (kN/m)	Connection Strength Input	Connection Strength (kN/m)
Geogrid		Geosynthetic	Active (Method A)		No	Friction Angle ≤ Adhesion	5	21	Linear				Parallel to Reinforcement	Slope Face	100	20	Constant	20
Shear Piles		Pile/Micro Pile	Active (Method A)	1						Shear	240	Parallel to surface						

Results
GLE / Morgenstern-Price
Surfaces with a factor of safety below 1.000
0.62



RILEY

SLIDEINTERPRET 9.028

Project	240065 - Russell Road, Wainui - Stage 1		
Group	Proposed GL Section AI (R-L) - Erosion & Remedial	*Scenario*	Extreme (50% saturated fill)
Drawn By	ADT	*Company*	Riley Consulants Ltd
Date	16/12/2025	*File Name*	Section AI (AB).slmd

RILEY	Slope Stability Summary of Results	
	Project:	240065 Vineway Russell Road
	Prepared by:	LKB
	Checked by:	JLB

Key:

Analysis not required

Note: Values are the calculated minimum FoS for each cross-section. Surfaces have been filtered for each scenario up to the target FoS.

		Scenario										
		Current GL			Proposed GL				Proposed GL with Remedials			
	Section	Long Term	Elevated	Seismic	Long Term	Elevated	Seismic	50% Fill Saturation	Long Term	Elevated	Seismic	50% Fill Saturation
Stage 1	A	1.29	0.91	0.68	1.06	<1	<1	<1	1.29	<1	<1	<1
	B	1.35	1.07	<1	<1	<1	<1	<1	1.01	<1	<1	<1
	C				1.33	<1	1.05	<1	1.84	1.44	1.4	1.39
	D	2.23	1.4	1.31	1.51	1.1	1.15	1.07	>2	1.47	1.36	1.25
	E (L-R)				<1	<1	<1	<1	<1	<1	<1	<1
	E (R-L)				1.54	1	1.01	<1	1.69	1.44	1.12	1.23
	F				1.3	1	<1	<1	1.33	1.18	1	1.18
	G				>2	>2	>2	>2				
	H	2.5	1.81	1.44	1.07	<1	<1	<1	1.61	1.49	1.13	1.35
	I	1.34	1.24	0.65	1.37	1.23	<1	1.22	1.61	1.35	<1	1.35
	J (L-R)				<1	<1	<1	<1	1.79	1.79	1.43	1.49
	J (R-L)				<1	<1	<1	<1	1.87	1.89	1.48	1.48
	K				<1	<1	<1	<1	<1	<1	<1	<1
	L				1.37	<1	1.15	<1	1.15	<1	<1	<1
	M	1.47	0.98	1.04	1.18	<1	<1	<1	1.54	<1	<1	<1
	N				<1	<1	<1	<1	1.91	1.34	1.25	1.34
	O				<1	<1	<1	<1	>2	1.3	1.53	1.34
	P				1.26	<1	<1	<1	1.53	1.3	1	1.26
	AE				1.14	<1	<1	<1	1.53	1.39	1.08	1.37
	AG				<1	<1	<1	<1	1.5	<1	<1	<1
	Q				1.15	<1	<1	<1	1.89	1.4	1.3	1.1
Stage 2	R	1.66	1.01	1.13	<1	<1	<1	<1	<1	<1	<1	<1
	S				1.3	1	0.74	0.87	1.55	1.48	1.04	1.11
	T	1.62	1.24	0.96	1.54	1.04	1.04	1	2.07	1.45	1.17	1.43
	U				1.31	<1	<1	<1	1.75	1.42	1.31	1.32
	V (L-R)	1.52	1	0.99	<1	<1	<1	<1	1.14	<1	<1	<1
	V (R-L)	1.52	0.99	1.01	>2	>2	>2	>2	1.6	<1	1.6	<1
	W				1.13	<1	<1	<1	1.83	1.33	1.26	1
	X	1.82	1.06	1.19	<1	<1	<1	<1	1.54	1.39	1.1	1.21
	Y	2.31	1.39	1.35	<1	<1	<1	<1	1.47	1.11	1.22	1.11
	Z				<1	<1	<1	-	<1	<1	<1	-
	AA				<1	<1	<1	<1	<1	<1	<1	<1
	AB	1.79	1.07	1.03	<1	<1	<1	<1	1.5	1	1.16	1

AC	2.18	1.44	1.23	1.13	<1	<1	-	1.56	1.43	1	-
AD (L-R)				1.13	<1	<1	<1	1.53	1.52	1.14	1.25
AD (R-L)				1.28	<1	1.23	<1	1.97	1.37	1.32	1.37
AF				<1	<1	<1	<1	<1	<1	<1	<1
AH				<1	<1	<1	<1	<1	<1	<1	<1
AI (L-R)				<1	<1	<1	<1	<1	<1	<1	<1
AI (R-L)				<1	<1	<1	<1	<1	<1	<1	<1

Note: All results from models with remedials meet the FoS requirements for areas within and directly under development areas
Results given above under the required FoS are outside the development area