5.2.14 Slope Ref. AA8

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA8	**Chainage:**	1880-1940	**Start Grid Ref:**	NG 90243 37019	**End Grid Ref:**	NG 90299 37045	**Elevation:**	20m AOD

Photo at Start Chainage (looking east)	Photo at End Chainage (looking west)
	

Rock Slope Characteristics:									
Dip (°):	75 - 80	Azimuth (°):	326	Height (m):	25 - 30	Length (m):	63	Vegetation Cover:	Up to 60% cover comprising lots of ivy, grass and small saplings.
Ditch Details:	0.5-1m deep; 2-5m wide Bund: 0.5m high, 0-4m wide	Roughness:	Rough	Verge Width (m):	0-1m				

Engineering Description of Rock:
Very strong thinly foliated dark grey schist. Contains occasional thin quartz foliations (PSAMMITE).

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose
N/A		

THC Monthly Reports:

Date	Location	Comments	Photo Reference
May 2018	Ch. 1850	Large stones in drain (x2)	

Existing Netting Details or other remedial work details:

Year of Works	Description of Works	Comments	2024 Inspection Observations
Before AECOM involvement (i.e. pre 2012)	Netting between Ch. 1895 and 1932.	Details of netting system include: - PVC coated double twist - Top cable 16mm galvanised - c.7m anchor spacing - Bottom anchors are stainless steel - Cable-anchor connection: stainless steel eye nuts and shackles at bottom - Netting lap connections using Spenax rings - No laps on anchors or vertical reinforcing Bimetallic corrosion protection present at bottom anchors but not in full contact. **2021 Inspection**: Netting generally in good condition, although bottom cable is locally slightly corroded. Bottom anchors and	No significant change to netting conditions observed in 2024 inspection.

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
		shackles are stainless steel. There is a plastic sheathing, however, locally the shackles are in contact with the galvanised cable. PVC coating cracking locally; no corrosion of wire where visible.	
2015 – Phase 8 works	- Large pillar of rock at Ch. 1920 at risk of toppling removed by heavy scaling, The ditch was cleared and roadside bund created. - Tree coppicing and light scaling carried out near crest of rock face.		No changes observed during 2024 inspection.

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2023 Inspection Observations**	**Photo Reference**
Ch. 1880	**2021 Inspection:** Minor accumulations of gravel sized rock at base of gully but still plenty of capacity in ditch. **2022 Inspection:** Soil slip/wash-out from 8m above ground level. There is a large ditch below with sufficient capacity.	Some additional soil washout and associated debris accumulation, however, ditch still has capacity to retain debris.	AA8-1 AA8-2
Ch. 1880 to 1895	**2019 Inspection:** No netting. Vegetated. Root jacking potential but large ditch below.	No changes observed during 2024 inspection.	
Ch.1895 to 1932	**2020 Inspection:** Vegetation well established and obscuring parts of the slope.	No changes observed during 2024 inspection.	
Ch. 1930	**2018 Inspection:** Ongoing failure of small blocks from crest. Debris successfully contained by rock trap ditch/bund. Area should be kept under observation in future inspections.	No changes observed during 2024 inspection.	
Ch. 1940	**2021 Inspection:** A lot of overhangs towards crest. Vegetation cover c.40 to 50% and dilated fractures evident. Some accumulation of gravel to cobble sized rock debris at base of watercourse within a 1 to 2m wide x 1m deep ditch with roadside bund. Still capacity and so does not require clearance.	No changes observed during 2024 inspection.	AA8-3

RISK RATING		Comments
Overall Hazard Rating =	2	
Pathway Rating =	2	
Receptor Rating =	1	
Risk Value =	**4.0**	
Risk Level =	**Low**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	- De-vegetation / coppicing of entire slope - The build-up of debris within ditch should be monitored and clearance works undertaken as required to maintain its capacity - Potential for bimetallic corrosion of bottom cable at anchor points – keep under observation.

Assessed in field by:	MT/SB	**Date:**	16/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

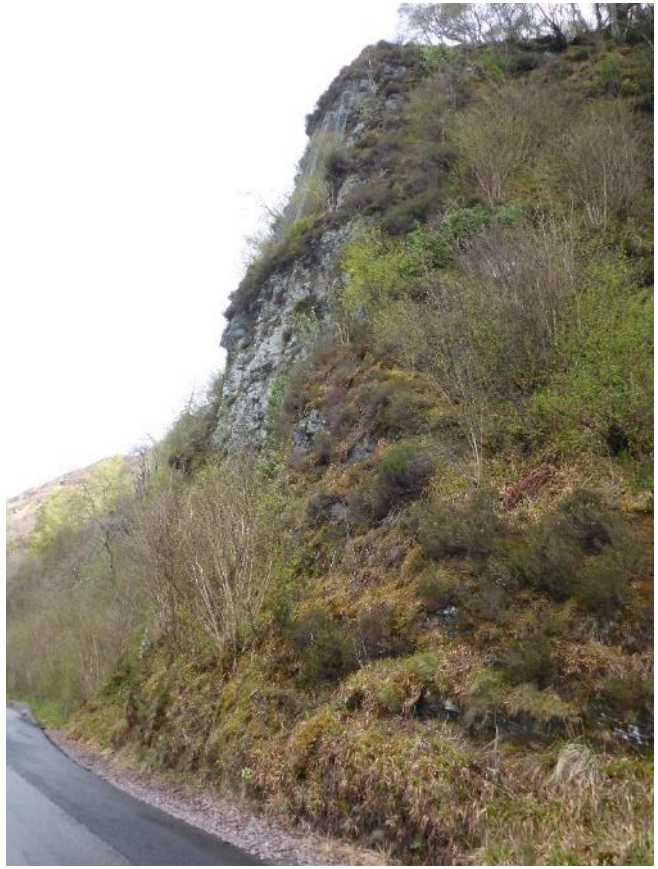
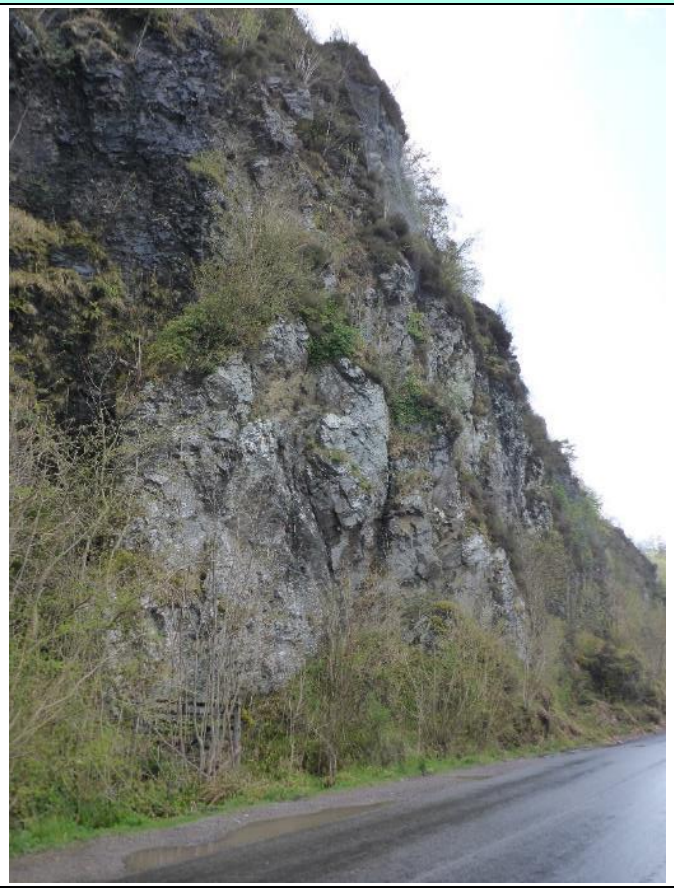
Photograph: AA8-1	Ch. 1880 – Accumulation of gravel sized blocks at based of gully. 2024 inspections showed evidence of further washout.	Year observation first noted: 2021

Photograph: AA8-2	Ch. 1880 – Soil slip/washout 8m above ground level. Evidence of further washout in 2024	Year observation first noted: 2022

Photograph: AA8-3	Ch. 1940 - A lot of overhangs towards crest. Some accumulation of gravel to cobble sized rock debris at base of watercourse within a 1 to 2m wide x 1m deep ditch with roadside bund.	Year observation first noted: 2021

5.2.15 Slope Ref. AA9

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA9	**Chainage:**	1940-1985	**Start Grid Ref:**	NG 90299 37045	**End Grid Ref:**	NG 90338 37061	**Elevation:**	12m AOD

Photo at Start Chainage (looking east)	Photo at End Chainage (looking west)
	

Rock Slope Characteristics:									
Dip (°):	82	Azimuth (°):	350	Height (m):	30	Length (m):	45	Vegetation Cover:	30-40% and locally >75% cover. Generally comprises grass and saplings.
Ditch Details:	Between Ch.1973 to 1988 – 1m wide, 0.5m deep ditch rock face more set back	Roughness:	Rough	Verge Width (m):	1.4m				

Engineering Description of Rock:
Strong thinly foliated dark grey medium schist. Some foliations are mica rich. Small ‘z’ folds were noted. (PSAMMITE).

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose
2021	Ch. 1978	To inspect overhanging square blocks near crest with dilated joint at rear. Findings - Block c.2m x 1m x 0.5m and appears to have dilated fracture at right hand side. Overall appears keyed in but vegetation growth around block could lead to root jacking. Recommendations: Recommend future inspection at height.

THC Monthly Reports:

Date	Location	Comments	Photo Reference
N/A			

Existing Netting Details or other remedial work details:

Year of Works	Description of Works	Comments	2024 Inspection Observations
Before AECOM involvement (i.e. pre 2012)	Netting between Ch. 1965 to 1975. No netting on lower 15m of slope.	Details of netting system include: - PVC coated double twist. - Top cable 16mm galvanised. - c.5m(?) anchor spacing and 25mm stainless steel bars - Cable-anchor connection: stainless steel eye nuts	No significant changes to condition of netting observed in the 2024 inspection.

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
		- 4 cable clamps (possibly others not identified) - Netting lap connections using Spenax rings - No laps on anchors or vertical reinforcing - A 0.2m to 0.3m gap between bottom cable and rock face. **2022 Inspection:** Bottom cable showing early signs of corrosion.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2023 Inspection Observations**	**Photo Reference**
Whole slope	**2012 Inspection:** Potential for ravelling and small block falls	No changes observed during 2024 inspection.	
Ch. 1965 to 1975	**2016 Inspection:** Netting noted to be gaping at sides and bottom. Potential for blocks up to 0.5m^3 to fall out either side or bottom and onto road below.	No debris or blocks accumulated. No other changes observed during 2024 inspection.	AA9-1
Ch.1978	**2020 Inspection:** Overhanging square blocks near crest with dilated joint at rear observed. Rope access inspection completed in 2021.	No changes observed during 2024 inspection.	

RISK RATING		Comments
Overall Hazard Rating =	2	
Pathway Rating =	3	
Receptor Rating =	1	
Risk Value =	**6.0**	
Risk Level =	**Moderate**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	- Improve netting system between Ch. 1965 and 1975.

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
		- Install vertical cables down either side of netting (25m each side) with additional anchors installed to secure in place (6 No. each side). - Install 2 No. lateral cables to profile netting (10m long). - Install 1 No. additional bottom anchor. - Future rope access inspection recommended to further inspect the overhanging block at Ch. 1978.

Assessed in field by:	MT/SB	**Date:**	16/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA9-1	Between Ch. 1965 to 1975 – Netting noted to be gaping at sides and bottom.	Year observation first noted: 2016

5.2.16 Slope Ref. AA10

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA10	**Chainage:**	1985-2297	**Start Grid Ref:**	NG 90338 37061	**End Grid Ref:**	NG 90610 37206	**Elevation:**	15m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:									
Dip (°):	85	Azimuth (°):	332	Height (m):	40	Length (m):	312	Vegetation Cover:	70% cover. Generally comprises grass and small to medium sized trees, with occasional large trees.
Ditch Details:	Ch. 1985-2010 only. Width 1.7, Depth 0.4	Roughness:	Rough	Verge Width (m):	Generally 10m, but 1m minimum.				

Engineering Description of Rock:
Very strong thinly foliated dark grey and white fine to medium schist. Contains thin laminations of quartz. (PSAMMITE)

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose**
2018	Ch. 2130	To inspect wedge c.15m above road level with trees growing above to left of block with potential for root jacking.

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
April 2013		Falling tree dislodged soil and rock with isolated block landing in road. Note: source of failure inspected in 2014 – no significant hazard identified.	

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
N/A			

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 1995	**2023 Inspection**: Small soil slip has come to rest on slope before deer fence (c.5m above toe of slope)	No changes observed during 2024 inspection.	
Ch. 1997	**2019 Inspection**: Potential root jacking of column of rock ca. 5 to 8m above toe. 3-4m verge so low risk.	Obscured by vegetation during 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 2000	**2012 Inspection**: Large scale potential wedge failure. Is c.10m wide x 10m high feature at the crest of the rock slope. No evidence of dilated fractures here and mass failure considered unlikely.	No changes observed during 2024 inspection. Still a potential hazard.	AA10-1
Ch. 2033-2188	**2016 Inspection**: Noted that slope is well vegetated in this area with uprooted trees. Root jacking evident, with potential to dislodge blocks. Recent failures evident. Specific hazards identified at Ch. 2068 and Ch.2130.	No changes observed during 2024 inspection.	
Ch. 2075	**2012 Inspection**: Potential wedge failure with root jacking identified.	No changes observed during 2024 inspection. Ivy starting to obscure view.	
Ch. 2110	**2017 Inspection**: Tree down c.8m above road level. Root ball has soil and rock weathering out but unlikely to be a risk to the road.	No changes observed during 2024 inspection.	
Ch. 2028	N/A	Tree has fallen down ca. 15m above road level and washout present. Soil, vegetation, and tree are resting on slope ca. 6m above road. Source area does not pose an increased risk of rock fall.	AA10-2
Ch. 2112	N/A	Several moss covered blocks present in culvert. Do not look recent. Currently are not blocking drainage gully.	
Ch. 2130	**2018 Inspection**: Potential wedge failure observed ~15m above road level. Potential for root jacking and release joints observed. The trajectory of a potential failure is difficult to predict, with the probable pathway to the left of the roadside outcrop. Potential failure volume is large enough to burst through the deer fence and may either come to rest in the ditch or at the edge of the road.	No changes observed during 2024 inspection.	
Ch. 2185	**2021 Inspection**: Small accumulation of gravel to cobble sized blocks at fence transported by intermittent waterflow in gully. No rocks past fence and at roadside so risk not considered to be significant	Accumulation of blocks has slightly increased since 2023.	AA10-3
Ch. 2188 to 2295	**2016 Inspection**: Rock face set further back here and it is considered that most failures within this section would be contained by the existing ditch and verge at the toe of the slope.	No changes observed during 2024 inspection.	
Ch. 2240	**2022 Inspection**: At crest of slope there are a number of trees leaning towards the road. If these fall there is potential for root balls to dislodge blocks, however, these are unlikely to impact the road as slope is set-back from road.	No changes observed during 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 2255	N/A.	Large block set back c. 10m from road. Not a recent fall – moss covered.	

RISK RATING		**Comments**
Overall Hazard Rating =	3	Reduced from 4 in 2018 due to detailed rope access inspection of wedge failure and accurate determination of potential failure volume.
Pathway Rating =	3	Increased from 2 in 2018 due to inspection of failure trajectory.
Receptor Rating =	1	
Risk Value =	**9.0**	
Risk Level =	**Moderate**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
- Install targeted combination of roadside rock fall catch fences and netting.	- Scale potential wedge failure at Ch. 2130.	- Targeted coppicing of trees growing in rock exposures and light scaling of broken/unstable rock.

Assessed in field by:	MT/SB	**Date:**	16/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA10-1	Ch. 2000 – Large scale wedge failure potential at crest of rock slope.	Year observation first noted: 2012

Photograph: AA10-2	Ch. 2028 – Combination of fallen tree and washout.	Year observation first noted: 2024

Photograph: AA10-3	Ch. 2185 – Small accumulation of gravel to cobble sized blocks at deer fence transported by intermittent waterflow.	Year observation first noted: 2021

5.2.17 Frenchman's Burn

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	Frenchman's Burn	**Chainage:**	2315	**Start Grid Ref:**	NG 90613 37210	**End Grid Ref:**	-	**Elevation:**	-

Upper Basin	**Lower Basin**
	

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
November 2020	Ch. 2345	Rock slip ca. 50m east of Frenchman's Burn. Failure occurred ca. 8m above road level in outcrop set back from road behind deer fence.	

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
Before AECOM involvement (i.e. pre 2012)	Formation of debris catch basins			
2020	Catch basins were cleared out by THC in late 2020			
2021	THC cleared debris from catch basins in summer 2021			

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 2345	**2020 Inspection:** Failure reported by THC (between Frenchman's Burn and AA11) inspected. Minor root jacking on face ca. 10m back from road edge. Potential for additional material to fail (ca. 1m³) but not posing risk to road due to verge width.	Possibly some new blocks present but well set back from the road. No other changes observed during 2024 inspection.	FB-1
Ch. 2315	**2021 Inspection:** Water levels are low. Both the lower and upper catch pits have good capacity.	Upper basin 50% full and lower basin 25% full but high water level so harder to visually access. Appears that debris may have been recently cleared out.	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	- Clear debris from basins as required to maintain capacity

Assessed in field by:	MT/SB	**Date:**	16/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: FB-1	Ch. 2345 – new blocks present below rock face but well set back from road.	Year observation first noted: 2020

5.2.18 Slope Ref. AA11

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA11	**Chainage:**	2360-2399	**Start Grid Ref:**	NG 90657 37232	**End Grid Ref:**	NG 90698 37266	**Elevation:**	10m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:									
Dip (°):	80	Azimuth (°):	332	Height (m):	20	Length (m):	39	Vegetation Cover:	0 to 60% cover comprising heather, grass and some sapling trees.
Ditch Details:	0.4m deep, 0.6-1m wide	Roughness:	Rough	Verge Width (m):	0-0.3m				

Engineering Description of Rock:
Extremely strong thinly foliated dark grey and white SCHIST. Foliations comprise quartz. Approximately the same quantity of dark grey and white foliations. (PSAMMITE)

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose**
N/A		

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
N/A			

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
Before AECOM involvement (i.e. pre 2012)		Details of netting system include: - PVC coated double twist. - Top cable 16mm galvanised. - c.5-6m anchor spacing (bottom anchors up to 11m) and 25mm galvanised bars (2 No. platypus anchors). - Cable-anchor connection: stainless eye nuts (M20 thread). - 4 cable clamps. - Netting lap connections using 2 staggered rows of Spenax rings every aperture. - No laps on anchors or vertical reinforcing. - No bimetallic corrosion protection between cable and eye nuts. Bottom cable corroded. Top cable secured with combination of direct anchors and corroded dropper cables attached to platypus anchors. **2020 Inspection:** Damaged intermediate bottom anchor (mesh caught and torn by grass cutter, pulling <1m long corroded anchor from face) at Ch. 2386.	No significant change to netting conditions observed in 2024 inspection.

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 2364	**2018 Inspection:** Wedge failure identified, comprising an overhanging column of rock ca. 6-8m above road level. Wedge of rock below has previously failed, possibly during construction but joints are tight and overhang. Not at imminent risk of failure.	No changes observed during 2024 inspection.	11A-1
Ch. 2377	**2018 Inspection:** Overhang noted ca. 8m above road level at up chainage end of buttress. Overhang ca. 1m. Dilated fractures and potential for small blocks to free fall ca. 2-3m before impacting mesh. Maximum block size ca. 0.4m x 0.4m x 0.4m so likely to be retained by existing netting.	Water seepage present. No other changes observed during 2024 inspection.	

RISK RATING		**Comments**
Overall Hazard Rating =	2	
Pathway Rating =	2	
Receptor Rating =	1.4	
Risk Value =	**4.8**	
Risk Level =	**Low**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	- Install bimetallic corrosion protection between existing galvanised cable and stainless steel eye nuts. - Replace bottom cable and install additional bottom anchors. - Replace dropper cables (allow 10No. 10m long) and install additional anchors (allow 6No.).

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA11-1	Ch. 2364 – Former wedge failure identified, leaving behind an overhanging column of rock ca. 6-8m above road level.	Year observation first noted: 2018

5.2.19 Slope Ref. AA12

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA12	**Chainage:**	2399 - 2467	**Start Grid Ref:**	NG 90698 37266	**End Grid Ref:**	NG 90740 37326	**Elevation:**	20m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:									
Dip (°):	80	Azimuth (°):	306	Height (m):	20	Length (m):	98	Vegetation Cover:	20-60% ground cover (gorse, heather, ferns) and small to medium trees.
Ditch Details:	None between Ch. 2399 to 2426, otherwise: 1.1m deep, 2.8m wide	Roughness:	Rough	Verge Width (m):	0.4m between Ch. 2399 to 2426				

Engineering Description of Rock:
Very strong dark to light grey very narrowly banded crystalline coarse to medium grained SCHIST.

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose/Findings	Photo Reference
2023	Ch. 2428	To inspect area where rock fall occurred and to determine if potential for further rock falls. Findings - Block keyed in at right hand side. Large, dilated fracture at back (block sticking out obliquely). To left of block there is another block of concern which was loose and removed/scaled during the rope access inspection. Rest of area is not at imminent risk of failure. Recommendations - Keep under observation during monthly/annual inspections.	

THC Monthly Reports:

Date	Location	Comments	Photo Reference
March 2023	Ch.2480	Rock fall event occurred on 10/03/2023. Note - THC record this within AA13/14 Upper however, the chainage is out-with AA13/14 Upper start and end chainage.	

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
2015 – Phase 8 works	7No. dowels installed at Ch. 2410, Ch. 2413 and Ch. 2423.			
2017 – Phase 9 works	- TECCO netting system installed between Ch. 2411 to 2427. - Spider netting system installed at Ch. 2462. - De-vegetation and light scaling.	**2020 Inspection:** TECCO netting locally has slight light coloured coating.	Slight corrosion on cut bar ends of anchors. No other significant change to netting condition observed in 2024 inspection.	AA12-1 AA12-2

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
NG 90790 37253	**2018 Inspection:** Large gully ca. 15m wide and 4m deep with watercourse above boundary between AA12/AA13. There is watercourse at risk of being washed out below. On upper slope there are small blocks (up to 0.3m diameter) presumably dislodged in root balls, and there is limited rock exposure.	No changes observed during 2024 inspection. Upper slope not inspected during 2024 inspection.	
Ch. 2399 to 2411	**2021 Inspection:** Vegetation well established on slope without netting (ca. 40% gorse cover). Potential for root jacking to cause small scale ravelling.	No changes observed during 2024 inspection.	
Ch. 2428	**2023 Inspection:** Several blocks in verge (up to 0.3m x 0.2m x 0.15m). Cumulatively around x10 blocks. Some blocks have come from c.10m up and have left overhang. Other tabular blocks have possibly come from beneath doweled overhanging block? Additionally, small block in rail boundary c. 0.25m x 0.1m x 0.2m. No fence damage and slope height here means unlikely block would have cleared fence. Most likely that block impacted road/roadside and someone has placed it within the railway boundary when clearing it away from the road.	No changes observed during 2024 inspection.	AA12-3

RISK RATING		Comments
Overall Hazard Rating =	1	
Pathway Rating =	2	Pathway rating increased from 1 in 2019 following re-assessment.
Receptor Rating =	1	
Risk Value =	**2**	
Risk Level =	**Low**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	N/A

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

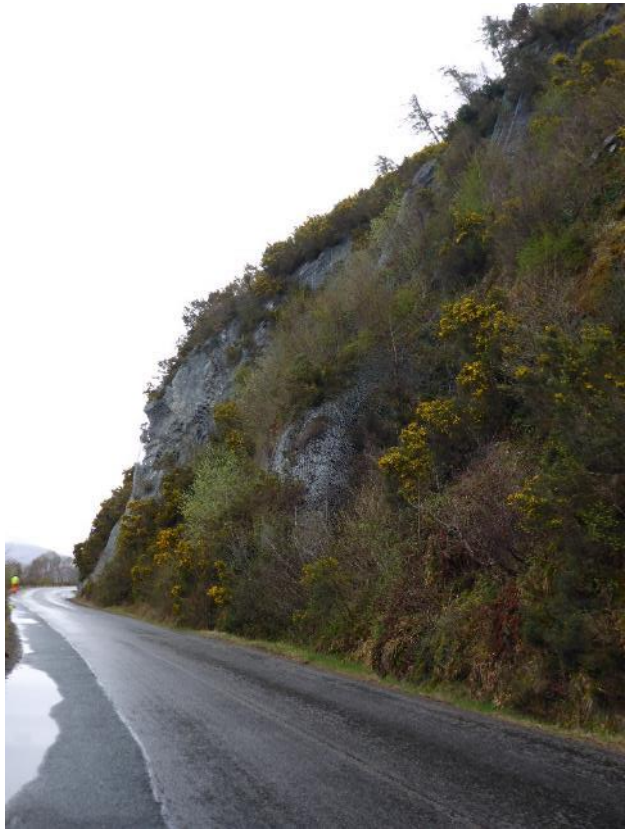
Photograph: AA12-1	General – slight corrosion on cut bar ends of anchors.	Year observation first noted: 2024

Photograph: AA12-1	Ch. 2462 – Spider netting.	Year observation first noted: 2017

Photograph: AA12-2	Ch. 2428 - Several blocks in verge (up to 0.3m x 0.2m x 0.15m). Cumulatively around x10 blocks. Some blocks have come from c.10m up and have left overhang.	Year observation first noted: 2023

5.2.20 Slope Ref. AA13

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA13	**Chainage:**	2467-2562	**Start Grid Ref:**	NG 90740 37326	**End Grid Ref:**	NG 90796 37399	**Elevation:**	12m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:													
Dip (°):	70 to 80	Azimuth (°):	301	Height (m):	25 to 30	Length (m):	95	Vegetation Cover:	40-50% cover comprising a lot of gorse and saplings	Ditch Details:	Locally no ditch. Where present 0.5m deep, 1.5m wide. Bund half way along.	Roughness:	Rough	Verge Width (m):	0-4m

Engineering Description of Rock:
Very strong thickly foliated GNEISS with quartz rich bands

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose**
N/A		

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
N/A			

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
Before AECOM involvement (i.e. pre 2012)	Netting installed	Details of netting system include: - PVC coated double twist - Top cable 12mm galvanised - c.5.5m anchor spacing and 25mm stainless steel bars - Cable-anchor connection: stainless steel eye nuts - 3 cable clamps - Netting lap connections using 3 rows of Spenax rings every third aperture. - No laps on anchors - Vertical Reinforcing: 8mm cable at 1m centres	No significant changes to netting observed in 2024 inspection.	

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
		Not all of the face is netted. The following faults have been identified with the netting system: small scale puncturing of mesh; wide spacing of spenax rings joining vertical reinforcing cables; slack cables; and corroded cable clamps. **2022 Inspection**: Netting has been torn, potentially by grass cutter at Ch. 2518.		
2015 – Phase 8 works	- Passive netting system extended across slope between Ch. 2552 to 2562.		No significant changes to netting observed in 2024 inspection.	
2017 - Phase 9 works	- Damaged netting repaired and slope re-profiled. - Dowel installation - Profiling cable installation - De-vegetation		No significant changes to netting observed in 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 2535	**2021 Inspection:** Overhanging area c.12 to 15m above toe with gaping mesh below. Potentially some dilated fractures around base of overhang. Large verge and ditch at toe mean low risk to road.	No changes observed during 2024 inspection from road level.	AA13-1
Ch.2552	**2023 Inspection:** Blocks behind netting c.1.5m above toe, source c.5m above toe (0.5m x 0.3m x 0.1m). Not extensively straining/deforming netting. No action required.	No changes observed during 2024 inspection.	AA13-2
Ch. 2558	**2019 Inspection:** Not blocking ditch and so no clearance work required. Keep under observation.	No changes observed during 2024 inspection.	AA13-3

RISK RATING		Comments
Overall Hazard Rating =	1	
Pathway Rating =	2	Pathway rating increased in 2019 following re-assessment.
Receptor Rating =	1.2	
Risk Value =	**2.4**	

Risk Level =	**Low**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	- Replace corroded cable clamps, re-tension and install additional spenax rings on vertical reinforcing cables between Ch. 2513 and 2528.

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA12-1	Ch. 2535 – Overhang area c. 12 to 15m above toe with gapping mesh below.	Year observation first noted: 2021

Photograph: AA11-2	Ch. 2552 - Blocks behind netting c.1.5m above toe, source c.5m above toe (0.5m x 0.3m x 0.1m).	Year observation first noted: 2023

Photograph: AA11-3	Ch. 2558 - Continued accumulation of gravel to cobble sized debris at base of watercourse.	Year observation first noted: 2019

5.2.21 Slope Ref. AA13/14 Upper

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA13/14 Upper	**Chainage:**	2505–2650	**Start Grid Ref:**	NG 90830 37319	**End Grid Ref:**	NG 90904 37388	**Elevation:**	m AOD

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
N/A			

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
2013 – Phase 7 works	Boulder removed at NG 89631 36342			

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
General	**2016 Inspection:** Main risk on this slope is associated with the uprooting of trees and boulders falling from their root balls. As many trees have fallen as are left standing and those that remain are leaning. A potential solution could be to fell the remaining trees leaving a 1-2m high stump and allowing the tree trunks to fall in line with / along the slope. This would form an interlocking barrier that will help to retain boulders on the slope and remove the risk of trees uprooting and exposing/releasing blocks in root balls. As a minimum, area should be surveyed annually by aerial drone, with topographic and photographic surveys to monitor condition of trees and frequency of tree falls.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	
NG 90850 37349	**2012 Inspection:** Potential for blocks up to approximately 7m³ to fail.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
	2013 Inspection: A tabular boulder 0.9m x 0.7m x 0.2m lodged between two trees; large tabular boulder 1.7m x 1.2 x 0.35m undercut by approximately two thirds with boulders resting on top; occasional blocks on rock face at risk of toppling (up to 0.6m x 0.4m x 0.25m).	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	
NG 90846 37351	**2016 Inspection:** Detached tabular boulder (1.6m x 1.0m x 1.0m). Not currently at risk of moving downslope, but if adjacent tree uproots this could destabilise it.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	
NG 90900 37380	**2016 Inspection:** Potentially unstable block located 20m above this location on an outcrop beneath a fallen tree. Estimated to be 2m x 1m x 1m.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	
NG 90807 37277	**2018 Inspection:** Risk of fallen trees with upturned root balls dislodging blocks remains high.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	
NG 90840 37318	**2018 Inspection:** At ca. 100m above road level tree has slid down slope root ball first dislodging blocks in root ball and underlying crag. It appears the debris has all be caught by fallen trees on the slope below.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	
0-20m NW of above	**2018 Inspection:** Risk of wedge failure from wedge with tree growing out of top. Blocks beneath are observed to have been dislodged by around 20mm. Blocks which fail would free fall and tumble down slope below, but due to fallen trees would be unlikely to reach road.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	
20m NW of above	**2018 Inspection:** Large block (3m long x 1.5m deep x 2.5m wide) with dilated fracture behind, which has been root jacked from the tree growing above. There is risk that the block could topple out but it is unlikely to reach the road due to the presence of fallen trees on the slope below.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	

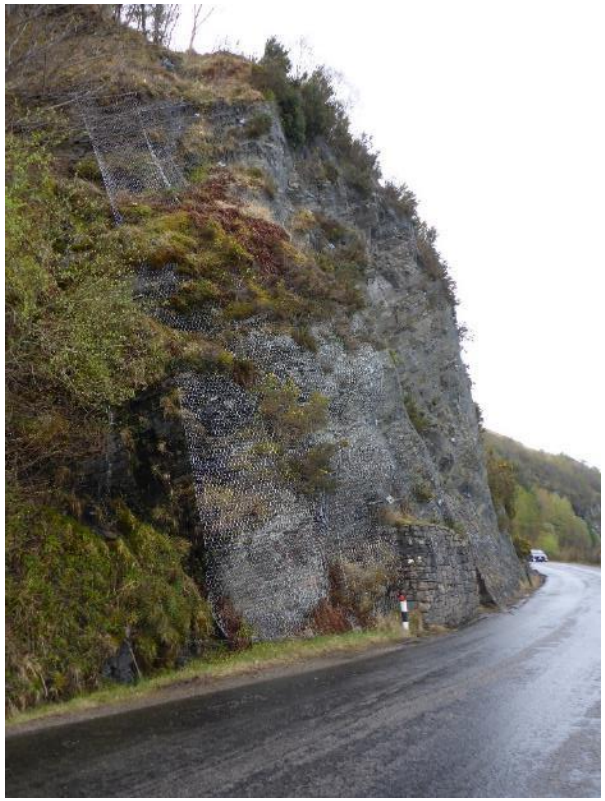
RISK RATING		Comments
Overall Hazard Rating =	3	
Pathway Rating =	3	
Receptor Rating =	1.2	
Risk Value =	**10.8**	
Risk Level =	**High**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	- Controlled removal or retention of unstable blocks.	- Fell trees. - Consider felling trees to fall along slope and leave stump 1-2m high to form barrier to down slope movement.

Assessed in field by:		**Date:**		**Reviewed by:**	PLM	**Date:**	19/07/24

5.2.22 Slope Ref. AA14W

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA14W	**Chainage:**	2562-2630	**Start Grid Ref:**	NG 90796 37399	**End Grid Ref:**	NG 90846 37438	**Elevation:**	12m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:							
Dip (°): 75	Azimuth (°): 324	Height (m): 15	Length (m): 85	Vegetation Cover: 100% on upper half of slope in places; c.10% on remaining slope. Predominantly comprising gorse bushes.	Ditch Details: Width 1.0 Depth 0.3	Roughness: Rough	Verge Width (m): 0.4m

Engineering Description of Rock:
Extremely strong to very strong grey and pink medium banded crystalline coarse grained GNEISS.

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose**
2017	Ch. 2615 to 2625	To inspect area (above buttress). This area has since been remediated in 2019.

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
N/A			

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
Before AECOM involvement (i.e. pre 2012)	Maccaferri Netting	Details of netting system include: - PVC coated double twist - Top cable 12mm galvanised - Up to 15m anchor spacing and 15mm bars - Cable-anchor connection: D shackle (connected with locking nuts on one side only)/Threaded eye nuts - 3/4 cable clamps - Netting lap connections using 2 row of cable twist connections every fourth aperture - No laps on anchors or vertical reinforcing **Note:** in 2013 new top cable and anchors were installed.	No significant change to netting observed in 2024 inspection.

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
2013 – Phase 7 works	New top cable and anchors installed between Ch. 2566 to 2576 and Ch. 2622 to 2627.	Anchor Type: 25mm GEWI bars	No significant change to netting components observed in 2024 inspection.
2019 – Phase 11 works	Active TECCO netting system installed between Ch. 2576 and 2633 to replace Maccaferri drape	**2021 Inspection:** TECCO netting in good condition. No defects observed other than very minor corrosion of some cut end bars.	No significant change to netting observed in 2024 inspection.

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
General	**2023 Inspection:** Localised small blocks (ravelling) behind TECCO c.15-20m upslope above buttress. No action required.	No changes observed during 2024 inspection.	AA14W-1

RISK RATING		**Comments**
Overall Hazard Rating =	2	
Pathway Rating =	1	
Receptor Rating =	N/A	Receptor rating only applicable when pathway rating is ≥2.
Risk Value =	**2**	- Formerly very high risk. Re-assessed following Phase 11 works and hazard and pathway ratings reduced. - Re-assessed during the 2022 inspection following changes to receptor rating. Risk value reduced from 2.4.
Risk Level =	**Low**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	N/A

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA14W-1	General – localised small blocks (ravelling) behind TECCO c. 15-20m upslope of buttress.	Year observation first noted: 2023

5.2.23 Slope Ref. AA14E

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA14E	**Chainage:**	2630 - 2664	**Start Grid Ref:**	NG 90846 37438	**End Grid Ref:**	NG 90871 37455	**Elevation:**	11m AOD

Photo	
	

Rock Slope Characteristics:									
Dip (°):	86	Azimuth (°):	347	Height (m):	30	Length (m):	33	Vegetation Cover:	Rock slope ca. 10 – 20% cover. Some grass with occasional sapling and gorse at crest of rock slope.
Ditch Details:	Width 1.0-1.2 Depth 0.8	Roughness:	Rough	Verge Width (m):	0-0.8m at roadside 20m to toe of rock slope				

Engineering Description of Rock:
Strong thinly foliated dark grey fine to medium grained SCHIST. Contains occasional thin foliations of quartz. Some laminations were noted to be mica rich. (PSAMMITE)

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose/Findings
2017	Ch. 2620	To inspect crest of rock face where potential failures may occur (existing catch fence my not prevent these reaching road). Findings - It was noted that there were overhangs with dilated joint sets at the crest of the rock slope behind low catch fence with green posts. If failure were to occur it would likely exceed capacity of catch fence: fence is only 1.5m height with no break rings. Recommendations - Recommend TECCO netting with face pattern bolts on upper half of rock face and TECCO drape on lower half of rock face. Alternatively, an appropriately designed catch fence could be considered.

THC Monthly Reports:

Date	Location	Comments	Photo Reference
N/A			

Existing Netting Details or other remedial work details:

Year of Works	Description of Works	Comments	2024 Inspection Observations	Photo Reference
Before AECOM involvement (i.e. pre 2012)	Mid-slope catch fence 1.5m high	Posts at 6m centres (140mm diameter, 8mm thick steel tubes). Fence constructed from double twist netting with 16mm horizontal stainless steel reinforcing cables at	Fence in good condition. Only surface corrosion on galvanised cable clamps. Upslope supports cables and clamps are stainless steel. No blocks in fence. No obvious change in cliffs above. Scree area between fence and cliff is very moss covered suggesting been	AA14E-1 AA14E-2

		0.4m vertical spacing. No brake rings.	there a long time. However, area at base of cliff up from 3rd fence post from the right behind leaning tree has an accumulation of scree blocks that are free of moss or only slightly covered indicating more activity. No immediate action. Proposed remedial solution still relevant. Keep under observation.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Crest of slope	**2012 Inspection:** Large overhang with dilated joints and potential for failures to exceed catch fence capacity/height.	No change noted during 2024 inspection.	

RISK RATING		**Comments**
Overall Hazard Rating =	3	
Pathway Rating =	3	
Receptor Rating =	1.4	
Risk Value =	**12.6**	
Risk Level =	**High**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
- Install TECCO netting with face pattern bolts on upper half of slope with TECCO drape on lower half; or install appropriately designed catch fence.	N/A	- Accumulation of debris behind existing catch fence to be monitored and clearance works undertaken in the event of a failure.

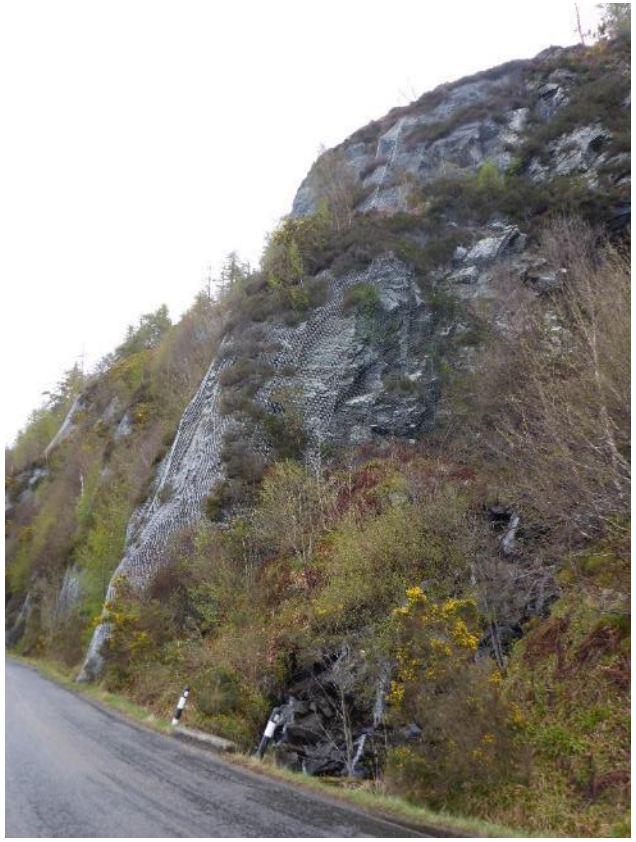
Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA14E-1	Mid-slope catch fence 1.5m high.	Year observation first noted: pre 2012

Photograph: AA14E-2	Mid-slope catch fence 1.5m high.	Year observation first noted: pre 2012

5.2.24 Slope Ref. AA15

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA15	**Chainage:**	2664-2851	**Start Grid Ref:**	NG 90871 37455	**End Grid Ref:**	NG 91005 37551	**Elevation:**	18m AOD

Photo at Start Chainage (looking east)	Photo at End Chainage (looking west)
	

Rock Slope Characteristics:									
Dip (°):	75	Azimuth (°):	335	Height (m):	25 - 30	Length (m):	171	Vegetation Cover:	50-60% cover; up to 75% locally: a lot of saplings, gorse bushes and heather.
Ditch Details:	Ch. 2690-2698: No Ditch Ch. 2695-2705: 2m wide, 0.3m deep Ch2705-2800: 2m wide, 0.5m deep.	Roughness:	Rough	Verge Width (m):	0.5 – 2.0m				

Engineering Description of Rock:
Very strong thickly foliated dark GNEISS with pinkish quartz bands.

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose**
N/A		

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
N/A			

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
Before AECOM involvement (i.e. pre 2012)	Netting installed.	Details of netting system include: - PVC coated double twist - Top cable 12mm galvanised - 4 – 7m anchor spacing at crest (but only terminal anchors at toe) and 25mm(?) stainless bars and occasional platypus anchors (6mm stainless steel cable)	No significant changes to netting observed in 2024 inspection.	

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
		- Cable-anchor connection: Stainless eye nuts (bar machined to M20 thread) and 150mm stainless faceplates - 3 cable clamps - Netting lap connections using 2 rows of spenax rings - No laps on anchors - 8mm cable at 1m spacing (3 cable clamps) **2016 Inspection:** Noted that there are only bottom anchors at either end of the passive rock fall netting system (true drape). Presence of 2-3m wide verge with ditch between Ch. 2713 and 2774 means debris is unlikely to reach road in this section but there is a potential for debris to reach road between Ch. 2663 and 2713. Top anchors noted to be infrequent and those that are visible are platypus type soil anchors.		
2015 – Phase 8 works	- Passive netting extended so now present between Ch. 2664 to 2773. - Active high strength netting (SPIDER mesh) installed over potential failure at Ch.2680		No significant changes to netting observed in 2024 inspection.	AA15-1

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 2700	N/A	Chainage marker 2700 is missing.	
Ch. 2790	**2016 Inspection:** Root jacking recorded beyond end of netting approximately 10m above road level and may have associated hazards.	No changes observed during 2024 inspection.	AA15-2
Ch. 2807-2810	**2018 Inspection:** Numerous blocks in roadside ditch originating from failure ca. 4-5m above road level, the largest is 0.5 x 0.4 x 0.2m. Total failure volume of ca. 0.5-0.75m³. Root jacking is evident as the	No changes observed during 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
	cause. Dilated fracture observed to left hand side of failure scar with the potential for similar size failures to occur in the future but the 2m wide x 0.3m deep ditch/verge should contain these failures. No remedial measures determined to be required.		
Ch. 2817	**2017 Inspection:** Large block approximately 0.5m³ was noted on the verge. Block appears to be recent. The source of the block has not been confirmed but an uprooted tree 20m above road noted as a possible source.	Block not identified in 2024 inspection.	
Ch. 2820	**2019 Inspection:** Two broken posts observed on post and wire fence between road and railway. Appear to have been struck by vehicle.	No changes observed during 2024 inspection.	
Ch. 2843	N/A	Block present in ditch. Unclear if block is recent or not. Dimensions are 0.6x0.5x0.3m. The source of the block is not clear but there are crags present above. There are also a few other smaller blocks around too and potential for further blocks to fall.	AA15-3
General	**2016 Inspection:** Vegetation (particularly gorse) becoming well established on rock slope obscuring rock mass and introducing potential for root jacking.	Vegetation has grown and now obscuring view of slope inspection. Vegetation also adds weight to netting and is growing through the netting. Recommend de-vegetation of slope.	

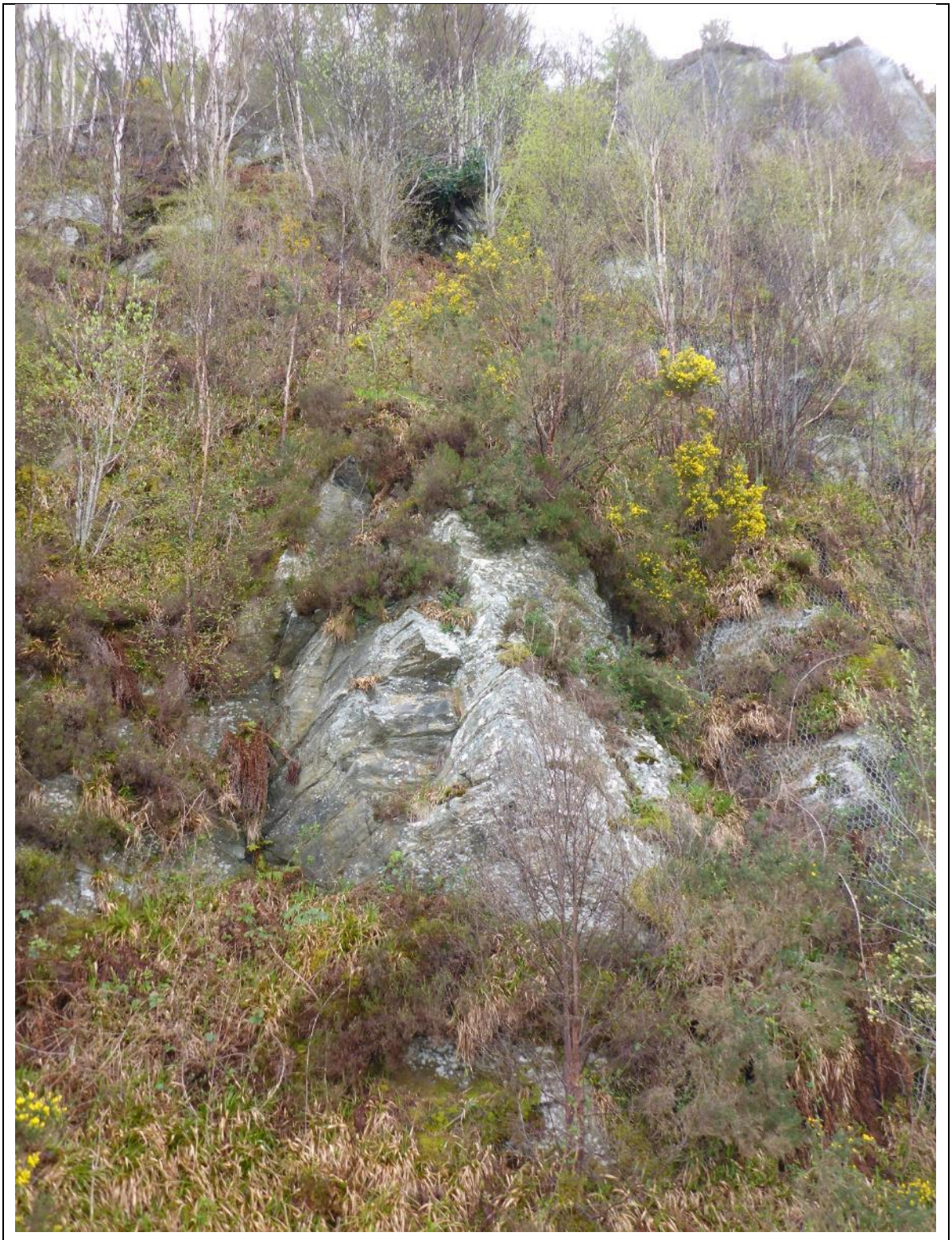
RISK RATING		Comments
Overall Hazard Rating =	3	Increased from 2 in 2021 to reflect increased root jacking risk,
Pathway Rating =	2	Reduced from 3 in 2018 following re-assessment of potential for failures to reach road.
Receptor Rating =	1.2	
Risk Value =	**7.2**	
Risk Level =	**Moderate**	

Recommended Remedial Works / Actions

Large Scale Rock Fall Protection Works (Category 3)	Localised Targeted Rock Fall Protection Works (Category 2)	Ongoing Maintenance (Category 1)
N/A	N/A	- De-vegetate rock face within existing passive rock fall netting (approx. 60% cover, 25m high slope). - Coppice trees towards crest of slope out with existing passive rock fall netting system from Ch. 2790 to 2851. - Install additional bottom anchors at max. 5m spacing between Ch. 2690 and 2700. - Replace top cable and install additional top anchors at maximum 5m spacing.

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA15-1	Ch. 2680 – active high strength netting (Spider Netting).	Year observation first noted: 2015



Photograph: AA15-2	Ch. 2790 – root jacking recorded beyond end of netting approximately 10m above road level.	Year observation first noted: 2016

Photograph: AA15-3	Ch. 2843 – block in ditch. Unclear if recent rock fall or not.	Year observation first noted: 2024

5.2.25 Slope Ref. AA15 Upper

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA15 Upper	**Chainage:**	2710–2733	**Start Grid Ref:**	NG 90955 37420	**End Grid Ref:**	NG 90971 37437	**Elevation:**	m AOD

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose/Findings**
2018	20m upslope from NG 90969 37395	To inspect condition of slope. Findings - Upper crag with large wedge sticking out ca. 85m above road level. No obvious dilation of joints but if failure were to occur may move significant distance downslope. Keep under observation for evidence of dilation. All elements of the strapping and cabling of the boulder undertaken as part of the Phase 7 works in 2013 are in a good condition.

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
N/A			

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
2013 – Phase 7 works	Block 100m above road level was strapped in place	**2018 Inspection:** All elements of the strapping and cabling are in a good condition. **2021 Inspection:** All elements of the strapping and cabling are good conditions, slight surface corrosion on cable only.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
General	**2021 Inspection:** Two or three protrusions of rock sticking out but look to be well wedged into rock mass. Small trees are giving the potential for root jacking but nothing is dilated or showing signs of imminent failure.	Not inspected on foot during 2024 Inspection – please refer to drone survey review within Section 4 of the report.	

RISK RATING		Comments
Overall Hazard Rating =	3	
Pathway Rating =	3	
Receptor Rating =	1.2	
Risk Value =	**10.8**	
Risk Level =	**High**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	- Fell trees. - Consider felling trees to fall along slope and leave stump 1-2m high to form barrier to down slope movement.

Assessed in field by:		**Date:**		**Reviewed by:**	PLM	**Date:**	19/07/24

5.2.26 Slope Ref. AA16

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA16	**Chainage:**	2851-2923	**Start Grid Ref:**	NG 91005 37551	**End Grid Ref:**	NG 91069 37601	**Elevation:**	18m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:													
Dip (°):	60 - 75	Azimuth (°):	332	Height (m):	15 - 20	Length (m):	72	Vegetation Cover:	60 to 70% cover. Generally comprised ground gorse, grass, etc.	Ditch Details:	Only between Ch. 2890-2920. 2m wide, 1m deep.	Roughness:	Rough	Verge Width (m):	1

Engineering Description of Rock:
Very strong thinly foliated dark grey schist. (PSAMMITE)

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose
2017	Ch. 2910	To inspect overhanging area of rock between 10 to 15m above road level. Findings - Overhanging blocks at crest of slope are generally keyed in with the exception of some small blocks. Joint sets were not noted to be dilated. A verge of 1.5m and ditch (2m wide and 0.5m deep) was recorded at roadside and considered adequate to contain small failures. Ditch capacity increased during Phase 12 works.

THC Monthly Reports:

Date	Location	Comments	Photo Reference
August 2018		New stones in drain (x4)	
March 2020	Ch. 2890	Large rock in drain	
July 2020	Ch. 2860	Large rock in ditch (ca. 0.5 x 0.4 x 0.3m). First observed 03/07/20. Originated from ca. 3m upslope.	

Existing Netting Details or other remedial work details:

Year of Works	Description of Works	Comments	2024 Inspection Observations
Before AECOM involvement (i.e. pre 2012)	Netting present between Ch. 2872 to 2899.	Details of netting system include: - PVC coated double twist - Top cable 16mm galvanised - 4 – 5m anchor spacing and 25mm galvanised bars - Cable-anchor connection: Galvanised eye nuts - 3 cable clamps	No significant change to netting observed.

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
		- Netting lap connections using 3 rows of galvanised spenax rings - No laps on anchors and possibly no vertical reinforcing At each top anchor on the top cable an additional dowel is located approximately 2m above and connected to the main cable with a 16mm dropper cable.	
2021 – Phase 12 works	Capacity of ditch at Ch. 2890 to 2920 has been increased.		No change – ditch remains effective.

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 2851 to 2872	**2023 Inspection:** Vegetation very well established (gorse, grass, large saplings). No netting, no ditch. Slope set back from road edge c.0.5-0.8m. Some dilated fractures evident but slope largely obscured. Potential for root jacking to cause block falls up to 1m x 0.4m x 0.4m. Most expected to reach road.	No changes observed during 2024 inspection.	
Ch. 2888	**2016 Inspection:** Broken section of rock mass 5-10m above road level with potential to fail if root jacking continues. Block size typically ~0.1m³ but total failure volume could be 2-3m³. May exceed capacity of mesh if all fails at same time. Verge quite narrow so could reach road.	No changes observed during 2024 inspection.	AA16-1
Ch. 2910	**2016 Inspection:** Overhang noted at the crest of the slope, however, 2017 rope access inspection indicated generally keyed in with no obvious dilation of joints. Area to be kept under observation in future inspections for signs of deterioration.	No changes observed during 2024 inspection.	AA16-2
Ch. 2922	**2023 Inspection:** 3x small blocks in verge (0.25m x 0.15m x 0.15m) – reported by THC to have occurred within 'the last few days'. Not known if landed here or moved here. Source not apparent from road level. Vegetated rock slope above but no fresh surfaces. Doesn't appear to have originated from roadside rockface. Upslope inspection carried out. AA16-17 Upper crags	No changes observed during 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
	directly above but no evidence of recent rock fall. Blocks observed to be resting on slope and against trees with lots of evidence of deer activity. Possible that block was dislodged by a deer.		

RISK RATING		Comments
Overall Hazard Rating =	3	Increased form 2 in 2021 to reflect increased root jacking risk.
Pathway Rating =	2	
Receptor Rating =	1	
Risk Value =	**6.0**	
Risk Level =	**Moderate**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	- Coppice tree growing within broken rock mass at Ch. 2888.	- Vegetation clearance / tree coppicing across slope. - Build-up of debris in ditch should be monitored and clearance works undertaken as required to maintain its capacity.

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA16-1	Ch. 2888 - Broken section of rock mass 5-10m above road level with potential to fail if root jacking continues.	Year observation first noted: 2016

Photograph: AA16-2	Ch. 2910 – Overhanging rock mass noted at crest of roadside slope.	Year observation first noted: 2016

5.2.27 Slope Ref. AA16-17-18 Upper

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA16-17-18 Upper	**Chainage:**	2766 - 3050	**Start Grid Ref:**	NG 91016 37460	**End Grid Ref:**	NG 91199 37660	**Elevation:**	m AOD

THC Monthly Reports:

Date	Location	Comments	Photo Reference
N/A			

Existing Netting Details or other remedial work details:

Year of Works	Description of Works	Comments	2024 Inspection Observations	Photo Reference
2013 – Phase 7 works	Unstable blocks removed and some strapped which were at risk of toppling 60-100m above road level at NG 91054 37487	Total estimated failure volume 3m³.	Not assessed during 2024 inspection.	

Hazards Observed:

Location	Description of Hazard (s) from Previous Inspections	2024 Inspection Observations	Photo Reference
General	**2014 Inspection:** A number of blocks have been removed or strapped. However, a large number of potentially loose blocks remain on small rock outcrops or within the root balls of uprooted trees.	Not inspected on foot during 2024 inspection.	
General	**2016 Inspection:** The main risk is associated with fallen trees dislodging small boulders. Larger scale failures from the natural rock outcrops are likely to be infrequent (every 20-30 years)	Not inspected on foot during 2024 inspection.	
High above AA16/17	**2018 Inspection:** Crags with fallen trees, including a large fallen tree at crest, and blocks which have been dislodged, including one 0.75m³	Not inspected on foot during 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
	block that has come to rest on fallen trees below where the slope is at a 45 degree angle. Crags centred around NG 91040 37525 and extending to NG 91131 37596. **2023 Inspection:** A further example of this hazard was noted at NGR NG 91103 37585 ±5m, alt. 50 ±5m. Block is 1.0m x 0.5m x 0.5m and resting against fallen tree trunk.		
General	**2021 Inspection:** Lower cliffs/crags are quite slabby in nature - not much is obviously as an immediate risk. Possibly one wedge c.1m³ at south-west end near crest warrants further inspection. Upper crags are fairly massive structure and no obvious blocks that could fail. Smoothish profile, >50m high. To fully assess a drone survey inspection is recommended as terrain means that safe access to crest is not possible.	Not inspected on foot during 2024 inspection.	
General	**2023 Inspection:** Lots of evidence of deer – potential cause of rock fall observed at road level Ch. 2922 (AA16).	Not inspected on foot during 2024 inspection.	
General	**2023 Inspection:** No evidence of source of block recently reported by THC but general condition of upper slope is poor with frequent fallen trees and blocks resting on slope and against tree trunks.	Not inspected on foot during 2024 inspection.	
High above AA18 at NGR NG 91189 37608	**2023 Inspection:** Hazards noted in this area include: -Loose block lying on ground amongst fallen long tree trunks. Block elongate and 1.2m max dimension. - Debris ‘dams’ of blocks and branches in water course that flows into AA18/19 – Likely source of some block falls. - Scree area cleared in September 2022 emergency works – scree is re-accumulating – needs to be cleared again.	Not inspected on foot during 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
High above AA18 at NGR NG 91206 37613	**2023 Inspection:** Hazards noted in this area include: - A 0.7x0.5x1.2m boulder on slope - There are several fallen trees with elevated root balls containing blocks/hanging blocks - A very tall tree leaning at 20° (bearing 290° from NGR location, ca. 30 – 35m away) at risk of falling.	Not inspected on foot during 2024 inspection.	

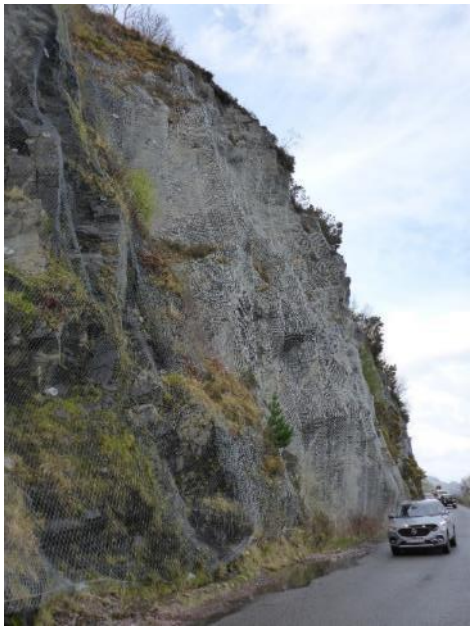
RISK RATING		Comments
Overall Hazard Rating =	3	
Pathway Rating =	3	
Receptor Rating =	1.2	
Risk Value =	**10.8**	
Risk Level =	**High**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
- Install rock fall catch fence along crest of roadside rock face.	N/A	- Consider felling trees to fall along slope and leave stump 1-2m high to form barrier to down slope movement.

Assessed in field by:		**Date:**		**Reviewed by:**	PLM	**Date:**	19/07/24

5.2.28 Slope Ref. AA17

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA17	**Chainage:**	2923-2987	**Start Grid Ref:**	NG 91069 37601	**End Grid Ref:**	NG 91123 37630	**Elevation:**	11m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:									
Dip (°):	80	Azimuth (°):	322	Height (m):	20	Length (m):	64	Vegetation Cover:	20% cover: moss, ferns, heather, gorse and saplings.
Ditch Details:	No ditch	Roughness:	Rough	Verge Width (m):	1 - 3				

Engineering Description of Rock:
Extremely strong to very strong dark grey narrowly banded crystalline medium grained GNEISS.

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose
2017	Ch. 2935	To inspect area of potential wedge failure and netting. Findings - Area noted to be very blast damaged between Ch. 2933 and Ch. 2946. Joint sets are noted to be very dilated with failure potential that could exceed capacity of Maccaferri (with 1 and locally two layers of chain link below). Rock mass is very broken and therefore an active netting system (e.g. TECCO) is not considered to be an appropriate option as drilling pattern bolts would dislodge material. Recommendations -Recommend opening mesh and scaling area before re-assessing. Existing mesh to be re-instated on completion.
2017	Ch. 2965	To inspect large wedge approximately 10m above road level. Findings – blocks are keyed in but condition should be monitored during future inspections.

THC Monthly Reports:

Date	Location	Comments	Photo Reference
N/A			

Existing Netting Details or other remedial work details:

Year of Works	Description of Works	Comments	2024 Inspection Observations
Before AECOM involvement (i.e. pre 2012)	Netting installed	Details of netting system include: - PVC coated double twist - Top cable 16-20mm galvanised - 2.5m anchor spacing at crest (but up to 12m at toe) and 25mm galvanised bars - Cable-anchor connection: None - 2 cable clamps - Netting lap connections: Netting joined with cable twists and lacing wire, with additional Spenax rings installed in 2015 - No laps on anchors and no vertical reinforcing (but numerous lateral/diagonal reinforcing cables - note that many of the anchors for these appear corroded).	No significant change to netting observed in 2024 inspection.

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
		Note: in 2015 top cable, anchors and additional spenax jointing were installed. **2016 Inspection:** Inspection of existing passive rock fall netting system identified the following faults: - Bottom anchors at a spacing of 8-12m between Ch. 2894 and 2935. Up chainage of this the bottom of the mesh is buried by coarse gravel in ditch, but appears to be well secured. - Many of the anchors for the reinforcing cables in the upper portion of the slope are corroded. **2017 Inspection:** Wide spacing of bottom anchors (up to 12m) with partially buried mesh and corroded eyelets observed **2022 Inspection**: Some localised corrosion on bottom cable noted	
2015 – Phase 8 works	New top cable, anchors and additional spenax jointing installed		No significant change to netting components observed in 2024 inspection.

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 2933 to 2946	**2017 Inspection:** Large area of blast damaged rock mass with potential to exceed capacity of mesh in event of failure.	No changes observed during 2024 inspection.	
Ch. 2965	**2017 Inspection:** Large wedge approximately 10m above road level, with smaller wedge above. Rope access inspection in 2017 confirmed blocks are currently keyed in but condition should be monitored during future inspections.	No changes observed during 2024 inspection.	
Ch. 2970	N/A	Netting has a small tear present. Likely to be caused by a passing vehicle. No signs of rock fall at this location.	AA17-1

General	**2020 Inspection:** Trees becoming well established at crest, with gorse present on cutting face.	No changes observed during 2024 inspection.	

RISK RATING		**Comments**
Overall Hazard Rating =	3	
Pathway Rating =	2	Reduced from 3 to 2 in 2023 following re-assessment of pathway. Most blocks not expected to reach road due to netting system.
Receptor Rating =	1.2	
Risk Value =	**7.2**	
Risk Level =	**Moderate**	

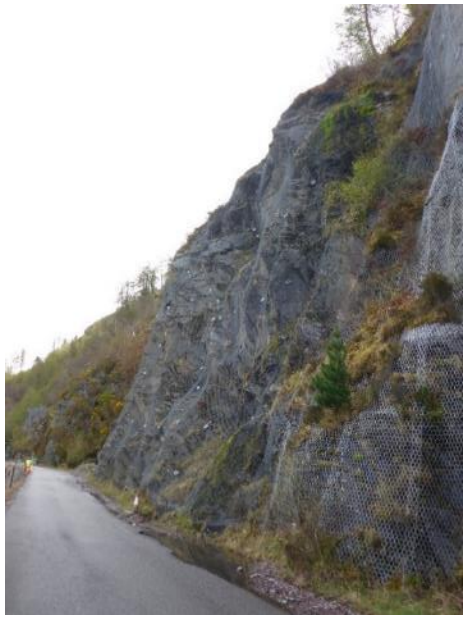
Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	- Ch. 2933-2946: Open up Maccaferri netting and carry out scaling before re-assessing. Netting to be reinstated on completion.	- Replace corroded anchor points on reinforcing cables.

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA17-1	Ch. 2970 – Netting has a small tear present.	Year observation first noted: 2024

5.2.29 Slope Ref. AA18

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA18	**Chainage:**	2987-3059	**Start Grid Ref:**	NG 91123 37630	**End Grid Ref:**	NG 91186 37649	**Elevation:**	10m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:									
Dip (°):	76	Azimuth (°):	346	Height (m):	15	Length (m):	72	Vegetation Cover:	10%-15% cover. Generally comprised grass, moss and heather
Ditch Details:	No ditch	Roughness:	Rough	Verge Width (m):	1.2				

Engineering Description of Rock:
Extremely strong thinly foliated dark grey SCHIST. Contains occasional thin foliations of quartz.

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose	Photo Reference
2023	Ch. 2990	To inspect condition of the netting/spike plates in waterfall area. Findings – TECCO netting is in good condition	AA18-1

THC Monthly Reports:

Date	Location	Comments	Photo Reference
N/A			

Existing Netting Details or other remedial work details:

Year of Works	Description of Works	Comments	2024 Inspection Observations	Photo Reference
2013 – Phase 7 works	A block removed (was caught in top of netting where it spans a small gully) and netting repaired		No significant changes to netting observed in 2024 inspection.	
2018 – Phase 10 works	- Maccaferri drape netting removed and replaced by active TECCO netting system - Installation of spot dowels - De-vegetation and scaling - A sprayed concrete buttress installed	Netting system in good condition but installation of incorrect spike plate / nut combination has not been resolved. **2020 Inspection:** At Ch. 2990 (waterfall area), TECCO showing greenish discolouration. Spike plate grey discoloured. **2022 Inspection:** Potential corrosion of netting mid-slope, mid-slope profiling cable and bottom cable observed at Ch. 3032. **2023 Inspection:** Rope access inspection completed to assess netting condition – netting is in good condition.	Wire rope grip bolts and threaded ends are showing signs of local corrosion. Also, some cut bar ends are starting to show signs of corrosion.	AA18-1

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
General	**2013 Inspection:** Many uprooted trees and associated boulders were present upslope of the rock face.	No changes observed during 2024 inspection.	
Ch.2990	**2021 Inspection:** Some loose blocks behind netting near crest. One block c.0.15m x 0.15m x 0.15m caught behind netting and pulling netting out slightly from slope. Several smaller blocks resting on slope adjacent to spike plate. Would be beneficial to move block down behind the netting. Source is likely to be the slight overhang at crest. Keep under observation for additional debris.	No changes observed during 2024 inspection.	
Ch.3012	**2021 Inspection:** A few small blocks sitting on ledge of rock face c.7m from toe. Not straining or deforming mesh so removal not required.	No changes observed during 2024 inspection.	

RISK RATING		**Comments**
Overall Hazard Rating =	1	
Pathway Rating =	1	
Receptor Rating =	N/A	Receptor rating only applicable when pathway rating is ≥2.
Risk Value =	**1**	- Rating reduced to 1.2 following Phase 10 Remedial Works (2018). Previously very high risk. - Re-assessed during the 2022 inspection following changes to receptor rating. Risk value reduced from 1.2.
Risk Level =	**Low**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	N/A

Assessed in field by:	MT/JG/PLM/CR	**Date:**	19/04/2023	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA18-1	Localised corrosion at wire rope grip bolts, threads and cut bar ends.	Year observation first noted: 2014

Photograph: AA18-2	Ch. 2990 – Some loose blocks behind netting near crest of slope.	Year observation first noted: 2021

5.2.30 Slope Ref. AA18/AA19

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA18/AA19	**Chainage:**	3059-3070	**Start Grid Ref:**	NG 91186 37649	**End Grid Ref:**	NG 91199 37660	**Elevation:**	10m AOD

Photo	
	

Rock Slope Characteristics:							
Dip (°): 76	Azimuth (°): 346	Height (m): 15	Length (m): 11	Vegetation Cover: 60% cover. Generally comprised grass.	Ditch Details: Bund: 2-3m wide, 0.5-1.5m high on road side; Ditch: 1-6m wide, 1.5-2m deep on slope side.	Roughness: Rough	Verge Width (m): 2-4

Engineering Description of Rock:
Strong thinly foliated dark grey SCHIST.

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose**
2024	Ch. 3055	To check the condition of the netting and the rock fall that has occurred to see if there is potential for further rock fall.

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
May 2018		Small washout of stones on road and verge from natural crag above AA18 & AA19. July 2018 - More small stones washed out.	
May 2022	Ch. 3065	Rock fall impacting road and railway at AA18/AA19 on 25/05/2022. Block originated from AA19 Upper and travelled down AA18/19 passing over the drape netting system. This has caused some minor damage, with several tears up to 0.2m observed. This damage is not considered to pose a significantly increased risk. An emergency inspection was carried out by AECOM on 27 May 2022 after a rock fall originating from the upper crags within AA19 Upper occurred on the 25 May 2022. The inspection concluded that whilst no imminent risk of further failure was observed, there is potential of future failure from the ongoing weathering and degradation of the material, particularly during and/or following periods of inclement weather. Scaling works were recommended to be completed as soon as possible. Works completed late 2022.	

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
2014	Maccaferri netting installed as emergency works following failure.	Details of netting system include: - PVC coated Maccaferri double twist - Top cable 16mm galvanised - 2m top and bottom anchor spacing and 25mm GEWI bars - Cable-anchor connection: galvanised eye nuts - 4 cable clamps - Netting lap connections: 3 rows of Spenax rings - No laps on anchors or vertical reinforcing **2016 Inspection:** It was noted that the cable clamps on the boundary ropes were corroded, although the non-threaded parts were not. The specification for the 2014 emergency works required the whole clamp system to be hot dip galvanised, but it appears the ones installed were not. **2017 Inspection:** It was noted that the non-threaded parts of cable clamps were also now corroded. **2020 Inspection:** Cable clamps well corroded and cables beginning to exhibit surface corrosion, particularly in waterfall. **2022 Inspection:** A rock fall in May 2022 has caused some minor damage to netting, with several tears up to 0.2m observed. **2023 Inspection:** Netting locally damaged by rock falls from upper slope. c.5-10 torn holes (max 10 apertures tall x 5 wide). Recommend patch netting at tears.	No changes observed to netting during 2024 inspection.	
September 2022 Urgent Works	Clearing out the roadside catch pit and increasing its capacity; and, Light scaling to remove loose material from the source area and accumulation scree.	**2023 Inspection:** Scree is accumulating on mid-slope ledge – needs to be cleared again.	No significant changes observed during 2024 inspection.	AA18/AA19U-1

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch.3060	**2018 Inspection:** Minor debris accumulation at bottom right of mesh but not loading system.	No changes observed during 2024 inspection.	
General	**2019 Inspection:** Slope continues to weather and ravel but debris retained by mesh – monitor build up.	No changes observed during 2024 inspection.	AA18/AA19-2
Ch.3052	**2021 Inspection:** In waterfall areas there is a slab of rock c.0.75m x 0.75m x 0.2m. Source not immediately clear but possibly from the rock slope west of the gully.	No changes observed during 2024 inspection.	
Ch. 3059	N/A	Wash out present at the base of the waterfall and mid slope ca. 10m above road level. Exposed subvertical face of weathered scree 1-2m high and 3-4m wide. Potential for this to slip down slope. As there is a large catch basin below there is no increased risk.	AA18/AA19-3
Ch3059	N/A	Large block 5m down slope from the top netting. Dimension 0.5m wide. Weathered out from soil.	AA18/AA19-4

RISK RATING		**Comments**
Overall Hazard Rating =	1	
Pathway Rating =	1	
Receptor Rating =	N/A	Receptor rating only applicable when pathway rating is ≥2.
Risk Value =	**1**	
Risk Level =	**Low**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	- Replace corroded components of netting system (c.80 clamps) with appropriate, suitably galvanised replacements. - Tears in netting from rock falls to be repaired. - Scree area cleared in September 2022 urgent works is refilling – would benefit from clearance.

Assessed in field by:	MT/SB/PLM/CR	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA18/AA19-1	Upslope area – showing the condition of the scree accumulating on mid-slope ledge.	Year observation first noted: 2022

Photograph: AA18/AA19-2	General – Slope continues to weather and ravel but debris retained by mesh.	Year observation first noted: 2019

Photograph: AA18/AA19-3	Ch. 3059 – Washout at base of waterfall and mid slope about 10m above road level.	Year observation first noted: 2024

Photograph: AA18/AA19-4	Ch. 3059 – Large block 5m down from top of netting.	Year observation first noted: 2024

5.2.31 Slope Ref. AA19

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA19	**Chainage:**	3070 – 3157	**Start Grid Ref:**	NG 91199 37660	**End Grid Ref:**	NG 91274 37698	**Elevation:**	10m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:							
Dip (°): 74	Azimuth (°): 341	Height (m): 25	Length (m): 87	Vegetation Cover: 10 to 20% cover. Grass, gorse, etc.	Ditch Details: Width 0.9m Depth 0.4m (clear with some standing water)	Roughness: Rough	Verge Width (m): 0

Engineering Description of Rock:
Very strong thinly foliated dark grey fine to medium grained SCHIST. Contains occasional thin foliations of quartz. (PSAMMITE).

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose	Photo Reference
N/A			

THC Monthly Reports:

Date	Location	Comments	Photo Reference
March 2023	Ch.3100	Rock fall (c.0.25m³) originating from AA19 Upper and impacting road at AA19 on 02/03/2023.	
March 2023	Ch.3100	Rock fall (c.0.1m³) originating from AA19 Upper and impacting road at AA19 on 29/03/2023.	

Existing Netting Details or other remedial work details:

Year of Works	Description of Works	Comments	2024 Inspection Observations	Photo Reference
2012	TECCO netting installed as emergency works following failure.	Details of netting system include: - TECCO - Top cable 12mm galvanised - 2.5-3.5m anchor spacing and 25/28mm solid galvanised and 32mm hollow galvanised bars - Cable-anchor connection: eye nuts - 4 cable clamps - Netting lap connections using T3 clips - No laps on anchors	No changes observed during 2024 inspection.	

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
		- Vertical and diagonal reinforcing/profiling cables (12mm galvanised) - 37 No. dowels also installed. **2019 Inspection:** Very localised corrosion of TECCO where touching old, corroded anchor installation. No other defects observed. **2022 Inspection:** Some of the cable clamps on the bottom cable are showing early signs of corrosion at Ch. 3100. Otherwise netting is in good condition. **2023 Inspection:** TECCO in good condition. Gabions - parts of mesh are damaged. Would be beneficial to clear out debris behind the gabions.		

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch.3100	**2018 Inspection:** Failure of ca. 0.25m³ observed 6-8m above road level and has been retained by mesh. Fractured overhanging block of ca. 0.5m³ could also fail in future but would be retained by mesh. Debris is not currently overloading the system so no remedial works are required at this stage. Keep under observation during future inspections.	No changes observed during 2024 inspection.	AA19-1
Ch. 3145 (above gabions and TECCO netting)	**2023 Inspection** – Rope access identified sporadic areas of rock exposure with occasional dilated joints and root jacking potential. Risk of occasional block falling (max. 0.5 x 0.5 x 0.5m).	No changes observed during 2024 inspection.	

RISK RATING		Comments
Overall Hazard Rating =	2	Increased from 1 in 2018 following observed failure being retained by mesh.
Pathway Rating =	1	
Receptor Rating =	N/A	Receptor rating only applicable when pathway rating is ≥2.

Risk Value =	**2**	
Risk Level =	**Low**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	N/A	- Clear debris from behind gabions.

Assessed in field by:	MT/SB	**Date:**	19/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA19-1	Ch. 3100 - Failure of ca. 0.25m³ block observed 6-8m above road level and has been retained by mesh.	Year observation first noted: 2018

5.2.32 Slope Ref. AA19 Upper

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA19U	**Chainage:**	3050 – 3157	**Start Grid Ref:**	NG 91199 37660	**End Grid Ref:**	NG 91274 37698	**Elevation:**	m AOD

Photo	
	

Rope Access Inspections:			
Year of Rope Access Inspection	**Location**	**Purpose**	**Photo Reference**
2022	Ch. 3100	Emergency rope access inspection to assess source area of rock fall after 02/03/2023 event. Inspection found scree on mid-slope ledge which was cleared in the September 2022 urgent works.	
2023	Ch. 3145 (above gabions)	To inspect area above TECCO netting. Findings - sporadic areas of rock exposure with occasional dilated joints and root jacking potential. Risk of occasional block falling.	
2023	Drop 1	To inspect condition of upper crags. Findings: - NG 91280 37656 ±5m, alt. 56.5AOD ±3m – possible source of large block on road beside gabions. - Generally upper area affected by root jacking. - Upper crags generally massive but there are areas where exposed faces have dilated joints and blocks could be released. Evidence of blocks lying on slope.	
2023	Drop 2	To inspect condition of upper crags. Findings: - NG 91273 37654 ±6m, alt. 43 ±5m – area of Maccaferri mesh strapped around rock protrusion 2m high and 4m wide secured by two cables. - Missing block and fresh surface at top of the Maccaferri mesh – again possible source of block at road. - Loose blocks noted in area around Maccaferri mesh and cables which are at risk of falling (currently only held in place by cables).	
2024	Drop 1	To inspect condition of upper craigs and TECCO netting. Findings: - Scree at top of mesh – not noticeably worse. - One large block 0.4 x 0.3 x 0.15m. Scratched with ‘A’ for future reference. Photos compared with 2023 and this block appears to be new.	AA19U-1

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
May 2022	Ch. 3065	Rock fall impacting road and railway at AA18/AA19 on 25/05/2022. An emergency inspection was carried out by AECOM on 27 May 2022 after a rock fall originating from the upper crags within AA19 Upper occurred on the 25 May 2022. The inspection concluded that whilst no imminent risk of further failure was observed, there is potential of future failure from the ongoing weathering and degradation of the material, particularly during and/or following periods of inclement weather. Scaling works were recommended to be completed as soon as possible. Works completed late 2022.	
March 2023	Ch.3100	Rock fall (c.0.25m³) originating from AA19 Upper and impacting road at AA19 on 02/03/2023.	
March 2023	Ch.3100	Rock fall (c.0.1m³) originating from AA19 Upper and impacting road at AA19 on 29/03/2023.	

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
Before AECOM Involvement (i.e. pre 2012)	Mesh around block at NG 91273 37654	**2023 Inspection:** Area of Maccaferri mesh strapped around rock protrusion 2m high and 4m wide secured by two cables. Loose blocks noted in this area.	No changes observed during 2024 inspection.	
2013 – Phase 7 works	Tree stump removed which was previously retained by cable straps.		No changes observed during 2024 inspection.	
2015 – Phase 8 works	Uprooted trees and associated root balls and loose blocks were removed		No changes observed during 2024 inspection.	
2022	- Emergency scaling works following rock fall. - Clearing out catch pit and increasing its capacity		No changes observed during 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**

General	**2012 Inspection:** Potential for numerous block falls approximately 60m above road due to root jacking. Block size up to 1m³.	No changes observed during 2024 inspection.	
NG 91276 37645	**2013 Inspection:** Developing toppling / root jacking failures (block size up to 1.5m x 2m x 1.5m) approximately 50m above road; 4 No. blocks (typically 1.5m x 2m x 0.4m) prone to toppling failure approximately 20m above TECCO mesh in slight gully on face (directly above left hand end of the gabions)	No changes observed during 2024 inspection.	
General	**2023 Inspection:** A number of loose blocks are lying on slope.	More loose blocks apparent lying on the slope, including, a large block 5m down from the crest of the slope.	AA19U-1

RISK RATING		**Comments**
Overall Hazard Rating =	3	Increased from 2 to reflect the observed frequency of rock falls at this location.
Pathway Rating =	4	
Receptor Rating =	1	
Risk Value =	**12.0**	
Risk Level =	**Very High**	**Increased to very high to reflect recent increase in rock fall frequency at this location.**

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
- Install rock fall catch fence above roadside cutting.	N/A	Scree area cleared in September 2022 urgent works is refilling – would benefit from clearance.

Assessed in field by:	PLM/CR	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA19U-1	General -Numerous loose blocks on upper slope.	Year observation first noted: 2023

5.2.33 Slope Ref. AA20

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA20	**Chainage:**	3157-3215	**Start Grid Ref:**	NG 91274 37698	**End Grid Ref:**	NG 91322 37727	**Elevation:**	13m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:									
Dip (°):	80 (rock slope)	Azimuth (°):	326	Height (m):	10	Length (m):	58	Vegetation Cover:	30 to 40% ground cover, small saplings and gorse
Ditch Details:	None	Roughness:	Rough	Verge Width (m):	0-1.5				

Engineering Description of Rock:
Lower slope adjacent to the road - very strong to strong dark grey mottled pink narrowly banded crystalline coarse grained GNEISS.

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose**
N/A		

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
August 2018	Ch. 3175	Small stones on road (x4).	

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
Before AECOM involvement (i.e. pre 2012)		Details of works include: - 4 No. rock dowels adjacent to the avalanche shelter. Bar approx. 20mm diameter, 150mm*150mm face plate. Bar length etc. unknown - Concrete and steel retaining wall/debris trap between Ch.3157 & Ch.3160, 3.4m high 33m long. 'I' beams noted to be corroded. - Concrete block with 10No, ground anchors on upper slope, details unknown. Below this is temporary works that have been left in place and consist of a catch fence of Maccaferri double twist netting between 2 tall tree stumps supported by cable to nearby rock outcrop and a catch fence of railway sleepers between 2 tree stumps. **2017 Inspection:** I beams that form part of retaining wall are noted as being corroded.	No significant changes observed during 2024 inspection.

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
2015 – Phase 8 works	1No. rock dowel installed	Rock dowel is 4m long, 25mm GEWI bar	No significant changes observed during 2024 inspection.
2019 – Phase 11 works	Ch. 3205 - Rock dowel (originally a test anchor)		No significant changes observed during 2024 inspection.
2021 – Phase 12 works	N/A	2022 Inspection: A block rotated out during the drilling of the temporary catch fence anchor during the Phase 12 works for AA20U. The block landed on a flat area above retaining wall in AA20 at Ch.3185 and is not at risk of moving downslope.	No significant changes observed during 2024 inspection.

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 3165 (above retaining wall)	**2016 Inspection:** Potential failures identified within rock outcrop immediately above wall (toe of blocks 4m above road level). Dilated discontinuities were evident and several blocks ranging in size from 0.1m³ to 0.5m³ (total failure volume around 2m³) are considered at risk of failure. Although the outcrop is set back from the top of the wall by around 1.5m, the ground is sloping and there is potential for blocks to reach the road.	No changes observed during 2024 inspection.	
Ch. 3170	**2022 Inspection:** In September 2021, a block rotated out during drilling of an anchor for the temporary catch fence installed during the Phase 12 works. The block came to rest on a flat area above the retaining wall and is not at risk of moving further down slope.	No changes observed during 2024 inspection.	
Ch. 3182	**2021 Inspection:** Root jacking observed. Potential for occasional small block fall. Limited verge width so may land on road.	No changes observed during 2024 inspection.	
Ch. 3205 (between wall and avalanche shelter)	**2017 Inspection:** Large potential wedge failure located approximately 2m above road level. Verge at this location is ~0.5m with no ditch.	No changes observed during 2024 inspection.	AA20-1
Ch.3200 to 3205 (between wall and avalanche shelter)	**2016 Inspection:** Ongoing ravelling type failures. Block size typically small (0.2m x 0.2m x 0.2m) but occasional larger blocks (0.1m³). Debris from previous failures in narrow verge (no ditch). Although some blocks could be removed by scaling, passive rock fall netting would offer a longer term solution.	No changes observed during 2024 inspection.	

RISK RATING		Comments
Overall Hazard Rating =	2	

Pathway Rating =	3	
Receptor Rating =	1.2	
Risk Value =	**7.2**	
Risk Level =	**Moderate**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	- Install passive rock fall netting system over rock face prone to ravelling at Ch. 3200 to 3205. - Light scale and dowel blocks above wall at Ch. 3175.	- N/A

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA20-1	Ch. 3205 - Large potential wedge failure located approximately 2m above road level. Verge at this location is ~0.5m with no ditch.	Year observation first noted: 2017

5.2.34 Slope Ref. AA20 Upper

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA20U	**Chainage:**	3157-3215	**Start Grid Ref:**	NG 91274 37698	**End Grid Ref:**	NG 91322 37727	**Elevation:**	13m AOD

Photo at Start Chainage (looking east)	
	

Engineering Description of Rock:
Lower slope adjacent to the road - very strong to strong dark grey mottled pink narrowly banded crystalline coarse grained GNEISS.

Rope Access Inspections:		
Year of Rope Access Inspection	**Location**	**Purpose**
N/A		

THC Monthly Reports:			
Date	**Location**	**Comments**	**Photo Reference**
August 2018	Ch. 3175	Small stones on road (x4).	

Existing Netting Details or other remedial work details:				
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**	**Photo Reference**
2021 – Phase 12 works	Rock fall catch fence installed between Ch. 3170 to 3215	Catch fence is 30m wide x 6m high situated c.15m above road level. **2023 Inspection:** New catch fence assessed and noted to be in good condition. There is some surface corrosion evident on shackle bolts. Additionally, there are a few small blocks which have been retained behind the fence.	Catch fence pins in large shackles along bottom rope of catch fence exhibiting surface corrosion. No other no significant changes to catch fence in 2024 inspection.	AA20U-1

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
General	**2014 Inspection:** Numerous loose blocks caused by root jacking and toppling failure were observed on the slope. Individual block size up to 0.125m³ and total failure volume is approximately 1m³.	No changes observed during 2024 inspection.	
Ch. 3172	**2016 Inspection:** 0.25m³ block approximately 12m above road level.	No changes observed during 2024 inspection.	
Ch. 3175	**2017 Inspection:** ~40m above road level, large area of fractured rock mass with dilated cracks between 50mm and 200mm, with concave joint curving at 70° down to 25° and area approximately 5m high, 2m deep and 5m wide. Rock mass is noted as overhanging at base and left hand side. It is considered that if	No changes observed during 2024 inspection.	

Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
	any of these blocks were to fail they are likely to reach road and railway. Unstable boulders were also noted beside uprooted tree on left hand side.		
Ch. 3190	**2016 Inspection:** 0.5m³ block approximately 15m above road level. Potential for root jacking.	No changes observed during 2024 inspection.	
Ch. 3195	**2017 Inspection:** 20m above road level. Partially unstable 4m³ block identified.	No changes observed during 2024 inspection.	
Ch. 3198	**2016 Inspection:** 1m³ block approximately 15m above road level. Potential for root jacking.	No changes observed during 2024 inspection.	
Ch. 3210	**2017 Inspection:** Rock mass 30m above road level is very fractured with open fractures. Noted at least 3No. blocks (dimensions 0.5 x 0.5 x 0.5) with clay infilled cracks on right hand side and base. Base is on an approximately 35° plane. Block is also supporting a 1.0-1.5m³ detached block with two trees and root jacking above.	No changes observed during 2024 inspection.	
NG 91361 37572	**2021 Inspection:** Boundary fence at edge of treeline above AA20 Upper has been severely damaged by fallen trees.	No changes observed during 2024 inspection.	

RISK RATING		Comments
Overall Hazard Rating =	3	
Pathway Rating =	2	Reduced from 5 in 2022 due to catch fence installation.
Receptor Rating =	1.2	
Risk Value =	**7.2**	
Risk Level =	**Moderate**	**Reduced from 'Very High' to 'Moderate' due to catch fence installation.**

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**
N/A	- Selected controlled removal of unstable blocks.	- Coppice trees growing on rock face.

Assessed in field by:	PLM/CR	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

Photograph: AA20U-1	Between Ch. 3170 to 3215 pins in large shackles along bottom rope of catch fence exhibiting surface corrosion	Year observation first noted: 2024

5.2.35 Slope Ref. AA21

GEOTECHNICAL ASSESSMENT SHEET											
Site:	A890 Stromeferry Bypass	**Slope Ref:**	AA21	**Chainage:**	3280-3386	**Start Grid Ref:**	NG 91381 37761	**End Grid Ref:**	NG 91451 37842	**Elevation:**	18m AOD

Photo at Start Chainage (looking east)	**Photo at End Chainage (looking west)**
	

Rock Slope Characteristics:							
Dip (°): 75	Azimuth (°): 320	Height (m): 15	Length (m): 106	Vegetation Cover: c.10% cover: saplings and shrubs.	Ditch Details: Typically none, although 1m wide, 0.5m deep towards end of section	Roughness: Rough	Verge Width (m): 0.5

Engineering Description of Rock:
Very strong thinly foliated dark grey GNEISS with white quartz banding.

Rope Access Inspections:

Year of Rope Access Inspection	Location	Purpose/Findings	Photo Reference
2017	Ch. 3305	To inspect large wedge of rock at crest behind gap in mesh (2m deep, 5m wide, 5-6m high). Findings - Wedge area is blast damaged with dilated joints at the rear. Big gap behind drape which would allow block to gain energy and potentially exceed capacity of passive netting system. Verge only 1m wide and no ditch present at this location, so likely to reach road in event of failure.	
2023	Ch. 3350	To inspect area where overhanging/fractured block is. To check if the remediation in place is adequate. Findings - Overhanging rock mass ca. 1.5m. Gape below is 2m. Block is at least 1m³ up to 1.5m³, with dilated release joint. Keyed in at bottom right. Block at crest has a dowel in it but positioning isn't optimal. Similarly block with cable restraint has a dowel at a sub-optimal position and orientation. Cable clamps on cable restraint are rusted. Recommendations - Install active netting system (TECCO) 5m width (between buttress) and then 2 panels of TECCO beyond this, profiled into face. Problem area is between 5-10m above toe so could drape lower half of slope. No ditch or verge at this location.	

THC Monthly Reports:

Date	Location	Comments	Photo Reference
N/A			

Existing Netting Details or other remedial work details:			
Year of Works	**Description of Works**	**Comments**	**2024 Inspection Observations**
Before AECOM involvement (i.e. pre 2012)	Netting between Ch. 3280 to 3370.	Details of netting system include: - PVC coated double twist - Top cable 16mm galvanised - c.5-5.5m anchor spacing and 25mm(?) galvanised bars - Cable-anchor connection: stainless steel eye nuts (bar machined to M20 thread) - 4 cable clamps - Netting lap connections using 2 rows of staggered spenax rings - Laps on anchors: Yes, every fourth anchor. 2 cable clamps on each side - Vertical Reinforcing: 8mm cable at 1m spacing (2 cable clamps) Several faults noted within netting system, which is generally in poor condition: -PVC coating is brittle and cracked in places, corrosion of wire noted. - lateral reinforcing cables are very slack with rare spenax jointing to netting. - cable clamps are corroded. **2016 Inspection:** PVC coating on netting is brittle and locally broken. Some corrosion of wire noted. Lateral reinforcing cables are very slack, with rare spenax jointing to netting. Cable clamps noted to be very corroded on both lateral and vertical reinforcing cables. **2023 Inspection:** 7No. stainless dowels face plates engraved 2002, 1 cable restraint and 16mm galvanised bars with corrosion protection at stainless dowels at Ch. 3350.	No significant changes to netting observed during 2024 inspection.
2015 – Phase 8 works	- Scaling and 5No. dowels installed - Additional bottom anchor installed to pre-existing netting		No significant changes to observed during 2024 inspection.

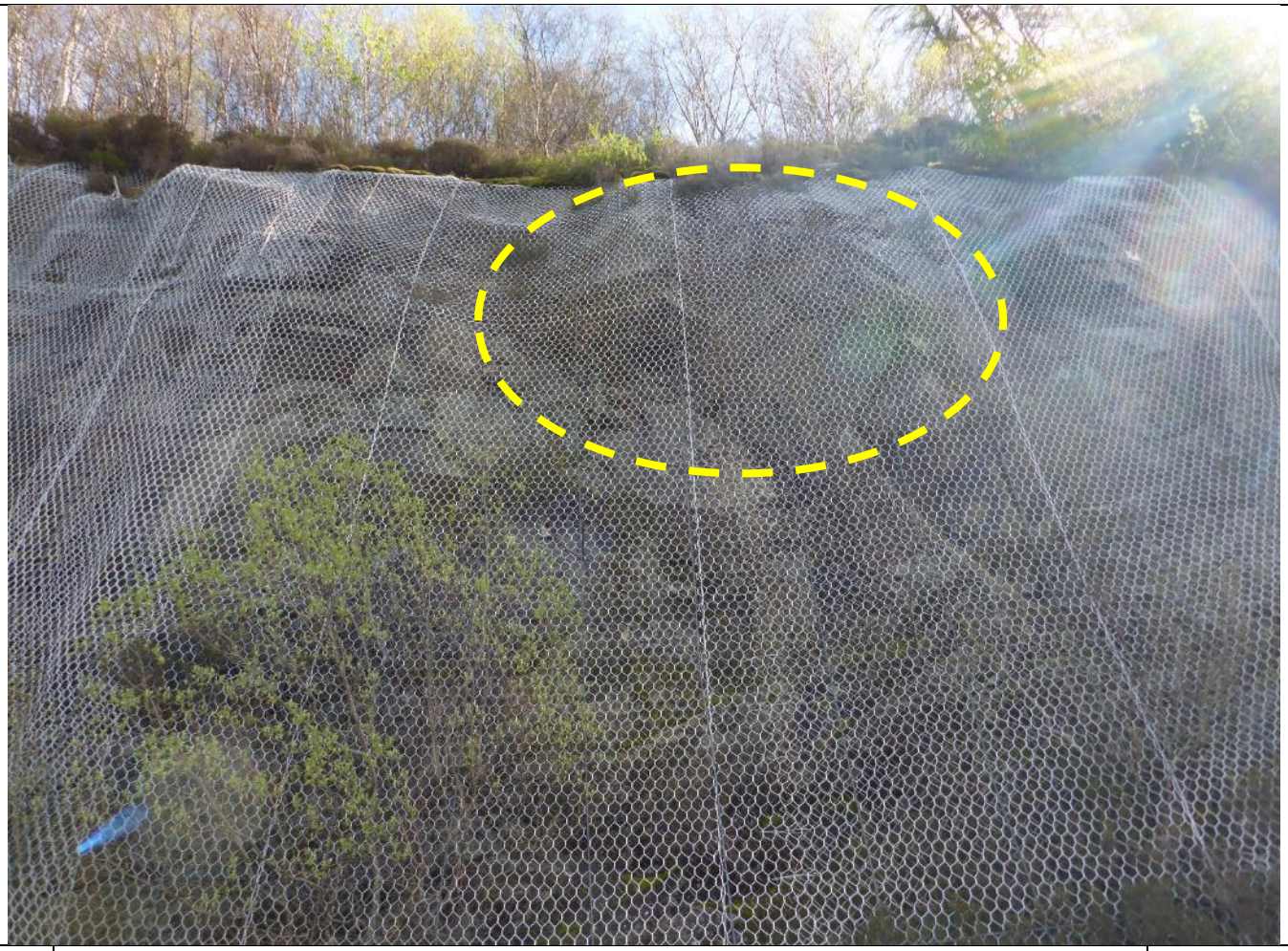
Hazards Observed:			
Location	**Description of Hazard (s) from Previous Inspections**	**2024 Inspection Observations**	**Photo Reference**
Ch. 3305	**2016 Inspection:** Large wedge at crest of rock slope (2m x 5m x 5-6m high). Rock mass blast damaged and dilated discontinuities present. Big gap between drape mesh and rockface would allow failure to gain energy and potentially exceed capacity of netting, impacting road below.	No changes observed during 2024 inspection.	AA21-1
Ch. 3310	**2016 Inspection:** Root jacking evident approximately 3m above road level. No immediate risk of failure but would be worth coppicing.	No changes observed during 2024 inspection.	AA21-2
Ch. 3322	**2016 Inspection:** Potential wedge failure approximately 5m above road level. Multiple blocks, total volume 1.5m^3.	No changes observed during 2024 inspection.	AA21-3
Ch. 3350	**2019 Inspection:** Rock mass at crest with dilated release plane. Numerous dowels, but only in one block, and a cable present. Ca. 15m above road level. 3m x 2m x 1.5m.	No changes observed during 2024 inspection.	AA21-4
Ch. 3363	**2016 Inspection:** Broken rock mass at crest. Root jacking an issue. Potential failure volume around 1m3 (multiple blocks). Mesh should contain but would benefit from coppicing and light scaling.	No changes observed during 2024 inspection.	AA21-5
Ch. 3371	**2021 Inspection:** Some dilated fractures on face of rock slope in area of water flow; freeze-thaw could lead to deterioration of some blocks.	No changes observed during 2024 inspection.	AA21-6
Ch. 3380	N/A	Culvert blocked. Recommend clearing out.	AA21-7

RISK RATING		Comments
Overall Hazard Rating =	3	
Pathway Rating =	3	
Receptor Rating =	1	
Risk Value =	**9**	
Risk Level =	**Moderate**	

Recommended Remedial Works / Actions		
Large Scale Rock Fall Protection Works (Category 3)	**Localised Targeted Rock Fall Protection Works (Category 2)**	**Ongoing Maintenance (Category 1)**

- Ch. 3305: Open existing drape and install 10m high x 8m wide panel of active netting (e.g. TECCO). Re-join drape netting on completion. - Ch. 3350: Replace current passive netting with active netting system (TECCO)	- Install dowels in potential failure at Ch. 3322 (4m long). - Coppice tree at crest at Ch. 3366 and light scale broken rock mass.	- Coppice tree at Ch. 3310. - Remove 3-4 No. cut logs trapped under top netting cable. - Re-tension lateral reinforcing cables and install additional spenax rings. - Replace corroded cable clamps on lateral and vertical reinforcing cables. - Ch. 3380 culvert is recommended to be cleared.

Assessed in field by:	MT/SB	**Date:**	17/04/2024	**Reviewed by:**	PLM	**Date:**	19/07/24

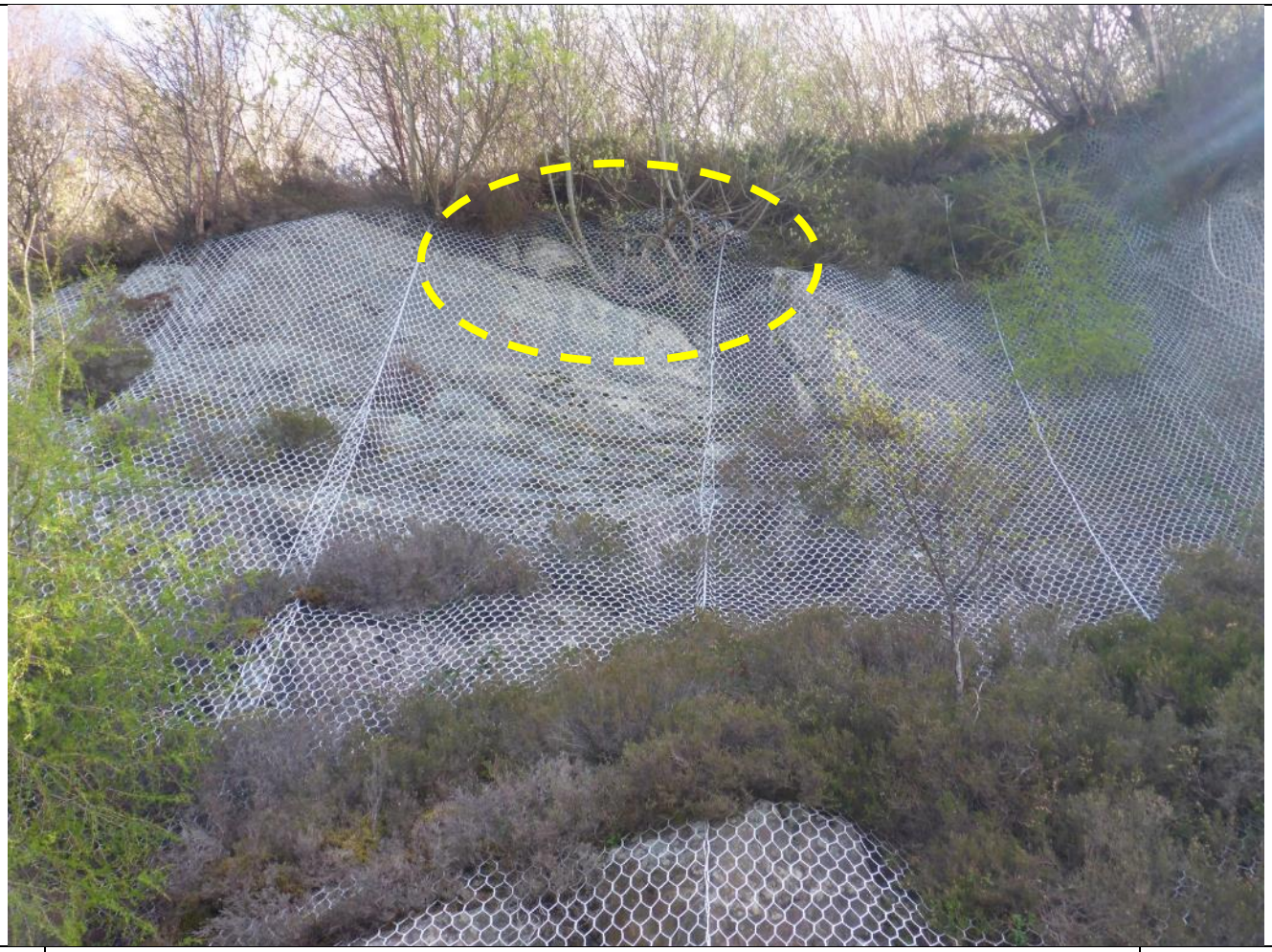


Photograph: AA21-1	Ch. 3305 – Large wedge at crest of rock slope behind netting.	Year observation first noted: 2016

Photograph: AA21-2	Ch. 3310 – Evidence of root jacking c. 3m above toe of slope.	Year observation first noted: 2016

Photograph: AA21-3	Ch. 3322 – Potential wedge failure c. 5m above road level.	Year observation first noted:

Photograph: AA21-4	Ch. 3350 – Overhanging rock mass at crest with dilated release plane.	Year observation first noted: 2019



Photograph: AA21-5	Ch. 3363 – Broken rock mass at crest. Root jacking an issue.	Year observation first noted: 2016

Photograph: AA21-6	Ch. 3371 – Some dilated fractures on rock face in area of water flow.	Year observation first noted: 2021

Photograph: AA21-7	Ch. 3380 – Blocked culvert.	Year observation first noted: 2024