

Discipline	Item	Drawing Ref.	Approx Chainage	Existing Features	Condition	Proposed Interventions	Quantity	Unit	Total Cost	Third Party Land Requ'd (Y/N)	Justification
Geotechnical Design	G01a	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	1880 - 1950			Debris Flow Catch Fence (4m High)	30	metre	£168,000	Yes	Provides a secondary line of defence from the two main channels upslope of the A83. May be removable in the future.
	G01b	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	1990 - 2100			Debris Flow Catch Fence (4m High)	35	metre	£196,000	Yes	Provides a secondary line of defence from the two main channels upslope of the A83. May be removable in the future.
	G02	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	2350 - 2500	Temporary HESCO bund	Requires upgrading to increase capacity.	Upgrade of HESCO Bund to increase resilience against debris flows.	160	metre	£398,080	Yes	Provides secondary line of defence in conjunction with Trunk Road measures.
						Extension of debris flow bund to south of existing HESCO bund. (Length over CH2130 - 2500)	220	metre	£547,360	Yes	Provides secondary line of defence in conjunction with Trunk Road measures. Topography relatively flat to west – appears to be sufficient space and suitable gradient for construction of a bund.
	G03a	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	2500 - 3160			Debris Flow Catch Fence (4m High)	325	metre	£1,820,000	Yes	If risk to OMR is not fully eliminated by measures above the A83, install debris flow catch fence & rockfall catch fence upslope of the OMR.
	G03b	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	2500 - 3160			Rockfall Catch Fence (6m High)	500	metre	£4,800,000	Yes	If risk to OMR is not fully eliminated by measures above the A83, install debris flow catch fence & rockfall catch fence upslope of the OMR.
	G04	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	3170 - 3200	Soil nailing installed to widen carriageway before Bridge B to aid vehicle tracking.	Some signs of distress and remedial measures likely to be required.	Re-profiling and installing additional nails at crest before replacing facing - soil nail facing showing signs of tension cracks and material having slumped behind facing at crest – possible removal of facing at crest.	80	No.	£60,000	Yes	Remedial work to existing soil nailing will increase resilience of the soil nailing and the OMR route for use for trunk road traffic when used as the diversion.
						Local repair of failure at northern end - installation of additional nails and new facing locally.	347	No.	£260,250		
Improvements to face drainage – improvements to face drainage running down pipes behind facing and into a toe drain to prevent local scour and erosion at the toe.							No.				
G05	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3490 - 3520			Cutting in soil and rock with geotechnical measures to allow steepened slope at curve widening (H05). Existing masonry retaining wall with stone blanket on slope above to be assessed.		No.		Yes	Providing stability to the cutting required to allow appropriate widening for HGVs.	
G06	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3690 - 3720			Cutting in soil and rock with geotechnical measures to allow steepened slope at curve widening (H06).		No.		Yes	Providing stability to the cutting required to allow appropriate widening for HGVs.	
Geotechnical Design Total									£8,249,690		
Road Design	H01	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	214 - 3816 (Full Chainage)			Provide road edge markings along full route and centre line markings from Ch214-CH2400.	8,515	metre	£12,955	Yes (from approx CH1180)	Increases safety of the road, especially during periods of darkness, as it provides a guideline for drivers to follow in this remote, rural location where natural light is reduced and there is no street lighting proposed.
	H02	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	1115 - 2400	Current end of two lane carriageway.		Widen to two lanes (7.3m) between chainage 1115 and 2400 (1285m).	6,446	square metre	£371,314	Yes (from approx CH1180)	Increasing the length of two-way road reduces the length of convoy required on the route which will reduce the journey time of this route when in use.
	H03	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	2400 - 2580			Taper of 1:40 applied to reduce two-lanes back to single lane on approach to steep, winding section.	-	-		Yes	Reduction back to single lane due to extensive work required to provide two-way working on the steep, winding geometry of this section. Would also remove the nature of the route as a hill race.
	H04	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	3180 - 3220	Tight sharp corner	Curve widening proposed based on vehicle tracking.	Widen on the outside of the curve. Structural (S02) and Geotechnical solutions required in conjunction with widening.	59	square metre	£3,399	Yes	Retains the inside of the curve for the purposes of racing.
	H05	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3460 - 3520	Tight sharp corner	Curve widening proposed based on vehicle tracking.	Widen on the outside of the curve.	76	square metre	£4,378	Yes	Retains the inside of the curve for the purposes of racing.

Abbreviation	
SoP	Standard of Protection. Initial proposal for 3.33%AEP (30-year).
AEP	Annual Exceedance Probability

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	H06	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3660 - 3720	Tight sharp corner	Curve widening proposed based on vehicle tracking.	Widen hairpin bend on outside. Cutting (G05) to allow steepened slope.	235	square metre	£13,537	Yes	Retains the inside of the curve for the purposes of racing.
Road Design Total									£405,582		
Structural Design	S01	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1740	Bridge A - Relatively new multi-box culvert. (Culvert 13)	Unlikely to meet 0.5% AEP Plus CC Standard. Intrusive excavations required to confirm structure can sustain 40 tonne loads.	Install temporary structure where old bridge was located to create a twin deck arrangement with one direction using bridge A and the other direction using the temporary structure.	1	Lump Sum	£315,000	Yes	Installing a temporary structure allows for two-way travel over this section without modifying existing bridge. This temporary bridge can later be removed when the LTS is opened to return the OMR back to its natural state.
	S02	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	3210	Bridge B - Stonemasonry Bridge (Culvert 30)	Curve widening required due to vehicle tracking. Repointed fairly recently. Intrusive excavations required to confirm structure can sustain 40 tonne loads.	Widen on the outside of the curve, insert portal structure with discrete abutments and redirect water courses, extend soil nailing.	1	Lump Sum	£215,000	Yes	Retains the inside of the curve for the purposes of racing and avoids detrimental works to the front facing of the masonry arch structure.
	S03	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	3290	Bridge C (Culvert 31)	No modifications to road width. Repointed fairly recently. Intrusive excavations required to confirm structure can sustain 40 tonne loads.		1	Lump Sum	£100,000	Yes	
	S04	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3490	Masonry retaining wall with stone blanket on upslope.	Detailed inspection required to confirm condition of structure and suitability of existing ground in relation to curve widening.			No.		Yes	
	S05	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3770 - 3810	Masonry retaining wall supporting OMR.	Detailed inspection required to confirm condition.			No.		Yes	
Structural Design Total									£630,000		
Flood Mitigation	W01	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	214 - 400	Flood Risk Extents	50% AEP (2 - Year)	Realignment of road to avoid flood risk area.	730	square metre	£42,051	No	Shifting road out with the flood extents and raising above flood level will reduce risk of flooding in the area.
	-	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	320	Culvert 1 D = 600mm	New culvert to be placed on realigned section of the OMR.	Upgrade to box culvert - 0.6*1.2m - 24m length Additional Work Required: Re-instate side road drainage - 160 m	24	metre	£16,800	No	Does not meet design requirements.
	-	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	510	Culvert 2 D = Twin 600mm	Needs replacement	Upgrade to box culvert - 0.6*1.8m - 11m in length Additional Work Required: 0.6*1.8m Box culvert headwall - 1no. Channel realignment - 30m2 Re-instate side road drainage - 40m	11	metre	£15,443	No	Does not meet design requirements.
	W02	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045 - A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	Approx 214 - 3816 (Full Chainage)	Existing side of road drainage ditches to be maintained over full length.	The extent to which further improvements to these drainage items can be achieved is to be determined at more detailed design stage.	Provide sufficiently designed side of road ditches on the upslope side of the OMR.	3600	metre		Yes (from approx CH1180)	Ditches in place to collect run-off from the upslope side. Maintaining this is required to prevent overspill onto the carriageway.
	-	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	705	Culvert 3 D = 600mm	Ok at Standard of Protection	0.6m headwall - 1no. 600 culvert - 2m Channel re-alignment - 10m2 Re-instate side road drainage - 70m	-	-	£2,948	No	

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-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	785	Culvert 4 D = 600mm	Ok at Standard of Protection	0.6m Headwall - 1no. 600 Culvert - 2m Channel re-alignment - 13m2	-	-	£1,943	No	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	805	Culvert 5 D = 600mm	Ok at Standard of Protection	0.6m headwall - 1no. 600 culvert - 2m Channel re-alignment - 10m2 Re-instate side road drainage - 115m	-	-	£3,623	No	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	915	Culvert 6 D = Twin 450mm	Ok at Standard of Protection	0.45m Headwall - 2no. 600 Culvert - 4m Re-instate side road drainage - 70m	-	-	£3,949	No	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	945	Roadside carrier drain pipe D = 600mm	The extent to which further improvements to these drainage items can be achieved is to be determined at more detailed design stage.					No	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1041	985	Culvert 7 D = Twin 600mm	Needs replacement	Upgrade to box culvert - 0.6*1.8m - 16m in length Additional Work Required: 600*1800 Box culvert headwall - 1no. Re-instate side road drainage - 185m	16	metre	£20,918	No	Does not meet design requirements.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1195	Culvert 8 D = 450mm	Ok at Standard of Protection	0.45m headwall - 1no. 450 culvert - 5m Re-instate side road drainage - 110m	-	-	£3,913	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1215	PE pipe connecting roadside carrier drain(s) D = 300mm	The extent to which further improvements to these drainage items can be achieved is to be determined at more detailed design stage.		1	No.		Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1225	PE pipe connecting roadside carrier drain(s) D = 300mm	The extent to which further improvements to these drainage items can be achieved is to be determined at more detailed design stage.		1	No.		Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1265	PE pipe connecting roadside carrier drain(s) D = 300mm	The extent to which further improvements to these drainage items can be achieved is to be determined at more detailed design stage.		1	No.		Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1270	PE pipe connecting roadside carrier drain(s) D = 300mm	The extent to which further improvements to these drainage items can be achieved is to be determined at more detailed design stage.		1	No.		Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1315	Culvert 9 D = 900mm	Needs replacement	Upgrade to box culvert - 0.9*1.2m - 12m in length Additional Work Required: 900*1200 Box culvert headwall - 1 Channel re-alignment - 15m2 Re-instate side road drainage - 90m	12	metre	£16,718	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1410	Culvert 10 D = 900mm	Ok at Standard of Protection	900 headwall - 1 900 culvert - 4m	-	-	£5,736	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1455	Culvert 11 D = 450mm	Ok at Standard of Protection	450 headwall - 1 450 culvert - 3.5m Channel re-alignment - 10m2 Re-instate side road drainage - 20m	-	-	£2,306	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1610	Culvert 12 D = 450mm	Ok at Standard of Protection	450 headwall - 1 450 culvert - 5m Re-instate side road drainage - 15m	-	-	£2,488	Yes	

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-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1042	1740	Culvert 13 (Croe Water) D = Twin Box ?	Not surveyed Twin box is prone to blockage - especially if significant sediment accretion is realised during extreme events - suggest regular inspection and intervention. Access provided for plant to access structure.	Flood relief culverts could be installed to mitigate insufficient capacity for 0.5% AEP. NN headwall - 1 NN culvert - 5m	-	-	-	Yes	If the risk of overtopping is present at the box culvert structure, the addition of flood relief culverts will remove this risk in the event of a flood.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	1840	Culvert 14 D = 900mm	Needs replacement	Upgrade to box culvert - 0.9*1.2m - 12m in length Additional Work Required: 900*1200 Box culvert headwall - 1 Channel re-alignment - 6m2 Re-instate side road drainage - 43m	12	metre	£15,878	Yes	Does not meet design requirements.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	1985	Culvert 15 D = 600mm	Ok at Standard of Protection	600 headwall - 1 600 culvert - 4m Re-instate side road drainage - 75m	-	-	£3,713	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	2065	Culvert 16 D = 750mm	Ok at Standard of Protection	750 headwall - 1 750 culvert - 3m Channel re-alignment - 9m2 Re-instate side road drainage - 26m	-	-	£3,990	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	2165	Culvert 17 D = 450mm	Needs replacement	Upgrade to 600mm - 27m in length Additional Work Required: 600 headwall - 1 Channel re-alignment - 9m2 Re-instate side road drainage - 90m	27	metre	£13,733	Yes	Does not meet design requirements.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	2255	Culvert 18 D = 725mm	Needs replacement	Upgrade to box culvert - 0.6*1.2m - 13.5m in length Additional Work Required: 600*1200 Box culvert headwall - 1no. Channel re-alignment - 13m2 Re-instate side road drainage - 100m	13.5	metre	£12,443	Yes	Does not meet design requirements.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	2375	Culvert 19 D = 750mm	Ok at Standard of Protection	750 headwall - 1no. 750 culvert - 4m Re-instate side road drainage - 26m	-	-	£4,445	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	2485	Culvert 20 D = 375mm	Ok at Standard of Protection	-	-	-	-	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1043	2580	Culvert 21 D = 1000mm	Ok at Standard of Protection	-	-	-	-	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044	2640	Culvert 22 D = 450mm	Ok at Standard of Protection	-	-	-	-	Yes	
W03		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044	2620	Problem Spill Pathway	In flood events water overspills onto the OMR increasing risk of incidents and road closures.	Increase capacity of side or road drainage to divert flows to the next culvert.	1	No.		Yes	Providing a toe drain at this location will reduce the risk of the OMR flooding.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044	2720	Culvert 23 D = 1000mm	Ok at Standard of Protection	-	-	-	-	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044	2755	Culvert 24 D = 450mm	Ok at Standard of Protection	-	-	-	-	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044	2830	Culvert 25 D = Twin 600mm	Needs replacement	-	-	metre	-	Yes	Does not meet design requirements.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044	2890	Culvert 26 D = 450mm	Ok at Standard of Protection	-	-	-	-	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044	2940	Culvert 27 D = 600mm	Needs replacement	Upgrade to box culvert -0.6*1.2m - 8m in length	8	metre	£4,800	Yes	Does not meet design requirements.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1044	2995	Culvert 28 D = 600mm	Ok at Standard of Protection	-	-	-	-	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	3115	Culvert 29 D = 450mm	Needs replacement	Upgrade to box culvert -0.6*1.2m - 7m in length	7	metre	£4,200	Yes	Does not meet design requirements.
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	3215	Culvert 30 (Bridge B)	Capacity not assessed during RABT study.	-	-	-	-	Yes	
-		A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	3305	Culvert 31 D = 800mm (Bridge C)	Ok at Standard of Protection	-	-	-	-	Yes	

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	-	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1045	3335	Culvert 32 D = 580mm	Ok at Standard of Protection	-				Yes	
	-	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3480	Culvert 33 D = 580mm	Ok at Standard of Protection	-				Yes	
	-	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3500	Culvert 34 D = 580mm	Ok at Standard of Protection	-				Yes	
	-	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3520	Culvert 35 D = 300mm	Ok at Standard of Protection	-				Yes	
	-	A83OMR-ACM-HGN-ZZ_ZZ-SK-CH-1046	3580	Culvert 36 D = 150mm	The extent to which further improvements to these drainage items can be achieved is to be determined at more detailed design stage.		1	No.		Yes	
Flood Mitigation Total									£202,031		