	Cod	e no. Sat _ N 3 5 _ 1 6 2		Eva	aluation s	sheet	t (S	lope	failur	e/Roc	kfall)		Date	2017/12/1	9
F	Regior	n Office				Latitu	ude	350	^o 27' 46	6.4"			Inspector	Yasir, Sajid, Shafique	e, Basharat
М	aintena	ance Unit			Coordinates	Longi	tude	730	⁰ 14' 56	6.9"					
L					Road name	N 3 5	5	Km							
[C	auses]					-								
	tem	factor	category of score	Check					[Counter	measure]					
phy	sed	talus slope,	3 or more correspondences	V	Disease							Type of	countermeasu	ires	
ogra	llaps acto	clear convex break of slope, eroded toe of slope,	2 correspondences		[Disaste	er typej	,		ated Reta	ining wall fo	or talus slope	e about :	3.5m high Ste	pped Retaining wall has b	een constr
top	ပိ	overhang, water catchment slope	no correspondence		Rock	fall	\checkmark						eren ingin ere	ppour rotanning train rido o	
			marked	V	Slope f	ailura	2			E	Effectiveness	of exist	ing counterme	asures	Check
	Soil	less strength with water	a little marked		Slope I	anure	v		Potential	slope failu	re are prevei	nted enc	ough, or, it is d	efended enough when it is	
suc		high density of cracks and	None		[Main cł	heck ob	oject]		generated	1.					
Jditio	ck	a weak layers,	a little marked	v	Cut sl	lope	\checkmark		Potential s when it is	slope failur generated	e are consid	erably p	revented, or it	is considerably defended	
l cor	Rc	susceptible to erosion,	None						Potential s	slope failur	e are partly r	orevente	d, or it is partly	v defended when it is	
ogica			It corresponds.		Natural	slope			generated	d. However	, it is not end	ough for	the remaining	factors.	V
eolo	nre	dip slope of bedding plane	None	V					There is n	no countern	neasure, or t	here is r	not effective ev	ven if countermeasures	
0	truct	debris on impermeability bedrock,	marked	V					are not pe	erformed.					
	Ś	the upper part is a hard /the toe of slope is weak.	a little marked		[Liston/]								[Evpected	aize of dispose all width longth	denth ata)
			V	Level of disaster history Check								size of disasterj(width, length,	depiri, etc.)		
		Topsoil, detached rock and unsteady rock	a little unstable		There is a histo	ry about	large	fallen roc	ks and slo	pe failures	that were				
ion			stability		obstacles to the road traffic after construction					truction of recent measures.					
codit			notable spring waster		There is a histo	There is a history about large fallen rocks and slope failures the				s that gets					
ace (Spring water	seepage	2/	to the road thou	ign there			to traffic.		W= 165m, L= 720m, I				-5m
Surfa			bare land with minor vagetation	V V	not get to the ro	ory about bad.	smai	rallen ro	cks and sid	ope failures	s that did				
		Surface condition	intermediate (bare · grass · tree)												
			mainly structure, mainly tree		NO disaster rec	oras									
			H≧50m	V	[Evaluation Rar	nk]					[De	escriptio	on]		., ,
			- 30≦H<50m ⊡ 15≤H∠30m		Bick	aster	Big	ſ	Medium	Small	i n tal	e site is us deno	s characterizi osit on slope.	ed by nignly jointed Gai . This talus deposit con	bbro and tains some
ofile		Height (H), dip (i)	E 15⊒11<50m H<15m		RISK				\bigcirc		bo	ulders d	of size equal	or greater than three m	3. Slope
P			i≧70°		Great risk		1		2	3	fail	lure mo	stly occurs o	luring rainfall when rain	water is
			<u>⊖</u> 45°≦i<70°	V	Medium risk	(1		2	3	de	litrated bris/talı	into aeposit. IS.	Guily erosion is promin	ient in
$\left + \right $	C		I < 45° 2 or more correspondences • claritv	V							┥└─				
naly	ourrac piping	hole, subsidence, heaving, bending of tree root,		Low risk 2 3					4						
Anor	fallen counte	tree, crack open crack, anomaly of	none		Organization responsible for countermeasure works according to the scale of the disaster						Influence on the traffice when				
					-Big: Grant aid					-Great risk: road closed for 2 days or more					
					-Medium: Major contractor in Pakistan					-Medium risk: road closed for 1 day or less					
					-Small: Local contractor					-Low risk: no road closure					



Code no.	S	at	_	3	5	_	1	6	2	
Road name	Ν	3	5					Km		

de no. Sat _ 3 5 _ 1 6 2	Photo sheet	Date 2017/12/19
ad name N 3 5 Km	Latitude 35° 27' 46.4"	Inspector Yasir, Sajid, Shafique, Basharat
	Longitude 73° 14' 56.9"	
Full view of the slope failure	View of slope failure on Valley side:	Road condition:Cut slope at the start point
View of the slope failure at the middle point	Existing countermeasures / anomalies: View of retaining wall as counter measure for slope failure	View of fallen blocks

Coc	le no. Sat _ N 3	5 _ 2 1	4		Evalu	uatio	n sheet ((debr	is flov	v)	Date	2017/12/20
Reg	ion Office		_			I	Latitude	35° 3	31' 58.6)"	Inspector	Yasir, Sajid, Shafique, Basharat
Mai	ntenance Unit				Coordina	ates	Lonaitude	73º 2	28' 18.6	5"		
					Road Na	ame	N 3 5 K	m				
[Ca	uses]											
iten	n factor	cate	gory	Check	<u>[</u> R	Road str	ructure]				[History]	
Ē	areas that river bed is 15°	more		str	ructure	catego	ry of sco	re	Check	catego	ry of score Check	
ri «	or more in watershed	0.15km ² - 0).50km ²	V			10m or more			V	There is a history	about debris flow that
∕ of	area	less than 0.	.15km ²		F	River	5m - 10m				were obstacles to	the road traffic after $$
er,		40°or more		V	v	width	3m - 5m				construction of red	cent measures.
rop	steepest slope of river bed	30° - 40°				l	less than 3m				There is a histor	y about debris flow
		less than 30	0°			l	less than 1m o	or			though there is	no obstacle to
	ana that along madiant is 200	0.20km ² or	more	V			No bridge / bo	x culver	t	V	traffic.	
	or more in watershed area).20km ²		E	Beam 1m - 2m							
		less than 0.	.08km ²		h	neight	2m - 3m				There is no histo	ory of debris flow
e	area that meadow and shrub	0.20km ² or	more				3m - 5m					
slop	(less than 10m height)	0.02km ² - 2	20km ²			į	5m or more					
ð	occupy in watershed area	less than 0.	.02km ²	V								
PT e	artificial works that cause			[P	otencia	al disaster mo	de]	Check		[Expected size of	f disaster] (width, length, depth, etc.)	
o b	negative effects	none		V	<i>ب</i> م	amada	of bridge/culv	ort				
٦	new crack and/or slope	certain		V		amaye	or bridge/cuiv	en				
	failure in stream	none			0	utflow	of ombookmor	\ +				
	traces of large slope	certain		V	0		or embankmer	it.			L= 25	500 m, W=71 m, D= 3-4 m
	failure in stream	none			De	ebris flo	oding on the	road	V			
								loud	v			
[Co	untermeasure]							0				
Т	ype of countermeasure Che	ck						Count	nization re	sponsible for	1	
			[Evaluation	Rank]				the so	cale of the	disaster	[Description/con	nments]
Ret	aining wall has been constructed	to	\sim	Scale of	Dia	Maalium	Creatil	-Big:	Grant aid		Debris flow is cro	ssing N-35 at this location which carries
prot	ect along the valley side of road ((N-	Risk 🔨	isaster	ыg	wealum	Small	-Med	um: Major	contractor in Pakis	tan <i>a huge debris ma</i>	aterial during rainy season. This debris
	35).		One of a	- 1	4	0	0	-Sma	II: Local co	ontractor	the road. No proc	er drainage control measures has been
			Great ri	SK	1	2	3	Influe	nce on the	traffice when	incorporate to mi	nimse the impact of this debris flow for
	none•low	none•low v				\bigcirc	0	poten	tial disaste	er	N-35. Debris cons	sisting of boulders sizes ranging from 1-
Ef	fect of existing moderate	f existing moderate			1	2	-Great risk: road clo		d closed for 2 days o	2 M2 . Boulders o	t granite, Amphibolite, Gabbro are found	
C	ountermesure high				2	0	-Medium risk: road closed for 1 da			ad closed for 1 day	y or les	
	enough		LOW IS	or.	2	3	4	-Low	risk: no ro	ad closure		

	Inspector	Yasir, Sajid, Sha	ifique, Ba	asharat						
[History]									
	category	of score	Check							
T w c	here is a history abo rere obstacles to the onstruction of recen	٧								
T tł tr	here is a history a hough there is no raffic.									
Т	here is no history	of debris flow								
[1	[Expected size of disaster] (width, length, depth, etc.)									
L= 2500 m, W=71 m, D= 3-4 m										

[Co

Type of counterm	easure	Ch	IECK
Retaining wall has b protect along the val 35	been const ley side of).	ructo roao	ed to d (N-
	none·lov	N	٧
Effect of existing	moderat	е	
countermesure	high		
	enough		



Code no.	Sat_	Ν	3	5	_	2	1	4
Region Office								
Maintenance Unit								

Photo :	sheet
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Coordinates		Lati	tude			35 ⁰	' 58	3.6"	I		
Coordinates	Longitude 73°					⁾ 28	8' 18	3.6"	I		
Road Name	Ν	_	3	5	Km						

Date	2017/12/20
Inspector	Yasir, Sajid, Shafique, Basharat







Mountain side view of the debris flow

Valley side view of the debris flow

Front view of the debris flow



Existing countermeasures / anomalies: Retaining wall has been constructed for N-35 road





Existing countermeasures / anomalies: Retaining wall has been constructed for N-35

Road condition

	Code	no. Sat _ N 3 5 _ 2 3 6		Eva	aluation s	heet (Slope	e failure	e/Roc	kfall)		Date	2017/12/2	21	
R	egion	Office				Latitude	35	5 ^o 31' 23	8.8"			Inspector	Yasir, Sajid, Shafique	e, Basharat	
Ма	intenar	nce Unit			Coordinates	Longitude	73	3 ^o 39' 59	.5"			L			
					Road name	N 3 5	Km								
[Ca	uses]				L										
lte	em	factor	category of score	Check				[Counter	measure]		F				
, hy	pgt	alus slope	3 or more correspondences	V		. 1					lype of o	countermeasu	ires		
gra	acto	clear convex break of slope,	2 correspondences		[Disaste	r type]	7			Botoining	well for	talua alana ak	hout 1m high		
obo	Control Contro	overhang, water catchment slope			Rock	fall				Retaining	wall for	talus slope at	bout im nign		
-			marked	1			-		F	ffectiveness	of evisti	na counterme		Check	
	io s	susceptible to erosion	a little marked	v	Slope f	ailure √		Detential			tod ono	ugh or it is d	ofondod onough whon it is	Oncok	
	S le	ess strength with water	None		[Main cl	eck object	_] 1	generated	siope ialiui I.	le ale pievei		ugh, or, it is u	erended enough when it is		
lons		high density of cracks and a weak layors	marked	V			1	e Potential s	e are conside	are considerably prevented or it is considerably def					
ndit	ock	susceptible to erosion.	a little marked		Cut sl	ope √		when it is	generated.		nabiy pi				
8	Ω	ast weathering	None					Potential s	slope failur	e are partly p	revented	d, or it is partly	v defended when it is		
gice			It corresponds.		Natural	slope		generated	I. However	, it is not eno	ugh for t	he remaining	factors.	V	
oloe	e c	alp slope of bedding plane.	None	V		<u>-</u>	-4	There is n	o countern	neasure, or th	nere is n	ot effective ev	ven if countermeasures		
Ğ	nctr	debris on impermeability bedrock, the upper part is a hard /the toe of slope is	marked	V				are not pe	erformed.						
	່ ¹ ັນ t		a little marked												
	v	veak.	None		[History]							[Expected	size of disaster](width, length,	depth, etc.)	
	instability					Leve	l of disas	ster history		C	Check				
	Т	opsoil, detached rock and unsteady rock		There is a histo	ry about larg	e fallen ro	ocks and slo	pe failures	that were						
tion				obstacles to the	road traffic	after cons	struction of re	ecent meas	sures.	,					
codi			notable spring waster		There is a histo	ry about lar	je fallen r	ocks and slo	ope failures	s that gets					
ice (Spring water	seepage		to the road though there is no obstacle to traffic.					W= 515m, L= 750r				-5m	
urfa			none	V	There is a histo	ry about sm ad	all fallen i	rocks and slo	ope failures	s that did					
S		Surface condition	bare land with minor vagetation	v	not get to the fo	au.									
		Surface condition	mainly structure mainly tree		No disaster rec	ords									
			H>50m	V	[Evaluation Bar	k]					scriptio	nl			
			エ30≦H<50m	\vdash	Sca	le of		[Lar	ge Talu	s slope with i	multiple scarps within the	main slope	
			.5 9 15≦H<30m		Risk	ster Bi	g	Medium	Small	failu	ure. Sm	all bushes ca	an be seen on the talus o	leposit.	
ofile		Height (H), dip (i)	 H<15m							Dui	ring rain	fall, the talus	slope failure makes this	site	
ሻ			i≧70°		Great risk	1		2	3	Vuli	ierable faco rur	for the contir	nuity and safety of N-35.	Due to this	
			<u>.</u> ਊ 45°≦i<70°		Maaliuwa wiala			\bigcirc	0	flov	v.	ion, guny ero	SIGH are visible and profi		
			i<45°	V	wealum risk	1		(2)	3	Ret	aining v	vall about 4 f	eet high was built to min	imize the	
2	Surface	e collapse, small fallen rock, gullv. erosion.	2 or more correspondences clarity	V	Low rick			3	Л	risk	but it h	as been dam	naged due to recent activ	ity.	
mal	biping t	ole, subsidence, heaving, bending of the root,	certain•unclarity		LOW HSK	2		5	4						
a f	allen tr	ee, crack, open crack, anomaly of	none		Organization re	sponsible for	counterr	measure wor	ks	Influen	ce on the	e traffice wher	n		
- C	COUNTER	meusure			according to the	e scale of the	disaster			potenti	al disast	er			
					-Big: Grant aid					-Great risk: road closed for 2 days or more					
					-Medium: Major contractor in Pakistan					-Medium risk: road closed for 1 day or less					
					-Small: Local co	ontractor				-Low ris	sk: no ro	ad closure			



Code no.	S	Sat		Ν	3	5	_	2	3	6	
Road name	Ν	3	5					Km			

de no.	5	Sat	_	N	3	5	_	2	3	6			Ρ	hoto s	sheet			Date		2017/12/	/21	
ad name	N	3	5					٢m				O a sulling to	Latitude		35° 3	31' 23.8"		Inspector	Ya	sir, Sajid, Shafiqu	ie, Basharat	
			II		11							Coordinates	s Longitude	e	73º 3	39' 59.5"	I	L				1
	and the second se									and the second se							いたがでしたが、ころ	A CARLON AND AND AND AND AND AND AND AND AND AN				
Full viev	w of	the l	andsli	de								View of land	dslide on V	alley side	:		Road co	ondition:Cut	t slope	e at the start poi	int	
				一般に見ていた。		and the second se	a set of the set of the set	and the second sec		and the second second	A State of the second											

View of the slope failure at the middle point

Existing countermeasures / anomalies: View of shed as counter measure

View of Multiple slope failure in the talus deposits

Code	e no. Sat N 3	5 _ 2 7 0		Evaluati	on shee	t (debri	is flow)		Date	2017/1	2/22
Regi	on Office				Latitude	34º 2	8' 55.5"		Inspector	Yasir, Sajid, Shafi	que, Basharat
Main	tenance Unit			Coordinates	Longitude	73º 5	6' 03.1"				
ļ				Road Name	N 3 5	Km					
[Cau	sesl										
item	factor	category	Check	[Road :	structure]				[History]		
L.	areas that river bed is 15°	0.50km ² or more		structur	e cate	gory of sco	re Cheo	:k	categ	jory of score	Check
rive	or more in watershed	0.15km ² - 0.50km ²	V		10m or mor	e	V		There is a histor	v about debris flow that	
∕ of	area	less than 0.15km ²		River	5m - 10m				were obstacles t	to the road traffic after	v
erty		40°or more	V	width	3m - 5m				construction of r	ecent measures.	
rop	steepest slope of river bed	30° - 40°			less than 3	m			There is a histe	ory about debris flow	
д.		less than 30°			less than 1	m or			though there is	s no obstacle to	
		0.20km ² or more			No bridge /	box culvert			traffic.		
	or more in watershed area	0.08km ² - 0.20km ²		Beam	1m - 2m		V				
		less than 0.08km ²		height	2m - 3m				There is no his	story of debris flow	
e	area that meadow and shrub	0.20km ² or more			3m - 5m						
slop	(less than 10m height)	0.02km ² - 20km ²			5m or more)					
oť	occupy in watershed area	less than 0.02km ²	V								
erty	artificial works that cause	certain		[Potend	cial disaster n	node]	Check		[Expected size	of disaster] (width, leng	th, depth, etc.)
lop	negative effects	none	V	Damac	e of bridge/ci	ulvert					
ā	new crack and/or slope	certain		Damag	je of blidge/c	uiven					
	failure in stream	none	V	Outfloy	v of embankm	ant					
	traces of large slope	certain		Outiov		ient			L= 1	1300 m, W=25 m, D=	2-3 m
	failure in stream	none	V	Debris	flooding on th	ne road	V				
[Cou	ntermeasurel				-						
		ck				Orgar	ization responsit	ole for			
- 13	pe of countermeasure Cher					count	ermeasure works	according to			
			Rankj			the sc	ale of the disaste	er	[Description/co	omments]	
			disaster	Big Mediu	um Small	-Big: (Grant aid		Mouth of chan	nel Is very wide near l	oad torming a
	Culvert with opening 1x1 m	Risk				-Medi	um: Major contra	ctor in Pakistan	different sizes	and some of size 2-3r	n3. Channel
		Great ri	isk	1 2	3	-Smal	I: Local contracto	or	divides into two	o near the road:	
						Influe	nce on the traffic	e when	a) Eastern cha	annel having culvert bo)X
	none•low	Medium	risk	1 2) 3	poten			b) Western Ch	annel without protecti	on
Effe	ect of existing moderate	v		-+	-	-Grea	t risk: road close	d for 2 days or mor	Sides of chanr	nel are steep having o	verhangs.
CO		Low ris	sk	2 3	4	-Medi	um risk: road clo:	sed for 1 day or les			
	enougn					-Low	risk: no road clos	ure			



Code no.	Sat_	Ν	3	5	_	2	7	0
Region Office								
Maintenance Unit								

Coordinatos		Lati	tude		34º 28' 55.5"								
Coordinates	L	ong	jitude	Э			730	⁰ 56	6' 03	3.1'	•		
Road Name	Ν	-	3	5	Km								





2017/12/22

Yasir, Sajid, Shafique, Basharat

Mountain side view of the debris flow

Valley side view of the debris flow

Front view of the debris flow

Date

Inspector







Inlet of the culvert for the debris flow

Road condition at the start point

Existing countermeasures / anomalies: Culvert outlet view

Code no. Sat_	N	3	5	_	2	7	2		
Region Office									
Maintenance Unit									

[Causes]	
----------	--

item	factor	category	Check
river	areas that river bed is 15°or more in watershed	0.50km ² or more 0.15km ² - 0.50km ²	
ď	area	less than 0.15km ²	V
erty		40°or more	٧
đo	steepest slope of river bed	30° - 40°	
Ē		less than 30°	
	area that slope gradient is 30° or more in watershed area	0.20km ² or more 0.08km ² - 0.20km ²	
		less than 0.08km ²	
slope	area that meadow and shrub (less than 10m height) occupy	0.20km ² or more 0.02km ² - 20km ²	
ď	in watershed area	less than 0.02km ²	V
erty	artificial works that cause	certain	
đo	negative effects	none	V
<u> </u>	new crack and/or slope	certain	
	failure in stream	none	V
	traces of large slope failure	certain	
	in stream	none	V

) II 3I		u (u						•,		
Latitud	е	35° 27' 38.1"								
Longitu	Longitude			73° 58' 9.4"						
		Km								
	Latitud Longitu	Latitude Longitude	Latitude 3 Longitude Km	Latitude 35 ^o Longitude 73 Km	Latitude 35° 2 Longitude 73° 5 Km	Latitude 35° 27' Longitude 73° 58 Km Km	Latitude 35° 27' 38 Longitude 73° 58' 9 Km Km	Latitude 35° 27' 38.1 Longitude 73° 58' 9.4' Km Km	Latitude 35° 27' 38.1" Longitude 73° 58' 9.4" Km Km	

Evaluation sheet (debris flow)

[Road st	ructure]	
structure	category of score	Check
	10m or more	V
River	5m - 10m	
width	3m - 5m	
	less than 3m	
	less than 1m or	
	No bridge / box culvert	٧
Beam	1m - 2m	
height	2m - 3m	
	3m - 5m	
	5m or more	

[Potencial disaster mode]	Check	_
Damage of bridge/culvert		
Outflow of embankment		
Debris flooding on the road	٧	

the scale of the disaster -Big: Grant aid

-Small: Local contractor

potential disaster

Influence on the traffice when

-Medium: Major contractor in Pakistan

		[History]
of score	Check	category of score Check
	V	There is a history about debris flow that were obstacles to the road traffic after construction of recent measures.
ulvert	√	There is a history about debris flow though there is no obstacle to v traffic.
		There is no history of debris flow
Check		[Expected size of disaster] (width, length, depth, etc.
	-	L= 2000 m, W=11.20 m, D= 0.3 m
d √		
Organization re countermeasur the scale of the	esponsible fo e works acc disaster	or cording to [Description/comments]

Date

Inspector

19-Dec-2017 Yasir, Sajid, Shafique, Basharai

[Countermeasure]

Type of counterm	neasure	Check
Paved drainage p si	ath towards de	s valley
	none·lov	N V
Effect of existing	moderat	е
countermesure	high	
	enough	

[Evaluation Rank]			
Scale of disaster Risk	Big	Medium	Small
Great risk	1	2	3
Medium risk	1	2	3
Low risk	2	3	4

A seasonal stream crosses the highway at this location. Two channels with large catchment area. The 272 contains small quantity of debris as compare to 273. The 273 contains considerable amount of debris containing some boulders of size 0.5 m3, which can threaten stability of the highway. -Great risk: road closed for 2 days or more Further, valley side of channels is very steep due to

-Medium risk: road closed for 1 day or les river erosion. Paved drainage path on valley side is protecting from erosion on valley side. -Low risk: no road closure



Code no. Sat_	Ν	3	5	_	2	7	2	
Region Office								
Maintenance Unit								

Photo	sheet
-------	-------

Coordinates		Lati	tude			35 ^o 31' 58.6"						
Coordinates	I	Long	jitude	9			730	⁾ 28	8' 18	3.6"	•	
Road Name	Ν	_	3	5	Km							

Date	2017/12/20
Inspector	Yasir, Sajid, Shafique, Basharat



Mountain side view of the debris flow

Valley side view of the debris flow

Front view of the debris flow



Existing countermeasures / anomalies: Retaining wall has been constructed for N-35 road





Existing countermeasures / anomalies: Retaining wall has been constructed for N-35

Road condition

	Cod	le no. Sat_ N 4 5 _ 1		Ev	aluation sh	eet (S	lope	failur	e/Rock	(fall)			Date	2018/1	2/4
F	Regio	n Office			Coordinates	Latitude	35	° 39' 37	7.3"				Inspector	Yasir, Sajid, Shafid	que, Basharat
М	ainten	ance Unit			L	ongitude	710	^o 45' 58	3.9"					-	-
					Road name		Km								
U]	auses tem	factor	category of score	Check				[Counter	measure]						
hy	eq .	talus slope,	3 or more correspondences	V		_					Туре о	f counter	measures		
topogra	Collaps factor	clear convex break of slope, eroded toe of slope , overhang, water catchment slope	2 correspondences 1 correspondences no correspondence		[Disaster f	ype] II √			No C	Counter N	leasure f	or rock fa	all. Retaining	wall for N-45	
	_	suscentible to erosion	marked		Slope fail	ure			Ef	fectivene	ess of exis	sting cour	ntermeasures	3	Check
	Soi	less strength with water	a little marked None	v	[Main che	ck object]		Potential generated	slope failure	e are prev	vented en	ough, or,	, it is defende	d enough when it is	;
onditions	Rock	high density of cracks and a weak layers susceptible to erosion,	marked a little marked	v √	Cut slop	pe		Potential s when it is	slope failure generated.	are cons	siderably	prevented	d, or it is cons	siderably defended	
ical c		fast weathering	None		Natural sl	оре		Potential s	slope failure	are partl	y prevent	ed, or it is	s partly defen	nded when it is	
eolog	Ire	dip slope of bedding plane / Joint Planes	None	v				There is n	no counterm	easure, e	or there is	not effec	tive even if c	ountermeasures	
Ō	tructu	debris on impermeability bedrock,	marked					are not pe	erformed.						V
	S	the upper part is a hard /the toe of slope is weak.	a little marked None	V	[History]							[Ex	pected size of	disaster](width, length,	depth, etc.)
			instability			Level	of disast	ter history	1		Check				
u		Topsoil, detached rock and unsteady rock	a little unstable stability	V	There is a history obstacles to the ro	about large ad traffic af	fallen roo ter const	cks and slo ruction of re	pe failures t ecent meas	hat were ures.	\checkmark				
coditio			notable spring water		There is a history	about large	fallen ro	cks and slo	ope failures	that gets					
ace o		Spring water	seepage none	V	to the road though	about smal	obstacle	to traffic.	one failures	that did			L= 140	m, W= 95 m, D= 0-	0.5 m
Surf			bare land with minor vagetation	V	not get to the road										
		Surface condition	intermediate (bare · grass · tree) mainly structure, mainly tree		No disaster record	ls									
			H≧50m	٧	[Evaluation Rank]	J]	Descript	ion]			
file			30≦H<50m		Risk Scale	er Big		Medium	Small	 	This cut . Marble a cointed a	slope is nd quari nd crack	generated (tzite is expo (ed with a ri	during excavation psed in this section isk of over hand h	n for N-45. n which is blocks
Pro		Height (H), dip (I)	H<15m i≧70°		Great risk	1		2	3	0	Clayey n	naterial i	is found on l	both sides of the	rock fall.
			ເອີ 45°≦i<70° i<45°	٧	Medium risk	1		2	3		Drainage	e is also	found on th	e right side of the	e rock fall
maly	Surfa piping	ce collapse, small fallen rock, gully, erosi <mark>p</mark> n, hele, subsidence, heaving, bending of tr ee root,	2 or more correspondences clarity certain • unclarity	V	Low risk	2		3	4						
Anc	court	ermeasure	none		Organization resp according to the s	onsible for c cale of the c	ounterm lisaster	easure wor	rks	Influ pote	ence on t ential disa	he traffic ster	e when		
					-Big: Grant aid -Medium: Maior or	ontractor in I	Pakistan			-Gre	eat risk: ro dium risk:	ad close	d for 2 days o sed for 1 day	or more	
					-Small: Local cont	ractor	anotari			-Lov	v risk: no	road clos	sure		



Code no.	Sat_	Ν	4	5	_	1	
Region Office							
Maintenance Unit							

	Photo sheet														
Coordinates	Latitude 35° 39' 37.3"														
Coordinates	1° 45'	58.	9"												
Road na	ame		Km												

Date	2018/12/4
Inspector	Yasir, Sajid, Shafique, Basharat



	Cod	e no. Sat_ N 4 5 _ 2		Eva	aluation s	heet	(S	lope	failure	/Roc	kfall)			Date	13/4/20	018
F	Regio	n Office				Latitud	de	359	[,] 40' 54.	8"				Inspector	Yasir, Sajid, Shafio	que, Basharat
М	ainten	ance Unit			Coordinates	Longitu	ıde	719	⁰ 45' 59.	6"						
					Road name			Km .								
IC	auses	1			Road hame			IXIII								
	tem	factor	category of score	Check					[Counterm	neasure	1					
hy	ğ	talus slope,	3 or more correspondences						-			Туре	of count	termeasures		
grap	apse	clear convex break of slope,	2 correspondences	V	[Disaste	r type]										
òodc	Colla	eroded toe of slope . overhand, water catchment slope	1 correspondences		Rock	fall				No	Counter M	easure	for rock	fall. Retaining	wall for N-45	
t	-		no correspondence								Effectivene	a of ov	ioting of		, ,	Chook
	lio	susceptible to erosion	a little marked		Slope fa	ailure			Potential c	lono failu					d opough whop it is	CHECK
s	S	less strength with water	None	V	[Main ch	neck obie	ectl		generated.	nope failu	ile ale piev	enteu e	nougn,			
ition	~	high density of cracks and a weak layers	marked		Cut al				Potential sl	ope failur	re are consi	iderably	, preven	ted, or it is cons	siderably defended	
puo	Roch	susceptible to erosion,	a little marked	٧	Cut si	ope	V		when it is g	generated	l.					
cal c		fast weathering	None		Natural	slope			Potential sl	ope failui	re are partly	/ prever	nted, or	it is partly defer	nded when it is	
logi	0	dip slope of bedding plare / Joint Planes	It corresponds.	V					generated.	However	r, it is not er	nough fo	or the re	emaining factors	S.	
Geo	cture	da hada aya da sa sa sa sa sa da 1965, ka salar sa l	marked						There is no are not per	o counterr formed.	measure, o	r there H	s not eff	ective even if c	ountermeasures	V
	Stru	the upper part is a hand /the toe of slope is	a little marked	V												<u> </u>
		weak.	None		[History]								[[Expected size of	disaster](width, length,	, depth, etc.)
			instability			Le	vel c	of disast	er history			Check] [
		Topsoil, detached rock and unsteady rock	a little unstable	V	There is a histor	ry about la	arge	fallen roc	ks and slop	e failures	that were					
ition			stability		obstacles to the	road traf	fic af	er constr	ruction of rea	cent mea	isures.					
cod		Spring water	notable spring water		There is a histor	ry about I oh there i	large is no	fallen roo	cks and slop	pe failure:	s that gets			I – 50	m W- 120 m D-	0 m
ace		Sping water	none	v	There is a histor		emall	fallen ro	cke and elor	no failura	e that did			L= 50	7 m, w= 130 m, D=	0 111
Surf			bare land with minor vagetation	v	not get to the ro	ad.	Sman	Talleri Tu	CK3 and 310	pe failure						
		Surface condition	intermediate (bare · grass · tree)		No diagotor room	rdo							1			
			mainly structure, mainly tree		No disaster reco	bras						v				
			H≧50m		[Evaluation Ran	k]					[Descrip	otion]			
			30≦H<50m	V	Scal disa	e of ster	Big	ſ	Medium	Small	/	his cut Iarhla	slope	is generated (during excavation	n for N-45. And and
ofile		Height (H), dip (i)	E 15≧R<3011 H<15m		Risk						s	ome op	ben cra	icks are also	observed with a r	isk of over
Pro		g (), u.p (.)	i≧70°	V	Great risk		1		2	3	h	ang blo	ocks. D	Drainage is als	o found on the bo	oth sides of
			<u>.</u> ਊ 45°≦i<70°		Modium rick		1		2	2	tł	ne rock	fall. H	ighly weather	ed.	
			i<45°		Wediam hisk		I		2	5	_ L					
ıaly	Surfa	ce collapse, small fallen rock, gully, erosion, hole, subsidence, heaving, hending of tree root	2 or more correspondences clarity certain unclarity	V	Low risk		2		3	4						
Anor	fallen court	tree, crack, open crack, anomaly of	none		Organization rea	sponsible scale of	for c the d	ounterme	easure work	(S	Influe poter	ence on ntial disa	the traf	fice when		
					-Big: Grant aid						-Grea	at risk: r	oad clo	sed for 2 days of	or more	
					-Medium: Major	contracto	or in F	Pakistan			-Med	lium risk	k: road c	closed for 1 day	or less	
					-Small: Local co	ontractor					-Low	risk: no	o road cl	losure		



Code no.	Sat_	Ν	4	5	_	2	
Region Office							
Maintenance Unit							

Photo sheet										
Coordinates	Latitude	35 ^o 40' 54.8"								
Coordinates	Longitud	de	71 ^o 45' :					6"		
Road na	ame					Km				

Date	13/4/2018
Inspector	Yasir, Sajid, Shafique, Basharat



	Coc	le no. Sat_ N 4 5 _ 3		Ev	aluation s	heet (Slop	e failur	e/Roc	:kfall)	Date	14/4/20	018
I	Regio	n Office				Latitude	3	4 ^o 55' 25	5.6"	-	Inspector	Yasir, Sajid, Shafic	jue, Basharat
M	ainter	ance Unit			Coordinates	Lonaitud	e 7	2º 50' 10).4"			·	
			1		Road name		Km						
IC	auses	51			Road name								
	Item	factor	category of score	Check				[Counter	measure	9]			
λ	g	talus slope,	3 or more correspondences	V				-		Type of	countermeasures		
grap	apse	clear convex break of slope,	2 correspondences		[Disaster	type]	_						
òodc	Colla	eroded toe of slope, overhang, water catchment slope	1 correspondences		Rock	all				Small drainage a	t the toe of the slope	failure	
Ŧ	-		no correspondence	2/						Effectiveness of exist	ting countermoscure	<u></u>	Chock
	oi	susceptible to erosion	a little marked	v	Slope fa	ilure √		Detential	alona failu			s ad analiah whan it in	Check
ú	S	less strength with water	None		[Main ch	eck obiec	-1 1	generated	d.	are prevented end		ed enlough when it is	
tion		high density of cracks and a weak layers	marked	V				Potential s	slope failu	re are considerably p	revented, or it is con	siderably defended	
ondi	Sock	susceptible to erosion,	a little marked		Cut sid	pe v		when it is	generated	d.			
al c	ш	fast weathering	None		Natural	slope v		Potential s	slope failu	re are partly prevente	ed, or it is partly defe	nded when it is	
logic	-	dip slope of bedding plane / Joint Planes	It corresponds.		Hatara	Nopo v		generated	d. Howeve	er, it is not enough for	the remaining factor	S.	
Geo	ture		None	V				There is n	no counter	measure, or there is l	not effective even if o	countermeasures	V
-	debris on impermeability bedrock,		marked a little marked	v				ure not pe					
	weak.				[History]						[Expected size of	disasterl(width, length,	depth. etc.)
-			instability	V		Leve	l of disa	aster history	,	Check			
		Topsoil, detached rock and unsteady rock	a little unstable	There is a history about large fallen rocks and slope failures that were									
ion			stability		obstacles to the road traffic after construction of recent measures.								
codit			notable spring water		There is a histor	y about lar	ge fallen	rocks and slo	ope failure	es that gets			
ice o		Spring water	seepage		to the road though there is no obstacle to traffic.					L= 322 m, W= 363 m, D= 4-5 m			-5 m
urfa			none	V	There is a history about small fallen rocks and slope failures the not get to the road.					es that did			
0)		Surface condition	intermediate (bare arass tree)	v									
			mainly structure, mainly tree		No disaster reco	rds							
			H≧50m	V	[Evaluation Ran	<]				[Descripti	on]		
			ਸ਼ੂ 30≦H<50m		Scale	e of	ia	Medium	Small	Rounded	to sub rounded bould	ers, gravels, pebbles	and cobbles
e			ੋ <u>ਵ</u> 15≦H<30m		Risk		чЯ	MEUIUIII	Small	with sandy, also abse	silty clayey matrix. At rved at different lavels	bout 0.5 to 1m thick sa along the slope. Few	and layers are boulders at
Prof		Height (H), dip (i)	H<15m		Great risk		1	2	3	the top a	nd mid of the slope fa	ilure which threaten th	ne road and
			i≧70° Ω 45°≤∶∠70°			_				traffic. This	s 300 to 400 m wide r	oad section was high	y susceptible
			'̄ 45' ≦I < 70' i < 45°	N	Medium risk		1	(2)	3	(damaged	l) is also observed at t	the toe of slope failure	e. Gullies are
	C		2 or more correspondences clarity	V							orved at different inte	nuals along the slope f	ailuro
Jaly	Surra pipine	te collapse, small fallen rock, gully, erosiph,	certain • unclarity		Low risk		2	3	4				
Von	fallen	tree, crack, open crack, anomaly of	none		Organization res	ponsible fo	r countei	rmeasure woi	rks	Influence on th	ne traffice when		
⋖	court	ermetasure			according to the	scale of th	e disaste	r		potential disas	ter		
_					-Big: Grant aid	-Big: Grant aid				-Great risk: roa	ad closed for 2 days	or more	
					-Medium: Major contractor in Pakistan				-Medium risk:	road closed for 1 day	y or less		
					-Small: Local co	ntractor				-Low risk: no r	oad closure		



Code no.	Sat_	Ν	4	5	_	3	
Region Office							
Maintenance Unit							

Photo sheet										
Coordinates	Latitude		34 ^o 55' 25.6"							
Coordinates	Longitud	de		72 ^o 50' 10.4"						
Road na	ame					Km				

Date	14/4/2018
Inspector	Yasir, Sajid, Shafique, Basharat







View of landslide on Valley side:



Road condition:Cut slope at the start point

View of the slope failure at the middle point with boulder which threaten the road and traffic.

Existing countermeasures / anomalies: View of channel at the toe of Slope Failure

View of sandy layer in the alluvial deposits.

	Coc	le no. Sat_ N 4 5 _ 4		Eva	aluation s	heet (S	Slope	e failur	e/Roc	kfall)		Date	15/4/20	018
F	Regio	n Office				Latitude	34	4º 55' 11	.2"	-		Inspector	Yasir, Sajid, Shafid	que, Basharat
M	ainten	ance Unit			Coordinates	Longitude	72	<u>2° 49' 43</u>	3.9"					
			l		Road name		Km							
[C	auses	5]												
Ĺ	ltem	factor	category of score	Check				[Counter	measure]]				
hy	pe	talus slope,	3 or more correspondences	V							Type of co	ountermeasures		
grap	apse	clear convex break of slope,	2 correspondences		[Disaster	type]	7			,				
topo	Coll fa	overhang, water catchment slope	1 correspondences		Rock f	all		Г	No Counter	· Measure f	or slope fail	ure. Culvert at on	e of the gully drainag	e.
_			marked	V		1	-		E	Effectivene	ss of existin	a countermeasure	es	Check
	Soil	susceptible to erosion	a little marked		Slope fa	ilure √		Potential	slope failu	re are prev	ented enou	gh, or, it is defend	led enough when it is	;
st	5	less strength with water	None		[Main ch	eck object		generated	d.	•	,		U U	
litior	×	high density of cracks and a weak layers	marked	V	Cut slo	pe √]	Potential	slope failur	re are cons	iderably pre	vented, or it is co	nsiderably defended	
conc	Roc	susceptible to erosion,	a little marked				4	when it is	generated	l.				
ical			None		Natural s	slope $$		Potential	slope failur 1. However	re are partly	/ prevented,	, or it is partly defe e remaining facto	ended when it is	V
olog	ē	dip slope of bedding plane / Joint Planes	None	V	L		4	There is r		measure e	r there is po	t offective even if		+
Ge	nctui	debris on impermeability bedrock	marked	V				are not pe	erformed.					
	Image: Second and the second							.						<u></u>
		weak.	None		[History]							[Expected size c	of disaster](width, length,	, depth, etc.)
	Topsoil, detached rock and unsteady rock a little unstable			V		Leve	l of disas	ster history	/		Check			
_					There is a history about large fallen rocks and slope failures the obstacles to the road traffic after construction of recent measures of the road traffic after construction					that were	\checkmark			
ditior			notable spring water		There is a history about large fallen rocks and slope failures t					s that gets				
) CO(Spring water	seepage		to the road though there is no obstacle to traffic.					L= 309 m, W= 520 m, D= 2-3 m			2-3 m	
rface			none	V	There is a history about small fallen rocks and slope failures t					s that did			. ,	
Sul			bare land with minor vagetation	V	not get to the road.									
		Surface condition	intermediate (bare · grass · tree)		No disaster records									
			mainly structure, mainly tree			1								
			H≦50M エ 30≤H<50m	v		(j e of	<u> </u>			ין די ר	Jescription)] sub rounded anou	ar to sub angular boul	ders, aravels
_			<u></u>		Risk	ter Bi	g	Medium	Small	p	ebbles and c	cobbles with sandy	, silty clayey matrix. Al	bout 0.5 to 1m
rofile		Height (H), dip (i)	H<15m					0			thick sand l	layers are also abs 300 to 400 m wide	erved at different lave	ls along the
Ē			i≧70°		Great risk	1		2	3		to erosion.	Gullies are observ	ved at different interva	ls along the
			<mark>.਼ੁਰੂ</mark> 45°≦i<70°	V	Medium risk	1		(2)	3	f	slope failu	re. Drainage is bo	unded on both sides o	f the slope
			i<45°					\bigcirc		_ Ľ	unu 03.1 (0d)	overflow	on the road	ao to material
۶le	Surfa	ce collapse, small fallen rock, gully, crosi pn,	2 or more correspondences clarity	ν	Low risk	2		3	4					
imor	fallen	tree, cubulaence, neaving, benaing or tree root, tree, crack, open, crack, anemaly of	none		Organization res	nonsible for	COUNTER	neasure wo	rks	 Influe	ence on the	traffice when		
A	count	ermeasure			according to the	scale of the	disaster			poter	Influence on the traffice when potential disaster			
L	r				-Big: Grant aid					-Gre	at risk: road	closed for 2 days	or more	
					-Medium: Major contractor in Pakistan				-Mec	lium risk: ro	ad closed for 1 da	y or less		
					-Small: Local cor	ntractor				-Low	risk: no roa	ad closure		



Code no.	Sat_	Ν	4	5	_	4	
Region Office							
Maintenance Unit							

	Pho	oto sheet
Coordinates	Latitude	34º 55' 11.
00010110100		

Longitude

	Dale	
34 ^o 55' 11.2"	Inspector	Yasi
72 ^o 49' 43.9"		

Date	15/4/2018
Inspector	Yasir, Sajid, Shafique, Basharat



View of the slope failure at the middle point

Existing countermeasures / anomalies: View of water channel at the toe of slope failure and parapit wall as counter measure


	Cod	e no. Sat_ N 4 5 _ 5		Εv	aluation sh	neet (S	lope	failure/	Rock	fall)		Date	16/4/20	018	
ł	Regio	n Office				Latitude	3	5° 47' 9.9"	1	-		Inspector	Yasir, Sajid, Shafic	que, Basharat	
N	ainten	ance Unit			Coordinates	onaitude	71	^o 46' 24 7	'11				<u> </u>		
					Deed name		1/m								
IC		1			Road name		NIII								
	tem	factor	category of score	Check				[Counterme	easurel						
Ž	70	talus slope	3 or more correspondences	V						Type of countermeasures					
raph	pse(tor	clear convex break of slope,	2 correspondences		[Disaster	type]									
bod	olla fac	eroded toe of slope ,	1 correspondences		Rock fa				Ste	epped reta	ining wall a	at the centre of slop	pe failure.		
9	0	overhang, water catchment slope	no correspondence		INDER 18	ui									
		susceptible to erosion	marked		Slope fail	ure √			Effe	ectivenes	s of existing	g countermeasures	5	Check	
	Soi	less strength with water	a little marked	V				Potential slop	pe failure	are preve	nted enoug	gh, or, it is defende	ed enough when it is		
suc			None		[Main che	ck object]	1	generated.							
ditio	승	high density of cracks and a weak layers,	marked	ν	Cut slop	be √		Potential slop	be failure a	are consic	lerably prev	vented, or it is cons	siderably defended		
con	Ro	susceptible to erosion, fast weathering	a little marked									and the second scale for	and a state of the first state		
lical			None		Natural sl	ope √		Potential slop	be failure a	are partly t is not end	prevented, ough for the	or it is partly defer	nded when it is	V	
olog	e	dip slope of bedding plane / Joint Planes	None	V				There is no c			there is not		countermeasures		
Ģ	Ictur	debris en impermechility bedreck	marked	v				are not perfor	rmed.	asule, or			ountermedoured		
	Stru	the upper part is a har d /the tee of slope is	V												
		weak.	None		[History]							[Expected size of	disaster](width, length,	depth, etc.)	
			instability	V		Level	of disas	ter history			Check				
		Topsoil, detached rock and unsteady rock	a little unstable		There is a history	about large	fallen ro	cks and slope t	failures the	nat were					
ion			stability		obstacles to the ro	bad traffic a	fter cons	truction of rece	ent measur	ires.					
codit			notable spring water		There is a history	about large	e fallen ro	ocks and slope	hat gets	\checkmark					
ce		Spring water	seepage		to the road though there is no obstacle to traffic.							L= 460	= 460 m, W= 275 m, D= 1-2 m		
urfa			none	V	There is a history	about sma	ll fallen ro	ocks and slope	e failures th	hat did					
S		Curfoce condition	bare land with minor vagetation	ν	not get to the road	1.									
		Surface condition	mainly structure, mainly tree		No disaster record	ds									
-			H≥50m	V	[Evaluation Rank]					[D	escription				
			ਤੁ 30≦H<50m		Scale	of					Schist is ex	י posed along this s	lope failure. 4-5 m th	hick alluvial	
0			. <u></u> 9 15≦H<30m		Risk	er Big		Medium	Small	de	posit is also	o observed along t	the slope failure. Hig	hly fractured	
rofile		Height (H), dip (i)	 H<15m		Ore et riels			0	2	rc	ock along th feet wide d	ne slope failure. Mi Irainage (damaged	nor scarps are also	observed. 1	
٩			i≧70°		Great risk	1		2	3	sla	pe failure.	Gullies are observ	ed at different interv	als along the	
			ਊ 45°≦i<70°		Medium risk	1		2	\bigcirc	s	lope failure	e. Water channel fo	or local supplies is a	lso found at	
			i<45°	V	Wediam hak	'		2	J			the top of the	e slope failure.		
naly	Surfa pipine	ce collapse, small fallen rock, gully, crosi pn, hole, subsidence, heaving, bending of tr ee root.	V	Low risk	2		3	4							
Non	fallen	tree, crack, open crack, anomaly of		Organization resp	onsible for	counterm	easure works	ı	Influer	nce on the t	traffice when				
◄	court	ermetasure		according to the scale of the disaster					potential disaster						
					-Big: Grant aid					-Great risk: road closed for 2 days or more					
					-Medium: Major contractor in Pakistan					-Medium risk: road closed for 1 day or less					
					-Small: Local contractor				-Low risk: no road closure						





Γ	Code	e no. N 7 5 _ 1 _ 1		Εv	aluation	shee	et (S	lope	e fai	lure/l	Roc	kfall)			Date	3-Dec	-17
	Region	n Office Muzzafarabad			O a sudia sta	Lati	tude	N	33°49	9' 23.61"					Inspector	Makoto T	okuda
N	aintena	ance Unit Murree			Coordinate	Long	itude	E	73°2	0' 8.36"						-	
			•		Road nam	e N 7	5	Km 2	2 5								
[C	auses																
_	tem	factor	category of score	Check					[Co	unterme	asure]		Tuno	foour	tormogauroa		
aphy	sed	talus slope, clear convex break of slope	2 correspondences	<u>√</u>	Disa	ster type	1						туре о		llenneasures		
topogra	Collap fact	eroded toe of slope , overhang, water catchinent slope	1 correspondences no correspondence		Ro	ck fall	1		Gab	ion Work	, Culve	ert, Water C	Channel V	Vorks			
			marked	\checkmark	Slope	o failuro	./				E	Effectivene	ess of exis	sting c	ountermeasure	3	Check
S	Soil	less strength with water	a little marked None		[Main	check o	v bject]		Pote gene	ential slop erated.	oe failu	re are prev	vented er	nough,	or, it is defende	d enough when it is	5
onditior	Rock	high density of cracks and a weak layers, susceptible to erosion,	marked a little marked	~	Cut	slope	✓		Pote whe	ential slop n it is ger	e failur nerated	e are cons	siderably	prever	nted, or it is con	siderably defended	
ogical c	Ľ	fast weathering	None It corresponds.		Natur	ral slope			Pote gene	ential slop erated. He	e failur owever	e are partl , it is not e	y prevent nough fo	ted, or r the r	it is partly defered emaining factors	nded when it is s.	1
eolo	ure		None	\checkmark					Ther	re is no co	ounterr	neasure, o	or there is	not ef	fective even if c	ountermeasures	
G	Structi	debris on impermeability bedrock, the upper part is a hard /the toe of slope is	marked a little marked	~					are r	not perfor	med.						
		weak.	None		[History]									i	[Expected size of	disaster](width, length	, depth, etc.)
L		Topsoil, detached rock and unsteady rock	instability a little unstable stability	\checkmark	There is a his obstacles to	story abou the road t	Level It large	of disas fallen ro iter cons	ster hi ocks ar structio	story nd slope f on of rece	ailures	that were sures.	Check				
e coditic		Spring water	notable spring waster seepage		There is a history about large fallen rocks and slope failures that gets to the road though there is no obstacle to traffic. 10m(L) × 20m ²						(W) × 0.5m(D) = 100m3						
Irfac			none	\checkmark	There is a his	story abou	it sma	l fallen r	ocks a	and slope	failure	s that did	./				
SU		Surface condition	bare land with minor vagetation intermediate (bare • grass • tree)	✓	not get to the	e road.							•				
			mainly structure, mainly tree														
			H≦50m 30≦H<50m		[Hazard]							[Descript Scarps c	an be	observed at	the convex break	. Gabion
Profile		Height (H), dip (i)	E 15≧H<3000 H<15m	~		A: the p is high	ossib	ility of	colla	pse/fall		r	not suffic rocks.	cient.	The culvert ar	e filled with the d	ebris and
			<u>ا≦</u> /0° ⊈ 45°≤i<70°			-							Cleaning	of th	e culvert is ad	visable.	
			i<45°	\checkmark	Hazard rank	B: the p is mode	ossib erate	ility of	colla	pse/fall		t t	The scar of a collapse in the past can be identified the slope seems stabilized due to its vegetation				ntified but on
Anomaly	Surfac piping fallen t counte	ce collapse, smatter faller rock, gully, erosion, hole, subsidence, heaving, bending of tree root, tree, crack, open crack, anomaly of ermeasure	certain • unclarity none	~	C: the possibility of collapse/fall												

Code	no.	N 7 5 _ 1	_ 1		
Regio	on Office	Muzza	farabad		
Maint	tenance Unit	Mu	rree		Check
[Cau	ses]				
item	fa	ctor	catego	ry	Check
Ŀ	areas that ri	ver bed is 15°	0.50km ² or mo	ore	
rixe	or more in wa	atershed	0.15km ² - 0.50	0km²	
/ of	area		less than 0.15	km ²	1
ert)			40°or more		
rop	steepest slop	e of river bed	30° - 40°		
ሲ			less than 30°		✓
		anadiantia 200	0.20km ² or mo	ore	
	or more in wat	ershed area	0.08km ² - 0.20	0km²	
			less than 0.08	km ²	1
ЭС	area that mea	dow and shrub	0.20km ² or mo	ore	
slop	(less than 10m	n height)	0.02km ² - 20k	m²	
o	occupy in wate	ershed area	less than 0.02	km ²	1
erty	artificial works	that cause	certain		
op(negative effect	ts	none		1
ď	new crack ar	nd/or slope	certain		
	failure in stre	am	none		✓
	traces of larg	e slope	certain		
	failure in stre	am	none		1

[Countermeasure]

Effect of existing countermesure

Gabion works

Type of countermeasure

none · low moderate

high

enough

Evaluation sheet (debris flow)

Coordinates	La	titu	Ide		N 33°49' 23.61"								
Coordinates	Lo	ngi	ituc	le	E 73°20' 8.36"								
Road Name	N 7 5		5		Km	2	5						

[Road structure] structure category of score Check 10m or more 5m - 10m River 1 width 3m - 5m less than 3m less than 1m or 1 No bridge / box culvert Beam 1m - 2m height 2m - 3m 3m - 5m 5m or more

[Potencial disaster mode]	Check
Damage of bridge/culvert	
Outflow of embankment	
Debris flooding on the road	1

Check [Hazard] Image: Image

Inspector Makoto Tokuda [History]						
Date 3-Dec-17 Inspector Makoto Tokuda History] Category of score Check There is a history about debris flow that were obstacles to the road traffic after construction of recent measures. Check There is a history about debris flow though there is no obstacle to traffic. Image: Check of the construction of recent measures. There is a history about debris flow though there is no obstacle to the construction of recent measures. Image: Check of the construction of the constructio						
[History] category of score Check There is a history about debris flow that						
There is a history about debris flow that						
were obstacles to the road traffic after						
construction of recent measures.						
There is a history about debris flow though there is no obstacle to traffic.						
There is no history of debris flow						

[Description/comments]

Trace of debris flow was observed at the valley side of the road. Gabion which are installed on the waterway was washed away probably during heavy rain. Reinforcement of the gabion is necessary to stabilize the gradient of river bed.



Code no.	Ν	7	5	_	1	_	1		
Region Office			abad						
Maintenance Unit	nit Murree								

heet

Coordinatos	Latitude				N 33°49' 23.61"									
Coordinates	Longitude						E	73°2	0' 8.3	6"				
Road Name	Ν	7	5		Km	2	5							

Date	3-Dec-17
nspector	Makoto Tokuda



Mountain side: Trace of slope failure was observed at the mountain side



Valley side: Trace of debris flow was observed at the valley side.

Road condition: No anomalies was confirmed on the road surface.



Existing countermeasures: Gabion works are undertaken at the toe of the mountain side. However, the debris is deposited on the top of the gabion and may outflow the gabion works in the future.





Existing countermeasures: The culvert is filled with debris
and rocks which may block the waterway from the
mountain area, resulting the flooding of the road.E

Existing countermeasures: Partial of the gabion works in the valley side was washed away by the debris. Reinforcement of the gabion work will be necessary to stabilize gradient of the river bed.

Code	no.	N 7 5 _ 1	_ 2			Evaluatio	on shee		
Regio	on Office	Muzzat	farabad			Coordinates	Latitude		
Maint	tenance Unit	Mu	rree			Coordinates	Longitude		
						Road Name	N 7 5		
[Caus	ses]								
item	fac	ctor	categor	у	Check	[Road s	structure]		
ər	areas that riv	ver bed is 15°	0.50km ² or mo	re	structure	e cate			
rive	or more in wa	atershed	0.15km ² - 0.50	km²		10m or mo			
/ of	area		less than 0.15	km ²		River	5m - 10m		
ert			40°or more		width	າ 3m - 5m			
rop	steepest slop	be of river bed	30° - 40°				less than 3		
а.			less than 30°		1		less than 1		
	area that slope	aradiant is 20°	0.20km ² or mo	re			No bridge		
	or more in wat	ershed area	0.08km ² - 0.20	km²	Beam	1m - 2m			
			less than 0.08	km ²	height	2m - 3m			
pe	area that mead	dow and shrub	0.20km ² or mo	re		3m - 5m			
slo	(less than 10m	n height)	0.02km ² - 20kr	n²		5m or mor			
/ of	occupy in wate	ershed area	less than 0.02	۲ ²					
erty	artificial works	that cause	certain			[Potenc	ial disaster		
rop	negative effect	ts	none		1	Damage	e of bridge/g		
д.	new crack an	nd/or slope	certain			Damag	e el bliage/		
	failure in stre	am	none		1	Outflow	of embank		
	traces of larg	e slope	certain			Oution	oromound		
	failure in stre	am	none		1	Debris f	flooding on t		
10							6		
Cour	ntermeasure								
Тур	pe of counterme	easure Che	ск [На	azard]					

et (debris flow)

	Coordinates	La	titu	Ide		N 33°49.427'							
		Lo	ngi	ituc	le		Ε	73	°20).16	64'		
	Road Name	lame N		5		Km							

egory of score Check re 1 ßm lm or 1 / box culvert

[Potencial disaster mode]	Checl
Damage of bridge/culvert	>
Outflow of embankment	
Debris flooding on the road	

[Hazard]		
	A: the possibility of debris flow is high	
Hazard rank:	B: the possibility of debris flow is moderate	
	C: the possibility of debris flow is low/none	v

Date	7-	Dec-17
Inspector	Mako	to Tokuc
[History]		
category of sco	re	Check
There is a history about deb were obstacles to the road t construction of recent meas	oris flow that raffic after ures.	
There is a history about though there is no obstact traffic.	debris flow cle to	
There is no history of del	oris flow	1

	[Expected size of disaster] (width, length, depth, etc.)
Debris flow is not expected	Debris flow is not expected

[Description/comments]

The collapse of the retaining wall was observed at the north side (undercut slope) of the bank near the box culvert. It maybe caused by the poor water drainage which of the back of the retaining wall. However, the box culvert under the road were clear from deposits and has a enough capacity to to drain the debris to the valley side. River training works have been carried out and the catchment area is full of vegetation

Type of counterm	Check			
Gabion works, Reta	ining wall			
	none·lov	N		
Effect of existing	moderat	e 🗸		
countermesure	high			
	enough			



Code no.	Ν	7	5	_	1	_	2					
Region Office	Muzzafarabad											
Maintenance Unit	Murree											

Photo sheet

Coordinatos		Lati	tude		N 33°49.427'							
Coordinates	Longitude				E 73°20.164'							
Road Name	N 7 5				Km							

Date	7-Dec-17
Inspector	Makoto Tokuda



Mountain side: Boulders and deposits are mostly observed on mountain side. Gabion are constructed to minimize the gradient of river bed.



Valley side: Retaining wall and gabions are constructed at the both side of the bank on the exit of the box culvert.

Road condition: No anomalies was observed on the road

		Photo
Existing countermeasures / anomalies: The box culvert are clear from any debris.	Existing countermeasures / anomalies: Damage on the retaining wall on the north side (undercut slope) on the mountain side.	Existing countermeasures / anomalies:

Γ	Cod	e no. N 7 5 _ 2		Eva	aluation	shee	et (S	lope	failure/Ro	ockfal	I)		Date	3-Dec-	·17
	Regior	n Office Muzzafarabad				Lati	tude	N 3	3°50' 38.53"		-		Inspector	Makoto To	okuda
Ν	ainten	ance Unit Murree			Coordinate	s Long	jitude	E	73°22' 6.91"				L		
			1		Road name	e N 7	5	Km 3	0 + 1 0 0						
[C	auses]					-								
	ltem	factor	category of score C	Check					[Countermeas	ure]					
yho	ed _	talus slope,	3 or more correspondences								Туре с	of cou	ntermeasures		
ogra	llaps acto	clear convex break of slope, eroded toe of slope.	2 correspondences		[Disas	ter type			Gabion Work M	icro Pile C	hannel Wor	k Rot	aining wall		
topo	CO CO	overhang, water catchment slope	no correspondence	Ň.	Roc	k fall				icio i lie, c		K, IVEL	annig wan		
			marked		01.00	6-11				Effective	eness of exi	isting	countermeasures		Check
	Soil	susceptible to erosion less strength with water	a little marked	\checkmark	Siope	failure	~		Potential slope	failure are p	prevented er	nough	n, or, it is defended	enough when it is	
su			None		[Main	check o	bject]		generated.						
onditio	Rock	high density of cracks and a weak layers, susceptible to erosion,	marked a little marked		Cut	slope	✓		Potential slope f when it is genera	ailure are c ated.	onsiderably	preve	ented, or it is consid	derably defended	
jical c	_	fast weathering	None	\checkmark	Natura	al slope			Potential slope f generated. How	ailure are p ever, it is no	artly preven	nted, o or the	r it is partly defend remaining factors.	ed when it is	1
eolog	nre	dip slope of bedding plane	None	\checkmark					There is no cour	ntermeasure	e, or there is	s not e	effective even if co	untermeasures	
G	ructi	debris on impermeability bedrock,	marked						are not performe	ed.					
	Ś	the upper part is a hard /the toe of slope is weak	a little marked		II linka m d										
-			instability	~	[HIStory]		level	of disast	er history		Check	1	Expected size of di	sasterj(width, length,	depth, etc.)
		Topsoil, detached rock and unsteady rock	a little unstable	\checkmark	There is a his	torv abou	ut large	fallen roc	ks and slope fail	ures that we	ere				
uo			stability		obstacles to t	he road t	raffic at	ter constr	uction of recent	neasures.					
oditi			notable spring waster		There is a his	tory abou	ut large	fallen roo	cks and slope fai	ures that g	ets 🖌				
ice c		Spring water	seepage		to the road the	ough the	re is no	obstacle	to traffic.				70m(w)*100m(h)	*2m(d)=14,000m3	
surfa			none	$\overline{\mathbf{v}}$	There is a his	tory abou road	ut smal	I fallen ro	cks and slope fai	lures that d	id				
0,		Surface condition	intermediate (bare-grass-tree)	`		rouu.									
			mainly structure, mainly tree		No disaster re	ecords									
			H≧50m								[Descrip	tion]			
			ਸੂ 30≦H<50m	\checkmark	[Hazard]						The 60n	n road	d on the valley s	ide was collapse	ed in 2016
le			ືຼ 15≦H<30m			A: the r	ossib	ilitv of c	ollapse/fall		damagin	ng the	e houses on the	valley.The count	termeasure
Prof		Height (H), dip (i)	H<15m		i	is high		.,			Retainin	anio Ia wai	II) is beina under	taken after the d	, disaster
			Ω 45°≤i∠70°		-						though t	the ef	fect is yet unkno	wn.	
			i<45°	$\overline{}$	Hazard	B: the p	ossib	ility of c	ollapse/fall	~	The cou	Intern	neasures constru	icted present de	ficiencies
	Surfa	ce collapse, small fallen rock-outly erosion	2 or more correspondences clarity	\checkmark	rank	is mode	erate				and the	emba nce	arikment may col	iapse again pro	aucing road
Anomaly	piping fallen	hole, subsidence, heaving, bending of tree root, tree, crack, open crack, anomaly of	certain•unclarity none			C: the p is low/r	oossib Ione	ility of c	ollapse/fall		Sabarder	100.			
A	counte	ermeasure			İ	is low/r	one								



Code no.	N 7 5 _ 2											
Region Office	Muzzafarabad											
Maintenance Unit			Murree									

Photo sheet

Coordinator	Latitude				N 33°50' 38.53"							
Coordinates	Longitude				E 73°22' 6.91"							
Road Name	ne N 7 5		Km	3	0	+	1	0	0			



Valley side: Valley side are covered mostly by the debris and small rocks

Date 3-Dec-17 Inspector Makoto Tokuda



Road condition: Road has been repaired after the slope failure occurred in 2016.



Mountain side: No anamolies has been observed in the

mountain side.



Existing countermeasures / anomalies: Surface erosion protection net are installed to minimize the surface erosion.

Existing countermeasures / anomalies: Micro piles are installed at the foundation of the lowest retaining wall (ongoing construction).

Existing countermeasures / anomalies: Retaining walls are constructed at the valley side of the road (ongoing construction).

Code	no.	N 7 5 _ 3		
Regio	on Office	Muzzat	farabad	
Maint	tenance Unit	Mu	rree	
Caus	sesl			
tem	fa	ctor	category	Check
er	areas that riv	ver bed is 15°	0.50km ² or more	1
rive	or more in wa	atershed	0.15km ² - 0.50km ²	2
/ of	area		less than 0.15km ²	
ert)			40°or more	
rop	steepest slop	e of river bed	30° - 40°	
Ъ			less than 30°	
	area that along	aradiant in 20°	0.20km ² or more	
	or more in wat	ershed area	0.08km ² - 0.20km ²	· 🗸
			less than 0.08km ²	
эс	area that mead	dow and shrub	0.20km ² or more	
sloj	(less than 10m	height)	0.02km ² - 20km ²	1
, of	occupy in wate	ershed area	less than 0.02km ²	
erty	artificial works	that cause	certain	
rop	negative effect	S	none	✓
٩	new crack ar	d/or slope	certain	
	failure in stre	am	none	✓
	traces of larg	e slope	certain	1
	failure in stre	am	none	

valuation sheet (debris flow)

Coordinates	La	titu	de		N 33°53' 29.05"							
Coordinates		Longitude			E 73°23' 59.28"							
Road Name	Ν	7	5		Km	4	4					

[Road structure] category of score Check structure 10m or more < River 5m - 10m width 3m - 5m less than 3m less than 1m or No bridge / box culvert Beam 1m - 2m ✓ height 2m - 3m 3m - 5m 5m or more

[Potencial disaster mode]	Chec
Damage of bridge/culvert	>
Outflow of embankment	
Debris flooding on the road	

[Hazard] A: the possibility of debris flow is high B: the possibility of debris flow is moderate Hazard rank: C: the possibility of debris flow is low/none V

	Date	3-Dec-17				
	Inspector	Mako	Makoto Tokuda			
[Histo	ry]			1		
	category of sco	re	Check			
There i were o constru	is a history about deb bstacles to the road t uction of recent meas	oris flow that traffic after sures.				
There thougl traffic.	is a history about h there is no obstac	debris flow cle to				
There	is no history of del	bris flow	~			
[Expec 100(L]	ted size of disaster] (width, leng n ³	sth, depth	, etc.)		

[Description/comments]

· Continuous water flow along the stream · Several slope failure are confirmed at the east side of the stream. • No new trace of the slopes Given the gentle slope and the layout of the bridge debris flow disaster is not expected.

[Countermeasure]

Type of counterm	Check				
No	None				
	none·lov	N 🗸			
Effect of existing	moderat	е			
countermesure	high				
	enough				



Code no.	Ν	7	5	_	3				
Region Office			Ν	luzz	afa	aba	d		
Maintenance Unit		Murree							

neet

Coordinatos		Lati	tude				NS	33°53	8' 29.	05"		
Coordinates	l	_ong	itude	e		E 73°23' 59.28"						
Road Name	Ν	7	5		Km	4	4	0	0	0	0	

Date	3-Dec-17
nspector	Makoto Tokuda



Mountain side: Boulders (1~2m) are observed on the river bed on the mountain side.



Valley side: Deposits in the valley side. Erosion on the bank may occurs in future.

Road condition: Some cracks was observed at the joints of the bridge.



Existing countermeasures / anomalies: Dumping of the garbages around the bridge reduce the capacity to drain the debris to the valley side.





Existing countermeasures / anomalies: Several surface collapse can be observed on the west side of the slope on the mountain side.

Existing countermeasures / anomalies: Several surface collapse can be observed on the west side of the slope on the mountain side.

Code	no.	N 7 5 _ 4				
Regio	on Office	Muzza	farabad			
Main	tenance Unit	Mu	rree			
[Cau	ses]					
item	fac	ctor	category	Check		
of river	areas that riv or more in wa area	ver bed is 15° atershed	0.50km ² or more 0.15km ² - 0.50km ²			
Property	steepest slop	e of river bed	40°or more 30° - 40° less than 30°	1		
	area that slope or more in wat	e gradient is 30° ershed area	0.20km ² or more 0.08km ² - 0.20km ² less than 0.08km ²	<i>·</i>		
of slope	area that mead (less than 10m occupy in wate	dow and shrub height) ershed area	0.20km ² or more 0.02km ² - 20km ² less than 0.02km ²	· ·		
operty	artificial works negative effect	that cause s	certain none	✓		
P	new crack an failure in stre	d/or slope am	certain none	1		
	traces of larg	e slope am	certain	 ✓ 		

Check

1

none•low moderate

high

enough

[Hazard]

Hazard rank:

[Countermeasure]

Effect of existing

countermesure

Bridge

Type of countermeasure

Evaluation sheet (debris flow)

Coordinates	La	titu	de		N 33°54' 15.46"							
Coordinates	Longitude			E 73°24' 50.64"								
Road Name	Ν	7	5		Km	4	6	+	8	5	0	

[Road structure] structure category of score Check 10m or more < River 5m - 10m width 3m - 5m less than 3m less than 1m or No bridge / box culvert Beam 1m - 2m ✓ height 2m - 3m 3m - 5m 5m or more

[Potencial disaster mode]	Check
Damage of bridge/culvert	>
Outflow of embankment	
Debris flooding on the road	

A: the possibility of debris flow is high B: the possibility of debris flow is moderate

V

C: the possibility of debris flow is low/none

Date	3-	Dec-17					
Inspector	Mako	Makoto Tokuda					
[History]		Ohaala					
category of sco	ore	Спеск					
There is a history about del were obstacles to the road construction of recent meas	bris flow that traffic after sures.						
There is a history about though there is no obsta traffic.	debris flow cle to						

[Expected size of disaster] (width, length, depth, etc.)
100(L)*2(W)*1(d) = 200m ³

[Description/comments]

The slope gradient of the stream near the road is gentle and the condition of the vegetation in the catchment area is dense. Big scale debris flow is not expected.



Code no.	Ν	7	5	_	4				
Region Office	Muzzafarabad								
Maintenance Unit	Murree								

Coordinates	Latitude				N 33°54' 15.46"							
	Longitude				E 73°24' 50.64"							
Road Name	Ν	7	5		Km	4	6	+	8	5	0	





Mountain side: Stream is filled with boulders (~3m) on the mountain side.



Valley side: Stream is filled with boulders (~2m) on the

stream.

valley side. There is trace of erosion on the both side of the



Road condition: Small cracks was confirmed at the joint section of the road and bridge.



Existing countermeasures : The height underneath the bridge seems enough to clear the debris to the valley side.





Existing anomalies: Cracks was confirmed on the bank of the valley side. It may collapse in near future due to the erosion. Others: Another small stream is flowing into this stream. This area is used as a carwash pit for the local people.

	Cod	de no. N 7 5 _ 5		Eva	aluation	shee	et (S	lope	failu	re/Ro	ockfal	I)		Date	;	13-Apr-	18
F	Regior	on Office Muzzafarabad				Lati	tude	33	°53'23.9	94"N		-		Insp	ector	Wakit	а
М	aintena	nance Unit Murree			Coordinates	Long	itude	73	°23'59.6	6"E					<u> </u>		
			1		Road name	• N 7	5	Km 4	4								
[Ca	auses	es]			L												
l	tem	factor	category of score C	heck					[Counte	ermeasu	ire]						
phy	sed	talus slope,	3 or more correspondences	<u> </u>	Diece	tor tupo						Туре	of co	untermeas	ures		
ogra	ollap: factc	eroded toe of slope ,	1 correspondences		[DISAS	ter type			Retainin	g wall, ga	abion wall						
top	ů –	overhang, water catchment slope	no correspondence		Roc	k fall	~			0 /0							
	-	susceptible to erosion	marked		Slope failure						Effectiv	eness of ex	kisting	g counterme	easures		Check
6	Soi	less strength with water	a little marked None	<u> </u>	[Main o	check o	• biect1		Potential slope failure are prevented enough, or, it is defended enough when it is generated.								
ondition	Rock	high density of cracks and a weak layers, susceptible to erosion,	marked a little marked	✓	Cut	slope			Potential when it is	l slope fa s generat	ilure are c ted.	onsiderabl	y prev	vented, or it	t is consider	ably defended	
jical c	ш.	fast weathering	None It corresponds		Natura	al slope			Potential generate	l slope fa ed. Howe	ilure are p ver. it is n	artly preve ot enough f	nted, for the	or it is partl e remaining	ly defended i factors.	when it is	~
eolog	ure	dip slope of bedding plane	None	✓					There is	no count	ermeasur	e, or there	is not	effective e	ven if count	ermeasures	
G	structi	debris on impermeability bedrock,	marked						are not p	performed	d.						
	0)	weak.	None	✓	[History]									[Expected	size of disas	ster](width, length,	depth, etc.)
			instability				Level	of disast	er histor	у		Chec	k				
tion		Topsoil, detached rock and unsteady rock	a little unstable stability	✓	There is a history about large fallen rocks an obstacles to the road traffic after constructio					s and slope failures that were ction of recent measures.							
e condi		Spring water	notable spring waster seepage		There is a history about large fallen rocks and slope failures that gets to the road though there is no obstacle to traffic.								lure: m(d)=5,400m3	00m3			
rfac∈			none	 Image: A start of the start of	There is a history about small fallen rocks and slope failures that dic not get to the road.						lid		Rock fall	I max size=2	2m*1m*1m=2m	3	
Su		Surface condition	bare land with minor vegetation intermediate (bare · grass · tree)	~								-					
			mainly structure, mainly tree									(Decention		, L			
			H≦50m エ 30≦H<50m	<u> </u>	[Hazard]							[Descri	ption] de: rock fa	alls occur o	constantly bec	ause the
Profile		Height (H), dip (i)	Diamon provide the second s			A: the possibility of collapse/fall is high			/fall	✓	base rock is highly fract wall is damaged signific Valley side: the concret			ficantly and the retaining	d weathered. d doesn't avoi ng wall is tiltin	The gabio id rock fall g because	
			'ਚੇ <u>45°≦i<70°</u> i<45°	✓ ✓	Hazard I rank i	B: the p s mode	ossib erate	ility of c	ollapse	/fall		subside	nt is d ence i y and	is expected protected	ed on is be ed if the slo d from furtl	ope is not trea her erosion. S	way. Roa nted Superficial
Anomaly	Surfact piping fallen counte	ace collapse, small fallen rock, gully, erosion, ig hole, subsidence, heaving, bending of tree root, n tree, crack, open crack, anomaly of ntermeasure	2 or more correspondences clarity certain unclarity none	~	(C: the p s low/n	oossib one	ility of c	ollapse	/fall		slope fa	ailure	may also	occur.		



Code no.	Ν	7	5	_	5				
Region Office	Muzzafarabad								
Maintenance Unit	Murree								

Photo	sheet
-------	-------

	Coordinates		Lati	tude		33°53'23.94"N							
		Longitude				73°23'59.66"E							
	Road Name	Ν	7	5		Km	4	4					





Overall view of the slope. Rock falls are expected in the mountain side and slope failure in the valley side.



Rock falls of 2m3 have happened in the past reaching the road.

The base rock of the mountain side slope is highly fractured and some layers are highly weathered facilitating rock falls



The gabion wall is damaged in many spots due to past rock falls and is thought not to operate properly as a countermeasure



away.



The retaining wall in the valley side is being damaged because the soil on which it is constructed is being washed

Slope failures have collapsed and damaged gabion walls constructed in the valley side as retaining walls for the embankment

Code no.	Sat_	Ν	7	5	_	7	
Region Office							
Maintenance Unit							

[Main body of landslide]

	-
Mountain side	
Valley side	
Both	V

[Causes]

		Category	Check
		exist clearly	V
	Result of photo	exist but partial and not clear	
-	Interpretation	exist but not clear	
l opographical factor		large and new cracks, steps and subsidence	
Tactor	Surface anomalies	small and old cracks, steps and subsidence	
		slight deformation	V
		no anomalies	
		fault, fracture zone	
	Geological	dip slope	
	Structure	undip slope/ no characteristic feature	V
	Main rock	metamorphic rock (schist, quartzite, phyllite etc.)	
		sedimentary rock (sandstone, limestone etc.)	V
Geological	landslide body	igneous rock (granite etc.)	
conditions	ianaenae zeag	quaternary deposit (colluvial deposit etc.)	
		much springs / much seepage	
	Hydrological	little springs /little seepage	V
	feature	trace of water	
		no water observed	

[History]

		category	Check
	Existing record	obvious	V
(documents or patrimony) Landslide Damage on road facilities and houses	slight		
	patrimony)	none	
	Damage on	obvious	
	road facilities	slight	V
	none		

Evaluation sheet (landslide)

Coordinator		Lati	tude			330	° 53	3' 34	1.5"	
Coordinates		Long	gitude	Э		739	[,] 24	' 38	3.0"	
Road Name	Ν	7	5		Km					

Date	2017/12/1
Inspector	Yasir, Sajid, Shafiq, Basharat

[Countermeasure]

Category			Type of countermeasure
There is no countermeasure			
Effectiveness of countermeasure	No effect		Retaining walls to protect
	Some effect	٧	road
	High effect		

[Evaluation Rank]

Scale of Risk	Big	Medium	Small
Great risk	1	2	3
Medium risk	1	2	3
Low risk	2	3	4

Organization responsible for countermeasure works according to the scale of the disaster

-Medium: Major contractor in Pakistan

Influence on the traffice when potential disaster

-Big: Grant aid

-Small: Local contractor

-Great risk: road closed for 2 days or more -Medium risk: road closed for 1 day or less -Low risk: no road closure

[Expected size of disaster] (width, length, depth, etc.)

L= 1020 m, W= 650, D, 10-15 m

[Description]

The landslide N-75-7 along the Murree expressway, is an old landslide with around 3 km² area . Lithology of the site is characterized by claystone, siltstone and sandstone of the Miocene Murree Formation. The visible scarp of the landslide indicates this is an old landslide, and has been reactivated many time in the past, consequently, small landslides were also observed within the landslide. The upper part of the slide is stable, however, the toe of the landslide material is active with potential for future landslide. The right side of the slide is reactivated and can be considered as potential threat to the road in future. Although, the retaining walls is already built to protect the road. However, the displacement upto 4 cm has been observed also in the retaining wall.



Code no. Sat_ N 7 5 _ 7	Photo sheet	Date 2017/12/1
Region Office	Latitude 33° 53' 34.5"	Inspector Yasir, Sajid, Shafiq, Basharat
Maintenance Unit	Coordinates Longitude 73° 24' 38.0"	
	Road Name N _ 7 5 Km	
Mountain side view of landslide	Valley side view of landslide	Road condition: Road is built through the landslide
Existing countermeasures / anomalies: Retaining and gabion walls has been constructed to protect the road	Existing countermeasures / anomalies: Upto 4 cm cracks were observed in the retaining wall	Existing countermeasures / anomalies: Retaining wall has been constructed

tor /er bed is 15° itershed	category 0.50km ² or more 0.15km ² - 0.50km ²	Check	Coordinates Road Name	Latitud Longit N 7
tor /er bed is 15° /tershed	category 0.50km ² or more 0.15km ² - 0.50km ²	Check	Road Name	Longit
ctor /er bed is 15° atershed	category 0.50km ² or more 0.15km ² - 0.50km ²	Check	Road Name	N 7
ctor /er bed is 15° atershed	category 0.50km ² or more 0.15km ² - 0.50km ²	Check	[Road s	hen 1 c t
ctor /er bed is 15° atershed	category 0.50km ² or more 0.15km ² - 0.50km ²	Check	[Road s	here 1
ver bed is 15° atershed	0.50km ² or more 0.15km ² - 0.50km ²		[uucture
atershed	0.15km ² - 0.50km ²		structure	
	less than 0.15km ²	v	River	10m c 5m - 1
e of river bed	40°or more 30° - 40°		width	3m - 5 less th
	less than 30°	v		less th
e gradient is 30°	0.20 km ² or more	٧	Deem	No bri
ershed area	0.08km - 0.20km less than 0.08km ²		height	2m - 3
low and shrub	0.20 km ² or more			3m - 5
rshed area	less than 0.02km ²			
that cause	certain		[Potenc	ial disa
S	none	٧	Damage	of brid
d/or slope	certain	V	Dumage	
am	none	- 1	Outflow	of emb
e slope	none	V		
am	1		Debris f	looding
	am e slope am	am none e slope certain am none	am none eslope certain √ am none	am none Outflow e slope certain v am none Debris f

Evaluation sheet (debris flow)

Coordinatos	Latitude			33º 54' 15.9"							
Coordinates	Longitu		tuc	le		73	3 0 (24	' 5	1"	
Road Name	Ν	7	5		Km	9					

[Road structure] structure category of score Check River 10m or more √ Sm - 10m 3m - 5m 10m less than 3m 10m 10m Beam less than 1m or No bridge / box culvert 11m - 2m height 2m - 3m 3m - 5m 10m - 5m 5m or more √ 10m - 10m 10m

[Potencial disaster mode]	Checl
Damage of bridge/culvert	٧
Outflow of embankment	
Debris flooding on the road	

11	spector	Yasir, Sajid,	Shafiq, B	ashar
[History]				
	category of sco	re	Check	
There is a were obsta	history about deb acles to the road to on of recent meas	oris flow that traffic after sures.	٧	
There is a though th traffic.	a history about iere is no obsta	debris flow cle to		
There is	no history of del	bris flow		
Exporter	l size of disaster] (width lass	th donth	ota
LExpected			un, deptri	, etc.,

2017/12/2

L= 1000 m, W=30 m, D= 4 m

Type of counterm	Check	
d to protect the road.	Culvert ha	s also be
Effect of existing countermesure	none · lov moderat high enough	w e √

[Evaluation Rank]			
Scale of disaster Risk	Big	Medium	Small
Great risk	1	2	3
Medium risk	1	2	3
Low risk	2	3	4

Organization responsible for countermeasure works according to the scale of the disaster
-Big: Grant aid
-Medium: Major contractor in Pakistan
-Small: Local contractor
Influence on the traffice when potential disaster
-Great risk: road closed for 2 days or mor -Medium risk: road closed for 1 day or les

-Low risk: no road closure

[Description/comments]

Date

A seasonal stream crosses the Murree expressway at this location. Stream brings along huge volume of debris every year. During 2007, the debris flow damaged the road completely. Big catachment area with debris fall/rock fall material are present on the upstream. Small landslides were also observed along the stream which contribute in the debris volume and have potential to damage the road in future. Sandstone bed along the left side of the stream is dipping towards the channel. Various sandstone boulders of size more than 2 m³ have been observed. The bridge and culvert has been damaged in the past due to debris flow. The debris flow is a potential threat to the road and shall be mitigated on high priority.



Code no. Sat_ N 7 5 9	Photo sheet	Date 2017/12/2				
Region Office	Latitude 33° 54' 15.9"	Inspector Yasir, Sajid, Shafiq, Basharat				
Maintenance Unit	Longitude 73° 24' 51"					
	Road Name N _ 7 5 Km					
Mountain side view of the debris flow	Valley side view of the debris flow	Front view of the debris flow from the road				
		<image/>				
The crack on road has been observed	Road condition	Existing countermeasures / anomalies: Retaining wall has been constructed at the toe of the slope failure				
Code	e no. Sat_ N 7	7 5 _ 2 0	7	Eva	luatio	n sh
--------	------------------------------	--	------------------------------	--------	------------	---------
Regio	on Office				L	atitud
Main	tenance Unit			Coordi	nates	ongit
			_	Road I	Name	N 7 (
[Cau	ses]					
item	factor	categ	ory Chec	ck	[Road str	ucture
Ľ	areas that river bed is	15° 0.50km ² or n	nore		structure	
rive	or more in watershed	0.15km ² - 0.5	50km ²		1	10m o
∕ of	area	less than 0.1	5km² √		River 5	5m - 1
ert)		40°or more			width 3	3m - 5
rop	steepest slope of river b	oed 30° - 40°	٧		ŀ	ess th
Δ.		less than 30°	5		ŀ	ess th
	area that along gradient is	0.20km ² or n	nore		1	No bri
	or more in watershed area	$\frac{30^{\circ}}{0.08 \text{ km}^2} - 0.2$	20km ²		Beam 1	lm - 2
		less than 0.0	l8km² √		height 2	2m - 3
ЭС	area that meadow and shr	ub 0.20km ² or n	nore		3	3m - 5
sloj	(less than 10m height)	0.02km ² - 20	km²		5	5m or
of	occupy in watershed area	less than 0.0	2km² √			
erty	artificial works that cause	certain			[Potencia	l disas
rop	negative effects	none	V		Damage	of brid
ሲ	new crack and/or slope	certain	V		Damago	
	failure in stream	none			Outflow o	femb
	traces of large slope	certain	V		o union o	
	failure in stream	none			Debris flo	oding
[Cou	ntermeasure]			l		
Ту	pe of countermeasure	Check				
		[[Evaluation Rank]			
is mad	de for the outflow of debris	materia	Scale of disaster Risk	Big	Medium	Ş
			Great risk	1	2	

heet (debris flow)

	Coordinatos	La	titu	de		33º 55' 28.9"							
C	Coordinates	Lo	ngi	tuc	le	73º 27' 3.5"							
	Road Name	Ν	7	5		Km	2	0					

Check category of score r more ٧ 0m m nan 3m nan 1m or dge / box culvert ٧ m ßm m more

[Potencial disaster mode]	Chec
Damage of bridge/culvert	
Outflow of embankment	
Debris flooding on the road	٧

category of score There is a history about debris flow th were obstacles to the road traffic afte construction of recent measures. There is a history about debris flo	Chec	<
There is a history about debris flow th were obstacles to the road traffic afte construction of recent measures. There is a history about debris flo	nat	
There is a history about debris fl	۶r	
though there is no obstacle to traffic.	ow V	
There is no history of debris flow		

2017/12/3

Date

Type of counterm	easure	Check
as made for the outflo	ow of debris	s materia
Effect of existing countermesure	none · lov moderat high enough	v v e

[Evaluation Rank]			
Scale of disaster Risk	Big	Medium	Small
Great risk	1	2	3
Medium risk	1	2	3
Low risk	2	3	4

Organization responsible for countermeasure works according to the scale of the disaster -Big: Grant aid -Medium: Major contractor in Pakistan -Small: Local contractor Influence on the traffice when

potential disaster

-Great risk: road closed for 2 days or mor

-Medium risk: road closed for 1 day or les

-Low risk: no road closure

The site is marked by the presence of landslide and debris flow. Geology of the site is characterized by active fault and highly jointed claystone and sandstone. Due to erosion along two gullies debris material has been found in the river bed. Beside, debris flow, there is also a potential landslide. Large open crack on the top indicates its future potential failure. The debris flow and landslide are in dangering the stability of the road. Small retaining walls has been constructed to protect the road.On the upstream small

benching were made to minimize erosional affect.

[Description/comments]



Code no.	Sa	at_	Ν	7	5	_	2	0	
Road name	Ν	_	75						

ode no.	Sat	N	7 5	_	2	0						Photo	o sheet		[Date		2017/	12/3	
ad name	N -	- 75									Latitu	ıde	33	3°55' 28.9"		Inspector	Yasir,	Sajid, Sha	afiq, Basha	ırat
			1	-1	1 1					Coordinates	Longi	itude	7	3° 27' 3.5"						
					いまたから													AR.		
View of	debris	flow at	start po	pint						View of deb	oris flow	v towards v	valley side		Road co the road	ndition at lo	ocation a	nd the reta	aining wall	to protect
Future p		I lands	lide. Ve	getat	tion a	nd tr	rees of	bon the r	main	Water seep	pages				Construct	ction of small	all check	dam to co	ontrol debri	s flow
body of	landslic	de		-							-									

Code	no. Sat N 7	5 _ 2 8	
Regio	on Office		
Maint	enance Unit		
[Caus item	ses] factor	category	Check
	aroog that river had in 15°	0.50 km ² or more	Chicola
iver	or more in watershed	$0.00 \text{ km}^2 - 0.50 \text{ km}^2$	
of r	area	less than 0.15 km^2	V
лт.		40°or more	
ope	steepest slope of river bed	30° - 40°	v
Ч		less than 30°	
		0.20km ² or more	V
	area that slope gradient is 30°	0.08km ² - 0.20km ²	
	of more in watersneu area	less than 0.08km ²	
e	area that meadow and shrub	0.20km ² or more	
slop	(less than 10m height)	0.02km ² - 20km ²	
of	occupy in watershed area	less than 0.02km ²	v
erty	artificial works that cause	certain	
rop	negative effects	none	V
ā	new crack and/or slope	certain	
	failure in stream	none	V
	traces of large slope	certain	
	failure in stream	none	V

luation sheet (debris flow)

Coordinatos	La	titu	de		33º 59' 16.6"							
Coordinates	Longitude				73º 29' 2.7"							
Road Name	Ν	7	5		Km							

[Road structure] Check structure category of score 10m or more ٧ River 5m - 10m width 3m - 5m less than 3m less than 1m or No bridge / box culvert Beam 1m - 2m height 2m - 3m 3m - 5m 5m or more ٧

[Potencial disaster mode]	Check
Damage of bridge/culvert	V
Outflow of embankment	
Debris flooding on the road	

Type of counterm	easure	Cł	neck
low of the debris. Ret	aining wal	ls h	as be
Effect of existing	none · lov moderat	∾ e	V
countermesure	high		
	enough		

- - -

.

Risk Scale of	Big	Medium	Small
Great risk	1	2	3
Medium risk	1	2	3
Low risk	2	3	4

- ...

spector category of scc history about del	Yasir, Sajid,	Shafiq, B	asha		
category of scc history about del	pre	Check			
category of scc history about del	ore	Check			
category of scc history about del	ore	Check			
category of scc history about del	ore	Check			
category of sco	ore	Check			
history about del	oris flow that	CHECK			
history about del	oris flow that				
There is a history about debris flow that were obstacles to the road traffic after construction of recent measures.					
There is a history about debris flow though there is no obstacle to traffic.					
There is no history of debris flow					
	i history about ere is no obsta no history of de	history about debris flow ere is no obstacle to no history of debris flow	n history about debris flow ere is no obstacle to no history of debris flow √		

[Expected size of disaster] (width, length, depth, etc.)

L= 440 m , W=12 m, D= 2-3 m

[Description/comments]

The site is located on a seasonal stream, where road has very sharp bend. Sides of the upstream are bounded by alternative beds of sandstone and claystone. Some boulders in the stream are of size greater than 3 m³. The culvert has been constructed for the debris outflow. Vegetation is also present on both sides of the stream. As a countermeasure benching on upstream side was made which is partially damaged. Downstream side retaining walls are also present. No historic record of debris flow and blockage of road has been found.

-Low risk: no road closure

the scale of the disaster -Big: Grant aid

-Medium: Major contractor in Pakistan -Small: Local contractor

countermeasure works according to

Organization responsible for

Influence on the traffice when potential disaster

-Great risk: road closed for 2 days or mor

-Medium risk: road closed for 1 day or les



Code no.	Sat_	Ν	7	5	_	2	8	
Region Office								
Maintenance Unit								

		F	ho	oto	sł	nee	et						[
Coordinatos	Latitude				33º 59' 16.6"								
Coordinates	Longitude			73º 29' 2.7"									
Road Name	Ν	_	7	5	Km								•

Date	2017/12/4
Inspector	Yasir, Sajid, Shafiq, Basharat



Front view of the debris flow from the road

Valley side view of the debris flow

Road condition at the site







Rock bed dipping towards the channel

Culvrt has been constructed fo the outflow of debris flow

Existing countermeasures / anomalies: Benches has been made on the upstream which are been partially destroyed

	Cod	e no. Sat _ N 7 5 _ 3 3		Eva	aluation s	sheet	Slop	e failur	e/Rock	(fall)		Date	2017/1	2/5
F	Regior	n Office				Latitud	•	34º 7' 14	.9"			Inspector	Yasir, Sajid, Shafi	iq, Basharat
M	ainten	ance Unit			Coordinates	Longitud	le	73º 29' 35	5.4"					
					Road name	N 7 5	Km							
[Ca	auses	1			Rodd Hallio		- Carrie							
	tem	factor	category of score	Check				[Counter	rmeasure]					
hy	þ	talus slope,	3 or more correspondences	V						Туре	of counte	rmeasures		
grap	apse	clear convex break of slope,	2 correspondences		[Disaste	er type]	_							
òodc	Colla fa	eroded toe of slope , overhang, water catchment slope	1 correspondences		Rock	fall								
¥	-		no correspondence						F 4	factive and af a	isting oo.	untormo o o uro o		Chaok
	oil	susceptible to erosion	a little marked	V	Slope f	ailure 🔨	/	Detential					d analish whan it is	Check
	õ	less strength with water	None		[Main ch	neck obie		generated	d.	are prevented e	enough, o	r, it is defended	a enough when it is	
tions		high density of cracks and a weak layers	marked	V				Potential	slope failure	are considerably	v prevente	ed. or it is cons	iderably defended	
ipuc	tock	susceptible to erosion,	a little marked		Cut sl	ope		when it is	generated.			.,	, ,	\checkmark
al c	Ľ.	fast weathering	None		Natural	slope	-	Potential	slope failure	are partly preve	nted, or it	is partly defen	ded when it is	
ogic		dip slope of bedding plane	It corresponds.		Natural	Slope y		generated	d. However, i	it is not enough f	or the ren	naining factors		
Geol	ture		None	V				There is r	no counterme	easure, or there	is not effe	ctive even if co	ountermeasures	
Ŭ	itruc	debris on impermeability bedrock,	marked					are not pe	enormed.					
	S	weak.	a liftie marked	V	[History]						15	innected size of a	lisastor](width longth	donth atc.)
$\left \right $			instability	V	[i listory]	Lev	el of dis	aster history	/	Chec		xpected size of t	iisasterj(widti), ierigtii,	depin, etc.)
		Topsoil, detached rock and unsteady rock	a little unstable		There is a histo	rv about la	de fallen	rocks and slo	pe failures th	hat were				
uo			stability		obstacles to the	road traffi	c after co	nstruction of r	recent measu	ures. V				
oditi			notable spring waster		There is a histo	ry about la	rge faller	n rocks and slo	ope failures t	that gets				
ce c		Spring water	seepage	V	to the road though there is no obstacle to traffic.						L= 300	m, W= 220 m, D 5-	-6 m	
urfa			none		There is a histo	ry about s	nall falle	n rocks and sl	ope failures	that did				
S		Surface condition	bare land with minor vagetation		not get to the ro	ad.					_			
		Surface condition	mainly structure mainly tree	V	No disaster rec	ords								
			H≧50m	V	Evaluation Rar	nk]				[Descrii	L Dition1			
			ਸੂ 30≦H<50m		Sca	le of	2:	Madhara	0	Landslide	was initiall	ly triggered durin	g 1992 flood. In March	2012,
e					Risk	ster	Big	Medium	Small	landslide	was reactiv v destrover	ated during the l d 200 meter roac	neavy rainfall. The land	dslide fic along this
rofil		Height (H), dip (i)	H<15m		Great risk	(1	2	3	road was	disrupted n	nore than one we	eek during March 2012	2. This section
ι.			i≧70°		Great hok		<u> </u>	2		is cut slop There are	e consistin large num	g of sandstone a ber of open crac	nd shale . The slide is ks and hanging boulde	s still active. ers As a
			ੇਊ 45°≦i<70°		Medium risk		1	2	3	counterm	easure NH	A has constructe	d the shed to protect t	he road from
$\left \right $			$1 < 45^{\circ}$	V						debris ma	terial.			
aly	Surfac	ce collapse, small fallen rock, gully, erosion,	certain•unclarity	V	Low risk		2	3	4					
mor	fallen	tree, crack, open crack, anomaly of	none		Organization re	sponsible f	or counte	rmeasure wo	l 	L Influence or	the traffi	ce when		
Ā	counte	ermeasure			according to the	e scale of t	ne disaste	er		potential dis	aster			
				·	-Big: Grant aid					-Great risk:	road close	ed for 2 days o	r more	
					-Medium: Major	contractor	in Pakis	stan -Medium risk: road closed for 1 day or less						
					-Small: Local co	ontractor				-Low risk: n	o road clo	sure		



Co	ode no.	Sa	at_	Ν	7	5	_	3	3	
Ro	oad name	Ν	7	5					Km	

de no. Sat_ N 7 5 _ 3 3	Photo sheet	Date 2017/12/5	
ad name N 7 5 Km	Latitude 34° 7' 14.9"	Inspector Yasir, Sajid, Shafiq, Bashar	at
	Longitude 73° 29' 35.4"		
Full view of the landslide	View of landslide on Valley side:	Road condition:Cut slope at the start point	
View of the slope failure at the middle point	Existing countermeasures / anomalies: View of shed as counter measure	View of fallen blocks on Shed	

Photo sheet

Region Office Inspector Yasir, Sajd, Shafique Maintenance Unit Coordinates Latitude 34° 52' 59.2" Inspector Yasir, Sajd, Shafique Causes Image to provide the origination of the stability of countermeasures Countermeasures Inspector Yasir, Sajd, Shafique Causes Image to provide the origination of the stability of countermeasures Countermeasures Inspector Yasir, Sajd, Shafique Coordinates Latitude 34° 52' 59.2" Inspector Yasir, Sajd, Shafique Countermeasures Countermeasures V V V V Countermeasures Countermeasures Inspector Yasir, Sajd, Shafique Visite of the origination of the streng ondences V V V V Susceptible to erosion a little marked V V V None Main check object of stability of cracks and a weak layers, susceptible to erosion, fast weathering None V Natural stope Effectiveness of existing countermeasures Potential stope failure are party prevented, or it is considerably defended when it is generated. Imarked V None None None None None Non	, Bashara		
Coordinates Coordinates <td>≻heck</td>	≻heck		
Causes Road name Km Image: tabus slope, clear convex break of slope, eroded tee oroded tee of slope, eroded tee oroded tee oroded	>heck		
Causes Term factor category of score Check item factor category of score Check Type of countermeasures issueptible to erosion 2 correspondences in correspondence Box Culvert for drainage issueptible to erosion a little marked V None Detnial slope failure are prevented enough, or, it is defended enough when it is generated. issueptible to erosion, assteringh with water a little marked V None None issueptible to erosion, assteringh with water a little marked V None None issueptible to erosion, assteringh with water a little marked V None None issueptible to erosion, assteringh with water a little marked V None None issueptible to erosion, assteringh with water narked V None None issueptible to erosion, assteringh with water narked V None None issueptible to erosion, asstering with water narked V None None issueptible to erosion, asstering with water narked V None None None ist	>heck		
Item factor category of score Check All parts stope. Jalues stope. 3 or more correspondences V Correspondences V 2 correspondences M rocorrespondences M Rock fall V rocorrespondences M Rock fall V susceptible to erosion marked V no marked V susceptible to erosion, marked V susceptible to erosion, marked V at weathering marked V None None None dip slope of bedding plane// Joint Playes It correspondences V None marked V a little marked None None dip slope of bedding plane// Joint Playes It correspondences V None natked V None natked V a little marked V None None All the usper part is a hard /the toe of slope is stability natked None natkabli y V Level of disaster history </td <td>∑heck</td>	∑heck		
Indust slope, performed performed be of slope, overhang, water catchment slope 3 or more correspondences V 1 2 correspondences 1 0 Disaster type Box Culvert for drainage 1 1 1 0 1 1 0 Sore performed cos 1 1 1 0 1 0 1 0 1 0 1 0 1 0 <td>∑heck</td>	∑heck		
Image: Signed clear convex break of slope, overhang, water catchment slope 1 correspondences no no Rock fall No Image: Signed clear convex break of slope, overhang, water catchment slope no marked no	∑heck		
Image: Spectral state Contregonations Contregonatins Contregonations	Check 		
Image: subscriptible to erosion less strength with water marked a little marked v None None Imarked v None Imarked a little marked v None Imarked v Imarked v Imarked a little marked v None Imarked v Imarked v Imarked a little marked v None Imarked v V Imarked association of associa meassociacia aspeciation of association of asso	Check 		
Subscription is definition of all the marked V None None None None None None debris on impermeability bedrock, the upper part is a hard /the toe of slope is marked V None natked V None None None None Imarked None None None None Ittle marked None None None None None None Imarked None None<	 √		
None Mone	√		
inigh density of cracks and a weak layers, susceptible to erosion, fast weathering Initiated V is susceptible to erosion, fast weathering a little marked None ib gh density of cracks and a weak layers, susceptible to erosion, fast weathering in little marked None ib gh dops of bedding plane/Joint Planes it corresponds. V ib gh dops of bedding plane/Joint Planes it corresponds. V instability marked V instability a little marked Inter is no countermeasure, or there is not effective even if countermeasures are not performed. instability a little unstable instability V instability instability v instability instability v instability instability v inter is a history about large fallen rocks and slope failures that were obstacle to traffic. v inter is a history about large fallen rocks and slope failures that gets to the road though there is no obstacle to traffic. L = 360 m, W = 315 m, D = 1-2 inter is a history about the road though there is no obstacle to traffic. inter is a history about small fallen rocks and slope failures that did	v		
a a	V		
Image: Solution of the solution	v		
None There is no countermeasure, or there is not effective even if countermeasures are not performed. None Item arked V Item arked V Item arked V None Item arked V Item arked V Item arked V Item arked V None Item arked V Ite			
g debris on impermeability bedrock, the upper part is a hard /the toe of slope is weak. marked V Ittle upper part is a hard /the toe of slope is weak. a little marked Ittle marked Itt			
Ite upper parties a nate manage Initial manage <td></td>			
Instability V	oth, etc.)		
Topsoil, detached rock and unsteady rock a little unstable There is a history about large fallen rocks and slope failures that were obstacles to the road traffic after construction of recent measures. \scale is a history about large fallen rocks and slope failures that gets to the road though there is no obstacle to traffic. \scale is a history about large fallen rocks and slope failures that gets to the road though there is no obstacle to traffic. \scale is a history about small fallen rocks and slope failures that did not act at to the road though there is no obstacle to traffic. L = 360 m, W = 315 m, D = 1-2			
Stability obstacles to the road traffic after construction of recent measures. Notable spring waster notable spring waster Spring water seepage none V There is a history about large fallen rocks and slope failures that gets to the road though there is no obstacle to traffic. There is a history about small fallen rocks and slope failures that did Description V There is a history about small fallen rocks and slope failures that did Description V There is a history about small fallen rocks and slope failures that did Description Description			
Spring water Initiable spring water I here is a history about large failen rocks and slope failures that gets to the road though there is no obstacle to traffic. L= 360 m, W= 315 m, D= 1-2 There is a history about small fallen rocks and slope failures that did Dest act to the road Dest act to the road			
none $$ There is a history about small fallen rocks and slope failures that did	L= 360 m, W= 315 m, D= 1-2 m		
5 been been to the strategiest of the proof of the proof			
δ bare land with minor vagetation $\sqrt{1000}$ field get to the road.			
Surface condition intermediate (bare · grass · tree) No disaster records			
mainly structure, mainly tree			
$\frac{1}{\xi} 30 \le H < 50 \text{ m}$	ctive		
	ent along		
Height (H), dip (i) H<15m Great risk 1 2 3	observed.		
$i \ge 70^{\circ}$ $l \ge i \ge 70^{\circ}$ l = transformed the slide. Loose debris is present of the slide. Loose deb	1 the slide. Io		
$\frac{1}{2} = \frac{45^{\circ} \ge 1 < 70^{\circ}}{1 < 45^{\circ}} \qquad \text{Medium risk} \qquad 1 \qquad 2 \qquad 3 \qquad \text{mitigation measures are present.}$			
Surface collapse, small fallen rock, gully, erosion, certain•unclarity biping hele, subsidence, heaving, bending of tree root, certain•unclarity Low risk 2 3 4			
Image: Construction of constructine on construction of construction of construc			
-Big: Grant aid -Great risk: road closed for 2 days or more			
-Medium: Major contractor in Pakistan -Medium risk: road closed for 1 day or less			
-Small: Local contractor -Low risk: no road closure			



Code no.	Sat_	Ν	9	0	_	1	
Region Office							
Maintenance Unit							

	F	Photo sheet								
Coordinates	Latitude		34º 52' 59.2"							
Coordinates	Longitud	72 ^o 45' 50.17"								
						14				

Date	31/03/2018
Inspector	Yasir, Sajid, Shafique, Basharat



	Cod	le no. Sat_ N 9 0 _ 2		Eva	aluation she	et (Slo	ope	failure	e/Rock	fall)			Date	2018/2	1/4
F	Regio	n Office			Coordinates	atitude	340	⁹ 54' 38.	.3"				Inspector	Yasir, Sajid, Shafic	que, Basharat
M	ainten	ance Unit			Lo	ngitude	72 ^c	[,] 49' 20.	.7"						
[C	auses	5]			Road name		\m								
	tem	factor	category of score Ch	neck				[Countern	measure]						
hy	ed	talus slope,	3 or more correspondences	V	-						Туре	of count	termeasures		
opogral	Collaps factor	clear convex break of slope, eroded toe of slope , overhang, water catchment slope	2 correspondences 1 correspondences		[Disaster typ Rock fall	e]			CI	heck da	ms along	g gulleys	s. Retaining wall	for N-90	
4			no correspondence	V					Fff	fectivene	ess of ex	istina ca	ountermeasures		Check
	Soil	susceptible to erosion	a little marked	•	Slope failur	e √		Potential s	slope failure	are pre	vented e	nough.	or, it is defende	d enough when it is	Oncok
s	None				[Main check	generated.									
onditior	Rock	high density of cracks and a weak layers, susceptible to erosion,	marked value of a little marked	V	Cut slope	\checkmark		Potential sl when it is g	lope failure generated.	are cons	siderably	preven	nted, or it is cons	iderably defended	
gical c	<u> </u>	fast weathering	None It corresponds.		Natural slop	е		Potential sl generated.	lope failure : . However, i	are part it is not e	ly prever enough fo	nted, or or the re	it is partly defen emaining factors	ded when it is	v
eolo	ure	dip slope of bedding plane / Joint Planes	None	V				There is no	o counterme	easure, c	or there is	s not eff	fective even if co	ountermeasures	
G	truct	debris on impermeability bedrock,	marked	V				are not per	rformed.						
	õ	the upper part is a hard /the tee of slope is	a little marked		II Kata a J									1	
_			instability	V	[HISTORY]	l evel of	disaste	er history			Check	1 r	Expected size of (disasterj(width, length,	depth, etc.)
		Topsoil, detached rock and unsteady rock	a little unstable	· · · · · ·	There is a history ab	out large fa	allen roc	ks and slop	oe failures th	nat were	1				
u			stability		obstacles to the road	traffic afte	r constr	uction of re	ecent measu	ures.	N				
oditi			notable spring water	V	There is a history ab	out large fa	allen roo	ks and slo	pe failures t	hat gets					
ice c		Spring water	seepage		to the road though th	ere is no ol	bstacle	to traffic.					L= 300	m, W= 310 m, D= 2	2-3 m
surfa			none	1	There is a history ab	out small fa	allen roo	cks and slo	pe failures t	that did					
0)		Surface condition	intermediate (bare-grass-tree)	v								-			
			mainly structure, mainly tree		No disaster records										
			H≧50m	V	[Evaluation Rank]]	Descrip	tion]			
Ð			4 9 9 15≦H<30m		Scale of disaster Risk	Big	Ν	Nedium	Small	A n v	A rotation la nainly active vater gullies	ndslide is e along th s. The che	mainly triggered duri e road. Active soil er eck dams are develop	ng the road construction. osion is present leading t bed along the gullies to m	The slide is o development of inimize the
Profil		Height (H), dip (i)	H<15m i≧70°		Great risk	1		2	3	e ti E	erosion. Har raffic mainly Bedrock is ii	nging debi y during th mpermeat	ris is also present on ne rainfall. Detached ble. Shrubs and gras	the slide. The slide is ob and hanging boulders are s is present on the slide.	structing the also present. Talus is present
	; ਉ i<45° i<45°				Medium risk	1		2	3	s	nainiy with t ilide.	the road.	Spring water is prese	nt. No counter measures	to protect the
naly	Surfa piping	ce collapse, small fallen rock, gully, erosi <mark>o</mark> n, hele, subsidence, heaving, bending of tr ee root,	Low risk	2		3	4	- L							
Anor	fallen count	tree, crack, open crack, anomaly of ermeasure		Organization responsible for countermeasure works according to the scale of the disaster					Influence on the traffice when potential disaster						
L			• •		-Big: Grant aid					-Great risk: road closed for 2 days or more					
					-Medium: Major contractor in Pakistan					-Medium risk: road closed for 1 day or less					
					-Small: Local contra	ctor				-Lov	v risk: nc	o road c	losure		



Code no.	Sat_	Ν	9	0	_	2	
Region Office							
Maintenance Unit							

Photo sheet											
Coordinates	Latitude	Latitude 34 ^o 54' 38.3"									
Coordinates	Longitud	ongitude 72° 49' 20.7									
Road name						Km					

Date	2018/1/4
Inspector	Yasir, Sajid, Shafique, Basharat



	Cod	e no. Sat_ N 9 0 _ 3]	Ev	aluation s	heet ((Slop	be failure	e/Rock	fall)		Date	2018/2	2/4
F	Regio	n Office				Latitude	Э	34º 55' 25	.6"			Inspector	Yasir, Sajid, Shafic	jue, Basharat
M	ainten	ance Unit			Coordinates	Longitud	le	72 ^o 50' 10	.4"					
			1		Road name		Km							
١C	auses	1			i toda hamo									
	tem	factor	category of score	Check				[Counter	measure]					
hy	þe	talus slope,	3 or more correspondences	V						Т	ype of cou	ntermeasures		
grap	lapse	clear convex break of slope, eroded too of slope, overhand, water	2 correspondences		[Disaste	r type]			Nia animtan				a dua in the state in a sec	
topc	Col fe	catchment slope	no correspondence		Rock	fall 🔨	/		No counter	measures. r	ketaining w	aii 101 11-90. DOX (cuivent for drainage	
			marked			•	1		Ef	fectiveness	of existing of	countermeasures		Check
	Soil	susceptible to erosion less strength with water	a little marked	V	Slope fa	allure 1	/	Potential slope failure are prevented enough, or, it is defended enough					d enough when it is	
su			None		[Main ch	eck obje	ct]	generated	generated.					
iditio	ъ	high density of cracks and a weak layers,	marked	V	Cut slo	ope 🔿	/	Potential s	slope failure	are conside	rably preve	ented, or it is cons	iderably defended	
l con	Ro	fast weathering	a little marked				_	Potential a		are partly p	evented o	r it is partly defen	ded when it is	
gica			It corresponds.	V	Natural	slope		generated	I. However, i	it is not enou	igh for the	remaining factors		
eolo	ar	dip slope of bedding plane / Joint Planes	None			<u> </u>		There is n	o counterme	easure, or th	ere is not e	offective even if co	ountermeasures	N
G	ructi	debris on impermeability bedrock,	marked	٧				are not pe	rformed.					v
	St	the upper part is a hard /the toe of slope is	a little marked		II Katawa J								1	
			instability	V	[History]	Lev	el of di	saster history		C	heck	Expected size of a	disasterj(width, length,	deptn, etc.)
	Topsoil, detached rock and unsteady rock		a little unstable	·····	There is a histor	v about la	rae faller	n rocks and slo	pe failures t	nat were				
uo			stability		obstacles to the	road traffi	c after co	onstruction of re	ecent measu	ures.	ν			
coditi			notable spring water	V	There is a histor	y about la	rge falle	n rocks and slo	ope failures t	that gets				
ice c		Spring water	seepage		to the road thou	gh there is	no obst	acle to traffic.				L= 500	m, W= 550 m, D= 0)-1 m
Surfa			none	N	There is a histor	y about isi ad.	mall falle	en rocks and slo	ope failures	that did				
0,		Surface condition	intermediate (bare grass tree)	v										
			mainly structure, mainly tree		No disaster reco	ords								
			H≧50m	V	[Evaluation Ran	k]				[De	scription]			
			10 30≦H<50m		Scal	e of ster l	Big	Medium	Small	This is to cor	s a cut slope lo struction of th	ocated on the N90. The e road. With the Schis	e landslides is a slope fail and granite as a bed roc	ure triggered due k of the slide,
ofile		Height (H) din (i)	≃ 15≧H<30M H<15m		Risk					part o soil ei	f the slide is al rosion mainly o	lso prone to rock fall w during the rain, is prese	ith detached and hanging ent on the slide leading to	boulders. Active presence of
Pro			i≧70°		Great risk		1	2	3	talus the sli	is present alon ide. No effectiv	ng the road and gullies ve counter measures a	on the slide. Spring wate re present. A culvert is bu	er is present in uilt to drain out
			<u>ਉ</u> 45°≦i<70°		Modium rick		1	2	\bigcirc	the ch	annel water. A	A retaining wall is built	to protect the landslide.	
			i<45°	V	Wedium fisk		I	2	ँ					
ily	Surfa	ce collapse, small fallen rock, gully, erosi <mark>o</mark> n,	2 or more correspondences clarity	V	Low risk		2	3	4					
oma	piping fallen	-hole, subsidence, heaving, bending of the root, tree_crack, open crack, anomaly of	certain•unclarity				or oo		deo.	lafluona	o on the tr	office when		
Countermedisure Countermedisure						Organization responsible for countermeasure works according to the scale of the disaster					Influence on the traffice when potential disaster			
L					Big: Grant aid				-Great risk: road closed for 2 days or more					
					-Medium: Major contractor in Pakistan				-Medium risk: road closed for 1 day or less					
					-Small: Local co	ntractor				-Low ris	sk: no road	closure		



Code no.	Sat_	Ν	9	0	_	3	
Region Office							
Maintenance Unit							

Photo sheet											
Coordinates	Latitude	Latitude 34 ^o 55' 25.6"									
Coordinates	Longitud	de			72	2° 50'	10.	4"			
Road name						Km					

Date	2018/2/4
Inspector	Yasir, Sajid, Shafique, Basharat





Road condition:Cut slope at the start point

Full view of the landslide

View of landslide on Valley side:





View of the slope failure at the middle point

Existing countermeasures / anomalies: View of Retaining Wall as counter measure

View of drainage that cuts the slope

	Coc	le no. Sat_ N 9 0 _ 4		Ev	aluation s	heet (S	Slope	failure	e/Rock	(fall)		Date	2018/3	3/4	
F	legio	n Office				Latitude	34	° 55' 11.	.3"	-		Inspector	Yasir, Sajid, Shafio	que, Basharat	
М	ainten	ance Unit			Coordinates	Longitude	72	^o 49' 43	.8"						
			l		Road name		Km								
[C	auses	5]													
Ē	em	factor	category of score	Check				[Counterr	measure]						
ohy	r ed	talus slope,	3 or more correspondences	V						Тур	e of cou	Intermeasures			
ogral	llaps actoi	clear convex break of slope, eroded toe of slope, overhand, water	2 correspondences		[Disaster	type	1		No counter	measures Re	taining w	all for N-90 Box	culvert for drainage		
topo	°, ≞	catchment slope	no correspondence		Rock f	all				medoureo. ne	annig v			,	
	_	susseptible to erasion	marked	V	Slope fa	ilure 🗸			Ef	fectiveness of	existing	countermeasures	;	Check	
	Soi	less strength with water	a little marked		Pote			Potential s	slope failure	e are prevented	l enough	n, or, it is defende	d enough when it is	;	
suo			None	N	[Main check object] generated.							antad ar it is sone	iderebly defended		
nditi	ock	high density of cracks and a weak layers, susceptible to erosion,	a little marked	v	Cut slope $$ Potential slope failure a when it is generated.				are considera	ory preve	enteu, or it is cons	suerably detended			
al co	Ŕ	fast weathering	None		Notural			Potential s	lope failure	are partly prev	vented, c	or it is partly defen	ded when it is		
ogic		dip slope of bedding plane / Joint Planes	It corresponds.	V	induidi s	sope	ļ	generated.	. However,	it is not enougl	n for the	remaining factors	.		
Geol	ture		None					There is not	o counterm	easure, or ther	e is not e	effective even if c	ountermeasures	V	
	Struc	debris on impermeability bedrock, the upper part is a hard /the toe of slope is	a little marked	V				are not per	nonnea.						
	•,	weak.	None	· · · · ·	[History]						[Expected size of	disaster](width, length,	, depth, etc.)		
			instability	V		Level	of disas	ter history		Che	eck				
_		Topsoil, detached rock and unsteady rock	a little unstable		There is a history	/ about large	e fallen ro	cks and slop	be failures t	hat were	/				
dition			stability	N						that gota	_				
e coc		Spring water	seepage	· ·	to the road thoug	h there is n	o obstacle	e to traffic.	pe failures	linal gets		L= 500	m, W= 660 m, D= 1	1-2 m	
rface			none		There is a history	about sma	Ill fallen ro	ocks and slo	pe failures	that did					
Su			bare land with minor vagetation	V	not get to the roa	ıd.					_				
		Surface condition	intermediate (bare · grass · tree)		No disaster reco	rds									
			H≧50m	V	Evaluation Rank	<u>را</u>				[Desc					
			ਸ਼ੂ <u>30≦</u> H<50m		Scale	e of tor Bi		Medium	Small	This is	an old la	andslide which is	retriggered during t	he	
ile			ੋਭ 15≦H<30m		Risk)	wealum	Small	constr Loose	uction of debris o	road. Detached b n the bedrock are	poulder are present	on the slide. ctive soil	
Prof		Height (H), dip (i)	H<15m		Great risk	1		2	3	erosio	n on the	slide leads to the	development of gu	llies. Shrubs	
			!≦70° ఆ 45°≤i<70°	$\left - \right $		_				are pre	esent on It to prof	the slide with no ect the slide.	trees. No counter m	neasures are	
			i<45°	V	Medium risk	1		2	(3)						
naly	Surface collapse, small fallen rock, gully, erosion, 2 or more correspondences clarity V				Low risk	2		3	4						
[2] fallen tree, crack, open crack, anomaly of courtermeasure						Organization responsible for countermeasure works according to the scale of the disaster					Influence on the traffice when potential disaster				
			-	I	-Big: Grant aid					-Great risk: road closed for 2 days or more					
					-Medium: Major contractor in Pakistan					-Medium risk: road closed for 1 day or less					
					-Small: Local cor	ntractor				-Low risk:	no road	closure			



Code no.	Sat_	Ν	9	0	_	4	
Region Office							
Maintenance Unit							

Photo sheet										
Coordinates	Latitude 34 ^o 55' 11.3'									
Coordinates	Longitud	gitude 72° 49' 43.8"								
Road name						Km				

Date	2018/3/4
Inspector	Yasir, Sajid, Shafique,
nopootoi	Basharat



Code no.	Sat_	Ν	9	0	_	5		5
Region Office								
Maintenance Unit								

Evaluation sheet (debris flow)

Coordinates	Latitude				35° 27' 33.5"							
Coordinates	Lo	ngi	itud	le	7	′3º	° 5	8'	11	1.2	,"	
Road Name					Km							

[Causes]

item	factor	category	Check
of river	areas that river bed is 15° or more in watershed area	0.50km ² or more 0.15km ² - 0.50km ² less than 0.15km ²	V
Property	steepest slope of river bed	40°or more 30° - 40° less than 30°	V
	area that slope gradient is 30° or more in watershed area	0.20km ² or more 0.08km ² - 0.20km ² less than 0.08km ²	
of slope	area that meadow and shrub (less than 10m height) occupy in watershed area	0.20km ² or more 0.02km ² - 20km ² less than 0.02km ²	V
operty.	artificial works that cause negative effects	certain none	٧
ā	new crack and/or slope failure in stream	certain none	٧
	traces of large slope failure in stream	certain none	٧

[Road st	ructure]	
structure	category of score	Check
River	10m or more 5m - 10m	
width	3m - 5m	
	less than 3m	v
	less than 1m or	
	No bridge / box culvert	V
Beam		
Beam	1m - 2m	
Beam height	1m - 2m 2m - 3m	
Beam height	1m - 2m 2m - 3m 3m - 5m	

[History]	
category of score	Check
There is a history about debris flow that were obstacles to the road traffic after construction of recent measures.	٧
There is a history about debris flow though there is no obstacle to traffic.	
There is no history of debris flow	

2018/4/4 Yasir, Sajid, Shafique,

Basharat

Date

Inspector

[Expected size of disaster] (width, length, depth, etc.)

L= 420 m, W=60 m, D= 2-3 m

[Countermeasure]

Type of counterm	Check	
Drainage Dive	rsion by Lo	cals
	none·lo	w v
Effect of existing	moderat	e
countermesure	high	
	enough	

[Evaluation Rank]			
Scale of disaster Risk	Big	Medium	Small
Great risk	1	2	3
Medium risk	1	2	3
Low risk	2	3	4

Organization responsible for countermeasure works according to the scale of the disaster -Big: Grant aid -Medium: Major contractor in Pakistan

-Small: Local contractor Influence on the traffice when potential disaster

-Great risk: road closed for 2 days or more -Low risk: no road closure

[Description/comments]

A very active debris flow mainly triggered during the intense monsoon rainfall of 2010 blocking the road for 3 weeks. The debris flow is active mainly during the rainy season blocking the road and obstructing the traffic. A channel is develop to drain the debris flow. Spring water is percolating in the slide debris. Active erosion leads to the development of gullies. -Medium risk: road closed for 1 day or less Hanging boulders are also present on the slide. Two roads are passes through the slide.

ame											
				-							
Road st	ruct	ure]									
structure			cate	gory o	of s	col	re		С	heo)
	10n	n or	mo	re							

Beam	1m - 2m		
neight	2m - 3m 3m - 5m 5m or more		
[Potenci	al disaster mode]	Check	
Damage	e of bridge/culvert		
Outflow	of embankment		
Debris fl	ooding on the road	v	



de no. Sat_ N 9 0 _ 5	Photo sheet	Date 2018/4/4
gion Office	Latitude 35° 27' 33.5"	Inspector Yasir, Sajid, Shafique, Basharat
intenance Unit	Longitude 73° 58' 11.2"	
	Road Name Km	
and the second		the state of the
	A A A A A A A A A A A A A A A A A A A	
A A A A A A A A A A A A A A A A A A A		
and the second second		
Contraction of the second		
		The second se
	the first of the second	All And and a second
and the second second second		
and a second second second		
Mountain side view of the debris flow	Valley side view of the debris flow	Front view of the debris flow
	Mar Contractor	
	the second s	and the second second
		Carlos Carlos 1
		de la constance
	. 12	A AND AND AND
View of fallen block with the debris flow that can damage the population along the downstream	Road condition	Existing countermeasures / anomalies: Drainage convertion
		future.

	Cod	le no. Sat_ N 9 5 _ 1		Eva	aluation s	heet (S	Slope	failure/	Rock	fall)		Date	2018/6	6/4
I	Regio	n Office				Latitude	35	^o 19' 29.9)"	-		Inspector	Yasir, Sajid, Shafic	ue, Basharat
N	ainten	ance Unit			Coordinates -	Longitude	72	^o 36' 41.9)"					
			1		Road name		Km							
[C	auses	5]												
Ĺ	ltem	factor	category of score	Check				[Counterme	easure]					
hy	ed	talus slope,	3 or more correspondences	V		_				Тур	be of count	termeasures		
ogral	llaps actoi	clear convex break of slope, eroded toe of slope, overhang, water	2 correspondences		Disaster	type]	1			Ν	lo counter	measures		
topo	° °	catchment slope	no correspondence		Rock f	all				•		medodreo		
	_	susseptible to erosion	marked	V	Slope fa	ilure 🗸			Effe	ectiveness of	existing co	ountermeasures		Check
	Soi	less strength with water	a little marked					Potential slo	pe failure	are prevente	d enough,	or, it is defende	d enough when it is	
suo			None	V	[Main che	eck object	1	Botontial clor	no failuro d	ara considora	bly proyon	tod or it is cons	idorably defended	
nditi	ock	susceptible to erosion,	a little marked	-	Cut slo	ope √		when it is get	nerated.	are considera	biy preven			
al co	Ľ.	fast weathering	None		Naturals	slope		Potential slop	pe failure a	are partly prev	vented, or	it is partly defen	ded when it is	
logic	0	dip slope of bedding plane / Joint Planes	It corresponds.	V		лоро		generated. H	lowever, it	t is not enoug	h for the re	emaining factors		
Geo	cture		None	v				There is no c are not perfo	counterme ormed.	asure, or ther	e is not eff	fective even if c	ountermeasures	V
	Stru	the upper part is a hard /the toe of slope is	a little marked											
		weak.	None		[History]							[Expected size of	disaster](width, length,	depth, etc.)
		Toposil detected took and upstoody took	instability	V		Leve	of disas	ter history	<u>, , , , , , , , , , , , , , , , , , , </u>	Che	eck			
L.		ropsoli, detached fock and unsteady fock	stability		obstacles to the	y about larg	e fallen ro after consi	cks and slope truction of rece	failures th	res.	/			
oditio			notable spring water		There is a history	y about larg	je fallen ro	ocks and slope	e failures th	hat gets				
ce co		Spring water	seepage		to the road thoug	h there is n	o obstacle	e to traffic.				L= 380	m, W= 620 m, D= 2	2-3 m
urfa			none	V	There is a history	y about sm	all fallen ro	ocks and slope	e failures tl	hat did				
0		Surface condition	intermediate (bare grass tree)	v	not get to the toa									
			mainly structure, mainly tree		No disaster reco	rds								
			H≧50m	V	[Evaluation Rank	<]				[Desc	ription]			
			E 30≦H<50m		Scale disas	eof ter Bi	g	Medium	Small	A deep s boulders	, gravels san	d and silt. The slide i	se debris of the slide is co s also prone to debris flow	w mainly during
ofile		Height (H), dip (i)	E 15≧H<5011 H<15m							the rainy the slide	. Around 15 m	ve soil erosion on the neter of slide scarp is	e slide leads to developm s prone to rock fall that of	ent of guillies on ten reach to the
Ę			i≧70°		Great risk	1		2	3	the slide	toe. The slide	e has the potential to	damage the road and dis	srupt the traffic
			ୁତ 45°≦i<70°		Medium risk	1		2	3	slide.		y season. No counte		i to stabilize the
			i<45°	√ √										
Jaly	Surfa pipino	ce collapse, small fallen rock, gully, erosi <mark>p</mark> n, hole, subsidence, heaving, bending of t ree root.	certain • unclarity	v	Low risk	2		3	4					
Anor	fallen court	tree, crack, open crack, anomaly of errors	none		Organization res	ponsible for scale of the	counterm disaster	easure works		Influence	on the traf disaster	fice when		
L					-Big: Grant aid					-Great ris	k: road clo	sed for 2 days c	or more	
					-Medium: Major o	contractor ir	n Pakistan			-Medium	risk: road o	closed for 1 day	or less	
					-Small: Local cor	ntractor				-Low risk:	no road c	losure		



Code no.	Sat_	Ν	9	5	_	1	
Region Office							
Maintenance Unit							

Photo sheet										
Coordinates	Latitude		35 ^o 19' 29.9"							
	Longitude		72 ^o 36' 41.9"							
Road name						Km				









View of the slope failure at the left flank

Existing countermeasures / anomalies: View of check dams as counter measure

View of scarp of the slope failure

Date

Inspector

2018/6/4

Yasir, Sajid, Shafique, Basharat
Code no.	Sat_	Ν	9	5	_	2		
Region Office								
Maintenance Unit								

Evaluation sheet (debris flow)

Coordinates	Latitude				35° 20' 18.9"							
	Longitude			72º 36' 39.0"								
Road Name					Km							

[Causes]

item	factor	category	Check
of river	areas that river bed is 15° or more in watershed area	0.50km ² or more 0.15km ² - 0.50km ² less than 0.15km ²	V
Property	steepest slope of river bed	40°or more 30° - 40° less than 30°	V
of slope	area that slope gradient is 30° or more in watershed area	0.20km ² or more 0.08km ² - 0.20km ² less than 0.08km ²	v
	area that meadow and shrub (less than 10m height) occupy in watershed area	0.20km ² or more 0.02km ² - 20km ² less than 0.02km ²	v
operty	artificial works that cause negative effects	certain none	٧
Pro-	new crack and/or slope failure in stream	certain none	٧
	traces of large slope failure in stream	certain none	٧

[Road structure] category of score Check structure 10m or more River 5m - 10m width 3m - 5m ٧ less than 3m less than 1m or No bridge / box culvert ٧ Beam 1m - 2m height 2m - 3m

3m - 5m

	5m or more		
Potenci	Check		
Damage	of bridge/culvert		
Dutflow	of embankment		
Debris fl	ooding on the road	٧	

[History] category of score Check There is a history about debris flow that were obstacles to the road traffic after v construction of recent measures. There is a history about debris flow though there is no obstacle to traffic.

2018/7/4

Yasir, Sajid, Shafique, Bashara

There is no history of debris flow

Date

Inspector

[Expected size of disaster] (width, length, depth, etc.)

L= 1900 m, W=140 m, D= 1-2 m

[Countermeasure]

Type of counterm	Check	
No Counter	r Measures	
Effect of existing	none · lov moderat	w √ œ
countermesure	high enough	

[Evaluation Rank]			
Scale of disaster Risk	Big	Medium	Small
Great risk	1	2	3
Medium risk	1	2	3
Low risk	2	3	4

Organization responsible for countermeasure works according to the scale of the disaster -Big: Grant aid -Medium: Major contractor in Pakistan -Small: Local contractor Influence on the traffice when potential

-Great risk: road closed for 2 days or more slide. -Medium risk: road closed for 1 day or less

-Low risk: no road closure

disaster

[Description/comments] This is an active debris flow. Channel of the DF is well

developed with detached boulders and gravels. The DF is drained by the spring water. Source of the DF is steep scrap with detached and jointed boulders. Eroded talus is present. The slide is mainly triggered during the rainy season. The DF can affect the road and disrupt the traffic. No mitigation measures are constructed to stabilize the



Code no.	Sat_	Ν	9	5	_	2	
Region Office							
Maintenance Unit							

Photo sheet												
Coordinates		Lati	titude 35° 20							3.9"	1	
	I	Long	jitud	е			720	⁾ 36	6' 39	9.0"	I	
Road Name					Km							



Mountain side view of the debris flow

Valley side view of the debris flow

Front view of the debris flow

Date

Inspector







2018/7/4

Yasir, Sajid, Shafique, Basharat

A view of slope failures along the debris flow

Road condition

Existing countermeasures / anomalies: Retaining wall is being constructed at the toe of the debris flow

Code no.	Sat_	Ν	9	5	_	3		
Region Office								
Maintenance Unit								

Evaluation sheet (debris flow)

Coordinates	Latitude				35º 25' 19.6"							
	Longitude			72º 36' 5.6"								
Road Name					Km							

[Causes]

[Countermeasure]

Type of countermeasure

Drainage Culvert

item	factor	category	Check
of river	areas that river bed is 15° or more in watershed area	0.50km ² or more 0.15km ² - 0.50km ² less than 0.15km ²	V
Property	steepest slope of river bed	40°or more 30° - 40° less than 30°	V
	area that slope gradient is 30° or more in watershed area	0.20km ² or more 0.08km ² - 0.20km ² less than 0.08km ²	v
of slope	area that meadow and shrub (less than 10m height) occupy in watershed area	0.20km ² or more 0.02km ² - 20km ² less than 0.02km ²	v
operty.	artificial works that cause negative effects	certain none	v
Pr	new crack and/or slope failure in stream	certain none	٧
	traces of large slope failure in stream	certain none	٧

[Road structure] structure category of score Check 10m or more 5m - 10m River width 3m - 5m less than 3m ٧ less than 1m or ٧ No bridge / box culvert Beam 1m - 2m height 2m - 3m 3m - 5m 5m or more

[Potencial disaster mode]	Check
Damage of bridge/culvert	V
Outflow of embankment	
Debris flooding on the road	

s floo	ding on the	road						
		Organ counte the sc	ization res ermeasure ale of the	sponsible for works according to disaster				
lium	Small	-Big: Grant aid						
Ium	Onnan	-Mediu	contractor in Pakistan					
)	2	-Smal	-Small: Local contractor					
-	3	Influer	Influence on the traffice when potential					
, ,		disast	disaster					
-	\bigcirc	-Great	risk: road	d closed for 2 davs or m				

Date2018/8/4InspectorYasir, Sajid, Shafique,
Basharat

[History]	
category of score	Check
There is a history about debris flow that were obstacles to the road traffic after construction of recent measures.	v
There is a history about debris flow though there is no obstacle to traffic.	
There is no history of debris flow	

[Expected size of disaster] (width, length, depth, etc.)

L= 1200 m, W=50 m, D= 2-3 m

[Description/comments] An active debris flow. Water is coming in the slide from the upstream glaciers. Upstream of the debris flow is also prone to rock fall. Detached boulders are present in the DF channel. The DF

Influence on the traffice when potential disaster -Great risk: road closed for 2 days or more -Medium risk: road closed for 1 day or less -Low risk: no road closure -Medium risk: road closure -Medium risk: road closure -Netium risk: road closure -

Check [Evaluation Rank] Scale Risk

Effect of existing countermesure	none·low	
	moderate	٧
	high	
	enough	

Scale of disaster Risk	Big	Medium	Small
Great risk	1	2	3
Medium risk	1	2	3
Low risk	2	3	4



Code no. Sat_ N 9 5 _ 3	Photo sheet	Date 2018/8/4
Region Office	Latitude 35° 25' 19.6"	Inspector Yasir, Sajid, Shafique, Basharat
Maintenance Unit	Longitude 72° 36' 5.6"	
	Road Name Km	
Mountain side view of the debris flow	Valley side view of the debris flow	Front view of the debris flow
The damage on road has been observed with inlet of pipes for debris flow	Road condition	Existing countermeasures / anomalies: Culvert / Pipes has been installed at the toe of the debris flow

	Coc	le no. Sat_ N 9 5 _ 4]	Eva	aluation s	sheet	(SI	ope	failure	e/Rock	(fall)			Date	2018/9	9/4
F	Regio	n Office				Latitud	de	350	^o 30' 58.	.7"	-			Inspector	Yasir, Sajid, Shafic	que, Basharat
М	ainten	ance Unit			Coordinates	Longitu	ıde	72	^o 33' 2.	0"					<u>.</u>	
			1		Road name			Km								
IC	auses	5]														
È	tem	factor	category of score	Check					[Counterr	neasure]						
hy	pe	talus slope,	3 or more correspondences	V								Туре с	of coun	termeasures		
grap	apse	clear convex break of slope,	2 correspondences		[Disaste	er type]				A				- 11 - 1 11 - 1		
topo	Coll fa	catchment slope	1 correspondences		Rock	fall				Appr	o. 1m nigi	n Retain	aing w	all at the toe of a	Slope Failure	
			marked	V			1			Ef	fectivenes	ss of exi	sting c	ountermeasures	;	Check
	Soil	susceptible to erosion	a little marked		Slope fa	ailure	ν		Potential s	slope failure	e are prev	ented ei	nough,	or, it is defende	d enough when it is	;
su			None		[Main ch	neck obje	ect]		generated	•	-					
ditio	×	high density of cracks and a weak layers,	marked	V	Cut sl	ope			Potential s	lope failure	are consi	derably	prever	nted, or it is cons	siderably defended	
con	Roc	susceptible to erosion, fast weathering	a little marked						when it is g	generated.				10 to a sufficient of a	de das base Mila	
gical		5	It corresponds.	V	Natural	slope			generated.	iope failure . However,	it is not er	ough fo	r the re	emaining factors	ided when it is	V
solo	e	dip slope of bedding plane / Joint Planes	None	-		I	!		There is no countermeasure, or there is not offective					fective even if c	ountermeasures	
Ğ	uctu	debris on impermeability bedrock,	marked	V					are not performed.							
	Sti	the upper part is a hard /the toe of slope is	a little marked													
			None		[History]			fdiaaat	or history			Chaol	I	[Expected size of	disaster](width, length,	depth, etc.)
		Topsoil, detached rock and unsteady rock	a little unstable	v	There is a histor		arge f		ks and slor	o failuros t	hat were	Check				
u			stability		obstacles to the road traffic after construction of recent measur						ures.	\checkmark				
oditio			notable spring water		There is a histor	ry about I	large	fallen roo	cks and slo	pe failures	that gets					
ce cí		Spring water	seepage		to the road thou	gh there i	is no (obstacle	to traffic.		L= 780 m, W= 1500 m, D=			= 3-4 m		
urfa			none	V	There is a histor	ry about s	small	fallen roo	cks and slo	pe failures	that did					
S		Surface condition	bare land with minor vagetation	v	not get to the ro	au.										
			mainly structure. mainly tree		No disaster reco	ords										
			H≧50m	V	[Evaluation Ran	nk]					[[Descrip	tion]			
			ਸੂ 30≦H<50m		Scal	le of ster	Bia	Ν	Medium	Small	lt i bo	is a comple ulders, gra	ex slide o vels. sa	comprising of rock fall nd and silt. Source of	l and debris flow. Debris is debris is from steep outc	s comprised of crop with
ile			e 15≦H<30m		Risk		Dig		noulum	omai	fra	actured and	d jointed e to slidi	rocks. Hanging and o	letached boulders are lyin Soil erosion leads to dev	ng on the debris
Prof		Height (H), dip (i)	H<15m ;>zo∘		Great risk		1		2	3	wa	ater chann	els in the	slide. The loose mat	terial on the slide is prone	to debris flow
			<u>ا≧</u> 1≧70° ≙ 45°≤i<70°	v		_			\bigcirc		- tri	gger the sl	ide. A sr	mall retaining wall is I	built, however, it is also da	amaged due to
			i<45°		Medium risk		1		(2)	3	Ta	iing rocks	and not e	enective to stabilize t	ne silde.	
Х	Surfa	ce collapse, small fallen rock, gully, erosion,	2 or more correspondences clarity	٧	l ow risk		2		3	۵	1 -					
mal	piping	hele, subsidence, heaving, bending of the root,	certain•unclarity		LOWTION		2		J	7						
2 fallen tree, crack, open crack, anomaly of none						sponsible	for co	ounterme isaster	easure worl	ks	Influe	ence on	the tra	ffice when		
					-Big: Grant aid	, 30010 UI	ane u	503101			-Gree	at risk: n	isaster			
					-Medium: Major	contracto	or in F	Pakistan			-Med	lium risk	: road	closed for 1 day	or less	
					-Small: Local co	ontractor					-Low	risk: no	road c	losure		



Code no.	Sat_	Ν	9	5	_	4	
Region Office						-	
Maintenance Unit							

	F	hc	oto	sł	nee	t				
oordinates	Latitude				3	5 ^o 30' :	58.	7"		
Joordinates	Longitud	de			7	'2º 33'	2.0)"		
Road na	ame			Km						

Date	2018/9/4
Inspector	Yasir, Sajid, Shafique, Basharat





View of the slope failure at the middle point

Existing countermeasures / anomalies: View of Retaining Wall as counter measure

View of gully developed in the slope failure

Code no.	Sat_	Ν	9	5	_	5		
Region Office								
Maintenance Unit								

Evaluation sheet (debris flow)

Coordinatos	La	titu	de		35° 30' 59.8"							
Coordinates	Lo	ngi	tud	le	72º 32' 7.5"							
Road Name					Km							

[Causes]

item	tactor	category	Check
of river	areas that river bed is 15° or more in watershed area	0.50km ² or more 0.15km ² - 0.50km ² less than 0.15km ²	V
Property	steepest slope of river bed	40°or more 30° - 40° less than 30°	V
	area that slope gradient is 30° or more in watershed area	0.20km ² or more 0.08km ² - 0.20km ² less than 0.08km ²	V
of slope	area that meadow and shrub (less than 10m height) occupy in watershed area	0.20km ² or more 0.02km ² - 20km ² less than 0.02km ²	v
Property	artificial works that cause negative effects	certain none	٧
	new crack and/or slope failure in stream	certain none	٧
	traces of large slope failure in stream	certain none	٧

[Road structure]

structure	category of score	Check
	10m or more	
River	5m - 10m	V
width	3m - 5m	
	less than 3m	
	less than 1m or	
	No bridge / box culvert	V
Beam	1m - 2m	
height	2m - 3m	
	3m - 5m	
	5m or more	

[Potencial disaster mode]	Check	
Damage of bridge/culvert		
Outflow of embankment		
Debris flooding on the road	٧	

ling to Pakistan Influence on the traffice when potential

disaster -Great risk: road closed for 2 days or more -Medium risk: road closed for 1 day or less

-Low risk: no road closure

Date	2018/10/4
Inspector	Yasir, Sajid, Shafique, Basharat

[History] category of score Check There is a history about debris flow that were obstacles to the road traffic after v construction of recent measures. There is a history about debris flow though there is no obstacle to traffic. There is no history of debris flow

[Expected size of disaster] (width, length, depth, etc.)

L= 1280 m, W=460 m, D= 2-3 m

[Description/comments]

This is an old debris flow and the road is built in the debris. Debris is comprised of boulder, gravels, sand and silt. Detached boulders are lying on the debris that are prone to slide to the road. Active erosion leads to development of gullies. Scarp of the slide is prone to rock fall. Eroded talus is present along the road. Excavation of the loose debris for construction material also trigger the slide. The slide is frequently damaging the road and obstructing the traffic, however, no mitigation measures are constructed to stabilize the slide.

Type of counterm	Type of countermeasure				
No Counter	r Measures				
Effect of existing	none · lov moderat	w √ e			
countermesure	high enough				

[Countermeasure]

[Evaluation Rank]				
Scale of disaster Risk	Big	Medium	Small	
Great risk	1	2	3	
Medium risk	1	2	3	
Low risk	2	3	4	

	Organization responsible for countermeasure works accordi the scale of the disaster
a a ll	-Big: Grant aid
IIali	-Medium: Major contractor in P
0	-Small: Local contractor



Code no.	Sat_	Ν	9	5	_	5	
Region Office							
Maintenance Unit							

Coordinatos		Lati	tude		35º 30' 59.8"							
Coordinates	Longitude				72	o 3	2' 7	.5"				
Road Name					Km							

Date	2018/10/4
Inspector	Yasir, Sajid, Shafique, Basharat

