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Mink Red Title	ģ	Des gr Work Whee	R	sk Details	5 5 2 5 5 5	Potential Causes	Potential Impacts (Consequences)	Pre-Treatment Ri Ex sting Controls (Project)	isk Leve	o sulla	Current Risk Rating	Risk Treatment Actions (Pro act s mitigation)	Treat	ment & Residual F	Residual Risk	Res duel Risk Owner
There is a threat of temporary stability issues related to existing revetment (related to temporary support)	Project Wide-000	DWP-RV-01 N	Uve-Test 8	Te Ara Tupus Allance	Section 9(2)	The causes of the threat is the unknown condition of existing revetment	The consequence of the threat include: - Collapse of sections of existing revertment - Fatalities and serious injury of workers - Oamage to plant and materials -increased temporary works and support to protect existing revertment stability and railway corridor	No controls exist prior to implementing treatment of this risk item	Extreme	Unifierly dis	HIGH	To be developed further. Potential treatments could include: PAI meetigations of existing rock revetment stability during design with current information and develop militation solutions and methodologies to be used during construction.	Externe can	HIGH	To be developed	Construction (Craig Service)
There is a threat of working in confined spaces for manhole inspections (operation) and installation (construction)	Project Wide - 000	DWP-DR-02	Live-Treat	Te Ara Tupua Alliance		The cause of the threat is the requirement to access menholes for installation and inspection The cause of the threat is NPO resource	The consequence of the threat is serious injury and potentially death of workers The consequence of the threat is that if RPOs	Rungs in manhole to enable access	Extreme	Rare	МБН	To be developed further. Potential treatments could include: Safe working method to be develop to govern work in confined spaces	TBC	#N/A	To be developed	Construction (Jessica Pritchard)
3 There is a threat of unavailability of Rail Protection Officers	Project Wide - 000	N/A	Live - Treat	Te Ara Tupua Alliance		availability one RPO needed per site (but may require spotters) RPOs may not be available to be onsite for extended work hours: this could stop or delay construction activities	are not available programme could be affected (Not expected to be a direct cost threat) Worker on site without sufficient rail protection	Agreement with KiwiRaii on Digital shield to reduce the number of RPO required	Moderate	Unlikely	MEDIUM	To be developed. Potential treatments could include: Train and develop project RPOs	TBC	#N/A	To be developed	Construction (Jessica Price and)
There is a threat that the lack of sufficient availability of Electrical Safety Observer Officers causes delays to work fronts not being able to operate	Project Wide - 000	N/A	Live - Treat	Te Ara Tupua Al lance		The cause of the threat is that not enough ESOs for required contraction joint. Niving that 1 x ESO required per work group for each piece of shape changing plant - Currently c.10 in WLG region. Number of work groups could be dependent on the number of ESO's	Consequence of the threat is the impact on delivery (critical path) - reducing the number of work groups: 3 ESO's - there is potential these may not be available and a team would not be able to be mobilised extending the programme based on ESO availability).	Kiwiraii have committed to us 3 ESO's This will provide 1 ESO per work crew. (If 1 ESO not available for any reason one work crew may need to stand down until an ESO is available.)	Extreme	Likely	CRITICAL	To be developed	TBC	an/a	To be developed	Construction (lession (ritchard)
There is a threat that because of frustration with the design of the shared path (width design speed) and maybe how busy it is cyclists choose to stay on State Highway over using the path. Risk of cyclist fatality on this road. (Project fails to achieve objective)	Project Wide-000	DWP-TS-01 DWP-TS-02 DWP-PS-01	Uve - Treat	Te Ara Tupua Alliance		The potential cause of the threat is user frustration with the design of the shared path (width design speed marking etc) and how busy it is	The consequence of the threat is that the project fails to achieve objective for commuters Serious injury fatalities etc on State Highway from users returning to State Highway or from accidents on path from conflicted users)	Current design seek provide a facility which is attractive to cyclist including but not limited to: - 30 km/h design speed - 3 m total width - tactile de ineation to encourage separation of different transport modes	Extreme	Ukely	CRITICAL	To Be Developed. Potential treatments could include:: Closing of the State Highway to cyclists widening of the path separated cyclist and pedestrian cycleways. Provision of an alternative cycle route for road cyclist groups on weekends/busy times	Extreme	CRITICAL	To be developed	Waka Kotahi (operation)
There is a threat that the number of people using the completed path are lower than the numbers forecast.	Project Wide-000	NA	live - Trest	Te Ara Topos Allance		The causes of the threat include: The project design or implementation does not shift enough people onto the path from other modes of transport. The number of people using the path is dependent on the quality of the connections to the path which are outside the scope of the project but are being investigated by Walas Kotahi. The existing path to the south of the proposed tie in provides a lower level of service for path users. It's narrow and does not have shared path the second of the project of the proposed ties are part of the proposed ties and the service for path users. It's narrow and does not have shared path extended to the project and the spearated path on hutt. Road limiting the potential for modal shift.	The consequences of the threat are that the project does not realise the outcomes sought meaning the project Pails to meet one of 2 project objectives.	No controls exist prior to implementing treatment of this risk item	9.1945	Possible	нем	The intention is to ensure the design implementation and ongoing maintenance create an environment that attracts people to use the ahera path including people already cycling on SH2. This will be supported by communications and behaviour change inhibitives for raise awareness and support people to use Te Ars Tupus. To Be Developed, Potential treatments could include: L. Work with the Te Ara Tupus Alliance to ensure the design of the path will meet the needs or people waiting cycling and fulling vision—mobility devices including acodic already cycling on SH2. 2. Identify critical gavia in connections and work with Council partners to Preside with Council partners to Preside and work with Council partners to Preside print to opening. 3. Identify critical gavia in connections and work with Council partners to Preside print to opening. 4. Produce an Upsake Strategy incorporating an Action Plant this set out the communications marketing will be have full to the delivered.	Service	MEDIUM	To be developed	Waka Kotahi (operation)
There is a threat of workers failing from bridge during construction (in NZ there have been 40 Fatalities 2011-2021 from failing from height)	Ngá Oranga - 001	DWP-88-01	Live - Treat	Te Ara Tupua Alliance		The causes of the threat include: - Requirement for the cyclewey bridge has to go over rail - Barrier requirements influence bridge design and features - Working at he hight for bridge erection and site spices for beams	The consequences of the threat include: - Potential Fatality or injury to workers - Costs of Prosecution / Enforceable Undertaking	Downer Critical Risk controls for working at height	Extreme	Rare	HIGH	To be Developed. Potential treatments could include: Seek to reduce the time and complexity of work to be undertaken at height including. Simplify site joints—obsted legitides splices versus welding box girders Provide suitable barriers on bridge Look to modularise as much as poss ble to mainrisse on site activities.	DET DET	an/a	To be developed	Construction (Jessica Pritchard)
There is a threat of a derailing train impacting the bridge pier during an event which cause track displacement/derailment e.g. large earthquake event	Ngá Óranga - 001	DWP-8R-01	Uve - Treat	Te Ara Tupus Alliance		The cause of the threat is a large earthquake dispacing the rail track near the bridge. Trains passing by the bridge then could erreal and impact into bridge piers (looking the is fixing founded into rock rails built on reclaimed land)	The consequences of the threat include: - Potential Intellities or serious injuries for occupants in train or users on bridge - Extreme Rare Event - Should not need pricing of multiple smaller events Noting in Extreme earthquake a train could be impacted derail be affected by lendatifies or multiple other factors along this route	Clearance distance between the track and bings piers is provided including a 3m maintenance route between rail and pier. Robust kersb setween tracks and bridge piers. Yowks I train oppration paying is response to extreme earthquake events.	Externe	Ram	нсн	To be developed. Petential treatments could include: Consideration of sesmic effects on adjacent structures and how the land will look around the bridge in an IL2 and IL3 sized event bridge in an IL2 and IL3 sized event with the look of the land of the tivide land beging first W2012 will be provided between the rail confrom and piers/uridge supports. The robust kerb and masimisation of distance between all and tridge supports will reduce the risk of collision with bridge piers. In addition in accordance with the firinge Masual the piers are designed for pier redundancy or impact loads.	ac ac	an/a	To be developed. Potential residual risk consideration include: The chance of a train approaching the bridge just as a very large earthquake hits would be a rare (very low probability event) out if it do occur it could be serious. However consequences on passengers on a train anywhere along this stretch in a very large earthquake event could be similar.	Waka Kotahi (operation) & KiwiRaii
There is a threat that a user could be harmed due to the ecological barrier provided along the seawalls not being adequate at deflecting overtopping spaish from the design storm event	Project Wide-000	DWP-RV-01 DWP-TS-02	Uve-Teat	Te Ara Tupus Alliance		The cause of the threat is wave overtopping at seawalls in particular where overtopping is exaccretated is once sections of the seawall have gravel in front scoured away over time	The consequence of the threat includes harm/injury to user[c] at worst case, unpleasant experience if saturated while commuting.	Wave modelling and analysis to understand the LoS and design to achieve an agreed threshold.	Minor	Ukely	MEDIUM	To be developed. Potential treatments could include: ITS warning signs and apps to improve user awareness	TBC	#N/A	To be developed	Waka Kotahi (operation)
10 Threat of existing utilities strike and relocation of services	Project Wide - 000	DWP-UN-01	Live - Treat	Te Ara Tupua Alliance		The causes of the threat include: - Limited and/or inaccurate information from utility providers - a more complex service network than anticipated - Insufficient controls in place during construction	The consequences of the threat include: - Serious Injury/Intality potential to workers from service strike - Additional cost of unknown service relocations	-Desktop study (before you dig) identification of services in the corridor - Consultation with utility and service owner to improve understanding onetwork and accuracy of data	Extreme	poss ible	CRITICAL	To be developed. Potential treatments could include: - Service location works within the construction corridor (including hydrovac and GPR investigations) - Design of service diversion/relocation works - Hazard controls on-site	367	sn/A	To be developed	Construction (Jessica Pritchard)
11 Threat that cyclist speeds on bridge ramps are excessive	Ngi Oranga - 001	DWP-TS-01 DWP-BR-01	Live - Treat	Te Ara Tupua Alliance		The cause of the threat is a cyclic coming down bridge rank picks up speed which exceed the design speed whole which exceed the ramps.	The consequence of the threat is that a Cyclists travelling at speed loses control resulting in a serious injury to them or other users	No controls exist prior to implementing treatment of this risk item	Severe	Possible	нібн	To be developed. Potential treatments could include: - Beduced landing. Powement markings to encourage stower speed: - Straight alignment and long sight distances Straight alignment and long sight distances to the nutries of the bottom of the bridge (at bott here) to consider a high speed some and potential for user impact.	TBC	#N/A	To be developed	Waka Kotahi (operation)
12 Threat that SH2 cycle lane closure endangers cyclist travel southbound on SH2	Ngå Oranga-001	DWP-15-01	Live - Treat	Te Ara Tupus Alliance		The casues of the threat is the cycle connection from SH2 on to TeA Trupus is removed to allow for the extension of the guardraits. Cyclists threeling southbound on SH2 are unable to join only onto the sheed point at the SH2 KiwRail access. As a result cyclists are required to stay on the shoulder of SH2 where the road narrows down substantially.	The consequence of the threat is vehicles side swiping cyclists on SHZ resulting in a serious injury or fatality.	No controls exist prior to implementing treatment of this risk item	Extreme	Unlikely	нібн	To be developed. Potential treatments could include: - Discourage cyclist access to SH2. - Widen the shoulder on SH2. - Path access still available at the Ngå Üranga intersection	TBC TBC	#N/A	To be developed. Potential residual risk consideration include: Cyclist choosing to use SH2 will not be prohibited	Waka Kotahi (operation)
13 Threat of vehicle using the path for Maintenance Bay Access	Project Wide - 000	10-S-19-01	Use-Treat	sone autoria	S	The cause of the threat is kiwifiali vehicles drive on the shared path to access the kiwifiali maintenance bays.	The consequence of the threat os increased likelihood of conflict between Kiwillail vehicles and path users reading to potential serious injury or fatality.	No controls exist prior to implementing treatment of this risk item	Severe	Unlikely	MEDIUM	To be developed. Potential treatments could include: Controlled access. SOP for all Kiwifial vehicles. Spotter required if reversing onto the shared path is required. Operation restrictions for example operation outside of peak path periods. Signage and pairs marking at maintenance baysWarning on VMS boards	78C	#N/A	To be developed. Potential residual risk consideration include: The residual risk after treatment is implemented include: - Turning of vehicles larger than utes requires reversing which enhances use vehicle clash - Risk of damage to specified pavement of maintenance bays	Waka Kotahi (operation) & KiwiRail
1.4 User Conflict at between users on main path and other users entering/exiting Uranga	Project Wide-000	DWP-15-01 DWP-LS-	Live - Treat	Te Ara Tupua Alliano		The causes of this threat includes: - Cyclists travelling at high speeds colliding with pedestrians exiting Uranga locations Bike users riding to bike stand and parks	The consequence of the threat is user collision resulting in serious injuries.	No controls exist prior to implementing treatment of this risk item	Sewire	Poss ble	HIGH	To be developed. Potential treatments could include: - pavement and cultural markings to highlight increased risk. - Strategic positioning of bike parks - Tractile delineation of Üranga transitions points	TBC	#N/A	To be developed	Waka Kotahi (operation)
13 Taurani	Project Wide-000	N/A	Live - Treat	Te Ara Tupua Allilance		The cause of the threat is: - the lack of ecope routes for pedestrians and all path users - Occurance of a larger enough earthquake to trigger a Tsunami	The consequence of the threat is srious injury or fatalities to path users and/or workers	No controls exist prior to implementing treatment of this risk item	Extreme	Rare	HIGH	To be developed. Potential treatments could include: - Course of path. Signage to direct pedestrians to nearest execusion points. - Track crossing execusion route via the track - Relying on mobile phone notification - Standard signage approach - Potential escape to the bridge as a high point.	387	an/a	To be developed	Waka Kotahi (operation)
Secret on path	Project Wide - 000	DWP-TS-01 DWP-DR-01	Live-Treat	Te Ara Tupua Al lance		The cause of the threat include: - Debris and ballast from the track washing over path. - Gravel landscaping finishes migrating on to the path	The consequence of the threat is sazard to cyclists and micro-mobility users.	No controls exist prior to implementing treatment of this risk item	Moderate	Ukdy	нібн	To be developed. Potential treatments could include: Maintenance of path to be agreed. Closure of path in a ignificant venther events. Nils beth or similar reduced teed of graved finish areas to contain loose finish materials. Concrete finishms between path and tranga with ripping to opture finer materials.	ac ac	SN/A	To be developed. Gravel materials still expected to track across to be diest with with path sweeping	Waka Kotahi (operation)
17 ITS cabinets	Project Wide - 000	DWP-T5-02	Uve-Treat	Te Ara Tupus Al land		The cause of the threat is opening of ITS cabinets onto path may result in cyclists colliding with ITS doors.	The consequence of the threat is injury to cyclists.	No controls exist prior to implementing treatment of this risk item	Moderate	Unlikely	MEDIUM	To be developed. Potential treatments could include: ITS cabinets to be located away from shared path with consideration for how they will be accessed and opened.	TBC	#N/A	To be developed	Waka Kotahi (operation)
18 Boat ramp at Honiana Te Puni Reserve	ve Honiana Te Puni Reserve	DWP-15-01	Live - Treat	Te Ara Tupua Alliance		The cause of the threat is conflict between vehicles and path users.	The consequence of the threat is injury to cyclists.	No controls exist prior to implementing treatment of this risk item	Severe	Unlikely	MEDIUM	To be developed. Potential treatments could include: Restricted which access to Horiana Te Puri Restricted which access to Horiana Te Puri Restricted the Residence of the Way from the main desire line for cyclists.	a ac	#N/A	To be developed	Waka Kotahi (operation)
19 Dog exercise area	Honiana Te Puni Resen	N/A	Live - Treat	Te Ara Tupua Allanco		Risk of off-lead dogs in the dog exercise area running across the shared path.	Serious injury for cyclists.		Moderate	Uniliteity	MEDIUM	To be developed: No dogs allowed on the main shared path. Lower cyclist speeds through path marking and signage	TBC TBC	#N/A	To be developed: responsibility for dog control sits with dog owner.	; Waka Kotahi (operation)
20 Low vision and blind users	Project Wide-000	DWP-TS-01 DWP-TS- 02	Live - Treat	Te Ara Tupua Alliance		Risk of low vision or blind users wandering across into the cyclist area of the separated path.	Serious injury for pedestrians or cyclists.		Moderate	Unlikely	MEDIUM	To be developed: Tactile defineation between the pedestrian and cyclist paths along the entire length of the project.	JBC TBC	#N/A	To be developed	Waka Kotahi (operation)

The control of the																				
	21	CCTV poles	Project Wide - 000	2	Live-Treat	Te Ara Tupua A liance		Sectio-	The causes of the threat is CCTV poles co lapsing and then falling onto electrified rail lines	making contact with the electrified overhead creating an electrical circuit in close proximity to the path. This could leading to serious		Severe	Rare		accordance with best practise design industry	DBT TBC	an/a	To be developed		
Mathematical production 1	22	Collision between vehicles and bridge piers	Ngå Oranga - 001	DW.	Live - Treat	Te Ara Tupua Alliance						Extreme	Uni kely	нібн	a TL-4 to ensure vehicle are unable to come into	TBC	#N/A	To be developed		
1	23	Public vehicle operators mistaking tiwitalis SH2 sliplane for an offramp	Oranga - (DWP	Live - Treat	Te Ara Tupua Alliance			thinkin it is a public slip lane. Vehicles are then	re-join from the slip lane leading to serious	Existing signage on SH2	Severe	Unlikely	MEDIUM	public/unauthorised vehicles opportunity to put a sign at the gate to phone to let them drive	78C	#N/A	To be developed	KiwiRail	
Part	24	Bollards	Project Wide - 000	DWP-TS-02	Live - Treat	Te Ara Tupua Alliance				Serious injury to cyclists		Moderate	Ukely	нібн		TBC	#N/A	To be developed)
1	25	Cyclist joining path from Hutt Road	Project Wide - 000	DWP-TS-02	Uve-Test	Te Ara Tupua Alliance			cross Hutt Road to join the path. There is an existing median island for pedestrians but this		Scope of the project does not extent to the Hutt Road crossing.	Severe	Unlikely	MEDIUM	investigate expanding scope to include upgrade of	age age	an/a	To be developed		
	26	Lack of safe alternative routes for users during path closure	Project Wide-	DWP-TS-02	Live - Treat	xe Te Ara Tupua Alianc						TBC	TBC	#N/A	communications. Path users encouraged to use	TBC	#N/A	Public still acess path	твс	
2	27	Sip on path markings	Project Wide - 000	DWP-TS-02	Live-Treat	Te Ara Tupua Alliam			Path marking materials becoming slippery in wel weather	User crash leadign to serious injury		TBC	TBC	#N/A	material choice of path markings To be developed:	78C	an/A	To be developed		
The content of the	28	Mixture of path users and vehicles at Honina Te Puni Reserve (shared user zone)	Honbra Te Puni Reserve	DWP-TS-01	Live - Treat	Te Ara Tupus Alliance						TBC	TBC	sn/A	-Cultural path markings -Potential tacible definestor to identify the main through route for vehicles and walking/cyclist users -Retractable bollards for restricted vehicle access (Walaa Kutshi maintanence KiwiRail (TBC) bost -ramp and integrated club vehicle access Mana Whenua	780	#N/A	To be developed		
The content of the	29	Vegetation encroachment clashing with users	Project Wide - 000	IO-SI-dMQ	Live- Teat	Te Ara Tupua Alliance			Vegetation landscaping finishing features clashing with path users	User crash leading to serious injury	Vegetation free zone as part of the design specification	J@L	TBC	#N/A	- Plant location along the edge to avoid encroachment - Species selection along the edge to keep the edge soft - Long sight lines - Pruning of encroahsment during maintaneone as	DEC DEC	#N/A	To be developed	Waka Kotahi (operation)	
1	30	Sharp edges of hard finishes artworks and corten walls	Project Wide - 000	DWP-LS-01	Uve - Trest	e Te Ara Tupua Alliance						TBC	TBC	an/A	To be developed: - Returns on corten wells	38C	#N/A	To be developed	Waka Kotahi (operation)	
Management containing and process and selection of the containing and process and selection of the containing and process an	31	User slip and trips on the revetment rock surfaces at Uranga	Project Wide-000	DWP-LS-01	Live - Treat	ce Te Ara Tupua Allanc						TBC	TBC	an/A	r Intentional placement of rock at Uranga to	TBC	#N/A	To be developed		
The content of the	32	Soft landscaping finishes and mulch being blown into users	de Project Wide - 000	11 DWP-15-01	at Une-Treat	pus Te Ara Tupua Al lan			into users and their eyes			781	TBC	m\/A	- intentional palcement of plants and Species to provide shelter	OBT TBC	#N/A	To be developed		
Part	33	Trees at Üranga restricting sight lines for user exiting Üranga	Project W	DWP-1S4	Live-Tre	Te Ara Tu			Plant and rock finishes impeding user sight lines enterign and exiting Granga to main path			TBC	TRC	#N/A	- Consider sight lines when placing landscape finishes elements (trees rocks artwork)	3E 3E	#N/A	To be developed		
The content of the	34		Project Wide - 000	DWP-15-01	Live-Treat	a Te Ara Tupua Aliano				•	0		٢	an/A	 - Location of the bike park set into the rock gardens or planted area of Ūranga to provide sufficent clearance between parked bikes and users 		#N/A	To be developed		
Company of the control for colors and control for colors and control for colors and co	35		ojed Proje		re - Live est Trea	Ara Te Ar	H					-	-		'- Consideration of loading in fixings To be developed:					
Company of the control of the production of the control of the c	37		Proje Pr	P-15		TeA Te						. DQL	Jac		To be developed	180	#N/A			
Part Control of the control of t	38	•	ProjeProj			Te A Te A	Н					_	_							
The second control of the control	40				Uve-							TBC	38	an/A	'To be developed:	3E 3E	#N/A			
1	41	Fence foundation design to consider ease of maintenance to replace fence posts		ž.	rest.							28	2	an/A	To be developed:	2 2	#N/A	To be developed		
The standard effect of the standard effects and the standard effects	42			15.03	Live-Treat T				No			TBC	TBC	stN/A	To be developed: -infill panels system to indicate path location transitions point e.g. Üranga bridge etc -infill to rpotect user agsint High wind - Alignment with pavement marking which provide the threshold treatment	TBC T	an/A			
Continued and the continued of the following and the continued of the cont	43	Use of fence for emergency excacuation wayfinding signage		_	Like -		Ш					₽C	₩.	#N/A	To be developed	JE JE	#N/A	To be developed		
Control containing on the transport of the control c	44	Grounding of fence to protect against electrocution		_	Live - Treat			•	1			_	-	#N/A	-		#N/A	To be developed		
For Principle of Manual Pr	45	CPTED considerations. Visual permeability of fence	_	_	Live- Treat							_	-	#N/A		-		To be developed		
## CPTD continuement on surging register and part of security of the part of s	46	Users climbing over the top of the fence			- Live							ı	_					To be developed		
And the first continued and the second of th	47		\vdash	2	t Tree		4			Safety and crime risk for nath up are and Mini-		180	 						 	
Les d'éging qu'en par les parts l'approprie les parts d'appropries de la fair de la print	48	CPTED considerations - lighting the path	_	4 DW	7				Lack or lighting on the path	Kotahi		Œ.	£	art/A	Part 3.1:2020) along the length of the path	aT JBY	an/A	To be developed		
The Control Anthonic for Contr	49	CPTED considerations - vertical lumination of faces		WP-TS-C					Lack of lighting height on the path	Safety and crime risk for path users and Waka Kotahi		TBC	TK.	mN/A	spaced very 15 m to ensure people faces can be lit up across the entire path	DE DE	#N/A	To be developed		
12 National regions of the large and unique or the large of the large	50	CPTED - illumination of Üranga	Τ	\$ 55.	1				Lack of lighting in the Üranga	Safety and crime risk for path users and Waka Kotahi		TBC	2g	#N/A	 Provision of pole lighting and CCTV together at) J	#N/A	To be developed		
Modernance section of implicing point in the internal process for the control of	51	Fall from heights - Maintenance access on bridge and adoption of false kerb			a year					Fall from heights - death/injury		TBC	78	an/A	- Kerbing on deck which provide for access to power supply for maintenance	5 E	#N/A	To be developed		
The description of the processing of the process	52	Maintenance access of lighting units and drivers in feature posts to be from the		_	re te				Installation of the ighting units are drivers in the	D fficult to maintain due to KiwiRail access		TBC	TBC	#N/A	- Maintenance access to drivers from shared path	TBC	#N/A	To be developed		
Ligate gave for train clinical and the presentation of the control	53	Grounding of feature posts fence and bridge handrail to protect against			rest -							3BC	-	#N/A	Grounding to de designed during Stage C following appropriate standards as advised by		#N/A			
Lighting table agreed transformed potals and consistent of the exercisposed - signal grand to decrease product formed potals and consistent potals and co	34	~0		DWP-15-04	Live - Treat 1				Cause includes the train driver experiencing glare from the light source including direct glare			TBC	ТВС	#N/A	Sivishal (Juvine Stace C) - huminaire fitting directional and forward facing to reduce glare - sideways spill on to shared path - Directional optic - Fine tuning of model to account for height and posion of train drivers and glare effects		#N/A			
Strewing motion of maintenance vehicles causing damage to powement Trips and halfs from kertning and items around the powement Trips and halfs from kertn	55	Lighting spill at gravel beach/seawall locations		_	Live- Treat							_	1BC	#N/A	crest of the revetment and seawall capping beam crest		1	To be developed		
1 Siles fisher and falls on the powement surface 2 Siles fisher and falls on the surface surface for an including powement surface 3 Siles fisher and fall surface for an including powement surface 1 Siles fisher and fall surface for an including powement surface 2 Siles fisher and surface surface and surface for an including powement surface 3 Siles fisher and surface surface for an including powement surface 4 Siles fisher and surface surface for an including powement surface 2 Siles fisher and surface surface for an including powement surface 3 Siles fisher and surface surface for an including powement surface 4 Siles fisher and surface surface surface surface for an including powement surface 2 Siles fisher and surface surf	36	- signal lighting conflict between shared path and Ūranga		DWP.	Live- Treat			Section				TBC	TBC	#N/A		DE DE	#N/A	To be developed		
Screwing motion of maintenance vehicles causing damage to pavement - Maintenance vehicles turning in and out of maintenance vehicles causing damage to pavement - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Extra Lidwards - Avoid trip hazards through appropriate design of edging sarvice lids and interneces with Uranga - Interneces	37	Slips flitips and falls on the pavement surface	Project Wide - 0	IWP-PS-01	Live - Treat	e Te Ara Tupua Allianos			complete - Loose chip or dirt on the pavement surface	- Potential harm to the user	None	Moderate	Likely	нібн	-Selection of appropriate asphalt -Project specification including pavement vertical tolerancesProvision of adequate surface for end use considering ride quality skid resistance and	-R 111	MEDIUM	To be developed	Waka Kotahi	
Trips and falls from kerbing and items around the pavement - Variations in the surface at the fence edge Urange tie in service lid tie in - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Ensure all work packages - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident - Ensure all work packages - Uneven surface leading to an injury causing incident - Uneven surface leading to an injury causing incident incident - Uneven surface leading to an injury causing incident i	58	Screwing motion of maintenance vehicles causing damage to pavement	Project Wide-(DWP-P5-01	Live - Treat	e Te Ara Tupus Allan.				- Uneven surface and asphalt damage leading to an injury	None	Moderate	Almost certain	HIGH	bay locations extended to the full width of the shared path to avoid pavement issues at these locations	Moderate	LOW	To be developed	Waka Kotahi	
a piped subsoil draininge system - Tramficied by construction plant to speed up consolidation of bulk fill materials - Consolidation of bulk fill materials	59	Trips and falls from kerbing and items around the pavement	Project Wide-000	DWP-P5-01	Live- Treat	Te Ara Tupus Allan.			- Variations in the surface at the fence edge Üranga tie in service lid tie in	- Uneven surface leading to an injury causing incident	None	Moderate	Lileiy	нісн	edging service lids and interfaces with Uranga such as using flush nibs and high friction is covers - Ensure all work packages design levels work with other work packages - Interception of runoff from rail corridor through	Moderate	LOW	To be developed	Waka Kotahi	
- Leaking or near from During or near from Dur			Wide-000	10-54	Treat	pus Alliance			 Leaching of fines from bulk fill and pavement materials due to tidal actions and stormwater 	cracking of the pavement and early failure	None	e	rely	CRITICAL	a piped subsoil drainage system - Trafficked by construction plant to speed up consolidation process - Use of filter cotth to retain fines in seawall and	derate	MEDIUM	To be developed	Waka Kotahi	
- incorrect geotechnical information leading to paivement leading to pai	60	surfaces and ponding of water leading to injury.	pct.	DW.	ě	5			- Incorrect geotechnical information leading to	- Ponding of water leading to ingress into the pavement leading to failure		Seve	3			ž j				

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61	Speeding of maintenance vehicles				Uve - Treat		ı					TBC	an/A	- Signage - Re speed of maint vehicles: Consider use of raised safety platforms at all access points to ensure appropriate geometry for speed management? Ramps could aligned for both crossing and thru traffic	JBC	O #N/A	To be developed	
62	Slips and trips from pavements joints between surface types or asphalt pore joints				Uve - Treat		T					TBC	A/A	Asphalt width controlled by fencing foundation at one side and nib kerb on the seaward side in the shared path and through the Uranga - Path markings location at joints to mitigate visual impact.	TBC	S SN/A	To be developed	
63	Plant adjacent to the rail (parked)				Live-Treat		I					TBC	an/A	- Digital shield for plant movements - Vortok fending - RPO control and ITD control - Proximity sensors - Beacons - Permit to work from KiwiRail - ESO	TBC	00 #N/A	To be developed	
64	Access for pavement maintenance plant				Live-Treat							281	ď m√A	- Pavement design life is 23 years but asphalt requires resurfacing after approx. 13 years - All heavy maintenance vehicle access through the north end at Honiana Te Puni Reserve	TBC	an/a	To be developed	
63	Scada Maintenance crew being striking HV DC lines.	Project Wide - 000	DWP-UN-01		Live-Treat	Te Ara Tupua Alliance	Se	ctio	SCADA fibre being pulled through and jointed in the same chamber as the HV DC traction lines	- Injury/ death to workers - Reputational damage - Programme delays	None	TBC	#N/A	- Separation of SCADA chambers from DC - ESO KiwiRail permit to dig requirements	TBC	D #N/A	To be developed	9
66	Service strike via drill shot under SH2	Project Wide - 000	DWP-UN-01		Live - Treat	Te Ara Tupua Allianze			Limited and inaccurate information from utility providers Large number of services present may have a more complex service network than anticipated -insufficient controls in place during construction	- Injury/ death to workers from service strike - Reputational damage - Programme delays - Interruption of an important service	None	ТВС	<u>R</u> #PV/A	- Reduction of the size of drill shots and/or need for the drill shots - Nulse of ITS power supply conduit at the BP to provide power supply for the path. - Taking power from a p lilar on the 58 lane of 5H2 reducing the size of the drill shot required under 5H2.	TBC	≝ #N/A	To be developed	
67	Issues with undermining the rail and while construction of the utilities trench is in construction .	yect Wide	WP-UN-01		we- Treat	Ara Tupua Alliance	ı		Undermining the railway by digging to deep into the existing rock/sea walls	Unacceptable movement of the Railway resulting in an increase in cost and programme losses	None	7BC	≝ #N/A	- Apply for a departure to reduce the minimum duct cover from 1 m (stage A design) to 600 mm	38 F	≅ #N/A	To be developed	
68	Programme delays caused by construction of the utilities trench in the main site access road	pe(c)	DWP. Dv	N-01	E E	n or or	н		- The main utility trench moving from side to side along the path	-Programme delays	None	TBC	d #N/A	- Position main service trench to allow vehicles to pass during construction	18C	¥ #N/A	To be developed	
69	Locking of ITS and electrical cabinets to avoid tampering by general public	roject) r	DWP-		Teest	ling 4	п		Public tampering with unlocked cabinets	Electrocution failure of lights on path		TBC	#N/A	Cabinets will be lockable and one of the hinges will be reversed so the cabinet door cannot be	TBC	29 #N/A	To be developed	
70	Appropriate IP rating of all cabinets for coastal environment	Project VP	DWP-	_	Treat	B of a	П		Causes of damage include: - Wave overtopping	Increase vulnerabi ity of luminaires		380	#N/A	taken off IP rating have been adopted in terms of outdoor use wave over topping considerations to be)	₩ sn/A	To be developed	
71	Inadequate chamber cover sets	Project	DWP.	_	Treat	n se	П		- Inundation - Too slippery for the users	Inadequate chamber cover sets causing a redesign increasing cost	None	38	#N/A	looked into during State C - Think about using high friction lids/ tape products - Use appropriate service lid cover rating for heavy	18C	MN/A	To be developed	
72	Water (storm or sea) filling the ut lity chambers	hoject	DWP.		Į.	n and .	П		- Too weak for maintenance vehicles - No drainage holes in the chambers	-Flooding and short circuiting of electrical cables and ITS infrastructure	None	38	≝ #N/A	Ensure the chambers have drainage holes drilled into the bottom of them	JBC .	MN/A	To be developed	Waka Kotahi
73	Lifting/placement of culverts into position causing injury due to awkward position	Project Wide - p	DWP-DR-02		live- Treat	Te Am Tupus Allance			Lack of space on site and specific culvert locations around xblocks		Most culverts to be made from PE (i.e. light weight material)	Significant	MEDIUM	Use of suitable equipment and trained competent staff. Placement of culverts at low tide and not on a rainy day white area is slippery.	Sgriftant	MEDIUM	To Be Developed	Constructor
74	Transporting culverts to site	oject Wide-	WP-DR-02		we - Treat	Alliance	ı		Long vehicles required to transport to site. PE pipes to be welded off site.	Injury for workers when lifting/moving	- Material and length selection to reduce lift weight	gnificant	MEDIUM	Use of suitable equipment and trained competent staff.	ignificant	MEDIUM	To Be Developed	Constructor
75	Culvert Storage on site	Project Wide - Pro	DWP-DR-02		Uve - Treat	Te Atra Tupus Te Alliance	ı		PE pipes w II be welded off site so will be longer. Small site footprint means that there is less space for manoeuvring	Increased risk of trips and falls due to reduced space	n/A	Insignificant	LOW	Use of suitable equipment and trained competent staff. Pre planning of pipe storage location	Insignificant	VERY LOW	To Be Developed	Constructor
76	Transport across the active site	roject Wide	WP-DR-02		Uve - Test	e Ara Tupua Alliance			Long length and large culverts may result in difficulty transporting across site due to narrow corridor	Damage to other material plant.	- Material and length selection to reduce lift weight	Major	HIGH	Use of suitable equipment and trained competent staff. Construction planning.	Major	MEDIUM	To Be Developed	Constructor
77	Placement and lifting of culverts	Project Wide - 000	DWP-DR-02		Uve-Treat	Te Am Tupus Allance			Litting of culvert in close proximity to rail Rotation of culverts during lifting	Cleats with Kiw Rail overhead lines or rail Injury to worker and public	- Material and length selection to reduce lift weight and improve plant control - Digital shield	Significant	HIGH	-Calibrate digital shield control to include pipes being lifted -Weather consideration choosing to lift when wind is low -Prepare a lifting procedure in construction work package	Sgnificant	MEDIUM	To Be Developed	Constructor
78	Path collapse from storm events driving piping and blowout underneath path	Project Wide - 000	OMP-DR-02		Uve- Treat	Tupua Allance			Water from storm events (rainfall and storm surge) piping outside culvert causing blow out or undermining	Injury reputation cost	- Concrete encasement through revetment	Sgniftant	LOW	- Water stop collars along upstream length	Sgniftant	LOW LOW	To Be Developed	Designer
79	Construction plant damaging pipe during installation requiring additional maintenance	Project Wide-	DWP-DR-02		Uve - Trest	Te Ara Tupua Alliance			Incorrect use of plant lack of site awareness	D fficulties in pipe installation.	- Pipe Material and thickness selection against construction loading	Insignificant	LOW	Construction staging design Temporary cover protection design to be checked by designer Discussion with constructors around Temporary cover protection	Insignificant	tow	To Be Developed	Constructor
80	Working in water where pipe outlets are within the tidal range	Project Wide-000	DWP-08-02		Uve - Treat	Tupus Allance			Contro led by the outlet location of the existing culvert	Slipping drowning and injury	- Weight of pipes	Extrame	CRITICAL	Use of suitable equipment and trained competent staff.	Extreme	HIGH	To Be Developed	Constructor
81	Public entering confined spaces by entering the pipes from the outlet end	hoject Wide - 000	DWP-DR-02		Uve - Trest	Te Ara Tupua Alliance	ı		Ease of access	Drowning trapped in confined space	Consideration of outlet control measures	Major	нісн	Physical separation of users from the outlets Signage Further workshop to treat culvert outlet physical separation trade-off against maintenance requirements	Significant	MEDIUM	To Be Developed	Designer
82	Maintenance operators entering confined spaces by entering the pipes from the outlet end	Project Wide - p	DWP-DR-02		Uve - Test	Re Ara Tupus Allance			Blockage of culverts	Drowning trapped in confined space	- Maintenance carried out from upstream end	Major	нісн	- CCTV and flushing TBC - Discussion with Waka Kotahi and Kiwi Rail Maintenance staff	Minor	MEDIUM	To Be Developed	Maintenance
83	Spill of hazardous material used in culvert construction into the ocean	Project Wide-000	DWP-DR-02		Live - Treat	Tupus Alliance			Misuse of plant uneven terrain	Exposure for construction workers' public and marine life	N/A	Major	ні с н	Environmental Control Plan. Use of suitable equipment and trained competent staff. Workshop to consider different options to mitigate this	Major .	М	To Be Developed	Constructor
84	Fall from heights during placement of revetment blocks around culvert	Project Wide	DWP-DR-02		Uve- Treat	Tupus		L	Lack of space on site slippery surface and specific culvert locations around xblocks	May cause injury to workers	N/A	Ехтете	нісн	Use of suitable equipment and trained competent staff. Construction to take place at low tide and not on a rainy day while area is slippery.	Externe	≹ HIGH	To be developed	Constructor
85	Fall from heights from culvert outlets during shared path operation (and maintenance)	- Project Wide	DWP-DR-02	1	Uve - Treat	Alliance Alliance		L	Lack of visibility of culvert slippery surface	May cause injury to public	N/A	Ехтете	нібн	Use of design features to create visibility of danger or reducing the impacts of falling. Further Workshops to consider different options to mitigate this	Extreme	HIGH HIGH	To be developed	Designer
86	Slippery surface/inadequate space at outlet causing slips trips and falls when maintaining the outlet	P roject Wide	2 DWP-DR-02		t Uve - Treat	Alliance Alliance		L	Lack of space on site slippery surface	May cause injury to maintenance staff and public	Culvert outlets designed with consideration to have minimal maintenance	Major	нісн	Maintenance to take place at low tide and not on a rainy day while area is slippery. Identification of risk in maintenance manual	Major	Мо нібн	To be developed	Maintenance
87	Undermining of existing rail corridor when constructing large chambers to allow connection of extension	Project Wid	DWP-DR-02		Uve - Trea	Allance			Lack of temporary retaining during construction	May cause serious injury to construction staff rail passengers and KR staff and may cause significant damage to rail corridor	N/A	Extreme	HIGH	Temporary works check by designer. Workshop between design and construction teams	Externe	HIGH HIGH	To be developed	Constructor
88	Large diameter culvert through the revetment create a confined spaces that could be accessed by the public	Project Wide -000	DWP-DR-02		Uve - Treat	All and		2	Position and grade of existing culverts and design performance in MRs detrmine the size and location of culvert outlets within the revetments	May cause injury to public who enter the confined space	n/a	Sgnificant	MEDIUM	Outlet design to deter public from entering large culverts. Workshop to consider different options to mitigate this	Sgnificant	MEDIUM	To be developed	Designer
89	Addition of manhole covers within shared path due to connection manholes - could cause s ip / trip / fall / Public I filing manhole covers	Project Wide -	DWP-DR-02		Live-Treat				Manhole lids for a lip or a dip from settlement	May cause injury to public	- Anti-slip coating on manhole lids - Lockable ids - Design requirements and specifications on manhole settlement	Sgnificant	MEDIUM	 Using sleeved coupling instead of manhole to elimaite the cover hazard Consider removal of manholes or incorporating asphalt on manhole lids to reduce slippery surface area. 	Sgnificant	LOW LOW	To be developed	Designer
90	Lirting and placement of large manholes	Project Wide-	DWP-DR-	20	1	1			Size of manholes small corridor for works	May cause injury to construction workers may cause damage to manhole	Using manholes only where required	Significant	MEDIUM	Area - Using sleeved coupling instead of manhole to eliminate the cover hazard. Consider removal of manholes.	Minor	MEDIUM	To be developed	Designer
91	Connection to existing culvert results in existing culvert collapsing beneath due to poor condition of existing culvert.	Project Wide - 000	DWP-DR-02		Live. Frest	Te Aza Vecus Allance			Poor structural integrety of existing culvert	May cause injury to construction workers may cause undermining of railway above require replacement/repair of existing culvert	N/A	Extreme	нісн	Site survey of structural integrity of outlets. Include structural assessment as part of the site survey	Extreme	MIGH HIGH	To be developed	Constructor
92	Collegoe of existing culvert resulting in subsidence/sink hole formation on nail/path	Project Wide -	DWP-DR-02		t Dive-Test	Te Arra Tupus Alliance			Structural integrity of existing culvert may be poor	Injury reputation cost	N/A	Significant	MEDIUM	Site survey of structural integrity of outlets. Design of culvert connection to incorporate findings from survey of structural integrity of culverts	Significant	MOJ LOW	To be developed	Designer
93	Maintenance required for the connections that degrade earlier than design life.	Project Wide - 000	DMP-DR-	03	t Live-Tres	Tupus			Ground movement	May cause settlement causing uneven path surfaces (and posing a trip hazard for path users).	- selection of couple type and materials - design requirements and spec fications to ensure design life is met	Minor	LOW	N/A	Mnor	LOW LOW	To be developed	Designer
94	Undermining of existing rail corridor when constructing subsoil trenches and catchpit manholes	- Project Wide-000	DWP-DR-	8	Uve - Trea	Tupus			Vertical cut to install subsoil drains	Injury reputation cost	Survey to understand the existing ground levels and distances between down main track and proposed subsoil location	Extreme	CRITICAL	Temporary works check by designer. Workshop between design and construction teams - Construction staging design	Extreme	HIGH	To be developed	Construction
95	Plant damaging drains during construction requiring additional maintenance	Project Wide 0 000	DWP-DR-01		sat Live-Treat	Te Ara Tupu Alliance		L	Incorrect use of plant lack of site awareness		Pipe Material and thickness selection against construction loading.	Insignificant	LOW	Construction staging design Temporary cover protection design to be checked by designer Discussion with constructors around Temporary cover protection.	Insignificant	LOW	To be developed	Construction
96	Working in water where outlets are within the tidal range/GWT	t Project 00 Wide - 00	P- DWP-DR	8	rest Une- Te	a Tupus e Allance		-	culvert	pipe installation	Weight of pipes. Bedding backfill specification suitable for working in water	ne Extreme	CRITICAL	Use of suitable equipment and trained competent staff.	ne Externa	High	To be developed	Construction
97	Installation of bridge uPVC downpipes resulting in fall from height	# Projec 00 Wide-0	DR- DWP-DR-		rest Uve - Tr	a Tupu		-	Incorrect plant and equipment	Injury and reputation	Construction sequencing and connection material selection	ant Extrem	нівн	Use of suitable equipment and trained competent staff.	ant Extrem		To be developed	Construction
98	Construction plant damaging structures (e.g. bridge piers/robust kerb) during installation of manholes and pipes to convey stormwater from bridge	t Projes 00 Wide -0	DWP.	_	Treat	e Allan		-	Incorrect use of plant lack of site awareness	D fficulties in SW network installation.	Construction sequencing material selection	ant Signific.	HIGH	Use of suitable equipment and trained competent staff.	ant Sgnific.	MEDIUM	To be developed	Construction
99	Construction plant damaging existing pipes/culverts during installation requiring additional work to achieve saddle connection	t Projec 30 Wide - 0.	R- DWP-DR-	10	est Une - To	Tupu		_	Incorrect use of plant. lack of site awareness	D fficulties in SW network installation. Injury for workers when lifting/moving	Survey to understand the location of the existing pipe	Significa	MEDIUM	Use of suitable equipment and trained competent staff.	Significa	MEDIUM	To be developed	Construction
100	Transportation and storage of subsoil pipes on site	Project Wide-00	DWP-DR	8	Ive - Tre	Tupus		L	Long length of subsoils may result in difficulty transporting across site due to narrow corridor	increased risk of trips and falls due to reduced space damage to other material and plant. Injury to construction workers	- Material and length selection to reduce lift weight	Major	MEDIUM	Use of suitable equipment and trained competent staff. Pre planning of storage location	Major	MEDIUM	To be developed	Construction
101	Slippery surface/inadequate space at subsoit outlet causing slips trips and falls when maintaining the outlet	roject fe - 000	80-4	8	e- Treat	Tupus			Lack of space on site slippery surface	May cause injury to maintenance staff and public	Subsoil outlets designed with consideration to have minimal maintenance	Major	нідн	Maintenance to take place at low tide and not on a rainy day while area is slippery. Identification of	Major	MEDIUM	To be developed	Waka Kotahi
102	Service strike of unknown existing KR Earthenware drains during subsoil installation	sject Wid Wk	WP-DR- DW	10	e - Treat Uh	Ara Tupu			Earthenware drain inlet buried	May cause injury to construction workers damage to material and plant	Site inspection completed prior to IPAA phase identifying KR earthenware drains.	prificant	CRITICAL	risk in maintenance manual Identification of services prior to construction commencement	prificant	MEDIUM	To be developed	Construction
H		ď	6		5	H					- -	35	#N/A		- S			
	New entries above here												#N/A					