Appendix A Scheme Estimates

Project estimate: Entire Route

Form C

Project name: Glen Innes to Tamaki Drive Shared Path

SE
Scheme estimate

Item	Description	Base estimate	Contingency	Funding risk
A	**Nett project property cost**			
	Investigation and reporting:			
	- consultancy fees	Nil	Nil	Nil
	- the NZTA-managed costs	Nil	Nil	Nil
B	**Total investigation and reporting**	**Nil**	**Nil**	**Nil**
	Design and project documentation:			
	- consultancy fees	1,985,689	298,000	597,000
	- the NZTA-managed costs			
C	**Total design and project documentation**	**1985689**	**298000**	**597000**
	Construction			
	MSQA			
	- consultancy fees	455,000	69,000	137,000
	- the NZTA-managed costs			
	- consent monitoring fees			
	Sub-total base MSQA	**455000**	**69000**	**137000**
	Physical works			
1	Environmental compliance	0		
2	Earthworks	1,835,205	367,041	734,082
3	Ground improvements	0	0	0
4	Drainage	321,599	48,240	112,560
5	Pavement and surfacing	16,623	2,493	5,818
6	Bridges	17,992,363	4,245,848	6,944,703
7	Retaining walls	1,208,180	202,772	433,636
8	Traffic services	1,444,704	216,706	361,176
9	Service relocations	210,000	31,500	70,000
10	Landscaping	3,341,609	501,241	1,169,563
11	Traffic management and temporary works	527,500	105,500	158,250
12	Preliminary and general	1,733,300	259,995	606,655
13	Extraordinary construction costs	0		
	Sub-total base physical works			
D	**Total construction**	**29086083**	**6050336**	**10733442**
E	**Project base estimate** (A+C+D)	**31,071,772**		
F	**Contingency** (Assessed/Analysed) (A+C+D)		**6,348,336**	
G	**Project expected estimate** (E+F)		**37,420,108**	
	Project property cost expected estimate			
	Investigation and reporting expected estimate		**Nil**	
	Design and project documentation expected estimate		2,283,689	
	Construction expected estimate		35,136,419	
H	**Funding risk** (Assessed/Analysed) (A+C+D)			**11,330,442**
I	**95th percentile Project Estimate** (G+H)			**48,750,550**
	Project property cost 95th percentile estimate			
	Investigation and reporting 95th percentile estimate			**Nil**
	Design and project documentation 95th percentile estimate			2,880,689
	Construction 95th percentile estimate			45,869,861

Date of estimate 20 January 2015	**Cost index (Qtr/Year) 3rd/2014**
Estimate prepared by Andrew McDonald	**Signed**
Estimate internal peer review by Nick Gluyas	**Signed**
Estimate external peer review by	**Signed**
Estimate accepted by the NZTA	**Signed**

Note: (1) These estimates are exclusive of escalation and GST
(2) Investigation and reporting project phase estimates are set to nil as these are now sunk costs

Project estimate: Section 1
Form C

Project name: Glen Innes to Tamaki Drive Shared Path

SE
Scheme estimate

Item	Description	Base estimate	Contingency	Funding risk
A	**Nett project property cost**			
	Investigation and reporting:			
	- consultancy fees	Nil	Nil	Nil
	- the NZTA-managed costs	Nil	Nil	Nil
B	**Total investigation and reporting**	**Nil**	**Nil**	**Nil**
	Design and project documentation:			
	- consultancy fees	282,000	42,000	85,000
	- the NZTA-managed costs			
C	**Total design and project documentation**	**282000**	**42000**	**85000**
	Construction			
	MSQA			
	- consultancy fees	75,000	11,000	23,000
	- the NZTA-managed costs			
	- consent monitoring fees			
	Sub-total base MSQA	75000	11000	23000
	Physical works			
1	Environmental compliance	0		
2	Earthworks	274,936	54,987	109,974
3	Ground improvements	0		
4	Drainage	168,820	25,323	59,087
5	Pavement and surfacing	0		
6	Bridges	1,482,463	348,811	571,180
7	Retaining walls	358,730	53,810	125,556
8	Traffic services	310,987	46,648	77,747
9	Service relocations	35,000	5,250	8,750
10	Landscaping	1,497,487	224,623	524,120
11	Traffic management and temporary works	164,500	32,900	49,350
12	Preliminary and general	303,100	45,465	106,085
13	Extraordinary construction costs	0		
	Sub-total base physical works			
D	**Total construction**	4671023	848816	1654849
E	**Project base estimate** (A+C+D)	4,953,023		
F	**Contingency** (Assessed/Analysed) (A+C+D)		890,816	
G	**Project expected estimate** (E+F)		5,843,839	
	Project property cost expected estimate			
	Investigation and reporting expected estimate		**Nil**	
	Design and project documentation expected estimate		324,000	
	Construction expected estimate		5,519,839	
H	**Funding risk** (Assessed/Analysed) (A+C+D)			1,739,849
I	**95th percentile Project Estimate** (G+H)			7,583,688
	Project property cost 95th percentile estimate			
	Investigation and reporting 95th percentile estimate			**Nil**
	Design and project documentation 95th percentile estimate			409,000
	Construction 95th percentile estimate			7,174,688

Date of estimate 20 January 2015	**Cost index (Qtr/Year) 3rd/2014**
Estimate prepared by Andrew McDonald	**Signed**
Estimate internal peer review by Nick Gluyas	**Signed**
Estimate external peer review by	**Signed**
Estimate accepted by the NZTA	**Signed**

Note: (1) These estimates are exclusive of escalation and GST
(2) Investigation and reporting project phase estimates are set to nil as these are now sunk costs

Schedule of Prices
Glen Innes to Tamaki Drive Shared Path
Section 1
Scheme Estimate

Base date
1 Jul 2014

Estimate date
18 Jan 2015

Item	Ref	Description	Unit	Quantity	Price	Amount
	S2	**EARTHWORKS**				
	2.2	**Demolition and dismantling installations**				
	2.2.1	Demolition to waste, including timber, concrete and masonry buildings, structures, etc. (building or structure indicated)				
	2.2.1.1	Landscape Supplies: remove existing concrete wall on west boundary and hardstand area as shown on Land Requirement Plan G401	LS	1.0	$ 9,000.00	$ 9,000.00
	2.2.2	Dismantling installations to waste, including safety barriers, fences, signs, sign supports, etc. (installation indicated)				
	2.2.2.1	Fence removal at underpass alleyway	m	20.0	$ 45.00	$ 900.00
	2.2.2.2	Boundary fence removal	m	714.0	$ 40.00	$ 28,560.00
	2.2.2.3	Vegetation clearance and tree removal	LS	1.0	$ 26,500.00	$ 26,500.00
	2.3	**Topsoil**				
	2.3.1	Topsoil stripping including temporary stockpiling of stripped topsoil (site indicated)				
	2.3.1.1	Topsoil stripped from all areas on the site	m3	4400.0	$ 9.43	$ 41,492.00
	2.6	**Fill**				
	2.6.1	Cut to fill (material classification indicated)				
	2.6.1.1	Type A soft material, including type R1 and type R2 hard materials	m3	3690.0	$ 11.73	$ 43,283.70
	2.6.2	Imported fill				
	2.6.2.1	Imported fill	m3	1400.0	$ 50.00	$ 70,000.00
	2.7	**Waste**				
	2.7.1	Cut to waste surplus material (material classification indicated)				
	2.7.1.1	Type A soft material, including type R1 and type R2 hard materials	m3	920.0	$ 60.00	$ 55,200.00
	Subtotal					**$ 274,935.70**
	S4	**DRAINAGE**				
	4.1	**Stormwater Management**				
	4.1.1	Stormwater management (Refer to separate cost sheet)	LS	1.0	$ 168,820.00	$ 168,820.00
	Subtotal					**$ 168,820.00**
	S6	**BRIDGES AND STRUCTURES**				
	6.1	**MSE Ramp**				
	6.1.0.1	Undercut to waste Type A soft material, including type R1 and type R2 hard materials depth 0 m to 0.5 m	m3	1488.0	$ 12.40	$ 18,451.20
	6.1.0.2	Bulk Full Material	m3	16100.0	$ 70.00	$ 1,127,000.00
	6.1.0.3	Geotextile fabric, Bidim A29	m2	2800.0	$ 3.20	$ 8,960.00
	6.1.0.4	Supply and install of geogrid	m2	10000.0	$ 4.25	$ 42,500.00
	6.1.0.5	Subsoil drains	m	5000.0	$ 3.00	$ 15,000.00
	6.1.0.6	Supply and installation of 1050 mm inside diametre culvert including allowance for headwalls and rip rap	m	35.0	$ 1,500.00	$ 52,500.00
	6.2	**Concrete Bridge Adjacent Underpass**				
	6.2.1.1	Site Clearence and Trim to Grade	LS	1.0	$ 3,000.00	$ 3,000.00
	6.2.1.2	Excavation of Abutments	m3	12.0	$ 45.00	$ 540.00

Item	Ref	Description	Unit	Quantity	Price	Amount
	6.2.1.3	40 MPa Reinforced Concrete Abutments	m3	12.0	$ 1,600.00	$ 19,200.00
	6.2.1.4	Supply Super T Bridge Beams 10m span	No	4.0	$ 16,000.00	$ 64,000.00
	6.2.1.5	Install Super T Bridge Beams 10m-22.5m span	No	4.0	$ 2,400.00	$ 9,600.00
	6.2.1.6	Abutment elastomeric Bearings	No	2.0	$ 1,000.00	$ 2,000.00
	6.2.1.7	Galvanised linkage bars	No	16.0	$ 190.00	$ 3,040.00
	6.2.1.8	40 Mpa reinforced Concrete Deck	m3	3.4	$ 190.00	$ 646.00
	6.2.1.9	1.4 m high handrails	m	20.0	$ 350.00	$ 7,000.00
	6.3	**Concrete Bridge Adjacent Informal Access from Felton Mathew Avenue**				
	6.3.3.1	Site Clearence and Trim to Grade	LS	1.0	$ 3,000.00	$ 3,000.00
	6.3.3.2	Excavation of Abutments	m3	12.0	$ 45.00	$ 540.00
	6.3.3.3	40 MPa Reinforced Concrete Abutments	m3	12.0	$ 1,600.00	$ 19,200.00
	6.3.3.4	Supply Super T Bridge Beams 10m span	No	4.0	$ 16,000.00	$ 64,000.00
	6.3.3.5	Install Super T Bridge Beams 10m-22.5m span	No	4.0	$ 2,400.00	$ 9,600.00
	6.3.3.6	Abutment elastomeric Bearings	No	2.0	$ 1,000.00	$ 2,000.00
	6.3.3.7	Galvanised linkage bars	No	16.0	$ 190.00	$ 3,040.00
	6.3.3.8	40 Mpa reinforced Concrete Deck	m3	3.4	$ 190.00	$ 646.00
	6.3.3.9	1.4 m high handrails	m	20.0	$ 350.00	$ 7,000.00
	Subtotal					**$ 1,482,463.20**
	S7	**RETAINING WALLS**				
	7.1	**Excavation and backfilling**				
	7.1.1.1	Concrete reinforced nib wall 0.3 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, formwork and supply and placement of concrete	m	75.0	$ 144.00	$ 10,800.00
	7.1.1.2	Concrete reinforced nib wall 0.5 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, formwork and supply and placement of concrete	m	95.0	$ 240.00	$ 22,800.00
	7.1.1.3	H-Pile timber walls 0.5 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	60.0	$ 305.00	$ 18,300.00
	7.1.1.4	H-Pile timber walls 0.75 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	70.0	$ 457.50	$ 32,025.00
	7.1.1.5	H-Pile timber walls 1.2 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	215.0	$ 732.00	$ 157,380.00
	7.1.1.6	H-Pile timber walls 1.5 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	45.0	$ 915.00	$ 41,175.00

Item	Ref	Description	Unit	Quantity	Price	Amount
	7.1.1.7	H-Pile timber walls 2.5 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	50.0	$ 1,525.00	$ 76,250.00
	Subtotal					**$ 358,730.00**
	S8	**TRAFFIC SERVICES**				
	8.2	**Pavement Markings and Delineation**				
	8.2.2	Line markings (width, type, colour, material indicated)				
	8.2.2.1	100 mm continuous white reflectorised paint	m	18.0	$ 8.00	$ 144.00
	8.2.4	Symbols (type, material, application, colour, indicated)				
	8.2.4.1	Cycle & pedestrian symbols with arrows	No	22.0	$ 60.00	$ 1,320.00
	8.3	**Road Signs**				
	8.3.1	Sign board at access points Includes wayfinding information and path use information	No	12.0	$ 800.00	$ 9,600.00
	8.5	**Lighting**				
	8.5.1	Trenching and ducts (duct diameter, type, and trench depth indicated)				
	8.5.1.3	100 mm orange PVC with marker tape in trenches up to 1.5 m deep	m	1640.0	$ 41.42	$ 67,928.80
	8.5.6	Concrete foundations including excavation and backfilling, steel reinforcing, bolt group, and formwork (concrete strength, cage, and size indicated)				
	8.5.6.1	25 MPa cast in situ concrete with PCAGE-10 and 1.0 m depth	No	61.0	$ 240.00	$ 14,640.00
	8.5.10	Cables (size and type indicated)				
	8.5.10.2	16 mm2 three core neutral screen	m	1928.0	$ 27.44	$ 52,904.32
	8.5.11	Lighting columns (type, height, and outreach indicated)				
	8.5.11.1	Frangible 6 m ground planted column	No	61.0	$ 1,500.00	$ 91,500.00
	8.5.13	Luminaires (type and power indicated)				
	8.5.13.4	Cree LEDway 30LED 700mA 70W Series E - 0° Tilt	No	61.0	$ 950.00	$ 57,950.00
	8.5.14	Lighting control equipment including identification of and connection to power supply	LS	1.0	$ 15,000.00	$ 15,000.00
	Subtotal					**$ 310,987.12**
	S9	**SERVICE RELOCATIONS**				
	9.2	**Electrical Power**				
	9.2.3	Underground power cables	PS	1.0	$ 15,000.00	$ 15,000.00
	9.3	**Water**				
	9.3.1	Water mains	PS	1.0	$ 15,000.00	$ 15,000.00
	9.4	**Sewerage**				
	9.4.1	Sewerage	PS	1.0	$ 5,000.00	$ 5,000.00
	Subtotal					**$ 35,000.00**
	S10	**LANDSCAPING AND URBAN DESIGN**				
	10.1	**Topsoil and planting**				
	10.1.1	Topsoil using stockpiled material (nominal thickness and application indicated)				
	10.1.1.1	250 mm thick to grassed verges / buffer zone	m2	3200.0	$ 2.49	$ 7,968.00

Item	Ref	Description	Unit	Quantity	Price	Amount
	10.1.2	Topsoil using stockpiled material (application indicated)				
	10.1.2.2	Slopes flatter than 1:2	m3	3600.0	$ 75.99	$ 273,564.00
	10.2	**Planting**				
	10.2.1	Grass - seeded (method and seed mixture indicated)				
	10.2.1.1	Hand sown amenity area mix 70 % sports (dwarf) rye grass 25 % Chewings type red fescue 5 % brown top	m2	8740.0	$ 1.97	$ 17,217.80
	10.2.4	Trees and planting				
	10.2.4.1	Replacement tree planting mitigation (provisional sum)	LS	1.0	$ 70,000.00	$ 70,000.00
	10.2.4.2	Divaricating plants and sedges, root trainer grade at 500 mm centres	No	11840.0	$ 5.00	$ 59,200.00
	10.2.5	Tree root protection				
	10.2.5.1	Boardwalk over totara roots at chainage 1,005	m2	60.0	$ 200.00	$ 12,000.00
	10.4	**Paving**				
	10.4.3	Path Construction				
	10.4.3.1	GAP40 basecourse to footpath	m3	660.0	$ 72.74	$ 48,008.40
	10.4.3.2	20 MPa concrete path 100 mm thick with 665 mesh and with brushed surface finish (based on subgrade CBR = 5)	m2	6560.0	$ 45.23	$ 296,708.80
	10.4.4	Concrete speed tables				
	10.4.4.1	5 kg/m3 black oxide concrete speed tables including stamped textured surface as per drawing G502	m2	63.0	$ 150.00	$ 9,450.00
	10.5	**Fences, Gates, and Handrails**				
	10.5.1	Temporary fences including maintenance and removal (type and location indicated)				
	10.5.1.1	Temporary fencing suitable for stock to be located 5 m outside the extent of works. Ch 95 to Ch 1485 east side	m	1390.0	$ 33.00	$ 45,870.00
	10.5.6	Fences (type indicated or drawing referenced)				
	10.5.6.3	Galvanised and powder coated black steel palaside panel fence 1.4 m high including post excavation and backfill and concrete foundation	m	1850.0	$ 350.00	$ 647,500.00
	10.6	**Street Furniture**				
	10.6.1	Bollards (type indicated)				
	10.6.1.3	Galvanised steel bollard including concrete foundation – removable with lock	No	10.0	$ 600.00	$ 6,000.00
	10.7	**Property Reinstatement**				
	10.7.1	Reinstatement of Landscape Supplies conrete bay wall	PS	1.0	$ 4,000.00	$ 4,000.00
	Subtotal					**$ 1,497,487.00**
	S11	**TRAFFIC MANAGEMENT**				
	11.1	**Traffic Management**				
	11.1.1	Temporary traffic management plan - preparation and implementation				
	11.1.1.1	Preparation	LS	1.0	$ 1,500.00	$ 1,500.00
	11.1.1.2	Implementation	LS	1.0	$ 1,000.00	$ 1,000.00
	11.1.2	Temporary traffic management plan management and maintenance				
	11.1.2.2	Level 2 traffic control	day	180.0	$ 900.00	$ 162,000.00
	Subtotal					**$ 164,500.00**
	S12	**PRELIMINARIES AND GENERAL**				
	12.1	**Establishment etc.**				

Item	Ref	Description	Unit	Quantity	Price	Amount
	12.1.1	Allowance for the Contractor's costs for establishing on Site, temporary environmental compliance, carrying out the Contract Works and for the recovery of the Contractor's other overheads and profit that are not otherwise provided for in other items and prices included in the Schedule of Prices.	LS	1.0	$ 298,100.00	$ 298,100.00
	12.3	**Plans, Operating Manuals, Records, etc.**				
	12.3.2	Owner's operating manuals, legalisation surveys, as-built drawings, RAMM data, bridge update data, photography, etc (as indicated)				
	12.3.2.1	As-built drawings	LS	1.0	$ 5,000.00	$ 5,000.00
	Subtotal					**$ 303,100.00**
					Total:	**$ 4,596,023.02**

Project estimate: Section 2
Form C

Project name: Glen Innes to Tamaki Drive Shared Path

SE
Scheme estimate

Item	Description	Base estimate	Contingency	Funding risk
A	**Nett project property cost**			
	Investigation and reporting:			
	- consultancy fees	Nil	Nil	Nil
	- the NZTA-managed costs	Nil	Nil	Nil
B	**Total investigation and reporting**	**Nil**	**Nil**	**Nil**
	Design and project documentation:			
	- consultancy fees	685000	103,000	206,000
	- the NZTA-managed costs			
C	**Total design and project documentation**	**685000**	**103000**	**206000**
	Construction			
	MSQA			
	- consultancy fees	150,000	23,000	45,000
	- the NZTA-managed costs			
	- consent monitoring fees			
	Sub-total base MSQA	150000	23000	45000
	Physical works			
1	Environmental compliance	0		
2	Earthworks	1,360,802	272,160	544,321
3	Ground improvements	0		
4	Drainage	140,799	21,120	49,280
5	Pavement and surfacing	14,823	2,223	5,188
6	Bridges	4,608,750	921,750	1,613,063
7	Retaining walls	634,000	95,100	221,900
8	Traffic services	568,122	85,218	142,031
9	Service relocations	70,000	10,500	24,500
10	Landscaping	1,222,935	183,440	428,027
11	Traffic management and temporary works	180,500	36,100	54,150
12	Preliminary and general	531,800	79,770	186,130
13	Extraordinary construction costs	0		
	Sub-total base physical works			
D	**Total construction**	9482530	1730382	3313588
E	**Project base estimate** (A+C+D)	10,167,530		
F	**Contingency** (Assessed/Analysed) (A+C+D)		1,833,382	
G	**Project expected estimate** (E+F)		12,000,912	
	Project property cost expected estimate			
	Investigation and reporting expected estimate		**Nil**	
	Design and project documentation expected estimate		788,000	
	Construction expected estimate		11,212,912	
H	**Funding risk** (Assessed/Analysed) (A+C+D)			3,519,588
I	**95th percentile Project Estimate** (G+H)			15,520,500
	Project property cost 95th percentile estimate			
	Investigation and reporting 95th percentile estimate			**Nil**
	Design and project documentation 95th percentile estimate			994,000
	Construction 95th percentile estimate			14,526,500

Date of estimate 20 January 2015	**Cost index (Qtr/Year) 3rd/2014**
Estimate prepared by Andrew McDonald	**Signed**
Estimate internal peer review by Nick Gluyas	**Signed**
Estimate external peer review by	**Signed**
Estimate accepted by the NZTA	**Signed**

Note: (1) These estimates are exclusive of escalation and GST
(2) Investigation and reporting project phase estimates are set to nil as these are now sunk costs

Schedule of Prices
Glen Innes to Tamaki Drive Shared Path
Section 2
Scheme Estimate

Base date
1 Jul 2014

Estimate date
18 Jan 2015

Item	Ref	Description	Unit	Quantity	Price	Amount
	S2	**EARTHWORKS**				
	2.2	**Demolition and dismantling installations**				
	2.2.2	Dismantling installations to waste, including safety barriers, fences, signs, sign supports, etc. (installation indicated)				
	2.2.2.1	Fence removal along the frontage of the pony club on St Johns Road	m	55.0	$ 45.00	$ 2,475.00
	2.2.2.2	Boundary fence removal	m	270.0	$ 40.00	$ 10,800.00
	2.2.2.3	Tree removal along boundary	LS	1.0	$ 23,000.00	$ 23,000.00
	2.2.2.4	Vegetation clearance	m2	12165.0	$ 50.00	$ 608,250.00
	2.3	**Topsoil**				
	2.3.1	Topsoil stripping including temporary stockpiling of stripped topsoil (site indicated)				
	2.3.1.1	Topsoil stripped from all areas on the site	m3	4335.0	$ 9.43	$ 40,879.05
	2.6	**Fill**				
	2.6.1	Cut to fill (material classification indicated)				
	2.6.1.1	Type A soft material, including type R1 and type R2 hard materials	m3	8120.0	$ 11.73	$ 95,247.60
	2.6.2	Imported fill				
	2.6.2.1	Imported Fill	m3	8625.0	$ 50.00	$ 431,250.00
	2.7	**Waste**				
	2.7.1	Cut to waste surplus material (material classification indicated)				
	2.7.1.1	Type A soft material, including type R1 and type R2 hard materials	m3	2030.0	$ 65.00	$ 131,950.00
	2.7.2	Cut to waste unsuitable material				
	2.7.2.1	kerb and channel, sawcut and remove	m	160.0	$ 45.00	$ 7,200.00
	2.7.2.2	Footpath, sawcut and remove	m2	162.5	$ 60.00	$ 9,750.00
	Subtotal					**$ 1,360,801.65**
	S4	**DRAINAGE**				
	4.1	**Stormwater Management**				
	4.1.1	Stormwater management (Refer to separate cost sheet)	LS	1.0	$ 113,170.00	$ 113,170.00
	4.2	**Kerbs and Channels**				
	4.2.3	Cast in situ concrete kerb and channel combination (type indicated)				
	4.2.3.1	Supply and install new kerb and channel as per ATCOP GD009 Type 3 Standard Engineering Detail	m	60.0	$ 100.00	$ 6,000.00
	4.3	**Subsoil Drains**				
	4.3.1	Subsoil drains including excavation, filter media and pipes, and backfilling (application category, pipe size, depth range, material, filtration class, and strength class indicated)				
	4.3.1.2	G3: Pavement subsoil drains Filtration Class 1 Strength Class A 100 mm diameter pipe 1.0 m to 1.5 m depth	m	60.0	$ 19.80	$ 1,188.00

Item	Ref	Description	Unit	Quantity	Price	Amount
	4.4	**Culverts**				
	4.4.1	Concrete pipe culverts including excavation in all materials, shoring appropriate to excavation depth, and backfill with excavated material (size, type, class, trench or embankment condition, bedding, haunching, side fill, and depth ranges indicated)				
	4.4.1.4	300 DN RCRRJ Class 2 Type H1 support depth 0 m to 1.5 m	m	40.0	$ 300.00	$ 12,000.00
	4.6	**Catch Pits, Cesspits, and Manholes**				
	4.6.1	Catch pits and cesspits including the chamber, benching, riser sections, precast beams, lintels and kerbs, frames and grates as required, but excluding leads (type, description, dimensions, and grate type indicated)				
	4.6.1.1	Precast concrete back entry catch pit 675 mm x 450 mm x 1200 mm 675 mm x 450 mm grate with 300 mm x 150 mm reinforced concrete apron	No	1.0	$ 1,440.80	$ 1,440.80
	4.6.2	Manholes including excavation, backfill, base, benching, riser sections and rungs, lid, adjustment rings, frame, and cover or grate (type, diameter, description, and depth from cover to invert indicated)				
	4.6.2.1	Precast concrete 1050 mm diameter with heavy duty cast iron frame and grate grate to invert depth not exceeding 1.4 m	No	2.0	$ 3,500.00	$ 7,000.00
	Subtotal					**$ 140,798.80**
	S5	**PAVEMENT AND SURFACING**				
	5.1	**Subbase**				
	5.1.3	Subbase from commercial sources (material, grading, and strength indicated)				
	5.1.3.2	Upper subbase AP65	m3	75.5	$ 70.00	$ 5,282.20
	5.2	**Basecourse**				
	5.2.1	Basecourse (application, material, and grading indicated)				
	5.2.1.3	NZTA M/4 AP40	m3	32.3	$ 95.00	$ 3,072.30
	5.4	**Surfacing**				
	5.4.8	Asphaltic concrete surfacing (application, type, and thickness indicated)				
	5.4.8.7	Mix 20 AC surfacing 40 mm thick including Grade 5/6 membrane	m2	215.6	$ 30.00	$ 6,468.00
	Subtotal					**$ 14,822.50**
	S6	**BRIDGES AND STRUCTURES**				
	6.1	**Elevated Bridge Ramp Chainage 745 to 870)**				
	6.1.0.1	Fill to form ramps at bridge ends	m3	120.0	$ 80.00	$ 9,600.00
	6.1.0.2	Site clearance and trim to grade	No	3.0	$ 19,000.00	$ 57,000.00
	6.1.0.3	Access track formation	m3	160.0	$ 80.00	$ 12,800.00
	6.1.0.4	Excavation of Foundations	m3	200.0	$ 45.00	$ 9,000.00
	6.1.0.5	40 MPa reinforced Concrete foundations	m3	200.0	$ 1,600.00	$ 320,000.00
	6.1.0.6	40 MPa Reinforced Concrete Abutments	m3	200.0	$ 1,500.00	$ 300,000.00
	6.1.0.7	Structural Steel Towers	m	150.0	$ 1,500.00	$ 225,000.00

Item	Ref	Description	Unit	Quantity	Price	Amount
	6.1.0.8	Structural Steel Beams	m	520.0	$ 1,600.00	$ 832,000.00
	6.1.0.9	GRP Decking	m2	700.0	$ 50.00	$ 35,000.00
	6.2	**Rail Over Bridge**				
	6.2.1.1	Prepare KiwiRail Management Plans	LS	1.0	$ 10,000.00	$ 10,000.00
	6.2.1.2	Implementation of Management Plans	LS	1.0	$ 20,000.00	$ 20,000.00
	6.2.1.3	Fill to form ramps at bridge ends	m3	120.0	$ 80.00	$ 9,600.00
	6.2.1.4	Site Clearence and Trim to Grade	LS	25.0	$ 2,000.00	$ 50,000.00
	6.2.1.5	Metal for Access Track	m3	160.0	$ 80.00	$ 12,800.00
	6.2.1.6	Excavation of Abutments	m3	14.0	$ 45.00	$ 630.00
	6.2.1.7	Establishment of Pilling Plant	ea	2.0	$ 4,000.00	$ 8,000.00
	6.2.1.8	Set Up Pilling plant for Each Pile	ea	18.0	$ 2,000.00	$ 36,000.00
	6.2.1.9	750 mm diameter Bored Piles- Soft Drilling	m	360.0	$ 120.00	$ 43,200.00
	6.2.1.10	750 mm diameter Bored Piles- Hard Drilling	m	180.0	$ 200.00	$ 36,000.00
	6.2.1.11	6mm Permanent Steel Liners for Soft Drilling	m	360.0	$ 400.00	$ 144,000.00
	6.2.1.12	40 MPa reinforced Concrete in Bored Piles	m3	240.0	$ 1,600.00	$ 384,000.00
	6.2.1.13	40 MPa Reinforced Concrete Abutments	m3	12.0	$ 1,400.00	$ 16,800.00
	6.2.1.14	600 mm diameter Pier Column Formwork and Falsework	m	108.0	$ 1,500.00	$ 162,000.00
	6.2.1.15	40 MPa Reinforced Concrete in Pier Columns	m3	30.0	$ 2,000.00	$ 60,000.00
	6.2.1.16	Supply Super T Bridge Beams 10m span	No	64.0	$ 16,000.00	$ 1,024,000.00
	6.2.1.17	Supply Super T Bridge Beams 30m-34m span	No	2.0	$ 50,000.00	$ 100,000.00
	6.2.1.18	Install Super T Bridge Beams 10m-22.5m span	No	64.0	$ 3,000.00	$ 192,000.00
	6.2.1.19	Install Super T Bridge Beams 30m span	No	2.0	$ 7,000.00	$ 14,000.00
	6.2.1.20	Abutment elastomeric Bearings	No	2.0	$ 1,000.00	$ 2,000.00
	6.2.1.21	Pier elastomeric Bearings	No	4.0	$ 1,000.00	$ 4,000.00
	6.2.1.22	Galvanised linkage bars	No	8.0	$ 190.00	$ 1,520.00
	6.2.1.23	40 Mpa reinforced Concrete Deck	m3	783.0	$ 600.00	$ 469,800.00
	6.2.1.24	Abutment Expansion Joints	m	40.0	$ 200.00	$ 8,000.00
	Subtotal					**$ 4,608,750.00**
	S7	**RETAINING WALLS**				
	7.1	**Excavation and backfilling**				
	7.1.1	Excavation (material classification and depth ranges indicated)				
	7.1.1.3	H-Pile timber walls 1 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	44.0	$ 690.00	$ 30,360.00
	7.1.1.4	H-Pile timber walls 1.2 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	20.0	$ 732.00	$ 14,640.00
	7.1.1.5	H-Pile timber walls 1.5 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	20.0	$ 1,000.00	$ 20,000.00

Item	Ref	Description	Unit	Quantity	Price	Amount
	7.1.1.6	H-Pile timber walls 2 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	50.0	$ 1,380.00	$ 69,000.00
	7.1.1.7	H-Pile timber walls 4.5 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, drilling and supply and placement of H-piles, concrete foundation and timber rounds	m	40.0	$ 3,100.00	$ 124,000.00
	7.1.1.8	Timber crib wall 6 m high Includes allowance for excavation, strip and stockpile topsoil, placement of A29 geofabric, drainage fill behind the wall, supply and placement of concrete foundation.	m	80.0	$ 4,700.00	$ 376,000.00
	Subtotal					**$ 634,000.00**
	S8	**TRAFFIC SERVICES**				
	8.1	**Road Furnature**				
	8.1.1	Traffic Islands				
	8.1.1.1	Supply and lay kerb to profile specified and as per ATCOP Dwg no. FP013	m	40.0	$ 70.00	$ 2,800.00
	8.1.1.2	Supply and lay 150mm depth McCallums concrete with exposed aggregate finish (20MPa) as per ATCOP Drawing No. FP013	m	25.0	$ 75.00	$ 1,875.00
	8.1.1.3	Sawcut and remove existing traffic island and reinstate pavement subbase (300mm deep GAP65), basecourse (150mm deep TNZ M/4) and surfacing (40mm AC14).	m	20.0	$ 40.00	$ 800.00
	8.2	**Pavement Markings and Delineation**				
	8.2.2	Line markings (width, type, colour, material indicated)				
	8.2.2.1	100 mm continuous white reflectorised paint	m	390.0	$ 8.00	$ 3,120.00
	8.2.2.5	100 mm broken white reflectorised paint	m	30.0	$ 2.76	$ 82.80
	8.2.2.9	300 mm white limit lines reflectorised paint	m	10.0	$ 8.41	$ 84.10
	8.2.2.13	Approved Green Surfacing (one coat only - note to allow minimum of 1-month before applying on new surfacing)	m2	60.0	$ 60.00	$ 3,600.00
	8.2.2.14	Permanent removal of general line marking including RRPMs	m	200.0	$ 5.00	$ 1,000.00
	8.2.2.15	Permanent removal of other roadmarkings	m	3.0	$ 10.00	$ 30.00
	8.2.4	Symbols (type, material, application, colour, indicated)				
	8.2.4.1	Cycle & pedestrian symbols with arrows	No	19.0	$ 60.00	$ 1,140.00
	8.2.4.2	7.2 m nominal length white lane arrows reflectorised paint	No	2.0	$ 85.00	$ 170.00
	8.2.6	Tactile pavers				
	8.2.6.1	Supply and install concrete tactile pavers	m2	2.2	$ 450.00	$ 972.00
	8.3	**Road Signs**				
	8.3.1	Sign board at access points Includes wayfinding information and path use information	No	10.0	$ 800.00	$ 8,000.00
	8.3.3	Regulatory and warning signs single post (type, grade, and size ranges indicated)				

Item	Ref	Description	Unit	Quantity	Price	Amount
	8.3.3.1	Remove existing sign	No	4.0	$ 50.00	$ 200.00
	8.3.3.2	RG 17 - Keep Left	No	1.0	$ 200.00	$ 200.00
	8.3.3.3	RG 6 Give Way Sign	No	1.0	$ 200.00	$ 200.00
	8.3.3.4	Vertiflex impact post with surface mounted socket	No	2.0	$ 100.00	$ 200.00
	8.3.3.5	New cycleway handrail as per ATCOP CD012	No	1.0	$ 400.00	$ 400.00
	8.4	**Traffic Signals**				
	8.4.1	Trenching and ducts (duct diameter, type, and trench depth indicated)				
	8.4.1.2	100 mm orange PVC with marker tape in trenches up to 1.5 m deep	m	10.0	$ 41.42	$ 414.20
	8.4.2	Saw cutting for trenches and installation of draw pits and chambers (material and thickness indicated)				
	8.4.2.2	Asphalt surfacing up to 50 mm thick	m	20.0	$ 15.54	$ 310.80
	8.4.3	Trench surface reinstatement (materials and thicknesses indicated)				
	8.4.3.2	150 mm basecourse	m2	10.0	$ 82.84	$ 828.40
	8.4.3.3	Mix 20 AC surfacing 50 mm thick	m2	10.0	$ 51.78	$ 517.80
	8.4.5	Draw pits and chambers including frames and lids (type and size indicated)				
	8.4.5.1	600 mm diameter chambers	No	1.0	$ 680.82	$ 680.82
	8.4.8	Cables (type indicated)				
	8.4.8.2	36-core traffic signal cable	m	20.0	$ 25.88	$ 517.60
	8.4.9	Poles including terminal assemblies (type, size, and application indicated)				
	8.4.9.1	5 m standard pole ground mount	No	2.0	$ 1,863.85	$ 3,727.70
	8.4.9.2	Signal pole relocation	No	3.0	$ 800.00	$ 2,400.00
	8.4.9.7	Pedestrian stub pole	No	2.0	$ 569.51	$ 1,139.02
	8.4.10	Signal faces including lanterns, masks, visors, target boards, mounting brackets, and straps (diameter, number of columns, number of aspects, and type indicated)				
	8.4.10.1	Cycle / pedestrian 2 aspect	No	6.0	$ 849.08	$ 5,094.48
	8.4.10.2	200 mm single column 3 aspect	No	2.0	$ 1,527.32	$ 3,054.64
	8.4.12	Pedestrian detection devices (type indicated)				
	8.4.12.1	Audio tactile pedestrian call button and driver	No	2.0	$ 828.38	$ 1,656.76
	8.5	**Lighting**				
	8.5.1	Trenching and ducts (duct diameter, type, and trench depth indicated)				
	8.5.1.3	100 mm orange PVC with marker tape in trenches up to 1.5 m deep	m	2560.0	$ 41.42	$ 106,035.20
	8.5.6	Concrete foundations including excavation and backfilling, steel reinforcing, bolt group, and formwork (concrete strength, cage, and size indicated)				
	8.5.6.1	25 MPa cast in situ concrete with PCAGE-10 and 1.0 m depth	No	105.0	$ 240.00	$ 25,200.00
	8.5.10	Cables (size and type indicated)				
	8.5.10.2	16 mm2 three core neutral screen	m	3820.0	$ 27.44	$ 104,820.80
	8.5.11	Lighting columns (type, height, and outreach indicated)				
	8.5.11.1	Frangible 6 m ground planted column	No	105.0	$ 1,500.00	$ 157,500.00
	8.5.12	Street Light Relocation				

Item	Ref	Description	Unit	Quantity	Price	Amount
	8.5.12.1	Relocate street light to new location and Connection to power by authorised contractor	No	2.0	$ 4,800.00	$ 9,600.00
	8.5.13	Luminaires (type and power indicated)				
	8.5.13.4	Cree LEDway 30LED 700mA 70W Series E - 0° Tilt	No	105.0	$ 950.00	$ 99,750.00
	8.5.14	Lighting control equipment including identification of and connection to power supply	LS	1.0	$ 20,000.00	$ 20,000.00
	Subtotal					**$ 568,122.12**
	S9	**SERVICE RELOCATIONS**				
	9.1	**Telecommunications**				
	9.1.1	Telecommunication cables	PS	1.0	$ 10,000.00	$ 10,000.00
	9.2	**Electrical Power**				
	9.2.1	Overhead power lines	PS	1.0	$ 30,000.00	$ 30,000.00
	9.2.3	Underground power cables	PS	1.0	$ 10,000.00	$ 10,000.00
	9.3	**Water**				
	9.3.1	Water mains	PS	1.0	$ 10,000.00	$ 10,000.00
	9.4	**Sewerage**				
	9.4.1	Sewerage	PS	1.0	$ 5,000.00	$ 5,000.00
	9.5	**Gas**				
	9.5.1	Gas mains	PS	1.0	$ 5,000.00	$ 5,000.00
	Subtotal					**$ 70,000.00**
	S10	**LANDSCAPING AND URBAN DESIGN**				
	10.1	**Topsoil and planting**				
	10.1.1	Topsoil using stockpiled material (nominal thickness and application indicated)				
	10.1.1.1	250 mm thick to grassed verges / buffer zone	m2	5000.0	$ 4.15	$ 20,750.00
	10.1.2	Topsoil using stockpiled material				
	10.1.2.2	Slopes flatter than 1:2	m3	3085.0	$ 75.99	$ 234,429.15
	10.2	**Planting**				
	10.2.4	Trees and planting				
	10.2.4.1	Replacement tree planting mitigation (provisional sum)	LS	1.0	$ 40,000.00	$ 40,000.00
	10.2.4.2	Divaricating plants and sedges, root trainer grade at 500 mm centres	No	4000.0	$ 5.00	$ 20,000.00
	10.4	**Paving**				
	10.4.3	Path Construction				
	10.4.3.1	GAP40 basecourse to path 100 mm thick	m3	1059.2	$ 72.74	$ 77,042.57
	10.4.3.2	20 MPa concrete path 100 mm thick with 665 mesh and with brushed surface finish (based on subgrade CBR = 5)	m2	9730.0	$ 45.23	$ 440,087.90
	10.4.4	Concrete speed tables				
	10.4.4.1	5 kg/m3 black oxide concrete speed tables including stamped textured surface as per drawing G502	m2	31.5	$ 150.00	$ 4,725.00
	10.5	**Fences, Gates, and Handrails**				
	10.5.1	Temporary fences including maintenance and removal (type and location indicated)				
	10.5.1.1	Temporary fencing suitable for stock to be located 5 m outside the extent of works. Ch 50 to Ch 750	m	700.0	$ 33.00	$ 23,100.00
	10.5.6	Fences (type indicated or drawing referenced)				
	10.5.6.3	Galvanised and powder coated black steel palaside panel fence 1.4 m high including post excavation and backfill and concrete foundation	m	700.0	$ 350.00	$ 245,000.00

Item	Ref	Description	Unit	Quantity	Price	Amount
	10.5.6.4	Ranch style timber fence 1.4 m high including post excavation and backfill and concrete foundation	m	55.0	$ 200.00	$ 11,000.00
	10.5.6.5	Timber fence 1.4 m high including post excavation and backfill and concrete foundation	m	170.0	$ 300.00	$ 51,000.00
	10.5.6.6	Timber paling boundary fence 1.8 m high including post excavation and backfill and concrete foundation	m	270.0	$ 180.00	$ 48,600.00
	10.6	**Street Furniture**				
	10.6.1	Bollards (type indicated)				
	10.6.1.3	Galvanised steel bollard including concrete foundation – removable with lock	No	12.0	$ 600.00	$ 7,200.00
	Subtotal					**$ 1,222,934.62**
	S11	**TRAFFIC MANAGEMENT**				
	11.1	**Traffic Management**				
	11.1.1	Temporary traffic management plan - preparation and implementation				
	11.1.1.1	Preparation	LS	1.0	$ 3,000.00	$ 3,000.00
	11.1.1.2	Implementation	LS	1.0	$ 2,000.00	$ 2,000.00
	11.1.2	Temporary traffic management plan management and maintenance				
	11.1.2.2	Level 2 traffic control	day	195.0	$ 900.00	$ 175,500.00
	Subtotal					**$ 180,500.00**
	S12	**PRELIMINARIES AND GENERAL**				
	12.1	**Establishment etc.**				
	12.1.1	Allowance for the Contractor's costs for establishing on Site, temporary environmental compliance, carrying out the Contract Works and for the recovery of the Contractor's other overheads and profit that are not otherwise provided for in other items and prices included in the Schedule of Prices.	LS	1.0	$ 523,800.00	$ 523,800.00
	12.3	**Plans, Operating Manuals, Records, etc.**				
	12.3.2	Owner's operating manuals, legalisation surveys, as-built drawings, RAMM data, bridge update data, photography, etc (as indicated)				
	12.3.2.1	As-built drawings	LS	1.0	$ 8,000.00	$ 8,000.00
	Subtotal					**$ 531,800.00**
					Total:	**$ 9,332,529.69**

Project estimate: Sections 3 and 4

Form C

Project name: Glen Innes to Tamaki Drive Shared Path

SE
Scheme estimate

Item	Description	Base estimate	Contingency	Funding risk
A	**Nett project property cost**			
	Investigation and reporting:			
	- consultancy fees	Nil	Nil	Nil
	- the NZTA-managed costs	Nil	Nil	Nil
B	**Total investigation and reporting**	**Nil**	**Nil**	**Nil**
	Design and project documentation:			
	- consultancy fees	1018689	153,000	306,000
	- the NZTA-managed costs			
C	**Total design and project documentation**	1018689	153000	306000
	Construction			
	MSQA			
	- consultancy fees	230,000	35,000	69,000
	- the NZTA-managed costs			
	- consent monitoring fees			
	Sub-total base MSQA	230000	35000	69000
	Physical works			
1	Environmental compliance	0		
2	Earthworks	199,467	39,893	79,787
3	Ground improvements	0		
4	Drainage	11,980	1,797	4,193
5	Pavement and surfacing	1,800	270	630
6	Bridges	11,901,150	2,975,288	4,760,460
7	Retaining walls	215,450	53,863	86,180
8	Traffic services	565,595	84,839	141,399
9	Service relocations	105,000	15,750	36,750
10	Landscaping	621,188	93,178	217,416
11	Traffic management and temporary works	182,500	36,500	54,750
12	Preliminary and general	898,400	134,760	314,440
13	Extraordinary construction costs	0		
	Sub-total base physical works			
D	**Total construction**	14932530	3471138	5765004
E	**Project base estimate** (A+C+D)	15,951,219		
F	**Contingency** (Assessed/Analysed) (A+C+D)		3,624,138	
G	**Project expected estimate** (E+F)		19,575,357	
	Project property cost expected estimate			
	Investigation and reporting expected estimate		**Nil**	
	Design and project documentation expected estimate		1,171,689	
	Construction expected estimate		18,403,668	
H	**Funding risk** (Assessed/Analysed) (A+C+D)			6,071,004
I	**95th percentile Project Estimate** (G+H)			25,646,361
	Project property cost 95th percentile estimate			
	Investigation and reporting 95th percentile estimate			**Nil**
	Design and project documentation 95th percentile estimate			1,477,689
	Construction 95th percentile estimate			24,168,672

Date of estimate 20 January 2015	**Cost index (Qtr/Year) 3rd/2014**
Estimate prepared by Andrew McDonald	**Signed**
Estimate internal peer review by Nick Gluyas	**Signed**
Estimate external peer review by	**Signed**
Estimate accepted by the NZTA	**Signed**

Note: (1) These estimates are exclusive of escalation and GST
(2) Investigation and reporting project phase estimates are set to nil as these are now sunk costs

Schedule of Prices
Glen Innes to Tamaki Drive Shared Path
Sections 3 and 4
Scheme Estimate

Base date
1 Jul 2014

Estimate date
18 Jan 2015

Item	Ref	Description	Unit	Quantity	Price	Amount
	S2	EARTHWORKS				
	2.2	Demolition and dismantling installations				
	2.2.2	Dismantling installations to waste, including safety barriers, fences, signs, sign supports, etc. (installation indicated)				
	2.2.2.1	Dismantle and recover timber from the existing boardwalk across Orakei Basin and transport to storage	LS	1.0	$ 60,000.00	$ 60,000.00
	2.2.2.2	Removal and relocation of structures within Hobson Bay Marina	PS	1.0	$ 40,000.00	$ 40,000.00
	2.2.2.3	Boundary fence removal	m	415.0	$ 45.00	$ 18,675.00
	2.2.2.4	Tree removal along boundary	LS	1.0	$ 30,000.00	$ 30,000.00
	2.3	Topsoil				
	2.3.1	Topsoil stripping including temporary stockpiling of stripped topsoil (site indicated)				
	2.3.1.1	Topsoil stripped from all areas on the site	m3	794.4	$ 9.43	$ 7,490.96
	2.6	Fill				
	2.6.1	Cut to fill (material classification indicated)				
	2.6.1.1	Type A soft material, including type R1 and type R2 hard materials	m3	63.0	$ 11.73	$ 738.99
	2.7	Waste				
	2.7.2	Cut to waste unsuitable material				
	2.7.2.1	Remove mass blocks under Orakei Road Bridge and excavate back to the bridge pier	LS	1.0	$ 24,000.00	$ 24,000.00
	2.7.2.2	Footpath, sawcut and remove	m2	412.5	$ 45.00	$ 18,562.50
	Subtotal					$ 199,467.45
	S4	DRAINAGE				
	4.1	Stormwater Management				
	4.1.1	Stormwater management (Refer to separate cost sheet)	LS		$ 113,170.00	$ -
	4.2	Kerbs and Channels				
	4.2.3	Cast in situ concrete kerb and channel combination (type indicated)				
	4.2.3.1	Supply and install new kerb and channel as per ATCOP GD009 Type 3 Standard Engineering Detail	m	100.0	$ 100.00	$ 10,000.00
	4.3	Subsoil Drains				
	4.3.1	Subsoil drains including excavation, filter media and pipes, and backfilling (application category, pipe size, depth range, material, filtration class, and strength class indicated)				
	4.3.1.2	G3: Pavement subsoil drains Filtration Class 1 Strength Class A 100 mm diameter pipe 1.0 m to 1.5 m depth	m	100.0	$ 19.80	$ 1,980.00
	Subtotal					$ 11,980.00
	S5	PAVEMENT AND SURFACING				
	5.4	Surfacing				

Item	Ref	Description	Unit	Quantity	Price	Amount
	5.4.8	Asphaltic concrete surfacing (application, type, and thickness indicated)				
	5.4.8.7	Mix 20 AC surfacing 40 mm thick including Grade 5/6 membrane	m2	60.0	$ 30.00	$ 1,800.00
	Subtotal					$ 1,800.00
	S6	BRIDGES AND STRUCTURES				
	6.1	Hobson Bay Bridge				
	6.1.0.1	Prepare Railway Management Plans	No	6.0	$ 20,000.00	$ 120,000.00
	6.1.0.2	Implementation of Railway Management Plans	No	1.0	$ 100,000.00	$ 100,000.00
	6.1.0.3	Earthworks - Fill to form ramps at bridge ends	m3	200.0	$ 75.00	$ 15,000.00
	6.1.0.4	Foundations - Site Clearence and Trim to Grade	LS	2.0	$ 55,000.00	$ 110,000.00
	6.1.0.5	Foundations - Metal for Access Track	m3	160.0	$ 100.00	$ 16,000.00
	6.1.0.6	Foundations - Excavation of Abutments	m3	25.0	$ 55.00	$ 1,375.00
	6.1.0.7	Foundations - Establishment of Pilling Plant	No	44.0	$ 4,000.00	$ 176,000.00
	6.1.0.8	Foundations - Set Up Pilling plant for Each Pile	No	88.0	$ 3,000.00	$ 264,000.00
	6.1.0.9	Foundations - 750 mm diameter Bored Piles- Soft Drilling 10m depth	m	880.0	$ 300.00	$ 264,000.00
	6.1.0.10	Foundations - 750 mm diameter Bored Piles- Hard Drilling	m	180.0	$ 500.00	$ 90,000.00
	6.1.0.11	Foundations - 6mm Permanent Steel Liners for Soft Drilling	m	880.0	$ 600.00	$ 528,000.00
	6.1.0.12	Foundations - 40 MPa reinforced Concrete in Bored Piles	m3	500.0	$ 1,400.00	$ 700,000.00
	6.1.0.13	Substructure - 40 MPa Reinforced Concrete Abutments	m3	20.0	$ 1,550.00	$ 31,000.00
	6.1.0.14	Substructure - Peir Cross Head Formwork and Falsework	m3	320.0	$ 2,500.00	$ 800,000.00
	6.1.0.15	Superstructure - Supply Super T Bridge Beams 30m-34m span	No	80.0	$ 60,000.00	$ 4,800,000.00
	6.1.0.16	Superstructure - Install Super T Bridge Beams 30m span	No	80.0	$ 20,000.00	$ 1,600,000.00
	6.1.0.17	Superstructure - Abutment elastomeric Bearings	No	80.0	$ 1,100.00	$ 88,000.00
	6.1.0.18	Superstructure - Galvanised linkage bars	No	160.0	$ 300.00	$ 48,000.00
	6.1.0.19	Superstructure - 40 Mpa reinforced Concrete Deck	m3	370.0	$ 660.00	$ 244,200.00
	6.1.0.20	Superstructure - 40 Mpa reinforced Concrete Diaphragms	m3	400.0	$ 1,250.00	$ 500,000.00
	6.1.0.21	Superstructure - Handrails	m	2200.0	$ 400.00	$ 880,000.00
	6.1.0.22	Superstructure - Abutment Expansion Joints	m	165.0	$ 500.00	$ 82,500.00
	6.2	Orakei Boardwalk				
	6.2.1.1	Foundations - Establishment of Pilling Plant	No	1.0	$ 3,000.00	$ 3,000.00
	6.2.1.2	Foundations - Set Up Pilling plant for Each Pile	No	200.0	$ 200.00	$ 40,000.00
	6.2.1.3	Foundations - 400 mm diameter Bored Piles- Soft Drilling	m	100.0	$ 120.00	$ 12,000.00
	6.2.1.4	Foundations - 400 mm diameter Bored Piles- Hard Drilling	m	100.0	$ 200.00	$ 20,000.00
	6.2.1.5	Foundations - Timber Piles	m	400.0	$ 20.00	$ 8,000.00
	6.2.1.6	Substructure - Timber Bearers	m	720.0	$ 20.00	$ 14,400.00
	6.2.1.7	Superstructure - Timber Joists	ea	4000.0	$ 25.00	$ 100,000.00
	6.2.1.8	Superstructure - UB Beams	ea	50.0	$ 50.00	$ 2,500.00
	6.2.1.9	Superstructure - Handrail relocated	m	710.0	$ 50.00	$ 35,500.00
	6.2.1.10	Superstructure - decking	m	3195.0	$ 65.00	$ 207,675.00
	Subtotal					$ 11,901,150.00
	S7	RETAINING WALLS				
	7.1	Excavation and backfilling				

Item	Ref	Description	Unit	Quantity	Price	Amount
	7.1.1	Excavation (material classification and depth ranges indicated)				
	7.1.1.3	Concrete reatining wall (4.5 m average height)	m	40.0	$ 3,800.00	$ 152,000.00
	7.1.1.4	Concrete reatining wall (4.5 m average height)	m	30.0	$ 2,115.00	$ 63,450.00
	Subtotal					$ 215,450.00
	S8	TRAFFIC SERVICES				
	8.2	Pavement Markings and Delineation				
	8.2.2	Line markings (width, type, colour, material indicated)				
	8.2.2.1	100 mm continuous white reflectorised paint	m	2665.0	$ 8.00	$ 21,320.00
	8.2.4	Symbols (type, material, application, colour, indicated)				
	8.2.4.1	Cycle & pedestrian symbols with arrows	No	15.0	$ 60.00	$ 900.00
	8.3	Road Signs				
	8.3.1	Sign board at access points Includes wayfinding information and path use information	No	15.0	$ 800.00	$ 12,000.00
	8.5	Lighting				
	8.5.1	Trenching and ducts (duct diameter, type, and trench depth indicated)				
	8.5.1.3	100 mm orange PVC with marker tape in trenches up to 1.5 m deep	m	2665.0	$ 41.42	$ 110,384.30
	8.5.6	Concrete foundations including excavation and backfilling, steel reinforcing, bolt group, and formwork (concrete strength, cage, and size indicated)				
	8.5.6.1	25 MPa cast in situ concrete with PCAGE-10 and 1.0 m depth	No	107.0	$ 240.00	$ 25,680.00
	8.5.10	Cables (size and type indicated)				
	8.5.10.2	16 mm2 three core neutral screen	m	3949.0	$ 27.44	$ 108,360.56
	8.5.11	Lighting columns (type, height, and outreach indicated)				
	8.5.11.1	Frangible 6 m ground planted column	No	107.0	$ 1,500.00	$ 160,500.00
	8.5.12	Street Light Relocation				
	8.5.12.1	Relocate street light to new location and Connection to power by authorised contractor	No	1.0	$ 4,800.00	$ 4,800.00
	8.5.13	Luminaires (type and power indicated)				
	8.5.13.4	Cree LEDway 30LED 700mA 70W Series E - 0° Tilt	No	107.0	$ 950.00	$ 101,650.00
	8.5.14	Lighting control equipment including identification of and connection to power supply	LS	1.0	$ 20,000.00	$ 20,000.00
	Subtotal					$ 565,594.86
	S9	SERVICE RELOCATIONS				
	9.1	Telecommunications				
	9.1.1	Telecommunication cables	PS	1.0	$ 25,000.00	$ 25,000.00
	9.2	Electrical Power				
	9.2.3	Underground power cables	PS	1.0	$ 10,000.00	$ 10,000.00
	9.3	Water				
	9.3.1	Water mains	PS	1.0	$ 5,000.00	$ 5,000.00
	9.4	Sewerage				
	9.4.1	Sewerage	PS	1.0	$ 10,000.00	$ 10,000.00
	9.5	Gas				
	9.5.1	Gas mains	PS	1.0	$ 15,000.00	$ 15,000.00
	9.5.2	Marina Services	PS	1.0	$ 40,000.00	$ 40,000.00
	Subtotal					$ 105,000.00

Item	Ref	Description	Unit	Quantity	Price	Amount
	S10	LANDSCAPING AND URBAN DESIGN				
	10.1	Topsoil and planting				
	10.1.1	Topsoil using stockpiled material (nominal thickness and application indicated)				
	10.1.1.1	250 mm thick to buffer zone	m2	3170.0	$ 4.15	$ 13,155.50
	10.2	Planting				
	10.2.4	Trees and planting				
	10.2.4.1	Replacement tree planting mitigation (provisional sum)	LS	1.0	$ 40,000.00	$ 40,000.00
	10.2.4.2	Divaricating plants and sedges, root trainer grade at 500 mm centres	No	1640.0	$ 5.00	$ 8,200.00
	10.4	Paving				
	10.4.3	Path Construction				
	10.4.3.1	GAP40 basecourse to path 100 mm thick	m3	577.1	$ 72.74	$ 41,980.07
	10.4.3.2	20 MPa concrete path 100 mm thick with 665 mesh and with brushed surface finish (based on subgrade CBR = 5)	m3	384.8	$ 45.23	$ 17,402.24
	10.4.4	Concrete speed tables				
	10.4.4.1	5 kg/m3 black oxide concrete speed tables including stamped textured surface as per drawing G502	m2	60.0	$ 150.00	$ 9,000.00
	10.5	Fences, Gates, and Handrails				
	10.5.1	Temporary fences including maintenance and removal (type and location indicated)				
	10.5.1.1	Temporary fencing suitable for stock to be located 5 m outside the extent of works	m	400.0	$ 60.00	$ 24,000.00
	10.5.6	Fences (type indicated or drawing referenced)				
	10.5.6.3	Galvanised and powder coated black steel palaside panel fence 1.4 m high including post excavation and backfill and concrete foundation	m	900.0	$ 350.00	$ 315,000.00
	10.5.6.6	Wire mesh boundary fence 1.8 m high including post excavation and backfill and concrete foundation	m	415.0	$ 350.00	$ 145,250.00
	10.6	Street Furniture				
	10.6.1	Bollards (type indicated)				
	10.6.1.3	Bollard including concrete foundation – removable with lock	No	12.0	$ 600.00	$ 7,200.00
	10.7	Property Reinstatement				
	10.7.1	Reinstatement of Landscape Supplies concrete bay wall	PS		$ 4,000.00	$ -
	Subtotal					$ 621,187.81
	S11	TRAFFIC MANAGEMENT				
	11.1	Traffic Management				
	11.1.1	Temporary traffic management plan - preparation and implementation				
	11.1.1.1	Preparation	LS	1.0	$ 3,000.00	$ 3,000.00
	11.1.1.2	Implementation	LS	1.0	$ 4,000.00	$ 4,000.00
	11.1.2	Temporary traffic management plan management and maintenance				
	11.1.2.2	Level 2 traffic control	day	195.0	$ 900.00	$ 175,500.00
	Subtotal					$ 182,500.00
	S12	PRELIMINARIES AND GENERAL				
	12.1	Establishment etc.				

Item	Ref	Description	Unit	Quantity	Price	Amount
	12.1.1	Allowance for the Contractor's costs for establishing on Site, temporary environmental compliance, carrying out the Contract Works and for the recovery of the Contractor's other overheads and profit that are not otherwise provided for in other items and prices included in the Schedule of Prices.	LS	1.0	$ 890,400.00	$ 890,400.00
	12.3	Plans, Operating Manuals, Records, etc.				
	12.3.2	Owner's operating manuals, legalisation surveys, as-built drawings, RAMM data, bridge update data, photography, etc (as indicated)				
	12.3.2.1	As-built drawings	LS	1.0	$ 8,000.00	$ 8,000.00
	Subtotal					$ 898,400.00
					Total:	$ 14,702,530.12

Chainage Merton Road: 0m chainage	Water management issues	Potential risks	Proposed design	Quantity	Unit measure	Rate ($/unit)	Cost ($)	Sub Total ($)	Comments/working
25 - 250	Retaining wall	Discharging flows, Structural integrity, Erosion	Surface water capture and disposal at retained locations.	0	m	50	0.00		Existing Countdown retaining appears sufficient, no additional retaining on west side required.
275-780	Retaining wall	Discharging flows, Structural integrity, Erosion	Surface water capture and disposal at retained locations.	505	m	50	25,250.00		
950-970	Retaining wall	Discharging flows, Structural integrity, Erosion	Surface water capture and disposal at retained locations.	20	m	50	1,000.00	26,250.00	
790 - 905	Swale	Stormwater ponding upstream of cycleway embankment	re-grade to allow swale drainage	85	m	50	4,250.00		Instead of retaining wall
1065-1215	Swale	Stormwater ponding upstream of cycleway embankment	re-grade to allow swale drainage	182	m	50	9,100.00	13,350.00	
1110	Culvert	Flooding and blockage	Inlet and outlet with rock apron and diversion path	30	m	1500	45,000.00	45,000.00	Assume 900mm dia culvert, intake and outlet headwall structure, downstream rip rap apron
260 - 275	Bridge	Slippery surface, ponding	Glass Reinforced Polyester plank bridge	0					
740 - 750	Bridge	Slippery surface, ponding	Kerbs, sumps, downpipes and discharge base	0					
240	Signage	-	Hazard signage	1	ea	500	500.00		
295	Signage	-	Hazard signage	1	ea	500	500.00		
725	Signage	-	Hazard signage	1	ea	500	500.00		
770	Signage	-	Hazard signage	1	ea	500	500.00	2,000.00	
90-150	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow	0					
380-720	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow	0					
740-1050	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow	0					
1220-1375	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow	0					
1470-1550	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow	0					
1550-1610	Sheetflow	Pressures on existing stormwater system	Upgrade local sump capacity, Vegetation margin	0					
1610-1640	Sheetflow	Pressures on existing stormwater system	Upgrade local sump capacity Vegetation margin	0					
0	Storage Attenuation	Overflow, concentrated flow and erosion	Tank, sump intake, pipeline discharge to Merten Rd	1	ea	10000	10,000.00	10,000.00	Assume an underground storage tank attenuation device
0-85	Kerb and Channel	Overflow into neighbouring properties, velocity, erosion	Flow to the attenuation pond/tank at Merten Rd and discharge into existing system	85	m	60	5,100.00	5,100.00	
150-255	Dish Channel	Velocity, erosion	Swales, channels, rock check dams	105	m	60	6,300.00		
275-380	Dish Channel	Velocity, erosion	Swales, channels, rock check dams	105	m	60	6,300.00		
725-740	Dish Channel	Velocity, erosion	Swales, channels, rock check dams	15	m	60	900.00		
905-965	Dish Channel	Velocity, erosion	Re-grade side slope form sheetflow	60	m	60	3,600.00		
1375-1465	Dish Channel	Velocity, erosion	Swales, channels, rock check dams	92	m	60	5,520.00	22,620.00	

255	Sump & pipeline	Erosion around shared path and rail service path	pipeline, outlet pipe, rock discharge point	1 ea	6000	6,000.00		
790-795	Sump Lead	Concentrated flow, erosion at adjoining entrance point to Felton Mathew Avenue	Under cycleway	10 m	200	8,000.00		Sump ≈ $6000 and sump lead(300 dia)≈ $200/m
800	Sump	Concentrated flow, erosion at adjoining entrance point to Felton Mathew Avenue	Sump upgrade	1 ea	6000	6,000.00		
1550	Sump	-	-	1 ea	6000	6,000.00		
Past 1640	Sump	-	-	1 ea	6000	6,000.00	32,000.00	
275	Riprap	Erosion around path/bridge and creek bed	Rock stabilised outlet	1 ea	2500	2,500.00		
745	Riprap	Erosion around path/bridge and creek bed	Rock stabilised outlet	1 ea	2500	2,500.00		
790	Riprap	Downstream erosion	Rock stabilised outlet	1 ea	2500	2,500.00		
905	Riprap	Downstream erosion	Rock stabilised outlet	1 ea	2500	2,500.00		
1370-1375	Riprap	Downstream erosion	Rock stabilised outlet	1 ea	2500	2,500.00	12,500.00	
						$168,820.00	$168,820.00	

Chainage St Johns Rd: 0m chainage	Water management issues	Potential risks	Proposed design	Quantity	Unit measure	Rate ($/unit)	Cost ($)	Sub Total($)	Comments/working
1150-1550	Retaining wall	Discharging flows. Structural integrity, Erosion	Surface water capture and disposal at retained locations.	400	m	50	20,000.00	20,000.00	provisional item for 400m of retaining wall
0 - 55	Stormwater Culvert/Pipe	Intersects with local stormwater network, Construction machinery damaging manholes.	Shared path same level as footpath, appropriate machinery access. Sheet flow drainage to existing kerb and channel.	0	m	60	0.00		
565	Stormwater Culvert/Pipe	Intersect with culvert/pipe	Extend culvert downstream. Rock outlet	1	ea	5000	5,000.00		
1040	Stormwater Culvert/Pipe	Cross natural flow path	Extend culvert downstream or bridge over. Rock channel	1	ea	10000	10,000.00		
1190	Stormwater Culvert/Pipe	Culvert/pipe position	Shared path over pipeline/upstream of culvert	1	ea	5000	5,000.00		
1315	Stormwater Culvert/Pipe	Culvert/pipe position	Extend culvert downstream or bridge over. Rock channel	1	ea	10000	10,000.00		
1465	Stormwater Culvert/Pipe	Culvert/pipe position	Shared path over pipeline/upstream of culvert	1	ea	5000	5,000.00		
1580	Stormwater Culvert/Pipe	Culvert/pipe position	Shared path over pipeline/upstream of culvert	1	ea	5000	5,000.00	40,000.00	
1985	Stormwater Pipe	Pipe position	Shared path over pipe	0					
2035	Stormwater Pipe	Pipe position	Shared path over pipe	0					
2290	Stormwater Pipe	Pipe position	Shared path over pipe	0					
2300	Stormwater Pipe	Pipe position	Shared path over pipe	0					
2480	Stormwater Pipe	Pipe position	Shared path over pipe	0					
2700	Stormwater Pipe	Pipe position	Shared path over pipe	0					
2320-2450	collecting flow	Ponding	Dish Channel	130	m	60	7,800.00		
2450-2727	collecting flow	Ponding	Kerb and Channel	277	m	60	16,620.00	24,420.00	
745 - 870	Bridge over Purewa creek	Slippery surface, ponding	Kerbs, sumps, downpipes and discharge base	0					
1630-1820	Bridge over railway line	Slippery surface, ponding	Kerbs, sumps, downpipes and discharge base	0					
2285-2320	Swale	Velocity, erosion, ponding	-	35	m	50	1,750.00	1,750.00	
1010 - 1030	Ponding zone	Flooding of shared path	Hazard signage	2	ea	500	1,000.00		
1165 - 1180	Ponding zone	Flooding of shared path	Hazard signage	2	ea	500	1,000.00		
1300 - 1320	Ponding zone	Flooding of shared path	Hazard signage	2	ea	500	1,000.00		ref purewa flood hazard mapping
1455 - 1480	Ponding zone	Flooding of shared path	Hazard signage	2	ea	500	1,000.00		ref purewa flood hazard mapping
1880 - 2170	Ponding zone	Culvert blockage forms flood pond next to shared path	Shared path elevation above the flood prone area. Hazard signage.	2	ea	500	1,000.00		ref purewa flood hazard mapping
1935	Signage	-	-	1	ea	500	500.00		ref purewa flood hazard mapping
2005-2010	Signage	-	-	1	ea	500	500.00		
2280 - 2330	Ponding zone	Flooding of shared path, catchpit blockage/cesspit overflow	Hazard signage	2	ea	500	1,000.00	7,000.00	ref. purewa flood hazard mapping
0-745	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow	0					
870-1630	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow	0					
1820-2225	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow	0					
2270-2330	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow	0					
2450 - 2725	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow	0					
2450	Discharge point	Erosion, ponding near MeadowBank railway station	Sump, sump lead and manhole to connect to existing AC storwater drainage	1	ea	10000	10,000.00		
2727	Discharge point	Erosion around path/bridge (stage 3)	Sump and lead connect to s/w and drain over edge of channel, rock outlet	1	ea	10000	10,000.00	20,000.00	
							$113,170.00	$113,170.00	

Appendix B Option Workshop Report

MWH

BUILDING A BETTER WORLD

WORKSHOP REPORT

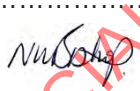
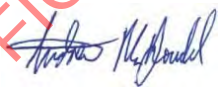
Glen Innes to Tamaki Drive Shared Path

Prepared for Auckland Transport

August 2014

QUALITY STATEMENT

PROJECT MANAGER	PROJECT TECHNICAL LEAD
Stephen Sinclair	Andrew McDonald

PREPARED BY			
Andrew McDonald		.....	...15/...08/...14
CHECKED BY			
Rachel Blewden		.....	...15/...08/...14
REVIEWED BY			
Neville Bishop		.....	...15/...08/...14
APPROVED FOR ISSUE BY			
Andrew McDonald		.....	...15/...08/...14

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REVISION SCHEDULE

Rev No	Date	Description	Signature or Typed Name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
1	15/08/14	Draft	A McDonald	R Blewden	N Bishop	A McDonald
2	18/08/14	Update following client feedback	A McDonald	R Blewden	N Bishop	A McDonald
3	20/08/14	Final	A McDonald	R Blewden	N Bishop	A McDonald

Auckland Transport

Glen Innes to Tamaki Drive Shared Path

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1 Introduction

1.1 Purpose of this Report

The purpose of this report is to briefly summarise options, route connectivity and constraints for the Glen Innes to Tamaki Drive shared path discussed during workshops held on the 16/06/2014, 30/06/2014 and 7/08/2014.

1.2 Site Description

The Glen Innes to Tamaki Drive shared walking and cycling path will seek to implement an approximately 6.5 km section of the Auckland Cycle Network (ACN) between the Glen Innes Town Centre and the Tamaki Drive cycle lanes.

The project will connect key destinations, including the Glen Innes Station area, the Meadowbank Station and the Orakei Station. The connection to Tamaki Drive will provide good linkages to the shared use path and on-road cycle lanes on Tamaki Drive and access to the city centre. The route parallels approximately, the existing rail line. The location plan is shown below in Figure 1-1.

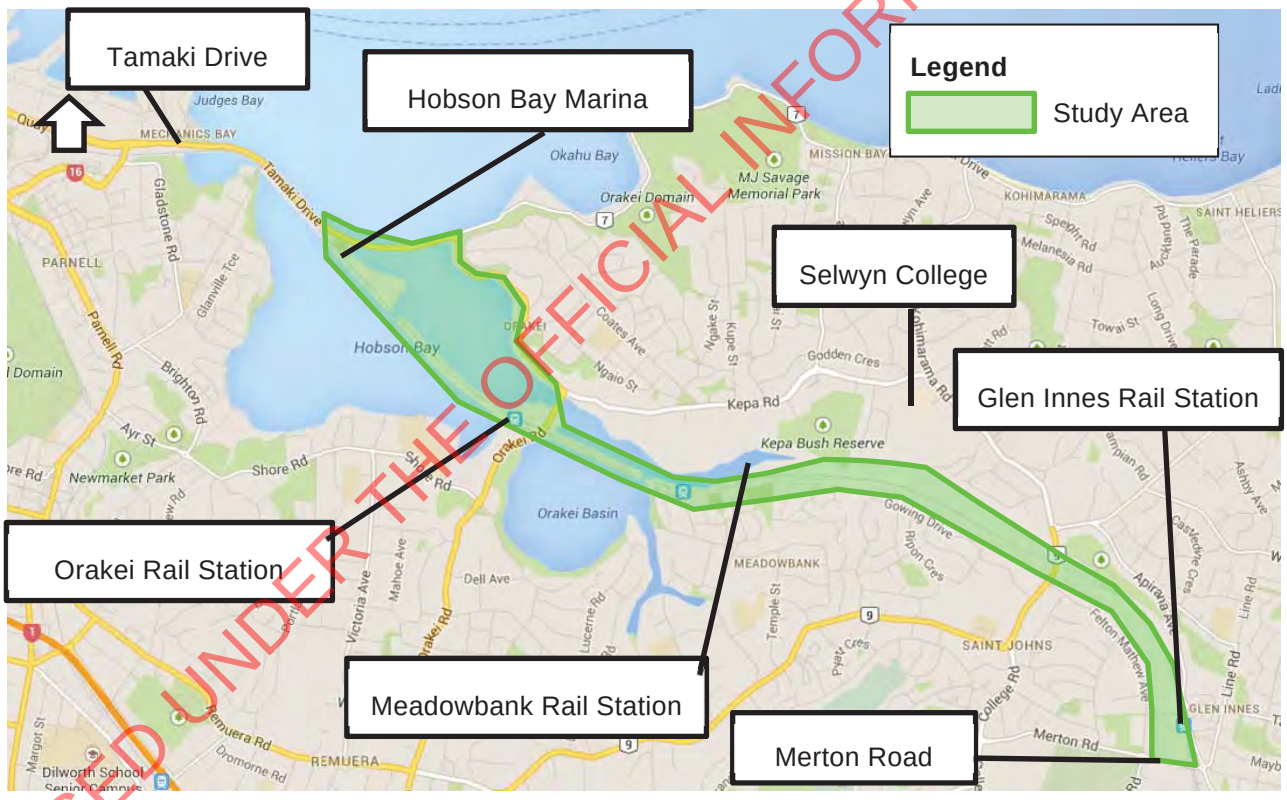

Figure 1-1 : Location map showing the study area.

The route has four distinct sections based on the environment and treatment options. As a consequence it is expected that some sections could be progressed faster than others and thus a staged approach could be implemented in order to progress construction. The four sections from south to north are:

- Merton Road to St Johns Road
- St Johns Road to Meadowbank Rail Station
- Meadowbank Rail Station to Orakei Rail Station
- Orakei Rail Station to Tamaki Drive

These sections will be described in more detail and will form the major headings of this report with the options assessed, the route connectivity and the constraints discussed for each section.

2 Design Standards

This route is to be designed to cycle metro route standards. The definition adopted for a cycle metro route is as follows:

"Cycle Metros take the highest priority as they target the highest number of potential users. They are high quality and traffic free segregated routes located within motorway corridors, rail corridors and on arterial or major collector roads. They offer a high level of safety connecting metropolitan/town centres, public transport interchanges and other key destinations. They can be shared off road paths along road corridors, rail corridors, through parks, reserves and esplanades or separated cycle facilities on road. The treatment is generally a 3 m wide shared path or a one/two-way protected cycle lane or a buffer cycle lane."

Based on the above definition a design philosophy statement has been developed. The key design criteria are:

- Preferred path width of 4 m, with reduced widths to be adopted on a case by case assessment
- Structures to be 4.5 m wide to provide an effective width of 4 m
- The route corridor to extend 1 m either side of the path (e.g. if the path is 4 m wide, the corridor width will be 6 m)
- Target gradient to be less than 5%, with a desirable maximum of 8%. Steeper gradients to be adopted on a case by case basis where constrained by the existing topography
- Path surface to be concrete, with timber boardwalk adopted where necessary
- Sections within the KiwiRail corridor will adopt the minimum fence offset of 2.75 m from the centre of the track or outside the high voltage masts whichever is further.

3 Land Ownership

The land ownership along the route is shown below in Figure 3-1. The route will cross a combination of NZ Transport Agency (NZTA), KiwiRail, and Auckland Council reserves / property. All agencies will need to work collaboratively to achieve the best outcomes for the project.

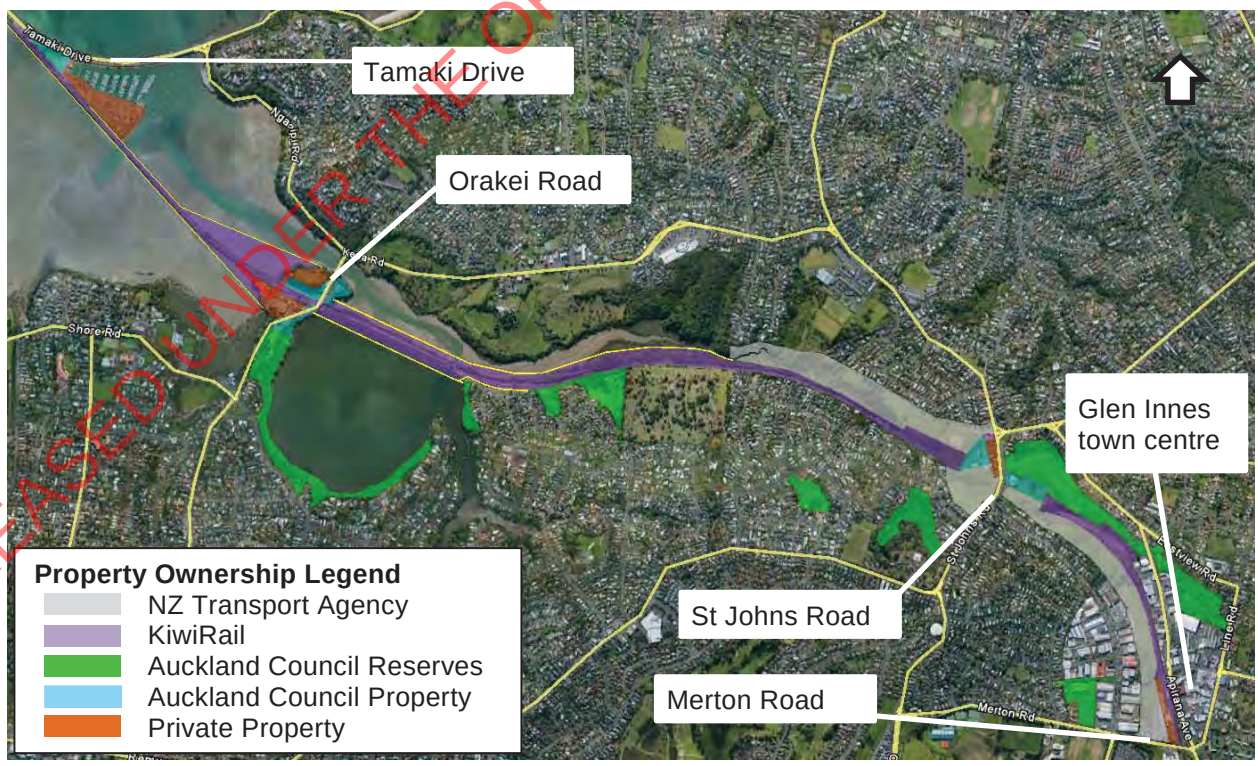

Figure 3-1 : Route land ownership.

4 Section 1 Merton Road to St Johns Road

4.1 Summary of Options Assessed for Section 1

Figure 4-1 shows the route options considered. In assessing these options it was considered critical that the connection to the underpass and Felton Mathew Avenue was as far west as possible. This helps to future proof by allowing as much length as possible for bridge ramps should a rail over bridge be required to replace the existing underpass in the future.

Figure 4-1 : Route options investigated along Section 1

Table 4-1: Overview of options assessment for Section 1

Section 1 Route Options	Summary Assessment
Orange	There were no suitable connectivity options at the southern end of this route. The rail corridor becomes narrow, with the alternative to link with Apirana Avenue. At the north end there are steep localised sections. As this route offered no significant benefits compared to other routes, this option was not investigated any further. ✗
Pink	This option is within the KiwiRail corridor. The main issue is connections at both ends. At the south end the route would need to climb out of the rail corridor to link with the underpass connection and through to Merton Road. At the northern end this route would need to climb steeply out of the rail trench (which is just before another section with gradient providing no respite for users) or cross the rail track. This route is on the same side as KiwiRail's third track option. The route is not direct and is less attractive than other options identified. Therefore this option was not investigated any further. ✗
Blue	This option provides a direct route along the western property boundary of the NZTA corridor. It is in close proximity to private properties which provides improved route security through passive surveillance, but landowners (mainly the residential properties to the north) may have concerns with the proximity of the path. A culvert will be required adjacent to 90 Felton Mathew Road. Crossing St Johns Road would be provided for by the installation of a 'toucan' crossing. This option is considered suitable for further investigation. ✓
Yellow	This option provides a reasonably direct route along the eastern property boundary of the NZTA corridor. The bushed area adjacent to 90 Felton Mathew Road will require two culverts and some bush clearance. This option is considered suitable for further investigation. ✓
Green	This provides an alternative option for crossing St Johns Road by providing a link to the signals at the intersection of St Johns Road and St Heliers Road. This option could be instead of, or additional to, the 'toucan' crossing. This option is considered suitable for further investigation. ✓

4.2 Section 1 Route Connectivity

This section of the route has good connectivity options with a mix of pedestrian and cycle access as identified in Figure 4-2.

Figure 4-2 : Section 1 route connectivity

4.3 Section 1 Route Constraints

The main challenge for Section 1 will be to minimise the steep gradients, particularly near to St Johns Road. The constraints for Section 1 are summarised in Figure 4-3.

Figure 4-3 : Section 1 route constraints

5 Section 2 St Johns Road to Orakei Basin

5.1 Summary of Options Assessed for Section 2

Figure 5-1 shows the route options considered.

Figure 5-1: Route options investigated along Section 2

Table 5-1: Overview of options assessment for Section 2

Section 2 Route Options	Summary Assessment
Blue	The blue route crosses St Johns Road via a 'toucan' signalised crossing, and links across to the residential properties along the northern edge of the NZTA property. The route departs from the property boundary to follow an existing track. Approximately opposite John Rymer Place the blue route crosses the stream. The stream is narrow at this location. The blue route continues along a relatively level plateau through the existing bush. The terrain starts to climb to the same level as the rail line at the west boundary of the Purewa Cemetery. At this point a rail over bridge will cross the rail line into the Tahapa Reserve. The bridge will ramp down into the KiwiRail corridor. The KiwiRail corridor drops away steeply and widening would require retaining structures. This is further complicate by a large water pipe running along the embankment that requires widening. The blue route will leave the rail corridor to link with Purewa Road which connects to the existing Orakei Basin boardwalk. Purewa Road also provides the connection to the Meadowbank rail station via the over bridge. Providing a shared path along Purewa Road would result in loss of parking. This option is considered suitable for further investigation. ✓
Green	This option connects the existing cycle lanes on St Heliers Bay Road via the signalise intersection. The intersection would require upgrading to cater for cyclists crossing. This option could be instead of, or additional to, the 'toucan' crossing on the blue route. This option is considered suitable for further investigation. ✓
Yellow	This option continues from the blue route along the residential property boundaries. There are some steep grades opposite John Rymer Place that would need to be resolved. The route follows the existing walking track, crosses the stream opposite Kempthorne Crescent and links back into the blue route. This option has some potential benefits with increased passive surveillance, but has some topographical challenges. This option is considered suitable for further investigation. ✓

Section 2 Route Options	Summary Assessment
Pink	This option was considered as part of the option investigation to identify suitable rail crossing locations. In general the KiwiRail corridor adjacent to the Purewa cemetery isn't wide enough to allow for a shared path, therefore the path would need to encroach into the cemetery property. A rail crossing location was considered near the eastern boundary of the Purewa cemetery, but the path location at this point is significantly lower than the rail track. An over bridge would require a ramp structure in advance of the bridge ramp to achieve the same level as the rail track. Alternatively an underpass into the cemetery could be considered. There are however, potential safety issues or perception of safety issues associated with underpasses. In addition, the underpass would encroach substantially into the cemetery. There are some connectivity benefits of the pink option, but these could equally be achieved by providing a path through the cemetery linking Gowing Drive with Tahapa Reserve and could be investigated as a future option. This option was not considered for further investigation. ✗
Orange	This provides an alternative option for the rail over bridge, ramping down into Tahapa Reserve. The path would follow the level terrain around the large depression in Tahapa Reserve. Retaining structures will be required to achieve the path width. This links through to the adjacent part of Tahapa Reserve to the west joining back into the KiwiRail reserve. This option provides some improved connectivity and avoids rail width constraints and potential disruption or relocation of water service on the blue route. This option is considered suitable for further investigation. ✓
Teal	This option was considered to avoid the need to cross the rail track. The terrain west of the Purewa Cemetery along the north side of the track drops away steeply into the coastal marine area. Given that this location is earmarked for KiwiRail's third track option, significant and environmentally challenging retaining and widening would be required, therefore this option was not considered for further investigation. ✗
White	This option stays within the KiwiRail corridor avoiding the potential loss of parking of the blue route at this location. The embankments are very steep and would require substantial retaining structures to enable path construction. As this option could potentially minimise parking loss it is considered suitable for further investigation. ✓

5.2 Section 2 Route Connectivity

Cycle routes with good connections allow pedestrian and cyclists to move fluidly between origins and destinations. There are some good pedestrian connections to the west of this section with some suitable for upgrading to cater for cyclists as shown in Figure 5-2. However there are some connectivity challenges through the middle and to the east of the route due to the inlet, the stream and the steep gradients north of the rail line. The existing rail line also creates a severance issue.

Due to the lack of existing connections, potential links or zones where links are desirable have been identified in Figure 5-2. North of the rail line potential connections could be created along the eastern boundary of Selwyn College with an alternative connection option from Whytehead Crescent. Both of these options would require land purchase. It is also noted that a housing development is proposed on the section east of Selwyn College.

South of the rail line a potential connection via Gowing Drive would be desirable. This would require land purchase. The rail line severance would require a rail over bridge which has constraints as discussed in Section 5.3. Alternatively a connection could be provided through the Purewa cemetery to the location of the proposed over bridge. This would also require land purchase to create the connection to the cemetery, and requires approval from the cemetery landowner(s) to allow the connection along the north boundary of the cemetery. A link to a busy arterial road such as St Johns Road via the cemetery's private road would provide a valuable connection to the path. The private road is scenic and could accommodate off-road and / or on-road facilities.

It is noted that the Orakei Greenways plan have identified potential walking and cycling routes, which include some of the options discussed above, but also include additional walking routes through Kepa Bush that would link to the yellow route.

This project will incorporate connectivity considerations into the development, but may not resolve all these connectivity issues. However it does provide a catalyst for new connections to be created to the shared path. In particular the rail over bridge location at the western boundary of the cemetery does support the development of good connections to Gowing Drive and St Johns Road while helping to overcome the rail severance.

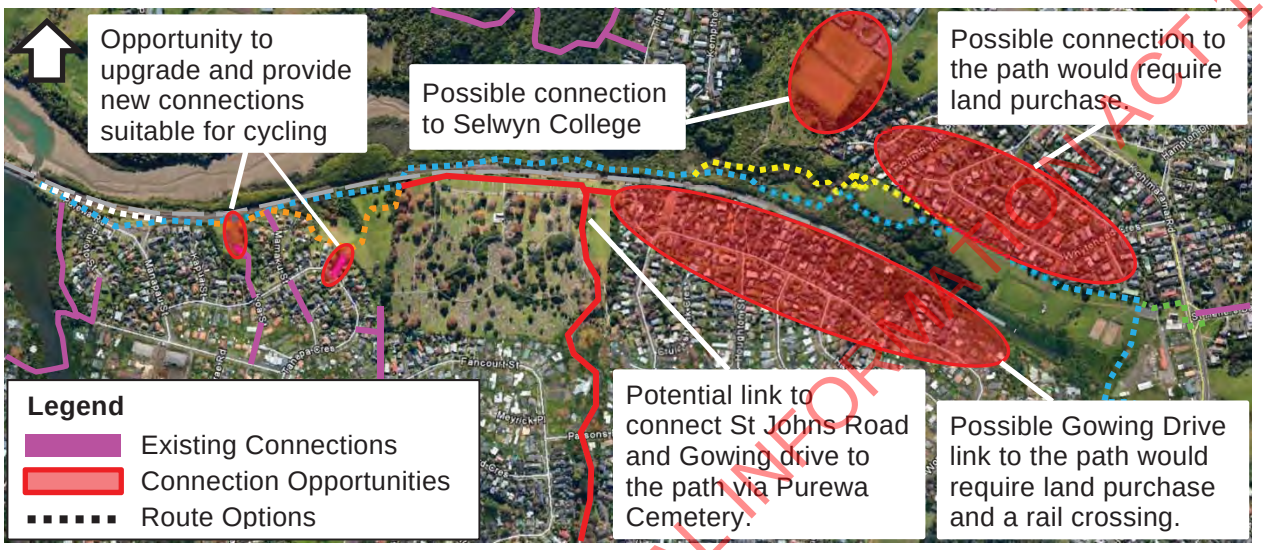

Figure 5-2: Section 2 route connectivity

5.3 Section 2 Route Constraints

A key constraint along Section 2 is the steep topography. Figure 5-3 shows contour lines for every 5 m change in height. As shown in Figure 5-3 there are steep gradients, particularly on the north side of the rail tracks. The topography provides challenges to achieve desired gradients along the proposed route and for connection opportunities.

In general the terrain on the north side of the rail line is below the level of the rail tracks. It's not until the west boundary of the cemetery that the terrain is at the same level as the rail tracks, which makes this a suitable location for the rail over bridge.

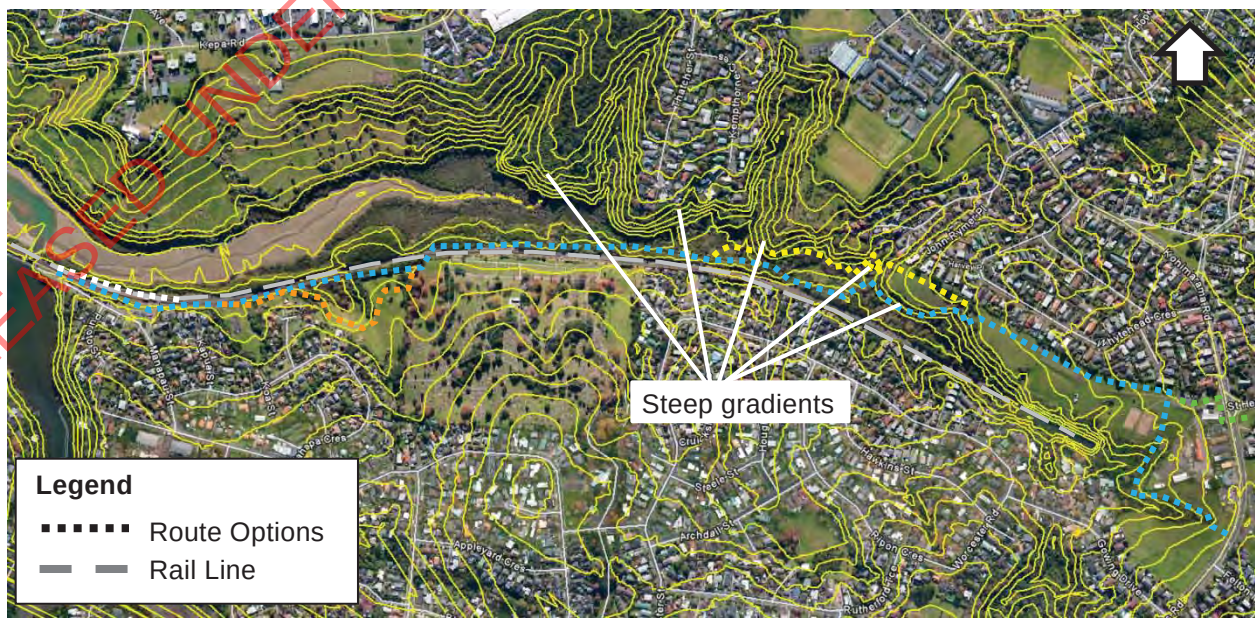

Figure 5-3: Section 2 topographical constraints

Structures are required to cross the stream. These structures are to be designed for light maintenance vehicles loads.

One of the key constraints to overcome is the risk (or the perceived risk) to personal safety through the bushed area. Crime prevention through environmental design (CEPTED) will be incorporated, however there will be sections where aspects such as passive surveillance and exit points that will be difficult to integrate. This will need to be mitigated by providing a strong focus on CEPTED elements such as:

- Path lighting
- Clear sightlines
- Landscape designs that provide surveillance at entry / exit points
- Use permeable fencing where possible to maintain visibility
- Provide a clear layout supported by way finding signs

It is expected that walking and cycling patronage will provide a reasonable level of passive surveillance. Active surveillance such as closed circuit television (CCTV) should also be considered, but only if there is still a perceived safety risk following the inclusion of CEPTED design principals.

Along the south side of the rail line, there is insufficient width outside the electrification masts to provide a shared path. Achieving adequate width would require land purchase. As discussed previously in this report, the terrain on the north side becomes level with the rail track at the western boundary of the cemetery. Therefore the western boundary of the cemetery was considered suitable for the rail over bridge. Due to the limited width on the south side of the rail corridor at this location, the over bridge pile would need to encroach into Tahapa Reserve. However this provides an opportunity to create a connection to the Tahapa Reserve (represented by the orange route in Figure 5-4), with potential for a future connection to the cemetery. The orange route avoids the risk of disturbing a large water pipe and the need for retaining walls to widen rail corridor just west of the cemetery.

The rail over bridge will need to be compliant with KiwiRail standards and have sufficient clearance over the high voltage cables and a span that allows for KiwiRail's future third track option.

The north side of the rail line, west of the cemetery, has steep embankments that would require significant retaining structures. This would also eliminate the need for the rail over bridge. However the over bridge is critical to helping mitigate the severance cause by the rail line.

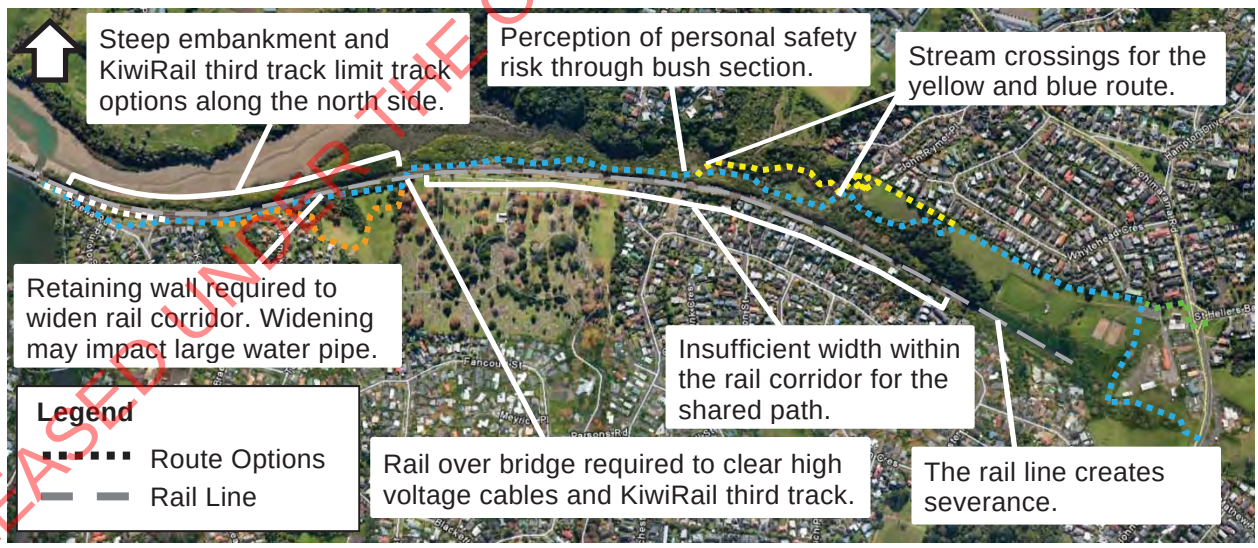

Figure 5-4: Section 2 constraints other than topographical constraints

6 Section 3 Orakei Basin Boardwalk

6.1 Summary of Options Assessed for Section 3

Figure 6-1 shows the route options considered. For this section there are only two possible options which are to widen the existing boardwalk or to provide a new structure on the north side of the rail line.

Figure 6-1 : Route options investigated along Section 3

Table 6-1: Overview of options assessment for Section 3

Section 3 Route Options	Summary Assessment
Blue	There is an existing boardwalk across Orakei Basin which currently caters to cyclists and pedestrians. The boardwalk is approximately 2.5 m wide and is recommended for widening to maintain route consistency of the level of service. This option is considered suitable for further investigation. ✔
Yellow	Due to the topographical constraints along the north side of the rail line from Section 2, there are no feasible connection opportunities at the west end. To connect with Section 2, a rail over bridge would be required which is costly and introduces undesirable gradients into the route. Therefore this option was not suitable with no benefits over the blue option and was not considered for further investigation. ✘

6.2 Section 3 Route Connectivity

This section of the route has connectivity options at either end of the section with mainly pedestrian access as identified in Figure 6-2. Sections of the Orakei Basin walkway through reserves could be upgraded to accommodate cyclists.

Figure 6-2 : Section 3 route connectivity

6.3 Section 3 Route Constraints

At this stage it is not clear whether the proposed Orakei Point development will proceed, and if it does what exactly is proposed is still under consideration. For now this is highlighted as an unknown risk, however if the development doesn't proceed, options have been identified as part of Section 4.

If possible the boardwalk structure will be widened to 4.5 m, providing an effective width of 4 m. if possible, the structure will be widened without the need to replace or add additional piles as this will simplify the work and minimise user disruption and consent requirements. Structural and geotechnical information has been requested from council and will be reviewed to determine the extent of widening possible. Surface treatments that provide a smoother running surface and that are less slippery in the wet will be considered, however these will also add weight to the structure which may limit the extent of widening that can be achieved.

The constraints for Section 3 are summarised in Figure 6-3.

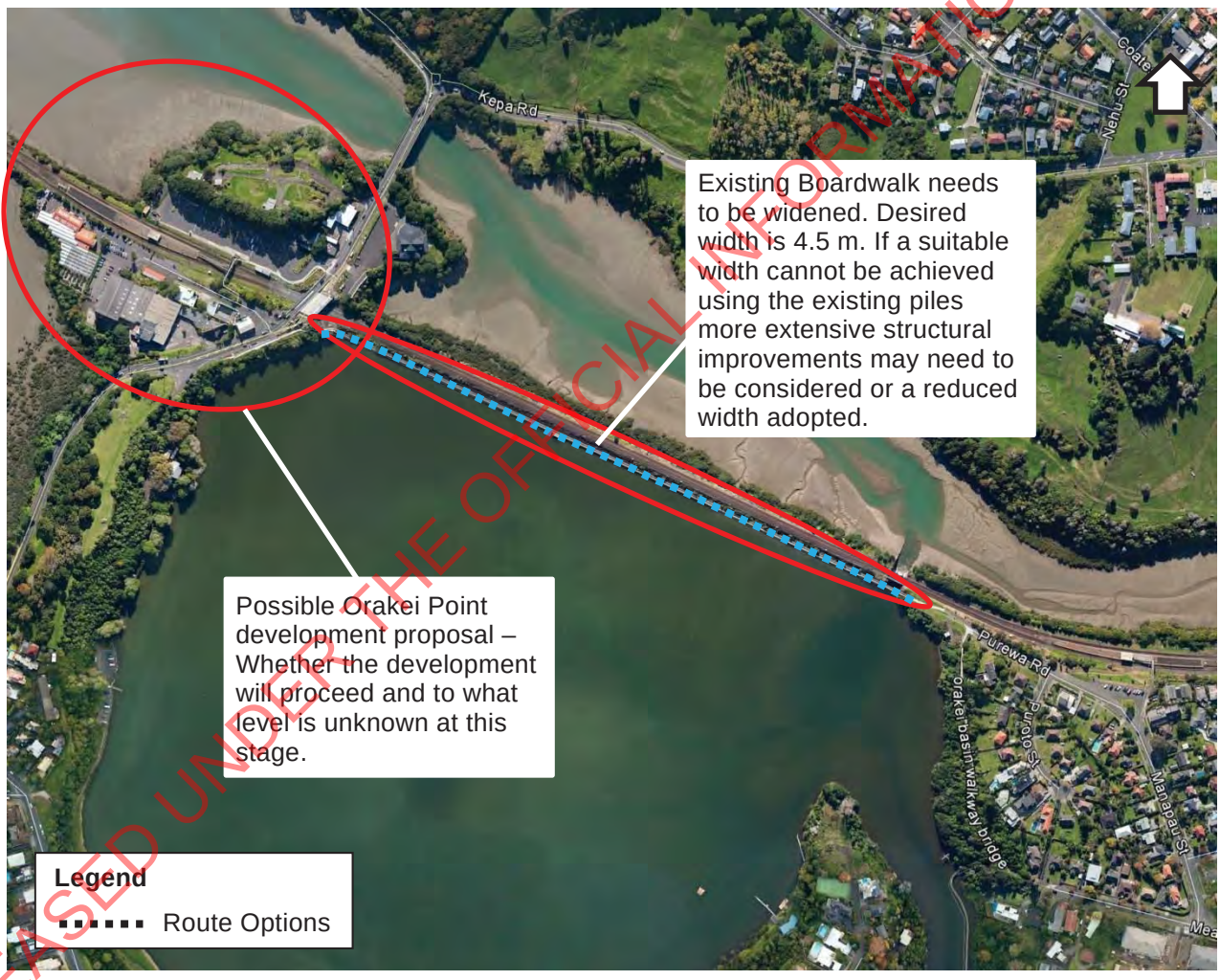

Figure 6-3 : Section 3 route constraints

7 Section 4 Orakei Basin to Tamaki Drive

7.1 Summary of Options Assessed for Section 4

Figure 7-1 shows the route options considered.

Figure 7-1 : Route options investigated along Section 4

Table 7-1: Overview of options assessment for Section 4

Section 4 Route Options	Summary Assessment
Blue	This option is a new structure on the northern side of the rail line. It is noted that this is also the same side as the proposed KiwiRail third track option, so the structure would need to be outside of this. The connection at the Orakei Basin end may be affected by the possible Orakei Point development, however an achievable option has been identified if the development does not proceed. Subject to the final design, land purchase may be required where the path neighbours the Hobson Bay Marina. The path will connect with Tamaki Drive at the northern end. This option is considered suitable for further investigation. ✓
Red	This option is a new structure on the southern side of the rail line. The main issue was connections at both ends. The connection at the Orakei Basin end may be affected by the proposed Orakei Point development and a boardwalk will need to be constructed around the point. At the north end the route would need to cross the rail line via an over bridge and the space to ramp up and down is limited. The red route offers no benefits compared to other options identified and has a higher estimated construction cost. Therefore this option is currently not considered for further investigation, however should the Orakei Point development proceed, this option may need to be reconsidered. ✗
Yellow	This option boarders the outside edge of Hobson Bay. A clip on structure would be required on the Orakei Road bridge and a boardwalk would be constructed around the bay. This route is slightly longer than the blue route with a greater expected environmental impact of the foreshore and coastline vegetation. The route would need to link to Ngapipi Road at the boat sheds. Along the boat sheds the route would narrow to approximately 2.5 m creating a pinch point. As a commuter link to the city centre, this option is less direct than other options, but for recreational users it provides a good connection to the beaches along Tamaki Drive to the east. Due to better geotechnical conditions the construction cost of the board walk around the edge of the bay is expected to be lower, however this is partially offset by the need to widen the existing Orakei Road Bridge. This option is considered suitable for further investigation. ✓
Green	This option follows Ngapipi Road through to the Tamaki Drive intersection. Heading north the road climbs upward for approximately 400 m to an apex at Ngaiwi Road with gradients up to approximately 6.5%. The route then heads downhill for approximately 300 m with gradients up to approximately 7.5% before levelling off. This road is a regional arterial and is used by large semi trailers, buses and other large trucks. At the southern end there are width constraints. The existing path is approximately 2.5 m wide. Widening to 3.5 to 4.5 m would require retaining walls for most of the southern section of Ngapipi Road. North of Ngaiwi Road the path width reduces to 2.2 m with limited options for widening due to the proximity of five residential houses. Widening outside the five properties would steepen already steep driveway. The long steep gradients and the busy road environment are not in keeping with the expectations of a metro cycle route and are not consistent with the other sections of the route. Combined with complexities of widening and impacts on private property, this option was not considered for further investigation.

7.2 Section 4 Route Connectivity

This section of the route has two connections at the southern end with mainly pedestrian access as identified in Figure 7-2. However the Orakei Basin walkway through the reserve section could be upgraded to accommodate cyclists. The route connects to Tamaki Drive where there is an existing shared path.

Figure 7-2 : Section 4 route connectivity

7.3 Section 4 Route Constraints

As mentioned in Section 6.3 there is uncertainty regarding the details and the likelihood of the Orakei Point development proceeding. If the development proceeds, options will be investigated to incorporate walking and cycling connections to link with the shared path. If the development does not proceed, options have been identified that will provide links to the Hobson Bay sections. The key improvements identified are:

- Widening the path under the Orakei Road Rail Bridge
- Create a path adjacent to the existing access road for the garden centre
- Widen the existing car park footpath to accommodate cyclists, although the gradients here will be steep.

For the blue route the geotechnical conditions are expected to be difficult. The structure will need to be outside the third track option for KiwiRail. Land purchase from the Hobson Bay Marina may be required.

The main constraints for the yellow route are widening of the Orakei Road Bridge and the pinch point adjacent to the boat sheds where the path would narrow to approximately 2.5 m..

The constraints for Section 4 are summarised in Figure 7-3.

Figure 7-3 : Section 4 route constraints

8 Consenting Strategy

This report has focused mainly on design constraints and the consenting assessments and effects on the environment have not been assessed, therefore cannot be commented on at this stage.

The consenting strategy is summarised as follows:

- Stage 1 (Glen Innes to St Johns Road) – subject to successful consultation process, will be implemented by resource consent applications to enable quick delivery. Option to subsequently designate.
- Stage 2 (St Johns Road to CMA – will be subject to a Notice of Requirement for a designation.
- Stage 2a (Orakei Point) – subject to a Notice of Requirement for a designation.
- Stage 3 (Orakei Basin) – subject to resource consents.
- Stage 4 (Hobson Bay) – subject to resource consents.

The consenting strategy will enable a staged delivery of the project. The strategy will need to be flexible as more detailed information becomes available with a collaborative approach between MWH, Auckland Transport and the NZTA to achieve the best for project outcomes.

9 Consultation Strategy

The consultation strategy seeks to engage with key stakeholders early in the project for the entire route to help identify important issues and opportunity as soon as possible. The early consultation will also attempt to identify if there are clear preferred options along the route, such as Section 1, that could be fast tracked to enable a staged delivery of the project.

The next stage will then be an early public consultation on the entire route. The public consultation material will identify the options being considered with a preferred option identified. Public feedback will be sought on all options presented. This process is expected to assist in the identification of affected parties. If a clear preferred option is identified with key stakeholders as discussed above, the public consultation will have a more targeted focus on that section(s).

10 Summary

The investigations to date have confirmed that there are viable options to achieve a coherent, direct, attractive, comfortable and safe walking and cycling route between Glen Innes and Tamaki Drive. Further option investigation, consent assessment and consultation will identify the preferred project route.

The route is classified as a cycle metro route. The design standards proposed seek to achieve a high level of service for its users that will encourage cycling and future proof the route for expected growth.

The key design constraints to overcome along the route are:

- Topography and associated gradient along the route and connecting to the route
- Impacts on the natural environment
- Impacts on the coastal environment
- Connectivity challenges due to gradients, severance caused by the rail line, and lack of links from catchment areas to the path
- Challenging geotechnical conditions, particularly across Hobson Bay. In addition obtaining geotechnical information will be difficult at locations and will require rail crossings, and likely removal of trees to gain access to test areas.
- Personal safety risks and / or the perceived risks to personal safety

The design, consenting and consultation philosophies will enable a staged implementation of the route, which is expected to lead to the advanced construction of one or two section of the route.

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Appendix C Crash History Data

POLICE CRASH LIST REPORT

2009-2013 Crashes

Run on: 14 Nov 2014

Crash List: Kohimarama / St John

Total Injury Crashes:	6
Total Non-Injury Crashes:	9

Deaths	0
Serious Injuries	1
Minor Injuries	5

Crash Movement	Number	%
Overtaking Crashes	3	20
Straight Road Lost Control/Head On	0	0
Bend - Lost Control/Head On	1	7
Rear End/Obstruction	6	40
Crossing/Turning	4	27
Pedestrian Crashes	1	7
Miscellaneous Crashes	0	0
Total	15	100 %

Injury crash factors (*)	No.Inj.Crashes	% Inj.Crashes
Failed Giveway/Stop	4	67
Poor Observation	4	67
Other	1	17
Total	9	151 %

(*) factors are counted once against a crash - ie two fatigued drivers count as one fatigue crash factor.

Crash Type	Single Party	Multiple Party	Total
Intersection	1	11	12
MidBlock	0	3	3
Total	1	14	15

Location	Local road	State Highway	Total
Urban road	15	0	15
Open road	0	0	0
Total	15	0	15

Environment	Light/Overcast	Dark/Twilight	Total
Dry	9	4	13
Wet	2	0	2
Icy	0	0	0
Total	11	4	15

Drivers at fault or part fault in Injury crashes	Male	Female	Total
15-19 years	1	0	1
20-24	0	0	0
25-29	2	0	2
30-39	1	0	1
40-49	0	1	1
50-59	1	0	1
60-69	0	0	0
70+	0	0	0
Total	5	1	6

Drivers at fault or part fault in Injury crashes	Male	Female	Total
Full	3	0	3
Learner	1	1	2
Restricted	1	0	1
Never licensed	0	0	0
Disqualified	0	0	0
Overseas	0	0	0
Expired	0	0	0
Other/Unknown	0	0	0
Total	5	1	6

Day/ Period	0000-0259	0300-0559	0600-0859	0900-1159	1200-1459	1500-1759	1800-2059	2100-2400	Total
Mon	0	0	1	0	1	1	0	0	3
Tue	0	0	0	0	0	0	0	0	0
Wed	0	0	0	0	2	1	0	1	4
Thu	0	0	0	0	3	1	1	0	5
Fri	0	0	0	0	0	1	0	0	1
Sat	0	0	0	0	0	0	1	0	1
Sun	0	0	0	0	1	0	0	0	1
Total	0	0	1	0	7	4	2	1	15

Month of year	Injury	%	Non-Injury	%	Total	%
Jan	0	0	0	0	0	0
Feb	0	0	0	0	0	0
Mar	0	0	2	22	2	13
Apr	0	0	1	11	1	7
May	2	33	0	0	2	13
Jun	0	0	1	11	1	7
Jul	1	17	1	11	2	13
Aug	0	0	2	22	2	13
Sep	3	50	0	0	3	20
Oct	0	0	0	0	0	0
Nov	0	0	1	11	1	7
Dec	0	0	1	11	1	7
Total	6	100 %	9	100 %	15	100 %

Crash (inj.) nos.	Fatal	Serious	Minor	Non-Inj	Total
2009	0 (0)	1 (1)	2 (2)	1 (-)	4 (3)
2010	0 (0)	0 (0)	0 (0)	2 (-)	2 (0)
2011	0 (0)	0 (0)	2 (2)	1 (-)	3 (2)
2012	0 (0)	0 (0)	1 (1)	3 (-)	4 (1)
2013	0 (0)	0 (0)	0 (0)	2 (-)	2 (0)
Total	0 (0)	1 (1)	5 (5)	9 (-)	15 (6)

Note: last 5 years of crashes shown

First Street	Distance	D/I/R	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day DDD	Time HHMM	Description of Events	Crash Factors (ENV = Environmental factors)	Road	Natural Light	Weather	Junction	Cntrl	Tot Inj F A T	S E R	M I N
KOHIMARAMA ROAD	40N		ST HELIERS BAY ROAD	201332335	04/04/2013	Thu	1340	SUV1 NBD on KOHIMARAMA ROAD changing lanes/overtaking to right hit CAR2	SUV1 incorrect merging/diverging manoeuvre, misjudged speed, etc of vehicle coming from behind or alongside	Dry	Bright	Fine	Unknown	Nil			
KOHIMARAMA ROAD	20S		ST HELIERS BAY ROAD	201238444	27/07/2012	Fri	1545	CAR1 SBD on KOHIMARAMA ROAD overtaking TRUCK2	CAR1 misjudged speed, etc of vehicle coming from behind or alongside	Dry	Bright	Fine	Unknown	Nil			
KOHIMARAMA ROAD		I	ST HELIERS BAY ROAD	2903687	27/05/2009	Wed	2220	CAR1 SBD on KOHIMARAMA ROAD hit PEDESTRIAN2 (Age 45) crossing road from right side	CAR1 did not stop at steady red light	Dry	Dark	Fine	T Type Junction	Traffic Signal	1		
KOHIMARAMA ROAD		I	ST HELIERS BAY ROAD	2903789	27/07/2009	Mon	1620	CAR1 SBD on KOHIMARAMA ROAD hit rear end of CAR2 stop/slow for signals	CAR1 attention diverted by driver dazzled by sun/lights ENV: dazzling sun	Dry	Bright	Fine	T Type Junction	Traffic Signal			1
KOHIMARAMA ROAD		I	ST HELIERS BAY ROAD	201331776	27/03/2013	Wed	1719	CAR1 EBD on ST HELIERS BAY ROAD missed inters or end of road, CAR1 hit Kerb	CAR1 too fast entering corner, lost control due to road conditions, new driver showed inexperience	Wet	Overcast	Light Rain	T Type Junction	Traffic Signal			
KOHIMARAMA ROAD		I	ST HELIERS BAY ROAD	201234810	29/03/2012	Thu	1435	CAR1 and TRUCK2 both WBD on ST HELIERS BAY ROAD and turning; collided	CAR1 misjudged speed, etc of vehicle coming from behind or alongside	Dry	Bright	Fine	T Type Junction	Traffic Signal			
KOHIMARAMA ROAD		I	ST HELIERS BAY ROAD	201204601	22/09/2012	Sat	1940	CAR1 SBD on KOHIMARAMA ROAD hit CAR2 turning right onto KOHIMARAMA ROAD from the left	CAR1 did not stop at steady red light, evading enforcement, stolen vehicle	Dry	Dark	Fine	T Type Junction	Traffic Signal			1
KOHIMARAMA ROAD		I	ST HELIERS BAY ROAD	201141388	18/08/2011	Thu	1457	CAR1 SBD on KOHIMARAMA ROAD hit rear end of CAR2 stop/slow for signals	CAR1 following too closely	Dry	Bright	Fine	T Type Junction	Traffic Signal			
ST HELIERS BAY ROAD		I	KOHIMARAMA ROAD	201240333	14/11/2012	Wed	1325	CAR1 and VAN2 both WBD on ST HELIERS BAY ROAD and turning; collided	CAR1 too far left/right VAN2 too far left/right	Dry	Overcast	Fine	T Type Junction	Traffic Signal			
ST HELIERS BAY ROAD		I	KOHIMARAMA ROAD	201037624	01/08/2010	Sun	1200	CAR1 SBD on ST HELIERS BAY ROAD hit CAR2 turning right onto ST HELIERS BAY ROAD from the left	CAR1 did not stop at steady red light, wrong pedal	Wet	Overcast	Light Rain	T Type Junction	Traffic Signal			
ST HELIERS BAY ROAD		I	ST JOHNS ROAD	2943808	24/12/2009	Thu	1628	CAR1 WBD on ST HELIERS BAY ROAD hit rear end of CAR2 stop/slow for cross traffic	CAR1 following too closely	Dry	Bright	Fine	T Type Junction	Give Way Sign			
ST JOHNS ROAD	10S		ST HELIERS BAY ROAD	201102627	02/05/2011	Mon	0604	CAR2 turning right hit by oncoming CAR1 NBD on ST JOHNS ROAD	CAR2 failed to give way when turning to non-turning traffic, failed to give way when waved through by other driver, didnt see/look when visibility obstructed by other vehicles, ENV: entering or leaving private house / farm	Dry	Dark	Fine	Driveway	Nil			1
ST JOHNS ROAD	30S		ST HELIERS BAY ROAD	201036637	16/06/2010	Wed	1318	CAR1 NBD on ST JOHNS ROAD changing lanes/overtaking to right hit CAR2	CAR1 didnt see/look behind when changing lanes, position or direction	Dry	Bright	Fine	Unknown	Nil			
ST JOHNS ROAD	10W		ST HELIERS BAY ROAD	201104289	01/09/2011	Thu	2027	SUV1 WBD on ST JOHNS ROAD hit rear of CAR2 turning right from centre line	SUV1 failed to notice car slowing ENV: entering or leaving private house / farm	Dry	Dark	Fine	Driveway	Nil			1
ST JOHNS ROAD		I	ST HELIERS BAY ROAD	2904494	21/09/2009	Mon	1250	CAR1 SBD on ST JOHNS ROAD hit MOTOR CYCLE2 merging from the left	MOTOR CYCLE2 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction	Dry	Bright	Fine	T Type Junction	Give Way Sign			1

First Street	Distance / DIR	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day DDD	Time HHMM	MV / DR / MT 1 VN VVV 234	Factors and Roles (A is for vehicle 1, B is for veh 2 etc)	OBJECT	CURVE	WET	LIGHT	WTHER	JUNCT	CNTRL	MARKS	SPDLMT	Total Inj FAT	Total Inj SER	Total Inj MIN	PED age	CYC age
KOHIMARAMA ROAD	40N	ST HELIERS BAY ROAD	201332335	04/04/2013	Thu	1340	AA 4N1C	184A 381A		R	D	BF	F		N	C	050					
KOHIMARAMA ROAD	20S	ST HELIERS BAY ROAD	201238444	27/07/2012	Fri	1545	AO CS1T	381A		R	D	BF	F		N	C	050					
KOHIMARAMA ROAD	I	ST HELIERS BAY ROAD	2903687	27/05/2009	Wed	2220	NB CS1E	322A		R	D	DO	F	T	T	X	050		1		45	
KOHIMARAMA ROAD	I	ST HELIERS BAY ROAD	2903789	27/07/2009	Mon	1620	FE CS1CC	363A 902		R	D	BF	F	T	T	C	050			1		
KOHIMARAMA ROAD	I	ST HELIERS BAY ROAD	201331776	27/03/2013	Wed	1719	DC CE2	111A 135A 402A	K	M	W	OF	L	T	T	C	050					
KOHIMARAMA ROAD	I	ST HELIERS BAY ROAD	201234810	29/03/2012	Thu	1435	GF CW2T	381A		E	D	BF	F	T	T	R	050					
KOHIMARAMA ROAD	I	ST HELIERS BAY ROAD	201204601	22/09/2012	Sat	1940	JA CS1C	322A 514A 517A		R	D	DO	F	T	T	C	050			1		
KOHIMARAMA ROAD	I	ST HELIERS BAY ROAD	201141388	18/08/2011	Thu	1457	FE CS1C	181A		R	D	B	F	T	T	C	050					
ST HELIERS BAY ROAD	I	KOHIMARAMA ROAD	201240333	14/11/2012	Wed	1325	GF CW1V	129A 129B		R	D	O	F	T	T	C	050					
ST HELIERS BAY ROAD	I	KOHIMARAMA ROAD	201037624	01/08/2010	Sun	1200	JA CS1C	322A 423A		R	W	OF	L	T	T	C	050					
ST HELIERS BAY ROAD	I	ST JOHNS ROAD	2943808	24/12/2009	Thu	1628	FB CW1C	181A		R	D	BF	F	T	G	C	050					
ST JOHNS ROAD	10S	ST HELIERS BAY ROAD	201102627	02/05/2011	Mon	0604	LB CN1C	303B 314B 377B 929		R	D	DO	F	D	N	C	050			1		
ST JOHNS ROAD	30S	ST HELIERS BAY ROAD	201036637	16/06/2010	Wed	1318	AA CN1C	372A		R	D	BF	F		N	C	050					
ST JOHNS ROAD	10W	ST HELIERS BAY ROAD	201104289	01/09/2011	Thu	2027	GD 4W1C	331A 929		R	D	DO	F	D	N	C	050			1		
ST JOHNS ROAD	I	ST HELIERS BAY ROAD	2904494	21/09/2009	Mon	1250	KA CS1M	302B 375B		M	D	BF	F	T	G	R	050			1		

POLICE CRASH LIST REPORT

2009-2013 Crashes

Run on: 17 Nov 2014

Crash List: Ngapipi - Kepa - Kohi

Total Injury Crashes:	70
Total Non-Injury Crashes:	119

Deaths	1
Serious Injuries	14
Minor Injuries	75

Crash Movement	Number	%
Overtaking Crashes	28	15
Straight Road Lost Control/Head On	4	2
Bend - Lost Control/Head On	66	35
Rear End/Obstruction	48	25
Crossing/Turning	38	20
Pedestrian Crashes	4	2
Miscellaneous Crashes	1	1
Total	189	100 %

Injury crash factors (*)	No.Inj.Crashes	% Inj.Crashes
Alcohol	7	10
Too fast	11	16
Failed Giveway/Stop	18	26
Failed Keep Left	4	6
Overtaking	2	3
Incorrect Lane/posn	14	20
Poor handling	19	27
Poor Observation	23	33
Poor judgement	7	10
Fatigue	3	4
Disabled/old/ill	4	6
Pedestrian factors	3	4
Vehicle factors	1	1
Other	5	7
Total	121	173 %

(*) factors are counted once against a crash - ie two fatigued drivers count as one fatigue crash factor.

Crash Type	Single Party	Multiple Party	Total
Intersection	12	75	87
MidBlock	27	75	102
Total	39	150	189

Location	Local road	State Highway	Total
Urban road	189	0	189
Open road	0	0	0
Total	189	0	189

Environment	Light/Overcast	Dark/Twilight	Total
Dry	97	29	126
Wet	48	12	60
Icy	0	0	0
Total	145	41	186

Day/ Period	0000-0259	0300-0559	0600-0859	0900-1159	1200-1459	1500-1759	1800-2059	2100-2400	Total
Mon	0	0	4	6	3	6	5	1	25
Tue	1	0	9	8	7	6	4	1	36
Wed	2	0	6	6	4	8	6	1	33
Thu	1	1	3	4	5	8	2	3	27
Fri	1	0	3	2	4	10	5	1	26
Sat	2	0	2	4	5	1	4	1	19
Sun	1	4	1	5	5	3	3	1	23
Total	8	5	28	35	33	42	29	9	189

Drivers at fault or part fault in Injury crashes	Male	Female	Total
15-19 years	8	3	11
20-24	2	9	11
25-29	8	4	12
30-39	7	2	9
40-49	7	5	12
50-59	4	3	7
60-69	1	0	1
70+	1	1	2
Total	38	27	65

Month of year	Injury	%	Non-Injury	%	Total	%
Jan	6	9	9	8	15	8
Feb	9	13	8	7	17	9
Mar	6	9	10	8	16	8
Apr	3	4	8	7	11	6
May	9	13	5	4	14	7
Jun	2	3	8	7	10	5
Jul	5	7	7	6	12	6
Aug	4	6	15	13	19	10
Sep	11	16	10	8	21	11
Oct	3	4	10	8	13	7
Nov	7	10	10	8	17	9
Dec	5	7	19	16	24	13
Total	70	100 %	119	100 %	189	100 %

Drivers at fault or part fault in Injury crashes	Male	Female	Total
Full	25	16	41
Learner	6	1	7
Restricted	3	5	8
Never licensed	0	1	1
Disqualified	1	0	1
Overseas	2	3	5
Expired	0	0	0
Other/Unknown	3	1	4
Total	40	27	67

Crash (inj.) nos.	Fatal	Serious	Minor	Non-Inj	Total
2009	0 (0)	3 (3)	19 (24)	24 (-)	46 (27)
2010	0 (0)	1 (1)	10 (11)	28 (-)	39 (12)
2011	0 (0)	6 (6)	10 (15)	19 (-)	35 (21)
2012	0 (0)	1 (1)	13 (17)	22 (-)	36 (18)
2013	1 (1)	1 (3)	5 (8)	26 (-)	33 (12)
Total	1 (1)	12 (14)	57 (75)	119 (-)	189 (90)

Note: last 5 years of crashes shown

Crash List: ngapipi-kepa-kohi cyclist 09-13

Total Injury Crashes:	14
Total Non-Injury Crashes:	2

Deaths	0
Serious Injuries	4
Minor Injuries	12

Crash Movement	Number	%
Overtaking Crashes	2	13
Straight Road Lost Control/Head On	0	0
Bend - Lost Control/Head On	0	0
Rear End/Obstruction	2	13
Crossing/Turning	12	75
Pedestrian Crashes	0	0
Miscellaneous Crashes	0	0
Total	16	100 %

Injury crash factors (*)	No.Inj.Crashes	% Inj.Crashes
Alcohol	1	7
Failed Giveway/Stop	9	64
Failed Keep Left	1	7
Incorrect Lane/posn	5	36
Poor Observation	9	64
Other	2	14
Total	27	192 %

(*) factors are counted once against a crash - ie two fatigued drivers count as one fatigue crash factor.

Crash Type	Single Party	Multiple Party	Total
Intersection	1	11	12
MidBlock	0	4	4
Total	1	15	16

Location	Local road	State Highway	Total
Urban road	16	0	16
Open road	0	0	0
Total	16	0	16

Environment	Light/Overcast	Dark/Twilight	Total
Dry	10	2	12
Wet	2	1	3
Icy	0	0	0
Total	12	3	15

Day/ Period	0000-0259	0300-0559	0600-0859	0900-1159	1200-1459	1500-1759	1800-2059	2100-2400	Total
Mon	0	0	1	0	0	1	1	0	3
Tue	0	0	2	0	0	0	0	0	2
Wed	0	0	1	1	0	1	1	0	4
Thu	0	0	0	1	0	0	0	0	1
Fri	0	0	1	0	0	1	0	0	2
Sat	0	0	2	0	1	0	0	0	3
Sun	0	1	0	0	0	0	0	0	1
Total	0	1	7	2	1	3	2	0	16

Drivers at fault or part fault in Injury crashes

	Male	Female	Total
15-19 years	0	0	0
20-24	0	3	3
25-29	1	1	2
30-39	1	0	1
40-49	1	1	2
50-59	0	0	0
60-69	0	0	0
70+	1	0	1
Total	4	5	9

Month of year	Injury	%	Non-Injury	%	Total	%
Jan	1	7	0	0	1	6
Feb	2	14	0	0	2	13
Mar	3	21	0	0	3	19
Apr	0	0	0	0	0	0
May	1	7	0	0	1	6
Jun	0	0	1	50	1	6
Jul	1	7	1	50	2	13
Aug	2	14	0	0	2	13
Sep	1	7	0	0	1	6
Oct	0	0	0	0	0	0
Nov	2	14	0	0	2	13
Dec	1	7	0	0	1	6
Total	14	100 %	2	100 %	16	100 %

Drivers at fault or part fault in Injury crashes

	Male	Female	Total
Full	4	5	9
Learner	0	0	0
Restricted	0	0	0
Never licensed	0	0	0
Disqualified	0	0	0
Overseas	1	0	1
Expired	0	0	0
Other/Unknown	0	0	0
Total	5	5	10

Crash (inj.) nos.	Fatal	Serious	Minor	Non-Inj	Total
2009	0 (0)	1 (1)	2 (2)	1 (-)	4 (3)
2010	0 (0)	0 (0)	2 (2)	0 (-)	2 (2)
2011	0 (0)	3 (3)	1 (3)	0 (-)	4 (6)
2012	0 (0)	0 (0)	4 (4)	0 (-)	4 (4)
2013	0 (0)	0 (0)	1 (1)	1 (-)	2 (1)
Total	0 (0)	4 (4)	10 (12)	2 (-)	16 (16)

Note: last 5 years of crashes shown

POLICE CRASH LIST REPORT

2009-2013 Crashes

Run on: 17 Nov 2014

Crash List: Orakei Road (Kepa to Shore)

Total Injury Crashes:	8
Total Non-Injury Crashes:	24

Deaths	0
Serious Injuries	0
Minor Injuries	9

Crash Movement	Number	%
Overtaking Crashes	6	19
Straight Road Lost Control/Head On	2	6
Bend - Lost Control/Head On	17	53
Rear End/Obstruction	1	3
Crossing/Turning	4	13
Pedestrian Crashes	2	6
Miscellaneous Crashes	0	0
Total	32	100 %

Injury crash factors (*)	No.Inj.Crashes	% Inj.Crashes
Alcohol	1	13
Too fast	2	25
Failed Giveway/Stop	1	13
Failed Keep Left	1	13
Incorrect Lane/posn	1	13
Poor handling	2	25
Poor Observation	3	38
Poor judgement	1	13
Pedestrian factors	1	13
Total	13	166 %

(*) factors are counted once against a crash - ie two fatigued drivers count as one fatigue crash factor.

Crash Type	Single Party	Multiple Party	Total
Intersection	1	12	13
MidBlock	12	7	19
Total	13	19	32

Location	Local road	State Highway	Total
Urban road	32	0	32
Open road	0	0	0
Total	32	0	32

Environment	Light/Overcast	Dark/Twilight	Total
Dry	10	1	11
Wet	13	7	20
Icy	0	0	0
Total	23	8	31

Day/ Period	0000-0259	0300-0559	0600-0859	0900-1159	1200-1459	1500-1759	1800-2059	2100-2400	Total
Mon	0	0	0	1	0	0	1	0	2
Tue	0	0	0	2	1	1	1	1	6
Wed	0	0	2	1	0	2	0	0	5
Thu	0	0	3	0	0	2	3	0	8
Fri	0	0	0	1	1	2	1	0	5
Sat	0	1	0	0	1	0	0	1	3
Sun	0	0	0	1	0	0	1	1	3
Total	0	1	5	6	3	7	7	3	32

Drivers at fault or part fault in Injury crashes

	Male	Female	Total
15-19 years	0	0	0
20-24	1	2	3
25-29	0	0	0
30-39	0	0	0
40-49	0	0	0
50-59	1	1	2
60-69	0	0	0
70+	0	0	0
Total	2	3	5

Month of year	Injury	%	Non-Injury	%	Total	%
Jan	0	0	3	13	3	9
Feb	0	0	0	0	0	0
Mar	2	25	2	8	4	13
Apr	1	13	0	0	1	3
May	2	25	5	21	7	22
Jun	0	0	1	4	1	3
Jul	0	0	2	8	2	6
Aug	1	13	2	8	3	9
Sep	0	0	2	8	2	6
Oct	2	25	4	17	6	19
Nov	0	0	0	0	0	0
Dec	0	0	3	13	3	9
Total	8	100 %	24	100 %	32	100 %

Drivers at fault or part fault in Injury crashes

	Male	Female	Total
Full	1	2	3
Learner	0	1	1
Restricted	1	0	1
Never licensed	0	0	0
Disqualified	0	0	0
Overseas	0	0	0
Expired	0	0	0
Other/Unknown	0	0	0
Total	2	3	5

Crash (inj.) nos.	Fatal	Serious	Minor	Non-Inj	Total
2009	0 (0)	0 (0)	2 (2)	3 (-)	5 (2)
2010	0 (0)	0 (0)	3 (4)	8 (-)	11 (4)
2011	0 (0)	0 (0)	1 (1)	4 (-)	5 (1)
2012	0 (0)	0 (0)	1 (1)	2 (-)	3 (1)
2013	0 (0)	0 (0)	1 (1)	7 (-)	8 (1)
Total	0 (0)	0 (0)	8 (9)	24 (-)	32 (9)

Note: last 5 years of crashes shown

First Street	Distance	D|R	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day DDD	Time HHMM	Description of Events	Crash Factors (ENV = Environmental factors)	Road	Natural Light	Weather	Junction	Cntrl	Tot Inj F A T	S E R	M I N
KEPA ROAD		I	ORAKEI ROAD	201038569	20/08/2010	Fri	1650	VAN1 NBD on ORAKEI ROAD lost control turning right, VAN1 hit Fence on right hand bend	VAN1 lost control when turning, inexperience	Wet	Overcast	Light Rain	Roundabo	Give Way Sign			
KEPA ROAD		I	ORAKEI ROAD	2942329	18/09/2009	Fri	1530	TRUCK1 WBD on KEPA ROAD changing lanes to left hit CAR2	TRUCK1 cut in after overtaking, intentional collision	Dry	Bright	Fine	Roundabo	Give Way Sign			
KEPA ROAD		I	ORAKEI ROAD	201033395	30/03/2010	Tue	1120	TRUCK1 WBD on KEPA ROAD changing lanes to left hit CAR2	TRUCK1 long vehicle tracked outside lane	Dry	Bright	Fine	Roundabo	Give Way Sign			
KEPA ROAD		I	ORAKEI ROAD	201037563	29/07/2010	Thu	1530	VAN1 WBD on KEPA ROAD overtaking CAR2	VAN1 too far left/right	Dry	Bright	Fine	Roundabo	Give Way Sign			
KEPA ROAD		I	ORAKEI ROAD	201002906	19/04/2010	Mon	2005	CAR1 entering/leaving driveway hit PEDESTRIAN2 (Age 47) walking on footpath	PEDESTRIAN2 crossing heedless of traffic	Wet	Dark	Light Rain	Roundabo	Give Way Sign			1
KEPA ROAD		I	ORAKEI ROAD	201039167	27/01/2010	Wed	1620	TRUCK1 WBD on KEPA ROAD overtaking CAR2	TRUCK1 too far left/right	Dry	Bright	Fine	Roundabo	Give Way Sign			
KEPA ROAD		I	ORAKEI ROAD	201141848	25/10/2011	Tue	1030	TRUCK1 WBD on KEPA ROAD changing lanes to left hit CAR2	TRUCK1 long vehicle tracked outside lane, misjudged speed of own vehicle	Dry	Bright	Fine	Roundabo	Give Way Sign			
ORAKEI ROAD	170	W	FACILITY ACCESS	201241446	06/12/2012	Thu	1530	CAR1 EBD on ORAKEI ROAD lost control turning right, CAR1 hit Fence, Guard Rail, Phone Box Etc. on right hand bend	CAR1 lost control when turning	Wet	Overcast	Heavy Rain	Unknown	Nil			
ORAKEI ROAD	340	S	KEPA ROA	201030505	21/01/2010	Thu	1850	CAR1 SBD on ORAKEI ROAD lost control turning right, CAR1 hit Guard Rail on right hand bend	CAR1 lost control when turning	Wet	Overcast	Light Rain	Unknown	Nil			
ORAKEI ROAD	200	S	KEPA ROAD	201132271	18/03/2011	Fri	1825	CAR1 WBD on ORAKEI ROAD lost control on curve and hit CAR2 head on	CAR1 lost control when turning, lost control due to road conditions ENV: road slippery (oil/diesel/fuel), heavy rain	Wet	Overcast	Heavy Rain	Unknown	Nil			
ORAKEI ROAD	300	S	KEPA ROAD	201043896	28/12/2010	Tue	1732	VAN1 NBD on ORAKEI ROAD lost control turning right on right hand bend	VAN1 too fast entering corner, lost control when turning ENV: road slippery (rain)	Wet	Overcast	Light Rain	Unknown	Nil			
ORAKEI ROAD	140	W	KEPA ROAD	2904457	04/05/2009	Mon	1100	CAR1 EBD on ORAKEI ROAD hit CAR2 headon on straight	CAR1 too fast for conditions, failed to keep left ENV: entering or leaving private house / farm	Dry	Bright	Fine	Driveway	Nil			1
ORAKEI ROAD	200	W	KEPA ROAD	2904135	30/08/2009	Sun	2209	CAR1 SBD on ORAKEI ROAD lost control; went off road to left, CAR1 hit Post Or Pole	CAR1 alcohol test above limit or test refused, attention diverted by cell phone	Wet	Dark	Heavy Rain	Unknown	Nil			1
ORAKEI ROAD	270	S	NGAPIPI ROAD	201204901	21/10/2012	Sun	1135	CAR1 EBD on ORAKEI ROAD lost control on curve and hit CAR2 head on	CAR1 too fast entering corner, lost control when turning	Wet	Overcast	Light Rain	Unknown	Nil			1
ORAKEI ROAD	380	E	SHORE ROAD	201241676	27/12/2012	Thu	0652	CAR1 SBD on ORAKEI ROAD lost control turning left, CAR1 hit Cliff Bank	CAR1 new driver showed inexperience	Wet	Overcast	Fine	Unknown	Nil			
ORAKEI ROAD	30	N	SHORE ROAD	201102801	23/03/2011	Wed	1530	CAR1 NBD on ORAKEI ROAD hit PEDESTRIAN2 (Age 16) crossing road fromleft side	ENV: visibility limited by parked vehicle	Dry	Bright	Fine	Roundabo	Give Way Sign			1
ORAKEI ROAD	280	N	SHORE ROAD	201336440	13/07/2013	Sat	0455	CAR1 NBD on ORAKEI ROAD lost control turning right, CAR1 hit Guard Rail on right hand bend	CAR1 alcohol test above limit or test refused	Wet	Dark	Fine	Unknown	Nil			
ORAKEI ROAD	300	N	SHORE ROAD	201134813	26/05/2011	Thu	0650	TRUCK1 SBD on ORAKEI ROAD and/or VAN2 cut corner/swung wide and collided head on	TRUCK1 failed to keep left VAN2 failed to keep left	Wet	Overcast	Heavy Rain	Unknown	Nil			

First Street	Distance	D| R	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day	Time HHMM	Description of Events	Crash Factors (ENV = Environmental factors)	Road	Natural Light	Weather	Junction	Cntrl	Tot Inj F S M A E I T R N
ORAKEI ROAD	300	N	SHORE ROAD	2930859	27/01/2009	Tue	1325	VAN1 SBD on ORAKEI ROAD hit rear end of CYCLIST2 stop/slow for obstruction	VAN1 following too closely	Wet	Overcast	Light Rain	Unknown	N/A	
ORAKEI ROAD	380	N	SHORE ROAD	201336810	10/08/2013	Sat	1345	CAR1 EBD on ORAKEI ROAD lost control on curve and hit CAR2 head on	CAR1 lost control due to road conditions ENV: road slippery (rain), road slippery (painted markings)	Wet	Overcast	Light Rain	Unknown	Nil	
ORAKEI ROAD	380	N	SHORE ROAD	201333675	28/05/2013	Tue	2150	CAR1 EBD on ORAKEI ROAD lost control turning right, CAR1 hit Other on right hand bend	CAR1 too fast entering corner, lost control when turning	Wet	Dark	Light Rain	Unknown	Nil	
ORAKEI ROAD	390	N	SHORE ROAD	201135867	28/05/2011	Sat	2255	CAR1 NBD on ORAKEI ROAD lost control turning right, CAR1 hit Guard Rail on right hand bend	CAR1 too fast entering corner, lost control when turning	Wet	Dark	Fine	Unknown	Nil	
ORAKEI ROAD	400	N	SHORE ROAD	201338600	12/09/2013	Thu	1832	CAR1 NBD on ORAKEI ROAD lost control turning right on right hand bend	CAR1 too fast for conditions, lost control when turning, lost control due to road conditions ENV: road slippery (rain)	Wet	Dark	Heavy Rain	Unknown	Nil	
ORAKEI ROAD	500	N	SHORE ROAD	201338933	11/10/2013	Fri	0908	CAR1 NBD on ORAKEI ROAD lost control turning right on right hand bend	CAR1 lost control due to road conditions ENV: road slippery (rain)	Wet	Overcast	Light Rain	Unknown	Nil	
ORAKEI ROAD	550	N	SHORE ROAD	201035455	12/05/2010	Wed	0710	CAR1 NBD on ORAKEI ROAD lost control turning right, CAR1 hit Guard Rail on right hand bend	CAR1 lost control when turning ENV: road slippery (rain)	Wet	Overcast	Light Rain	Unknown	Nil	
ORAKEI ROAD		I	SHORE ROAD	201035542	10/06/2010	Thu	0600	CYCLIST1 EBD on SHORE ROAD hit CAR2 merging from the left	CAR2 failed to give way at stop sign, didnt see/look when required to give way to traffic from another direction	Unkno	Overcast	Unknow	Roundabo	Stop Sign	
ORAKEI ROAD		I	SHORE ROAD	201003025	23/05/2010	Sun	1847	CAR1 EBD on SHORE ROAD hit CAR2 merging from the left	CAR2 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction	Wet	Dark	Light Rain	Roundabo	Give Way Sign	1
ORAKEI ROAD		I	SHORE ROAD	2940379	02/10/2009	Fri	1400	CYCLIST1 EBD on SHORE ROAD hit CAR2 merging from the left	CAR2 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction	Dry	Overcast	Fine	Roundabo	Give Way Sign	
ORAKEI ROAD	390	N	UPLAND ROAD	201324608	23/10/2013	Wed	1100	CAR1 EBD on ORAKEI ROAD lost control turning right, CAR1 went Over Bank, Parked Vehicle on right hand bend	CAR1 lost control when turning, inexperience	Wet	Overcast	Light Rain	Unknown	Nil	1
ORAKEI ROAD		I	UPLAND ROAD	201338398	23/10/2013	Wed	0745	CAR1 SBD on ORAKEI ROAD sideswiped by CAR2 turning left	CAR1 didnt see/look behind when changing lanes, position or direction	Dry	Overcast	Fine	Roundabo	Give Way Sign	
SHORE ROAD		I	ORAKEI ROAD	201332883	16/05/2013	Thu	2020	SUV1 EBD on ORAKEI ROAD hit CAR2 crossing at right angle from right	SUV1 failed to give way at give way sign, misjudged speed etc of vehicle coming from another dirn with right of way	Dry	Dark	Fine	Roundabo	Give Way Sign	
UPLAND ROAD		I	ORAKEI ROAD	201001712	02/03/2010	Tue	1817	CYCLIST1 (Age 31) WBD on UPLAND ROAD cutting corner hit PEDESTRIAN2 (Age 21) 2 (Age 21) head on	CYCLIST1 driving or riding on footpath, didnt see/look when visibility limited by roadside features ENV: visibility limited by hedge or fence	Dry	Bright	Fine	Roundabo	Give Way Sign	2

First Street	Distance	DIR	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day	Time HHMM	MVT	DVR	MVN 1	VVV 234	Factors and Roles A is for vehicle 1 B is for veh 2 etc	OBJECT	CUREWT	LIGHT	WEATHER	JUNCTION	CONTROL	MANOEUVRE	SPEED	Total Inj	FATAL	SERIOUS	MINOR	PEDAge	CYCAge
KEPA ROAD		I	ORAKEI ROAD	201039167	27/01/2010	Wed	1620	AO	TW	1	C	129A		E	D	BF	F	R	G	P	050					
KEPA ROAD		I	ORAKEI ROAD	201033395	30/03/2010	Tue	1120	AC	TW	1	C	179A		M	D	BN	F	R	G	C	050					
KEPA ROAD		I	ORAKEI ROAD	201038569	20/08/2010	Fri	1650	DA	VN	2		131A 400A	F	M	W	ON	L	R	G	L	050					
KEPA ROAD		I	ORAKEI ROAD	201002906	19/04/2010	Mon	2005	PC	CW	1	E	711B		M	W	DO	L	R	G	P	050	1		47		
KEPA ROAD		I	ORAKEI ROAD	201141848	25/10/2011	Tue	1030	AC	TW	1	C	179A 386A		E	D	BF	F	R	G	R	050					
KEPA ROAD		I	ORAKEI ROAD	2942329	18/09/2009	Fri	1530	AC	TW	1	C	159A 512A		R	D	BF	F	R	G	C	050					
KEPA ROAD		I	ORAKEI ROAD	201037563	29/07/2010	Thu	1530	AO	VW	1	C	129A		E	D	BN	F	R	G	R	050					
ORAKEI ROAD	170	W	FACILITY ACCESS	201241446	06/12/2012	Thu	1530	DA	CE	1		131A	FGJ	S	W	OF	H		N	P	050					
ORAKEI ROAD	340	S	KEPA ROA	201030505	21/01/2010	Thu	1850	DA	CS	1		131A	G	E	W	ON	L		N	P	050					
ORAKEI ROAD	200	S	KEPA ROAD	201132271	18/03/2011	Fri	1825	BF	CW	1	C	131A 135A 806 901		E	W	OF	H		N	C	050					
ORAKEI ROAD	300	S	KEPA ROAD	201043896	28/12/2010	Tue	1732	DA	VN	1		111A 131A 801		M	W	OF	L		N	P	050					
ORAKEI ROAD	140	W	KEPA ROAD	2904457	04/05/2009	Mon	1100	BA	CE	1	C	110A 120A 929		R	D	BF	F	D	N	C	050	1				
ORAKEI ROAD	200	W	KEPA ROAD	2904135	30/08/2009	Sun	2209	CB	CS	1		103A 359A	P	R	W	DO	H		N	P	050	1				
ORAKEI ROAD	270	S	NGAPIPI ROAD	201204901	21/10/2012	Sun	1135	BF	CE	1	C	111A 131A		M	W	OF	L		N	C	050	1				
ORAKEI ROAD	380	E	SHORE ROAD	201241676	27/12/2012	Thu	0652	DB	CS	1		402A	C	S	W	OF	F		N	C	050					
ORAKEI ROAD	30	N	SHORE ROAD	201102801	23/03/2011	Wed	1530	NA	CN	1	E	839		R	D	BF	F	R	G	C	050	1		16		
ORAKEI ROAD	280	N	SHORE ROAD	201336440	13/07/2013	Sat	0455	DA	CN	1		103A	G	E	W	DO	F		N	R	050					
ORAKEI ROAD	300	N	SHORE ROAD	2930859	27/01/2009	Tue	1325	FF	VS	1	S	181A		M	W	O	L			P	050					
ORAKEI ROAD	300	N	SHORE ROAD	201134813	26/05/2011	Thu	0650	BD	TS	1	V	120A 120B		M	W	OF	H		N	P	050					
ORAKEI ROAD	380	N	SHORE ROAD	201336810	10/08/2013	Sat	1345	BF	CE	1	C	135A 801 807		M	W	OF	L		N	P	050					
ORAKEI ROAD	380	N	SHORE ROAD	201333675	28/05/2013	Tue	2150	DA	CE	1		111A 131A	X	M	W	DO	L		N	P	050					
ORAKEI ROAD	390	N	SHORE ROAD	201135867	28/05/2011	Sat	2255	DA	CN	1		111A 131A	G	M	W	DO	F		N	P	050					
ORAKEI ROAD	400	N	SHORE ROAD	201338600	12/09/2013	Thu	1832	DA	CN	1		110A 131A 135A 801		S	W	DO	H		N	P	050					
ORAKEI ROAD	500	N	SHORE ROAD	201338933	11/10/2013	Fri	0908	DA	CN	1		135A 801		M	W	OF	L		N	C	050					
ORAKEI ROAD	550	N	SHORE ROAD	201035455	12/05/2010	Wed	0710	DA	CN	1		131A 801	G	M	W	ON	L		N	C	050					
ORAKEI ROAD		I	SHORE ROAD	2940379	02/10/2009	Fri	1400	KA	SE	2	C	302B 375B		E	D	O	F	R	G	P	050					
ORAKEI ROAD		I	SHORE ROAD	201003025	23/05/2010	Sun	1847	KA	CE	2	C	302B 375B		R	W	DO	L	R	G	C	050	1				
ORAKEI ROAD		I	SHORE ROAD	201035542	10/06/2010	Thu	0600	KA	SE	2	C	301B 375B		M		OO		R	S	R	050					
ORAKEI ROAD	390	N	UPLAND ROAD	201324608	23/10/2013	Wed	1100	DA	CE	1	C	131A 400A	EM	M	W	OF	L		N	L	050	1				
ORAKEI ROAD		I	UPLAND ROAD	201338398	23/10/2013	Wed	0745	GB	CS	1	C	372A		R	D	OF	F	R	G	R	050					
SHORE ROAD		I	ORAKEI ROAD	201332883	16/05/2013	Thu	2020	HA	4E	2	C	302A 382A		R	D	DO	F	R	G	C	050					
UPLAND ROAD		I	ORAKEI ROAD	201001712	02/03/2010	Tue	1817	BB	SW	1	E	204A 378A 835		M	D	BF	F	R	G	R	050	2		21	31	

POLICE CRASH LIST REPORT

2009-2013 Crashes

Run on: 17 Nov 2014

Crash List: remuera - st john

Total Injury Crashes:	88
Total Non-Injury Crashes:	241

Deaths	0
Serious Injuries	6
Minor Injuries	90

Crash Movement	Number	%
Overtaking Crashes	30	9
Straight Road Lost Control/Head On	20	6
Bend - Lost Control/Head On	32	10
Rear End/Obstruction	151	46
Crossing/Turning	81	25
Pedestrian Crashes	12	4
Miscellaneous Crashes	3	1
Total	329	100 %

Injury crash factors (*)	No.Inj.Crashes	% Inj.Crashes
Alcohol	8	9
Too fast	4	5
Failed Giveway/Stop	35	40
Overtaking	2	2
Incorrect Lane/posn	10	11
Poor handling	9	10
Poor Observation	43	49
Poor judgement	5	6
Fatigue	1	1
Disabled/old/ill	3	3
Pedestrian factors	7	8
Other	6	7
Total	133	151 %

(*) factors are counted once against a crash - ie two fatigued drivers count as one fatigue crash factor.

Crash Type	Single Party	Multiple Party	Total
Intersection	17	171	188
MidBlock	16	125	141
Total	33	296	329

Location	Local road	State Highway	Total
Urban road	329	0	329
Open road	0	0	0
Total	329	0	329

Environment	Light/Overcast	Dark/Twilight	Total
Dry	198	42	240
Wet	42	42	84
Icy	0	0	0
Total	240	84	324

Day/ Period	0000-0259	0300-0559	0600-0859	0900-1159	1200-1459	1500-1759	1800-2059	2100-2400	Total
Mon	2	0	9	7	7	11	7	2	45
Tue	0	0	12	9	3	15	7	0	46
Wed	1	0	8	7	7	14	7	3	47
Thu	1	2	13	6	15	11	10	4	62
Fri	2	0	7	14	7	16	9	3	58
Sat	5	2	0	9	9	10	5	4	44
Sun	3	1	2	4	6	4	7	0	27
Total	14	5	51	56	54	81	52	16	329

Drivers at fault or part fault in Injury crashes

	Male	Female	Total
15-19 years	3	3	6
20-24	5	6	11
25-29	7	3	10
30-39	4	6	10
40-49	7	4	11
50-59	7	4	11
60-69	7	2	9
70+	4	4	8
Total	44	32	76

Month of year	Injury	%	Non-Injury	%	Total	%
Jan	4	5	11	5	15	5
Feb	4	5	13	5	17	5
Mar	8	9	20	8	28	9
Apr	7	8	21	9	28	9
May	16	18	28	12	44	13
Jun	5	6	19	8	24	7
Jul	6	7	14	6	20	6
Aug	13	15	24	10	37	11
Sep	9	10	19	8	28	9
Oct	2	2	19	8	21	6
Nov	10	11	27	11	37	11
Dec	4	5	26	11	30	9
Total	88	100 %	241	100 %	329	100 %

Drivers at fault or part fault in Injury crashes

	Male	Female	Total
Full	32	21	53
Learner	2	0	2
Restricted	4	8	12
Never licensed	1	0	1
Disqualified	0	0	0
Overseas	1	1	2
Expired	0	0	0
Other/Unknown	6	3	9
Total	46	33	79

Crash (inj.) nos.	Fatal	Serious	Minor	Non-Inj	Total
2009	0 (0)	0 (0)	18 (20)	46 (-)	64 (20)
2010	0 (0)	1 (1)	16 (20)	62 (-)	79 (21)
2011	0 (0)	3 (3)	15 (17)	45 (-)	63 (20)
2012	0 (0)	2 (2)	20 (20)	50 (-)	72 (22)
2013	0 (0)	0 (0)	13 (13)	38 (-)	51 (13)
Total	0 (0)	6 (6)	82 (90)	241 (-)	329 (96)

Note: last 5 years of crashes shown

Crash List: Remuera - St John Cyclist

Total Injury Crashes:	20
Total Non-Injury Crashes:	4

Deaths	0
Serious Injuries	2
Minor Injuries	18

Crash Movement	Number	%
Overtaking Crashes	6	25
Straight Road Lost Control/Head On	0	0
Bend - Lost Control/Head On	1	4
Rear End/Obstruction	5	21
Crossing/Turning	12	50
Pedestrian Crashes	0	0
Miscellaneous Crashes	0	0
Total	24	100%

Injury crash factors (*)	No. Inj Crashes	% Inj Crashes
Failed Giveway/Stop	11	55
Overtaking	2	10
Incorrect Lane/posn	1	5
Poor handling	2	10
Poor Observation	13	65
Poor judgement	2	10
Other	2	10
Total	33	165%

(*) factors are counted once against a crash - ie two fatigued drivers count as one fatigue crash factor.

Crash Type	Single Party	Multiple Party	Total
Intersection	0	15	15
Mid Block	1	8	9
Total	1	23	24

Location	Local road	State Highway	Total
Urban road	24	0	24
Open road	0	0	0
Total	24	0	24

Environment	Light/Overcast	Dark/Twilight	Total
Dry	14	4	18
Wet	2	4	6
Icy	0	0	0
Total	16	8	24

Day/ Period	0000-0259	0300-0559	0600-0859	0900-1159	1200-1459	1500-1759	1800-2059	2100-2400	Total
Mon	0	0	2	0	0	1	2	0	5
Tue	0	0	2	0	0	0	0	0	2
Wed	0	0	1	0	0	1	1	0	3
Thu	0	0	1	1	2	4	0	0	8
Fri	0	0	0	0	0	2	0	0	2
Sat	0	0	0	1	0	1	0	0	2
Sun	0	0	0	1	0	0	1	0	2
Total	0	0	6	3	2	9	4	0	24

Drivers at fault or part fault in Injury crashes

	Male	Female	Total
15-19 years	0	1	1
20-24	0	1	1
25-29	2	0	2
30-39	1	0	1
40-49	1	1	2
50-59	1	1	2
60-69	2	0	2
70+	1	0	1
Total	8	4	12

Month of year	Injury	%	Non-Injury	%	Total	%
Jan	0	0	0	0	0	0
Feb	0	0	0	0	0	0
Mar	3	15	0	0	3	13
Apr	1	5	0	0	1	4
May	4	20	1	25	5	21
Jun	1	5	1	25	2	8
Jul	2	10	0	0	2	8
Aug	2	10	1	25	3	13
Sep	3	15	0	0	3	13
Oct	1	5	0	0	1	4
Nov	2	10	1	25	3	13
Dec	1	5	0	0	1	4
Total	20	100%	4	100%	24	100%

Drivers at fault or part fault in Injury crashes

	Male	Female	Total
Full	6	2	8
Learner	0	0	0
Restricted	0	2	2
Never licensed	0	0	0
Disqualified	0	0	0
Overseas	0	0	0
Expired	0	0	0
Other/Unknown	4	1	5
Total	10	5	15

Crash (inj.) nos.	Fatal	Serious	Minor	Non-Inj	Total
2009	0 (0)	0 (0)	4 (4)	0 (-)	4 (4)
2010	0 (0)	1 (1)	2 (2)	1 (-)	4 (3)
2011	0 (0)	1 (1)	7 (7)	1 (-)	9 (8)
2012	0 (0)	0 (0)	3 (3)	1 (-)	4 (3)
2013	0 (0)	0 (0)	2 (2)	1 (-)	3 (2)
Total	0 (0)	2 (2)	18 (18)	4 (-)	24 (20)

Note: last 5 years of crashes shown

First Street	Distance	D|R	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day	Time HHMM	Description of Events	Crash Factors (ENV = Environmental factors)	Road	Natural Light	Weather	Junction	Cntrl	Tot Inj F A T	S E R	M I N
FELTON MATHEW AVENUE	10	E	ST JOHNS ROAD	201303263	19/08/2013	Mon	1758	MOTOR CYCLE1 EBD on FELTON MATHEW AVENUE hit CAR2 U-turning from same direction of travel	MOTOR CYCLE1 lost control avoiding another vehicle CAR2 didnt see/look behind when changing lanes, position or direction	Dry	Twilight	Fine	T Type Junction	Give Way Sign			1
FELTON MATHEW AVENUE	1		ST JOHNS ROAD	2903788	29/04/2009	Wed	1800	CAR1 NBD on ST JOHNS ROAD turning right hit PEDESTRIAN2 (Age 73) crossing FELTON MATHEW AVENUE from left	PEDESTRIAN2 crossing heedless of traffic	Dry	Twilight	Fine	T Type Junction	Stop Sign			1
GOWING DRIVE	5	W	ST JOHNS ROAD	2935646	29/05/2009	Fri	1530	CAR1 WBD on GOWING DRIVE hit PEDESTRIAN2 crossing road from right side	PEDESTRIAN2 crossing heedless of traffic	Dry	Bright	Fine	T Type Junction	Give Way Sign			
GOWING DRIVE	1		ST JOHNS ROAD	201203976	17/08/2012	Fri	1830	CAR1 SBD on ST JOHNS ROAD turning right hit PEDESTRIAN2 (Age 61) crossing GOWING DRIVE from left	CAR1 alcohol test above limit or test refused, did not see or look for other party until too late PEDESTRIAN2 crossing heedless of traffic ENV: street lighting inadequate	Dry	Dark	Fine	T Type Junction	Give Way Sign			1
KOHIMARAMA ROAD	1		ST HELIERS BAY ROAD	201331776	27/03/2013	Wed	1719	CAR1 EBD on ST HELIERS BAY ROAD missed inters or end of road, CAR1 hit Kerb	CAR1 too fast entering corner, lost control due to road conditions, new driver showed inexperience	Wet	Overcast	Light Rain	T Type Junction	Traffic Signal			
KOHIMARAMA ROAD	1		ST HELIERS BAY ROAD	2903687	27/05/2009	Wed	2220	CAR1 SBD on KOHIMARAMA ROAD hit PEDESTRIAN2 (Age 45) crossing road from right side	CAR1 did not stop at steady red light	Dry	Dark	Fine	T Type Junction	Traffic Signal	1		
KOHIMARAMA ROAD	1		ST HELIERS BAY ROAD	201204601	22/09/2012	Sat	1940	CAR1 SBD on KOHIMARAMA ROAD hit CAR2 turning right onto KOHIMARAMA ROAD from the left	CAR1 did not stop at steady red light, evading enforcement, stolen vehicle	Dry	Dark	Fine	T Type Junction	Traffic Signal			1
KOHIMARAMA ROAD	1		ST HELIERS BAY ROAD	2903789	27/07/2009	Mon	1620	CAR1 SBD on KOHIMARAMA ROAD hit rear end of CAR2 stop/slow for signals	CAR1 attention diverted by driver dazzled by sun/lights ENV: dazzling sun	Dry	Bright	Fine	T Type Junction	Traffic Signal			1
KOHIMARAMA ROAD	1		ST HELIERS BAY ROAD	201234810	29/03/2012	Thu	1435	CAR1 and TRUCK2 both WBD on ST HELIERS BAY ROAD and turning; collided	CAR1 misjudged speed, etc of vehicle coming from behind or alongside	Dry	Bright	Fine	T Type Junction	Traffic Signal			
KOHIMARAMA ROAD	1		ST HELIERS BAY ROAD	201141388	18/08/2011	Thu	1457	CAR1 SBD on KOHIMARAMA ROAD hit rear end of CAR2 stop/slow for signals	CAR1 following too closely	Dry	Bright	Fine	T Type Junction	Traffic Signal			
ST HELIERS BAY ROAD	1		KOHIMARAMA ROAD	201240333	14/11/2012	Wed	1325	CAR1 and VAN2 both WBD on ST HELIERS BAY ROAD and turning; collided	CAR1 too far left/right VAN2 too far left/right	Dry	Overcast	Fine	T Type Junction	Traffic Signal			
ST HELIERS BAY ROAD	1		KOHIMARAMA ROAD	201037624	01/08/2010	Sun	1200	CAR1 SBD on ST HELIERS BAY ROAD hit CAR2 turning right onto ST HELIERS BAY ROAD from the left	CAR1 did not stop at steady red light, wrong pedal	Wet	Overcast	Light Rain	T Type Junction	Traffic Signal			
ST HELIERS BAY ROAD	1		ST JOHNS ROAD	2943808	24/12/2009	Thu	1628	CAR1 WBD on ST HELIERS BAY ROAD hit rear end of CAR2 stop/slow for cross traffic	CAR1 following too closely	Dry	Bright	Fine	T Type Junction	Give Way Sign			
ST JOHNS ROAD	60	E	COLLEGE ROAD	2939134	12/08/2009	Wed	2200	CAR1 EBD on ST JOHNS ROAD lost control turning left, CAR1 hit Fence	CAR1 too far left/right	Dry	Dark	Fine	Unknown	Nil			
ST JOHNS ROAD	100	N	COLLEGE ROAD	201237975	27/08/2012	Mon	1820	CAR1 NBD on ST JOHNS ROAD hit parked veh, CAR1 hit Parked Vehicle	CAR1 alcohol test below limit, too far left/right	Dry	Twilight	Fine	Unknown	N/A			
ST JOHNS ROAD	150	N	COLLEGE ROAD	201205383	11/12/2012	Tue	0509	CAR1 SBD on ST JOHNS ROAD lost control; went off road to left, CAR1 hit Parked Vehicle	CAR1 too far left/right, illness with no warning (eg heart attack)	Dry	Dark	Fine	Unknown	Nil			1
ST JOHNS ROAD	200	N	COLLEGE ROAD	2938947	31/07/2009	Fri	1345	CAR1 NBD on ST JOHNS ROAD sideswiped by VAN2 turning left	VAN2 turned left from near centre line ENV: entering or leaving private house / farm	Dry	Bright	Fine	Driveway	Nil			
ST JOHNS ROAD	1		COLLEGE ROAD	201331358	26/02/2013	Tue	0850	CAR1 SBD on ST JOHNS ROAD hit CAR2 crossing at right angle from right	CAR1 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction	Dry	Bright	Fine	Roundabo	Give Way Sign			

First Street	Distance	D| R	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day	Time HHMM	Description of Events	Crash Factors (ENV = Environmental factors)	Road	Natural Light	Weather	Junction	Cntrl	Tot Inj F A T	S E R	M I N
ST JOHNS ROAD		I	COLLEGE ROAD	201232429	04/03/2012	Sun	1630	VAN1 WBD on ST JOHNS ROAD hit rear end of CAR2 stop/slow for cross traffic	VAN1 inattentive, attention diverted	Dry	Bright	Fine	Roundabo	Give Way Sign			
ST JOHNS ROAD		I	COLLEGE ROAD	201142433	06/09/2011	Tue	0730	VAN2 turning right hit by oncoming VAN1 SBD on ST JOHNS ROAD	VAN1 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction	Dry	Bright	Fine	Roundabo	Give Way Sign			
ST JOHNS ROAD		I	COLLEGE ROAD	201036909	02/07/2010	Fri	0830	CAR1 EBD on ST JOHNS ROAD hit CAR2 turning right onto ST JOHNS ROAD from the left	CAR2 failed to give way at give way sign	Wet	Overcast	Fine	Roundabo	Give Way Sign			
ST JOHNS ROAD	100	S	FELTON MATHEW AVENUE	201334611	23/05/2013	Thu	0815	CAR1 entering/leaving driveway hit PEDESTRIAN2 walking on footpath	CAR1 didnt see/look when required to give way to ped ENV: entering or leaving other commercial	Wet	Overcast	Light Rain	Driveway	Nil			
ST JOHNS ROAD	20	W	FELTON MATHEW AVENUE	201141641	19/11/2011	Sat	0205	CAR1 WBD on ST JOHNS ROAD hit parked veh, CAR1 hit Parked Vehicle	CAR1 alcohol test above limit or test refused, too far left/right	Dry	Dark	Fine	Unknown	Nil			
ST JOHNS ROAD	60	W	FELTON MATHEW AVENUE	201358138	10/10/2013	Thu	2220	CAR2 EBD on ST JOHNS ROAD opened door into path of another party, CAR1 hit Parked Vehicle	CAR1 alcohol test above limit or test refused	Wet	Dark	Light Rain	Unknown	Nil			
ST JOHNS ROAD		I	FELTON MATHEW AVENUE	201357339	27/11/2013	Wed	1850	CAR1 SBD on ST JOHNS ROAD hit CAR2 turning right onto ST JOHNS ROAD from the left	CAR2 failed to give way at give way sign, emotionally upset/road rage, didnt see/look when visibility obstructed by other vehicles	Wet	Overcast	Light Rain	T Type Junction	Give Way Sign			
ST JOHNS ROAD		I	FELTON MATHEW AVENUE	201303410	23/05/2013	Thu	1815	CAR1 SBD on ST JOHNS ROAD hit CAR2 turning right onto ST JOHNS ROAD from the left	CAR2 failed to give way at give way sign	Dry	Twilight	Fine	T Type Junction	Give Way Sign			2
ST JOHNS ROAD	150	E	GOWING DRIVE	201232772	24/01/2012	Tue	0515	CAR1 WBD on ST JOHNS ROAD hit parked veh, CAR1 hit Parked Vehicle	CAR1 alcohol test above limit or test refused, too far left/right	Dry	Dark	Fine	Unknown	Nil			
ST JOHNS ROAD	20	N	GOWING DRIVE	201037625	17/07/2010	Sat	0120	CAR1 SBD on ST JOHNS ROAD hit parked veh, CAR1 hit Parked Vehicle	CAR1 too far left/right, fatigue (drowsy, tired, fell asleep)	Dry	Dark	Fine	Unknown	Nil			
ST JOHNS ROAD	30	N	GOWING DRIVE	2944865	06/12/2009	Sun	1200	CAR1 SBD on ST JOHNS ROAD hit parked veh, CAR1 hit Parked Vehicle	CAR1 too far left/right	Dry	Overcast	Fine	Unknown	Nil			
ST JOHNS ROAD		I	GOWING DRIVE	201339061	02/10/2013	Wed	2230	CAR1 EBD on ST JOHNS ROAD lost control turning right on right hand bend	CAR1 alcohol suspected, lost control when turning	Dry	Dark	Fine	T Type Junction	Give Way Sign			
ST JOHNS ROAD	10	S	ST HELIERS BAY ROAD	201102627	02/05/2011	Mon	0604	CAR2 turning right hit by oncoming CAR1 NBD on ST JOHNS ROAD	CAR2 failed to give way when turning to non-turning traffic, failed to give way when waved through by other driver, didnt see/look when visibility obstructed by other vehicles ENV: entering or leaving private house/farm	Dry	Dark	Fine	Driveway	Nil			1
ST JOHNS ROAD	30	S	ST HELIERS BAY ROAD	201036637	16/06/2010	Wed	1318	CAR1 NBD on ST JOHNS ROAD changing lanes/overtaking to right hit CAR2	CAR1 didnt see/look behind when changing lanes, position or direction	Dry	Bright	Fine	Unknown	Nil			
ST JOHNS ROAD	60	S	ST HELIERS BAY ROAD	201235985	04/05/2012	Fri	2152	CAR1 NBD on ST JOHNS ROAD hit rear of left turning CAR2	CAR1 following too closely, failed to notice car slowing, attention diverted by scenery or persons outside vehicle ENV: entering or leaving other commercial	Dry	Dark	Fine	Driveway	N/A			
ST JOHNS ROAD	100	S	ST HELIERS BAY ROAD	201237916	17/05/2012	Thu	0830	CAR1 SBD on ST JOHNS ROAD hit rear end of CAR2 stop/slow for queue	CAR1 following too closely, failed to notice car slowing	Dry	Bright	Fine	Unknown	N/A			
ST JOHNS ROAD	150	S	ST HELIERS BAY ROAD	201032472	01/04/2010	Thu	1226	CAR1 NBD on ST JOHNS ROAD hit rear end of CAR2 stop/slow for obstruction	CAR1 following too closely CAR2 suddenly braked ENV: entering or leaving other non-commercial	Dry	Bright	Unknow	Driveway	Nil			
ST JOHNS ROAD	150	S	ST HELIERS BAY ROAD	201044103	23/12/2010	Thu	1417	CAR1 SBD on ST JOHNS ROAD hit parked veh, CAR1 hit Parked Vehicle	CAR1 too far left/right, attention diverted by other traffic	Dry	Bright	Fine	Unknown	Nil			

First Street	Distance	D|| R	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day	Time HHMM	Description of Events	Crash Factors (ENV = Environmental factors)	Road	Natural Light	Weather	Junction	Cntrl	Tot Inj F A T	S E R	M I N
ST JOHNS ROAD	200	S	ST HELIERS BAY ROAD	201001260	19/02/2010	Fri	1541	CAR1 SBD on ST JOHNS ROAD hit PEDESTRIAN2 (Age 17) crossing road from left side	PEDESTRIAN2 stepped out from behind vehicle, crossing road, running heedless of traffic	Dry	Bright	Fine	Unknown	Nil			1
ST JOHNS ROAD	10	W	ST HELIERS BAY ROAD	201104289	01/09/2011	Thu	2027	SUV1 WBD on ST JOHNS ROAD hit rear of CAR2 turning right from centre line	SUV1 failed to notice car slowing ENV: entering or leaving private house / farm	Dry	Dark	Fine	Driveway	Nil			1
ST JOHNS ROAD	I		ST HELIERS BAY ROAD	2904494	21/09/2009	Mon	1250	CAR1 SBD on ST JOHNS ROAD hit MOTOR CYCLE2 merging from the left	MOTOR CYCLE2 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction	Dry	Bright	Fine	T Type Junction	Give Way Sign			1

First Street	Distance	DIR	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day	Time HHMM	MVT	DVR 1	DVR 2	DVR 3	DVR 4	Factors and Roles A is for vehicle 1 B is for veh 2 etc	OBJECT	CURVE	WET	LIGHT	WEATHER	JUNCTION	CONTROL	MANOEUVRE	SPEED	Total Inj	FATAL	SERIOUS	MINOR	PED Age	CYC Age
FELTON MATHEW AVENUE	10	E	ST JOHNS ROAD	201303263	19/08/2013	Mon	1758	MC	ME	1	C		137A 372B		R	D	TF	F	T	G	C	050				1		
FELTON MATHEW AVENUE	I		ST JOHNS ROAD	2903788	29/04/2009	Wed	1800	NF	CN	2	E		711B		R	D	TO	F	T	S	C	050			1		73	
GOWING DRIVE	5	W	ST JOHNS ROAD	2935646	29/05/2009	Fri	1530	NB	CW	1	E		711B		R	D	BF	F	T	G	N	050						
GOWING DRIVE	I		ST JOHNS ROAD	201203976	17/08/2012	Fri	1830	NF	CS	2	E		103A 370A 711B 862		R	D	DO	F	T	G	P	050			1		61	
KOHIMARAMA ROAD	I		ST HELIERS BAY ROAD	201204601	22/09/2012	Sat	1940	JA	CS	1	C		322A 514A 517A		R	D	DO	F	T	T	C	050			1			
KOHIMARAMA ROAD	I		ST HELIERS BAY ROAD	201141388	18/08/2011	Thu	1457	FE	CS	1	C		181A		R	D	B	F	T	T	C	050						
KOHIMARAMA ROAD	I		ST HELIERS BAY ROAD	201234810	29/03/2012	Thu	1435	GF	CW	2	T		381A		E	D	BF	F	T	T	R	050						
KOHIMARAMA ROAD	I		ST HELIERS BAY ROAD	2903687	27/05/2009	Wed	2220	NB	CS	1	E		322A		R	D	DO	F	T	T	X	050	1				45	
KOHIMARAMA ROAD	I		ST HELIERS BAY ROAD	2903789	27/07/2009	Mon	1620	FE	CS	1	CC		363A 902		R	D	BF	F	T	T	C	050			1			
KOHIMARAMA ROAD	I		ST HELIERS BAY ROAD	201331776	27/03/2013	Wed	1719	DC	CE	2			111A 135A 402A	K	M	W	OF	L	T	T	C	050						
ST HELIERS BAY ROAD	I		KOHIMARAMA ROAD	201240333	14/11/2012	Wed	1325	GF	CW	1	V		129A 129B		R	D	O	F	T	T	C	050						
ST HELIERS BAY ROAD	I		KOHIMARAMA ROAD	201037624	01/08/2010	Sun	1200	JA	CS	1	C		322A 423A		R	W	OF	L	T	T	C	050						
ST HELIERS BAY ROAD	I		ST JOHNS ROAD	2943808	24/12/2009	Thu	1628	FB	CW	1	C		181A		R	D	BF	F	T	G	C	050						
ST JOHNS ROAD	60	E	COLLEGE ROAD	2939134	12/08/2009	Wed	2200	DB	CE	1			129A	F	E	D	DO	F		N	N	050						
ST JOHNS ROAD	100	N	COLLEGE ROAD	201237975	27/08/2012	Mon	1820	EA	CN	1	C		102A 129A	M	R	D	TO	F			C	050						
ST JOHNS ROAD	150	N	COLLEGE ROAD	201205383	11/12/2012	Tue	0509	CB	CS	1	C		129A 501A	M	R	D	DO	F		N	C	050	1					
ST JOHNS ROAD	200	N	COLLEGE ROAD	2938947	31/07/2009	Fri	1345	GB	CN	1	V		175B 929		R	D	BF	F	D	N	C	050						
ST JOHNS ROAD	I		COLLEGE ROAD	201232429	04/03/2012	Sun	1630	FB	VW	1	C		330A 350A		R	D	BF	F	R	G	C	050						
ST JOHNS ROAD	I		COLLEGE ROAD	201036909	02/07/2010	Fri	0830	JA	CE	1	C		302B		M	W	O	F	R	G	N	050						
ST JOHNS ROAD	I		COLLEGE ROAD	201331358	26/02/2013	Tue	0850	HA	CS	1	C		302A 375A		E	D	BF	F	R	G	C	050						
ST JOHNS ROAD	I		COLLEGE ROAD	201142433	06/09/2011	Tue	0730	LB	VS	1	V		302A 375A		R	D	BN	F	R	G	R	050						
ST JOHNS ROAD	100	S	FELTON MATHEW AVENUE	201334611	23/05/2013	Thu	0815	PC	CS	1	E		376A 927		R	W	OF	L	D	N	C	050						
ST JOHNS ROAD	20	W	FELTON MATHEW AVENUE	201141641	19/11/2011	Sat	0205	EA	CW	1	C		103A 129A	M	R	D	DO	F		N	C	050						
ST JOHNS ROAD	60	W	FELTON MATHEW AVENUE	201358138	10/10/2013	Thu	2220	EE	CE	1	C		103A	M	R	W	DO	L		N	C	050						
ST JOHNS ROAD	I		FELTON MATHEW AVENUE	201357339	27/11/2013	Wed	1850	JA	CS	1	C		302B 357B 377B		R	W	OF	L	T	G	P	050						
ST JOHNS ROAD	I		FELTON MATHEW AVENUE	201303410	23/05/2013	Thu	1815	JA	CS	1	C		302B		E	D	TO	F	T	G	C	050			2			
ST JOHNS ROAD	150	E	GOWING DRIVE	201232772	24/01/2012	Tue	0515	EA	CW	1	C		103A 129A	M	R	D	DO	F		N	C	050						
ST JOHNS ROAD	20	N	GOWING DRIVE	201037625	17/07/2010	Sat	0120	EA	CS	1	C		129A 410A	M	R	D	DO	F		N	P	050						
ST JOHNS ROAD	30	N	GOWING DRIVE	2944865	06/12/2009	Sun	1200	EA	CS	1	C		129A	M	E	D	OF	F		N	C	050						
ST JOHNS ROAD	I		GOWING DRIVE	201339061	02/10/2013	Wed	2230	DA	CE	1			101A 131A		E	D	DF	F	T	G	R	050						
ST JOHNS ROAD	10	S	ST HELIERS BAY ROAD	201102627	02/05/2011	Mon	0604	LB	CN	1	C		303B 314B 377B 929		R	D	DO	F	D	N	C	050			1			
ST JOHNS ROAD	30	S	ST HELIERS BAY ROAD	201036637	16/06/2010	Wed	1318	AA	CN	1	C		372A		R	D	BF	F		N	C	050						
ST JOHNS ROAD	60	S	ST HELIERS BAY ROAD	201235985	04/05/2012	Fri	2152	GA	CN	1	C		181A 331A 352A 927		R	D	DO	F	D		C	050						
ST JOHNS ROAD	100	S	ST HELIERS BAY ROAD	201237916	17/05/2012	Thu	0830	FD	CS	1	C		181A 331A		R	D	B	F			C	050						
ST JOHNS ROAD	150	S	ST HELIERS BAY ROAD	201032472	01/04/2010	Thu	1226	FF	CN	1	C		181A 191B 930		E	D	BF	F	D	N	C	050						
ST JOHNS ROAD	150	S	ST HELIERS BAY ROAD	201044103	23/12/2010	Thu	1417	EA	CS	1	V		129A 353A	M	E	D	BF	F		N	P	050						
ST JOHNS ROAD	200	S	ST HELIERS BAY ROAD	201001260	19/02/2010	Fri	1541	NA	CS	1	E		712B 713B		R	D	BF	F		N	C	050			1		17	

First Street	Distance	DIR	Second street or landmark	Crash Number	Date DD/MM/YYYY	Day	Time DDD HHMM	MVT	DVR 1	MVN 234	VVV	Factors and Roles A is for vehicle 1 B is for veh 2 etc	OBJECT	CURVE	WET	LIGHT	WEATHER	JUNCTION	CONTROL	MANOEUVRE	SPEED	Total Inj	FATAL	SERIOUS	MINOR	PED Age	CYC Age
ST JOHNS ROAD	10	W	ST HELIERS BAY ROAD	201104289	01/09/2011	Thu	2027	GD	4	W	LC	331A 929		R	D	DO	F	D	N	C	050	1					
ST JOHNS ROAD		I	ST HELIERS BAY ROAD	2904494	21/09/2009	Mon	1250	KA	CS	1	M	302B 375B		M	D	BF	F	T	G	R	050	1					

Appendix D Consultation and Communication Plan

MWH

BUILDING A BETTER WORLD

Contract No. 312-13-604-PS: Glen Innes to Tamaki Drive Shared Path

Consultation and Communication Plan

Prepared for Auckland Transport

July 2014

DRAFT FOR CLIENT COMMENT

QUALITY STATEMENT

PROJECT MANAGER	PROJECT TECHNICAL LEAD
Stephen Sinclair	Andrew McDonald

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Emma Monk / Janan Dunning	.....	...../...../.....
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REVISION SCHEDULE

Rev No	Date	Description	Signature or Typed Name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
1	21 July 2014	Update	JD	CS	CS	AM

Auckland Transport
Glen Innes to Tamaki Drive Shared Path

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Appendix A Stakeholder Contact List and Consultation Activity Plan

1 Introduction

This document sets out an updated Consultation and Communications Plan for Auckland Transport's Glen Innes to Tamaki Drive Shared Path Project (the Project).

This is intended to be a living document which will be progressively populated and updated to reflect further information and understanding of the project as it develops, the opinions of the community it will affect, and any changes in approach to the project by Auckland Transport (AT). All changes will be approved by AT prior to formalising any updates.

The implementation of this plan is intended to support the definition of the scope, the preferred route and design, and the full physical implementation of the project. This effectiveness of this Consultation and Communication Plan will be integral to underpinning the consents and approvals phase of the project.

2 Background

Growing pressure on the Auckland transport network and demands for a range of transport mode options due to increasing employment and population in the Auckland region has driven the need to develop an integrated, high capacity, high quality transport infrastructure to underpin the on-going development of Auckland's strategic role in New Zealand's economy.

AT's vision for Auckland is to provide an integrated road, rail, bus, ferry, cycle and walking network that gives effective access to transport for people and goods. This includes networks that provide for active transport modes such as walking and cycling, and which provide attractive and viable alternatives to private vehicle use.

The Auckland Transport Plan (ATP) provides a framework for the development of an integrated multi modal transport solution for Auckland, and incorporates the Auckland Regional Cycle Network (ARCN). This integration will help ensure that active transport modes such as walking and cycling are afforded appropriate priority in achieving Auckland Transport's vision for regionally integrated transport solutions.

2.1 Project Description

The Project will link Glen Innes to Tamaki Drive via a 7.5 kilometre generally 3.0 metre wide shared path. The Project will provide a continuous walking and cycling facility between the city centre and the eastern suburbs, consistent with AT's integrated multi-modal transport vision. While the final Project route is still to be determined, Image 2-1 shows an indicative route and the general project area.

Image 2-1: Aerial map of indicative route and project area (image sourced from Google Maps)

Project feasibility studies completed by Beca[1] and SKM[2] in 2014 identified some considerations and constraints for the Project that are relevant to implementing this Consultation and Communication Plan. These include:

- Potential private property interests;
- Hobson Bay as a Regionally Significant Landscape and an Area of Coastal Protection;
- Orakei Point / Orakei Basin recognised for archaeological and geological features;
- The geological, historical / cultural, scientific / educational, visual amenity and archaeological values associated with the project area;
- Constraints associated with the placement of a shared path along a rail corridor (safety, cost and construction requirements for example);
- The effects associated with the removal of native bush;
- The significance of the Eastern Bays area to Ngati Whatua o Orakei.

In light of the above, this Consultation and Communications Plan provides a mechanism to recognise the sensitivities and constraints identified at the project feasibility stage, the obligation of AT to seek input from appropriate parties in respect of those sensitivities and constraints, and for consultation outcomes to play a key part in addressing those matters.

3 Project Objectives

The overall objectives for the Project are:

A. To identify a preferred route for a shared path that:
   - connects the existing sections of the Auckland Cycle Network between Tamaki Drive and Glen Innes;
   - provides an appropriate level of service for commuter cyclists in recognition of its function as part of the Auckland Cycle Network.

B. To develop a cost effective shared path whilst balancing the need to provide for a good standard of facility that is consistent with its function as a strategic component of the Auckland Cycle Network.

C. To provide for a shared path that:
   - is safe, convenient and attractive path for walking and cycling;
   - supports a variety of user types and confidence levels;
   - promotes sustainability through the encouragement of walking and cycling as an alternative to motorised transport.

4 Purpose of this Consultation and Communications Plan

The overall purpose of this Consultation and Communications Plan is to:

- Clearly communicate to key stakeholders the objectives and details of the Project;
- Provide for stakeholders to express their views and contribute to the Project;
- Seek input and views from key stakeholders relevant to the Project; and
- Provide the opportunity for those interested in the Project to provide input and meaningfully contribute to the development of the Project.

The consultation process is useful to identify issues, concerns and the potential effects that the Project may have on potentially affected parties and key stakeholder. Consultation will provide an opportunity for AT to take into consideration these concerns as they progress with the Project, and will assist AT in developing and communicating the Project Objectives identified above.

[1] Hobson Bay Shared Path – Project Feasibility Report 2012
[2] A18:Eastern Transport Corridor Cycleway – Project Feasibility Report 2008

The reasons for developing this Consultation and Communications Plan are:

- To set a framework to help implement effective consultation and communication that is consistent with best practice, and provides guidance to the Project Team, Stakeholders and the public;
- To guide the consultation process and schedule;
- To provide information and guidance that can be used throughout the project;
- To provide an effective and auditable method of consultation outcomes with design solutions, so the Project Team can adapt the design to respond to issues captured during consultation.

4.1 Project Consultation & Communication Objectives

Taking into account AT's statutory obligations and best-practice guidelines, the following consultation objectives have been developed for the Project.

4.1.1 Information Provision and Feedback

- To ensure information about the Project is freely available and accessible to all parties and that people are aware of how they can provide feedback.
- To provide the opportunity for any person or organisation interested in, or affected by, the Project can provide feedback on the Project.
- To gain feedback from key stakeholders on the Project and any matters of significance or concern and use this information to help identity the most feasible option.
- To clearly document how feedback has been incorporated into the Project and ensure this is publicly available.

4.1.2 Relationship Development

- To develop strong relationships with stakeholders in order to facilitate an open dialogue and instil trust that the decisions made by AT have given due consideration to the feedback from stakeholders.
- Ensure that the consultation and communication outcomes are given genuine consideration and matters of significance or concern are dealt with appropriately and with respect.
- To ensure that the consultation and communication activities support the wider efforts of AT to develop strong relationships with stakeholders and the community in which they operate.
- To document how consultation outcomes have been considered and where appropriate are incorporated into or influence the Project.

4.1.3 Tangata whenua

- To ensure that tangata whenua are consulted in accordance with the status afforded to them by way of legislative requirements and in a manner that meets their cultural or organisational needs.
- To gain the help and advice of tangata whenua in identifying firstly, matters of significance to them and secondly, practicable ways to provide for these within the outcomes of the Project.
- To enhance the relationships with tangata whenua by understanding the importance of cultural, environmental and heritage elements in the Project area.

While this consultation and communication strategy draws on the NZ Transport Agency's 2008 Public Engagement Policy and Guidelines, it has been specifically tailored to the needs of AT in respect of the Project.

5 Statutory Framework and Guidelines

In undertaking the Project, AT is subject to a number of legislative requirements. In addition there are a number of other statutory and policy documents that prescribe and guide how consultation should be undertaken. These requirements are outlined below, and the proposed approach in this plan has been designed to ensure that these various requirements are met.

5.1 Resource Management Act 1991

While consultation with stakeholders and affected parties is not mandatory under the Resource Management Act 1991 (RMA), the products of consultation can be a valuable source of information, particularly in identifying and assessing potential adverse effects and can also contribute to good project development and design.

The Fourth Schedule (Clause 1(h)) of the RMA states that an Assessment of Environmental Effects (AEE) should include a statement that identifies those persons interested in or affected by the proposal, details of any consultation undertaken, and any response to the views of those consulted. Furthermore, the Environment Court has stated that it is recognised as good practice to consult.

Section 6 of the RMA sets out the "Matters of National Importance" that shall be recognised and provided for by all persons exercising functions and powers under the Act and includes:

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

(f) the protection of historic heritage from inappropriate subdivision, use and development.

Subsection (f) was introduced under the Resource Management Amendment Act 2003. The definition of "historic heritage" includes "*sites of significance to Maori, including waahi tapu*".

Section 7 of the Act sets out "Other Matters" that persons exercising functions and powers under the RMA shall have particular regard and includes:

(a) kaitiakitanga
(aa) The ethic of stewardship

Section 8 of the RMA requires that:

"8. Treaty of Waitangi – In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)"

In the context of a consultation strategy, these sections of the RMA are considered to be particularly pertinent as consultation is a fundamental tool in addressing sections 6, 7 and 8 of the RMA.

5.2 Local Government Act 2002

Section 82 of the LGA 2002 contains principles for consultation which provide valuable guidance on how the consultation should be conducted. These principles are as follows:

a) that persons who will or may be affected by, or have an interest in, the decision or matter should be provided by the local authority with reasonable access to relevant information in a manner and format that is appropriate to the preferences and needs of those persons:

b) that persons who will or may be affected by, or have an interest in, the decision or matter should be encouraged by the local authority to present their views to the local authority:

c) that persons who are invited or encouraged to present their views to the local authority should be given clear information by the local authority concerning the purpose of the consultation and the scope of the decisions to be taken following the consideration of views presented:

d) that persons who wish to have their views on the decision or matter considered by the local authority should be provided by the local authority with a reasonable opportunity to present those views to the local authority in a manner and format that is appropriate to the preferences and needs of those persons:

e) that the views presented to the local authority should be received by the local authority with an open mind and should be given by the local authority, in making a decision, due consideration:

f) that persons who present views to the local authority should be provided by the local authority with information concerning both the relevant decisions and the reasons for those decisions.

5.3 Land Transport Management Act 2003

The objective of the NZ Transport Agency (Transport Agency) under the Land Transport Management Act 2003 (LTMA) is:
To operate the State highway system in a way that contributes to an integrated, safe, responsive and sustainable land transport system.

In meeting its objective the Transport Agency must exhibit a sense of social and environmental responsibility which includes:

a) Avoiding, to the extent reasonable in the circumstances, adverse effects on the environment; and

b) Taking into account the views of affected communities; and

c) Giving early and full consideration to land transport options and alternatives in a manner that contributes to paragraphs a) and b); and

d) Providing early and full opportunities for the persons and organisations listed in section 15(1) to contribute to the development of its land transport programmes.

5.4 Proposed Auckland Unitary Plan

Under the Proposed Auckland Unitary Plan Part 3, Chapter G, Section 2.7.4, a cultural impact assessment (CIA) will be required for all applications requiring resource consents under a number of criteria. The CIA will be written Mana Whenua or a nominated party. The CIA requires engagement with Mana Whenua to establish the statement of Mana Whenua values and a description of the consultative processes used in preparing the report.

5.5 Historic Places Act 1993

The Historic Places Act 1993 requires that an archaeological authority is applied for under Section 11 in the event that works will result in the destruction, damage or modification of any archaeological site. The Historic Places Act is administered by the Heritage New Zealand (HNZ), formerly the New Zealand Historic Places Trust.

AT will consult with HNZ before commencement of any works to identify appropriate procedures to follow in the event of any disturbance of any archaeological sites and/or artefacts. In addition where any sites or artefacts are discovered, AT will consult HNZ further to determine appropriate courses of action.

5.6 Statement of Principles for Consultation

The Environment Court developed from a number of decisions a statement of principles for consultation. These principles have been primarily developed through case law relating to resource consents and designations.

The statement of principles is quoted in case of *Horahora Marae v Minister of Corrections A085/2004,* which specifically cites earlier case law from the decision in the *Land Air Water Association and Others v Waikato Regional Council A11/2001.*

The Environment Court's statement of principles for consultation is:

i. The nature and object of consultation must be related to the circumstances.

ii. Adequate information of the proposals is to be given in a timely manner so that those consulted know what is proposed.

iii. Those consulted must be given a reasonable opportunity to state their views.

iv. While those consulted cannot be forced to state their views, they cannot complain, if having had both time and opportunity, they for any reason fail to avail themselves of the opportunity.

v. Consultation is never to be treated perfunctorily or as a mere formality.

vi. The parties are to approach consultation with an open mind.

vii. Consultation is an intermediate situation involving meaningful discussions and does not necessarily involve resolution by agreement.

viii. Neither party is entitled to make demands.

ix. There is no universal requirement as to form or duration.

x. The whole process is to be underlain by fairness.

These principles can be further drawn on from other decisions of the Court to include that:

- There is an overall duty on the part of both parties to act reasonably and in good faith, because consultation is not a one-sided affair.
- Consultation has overlapping requirements of reasonableness, fairness, open mind, freedom from demands, and the need to avail oneself of the consultation opportunity.
- Consultation is as much about listening as it is about imparting information, and is more about the quality of information imparted than it is about the quantity.
- Consultation is not an end or an obligation in itself, it is just one possible method of gathering views from those affected so that they can be taken account of in the decision-making process. The primary obligation is to ensure that the decision-maker has sufficient material before it to make the necessary decisions about Part 2 RMA issues.

6 Engagement Framework

The framework that will be used for the consultation and communications for this Project will be the IAP2[3] Spectrum of Public Participation, reference at http://www.iap2.org.au/documents/item/84.

7 Project Stakeholders

The following table sets out the potential stakeholders for the project, their group (Key Stakeholders, Directly Affected Parties, Affected Parties and Other Interested Stakeholders), their status on the IAP2 spectrum and key drivers they may have. Contact details for these groups are detailed in the Stakeholder Contacts Details tab in the spreadsheet attached as Appendix A.

It is important to acknowledge that the following lists will be updated as the project progresses should further key stakeholders and affected parties be identified.

The aim of this consultation is to establish a two-way flow of information and opinion between the Project Team and key stakeholders, tangata whenua and affected and interested parties. Table 7-1 sets out the key stakeholders, tangata whenua, and interested and affected parties that may take part in the consultation process. The parties are identified at this stage however this list may be updated as appropriate, as the consultation process advances.

[3] IAP2 – the International Association for Public Participation – the preeminent international organisation advancing the practice of public participation.

Table 7-1: Identified Stakeholders

Stakeholder	Group	IAP2 spectrum	Details
Auckland Transport Community Transport	Key stakeholders	Involve	Internal stakeholders need to be kept actively involved in the project to ensure that it meets internal requirements and aligns with other activities
Auckland Transport internal stakeholders and Steering Group members	Key stakeholders	Involve	Internal stakeholders need to be kept actively involved in the project to ensure that it meets internal requirements and aligns with other activities
Auckland Transport PT Operations	Key stakeholders	Involve	Internal stakeholders need to be kept actively involved in the project to ensure that it meets internal requirements and aligns with other activities
Auckland Council	Key stakeholders	Consult	Auckland Council Parks, Stormwater and Environmental Teams will need to be kept informed of the project and how it relates to them.
New Zealand Transport Agency	Key stakeholders	Consult	The project needs to comply with NZTA standards and guidelines
KiwiRail	Directly Affected	Involve	The path may run directly along with railway, within the KiwiRail designation. In addition the Project needs to comply with KiwiRail standards and guidelines
Maugakiekie-Tamaki Local Board	Key stakeholder	Consult	The Project falls in the Maugakiekie-Tamaki Local Board The Board covers the suburbs of One Tree Hill, Royal Oak, Onehunga, Penrose, Mt Wellington, Panmure and Glen Innes. This project will support the Board's Greenways Network Plan.
Waitemata Local Board	Key stakeholder	Consult	The Project connects to the Waitemata Local Board area. The Board area includes the Auckland central business district (CBD) and fringe retail and commercial areas (including Newmarket), and the inner city residential suburbs of Westmere, Grey Lynn, Ponsonby and Parnell. This project will support the Board' Greenways Network Plan.
Tangata whenua: • Ngāti Whātua o Ōrākei • Te Kawerau a Maki • Ngāti Tamaoho • Te Ākitai Waiohua • Ngāti Maru (Hauraki) • Patukirikiri • Ngāti Paoa • Ngāti Tamaterā	Key stakeholder	Consult	Consultation with tangata whenua is fundamental meeting AT's statutory obligations in respect of effective and meaningful consultation. The project passes through a variety of areas including land, waterways, and coastal environments that may be of interest to tangata whenua.
Cycle Action Auckland	Other interested	Consult	Cycle Action is actively involved in advocating and consulting with Auckland Council, AT and NZTA for an improved cycling environment in Auckland. Given the importance of this group as representative of

			a key end user group, it is important that they have the opportunity to be involved in, and contribute to the project.
Mobility Research	Other interested	Consult	Supply and install Tactile Ground Surface Indicators to aid blind and vision impaired pedestrians negotiate the built environment with dignity and safety.
Walk Auckland	Other interested	Consult	Walk Auckland are a charity that aims to promote the right of people to walk with independence, comfort and safety.
Royal New Zealand Foundation of the Blind	Other interested	Consult	RNZFB are a non-profit organisation that strives to empower and support our members to ensure they have the same opportunities and choices as everyone else.
CCS Disability Action	Other interested	Consult	CCS Disability Action provide support and strengthen communities so people with disabilities are included in the life of the family and in their community
Tamaki Redevelopment Company	Other interested	Consult	The aim of this group is to regenerate the Tamaki area through their approach to place-making and building connected and thriving communities.
Glen Innes Business Association	Other interested	Consult	To support business in Glen Innes
Remuera Business Association	Other interested	Consult	To support business in Remuera
Property owners (including Hobson Views Limited – own proposed development area)	Direct affected and affected	Consult	To be identified To be covered by AT (section 2.5 of the Engineering Professional Services Contract)
Community groups	Other interested	Consult	There are a number of community groups that may be interested in this project, including: • Glen Innes Health and Wellness Network • Stonefields Residents Group • Tamaki Drive Protection Society • Orakei Basin Protection Society • Auckland Central Cycling Club
Utility service providers	Key stakeholder	Consult	There are a number of services that run in the Project area. Groups that will need to be contact include: • Watercare • Transpower • Vector
Emergency services	Key stakeholder	Consult	This includes: • Police • Fire • St Johns Ambulance
Education facilities	Other interested	Consult	There are a number of educational facilities in the area surrounding the Project area. Some will have a higher interest in the Project than others. Facilities include: • Parnell District School • Orakei School • St Kentigern

			• Meadowbank School • Kohimarama School • The College of St John the Evangelist • Glen Innes School • Glen Taylor School • University of Auckland • Tamaki College • Pt England School • Glenbrae School • Sacred Heart College • St Thomas's School • Selwyn College • Victoria Avenue School • Mt Carmel School • Glendowie College • St. Heliers Primary • St. Ignatius School
Land Developments	Directly affected / Other interested	Consult	Including: • Orakei Point Development • SHA (Kohimarama Road and the Meadowbank Cluster)
Remuera Golf Club	Other interested	Consult	The facility will provide people using the golf club with an alternative transport choice, and hence the club may have an interest in the project.
Auckland Netball Centre	Other interested	Consult	The facility will provide people using the netball club with an alternative transport choice, and hence the club may have an interest in the project.
Auckland Uni Cricket Club	Other interested	Consult	The facility will provide people using the cricket club with an alternative transport choice, and hence the club may have an interest in the project.
General public	Other interested	Inform/Consult	The general public, both those in the vicinity of the Project and also those who may use the facility in the wider Auckland area may have an interest in the project and have feedback to provide.

8 Consultation and Communication Methods

Taking the above into account, consideration will be given to how each stakeholder should be engaged throughout the project. When selecting a communication method it is worth keeping in mind two things:

1) A consultee may have a preference for a method of consultation and thus should be asked of any preferences at the outset of a project; and
2) The methods of consultation and stakeholder engagement generally vary throughout a project.

Keeping these two matters in mind, there are a number of methods to ensure that stakeholders are engaged, these include:

- Information on the AT website – general information for all stakeholders
- Letters – for specific parties with individual issues
- Regular email updates – general information to keep all stakeholders informed or specific email updates for key stakeholder groups
- Newsletters – general information to keep all stakeholders informed
- Open days – provision of general information for the public and to seek feedback
- Workshops – for specific stakeholders to gain key feedback

- Face to face meetings – for those parties with a high level of interest/investment in the project
- Hui – to seek feedback and views of tangata whenua.

Open days and workshops will be managed in conjunction with other communication activities such as advertising, newsletter production, meetings with Council representatives, media liaison and website updates. Appropriate methods to gather, record and assess feedback from the public and stakeholders must be available for all methods of stakeholder engagement.

9 Consultation and Communications Activities

9.1 Proposed Activities

This consultation and communications plan includes certain activities that are to be undertaken at various stages of the project. Details of the proposed activities are provided in the Activity Plan tab of the spreadsheet attached in Appendix A.

Timing of activities and additional activities will be added to this table across the duration of the project as new issues and stakeholders are identified.

9.2 Monitoring Engagement

A consultation and communication database will be developed to record all stakeholder's and affected party's contact details, all correspondence and documentation sent to and received from the various parties, attendees at meetings and workshops, information provided and feedback given.

9.3 Reporting on Feedback

The database and any updates to the consultation and communication plan will be regularly provided to AT at a frequency to be agreed, but no less than monthly.

Following the completion of all activities above, a detailed report will be provided to summarise all engagements and feedback received.

10 Risks to Project

Undertaking the Consultation and Communications Plan for the project has the potential to introduce risks to the project as landowners, local body politicians, interest groups and the media have the potential to disrupt the programme. Acknowledging the risks and providing mitigation measures can reduce the potential for disruption to the Project programme. An indicative list of consultation risks to the programme, and proposed mitigation measures are outlined in Table 10-1 below.

Table 10-1: Consultation Risk Identification

Risk	Probability	Significance / Consequence	Mitigation and Responses
Non-identification of affected parties	Low	High Delay to project if landowner/occupier has not been involved in the Project and input is required, or expected	Comprehensive assessment of land ownership/occupiers during consultation database start-up
Engagement with stakeholder leads to surprise of process and opposition to project	Medium	Medium Surprised stakeholder may prove difficult to negotiate with, delays to the Project Development of unrealistic	Good communications planning and execution to ensure people are well informed about the Project.

		outcomes	
Stakeholder may go to local body politician, MP or Media to complain	Medium	Medium	Ensure that local body politicians are well aware of the Project. Pre-prepare questions and answers and press releases.
Political interference with project	Low	Medium Delay to project if agreement cannot be reached	Ensure that local body politicians are well informed of the Project.
Key stakeholder has unrealistic requirements for the project	Low	High Increased project costs or delay to mediate a solution	Early engagement with stakeholders and clear communication regarding project scope and budget.
Key stakeholder not identified	Low	Low	Early identification of stakeholders and ongoing review of these people/groups. Some mass communications to raise the issue widely and allow stakeholders to approach AT if not already engaged

11 Consultation Outcomes

The desired outcomes in respect of this Consultation and Communications Plan are that:

- All people and organisations interested in or affected by the project are given the opportunity to actively and fully participate in the consultation process.
- All legislative requirements for consultation are met.
- All participants in the process have sufficient understanding of the project to enable informed and useful responses.
- All participants are satisfied that consultation has been undertaken in a genuine and open minded manner.
- All participants are satisfied that their responses, feedback and advice has been carefully considered.
- All participants have a full understanding of how the results of the consultation have been treated.
- The consent authority is satisfied that the consultation has been undertaken in accordance with the RMA.
- AT has a full record of the feedback received and an audit trail of a comprehensive consultation process to support any future actions.

The Consultation Plan is a living document and will be updated throughout the Project to ensure it remains effective and relevant.

Appendix A Stakeholder Contact List and Consultation Activity Plan

DRAFT Stakeholder Contact List

Revised: 24 July 2014

Organisation	IAP2 Spectrum	Contact Name	Role	Address	Phone	Email	Engagement record
Auckland Transport Community Transport	Involve						
Auckland Transport internal stakeholders and Steering Group members	Involve						
Auckland Transport PT Operations	Involve						
Auckland Council	Consult						
New Zealand Transport Agency	Consult						
KiwiRail	Involve						
Orakei Local Board	consult	Desley Simpson	Chair	Shop 25, Meadowbank Shopping Centre 35 St Johns Road Meadowbank	021 971 786	desley.simpson@aucklandcouncilgovt.nz	
Maugakiekie-Tamaki Local Board	Consult	Simon Randall	Chair	7-13 Pilkington Road Panmure	021 286 7999	simon.randall@aucklandcouncil.govt.nz	
Waitemata Local Board	Consult	Shale Chambers	Chair	Level 2 32 Granham Street	021 286 7111	Shale.chambers@auckalndcouncil.govt.nz	
Tangata whenua	Consult	In part: • Ngāti Whātua o Ōrākei • Te Kawerau a Maki • Ngāti Tamaoho • Te Ākitai Waiohua • Ngāti Maru (Hauraki) • Patukirikiri • Ngāti Paoa • Ngāti Tamaterā					
Cycle Action Auckland	Consult	Barbara Cuthbert	Chair		0274 125 824	cuthash@world-net.co.nz	
Mobility Research	Consult	Ron Mitchell	Operations Manager	10 Eden Street Newmarket	021 766 000	ron@mobilityresearch.co.nz	
Walk Auckland	Consult	Andy Smith			09 361 2133	andysmith@clear.net.nz	
Royal New Zealand Foundation of the Blind	Consult	Chief Executive	Sandra Budd	4 Maunsell Road Parnell	09 355 6900		
CCS Disability Action	Consult	Chief Executive	David Matthews	14 Erson Avenue Royal Oak	09 625 9378		
Tamaki Redevelopment Company	Consult	Chief Executive	Debra Lawson	244 Apirana Avenue Glen Innes	09 521 5221		
Glen Innes Business Association	Consult	Chair	Gary Holmes	44 Mayfair Place Glen Innes	09 521 7200	admin@giba.org.nz	
Remuera Business Association	Consult	Scott Dargaville	Chairman	Remuera Gallery 360 Remuera Road		scott.dargaville@paradise.net.nz	
Glen Innes Health and Wellness Network	Consult						

Organisation	IAP2 Spectrum	Contact Name	Role	Address	Phone	Email	Engagement record
Stonefields Residents Group	Consult	Hari Segar	Chair			http://stonefields.org.nz/ - Contact us page on website	
Tamaki Drive Protection Society	Consult	Kenneth Palmer	Chair	PO Box 25261 St Heliers Bay	09 528 0581	protect@tamakidrive.org.nz	
Auckland Central Cycling Club	Consult	Richard Justice		PO Box 91470 Victoria Street West	021 223 4741	richardjustice@richardjustice.com	
Auckland University Cricket Club	Consult	Richard Walker	Club Manager	PO Box 18-193 Glen Innes, Auckland, 1743	027 424 1880	admix@xxxx.xx.nz	
Auckland Netball Centre	Consult	Mary Gardiner	Chair	PO Box 18257, Glen Innes, Auckland 1743	09 570 0030	reception@aucklandnetball.co.nz	
Remuera Golf Club	Consult	Chris Davies	Manager	P.O. Box 87-180 Meadowbank Auckland	09 524 4288	office@remueragolfclub.com	
Land Developments (including Orakei Point Development, SHAs at Kohimarama Road and the Meadowbank Cluster)	Consult	TBD					
Watercare	Consult						
Transpower	Consult						
Vector	Consult						
Police	Consult						
Fire	Consult						
St Johns Ambulance	Consult						
Parnell District School	Consult	Gary Cain	Principal	48 St Stephens Avenue Parnell	09 3793008	office@parnell.school.nz	
Orakei School	Consult	Matthew Crumpton	Principal	Grace Street PO Box 42087 Orakei	09 5210657	office@orakei.school.nz	
St Kentigern	Consult	Sandra Hastie	Principal	514 Remuera Road PO Box 28399 Remuera	09 5201400	skg_admin@saintkentigern.com	
Meadowbank School	Consult	Ronald Ayson	Principal	68 Waiatarua Road Remuera	09 5203739	principal@meadowbank.school.nz	
Kohimarama School	Consult	Diane Manners	Principal	112 Kohimarama Road Kohimarama	09 5285306	office@kohi.school.nz	
The College of St John the Evangelist	Consult	Rev'd Canon Tony Gerritsen	Principal	Private Bag 28 907 Remuera 1541 Auckland	09 521 2725		
Victoria Avenue School	Consult	Janice Adamson	Principal	282 Victoria Avenue Remuera Auckland, 1050	09 520 0602	j.adamson@victoria-avenue.school.nz	
Mt Carmel School	Consult	Annette Donnelly	Principal	6 Mt Carmel Place Meadowbank Auckland 1072	09 521 5161	office@mtcarmel.school.nz	
Glendowie College	Consult	Stephen Roe	Deputy Principal (HR)	21 Crossfield Road, Glendowie, Auckland 1071	09 575 9128 ext 105	stephen.roe@glendowie-college.school.nz	
St. Heliers Primary	Consult	Craig McCarthny	Principal	PO Box 25110, St Heliers, Auckland 1740	09 575 8311	secretary@stheliers.school.nz	

Organisation	IAP2 Spectrum	Contact Name	Role	Address	Phone	Email	Engagement record
St. Ignatius School	Consult	John Crawford	Parish Council Chairman	12 Kotiri St, St Heliers	09 575 5227	stignatius_stheliers@xtra.co.nz	
Glen Innes School	Consult	Jonathan Hendricks	Principal	Eastview Road PO Box 18134 Glen Innes	09 5283507	admin@gleninnes.school.nz	
Glen Taylor School	Consult	Linda Avery	Principal	172 West Tamaki Road Glendowie	09 5286325	office@glentaylor.school.nz	
University of Auckland s(Tamaki Campus)	Consult	Professor Peter Thorne	Acting Head of Tamaki Campus	261 Morrin Road St Johns	09 373 7599 ext 81772	pr.thorne@auckland.ac.nz	
Tamaki College	Consult	Soana Pamaka	Principal	Elstree Avenue PO Box 18061 Glen Innes	09 5211104	admin@tamaki.ac.nz	
Pt England School	Consult	Russell Burt	Principal	130 Pt England Road Panmure	09 5276247	admin@ptengland.school.nz	
Glenbrae School	Consult	Lesley Elia	Principal	103 Leybourne Circle Glen Innes	09 5285025	office@glenbrae.school.nz	
Sacred Heart College	Consult	James Dale	Principal	250 West Tamaki Road Glendowie	09 5293660	office@sacredheart.school.nz	
St Thomas's School	Consult	Michael Maher	Principal	113 Allum Street Kohimarama	09 5283938	office@stthomas.school.nz	
Selwyn College	Consult	Sheryll Ofner	Principal	203 Kohimarama Road Kohimarama	09 5219610	info@selwyn.school.nz	

DRAFT Communications and Consultation Activity Plan

Revised: 24 July 2014

Note: the dates provided below are completion dates.

Completion Date	Task	Who	Objective	Responsibility	Anticipated Outcome
Phase 1 – Review and establishment: Stakeholder Engagement					
8-Aug-14	Undertake an initial high level review of project information, consultation undertaken to date and outcomes.	Project team	To avoid inconsistencies and duplication, and to be informed by the consultation outcomes to date.	MWH	Identification of any consultation gaps and / or weaknesses to date. To get everyone in the project team at the same starting point / understanding of the project.
8-Aug-14	Site walk through	Project team	Gain a clear understanding of the Project area and potential stakeholders, sensitive receivers and the receiving environment, and a sense of place.	AT / MWH	Validation / confirmation of the stakeholders and affected parties / environmental effects identified to date. Identification of any additional stakeholders, affected parties or potential environmental effects not yet considered.
8-Aug-14	Internal Workshop	Project team	To consolidate understanding of the project, alignment, environment and potentially affected parties / stakeholders. Undertake MCA. Confirm the prefered route options in respect of technical feasibility, effects and consentability.	AT / MWH	Confirmation of stakeholders and affected parties / the likely scale and extent of anticipated environmental effects. Validate the next stage of consultation strategy. Get the project team aligned before engaging with external parties. Confirm the preferred route options from a technical perspective.
11-Aug	Workshop with AT, AC, NZTA and KiwiRail	Project team, AT, AC , NZTA and KiwiRail	To present the preferred Project route and reasons to the key stakeholders. To engage them in a facilitated workshop, MCA process to validate / update / confirm the preferred route options and reasons. To foster trust, openess and gain concensus where possible.	AT / MWH	To provide information on the Project, to get feedback on issues, ideas and interdependencies. To provide for key stakeholder's objectives and perspectives, and to gain value / support for the project. To identify the preferred route options and to gain as much concensus as possible.
12-Aug	Meet with tangata whenua	AT / Tangata whenua	To provide information on the project, rout options, and seek feedback.	AT	Tangata whenua are involved early in the Project, and have the opportunity to engage with AT and for any concerns to be taken into account.
15-Aug	Workshop / Tangata whenua feedback period: receive and compile feedback following the workshop / Tangata whenua consultation - distribute to workshop attendees.	Project team, AT, AC , NZTA, tangata whenua and KiwiRail	To provide workshop attendees / tangata whenua time to consider and respond to the workshop discussions - document and confirm workshop / consultation outcomes. Apply outcomes to the project where appropriate.	MWH	The preferred route options and methodology are confirmed to the extent possible across all key stakeholders before commencing the public consultation phase.
20-Aug	Identify issues, options and constraints: provide summary and confirm draft consultation strategy	AT / Project Team	To pull together all identified issues from consultation to date, identify high level constraints and options where necessary.	MWH	Recognises the issues and options raised in consultation, and tests them against the Project constraints (e.g. environmental, political, financial, schedule etc). Provides a further assessment framework for the preferred route option before going into the next consultation phase.
Phase 2 - Public Consultation					
20-Aug	Meeting with Waitemata, Orakei and Maugakiekie-Tamaki Local Boards and the Tamaki Redevelopment Company	Project team, Waitemata, Orakei and Maugakiekie-Tamaki Local Boards and the Tamaki Redevelopment Company	To provide information on the Project and to get feedback on the preferred route options, and other details.	AT / MWH	Community boards have the opportunity to get involved add value / community input into the route selection. Information exchange between AT and the community boards. Foster openness and trust. Note: Orakei CB meeting = 7 Aug, Waitemamta CB meeting = 12 Aug and Maugakiekie-Tamaki CB meeting = 19 August
15-Aug-14	Create Project webpage on the AT website (this will be regularly updated throughout the Project to keep all informed on the current status)	Project team	To provide clear information to stakeholders and the public which is current, and takes account of feedback provided to date from the workshops and direct stakeholder engagement. To provide a channel of direct contact / engagement with AT from the public.	AT	The public is able to stay up to date on the project, and will also be able to contact AT for further information or to provide comment and opinion.
21-Aug	Letters / emails to stakeholders advising of the project and the preferred route / route options	Educational facilities, emergency services, business associations, cycle action, Walk Auckland RNZFB, CCS and community groups.	To provide information on the Project and to get feedback on the preferred route options, and other details. This may also include responses from the local community boards. Feedback channels are provided.	AT / MWH	All stakeholders are involved in helping to determine / finalise / confirm the prefered route. The issues raised by stakeholders can be addressed where possible, or considered in the context of the Project constraints.
21-Aug	Direct newsletter drop (1st Project community newsletter) to the local community (agree with AT as to reach of newsletter) to parties directly or potentially affected by proximity.	General public	To provide information on the project and to direct people to the website / contacts for more information. All newsletters to be supported by a distribution strategy and media support. All newsletters to include a feedback form.	AT / MWH	A reasonable effort is made to contact all potentially affected owners and occupiers along the route to provide information and an opportunity to engage in the process.
24-Aug	Public Open Day	Project team, AT, all stakeholders / affected parties / General public	Provide a drop-in open day with information, concept sketches, route options, project team representatives etc	AT / MWH	Provides an opportunity for affected parties and the public to talk directly to, and discuss the proposal with the project team, provide feedback and for the project team to inform public of the consultation / route selection process.
30-Aug	Identify and meet with affected landowner / occupier on request. Follow up as necessary before 19 Sep.	Landowners / occupiers (including property developers)	To ensure that all potentially affected landowners / occupiers are given information about the project, the process that will be followed, their rights and also to reassure them of what impact the project may have on them.	AT / MWH	Individual landowners / occupiers are met and their issues/ perspectives are discussed. Meetings may be either individual or collective (e.g. community hall).
5-Sep	Responses / feedback to consultation invited by COB 19 of Sept.	All stakeholders / affected parties	Provides an opportunity for stakeholders to input into the final route selection, and for affected party / stakeholder perspectives to be taken into account in confirming the route.	MWH	Completion of pre-construction public consultation.
10-Sep	Collate and summarise all feedback and responses from all sources.	Project Team	To provide a summary document that captures all matters raised through consultation, and addresses each one.	MWH	A summary doument "touchstone" that provides an overview of consultation and outcomes, resulting decisions and impact on the project / affected parties, and on the design.
12-Sep	Final route is confirmed. Outcome is advised via the web site / community newsletter, and by direct letter or email to stakeholders / affected parties where appropriate.	All stakeholders / affected parties	To communicate the final route selected, to all parties.	AT	Enable design and approvals phase to progress.
Stage 3 – Post-Project Commencement					
Dates to be confirmed	Project community newsletter drops periodically throughout the construction phase.	General public / all stakeholders and affected parties.	To provide information on the confirmed route, and the likely construction programme. All newsletters to be supported by a distribution strategy and media support.	AT / MWH	The community is kept up to date and informed of key phases of the construction process.
Dates to be confirmed	Newspaper adverts advising of onsite work / construction phases prior to commencement.	General public / all stakeholders and affected parties.	To ensure that people (especially nearby residents) are kept informed of activities along the site	AT / MWH	The community is kept up to date and informed of key phases of the construction process.
Dates to be confirmed	Article(s) in Our Auckland	General public / all stakeholders and affected parties.	Provide information on the Project and provide advanced warning to the public of key construction events / disruption. Also advise the public of the opening in due course.	AT / MWH	The community is kept up to date and informed of key phases of the construction process.

Appendix E Risk Register

Ian Rich – HNO Risk Advisor (Tel: 04 894 6287)
Ian.Rich nzta.govt.nz
October 2013

Risk Register

Project/Contract:	Glen Innes to Tamaki Drive Shared Path
Project/Contract ID:	C312-13-604
AT Office:	Henderson
AT Lead:	Hendrik Hilhorst

Document Date:	5 December 2014	
Supplier Lead 1:	Andrew McDonald	MWH
Supplier Lead 2:	Prasad Tala	MWH
RM Specialist:	Chris Scrafton	MWH

Rank	RID	Risk Title	Description Cause Consequence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Current Exposure Semi Quantitative Cons.	Prob	Risk Score	Treatment Strategy refer to Actions Register for detail	Residual Target Exposure Semi Quantitative Cons.	Prob	Risk Score	Commentary Closure Statement
7	1	Development	Description: There is a threat associated with development at 234 Orakei Road. Cause: The cause of the threat is the uncertainty with the development and how the shared path can integrate. Consequence: The consequence of the threat is poor connectivity and continuity of the route. Likely increased costs.	Hendrik Hilhorst	AT	8/05/2014	Live - Treat	Project	None	High	Medium	19	Consultation with the developers. Negotiations required to identify options to incorporate continuity of the shared path into the development.	High	Low	16	
7	2	Ecological	Description: There is a threat to the ecology in the section north of St Johns Road. Cause: The cause of the threat is the earthworks associated with the path and/or bridge construction. Consequence: The consequence of the threat is significant adverse ecological impact and negative community perceptions regarding the public / AT.	Chris Scrafton	MWH	8/05/2014	Live - Treat	Project	None	High	Medium	19	Site visit by an ecologist to understand the environment and likely project impact. If necessary develop a strategy to minimise the impact of the works or identify an alternative route.	High	Low	16	
1	3	CMA	Description: There is a threat of issues to construction due to proposed physical works within the Coastal Marine Area. Cause: The cause of the threat is based on possible objections from stakeholders or inability to obtain consents to undertake the work. Consequence: The consequence of the threat is halt the project (worse case) or to deviate the route.	Chris Scrafton	MWH	8/05/2014	Live - Treat	Project	None	Very High	High	24	Understand the project impacts against the Resource Management Act (CMA section).	High	Low	16	
7	4	Personal Safety	Description: There is a threat that areas of the shared path will not feel safe Cause: The cause of the threat stems from attributes of some of the urban and non urban environments the route passes through (challenges implementing CPTED). Consequence: The consequence of the threat is that the shared path feels unsafe, particularly outside daylight hours and is consequently underutilised.	Andrew McDonald	MWH	8/05/2014	Live - Treat	Operation	None	High	Medium	19	Adopt the principals of CPTED where possible. In particular create a public space that is well used, feels open, provides good visibility and is well lit. Challenges will be to create passive surveillance.	Medium	Low	11	
2	5	Project Costs	Description: There is a threat of significant cost increases during project development. Cause: The cause of the threat is from difficult terrain conditions and resultant mitigation measures. Consequence: The consequence of the threat is significant increased costs which make the project less economically viable.	Andrew McDonald	MWH	8/05/2014	Live - Treat	Project	None	Very High	Medium	23	Undertake site visits to establish the optimum route that minimises high cost treatments while achieving the criteria for a metro cycle route. May need to consider localised compromises.	Very High	Low	20	
12	6	Design Standards	Description: There is a threat that the ideal design requirements of cycle metro route cannot be achieved. Cause: The cause of the threat is the terrain and sensitive environment which may limit opportunities to achieve the preferred design. Consequence: The consequence of the threat are pinch points, steep gradients, poor surface, insufficient lighting etc which result in route that does not have wide apeal and is underutilised.	Andrew McDonald	MWH	8/05/2014	Live - Treat	Project	None	Medium	High	17	Undertake site visits to establish the route that maximises the ability to achieve the design standards. May need to consider localised compromises to the preferred design standard.	Medium	Low	11	
14	7	Land Requirements	Description: There is a threat that the route is planned on land currently designated by other organisations. Cause: The cause of the threat is the existing KiwiRail and NZTA designation and proposed land use by those organisations. Consequence: Due to the existing planned use of the designated lane, it may limit the options for the proposed shared path.	Andrew McDonald & Hendrik Hilhorst	MWH / AT	8/05/2014	Emerging	Project	None	Medium	Medium	15	Consult with KiwiRail, NZTA and Auckland Council early and throughout the project development.	Medium	Low	11	

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October 2013

Risk Register

Project/Contract:	Glen Innes to Tamaki Drive Shared Path
Project/Contract ID:	C312-13-604
AT Office:	Henderson
AT Lead:	Hendrik Hilhorst

Document Date:	5 December 2014	
Supplier Lead 1:	Andrew McDonald	MWH
Supplier Lead 2:	Prasad Tala	MWH
RM Specialist:	Chris Scrafton	MWH

									Current Exposure				Residual Target Exposure			
									Semi Quantitative			Treatment Strategy	Semi Quantitative			
Rank	RID	Risk Title	Description Cause Conse uence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Cons .	Prob	Risk Score	refer to Actions Register for detail	Cons .	Prob	Risk Score	Commentary Closure Statement
7	8	Third KiwiRail Track	Description: There is a threat due to the uncertainty regarding KiwiRail's plans to provide a third track along the route. Cause: The cause of the threat is due to KiwiRail being unable define the likelihood of when or if a third track will be implemented. Conse uence: Difficult to plan the route, potential to unnecessarily increase the project costs particularly at Hobson Bay.	Andrew McDonald & Hendrik Hilhorst	MWH / AT	8/05/2014	Emerging	Project	None	High	Medium	19	Engage with KiwiRail early and throughout the project, however KiwiRail may not be in a position to confirm.	High	Medium	19	
14	9	Services	Description: There is a threat that significant cost is incurred addressing issues with services location. Cause: The cause of the threat is the existing services along the proposed route. Conse uence: Significantly increasing the construction cost of project and influencing the cost effectiveness of project.	Andrew McDonald	MWH	8/05/2014	Live - Treat	Project	None	Medium	Medium	15	Ensure investigation of existing services is conducted on the vicinity of the project and verified on site where possible.	Medium	Low	11	
3	10	Programme Timeline	Description: There is a threat that programme timeframe may extend. Cause: The cause of the threat is numerous, e.g. unrealistic programme, consent delays, consultation with affected parties, public objection, evonmental issue, disruption to the scheme assessment process. Conse uence: Delays to the project delivery resulting in additional cost and negative public perception.	Andrew McDonald & Hendrik Hilhorst	MWH / AT	8/05/2014	Live - Treat	Project	None	High	High	21	Identify key activities in the project programme. Start critical activities early, e.g. geotechnical investigations that will likely require consents. Identify risk early.	High	Medium	19	
19	11	Land Acquisition	Description: There is a threat that land aquisition is required to achieve project objectives. Cause: The cause of the threat may be a landowner that does not wish to sell part or all of their property. Conse uence: Delays to the project, increased costs or acceptance of a substandard section in the route.	Andrew McDonald & Hendrik Hilhorst	MWH / AT	8/05/2014	Live - Treat	Project	None	Medium	Low	11	Route selection to avoid the need for land purchase wherever possible unless it is the most economical option available.	Medium	Very Low	4	
14	12	Cultural / Heritage	Description: There is a threat that cultural and heritage sites exist on the proposed route. Cause: The cause of the threat is sensitive cultural / heritage sites that need to be mitigated or avoided. Conse uence: Delays to the project, increased costs or acceptance of a substandard section in the route.	Andrew McDonald	MWH	8/05/2014	Live - Treat	Project	None	Medium	Medium	15	Comprehensive communication plan prepared. Identify issues through consultation with Iwi and the Historical Places Trust. Further engagement as required to develop mitigation options.	Medium	Very Low	4	
5	13	Site Visit Health & Safety	Description: There is a threat of injury during on site activities (e.g. site visits, topographical survey, geotechnical investigation). Cause: The cause of the threat is individual health and safety from risks such as undulating terrain, trains withing the KiwiRail corridor, high voltage (25,000 volts) electrification of the trains, etc Conse uence: Serious injury or death to people working on site.	Andrew McDonald	MWH	8/05/2014	Live - Treat	Project	None	Very High	Low	20	Comprehensive health and safety plan prepared. Need to follow the plan and brief everyone before going on site.	Very High	Very Low	13	
7	14	Funding	Description: There is a threat that the project is not economically justifiable. Cause: The cause of the threat is high construction costs and/or difficulty justifying strong demand for the facility (e.g. using the buffer zone method in the EEM may derive low user volumes due to the sparce residential housing immediately surrounding the proposed route). Conse uence: The project is either cancelled or sustantially compromised resulting in negative public perception.	Andrew McDonald	MWH	8/05/2014	Live - Treat	Project	None	High	Medium	19	May need to develop an alternative assessment to justify appropriate cycling numbers. May involve discussions with the funding arm of NZTA.	High	Low	16	
5	15	Consultation (General)	Description: There is a threat of lack of support for the project. Cause: The cause of the threat is inappropriate stakeholder engagement. Conse uence: Due to support from key stakeholders the project is delayed or potentially cancelled.	Andrew McDonald & Hendrik Hilhorst	MWH / AT	8/05/2014	Live - Treat	Project	None	Very High	Low	20	Comprehensive communication plan prepared that identifies key stakeholders. Engage with stakeholders as definded in the communication plan.	Very High	Very Low	13	

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Risk Register

Project/Contract:	Glen Innes to Tamaki Drive Shared Path
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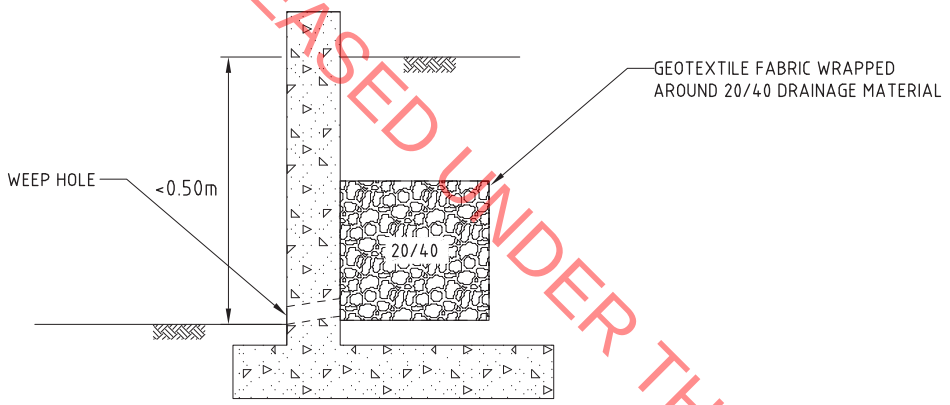
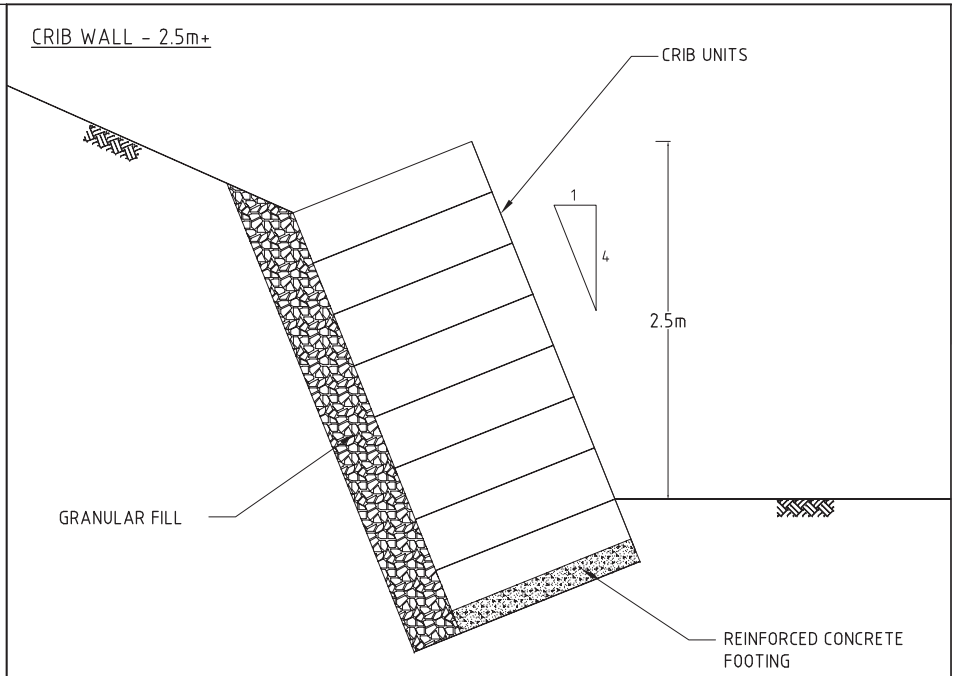
Rank	RID	Risk Title	Description Cause Conse uence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Current Exposure Semi Quantitative Cons.	Prob	Risk Score	Treatment Strategy refer to Actions Register for detail	Residual Target Exposure Semi Quantitative Cons.	Prob	Risk Score	Commentary Closure Statement
1	16	Community	Description: There is an opportunity to generate heightened positive public interest and community support. Cause: The cause of the opportunity is that the project is essentially a good news story. Conse uence: Excellent public profile for Auckland Transport and supporting partners. Benefits to the wider community through improved transport options, connectivity and improved health.	Andrew McDonald & Hendrik Hilhorst	MWH / AT	8/05/2014	Live - Treat	Project	None	Very High	Low	20	Capture as much of the communities aspirational desires in the delivery of the project. Provide a facility that is coherent and meets the objectives of a cycle metro route.	Very High	High	24	
3	17	KiwiRail Requirements	Description: There is a risk that the design requirements that KiwiRail require change from our current understanding. Of particular importance is the seperation required from the track to the path/fencing. Cause: The cause of the threat is a potential change in policy/standards or incorrect information provided initially. Conse uence: Alter or limit route selection and require design changes.	Andrew McDonald & Hendrik Hilhorst	MWH/AT	28/05/2014	Live - Treat	Project	AT undertaking discussions with KiwiRail	High	High	21	Need to continue to engage with KiwiRail on a governance level and a project level to confirm their desgin requirements.	High	Medium	19	

Appendix F Concept Details of Retaining Walls

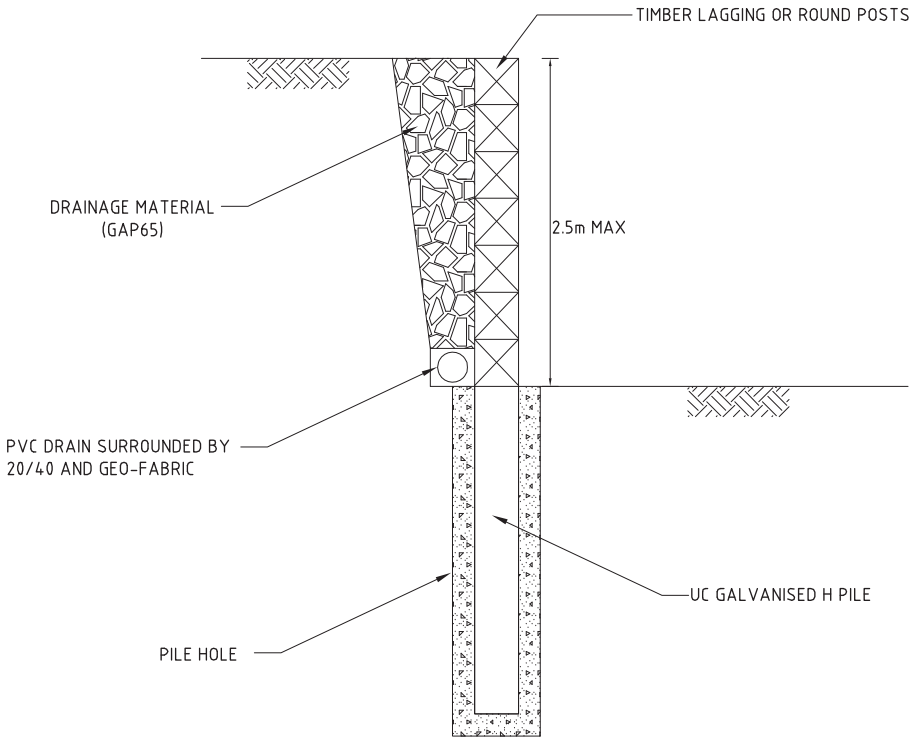
CONCRETE NIB WALL - 0-0.5m



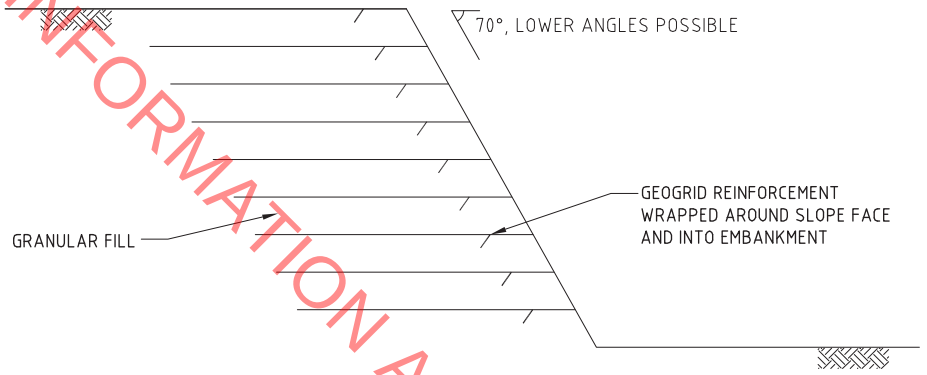
CRIB WALL - 2.5m+



H PILE TIMBER WALL - 0.5-2.5m



MSE WALL



Appendix G Stormwater Management Report

Glen Innes to Tamaki Drive Cycle Route

Stormwater Management Scheme Assessment Report

January 2015

Table of Contents

1 Introduction

This report is a Scheme Assessment in which the scope and constraints involved with the project are identified and the approaches to mitigate project risks are described in concept form. Any special difficulties that present from the Scheme Assessment are described. The constraints identified in this report are then further developed at later stages during the Assessment of Effects and Detailed Design.

Orākei is ideally suited for walkways and cycleways with beautiful scenery and a rich cultural heritage. There is a number of existing Greenway routes in Orākei including a walking track around Orākei Basin which is well used by the community. The Glen Innes to Tamaki Drive Shared Path Route project (referred to as "the Cycleway" in this report) will contribute to extending Auckland's Cycle Network (ACN) which is a priority project for Auckland Transport (AT). The cycleway will intersect with the train stations on route including the Glen Innes, Meadowbank and Orākei Station, creating a well-connected walking and cycling path.

The cycleway project will connect Tamaki Drive cycle lanes to Glen Innes town centre, spanning a distance of 7.3km and changing in elevation from 2m to 65m above mean sea level. The proposed cycleway alignment crosses Hobson Bay and the Orākei basin on new structures beside the railway embankment. The proposed alignment follows the railway corridor alongside Purewa Creek, through Kepa Bush Reserve, Apirana Reserve and public land that is designated for transport purposes between St Johns Rd and Merton Road.

For Stage 1, Merton Road to St Johns Road, the cycleway will be built on natural ground with the exception of two short bridges and an earth ramp embankment over a culvert. For Stage 2, St Johns Road to the Orakei Basin gates, the cycleway includes two long bridges crossing the Eastern Line railway corridor and over Purewa Creek. For Stage 3, spanning across the Orakei Basin to Orakei Road, the cycleway will be constructed with glass reinforced polyester (GRP) planks on a structure attached to the railway corridor. In Stage 4, Orakei Road to Tamaki Drive, the cycleway is predominantly a bridge structure constructed beside the existing rail corridor, spanning across Hobson Bay.

The cycleway surface will have a typical concrete path width of 4m, with a 1m grass strip on either side of the cycleway surface. The proposed bridges and structures will be 4.5m wide in cross section and be impervious surfaces with localised stormwater drainage. In total, the cycleway will contribute approximately 29,200m^2 of impervious, shared path surface area over its length. The effects of the change in impervious area and of the cycleway structure on flow paths are considered in the stormwater design.

Drainage off the cycleway surface is provided by a 2% super-elevation which in general follows the contours. The intention of the cycleway design is to maintain existing sheet flow conditions wherever possible and minimise the concentration of flows along the alignment. Where flow is concentrated, stormwater design will reduce the risks of erosion, blockages and other drainage issues that may occur.

Stormwater discharges off the cycleway will need to comply with Auckland Council Stormwater Unit requirements to meet network discharge consent obligations where these exist in terms of stormwater quality and quantity. Stormwater generated from the cycleway needs to be assessed under both the Operative Regional Plan (Air Land and Water) and the Proposed Auckland Unitary Plan (PAUP). Auckland Council have already indicated that the cycleway should be assessed as a single site and stormwater treatment is required for Stage 1 of the cycleway that falls within a Stormwater Management Area Flow (SMAF) 2 area to mitigate flow impacts where the impacts are more than minor.

The cycleway is fully within the Orākei Ward and Local Board area. Key stakeholders identified in developing the cycleway include: Auckland Transport; NZTA; KiwiRail; Ngāti Whātua Orākei; Mana whenua interests; Orakei Point Development; Department of Conservation; local residents and transport user groups. Other groups may be identified and added as the cycleway design progresses.

2 Site Description

The cycleway crosses through two catchments. Stage 1 is in the Glen Innes Catchment, which drains to Omaru Creek and out into Tamaki River. Stages 2 to 4 are in the Orakei Catchment which drains to Purewa Creek and into Hobson Bay.

The sub-catchments of Stage 1 that drain to Omaru Creek are a mix of residential and commercial property with commercial property boundaries upstream of the cycleway and railway corridor land downstream of the cycleway. Runoff flows through existing railway culverts and stormwater systems into the upper reaches of Omaru Creek. Omaru Creek is part of a Stormwater Management Area: Flow 2 (SMAF2) area nominated for streams that are identified as being sensitive to changes in the stormwater flow regime, have a high natural value, and are at potential risk from an increase in impervious area associated with future development (ref: Auckland Council TR2013/043). SMAF2 areas typically have greater levels of existing development than SMAF1 areas while having high natural values and sensitivity to increases in stormwater flows.

The sub-catchments along Stage 2 that drain to the Purewa Creek are considered to be urban areas with a natural character. The Purewa Creek corridor is covered in a range of vegetation that becomes dense in sections making access to the corridor difficult. The cycleway follows the Eastern Line railway corridor alongside Purewa Creek, which separates the developed areas from the green space surrounding the creek. The cycleway alignment is proposed through sections of the green space, and along the base of the railway embankment near Purewa Creek as well as in green space leading to the catchment ridgeline at St John Street. Catchment runoff drains into Purewa Creek via overland sheet flow and stormwater pipes up to 750 mm in diameter. The cycleway will be designed to manage the stormwater flows, minimise flooding issues and not interfere with current stormwater outlets.

Stages 3 and 4 are predominantly cycleway structures that do not have flowpaths or flooding issues to consider. The structures will be designed to be above highest astronomical tide level (HAT) and above the level of a design wave height. Short parts of Stages 3 and 4 cross existing infrastructure or approach existing roads, and these parts will be connected into existing stormwater infrastructure which in turn discharges directly to the sea.

Auckland Council holds legacy Integrated Catchment Study (ICS) documentation that was prepared to support resource consent applications to manage stormwater discharges into Auckland harbour. Referenced materials include: the Purewa Floodplain Hazard Mapping report, 2006 and ICS Area 2: Hobson/Waitemata, 2005 – both reports identify flood hazards along the proposed cycleway alignment that will require stormwater assessment and design mitigation where required. Auckland Council has a Waitemata Harbour and Greater Tamaki network discharge consent, which explains the consultation process and stormwater and stream management issues in the area.

2.1 Climate and Rainfall

The climate in the Auckland Region is affected by ocean influences and the subtropical latitude. These factors produce warm reasonably dry and humid summers and mild wet winters, with annual mean temperatures of approximately 15^0C. The predominant winds are southerly and southwest

Average annual rainfall in the Auckland Region is around 1,200 mm per annum.

2.2 Tidal Design Boundary

The tidal boundary will be defined by a combination of tidal level, wave height, atmospheric surge and climate change components. Tide data for the 2014 year was compiled by NIWA based on a data at Ports of Auckland with HAT levels based on tide data from the last 50 years.

In the Auckland region, present climate tides fluctuate between -1.2m and +1.5m of mean sea level (MSL) during an average month. The predicted Highest Astronomical Tide (HAT) based on 2014 tide data is around +2m above MSL. Design wave height and atmospheric surge can be determined from scientific data for Waitemata Harbour and will be in the order of 0.5m for each component. The climate change sea level rise over a 100 year horizon is currently in the order of 0.5m to 0.8m. A further freeboard allowance above design tidal level may be required in the design of structures.

Therefore the tidal design boundary level for the cycleway will be in the order of 3.5m above MSL plus freeboard allowance. This will be confirmed during detailed design and comparative with other engineering projects around the coastline.

2.3 Geology and Soils

The site geology as indicated on the Institute of Geological & Nuclear Sciences (GNS Science) 1:250,000 Geological Map of Auckland, Map 3, dated 2001 is made up of the Auckland Volcanic Field, Taupo Pumice Alluvium, East Coast Bays Formation, Puketoka Formation and recent construction fill material.

The Auckland Volcanic Field observed around the Orakei Basin is made up of Ash, lapilli and lithic tuff. Taupo Pumice Alluvium is observed in sections around the coastline and consists of pumice sands, silt and gravels. East Coast Bays Formation observed around the majority of the site (Stages 2 and 3 cycleway) is described as containing alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grit beds. The Puketoka Formation predominantly in the Glenn Innes area (Stage 1 cycleway) consists of pumiceous mud, sand and gravel with muddy peat and Lignite. The construction fill material is evident at the north-western part of Tamaki Drive and is made up of recompacted clay to gravel sized material which may include demolition debris (Stage 4 cycleway).

With reference to TR2013/040 *Stormwater Disposal via Soakage in the Auckland Region*, Figure 8 in that report indicates that the cycleway alignment is entirely outside identified soakage areas. Therefore, in terms of the potential for stormwater disposal by soakage, the entire scheme length is within non-soakage soils and soakage disposal is not feasible.

In terms of runoff from pervious surfaces, TP108 *Guidelines for Stormwater Runoff Modelling in the Auckland Region* Table 3.2 of that report indicates that the soil classification for Stages 1 and 2 of the cycleway are Group C. Stage 3 and 4 of the cycleway is on modified fills and also assumed to be Group C soils. This implies that the rainfall-runoff response from the soil is high throughout the cycleway alignment.

In terms of drainage effects on the receiving stormwater catchment, the change from existing natural soils to impervious cycleway surface is the smallest out of the main soils classifications in the Auckland region.

3 Project Constraints

3.1 Stormwater Catchment and Management

The proposed cycleway is to be constructed within a range of environments from dense bush to bridges crossing large bodies of water. The cycleway will generally follow the path of the railway line, with elevation changes to traverse the topography and avoid infrastructure such as the railway line. For Stages 1 to 3 of the proposed cycleway, there is one design alignment option however in Stage 4 two design alignment options are being considered (an alignment along the rail corridor and an alignment around the bays of Ngapipi Road).

Stormwater generated from the cycleway needs to be assessed under both the Operative Regional Plan (Air Land and Water) and the Proposed Auckland Unitary Plan (PAUP). The discharge from the new impervious surface created in Stages 1 – 4 will need to be assessed to see if it meets the thresholds and specified conditions in the ALW Plan. In this regard it is noted that delivering the project in sections may be beneficial as the ALW Plan sets its thresholds as 1000m^2 and between 1000 and 5000m^2 (a permitted activity if it meets specified conditions in 5.5.1 of the ALW Plan) and over 5000 m^2 requires consent as a restricted discretionary activity).

For the proposed cycleway, the impervious areas are spread over 4 stages and with each stage draining to a dominant catchment. This is summarised in Table 3-1.

Table 3-1: Impervious Areas of the Proposed Cycleway

Cycleway Stage	Length of 4m wide impervious surface (m)	Impervious Area (m^2)	Reporting to Dominant Catchment
1	1,640	6,560	Omaru Creek
2	2,730	10,920	Purewa Creek
3	690	2,760	Orakei Basin
4 (rail option)	1,680	6,720	Hobson Bay
4 (bays option)	1,570	6,280	Hobson Bay
Total	6,630 to 6,740	26,520 to 26,960	

Key considerations in the ALW Plan include:

- Is the development authorised by any network discharge (NDC) consent for the catchment the section of the project is located within – determining if there is a NDC for each catchment is important.
- Does the method proposed for managing the stormwater takes into account the requirements of the relevant Integrated Catchment Management Plan and the conditions of the NDC (associated with storm water treatment and attenuation).
- Will the asset be vested in the Auckland Council and will the Council's Stormwater Unit provide written approval regarding the operational and maintenance aspects of the proposed works ARC (written approval assists in meeting conditions of the ALW Plan).

Stage 1 is in the Stormwater Management Area Flow (SMAF 2) area draining to Omaru Creek as identified in the PAUP. Under 4.14 Stormwater Management – Flow, resource consent for the new impervious areas is required as a controlled activity. The controlled activity assessment is required to show that the proposal meets hydrology mitigation requirements. The proposed flow mitigation measures will be designed with reference to TR2013/035 *Auckland Unitary Plan stormwater management provisions: technical basis of contaminant and volume management requirements* to meet SMAF2 requirements and summarised in Table 3-2.

Table 3-2: SMAF Hydrological Requirements (ref: Executive Summary TR2013/035)

Area	Stormwater mitigation	Flow/volume mitigation requirement
SMAF 1	Level 1 hydrology mitigation	• provide detention (temporary storage) with a volume equal to the runoff volume from the 95th percentile, 24 hr rainfall event for the impervious area for which hydrology mitigation is required; and • provide retention (volume reduction) of a 10mm, 24 hr rainfall event for the impervious area for which hydrology mitigation is required
SMAF 2	Level 2 hydrology mitigation	• provide detention (temporary storage) with a volume equal to the runoff volume from the 90th percentile, 24 hr rainfall event for the impervious area for which hydrology mitigation is required; and • provide retention (volume reduction) of a 8mm, 24 hr rainfall event for the impervious area for which hydrology mitigation is required

An initial assessment of the cycleway project and the nature of the SMAF2 requirements imply that an acceptable solution will be feasible.

As part of the design process following this Scheme Assessment stage, a consent application will be prepared under the PAUP for discharge from new impervious areas. Matters considered in the consent documentation will include:

- the nature, volume and peak flow of the stormwater discharge
- the sensitivity of the receiving environment to stormwater contaminants and flows
- avoiding the creation or increase of flood risk to other properties
- options for managing stormwater on-site or through communal management devices
- the adoption of water sensitive design and green infrastructure where practicable
- consistency with any relevant network discharge consent or publicly available and current Auckland Council stormwater management plans/analysis
- opportunities to reduce existing adverse effects and enhance receiving environments

Stages 2 – 4 of the cycleway are not located in a SMAF under the PAUP; resource consent is expected to be required under 4.14 Stormwater Management – Discharges, as a restricted discretionary activity where they are located on the land. Discharge from structures in the CMA may be permitted under the PAUP (6 Coastal - General Coastal Marine zone 2. Land and water

use controls 2.15 Discharges) and under the Regional Plan Coastal (rule 20.5.4). This will be confirmed by the Council during consent application.

The requirement for stormwater treatment will be considered for all Stages of the cycleway during detailed design.

3.2 Stormwater Risks

The Cycleway development includes the following *short-term* and *long-term* environmental effects:

- Siltation of the receiving environment as a result of construction sediments (short term);
- Increased quantity of runoff volume and flow rate due to the increase in impermeable surfaces. This can result in increased erosion impacts and increased flood risk within the downstream channels, streams, piped reticulation and culverts (long term);
- Blocking overland flood paths. This can result in new ponding areas, diversion of existing overland flowpaths, increased erosion and increased flood risks (long term);
- Issues of cycleway performance and serviceability, safety, operations and maintenance;
- Damage to existing public assets in the region of the proposed works.

Adequate stormwater management planning will avoid, minimise or mitigate the potential adverse environmental effects of the cycleway.

3.3 Site Specific Stormwater Management Challenges

The route presents a number of challenges for the development of a successful best practice stormwater management system, including:

- Close proximity to existing residential properties and other Auckland Council assets including the railway lines and arterial routes (Merton Road, St Johns Road, Orakei Road and Tamaki Drive);
- Close proximity to Hobson Bay, Orakei Basin, Purewa Creek, Omaru Creek waterways;
- Proximity to transport routes, stormwater and sewage infrastructure, overland flowpaths;
- Physical constraints such as topography, limited corridor width and construction access;
- Existing and potential protected ecological areas and reserves with dense bush creating limited access;
- The lack of availability of land and the long narrow nature of the proposed works site limiting options for the formation of stormwater treatment devices such as ponds and swales;

To best address the stormwater management related risks and challenges associated with the proposed cycleway, it is important to firstly identify the stormwater management objectives and general criteria. A range of options can then be given consideration, in conjunction with identifying the challenges to overcome, to best practicably avoid, remedy or mitigate adverse environmental effects.

4 Stormwater Management Objectives

Regional policy for stormwater management in the Auckland Region is outlined in the Regional Plan Air, Land and Water.

The general philosophy for determining best practice for stormwater management is:

- Recognise cultural values and kitianga mauri as best practicable
- Preserve ecological value as best as practicable;
- Preserve the natural character of bays, basins and rivers and their margins;
- Provide sustainable management of natural and physical resources;
- Provide treatment to meet or exceed regional/territorial standards;
- Identify site specific management practice such that no single solution is deemed a panacea;
- The "Treatment Train" approach is preferable.

In general, the objectives for Stormwater Management can be broken down into *short-term* and *long-term* objectives, as follows:

4.1 Short Term Stormwater Management

The principal short term impact of the cycleway construction will be on water quality, arising from earthworks sediments and possible construction activity contaminants mobilised in stormwater runoff during the construction of the cycleway. This will be managed through appropriate erosion and sediment control planning and practices, and prompt responses if any contamination is identified.

Stage 1 will include at least 10,000m^3 of imported fill volume in an earth embankment crossing a small stream initially assessed as being intermittent between chainage 1060 and 1220 m. The earthworks will require resource consent under the Regional Plan: Sediment Control, the Regional Plan: Air Land and Water (for any works in the stream) and the PAUP.

For Stages 2 to 4 the construction works will be staged, with minimal fill requirements but a number of structural installations will be included such as bridges and retaining walls. The individual exposed working surfaces are expected to be less than 10,000m^2 including access arrangements and erosion and sediment control practices will be required for all Stages.

Erosion and sediment control measures for the proposed cycleway construction activity will be covered under best practice guidelines of the Auckland Council Technical Publication No 90 (TP90) *Erosion and Sediment Control Guidelines for Land Disturbing Activities*.

Prior to construction of the Cycleway, an E&SC Plan will be confirmed with AC, AT and the Contractor prior to works commencing. The E&SC Plan will include practices and strategies to:

- stage works into manageable areas;
- minimise earthworks, minimise construction timeframe, minimise stockpiles and access routes;

- ensure progressive and timely reinstatement;
- ensure clean water diversion and maintenance of existing drainage paths;
- install silt fences (including returns) and water quality treatment devices to control and minimise sediment generation;
- utilise existing vegetation to treat runoff.

4.2 Long Term Stormwater Management

In the long term, the proposed cycleway is expected to have a minimal water quality impact on the receiving environment due to the inherent low impact of cycling as a mode of transportation and the implied reduction in use of personal vehicular transportation.

Water quantity issues will be assessed to protect the public and the environment from flooding and erosion issues caused by the cycleway impacts on stormwater runoff. Effective drainage is essential for safety, pavement durability and protection of surrounding land from erosion.

While only Stage 1 is located in a SMAF area, resource consent is expected for all stages under 4.14 Stormwater Management – Discharges. Treatment will enable the stages to meet the permitted activity requirements or improve resource consent being granted. The stages will be assessed based on their environment with stormwater management that is appropriate, so that the project will deliver a design that deals with stormwater appropriately and has no adverse effects.

Where required, to address long-term water quality and quantity issues, the approach is generally to be consistent with the TP10 *Stormwater Management Devices Design Guideline Manual* and TR2013/035 *Auckland Unitary Plan stormwater management provisions: Technical basis of contaminant and volume management requirements*.

5 Stormwater Management Design Standards and Guidelines

5.1 Reference Materials

The cycleway is an Auckland Transport (AT) project that is required to follow design standards and code of practices for stormwater management in Auckland and New Zealand. Auckland Council (AC) has developed a number of documents that provide guidelines of how to achieve a best management practice. Key AC documents that specifically relate to stormwater management are listed below and in Section 8

References.

- Auckland Council Code of Practice For Land Development and Subdivision, Chapter 4 – Stormwater (2013);
- Auckland Transport Code of Practice, Chapter 12 – Footpaths and Pedestrian Facilities (2013);
- TP10 (2003) Stormwater Management Devices: Design Guidelines Manual;
- TP90 (1999) Erosion and Sediment Control Guidelines for Land Disturbing Activities;
- TP108 (1999) Guidelines for stormwater runoff modelling in the Auckland Region;
- TP124 (2000) Low Impact Design Manual for the Auckland Region;
- TP148 (2001) Riparian Zone Management: Strategy: Guidelines: Planting Guide;
- TP238 (2004) Hauraki regional harbour model: Set up calibration and verification;
- TR2013/035 Auckland Unitary Plan stormwater management provisions: Technical basis of contaminant and volume management requirements;
- TR2013/040 Stormwater disposal via soakage in the Auckland Region;
- Auckland Council Regional Plan: Air, Land and Water, Chapter 5 – Discharges to Land and Water and Land Management (2010);
- Auckland Council District Plan, Operative Auckland City - Central Area Section (2005);
- Auckland Council Regional Plan, Sediment Control (2014);
- Watercourse Guidelines (2003) How to Care for Streams in Auckland City;
- AUSTROADS (2009) Guide to Road Design Part 6A: Pedestrian and Cyclist Paths.

The cycleway design requirements are described below, and are based on the recognised standards stated above.

5.2 Surface Drainage

Surface drainage design standards are stated in AC Code of Practice Chapter 4. Primary flow paths will be designed to a 10% AEP rainfall design standard if acceptable overland flow paths are available, otherwise the 1% AEP rainfall design standard will apply. Secondary flow paths (including culverts, bridges and overland flow paths) will be allowed for in the stormwater management design, up to the 1% AEP rainfall event. Other design aspects of surface water management on the cycleway are:

- The cycleway will be constructed so that water does not pond on the surface and debris does not normally wash onto the path during rain. The 4m wide impermeable path will have 2% super-elevation and catch drains to control water and prevent water and sediments from flowing onto the path. The proposed cycleway super-elevation will allow sheet flow across the path and serve to minimise the impact of concentrated flows from off the cycleway surface and mimic the existing, pre-cycleway sheet flow characteristics.

- Bridges will be designed with kerbs, sumps, downpipes and a discharge bases to remove the stormwater from the bridge deck and dispose of it at the base of the structure on natural ground.

- To meet a low hazard criterion during flooding of shared paths the product of water depth (m) and water velocity (m/s) should be less than 0.35m^2/s.

- Where sections of a path are likely to be subjected to pond inundation, overland flowpaths, damp or slippery surfaces, or accumulate debris on the path, signs will be erected to warn users of risks and regular maintenance measures will be put in place.

5.3 Culvert and Drain Design

- Culverts under the cycleway will be designed to pass the 10% AEP rainfall storm event without impacting on upstream or downstream properties. Larger rainfall events will be managed over the cycleway with overland flow paths.

- Longitudinal drains and channels will be designed to pass the 10% AEP rainfall storm event and to minimise the likelihood of erosion due to concentrated flows and velocity, blockages and the consequent ponding of water at low points in the alignment. In Stage 1, the channels may contribute to meeting SMAF2 requirements.

5.4 Retaining walls

- Retaining structures, (concrete or timber crib walls and timber soldier pile type walls) will be backfilled with free draining granular material and slotted sub-soil drainage pipes at the base to drain earth water pressures from behind the wall. Subsoil drainage will cross beneath the cycleway at regular intervals and connect to stormwater drainage channels or pipelines as available.

- Surface water drainage from upstream catchments that intersect with retaining walls will be managed with surface drainage channels to minimise the amounts of water loading on the retaining wall structure. Surface water will be passed under the cycleway at appropriate locations and connected with downstream drainage or released into the receiving environment after suitable erosion control measures.

6 Project Specific Stormwater Runoff Assessment

The development of the proposed cycleway will add impervious surface to existing catchments. Based on the relatively impervious natural surface geology and the relatively small proportion of cycleway surface compared to the overall catchment areas, the hydrological impacts of the proposed concrete cycleway are expected to be minor. The existing capacities of the inlets in the area will be checked for capacity although it is not the intention of this project to necessitate pipeline upgrades if downstream reticulation is identified to be currently below AC code of practice standards.

The cycleway will draw the community into reserves and protected land that has been more isolated in the past. A water quality assessment will be done to address any contamination issues that could arise due to the cycleway in both the short and long term.

6.1 Stormwater Management

The full length of the proposed cycleway has been assessed for stormwater management issues and this is presented in Appendix A Proposed Stormwater Management Schedule. The items in the schedule are quantified and provided with nominal mitigation measures which will be addressed during design. The schedule also provides a means of estimating the costs of mitigation measures for project budgeting purposes.

The cycleway will cross over most stormwater reticulation without impacts, but if necessary an existing pipeline will be extended to provide a means of crossing over a pipeline. The existing piped system diameter will be unchanged in any pipeline extension. New or upgraded culvert headwall structures may be provided to stabilise an existing pipeline intake or outlet. When the cycleway crosses a natural flow path measures will be taken to provide erosion protection around the cycleway.

Wherever possible, overland flowpaths across the cycleway will not be diverted but will be accommodated across the cycleway towards creeks and intakes. The cycleway has a 2% cross-fall which follows the contours to minimise upstream ponding, minimise the concentration of flows and minimise interference with existing sheet flow patterns.

At the Merton Road end of the cycleway, new runoff from the cycleway surface will drain into an existing SMAF2 drainage system and flow detention pond system. This system will be assessed to determine whether new detention capacity is required or if the existing system can accommodate more flows.

In Stage 1, the cycleway runoff will report to up to four existing ponding locations where drainage pipelines cross under the railway corridor or drain into Omaru Creek. The effects of the impervious cycleway area will be to marginally increase the pond volume and top water level for design storm events. This increase will be assessed during future design stages and mitigated where required.

In Stage 2, the cycleway area will contribute flows and volume into Purewa Creek. The Purewa Creek floodplain is not close to any housing and does not present a flood risk. The main risk will be the control of potential erosion into the creek.

In Stages 3 and 4, the cycleway will be predominantly on a structure directly over water and will not require specific runoff control measures. Minor lengths of the cycleway will be connected into existing drainage systems.

6.2 Stormwater Treatment

The cycleway will be assessed for water quality impacts in the short term and long term, and this will determine the extent of required stormwater treatment measures. As the pathway is not a vehicular road or carpark, stormwater treatment is not expected to be a large requirement for the cycleway. However each of the stages will need to meet the relevant permitted activity conditions or obtain resource consent for the environment the stage traverses and this may mean a different solution for each stage.

7 Operation and Maintenance

The proposed cycleway will require an operations and maintenance (O&M) plan for AC or AT to manage over the long term. A number of stormwater related issues will need to be identified and included into the O&M plan.

A stormwater O&M plan, based on existing AT practices and procedures, will be prepared to identify and schedule the monitoring and maintenance requirements for the stormwater infrastructure of the cycleway work (for example, inspection and clearance of debris and other material).

The development of a regular monitoring and maintenance programme will help to address issues as they arise. Maintenance will also ensure that the stormwater management system operates as intended.

7.1 O&M Document Application

7.1.1 General Operational Objectives

7.1.1.1 Stormwater Collection and Conveyance System

The principal operational objectives of the stormwater collection and conveyance system are:

- Conveyance to prevent surface flooding: Stormwater from the cycleway surface needs to be safely conveyed away.
- Ensure stability and safety of conveyance system: The hydraulic action of flowing water in the system must not cause erosion or structural damage to receiving waterbodies or cycleway infrastructure.
- Provide primary treatment of stormwater (pre-treatment) where required: including swales, vegetative filter strips, catchpits and grit traps provide initial treatment of water, to slow down flows or to improve quality.
- Avoid increased flooding to adjacent residential properties.

7.1.1.2 Stormwater Treatment Devices

By design, the principal operational objectives of stormwater treatment devices are:

- To provide treatment of stormwater via sediment and rubbish removal, filtration or settlement and biological process.
- To protect the receiving environment. Treatment of stormwater runoff can serve to protect the receiving environment from the cumulative effects of contamination delivered via stormwater drainage systems.

7.1.1.3 Landscaping

The general objective of stormwater management related to landscaping maintenance is that appropriate planting is maintained in a sound and healthy condition so that the flow conveyance, treatment characteristics or aesthetic values are not adversely affected. Also, the cycleway should be cleared of waterborne sediments and debris.

7.1.2 Implementation

The O&M plan will include figures and plans showing the location of system features as an overview for the purpose of network orientation, and location of existing stormwater management features.

A schedule of recommended O&M activities will be provided to best ensure that the site stormwater management system continues to function as intended. This intended function includes meeting AC and AT requirements. The maintenance schedule should also include distinction between stormwater assets versus vegetation and landscaping, on the basis that separate contractors may undertake the various activities.

Appointed maintenance operators will need to be skilled and take responsibility for undertaking scheduled activities to an acceptable safety and industry standard. The maintenance operator will also need to take responsibility for providing the road maintenance operations manager a regular summary report of the maintenance activities including reviewing the scheduled frequency and requirements of the maintenance activities. Contractors may need an induction process to understand the objectives of cycleway maintenance for this site.

Maintenance works at specific stormwater management devices should be covered by checklists in the O&M plan. Such forms should be completed and submitted with the regular summary report of the maintenance activities.

7.2 O&M Plan Review

A regular O&M document review should include:

- Updating the maintenance schedule where action and frequency refinements can be made based on the previous year's maintenance report findings;
- Updating to current AC policies and safety procedures;
- Review and update the regular and reactive maintenance procedures for the stormwater collection and conveyance system and for the stormwater treatment based on the previous year's maintenance report findings;
- Review and update the regular and reactive maintenance procedures for any landscape features associated with the stormwater management system;
- Note any unusual or large maintenance activities, changes in the cycleway, and effects of heavy storm events.
- Review and update the maintenance contacts list, and;
- Review and refinement of the budget estimates, based on the cost of maintenance works incurred in the previous year.

8 References

In addition to the design documents listed in Section 4, other documents are referenced in this scheme assessment, as follows:

Beca Carter Hollings and Ferner, 1995. Glen Innes – Point England Catchment Management Plan, for Auckland City Council.

AWT NZ Ltd/Maunsell, 2005. ICS Area 2: Hobson / Waitemata, Integrated Catchment Study, Stage 3B, Main Report

R. Seyb, M. Lindgreen, I. Mayhew, G. Ockleston, R. Ouwejan, 2008. Developing Contaminant Management Priorities in Auckland City. NZWWA Stormwater Conference 2008.

Ira, S J T (2013). The Greater Tamaki consolidated receiving environment stormwater network discharge consent: consultation summary document. Prepared by Koru Environmental Consultants Ltd for Auckland Council. Auckland Council working report, WR2013/011.

Ira, S J T (2013). Waitemata Harbour stormwater network discharge consent: consultation summary document. Prepared by Koru Environmental Consultants Ltd for Auckland Council. Auckland Council working report, WR2013/002.

APPENDIX A

Proposed Stormwater Management Schedule

Stage 1 Merton Road to St Johns Road

Chainage *Merton Road: 0m chainage*	*Water management issues*	*Potential risks*	*Proposed design*
25 - 250	Retaining wall	Discharging flows, Structural integrity, Erosion	Surface water capture and disposal at retained locations.
275-780	Retaining wall	Discharging flows, Structural integrity, Erosion	Surface water capture and disposal at retained locations.
950-970	Retaining wall	Discharging flows, Structural integrity, Erosion	Surface water capture and disposal at retained locations.
790 - 905	Swale	Stormwater ponding upstream of cycleway embankment	re-grade to allow swale drainage
1065-1215	Swale	Stormwater ponding upstream of cycleway embankment	re-grade to allow swale drainage
1110	Culvert	Flooding and blockage	Inlet and outlet with rock apron and diversion path
260 - 275	Bridge	Slippery surface, ponding	Glass Reinforced Polyester plank bridge
740 - 750	Bridge	Slippery surface, ponding	Kerbs, sumps, downpipes and discharge base
240	Signage	-	Hazard signage
295	Signage	-	Hazard signage
725	Signage	-	Hazard signage
770	Signage	-	Hazard signage
90-150	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow
380-720	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow
740-1050	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow
1220-1375	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow
1470-1550	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabalise and filter flow
1550-1610	Sheetflow	Pressures on existing stormwater system	Upgrade local sump capacity, Vegetation margin
1610-1640	Sheetflow	Pressures on existing stormwater system	Upgrade local sump capacity Vegetation margin
0	Storage Attenuation	Overflow, concentrated flow and erosion	Tank, sump intake, pipeline discharge to Merten Rd
0-85	Kerb and Channel	Overflow into neighbouring properties, velocity, erosion	Flow to the attenuation pond/tank at Merten Rd and discharge into existing system
150-255	Dish Channel	Velocity, erosion	Swales, channels, rock check dams
275-380	Dish Channel	Velocity, erosion	Swales, channels, rock check dams
725-740	Dish Channel	Velocity, erosion	Swales, channels, rock check dams
905-965	Dish Channel	Velocity, erosion	Re-grade side slope form sheetflow
1375-1465	Dish Channel	Velocity, erosion	Swales, channels, rock check dams
255	Sump & pipeline	Erosion around shared path and rail service path	pipeline, outlet pipe, rock discharge point
790-795	Sump Lead	Concentrated flow, erosion at adjoining entrance point to Felton Mathew Avenue	Under cycleway
800	Sump	Concentrated flow, erosion at adjoining entrance point to Felton Mathew Avenue	Sump upgrade
1550	Sump	-	-
Past 1640	Sump	-	-
275	Riprap	Erosion around path/bridge and creek bed	Rock stabilised outlet
745	Riprap	Erosion around path/bridge and creek bed	Rock stabilised outlet
790	Riprap	Downstream erosion	Rock stabilised outlet
905	Riprap	Downstream erosion	Rock stabilised outlet
1370-1375	Riprap	Downstream erosion	Rock stabilised outlet

Stage 2 St Johns Road to Orakei Basin Gates

Chainage *St Johns Rd: 0m chainage*	*Water management issues*	*Potential risks*	*Proposed design*
1150-1550	Retaining wall	Discharging flows, Structural integrity, Erosion	Surface water capture and disposal at retained locations.
0 - 55	Stormwater Culvert/Pipe	Intersects with local stormwater network, Construction machinery damaging manholes.	Shared path same level as footpath, appropriate machinery access. Sheet flow drainage to existing kerb and channel.
565	Stormwater Culvert/Pipe	Intersect with culvert/pipe	Extend culvert downstream. Rock outlet
1040	Stormwater Culvert/Pipe	Cross natural flow path	Extend culvert downstream or bridge over. Rock channel
1190	Stormwater Culvert/Pipe	Culvert/pipe position	Shared path over pipeline/upstream of culvert
1315	Stormwater Culvert/Pipe	Culvert/pipe position	Extend culvert downstream or bridge over. Rock channel
1465	Stormwater Culvert/Pipe	Culvert/pipe position	Shared path over pipeline/upstream of culvert
1580	Stormwater Culvert/Pipe	Culvert/pipe position	Shared path over pipeline/upstream of culvert
1985	Stormwater Pipe	Pipe position	Shared path over pipe
2035	Stormwater Pipe	Pipe position	Shared path over pipe
2290	Stormwater Pipe	Pipe position	Shared path over pipe
2300	Stormwater Pipe	Pipe position	Shared path over pipe
2480	Stormwater Pipe	Pipe position	Shared path over pipe
2700	Stormwater Pipe	Pipe position	Shared path over pipe
2320-2450	collecting flow	Ponding	Dish Channel
2450-2727	collecting flow	Ponding	Kerb and Channel
745 - 870	Bridge over Purewa creek	Slippery surface, ponding	Kerbs, sumps, downpipes and discharge base
1630-1820	Bridge over railway line	Slippery surface, ponding	Kerbs, sumps, downpipes and discharge base
2285-2320	Swale	Velocity, erosion, ponding	-
1010 - 1030	Ponding zone	Flooding of shared path	Hazard signage
1165 - 1180	Ponding zone	Flooding of shared path	Hazard signage
1300 - 1320	Ponding zone	Flooding of shared path	Hazard signage
1455 - 1480	Ponding zone	Flooding of shared path	Hazard signage
1880 - 2170	Ponding zone	Culvert blockage forms flood pond next to shared path	Shared path elevation above the flood prone area. Hazard signage.
1935	Signage	-	-
2005-2010	Signage	-	-
2280 - 2330	Ponding zone	Flooding of shared path, catchpit blockage/cesspit overflow	Hazard signage
0-745	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow
870-1630	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow
1820-2225	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow
2270-2330	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow
2450 - 2725	Sheetflow	Localised runoff, stormwater treatment	Vegetation margin to stabilise and filter flow
2450	Discharge point	Erosion, ponding near MeadowBank railway station	Sump, sump lead and manhole to connect to existing AC storwater drainage
2727	Discharge point	Erosion around path/bridge (stage 3)	Sump and lead connect to s/w and drain over edge of channel, rock outlet

Stage 3 Orakei Basin to Orakei Road

Chainage	*Water management issues*	*Potential risks*	*Proposed design*
0 - 600	Bridge over Orakei Basin	Slippery surface, ponding	Kerbs, sumps, downpipes and discharge base

Stage 4 Orakei Road to Tamaki Drive

Chainage	*Water management issues*	*Potential risks*	*Proposed design*
0-1600	Bridge Over Hobson Bay	Slippery surface, ponding	Kerbs, sumps, downpipes and discharge base

Appendix H Preliminary Design Philosophy Statement

MWH

BUILDING A BETTER WORLD

DESIGN PHILOSOPHY STATEMENT

Glen Innes to Tamaki Drive Shared Path

Prepared for Auckland Transport

September 2014

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Auckland Transport

Glen Innes to Tamaki Drive Shared Path

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1 Introduction

This design philosophy statement (DPS) details the standards and assumptions that are being used to complete the scheme design of the Auckland Transport (AT) Glen Innes to Tamaki Drive project. This report documents the project standards being applied as at May 2014, following the requirements in accordance with Clause 16 of the NZ Transport Agency (NZTA) *Standard Specification – Investigation and Reporting*.

2 Background

The Glen Innes to Tamaki Drive Walking and Cycling project will seek to implement approximately a 6.5 km section of the Auckland Cycle Network (ACN) between the Glen Innes Town Centre and the Tamaki Drive cycle lanes.

The Project will connect key destinations, including the Glen Innes Station area, the Meadowbank Station area and the Orakei Station area. The connection to Tamaki Drive shall provide good linkages to the shared use path and on-road cycle lanes on Tamaki Drive and access to the city centre.

The project will connect seamlessly with the proposed Point England to Panmure cycleways at Merton Road which is currently in the detail design stage.

2.1 Study Area

The study area extends from Merton Road in Glen Innes to Tamaki Drive as shown in Figure 2-1 below, with several options considered for the Hobson Bay crossing.

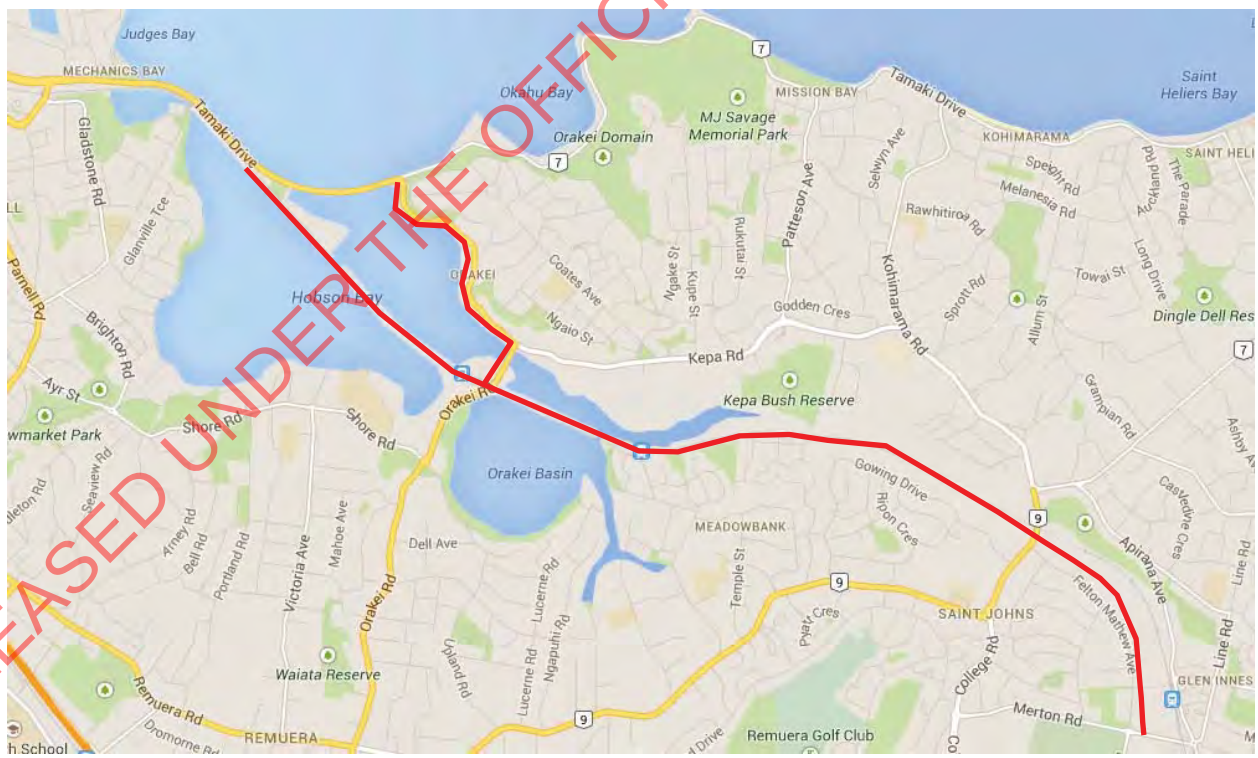

Figure 2-1: Route Corridor

2.2 Project Outcomes

The Glen Innes to Tamaki Drive Shared Path provides a walking and cycling facility separate from the road network. This is a significant feature as it links communities to many schools and key desitinations. Because it is a separate facility, it makes cycling and walking a more desirable option for a wider group of people. Providing dedicated provision for active transport modes away from the real and perceived dangers of traffic.

The key project outcomes included identification of a shared path that:

- Provides a clear,logical and direct route between Glen Innes and Tamaki Drive consistent with the intent of a Cycle Metro route providing the highest priority to target the highest number of potential users;
- Minimises crossing of busy roads
- Universal access
- Enables an important segment of the Auckland Cycle Network to be completed which connects the exisiting cycle facilities on Tamaki Drive to Glen Innes and centres further to the east;
- Integrates the use of public transport and active modes, eg. providing easy connections for longer journeys
- Improves the continuity of cycle routes;
- Improves user comfort and user mobility through the key Cycle Metro connections;
- Improves safety for cyclists;
- Minimises conflicts between cyclists, pedestrians and other facility users along the route including rail and road vehicles;
- Provides a high level of service and encourages increased walking and cycling
- Is compliant with the inspection and maintenance requirements of Auckland Transport;
- Achieves overall acceptance by KiwiRail such that there is support in principal for a Deed of Grant;
- Enables connections to key destinations through local greenway and feeder links
- Encourages investment by Auckland Council and local boards in community facilities that are complementary and enhance the user experience of those riding along the route.
- Aligns with the Auckland Plan and other relevant strategic documents thereby contributing to the mayor's widely-shared vision – to be the world's most liveable city Implicit in the above is the personal safety of all users of the shared path facility at all times.

3 Design Standards

Design standards will comply with the current versions of the following New Zealand documents:

- Building Act;
- Health and Safety in Employment Act;
- Resource Management Act;

Other New Zealand, Australian and KiwiRail standards and guidelines will be used as listed below in determining the treatment options:

- NZ Transport Agency, Manual of Traffic Signs and Markings (MOTSAM) – Part 1: Traffic Signs.
- NZ Transport Agency, Manual of Traffic Signs and Markings (MOTSAM) – Part 2: Markings.
- NZ Transport Agency, Land Transport Rule Traffic Control Devices 2004 and subsequent amendments.
- NZ Transport Agency, RTS 14: Guidelines for Facilities for Blind and Vision Impaired Pedestrians.
- NZ Transport Agency, Pedestrian Planning Guide – Chapter 15.
- NZ Transport Agency, Cycle Network and Route Planning Guide (CNRPG).
- Auckland Traffic Management Unit, Traffic Signals Design Guidelines.
- Auckland Transport Operations Centre (ATOC).
- Auckland Transport Code of Practice (ATCOP).
- Auckland City Council, Standard Engineering Details.

- AUSTROADS – Cycling Aspects of Austroads Guides.
- Auckland Regional Urban Cycle Design Guidelines.
- KiwiRail Design Requirements.
- Design For Access and Mobility making use of AS/NZS 4121, AS/NZS 1428, and RTS 14.
- Check structural standards (e.g. building code).
- Check drainage standards

3.1 Route Design Requirements

There will be some key decisions to be made in the process of achieving the optimum design for the Walking and Cycling facility. Where possible good design features used on other cycling facilities around Auckland will be adopted to provide consistency of treatment across the Auckland Cycle Network.

3.1.1 Design Speeds

The design speed adopted for cyclists is 20 km/h as recommended in Austroads. Although given the gradients along the route, it is important to recognise that cyclists speeds of 30 km/h will not be unexpected.

3.1.2 Cross-sections

Figure 3-1 below from the Austroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths (Appendix A.3, Figure A.2) illustrate how different range of widths can be applied for different types of users and demands.

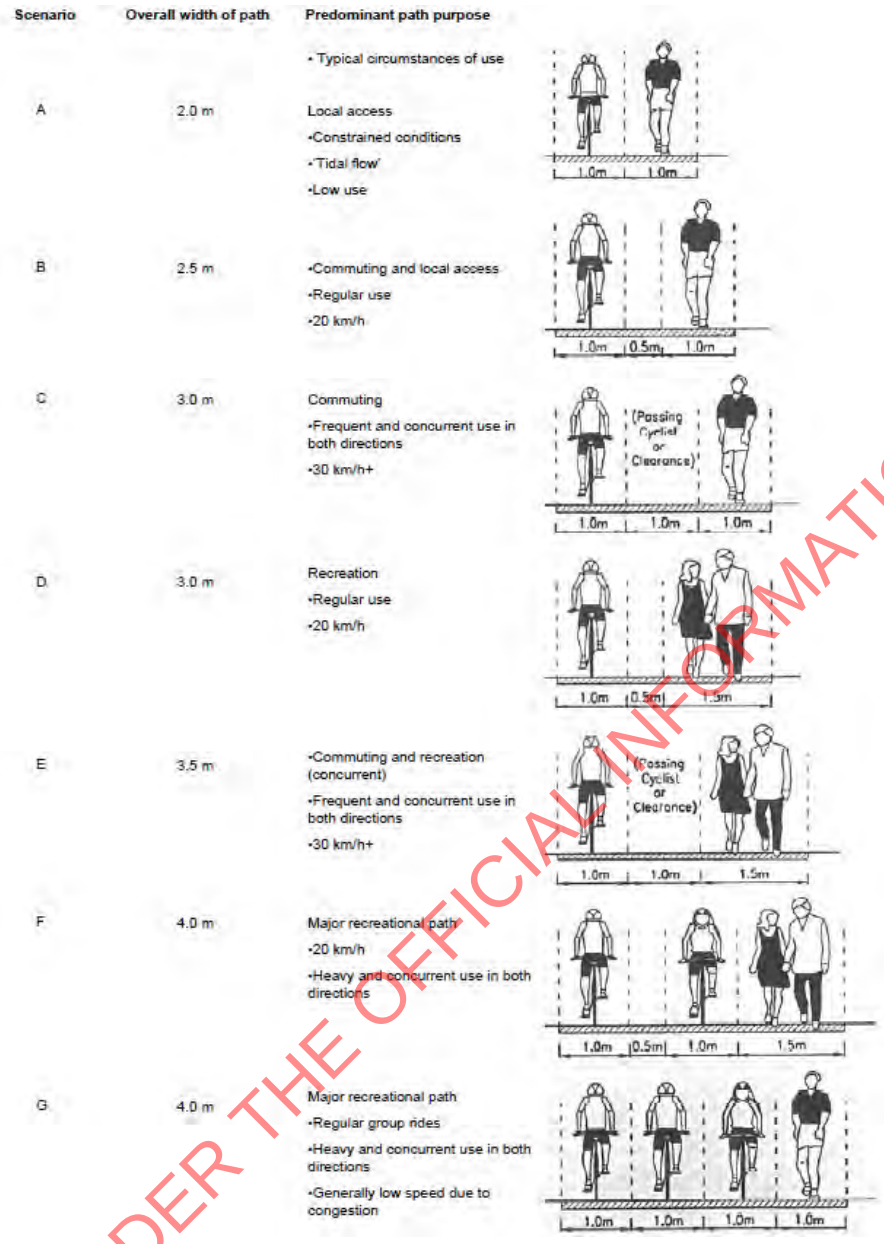

Figure 3-1: Bicycle Path Operation

To provide some guidance for the development of the path width a spreadsheet tool named SUPLOS (Shared Use Path Level Of Service) developed for the USA Federal Highways Administration (Patten et al, 2006) has be used. SUPLOS was used to assess the level of service (LOS) for a shared path based on the path width, and the number / modal split of users. A 4 m wide path achieves a LOS of 'A' based on the following assumptions:

- 70 path users in one direction during the peak hour
- Modal split of the 70 path users is as follows: 55% adult cyclists, 5% child cyclists, 25% pedestrians, 10% runners, 5% skate boarders / rollerbladers.
- No centre line marked

The number of users will increase significantly over the life of the shared path (e.g. 40 years for the assessment of benefits), therefore it is important to cater for the future demand.

A sensitivity analysis based on the assumptions above shows that if the path width is reduced to 3.9 m, the LOS drops to 'B'.

A width of 4 m aligns with the Austroads 'Major Recreational Path' with heavy and concurrent use and given the link to Tamaki Drive the route could be expected to experience groups of cyclists. Providing adequate path width will help to mitigate conflict between users, which will be particularly important on sections with moderate gradients.

Based on providing a high current LOS that allows for future demand, groups of cyclists and gradients along the route, a preferred path width of 4 m is proposed with a desirable minimum path width of 3 m. There are expected to be situations where site constraints do not allow for the desirable minimum width. In accordance with ATCOP, any reduction in the desireable minimum width will be reviewed on a case by case basis. Any such reductions should be to no less than 2.5 m except in exceptional circumstances and for a short distance (e.g. 10 m).

3.1.3 Surfacing

It is proposed that material used for the shared paths and crossings is in accordance with existing Auckland City's Standard Engineering Details.

The shared path surface will be concrete where possible to achieve a high level of service for pedestrians and cyclists. The shared path cross fall will be sympathetic to the surrounding contour.

Where it is not possible to provide a concrete surface, timber boardwalks will be adopted in accordance Section 4.2.3 of the Austroads Guide to Road Design – Part 6A (2009) (p24-25). Where possible decking shall be parallel to the direction of travel. The surfacing shall provide a smooth ride with a groove not wider than 12 mm and any step no higher than 10 mm. Decking perpendicular to the direction of travel shall not have any step higher than 10 mm.

Timber decking surfaces can become slippery when wet, therefore timber should not be used on corners where avoidable. Painting timber with a sand mix will be considered.

Maintenance vehicle access is essential with routine landscaping, street lighting and rail servicing as required. This will be achieved with removable bollards at some locations and the pavement is constructed to a depth which accommodates light commercial vehicles. Type 1 pavement will be allowed for in the locations where access to 8.5 tonnes design vehicle is essential during emergencies.

3.1.4 Horizontal and Vertical Alignment

The route is proposed to have a route corridor 2 m wider than the path width. This will enable 1 m clearance to be provided either side of the path. The 1 m clearance has several benefits including:

- Creates a sense of space for an improved user experience
- Provides space for evasive manoeuvers if necessary
- Future proofing
- Improved visibility to minimise conflict and to improve personal safety
- Allowance for critical infrastructure such a lighting
- Opportunity for users to pull off the path to stop / rest
- Opportunity to create points of interest / landscaping features will be incorporated where the width can be easily increased

The Horizontal alignments will be designed to give a visually pleasing look while keeping the path viable for commuters. The preferred design width will be 4.0 m in accordance with Section 3.1.2. with reduced widths where site constraints do not allow for 4.0 m. The path will also have decreasing radii alignment deflections on approaches to road crossings, this provides a visual queue to cyclists and is a speed reduction facility. The design will have a desirable maximum gradient of 1:20 (5%) on straight sections and on the inside or left hand curves. This complies with mobility user requirements. Where gradients of 5% cannot be met a maximum gradient of 1:12 (8%) will be adopted for short lengths of 9 m with a 1.2 m flat rest area. This complies with NZS 4121 Design for Access & Mobility.Fencing

Safety fencing will be provided to protect hazards like drains and steep banks along the route. It is proposed to provide stock fences where the route passes through fields with livestock. It is expected that fencing, typically 1.8 m timber paling fencing, will required along residential properties neighbouring the path, however where possible permeable fencing will be used to improve visibility and to contribute to an open environment.

Refer to Section 3.7.1 for specifications relating to fencing in the KiwiRail corridor.

3.1.5 Cycling Facilities Offset From Rail Tracks

Austroads recommends cycling facilities to be designed in relation to the degree of separation for cyclists to the speed and volume of general traffic. In this project context, the degree of separation is mainly related to protection and separation from rail corridor as the majority of the route follows the rail corridor. Any proposed paths next to rail corridor should have a clearance of 2.75 m from the centre line of the rail track in accordance to KiwiRail standards. But with the new electric trains that will soon run on Auckland's rail network, all rail corridors have been upgraded for electrification by overhead electrical wires running above the tracks and masts adjacent to the tracks. So the shared path will need to run outside the masts. The masts are generally located at 2 m to 3 m from the outer edge of the rail line.

3.1.6 Pedestrian / Cyclist Crossings (Toucan)

It is recommended in Austroads that for cyclists crossing the road using refuge islands, the cut through width for a bicycle shared used path is the width of bicycle shared use path plus 2 m. This applies to some of the sections within the road reserve where the path needs to cross.

The implementation of a Toucan will be investigated as necessary. These are a pedestrian hybrid signal crossing that creates an exclusive phase for cyclists and pedestrians to cross the intersection. A Toucan permits cyclists to ride across the crossing, as cyclists are usually required by law to dismount at formal pedestrian crossings including school crossings.

3.1.7 Sight Distance

Sight distance checks will be conducted at the locations where the path crosses the road sections. This will be undertaken in accordance with AUSTROADS Guide to Road Design Part 4A: *Unsignalised and Signalised Intersections* chapter 3.3.

3.1.8 Signage

Signage and wayfinding signs will be installed as per Auckland Transport standards. Currently Auckland Transport are developing a directional signage manual. Depending of the release date of this manual, the design standards will be incorporated. All other signs and markings will be in accordance with the Manual of Traffic Signs and Markings (MOTSAM) and Traffic Control Devices (TCD) Manual.

3.1.9 Traffic Signs and Road Markings

References to MOTSAM and TCD Rules will be made during the design of markings and traffic signs as appropriate.

It is proposed to use a single sign board to provide path users warnings, street directions along with route finding information.

3.1.10 Traffic Signals

References to Auckland Traffic Management Unit's (TMU) Traffic Signals Design Guidelines will be made during the design of the signalised pedestrian crossings.

3.1.11 Local landscape

In accordance with the KiwiRail requirements, no planting will be provided within the rail corridor.

Outside of the KiwiRail corridor landscape planting options will be developed to enhance the user experience and minimise upkeep. Creating spaces that feel cared for help to improve crime prevention. In achieving the Greenways principles, the proposed design will minimise the impact of the existing ecology.

3.1.12 Design Vehicle

It is assumed that the path will designed for a design vehicle of 3.5 tonnes, but there is a need to design for 8.5 tonnes to provide access during emergencies. Structures will be designed for pedestrian and cycling traffic, unless it is determined that access across specific structures will be required for maintenance vehicle access.

3.1.13 Departure from Standards

From the KiwiRail point of view, any departures from standards will be discussed in later stages as further investigation will be necessary in terms of property boundary checks to determine the path widths at some constrained locations.

3.1.14 Connections

Access to the shared path can be enhanced by providing links to adjacent streets, schools and parks. These will be assesses based on creating links to residential areas, school travel desire lines, current land use and planned land use.

3.2 Lighting Design

3.2.1 Design Standards

The lighting design will be based on relevant sections of the AS/NZS 1158:2005 Lighting for Roads and Public Spaces (Parts 1.1 and 3.1), the Auckland Transport Code of Practice (ATCOP) and current AT requirements. All electrical installations shall comply with the New Zealand Wiring Rules AS/NZS 3000:2007. Only white lights shall be used within the rail corridor.

3.2.2 Design Basis and Assumptions

A lighting design will be carried out along the proposed route with appropriate spacing and specific review will be carried out at critical locations in accordance with AS/NZS 1158.4. (2007 modified).

Due to the presence of CCTV cameras at key locations, white light lamps (metal hallide or LED) will be used as they provide a vastly superior quality of light for CCTV imaging.

There will be perceived dangers along the path during the hours of darkness. The design will ensure that the poles and fittings proposed will have minimal light spill into residential properties immediately adjacent to the shared path. It is recommended to have some lighting trials in the detailed design next stage to ensure the colour of the lamps did not look like train signals to approaching train drivers. It should be investigated if the lighting system could be dimmer ready where by the lights can be dimmed if required.

Further discussion with KiwiRail and ATOC will be required to ensure that new CCTV installations if any can be integrated with their existing system.

3.3 Stormwater Drainage

The proposed works will require drainage works critically affecting the stormwater flow path along the rail corridor. A detailed investigation of stormwater should be carried out at critical locations. The design will consider for positive drainage away from rail corridor, and need to be easily accessible for maintenance requirements.

3.3.1 Design Standards

There are a number of design standards and codes of practice for stormwater management in New Zealand. However, the standards that can be applied in the stormwater design requirements for this project are as follows:

- Auckland Council Code of Practice
- Auckland Regional Council
- KiwiRail standards

The landuse of the contributing catchment is existing rail corridor, light industrial area, residential area.

3.4 Structural Design

A small bridges is required across the stream north of Glen Innes Station and two across the stream south of Selwyn College. At least one rail overbridge will be required as well as a potential bridge across

Hobson Bay alongside the railway line or alternatively around the bay edge. Widening of several structures may also be required including the underpass at Glen Innes Station and the Orakei Road bridge.

These requires structural design and consents for the bridges.

3.4.1 Design Standards and Requirements

- AS/NZS 1170 Structural Design Actions Set
- NZBC (Building Code) where applicable, i.e. B1 – structure; F4 – falling from height.
- NZS 3101:2006 Concrete Structures Standard
- NZS 3404:2009 Steel Structures Standard
- NZS 4230:2004 Design of Reinforced Concrete Masonry Structures
- NZS 3603:1993 Timber Structures Standard

Appropriate standards depend on the type of structure selected.

3.4.2 Bridge Design Criteria Adopted

Bridge structures are difficult and costly to retrospectively widen. Therefore a key future proofing measure is to design structures with adequate width. Bridges will be design 4.5 m wide to provide a 4 m effective width and will adopt the following aspects into the design:

- Bridge Structures - Concrete bridge preferred. Avoid steel beam bridges across the rail corridor due to expected maintenance costs around high voltage cables.
- Clearances: KiwiRail requirement – 3.5 m set back.
- Bridge clearance above the KiwiRail electrified cables to be 0.5 m.
- Type: Class 4 bridges preferred because of being on rail corridor (above Class 3 is above 7000 people using the facility).
- Seismic, wind and operational Design to NZTA Bridge Manual and AS/NZS 1170 – 100 yr seismic, 1 in 100 yr flood, 1 in 500 yr wind storm (140km/h to 160 km/h)
- Footpaths, ramps and landings - (NZS 4121: 2001 Section 6)
- Overload - need to comply with NZTA Bridge Manual for accidental overload.

3.5 Urban Design and Landscaping Design

'Urban design is the art of making places for people. It includes the way places work and matters such as community safety, as well as how they look. It concerns the connections between people and places, movement and urban form, nature and the built fabric, and the processes for ensuring successful villages, towns and cities.'[1]

The landscape assessment and urban design will be in accordance with ATCOP's philosophy following AT's Urban Design principles:

- Fitting into the built fabric
- Connecting modes and communities
- Design Sustainably
- Incorporating heritage and cultural contexts
- Designing an experience in movement along streets
- Creating self-explaining road environments

[1] DETR and CABE (2000) By Design: Urban Design in the Planning System: Towards Better Practice. London

- Achieving integrated and minimal maintenance design

It is proposed to take a holistic approach to urban design whereby the above principles are all taken into consideration and the design is focussed on improving the quality of people's overall experience of the route while delivering on the project objectives.

The project will give effect to the principles and recommendations stated in:

- NZTA Urban Design Policy
- NZTA Urban Design Professional Services Guide
- New Zealand Urban Design Protocol
- Ministry of Justice National Guidelines for Crime Prevention through Environmental Design (CPTED) and National Guidelines for Injury Prevention through Environmental Design (IPTED)

3.6 Utilities

Utilities works including any diversionary works or new works will be communicated with the relevant service authority. Some intrusive investigations may be required at specific locations.

The investigations will meet the requirements of the current legislation relating to utility service works including:

- Government Roading Powers Act 1989
- Auckland Metropolitan Drainage Act 1960
- Local Government Act 2002
- Electricity Act 1992
- Telecommunications Act 1987
- Gas Act 1992
- PWA 1981

3.7 KiwiRail Standards

Decisions will need to be made in the process of achieving the optimum design for the shared path along the rail corridor. They include:

3.7.1 Fences

The safety fencing along the railway line is a key concern for KiwiRail with respect to cyclists and pedestrians in this area. In accordance with discussions between KiwiRail and Auckland Transport fencing proposed is 1.5 m to 1.8 m high bonded fences. Fencing will be equivalent to palisade style fencing which is permeable thus improving visibility and providing a more open feel. The clearance distance profiles will be agreed with KiwiRail in accordance to T200 standards. As discussed in Section 3.1.5 the path will need to run outside this KiwiRail electrification masts. Therefore the fence will also generally be installed outside the masts. The masts are generally located at 2 m to 3 m from the outer edge of the rail line.

3.7.2 Bridge structures

3.7.3 Refer to Section 3.4.2 for bridge specifications.Services

In regards to KiwiRail ground mounted services, the proposed treatment options may require the relocation of some of the existing KiwiRail signalling equipment in some sections of the route.

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Appendix I Geotechnical Reports

I.1 Preliminary Geotechnical Assessment Report

I.2 Geotechnical Factual and Interpretive Report

Glenn Innes to Tamaki Drive Shared path

Prepared for Auckland Transport

May 2014

QUALIT STATEMENT

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CHECKED B			
Alex Naylor	.....		02/05/2014
REVIEWED B			
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APPROVED FOR ISSUE B			
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REVISION SCHEDULE

Rev No	Date	Description	Signature or Typed Name (documentation on file). Prepared by	Checked by	Reviewed by	Approved by
1	06/05/14	Draft for Client	MM	AN	AI	

Auckland Transport

Glenn Innes to Tamaki Drive Shared path

CONTENTS

LIST OF FIGURES

1 Introduction

MWH New Zealand Ltd (MWH) has been engaged by Auckland Transport (AT) to prepare a Preliminary Geotechnical Appraisal Report (PGAR) as part of the Scheme Assessment Report for a 7.5 km, 3.0 m wide shared path from Tamaki Drive to Glen Innes.

As a result of the increasing population in Auckland City the demand for transport has increased and quality transport infrastructure is needed to meet these rising demands and provide integrated multi-modal transport solutions for Auckland.

The Auckland Cycle Network (ACN) has identified the proposed route, the extent and location of this is shown below in Figure 1. The finished shared path would link Tamaki Drive, Orakei Station, Meadowbank Station and Glen Innes Station providing continuous walking and cycling facilities between the city centre and the eastern suburbs.

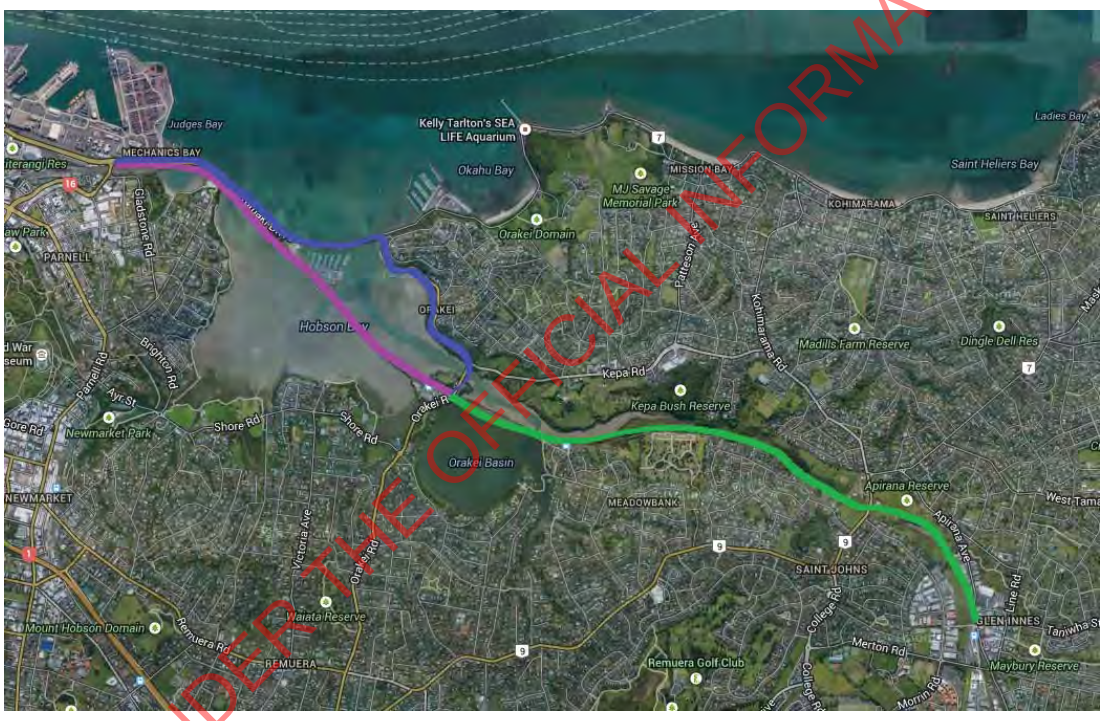


Figure 1 Site location plan showing proposed routes

2 Scope of Report

The Scope of this PGAR is to outline any potential geotechnical issues related to the proposed Shared Pathway route options that may arise and that can be resolved during the Scheme Assessment Report (SAR) phase. The PGAR consists of the following

- Desk study including overview of proposed future development works and review of geological maps and existing reports
- Field reconnaissance
- Identification and discussion of likely geotechnical issues related to the proposed development works
- Preparation of recommended geotechnical field and laboratory testing to be done as part of future investigations.

3 Existing Information

Three sections have been highlighted for development by Auckland Transport. Section 1 extends between Tamaki Drive and Orakei Station, Section 2 between Orakei Station and Meadowbank Station, and Section 3 includes the area between Meadowbank Station and Glenn Innes Station. The proposed route is shown in Appendix A.

A feasibility report entitled Hobson Bay Shared Path – Project Feasibility Report dated 17 October 2012 was prepared by Beca Carter Hollings and Ferner Ltd (Beca), which assessed the feasibility of the various routes in Section 1 that would connect Tamaki Drive to Orakei Station. Five routes were proposed in the Project Feasibility Report (PFR) as shown in Figure 2. Route 1 was discounted by AT. Routes 2 to 5 which involve development over Hobson Bay or along Ngapipi Road will be considered for this PGAR and have outlined further in Section 5 of this report.

Figure 2 Proposed routes connecting Tamaki Drive to Orakei Station

The existing timber boardwalk connecting Orakei Station to Meadowbank Station was constructed in 2010. In the absence of any construction details, a visual non-intrusive inspection was undertaken at the time of the site walkover to determine the construction design. AT has advised that structural calculations will be provided for review.

A PFR entitled A18: Eastern Transport Corridor Cycleway' dated 16 September 2008 has been undertaken by SKM for Section 3 between Meadow Bank Station and Glenn Innes. The report includes an assessment of the cycle route by examining topography and other site constraints before recommending a proposed route.

General descriptions and characteristics of rock and soil materials likely to be encountered at the project site were obtained from the 1:250,000 Geology of the Auckland Urban Area, Map 3, dated 2001. This is discussed in further detail in Section 6 of this report.

4 Site Description

The project site is located in the Auckland Isthmus and is surrounded by the suburbs of Parnell, Remuera, Orakei, Meadowbank, and Glenn Innes. The area includes Hobson Bay, Orakei Basin and the Purewa Creek.

Given the extent of the project site, the topography and vegetation cover varies considerably. This is described below for the relevant sections as detailed in Appendix A

- Section 1: This section of the proposed route includes four potential alternatives that link Tamaki Drive to Orakei Station. Route 2 and 3 are located in Hobson Bay and Route 4 and 5 are located along Ngapipi Road and the western coastline.

  Tamaki Drive is at the north end of the site and consists of a relatively flat grade sealed road with a four lane cross section and small bridge built on reclaimed land. An existing shared path is located on either side of the road. Standard street lighting masts are located on Tamaki Drive.

  Hobson Bay is a shallow intertidal bay surrounded by sand and mud with mangrove/swamp like vegetation. The railway embankment across Hobson Bay forms one of the proposed routes connecting Tamaki Drive to Orakei Station it is of relatively flat grade, constructed from bulk granular fill material with part of the embankment covered with medium dense vegetation such as trees and shrubs.

  Ngapipi Road forms the other proposed route connecting Tamaki Drive to Orakei Station and is located along the eastern coastline of Hobson Bay. The existing sealed road has a two lane cross section with a paved footpath on either side of the road. The vegetation cover along Ngapipi Road is medium-dense while the coastline is densely vegetated with trees and shrubs. Steep gradients were observed between the Ngapipi-Kepa-Orakei and Ngaiwi-Ngapipi intersections, and an approximately 50m long section of road is supported by a concrete crib wall. Standard streetlighting masts are located on Ngapipi Road. Stormwater drainage is managed by kerb-and-channel which drains directly into catchpits.

  Orakei Station is located on near level ground, there is gentle incline leading to the platform from the Orakei Basin boardwalk. Electrified masts have been installed on the northern and southern elevations of the rail lines.

- Section 2: This section of the proposed route consists of the newly constructed boardwalk, which runs alongside the railway linking Orakei Station and Meadowbank Station. The boardwalk is a timber bridge structure constructed on timber piles.

- Section 3: This section of the proposed route runs along the railway corridor between Meadowbank Station and Glenn Innes Station. A rail tunnel runs under a hill (above which Saint John's Road traverses) for approximately 500m. The railway line itself is on relatively flat grade and the vegetation cover appears to be dense on either side of the line. The gradient steepens towards Saint John's Road where the rail line goes through the tunnel. Contour lines also show that there are some steep gradients leading toward Purewa Creek on the northern side of the rail line.

5 Proposed Works

The proposed route has been separated into three sections:

- Section 1 includes the development of a shared facility between Tamaki Drive and Orakei Station,
- Section 2 includes widening of the existing boardwalk between Orakei Station and Meadowbank Station,
- Section 3 includes development or widening of a shared facility between Meadowbank Station and Glenn Innes Station.

5.1 Section 1 Tamaki Drive to Orakei Station

Four options have been considered by Auckland Transport to connect these two locations. The options, as described, in the Beca PFR have been listed below

- Route 2 – Connects the existing shared path at Orakei Station to Tamaki Drive via a crossing of Hobson Bay adjacent to the south side of the Rail Line embankment. This would require an at-grade connection from the existing shared path within Orakei Basin out to Orakei Road, continuing on a widened footpath on the western side of Orakei Road around the southern perimeter boundary of Orakei Point on a new shared path. From there it would follow the rail alignment on the southern side of the rail embankment and connect to the existing path at Tamaki Drive.
- Route 3 – Connects the existing shared path at Orakei Station to Tamaki Drive via a crossing over Hobson Bay adjacent to the north side of the railway line embankment. This would require an at-grade connection from the existing shared path within Orakei Basin out to Orakei Road. From Orakei Road the shared path would continue over the existing Orakei Road Bridge over the rail corridor and through the car park at the station. From there it would follow the rail alignment on the northern side of the rail embankment and connect to the existing path at Tamaki Drive. The design for this solution would need to allow for the proposed Third Main line on the northern side of the embankment.
- Route 4 – Connects the existing shared path to Tamaki Drive via a coastal route alongside Ngapipi Road. This route would involve the widening of the existing pathway over the Orakei Road Bridge and construction of a new 3m wide shared use bridge alongside the existing Orakei Road Bridge. At this point the path would follow the coastline until the intersection with Ngapipi Road.
- Route 5 – Connects the existing shared path to Tamaki Drive via Ngapipi Road. This involves widening the existing pathway over the Orakei Road Bridge and the likely construction of a new shared use bridge alongside the existing road bridge across the Purewa Creek. From there the existing pathway will be widened along the western side of Ngapipi Road and this will need to be supported out over the existing steep bank on Ngapipi Road until Ngaiwi Street. From Ngaiwi Street the shared path utilises the existing pathway with some sections being widened.

5.2 Section 2 Orakei Station to Meadowbank Station

Section 2 involves the widening of the existing timber boardwalk connecting Orakei Station to Meadowbank Station. The existing boardwalk needs to be widened to 3m to meet a 50 year design life. Any potential widening will likely be undertaken on the southern side of the bridge to meet KiwiRail clearance requirements. In the absence of the structural calculations for the design of the existing boardwalk it is difficult to confirm the feasibility of supporting a new structure from the existing boardwalk. A more practical solution may be to construct a new substructure alongside the existing and support the widened section of the boardwalk.

5.3 Section 2 Meadowbank Station to Glenn Innes Station

Section 3 includes the development of a shared path facility to connect Meadowbank Station to Glenn Innes. The PFR undertaken by SKM proposed development alongside the railway line. AT have advised that there is a strong preference to utilise the existing railway corridor or designated NZTA Eastern Transport Corridor however all options, including on/off road routes are also to be considered.

6 Regional Geology

The site geology as indicated on the Institute of Geological & Nuclear Sciences (GNS Science) 1:250,000 Geological Map of Auckland, Map 3, dated 2001 is made up of the Auckland Volcanic Field, Taupo Pumice Alluvium, East Coast Bays Formation, Puketoka Formation and recent construction fill material.

The Auckland Volcanic Field observed around the Orakei Basin is made up of Ash, lapilli and lithic tuff. Taupo Pumice Alluvium is observed in sections around the coastline and consists of pumice sands, silt and gravels. East Coast Bays Formation observed around the majority of the site is described as containing alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grit beds. The Puketoka Formation predominantly in the Glenn Innes area consists of pumiceous mud, sand and gravel with muddy peat and Lignite. The construction fill material is evident at the north-western part of Tamaki Drive and is made up of recompacted clay to gravel sized material which may include demolition debris.

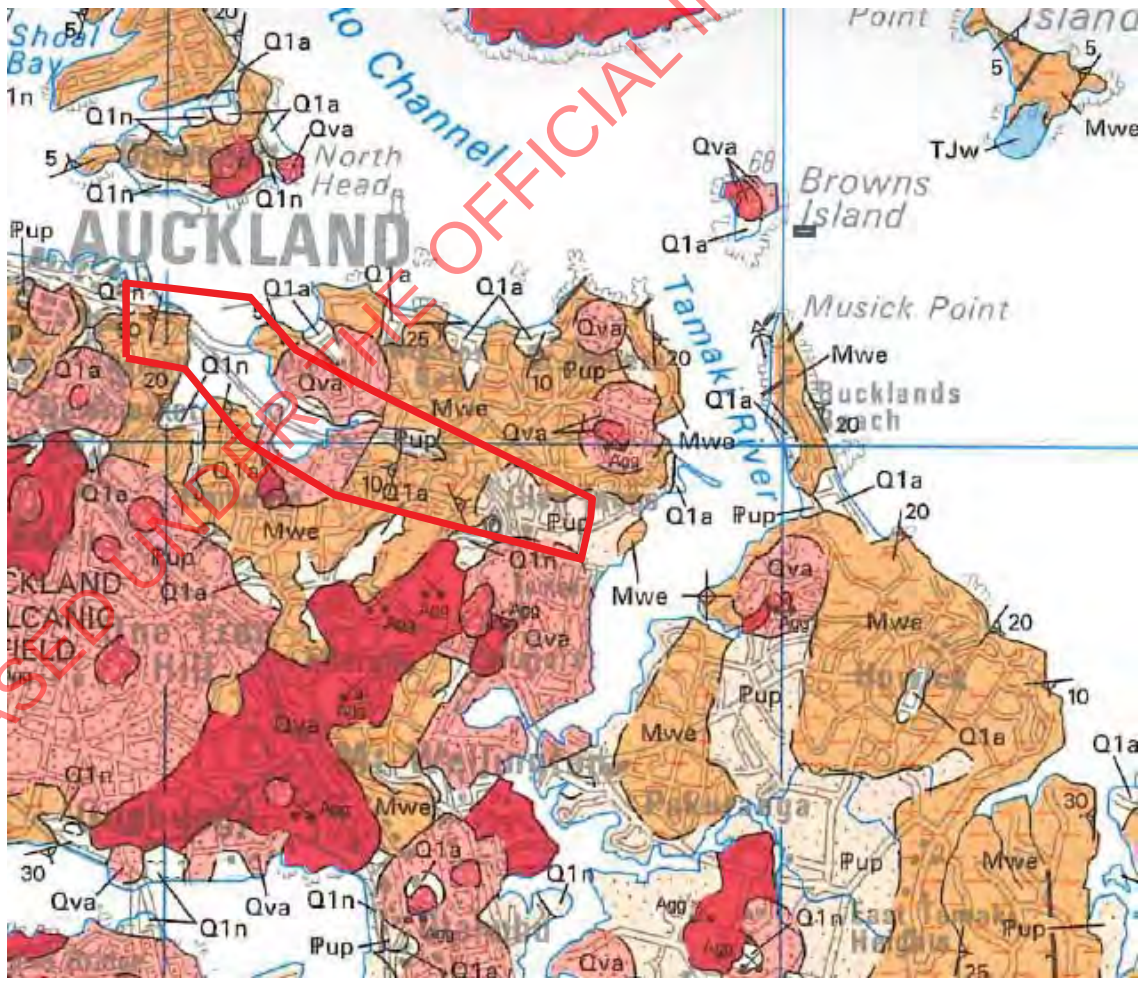


Figure 3: Site Geology, IGNS 1:250,000 Geological Map of Auckland, 2001

6.1 Seismicity

The Auckland area is considered to be one of the lowest earthquake activity regions of New Zealand (IGNS, 2001 Geology of the Auckland Area). Most earthquakes recorded in the region are less than Richter Magnitude 4 (M4), not widely felt and do not result in significant property damage or loss of life. Over the last 150 years there appear to be only two earthquakes recorded with magnitudes in excess of M5. On average the Auckland region may expect to experience Modified Mercalli Shaking Intensity of MM7 or greater every 650 years.

The main active faults indicated on the GNS Sciences New Zealand Active Faults Database are the Wairoa Faults (North and South) located approximately 15km from the site and the Kerepehi Fault located approximately 65km from the site. The Wairoa Faults are active normal faults however there is no known recurrence interval at this fault. The Kerepehi Fault is an active normal fault with a recurrence interval of between 5000 and 10000 years.

7 Geotechnical Issues

7.1 Slope Instability

Section 1 – Route 2 and 3 crossing over Hobson Bay: Section 4.2.1 of the Beca PFR states that In regard to stability of the embankment it is understood that the current embankment has seismic stability issues . In the absence of any technical documentation that could confirm the construction material and methodology used for the railway embankment, and considering the likely age of the embankment it would be reasonable to assume that in the event of an earthquake there would likely be seismic stability issues.

Section 1 – Route 4 coastal route following Ngapipi Road: Instability would be a concern depending on the proximity of any construction work to the base of the slope especially because of the several moderately steep slopes on this site. It is difficult to comment on evidence of slope instability or scour because of the existing dense vegetative cover. There is no evidence in the historical aerial photographs that would suggest any recent movement in the vegetation. However it is possible that there are areas of slope instability that are obscured from view.

Section 1 – Route 5 Along Ngapipi Road: There are several moderate-steep gradients evident along Ngapipi Road and a 50m section of the road is supported by a concrete crib wall. An absence of evidence of past slope instability, such as movement in the vegetative cover or damage to the surrounding pavement and road surface, indicate that it is unlikely that slope stability will pose a risk to any development works at the site. However the presence of dense vegetation around the western side of Ngapipi Road may obscure areas of the slope instability from view.

Section 2 – Orakei Station to Meadowbank Station: The proposed works involved widening the existing timber boardwalk between the two stations. Currently there is a timber walkway alongside the southern abutment of the Orakei Road Bridge if this walkway is to be widened there will likely be stability issues that would require to be addressed.

Section 3 – Meadowbank Station to Glenn Innes Station: Due to site accessibility constraints this section was assessed via a desk top study. There does not appear to be any change in the vegetative cover over the last 10 years around this site that would be indicative of slope instability and on this basis it is unlikely that stability will pose a risk to any development works at this site. However, contour lines also show that there are some steep gradients leading toward Purewa Creek on the northern side of the rail line and therefore this area may be at a risk of instability depending on the extent of work undertaken.

At each of the four sites listed above there was no evidence on site or indicators from the desktop study that suggest that slope stability is an issue. However, if new structures are proposed to be constructed at the site, an accurate assessment of slope stability risks cannot be determined until the vegetation is cleared, and appropriate site access is granted. This should only be carried out once a more definitive location for the proposed structure is known.

7.2 Foundation Conditions

Due to the extent of the proposed works the soil conditions across the length of the site are varied. The sections that will likely require structural foundation work and the relevant soil types are as follows

- Section 1 – Route 2 and 3 crossing over Hobson Bay: Sandy Estuarine deposits, engineered fill depending on railway embankment construction
- Section 1 – Route 4 coastal route following Ngapipi Road: Sand Estuarine deposits
- Section 1 – Route 5 along Ngapipi Road: Taupo Pumice Alluvium, Auckland Volcanic Field
- Section 2 – Crossing over Orakei Basin: Sandy Estuarine deposits
- Section 3 – Meadowbank Station to Glenn Innes Station: Auckland Volcanic Field, East Coast Bays Formation, Puketoka Formation

The bearing capacity of the foundation soils at each proposed construction site will be assessed against the design loads applied by the structure. Detailed ground investigation boreholes will be sited at the approximate locations of the structures to characterise the foundation soils. A discussion and recommendation on suitable foundation types will be made after considering the properties of the materials at the site, likely design loads and groundwater conditions.

7.3 Settlement

Settlement is primarily a risk for any development undertaken in Hobson Bay, along the Ngapipi coastline, within Orakei Bay and adjacent to the Purewa Creek by Meadowbank Station. This is because of the proximity these sites to water-bodies and the likelihood of encountering soft organic soils on site. These areas are low energy environments where soft soil materials and organics, which are prone to settlement, are common. Therefore if structures were to be designed and built, field investigations at their proposed location will need to be carried out.

7.4 Groundwater

Due to the location of the proposed works to coastal water bodies, fluctuating water levels due to tides will need to be considered for future investigation.

7.5 Service Check

A full service check and markout is recommended prior to commencement of any site investigations. Locations of buried pipelines and underground power will need to be determined for the proposed development. Electrification masts are installed alongside the northern and southern elevations of the rail line and these will need to be considered during the proposed route selection phase. Standard street lighting masts are evident along public roads.

7.6 Site Access

Site access approvals for site investigations will need to be undertaken at respective locations shown on the attached Proposed Geotechnical Investigation Plans (Appendix B). As the site is densely vegetated, the formation of access to test locations and its associated costs and environmental effects will have to be considered before commencing the investigation. Access agreements for these locations will be need to be organised between AT and KiwiRail. The locations of individual test positions will need to be reassessed prior to commencement of site investigation works.

7.7 Li uefaction Potential

Liquefaction is a phenomenon whereby saturated cohesionless soils lose their stiffness and strength due to repeated intense cyclic loading. It results in a slurry-like soil that can cause both surface and subsurface ground deformations and consequently damage to structures located on or in the ground.

The risk of liquefaction is likely to be low considering that the proximity of the nearest fault line (Wairoa Faults) is approximately 15km away. However, liquefaction risk should not be completely discounted. Any proposed works undertaken adjacent to water-bodies where sandy estuarine deposits are present maybe susceptible to liquefaction. Following the preliminary geotechnical investigations proposed under Phase 1', any evidence of sand, silts or clays would indicate the sites liquefaction potential and this may impact the proposed structures.

8 Site Investigation Methodology

8.1 Field Investigation and Testing

The proposed site investigations are based on the route options identified above for the shared path and are subject to change in relation to the scope of the project or limiting factors that influence their feasibility.

Geotechnical site investigations are recommended to be carried out in two stages to facilitate a more focussed ground investigation program. This will be particularly cost effective as the project is currently in the feasibility stage and the location and numbers of structures are yet to be confirmed.

Phase 1 of the ground investigation works will include shallow hand investigations with in situ testing to confirm soil materials, strengths and general groundwater information for all route options across the general site area. These investigations are to be conducted at widely spaced intervals to cover the proposed development area. Approximate locations of proposed investigations are indicated on the attached Proposed Geotechnical Investigation Plan (Appendix B).

Phase 2 of the ground investigations will be focussed on the confirmed selected route for the shared path and associated structures to determine bearing conditions and suitable types of foundations. These investigations should be deferred until the preferred layout option and the locations of the proposed structures are confirmed.

The recommended ground investigation in each phase is as follows

- Phase 1 Ground Investigation
    - 18 x Hand Auger Holes to 4.0m
    - Shear vanes 0.5m centres in each hole
    - 18 x scala penetrometer tests to 4.0m
- Phase 2 Ground Investigation Sub ect to change
    - Boreholes/CPTs are recommended for any potential structural foundation work across Hobson Bay, and between Meadowbank Station and Glenn Innes Station. These tests will be undertaken to assess foundation conditions and the stability of the ground. In situ samples will be taken from these cores for further analysis by an IANZ accredited laboratory.
    - Test Pits will be undertaken for field logging, in situ strength testing and provide information on groundwater levels. The test pits will also provide samples for laboratory testing as it is likely that in situ materials obtained from proposed excavations will be used as fill.

9 Conclusions and Recommendations

Due to the number of proposed routes available it would not be prudent to make recommendations for site testing or comment on the suitability of areas proposed for construction without more information about the proposed structures.

From the plans provided by the client and after conducting a site walkover it appears that each site proposed as part of the upgrade has its advantages and disadvantages. Proposed routes 2 and 3 in section 1 are the most direct however the feasibility of the routes will be determined by the ground investigations and the type of material encountered. Route 4 in Section 1 is advantageous because there is likely to be minimal disruption to existing road usage during construction, although site accessibility for construction along the coastline may be an issue. The converse applies for Route 5, where the apparent site geology and reasonable construction access is preferable while the disruption to existing road usage during construction would require to be accounted for. Development in Section 2 can be undertaken alongside the existing boardwalk to match existing structural design. Development in Section 3 will depend on the proposed shared path route and the ground profile once the vegetative cover is removed accessibility will be an issue on the northern elevation of the rail track. There are no indicators of soil instability at either site this will however need to be reassessed once the vegetative cover is removed and should only be undertaken once a more definitive location for the proposed structure is known.

Due to the limited amount of existing geotechnical information available, the ground investigations should be staged to provide a good indication of the suitability of the sites. The first phase would cover the three proposed sections with low cost shallow testing. The information gathered from the first phase of investigations would then be incorporated into the proposed layout plan and used to develop a preliminary geotechnical model for the sites. Phase 2 of the investigation programme would be route and structure specific, with deeper higher cost investigations that would specifically target areas within the site to obtain information suitable for use in the design of the proposed structures.

Limitations

This report has been prepared for Auckland Transport in accordance with the generally accepted practices and standards in use at the time it was prepared. MWH accepts no liability to any third party who relies on this report.

The information contained in this report is accurate to the best of our knowledge at the time of issue. MWH NZ has made no independent verification of this information beyond the agreed scope set out in the report.

The interpretations as to the likely subsurface conditions contained in this report are based on existing site information inferred from geological maps, existing reports and the result of a site visit as described in this report. No subsurface investigations have been undertaken by MWH NZ Ltd at this stage. The type, spacing and frequency of the proposed investigations, sampling, and testing of materials were selected to meet the technical, financial and time requirements agreed by the client.

Actual ground conditions encountered may vary from the predicted subsurface conditions. For example, subsurface groundwater conditions often change seasonally and over time. No warranty is expressed or implied that the actual conditions encountered will conform exactly to the conditions described herein.

Where conditions encountered at the site differ from those inferred in this report MWH NZ should be notified of such changes, and should be given an opportunity to review the report recommendations made in this report in light of any further information.

This report does not purport to describe all the site characteristics and properties. Subsurface conditions and testing relevant to construction works must be undertaken and assessed by any contractors as necessary for their own purposes.

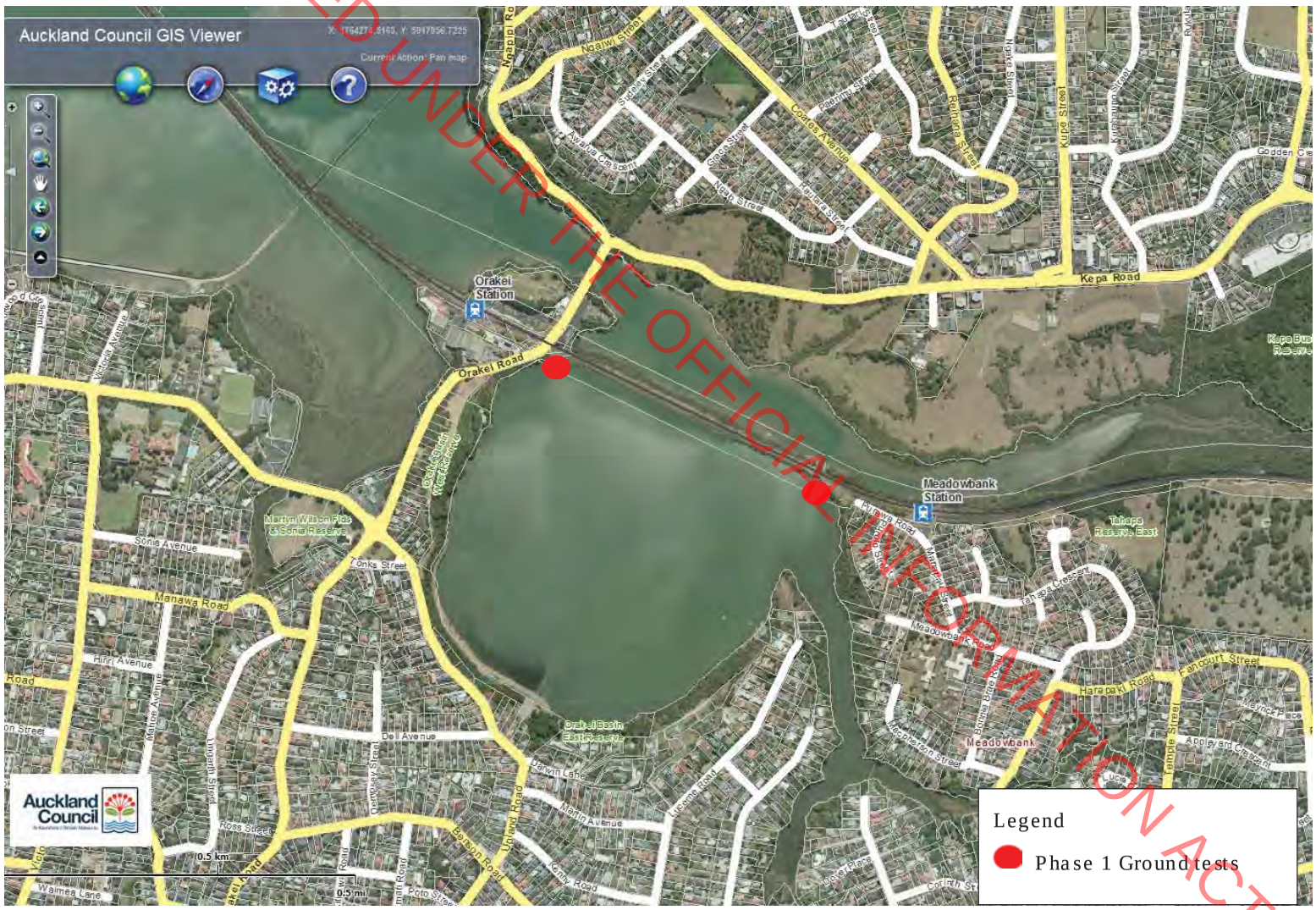
References

- Edbrooke, S.W. (compiler) (2001). Geology of the Auckland Area , Institute of Geological and Nuclear Sciences 1:250,000 geological map 3
- GNS Science New Zealand Active Faults Database
- Beca Carter Hollings and Ferner Ltd (Beca) Report: Hobson Bay Shared Path - Project Feasibility Report dated 17 October 2012
- SKM Report - A18: Eastern Transport Corridor Cycleway dated 16 September 2008.

Appendix A Site Plan

Appendix B Phase 1 Site Investigation Plan Section 1

Appendix B Phase 1 Site Investigation Plan Section 2



Appendix B Phase 1 Site Investigation Plan Section 3

MWH

BUILDING A BETTER WORLD

Geotechnical Factual Report

Glen Innes to Tamaki Drive Shared Path Section 1

Prepared for Auckland Transport

October 2014

This document has been prepared for the benefit of Auckland Transport. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval to fulfill a legal requirement.

QUALITY STATEMENT

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Libby Davy	pp	…13/10/14
CHECKED BY		
Ilai Waqa	.....	…15/10/14
REVIEWED BY		
Jen Kelly	.....	…17/10/14
APPROVED FOR ISSUE BY		
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REVISION SCHEDULE

Rev No	Date	Description	Signature Required			
			Prepared By	Checked By	Reviewed By	Approved By

Auckland Transport

Glen Innes to Tamaki Drive Shared Path Section 1 Geotechnical Factual Report

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LIST OF FIGURES

LIST OF TABLES

APPENDICES

1 Introduction

MWH NZ Limited (MWH) has been engaged by Auckland Transport to undertake a site investigation and prepare a Geotechnical Factual Report for Section 1 of the Glen Innes to Tamaki Drive Shared Path. Section 1 starts from Merton Road and ends at St Johns Road, Glen Innes.

The site investigation and factual report has been undertaken and prepared for the purpose of providing geotechnical information for the construction of a shared path that will include retaining walls, stream crossings and an earth embankment.

2 Site Information

2.1 Site Location

Section 1 of the shared path is approximately 1.5km long and is located between Merton Road to the south and St Johns Road to the north in Glen Innes, Auckland. A detailed Site Plan showing the location of testing is included in Appendix A.

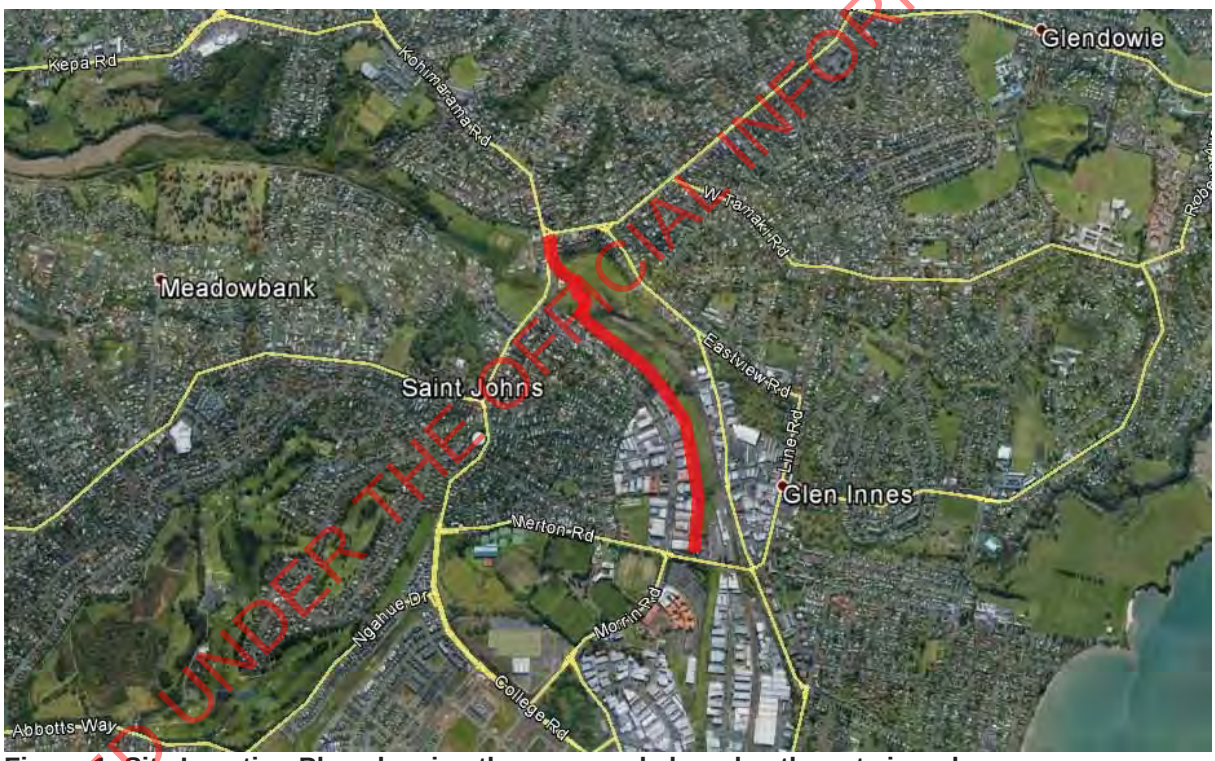

Figure 1: Site Location Plan showing the proposed shared path route in red.

2.2 Site Description

The majority of the land designated for the shared path is owned by NZTA and is currently leased by the Auckland Pony Club.

The terrain along the proposed path route is generally flat from Mertons Road through Glen Innes train station where it dips down to the underpass and back up again over a small stream. As the path continues north it will run along the edge of an industrial area that has been built up with fill to obtain the same level as Felton Mathews Road before the ground slopes down to the reserve. Another creek is crossed at the edge of the industrial sites before the terrain steepens up towards St Johns Road.

3 Geology

Published geological information for the area as shown on the 1:250,000 Institute of Geological and Nuclear Sciences (IGNS) Geology of the Auckland Urban Area, Map 3, dated 2001 indicates the underlying geology to comprise the following; Puketoka Formation consisting of pumiceous mud, sand and gravel with muddy peat and lignite and East Coast Bays Formation described as containing alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grit beds. A summary of the published geology is given in Table 1.

Table 1: Published Geology

Group	Formation	Description	Deposition Age
Tauranga Group	Puketoka Formation	Pumiceous mud, sand and gravel with muddy peat and lignite; rhyolite pumice, ignimbrite, tephra and alluvia.	0.071-3.6 million years
Waitemata Group	East Coast Bays	Alternate sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grits.	16.4-23.8 million years

4 Seismicity

The Auckland area is considered to be one of the lowest earthquake activity regions of New Zealand (IGNS, 2001 “Geology of the Auckland Area”). Most earthquakes recorded in the region are less than Richter Magnitude 4 (M4), not widely felt and do not result in significant property damage or loss of life. Over the last 150 years there appear to be only two earthquakes recorded with magnitudes in excess of M5. On average the Auckland region may expect to experience Modified Mercalli Shaking Intensity of MM7 or greater every 650 years.

The main active faults indicated on the GNS Sciences New Zealand Active Faults Database are the Wairoa Faults (North and South) located approximately 20km from the site and the Kerepehi Fault located approximately 65km from the site. The Wairoa Faults are active normal faults however there is no known recurrence interval at this fault. The Kerepehi Fault is an active normal fault with a recurrence interval of between 5000 and 10000 years.

5 Site Investigations

5.1 Introduction

The site investigations completed to date were carried out between 18 August and 9 September 2014, the weather over this period was generally cloudy with intermittent rain. All excavations and drilling were supervised by a Geotechnical Engineer/Engineering Geologist from MWH and were logged in accordance with the Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, (New Zealand Geotechnical Society, 2005). A summary of the scope of the ground investigations is outlined in Table 2.

Table 2: Summary of Ground Investigation Works

Investigation Method	Number of Tests	Maximum Depth (m)	Sampling Regime	Logged by	Appendix
Test Pits	3	3.9	Bulk	MWH	C
Hand Augers	10	4	N/A	MWH	C

5.2 Site Investigation

The results of the site investigations are given in the appendices and a site plan showing the investigation locations has been included in Appendix A. A summary of all the testing locations is included in Table 3.

Table 3: Site Investigation Locations

Investigation I.D	Type
HA01	Hand Auger
HA02	Hand Auger
HA02-A	Hand Auger
HA03	Hand Auger
HA04	Hand Auger
HA05	Hand Auger
HA05-A	Hand Auger
HA06	Hand Auger
HA07	Hand Auger
HA08	Hand Auger
TP01	Test pit
TP02	Test pit
TP03	Test pit

5.3 Test Pits

Test pits were advanced using a 13 tonne excavator with an 800 mm toothed bucket. The test pits were approximately 0.8 m wide, 2 m long and on average 3.5 m deep. Pits deeper than 1.0m were not entered and instead the material being removed was examined at the surface.

Shear strength testing was undertaken within cohesive soils using a hand held Pilcon shear vane at regular intervals. A Scala Penetrometer was undertaken in granular, non-cohesive soils for information on density beside the test pits.

Reinstatement was achieved by lightly compacting layers of excavated material back into the pit and track rolled.

Test photos are presented in Appendix B and logs in Appendix C.

5.4 Hand Augers

Hand augers were undertaken up to 2-4m depth or to refusal. Shear strength testing was undertaken within cohesive soils in hand augers using a hand held Pilcon shear vane at 0.5m intervals. A Scala Penetrometer was undertaken in granular, non-cohesive soils for density alongside the hand augers.

Hand auger logs are presented in Appendix C.

6 Groundwater

Groundwater levels and seepage levels were recorded at time of the excavations/drilling. The recorded levels are listed in Table 4.

Table 4: Summary of Groundwater Levels

Location	Depth (m)
HA02	2.9
HA02-A	2.4
HA03	1.5
HA05A	1.5
HA07	2.4
TP02	1.4 (seepage)
TP03	0.7, 1.9, 3.3 (seepage)

7 Laboratory Testing

Laboratory testing has been undertaken on selected samples from the test pit excavations. The samples have been tested by Opus Auckland Laboratory; the extent of the testing is outlined in the laboratory testing summary in Table 5.

The tests undertaken and the testing specifications were as follows:

- Natural Moisture Content: NZS4402, 1986; test 2.1
- Atterberg Limits: NZS4402, 1986; tests 2.2, 2.3 and 2.4
- Hydrometer Grading: NZS4402, 1986; test 2.8.4

The laboratory testing results are presented in Appendix D.

Table 5 : Laboratory Testing Summary

Item	Quantity	Laboratory
Natural Moisture Content	3	Opus Auckland Laboratory
Atterberg Limits	3	Opus Auckland Laboratory
Hydrometer Grading	4	Opus Auckland Laboratory

8 Limitations

This report has been prepared for Auckland Transport in accordance with the generally accepted practices and standards in use at the time it was prepared. MWH accepts no liability to any third party who relies on this report.

The information contained in this report is accurate to the best of our knowledge at the time of issue. MWH NZ has made no independent verification of this information beyond the agreed scope set out in the report.

The interpretations as to the likely subsurface conditions contained in this report are based on the site observations and field investigations made at discrete locations as described in this report. The type, spacing and frequency of the investigations, sampling, and testing of materials were selected to meet the

technical, financial and time requirements agreed by the client. MWH NZ accepts no liability for any unknown or adverse ground conditions.

Actual ground conditions encountered may vary from the predicted subsurface conditions. For example, subsurface groundwater conditions often change seasonally and over time. No warranty is expressed or implied that the actual conditions encountered will conform exactly to the conditions described herein.

Where conditions encountered at the site differ from those inferred in this report MWH NZ should be notified of such changes, and should be given an opportunity to review the report recommendations made in this report in light of any further information.

This report does not purport to describe all the site characteristics and properties. Subsurface conditions and testing relevant to construction works must be undertaken and assessed by any contractors as necessary for their own purposes.

References

1. Edbrooke, S.W. (compiler) (2001). "Geology of the Auckland Area", Institute of Geological and Nuclear Sciences 1:250,000 geological map 3

2. GNS Science “New Zealand Active Faults Database”

3. New Zealand Geotechnical Society, “Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes”, December 2005.

Appendix A Site Plan

Site Plan showing investigation locations

Scale: 1:10000 (approx.)

Test Pit
Hand Auger

Appendix B Test Pit Photos

Glen Innes to Tamaki Drive Section 1
TP1

Test Pit 1 (TP1)

TP1 Spoil

Glen Innes to Tamaki Drive Section 1
TP2

Test Pit 2 (TP2)

TP2 Spoil

Glen Innes to Tamaki Drive Section 1
TP3

Test Pit 3 (TP3)

Appendix C Testpit and Hand Auger Logs

MWH NEW ZEALAND LTD
Level 3
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Auckland 1149
Tel: 09 580 4500
Fax: 09 580 4514

HAND AUGER LOG

Job No: 80504522
Hole No: HA01
Sheet: 1 of 1

Client: Auckland Transport
Started: 09/09/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 09/09/14

Logged: AN

Investigation Location: Site Plan
Description:
Checked: IW

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	depth (m)
0.2			Silty TOPSOIL with minor gravel; dark brown, firm, moist; Gravel, fine	(0.2)		moist	0.2
0.4			Silty CLAY; orange brown, very stiff, moist; high plasticity				0.4
0.6	Vane sample	170/86	becomes light grey stained orange				0.6
0.8							0.8
1.0	Vane sample	139/76				moist	1.0
1.2							1.2
1.4							1.4
1.6	Vane sample	133/77					1.6
1.8							1.8
2.0	Vane sample	216+/139		(2)			2.0
2.2			Hand auger terminated at 2m due to Target Depth				2.2
2.4							2.4
2.6							2.6
2.8							2.8
3.0							3.0
3.2							3.2
3.4							3.4
3.6							3.6
3.8							3.8
4.0							4.0
4.2							4.2
4.4							4.4
4.6							4.6
4.8							4.8
5.0							5.0

Notes:No groundwater encountered

Contractor: MWH

MWH NEW ZEALAND LTD
Level 3
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111 Carlton Gore Road
Newmarket
Auckland 1149
Tel: 09 580 4500
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HAND AUGER LOG

Job No: 80504522
Hole No: HA02
Sheet: 1 of 1

Client: Auckland Transport
Started: 09/09/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 09/09/14

Logged: AN

Investigation Location: Site Plan
Description:
Checked: IW

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	depth (m)
0.2			Silty TOPSOIL with trace of roots; dark brown, firm, moist	(0.2)		moist	0.2
0.4			Silty CLAY; light grey stained orange, stiff to very stiff, moist; high plasticity				0.4
0.6	Vane sample	110/54					0.6
0.8							0.8
1.0	Vane sample	128/59					1.0
1.2							1.2
1.4							1.4
1.6	Vane sample	173/83				moist	1.6
1.8							1.8
2.0	Vane sample	111/56					2.0
2.2							2.2
2.4							2.4
2.6	Vane sample	102/52					2.6
2.8					▽		2.8
3.0	Vane sample	83/34	Hand auger terminated at 3m	(3)			3.0
3.2							3.2
3.4							3.4
3.6							3.6
3.8							3.8
4.0							4.0
4.2							4.2
4.4							4.4
4.6							4.6
4.8							4.8
5.0							5.0

Notes: Auger terminated due to overhead trees preventing going deeper.
Groundwater encountered at 2.9m.

Contractor: MWH

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HAND AUGER LOG

Job No: 80504522
Hole No: HA02A
Sheet: 1 of 1

Client: Auckland Transport
Started: 09/09/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 09/09/14

Logged: AN

Investigation Location: Site Plan
Description:
Checked: IW

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	Scala Penetration (Blows/100mm) SCALA PENETROMETER TEST: +DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999 +DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988	depth (m)
0.0			Silty TOPSOIL; dark brown, firm, moist			moist		0.0
0.2			(0.2)					0.2
0.4			Silty CLAY; orange brown, very stiff, moist; high plasticity					0.4
0.6	Vane sample	128/59	becomes light grey stained orange					0.6
0.8								0.8
1.0	Vane sample	127/69	becomes minor light brown organics			moist		1.0
1.2								1.2
1.4								1.4
1.6	Vane sample	120/68						1.6
1.8								1.8
2.0	Vane sample	82/46	(2) Clayey SILT; light grey stained orange, very stiff, moist; medium plasticity					2.0
2.2								2.2
2.4			becomes wet and stiff		▽			2.4
2.6	Vane sample	69/29						2.6
2.8								2.8
3.0	Vane sample	77/31				moist		3.0
3.2								3.2
3.4			becomes stained red					3.4
3.6	Vane sample	111/43						3.6
3.8			becomes stained orange					3.8
4.0	Vane sample	131/46	(4) Hand auger terminated at 4m due to Target Depth					4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8
5.0								5.0

Notes: Groundwater encountered at 2.4m

Contractor: MWH

MWH NEW ZEALAND LTD
Level 3
MWH House
111 Carlton Gore Road
Newmarket
Auckland 1149
Tel: 09 580 4500
Fax: 09 580 4514

HAND AUGER LOG

Job No: 80504522
Hole No: HA03
Sheet: 1 of 1

Client: Auckland Transport
Started: 09/09/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 09/09/14

Logged: AN

Investigation Location: Site Plan
Description:
Checked: IW

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	Scala Penetration (Blows/100mm) SCALA PENETROMETER TEST: +DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999 +DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988	depth (m)
0.2			Silty TOPSOIL with minor gravel; dark brown, firm, moist; Gravel, fine (0.2)			moist		0.2
0.4			Silty clayey FILL with trace of gravel; brown and yellow, stiff, moist; Gravel, fine. (FILL)			moist		0.4
0.6	Vane sample	133/31	(0.7)					0.6
0.8			CLAY with some silt; orange brown, very stiff, moist; high plasticity			moist		0.8
1.0	Vane sample	147/82	becomes grey stained orange (1.2)					1.0
1.2			Clayey SILT with trace of sand; bluish grey, very stiff, moist; high plasticity					1.2
1.4					▽			1.4
1.6	Vane sample	122/34						1.6
1.8								1.8
2.0	Vane sample	154/45						2.0
2.2								2.2
2.4								2.4
2.6	Vane sample	188/93	becomes minor fine grained sand, light grey stained orange			moist		2.6
2.8								2.8
3.0	Vane sample	216+/116						3.0
3.2								3.2
3.4								3.4
3.6	Vane sample	147/76						3.6
3.8								3.8
4.0	Vane sample	151/77	(4) Hand auger terminated at 4m due to Target Depth					4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8
5.0								5.0

Notes:Groundwater encountered at 1.5m

Contractor: MWH

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Auckland 1149
Tel: 09 580 4500
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HAND AUGER LOG

Job No: 80504522
Hole No: HA04
Sheet: 1 of 1

Client: Auckland Transport
Started: 18/08/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 18/08/14

Logged: MM

Investigation Location: Site Plan
Description:
Checked: LD

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	depth (m)
0.0	TOPSOIL; brown, firm, moist			moist	0.0
	(0.05)				
0.2	Hand auger terminated at 0.05m due to Unable to Auger				0.2
0.4					0.4
0.6					0.6
0.8					0.8
1.0					1.0
1.2					1.2
1.4					1.4
1.6					1.6
1.8					1.8
2.0					2.0
2.2					2.2
2.4					2.4
2.6					2.6
2.8					2.8
3.0					3.0
3.2					3.2
3.4					3.4
3.6					3.6
3.8					3.8
4.0					4.0
4.2					4.2
4.4					4.4
4.6					4.6
4.8					4.8
5.0					5.0

Notes:No groundwater encountered

Contractor: MWH

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HAND AUGER LOG

Job No: 80504522
Hole No: HA05
Sheet: 1 of 1

Client: Auckland Transport
Started: 18/08/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 18/08/14

Logged: MM

Investigation Location: Site Plan
Description:
Checked: LD

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	Scala Penetration (Blows/100mm) SCALA PENETROMETER TEST: +DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999 +DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988	depth (m)
0.0			Silty TOPSOIL; brown, soft, moist; low plasticity			moist		0.0
			(0.15)					
0.2			SILT with trace of clay; brown, soft, moist; low plasticity. (FILL)					0.2
0.4			Becomes orange brown silty clay, firm					0.4
0.6	Vane sample	59/20						0.6
0.8			Becomes trace coarse grained gravel, stiff					0.8
1.0	Vane sample	UTP	(1) Becomes brown gravel, trace organics			moist		1.0
1.2			Hand auger terminated at 1m due to UTP					1.2
1.4								1.4
1.6								1.6
1.8								1.8
2.0								2.0
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3.0								3.0
3.2								3.2
3.4								3.4
3.6								3.6
3.8								3.8
4.0								4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8
5.0								5.0

Notes:No groundwater encountered

Contractor: MWH

MWH NEW ZEALAND LTD
Level 3
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Tel: 09 580 4500
Fax: 09 580 4514

HAND AUGER LOG

Job No: 80504522
Hole No: HA05A
Sheet: 1 of 1

Client: Auckland Transport
Started: 18/08/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 18/08/14

Logged: MM

Investigation Location: Site Plan
Description:
Checked: LD

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	depth (m)
0.2			Silty TOPSOIL with trace of roots; brown, soft, moist			moist	0.2
			(0.25)				
0.4			Silty CLAY; orange grey mottled brown, stiff, moist; low plasticity				0.4
0.6	Vane sample	77/28				moist	0.6
0.8			becomes high plasticity, firm				0.8
1.0			(1)				1.0
	Vane sample	77/12	5mm of trace fine to coarse grained gravel			moist	
1.2			SILT; dark orange brown and grey, firm, moist; high plasticity				1.2
			(1.2)				
1.4			Clayey SILT; light orange grey and brown, firm to stiff, wet; high plasticity				1.4
			becomes very stiff, low plasticity		▽	wet	
1.6	Vane sample	145/15					1.6
			(1.65)				
1.8			Silty CLAY; light orange grey and brown, stiff to very stiff, moist; low plasticity				1.8
2.0	Vane sample	145/90				moist	2.0
2.2							2.2
2.4			(2.5)				2.4
2.6	Vane sample	145/71	Clayey SILT; light grey mottled orange, very stiff, moist; low plasticity				2.6
2.8			becomes trace fine grained sand			moist	2.8
3.0			(3)				3.0
	Vane sample	142/49	becomes trace organics				
3.2			Hand auger terminated at 3m due to Target Depth				3.2
3.4							3.4
3.6							3.6
3.8							3.8
4.0							4.0
4.2							4.2
4.4							4.4
4.6							4.6
4.8							4.8
5.0							5.0

Notes:Groundwater encountered at 1.5m

Contractor: MWH

MWH NEW ZEALAND LTD
Level 3
MWH House
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Auckland 1149
Tel: 09 580 4500
Fax: 09 580 4514

HAND AUGER LOG

Job No: 80504522
Hole No: HA06
Sheet: 1 of 1

Client: Auckland Transport
Started: 18/08/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 18/08/14

Logged: MM

Investigation Location: Site Plan
Description:
Checked: LD

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	Scala Penetration (Blows/100mm) SCALA PENETROMETER TEST: +DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999 +DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988	depth (m)
0.2			Silty TOPSOIL; dark brown, soft, moist; low plasticity (0.25)			moist	0 1 2 3 4 5 6 7 8 9 10	0.2
0.4			SILT with minor clay; light brownish orange, firm, moist; low plasticity					0.4
0.6	Vane sample	164/62	becomes trace roots, light grey mottled orange, stiff					0.6
0.8								0.8
1.0	Vane sample	151/73						1.0
1.2			becomes some clay, no roots, very stiff			moist		1.2
1.4								1.4
1.6	Vane sample	154/83						1.6
1.8								1.8
2.0	Vane sample	185/111	Hand auger terminated at 2m due to Target Depth (2)					2.0
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3.0								3.0
3.2								3.2
3.4								3.4
3.6								3.6
3.8								3.8
4.0								4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8
5.0								5.0

Notes:No groundwater encountered

Contractor: MWH

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HAND AUGER LOG

Job No: 80504522
Hole No: HA07
Sheet: 1 of 1

Client: Auckland Transport
Started: 18/08/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 18/08/14

Logged: MM

Investigation Location: Site Plan
Description:
Checked: LD

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition
0.2			Silty TOPSOIL with trace of roots; dark brown, soft, moist; low plasticity (0.25)			moist
0.4			SILT with some organics; orange brown mottled brown, stiff, moist; low plasticity			
0.6	Vane sample	130/62				
0.8			becomes light grey mottled orange, no organics			moist
1.0	Vane sample	151/71	becomes mottled red (1.2)			
1.2			Clayey SILT; light grey mottled red, stiff, moist; low plasticity			
1.4						
1.6	Vane sample	120/62	becomes medium plasticity (1.8)			
1.8			SILT with minor clay; light grey mottled red, stiff, moist; medium plasticity			
2.0	Vane sample	160/74				
2.2			becomes trace fine grained sand, low plasticity, soft			
2.4			becomes orange		▽	wet
2.6	Vane sample	123/37	(2.7)			
2.8			Sandy SILT; light grey mottled orange, soft, wet; low plasticity (3)			moist
3.0	Vane sample	151/43	SILT with minor clay; light brownish yellow, firm, moist; low plasticity			
3.2						moist
3.4			(3.5)			
3.6	Vane sample	216/68	becomes soft			moist
3.8			Sandy SILT; light brownish yellow, very soft, moist; low plasticity (3.7)			moist
4.0	Vane sample	96/37	SILT with minor clay; light grey mottled orange, stiff to very stiff, moist; low plasticity (4)			
4.2			Hand auger terminated at 4m due to Target Depth			
4.4						
4.6						
4.8						
5.0						

Scala Penetration (Blows/100mm)

SCALA PENETROMETER TEST:
+DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999
+DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988

0 1 2 3 4 5 6 7 8 9 10

Notes: Groundwater encountered at 2.4m

Contractor: MWH

MWH NEW ZEALAND LTD
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HAND AUGER LOG

Job No: 80504522
Hole No: HA08
Sheet: 1 of 1

Client: Auckland Transport
Started: 04/09/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 04/09/14

Logged: LD

Investigation Location: Site Plan
Description:
Checked: IW

Equipment Type:
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	Scala Penetration (Blows/100mm) SCALA PENETROMETER TEST: +DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999 +DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988	depth (m)
0.2			Silty TOPSOIL; brown, firm, moist; low plasticity (0.2)			moist		0.2
0.4			CLAY; orange brown, very stiff, moist; high plasticity					0.4
0.6	Vane sample	127/52				moist		0.6
0.8			becomes grey mottled orange and brown becomes trace silt clasts stained dark orange brown (1)					0.8
1.0	Vane sample	216/102	Silty CLAY; grey mottled orange, hard, moist; medium plasticity (1.2)			moist		1.0
1.2			SILT with minor clay; light grey mottled orange, hard, dry; low plasticity					1.2
1.4								1.4
1.6	Vane sample	188/77	becomes trace clay			dry		1.6
1.8			becomes trace red mottles becomes brown yellow					1.8
2.0	Vane sample	216/102	Hand auger terminated at 2m due to Target Depth (2)					2.0
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3.0								3.0
3.2								3.2
3.4								3.4
3.6								3.6
3.8								3.8
4.0								4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8
5.0								5.0

Notes:No groundwater encountered

Contractor: MWH

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TEST PIT LOG

Job No: 80504522
Hole No: TP01
Sheet: 1 of 1

Client: Auckland Transport
Started: 04/09/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 04/09/14

Logged: LD

Investigation Location: Site Plan
Description:
Checked: IW

Equipment Type: 13 Tonne Excavator
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	Scala Penetration (Blows/100mm) SCALA PENETROMETER TEST: +DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999 +DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988	depth (m)
0.0			Silty TOPSOIL; brown, soft, moist; low plasticity			moist		0.0
0.2			(0.2)					0.2
0.4			SILT with minor clay; orange brown, stiff, moist; medium plasticity					0.4
0.6								0.6
0.8	Vane sample	123/56				moist		0.8
1.0								1.0
1.2	Vane sample	UTP	(1.2)					1.2
1.4			Clayey SILT; light pinkish grey mottled red, hard, moist; Completely weathered SILTSTONE, extremely weak.					1.4
1.6	Bulk sample							1.6
1.8								1.8
2.0								2.0
2.2						moist		2.2
2.4								2.4
2.6								2.6
2.8								2.8
3.0			(3)					3.0
			Test pit terminated at 3m due to UTP					
3.2								3.2
3.4								3.4
3.6								3.6
3.8								3.8
4.0								4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8
5.0								5.0

Notes:No groundwater encountered

Contractor: Sorenson Contractors

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MWH House
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TEST PIT LOG

Job No: 80504522
Hole No: TP02
Sheet: 1 of 1

Client: Auckland Transport
Started: 04/09/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 04/09/14

Logged: LD

Investigation Location: Site Plan
Description:
Checked: IW

Equipment Type: 13 Tonne Excavator
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition	Scala Penetration (Blows/100mm)	depth (m)
0.2			Silty TOPSOIL; brown, firm, moist; low plasticity (0.3)			moist	SCALA PENETROMETER TEST: +DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999 +DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988 0 1 2 3 4 5 6 7 8 9 10	0.2
0.4			SILT; brownish grey, firm, moist; medium plasticity					0.4
0.6								0.6
0.8	Vane sample	77/28				moist		0.8
1.0			(1)					1.0
1.2	Disturbed sample	71/15	Silty CLAY with some gravel; orange grey mottled brown, stiff, moist; medium plasticity. Silt. Gravel, fine to coarse, unsorted, angular, black					1.2
1.4	Vane sample		very minor seepage		≈	moist		1.4
1.6	Vane sample	154/39						1.6
1.8			(1.8)					1.8
2.0	Vane sample Bulk sample	167/62	CLAY with some silt and trace of roots; light orange grey, very stiff, moist; high plasticity					2.0
2.2								2.2
2.4						moist		2.4
2.6	Vane sample	117/37						2.6
2.8			(2.9)					2.8
3.0	Vane sample	UTP	SILT; light grey mottled pink, hard, moist; low plasticity. Completely weathered SILTSTONE, extremely weak					3.0
3.2	Disturbed sample					moist		3.2
3.4			(3.5)					3.4
3.6			Test pit terminated at 3.5m due to UTP					3.6
3.8								3.8
4.0								4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8
5.0								5.0

Notes:Minor seepage recorded at 1.5m

Contractor: Sorenson Contractors

MWH NEW ZEALAND LTD
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MWH House
111 Carlton Gore Road
Newmarket
Auckland 1149
Tel: 09 580 4500
Fax: 09 580 4514

TEST PIT LOG

Job No: 80504522
Hole No: TP03
Sheet: 1 of 1

Client: Auckland Transport
Started: 04/09/14

Project: Glen Innes to Tamaki Drive Shared Path
Location: Glen Innes, Auckland
Finished: 04/09/14

Logged: LD

Investigation Location: Site Plan
Description:
Checked: IW

Equipment Type: 13 Tonne Excavator
RL Surface:

Easting: Northing:
Datum:

depth (m)	Samples	Peak Strength/ Residual Strength (kPa)	Material Description (Logging carried out in accordance with Guidelines for the Field Classification of Soil and Rock for Engineering Purposes. New Zealand Geotechnical Society, 2005)	graphic log	Seepages	moisture condition
0.2			Silty TOPSOIL; brown, soft, saturated; low plasticity (0.2)			saturated
0.4			Silty clayey FILL; yellowish brown, firm, moist; medium plasticity			
0.6	Vane sample	99/28	(0.7)			
0.8			seepage beneath fill		≈	
1.0	Vane sample	111/40	Clayey SILT; dark grey, very stiff, moist; medium plasticity becomes dark brown (1.1)			moist
1.2	Bulk sample		Silty CLAY; grey mottled orange, very stiff, moist; medium plasticity			
1.4	Vane sample	97/8				
1.6						
1.8						
2.0	Vane sample	120/22	becomes light grey with trace orange brown mottles seepage - 100-200ml/min		≈	moist
2.2						
2.4			becomes trace fine grained sand			
2.6	Vane sample	111/54				
2.8						
3.0			(3.1)			
3.2			Sandy SILT; light brownish grey, saturated; Sand, fine (3.3)		≈	moist
3.4	Bulk sample		Silty fine SAND; dark grey, seepage			
3.6						moist
3.8			(3.9)			
4.0			Test pit terminated at 3.9m due to Hole collapsing			
4.2						
4.4						
4.6						
4.8						
5.0						

Scala Penetration (Blows/100mm)

SCALA PENETROMETER TEST:
+DETERMINATION OF "GOOD GROUND" IN ACCORDANCE WITH NZS 3604: 1999
+DETERMINATION OF PENETRATION RESISTANCE OF A SOIL IN ACCORDANCE WITH NZS 4402: 1988

0 1 2 3 4 5 6 7 8 9 10

Notes:Seepage recorded at depths 0.7, 1.95 and 3.3m

Contractor: Sorenson Contractors

Appendix D Laboratory Test Results

PLASTICITY INDEX TEST REPORT

OPUS

Project:	**Glen Innes to Tamaki Drive**
Location:	**Glen Innes to Tamaki Drive**
Client:	**MWH**
Contractor:	**n/a**
Sampled by:	**Libby Davy**
Date sampled:	**04/09/2014**
Sampling method:	**Test pit**
Sample description:	**Brown mottled red; clayey SILT; weathered; moist to dry; plastic**
Sample condition:	**As Received**
Sample reference:	**TP1**
Sample depth:	**1.60m**

Project number:	**1-L0140.70**
Lab ref number:	**014/14**
Client Ref:	**80504522**

Test Results

As rec'd water content:	**53.2%**
Liquid limit:	**76**
Plastic limit:	**51**
Plasticity Index:	**25**

Test methods		Notes
Water Content:	NZS 4402 : 1986, Test 2.1	Test performed on: Fraction passing 0.425mm test sieve
Liquid Limit:	NZS 4402 : 1986, Test 2.2	Sample descriptions are not covered by IANZ accreditation.
Plastic Limit:	NZS 4402 : 1986, Test 2.3	
Plasticity Index:	NZS 4402 : 1986, Test 2.4	

Date tested: 25/09/14
Date reported: 26/09/14

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full

IANZ Approved Signatory
Thirushen Pillay
Designation: *Senior Civil Engineering Technician*
Date: 26/09/14

IANZ ACCREDITED LABORATORY
All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Opus International Consultants Ltd
Auckland Laboratory
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Website www.opus.co.nz

PLASTICITY INDEX TEST REPORT

OPUS

Project:	**Glen Innes to Tamaki Drive**
Location:	**Glen Innes to Tamaki Drive**
Client:	**MWH**
Contractor:	**n/a**
Sampled by:	**Libby Davy**
Sampling method:	**Test pit**
Sample description:	**Grey mottled brown; silty CLAY; moist; plastic**
Sample condition:	**As Received**
Sample reference:	**TP2**
Sample depth:	**2.00m**

Date sampled: **04/09/2014**

Project number:	**1-L0140.70**
Lab ref number:	**015/14**
Client Ref:	**80504522**

Test Results

As rec'd water content:	**42.6%**
Liquid limit:	**76**
Plastic limit:	**29**
Plasticity Index:	**47**

Test methods		Notes
Water Content:	NZS 4402 : 1986, Test 2.1	Test performed on: Fraction passing 0.425mm test sieve
Liquid Limit:	NZS 4402 : 1986, Test 2.2	Sample descriptions are not covered by IANZ accreditation.
Plastic Limit:	NZS 4402 : 1986, Test 2.3	
Plasticity Index:	NZS 4402 : 1986, Test 2.4	

Date tested: 24-25/09/2014
Date reported: 26/09/14

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
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IANZ Approved Signatory
Thirushen Pillay
Designation: *Senior Civil Engineering Technician*
Date: 26/09/14

IANZ ACCREDITED LABORATORY
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PLASTICITY INDEX TEST REPORT

OPUS

Project:	**Glen Innes to Tamaki Drive**
Location:	**Glen Innes to Tamaki Drive**
Client:	**MWH**
Contractor:	**n/a**
Sampled by:	**Libby Davy**
Date sampled:	**04/09/2014**
Sampling method:	**Test pit**
Sample description:	**Brown mottled dark brown; silty CLAY; moist; plastic; traces of rootlets**
Sample condition:	**As Received**
Sample reference:	**TP3**
Sample depth:	**1.30m**

Project number:	**1-L0140.70**
Lab ref number:	**016/14**
Client Ref:	**80504522**

Test Results

As rec'd water content:	**27.9%**
Liquid limit:	**55**
Plastic limit:	**24**
Plasticity Index:	**31**

Test methods		Notes
Water Content:	NZS 4402 : 1986, Test 2.1	Test performed on: Fraction passing 0.425mm test sieve
Liquid Limit:	NZS 4402 : 1986, Test 2.2	Sample descriptions are not covered by IANZ accreditation.
Plastic Limit:	NZS 4402 : 1986, Test 2.3	
Plasticity Index:	NZS 4402 : 1986, Test 2.4	

Date tested: 24-25/09/2014
Date reported: 26/09/14

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
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IANZ Approved Signatory
Thirushen Pillay
Designation: *Senior Civil Engineering Technician*
Date: 26/09/14

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PARTICLE SIZE ANALYSIS (HYDROMETER METHOD)

TEST REPORT

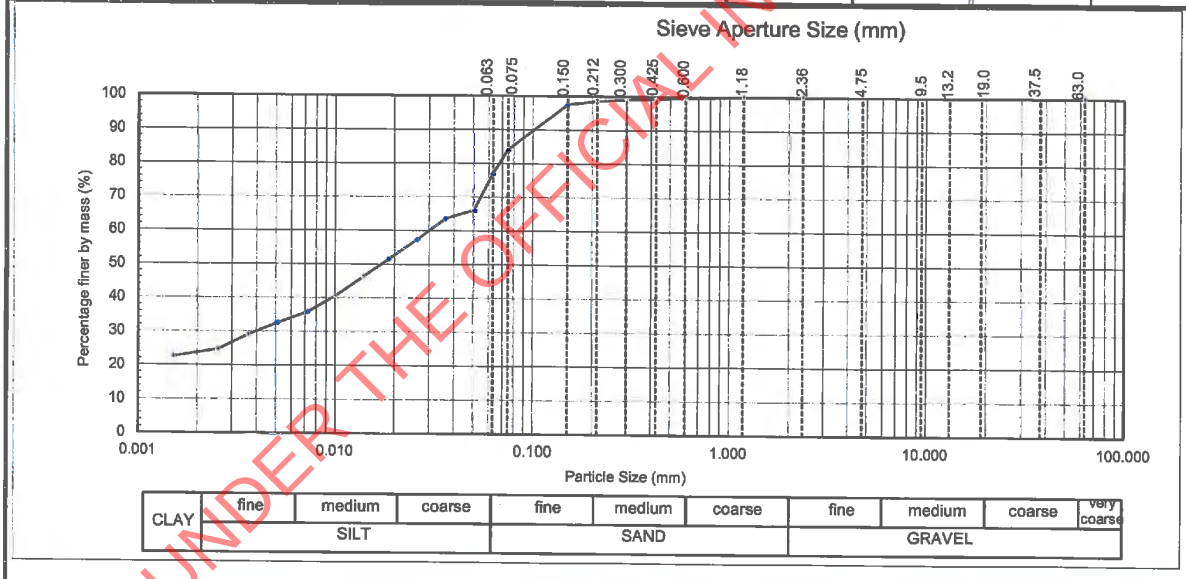
OPUS

Project:	**Glen Innes to Tamaki Drive**
Location:	**Glen Innes to Tamaki Drive**
Client:	**MWH**
Contractor:	**N/A**
Sampled by:	**Libby Davy** Date sampled: **04/09/14**
Sampling Method:	**Test pit**
Sample description:	**Brown mottled red; clayey SILT; weathered ; moist to dry; plastic**
Sample condition:	**As received**
Sample reference:	**TP1**
Sample depth:	**1.6m**
Solid particle density (t/m^3):	**2.72 (Assumed)**
Water content (as received):	**53.2%**

Project number:	**1-L0140.70**
Lab ref number:	**017/14**
Client Ref:	**80504522**

Sieve Analysis						Hydrometer Analysis			
Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)
63.0	--	4.75	--	0.300	99	0.0507	66	0.0072	36
37.5	--	2.36	100	0.212	99	0.0362	64	0.0051	33
19.0	--	1.18	100	0.150	98	0.0261	57	0.0036	29
13.2	--	0.600	100	0.075	84	0.0188	52	0.0026	25
9.5	--	0.425	99	0.063	77	0.0140	46	0.0015	22
						0.0100	41		

Note: "--" denotes sieve not used and/or hydrometer analysis not tested



Test Methods	Notes
Particle Size Analysis: NZS 4402:1986: Test 2.8.4 (Washed Grading & Hydrometer Method)	pH of suspension: 8.3 (Electrometric method was used)

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.

Date Tested: 24-25/09/14 **This report may only be reproduced in full**

Date Reported: 26/09/14

IANZ Approved Signatory *Thirushen Pillay*

Designation : *Senior Civil Engineering Technician*

Date : 26/09/14

IANZ ACCREDITED LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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PARTICLE SIZE ANALYSIS (HYDROMETER METHOD)

TEST REPORT

OPUS

Project:	**Glen Innes to Tamaki Drive**
Location:	**Glen Innes to Tamaki Drive**
Client:	**MWH**
Contractor:	**N/A**
Sampled by:	**Libby Davy** Date sampled: **04/09/14**
Sampling Method:	**Test pit**
Sample description:	**Grey mottled brown; silty CLAY; moist; plastic**
Sample condition:	**As received**
Sample reference:	**TP2**
Sample depth:	**2m**
Solid particle density (t/m^3):	**2.75 (Assumed)**
Water content (as received):	**42.6%**

Project number:	**1-L0140.70**
Lab ref number:	**018/14**
Client Ref:	**80504522**

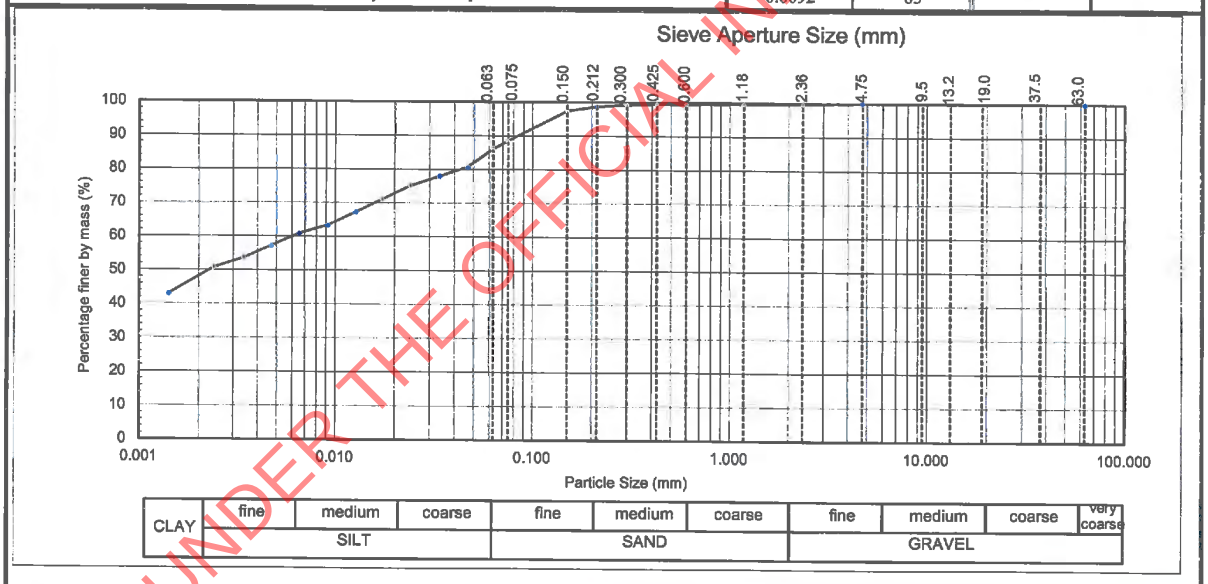
Sieve Analysis

Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)
63.0	--	4.75	100	0.300	99
37.5	--	2.36	100	0.212	99
19.0	--	1.18	100	0.150	97
13.2	--	0.600	100	0.075	88
9.5	--	0.425	99	0.063	86

Note: "--" denotes sieve not used and/or hydrometer analysis not tested

Hydrometer Analysis

Particle Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)
0.0469	81	0.0066	61
0.0336	78	0.0047	57
0.0240	75	0.0034	54
0.0173	71	0.0024	51
0.0128	67	0.0014	43
0.0092	63		



Test Methods	Notes
Particle Size Analysis: NZS 4402:1986: Test 2.8.4 (Washed Grading & Hydrometer Method)	pH of suspension: 9.5 (Electrometric method was used)

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.

Date Tested: 23-25/09/14 **This report may only be reproduced in full**

Date Reported: 26/09/14

IANZ Approved Signatory *Thirushen Pillay*

Designation : *Senior Civil Engineering Technician*

Date : 26/09/14

IANZ ACCREDITED LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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PARTICLE SIZE ANALYSIS (HYDROMETER METHOD)

TEST REPORT

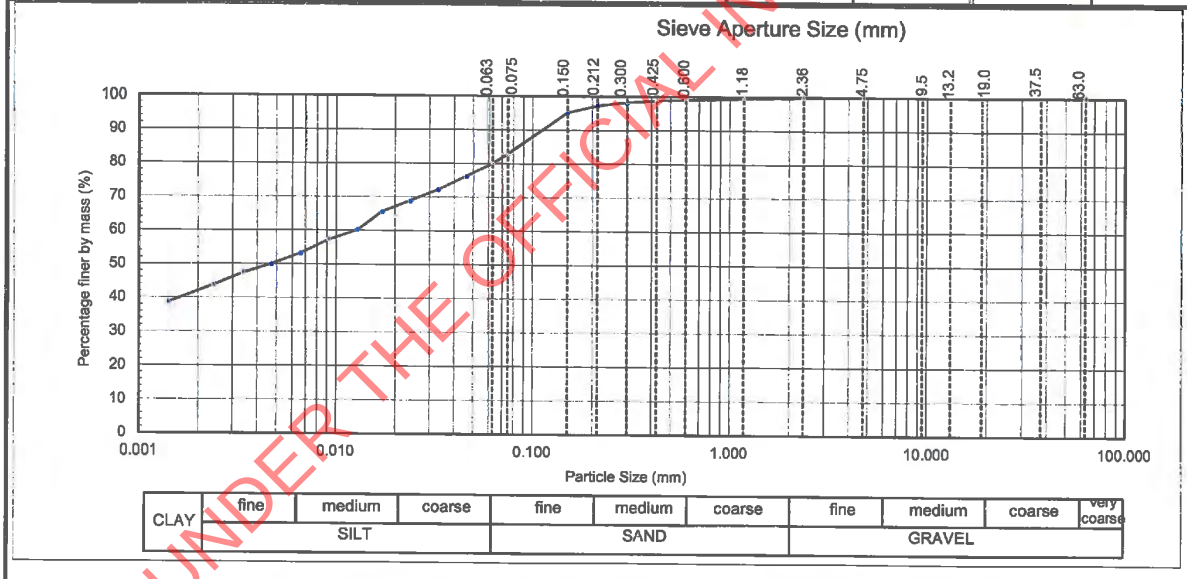
OPUS

Project:	**Glen Innes to Tamaki Drive**
Location:	**Glen Innes to Tamaki Drive**
Client:	**MWH**
Contractor:	**N/A**
Sampled by:	**Libby Davy** Date sampled: **04/09/14**
Sampling Method:	**Test pit**
Sample description:	**Brown mottled dark brown; silty CLAY; moist; plastic; traces of rootlets**
Sample condition:	**As received**
Sample reference:	**TP3**
Sample depth:	**1.3m**
Solid particle density (t/m^3):	**2.75 (Assumed)**
Water content (as received):	**27.9%**

Project number:	**1-L0140.70**
Lab ref number:	**019/14**
Client Ref:	**80504522**

Sieve Analysis						Hydrometer Analysis			
Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)
63.0	–	4.75	100	0.300	98	0.0461	76	0.0066	53
37.5	–	2.36	100	0.212	97	0.0332	72	0.0047	50
19.0	–	1.18	100	0.150	95	0.0239	69	0.0034	47
13.2	–	0.600	99	0.075	83	0.0171	66	0.0024	44
9.5	–	0.425	99	0.063	80	0.0128	60	0.0014	39
						0.0092	57		

Note: "–" denotes sieve not used and/or hydrometer analysis not tested



Test Methods	Notes
Particle Size Analysis: NZS 4402:1986: Test 2.8.4 (Washed Grading & Hydrometer Method)	pH of suspension: 10.0 (Electrometric method was used)

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.

Date Tested: 23-25/09/14 **This report may only be reproduced in full**

Date Reported: 26/09/14

IANZ Approved Signatory *Thirushen Pillay*

Designation : *Senior Civil Engineering Technician*

Date : 26/09/14

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PARTICLE SIZE ANALYSIS (HYDROMETER METHOD)

TEST REPORT

OPUS

Project:	**Glen Innes to Tamaki Drive**
Location:	**Glen Innes to Tamaki Drive**
Client:	**MWH**
Contractor:	**N/A**
Sampled by:	**Libby Davy**
Date sampled:	**04/09/14**
Sampling Method:	**Test pit**
Sample description:	**Grey; silty SAND**
Sample condition:	**As received**
Sample reference:	**TP3**
Sample depth:	**3.3m**
Solid particle density (t/m^3):	**2.7 (Assumed)**
Water content (as received):	**32.6%**

Project number:	**1-L0140.70**
Lab ref number:	**020/14**
Client Ref:	**80504522**

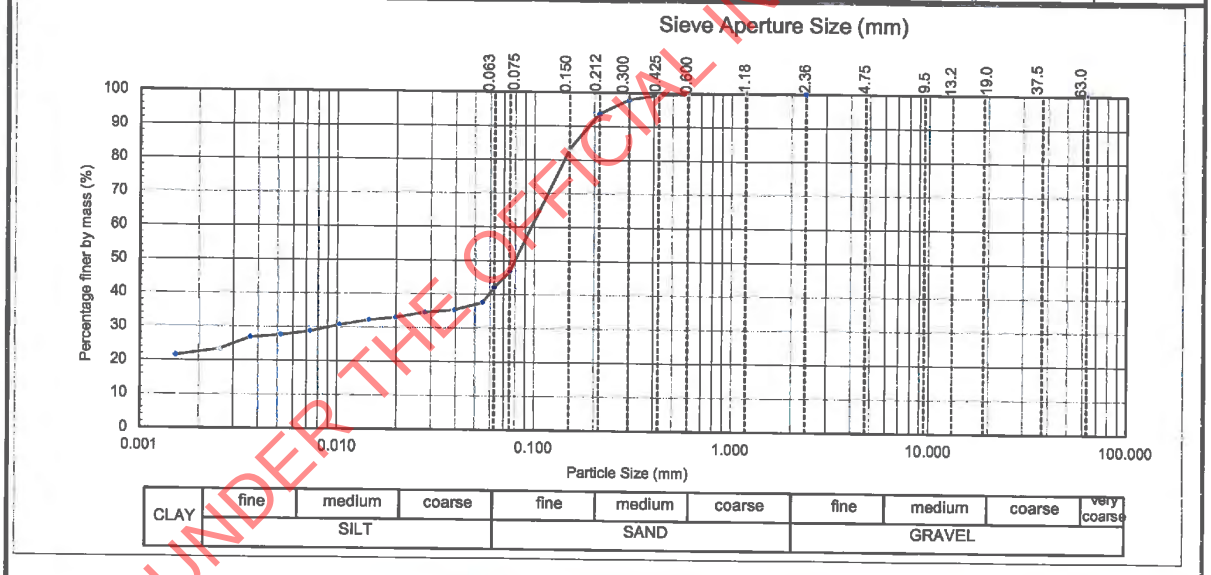
Sieve Analysis

Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)
63.0	--	4.75	--	0.300	98
37.5	--	2.36	100	0.212	94
19.0	--	1.18	100	0.150	83
13.2	--	0.600	100	0.075	47
9.5	--	0.425	99	0.063	42

Note: "--" denotes sieve not used and/or hydrometer analysis not tested

Hydrometer Analysis

Particle Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)
0.0549	38	0.0073	29
0.0391	35	0.0052	28
0.0277	35	0.0036	27
0.0197	33	0.0026	23
0.0144	32	0.0015	21
0.0102	31		



Test Methods	Notes
Particle Size Analysis: NZS 4402:1986: Test 2.8.4 (Washed Grading & Hydrometer Method)	pH of suspension: 10.0 (Electrometric method was used)

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.

Date Tested: 24-25/09/14 **This report may only be reproduced in full**

Date Reported: 26/09/14

IANZ Approved Signatory *Thirushen Pillay*

Designation : *Senior Civil Engineering Technician*

Date : 26/09/14

IANZ ACCREDITED LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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MWH

BUILDING A BETTER WORLD

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MWH

BUILDING A BETTER WORLD

Geotechnical Interpretive Report

Glen Innes to Tamaki Drive Shared Path Section 1

Prepared for Auckland Transport

November 2014

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This disclaimer shall apply notwithstanding that the report may be made available to Auckland Council and other persons for an application for permission or approval to fulfil a legal requirement.

QUALITY STATEMENT

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CHECKED BY		
Steve Woods		7/10/14
REVIEWED BY		
Ilai Waqa		3/11/14
APPROVED FOR ISSUE BY		
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REVISION SCHEDULE

Rev No	Date	Description	Signature or Typed Name (documentation on file). Prepared by	Checked by	Reviewed by	Approved by
1	3/11/14	Draft for client	JR	SW	IW	AM

Executive Summary

MWH NZ Limited (MWH) has been engaged by Auckland Transport to undertake a site investigation and prepare a Geotechnical Interpretative Report for Section 1 of the Glen Innes to Tamaki Drive Shared Path. Section 1 starts from Merton Road and ends at St Johns Road, Glen Innes, Auckland.

Due to site topography and the target gradient for the shared path, four retaining structures and two bridges spanning the two gullies will be required.

Site investigations were carried out between 18 August and 9 September 2014. The investigations comprised 3 test pits and 10 hand augers to a maximum of 3m depth and laboratory testing of samples for particle size distribution, natural water content and plasticity index.

The key geotechnical investigation findings and recommendations are:

- Ground conditions comprised silty clay and clayey silt inferred to be residual soils of the East Coast Bays Formation.
- Areas of fill were encountered at some locations, inferred to be associated with the industrial area adjacent to the site.
- The in-situ soils, excluding fill and topsoil are considered suitable for use as fill. Given groundwater was encountered at most of the investigation sites, the material is likely to require drying before being used as fill.
- Cut slopes up to 4m high should be no steeper than 1.5H:1V without further testing.
- Cut slopes over 4m high should be no steeper than 2H:1V without further testing.
- Fill Slopes should be no steeper than 2H:1V without further testing.
- All formed slopes will require vegetation cover to manage long term weathering of the material.
- Retaining walls supporting cut slopes should be backfilled with imported granular material to collect groundwater seepage. These walls should be designed for a preliminary coefficient of active pressure of 0.33 subject to confirmation of final geometry.
- Retaining walls supporting fill materials should be backfilled with imported granular materials for ease of construction and control of groundwater seepage. These walls should be designed for a coefficient of active pressure of 0.4 subject to confirmation of final geometry. Any fill materials identified in the wall foundations will need to be removed and replaced with compacted material.
- If mechanically stabilised earth structures in excess of 2m high are to be constructed use of the natural material as fill could be considered with further testing.
- Shallow foundations are considered appropriate for the proposed bridge structures. Subject to confirmation based on the final foundation geometry, an initial factored bearing capacity (for use with ultimate limit state loads) of 150 kPa can be adopted for initial foundation sizing.
- The most significant construction issues are considered to be the presence of groundwater and the presence of fill on the site. It will be necessary to include drainage measures such as toe and subsoil drains to collect groundwater seepage from cut faces and discharge it to on-site water courses. Existing fill materials will need to be excavated and replaced with compacted fill if encountered beneath fills, retaining walls or bridge foundations. During the investigations fill material was found in three of the 13 investigation sites at depths up 1m.

Following refinement of the initial concept with the recommendations above, more detailed checks on the geotechnical design of slopes and structures can be undertaken. This process will also allow for any areas needing more detailed investigation or testing which could lead to design refinements and result in significant cost savings.

Auckland Transport

Glen Innes to Tamaki Drive Shared Path-Section 1

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APPENDICES

1 Introduction

MWH NZ Limited (MWH) has been engaged by Auckland Transport to undertake a site investigation and prepare a Geotechnical Interpretative Report for Section 1 of the Glen Innes to Tamaki Drive Shared Path. Section 1 starts from Merton Road and ends at St Johns Road, Glen Innes, Auckland.

The Glen Innes to Tamaki Drive shared walking and cycling path will seek to implement an approximately 6.5 km section of the Auckland Cycle Network (ACN) between the Glen Innes Town Centre and the Tamaki Drive cycle lanes.

The project will connect key destinations, including the Glen Innes Station area, the Meadowbank Station and the Orakei Station. The connection to Tamaki Drive will provide good linkages to the shared use path and on-road cycle lanes on Tamaki Drive and access to the city centre.

The site investigation and interpretative report has been undertaken and prepared as part of a Scheme Assessment Report for the purpose of providing geotechnical information for the design and construction of the shared path, including retaining walls and bridge crossings.

This report should be read in conjunction with the Factual Geotechnical Report for this project dated October 2014 completed by MWH.

2 Scope

The following scope of work was undertaken as the basis for this report:

- Review of the factual geotechnical report,
- Review of scheme assessment preliminary drawings of proposed path route,
- Walkover of the site by our engineering geologist and geotechnical engineer
- Geotechnical assessment and analysis of ground conditions encountered

3 Site Description

Section 1 of the shared path is approximately 1.5km long and is located between Merton Road and St Johns Road in Glen Innes, Auckland. A detailed Site Plan showing the location of testing is included in Appendix A. Figure 3-1 shows the proposed shared path route in red.

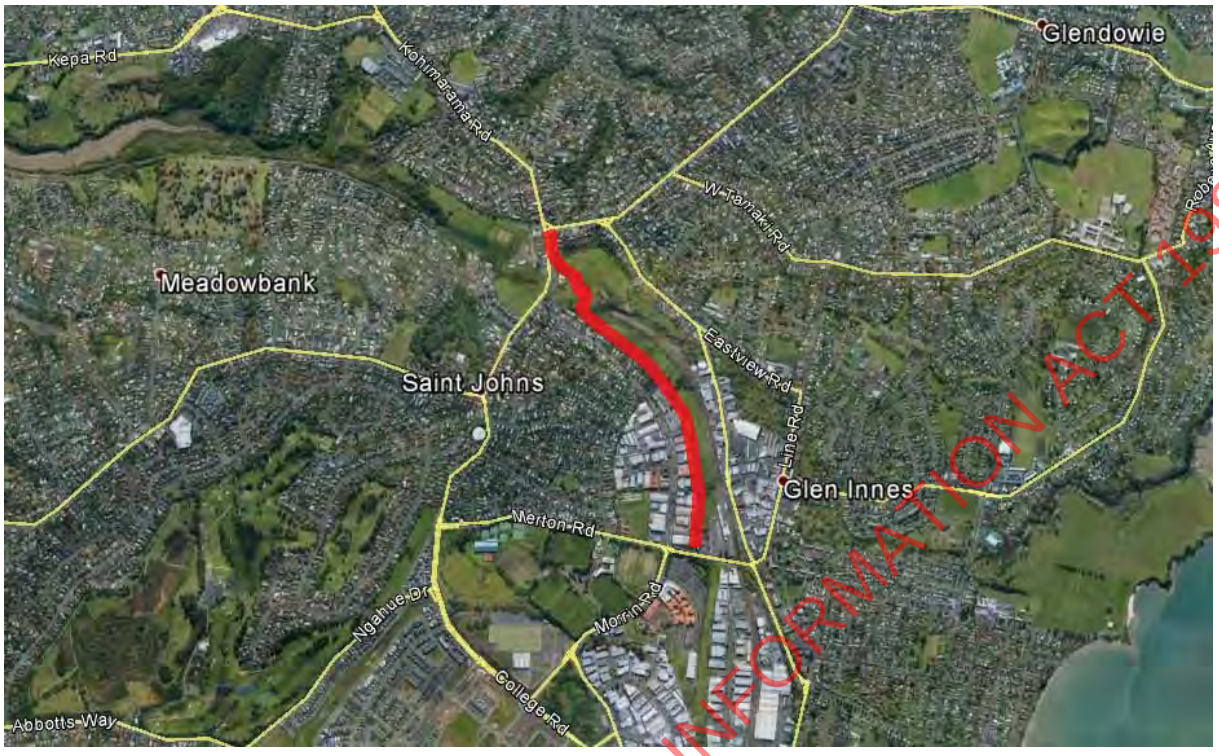


Figure 3-1: Site Location Plan showing the proposed shared path route in red.

The majority of the land designated for the shared path is owned by NZTA and currently leased by the Auckland Pony Club.

The terrain along the path route is generally flat from Merton Road through Glen Innes train station where it dips down to the underpass and back up again over a small stream. As the path continues north it will run along the edge of an industrial area that has been built up with fill to obtain the same level as Felton Mathews Road before the ground slopes down to the reserve. Another creek is crossed at the edge of the industrial sites before the terrain steepens up towards St Johns Road.

The proposed shared path route is mostly vegetated with grass with a few trees lining the sides of the two streams. The current land use adjoining the shared path route includes an industrial area to the south and residential and reserve land to the north.

Stormwater flows follow the slope of the ground and drain down to the two streams. No underground services were recorded along this section of the shared path route.

4 Published Geology

Published geological information for the area as shown on the 1:250,000 Institute of Geological and Nuclear Sciences (IGNS) Geology of the Auckland Urban Area, Map 3, dated 2001 indicates the underlying geology to comprise the following; Puketoka Formation consisting of pumiceous mud, sand and gravel with muddy peat and lignite and East Coast Bays Formation described as containing alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grit beds.

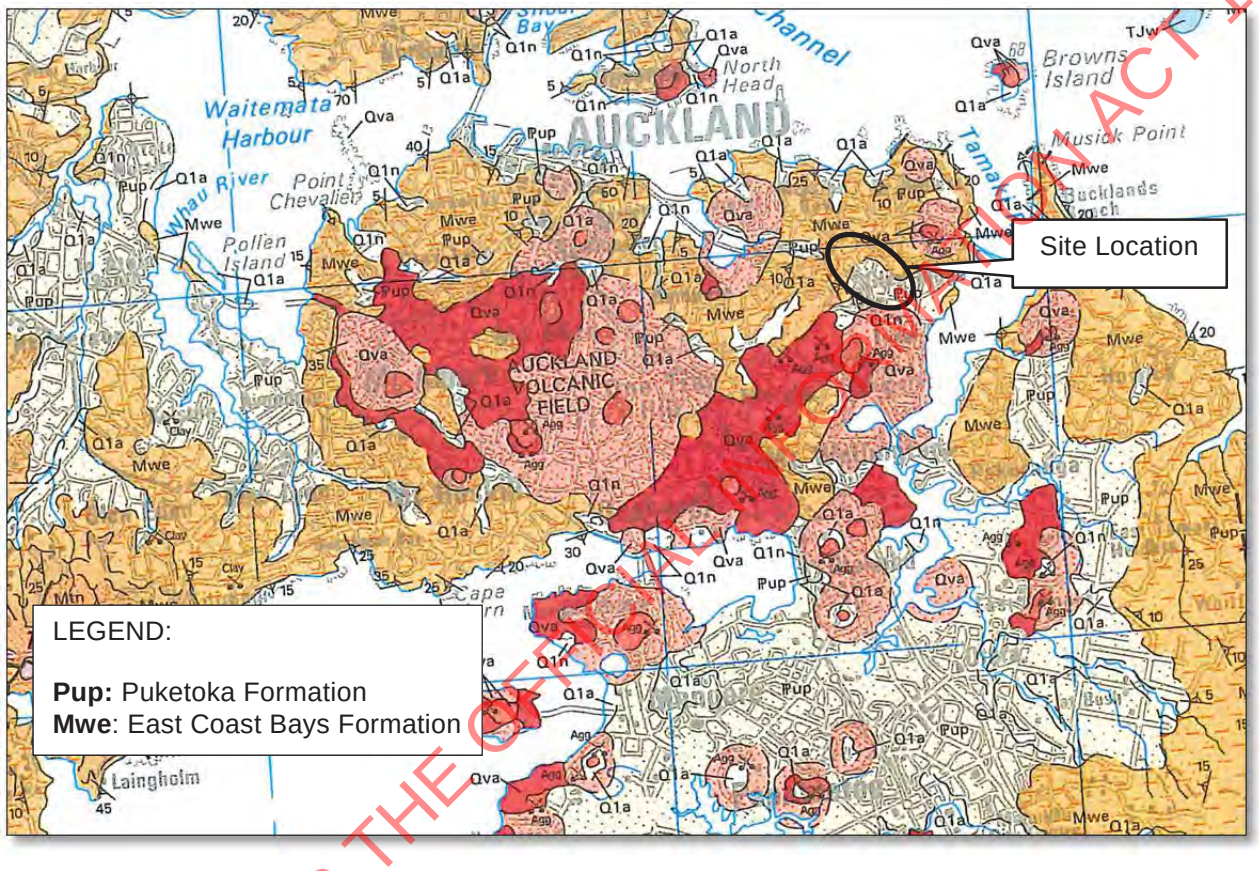


Figure 4-1: Excerpt from GNS 1:250,000 Geological Map

4.1 Regional Seismicity

The Auckland area is considered to be one of the lowest earthquake activity regions of New Zealand (IGNS, 2001 "Geology of the Auckland Area"). Most earthquakes recorded in the region are less than Magnitude 4 (M4) and not widely felt or normally cause damage. Over the last 150 years there appear to be only two earthquakes recorded with magnitudes in excess of M5. On average the Auckland region may expect to experience Modified Mercalli Shaking Intensity of MM7 or greater every 650 years.

The main active faults indicated on the GNS Sciences New Zealand Active Faults Database are the Wairoa Faults (North and South) located approximately 20km from the site and the Kerepehi Fault located approximately 65km from the site. The Wairoa Faults are active normal faults dipping 60 to 70 degrees to the west with an apparent vertical slip rate of 0.1mm per year; however there is no known recurrence interval at this fault. The Kerepehi Fault is an active normal fault with a recurrence interval of between 5000 and 10000 years.

This site is considered a Class C - Shallow Soil Site as defined by AS/NZS1170.

5 Proposed Works

The proposed works consist of constructing a shared path along the proposed route to a cycle metro route standard.

The proposed route is along the western property boundary of the NZTA rail corridor. This route allows for having the connection to the existing underpass and Felton Mathew Avenue as far west as possible leaving adequate space for bridge ramps should a rail over-bridge be required to replace the existing underpass in the future.

A culvert will be required adjacent to 90 Felton Mathew Road. Crossing St Johns Road would be provided for by the installation of a 'toucan' crossing.

Based on the definition of a cycle metro route standard provide by Auckland Transport, the following key design criteria have been developed:

- Preferred path width of 4 m, with reduced widths to be adopted on a case by case assessment
- Structures to be 4.5 m wide to provide an effective width of 4 m
- The route corridor to extend 1 m either side of the path (e.g. if the path is 4 m wide, the corridor width will be 6 m)
- Target gradient to be less than 5%, with a desirable maximum of 8%. Steeper gradients to be adopted on a case by case basis where constrained by the existing topography
- Path surface to be concrete, with timber boardwalk adopted where necessary
- Sections within the KiwiRail corridor will adopt the minimum fence offset of 2.75 m from the centre of the track or outside the high voltage masts whichever is further.
- Installation of swale drain (3.0m wide x 0.5m deep) on one side of road with associated low impact design stormwater collection and discharge structures.

Proposed Structures

Due to site topography and the target gradient for the shared path, four retaining structures and two bridges spanning the two gullies will be required. The proposed retaining structures are indicated below:

Table 5-1: Proposed Retaining Structures

Retaining Wall & Bridge ID	Location	Description
R1	South of underpass and link to Felton Mathews Avenue	30m long retaining wall to ease gradient (approx. 1.5m high)
R2	Northern side of underpass and link to Felton Mathews Avenue	40m long retaining wall to ease gradient (approx. 1.5m high).
R3	East sloping ground immediately north of R2 retaining structure	200m long retaining wall against industrial property boundary (approx. 2.5m high)
R4	North of the stream approaching St Johns Road	70m long retaining wall to ease gradient (approx. 1.5m high)
1	Link to underpass near Felton Mathews Avenue (between R1 and R2)	Link to underpass.
2	Embankment with retaining walls across gully area south of R4 retaining structure.	Earth embankment with retaining wall.

The bridges and embankments are to accommodate pedestrians and maintenance vehicles (<10,000kg) which corresponds to a 5.0kPa uniformly distributed action and 31kN concentrated load.

6 Existing Information

Existing information used in the preparation of this interpretive report included the MWH NZ Ltd Preliminary Geotechnical Appraisal Report, dated May 2014.

A PFR entitled 'A18: Eastern Transport Corridor Cycleway' dated 16 September 2008 has been undertaken by SKM for Section 3 between Meadow Bank Station and Glenn Innes. The report includes an assessment of the cycle route by examining topography and other site constraints before recommending a proposed route.

7 Geotechnical Issues

The following geotechnical issues identified during previous site assessments, walkovers and knowledge of the site has been discussed in full detail in the following report

- Stability of existing and proposed cut / fill slopes
- Use of site won or imported fill material as structural fill
- Foundation conditions for the various structures required to bridge over existing features and maintain consistent grade
- Settlement risk from the possible structures and fill
- Liquefaction risk of the underlying soils
- Perched or elevated groundwater which may affect temporary stability of excavations.

8 Field Investigations

The site investigations completed to date were carried out between 18 August and 9 September 2014, the weather over this period was generally cloudy with intermittent rain. All excavations and drilling were supervised by an Engineering Geologist from MWH and were logged in accordance with the Guidelines for the Field Classification of Soil and Rock for Engineering Purposes (New Zealand Geotechnical Society, 2005).

The site investigation locations are indicated on the attached site plan in Appendix A. All results of the investigation are included in Appendix C of the MWH NZ Ltd Geotechnical Factual Report. A summary of the scope of the ground investigations is outlined in Table 8-1.

Table 8-1: Summary of Ground Investigation Works

Investigation Method	Number of Tests	Maximum Depth (m)
Test Pits (TP)	3	3
Hand Augers (HA)	10	3

9 Site Investigation Results

The results of the site investigations indicate silty clay with minor sandy silt and silty fine sand residual soils overlying siltstone/ sandstone, consistent with Waitemata Group, East Coast Bays Formation soils with localized areas of fill. The results of the investigations are discussed in more detail below. The following subsoil materials were encountered at the site during the investigation;

9.1 Fill

Fill material to at least 1m depth was encountered in low lying areas in HA3, HA5 and TP3 corresponding to approximate chainages 640, 765 and 1115m respectively. The fill encountered typically consisted of silty clayey material with trace gravel, recording firm to stiff strengths, however it is believed that the fill is uncontrolled.

9.2 Topsoil

Topsoil was encountered across the site between 0.1m and 0.3m thickness

9.3 Residual Waitemata Group Soils

The subsoil materials identified during the site investigation comprised near surface alternating layers of orange, stiff to very stiff clayey silt, (weathering to silty clay near the surface) and occasional sandy silt/ silty sand. Hand held shear vane testing recorded greater than 69 kPa for in situ soils and consistently above 100 kPa across the site. Silty clay layers are approximately 3m thickness and indicative of East Coast Bays Formation.

Localised areas of weaker subsoil strengths were encountered across the site coinciding with areas of known high ground water and seepages.

9.4 Waitemata Group Rock

Waitemata Group soils graded into Waitemata Group rock at depths of 1.2m and 2.9m below ground level in TP01 and TP02 respectively.

Waitemata Group rock is described as being dark grey, highly weathered, very weak siltstone.

9.5 Groundwater

Groundwater readings and seepage levels were recorded at time of the excavations/drilling. The recorded levels are listed in Table 9-1 below.

Table 9-1: Summary of Groundwater Levels

Location	Depth (m)
HA02	2.9
HA02-A	2.4
HA03	1.5
HA05A	1.5
HA07	2.4
TP02	1.4 (seepage)
TP03	0.7, 1.9, 3.3 (seepage)

Groundwater and seepage were recorded only in low lying areas compared with the surrounding topography. In TP03 seepage was recorded at multiple depths during the investigation between soil boundaries and in more granular deposits.

10 Laboratory Testing

Selected samples were collected from the site investigations and submitted to an IANZ registered laboratory for testing. The tests estimate the range of materials and material strengths encountered at the site. The laboratory test results can be used alongside in situ testing, knowledge of similar materials elsewhere and good engineering practice to provide recommended parameters for use in design. The following laboratory tests were undertaken as part of the investigation:

- Particle Size Distribution (PSD)
- Natural water content
- Plasticity Index (Atterberg Limit)

The original results from the laboratory testing are provided in Appendix D of the MWH NZ Ltd Factual Report, October 2014.

11 Geotechnical Assessment

11.1 Design Parameters

The derivation of geotechnical design parameters were based on:

- Insitu ground testing using hand held shear vane and Scala Penetrometer (DCP)
- Back analysis of existing slopes and
- Engineering judgement based on experience of similar soils elsewhere.

The following geotechnical parameters are recommended to be used for design purposes in Silty Clay and Clayey Silt soils that are common in the area. All of the proposed works; retaining wall construction, cut batters and fill embankments will be constructed entirely within the Silty Clay/Clayey Silt layer.

Table 11-1 Recommended geotechnical parameters for design purposes

Soil Type	Recommended Geotechnical Design Parameters			
	Unit Weight (kN/m^3)	Drained Cohesion c' (kPa)	Drained Friction Angle Ø' (Degrees)	Undrained Shear Strength Su (kPa)
Silty Clay and Clayey Silt (Residual Waitemata Group Soils)	17	4	25	40

11.2 Seismic Design Parameters

In order to define defendable design targets for the slopes, retaining walls and bridges, seismic design parameters for the project have been evaluated using the 3rd Edition of NZTA's Bridge Manual (2013), which recommends the use of 'unweighted' Peak Ground Accelerations (PGA) and effective earthquake magnitude in the seismic design of soil structures which are subject to sudden loss of stability and strength such as liquefaction.

The following assumptions have been used for the calculation of the PGA's for the project, and are further summarised in Table 11-2:

- Retaining structures, bridges and embankments were assessed to have an Importance Level (IL) of 2 based on Table 2.1, 2.2 and 2.3 of the Bridge Manual and 3.2 of NZS1170.0.
- The 1000 year return period PGA coefficient for class C shallow site subsoil from Figure 6.1(a) was found to be approximately 0.15.
- Based on Figures 6.2(a) and 6.2(e) of the Bridge Manual, the effective earthquake magnitudes required to be used with unweighted PGA's associated with 2,500-year and 100-year return periods for a site is 5.75.

- To avoid collapse of bridge structures, the seismic stability of the supporting ground to bridge structures should be designed for a maximum considered earthquake (MCE) of magnitude 6.5 as determined from Figure 6.3 of the Bridge Manual with a PGA of 1.5 times the maximum design PGA's derived from ULS.
- In addition to the ULS, soil structures shall be designed for SLS requirements to ensure their satisfactory performance after seismic events. Specifically, the Bridge Manual requires that after an event with a return period significantly less than the design value, damage should be minor, and there should be no disruption to traffic using a quarter of the return period factor (Ru/4) as stated in Table 5.1 of the Bridge Manual.
- Structures and engineered slopes have a design life of 100 years.
- Site subsoil class C (shallow soil site) based on Table 3.2 from NZS 1170.5 where stiff (Su of 50 – 100kPa) cohesive material was encountered than 40m deep.

Table 11-2 : Seismic Design Parameters

Case	Type	Importance level	Height (m)	Return Period	Return Period Factor, R_u	Peak Ground Acceleration
Ultimate Limit state	Retaining walls	2	<5	1/1000	1.3	0.2g
	Bridges	2	-	1/1000	1.3	0.2g
	Earth Slopes	2	<6	1/100	0.5	0.08g
	Earth Slopes	2	>6 high	1/500	1.0	0.15g
Minor Earthquake/ Serviceability Limit State	Retaining walls	2	<5	1/50	0.35	0.05g
	Bridges	2	-	-	0.325 (ULS Ru/4)	0.05g
	Earth Slopes	2	<6	-	0.125 (ULS Ru/4)	0.02g
	Earth Slopes	2	>6 high	-	0.25 (ULS Ru/4)	0.04g
Maximum Considered Earthquake	Retaining walls	2	<5	-	-	0.3g (1.5 *ULS PGA)
	Bridges	2	-	-	-	0.3g (1.5 *ULS PGA)
	Earth Slopes	2	<6	-	-	0.12g (1.5* ULS PGA)
	Earth Slopes	2	>6 high	-	-	0.23g (1.5 *ULS PGA)

Lesser design standards may be acceptable for a cycleway structure if the above parameters are found to lead to excessive costs, with the agreement of Auckland Transport.

11.3 Engineered Slopes

11.3.1 Existing Slopes

Slopes in these materials on other sites have been found to perform adequately at 1H:1V. Analyses were carried out for a 5m high 1H:1V slope using the Geostudio Slope/W software. The analyses used the Morgensten-Price Method and assumed the conservative material parameters in Table 11-1 above for the clay silt material. The stability analyses outputs are contained in Appendix B and the results are summarized in Table 11-3 below.

Table 11-3: Existing Slope Stability Analysis Results Summary

Scenario	Factor of Safety (FOS)
Short term static (undrained conditions)	2.78
Long term static (drained conditions)	1.03

Given a calculated factor of safety of just over one under long term conditions the properties in Table 11-1 are considered to reasonably estimate the lower bound strength of the material.

11.3.2 Cut Slopes

11.3.2.1 General

The preliminary road geometric design shows the shared path in a cut situation from approximate chainage 150 to 225m, 275 to 375m, 900 to 970m and from 1290 to 1460m. The path is shown as being supported by fill from chainage 1060 to 1210m and the remainder of the path construction appears to be a combination of cutting and filling, with the cut face on the east side of the path and filling on the west side.

The maximum cut depths identified from the geometric design appears to be approximately 2.7m at chainage 310m.

11.3.2.2 Stability Assessment

Although slopes as steep as 1H:1V may be globally stable in these soils, re-vegetation and erosion resistance considerations mean that flatter slopes are preferable from a long term stability perspective. A trial slope of 1.5H:1V has therefore been selected.

Slope stability analyses were carried out for a maximum cut depth of approximately 4m. The ground model assumed the conservative material parameters in Table 11-1 and a shallow groundwater level as was indicated by the ground investigation data.

A required factor of safety of 1.5 for the static case and 1.0 for the seismic case were adopted from section 6.4.1 of the Bridge Manual. The analyses outputs are contained in Appendix B and a summary of the results are presented in Table 11-4.

Table 11-4 Cut Slope Stability Analysis Results Summary

Scenario	FOS	Required FOS
Short term static (undrained conditions)	3.3	1.5
Long term static (drained conditions)	1.5	1.5
Short term seismic (undrained conditions, maximum considered earthquake)	2.1	1.0

As this analysis was for 4m high 1.5H:1V slopes and the static criteria was only just met, cut slopes up to 4m high should be no steeper than 1.5H:1V without further testing. Cut slopes over 4m high should be no steeper than 2H:1V without further testing. As the factor of safety under the maximum considered earthquake is greater than one (indicating no displacement), no other earthquake cases were considered.

11.3.2.3 Construction Issues

All formed slopes will require vegetation cover to manage long term weathering of the material.

Groundwater at shallow depths was indicated in some of the investigation data. It will be necessary to install drainage measures such as toe and subsoil drains to collect groundwater seepage from the cut faces and discharge it to nearby water courses.

11.3.3 Fill Slopes

11.3.3.1 General

Filling is required at approximate chainage 1060 to 1210m to maintain the longitudinal gradient. Fill heights of greater than 8m are possible.

11.3.3.2 Material Sources

The in-situ soils, excluding fill and topsoil are considered suitable for use as fill. Given groundwater was encountered at most of the investigation sites, the material are likely to require drying before being used as fill.

11.3.3.3 Stability Assessment

Slope stability analyses were carried out at chainage 1150m where the fill height appears to be at a maximum. A fill height of 7m with a 2H:1V slope was modelled in the analysis. The ground model assumed in-situ soils were used for the embankment, having the parameters in Table 11-1, i.e. it was assumed that the strengths for insitu material could be maintained when placed as fill.

A required factor of safety of 1.5 for the static case and 1.0 for the seismic case were adopted from section 6.4.1 of the Bridge Manual. The analyses outputs are contained in Appendix B and a summary of the results are presented in Table 11-5.

Table 11-5 Fill Slope Stability Analysis Results Summary

Scenario	FOS	Required FOS
Short term static (undrained conditions)	1.9	1.5
Long term static (drained conditions)	1.5	1.5
Short term seismic (undrained conditions, maximum considered earthquake)	1.2	1.0

All formed slopes will require vegetation cover to manage long term weathering of the material.

As this analysis was undertaken for a 2H:1V slope and only just met long term stability requirements, fill slopes should be no steeper than 2H:1V without further testing. For embankments greater than 7m high, further consideration would be needed for slope angles or alternative solutions.

If the cut to fill balance means that the material needs to be imported for the fill, additional stability analysis will be required. It is anticipated that 2H:1V slopes will be appropriate for most imported materials.

11.3.3.4 Construction Issues

Placing the fill will require the stripping of topsoil within the embankment footprint. Topsoil depths of 0.2 to 0.3m were identified in the test pits at this fill location (approximately chainage 1060 to 1210m).

Fill material to at least 1m depth was encountered in various investigation locations. The extent of this fill is unknown. It will be necessary to excavate this fill if encountered beneath the proposed fill areas and replace it with compacted fill.

11.4 Retaining Structures

11.4.1 Retaining Structure 1

11.4.1.1 Available Data

Retaining Structure 1 (R1) is located south of the underpass and link to Felton Matthews Avenue, refer to site plan in Appendix A for location. The structure is to be approximately 30m long, 1.5m high and appears it will support a cut slope.

The nearest investigation data is HA2 which indicates very stiff silty clay to at least 3m depth after an initial 0.2m thick topsoil layer. Groundwater was noted at 2.9m below ground surface.

11.4.1.2 Structure Type

A number of retaining wall solutions including gabion basket, timber pole and crib walls are considered appropriate for this design situation, with the choice dependant on relative cost and landscaping/appearance requirements.

11.4.1.3 Construction Issues

As the wall is to support a cut slope, there may be groundwater seepage issues as discussed in section 11.3.3.1. The area immediately behind the wall should be backfilled with imported granular material and a perforated pipe installed running the length of the wall base to discharge to nearby water courses.

These walls should be designed for a preliminary coefficient of active earth pressure of 0.33 subject to confirmation of final geometry.

11.4.2 Retaining Structure 2

11.4.2.1 Available Data

Retaining Structure 2 (R2) is located to the northern side of the underpass and link to Felton Mathews Avenue, refer to site plan in Appendix A for location. It is approximately 40m long and 1.5m high and appears it will support fill material.

The nearest investigation information is HA2A which indicates a layer of very stiff silty clay to 2m depth and stiff to very stiff clayey silt below this to at least 4m depth. Groundwater was noted at 2.4m depth.

11.4.2.2 Structure Type

A number of retaining wall solutions including gabion basket, timber pole and crib walls are considered appropriate for this design situation, with the choice dependant on relative cost and landscaping/appearance requirements.

11.4.2.3 Construction Issues

Any existing fill material identified in the wall foundations will need to be removed and replaced with compacted material.

Retaining walls supporting fill materials should be backfilled with imported granular materials for ease of construction and control of groundwater seepage. These walls should be designed for a preliminary coefficient of active pressure of 0.4 subject to confirmation of final geometry.

11.4.3 Retaining Structure 3

11.4.3.1 Available Data

Retaining Structure 3 (R3) is intended to run for 200m along the industrial estate boundary to the west of the path, refer to site plan in Appendix A for location. It is understood that this part of the industrial estate was built on fill which appears to be uncontrolled.

The nearest investigation data is HA2A which is at the start of the proposed wall and HA3 which is towards the end of the wall. HA2 indicates a layer of very stiff silty clay to 2m depth and stiff to very stiff clayey silt below this to at least 4m depth. Groundwater was noted at 2.4m depth. HA3 indicates old fill to 0.7m depth, very stiff clay with some silt to at 1.2m depth and very stiff clayey silt to at least 4m depth.

11.4.3.2 Structure Type

A number of retaining wall solutions including gabion basket, timber pole and crib walls are considered appropriate for this design situation, with the choice dependant on relative cost and landscaping/appearance requirements.

11.4.3.3 Construction Issues

The area immediately behind the wall should be backfilled with imported granular material and a perforated pipe installed running the length of the wall base to discharge to nearby water courses.

These walls should be designed for a primary coefficient of active earth pressure of 0.4 subject to confirmation of final geometry.

11.4.4 Retaining Structure 4

11.4.4.1 Available Data

Retaining Structure 4 (R4) is located north of the stream approaching St Johns Road. Refer to site plan in Appendix A for location. The wall is approximately 70m long and 1.5m high. It is likely that this wall will be on the upslope side of the cycle path, supporting a cut slope.

The nearest investigation data are TP1 and HA8. TP1 indicates stiff silt to a depth of 1.2m and hard clayey silt below this to a depth of at least 3m. No groundwater was encountered in TP1. HA8 indicated very stiff clay to a depth of 1m, hard silty clay below this to a depth of 1.2m which is underlain by hard silt to a depth of at least 2m.

11.4.4.2 Structure Type

A number of retaining wall solutions including gabion basket, timber pole and crib walls are considered appropriate for this design situation, with the choice dependant on relative cost and landscaping/appearance requirements.

11.4.4.3 Construction Issues

The area immediately behind the wall should be backfilled with imported granular material and a perforated pipe installed running the length of the wall base to discharge to nearby water courses.

These walls should be designed for a preliminary coefficient of active earth pressure of 0.33 subject to confirmation of final geometry.

11.5 Bridge Structures

11.5.1 Bridge Structure 1

11.5.1.1 Data Available

Bridge Structure 1 (B1) is to link to the underpass near Felton Mathews Avenue (between R1 and R2), refer to site plan in Appendix A for location.

The nearest investigation data are HA2 and HA2-A. HA2 indicates very stiff silty clay to at least 3m depth after an initial 0.2m thick topsoil layer. Groundwater was noted at 2.9m below ground surface. HA2A indicates a layer of very stiff silty clay to 2m depth and stiff to very stiff clayey silt below this to at least 4m depth. Groundwater was noted at 2.4m depth.

11.5.1.2 Foundation Options

Assuming the bridge foundations will be constructed on the clayey silt/silty clay layers of the East Coast Bay formation, shallow foundation solutions are considered appropriate. Subject to confirmation based on the final foundation geometry, an initial factored bearing capacity (for use with ultimate limit state loads) of 150 kPa can be adopted for initial foundation sizing.

11.5.1.3 Construction Issues

Existing fill materials will need to be excavated and replaced with compacted fill if encountered beneath bridge foundations.

11.5.1 Bridge Structure 2

11.5.1.1 Data Available

Bridge Structure 2 (B2) crosses the gully area south of R4 retaining structure. Refer to site plan in Appendix A for location.

Nearest investigation data is TP1 and TP2 which indicate alternating layers of stiff to very stiff silty clay and clayey silt to at least 3.5m depth. Seepage was noted in TP2 at a depth of 1.4m.

11.5.1.2 Foundation Options

Shallow foundations are considered appropriate for the proposed bridge structures. Subject to confirmation based on the final foundation geometry, an initial factored bearing capacity (for use with ultimate limit state loads) of 150 kPa can be adopted for initial foundation sizing.

11.5.1.3 Construction Issues

Existing fill materials will need to be excavated and replaced with compacted fill if encountered beneath bridge foundations.

11.6 Subgrade

HA05, HA6, HA7 and HA8 were undertaken in areas where the shared path is likely to be in cut. Scala penetrometer results at each of these locations were used to estimate CBR values for the cut sections. It is assumed that any existing fill on the site will be removed prior to laying the pavement.

Excluding topsoil and fill materials, typical scala penetrometer readings in the upper layers of in-situ soil were 50mm per blow indicating a design CBR of 2-3%. There was a general trend of increasing resistance and therefore CBR with depth.

It is assumed that since the fill material will be compacted, the CBR values in fill materials will be at least 3.

12 Construction Risks

The formation of new cut slopes will expose residual Waitemata Group soils (clayey silt and silty sand) which are susceptible to erosion during periods of increased rainfall. This should be taken into consideration when drawing up the earthworks management plan. Fresh cut surfaces should be protected from erosion by the immediate application of hydroseed following construction.

Groundwater seepage can be expected from cut faces and will need to be collected and discharged to local watercourses. If seepage flows result in excessive erosion of the cut faces, the flows will need to be collected by horizontal drains or other drainage measures and discharged into the collection system.

The presence of non-engineered fill at 3 of the 13 investigation locations means that allowance must be made for over-excavation and replacement of these materials with compacted fill, particularly under fill embankments, retaining structures and bridge foundations.

13 Conclusions and Recommendations

Key findings from the investigation are:

- Ground conditions comprised silty clay and clayey silt inferred to be residual soils of the East Coast Bays Formation.
- Areas of fill were encountered at some locations, inferred to be associated with the industrial area adjacent to the site.
- The in-situ soils, excluding fill and topsoil are considered suitable for use as fill. Given groundwater was encountered at most of the investigation sites, the material is likely to require drying before being used as fill.
- Cut slopes up to 4m high should be no steeper than 1.5H:1V without further testing.
- Cut slopes over 4m high should be no steeper than 2H:1V without further testing.
- Fill Slopes should be no steeper than 2H:1V without further testing.
- All formed slopes will require vegetation cover to manage long term weathering of the material.
- Retaining walls supporting cut slopes should be backfilled with imported granular material to collect groundwater seepage. These walls should be designed for a preliminary coefficient of active pressure of 0.33 subject to confirmation of final geometry.
- Retaining walls supporting fill materials should be backfilled with imported granular materials for ease of construction and control of groundwater seepage. These walls should be designed for a coefficient of active pressure of 0.4 subject to confirmation of final geometry. Any fill materials identified in the wall foundations will need to be removed and replaced with compacted material.
- If mechanically stabilised earth structures in excess of 2m high are to be constructed use of the natural material as fill could be considered with further testing.
- Shallow foundations are considered appropriate for the proposed bridge structures. Subject to confirmation based on the final foundation geometry, an initial factored bearing capacity (for use with ultimate limit state loads) of 150 kPa can be adopted for initial foundation sizing.
- The most significant construction issues are considered to be the presence of groundwater and the presence of fill on the site. It will be necessary to include drainage measures such as toe and subsoil drains to collect groundwater seepage from cut faces and discharge it to on-site water courses. Existing fill materials will need to be excavated and replaced with compacted fill if encountered beneath fills, retaining walls or bridge foundations. During the investigations fill material was found in three of the 13 investigation sites at depths up 1m.

Following refinement of the initial concept with the recommendations above, more detailed checks on the geotechnical design of slopes and structures can be undertaken. This process will also allow for any areas needing more detailed investigation or testing which could lead to design refinements and result in significant cost savings.

14 Limitations

This report has been prepared for Auckland Transport in accordance with the generally accepted practices and standards in use at the time it was prepared. MWH accepts no liability to any third party who relies on this report.

The information contained in this report is accurate to the best of our knowledge at the time of issue. MWH NZ has made no independent verification of this information beyond the agreed scope set out in the report.

The interpretations as to the likely subsurface conditions contained in this report are based on the site observations and field investigations made at discrete locations as described in this report. The type, spacing and frequency of the investigations, sampling, and testing of materials were selected to meet the technical, financial and time requirements agreed by the client. MWH NZ accepts no liability for any unknown or adverse ground conditions.

Actual ground conditions encountered may vary from the predicted subsurface conditions. For example, subsurface groundwater conditions often change seasonally and over time. No warranty is expressed or implied that the actual conditions encountered will conform exactly to the conditions described herein.

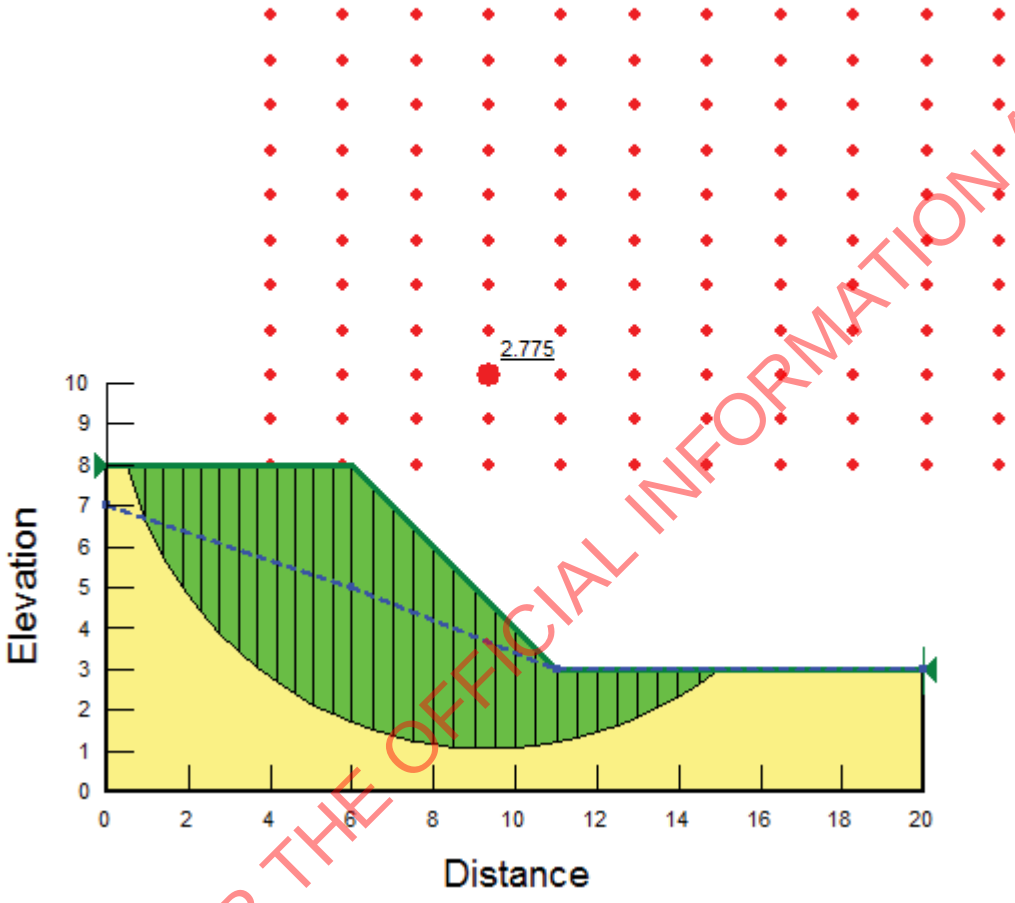
Where conditions encountered at the site differ from those inferred in this report MWH NZ should be notified of such changes, and should be given an opportunity to review the report recommendations made in this report in light of any further information.

This report does not purport to describe all the site characteristics and properties. Subsurface conditions and testing relevant to construction works must be undertaken and assessed by any contractors as necessary for their own purposes.

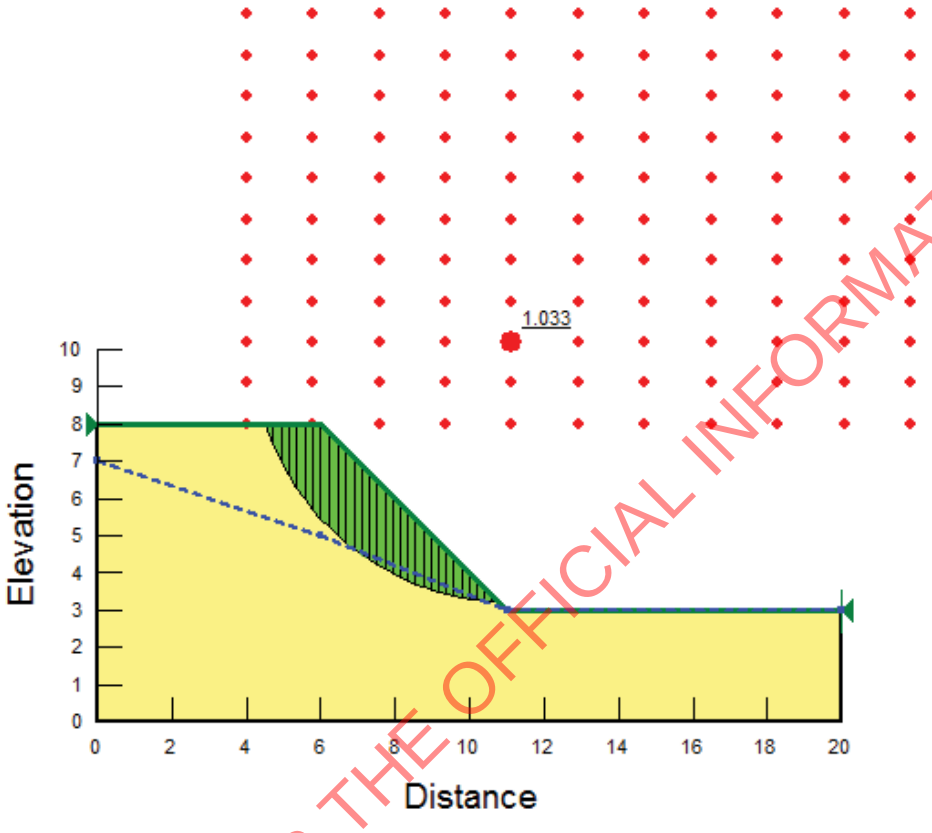
Appendix A Site Plan

Appendix B Slope/W Results

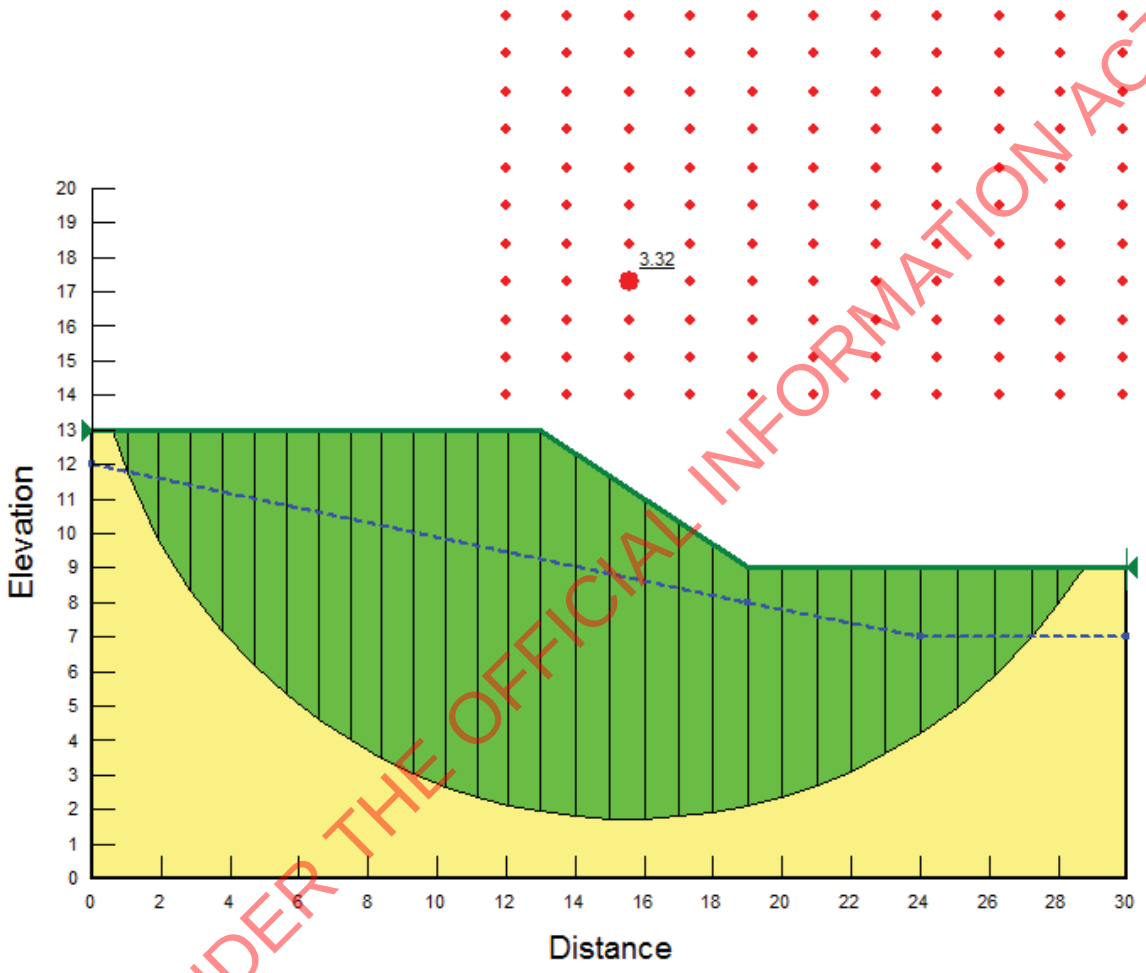
1H:1V slope
Static Case
Short term undrained conditions
Undrained shear strength, c = 40 kPa



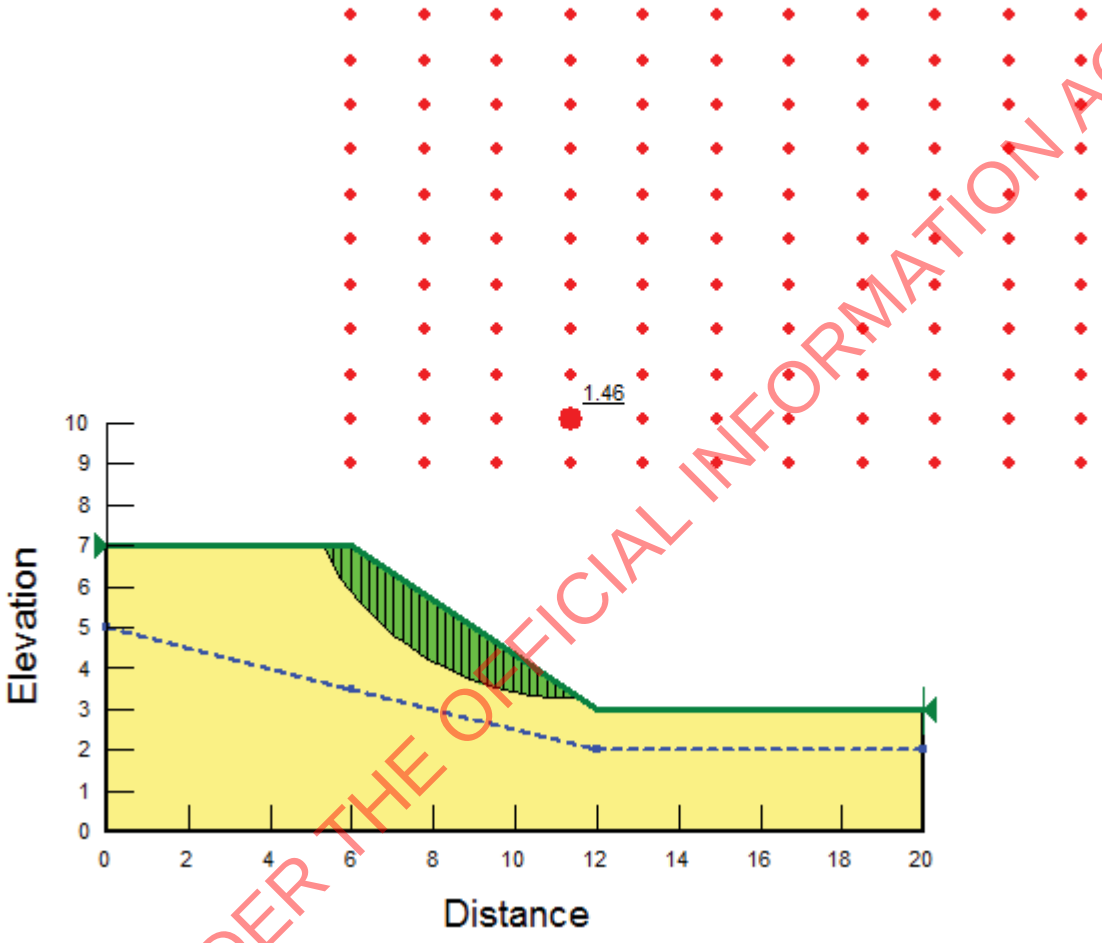
1H:1V slope
Static Case
Long term drained conditions
Drained cohesion, c' = 4 kPa
Drained Friction angle, Phi' = 25 degrees



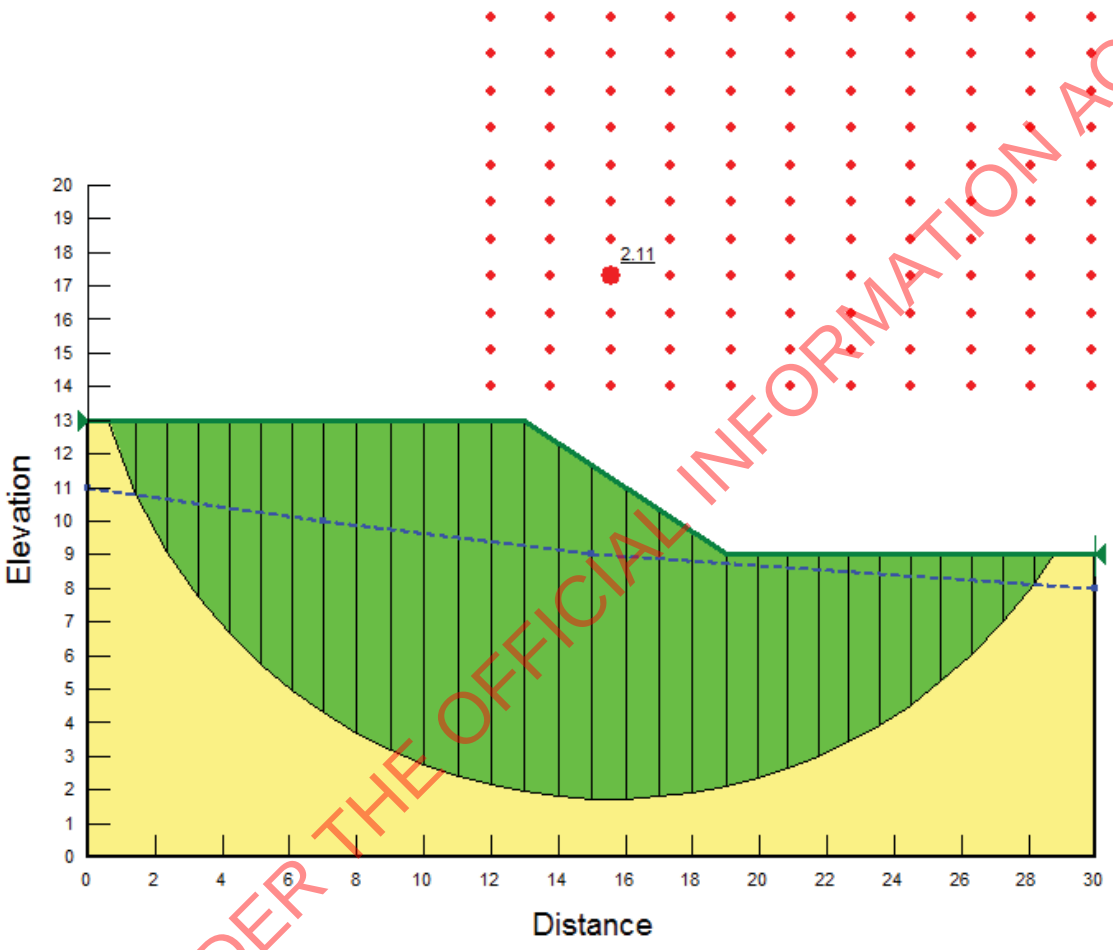
1.5H:1V slope
Static case
Short term undrained conditions
Undrained shear strength = 40 kPa



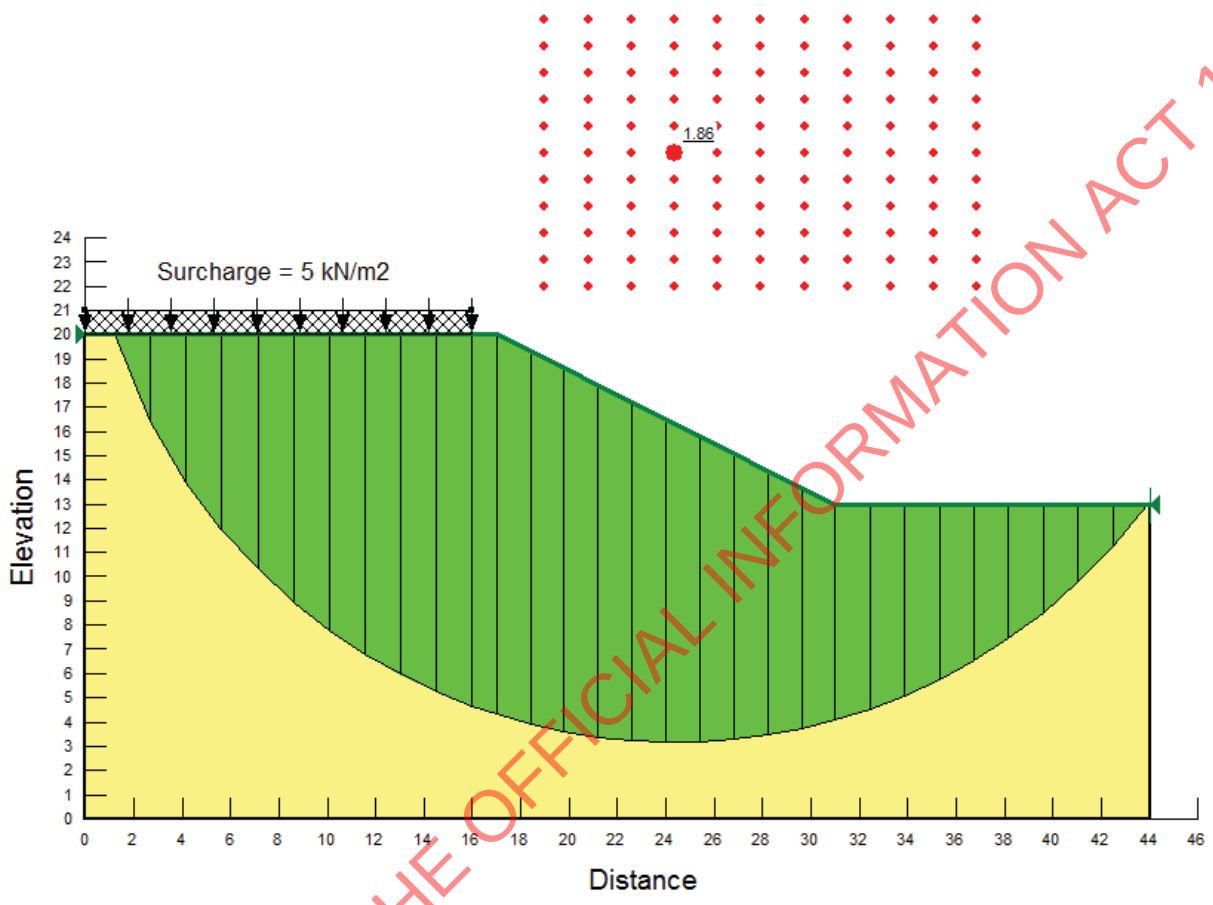
1.5H to 1V slope
Static Case
Long term drained conditions
Drained cohesion, c' = 4 kPa
Drained angle of friction, phi' = 25 degrees



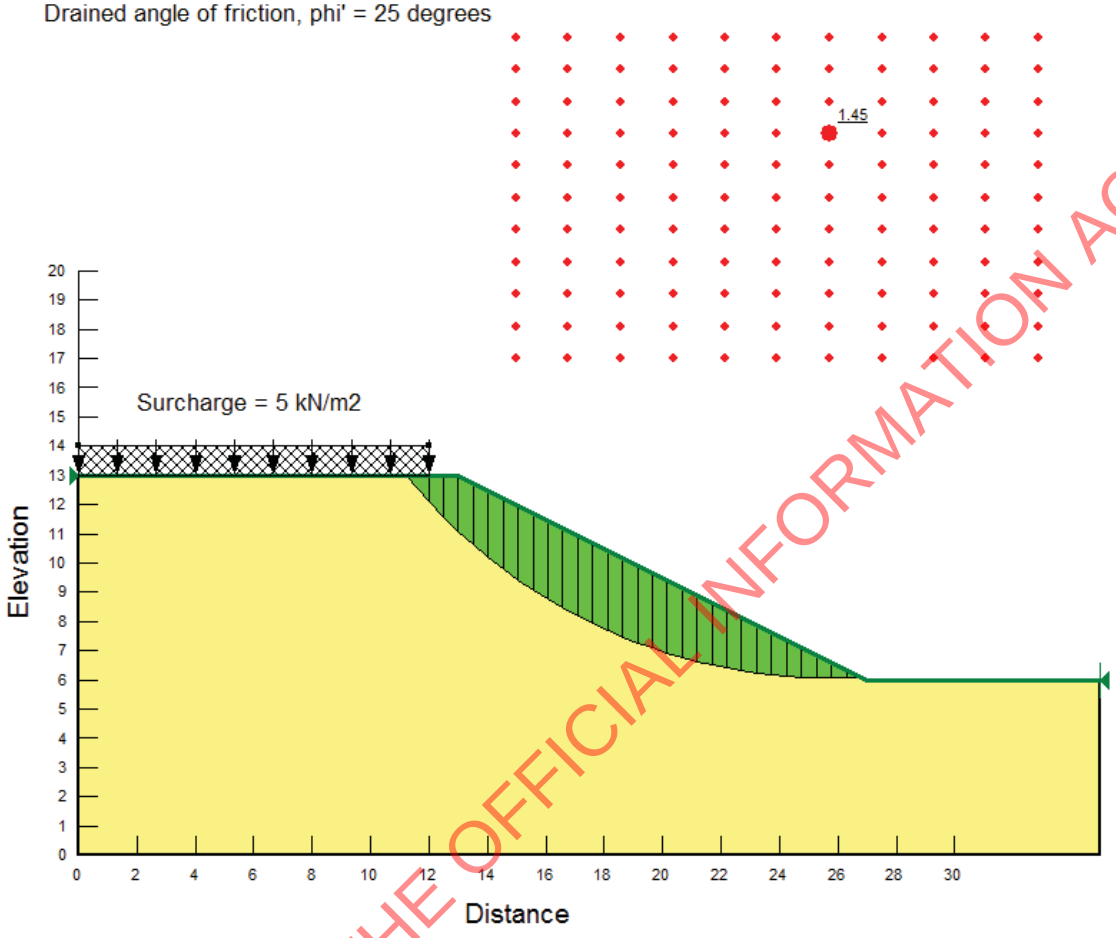
1.5H:1V slope
Seismic case (maximum considered earthquake)
Short term undrained conditions
Undrained shear strength = 40 kPa



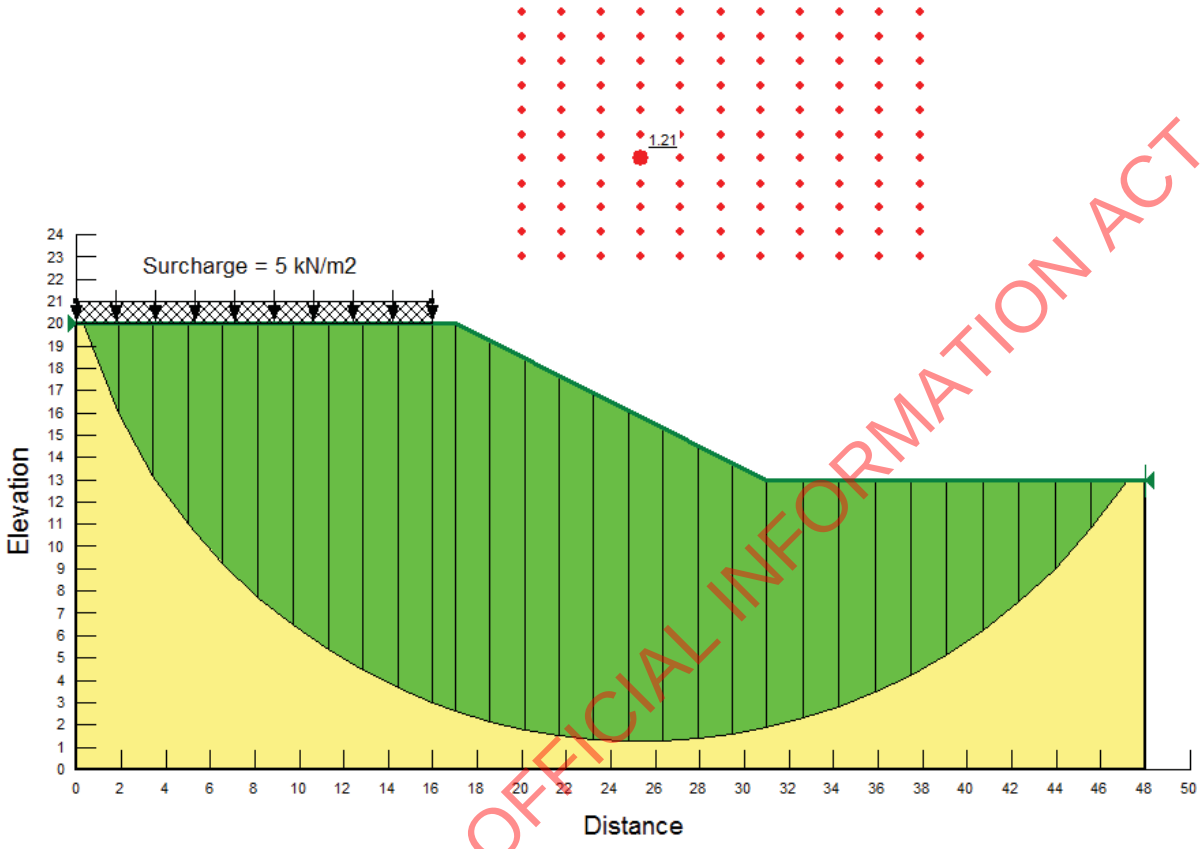
2H:1V slope
Static case
Short term undrained conditions
Undrained shear strength = 40 kPa



2H:1V slope
Static case
Long term drained conditions
Drained cohesion, c' = 4 kPa
Drained angle of friction, phi' = 25 degrees



2H:1V slope
Seismic case (maximum considered earthquake)
Short term undrained conditions
Undrained shear strength, c = 40 kPa



Appendix J Economic Evaluation Manual Worksheets

Worksheet 1 - Evaluation Summary and TIO Upload

Upload V1.0 (1Oct13)

This spreadsheet can be automatically uploaded into Transport Investment Online. To enable automatic upload please do not adjust the columns or rows.

Activity name		Glen Innes to Tamaki Drive Shared Path
Reference		0
Evaluator(s)	- name, organisation	Andrew McDonald / Brian Yip (MWH)
Reviewer(s)	- name, organisation	Prasad Tala (MWH)
Date of evaluation	mm/yyyy	12-2014
Time zero / implementation start date	1 July yyyy	2015
Construction duration	Months	36
Base date of costs and benefits	1 July yyyy	2015
Location		Starting from Merton Road through NZTA, Council and KiwiRail land to Tamaki Drive
Problem definition		Services, Kiwirail criteria, structures, drainage, connections
Do minimum description		Do nothing
Alternatives considered (or page references to relevant)		
Options considered (or page references to relevant)		Fully protected route with controlled crossing facilities. Options to be assessed are the various route
Preferred option description		Shared walking and cycling path

Statistics		**Base rate**	**Growth rate (%)**	**New users/transfer**
Road traffic - Annual Average Daily Traffic (AADT)	AADT	0	0.00	
Pedestrians - Annual Average Daily	Count	505	0.07	130
Cyclists - Annual Average Daily	Count	505	0.07	217
Annual Patronage - Total	Count	0	0.00	0
Annual Patronage - Peak Period	Count	0	0.00	
Freight volume	tonnes	0	0.00	0
Heavy Vehicles Volume	AADT	0	0.00	
Heavy Vehicles Volume	%	0.00		
Road Category		Urban arterial		

		Before	**After**
Roughness	IRI/NAASRA	0	0
Posted speed	km/h	0	0
Average traffic speed	km/h	0	0
Length of road / route	km	7.20	6.50
Road width	metres	0.00	0.00
Travel time on route	minutes	0	0

		Period start am	**Period stop am**	**Period start pm**	**Period stop pm**
Peak Period					
Peak Period Traffic flow	Vehicles/hr	0			
Period of crash analysis	yyyy - yyyy				

	Fatal	**Serious**	**Minor**	**Non Injury**
Recorded crashes in period (row 4 crash analysis)	0.0	0.0	0.0	0.0
Total estimated crashes per year - do minimum (row 11)				
Predicted crashes per year - preferred option (row 20)				

Heavy Vehicle Trips Saved (average per year)	count	0
Vehicle Operating Cost Savings (per annum)	$/vehicle	0
Travel time savings (per day)	minutes	0

Costs		**Do minimum**	**Preferred option**
Construction / implementation	$	0	32,659,686
Present Value Construction / implementation	$	0	32,659,686
Present Value Maintenance, renewal and operating costs	$	0	340,400
Present Value Total costs (whole of life)	$	0	33,000,086
Present Value Cost savings	$	0	
Present Value Funding assistance	$	0	

Benefits (Present Value)		
Travel time cost savings	$	44,207,622
Vehicle operating cost savings	$	0
Crash cost savings	$	3,113,894
Seal extension benefits	$	0
Driver frustration reduction benefits	$	0
Risk reduction benefits	$	0
Vehicle emission reduction benefits	$	0
Other external benefits (noise, visual, impact etc)	$	0
Mode change benefits	$	0
Walking and cycling health benefits	$	70,554,287
Service or facility user benefits	$	0
Parking user cost savings	$	0
Dis-benefits during implementation/construction	$	0
Road Traffic reduction benefits	$	0
National strategic benefits	$	0
Agglomeration benefits (WEB)	$	0
Increased Labour Supply (WEB)	$	0
Imperfect Competition (WEB)	$	0
Total Benefits Present Value	$	117,875,803.49

Non monetised benefits or national strategic factors	
Benefit Cost Ratio (BCRn) National	3.57
Benefit Cost Ratio (BCRg) Government	0.00
First Year Rate of Return (FYRR)	9.02%

Sensitivity Analysis - BCR range	2.61	4.73

SP11 Walking and cycling facilities (Modified)

Spreadsheet v 2.0 (1-July-13)

Worksheet 1 - Evaluation summary

Worksheet 1 provides a summary of the general data used for the evaluation as well as the results of the analysis. The information required is a subset of the information required for assessment in terms of the NZTA's *Planning and Investment Knowledge Base*.

1	Evaluator(s)	Andrew McDonald / Brian Yip (MWH)					
	Reviewer(s)	Prasad Tala (MWH)					
2	Activity details						
	Approved organisation name	MWH Global					
	Activity name	Glen Innes to Tamaki Drive Shared Path					
	Your reference						
	Activity description	Shared walking and cycling path					
	Describe the issues to be addressed	Services, Kiwirail criteria, structures, drainage, connections					
3	Location						
	Brief description of location	Starting from Merton Road through NZTA, Council and KiwiRail land to Tamaki Drive					
4	Alternatives and options						
	Describe the do-minimum	Do nothing					
	Summarise the options assessed	Fully protected route with controlled crossing facilities. Options to be assessed are the various route options, connections and structures.					
5	Timing						
	Time zero (assumed construction start date)	1 July 2015					
	Expected duration of construction (months)	36					
	Period of analysis	40					
6	Economic efficiency						
	Date economic evaluation completed (mm/yyyy)	Dec-14					
	Base date for costs and benefits	1 July 2015					
	Land designation required	no					
7	Data (only fill the applicable data)						
	Existing pedestrian/cycling volumes	0	AADT in year	2013			
	Estimated new pedestrian/cyclist volume	722.00	AADT				
	Estimated motor vehicle volumes	0	AADT				
	Estimated motor vehicle speed	0	km/h				
	Cyclist growth rate	6.89	%				
	Width available for walking/cycling before	0	m				
	Width available for walking/cycling after	3	m				
	Length walked/cycled after works	6.5	km				
	Length walked/cycled before works	7.2	km				
	Expected reduction in private vehicle travel	0	km per year				
8	PV cost of do-minimum					$ 0	**A**
9	PV cost of the preferred option					$ 33,000,086	**B**
10	Benefit values from worksheet 4, 5, 6						
	PV travel time cost savings	$ 31,132,129	**C** x Update factor ^{TTC}	1.42	= $	44,207,622	**X**
	PV facility benefits	$ 61,889,725	**D** x Update factor ^{WCB}	1.14	= $	70,554,287	**Y**
	PV crash cost savings	$ 2,511,205	**E** x Update factor ^{AC}	1.24	= $	3,113,894	**Z**

11 $BCR_N = \frac{\text{PV net benefits}}{\text{PV economic costs}} = \frac{\mathbf{X + Y + Z}}{\mathbf{B - A}} = \frac{117,875,803}{33,000,086} = 3.57$

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-13)

Worksheet 2 - Cost of do-minimum

Worksheet 2 is used for calculating the PV cost of the do-minimum. The do-minimum is the minimum level of expenditure necessary to keep a facility open and generally consists of maintenance work.

1 Historic maintenance cost data (indicate whether assessed or actual)

Maintenance costs for the site over last three years

Year 1	2012	Assessed	$	0
Year 2	2013	Assessed	$	0
Year 3	2014	Assessed	$	0
Maintenance costs for the site this year	2015	Assessed	$	0
Future annual maintenance costs		Assessed	$	0

2 PV of annual maintenance and inspection costs following the work

Annual cost = $ 0 x 15.49 = $ 0 **(a)**

3 PV of periodic maintenance costs (including any capital work)

Time zero 1st July in the year 2015

Periodic maintenance will be required in the following years:

Year	Type of maintenance	Amount $	SPPWF	Present value

Sum of PV of periodic maintenance $ 0 **(b)**

4 PV of annual operating costs

Annual cost = $ 0 x 15.49 = $ 0 **(c)**

5 PV cost of the do-minimum

(a) + **(b)** + **(C)** = $ 0 **A**

Transfer the PV cost of do minimum **A**, to **A** on worksheet 1

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-13)

Worksheet 3 - Cost of the option(s)

Worksheet 3 is used for calculating the PV cost of the walking or cycling facility.

1 PV of estimated cost of proposed work (as per attached estimate sheet)

Year1	$	5,844,000	x	0.94			**(a)**
Year2	$	13,015,000	x	0.89	= $	32,659,686	
Year3	$	18,560,000	x	0.84			

2 PV of maintenance in year 1 $ 50,000 **(b)**

3 PV of annual maintenance costs following the work

(years 2 to 40 inclusive) $ 20,000 x 14.52 = $ 290,400 **(c)**

4 PV of periodic maintenance costs

Time zero 1st July in the year 2015

Periodic maintenance will be required in the following years:

Year	Type of maintenance	Amount $	SPPWF	Present Value

Sum of PV of periodic maintenance costs = $ 0 **(d)**

5 PV cost of additional annual maintenance

$ 0 x 14.52 = $ 0 **(e)**

6 PV of total cost of option

PV total costs **(a)** + **(b)** + **(c)** + **(d)** + **(e)** = $ 33,000,086 **B**

Transfer the PV total cost for the preferred option **B**, to **B** on worksheet 1

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-13)

Worksheet 4 - Travel time cost savings (cyclists only)

Worksheet 4 is used for calculating pedestrian and cyclist travel time cost savings.

1 Road category (Select) — Urban arterial

2 Travel time data

Walkers and/or cyclists average annual daily traffic current (AADT) (or volumes affected by the improvement)					505
Traffic growth rate (per annum)					6.89%
Travel time cost (TTC)	(Table 4.7)			$	19.36

	Do-minimum		Option	
Length of route (km)	L^{dm}	1.80	L^{opt}	1.64
Mean vehicle speed	VS^{dm}	15.00	VS^{opt}	22.00
Relative attractiveness	(Table SP11.1)			2.00

3 Annual TTC for the do-minimum

$$\frac{AADT \times 365 \times L^{dm} \times TTC}{VS^{dm}} = \$ \quad 428{,}224 \quad \textbf{(a)}$$

4 Annual TTC for the option

$$\frac{AADT \times 365 \times L^{opt} \times TTC}{VS^{opt} \times RA} = \$ \quad 133{,}009 \quad \textbf{(b)}$$

5 Value of annual TTC savings — **(a) - (b)** = $ 295,215 **(c)**

6 PV of travel time cost savings — DF 28.21 — **(c)** x DF = $ 8,328,127 **C**

Transfer the PV of travel time cost savings for the preferred option **C**, to **C** on worksheet 1

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-13)

Worksheet 4 - Travel time cost savings (cyclists only)

Worksheet 4 is used for calculating pedestrian and cyclist travel time cost savings.

1	Road category (Select)				Urban arterial	
2	Travel time data					
	Walkers and/or cyclists average annual daily traffic current (AADT) (or volumes affected by the improvement)				505	
	Traffic growth rate (per annum)				6.89%	
	Travel time cost (TTC)	(Table 4.7)		$	19.36	

	Do-minimum		Option	
Length of route (km)	L^{dm}	1.80	L^{opt}	2.70
Mean vehicle speed	VS^{dm}	15.00	VS^{opt}	22.00
Relative attractiveness	(Table SP11.1)			2.00

3	Annual TTC for the do-minimum				
	$\frac{AADT \times 365 \times L^{dm} \times TTC}{VS^{dm}}$		= $	428,224	**(a)**
4	Annual TTC for the option				
	$\frac{AADT \times 365 \times L^{opt} \times TTC}{VS^{opt} \times RA}$		= $	218,978	**(b)**
5	Value of annual TTC savings		**(a) - (b)** = $	209,246	**(c)**
6	PV of travel time cost savings	DF 27.20	**(c)** x DF = $	5,691,375	**C**

Transfer the PV of travel time cost savings for the preferred option **C**, to **C** on worksheet 1

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-13)

Worksheet 4 - Travel time cost savings (cyclists only)

Worksheet 4 is used for calculating pedestrian and cyclist travel time cost savings.

1	Road category (Select)				Urban arterial	
2	Travel time data					
	Walkers and/or cyclists average annual daily traffic current (AADT) (or volumes affected by the improvement)				505	
	Traffic growth rate (per annum)				6.89%	
	Travel time cost (TTC)	(Table 4.7)		$	19.36	

	Do-minimum		Option	
Length of route (km)	L^{dm}	1.80	L^{opt}	0.69
Mean vehicle speed	VS^{dm}	15.00	VS^{opt}	22.00
Relative attractiveness	(Table SP11.1)			2.00

3	Annual TTC for the do-minimum			
	$\frac{AADT \times 365 \times L^{dm} \times TTC}{VS^{dm}}$	= $	428,224	**(a)**
4	Annual TTC for the option			
	$\frac{AADT \times 365 \times L^{opt} \times TTC}{VS^{opt} \times RA}$	= $	55,961	**(b)**
5	Value of annual TTC savings	**(a) - (b)** = $	372,263	**(c)**
6	PV of travel time cost savings	DF 27.20 **(c)** x DF = $	10,125,353	**C**

Transfer the PV of travel time cost savings for the preferred option **C**, to **C** on worksheet 1

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-13)

Worksheet 4 - Travel time cost savings (cyclists only)

Worksheet 4 is used for calculating pedestrian and cyclist travel time cost savings.

1 Road category (Select) — Urban arterial

2 Travel time data

Walkers and/or cyclists average annual daily traffic current (AADT) (or volumes affected by the improvement)					505
Traffic growth rate (per annum)					6.89%
Travel time cost (TTC)	(Table 4.7)			$	19.36

	Do-minimum		Option	
Length of route (km)	L^{dm}	1.80	L^{opt}	1.99
Mean vehicle speed	VS^{dm}	15.00	VS^{opt}	22.00
Relative attractiveness	(Table SP11.1)			2.00

3 Annual TTC for the do-minimum

$$\frac{AADT \times 365 \times L^{dm} \times TTC}{VS^{dm}} = \$\ 428{,}224 \quad \textbf{(a)}$$

4 Annual TTC for the option

$$\frac{AADT \times 365 \times L^{opt} \times TTC}{VS^{opt} \times RA} = \$\ 161{,}395 \quad \textbf{(b)}$$

5 Value of annual TTC savings — **(a) - (b)** = $ 266,829 **(c)**

6 PV of travel time cost savings — DF 26.19 — **(c)** x DF = $ 6,987,274 **C**

Transfer the PV of travel time cost savings for the preferred option **C**, to **C** on worksheet 1

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-1

Worksheet 5 - Benefits for walking and cycling facilities

Worksheet 5 is used to calculate the walking and cycling facility benefits for the various options. Only one category for walking and one category for cycling may be used in an evaluation of a proposal. If an activity contains more categories, they must be submitted as separate evaluations.

Activities that combine walking and cycling may claim benefits for both modes but safety issues arising from pedestrian/cycle conflicts must be addressed, and if there are additional crash costs these must be accounted for in worksheet 6. Make sure the estimates of the new number of pedestrians and/or cyclists generated by the facility are realistic.

Required information:
L Length of new facility in kilometres
NPD Number of additional pedestrians per day
NTD Number of additional cycle trips per day
NSD Number of additional and existing cycle trips per day
DF Discount factor. The discount factor will be differ by mode depending on the growth rate

Health and environment benefits for walking facility

Pedestrian growth rate (per annum) 6.89%

1 Health and environment benefits for footpaths and other pedestrian facilities

Benefit = number of additional pedestrians/day x length of new facility in km x 365 x $2.70

L	1.64	x NPD	217	x 365 x $2.70 x DF	28.21	= $	9,893,939	**(a)**

2 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for pedestrians)

Benefit = number of additional pedestrians/day x 365 x $2.70

NPD	217	x 365 x $2.70 x DF	28.21	= $	6,032,890	**(b)**

Transfer total **(a)** or **(b)** to **D** on worksheet 1.

Health and environment benefits for cycling facility

Cyclist growth rate (per annum) 6.89%

3 Health and environment benefits for cycle lanes, cycleways or increased road shoulder widths

Benefit = number of additional cycle trips/day x length of new facility in km x 365 x $1.40

L	1.64	x NTD	217	x 365 x $1.40 x DF	28.21	= $	5,130,191	**(c)**

4 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of additional cycle trips/day x 365 x $4.20

NTD	217	x 365 x $4.20 x DF	28.21	= $	9,384,495	**(d)**

Transfer total **(c)** or **(d)** to **D** on worksheet 1.

Safety benefits for cycling facility

5 Safety benefit for cycle lanes, cycleways or increased road shoulder widths in the absence of a specific crash analysis

Benefit = number of new and existing cycle trips/day x length of new facility in km x 365 x $0.05

L	1.64	x NSD	722	x 365 x $0.05 x DF	28.21	= $	609,611	**(e)**

6 Safety benefit from improvements at hazardous sites in the absence of a specific crash analysis (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of new and existing cycle trips/day x 365 x $0.15

NSD	722	x 365 x $0.15 x DF	28.21	= $	1,115,142	**(f)**

Transfer total **(e)** or **(f)** to **E** on worksheet 1.

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-1

Worksheet 5 - Benefits for walking and cycling facilities

Worksheet 5 is used to calculate the walking and cycling facility benefits for the various options. Only one category for walking and one category for cycling may be used in an evaluation of a proposal. If an activity contains more categories, they must be submitted as separate evaluations.

Activities that combine walking and cycling may claim benefits for both modes but safety issues arising from pedestrian/cycle conflicts must be addressed, and if there are additional crash costs these must be accounted for in worksheet 6. Make sure the estimates of the new number of pedestrians and/or cyclists generated by the facility are realistic.

Required information:
L Length of new facility in kilometres
NPD Number of additional pedestrians per day
NTD Number of additional cycle trips per day
NSD Number of additional and existing cycle trips per day
DF Discount factor. The discount factor will be differ by mode depending on the growth rate

Health and environment benefits for walking facility

Pedestrian growth rate (per annum) 6.89%

1 Health and environment benefits for footpaths and other pedestrian facilities

Benefit = number of additional pedestrians/day x length of new facility in km x 365 x $2.70

L	2.70	x NPD	217	x 365 x $2.70 x DF	27.20	= $	15,705,100	**(a)**

2 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for pedestrians)

Benefit = number of additional pedestrians/day x 365 x $2.70

NPD	217	x 365 x $2.70 x DF	27.20	= $	5,816,704	**(b)**

Transfer total **(a)** or **(b)** to **D** on worksheet 1.

Health and environment benefits for cycling facility

Cyclist growth rate (per annum) 6.89%

3 Health and environment benefits for cycle lanes, cycleways or increased road shoulder widths

Benefit = number of additional cycle trips/day x length of new facility in km x 365 x $1.40

L	2.70	x NTD	217	x 365 x $1.40 x DF	27.20	= $	8,143,385	**(c)**

4 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of additional cycle trips/day x 365 x $4.20

NTD	217	x 365 x $4.20 x DF	27.20	= $	9,048,206	**(d)**

Transfer total **(c)** or **(d)** to **D** on worksheet 1.

Safety benefits for cycling facility

5 Safety benefit for cycle lanes, cycleways or increased road shoulder widths in the absence of a specific crash analysis

Benefit = number of new and existing cycle trips/day x length of new facility in km x 365 x $0.05

L	2.70	x NSD	722	x 365 x $0.05 x DF	27.20	= $	967,664	**(e)**

6 Safety benefit from improvements at hazardous sites in the absence of a specific crash analysis (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of new and existing cycle trips/day x 365 x $0.15

NSD	722	x 365 x $0.15 x DF	27.20	= $	1,075,182	**(f)**

Transfer total **(e)** or **(f)** to **E** on worksheet 1.

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-1

Worksheet 5 - Benefits for walking and cycling facilities

Worksheet 5 is used to calculate the walking and cycling facility benefits for the various options. Only one category for walking and one category for cycling may be used in an evaluation of a proposal. If an activity contains more categories, they must be submitted as separate evaluations.

Activities that combine walking and cycling may claim benefits for both modes but safety issues arising from pedestrian/cycle conflicts must be addressed, and if there are additional crash costs these must be accounted for in worksheet 6. Make sure the estimates of the new number of pedestrians and/or cyclists generated by the facility are realistic.

Required information:
L Length of new facility in kilometres
NPD Number of additional pedestrians per day
NTD Number of additional cycle trips per day
NSD Number of additional and existing cycle trips per day
DF Discount factor. The discount factor will be differ by mode depending on the growth rate

Health and environment benefits for walking facility

Pedestrian growth rate (per annum) 6.89%

1 Health and environment benefits for footpaths and other pedestrian facilities

Benefit = number of additional pedestrians/day x length of new facility in km x 365 x $2.70

L	0.69	x NPD	217	x 365 x $2.70 x DF	27.20	= $	4,013,526	**(a)**

2 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for pedestrians)

Benefit = number of additional pedestrians/day x 365 x $2.70

NPD	217	x 365 x $2.70 x DF	27.20	= $	5,816,704	**(b)**

Transfer total **(a)** or **(b)** to **D** on worksheet 1.

Health and environment benefits for cycling facility

Cyclist growth rate (per annum) 6.89%

3 Health and environment benefits for cycle lanes, cycleways or increased road shoulder widths

Benefit = number of additional cycle trips/day x length of new facility in km x 365 x $1.40

L	0.69	x NTD	217	x 365 x $1.40 x DF	27.20	= $	2,081,087	**(c)**

4 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of additional cycle trips/day x 365 x $4.20

NTD	217	x 365 x $4.20 x DF	27.20	= $	9,048,206	**(d)**

Transfer total **(c)** or **(d)** to **D** on worksheet 1.

Safety benefits for cycling facility

5 Safety benefit for cycle lanes, cycleways or increased road shoulder widths in the absence of a specific crash analysis

Benefit = number of new and existing cycle trips/day x length of new facility in km x 365 x $0.05

L	0.69	x NSD	722	x 365 x $0.05 x DF	27.20	= $	247,292	**(e)**

6 Safety benefit from improvements at hazardous sites in the absence of a specific crash analysis (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of new and existing cycle trips/day x 365 x $0.15

NSD	722	x 365 x $0.15 x DF	27.20	= $	1,075,182	**(f)**

Transfer total **(e)** or **(f)** to **E** on worksheet 1.

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-1

Worksheet 5 - Benefits for walking and cycling facilities

Worksheet 5 is used to calculate the walking and cycling facility benefits for the various options. Only one category for walking and one category for cycling may be used in an evaluation of a proposal. If an activity contains more categories, they must be submitted as separate evaluations.

Activities that combine walking and cycling may claim benefits for both modes but safety issues arising from pedestrian/cycle conflicts must be addressed, and if there are additional crash costs these must be accounted for in worksheet 6. Make sure the estimates of the new number of pedestrians and/or cyclists generated by the facility are realistic.

Required information:
L Length of new facility in kilometres
NPD Number of additional pedestrians per day
NTD Number of additional cycle trips per day
NSD Number of additional and existing cycle trips per day
DF Discount factor. The discount factor will be differ by mode depending on the growth rate

Health and environment benefits for walking facility

Pedestrian growth rate (per annum) 6.89%

1 Health and environment benefits for footpaths and other pedestrian facilities

Benefit = number of additional pedestrians/day x length of new facility in km x 365 x $2.70

L	1.99	x NPD	217	x 365 x $2.70 x DF	26.19	= $	11,144,084	**(a)**

2 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for pedestrians)

Benefit = number of additional pedestrians/day x 365 x $2.70

NPD	217	x 365 x $2.70 x DF	26.19	= $	5,600,042	**(b)**

Transfer total **(a)** or **(b)** to **D** on worksheet 1.

Health and environment benefits for cycling facility

Cyclist growth rate (per annum) 6.89%

3 Health and environment benefits for cycle lanes, cycleways or increased road shoulder widths

Benefit = number of additional cycle trips/day x length of new facility in km x 365 x $1.40

L	1.99	x NTD	217	x 365 x $1.40 x DF	26.19	= $	5,778,414	**(c)**

4 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of additional cycle trips/day x 365 x $4.20

NTD	217	x 365 x $4.20 x DF	26.19	= $	8,711,177	**(d)**

Transfer total **(c)** or **(d)** to **D** on worksheet 1.

Safety benefits for cycling facility

5 Safety benefit for cycle lanes, cycleways or increased road shoulder widths in the absence of a specific crash analysis

Benefit = number of new and existing cycle trips/day x length of new facility in km x 365 x $0.05

L	1.99	x NSD	722	x 365 x $0.05 x DF	26.19	= $	686,638	**(e)**

6 Safety benefit from improvements at hazardous sites in the absence of a specific crash analysis (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of new and existing cycle trips/day x 365 x $0.15

NSD	722	x 365 x $0.15 x DF	26.19	= $	1,035,133	**(f)**

Transfer total **(e)** or **(f)** to **E** on worksheet 1.

SP11 Walking and cycling facilities

Spreadsheet v 2.0 (1-July-13)

Worksheet 7 – Cycle demand

This worksheet is used to calculate cycle demand for a new cycle facility. The new commuters section of the worksheet calculates the total new daily cyclist commuters. The new other section calculates the total daily new other cyclists. Finally the overall new cyclists is devised.

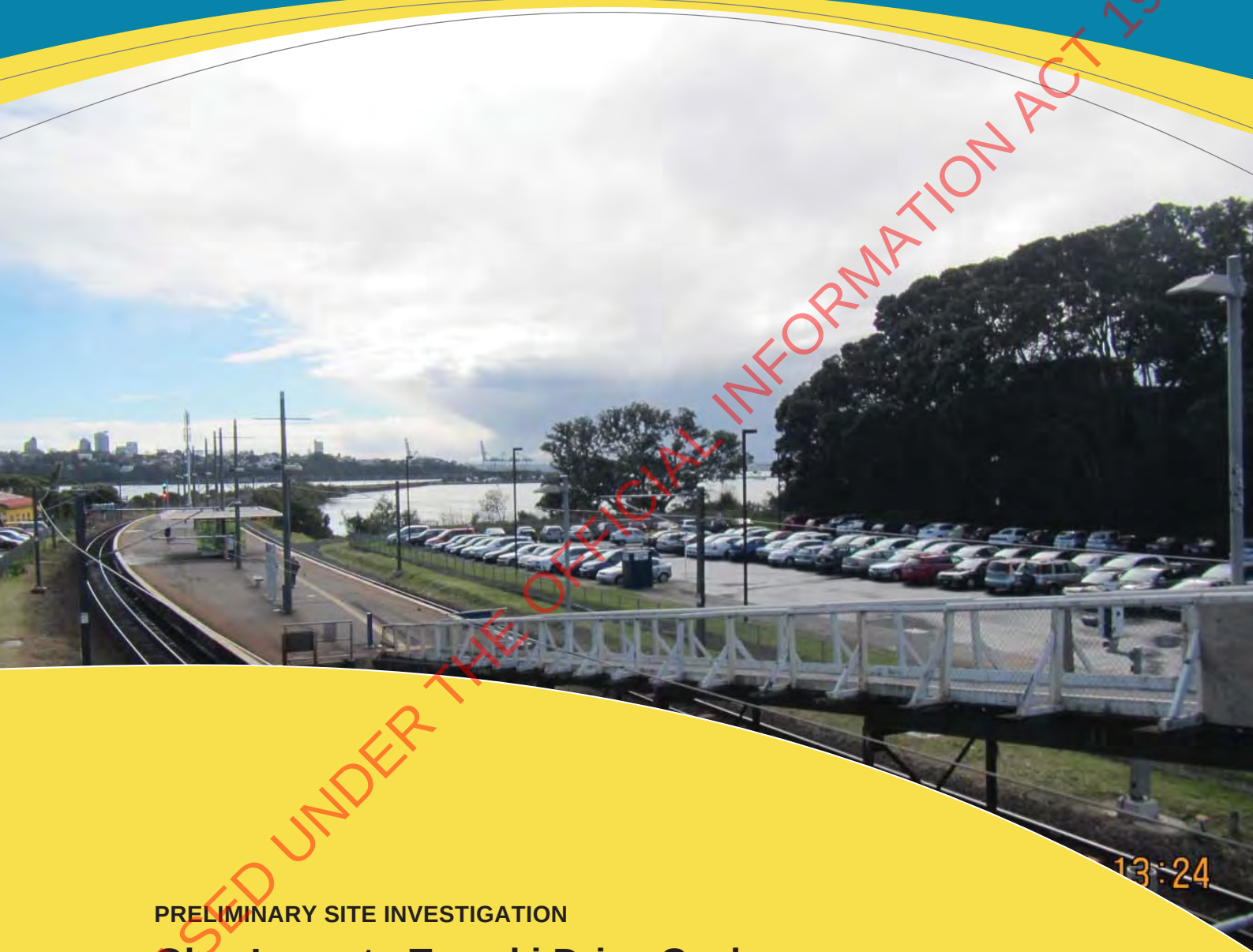
New and Existing cyclists

	Buffers (km)	<0.4	0.4 to <0.8	0.8 to ≤ 1.6
1	Area (km^2)	3.7	5.3	13.7
2	Density per square kilometre	1189	1072	1098
3	Population in each buffer **(3)** = **(1)** x **(2)**	4,399.30	5,681.60	15,042.60
4	Total population in all buffers (Sum of **(3)**)		25,123.50	
5	Commute share (single value for all)		1.76%	
6	Likelihood of new cyclist multiplier	1.04	0.54	0.21
7	Row **(7)** = **(3)** x **(6)**	4,575.27	3,068.06	3,158.95
8	Sum of row **(7)**		10,802.28	
9	Cyclist rate **(9)** = (**(5)** x 0.96) + 0.32%		2.01%	
10	Total existing daily cyclists **(10)** = **(4)** x **(9)**		505.00	
11	Total new daily cyclists **(11)** = **(8)** x **(9)**		217.00	

Appendix K Preliminary Site Investigation (Contamination)

MWH

BUILDING A BETTER WORLD



PRELIMINARY SITE INVESTIGATION

Glen Innes to Tamaki Drive Cycleway

Prepared for Auckland Transport

September 2014

MWH New Zealand Limited (MWH) has prepared this report for the use of Auckland Transport in accordance with the usual care and thoroughness of the consulting profession. It has been prepared in accordance with the scope of work and for the purpose outlined in this report. It is based on accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. MWH makes no determination or recommendation regarding a decision to provide or not to provide financing with respect to the site.

There is no investigation that is thorough enough to preclude the presence of materials at the site, which presently, or in the future, may be considered hazardous. As regulatory evaluation criteria are subject to change, concentrations of contaminants present and considered acceptable may, in the future, become subject to different regulatory standards which cause them to become unacceptable and require remediation for the site to be suitable for the existing or proposed land use activities.

The methodology adopted and sources of information used by MWH are outlined in this report. MWH has made no independent verification of the information beyond the agreed scope of works and MWH assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to MWH was false.

This report was prepared in September 2014 and is based on the conditions encountered and information reviewed at the time of preparation. MWH disclaims any responsibility for any changes that may have occurred after this time.

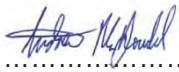
This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners

This report has been prepared for the benefit of Auckland Transport. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to Auckland Council and other persons for an application for permission or approval or to fulfil a legal requirement.

QUALITY STATEMENT

PROJECT MANAGER	PROJECT TECHNICAL LEAD
Stephen Sinclair	Garrett Hall

PREPARED BY		
Isobel Oldfield and Abby Burdis		30/09/2014
REVIEWED BY		
Garrett Hall		30/09/2014
APPROVED FOR ISSUE BY		
Andrew McDonald		30/09/2014

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REVISION SCHEDULE

Rev No	Date	Description	Signature or Typed Name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
1	25/09/14	Draft	IO & AB	GH	GH	
2	30/09/14	Final	IO	GH	GH	AM

Auckland Transport

Glen Innes to Tamaki Drive Cycleway

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APPENDICES

Appendix A – Auckland Council Records
Appendix B – Auckland Council Correspondence
Appendix C – Certificates of Title
Appendix D – Aerial Photographs

1 Introduction

1.1 Proposed Activity and Location

MWH New Zealand Ltd (MWH) was commissioned by Auckland Transport (AT) to undertake a preliminary site investigation to identify any potentially contaminated land along the proposed Glen Innes to Tamaki Drive shared path (the shared path). The proposed shared path runs northwest from Merton Road in Glenn Innes to Tamaki Drive.

Figure 1-1 shows the location of the proposed shared path, approximately 10 km southeast of Auckland Central. Route options are highlighted in different colours, with the preferred route generally following the blue line.

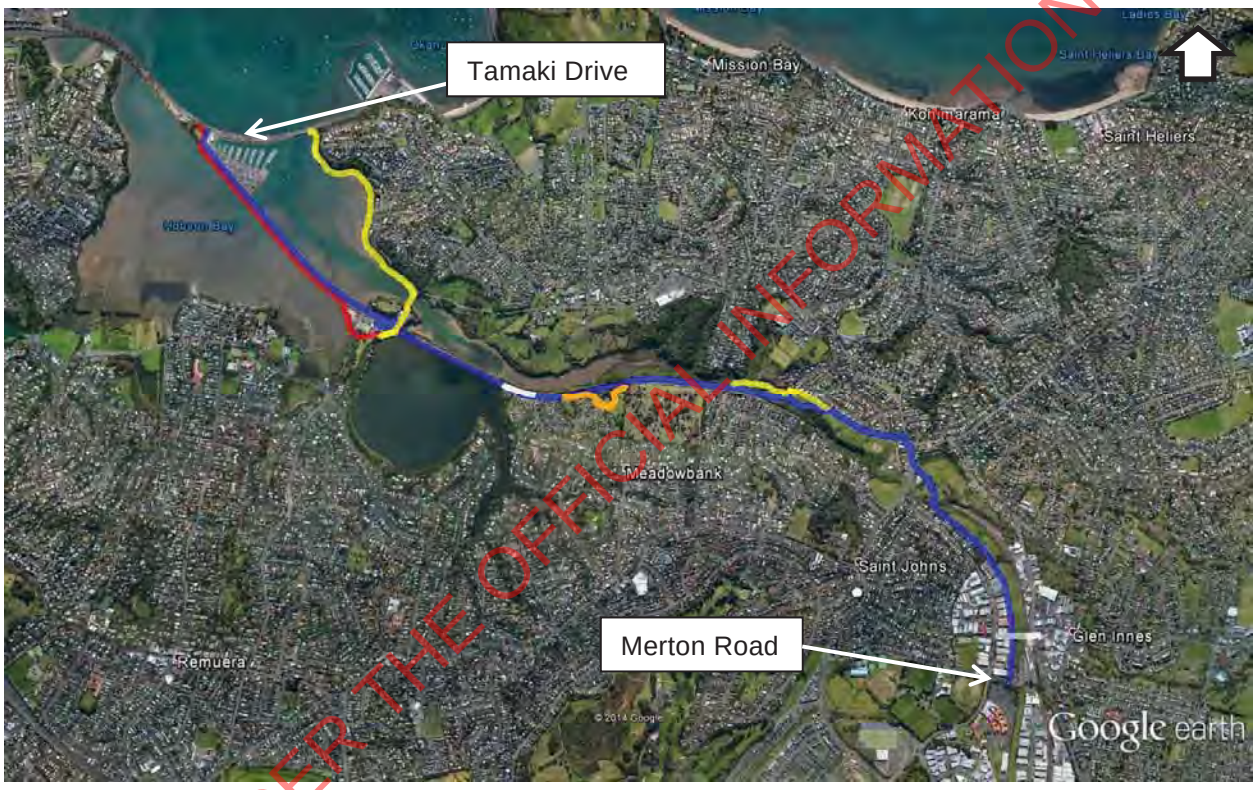


Figure 1-1: Glen Innes to Tamaki Drive Route Overview

For ease of discussion, this Report splits the route into three sections. Section one extends from Merton Road to St Johns Road and is shown in Figure **1-2**. Section two extends from St Johns Road to Orakei Road and is shown in Figure 1-3. Finally Section three extends from Orakei Road across (or around) Hobson Bay to Tamaki Drive as shown in Figure **1-4**.

Figure 1-2: Section One

Figure 1-3: Section Two

Figure 1-4: Section Three

The following preliminary site investigation uses a request for Auckland Council to review information held for properties along the route, aerial photographs and Certificates of Title to assess the potential for contamination along the route.

2 Summary of Previous Activities

2.1 Auckland Council Information

Auckland Council provided information regarding resource consents and pollution / contamination incidents within approximately 200 metres of the proposed shared path route. In addition, Auckland Council obtained records involving any landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments from the former Auckland Regional Council and the current Natural Resources and Specialist Input Unit databases. Records provided by Auckland Council are attached in Appendix A. Correspondence providing further information regarding more relevant events are attached in Appendix B.

Section 1

Section 1 of the proposed shared path extends form Merton Road, Glen Innes, to St Johns Road, Meadowbank. Resource consents in Section 1 are predominantly related to the construction of investigative bores, the construction of a petrol station, and the re-development of a supermarket and all of the associated discharges. Minor incident reports were commonly related to stormwater discharge, sewer overflow, dirt / sediment runoff, and paint entering waterways.

Two petroleum depots are located approximately 50 m from the proposed route in Section 1. Petroleum depots are listed on the Hazardous Activities and Industries List (HAIL), with contaminants of concern associated with this land use listed as hydrocarbons, solvents, lead and other metals, and waste oil (Ministry for the Environment, 2012). Given the separation distance from the proposed route it is unlikely that this land use would result in a risk of contamination within the proposed route.

Auckland Council records also noted that during November 2011, 10 – 15 Litres of petrol was spilt in a Mobil petrol station approximately 50 m from Section 1 of the proposed route. Auckland Council confirmed that the Fire Service responded adequately and no petrol entered any drains; therefore, it is highly unlikely that this incident would be a source of contamination at this site.

Auckland Council recorded an incident during February 2014 involving Dry Weather Sewer Overflow from the Watercare network on Felton Mathew Avenue. Discharge was pumped from a creek by Watercare contractors and observed the following day to be still present but clearing up. No further information was supplied regarding this incident, however residual contamination within the actual route is unlikely.

Due to the location of an industrial area near Section 1 of the proposed shared path, Certificates of Title for the industrial area were obtained and are attached in Appendix C. The Certificates of Title did not indicate any potentially contaminating land uses.

Section 2

Section 2 of the proposed shared path extends from St Johns Road following the of North Island Main Trunk (NIMT) railway line to Orakei Road, Remuera. Resource consents for this area provided by Auckland Council are predominantly related to the construction of investigative bores and the cleaning of a bridge. A notable contamination incident in the area includes a drum of contaminants (likely old thick oil) located by contractors while cleaning a stream on Selwyn College property. They were unable to move it therefore a list of contractors who could do so was passed on to Selwyn College. Auckland Council could provide no further information as to whether the contaminant had been removed or if it had entered ground or water at any stage. Sewlyn College is located approximately 300 metres from the nearest proposed route and therefore it is considered unlikely that any contamination on this site would affect the proposed shared path.

Two land parcels with land uses that are listed on the HAIL are located along the section 2 route. The first is Purewa Cemetery and Crematorium. The Ministry for the Environment (MfE) lists contaminants of concern associated with this land use nitrates, lead, mercury, formaldehyde and biological hazards. The proposed route runs along the boundary of the Purewa Cemetery with the NIMT railway line separating the two land uses. It is noted that the area of the cemetery closest to the proposed route has yet to be utilised and therefore it is considered unlikely that any contaminants of concern will have migrated into the proposed area for development.

At the western boundary of the cemetery the route crosses the railway tracks and runs through Tahape Reserve. This reserve is split into two, the western of which is situated on a closed landfill. Landfill sites are listed on the HAIL with contaminants of concern listed as hydrocarbons, metals, organic acids, landfill gas, and ammonia (Ministry for the Environment, 2012). Auckland Council commissioned Tonkin & Taylor Ltd (T&T) to undertake a contamination assessment of this location (Tonkin and Taylor, 2012).

Tonkin and Taylor analysed 24 surface soil samples and one groundwater sample, the locations of which are shown in Figure **2-1**. Soil samples were analysed for metals, polycyclic aromatic hydrocarbons (PAHs), and asbestos containing material (ACM). None of the samples tested detected ACM.

Sample TR 14 returned a mercury concentration elevated above the proposed Air, Land and Water Plan (PLAWP) and samples TR 2. TR 8 and TR 17 exceeded the Auckland Council Tier 1 and PALWP criteria for Benzo a pyrene equivalents (BaP eq). All results recorded were below the National Environmental Standard for Assessing and Managing Contaminated Land (NES), recreation and park maintenance workers soil contaminant standard.

Figure 2-1: Sampling Locations **(Tonkin and Taylor, 2012)**

It is therefore concluded that while there is some risk to human health from the elevated contaminant levels within the western end of the Tahape Reserve these concentrations are likely to be below the NES commercial/industrial guidelines and therefore the risk to construction workers who will install the proposed shared path will be minimal if appropriate site controls are implemented.

It is noted that an earlier 1992 T&T study found that organic waste was buried in the reserve between approximately 1.2 metres and 3.5 metres. There is therefore a risk of the land settling due to decomposition of this waste (Tonkin and Taylor, 1992).

Section 3

Section 3 of the proposed shared pathway extends from Orakei Road, Remuera to the eastern end of Tamaki Drive. Resource consents in this section are predominantly related to the construction of investigative bores, and the expansion of the marina requiring reclamation and disturbance of the seabed. Minor incident reports involve sewage overflow, and paint entering waterways.

2.2 Aerial Photographs

Aerial photographs were sourced from Auckland Council GIS viewer and Google Earth Pro dated 1940, 1959, 1996, 2006, 2008, and 2010. All aerials are attached in Appendix D. All aerial photographs show the existence of the NIMT railway line. MfE includes Railway yards including goods-handling yards, workshops, refueling facilities and maintenance areas on the HAIL and identifies the contaminants of concern as a wide variety of chemicals, dependent of the products being transported. While railway lines themselves are not on the HAIL given the age of the tracks it is likely that contaminants have accumulated from years of train movements.

Section 1

The 1940 and 1959 aerial photographs of section 1 which follow the railway northwest from Glenn Innes show predominantly pastoral land. By 1996, the area is largely residential and industrial, including petroleum depots, a supermarket, and manufacturing businesses.

Section 2

Similar to section 1, aerials show that section 2 was predominantly pastoral with the exception of the development of residential area on the western side of the section between 1940 and 1959. A cemetery can be identified, directly south of the proposed shared path in all aerials from 1940 - 2010.

Section 3

Although early aerials are relatively unclear, this section appears to have changed very little since 1940. A marina can be identified where the route meets Orakei Road, with the railway line extending across Hobson Bay clear within all the aerials viewed.

2.3 Site Visit

A site visit was undertaken by MWH during July 2014, observations from this site visit are summarised below.

2.3.1 Section One

Section one includes the Glen Innes Railway station which is likely to contribute a range of contaminants which may include hydrocarbons and heavy metals. The route then runs through a grazed paddock along the boundary with an industrial area that included a mechanics workshop and roofing factory. The route runs through the pony club and behind a residential development which is unlikely to contribute any contaminants of concern. It is noted however that part of the route is located within an area that has was historically rural and therefore the presence of organochlorine pesticides cannot be discounted.

2.3.2 Section Two

Section two runs through a bush remnant area and along the edge of the NIMT railway line, before crossing on the western boundary of Purewa Cemetery and continuing through Tahape Reserve which is situated over a closed landfill. As discussed above both the cemetery and the closed landfill are considered hazardous land uses and may have contributed contaminants of concern to the surrounding soils. A T&T investigation indicates that concentrations of contaminants within the closed landfill are not of concern for the proposed development. The route continues to travel along the NIMT railway line, across Orakei Basin to Orakei Road.

2.3.3 Section Three

Section three consists of two likely options, the blue route option is to run along the NIMT railway line across Hobson Bay and meet up with Tamaki Drive near a marina. The second option would follow the line of the coast and would predominantly be situated within the coastal marine area before meeting Ngapipi Road.

3 Assessment of Risk

A number of potential contaminating activities have been identified along the proposed shared path. Potential contamination constraints on the project have been summarised in Table 3-1 below

Table 3-1: Present Land Use

Section	Land-use	Potential Risk	Recommended Further Investigations
Section 1	Predominantly grazed reserve land, adjacent to industrial and residential areas. Part of the route will cross the NIMT railway line.	Unclear whether horticultural activities have occurred within the reserve land and therefore organochlorine pesticides (OCPs) could be a contaminant of concern. Industrial areas may have contributed heavy metals and hydrocarbon contaminants to local soils. Contaminants associated with rail tracks include heavy metals and a range of hydrocarbons.	Soil sampling is recommended along the boundary of the industrial area and within the reserve land to confirm presence or absence of contaminants. The route will not intercept the rail corridor and therefore the risk of contamination from rail tracks is considered negligible.
Section 2	Land use predominantly residential and reserve land. The proposed route will include a cemetery and closed landfill as well as the rail corridor.	Unclear whether horticultural activities have occurred within the reserve land and therefore OCPs could be a contaminant of concern. Cemetery's contribute a range of contaminants including nitrates, lead, mercury, formaldehyde, and biological hazards. Closed landfills may contribute a range of contaminants including a wide range of hydrocarbons and heavy metals. Contaminants associated with rail tracks include heavy metals and a range of hydrocarbons.	Soil sampling is recommended within the reserve areas to confirm presence or absence of OCPs. The route will not be constructed within the boundary of the cemetery, but will include the edge of the north west corner and therefore it is recommended one soil sample be undertaken to identify any migration of contaminants. A detailed site investigation exists for Tahape closed landfill and concluded that all contaminants were below the maintenance worker guidelines, it is therefore considered that the risk to excavation workers is minimal subject to appropriate health and safety controls and further investigation is not required. It is recommended that samples are taken along the proposed route where the route includes the rail corridor to quantify the level of contamination.
Section 3	A railway station,	Contaminants associated with	It is recommended that soil

Section	Land-use	Potential Risk	Recommended Further Investigations
	railway tracks across Orakei and Hobson Bay and a marina.	rail tracks include heavy metals and a range of hydrocarbons A boat marina may also contribute hydrocarbons from refuelling activities.	sampling be undertaken within the rail corridor to quantify levels of contamination. The route is some distance from the boat marina and therefore further sampling in this area is not required.

4 Conclusion and Recommendations

The proposed Glen Innes to Tamaki Drive shared path route is approximately 6.5 kilometres long and traverses through a number of land uses which may have contributed contaminants to the land. It should also be noted that the information available to assess was limited and it cannot be confidently assumed that all potentially contaminating land uses have been identified.

Table 3-1 summarises the land uses which may pose a risk to human health and summarises recommended further investigations to quantify those risks. A detailed site investigation should be undertaken to quantify the level of contamination along the proposed route with reference to appropriate soil contaminant standards outlined in the NES.

Appendix A - Auckland Council Records

Auckland Council
Te Kaunihera o Tāmaki Makaurau

19 August

MWH New Zealand Ltd
PO Box 13 249
Christchurch 8141

Attention: Isobel Oldfield

Dear Isobel

Site Contamination Enquiry – *Waterview cycleway – Section 1 - Area of land from Merton Road, St Johns to St Johns Road, Meadowbank*

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment (6-05 and 6-05-SV, respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

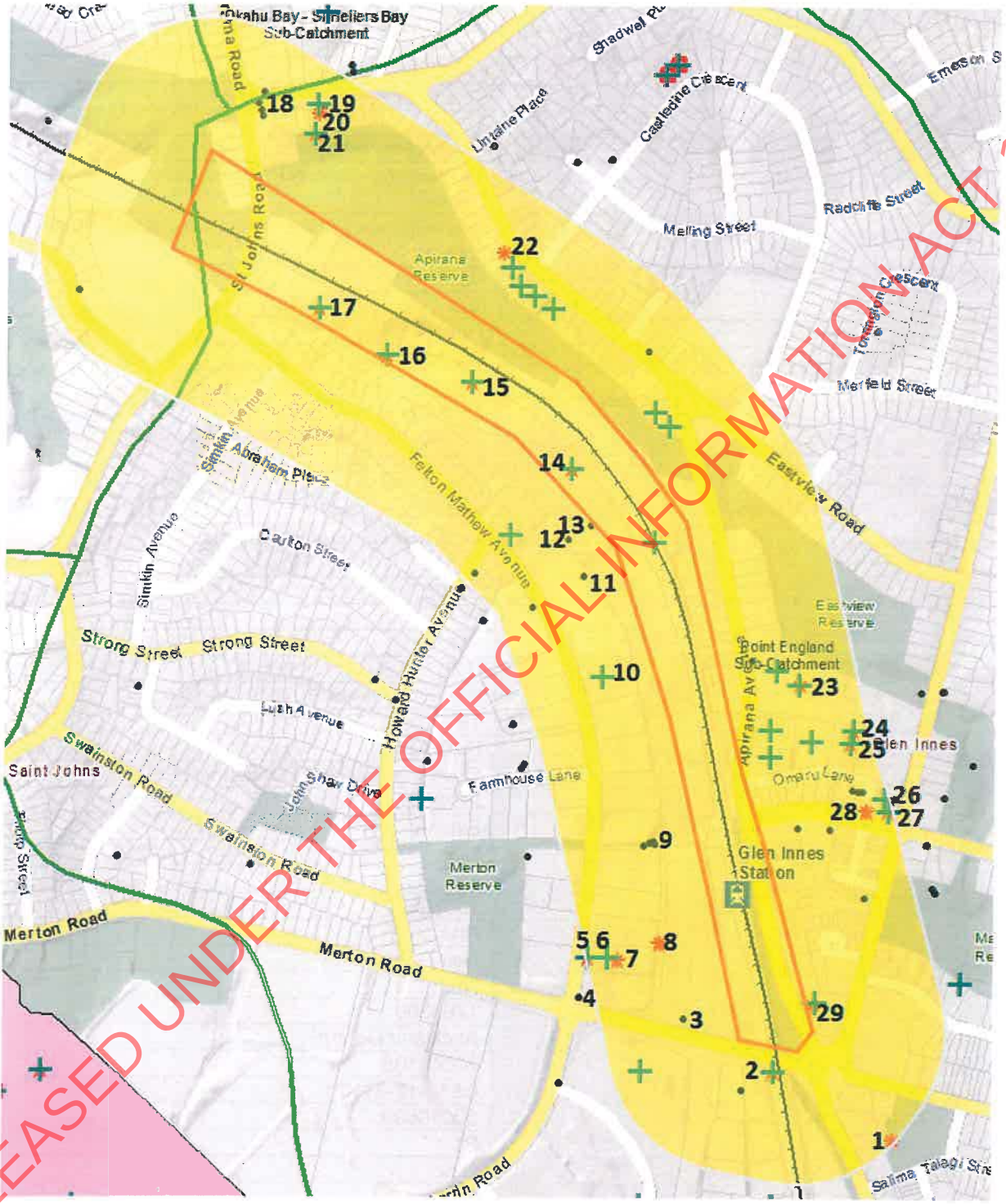
Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 1 - 2.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

pp

David Hampson
Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment A:



1. ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	redevelopment of residential Housing NZ site for higher density residential housing on former horticultural land
ACTIVITY ID:	20333
ACTIVITY STATUS:	Completed
CONSENT STATUS:	Assessment Completed
EASTING:	1765480

EXPIRY DATE:	Null
FILE REFERENCE:	T096-05-3371
GRANTED DATE:	Null
LOC TYPE:	Area
NORTHING:	5916600
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51127
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	330 Apirana Avenue Point England Auckland Central
PURPOSE:	redevelopment of residential, increased density of housing
REVIEW DATE:	Null
SITE DESCR:	Null
SITE NAME:	Talbot Park
WORKS DESCRIPTION:	PO peter Kavanagh

2. ACTIVITY DESCRIPTION:	To authorise the construction of up to 23 geotechnical bores associated with the eastern corridor project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Auckland Isthmus Waitemata
AQUIFER TE:	Null
BORE ID:	21905
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	Null
CASING FROM:	0
CASING TO:	18
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	27926
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030521
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1765300
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040508
FILE REFERENCE:	C512-12-3118*
GRANTED DATE:	20030509
GROUND ELE:	21
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5916700
PROCESSING OFFICER:	_Michelle Ip
PROPERTY ADDRESS:	Various - Eastern Corridor Auckland City, Manukau City
PURPOSE:	To authorise the construction of up to 23

	geotechnical bores associated with the eastern corridor project.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	22
WORKS DESCRIPTION:	Construction of up to 23 100mm diameter bores to a depth of approximately 40m. Installation of PVC casing to various depths.

3. ACTIONED BY:	Tim Butler
CATCHMENT CODE:	605
CULPRIT TRACED:	YES
IMPACT:	Stormwater
INCIDENT NUMBER:	11/0033
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	14/12/2010
LOCATION:	88 Merton Rd
POLLUTANT TYPE:	Dirt / Inert Minerals / Sediment
PROBLEM FOUND:	YES
RECIEVED:	From ARC
RECORD DATE:	14/12/2010
REPORT:	Sediment Entering SW
SUBURB:	St Johns
VOLUME:	10-200 litres

4. ACTIONED BY:	Andrea Horton
CATCHMENT CODE:	605
CULPRIT TRACED:	NO
IMPACT:	Potential
INCIDENT NUMBER:	11/3863
INCIDENT TYPE:	Earthworks
INVESTIGATION DATE:	7/10/2011
LOCATION:	Felton Mathew Ave
POLLUTANT TYPE:	Dirt / Inert Minerals / Sediment
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	7/10/2011
REPORT:	Large pile of dirt with no sediment controls in place
SUBURB:	St Johns
VOLUME:	N/A

5. ACTIVITY DESCRIPTION:	To authorise the construction of ten bores for environmental monitoring.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	22953
BORE LOG:	Null

BORE USE:	Observation / Piezo
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Tonkin & Taylor Limited
CONSENT NUMBER:	34726
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1765020
ENVIRONMENT:	Null
EXPIRY DATE:	20080819
FILE REFERENCE:	C512-12-4052*
GRANTED DATE:	20070820
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5916870
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	134 Felton Mathew Avenue St Johns Auckland Central
PURPOSE:	To authorise the construction of ten bores for environmental monitoring.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Tonkin and Taylor
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	A construction of ten 50mm diameter bores to an approximate depth of 6m. Installation of Class V PVC casing material to an approximate depth of 6m. Proposed grouting to 6m.

6. ACTIVITY DESCRIPTION:	Long term remediation associated with the development of a new supermarket.
ACTIVITY ID:	21110
ACTIVITY STATUS:	Null
ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	Progressive Enterprises Ltd
CONSENT NUMBER:	37703
CONSENT STATUS:	Issued
DATE CREATE:	19/08/2014 7:22:11 p.m.
EXPIRY DATE:	20451031

FILE REFERENCE:	21610
GRANTED DATE:	20120127
LOC TYPE:	Point
PROCESSING OFFICER:	Mark Crooks
PROPERTY ADDRESS:	134 Felton Mathew Avenue St Johns Auckland Central
PURPOSE:	To discharge contaminants to land associated with the remediation of land containing elevated levels of contaminants associated with the development of a supermarket.
REVIEW DATE:	20130127
SITE DESCRIPTION:	remediation associated with the development of a new supermarket.
SITE NAME:	Progressive Enterprises
WORKS DESCRIPTION:	Null

6. ACTIVITY DESCRIPTION:	Short term remediation for the ongoing discharge of contaminants to land associated with the development of a new supermarket.
ACTIVITY ID:	21094
ACTIVITY STATUS:	Null
ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	Progressive Enterprises Ltd
CONSENT NUMBER:	37478
CONSENT STATUS:	Issued
DATE CREATE:	19/08/2014 7:22:11 p.m.
EXPIRY DATE:	20151031
FILE REFERENCE:	21610
GRANTED DATE:	20120127
LOC TYPE:	Point
PROCESSING OFFICER:	Mark Crooks
PROPERTY ADDRESS:	134 Felton Mathew Avenue St Johns Auckland Central
PURPOSE:	To discharge contaminants to land associated with the remediation of land containing elevated levels of contaminants, and for the ongoing discharge of contaminants associated with the development of a supermarket.
REVIEW DATE:	20130127
SITE DESCRIPTION:	The ongoing discharge of contaminants to land associated with the development of a new supermarket.
SITE NAME:	Progressive Enterprises Limited
WORKS DESCRIPTION:	Null

7. ACTIVITY DESCRIPTION:	To authorise the construction of five bores for contaminated site investigation.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	23385
BORE LOG:	Null
BORE USE:	Water Quality
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null

CASING TYPE:	Null
CONSENT HOLDER:	Null
CONSENT NUMBER:	52211
CONSENT STATUS:	Assessment Completed
CONSULTANT:	Tonkin & Taylor Limited
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1765065
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	C512-12-4439*
GRANTED DATE:	20090619
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5916865
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	134 Felton Mathew Avenue St Johns Auckland Central
PURPOSE:	To authorise the construction of five bores for contaminated site investigation.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Shanghai Investment Trust
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	The construction of five 100mm diameter bores to a maximum depth of 5m. Installation of UPVC casing material to an approximate depth of 5m.

8. ACTIVITY DESCRIPTION:	To construct up to 6 bores for geological, groundwater and contaminated site investigations.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	23560
BORE LOG:	Null
BORE USE:	Geotechnical
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Null

CONSENT NUMBER:	52366
CONSENT STATUS:	Assessment Completed
CONSULTANT:	Tonkin & Taylor Limited
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1765128.8
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	C512-12-4589*
GRANTED DATE:	20100223
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5916892
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	134 Felton Mathew Avenue St Johns Auckland Central
PURPOSE:	To construct up to 6 bores for geological, groundwater and contaminated site investigations.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	NZTA-134 Felton Matthew Dr
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	The construction of six 50mm diameter bores to an approximate depth of 4m. Installation of UPVC casing to depth of 4m.

9. ACTIONED BY:	Bridgette Rademakers
CATCHMENT CODE:	605
CULPRIT TRACED:	YES
IMPACT:	Nil
INCIDENT NUMBER:	13/2066
INCIDENT TYPE:	Natural
INVESTIGATION DATE:	14/06/2013
LOCATION:	122A Felton Mathew Ave
POLLUTANT TYPE:	Natural
PROBLEM FOUND:	YES
RECIEVED:	Enviroline
RECORD DATE:	14/06/2013
REPORT:	Oily & rusty colour water entering storm water drain from business
SUBURB:	St Johns
VOLUME:	Nil

9. ACTIONED BY:	Tim Butler
CATCHMENT CODE:	605
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	12/3140
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	1/09/2012
LOCATION:	Felton Mathew Ave
POLLUTANT TYPE:	Paint / Dye / Inks
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	1/09/2012
REPORT:	Paint in the stream
SUBURB:	St Johns
VOLUME:	10-200 litres

9. ACTIONED BY:	Tim Butler
CATCHMENT CODE:	605
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	12/3143
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	1/09/2012
LOCATION:	277 St Johns Rd
POLLUTANT TYPE:	Paint / Dye / Inks
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	1/09/2012
REPORT:	Creamy substance in the stream
SUBURB:	St Johns
VOLUME:	10-200 litres

9. ACTIONED BY:	Tim Butler
CATCHMENT CODE:	605
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	12/3139
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	1/09/2012
LOCATION:	122A Felton Mathew Ave
POLLUTANT TYPE:	Paint / Dye / Inks
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	1/09/2012
REPORT:	Paint Dumped into S/W
SUBURB:	St Johns
VOLUME:	10-200 litres

10. ACTIVITY DESCRIPTION:	To discharge to air from a roof tile manufacturing facility.
ACTIVITY ID:	20118
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Discharge To Air
CONSENT HOLDER:	AHI Roofing Limited
CONSENT NUMBER:	29066
CONSENT STATUS:	Issued

DATE CREATE:	18/08/2014 7:20:34 p.m.
EXPIRY DATE:	20220402
FILE REFERENCE:	17433
GRANTED DATE:	20120402
LOC TYPE:	Point
PROCESSING OFFICER:	Jared Osman
PROPERTY ADDRESS:	90 Felton Mathew Avenue St Johns Auckland Central
PURPOSE:	To discharge contaminants into air from the chip coating, painting and glazing of steel roofing products.
REVIEW DATE:	20130330
SITE DESCRIPTION:	90 - 104 Felton Mathew Avenue, St Johns
SITE NAME:	AHI Roofing Limited
WORKS DESCRIPTION:	Null

11. ACTIONED BY:	Anahita Djamali
CATCHMENT CODE:	605
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	12/0763
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	9/02/2012
LOCATION:	90 Felton Mathew Ave
POLLUTANT TYPE:	Paint / Dye / Inks
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	9/02/2012
REPORT:	Water Pollution
SUBURB:	St Johns
VOLUME:	200-1000 litres

12. ACTIONED BY:	Nora Leuschner
CATCHMENT CODE:	605
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	09/0523
INCIDENT TYPE:	Sewage Overflow
INVESTIGATION DATE:	5/02/2009
LOCATION:	90/104 Felton Mathew Ave
POLLUTANT TYPE:	Wastewater - Sewer Overflow
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	5/02/2009
REPORT:	DWSO
SUBURB:	St Johns
VOLUME:	200-1000 litres

13. ACTIONED BY:	Moka Leilani Seaton
CATCHMENT CODE:	605
CULPRIT TRACED:	YES
IMPACT:	Nil
INCIDENT NUMBER:	08/3283
INCIDENT TYPE:	Not Found
INVESTIGATION DATE:	1/10/2008
LOCATION:	Felton Mathew Ave
POLLUTANT TYPE:	Not Found / Nothing

PROBLEM FOUND:	NO
RECIEVED:	Hotline
RECORD DATE:	1/10/2008
REPORT:	White Stream
SUBURB:	St Johns
VOLUME:	Nil

14. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1764990
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5917600
PROCESSING OFFICER:	Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null

TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

15. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1764840
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5917730
PROCESSING OFFICER:	Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central

TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

16. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1764710
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5917770
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39

WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

17. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1764610
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5917840
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores

	to a depth of no greater than 40m. Installation of PVC casing.

18. ACTIONED BY:	Thomas Harre
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Stormwater
INCIDENT NUMBER:	08/2792
INCIDENT TYPE:	Sediment / Stormwater
INVESTIGATION DATE:	7/08/2008
LOCATION:	St Heliers Bay Rd
POLLUTANT TYPE:	Dirt / Inert Minerals / Sediment
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	7/08/2008
REPORT:	De-watering
SUBURB:	St Heliers
VOLUME:	200-1000 litres

18. ACTIONED BY:	Toby Barach
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Stormwater
INCIDENT NUMBER:	08/2958
INCIDENT TYPE:	Sediment / Stormwater
INVESTIGATION DATE:	4/09/2008
LOCATION:	St Heliers Bay Rd
POLLUTANT TYPE:	Dirt / Inert Minerals / Sediment
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	4/09/2008
REPORT:	Sediment discharge
SUBURB:	St Heliers
VOLUME:	10-200 litres

18. ACTIONED BY:	Hazel Meadows
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Stormwater
INCIDENT NUMBER:	08/3442
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	17/10/2008
LOCATION:	Cnr St Heliers Bay Rd and Kohimarama Rd
POLLUTANT TYPE:	Dirt / Inert Minerals / Sediment
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	17/10/2008
REPORT:	Sediment washed to stormwater
SUBURB:	St Heliers
VOLUME:	10-200 litres

18. ACTIONED BY:	Stuart Timmis
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Stormwater
INCIDENT NUMBER:	08/3541
INCIDENT TYPE:	Sediment / Stormwater

INVESTIGATION DATE:	31/10/2008
LOCATION:	St Heliers Bay Rd
POLLUTANT TYPE:	Dirt / Inert Minerals / Sediment
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	31/10/2008
REPORT:	Discharge of sediment to s/w
SUBURB:	St Heliers
VOLUME:	<10 litres

19. ACTIONED BY:	Tim Butler
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Nil
INCIDENT NUMBER:	11/4155
INCIDENT TYPE:	Spill Report (No Pollution)
INVESTIGATION DATE:	11/11/2011
LOCATION:	350 St Heliers Bay Rd
POLLUTANT TYPE:	Hydrocarbon - Fuel / Diesel
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	11/11/2011
REPORT:	Petrol Spill
SUBURB:	St Heliers
VOLUME:	<10 litres

20. ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	TPH and Benzne beneth former UST in one location.
ACTIVITY ID:	20258
ACTIVITY STATUS:	Completed
CONSENT STATUS:	Assessment Completed
EASTING:	1764608
EXPIRY DATE:	Null
FILE REFERENCE:	5-41-3354
GRANTED DATE:	Null
LOC TYPE:	Area
NORTHING:	5918130
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51037
PROCESSING OFFICER:	_Guy Sowry
PROPERTY ADDRESS:	350 St Heliers Bay Road St Johns Auckland Central
PURPOSE:	Operating service station with minimal contamintion in ground. Site manegment required.
REVIEW DATE:	Null
SITE DESCR:	Lot 12 dp 50771
SITE NAME:	Mobil Clearview
WORKS DESCRIPTION:	Site Management Plan

21. ACTIVITY DESCRIPTION:	Null
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Auckland Isthmus Waitemata
AQUIFER TE:	Null
BORE ID:	21733

BORE LOG:	Y
BORE USE:	Observation / Piezo
CASING DIA:	Null
CASING FROM:	0
CASING TO:	1
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Mobil Oil NZ Limited
CONSENT NUMBER:	26969
CONSENT STATUS:	Expired
CONSULTANT:	Pattle Delamore Partners Limited
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1764600
ENVIRONMENT:	Null
EXPIRY DATE:	20030721
FILE REFERENCE:	C512-12-2953*
GRANTED DATE:	20020719
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918100
PROCESSING OFFICER:	Roger Bannister
PROPERTY ADDRESS:	350 St Heliers Bay Road Auckland City
PURPOSE:	Authorise the construction of up to three (3) environmental monitoring bores.
REVIEW DATE:	Null
SCREEN FROM:	1
SCREEN TO:	7
SCREEN TYPE:	PVC/ABS
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	Construction of up to three (3) 50mm diameter bores to a depth of approximately 6m. Installation of PVC casing to a depth of approximately 3m.

22. ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	Residential site preliminary investigation.
ACTIVITY ID:	20881
ACTIVITY STATUS:	Occurring
CONSENT STATUS:	Under Assessment
EASTING:	1764887
EXPIRY DATE:	Null
FILE REFERENCE:	6-05-3962
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5917922

PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51825
PROCESSING OFFICER:	Mark Crooks
PROPERTY ADDRESS:	35 Apirana Avenue St Johns Auckland Central
PURPOSE:	File reference 6-05-3962, Residential PSI review for subdivision.
REVIEW DATE:	Null
SITE DESCR:	Residential site preliminary investigation.
SITE NAME:	35 Apirana Ave, GI
WORKS DESCRIPTION:	Residential PSI review

23. ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	The existing supermarket car park, previously a car sales yard with USTs and dang. goods, a car wrecking site, and a supermarket site, to be partially re-developed to accomodate an extension of a supermarket building, and construction of a petrol statio
ACTIVITY ID:	20534
ACTIVITY STATUS:	Completed
CONSENT STATUS:	Assessment Completed
EASTING:	1765335
EXPIRY DATE:	Null
FILE REFERENCE:	3604
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5917277
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51421
PROCESSING OFFICER:	Andrew Kalbarczyk
PROPERTY ADDRESS:	182 Apirana Avenue Glen Innes Auckland Central
PURPOSE:	File #: 6-05-3604. A site occupied by a supermarket and carpark, previously used as a car sales yard with USTs and dang.goods, a car wrecking yard, and another supermarket to be re-developed by the extension of the supermarket building and construction
REVIEW DATE:	Null
SITE DESCR:	Lot1 DP 122742 and Lots 4&5 DP53260
SITE NAME:	Pak'N'Save Glen Innes, 182-194 Apirana Ave
WORKS DESCRIPTION:	A Ground Contam Assess Report by T&T, dated 15/9/2004, addit'l testing in Aug 2007 and addit'l contam assmnt Feb 2007 identified overall low risk of contamination on site.

24. ACTIVITY DESCRIPTION:	To authorise the construction of 6 bores for groundwater monitoring and chemical analysis.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	23152
BORE LOG:	Null
BORE USE:	Observation / Piezo
CASING DIA:	Null
CASING FROM:	Null

CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Foodstuffs (Auckland) Limited
CONSENT NUMBER:	35702
CONSENT STATUS:	Expired
CONSULTANT:	Babbage Consultants Ltd
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1765415
ENVIRONMENT:	Null
EXPIRY DATE:	20090410
FILE REFERENCE:	C512-12-4230*
GRANTED DATE:	20080411
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5917210
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	182 Apirana Avenue Glen Innes Auckland Central
PURPOSE:	To authorise the construction of 6 bores for groundwater monitoring and chemical analysis.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Foodstuffs Auckland - Pak 'n Save Glen Innes
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	The construction of six 100mm diameter bores to a maximum depth of between 5 -10m. Installation of temporary steel casing material to an approximate depth of between 0 and 10m. Proposed grouting to betwen 0 and 10m...

25: ACTIVITY DESCRIPTION:	To authorise the construction of six bores for environmental monitoring.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	22905
BORE LOG:	Null
BORE USE:	Observation / Piezo
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null

CASING TYPE:	Null
CONSENT HOLDER:	Tonkin & Taylor Limited
CONSENT NUMBER:	34300
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1765412
ENVIRONMENT:	Null
EXPIRY DATE:	20080613
FILE REFERENCE:	C512-12-4008*
GRANTED DATE:	20070613
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5917192
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	182 Apirana Avenue Glen Innes Auckland Central
PURPOSE:	To authorise the construction of six bores for environmental monitoring.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	A construction of six 50mm diameter bores to an approximate depth of 10m. Installation of HPPE casing material to an approximate depth of 10m. Proposed grouting to 0.5m.

26. ACTIVITY DESCRIPTION:	Application to discharge contaminants to ground namely the advancement of boreholes into ground possibly containing separate phase hydrocarbons.
ACTIVITY ID:	21169
ACTIVITY STATUS:	Null
ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	Pattle Delamore Partners Limited
CONSENT NUMBER:	38707
CONSENT STATUS:	Expired
DATE CREATE:	18/08/2014 7:20:34 p.m.
EXPIRY DATE:	20110228
FILE REFERENCE:	22229
GRANTED DATE:	20101126

LOC TYPE:	Point
PROCESSING OFFICER:	Andrew Kalbarczyk
PROPERTY ADDRESS:	115 Line Road Glen Innes Auckland Central
PURPOSE:	To discharge contaminants to land or water associated with the proposed investigation of the site, namely the advancement of boreholes into ground possibly containing separate phase hydrocarbons.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Taniwaha Street, Glen Innes
WORKS DESCRIPTION:	Null

27. ACTIVITY DESCRIPTION:	To authorise the construction of six bores for groundwater monitoring purposes.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	22922
BORE LOG:	Null
BORE USE:	Observation / Piezo
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Chevron New Zealand ***USE 751***
CONSENT NUMBER:	34389
CONSENT STATUS:	Expired
CONSULTANT:	URS New Zealand Limited
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1765469
ENVIRONMENT:	Null
EXPIRY DATE:	20080709
FILE REFERENCE:	C512-12-4023*
GRANTED DATE:	20070710
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5917091
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	115 Line Road Glen Innes Auckland Central
PURPOSE:	To authorise the construction of six bores for groundwater monitoring purposes.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null

SITE NAME:	Null
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	A construction of six 50mm diameter bores to an approximate depth of 5m. Installation of D PVC casing material to an approximate depth of 5m. Proposed grouting to 0.5m.

28. ACTIVITY DESCRIPTION:	To authorise the construction of ten bores to conduct a groundwater investigation and contaminated site investigation.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	23747
BORE LOG:	Null
BORE USE:	Observation / Piezo
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Null
CONSENT NUMBER:	52496
CONSENT STATUS:	Assessment Completed
CONSULTANT:	Pattle Delamore Partners Limited
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1765438
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	C512-12-4713
GRANTED DATE:	20101013
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5917091
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	115 Line Road Glen Innes Auckland Central
PURPOSE:	To authorise the construction of ten bores to conduct a groundwater investigation and contaminated site investigation.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Roger Innes Gordon

STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	The construction of ten 50mm diameter bores to a maximum depth of 5m.

29. ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	Mobil Glen Innes
ACTIVITY ID:	20814
ACTIVITY STATUS:	Occurring
CONSENT STATUS:	Under Assessment
EASTING:	1765358
EXPIRY DATE:	Null
FILE REFERENCE:	6-05-3899
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5916800
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51744
PROCESSING OFFICER:	Sarah Pinkerton
PROPERTY ADDRESS:	296 Apirana Avenue Glen Innes Auckland Central
PURPOSE:	Hotspot of TPH/BTEX above comm/ind appears to be localised. Effects on environment likely to be minor. Have requested SMP.
REVIEW DATE:	Null
SITE DESCR:	Lot 4 DP 145066
SITE NAME:	296 Apirana Ave, Glen Innes
WORKS DESCRIPTION:	c/o Kylie Eckersley File 6-05-3899

Auckland Council
Te Kaunihera o Tāmaki Makaurau

08 September 2014

MWH New Zealand Ltd
PO Box 13 249
Christchurch

Attention: Isobel Oldfield

Dear Isobel

Site Contamination Enquiry – *Waterview cycleway – Section 2 – Area of land from St Johns Road, Meadowbank to Orakei Road, Remuera*

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment 6-05, 5-41 and 5-42-SV, respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

We have identified that the following site (within 200 metres of the area searched) may have been subject to historic filling / importation of unverified-origin material. Please note that this information is indicative only and our database of such sites is incomplete.

INDICATIVE ONLY	**Please contact Contaminated Land (Environmental Services)**
PROPERTY INFO:	AUCKLAND COUNCIL
SITE ID:	24
SITE NAME:	Tahapa Crescent Eastern Bays

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

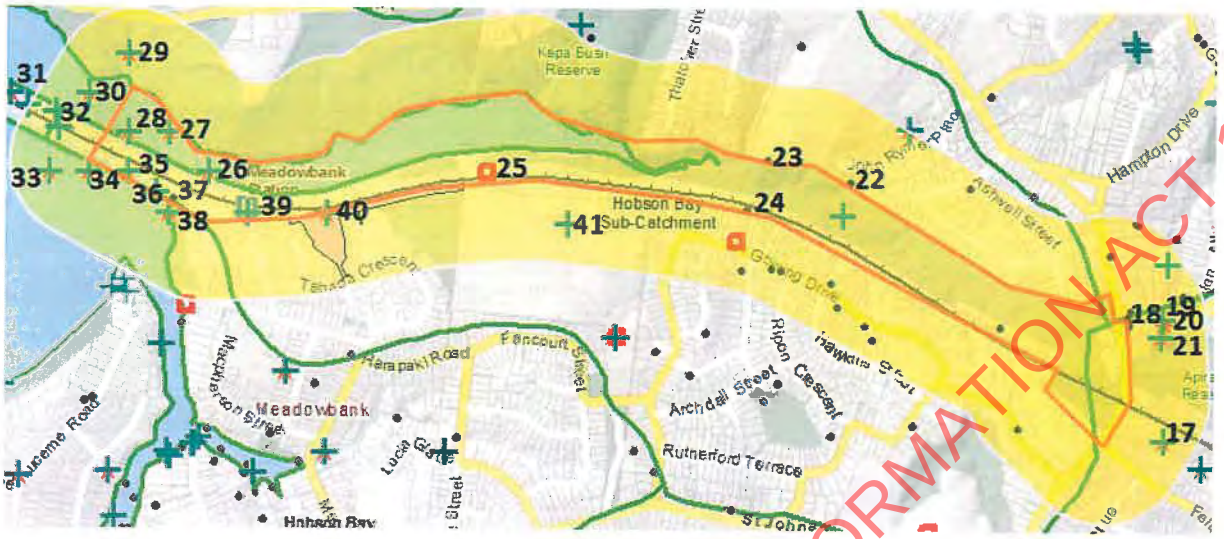
I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 1 - 2.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

David Hampson
Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment B:



Note: sites 17, 18, 19, 20 + 21 included in Attachment A (Letter and Map dated 19 August 2014)

22. ACTIONED BY:	John Langi
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Potential
INCIDENT NUMBER:	13/3826
INCIDENT TYPE:	Sewage Overflow
INVESTIGATION DATE:	5/12/2013
LOCATION:	64 John Rymer Place
POLLUTANT TYPE:	Wastewater - Sewer Overflow
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	5/12/2013
REPORT:	DWSO
SUBURB:	Kohimarama
VOLUME:	<10 litres

23. ACTIONED BY:	Tim Butler
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Potential
INCIDENT NUMBER:	14/0255
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	22/01/2014
LOCATION:	245 Kohimarama Rd
POLLUTANT TYPE:	Hydrocarbon - Oil
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	22/01/2014
REPORT:	Potential water pollution
SUBURB:	Kohimarama
VOLUME:	10-200 litres

24. ACTIONED BY:	Haylee Puckey

CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Offensive or Objectionable
INCIDENT NUMBER:	08/2651
INCIDENT TYPE:	Open Burning
INVESTIGATION DATE:	18/07/2008
LOCATION:	106 Gowing Dr
POLLUTANT TYPE:	Smoke
PROBLEM FOUND:	YES
RECIEVED:	Enviroline
RECORD DATE:	22/07/2008
REPORT:	burning
SUBURB:	Meadowbank
VOLUME:	N/A

25. ACTIVITY:	Disposal/Deposit/Replenishment
ACTIVITY DESCRIPTION:	Sand Beach and associated rock groyne
ACTIVITY ID:	20037
ACTIVITY STATUS:	Proposed
APPLICANT:	Null
APPLICATION:	28962
APPLICATION STATUS:	Withdrawn
EASTING:	1762900
FILE REFERENCE:	17349
LOC TYPE:	Area
LODGED DATE:	20040213
NORTHING:	5918500
PROCESSING OFFICER:	Andrew Benson
PROPERTY ADDRESS:	8 Tamaki Drive Orakei Auckland Central
PURPOSE:	Sand Beach and associated rock groyne
SITE DESCRIPTION:	Null
SITE NAME:	Orakei Marina Tamaki Drive Orakei
WORKS DESCRIPTION:	Null

26. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39

EASTING:	1762200
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918500
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

27. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1762100

ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918600
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

28. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1762000
ENVIRONMENT:	Auckland Central

EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918600
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

29. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1762000
ENVIRONMENT:	Auckland Central

EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918800
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

30. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1761900
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724

FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918700
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

31. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1761700
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724

FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918700
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

32. ACTIVITY DESCRIPTION:	Disturbance of the seabed with the drilling of 100mm boreholes for the purpose of geotechnical investigations.
ACTIVITY ID:	20122
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Coastal Other
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28011
CONSENT STATUS:	Expired
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20031214
FILE REFERENCE:	16790
GRANTED DATE:	20030714
LOC TYPE:	Point
PROCESSING OFFICER:	_Alan Moore
PROPERTY ADDRESS:	
PURPOSE:	This consent shall expire on 14 December 2003 unless it has lapsed, been surrendered of been cancelled at an earlier date pursuant to the Resource Management Act 1991. To authorise the disturbance of the foreshore and seabed for the purposes of drilling
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Hobson Bay & Orakei Basin
WORKS DESCRIPTION:	Null

33. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1761800
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918500
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

34. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24

	investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1761900
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918500
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

35. ACTIVITY DESCRIPTION:	To authorise the construction of up to 16 bores for

	investigation purposes.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Y
BORE ID:	21951
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	80
CASING FROM:	0
CASING TO:	45
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28231
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20040212
DIAMETER:	80
DIAMETER F:	0
DIAMETER T:	45
EASTING:	1762000
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040824
FILE REFERENCE:	C512-12-3153*
GRANTED DATE:	20030820
GROUND ELE:	62
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918500
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Eastern Corridor Auckland City & Manukau City
PURPOSE:	To authorise the construction of up to 16 bores for investigation purposes.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	St Johns
SITE NAME:	Null
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Manukau
TOTAL DEPT:	45
WORKS DESCRIPTION:	Construction of up to 16 100mm diameter bores, to a depth of approximately 40m. Installation of PVC casing.

36. ACTIVITY DESCRIPTION:	In cleaning a bridge - dust from process of painted & rusted steel
ACTIVITY ID:	20295
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Discharge To Air

CONSENT HOLDER:	TEMCO Ltd
CONSENT NUMBER:	31367
CONSENT STATUS:	Expired (Not Replace
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20060331
FILE REFERENCE:	18596
GRANTED DATE:	20051122
LOC TYPE:	Point
PROCESSING OFFICER:	_Xenia Meier
PROPERTY ADDRESS:	Railway Land Auckland Central Auckland Central
PURPOSE:	To authorise the discharge of contaminants into air from dry abrasive blasting of the North Island Main Trunk Line Bridge No. 382, Auckland in accordance with Section 15(1)(c) of the Resource Management Act 1991.
REVIEW DATE:	Null
SITE DESCRIPTION:	End of Purewa Road, Meadowbank - adj to 187 Meadowbank Rd (Reserve)
SITE NAME:	Temco - Bridge no.382
WORKS DESCRIPTION:	Null

37. ACTIONED BY:	Matthew Harrex
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	08/2620
INCIDENT TYPE:	Sewage Overflow
INVESTIGATION DATE:	15/07/2008
LOCATION:	Purewa Rd
POLLUTANT TYPE:	Wastewater - Sewer Overflow
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	15/07/2008
REPORT:	DWSO
SUBURB:	Orakei
VOLUME:	10-200 litres

38. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null

DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1762100
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918400
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

38. ACTIVITY DESCRIPTION:	To authorise the construction of up to 16 bores for investigation purposes.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Y
BORE ID:	21951
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	80
CASING FROM:	0
CASING TO:	45
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28231
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20040212
DIAMETER:	80

DIAMETER F:	0
DIAMETER T:	45
EASTING:	1762100
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040824
FILE REFERENCE:	C512-12-3153*
GRANTED DATE:	20030820
GROUND ELE:	62
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918400
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Eastern Corridor Auckland City & Manukau City
PURPOSE:	To authorise the construction of up to 16 bores for investigation purposes.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	St Johns
SITE NAME:	Null
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Manukau
TOTAL DEPT:	45
WORKS DESCRIPTION:	Construction of up to 16 100mm diameter bores, to a depth of approximately 40m. Installation of PVC casing.

39. ACTIVITY DESCRIPTION:	To dry adrasive blast clean, Bridge no. 382
ACTIVITY ID:	20196
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	TEMCO Ltd
CONSENT NUMBER:	31365
CONSENT STATUS:	Expired (Not Replace
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20060331
FILE REFERENCE:	18595
GRANTED DATE:	20060117
LOC TYPE:	Point
PROCESSING OFFICER:	Trent Sunich
PROPERTY ADDRESS:	Railway Land Auckland Central Auckland Central
PURPOSE:	To authorise the discharge of contaminants to land and or water from maintenance works to be undertaken on Bridge Number 382 in accordance with Section 15(1)(b) of the Resource Management Act 1991.
REVIEW DATE:	Null
SITE DESCRIPTION:	End of Purewa Rd, Meadowbank- adjacent to 187 Meadowbank Rd - Reserve Land
SITE NAME:	Temco- Bidge 382,

WORKS DESCRIPTION:	Null

40. ACTIVITY DESCRIPTION:	Groundwater quality sampling
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	1368
BORE LOG:	Y
BORE USE:	Observation / Piezo
CASING DIA:	Null
CASING FROM:	0
CASING TO:	6
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Auckland City Council
CONSENT NUMBER:	12789
CONSENT STATUS:	Expired
CONSULTANT:	Tonkin & Taylor Limited
CONTRACTOR:	Null
DATE DRILL:	19940727
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1762500
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	19950623
FILE REFERENCE:	C512-12-1290
GRANTED DATE:	19940624
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Alluvium
NORTHING:	5918400
PROCESSING OFFICER:	Gillian Crowcroft
PROPERTY ADDRESS:	
PURPOSE:	Authorize the construction of a bore for groundwater level and/or Chemistry investigations
REVIEW DATE:	Null
SCREEN FROM:	6
SCREEN TO:	10
SCREEN TYPE:	PVC/ABS
SITE DESCRIPTION:	Tahapa Reserve, Tahapa Crescent, Meadowbank
SITE NAME:	Null
STATIC WAT:	4.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	10
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx 13m depth. Installation of PVC casing to approx 10m and PVC screen from approx. 10m to 13m if required.

41. ACTIVITY DESCRIPTION:	Proposal to install two new drainage pipes via trenching and to construct a retaining wall within

	the Purewa cemetery in Meadowbank. The area of works will be undertaken on a site subject to contaminated land,soil warning area and an overland flow path.
ACTIVITY ID:	21481
ACTIVITY STATUS:	Occurring
ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	Purewa Cemetery Trust Board
CONSENT NUMBER:	42882
CONSENT STATUS:	Issued
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20190606
FILE REFERENCE:	24510
GRANTED DATE:	20140606
LOC TYPE:	Point
PROCESSING OFFICER:	_Samuel Woolley
PROPERTY ADDRESS:	4 Parsons Road Meadowbank, Auckland Central
PURPOSE:	To discharge contaminants from the disturbance of a contaminated site.
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	4 Parsons Road, Meadowbank
WORKS DESCRIPTION:	Null

09 September 2014

MWH New Zealand Ltd
PO Box 13 249
Christchurch

Attention: Isobel Oldfield

Dear Isobel

Site Contamination Enquiry – *Waterview Cycleway – Section 3 – Area of land from Orakei Road, Remurea to Tamaki Drive, Remuera*

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file for the catchment (5-41 and 5-42-SV, respectively) were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council, Natural Resources and Specialist Input, Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current Natural Resources and Specialist Input Unit databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within approximately 200 metres of the site. Relevant details of the identified consents are appended to this letter (Attachment A).

The details provided are in accordance with the obligation to make information publicly available upon request. While the Auckland Council has carried out the search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

In addition, it is recommended that you contact the local customer service centre of the Auckland Council, specific to the site being investigated: 35 Graham Street, Auckland Central as they also may hold files with relevant information.

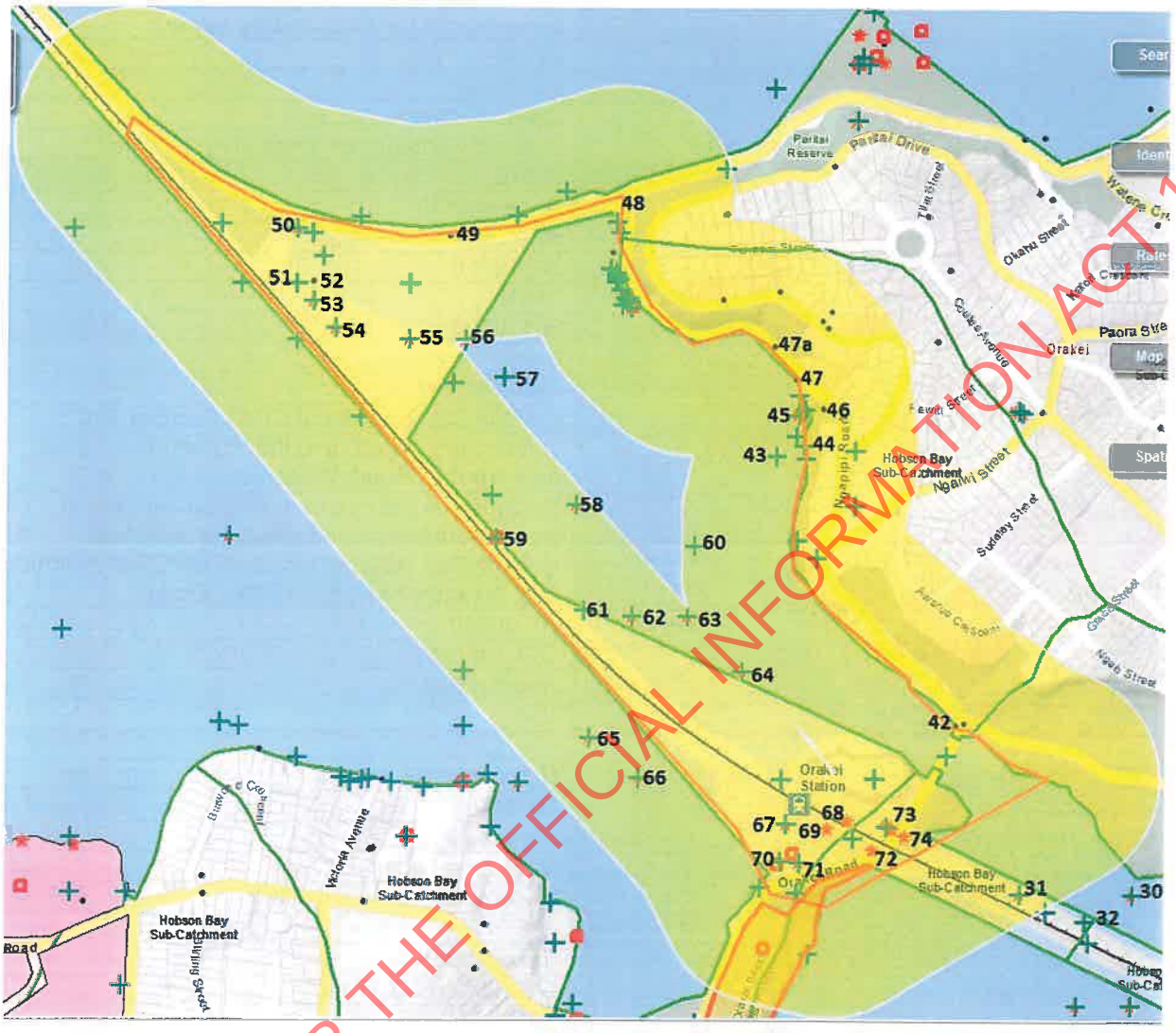
I trust that this answers your query. If you wish to discuss the matter further, please contact Andrew Kalbarczyk on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 1 - 2.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely

David Hampson
Team Leader - Earthworks and Contaminated Land
Natural Resources and Specialist Input

Attachment C:



Note: sites 30, 31 + 32 details included in Attachment B (Letter and Map dated 08 September 2014)

42. ACTIONED BY:	Glenn Riddell
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Land Only
INCIDENT NUMBER:	14/2453
INCIDENT TYPE:	Potential Water/Land Pollution
INVESTIGATION DATE:	25/07/2014
LOCATION:	near 250 Orakei Rd
POLLUTANT TYPE:	Paint / Dye / Inks
PROBLEM FOUND:	YES
RECIEVED:	Enviroline
RECORD DATE:	25/07/2014
REPORT:	Paint is entering drain from contractors painting a bridge
SUBURB:	Remuera
VOLUME:	<10 litres

43. ACTIVITY DESCRIPTION:	To authorise the use of motorised vehicles in CPA1 Number 51d, in order to assist in the demolition of the Hobson Bay sewer.
ACTIVITY ID:	20149
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Coastal Other
CONSENT HOLDER:	Fletcher Construction Engineering Limited
CONSENT NUMBER:	37876
CONSENT STATUS:	Surrendered
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20170215
FILE REFERENCE:	21812
GRANTED DATE:	20100430
LOC TYPE:	Point
PROCESSING OFFICER:	Sarah McCarter
PROPERTY ADDRESS:	Hobson Bay The part of CPA1 Number 51d immediately adjacent to the Hobson Bay sewer, near Ngapipi Road Waitemata Harbour ACC
PURPOSE:	To authorise the use of motorised vehicles to traverse rubble mound along the line of the Hobson Bay sewer at Hobson Bay CPA1 Number 51d, adjacent to Ngapipi Road, Orakei.
REVIEW DATE:	20100930
SITE DESCRIPTION:	CPA1 #51d
SITE NAME:	Hobson Bay
WORKS DESCRIPTION:	Null

44. ACTIVITY DESCRIPTION:	Null
ACTIVITY ID:	20182
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Discharge Other
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	29875
CONSENT STATUS:	Surrendered
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20170215
FILE REFERENCE:	17420
GRANTED DATE:	20061221
LOC TYPE:	Point
PROCESSING OFFICER:	_Christine Mitchell
PROPERTY ADDRESS:	33 Ngapipi Road Orakei Auckland Central
PURPOSE:	To authorise the discharge of treated groundwater, to a reticulated stormwater system, associated with the dewatering of the Hobson Bay wastewater tunnel in accordance with Section 15 of the Resource Management Act 1991.
REVIEW DATE:	20070930
SITE DESCRIPTION:	Null
SITE NAME:	Hobson Bay Sewer Pipeline
WORKS DESCRIPTION:	Null

45. ACTIONED BY:	Matthew Harrex
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	11/0521

INCIDENT TYPE:	Sewage Overflow
INVESTIGATION DATE:	20/02/2011
LOCATION:	5 Ngapipi Rd
POLLUTANT TYPE:	Wastewater - Sewer Overflow
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	20/02/2011
REPORT:	DWSO
SUBURB:	Orakei
VOLUME:	>1000 litres

46. ACTIONED BY:	Glenn Riddell
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Offensive or Objectionable
INCIDENT NUMBER:	08/4108
INCIDENT TYPE:	Air Pollution
INVESTIGATION DATE:	12/12/2008
LOCATION:	20 Ngapipi Rd
POLLUTANT TYPE:	Odour
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	12/12/2008
REPORT:	Odour from pumping station
SUBURB:	Orakei
VOLUME:	N/A

47. ACTIONED BY:	Hazel Meadows
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	08/3326
INCIDENT TYPE:	Sewage Overflow
INVESTIGATION DATE:	13/10/2008
LOCATION:	10 Ngapipi Rd
POLLUTANT TYPE:	Wastewater - Sewer Overflow
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	13/10/2008
REPORT:	DWSO to sea
SUBURB:	Orakei
VOLUME:	10-200 litres

47a. ACTIONED BY:	Bridgette Rademakers
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Stormwater
INCIDENT NUMBER:	13/1856
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	17/05/2013
LOCATION:	10 Ngapipi Rd
POLLUTANT TYPE:	Concrete Wastewater
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	17/05/2013
REPORT:	Concrete Slurry
SUBURB:	Orakei

VOLUME:	10-200 litres

48. ACTIONED BY:	Katie Navrotskaya
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	10/2738
INCIDENT TYPE:	Sewage Overflow
INVESTIGATION DATE:	13/09/2010
LOCATION:	Ngapipi Rd
POLLUTANT TYPE:	Wastewater - Sewer Overflow
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	13/09/2010
REPORT:	DWSO
SUBURB:	Orakei
VOLUME:	10-200 litres

49. ACTIONED BY:	Natalie James
CATCHMENT CODE:	541
CULPRIT TRACED:	NO
IMPACT:	Potential
INCIDENT NUMBER:	12/0685
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	3/02/2012
LOCATION:	Tamaki Dr
POLLUTANT TYPE:	Paint / Dye / Inks
PROBLEM FOUND:	YES
RECIEVED:	Enviroline
RECORD DATE:	3/02/2012
REPORT:	Water Pollution
SUBURB:	Orakei
VOLUME:	N/A

50. ACTIONED BY:	Natalie James
CATCHMENT CODE:	541
CULPRIT TRACED:	NO
IMPACT:	Potential
INCIDENT NUMBER:	12/0685
INCIDENT TYPE:	Water / Land Pollution
INVESTIGATION DATE:	3/02/2012
LOCATION:	Tamaki Dr
POLLUTANT TYPE:	Paint / Dye / Inks
PROBLEM FOUND:	YES
RECIEVED:	Enviroline
RECORD DATE:	3/02/2012
REPORT:	Water Pollution
SUBURB:	Orakei
VOLUME:	N/A

51. ACTIVITY DESCRIPTION:	Outboard Boating Club Marina reclamation
ACTIVITY ID:	20015
ACTIVITY STATUS:	Completed
ACTIVITY TYPE:	Reclamation
CONSENT HOLDER:	Outboard Boating Club of Auckland
CONSENT NUMBER:	16257
CONSENT STATUS:	Expired

DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	19980607
FILE REFERENCE:	H978294
GRANTED DATE:	19970826
LOC TYPE:	Point
PROCESSING OFFICER:	_Libby Boak
PROPERTY ADDRESS:	Outboard Boating Club Marina, Whakatakataka Bay, Tamaki Drive, Auckland City Waitemata Harbour ACC
PURPOSE:	Order in Council - Outboard Boating Club Marina reclamation
REVIEW DATE:	Null
SITE DESCRIPTION:	Outboard Boating Club Marina Whakatakataka Bay
SITE NAME:	Outboard Boating Club Marina,
WORKS DESCRIPTION:	3.34 hectare reclamation

51. ACTIVITY DESCRIPTION:	Outboard Boating Club Marina reclamation
ACTIVITY ID:	20015
ACTIVITY STATUS:	Completed
ACTIVITY TYPE:	Reclamation
CONSENT HOLDER:	Outboard Boating Club of Auckland
CONSENT NUMBER:	21091
CONSENT STATUS:	Superseded
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	19980607
FILE REFERENCE:	H8082
GRANTED DATE:	19970826
LOC TYPE:	Point
PROCESSING OFFICER:	_Libby Boak
PROPERTY ADDRESS:	Outboard Boating Club Marina, Whakatakataka Bay, Tamaki Drive, Auckland City Waitemata Harbour ACC
PURPOSE:	Outboard boating club marina - works consent
REVIEW DATE:	Null
SITE DESCRIPTION:	Outboard Boating Club Marina Whakatakataka Bay
SITE NAME:	Outboard Boating Club Marina,
WORKS DESCRIPTION:	Outboard Boating Club Marina - 221 berths

51. ACTIVITY DESCRIPTION:	Outboard Boating Club Marina reclamation
ACTIVITY ID:	20015
ACTIVITY STATUS:	Completed
ACTIVITY TYPE:	Reclamation
CONSENT HOLDER:	Outboard Boating Club of Auckland
CONSENT NUMBER:	22905
CONSENT STATUS:	Issued
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	Null
FILE REFERENCE:	8082
GRANTED DATE:	19990924
LOC TYPE:	Point
PROCESSING OFFICER:	_Hans van der Wal
PROPERTY ADDRESS:	Outboard Boating Club Marina, Whakatakataka Bay, Tamaki Drive, Auckland City Waitemata Harbour ACC
PURPOSE:	Change of public access conditions to Outboard

	Boating Club Whakatakataka Bay Tamaki Drive pursuant to s127(1), standardising these conditions and formalising the access arrangements.
REVIEW DATE:	Null
SITE DESCRIPTION:	Outboard Boating Club Marina Whakatakataka Bay
SITE NAME:	Outboard Boating Club Marina,
WORKS DESCRIPTION:	Null

51. ACTIVITY DESCRIPTION:	Outboard Boating Club Marina reclamation
ACTIVITY ID:	20015
ACTIVITY STATUS:	Completed
ACTIVITY TYPE:	Reclamation
CONSENT HOLDER:	Outboard Boating Club of Auckland
CONSENT NUMBER:	8431
CONSENT STATUS:	Replaced
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	19920508
FILE REFERENCE:	H928082
GRANTED DATE:	19920507
LOC TYPE:	Point
PROCESSING OFFICER:	_Libby Boak
PROPERTY ADDRESS:	Outboard Boating Club Marina, Whakatakataka Bay, Tamaki Drive, Auckland City Waitemata Harbour ACC
PURPOSE:	TO OCCUPY AREAS OF SEABED BEING LAND OF THE CROWN, FOR THE CONSTRUCTION AND OPERATION OF A COMMERCIAL MARINA FACILITY.
REVIEW DATE:	Null
SITE DESCRIPTION:	Outboard Boating Club Marina Whakatakataka Bay
SITE NAME:	Outboard Boating Club Marina,
WORKS DESCRIPTION:	EXTENSION TO EXISTING MARINA

51. ACTIVITY DESCRIPTION:	Outboard Boating Club Marina reclamation
ACTIVITY ID:	20015
ACTIVITY STATUS:	Completed
ACTIVITY TYPE:	Reclamation
CONSENT HOLDER:	Outboard Boating Club of Auckland
CONSENT NUMBER:	8614
CONSENT STATUS:	Expired
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	19970607
FILE REFERENCE:	H928294
GRANTED DATE:	19920623
LOC TYPE:	Point
PROCESSING OFFICER:	Null
PROPERTY ADDRESS:	Outboard Boating Club Marina, Whakatakataka Bay, Tamaki Drive, Auckland City Waitemata Harbour ACC
PURPOSE:	Order in council - Outboard Boating club marina Reclamation
REVIEW DATE:	Null
SITE DESCRIPTION:	Outboard Boating Club Marina Whakatakataka Bay

SITE NAME:	Outboard Boating Club Marina,
WORKS DESCRIPTION:	OBC Marina Reclamation

52. ACTIONED BY:	Simon Greening
CATCHMENT CODE:	541
CULPRIT TRACED:	YES
IMPACT:	Natural Water
INCIDENT NUMBER:	11/4638
INCIDENT TYPE:	Oil in CMA
INVESTIGATION DATE:	22/12/2011
LOCATION:	7 Tamaki Dr
POLLUTANT TYPE:	Hydrocarbon - Fuel / Diesel
PROBLEM FOUND:	YES
RECIEVED:	Hotline
RECORD DATE:	22/12/2011
REPORT:	Diesel Leak
SUBURB:	Orakei
VOLUME:	<10 litres

53. ACTIVITY DESCRIPTION:	Null
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21650
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	Null
CASING FROM:	0
CASING TO:	2
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Mobil Oil NZ Limited
CONSENT NUMBER:	26534
CONSENT STATUS:	Expired
CONSULTANT:	Pattle Delamore Partners Limited
CONTRACTOR:	Null
DATE DRILL:	20020319
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1760430
ENVIRONMENT:	Null
EXPIRY DATE:	20030317
FILE REFERENCE:	C512-12-2889*
GRANTED DATE:	20020315
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5919770
PROCESSING OFFICER:	Roger Bannister
PROPERTY ADDRESS:	7 Tamaki Drive Auckland Central Auckland Central
PURPOSE:	Authorise the construction of up to three (3)

	environmental bores.
REVIEW DATE:	Null
SCREEN FROM:	2
SCREEN TO:	5
SCREEN TYPE:	PVC/ABS
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	2.65
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	5
WORKS DESCRIPTION:	Construction of up to three (3) 50mm diameter bores to a depth of approximately 5m. Installation of PVC casing to a depth of approximately 5m.

54. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1760470
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5919720
PROCESSING OFFICER:	Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.

REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

55. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1760470
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5919720
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null

SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

56. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1760700
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5919700
PROCESSING OFFICER:	Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35

SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

56. ACTIVITY DESCRIPTION:	To authorise the construction of up to 16 bores for investigation purposes.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Y
BORE ID:	21951
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	80
CASING FROM:	0
CASING TO:	45
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28231
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20040212
DIAMETER:	80
DIAMETER F:	0
DIAMETER T:	45
EASTING:	1760700
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040824
FILE REFERENCE:	C512-12-3153*
GRANTED DATE:	20030820
GROUND ELE:	62
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND USE N:	Null
LOCTYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5919700
PROCESSING OFFICER:	Sarah Pinkerton
PROPERTY ADDRESS:	Eastern Corridor Auckland City & Manukau City
PURPOSE:	To authorise the construction of up to 16 bores for investigation purposes.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	St Johns
SITE NAME:	Null

STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Manukau
TOTAL DEPT:	45
WORKS DESCRIPTION:	Construction of up to 16 100mm diameter bores, to a depth of approximately 40m. Installation of PVC casing.

57. ACTIVITY DESCRIPTION:	Construct barge landing reclamation of 600m2 footprint.
ACTIVITY ID:	20063
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Reclamation
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	29711
CONSENT STATUS:	Surrendered
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20170215
FILE REFERENCE:	17420
GRANTED DATE:	20061221
LOC TYPE:	Point
PROCESSING OFFICER:	Quentin Smith
PROPERTY ADDRESS:	Outboard Boating Club - Tamaki Drive, Orakei southeast of the Outboard Boating Club Reclamation off Tamaki Drive, east of the NIMT Railway, Orake Waitemata Harbour ACC
PURPOSE:	To reclaim part of the foreshore and seabed including associated disturbance and vegetation removal for a barge landing and unloading site of approximately 600m² footprint area in Hobson Bay southeast of the Outboard Boating Club Reclamation, in accordan
REVIEW DATE:	20070930
SITE DESCRIPTION:	Null
SITE NAME:	Outboard Boating Club - Tamaki Drive, Orakei
WORKS DESCRIPTION:	Null

58. ACTIVITY DESCRIPTION:	To authorise the construction of up to 16 bores for investigation purposes.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Y
BORE ID:	21951
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	80
CASING FROM:	0
CASING TO:	45
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28231
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20040212
DIAMETER:	80

DIAMETER F:	0
DIAMETER T:	45
EASTING:	1760900
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040824
FILE REFERENCE:	C512-12-3153*
GRANTED DATE:	20030820
GROUND ELE:	62
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5919400
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Eastern Corridor Auckland City & Manukau City
PURPOSE:	To authorise the construction of up to 16 bores for investigation purposes.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	St Johns
SITE NAME:	Null
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Manukau
TOTAL DEPT:	45
WORKS DESCRIPTION:	Construction of up to 16 100mm diameter bores, to a depth of approximately 40m. Installation of PVC casing.

59. ACTIVITY:	Discharge Other
ACTIVITY DESCRIPTION:	Erect & temporarily occupy the CMA with coffer dams for construction works, reconstruct sluice gates, impound more than 8 hectares of CMA
ACTIVITY ID:	20193
ACTIVITY STATUS:	Proposed
APPLICANT:	Auckland City Council
APPLICATION:	30854
APPLICATION STATUS:	Invalid
EASTING:	1760758
FILE REFERENCE:	18285
LOC TYPE:	Point
LODGED DATE:	20050411
NORTHING:	5919340
PROCESSING OFFICER:	Andrew Benson
PROPERTY ADDRESS:	Orakei Basin Orakei Auckland City
PURPOSE:	Null
SITE DESCRIPTION:	Erect & temporarily occupy the CMA with coffer dams for construction works, reconstruct sluice gates, impound more than 8 hectares of CMA
SITE NAME:	ACC -Orakei Basin
WORKS DESCRIPTION:	Null

60. ACTIVITY DESCRIPTION:	Construct barge landing reclamation of 375m2 footprint.
ACTIVITY ID:	20064
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Reclamation
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	29712
CONSENT STATUS:	Surrendered
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20170215
FILE REFERENCE:	17420
GRANTED DATE:	20061221
LOC TYPE:	Point
PROCESSING OFFICER:	_Quentin Smith
PROPERTY ADDRESS:	Ngapipi Road, Orakei beside the existing trunk sewer pipe, west of Ngapipi Road, Orakei Auckland City Waitemata Harbour ACC
PURPOSE:	To reclaim part of the foreshore and seabed including associated disturbance and vegetation removal for a barge landing and unloading site of approximately 375m2 footprint area in Hobson Bay west of Ngapipi Road, Orakei, in accordance with Section 12(1)
REVIEW DATE:	20070930
SITE DESCRIPTION:	Null
SITE NAME:	Ngapipi Road, Orakei
WORKS DESCRIPTION:	Null

61. ACTIVITY DESCRIPTION:	Disturbance of the seabed with the drilling of 100mm boreholes for the purpose of geotechnical investigations.
ACTIVITY ID:	20122
ACTIVITY STATUS:	Proposed
ACTIVITY TYPE:	Coastal Other
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28011
CONSENT STATUS:	Expired
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20031214
FILE REFERENCE:	16790
GRANTED DATE:	20030714
LOC TYPE:	Point
PROCESSING OFFICER:	_Alan Moore
PROPERTY ADDRESS:	
PURPOSE:	This consent shall expire on 14 December 2003 unless it has lapsed, been surrendered of been cancelled at an earlier date pursuant to the Resource Management Act 1991. To authorise the disturbance of the foreshore and seabed for the purposes of drilling
REVIEW DATE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Hobson Bay & Orakei Basin
WORKS DESCRIPTION:	Null

62. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1761000
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5919200
PROCESSING OFFICER:	Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

63. ACTIVITY DESCRIPTION:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21941
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	100
CASING FROM:	0
CASING TO:	35
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28121
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20030811
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	39
EASTING:	1761100
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20040724
FILE REFERENCE:	C512-12-3143*
GRANTED DATE:	20030722
GROUND ELE:	17
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5919200
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Multiple Road Reserves througout Auckland City & Manukau City
PURPOSE:	Authorise the construction of up to 24 investigation bores associated with the Transit Eastern Corridor Project.
REVIEW DATE:	Null
SCREEN FROM:	35
SCREEN TO:	39
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	14.1
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	39
WORKS DESCRIPTION:	Construction of up to 24 100mm diameter bores to a depth of no greater than 40m. Installation of PVC casing.

64. ACTIVITY DESCRIPTION:	To authorise the construction of up to 2 bores for investigation purposes.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	21954
BORE LOG:	Null
BORE USE:	Null
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Watercare Services Limited
CONSENT NUMBER:	28256
CONSENT STATUS:	Expired
CONSULTANT:	Tonkin & Taylor Limited
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1761200
ENVIRONMENT:	Null
EXPIRY DATE:	20040903
FILE REFERENCE:	C512-12-3156*
GRANTED DATE:	20030902
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5919100
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	Hobson Bay Auckland City
PURPOSE:	To authorise the construction of up to 2 bores for investigation purposes.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Investigations for proposed Hobson Bay tunnel
SITE NAME:	Hobson Bay
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	Construction of up to 2 bores to a depth of approximately 100mm. Installation of HW Steel casing to a depth of approximately 50m.

65. ACTIVITY DESCRIPTION:	Null
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Auckland Isthmus Waitemata

AQUIFER TE:	Null
BORE ID:	28213
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Null
CONSENT NUMBER:	0
CONSENT STATUS:	Null
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20031125
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1760925
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	Null
GRANTED DATE:	Null
GROUND ELE:	0
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Related to C512-12-3202
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918980
PROCESSING OFFICER:	Null
PROPERTY ADDRESS:	Null
PURPOSE:	Null
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Eastern Transport Corridor
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL_DEPT:	21
WORKS DESCRIPTION:	Null

65 ACTIVITY DESCRIPTION:	To authorise the construction of up to 14 bores for geotechnical investigation purposes.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Auckland Isthmus Waitemata
AQUIFER TE:	Null
BORE ID:	22002
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	Null
CASING FROM:	0
CASING TO:	11

CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28564
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20040301
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1760925
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20041120
FILE REFERENCE:	C512-12-3202*
GRANTED DATE:	20031119
GROUND ELE:	24
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918980
PROCESSING OFFICER:	_Amy Boulton
PROPERTY ADDRESS:	ACC Owned Road Reserves/Parks & Crown Seabed Parnell to St Johns Auckland City
PURPOSE:	To authorise the construction of up to 14 bores for geotechnical investigation purposes.
REVIEW DATE:	Null
SCREEN FROM:	11
SCREEN TO:	16
SCREEN TYPE:	Null
SITE DESCRIPTION:	Road reserves, Parks & Crown seabed Parnell to St Johns
SITE NAME:	Eastern Transport Corridor
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	40
WORKS DESCRIPTION:	Construction of up to 14 bores to a depth of approximately 100mm. Installation of PVC casing.

66. ACTIVITY DESCRIPTION:	Null
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Auckland Isthmus Waitemata
AQUIFER TE:	Null
BORE ID:	28211
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Null
CONSENT NUMBER:	0

CONSENT STATUS:	Null
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20031127
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1761013
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	Null
GRANTED DATE:	Null
GROUND ELE:	0
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Related to C512-12-3202
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918907
PROCESSING OFFICER:	Null
PROPERTY ADDRESS:	Null
PURPOSE:	Null
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Eastern Transport Corridor
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	24
WORKS DESCRIPTION:	Null

66. ACTIVITY DESCRIPTION:	To authorise the construction of up to 14 bores for geotechnical investigation purposes.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Auckland Isthmus Waitemata
AQUIFER TE:	Null
BORE ID:	22002
BORE LOG:	Y
BORE USE:	Null
CASING DIA:	Null
CASING FROM:	0
CASING TO:	11
CASING TYPE:	Null
CONSENT HOLDER:	Opus International Consultants Ltd
CONSENT NUMBER:	28564
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	20040301
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null

EASTING:	1761013
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	20041120
FILE REFERENCE:	C512-12-3202*
GRANTED DATE:	20031119
GROUND ELE:	24
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918907
PROCESSING OFFICER:	_Amy Boulton
PROPERTY ADDRESS:	ACC Owned Road Reserves/Parks & Crown Seabed Parnell to St Johns Auckland City
PURPOSE:	To authorise the construction of up to 14 bores for geotechnical investigation purposes.
REVIEW DATE:	Null
SCREEN FROM:	11
SCREEN TO:	16
SCREEN TYPE:	Null
SITE DESCRIPTION:	Road reserves, Parks & Crown seabed Parnell to St Johns
SITE NAME:	Eastern Transport Corridor
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	40
WORKS DESCRIPTION:	Construction of up to 14 bores to a depth of approximately 100mm. Installation of PVC casing.

67. ACTIVITY DESCRIPTION:	Garden Centre
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Auckland Isthmus Waitemata
AQUIFER TE:	Y
BORE ID:	1364
BORE LOG:	Y
BORE USE:	Irrigation
CASING DIA:	100
CASING FROM:	0
CASING TO:	64
CASING TYPE:	PVC/ABS
CONSENT HOLDER:	Kings Plant Barn Limited
CONSENT NUMBER:	12780
CONSENT STATUS:	Expired
CONSULTANT:	Null
CONTRACTOR:	Null
DATE DRILL:	19940722
DIAMETER:	100
DIAMETER F:	0
DIAMETER T:	312
EASTING:	1761280
ENVIRONMENT:	Auckland Central
EXPIRY DATE:	19950623

FILE REFERENCE:	C512-12-1284
GRANTED DATE:	19940623
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Waitemata
NORTHING:	5918825
PROCESSING OFFICER:	_Gillian Crowcroft
PROPERTY ADDRESS:	236 Orakei Road Remuera Auckland Central
PURPOSE:	Authorize the construction of a bore for the extraction of groundwater for irrigation supply
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	236 ORAKEI ROAD, REMUERA
SITE NAME:	Null
STATIC WAT:	1.5
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	312
WORKS DESCRIPTION:	Construction of a 100mm dia. bore to approx. 200m depth and installation of PVC casing to approx. 70m

68. ACTIVITY DESCRIPTION:	The construction of five bores for geotechnical and groundwater investigation.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	27850
BORE LOG:	Null
BORE USE:	Geotechnical
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Null
CONSENT NUMBER:	52556
CONSENT STATUS:	Under Assessment
CONSULTANT:	Peters & Cheung Ltd
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1761393
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	c512-12-4789*
GRANTED DATE:	20110218
GROUND ELE:	Null
HYDSYS NUMBER:	Null

LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5918832
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	240 Orakei Road Remuera Auckland Central
PURPOSE:	The construction of five bores for geotechnical and groundwater investigation.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	KiwiRail
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	Null

69. ACTIVITY DESCRIPTION:	The construction of five bores for geotechnical and groundwater investigation.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	27850
BORE LOG:	Null
BORE USE:	Geotechnical
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Null
CONSENT NUMBER:	52556
CONSENT STATUS:	Under Assessment
CONSULTANT:	Peters & Cheung Ltd
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1761356
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	c512-12-4789*
GRANTED DATE:	20110218
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5918816

PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	240 Orakei Road Remuera Auckland Central
PURPOSE:	The construction of five bores for geotechnical and groundwater investigation.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	KiwiRail
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	Null

70. ACTIVITY DESCRIPTION:	Short term remediation consent
ACTIVITY ID:	20896
ACTIVITY STATUS:	Null
ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	ORC Limited
CONSENT NUMBER:	35421
CONSENT STATUS:	Expired
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20101231
FILE REFERENCE:	20093
GRANTED DATE:	20080229
LOC TYPE:	Point
PROCESSING OFFICER:	Rebecca Cleghorn
PROPERTY ADDRESS:	228 Orakei Road Remuera Auckland Central
PURPOSE:	To authorise the discharge of contaminants to ground during land disturbance (remediation) in accordance with Section 15 of the Resource Management Act 1991.
REVIEW DATE:	20091231
SITE DESCRIPTION:	Null
SITE NAME:	ORC Limited
WORKS DESCRIPTION:	Null

70. ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	Application to discharge contaminants from soil remediation from the construction of a residental apartment block.
ACTIVITY ID:	20838
ACTIVITY STATUS:	Null
APPLICANT:	ORC Trust (Trustees ORC Limited)
APPLICATION:	34881
APPLICATION STATUS:	Withdrawn
EASTING:	1761264
FILE REFERENCE:	20093
LOC TYPE:	Point
LODGED DATE:	20070919
NORTHING:	5918751
PROCESSING OFFICER:	Rebecca Cleghorn
PROPERTY ADDRESS:	228 Orakei Road Remuera Auckland Central
PURPOSE:	Null
SITE DESCRIPTION:	Null

SITE NAME:	Null
WORKS DESCRIPTION:	Null

71. ACTIVITY DESCRIPTION:	To authorise the construction of three bores for groundwater monitoring.
ACTIVITY STATUS:	Proposed
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	22845
BORE LOG:	Null
BORE USE:	Observation / Piezo
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	ORC Limited
CONSENT NUMBER:	33984
CONSENT STATUS:	Expired
CONSULTANT:	Pattle Delamore Partners Limited
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1761303
ENVIRONMENT:	Null
EXPIRY DATE:	20080401
FILE REFERENCE:	C512-12-3958*
GRANTED DATE:	20070330
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5918756
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	234 Orakei Road Remuera Auckland Central
PURPOSE:	To authorise the construction of three bores for groundwater monitoring.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	Null
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	Construction of three 75mm diameter bores to an approximate depth of 5m. Installation of class D PVC casing material to an approximate depth of 5m. Depth to top of screen to 3m and bottom to 5m. Proposed grouting length to 2.5m.

72. ACTIVITY DESCRIPTION:	The construction of five bores for geotechnical and groundwater investigation.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	27850
BORE LOG:	Null
BORE USE:	Geotechnical
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Null
CONSENT NUMBER:	52556
CONSENT STATUS:	Under Assessment
CONSULTANT:	Peters & Cheung Ltd
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1761437
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	c512-12-4789*
GRANTED DATE:	20110218
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5918779
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	240 Orakei Road Remuera Auckland Central
PURPOSE:	The construction of five bores for geotechnical and groundwater investigation.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	KiwiRail
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	Null

73. ACTIVITY DESCRIPTION:	consent is sought for discharge of contaminants to ground from imported contaminated fill as part of the construction of a commuter carpark
ACTIVITY ID:	20522
ACTIVITY STATUS:	Occurring

ACTIVITY TYPE:	Contaminated Site Discharge
CONSENT HOLDER:	Auckland Transport (for regional consents)
CONSENT NUMBER:	32787
CONSENT STATUS:	Issued
DATE CREATE:	5/09/2014 7:23:17 p.m.
EXPIRY DATE:	20411231
FILE REFERENCE:	19164
GRANTED DATE:	20060714
LOC TYPE:	Point
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	240 Orakei Road Remuera Auckland Central
PURPOSE:	To authorise the ongoing diffuse discharge of contaminants to ground in accordance with Section 15 of the Resource Management Act 1991.
REVIEW DATE:	20070228
SITE DESCRIPTION:	retention of contaminated fill on site . Ann fee category Low per Sarah Pinkerton
SITE NAME:	Adams Earthmoving
WORKS DESCRIPTION:	Null

73. ACTIVITY:	Contaminated Site Discharge
ACTIVITY DESCRIPTION:	Site requiring a earthworks/coastal and stormwater consent
ACTIVITY ID:	20428
ACTIVITY STATUS:	Occurring
CONSENT STATUS:	Superceded By Consent
EASTING:	1761462
EXPIRY DATE:	Null
FILE REFERENCE:	5-41-3533
GRANTED DATE:	Null
LOC TYPE:	Point
NORTHING:	5918824
PERMITTED:	Contaminated Site Discharge
PERMITTED ACTIVITY TYPE :	51299
PROCESSING OFFICER:	_Sarah Pinkerton
PROPERTY ADDRESS:	240 Orakei Road Remuera Auckland Central
PURPOSE:	Null
REVIEW DATE:	Null
SITE DESCR:	Null
SITE NAME:	Orakei Commuter Carpark
WORKS DESCRIPTION:	Contaminated material imported onto site so CS consent required. File 19164 Consent 32787

73. ACTIVITY DESCRIPTION:	The construction of five bores for geotechnical and groundwater investigation.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	27850
BORE LOG:	Null
BORE USE:	Geotechnical
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null

CONSENT HOLDER:	Null
CONSENT NUMBER:	52556
CONSENT STATUS:	Under Assessment
CONSULTANT:	Peters & Cheung Ltd
CONTRACTOR:	Null
DATE DRILL:	Null
DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1761471
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	c512-12-4789*
GRANTED DATE:	20110218
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5918816
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	240 Orakei Road Remuera Auckland Central
PURPOSE:	The construction of five bores for geotechnical and groundwater investigation.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	KiwiRail
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	Null

74. ACTIVITY DESCRIPTION:	The construction of five bores for geotechnical and groundwater investigation.
ACTIVITY STATUS:	Drilled
ALW PLAN:	Null
AQUIFER:	Null
AQUIFER TE:	Null
BORE ID:	27850
BORE LOG:	Null
BORE USE:	Geotechnical
CASING DIA:	Null
CASING FROM:	Null
CASING TO:	Null
CASING TYPE:	Null
CONSENT HOLDER:	Null
CONSENT NUMBER:	52556
CONSENT STATUS:	Under Assessment
CONSULTANT:	Peters & Cheung Ltd
CONTRACTOR:	Null
DATE DRILL:	Null

DIAMETER:	Null
DIAMETER F:	Null
DIAMETER T:	Null
EASTING:	1761493
ENVIRONMENT:	Null
EXPIRY DATE:	Null
FILE REFERENCE:	c512-12-4789*
GRANTED DATE:	20110218
GROUND ELE:	Null
HYDSYS NUMBER:	Null
LAND USE:	Null
LAND USE U:	Null
LAND_USE N:	Null
LOC TYPE:	Point
MAIN AQUIFER:	Null
NORTHING:	5918803
PROCESSING OFFICER:	Reginald Samuel
PROPERTY ADDRESS:	240 Orakei Road Remuera Auckland Central
PURPOSE:	The construction of five bores for geotechnical and groundwater investigation.
REVIEW DATE:	Null
SCREEN FROM:	Null
SCREEN TO:	Null
SCREEN TYPE:	Null
SITE DESCRIPTION:	Null
SITE NAME:	KiwiRail
STATIC WAT:	Null
SUB AQUIFER:	Null
TLA:	Auckland Central
TOTAL DEPT:	Null
WORKS DESCRIPTION:	Null

Appendix B – Auckland Council Correspondence

Sujata Sinha

From: Maxine Nairn-Parker <Maxine.Nairn-Parker@aucklandcouncil.govt.nz> on behalf of Contaminated Sites <xxxxxxxxxxxxxxxx@xxxxxxxxxxxxxxx.xxxx.xx>
Sent: Wednesday, 10 September 2014 5:09 p.m.
To: Isobel Oldfield
Subject: FW: Cycleway - Section 1 - Merton Road, St Johns to St Johns Road, Meadowbank

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Isobel - not sure if you received this information below on Section 1 enquiries _ I will follow up on enquiries from Section 2 and send your report on section 3

Many Thanks – Maxine

Maxine Nairn-Parker| Business Services Team
Auckland Council | Resource Consents Department

Level 2, 35 Graham Street, Private Bag 92 300, Auckland 1142
Visit our website: www.aucklandcouncil.govt.nz

Further information on the pollution incidents are as follows:

Incident 12/073 – 90 Felton Mathew Avenue, St Johns

- There was a Dry Weather Sewer Overflow from the Watercare network on the morning of 9/2/12 which discharged to the creek behind 90 Felton Matthew Ave on the morning of 9/2/12
- The Pollution Hotline was notified on the evening of 9/2/12. Pollution response attended, observed wastewater in the creek and called Watercare. Watercare contractors arrived on site and began to pump out the discharge from the creek
- Pollution response returned to the site on the morning of 10/2/12 and observed that the discharge was still present but was clearing up

Incident 11/4155 – 350 St Heliers Bay Road, St Heliers

- On 11/11/11 approximately 10-15L of petrol was spilt, from a car with a hole in the fuel tank, onto the forecourt of the Mobil petrol station.
- The Fire Service used peat and zeolite to absorb the spill
- Pollution response attended. No petrol had entered any drains on the forecourt

I hope this information is helpful – let me know if you require anything else.

Regards

Cushla Barfoot | Senior Pollution Specialist
Auckland Council | Resource Consents Department
Ext: (40)2666 |Phone (09) 352 2666 | Mob: 021 914 530
Auckland Council, Level 2, 35 Graham Street, Auckland Central,

Visit our website: www.aucklandcouncil.govt.nz

From: Isobel Oldfield [mailto:Isobel.Oldfield@mwhglobal.com]
Sent: Monday, 25 August 2014 3:40 p.m.
To: Contaminated Sites
Subject: RE: Cycleway - Section 1 - Merton Road, St Johns to St Johns Road, Meadowbank

Hi Maxine,

Thank you for your help with this and I apologise for the delay in replying I have been travelling for work and have only just had a chance to look through the information you sent me. In regards to the information provided so far can you please provide more information for the following incidents:

- 11 – discharge paint/dye/ink to surface water
- 19 – Spill report 350 Heliers Bay Road
- 20 – THP and benzene beneath former UST

I am more used to obtaining this information from Environment Canterbury as I am based in Christchurch so I am unfamiliar with Auckland Councils system. This information will form the basis of a PSI (preliminary site investigation) as outlined in the relevant MfE guidelines. As per these guidelines every Regional Council keeps a list of properties with have a HAIL (Hazardous Activities and Industries List) activity occurring on the site now or in the past. In Canterbury this is called the LLUR (Listed Land Use Register).

While the information you sent me is helpful, what I really need to know is whether each legal description I sent you is on your equivalent of the LLUR and if so why – ie is it a petrol station, closed landfill etc… I am aware that these records may be incomplete.

Kind regards
Isobel Oldfield

From: Maxine Nairn-Parker [mailto:Maxine.Nairn-Parker@aucklandcouncil.govt.nz] **On Behalf Of** Contaminated Sites
Sent: Thursday, 21 August 2014 9:10 a.m.
To: Isobel Oldfield
Subject: Cycleway - Section 1 - Merton Road, St Johns to St Johns Road, Meadowbank

Hi Isobel -- please find attached the 1st Section of the search and report on the Cylceway investigation.
I have taken a rough indication of your selected areas on both side of the railway line, and extended out
By 200m, ensuring I also included the specific properties on Felton Mathew Avenue, Delwyn Lane etc.

The small black spots are pollution incidents that have been reported and filed into GIS history – as discussed

I have not taken time to do an in-depth search via SIIED's as this would take a lot of time and then cost to your Company. Also I have not checked and recorded each land title in the search area, as once again this would Relate in extra costs to you – maybe once you know the exact route the cycleway will take, then I can go in To check and record each site.

The other green crosses without numbers beside them are consents for either Earthworks, Stormwater Discharge Stream-works or River/Stream Diversion etc.

Please let me know if
1: you require further information on this search area
2: I have covered enough of the area for you.
To ensure we are both on the right track and you are getting enough information to cover your requirements.

Following on from my phone message to your landline, please send me the next section of area to be searched and reported on for the land from St Johns Road, where it looks like it expanse out towards, St Heilers Bay road then around towards Kepa Road and railway line to Orakei Road -- then do the same for the 3rd section from Orakei Road to Tamaki Drive taking in both sides of the bay/inlet with a breakdown of the Property addresses and Legal Descriptions as per Section 1 (that was most helpful)

Many Thanks – Maxine

Maxine Nairn-Parker| Business Services Team
Auckland Council | Resource Consents Department

Level 2, 35 Graham Street, Private Bag 92 300, Auckland 1142
Visit our website: www.aucklandcouncil.govt.nz

From: Isobel Oldfield [mailto:Isobel.Oldfield@mwhglobal.com]
Sent: Tuesday, 19 August 2014 9:45 a.m.
To: Contaminated Sites
Subject: Document2
Importance: High

Good morning Maxine,

If you could please focus on the attached properties I would appreciate it. Could you please give me an approximate timeframe for receiving the information regarding the attached land parcels.

I appreciate all your help in this matter.
Kind regards
Isobel Oldfield

Isobel Oldfield
Graduate Environmental Scientist
MWH New Zealand Ltd
Hazeldean Buisness Park
6 Hazeldean Road
PO Box 13249
Christchurch 8141

Tel: +64 3 341 4707
Mobile: +64 27 837 3726
Fax: +64 3 366 7780

www.mwhglobal.com

Sujata Sinha

From: Cushla Barfoot <xxxxxx.xxxxxxx@xxxxxxxxxxxxxx.xxxx.xx>
Sent: Thursday, 11 September 2014 10:44 a.m.
To: Isobel Oldfield
Cc: Maxine Nairn-Parker
Subject: RE: Waterview Cycleway - Section 2 - St Johns Road, Meadowbank -Orakei Road, Remura 080914

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Isobel

Maxine has asked me to respond to that part of your request highlighted below:

245 Kohimarama Rd
Contractors cleaning up a stream found a drum of contaminants (likely old thick oil) on the Selwyn College property. The drum was rusted/rotting so could not be moved. The Pollution Response Advisor gave the contractor a list of contractors who could suck/vacuum out the contaminant and advised them to pass this list onto Selwyn College. We have no further correspondence on this, so unable to advise if Selwyn College removed the contaminant or if it had entered ground or water at any stage.

Purewa Cemetery
I can't find any pollution incidents at 100-102 St Johns Road which is the address of the cemetery. Let me know if there is a date and different address for this incident?
Maxine – this may be something you will need to respond to.

Let me know if you require anything further with regard to pollution incidents.

Regards

Cushla Barfoot | Senior Pollution Specialist
Auckland Council | Resource Consents Department
Ext: (40)2666 |Phone (09) 352 2666 | Mob: 021 914 530
Auckland Council, Level 2, 35 Graham Street, Auckland Central,

Visit our website: www.aucklandcouncil.govt.nz

From: Isobel Oldfield [mailto:Isobel.Oldfield@mwhglobal.com]
Sent: Wednesday, 10 September 2014 9:13 a.m.
To: Maxine Nairn-Parker
Cc: Andrew McDonald
Subject: RE: Waterview Cycleway - Section 2 - St Johns Road, Meadowbank -Orakei Road, Remura 080914

Good morning Maxine,

Thank you for the additional information, there are two incidents I am interested in, as listed below – could you please provide any additional information you hold on these:

- 23 – 245 Kohimaramara Road, hydrocarbon spill
- 41 – Purewa Cemetery – discharge of contaminants from disturbance of a contaminated site

Additionally do you have the additional information I asked for in relation to section one:

> *In regards to the information provided so far can you please provide more information for the following incidents:*
> - *11 – discharge paint/dye/ink to surface water*
> - *19 – Spill report 350 Heliers Bay Road*
> - *20 – THP and benzene beneath former UST*

Finally were you able to establish whether Auckland Council has a land use register as outlined in my email on 25 August and copied below:

> *I am more used to obtaining this information from Environment Canterbury as I am based in Christchurch so I am unfamiliar with Auckland Councils system. This information will form the basis of a PSI (preliminary site investigation) as outlined in the relevant MfE guidelines. As per these guidelines every Regional Council keeps a list of properties with have a HAIL (Hazardous Activities and Industries List) activity occurring on the site now or in the past. In Canterbury this is called the LLUR (Listed Land Use Register).*
>
> *While the information you sent me is helpful, what I really need to know is whether each legal description I sent you is on your equivalent of the LLUR and if so why – ie is it a petrol station, closed landfill etc… I am aware that these records may be incomplete.*

Kind regards
Isobel Oldfield

From: Maxine Nairn-Parker [mailto:Maxine.Nairn-Parker@aucklandcouncil.govt.nz]
Sent: Monday, 8 September 2014 3:16 p.m.
To: Isobel Oldfield
Subject: Waterview Cycleway - Section 2 - St Johns Road, Meadowbank -Orakei Road, Remura 080914

HI Isobel -- I know either NZTA or AT are after you for this report – so thought I would send you stage 2now rather than making you wait another day
Please note – I am unable to print today, so cannot print and sign and rescan to get you a signed copy – but you can work with the rest of the report
Tomorrow I will sign and rescan the 1st two pages for your files.
Hoping to get Section 3 to you by end of tomorrow – enjoy your week.
Regards Maxine
Maxine Nairn-Parker

Appendix C – Certificates of Title

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

Identifier	**NA40D/978**
Land Registration District	**North Auckland**
Date Issued	22 August 1978

Prior References
NA2C/352 NA31A/537 NA31A/538
NA32A/204

Estate	Fee Simple
Area	2.2830 hectares more or less
Legal Description	Lot 1 Deposited Plan 84454

Proprietors
AHI Roofing Limited

Interests

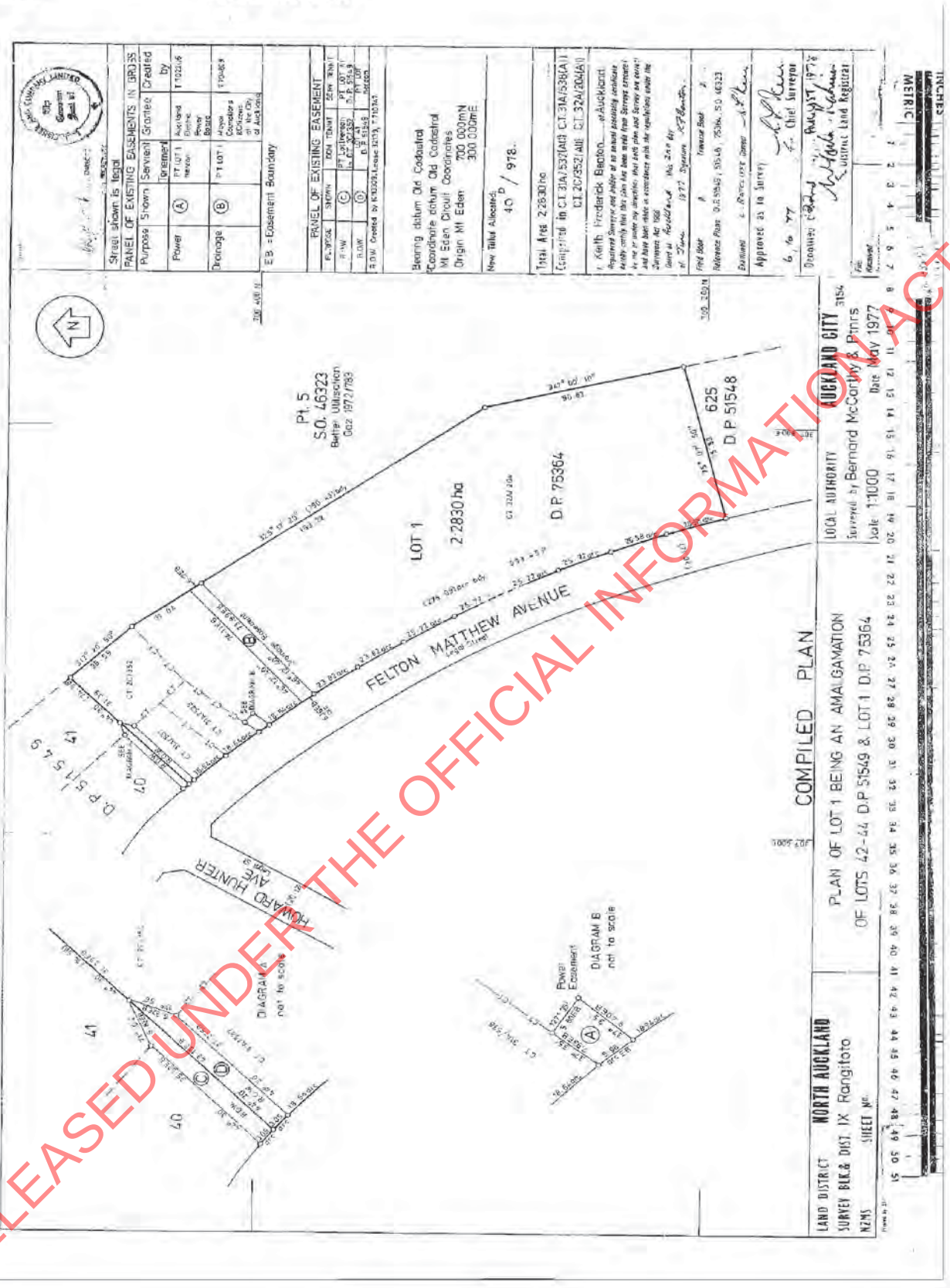
Subject to a drainage right (in gross) over part marked B on Plan 75364 in favour of the Auckland City Council created by Transfer 704808

Subject to an electricity right (in gross) over part marked A on Plan 75364 in favour of the Auckland Electric Power Board created by Transfer 702206

Appurtenant hereto is a right of way specified in Easement Certificate K113309 (affects part formerly CT NA2C/352)

Subject to a right of way over part coloured yellow on Plan 51549 specified in Easement Certificate K113309

Subject to Section 387B (4) Municipal Corporations Act 1954 (affects part formerly CT NA32A/204)



COMPUTER INTEREST REGISTER
UNDER LAND TRANSFER ACT 1952

Historical Search Copy

R W Muir
Registrar-General
of Land

Identifier 44146
Land Registration District North Auckland
Date Registered 12 July 2002 09:00 am

Cancelled

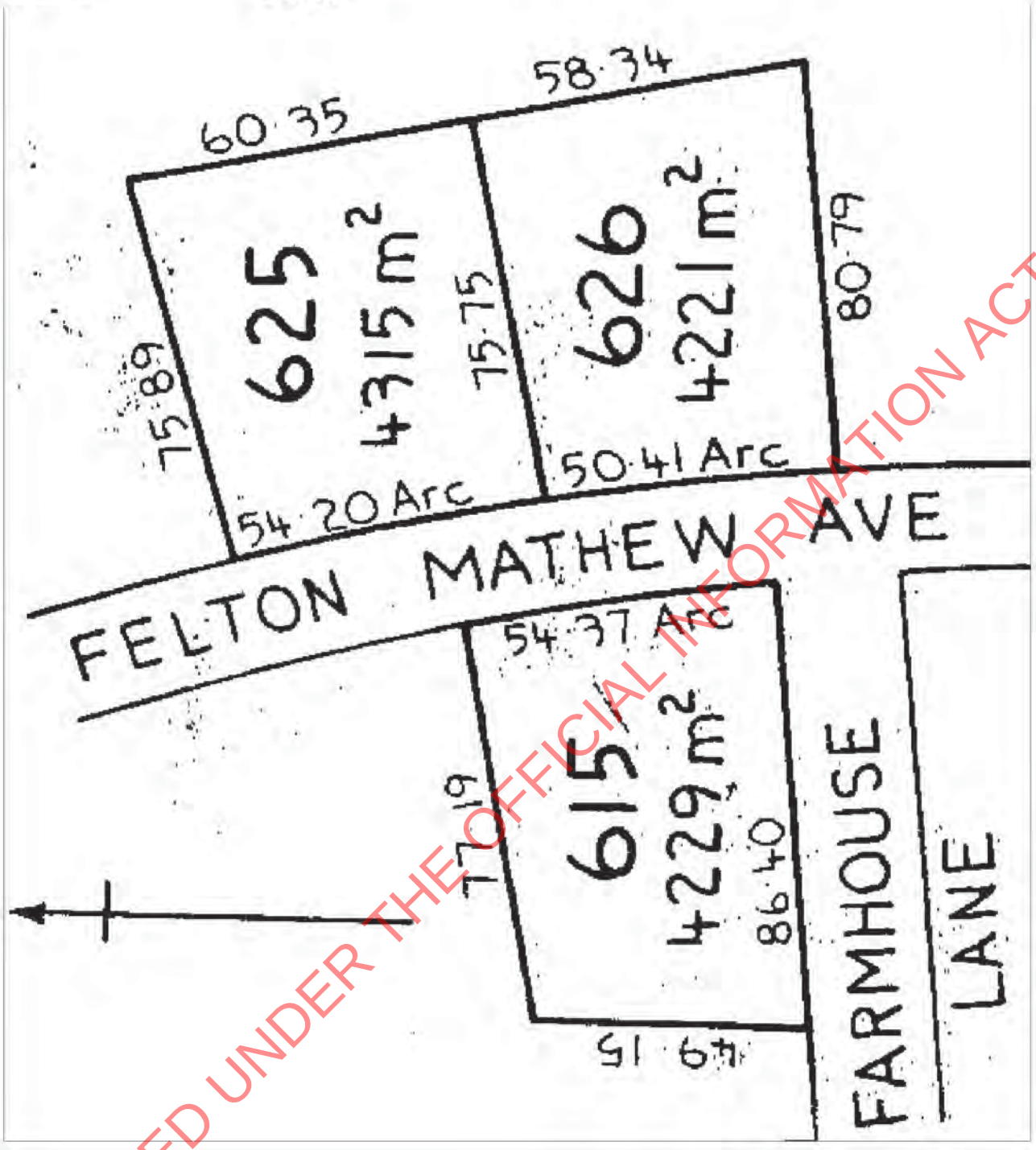
Prior References
NA49A/744

Estate	Leasehold	**Instrument**	L B383962.1
Area	4315 square metres more or less	**Term**	21 years from 5.6.1984 (renewal clause)
Legal Description	Lot 625 Deposited Plan 51548		

Original Proprietors
Annik Investments Limited

Interests
Fencing Clause in Lease B383962.1 - 21.2.1985 at 11.10 am
5280504.3 Mortgage to Allied Finance Limited - 12.7.2002 at 9:00 am
5412193.1 Mortgage to Beneficial Finance Limited - 25.11.2002 at 9:00 am
6003656.1 CAVEAT BY PROSPECTIVE INVESTMENTS LIMITED - 13.5.2004 at 9:00 am
6109970.1 Withdrawal of Caveat 6003656.1 - 10.8.2004 at 9:00 am
6109970.2 Discharge of Mortgage 5412193.1 - 10.8.2004 at 9:00 am
6109970.3 Discharge of Mortgage 5280504.3 - 10.8.2004 at 9:00 am
6109970.4 Transfer to Prospective Investments Limited - 10.8.2004 at 9:00 am
6109970.5 Transfer to AHI Roofing Limited - 10.8.2004 at 9:00 am
Cancelled see now CT 247418

Identifier 44146



COMPUTER INTEREST REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

Identifier	**247418**
Land Registration District	**North Auckland**
Date Registered	12 October 2005 09:00 am

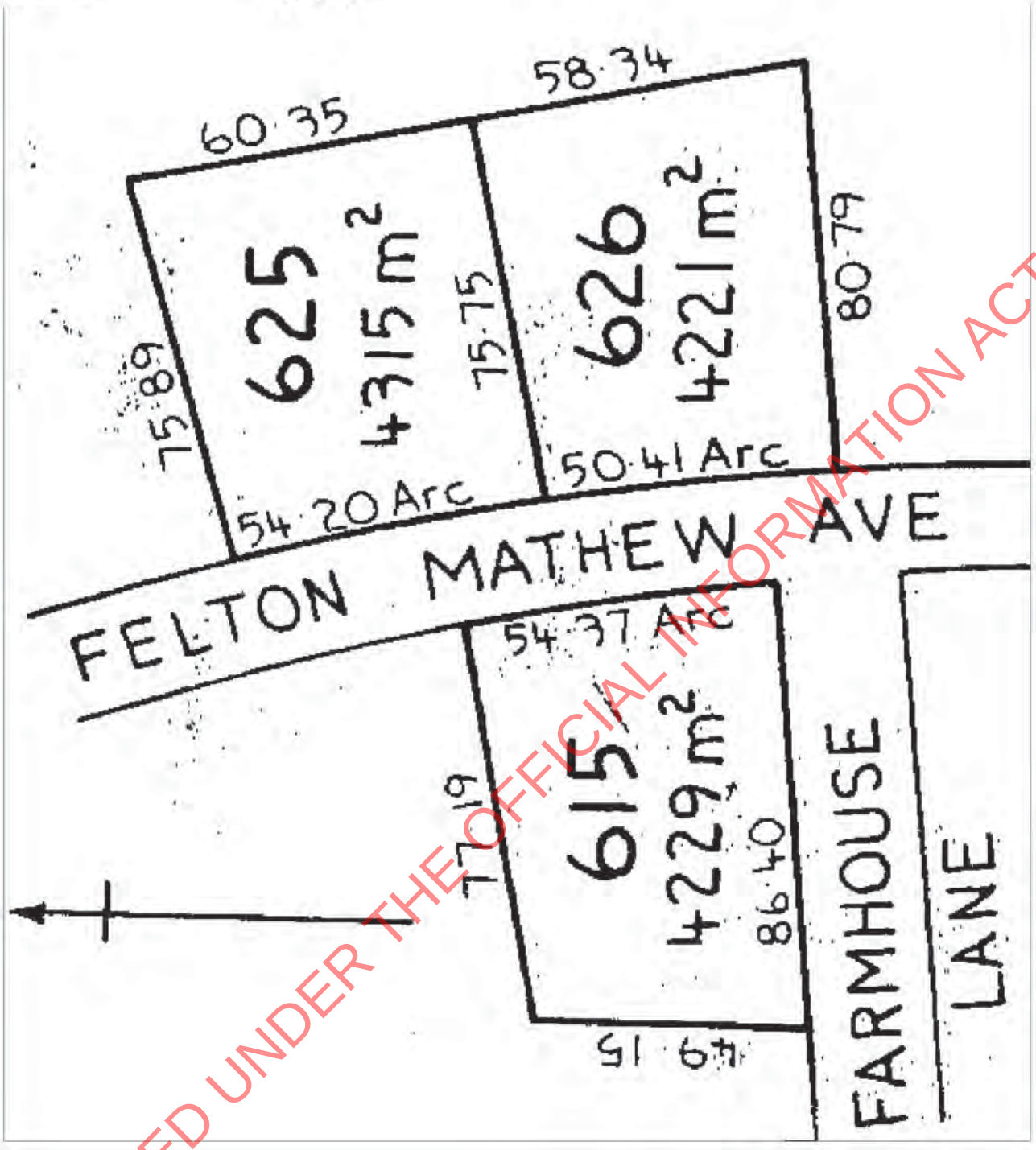
Prior References
NA49A/744

Estate	Leasehold	**Instrument**	L 6606876.1
Area	4315 square metres more or less	**Term**	21 years commencing on the 5.6.2005 (Fencing and Renewal clause)
Legal Description	Lot 625 Deposited Plan 51548		

Proprietors
AHI Roofing Limited

Interests

Identifier 247418



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

Identifier	**NA49A/744**
Land Registration District	**North Auckland**
Date Issued	21 July 1981

Prior References
NA1C/1189

Estate	Fee Simple
Area	4315 square metres more or less
Legal Description	Lot 625 Deposited Plan 51548

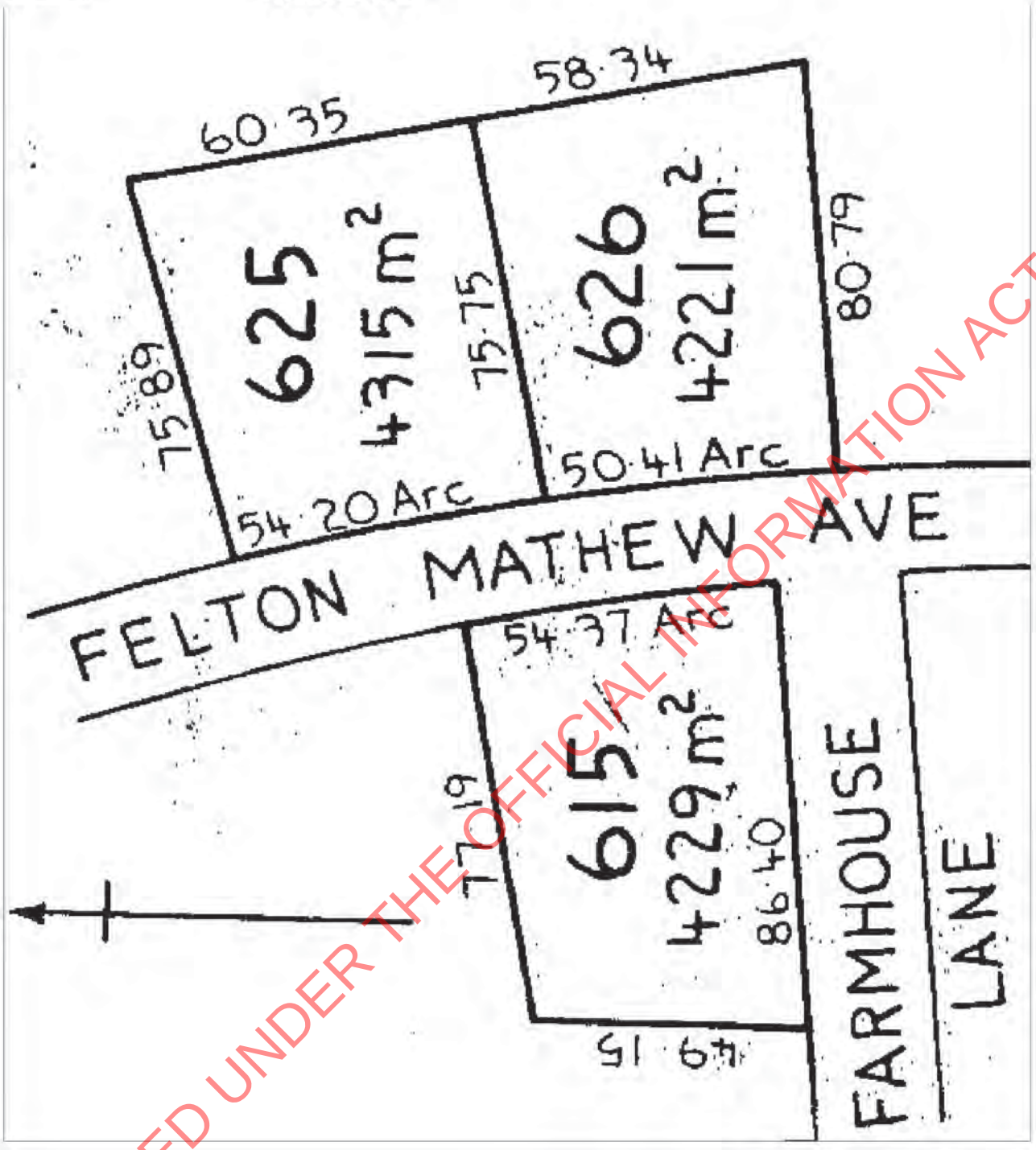
Proprietors
St. John's Holdings Limited

Interests

6606876.1 Lease in renewal of Lease B383962.1 Term 21 years commencing on the 5.6.2005 CT 247418 issued - 12.10.2005 at 9:00 am (Fencing and Renewal clauses)

8307315.1 Mortgage to ASB Bank Limited - 13.10.2009 at 2:18 pm

Identifier NA49A/744



COMPUTER INTEREST REGISTER
UNDER LAND TRANSFER ACT 1952

R W Muir
Registrar-General
of Land

Historical Search Copy

Cancelled

Identifier	**100140**
Land Registration District	**North Auckland**
Date Registered	06 March 1985 11:00 am

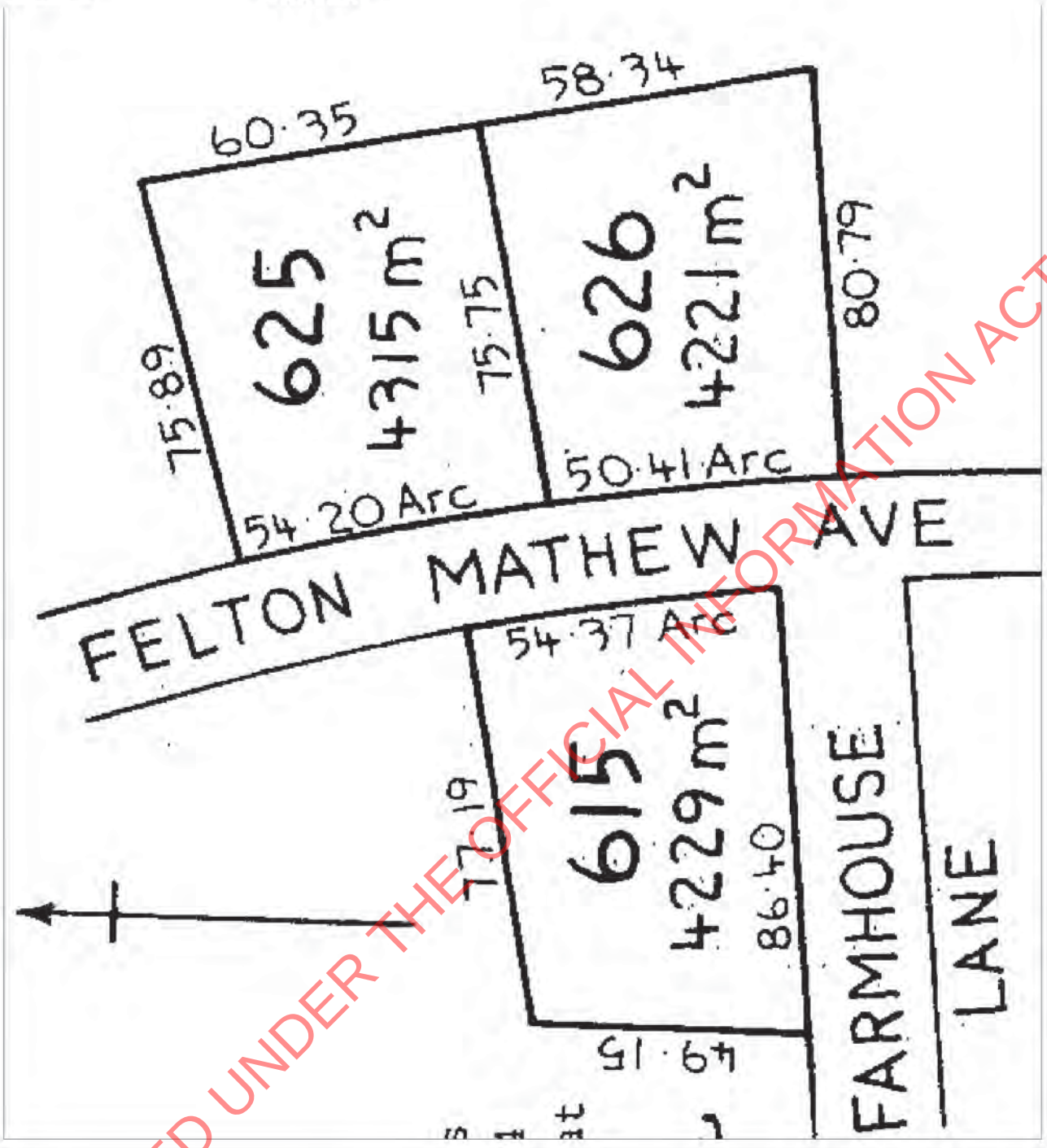
Prior References
NA49A/745

Estate	Leasehold	**Instrument**	L B388286.1
Area	4221 square metres more or less	**Term**	21 years from 5.6.1984 (renewal clause)
Legal Description	Lot 626 Deposited Plan 51548		

Original Proprietors
Claremont Properties Limited

Interests
Fencing Clause in Lease B388286.1 - 6.3.1985 at 11.00 am
5644128.1 Transfer to Annik Investments Limited - 3.7.2003 at 9:00 am
5644128.2 Mortgage to TTNZ Custodians (FM) Limited - 3.7.2003 at 9:00 am
5644128.3 Mortgage to Auckland Finance Limited - 3.7.2003 at 9:00 am
5813067.1 Change of Name of the mortgagee in Mortgage 5644128.2 to FM Custodians Limited - 26.11.2003 at 9:00 am
6003661.1 CAVEAT BY PROSPECTIVE INVESTMENTS LIMITED - 13.5.2004 at 9:00 am
6109970.6 Discharge of Mortgage 5644128.2 - 10.8.2004 at 9:00 am
6109970.7 Discharge of Mortgage 5644128.3 - 10.8.2004 at 9:00 am
6109970.8 Withdrawal of Caveat 6003661.1 - 10.8.2004 at 9:00 am
6109970.9 Transfer to Prospective Investments Limited - 10.8.2004 at 9:00 am
6109970.10 Transfer to AHI Roofing Limited - 10.8.2004 at 9:00 am

Identifier **100140**



COMPUTER INTEREST REGISTER UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General of Land

Identifier	**299868**
Land Registration District	**North Auckland**
Date Registered	21 July 2006 09:00 am

Prior References
NA49A/745

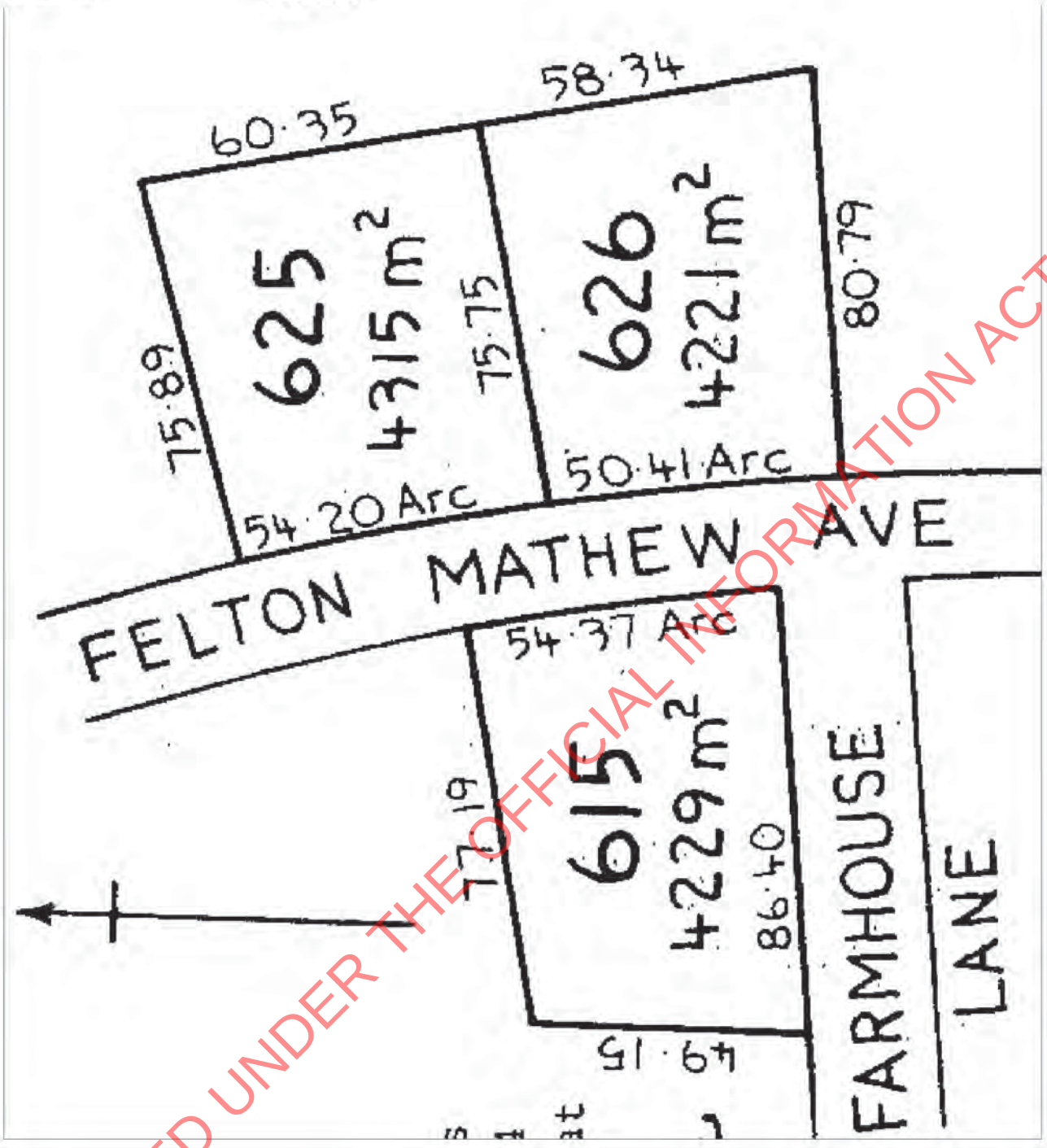
Estate	Leasehold	**Instrument**	L 6957710.1
Area	4221 square metres more or less	**Term**	in renewal of Lease B388286.1 for the term of 21 years from he 5.6.2005 (renewal clause)

Legal Description Lot 626 Deposited Plan 51548

Proprietors
AHI Roofing Limited

Interests
Fencing covenant in Lease 6957710.1 - 21.7.2006 at 9:00 am

Identifier 299868



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

Identifier	**NA49A/745**
Land Registration District	**North Auckland**
Date Issued	21 July 1981

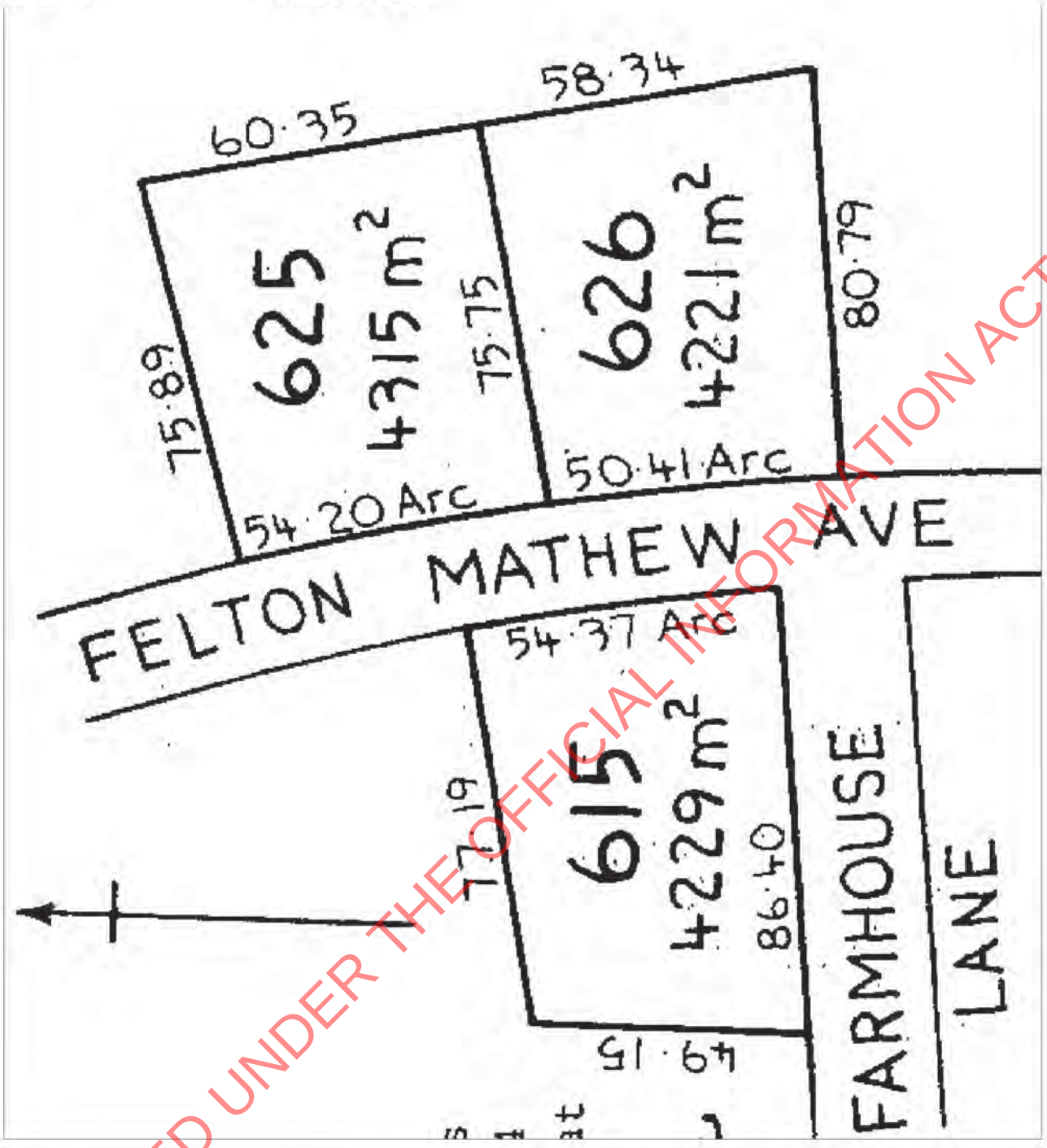
Prior References
NA1C/1189

Estate	Fee Simple
Area	4221 square metres more or less
Legal Description	Lot 626 Deposited Plan 51548

Proprietors
KOL Holdings Limited

Interests
Subject to an electricity right (in gross) over part coloured yellow on DP 51548 in favour of The Auckland Electric Power Board created by Transfer 702206
6957710.1 Lease in renewal of Lease B388286.1 for the term of 21 years from the 5.6.2005 (renewal clause) CT 299868 issued - 21.7.2006 at 9:00 am

Identifier NA49A/745



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

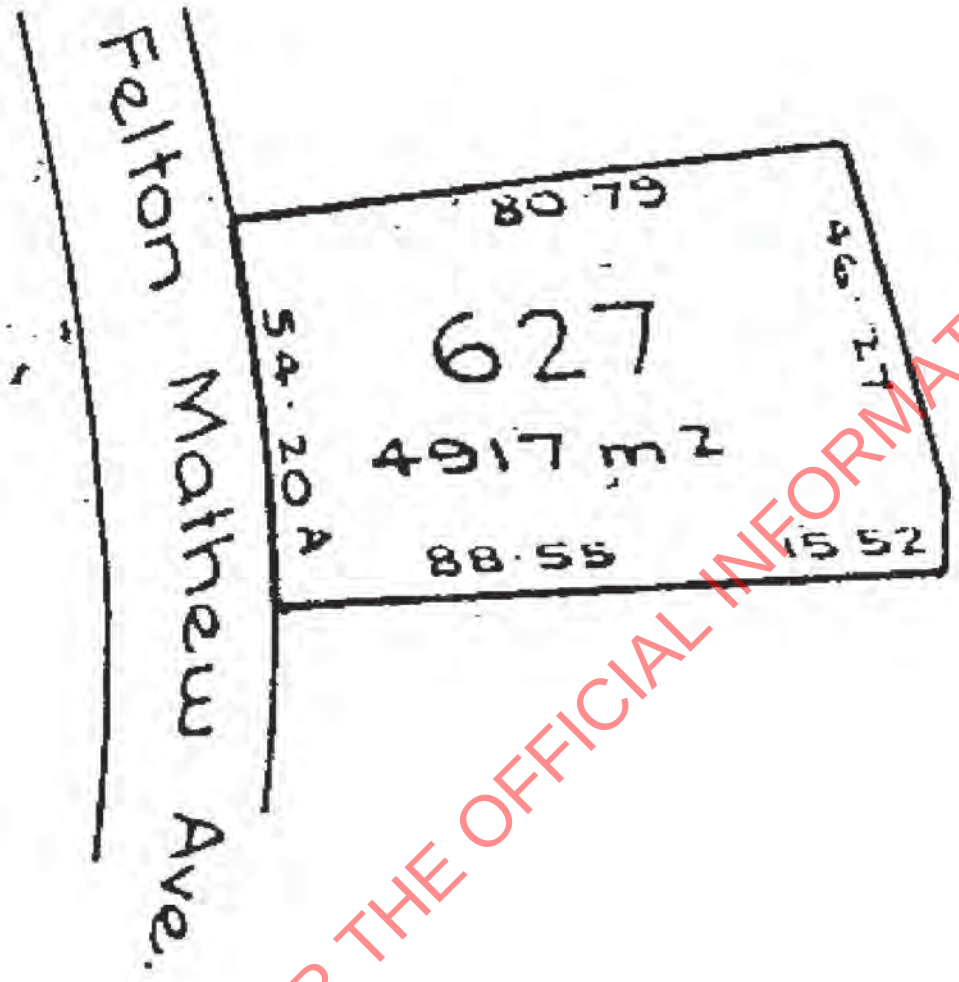
Identifier	**NA49A/746**
Land Registration District	**North Auckland**
Date Issued	21 July 1981

Prior References
NA1C/1189

Estate	Fee Simple
Area	4917 square metres more or less
Legal Description	Lot 627 Deposited Plan 52653

Proprietors
Shiseido (N.Z.) Limited

Interests
Fencing Clause in Lease A70847 - 14.4.1965 at 12.22 pm



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

Identifier	**NA50B/120**
Land Registration District	**North Auckland**
Date Issued	15 July 1981

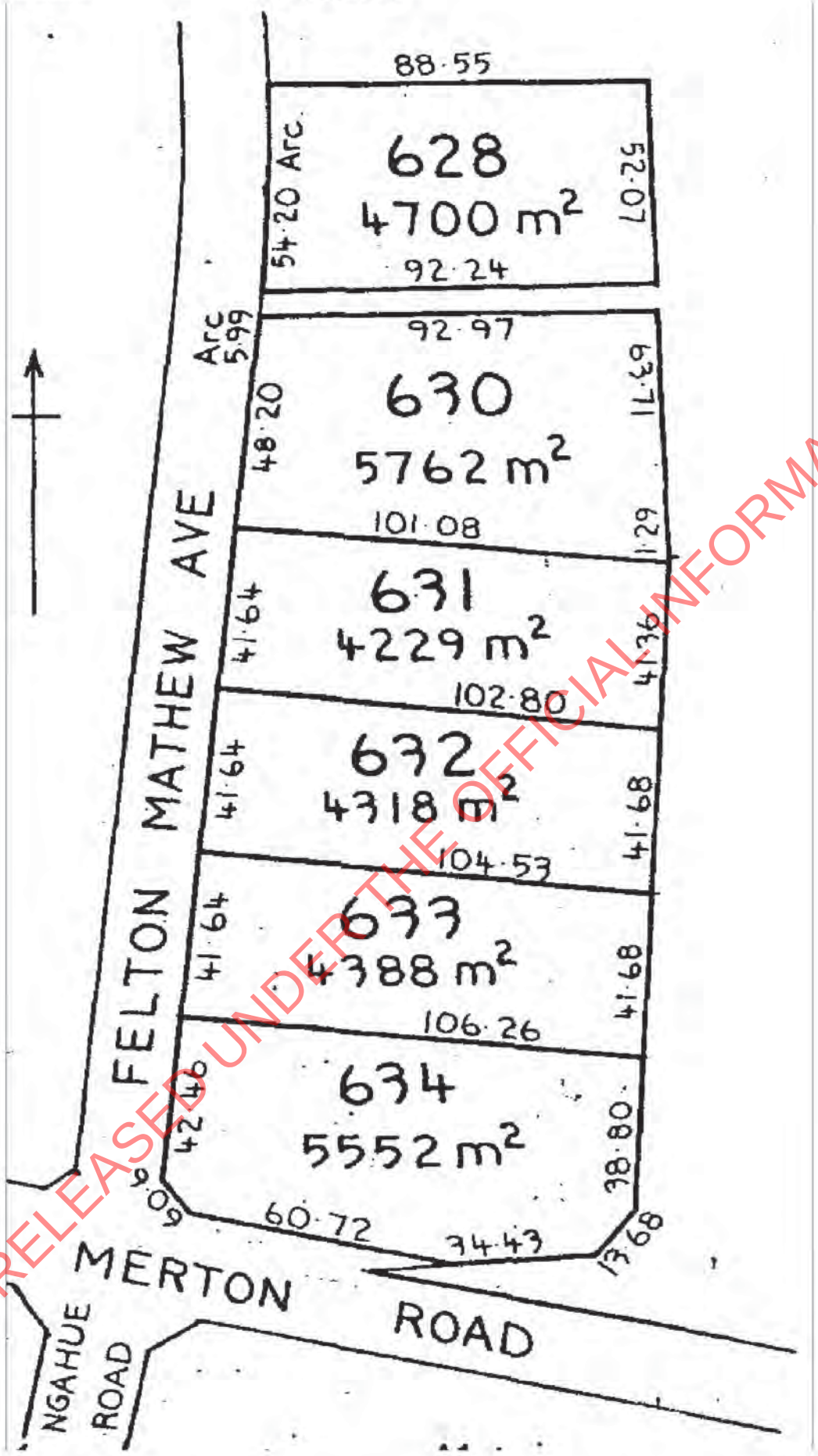
Prior References
NA1C/1190

Estate	Fee Simple
Area	4700 square metres more or less
Legal Description	Lot 628 Deposited Plan 52653

Proprietors
Allen John Walbridge, Terence Austin Brown and Robin Winston Hargrave

Interests
D511258.4 Mortgage to Bank of New Zealand - 2.6.2000 at 10.24 am

Identifier **NA50B/120**



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

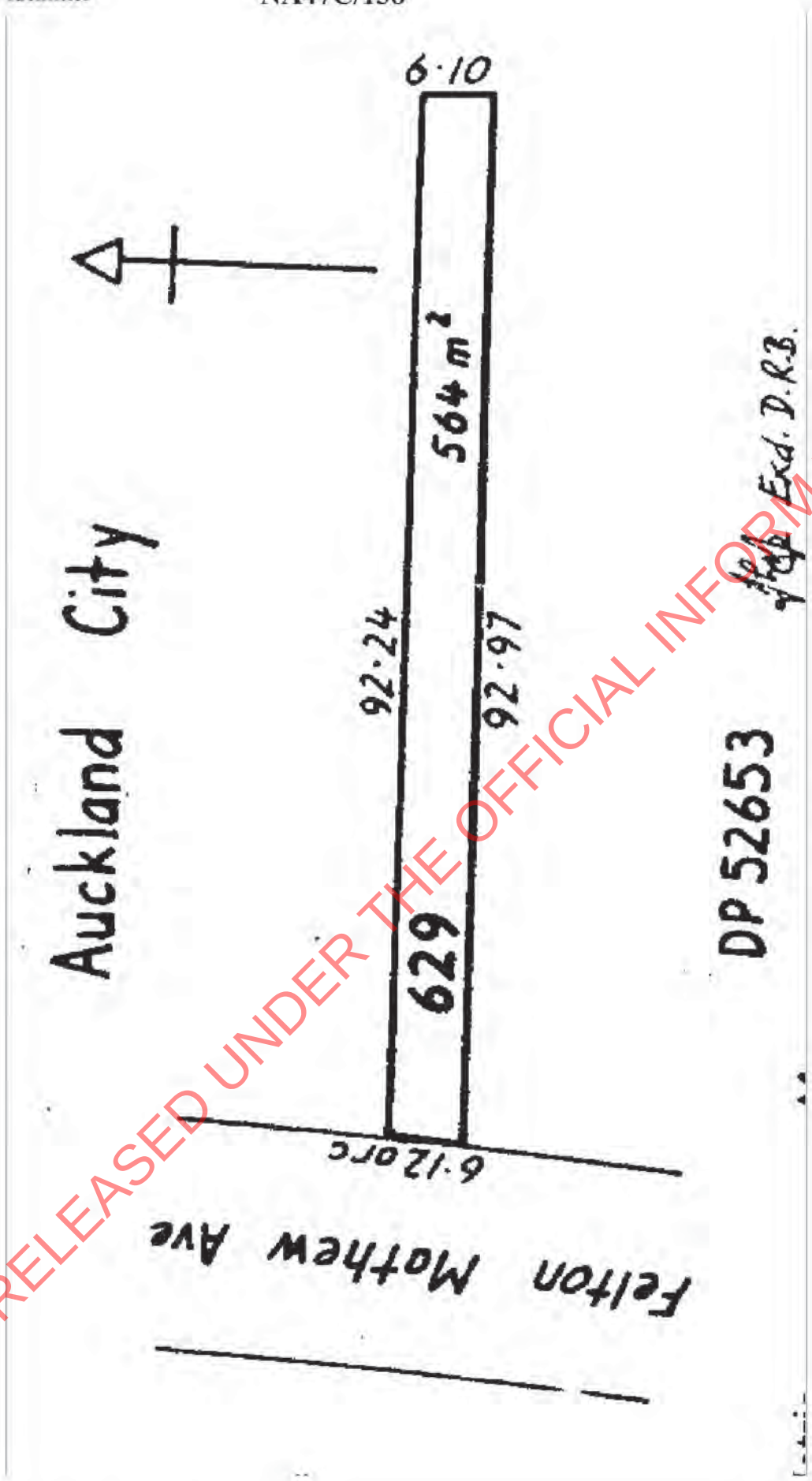
Identifier	**NA47C/138**
Land Registration District	**North Auckland**
Date Issued	06 December 1979

Prior References
NA1C/1190

Estate	Fee Simple
Area	564 square metres more or less
Legal Description	Lot 629 Deposited Plan 52653

Proprietors
Auckland Council

Interests



COMPUTER UNIT TITLE REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

Identifier	**NA115B/700**
Land Registration District	**North Auckland**
Date Issued	03 March 1998

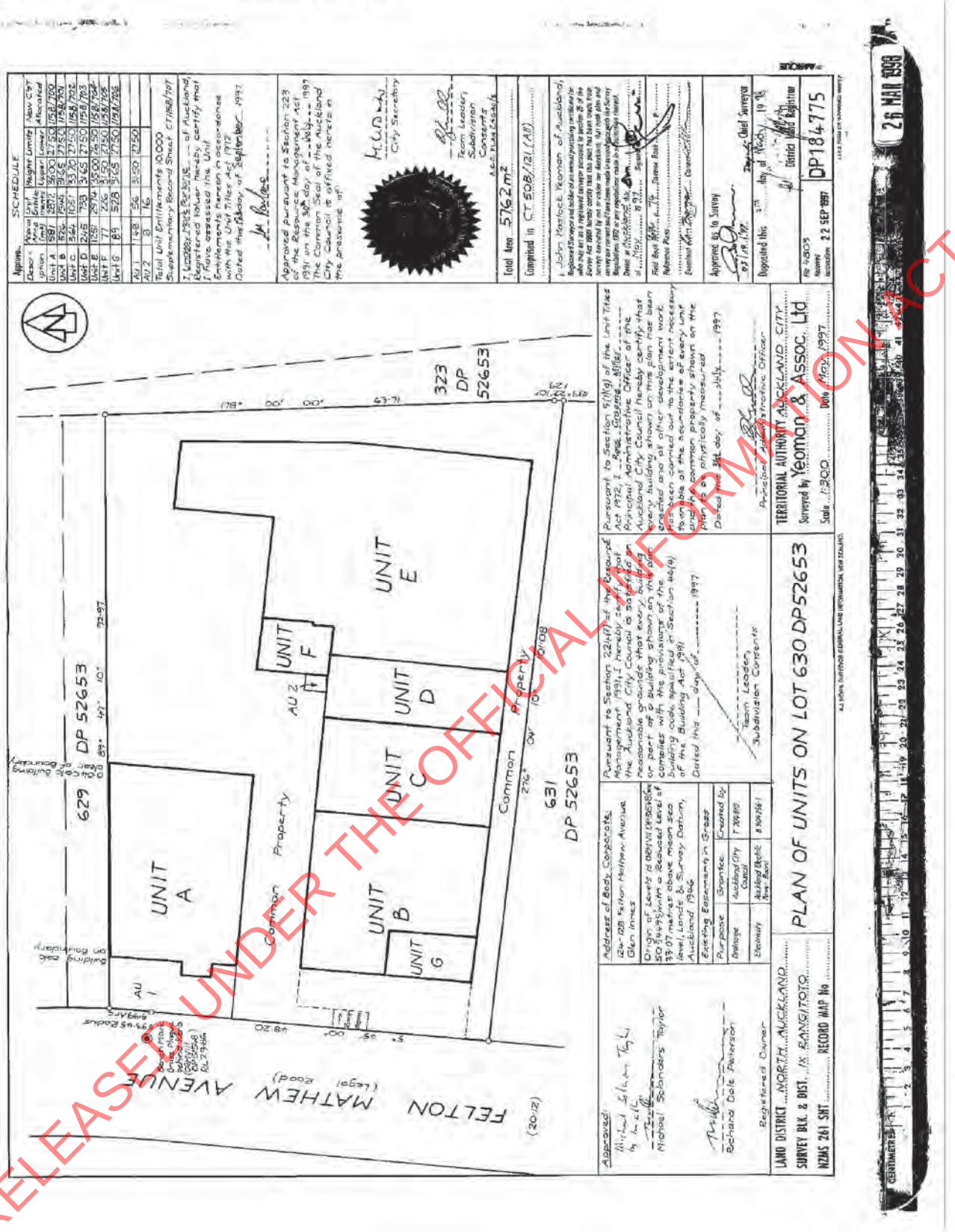
Prior References	**Supplementary Record Sheet**
NA50B/121	NA115B/707

Estate	Stratum in Freehold
Legal Description	Unit A and Accessory Unit 1 Deposited Plan 184775

Proprietors
Michael Sclanders Taylor and Richard Dale Peterson

The above estates are subject to the reservations, restrictions, encumbrances, liens and interests noted below and on the relevant unit plan and supplementary record sheet

D271499.2 Mortgage to National Bank of New Zealand Limited - 13.5.1998 at 3.24 pm



Identifier **NA115B/700**

SUPPLEMENTARY RECORD SHEET UNDER UNIT TITLES ACT 1972

Search Copy

Identifier	**NA115B/707**
Land Registration District	**North Auckland**
Date Issued	03 March 1998
Plan Number	DP 184775

Subdivision of
Lot 630 Deposited Plan 52653

Prior References
NA50B/121

Unit Titles Issued

NA115B/700	NA115B/701	NA115B/702	NA115B/703
NA115B/704	NA115B/706	NA128C/599	

Interests
OWNERSHIP OF COMMON PROPERTY

Pursuant to Section 47 Unit Titles Act 2010 -

(a) the body corporate owns the common property and

(b) the owners of all the units are beneficially entitled to the common property as tenants in common in shares proportional to the ownership interest (or proposed ownership interest) in respect of their respective units.

The above memorial has been added to Supplementary Record Sheets issued under the Unit Titles Act 1972 to give effect to Section 47 of the Unit Titles Act 2010.
Subject to a drainage right (in gross) over part marked blue on DP 51548 in favour of Auckland City Council created by Transfer 704810
Subject to an electricity right (in gross) over part in favour of The Auckland Electric Power Board created by Transfer B904256.1 - 27.10.1988 at 2.16 pm
Fencing Covenant in Transfer C503774.3 - 3.8.1993 at 2.29 pm
D259725.1 Notice of Change of rules of the Body Corporate - 7.4.1998 at 11.59 am

COMPUTER UNIT TITLE REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

Identifier	**NA115B/701**
Land Registration District	**North Auckland**
Date Issued	03 March 1998

Prior References	**Supplementary Record Sheet**
NA50B/121	NA115B/707

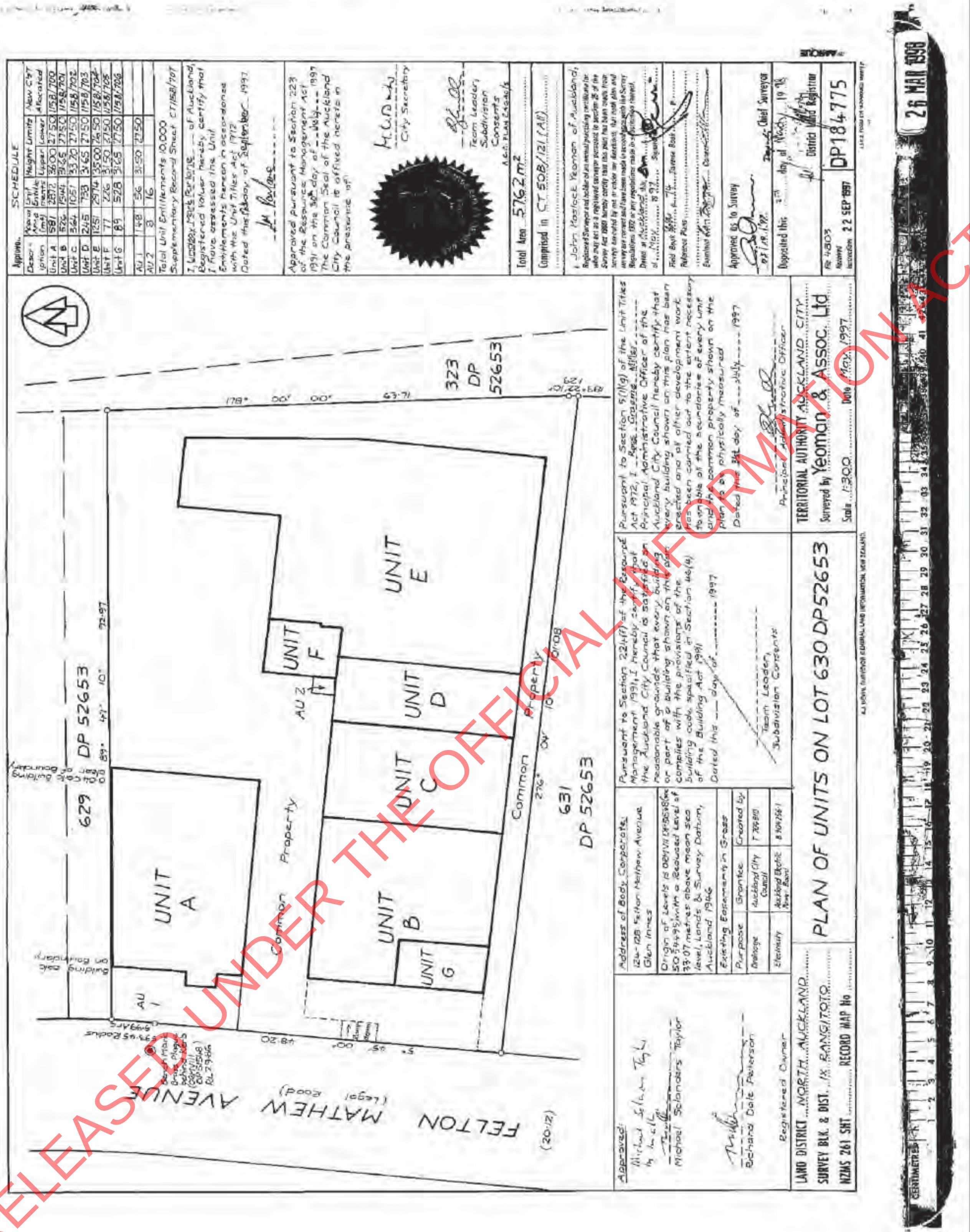
Estate	Stratum in Freehold
Legal Description	Unit B Deposited Plan 184775

Proprietors
Michael Sclanders Taylor and Richard Dale Peterson

The above estates are subject to the reservations, restrictions, encumbrances, liens and interests noted below and on the relevant unit plan and supplementary record sheet

D271499.2 Mortgage to National Bank of New Zealand Limited - 13.5.1998 at 3.24 pm

Identifier **NA115B/701**



Identifier **NA115B/701**

SUPPLEMENTARY RECORD SHEET UNDER UNIT TITLES ACT 1972

Search Copy

Identifier	**NA115B/707**
Land Registration District	**North Auckland**
Date Issued	03 March 1998
Plan Number	DP 184775

Subdivision of
Lot 630 Deposited Plan 52653

Prior References
NA50B/121

Unit Titles Issued

NA115B/700	NA115B/701	NA115B/702	NA115B/703
NA115B/704	NA115B/706	NA128C/599	

Interests
OWNERSHIP OF COMMON PROPERTY

Pursuant to Section 47 Unit Titles Act 2010 -

(a) the body corporate owns the common property and

(b) the owners of all the units are beneficially entitled to the common property as tenants in common in shares proportional to the ownership interest (or proposed ownership interest) in respect of their respective units.

The above memorial has been added to Supplementary Record Sheets issued under the Unit Titles Act 1972 to give effect to Section 47 of the Unit Titles Act 2010.
Subject to a drainage right (in gross) over part marked blue on DP 51548 in favour of Auckland City Council created by Transfer 704810
Subject to an electricity right (in gross) over part in favour of The Auckland Electric Power Board created by Transfer B904256.1 - 27.10.1988 at 2.16 pm
Fencing Covenant in Transfer C503774.3 - 3.8.1993 at 2.29 pm
D259725.1 Notice of Change of rules of the Body Corporate - 7.4.1998 at 11.59 am

COMPUTER UNIT TITLE REGISTER
UNDER LAND TRANSFER ACT 1952

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Identifier	**NA115B/702**
Land Registration District	**North Auckland**
Date Issued	03 March 1998

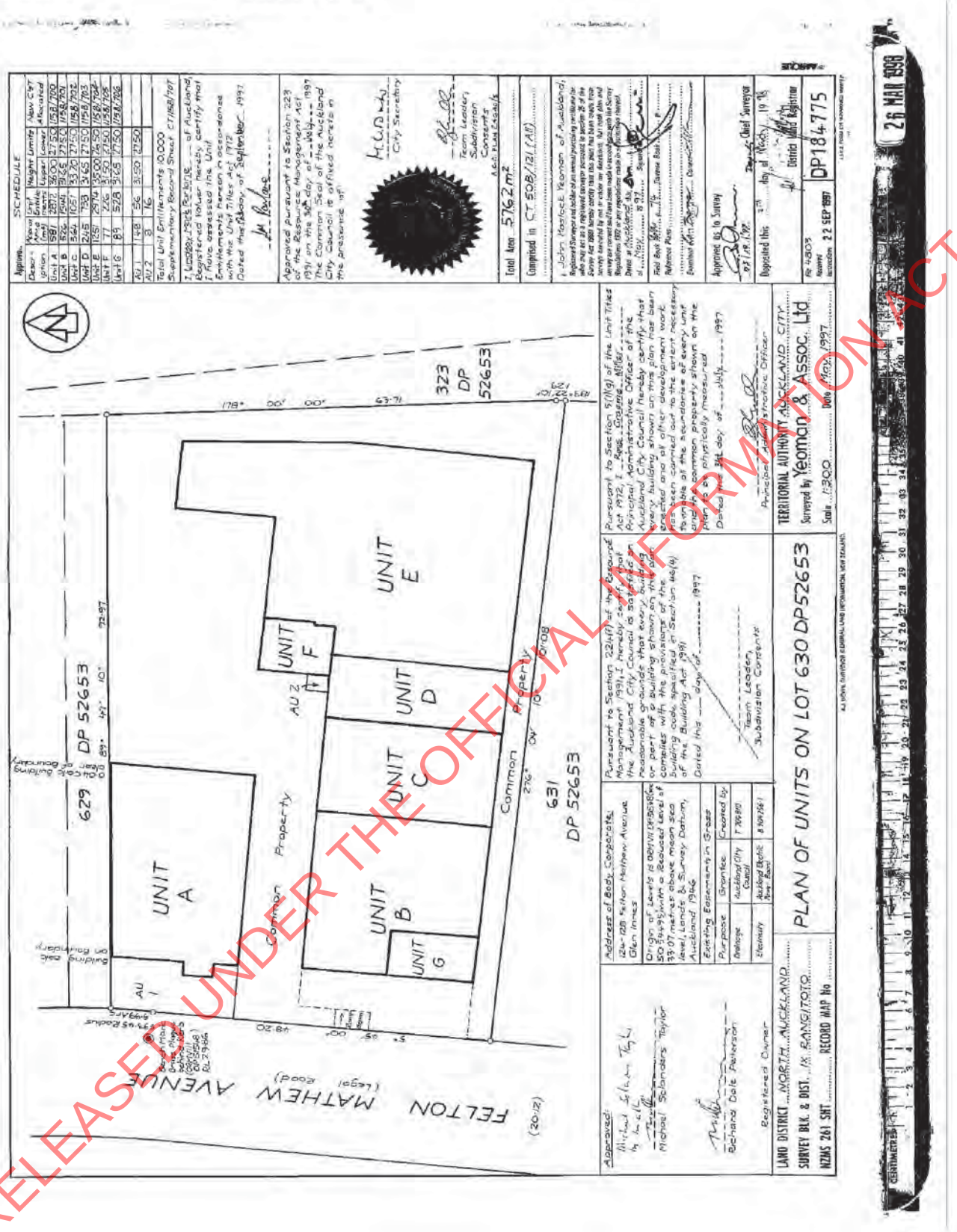
Prior References	**Supplementary Record Sheet**
NA50B/121	NA115B/707

Estate	Stratum in Freehold
Legal Description	Unit C Deposited Plan 184775

Proprietors

Peter James Smith, Gina Christine Smith and Andrew Thomas Williams

The above estates are subject to the reservations, restrictions, encumbrances, liens and interests noted below and on the relevant unit plan and supplementary record sheet



Identifier **NA115B/702**

SUPPLEMENTARY RECORD SHEET UNDER UNIT TITLES ACT 1972

Search Copy

Identifier	**NA115B/707**
Land Registration District	**North Auckland**
Date Issued	03 March 1998
Plan Number	DP 184775

Subdivision of
Lot 630 Deposited Plan 52653

Prior References
NA50B/121

Unit Titles Issued

NA115B/700	NA115B/701	NA115B/702	NA115B/703
NA115B/704	NA115B/706	NA128C/599	

Interests
OWNERSHIP OF COMMON PROPERTY

Pursuant to Section 47 Unit Titles Act 2010 -

(a) the body corporate owns the common property and

(b) the owners of all the units are beneficially entitled to the common property as tenants in common in shares proportional to the ownership interest (or proposed ownership interest) in respect of their respective units.

The above memorial has been added to Supplementary Record Sheets issued under the Unit Titles Act 1972 to give effect to Section 47 of the Unit Titles Act 2010.
Subject to a drainage right (in gross) over part marked blue on DP 51548 in favour of Auckland City Council created by Transfer 704810
Subject to an electricity right (in gross) over part in favour of The Auckland Electric Power Board created by Transfer B904256.1 - 27.10.1988 at 2.16 pm
Fencing Covenant in Transfer C503774.3 - 3.8.1993 at 2.29 pm
D259725.1 Notice of Change of rules of the Body Corporate - 7.4.1998 at 11.59 am

COMPUTER UNIT TITLE REGISTER
UNDER LAND TRANSFER ACT 1952

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Part-Cancelled

Identifier	**NA115B/703**
Land Registration District	**North Auckland**
Date Issued	03 March 1998

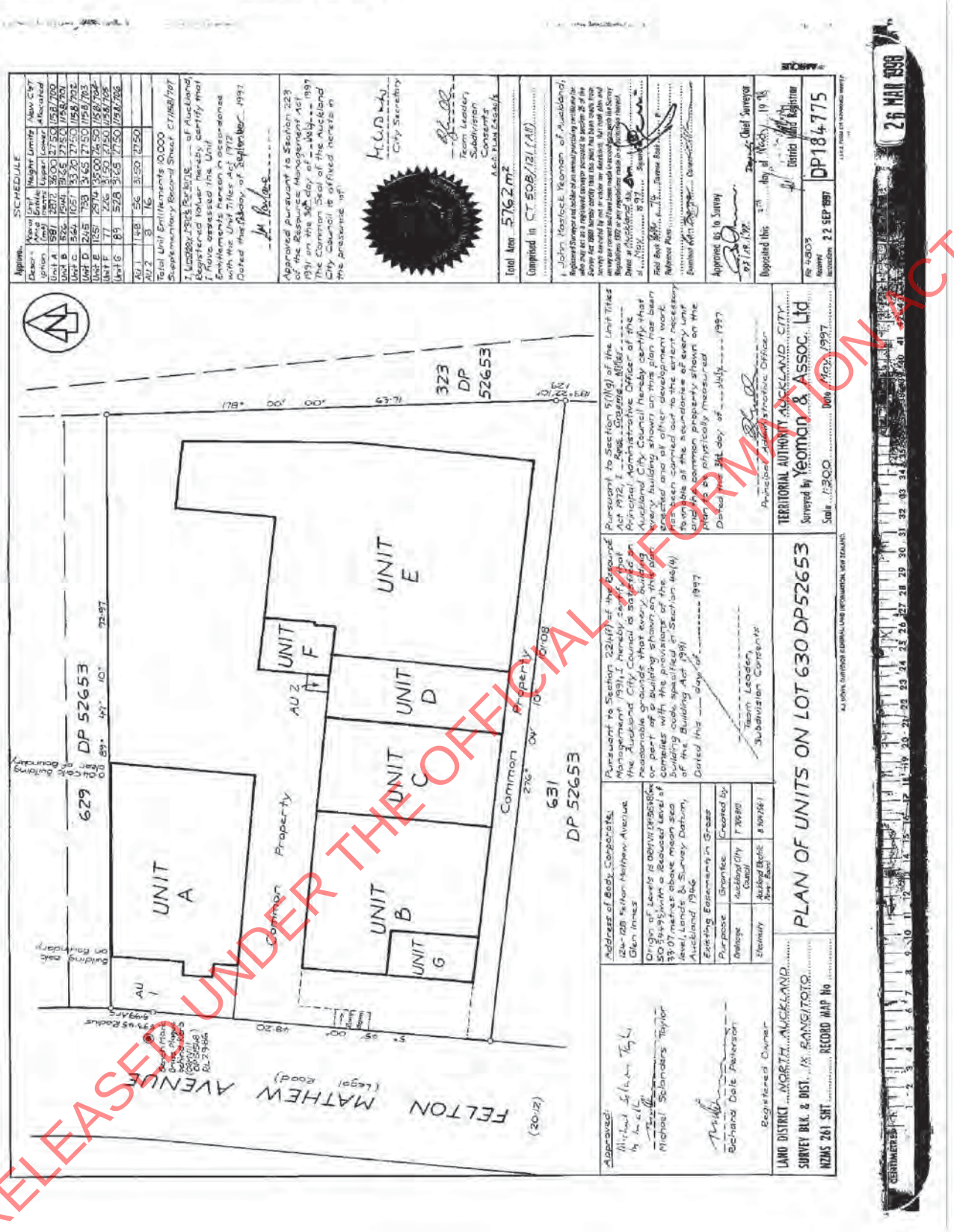
Prior References
NA50B/121

Supplementary Record Sheet
NA115B/707

Estate	Stratum in Freehold
Legal Description	Unit D Deposited Plan 184775

Proprietors
Jeffrey Morris Napier, Petrina Anne Napier and Brian Kenneth Rowe

The above estates are subject to the reservations, restrictions, encumbrances, liens and interests noted below and on the relevant unit plan and supplementary record sheet



Identifier **NA115B/703**

SUPPLEMENTARY RECORD SHEET UNDER UNIT TITLES ACT 1972

Search Copy

Identifier	**NA115B/707**
Land Registration District	**North Auckland**
Date Issued	03 March 1998
Plan Number	DP 184775

Subdivision of
Lot 630 Deposited Plan 52653

Prior References
NA50B/121

Unit Titles Issued

NA115B/700	NA115B/701	NA115B/702	NA115B/703
NA115B/704	NA115B/706	NA128C/599	

Interests
OWNERSHIP OF COMMON PROPERTY

Pursuant to Section 47 Unit Titles Act 2010 -

(a) the body corporate owns the common property and

(b) the owners of all the units are beneficially entitled to the common property as tenants in common in shares proportional to the ownership interest (or proposed ownership interest) in respect of their respective units.

The above memorial has been added to Supplementary Record Sheets issued under the Unit Titles Act 1972 to give effect to Section 47 of the Unit Titles Act 2010.
Subject to a drainage right (in gross) over part marked blue on DP 51548 in favour of Auckland City Council created by Transfer 704810
Subject to an electricity right (in gross) over part in favour of The Auckland Electric Power Board created by Transfer B904256.1 - 27.10.1988 at 2.16 pm
Fencing Covenant in Transfer C503774.3 - 3.8.1993 at 2.29 pm
D259725.1 Notice of Change of rules of the Body Corporate - 7.4.1998 at 11.59 am

COMPUTER UNIT TITLE REGISTER
UNDER LAND TRANSFER ACT 1952

R W Muir
Registrar-General
of Land

Search Copy

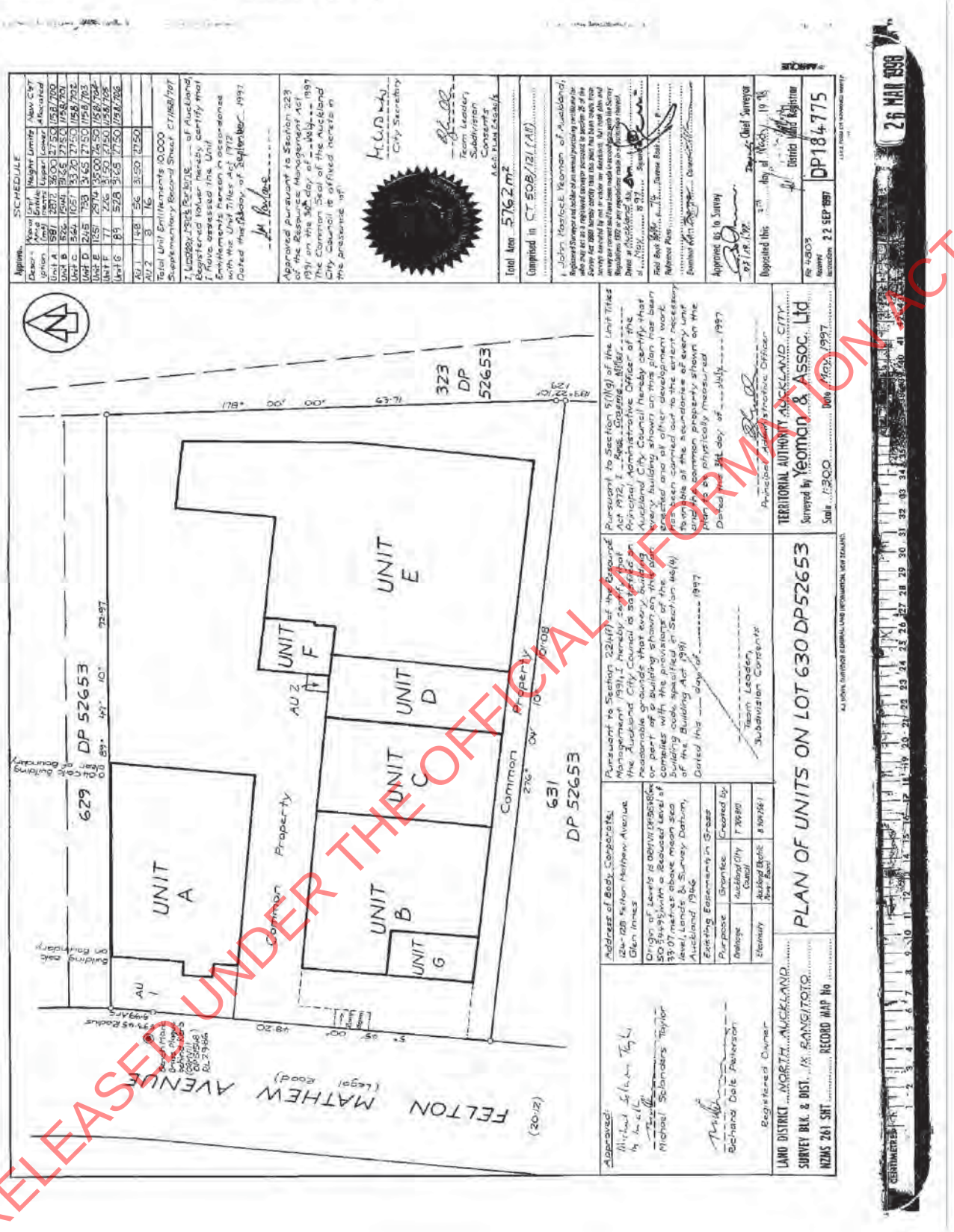
Identifier	**NA115B/704**
Land Registration District	**North Auckland**
Date Issued	03 March 1998

Prior References	**Supplementary Record Sheet**
NA50B/121	NA115B/707

Estate	Stratum in Freehold
Legal Description	Unit E Deposited Plan 184775

Proprietors
Inbox Solutions Limited

The above estates are subject to the reservations, restrictions, encumbrances, liens and interests noted below and on the relevant unit plan and supplementary record sheet



Identifier **NA115B/704**

SUPPLEMENTARY RECORD SHEET UNDER UNIT TITLES ACT 1972

Search Copy

Identifier	**NA115B/707**
Land Registration District	**North Auckland**
Date Issued	03 March 1998
Plan Number	DP 184775

Subdivision of
Lot 630 Deposited Plan 52653

Prior References
NA50B/121

Unit Titles Issued

NA115B/700	NA115B/701	NA115B/702	NA115B/703
NA115B/704	NA115B/706	NA128C/599	

Interests
OWNERSHIP OF COMMON PROPERTY

Pursuant to Section 47 Unit Titles Act 2010 -

(a) the body corporate owns the common property and

(b) the owners of all the units are beneficially entitled to the common property as tenants in common in shares proportional to the ownership interest (or proposed ownership interest) in respect of their respective units.

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Subject to a drainage right (in gross) over part marked blue on DP 51548 in favour of Auckland City Council created by Transfer 704810
Subject to an electricity right (in gross) over part in favour of The Auckland Electric Power Board created by Transfer B904256.1 - 27.10.1988 at 2.16 pm
Fencing Covenant in Transfer C503774.3 - 3.8.1993 at 2.29 pm
D259725.1 Notice of Change of rules of the Body Corporate - 7.4.1998 at 11.59 am

COMPUTER UNIT TITLE REGISTER
UNDER LAND TRANSFER ACT 1952

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Identifier	**NA115B/706**
Land Registration District	**North Auckland**
Date Issued	03 March 1998

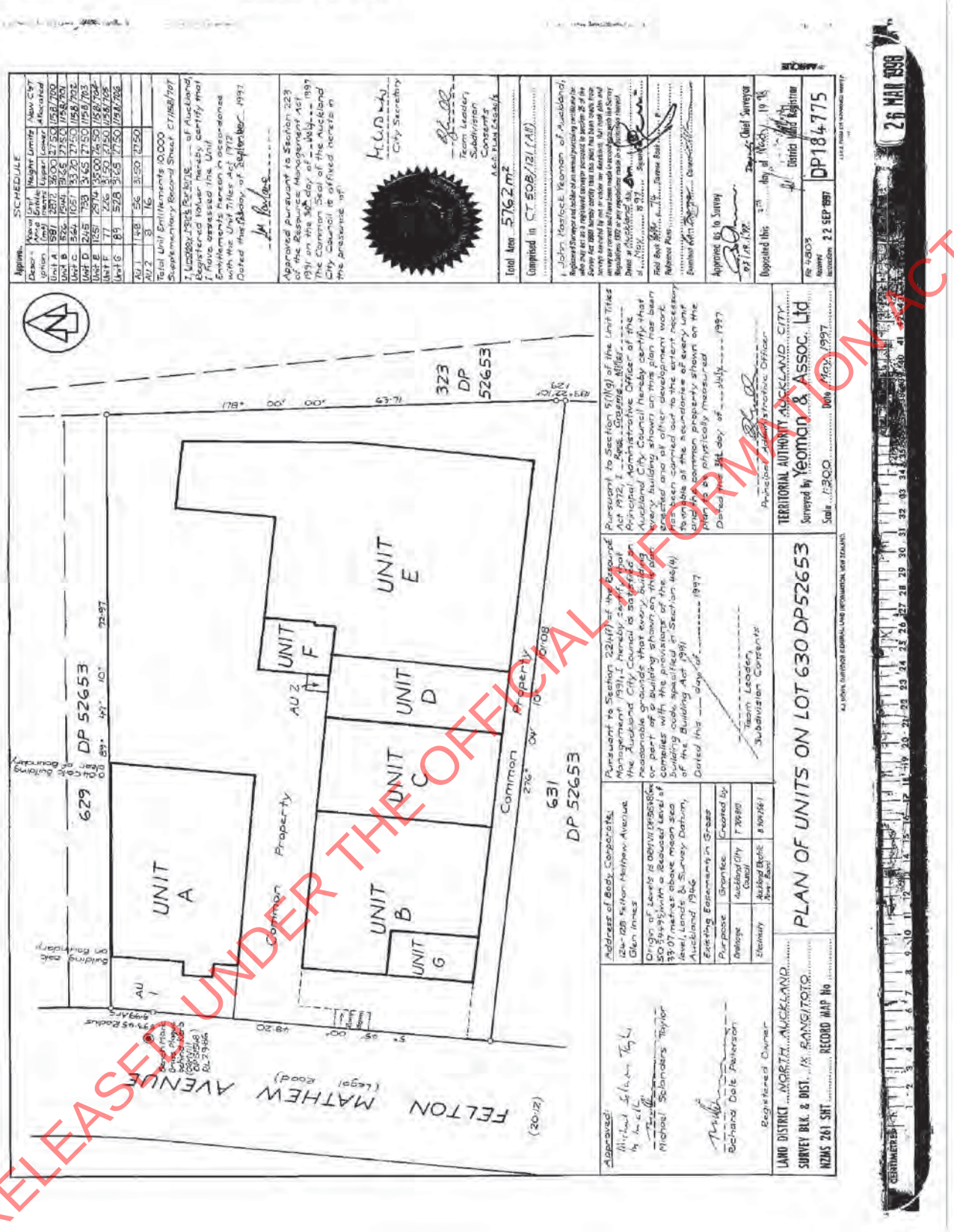
Prior References	**Supplementary Record Sheet**
NA50B/121	NA115B/707

Estate	Stratum in Freehold
Legal Description	Unit G Deposited Plan 184775

Proprietors
Michael Sclanders Taylor and Richard Dale Peterson

The above estates are subject to the reservations, restrictions, encumbrances, liens and interests noted below and on the relevant unit plan and supplementary record sheet

D271499.2 Mortgage to National Bank of New Zealand Limited - 13.5.1998 at 3.24 pm



Identifier **NA115B/706**

SUPPLEMENTARY RECORD SHEET UNDER UNIT TITLES ACT 1972

Search Copy

Identifier	**NA115B/707**
Land Registration District	**North Auckland**
Date Issued	03 March 1998
Plan Number	DP 184775

Subdivision of
Lot 630 Deposited Plan 52653

Prior References
NA50B/121

Unit Titles Issued

NA115B/700	NA115B/701	NA115B/702	NA115B/703
NA115B/704	NA115B/706	NA128C/599	

Interests
OWNERSHIP OF COMMON PROPERTY

Pursuant to Section 47 Unit Titles Act 2010 -

(a) the body corporate owns the common property and

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Subject to a drainage right (in gross) over part marked blue on DP 51548 in favour of Auckland City Council created by Transfer 704810
Subject to an electricity right (in gross) over part in favour of The Auckland Electric Power Board created by Transfer B904256.1 - 27.10.1988 at 2.16 pm
Fencing Covenant in Transfer C503774.3 - 3.8.1993 at 2.29 pm
D259725.1 Notice of Change of rules of the Body Corporate - 7.4.1998 at 11.59 am

SUPPLEMENTARY RECORD SHEET
UNDER UNIT TITLES ACT 1972

Search Copy

Identifier	**NA115B/707**
Land Registration District	**North Auckland**
Date Issued	03 March 1998
Plan Number	DP 184775

Subdivision of
Lot 630 Deposited Plan 52653

Prior References
NA50B/121

Unit Titles Issued

NA115B/700	NA115B/701	NA115B/702	NA115B/703
NA115B/704	NA115B/706	NA128C/599	

Interests

OWNERSHIP OF COMMON PROPERTY
Pursuant to Section 47 Unit Titles Act 2010 -

(a) the body corporate owns the common property and

(b) the owners of all the units are beneficially entitled to the common property as tenants in common in shares proportional to the ownership interest (or proposed ownership interest) in respect of their respective units.

The above memorial has been added to Supplementary Record Sheets issued under the Unit Titles Act 1972 to give effect to Section 47 of the Unit Titles Act 2010.

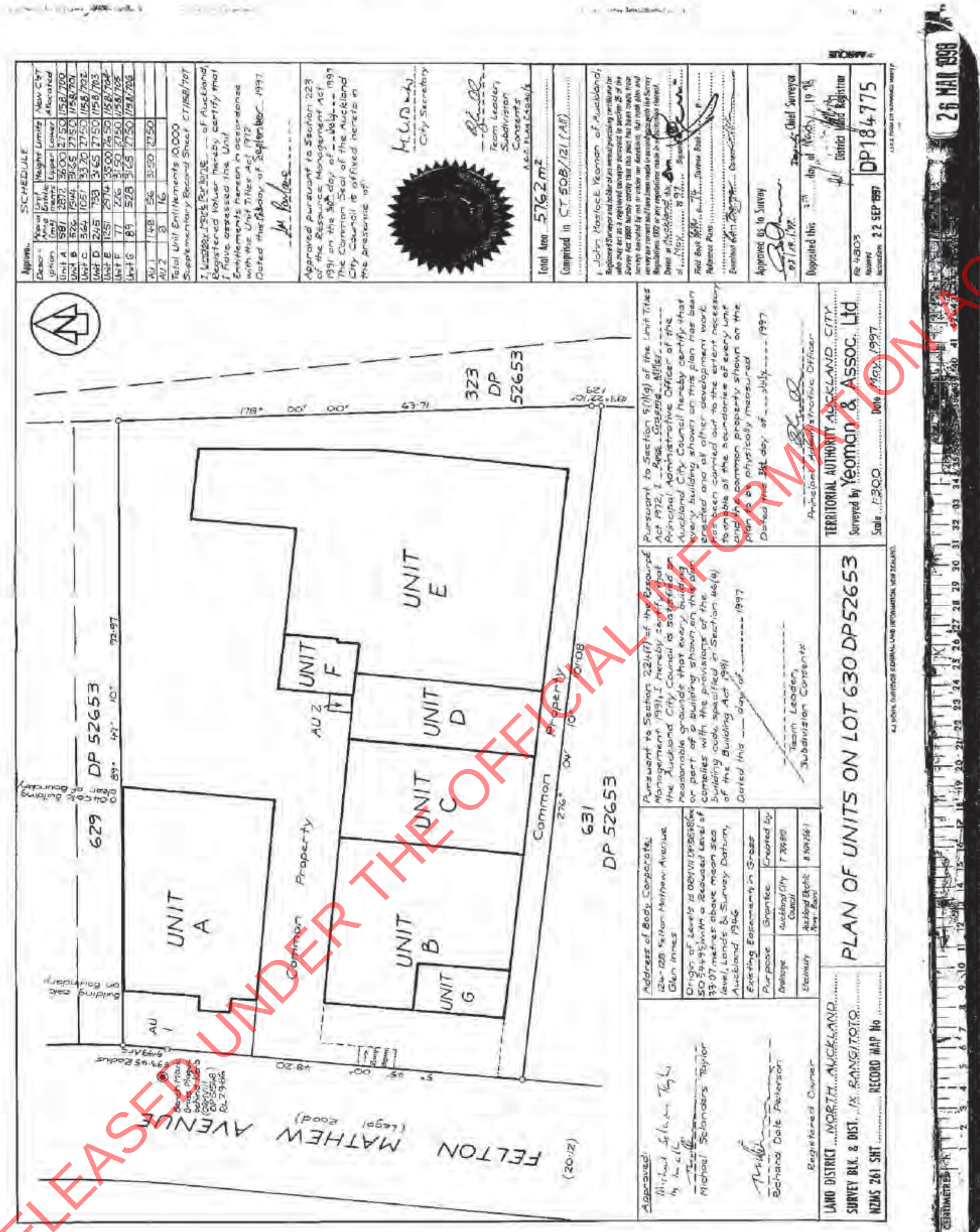
Subject to a drainage right (in gross) over part marked blue on DP 51548 in favour of Auckland City Council created by Transfer 704810

Subject to an electricity right (in gross) over part in favour of The Auckland Electric Power Board created by Transfer B904256.1 - 27.10.1988 at 2.16 pm

Fencing Covenant in Transfer C503774.3 - 3.8.1993 at 2.29 pm

D259725.1 Notice of Change of rules of the Body Corporate - 7.4.1998 at 11.59 am

Identifier **NA115B/707**



COMPUTER UNIT TITLE REGISTER
UNDER LAND TRANSFER ACT 1952

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Identifier	**NA128C/599**
Land Registration District	**North Auckland**
Date Issued	22 March 2000

Prior References		**Supplementary Record Sheet**
NA115B/705	NA115C/703	NA115B/707

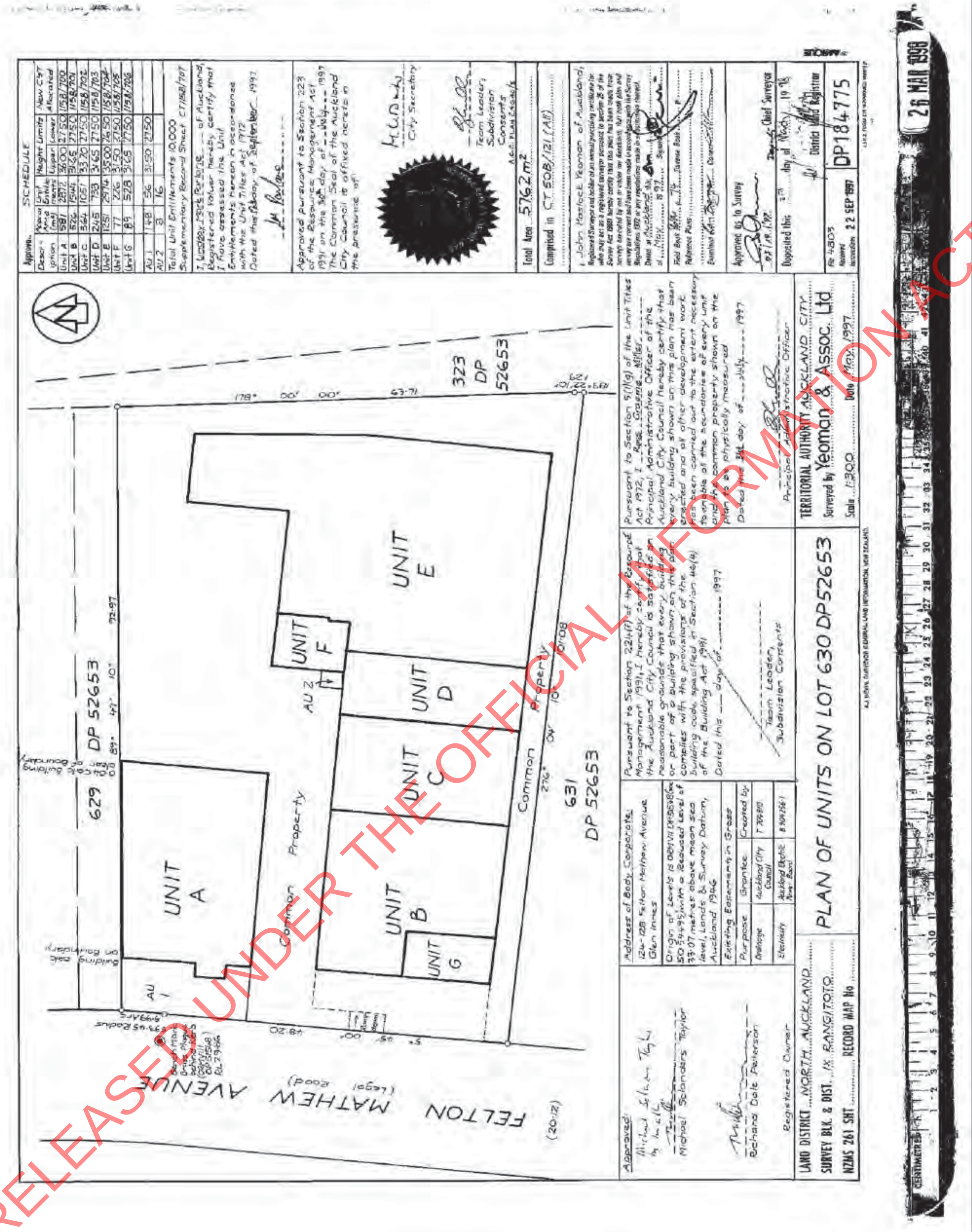
Estate	Stratum in Freehold
Legal Description	Unit F and Accessory Unit 2 Deposited Plan 184775

Proprietors

Peter James Smith, Gina Christine Smith and Andrew Thomas Williams

The above estates are subject to the reservations, restrictions, encumbrances, liens and interests noted below and on the relevant unit plan and supplementary record sheet

Identifier **NA128C/599**



Identifier NA128C/599

SUPPLEMENTARY RECORD SHEET UNDER UNIT TITLES ACT 1972

Search Copy

Identifier	**NA115B/707**
Land Registration District	**North Auckland**
Date Issued	03 March 1998
Plan Number	DP 184775

Subdivision of
Lot 630 Deposited Plan 52653

Prior References
NA50B/121

Unit Titles Issued

NA115B/700	NA115B/701	NA115B/702	NA115B/703
NA115B/704	NA115B/706	NA128C/599	

Interests
OWNERSHIP OF COMMON PROPERTY

Pursuant to Section 47 Unit Titles Act 2010 -

(a) the body corporate owns the common property and

(b) the owners of all the units are beneficially entitled to the common property as tenants in common in shares proportional to the ownership interest (or proposed ownership interest) in respect of their respective units.

The above memorial has been added to Supplementary Record Sheets issued under the Unit Titles Act 1972 to give effect to Section 47 of the Unit Titles Act 2010.
Subject to a drainage right (in gross) over part marked blue on DP 51548 in favour of Auckland City Council created by Transfer 704810
Subject to an electricity right (in gross) over part in favour of The Auckland Electric Power Board created by Transfer B904256.1 - 27.10.1988 at 2.16 pm
Fencing Covenant in Transfer C503774.3 - 3.8.1993 at 2.29 pm
D259725.1 Notice of Change of rules of the Body Corporate - 7.4.1998 at 11.59 am

COMPUTER INTEREST REGISTER UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General of Land

Identifier	**81513**
Land Registration District	**North Auckland**
Date Registered	08 March 1985 11:09 am

Prior References
NA50B/122

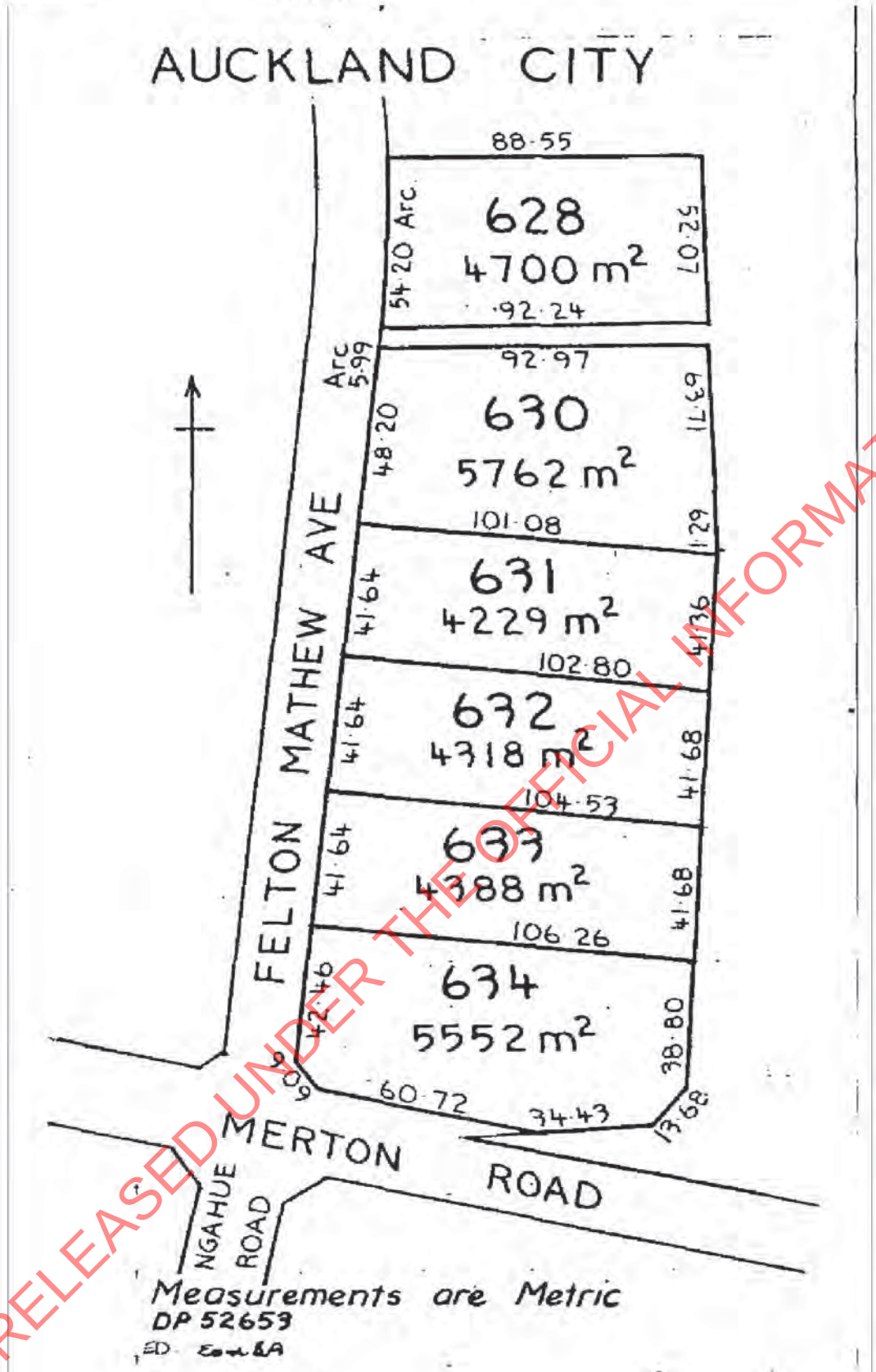
Estate	Leasehold	**Instrument**	L B389238.1
Area	4229 square metres more or less	**Term**	21 years from the 21.6.1984 (renewal clause)

Legal Description Lot 631 Deposited Plan 52653

Proprietors
Ellen Marjorie Cunningham and Andrew William Cunningham

Interests
Fencing Clause in Lease B389238.1 - 8.3.1985 at 11.09 am

Identifier 81513



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

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R W Muir
Registrar-General
of Land

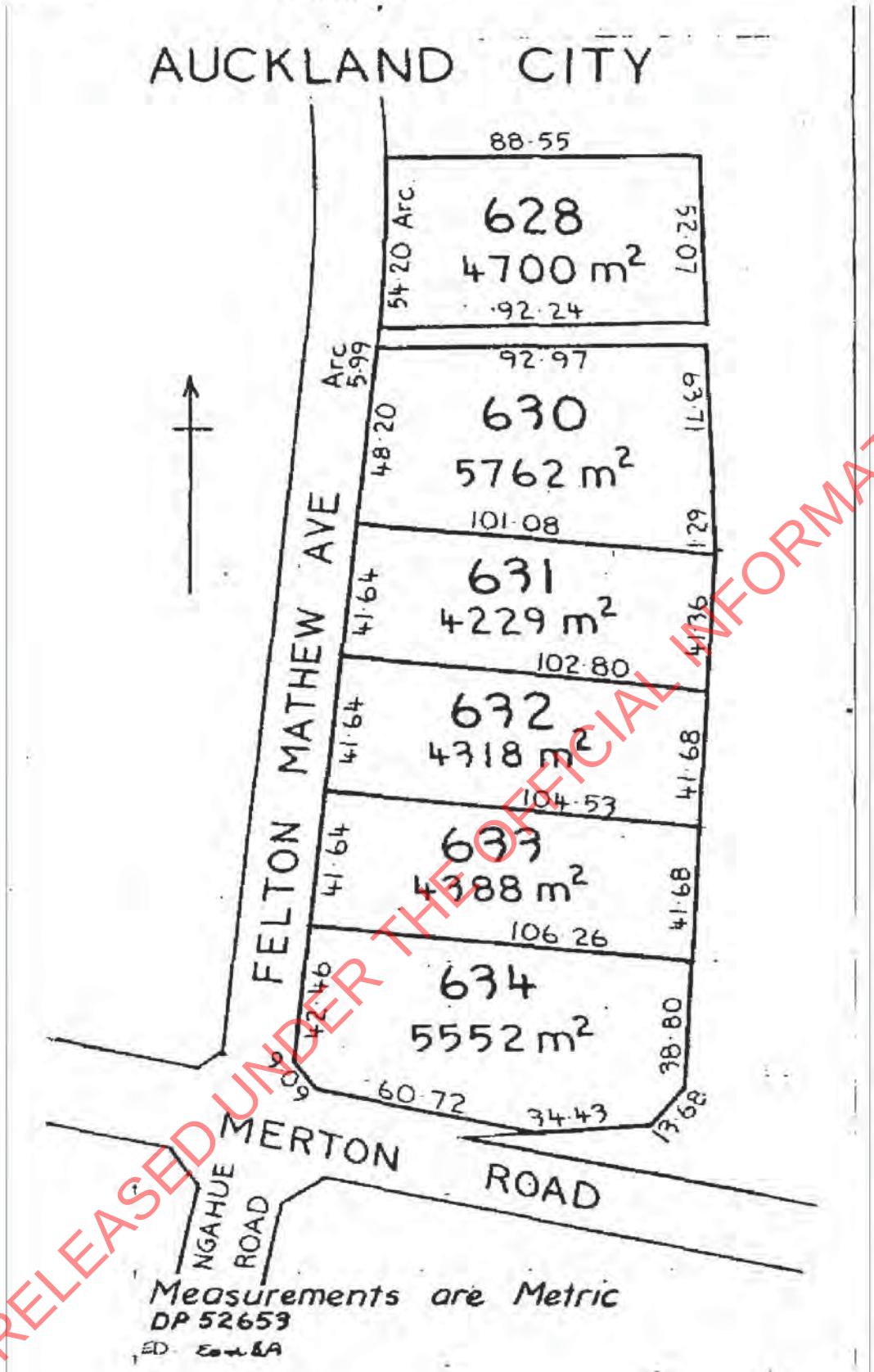
Identifier	**NA50B/122**
Land Registration District	**North Auckland**
Date Issued	15 July 1981

Prior References
NA1C/1190

Estate	Fee Simple
Area	4229 square metres more or less
Legal Description	Lot 631 Deposited Plan 52653

Proprietors
Ellen Marjorie Cunningham and Andrew William Cunningham

Interests
B389238.1 Lease Term 21 years from the 21.6.1984 (renewal clause) CT 81513 issued - 8.3.1985 at 11:09 am
8600215.2 Mortgage to ASB Bank Limited - 1.11.2010 at 10:33 am



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

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R W Muir
Registrar-General
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Identifier	**NA50B/123**
Land Registration District	**North Auckland**
Date Issued	15 July 1981

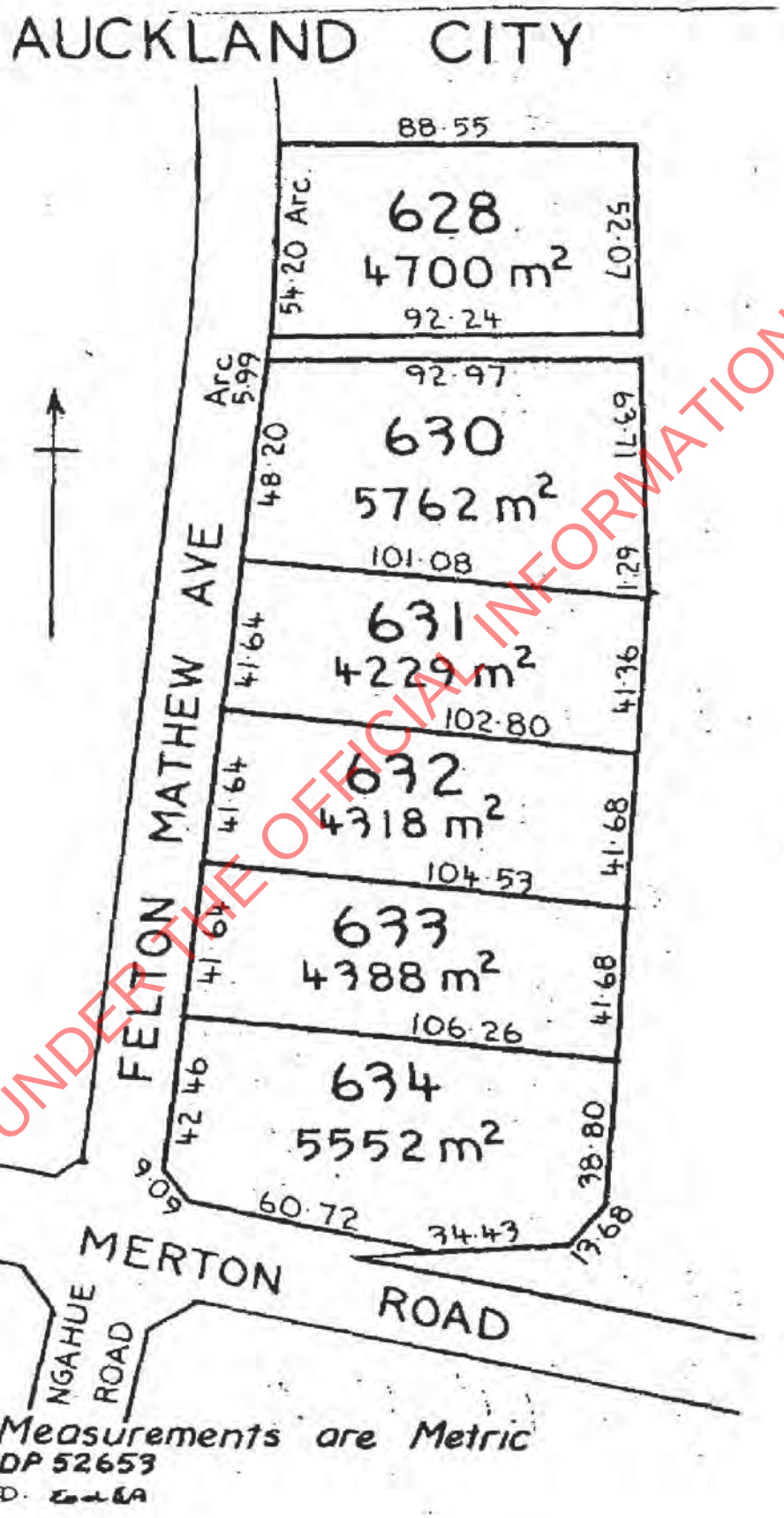
Prior References
NA1C/1190

Estate	Fee Simple
Area	4318 square metres more or less
Legal Description	Lot 632 Deposited Plan 52653
Proprietors	
General Distributors Limited	

Interests

Fencing Covenant in Transfer C462412.2 - 16.3.1993 at 11.53 am

9747167.3 Covenant pursuant to Section 108(2)(d) Resource Management Act 1991 - 23.6.2014 at 2:45 pm



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UNDER LAND TRANSFER ACT 1952

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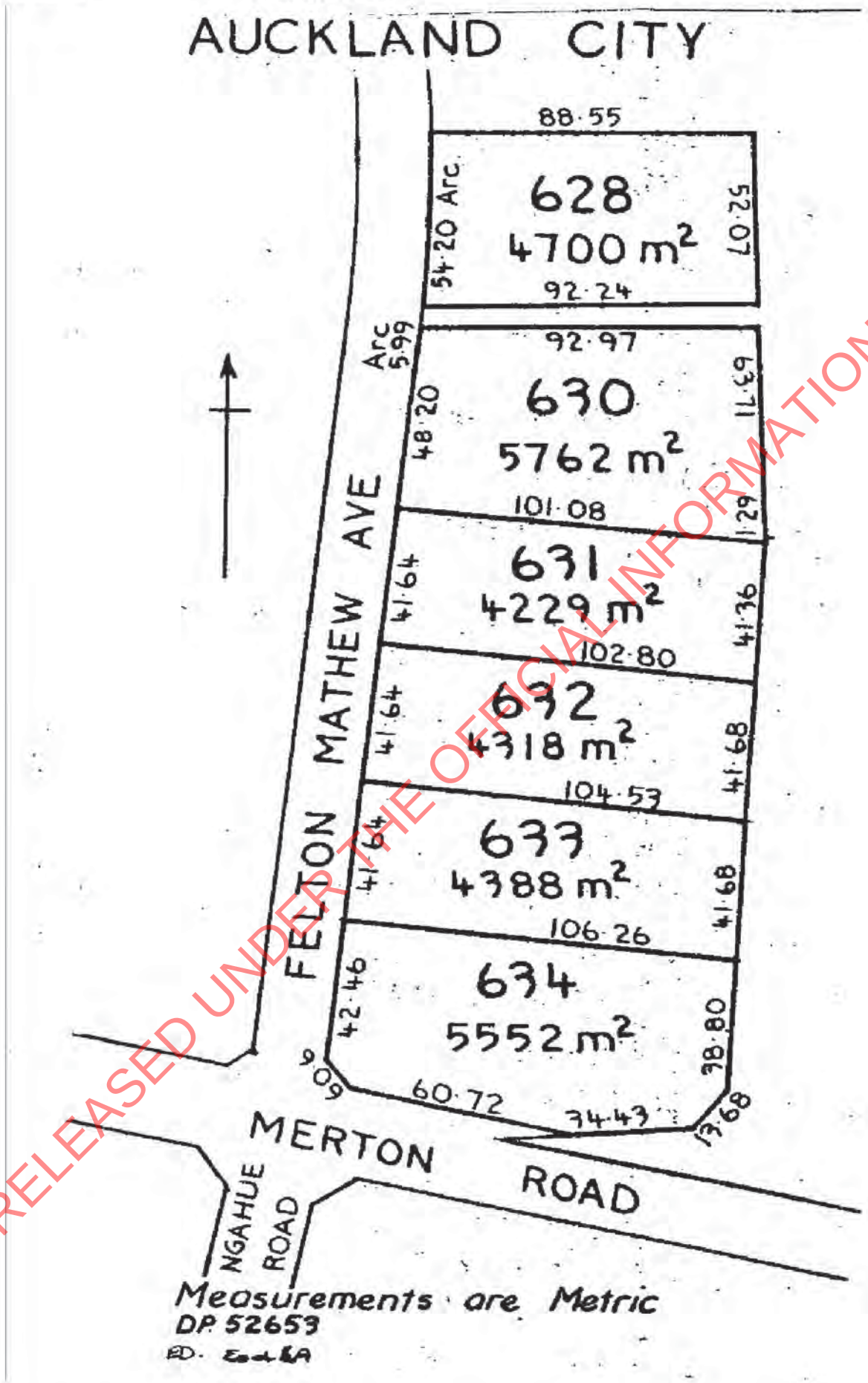
Identifier	**NA50B/124**
Land Registration District	**North Auckland**
Date Issued	15 July 1981

Prior References
NA1C/1190

Estate	Fee Simple
Area	4388 square metres more or less
Legal Description	Lot 633 Deposited Plan 52653

Proprietors
General Distributors Limited

Interests
Subject to an electric current right (in gross) over part coloured yellow on Plan 51548 in favour of The Auckland Electric Power Board created by Transfer 702206
Fencing Covenant in Transfer C462412.2 - 16.3.1993 at 11.53 am
9747167.3 Covenant pursuant to Section 108(2)(d) Resource Management Act 1991 - 23.6.2014 at 2:45 pm



COMPUTER INTEREST REGISTER
UNDER LAND TRANSFER ACT 1952

Historical Search Copy

R W Muir
Registrar-General
of Land

Identifier 264920
Land Registration District North Auckland
Date Registered 23 December 2005 09:00 am

Cancelled

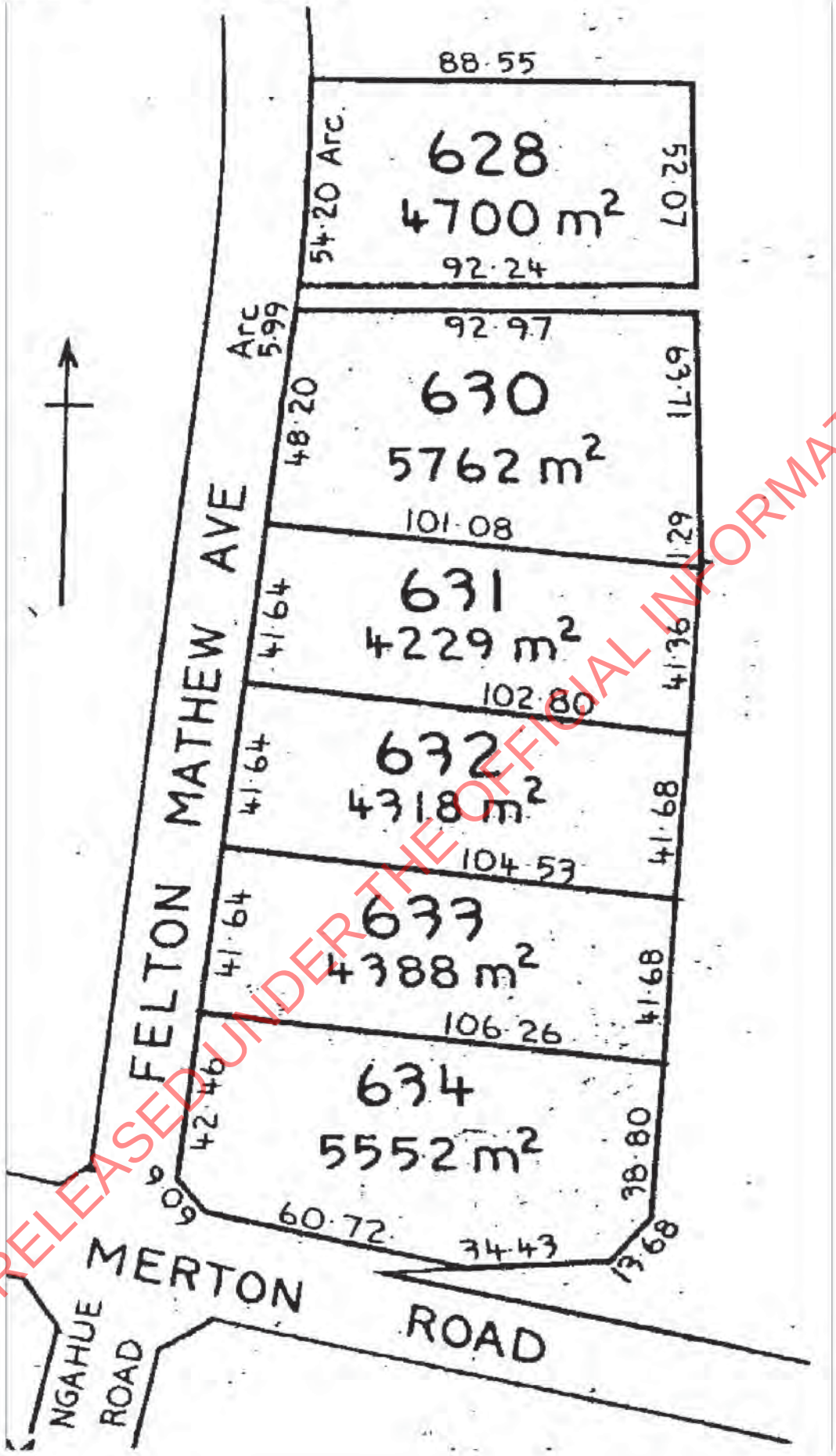
Prior References
NA50B/125

Estate	Leasehold	**Instrument**	L 6706696.1
Area	5552 square metres more or less	**Term**	21 years from 21.6.2005 (renewal clause)
Legal Description	Lot 634 Deposited Plan 52653		

Original Proprietors
APL Properties Limited

Interests
Fencing covenant in Lease 6706696.1 - 23.12.2005 at 9:00 am
7339346.1 Transfer to Runymede Forty Two Limited - 26.4.2007 at 9:00 am
7351857.1 Mortgage to Westpac New Zealand Limited - 3.5.2007 at 9:00 am
7918758.1 Change of Name of Runymede Forty Two Limited to Great Eastern Developments Limited - 26.8.2008 at 9:00 am
7996207.1 Mortgage to Argyle Estates Limited - 13.11.2008 at 9:26 am
8026387.1 Discharge of Mortgage 7351857.1 - 19.12.2008 at 9:02 am
8026387.2 Discharge of Mortgage 7996207.1 - 19.12.2008 at 9:02 am
8026387.4 Transfer to Kelly Marie Barnard - 19.12.2008 at 9:02 am
8428809.1 Transfer to General Distributors Limited - 12.3.2010 at 11:38 am
9747167.1 Surrender of the within lease - 23.6.2014 at 2:45 pm.
CANCELLED

Identifier 264920



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R W Muir
Registrar-General
of Land

Identifier	**NA50B/125**
Land Registration District	**North Auckland**
Date Issued	15 July 1981

Prior References
NA1C/1190

Estate	Fee Simple
Area	5552 square metres more or less
Legal Description	Lot 634 Deposited Plan 52653

Proprietors
General Distributors Limited

Interests

B465663.3 Lease of Warehouse 1 Plan 95187 Term the residue of the term of Lease B436463.1 less the last day thereof commencing on the 21.6.1984 Composite CT NA56A/1379 issued - 3.10.1985 at 11.05 am

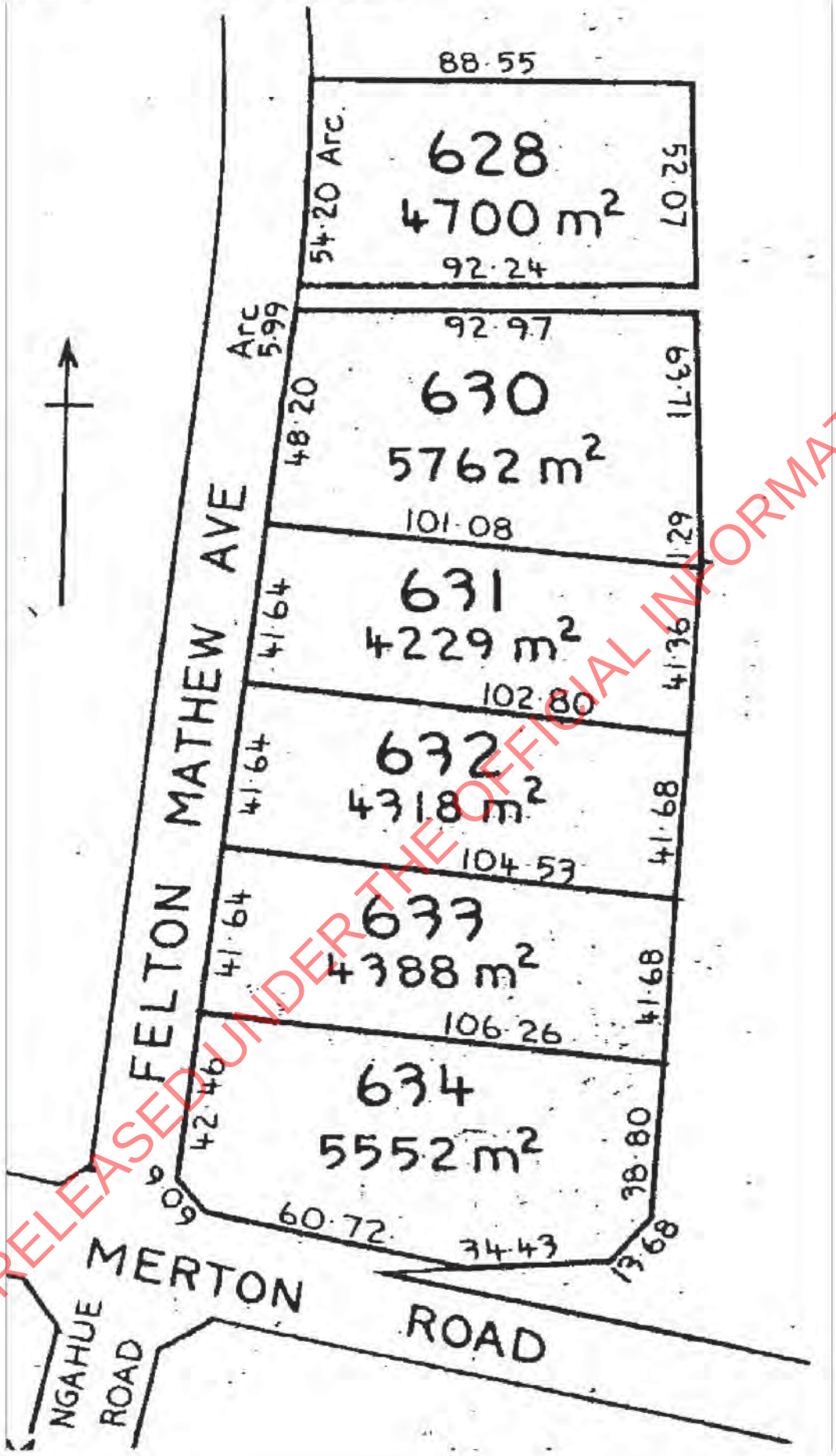
Land Covenant in Lease B465663.3 - 3.10.1985 at 11.05 am

B465663.4 Lease of Warehouse 2 Term the residue of the term of Lease B436463.1 less the last day thereof commencing on the 21.6.1984 Composite CT NA56A/1380 issued - 3.10.1985 at 11.05 am

Land Covenant in Lease B465663.4 - 3.10.1985 at 11.05 am

9747167.3 Covenant pursuant to Section 108(2)(d) Resource Management Act 1991 - 23.6.2014 at 2:45 pm

Identifier NA50B/125



COMPUTER INTEREST REGISTER
UNDER LAND TRANSFER ACT 1952

Historical Search Copy

R W Muir
Registrar-General
of Land

Identifier NA56A/1379 **Cancelled**
Land Registration District North Auckland
Date Registered 03 October 1985 12:00 am

Prior References
NA50B/125 NA51A/1116

Estate	Leasehold - 1/2 share	**Instrument**	L B436463.1
Area	5552 square metres more or less	**Term**	21 years from the 21.6.1984
Legal Description	Lot 634 Deposited Plan 52653		

Original Proprietors
APL Properties Limited

Estate	Leasehold	**Instrument**	L B465663.3
		Term	for the residue of the term of Lease B436463.1 less the last day thereof commencing on 21.6.1984

Legal Description Warehouse 1 Deposited Plan 95187

Original Proprietors
APL Properties Limited

Interests

B465663.3 Lease of Warehouse 1 DP 95187 Term for the residue of the term of Lease B436463.1 less the last day thereof commencing on 21.6.1984 Composite CT NA56A/1379 issued - 3.10.1985 (Affects Head Leasehold Estate)

Land Covenant in Lease B465663.3 - 3.10.1985 (Affects Head Leasehold Estate)

B465663.4 Lease of Warehouse 2 Plan 100988 Composite CT NA56A/1380 issued - 3.10.1985 (Affects Head Leasehold Estate)

Land Covenant in Lease B465663.4 - 3.10.1985 (Affects Head Leasehold Estate)

D377223.1 Mortgage to Westpac Banking Corporation - 13.4.1999 at 2.48 pm

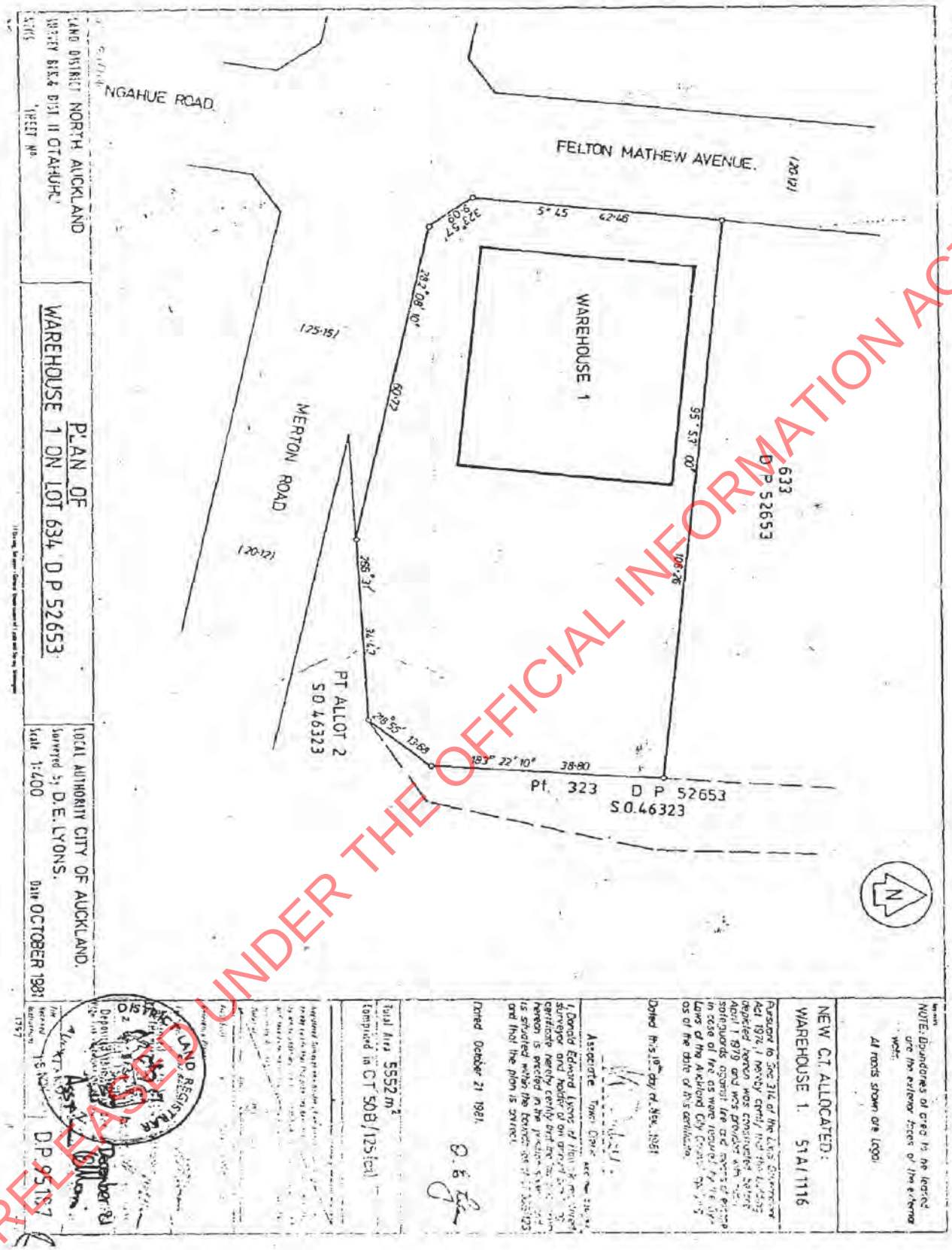
D558196.1 Variation of Mortgage D377223.1 - 16.11.2000 at 12.18 pm

7095691.1 Application pursuant to Section 99A Land Transfer Act 1952 vesting Mortgage D377223.1 in Westpac New Zealand Limited - 2.11.2006 at 9:00 am

7339296.1 Discharge of Mortgage D377223.1 - 26.4.2007 at 9:00 am

CANCELLED

Identifier **NA56A/1379**



COMPUTER INTEREST REGISTER
UNDER LAND TRANSFER ACT 1952

Historical Search Copy

R W Muir
Registrar-General
of Land

Cancelled

Identifier	**NA56A/1380**
Land Registration District	**North Auckland**
Date Registered	03 October 1985 12:00 am

Prior References
NA50B/125 NA55C/1211

Estate	Leasehold - 1/2 share	**Instrument**	L B436463.1
Area	5552 square metres more or less	**Term**	21 years from the 21.6.1984
Legal Description	Lot 634 Deposited Plan 52653		

Original Proprietors
Barwick Russell Pirrit as to a 1/8 share
David Andrew Pirrit as to a 1/8 share
The New Zealand Guardian Trust company Limited and William Charles Chick as to a 1/4 share as Executors
William Charles Chick as to a 1/2 share

Estate	Leasehold	**Instrument**	L B465663.4
		Term	for the residue of the term of Lease B436463.1 less the last day thereof commencing on 21.6.1984
Legal Description	Warehouse 2 Deposited Plan 100988		

Original Proprietors
Barwick Russell Pirrit as to a 1/8 share
David Andrew Pirrit as to a 1/8 share
The New Zealand Guardian Trust company Limited and William Charles Chick as to a 1/4 share as Executors
William Charles Chick as to a 1/2 share

Interests
B275806.7 Mortgage to Broadbank Corporation Limited - 28.3.1984 at 2.36 pm
B465663.3 Lease of Warehouse 1 Plan 95187 Composite CT NA56A/1379 issued - 3.10.1985 at 11.05 am (Affects Head Leasehold Estate)
Land Covenant in Lease B465663.3 - 3.10.1985 at 11.05 am (Affects Head Leasehold Estate)
B465663.4 Lease of Warehouse 2 DP 100988 Term for the residue of the term of Lease B436463.1 less the last day thereof commencing on 21.6.1984 Composite CT NA56A/1380 issued - 3.10.1985 at 11.05 am (Affects Head Leasehold Estate)
Land Covenant in Lease B465663.4 - 3.10.1985 at 11.05 am (Affects Head Leasehold Estate)
5509988.1 Transmission of the 1/2 share of William Charles Chick to The New Zealand Guardian Trust Company Limited as Executor - 6.3.2003 at 9:00 am
5509988.2 Transmission of the 1/4 share of The New Zealand Guardian Trust Company Limited and William Charles Chick to The New Zealand Guardian Trust Company Limited - 6.3.2003 at 9:00 am
5679099.1 CAVEAT BY APL PROPERTIES LIMITED - 1.8.2003 at 9:32 am
5688750.1 Discharge of Mortgage B275806.7 - 11.8.2003 at 9:00 am
5688750.2 Withdrawal of Caveat 5679099.1 - 11.8.2003 at 9:00 am
5688750.3 Transfer to APL Properties Limited - 11.8.2003 at 9:00 am
5688750.4 Mortgage to Westpac Banking Corporation - 11.8.2003 at 9:00 am
7095691.1 Application pursuant to Section 99A Land Transfer Act 1952 vesting Mortgage 5688750.4 in

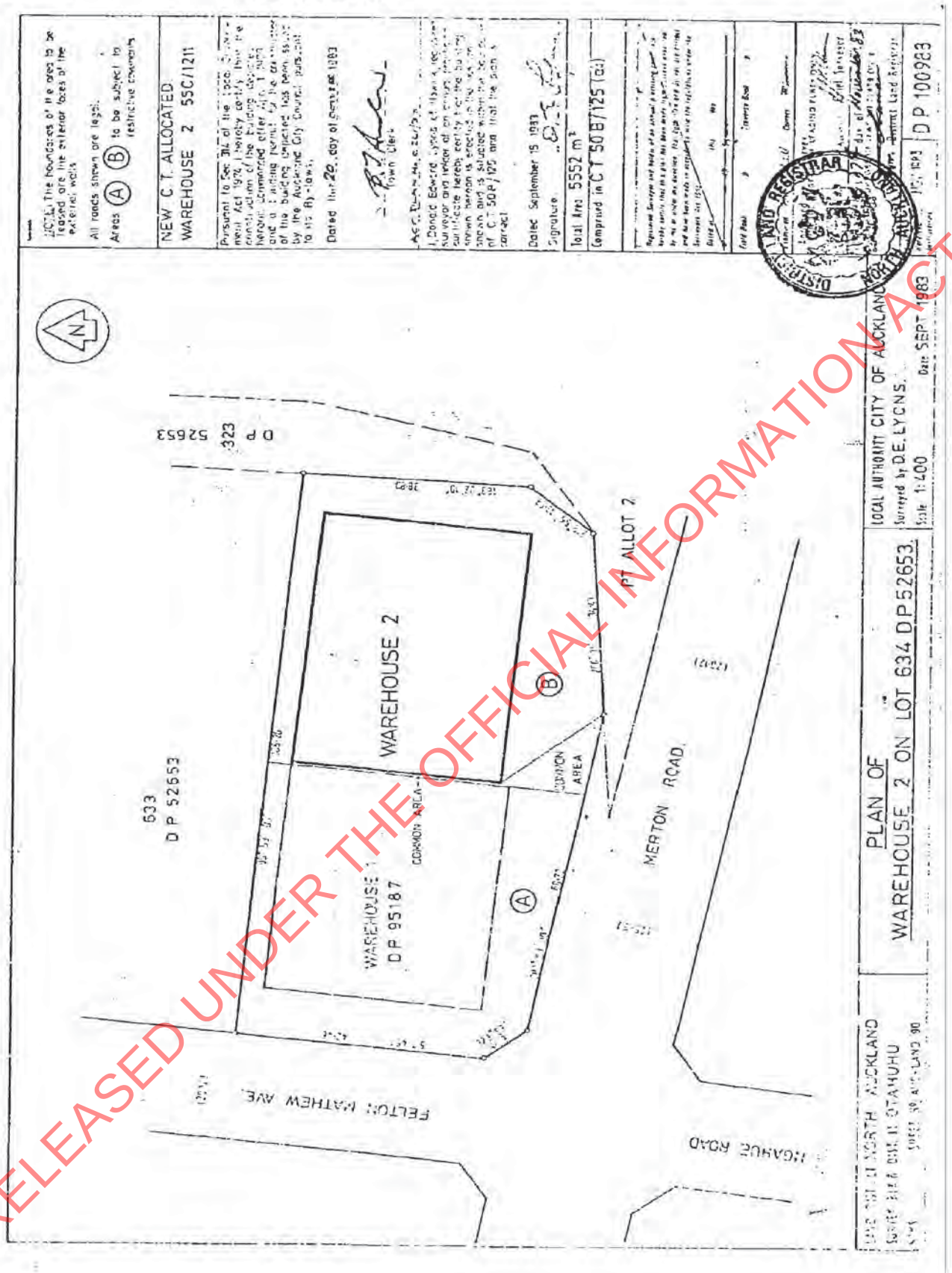
Identifier **NA56A/1380**

Westpac New Zealand Limited - 2.11.2006 at 9:00 am

7339296.2 Discharge of Mortgage 5688750.4 - 26.4.2007 at 9:00 am

CANCELLED

Identifier **NA56A/1380**

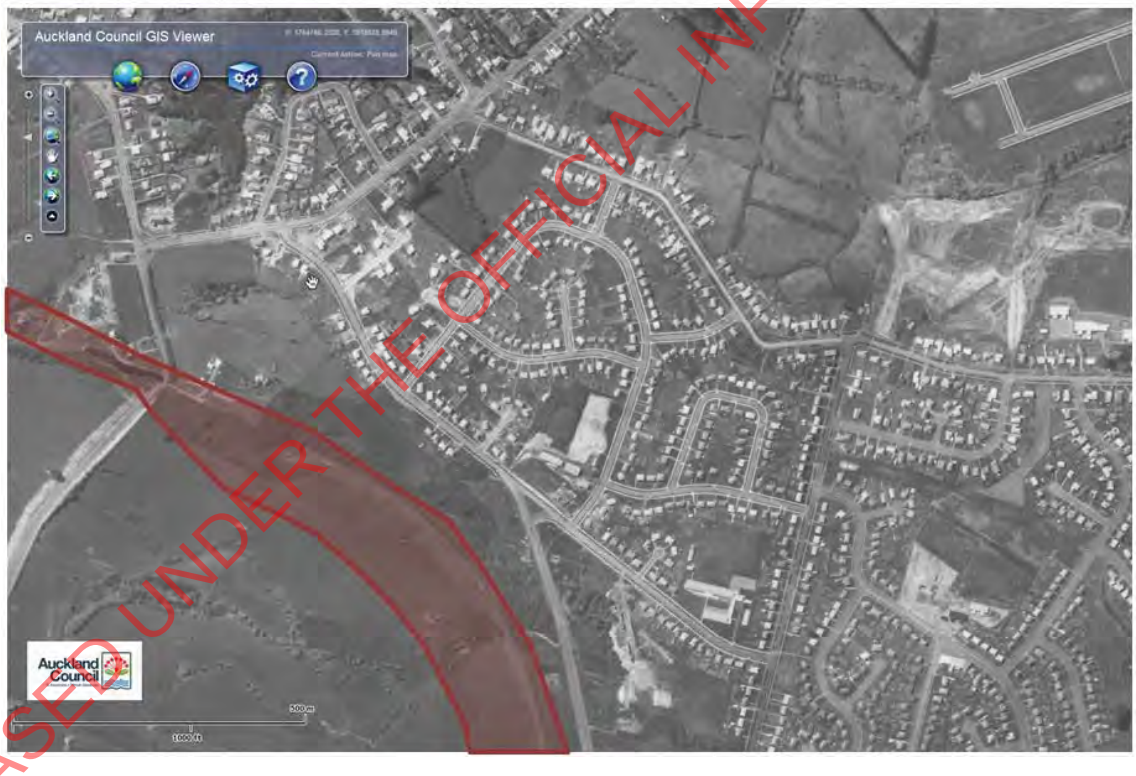


Appendix D – Aerial Photographs

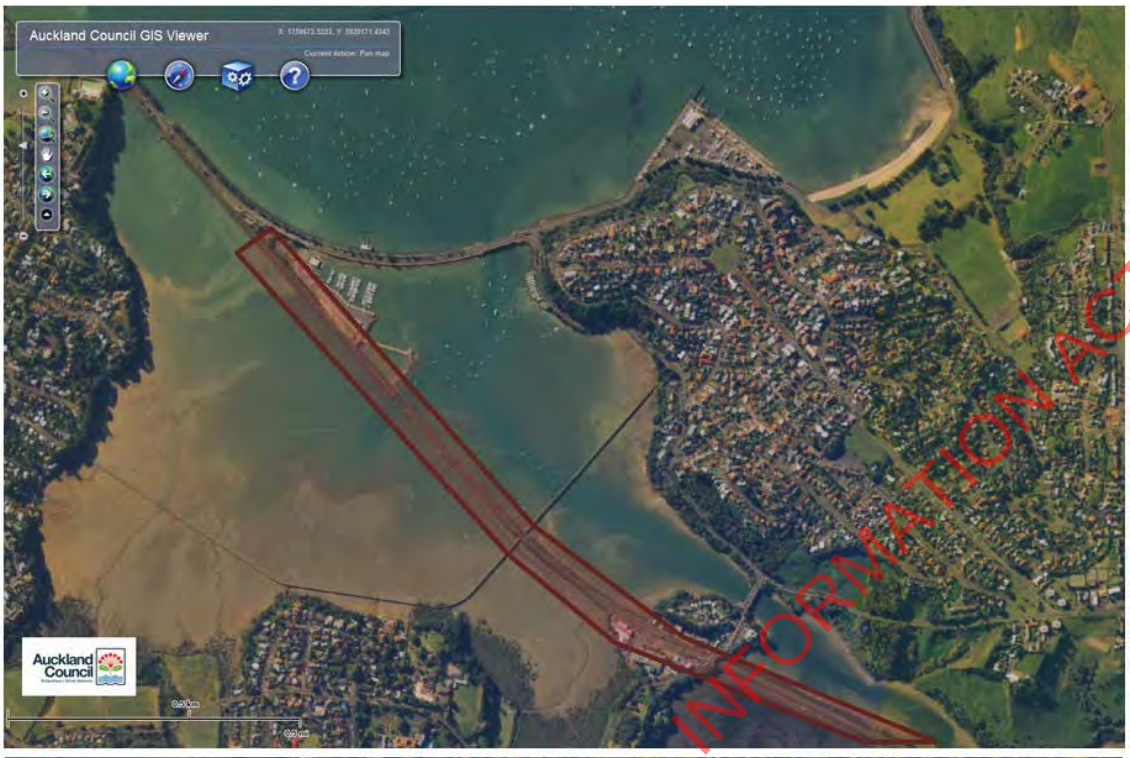
Glen Innes to Tamaki Drive Aerial Photographs

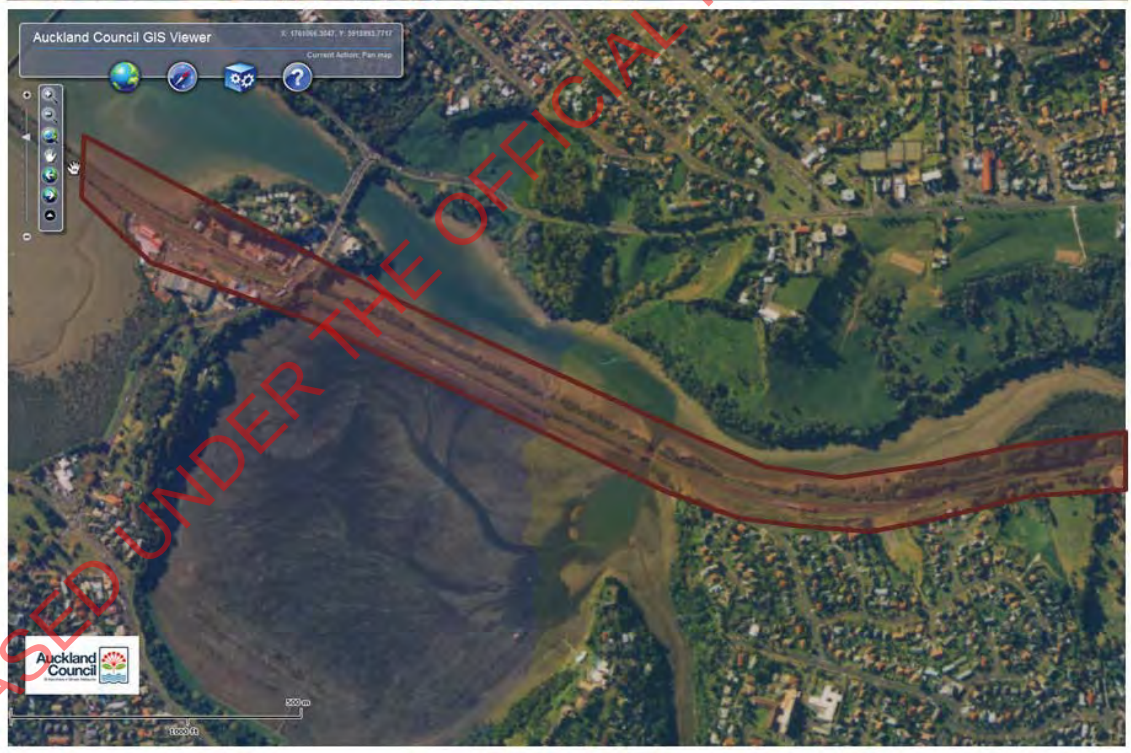
1940

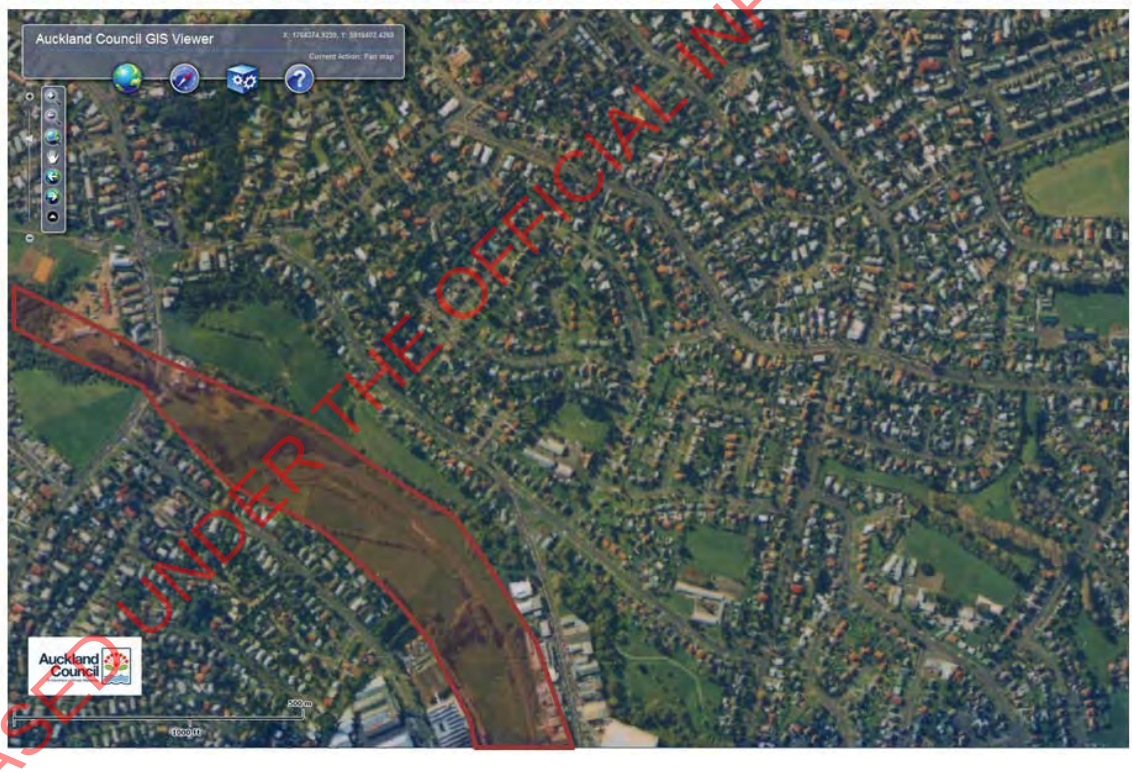
1959



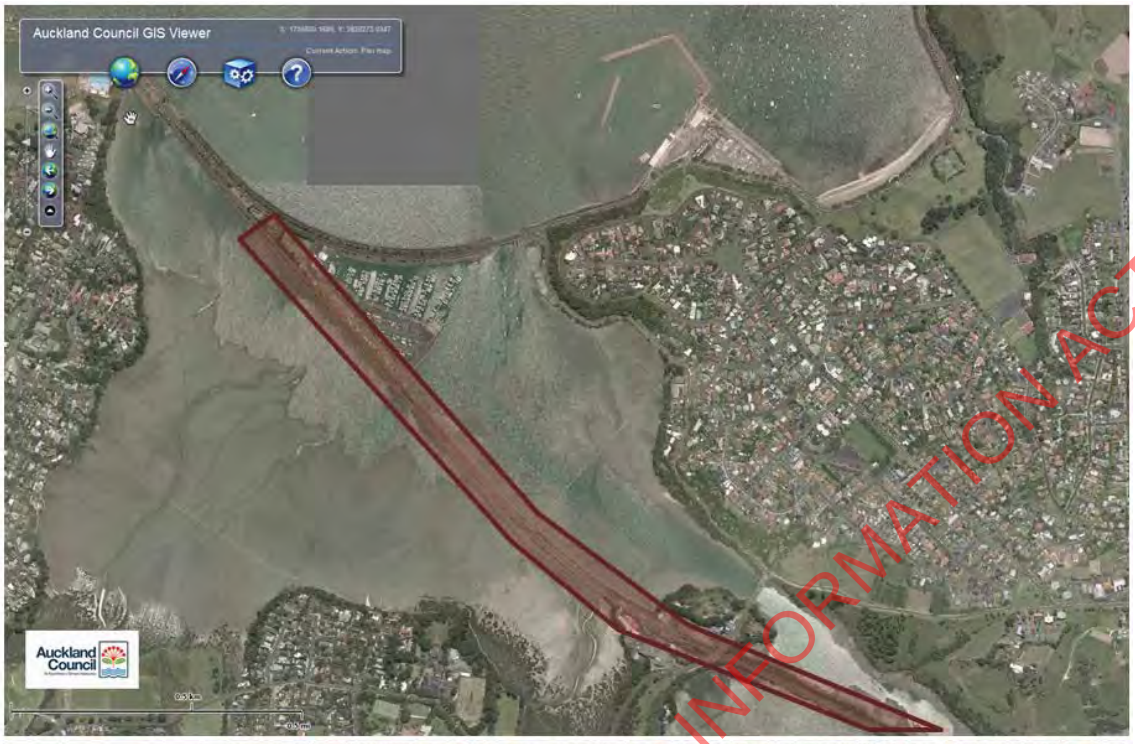
1996

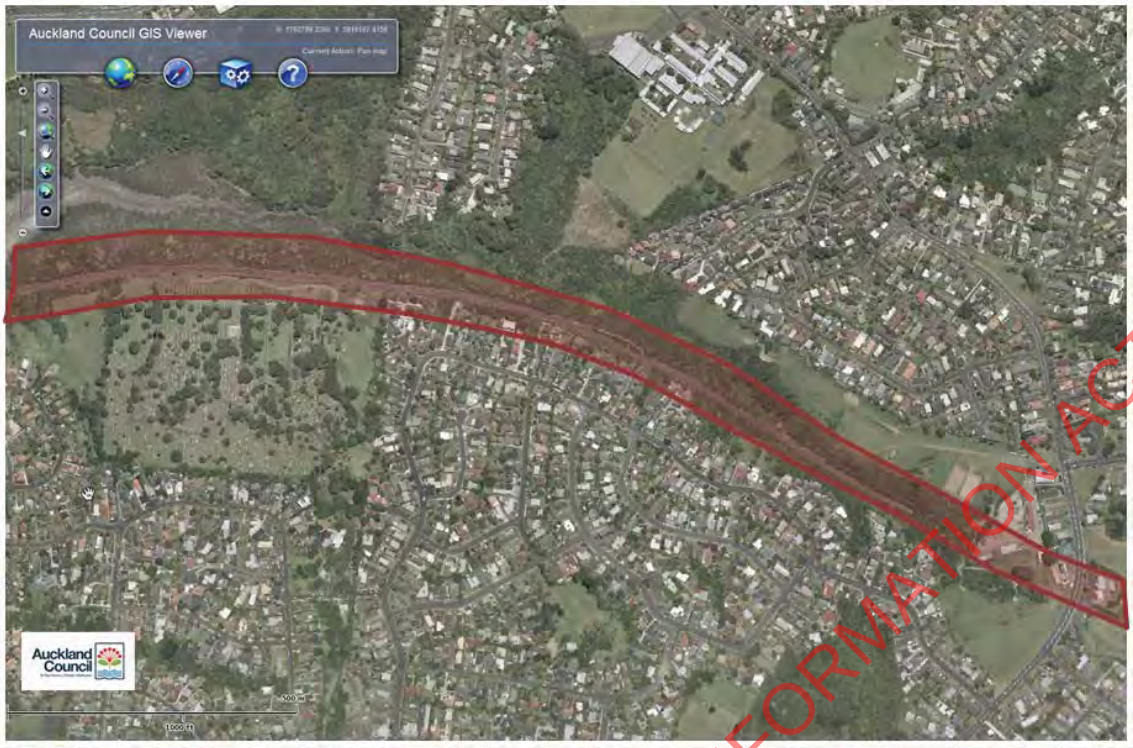


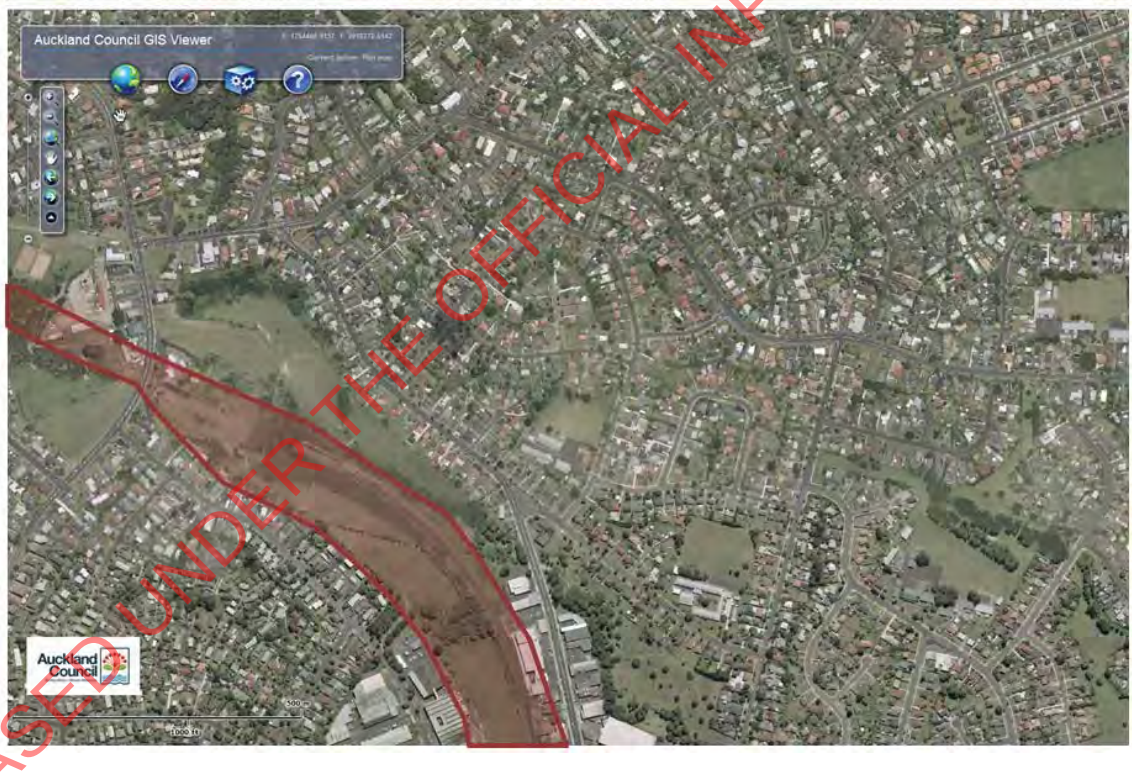


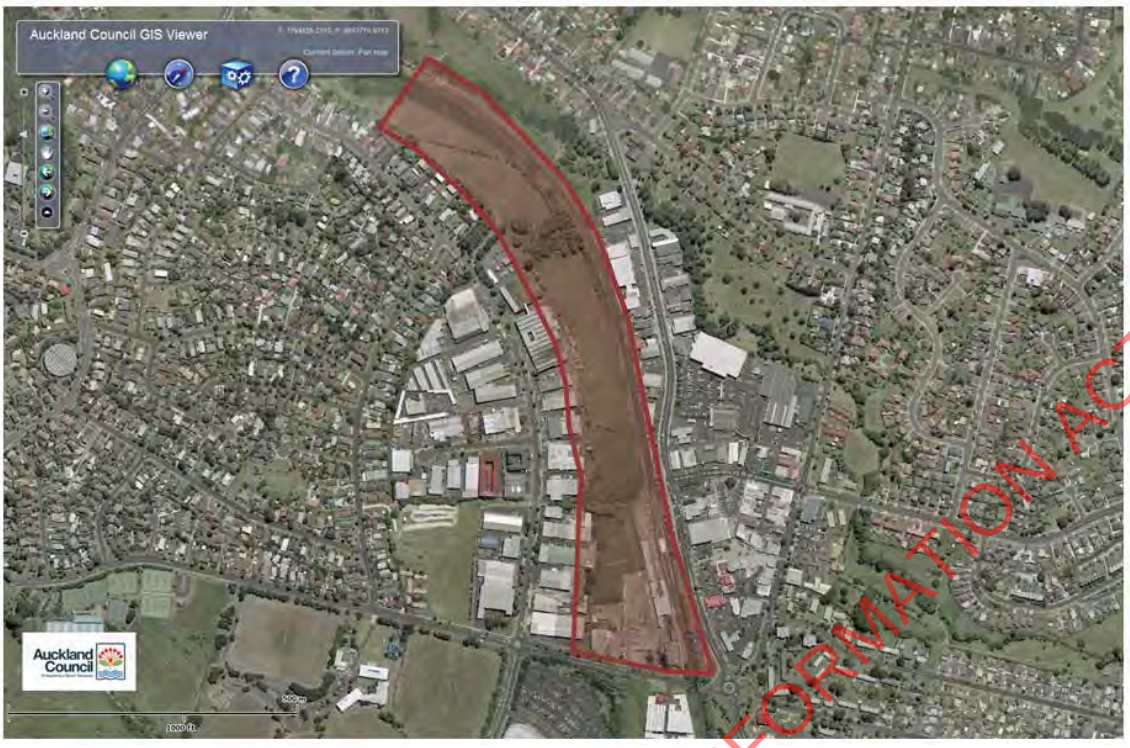


2006

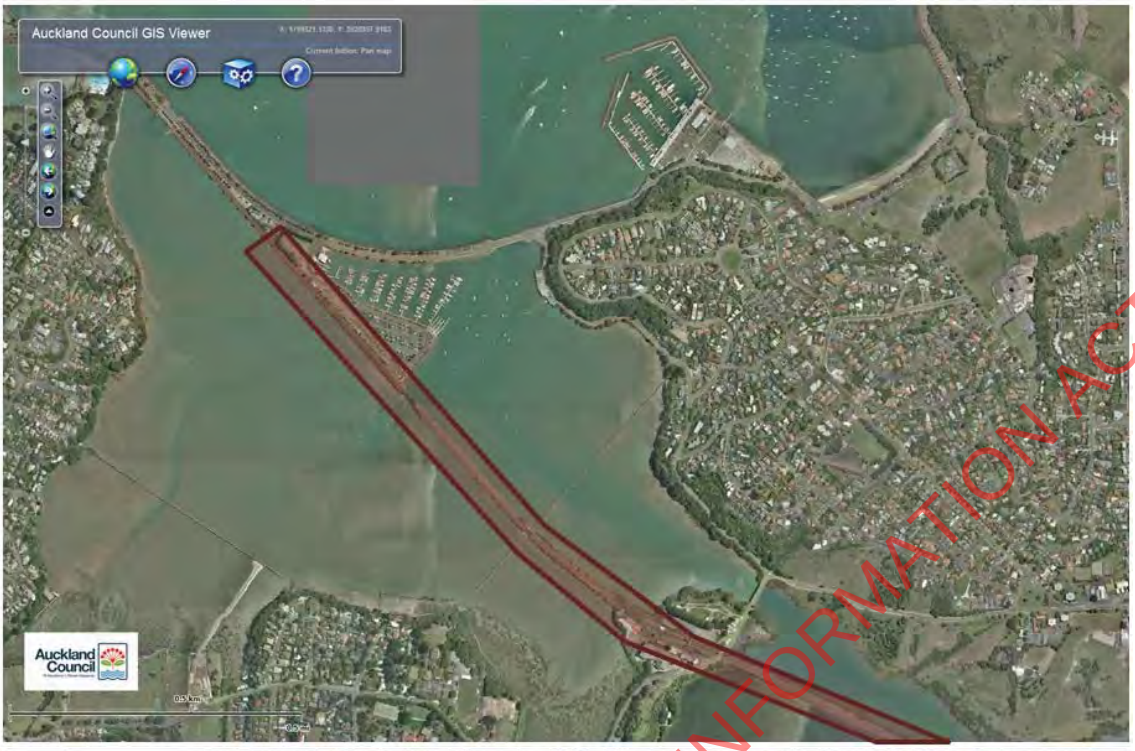


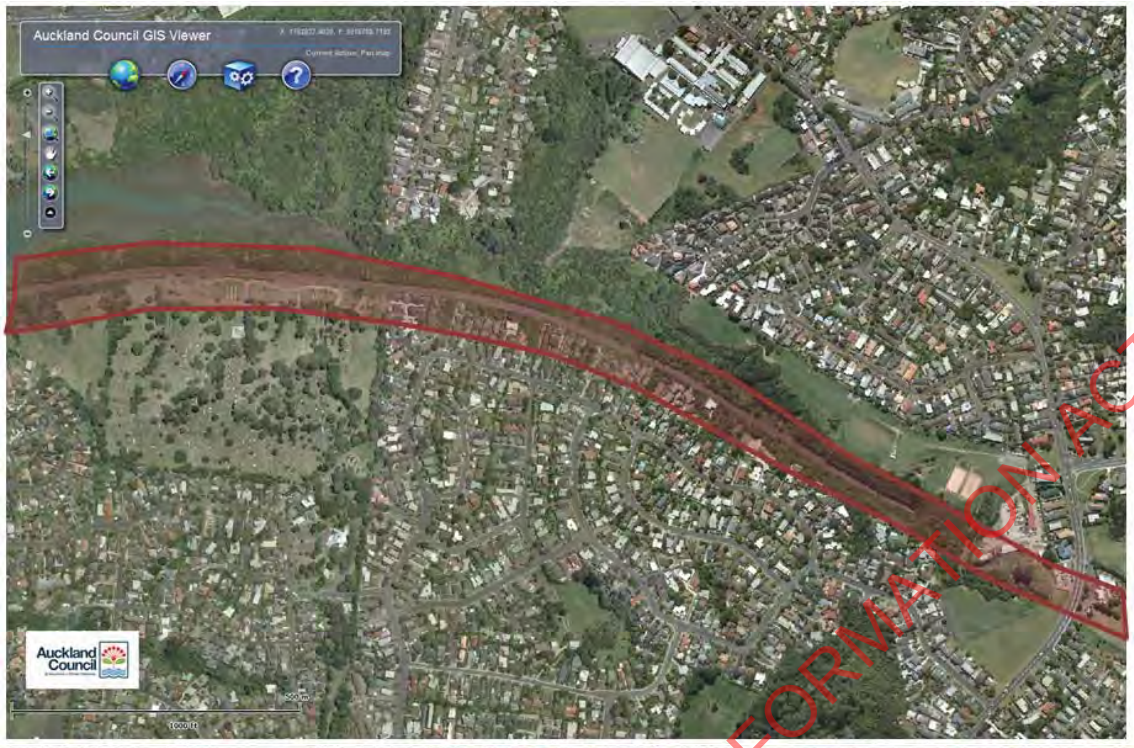


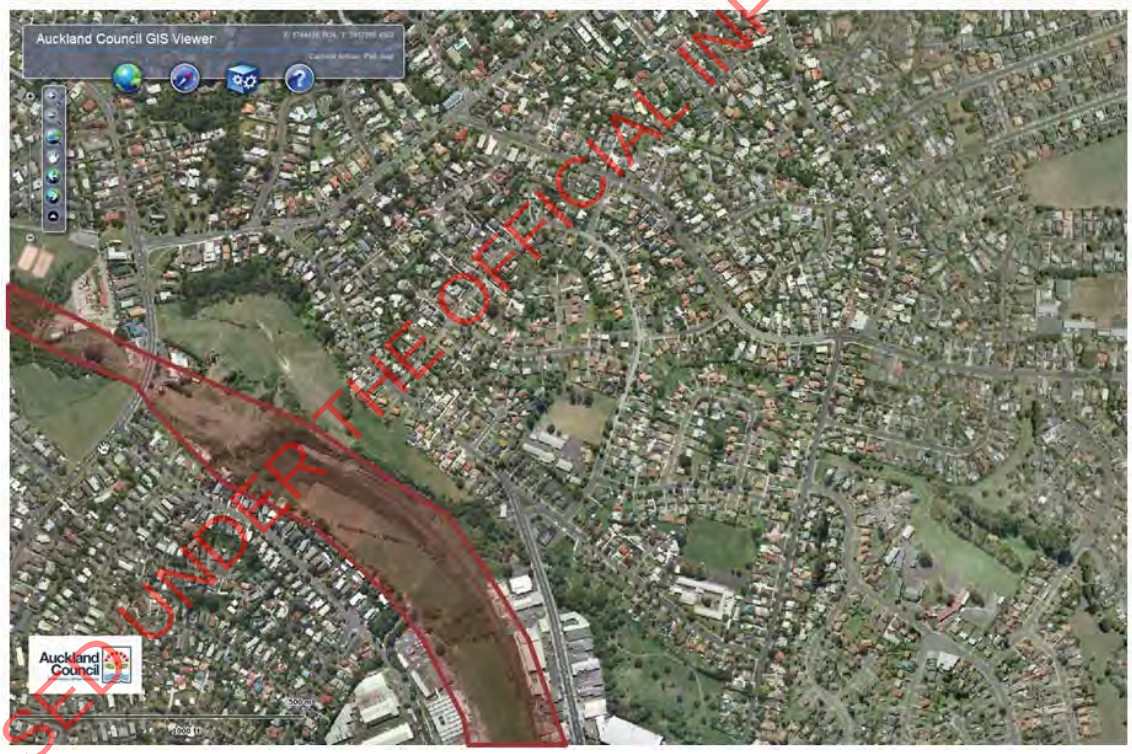




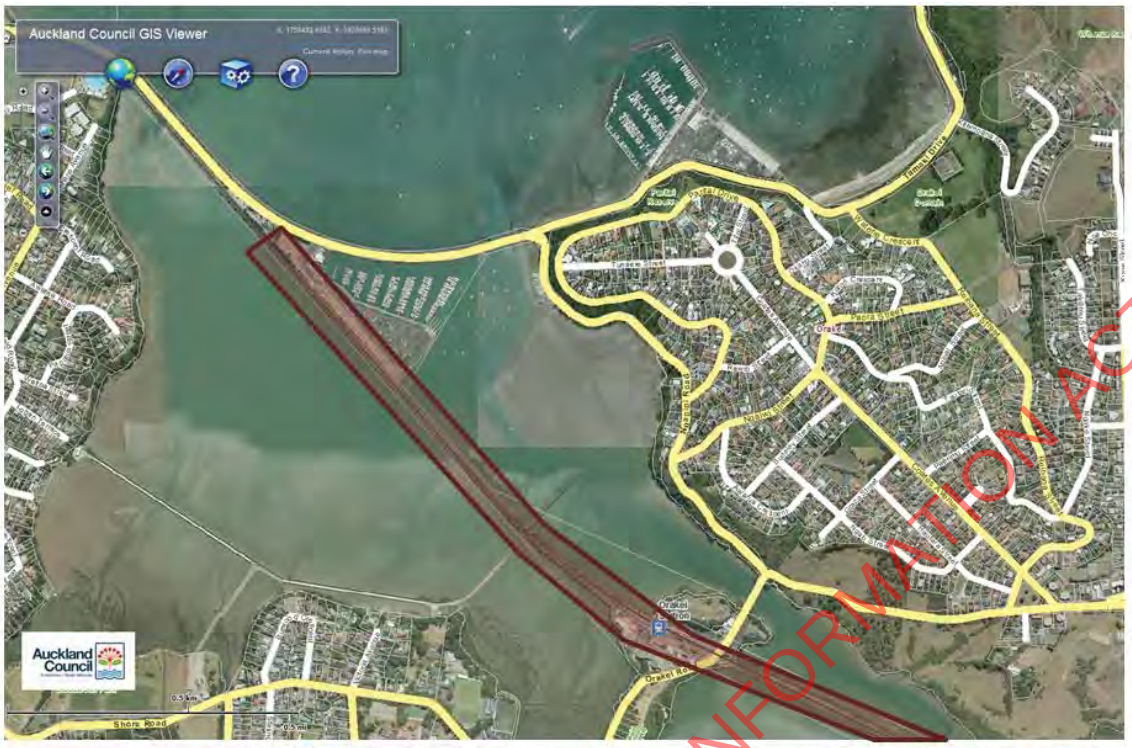
2008

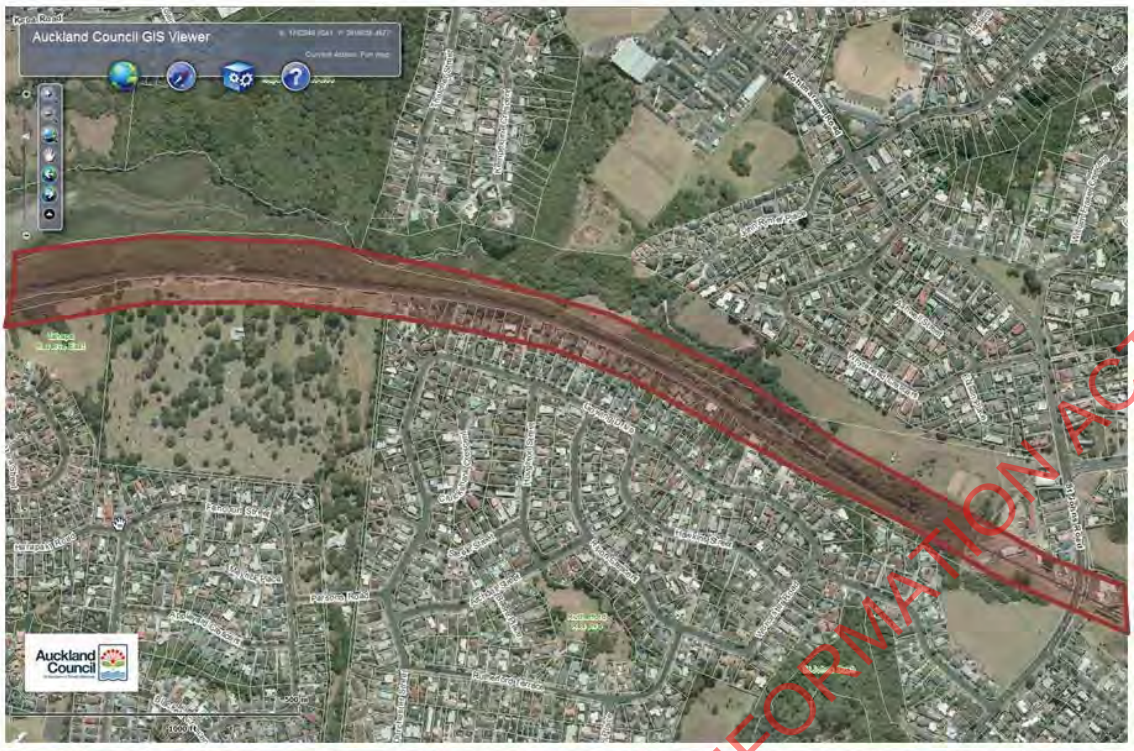


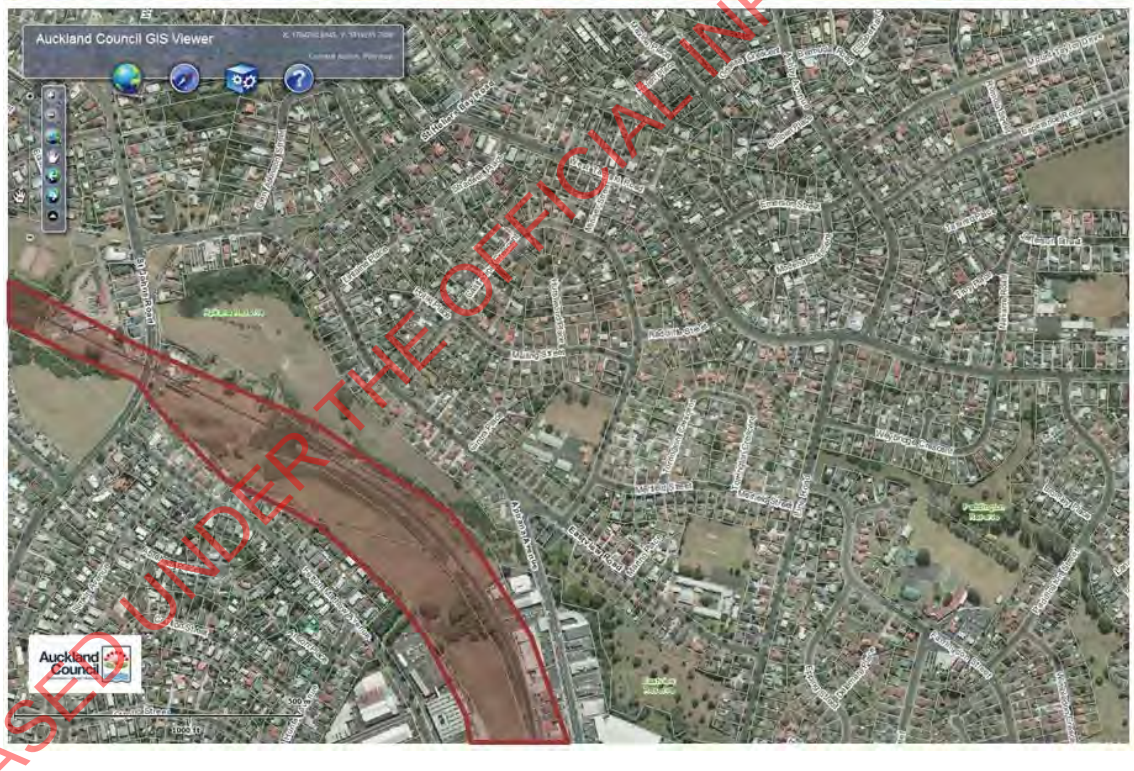




2010







MWH

BUILDING A BETTER WORLD

ABOUT MWH IN NEW ZEALAND

MWH in New Zealand has been providing private and public sector clients with infrastructure and environmental expertise for over 100 years.

Our offices across New Zealand are part of a global operation of 7000 staff in 35 countries giving us an unparalleled ability to combine local knowledge with international expertise.

Around the world our purpose is to work with clients and communities to help build a better world.

In New Zealand our extensive range of services covers the following disciplines:

- Asset Management
- Business Solutions
- Civil and Structural Engineering
- Energy Generation
- Environmental Science and Management
- Geoscience and Geotechnical
- Mechanical, Electrical and Building Services
- Planning, Policy and Resource Management
- Programme Management
- Roads and Highways
- Solid Waste
- Stormwater
- Surveying
- Transport Planning
- Water Resources
- Water Supply
- Wastewater

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Appendix L Section 1 Detailed Site Investigation (Contamination)

MWH

BUILDING A BETTER WORLD

DETAILED SITE INVESTIGATION

Glen Innes to Tamaki Drive Shared Path – Section 1

Prepared for Auckland Transport

November 2014

MWH New Zealand Limited (MWH) has prepared this report for the use of Auckland Transport in accordance with the usual care and thoroughness of the consulting profession. It has been prepared in accordance with the scope of work and for the purpose outlined in this report. It is based on accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. MWH makes no determination or recommendation regarding a decision to provide or not to provide financing with respect to the site.

There is no investigation that is thorough enough to preclude the presence of materials at the site, which presently, or in the future, may be considered hazardous. As regulatory evaluation criteria are subject to change, concentrations of contaminants present and considered acceptable may, in the future, become subject to different regulatory standards which cause them to become unacceptable and require remediation for the site to be suitable for the existing or proposed land use activities.

The methodology adopted and sources of information used by MWH are outlined in this report. MWH has made no independent verification of the information beyond the agreed scope of works and MWH assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to MWH was false.

This report was prepared in September 2014 and is based on the conditions encountered and information reviewed at the time of preparation. MWH disclaims any responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners

This report has been prepared for the benefit of Auckland Transport. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to Auckland Council and other persons for an application for permission or approval or to fulfil a legal requirement.

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APPROVED FOR ISSUE BY		
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REVISION SCHEDULE

Rev No	Date	Description	Signature or Typed Name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
1	03/11/14	Draft	DG	PH	PH	AM
2						

Auckland Transport

Glen Innes to Tamaki Drive Shared Path – Section 1

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LIST OF FIGURES

APPENDICES

1 Introduction

1.1 Proposed Activity and Location

MWH New Zealand Ltd (MWH) was commissioned by Auckland Transport (AT) to undertake a Detailed Site Investigation (DSI) to identify any potential soil contamination in land along Section 1 of the proposed Glen Innes to Tamaki Drive Shared Path Project (the Shared Path). This section of the proposed Shared Path runs northwest from Merton Road in Glenn Innes to St. Johns Road in Meadowbank.

Section 1 is located entirely on rural pasture land, however a number of varying land uses are adjacent to the proposed alignment. The majority of the Shared Path is owned by the New Zealand Transport Agency (NZTA) and is currently leased by the Auckland Pony Club.

Section 1 begins at Merton Road between a landscape supplies yard and a supermarket. As the path continues north it runs directly adjacent to an industrial area (<10 m to the west) which extends for the first 750 m of the alignment. The adjacent land then changes to a residential area for the remainder of Section 1. Glen Innes Railway Station is also in close proximity to the start of Section 1 (approximately 100 m to the east) and runs adjacent to the railway line within a KiwiRail-owned corridor, typically 50 to 100 m to the east. The industrial area has been built up with fill to obtain the same level as Felton Mathew Road before the ground slopes down through the reserve to the railway line below.

Figure 1-1 shows Section 1 of the proposed Shared Path, which extends from Merton Road to St Johns Road, in Glen Innes.

Figure 1-1: Glen Innes to Tamaki Drive Shared Path Route – Section 1 (blue line).

The following DSI builds upon the recommendations outlined in the Preliminary Site Inspection (PSI) prepared by MWH for Auckland Transport in September 2014, for the full Shared Path route.

The PSI identified that Section 1 of the Shared Path was adjacent to an industrial area, and there was uncertainty as to whether the nearby industrial activities may have contributed heavy metals and

hydrocarbon contaminants to local soils. It was also unclear whether horticultural activities had occurred within the reserve land and therefore organochlorine pesticides (OCPs) could be a concern.

Soil sampling, as part of a DSI, was recommended along the boundary of the industrial area and within the reserve land of Section 1 to confirm the presence or absence of these potential contaminants. Industrial activities present along Section 1 of the Shared Path route, include petroleum depots, a mechanics workshop and manufacturing businesses (such as a roofing factory). These types of activities are listed on the Hazardous Activities and Industries List (HAIL) and the NES[1] will therefore apply to the proposed physical works (disturbance) activities on or adjacent to the land where these industries are located.

1.2 Summary of Works

Design of the Glen Innes to Tamaki Drive Shared Path is still being developed, but early scoping indicates that Section 1 of the Shared Path will involve approximately 1.4 km of path construction, retaining walls, culvert installation, fencing and earthworks. One bridge will be required in this section, including over the stream adjacent to the path connection to Felton Mathew Avenue. A culvert is required to cross the creek that is crossed at the edge of the industrial sites before the terrain slopes upwards towards St Johns Road. It is expected that retaining walls will be required along approximately 80% of the industrial section.

Based on the definition of a cycle metro route standard provide by AT, the following key design criteria have been developed:

- Preferred path width of 4 m, with reduced widths to be adopted on a case by case assessment.
- Structures to be 4.5 m wide to provide an effective width of 4 m.
- The route corridor to extend 1 m either side of the path (e.g. if the path is 4 m wide, the corridor width will be 6 m).
- Target gradient to be less than 5%, with a desirable maximum of 8%. Steeper gradients to be adopted on a case by case basis where constrained by the existing topography.
- Path surface to be concrete, with timber boardwalk adopted where necessary.
- Sections within the KiwiRail corridor will adopt the minimum fence offset of 2.75 m from the centre of the track or outside the high voltage masts, whichever is further.
- Installation of swale drain (3 m wide x 0.5 m deep) on one side of road with associated low impact design stormwater collection and discharge structures.

Excavation is expected to be up to 1 m below ground level (bgl) where retaining walls are required, and 0.5 m elsewhere.

[1] National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health, Commercial/Industrial Guidelines, MfE 2012.

2 Soil Sampling and Analysis

2.1 Methodology

Soil sampling was undertaken at 15 locations along the Section 1 of the Shared Path route. The majority of these sampling points were located adjacent to the industrial area, with just two of the 15 sites adjacent to the residential area. The locations of the soil sampling sites are shown in Figure 2-1.

Soil sampling was undertaken on the 2nd October 2014. Soil samples were collected at depths of i) approximately 500 mm bgl for all 15 sites, and ii) 1 m bgl for 10 of the sites directly adjacent to the highest density areas of industrial activity, using a 50 mm hand auger. Soil samples were taken in accordance with standard MWH environmental monitoring procedures and were consistent with the Ministry for the Environment (MFE) Contaminated Land Management Guidelines No. 5 Site Investigation and Analysis of Soils (Revised 2011), as required under the NES. A service location company undertook an electromagnetic induction (EMI) and ground penetrating radar (GPR) survey during drilling to ensure any potential underground services were avoided.

Samples were analysed by R.J. Hill Laboratories who are fully accredited. All shallow soil samples (500 mm bgl) were analysed for heavy metals (including arsenic, cadmium, chromium, copper, lead, nickel and zinc), Polycyclic Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons (TPHs) and Semi-volatile Organic Compounds (SVOCs). One shallow sample (Site 10A) was also analysed for Volatile Organic Compounds (VOCs) as there were unbunded chemical barrels stored against the fence, and suspected evidence of contamination in this area. All deeper soil samples (1 m bgl) were held on cold storage by R.J. Hill Laboratories to be analysed at a later date if required.

Figure 2-1: Soil sampling locations along Section One of the Glen Innes to Tamaki Drive Shared Path Route.

2.2 Assessment Criteria

The guideline documents referred to below provide soil assessment criteria for potentially contaminated land.

National Environmental Standard (NES)

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations (NES, 2011) provide a national environmental standard for activities on pieces of land where soil may be contaminated in such a way as to present a risk to human health.

The NES sets out a set of chemical-specific soil contamination standards that define an adequate level of protection for human health for a range of differing land uses in New Zealand. The land use category 'commercial / industrial outdoor worked (unpaved)' is considered appropriate for this assessment.

Auckland Council Regional Plan: Air, Land and Water

Regional Discharge Permitted Activity Criteria are outlined in Schedule 10 of the Auckland Council Regional Air, Land and Water Plan (ALWP), where the Discharge Standard is considered appropriate.

Background ranges of trace metal concentrations in soil in the Auckland region are outlined in the Auckland Regional Council TP153: Background Concentrations of Inorganic Elements in Soils from the Auckland Region, 2001.

2.3 Results

Contamination concentrations in the analysed soil samples have been compared to the assessment criteria identified in Section 2.2 above, as outlined in Table 2-1. A summary of the laboratory analysis results are provided in Appendix A.

These results indicate that:

- No exceedences of the NES human health soil contaminant standards were observed at any of the sampling sites.
- The concentration of Total Lead exceeds the ALWP Permitted Activity Criterion of 250 mg/kg at Site 3 (770 mg/kg).
- The concentration of Total Copper exceeds the ALWP Permitted Activity Criterion of 400 mg/kg at Site 1 (950 mg/kg).
- The concentrations of Total Arsenic, Cadmium, Chromium, Copper and Nickel are typically within the range of estimated background concentrations, except for minor exceedences at Site 1 (Cadmium, Lead, Nickel), Site 3 (Chromium, Copper, Zinc), Site 5 (Zinc) and Site 10A (Arsenic). With the exception of Lead and Copper exceedences noted above, all results are within the ALWP Permitted Activity Criteria.
- TPH C7-C9 results were typically below laboratory detection limits, except for Site 10 (18 mg/kg) which is not considered elevated.
- All other analysis parameters were below laboratory detection limits.

Table 2-1: Results summary (for parameters that recorded results above laboratory detection limits)

Parameters (mg/kg)	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10A	Site 10	Site 11	Site 12	Site 13	Site 14	NES[2]	ALWP[3]	ARC TP153: (Background Conc)[4]
Heavy Metals																		
Total Arsenic	4	<2	7	2	4	4	<2	4	3	22	3	3	3	3	3	70	100	0.4 – 12
Total Cadmium	1.18	<0.10	0.58	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	0.20	0.12	<0.10	<0.10	<0.10	<0.10	1,300	7.5	<0.1 – 0.65
Total Chromium	42	4	130	41	52	45	43	54	42	39	38	37	42	50	35	>10,000	400	2 – 55
Total Copper	28	2	69	9	22	18	12	16	12	27	13	8	14	17	6	>10,000	325	1 – 45
Total Lead	68	37	770	10	32	13	8	12	9	51	11	7	11	12	8	3,300	250	<1.5 – 65
Total Nickel	54	<2	33	13	30	23	14	17	9	23	15	11	17	23	8		105	0.9 – 35
Total Zinc	950	46	186	48	200	75	29	39	24	87	42	30	44	48	16		400	9 – 180
Total Petroleum Hydrocarbons																		
TPH C7 – C9	<9	<8	<10	<9	<9	<9	<9	<9	<9	<10	18	<9	<9	<9	<9			
Other Compounds																		
All Below Detection Limits																		

Note: Exceedences highlighted red

[2] National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health, Commercial/Industrial Guidelines, MfE 2012.
[3] Auckland Regional Council Air, Land and Water Plan: Schedule 10. Permitted Activity Criteria (Discharge).
[4] Auckland Regional Council TP153: Background Concentrations in Inorganic Elements in Soils from the Auckland Region, 2001.

3 Assessment of Risk

There were no exceedances of the relevant NES human health soil contaminant standards in any of the soil samples analysed, and no evidence was observed that the soils in the vicinity of Section 1 of the Shared Path adjacent to the industrial or residential areas will pose a risk to human health during the proposed works. However, care should always be taken to avoid direct contact with and inhalation / ingestion of soils and dust during disturbance activities associated with construction.

Zinc and Lead concentrations were elevated above the ALWP Permitted Activity Criteria at Site 1 and 3, respectively; however concentrations of both contaminants were well within the NES human health soil contaminant standards.

Elevated zinc and lead concentrations are not uncommon in areas adjacent to roads and paved surfaces that experience stormwater runoff. Major sources of zinc in stormwater include galvaninzed surfaces (e.g. roofs, gutters etc) and wear from vehicle tires, while lead is common in roadside soils that pre-date lead being removed from petrol.

The sampling site (Site 10A) adjacent to the unbunded chemical barrels stored against the fence did not show evidence of soil contamination. While some parameters (such as Arsenic, Lead, Nickel and Zinc) were at higher concentrations than the sampling sites directly adjacent, these concentrations were not at levels of concern and were within the ALWP Permitted Activity Criteria. Sampling however was undertaken in the subsoil and if this contamination is recent then it is possible contaminants have not yet migrated through the topsoil.

While the Glen Innes Railway Station and railway line are likely to contribute a range of contaminants to the environment, including hydrocarbons and heavy metals, this rail corridor is located 50-100 m down-gradient from the Shared Path route, with the Shared Path route not proposed to intersect the rail corridor at any point in Section 1 and there is no evidence that the corridor is resulting in contamination of the soils along the Shared Path route alignment.

Fill was encountered only in low lying areas, to at least 1.0 m depth. The fill encountered typically consisted of silty clayey material with trace/inter-mixed gravel. It is believed that the fill is uncontrolled, and the exact source and nature of the fill is unknown. If the fill was from historic industrial land there is potential that contaminated soil could be present.

Groundwater is typically 1.5 to 3 m bgl in the area, with seepage possible at shallower depths. There is a risk of potentially contaminated surface materials coming in contact with groundwater or seepage-impacted soils during excavation. If excavations occur below the groundwater table then there is the possibility of direct contamination of groundwater during the construction. As excavations are not proposed deeper than 1 m bgl during construction works, and no evidence of significant soil contamination in the area, the risk of construction works contaminating groundwater is considered very minor.

The likely source of contamination associated with the proposed works, potential human and environmental receptors, exposure pathways and risk assessment are outlined in 3-1 below.

Table 3-1: Contaminant Pathway and Risk Assessment

Contaminant Source	Potential Receptor	Exposure Pathway	Risk Assessment	Proposed Mitigation
During Construction Works				
Heavy Metals, PAHs, TPHs, and SVOCs in subsoil	Site Construction Workers	Exposure of site workers to contaminants in soil and groundwater during site works. Potential for dermal contact, ingestion or inhalation of dust.	Risk to site workers considered low due to potential contaminant concentrations well below NES human health contaminant standards.	Standard personal protection equipment should be used during construction works. If suspected evidence of recent surface contamination from adjacent industrial activities, an additional contamination assessment should be undertaken to confirm risk and source.
	General Public	Exposure of general public to dust blown off-site containing contaminants. Potential for dermal contact, ingestion or inhalation of dust.	The neighbouring properties are industrial and residential in nature and in some case in close proximity (< 10 m) to the proposed works. Potential for dermal contact, ingestion or inhalation of dust. Risk to general public considered low due to potential contaminant concentrations well below the NES human health soil contaminant standards.	Care should be taken not to undertake excavation works in high wind conditions. Public access to the site is to be restricted. Dust suppressant (such as water) to be applied to any stockpiled material.
	Shallow groundwater resources for public use	Soil contaminants exposed to rainfall during site excavations, or stockpiling of material. Possible leaching of contaminants into groundwater. Possible run-off of contaminants from stockpiled soils leaching into open excavations and into groundwater.	Risk is considered low as no known groundwater abstraction and/or use in the vicinity of the site. The groundwater table is below the proposed maximum depth of excavation.	None proposed.
Upon Completion of Works				
The Shared Path surface to be sealed upon completion of works, therefore no potential contaminants likely to produce ongoing hazard to the general public or aquatic ecosystems				

4 Conclusion and Recommendations

The analytical results indicate that there will be negligible risks to human health from exposure to contaminants in soil during the construction of Section 1 of the proposed Glen Innes to Tamaki Drive Shared Path.

While the adjacent industrial land poses a continual risk of contamination to the surrounding land (such as from chemical spills), and the source of fill material is unknown, the risks to site workers and the public is still considered low to contaminant concentrations being well below human health guidelines.

If evidence of surface contamination from industrial spills is suspected prior to or during construction, further contamination investigations should be undertaken to determine the source(s) of the potential contamination and any associated risks.

Appendix A – Laboratory Analysis Results

Hill Laboratories
BETTER TESTING BETTER RESULTS

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Hamilton 3240, New Zealand

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ANALYSIS REPORT

Client:	MWH New Zealand Limited	**Lab No:**	1334535	SPv1
Contact:	I Oldfield	**Date Registered:**	03-Oct-2014	
	C/- MWH New Zealand Limited	**Date Reported:**	14-Oct-2014	
	PO Box 13249	**Quote No:**	64142	
	CHRISTCHURCH 8141	**Order No:**		
		Client Reference:	80504522	
		Submitted By:	Daniel Gulliver	

Sample Type: Soil

Sample Name:		Site 1 - 0.4m 02-Oct-2014 8:35 am	Site 2 - 0.4m 02-Oct-2014 9:35 am	Site 3 - 0.4m 02-Oct-2014 9:20 am	Site 4 - 0.4m 02-Oct-2014 9:10 am	Site 5 - 0.4m 02-Oct-2014 9:00 am
Lab Number:		1334535.1	1334535.2	1334535.4	1334535.6	1334535.8
Individual Tests						
Dry Matter	g/100g as rcvd	78	84	76	77	76
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	< 2	7	2	4
Total Recoverable Cadmium	mg/kg dry wt	1.18	< 0.10	0.58	< 0.10	0.14
Total Recoverable Chromium	mg/kg dry wt	42	4	130	41	52
Total Recoverable Copper	mg/kg dry wt	28	2	69	9	22
Total Recoverable Lead	mg/kg dry wt	68	37	770	9.8	32
Total Recoverable Nickel	mg/kg dry wt	54	< 2	33	13	30
Total Recoverable Zinc	mg/kg dry wt	950	46	186	48	200
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Chrysene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Naphthalene	mg/kg dry wt	< 0.15	< 0.14	< 0.16	< 0.15	< 0.15
Phenanthrene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Pyrene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Haloethers in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Bis(2-chloroethyl)ether	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Bis(2-chloroisopropyl)ether	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
4-Bromophenyl phenyl ether	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
4-Chlorophenyl phenyl ether	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Nitrogen containing compounds in SVOC Soil Samples by GC-MS						
3,3'-Dichlorobenzidine	mg/kg dry wt	< 7	< 7	< 8	< 7	< 8
2,4-Dinitrotoluene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,6-Dinitrotoluene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3

Sample Type: Soil						
Sample Name:		Site 1 - 0.4m 02-Oct-2014 8:35 am	Site 2 - 0.4m 02-Oct-2014 9:35 am	Site 3 - 0.4m 02-Oct-2014 9:20 am	Site 4 - 0.4m 02-Oct-2014 9:10 am	Site 5 - 0.4m 02-Oct-2014 9:00 am
Lab Number:		1334535.1	1334535.2	1334535.4	1334535.6	1334535.8
Nitrogen containing compounds in SVOC Soil Samples by GC-MS						
Nitrobenzene	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
N-Nitrosodi-n-propylamine	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
N-Nitrosodiphenylamine	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Organochlorine Pesticides in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
alpha-BHC	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
beta-BHC	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
delta-BHC	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
gamma-BHC (Lindane)	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
4,4'-DDD	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
4,4'-DDE	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
4,4'-DDT	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Dieldrin	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Endosulfan I	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endosulfan II	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endosulfan sulphate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endrin	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endrin ketone	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Heptachlor	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Heptachlor epoxide	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Hexachlorobenzene	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Polycyclic Aromatic Hydrocarbons in SVOC Soil Samples by GC-MS						
Acenaphthene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Acenaphthylene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Anthracene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Benzo[a]anthracene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Benzo[g,h,i]perylene	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Benzo[k]fluoranthene	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
2-Chloronaphthalene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Chrysene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Dibenzo[a,h]anthracene	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Fluoranthene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Fluorene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
2-Methylnaphthalene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Naphthalene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Phenanthrene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Pyrene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
Phenols in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	< 5	< 5	< 5	< 5	< 5
2-Chlorophenol	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
2,4-Dichlorophenol	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
2,4-Dimethylphenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2-Methylphenol (o-Cresol)	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
2-Nitrophenol	mg/kg dry wt	< 5	< 5	< 5	< 5	< 5
Pentachlorophenol (PCP)	mg/kg dry wt	< 30	< 30	< 30	< 30	< 30
Phenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,4,5-Trichlorophenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,4,6-Trichlorophenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3

Sample Type: Soil						
Sample Name:		Site 1 - 0.4m 02-Oct-2014 8:35 am	Site 2 - 0.4m 02-Oct-2014 9:35 am	Site 3 - 0.4m 02-Oct-2014 9:20 am	Site 4 - 0.4m 02-Oct-2014 9:10 am	Site 5 - 0.4m 02-Oct-2014 9:00 am
Lab Number:		1334535.1	1334535.2	1334535.4	1334535.6	1334535.8
Plasticisers in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	< 6	< 6	< 6	< 6	< 6
Butylbenzylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di(2-ethylhexyl)adipate	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Diethylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Dimethylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di-n-butylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di-n-octylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Other Halogenated compounds in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,3-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,4-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Hexachlorobutadiene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Hexachlorocyclopentadiene	mg/kg dry wt	< 7	< 7	< 8	< 7	< 8
Hexachloroethane	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,2,4-Trichlorobenzene	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Other compounds in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	< 14	< 13	< 15	< 14	< 15
Carbazole	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Dibenzofuran	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Isophorone	mg/kg dry wt	< 1.4	< 1.3	< 1.5	< 1.4	< 1.5
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 9	< 8	< 10	< 9	< 9
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	< 70

Sample Name:		Site 6 - 0.4m 02-Oct-2014 10:25 am	Site 7 - 0.4m 02-Oct-2014 10:50 am	Site 8 - 0.4m 02-Oct-2014 11:00 am	Site 9 - 0.4m 02-Oct-2014 11:05 am	Site 10a - 0.4m 02-Oct-2014 11:20 am
Lab Number:		1334535.10	1334535.12	1334535.14	1334535.16	1334535.18
Individual Tests						
Dry Matter	g/100g as rcvd	76	79	76	78	74
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	< 2	4	3	22
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	0.20
Total Recoverable Chromium	mg/kg dry wt	45	43	54	42	39
Total Recoverable Copper	mg/kg dry wt	18	12	16	12	27
Total Recoverable Lead	mg/kg dry wt	13.3	7.6	12.2	8.9	51
Total Recoverable Nickel	mg/kg dry wt	23	14	17	9	23
Total Recoverable Zinc	mg/kg dry wt	75	29	39	24	87
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Benzo[a]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Chrysene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04

Sample Type: Soil						
Sample Name:		Site 6 - 0.4m 02-Oct-2014 10:25 am	Site 7 - 0.4m 02-Oct-2014 10:50 am	Site 8 - 0.4m 02-Oct-2014 11:00 am	Site 9 - 0.4m 02-Oct-2014 11:05 am	Site 10a - 0.4m 02-Oct-2014 11:20 am
Lab Number:		1334535.10	1334535.12	1334535.14	1334535.16	1334535.18
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Naphthalene	mg/kg dry wt	< 0.15	< 0.14	< 0.15	< 0.14	< 0.16
Phenanthrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Pyrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04
Haloethers in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Bis(2-chloroethyl)ether	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Bis(2-chloroisopropyl)ether	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
4-Bromophenyl phenyl ether	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
4-Chlorophenyl phenyl ether	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Nitrogen containing compounds in SVOC Soil Samples by GC-MS						
3,3'-Dichlorobenzidine	mg/kg dry wt	< 8	< 7	< 8	< 7	< 8
2,4-Dinitrotoluene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,6-Dinitrotoluene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Nitrobenzene	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
N-Nitrosodi-n-propylamine	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
N-Nitrosodiphenylamine	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Organochlorine Pesticides in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
alpha-BHC	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
beta-BHC	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
delta-BHC	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
gamma-BHC (Lindane)	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
4,4'-DDD	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
4,4'-DDE	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
4,4'-DDT	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Dieldrin	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Endosulfan I	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endosulfan II	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endosulfan sulphate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endrin	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endrin ketone	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Heptachlor	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Heptachlor epoxide	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Hexachlorobenzene	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Polycyclic Aromatic Hydrocarbons in SVOC Soil Samples by GC-MS						
Acenaphthene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Acenaphthylene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Anthracene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Benzo[a]anthracene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Benzo[g,h,i]perylene	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Benzo[k]fluoranthene	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
2-Chloronaphthalene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Chrysene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Dibenzo[a,h]anthracene	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Fluoranthene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Fluorene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
2-Methylnaphthalene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Naphthalene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Phenanthrene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8
Pyrene	mg/kg dry wt	< 0.8	< 0.7	< 0.8	< 0.7	< 0.8

Sample Type: Soil						
Sample Name:		Site 6 - 0.4m 02-Oct-2014 10:25 am	Site 7 - 0.4m 02-Oct-2014 10:50 am	Site 8 - 0.4m 02-Oct-2014 11:00 am	Site 9 - 0.4m 02-Oct-2014 11:05 am	Site 10a - 0.4m 02-Oct-2014 11:20 am
Lab Number:		1334535.10	1334535.12	1334535.14	1334535.16	1334535.18
Phenols in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	< 5	< 5	< 5	< 5	< 5
2-Chlorophenol	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
2,4-Dichlorophenol	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
2,4-Dimethylphenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2-Methylphenol (o-Cresol)	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
2-Nitrophenol	mg/kg dry wt	< 5	< 5	< 5	< 5	< 5
Pentachlorophenol (PCP)	mg/kg dry wt	< 30	< 30	< 30	< 30	< 30
Phenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,4,5-Trichlorophenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,4,6-Trichlorophenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Plasticisers in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	< 6	< 6	< 6	< 6	< 6
Butylbenzylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di(2-ethylhexyl)adipate	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Diethylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Dimethylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di-n-butylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di-n-octylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Other Halogenated compounds in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,3-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,4-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Hexachlorobutadiene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Hexachlorocyclopentadiene	mg/kg dry wt	< 8	< 7	< 8	< 7	< 8
Hexachloroethane	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,2,4-Trichlorobenzene	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Other compounds in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	< 15	< 14	< 15	< 14	< 15
Carbazole	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Dibenzofuran	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Isophorone	mg/kg dry wt	< 1.5	< 1.4	< 1.5	< 1.4	< 1.5
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 9	< 9	< 9	< 9	< 10
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	< 70
BTEX in VOC Soils by Purge&Trap GC-MS						
Benzene	mg/kg dry wt	-	-	-	-	< 0.5
Toluene	mg/kg dry wt	-	-	-	-	< 0.9
Ethylbenzene	mg/kg dry wt	-	-	-	-	< 0.5
m&p-Xylene	mg/kg dry wt	-	-	-	-	< 0.5
o-Xylene	mg/kg dry wt	-	-	-	-	< 0.5
Halogenated Aliphatics in VOC Soils by Purge&Trap GC-MS						
Bromomethane (Methyl Bromide)	mg/kg dry wt	-	-	-	-	< 3
Carbon tetrachloride	mg/kg dry wt	-	-	-	-	< 0.5
Chloroethane	mg/kg dry wt	-	-	-	-	< 1.0
Chloromethane	mg/kg dry wt	-	-	-	-	< 1.0
1,2-Dibromo-3-chloropropane	mg/kg dry wt	-	-	-	-	< 1.0
1,2-Dibromoethane (ethylene dibromide, EDB)	mg/kg dry wt	-	-	-	-	< 1.0
Dibromomethane	mg/kg dry wt	-	-	-	-	< 1.0
Dichlorodifluoromethane	mg/kg dry wt	-	-	-	-	< 1.0

Sample Type: Soil						
Sample Name:		Site 6 - 0.4m 02-Oct-2014 10:25 am	Site 7 - 0.4m 02-Oct-2014 10:50 am	Site 8 - 0.4m 02-Oct-2014 11:00 am	Site 9 - 0.4m 02-Oct-2014 11:05 am	Site 10a - 0.4m 02-Oct-2014 11:20 am
Lab Number:		1334535.10	1334535.12	1334535.14	1334535.16	1334535.18
Halogenated Aliphatics in VOC Soils by Purge&Trap GC-MS						
1,1-Dichloroethane	mg/kg dry wt	-	-	-	-	< 0.5
1,2-Dichloroethane	mg/kg dry wt	-	-	-	-	< 1.0
1,1-Dichloroethene	mg/kg dry wt	-	-	-	-	< 0.5
cis-1,2-Dichloroethene	mg/kg dry wt	-	-	-	-	< 0.5
trans-1,2-Dichloroethene	mg/kg dry wt	-	-	-	-	< 0.5
Dichloromethane (methylene chloride)	mg/kg dry wt	-	-	-	-	< 10
1,2-Dichloropropane	mg/kg dry wt	-	-	-	-	< 1.0
1,3-Dichloropropane	mg/kg dry wt	-	-	-	-	< 1.0
1,1-Dichloropropene	mg/kg dry wt	-	-	-	-	< 0.5
cis-1,3-Dichloropropene	mg/kg dry wt	-	-	-	-	< 1.0
trans-1,3-Dichloropropene	mg/kg dry wt	-	-	-	-	< 1.0
Hexachlorobutadiene	mg/kg dry wt	-	-	-	-	< 0.5
1,1,1,2-Tetrachloroethane	mg/kg dry wt	-	-	-	-	< 0.5
1,1,2,2-Tetrachloroethane	mg/kg dry wt	-	-	-	-	< 1.0
Tetrachloroethene (tetrachloroethylene)	mg/kg dry wt	-	-	-	-	< 1.0
1,1,1-Trichloroethane	mg/kg dry wt	-	-	-	-	< 0.5
1,1,2-Trichloroethane	mg/kg dry wt	-	-	-	-	< 1.0
Trichloroethene (trichloroethylene)	mg/kg dry wt	-	-	-	-	< 0.5
Trichlorofluoromethane	mg/kg dry wt	-	-	-	-	< 0.5
1,2,3-Trichloropropane	mg/kg dry wt	-	-	-	-	< 1.0
1,1,2-Trichlorotrifluoroethane (Freon 113)	mg/kg dry wt	-	-	-	-	< 5
Vinyl chloride	mg/kg dry wt	-	-	-	-	< 1.0
Haloaromatics in VOC Soils by Purge&Trap GC-MS						
Bromobenzene	mg/kg dry wt	-	-	-	-	< 0.5
Chlorobenzene (monochlorobenzene)	mg/kg dry wt	-	-	-	-	< 0.5
2-Chlorotoluene	mg/kg dry wt	-	-	-	-	< 0.5
4-Chlorotoluene	mg/kg dry wt	-	-	-	-	< 0.5
1,2-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.5
1,3-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.5
1,4-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.5
1,2,3-Trichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.5
1,2,4-Trichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.5
1,3,5-Trichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.5
Monoaromatic Hydrocarbons in VOC Soils by Purge&Trap GC-MS						
n-Butylbenzene	mg/kg dry wt	-	-	-	-	< 0.5
tert-Butylbenzene	mg/kg dry wt	-	-	-	-	< 0.5
Isopropylbenzene (Cumene)	mg/kg dry wt	-	-	-	-	< 0.5
4-Isopropyltoluene (p-Cymene)	mg/kg dry wt	-	-	-	-	< 0.5
n-Propylbenzene	mg/kg dry wt	-	-	-	-	< 0.5
sec-Butylbenzene	mg/kg dry wt	-	-	-	-	< 0.5
Styrene	mg/kg dry wt	-	-	-	-	< 0.5
1,2,4-Trimethylbenzene	mg/kg dry wt	-	-	-	-	< 0.5
1,3,5-Trimethylbenzene	mg/kg dry wt	-	-	-	-	< 0.5
Ketones in VOC Soils by Purge&Trap GC-MS						
Acetone	mg/kg dry wt	-	-	-	-	< 44
2-Butanone (MEK)	mg/kg dry wt	-	-	-	-	< 6
Methyl tert-butylether (MTBE)	mg/kg dry wt	-	-	-	-	< 5
4-Methylpentan-2-one (MIBK)	mg/kg dry wt	-	-	-	-	< 10
Trihalomethanes in VOC Soils by Purge&Trap GC-MS						
Bromodichloromethane	mg/kg dry wt	-	-	-	-	< 0.5

Sample Type: Soil						
Sample Name:		Site 6 - 0.4m 02-Oct-2014 10:25 am	Site 7 - 0.4m 02-Oct-2014 10:50 am	Site 8 - 0.4m 02-Oct-2014 11:00 am	Site 9 - 0.4m 02-Oct-2014 11:05 am	Site 10a - 0.4m 02-Oct-2014 11:20 am
Lab Number:		1334535.10	1334535.12	1334535.14	1334535.16	1334535.18
Trihalomethanes in VOC Soils by Purge&Trap GC-MS						
Bromoform (tribromomethane)	mg/kg dry wt	-	-	-	-	< 1.0
Chloroform (Trichloromethane)	mg/kg dry wt	-	-	-	-	< 0.5
Dibromochloromethane	mg/kg dry wt	-	-	-	-	< 0.5
Other VOC in Soils by Purge&Trap GC-MS						
Carbon disulphide	mg/kg dry wt	-	-	-	-	< 6
Naphthalene	mg/kg dry wt	-	-	-	-	< 0.5
System monitoring Compounds for VOC - % Recovery						
4-Bromofluorobenzene	%	-	-	-	-	94
Toluene-d8	%	-	-	-	-	100

Sample Name:		Site 10 - 0.4m 02-Oct-2014 11:30 am	Site 11 - 0.4m 02-Oct-2014 11:40 am	Site 12 - 0.4m 02-Oct-2014 11:45 am	Site 13 - 0.4m 02-Oct-2014 11:55 am	Site 14 - 0.4m 02-Oct-2014 12:10 pm
Lab Number:		1334535.20	1334535.22	1334535.23	1334535.24	1334535.25
Individual Tests						
Dry Matter	g/100g as rcvd	77	78	76	74	78
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	3	3	3	3	3
Total Recoverable Cadmium	mg/kg dry wt	0.12	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	38	37	42	50	35
Total Recoverable Copper	mg/kg dry wt	13	8	14	17	6
Total Recoverable Lead	mg/kg dry wt	11.1	7.3	11.2	11.5	8.1
Total Recoverable Nickel	mg/kg dry wt	15	11	17	23	8
Total Recoverable Zinc	mg/kg dry wt	42	30	44	48	16
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	mg/kg dry wt	< 0.14	< 0.14	< 0.15	< 0.15	< 0.14
Phenanthrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Haloethers in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Bis(2-chloroethyl)ether	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Bis(2-chloroisopropyl)ether	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
4-Bromophenyl phenyl ether	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
4-Chlorophenyl phenyl ether	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Nitrogen containing compounds in SVOC Soil Samples by GC-MS						
3,3'-Dichlorobenzidine	mg/kg dry wt	< 7	< 7	< 8	< 8	< 7
2,4-Dinitrotoluene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,6-Dinitrotoluene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Nitrobenzene	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
N-Nitrosodi-n-propylamine	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
N-Nitrosodiphenylamine	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3

Sample Type: Soil						
Sample Name:		Site 10 - 0.4m 02-Oct-2014 11:30 am	Site 11 - 0.4m 02-Oct-2014 11:40 am	Site 12 - 0.4m 02-Oct-2014 11:45 am	Site 13 - 0.4m 02-Oct-2014 11:55 am	Site 14 - 0.4m 02-Oct-2014 12:10 pm
Lab Number:		1334535.20	1334535.22	1334535.23	1334535.24	1334535.25
Organochlorine Pesticides in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
alpha-BHC	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
beta-BHC	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
delta-BHC	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
gamma-BHC (Lindane)	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
4,4'-DDD	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
4,4'-DDE	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
4,4'-DDT	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Dieldrin	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Endosulfan I	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endosulfan II	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endosulfan sulphate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endrin	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Endrin ketone	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Heptachlor	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Heptachlor epoxide	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Hexachlorobenzene	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Polycyclic Aromatic Hydrocarbons in SVOC Soil Samples by GC-MS						
Acenaphthene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Acenaphthylene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Anthracene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Benzo[a]anthracene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Benzo[g,h,i]perylene	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Benzo[k]fluoranthene	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
2-Chloronaphthalene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Chrysene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Dibenzo[a,h]anthracene	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Fluoranthene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Fluorene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
2-Methylnaphthalene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Naphthalene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Phenanthrene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Pyrene	mg/kg dry wt	< 0.7	< 0.7	< 0.8	< 0.8	< 0.7
Phenols in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	< 5	< 5	< 5	< 5	< 5
2-Chlorophenol	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
2,4-Dichlorophenol	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
2,4-Dimethylphenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2-Methylphenol (o-Cresol)	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
2-Nitrophenol	mg/kg dry wt	< 5	< 5	< 5	< 5	< 5
Pentachlorophenol (PCP)	mg/kg dry wt	< 30	< 30	< 30	< 30	< 30
Phenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,4,5-Trichlorophenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
2,4,6-Trichlorophenol	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Plasticisers in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	< 6	< 6	< 6	< 6	< 6
Butylbenzylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di(2-ethylhexyl)adipate	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4

Sample Type: Soil						
Sample Name:		Site 10 - 0.4m 02-Oct-2014 11:30 am	Site 11 - 0.4m 02-Oct-2014 11:40 am	Site 12 - 0.4m 02-Oct-2014 11:45 am	Site 13 - 0.4m 02-Oct-2014 11:55 am	Site 14 - 0.4m 02-Oct-2014 12:10 pm
Lab Number:		1334535.20	1334535.22	1334535.23	1334535.24	1334535.25
Plasticisers in SVOC Soil Samples by GC-MS						
Diethylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Dimethylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di-n-butylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Di-n-octylphthalate	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Other Halogenated compounds in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,3-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,4-Dichlorobenzene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Hexachlorobutadiene	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
Hexachlorocyclopentadiene	mg/kg dry wt	< 7	< 7	< 8	< 8	< 7
Hexachloroethane	mg/kg dry wt	< 3	< 3	< 3	< 3	< 3
1,2,4-Trichlorobenzene	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Other compounds in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	< 14	< 14	< 15	< 15	< 14
Carbazole	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Dibenzofuran	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Isophorone	mg/kg dry wt	< 1.4	< 1.4	< 1.5	< 1.5	< 1.4
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	18	< 9	< 9	< 9	< 9
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	< 70

Analyst's Comments

Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22-25
TPH Oil Industry Profile + PAHscreen	Sonication in DCM extraction, SPE cleanup, GC-FID & GC-MS analysis. Tested on as received sample. US EPA 8015B/MfE Petroleum Industry Guidelines [KBIs:5786,2805,10734;2695]	0.010 - 60 mg/kg dry wt	1-2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22-25
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg dry wt	1-2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22-25
Semivolatile Organic Compounds Screening in Soil by GC-MS	Sonication extraction, GPC cleanup (if required), GC-MS FS analysis. Tested on as received sample	0.3 - 30 mg/kg dry wt	1-2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22-25
Volatile Organic Compounds Screening in Soil by Purge&Trap	Sonication extraction, Purge & Trap, GC-MS FS analysis. Tested on as received sample [KBIs:31662,28233,2694]	0.10 - 22 mg/kg dry wt	18
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1-2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22-25
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22-25

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

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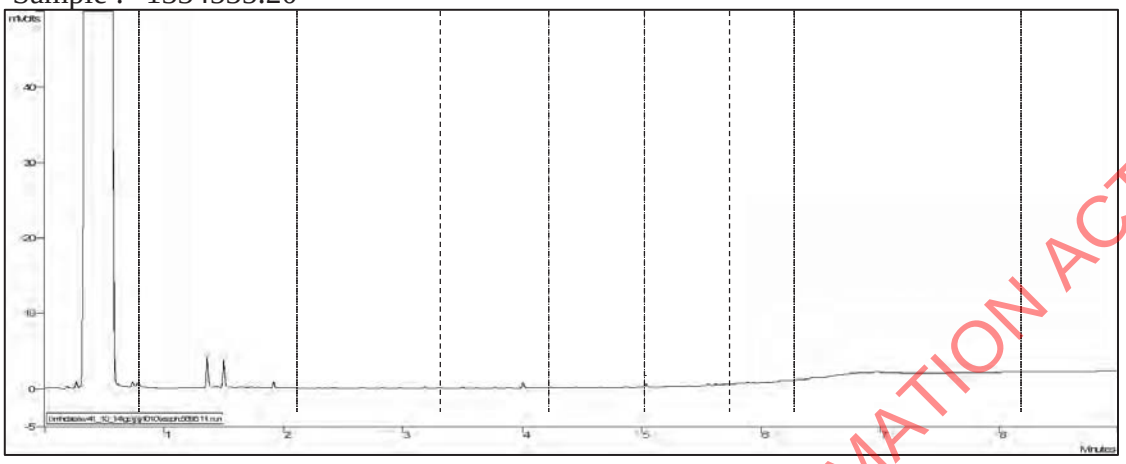

C7 C10 C15 C20 C25 C30 C34 C44

Appendix M Multi Criteria Analysis Assessment

TECHNICAL NOTE

Pro ect	Glen Innes to Tamaki Drive Cycle Way		
Sub ect	Multi-Criteria Analysis Workshop		
Date Of Workshop	29/08/14	Date	03/09/14
Client	Auckland Transport	Job Number	80504522

1.0 Introduction

Multi-Criteria Analysis (MCA) has been used to compare and make an informed decision about the different route choices specified for the cycle path.

MCA involves scoring different options against a number of criteria which reflect the issues that need to be considered to achieve the best possible outcome. The criteria scores are combined to produce an overall option score or rating which can be used to identify a preferred option.

2.0 Workshop

A workshop was held on 29 August 2014 to go through the MCA process. The workshop attendees are listed in the table below.

Table 2 1: MCA Workshop Attendees

Workshop Attendee	Organisation
Steve Patton	AT
Nesh Pillay	AT
Hendrik Hilhorst	AT
Kumaran Nair	NZTA
Andrew McDonald	MWH
Chris Scrafton	MWH
Rachel Blewden	MWH

3.0 MCA Criteria and Weighting

A set of criteria was developed to assess the routes. Each criteria has a different weighting, the weighting reflects the importance of the criteria in the assessment. Criteria with a higher weighting will have a greater influence on the final rating score. The criteria used to evaluate the routes and the weighting assigned to each is set out in
Table 3-1 below.

1 = Low Importance 10 = High Importance

The criteria and the weightings were established prior to the workshop and then refined during the workshop after feedback from workshop attendees. The table below sets out the final criteria and weightings.

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Table 3 1: MCA Criteria and Weightings

Criteria	Description	Weighting	Discussion
Extent of amenity effects	The number of third party properties (residential, commercial etc.) and people potentially affected by the Project.	2	The weight of amenity effects was lowered as the collective view was that we should not let this adversely affect a preferred design option
Scale of amenity effects	The scale of effects on amenity values for residents of third party property. Effects include: • Noise • Vibration • Visual • Dust • Privacy	5	The scale of amenity effects is weighted higher than the extent as it had a wider impact. But as above should not adversely affect a preferred design option
Effects on community facilities (inc. public open space)	The effects on people's ability to use and enjoy: • existing community facilities, including private facilities • areas of public open space	7	An important part of the project is creating facilities for the public and community to enjoy
Effects on waterbodies or any sites of ecological significance	Whether the proposed route passes through and/or affects waterbodies or any sites of ecological significance. Refer to District Plan and PAUP planning maps	5	Considered likely that any potential adverse effects will be able to be adequately avoided or mitigated.
Effects on vegetation	The amount and significance of any vegetation alteration/removal required for the proposed route.	5	Considered likely that any potential adverse effects will be able to be adequately avoided or mitigated.
Effects on sites of cultural significance	Whether the proposed route passes through and/or affects sites of cultural significance Refer to District Plan and PAUP planning maps	6	Important to demonstrate significance of cultural sites.
Effects on sites of heritage / archaeological value	Whether the proposed route passes through and/or affects sites of heritage/archaeological significance Refer to District Plan and PAUP planning maps/NZAA database	5	Considered likely that any potential adverse effects will be able to be adequately avoided or mitigated.
Cost	The likely financial cost of the proposed route.	6	Important to demonstrate a financial feasibility although acknowledging the strategic importance of the route.
Safety	Whether the proposed route provides a safe environment for pedestrians and cyclists by	9	The overall safety of the route was deemed to be of high importance

	for example, minimising interaction with roads. The degree to which the proposed route implements Crime Prevention Through Environmental Design principles. Includes personal and perceived safety. - User conflict - Cyclist speeds - Non-slip surface - Visibility - Road crossings - Good lighting - High level of user activity - Options to avoid confrontation		
Comfort	The degree to which the proposed route avoids significant slopes, complicated manoeuvres and exposure to the elements. - Surface - Gradients - Complicated manoeuvers - Protection from the elements	7	The comfort of the route will be important for both commuter and recreational cyclists so was weighted slightly higher than directness and attractiveness
Directness	The degree to which the proposed route constitutes a direct path for users wanting to travel to a destination.	6	Directness is likely to be more important for commuter cyclists and attractiveness more important for recreational cyclists. Therefore, both criteria were weighted the same and slightly lower than comfort
Attractiveness	The degree to which the proposed route constitutes an attractive alternative route for potential users to get from A to B. - Variety of experiences / environments - Variety of views - Integrates with the surrounding environment - Contributes to social interaction (e.g. ability to ride 2 abreast) - Passes places of interest	6	See comment above
Connectivity	The degree to which the proposed route provides opportunity for connections to residential areas, public open spaces, commercial areas and other land uses.	8	Important to provide connections or to create the opportunity for future connections to potential users, and destination.

4.0 Workshop Outcomes

For the purposes of the workshop only Section One of the project (Merton Road to St Johns Road) was analysed. Because there are two options to cross St Johns Road the MCA was carried out to the termination of the two options. Therefore the MCA process was carried out for the four options shown in Figure 2-1 below:

- MCA Section One - Blue vs ellow Route (From Glen Innes Station to prior to St Johns Road)
- MCA Section Two - Blue vs Green Route (Crossing St Johns Road)

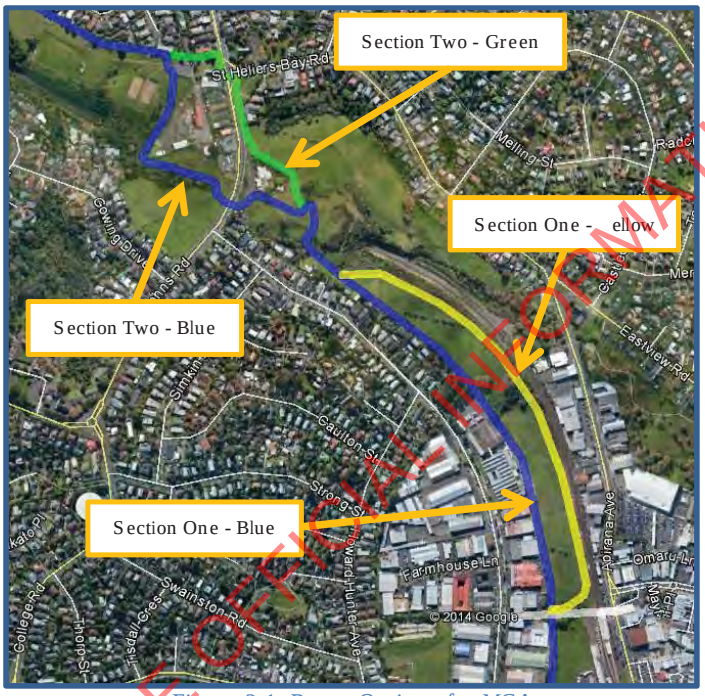

Figure 2 1: Route Options for MCA

Each option was rated between 2 and -2 depending on how positively or negatively the option supports the criteria or the how positive or negative the effect is.

Table 4 1: Rating Values

Evaluation	Rating
1. Strongly supports criteria or 2. Significant Potential Positive Effect	+2
1. Supports criteria or 2. Potential Positive Effect	+1
1. Limited support of criteria or neutral to this criteria or 2. No more than Minor Potential Adverse Effect (with opportunities to remedy or mitigate)	0
1. Not supportive of criteria or 2. Potential Adverse Environmental Effect (with limited opportunities to remedy or mitigate)	-1

Evaluation	Rating
1. Strongly not supportive of criteria or 2. Significant Potential Adverse Effect (with little or no opportunities to mitigate)	-2

All workshop attendees discussed each of the criteria in respect to the two route options for both sections and a collective rating was decided on.

4.1 MCA Section One

The ratings for Section One including notes on the discussion had for each of the criteria are detailed in Table 4-1.

Table 4 1: Section One Ratings

Criteria	Rating		Discussion
	Blue	ellow	
Extent of amenity effects	-2	-1	Blue directly affects more parties – residents and commercial ellow mainly affects Kiwirail only
Scale of amenity effects	-2	0	The Blue route affects privacy and visual effects For the ellow route effects are easier for Kiwirail to mitigate
Effects on community facilities (inc. public open space)	2	1	Both routes will affect the Pony Club but the Blue route slightly less Both routes provide connections to other community facilities such as reserves and walkways making both options positive overall.
Effects on waterbodies or any sites of ecological significance	0	-1	The ellow route affects an existing stream
Effects on vegetation	0	-1	No notable trees, the ellow route removes slightly more vegetation
Effects on sites of cultural significance	0	0	No effects on any sites of cultural significance
Effects on sites of heritage / archaeological value	0	0	No effects of heritage / archaeological value
Cost	0	0	Both routes will have a similar cost so unable to rate one more than the other
Safety	2	1	Blue route has more visual security and easier to escape' in an emergency
Comfort	1	0	Neither route has excessive gradients but ellow route is slightly more undulating
Directness	2	-1	Blue route is fairly direct whereas yellow is a deviation from the direct path
Attractiveness	0	1	ellow slightly more attractive with the reserve on the other side of the rail line. With future development blue may have residential on both sides of the route. ellow only on one side
Connectivity	1	0	Blue route provides better connectivity to the rest of the route

4.2 MCA Section Two

The ratings for Section Two including notes on the discussion had for each of the criteria are detailed in Table 4-2.

Table 4 2: Section Two Ratings

Criteria	Rating		Discussion
	Blue	Green	
Extent of amenity effects	0	-1	The Green route has more third party effects
Scale of amenity effects	-2	0	The Blue route affects the pony club which is harder to mitigate than residential effects
Effects on community facilities (inc. public open space)	1	2	Both link to reserves, Green route links to the reserve north of the rail line
Effects on waterbodies or any sites of ecological significance	-1	0	No effects
Effects on vegetation	0	0	No major vegetation removal on either route, is expected the route will go around trees
Effects on sites of cultural significance	0	0	No effects on any sites of cultural significance
Effects on sites of heritage / archaeological value	0	0	No effects of heritage / archaeological value
Cost	0	-1	Green route slightly more expensive due to upgrade to the signalised intersection
Safety	-1	1	The Green route has more visual surveillance and ability to 'escape'. The Blue route is more 'hidden' by vegetation and has steeper gradients
Comfort	0	1	Green is relatively flat, Blue route has more gradients
Directness	0	1	The Green route is slightly more direct, less distance to travel
Attractiveness	1	0	Blue route has a more attractive outlook as away from the road and trees
Connectivity	0	2	The Green route connects to more reserve area

5.0 Results Conclusions

The final results of the MCA are detailed in Table 5-1.

Table 5 1: MCA Results

Section	Weighted Average Rating
Section One – Blue	0.58
Section One – Yellow	0.05
Section Two – Blue	-0.14
Section Two - Green	0.57

For Section One the Blue route was rated higher than the ellow route and for Section Two the Green Route was higher than the Blue Route. Therefore, it is recommended that the Blue route is continued with for Section One at the Glen Innes end of the route and the Green Route for Section Two where the route crosses St Johns Road.

Based on the MCA scoring, each of the preferred options scored significantly higher than the alternatives.

Glen Innes to Tamaki Drive Section 1 Criteria Table

Criteria	Comments
Extent of amenity effects	The number of third party properties (residential, commercial etc.) and people potentially affected by the Project.
Scale of amenity effects	The scale of effects on amenity values for residents of third party property. Effects include: • Noise • Vibration • Visual • Dust • Privacy
Effects on community facilities (inc. public open space)	The effects on people's ability to use and enjoy: • existing community facilities, including private facilities • areas of public open space
Effects on waterbodies or any sites of ecological significance	Whether the proposed route passes through and/or affects waterbodies or any sites of ecological significance. *Refer to District Plan and PAUP planning maps
Effects on vegetation	The amount and significance of any vegetation alteration/removal required for the proposed route.
Effects on sites of cultural significance	Whether the proposed route passes through and/or affects sites of cultural significance *Refer to District Plan and PAUP planning maps
Effects on sites of heritage/archaeological value	Whether the proposed route passes through and/or affects sites of heritage/archaeological significance *Refer to District Plan and PAUP planning maps/NZAA database
Cost	The likely financial cost of the proposed route.
Safety	Whether the proposed route provides a safe environment for pedestrians and cyclists by for example, minimising interaction with roads.
Perception of Safety	The degree to which the proposed route implements Crime Prevention Through Environmental Design principles.

Comfort	The degree to which the proposed route avoids significant slopes, complicated manoeuvres and exposure to the elements.
Directness	The degree to which the proposed route constitutes a direct path for users wanting to travel to a destination.
Coherence	The degree to which users of the proposed route are able to understand where the route goes to and where entrance and exit points are.
Attractiveness	The degree to which the proposed route constitutes an attractive alternative route for potential users to get from A to B.
Connectivity	The degree to which the proposed route provides opportunity for connections to residential areas, public open spaces, commercial areas and other land uses.

Glen Innes to Tamaki Drive Section 1 Criteria Weight Determination Matrix

Refs:	Cr-1	Cr-2	Cr-3	Cr-4	Cr-5	Cr-6	Cr-7	Cr-8	Cr-9	Cr-10	Cr-11	Cr-12	Cr-13	Cr-14	Cr-15
10															
9									■						
8															■
7			■								■				
6						■		■				■		■	
5		■		■	■		■								
4															
3															
2	■														
1															
0										■			■		
Criteria	Extent of amenity effects	Scale of amenity effects	Effects on community facilities (inc. public open space)	Effects on waterbodies or any sites of ecological	Effects on vegetation	Effects on sites of cultural significance	Effects on sites of heritage/archaeological value	Cost	Safety	Perception of Safety	Comfort	Directness	Coherence	Attractiveness	Connectivity
Weight >	**2**	**5**	**7**	**5**	**5**	**6**	**5**	**6**	**9**	**0**	**7**	**6**	**0**	**6**	**8**

Unit Weighting:	0.026	0.065	0.091	0.065	0.065	0.078	0.065	0.078	0.117	0.000	0.091	0.078	0.000	0.078	0.104

Glen Innes to Tamaki Drive Section 1 MCA Option Matrix

	Criteria:	Cr2-1 Extent of amenity effects	Cr2-2 Scale of amenity effects	Cr2-3 Effects on community facilities (inc. public open space)	Cr2-4 Effects on waterbodies or any sites of ecological significance	Cr2-5 Effects on vegetation	Cr2-6 Effects on sites of cultural significance	Cr2-7 Effects on sites of heritage/archaeological value	Cr2-8 Cost	Cr2-9 Safety	Cr2-10 Perception of Safety	Cr2-11 Comfort	Cr2-12 Directness	Cr2-13 Coherence	Cr2-14 Attractiveness	Cr2-15 Connectivity	
	Weights:	0.026	0.065	0.091	0.065	0.065	0.078	0.065	0.078	0.117	0.000	0.091	0.078	0.000	0.078	0.104	
S1-BLU	Section 1 - Against Property Boundaries	-2	-2	2	0	0	0	0	0	2	2	1	2	0	0	1	
S1-YEL	Section 1 - Against Rail Line	-1	0	1	-1	-1	0	0	0	1	1	0	-1	0	1	0	
S2-BLU	Section 2 - Cross at St Johns Road	0	-2	1	-1	0	0	0	0	-1	-1	0	0	0	1	0	
S2-GRE	Section 2 - Cross at Kohimarama / St Heliers Intersection	-1	0	2	0	0	0	0	-1	1	1	1	1	0	0	2	
S3-BLU	Section 3 - Through Bush																
S3-YEL	Section 3 - Along Existing Track Through Bush																
S4-BLU	Section 4 - Along Rail Line																
S4-ORA	Section 4 - Through Tehapa Reserve																
S5-BLU	Section 5 - Through Meadowbank Station																
S5-WHI	Section 5 - Along Rail Line																
S6-BLU	Section 6 - Along Rail Line																
S6-YEL	Section 6 - Ngapipi Drive																

	Weighted Sum of Scores	Score Profile	Option Rank
Section 1 - Against Property Boundaries	0.58		1
Section 1 - Against Rail Line	0.05		3
Section 2 - Cross at St Johns Road	-0.14		12
Section 2 - Cross at Kohimarama / St Heliers Intersection	0.57		2
Section 3 - Through Bush	0.00		4
Section 3 - Along Existing Track Through Bush	0.00		4
Section 4 - Along Rail Line	0.00		4
Section 4 - Through Tehapa Reserve	0.00		4
Section 5 - Through Meadowbank Station	0.00		4
Section 5 - Along Rail Line	0.00		4
Section 6 - Along Rail Line	0.00		4
Section 6 - Ngapipi Drive	0.00		4

Appendix N Scheme Design Drawings

N.1 Section 1

N.2 Section 2

N.3 Section 3 and 4

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