Otaki to North of Levin — Summary

Expected construction 2025-2029

Road/Shared Path

New 24 km four lane road wi h shared path

Do Minimum

Do Minimum	Existing SH1/SH57		Units	Assumptions and notes
Road Length	18		km	Length of existing road. (SH1 only).
Number of lanes	2			Total number of lanes in each direction, including shared pathways
Lane kilometres	36		km	Road length multiplied by the number of lanes
Infrastructure Type	State Highway			
Emissions				
Construction	0		tCO2e	Total do minimum construction emissions.
Cumulative Enabled	890,811	2029-2048	tCO2e	Cumulative enabled 'Do Minimum' emissions over the period (see worksheets)

Do Intervention

Do Intervention	New Expressway		Units	Assumptions and notes
Road Length	24		km	Length of road of new road (for which the construction emissions are estimated)
Number of vehicle lanes	4			Total number of vehicle lanes in each direction
Number of shared paths	1			Shared pathway
Lane kilometres	120		km	Road length multiplied by the number of lanes
Infrastructure Type	State Highway with Shared Path			
Emissions Breakdown				
Construction	238,690		tCO2e	Estimated construction based on the data available (see worksheets)
Cumulative Enabled	935,349	2029-2048	tCO2e	Cumulative enabled 'Do Intervention' emissions over the period (see worksheets)

Emissions Summary

Emissions Summary				Units	Assumptions and notes
Construction	238,690			tCO2e	Estimated construction emissions (see worksheets for assumptions)
Construction Emissions per Kilometre	9 945			tCO2e/km	
Construction Emissions per Lane Kilometre	1 989			tCO2e/lane km	
Enabled					
Cumulative enabled emissions	2029-2038	2039-2048	Total		
Do minimum vehicle emissions	468,598	422,212	890,811	tCO2e	Estimated enabled emissions
Do intervention vehicle emissions	494,083	441,266	935,349	tCO2e	
Cumulative change in vehicle journey emissions	25,485	19,054	44,539	tCO2e	Enabled emissions increase as a result of project for 2029-2038 period; the data for 2039-2048 shows effect of improvements in fleet emissions.

Project Information

Do minimum = existing SH1 and SH57. For modelling of enabled emissions, traffic on both of these roads is considered.
Do Intervention = Do minimum + New 4 lane highway from north of Levin to Manakau (joining PP2O Expressway) with separated shared path.
Construction emissions estimated for major items (earthworks, concrete, steel, aggregate, asphalt) based on schedule provided by project team. Refer to worksheets for further details.
Enabled emissions calculated based on traffic modelling for three key routes only (SH1, SH57 and new expressway). Does not include wider network effects.
Enabled emissions over these routes increase due to increased VKT, then decline with expected improvements in fleet efficiency.
The enabled emissions assessment does not include calculation of avoided emissions from the shared path.

Otaki to North of Levin — Enabled Emissions

Road/Shared Path

Do Minimum	Existing SH1/SH57				Units	Source
Road Length	18				km	
Number of lanes	2					
Lane kilometres	36				km	

Inputs for VEPM

Forecast Year	2018	2029	2039	2049	Units	Source
Speed Car	74	64	60	55	km/hr	Vehicle Modelling Data worksheet; SH1 & SH57 combined
Speed LCV	74	64	60	55	km/hr	
Speed HCV	76	65	61	56	km/hr	
Speed Bus	76	65	61	56	km/hr	

Outputs from VEPM

	2018	2029	2039	2049	Units	Source
CO2 Light	187	177	136	68	g/km	VEPM6.2 (emissions associated with forecast speed)
CO2 Heavy	611	627	620	590	g/km	VEPM6.2 (emissions associated with forecast speed)

VKT Inputs

	2018	2029	2039	2049	Units	Source
Light vehicle journeys	130,107,831	175,650,363	213,192,481	243,770,003	VKT	Assumes modelled daily traffic is consistent 365 days a year. Data from O2NL_Modelling Excerpt 230721_v2 (003).xlsx. See Traffic Data worksheet
Heavy vehicle journeys	17,569,824	24,198,464	29,550,017	34,695,868	VKT	
Public Transport	0	0	0	0	VKT	
Cycling	0	0	0	0	VKT	
Walking	0	0	0	0	VKT	

Calculated Emissions

Annual calculated emissions	2018	2029	2039	2049	Units
From light vehicle journeys	24,322	31,169	29,041	16,600	tCO2e
From heavy vehicle journeys	10,731	15,175	18,335	20,467	tCO2e
From public Transport	0	0	0	0	tCO2e
From cycling	0	0	0	0	tCO2e
From walking	0	0	0	0	tCO2e
Total	35,053	46,344	47,376	37,066	tCO2e

Cumulative calculated emissions		2029-2038	2039-2048	Total	Units	Source
From light vehicle journeys		301,050	228,203	529,253	tCO2e	Project completion 2029
From heavy vehicle journeys		167,548	194,009	361,557	tCO2e	
From public Transport		0	0	0	tCO2e	
From cycling		0	0	0	tCO2e	
From walking		0	0	0	tCO2e	
Total		468,598	422,212	890,811	tCO2e	

			Units
Do Minimum Total Enabled Emissions	890,811	2029-2048	tCO2e

Do Intervention Existing Route					Units
Road Length	18				km
Number of lanes	2				
Lane kilometres	36				km

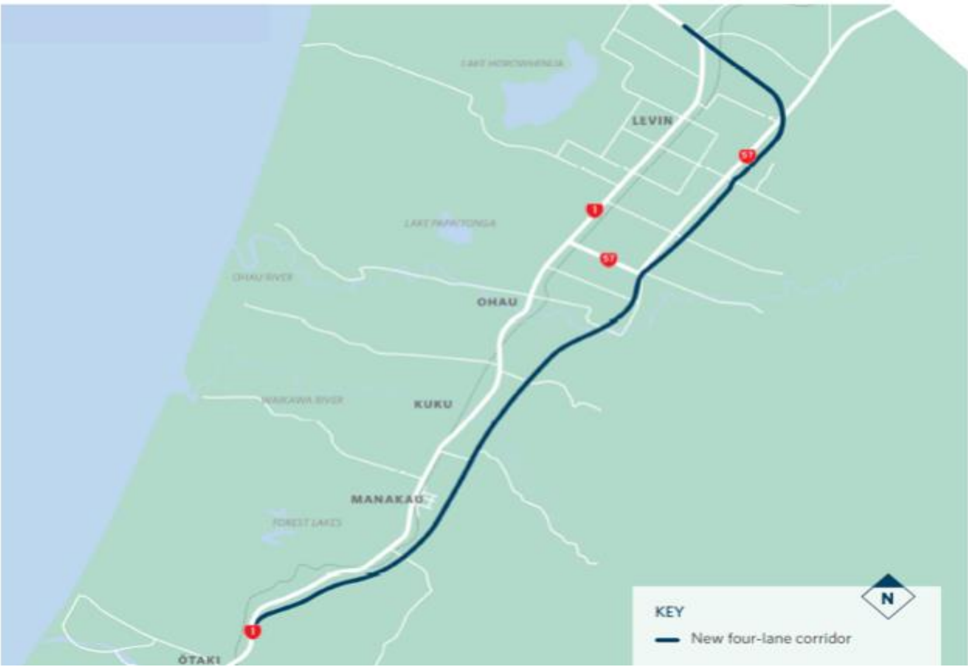
Inputs for VEPM - Existing Route Traffic on existing route when project is in place

Forecast Year	2018	2029	2039	2049	Units
Speed Car		63	62	62	km/hr
Speed LCV		63	62	62	km/hr
Speed HCV		67	67	67	km/hr
Speed Bus		67	67	67	km/hr

Outputs from VEPM Existing Route

	2018	2029	2039	2049	Units	Source
CO2 Light		178	136	67	g/km	Estimated using VEPM6.2
CO2 Heavy		622	603	557	g/km	

VKT Existing Route



	2018	2029	2039	2049		
Light vehicle journeys		64,356,031	78,207,362	94,305,493	VKT	Assumes modelled daily traffic is consistent 365 days a year. Data from O2NL_Modelling Excerpt 230721_v2 (003).xlsx. See Traffic Data worksheet
Heavy vehicle journeys		6,632,817	7,389,421	9,010,363	VKT	
Public Transport	0	0	0	0	VKT	
Cycling	0	0	0	0	VKT	
Walking	0	0	0	0	VKT	

Do Intervention New Route

Traffic on new highway

Road Length	24	km
Number of vehicle lanes	4	
Lane kilometres	120	km

Inputs for VEPM Expressway

Forecast Year	2018	2029	2039	2049		Linked to Summary sheet
Speed Car	-	100	100	100	km/hr	
Speed LCV	-	100	100	100	km/hr	
Speed HCV	-	100	100	100	km/hr	
Speed Bus	-	100	100	100	km/hr	

Outputs from VEPM Expressway

	2018	2029	2039	2049		
CO2 Light	-	190	145	72	g/km	Estimated using VEPM6.2
CO2 Heavy	-	591	574	530	g/km	

VKT Expressway

	2018	2029	2039	2049		
Light vehicle journeys	-	119,274,100	146,735,604	171,544,346	VKT	Assumes modelled daily traffic is consistent 365 days a year. Data from O2NL_Modelling Excerpt 230721_v2 (003).xlsx. See Traffic Data worksheet
Heavy vehicle journeys	-	18,427,924	23,214,310	28,168,860	VKT	
Public Transport	-	0	0	0	VKT	
Cycling	-	0	0	0	VKT	
Walking	-	0	0	0	VKT	

Calculated Emissions

	2018	2029	2039	2049	
From light vehicle existing road journeys	-	**11,444**	**10,604**	**6,305**	tCO2e
From heavy vehicle existing road journeys	-	**4,124**	**4,459**	**5,022**	tCO2e
From light vehicle expressway journeys	-	**22,683**	**21,294**	**12,335**	tCO2e
From heavy vehicle expressway journeys	-	**10,891**	**13,319**	**14,916**	tCO2e
From public transport	-	**0**	**0**	**0**	tCO2e
From cycling	-	**0**	**0**	**0**	tCO2e
From walking	-	**0**	**0**	**0**	tCO2e
Total	-	**49,141**	**49,675**	**38,578**	tCO2e

Cumulative calculated emissions		2029-2038	2039-2048	Total	
Total	-	**494,083**	**441,266**	**935,349**	tCO2e

Intervention Total Enabled Emissions	**935,349**	2029-2048	tCO2e

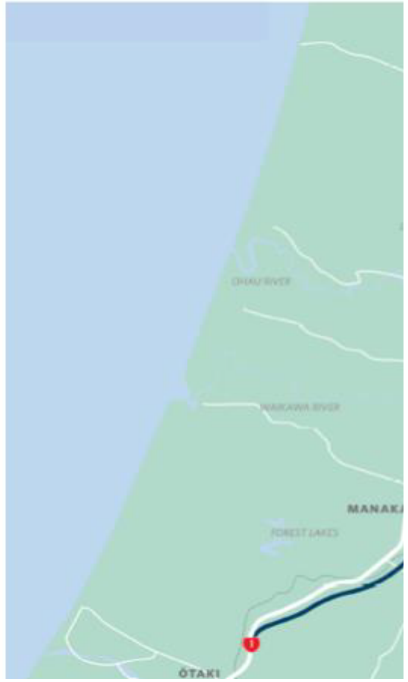
References

Source of emissions factors for enabled emissions is the Vehicle Emission Prediction Model VEPM6.2
https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/air-quality-climate/planning-and-assessment/vehicle-emissions-prediction-model/

Otaki to North of Levin — Traffic Modelling Data

Source: Provided to WK via email from Stantec, 23 July 2021. Based on SATURN model for Horowhenua medium growth scenario.

			2018 Base	2029	2029	2039	2039	2049	2049
			Base (00e_00)	DoMin (00e_M1)	Option (01e_M1)	DoMin (00e_M1)	Option (01e_M1)	DoMin (00e_M1)	Option (01e_M1)
	Vehicle Type		Daily	Daily	Daily	Daily	Daily	Daily	Daily
Existing SH Network (SH1 and SH57 Combined)	LV	VKT (km)	356,460	481,234	176,318	584,089	214,267	667,863	258,371
	LV	Average Speed (km/h)	74	64	63	60	62	55	62
	HV	VKT (km)	48,137	66,297	18,172	80,959	20,245	95,057	24,686
	HV	Average Speed (km/h)	76	65	67	61	67	56	67
Expressway	LV	VKT (km)	0	0	326,778	0	402,015	0	469,985
	LV	Average Speed (km/h)	0	0	100	0	100	0	100
	HV	VKT (km)	0	0	50,487	0	63,601	0	77,175
	HV	Average Speed (km/h)	0	0	100	0	100	0	100



NZ TRANSPORT AGENCY
WAKA KOTAHI

Otaki to North of Levin

Guideline and Supporting information on methodology for transport modelling

Name of Project
Traffic Consultant
Report (if available)
Model Software
Model
Model validation
Time horizons and growth assumptions
Network assumptions and interdependencies
Model Scenario Assumptions Do Minimum
Model Scenario Assumptions Do Intervention/With Project
Induced Traffic
Interface with Vehicle Emission Prediction Model (Where relevant)
General assumptions/Limitations

Final CIPA O2NL 24Aug21

Traffic Modelling Methodology and Assumptions

Waka Kotahi Guidelines for transport model development
Research Report 659 Urban transport modelling in New Zealand – data, practice and resour

NZUP O2NL
Quality Transport Planning/Stantec
Otaki to North of Levin ExpresswayTraffic Model Update v20aOctober2020
SATURN https://saturnsoftware2.co.uk/
The Otaki to North of Levin Traffic Model (O2NLTM)is a traffic model implemented within the SATURN software originally developed during 2011 and 2011. The base year of the model has been updated from 2011 in v11 to 2018 in v20a, based on the 2018 census data for population and employment provided by Statistics New Zealand
The model covers much of the Horowhenua District,including the major township of Levin andextending as far north on SH1 as the Manawatu River (thereby excluding Foxton to the north) and extending north on SH57 to just south of Shannon. At the southern extent, the model extends beyond HorowhenuaDistrict to the Otaki River, into theneighbouring Kapiti CoastDistrict, thereby including the town of Otaki. The model extent was based on capturing the effects and benefits of the O2NL Expressway scheme
The Model Validation Report (MVR) was finalised in 2013 for the original model version. Model validation has been undertaken for the update to v20a (see trafffic report).
DoMin and O2NL, medium growth, for 2018, 2029, 2039 and 2049. • The results are based on a 75th %ile growth for medium growth. • While the current SATURN model does not consider induced traffic, we are advised by Stantec that the most significant impact on the VKT and emissions is the land use assumptions; the modelling includes testing of three population growth scenarios (low, medium, high).
The SATURN model includes assumed completion of a number of projects (full details s10.6 of report) for the do Min and with intervension 2029/39/49 scenarios. Including those within Safety Networks Programme, Taraika Master Plan,HDC Speed Limit Review, and HDC Local Improvements. The with intervension scenarios also include addiitional network effects as a result of O2NL.
A 'Do Minimum' network with likely / committed schemes as collated and advised by Stantc.
A 'With Expressway' network that additionally incudes the August 2020 Draft Preferred Alignment used as the basis of public consultation, and associated works.
Planned growth through population has been included, but induced traffic effects still to be modelled.
n/a traffic modelling provided flow/speed data only for SH2/57 and the proposed Expressway, which was incorporated into the CIPA spreadsheet and VEPM emissions factors entered manually
Induced traffic effects and wider network effects are not included in the CIPA modelling, but will be in future update. The current assessment scenario includes SH2/SH57 do minimum, compared with the proposed Expressway.

[Transport model development guidelines (nzta.govt.nz)](https://www.nzta.govt.nz/assets/resources/research/reports/65)
https://www.nzta.govt.nz/assets/resources/research/reports/65

Otaki to North of Levin   Construction Emissions

Expected construction 2025-2029

Road/Shared Path

		Units		Emissions Factor	Unit	Sources and notes
Do Intervention	**New Expressway**					
Material Quantities Estimate						
Construction Fuel Use						
Diesel	10,674,900	L	28715	0.0027	tCO2e/L	MfE 2020
Construction Materials						
Concrete	322,104	tonnes	35431	0.11	tCO2e/tonne	AECOM derived factor (see below)
Steel	52,659	tonnes	150078	2.85	tCO2e/tonne	MfE 2020
Road Surface						
Crushed rock or recycled material	0	tonnes		0.0032	tCO2e/tonne	IS Calculator NZ v2.0
Gravel	1,245,785	tonnes	22673	0.0182	tCO2e/tonne	IS Calculator NZ v2.0
Bitumen	0	tonnes		0.3966	tCO2e/tonne	IS Calculator NZ v2.0
Asphalt	33060	tonnes	1792	0.0542	tCO2e/tonne	IS Calculator NZ v2.2
Project Breakdown Total	**238,690**	tonnes of CO2e				
Calculated Emissions						
Best estimate of calculated emissions	**238,690**	tonnes of CO2e				

Assumptions

Emissions for construction have been calculated from data provided by Waka Kotahi for this project. When possible assumptions have been made in a consistent manner to ensure comparability between projects.
Refer to construction schedule worksheet for indicative schedule of quantities of concrete, steel, aggregates, gravels and fuels used during construction. Noting that this is pre-DBC.
Based on previous research for Waka Kotahi, only emissions from the largest emission sources from construction of infrastructure projects have been estimated (concrete, steel, aggregates, asphalt, and on-site fuel use).
Materials and works related to bridge abutments have been included where relevant.
Fuel used in the construction is assumed to be 2 litres of diesel for every m3 of earth works (AECOM derived fuel-use ratio).
The following were not included in the estimate: fuel used in quarrying activity; emissions from the transportation of construction materials to/from site.

Emission factors are sourced from MfE's 2020 Guide (see link below) where appropriate, or from the ISCA-IS Calculator v2.0.
https://environment.govt.nz/publications/measuring-emissions-detailed-guide-2020/
The ISCA-IS Calculator v2.0 is available for ISCA members at https://www.isca.org.au/Tools-and-Resources
The emission factor for concrete is based on MfE 2020 and ISCA guidance and is based on a standard concrete mix.

Otaki to North of Levin   Construction Schedule

Source: Provided by NZUP Project Team, July 2021 (pre DBC) (File: O2NL Schedule of Quantities.xlsx)

	Otaki to North of Levin Schedule f Quantities			Material	Unit	Material	Unit	Material	Unit	Material	Unit	Material	Unit	
Ref	Descripti n	Unit	Quantity	C ncrete	t r m3	Steel	t r m3	Asphalt	t r m3	Aggregates	t r m3	Fuel	l r kg	Assumpti n / N tes
D1	ENVIRONMENTAL COMPLIANCE													
1.1	Stormwater Discharge Mitigation													
1.1.1	Erosion and sediment control measures													
1.1.1.1	Temp rary er si n and sediment c ntr l measures f r he wh le site: installati n, disestablishment and reinstatement f silt fences, t rmwater diversi n bunds, sediment ret nti n p nds, treatment systems, temp rary dr p structures, flumes, c nt ur drains and her structures required er si n and sediment c ntr l c mpliance requirements.	LS	1											
D2	EARTHWORKS													
2.0	Earthworks													
2.0.1	Ear hw rks ass ciated w rks, site clearance, dem liti n and di mantling ub gr de pr te ti n trimming and h ping l pe	LS	1											
2.3	Topsoil													
2.3.1	Topsoil stripping including temporary stockpi ing of stripped topsoil													
2.3.1.1	T ps il stripped fr m all areas n he site	m3	915200									1830400	l	Ear hw rks @ 2l diesel at per m3 m ved
2.6	Fill													
2.6.1	Cut to fi l													
2.6.1.1	Cut t fill	m3	3300000									6600000	l	Ear hw rks @ 2l diesel at per m3 m ved
2.6.1.5	C nstruct n ise bunds	m3	278000											
2.6.5	Imported fill from commercial sources (material and grading indicated)													
2.6.5.1	AP100 granular fill r appr v d T pe A ft material	m3	410000											
2.7	Waste and surp us													
2.7.1	Cut to waste (Type A Type R1 and Type R2 materials)													
2.7.1.1	Cut t waste	m3	930000									1860000		Ear hw rks @ 2l diesel at per m3 m ved
D3	GROUND IMPROVEMENTS													
3.0	Ground Improvements													
3.0.1	Gr und impr vement ass ciated w rks, ge textiles and ge grids	LS	1											
3.1	Insitu Subgrade Stabilisation													
3.1.1	Ma nline, Interchange Ramps, R und b uts - Cement st bilisati n f subgr de 250mm n minal dep h (excluding s pply f stabilising agent and materia)	m2	185000							2775	t			W rk n 15kg/sq.m f r h ggrega (say 6mm n m.size)
3.1.2	Ma nline, Interchange Ramps, R und b uts - O dinary P rtland cement @ 3% by mass	t	3500	3,500.00	t									
D4	DRAINAGE													
4.0	Drainage													
4.0.1	Drainage ass ciated w rks, r p rap, flume, kerb and channel, debris scre ns, fish passage, scruff d mes	LS	1											
4.3	Subsoil Drains													
4.3.1	Subsoil drains including excavation, filter media and pipes, and backfilling													
4.3.1.7	110 mm diameter twin wall perf rat d HDPE subs il pipe Filtrati n Class 1 Streng h Class B up t 1.0m bel w f rmati n level f rmati n level	m	50000											tic immaterial exclud d based n pre i us research f r Waka K tahi.
4.3.3	Cleaning eyes to subsoil drains													
4.3.3.1	Cleaning eyes t subs il drains including T by B x at gr und le el	N	1000											Plastic immaterial exclud d based n pre i us research f r Waka K tahi
4.3.4	Outlets to subsoil drains													
4.3.4.1	Outlets t subs il drains, 300mm x 300mm x 100mm hick reinf r ed n rete fa ing	N	500	11.25	t	0.711	t							
4.4	Culverts													
4.4.1	Concrete pipe culverts and stormwater pipes including excavation in a l materials, shoring appropriate to excavation depth, and backf ll with excavated material													
4.4.1.1	DN 450 RCRRJ C ass 4 c ncrete p pe	m	6500	458.25	t									
4.4.1.2	DN 900 Culvert c ncrete pipe	m	100	14.10	t									16%
4.4.1.3	DN 1000 Culvert n rete pipe	m	100	20.00	t									
4.4.1.4	DN 1200 Culvert c ncrete p pe	m	100	24.00	t									
4.4.2	Rectangular concrete culverts including excavation in all materials, shoring appropriate to excavation depth and backfi l with excavated material													
4.4.2.1	Precast b x culvert 1.30m w de x 1.20m h gh	m	50	481.00	t	76.00	t							C ncrete is 6.1t per m2, re is 0.97t per m2
4.4.2.2	re a t b x ul ert 1.50m wide x 1.20m high	m	50	585.00	t	87.30	t							
4.4.2.3	Precast b x culvert 1.50m w de x 1.30m h gh	m	50	594.75	t	94.58	t							
4.4.2.4	Precast b x culvert 1.75m wide x 1.20m high	m	50	640.50	t	101.85	t							
4.4.2.5	re a t b x ul ert 1.90m wide x 1.50m high	m	50	869.25	t	138.23	t							
4.4.2.6	Precast b x culvert 2.00m w de x 1.50m h gh	m	50	915.00	t	145.50	t							
4.4.2.7	re a t b x ul ert 2.10m wide x 1.50m high	m	150	2,882.25	t	458.33	t							
4.4.2.8	Precast b x culvert 2.05m w de x 2.00m h gh	m	50	1,250.50	t	194.00	t							
4.4.2.9	Precast b x culvert 2.80m wide x 2.50m high	m	50	2,135.00	t	339.50	t							
4.4.2.10	re a t b x ul ert 2.70m wide x 3.00m high	m	100	4,698.00	t	742.2	t							
4.5	Headwalls and Inlet and Outlet Structures													
4.5.1	Precast concrete headwal s, wingwalls including bedding and backf ll													
4.5.1.2	Hynds WW0600 wingwa l	N	250	207.00	t									D1.7-Hynds-Wingwa ls.pdf
4.5.7	Erosion control and scour protection at headwalls and other inlet and outlet structures to culverts and flumes (type and size indicated)													
4.5.7.1	Rip rap pr tecti n (d50 = 450mm)	t	10000							1000	t			Assum d t be crushed r ck
4.6	Catch Pits Cesspits and Manholes													
4.6.2	Manho es & Sumps including excavation, backfill, base, benching, riser sections and rungs lid adjustment rings frame and cover or grate													
4.6.2.2	Precast c ncrete 1200 mm diameter wi h Class D 210 kN cast ir n frame and c ver t invert dep h n t exceeding 1.5 m	N	100	190.60	t	59.	t							https://www.hynds.co.nz/wp-content/uploads/D4.1-Hyspec-Manhole-System.pdf
4.6.2.5	Standa d precast c ncrete sumps,	N	250	05.00	t	5.25	t							https://www.humes.co.nz/assets/Product-Guide/08a41cfab1/Humes-Stormwater-Collection-Products.pdf

D5	PAVEMENT AND SURFACING								
5.1	Subbase - Granular								
5.1.3	**Granular Subbase from commercial sources**								
5.1.3.1	Mainline - AP65 subbase 250mm r 400mm hick bas d n pavement design	m3	250000				450000 t		Assuming density of aggregate of 1800kg/m3 (CI AECOM)
5.1.3.2	Interchange Ramps, R undab uts - AP65 subbase 250mm r 400mm hick based n pavement design	m3	21000				37800 t		Assuming density of aggregate of 1800kg/m3 (CI AECOM)
5.1.3.3	L cal r ads - AP65 subbase 250mm hick	m3	32000				57600 t		Assuming density of aggregate of 1800kg/m3 (CI AECOM)
5.2	Basecourse - Granular								
5.2.1	**Granular Basecourse from commercial sources**								
5.2.1.1	Mainline - FBS40 (Wirtgen Grading Envel pe) basec urse 250mm hick	m3	175000				315000 t		Assuming density of aggregate of 1800kg/m3 (CI AECOM). Assume gravel.
5.2.1.2	Interchange Ramps - FBS40 (Wirtgen Gr ding Envel pe) basec urse 250mm hick	m3	6000				10800 t		Assuming density of aggregate of 1800kg/m3 (CI AECOM). Assume gravel.
5.2.1.3	L cal r ads - M/4 AP40 basec urse 160mm hick	m3	19000				34200 t		Assuming density of aggregate of 1800kg/m3 (CI AECOM). Assume gravel.
5.2.1.4	Mainline, Interchange Ramps - F amed bitumen stabilisati n 250mm n minal dep h (excluding s pply f stabilising gent and material)	m2	720000				324000 t		Assuming density of aggregate of 1800kg/m3 (CI AECOM). Assume gravel.
5.2.1.5	Mainline, Interchange Ramps - FBS Ordinary P rtland cem nt @ 1% by ma	t	4500	4,500.00 t					
5.2.1.6	Ma nline, Interchange Ramps - FBS Bitumen @ 3% by mass	t	13000			390 t	12610 t		
5.3	**Basecourse - Structural Asphalt**								https://www.hgleach.co.nz/wp-content/uploads/2019/05/Matatoki-Quarry-Price-List-2019.pdf
5.3.1	**Basecourse - Structural Asphalt**								
5.3.1.1	R und b uts - Grade 4 Emulsi n Seal	m2	23000			345 t			
5.3.1.2	R und b ut - AC14HF L wer ba e ur e 60mm hi k	m3	1500			2,250.00 t			
5.3.1.3	R und b uts - AC20 Upper basec urse 200mm hick	m3	4750			7,125.00 t			
5.4	**Surfacing**								https://www.hgleach.co.nz/w -content/uploads/2019/05/Matat ki-Quarry-Price-List-2019.pdf
5.4.5	**First coat seal**								
5.4.5.1	Ma nline - G2/4 Tw c at ch p seal	m2	670000			10,050.00 t			
5.4.5.3	Interchange Ramps - G2/4 Tw c at chip seal	m2	23000			345.00 t			
5.4.5.5	L al r ad - G3/5 Tw at hip eal	m2	110000			1,650.00 t			
5.4.5.7	L cal R ads - Sec nd c at seal	m2	11000			165.00 t			
5.4.8	**Asphaltic concrete surfacing**								
5.4.8.10	Ma nline - 60 mm hick EMOGPA11 n tack c at	m2	670000			10,050.00 t			
5.4.8.10	Interchange Ramps - 60 mm hick EMOGPA11 n tack c at	m2	23000			345.00 t			
5.4.8.10	R und b ut - 60 mm hi k SMA11 n ta k at	m2	23000			345.00 t			
5.6	Concrete								
5.6.1	**Concrete Footpath**								
5.6.1.1	C ncrete shared use pa h - 4m w de, 20MPa br m finish, 150mm hick	m2	68000	25,500.00 t	5,801.76 t				
5.7	Roundabouts								
5.7.1	**Roundabout Construct on**								
5.7.1.1	R und b ut C nstructi n	m2	12120	10,605.00 t	1,034.08 t				350mm hick
D6	BRIDGES / STRUCTURES								
6.1	EXPRESSWAY BRIDGES								
6.1.1	NIMTR Bridge	m2	1320	1,782.00 t	250.27 t				All w 2500kg/m3 f r c ncrete and 5% by v lume f teel weight 7,900kg/m3 (450mm hick deck) All w 20% fact r
6.1.3	EO f r butments	LS	1	2,673.00 t	375.41 t				
6.1.2	Ohau Ri er Bridge	m2	4950	6,682.50 t	938.52 t				
6.1.3	EO f r butments	LS	1	10,023.75 t	1,407.78 t				
6.1.4	Kuku Stream Bridge	m2	627	846.45 t	118.88 t				
6.1.5	EO f r butment	LS	1	1,269.68 t	178.32 t				
6.1.6	Kuku East R d Br dge	m2	1056	1,425.60 t	200.22 t				
6.1.7	EO f r butment	LS	1	2,138.40 t	300.33 t				
6.1.8	Wa kawa Stream Br dge	m2	3729	5,034.15 t	707.02 t				
6.1.9	EO f r butments	LS	1	7,551.23 t	1,060.53 t				
6.1.10	Waiauti Stream Bridge N r h	m2	1056	1,425.60 t	200.22 t				
6.1.11	EO f r butments	LS	1	2,138.40 t	300.33 t				
6.1.12	Waiauti Stream Bridge S u h	m2	627	846.45 t	118.88 t				
6.1.13	EO f r butments	LS	1	1,269.68 t	178.32 t				
6.1.14	Ex SH1 Cr ssing near Ta l rs	m2	2604	3,515.40 t	493.72 t				
6.1.15	P2O Culvert N 1 Ext n i n (Gre nw d Stream)	m2	178	239.76 t	33.67 t				
6.2	LOCAL ROAD BRIDGES								
6.2.1	Queen Street Ove bi dge	m2	740	999.00 t	140.30 t				
6.2.2	EO f r butments	LS	1	1,498.50 t	210.46 t				
6.2.3	Tararua Interchange Br dge (Grade Separated Diam nd wi h RABs)	m2	962	1,298.70 t	182.4 t				
6.2.4	EO f r butments	LS	1	1,948.05 t	273.59 t				
6.2.5	Muhun a East R ad Overbridge	m2	629	849.15 t	[illegible] t				
6.2.6	EO f r butment	LS	1	1,273.73 t	[illegible] t				
6.2.7	N r h Manakau br dge	m2	629	849.15 t	119.26 t				
6.2.8	EO f r butment	LS	1	1,273.73 t	178.89 t				
6.2.9	H ni Ta pua small br dge	m2	629	849.15 t	119.26 t				
6.2.10	EO f r butments	LS	1	1,273.73 t	178.89 t				
6.3	PROPERTY ACCESS STRUCUTRES								
6.3.1	RP11080 - 5m x 5m B x Culvert	m2	250	38,125.00 t	6,062.50 t				C ncrete is 6.1t per m2, re is 0.97t per m2
6.3.2	RP27530 - 3m x 3m B x Culvert	m2	150	8,235.00 t	1,309.50 t				
6.3.3	RP27530 - 3m x 3m B x Culvert	m2	150	8,235.00 t	1,309.50 t				
6.3.4	RP27530 - 3m x 3m B x Culvert	m2	180	9,882.00 t	[illegible] t				
6.3.5	RP27530 - 3m x 3m B x Culvert	m2	150	8,235.00 t	[illegible] t				
6.3.6	RP11080 - 5m x 5m B x Culvert	m2	250	38,125.00 t	[illegible] t				
6.3.7	RP27530 - 3m x 3m B x Culvert	m2	150	[illegible] t	[illegible] t				
6.3.8	RP27530 - 3m x 3m B x Culvert	m2	150	[illegible] t	1,309.50 t				
6.3.9	RP27530 - 3m x 3m B x Culvert	m2	150	[illegible] t	[illegible] t				
6.3.10	RP27530 - 3m x 3m B x Culvert	m2	195	[illegible] t	[illegible] t				
6.3.11	RP27530 - 3m x 3m B x Culvert	m2	150	[illegible] t	1,309.50 t				
6.3.12	RP27530 - 3m x 3m B x Culvert	m2	150	[illegible] t	[illegible] t				
6.3.13	RP11080 - 5m x 5m B x Culvert	m2	250	[illegible] t	6,062.50 t				
D7	RETAINING WALLS								
7.1	Excavation and backfi ling								
7.1.1.3	1.5m high p le and rail retaining tru ture	m2	750					22500 l	Ear hw rks @ 2l diesel at per m3 m ved
7.1.1.4	7.0m h gh Se ant wall at Tararua	m2	5000					70000 l	Ear hw rks @ 2l diesel at per m3 m ved
D8	TRAFFIC SERVICES								
8.0	Road Safety Barrier Systems								
8.0	**Road Safety Barrier Systems**								
8.0.1	R ad safety barrier ass ciated w rks including Thri beam transiti ns, gr und beam requirements)	LS	1						

8.1.6	**Rigid roadside and median safety barriers**					
8.1.6.4	F- hape barrier 1070 mm high (NZTA M23 c mpliant) NCHRP350 TL5	m	1300	1,189.50	t	https://www.nzta.govt.nz/assets/resources/road-safety-barrier-systems/docs/m23-road-safety-barrier-systems-appendix-a.pdf
8.1.9	**Flexible safety barrier systems**					
8.1.9.1	Wire r pe barrier system (NZTA M23 c mpliant) MASH TL3	m	90000	1,674.00	t	https://www.ingalcivil.co nz/products/road-safety-barriers/guardrail/ezy-guard-smart-4?gclid=CjwKCAjw87SHBhBiEiwAukSeUcEKEWh4n4dF306f3QOg2baSKAmCfZMfbZYnCvKYQXUu1imTKQfv3RoCz3kQAvD_BwE
8.1.9.2	Wire r pe safety barrier terminal (NZTA M 3 mpliant) MASH TL3	N	100	3.35	t	
8.1.9.3	Wire r pe safety barrier interm diate anch r (NZTA M23 c mpliant) MASH TL3	N	50	1.67	t	
8.2	**Pavement Markings and Delineation**					
8.2.1	**Pavement Markings and Del neation nstallation**					
8.2.1.1	a em nt Marking and Delineati n in tallati n	LS	1			

8.3	**Road Signs**		
8.3.1	**Road Signs Installation**		
8.3.1.1	Road signs installation	LS	1
8.5	**Lighting**		
8.5	**Lighting Installation**		
8.5.1.1	Lighting Installation at interchange	N	100
8.5.1.2	Lighting Installation at intersections	N	80

D9	SERVICE RELOCATIONS					
9.1	Services Relocation					
9.1.1	Ser i e Rel ati n	LS	1			
D10	LANDSCAPING AND URBAN DESIGN					
10.0	Landscaping					
10.0.1	Landsc ping ass ciated w rks	LS	1			
10.1	Topsoil					
10 1.1	**Topsoil** **using stockp led material**					
10.1.1.4	Sl pes steeper han 1:2 100 mm thick, Mix 6	m2	660000	132000	l	Assume separate t previ us ear hw rks. Ear hw rks @ 2l diesel at per m3 m ved
10 1.2	**Topsoil** **using material from commercial sources**					
10.1.2.1	100 mm hick t grass d ve ges	m2	500000	100000	l	Assume separate t previ us ear hw rks. Ear hw rks @ 2l diesel at per m3 m ved
10.1.2.3	00 mm hick t planted areas (fil batters and amenity planting), Mix 4, Mix 2	m2	100000	60000	l	
10.5	Fences, Gates, and Handrails					
10 5.1	**Temporary & permanent fences** **including maintenance and removal**					
10.5.1.1	Seven wire and timber p st fence	m	50000			Assume timber material, likely t be immaterial based n previ us research based f r Waka K tahi
10.5.1.2	Amenity fencing	m	10000			Assume timber material, likely t be immaterial based n previ us research based f r Waka K tahi
10.5.1.3	SUP fencing	m	32940			Assume timber material, likely t be immaterial based n previ us research ba ed f r Waka K tahi
10.5.1.4	N ise att nuati n fencing	m	10000			Assume timber material, likely t be immaterial based n previ us research based f r Waka K tahi
D11	TRAFFIC MANAGEMENT					
11.1	Traffic Management					
11 1.1	**Temporary traff c management plan preparation**					
11.1.1.1	Preparati n f site pecific temp rary traffic management plan	LS	1			
11 1.2	**Temporary traff c management - imp ementation, management and maintenance**					
11.1.2.1	Maintenance f temp rary traffic management	m n h	60			Exclude as perati nal emissi ns n t c nsider d at his stage f asses ment
D12	PRELIMINARIES AND GENERAL					
12.1	Preliminary and General					
12 1.1	Preliminary and General	LS	1			
D13	EXTRAORDINARY CONSTRUCTION COSTS					
13.1	Unscheduled Items					
	SUB TOTAL 'A" (ex lu ive f GST)					

T tals	322 103.86 t	52 658.52 t	33 060.00 t	1 245 785.00 t	10 674 900.00 l