Walnut Avenue Improvements

Construction

Expected construction 2021-2022
Replacing roundabouts with traffic signals to improve crossing safety

	Units		Emissions Factor	Unit	Sources and notes
Do Intervention					
Material Quantities Estimate					
Construction Fuel Use					
Diesel	-	L	0.0027	tCO2e/L	MfE 2020
Construction Materials					
Concrete	179	tonnes	0.11	tCO2e/tonne	AECOM derived factor (See assumptions below)
Steel	67	tonnes	2.85	tCO2e/tonne	MfE 2020
Road Surface					
Crushed rock or recycled material	-	tonnes	0.0032	tCO2e/tonne	IS Calculator NZ v2.0
Gravel	10,531	tonnes	0.0182	tCO2e/tonne	IS Calculator NZ v2.0
Bitumen	-	tonnes	0.3966	tCO2e/tonne	IS Calculator NZ v2.0
Asphalt	5,607	tonnes	0.0542	tCO2e/tonne	IS Calculator NZ v2.0
Project Breakdown Total	**706**	tonnes of CO2e			
Calculated Emissions					
Best estimate of calculated emissions	**706**	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
Refer to construction schedule worksheet for indicative schedule of quantities of concrete, steel, aggregates, gravels and fuels used during construction.
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.

Walnut Avenue Improvements Construction Schedule

Source Schedule of quantities as provided in RFT, prepared by Beca, March 2020. Supplied by WK.

Schedule of Prices				Material	Unit	Material	Unit	Material	Unit	Material	Unit	Material	Unit	
Code	Description	Quantity	Qty	Concrete	t or m3	Steel	t or m3	Asphalt	t or m3	Aggregates	t or m3	Fuel	l or kg	Assumptions/Notes
1	Environmental Compliance	1	LS											
2	Earthworks	1	LS											
3	Ground Improvements	1	LS											
4	Drainage	1	LS											
5	Pavement and Surfacing	1	LS											
6	Bridges	1	LS											
7	Retaining Walls	1	LS											
8	Traffic Services	1	LS											
9	Service Relocations	1	LS											
10	Landscaping	1	LS											
11	Traffic Management and Temporary Works	1	LS											
12	Preliminary and General	1	LS											
13	Extraordinary Construction Costs	1	LS											
14	Dayworks	1	LS											
15	**Tender Total**													
	On site Overheads													
	On-Site Overheads and Profit are to be included within the rates for Preliminaries & General		Note											
	Off site Overheads and Profit													
	Off-Site Overheads and Profit are to be included within the rates of the Schedule of Prices		Note											
1.00	**ENVIRONMENTAL COMPLIANCE**													
1.01	Prepare the Contractors Environmental Management Plan (CEMP) & Erosion and Sediment Control Plan	1	LS											
1.02	Update, implement and maintain the Contractor's Environmental Management Plan (CEMP) & Erosion and Sediment Control Plan and Controls including all temporary works and removal on completion	1	LS											
	TOTAL ENVIRONMENTAL COMPLIANCE													
2.00	**EARTHWORKS**													
	Site Clearance													
2.01	General site clearance including bushes, undergrowth, fences including foundations, rubbish, debris etc to waste off site - approximately 22 500m2	1	LS											
2.02	Remove trees. Including; stumps and root ball and dispose off site	46	no											
	Demolition													
	Break out and dispose off site													
2.03	Existing traffic islands. Including; concrete apron / infill	1	LS											
2.04	Existing footpath	1	LS											
2.05	Existing kerbs	1	LS											
2.06	Existing concrete rail stop	1	LS											
2.07	Existing gates and take to assigned lay down area	1	LS											
2.08	Existing type C luminaire. Including; all disconnections, terminations etc.	1	LS											
2.09	Existing type W column. Including; foundation, cabling and disconnections	1	LS											
2.10	Large sign. Including; posts, foundations and power disconnections	1	LS											
2.11	Existing traffic signs. Including foundation	1	LS											
2.12	Sign 1 (ADS Southbound)	1	LS											
2.13	Sign 2 (ADS Northbound)	1	LS											
2.14	Existing gravel rail stop mound as per drawing 3337200-CE-015 Rev 0	1	LS											
2.15	Remove and dispose of fence off site	1	LS											
2.16	Remove existing line markings	1	LS											
	Earthworks													
2.17	Strip topsoil and stockpile on site average depth 200mm	290	m3									580	l	Assume separate to previous earthworks. Earthworks @ 2l diesel at per m3 moved
2.18	Strip topsoil to waste off-site, allow to load, cart and dispose off-site to a managed landfill licensed to accept the typical contaminants as identified in the Detailed Site Investigation	50	m3									100	l	Assume separate to previous earthworks. Earthworks @ 2l diesel at per m3 moved
2.19	Imported GAP65	25	m3							45	t			Assuming density of aggregate of 1800kg/m3 (CI AECOM)
2.20	Allow cut to waste off-site, allow to load, cart and dispose off-site to approved landfill licensed to accept the typical contaminant levels as identified in the Detailed Site Investigation	2,093	m3							3767.4	t			Assuming density of aggregate of 1800kg/m3 (CI AECOM)
2.21	Allow to undercut soft or unsuitable material to waste off-site, allow to load, cart and dispose off-site to a managed landfill licensed to accept the typical contaminant levels as identified in the Detailed Site Investigation, and fill with GASP65 - Provisional Item	130	m3							234	t			Assuming density of aggregate of 1800kg/m3 (CI AECOM)
	Imported topsoil													
2.22	Allow to uplift from stockpile and re-spread topsoil	285	m3							513	t			Assuming density of aggregate of 1800kg/m3 (CI AECOM)
2.23	Extra over for imported topsoil if required - Provisional Item	50	m3							90	t			Assuming density of aggregate of 1800kg/m3 (CI AECOM)
2.24	Allow to supply materials and construct garden beds as per specifications and drawings. Includes; prepare subsoil, topsoil and timber battens	215	m2									43	l	Assume 100mm thick. Earthworks @ 2l diesel at per m3 moved.
	TOTAL EARTHWORKS													
3.00	**GROUND IMPROVEMENTS**													
4.00	**DRAINAGE**													
4.01	Abandon stormwater pipes. Allow to plug each end with concrete extending over a minimum of 1m.	2	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.02	Remove existing manhole and extend pipe on grade to new manhole	1	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.03	Remove soakpit cover and vertical pipe. Remove soakpit covers up to 1m below ground level. Backfill with AP65 to underside of pavement level	1	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.04	Remove existing sumps and abandon stormwater pipe in accordance with drawings and specifications	1	LS											
4.05	Remove sump and sump lead. Backfill and make good surfacing	7	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.06	Remove existing slot drain	1	LS											Excluded as likely to immaterial based on previous research for Waka Kotahi.
	Storm Water Drainage													
	Supply and install RCRRJ Class 4 storm-water pipe 300mm dia.													
4.07	Between 0.0m - 1.5m deep	130	m	24.7	t	4.94	t							Estimate provided by AECOM quantity surveyor 19/07/21
	Supply and install RCRRJ Class 4 storm-water pipe 225mm dia.													
4.08	Between 0.0m - 1.5m deep	3	m	0.42	t	0.114	t							Estimate provided by AECOM quantity surveyor 19/07/21
	Works to existing Stormwater													
4.09	Supply and install RCRRJ Class 4 storm-water pipe, 150mm dia including direct connection to existing stormwater as CCC CSS SD361 drawings and specifications	5	m	0.5	t	0.19	t							Estimate provided by AECOM quantity surveyor 19/07/21
	Manholes													
	Supply and install 1050 dia manhole and base													
4.10	0.0m - 1.5m	4	no	8.5	t	0.152	t							Estimate provided by AECOM quantity surveyor 19/07/21
	Supply and install 1050 dia. manhole and base complete with hinged debris screen and manhole filter bag													
4.11	0.0m - 1.5m	2	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
	Works to Existing Lids, Covers, Grates etc.													
	Allow to raise existing manhole lids to tie into new levels													
4.12	0 to 100mm	1	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.13	250 to 350mm	1	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.14	500 to 600mm	1	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
	Allow to lower existing manhole lids to tie into new levels													
4.15	0 to 100mm	2	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.16	Allow to adjust catch pit grate level to new kerb level	2	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.17	Allow to adjust fire hydrant / valve pit lid level to tie into new carriageway	7	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.18	Replace top two DN900 manhole risers and reinstate existing manhole frame and lid.	1	LS											Excluded as likely to immaterial based on previous research for Waka Kotahi.
	Sumps													
	Supply and install single sump catch pit complete as drawing 3337200-CE-038 Rev 0													
4.19	0 0m - 1 5m	8	no	4.08	t	0.72	t							Estimate provided by AECOM quantity surveyor 19/07/21
	and base including cast iron frame and grate and 150mm thick concrete mowing strip													
4.20	0.0m - 1.5m	3	no	1.53	t	0.27	t							Estimate provided by AECOM quantity surveyor 19/07/21
4.21	Relocation of existing sump as drawing 3337200-CE-039 and specifications	1	LS											Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.22	Supply and install subsoil rodding eye and cover	7	no											Excluded as likely to immaterial based on previous research for Waka Kotahi.

Walnut Avenue Improvements Construction Schedule

Source Schedule of quantities as provided in RFT, prepared by Beca, March 2020. Supplied by WK.

Schedule of Prices				Material Unit	Material Unit	Material Unit	Material Unit	Material Unit	
Code	Description	Quantity	Qty	Concrete t r m3	Steel t r m3	Asphalt t r m3	Aggregates t r m3	Fuel l r kg	Assumptions/ Notes
	Kerbing								
4.23	Supply and install kerb and channel as per NZS 4404 2010 (Drawing 3337200-CE-36). Including; 150mm AP40 M/4 sub-base compacted to TNZ B/2	800	m	80 t	1.5104 t				Aggregate element included only. Estimate provided by AECOM quantity surveyor 19/07/21
4.24	Supply and install heavy commercial drop kerb. Including; 150mm AP40 M/4 sub-base compacted to TNZ B/2	23	m	2.256 t	0.04259328 t				Aggregate element included only. Estimate provided by AECOM quantity surveyor 19/07/21
4.25	Supply and install vehicle kerb crossing. Include to tie into existing (Drawings 3337200-CE-026, 036, 037 & 038)	6	m	0.6 t	0.011328 t				Estimate provided by AECOM quantity surveyor 19/07/21
4.26	Break out and remove existing kerb and replace with vehicle kerb crossing - Refer drawing 3337200-CE-291	20	m	2 t	1.5104 t				Estimate provided by AECOM quantity surveyor 19/07/21
4.27	Supply and install subsoil drains below new kerb and channel at ubg de	830	m						Excluded as likely to immaterial based on previous e ar h f W ka Kot hi
4.28	specifications	30	m	3 t	0.1896 t				19/07/21
	Grassed Swales								
	South basin and swale as drawings 333 200 CE 064 Rev 0 and 3337200 CE 081 Rev 0 (forming, topsoil and grass seeding measured elsewhere)		Note						
4.29	Supply and install 100 dia HDPE smooth bore punched subsoil drain, 5-8mm pea gravel with no fines, non-woven geotextile in accordance with TNZ F/7 Filtration Class 1; Class B Strength	60	m						Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.30	Supply and install 100 dia HDPE smooth bore punched subsoil drain, non-woven geotextile in accordance with TNZ F/7 Filtration Class 1; Class B Strength	30	m						Excluded as likely to immaterial based on previous research for Waka Kotahi.
	North basin and swale as drawings 333 200 CE 065 Rev 0 and 3337200 CE 081 Rev 0 (forming, topsoil and grass seeding to swale measured elsewhere)		Note						
4.31	Supply and install 100 dia HDPE smooth bore punched subsoil drain, 5-8mm pea gravel with no fines, non-woven geotextile in accordance with TNZ F/7 Filtration Class 1; Class B Strength	40	m						Excluded as likely to immaterial based on previous research for Waka Kotahi.
4.32	Supply and install 100 dia HDPE smooth bore punched subsoil drain, non-woven geotextile in accordance with TNZ F/7 Filtration Class 1; Class B Strength	15	m						Excluded as likely to immaterial based on previous research for Waka Kotahi.
	Soakage Field								
4.33	75 - 150 washed boulders	210	m3				336.42 t		Assume crushed rock. Rip Rap 1602kg/m3
	TOTAL DRAINAGE								
5.00	**PAVEMENT AND SURFACING**								
	State Highway								
	Overlay Pavement 1a								
5.01	Allow to mill existing pavement to 250mm	3,590	m2				1615.5 t		Assuming dens ty of aggregate of 1800kg/m3 (CI AECOM)
5.02	Supply and place grade 3 chip seal	3 590	m2			538.5 t			Assumin 0.1m deep and 1.5t/m3
5.03	Supply and place 200mm AC20 asphalt concrete	3,590	m2			1077 t			1.5t/m3
5.04	Supply and place 50mm SMA 10 wearing course (PSV56), including tack coat as required	3 590	m2			269.25 t			1 t/m3
	Overlay Pavement 2a								
5.05	Allow to mill existing pavement to 240mm	3,270	m2				1412.64 t		
5.06	Supply and place 190 NZTA M/4 AP40 basecourse + 1.5% cement	625	m3			93.75 t			A uming 0.1m deep and 1.5t/m3
5.07	Supply and place grade 3 chip seal	3,270	m2			490.5 t			ssuming 0.1m deep and 1.5t/m3
5.08	Supply and place 50mm SMA 10 wearing course (PSV56), including tack coat as required	3 270	m2			245.25 t			1.5t/m3
	Widening Pavement Pavement 1b								
5.09	Allow for sub-grade preparation and testing	1 430	m2					57 l	Assume separate to previous earthworks. Earthworks @ 2l diesel at per m3 moved
5.10	Supply and install geogrid and geotextile in base of excavation	1 430	m2						Exclude as polymer (plastic), likely to be immaterial based on previous research for Waka Kotahi
5.11	Supply and place 200mm NZTA M/4 AP40 basecourse	290	m3				522.00 t		Assuming dens ty of aggregate of 1800kg/m3 (CI AECOM)
5.12	Supply and place grade 3 chip seal	1 430	m2			214.5 t			Assuming 0.1m deep and 1.5t/m3
5.13	Supply and place 200mm AC20 asphalt concrete	1,430	m2			429 t			1.5t/m3
5.14	Supply and place 50mm SMA 10 wearing course (PSV56), including tack coat as required	1 430	m2			107.25 t			1.5t/m3
	Widening Pavement Pavement 2b								
5.15	Allow for sub-grade preparation and testing	1 275	m2					510 l	Assume separate to previous earthworks. Earthworks @ 2l diesel at per m3 moved
5.16	Supply and install geogrid and geotextile in base of excavation	1,275	m2						Exclude as polymer (plastic), likely to be immaterial based on previous research for Waka Kotahi
5.17	Supply and place 295mm AP65 sub-base	375	m3				675.00 t		Assuming dens ty of aggregate of 1800kg/m3 (CI AECOM)
5.18	Supply and place 190 NZTA M/4 AP40 basecourse + 1.5% cement	245	m3			36 5 t			Assuming 0.1m deep and 1.5t/m3
5.19	g ad 3 chip seal	1,275	m2			91.25 t			Assuming 0.1m deep and 1.5t/m3
5.20	as required	1,275	m2			95.625 t			1.5t/m3
	East Street / Walnut Avenue								
	Overlay Pavement 3a								
5.21	Allow to mill existing pavement to 210mm	1,400	m2				529.2 t		Assuming dens ty of aggregate of 1800kg/m3 (CI AECOM)
5.22	Supply and place grade 3 chip seal	1 400	m2			210 t			Assuming 0.1m deep and 1.5t/m3
5.23	Supply and place 160mm AC20 asphalt concrete	1,400	m2			336 t			1.5t/m3
5.24	Supply and place 50mm SMA 10 wearing course (PSV56), including tack coat as required	1 400	m2			105 t			1.5t/m3
	Overlay Pavement 4a								
5.25	Allow to mill existing pavement to 220mm	1 910	2				756.36 t		Assuming dens ty of aggregate of 1800kg/m3 (CI AECOM)
5.26	Supply and place 170mm NZTA M/4 AP40 basecourse + 1.5% cement	325	m3			82.875 t			1.5t/m3
5.27	Supply and place grade 3 chip seal	2 230	m2			334.5 t			Assuming 0.1m deep and 1.5t/m3
5.28	Supply and place 50mm SMA 10 wearing course (PSV56), including tack coat as required	1 910	m2			143.25 t			1.5t/m3
	Widening Pavement Pavement 3b								
5.29	Allow for sub-grade preparation and testing	64	m2					25.6 l	Assumed 0.2m depth. Earthworks @ 2l diesel at per m3 moved
5.30	Supply and place geogrid and geotextile in base of excavation	64	m2						Exclude as polymer (plastic), likely to be immaterial based on previous research for Waka Kotahi
5.31	Supply and place 200mm NZTA M/4 AP40 basecourse	15	m3				5.94 t		Assuming dens ty of aggregate of 1800kg/m3 (CI AECOM)
5.32	Supply and place grade 3 chip seal	64	m2			9.6 t			Assuming 0.1m deep and 1.5t/m3
5.33	Supply and place 160mm AC20 asphalt concrete	64	m2			15.36 t			1.5t/m3
5.34	Supply and place 50mm SMA 10 wearing course (PSV56), including tack coat as required	64	m2			4.8 t			1.5t/m3
	Widening Pavement Pavement 4b								
5.35	Allow for sub-grade preparation and testing	230	m2					92 l	Assumed 0.2m depth. Earthworks @ 2l diesel at per m3 moved
5.36	Supply and place geogrid and geotextile in base of excavation	230	m2						Exclude as polymer (plastic), likely to be immaterial based on previous research for Waka Kotahi
5.37	Supply and place 290mm AP65 sub-base	55	m3				28.71 t		Assuming dens ty of aggregate of 1800kg/m3 (CI AECOM)
5.38	Supply and place 170 NZTA M/4 AP40 basecourse + 5% cement	35	m3			52.5 t			1.5t/m3
5.39	Supply and place grade 3 chip seal	230	m2			34.5 t			Assuming 0.1m deep and 1.5t/m3
5.40	Supply and place 50mm SMA 10 wearing cours (PSV56), including tack coat as required	230	m2			17.25 t			1.5t/m3
	Concrete Commercial Vehicle Crossing								
5.41	Allow to form new concrete commercial vehicle crossing complete, as drawings and specifications	120	m2	45 t					Assuming 0.15m depth at 2.5t/m3
	Saw cutting								
5.42	Allow to saw cut and tie in existing pavements	200	m						Likely to be immaterial based on previous research for Waka Kotahi
5.43	Crack bandage to interface of new and existing pavements	200	m						Likely to be immaterial based on previous research for Waka Kotahi
	Others								
5.44	Extra over for supply and place 50mm SMA 10 wearing course where higher PSV is required (from PSV56 to PSV70)	2,975	m2			223.125 t			1.5t/m3
	TOTAL PAVEMENT AND SURFACING								
6.00	**BRIDGES**								
7.00	**RETAINING WALLS**								
8.00	**TRAFFIC SERVICES**								
	Road markings in accordance with NZTA Manual of Traffic Signs and Markings Part II - Markings and TPC Manual		Note						
	Temporary Road Markings								
	White reflectorised line marking								
8.01	Border line; 100mm wide	1,815	m						Likely to be immaterial based on previous research for Waka Kotahi
8.02	Centre line 100mm wide continuous line	315	m						Likely to be immaterial based on previous research for Waka Kotahi
8.03	Centre line 100mm wide 3m stripe 7m gap	680	m						Likely to be immaterial based on previous research for Waka Kotahi
8.04	Continuity line; 100mm wide, 1m stripe, 3m gap	95	m						Likely to be immaterial based on previous research for Waka Kotahi
8.05	Crossing line 100mm wide	295	m						Likely to be immaterial based on previous research for Waka Kotahi
8.06	Edgeline; 100mm wide	870	m						Likely to be immaterial based on previous research for Waka Kotahi
8.07	Limit line; 300 wide	110	m						Likely to be immaterial based on previous research for Waka Kotahi
8.08	Median bar 600 wide	300	m						Likely to be immaterial based on previous research for Waka Kotahi
	Yellow reflectorised line marking								Likely to be immaterial based on previous research for Waka Kotahi

Walnut Avenue Improvements Construction Schedule

Source Schedule of quantities as provided in RFT, prepared by Beca, March 2020. Supplied by WK.

Schedule of Prices				Material	Unit	Material	Unit	Material	Unit	Material	Unit	Material	Unit	
Code	Description	Quantity	Qty	Concrete	t r m3	Steel	t r m3	Asphalt	t r m3	Aggregates	t r m3	Fuel	l r kg	Assumpti ns/ N tes
8.09	No stopping; 100mm wide, 1m stripe, 2m gap	1,415	m											Likely to be immaterial based on previous research for Waka Kotahi
8.10	100mm wide ye low border and cross hatching to level crossing	190	m2											Likely to be immaterial based on previous research for Waka Kotahi
	Permanent Road Markings													Likely to be immaterial based on previous research for Waka Kotahi
	White reflectorised line marking													Likely to be immaterial based on previous research for Waka Kotahi
8.11	Border line 100mm wide	1 815	m											Likely to be immaterial based on previous research for Waka Kotahi
8.12	Centre line; 100mm wide	320	m											Likely to be immaterial based on previous research for Waka Kotahi
8.13	Centre line; 100mm wide, continuous line; 3m stripe, 7m gap	680	m											Likely to be immaterial based on previous research for Waka Kotahi
8.14	Continuity line 100mm wide 1m stripe 3m gap	95	m											Likely to be immaterial based on previous research for Waka Kotahi
8.15	Crossing line; 100mm wide	295	m											Likely to be immaterial based on previous research for Waka Kotahi
8.16	Edgeline 100mm wide	870	m											Likely to be immaterial based on previous research for Waka Kotahi
8.17	Limit line 300 wide	110	m											Likely to be immaterial based on previous research for Waka Kotahi
8.18	Median bar; 600 wide	300	m											Likely to be immaterial based on previous research for Waka Kotahi
	Yellow reflectorised line marking													Likely to be immaterial based on previous research for Waka Kotahi
8.19	No stopping; 100mm wide, 1m stripe, 2m gap	1,415	m											Likely to be immaterial based on previous research for Waka Kotahi
8.20	100mm wide ye low border and cross hatching to level crossing	190	m2											Likely to be immaterial based on previous research for Waka Kotahi
	Green pavement marking													Likely to be immaterial based on previous research for Waka Kotahi
8.21	Cycleway Surface Marking	1,065	m2											Likely to be immaterial based on previous research for Waka Kotahi
	Symbols Lettering etc													Likely to be immaterial based on previous research for Waka Kotahi
8.22	Cycle lane symbol	65	no											Likely to be immaterial based on previous research for Waka Kotahi
8.23	Directional arrow; combined	10	no											Likely to be immaterial based on previous research for Waka Kotahi
8.24	Directional arrow; left turn	11	no											Likely to be immaterial based on previous research for Waka Kotahi
8.25	Directional arrow right turn	23	no											Likely to be immaterial based on previous research for Waka Kotahi
8.26	Directional arrow; straight	13	no											Likely to be immaterial based on previous research for Waka Kotahi
8.27	Fire hydrant	7	no											Likely to be immaterial based on previous research for Waka Kotahi
8.28	Lettering "X RAIL"	4	no											Likely to be immaterial based on previous research for Waka Kotahi
8.29	RRPM's	141	no											Likely to be immaterial based on previous research for Waka Kotahi
8.30	Kerb top markers yellow monodirectional	96	no											Likely to be immaterial based on previous research for Waka Kotahi
	Road signs, gantries													Likely to be immaterial based on previous research for Waka Kotahi
	Supply and installation of new s gns inclusive of foundations all in accordance w th drawings and specifications													Likely to be immaterial based on previous research for Waka Kotahi
8.31	Sign 1 (ADS South bound)	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.32	Sign 2 (ADS North bound)	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.33	3a (re-use existing Christchurch to the right)	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.34	4b (re-use existing Allenton to the right)	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.35	5a (re-use existing Timaru to the left)	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.36	5b (re-use existing Timaru to the right)	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.37	6b (re-use existing Town Centre to the Right)	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.38	PW-3	7	no											Likely to be immaterial based on previous research for Waka Kotahi
8.39	PW-43.3	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.40	RG-7	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.41	RG-12	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.42	600 dia arrow disc sign. RG-17	14	no											Likely to be immaterial based on previous research for Waka Kotahi
8.43	Sign 7	1	no											Likely to be immaterial based on previous research for Waka Kotahi
8.44	Sign WXL1	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.45	Sign WXR1	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.46	Sign WX1-L	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.47	Sign WX1-R	2	no											Likely to be immaterial based on previous research for Waka Kotahi
	Supply and installation of new signs fixed to fence / gate all in accordance w th drawings and specifications													Likely to be immaterial based on previous research for Waka Kotahi
8.48	600 x 600mm "LOOK FOR TRAINS" sign. WX8 (a)	8	no											Likely to be immaterial based on previous research for Waka Kotahi
8.49	600 x 600mm "EMERGENCY EXIT PLEASE PUSH GATE" sig . Emergency Exit Gate (b)	4	no											Likely to be immaterial based on previous research for Waka Kotahi
8.50	600 x 600mm "EMERGENCY EXIT" sign. Directional Emergency Exit (left) (d)	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.51	600 x 600mm EMERGENCY EXIT sign. Directional Emerge cy Exit (right) (e)	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.52	600 dia "NO ENTRY" disc sign. RG-9 (c)	4	no											Likely to be immaterial based on previous research for Waka Kotahi
	Traffic signals													Likely to be immaterial based on previous research for Waka Kotahi
	Supply and installation of new traffic signa s in accordance with drawings and specifications													Likely to be immaterial based on previous research for Waka Kotahi
8.53	200mm 6 Aspect Lantern with closed visor	16	no											Likely to be immaterial based on previous research for Waka Kotahi
8.54	200mm 6 Aspect Lantern with open visor	17	no											Likely to be immaterial based on previous research for Waka Kotahi
8.55	300mm 6 Aspect Lantern with closed visor	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.56	300mm 6 Aspect Lantern with open visor	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.57	Pedestrian Lantern	12	no											Likely to be immaterial based on previous research for Waka Kotahi
8.58	Pedestrian push button	12	no											Likely to be immaterial based on previous research for Waka Kotahi
	SCATS Connection													Likely to be immaterial based on previous research for Waka Kotahi
8.59	Allow for nstal at on of E-PROM Data, testing and connect on to the SCATS system to Traffic Oper ions Centre (WTOC) (Including connection with adjacent intersection)	1	LS											Likely to be immaterial based on previous research for Waka Kotahi
8.60	Supply and install CCTV cameras	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.61	Supply and install Fibre connection with comms (including connection with adjacent intersection and level crossing)	1	LS											Likely to be immaterial based on previous research for Waka Kotahi
8.62	Allowance for spare ethernet cable to CCTV and communication devices	1	LS											Likely to be immaterial based on previous research for Waka Kotahi
	Poles													Likely to be immaterial based on previous research for Waka Kotahi
	Supply and install poles including retention socket connections earthing and cabling													Likely to be immaterial based on previous research for Waka Kotahi
8.63	Supply and install pole - Type 1. Including foundation	5	no											Likely to be immaterial based on previous research for Waka Kotahi
8.64	Supply and install pole - Type 7. Including foundation	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.65	Supply and install pole - Type 8. Including foundation	8	no											Likely to be immaterial based on previous research for Waka Kotahi
	Ducting													Likely to be immaterial based on previous research for Waka Kotahi
8.66	Supply and install 1no. 100 dia. orange uPVC duct, laid in trench 0.6 - 1m deep, including all bedding, joints, connections, backfill and draw wires (from access chambers to poles)	175	m											Likely to be immaterial based on previous research for Waka Kotahi
8.67	Supply and install 3no. 100 dia. orange uPVC duct, laid in trench 0.6 - 1m deep, including all bedding, joints, connections, backfill and draw wires (between access chambers)	370	m											Likely to be immaterial based on previous research for Waka Kotahi
8.68	Supply and install 1no. 50 dia. orange uPVC duct, laid in trench minimum 300mm, including all bedding, joints, connections, backfill and draw wires (from access chambers to kerbside junction box)	110	m											Likely to be immaterial based on previous research for Waka Kotahi
	Loop Feeders													Likely to be immaterial based on previous research for Waka Kotahi
8.69	Supply and install loop feeder cables from control cabinets to kerbside junction boxes (assumes 2 pair loop feeder cable)	1 105	m											Likely to be immaterial based on previous research for Waka Kotahi

Walnut Avenue Improvements Construction Schedule

Source Schedule of quantities as provided in RFT, prepared by Beca, March 2020. Supplied by WK.

Schedule of Prices				Material	Unit	Material	Unit	Material	Unit	Material	Unit	Material	Unit	
Code	Description	Quantity	Qty	Concrete	m3	Steel	m3	Asphalt	m3	Aggregates	m3	Fuel	kg	Assumptions/Notes
	Detection Loop													Likely to be immaterial based on previous research for Waka Kotahi
8.70	Supply and install Vehicle Detector Loop	24	no											Likely to be immaterial based on previous research for Waka Kotahi
8.71	Supply and install Cycle Detector Loop	6	no											Likely to be immaterial based on previous research for Waka Kotahi
8.72	Supply and install Queue Detector Loop	5	no											Likely to be immaterial based on previous research for Waka Kotahi
	Controllers													Likely to be immaterial based on previous research for Waka Kotahi
8.73	Supply and install 20 group Aldridge ATSC4 ELV Traffic Signal Controllers with VC6 compliance	2	no											Likely to be immaterial based on previous research for Waka Kotahi
8.74	Allow for commissioning	1	LS											Likely to be immaterial based on previous research for Waka Kotahi
	Power Connection													Likely to be immaterial based on previous research for Waka Kotahi
8.75	Supply, install and terminate power cable into traffic control cabinets. (2no.)	1	LS											Likely to be immaterial based on previous research for Waka Kotahi
	Traffic Signal Equipment													Likely to be immaterial based on previous research for Waka Kotahi
	Access Chambers													Likely to be immaterial based on previous research for Waka Kotahi
8.76	Supply and install concrete Access Chambers with lid 1.5m deep	29	no											Likely to be immaterial based on previous research for Waka Kotahi
	Junction Boxes													Likely to be immaterial based on previous research for Waka Kotahi
8.77	Supply and install Kerbside Junction Box behind kerb.	11	no											Likely to be immaterial based on previous research for Waka Kotahi
	Multi core cable													Likely to be immaterial based on previous research for Waka Kotahi
8.78	Supply and install orange 36 core cable from controllers to poles	880	m											Likely to be immaterial based on previous research for Waka Kotahi
	Lighting													
	Supply and install street lighting columns including cast-in foundations, connections and earthing													
	Energy absorbing octagonal sectional steel column with mitred outreach 10m mounting height 3m outreach.													No data available.
8.79	Column Type Z	23	no			17.25	t							Estimate provided by AECOM quantity surveyor 19/07/21
	Energy absorbing octagonal sectional steel column with mitred outreach 12m mounting height 3m outreach.													
8.80	Column Type V	5	no			3.75	t							Estimate provided by AECOM quantity surveyor 19/07/21
	Supply and install Juma / JUSP octagonal sectional column with mitred outreach 10m mounting height 3m outreach including all foundations, connections, cabling and earthing													
8.81	Column Type X	8	no											Likely to be immaterial based on previous research for Waka Kotahi
	Existing column to be retained.													Likely to be immaterial based on previous research for Waka Kotahi
8.82	Column Type Y	11	no											Likely to be immaterial based on previous research for Waka Kotahi
	Existing Luminaire to be retained													Likely to be immaterial based on previous research for Waka Kotahi
8.83	Type A	3	no											Likely to be immaterial based on previous research for Waka Kotahi
	Supply and install luminaire as per Specifications and Drawings													Likely to be immaterial based on previous research for Waka Kotahi
8.84	Type D - TRANSLEDER TL-B-2-V-068-06-SC-PL-8810LM 4000K LED LUMINAIRE	17	no											Likely to be immaterial based on previous research for Waka Kotahi
8.85	Type E - TRANSLEDER TL-B-2-V-098-06-SC-PL-12110LM 4000K LED LUMINAIRE	12	no											Likely to be immaterial based on previous research for Waka Kotahi
8.86	Type G - TRANSLEDER TL-B-3-V-151-09-SC-PL-17200LM 4000K LED LUMINAIRE	4	no											Likely to be immaterial based on previous research for Waka Kotahi
8.87	Type H - TRANSLEDER TL-B-3-V-126-09-SC-PL-15000LM 4000K LED LUMINAIRE	4	no											Likely to be immaterial based on previous research for Waka Kotahi
8.88	Type K - TRANSLEDER TL-B-2-V-068-06-SC-PL-8810LM 4000K LED LUMINAIRE	5	no											Likely to be immaterial based on previous research for Waka Kotahi
8.89	Type L - TRANSLEDER TL-B-2-V-098-06-SC-PL-12110LM 4000K LED LUMINAIRE	2	no											Likely to be immaterial based on previous research for Waka Kotahi
	TOTAL TRAFFIC SERVICES													
9.00	**SERVICES RELOCATIONS**													
9.01	Main Contractor to allow for trenching / earthworks (assume 30m, 1m deep trench) for the substation relocation and associated works . To include for attendance during works, traffic management.	1	LS											
9.02	Main Contractor to allow for 1m deep trench for Chorus cable relocation. Liaise with Chorus to execute. (item 9.03)	10	m									40	l	Assume 2m wide trench. Earthworks @ 2l diesel at per m3 moved
~~9.03~~	~~Relocate existing Chorus pit to new boundary position including trench.~~	–	~~LS~~											
	Electrical Cable													
9.04	Main contractor to allow for trenching (including back-fill) to electrical works, , take possession of free issued duct and install in trench.		Note											
9.04.1	Trench as per EA Networks drawings WU1058a Sheet 5 Detail Section A	12	m									24	l	Assume 1m wide, 1m deep trench. Earthworks @ 2l diesel at per m3 moved
9.04.2	Trench as per EA Networks drawings WU1058a Sheet 5 Detail Section B	115	m									460	l	Assume 1m wide, 1m deep trench. Earthworks @ 2l diesel at per m3 moved
9.04.3	Trench as per EA Networks drawings WU1058a Sheet 5 Detail Section C	18	m									72	l	Assume 1m wide, 1m deep trench. Earthworks @ 2l diesel at per m3 moved
9.04.4	Trench as per EA Networks drawings WU1058a Sheet 5 Detail Section D, E	60	m									240	l	Assume 1m wide, 1m deep trench. Earthworks @ 2l diesel at per m3 moved
9.04.5	Section F, G, H	50	m									640	l	diesel at per m3 moved
9.04.6	Trench as per EA Networks drawings WU1058a Sheet 5 Detail Section I	15	m									60	l	Assume 1m wide, 1m deep trench. Earthworks @ 2l diesel at per m3 moved
9.04.7	Trench as per EA Networks drawings WU1058a Sheet 5 Detail Section Typical trench Sections (SL and LV Cables)	53	m									2148	l	Assume 1m wide, 1m deep trench. Earthworks @ 2l diesel at per m3 moved
9.05	Scope not yet defined between EA Networks and design documentation (Provisional Sum)	1	PS											N/A
	Relocation of Services													
9.06	Relocation of unknown existing services not covered by Design Documentation (Gas, electrical and comms) - Provisional Sum	1	PS											N/A
	Protection of Services													
	Liaise with service providers to execute identification / stand over / direct service provision.		Note											
9.07	Service investigation - locate, protect, survey and record existing services	1	LS											N/A
9.08	Additional hydro excavation to confirm design including but not limited to record / survey physical location of existing service at every excavated pothole. By Engineer's instructions only - Provisional Sum	1	PS											N/A
9.09	with service providers, service protection and relocation including stand over, identification and direct costs of unknown services / service clashes - Provisional Sum	1	PS											N/A
	TOTAL SERVICE RELOCATIONS													
10.00	**LANDSCAPING**													
	Grassing, hydro seeding, planting, re vegetation, mulch													
10.01	Grass seeding	2,440	m2											N/A
	Fencing													
10.02	Supply and install 1.2m high galvanised chain-link fence on grade including 200 dia 20MPa concrete footing as drawing 3337200-CE-280 Rev 0	275	m			20.625	t							Estimate provided by AECOM quantity surveyor 19/07/21
	Asphalt Footpaths													
10.03	7 CCC tbilis AP20 r TNZ M 4 AP20	80	m3					120	t					1.5t/m3
10.04	NZTA M/10 DG7	740	m2					1110	t					1.5t/m3
10.05	Supply and install 150 x 25mm H4 timber edge batten with 50 x 50 x 600mm H4 timber pegs at 1m centres	250	m											N/A
10.06	Pram crossings	12	no											N/A
10.07	Supply and install tactile pavers	40	m2	6	t									Assuming 0.15m depth at 2.5t/m3
	Traffic Islands													
10.08	Supply and install Pedestrian Islands. Including; kerb, nosing and concrete infill (Drawings 3337200-CE-236)	550	m2											N/A
	TOTAL LANDSCAPING													
11.00	**TRAFFIC MANAGEMENT AND TEMPORARY WORKS**													
11.01	Prepare Contractor's Temporary Traffic Management Plan	1	LS											N/A
11.02	Implement and maintain the Contractor's temporary traffic management plan including temporary works and removal on completion	1	LS											N/A
	TOTAL TRAFFIC MANAGEMENT AND TEMPORARY WORKS													
12.00	**PRELIMINARY AND GENERAL**													
	Survey													N/A
12.01	Survey, set out & verify design	1	LS											N/A
	Fixed costs													N/A
12.02	Site establishment	1	LS											N/A
12.03	Site demobilisation / Clean up	1	LS											N/A
12.04	Contract Insurances	1	LS											N/A
12.05	Project Signboards	1	LS											N/A
12.06	Programme	1	LS											N/A
12.07	Specification	1	LS											N/A
12.08	Health and Safety	1	LS											N/A
12.09	As-built drawings, Operation, Maintenance manuals, Producer Statements and RAMM data	1	LS											N/A
12.10	KiwiRail compliance and liaison	1	LS											N/A

Walnut Avenue Improvements Construction Schedule

Source Schedule of quantities as provided in RFT, prepared by Beca, March 2020. Supplied by WK.

Schedule of Prices

Code	Description	Quantity	Qty	Material Concrete	Unit t r m3	Material Steel	Unit t r m3	Material Asphalt	Unit t r m3	Material Aggregates	Unit t r m3	Material Fuel	Unit l r kg	Assumptions/ Notes
12.11	Network Maintenance	1	LS											N/A
12.12	Reporting	1	LS											N/A
12.13	Allow for any items not included above that the contractor deems necessary to complete the works	1	LS											N/A
	TOTAL PRELIMINARY AND GENERAL													N/A
														N/A
13.00	**EXTRAORDINARY CONSTRUCTION COSTS**													N/A
	KiwiRail Works													N/A
13.01	Cut yard track rail and remove to assigned rail lay down area including all items down to sub-base level; all works in accordance with drawing 3337200-CE-015, specifications and KiwiRail requirements	1	LS											N/A
13.02	Demolition of existing KiwiRail Depot Building including all slabs and foundations, termination of services and disposal off site - approximately 245m2	1	LS											N/A
	New KiwiRail Depot Building													N/A
13.03	New KiwiRail Depot Building - 30m by 8.4m in accordance with Drawing CE-291 and scope of works as per Schedule 5	1	PS											N/A
13.04	1.8m high galvanised chainlink fence including appropriate stays and posts founded in concrete footings	208	m			15.6	t							Estimate provided by AECOM quantity surveyor 19/07/21
13.05	Vehicle gates - up lift existing KiwiRail depot compound gates, store and reinstall including mounting to new gate posts (Drawing CE-291)	2	no											N/A
13.06	Pedestrian gate - supply and install new 1.2m wide chain link gate	1	no											N/A
	Temporary Depot Works													
13.07	[illegible] room in accordance with Drawing CE-291 and scope of temporary works as per Schedule 5 until receipt of the Code of Compliance for the new permanent depot including relocation from old depot into the temporary depot and from temporary depot to the new permanent depot and including provision (and later disconnection) of all necessary temporary services such as power, waste water, water, data, etc. until receipt of Code of Compliance for the new permanent depot.	1	LS											N/A
	TOTAL EXTRAORDINARY CONSTRUCTION COSTS													
14.00	**DAYWORKS**													
	All items in this section are PROVISIONAL		Note											
	Labour													
14.01	Skilled (e.g. Labourer or Concrete worker)	200	hr											N/A
14.02	Drain layer	200	hr											N/A
14.03	Leading hand	200	hr											N/A
14.04	Working foreman	200	hr											N/A
14.05	Traffic management crew	200	hr											N/A
14.06	Mobile closure	20	day											N/A
14.07	Semi-static closure	20	day											N/A
14.08	Lane closure	20	day											N/A
14.09	Shoulder closure	20	day											N/A
14.10	VMS	20	day											N/A
	Plant (Provisional)													
14.12	latest edition of the Civil Contractors New Zealand Plant Hire Rates (The Blue Book) and calculate the total amount into the tender amount (e.g. $10 000 x 90% - $9 000 total)	20 000	%											N/A
	Note that 'Blue Book' rates are inclusive of the cost of fuel, maintenance, repairs, machine operator, on-site Overheads and Off-site Overheads and Profit.		Note											N/A
	Working Day Rate													
14.13	Rate per working day (PROVISIONAL)	20	day											N/A
	Valuation of Variations from Net Costs													
14.14	Allow the Provisional Sum for Variations to be valued from Net Costs	1	PS											N/A
14.15	% for On-site Overheads applicable to Variations to be valued from New Costs (Provisional Item)	200,000	%											N/A
14.16	% for Off-site Overheads applicable to Variations to be valued from New Costs (Provisional Item)	200 000	%											N/A
	TOTAL DAYWORKS													
		Total		179	t	67	t	6,587	t	10,531	t	5,607	l	