

# + Environmental Product Declaration

For ready-mixed concrete



In accordance with ISO 14025 and EN 15804+A1 for:

## FIRTH CERTIFIED READY-MIXED CONCRETE

Programme:	EPD Australasia, <a href="http://www.epd-australasia.com">www.epd-australasia.com</a>
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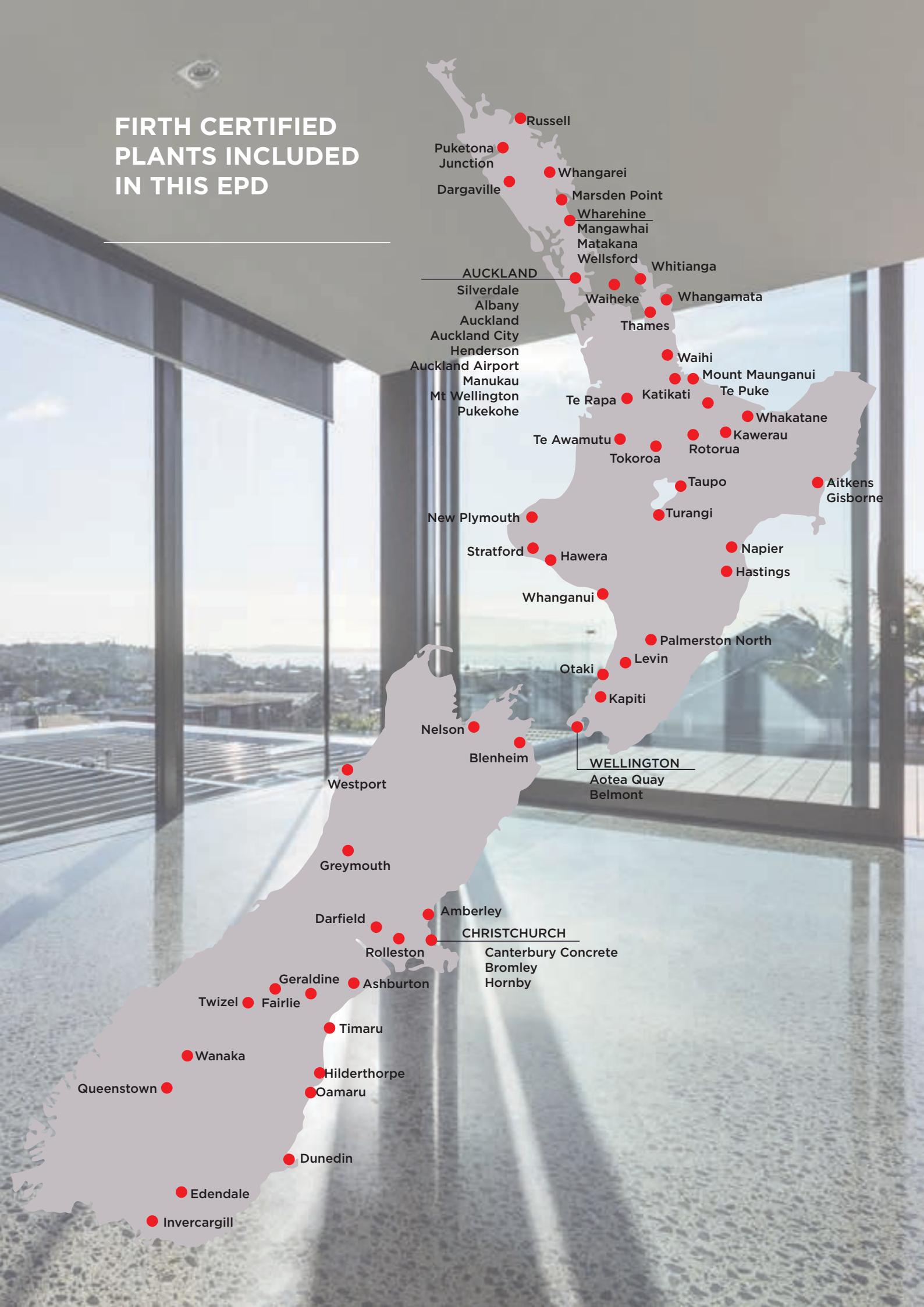
Firth Industries Ltd (Firth) is New Zealand's largest manufacturer of concrete and concrete masonry products. The history of Firth is part of the history of New Zealand. We've been developing, manufacturing and delivering concrete and concrete products to New Zealanders for almost a century. Firth, has over 70 manufacturing sites across the geography of New Zealand spanning from the Bay of Islands down to Invercargill.

Our products are the building blocks of the built environment and iconic buildings across the New Zealand landscape and contribute to the long-term infrastructure of the communities we reside in. Firth plays an important role in supporting growth in 70 regions throughout New Zealand, buying from local suppliers and providing employment to approximately 650 people.

All of Firth Industries' products are formulated to meet strict NZ standards. Our engineers ensure Firth customers consistently receive delivery of the highest quality product that they can rely on. Our concrete products are tried and trusted so customers can be sure what we make, makes the grade. Always.



## FIRTH CERTIFIED PLANTS INCLUDED IN THIS EPD



# WHAT IS AN EPD?

AN ENVIRONMENTAL PRODUCT DECLARATION, OR EPD, IS A STANDARDISED AND VERIFIED WAY OF QUANTIFYING THE ENVIRONMENTAL IMPACTS OF A PRODUCT BASED ON A CONSISTENT SET OF RULES KNOWN AS A PCR (PRODUCT CATEGORY RULES).

EPDs report the measured lifecycle environmental impact of a product so designers and builders can make more informed decisions.

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

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<b>CEN standard EN 15804+A1 served as the core PCR</b>			
PCR:	PCR 2012:01 Construction Products and Construction Services, Version 2.32, 2020-07-01		
PCR review was conducted by:	The Technical Committee of the International EPD® System		
Chair:	Massimo Marino. Contact via <a href="mailto:info@environdec.com">info@environdec.com</a>		
Independent verification of the declaration and data, according to ISO 14025:	<input type="checkbox"/> EPD process certification (Internal) <input checked="" type="checkbox"/> EPD verification (External )		
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	Approved by: EPD Australasia Procedure for follow-up of data during EPD validity involved third-party verifier <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
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# FIRTH'S SUSTAINABILITY COMMITMENT

AS NZ'S LARGEST CONCRETE COMPANY AND A LEADER IN CONCRETE DESIGN AND INNOVATION, FIRTH ARE COMMITTED TO UNDERSTANDING AND MITIGATING ANY ADVERSE IMPACT OUR OPERATION HAS ON THE ENVIRONMENT AND INTEGRATING THE CORE PRINCIPLES OF SUSTAINABILITY THROUGHOUT OUR OPERATION.

Implementing sustainable practices throughout the manufacturing process is only the beginning of the contribution Firth makes to long-term sustainable building. Firth recognises that the integration of sustainability goals into business operations is key to the longevity of the concrete industry and its impact on the ecological, social and economic environment. Firth's sustainability framework encompasses pillars centred on carbon reduction, water conservation, the circular economy, supply chain efficiency and social sustainability.

REDUCE / RECYCLE / DESIGN / CONNECT

Firth are in a very strong position to assist the construction industry in economically reducing its carbon footprint and achieving its sustainability goals.

As part of these initiatives, Firth Industries has launched the EC<sup>3</sup> - Embodied Carbon Concrete Calculator which has been developed with thinkstep-anz and verified by start2see. The EC<sup>3</sup> calculator allows Firth to calculate the carbon footprint of any Firth concrete mix (cradle to gate).

An EPD is a declaration of past performance of common mixes. The EC<sup>3</sup> calculator allows Firth Engineers to meet the challenge of designing concrete mixes based upon customers' demands of strength, durability, and lower carbon footprint. We invite you to call to discuss what is achievable in your area.

If you wish to lower the carbon footprint of your concrete mixes, follow the process below:

- 1 Determine the concrete strengths applicable to your project.
- 2 Determine if there are any special durability requirements.
- 3 Determine the location of the project.
- 4 Talk to Firth about what is available in your area.
- 5 Specify the Strength and Embodied Carbon (EC) rating your wish to achieve, plus any special requirements.



Firth have developed an embodied carbon (EC) rating for various strength grades. The larger the EC number the lower the carbon footprint relative to the baseline benchmark. By specifying an EC rating after discussing

with Firth, we will ensure that the cradle to gate carbon footprint will be less than summarised in the following table. The global warming potential is assessed using the independently verified EC<sup>3</sup> calculator.

#### Cradle to Gate Global Warming Potential kg CO<sub>2</sub>eq per m<sup>3</sup>

EC rating	Strength Grade, MPa						
	20	25	30	35	40	45	50
EC10	256	282	312	351	397	446	495
EC20	227	250	278	312	353	396	440
EC30	199	219	243	273	309	347	385
EC40	170	188	208	234	265	297	330
EC50	142	157	174	195	220	248	275

#### Table colour code

	Typically available at all Firth Plants supplied by NZ manufactured cement <sup>(1)</sup>
	Available at selected plants and will require special mix designs
	Limited availability at supply locations currently, but a target for future developments.

(1) Check with Firth as some South Island plants may not have NZ manufactured cement available to them.

(2) Applicable for standard concrete only. (Not applicable for blockfill, self compacting, tremie mixes)



# PRODUCT INFORMATION

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## Declared Unit

The declared unit for the EPD is 1 m<sup>3</sup> of standard grades of ready-mixed concrete at 17.5 MPa, 20 MPa, 25 MPa, 30 MPa, 35 MPa, 40 MPa, 45 MPa and 50 MPa at a batching plant gate.

## Product(s) covered by this EPD

Firth Certified Concrete® is manufactured at a regionally located batching plant via a truck mix or central mix system that conforms to a precise engineered mix design and is delivered to a customer site in a freshly mixed, plastic or unhardened state. Certified Concrete® is made to specific requirements, often containing additives for colour, waterproofing, hardening or mixes that allow pumping to sites with difficult access.

Firth Certified Concrete® is made in accordance with NZS 3104:2003 to ensure that the production and testing regimes achieve the target strengths for concretes from 17.5 to 50 MPa.

This Environmental Product Declaration (EPD) covers the most common grades of Certified Concrete® produced by Firth

around New Zealand. All environmental data in this EPD is reported as an average of each of Firth's over 70 sites around New Zealand, weighted by FY19 sales and includes a national, North Island and South Island average.

Firth can produce plant-specific and mix-specific environmental profiles on request using the EC<sup>3</sup> calculator. Please contact [info@firth.co.nz](mailto:info@firth.co.nz) to receive a specific environmental profile for your concrete.

## Product Components

Concrete mixes covered by this EPD are manufactured with a combination of cement, coarse and fine aggregate, supplementary cementitious materials, secondary materials, recycled or fresh water and admixtures that are primarily sourced locally.

None of the products in this EPD contain any materials included on the Candidate List of substances of very high concern under the European Reach Regulation (EC 1907/2006) at a concentration greater than 0.1% weight/weight. Refer to Firth's Declare labels for further certification on hazardous substances.

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## Content Declaration

**TABLE 1:** Content declaration

Product	Concrete Density (kg/m <sup>3</sup> )	Cement	Coarse Aggregates	Fine Aggregates	Water (recycled or fresh)	Admixtures	Supplementary Cementitious Materials (SCM)
Firth Certified Concrete® 17.5 - 50MPa	2150-2500	10-25%	25-55%	30-60%	5-15%	0.05-1.0%	0-10%

Percentages are by mass



## Durability of Concrete

Concrete offers optimum whole-life performance. Concrete as a building material provides exceptional durability and long life in any structure. This reduces the total cost of ownership as well as the environmental impact associated with more frequent rehabilitation or reconstruction.

## Application

The ready-mix concrete covered by this EPD can be used in structures and building elements that extend through the construction industry, roading & infrastructure, industrial and commercial projects to residential builds.

## Industry Classification

**TABLE 2:** Industry classification

Category	Classification	Code	Product
Articles of concrete, cement and plaster	UN CPC v2.1	37510	Non-refractory mortars and concretes
Cement, lime, plaster and concrete product manufacturing	ANZSIC 2006	203300	Ready-mixed concrete



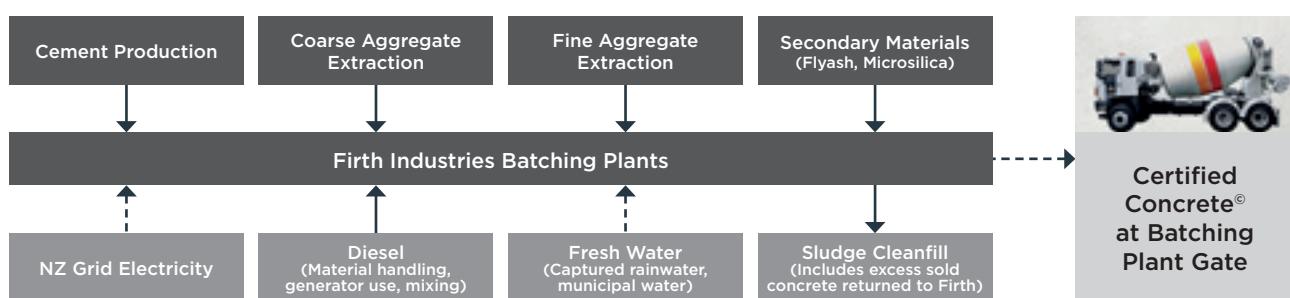
# SYSTEM BOUNDARIES

As shown in the table below, this EPD is of the ‘cradle-to-gate’ type. This EPD includes the environmental impacts associated with raw materials extraction and processing of inputs (cement, supplementary cementitious materials, aggregates, additives, and water), transport to, between and within the manufacturing site, and the manufacturing of average product up to the exit gate of the manufacturing site.

**TABLE 3:** Modules included in the scope of the EPD

Product stage			Construction process stage		Use stage							End of life stage			Benefits and loads beyond the system boundary	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

## Firth Ready-mixed Concrete Production (A1-A3)



This table reflects cradle to gate of concrete manufacture.

## Raw Material (A1) and Transportation (A2)

Cement is primarily sourced from Golden Bay Cement's manufacturing plant in Portland, New Zealand. The GBC cement plant quarries rock and limestone from the Portland and Wilsonville quarries. For more information on this process, please see Golden Bay Cement's EPD (EPD S-P-01170). Cement is transported via a distribution network to concrete batching plants.

Fine and coarse aggregate is sourced from a local quarry where it goes through an excavation, screening and potentially a crushing process and is transported via a distribution network to the concrete batching plants to be fed into the manufacturing process.

Additional components, including secondary materials (fly ash and silica fume), water and admixtures are locally sourced where possible.



## Manufacture (A3)

Firth Certified Concrete® is manufactured using a controlled PLC system to a specific mix design based on strength and/or design properties. The combination of cement, supplementary cementitious materials, aggregates, water and admixtures are mixed via truck bowl rotation or central mixer prior to dispatch to the customer. Most Firth plants mix concrete by truck, the exceptions being plants at Albany, Henderson, Manukau, Te Rapa, Mt Maunganui, Belmont and Hornby where central mixers are used.

Cement (and flyash) are delivered to the site in sealed tanker trucks and then pneumatically transferred into the silo using compressors mounted on the delivery trucks.

Aggregates for making concrete are brought to the site by truck and trailer and stored in aggregate storage bins. The material is then transferred to the weigh hopper of the batching plant. Aggregate is dropped into the feed hopper within the batching plant, and then into the concrete truck or central mixer. Transfer of material is plant specific but is typically a combination of conveyors and loader.

The energy use at a batching plant is primarily electricity supplemented with diesel for loaders and truck mixing of concrete.



# PRODUCT LIFECYCLE ASSESSMENT

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## LIFE CYCLE INVENTORY (LCI) DATA AND ASSUMPTIONS

Primary data were used for all manufacturing operations up to the factory gate, including upstream data for the production of cement by Firth's sister company Golden Bay Cement. For operations at Firth's batching plants, data was sourced for FY2019 (1 July 2018 to 30 June 2019).

Secondary data from the GaBi Life Cycle Inventory Database 2020 (Sphera 2020) was used for input materials sourced from other suppliers such as the production of crushed rock, sand and combusted fuels. Most of these datasets have a reference year between 2014 and 2019 and all fall within the 10 year limit allowable for generic data under EN 15804.

### Material Usage

Data for cement usage comes from the Golden Bay Cement EPD (Golden Bay Cement 2019) and, where appropriate, the Holcim EPD (Holcim 2019). Other data on raw material use comes from the GaBi Life Cycle Inventory Database, with production processes coming from international sources where NZ LCI data was not available.

### Electricity

- The emission factor used was for medium-voltage NZ electricity at an industrial consumer. Four sites did not have electricity consumption data, and an average was applied.
- Diesel-powered generators were used instead of grid electricity at 7 sites. We have used average electricity use per grade from other sites to split diesel use of generators from other diesel consumption.

### Diesel Consumption

- Diesel is used in loaders and other production equipment at the batching plants. 11 sites did not have data, and an average was applied. For the sites that used generators, diesel usage was subtracted from this figure.
- Electric concrete mixers are used in 9 plants, with the remainder mixing the batched concrete in trucks on-site. For electric mixers, this is already included in the electricity data, but for other plants it has been modelled with additional diesel consumption.

### Solid Waste

- Waste data has been modelled as landfill, with data being taken from an average of the Auckland plants and applied across New Zealand due to a lack of consistent data across New Zealand. It includes all unneeded concrete sold and returned by the end consumer, as well as sediment from washing down plant, equipment and trucks.

### Water

- Firth use a combination of captured rainwater that falls on the production hardstand areas and metered municipal/bore water. Metered water data was available for 29 sites, with average water usage per cubic metre being applied to the remaining sites. Captured rainwater is used at most sites, but is not measured. We have estimated both total diverted rainfall and rainwater used in the production process itself, and our estimate constitutes approximately 80-90% of the total freshwater use.
- 19 sites have trade waste consents (liquid wastewater discharge), with an average factor applied for 13 of these.

### Transport

- Transport data was calculated per-site for a combination of coastal shipping of cement, cement shipment by train where appropriate, and transport by truck for aggregates, cement and sand.
- Transport distances were not available for landfill waste, so a standardised value of 30km was used.



## Cut off criteria

Environmental impacts relating to personnel, infrastructure, and production equipment not directly consumed in the process are excluded from the system boundary as per the PCR (EPD International 2020, section 7.5.4). All other reported data were incorporated and modelled using the best available life cycle inventory data.

## Allocation

Impacts are allocated to all aggregates (including manufactured sand) on a mass basis. Fly ash from the Huntly Power Station has been treated as a secondary material and allocated zero production impact as Firth pay only for transportation of this material. Silica fume is a valuable by-product of ferro silicon production and a proportion of the environmental impacts of manufacturing is allocated to silica fume based on the price ratio of the products. Silica fume is not considered a secondary material.

## Assessment Indicators

The results tables describe the different environmental indicators for each product per declared unit, for each declared module. The first section of each table contains the environmental impact indicators, describing the potential environmental impacts of the product as shown in pages 18-33. The second section shows the resource indicators, describing the use of renewable and non-renewable material resources, renewable and non-renewable primary energy and water, as shown in pages 35-50. The final section of each table displays the waste and other outputs, as shown in pages 52-67.

For Firth ready-mixed concrete, the following indicators are not relevant, hence they result in zero values:

- Components for re-use (CRU)
- Materials for energy recovery (MER)
- Exported electrical energy (EEE)
- Exported thermal energy (EET)



# RESULTS OF ASSESSMENT

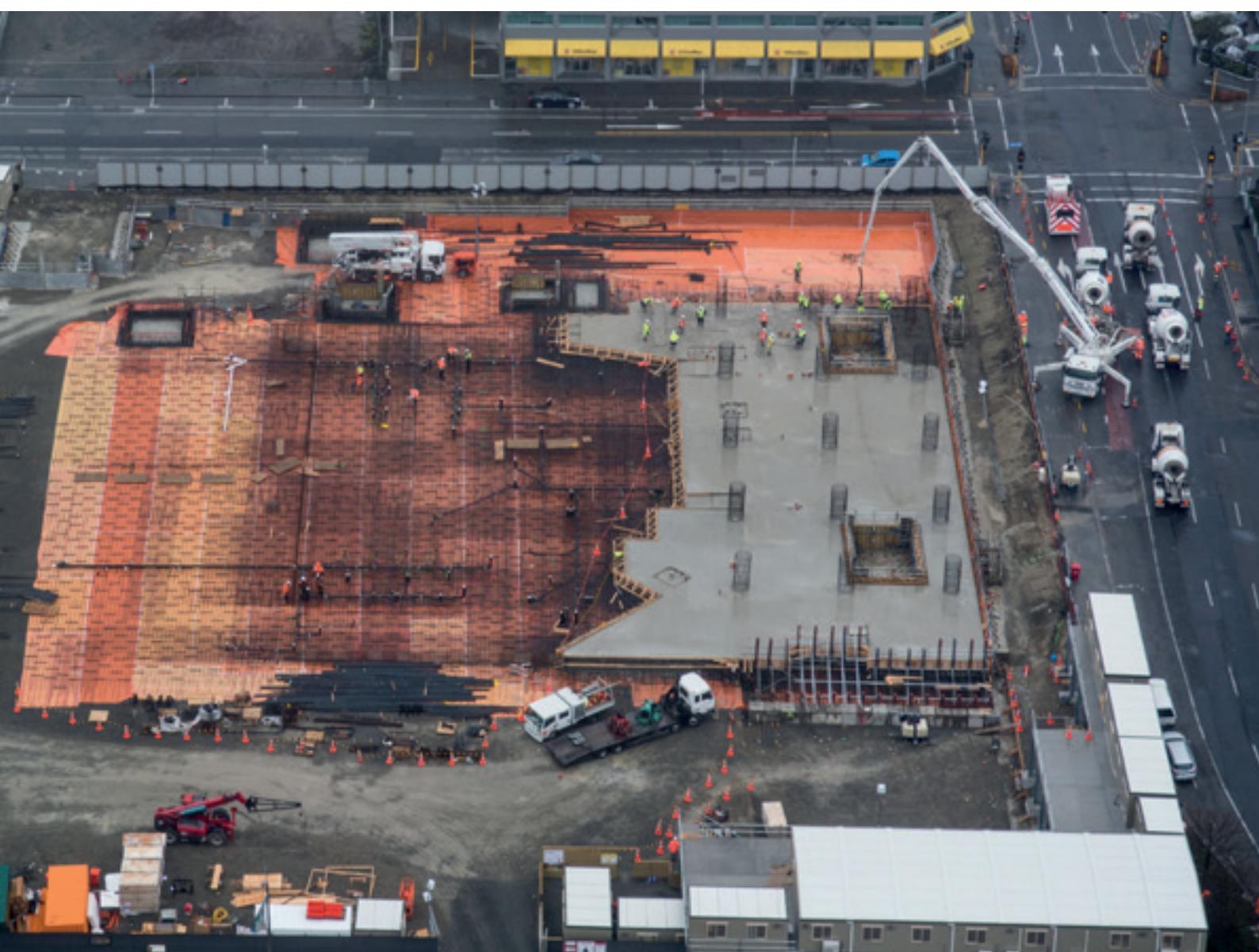
The following pages outline the results for potential environmental impact, use of resources and waste production of 1m<sup>3</sup> of standard ready-mixed concrete at various strengths for each of Firth's batching plants across the North and South Island.

## Explanation of Averages

The weighted averages for each grade of concrete declared in the EPD have been calculated based on the total volume of each grade produced at the applicable batching plants during FY2019. Specific emissions for each mix design have been calculated per-plant, and together these form the weighted average.

## Variability in results

The results are averages per site that may cover multiple mix designs. The variation between these mix designs is not provided at site level, but is expected to be of similar magnitude or lower than the variation between the sites, which is presented on pages 15-16.



# VARIABILITY OF RESULTS

North Island				South Island - NZ Cement				South Island - Imported Cement			
Strength	Average	Min	Max	Strength	Average	Min	Max	Strength	Average	Min	Max
<b>Global warming potential (kg CO<sub>2</sub> eq.)</b>											
17.5 MPa	208	-16%	17%	17.5 MPa	199	-7%	7%	17.5 MPa	227	-6%	5%
20 MPa	223	-14%	13%	20 MPa	209	-8%	20%	20 MPa	237	-6%	19%
25 MPa	248	-18%	11%	25 MPa	230	-7%	14%	25 MPa	262	-6%	13%
30 MPa	263	-16%	11%	30 MPa	250	-8%	16%	30 MPa	288	-9%	14%
35 MPa	283	-14%	14%	35 MPa	264	-4%	39%	35 MPa	310	-6%	29%
40 MPa	307	-14%	14%	40 MPa	286	-4%	28%	40 MPa	342	-4%	26%
45 MPa	345	-16%	14%	45 MPa	319	-6%	19%	45 MPa	366	-4%	21%
50 MPa	365	-33%	16%	50 MPa	354	-1%	16%	50 MPa	412	-2%	15%
<b>Ozone depletion potential (kg CFC 11 eq.)</b>											
17.5 MPa	1.61E-12	-17%	15%	17.5 MPa	1.54E-12	-15%	8%	17.5 MPa	3.98E-06	-12%	6%
20 MPa	1.74E-12	-17%	7%	20 MPa	1.62E-12	-9%	7%	20 MPa	4.16E-06	-4%	11%
25 MPa	1.91E-12	-17%	7%	25 MPa	1.73E-12	-6%	6%	25 MPa	4.64E-06	-5%	9%
30 MPa	2.03E-12	-17%	8%	30 MPa	1.90E-12	-11%	5%	30 MPa	5.18E-06	-10%	11%
35 MPa	2.17E-12	-14%	10%	35 MPa	2.04E-12	-8%	13%	35 MPa	5.69E-06	-6%	18%
40 MPa	2.34E-12	-12%	10%	40 MPa	2.19E-12	-5%	21%	40 MPa	6.3E-06	-5%	28%
45 MPa	2.56E-12	-18%	13%	45 MPa	2.39E-12	-6%	15%	45 MPa	6.77E-06	-4%	23%
50 MPa	2.67E-12	-28%	16%	50 MPa	2.62E-12	-6%	10%	50 MPa	7.44E-06	-2%	15%
<b>Acidification potential (kg SO<sub>2</sub> eq.)</b>											
17.5 MPa	0.309	-15%	39%	17.5 MPa	0.322	-11%	61%	17.5 MPa	0.690	-6%	17%
20 MPa	0.321	-11%	41%	20 MPa	0.338	-12%	78%	20 MPa	0.721	-7%	36%
25 MPa	0.349	-15%	40%	25 MPa	0.376	-14%	64%	25 MPa	0.801	-6%	29%
30 MPa	0.366	-13%	38%	30 MPa	0.394	-8%	67%	30 MPa	0.877	-9%	28%
35 MPa	0.393	-12%	38%	35 MPa	0.402	-5%	78%	35 MPa	0.939	-6%	35%
40 MPa	0.426	-13%	35%	40 MPa	0.434	-6%	70%	40 MPa	1.04	-5%	25%
45 MPa	0.485	-15%	25%	45 MPa	0.493	-10%	59%	45 MPa	1.11	-5%	23%
50 MPa	0.521	-32%	30%	50 MPa	0.537	-4%	37%	50 MPa	1.26	-3%	17%
<b>Eutrophication potential (kg PO<sub>4</sub><sup>3-</sup> eq.)</b>											
17.5 MPa	0.0725	-14%	39%	17.5 MPa	0.0757	-11%	65%	17.5 MPa	0.267	-5%	6%
20 MPa	0.0755	-10%	42%	20 MPa	0.0796	-13%	80%	20 MPa	0.279	-6%	25%
25 MPa	0.0824	-15%	37%	25 MPa	0.0887	-14%	66%	25 MPa	0.310	-6%	18%
30 MPa	0.0867	-13%	38%	30 MPa	0.0934	-8%	68%	30 MPa	0.343	-10%	19%
35 MPa	0.0933	-11%	38%	35 MPa	0.0957	-6%	73%	35 MPa	0.371	-6%	23%
40 MPa	0.102	-14%	33%	40 MPa	0.104	-7%	72%	40 MPa	0.412	-4%	26%
45 MPa	0.117	-17%	23%	45 MPa	0.117	-9%	62%	45 MPa	0.442	-4%	22%
50 MPa	0.120	-31%	24%	50 MPa	0.127	-3%	27%	50 MPa	0.488	-1%	13%

North Island				South Island - NZ Cement				South Island - Imported Cement			
Strength	Average	Min	Max	Strength	Average	Min	Max	Strength	Average	Min	Max
<b>Formation potential of tropospheric ozone* (kg C<sub>2</sub>H<sub>2</sub> eq.)</b>											
17.5 MPa	0.00683	-451%	301%	17.5 MPa	0.0106	-196%	161%	17.5 MPa	0.0250	-61%	112%
20 MPa	0.0103	-307%	162%	20 MPa	0.0114	-184%	146%	20 MPa	0.0253	-58%	127%
25 MPa	0.0129	-242%	141%	25 MPa	0.00998	-180%	187%	25 MPa	0.0278	-46%	121%
30 MPa	0.0142	-218%	136%	30 MPa	0.0169	-141%	72%	30 MPa	0.0349	-46%	90%
35 MPa	0.0169	-179%	85%	35 MPa	0.0255	-125%	22%	35 MPa	0.0455	-50%	16%
40 MPa	0.0197	-149%	79%	40 MPa	0.0264	-122%	30%	40 MPa	0.0486	-43%	59%
45 MPa	0.0132	-142%	204%	45 MPa	0.0299	-87%	46%	45 MPa	0.0535	-16%	54%
50 MPa	0.0256	-168%	98%	50 MPa	0.037	-103%	19%	50 MPa	0.0624	-35%	6%
<b>Abiotic depletion potential (elements) (kg Sb eq.)</b>											
17.5 MPa	6.49E-06	-15%	19%	17.5 MPa	6.74E-06	-14%	19%	17.5 MPa	9.96E-05	-11%	5%
20 MPa	6.72E-06	-17%	13%	20 MPa	6.95E-06	-17%	16%	20 MPa	1.04E-04	-5%	10%
25 MPa	7.03E-06	-18%	13%	25 MPa	6.99E-06	-13%	19%	25 MPa	1.15E-04	-3%	9%
30 MPa	7.40E-06	-18%	13%	30 MPa	7.56E-06	-15%	13%	30 MPa	1.28E-04	-9%	10%
35 MPa	7.77E-06	-18%	13%	35 MPa	7.91E-06	-19%	28%	35 MPa	1.40E-04	-6%	19%
40 MPa	8.00E-06	-13%	17%	40 MPa	8.27E-06	-14%	13%	40 MPa	1.55E-04	-5%	26%
45 MPa	8.43E-06	-19%	12%	45 MPa	8.76E-06	-17%	14%	45 MPa	1.66E-04	-4%	22%
50 MPa	9.30E-06	-28%	45%	50 MPa	9.35E-06	-13%	16%	50 MPa	1.83E-04	-2%	14%
<b>Abiotic depletion potential (fossil fuels) (MJ, NCV)</b>											
17.5 MPa	1,080	-16%	31%	17.5 MPa	1,090	-13%	28%	17.5 MPa	896	-12%	25%
20 MPa	1,130	-14%	32%	20 MPa	1,140	-14%	45%	20 MPa	924	-13%	58%
25 MPa	1,220	-17%	28%	25 MPa	1,250	-14%	36%	25 MPa	1,010	-13%	49%
30 MPa	1,280	-16%	29%	30 MPa	1,320	-11%	38%	30 MPa	1,070	-10%	49%
35 MPa	1,370	-15%	30%	35 MPa	1,340	-4%	60%	35 MPa	1,080	-8%	56%
40 MPa	1,470	-11%	28%	40 MPa	1,450	-5%	45%	40 MPa	1,190	-7%	49%
45 MPa	1,680	-15%	18%	45 MPa	1,610	-9%	40%	45 MPa	1,260	-6%	33%
50 MPa	1,750	-29%	18%	50 MPa	1,750	-2%	30%	50 MPa	1,450	-2%	20%

\* Variability is high for the indicator “formation potential of tropospheric ozone” as there are both negative and positive values in the results. The negative values occur because nitrogen monoxide (NO) has a negative characterisation factor within EN 15804:2012+A1:2013. These negative values should not be interpreted as the product reducing tropospheric ozone (which causes summer smog).

**+ Potential  
Environmental  
Impact**

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# POTENTIAL ENVIRONMENTAL IMPACT

**17.5MPa STANDARD**

PER 1m<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>North Island Average</b>	<b>208</b>	<b>1.61E-12</b>	<b>0.309</b>	<b>0.0725</b>	<b>0.00683</b>	<b>6.49E-06</b>	<b>1,080</b>
Auckland Airport	231	1.76E-12	0.397	0.0944	0.0214	7.71E-06	1,270
Auckland Albany	213	1.69E-12	0.312	0.0728	0.00190	7.37E-06	1,130
Auckland City	198	1.61E-12	0.284	0.0661	0.00746	7.01E-06	1,030
Auckland Henderson	204	1.65E-12	0.290	0.0674	0.00638	7.16E-06	1,060
Auckland Mt Wellington	203	1.65E-12	0.281	0.0655	0.00938	7.08E-06	1,030
Auckland Manukau	206	1.68E-12	0.286	0.0665	0.0119	7.21E-06	1,040
Auckland Pukekohe	219	1.76E-12	0.312	0.0728	0.0109	7.36E-06	1,120
Auckland Silverdale	208	1.67E-12	0.305	0.0712	0.00805	7.22E-06	1,090
Dargaville	212	1.65E-12	0.316	0.0738	2.34E-04	6.87E-06	1,130
Gisborne	214	1.65E-12	0.317	0.0738	0.0237	6.01E-06	1,030
Hamilton	205	1.64E-12	0.282	0.0652	0.0134	6.65E-06	1,000
Hastings	179	1.41E-12	0.264	0.0620	0.0163	5.62E-06	902
Hawera	225	1.61E-12	0.367	0.0871	-9.30E-04	6.10E-06	1,230
Kapiti	188	1.44E-12	0.296	0.0696	0.0150	5.69E-06	981
Katikati	213	1.61E-12	0.329	0.0773	-0.00479	6.59E-06	1,160
Kawerau	220	1.68E-12	0.317	0.0746	0.0120	6.44E-06	1,100
Levin	197	1.46E-12	0.334	0.0788	0.00977	5.98E-06	1,090
Marsden Point	208	1.66E-12	0.297	0.0695	0.00865	6.84E-06	1,060
Mt Maunganui	209	1.62E-12	0.300	0.0706	0.00302	6.45E-06	1,080
Napier	174	1.34E-12	0.270	0.0635	0.0108	5.53E-06	918
New Plymouth	225	1.58E-12	0.372	0.0888	-0.0120	6.06E-06	1,280
Otaki	200	1.47E-12	0.343	0.0819	0.0274	5.67E-06	1,050
Paihia	202	1.66E-12	0.277	0.0645	0.0125	6.94E-06	1,010
Palmerston North	197	1.49E-12	0.314	0.0734	0.0133	5.93E-06	1,030
Rotorua	226	1.71E-12	0.336	0.0790	9.25E-04	6.77E-06	1,180
Russell	206	1.65E-12	0.307	0.0715	0.00971	7.12E-06	1,080
Stratford	209	1.49E-12	0.355	0.0842	-0.00578	5.93E-06	1,190
Taupo	229	1.70E-12	0.364	0.0853	-0.00139	6.81E-06	1,240
Te Awamutu	202	1.59E-12	0.293	0.0681	0.0122	6.37E-06	1,020
Te Puke	243	1.85E-12	0.348	0.0827	0.00589	6.83E-06	1,230
Thames	207	1.69E-12	0.288	0.0664	0.0127	7.07E-06	1,030
Tokoroa	218	1.70E-12	0.318	0.0745	0.0104	6.72E-06	1,110
Turangi	230	1.54E-12	0.428	0.101	-0.0240	6.33E-06	1,410
Waiheke Readymix	199	1.59E-12	0.299	0.0695	0.00360	7.01E-06	1,070
Waihi	204	1.61E-12	0.309	0.0718	0.00492	7.03E-06	1,090
Wanganui	196	1.42E-12	0.337	0.0789	-0.00350	5.84E-06	1,120
Wellington Aotea Quay	201	1.54E-12	0.300	0.0714	0.0173	5.68E-06	1,010
Wellington Belmont	200	1.55E-12	0.288	0.0683	0.0216	5.68E-06	972
Whakatane	215	1.67E-12	0.301	0.0708	0.0163	6.11E-06	1,040
Whangamata	223	1.73E-12	0.346	0.0809	0.00407	7.30E-06	1,200
Whangarei	201	1.64E-12	0.271	0.0632	0.0115	6.77E-06	994
Wharehine Mangawhai	195	1.59E-12	0.278	0.0643	0.00781	6.91E-06	1,010
Wharehine Matakana	198	1.63E-12	0.274	0.0629	0.0145	6.94E-06	982
Wharehine Wellsford	196	1.62E-12	0.271	0.0624	0.0111	6.94E-06	986
Whitianga	210	1.60E-12	0.344	0.0797	-0.00537	7.01E-06	1,190

# POTENTIAL ENVIRONMENTAL IMPACT

**17.5MPa STANDARD**

PER 1m<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>							
<b>South Island Average</b>	<b>199</b>	<b>1.54E-12</b>	<b>0.322</b>	<b>0.0757</b>	<b>0.0106</b>	<b>6.74E-06</b>	<b>1,090</b>
Amberley	206	1.65E-12	0.347	0.0807	0.00683	8.05E-06	1,190
Ashburton	189	1.45E-12	0.302	0.0710	0.0166	5.77E-06	992
Blenheim	188	1.48E-12	0.288	0.0671	0.0215	6.01E-06	951
Chch Bromley	194	1.61E-12	0.313	0.0727	0.0130	7.86E-06	1,090
Chch Canterbury Concrete	201	1.67E-12	0.316	0.0736	0.0189	7.94E-06	1,090
Chch Hornby	191	1.62E-12	0.293	0.0677	0.0184	7.87E-06	1,030
Darfield	195	1.62E-12	0.312	0.0724	0.0132	7.83E-06	1,090
Dunedin	209	1.49E-12	0.368	0.0875	-0.0102	6.31E-06	1,250
Edendale	207	1.31E-12	0.520	0.125	0.0277	6.50E-06	1,400
Fairlie	209	1.48E-12	0.367	0.0870	-0.00657	6.15E-06	1,220
Geraldine	203	1.49E-12	0.339	0.0803	0.00447	6.25E-06	1,130
Greymouth	189	1.46E-12	0.308	0.0712	0.0198	5.89E-06	983
Hilderthorpe	201	1.53E-12	0.328	0.0773	0.0188	6.29E-06	1,070
Invercargill	203	1.45E-12	0.348	0.0829	-0.00821	5.96E-06	1,180
Nelson	205	1.56E-12	0.312	0.0740	0.0130	6.06E-06	1,060
Oamaru	203	1.52E-12	0.330	0.0784	0.00984	6.31E-06	1,110
Queenstown	208	1.47E-12	0.374	0.0873	-0.00579	5.99E-06	1,220
Rolleston	186	1.44E-12	0.293	0.0693	0.0211	5.81E-06	960
Timaru	205	1.49E-12	0.355	0.0846	0.00530	6.10E-06	1,160
Twizel	195	1.47E-12	0.324	0.0757	0.0168	6.04E-06	1,040
Wanaka	213	1.50E-12	0.384	0.0900	-0.00417	6.03E-06	1,240
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>							
<b>South Island Average</b>	<b>227</b>	<b>3.98E-06</b>	<b>0.690</b>	<b>0.267</b>	<b>0.0250</b>	<b>9.96E-05</b>	<b>896</b>
Amberley	236	3.91E-06	0.712	0.269	0.0178	9.97E-05	1,030
Ashburton	215	3.88E-06	0.651	0.254	0.0327	9.66E-05	786
Blenheim	218	3.92E-06	0.662	0.258	0.0333	9.80E-05	805
Darfield	224	3.80E-06	0.666	0.255	0.0248	9.70E-05	925
Dunedin	231	3.91E-06	0.705	0.269	0.0119	9.78E-05	985
Edendale	223	3.49E-06	0.808	0.284	0.0530	8.83E-05	1,120
Fairlie	235	3.96E-06	0.724	0.274	0.00985	9.89E-05	1,010
Geraldine	229	3.97E-06	0.696	0.268	0.0209	9.92E-05	924
Greymouth	218	3.88E-06	0.670	0.258	0.0308	9.69E-05	823
Hilderthorpe	228	4.07E-06	0.694	0.270	0.0357	1.02E-04	850
Invercargill	221	3.85E-06	0.667	0.258	0.0198	9.62E-05	873
Nelson	238	4.22E-06	0.714	0.279	0.0257	1.05E-04	902
Oamaru	229	4.05E-06	0.693	0.269	0.0296	1.01E-04	870
Queenstown	231	3.96E-06	0.713	0.271	0.0165	9.88E-05	950
Rolleston	214	3.84E-06	0.650	0.254	0.0328	9.57E-05	794
Timaru	232	3.98E-06	0.714	0.273	0.0218	9.94E-05	952
Twizel	221	3.94E-06	0.678	0.262	0.0331	9.83E-05	831
Wanaka	232	4.06E-06	0.719	0.275	0.0253	1.01E-04	912
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>208</b>	<b>1.29E-06</b>	<b>0.440</b>	<b>0.137</b>	<b>0.0160</b>	<b>3.70E-05</b>	<b>1,030</b>

# POTENTIAL ENVIRONMENTAL IMPACT

20MPa STANDARD

PER 1m<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>North Island Average</b>	<b>223</b>	<b>1.74E-12</b>	<b>0.321</b>	<b>0.0755</b>	<b>0.0103</b>	<b>6.72E-06</b>	<b>1,130</b>
Auckland Airport	245	1.84E-12	0.413	0.0986	0.0224	7.59E-06	1,320
Auckland Albany	241	1.86E-12	0.341	0.0806	0.00515	7.26E-06	1,220
Auckland City	231	1.81E-12	0.319	0.0755	0.0109	6.94E-06	1,140
Auckland Henderson	229	1.81E-12	0.317	0.0746	0.00944	7.12E-06	1,140
Auckland Mt Wellington	236	1.86E-12	0.318	0.0752	0.0125	6.99E-06	1,150
Auckland Manukau	221	1.78E-12	0.302	0.0708	0.0131	7.27E-06	1,090
Auckland Pukekohe	231	1.83E-12	0.326	0.0763	0.0116	7.31E-06	1,160
Auckland Silverdale	228	1.79E-12	0.326	0.0766	0.0107	7.14E-06	1,150
Dargaville	223	1.72E-12	0.328	0.0768	9.02E-04	6.95E-06	1,170
Gisborne	212	1.64E-12	0.314	0.0731	0.0235	5.95E-06	1,020
Hamilton	220	1.74E-12	0.299	0.0696	0.0151	6.65E-06	1,050
Hastings	197	1.53E-12	0.287	0.0678	0.0183	5.81E-06	975
Hawera	236	1.70E-12	0.382	0.0908	5.28E-04	6.26E-06	1,280
Kapiti	201	1.51E-12	0.312	0.0738	0.0165	5.61E-06	1,030
Katikati	220	1.66E-12	0.336	0.0792	-0.00403	6.66E-06	1,190
Kawerau	230	1.75E-12	0.328	0.0774	0.0130	6.57E-06	1,130
Levin	212	1.55E-12	0.353	0.0837	0.0117	5.96E-06	1,140
Marsden Point	216	1.72E-12	0.306	0.0718	0.00938	6.89E-06	1,090
Mt Maunganui	222	1.71E-12	0.314	0.0743	0.00481	6.48E-06	1,130
Napier	192	1.47E-12	0.293	0.0692	0.0127	5.80E-06	993
New Plymouth	234	1.64E-12	0.380	0.0910	-0.00876	5.98E-06	1,300
Otaki	197	1.47E-12	0.340	0.0808	0.0270	5.89E-06	1,040
Paihia	216	1.75E-12	0.292	0.0684	0.0135	7.04E-06	1,060
Palmerston North	209	1.57E-12	0.330	0.0775	0.0148	5.93E-06	1,080
Rotorua	233	1.76E-12	0.345	0.0812	0.00154	6.77E-06	1,210
Russell	225	1.77E-12	0.328	0.0768	0.0110	7.19E-06	1,140
Stratford	227	1.61E-12	0.374	0.0892	-0.00202	5.97E-06	1,250
Taupo	239	1.78E-12	0.377	0.0885	-4.03E-05	6.92E-06	1,280
Te Awamutu	221	1.73E-12	0.316	0.0740	0.0144	6.58E-06	1,090
Te Puke	240	1.83E-12	0.345	0.0818	0.00574	6.76E-06	1,220
Thames	221	1.79E-12	0.304	0.0705	0.0143	7.18E-06	1,080
Tokoroa	227	1.76E-12	0.329	0.0771	0.0114	6.82E-06	1,140
Turangi	252	1.69E-12	0.454	0.107	-0.0213	6.50E-06	1,490
Waiheke Readymix	228	1.78E-12	0.331	0.0779	0.00709	7.07E-06	1,170
Waihi	217	1.70E-12	0.324	0.0757	0.00630	7.15E-06	1,140
Wanganui	200	1.45E-12	0.343	0.0803	-0.00281	5.90E-06	1,140
Wellington Aotea Quay	216	1.62E-12	0.319	0.0764	0.0190	5.62E-06	1,070
Wellington Belmont	211	1.62E-12	0.303	0.0721	0.0228	5.73E-06	1,020
Whakatane	231	1.78E-12	0.320	0.0756	0.0180	6.21E-06	1,100
Whangamata	233	1.78E-12	0.356	0.0835	0.00548	7.20E-06	1,230
Whangarei	221	1.77E-12	0.294	0.0691	0.0129	6.87E-06	1,070
Wharehine Mangawhai	216	1.73E-12	0.301	0.0701	0.0103	7.02E-06	1,080
Wharehine Matakana	222	1.80E-12	0.301	0.0699	0.0167	7.10E-06	1,070
Wharehine Wellsford	217	1.76E-12	0.294	0.0682	0.0133	7.11E-06	1,060
Whitianga	229	1.73E-12	0.366	0.0852	-0.00308	7.17E-06	1,260

# POTENTIAL ENVIRONMENTAL IMPACT

**20MPa STANDARD**

PER 1m<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>							
<b>South Island Average</b>	<b>209</b>	<b>1.62E-12</b>	<b>0.338</b>	<b>0.0796</b>	<b>0.0114</b>	<b>6.95E-06</b>	<b>1,140</b>
Amberley	212	1.69E-12	0.355	0.0826	0.00762	8.09E-06	1,220
Ashburton	195	1.48E-12	0.310	0.0730	0.0171	5.75E-06	1,010
Blenheim	195	1.53E-12	0.297	0.0694	0.0223	6.09E-06	980
Chch Bromley	211	1.72E-12	0.336	0.0785	0.0151	8.03E-06	1,160
Chch Canterbury Concrete	210	1.73E-12	0.328	0.0766	0.0199	8.04E-06	1,130
Chch Hornby	203	1.70E-12	0.310	0.0721	0.0198	7.99E-06	1,090
Darfield	202	1.60E-12	0.319	0.0748	0.0136	7.12E-06	1,090
Dunedin	222	1.55E-12	0.387	0.0924	-0.00959	6.17E-06	1,300
Edendale	234	1.51E-12	0.562	0.136	0.0281	7.15E-06	1,540
Fairlie	215	1.51E-12	0.375	0.0890	-0.00627	6.15E-06	1,250
Geraldine	208	1.51E-12	0.347	0.0825	0.00436	6.19E-06	1,160
Greymouth	193	1.49E-12	0.314	0.0727	0.0204	5.91E-06	1,000
Hilderthorpe	211	1.59E-12	0.342	0.0809	0.0196	6.32E-06	1,110
Invercargill	209	1.48E-12	0.357	0.0851	-0.00804	6.01E-06	1,210
Nelson	221	1.66E-12	0.333	0.0793	0.0149	6.17E-06	1,120
Oamaru	211	1.57E-12	0.341	0.0811	0.0104	6.31E-06	1,140
Queenstown	215	1.52E-12	0.384	0.0897	-0.00534	6.05E-06	1,240
Rolleston	195	1.49E-12	0.305	0.0725	0.0221	5.80E-06	995
Timaru	220	1.58E-12	0.377	0.0901	0.00638	6.16E-06	1,230
Twizel	203	1.52E-12	0.335	0.0786	0.0176	6.05E-06	1,070
Wanaka	213	1.50E-12	0.384	0.0900	-0.00407	6.06E-06	1,240
Westport	250	1.59E-12	0.600	0.143	0.0196	7.30E-06	1,650
<b>Based on Imported Cement Supply</b>							
<b>South Island Average</b>	<b>237</b>	<b>4.16E-06</b>	<b>0.721</b>	<b>0.279</b>	<b>0.0253</b>	<b>1.04E-04</b>	<b>924</b>
Amberley	242	4.04E-06	0.732	0.277	0.0190	1.03E-04	1,050
Ashburton	222	4.01E-06	0.671	0.263	0.0337	9.97E-05	801
Blenheim	227	4.08E-06	0.686	0.268	0.0346	1.02E-04	828
Darfield	231	4.02E-06	0.694	0.268	0.0259	1.01E-04	920
Dunedin	246	4.22E-06	0.751	0.288	0.0143	1.05E-04	1,020
Edendale	253	4.05E-06	0.895	0.320	0.0575	1.02E-04	1,210
Fairlie	242	4.09E-06	0.743	0.283	0.0107	1.02E-04	1,030
Geraldine	235	4.09E-06	0.716	0.276	0.0213	1.02E-04	941
Greymouth	223	3.99E-06	0.686	0.265	0.0316	9.94E-05	836
Hilderthorpe	239	4.31E-06	0.730	0.285	0.0375	1.07E-04	879
Invercargill	227	3.98E-06	0.686	0.266	0.0209	9.92E-05	891
Nelson	256	4.60E-06	0.771	0.303	0.0287	1.14E-04	953
Oamaru	237	4.23E-06	0.719	0.280	0.0310	1.05E-04	891
Queenstown	238	4.11E-06	0.735	0.280	0.0177	1.02E-04	969
Rolleston	225	4.05E-06	0.683	0.267	0.0345	1.01E-04	820
Timaru	249	4.34E-06	0.767	0.295	0.0244	1.08E-04	998
Twizel	230	4.13E-06	0.707	0.274	0.0347	1.03E-04	854
Wanaka	232	4.06E-06	0.720	0.275	0.0254	1.01E-04	912
Westport	282	4.32E-06	0.983	0.348	0.0307	1.09E-04	1,460
<b>South Island Average, 2019 Production</b>	<b>215</b>	<b>9.22E-07</b>	<b>0.421</b>	<b>0.123</b>	<b>0.0160</b>	<b>2.86E-05</b>	<b>1,090</b>

# POTENTIAL ENVIRONMENTAL IMPACT

**25MPa STANDARD**

PER 1m<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>North Island Average</b>	<b>248</b>	<b>1.91E-12</b>	<b>0.349</b>	<b>0.0824</b>	<b>0.0129</b>	<b>7.03E-06</b>	<b>1,220</b>
Auckland Airport	275	2.05E-12	0.447	0.107	0.0254	7.85E-06	1,430
Auckland Albany	263	2.02E-12	0.367	0.0871	0.00779	7.46E-06	1,310
Auckland City	253	1.97E-12	0.345	0.0819	0.0132	7.22E-06	1,230
Auckland Henderson	257	2.01E-12	0.349	0.0827	0.0124	7.42E-06	1,250
Auckland Mt Wellington	263	2.05E-12	0.349	0.0830	0.0152	7.28E-06	1,250
Auckland Manukau	241	1.93E-12	0.326	0.0767	0.0152	7.52E-06	1,170
Auckland Pukekohe	260	2.03E-12	0.359	0.0848	0.0145	7.61E-06	1,270
Auckland Silverdale	255	1.99E-12	0.357	0.0846	0.0136	7.49E-06	1,260
Dargaville	245	1.88E-12	0.353	0.0832	0.00339	7.22E-06	1,250
Gisborne	228	1.75E-12	0.336	0.0783	0.0252	6.19E-06	1,090
Hamilton	246	1.93E-12	0.330	0.0773	0.0177	6.96E-06	1,160
Hastings	204	1.59E-12	0.296	0.0702	0.0191	5.98E-06	1,010
Hawera	262	1.88E-12	0.416	0.0993	0.00358	6.61E-06	1,390
Kapiti	223	1.65E-12	0.342	0.0815	0.0192	5.73E-06	1,120
Katikati	241	1.80E-12	0.361	0.0854	-0.00167	6.89E-06	1,270
Kawerau	248	1.88E-12	0.351	0.0831	0.0151	6.79E-06	1,210
Levin	234	1.71E-12	0.384	0.0913	0.0144	6.32E-06	1,240
Marsden Point	245	1.91E-12	0.338	0.0799	0.0122	7.12E-06	1,200
Mt Maunganui	242	1.85E-12	0.337	0.0801	0.00680	6.75E-06	1,200
Napier	215	1.63E-12	0.322	0.0765	0.0154	6.12E-06	1,090
New Plymouth	259	1.82E-12	0.412	0.0990	-0.00603	6.33E-06	1,400
Otaki	232	1.69E-12	0.387	0.0926	0.0311	6.08E-06	1,180
Paihia	239	1.91E-12	0.318	0.0750	0.0156	7.23E-06	1,150
Palmerston North	226	1.69E-12	0.354	0.0834	0.0169	6.19E-06	1,150
Rotorua	249	1.88E-12	0.364	0.0859	0.00348	7.11E-06	1,280
Russell	237	1.86E-12	0.342	0.0803	0.0124	7.34E-06	1,190
Stratford	274	1.81E-12	0.488	0.108	0.00377	7.92E-06	1,550
Taupo	259	1.92E-12	0.401	0.0944	0.00222	7.16E-06	1,360
Te Awamutu	241	1.88E-12	0.340	0.0799	0.0164	6.91E-06	1,170
Te Puke	263	1.99E-12	0.372	0.0887	0.00830	7.05E-06	1,310
Thames	246	1.97E-12	0.334	0.0777	0.0167	7.54E-06	1,180
Tokoroa	249	1.92E-12	0.355	0.0837	0.0138	7.10E-06	1,230
Turangi	271	1.83E-12	0.476	0.113	-0.0183	6.75E-06	1,560
Waiheke Readymix	257	1.98E-12	0.364	0.0862	0.0105	7.28E-06	1,280
Waihi	250	1.94E-12	0.363	0.0855	0.01000	7.56E-06	1,270
Wanganui	223	1.61E-12	0.372	0.0876	5.11E-04	6.21E-06	1,230
Wellington Aotea Quay	241	1.80E-12	0.353	0.0848	0.0220	5.98E-06	1,170
Wellington Belmont	234	1.78E-12	0.334	0.0800	0.0255	6.00E-06	1,110
Whakatane	242	1.86E-12	0.334	0.0789	0.0192	6.41E-06	1,150
Whangamata	255	1.95E-12	0.384	0.0903	0.00797	7.61E-06	1,320
Whangarei	240	1.90E-12	0.316	0.0747	0.0146	7.04E-06	1,140
Wharehine Mangawhai	238	1.89E-12	0.326	0.0765	0.0125	7.25E-06	1,170
Wharehine Matakana	241	1.93E-12	0.323	0.0754	0.0187	7.30E-06	1,150
Wharehine Wellsford	234	1.88E-12	0.313	0.0730	0.0147	7.36E-06	1,130
Whitianga	255	1.91E-12	0.398	0.0929	-1.89E-04	7.53E-06	1,360

# POTENTIAL ENVIRONMENTAL IMPACT

**25MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>							
<b>South Island Average</b>	<b>230</b>	<b>1.73E-12</b>	<b>0.376</b>	<b>0.0887</b>	<b>0.00998</b>	<b>6.99E-06</b>	<b>1,250</b>
Amberley	232	1.83E-12	0.382	0.0894	0.0102	8.29E-06	1,300
Ashburton	218	1.64E-12	0.343	0.0813	0.0191	6.08E-06	1,120
Blenheim	215	1.67E-12	0.325	0.0764	0.0247	6.36E-06	1,070
Chch Bromley	228	1.83E-12	0.359	0.0842	0.0172	8.21E-06	1,230
Chch Canterbury Concrete	226	1.84E-12	0.351	0.0822	0.0218	8.21E-06	1,200
Chch Hornby	218	1.76E-12	0.329	0.0773	0.0214	7.58E-06	1,130
Darfield	221	1.79E-12	0.348	0.0813	0.0161	8.16E-06	1,200
Dunedin	247	1.72E-12	0.423	0.101	-0.00802	6.49E-06	1,410
Edendale	257	1.65E-12	0.597	0.144	0.0286	7.45E-06	1,650
Fairlie	236	1.66E-12	0.404	0.0964	-0.00383	6.43E-06	1,340
Geraldine	227	1.64E-12	0.375	0.0894	0.00614	6.41E-06	1,240
Greymouth	216	1.65E-12	0.347	0.0808	0.0233	6.21E-06	1,100
Hilderthorpe	239	1.77E-12	0.382	0.0909	0.0220	6.53E-06	1,230
Invercargill	231	1.63E-12	0.391	0.0935	-0.00749	6.34E-06	1,320
Nelson	240	1.80E-12	0.359	0.0859	0.0173	6.39E-06	1,210
Oamaru	240	1.76E-12	0.383	0.0916	0.0125	6.64E-06	1,270
Queenstown	237	1.67E-12	0.419	0.0981	-0.00377	6.35E-06	1,350
Rolleston	214	1.63E-12	0.331	0.0791	0.0242	6.09E-06	1,080
Timaru	235	1.68E-12	0.397	0.0951	0.00799	6.37E-06	1,290
Twizel	217	1.62E-12	0.356	0.0838	0.0191	6.26E-06	1,140
Wanaka	240	1.67E-12	0.426	0.1000	-0.00345	6.44E-06	1,370
Westport	262	1.67E-12	0.618	0.147	0.0212	7.40E-06	1,700
<b>Based on Imported Cement Supply</b>							
<b>South Island Average</b>	<b>262</b>	<b>4.64E-06</b>	<b>0.801</b>	<b>0.310</b>	<b>0.0278</b>	<b>1.15E-04</b>	<b>1,010</b>
Amberley	266	4.51E-06	0.802	0.306	0.0229	1.14E-04	1,110
Ashburton	248	4.53E-06	0.751	0.296	0.0379	1.12E-04	878
Blenheim	251	4.56E-06	0.760	0.298	0.0385	1.13E-04	897
Darfield	254	4.40E-06	0.757	0.292	0.0296	1.11E-04	1,010
Dunedin	274	4.78E-06	0.834	0.323	0.0190	1.18E-04	1,090
Edendale	278	4.54E-06	0.971	0.351	0.0615	1.14E-04	1,290
Fairlie	266	4.57E-06	0.816	0.313	0.0151	1.14E-04	1,100
Geraldine	258	4.54E-06	0.783	0.304	0.0250	1.13E-04	1,000
Greymouth	250	4.52E-06	0.769	0.298	0.0360	1.12E-04	914
Hilderthorpe	272	4.96E-06	0.828	0.326	0.0426	1.23E-04	967
Invercargill	252	4.47E-06	0.760	0.297	0.0249	1.11E-04	961
Nelson	280	5.06E-06	0.842	0.332	0.0325	1.25E-04	1,020
Oamaru	271	4.89E-06	0.820	0.322	0.0364	1.21E-04	984
Queenstown	263	4.61E-06	0.812	0.312	0.0221	1.14E-04	1,040
Rolleston	247	4.49E-06	0.749	0.295	0.0380	1.11E-04	885
Timaru	266	4.66E-06	0.816	0.316	0.0273	1.16E-04	1,040
Twizel	247	4.46E-06	0.757	0.295	0.0375	1.11E-04	901
Wanaka	261	4.63E-06	0.809	0.311	0.0301	1.15E-04	997
Westport	296	4.61E-06	1.03	0.367	0.0330	1.15E-04	1,500
<b>South Island Average, 2019 Production</b>	<b>241</b>	<b>1.83E-06</b>	<b>0.534</b>	<b>0.174</b>	<b>0.0202</b>	<b>4.99E-05</b>	<b>1,130</b>

# POTENTIAL ENVIRONMENTAL IMPACT

**30MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>North Island Average</b>	<b>263</b>	<b>2.03E-12</b>	<b>0.366</b>	<b>0.0867</b>	<b>0.0142</b>	<b>7.40E-06</b>	<b>1,280</b>
Auckland Airport	279	2.10E-12	0.454	0.109	0.0258	8.33E-06	1,460
Auckland Albany	270	2.09E-12	0.376	0.0893	0.00806	7.86E-06	1,350
Auckland City	254	2.00E-12	0.349	0.0825	0.0128	7.67E-06	1,250
Auckland Henderson	265	2.07E-12	0.359	0.0851	0.0126	7.75E-06	1,290
Auckland Mt Wellington	264	2.08E-12	0.352	0.0834	0.0152	7.65E-06	1,270
Auckland Manukau	267	2.11E-12	0.357	0.0844	0.0176	7.90E-06	1,280
Auckland Pukekohe	270	2.12E-12	0.372	0.0877	0.0155	8.04E-06	1,320
Auckland Silverdale	283	2.20E-12	0.390	0.0927	0.0159	8.02E-06	1,380
Dargaville	266	2.04E-12	0.377	0.0891	0.00563	7.55E-06	1,340
Gisborne	247	1.88E-12	0.361	0.0845	0.0273	6.43E-06	1,170
Hamilton	269	2.09E-12	0.356	0.0836	0.0200	7.25E-06	1,240
Hastings	221	1.71E-12	0.318	0.0755	0.0209	6.20E-06	1,080
Hawera	283	2.03E-12	0.444	0.106	0.00559	6.93E-06	1,480
Kapiti	244	1.80E-12	0.370	0.0884	0.0217	6.08E-06	1,210
Katikati	264	1.97E-12	0.388	0.0922	6.86E-04	7.21E-06	1,360
Kawerau	272	2.05E-12	0.380	0.0902	0.0175	7.10E-06	1,300
Levin	251	1.83E-12	0.407	0.0970	0.0164	6.56E-06	1,310
Marsden Point	254	1.99E-12	0.348	0.0823	0.0132	7.37E-06	1,240
Mt Maunganui	266	2.02E-12	0.366	0.0874	0.00924	7.09E-06	1,300
Napier	222	1.69E-12	0.332	0.0789	0.0161	6.25E-06	1,120
New Plymouth	278	1.95E-12	0.437	0.105	-0.00449	6.63E-06	1,480
Otaki	251	1.86E-12	0.414	0.0992	0.0335	6.75E-06	1,280
Paihia	254	2.02E-12	0.335	0.0792	0.0172	7.51E-06	1,210
Palmerston North	252	1.87E-12	0.390	0.0922	0.0200	6.55E-06	1,270
Rotorua	277	2.08E-12	0.397	0.0942	0.00637	7.56E-06	1,390
Russell	266	2.06E-12	0.376	0.0887	0.0149	7.60E-06	1,300
Stratford	274	1.94E-12	0.436	0.105	0.00274	6.67E-06	1,450
Taupo	286	2.11E-12	0.435	0.103	0.00467	7.56E-06	1,470
Te Awamutu	275	2.12E-12	0.382	0.0903	0.0199	7.36E-06	1,310
Te Puke	290	2.15E-12	0.417	0.0974	0.0113	7.74E-06	1,440
Thames	271	2.14E-12	0.361	0.0846	0.0191	7.83E-06	1,280
Tokoroa	259	1.99E-12	0.368	0.0867	0.0149	7.28E-06	1,270
Turangi	293	1.98E-12	0.505	0.120	-0.0168	7.04E-06	1,650
Waiheke Readymix	275	2.05E-12	0.413	0.0932	0.0121	8.38E-06	1,410
Waihi	275	2.12E-12	0.393	0.0930	0.0126	7.89E-06	1,370
Wanganui	246	1.77E-12	0.403	0.0950	0.00345	6.52E-06	1,320
Wellington Aotea Quay	259	1.93E-12	0.377	0.0909	0.0241	6.35E-06	1,250
Wellington Belmont	256	1.93E-12	0.363	0.0872	0.0280	6.35E-06	1,210
Whakatane	271	2.07E-12	0.368	0.0874	0.0221	6.79E-06	1,260
Whangamata	277	2.11E-12	0.411	0.0970	0.0102	7.92E-06	1,410
Whangarei	260	2.06E-12	0.338	0.0801	0.0170	7.46E-06	1,220
Wharehine Mangawhai	263	2.06E-12	0.354	0.0835	0.0150	7.52E-06	1,260
Wharehine Matakana	254	2.03E-12	0.338	0.0791	0.0201	7.57E-06	1,200
Wharehine Wellsford	254	2.02E-12	0.336	0.0787	0.0168	7.52E-06	1,200
Whitianga	269	2.01E-12	0.414	0.0971	0.00153	7.63E-06	1,410

# POTENTIAL ENVIRONMENTAL IMPACT

**30MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>							
<b>South Island Average</b>	<b>250</b>	<b>1.90E-12</b>	<b>0.394</b>	<b>0.0934</b>	<b>0.0169</b>	<b>7.56E-06</b>	<b>1,320</b>
Amberley	253	1.97E-12	0.412	0.0968	0.0128	8.58E-06	1,390
Ashburton	231	1.69E-12	0.379	0.0867	0.0210	6.68E-06	1,210
Blenheim	243	1.86E-12	0.363	0.0857	0.0279	6.78E-06	1,190
Chch Bromley	246	1.96E-12	0.384	0.0906	0.0194	8.45E-06	1,310
Chch Canterbury Concrete	245	1.97E-12	0.377	0.0888	0.0240	8.47E-06	1,280
Chch Hornby	243	1.97E-12	0.365	0.0859	0.0244	8.45E-06	1,260
Darfield	246	1.96E-12	0.381	0.0898	0.0189	8.48E-06	1,310
Dunedin	271	1.88E-12	0.458	0.110	-0.00665	6.84E-06	1,520
Edendale	286	1.85E-12	0.641	0.155	0.0291	7.93E-06	1,800
Fairlie	253	1.78E-12	0.428	0.102	-0.00161	6.75E-06	1,420
Geraldine	243	1.77E-12	0.396	0.0945	0.00875	6.80E-06	1,310
Greymouth	239	1.81E-12	0.380	0.0889	0.0261	6.57E-06	1,200
Hilderthorpe	273	2.00E-12	0.431	0.103	0.0250	6.96E-06	1,380
Invercargill	261	1.82E-12	0.436	0.105	-0.00701	6.71E-06	1,460
Nelson	269	2.00E-12	0.397	0.0955	0.0207	6.83E-06	1,330
Oamaru	275	2.00E-12	0.433	0.104	0.0151	7.11E-06	1,430
Queenstown	266	1.85E-12	0.462	0.109	-0.00198	6.71E-06	1,480
Rolleston	236	1.78E-12	0.362	0.0868	0.0268	6.44E-06	1,180
Timaru	247	1.77E-12	0.413	0.0991	0.00933	6.65E-06	1,350
Twizel	243	1.80E-12	0.394	0.0930	0.0211	6.73E-06	1,260
Wanaka	274	1.90E-12	0.481	0.113	-0.00254	6.98E-06	1,540
Westport	290	1.87E-12	0.658	0.157	0.0249	7.83E-06	1,820
<b>Based on Imported Cement Supply</b>							
<b>South Island Average</b>	<b>288</b>	<b>5.18E-06</b>	<b>0.877</b>	<b>0.343</b>	<b>0.0349</b>	<b>1.28E-04</b>	<b>1,070</b>
Amberley	291	5.00E-06	0.878	0.338	0.0269	1.26E-04	1,190
Ashburton	262	4.67E-06	0.800	0.308	0.0404	1.16E-04	958
Blenheim	283	5.19E-06	0.858	0.338	0.0436	1.28E-04	992
Darfield	282	4.96E-06	0.843	0.328	0.0341	1.25E-04	1,090
Dunedin	301	5.30E-06	0.915	0.356	0.0233	1.31E-04	1,170
Edendale	309	5.15E-06	1.07	0.390	0.0664	1.29E-04	1,380
Fairlie	286	4.97E-06	0.875	0.337	0.0190	1.23E-04	1,150
Geraldine	276	4.89E-06	0.836	0.326	0.0290	1.21E-04	1,050
Greymouth	277	5.04E-06	0.851	0.331	0.0403	1.25E-04	993
Hilderthorpe	311	5.73E-06	0.947	0.374	0.0488	1.41E-04	1,080
Invercargill	284	5.10E-06	0.857	0.337	0.0300	1.26E-04	1,050
Nelson	314	5.73E-06	0.943	0.374	0.0379	1.41E-04	1,120
Oamaru	311	5.68E-06	0.941	0.371	0.0428	1.40E-04	1,100
Queenstown	295	5.24E-06	0.909	0.351	0.0274	1.29E-04	1,130
Rolleston	273	5.00E-06	0.828	0.327	0.0422	1.24E-04	962
Timaru	279	4.93E-06	0.857	0.332	0.0298	1.22E-04	1,090
Twizel	276	5.02E-06	0.845	0.330	0.0419	1.24E-04	991
Wanaka	298	5.36E-06	0.923	0.357	0.0364	1.32E-04	1,110
Westport	329	5.25E-06	1.12	0.407	0.0384	1.31E-04	1,590
<b>South Island Average, 2019 Production</b>	<b>257</b>	<b>1.23E-06</b>	<b>0.503</b>	<b>0.151</b>	<b>0.0231</b>	<b>3.64E-05</b>	<b>1,240</b>

# POTENTIAL ENVIRONMENTAL IMPACT

**35MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>North Island Average</b>	<b>283</b>	<b>2.17E-12</b>	<b>0.393</b>	<b>0.0933</b>	<b>0.0169</b>	<b>7.77E-06</b>	<b>1,370</b>
Auckland Airport	307	2.31E-12	0.485	0.116	0.0287	8.75E-06	1,570
Auckland Albany	292	2.24E-12	0.402	0.0955	0.0101	8.22E-06	1,440
Auckland City	269	2.11E-12	0.366	0.0867	0.0143	7.93E-06	1,310
Auckland Henderson	295	2.24E-12	0.417	0.0953	0.0165	8.68E-06	1,450
Auckland Mt Wellington	279	2.20E-12	0.369	0.0876	0.0168	8.17E-06	1,330
Auckland Manukau	281	2.22E-12	0.373	0.0882	0.0192	8.24E-06	1,340
Auckland Pukekohe	293	2.30E-12	0.399	0.0943	0.0182	8.44E-06	1,410
Auckland Silverdale	288	2.24E-12	0.397	0.0943	0.0160	8.26E-06	1,400
Dargaville	287	2.18E-12	0.401	0.0950	0.00726	7.79E-06	1,420
Gisborne	258	1.96E-12	0.376	0.0881	0.0286	6.53E-06	1,210
Hamilton	279	2.18E-12	0.369	0.0868	0.0208	7.57E-06	1,290
Hastings	243	1.86E-12	0.346	0.0826	0.0233	6.50E-06	1,170
Hawera	293	2.09E-12	0.455	0.109	0.00694	7.01E-06	1,510
Kapiti	281	2.04E-12	0.419	0.101	0.0259	6.34E-06	1,360
Katikati	300	2.23E-12	0.432	0.103	0.00444	7.72E-06	1,510
Kawerau	301	2.26E-12	0.415	0.0989	0.0203	7.56E-06	1,420
Levin	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Marsden Point	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mt Maunganui	288	2.18E-12	0.393	0.0940	0.0112	7.44E-06	1,390
Napier	249	1.87E-12	0.365	0.0874	0.0190	6.61E-06	1,230
New Plymouth	305	2.14E-12	0.472	0.114	-0.00112	6.98E-06	1,590
Otaki	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Paihia	286	2.24E-12	0.372	0.0885	0.0199	7.82E-06	1,330
Palmerston North	265	1.96E-12	0.408	0.0966	0.0215	6.77E-06	1,320
Rotorua	287	2.18E-12	0.414	0.0982	0.00557	8.05E-06	1,460
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	295	2.09E-12	0.464	0.112	0.00513	6.97E-06	1,540
Taupo	297	2.19E-12	0.450	0.106	0.00498	7.85E-06	1,520
Te Awamutu	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Puke	302	2.27E-12	0.418	0.1000	0.0125	7.52E-06	1,460
Thames	304	2.38E-12	0.400	0.0942	0.0223	8.23E-06	1,410
Tokoroa	287	2.19E-12	0.401	0.0949	0.0177	7.70E-06	1,380
Turangi	323	2.21E-12	0.542	0.129	-0.0134	7.55E-06	1,780
Waiheke Readymix	309	2.36E-12	0.426	0.101	0.0148	8.33E-06	1,500
Waihi	289	2.23E-12	0.412	0.0975	0.0136	8.23E-06	1,440
Wanganui	265	1.91E-12	0.429	0.102	0.00501	6.81E-06	1,410
Wellington Aotea Quay	287	2.12E-12	0.414	0.1000	0.0272	6.70E-06	1,370
Wellington Belmont	283	2.13E-12	0.400	0.0964	0.0312	6.87E-06	1,330
Whakatane	295	2.25E-12	0.398	0.0947	0.0244	7.30E-06	1,360
Whangamata	296	2.26E-12	0.435	0.103	0.0117	8.37E-06	1,500
Whangarei	291	2.29E-12	0.372	0.0885	0.0206	7.99E-06	1,340
Wharehine Mangawhai	307	2.38E-12	0.403	0.0957	0.0195	8.07E-06	1,430
Wharehine Matakana	285	2.26E-12	0.374	0.0880	0.0230	8.00E-06	1,320
Wharehine Wellsford	286	2.25E-12	0.373	0.0879	0.0200	7.89E-06	1,330
Whitianga	315	2.34E-12	0.472	0.111	0.00611	8.34E-06	1,600

# POTENTIAL ENVIRONMENTAL IMPACT

**35MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>							
<b>South Island Average</b>	<b>264</b>	<b>2.04E-12</b>	<b>0.402</b>	<b>0.0957</b>	<b>0.0255</b>	<b>7.91E-06</b>	<b>1,340</b>
Amberley	296	2.27E-12	0.470	0.111	0.0180	9.13E-06	1,570
Ashburton	255	1.88E-12	0.395	0.0944	0.0222	6.43E-06	1,280
Blenheim	270	2.06E-12	0.400	0.0949	0.0311	7.15E-06	1,300
Chch Bromley	260	2.06E-12	0.403	0.0954	0.0209	8.72E-06	1,370
Chch Canterbury Concrete	270	2.14E-12	0.411	0.0974	0.0267	8.83E-06	1,390
Chch Hornby	254	2.05E-12	0.380	0.0897	0.0256	8.70E-06	1,310
Darfield	268	2.11E-12	0.412	0.0973	0.0213	8.81E-06	1,400
Dunedin	294	2.03E-12	0.492	0.119	-0.00570	7.12E-06	1,630
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	275	1.93E-12	0.461	0.110	-6.86E-05	7.10E-06	1,520
Geraldine	263	1.89E-12	0.426	0.102	0.00940	6.96E-06	1,410
Greymouth	272	2.02E-12	0.427	0.1000	0.0301	6.85E-06	1,340
Hilderthorpe	285	2.09E-12	0.448	0.107	0.0260	7.23E-06	1,440
Invercargill	304	2.08E-12	0.501	0.121	-0.00632	6.96E-06	1,670
Nelson	295	2.18E-12	0.432	0.104	0.0236	7.11E-06	1,440
Oamaru	301	2.18E-12	0.471	0.114	0.0169	7.53E-06	1,550
Queenstown	305	2.11E-12	0.523	0.124	1.23E-04	7.17E-06	1,660
Rolleston	262	1.97E-12	0.398	0.0958	0.0297	6.90E-06	1,290
Timaru	299	2.09E-12	0.488	0.118	0.0127	6.85E-06	1,570
Twizel	282	2.06E-12	0.451	0.107	0.0246	7.23E-06	1,430
Wanaka	368	2.30E-12	0.716	0.154	0.00405	1.01E-05	2,140
Westport	317	2.06E-12	0.699	0.166	0.0279	8.33E-06	1,940
<b>Based on Imported Cement Supply</b>							
<b>South Island Average</b>	<b>310</b>	<b>5.69E-06</b>	<b>0.939</b>	<b>0.371</b>	<b>0.0455</b>	<b>1.40E-04</b>	<b>1,080</b>
Amberley	341	5.98E-06	1.03	0.399	0.0348	1.49E-04	1,330
Ashburton	290	5.37E-06	0.879	0.348	0.0445	1.32E-04	994
Blenheim	316	5.83E-06	0.956	0.378	0.0487	1.44E-04	1,090
Darfield	308	5.46E-06	0.920	0.359	0.0381	1.37E-04	1,170
Dunedin	326	5.81E-06	0.992	0.388	0.0272	1.43E-04	1,250
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	311	5.46E-06	0.952	0.368	0.0226	1.35E-04	1,230
Geraldine	299	5.34E-06	0.906	0.355	0.0315	1.32E-04	1,120
Greymouth	316	5.81E-06	0.969	0.380	0.0465	1.43E-04	1,100
Hilderthorpe	324	5.98E-06	0.987	0.390	0.0509	1.47E-04	1,120
Invercargill	332	6.07E-06	1.000	0.397	0.0377	1.49E-04	1,180
Nelson	344	6.34E-06	1.04	0.412	0.0427	1.56E-04	1,200
Oamaru	340	6.26E-06	1.03	0.408	0.0474	1.54E-04	1,190
Queenstown	339	6.11E-06	1.05	0.407	0.0344	1.50E-04	1,260
Rolleston	303	5.58E-06	0.919	0.364	0.0469	1.38E-04	1,050
Timaru	340	6.15E-06	1.04	0.409	0.0382	1.51E-04	1,250
Twizel	321	5.90E-06	0.982	0.386	0.0490	1.45E-04	1,120
Wanaka	399	6.69E-06	1.27	0.458	0.0526	1.67E-04	1,600
Westport	360	5.85E-06	1.22	0.445	0.0430	1.45E-04	1,690
<b>South Island Average, 2019 Production</b>	<b>268</b>	<b>6.07E-07</b>	<b>0.457</b>	<b>0.124</b>	<b>0.0283</b>	<b>2.21E-05</b>	<b>1,310</b>

# POTENTIAL ENVIRONMENTAL IMPACT

**40MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>North Island Average</b>	<b>307</b>	<b>2.34E-12</b>	<b>0.426</b>	<b>0.102</b>	<b>0.0197</b>	<b>8.00E-06</b>	<b>1,470</b>
Auckland Airport	321	2.41E-12	0.502	0.121	0.0303	8.93E-06	1,630
Auckland Albany	316	2.43E-12	0.430	0.103	0.0129	8.58E-06	1,530
Auckland City	304	2.35E-12	0.405	0.0969	0.0178	8.23E-06	1,440
Auckland Henderson	306	2.38E-12	0.407	0.0971	0.0167	8.40E-06	1,460
Auckland Mt Wellington	306	2.39E-12	0.400	0.0953	0.0196	8.37E-06	1,430
Auckland Manukau	316	2.47E-12	0.413	0.0985	0.0227	8.60E-06	1,470
Auckland Pukekohe	333	2.58E-12	0.445	0.106	0.0224	8.82E-06	1,560
Auckland Silverdale	263	2.05E-12	0.370	0.0875	0.0122	7.77E-06	1,310
Dargaville	314	2.38E-12	0.431	0.103	0.0106	8.15E-06	1,520
Gisborne	298	2.22E-12	0.435	0.101	0.0331	7.30E-06	1,390
Hamilton	316	2.43E-12	0.411	0.0973	0.0246	7.87E-06	1,430
Hastings	285	2.17E-12	0.400	0.0959	0.0278	7.36E-06	1,350
Hawera	324	2.32E-12	0.498	0.120	0.00978	7.57E-06	1,650
Kapiti	296	2.17E-12	0.445	0.107	0.0249	7.10E-06	1,450
Katikati	335	2.48E-12	0.472	0.113	0.00892	8.19E-06	1,640
Kawerau	325	2.44E-12	0.445	0.106	0.0227	8.03E-06	1,520
Levin	298	2.14E-12	0.474	0.114	0.0192	7.28E-06	1,530
Marsden Point	307	2.38E-12	0.408	0.0971	0.0187	8.28E-06	1,450
Mt Maunganui	309	2.34E-12	0.418	0.1000	0.0133	7.81E-06	1,480
Napier	294	2.21E-12	0.423	0.102	0.0238	7.44E-06	1,420
New Plymouth	340	2.39E-12	0.521	0.126	4.13E-04	7.70E-06	1,760
Otaki	296	2.16E-12	0.480	0.116	0.0353	7.38E-06	1,490
Paihia	299	2.35E-12	0.386	0.0921	0.0214	8.12E-06	1,380
Palmerston North	304	2.24E-12	0.462	0.110	0.0263	7.38E-06	1,490
Rotorua	314	2.36E-12	0.443	0.106	0.0101	8.19E-06	1,550
Russell	314	2.40E-12	0.430	0.102	0.0196	8.25E-06	1,490
Stratford	330	2.34E-12	0.509	0.123	0.00847	7.50E-06	1,690
Taupo	331	2.44E-12	0.491	0.116	0.00935	8.21E-06	1,650
Te Awamutu	309	2.37E-12	0.424	0.1000	0.0233	7.89E-06	1,450
Te Puke	334	2.50E-12	0.456	0.110	0.0158	7.94E-06	1,590
Thames	319	2.50E-12	0.418	0.0986	0.0236	8.56E-06	1,470
Tokoroa	335	2.39E-12	0.510	0.112	0.0239	9.33E-06	1,660
Turangi	349	2.40E-12	0.574	0.136	-0.00973	7.99E-06	1,880
Waiheke Readymix	320	2.41E-12	0.457	0.106	0.0165	8.95E-06	1,580
Waihi	326	2.48E-12	0.455	0.108	0.0180	8.53E-06	1,570
Wanganui	305	2.19E-12	0.481	0.114	0.0103	7.33E-06	1,570
Wellington Aotea Quay	309	2.27E-12	0.446	0.108	0.0283	7.07E-06	1,470
Wellington Belmont	299	2.23E-12	0.424	0.102	0.0312	7.00E-06	1,410
Whakatane	319	2.42E-12	0.427	0.102	0.0270	7.57E-06	1,460
Whangamata	332	2.50E-12	0.477	0.113	0.0160	8.60E-06	1,630
Whangarei	296	2.34E-12	0.377	0.0897	0.0217	8.17E-06	1,360
Wharehine Mangawhai	309	2.40E-12	0.407	0.0967	0.0192	8.29E-06	1,450
Wharehine Matakana	301	2.38E-12	0.393	0.0925	0.0248	8.26E-06	1,380
Wharehine Wellsford	314	2.45E-12	0.404	0.0957	0.0228	8.28E-06	1,440
Whitianga	327	2.44E-12	0.487	0.115	0.00781	8.50E-06	1,650

# POTENTIAL ENVIRONMENTAL IMPACT

**40MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>							
<b>South Island Average</b>	<b>286</b>	<b>2.19E-12</b>	<b>0.434</b>	<b>0.104</b>	<b>0.0264</b>	<b>8.27E-06</b>	<b>1,450</b>
Amberley	320	2.43E-12	0.503	0.120	0.0212	9.37E-06	1,670
Ashburton	287	2.12E-12	0.443	0.106	0.0252	7.19E-06	1,440
Blenheim	292	2.12E-12	0.463	0.104	0.0343	8.13E-06	1,450
Chch Bromley	284	2.22E-12	0.435	0.103	0.0237	8.99E-06	1,470
Chch Canterbury Concrete	292	2.29E-12	0.442	0.105	0.0293	9.08E-06	1,490
Chch Hornby	274	2.18E-12	0.408	0.0966	0.0279	8.90E-06	1,390
Darfield	293	2.23E-12	0.446	0.107	0.0242	8.25E-06	1,490
Dunedin	333	2.30E-12	0.549	0.133	-0.00306	7.71E-06	1,820
Edendale	349	2.25E-12	0.738	0.179	0.0301	8.75E-06	2,100
Fairlie	298	2.10E-12	0.493	0.118	0.00279	7.47E-06	1,620
Geraldine	292	2.09E-12	0.466	0.112	0.0125	7.36E-06	1,530
Greymouth	298	2.21E-12	0.464	0.109	0.0333	7.37E-06	1,450
Hilderthorpe	330	2.40E-12	0.514	0.124	0.0301	7.87E-06	1,640
Invercargill	325	2.25E-12	0.534	0.129	-0.00570	7.63E-06	1,780
Nelson	367	2.65E-12	0.525	0.128	0.0324	7.57E-06	1,720
Oamaru	331	2.38E-12	0.516	0.125	0.0192	8.04E-06	1,700
Queenstown	331	2.28E-12	0.562	0.133	0.00190	7.60E-06	1,790
Rolleston	284	2.11E-12	0.427	0.103	0.0321	7.13E-06	1,380
Timaru	312	2.21E-12	0.506	0.122	0.0152	7.47E-06	1,640
Twizel	313	2.26E-12	0.496	0.118	0.0274	7.59E-06	1,570
Wanaka	340	2.33E-12	0.586	0.139	-0.00118	7.84E-06	1,860
Westport	341	2.23E-12	0.733	0.175	0.0312	8.83E-06	2,050
<b>Based on Imported Cement Supply</b>							
<b>South Island Average</b>	<b>342</b>	<b>6.30E-06</b>	<b>1.04</b>	<b>0.412</b>	<b>0.0486</b>	<b>1.55E-04</b>	<b>1,190</b>
Amberley	369	6.54E-06	1.11	0.435	0.0396	1.63E-04	1,400
Ashburton	328	6.08E-06	0.991	0.394	0.0504	1.50E-04	1,110
Blenheim	339	6.05E-06	1.04	0.398	0.0525	1.50E-04	1,230
Darfield	339	6.14E-06	1.02	0.401	0.0430	1.52E-04	1,220
Dunedin	371	6.69E-06	1.13	0.443	0.0348	1.64E-04	1,370
Edendale	379	6.51E-06	1.27	0.475	0.0773	1.61E-04	1,580
Fairlie	338	5.98E-06	1.03	0.401	0.0276	1.48E-04	1,300
Geraldine	332	5.99E-06	1.01	0.396	0.0374	1.48E-04	1,210
Greymouth	346	6.38E-06	1.06	0.417	0.0513	1.57E-04	1,190
Hilderthorpe	377	7.02E-06	1.15	0.456	0.0592	1.72E-04	1,270
Invercargill	355	6.51E-06	1.07	0.425	0.0415	1.60E-04	1,260
Nelson	430	8.06E-06	1.29	0.520	0.0567	1.96E-04	1,420
Oamaru	375	6.91E-06	1.13	0.450	0.0529	1.70E-04	1,290
Queenstown	368	6.67E-06	1.13	0.442	0.0393	1.64E-04	1,340
Rolleston	328	6.08E-06	0.994	0.395	0.0508	1.50E-04	1,120
Timaru	355	6.42E-06	1.08	0.426	0.0418	1.58E-04	1,300
Twizel	356	6.60E-06	1.09	0.430	0.0547	1.62E-04	1,220
Wanaka	372	6.80E-06	1.15	0.448	0.0482	1.67E-04	1,320
Westport	388	6.38E-06	1.30	0.478	0.0476	1.58E-04	1,770
<b>South Island Average, 2019 Production</b>	<b>288</b>	<b>4.07E-07</b>	<b>0.471</b>	<b>0.123</b>	<b>0.0284</b>	<b>1.78E-05</b>	<b>1,430</b>

# POTENTIAL ENVIRONMENTAL IMPACT

**45MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>North Island Average</b>	<b>345</b>	<b>2.56E-12</b>	<b>0.485</b>	<b>0.117</b>	<b>0.0132</b>	<b>8.43E-06</b>	<b>1,680</b>
Auckland Airport	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Auckland Albany	369	2.79E-12	0.493	0.118	0.0187	9.27E-06	1,740
Auckland City	311	2.39E-12	0.414	0.0993	0.0180	8.08E-06	1,470
Auckland Henderson	349	2.68E-12	0.457	0.109	0.0211	8.96E-06	1,620
Auckland Mt Wellington	328	2.56E-12	0.426	0.102	0.0220	8.83E-06	1,530
Auckland Manukau	355	2.77E-12	0.460	0.110	0.0261	9.45E-06	1,640
Auckland Pukekohe	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Auckland Silverdale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dargaville	392	2.90E-12	0.517	0.125	0.0180	8.51E-06	1,800
Gisborne	314	2.35E-12	0.451	0.106	0.0349	7.34E-06	1,450
Hamilton	316	2.44E-12	0.412	0.0973	0.0244	8.01E-06	1,430
Hastings	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hawera	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kapiti	312	2.28E-12	0.468	0.113	0.0261	7.32E-06	1,530
Katikati	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kawerau	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Levin	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Marsden Point	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mt Maunganui	342	2.51E-12	0.481	0.111	0.0177	8.80E-06	1,650
Napier	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New Plymouth	374	2.63E-12	0.569	0.138	0.00228	8.31E-06	1,920
Otaki	309	2.26E-12	0.492	0.119	0.0401	7.49E-06	1,520
Paihia	364	2.81E-12	0.458	0.110	0.0279	8.83E-06	1,630
Palmerston North	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rotorua	341	2.56E-12	0.477	0.114	0.0120	8.76E-06	1,660
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	365	2.59E-12	0.559	0.135	0.0106	8.21E-06	1,850
Taupo	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Awamutu	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Puke	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Thames	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tokoroa	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Turangi	377	2.62E-12	0.607	0.144	-0.00552	8.48E-06	1,990
Waiheke Readymix	357	2.67E-12	0.496	0.116	0.0206	9.15E-06	1,710
Waihi	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanganui	327	2.34E-12	0.509	0.121	0.0136	7.62E-06	1,660
Wellington Aotea Quay	291	2.11E-12	0.439	0.106	0.0156	6.84E-06	1,460
Wellington Belmont	315	2.33E-12	0.453	0.109	0.0286	7.41E-06	1,500
Whakatane	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Whangamata	330	2.49E-12	0.475	0.113	0.0152	8.72E-06	1,630
Whangarei	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wharehine Mangawhai	359	2.75E-12	0.462	0.111	0.0245	8.66E-06	1,630
Wharehine Matakana	344	2.66E-12	0.441	0.105	0.0286	8.45E-06	1,540
Wharehine Wellsford	347	2.68E-12	0.441	0.105	0.0260	8.53E-06	1,560
Whitianga	360	2.64E-12	0.521	0.124	0.0138	8.36E-06	1,750

# POTENTIAL ENVIRONMENTAL IMPACT

**45MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>							
<b>South Island Average</b>	<b>319</b>	<b>2.39E-12</b>	<b>0.493</b>	<b>0.117</b>	<b>0.0299</b>	<b>8.76E-06</b>	<b>1,610</b>
Amberley	366	2.74E-12	0.566	0.136	0.0272	9.87E-06	1,870
Ashburton	325	2.35E-12	0.496	0.120	0.0284	7.31E-06	1,590
Blenheim	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chch Bromley	321	2.41E-12	0.513	0.118	0.0295	1.00E-05	1,680
Chch Canterbury Concrete	361	2.75E-12	0.537	0.129	0.0373	9.75E-06	1,780
Chch Hornby	301	2.37E-12	0.445	0.106	0.0310	9.18E-06	1,510
Darfield	335	2.57E-12	0.505	0.121	0.0294	9.52E-06	1,690
Dunedin	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Edendale	378	2.45E-12	0.782	0.190	0.0307	9.25E-06	2,250
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	334	2.37E-12	0.525	0.127	0.0169	7.90E-06	1,720
Greymouth	380	2.71E-12	0.580	0.138	0.0437	7.51E-06	1,780
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nelson	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Oamaru	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Queenstown	362	2.49E-12	0.611	0.145	0.00385	8.00E-06	1,930
Rolleston	303	2.25E-12	0.454	0.110	0.0344	7.39E-06	1,470
Timaru	333	2.36E-12	0.535	0.130	0.0173	7.87E-06	1,730
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>							
<b>South Island Average</b>	<b>366</b>	<b>6.77E-06</b>	<b>1.11</b>	<b>0.442</b>	<b>0.0535</b>	<b>1.66E-04</b>	<b>1,260</b>
Amberley	423	7.63E-06	1.28	0.503	0.0487	1.89E-04	1,550
Ashburton	371	6.96E-06	1.12	0.449	0.0573	1.70E-04	1,220
Blenheim	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Darfield	387	7.04E-06	1.16	0.459	0.0510	1.75E-04	1,390
Dunedin	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Edendale	410	7.13E-06	1.37	0.514	0.0823	1.76E-04	1,670
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	380	6.95E-06	1.15	0.456	0.0457	1.71E-04	1,350
Greymouth	442	8.36E-06	1.36	0.541	0.0672	2.03E-04	1,430
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nelson	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Oamaru	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Queenstown	404	7.37E-06	1.24	0.486	0.0452	1.81E-04	1,440
Rolleston	351	6.53E-06	1.06	0.424	0.0544	1.60E-04	1,190
Timaru	378	6.87E-06	1.15	0.455	0.0458	1.69E-04	1,370
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>320</b>	<b>8.62E-08</b>	<b>0.500</b>	<b>0.121</b>	<b>0.0304</b>	<b>1.08E-05</b>	<b>1,600</b>

# POTENTIAL ENVIRONMENTAL IMPACT

**50MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>North Island Average</b>	<b>365</b>	<b>2.67E-12</b>	<b>0.521</b>	<b>0.120</b>	<b>0.0256</b>	<b>9.30E-06</b>	<b>1,750</b>
Auckland Airport	399	2.97E-12	0.591	0.143	0.0386	9.91E-06	1,930
Auckland Albany	422	3.09E-12	0.571	0.134	0.0249	9.86E-06	1,960
Auckland City	404	3.05E-12	0.518	0.126	0.0288	9.11E-06	1,820
Auckland Henderson	388	2.93E-12	0.515	0.122	0.0256	9.73E-06	1,800
Auckland Mt Wellington	399	2.94E-12	0.539	0.124	0.0301	9.85E-06	1,840
Auckland Manukau	347	2.62E-12	0.468	0.109	0.0258	9.09E-06	1,620
Auckland Pukekohe	396	3.02E-12	0.518	0.124	0.0291	9.46E-06	1,800
Auckland Silverdale	246	1.92E-12	0.352	0.0831	0.00984	7.39E-06	1,240
Dargaville	354	2.58E-12	0.509	0.116	0.0159	9.41E-06	1,730
Gisborne	324	2.23E-12	0.540	0.113	0.0375	9.36E-06	1,630
Hamilton	321	2.45E-12	0.420	0.0995	0.0228	7.73E-06	1,450
Hastings	359	2.70E-12	0.495	0.120	0.0359	8.36E-06	1,660
Hawera	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kapiti	351	2.52E-12	0.529	0.128	0.0249	7.64E-06	1,720
Katikati	380	2.80E-12	0.524	0.126	0.0145	8.66E-06	1,810
Kawerau	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Levin	356	2.52E-12	0.561	0.135	0.0211	7.81E-06	1,800
Marsden Point	376	2.41E-12	0.677	0.129	0.0295	1.35E-05	2,070
Mt Maunganui	353	2.66E-12	0.471	0.114	0.0177	8.45E-06	1,660
Napier	351	2.58E-12	0.500	0.121	0.0271	7.93E-06	1,670
New Plymouth	405	2.85E-12	0.607	0.148	0.00656	8.70E-06	2,040
Otaki	399	2.90E-12	0.616	0.149	0.0508	8.96E-06	1,920
Paihia	360	2.73E-12	0.477	0.111	0.0274	9.37E-06	1,660
Palmerston North	361	2.59E-12	0.546	0.131	0.0288	7.72E-06	1,750
Rotorua	366	2.62E-12	0.555	0.124	0.0174	1.01E-05	1,850
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Taupo	359	2.63E-12	0.524	0.125	0.0128	8.50E-06	1,760
Te Awamutu	364	2.76E-12	0.490	0.117	0.0293	8.54E-06	1,670
Te Puke	370	2.71E-12	0.521	0.122	0.0189	9.14E-06	1,780
Thames	385	2.93E-12	0.491	0.117	0.0309	8.81E-06	1,700
Tokoroa	376	2.83E-12	0.507	0.121	0.0279	8.82E-06	1,730
Turangi	327	2.18E-12	0.553	0.132	-0.0175	7.08E-06	1,800
Waiheke Readymix	372	2.59E-12	0.591	0.125	0.0244	1.12E-05	1,910
Waihi	401	3.01E-12	0.543	0.130	0.0266	9.36E-06	1,860
Wanganui	348	2.32E-12	0.605	0.131	0.0177	9.67E-06	1,870
Wellington Aotea Quay	336	2.33E-12	0.535	0.123	0.0196	8.30E-06	1,730
Wellington Belmont	304	2.14E-12	0.465	0.112	0.00911	6.67E-06	1,540
Whakatane	366	2.57E-12	0.558	0.120	0.0345	9.92E-06	1,780
Whangamata	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Whangarei	365	2.63E-12	0.537	0.114	0.0304	1.09E-05	1,780
Wharehine Mangawhai	410	3.07E-12	0.523	0.125	0.0308	9.04E-06	1,810
Wharehine Matakana	394	3.02E-12	0.498	0.119	0.0337	9.12E-06	1,730
Wharehine Wellsford	374	2.89E-12	0.474	0.113	0.0284	9.09E-06	1,670
Whitianga	369	2.53E-12	0.625	0.132	0.0144	1.13E-05	1,990

# POTENTIAL ENVIRONMENTAL IMPACT

50MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Global warming potential	Ozone depletion potential	Acidification potential of soil and water	Eutrophication potential	Formation potential of tropospheric ozone	Abiotic depletion potential (elements)	Abiotic depletion potential (fossil fuels)
	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	kg SO <sub>2</sub> eq.	kg PO <sub>4</sub> <sup>3-</sup> eq.	kg C <sub>2</sub> H <sub>2</sub> eq.	kg Sb eq.	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>							
<b>South Island Average</b>	<b>354</b>	<b>2.62E-12</b>	<b>0.537</b>	<b>0.127</b>	<b>0.0370</b>	<b>9.35E-06</b>	<b>1,750</b>
Amberley	389	2.89E-12	0.597	0.143	0.0306	1.00E-05	1,960
Ashburton	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Blenheim	365	2.50E-12	0.617	0.132	0.0439	1.01E-05	1,850
Chch Bromley	356	2.65E-12	0.562	0.130	0.0339	1.04E-05	1,820
Chch Canterbury Concrete	366	2.78E-12	0.545	0.131	0.0380	9.89E-06	1,800
Chch Hornby	351	2.70E-12	0.513	0.123	0.0367	9.69E-06	1,720
Darfield	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dunedin	362	2.50E-12	0.590	0.143	-9.39E-04	8.23E-06	1,950
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Greymouth	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	398	2.50E-12	0.737	0.161	2.03E-04	1.08E-05	2,280
Nelson	410	2.74E-12	0.670	0.147	0.0392	9.91E-06	2,050
Oamaru	403	2.86E-12	0.617	0.150	0.0244	8.86E-06	2,020
Queenstown	381	2.60E-12	0.648	0.152	0.00549	8.38E-06	2,030
Rolleston	352	2.47E-12	0.560	0.129	0.0413	8.52E-06	1,740
Timaru	355	2.52E-12	0.566	0.137	0.0199	8.17E-06	1,830
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>							
<b>South Island Average</b>	<b>412</b>	<b>7.44E-06</b>	<b>1.26</b>	<b>0.488</b>	<b>0.0624</b>	<b>1.83E-04</b>	<b>1,450</b>
Amberley	450	8.18E-06	1.36	0.537	0.0537	2.02E-04	1,620
Ashburton	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Blenheim	422	7.32E-06	1.31	0.488	0.0660	1.82E-04	1,580
Darfield	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dunedin	403	7.31E-06	1.22	0.482	0.0404	1.79E-04	1,460
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Greymouth	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	431	7.28E-06	1.34	0.492	0.0531	1.81E-04	1,700
Nelson	475	8.34E-06	1.47	0.553	0.0643	2.05E-04	1,740
Oamaru	456	8.54E-06	1.38	0.552	0.0660	2.09E-04	1,520
Queenstown	425	7.74E-06	1.31	0.511	0.0489	1.90E-04	1,510
Rolleston	407	7.38E-06	1.25	0.483	0.0640	1.81E-04	1,420
Timaru	404	7.39E-06	1.23	0.487	0.0506	1.81E-04	1,440
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>355</b>	<b>2.35E-07</b>	<b>0.558</b>	<b>0.138</b>	<b>0.0384</b>	<b>1.48E-05</b>	<b>1,730</b>

+ Use of  
Resources



# USE OF RESOURCES

**17.5MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>North Island Average</b>	<b>276</b>	<b>0</b>	<b>276</b>	<b>1,150</b>	<b>0</b>	<b>1,150</b>	<b>2.24</b>	<b>173</b>	<b>0</b>	<b>1.46</b>
Auckland Airport	290	0	290	1,360	0	1,360	2.41	186	0	1.17
Auckland Albany	309	0	309	1,220	0	1,220	2.25	174	0	1.26
Auckland City	280	0	280	1,120	0	1,120	2.12	164	0	1.05
Auckland Henderson	300	0	300	1,150	0	1,150	2.19	169	0	1.08
Auckland Mt Wellington	292	0	292	1,120	0	1,120	2.21	170	0	1.20
Auckland Manukau	305	0	305	1,130	0	1,130	2.26	174	0	1.05
Auckland Pukekohe	304	0	304	1,200	0	1,200	2.39	184	0	1.16
Auckland Silverdale	289	0	289	1,180	0	1,180	2.23	172	0	1.05
Dargaville	284	0	284	1,210	0	1,210	2.26	175	0	2.64
Gisborne	283	0	283	1,090	0	1,090	2.43	187	0	1.32
Hamilton	292	0	292	1,080	0	1,080	2.27	175	0	1.08
Hastings	240	0	240	964	0	964	1.97	152	0	1.58
Hawera	269	0	269	1,290	0	1,290	2.35	181	0	5.56
Kapiti	245	0	245	1,040	0	1,040	2.03	157	0	1.16
Katikati	272	0	272	1,240	0	1,240	2.23	172	0	1.36
Kawerau	331	0	331	1,160	0	1,160	2.44	189	0	2.90
Levin	237	0	237	1,150	0	1,150	2.05	159	0	1.24
Marsden Point	277	0	277	1,140	0	1,140	2.27	175	0	1.52
Mt Maunganui	274	0	274	1,150	0	1,150	2.26	175	0	1.12
Napier	230	0	230	979	0	979	1.86	144	0	0.881
New Plymouth	263	0	263	1,340	0	1,340	2.29	177	0	1.14
Otaki	232	0	232	1,100	0	1,100	2.16	166	0	0.983
Paihia	283	0	283	1,090	0	1,090	2.23	172	0	1.34
Palmerston North	258	0	258	1,100	0	1,100	2.11	163	0	1.47
Rotorua	304	0	304	1,260	0	1,260	2.42	187	0	1.85
Russell	275	0	275	1,160	0	1,160	2.22	171	0	1.85
Stratford	249	0	249	1,250	0	1,250	2.13	165	0	2.49
Taupo	291	0	291	1,320	0	1,320	2.40	185	0	1.39
Te Awamutu	266	0	266	1,090	0	1,090	2.22	171	0	1.04
Te Puke	298	0	298	1,300	0	1,300	2.67	206	0	1.24
Thames	298	0	298	1,120	0	1,120	2.28	176	0	1.27
Tokoroa	294	0	294	1,180	0	1,180	2.39	185	0	6.93
Turangi	262	0	262	1,470	0	1,470	2.21	171	0	1.98
Waiheke Readymix	278	0	278	1,160	0	1,160	2.09	162	0	1.31
Waihi	285	0	285	1,180	0	1,180	2.15	166	0	1.58
Wanganui	241	0	241	1,180	0	1,180	1.98	153	0	1.92
Wellington Aotea Quay	254	0	254	1,070	0	1,070	2.23	172	0	1.14
Wellington Belmont	259	0	259	1,030	0	1,030	2.25	173	0	1.47
Whakatane	274	0	274	1,100	0	1,100	2.43	188	0	2.62
Whangamata	295	0	295	1,290	0	1,290	2.35	182	0	2.13
Whangarei	282	0	282	1,080	0	1,080	2.22	172	0	1.33
Wharehine Mangawhai	278	0	278	1,090	0	1,090	2.10	162	0	1.24
Wharehine Matakana	283	0	283	1,070	0	1,070	2.19	169	0	1.22
Wharehine Wellsford	286	0	286	1,070	0	1,070	2.16	166	0	1.46
Whitianga	275	0	275	1,270	0	1,270	2.14	165	0	1.57

# USE OF RESOURCES

**17.5MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>Based on NZ manufactured Cement Supply</b>										
<b>South Island Average</b>	<b>275</b>	<b>0</b>	<b>275</b>	<b>1,170</b>	<b>0</b>	<b>1,170</b>	<b>2.07</b>	<b>160</b>	<b>0</b>	<b>1.28</b>
Amberley	302	0	302	1,300	0	1,300	2.05	159	0	1.24
Ashburton	236	0	236	1,060	0	1,060	2.04	157	0	0.954
Blenheim	263	0	263	1,020	0	1,020	2.06	159	0	0.961
Chch Bromley	294	0	294	1,200	0	1,200	1.98	153	0	1.17
Chch Canterbury Concrete	304	0	304	1,200	0	1,200	2.09	161	0	1.17
Chch Hornby	307	0	307	1,140	0	1,140	1.99	153	0	1.12
Darfield	299	0	299	1,190	0	1,190	2.00	154	0	0.911
Dunedin	257	0	257	1,310	0	1,310	2.05	158	0	1.05
Edendale	215	0	215	1,460	0	1,460	1.84	142	0	2.32
Fairlie	268	0	268	1,290	0	1,290	2.08	161	0	1.39
Geraldine	292	0	292	1,200	0	1,200	2.08	161	0	1.10
Greymouth	248	0	248	1,050	0	1,050	2.04	158	0	3.76
Hilderthorpe	276	0	276	1,130	0	1,130	2.14	165	0	1.16
Invercargill	247	0	247	1,250	0	1,250	2.03	156	0	1.84
Nelson	266	0	266	1,120	0	1,120	2.22	171	0	1.49
Oamaru	288	0	288	1,170	0	1,170	2.13	164	0	2.04
Queenstown	247	0	247	1,280	0	1,280	2.08	161	0	1.15
Rolleston	234	0	234	1,020	0	1,020	2.02	156	0	0.874
Timaru	253	0	253	1,230	0	1,230	2.09	162	0	1.34
Twizel	281	0	281	1,100	0	1,100	2.07	160	0	1.43
Wanaka	254	0	254	1,300	0	1,300	2.13	165	0	1.26
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>										
<b>South Island Average</b>	<b>136</b>	<b>0</b>	<b>136</b>	<b>979</b>	<b>0</b>	<b>979</b>	<b>69.4</b>	<b>9.07</b>	<b>77.8</b>	<b>1.56</b>
Amberley	175	0	175	1,150	0	1,150	68.2	8.90	76.4	1.46
Ashburton	109	0	109	863	0	863	67.6	8.83	75.8	1.17
Blenheim	136	0	136	885	0	885	68.4	8.94	76.7	1.18
Darfield	175	0	175	1,040	0	1,040	66.3	8.67	74.3	1.13
Dunedin	129	0	129	1,070	0	1,070	68.1	8.90	76.3	1.27
Edendale	100.0	0	100.0	1,190	0	1,190	60.9	7.96	68.3	2.52
Fairlie	139	0	139	1,090	0	1,090	69.1	9.02	77.4	1.62
Geraldine	163	0	163	1,000	0	1,000	69.2	9.04	77.5	1.33
Greymouth	121	0	121	901	0	901	67.7	8.85	75.9	3.98
Hilderthorpe	143	0	143	932	0	932	71.1	9.28	79.6	1.39
Invercargill	120	0	120	950	0	950	67.2	8.78	75.3	2.06
Nelson	129	0	129	981	0	981	73.6	9.61	82.5	1.73
Oamaru	155	0	155	951	0	951	70.7	9.24	79.2	2.27
Queenstown	118	0	118	1,030	0	1,030	69.1	9.03	77.5	1.37
Rolleston	109	0	109	871	0	871	66.9	8.74	75.0	1.09
Timaru	124	0	124	1,030	0	1,030	69.5	9.07	77.8	1.57
Twizel	152	0	152	907	0	907	68.7	8.97	76.9	1.65
Wanaka	121	0	121	986	0	986	70.8	9.25	79.4	1.49
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>233</b>	<b>0</b>	<b>233</b>	<b>1,110</b>	<b>0</b>	<b>1,110</b>	<b>23.9</b>	<b>110</b>	<b>25.2</b>	<b>1.36</b>

# USE OF RESOURCES

20MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>North Island Average</b>	<b>294</b>	<b>0</b>	<b>294</b>	<b>1,200</b>	<b>0</b>	<b>1,200</b>	<b>2.46</b>	<b>190</b>	<b>0</b>	<b>1.32</b>
Auckland Airport	296	0	296	1,400	0	1,400	2.60	200	0	1.20
Auckland Albany	326	0	326	1,300	0	1,300	2.63	203	0	1.32
Auckland City	300	0	300	1,220	0	1,220	2.56	198	0	1.12
Auckland Henderson	316	0	316	1,220	0	1,220	2.54	196	0	1.14
Auckland Mt Wellington	312	0	312	1,220	0	1,220	2.66	205	0	1.27
Auckland Manukau	316	0	316	1,180	0	1,180	2.44	189	0	1.08
Auckland Pukekohe	310	0	310	1,240	0	1,240	2.54	196	0	1.18
Auckland Silverdale	300	0	300	1,230	0	1,230	2.50	193	0	1.09
Dargaville	292	0	292	1,250	0	1,250	2.39	184	0	2.67
Gisborne	280	0	280	1,080	0	1,080	2.40	185	0	1.31
Hamilton	302	0	302	1,130	0	1,130	2.48	192	0	1.12
Hastings	256	0	256	1,040	0	1,040	2.20	169	0	1.62
Hawera	280	0	280	1,340	0	1,340	2.50	193	0	5.59
Kapiti	251	0	251	1,080	0	1,080	2.20	170	0	1.18
Katikati	278	0	278	1,260	0	1,260	2.31	179	0	1.38
Kawerau	340	0	340	1,200	0	1,200	2.56	198	0	2.92
Levin	246	0	246	1,200	0	1,200	2.25	173	0	1.28
Marsden Point	284	0	284	1,170	0	1,170	2.38	184	0	1.54
Mt Maunganui	284	0	284	1,190	0	1,190	2.44	188	0	1.15
Napier	248	0	248	1,050	0	1,050	2.08	160	0	0.930
New Plymouth	268	0	268	1,350	0	1,350	2.43	188	0	1.15
Otaki	235	0	235	1,100	0	1,100	2.11	163	0	0.987
Paihia	293	0	293	1,140	0	1,140	2.40	186	0	1.37
Palmerston North	266	0	266	1,140	0	1,140	2.26	175	0	1.49
Rotorua	309	0	309	1,280	0	1,280	2.52	194	0	1.87
Russell	288	0	288	1,230	0	1,230	2.45	189	0	1.89
Stratford	262	0	262	1,310	0	1,310	2.37	183	0	2.54
Taupo	300	0	300	1,350	0	1,350	2.54	196	0	1.42
Te Awamutu	283	0	283	1,170	0	1,170	2.47	191	0	1.09
Te Puke	294	0	294	1,290	0	1,290	2.64	203	0	1.23
Thames	310	0	310	1,170	0	1,170	2.47	191	0	1.31
Tokoroa	302	0	302	1,220	0	1,220	2.50	193	0	6.96
Turangi	280	0	280	1,550	0	1,550	2.50	193	0	2.03
Waiheke Readymix	298	0	298	1,250	0	1,250	2.49	192	0	1.38
Waihi	296	0	296	1,230	0	1,230	2.32	179	0	1.61
Wanganui	245	0	245	1,200	0	1,200	2.04	157	0	1.93
Wellington Aotea Quay	262	0	262	1,120	0	1,120	2.42	187	0	1.17
Wellington Belmont	267	0	267	1,070	0	1,070	2.39	184	0	1.50
Whakatane	287	0	287	1,160	0	1,160	2.64	204	0	2.66
Whangamata	299	0	299	1,310	0	1,310	2.49	192	0	2.15
Whangarei	297	0	297	1,150	0	1,150	2.48	192	0	1.38
Wharehine Mangawhai	294	0	294	1,160	0	1,160	2.38	184	0	1.30
Wharehine Matakana	303	0	303	1,150	0	1,150	2.50	193	0	1.28
Wharehine Wellsford	304	0	304	1,150	0	1,150	2.42	187	0	1.51
Whitianga	290	0	290	1,340	0	1,340	2.38	184	0	1.62

# USE OF RESOURCES

20MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>Based on NZ manufactured Cement Supply</b>										
South Island Average	284	0	284	1,220	0	1,220	2.18	168	0	1.24
Amberley	307	0	307	1,320	0	1,320	2.12	164	0	1.26
Ashburton	239	0	239	1,080	0	1,080	2.11	163	0	0.965
Blenheim	269	0	269	1,050	0	1,050	2.15	166	0	0.979
Chch Bromley	308	0	308	1,270	0	1,270	2.19	169	0	1.21
Chch Canterbury Concrete	312	0	312	1,240	0	1,240	2.20	170	0	1.19
Chch Hornby	317	0	317	1,190	0	1,190	2.14	165	0	1.15
Darfield	287	0	287	1,180	0	1,180	2.11	163	0	0.894
Dunedin	261	0	261	1,360	0	1,360	2.22	171	0	1.06
Edendale	244	0	244	1,610	0	1,610	2.13	164	0	2.40
Fairlie	271	0	271	1,310	0	1,310	2.15	166	0	1.40
Geraldine	294	0	294	1,220	0	1,220	2.15	166	0	1.11
Greymouth	251	0	251	1,060	0	1,060	2.09	162	0	3.77
Hilderthorpe	282	0	282	1,170	0	1,170	2.26	175	0	1.18
Invercargill	251	0	251	1,270	0	1,270	2.09	162	0	1.86
Nelson	279	0	279	1,190	0	1,190	2.42	187	0	1.53
Oamaru	292	0	292	1,200	0	1,200	2.22	172	0	2.05
Queenstown	252	0	252	1,310	0	1,310	2.16	167	0	1.16
Rolleston	239	0	239	1,060	0	1,060	2.13	164	0	0.892
Timaru	264	0	264	1,290	0	1,290	2.28	176	0	1.38
Twizel	286	0	286	1,130	0	1,130	2.17	168	0	1.44
Wanaka	254	0	254	1,300	0	1,300	2.13	165	0	1.26
Westport	255	0	255	1,710	0	1,710	2.27	175	0	39.2
<b>Based on Imported Cement Supply</b>										
South Island Average	128	0	128	1,000	0	1,000	72.5	9.48	81.3	1.52
Amberley	175	0	175	1,170	0	1,170	70.5	9.21	79.0	1.48
Ashburton	108	0	108	877	0	877	70.0	9.14	78.4	1.19
Blenheim	137	0	137	908	0	908	71.2	9.30	79.8	1.21
Darfield	156	0	156	1,020	0	1,020	70.1	9.16	78.6	1.12
Dunedin	123	0	123	1,090	0	1,090	73.7	9.62	82.6	1.30
Edendale	111	0	111	1,290	0	1,290	70.6	9.22	79.1	2.63
Fairlie	138	0	138	1,110	0	1,110	71.3	9.32	79.9	1.63
Geraldine	161	0	161	1,020	0	1,020	71.4	9.33	80.0	1.34
Greymouth	121	0	121	914	0	914	69.5	9.08	77.9	3.99
Hilderthorpe	142	0	142	959	0	959	75.2	9.82	84.2	1.42
Invercargill	121	0	121	967	0	967	69.5	9.08	77.9	2.08
Nelson	129	0	129	1,030	0	1,030	80.2	10.5	89.9	1.79
Oamaru	154	0	154	970	0	970	73.8	9.64	82.7	2.29
Queenstown	118	0	118	1,040	0	1,040	71.7	9.36	80.3	1.40
Rolleston	107	0	107	895	0	895	70.7	9.24	79.3	1.12
Timaru	122	0	122	1,070	0	1,070	75.7	9.88	84.8	1.62
Twizel	151	0	151	928	0	928	72.1	9.41	80.7	1.68
Wanaka	121	0	121	987	0	987	70.8	9.25	79.4	1.49
Westport	115	0	115	1,540	0	1,540	75.3	9.84	84.4	39.5
<b>South Island Average, 2019 Production</b>	<b>254</b>	<b>0</b>	<b>254</b>	<b>1,170</b>	<b>0</b>	<b>1,170</b>	<b>17.8</b>	<b>133</b>	<b>18.0</b>	<b>1.30</b>

# USE OF RESOURCES

**25MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>North Island Average</b>	<b>318</b>	<b>0</b>	<b>318</b>	<b>1,290</b>	<b>0</b>	<b>1,290</b>	<b>2.77</b>	<b>214</b>	<b>0</b>	<b>1.42</b>
Auckland Airport	322	0	322	1,510	0	1,510	2.98	230	0	1.28
Auckland Albany	345	0	345	1,380	0	1,380	2.93	226	0	1.38
Auckland City	321	0	321	1,300	0	1,300	2.84	220	0	1.18
Auckland Henderson	341	0	341	1,330	0	1,330	2.90	224	0	1.21
Auckland Mt Wellington	336	0	336	1,320	0	1,320	3.00	231	0	1.34
Auckland Manukau	335	0	335	1,260	0	1,260	2.71	209	0	1.14
Auckland Pukekohe	335	0	335	1,350	0	1,350	2.91	225	0	1.26
Auckland Silverdale	326	0	326	1,340	0	1,340	2.85	220	0	1.17
Dargaville	313	0	313	1,330	0	1,330	2.68	207	0	2.73
Gisborne	295	0	295	1,150	0	1,150	2.60	200	0	1.35
Hamilton	326	0	326	1,230	0	1,230	2.83	218	0	1.19
Hastings	264	0	264	1,070	0	1,070	2.28	176	0	1.65
Hawera	304	0	304	1,450	0	1,450	2.82	217	0	5.66
Kapiti	268	0	268	1,170	0	1,170	2.48	192	0	1.23
Katikati	296	0	296	1,340	0	1,340	2.58	199	0	1.43
Kawerau	357	0	357	1,270	0	1,270	2.80	216	0	2.97
Levin	268	0	268	1,300	0	1,300	2.52	194	0	1.34
Marsden Point	307	0	307	1,280	0	1,280	2.75	212	0	1.61
Mt Maunganui	302	0	302	1,270	0	1,270	2.68	207	0	1.20
Napier	269	0	269	1,150	0	1,150	2.36	182	0	0.992
New Plymouth	291	0	291	1,460	0	1,460	2.74	211	0	1.22
Otaki	261	0	261	1,240	0	1,240	2.55	196	0	1.07
Paihia	313	0	313	1,230	0	1,230	2.70	209	0	1.43
Palmerston North	282	0	282	1,210	0	1,210	2.48	191	0	1.54
Rotorua	327	0	327	1,350	0	1,350	2.71	209	0	1.92
Russell	300	0	300	1,270	0	1,270	2.61	202	0	1.92
Stratford	427	0	427	1,610	0	1,610	2.70	208	0	2.83
Taupo	318	0	318	1,430	0	1,430	2.79	216	0	1.47
Te Awamutu	303	0	303	1,250	0	1,250	2.71	209	0	1.15
Te Puke	316	0	316	1,380	0	1,380	2.93	226	0	1.29
Thames	334	0	334	1,270	0	1,270	2.79	215	0	1.38
Tokoroa	323	0	323	1,300	0	1,300	2.78	215	0	7.02
Turangi	298	0	298	1,620	0	1,620	2.74	211	0	2.09
Waiheke Readymix	322	0	322	1,350	0	1,350	2.86	221	0	1.45
Waihi	327	0	327	1,350	0	1,350	2.74	211	0	1.70
Wanganui	267	0	267	1,290	0	1,290	2.33	180	0	2.00
Wellington Aotea Quay	286	0	286	1,230	0	1,230	2.73	210	0	1.23
Wellington Belmont	288	0	288	1,170	0	1,170	2.67	206	0	1.56
Whakatane	298	0	298	1,210	0	1,210	2.78	214	0	2.69
Whangamata	323	0	323	1,410	0	1,410	2.77	214	0	2.22
Whangarei	314	0	314	1,220	0	1,220	2.73	211	0	1.43
Wharehine Mangawhai	314	0	314	1,250	0	1,250	2.67	206	0	1.35
Wharehine Matakana	320	0	320	1,230	0	1,230	2.75	212	0	1.33
Wharehine Wellsford	320	0	320	1,210	0	1,210	2.63	203	0	1.56
Whitianga	315	0	315	1,440	0	1,440	2.70	209	0	1.69

# USE OF RESOURCES

25MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>Based on NZ manufactured Cement Supply</b>										
<b>South Island Average</b>	<b>295</b>	<b>0</b>	<b>295</b>	<b>1,330</b>	<b>0</b>	<b>1,330</b>	<b>2.42</b>	<b>186</b>	<b>0</b>	<b>1.39</b>
Amberley	323	0	323	1,400	0	1,400	2.37	183	0	1.30
Ashburton	260	0	260	1,180	0	1,180	2.38	184	0	1.03
Blenheim	288	0	288	1,130	0	1,130	2.40	185	0	1.03
Chch Bromley	322	0	322	1,340	0	1,340	2.39	184	0	1.26
Chch Canterbury Concrete	325	0	325	1,300	0	1,300	2.40	185	0	1.23
Chch Hornby	317	0	317	1,220	0	1,220	2.35	181	0	1.16
Darfield	322	0	322	1,310	0	1,310	2.31	178	0	0.979
Dunedin	283	0	283	1,470	0	1,470	2.51	194	0	1.13
Edendale	264	0	264	1,720	0	1,720	2.39	184	0	2.46
Fairlie	290	0	290	1,400	0	1,400	2.40	186	0	1.46
Geraldine	311	0	311	1,300	0	1,300	2.38	184	0	1.16
Greymouth	272	0	272	1,160	0	1,160	2.38	183	0	3.83
Hilderthorpe	304	0	304	1,290	0	1,290	2.61	201	0	1.24
Invercargill	271	0	271	1,380	0	1,380	2.35	181	0	1.91
Nelson	296	0	296	1,270	0	1,270	2.66	205	0	1.58
Oamaru	317	0	317	1,330	0	1,330	2.57	198	0	2.12
Queenstown	272	0	272	1,410	0	1,410	2.42	187	0	1.22
Rolleston	257	0	257	1,140	0	1,140	2.36	182	0	0.944
Timaru	277	0	277	1,350	0	1,350	2.45	189	0	1.41
Twizel	299	0	299	1,200	0	1,200	2.34	181	0	1.48
Wanaka	278	0	278	1,430	0	1,430	2.43	188	0	1.33
Westport	265	0	265	1,760	0	1,760	2.42	187	0	39.3
<b>Based on Imported Cement Supply</b>										
<b>South Island Average</b>	<b>131</b>	<b>0</b>	<b>131</b>	<b>1,090</b>	<b>0</b>	<b>1,090</b>	<b>81.0</b>	<b>10.6</b>	<b>90.7</b>	<b>1.75</b>
Amberley	177	0	177	1,230	0	1,230	78.6	10.3	88.1	1.56
Ashburton	112	0	112	956	0	956	79.1	10.3	88.6	1.28
Blenheim	140	0	140	979	0	979	79.5	10.4	89.1	1.29
Darfield	179	0	179	1,130	0	1,130	76.7	10.00	85.9	1.23
Dunedin	127	0	127	1,170	0	1,170	83.3	10.9	93.4	1.40
Edendale	115	0	115	1,370	0	1,370	79.2	10.3	88.8	2.71
Fairlie	141	0	141	1,170	0	1,170	79.8	10.4	89.4	1.72
Geraldine	163	0	163	1,080	0	1,080	79.1	10.3	88.7	1.42
Greymouth	125	0	125	993	0	993	78.9	10.3	88.4	4.08
Hilderthorpe	142	0	142	1,050	0	1,050	86.5	11.3	96.9	1.52
Invercargill	125	0	125	1,040	0	1,040	77.9	10.2	87.3	2.16
Nelson	131	0	131	1,100	0	1,100	88.3	11.5	99.0	1.87
Oamaru	157	0	157	1,060	0	1,060	85.3	11.1	95.6	2.40
Queenstown	121	0	121	1,120	0	1,120	80.4	10.5	90.1	1.48
Rolleston	111	0	111	962	0	962	78.3	10.2	87.7	1.20
Timaru	125	0	125	1,120	0	1,120	81.4	10.6	91.2	1.68
Twizel	154	0	154	977	0	977	77.7	10.2	87.1	1.73
Wanaka	126	0	126	1,070	0	1,070	80.8	10.5	90.5	1.59
Westport	115	0	115	1,580	0	1,580	80.4	10.5	90.1	39.5
<b>South Island Average, 2019 Production</b>	<b>236</b>	<b>0</b>	<b>236</b>	<b>1,210</b>	<b>0</b>	<b>1,210</b>	<b>33.4</b>	<b>116</b>	<b>35.8</b>	<b>1.49</b>

# USE OF RESOURCES

30MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>North Island Average</b>	<b>336</b>	<b>0</b>	<b>336</b>	<b>1,360</b>	<b>0</b>	<b>1,360</b>	<b>2.95</b>	<b>228</b>	<b>0</b>	<b>1.43</b>
Auckland Airport	335	0	335	1,550	0	1,550	3.01	232	0	1.29
Auckland Albany	358	0	358	1,430	0	1,430	3.00	231	0	1.41
Auckland City	331	0	331	1,340	0	1,340	2.84	219	0	1.20
Auckland Henderson	353	0	353	1,370	0	1,370	2.97	230	0	1.24
Auckland Mt Wellington	345	0	345	1,350	0	1,350	2.99	231	0	1.36
Auckland Manukau	360	0	360	1,360	0	1,360	3.03	234	0	1.21
Auckland Pukekohe	351	0	351	1,410	0	1,410	3.02	233	0	1.30
Auckland Silverdale	356	0	356	1,460	0	1,460	3.18	246	0	1.25
Dargaville	334	0	334	1,410	0	1,410	2.95	228	0	2.79
Gisborne	312	0	312	1,230	0	1,230	2.83	218	0	1.41
Hamilton	347	0	347	1,310	0	1,310	3.11	240	0	1.25
Hastings	280	0	280	1,140	0	1,140	2.49	192	0	1.69
Hawera	324	0	324	1,540	0	1,540	3.07	237	0	5.72
Kapiti	288	0	288	1,260	0	1,260	2.73	211	0	1.29
Katikati	318	0	318	1,430	0	1,430	2.87	221	0	1.50
Kawerau	379	0	379	1,360	0	1,360	3.10	239	0	3.04
Levin	284	0	284	1,370	0	1,370	2.72	210	0	1.38
Marsden Point	319	0	319	1,320	0	1,320	2.85	220	0	1.64
Mt Maunganui	325	0	325	1,370	0	1,370	2.99	231	0	1.27
Napier	277	0	277	1,180	0	1,180	2.45	189	0	1.01
New Plymouth	309	0	309	1,540	0	1,540	2.96	229	0	1.27
Otaki	288	0	288	1,340	0	1,340	2.77	213	0	1.14
Paihia	329	0	329	1,290	0	1,290	2.89	223	0	1.47
Palmerston North	306	0	306	1,330	0	1,330	2.79	215	0	1.61
Rotorua	355	0	355	1,460	0	1,460	3.06	236	0	2.00
Russell	324	0	324	1,380	0	1,380	2.99	231	0	2.00
Stratford	307	0	307	1,510	0	1,510	2.94	227	0	2.66
Taupo	344	0	344	1,540	0	1,540	3.12	241	0	1.54
Te Awamutu	335	0	335	1,380	0	1,380	3.14	243	0	1.24
Te Puke	370	0	370	1,510	0	1,510	3.20	247	0	1.40
Thames	356	0	356	1,360	0	1,360	3.10	239	0	1.44
Tokoroa	333	0	333	1,350	0	1,350	2.91	224	0	7.05
Turangi	318	0	318	1,710	0	1,710	3.01	232	0	2.14
Waiheke Readymix	403	0	403	1,490	0	1,490	2.94	227	0	1.59
Waihi	350	0	350	1,450	0	1,450	3.05	235	0	1.77
Wanganui	288	0	288	1,380	0	1,380	2.61	201	0	2.06
Wellington Aotea Quay	305	0	305	1,310	0	1,310	2.94	227	0	1.29
Wellington Belmont	309	0	309	1,260	0	1,260	2.93	226	0	1.62
Whakatane	325	0	325	1,320	0	1,320	3.13	242	0	2.77
Whangamata	344	0	344	1,490	0	1,490	3.04	235	0	2.28
Whangarei	336	0	336	1,300	0	1,300	2.98	230	0	1.49
Wharehine Mangawhai	336	0	336	1,340	0	1,340	2.99	231	0	1.42
Wharehine Matakana	334	0	334	1,280	0	1,280	2.91	225	0	1.37
Wharehine Wellsford	337	0	337	1,280	0	1,280	2.90	224	0	1.61
Whitianga	326	0	326	1,490	0	1,490	2.89	223	0	1.72

# USE OF RESOURCES

**30MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>Based on NZ manufactured Cement Supply</b>										
<b>South Island Average</b>	<b>325</b>	<b>0</b>	<b>325</b>	<b>1,400</b>	<b>0</b>	<b>1,400</b>	<b>2.68</b>	<b>207</b>	<b>0</b>	<b>1.44</b>
Amberley	343	0	343	1,500	0	1,500	2.63	203	0	1.36
Ashburton	311	0	311	1,270	0	1,270	2.46	190	0	1.12
Blenheim	314	0	314	1,250	0	1,250	2.73	211	0	1.11
Chch Bromley	339	0	339	1,420	0	1,420	2.61	202	0	1.31
Chch Canterbury Concrete	343	0	343	1,390	0	1,390	2.63	203	0	1.28
Chch Hornby	352	0	352	1,360	0	1,360	2.63	203	0	1.25
Darfield	344	0	344	1,410	0	1,410	2.61	201	0	1.05
Dunedin	305	0	305	1,590	0	1,590	2.79	215	0	1.19
Edendale	290	0	290	1,860	0	1,860	2.71	209	0	2.53
Fairlie	308	0	308	1,480	0	1,480	2.61	201	0	1.51
Geraldine	329	0	329	1,380	0	1,380	2.57	198	0	1.21
Greymouth	294	0	294	1,270	0	1,270	2.65	204	0	3.89
Hilderthorpe	334	0	334	1,440	0	1,440	3.01	233	0	1.33
Invercargill	296	0	296	1,530	0	1,530	2.68	207	0	1.98
Nelson	324	0	324	1,390	0	1,390	3.01	232	0	1.66
Oamaru	348	0	348	1,490	0	1,490	2.98	230	0	2.21
Queenstown	296	0	296	1,540	0	1,540	2.75	213	0	1.29
Rolleston	279	0	279	1,240	0	1,240	2.63	203	0	1.000
Timaru	291	0	291	1,410	0	1,410	2.59	200	0	1.45
Twizel	324	0	324	1,320	0	1,320	2.64	203	0	1.55
Wanaka	309	0	309	1,600	0	1,600	2.82	218	0	1.41
Westport	291	0	291	1,880	0	1,880	2.76	213	0	39.3
<b>Based on Imported Cement Supply</b>										
<b>South Island Average</b>	<b>137</b>	<b>0</b>	<b>137</b>	<b>1,150</b>	<b>0</b>	<b>1,150</b>	<b>90.3</b>	<b>11.8</b>	<b>101</b>	<b>1.87</b>
Amberley	180	0	180	1,310	0	1,310	87.3	11.4	97.8	1.64
Ashburton	159	0	159	1,040	0	1,040	81.5	10.6	91.3	1.38
Blenheim	146	0	146	1,080	0	1,080	90.5	11.8	101	1.40
Darfield	183	0	183	1,210	0	1,210	86.5	11.3	96.9	1.33
Dunedin	131	0	131	1,250	0	1,250	92.5	12.1	104	1.49
Edendale	122	0	122	1,460	0	1,460	89.9	11.7	101	2.82
Fairlie	146	0	146	1,230	0	1,230	86.6	11.3	97.1	1.79
Geraldine	170	0	170	1,130	0	1,130	85.3	11.1	95.6	1.49
Greymouth	130	0	130	1,080	0	1,080	87.9	11.5	98.5	4.17
Hilderthorpe	147	0	147	1,160	0	1,160	100.0	13.1	112	1.65
Invercargill	129	0	129	1,130	0	1,130	89.0	11.6	99.7	2.27
Nelson	137	0	137	1,200	0	1,200	99.9	13.1	112	1.98
Oamaru	162	0	162	1,180	0	1,180	99.1	12.9	111	2.53
Queenstown	125	0	125	1,210	0	1,210	91.4	11.9	102	1.59
Rolleston	116	0	116	1,040	0	1,040	87.2	11.4	97.7	1.29
Timaru	130	0	130	1,170	0	1,170	85.9	11.2	96.3	1.73
Twizel	161	0	161	1,070	0	1,070	87.5	11.4	98.0	1.83
Wanaka	133	0	133	1,190	0	1,190	93.5	12.2	105	1.72
Westport	121	0	121	1,670	0	1,670	91.5	12.0	103	39.6
<b>South Island Average, 2019 Production</b>	<b>284</b>	<b>0</b>	<b>284</b>	<b>1,330</b>	<b>0</b>	<b>1,330</b>	<b>23.5</b>	<b>160</b>	<b>24.0</b>	<b>1.50</b>

# USE OF RESOURCES

**35MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>North Island Average</b>	<b>359</b>	<b>0</b>	<b>359</b>	<b>1,450</b>	<b>0</b>	<b>1,450</b>	<b>3.19</b>	<b>246</b>	<b>0</b>	<b>1.44</b>
Auckland Airport	362	0	362	1,660	0	1,660	3.36	259	0	1.37
Auckland Albany	380	0	380	1,520	0	1,520	3.26	252	0	1.47
Auckland City	347	0	347	1,400	0	1,400	3.01	233	0	1.24
Auckland Henderson	433	0	433	1,540	0	1,540	3.25	251	0	1.40
Auckland Mt Wellington	366	0	366	1,420	0	1,420	3.16	244	0	1.41
Auckland Manukau	376	0	376	1,420	0	1,420	3.20	247	0	1.25
Auckland Pukekohe	375	0	375	1,500	0	1,500	3.31	256	0	1.36
Auckland Silverdale	364	0	364	1,490	0	1,490	3.23	249	0	1.27
Dargaville	353	0	353	1,490	0	1,490	3.20	247	0	2.84
Gisborne	322	0	322	1,270	0	1,270	2.97	229	0	1.44
Hamilton	361	0	361	1,370	0	1,370	3.23	249	0	1.29
Hastings	300	0	300	1,230	0	1,230	2.76	213	0	1.75
Hawera	332	0	332	1,570	0	1,570	3.19	246	0	5.74
Kapiti	317	0	317	1,400	0	1,400	3.19	246	0	1.38
Katikati	353	0	353	1,580	0	1,580	3.33	257	0	1.60
Kawerau	408	0	408	1,480	0	1,480	3.45	267	0	3.12
Levin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Marsden Point	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mt Maunganui	347	0	347	1,460	0	1,460	3.26	252	0	1.33
Napier	301	0	301	1,290	0	1,290	2.78	215	0	1.08
New Plymouth	334	0	334	1,650	0	1,650	3.30	255	0	1.35
Otaki	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Paihia	357	0	357	1,410	0	1,410	3.31	255	0	1.56
Palmerston North	319	0	319	1,380	0	1,380	2.95	227	0	1.64
Rotorua	371	0	371	1,540	0	1,540	3.16	244	0	2.04
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	327	0	327	1,600	0	1,600	3.20	247	0	2.72
Taupo	357	0	357	1,600	0	1,600	3.24	250	0	1.58
Te Awamutu	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Puke	352	0	352	1,530	0	1,530	3.43	265	0	1.40
Thames	387	0	387	1,490	0	1,490	3.52	272	0	1.53
Tokoroa	360	0	360	1,460	0	1,460	3.24	250	0	7.12
Turangi	349	0	349	1,840	0	1,840	3.38	261	0	2.23
Waiheke Readymix	378	0	378	1,580	0	1,580	3.48	269	0	1.61
Waihi	367	0	367	1,520	0	1,520	3.22	248	0	1.81
Wanganui	306	0	306	1,470	0	1,470	2.84	219	0	2.11
Wellington Aotea Quay	330	0	330	1,420	0	1,420	3.27	253	0	1.36
Wellington Belmont	338	0	338	1,390	0	1,390	3.26	252	0	1.70
Whakatane	352	0	352	1,430	0	1,430	3.42	264	0	2.84
Whangamata	366	0	366	1,580	0	1,580	3.27	252	0	2.34
Whangarei	368	0	368	1,420	0	1,420	3.37	260	0	1.58
Wharehine Mangawhai	377	0	377	1,500	0	1,500	3.54	273	0	1.54
Wharehine Matakana	364	0	364	1,400	0	1,400	3.30	255	0	1.46
Wharehine Wellsford	366	0	366	1,410	0	1,410	3.31	256	0	1.70
Whitianga	372	0	372	1,680	0	1,680	3.46	267	0	1.85

# USE OF RESOURCES

**35MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>Based on NZ manufactured Cement Supply</b>										
<b>South Island Average</b>	<b>340</b>	<b>0</b>	<b>340</b>	<b>1,430</b>	<b>0</b>	<b>1,430</b>	<b>2.89</b>	<b>223</b>	<b>0</b>	<b>1.29</b>
Amberley	381	0	381	1,680	0	1,680	3.15	243	0	1.47
Ashburton	289	0	289	1,340	0	1,340	2.82	218	0	1.11
Blenheim	340	0	340	1,370	0	1,370	3.06	236	0	1.18
Chch Bromley	353	0	353	1,480	0	1,480	2.78	214	0	1.34
Chch Canterbury Concrete	366	0	366	1,500	0	1,500	2.92	226	0	1.35
Chch Hornby	364	0	364	1,410	0	1,410	2.75	213	0	1.28
Darfield	365	0	365	1,510	0	1,510	2.87	221	0	1.10
Dunedin	324	0	324	1,690	0	1,690	3.05	236	0	1.25
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	329	0	329	1,580	0	1,580	2.87	221	0	1.57
Geraldine	344	0	344	1,470	0	1,470	2.80	217	0	1.25
Greymouth	320	0	320	1,400	0	1,400	3.05	236	0	3.97
Hilderthorpe	347	0	347	1,500	0	1,500	3.15	243	0	1.37
Invercargill	326	0	326	1,720	0	1,720	3.19	246	0	2.08
Nelson	346	0	346	1,500	0	1,500	3.33	257	0	1.72
Oamaru	373	0	373	1,620	0	1,620	3.29	254	0	2.28
Queenstown	330	0	330	1,720	0	1,720	3.21	248	0	1.39
Rolleston	305	0	305	1,360	0	1,360	2.93	227	0	1.08
Timaru	326	0	326	1,630	0	1,630	3.23	249	0	1.56
Twizel	359	0	359	1,500	0	1,500	3.10	239	0	1.65
Wanaka	584	0	584	2,200	0	2,200	3.52	271	0	1.92
Westport	319	0	319	2,010	0	2,010	3.07	237	0	39.4
<b>Based on Imported Cement Supply</b>										
<b>South Island Average</b>	<b>128</b>	<b>0</b>	<b>128</b>	<b>1,170</b>	<b>0</b>	<b>1,170</b>	<b>99.2</b>	<b>13.0</b>	<b>111</b>	<b>1.58</b>
Amberley	187	0	187	1,450	0	1,450	104	13.6	117	1.81
Ashburton	114	0	114	1,070	0	1,070	93.6	12.2	105	1.42
Blenheim	150	0	150	1,170	0	1,170	102	13.3	114	1.51
Darfield	187	0	187	1,290	0	1,290	95.2	12.4	107	1.41
Dunedin	134	0	134	1,330	0	1,330	101	13.2	114	1.58
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	151	0	151	1,310	0	1,310	95.2	12.4	107	1.87
Geraldine	170	0	170	1,200	0	1,200	93.1	12.2	104	1.56
Greymouth	131	0	131	1,180	0	1,180	101	13.2	114	4.30
Hilderthorpe	152	0	152	1,200	0	1,200	104	13.6	117	1.70
Invercargill	127	0	127	1,250	0	1,250	106	13.8	119	2.42
Nelson	140	0	140	1,280	0	1,280	111	14.4	124	2.08
Oamaru	168	0	168	1,270	0	1,270	109	14.3	122	2.64
Queenstown	130	0	130	1,340	0	1,340	107	13.9	119	1.73
Rolleston	123	0	123	1,140	0	1,140	97.4	12.7	109	1.39
Timaru	126	0	126	1,320	0	1,320	107	14.0	120	1.91
Twizel	167	0	167	1,200	0	1,200	103	13.4	115	1.98
Wanaka	365	0	365	1,690	0	1,690	117	15.2	131	2.30
Westport	128	0	128	1,780	0	1,780	102	13.3	114	39.7
<b>South Island Average, 2019 Production</b>	<b>320</b>	<b>0</b>	<b>320</b>	<b>1,400</b>	<b>0</b>	<b>1,400</b>	<b>13.2</b>	<b>200</b>	<b>11.9</b>	<b>1.32</b>

# USE OF RESOURCES

40MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>North Island Average</b>	<b>375</b>	<b>0</b>	<b>375</b>	<b>1,550</b>	<b>0</b>	<b>1,550</b>	<b>14.0</b>	<b>270</b>	<b>0</b>	<b>1.50</b>
Auckland Airport	375	0	375	1,710	0	1,710	3.54	273	0	1.41
Auckland Albany	404	0	404	1,620	0	1,620	3.57	276	0	1.54
Auckland City	376	0	376	1,530	0	1,530	26.9	268	0	1.33
Auckland Henderson	394	0	394	1,540	0	1,540	3.49	269	0	1.36
Auckland Mt Wellington	388	0	388	1,520	0	1,520	3.51	271	0	1.48
Auckland Manukau	408	0	408	1,560	0	1,560	3.65	282	0	1.35
Auckland Pukekohe	410	0	410	1,650	0	1,650	3.83	295	0	1.47
Auckland Silverdale	336	0	336	1,390	0	1,390	113	225	0	1.19
Dargaville	379	0	379	1,600	0	1,600	3.56	275	0	2.92
Gisborne	375	0	375	1,450	0	1,450	3.42	264	0	1.56
Hamilton	392	0	392	1,500	0	1,500	3.71	286	0	1.38
Hastings	346	0	346	1,420	0	1,420	3.26	251	0	1.87
Hawera	364	0	364	1,710	0	1,710	3.56	275	0	5.83
Kapiti	342	0	342	1,510	0	1,510	34.2	256	0	1.44
Katikati	386	0	386	1,720	0	1,720	3.77	291	0	1.69
Kawerau	434	0	434	1,590	0	1,590	3.75	289	0	3.19
Levin	327	0	327	1,590	0	1,590	35.6	252	0	1.50
Marsden Point	374	0	374	1,530	0	1,530	3.52	271	0	1.79
Mt Maunganui	369	0	369	1,550	0	1,550	3.52	271	0	1.39
Napier	348	0	348	1,490	0	1,490	3.32	256	0	1.21
New Plymouth	371	0	371	1,820	0	1,820	3.70	286	0	1.45
Otaki	328	0	328	1,550	0	1,550	38.3	253	0	1.25
Paihia	372	0	372	1,470	0	1,470	3.46	267	0	1.60
Palmerston North	357	0	357	1,560	0	1,560	3.42	264	0	1.75
Rotorua	393	0	393	1,620	0	1,620	3.52	272	0	2.10
Russell	370	0	370	1,570	0	1,570	3.59	277	0	2.13
Stratford	360	0	360	1,750	0	1,750	3.62	279	0	2.81
Taupo	388	0	388	1,730	0	1,730	3.69	285	0	1.67
Te Awamutu	369	0	369	1,520	0	1,520	3.56	275	0	1.34
Te Puke	381	0	381	1,660	0	1,660	3.83	295	0	1.48
Thames	404	0	404	1,550	0	1,550	3.70	286	0	1.58
Tokoroa	517	0	517	1,740	0	1,740	3.61	279	0	7.41
Turangi	376	0	376	1,940	0	1,940	3.71	287	0	2.31
Waiheke Readymix	428	0	428	1,660	0	1,660	3.54	274	0	1.69
Waihi	398	0	398	1,660	0	1,660	3.70	285	0	1.90
Wanganui	343	0	343	1,630	0	1,630	3.33	257	0	2.21
Wellington Aotea Quay	351	0	351	1,530	0	1,530	18.2	272	0	1.42
Wellington Belmont	349	0	349	1,460	0	1,460	20.7	266	0	1.73
Whakatane	373	0	373	1,520	0	1,520	3.73	288	0	2.91
Whangamata	395	0	395	1,710	0	1,710	3.73	288	0	2.43
Whangarei	376	0	376	1,450	0	1,450	3.43	265	0	1.60
Wharehine Mangawhai	383	0	383	1,530	0	1,530	3.56	275	0	1.55
Wharehine Matakana	380	0	380	1,470	0	1,470	3.51	271	0	1.50
Wharehine Wellsford	393	0	393	1,510	0	1,510	3.66	283	0	1.78
Whitianga	383	0	383	1,730	0	1,730	3.62	279	0	1.89

# USE OF RESOURCES

40MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>Based on NZ manufactured Cement Supply</b>										
<b>South Island Average</b>	<b>362</b>	<b>0</b>	<b>362</b>	<b>1,540</b>	<b>0</b>	<b>1,540</b>	<b>3.14</b>	<b>242</b>	<b>0</b>	<b>1.37</b>
Amberley	402	0	402	1,770	0	1,770	3.44	265	0	1.53
Ashburton	326	0	326	1,500	0	1,500	3.20	247	0	1.21
Blenheim	430	0	430	1,520	0	1,520	3.18	245	0	1.34
Chch Bromley	374	0	374	1,580	0	1,580	3.06	236	0	1.40
Chch Canterbury Concrete	385	0	385	1,590	0	1,590	3.20	247	0	1.41
Chch Hornby	380	0	380	1,500	0	1,500	3.00	231	0	1.33
Darfield	368	0	368	1,570	0	1,570	3.23	249	0	1.13
Dunedin	360	0	360	1,880	0	1,880	3.51	271	0	1.36
Edendale	344	0	344	2,170	0	2,170	3.42	264	0	2.68
Fairlie	351	0	351	1,690	0	1,690	3.15	243	0	1.63
Geraldine	371	0	371	1,590	0	1,590	3.15	243	0	1.33
Greymouth	347	0	347	1,520	0	1,520	3.36	259	0	4.04
Hilderthorpe	388	0	388	1,710	0	1,710	3.69	285	0	1.48
Invercargill	353	0	353	1,850	0	1,850	3.42	264	0	2.15
Nelson	401	0	401	1,770	0	1,770	4.23	327	0	1.89
Oamaru	404	0	404	1,760	0	1,760	3.63	280	0	2.37
Queenstown	354	0	354	1,850	0	1,850	3.51	271	0	1.46
Rolleston	323	0	323	1,450	0	1,450	3.20	247	0	1.13
Timaru	348	0	348	1,700	0	1,700	3.37	260	0	1.62
Twizel	385	0	385	1,630	0	1,630	3.47	268	0	1.73
Wanaka	365	0	365	1,930	0	1,930	3.57	276	0	1.58
Westport	345	0	345	2,120	0	2,120	3.35	259	0	39.5
<b>Based on Imported Cement Supply</b>										
<b>South Island Average</b>	<b>132</b>	<b>0</b>	<b>132</b>	<b>1,280</b>	<b>0</b>	<b>1,280</b>	<b>110</b>	<b>14.4</b>	<b>123</b>	<b>1.73</b>
Amberley	189	0	189	1,530	0	1,530	114	14.9	128	1.90
Ashburton	128	0	128	1,200	0	1,200	106	13.9	119	1.56
Blenheim	234	0	234	1,310	0	1,310	105	13.8	118	1.68
Darfield	169	0	169	1,330	0	1,330	107	14.0	120	1.48
Dunedin	142	0	142	1,460	0	1,460	117	15.2	131	1.73
Edendale	131	0	131	1,670	0	1,670	114	14.8	127	3.05
Fairlie	156	0	156	1,390	0	1,390	104	13.6	117	1.97
Geraldine	175	0	175	1,300	0	1,300	105	13.7	117	1.67
Greymouth	140	0	140	1,280	0	1,280	111	14.5	125	4.40
Hilderthorpe	159	0	159	1,360	0	1,360	122	16.0	137	1.88
Invercargill	140	0	140	1,340	0	1,340	113	14.8	127	2.51
Nelson	139	0	139	1,500	0	1,500	141	18.4	157	2.35
Oamaru	178	0	178	1,380	0	1,380	121	15.8	135	2.76
Queenstown	136	0	136	1,420	0	1,420	116	15.2	130	1.83
Rolleston	125	0	125	1,210	0	1,210	106	13.9	119	1.48
Timaru	139	0	139	1,380	0	1,380	112	14.6	125	1.98
Twizel	170	0	170	1,300	0	1,300	115	15.0	129	2.10
Wanaka	142	0	142	1,400	0	1,400	119	15.5	133	1.96
Westport	137	0	137	1,860	0	1,860	111	14.5	125	39.8
<b>South Island Average, 2019 Production</b>	<b>349</b>	<b>0</b>	<b>349</b>	<b>1,510</b>	<b>0</b>	<b>1,510</b>	<b>10.00</b>	<b>227</b>	<b>7.96</b>	<b>1.39</b>

# USE OF RESOURCES

**45MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>North Island Average</b>	<b>405</b>	<b>0</b>	<b>405</b>	<b>1,750</b>	<b>0</b>	<b>1,750</b>	<b>46.1</b>	<b>300</b>	<b>0</b>	<b>1.66</b>
Auckland Airport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Auckland Albany	460	0	460	1,820	0	1,820	4.23	327	0	1.69
Auckland City	377	0	377	1,550	0	1,550	147	276	0	1.34
Auckland Henderson	434	0	434	1,710	0	1,710	4.03	311	0	1.48
Auckland Mt Wellington	413	0	413	1,620	0	1,620	3.79	293	0	1.55
Auckland Manukau	451	0	451	1,730	0	1,730	4.11	318	0	1.46
Auckland Pukekohe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Auckland Silverdale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dargaville	438	0	438	1,860	0	1,860	4.58	353	0	3.10
Gisborne	375	0	375	1,510	0	1,510	3.65	282	0	1.60
Hamilton	395	0	395	1,510	0	1,510	3.70	286	0	1.38
Hastings	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hawera	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kapiti	356	0	356	1,590	0	1,590	41.4	271	0	1.48
Katikati	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kawerau	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Levin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Marsden Point	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mt Maunganui	454	0	454	1,730	0	1,730	3.82	295	0	1.56
Napier	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New Plymouth	405	0	405	1,980	0	1,980	4.09	316	0	1.54
Otaki	340	0	340	1,580	0	1,580	3.47	268	0	1.29
Paihia	430	0	430	1,710	0	1,710	4.30	332	0	1.77
Palmerston North	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rotorua	422	0	422	1,750	0	1,750	3.84	296	0	2.18
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	397	0	397	1,920	0	1,920	4.02	311	0	2.92
Taupo	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Awamutu	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Puke	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Thames	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tokoroa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Turangi	405	0	405	2,050	0	2,050	4.07	314	0	2.39
Waiheke Readymix	452	0	452	1,790	0	1,790	4.04	312	0	1.78
Waihi	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanganui	364	0	364	1,720	0	1,720	3.61	278	0	2.28
Wellington Aotea Quay	330	0	330	1,520	0	1,520	121	250	0	1.35
Wellington Belmont	366	0	366	1,570	0	1,570	64.0	277	0	1.78
Whakatane	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Whangamata	395	0	395	1,710	0	1,710	3.69	285	0	2.42
Whangarei	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wharehine Mangawhai	424	0	424	1,700	0	1,700	4.21	325	0	1.68
Wharehine Matakana	412	0	412	1,610	0	1,610	4.06	313	0	1.60
Wharehine Wellsford	420	0	420	1,630	0	1,630	4.09	316	0	1.86
Whitianga	403	0	403	1,810	0	1,810	4.07	314	0	1.95

# USE OF RESOURCES

**45MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>Based on NZ manufactured Cement Supply</b>										
<b>South Island Average</b>	<b>403</b>	<b>0</b>	<b>403</b>	<b>1,700</b>	<b>0</b>	<b>1,700</b>	<b>3.50</b>	<b>270</b>	<b>0</b>	<b>1.45</b>
Amberley	441	0	441	1,970	0	1,970	4.01	310	0	1.65
Ashburton	351	0	351	1,650	0	1,650	3.66	282	0	1.29
Blenheim	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chch Bromley	466	0	466	1,780	0	1,780	3.40	263	0	1.58
Chch Canterbury Concrete	442	0	442	1,880	0	1,880	4.04	312	0	1.58
Chch Hornby	403	0	403	1,610	0	1,610	3.33	257	0	1.40
Darfield	422	0	422	1,790	0	1,790	3.70	286	0	1.28
Dunedin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Edendale	372	0	372	2,320	0	2,320	3.75	289	0	2.76
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	408	0	408	1,780	0	1,780	3.65	282	0	1.44
Greymouth	401	0	401	1,820	0	1,820	4.39	339	0	4.22
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nelson	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Oamaru	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Queenstown	381	0	381	1,990	0	1,990	3.87	299	0	1.54
Rolleston	341	0	341	1,530	0	1,530	3.43	265	0	1.18
Timaru	369	0	369	1,800	0	1,800	3.61	279	0	1.68
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>										
<b>South Island Average</b>	<b>133</b>	<b>0</b>	<b>133</b>	<b>1,340</b>	<b>0</b>	<b>1,340</b>	<b>118</b>	<b>15.4</b>	<b>132</b>	<b>1.75</b>
Amberley	193	0	193	1,680	0	1,680	133	17.4	149	2.08
Ashburton	124	0	124	1,300	0	1,300	121	15.9	136	1.69
Blenheim	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Darfield	193	0	193	1,510	0	1,510	123	16.0	138	1.68
Dunedin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Edendale	138	0	138	1,770	0	1,770	124	16.2	139	3.16
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	181	0	181	1,430	0	1,430	121	15.8	136	1.83
Greymouth	129	0	129	1,510	0	1,510	146	19.0	163	4.69
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nelson	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Oamaru	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Queenstown	140	0	140	1,520	0	1,520	129	16.8	144	1.95
Rolleston	128	0	128	1,270	0	1,270	114	14.9	128	1.55
Timaru	145	0	145	1,460	0	1,460	120	15.7	134	2.06
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>400</b>	<b>0</b>	<b>400</b>	<b>1,690</b>	<b>0</b>	<b>1,690</b>	<b>4.96</b>	<b>267</b>	<b>1.69</b>	<b>1.46</b>



# USE OF RESOURCES

50MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>North Island Average</b>	<b>493</b>	<b>0</b>	<b>493</b>	<b>1,820</b>	<b>0</b>	<b>1,820</b>	<b>29.8</b>	<b>316</b>	<b>0</b>	<b>1.75</b>
Auckland Airport	448	0	448	2,010	0	2,010	4.53	350	0	1.62
Auckland Albany	541	0	541	2,030	0	2,030	4.84	373	0	1.88
Auckland City	461	0	461	1,890	0	1,890	4.77	368	0	1.59
Auckland Henderson	500	0	500	1,880	0	1,880	4.47	345	0	1.62
Auckland Mt Wellington	538	0	538	1,920	0	1,920	4.56	352	0	1.82
Auckland Manukau	471	0	471	1,700	0	1,700	71.1	306	0	1.48
Auckland Pukekohe	465	0	465	1,880	0	1,880	4.64	358	0	1.63
Auckland Silverdale	317	0	317	1,320	0	1,320	184	209	0	1.14
Dargaville	490	0	490	1,810	0	1,810	3.91	301	0	3.13
Gisborne	564	0	564	1,700	0	1,700	3.40	262	0	1.87
Hamilton	391	0	391	1,520	0	1,520	79.3	291	0	1.38
Hastings	414	0	414	1,730	0	1,730	4.17	322	0	2.07
Hawera	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kapiti	385	0	385	1,770	0	1,770	104	305	0	1.57
Katikati	426	0	426	1,880	0	1,880	4.35	336	0	1.81
Kawerau	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Levin	373	0	373	1,850	0	1,850	98.1	305	0	1.64
Marsden Point	850	0	850	2,160	0	2,160	3.50	270	0	2.56
Mt Maunganui	411	0	411	1,730	0	1,730	4.07	314	0	1.52
Napier	393	0	393	1,730	0	1,730	52.2	310	0	1.35
New Plymouth	433	0	433	2,110	0	2,110	4.49	346	0	1.62
Otaki	429	0	429	1,980	0	1,980	4.56	352	0	1.54
Paihia	476	0	476	1,740	0	1,740	46.9	319	0	1.83
Palmerston North	398	0	398	1,800	0	1,800	67.5	317	0	1.88
Rotorua	557	0	557	1,930	0	1,930	3.94	304	0	2.41
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Taupo	412	0	412	1,830	0	1,830	4.04	312	0	1.74
Te Awamutu	418	0	418	1,740	0	1,740	4.26	328	0	1.48
Te Puke	465	0	465	1,860	0	1,860	4.15	321	0	1.65
Thames	453	0	453	1,770	0	1,770	4.58	353	0	1.73
Tokoroa	443	0	443	1,800	0	1,800	4.38	338	0	7.36
Turangi	339	0	339	1,850	0	1,850	163	264	0	2.21
Waiheke Readymix	641	0	641	1,990	0	1,990	3.86	298	0	2.07
Waihi	465	0	465	1,940	0	1,940	4.65	359	0	2.10
Wanganui	546	0	546	1,940	0	1,940	3.53	272	0	2.56
Wellington Aotea Quay	449	0	449	1,780	0	1,780	135	278	0	1.58
Wellington Belmont	334	0	334	1,590	0	1,590	236	259	0	1.70
Whakatane	585	0	585	1,850	0	1,850	3.97	307	0	3.27
Whangamata	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Whangarei	621	0	621	1,870	0	1,870	3.92	302	0	2.04
Wharehine Mangawhai	478	0	478	1,880	0	1,880	6.75	375	0	1.82
Wharehine Matakana	460	0	460	1,810	0	1,810	4.69	362	0	1.74
Wharehine Wellsford	450	0	450	1,750	0	1,750	4.42	341	0	1.94
Whitianga	624	0	624	2,080	0	2,080	3.71	286	0	2.29

# USE OF RESOURCES

50MPa STANDARD

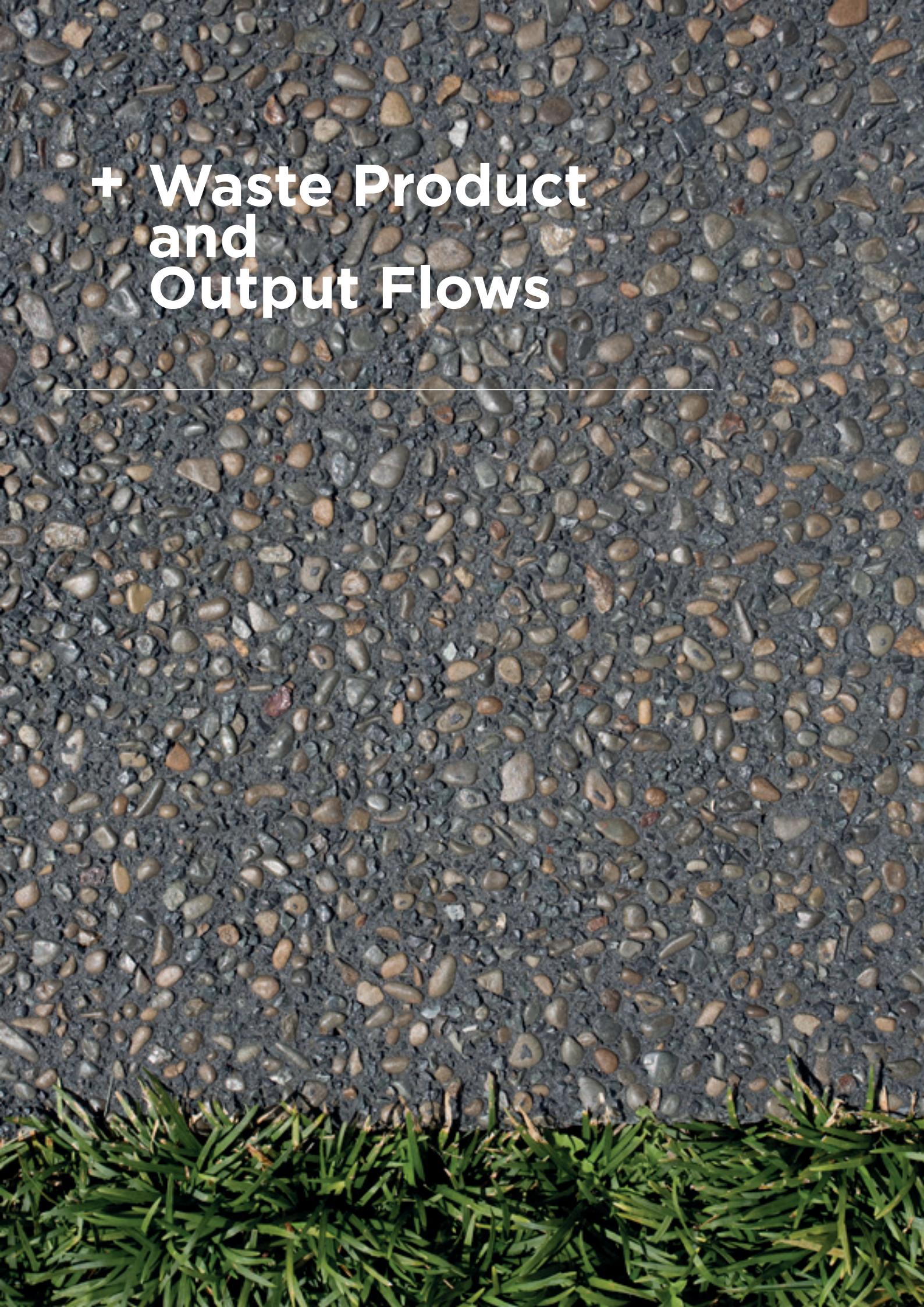
PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Renewable primary energy as energy	Renewable primary energy as materials	Renewable primary energy total	Non-renewable primary energy as energy	Non-renewable primary energy as materials	Non-renewable primary energy total	Use of secondary material	Use of renewable secondary fuels	Use of non-renewable secondary fuels	Use of net fresh water
	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	MJ, NCV	kg	MJ, NCV	MJ, NCV	m <sup>3</sup>
<b>Based on NZ manufactured Cement Supply</b>										
South Island Average	456	0	456	1,830	0	1,830	3.93	303	0	1.52
Amberley	459	0	459	2,050	0	2,050	4.30	332	0	1.70
Ashburton	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Blenheim	607	0	607	1,920	0	1,920	3.85	297	0	1.69
Chch Bromley	497	0	497	1,930	0	1,930	3.83	296	0	1.68
Chch Canterbury Concrete	452	0	452	1,900	0	1,900	4.09	316	0	1.60
Chch Hornby	445	0	445	1,820	0	1,820	3.94	304	0	1.53
Darfield	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dunedin	389	0	389	2,020	0	2,020	3.84	296	0	1.44
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Greymouth	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	625	0	625	2,350	0	2,350	3.83	296	0	2.63
Nelson	622	0	622	2,100	0	2,100	4.38	338	0	2.26
Oamaru	462	0	462	2,080	0	2,080	4.49	346	0	2.54
Queenstown	414	0	414	2,090	0	2,090	4.07	314	0	1.61
Rolleston	461	0	461	1,790	0	1,790	3.88	299	0	1.42
Timaru	390	0	390	1,900	0	1,900	3.89	300	0	1.74
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>										
South Island Average	228	0	228	1,540	0	1,540	130	16.9	145	1.93
Amberley	192	0	192	1,740	0	1,740	143	18.6	160	2.17
Ashburton	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Blenheim	369	0	369	1,670	0	1,670	128	16.7	143	2.10
Darfield	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dunedin	150	0	150	1,550	0	1,550	127	16.6	143	1.85
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Greymouth	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	386	0	386	1,790	0	1,790	127	16.6	142	3.04
Nelson	351	0	351	1,820	0	1,820	145	19.0	163	2.74
Oamaru	183	0	183	1,610	0	1,610	149	19.4	167	3.02
Queenstown	161	0	161	1,600	0	1,600	135	17.6	151	2.04
Rolleston	221	0	221	1,500	0	1,500	129	16.8	144	1.83
Timaru	149	0	149	1,530	0	1,530	129	16.8	144	2.15
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>448</b>	<b>0</b>	<b>448</b>	<b>1,820</b>	<b>0</b>	<b>1,820</b>	<b>7.89</b>	<b>294</b>	<b>4.59</b>	<b>1.54</b>

+ Waste Product  
and  
Output Flows

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# WASTE PRODUCTION AND OUTPUT FLOWS

**17.5MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>North Island Average</b>	<b>3.33E-06</b>	<b>149</b>	<b>0.00121</b>	<b>0.00658</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Auckland Airport	5.14E-06	149	0.00144	0.00705	0	0	0	0
Auckland Albany	3.73E-06	149	0.00129	0.00660	0	0	0	0
Auckland City	3.65E-06	149	0.00122	0.00622	0	0	0	0
Auckland Henderson	3.66E-06	149	0.00120	0.00642	0	0	0	0
Auckland Mt Wellington	3.65E-06	149	0.00120	0.00647	0	0	0	0
Auckland Manukau	3.67E-06	149	0.00118	0.00661	0	0	0	0
Auckland Pukekohe	3.71E-06	149	0.00125	0.00700	0	0	0	0
Auckland Silverdale	3.72E-06	149	0.00126	0.00653	0	0	0	0
Dargaville	3.48E-06	149	0.00122	0.00662	0	0	0	0
Gisborne	3.04E-06	149	0.00117	0.00711	0	0	0	0
Hamilton	3.39E-06	149	0.00120	0.00665	0	0	0	0
Hastings	3.09E-06	149	0.00131	0.00577	0	0	0	0
Hawera	3.06E-06	149	0.00141	0.00689	0	0	0	0
Kapiti	3.07E-06	149	0.00122	0.00596	0	0	0	0
Katikati	3.36E-06	149	0.00117	0.00653	0	0	0	0
Kawerau	3.09E-06	149	0.00122	0.00716	0	0	0	0
Levin	4.61E-06	149	0.00127	0.00602	0	0	0	0
Marsden Point	3.52E-06	149	0.00123	0.00666	0	0	0	0
Mt Maunganui	3.30E-06	149	0.00115	0.00663	0	0	0	0
Napier	3.07E-06	149	0.00124	0.00545	0	0	0	0
New Plymouth	3.04E-06	149	0.00118	0.00672	0	0	0	0
Otaki	4.38E-06	149	0.00136	0.00632	0	0	0	0
Paihia	3.61E-06	149	0.00123	0.00654	0	0	0	0
Palmerston North	3.13E-06	149	0.00123	0.00618	0	0	0	0
Rotorua	3.33E-06	149	0.00118	0.00710	0	0	0	0
Russell	5.10E-06	149	0.00127	0.00650	0	0	0	0
Stratford	3.06E-06	149	0.00156	0.00625	0	0	0	0
Taupo	3.31E-06	149	0.00121	0.00703	0	0	0	0
Te Awamutu	3.31E-06	149	0.00117	0.00649	0	0	0	0
Te Puke	3.30E-06	149	0.00117	0.00782	0	0	0	0
Thames	3.59E-06	149	0.00120	0.00668	0	0	0	0
Tokoroa	3.36E-06	149	0.00136	0.00701	0	0	0	0
Turangi	3.08E-06	149	0.00131	0.00648	0	0	0	0
Waiheke Readymix	3.65E-06	149	0.00124	0.00613	0	0	0	0
Waihi	3.59E-06	149	0.00123	0.00630	0	0	0	0
Wanganui	3.10E-06	149	0.00124	0.00581	0	0	0	0
Wellington Aotea Quay	2.97E-06	149	0.00117	0.00653	0	0	0	0
Wellington Belmont	2.98E-06	149	0.00116	0.00658	0	0	0	0
Whakatane	3.11E-06	149	0.00120	0.00713	0	0	0	0
Whangamata	3.63E-06	149	0.00125	0.00689	0	0	0	0
Whangarei	3.52E-06	149	0.00121	0.00652	0	0	0	0
Wharehine Mangawhai	3.65E-06	149	0.00126	0.00615	0	0	0	0
Wharehine Mataketaka	3.65E-06	149	0.00126	0.00641	0	0	0	0
Wharehine Wellsford	3.65E-06	149	0.00124	0.00632	0	0	0	0
Whitianga	3.57E-06	149	0.00123	0.00627	0	0	0	0

# WASTE PRODUCTION AND OUTPUT FLOWS

17.5MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>								
South Island Average	3.59E-06	149	0.00122	0.00605	0	0	0	0
Amberley	4.10E-06	149	0.00124	0.00602	0	0	0	0
Ashburton	3.16E-06	149	0.00123	0.00597	0	0	0	0
Blenheim	3.21E-06	149	0.00124	0.00604	0	0	0	0
Chch Bromley	4.08E-06	149	0.00122	0.00579	0	0	0	0
Chch Canterbury Concrete	4.07E-06	149	0.00123	0.00613	0	0	0	0
Chch Hornby	4.09E-06	149	0.00121	0.00582	0	0	0	0
Darfield	4.04E-06	149	0.00115	0.00586	0	0	0	0
Dunedin	3.25E-06	149	0.00117	0.00601	0	0	0	0
Edendale	4.45E-06	149	0.00180	0.00538	0	0	0	0
Fairlie	3.17E-06	149	0.00126	0.00610	0	0	0	0
Geraldine	3.18E-06	149	0.00126	0.00611	0	0	0	0
Greymouth	3.19E-06	149	0.00126	0.00598	0	0	0	0
Hilderthorpe	3.25E-06	149	0.00127	0.00627	0	0	0	0
Invercargill	3.15E-06	149	0.00120	0.00593	0	0	0	0
Nelson	3.17E-06	149	0.00119	0.00650	0	0	0	0
Oamaru	3.22E-06	149	0.00125	0.00624	0	0	0	0
Queenstown	3.12E-06	149	0.00123	0.00610	0	0	0	0
Rolleston	4.62E-06	149	0.00125	0.00591	0	0	0	0
Timaru	3.18E-06	149	0.00130	0.00613	0	0	0	0
Twizel	3.14E-06	149	0.00128	0.00606	0	0	0	0
Wanaka	3.09E-06	149	0.00125	0.00625	0	0	0	0
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>								
South Island Average	3.11E-06	149	0.00112	0	0	0	0	0
Amberley	3.82E-06	149	0.00114	0	0	0	0	0
Ashburton	2.88E-06	149	0.00112	0	0	0	0	0
Blenheim	2.93E-06	149	0.00114	0	0	0	0	0
Darfield	3.76E-06	149	0.00105	0	0	0	0	0
Dunedin	2.96E-06	149	0.00106	0	0	0	0	0
Edendale	4.19E-06	149	0.00171	0	0	0	0	0
Fairlie	2.88E-06	149	0.00115	0	0	0	0	0
Geraldine	2.89E-06	149	0.00115	0	0	0	0	0
Greymouth	2.91E-06	149	0.00116	0	0	0	0	0
Hilderthorpe	2.95E-06	149	0.00116	0	0	0	0	0
Invercargill	2.87E-06	149	0.00110	0	0	0	0	0
Nelson	2.87E-06	149	0.00108	0	0	0	0	0
Oamaru	2.92E-06	149	0.00114	0	0	0	0	0
Queenstown	2.83E-06	149	0.00113	0	0	0	0	0
Rolleston	4.34E-06	149	0.00115	0	0	0	0	0
Timaru	2.89E-06	149	0.00119	0	0	0	0	0
Twizel	2.85E-06	149	0.00118	0	0	0	0	0
Wanaka	2.79E-06	149	0.00114	0	0	0	0	0
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>3.49E-06</b>	<b>149</b>	<b>0.00119</b>	<b>0.00407</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# WASTE PRODUCTION AND OUTPUT FLOWS

**20MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>North Island Average</b>	<b>3.37E-06</b>	<b>149</b>	<b>0.00121</b>	<b>0.00721</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Auckland Airport	5.00E-06	149	0.00144	0.00761	0	0	0	0
Auckland Albany	3.49E-06	149	0.00127	0.00771	0	0	0	0
Auckland City	3.41E-06	149	0.00120	0.00751	0	0	0	0
Auckland Henderson	3.49E-06	149	0.00119	0.00744	0	0	0	0
Auckland Mt Wellington	3.39E-06	149	0.00117	0.00779	0	0	0	0
Auckland Manukau	3.62E-06	149	0.00118	0.00716	0	0	0	0
Auckland Pukekohe	3.62E-06	149	0.00124	0.00745	0	0	0	0
Auckland Silverdale	3.55E-06	149	0.00124	0.00732	0	0	0	0
Dargaville	3.48E-06	149	0.00122	0.00700	0	0	0	0
Gisborne	3.02E-06	149	0.00117	0.00704	0	0	0	0
Hamilton	3.29E-06	149	0.00119	0.00727	0	0	0	0
Hastings	3.09E-06	149	0.00131	0.00643	0	0	0	0
Hawera	3.06E-06	149	0.00141	0.00731	0	0	0	0
Kapiti	2.96E-06	149	0.00122	0.00644	0	0	0	0
Katikati	3.35E-06	149	0.00117	0.00678	0	0	0	0
Kawerau	3.10E-06	149	0.00123	0.00750	0	0	0	0
Levin	4.52E-06	149	0.00126	0.00658	0	0	0	0
Marsden Point	3.50E-06	149	0.00123	0.00697	0	0	0	0
Mt Maunganui	3.25E-06	149	0.00115	0.00715	0	0	0	0
Napier	3.12E-06	149	0.00124	0.00609	0	0	0	0
New Plymouth	2.94E-06	149	0.00117	0.00713	0	0	0	0
Otaki	4.52E-06	149	0.00137	0.00617	0	0	0	0
Paihia	3.58E-06	149	0.00123	0.00704	0	0	0	0
Palmerston North	3.06E-06	149	0.00123	0.00663	0	0	0	0
Rotorua	3.29E-06	149	0.00119	0.00738	0	0	0	0
Russell	5.03E-06	149	0.00127	0.00719	0	0	0	0
Stratford	2.97E-06	149	0.00155	0.00694	0	0	0	0
Taupo	3.30E-06	149	0.00122	0.00744	0	0	0	0
Te Awamutu	3.31E-06	149	0.00117	0.00723	0	0	0	0
Te Puke	3.29E-06	149	0.00117	0.00772	0	0	0	0
Thames	3.56E-06	149	0.00120	0.00724	0	0	0	0
Tokoroa	3.36E-06	149	0.00136	0.00733	0	0	0	0
Turangi	3.04E-06	149	0.00131	0.00731	0	0	0	0
Waiheke Readymix	3.51E-06	149	0.00123	0.00728	0	0	0	0
Waihi	3.59E-06	149	0.00124	0.00679	0	0	0	0
Wanganui	3.10E-06	149	0.00124	0.00597	0	0	0	0
Wellington Aotea Quay	2.86E-06	149	0.00117	0.00709	0	0	0	0
Wellington Belmont	2.94E-06	149	0.00116	0.00699	0	0	0	0
Whakatane	3.07E-06	149	0.00120	0.00773	0	0	0	0
Whangamata	3.53E-06	149	0.00125	0.00728	0	0	0	0
Whangarei	3.46E-06	149	0.00121	0.00727	0	0	0	0
Wharehine Mangawhai	3.58E-06	149	0.00125	0.00697	0	0	0	0
Wharehine Mataketana	3.59E-06	149	0.00126	0.00733	0	0	0	0
Wharehine Wellsford	3.62E-06	149	0.00124	0.00710	0	0	0	0
Whitianga	3.54E-06	149	0.00123	0.00698	0	0	0	0

# WASTE PRODUCTION AND OUTPUT FLOWS

20MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>								
South Island Average	3.67E-06	149	0.00122	0.00639	0	0	0	0
Amberley	4.09E-06	149	0.00124	0.00623	0	0	0	0
Ashburton	3.12E-06	149	0.00122	0.00618	0	0	0	0
Blenheim	3.21E-06	149	0.00124	0.00629	0	0	0	0
Chch Bromley	4.07E-06	149	0.00122	0.00640	0	0	0	0
Chch Canterbury Concrete	4.07E-06	149	0.00123	0.00644	0	0	0	0
Chch Hornby	4.07E-06	149	0.00120	0.00627	0	0	0	0
Darfield	3.69E-06	149	0.00116	0.00619	0	0	0	0
Dunedin	3.12E-06	149	0.00117	0.00650	0	0	0	0
Edendale	4.72E-06	149	0.00190	0.00623	0	0	0	0
Fairlie	3.13E-06	149	0.00126	0.00630	0	0	0	0
Geraldine	3.12E-06	149	0.00125	0.00630	0	0	0	0
Greymouth	3.18E-06	149	0.00126	0.00614	0	0	0	0
Hilderthorpe	3.20E-06	149	0.00127	0.00663	0	0	0	0
Invercargill	3.15E-06	149	0.00120	0.00613	0	0	0	0
Nelson	3.15E-06	149	0.00120	0.00708	0	0	0	0
Oamaru	3.18E-06	149	0.00125	0.00651	0	0	0	0
Queenstown	3.11E-06	149	0.00123	0.00633	0	0	0	0
Rolleston	4.56E-06	149	0.00125	0.00624	0	0	0	0
Timaru	3.12E-06	149	0.00130	0.00668	0	0	0	0
Twizel	3.06E-06	149	0.00125	0.00636	0	0	0	0
Wanaka	3.10E-06	149	0.00124	0.00625	0	0	0	0
Westport	4.72E-06	149	0.00185	0.00665	0	0	0	0
<b>Based on Imported Cement Supply</b>								
South Island Average	3.08E-06	149	0.00112	0	0	0	0	0
Amberley	3.79E-06	149	0.00113	0	0	0	0	0
Ashburton	2.83E-06	149	0.00112	0	0	0	0	0
Blenheim	2.92E-06	149	0.00113	0	0	0	0	0
Darfield	3.39E-06	149	0.00106	0	0	0	0	0
Dunedin	2.81E-06	149	0.00106	0	0	0	0	0
Edendale	4.41E-06	149	0.00179	0	0	0	0	0
Fairlie	2.83E-06	149	0.00115	0	0	0	0	0
Geraldine	2.82E-06	149	0.00114	0	0	0	0	0
Greymouth	2.89E-06	149	0.00116	0	0	0	0	0
Hilderthorpe	2.88E-06	149	0.00115	0	0	0	0	0
Invercargill	2.85E-06	149	0.00109	0	0	0	0	0
Nelson	2.81E-06	149	0.00108	0	0	0	0	0
Oamaru	2.87E-06	149	0.00114	0	0	0	0	0
Queenstown	2.81E-06	149	0.00112	0	0	0	0	0
Rolleston	4.26E-06	149	0.00114	0	0	0	0	0
Timaru	2.80E-06	149	0.00118	0	0	0	0	0
Twizel	2.76E-06	149	0.00114	0	0	0	0	0
Wanaka	2.79E-06	149	0.00113	0	0	0	0	0
Westport	4.41E-06	149	0.00173	0	0	0	0	0
<b>South Island Average, 2019 Production</b>	<b>3.60E-06</b>	<b>149</b>	<b>0.00120</b>	<b>0.00497</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# WASTE PRODUCTION AND OUTPUT FLOWS

**25MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>North Island Average</b>	<b>3.38E-06</b>	<b>149</b>	<b>0.00123</b>	<b>0.00811</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Auckland Airport	4.96E-06	149	0.00143	0.00874	0	0	0	0
Auckland Albany	3.46E-06	149	0.00126	0.00858	0	0	0	0
Auckland City	3.43E-06	149	0.00120	0.00833	0	0	0	0
Auckland Henderson	3.48E-06	149	0.00119	0.00849	0	0	0	0
Auckland Mt Wellington	3.39E-06	149	0.00118	0.00878	0	0	0	0
Auckland Manukau	3.63E-06	149	0.00118	0.00793	0	0	0	0
Auckland Pukekohe	3.61E-06	149	0.00124	0.00853	0	0	0	0
Auckland Silverdale	3.57E-06	149	0.00124	0.00835	0	0	0	0
Dargaville	3.48E-06	149	0.00123	0.00786	0	0	0	0
Gisborne	3.07E-06	149	0.00119	0.00761	0	0	0	0
Hamilton	3.30E-06	149	0.00121	0.00828	0	0	0	0
Hastings	3.14E-06	149	0.00132	0.00668	0	0	0	0
Hawera	3.10E-06	149	0.00142	0.00825	0	0	0	0
Kapiti	2.90E-06	149	0.00122	0.00727	0	0	0	0
Katikati	3.35E-06	149	0.00117	0.00757	0	0	0	0
Kawerau	3.10E-06	149	0.00123	0.00821	0	0	0	0
Levin	4.57E-06	149	0.00127	0.00737	0	0	0	0
Marsden Point	3.45E-06	149	0.00122	0.00806	0	0	0	0
Mt Maunganui	3.27E-06	149	0.00116	0.00787	0	0	0	0
Napier	3.14E-06	149	0.00125	0.00692	0	0	0	0
New Plymouth	2.98E-06	149	0.00118	0.00802	0	0	0	0
Otaki	4.42E-06	149	0.00137	0.00746	0	0	0	0
Paihia	3.54E-06	149	0.00122	0.00792	0	0	0	0
Palmerston North	3.09E-06	149	0.00123	0.00725	0	0	0	0
Rotorua	3.37E-06	149	0.00119	0.00795	0	0	0	0
Russell	5.04E-06	149	0.00127	0.00766	0	0	0	0
Stratford	3.22E-06	149	0.00312	0.00790	0	0	0	0
Taupo	3.32E-06	149	0.00122	0.00818	0	0	0	0
Te Awamutu	3.36E-06	149	0.00117	0.00794	0	0	0	0
Te Puke	3.30E-06	149	0.00118	0.00859	0	0	0	0
Thames	3.61E-06	149	0.00121	0.00817	0	0	0	0
Tokoroa	3.37E-06	149	0.00136	0.00814	0	0	0	0
Turangi	3.05E-06	149	0.00131	0.00802	0	0	0	0
Waiheke Readymix	3.44E-06	149	0.00122	0.00839	0	0	0	0
Waihi	3.60E-06	149	0.00124	0.00802	0	0	0	0
Wanganui	3.12E-06	149	0.00124	0.00682	0	0	0	0
Wellington Aotea Quay	2.90E-06	149	0.00117	0.00799	0	0	0	0
Wellington Belmont	2.96E-06	149	0.00117	0.00783	0	0	0	0
Whakatane	3.10E-06	149	0.00120	0.00813	0	0	0	0
Whangamata	3.60E-06	149	0.00124	0.00810	0	0	0	0
Whangarei	3.43E-06	149	0.00120	0.00801	0	0	0	0
Wharehine Mangawhai	3.57E-06	149	0.00125	0.00782	0	0	0	0
Wharehine Matakana	3.58E-06	149	0.00125	0.00806	0	0	0	0
Wharehine Wellsford	3.65E-06	149	0.00124	0.00771	0	0	0	0
Whitianga	3.58E-06	149	0.00124	0.00792	0	0	0	0

# WASTE PRODUCTION AND OUTPUT FLOWS

**25MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>								
South Island Average	3.52E-06	149	0.00123	0.00708	0	0	0	0
Amberley	4.07E-06	149	0.00124	0.00694	0	0	0	0
Ashburton	3.15E-06	149	0.00122	0.00698	0	0	0	0
Blenheim	3.23E-06	149	0.00124	0.00702	0	0	0	0
Chch Bromley	4.07E-06	149	0.00122	0.00700	0	0	0	0
Chch Canterbury Concrete	4.07E-06	149	0.00123	0.00702	0	0	0	0
Chch Hornby	3.80E-06	149	0.00120	0.00688	0	0	0	0
Darfield	4.07E-06	149	0.00116	0.00677	0	0	0	0
Dunedin	3.14E-06	149	0.00117	0.00736	0	0	0	0
Edendale	4.73E-06	149	0.00189	0.00699	0	0	0	0
Fairlie	3.15E-06	149	0.00125	0.00704	0	0	0	0
Geraldine	3.12E-06	149	0.00125	0.00699	0	0	0	0
Greymouth	3.19E-06	149	0.00126	0.00696	0	0	0	0
Hilderthorpe	3.15E-06	149	0.00127	0.00763	0	0	0	0
Invercargill	3.18E-06	149	0.00120	0.00688	0	0	0	0
Nelson	3.14E-06	149	0.00120	0.00780	0	0	0	0
Oamaru	3.17E-06	149	0.00125	0.00753	0	0	0	0
Queenstown	3.13E-06	149	0.00123	0.00710	0	0	0	0
Rolleston	4.59E-06	149	0.00125	0.00691	0	0	0	0
Timaru	3.14E-06	149	0.00129	0.00718	0	0	0	0
Twizel	3.04E-06	149	0.00122	0.00686	0	0	0	0
Wanaka	3.14E-06	149	0.00125	0.00713	0	0	0	0
Westport	4.71E-06	149	0.00186	0.00710	0	0	0	0
<b>Based on Imported Cement Supply</b>								
South Island Average	2.95E-06	149	0.00111	0	0	0	0	0
Amberley	3.75E-06	149	0.00112	0	0	0	0	0
Ashburton	2.81E-06	149	0.00110	0	0	0	0	0
Blenheim	2.90E-06	149	0.00112	0	0	0	0	0
Darfield	3.75E-06	149	0.00105	0	0	0	0	0
Dunedin	2.79E-06	149	0.00105	0	0	0	0	0
Edendale	4.39E-06	149	0.00177	0	0	0	0	0
Fairlie	2.81E-06	149	0.00113	0	0	0	0	0
Geraldine	2.79E-06	149	0.00113	0	0	0	0	0
Greymouth	2.87E-06	149	0.00115	0	0	0	0	0
Hilderthorpe	2.79E-06	149	0.00114	0	0	0	0	0
Invercargill	2.84E-06	149	0.00108	0	0	0	0	0
Nelson	2.78E-06	149	0.00107	0	0	0	0	0
Oamaru	2.81E-06	149	0.00112	0	0	0	0	0
Queenstown	2.79E-06	149	0.00111	0	0	0	0	0
Rolleston	4.26E-06	149	0.00113	0	0	0	0	0
Timaru	2.80E-06	149	0.00117	0	0	0	0	0
Twizel	2.72E-06	149	0.00110	0	0	0	0	0
Wanaka	2.80E-06	149	0.00113	0	0	0	0	0
Westport	4.38E-06	149	0.00173	0	0	0	0	0
<b>South Island Average, 2019 Production</b>	<b>3.38E-06</b>	<b>149</b>	<b>0.00118</b>	<b>0.00426</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# WASTE PRODUCTION AND OUTPUT FLOWS

**30MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>North Island Average</b>	<b>3.49E-06</b>	<b>149</b>	<b>0.00125</b>	<b>0.00864</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Auckland Airport	5.22E-06	149	0.00148	0.00882	0	0	0	0
Auckland Albany	3.65E-06	149	0.00130	0.00878	0	0	0	0
Auckland City	3.69E-06	149	0.00125	0.00831	0	0	0	0
Auckland Henderson	3.63E-06	149	0.00122	0.00871	0	0	0	0
Auckland Mt Wellington	3.61E-06	149	0.00122	0.00877	0	0	0	0
Auckland Manukau	3.70E-06	149	0.00121	0.00888	0	0	0	0
Auckland Pukekohe	3.80E-06	149	0.00128	0.00885	0	0	0	0
Auckland Silverdale	3.70E-06	149	0.00126	0.00933	0	0	0	0
Dargaville	3.54E-06	149	0.00124	0.00864	0	0	0	0
Gisborne	3.09E-06	149	0.00120	0.00829	0	0	0	0
Hamilton	3.32E-06	149	0.00121	0.00910	0	0	0	0
Hastings	3.16E-06	149	0.00132	0.00729	0	0	0	0
Hawera	3.16E-06	149	0.00144	0.00899	0	0	0	0
Kapiti	2.95E-06	149	0.00122	0.00800	0	0	0	0
Katikati	3.39E-06	149	0.00118	0.00840	0	0	0	0
Kawerau	3.14E-06	149	0.00124	0.00907	0	0	0	0
Levin	4.60E-06	149	0.00128	0.00798	0	0	0	0
Marsden Point	3.54E-06	149	0.00124	0.00836	0	0	0	0
Mt Maunganui	3.31E-06	149	0.00117	0.00876	0	0	0	0
Napier	3.18E-06	149	0.00126	0.00719	0	0	0	0
New Plymouth	3.04E-06	149	0.00120	0.00868	0	0	0	0
Otaki	4.63E-06	149	0.00138	0.00810	0	0	0	0
Paihia	3.61E-06	149	0.00124	0.00847	0	0	0	0
Palmerston North	3.14E-06	149	0.00125	0.00817	0	0	0	0
Rotorua	3.45E-06	149	0.00121	0.00896	0	0	0	0
Russell	5.01E-06	149	0.00127	0.00875	0	0	0	0
Stratford	3.08E-06	149	0.00158	0.00862	0	0	0	0
Taupo	3.39E-06	149	0.00124	0.00914	0	0	0	0
Te Awamutu	3.41E-06	149	0.00120	0.00920	0	0	0	0
Te Puke	3.39E-06	149	0.00157	0.00938	0	0	0	0
Thames	3.62E-06	149	0.00122	0.00907	0	0	0	0
Tokoroa	3.41E-06	149	0.00137	0.00851	0	0	0	0
Turangi	3.10E-06	149	0.00134	0.00881	0	0	0	0
Waiheke Readymix	3.70E-06	149	0.00204	0.00861	0	0	0	0
Waihi	3.64E-06	149	0.00125	0.00893	0	0	0	0
Wanganui	3.15E-06	149	0.00125	0.00765	0	0	0	0
Wellington Aotea Quay	2.99E-06	149	0.00118	0.00861	0	0	0	0
Wellington Belmont	3.01E-06	149	0.00117	0.00859	0	0	0	0
Whakatane	3.14E-06	149	0.00121	0.00918	0	0	0	0
Whangamata	3.64E-06	149	0.00126	0.00891	0	0	0	0
Whangarei	3.54E-06	149	0.00123	0.00874	0	0	0	0
Wharehine Mangawhai	3.57E-06	149	0.00126	0.00876	0	0	0	0
Wharehine Mataketaka	3.64E-06	149	0.00126	0.00853	0	0	0	0
Wharehine Wellsford	3.61E-06	149	0.00124	0.00848	0	0	0	0
Whitianga	3.55E-06	149	0.00124	0.00845	0	0	0	0

# WASTE PRODUCTION AND OUTPUT FLOWS

30MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>								
South Island Average	3.74E-06	149	0.00125	0.00784	0	0	0	0
Amberley	4.11E-06	149	0.00125	0.00770	0	0	0	0
Ashburton	3.23E-06	149	0.00174	0.00720	0	0	0	0
Blenheim	3.29E-06	149	0.00125	0.00799	0	0	0	0
Chch Bromley	4.09E-06	149	0.00123	0.00766	0	0	0	0
Chch Canterbury Concrete	4.10E-06	149	0.00124	0.00769	0	0	0	0
Chch Hornby	4.08E-06	149	0.00121	0.00770	0	0	0	0
Darfield	4.10E-06	149	0.00118	0.00764	0	0	0	0
Dunedin	3.19E-06	149	0.00118	0.00816	0	0	0	0
Edendale	4.82E-06	149	0.00192	0.00793	0	0	0	0
Fairlie	3.21E-06	149	0.00126	0.00765	0	0	0	0
Geraldine	3.23E-06	149	0.00126	0.00753	0	0	0	0
Greymouth	3.25E-06	149	0.00128	0.00776	0	0	0	0
Hilderthorpe	3.18E-06	149	0.00128	0.00883	0	0	0	0
Invercargill	3.21E-06	149	0.00121	0.00786	0	0	0	0
Nelson	3.21E-06	149	0.00121	0.00882	0	0	0	0
Oamaru	3.22E-06	149	0.00126	0.00874	0	0	0	0
Queenstown	3.15E-06	149	0.00124	0.00807	0	0	0	0
Rolleston	4.64E-06	149	0.00126	0.00770	0	0	0	0
Timaru	3.22E-06	149	0.00130	0.00758	0	0	0	0
Twizel	3.21E-06	149	0.00129	0.00772	0	0	0	0
Wanaka	3.22E-06	149	0.00126	0.00826	0	0	0	0
Westport	4.77E-06	149	0.00187	0.00808	0	0	0	0
<b>Based on Imported Cement Supply</b>								
South Island Average	3.08E-06	149	0.00113	0	0	0	0	0
Amberley	3.75E-06	149	0.00112	0	0	0	0	0
Ashburton	2.89E-06	149	0.00162	0	0	0	0	0
Blenheim	2.91E-06	149	0.00112	0	0	0	0	0
Darfield	3.74E-06	149	0.00105	0	0	0	0	0
Dunedin	2.79E-06	149	0.00104	0	0	0	0	0
Edendale	4.44E-06	149	0.00178	0	0	0	0	0
Fairlie	2.84E-06	149	0.00112	0	0	0	0	0
Geraldine	2.87E-06	149	0.00113	0	0	0	0	0
Greymouth	2.89E-06	149	0.00114	0	0	0	0	0
Hilderthorpe	2.76E-06	149	0.00113	0	0	0	0	0
Invercargill	2.83E-06	149	0.00108	0	0	0	0	0
Nelson	2.79E-06	149	0.00106	0	0	0	0	0
Oamaru	2.80E-06	149	0.00111	0	0	0	0	0
Queenstown	2.76E-06	149	0.00110	0	0	0	0	0
Rolleston	4.28E-06	149	0.00113	0	0	0	0	0
Timaru	2.86E-06	149	0.00117	0	0	0	0	0
Twizel	2.84E-06	149	0.00116	0	0	0	0	0
Wanaka	2.81E-06	149	0.00111	0	0	0	0	0
Westport	4.39E-06	149	0.00172	0	0	0	0	0
<b>South Island Average, 2019 Production</b>	<b>3.65E-06</b>	<b>149</b>	<b>0.00121</b>	<b>0.00595</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# WASTE PRODUCTION AND OUTPUT FLOWS

**35MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>North Island Average</b>	<b>3.60E-06</b>	<b>149</b>	<b>0.00128</b>	<b>0.00935</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Auckland Airport	5.28E-06	149	0.00149	0.00984	0	0	0	0
Auckland Albany	3.72E-06	149	0.00131	0.00955	0	0	0	0
Auckland City	3.75E-06	149	0.00126	0.00883	0	0	0	0
Auckland Henderson	3.72E-06	149	0.00188	0.00953	0	0	0	0
Auckland Mt Wellington	3.81E-06	149	0.00125	0.00926	0	0	0	0
Auckland Manukau	3.80E-06	149	0.00122	0.00937	0	0	0	0
Auckland Pukekohe	3.87E-06	149	0.00129	0.00970	0	0	0	0
Auckland Silverdale	3.81E-06	149	0.00129	0.00947	0	0	0	0
Dargaville	3.56E-06	149	0.00125	0.00939	0	0	0	0
Gisborne	3.09E-06	149	0.00121	0.00870	0	0	0	0
Hamilton	3.44E-06	149	0.00124	0.00946	0	0	0	0
Hastings	3.20E-06	149	0.00134	0.00808	0	0	0	0
Hawera	3.15E-06	149	0.00144	0.00934	0	0	0	0
Kapiti	2.90E-06	149	0.00125	0.00935	0	0	0	0
Katikati	3.46E-06	149	0.00121	0.00974	0	0	0	0
Kawerau	3.22E-06	149	0.00126	0.0101	0	0	0	0
Levin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Marsden Point	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mt Maunganui	3.38E-06	149	0.00119	0.00955	0	0	0	0
Napier	3.22E-06	149	0.00128	0.00814	0	0	0	0
New Plymouth	3.06E-06	149	0.00120	0.00966	0	0	0	0
Otaki	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Paihia	3.59E-06	149	0.00125	0.00968	0	0	0	0
Palmerston North	3.18E-06	149	0.00126	0.00863	0	0	0	0
Rotorua	3.71E-06	149	0.00129	0.00926	0	0	0	0
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	3.11E-06	149	0.00158	0.00939	0	0	0	0
Taupo	3.48E-06	149	0.00126	0.00950	0	0	0	0
Te Awamutu	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Puke	3.33E-06	149	0.00120	0.01000	0	0	0	0
Thames	3.64E-06	149	0.00123	0.0103	0	0	0	0
Tokoroa	3.49E-06	149	0.00139	0.00951	0	0	0	0
Turangi	3.19E-06	149	0.00136	0.00991	0	0	0	0
Waiheke Readymix	3.72E-06	149	0.00128	0.0102	0	0	0	0
Waihi	3.75E-06	149	0.00129	0.00943	0	0	0	0
Wanganui	3.21E-06	149	0.00128	0.00832	0	0	0	0
Wellington Aotea Quay	3.03E-06	149	0.00120	0.00959	0	0	0	0
Wellington Belmont	3.14E-06	149	0.00120	0.00955	0	0	0	0
Whakatane	3.27E-06	149	0.00124	0.01000	0	0	0	0
Whangamata	3.77E-06	149	0.00128	0.00957	0	0	0	0
Whangarei	3.65E-06	149	0.00125	0.00987	0	0	0	0
Wharehine Mangawhai	3.60E-06	149	0.00127	0.0104	0	0	0	0
Wharehine Matakana	3.71E-06	149	0.00129	0.00967	0	0	0	0
Wharehine Wellsford	3.63E-06	149	0.00126	0.00971	0	0	0	0
Whitianga	3.67E-06	149	0.00127	0.0101	0	0	0	0

# WASTE PRODUCTION AND OUTPUT FLOWS

**35MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>								
South Island Average	4.23E-06	149	0.00126	0.00847	0	0	0	0
Amberley	4.16E-06	149	0.00127	0.00921	0	0	0	0
Ashburton	3.15E-06	149	0.00125	0.00826	0	0	0	0
Blenheim	3.33E-06	149	0.00127	0.00897	0	0	0	0
Chch Bromley	4.16E-06	149	0.00126	0.00814	0	0	0	0
Chch Canterbury Concrete	4.15E-06	149	0.00126	0.00856	0	0	0	0
Chch Hornby	4.17E-06	149	0.00124	0.00807	0	0	0	0
Darfield	4.16E-06	149	0.00120	0.00840	0	0	0	0
Dunedin	3.22E-06	149	0.00120	0.00894	0	0	0	0
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	3.28E-06	149	0.00128	0.00840	0	0	0	0
Geraldine	3.22E-06	149	0.00128	0.00822	0	0	0	0
Greymouth	3.22E-06	149	0.00129	0.00894	0	0	0	0
Hilderthorpe	3.27E-06	149	0.00131	0.00921	0	0	0	0
Invercargill	3.11E-06	149	0.00122	0.00934	0	0	0	0
Nelson	3.22E-06	149	0.00123	0.00976	0	0	0	0
Oamaru	3.30E-06	149	0.00128	0.00964	0	0	0	0
Queenstown	3.19E-06	149	0.00127	0.00941	0	0	0	0
Rolleston	4.75E-06	149	0.00128	0.00860	0	0	0	0
Timaru	3.04E-06	149	0.00132	0.00946	0	0	0	0
Twizel	3.25E-06	149	0.00131	0.00908	0	0	0	0
Wanaka	3.49E-06	149	0.00384	0.0103	0	0	0	0
Westport	4.89E-06	149	0.00190	0.00901	0	0	0	0
<b>Based on Imported Cement Supply</b>								
South Island Average	3.90E-06	149	0.00113	0	0	0	0	0
Amberley	3.72E-06	149	0.00111	0	0	0	0	0
Ashburton	2.76E-06	149	0.00111	0	0	0	0	0
Blenheim	2.91E-06	149	0.00112	0	0	0	0	0
Darfield	3.76E-06	149	0.00105	0	0	0	0	0
Dunedin	2.79E-06	149	0.00105	0	0	0	0	0
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	2.88E-06	149	0.00114	0	0	0	0	0
Geraldine	2.83E-06	149	0.00114	0	0	0	0	0
Greymouth	2.80E-06	149	0.00114	0	0	0	0	0
Hilderthorpe	2.83E-06	149	0.00115	0	0	0	0	0
Invercargill	2.65E-06	149	0.00106	0	0	0	0	0
Nelson	2.76E-06	149	0.00106	0	0	0	0	0
Oamaru	2.84E-06	149	0.00112	0	0	0	0	0
Queenstown	2.73E-06	149	0.00110	0	0	0	0	0
Rolleston	4.34E-06	149	0.00113	0	0	0	0	0
Timaru	2.59E-06	149	0.00115	0	0	0	0	0
Twizel	2.82E-06	149	0.00115	0	0	0	0	0
Wanaka	2.99E-06	149	0.00366	0	0	0	0	0
Westport	4.46E-06	149	0.00173	0	0	0	0	0
<b>South Island Average, 2019 Production</b>	<b>4.19E-06</b>	<b>149</b>	<b>0.00124</b>	<b>0.00753</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# WASTE PRODUCTION AND OUTPUT FLOWS

**40MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>North Island Average</b>	<b>3.69E-06</b>	<b>149</b>	<b>0.00126</b>	<b>0.0102</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Auckland Airport	5.29E-06	149	0.00149	0.0104	0	0	0	0
Auckland Albany	3.76E-06	149	0.00131	0.0105	0	0	0	0
Auckland City	3.68E-06	149	0.00125	0.0102	0	0	0	0
Auckland Henderson	3.74E-06	149	0.00124	0.0102	0	0	0	0
Auckland Mt Wellington	3.75E-06	149	0.00124	0.0103	0	0	0	0
Auckland Manukau	3.79E-06	149	0.00123	0.0107	0	0	0	0
Auckland Pukekohe	3.83E-06	149	0.00129	0.0112	0	0	0	0
Auckland Silverdale	3.64E-06	149	0.00123	0.00854	0	0	0	0
Dargaville	3.58E-06	149	0.00125	0.0104	0	0	0	0
Gisborne	3.20E-06	149	0.00143	0.01000	0	0	0	0
Hamilton	3.38E-06	149	0.00123	0.0109	0	0	0	0
Hastings	3.42E-06	149	0.00138	0.00955	0	0	0	0
Hawera	3.26E-06	149	0.00146	0.0104	0	0	0	0
Kapiti	3.16E-06	149	0.00124	0.00973	0	0	0	0
Katikati	3.49E-06	149	0.00120	0.0110	0	0	0	0
Kawerau	3.31E-06	149	0.00127	0.0110	0	0	0	0
Levin	4.69E-06	149	0.00129	0.00955	0	0	0	0
Marsden Point	3.72E-06	149	0.00127	0.0103	0	0	0	0
Mt Maunganui	3.43E-06	149	0.00118	0.0103	0	0	0	0
Napier	3.40E-06	149	0.00131	0.00973	0	0	0	0
New Plymouth	3.22E-06	149	0.00121	0.0108	0	0	0	0
Otaki	4.69E-06	149	0.00139	0.00962	0	0	0	0
Paihia	3.68E-06	149	0.00127	0.0101	0	0	0	0
Palmerston North	3.27E-06	149	0.00127	0.01000	0	0	0	0
Rotorua	3.57E-06	149	0.00124	0.0103	0	0	0	0
Russell	5.08E-06	149	0.00130	0.0105	0	0	0	0
Stratford	3.19E-06	149	0.00160	0.0106	0	0	0	0
Taupo	3.46E-06	149	0.00126	0.0108	0	0	0	0
Te Awamutu	3.50E-06	149	0.00121	0.0104	0	0	0	0
Te Puke	3.37E-06	149	0.00121	0.0112	0	0	0	0
Thames	3.72E-06	149	0.00124	0.0109	0	0	0	0
Tokoroa	3.57E-06	149	0.00291	0.0106	0	0	0	0
Turangi	3.26E-06	149	0.00136	0.0109	0	0	0	0
Waiheke Readymix	3.82E-06	149	0.00178	0.0104	0	0	0	0
Waihi	3.68E-06	149	0.00127	0.0108	0	0	0	0
Wanganui	3.25E-06	149	0.00128	0.00976	0	0	0	0
Wellington Aotea Quay	3.09E-06	149	0.00121	0.0103	0	0	0	0
Wellington Belmont	3.10E-06	149	0.00119	0.0101	0	0	0	0
Whakatane	3.28E-06	149	0.00124	0.0109	0	0	0	0
Whangamata	3.69E-06	149	0.00128	0.0109	0	0	0	0
Whangarei	3.71E-06	149	0.00125	0.0101	0	0	0	0
Wharehine Mangawhai	3.70E-06	149	0.00128	0.0104	0	0	0	0
Wharehine Mataketaka	3.74E-06	149	0.00129	0.0103	0	0	0	0
Wharehine Wellsford	3.66E-06	149	0.00125	0.0107	0	0	0	0
Whitianga	3.67E-06	149	0.00127	0.0106	0	0	0	0

# WASTE PRODUCTION AND OUTPUT FLOWS

40MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>								
South Island Average	4.19E-06	149	0.00126	0.00920	0	0	0	0
Amberley	4.14E-06	149	0.00127	0.0101	0	0	0	0
Ashburton	3.33E-06	149	0.00126	0.00936	0	0	0	0
Blenheim	3.42E-06	149	0.00220	0.00931	0	0	0	0
Chch Bromley	4.17E-06	149	0.00126	0.00896	0	0	0	0
Chch Canterbury Concrete	4.15E-06	149	0.00126	0.00936	0	0	0	0
Chch Hornby	4.15E-06	149	0.00124	0.00878	0	0	0	0
Darfield	3.76E-06	149	0.00120	0.00945	0	0	0	0
Dunedin	3.28E-06	149	0.00121	0.0103	0	0	0	0
Edendale	4.89E-06	149	0.00194	0.01000	0	0	0	0
Fairlie	3.33E-06	149	0.00128	0.00921	0	0	0	0
Geraldine	3.26E-06	149	0.00128	0.00923	0	0	0	0
Greymouth	3.33E-06	149	0.00130	0.00983	0	0	0	0
Hilderthorpe	3.32E-06	149	0.00130	0.0108	0	0	0	0
Invercargill	3.31E-06	149	0.00123	0.01000	0	0	0	0
Nelson	3.03E-06	149	0.00122	0.0124	0	0	0	0
Oamaru	3.36E-06	149	0.00132	0.0106	0	0	0	0
Queenstown	3.25E-06	149	0.00127	0.0103	0	0	0	0
Rolleston	4.73E-06	149	0.00128	0.00936	0	0	0	0
Timaru	3.28E-06	149	0.00133	0.00988	0	0	0	0
Twizel	3.26E-06	149	0.00131	0.0102	0	0	0	0
Wanaka	3.29E-06	149	0.00129	0.0105	0	0	0	0
Westport	5.00E-06	149	0.00190	0.00982	0	0	0	0
<b>Based on Imported Cement Supply</b>								
South Island Average	3.77E-06	149	0.00113	0	0	0	0	0
Amberley	3.67E-06	149	0.00110	0	0	0	0	0
Ashburton	2.88E-06	149	0.00110	0	0	0	0	0
Blenheim	2.99E-06	149	0.00205	0	0	0	0	0
Darfield	3.31E-06	149	0.00104	0	0	0	0	0
Dunedin	2.78E-06	149	0.00103	0	0	0	0	0
Edendale	4.40E-06	149	0.00176	0	0	0	0	0
Fairlie	2.89E-06	149	0.00112	0	0	0	0	0
Geraldine	2.82E-06	149	0.00113	0	0	0	0	0
Greymouth	2.87E-06	149	0.00113	0	0	0	0	0
Hilderthorpe	2.80E-06	149	0.00111	0	0	0	0	0
Invercargill	2.83E-06	149	0.00106	0	0	0	0	0
Nelson	2.45E-06	149	0.00101	0	0	0	0	0
Oamaru	2.85E-06	149	0.00114	0	0	0	0	0
Queenstown	2.75E-06	149	0.00109	0	0	0	0	0
Rolleston	4.29E-06	149	0.00112	0	0	0	0	0
Timaru	2.81E-06	149	0.00116	0	0	0	0	0
Twizel	2.77E-06	149	0.00114	0	0	0	0	0
Wanaka	2.78E-06	149	0.00111	0	0	0	0	0
Westport	4.54E-06	149	0.00172	0	0	0	0	0
<b>South Island Average, 2019 Production</b>	<b>4.16E-06</b>	<b>149</b>	<b>0.00125</b>	<b>0.00858</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# WASTE PRODUCTION AND OUTPUT FLOWS

**45MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>North Island Average</b>	<b>3.55E-06</b>	<b>149</b>	<b>0.00127</b>	<b>0.0114</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Auckland Airport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Auckland Albany	3.77E-06	149	0.00143	0.0124	0	0	0	0
Auckland City	3.50E-06	149	0.00119	0.0105	0	0	0	0
Auckland Henderson	3.77E-06	149	0.00125	0.0118	0	0	0	0
Auckland Mt Wellington	3.86E-06	149	0.00126	0.0111	0	0	0	0
Auckland Manukau	4.07E-06	149	0.00131	0.0121	0	0	0	0
Auckland Pukekohe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Auckland Silverdale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dargaville	3.30E-06	149	0.00123	0.0134	0	0	0	0
Gisborne	3.17E-06	149	0.00122	0.0107	0	0	0	0
Hamilton	3.46E-06	149	0.00124	0.0108	0	0	0	0
Hastings	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hawera	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kapiti	3.19E-06	149	0.00125	0.0103	0	0	0	0
Katikati	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kawerau	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Levin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Marsden Point	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mt Maunganui	3.54E-06	149	0.00191	0.0112	0	0	0	0
Napier	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New Plymouth	3.39E-06	149	0.00129	0.0120	0	0	0	0
Otaki	4.71E-06	149	0.00142	0.0102	0	0	0	0
Paihia	3.66E-06	149	0.00127	0.0126	0	0	0	0
Palmerston North	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rotorua	3.75E-06	149	0.00128	0.0112	0	0	0	0
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	3.34E-06	149	0.00160	0.0118	0	0	0	0
Taupo	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Awamutu	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Te Puke	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Thames	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tokoroa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Turangi	3.35E-06	149	0.00137	0.0119	0	0	0	0
Waiheke Readymix	3.73E-06	149	0.00169	0.0118	0	0	0	0
Waihi	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanganui	3.26E-06	149	0.00128	0.0106	0	0	0	0
Wellington Aotea Quay	3.03E-06	149	0.00116	0.00948	0	0	0	0
Wellington Belmont	3.20E-06	149	0.00119	0.0105	0	0	0	0
Whakatane	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Whangamata	3.78E-06	149	0.00130	0.0108	0	0	0	0
Whangarei	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wharehine Mangawhai	3.61E-06	149	0.00128	0.0123	0	0	0	0
Wharehine Matakana	3.59E-06	149	0.00127	0.0119	0	0	0	0
Wharehine Wellsford	3.60E-06	149	0.00126	0.0120	0	0	0	0
Whitianga	3.38E-06	149	0.00122	0.0119	0	0	0	0

# WASTE PRODUCTION AND OUTPUT FLOWS

45MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>								
South Island Average	4.10E-06	149	0.00150	0.0103	0	0	0	0
Amberley	4.13E-06	149	0.00127	0.0118	0	0	0	0
Ashburton	3.17E-06	149	0.00125	0.0107	0	0	0	0
Blenheim	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chch Bromley	4.23E-06	149	0.00204	0.00997	0	0	0	0
Chch Canterbury Concrete	4.09E-06	149	0.00126	0.0118	0	0	0	0
Chch Hornby	4.14E-06	149	0.00124	0.00976	0	0	0	0
Darfield	4.13E-06	149	0.00120	0.0108	0	0	0	0
Dunedin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Edendale	4.97E-06	149	0.00194	0.0110	0	0	0	0
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	3.28E-06	149	0.00128	0.0107	0	0	0	0
Greymouth	2.89E-06	149	0.00125	0.0129	0	0	0	0
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nelson	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Oamaru	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Queenstown	3.28E-06	149	0.00128	0.0113	0	0	0	0
Rolleston	4.76E-06	149	0.00129	0.0101	0	0	0	0
Timaru	3.37E-06	149	0.00134	0.0106	0	0	0	0
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>								
South Island Average	3.50E-06	149	0.00112	0	0	0	0	0
Amberley	3.58E-06	149	0.00107	0	0	0	0	0
Ashburton	2.66E-06	149	0.00106	0	0	0	0	0
Blenheim	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Darfield	3.62E-06	149	0.00102	0	0	0	0	0
Dunedin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Edendale	4.44E-06	149	0.00175	0	0	0	0	0
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	2.77E-06	149	0.00110	0	0	0	0	0
Greymouth	2.29E-06	149	0.00103	0	0	0	0	0
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nelson	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Oamaru	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Queenstown	2.73E-06	149	0.00108	0	0	0	0	0
Rolleston	4.28E-06	149	0.00111	0	0	0	0	0
Timaru	2.87E-06	149	0.00116	0	0	0	0	0
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>4.09E-06</b>	<b>149</b>	<b>0.00150</b>	<b>0.0101</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# WASTE PRODUCTION AND OUTPUT FLOWS

**50MPa STANDARD**

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>North Island Average</b>	<b>3.68E-06</b>	<b>149</b>	<b>0.00215</b>	<b>0.0120</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Auckland Airport	5.33E-06	149	0.00150	0.0133	0	0	0	0
Auckland Albany	3.59E-06	149	0.00198	0.0142	0	0	0	0
Auckland City	3.54E-06	149	0.00124	0.0140	0	0	0	0
Auckland Henderson	3.82E-06	149	0.00163	0.0131	0	0	0	0
Auckland Mt Wellington	3.64E-06	149	0.00218	0.0134	0	0	0	0
Auckland Manukau	3.63E-06	149	0.00172	0.0116	0	0	0	0
Auckland Pukekohe	3.78E-06	149	0.00129	0.0136	0	0	0	0
Auckland Silverdale	3.52E-06	149	0.00119	0.00795	0	0	0	0
Dargaville	3.68E-06	149	0.00221	0.0114	0	0	0	0
Gisborne	3.42E-06	149	0.00355	0.00995	0	0	0	0
Hamilton	3.28E-06	149	0.00123	0.0110	0	0	0	0
Hastings	3.54E-06	149	0.00142	0.0122	0	0	0	0
Hawera	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kapiti	3.08E-06	149	0.00121	0.0116	0	0	0	0
Katikati	3.46E-06	149	0.00120	0.0127	0	0	0	0
Kawerau	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Levin	4.61E-06	149	0.00127	0.0116	0	0	0	0
Marsden Point	4.31E-06	150	0.00665	0.0103	0	0	0	0
Mt Maunganui	3.51E-06	149	0.00120	0.0119	0	0	0	0
Napier	3.31E-06	149	0.00130	0.0118	0	0	0	0
New Plymouth	3.38E-06	149	0.00125	0.0131	0	0	0	0
Otaki	4.91E-06	149	0.00142	0.0134	0	0	0	0
Paihia	3.73E-06	149	0.00186	0.0121	0	0	0	0
Palmerston North	3.03E-06	149	0.00119	0.0120	0	0	0	0
Rotorua	3.83E-06	149	0.00272	0.0115	0	0	0	0
Russell	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stratford	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Taupo	3.45E-06	149	0.00126	0.0118	0	0	0	0
Te Awamutu	3.50E-06	149	0.00121	0.0125	0	0	0	0
Te Puke	3.61E-06	149	0.00184	0.0122	0	0	0	0
Thames	3.47E-06	149	0.00123	0.0134	0	0	0	0
Tokoroa	3.54E-06	149	0.00140	0.0128	0	0	0	0
Turangi	2.85E-06	149	0.00126	0.01000	0	0	0	0
Waiheke Readymix	3.97E-06	149	0.00394	0.0113	0	0	0	0
Waihi	3.65E-06	149	0.00127	0.0136	0	0	0	0
Wanganui	3.54E-06	149	0.00337	0.0103	0	0	0	0
Wellington Aotea Quay	3.18E-06	149	0.00218	0.0106	0	0	0	0
Wellington Belmont	2.80E-06	149	0.00109	0.00983	0	0	0	0
Whakatane	3.52E-06	149	0.00342	0.0116	0	0	0	0
Whangamata	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Whangarei	3.98E-06	149	0.00361	0.0115	0	0	0	0
Wharehine Mangawhai	3.43E-06	149	0.00145	0.0142	0	0	0	0
Wharehine Matakana	3.63E-06	149	0.00128	0.0137	0	0	0	0
Wharehine Wellsford	3.73E-06	149	0.00127	0.0130	0	0	0	0
Whitianga	4.10E-06	149	0.00383	0.0109	0	0	0	0

# WASTE PRODUCTION AND OUTPUT FLOWS

50MPa STANDARD

PER 1M<sup>3</sup> OF STANDARD READY-MIXED CONCRETE

Firth Batching Plant	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed	Components for re-use	Materials for recycling	Materials for energy recovery	Exported electrical energy	Exported thermal energy
	kg	kg	kg	kg	kg	kg	MJ, NCV	MJ, NCV
<b>Based on NZ manufactured Cement Supply</b>								
South Island Average	4.28E-06	149	0.00168	0.0115	0	0	0	0
Amberley	4.05E-06	149	0.00126	0.0126	0	0	0	0
Ashburton	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Blenheim	3.54E-06	149	0.00369	0.0113	0	0	0	0
Chch Bromley	4.21E-06	149	0.00206	0.0112	0	0	0	0
Chch Canterbury Concrete	4.12E-06	149	0.00132	0.0120	0	0	0	0
Chch Hornby	4.11E-06	149	0.00124	0.0115	0	0	0	0
Darfield	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dunedin	3.37E-06	149	0.00120	0.0113	0	0	0	0
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Greymouth	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	3.64E-06	149	0.00393	0.0112	0	0	0	0
Nelson	3.20E-06	149	0.00360	0.0128	0	0	0	0
Oamaru	3.38E-06	149	0.00129	0.0131	0	0	0	0
Queenstown	3.28E-06	149	0.00149	0.0119	0	0	0	0
Rolleston	4.70E-06	149	0.00236	0.0114	0	0	0	0
Timaru	3.37E-06	149	0.00133	0.0114	0	0	0	0
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Based on Imported Cement Supply</b>								
South Island Average	4.00E-06	149	0.00217	0	0	0	0	0
Amberley	3.45E-06	149	0.00104	0	0	0	0	0
Ashburton	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Blenheim	3.01E-06	149	0.00349	0	0	0	0	0
Darfield	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dunedin	2.82E-06	149	0.00101	0	0	0	0	0
Edendale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fairlie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Geraldine	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Greymouth	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hilderthorpe	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invercargill	3.09E-06	149	0.00374	0	0	0	0	0
Nelson	2.60E-06	149	0.00338	0	0	0	0	0
Oamaru	2.76E-06	149	0.00107	0	0	0	0	0
Queenstown	2.71E-06	149	0.00128	0	0	0	0	0
Rolleston	4.17E-06	149	0.00217	0	0	0	0	0
Timaru	2.83E-06	149	0.00113	0	0	0	0	0
Twizel	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wanaka	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Westport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>South Island Average, 2019 Production</b>	<b>4.26E-06</b>	<b>149</b>	<b>0.00168</b>	<b>0.0111</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# ADDITIONAL ENVIRONMENTAL INFORMATION

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Firth Industries is committed to sustainability from our raw materials through to distribution. To ensure our systems operate at best practise, Firth holds ISO 9001, ISO 14001 and ISO 45001 certification across all manufacturing sites operating an independently accredited health, safety, environmental, quality and wellbeing management system that focuses on eliminating the potential for harm to our people and the environment.

Firth has been reviewing the environmental credentials of their manufactured concrete for a considerable period. Firth are the only company to have Declare labels for Certified Concrete® products and have been the supplier of choice for many Green Star and Homestar projects within the New Zealand building sector.

Firth Industries Ltd. consider sustainability to be a journey and continually seek out opportunities for continuous improvement in this area. Firth is committed to pursuing high standards of environmental performance and have identified a number of practical ways to contribute to sustainable building products.

This includes producing and promoting architecturally designed products and practise to encourage the design of healthy and sustainable buildings. Firth hold the following certification that supports this goal and may contribute to points under sustainability rating tools.

## ISO 14001

To ensure that Firth operates under an effective environmental management system (EMS), Firth holds ISO9001 ISO14001 and ISO45001 certification across all over 70 manufacturing sites.

ISO14001 provides a framework to ensure that Firth management systems focus on eliminating the potential for harm to our people and the environment.

## Declare

Declare is a database of non-toxic, sustainably sourced building products that meet the stringent requirements of the International Living Future Institute's Living Building Challenge. Declare is an ingredients initiative for building products that is designed to shape a greener, healthier environment for construction workers, business employees, and customers alike.

### A Declare label answers three questions:

- Where does a product come from?
- What is it made of?
- Where does it go at the end of its life?

By providing a clear and informative "nutrition label" and a publicly accessible database of building products, Declare facilitates effective communication between manufacturers, building product specifiers, and consumers.

Firth became the first ready-mix and concrete masonry manufacturer in the world to acquire Declare labels for its Certified Concrete®. The following products have achieved LBC Red List approved meaning that these products meet the strict Declare materials standards:

- Firth Standard Concrete Mix
- Firth Special Concrete Mix Additives

## **Homestar**

Homestar is a comprehensive, independent national rating tool, run by the not-for-profit New Zealand Green Building Council (NZGBC), that measures the health, warmth and efficiency of New Zealand houses. A home is rated on a scale from 1 to 10.

To rate a home's performance and environmental impact, Homestar awards points across several categories: density & resource efficiency; energy, health & comfort; water; waste; materials; site; home management; and an optional innovation category.

A typical house built to the New Zealand building code would achieve a 3 - 4 Homestar. A 6 Homestar rating or higher means the home will be easier and more cost effective to keep warm, healthy and more environmentally friendly than a typical new house built to building code. A 10 Homestar rating means you've built a world leading home.

To achieve a high Homestar rating beyond the standard building code, engage a Homestar Assessor before you get your plans agreed by your local council.

## **Green Star**

Green Star is the NZGBC's rating tool for commercial buildings.

This EPD meets NZGBC's requirements of being "a product-specific, third-party EPD" issued in accordance with ISO 14025 and EN 15804.



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FOR MORE INFORMATION VISIT [FIRTH.CO.NZ](http://FIRTH.CO.NZ) OR CALL 0800 FIRTH 1