



# HUMES

## Environmental Product Declaration

In accordance with ISO 14025 and EN 15804+A2:2019 for:

# Precast Concrete Products



|                            |                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------|
| Programme:                 | EPD Australasia, <a href="https://epd-australasia.com/">https://epd-australasia.com/</a> |
| Programme operator:        | EPD Australasia Limited                                                                  |
| EPD registration number:   | S-P-09350                                                                                |
| Valid from:                | 2023-07-31                                                                               |
| Valid until:               | 2028-07-31                                                                               |
| Geographical scope of EPD: | New Zealand                                                                              |
| Version 1.1                | 2023-08-21                                                                               |

**WWW.HUMES.CO.NZ**

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.epd-australasia.com](https://www.epd-australasia.com)



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## General Information

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).

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. The results for EN15804+A1 compliant EPDs are not comparable with EN15804+A2 compliant studies as the methodologies are different. EN 15804+A1 compliant results are included in this document to assist comparability across EPDs.

|                                                                                          |                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Declaration Owner</b>                                                                 | <b>Humes Pipeline Systems</b>                                                                                                                                                                                                                                   |
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| <b>Geographical Scope</b>                                                                | <b>New Zealand</b>                                                                                                                                                                                                                                              |
| <b>Reference Year for Data</b>                                                           | <b>2018-07-01 to 2019-06-30</b>                                                                                                                                                                                                                                 |
| <b>EPD produced by</b>                                                                   | <b>thinkstep Ltd</b>                                                                                                                                                                                                                                            |
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| <b>EPD programme operator:</b>                                                           | <b>EPD Australasia Limited</b>                                                                                                                                                                                                                                  |
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| <b>PCR</b>                                                                               | PCR 2019.14 Construction Products Version 1.11, 2021-02-05<br>c-PCR-003 Concrete and Concrete Elements (EN 16757:2017),<br>2019-12-20 (valid until 2024-12-30)                                                                                                  |
| <b>PCR review was conducted by</b>                                                       | The Technical Committee of the International EPD® System                                                                                                                                                                                                        |
| <b>Chair</b>                                                                             | Claudia A. Peña. Contact via <a href="mailto:info@environdec.com">info@environdec.com</a>                                                                                                                                                                       |
| <b>Independent verification of the declaration and data, according to ISO 14025</b>      | <input type="checkbox"/> EPD process certification (Internal)<br><input checked="" type="checkbox"/> EPD verification (External)                                                                                                                                |
| <b>Third party verifier</b>                                                              | Rob Rouwette (start2see Pty Ltd) Email: <a href="mailto:rob.rouwette@start2see.com.au">rob.rouwette@start2see.com.au</a>                                                                                                                                        |
| <b>Verifier approved by</b>                                                              | EPD Australasia                                                                                                                                                                                                                                                 |
| <b>Procedure for follow-up of data during EPD validity involved third-party verifier</b> | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No                                                                                                                                                                                          |



## About us

Founded in 1923 by pioneering industrialist, Walter Hume, **Humes Pipeline Systems** is a company built on the principals of innovation, manufacturing expertise and quality products supported by a team of capable people who are proud to serve their customers

For over 100 years, Humes have been sourcing and distributing a range of products of various materials, and also manufactures a range of concrete pipe and precast structures for the infrastructure, drain laying and rural markets throughout New Zealand. Humes is a standalone business unit within the Building Products division of the Fletcher Building Group.

The Humes business is supported by a Team of over 250+ employees working across 23 sites (manufacturing and sales) all over New Zealand providing extensive product and service coverage and is supported by a team in their Auckland Support Office.

- Innovative expertise since 1923
- Connecting communities with smarter solutions
- Cleaning up waterways
- Pioneers in the industry
- Building lifelong assets

Humes holds current certifications under AS/NZS 9001 for Quality Management Systems, as well as being licensed under various product certification schemes.



## Product Description

This EPD covers reinforced concrete products manufactured by Humes, across four precast manufacturing locations in New Zealand – Hornby (Christchurch), Papakura (Auckland), Te Rapa (Hamilton) and Nelson. It also includes concrete sump and riser products, produced at Hornby and Papakura. It does not include Concrete Sleepers (covered under Humes RCP EPD S-P-09351).

Precast concrete is a high quality and extremely versatile product manufactured in a controlled factory environment using standardised production techniques. Precast concrete is available in a vast range of different sizes, shapes and finishes and it is used in a variety of applications, including buildings, bridges, infrastructure and landscaping.

This EPD covers a range of different precast concrete products, used in a variety of different applications by many different end users. For convenience in interpreting the data presented, the precast products covered have been grouped into similar use areas. Where a precast unit is modified after casting with additional components (such as plastic fittings), these are not included, and should be treated separately when calculating the overall product impact. The summary of products included are:

**Box Culverts and Wingwalls:** Box culverts are medium to large structures used to allow passage under another structure, typically a road or similar. They are often used for stream and water management, where the natural watercourse direction is generally maintained, underpasses for vehicles or livestock, or pump stations and vertical access chambers. Box culverts are typically installed with header beams and wingwalls on each end to retain the surrounding ground slope.

**Livestock Troughs:** Humes concrete troughs are used by farmers and lifestyle blocks all over New Zealand, and are regarded for their durability, and simplicity to use. Troughs are manufactured for both water and feed, and are suited to a variety of different livestock breeds.

### **Cesspits, sumps, risers, tanks, riser bases and lids:**

Core to all water management solutions, concrete chambers, pits and lids are used in water infrastructure all around New Zealand. Cesspits and sumps are often the first point of entry of stormwater into the network.

**Pre-stressed power poles:** Manufactured exclusively in Nelson, pre-stressed power poles are used by local utility providers as a durable, and versatile platform to support power and telecommunication wiring above ground.

**Pre-Stressed bridges:** Our pre-stressed bridges are used all over the North Island to aid in access into and around farms, lifestyle blocks, rural areas and many more. Being manufactured to the length required by each customer gives a full range of flexibility options to allow the specific needs to be met.

**Ducting:** Humes concrete ducting is used throughout New Zealand to protect utility networks and for water races and drainage

**Blocks:** Reinforced and unreinforced concrete blocks are used for retaining or protecting embankments.

### **Engineered to order product (not included in EPD):**

Humes manufactures a large range of engineered to order products, designed specifically for customers requests and needs. Due to the high complexity and variability of these products, they are not specifically included in this EPD, however it can be used as a reference point to identify the impact of any components using similar products from within this document.

**Table 1 – Industry Classification**

| PRODUCT                                      | CLASSIFICATION | CODE                                          | CATEGORY                                                                                                       |
|----------------------------------------------|----------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Box culverts and wingwalls                   | UN CPC Ver.2   | 375 Articles of concrete, cement and plaster. | Prefabricated structural components for building or civil engineering, of cement, concrete or artificial stone |
| Cesspits, sumps, tanks, riser bases and lids |                |                                               |                                                                                                                |
| Pre-stressed power poles                     |                |                                               |                                                                                                                |
| Pre-stressed bridges                         |                |                                               |                                                                                                                |
| Ducting                                      | ANZSIC 2006    | 2034                                          | Concrete Product Manufacturing                                                                                 |
| Livestock Troughs                            |                |                                               |                                                                                                                |
| Blocks and general precast                   |                |                                               |                                                                                                                |
| Livestock Troughs                            |                |                                               |                                                                                                                |
| Blocks and general precast                   |                |                                               |                                                                                                                |

**Table 2 – Summary of the Precast Product Range**

| PRODUCT/FACTORY                              | HORNBY | PAPAKURA | TE RAPA             | NELSON              |
|----------------------------------------------|--------|----------|---------------------|---------------------|
| Box culverts                                 | Yes    |          | Yes                 |                     |
| Wingwalls and headwalls                      | Yes    | Yes      | Yes                 | Yes                 |
| Livestock troughs                            | Yes    |          |                     | Yes                 |
| Cesspits, sumps, tanks, riser bases and lids | Yes    | Yes      | Yes (Limited Range) | Yes (Limited Range) |
| Pre-stressed power poles                     |        |          |                     | Yes                 |
| Pre-stressed bridges                         |        |          | Yes                 |                     |
| Ducting                                      | Yes    | Yes      | Yes                 |                     |
| Blocks and general                           | Yes    | Yes      |                     | Yes                 |





**Table 3 – Product Details and Relevant Standards**

| PRODUCT TYPE                                 | DESIGN LIFE (YEARS) | RELEVANT STANDARDS                           | APPLICATION                                                                                     |
|----------------------------------------------|---------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------|
| Box culverts                                 | 100                 | NZS 3103 Part1:2006<br>Transit Bridge Manual | Waterways, stock underpasses, vertical chambers, pump stations, channels, bridging              |
| Wingwalls                                    | 100                 | NZS 3109:2007                                | Culvert inlets and outlets for subdivision, roading, etc                                        |
| Livestock troughs                            | 20                  | NZS 3109:2007                                | Feeding livestock, stock water                                                                  |
| Cesspits, sumps, tanks, riser bases and lids | 50-100              | NZS 3109:2007                                | Stormwater drainage and collection, onsite residential primary wastewater treatment, telco pits |
| Prestressed power poles                      | 50                  | AS/NZS 4065:2010<br>AS/NZS 4647:2000         | Above ground power and telecommunication wiring support                                         |
| Prestressed bridges                          | 50                  | NZS 3109:2007                                | Access in rural areas                                                                           |
| Ducting                                      | 100                 | NZS 3109:2007                                | Protecting utility networks, water races, drainage                                              |
| Blocks                                       | 100                 | NZS 3109:2007                                | Retaining or protecting embankments                                                             |
| General precast                              | Varies              | NZS 3109:2007                                | Various                                                                                         |



## Declared Unit

**Humes Precast Concrete Products** cover a wide range of areas, with unique designs, and a range of reinforcing designs, dependant on the final use case for the products.

Precast units come in a variety of designs, shapes and sizes. Each factory and local area will have its own regional variations to the specific designs, which add an additional layer of complexity.

The declared unit for this EPD is "1 Tonne of Precast Concrete Product".

This EPD covers 799 unique products, including 102 sump and riser products produced on the pipe plants. In order to simplify communication of environmental profiles, it is necessary to group products according to key characteristics. Grouping is based on the product type and, where necessary, further grouping by product dimension, production site, and/or reinforcing proportion. The impacts are declared for a representative product for each group.

All products in this EPD are listed in tables 4 to 51, including the product specification and mass, production site, and product group. This can be used to convert specific product types to their mass, and therefore their environmental impact.

# Product Specifications

Humes' reinforced concrete precast products included in this EPD are listed below with separate tables for each group of product. The tables include the conversion factors for product mass (t), site of manufacture, and identification of the product group.

## Bases

As Manhole Risers on Base are manufactured in a 2 stage process, the impacts for each stage has been independently assessed. Groups 1-5 show the basing stage only, and will need to be added to the relevant riser height from groups 46 & 48 (the riser stage) to calculate the full impact. To aid, we have included the product codes of the based units and the respective riser heights that can apply to each base diameter and thickness in groups 1-5. The only exception is the "One Piece" units, for which the weight and results cover the combined riser and base system.

**Table 4 - Group 1 – Riser/Sump Base - HPA - Papakura**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                 | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP                 | GROUP # |
|--------|-------------|----------|-------------------------------|--------------------------------|---------------------|-----------------------|---------|
| HPA    | 80088375    | Papakura | MANHOLE RISER+FL BASE NO HOLE | 2300.2400.150MM 2430 EF LEN    | 2329                | Riser/Sump Base - HPA | 1       |
| HPA    | 80088377    | Papakura | MANHOLE RISER+FL BASE NO HOLE | 2050.1500.150MM                | 1824                | Riser/Sump Base - HPA | 1       |
| HPA    | 80090866    | Papakura | CIRCULAR SUMP+INTERNAL BASE   | 600.600.100MM FJ               | 68                  | Riser/Sump Base - HPA | 1       |
| HPA    | 80090867    | Papakura | CIRCULAR SUMP+INTERNAL BASE   | 600.900.100MM FJ               | 68                  | Riser/Sump Base - HPA | 1       |
| HPA    | 80090868    | Papakura | CIRCULAR SUMP+INTERNAL BASE   | 600.1200.100MM FJ              | 68                  | Riser/Sump Base - HPA | 1       |
| HPA    | 80090869    | Papakura | CIRCULAR SUMP+INTERNAL BASE   | 600.1500.100MM FJ              | 68                  | Riser/Sump Base - HPA | 1       |
| HPA    | 80090870    | Papakura | CIRCULAR SUMP+INTERNAL BASE   | 600.1800MM FJ                  | 68                  | Riser/Sump Base - HPA | 1       |
| HPA    | 80090873    | Papakura | CIRCULAR SUMP+INTERNAL BASE   | 750.900MM FJ                   | 106                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80090874    | Papakura | CIRCULAR SUMP+INTERNAL BASE   | 750.1200MM FJ                  | 106                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80090953    | Papakura | MANHOLE RISER+FL BASE         | 1050.600.150MM NJ 570 EF LEN   | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80090955    | Papakura | MANHOLE RISER+FL BASE         | 1050.900.150MM NJ 880 EF LEN   | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80090956    | Papakura | MANHOLE RISER+FL BASE         | 1050.1200.150MM NJ             | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80090957    | Papakura | MANHOLE RISER+FL BASE         | 1050.1500.150MM NJ             | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80090958    | Papakura | MANHOLE RISER+FL BASE         | 1050.1800.150MM NJ 1810 EF LEN | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80090959    | Papakura | MANHOLE RISER+FL BASE         | 1050.2100.150MM NJ 2110 EF LEN | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80090960    | Papakura | MANHOLE RISER+FL BASE         | 1050.2400.150MM NJ 2430 EF LEN | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091053    | Papakura | MANHOLE RISER+FL BASE         | 1050.600.150MM 570 EF LEN      | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091054    | Papakura | MANHOLE RISER+FL BASE         | 1050.900.150MM 880 EF LEN      | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091055    | Papakura | MANHOLE RISER+FL BASE         | 1050.1200.150MM                | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091056    | Papakura | MANHOLE RISER+FL BASE         | 1050.1500.150MM                | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091057    | Papakura | MANHOLE RISER+FL BASE         | 1050.1800.150MM 1810 EF LEN    | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091058    | Papakura | MANHOLE RISER+FL BASE         | 1050.2100.150MM OJ 2110 EF LEN | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091059    | Papakura | MANHOLE RISER+FL BASE         | 1050.2400.150MM 2430 EF LEN    | 632                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091060    | Papakura | MANHOLE RISER+INTERNAL BASE   | 1050.900.100MM 880 EF LEN      | 421                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091061    | Papakura | MANHOLE RISER+INTERNAL BASE   | 1050.1200.100MM                | 421                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091062    | Papakura | MANHOLE RISER+FL BASE         | 1200.600.150MM 570 EF LEN      | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091065    | Papakura | MANHOLE RISER+FL BASE         | 1200.900.150MM 880 EF LEN      | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091066    | Papakura | MANHOLE RISER+FL BASE DRILLED | 1200.900.150MM 880 EF LEN      | 779                 | Riser/Sump Base - HPA | 1       |

## Bases continued

**Table 4 ctd** - Group 1 – Riser/Sump Base - HPA - Papakura

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                 | DESCRIPTION 2               | PRODUCT WEIGHT [KG] | GROUP                 | GROUP # |
|--------|-------------|----------|-------------------------------|-----------------------------|---------------------|-----------------------|---------|
| HPA    | 80091067    | Papakura | MANHOLE RISER+FL BASE         | 1200.1200.150MM             | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091068    | Papakura | MANHOLE RISER+FL BASE         | 1200.1500.150MM             | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091069    | Papakura | MANHOLE RISER+FL BASE DRILLED | 1200.1500.150MM             | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091070    | Papakura | MANHOLE RISER+FL BASE         | 1200.1800.150MM 1810 EF LEN | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091071    | Papakura | MANHOLE RISER+FL BASE         | 1200.2100.150MM 2110 EF LEN | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091073    | Papakura | MANHOLE RISER+FL BASE         | 1200.2400.150MM 2430 EF LEN | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091074    | Papakura | MANHOLE RISER+FL BASE         | 1350.600.150MM 570 EF LEN   | 942                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091075    | Papakura | MANHOLE RISER+FL BASE         | 1350.900.150MM 880 EF LEN   | 942                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091076    | Papakura | MANHOLE RISER+FL BASE         | 1350.1200.150MM             | 942                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091077    | Papakura | MANHOLE RISER+FL BASE         | 1350.1500.150MM             | 942                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091078    | Papakura | MANHOLE RISER+FL BASE         | 1350.1800.150MM 1810 EF LEN | 942                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091079    | Papakura | MANHOLE RISER+FL BASE         | 1350.2100.150MM 2110 EF LEN | 942                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091080    | Papakura | MANHOLE RISER+FL BASE         | 1350.2400.150MM 2430 EF LEN | 942                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091081    | Papakura | MANHOLE RISER+FL BASE         | 1500.600.150MM 570 EF LEN   | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091082    | Papakura | MANHOLE RISER+FL BASE DRILLED | 1500.600.150MM 570 EF LEN   | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091083    | Papakura | MANHOLE RISER+FL BASE         | 1500.900.150MM 880 EF LEN   | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091084    | Papakura | MANHOLE RISER+FL BASE DRILLED | 1500.900.150MM 880 EF LEN   | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091085    | Papakura | MANHOLE RISER+FL BASE         | 1500.1200.150MM             | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091087    | Papakura | MANHOLE RISER+FL BASE         | 1500.1500.150MM             | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091088    | Papakura | MANHOLE RISER+FL BASE         | 1500.1800.150MM 1810 EF LEN | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091090    | Papakura | MANHOLE RISER+FL BASE         | 1500.2100.150MM 2110 EF LEN | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091091    | Papakura | MANHOLE RISER+FL BASE         | 1500.2400.150MM 2430 EF LEN | 1103                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091098    | Papakura | MANHOLE RISER+FL BASE         | 2050.600.150MM 570 EF LEN   | 1824                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091099    | Papakura | MANHOLE RISER+FL BASE         | 2050.900.150MM 880 EF LEN   | 1824                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091100    | Papakura | MANHOLE RISER+FL BASE         | 2050.1200.150MM             | 1824                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091101    | Papakura | MANHOLE RISER+FL BASE         | 2050.1500.150MM             | 1824                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091102    | Papakura | MANHOLE RISER+FL BASE         | 2050.1800.150MM 1810 EF LEN | 1824                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091103    | Papakura | MANHOLE RISER+FL BASE         | 2050.2100.150MM 2110 EF LEN | 1824                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091104    | Papakura | MANHOLE RISER+FL BASE         | 2050.2400.150MM 2430 EF LEN | 1824                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091105    | Papakura | MANHOLE RISER+FL BASE DRILLED | 2300.600.150MM 570 EF LEN   | 2329                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091106    | Papakura | MANHOLE RISER+FL BASE         | 1800.600.150MM 570 EF LEN   | 1509                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091107    | Papakura | MANHOLE RISER+FL BASE         | 1800.900.150MM 880 EF LEN   | 1509                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091109    | Papakura | MANHOLE RISER+FL BASE         | 1800.1200.150MM             | 1509                | Riser/Sump Base - HPA | 1       |

## Bases continued

**Table 4 ctd** - Group 1 – Riser/Sump Base - HPA - Papakura

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                 | DESCRIPTION 2               | PRODUCT WEIGHT [KG] | GROUP                 | GROUP # |
|--------|-------------|----------|-------------------------------|-----------------------------|---------------------|-----------------------|---------|
| HPA    | 80091110    | Papakura | MANHOLE RISER+FL BASE         | 1800.1500.150MM             | 1509                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091112    | Papakura | MANHOLE RISER+FL BASE         | 1800.1800.150MM 1810 EF LEN | 1509                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091114    | Papakura | MANHOLE RISER+FL BASE         | 1800.2100.150MM 2110 EF LEN | 1509                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091116    | Papakura | MANHOLE RISER+FL BASE         | 1800.2400.150MM 2430 EF LEN | 1509                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091117    | Papakura | MANHOLE RISER+FL BASE DRILLED | 1800.2400.150MM 2430 EF LEN | 1509                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091118    | Papakura | MANHOLE RISER+FL BASE         | 2050.2400.200MM 2430 EF LEN | 2432                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091120    | Papakura | MANHOLE RISER+FL BASE DRILLED | 2300.1200.150MM             | 2329                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091128    | Papakura | MANHOLE RISER+FL BASE DRILLED | 2300.1500.150MM             | 2329                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091129    | Papakura | MANHOLE RISER+FL BASE DRILLED | 2300.1800.150MM 1810 EF LEN | 2329                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091130    | Papakura | MANHOLE RISER+FL BASE DRILLED | 2300.2100.150MM 2110 EF LEN | 2329                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091134    | Papakura | MANHOLE RISER+FL BASE NO HOLE | 1200.1500.150MM             | 779                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091138    | Papakura | MANHOLE RISER+FL BASE DRILLED | 2300.2400.150MM 2430 EF LEN | 2329                | Riser/Sump Base - HPA | 1       |
| HPA    | 80091168    | Papakura | MANHOLE RISER+INTERNAL BASE   | 1050.600.100MM 570 EF LEN   | 421                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091169    | Papakura | MANHOLE RISER+INTERNAL BASE   | 1050.1500.100MM             | 421                 | Riser/Sump Base - HPA | 1       |
| HPA    | 80091187    | Papakura | MANHOLE RISER+INTERNAL BASE   | 1050.1800.100MM 1810 EF LEN | 421                 | Riser/Sump Base - HPA | 1       |

**Table 5** - Group 2 – Riser – One Piece - HHY - Hornby

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1               | DESCRIPTION 2   | PRODUCT WEIGHT [KG] | GROUP                   | GROUP # |
|--------|-------------|----------|-----------------------------|-----------------|---------------------|-------------------------|---------|
| HHY    | 80091092    | Hornby   | MANHOLE RISER+BASE ONE UNIT | 1050.600.150MM  | 1055                | Riser - One Piece - HHY | 2       |
| HHY    | 80091096    | Hornby   | ONE UNIT MANHOLE RISER+BASE | 1050.1200.150MM | 1388                | Riser - One Piece - HHY | 2       |

**Table 6** - Group 3 – Riser Base - HNN - Nelson

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1               | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP            | GROUP # |
|--------|-------------|----------|-----------------------------|--------------------------------|---------------------|------------------|---------|
| HNN    | 80091053    | Nelson   | MANHOLE RISER+FL BASE       | 1050.600.150MM 570 EF LEN      | 632                 | Riser Base - HNN | 3       |
| HNN    | 80091054    | Nelson   | MANHOLE RISER+FL BASE       | 1050.900.150MM 880 EF LEN      | 632                 | Riser Base - HNN | 3       |
| HNN    | 80091055    | Nelson   | MANHOLE RISER+FL BASE       | 1050.1200.150MM                | 632                 | Riser Base - HNN | 3       |
| HNN    | 80091056    | Nelson   | MANHOLE RISER+FL BASE       | 1050.1500.150MM                | 632                 | Riser Base - HNN | 3       |
| HNN    | 80091057    | Nelson   | MANHOLE RISER+FL BASE       | 1050.1800.150MM 1810 EF LEN    | 632                 | Riser Base - HNN | 3       |
| HNN    | 80091058    | Nelson   | MANHOLE RISER+FL BASE       | 1050.2100.150MM OJ 2110 EF LEN | 632                 | Riser Base - HNN | 3       |
| HNN    | 80091059    | Nelson   | MANHOLE RISER+FL BASE       | 1050.2400.150MM 2430 EF LEN    | 632                 | Riser Base - HNN | 3       |
| HNN    | 80091065    | Nelson   | MANHOLE RISER+FL BASE       | 1200.900.150MM 880 EF LEN      | 779                 | Riser Base - HNN | 3       |
| HNN    | 80091076    | Nelson   | MANHOLE RISER+FL BASE       | 1350.1200.150MM                | 942                 | Riser Base - HNN | 3       |
| HNN    | 80091092    | Nelson   | MANHOLE RISER+BASE ONE UNIT | 1050.600.150MM                 | 1055                | Riser Base - HNN | 3       |

## Bases continued

**Table 6 ctd - Group 3 – Riser Base - HNN - Nelson**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                 | DESCRIPTION 2               | PRODUCT WEIGHT [KG] | GROUP            | GROUP # |
|--------|-------------|----------|-------------------------------|-----------------------------|---------------------|------------------|---------|
| HNN    | 80091094    | Nelson   | ONE UNIT MANHOLE RISER+BASE   | 1050.900.150MM              | 1225                | Riser Base - HNN | 3       |
| HNN    | 80091096    | Nelson   | ONE UNIT MANHOLE RISER+BASE   | 1050.1200.150MM             | 1388                | Riser Base - HNN | 3       |
| HNN    | 80091131    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1200.600.150MM 570 EF LEN   | 779                 | Riser Base - HNN | 3       |
| HNN    | 80091132    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1200.900.150MM 880 EF LEN   | 779                 | Riser Base - HNN | 3       |
| HNN    | 80091133    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1200.1200.150MM             | 779                 | Riser Base - HNN | 3       |
| HNN    | 80091134    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1200.1500.150MM             | 779                 | Riser Base - HNN | 3       |
| HNN    | 80091135    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1200.1800.150MM 1810 EF LEN | 779                 | Riser Base - HNN | 3       |
| HNN    | 80091136    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1200.2100.150MM 2110 EF LEN | 779                 | Riser Base - HNN | 3       |
| HNN    | 80091137    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1200.2400.150MM 2430 EF LEN | 779                 | Riser Base - HNN | 3       |
| HNN    | 80091139    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1350.600.150MM 570 EF LEN   | 942                 | Riser Base - HNN | 3       |
| HNN    | 80091140    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1350.900.150MM 880 EF LEN   | 942                 | Riser Base - HNN | 3       |
| HNN    | 80091141    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1350.1200.150MM             | 942                 | Riser Base - HNN | 3       |
| HNN    | 80091142    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1350.1500.150MM             | 942                 | Riser Base - HNN | 3       |
| HNN    | 80091143    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1350.1800.150MM 1810 EF LEN | 942                 | Riser Base - HNN | 3       |
| HNN    | 80091144    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1350.2100.150MM 2110 EF LEN | 942                 | Riser Base - HNN | 3       |
| HNN    | 80091145    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1350.2440.150MM 2430 EF LEN | 942                 | Riser Base - HNN | 3       |
| HNN    | 80091148    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1500.1200.150MM             | 1103                | Riser Base - HNN | 3       |
| HNN    | 80091149    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1500.1500.150MM             | 1103                | Riser Base - HNN | 3       |
| HNN    | 80091150    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1500.1800.150MM 1810 EF LEN | 1103                | Riser Base - HNN | 3       |
| HNN    | 80091151    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1500.2100.150MM 2110 EF LEN | 1103                | Riser Base - HNN | 3       |
| HNN    | 80091152    | Nelson   | MANHOLE RISER+FL BASE NO HOLE | 1500.2440.150MM 2430 EF LEN | 1103                | Riser Base - HNN | 3       |

**Table 7 - Group 4 – Riser/Sump Base - HHY - Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                 | DESCRIPTION 2               | PRODUCT WEIGHT [KG] | GROUP                 | GROUP # |
|--------|-------------|----------|-------------------------------|-----------------------------|---------------------|-----------------------|---------|
| HHY    | 80088370    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2050.2100.150MM             | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088374    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2050.2440.150MM             | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088375    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2300.2400.150MM 2430 EF LEN | 2329                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088376    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2050.600.150MM              | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088377    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2050.1500.150MM             | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088378    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2050.1800.150MM             | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088379    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2300.1200.150MM             | 2329                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088380    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2300.600.150MM              | 2329                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088381    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2300.1500.150MM             | 2329                | Riser/Sump Base - HHY | 4       |



## Bases continued

**Table 7 ctd - Group 4 – Riser/Sump Base - HHY - Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                 | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP                 | GROUP # |
|--------|-------------|----------|-------------------------------|--------------------------------|---------------------|-----------------------|---------|
| HHY    | 80088385    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2300.1800.150MM                | 2329                | Riser/Sump Base - HHY | 4       |
| HHY    | 80088386    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2050.1200.150MM                | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80089095    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1650.2100.150MM 2110 EF LEN    | 1306                | Riser/Sump Base - HHY | 4       |
| HHY    | 80089704    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 2050.900.150MM                 | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80090864    | Hornby   | CIRCULAR SUMP+FL BASE         | 600.600.150MM FJ               | 204                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80090883    | Hornby   | SQUARE MANHOLE RISER+BASE     | 900.900.1000MM                 | 1512                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091053    | Hornby   | MANHOLE RISER+FL BASE         | 1050.600.150MM 570 EF LEN      | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091054    | Hornby   | MANHOLE RISER+FL BASE         | 1050.900.150MM 880 EF LEN      | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091055    | Hornby   | MANHOLE RISER+FL BASE         | 1050.1200.150MM                | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091056    | Hornby   | MANHOLE RISER+FL BASE         | 1050.1500.150MM                | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091057    | Hornby   | MANHOLE RISER+FL BASE         | 1050.1800.150MM 1810 EF LEN    | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091058    | Hornby   | MANHOLE RISER+FL BASE         | 1050.2100.150MM OJ 2110 EF LEN | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091059    | Hornby   | MANHOLE RISER+FL BASE         | 1050.2400.150MM 2430 EF LEN    | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091061    | Hornby   | MANHOLE RISER+INTERNAL BASE   | 1050.1200.100MM                | 421                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091067    | Hornby   | MANHOLE RISER+FL BASE         | 1200.1200.150MM                | 779                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091099    | Hornby   | MANHOLE RISER+FL BASE         | 2050.900.150MM 880 EF LEN      | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091100    | Hornby   | MANHOLE RISER+FL BASE         | 2050.1200.150MM                | 1824                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091118    | Hornby   | MANHOLE RISER+FL BASE         | 2050.2400.200MM 2430 EF LEN    | 2432                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091121    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1050.600.150MM 570 EF LEN      | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091122    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1050.900.150MM 880 EF LEN      | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091123    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1050.1200.150MM                | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091124    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1050.1500.150MM                | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091125    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1050.1800.150MM 1810 EF LEN    | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091126    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1050.2100.150MM 2110 EF LEN    | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091127    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1050.2400.150MM 2430 EF LEN    | 632                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091128    | Hornby   | MANHOLE RISER+FL BASE DRILLED | 2300.1500.150MM                | 2329                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091131    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1200.600.150MM 570 EF LEN      | 779                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091132    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1200.900.150MM 880 EF LEN      | 779                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091133    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1200.1200.150MM                | 779                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091134    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1200.1500.150MM                | 779                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091135    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1200.1800.150MM 1810 EF LEN    | 779                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091136    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1200.2100.150MM 2110 EF LEN    | 779                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091137    | Hornby   | MANHOLE RISER+FL BASE NO HOLE | 1200.2400.150MM 2430 EF LEN    | 779                 | Riser/Sump Base - HHY | 4       |



## Bases continued

**Table 7 ctd - Group 4 – Riser/Sump Base - HHY - Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                  | DESCRIPTION 2               | PRODUCT WEIGHT [KG] | GROUP                 | GROUP # |
|--------|-------------|----------|--------------------------------|-----------------------------|---------------------|-----------------------|---------|
| HHY    | 80091139    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1350.600.150MM 570 EF LEN   | 942                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091140    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1350.900.150MM 880 EF LEN   | 942                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091141    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1350.1200.150MM             | 942                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091142    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1350.1500.150MM             | 942                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091143    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1350.1800.150MM 1810 EF LEN | 942                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091144    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1350.2100.150MM 2110 EF LEN | 942                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091145    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1350.2440.150MM 2430 EF LEN | 942                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091146    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1500.600.150MM 570 EF LEN   | 1103                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091147    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1500.900.150MM 880 EF LEN   | 1103                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091148    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1500.1200.150MM             | 1103                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091149    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1500.1500.150MM             | 1103                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091150    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1500.1800.150MM 1810 EF LEN | 1103                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091151    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1500.2100.150MM 2110 EF LEN | 1103                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091152    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1500.2440.150MM 2430 EF LEN | 1103                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091160    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1800.600.150MM 570 EF LEN   | 1509                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091161    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1800.900.150MM 880 EF LEN   | 1509                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091162    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1800.1200.150MM             | 1509                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091163    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1800.1500.150MM             | 1509                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091164    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1800.1800.150MM 1810 EF LEN | 1509                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091165    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1800.2100.150MM 2110 EF LEN | 1509                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091166    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 1800.2400.150MM 2430 EF LEN | 1509                | Riser/Sump Base - HHY | 4       |
| HHY    | 80091168    | Hornby   | MANHOLE RISER+INTERNAL BASE    | 1050.600.100MM 570 EF LEN   | 421                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80091169    | Hornby   | MANHOLE RISER+INTERNAL BASE    | 1050.1500.100MM             | 421                 | Riser/Sump Base - HHY | 4       |
| HHY    | 80104289    | Hornby   | MANHOLE RISER+FL BASE NO HOLE  | 2300.2100.150MM 2110 EF LEN | 2329                | Riser/Sump Base - HHY | 4       |
| HHY    | 80107051    | Hornby   | MANHOLE RISER+BIG FOOT FL BASE | 1050.2440.300MM             | 1263                | Riser/Sump Base - HHY | 4       |

## Bases continued

**Table 8 - Group 5 – Sump Base Alternative Reinforcing – HHY – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1               | DESCRIPTION 2     | PRODUCT WEIGHT [KG] | GROUP                                   | GROUP # |
|--------|-------------|----------|-----------------------------|-------------------|---------------------|-----------------------------------------|---------|
| HHY    | 80090866    | Hornby   | CIRCULAR SUMP+INTERNAL BASE | 600.600.100MM FJ  | 68                  | Sump Base Alternative Reinforcing – HHY | 5       |
| HHY    | 80090867    | Hornby   | CIRCULAR SUMP+INTERNAL BASE | 600.900.100MM FJ  | 68                  | Sump Base Alternative Reinforcing – HHY | 5       |
| HHY    | 80090868    | Hornby   | CIRCULAR SUMP+INTERNAL BASE | 600.1200.100MM FJ | 68                  | Sump Base Alternative Reinforcing – HHY | 5       |
| HHY    | 80090875    | Hornby   | CIRCULAR SUMP+INTERNAL BASE | 900.600MM FJ      | 153                 | Sump Base Alternative Reinforcing – HHY | 5       |
| HHY    | 80090876    | Hornby   | CIRCULAR SUMP+INTERNAL BASE | 900.900MM FJ      | 153                 | Sump Base Alternative Reinforcing – HHY | 5       |
| HHY    | 80090877    | Hornby   | CIRCULAR SUMP+INTERNAL BASE | 900.1200MM FJ     | 153                 | Sump Base Alternative Reinforcing – HHY | 5       |
| HHY    | 80090878    | Hornby   | CIRCULAR SUMP+INTERNAL BASE | 900.1500MM FJ     | 153                 | Sump Base Alternative Reinforcing – HHY | 5       |

## Blocks & Other Precast

**Table 9 - Group 6 – Anchorbloc**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1 | DESCRIPTION 2               | PRODUCT WEIGHT [KG] | GROUP       | GROUP # |
|--------|-------------|----------|---------------|-----------------------------|---------------------|-------------|---------|
| HHY    | 80091992    | Hornby   | ANCHORBLOC    | 1000MM HIGH STD             | 1500                | Anchorblock | 6       |
| HHY    | 80091994    | Hornby   | ANCHORBLOC    | 500MM HIGH - 1/2 HEIGHT     | 677.5               | Anchorblock | 6       |
| HHY    | 80091995    | Hornby   | ANCHORBLOC    | 600MM WIDE - LEFT HAND 1/2  | 677.5               | Anchorblock | 6       |
| HHY    | 80091996    | Hornby   | ANCHORBLOC    | 600MM WIDE - RIGHT HAND 1/2 | 677.5               | Anchorblock | 6       |
| HPA    | 80091992    | Papakura | ANCHORBLOC    | 1000MM HIGH STD             | 1500                | Anchorblock | 6       |
| HPA    | 80091994    | Papakura | ANCHORBLOC    | 500MM HIGH - 1/2 HEIGHT     | 677.5               | Anchorblock | 6       |
| HPA    | 80091995    | Papakura | ANCHORBLOC    | 600MM WIDE - LEFT HAND 1/2  | 677.5               | Anchorblock | 6       |
| HPA    | 80091996    | Papakura | ANCHORBLOC    | 600MM WIDE - RIGHT HAND 1/2 | 677.5               | Anchorblock | 6       |

**Table 10 - Group 7 – General Precast**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                  | DESCRIPTION 2    | PRODUCT WEIGHT [KG] | GROUP           | GROUP # |
|--------|-------------|----------|--------------------------------|------------------|---------------------|-----------------|---------|
| HHY    | 80091694    | Hornby   | CONCRETE SIDE ENTRY KERB BLOCK |                  | 55                  | General Precast | 7       |
| HHY    | 80091762    | Hornby   | CONCRETE VALVE SURROUND STD    | 150MM            | 48                  | General Precast | 7       |
| HNN    | 80089044    | Nelson   | EXTENSION                      | PADMOUNT         | 35                  | General Precast | 7       |
| HNN    | 80091277    | Nelson   | PAD MOUNT TRANSFORMER          |                  | 988                 | General Precast | 7       |
| HNN    | 80091325    | Nelson   | MANHOLE ADJUSTMENT RING        | 75MM 540 OPENING | 26                  | General Precast | 7       |
| HNN    | 80091762    | Nelson   | CONCRETE VALVE SURROUND STD    | 150MM            | 48                  | General Precast | 7       |
| HNN    | 80092029    | Nelson   | TOOTH CONNECTOR                | LEFT HAND        | 375                 | General Precast | 7       |
| HPA    | 80091469    | Papakura | BACK ENTRY KERB BLOCK          | HUMES STD        | 75                  | General Precast | 7       |
| HPA    | 80091711    | Papakura | WHEELSTOP                      | 2M               | 112                 | General Precast | 7       |

## Blocks & Other Precast continued

**Table 11 - Group 8 – Gully Surround**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1           | DESCRIPTION 2         | PRODUCT WEIGHT [KG] | GROUP          | GROUP # |
|--------|-------------|----------|-------------------------|-----------------------|---------------------|----------------|---------|
| HNN    | 80091676    | Nelson   | CONCRETE GULLY SURROUND | SQUARE FULL           | 40.8                | Gully Surround | 8       |
| HNN    | 80091677    | Nelson   | CONCRETE GULLY SURROUND | 150MM SEMI CIRCLE     | 30                  | Gully Surround | 8       |
| HNN    | 80091678    | Nelson   | CONCRETE GULLY SURROUND | SEMI CIRCLE LID SOLID | 14                  | Gully Surround | 8       |
| HNN    | 80091679    | Nelson   | CONCRETE GULLY SURROUND | SQUARE LID HOLE       | 12                  | Gully Surround | 8       |
| HNN    | 80091716    | Nelson   | CONCRETE GULLY SURROUND | SQUARE LID SOLID      | 12                  | Gully Surround | 8       |

## Bridges

**Table 12 - Group 9 – Bridge Accessories**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1               | DESCRIPTION 2          | PRODUCT WEIGHT [KG] | GROUP              | GROUP # |
|--------|-------------|----------|-----------------------------|------------------------|---------------------|--------------------|---------|
| HHC    | 80091818    | Te Rapa  | ABUTMENT SLAB 1 SPECIAL     | PCDTB4X.70X.31 TYPE TT | 1850                | Bridge Accessories | 9       |
| HHC    | 80091819    | Te Rapa  | END PANEL TYPE TT 1 SPECIAL | PCDTB 5.2X0.8X0.151    | 1560                | Bridge Accessories | 9       |

**Table 13 - Group 10 – Bridge Decks**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP       | GROUP # |
|--------|-------------|----------|------------------------------|---------------|---------------------|-------------|---------|
| HHC    | 80091809    | Te Rapa  | DOUBLE TEE RURAL BRIDGE DECK | 8000.2000MM   | 10610               | Bridge Deck | 10      |
| HHC    | 80091810    | Te Rapa  | DOUBLE TEE RURAL BRIDGE DECK | 10000.2000MM  | 13250               | Bridge Deck | 10      |
| HHC    | 80091812    | Te Rapa  | DOUBLE TEE RURAL BRIDGE DECK | 12000.2000MM  | 15910               | Bridge Deck | 10      |
| HHC    | 80091814    | Te Rapa  | DOUBLE TEE RURAL BRIDGE DECK | 14000.2000MM  | 18550               | Bridge Deck | 10      |
| HHC    | 80091816    | Te Rapa  | DOUBLE TEE RURAL BRIDGE DECK | 16000.2000MM  | 21180               | Bridge Deck | 10      |
| HHC    | 80091817    | Te Rapa  | DOUBLE TEE RURAL BRIDGE DECK | 18000.2000MM  | 23860               | Bridge Deck | 10      |

## Culverts

**Table 14 - Group 11 – Culvert – Te Rapa**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP         | GROUP # |
|--------|-------------|----------|------------------------------|--------------------------------|---------------------|---------------|---------|
| HHC    | 80088852    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHC | 11      |
| HHC    | 80088853    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHC | 11      |
| HHC    | 80088854    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHC | 11      |
| HHC    | 80088855    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHC | 11      |
| HHC    | 80088858    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert - HHC | 11      |
| HHC    | 80088859    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert - HHC | 11      |
| HHC    | 80088860    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert - HHC | 11      |
| HHC    | 80088861    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert - HHC | 11      |
| HHC    | 80088864    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert - HHC | 11      |
| HHC    | 80088865    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert - HHC | 11      |
| HHC    | 80088866    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert - HHC | 11      |
| HHC    | 80088867    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert - HHC | 11      |
| HHC    | 80088872    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert - HHC | 11      |
| HHC    | 80088873    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert - HHC | 11      |
| HHC    | 80088877    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert - HHC | 11      |
| HHC    | 80088878    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert - HHC | 11      |
| HHC    | 80088879    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert - HHC | 11      |
| HHC    | 80088883    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert - HHC | 11      |
| HHC    | 80088884    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert - HHC | 11      |
| HHC    | 80088885    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert - HHC | 11      |
| HHC    | 80088886    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHC | 11      |
| HHC    | 80088887    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHC | 11      |
| HHC    | 80088888    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHC | 11      |
| HHC    | 80088889    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHC | 11      |
| HHC    | 80088890    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHC | 11      |
| HHC    | 80088891    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHC | 11      |
| HHC    | 80088892    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088893    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088894    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088895    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088896    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088897    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088898    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |

## Culverts continued

**Table 14 ctd** - Group 11 – Culvert – Te Rapa

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP         | GROUP # |
|--------|-------------|----------|------------------------------|--------------------------------|---------------------|---------------|---------|
| HHC    | 80088899    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088900    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088901    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088902    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088903    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088904    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088905    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088906    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088907    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088908    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088909    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088910    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088911    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088912    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHC | 11      |
| HHC    | 80088913    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088914    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088915    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088916    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088917    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088918    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHC | 11      |
| HHC    | 80088919    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088920    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088921    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088922    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088923    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088924    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088925    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088926    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088927    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088928    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088929    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088930    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088931    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |

## Culverts continued

**Table 14 ctd - Group 11 – Culvert – Te Rapa**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP         | GROUP # |
|--------|-------------|----------|------------------------------|--------------------------------|---------------------|---------------|---------|
| HHC    | 80088932    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088933    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088934    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088935    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088936    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088939    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 3500.1500.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088940    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 3500.1500.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80088941    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 3500.1500.1550MM 200+200 WALLS | 9440                | Culvert - HHC | 11      |
| HHC    | 80088942    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 3500.1500.1550MM 200+200 WALLS | 9440                | Culvert - HHC | 11      |
| HHC    | 80088944    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 3500.2000.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088945    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 3500.2000.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088946    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 3500.2000.1550MM 200+200 WALLS | 9460                | Culvert - HHC | 11      |
| HHC    | 80088947    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 3500.2000.1550MM 200+200 WALLS | 10210               | Culvert - HHC | 11      |
| HHC    | 80088948    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 3500.2000.1550MM 200+200 WALLS | 10210               | Culvert - HHC | 11      |
| HHC    | 80088949    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 3500.2500.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088950    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 3500.2500.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088951    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 3500.2500.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088952    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 3500.2500.1550MM 200+200 WALLS | 10230               | Culvert - HHC | 11      |
| HHC    | 80088953    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 3500.2500.1550MM 200+200 WALLS | 10990               | Culvert - HHC | 11      |
| HHC    | 80088954    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 3500.2500.1550MM 200+200 WALLS | 10990               | Culvert - HHC | 11      |
| HHC    | 80088962    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHC | 11      |
| HHC    | 80088963    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHC | 11      |
| HHC    | 80088964    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHC | 11      |
| HHC    | 80088965    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHC | 11      |
| HHC    | 80088966    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHC | 11      |
| HHC    | 80088967    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHC | 11      |
| HHC    | 80088968    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHC | 11      |
| HHC    | 80088969    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHC | 11      |
| HHC    | 80088970    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHC | 11      |
| HHC    | 80088971    | Te Rapa  | STD BOX CULVERT EDGE 1.2-2.0 | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHC | 11      |
| HHC    | 80088972    | Te Rapa  | STD BOX CULVERT INT 1.2-2.0  | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHC | 11      |
| HHC    | 80095510    | Te Rapa  | STD BOX CULVERT INT1.2-2.0   | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHC | 11      |
| HHC    | 80095511    | Te Rapa  | STD BOX CULVERT INT0.6-1.2   | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |
| HHC    | 80095512    | Te Rapa  | STD BOX CULVERT INT1.2-2.0   | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHC | 11      |



## Culverts continued

**Table 15 - Group 12 – Culvert – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP         | GROUP # |
|--------|-------------|----------|------------------------------|--------------------------------|---------------------|---------------|---------|
| HHY    | 80088852    | Hornby   | STD BOX CULVERT INT 0-0.6    | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHY | 12      |
| HHY    | 80088853    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHY | 12      |
| HHY    | 80088854    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHY | 12      |
| HHY    | 80088855    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert - HHY | 12      |
| HHY    | 80088858    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert - HHY | 12      |
| HHY    | 80088859    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert - HHY | 12      |
| HHY    | 80088860    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert - HHY | 12      |
| HHY    | 80088861    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert - HHY | 12      |
| HHY    | 80088864    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert - HHY | 12      |
| HHY    | 80088865    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert - HHY | 12      |
| HHY    | 80088866    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert - HHY | 12      |
| HHY    | 80088867    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert - HHY | 12      |
| HHY    | 80088872    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert - HHY | 12      |
| HHY    | 80088873    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert - HHY | 12      |
| HHY    | 80088877    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert - HHY | 12      |
| HHY    | 80088878    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert - HHY | 12      |
| HHY    | 80088879    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert - HHY | 12      |
| HHY    | 80088883    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert - HHY | 12      |
| HHY    | 80088884    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert - HHY | 12      |
| HHY    | 80088885    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert - HHY | 12      |
| HHY    | 80088886    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHY | 12      |
| HHY    | 80088887    | Hornby   | STD BOX CULVERT INT 0-0.6    | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHY | 12      |
| HHY    | 80088888    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHY | 12      |
| HHY    | 80088889    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHY | 12      |
| HHY    | 80088890    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHY | 12      |
| HHY    | 80088891    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 2500.1000.1550MM 200+200 WALLS | 6360                | Culvert - HHY | 12      |
| HHY    | 80088892    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088893    | Hornby   | STD BOX CULVERT INT 0-0.6    | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088894    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088895    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088896    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088897    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 2500.1500.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088898    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |

## Culverts continued

**Table 15 ctd - Group 12 – Culvert – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP         | GROUP # |
|--------|-------------|----------|------------------------------|--------------------------------|---------------------|---------------|---------|
| HHY    | 80088899    | Hornby   | STD BOX CULVERT INT 0-0.6    | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088900    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088901    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088902    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088903    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 2500.2000.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088904    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088905    | Hornby   | STD BOX CULVERT INT 0-0.6    | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088906    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088907    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 2500.2500.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088908    | Hornby   | STD BOX CULVERT INT 0-0.6    | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088909    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088910    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088911    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088912    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |
| HHY    | 80088913    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088914    | Hornby   | STD BOX CULVERT INT 0-0.6    | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088915    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088916    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088917    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088918    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 3000.1500.1550MM 200+200 WALLS | 7910                | Culvert - HHY | 12      |
| HHY    | 80088919    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088920    | Hornby   | STD BOX CULVERT INT 0-0.6    | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088921    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088922    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088923    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088924    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 3000.2000.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088925    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088926    | Hornby   | STD BOX CULVERT INT 0-0.6    | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088927    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088928    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088929    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088930    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 3000.2500.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088931    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |

## Culverts continued

**Table 15 ctd - Group 12 – Culvert – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP         | GROUP # |
|--------|-------------|----------|------------------------------|--------------------------------|---------------------|---------------|---------|
| HHY    | 80088932    | Hornby   | STD BOX CULVERT INT 0-0.6    | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088933    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088934    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088935    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088936    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 3000.3000.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088939    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 3500.1500.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088940    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 3500.1500.1550MM 200+200 WALLS | 8680                | Culvert - HHY | 12      |
| HHY    | 80088941    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 3500.1500.1550MM 200+200 WALLS | 9440                | Culvert - HHY | 12      |
| HHY    | 80088942    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 3500.1500.1550MM 200+200 WALLS | 9440                | Culvert - HHY | 12      |
| HHY    | 80088944    | Hornby   | STD BOX CULVERT INT 0-0.6    | 3500.2000.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088945    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 3500.2000.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088946    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 3500.2000.1550MM 200+200 WALLS | 9460                | Culvert - HHY | 12      |
| HHY    | 80088947    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 3500.2000.1550MM 200+200 WALLS | 10210               | Culvert - HHY | 12      |
| HHY    | 80088948    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 3500.2000.1550MM 200+200 WALLS | 10210               | Culvert - HHY | 12      |
| HHY    | 80088949    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 3500.2500.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088950    | Hornby   | STD BOX CULVERT INT 0-0.6    | 3500.2500.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088951    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 3500.2500.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088952    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 3500.2500.1550MM 200+200 WALLS | 10230               | Culvert - HHY | 12      |
| HHY    | 80088953    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 3500.2500.1550MM 200+200 WALLS | 10990               | Culvert - HHY | 12      |
| HHY    | 80088954    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 3500.2500.1550MM 200+200 WALLS | 10990               | Culvert - HHY | 12      |
| HHY    | 80088962    | Hornby   | STD BOX CULVERT INT 0-0.6    | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHY | 12      |
| HHY    | 80088963    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHY | 12      |
| HHY    | 80088964    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHY | 12      |
| HHY    | 80088965    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHY | 12      |
| HHY    | 80088966    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert - HHY | 12      |
| HHY    | 80088967    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHY | 12      |
| HHY    | 80088968    | Hornby   | STD BOX CULVERT INT 0-0.6    | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHY | 12      |
| HHY    | 80088969    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHY | 12      |
| HHY    | 80088970    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHY | 12      |
| HHY    | 80088971    | Hornby   | STD BOX CULVERT EDGE 1.2-2.0 | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHY | 12      |
| HHY    | 80088972    | Hornby   | STD BOX CULVERT INT 1.2-2.0  | 4000.2000.1550MM 225+200 WALLS | 11080               | Culvert - HHY | 12      |
| HHY    | 80094445    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert - HHY | 12      |

## Culverts continued

**Table 16 - Group 13 – Culvert, Alternative Reinforcing – HHC**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP                                  | GROUP # |
|--------|-------------|----------|------------------------------|--------------------------------|---------------------|----------------------------------------|---------|
| HHC    | 80088851    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088856    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088857    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088862    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088863    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088868    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088869    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088870    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088871    | Te Rapa  | STD BOX CULVERT INT 0.6-1.2  | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088874    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088875    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088876    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088880    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088881    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088882    | Te Rapa  | STD BOX CULVERT EDGE 0.6-1.2 | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088937    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 3500.1500.1550MM 200+200 WALLS | 8680                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088938    | Te Rapa  | STD BOX CULVERT INT 0-0.6    | 3500.1500.1550MM 200+200 WALLS | 8680                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088943    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 3500.2000.1550MM 200+200 WALLS | 9460                | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80088961    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert, Alternative Reinforcing - HHC | 13      |
| HHC    | 80094445    | Te Rapa  | STD BOX CULVERT EDGE 0-0.6   | 3000.1000.1550MM 200+200 WALLS | 7130                | Culvert, Alternative Reinforcing - HHC | 13      |

## Culverts continued

**Table 17 - Group 14 – Culvert - Alternative Reinforcing - HHY**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP                                  | GROUP # |
|--------|-------------|----------|------------------------------|--------------------------------|---------------------|----------------------------------------|---------|
| HHY    | 80088851    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 1000.1000.1550MM 150+150 WALLS | 2980                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088856    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088857    | Hornby   | STD BOX CULVERT INT 0-0.6    | 1500.1000.1550MM 150+150 WALLS | 3570                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088862    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088863    | Hornby   | STD BOX CULVERT INT 0-0.6    | 1500.1500.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088868    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088869    | Hornby   | STD BOX CULVERT INT 0-0.6    | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088870    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088871    | Hornby   | STD BOX CULVERT INT 0.6-1.2  | 2000.1000.1550MM 150+150 WALLS | 4150                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088874    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088875    | Hornby   | STD BOX CULVERT INT 0-0.6    | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088876    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 2000.1500.1550MM 150+150 WALLS | 4730                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088880    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088881    | Hornby   | STD BOX CULVERT INT 0-0.6    | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088882    | Hornby   | STD BOX CULVERT EDGE 0.6-1.2 | 2000.2000.1550MM 150+150 WALLS | 5310                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088937    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 3500.1500.1550MM 200+200 WALLS | 8680                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088938    | Hornby   | STD BOX CULVERT INT 0-0.6    | 3500.1500.1550MM 200+200 WALLS | 8680                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088943    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 3500.2000.1550MM 200+200 WALLS | 9460                | Culvert, Alternative Reinforcing – HHY | 14      |
| HHY    | 80088961    | Hornby   | STD BOX CULVERT EDGE 0-0.6   | 4000.1500.1550MM 225+200 WALLS | 10310               | Culvert, Alternative Reinforcing – HHY | 14      |

## Culverts continued

**Table 18 - Group 15 – Rain Garden – Te Rapa**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1 | DESCRIPTION 2                 | PRODUCT WEIGHT [KG] | GROUP       | GROUP # |
|--------|-------------|----------|---------------|-------------------------------|---------------------|-------------|---------|
| HHC    | 80089646    | Te Rapa  | RAIN GARDEN   | 3000.2000.1550MM              | 6470                | Rain Garden | 15      |
| HHC    | 80089655    | Te Rapa  | RAIN GARDEN   | 2500.2000.1550MM LEFT HAND    | 5850                | Rain Garden | 15      |
| HHC    | 80089677    | Te Rapa  | RAIN GARDEN   | 3000.2500.1550MM              | 7050                | Rain Garden | 15      |
| HHC    | 80089678    | Te Rapa  | RAIN GARDEN   | 3000.2000.1550MM RIGHT HAND   | 6430                | Rain Garden | 15      |
| HHC    | 80089679    | Te Rapa  | RAIN GARDEN   | 2000.1500.1550MM RIGHT HAND   | 4690                | Rain Garden | 15      |
| HHC    | 80089684    | Te Rapa  | RAIN GARDEN   | 3000.2500.1550MM LEFT HAND    | 7010                | Rain Garden | 15      |
| HHC    | 80089685    | Te Rapa  | RAIN GARDEN   | 2500.2500.1550MM LEFT HAND    | 6430                | Rain Garden | 15      |
| HHC    | 80089686    | Te Rapa  | RAIN GARDEN   | 2500.2000.1550MM              | 5890                | Rain Garden | 15      |
| HHC    | 80089687    | Te Rapa  | RAIN GARDEN   | 1500.1500.1550MM              | 4140                | Rain Garden | 15      |
| HHC    | 80089691    | Te Rapa  | RAIN GARDEN   | 2000.2000.1550MM              | 5300                | Rain Garden | 15      |
| HHC    | 80089692    | Te Rapa  | RAIN GARDEN   | 2000.2000.1550MM RIGHT HAND   | 5270                | Rain Garden | 15      |
| HHC    | 80089693    | Te Rapa  | RAIN GARDEN   | 2000.1500.1550MM LEFT HAND    | 4690                | Rain Garden | 15      |
| HHC    | 80089699    | Te Rapa  | RAIN GARDEN   | 2500.2500.1550MM              | 6470                | Rain Garden | 15      |
| HHC    | 80089718    | Te Rapa  | RAIN GARDEN   | 3000.1500.1550MM RIGHT HAND   | 5850                | Rain Garden | 15      |
| HHC    | 80089723    | Te Rapa  | RAIN GARDEN   | 2500.2500.1550MM RIGHT HAND   | 6430                | Rain Garden | 15      |
| HHC    | 80089727    | Te Rapa  | RAIN GARDEN   | 3000.2500.1550MM RIGHT HAND   | 7010                | Rain Garden | 15      |
| HHC    | 80089728    | Te Rapa  | RAIN GARDEN   | 1500.1500.1550MM CENTRAL SLOT | 4110                | Rain Garden | 15      |
| HHC    | 80089735    | Te Rapa  | RAIN GARDEN   | 3000.1500.1550MM              | 5880                | Rain Garden | 15      |
| HHC    | 80089742    | Te Rapa  | RAIN GARDEN   | 3000.1500.1550MM LEFT HAND    | 5850                | Rain Garden | 15      |
| HHC    | 80089743    | Te Rapa  | RAIN GARDEN   | 2000.1500.1550MM              | 4720                | Rain Garden | 15      |
| HHC    | 80089753    | Te Rapa  | RAIN GARDEN   | 2500.2000.1550MM RIGHT HAND   | 5850                | Rain Garden | 15      |
| HHC    | 80089756    | Te Rapa  | RAIN GARDEN   | 3000.2000.1550MM LEFT HAND    | 6430                | Rain Garden | 15      |
| HHC    | 80089757    | Te Rapa  | RAIN GARDEN   | 2000.2000.1550MM LEFT HAND    | 5270                | Rain Garden | 15      |
| HHC    | 80100384    | Te Rapa  | RAIN GARDEN   | 1750.1500.1550MM              | 4430                | Rain Garden | 15      |
| HHC    | 80100385    | Te Rapa  | RAIN GARDEN   | 1750.1500.1550MM RIGHT HAND   | 4400                | Rain Garden | 15      |
| HHC    | 80100386    | Te Rapa  | RAIN GARDEN   | 1750.1500.1550MM LEFT HAND    | 4400                | Rain Garden | 15      |



## Ducting

**Table 19 - Group 16 – Ducting**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                 | DESCRIPTION 2    | PRODUCT WEIGHT [KG] | GROUP   | GROUP # |
|--------|-------------|----------|-------------------------------|------------------|---------------------|---------|---------|
| HHC    | 80099714    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 300.145.2400MM   | 550                 | Ducting | 16      |
| HHC    | 80099790    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 300.220.2400MM   | 650                 | Ducting | 16      |
| HHC    | 80099791    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 300.295.2400MM   | 750                 | Ducting | 16      |
| HHC    | 80099792    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 600.400.2400MM   | 1180                | Ducting | 16      |
| HHC    | 80099806    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 700.600.2440MM   | 1530                | Ducting | 16      |
| HHC    | 80099816    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 700.750.2440MM   | 1730                | Ducting | 16      |
| HHC    | 80099858    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 700.1070.2440MM  | 2130                | Ducting | 16      |
| HHC    | 80099863    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 1250.1060.1400MM | 1900                | Ducting | 16      |
| HHC    | 80099867    | Te Rapa  | CONCRETE DUCTING LID HN-HO-72 | 300.130.1200MM   | 200                 | Ducting | 16      |
| HHC    | 80099869    | Te Rapa  | CONCRETE DUCTING LID HN-HO-72 | 600.150.1200MM   | 380                 | Ducting | 16      |
| HHC    | 80099870    | Te Rapa  | CONCRETE DUCTING LID HN-HO-72 | 700.150.1220MM   | 430                 | Ducting | 16      |
| HHC    | 80099871    | Te Rapa  | CONCRETE DUCTING LID HN-HO-72 | 1250.150.1400MM  | 780                 | Ducting | 16      |
| HHC    | 80101328    | Te Rapa  | CONCRETE DUCTING HN-HO-72     | 600.685.2400MM   | 1580                | Ducting | 16      |
| HHY    | 80099714    | Hornby   | CONCRETE DUCTING HN-HO-72     | 300.145.2400MM   | 550                 | Ducting | 16      |
| HHY    | 80099790    | Hornby   | CONCRETE DUCTING HN-HO-72     | 300.220.2400MM   | 650                 | Ducting | 16      |
| HHY    | 80099791    | Hornby   | CONCRETE DUCTING HN-HO-72     | 300.295.2400MM   | 750                 | Ducting | 16      |
| HHY    | 80099792    | Hornby   | CONCRETE DUCTING HN-HO-72     | 600.400.2400MM   | 1180                | Ducting | 16      |
| HHY    | 80099806    | Hornby   | CONCRETE DUCTING HN-HO-72     | 700.600.2440MM   | 1530                | Ducting | 16      |
| HHY    | 80099816    | Hornby   | CONCRETE DUCTING HN-HO-72     | 700.750.2440MM   | 1730                | Ducting | 16      |
| HHY    | 80099858    | Hornby   | CONCRETE DUCTING HN-HO-72     | 700.1070.2440MM  | 2130                | Ducting | 16      |
| HHY    | 80099863    | Hornby   | CONCRETE DUCTING HN-HO-72     | 1250.1060.1400MM | 1900                | Ducting | 16      |
| HHY    | 80099867    | Hornby   | CONCRETE DUCTING LID HN-HO-72 | 300.130.1200MM   | 200                 | Ducting | 16      |
| HHY    | 80099869    | Hornby   | CONCRETE DUCTING LID HN-HO-72 | 600.150.1200MM   | 380                 | Ducting | 16      |
| HHY    | 80099870    | Hornby   | CONCRETE DUCTING LID HN-HO-72 | 700.150.1220MM   | 430                 | Ducting | 16      |
| HHY    | 80099871    | Hornby   | CONCRETE DUCTING LID HN-HO-72 | 1250.150.1400MM  | 780                 | Ducting | 16      |
| HHY    | 80101328    | Hornby   | CONCRETE DUCTING HN-HO-72     | 600.685.2400MM   | 1580                | Ducting | 16      |

## Ducting continued

**Table 19 ctd** - Group 16 – Ducting

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                 | DESCRIPTION 2    | PRODUCT WEIGHT [KG] | GROUP   | GROUP # |
|--------|-------------|----------|-------------------------------|------------------|---------------------|---------|---------|
| HPA    | 80099714    | Papakura | CONCRETE DUCTING HN-HO-72     | 300.145.2400MM   | 550                 | Ducting | 16      |
| HPA    | 80099790    | Papakura | CONCRETE DUCTING HN-HO-72     | 300.220.2400MM   | 650                 | Ducting | 16      |
| HPA    | 80099791    | Papakura | CONCRETE DUCTING HN-HO-72     | 300.295.2400MM   | 750                 | Ducting | 16      |
| HPA    | 80099792    | Papakura | CONCRETE DUCTING HN-HO-72     | 600.400.2400MM   | 1180                | Ducting | 16      |
| HPA    | 80099806    | Papakura | CONCRETE DUCTING HN-HO-72     | 700.600.2440MM   | 1530                | Ducting | 16      |
| HPA    | 80099816    | Papakura | CONCRETE DUCTING HN-HO-72     | 700.750.2440MM   | 1730                | Ducting | 16      |
| HPA    | 80099858    | Papakura | CONCRETE DUCTING HN-HO-72     | 700.1070.2440MM  | 2130                | Ducting | 16      |
| HPA    | 80099863    | Papakura | CONCRETE DUCTING HN-HO-72     | 1250.1060.1400MM | 1900                | Ducting | 16      |
| HPA    | 80099867    | Papakura | CONCRETE DUCTING LID HN-HO-72 | 300.130.1200MM   | 200                 | Ducting | 16      |
| HPA    | 80099869    | Papakura | CONCRETE DUCTING LID HN-HO-72 | 600.150.1200MM   | 380                 | Ducting | 16      |
| HPA    | 80099870    | Papakura | CONCRETE DUCTING LID HN-HO-72 | 700.150.1220MM   | 430                 | Ducting | 16      |
| HPA    | 80099871    | Papakura | CONCRETE DUCTING LID HN-HO-72 | 1250.150.1400MM  | 780                 | Ducting | 16      |
| HPA    | 80101328    | Papakura | CONCRETE DUCTING HN-HO-72     | 600.685.2400MM   | 1580                | Ducting | 16      |

## Lids

**Table 20** - Group 17 – Lid - Closed - HNN – Nelson

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1      | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP              | GROUP # |
|--------|-------------|----------|--------------------|---------------|---------------------|--------------------|---------|
| HNN    | 80091392    | Nelson   | CLOSED MANHOLE LID | 1050.100MM    | 227                 | Lid - Closed - HNN | 17      |
| HNN    | 80091396    | Nelson   | CLOSED MANHOLE LID | 600.50MM      | 48                  | Lid - Closed - HNN | 17      |
| HNN    | 80091398    | Nelson   | CLOSED MANHOLE LID | 600.100MM     | 96                  | Lid - Closed - HNN | 17      |

**Table 21** - Group 18 – Lid <1050 - HNN – Nelson

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1 | DESCRIPTION 2          | PRODUCT WEIGHT [KG] | GROUP           | GROUP # |
|--------|-------------|----------|---------------|------------------------|---------------------|-----------------|---------|
| HNN    | 80091343    | Nelson   | MANHOLE LID   | 900.100MM              | 140                 | Lid <1050 - HNN | 18      |
| HNN    | 80091346    | Nelson   | MANHOLE LID   | 1050.100MM             | 218                 | Lid <1050 - HNN | 18      |
| HNN    | 80091348    | Nelson   | MANHOLE LID   | 1050.150MM 540 OPENING | 327                 | Lid <1050 - HNN | 18      |
| HNN    | 80091414    | Nelson   | MANHOLE LID   | 900.150MM              | 220                 | Lid <1050 - HNN | 18      |
| HNN    | 80091606    | Nelson   | MANHOLE LID   | 1050.150MM 610 OPENING | 312                 | Lid <1050 - HNN | 18      |

**Table 22** - Group 19 – Lid >2000 - HNN – Nelson

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1 | DESCRIPTION 2          | PRODUCT WEIGHT [KG] | GROUP           | GROUP # |
|--------|-------------|----------|---------------|------------------------|---------------------|-----------------|---------|
| HNN    | 80091372    | Nelson   | MANHOLE LID   | 2050.200MM 540 OPENING | 1881                | Lid >2000 - HNN | 19      |
| HNN    | 80091375    | Nelson   | MANHOLE LID   | 2300.200MM 540 OPENING | 2503                | Lid >2000 - HNN | 19      |

## Lids continued

**Table 23 - Group 20 – Lid 1050-1200 - HHY – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1      | DESCRIPTION 2                  | PRODUCT WEIGHT [KG] | GROUP               | GROUP # |
|--------|-------------|----------|--------------------|--------------------------------|---------------------|---------------------|---------|
| HHY    | 80074754    | Hornby   | MANHOLE LID        | 1200.150MM 610 OPENING         | 440                 | Lid 1050-1200 - HHY | 20      |
| HHY    | 80090892    | Hornby   | SQUARE MANHOLE LID | 1200MM 600 OPENING CHCH CITY   | 1430                | Lid 1050-1200 - HHY | 20      |
| HHY    | 80091348    | Hornby   | MANHOLE LID        | 1050.150MM 540 OPENING         | 327                 | Lid 1050-1200 - HHY | 20      |
| HHY    | 80091353    | Hornby   | MANHOLE LID        | 1200.150MM 540 OPENING         | 452                 | Lid 1050-1200 - HHY | 20      |
| HHY    | 80091355    | Hornby   | MANHOLE LID        | 1200.200MM 540 OPENING         | 602                 | Lid 1050-1200 - HHY | 20      |
| HHY    | 80091378    | Hornby   | MANHOLE LID        | 1050MM 610 OPENING RR CHCH CTY | 450                 | Lid 1050-1200 - HHY | 20      |
| HHY    | 80091392    | Hornby   | CLOSED MANHOLE LID | 1050.100MM                     | 227                 | Lid 1050-1200 - HHY | 20      |
| HHY    | 80091393    | Hornby   | CLOSED MANHOLE LID | 1050.150MM                     | 341                 | Lid 1050-1200 - HHY | 20      |
| HHY    | 80091606    | Hornby   | MANHOLE LID        | 1050.150MM 610 OPENING         | 312                 | Lid 1050-1200 - HHY | 20      |
| HHY    | 80091881    | Hornby   | MANHOLE LID        | 1050.200MM 610 OPENING         | 415.2               | Lid 1050-1200 - HHY | 20      |

**Table 24 - Group 21 – Lid 1050-1200 - HPA – Papakura**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1      | DESCRIPTION 2          | PRODUCT WEIGHT [KG] | GROUP               | GROUP # |
|--------|-------------|----------|--------------------|------------------------|---------------------|---------------------|---------|
| HPA    | 80074754    | Papakura | MANHOLE LID        | 1200.150MM 610 OPENING | 440                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091348    | Papakura | MANHOLE LID        | 1050.150MM 540 OPENING | 327                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091353    | Papakura | MANHOLE LID        | 1200.150MM 540 OPENING | 452                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091355    | Papakura | MANHOLE LID        | 1200.200MM 540 OPENING | 602                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091392    | Papakura | CLOSED MANHOLE LID | 1050.100MM             | 227                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091393    | Papakura | CLOSED MANHOLE LID | 1050.150MM             | 341                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091430    | Papakura | MANHOLE LID        | 1200.150MM HCC         | 525                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091606    | Papakura | MANHOLE LID        | 1050.150MM 610 OPENING | 312                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091610    | Papakura | MANHOLE LID HD60   | 1050.150MM 610 OPENING | 320                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091611    | Papakura | MANHOLE LID HD60   | 1200.150MM 610 OPENING | 500                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091616    | Papakura | MANHOLE LID LD20   | 1050.100MM 610 OPENING | 220                 | Lid 1050-1200 - HPA | 21      |
| HPA    | 80091888    | Papakura | MANHOLE LID        | 1200.200MM 610 OPENING | 301                 | Lid 1050-1200 - HPA | 21      |

## Lids continued

**Table 25** - Group 22 – Lid 1200-1800 - HNN – Nelson

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1 | DESCRIPTION 2          | PRODUCT WEIGHT [KG] | GROUP               | GROUP # |
|--------|-------------|----------|---------------|------------------------|---------------------|---------------------|---------|
| HNN    | 80074754    | Nelson   | MANHOLE LID   | 1200.150MM 610 OPENING | 440                 | Lid 1200-1800 - HNN | 22      |
| HNN    | 80091353    | Nelson   | MANHOLE LID   | 1200.150MM 540 OPENING | 452                 | Lid 1200-1800 - HNN | 22      |
| HNN    | 80091355    | Nelson   | MANHOLE LID   | 1200.200MM 540 OPENING | 602                 | Lid 1200-1800 - HNN | 22      |
| HNN    | 80091362    | Nelson   | MANHOLE LID   | 1500.200MM 540 OPENING | 1020                | Lid 1200-1800 - HNN | 22      |
| HNN    | 80091366    | Nelson   | MANHOLE LID   | 1800.200MM 540 OPENING | 1497                | Lid 1200-1800 - HNN | 22      |
| HNN    | 80091892    | Nelson   | MANHOLE LID   | 1350.200MM 610 OPENING | 615                 | Lid 1200-1800 - HNN | 22      |
| HNN    | 80091895    | Nelson   | MANHOLE LID   | 1500.200MM 610 OPENING | 985                 | Lid 1200-1800 - HNN | 22      |
| HNN    | 80091896    | Nelson   | MANHOLE LID   | 1800.200MM 610 OPENING | 1123                | Lid 1200-1800 - HNN | 22      |

## Pits, Traps & Catchpits

**Table 26** - Group 23 – Catchpit - HHY – Hornby

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1               | DESCRIPTION 2   | PRODUCT WEIGHT [KG] | GROUP          | GROUP # |
|--------|-------------|----------|-----------------------------|-----------------|---------------------|----------------|---------|
| HHY    | 80091449    | Hornby   | CONCRETE CESSPIT            | 300.300.600MM   | 180                 | Catchpit - HHY | 23      |
| HHY    | 80091451    | Hornby   | CONCRETE CESSPIT            | 450.450.1200MM  | 568                 | Catchpit - HHY | 23      |
| HHY    | 80091455    | Hornby   | CONCRETE CESSPIT            | 450.450.900MM   | 404                 | Catchpit - HHY | 23      |
| HHY    | 80091461    | Hornby   | CONCRETE BACK ENTRY CESSPIT | 675.450.1200MM  | 621                 | Catchpit - HHY | 23      |
| HHY    | 80091463    | Hornby   | CONCRETE FLAT TOP CESSPIT   | 675.450.1200MM  | 621                 | Catchpit - HHY | 23      |
| HHY    | 80091467    | Hornby   | CONCRETE CESSPIT RISER      | 675.450.300MM   | 152                 | Catchpit - HHY | 23      |
| HHY    | 80091499    | Hornby   | MUD TANK                    | 500.500.900MM   | 525                 | Catchpit - HHY | 23      |
| HHY    | 80091504    | Hornby   | CONCRETE CESSPIT            | 450.450.600MM   | 274                 | Catchpit - HHY | 23      |
| HHY    | 80091507    | Hornby   | DOUBLE SUMP                 | 1140.680.1210MM | 1075                | Catchpit - HHY | 23      |
| HHY    | 80091552    | Hornby   | MUD TANK RISER              | 500.500.300MM   | 137.5               | Catchpit - HHY | 23      |
| HHY    | 80091568    | Hornby   | CONCRETE CESSPIT RISER      | 675.450.100MM   | 92                  | Catchpit - HHY | 23      |

**Table 27** - Group 24 – Catchpit - HNN – Nelson

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                  | DESCRIPTION 2   | PRODUCT WEIGHT [KG] | GROUP          | GROUP # |
|--------|-------------|----------|--------------------------------|-----------------|---------------------|----------------|---------|
| HNN    | 80091449    | Nelson   | CONCRETE CESSPIT               | 300.300.600MM   | 180                 | Catchpit - HNN | 24      |
| HNN    | 80091451    | Nelson   | CONCRETE CESSPIT               | 450.450.1200MM  | 568                 | Catchpit - HNN | 24      |
| HNN    | 80091455    | Nelson   | CONCRETE CESSPIT               | 450.450.900MM   | 404                 | Catchpit - HNN | 24      |
| HNN    | 80091463    | Nelson   | CONCRETE FLAT TOP CESSPIT      | 675.450.1200MM  | 621                 | Catchpit - HNN | 24      |
| HNN    | 80091504    | Nelson   | CONCRETE CESSPIT               | 450.450.600MM   | 274                 | Catchpit - HNN | 24      |
| HNN    | 80091507    | Nelson   | DOUBLE SUMP                    | 1140.680.1210MM | 1075                | Catchpit - HNN | 24      |
| HNN    | 80091691    | Nelson   | CONCRETE BACK ENTRY KERB BLOCK | NELSON          | 125                 | Catchpit - HNN | 24      |

## Pits, Traps & Catchpits continued

**Table 28 - Group 25 – Catchpit - HPA – Papakura**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1               | DESCRIPTION 2  | PRODUCT WEIGHT [KG] | GROUP          | GROUP # |
|--------|-------------|----------|-----------------------------|----------------|---------------------|----------------|---------|
| HPA    | 80091449    | Papakura | CONCRETE CESSPIT            | 300.300.600MM  | 180                 | Catchpit - HPA | 25      |
| HPA    | 80091451    | Papakura | CONCRETE CESSPIT            | 450.450.1200MM | 568                 | Catchpit - HPA | 25      |
| HPA    | 80091453    | Papakura | CONCRETE CESSPIT RISER      | 450.450.300MM  | 106                 | Catchpit - HPA | 25      |
| HPA    | 80091455    | Papakura | CONCRETE CESSPIT            | 450.450.900MM  | 404                 | Catchpit - HPA | 25      |
| HPA    | 80091457    | Papakura | CONCRETE BACK ENTRY CESSPIT | 675.450.1650MM | 900                 | Catchpit - HPA | 25      |
| HPA    | 80091458    | Papakura | CONCRETE FLAT TOP CESSPIT   | 675.450.1800MM | 1010                | Catchpit - HPA | 25      |
| HPA    | 80091459    | Papakura | CONCRETE BACK ENTRY CESSPIT | 675.450.1800MM | 1010                | Catchpit - HPA | 25      |
| HPA    | 80091461    | Papakura | CONCRETE BACK ENTRY CESSPIT | 675.450.1200MM | 621                 | Catchpit - HPA | 25      |
| HPA    | 80091463    | Papakura | CONCRETE FLAT TOP CESSPIT   | 675.450.1200MM | 621                 | Catchpit - HPA | 25      |
| HPA    | 80091465    | Papakura | CONCRETE CESSPIT RISER      | 675.450.600MM  | 280                 | Catchpit - HPA | 25      |
| HPA    | 80091467    | Papakura | CONCRETE CESSPIT RISER      | 675.450.300MM  | 152                 | Catchpit - HPA | 25      |
| HPA    | 80091489    | Papakura | CONCRETE CESSPIT            | 450.300.900MM  | 305                 | Catchpit - HPA | 25      |
| HPA    | 80091502    | Papakura | CONCRETE CESSPIT            | 450.300.600MM  | 203                 | Catchpit - HPA | 25      |
| HPA    | 80091509    | Papakura | CONCRETE FLAT TOP CESSPIT   | 675.450.1650MM | 900                 | Catchpit - HPA | 25      |
| HPA    | 80091518    | Papakura | CONCRETE FLAT TOP CESSPIT   | 675.530.1220MM | 730                 | Catchpit - HPA | 25      |

**Table 29 - Group 26 – Cesspit Silt Traps – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1               | DESCRIPTION 2      | PRODUCT WEIGHT [KG] | GROUP              | GROUP # |
|--------|-------------|----------|-----------------------------|--------------------|---------------------|--------------------|---------|
| HHY    | 80091511    | Hornby   | SINGLE SILT TRAP UNFINISHED |                    | 516                 | Cesspit Silt Traps | 26      |
| HHY    | 80091513    | Hornby   | DOUBLE SILT TRAP UNFINISHED |                    | 889                 | Cesspit Silt Traps | 26      |
| HHY    | 80091515    | Hornby   | SILT TRAP DOUBLE            | 3 WAY              | 1215                | Cesspit Silt Traps | 26      |
| HHY    | 80091524    | Hornby   | SINGLE SILT TRAP RISER      | 100MM CHRISTCHURCH | 81.6                | Cesspit Silt Traps | 26      |
| HHY    | 80091526    | Hornby   | SINGLE SILT TRAP RISER      | 200MM              | 160                 | Cesspit Silt Traps | 26      |
| HHY    | 80091528    | Hornby   | SINGLE SILT TRAP RISER      | 300MM              | 240                 | Cesspit Silt Traps | 26      |
| HHY    | 80091530    | Hornby   | SINGLE SILT TRAP RISER      | 400MM              | 346                 | Cesspit Silt Traps | 26      |
| HHY    | 80091532    | Hornby   | SINGLE SILT TRAP RISER      | 500MM              | 400                 | Cesspit Silt Traps | 26      |
| HHY    | 80091535    | Hornby   | SINGLE SILT TRAP RISER      | 600MM              | 480                 | Cesspit Silt Traps | 26      |
| HHY    | 80091553    | Hornby   | DOUBLE SILT TRAP RISER      | 200MM              | 250                 | Cesspit Silt Traps | 26      |
| HHY    | 80091556    | Hornby   | DOUBLE SILT TRAP RISER      | 300MM              | 375                 | Cesspit Silt Traps | 26      |
| HHY    | 80091558    | Hornby   | DOUBLE SILT TRAP RISER      | 100MM              | 120                 | Cesspit Silt Traps | 26      |
| HHY    | 80091559    | Hornby   | DOUBLE SILT TRAP RISER      | 600MM              | 750                 | Cesspit Silt Traps | 26      |
| HHY    | 80091560    | Hornby   | DOUBLE SILT TRAP RISER      | 400MM              | 500                 | Cesspit Silt Traps | 26      |
| HHY    | 80091566    | Hornby   | DOUBLE SILT TRAP RISER      | 500MM              | 625                 | Cesspit Silt Traps | 26      |
| HHY    | 80091765    | Hornby   | SINGLE SILT TRAP            | 3 WAY              | 600                 | Cesspit Silt Traps | 26      |

## Pits, Traps & Catchpits continued

**Table 30 - Group 27 – Inspection Pit**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                  | DESCRIPTION 2         | PRODUCT WEIGHT [KG] | GROUP          | GROUP # |
|--------|-------------|----------|--------------------------------|-----------------------|---------------------|----------------|---------|
| HHY    | 80091783    | Hornby   | TELECOM TURNING PIT ROADWAY HD | 600.550.550MM         | 350                 | Inspection Pit | 27      |
| HPA    | 80091730    | Papakura | INSPECTION PIT ROADWAY         | 1200.900.1200MM       | 1750                | Inspection Pit | 27      |
| HPA    | 80091732    | Papakura | INSPECTION PIT+LID ROADWAY     | 2050.1200.1200MM 6PCE | 3630                | Inspection Pit | 27      |
| HPA    | 80091734    | Papakura | INSPECTION PIT PATHWAY         | 1220.550.900MM 5PCE   | 825                 | Inspection Pit | 27      |
| HPA    | 80091736    | Papakura | INSPECTION PIT+LID ROADWAY     | 2700.1400.1400MM 6PCE | 6570                | Inspection Pit | 27      |
| HPA    | 80091775    | Papakura | TELECOM TURNING PIT PATHWAY    | 550.550MM             | 180                 | Inspection Pit | 27      |
| HPA    | 80091779    | Papakura | INSPECTION PIT PATHWAY         | 1220.550.550MM 5PCE   | 580                 | Inspection Pit | 27      |
| HPA    | 80091783    | Papakura | TELECOM TURNING PIT ROADWAY HD | 600.550.550MM         | 350                 | Inspection Pit | 27      |
| HPA    | 80091786    | Papakura | INSPECTION PIT ROADWAY         | 1220.550.900MM 5PCE   | 1165                | Inspection Pit | 27      |
| HPA    | 80091803    | Papakura | INSPECTION PIT ROADWAY         | 1220.550.550MM 3PCE   | 880                 | Inspection Pit | 27      |

**Table 31 - Group 28 – Stone Trap - HHY – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1       | DESCRIPTION 2              | PRODUCT WEIGHT [KG] | GROUP            | GROUP # |
|--------|-------------|----------|---------------------|----------------------------|---------------------|------------------|---------|
| HHY    | 80091564    | Hornby   | EFFLUENT STONE TRAP | 2600.3450.900MM RIGHT HAND | 3400                | Stone Trap - HHY | 28      |
| HHY    | 80091570    | Hornby   | EFFLUENT STONE TRAP | 2300.2800.900MM            | 2360                | Stone Trap - HHY | 28      |
| HHY    | 80091576    | Hornby   | EFFLUENT STONE TRAP | 2600.3450.900MM LEFT HAND  | 3400                | Stone Trap - HHY | 28      |

## Poles

**Table 32 - Group 29 – Poles – Nelson**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1            | DESCRIPTION 2        | PRODUCT WEIGHT [KG] | GROUP | GROUP # |
|--------|-------------|----------|--------------------------|----------------------|---------------------|-------|---------|
| HNN    | 80074258    | Nelson   | POWER POLE               | 10.6M GREYMOUTH      | 1245                | Poles | 29      |
| HNN    | 80074259    | Nelson   | POWER POLE               | 12.2M GREYMOUTH      | 1750                | Poles | 29      |
| HNN    | 80074273    | Nelson   | EARTHED POWER POLE       | 10.6M 8% MICROSILICA | 1245                | Poles | 29      |
| HNN    | 80074274    | Nelson   | EARTHED POWER POLE STUB  | 10M 8% MICROSILICA   | 1205                | Poles | 29      |
| HNN    | 80074275    | Nelson   | EARTHED POWER POLE LIGHT | 10M 8% MICROSILICA   | 910                 | Poles | 29      |

**Table 33 - Group 30 – Poles - Blocks & Stubs – Nelson**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1         | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP                  | GROUP # |
|--------|-------------|----------|-----------------------|---------------|---------------------|------------------------|---------|
| HNN    | 80074260    | Nelson   | ANCHOR BLOCK DEAD MAN | GREYMOUTH     | 260                 | Poles - Blocks & Stubs | 30      |
| HNN    | 80089021    | Nelson   | POWER POLE STUB       | 5.8M          | 787.5               | Poles - Blocks & Stubs | 30      |
| HNN    | 80089170    | Nelson   | BASE BLOCK HEAD STONE |               | 87.5                | Poles - Blocks & Stubs | 30      |
| HNN    | 80091279    | Nelson   | THRUST BLOCK          | 500.200.100MM | 25                  | Poles - Blocks & Stubs | 30      |

## Septic Tanks

**Table 34 - Group 31 – Septic Tank Body**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1    | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP            | GROUP # |
|--------|-------------|----------|------------------|---------------|---------------------|------------------|---------|
| HHY    | 80091834    | Hornby   | SEPTIC TANK BODY | 4500L         | 3275                | Septic Tank Body | 31      |
| HNN    | 80091825    | Nelson   | SEPTIC TANK BODY | 2700L         | 950                 | Septic Tank Body | 31      |
| HPA    | 80091825    | Papakura | SEPTIC TANK BODY | 2700L         | 950                 | Septic Tank Body | 31      |
| HPA    | 80091830    | Papakura | SEPTIC TANK BODY | 3300L         | 2070                | Septic Tank Body | 31      |

**Table 35 - Group 32 – Septic Tank Lid**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1   | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP           | GROUP # |
|--------|-------------|----------|-----------------|---------------|---------------------|-----------------|---------|
| HHY    | 80091836    | Hornby   | SEPTIC TANK LID | 4500L         | 1100                | Septic Tank Lid | 32      |
| HNN    | 80091831    | Nelson   | SEPTIC TANK LID | 3300L         | 775                 | Septic Tank Lid | 32      |
| HPA    | 80091827    | Papakura | SEPTIC TANK LID | 2700L         | 467                 | Septic Tank Lid | 32      |
| HPA    | 80091831    | Papakura | SEPTIC TANK LID | 3300L         | 775                 | Septic Tank Lid | 32      |

## Troughs

**Table 36 - Group 33 – Trough Reinforcing style 1**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2               | PRODUCT WEIGHT [KG] | GROUP                        | GROUP # |
|--------|-------------|----------|------------------------------|-----------------------------|---------------------|------------------------------|---------|
| HHY    | 80091943    | Hornby   | CONCRETE TROUGH CB750        | 750L BOTTOM ENTRY+INWALL 25 | 680                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091944    | Hornby   | CONCRETE FEED CHANNEL END    | 2.665M                      | 1110                | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091946    | Hornby   | CONCRETE FEED CHANNEL MIDDLE | 2.6M                        | 1030                | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091947    | Hornby   | CONCRETE TROUGH CB100        | 100L BALLCOCK COVER+PLUG    | 238                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091949    | Hornby   | CONCRETE TROUGH CB150        | 150L BALLCOCK COVER+PLUG    | 295                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091951    | Hornby   | CONCRETE TROUGH CB500        | 500L BALLCOCK COVER+PLUG    | 592                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091953    | Hornby   | CONCRETE TROUGH CB750        | 750L BALLCOCK COVER+PLUG    | 680                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091955    | Hornby   | CONCRETE TROUGH CB1000       | 1000L BALLCOCK COVER+PLUG   | 1050                | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091957    | Hornby   | CONCRETE TROUGH CB1500       | 1500L BALLCOCK COVER+PLUG   | 1200                | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091965    | Hornby   | CONCRETE TROUGH RB200        | 200L BALLCOCK COVER+PLUG    | 278                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091967    | Hornby   | CONCRETE TROUGH RB300        | 300L BALLCOCK COVER+PLUG    | 388                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091969    | Hornby   | CONCRETE TROUGH RB400        | 400L BALLCOCK COVER+PLUG    | 530                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091971    | Hornby   | CONCRETE PIG TROUGH          | 1M                          | 69                  | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091973    | Hornby   | CONCRETE PIG TROUGH          | 2M                          | 134                 | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091975    | Hornby   | CONCRETE TROUGH COVER RB     | 300 - 400                   | 30                  | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091977    | Hornby   | CONCRETE TROUGH COVER CB     | 100                         | 30                  | Troughs, Reinforcing Style 1 | 33      |
| HHY    | 80091979    | Hornby   | CONCRETE TROUGH COVER CB     | 150-2500                    | 30                  | Troughs, Reinforcing Style 1 | 33      |
| HNN    | 80091975    | Nelson   | CONCRETE TROUGH COVER RB     | 300 - 400                   | 30                  | Troughs, Reinforcing Style 1 | 33      |
| HNN    | 80091977    | Nelson   | CONCRETE TROUGH COVER CB     | 100                         | 30                  | Troughs, Reinforcing Style 1 | 33      |
| HNN    | 80091979    | Nelson   | CONCRETE TROUGH COVER CB     | 150-2500                    | 30                  | Troughs, Reinforcing Style 1 | 33      |



## Troughs continued

**Table 37 - Group 34 – Trough Reinforcing style 2**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1          | DESCRIPTION 2             | PRODUCT WEIGHT [KG] | GROUP                        | GROUP # |
|--------|-------------|----------|------------------------|---------------------------|---------------------|------------------------------|---------|
| HNN    | 80091959    | Nelson   | CONCRETE TROUGH CB2500 | 2500L BALLCOCK COVER+PLUG | 1575                | Troughs, Reinforcing Style 2 | 34      |
| HNN    | 80091971    | Nelson   | CONCRETE PIG TROUGH    | 1M                        | 69                  | Troughs, Reinforcing Style 2 | 34      |
| HNN    | 80091973    | Nelson   | CONCRETE PIG TROUGH    | 2M                        | 134                 | Troughs, Reinforcing Style 2 | 34      |

**Table 38 - Group 35 – Trough Reinforcing style 3**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1                | DESCRIPTION 2             | PRODUCT WEIGHT [KG] | GROUP                        | GROUP # |
|--------|-------------|----------|------------------------------|---------------------------|---------------------|------------------------------|---------|
| HHY    | 80091959    | Hornby   | CONCRETE TROUGH CB2500       | 2500L BALLCOCK COVER+PLUG | 1575                | Troughs, Reinforcing Style 3 | 35      |
| HHY    | 80091961    | Hornby   | CONCRETE TROUGH CT1500       | 1500L NO BALLCOCK COVER   | 1100                | Troughs, Reinforcing Style 3 | 35      |
| HHY    | 80091962    | Hornby   | CONCRETE TROUGH CT1000       | 1000L NO BALLCOCK COVER   | 800                 | Troughs, Reinforcing Style 3 | 35      |
| HHY    | 80091963    | Hornby   | CONCRETE TROUGH CT500        | 500L NO BALLCOCK COVER    | 475                 | Troughs, Reinforcing Style 3 | 35      |
| HHY    | 80091964    | Hornby   | CONCRETE TROUGH CT750        | 750L NO BALLCOCK COVER    | 575                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091944    | Nelson   | CONCRETE FEED CHANNEL END    | 2.665M                    | 1110                | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091946    | Nelson   | CONCRETE FEED CHANNEL MIDDLE | 2.6M                      | 1030                | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091947    | Nelson   | CONCRETE TROUGH CB100        | 100L BALLCOCK COVER+PLUG  | 238                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091949    | Nelson   | CONCRETE TROUGH CB150        | 150L BALLCOCK COVER+PLUG  | 295                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091951    | Nelson   | CONCRETE TROUGH CB500        | 500L BALLCOCK COVER+PLUG  | 592                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091953    | Nelson   | CONCRETE TROUGH CB750        | 750L BALLCOCK COVER+PLUG  | 680                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091955    | Nelson   | CONCRETE TROUGH CB1000       | 1000L BALLCOCK COVER+PLUG | 1050                | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091957    | Nelson   | CONCRETE TROUGH CB1500       | 1500L BALLCOCK COVER+PLUG | 1200                | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091961    | Nelson   | CONCRETE TROUGH CT1500       | 1500L NO BALLCOCK COVER   | 1100                | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091962    | Nelson   | CONCRETE TROUGH CT1000       | 1000L NO BALLCOCK COVER   | 800                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091963    | Nelson   | CONCRETE TROUGH CT500        | 500L NO BALLCOCK COVER    | 475                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091964    | Nelson   | CONCRETE TROUGH CT750        | 750L NO BALLCOCK COVER    | 575                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091965    | Nelson   | CONCRETE TROUGH RB200        | 200L BALLCOCK COVER+PLUG  | 278                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091967    | Nelson   | CONCRETE TROUGH RB300        | 300L BALLCOCK COVER+PLUG  | 388                 | Troughs, Reinforcing Style 3 | 35      |
| HNN    | 80091969    | Nelson   | CONCRETE TROUGH RB400        | 400L BALLCOCK COVER+PLUG  | 530                 | Troughs, Reinforcing Style 3 | 35      |

## Wingwalls & Headwalls

**Table 39 - Group 36 – Headwall**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1        | DESCRIPTION 2     | PRODUCT WEIGHT [KG] | GROUP    | GROUP # |
|--------|-------------|----------|----------------------|-------------------|---------------------|----------|---------|
| HHC    | 80092610    | Te Rapa  | TRAVERSABLE HEADWALL | 1:4 SLOPE TRANSIT | 1927                | Headwall | 36      |
| HHC    | 80092612    | Te Rapa  | MOUNTABLE HEADWALL   | 1:6 SLOPE TRANSIT | 2779                | Headwall | 36      |
| HHY    | 80092610    | Hornby   | TRAVERSABLE HEADWALL | 1:4 SLOPE TRANSIT | 1927                | Headwall | 36      |
| HHY    | 80092612    | Hornby   | MOUNTABLE HEADWALL   | 1:6 SLOPE TRANSIT | 2779                | Headwall | 36      |
| HNN    | 80092610    | Nelson   | TRAVERSABLE HEADWALL | 1:4 SLOPE TRANSIT | 1927                | Headwall | 36      |
| HNN    | 80092612    | Nelson   | MOUNTABLE HEADWALL   | 1:6 SLOPE TRANSIT | 2779                | Headwall | 36      |

**Table 40 - Group 37 – Wingwall - 150 - HHY**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1     | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP                | GROUP # |
|--------|-------------|----------|-------------------|---------------|---------------------|----------------------|---------|
| HHY    | 80091707    | Hornby   | CONCRETE WINGWALL | 150-300MM     | 224                 | Wingwall - 150 - HHY | 37      |

**Table 41 - Group 38 – Wingwall - 150 - HPA**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1     | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP                | GROUP # |
|--------|-------------|----------|-------------------|---------------|---------------------|----------------------|---------|
| HPA    | 80091707    | Papakura | CONCRETE WINGWALL | 150-300MM     | 224                 | Wingwall - 150 - HPA | 38      |

**Table 42 - Group 39 – Wingwall - 300 - HHY**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1     | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP                | GROUP # |
|--------|-------------|----------|-------------------|---------------|---------------------|----------------------|---------|
| HHY    | 80091703    | Hornby   | CONCRETE WINGWALL | 300-600MM     | 705                 | Wingwall - 300 - HHY | 39      |

**Table 43 - Group 40 – Wingwall - 300 - HPA**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1     | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP                | GROUP # |
|--------|-------------|----------|-------------------|---------------|---------------------|----------------------|---------|
| HPA    | 80091703    | Papakura | CONCRETE WINGWALL | 300-600MM     | 705                 | Wingwall - 300 - HPA | 40      |

**Table 44 - Group 41 – Wingwall - 600 - HHY**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1     | DESCRIPTION 2    | PRODUCT WEIGHT [KG] | GROUP                | GROUP # |
|--------|-------------|----------|-------------------|------------------|---------------------|----------------------|---------|
| HHY    | 80092008    | Hornby   | CONCRETE WINGWALL | 600-1050MM SMALL | 2160                | Wingwall - 600 - HHY | 41      |

**Table 45 - Group 42 – Wingwall - 600 - HPA**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1     | DESCRIPTION 2    | PRODUCT WEIGHT [KG] | GROUP                | GROUP # |
|--------|-------------|----------|-------------------|------------------|---------------------|----------------------|---------|
| HPA    | 80092008    | Papakura | CONCRETE WINGWALL | 600-1050MM SMALL | 2160                | Wingwall - 600 - HPA | 42      |

## Wingwalls & Headwalls continued

**Table 46** - Group 43 – Wingwall - 900-1500

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1     | DESCRIPTION 2    | PRODUCT WEIGHT [KG] | GROUP               | GROUP # |
|--------|-------------|----------|-------------------|------------------|---------------------|---------------------|---------|
| HHY    | 80091983    | Hornby   | CONCRETE WINGWALL | 900-1050MM LARGE | 3670                | Wingwall - 900-1500 | 43      |
| HHY    | 80091985    | Hornby   | CONCRETE WINGWALL | 1200-1350MM      | 5560                | Wingwall - 900-1500 | 43      |
| HHY    | 80091986    | Hornby   | CONCRETE WINGWALL | 1500-1800MM      | 7920                | Wingwall - 900-1500 | 43      |
| HPA    | 80091983    | Papakura | CONCRETE WINGWALL | 900-1050MM LARGE | 3670                | Wingwall - 900-1500 | 43      |
| HPA    | 80091985    | Papakura | CONCRETE WINGWALL | 1200-1350MM      | 5560                | Wingwall - 900-1500 | 43      |
| HPA    | 80091986    | Papakura | CONCRETE WINGWALL | 1500-1800MM      | 7920                | Wingwall - 900-1500 | 43      |

**Table 47** - Group 44 – Wingwall - HNN

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1     | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP          | GROUP # |
|--------|-------------|----------|-------------------|---------------|---------------------|----------------|---------|
| HNN    | 80091703    | Nelson   | CONCRETE WINGWALL | 300-600MM     | 705                 | Wingwall - HNN | 44      |
| HNN    | 80091707    | Nelson   | CONCRETE WINGWALL | 150-300MM     | 224                 | Wingwall - HNN | 44      |

## Sumps & Risers

**Table 48** - Group 45 – Adjustment Rings

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1 | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP            | GROUP # |
|--------|-------------|----------|---------------|---------------|---------------------|------------------|---------|
| HHY    | 80090806    | Hornby   | MANHOLE RISER | 1050.100MM    | 60                  | Adjustment Rings | 45      |
| HHY    | 80090809    | Hornby   | MANHOLE RISER | 1050.150MM    | 85                  | Adjustment Rings | 45      |

**Table 49** - Group 46 – Riser – Spun – Hornby

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1         | DESCRIPTION 2           | PRODUCT WEIGHT [KG] | GROUP        | GROUP # |
|--------|-------------|----------|-----------------------|-------------------------|---------------------|--------------|---------|
| HHY    | 80090814    | Hornby   | MANHOLE RISER NO HOLE | 1050.300MM 270 EF LEN   | 170                 | Riser - Spun | 46      |
| HHY    | 80090823    | Hornby   | MANHOLE RISER NO HOLE | 1050.600MM 570 EF LEN   | 340                 | Riser - Spun | 46      |
| HHY    | 80090824    | Hornby   | MANHOLE RISER         | 1050.675MM 570 EF LEN   | 341                 | Riser - Spun | 46      |
| HHY    | 80090825    | Hornby   | MANHOLE RISER NO HOLE | 1050.900MM 880 EF LEN   | 510                 | Riser - Spun | 46      |
| HHY    | 80090826    | Hornby   | MANHOLE RISER NO HOLE | 1050.1200MM             | 680                 | Riser - Spun | 46      |
| HHY    | 80090827    | Hornby   | MANHOLE RISER NO HOLE | 1050.1500MM             | 851                 | Riser - Spun | 46      |
| HHY    | 80090828    | Hornby   | MANHOLE RISER NO HOLE | 1050.1800MM 1810 EF LEN | 1021                | Riser - Spun | 46      |
| HHY    | 80090829    | Hornby   | MANHOLE RISER NO HOLE | 1050.2100MM 2110 EF LEN | 1215                | Riser - Spun | 46      |
| HHY    | 80090830    | Hornby   | MANHOLE RISER NO HOLE | 1050.2400MM 2430 EF LEN | 1385                | Riser - Spun | 46      |
| HHY    | 80090961    | Hornby   | MANHOLE RISER         | 1050.300MM 270 EF LEN   | 176                 | Riser - Spun | 46      |
| HHY    | 80090962    | Hornby   | MANHOLE RISER         | 1050.600MM 570 EF LEN   | 346                 | Riser - Spun | 46      |
| HHY    | 80090963    | Hornby   | MANHOLE RISER         | 1050.900MM 880 EF LEN   | 516                 | Riser - Spun | 46      |
| HHY    | 80090964    | Hornby   | MANHOLE RISER         | 1050.1200MM             | 692                 | Riser - Spun | 46      |
| HHY    | 80090965    | Hornby   | MANHOLE RISER         | 1050.1500MM             | 868                 | Riser - Spun | 46      |
| HHY    | 80090966    | Hornby   | MANHOLE RISER         | 1050.1800MM 1810 EF LEN | 1038                | Riser - Spun | 46      |
| HHY    | 80090967    | Hornby   | MANHOLE RISER         | 1050.2100MM 2110 EF LEN | 1208                | Riser - Spun | 46      |

## Sumps & Risers continued

**Table 49 ctd - Group 46 – Riser – Spun – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1         | DESCRIPTION 2           | PRODUCT WEIGHT [KG] | GROUP        | GROUP # |
|--------|-------------|----------|-----------------------|-------------------------|---------------------|--------------|---------|
| HHY    | 80090968    | Hornby   | MANHOLE RISER         | 1050.2400MM 2430 EF LEN | 1383                | Riser - Spun | 46      |
| HHY    | 80090973    | Hornby   | MANHOLE RISER         | 1200.900MM 880 EF LEN   | 645                 | Riser - Spun | 46      |
| HHY    | 80090984    | Hornby   | MANHOLE RISER         | 1350.300MM 270 EF LEN   | 268                 | Riser - Spun | 46      |
| HHY    | 80090985    | Hornby   | MANHOLE RISER         | 1350.600MM 570 EF LEN   | 528                 | Riser - Spun | 46      |
| HHY    | 80090986    | Hornby   | MANHOLE RISER         | 1350.900MM 880 EF LEN   | 787                 | Riser - Spun | 46      |
| HHY    | 80090987    | Hornby   | MANHOLE RISER         | 1350.1200MM             | 1055                | Riser - Spun | 46      |
| HHY    | 80090989    | Hornby   | MANHOLE RISER         | 1350.1800MM 1810 EF LEN | 1583                | Riser - Spun | 46      |
| HHY    | 80090991    | Hornby   | MANHOLE RISER         | 1350.2400MM 2430 EF LEN | 2110                | Riser - Spun | 46      |
| HHY    | 80090994    | Hornby   | MANHOLE RISER         | 1500.600MM 570 EF LEN   | 583                 | Riser - Spun | 46      |
| HHY    | 80090996    | Hornby   | MANHOLE RISER         | 1500.900MM 880 EF LEN   | 869                 | Riser - Spun | 46      |
| HHY    | 80091000    | Hornby   | MANHOLE RISER         | 1500.1500MM             | 1461                | Riser - Spun | 46      |
| HHY    | 80091004    | Hornby   | MANHOLE RISER         | 1500.2440MM 2440 EF LEN | 2330                | Riser - Spun | 46      |
| HHY    | 80091006    | Hornby   | MANHOLE RISER         | 1800.300MM 270 EF LEN   | 416                 | Riser - Spun | 46      |
| HHY    | 80091007    | Hornby   | MANHOLE RISER         | 1800.600MM 570 EF LEN   | 819                 | Riser - Spun | 46      |
| HHY    | 80091008    | Hornby   | MANHOLE RISER         | 1800.900MM 880 EF LEN   | 1221                | Riser - Spun | 46      |
| HHY    | 80091010    | Hornby   | MANHOLE RISER         | 1800.1200MM             | 1637                | Riser - Spun | 46      |
| HHY    | 80091011    | Hornby   | MANHOLE RISER         | 1800.1500MM             | 2053                | Riser - Spun | 46      |
| HHY    | 80091013    | Hornby   | MANHOLE RISER         | 1800.1800MM 1810 EF LEN | 2456                | Riser - Spun | 46      |
| HHY    | 80091015    | Hornby   | MANHOLE RISER         | 1800.2100MM 2110 EF LEN | 2858                | Riser - Spun | 46      |
| HHY    | 80091017    | Hornby   | MANHOLE RISER         | 1800.2400MM 2430 EF LEN | 3275                | Riser - Spun | 46      |
| HHY    | 80091019    | Hornby   | MANHOLE RISER NO HOLE | 1200.300MM 270 EF LEN   | 220                 | Riser - Spun | 46      |
| HHY    | 80091020    | Hornby   | MANHOLE RISER NO HOLE | 1200.600MM 570 EF LEN   | 432                 | Riser - Spun | 46      |
| HHY    | 80091021    | Hornby   | MANHOLE RISER NO HOLE | 1200.900MM 880 EF LEN   | 645                 | Riser - Spun | 46      |
| HHY    | 80091022    | Hornby   | MANHOLE RISER NO HOLE | 1200.1200MM             | 865                 | Riser - Spun | 46      |
| HHY    | 80091023    | Hornby   | MANHOLE RISER NO HOLE | 1200.1500MM             | 1085                | Riser - Spun | 46      |
| HHY    | 80091024    | Hornby   | MANHOLE RISER NO HOLE | 1200.1800MM 1810 EF LEN | 1297                | Riser - Spun | 46      |
| HHY    | 80091025    | Hornby   | MANHOLE RISER NO HOLE | 1200.2100MM 2110 EF LEN | 1510                | Riser - Spun | 46      |
| HHY    | 80091026    | Hornby   | MANHOLE RISER NO HOLE | 1200.2400MM 2430 EF LEN | 1730                | Riser - Spun | 46      |
| HHY    | 80091027    | Hornby   | MANHOLE RISER NO HOLE | 1350.300MM 270 EF LEN   | 265                 | Riser - Spun | 46      |
| HHY    | 80091028    | Hornby   | MANHOLE RISER NO HOLE | 1350.600MM 570 EF LEN   | 528                 | Riser - Spun | 46      |
| HHY    | 80091029    | Hornby   | MANHOLE RISER NO HOLE | 1350.900MM 880 EF LEN   | 787                 | Riser - Spun | 46      |
| HHY    | 80091030    | Hornby   | MANHOLE RISER NO HOLE | 1350.1200MM             | 1055                | Riser - Spun | 46      |
| HHY    | 80091031    | Hornby   | MANHOLE RISER NO HOLE | 1350.1500MM             | 1315                | Riser - Spun | 46      |
| HHY    | 80091032    | Hornby   | MANHOLE RISER NO HOLE | 1350.1800MM 1810 EF LEN | 1575                | Riser - Spun | 46      |
| HHY    | 80091033    | Hornby   | MANHOLE RISER NO HOLE | 1350.2100MM 2110 EF LEN | 1842                | Riser - Spun | 46      |
| HHY    | 80091034    | Hornby   | MANHOLE RISER NO HOLE | 1350.2400MM 2430 EF LEN | 2100                | Riser - Spun | 46      |

## Sumps & Risers continued

**Table 49 ctd - Group 46 – Riser – Spun – Hornby**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1         | DESCRIPTION 2           | PRODUCT WEIGHT [KG] | GROUP        | GROUP # |
|--------|-------------|----------|-----------------------|-------------------------|---------------------|--------------|---------|
| HHY    | 80091035    | Hornby   | MANHOLE RISER NO HOLE | 1500.300MM 270 EF LEN   | 296                 | Riser - Spun | 46      |
| HHY    | 80091036    | Hornby   | MANHOLE RISER NO HOLE | 1500.600MM 570 EF LEN   | 583                 | Riser - Spun | 46      |
| HHY    | 80091037    | Hornby   | MANHOLE RISER NO HOLE | 1500.900MM 880 EF LEN   | 869                 | Riser - Spun | 46      |
| HHY    | 80091038    | Hornby   | MANHOLE RISER NO HOLE | 1500.1200MM             | 1165                | Riser - Spun | 46      |
| HHY    | 80091039    | Hornby   | MANHOLE RISER NO HOLE | 1500.1500MM             | 1461                | Riser - Spun | 46      |
| HHY    | 80091040    | Hornby   | MANHOLE RISER NO HOLE | 1500.1800MM 1810 EF LEN | 1748                | Riser - Spun | 46      |
| HHY    | 80091041    | Hornby   | MANHOLE RISER NO HOLE | 1500.2100MM 2110 EF LEN | 2034                | Riser - Spun | 46      |
| HHY    | 80091042    | Hornby   | MANHOLE RISER NO HOLE | 1500.2400MM 2430 EF LEN | 2330                | Riser - Spun | 46      |
| HHY    | 80091045    | Hornby   | MANHOLE RISER NO HOLE | 1800.300MM 270 EF LEN   | 410                 | Riser - Spun | 46      |
| HHY    | 80091046    | Hornby   | MANHOLE RISER NO HOLE | 1800.600MM 570 EF LEN   | 819                 | Riser - Spun | 46      |
| HHY    | 80091047    | Hornby   | MANHOLE RISER NO HOLE | 1800.900MM 880 EF LEN   | 1221                | Riser - Spun | 46      |
| HHY    | 80091048    | Hornby   | MANHOLE RISER NO HOLE | 1800.1200MM             | 1637                | Riser - Spun | 46      |
| HHY    | 80091049    | Hornby   | MANHOLE RISER NO HOLE | 1800.1500MM             | 2053                | Riser - Spun | 46      |
| HHY    | 80091050    | Hornby   | MANHOLE RISER NO HOLE | 1800.1800MM 1810 EF LEN | 2456                | Riser - Spun | 46      |
| HHY    | 80091051    | Hornby   | MANHOLE RISER NO HOLE | 1800.2100MM 2110 EF LEN | 2865                | Riser - Spun | 46      |
| HHY    | 80091052    | Hornby   | MANHOLE RISER NO HOLE | 1800.2400MM 2430 EF LEN | 3275                | Riser - Spun | 46      |
| HHY    | 80091170    | Hornby   | MANHOLE RISER NO HOLE | 2050.300MM 270 EF LEN   | 513                 | Riser - Spun | 46      |
| HHY    | 80091171    | Hornby   | MANHOLE RISER NO HOLE | 2050.600MM 570 EF LEN   | 1044                | Riser - Spun | 46      |
| HHY    | 80091172    | Hornby   | MANHOLE RISER NO HOLE | 2050.900MM 880 EF LEN   | 1577                | Riser - Spun | 46      |
| HHY    | 80091173    | Hornby   | MANHOLE RISER NO HOLE | 2050.1200MM             | 2087                | Riser - Spun | 46      |
| HHY    | 80091174    | Hornby   | MANHOLE RISER NO HOLE | 2050.1500MM             | 2618                | Riser - Spun | 46      |
| HHY    | 80091175    | Hornby   | MANHOLE RISER NO HOLE | 2050.1800MM 1810 EF LEN | 3131                | Riser - Spun | 46      |
| HHY    | 80091176    | Hornby   | MANHOLE RISER NO HOLE | 2050.2100MM 2110 EF LEN | 3593                | Riser - Spun | 46      |
| HHY    | 80091177    | Hornby   | MANHOLE RISER NO HOLE | 2050.2400MM 2430 EF LEN | 4175                | Riser - Spun | 46      |
| HHY    | 80091178    | Hornby   | MANHOLE RISER NO HOLE | 2300.300MM 270 EF LEN   | 820                 | Riser - Spun | 46      |
| HHY    | 80091179    | Hornby   | MANHOLE RISER NO HOLE | 2300.600MM 570 EF LEN   | 1640                | Riser - Spun | 46      |
| HHY    | 80091180    | Hornby   | MANHOLE RISER NO HOLE | 2300.900MM 880 EF LEN   | 2450                | Riser - Spun | 46      |
| HHY    | 80091181    | Hornby   | MANHOLE RISER NO HOLE | 2300.1200MM             | 3270                | Riser - Spun | 46      |
| HHY    | 80091182    | Hornby   | MANHOLE RISER NO HOLE | 2300.1500MM             | 4080                | Riser - Spun | 46      |
| HHY    | 80091183    | Hornby   | MANHOLE RISER NO HOLE | 2300.1800MM 1810 EF LEN | 4900                | Riser - Spun | 46      |
| HHY    | 80091184    | Hornby   | MANHOLE RISER NO HOLE | 2300.2100MM 2110 EF LEN | 5710                | Riser - Spun | 46      |
| HHY    | 80091185    | Hornby   | MANHOLE RISER NO HOLE | 2300.2400MM 2430 EF LEN | 6525                | Riser - Spun | 46      |

**Table 50 - Group 47 – Riser - VT**

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1    | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP      | GROUP # |
|--------|-------------|----------|------------------|---------------|---------------------|------------|---------|
| HPA    | 80074168    | Papakura | MANHOLE RISER VT | 2400.2500MM   | 9375                | Riser - VT | 47      |





## Sumps & Risers continued

**Table 51** - Group 48 – Sump

| BRANCH | ITEM NUMBER | LOCATION | DESCRIPTION 1 | DESCRIPTION 2 | PRODUCT WEIGHT [KG] | GROUP | GROUP # |
|--------|-------------|----------|---------------|---------------|---------------------|-------|---------|
| HHY    | 80090838    | Hornby   | CIRCULAR SUMP | 600.300MM FJ  | 70                  | Sump  | 48      |
| HHY    | 80090839    | Hornby   | CIRCULAR SUMP | 600.600MM FJ  | 140                 | Sump  | 48      |
| HHY    | 80090840    | Hornby   | CIRCULAR SUMP | 600.900MM FJ  | 210                 | Sump  | 48      |
| HHY    | 80090841    | Hornby   | CIRCULAR SUMP | 600.1200MM FJ | 280                 | Sump  | 48      |
| HHY    | 80090842    | Hornby   | CIRCULAR SUMP | 600.1500MM FJ | 350                 | Sump  | 48      |
| HHY    | 80090844    | Hornby   | CIRCULAR SUMP | 750.600MM FJ  | 196                 | Sump  | 48      |
| HHY    | 80090845    | Hornby   | CIRCULAR SUMP | 750.900MM FJ  | 294                 | Sump  | 48      |
| HHY    | 80090846    | Hornby   | CIRCULAR SUMP | 750.1200MM FJ | 392                 | Sump  | 48      |
| HHY    | 80090847    | Hornby   | CIRCULAR SUMP | 900.300MM FJ  | 131                 | Sump  | 48      |
| HHY    | 80090848    | Hornby   | CIRCULAR SUMP | 900.600MM FJ  | 262                 | Sump  | 48      |
| HHY    | 80090849    | Hornby   | CIRCULAR SUMP | 900.900MM FJ  | 393                 | Sump  | 48      |
| HHY    | 80090850    | Hornby   | CIRCULAR SUMP | 900.1200MM FJ | 524                 | Sump  | 48      |
| HHY    | 80090851    | Hornby   | CIRCULAR SUMP | 900.1500MM FJ | 655                 | Sump  | 48      |
| HHY    | 80090879    | Hornby   | CIRCULAR SUMP | 600.2400MM FJ | 560                 | Sump  | 48      |
| HHY    | 80090880    | Hornby   | CIRCULAR SUMP | 600.1800MM FJ | 420                 | Sump  | 48      |

# Content Declaration

The composition range for Humes' precast concrete products (excluding sumps & risers) is given in Table 52, and their packaging in Table 53. The concrete is purchased ready mixed, so component details are not available. The products do not contain biogenic carbon.

The composition range for Humes' sumps and risers is given in Table 54, and their packaging in Table 55. The concrete is batch-mixed onsite for sumps and risers (produced on the pipe plants), so details are provided for each component.

**Table 52 – Content declaration of Humes precast concrete products (per 1 tonne product)**

| PRODUCT COMPONENTS            | WEIGHT, KG | POST-CONSUMER RECYCLED MATERIAL, WEIGHT-% | RENEWABLE MATERIAL, WEIGHT-% |
|-------------------------------|------------|-------------------------------------------|------------------------------|
| Steel (reinforcement)         | <243       | 0*                                        | 0                            |
| Galvanised steel (anchors)    | <2.23      | 0                                         | 0                            |
| Concrete                      | >757       | 0                                         | 0                            |
| Plastic sundries              | <13.2      | 0                                         | 0                            |
| Aluminium (selected products) | <0.0423    | 0                                         | 0                            |
| Brass (selected products)     | <1.39      | 0                                         | 0                            |
| Total                         | 1000       |                                           |                              |

**Table 53 – Packaging of Humes precast concrete products (per 1 tonne product)**

| PACKAGING MATERIALS | WEIGHT, KG | WEIGHT-% (VERSUS THE PRODUCT) | WEIGHT BIOGENIC CARBON, KG C/KG |
|---------------------|------------|-------------------------------|---------------------------------|
| Timber dunnage      | 4.96       | 0.50%                         | 0.5                             |
| Total               | 4.96       | 0.50%                         |                                 |

**Table 54 – Content declaration of Humes sumps and riser products (per 1 tonne product)**

| PRODUCT COMPONENTS | WEIGHT, KG  | POST-CONSUMER RECYCLED MATERIAL, WEIGHT-% | RENEWABLE MATERIAL, WEIGHT-% |
|--------------------|-------------|-------------------------------------------|------------------------------|
| Steel              | 11.9-44.2   | 0*                                        | 0                            |
| Cement             | 134-145     | 0                                         | 0                            |
| Aggregate          | 763-796     | 0                                         | 0                            |
| Admixtures         | <0.683      | 0                                         | 0                            |
| Fly ash            | <15.2       | 0                                         | 0                            |
| Plastic sundries   | 0.0162-2.33 | 0                                         | 0                            |
| Galv               | <6.67       | 0                                         | 0                            |
| Added Water        | 47.1-54.5   | 0                                         | 0                            |
| Total              | 1000        |                                           |                              |

**Table 55 – Packaging of Humes sumps and riser products (per 1 tonne product)**

| PACKAGING MATERIALS | WEIGHT, KG | WEIGHT-% (VERSUS THE PRODUCT) | WEIGHT BIOGENIC CARBON, KG C/KG |
|---------------------|------------|-------------------------------|---------------------------------|
| Timber dunnage      | 2.96       | 0.30%                         | 0.5                             |
| Total               | 2.96       | 0.30%                         |                                 |

\* The composition of the scrap input to the steel reinforcement is not known, so no post-consumer recycled material has been declared. The scrap input is 23.1% for rebar and 6.7% for steel wire, made up of a mix of pre-consumer and post-consumer scrap.

The product as supplied is non-hazardous. The products included in this EPD do not contain any substances of very high concern as defined by European REACH regulation in concentrations >0.1% (m/m). Precast concrete products and pipes are classified as non-dangerous goods according to the Land Transport Rule: Dangerous Goods 2005. When concrete products are cut, sawn, abraded or crushed, dust is created which contains crystalline silica, some of which may be respirable (particles small enough to go into the deep parts of the lung when breathed in), and which is hazardous. Exposure through inhalation should be avoided. Dust from this product is classified as Hazardous under the Hazardous Substances and New Organisms Act 1996 (HSNO Act) and is subject to Workplace Exposure Standards (WorkSafe NZ WES-BEI indices Edition 13, April 2022).



## Manufacturing Process

To produce precast concrete components, reinforcement steel is placed into re-useable and largely fixed moulds, and concrete is poured, vibrated and cured. If specified, architectural finishes (such as honing, polishing or staining) may then be applied while still in the factory. The finished precast components are then transported to site and then craned into position on site.

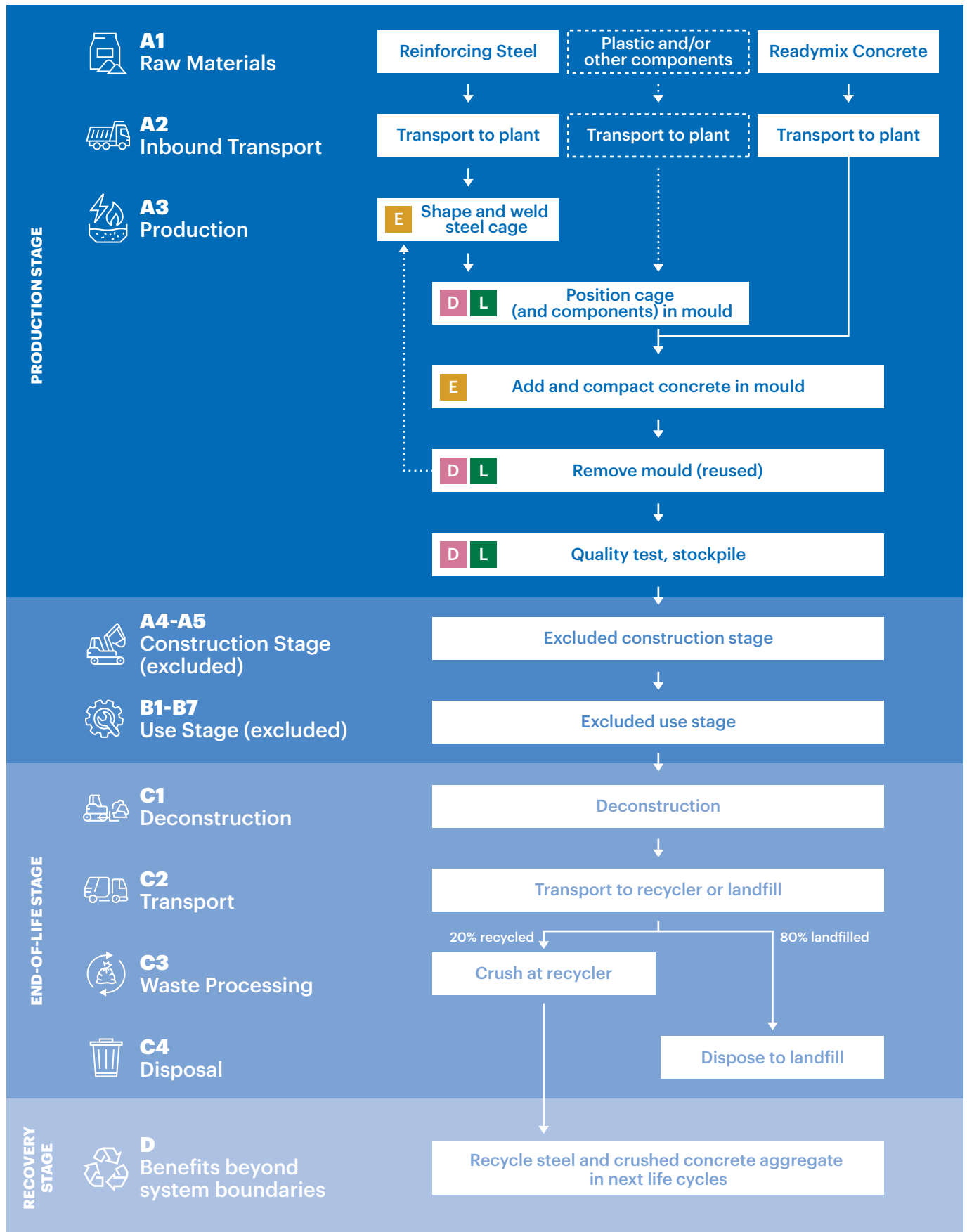
This manufacturing process allows for a high turnover of repeatable, consistent products manufactured to the same design each time. Where customisation is required by the customer, these are managed on a product by product basis, and involve the adjustment of the moulds, or in some cases, temporary moulds. Customised precast concrete products are not covered by this EPD.

Precast Concrete (Read-Mix) is manufactured offsite by specialised suppliers, who transport it to the manufacturing sites, where it is immediately loaded into a distribution skip, and craned to the concrete mould for pouring.

Fabricated reinforcing is assembled into component parts by suppliers, and transported to the manufacturing site, where it is stored securely until it is required for production. When required, it is placed in the mould, along with any other fittings, prior to the concrete being poured.

Additional fittings may be required for some products. Most commonly these are the cast in metal lifting anchors, which are used post production to lift the product from the mould, and by customers to install the product in it's final location, and reinforcing spacers which are typically plastic inserts used to hold the reinforcing in the correct position within the mould to meet the structural design requirements, and to ensure there is a large enough layer of concrete between the exposed surface and the reinforcing (cover). Both of these items are purchased from their manufacturers, and stored on site until required for the manufacturing process.

# System Boundaries



**Legend** Manufacturing energy inputs

**E** Electricity

**D** Diesel

**L** LPG

# System Boundaries

This EPD is of the type 'cradle-to-gate with modules C1-C4 and module D (A1-A3 + C + D)'. Construction phase (A4-A5) and use phase (B1-B7) modules are dependent on particular scenarios and best considered at the project level.

The modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation are shown in Table 9.

**Table 56 – Modules included in the scope of the EPD**

|                      | PRODUCT STAGE       |                            |               | CONSTRUCTION PROCESS STAGE |                             |     | USE STAGE   |        |             |               |                        |                       | END OF LIFE STAGE           |                               |                  |          | RESOURCE RECOVERY                      |
|----------------------|---------------------|----------------------------|---------------|----------------------------|-----------------------------|-----|-------------|--------|-------------|---------------|------------------------|-----------------------|-----------------------------|-------------------------------|------------------|----------|----------------------------------------|
|                      | Raw material supply | Transport of raw materials | Manufacturing | Transport to customer      | Construction / Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction / demolition | Transport to waste processing | Waste processing | Disposal | Reuse - Recovery- Recycling- potential |
| Module               | A1                  | A2                         | A3            | A4                         | A5                          | B1  | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                          | C2                            | C3               | C4       | D                                      |
| Modules declared     | X                   | X                          | X             | ND                         | ND                          | ND  | ND          | ND     | ND          | ND            | ND                     | ND                    | X                           | X                             | X                | X        | X                                      |
| Geography            | GLO                 | GLO                        | NZ            |                            |                             |     |             |        |             |               |                        |                       | NZ                          | NZ                            | NZ               | NZ       | GLO                                    |
| Specific data        | >90%                |                            |               |                            |                             |     |             |        |             |               |                        |                       |                             |                               |                  |          |                                        |
| Variation - products | <10%                |                            |               |                            |                             |     |             |        |             |               |                        |                       |                             |                               |                  |          |                                        |
| Variation - sites    | N/A                 |                            |               |                            |                             |     |             |        |             |               |                        |                       |                             |                               |                  |          |                                        |

X = included in the EPD; ND = Module not declared (such a declaration shall not be regarded as an indicator result of zero).

## Production (Module A1-A3)

The production stage includes the environmental impacts associated with raw materials extraction and processing of inputs, transport to, between and within the manufacturing site, manufacturing of average product at the exit gate of the manufacturing site and transport of product to customer.

The raw materials are supplied by third parties and typically transported to site by truck. For precast concrete products, the ready-mix concrete is supplied from a concrete batching plant adjacent to our site. For sump and riser products, the concrete is batched onsite.

## End-of-life (C1-C4)

When infrastructure reaches the end of its functional life, it is typically demolished (C1) and the demolition waste transported (C2) to a processing facility. Waste processing (C3) includes the crushing of precast concrete and separation of recyclable waste. Materials that cannot be recycled will be disposed (C4).

The end-of-life stage for Humes precast products have been modelled as 20% recycled and 80% landfilled,

based on typical scenario for precast concrete in the BRANZ guidance for modelling Building end-of-life. Due to high uncertainty in the parameters and lack of data, CO<sub>2</sub>-uptake (carbonation) has not been included at end-of-life.

The waste flows and a brief description of the scenario at end-of-life are shown in Table 57.

**Table 57 – End-of-life scenario, processes and parameters, per declared unit (1 tonne)**

| SCENARIO / MODULE     | PARAMETER                   | PRESTRESSED                                                                                                                                    |
|-----------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Definition    | Declared Unit               | 1 tonne                                                                                                                                        |
|                       | Assumed composition         | 2% steel, 98% concrete                                                                                                                         |
| Deconstruction (C1)   | Process and assumptions     | Demolition using a 100 kW excavator using 0.172kg diesel per tonne                                                                             |
|                       | kg collected separately     | 1000                                                                                                                                           |
| Transport (C2)        | Process and assumptions     | Transport 100 km by truck                                                                                                                      |
|                       | kg transported              | 1000                                                                                                                                           |
| Waste processing (C3) | Process and assumptions     | Crushing of 20% of precast item and separation of steel and concrete for recycling (100 kW excavator as proxy using 0.811kg diesel per tonne). |
|                       | kg crushed                  | 200                                                                                                                                            |
|                       | kg for recycling (concrete) | 196                                                                                                                                            |
|                       | kg for recycling (steel)    | 4                                                                                                                                              |
| Disposal (C4)         | Process and assumptions     | 80% of precast item sent to inert landfill.                                                                                                    |
|                       | kg disposed                 | 800                                                                                                                                            |

## Recovery (module D)

Module D declares a potential credit or burden for the net scrap associated with recyclable materials leaving a product system. The concrete rubble and steel scrap produced in module C3 can replace natural coarse aggregates (crushed rock) and virgin steel (after further processing).

The steel credit considers net scrap after subtracting the amount of steel scrap used in production of the

reinforcing steel in the first product life cycle.

Module D is only relevant for the 20% of product recycled.

Concrete contains no recycled materials, and thus 100% of the concrete volume has been assumed to replace virgin crushed aggregates in module D. Reinforcing steel contains up to 23.1% recycled content, which means 76.9% of steel sent to recycling is credited in module D.

# Life cycle assessment methodology

Primary data were used for all manufacturing operations up to the factory gate. Primary data for Humes' operations was sourced from the period 01 July 2018 to 30 June 2019. Background data was used for input materials sourced from other suppliers.

All data in the background system were from the GaBi Life Cycle Inventory Database 2021.2 (Sphera, 2021). Most datasets have a reference year between 2017 and 2020 and all fall within the 10 year limit allowable for generic data under EN 15804.

## Upstream data

Data for steel input is taken from worldsteel LCI data. Data for cement input is taken from the Golden Bay Cement EPD. Electricity and water were modelled to reflect New Zealand conditions.

Other upstream (supply chain) data used were Australian, or European due to a lack of consistent LCI data for New Zealand at the time this study was conducted.

## Electricity

The composition of the electricity grid mix is modelled in GaBi and updated annually. The New Zealand electricity grid consumption mix (2017) is made up of hydro (59.30%), geothermal (17.96%), natural gas (12.93%), wind (4.66%), coal gases (2.15%), hard coal (1.36%), biomass (0.70%), biogas (0.69%), and photovoltaics (0.27%), lignite (0.05%) and fuel oil (0.03%). The emission factor for the New Zealand national grid mix 1kV-60kV for the GWP-GHG indicator is 0.145 kg CO<sub>2</sub>e/kWh.

## Transport

Where transport data was not available for any material, a standard value of 100 km was used.

## Explanation of Representative Products & Variation

This EPD covers 799 unique products, including 102 sump and riser products produced on the pipe plants. Grouping is based on the product type and, where necessary, further grouping by product dimension, production site, and/or reinforcing proportion. The impacts are declared for a representative product for each group.

For many groups, the GWP-GHG impacts for all products in the group fall within  $\pm 10\%$  of the average impact. Some groups have products that sit outside this range. The range of GWP-GHG impacts for each group is detailed in the environmental performance section.

## Cut off criteria

The cut-off criteria applied are 1% of cumulative mass input and 1% of cumulative energy usage, providing the minor flows do not have significant environmental relevance.

Inputs knowingly excluded from the inventory are packaging materials for minor inputs such as mould oil, which is used in small quantities. These materials are well below the materiality cut-off and have been excluded. Personnel is excluded as per section 4.3.1 in the PCR (EPD International, 2021). thinkstep-anz consistently excludes environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process, ('capital goods') regardless of potential significance. High-quality infrastructure-related data isn't always available and there is no clear cut-off for what to include. For this reason, capital goods data are applied to LCA studies inconsistently. This is expected to lead to reduced consistency and comparability of EPDs. Capital goods were previously excluded from EPDs, thus including capital goods in current EPDs would further reduce their comparability.

## Allocation

The inputs and outputs of Humes' production processes were collected separately for each site, and for the pipe and precast production units on combined sites. All products are produced and sold by Humes, and there are no valuable by-products. The difference in the value per tonne of precast is low (less than 25%).

Where the data covered only a single production type (e.g. pipes at Papakura, precast at Papakura), all inputs and outputs were allocated by mass. Any data that was only available on a site-wide basis (e.g. waste) was allocated by mass.

The data for Te Rapa precast covered both the open air cured precast products and the natural gas cured prestressed sleepers. Natural gas is only used for the sleeper curing process and was fully allocated to the sleepers. All other inputs and outputs were allocated by mass.

The data for Nelson precast included both the open air cured precast products and the prestressed sleepers, cured via electric kettle. The electricity supply for the electric kettle was not independently metered, so a single electricity input was available for the whole site. The electricity consumption for Te Rapa precast site was used to support allocation. The Te Rapa electricity per tonne of production was used as a proxy for the site-wide electricity consumption for Nelson, with the remainder allocated to the pole curing process. All other inputs and outputs were allocated by mass.

Hornby uses diesel for curing pipes, while precast is air cured. The diesel used for curing was not specifically measured. Papakura precast's diesel consumption was used to estimate the usage for Hornby precast, with the remainder allocated to Hornby pipes for curing.

Allocation for input materials that contain secondary material occurs in the upstream datasets.

Fly ash and silica fume used in the concrete mixes have environmental impacts allocated based on economic value in the background data.

## Assumptions

The ready-mixed concrete supplied to Humes is modelled based on supplier data for the specific mix used for each precast product, as indicated by Humes' BOMs. The concrete composition for the sump and riser products is taken from Humes' BOMs and is specific to each product and site.

All sites run on mains water, but not all sites have water meters, as water is often not charged on a usage basis in New Zealand. The measured water input for Papakura has been used as a proxy for water usage per tonne for Hornby. Wastewater outputs are assumed to be the same as water inputs as a conservative assumption. No data was available for the quantity or waste treatment of excess reinforcing steel or concrete, and these have not been modelled.





## Assessment Indicators

The results tables describe the different environmental indicators for each product per declared unit, for each declared module.

Tables 58 presents the covered indicators, including the core and additional environmental impact indicators, life cycle inventory indicators, describing resource use and waste and other outputs, indicators used in the previous standard (EN15804+A1), and the biogenic carbon content of the product and its packaging.

For precast products, the following indicators are not relevant, hence result in zero values:

- Components for re-use (CRU) is zero since there are none produced.
- Materials for recycling (MFR) is zero since no waste is available for recycling.
- Materials for energy recovery (MER) is zero since no waste is available for energy recovery.
- Exported electrical energy (EEE) is zero since there is none produced.
- Exported thermal energy (EET) is zero since there is none produced

**Table 58 - Assessment indicators**

| INDICATOR                                                    | INDICATORS, ABBR. | UNITS                                   |
|--------------------------------------------------------------|-------------------|-----------------------------------------|
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS</b>       |                   |                                         |
| Climate change – total                                       | GWP-total         | kg CO <sub>2</sub> -eq.                 |
| Climate change – fossil                                      | GWP-fossil        | kg CO <sub>2</sub> -eq.                 |
| Climate change – biogenic                                    | GWP-biogenic      | kg CO <sub>2</sub> -eq.                 |
| Climate change – land use and land use change                | GWP-luluc         | kg CO <sub>2</sub> -eq.                 |
| Ozone depletion                                              | ODP               | kg CFC11-eq.                            |
| Acidification                                                | AP                | Mole of H <sup>+</sup> eq.              |
| Eutrophication aquatic freshwater                            | EP-freshwater     | kg P eq.                                |
| Eutrophication aquatic marine                                | EP-marine         | kg N eq.                                |
| Eutrophication terrestrial                                   | EP-terrestrial    | Mole of N eq.                           |
| Photochemical ozone formation                                | POCP              | kg NMVOC eq.                            |
| Depletion of abiotic resources – minerals and metals*        | ADP-m&m           | kg Sb-eq.                               |
| Depletion of abiotic resources – fossil fuels*               | ADP-fossil        | MJ                                      |
| Water Depletion Potential*                                   | WDP               | m <sup>3</sup> world equiv.             |
| <b>EN15804+A2 RESOURCE USE INDICATORS</b>                    |                   |                                         |
| Renewable primary energy as energy carrier                   | PERE              | MJ                                      |
| Renewable primary energy resources as material utilization   | PERM              | MJ                                      |
| Total use of renewable primary energy resources              | PERT              | MJ                                      |
| Non-renewable primary energy as energy carrier               | PENRE             | MJ                                      |
| Non-renewable primary energy as material utilization         | PENRM             | MJ                                      |
| Total use of non-renewable primary energy resources          | PENRT             | MJ                                      |
| Use of secondary material                                    | SM                | kg                                      |
| Use of renewable secondary fuels                             | RSF               | MJ                                      |
| Use of non-renewable secondary fuels                         | NRSF              | MJ                                      |
| Use of net fresh water                                       | FW                | m <sup>3</sup>                          |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW INDICATORS</b>  |                   |                                         |
| Hazardous waste disposed                                     | HWD               | kg                                      |
| Non-hazardous waste disposed                                 | NHWD              | kg                                      |
| Radioactive waste disposed                                   | RWD               | kg                                      |
| Components for reuse                                         | CRU               | kg                                      |
| Materials for recycling                                      | MFR               | kg                                      |
| Materials for energy recovery                                | MER               | kg                                      |
| Exported electrical energy                                   | EEE               | MJ                                      |
| Exported thermal energy                                      | EET               | MJ                                      |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS</b> |                   |                                         |
| IPCC AR5 Global Warming Potential **                         | GWP-GHG           | kg CO <sub>2</sub> -eq.                 |
| Particulate Matter emissions                                 | PM                | Disease incidences                      |
| Ionising Radiation – human health ***                        | IRP               | kBq U235 eq.                            |
| Eco-toxicity (freshwater)                                    | ETP-fw            | CTUe                                    |
| Human Toxicity, cancer *                                     | HTPc              | CTUh                                    |
| Human Toxicity, non-cancer *                                 | HTPnc             | CTUh                                    |
| Land use related impacts / soil quality *                    | SQP               | Pt                                      |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>         |                   |                                         |
| Biogenic carbon content - product                            | BCC-prod          | kg C                                    |
| Biogenic carbon content - packaging                          | BCC-pack          | kg C                                    |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS</b>            |                   |                                         |
| Global warming potential                                     | GWP               | kg CO <sub>2</sub> eq.                  |
| Ozone depletion potential                                    | ODP               | kg CFC 11 eq.                           |
| Acidification potential                                      | AP                | kg SO <sub>2</sub> eq.                  |
| Eutrophication potential                                     | EP                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. |
| Photochemical ozone creation potential                       | POCP              | kg C <sub>2</sub> H <sub>4</sub> eq.    |
| Abiotic depletion potential for non-fossil resources         | ADPe              | kg Sb eq.                               |
| Abiotic depletion potential for fossil resources             | ADPf              | MJ                                      |

\* The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

\*\* This indicator is calculated using the characterisation factors from the IPCC AR5 report (IPCC 2013) and has been included in the EPD following the PCR. The indicator is more likely to be in line with other GHG reporting in Australia and New Zealand.

\*\*\* This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and some construction materials, is also not measured by this indicator.



## Environmental Performance

|                                                               |           |
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# Environmental Performance

**Table 59** - Cradle-to-gate (A1-A3) per tonne

| REPRESENTATIVE PRODUCT                                                                     |                                         | HPA-80091055             | HHY-80091096               | HNN-80091065     | HHY-80091053             |
|--------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------|----------------------------|------------------|--------------------------|
| GROUP DESCRIPTION                                                                          |                                         | RISER/SUMP BASE<br>- HPA | RISER - ONE PIECE<br>- HHY | RISER BASE - HNN | RISER/SUMP BASE<br>- HHY |
| GROUP #                                                                                    |                                         | GROUP 1                  | GROUP 2                    | GROUP 3          | GROUP 4                  |
| INDICATORS, ABBR.                                                                          | UNITS                                   |                          |                            |                  |                          |
| EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST       |                                         |                          |                            |                  |                          |
| GWP-TOTAL                                                                                  | kg CO <sub>2</sub> -eq.                 | 149                      | 178                        | 220              | 200                      |
| GWP-FOSSIL                                                                                 | kg CO <sub>2</sub> -eq.                 | 148                      | 177                        | 218              | 200                      |
| GWP-BIOGENIC                                                                               | kg CO <sub>2</sub> -eq.                 | 0.263                    | 0.613                      | 2.62             | 0.620                    |
| GWP-LULUC                                                                                  | kg CO <sub>2</sub> -eq.                 | 0.0302                   | 0.0381                     | 0.0417           | 0.0426                   |
| ODP                                                                                        | kg CFC11-eq.                            | 2.16E-10                 | 2.71E-10                   | 3.18E-10         | 2.70E-10                 |
| AP                                                                                         | Mole of H <sup>+</sup> eq.              | 0.288                    | 0.329                      | 0.436            | 0.404                    |
| EP-FRESHWATER                                                                              | kg P eq.                                | 2.10E-04                 | 2.38E-04                   | 4.55E-04         | 2.45E-04                 |
| EP-MARINE                                                                                  | kg N eq.                                | 0.0983                   | 0.120                      | 0.155            | 0.132                    |
| EP-TERRESTRIAL                                                                             | Mole of N eq.                           | 1.07                     | 1.28                       | 1.66             | 1.41                     |
| POCP                                                                                       | kg NMVOC eq.                            | 0.271                    | 0.327                      | 0.425            | 0.368                    |
| ADP-M&M                                                                                    | kg Sb-eq.                               | 6.02E-05                 | 8.34E-05                   | 2.50E-05         | 1.24E-04                 |
| ADP-FOSSIL                                                                                 | MJ                                      | 896                      | 1,060                      | 1,340            | 1,320                    |
| WDP                                                                                        | m <sup>3</sup> world equiv.             | 28.7                     | 25.6                       | 39.8             | 40.7                     |
| EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST                    |                                         |                          |                            |                  |                          |
| PERE                                                                                       | MJ                                      | 238                      | 461                        | 492              | 466                      |
| PERM                                                                                       | MJ                                      | 0                        | 0                          | 0                | 0                        |
| PERT                                                                                       | MJ                                      | 238                      | 461                        | 492              | 466                      |
| PENRE                                                                                      | MJ                                      | 896                      | 1,060                      | 1,340            | 1,320                    |
| PENRM                                                                                      | MJ                                      | 0                        | 0                          | 0                | 0                        |
| PENRT                                                                                      | MJ                                      | 896                      | 1,060                      | 1,340            | 1,320                    |
| SM                                                                                         | kg                                      | 2.19                     | 0.0102                     | 3.16             | 2.23                     |
| RSF                                                                                        | MJ                                      | 257                      | 315                        | 374              | 314                      |
| NRSF                                                                                       | MJ                                      | 0                        | 0                          | 0                | 0                        |
| FW                                                                                         | m <sup>3</sup>                          | 1.31                     | 1.40                       | 1.82             | 1.76                     |
| EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST  |                                         |                          |                            |                  |                          |
| HWD                                                                                        | kg                                      | 0.00196                  | 0.00376                    | 0.00533          | 0.00375                  |
| NHWD                                                                                       | kg                                      | 17.7                     | 20.9                       | 23.5             | 22.8                     |
| RWD                                                                                        | kg                                      | 0.00658                  | 0.00693                    | 0.00778          | 0.00705                  |
| CRU                                                                                        | kg                                      | 0                        | 0                          | 0                | 0                        |
| MFR                                                                                        | kg                                      | 0                        | 0                          | 0                | 0                        |
| MER                                                                                        | kg                                      | 0                        | 0                          | 0                | 0                        |
| EEE                                                                                        | MJ                                      | 0                        | 0                          | 0                | 0                        |
| EET                                                                                        | MJ                                      | 0                        | 0                          | 0                | 0                        |
| EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST |                                         |                          |                            |                  |                          |
| GWP-GHG                                                                                    | kg CO <sub>2</sub> -eq.                 | 149                      | 178                        | 220              | 200                      |
| PM                                                                                         | Disease incidences                      | 3.54E-06                 | 5.23E-06                   | 7.43E-06         | 6.11E-06                 |
| IRP                                                                                        | kBq U235 eq.                            | 0.992                    | 0.942                      | 1.07             | 0.969                    |
| ETP-FW                                                                                     | CTUe                                    | 602                      | 839                        | 799              | 872                      |
| HTPC                                                                                       | CTUh                                    | 7.00E-09                 | 2.20E-08                   | 1.08E-08         | 2.55E-08                 |
| HTPNC                                                                                      | CTUh                                    | 3.60E-07                 | 4.50E-07                   | 5.24E-07         | 6.58E-07                 |
| SQP                                                                                        | Pt                                      | 1,510                    | 2,910                      | 5,110            | 2,920                    |
| EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS                                              |                                         |                          |                            |                  |                          |
| BCC-prod                                                                                   | kg C                                    | 0                        | 0                          | 0                | 0                        |
| BCC-pack                                                                                   | kg C                                    | 0.232                    | 3.48                       | 5.06             | 3.48                     |
| EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST            |                                         |                          |                            |                  |                          |
| GWP                                                                                        | kg CO <sub>2</sub> eq.                  | 147                      | 176                        | 217              | 197                      |
| ODP                                                                                        | kg CFC 11 eq.                           | 4.05E-10                 | 5.09E-10                   | 5.97E-10         | 5.07E-10                 |
| AP                                                                                         | kg SO <sub>2</sub> eq.                  | 0.219                    | 0.247                      | 0.330            | 0.311                    |
| EP                                                                                         | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0404                   | 0.0494                     | 0.0650           | 0.0533                   |
| POCP                                                                                       | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0165                   | 0.0205                     | 0.0265           | 0.0281                   |
| ADPE                                                                                       | kg Sb eq.                               | 6.03E-05                 | 8.35E-05                   | 2.51E-05         | 1.24E-04                 |
| ADPF                                                                                       | MJ                                      | 871                      | 1,040                      | 1,310            | 1,280                    |



**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HHY-80090868                                  | HHY-80091992 | HNN-80091762    | HNN-80091676   |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------------|--------------|-----------------|----------------|
| GROUP DESCRIPTION                                                                                 |                                         | SUMP BASE<br>ALTERNATIVE<br>REINFORCING – HHY | ANCHORBLOCK  | GENERAL PRECAST | GULLY SURROUND |
| GROUP #                                                                                           |                                         | GROUP 5                                       | GROUP 6      | GROUP 7         | GROUP 8        |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |                                               |              |                 |                |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |                                               |              |                 |                |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 254                                           | 141          | 240             | 201            |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 254                                           | 140          | 237             | 198            |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | 0.330                                         | 0.917        | 2.62            | 2.59           |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.0481                                        | 0.0362       | 0.0453          | 0.0378         |
| ODP                                                                                               | kg CFC11-eq.                            | 3.14E-10                                      | 2.16E-10     | 3.18E-10        | 3.24E-10       |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 0.544                                         | 0.245        | 0.492           | 0.362          |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 2.62E-04                                      | 2.33E-04     | 4.61E-04        | 4.49E-04       |
| EP-MARINE                                                                                         | kg N eq.                                | 0.159                                         | 0.0997       | 0.169           | 0.146          |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 1.70                                          | 1.08         | 1.79            | 1.56           |
| POCP                                                                                              | kg NMVOC eq.                            | 0.451                                         | 0.264        | 0.474           | 0.391          |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 3.59E-05                                      | 6.94E-05     | 9.34E-05        | 2.96E-05       |
| ADP-FOSSIL                                                                                        | MJ                                      | 1,760                                         | 841          | 1,580           | 1,100          |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 68.6                                          | 15.8         | 40.5            | 21.9           |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |                                               |              |                 |                |
| PERE                                                                                              | MJ                                      | 496                                           | 436          | 495             | 490            |
| PERM                                                                                              | MJ                                      | 0                                             | 0            | 0               | 0              |
| PERT                                                                                              | MJ                                      | 496                                           | 436          | 495             | 490            |
| PENRE                                                                                             | MJ                                      | 1,760                                         | 841          | 1,580           | 1,100          |
| PENRM                                                                                             | MJ                                      | 0                                             | 0            | 0               | 0              |
| PENRT                                                                                             | MJ                                      | 1,760                                         | 841          | 1,580           | 1,100          |
| SM                                                                                                | kg                                      | 7.35                                          | 0.00941      | 1.40            | 0.231          |
| RSF                                                                                               | MJ                                      | 369                                           | 257          | 373             | 380            |
| NRSF                                                                                              | MJ                                      | 0                                             | 0            | 0               | 0              |
| FW                                                                                                | m <sup>3</sup>                          | 2.48                                          | 1.12         | 1.82            | 1.39           |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |                                               |              |                 |                |
| HWD                                                                                               | kg                                      | 0.00526                                       | 0.00196      | 0.00532         | 0.00543        |
| NHWD                                                                                              | kg                                      | 25.2                                          | 15.9         | 22.0            | 21.2           |
| RWD                                                                                               | kg                                      | 0.00703                                       | 0.00797      | 0.00776         | 0.00786        |
| CRU                                                                                               | kg                                      | 0                                             | 0            | 0               | 0              |
| MFR                                                                                               | kg                                      | 0                                             | 0            | 0               | 0              |
| MER                                                                                               | kg                                      | 0                                             | 0            | 0               | 0              |
| EEE                                                                                               | MJ                                      | 0                                             | 0            | 0               | 0              |
| EET                                                                                               | MJ                                      | 0                                             | 0            | 0               | 0              |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |                                               |              |                 |                |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 254                                           | 141          | 239             | 201            |
| PM                                                                                                | Disease incidences                      | 7.61E-06                                      | 4.41E-06     | 7.93E-06        | 6.53E-06       |
| IRP                                                                                               | kBq U235 eq.                            | 1.00                                          | 1.15         | 1.02            | 1.05           |
| ETP-FW                                                                                            | CTUe                                    | 983                                           | 787          | 826             | 774            |
| HTPC                                                                                              | CTUh                                    | 1.49E-08                                      | 7.86E-09     | 4.44E-08        | 1.36E-08       |
| HTPNC                                                                                             | CTUh                                    | 8.48E-07                                      | 2.35E-07     | 8.52E-07        | 3.48E-07       |
| SQP                                                                                               | Pt                                      | 2,940                                         | 2,910        | 5,120           | 5,110          |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |                                               |              |                 |                |
| BCC-prod                                                                                          | kg C                                    | 0                                             | 0            | 0               | 0              |
| BCC-pack                                                                                          | kg C                                    | 3.48                                          | 3.48         | 5.06            | 5.06           |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |                                               |              |                 |                |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 250                                           | 139          | 235             | 198            |
| ODP                                                                                               | kg CFC 11 eq.                           | 5.90E-10                                      | 4.05E-10     | 5.97E-10        | 6.09E-10       |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.426                                         | 0.179        | 0.375           | 0.266          |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0636                                        | 0.0412       | 0.0695          | 0.0620         |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0378                                        | 0.00875      | 0.0374          | 0.0196         |
| ADPE                                                                                              | kg Sb eq.                               | 3.59E-05                                      | 6.96E-05     | 9.34E-05        | 2.97E-05       |
| ADPF                                                                                              | MJ                                      | 1,720                                         | 818          | 1,550           | 1,070          |

**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                     |                                         | HHC-80091818       | HHC-80091817 | HHC-80088920  | HHY-80088920  |
|--------------------------------------------------------------------------------------------|-----------------------------------------|--------------------|--------------|---------------|---------------|
| GROUP DESCRIPTION                                                                          |                                         | BRIDGE ACCESSORIES | BRIDGE DECK  | CULVERT - HHC | CULVERT - HHY |
| GROUP #                                                                                    |                                         | GROUP 9            | GROUP 10     | GROUP 11      | GROUP 12      |
| INDICATORS, ABBR.                                                                          | UNITS                                   |                    |              |               |               |
| EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST       |                                         |                    |              |               |               |
| GWP-TOTAL                                                                                  | kg CO <sub>2</sub> -eq.                 | 305                | 263          | 267           | 292           |
| GWP-FOSSIL                                                                                 | kg CO <sub>2</sub> -eq.                 | 303                | 260          | 265           | 292           |
| GWP-BIOGENIC                                                                               | kg CO <sub>2</sub> -eq.                 | 2.03               | 2.02         | 2.02          | 0.355         |
| GWP-LULUC                                                                                  | kg CO <sub>2</sub> -eq.                 | 0.0585             | 0.0506       | 0.0518        | 0.0559        |
| ODP                                                                                        | kg CFC11-eq.                            | 3.60E-10           | 3.68E-10     | 3.67E-10      | 3.09E-10      |
| AP                                                                                         | Mole of H <sup>+</sup> eq.              | 0.849              | 0.685        | 0.715         | 0.689         |
| EP-FRESHWATER                                                                              | kg P eq.                                | 6.21E-04           | 6.10E-04     | 6.11E-04      | 2.74E-04      |
| EP-MARINE                                                                                  | kg N eq.                                | 0.211              | 0.193        | 0.193         | 0.179         |
| EP-TERRESTRIAL                                                                             | Mole of N eq.                           | 2.27               | 2.07         | 2.07          | 1.92          |
| POCP                                                                                       | kg NMVOC eq.                            | 0.639              | 0.573        | 0.570         | 0.524         |
| ADP-M&M                                                                                    | kg Sb-eq.                               | 1.39E-04           | 2.16E-04     | 1.95E-04      | 1.10E-04      |
| ADP-FOSSIL                                                                                 | MJ                                      | 2,670              | 2,180        | 2,220         | 2,230         |
| WDP                                                                                        | m <sup>3</sup> world equiv.             | 126                | 82.3         | 96.2          | 95.1          |
| EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST                    |                                         |                    |              |               |               |
| PERE                                                                                       | MJ                                      | 384                | 376          | 378           | 504           |
| PERM                                                                                       | MJ                                      | 0                  | 0            | 0             | 0             |
| PERT                                                                                       | MJ                                      | 384                | 376          | 378           | 504           |
| PENRE                                                                                      | MJ                                      | 2,650              | 2,170        | 2,200         | 2,210         |
| PENRM                                                                                      | MJ                                      | 15.5               | 11.3         | 18.0          | 18.7          |
| PENRT                                                                                      | MJ                                      | 2,670              | 2,180        | 2,220         | 2,230         |
| SM                                                                                         | kg                                      | 15.5               | 7.57         | 11.2          | 11.2          |
| RSF                                                                                        | MJ                                      | 270                | 276          | 275           | 363           |
| NRSF                                                                                       | MJ                                      | 0                  | 0            | 0             | 0             |
| FW                                                                                         | m <sup>3</sup>                          | 3.98               | 2.92         | 3.27          | 3.12          |
| EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST  |                                         |                    |              |               |               |
| HWD                                                                                        | kg                                      | 0.00343            | 0.00351      | 0.00349       | 0.00519       |
| NHWD                                                                                       | kg                                      | 31.5               | 25.0         | 28.0          | 28.4          |
| RWD                                                                                        | kg                                      | 0.00756            | 0.00776      | 0.00788       | 0.00724       |
| CRU                                                                                        | kg                                      | 0                  | 0            | 0             | 0             |
| MFR                                                                                        | kg                                      | 0                  | 0            | 0             | 0             |
| MER                                                                                        | kg                                      | 0                  | 0            | 0             | 0             |
| EEE                                                                                        | MJ                                      | 0                  | 0            | 0             | 0             |
| EET                                                                                        | MJ                                      | 0                  | 0            | 0             | 0             |
| EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST |                                         |                    |              |               |               |
| GWP-GHG                                                                                    | kg CO <sub>2</sub> -eq.                 | 302                | 260          | 265           | 291           |
| PM                                                                                         | Disease incidences                      | 1.20E-05           | 1.00E-05     | 1.05E-05      | 9.26E-06      |
| IRP                                                                                        | kBq U235 eq.                            | 1.13               | 1.06         | 1.13          | 1.05          |
| ETP-FW                                                                                     | CTUe                                    | 909                | 844          | 861           | 1,060         |
| HTPC                                                                                       | CTUh                                    | 2.44E-08           | 4.78E-08     | 2.22E-08      | 2.17E-08      |
| HTPNC                                                                                      | CTUh                                    | 1.68E-06           | 1.41E-06     | 1.34E-06      | 1.23E-06      |
| SQP                                                                                        | Pt                                      | 2,510              | 2,500        | 2,500         | 2,950         |
| EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS                                              |                                         |                    |              |               |               |
| BCC-prod                                                                                   | kg C                                    | 0                  | 0            | 0             | 0             |
| BCC-pack                                                                                   | kg C                                    | 2.71               | 2.71         | 2.71          | 3.48          |
| EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST            |                                         |                    |              |               |               |
| GWP                                                                                        | kg CO <sub>2</sub> eq.                  | 298                | 257          | 261           | 287           |
| ODP                                                                                        | kg CFC 11 eq.                           | 6.76E-10           | 6.92E-10     | 6.89E-10      | 5.81E-10      |
| AP                                                                                         | kg SO <sub>2</sub> eq.                  | 0.682              | 0.541        | 0.568         | 0.550         |
| EP                                                                                         | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0820             | 0.0760       | 0.0757        | 0.0703        |
| POCP                                                                                       | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0690             | 0.0573       | 0.0554        | 0.0517        |
| ADPE                                                                                       | kg Sb eq.                               | 1.39E-04           | 2.16E-04     | 1.95E-04      | 1.10E-04      |
| ADPF                                                                                       | MJ                                      | 2,600              | 2,130        | 2,170         | 2,170         |

**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HHC-80088875                                | HHY-80088875                                 | HHC-80089718 | HHY-80099791 |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------------------|----------------------------------------------|--------------|--------------|
| GROUP DESCRIPTION                                                                                 |                                         | CULVERT,<br>ALTERNATIVE<br>REINFORCING- HHC | CULVERT,<br>ALTERNATIVE<br>REINFORCING – HHY | RAIN GARDEN  | DUCTING      |
| GROUP #                                                                                           |                                         | GROUP 13                                    | GROUP 14                                     | GROUP 15     | GROUP 16     |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |                                             |                                              |              |              |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |                                             |                                              |              |              |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 297                                         | 321                                          | 247          | 262          |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 295                                         | 321                                          | 245          | 261          |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | 2.03                                        | 0.377                                        | 2.01         | 0.336        |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.0577                                      | 0.0617                                       | 0.0475       | 0.0504       |
| ODP                                                                                               | kg CFC11-eq.                            | 3.61E-10                                    | 3.05E-10                                     | 3.71E-10     | 3.14E-10     |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 0.826                                       | 0.798                                        | 0.651        | 0.576        |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 6.21E-04                                    | 2.83E-04                                     | 6.05E-04     | 2.67E-04     |
| EP-MARINE                                                                                         | kg N eq.                                | 0.208                                       | 0.194                                        | 0.183        | 0.163        |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 2.24                                        | 2.08                                         | 1.97         | 1.75         |
| POCP                                                                                              | kg NMVOC eq.                            | 0.626                                       | 0.579                                        | 0.535        | 0.467        |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 2.29E-04                                    | 1.35E-04                                     | 1.28E-04     | 1.50E-04     |
| ADP-FOSSIL                                                                                        | MJ                                      | 2,590                                       | 2,590                                        | 2,000        | 1,850        |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 118                                         | 117                                          | 82.8         | 71.2         |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |                                             |                                              |              |              |
| PERE                                                                                              | MJ                                      | 384                                         | 508                                          | 374          | 499          |
| PERM                                                                                              | MJ                                      | 0                                           | 0                                            | 0            | 0            |
| PERT                                                                                              | MJ                                      | 384                                         | 508                                          | 374          | 499          |
| PENRE                                                                                             | MJ                                      | 2,560                                       | 2,560                                        | 1,970        | 1,840        |
| PENRM                                                                                             | MJ                                      | 26.5                                        | 27.6                                         | 24.5         | 14.5         |
| PENRT                                                                                             | MJ                                      | 2,590                                       | 2,590                                        | 2,000        | 1,850        |
| SM                                                                                                | kg                                      | 14.4                                        | 14.4                                         | 9.21         | 7.78         |
| RSF                                                                                               | MJ                                      | 271                                         | 358                                          | 278          | 369          |
| NRSF                                                                                              | MJ                                      | 0                                           | 0                                            | 0            | 0            |
| FW                                                                                                | m <sup>3</sup>                          | 3.79                                        | 3.63                                         | 2.94         | 2.54         |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |                                             |                                              |              |              |
| HWD                                                                                               | kg                                      | 0.00344                                     | 0.00511                                      | 0.00353      | 0.00526      |
| NHWD                                                                                              | kg                                      | 30.6                                        | 30.9                                         | 26.4         | 25.6         |
| RWD                                                                                               | kg                                      | 0.00792                                     | 0.00725                                      | 0.00773      | 0.00746      |
| CRU                                                                                               | kg                                      | 0                                           | 0                                            | 0            | 0            |
| MFR                                                                                               | kg                                      | 0                                           | 0                                            | 0            | 0            |
| MER                                                                                               | kg                                      | 0                                           | 0                                            | 0            | 0            |
| EEE                                                                                               | MJ                                      | 0                                           | 0                                            | 0            | 0            |
| EET                                                                                               | MJ                                      | 0                                           | 0                                            | 0            | 0            |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |                                             |                                              |              |              |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 295                                         | 320                                          | 246          | 261          |
| PM                                                                                                | Disease incidences                      | 1.17E-05                                    | 1.05E-05                                     | 9.71E-06     | 7.96E-06     |
| IRP                                                                                               | kBq U235 eq.                            | 1.15                                        | 1.07                                         | 1.10         | 1.05         |
| ETP-FW                                                                                            | CTUe                                    | 915                                         | 1,120                                        | 842          | 1,020        |
| HTPC                                                                                              | CTUh                                    | 2.67E-08                                    | 2.58E-08                                     | 1.82E-08     | 1.96E-08     |
| HTPNC                                                                                             | CTUh                                    | 1.63E-06                                    | 1.52E-06                                     | 1.14E-06     | 9.43E-07     |
| SQP                                                                                               | Pt                                      | 2,510                                       | 2,960                                        | 2,500        | 2,940        |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |                                             |                                              |              |              |
| BCC-prod                                                                                          | kg C                                    | 0                                           | 0                                            | 0            | 0            |
| BCC-pack                                                                                          | kg C                                    | 2.71                                        | 3.48                                         | 2.71         | 3.48         |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |                                             |                                              |              |              |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 290                                         | 315                                          | 242          | 257          |
| ODP                                                                                               | kg CFC 11 eq.                           | 6.79E-10                                    | 5.72E-10                                     | 6.96E-10     | 5.90E-10     |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.662                                       | 0.644                                        | 0.513        | 0.454        |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0809                                      | 0.0753                                       | 0.0725       | 0.0652       |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0663                                      | 0.0625                                       | 0.0486       | 0.0405       |
| ADPE                                                                                              | kg Sb eq.                               | 2.29E-04                                    | 1.35E-04                                     | 1.28E-04     | 1.50E-04     |
| ADPF                                                                                              | MJ                                      | 2,520                                       | 2,520                                        | 1,950        | 1,810        |



**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HNN-80091396       | HNN-80091346    | HNN-80091372    | HHY-80091393        |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------|-----------------|-----------------|---------------------|
| GROUP DESCRIPTION                                                                                 |                                         | LID - CLOSED - HNN | LID <1050 - HNN | LID >2000 - HNN | LID 1050-1200 - HHY |
| GROUP #                                                                                           |                                         | GROUP 17           | GROUP 18        | GROUP 19        | GROUP 20            |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |                    |                 |                 |                     |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |                    |                 |                 |                     |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 228                | 304             | 307             | 324                 |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 225                | 301             | 304             | 324                 |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | 2.63               | 2.65            | 2.67            | 0.348               |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.0447             | 0.0586          | 0.0587          | 0.0621              |
| ODP                                                                                               | kg CFC11-eq.                            | 3.18E-10           | 3.15E-10        | 3.08E-10        | 3.13E-10            |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 0.494              | 0.729           | 0.746           | 0.788               |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 4.62E-04           | 4.82E-04        | 4.80E-04        | 2.84E-04            |
| EP-MARINE                                                                                         | kg N eq.                                | 0.162              | 0.199           | 0.199           | 0.195               |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 1.73               | 2.12            | 2.13            | 2.09                |
| POCP                                                                                              | kg NMVOC eq.                            | 0.448              | 0.579           | 0.585           | 0.580               |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 2.45E-04           | 1.92E-04        | 8.21E-05        | 1.47E-04            |
| ADP-FOSSIL                                                                                        | MJ                                      | 1,480              | 2,310           | 2,370           | 2,570               |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 38.6               | 95.9            | 103             | 116                 |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |                    |                 |                 |                     |
| PERE                                                                                              | MJ                                      | 497                | 512             | 508             | 513                 |
| PERM                                                                                              | MJ                                      | 0                  | 0               | 0               | 0                   |
| PERT                                                                                              | MJ                                      | 497                | 512             | 508             | 513                 |
| PENRE                                                                                             | MJ                                      | 1,420              | 2,300           | 2,370           | 2,560               |
| PENRM                                                                                             | MJ                                      | 62.2               | 13.7            | 5.29            | 8.76                |
| PENRT                                                                                             | MJ                                      | 1,480              | 2,310           | 2,370           | 2,570               |
| SM                                                                                                | kg                                      | 3.06               | 11.4            | 12.4            | 14.3                |
| RSF                                                                                               | MJ                                      | 373                | 370             | 362             | 368                 |
| NRSF                                                                                              | MJ                                      | 0                  | 0               | 0               | 0                   |
| FW                                                                                                | m <sup>3</sup>                          | 1.79               | 3.18            | 3.34            | 3.63                |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |                    |                 |                 |                     |
| HWD                                                                                               | kg                                      | 0.00532            | 0.00528         | 0.00516         | 0.00525             |
| NHWD                                                                                              | kg                                      | 23.3               | 30.6            | 31.1            | 31.3                |
| RWD                                                                                               | kg                                      | 0.00866            | 0.00831         | 0.00779         | 0.00741             |
| CRU                                                                                               | kg                                      | 0                  | 0               | 0               | 0                   |
| MFR                                                                                               | kg                                      | 0                  | 0               | 0               | 0                   |
| MER                                                                                               | kg                                      | 0                  | 0               | 0               | 0                   |
| EEE                                                                                               | MJ                                      | 0                  | 0               | 0               | 0                   |
| EET                                                                                               | MJ                                      | 0                  | 0               | 0               | 0                   |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |                    |                 |                 |                     |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 227                | 302             | 305             | 323                 |
| PM                                                                                                | Disease incidences                      | 7.96E-06           | 1.08E-05        | 1.10E-05        | 1.04E-05            |
| IRP                                                                                               | kBq U235 eq.                            | 1.14               | 1.18            | 1.13            | 1.09                |
| ETP-FW                                                                                            | CTUe                                    | 901                | 942             | 928             | 1,100               |
| HTPC                                                                                              | CTUh                                    | 2.02E-08           | 2.48E-08        | 2.18E-08        | 2.56E-08            |
| HTPNC                                                                                             | CTUh                                    | 6.57E-07           | 1.32E-06        | 1.35E-06        | 1.50E-06            |
| SQP                                                                                               | Pt                                      | 5,110              | 5,140           | 5,140           | 2,970               |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |                    |                 |                 |                     |
| BCC-prod                                                                                          | kg C                                    | 0                  | 0               | 0               | 0                   |
| BCC-pack                                                                                          | kg C                                    | 5.06               | 5.06            | 5.06            | 3.48                |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |                    |                 |                 |                     |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 224                | 298             | 301             | 318                 |
| ODP                                                                                               | kg CFC 11 eq.                           | 5.97E-10           | 5.91E-10        | 5.78E-10        | 5.88E-10            |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.380              | 0.579           | 0.594           | 0.634               |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0672             | 0.0795          | 0.0796          | 0.0760              |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0300             | 0.0553          | 0.0575          | 0.0618              |
| ADPE                                                                                              | kg Sb eq.                               | 2.46E-04           | 1.92E-04        | 8.20E-05        | 1.47E-04            |
| ADPF                                                                                              | MJ                                      | 1,440              | 2,250           | 2,320           | 2,510               |

**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HPA-80091610        | HNN-80091896        | HHY-80091449   | HNN-80091507   |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------|---------------------|----------------|----------------|
| GROUP DESCRIPTION                                                                                 |                                         | LID 1050-1200 - HPA | LID 1200-1800 - HNN | CATCHPIT - HHY | CATCHPIT - HNN |
| GROUP #                                                                                           |                                         | GROUP 21            | GROUP 22            | GROUP 23       | GROUP 24       |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |                     |                     |                |                |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |                     |                     |                |                |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 283                 | 416                 | 185            | 219            |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 283                 | 413                 | 184            | 216            |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | -0.319              | 2.74                | 0.622          | 2.61           |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.0440              | 0.0800              | 0.0410         | 0.0416         |
| ODP                                                                                               | kg CFC11-eq.                            | 3.17E-10            | 2.92E-10            | 2.70E-10       | 3.19E-10       |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 0.640               | 1.14                | 0.345          | 0.423          |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 2.46E-04            | 5.12E-04            | 2.44E-04       | 4.55E-04       |
| EP-MARINE                                                                                         | kg N eq.                                | 0.173               | 0.255               | 0.124          | 0.157          |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 1.86                | 2.73                | 1.32           | 1.67           |
| POCP                                                                                              | kg NMVOC eq.                            | 0.498               | 0.786               | 0.339          | 0.429          |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 1.40E-04            | 1.35E-04            | 3.03E-04       | 9.81E-05       |
| ADP-FOSSIL                                                                                        | MJ                                      | 2,090               | 3,680               | 1,130          | 1,330          |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 80.9                | 185                 | 25.6           | 30.3           |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |                     |                     |                |                |
| PERE                                                                                              | MJ                                      | 303                 | 526                 | 465            | 492            |
| PERM                                                                                              | MJ                                      | 0                   | 0                   | 0              | 0              |
| PERT                                                                                              | MJ                                      | 303                 | 526                 | 465            | 492            |
| PENRE                                                                                             | MJ                                      | 2,070               | 3,670               | 1,130          | 1,330          |
| PENRM                                                                                             | MJ                                      | 22.7                | 7.09                | 0              | 0              |
| PENRT                                                                                             | MJ                                      | 2,090               | 3,680               | 1,130          | 1,330          |
| SM                                                                                                | kg                                      | 9.45                | 24.3                | 0.157          | 0.792          |
| RSF                                                                                               | MJ                                      | 372                 | 343                 | 315            | 375            |
| NRSF                                                                                              | MJ                                      | 0                   | 0                   | 0              | 0              |
| FW                                                                                                | m <sup>3</sup>                          | 2.66                | 5.29                | 1.40           | 1.58           |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |                     |                     |                |                |
| HWD                                                                                               | kg                                      | 0.00531             | 0.00489             | 0.00375        | 0.00535        |
| NHWD                                                                                              | kg                                      | 27.1                | 40.8                | 20.9           | 21.5           |
| RWD                                                                                               | kg                                      | 0.00616             | 0.00767             | 0.00769        | 0.00792        |
| CRU                                                                                               | kg                                      | 0                   | 0                   | 0              | 0              |
| MFR                                                                                               | kg                                      | 0                   | 0                   | 0              | 0              |
| MER                                                                                               | kg                                      | 0                   | 0                   | 0              | 0              |
| EEE                                                                                               | MJ                                      | 0                   | 0                   | 0              | 0              |
| EET                                                                                               | MJ                                      | 0                   | 0                   | 0              | 0              |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |                     |                     |                |                |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 283                 | 412                 | 184            | 218            |
| PM                                                                                                | Disease incidences                      | 7.17E-06            | 1.56E-05            | 5.44E-06       | 7.20E-06       |
| IRP                                                                                               | kBq U235 eq.                            | 0.898               | 1.20                | 1.01           | 1.04           |
| ETP-FW                                                                                            | CTUe                                    | 925                 | 1,080               | 852            | 797            |
| HTPC                                                                                              | CTUh                                    | 2.00E-08            | 3.49E-08            | 2.96E-08       | 2.91E-08       |
| HTPNC                                                                                             | CTUh                                    | 1.08E-06            | 2.40E-06            | 5.50E-07       | 5.96E-07       |
| SQP                                                                                               | Pt                                      | 1,540               | 5,170               | 2,920          | 5,110          |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |                     |                     |                |                |
| BCC-prod                                                                                          | kg C                                    | 0                   | 0                   | 0              | 0              |
| BCC-pack                                                                                          | kg C                                    | 0.232               | 5.06                | 3.48           | 5.06           |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |                     |                     |                |                |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 278                 | 405                 | 182            | 215            |
| ODP                                                                                               | kg CFC 11 eq.                           | 5.95E-10            | 5.48E-10            | 5.08E-10       | 5.99E-10       |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.508               | 0.926               | 0.261          | 0.317          |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0683              | 0.0979              | 0.0507         | 0.0654         |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0435              | 0.0969              | 0.0223         | 0.0280         |
| ADPE                                                                                              | kg Sb eq.                               | 1.40E-04            | 1.35E-04            | 3.04E-04       | 9.82E-05       |
| ADPF                                                                                              | MJ                                      | 2,050               | 3,590               | 1,100          | 1,300          |

**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HPA-80091502   | HHY-80091532       | HPA-80091734   | HHY-80091564     |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|----------------|--------------------|----------------|------------------|
| GROUP DESCRIPTION                                                                                 |                                         | CATCHPIT - HPA | CESSPIT SILT TRAPS | INSPECTION PIT | STONE TRAP - HHY |
| GROUP #                                                                                           |                                         | GROUP 25       | GROUP 26           | GROUP 27       | GROUP 28         |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |                |                    |                |                  |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |                |                    |                |                  |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 186            | 209                | 229            | 267              |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 185            | 209                | 229            | 267              |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | 0.281          | 0.271              | 0.302          | 0.336            |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.0387         | 0.0394             | 0.0469         | 0.0508           |
| ODP                                                                                               | kg CFC11-eq.                            | 2.13E-10       | 3.30E-10           | 2.08E-10       | 3.13E-10         |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 0.412          | 0.371              | 0.588          | 0.593            |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 2.25E-04       | 2.50E-04           | 2.38E-04       | 2.66E-04         |
| EP-MARINE                                                                                         | kg N eq.                                | 0.117          | 0.136              | 0.141          | 0.166            |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 1.27           | 1.46               | 1.52           | 1.78             |
| POCP                                                                                              | kg NMVOC eq.                            | 0.338          | 0.366              | 0.424          | 0.476            |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 2.77E-04       | 7.48E-05           | 2.77E-04       | 6.42E-05         |
| ADP-FOSSIL                                                                                        | MJ                                      | 1,320          | 1,180              | 1,870          | 1,920            |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 51.2           | 30.4               | 83.1           | 77.5             |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |                |                    |                |                  |
| PERE                                                                                              | MJ                                      | 249            | 493                | 256            | 499              |
| PERM                                                                                              | MJ                                      | 0              | 0                  | 0              | 0                |
| PERT                                                                                              | MJ                                      | 249            | 493                | 256            | 499              |
| PENRE                                                                                             | MJ                                      | 1,320          | 1,180              | 1,840          | 1,910            |
| PENRM                                                                                             | MJ                                      | 0              | 0                  | 33.1           | 6.42             |
| PENRT                                                                                             | MJ                                      | 1,320          | 1,180              | 1,870          | 1,920            |
| SM                                                                                                | kg                                      | 5.61           | 1.77               | 10.2           | 8.65             |
| RSF                                                                                               | MJ                                      | 253            | 387                | 247            | 368              |
| NRSF                                                                                              | MJ                                      | 0              | 0                  | 0              | 0                |
| FW                                                                                                | m <sup>3</sup>                          | 1.85           | 1.58               | 2.62           | 2.69             |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |                |                    |                |                  |
| HWD                                                                                               | kg                                      | 0.00194        | 0.00553            | 0.00189        | 0.00525          |
| NHWD                                                                                              | kg                                      | 20.5           | 21.2               | 24.2           | 26.3             |
| RWD                                                                                               | kg                                      | 0.00725        | 0.00746            | 0.00715        | 0.00713          |
| CRU                                                                                               | kg                                      | 0              | 0                  | 0              | 0                |
| MFR                                                                                               | kg                                      | 0              | 0                  | 0              | 0                |
| MER                                                                                               | kg                                      | 0              | 0                  | 0              | 0                |
| EEE                                                                                               | MJ                                      | 0              | 0                  | 0              | 0                |
| EET                                                                                               | MJ                                      | 0              | 0                  | 0              | 0                |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |                |                    |                |                  |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 185            | 209                | 229            | 267              |
| PM                                                                                                | Disease incidences                      | 5.00E-06       | 5.60E-06           | 6.96E-06       | 8.18E-06         |
| IRP                                                                                               | kBq U235 eq.                            | 1.07           | 1.01               | 1.09           | 1.02             |
| ETP-FW                                                                                            | CTUe                                    | 657            | 929                | 765            | 1,010            |
| HTPC                                                                                              | CTUh                                    | 1.76E-08       | 1.10E-08           | 2.31E-08       | 1.73E-08         |
| HTPNC                                                                                             | CTUh                                    | 7.40E-07       | 3.85E-07           | 1.17E-06       | 9.77E-07         |
| SQP                                                                                               | Pt                                      | 1,520          | 2,940              | 1,530          | 2,940            |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |                |                    |                |                  |
| BCC-prod                                                                                          | kg C                                    | 0              | 0                  | 0              | 0                |
| BCC-pack                                                                                          | kg C                                    | 0.232          | 3.48               | 0.232          | 3.48             |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |                |                    |                |                  |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 182            | 207                | 225            | 263              |
| ODP                                                                                               | kg CFC 11 eq.                           | 4.00E-10       | 6.19E-10           | 3.90E-10       | 5.88E-10         |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.324          | 0.279              | 0.475          | 0.468            |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0468         | 0.0565             | 0.0547         | 0.0660           |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0291         | 0.0199             | 0.0455         | 0.0425           |
| ADPE                                                                                              | kg Sb eq.                               | 2.77E-04       | 7.49E-05           | 2.77E-04       | 6.42E-05         |
| ADPF                                                                                              | MJ                                      | 1,280          | 1,150              | 1,820          | 1,870            |

**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HNN-80074258 | HNN-80074260           | HNN-80091825     | HNN-80091831    |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|--------------|------------------------|------------------|-----------------|
| GROUP DESCRIPTION                                                                                 |                                         | POLES        | POLES - BLOCKS & STUBS | SEPTIC TANK BODY | SEPTIC TANK LID |
| GROUP #                                                                                           |                                         | GROUP 29     | GROUP 30               | GROUP 31         | GROUP 32        |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |              |                        |                  |                 |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |              |                        |                  |                 |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 315          | 504                    | 270              | 243             |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 312          | 500                    | 267              | 241             |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | 2.93         | 3.12                   | 2.63             | 2.62            |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.116        | 0.157                  | 0.0513           | 0.0464          |
| ODP                                                                                               | kg CFC11-eq.                            | 3.13E-10     | 4.71E-10               | 3.16E-10         | 3.18E-10        |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 0.715        | 1.42                   | 0.593            | 0.506           |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 5.96E-04     | 6.60E-04               | 4.70E-04         | 4.63E-04        |
| EP-MARINE                                                                                         | kg N eq.                                | 0.229        | 0.320                  | 0.185            | 0.169           |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 2.43         | 3.42                   | 1.96             | 1.80            |
| POCP                                                                                              | kg NMVOC eq.                            | 0.654        | 0.983                  | 0.531            | 0.475           |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 1.79E-04     | 2.60E-04               | 1.54E-04         | 1.25E-04        |
| ADP-FOSSIL                                                                                        | MJ                                      | 2,500        | 4,750                  | 1,930            | 1,610           |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 107          | 263                    | 58.6             | 46.6            |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |              |                        |                  |                 |
| PERE                                                                                              | MJ                                      | 2,040        | 2,090                  | 501              | 497             |
| PERM                                                                                              | MJ                                      | 0            | 0                      | 0                | 0               |
| PERT                                                                                              | MJ                                      | 2,040        | 2,090                  | 501              | 497             |
| PENRE                                                                                             | MJ                                      | 2,500        | 4,690                  | 1,930            | 1,610           |
| PENRM                                                                                             | MJ                                      | 0            | 60.8                   | 0                | 0               |
| PENRT                                                                                             | MJ                                      | 2,500        | 4,750                  | 1,930            | 1,610           |
| SM                                                                                                | kg                                      | 2.55         | 28.5                   | 3.68             | 3.03            |
| RSF                                                                                               | MJ                                      | 368          | 334                    | 371              | 373             |
| NRSF                                                                                              | MJ                                      | 0            | 0                      | 0                | 0               |
| FW                                                                                                | m <sup>3</sup>                          | 6.13         | 9.90                   | 2.26             | 1.98            |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |              |                        |                  |                 |
| HWD                                                                                               | kg                                      | 0.00525      | 0.00477                | 0.00530          | 0.00533         |
| NHWD                                                                                              | kg                                      | 23.3         | 44.4                   | 24.0             | 23.4            |
| RWD                                                                                               | kg                                      | 0.00815      | 0.00921                | 0.00789          | 0.00797         |
| CRU                                                                                               | kg                                      | 0            | 0                      | 0                | 0               |
| MFR                                                                                               | kg                                      | 0            | 0                      | 0                | 0               |
| MER                                                                                               | kg                                      | 0            | 0                      | 0                | 0               |
| EEE                                                                                               | MJ                                      | 0            | 0                      | 0                | 0               |
| EET                                                                                               | MJ                                      | 0            | 0                      | 0                | 0               |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |              |                        |                  |                 |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 313          | 499                    | 268              | 242             |
| PM                                                                                                | Disease incidences                      | 9.90E-06     | 1.85E-05               | 9.08E-06         | 8.16E-06        |
| IRP                                                                                               | kBq U235 eq.                            | 1.06         | 1.34                   | 1.04             | 1.06            |
| ETP-FW                                                                                            | CTUe                                    | 4,650        | 4,980                  | 870              | 833             |
| HTPC                                                                                              | CTUh                                    | 9.34E-08     | 8.39E-08               | 5.52E-08         | 3.45E-08        |
| HTPNC                                                                                             | CTUh                                    | 1.45E-06     | 3.01E-06               | 1.16E-06         | 8.33E-07        |
| SQP                                                                                               | Pt                                      | 5,350        | 5,410                  | 5,130            | 5,120           |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |              |                        |                  |                 |
| BCC-prod                                                                                          | kg C                                    | 0            | 0                      | 0                | 0               |
| BCC-pack                                                                                          | kg C                                    | 5.06         | 5.06                   | 5.06             | 5.06            |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |              |                        |                  |                 |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 308          | 490                    | 264              | 239             |
| ODP                                                                                               | kg CFC 11 eq.                           | 5.88E-10     | 7.83E-10               | 5.94E-10         | 5.97E-10        |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.552        | 1.16                   | 0.460            | 0.388           |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0912       | 0.121                  | 0.0749           | 0.0697          |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0606       | 0.122                  | 0.0485           | 0.0368          |
| ADPE                                                                                              | kg Sb eq.                               | 1.79E-04     | 2.60E-04               | 1.54E-04         | 1.25E-04        |
| ADPF                                                                                              | MJ                                      | 2,450        | 4,640                  | 1,890            | 1,570           |

**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HHY-80091957                    | HNN-80091971                    | HNN-80091957                    | HHY-80092610 |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------|
| GROUP DESCRIPTION                                                                                 |                                         | TROUGHS,<br>REINFORCING STYLE 1 | TROUGHS,<br>REINFORCING STYLE 2 | TROUGHS,<br>REINFORCING STYLE 3 | HEADWALL     |
| GROUP #                                                                                           |                                         | GROUP 33                        | GROUP 34                        | GROUP 35                        | GROUP 36     |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |                                 |                                 |                                 |              |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |                                 |                                 |                                 |              |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 186                             | 261                             | 221                             | 234          |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 185                             | 258                             | 218                             | 234          |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | 0.611                           | 2.62                            | 2.61                            | 0.315        |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.0403                          | 0.0493                          | 0.0419                          | 0.0447       |
| ODP                                                                                               | kg CFC11-eq.                            | 2.73E-10                        | 3.20E-10                        | 3.21E-10                        | 3.18E-10     |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 0.358                           | 0.558                           | 0.434                           | 0.479        |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 2.41E-04                        | 4.67E-04                        | 4.56E-04                        | 2.58E-04     |
| EP-MARINE                                                                                         | kg N eq.                                | 0.125                           | 0.181                           | 0.157                           | 0.149        |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 1.33                            | 1.92                            | 1.68                            | 1.60         |
| POCP                                                                                              | kg NMVOC eq.                            | 0.342                           | 0.518                           | 0.432                           | 0.416        |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 1.95E-04                        | 1.24E-04                        | 7.54E-05                        | 9.40E-05     |
| ADP-FOSSIL                                                                                        | MJ                                      | 1,150                           | 1,820                           | 1,350                           | 1,530        |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 29.8                            | 49.5                            | 33.4                            | 51.3         |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |                                 |                                 |                                 |              |
| PERE                                                                                              | MJ                                      | 465                             | 500                             | 494                             | 494          |
| PERM                                                                                              | MJ                                      | 0                               | 0                               | 0                               | 0            |
| PERT                                                                                              | MJ                                      | 465                             | 500                             | 494                             | 494          |
| PENRE                                                                                             | MJ                                      | 1,140                           | 1,820                           | 1,340                           | 1,510        |
| PENRM                                                                                             | MJ                                      | 5.05                            | 0                               | 5.05                            | 16.2         |
| PENRT                                                                                             | MJ                                      | 1,150                           | 1,820                           | 1,350                           | 1,530        |
| SM                                                                                                | kg                                      | 0.595                           | 1.95                            | 1.52                            | 4.84         |
| RSF                                                                                               | MJ                                      | 318                             | 376                             | 377                             | 374          |
| NRSF                                                                                              | MJ                                      | 0                               | 0                               | 0                               | 0            |
| FW                                                                                                | m <sup>3</sup>                          | 1.50                            | 2.04                            | 1.66                            | 2.07         |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |                                 |                                 |                                 |              |
| HWD                                                                                               | kg                                      | 0.00378                         | 0.00537                         | 0.00539                         | 0.00534      |
| NHWD                                                                                              | kg                                      | 21.6                            | 22.8                            | 22.3                            | 23.2         |
| RWD                                                                                               | kg                                      | 0.00730                         | 0.00781                         | 0.00793                         | 0.00735      |
| CRU                                                                                               | kg                                      | 0                               | 0                               | 0                               | 0            |
| MFR                                                                                               | kg                                      | 0                               | 0                               | 0                               | 0            |
| MER                                                                                               | kg                                      | 0                               | 0                               | 0                               | 0            |
| EEE                                                                                               | MJ                                      | 0                               | 0                               | 0                               | 0            |
| EET                                                                                               | MJ                                      | 0                               | 0                               | 0                               | 0            |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |                                 |                                 |                                 |              |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 186                             | 260                             | 220                             | 234          |
| PM                                                                                                | Disease incidences                      | 5.54E-06                        | 8.64E-06                        | 7.33E-06                        | 6.82E-06     |
| IRP                                                                                               | kBq U235 eq.                            | 1.00                            | 1.02                            | 1.06                            | 1.02         |
| ETP-FW                                                                                            | CTUe                                    | 862                             | 860                             | 810                             | 981          |
| HTPC                                                                                              | CTUh                                    | 2.34E-08                        | 5.89E-08                        | 2.38E-08                        | 1.50E-08     |
| HTPNC                                                                                             | CTUh                                    | 5.23E-07                        | 1.09E-06                        | 5.81E-07                        | 6.69E-07     |
| SQP                                                                                               | Pt                                      | 2,920                           | 5,130                           | 5,110                           | 2,930        |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |                                 |                                 |                                 |              |
| BCC-prod                                                                                          | kg C                                    | 0                               | 0                               | 0                               | 0            |
| BCC-pack                                                                                          | kg C                                    | 3.48                            | 5.06                            | 5.06                            | 3.48         |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |                                 |                                 |                                 |              |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 183                             | 256                             | 218                             | 231          |
| ODP                                                                                               | kg CFC 11 eq.                           | 5.12E-10                        | 6.02E-10                        | 6.04E-10                        | 5.98E-10     |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.271                           | 0.430                           | 0.327                           | 0.371        |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0510                          | 0.0738                          | 0.0658                          | 0.0606       |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0230                          | 0.0458                          | 0.0279                          | 0.0306       |
| ADPE                                                                                              | kg Sb eq.                               | 1.95E-04                        | 1.24E-04                        | 7.55E-05                        | 9.40E-05     |
| ADPF                                                                                              | MJ                                      | 1,120                           | 1,780                           | 1,320                           | 1,490        |

**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HHY-80091707            | HPA-80091707            | HHY-80091703            | HPA-80091703            |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| GROUP DESCRIPTION                                                                                 |                                         | WINGWALL - 150<br>- HHY | WINGWALL - 150<br>- HPA | WINGWALL - 300<br>- HHY | WINGWALL - 300<br>- HPA |
| GROUP #                                                                                           |                                         | GROUP 37                | GROUP 38                | GROUP 39                | GROUP 40                |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |                         |                         |                         |                         |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |                         |                         |                         |                         |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 297                     | 249                     | 351                     | 293                     |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 297                     | 249                     | 351                     | 292                     |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | 0.665                   | 0.311                   | 0.381                   | 0.324                   |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.0618                  | 0.0506                  | 0.0675                  | 0.0582                  |
| ODP                                                                                               | kg CFC11-eq.                            | 2.61E-10                | 2.04E-10                | 3.05E-10                | 2.00E-10                |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 0.745                   | 0.657                   | 0.897                   | 0.803                   |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 2.75E-04                | 2.43E-04                | 2.92E-04                | 2.53E-04                |
| EP-MARINE                                                                                         | kg N eq.                                | 0.181                   | 0.151                   | 0.209                   | 0.172                   |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 1.94                    | 1.63                    | 2.24                    | 1.86                    |
| POCP                                                                                              | kg NMVOC eq.                            | 0.546                   | 0.460                   | 0.633                   | 0.537                   |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 2.40E-04                | 2.74E-04                | 1.52E-04                | 2.02E-04                |
| ADP-FOSSIL                                                                                        | MJ                                      | 2,460                   | 2,110                   | 2,920                   | 2,610                   |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 110                     | 98.7                    | 138                     | 133                     |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |                         |                         |                         |                         |
| PERE                                                                                              | MJ                                      | 486                     | 259                     | 516                     | 265                     |
| PERM                                                                                              | MJ                                      | 0                       | 0                       | 0                       | 0                       |
| PERT                                                                                              | MJ                                      | 486                     | 259                     | 516                     | 265                     |
| PENRE                                                                                             | MJ                                      | 2,460                   | 2,080                   | 2,900                   | 2,600                   |
| PENRM                                                                                             | MJ                                      | 0                       | 26.3                    | 20.6                    | 11.6                    |
| PENRT                                                                                             | MJ                                      | 2,460                   | 2,110                   | 2,920                   | 2,610                   |
| SM                                                                                                | kg                                      | 12.5                    | 12.5                    | 17.4                    | 17.4                    |
| RSF                                                                                               | MJ                                      | 304                     | 243                     | 358                     | 238                     |
| NRSF                                                                                              | MJ                                      | 0                       | 0                       | 0                       | 0                       |
| FW                                                                                                | m <sup>3</sup>                          | 3.44                    | 2.99                    | 4.14                    | 3.81                    |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |                         |                         |                         |                         |
| HWD                                                                                               | kg                                      | 0.00362                 | 0.00186                 | 0.00511                 | 0.00182                 |
| NHWD                                                                                              | kg                                      | 31.2                    | 26.0                    | 33.7                    | 30.1                    |
| RWD                                                                                               | kg                                      | 0.00726                 | 0.00702                 | 0.00730                 | 0.00660                 |
| CRU                                                                                               | kg                                      | 0                       | 0                       | 0                       | 0                       |
| MFR                                                                                               | kg                                      | 0                       | 0                       | 0                       | 0                       |
| MER                                                                                               | kg                                      | 0                       | 0                       | 0                       | 0                       |
| EEE                                                                                               | MJ                                      | 0                       | 0                       | 0                       | 0                       |
| EET                                                                                               | MJ                                      | 0                       | 0                       | 0                       | 0                       |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |                         |                         |                         |                         |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 296                     | 248                     | 350                     | 291                     |
| PM                                                                                                | Disease incidences                      | 1.01E-05                | 7.77E-06                | 1.17E-05                | 9.50E-06                |
| IRP                                                                                               | kBq U235 eq.                            | 1.06                    | 1.09                    | 1.10                    | 1.08                    |
| ETP-FW                                                                                            | CTUe                                    | 1,010                   | 783                     | 1,150                   | 821                     |
| HTPC                                                                                              | CTUh                                    | 3.88E-08                | 2.49E-08                | 2.91E-08                | 2.68E-08                |
| HTPNC                                                                                             | CTUh                                    | 1.58E-06                | 1.36E-06                | 1.78E-06                | 1.74E-06                |
| SQP                                                                                               | Pt                                      | 2,960                   | 1,540                   | 2,970                   | 1,550                   |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |                         |                         |                         |                         |
| BCC-prod                                                                                          | kg C                                    | 0                       | 0                       | 0                       | 0                       |
| BCC-pack                                                                                          | kg C                                    | 3.48                    | 0.232                   | 3.48                    | 0.232                   |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |                         |                         |                         |                         |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 291                     | 244                     | 344                     | 286                     |
| ODP                                                                                               | kg CFC 11 eq.                           | 4.90E-10                | 3.84E-10                | 5.73E-10                | 3.75E-10                |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.600                   | 0.533                   | 0.727                   | 0.657                   |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0698                  | 0.0579                  | 0.0805                  | 0.0649                  |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0622                  | 0.0528                  | 0.0725                  | 0.0680                  |
| ADPE                                                                                              | kg Sb eq.                               | 2.40E-04                | 2.74E-04                | 1.52E-04                | 2.02E-04                |
| ADPF                                                                                              | MJ                                      | 2,400                   | 2,050                   | 2,850                   | 2,540                   |



**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                     |                                         | HHY-80092008            | HPA-80092008            | HHY-80091983            | HNN-80091703   |
|--------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------|-------------------------|-------------------------|----------------|
| GROUP DESCRIPTION                                                                          |                                         | WINGWALL - 600<br>- HHY | WINGWALL - 600<br>- HPA | WINGWALL - 900-<br>1500 | WINGWALL - HNN |
| GROUP #                                                                                    |                                         | GROUP 41                | GROUP 42                | GROUP 43                | GROUP 44       |
| INDICATORS, ABBR.                                                                          | UNITS                                   |                         |                         |                         |                |
| EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST       |                                         |                         |                         |                         |                |
| GWP-TOTAL                                                                                  | kg CO <sub>2</sub> -eq.                 | 257                     | 200                     | 304                     | 226            |
| GWP-FOSSIL                                                                                 | kg CO <sub>2</sub> -eq.                 | 257                     | 200                     | 303                     | 223            |
| GWP-BIOGENIC                                                                               | kg CO <sub>2</sub> -eq.                 | 0.339                   | 0.288                   | 0.339                   | 2.61           |
| GWP-LULUC                                                                                  | kg CO <sub>2</sub> -eq.                 | 0.0491                  | 0.0402                  | 0.0570                  | 0.0433         |
| ODP                                                                                        | kg CFC11-eq.                            | 3.12E-10                | 2.09E-10                | 3.14E-10                | 3.21E-10       |
| AP                                                                                         | Mole of H <sup>+</sup> eq.              | 0.559                   | 0.479                   | 0.708                   | 0.450          |
| EP-FRESHWATER                                                                              | kg P eq.                                | 2.64E-04                | 2.26E-04                | 2.77E-04                | 4.59E-04       |
| EP-MARINE                                                                                  | kg N eq.                                | 0.161                   | 0.125                   | 0.185                   | 0.160          |
| EP-TERRESTRIAL                                                                             | Mole of N eq.                           | 1.72                    | 1.35                    | 1.99                    | 1.71           |
| POCP                                                                                       | kg NMVOC eq.                            | 0.457                   | 0.367                   | 0.541                   | 0.442          |
| ADP-M&M                                                                                    | kg Sb-eq.                               | 8.02E-05                | 1.17E-04                | 8.73E-05                | 1.62E-04       |
| ADP-FOSSIL                                                                                 | MJ                                      | 1,800                   | 1,520                   | 2,330                   | 1,400          |
| WDP                                                                                        | m <sup>3</sup> world equiv.             | 70.3                    | 65.8                    | 99.3                    | 33.5           |
| EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST                    |                                         |                         |                         |                         |                |
| PERE                                                                                       | MJ                                      | 496                     | 247                     | 507                     | 495            |
| PERM                                                                                       | MJ                                      | 0                       | 0                       | 0                       | 0              |
| PERT                                                                                       | MJ                                      | 496                     | 247                     | 507                     | 495            |
| PENRE                                                                                      | MJ                                      | 1,800                   | 1,510                   | 2,330                   | 1,390          |
| PENRM                                                                                      | MJ                                      | 6.74                    | 14.3                    | 4.96                    | 11.3           |
| PENRT                                                                                      | MJ                                      | 1,800                   | 1,520                   | 2,330                   | 1,400          |
| SM                                                                                         | kg                                      | 7.62                    | 7.62                    | 11.8                    | 1.37           |
| RSF                                                                                        | MJ                                      | 366                     | 249                     | 369                     | 377            |
| NRSF                                                                                       | MJ                                      | 0                       | 0                       | 0                       | 0              |
| FW                                                                                         | m <sup>3</sup>                          | 2.52                    | 2.20                    | 3.22                    | 1.66           |
| EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST  |                                         |                         |                         |                         |                |
| HWD                                                                                        | kg                                      | 0.00523                 | 0.00190                 | 0.00527                 | 0.00538        |
| NHWD                                                                                       | kg                                      | 25.4                    | 22.0                    | 29.2                    | 22.1           |
| RWD                                                                                        | kg                                      | 0.00717                 | 0.00659                 | 0.00723                 | 0.00820        |
| CRU                                                                                        | kg                                      | 0                       | 0                       | 0                       | 0              |
| MFR                                                                                        | kg                                      | 0                       | 0                       | 0                       | 0              |
| MER                                                                                        | kg                                      | 0                       | 0                       | 0                       | 0              |
| EEE                                                                                        | MJ                                      | 0                       | 0                       | 0                       | 0              |
| EET                                                                                        | MJ                                      | 0                       | 0                       | 0                       | 0              |
| EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST |                                         |                         |                         |                         |                |
| GWP-GHG                                                                                    | kg CO <sub>2</sub> -eq.                 | 257                     | 199                     | 303                     | 225            |
| PM                                                                                         | Disease incidences                      | 7.78E-06                | 5.72E-06                | 9.48E-06                | 7.49E-06       |
| IRP                                                                                        | kBq U235 eq.                            | 1.02                    | 1.02                    | 1.06                    | 1.08           |
| ETP-FW                                                                                     | CTUe                                    | 996                     | 693                     | 1,080                   | 826            |
| HTPC                                                                                       | CTUh                                    | 1.68E-08                | 1.46E-08                | 2.15E-08                | 3.04E-08       |
| HTPNC                                                                                      | CTUh                                    | 8.95E-07                | 8.63E-07                | 1.27E-06                | 6.57E-07       |
| SQP                                                                                        | Pt                                      | 2,940                   | 1,520                   | 2,960                   | 5,110          |
| EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS                                              |                                         |                         |                         |                         |                |
| BCC-prod                                                                                   | kg C                                    | 0                       | 0                       | 0                       | 0              |
| BCC-pack                                                                                   | kg C                                    | 3.48                    | 0.232                   | 3.48                    | 5.06           |
| EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST            |                                         |                         |                         |                         |                |
| GWP                                                                                        | kg CO <sub>2</sub> eq.                  | 253                     | 196                     | 298                     | 222            |
| ODP                                                                                        | kg CFC 11 eq.                           | 5.86E-10                | 3.92E-10                | 5.91E-10                | 6.03E-10       |
| AP                                                                                         | kg SO <sub>2</sub> eq.                  | 0.440                   | 0.382                   | 0.564                   | 0.340          |
| EP                                                                                         | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.0642                  | 0.0492                  | 0.0727                  | 0.0668         |
| POCP                                                                                       | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0392                  | 0.0352                  | 0.0522                  | 0.0299         |
| ADPE                                                                                       | kg Sb eq.                               | 8.02E-05                | 1.17E-04                | 8.73E-05                | 1.62E-04       |
| ADPF                                                                                       | MJ                                      | 1,760                   | 1,480                   | 2,280                   | 1,370          |

**Table 59 ctd - Cradle-to-gate (A1-A3) per tonne**

| REPRESENTATIVE PRODUCT                                                                            |                                         | HHY-80090809     | HHY-80091177 | HPA-80074168 | HHY-80090839 |
|---------------------------------------------------------------------------------------------------|-----------------------------------------|------------------|--------------|--------------|--------------|
| GROUP DESCRIPTION                                                                                 |                                         | ADJUSTMENT RINGS | RISER - SPUN | RISER - VT   | SUMP         |
| GROUP #                                                                                           |                                         | GROUP 45         | GROUP 46     | GROUP 47     | GROUP 48     |
| INDICATORS, ABBR.                                                                                 | UNITS                                   |                  |              |              |              |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>       |                                         |                  |              |              |              |
| GWP-TOTAL                                                                                         | kg CO <sub>2</sub> -eq.                 | 335              | 241          | 194          | 265          |
| GWP-FOSSIL                                                                                        | kg CO <sub>2</sub> -eq.                 | 334              | 240          | 194          | 264          |
| GWP-BIOGENIC                                                                                      | kg CO <sub>2</sub> -eq.                 | 1.40             | 1.30         | -0.160       | 1.46         |
| GWP-LULUC                                                                                         | kg CO <sub>2</sub> -eq.                 | 0.0665           | 0.0467       | 0.0355       | 0.0520       |
| ODP                                                                                               | kg CFC11-eq.                            | 1.63E-13         | 1.34E-13     | 1.71E-10     | 1.34E-13     |
| AP                                                                                                | Mole of H <sup>+</sup> eq.              | 1.08             | 0.740        | 0.432        | 0.912        |
| EP-FRESHWATER                                                                                     | kg P eq.                                | 2.59E-04         | 2.26E-04     | 2.20E-04     | 2.36E-04     |
| EP-MARINE                                                                                         | kg N eq.                                | 0.368            | 0.311        | 0.125        | 0.327        |
| EP-TERRESTRIAL                                                                                    | Mole of N eq.                           | 3.99             | 3.39         | 1.35         | 3.56         |
| POCP                                                                                              | kg NMVOC eq.                            | 1.08             | 0.879        | 0.368        | 0.948        |
| ADP-M&M                                                                                           | kg Sb-eq.                               | 4.25E-04         | 5.35E-05     | 1.62E-04     | 8.19E-05     |
| ADP-FOSSIL                                                                                        | MJ                                      | 3,050            | 1,840        | 1,470        | 2,340        |
| WDP                                                                                               | m <sup>3</sup> world equiv.             | 72.3             | 30.7         | 42.9         | 51.2         |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>                    |                                         |                  |              |              |              |
| PERE                                                                                              | MJ                                      | 500              | 483          | 231          | 475          |
| PERM                                                                                              | MJ                                      | 0                | 0            | 0            | 0            |
| PERT                                                                                              | MJ                                      | 500              | 483          | 231          | 475          |
| PENRE                                                                                             | MJ                                      | 2,990            | 1,840        | 1,470        | 2,240        |
| PENRM                                                                                             | MJ                                      | 61.1             | 6.53         | 0.738        | 105          |
| PENRT                                                                                             | MJ                                      | 3,050            | 1,840        | 1,480        | 2,340        |
| SM                                                                                                | kg                                      | 4.22             | 1.08         | 2.37         | 3.38         |
| RSF                                                                                               | MJ                                      | 309              | 324          | 246          | 290          |
| NRSF                                                                                              | MJ                                      | 0                | 0            | 0            | 0            |
| FW                                                                                                | m <sup>3</sup>                          | 2.40             | 1.41         | 1.54         | 1.87         |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES A1-A3, PER TONNE OF PRECAST</b>  |                                         |                  |              |              |              |
| HWD                                                                                               | kg                                      | 5.97E-07         | 1.92E-07     | 0.00155      | 3.56E-07     |
| NHWD                                                                                              | kg                                      | 21.7             | 17.0         | 29.3         | 19.8         |
| RWD                                                                                               | kg                                      | 0.00838          | 0.00770      | 0.00457      | 0.00722      |
| CRU                                                                                               | kg                                      | 0                | 0            | 0            | 0            |
| MFR                                                                                               | kg                                      | 0                | 0            | 0            | 0            |
| MER                                                                                               | kg                                      | 0                | 0            | 0            | 0            |
| EEE                                                                                               | MJ                                      | 0                | 0            | 0            | 0            |
| EET                                                                                               | MJ                                      | 0                | 0            | 0            | 0            |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b> |                                         |                  |              |              |              |
| GWP-GHG                                                                                           | kg CO <sub>2</sub> -eq.                 | 332              | 240          | 193          | 263          |
| PM                                                                                                | Disease incidences                      | 1.75E-05         | 1.38E-05     | 5.02E-06     | 1.56E-05     |
| IRP                                                                                               | kBq U235 eq.                            | 1.18             | 1.18         | 0.628        | 1.09         |
| ETP-FW                                                                                            | CTUe                                    | 1,290            | 1,080        | 660          | 1,230        |
| HTPC                                                                                              | CTUh                                    | 1.03E-07         | 3.23E-08     | 5.00E-08     | 5.05E-08     |
| HTPNC                                                                                             | CTUh                                    | 2.05E-06         | 8.40E-07     | 9.90E-07     | 1.29E-06     |
| SQP                                                                                               | Pt                                      | 2,710            | 2,670        | 1,120        | 2,680        |
| <b>EN15804+A2 BIOGENIC CARBON CONTENT INDICATORS</b>                                              |                                         |                  |              |              |              |
| BCC-prod                                                                                          | kg C                                    | 0                | 0            | 0            | 0            |
| BCC-pack                                                                                          | kg C                                    | 3.75             | 3.75         | 0.247        | 3.75         |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES A1-A3, PER TONNE OF PRECAST</b>            |                                         |                  |              |              |              |
| GWP                                                                                               | kg CO <sub>2</sub> eq.                  | 328              | 238          | 190          | 260          |
| ODP                                                                                               | kg CFC 11 eq.                           | 2.18E-13         | 1.79E-13     | 3.21E-10     | 1.79E-13     |
| AP                                                                                                | kg SO <sub>2</sub> eq.                  | 0.825            | 0.535        | 0.339        | 0.686        |
| EP                                                                                                | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 0.132            | 0.113        | 0.0491       | 0.118        |
| POCP                                                                                              | kg C <sub>2</sub> H <sub>4</sub> eq.    | 0.0858           | 0.0449       | 0.0362       | 0.0622       |
| ADPE                                                                                              | kg Sb eq.                               | 4.25E-04         | 5.35E-05     | 1.62E-04     | 8.19E-05     |
| ADPF                                                                                              | MJ                                      | 2,990            | 1,810        | 1,440        | 2,290        |

## Precast grouping and variation (A1-A3) per tonne

**Table 60 - Range in GWP-GHG results (modules A1-A3)**

| GROUP # | GROUP NAME                              | REPRESENTATIVE PRODUCT CODE | PRODUCTION FACILITY      | MIN DEV | MAX DEV |
|---------|-----------------------------------------|-----------------------------|--------------------------|---------|---------|
| 1       | Riser/Sump Base - HPA                   | HPA-80091055                | Papakura                 | -2%     | 7%      |
| 2       | Riser - One Piece - HHY                 | HHY-80091096                | Hornby                   | 0%      | 0%      |
| 3       | Riser Base - HNN                        | HNN-80091065                | Nelson                   | -2%     | 4%      |
| 4       | Riser/Sump Base - HHY                   | HHY-80091053                | Hornby                   | -8%     | 9%      |
| 5       | Sump Base Alternative Reinforcing – HHY | HHY-80090868                | Hornby                   | -12%    | 0%      |
| 6       | Anchorblock                             | HHY-80091992                | Hornby                   | -10%    | 1%      |
| 7       | General Precast                         | HNN-80091762                | Nelson                   | -33%    | 30%     |
| 8       | Gully Surround                          | HNN-80091676                | Nelson                   | 0%      | 7%      |
| 9       | Bridge Accessories                      | HHC-80091818                | Hamilton Civil (Te Rapa) | 0%      | 2%      |
| 10      | Bridge Deck                             | HHC-80091817                | Hamilton Civil (Te Rapa) | -5%     | 2%      |
| 11      | Culvert - HHC                           | HHC-80088920                | Hamilton Civil (Te Rapa) | -9%     | 6%      |
| 12      | Culvert - HHY                           | HHY-80088920                | Hornby                   | -7%     | 5%      |
| 13      | Culvert, Alternative Reinforcing – HHC  | HHC-80088875                | Hamilton Civil (Te Rapa) | -5%     | 8%      |
| 14      | Culvert, Alternative Reinforcing – HHY  | HHY-80088875                | Hornby                   | -5%     | 8%      |
| 15      | Rain Garden                             | HHC-80089718                | Hamilton Civil (Te Rapa) | -4%     | 4%      |
| 16      | Ducting                                 | HHY-80099791                | Hornby                   | -14%    | 9%      |
| 17      | Lid - Closed - HNN                      | HNN-80091396                | Nelson                   | -6%     | 0%      |
| 18      | Lid <1050 - HNN                         | HNN-80091346                | Nelson                   | -5%     | 26%     |
| 19      | Lid >2000 - HNN                         | HNN-80091372                | Nelson                   | -3%     | 0%      |
| 20      | Lid 1050-1200 - HHY                     | HHY-80091393                | Hornby                   | -14%    | 5%      |
| 21      | Lid 1050-1200 - HPA                     | HPA-80091610                | Papakura                 | -26%    | 24%     |
| 22      | Lid 1200-1800 - HNN                     | HNN-80091896                | Nelson                   | -20%    | 4%      |
| 23      | Catchpit - HHY                          | HHY-80091449                | Hornby                   | -3%     | 13%     |
| 24      | Catchpit - HNN                          | HNN-80091507                | Nelson                   | -4%     | 10%     |
| 25      | Catchpit - HPA                          | HPA-80091502                | Papakura                 | -9%     | 8%      |
| 26      | Cesspit Silt Traps                      | HHY-80091532                | Hornby                   | -4%     | 9%      |
| 27      | Inspection Pit                          | HPA-80091734                | Papakura                 | -30%    | 17%     |
| 28      | Stone Trap - HHY                        | HHY-80091564                | Hornby                   | -2%     | 0%      |
| 29      | Poles                                   | HNN-80074258                | Nelson                   | -5%     | 7%      |
| 30      | Poles - Blocks & Stubs                  | HNN-80074260                | Nelson                   | -62%    | 52%     |
| 31      | Septic Tank Body                        | HNN-80091825                | Nelson                   | -15%    | 2%      |
| 32      | Septic Tank Lid                         | HNN-80091831                | Nelson                   | -4%     | 5%      |
| 33      | Troughs, Reinforcing Style 1            | HHY-80091957                | Hornby                   | -4%     | 3%      |
| 34      | Troughs, Reinforcing Style 2            | HNN-80091971                | Nelson                   | -6%     | 4%      |
| 35      | Troughs, Reinforcing Style 3            | HNN-80091957                | Nelson                   | -10%    | 7%      |
| 36      | Headwall                                | HHY-80092610                | Hornby                   | -12%    | 3%      |
| 37      | Wingwall - 150 - HHY                    | HHY-80091707                | Hornby                   | 0%      | 0%      |
| 38      | Wingwall - 150 - HPA                    | HPA-80091707                | Papakura                 | 0%      | 0%      |
| 39      | Wingwall - 300 - HHY                    | HHY-80091703                | Hornby                   | 0%      | 0%      |
| 40      | Wingwall - 300 - HPA                    | HPA-80091703                | Papakura                 | 0%      | 0%      |
| 41      | Wingwall - 600 - HHY                    | HHY-80092008                | Hornby                   | 0%      | 0%      |
| 42      | Wingwall - 600 - HPA                    | HPA-80092008                | Papakura                 | 0%      | 0%      |
| 43      | Wingwall - 900-1500                     | HHY-80091983                | Hornby                   | -7%     | 8%      |
| 44      | Wingwall - HNN                          | HNN-80091703                | Nelson                   | -2%     | 0%      |
| 45      | Adjustment Rings                        | HHY-80090809                | Hornby                   | -7%     | 0%      |
| 46      | Riser - Spun                            | HHY-80091177                | Hornby                   | -7%     | 5%      |
| 47      | Riser - VT                              | HPA-80074168                | Papakura                 | 0%      | 0%      |
| 48      | Sump                                    | HHY-80090838                | Hornby                   | -9%     | 7%      |

## End-of-Life (Modules C & D), per tonne

**Table 61** - End of Life (Modules C&D), per tonne of precast

|                                                                                                         |                                         | C1       | C2       | C3       | C4       | D         |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------|----------|----------|----------|----------|-----------|
| INDICATORS, ABBR.                                                                                       | UNITS                                   |          |          |          |          |           |
| <b>EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS, MODULES C1-C4 AND D, PER TONNE OF PRECAST</b>       |                                         |          |          |          |          |           |
| GWP-TOTAL                                                                                               | kg CO <sub>2</sub> -eq.                 | 0.622    | 8.79     | 0.588    | 11.8     | -6.53     |
| GWP-FOSSIL                                                                                              | kg CO <sub>2</sub> -eq.                 | 0.622    | 8.79     | 0.588    | 12.1     | -6.51     |
| GWP-BIOGENIC                                                                                            | kg CO <sub>2</sub> -eq.                 | 7.45E-05 | 0.00443  | 7.04E-05 | -0.352   | -0.00812  |
| GWP-LULUC                                                                                               | kg CO <sub>2</sub> -eq.                 | 9.42E-06 | 1.77E-04 | 8.90E-06 | 0.0355   | -0.00540  |
| ODP                                                                                                     | kg CFC11-eq.                            | 7.03E-17 | 1.29E-15 | 6.64E-17 | 4.70E-14 | -3.00E-14 |
| AP                                                                                                      | Mole of H <sup>+</sup> eq.              | 0.00296  | 0.0158   | 0.00279  | 0.0862   | -0.0127   |
| EP-FRESHWATER                                                                                           | kg P eq.                                | 1.10E-07 | 1.45E-06 | 1.04E-07 | 2.03E-05 | -4.66E-06 |
| EP-MARINE                                                                                               | kg N eq.                                | 0.00143  | 0.00656  | 0.00135  | 0.0224   | -0.00294  |
| EP-TERRESTRIAL                                                                                          | Mole of N eq.                           | 0.0157   | 0.0723   | 0.0148   | 0.246    | -0.0313   |
| POCP                                                                                                    | kg NMVOC eq.                            | 0.00400  | 0.0154   | 0.00378  | 0.0678   | -0.0109   |
| ADP-M&M                                                                                                 | kg Sb-eq.                               | 1.02E-08 | 1.36E-07 | 9.59E-09 | 1.14E-06 | -1.32E-05 |
| ADP-FOSSIL                                                                                              | MJ                                      | 8.29     | 117      | 7.83     | 161      | -71.7     |
| WDP                                                                                                     | m <sup>3</sup> world equiv.             | 0.00485  | 0.0576   | 0.00458  | 1.30     | -14.8     |
| <b>EN15804+A2 RESOURCE USE PARAMETERS, MODULES C1-C4 AND D, PER TONNE OF PRECAST</b>                    |                                         |          |          |          |          |           |
| PERE                                                                                                    | MJ                                      | 0.0239   | 0.569    | 0.0226   | 21.6     | -3.15     |
| PERM                                                                                                    | MJ                                      | 0        | 0        | 0        | 0        | 0         |
| PERT                                                                                                    | MJ                                      | 0.0239   | 0.569    | 0.0226   | 21.6     | -3.15     |
| PENRE                                                                                                   | MJ                                      | 8.29     | 117      | 7.83     | 161      | -71.7     |
| PENRM                                                                                                   | MJ                                      | 0        | 0        | 0        | 0        | 0         |
| PENRT                                                                                                   | MJ                                      | 8.29     | 117      | 7.83     | 161      | -71.7     |
| SM                                                                                                      | kg                                      | 0        | 0        | 0        | 0        | 0         |
| RSF                                                                                                     | MJ                                      | 0        | 0        | 0        | 0        | 0         |
| NRSF                                                                                                    | MJ                                      | 0        | 0        | 0        | 0        | 0         |
| FW                                                                                                      | m <sup>3</sup>                          | 7.27E-05 | 0.00113  | 6.87E-05 | 0.0396   | -0.349    |
| <b>EN15804+A2 WASTE MATERIAL AND OUTPUT FLOW PARAMETERS, MODULES C1-C4 AND D, PER TONNE OF PRECAST</b>  |                                         |          |          |          |          |           |
| HWD                                                                                                     | kg                                      | 2.50E-11 | 4.21E-10 | 2.36E-11 | 1.71E-08 | 7.31E-09  |
| NHWD                                                                                                    | kg                                      | 1.31E-04 | 0.00279  | 1.24E-04 | 801      | 0.641     |
| RWD                                                                                                     | kg                                      | 1.94E-07 | 1.61E-05 | 1.84E-07 | 0.00169  | -0.00193  |
| CRU                                                                                                     | kg                                      | 0        | 0        | 0        | 0        | 0         |
| MFR                                                                                                     | kg                                      | 0        | 0        | 200      | 0        | 0         |
| MER                                                                                                     | kg                                      | 0        | 0        | 0        | 0        | 0         |
| EEE                                                                                                     | MJ                                      | 0        | 0        | 0        | 0        | 0         |
| EET                                                                                                     | MJ                                      | 0        | 0        | 0        | 0        | 0         |
| <b>EN15804+A2 ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS, MODULES C1-C4 AND D, PER TONNE OF PRECAST</b> |                                         |          |          |          |          |           |
| GWP-GHG                                                                                                 | kg CO <sub>2</sub> -eq.                 | 0.620    | 8.78     | 0.586    | 12.1     | -6.40     |
| PM                                                                                                      | Disease incidences                      | 3.36E-08 | 1.12E-07 | 3.17E-08 | 1.07E-06 | -2.97E-07 |
| IRP                                                                                                     | kBq U235 eq.                            | 2.17E-05 | 0.00189  | 2.05E-05 | 0.177    | -0.221    |
| ETP-FW                                                                                                  | CTUe                                    | 2.22     | 44.6     | 2.10     | 91.5     | -14.0     |
| HTPC                                                                                                    | CTUh                                    | 3.75E-11 | 7.61E-10 | 3.54E-11 | 1.35E-08 | -3.14E-09 |
| HTPNC                                                                                                   | CTUh                                    | 2.28E-09 | 2.76E-08 | 2.15E-09 | 1.49E-06 | -8.12E-08 |
| SQP                                                                                                     | Pt                                      | 0.0172   | 0.299    | 0.0163   | 32.4     | -5.70     |
| <b>EN15804+A1 ENVIRONMENTAL IMPACT INDICATORS, MODULES C1-C4 AND D, PER TONNE OF PRECAST</b>            |                                         |          |          |          |          |           |
| GWP                                                                                                     | kg CO <sub>2</sub> eq.                  | 0.614    | 8.68     | 0.580    | 11.5     | -6.25     |
| ODP                                                                                                     | kg CFC 11 eq.                           | 9.37E-17 | 1.73E-15 | 8.86E-17 | 6.27E-14 | -3.99E-14 |
| AP                                                                                                      | kg SO <sub>2</sub> eq.                  | 0.00205  | 0.0114   | 0.00194  | 0.0685   | -0.0102   |
| EP                                                                                                      | kg (PO <sub>4</sub> ) <sup>3-</sup> eq. | 4.79E-04 | 0.00223  | 4.53E-04 | 0.00777  | -0.00103  |
| POCP                                                                                                    | kg C <sub>2</sub> H <sub>4</sub> eq.    | 1.99E-04 | -0.00182 | 1.88E-04 | 0.00526  | -0.00234  |
| ADPE                                                                                                    | kg Sb eq.                               | 1.02E-08 | 1.36E-07 | 9.60E-09 | 1.15E-06 | -1.32E-05 |
| ADPF                                                                                                    | MJ                                      | 8.28     | 117      | 7.82     | 156      | -67.1     |

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