Target Zero Waste Home Construction
Project Objective

How close to a zero waste to land fill construction is possible?
Project Strategy

This project is focused on avoid & reduce as the key drivers.
Approx. 9126kg of waste was generated
**Project Overview**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Waste (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laying of Slab</td>
<td>204.70</td>
</tr>
<tr>
<td>Framing</td>
<td>267.24</td>
</tr>
<tr>
<td>Roof &amp; Brick</td>
<td>6925.10</td>
</tr>
<tr>
<td>Rough in</td>
<td>11.73</td>
</tr>
<tr>
<td>Paint, Tile and Finish</td>
<td>1336.40</td>
</tr>
<tr>
<td>Packaging</td>
<td>66.99</td>
</tr>
<tr>
<td>Illegal Dumping</td>
<td>53.56</td>
</tr>
</tbody>
</table>

**Relative waste (mass kg, construction phase)**
Project Overview

Sample Photos:
Project Overview -

Walkthrough baseline construction to identify potential design opportunities
Project Overview -
Completed Baseline Home
Phase 2

Workshop and design a “Target Zero Waste Home” construction
Phase 2

- Reviewed data and causal factors
- Identified material selection opportunities to reduce waste,
- Identified opportunities to reuse waste in current or subsequent builds,
- Identified current available technologies that provide waste minimisation opportunities,
- Identified redesign of construction using material optimisation,
Summary of workshopped waste avoidance strategies

• Reuse of waste materials on site;
• Sandwich panels;
• QA by brick manufactures to tighter tolerances;
• Second-hand bricks (unlikely to meet BCA code);
• Compressed bricks;
• Hebel panel;
• Metal roof;
• Size plaster board to room;
• Concrete polish wet areas in lieu of tiles;
• Polystyrene & render;
• Design options that use materials efficiently
Summary of workshopped agreed strategies

• Metal Roof;
• Cement bricks using off cuts and in façade under render;
• Plaster board ordered to room sizes;
• Utilise square set plaster work in lieu of cornice;
• Order exact waffle pods to suite slab layout;
• Eliminate plaster bulk head from kitchen;
• Reuse temp timber bracing as noggins;
• Select tile size to minimise off cuts;
• Replace internal wall tiles with splash solid backs;
• Cutting schedule to minimise waste on eves;
• Install full length wardrobes
Phase 3 & 4

Construct a “Target Zero Waste Home” construction

Gather learning's
Leading Sustainable Innovation

Slab
Framing
Roofing

Leading Sustainable Innovation
Bricks

Leading Sustainable Innovation
Plaster
Bulk bags used for recycling
Bulk bags used for recycling
Internal Fix
Non Recyclable Materials
Waste by Fate

- Recycled
- Reused
- Landfill

Leading Sustainable Innovation
Comparison of waste generation by Material

- Baseline Construction
- Demonstration Home
Comparison of Greenhouse Gas Contributions

![Comparison of Greenhouse Gas Contributions](chart.png)

- **Slab**:
  - Initial house: 194.7 kg
  - Final house: 252.2 kg

- **Framing**:
  - Initial house: 123.2 kg
  - Final house: 315.2 kg

- **Roof and brick**:
  - Initial house: 867.3 kg
  - Final house: 7010.8 kg

- **Plasterwork**:
  - Initial house: 1336.4 kg
  - Final house: 778.9 kg

- **Rough-in and fit-out**:
  - Initial house: 213.4 kg
  - Final house: 302.8 kg

- **Various**:
  - Initial house: 118.5 kg
  - Final house: 135.8 kg

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Key Achievements

No site clean was required until completion of build

Pre-cut metal roofing exceeded expectation

Delivery of sand in jumbo bags eliminated sand run-off to drains, quantity required and were used to sort material for recycling

Polystyrene pods where ordered and installed according to plan with only one pod remaining and 2 x bags

Generally most contractors segregated materials well, although regular resorting of material was required.

Substitution of materials provided the greatest gain in reduction of waste

Site cut material was used on the development in parkland development

Concrete bricks work very well with little to no rejects

Use of half bricks in sills reduced brick waste significantly

Almost the entire frame bracing materials was used as noggins, spacers or bracing in final structure

Elimination of cornices and use of square set finish for plaster work eliminated cornice waste
Challenges

Room on site restricted external building works and made segregation difficult at times, causing double handling

Contractors did not always sort material into categories, requiring resorting through all phases

Some sectors of the supply chain did not adapt to lean/accurate delivery quantities

Supply chain internal communication challenges caused over delivery and not to specification, ie: frame supplier delivered noggins and bulkheads, brick supplier over delivered by four pallets these were not accepted on site and returned to the supplier for restocking

Internal communications with supply installer did not always run smoothly, ie: plaster ordered to room size but contractors, fixed plaster as normal causing extra waste

Not all surplus or waste material was able to be reused or recycled
The Final Result

Project Target was 80% deviation from landfill

72% of the total construction waste diverted from landfill was achieved via avoidance strategies in comparison to the baseline home.

Total quantity of construction waste that was diverted from landfill compared to the baseline home was 99%.
Final Stages of the Demonstration Home
Questions?