MorrisonLow

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Construction and Demolition Waste Minimisation

Report 2 – Markets

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Document status

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Contents

1 Context

Porirua City Council (PCC), and its partners (Kainga Ora, Hutt City Council (HCC) and Kapiti Coast District Council (KCDC)) are seeking to put forward a business case to utilise, repurpose and sell resources arising from construction and demolition activities in the region. To inform the business case, seven reports have been commissioned (Figure 1), ultimately culminating in one consolidated report (Report 8).

This is Report 2 – Markets, which summarises the information gathered on existing and potential markets for C&D material.

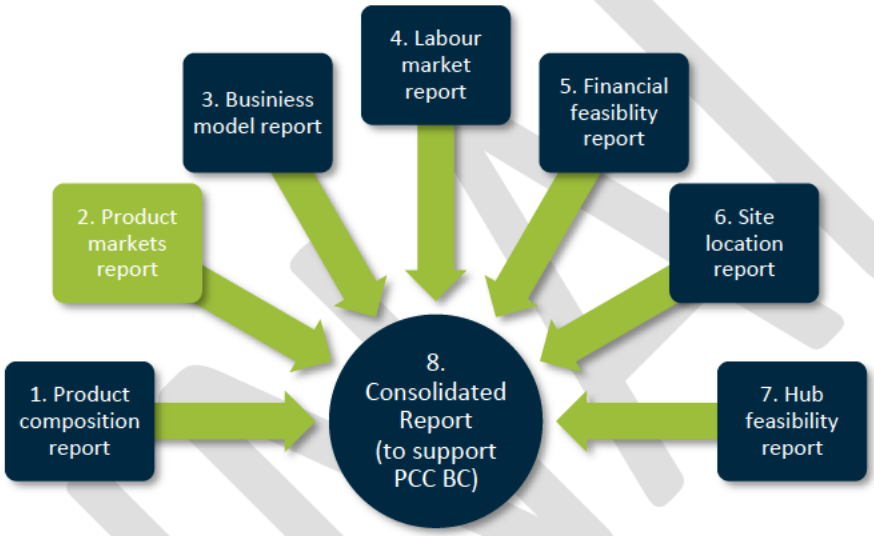

Figure 1 Report structure to inform the business case

2 Methodology

2.1 Desktop review

Information on markets for C&D materials are a culmination of existing subject matter knowledge held by Morrison Low, PCC and its partners, review of professional reports and the case studies published by Resource Efficiency in the Building and Related Industries (REBRI) site.

2.2 Workshops

An initial workshop was held with the project team from PCC and its partners on 25 March 2021. This workshop covered the current status and information known about construction and demolition materials and markets in the Porirua City area as well as the wider Wellington Region.

A follow up workshop was held with the project team on 8 April 2021 at which the initial findings from the review of potential markets was presented to the project team.

2.3 Interviews

In addition, interviews were conducted with individuals from the following parties to gauge their views on markets for C&D materials:

- EnviroNZ
- Waste Management NZ
- Green Gorilla
- Fletcher Building
- Marlborough District Council
- Auckland Council
- Woods Waste

The following sample questions were raised to initiate the discussion:

- Are you able to summarise what 'needs to be in place' for end markets to be viable and further what are key inhibitors?
- What are the minimum and maximum tonnages (of a particular waste stream or streams) that makes recovery viable? Is there a range as far as large volume end market demand versus low volume?
- On the spectrum of destructive demolition (bulldozers, diggers, grabs claws) to deconstruction via 'soft strip', how do you manage the demand of the developers (who want the site clear) with the demand of the end users (who want a quality product for re-use)?
- To what extent are the end markets offshore, if at all?
- Have you been directly engaged in reducing the amount of waste produced in construction? (renovation/new builds for residential, commercial, industrial) if so, what worked and what did not?

3 Market observations

Through this research the following observations have been made regarding potential markets for C&D materials:

- The general feedback from interviews with industry were positive. They are thinking about C&D waste and provided useful insights, however, they are also understandably protective of their IP, which includes their product markets.
  - Early engagement with potential industry partners as part of any future commercial arrangements for a C&D waste facility would be beneficial to enable them to present their end-market offering in a confidential setting.
- A recurring theme in conversations was that the quality of C&D generated material is prohibitive to its reuse for its original purpose, for example timber from demolition is only in rare circumstances able to be reused in construction. This results in the material having zero monetary value (metals have scrap value only). Therefore, the greater the degree of at source separation through soft strip deconstruction that can be achieved, the more recovery can be achieved. However, source separation is often constrained by the space available on site for storing separated waste materials and limited time available in the construction programme to undertake additional sorting.
  - Allocating a resource within the C&D waste facility's organisational structure to work with

construction companies and developers to overcome space and time constraints to allow for source separation would be beneficial.

- C&D MRFs involve significant destruction of material however, they address the space and time constraints of construction sites, with contractors being able to deliver mixed bins to the C&D waste facility in the same way they currently do with bins destined for landfill disposal.
  - Catering for both mixed loads and source-separated materials within the C&D waste facility would be recommended.
- While some markets are established with effective processing to make a useable product (e.g. concrete), others are less so and viable alternatives to landfill disposal can be difficult to find (e.g. treated timber). While some markets are currently small, they are likely to grow (as opposed to contract) over time. Regardless of the scale of the current market, there will be ongoing volatility in the markets, as seen with recycling commodities.
  - Due to the importance of maintaining markets, having a resource focused on identifying and maintaining markets within the C&D waste facility structure is seen as key to minimising the risk of market volatility and ensuring good waste diversion outcomes.
  - There could be an allowance made for an innovation hub to develop new products as part of the C&D waste facility.
- Over time, the markets will shift from lower grade recycling, or "down-cycling', to more circular solutions where materials are recycled back into their original form. The best examples of these are concrete and plasterboard. Crushed concrete can be used for informal roading on construction sites but now engineered aggregate products are being produced from the recycled concrete that goes back into new concrete. The gypsum in plasterboard may be used for clay remediation in landscaping however, the volumes required for this are minimal in comparison with the volumes produced by C&D activities. A solution for turning discarded plasterboard back into plasterboard is in development.
- Local government and central government agencies, like Kainga Ora, have significant forward construction programmes. As such, there is an opportunity for the public sector to create demand for recycled C&D materials by specifying them in their own construction programmes. This is different to the role that local government plays in creating markets for kerbside recycling materials, as these materials generally need to be taken back into markets directed at food and beverage manufacturing.
  - To help close this loop, the use of products from the C&D waste facility could be made a condition of partnering in the facility's development.
- Industry feedback was consistent in the opinion that the most significant inhibitor to market establishment are regulations, policies, specifications and standards restricting use of alternative materials for building and construction. Regulations have tightened over time due to the legal risk associated with the use of inappropriate materials.
  - Both local government and central government agencies can influence change in this area as they are often the owner of the inhibiting standards.
  - The risks associated with allowing the use of alternative materials need to be addressed for changes to be made and some agencies such as Auckland Transport, who have recently adopted a specification for use of recycled concrete in roading, are making positive progress in this area.
- Report 1 – Material Composition identifies timber as one of the greatest contributors to the C&D waste stream, second only by weight to steel.

- Industry feedback indicates that the primary instances where timber is clearly untreated is whole pallets and native timber panelling (which is also often considered treated and recorded as such if an immediate reuse or storage solution is not found). As a result, timber is often classified as treated as a precautionary measure as contamination cannot be accommodated in typical downcycling of untreated timber to mulch.
- Treated timber also includes composite and painted timber. Composite timber such as plywood may be used in construction formwork but if the grade cannot be identified its use may present too great a risk.
- High level feedback from Fletcher Building indicates that there is capacity in the Golden Bay Cement plant to receive and use quality, processed used treated timber as a fuel. The exact capacity, however, is unknown and the cost of transport to Whangarei is expected to be prohibitive to leveraging off this opportunity.

3.1 Emerging trends

- Identification of product cycles and product stewardship including for PVC pipes and plasterboard.
- Major vertical build construction companies including Kainga Ora, are proactively seeking to design out their waste with development of flat pack, off site, precision engineered buildings. A solution which promises to mitigate the inevitable trade-off between time, expense and waste experienced in the industry.
- The construction industry is increasing its focus on "eco" alternatives to traditional building materials due to the broader environmental benefits (such as reduced greenhouse gas emissions from the use of recycled material over virgin raw materials). This is starting to create demand for products made from recycled C&D materials.

4 Product markets

Table 1 provides a summary of the known markets for C&D material by type as identified in Report 1 and the reliability of these markets. Market reliability is an indication of whether the markets for that particular material are proven but it does not give an indication of the total capacity of the market in the Wellington Region.

Table 1 Known product markets for C&D materials

C&D material	Known market(s)	Processing or market proximity	Anticipated processing capacity	Market reliability
Timber (untreated)	Chipped for use in: parks, reserves and sold for private use (i.e. landscaping, composting); animal bedding e.g. Goodwood; or compressed to create wood composite products or domestic fire pellets.	Local – Companies processing guaranteed untreated timber are common given markets are stable e.g. Composting NZ.	High – Given the stable markets and low volumes of available material no capacity issues are anticipated	Stable – ongoing market demand for both mulch, bedding and fuel.
Timber (treated)	Some used as a fuel in cement kilns (Golden Bay Cement) May be able to develop markets as a replacement boiler or sludge drier fuel, providing suitable scrubbing of air discharges was allowed for.	Out of district – The only known current market for treated timber is in Whangarei. Processing of treated timber for use as a fuel is not yet occurring in the Wellington region however the technology could easily be brought locally or existing equipment for untreated timber modified for local use.	High – If a market was made available there would be no anticipated restrictions on ability to process.	Medium – Early indications are that the Whangarei cement plant has capacity to accept material. Distance may be prohibitive.
Timber (native)	Boutique private builds and furniture, but the market is small (includes framing, weatherboards, floorboards)	Local – Companies such as Scaife Timber in Mangaroa and No. 8 Building Recyclers in Lower Hutt specialise in this activity. Report 1 does not identify quantities of native timber being received at facilities as it is likely that these companies already serve this market and are therefore already diverting it.	High – Processing is undertaken by the private market who take the products to sell at a profit. No processing capacity restriction is anticipated	High – The market is managed by the private sector and there is ongoing demand for high quality native timber.
Hardfill	Used by construction industry either as low quality fill or higher quality recycled aggregate	Local – There are multiple concrete crushing plants available both locally and nationally.	High – given availability of plant, no capacity constraints are anticipated particularly if quantities, timing and location are know.	Medium – while use of the product is increasing, there are issues with matching supply with demand
Plaster board	Gypsum is separated from plasterboard coating and used in agriculture (e.g. soil conditioner, composting additive), plasterboard manufacturing, or as additive to WWTP sludge to reduce moisture.	A local market does not yet exist – there are no local processors for provision to landscaping suppliers. Out of district – If Winstones are successful in their 'plasterboard to plasterboard' initiative, the plant will be in Auckland.	Low - the amount of gypsum that can be used through landscaping activities is limited. It is unknown what the capacity of the Winstones plant will be.	Low – the amount of gypsum that can be used through landscaping activities is limited. Winstones recycling of plasterboard is not yet operational
Flat glass	Crushed and used in building products e.g. 5R or used in construction industry as high quality alternative to sand	Out of district – 5R processing occurs in Auckland and Christchurch.	High – It is anticipated that, 5R would have sufficient capacity to process it.	High – 5R manage several markets directly that have capacity for the volumes anticipated.
Metals (ferrous and non-Ferrous)	Sold to scrap metal companies (Sims Pacific Metals) that sort and sell to smelters on and off shore	Local – Numerous local scrap metal collectors are in operation.	High – there are no anticipated capacity constraints for recycling scrap metal.	High – both the ferrous and non-ferrous scrap metal markets are reliable.
Paper, cardboard,	Use of existing markets available for kerbside-collected paper and card, noting that markets for these products are currently unstable	Local – e.g. OJI MRF in Seaview	High – there is no anticipated capacity constraint at the MRF	Medium - recent instability in export markets due to China's ban on waste paper imports and flow on effects, including impact on NZ markets.
Plastics	Soft plastics through Future Posts, packaging and building components through plastic recyclers Niche markets for particular products through product stewardship, e.g. PVC pipes and HDPE	Local – MRF in Seaview is able to process plastics 1,2 and 5. Future Post have 14 drop off locations in the wider region but these are small scale.	Medium – The MRF is not anticipated to have any processing constraints. Future Posts match the capacity of their collection stations to their capacity to produce their products and all collection stations are currently domestic size (circa 80 litres)	Low – The market for plastics is very volatile. Future Posts have limited capacity to process plastics and match demand for their products.

C&D material	Known market(s)	Processing or market proximity	Anticipated processing capacity	Market reliability
Salvageable fixtures	Sale to local salvage yards. Shipped offshore for use in low-cost building in the Pacific Islands. (includes roofing iron, framing, cladding, window joinery, doors, cabinetry, furniture, bathroom fixtures)	Local – Local salvage yards e.g. No. 8 Building Recyclers in Lower Hutt receive these materials. Report 1 does not identify quantities of fixtures and fitting being received at facilities it is likely that these items are grouped into one of the broader categories if not already collected by salvage yards e.g. roofing iron. Trow group do not currently operate in Wellington but may in the future.	Low – capture of these items requires an established deconstruction resource not yet present locally	Low – Markets are often saturated

5 Conclusion

Established, stable markets for recovered material are critical for the success of a C&D waste minimisation initiative. For most materials, there are already markets that have a medium to high degree of reliability. Looking ahead these markets are likely to both grow and become more circular over time. There is a need for resources to be allocated within the structure of any C&D waste facility or operation that:

- Focus on finding and retaining markets over time
- Work with construction industry and developers to increase source separation, retaining the value of materials
- Work with the facility partners and the wider public sector to promote use of recovered material within their own construction projects
- Promote changes to regulations, specifications, standards and policies to allow more recovered materials to be used in construction .

Outside of the C&D waste operation there is also a need to encourage the construction sector to reduce C&D waste through changes to their material selection and construction methodology. This activity would most likely sit with the broader C&D sector as opposed to the facility operator.