WELLINGTON REGION WASTE MANAGEMENT AND MINIMISATION PLAN JOINT COMMITTEE
19 NOVEMBER 2018

Absolutely Positively Wellington City Council
Me Heke Ki Pōneke

ORDINARY MEETING

OF

WELLINGTON REGION WASTE MANAGEMENT AND MINIMISATION PLAN JOINT COMMITTEE

AGENDA

Time: 9.30am
Date: Monday, 19 November 2018
Venue: Committee Room 1
Ground Floor, Council Offices
101 Wakefield Street
Wellington

MEMBERSHIP

Councillor McLeod	Upper Hutt City Council
Councillor Peterson	Masterton District Council
Councillor Pannett	Wellington City Council
Councillor Greathead	Carterton District Council
Councillor Craig	South Wairarapa District Council
Councillor Bridson	Hutt City Council
Councillor Elliot	Kapiti Coast District Council
Councillor Gaylor	Greater Wellington Regional Council
Councillor Ford	Porirua City Council

Have your say!
You can make a short presentation to the Councillors at this meeting. Please let us know by noon the working day before the meeting. You can do this either by phoning 04-803-8334, emailing public.participation@wcc.govt.nz or writing to Democracy Services, Wellington City Council, PO Box 2199, Wellington, giving your name, phone number, and the issue you would like to talk about.

AREA OF FOCUS

Under the Waste Minimisation Act 2008 territorial authorities were required to develop a Waste Management and Minimisation Plan (WMMP) by 2012.

In 2011, 8 Councils in the greater Wellington region adopted the first regional WMMP. The Councils agreed that a Joint Committee should be established to oversee the implementation of the WMMP.

Quorum: 4 members

TABLE OF CONTENTS
19 NOVEMBER 2018

1 Meeting Conduct

1.1 Apologies

The Chairperson invites notice from members of apologies, including apologies for lateness and early departure from the meeting, where leave of absence has not previously been granted.

1.2 Conflict of Interest Declarations

Members are reminded of the need to be vigilant to stand aside from decision making when a conflict arises between their role as a member and any private or other external interest they might have.

1.3 Confirmation of Minutes

The minutes of the meeting held on 1 October 2018 will be put to the Wellington Region Waste Management and Minimisation Plan Joint Committee for confirmation.

1.4 Items not on the Agenda

The Chairperson will give notice of items not on the agenda as follows.

Matters Requiring Urgent Attention as Determined by Resolution of the Wellington Region Waste Management and Minimisation Plan Joint Committee.

The Chairperson shall state to the meeting:

1. The reason why the item is not on the agenda; and
2. The reason why discussion of the item cannot be delayed until a subsequent meeting.

The item may be allowed onto the agenda by resolution of the Wellington Region Waste Management and Minimisation Plan Joint Committee.

Minor Matters relating to the General Business of the Wellington Region Waste Management and Minimisation Plan Joint Committee.

The Chairperson shall state to the meeting that the item will be discussed, but no resolution, decision, or recommendation may be made in respect of the item except to refer it to a subsequent meeting of the Wellington Region Waste Management and Minimisation Plan Joint Committee for further discussion.

1.5 Public Participation

A maximum of 60 minutes is set aside for public participation at the commencement of any meeting of the Council or committee that is open to the public. Under Standing Order 3.23.3 a written, oral or electronic application to address the meeting setting forth the subject, is required to be lodged with the Chief Executive by 12.00 noon of the working day prior to the meeting concerned, and subsequently approved by the Chairperson.

Requests for public participation can be sent by email to public.participation@wcc.govt.nz, by post to Democracy Services, Wellington City Council, PO Box 2199, Wellington, or by phone at 04 803 8334, giving the requester's name, phone number and the issue to be raised.

2. General Business

REGIONAL CONSTRUCTION AND DEMOLITION WASTE MINIMISATION

Purpose

1. This report asks the Wellington Region Waste Management and Minimisation Plan Joint Committee to support a joint-council regional approach to the advancement of construction and demolition (C&D) waste minimisation.

Summary

2. It is currently estimated that approximately 578,000 tonnes of C&D waste is being disposed of into landfill every year within the Wellington Region.

3. As detailed within the Wellington Region Waste Management and Minimisation Plan (WMMP) (2016-2023), the territorial authorities of the Wellington Region are committed to reducing the amount of waste sent to landfill. The WMMP signals that the Councils intend to work collaboratively to undertake research and actions to advance solutions to waste management issues.

4. Given that C&D activity is generating substantial quantities of waste and much of this waste will be potentially recoverable (e.g. brick and concrete, timber, plasterboard, and metal), C&D waste has the potential to be a priority waste stream targeted by councils as a means to reduce waste to landfill.

5. This report explores the C&D waste issue, explaining why it is a particular issue within the Wellington Region. It also sets out the opportunities that councils have to reduce C&D waste.

6. In summary, initial analysis suggests that councils have the greatest potential to reduce the amount of C&D waste sent to landfill through instigating a combination of policy-based and operational investment measures. These measures include:

   (i) Regulatory Intervention (Bylaw provisions applicable to C&D activities).

   (ii) Council Procurement Policy.

   (iii) Establishing processing capacity by investing in dry waste processing, investing in concrete processing, and making C&D waste processing area/s available.

7. If the eight Councils of the Wellington Region decide to work regionally to progress the C&D waste minimisation options discussed in this report, then further anaylsis of the relevant option/s is recommended.

8. This report should be read in conjunction with the C&D Issues and Options Paper contained in Appendix 1. The attached report more comprehensively discusses the C&D waste issues and options summarised below.

Should the additional investment in C&D resource recovery facilities (see option (iii) above) be further considered by territorial authorities, then subsequent analysis will need to take into account project-level and territorial authority specific cost-benefit considerations; geotechnical/seismic analysis; respective Council significance and engagement policies, and any other council relevant planning considerations and processes.

Recommendation/s

That the Wellington Region Waste Management and Minimisation Plan Joint Committee:

1. Receives the information.
2. Agrees that a copy of the C&D Issues and Options Paper (as contained in Appendix 1) be submitted to each of the eight respective territorial authorities of the Wellington Region for their consideration.
3. Notes that the regional waste bylaw review process will identify the issue of C&D waste minimisation as a regional bylaw issue requiring attention.

Background

9. The New Zealand construction sector is relatively waste-intensive in New Zealand. Construction and demolition activity can generate substantial quantities of dense material, much of which is recoverable, such as brick and concrete, timber, plasterboard and metal.
10. In 2013/14, available waste data suggested that approximately 32,099 tonnes of waste sent to municipal (Class 1) landfill in the Wellington Region was C&D waste (being 12.7% of Class 1 Landfill waste stream).
11. Available data also indicates that the majority of C&D waste is currently being sent to Class 2-4 landfills. In 2015 Class 2-4 landfill operators reported their C&D waste tonnages to be approximately 525,000 tonnes per annum. This converts into a per capita disposal rate of 1.06 tonnes per capita per annum (Wellington Region Waste Assessment, 2016, p.55). On the basis that a significant part of the waste stream could be diverted away from landfill, the Wellington Region Waste Assessment has identified construction and demolition waste as being a priority waste stream that could be targeted by councils as a means to reduce waste to landfill (2016, p.87).
12. The eight territorial authorities of the Wellington Region subsequently adopted the Wellington Region WMMP in 2017. This plan details the council's joint strategy for minimising waste in the region over the next 6 years.
13. In accordance with the Waste Minimisation Act (2008), territorial authorities are legally required to adopt a waste management and minimisation plan for the purposes of promoting effective and efficient waste management within its district. The higher-level purpose of the Waste Minimisation Act is to encourage waste minimisation and a decrease in waste disposal in order to –

    (a) Protect the environment from harm; and
    (b) Provide environmental, social, economic, and cultural benefits.

14. The Wellington Region WMMP identifies a range of actions proposed by territorial authorities that have the potential to support C&D waste minimisation (see below).

15. **Table 1: C&D Waste Minimisation-related Actions in the Wellington Region WMMP.**

WMMP Action #	Council	Action Description
R.IN.1	All eight territorial authorities	Investigate and if feasible develop a region-wide resource recovery network – including facilities for construction and demolition waste.
R.LM.3	All eight territorial authorities	The councils will work collaboratively to undertake research and actions to advance solutions to waste management issues.
R.3	Hutt City Council	Waste minimisation plans are required as part of Council building projects.
E.12		Promote and encourage construction and demolition waste reduction, reuse and recycling wherever possible.
IN.3	Kapiti Coast District Council	Explore the establishment of additional diversion facilities. This may include supporting the establishment of facilities to divert and recover waste streams such as C&D waste.
IN.1	Porirua City Council	Investigate and, were feasible design and implement new, or upgraded, facilities to enable more effective diversion from landfill (e.g. drop-off areas and sales yard for construction and demolition materials).
E.6	Masterton District Council Carterton District Council South Wairarapa District Council	Promote industrial and commercial waste reduction mechanisms by, promoting waste audits of businesses and promoting cleaner production. [This action is intended to connect to regional action R.IN.1: Investigate and if feasible develop a region-wide resource recovery network – including facilities for construction and demolition waste].
LM12	Wellington City Council	Investigate the option for WCC construction and demolition procurement activities to include the requirement for waste minimisation and management plans.

16. In April this year, the Joint WMMP Committee recommended that officers report back on suggested options for advancing a reduction in construction and demolition waste, in addition to ICI (industrial, commercial and institutional) waste within the Wellington Region (specific to Class 1 Landfills).

17. In response to this recommendation, Tonkin and Taylor was commissioned to prepare a background report identifying the C&D waste minimisation issues and options for the Wellington Region. This report is now complete and is contained in Appendix 1 of this report.

18. Although the Joint WMMP Committee have recommended that officers more extensively report back on options for addressing industrial, commercial and institutional waste streams, existing regional WMMP implementation priorities, together with available budgets and resourcing, act to limit officer capacity to report back on these other waste streams at the current time.

19. The following discussion provides a summary of the primary C&D waste issues and the core suite of options available to councils to help promote C&D waste minimisation in the Wellington Region.

20. This discussion should be read in conjunction with the C&D Issues and Options Paper prepared by Tonkin and Taylor attached in Appendix 1.

Discussion – C&D Waste Minimisation Challenges

21. C&D waste is a high volume waste stream in the Wellington Region. It is currently estimated that 578,000 tonnes of C&D waste (per annum) is currently being sent to landfills in the region.

22. C&D waste generally encompasses, but is not limited to, materials such as:

- Concrete, bricks and tiles
- Wood, glass and plastic
- Metals
- Soil, stones and dredging spoil
- Insulation materials and asbestos containing construction materials, and
- Gypsum based construction materials.

23. As discussed in more detail in the appended report, a number of factors act together to constrain the amount of C&D waste minimisation and diversion occurring in the Wellington Region. These factors are summarised below:

Low cost & availability of C&D waste disposal:

24. C&D waste minimisation and diversion is currently limited as a consequence of the low cost of C&D waste disposal, and the presence of relatively cheap disposal options available close to most major construction activity. To date, the low cost and ready availability of C&D landfill disposal options has limited the commercial viability of establishing new C&D material diversion and reprocessing facilities.

Lack of Local Government regulatory intervention

25. Currently there is no requirement to consider the matter of waste reduction, waste diversion or C&D material recovery when undertaking construction and demolition projects within the Wellington Region. There is also an absence of data pertaining to C&D waste composition and quantities within the Region.

26. Regulatory intervention has the ability to address these issues and promote C&D waste minimisation via the establishment of appropriate Waste Bylaw regulation and Building Control standards.

Reliance on voluntary waste minimisation/sustainability initiatives in the C&D sector

27. Currently the construction sector is focused defined quality and timely completion that is delivered at the lowest cost. While opportunities may also exist to reduce waste, project managers and site staff are unlikely to focus much effort on waste minimisation without third party intervention.

28. In some cases however, C&D waste minimisation activities are occurring where project targets voluntarily incorporate sustainability considerations, and/or where the value of resource diversion outweighs the cost of disposal.

C&D data uncertainty

29. There is currently a lack of information pertaining to C&D waste management within the Region. Key data gaps include certainty around C&D waste generation quantities and composition, and the capacity and capability to process this waste at existing facilities.

Industry uncertainty

30. The issue of data uncertainty (discussed above) compounds the issue of uncertainty relating to:

- The level of anticipated construction activity in the region.
- The impact of evolving construction sector technologies and work (e.g. the use of modular/prefabricated buildings).
- The potential for disaster events that will produce spikes in C&D waste generation.

31. In summary, the factors discussed above create a range of challenges for C&D waste minimisation for the Wellington Region.

32. Of the challenges identified, the low cost of C&D waste disposal exists as an overarching impediment to C&D waste minimisation for the region. Central Government exists as the primary body able to address this issue, potentially via the application of waste levy as a means to increase disposal costs. This measure is currently being considered by Central Government.

33. Notwithstanding the issue of low cost disposal, councils have a range of options available to them as a means to promote both C&D waste minimisation and stimulate C&D resource recovery. These options are discussed below.

C&D Waste Minimisation Opportunities

34. The Councils of the Wellington Region have the ability to promote C&D waste minimisation in a number of ways. The options available to Councils are outlined in table 2 (below), and more comprehensively considered within the attached C&D Waste Minimisation Issues and Options Paper prepared by Tonkin and Taylor (contained in Appendix 1).

35. **Table 2: Local Authority C&D Waste Minimisation Options Summary**

#	Option	Summary
1.	Procurement Policy	Councils develop and use procurement policy and practices to specify C&D waste minimisation project requirements for Council projects, including: • Minimising the wastage of materials. • Using recovered or recycling C&D waste where feasible to do so. • Maximising the recovery of waste produced. • Reporting on waste generation, treatment, processing and disposal.
2.	Bylaw Regulation	Councils develop a regionally consistent bylaw to promote C&D waste management and minimisation best practice. This could require the consideration of the following on large building and demolition projects: • On site storage, and material/resource sorting. • Transport. • Diversion and processing. • Disposal (Targeting Class 2 – 4 Landfills) and/or reuse. • Data provision and reporting back to Councils.
3.	Invest in waste processing (dry waste)	Councils invest in one or more sites for the sorting and processing of 'dry' C&D waste currently disposed of at Class 1 and 2 Landfills. Likely target materials are metals, concrete/rubble and usable timber off cuts. Potential Council owned locations include Otaihanga Landfill, Silverstream Landfill, Spicer Landfill and Southern Landfill.
4.	Invest in waste processing (concrete)	Councils invest in one or more sites for the processing of concrete/rubble currently disposed of at Class 2 - 4 landfills for aggregate. Potential Council owned locations include Kiwi Point Quarry, Silverstream Landfill, Spicer Landfill and Southern Landfill.
5.	Making C&D Waste processing area available	Councils make suitable space available for private or community sector organisations to sort and/or process C&D waste currently disposed of at Class 1 and 2 Landfills. Potential Council owned locations include Otaihanga Landfill, Silverstream Landfill, Spicer Landfill and Southern Landfill.
6.	Regional Council Resource consent compliance (illegal dumping)	Councils support the Regional Councils to develop a strategy to address inappropriate disposal of C&D waste and other materials in Class 2 – 4 Landfills across the region. This should cover resourcing for compliance activity (particularly for Permitted Activities) and a longer term focus on improving the clarity of resource consent and Permitted Activity conditions.
7.	Integrated plan / roadmap	Councils develop an integrated plan to deliver on C&D waste objectives for the Wellington Region. Ideally this would include:

#	Option	Summary
		• Engagement with key private and community sector stakeholders • An integrated approach to address the issues identified in this report • Timeline, budget, action owners and metrics to measure progress (linked to the WMMP targets) • Funding from multiple parties.
8.	Regulating construction /demolition activities via resource consents and building consents.	Councils develop a consistent approach to influence waste generation and management of C&D activities through the regulation of development (RMA) and building (Building Act) activity.

36. Of the eight opportunities that exist for Councils to promote C&D waste minimisation, advancing a combination of policy-based and operational investment measures appears to hold the greatest opportunity for Councils to:

- To understand and address the environmental and human health impacts of C&D waste management options.
- To ensure C&D materials are disposed of at appropriate facilities.
- To promote efficient C&D waste management and minimisation.
- Reduce the amount of C&D waste disposed of to landfill.
- To increase the reuse, recovery and recycling of C&D waste.
- To advance C&D waste minimisation in partnership with private and community stakeholders.
- To improve data of C&D waste disposal, recovery and recycling.
- To investigate the use of available technologies for C&D waste recovery and recycling.

37. The attached C&D Issues and Options Paper finds that following C&D waste minimisation options would benefit from further consideration by the Councils of the Wellington Region:

(i) **Regulatory Intervention (Bylaw provisions connected to construction & demolition activities)** – Regulatory intervention could help to ensure that C&D waste minimisation is considered when planning for large construction and demolition projects and help ensure that residual materials are taken to an appropriate disposal facility. It could also improve data on the management of C&D waste in the Wellington Region. Regulatory intervention will impact on Class 1 – 4 landfills.

It is noted that the establishment of regulatory intervention is currently being considered as part of the regional waste bylaw review process.

(ii) **Council Procurement Policy** – The establishment of C&D waste minimisation requirements within Council procurement policy has the potential to impact on all waste materials generated on Council projects (i.e. those going to Class 1 – 4 landfills). It also has the potential to promote the sustainability and reduce the environmental footprint of Council development projects.

(iii) **Establishing processing capacity by investing in dry waste processing, investing in concrete processing, and making C&D waste processing area/s available** – These options will initially impact largely on C&D materials currently disposed of at Class 1 landfills, with Class 2 – 4 landfills potentially presenting a cheaper option that will be preferable for most projects. Council procurement requirements and links to sustainability ratings for other projects have the potential to broaden the impact of this option to some materials currently disposed of at Class 2 – 4 landfills.

It is noted that should the additional investment in C&D resource recovery facilities be further considered by councils, then subsequent analysis will need to take into account project-level and territorial authority specific cost-benefit considerations; geotechnical/seismic analysis; respective Council significance and engagement policies, and any other relevant council planning considerations and processes.

38. The three core C&D waste minimisation options noted above each target different challenges to C&D waste minimisation within the Wellington Region (e.g. sustainability, data reporting, and the availability of local diversion/C&D material recovery and reprocessing facilities). In turn, the implementation of any one option in isolation from supporting actions will be unlikely to make a significant impact on the amount of C&D waste generated in the region. As such, for optimal effectiveness in addressing these issues, the options would be best advanced together, as multipronged joint-council approach to promoting C&D waste minimisation.

39. Due to the regional nature of the C&D waste issue, a joint-Council regional approach logically holds the most potential to effectively reduce C&D waste within the region.

Conclusion

40. This report provides outlines the C&D waste minimisation issues that exist within the Wellington Region, and provides an overview of the opportunities that local authorities have to address these issues through regional-level working.

41. This report is intended to be read in conjunction with the C&D Issues and Options Paper contained in Appendix 1. The attached report more comprehensively discusses the C&D issues and options summarised above.

42. Of the options suggested for further consideration, the possible establishment of relevant waste bylaw regulation is the only option currently being advanced by territorial authorities.

43. To enhance the effectiveness of any subsquent waste bylaw regulation developed by councils as a means to promote C&D waste minimsation, councils could also invest in regional-level C&D waste diversion capacity, and establish procurement policy provisions that require the consideration of C&D waste minimsiation for council development projects.

44. If the eight Councils of the Wellington Region decide that they do wish to work regionally to progress the C&D waste minimisaiton options discussed in this report, further anaylsis of the relevant option/s is recommended.

Attachments

Author	Emma Richardson, Regional WMMP Planner
Authoriser	David Chick, Chief City Planner

SUPPORTING INFORMATION

Engagement and Consultation

No consultation or community engagement has occurred as part of the preparation of this report, or as part of the preparation of the Issues and Options Paper contained in Appendix 1. Should local authorities decide to further investigate or progress any of the options outlined within this report, associated stakeholder consultation and engagement is recommended.

Treaty of Waitangi considerations

This report is not inconsistent with the principles of the Treaty of Waitangi.

Financial implications

This report identifies a range of C&D waste minimisation issues and options to the Wellington Region. Should local authorities decide to progress any of the operational investment options outlined within this report, a more detailed analysis of the social, environment, cultural and economic implications is recommended.

Policy and legislative implications

This report is consistent with the suite of Wellington Region WMMP actions identifed in table 1 contained in this report, including actions: R.IN.1 (relevant to eight territorial authorities; R.LM.3 (relevant to all eight territorial authorities); R.3 & E.12 (relevant to Hutt City Council); IN.3 (relevant to Kapiti Coast District Council); IN.1 (relevant to Porirua City Council); E.6 (relevant to Masterton District Council, Carterton District Council, South Wairarapa District Council; and LM12 (relevant to Wellington City Council).

Risks / legal

There are no risks or legal implications assoicated with this report.

Climate Change impact and considerations

There are no direct climate change impacts assoicated arising from the content of this report. However, should any of the identifed C&D waste reduction options be progressed, they will have the potential to generate climate change impacts. As detailed within the C&D Waste Minimisation Issues and Options Paper, preliminary analysis of the options suggests that any such impacts have the potential to be either similar to the current situation, or result in an improvement from the current situation.

Communications Plan

No communications plan has been developed as part of the preparation of this report.

Health and Safety Impact considered

The recommendations contained in this report will not result in any adverse health or safety impacts.

REPORT

Tonkin+Taylor

Regional C&D Waste Issues and Options Paper

Prepared for
Wellington Regional WMMP Working Group
Prepared by
Tonkin & Taylor Ltd
Date
October 2018
Job Number
1007345.v3.0

Exceptional thinking together
www.tonkintaylor.co.nz

Document Control

Title: Regional C&D Waste Issues and Options Paper					
Date	**Version**	**Description**	**Prepared by:**	**Reviewed by:**	**Authorised by:**
13 July	1.2	Draft for workshop	ANAI, CHP	CHP	-
25 July	1.3	Edited draft by TA Officers for review and amendment			
2 August	1.4	Final draft for internal review	CHP		
October	FINAL		CHP, ANAI	HEC	HEC

Distribution:

Wellington Regional WMMP Working Group	1 copy
Tonkin & Taylor Ltd (FILE)	1 copy

Table of contents

Executive summary

Construction and demolition (C&D) waste is a problematic high volume waste stream in the Wellington Region. While a range of opportunities exist to reduce, reuse and recycle this waste, to date such waste management and minimisation mechanisms remain unutilised and underdeveloped in the Wellington context.

Projected quantities of C&D waste disposed of to landfill in the Wellington Region estimate that a total of 570,000 tonnes of waste (per annum) is currently being sent to landfill in the Wellington Region. Approximately 95% of this waste is being sent to Class 2-4 landfills. This report reviews the scope of C&D waste minimisation issues within the Wellington Region, and identifies a range of options available to the councils in response to the issues identified. Some of the issues and options identified are consistent with other parts of New Zealand, and in some cases international experience. Others are specific to the Wellington Region.

In summary, the primary C&D waste minimisation issues in the Wellington Region include:

- A lack of data and related uncertainty on C&D waste.
- Limited capacity to process and recover C&D waste.
- A small number of appropriate C&D disposal sites.
- A lack of regulatory intervention promoting C&D waste minimisation.
- Limited and variable regulatory oversight of C&D waste disposal.
- The availability of low cost disposal for C&D waste, close to where many major projects are occurring.

The report suggests that all of the options available to the Councils of the Wellington Region in response to these issues have the potential to reduce the amount of materials disposed of at Class 1, 2 and 4 landfills. However, several options are likely to be more effective than others and therefore justify further consideration.

Of the options suggested for further consideration, the establishment of C&D waste minimisation Council procurement policy standards, and the establishment of regulatory standards to require C&D waste management and minimisation planning and reporting, have the most potential to impact on materials disposed of at Class 2 – 4 landfills. In addition to establishing an effective policy and regulatory foundation for C&D waste minimisation and planning, the creation of additional processing capability has the highest potential to reduce the amount of materials disposed of at Class 1 Landfills, which is where relatively high disposal costs present more opportunity for savings.

The options identified for further consideration are summarised below:

- **Establish processing capacity for dry waste and concrete processing, and by making space available for C&D diversion/processing** – These two options will initially impact largely on C&D materials currently disposed of at Class 1 landfills, with Class 2 – 4 landfills presenting a cheaper option that will be preferable for most projects. Council procurement requirements and links to sustainability ratings for other projects have the potential to broaden the impact of this option to some materials currently disposed of at Class 2 – 4 landfills.
- **Council Procurement Standards/Policy** – Establishing C&D waste management and minimisation policy standards for all Council construction and deconstruction projects has the potential to reduce the waste materials generated on Council projects (i.e. those going to Class 1 – 4 landfills).
- **Territorial Authority Regulatory Intervention (bylaw provisions and consenting conditions)** – Regulatory intervention via the establishment of appropriate bylaw provisions and

consenting conditions to require C&D waste management and minimisation planning and reporting, will improve both improve local data on the management of C&D waste and help to ensure that residual materials are taken to an appropriate disposal facility. Regulatory standards will also encourage the consideration of C&D waste minimisation planning during the early stages of development projects.

The analysis completed suggests that, collectively, the Councils of the Wellington Region should focus should be on a combination of additional processing capability (the hard infrastructure) with supporting Council policy (bylaw, consent conditions, procurement policy). Ideally, Council policy and regulatory intervention, together with making space available for infrastructure, would be enough to encourage the private sector to invest in processing capacity. However, in light of the low cost of the status quo it seems likely that Councils would also need to invest in creating some processing capacity via capital investment.

It is important to note that implementing individual options is unlikely to have a significant impact. Therefore a multipronged approach will be required in order for Councils to significantly reduce the high quantity of C&D waste being sent to landfill within the Wellington Region. Such an approach would need to incorporate the demonstration of territorial authority leadership through procurement practices for Council construction and demolition projects, the establishment of an effective regulatory framework, and the provision of infrastructure necessary to support the establishment of C&D resource recovery sites/facilities.

While a joint territorial authority (and regional council) commitment to pay for C&D waste recovery on their projects, and where appropriate, to make use of the recovered materials, will improve the viability of C&D recovery operations in the Wellington Region, the councils should not be the only purchaser of C&D waste recovery services or recovered products. Therefore Council guidance and standards applicable to other public sector projects and private sector developments also remains important.

1 Introduction

Construction and demolition (C&D) waste is a problematic high volume waste stream in the Wellington Region. While a range of opportunities exist to reduce, reuse and recycle this waste, to date such waste management and minimisation mechanisms remain unutilised and underdeveloped in the Wellington context.

In response to this issue, the eight territorial authorities of the Wellington Region have engaged Tonkin & Taylor Ltd (T+T) to undertake a review of the scope of C&D waste minimisation issues within the Wellington Region, and to identify the range of options available to the councils in response to the issues identified. The findings of the review are documented in this report.

In summary, the review informing this report considered the following (as agreed to in the Letter of engagement and associated work brief, dated 8th June 2018):

- Review of the current situation, considering information which is available as part of the Regional Waste Assessment, site operators, Greater Wellington Regional Council and existing knowledge held by T+T for the Wellington region.
- Review of the estimated quantities and characteristics of C&D waste and future anticipated quantities, noting gaps in data identified.
- High level analysis of the issues and opportunities associated with minimisation and diversion of C&D waste, with particular reference to material currently disposed of at Class 1, 2, 3 landfills.
- High level analysis of the costs and benefits associated with each of the options identified.
- Drafting an Issues and Options report. The initial working copy was discussed in a workshop with the WMMP Steering Group on 16th July 2018. The Waste Management and Minimisation Plan Steering Group comprises of territorial authority officers from around the region.

2 Background

The Wellington Region Waste Minimisation and Management Plan (WMMP) 2017 – 2023 sets the strategic direction for territorial authority-level waste management and minimisation activities across the Wellington Region. The WMMP has a target to reduce the total quantity of waste sent to Class 1 landfills by 200kg per person, by 2027. This target includes reducing the amount of C&D materials being disposed of into the region's three Council owned Class One landfills (see section 3.3 below).

Within the WMMP, councils also identify a range of actions that recognise the need to investigate options for minimising the amount of construction and demolition waste produced across the region[1]. These actions encompass the potential development of facilities for diverting construction and demolition waste away from all Class 1 – 4 landfill types, as well as the processing of diverted material for re-use. As such, the councils acknowledge the importance of investigating the potential expansion of the region's resource recovery network in order to reduce the amount of waste disposed of into all landfills across the region.

As detailed within the Technical Guidelines for Disposal to Land (2016), prepared by the Waste Management Institute of New Zealand, landfills can be categorised into the following four types:

- **Class 1 – Landfill (Municipal Solid Waste Landfill)**

  A Class 1 landfill is a site that accepts municipal solid waste. A Class 1 landfill generally also accepts C&D waste, some industrial wastes and contaminated soils. Class 1 landfills often use managed fill and clean fill materials they accept, as daily cover.

- **Class 2 – Landfill (C&D Landfill):**

  A Class 2 landfill is a site that accepts non-putrescible wastes including C&D wastes, inert industrial wastes, managed fill material and clean fill material. C&D waste can contain biodegradable and leachable components which can result in the production of leachate – thereby necessitating an increased level of environmental protection.

- **Class 3 – Landfill (Managed Fill):**

  A Class 3 landfill accepts managed fill materials. These comprise predominantly clean fill materials, but may also include other inert materials and soils with chemical contaminants at concentrations greater than local natural background concentrations, but with specified maximum total concentrations.

- **Class 4 – Landfill (Clean Fill):**

  A Class 4 landfill accepts only clean fill material. The principal control on contaminant discharges to the environment from Class 4 landfills is the waste acceptance criteria. Stringent siting requirements to protect groundwater and surface water receptors are not required.

[1] See the Wellington Regional WMMP Regional action R.IN.1; Hutt City actions R.2; E.12; KCDC action IN.3; PCC action IN.1; Combined Wairarapa Council Actions E.6; WCC LM12.

3 Current situation

3.1 Sources of data

Information on C&D waste management in the Wellington region can be difficult to obtain. For this project we have:

- Reviewed the 2016 Regional Waste Assessment[2].
- Talked with some operators of the landfills (where possible).
- Sought information from Greater Wellington Regional Council.
- Drawn on our knowledge of Class 1 Landfill operations and C&D waste disposal sites around the region.

Land used exclusively for cleanfill disposal is a Permitted Activity under the Regional Plan for Discharges to Land for the Wellington Region, Rule 10. This means there is no mechanism for identifying sites or gathering data on the type or quantity of material entering this type of site. Larger cleanfill disposal sites may be captured under other Regional or District Plan requirements, however smaller sites or those operating for short periods of time are unlikely to be subject to formal consent processes.

3.2 Material types

C&D waste is defined in the New Zealand Waste List (L code) 17 as C&D wastes (including excavated soil from contaminated sites). The waste list provides a high-level list of the material types including:

- Concrete, bricks and tiles
- Wood, glass and plastic
- Bituminous mixtures, coal tar and tarred products
- Metals (including alloys)
- Soil (including excavated soil from contaminated sites), stones and dredging spoil
- Insulation materials and asbestos containing construction materials
- Gypsum based construction material
- Other C&D wastes.

Where any material type listed above is/contains hazardous material, it should be sent to a Class 1 landfill[3].

3.3 C&D Waste Disposal Sites in the Wellington Region

The 2016 Regional Waste Assessment identifies the destinations where C&D waste is likely to be disposed of in the region.

Existing quantities of C&D waste produced in the Wellington region are not well documented. The Wellington Regional Waste Assessment has some C&D waste information, however this is largely focused on municipal solid waste (MSW) and Class 1 landfills and composition/ source data from a survey in SWAP surveys in September 2013 and June 2014.

[2] Wellington Region Waste Assessment 2016

[3] This is consistent with Ministry for the Environment Guidance and it is likely that Resource Consent or Permitted Activity rules covering Class 2 – 4 landfills will preclude the disposal of hazardous materials. In practice rules and consent wording is not always clear and compliance/auditing of materials entering disposal sites provides less than 100% coverage of loads entering specific sites.

There are also disposal sites that fit the Class 2 - 4 definitions in the Wellington region. There are two consented Class 2 landfills: C&D landfill and T & T landfill, both located south west of Wellington. There are also several consented clean fills (Class 4) currently (September 2018) operating in the Wellington region. Because disposal of clean fill and the disposal of on-farm waste is a permitted activity in the Wellington Region, smaller clean fill sites and farm dumps are not recorded by Councils and have not been identified here.

As smaller sites accepting only inert materials do not require formal approvals, identifying these sites is difficult. The list presented in Table 3.1 notes sites with Resource Consents for waste disposal and others of a reasonable scale that have been identified for this project. There will multiple other sites around the Wellington Region that are not identified here. The sites identified in this study are identified in Table 3.1 and Figure 3.1.

Table 3.1: Disposal sites in the Wellington Region

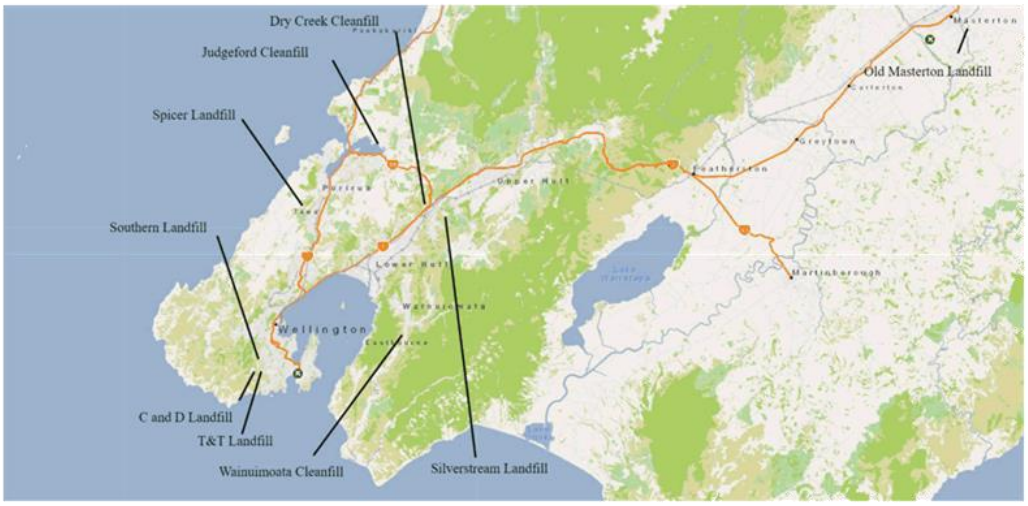
Site name	Location	Landfill Class	Capacity (approx.)	Capacity (years at current filling rate)
Southern Landfill	Happy Valley, Wellington	Class 1	C&D waste accepted as general waste, materials likely to be diverted to C&D and T and T landfills nearby.	
Silverstream Landfill	Silverstream, Lower Hutt	Class 1	When primarily cleanfill material arrives at Silverstream Landfill it is diverted to Wainuiomata cleanfill. C&D waste accepted as general waste.	
Spicer Landfill	Broken Hill, Porirua	Class 1	Some cleanfill material accepted for cover, C&D waste accepted as general waste.	
C&D landfill	Happy Valley, Wellington	Class 2	300,000m^3[4] Est 2.9 M m^3	1-2 years[4] 35 years[5]
T & T landfill	Wellington	Class 2	Unknown	Scheduled for completion 2019-20
Old Masterton landfill	Nursey Road, Masterton	Class 4 Landfill capping	Not available	
Judgeford cleanfill	Judgeford, Porirua	Class 4	340,000m^3	Unknown
Wainuiomata cleanfill	Wainuiomata, Wellington	Class 4	Not available	6-12 months
Dry Creek Cleanfill	Haywards, Lower Hutt	Class 4 Quarry overburden	Not available	
Permitted activity*	Unknown locations and number of sites.	n/a	Not available	

*There are an unknown number of sites across the region operating under permitted activity provisions. Permitted activities are not actively monitored by Greater Wellington Regional Council.

There is limited information available on charges for disposal at Class 2-4 landfills in the Wellington Region. Class 1 Landfills charge around $115/T with discounts in some cases for cleanfill where this is required for operational purposes. Our estimate of disposal charges is $10-25 per m^3 of material.

[4] Existing gully space
[5] Consent for gully next to C&D landfill – western gully for C&D waste

Figure 3.1: Map of Identified Landfill and Cleanfill Sites in the Wellington Region



3.4 Quantity of C&D Waste in the Wellington Region

The 2016 Regional Waste Assessment estimated the volume of C&D waste sent to Class 1 landfills for 2014/15 to be 32,099 tonnes per annum. In contrast, estimates from landfill operators in 2015 suggested that 525,000 tonnes per annum was being disposed of into Class 2-4 landfills within the Wellington Region. The estimate of 525,000 tonnes per annum converts into a per capita disposal rate of 1.06 tonnes per person per annum.

It is also noted that demolition activity in the Wellington Region following the 2016 Kaikoura earthquake would have resulted in a significant increase in C&D material requiring disposal in 2017, however the precise amount remains unknown.

The Waste Assessment identified a lack of sorting facilities in the region for C&D waste. The locations where sorting was being undertaken included Woods Waste (central Wellington) and Southern and C&D landfill. The materials currently being sorted at these sites includes metals, wood, concrete, brick, plasterboard including some types of plastics.

Table 3.2: Estimated quantity of C&D waste sent to landfill in the Wellington Region (2018)

Landfill type	Approximate annual quantity accepted (T)
Class 1	32,099 T/year [6,7]
Class 2-4	Estimated 546,070 T/year[8]

[6] Data taken from the Wellington Region Waste Assessment 2016 – Table 26 – C&D waste (activity class) to class 1 landfills from Wellington Region

[7] Data taken from the Wellington Region Waste Assessment 2016 – approximate annual quantity of all waste accepted is 225,000 T per year at Southern, Silverstream and Spicer landfills.

[8] Data taken from the Wellington Region Waste Assessment 2016. This supported by available data on capacity and remaining life for C&D landfill (300,000 m³, 1-2 years) and Judgeford Cleanfill (340,000 m³, 1-2 years life) assuming that the majority of C&D waste material goes to Class 2 landfills.

3.5 Framework for C&D Waste Management in Wellington

The management of C&D waste in the Wellington region is influenced by a number of factors. These include:

- Statutory requirements.
- The availability of services (collection, processing, markets and disposal sites).
- The cost for various services and facilities.

3.5.1 Statutory requirements

A range of legislation has the potential to influence the management of C&D waste. This includes the Building Act 2004 (Building Act), the Waste Minimisation Act 2008 (WMA) and the Resource Management Act 1991 (RMA).

The Building Act controls building and demolition activity with a focus on building structures and safety. The Act precludes the demolition, or removal of the building if that demolition or removal would be in breach of any other Act.

The WMA is focussed on waste minimisation and a decrease in waste disposal in order to create environmental, social, economic, and cultural benefits, and to protect the environment. The Act provides a range of tools for central and local government to use to achieve these outcomes, which include:

- A waste levy, currently applied to waste disposal sites that accept household waste[9] (effectively Class 1 landfills).
- Provision for product stewardship, requiring product owners (manufacturers or importers) to take responsibility for the management of products when they become waste[10].
- Provision for bylaws (previously included in the Local Government Act 2002) covering various aspects of solid waste management[11].
- Territorial Authority waste management and minimisation planning requirements for the promotion of effective and efficient waste management within a City/District.

The RMA deals with land use planning and the management of discharges to land, air or water. This includes waste processing operations and the disposal of waste in Class 1 – 4 landfills. The RMA provides for permitted activities, activities that can proceed with no formal approval or assessment by the relevant regulatory authority. Many cleanfill disposal sites (Class 4 landfills) and waste processing activities are covered by Permitted Activity rules.

In the Wellington Region there are various controls on C&D activity that may impact on the management of C&D waste. They include:

- Regional Plan controls on waste disposal (discharge of waste to land, discharge to air from a waste disposal facility, discharge to land where contaminants may impact ground or surface water).

[9] At the time of writing (Sept 2018) Government has signalled an intention to review both the value and the scope of the waste levy. It is possible that this will result in an increase from the current $10 per T applied at Class 1 Landfills. It is also possible that this will result in the levy being applied at Class 2 and 3 Landfills at $10 per T or more.
[10] At the time of writing (Sept 2018) there are a number of voluntary product stewardship schemes in place. The WMA provides for compulsory schemes and Government has signalled an intention to implement compulsory schemes where there is a strong case for doing so.
[11] There is a model bylaw focussed on household collections and data provision. Christchurch City Council have a Cleanfill and Waste Handling Operations bylaw (2015) that controls of the processing and disposal of C&D waste at sites within Christchurch City.

- Regional Plan controls on building or demolition in the coastal marine area, lake bed or stream bed.
- District Plan controls on building and demolition activity.
- Building Control Authority (relevant City or District Council) Building Act requirements for both demolition and construction.

MfE in collaboration with local government and industry developed best practice guides for the reduction of C&D waste in the late 1990's with the material maintained and updated by BRANZ. The Resource Efficiency in Building and Related Industries (REBRI) project developed a set of practical guides that reduces waste through improved resource efficiency. The guidelines look at the whole life of a building, from design and construction through to deconstruction/demolition.

3.6 Other factors

There are several other factors that have an impact on the management on C&D waste in the Wellington Region that should also be acknowledged, as follows:

- **The availability of quarried aggregate**. Concrete often makes up a significant proportion of C&D waste, and in many areas in New Zealand is reprocessed for use as aggregate. As there are numerous quarries across the Wellington Region[12] it currently makes it difficult for crushed (reprocessed) concrete to compete within this market[13]. In contrast, in Auckland, quarries are located a significant distance from the central city and other areas where major construction takes place, and as a result the reprocessing of concrete for aggregate is a cost competitive option.
- **The availability of suitable industrial land for C&D waste processing facilities.** C&D waste processing typically requires a relatively large amount of space (for sorting and for stockpiling of materials) and involves noisy and/or dusty operations. Industrial land in the cities where significant construction activity is taking place is often at a premium[14].
- **Construction and demolition processes.** C&D work is completed by specialist contractors with specific projects procured on the basis of a range of factors including quality of work, safety, availability and price. Typically price dominates with contractors generally offering the cheapest option that meets their client's requirements.

  For construction many projects are managed by one party with a large number of subcontractors. Similarly, these projects are incentivised to provide the required quality of work at the lowest price. The cost of solid waste management is typically a small proportion of the total construction cost. Key factors influencing overall cost include labour, materials and total time. From a waste perspective this means that:

  - Projects may be already be reusing materials where it is easy to do so and/or saves a significant amount of money[15].
  - There is limited overall consideration of waste costs and potential for recovery (each subcontractor is focussed on their part of the project).
  - Any waste recovery option that impacts on overall project timeline is unlikely to be voluntarily implemented.

[12] For example Kiwi Point, Horowiki, Dry Creek, Waitohu, Paraparaumu.
[13] The life span of these quarries nevertheless remains variable.
[14] For example, in Wellington City's eastern suburbs (Airport, Weta Workshop/Film studios), Wellington CBD, Hutt CBD, Porirua major housing developments
[15] A recent example of this in practice is the recycling of concrete at CentrePort during repair and redevelopment after the November 2016 Kaikoura earthquake. In this case CentrePort had space available to stockpile and crush concrete for reuse as backfill in land repair activities across the port reconstruction.

In some cases space is also at a premium making timely removal of waste a priority over sorting or reusing materials on site. In other main centres in New Zealand waste companies sort C&D waste skips before recovering or disposing of materials. Commercial viability is linked to the cost of transport and disposal and markets (value) for recovered materials.

For demolition, time and cost are likely to be the key drivers of current practice. Where there is a financial benefit in doing so contractors are more likely to recover materials and reflect this in their price. Examples include metals (copper, aluminium fittings) and high value native timbers. In other areas in New Zealand, and internationally, the cost of transport and disposal of demolition material means manufacturing aggregate from concrete/rubble is viable. In the Wellington Region low disposal costs and the close proximity of disposal sites, together with the availability of other sources of aggregate, make resource recovery more difficult.

- **Green building initiatives.** There are several initiatives to promote sustainability in buildings in New Zealand. GreenStar is a building rating system that includes consideration of waste from construction. Another initiative is the Infrastructure Rating tool developed by ISCA, which assesses a range of factors including waste generation for projects including transport and other urban infrastructure. Where projects are targeting a high rating under this type of system waste is often a target area. In the Wellington Region these voluntary schemes have the potential to improve C&D waste reduction outcomes where clients are prepared to pay a premium for documented waste recovery.

4 Future situation

While historic data on the quantity of C&D waste material generated in the Wellington Region is useful, it is important to consider likely future quantity and characteristics. It is also important to consider how available services and facilities may change over time.

In terms of identifying further scenarios for the estimation of C&D waste, a review of potential infrastructure in the region has been identified.

4.1 Measures of potential growth

There are several potential approaches to predicting future C&D waste generation. Conventional 'predictors' for waste generation like population or households can be used. Other factors of relevance for C&D waste include construction activity (new building consents via Statistics NZ, major projects via media and regional development reporting) and Regional GDP (Statistics NZ).

4.1.1 Regional GDP

GDP for the Wellington Region is reported by Statistics New Zealand[16]. GDP in Wellington is driven by the service and government sectors. In the Wellington Region construction activity is driven by commercial building (for example Wellington Airport terminal, Wellington Central Business District (CBD) office construction or upgrades), residential (sizable developments in Wellington, Porirua, Hutt Valley and Kapiti) and transport infrastructure (SH1 Peka Peka to Otaki and Transmission Gully, Wellington Airport runway).

Statistics NZ data shows Wellington Regional GDP had an average increase of approximately 2.9% on average year on year since 2008 until the end of 2017, with the GDP average increasing by 3% over the three years prior to the end of 2017. Appendix A provides a table of the data available for GDP for the Wellington region.

4.1.2 Building consent data

The number of building consents issued since 1990 is available on the Statistics New Zealand website[17]. The data show that the number of new building consents for construction has been increasing since June 2008. The lowest number of consents for the Region was seen for the South Wairarapa (average from 2008; 9.7 per month, average for 2017; 11.3 per month). The highest number of consents was for Wellington City with an average from 2008 of 93.4 per month and an average for 2017 of 77.3 per month.

The difference in averages for each district in the Wellington region was reviewed. There is significant variation in the number and type of building consents (see Appendix A, summarising a range of data that is related to construction and demolition activity).

The National Construction Pipeline Report[18] for 2017 indicated that during 2016 there was an increase of 15% in residential building activity. The report does highlight that non-residential building activity in Wellington is expected to remain at the current levels until 2020, after which there is an expected decrease in growth. The data highlighted in this report draws on similar

[16] Statistics New Zealand, Regional Gross Domestic Product
http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=b4008085-9afc-451c-8bf1-aef6d29b9db3
[17] Statistics New Zealand, Building consents by territorial authority and selected wards (monthly)
[18] http://www.mbie.govt.nz/publications-research/research/construction-sector-productivity/national-construction-pipeline-report-2017.pdf

patterns in terms of residential dwelling consents, with a 16% increase and growth to increase until at least 2020.

4.1.3 Population

The population in the Wellington region was reviewed back to 2008 and is available from Statistics New Zealand. Population data is available until the end of 2017. The average annual increase from 2008 to 2017 is 0.9%, with population average increase over the last 4 years at 1.2%, since 2014. With the highest increases in Carterton District (19.9% increase between 2008 and 2017), followed by Wellington City with an 11.5% increase in population (see Appendix A).

4.2 Future activity and trends

There are a number of factors which may have an impact on the future C&D waste generation in the Wellington region. These are discussed below along with the potential associated impact which can be attributed to these impacts. It is difficult to develop accurate figures for potential C&D waste generation, in many cases the focus is on highlighting uncertainty or broad order of magnitude impacts.

4.2.1 Kiwibuild

Kiwibuild was set up in December 2017 by the Ministry of Business, Innovation and Employment (MBIE) to deliver the Government's KiwiBuild programme. The key aim of Kiwibuild is to deliver affordable homes into the market, due to demand outweighing supply in the last ten years.

At the time of writing (July 2018) there is no detail of the number of homes proposed for Wellington as yet, however Wellington is one of the areas highlighted where proposals were specifically being sought. Houses are currently being developed in Auckland primarily.

From a C&D waste generation perspective the impact of Kiwibuild is uncertain. An increase in residential building activity is likely to result in an increase in waste based on current per house waste generation. However, larger scale building activity may result in a decrease in waste per house as a result of the potential commercial benefits of:

- Developing waste 'hubs' to capture specific waste streams.
- Increased use of modular components or buildings (see Section 4.2.2).
- Pressure on construction companies to reduce costs to secure the large contracts on offer with waste disposal costs one of many areas for potential cost savings.

4.2.2 Modular buildings

There has been a significant amount of discussion around the potential benefits of modular residential buildings in the New Zealand market. This is largely in response to the relatively low productivity of the New Zealand construction sector. As noted above, Central Government have identified modular construction as one change that will make it possible to deliver a large number of new residential properties in a relatively short period of time.

Modular construction is relatively common internationally. Fletcher Construction have developed a new modular build house which can be delivered to site in 4-5 sections and assembled on site within one week.

The impact of modular construction on C&D waste generation is uncertain. Manufacturing of components in New Zealand is likely to shift the location of waste generation (from the building site to the factory). Depending on the manufacturing process standardised designs are likely to target maximum material utilisation i.e. less waste. In some cases modular buildings may be designed for

ease of deconstruction and reuse, reducing the generation of waste when a building is no longer needed or functioning. If modular components are generated off shore manufacturing waste will be generated and managed elsewhere. Building site waste would shift to packaging (including protection) and off cuts from final, on site adjustments.

4.2.3 Future development

As detailed below, there are a number of large scale future developments in the pre-planning or planning stages proposed for the Wellington region[19]. These developments have the potential to increase expected quantities of C&D waste material in the region beyond the status quo. Wellington Airport – there is a proposal for a runway extension which is currently on hold, along with a programme of refurbishment works across the site.

- Citiblox apartments – a new apartment block proposed for central Wellington.
- Masterton Civic Centre development – Development of a large capacity venue with a varied use to include sports hosting, music and performing arts.
- Indoor arena in Wellington to seat approximately 10-12,000. WCC are seeking an investment partner.
- Refurbishment of Wellington railway station.
- Shelley Bay development with an approximate value of $500M comprising hotels, apartments, ferry terminal etc.
- Hutt City CBD development.
- State highway developments, for example Peka Peka to Otaki (in construction), Transmission Gully (in construction), Melling Interchange/RiverLink (currently being re-evaluated) and the Petone to Grenada Link Road (currently being re-evaluated).
- 3 Waters infrastructure development/upgrade in across Wairarapa.
- Plimmerton Farm – 386 hectares development of 1,500 plus sections and 60 lifestyle blocks.
- Kenepuru Hospital redevelopment – Redevelopment of 50 hectares into more than 600 affordable homes of medium density and standalone homes.
- New highway from Otaki to north of Levin, in June 2018 NZTA announced that there was a new strategic direction set out of the last Government`s draft Policy Statement on Land Transport. The current status for the extension of SH1 is that this project has been identified as requiring re-evaluation.
- Ongoing works to earthquake damaged buildings across the region.
- Let's Get Wellington Moving (Central Wellington) is also likely to involve significant construction activity associated with transport and urban development projects.

At this stage the level of detail surrounding these potential upcoming developments is not at a point that allows assumptions to be made around the potential C&D waste associated with these developments.

4.2.4 Natural disasters

In addition to trends that can be predicted (with some uncertainty) natural disasters are a potentially significant driver of both C&D activity in the Wellington Region. The Kaikoura earthquake

[19] https://www.wellingtonnz.com/business/invest/key-investment-sectors/large-construction-projects/

has been an illustration of this with several large buildings demolished to date and potential for further demolition, rebuilds and refurbishments.

When considering future activity, consideration needs to be given to ensuring that processing and disposal arrangements provide for emergency situation capacity and significant spikes in C&D waste generation.

4.2.5 Waste Levy

As noted previously, Government have clearly signalled a review of the waste levy (currently $10/T) and the potential for facilities to be impacted. At the time of writing (July 2018) there is no detail available regarding how the waste levy will change. Consideration is currently being given to raising the levy and/or extending the coverage of the levy (to Class 2-3 landfills).

With disposal charges as low as $10 - $25/m^3 for Class 2 - 3 Landfills[20] the current $10/T levy encourages non-household, relatively inert materials, to be disposed of at Class 2-3 Landfills. This means a change in the levy has the potential to have a material impact on disposal processing or choices for C&D waste materials. For example:

- If a $10/T levy was imposed on Class 2 - 3 Landfills this would increase disposal costs. However, if imposed in isolation from levy increases for Class 1 landfills it could remove the differential between Class 1 and Class 2 - 3 Landfills.
- If the levy at Class 1 Landfills was increased this would increase the driver for C&D waste to be disposed of at Class 2 - 4 Landfills.
- If a levy is introduced at Class 2 - 3 Landfills this will improve the financial viability of processing/recovery of some materials. In this instance, the feasibility of C&D resource recovery will depend on the existence of local markets and availability of processing capacity and capability.

4.2.6 Emissions trading scheme

Under the Climate Change Response Act 2002, the Emissions Trading Scheme (ETS) landfill operators are required to report on the annual tonnage landfilled to enable a calculation of the emission unit surrender obligations and thus the associated cost for landfill owners. Currently the ETS obligations apply for sites accepting household waste only (effectively Class 1 Landfills), drawing on the waste levy approach. If the levy is extended to other landfills there is potential for the ETS to also extended to apply to Class 2 – 3 Landfills. This would result in a relatively small increase[21] in the cost of disposal to allow landfill operators to recover the cost of meeting their ETS obligations.

4.3 Projected C&D Waste Quantity in the Wellington Region

Based on the data presented in Section 3 and potential drivers of growth C&D waste volumes have been projected out to 2030. This estimate assumes:

- Continuation of the current average population growth year on year of 1.2% in the Wellington region.
- Reliance on the accuracy of estimates used in the 2016 Waste Assessment for C&D waste to class 2 - 4 landfills, being 1.057 tonnes per capita.
- That the approximately 32,000 T/year of C&D waste disposed of at Class 1 landfills (from the 2016 Waste Assessment) stays at this level i.e. any growth goes to Class 2 - 4 landfills).

[20] For inert materials 1m^3 is typically 1-3T.
[21] C&D waste has a relatively lower organic/degradable fraction meaning the ETS liability is likely to be relatively low.

Projected quantities of C&D waste disposed of to landfill based on a constant quantity of waste per capita are presented in Table 4.1[22]. This does not make any adjustments for natural disasters or attempt to account for the impact of changes due to the influence of changes in the waste levy or ETS. The lack of detailed projections for building activity or wider economic activity make it difficult to base projections on these indicators.

Table 4.1: Projected C&D waste quantity in the Wellington Region

Landfill type	Estimated tonnage (2016)	Estimated tonnage (2018)	Future tonnage (2030)
Class 1	32,000[23]	32,000	32,000
Class 2-4	525,000[24]	546,070	634,308
Total	Est 560,000	Est 580,000	Est 665,000

[22] Population growth estimated at around 1.2% per annum.
[23] Data taken from the Wellington Region Waste Assessment 2016, assumed to stay at a similar level with growth predominantly disposed of at Class 2 facilities.
[24] Data taken from the Wellington Region Waste Assessment 2016 – operator estimate

5 Objectives for C&D Waste Management in the Wellington Region

5.1 Reporting Objectives

The Waste Minimisation Act (2008) sets the overarching objectives for C&D waste management in New Zealand. The purpose of the Waste Minimisation Act (2008) is to encourage waste minimisation and a decrease in waste disposal in order to—

(a) protect the environment from harm; and
(b) provide environmental, social, economic, and cultural benefits.

The Act consequently recognises the importance of promoting the socio-economic, cultural and environmental benefits as a result of waste minimisation activities. While C&D waste disposal is currently low cost within the Wellington Region, there currently remains scope to improve the efficiency of C&D waste resources in a manner that is beneficial to the community. The diversion and reuse of C&D waste resources will also have the additional benefit of extending the capacity based life of landfill facilities across the region.

For the purposes of this report, the objectives of the Wellington Region Waste Minimisation and Management Plan provide a useful guide to the strategic waste priorities of territorial authorities within the region. The plan's goals, and underlying objectives, can be summarised as:

Waste Free *– reducing waste to landfill, increase reuse, recovery and recycling, investigate recovery and treatment technologies and improve data.*
Working together *– partnerships (between Councils, with the private and community sectors), producer responsibility*
Benefit our communities *– identify efficiency, understand short and long term cost impacts, understand environmental impacts and protect human health.*

For C&D waste this suggests objectives for C&D waste should include:

- To reduce the amount of C&D waste disposed of to landfill (Class 1 – 4).
- To increase the reuse, recovery and recycling of C&D waste.
- To investigate the use of available technologies for C&D waste recovery and recycling.
- To improve data on C&D waste disposal, recovery and recycling.
- To advance C&D waste minimisation in partnership with the private and community stakeholders.
- To promote efficient C&D waste management and minimisation.
- To understand and address the environmental and human health impacts of C&D waste management options.
- To ensure C&D waste materials are disposed of at appropriate facilities.

5.2 Council Roles

It is also important to understand the range of roles local authorities currently take in the waste management system in the Wellington Region. As signalled in the Figure 5.1 (below), these roles include:

- **Community leadership**
  - Long Term Plan
  - Waste Minimisation and Management Plan
- **Regulatory**
  - Bylaw
  - Consents
- **Public Good**
  - Litter and illegal dumping
  - Recycling
- **Commercial services**
  - Refuse collection for households
  - Refuse transfer stations, landfills

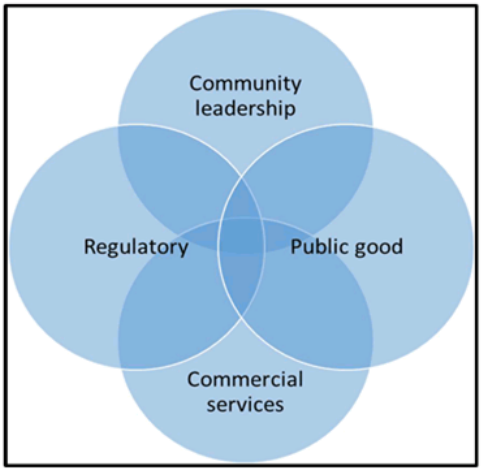


Figure 5.1: Council roles

As a number of councils own and operate landfills, and offer waste management services in the community, when considering how to advance construction and demolition waste minimisation options, councils should remain cognisant of the potential for any actual and/or perceived conflict of interest with privately owned waste companies. While these considerations should not necessarily preclude any council investment in C&D waste minimisation initiatives or investments, they do highlight the importance of any such initiatives/investments being undertaken for the purpose of supporting the public good.

6 Issues

In light of the reporting objectives identified in section 5, the C&D waste situation overview presented in sections 3 and 4 suggests that there are a number of C&D minimisation waste issues in the Wellington region, as discussed below:

6.1 Data

One of the challenges in compiling a summary of the current situation has been the lack of information on C&D waste management in the Wellington Region. This is not unusual in New Zealand and reflects the lack of formal oversight of a large proportion of C&D waste processing and disposal.

Key data gaps include:

- The quantity of C&D waste generated in the Wellington Region.
  For this report estimates have been developed based on operator comments, approximate annual quantities accepted at landfills and historic data for Class 1 Landfills. While there is data on waste from Construction and demolition activities entering Class 1 landfills data on materials entering Class 2 -4 Landfills is very limited. Estimates for materials to Class 2 – 4 are based on population or economic activity and typical waste generation rather than actual figures for the Region or individual sites.
- The composition of C&D waste.
  The composition of C&D waste is related to specific projects and will vary significantly between projects and through different project phases.
- Capacity (how much materials can be accepted) and capability (what sort of materials can be processed) of existing facilities.
  For this project we have used consent information where available and our knowledge of the sector in the Wellington Region.

Approaches adopted elsewhere to address this issue include periodic surveys of C&D waste facilities or using regulatory functions of Councils to require information on the quantity and type of material accepted by each facility. Internationally C&D waste facilities are often covered by waste levy regimes including associated detailed reporting and audit requirements.

6.2 Capacity – Diversion Processing

The research completed for this report suggests there is very limited reuse and processing of C&D waste in the Wellington Region. This is likely to reflect commercial viability in some cases[25] including the presence of relatively cheap disposal options available close to most major construction activity. In other areas significant C&D waste processing activity often involves companies or individuals focussed on resource efficiency as core to their approach. In many cases C&D waste recovery is supported by project owners requiring waste minimisation or broader sustainability outcomes for their projects.

C&D Waste processing requires space and capital investment. Successful resource recovery operations also rely on motivated management and staff – in reality resource recovery is about business philosophy as well as business opportunity. In the Wellington Region the established approach employing conventional demolition and hauling materials to low cost disposal is a commercially viable business model. Large scale processing for reuse, recovery or recycling is likely

[25] For example quarried aggregate vs. recycled crushed concrete.

to involve a new entrant to the market or a significant change in business model for one or more of the current waste and demolition contractors.

6.3 Capacity - Disposal

With the current generation of C&D waste in the order of 550,000 T per year, it is important that there is sufficient capacity to manage these materials appropriately. In the absence of significant reuse, recovery or recycling activity these materials will require suitable disposal locations.

The information collected for this report suggests that the Region is reliant on a small number of Class 2 disposal sites to provide adequate capacity for C&D waste. If these sites were to stop operating or reach capacity there is potential for this material to be disposed of at the Class 1 facilities in the region. The impacts of this would include:

- A significant increase in costs for C&D waste generators;
- An impact on the available capacity in Class 1 landfills. 0.5M T per year of C&D waste would have a significant impact on available capacity in Class 1 Landfills in the region[26]; and/or
- Inappropriate/illegal disposal of C&D waste in Class 4 Landfills, and potentially farm dumps, to avoid high disposal charges at Class 1 landfills.

These factors may result in an increase in recovery activity if the costs (transport and disposal) make diversion/recovery alternatives more commercial attractive. If the cost of managing waste materials (through recovery or disposal) increase there is potential for design or methodology changes to reduce waste materials on construction or demolition projects.

6.4 Uncertainty

As noted in Section 6.1, there is considerable uncertainty regarding the quantity of C&D waste material currently reused, recycled or disposed in the Wellington Region. This is compounded by challenges in predicting future C&D waste generation reflecting uncertainty with respect to:

- Construction activity in the region.
- The impact of current work to improve the efficiency of the construction sector in New Zealand (e.g. modular/prefabricated buildings).
- The potential for disaster events producing spikes in C&D waste generation.

This uncertainty means that planning for future processing and disposal capacity needs to account for this variability, with pricing likely to reflect lower volumes (higher cost).

6.5 Regulatory Intervention

There are a number of ways that regulation can support effective management of C&D waste. This includes resource consents for processing and disposal sites, waste bylaws and the regulation of building and demolition activity under the RMA and Building Act.

Controls on disposal sites

Class 1 and 2 landfills are consented by Greater Wellington Regional Council. For Class 2 landfills consent monitoring is focussed on offsite discharges rather than materials entering the disposal sites. There is also limited auditing of the quantity and characteristics of the materials entering each consented site. Class 4 landfills are typically Permitted Activity and therefore not subject to any

[26] These sites are currently accepting around 0.25M T of general waste per year i.e. half of the estimated C&D waste currently disposed of at Class 2-4 landfills. If all C&D waste was disposed of at Class 1 landfills that would be three times the current amount i.e. landfill life would be reduced by two thirds.

planned compliance activity. It is difficult to know whether this is occurring and to what degree without detailed compliance/auditing of both consented (Class 2-3) and permitted activities

Historically this has meant that Class 2 and 4 landfills have accepted a wide range of materials with limited oversight from the Regional Council. Because they are assumed to be accepting largely inert materials and are designed accordingly, the development and operations costs are relatively low. Key challenges for the Regional Council are resourcing for compliance activities for consented activities and funding and resources for monitoring permitted activities.

The key issue for controls on disposal sites is the potential for materials to be deposited at inappropriate landfills as a result of unclear requirements and limited compliance activity. This results in low disposal costs and in some cases poses an environmental risk. Other issues include:

- Illegal dumping of materials on public and private land - cost of clean-up, lost revenue (for collections and/or disposal), lost levy.
- Illegal dumping of the 'wrong' materials at disposal facilities e.g. general waste to a managed fill - environmental impacts (land contamination, discharge of contaminants to water), lost revenue for appropriate facilities, lost levy revenue.

Waste bylaws

Current waste bylaws in the Wellington Region are focussed on collection of general waste from domestic and commercial properties rather than C&D waste. The Regional WMMP Working Group are in the process of reviewing these waste-related bylaws. This regional bylaw review process has the potential to result in regional consistency across future territorial authority bylaw provisions, and, where relevant, the potential expansion to bylaw provisions to promote C&D waste minimisation and address C&D data gaps.

Development and building controls

We have not identified any C&D waste minimisation specific requirements under District Plans around the Wellington Region or through the application of building controls under the Building Act. There is New Zealand guidance available on the development of site specific waste management plans for building and construction activity and there is potential to incorporate requirements for waste management plans in Resource Consents or Building Consent processes.

6.6 Construction and Demolition Sector

As noted in Section 3.6, C&D activity within the Wellington Region is currently focussed on defined quality, lowest cost and timely completion. While there may be opportunities to deliver on these key drivers and also reduce waste, project managers and site staff are unlikely to focus a lot of effort on waste minimisation without third party intervention.

In some cases C&D waste minimisation activities are already occurring. For example:

- Where the price of conventional waste management (everything in one bin, disposal at landfill) is high it has encouraged projects to implement alternatives[27].
- Sustainability rating tools and/or client requirements have provided the motivator for reducing waste on specific projects.

[27] For example in Auckland (combination of transport distance/cost and disposal charges) and Christchurch (high disposal costs, regulation of cleanfills via Christchurch City Council by-law.

- Publically funded projects promoting existing voluntary guidance[28] and support processing and reuse/ recovery initiatives[29].

Key issues in Wellington include:

- A lot of major commercial demolition and construction is on confined sites (Wellington Airport, Wellington CBD, Hutt CBD), limiting the potential for on-site C&D waste diversion, separation and short-term storage

  In other urban centres off-site sorting and processing sites have been established to address this limitation, reflecting the high cost of transporting and disposing of unsorted materials in those areas. The low cost of disposal in Wellington and proximity of disposal sites to major projects makes this less attractive commercially.

- Costs for the conventional single bin to landfill approach are low due to a combination of proximity to disposal sites and low disposal charges, incentivising waste disposal over waste diversion

  Even where there is potential to sort materials on site the relatively low cost of transport and disposal makes it difficult to justify C&D waste recovery activities for many projects.

- There is limited client interest in sustainability certification for buildings (GreenStar, ISCA) or general information available on how to reduce waste or make use of recovered materials.

  Sustainability certification schemes have encouraged C&D waste recovery in other areas alongside commercial factors (expensive disposal, high transport costs and availability of materials for reuse).

- The markets for recovered materials in the Wellington Region are undeveloped.

  C&D waste recovery requires a viable market for recovered materials. For example, there is limited crushed concrete available in Wellington therefore designers are unfamiliar with the product and don't specify crushed concrete.

[28] REBRI Guidance maintained by BRANZ.
[29] Examples include Christchurch City Council's Target Sustainability programme and Tauranga City Council's REBRI programme.

7 Options

7.1 Option Overview

There are a range of options that could be considered in light of the current situation (Section 3), potential future scenarios (Section 4) and issues identified in the report (Section 6.2). These options draw on actions taken in New Zealand, and internationally, and provide targeted solutions to Wellington Region specific issues. Table 7.1 summarises the options identified.

Table 7.1: Option summary

Option	Summary
Procurement Policy	Council C&D project specifications include requirements to: - Use recovered or recycling C&D waste where feasible to do so. - Minimise the wastage of materials. - Maximise the recovery of waste produced. - Report on waste generation, treatment, processing and disposal.
Bylaw Regulation	New Council (regionally consistent) bylaw focussed on C&D waste management and minimisation including: - On site storage and sorting. - Transport. - Processing. - Disposal (Targeting Class 2 – 4 Landfills) and/or reuse. - Data Provision.
Invest in waste processing (dry waste)	Councils invest in one or more sites for the sorting and processing of 'dry' C&D waste currently disposed of at Class 1 and 2 Landfills. Likely target materials are metals, concrete/rubble and usable timber off cuts. Potential Council owned locations include Otaihanga Landfill, Silverstream Landfill, Spicer Landfill and Southern Landfill.
Invest in waste processing (concrete)	Councils invest in one or more sites for the processing of concrete/rubble currently disposed of at Class 2 - 4 landfills for aggregate. Potential Council owned locations include Kiwi Point Quarry, Silverstream Landfill, Spicer Landfill and Southern Landfill.
Making C&D Waste processing area available	Councils make suitable space available for private or community sector organisations to sort and/or process C&D waste currently disposed of at Class 1 and 2 Landfills. Potential Council owned locations include Otaihanga Landfill, Silverstream Landfill, Spicer Landfill and Southern Landfill.
Regional Council Resource consent compliance (illegal dumping)	Councils support the Regional Councils to develop a strategy to address inappropriate disposal of C&D waste and other materials in Class 2 – 4 Landfills across the region. This should cover resourcing for compliance activity (particularly for Permitted Activities) and a longer term focus on improving the clarity of resource consent and Permitted Activity conditions.
Integrated plan / roadmap	Councils develop an integrated plan to deliver on C&D waste objectives for the Wellington Region. Ideally this would include: - Engagement with key private and community sector stakeholders - An integrated approach to address the issues identified in this report - Timeline, budget, action owners and metrics to measure progress (linked to the WMMP targets) - Funding from multiple parties.

Option	Summary
Regulating construction /demolition activities via resource consents and building consents.	Councils develop a consistent approach to influence waste generation and management of C&D activities through the regulation of development (RMA) and building (Building Act) activity.

Table 7.2 (below) notes the objectives, roles and issues relevant to each option. Sections 7.3 – 7.10 go on to discuss each option in more detail, followed by a summary of the option evaluation in section 7.11.

Table 7.2: C&D Waste Management Options

	Procurement Policy	Bylaw	Invest in processing (dry waste)	Invest in processing (concrete)	C&D Waste area available	Resource consent (illegal dumping)	Integrated plan/ roadmap	Regulating construction /demolition activities
Objectives								
To reduce the amount of C&D waste disposed of to landfill (Class 1 – 4).	Y							
To increase the reuse, recovery and recycling of C&D waste.	Y		Y	Y	Y			
To investigate use of available technologies for C&D waste recovery and recycling.			Y	Y	Y		Y	
To improve data on C&D waste disposal, recovery and recycling.		Y				Y	Y	Y
To work on C&D waste management in partnership with the private and community sectors.					Y		Y	
To promote efficient C&D waste management	Y		Y	Y	Y		Y	Y
To understand and address the environmental and human health impacts.						Y		
Roles								
Community Leadership	Y	Y	Y	Y	Y	Y	Y	Y
Regulatory		Y				Y		Y
Public Good	Y	Y	Y	Y	Y	Y	Y	Y
Commercial Services			Y	Y	Y			
Issues								
Data		Y				Y	Y	
Capacity - Processing	Y		Y	Y	Y		Y	

	Procurement Policy	Bylaw	Invest in processing (dry waste)	Invest in processing (concrete)	C&D Waste area available	Resource consent (illegal dumping)	Integrated plan/ roadmap	Regulating construction /demolition activities
Capacity - Disposal							Y	
Uncertainty							Y	Y
Regulation		Y				Y	Y	Y
C&D Sector	Y						Y	Y

7.2 Option Analysis Approach

Each of the options identified in Section 7.1 have been evaluated against the objectives for C&D waste noted in Section 5.

The objectives considered were to:

- To reduce the amount of C&D waste disposed of to landfill (Class 1 – 4).
- To increase the reuse, recovery and recycling of C&D waste.
- To investigate the use of available technologies for C&D waste recovery and recycling.
- To improve data on C&D waste disposal, recovery and recycling.
- To advance C&D waste minimisation in partnership with the private and community stakeholders.
- To promote efficient C&D waste management and minimisation.
- To understand and address the environmental and human health impacts of C&D waste management options.
- To ensure C&D waste materials are disposed of at appropriate facilities.

For each objective the option was scored 1, 2 or 3. The ranking of 3 represents an improvement from current situation, 2 is similar to the current situation, and 1 where there is increased cost or the option contrary to the objective. The intention of the analysis is to identify options that justify further consideration. In all cases further work will be required to quantify implementation and ongoing costs, and likely performance against the remaining objectives.

7.3 Procurement

Councils and other public sector organisations are major clients for construction projects in the Wellington Region. Standard requirements relevant to effective C&D waste minimisation in all Council construction contracts would therefore have a material impact on the market in the Wellington Region. These could include rules requiring projects to:

- The use of recovered material, or recycling C&D waste where feasible to do so.
- Minimising the wastage of materials.
- Maximising the recovery of waste produced.

- Reporting on waste generation, treatment, processing and disposal.

Example specifications exist and could be readily adapted and used for Council projects (see for example the REBRI Contract specifications for waste management in Appendix B and the draft C&D waste bylaw provisions provided by Eunomia Consulting in Appendix C).

It is noted that the adaption and refinement of these provisions may be required. When considering the appropriateness of these provisions, the Council may wish to consider:

- The Council's willingness to pay for improved C&D waste minimisation outcomes.
- The Council's willingness to use recovered materials in construction projects.
- The availability of appropriate support services e.g. on site and off site waste sorting centres, and material processing facilities.
- The need for suitable quality assurance associated with any recovered materials.

Table 7.3: Procurement Costs vs Benefits

Assessment criteria	Rank[30]	Assessment Assumptions / Comments
Implementation cost - Procurement provisions/policy adopted	3	Possible procurement provisions are available (see Appendix B).
Ongoing costs - Ongoing technical support from Council waste staff - Potential higher cost for recovered materials. - Additional cost paid for C&D waste processing.	1	Accommodate within existing teams There may be a contract cost increase as a result of additional C&D waste minimisation requirements.
Reduce C&D waste to landfill	3	Effective procurement provisions would be likely to reduce C&D waste disposal to landfill.
Increase the reuse, recovery and recycling of C&D waste.	3	Effective procurement provisions would be likely to reduce C&D waste, but effectiveness will rely on the availability of recovered materials and recovery/recycling services
Improved data on C&D waste diversion and disposal rates.	2	Improved information from Council projects, but not across the C&D sector.
Partnerships for C&D waste management	2	Partnerships could be effective in supporting processing capacity but the focus of this option is on Councils as clients rather than partners.
To understand and address the environmental and human health impacts	2	Hazardous C&D waste would still be required to be safely disposed of into Class 1 landfill.

[30] 3 = improvement from current situation, 2 = similar to current situation, 1 = increased cost, or contrary to objectives.

Assessment criteria	Rank[30]	Assessment Assumptions / Comments
Climate change impact	2	Disposal related benefits/impacts: limited to Council controlled projects. Transport related benefits impacts: limited to Council controlled projects Materials use related benefits impacts: Council controlled projects have the potential to support broader market development.
Overall (maximum 24)	18	

7.4 Bylaw Provisions

Councils have the ability to put in place bylaws for various aspects of waste management under the WMA. In addition to the current work reviewing the existing waste-related bylaw around the Wellington Region, councils could put in place controls on the collection and processing of C&D and cleanfill waste. A bylaw addressing cleanfill waste is currently in place in Christchurch and could provide a template for a similar bylaw (see Appendix D). Draft C&D waste management and minimisation bylaw provisions have also been development for Eunomia Consulting for a number of territorial authorities around New Zealand (see Appendix C). Relatedly, existing industry guidance has already been developed by REBRI outlining the scope of what a C&D waste management plan should comprise of (see Appendix E).

For controls in bylaws to be effective in the Wellington Region they would need to be implemented across multiple councils. Controls could cover:

- On site storage and sorting.
- Transport.
- Processing.
- Disposal and/or reuse.
- Data reporting to Councils.

The impact of bylaw provisions covering C&D waste include:

- Enhanced consideration of C&D waste minimisation planning as part of construction and deconstruction activities.
- Improved data on C&D waste processing and disposal.
- Improved control on the disposal of materials at Class 2 – 4 landfills.

Table 7.4: Bylaw Costs vs Benefits

Assessment criteria	Score[31]	Assessment Assumptions / Comments
Implementation cost - Draft bylaw developed.	3	See Appendix C and D for bylaw examples.
Ongoing costs - Ongoing technical support from Council waste staff - Licensing and enforcement.	2	Accommodate within existing teams Additional resource, logically shared with solid waste bylaw.

[31] 3 = improvement from current situation or low cost, 2 = similar to current situation, 1 = increased cost or contrary to objective.

Assessment criteria	Score[31]	Assessment Assumptions / Comments
Reduce C&D waste to landfill.	2	Limited direct impact.
Increase the reuse, recovery and recycling of C&D waste.	2	Limited direct impact.
Improved data on C&D waste.	3	Significant improvement in data once implemented.
Partnerships for C&D waste management.	2	Improved data will inform and enable partnership discussions.
To understand and address the environmental and human health impacts.	3	Improved information will inform broader assessment.
Climate change impacts	2	Disposal related impacts – no direct impact, may improve selection of disposal facility. Transport related impacts – no direct impact. Materials use related impacts – no impact.
Overall (maximum 24)	19	

7.5 Invest in waste processing (dry waste)

As noted previously in this report, C&D waste diversion and processing is limited in the Wellington Region. The information presented suggests that this is in part related to the low cost for transport and disposal of materials at existing Class 2 landfills. It is also due to the lack local and central government intervention incentivising and/or requiring C&D waste diversion. It is also possible that there is unserviced demand for processing of C&D materials, for example where projects are seeking sustainability ratings, or clients are seeking C&D waste reduction on their projects[32].

In this context, there is potential for Councils to invest in one or more sites for the sorting and processing of 'dry' C&D waste[33]. Target materials could include metals (copper, aluminium, high quality steel), concrete/rubble and usable timber[34]. Council owned locations that could be suitable for dry waste diversion activities include Otaihanga Landfill, Silverstream Landfill, Spicer Landfill and Southern Landfill. These are all located in areas where significant construction activity is anticipated[35].

Sorting and processing doesn't need to be complex with key requirements including:

- Space for receiving loads – a large compacted or hard stand area
- Space and equipment for sorting – bobcat or small digger for moving materials
- Space for storage of materials – to allow for simple sorting, designed to protect materials quality

[32] For example, when Meridian Energy developed their office building on the Wellington Waterfront they worked with Wellington City Council to sort and divert waste from the construction activity as part of their sustainability rating process.
[33] Easily identifiable/removable materials are recovered at Spicer and Southern Landfill transfer stations. What is proposed here is actively sorting C&D waste materials rather than opportunistic recovery from the transfer pit.
[34] The recently established sorting operation at Blenheim Transfer Station targets brick, soil, rubble, glass, plastics, metals, wood, GIB and cardboard
[35] Kapiti transport projects, residential development, Hutt CBD and transport projects, Porirua residential and CBD developments and Wellington Airport and CBD projects respectively.

Table 7.5: Dry waste processing Costs vs Benefits

Assessment criteria	Rank[36]	Assessment Assumptions / Comments
Implementation cost - Identify suitable location - Site design (drop-off, sorting, stockpile). - Site construction and plant purchase.	1	Possible locations could target existing Council owned sites, or a potential shared regional facility on a new site. Estimated cost to develop a simple sorting yard with storage bunkers is $50 – 100,000 depending on site conditions.
Ongoing costs - Site operations (staff, maintenance, fuel/power) - Costs less revenue (gate rate, materials sale).	1	Potentially integrate into existing operational site, or develop at a standalone (TA or regional) facility. Costs will vary accordingly. The Council/s will need to determine whether the operation would be funded on a fully commercial basis, or as public good.
Reduce C&D waste to landfill.	3	Potentially significant impact
Increase the reuse, recovery and recycling of C&D waste.	3	Potentially significant impact
Improved data on C&D waste.	2	Potentially improve data availability but highly dependent on pricing and resulting market share.
Partnerships for C&D waste management	3	Potential to develop and operate in partnership with private and/or community sector.
To understand and address the environmental and human health impacts.	2	Limited impact although may target the removal of potentially hazardous materials, for example paint, adhesive or filler containers.
Climate change impacts	3	Disposal related benefits/impacts – reduced disposal of recoverable materials. Transport related benefits/impacts – similar transport required, to markets rather than disposal. Materials use related benefits/impacts – recovered materials displacing new, typically with lower net climate impact.
Overall (maximum 24)	18	

7.6 Invest in waste processing (concrete)

As noted in Section 6.2 there is limited existing processing of C&D waste materials in the Wellington Region. The information presented suggests that this is in part related to the low cost for transport and disposal of materials at existing Class 2 landfills. The lack of markets for recovered materials is also likely to be a factor with recycled crushed concrete viable elsewhere in New Zealand, but this is not a strong feature of the Wellington Regional market.

In this context there is potential for Councils to invest in one or more sites targeting the production of recycled crushed concrete for Wellington Region projects. Council owned locations that could be suitable include Kiwi Point Quarry (WCC), Silverstream Landfill, Spicer Landfill and Southern Landfill.

[36] 3 = improvement from current situation or low cost, 2 = similar to current situation, 1 = increased cost or contrary to objective.

An existing rock processing operation is the most logical choice with potential to use existing equipment or complement existing plant with specialist concrete crushing equipment. Key considerations include:

- Managing noise and dust impacts on neighbouring properties.
- Space and equipment for processing.
- Space for stockpiles.

Table 7.6: Concrete processing Costs vs Benefits

Assessment criteria	Rank[37]	Assessment Assumptions / Comments
Implementation cost - Identify suitable location - Site design (drop-off, sorting, stockpile). - Site construction and plant purchase.	2	Target Council owned sites, e.g. Kiwi Point Quarry[38]. Costs will be limited if using an existing quarry operation.
Ongoing costs - Site operations (staff, maintenance, fuel/power) - Costs less revenue (gate rate, materials sale)	2	This ranking assumes the integration of concrete crushing within existing operations. Need to determine whether operation will be funded as public good or on fully commercial basis.
Reduce C&D waste to landfill	3	Potentially significant impact
Increase the reuse, recovery and recycling of C&D waste.	3	Potentially significant impact
Improved data on C&D waste	2	Potentially improved data availability, but this would be highly dependent on pricing and resulting market share.
Partnerships for C&D waste management	2	Crushed concrete will compete with commercial aggregate products from quarries around the Region, potential reduced need for new sites or expansion of existing sites. The Council/s will need to determine whether the operation would be funded on a fully commercial basis, or as public good.
To understand and address the environmental and human health impacts.	2	Limited impact, potentially reduce the need for new or expanded quarry operations.
Climate change impacts	3	Disposal related impacts – reduced disposal of recoverable materials. Transport related impacts – depending on processing location, crushed concrete produced closer to point of use. Materials use related impacts – crushed concrete displacing virgin aggregate, typically with lower net climate impact.
Overall (maximum 24)	19	

[37] 3 = improvement from current situation or low cost, 2 = similar to current situation, 1 = increased cost or contrary to objective.
[38] Kiwi Point Quarry is the logical first location.

7.7 Making C&D Waste processing area available

As noted and discussed in Section 6.4 and 6.5 there is limited existing processing of C&D waste materials in the Wellington Region. An alternative to Councils investing in processing operations (dry waste and/or concrete) is to make space available for private or community sector organisations to establish this type of operation. This model has been adopted in other areas, for example the former Te Maunga Landfill (now transfer station and open space) in Tauranga. Tauranga City Council have made space available at a low or nominal rent for various activities including organic and C&D waste processing and a commercial materials recovery facility.

Key considerations include:

- Council's role (i.e. land owner, part-funder, partner).
- Managing regulatory requirements i.e. who is responsible (RMA, safety).

Table 7.7: Space for C&D waste processing - Costs vs Benefits

Assessment criteria	Rank[39]	Assessment Assumptions / Comments
Implementation cost - Identify suitable location(s) - Site design (drop-off, sorting, stockpile). - Site construction and plant purchase.	2	Target Council owned sites, Kiwi Point Quarry is the logical first location. Implementation costs will be limited if a private sector development.
Ongoing costs - Site operations (staff, maintenance, fuel/power) - Costs less revenue (gate rate, materials sale)	2	Private or community sector cost The Council will need to determine whether operation will be funded as public good or on fully commercial basis.
Reduce C&D waste to landfill	3	Potentially significant impact to reduce waste to landfill, but this will be subject to project commercial viability, and/or suitable community sector partnerships.
Increase the reuse, recovery and recycling of C&D waste.	3	Potentially significant impact to divert and reuse waste, subject to commercial viability and/or suitable community sector partnerships.
Improved data on C&D waste	2	Potentially improve data availability, but this will be highly dependent on pricing and resulting market share.
Partnerships for C&D waste management	3	Targeting development and operation in partnership with private and/or community sector.
To understand and address the environmental and human health impacts.	2	Limited impact

[39] 3 = improvement from current situation or low cost, 2 = similar to current situation, 1 = increased cost or contrary to objective.

Assessment criteria	Rank[39]	Assessment Assumptions / Comments
Climate change impact	3	Disposal related benefits/impacts – reduced disposal of recoverable materials. Transport related benefits/impacts – similar transport required, to markets rather than disposal. Materials use related benefits/impacts – recovered materials displacing new, typically with lower net climate impact.
Overall (maximum 20)	20	

7.8 Regional Council resource consent compliance (illegal dumping)

One of the issues identified includes the potential for inappropriate disposal of C&D waste materials at Class 2 – 4 landfills in the Wellington Region and on privately owned land. It is difficult to know whether this is occurring and to what degree without detailed compliance/auditing of both consented (Class 2-3) and permitted activities.

As noted elsewhere Regional Council has limited resources and limited funding for compliance activity.

There is potential for Councils to develop a strategy to address illegal dumping (inappropriate disposal) of C&D waste and other materials in Class 2 – 4 Landfills across the region. In New South Wales (NSW) a similar strategy was developed to target commercial scale illegal dumping driven in part by levy avoidance[40]. The strategy should be developed in close consultation with key stakeholders and identify a package of actions that are partly existing (already funded) and partly initiatives that are unfunded. In NSW actions included establishing collaborative RID (Report Illegal Dumping) squads, researching drivers for illegal dumping and education of transporters and waste generators. An outline scope for an Illegal dumping strategy might include:

The issue(s):

- *Illegal dumping of materials on public and private land - cost of clean-up, lost revenue (for collections and/or disposal), lost levy.*
- *Illegal dumping of the 'wrong' materials at disposal facilities e.g. general waste to a managed fill - environmental impacts, lost revenue for appropriate facilities, lost levy revenue.*
- *Note: need to be clear on cross over between litter (Litter Act) and illegal dumping (Health Act, RMA, WMA).*

Stakeholders:

- *Territorial authorities - clean-up of illegal dumping, lost revenue as providers of waste services, lost levy funding.*
- *Regional Council - monitoring and enforcement of consented disposal facilities (in theory funded by consent holder), monitoring and enforcement of permitted activity (may be part funded by fines).*
- *Central government - potential for improved data and increased levy returns.*

Potential strategy outline:

[40] The NSW Levy is currently over AU$135 per tonne in metro Sydney

- *Objective(s)*
- *Framework for action - regulatory, collaboration…*
- *Activities*
  - *Funded/existing*
  - *Additional*
- *KPI, monitoring and evaluation.*

Table 7.8: Illegal dumping strategy - Costs vs Benefits

Assessment criteria	Rank[41]	Assessment Assumptions / Comments
Implementation cost - Strategy drafting - Stakeholder engagement - Identify funding sources (consent fees, rates, WMF)	1	This would likely be a resource intensive project that would be dependent on voluntary stakeholder engagement.
Ongoing costs - Strategy reporting/updates - Compliance/audit functions	1	Ongoing costs could potentially be integrated across existing Regional Council and TA roles.
Reduce C&D waste to landfill	2	A focus on appropriate (safe) disposal may just shift materials to more appropriate disposal site.
Increase the reuse, recovery and recycling of C&D waste.	2	A focus on appropriate (safe) disposal may just shift materials to more appropriate disposal site. However, if an appropriate site has a higher cost it may subsequently promote shift to resource recovery.
Improved data on C&D waste	3	Likely to improve data
Partnerships for C&D waste management	3	Develop in partnership with key stakeholders.
To understand and address the environmental and human health impacts.	2	A well designed strategy should significantly improve evidence base for understanding real impacts of C&D waste management.
Climate change impact	2	Disposal related benefit impacts: no direct impact, may improve selection of disposal facility. Transport related benefits/impacts: no direct impact. Materials use related impacts – no impact.
Overall (maximum 24)	16	

7.9 Integrated roadmap for C&D waste minimisation

Many of the options presented in Section 7 have the potential to improve the management of C&D waste in the Wellington Region on their own. It is clear when the individual options are compared

[41] 3 = improvement from current situation or low cost, 2 = similar to current situation, 1 = increased cost or contrary to objective.

with objectives and issues (see Section 7.1) that a range of options will be required to achieve all of the objectives and address the issues identified.

This suggests that there may be value in the Councils of the Wellington Region developing an integrated plan to deliver on the C&D waste minimisation objectives. Ideally this would include:

- An integrated approach to address the issues identify in this report.
  - Addressing regional waste recovery capacity and capability.
  - Developing local markets for recovered materials.
  - Addressing disposal issues (current low costs, inappropriate disposal).
- Timeline, budget, action owners and metrics to measure progress (linked to the WMMP targets).
- Engagement with key private and community sector stakeholders.
- Securing funding from multiple parties.

Table 7.9: Integrated Roadmap - Costs vs Benefits

Assessment criteria	Rank[42]	Comments
Implementation cost - Strategy drafting - Stakeholder engagement - Identify funding sources (consent fees, rates, WMF)	1	This would likely be a resource intensive planning and public engagement project.
Ongoing costs - Strategy reporting/updates - Compliance/audit functions	2	Integrate with existing roles (Regional Council and TA).
Reduce C&D waste to landfill	2	Relies on implementation of strategy components. Likely to be more effective with integrated approach.
Increase the reuse, recovery and recycling of C&D waste.	2	Relies on implementation of strategy components. Likely to be more effective with integrated approach.
Improved data on C&D waste	2	Components are likely to improve data availability and quality.
Partnerships for C&D waste management	2	Develop in partnership with key stakeholders.
To understand and address the environmental and human health impacts.	2	Components are likely to improve evidence base for understanding real impacts of C&D waste management.
Climate change impact	2	Disposal related benfits/impacts: no direct impact, may improve selection of disposal facility. Transport related benefits/impacts:no direct impact. Materials use related benefits/impacts: no impact.
Overall (maximum 24)	15	

[42] 3 = improvement from current situation or low cost, 2 = similar to current situation, 1 = increased cost or contrary to objective.

7.10 Regulating C&D activities through consenting requirements

In addition to Council's role in regulating waste activity through Resource Consents[43] and bylaws,[44] territorial authorities regulate development and construction activity through the RMA[45] and Building Act. The focus of this activity is unlikely to be on waste generation or management, but there is potential to provide guidance or set requirements relating to C&D waste.

Councils have the potential to develop a consistent approach to influencing waste generation and management on C&D activities through the regulation of development (RMA) and building (Building Act) activity. Examples could include:

- Requiring project waste management and minimisation plans.
- Targeting and helping facilitate waste reduction during construction and demolition projects.
- Encouraging (including through building approvals) the use of recovered materials.

As noted in Section 7.3, the REBRI suite of tools provides a starting point for C&D waste minimisation covering design, planning, materials recovery and reuse. The REBRI material also provides guidance on including C&D waste minimisation aspects in contracts. This material could provide guidance in the context of consenting construction and demolition activities or be used as the basis for developing appropriate performance standards and/or reporting requirements (see Appendix B).

Table 7.10: Consenting requirements for C&D activities - Costs vs Benefits

Assessment criteria	Rank[46]	Comments
Implementation cost - Identifying specific mechanisms to encourage waste reduction and recovered materials use. - Engagement with Council RMA and Building staff on practical implementation matters.	3	Implementing new (additional) consenting standards would be most effective when implemented regionally. New controls would take time to be implemented but would draw on existing resources within Councils.
Ongoing costs - Ongoing technical support from Council waste staff	2	Integrate with existing roles (Regional Council and TA).
Reduce C&D waste to landfill	2	Anticipate a reduction but rely on the availability of recovery/recycling services
Increase the reuse, recovery and recycling of C&D waste.	2	Anticipate an increase but rely on the availability of recovered materials based products and recovery/recycling services
Improved data on C&D waste	3	Waste management plans requiring reporting to Council will improve data availability and quality.
Partnerships for C&D waste management	2	No change as a result of this option but is likely to be more successful if there are partnerships to deliver processing capacity.

[43] Regional Council, for discharges to the environment from disposal or processing sites, Territorial Authorities for the use of landfill processing or disposal.
[44] Under the WMA
[45] For example where a proposal exceeds District Plan building footprint or height rules, development in specific zones.
[46] 3 = improvement from current situation or low cost, 2 = similar to current situation, 1 = increased cost or contrary to objective.

To understand and address the environmental and human health impacts.	2	Limited impact
Climate change impacts	2	Disposal related impacts – no direct impact, may improve selection of disposal facility. Transport related impacts – no direct impact. Materials use related impacts – no impact.
Overall (maximum 24)	18	

7.11 Option Evaluation Summary

Sections 7.3 – 7.10 outline the eight options available to Councils to achieve their objectives for C&D waste minimisation in the Wellington Region. The options have also been considered with reference to key issues identified in Section 6. The evaluation has assigned a score against several criteria and is summarised here. A higher overall score indicates a more preferable option. The most preferable options (scoring 3) for each objective are highlighted in **bold** in Table 7.11.

Table 7.11: Option evaluation summary[47]

	Procurement Policy	Bylaw	Invest in processing (dry waste)	Invest in processing (concrete)	Make C&D Waste area available	Resource consent (illegal dumping)	Integrated plan/ roadmap	Regulating construction /demolition activities
Section	**7.3**	**7.4**	**7.5**	**7.6**	**7.7**	**7.8**	**7.9**	**7.10**
Implementation cost	**3**	**3**	1	2	2	1	1	1
Ongoing costs	1	2	1	2	2	1	2	2
Reduce C&D waste to landfill	**3**	2	**3**	**3**	3	2	2	2
Increase the reuse, recovery and recycling of C&D waste.	**3**	2	**3**	**3**	**3**	2	2	2
Improved data on C&D waste	2	**3**	2	2	2	**3**	2	**3**
Partnerships for C&D waste management	2	2	**3**	2	**3**	3	2	2
To understand and address the environmental and human health impacts.	2	**3**	2	2	2	2	2	2
Climate change impacts	2	2	**3**	**3**	**3**	2	2	2
Overall (maximum 24)	**18**	**19**	**18**	**19**	**20**	**16**	**15**	**18**

[47] Scoring: 3 = improvement from current situation or low cost, 2 = similar to current situation, 1 = increased cost or contrary to objective.

The evaluation suggests that in all cases, the options for intervention identified will impact the materials disposed of at Class 1, 2 and 4 landfills. However, six options have the potential to be particularly effective in achieving the objectives of the evaluation and therefore would benefit from further consideration by the Councils of the Wellington Region. Nevertheless, it is important to recognise that implementing any one option individually will, alone, be unlikely to make a significant impact. A multipronged approach is therefore required, combining provision of appropriate infrastructure, Council leadership (through procurement) and establishing the right policy framework.

The options identified for further consideration are summarised below:

- **Establishing processing capacity by investing in dry waste processing, investing in concrete processing & making C&D Waste area available** – These options will initially impact largely on C&D materials currently disposed of at Class 1 landfills with Class 2 – 4 landfills presenting a cheaper option that will be preferable for most projects. Council procurement requirements and links to sustainability ratings for other projects have the potential to broaden the impact of this option to some materials currently disposed of at Class 2 – 4 landfills.
- **Procurement Policy** - This option has the potential to impact on all waste materials generated on Council projects (i.e. those going to Class 1 – 4 landfills) through contractual obligations for processing or disposal.
- **Regulatory Intervention (Bylaw and Regulating construction & demolition activities)** – Regulatory intervention could improve data on the management of C&D waste in the Wellington Region. It will could help to ensure that C & D waste minimisation is considered when planning for large construction and demolition projects and help ensure that residual materials are taken to an appropriate disposal facility. Regulatory intervention will impact on Class 1 – 4 landfills.

8 Conclusion

This report has outlined issues and opportunities relating to construction and demolition waste minimisation in the Wellington Region. Some of the issues and options identified are consistent with other parts of New Zealand, and in some cases international experience. Others are specific to the Wellington Region.

In summary, the issues include

- A lack of data and related uncertainty on C&D waste in the Region.
- A lack of regulatory intervention promoting C&D waste minimisation.
- Limited capacity to process and recover C&D waste.
- A small number of appropriate disposal sites.
- Limited and variable regulatory oversight of C&D waste disposal at Class 2 - 4 landfills.
- The availability of low cost disposal for C&D waste, close to where many major projects are occurring.

The C&D waste minimisation options identified to address these issues will have varying levels of impact on material disposed of at Class 1 and Class 2 – 4 Landfills. Of the options suggested for further consideration, procurement, introducing C&D waste management requirements in resource and building consents, and a C&D waste focussed bylaw have the most potential to impact on materials disposed of at Class 2 – 4 landfills. Developing additional processing capability is most likely to impact on materials disposed of at Class 1 Landfills where relatively high costs present more opportunity for savings.

The analysis presented here suggests that the Council focus should be on a combination of additional processing capability (the hard infrastructure) with supporting Council policy (bylaw, consent conditions, procurement policy). Ideally, the establishment of Council C&D related waste minimisation policy, together with making space available for infrastructure, would be enough to encourage the private sector to invest in processing capacity. However, in light of the low cost of the status quo it seems likely that Councils would also need to invest in creating some processing capacity via capital investment.

It is also important to recognise that implementing individual options in isolation from other measures is unlikely to have a significant impact. An integrated approach is therefore required combining provision of appropriate infrastructure, Council leadership (through procurement) and establishing an effective policy framework.

As discussed in this report, a joint territorial authority (and regional council) commitment to pay for C&D waste recovery on their projects, and where appropriate, to make use of the recovered materials, would improve the viability of C&D recovery operations in the Wellington Region. However, councils should not be the only purchaser of C&D waste recovery services or recovered products. This highlights the importance of the provision of Council guidance for other public sector projects and for private sector developments. It also suggests that the support of sustainability rating tools, such as GreenStar and ISCA, should form part of Council activity to promote resource recovery for C&D waste.

This paper has provided a high level analysis of C&D waste minimisation options, premised on a range of analytical assumptions. As a consequence, the conclusions of the analysis would benefit from further testing.

9 Applicability

This report has been prepared for the exclusive use of our client Wellington Regional WMMP Working Group, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd

t:\wellington\tt projects\1007345\workingmaterial\cd issues and options report 3.0 (final) (for submission er).docx

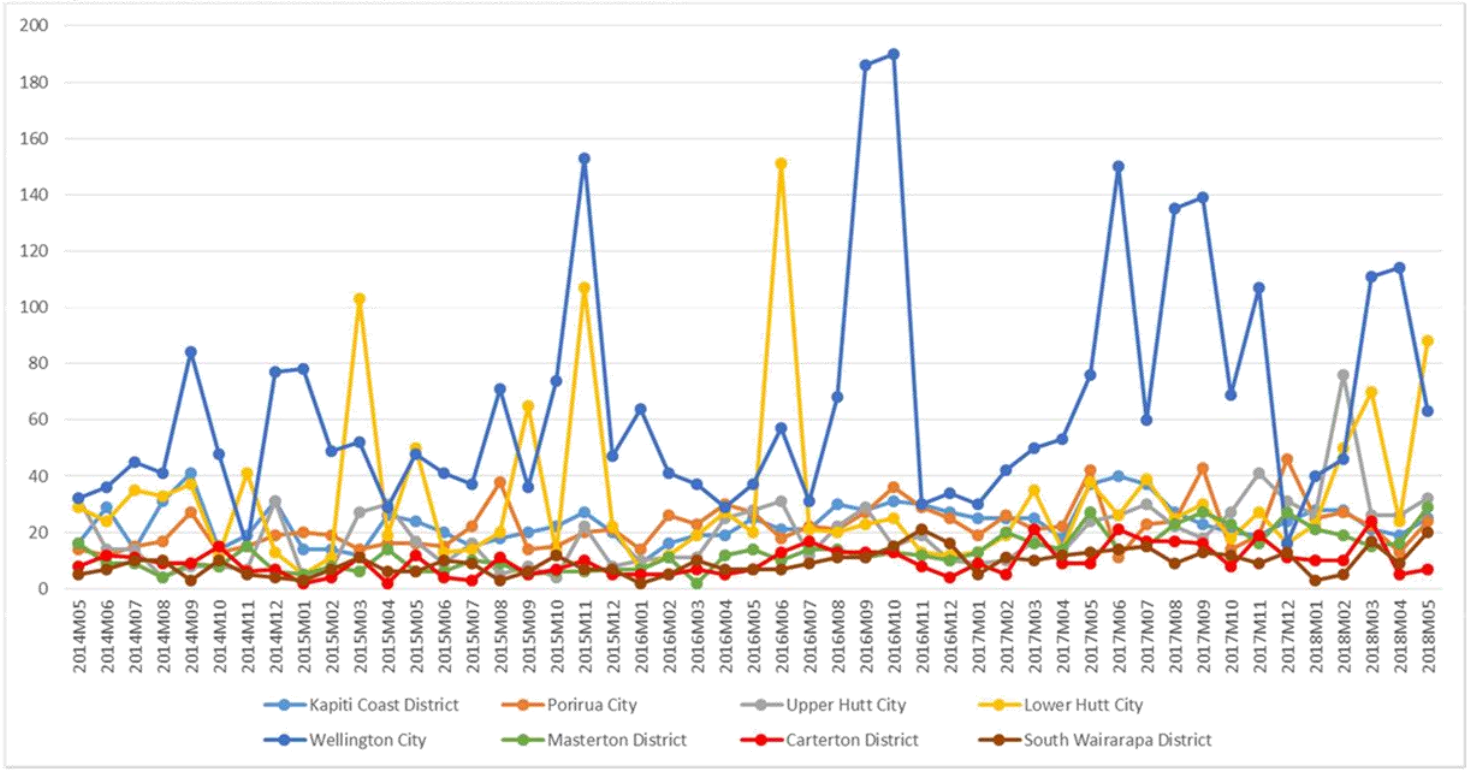
Appendix A : Potential Growth Data Sources

Year	GDP per person, by region (Annual-March) ($)	Percentage change (%)
2008	53869	
2009	55084	2.3
2010	57073	3.6
2011	58162	1.9
2012	61271	5.3
2013	61938	1.1
2014	64233	3.7
2015	66250	3.1
2016	67800	2.3
2017	69851	3.0
Average (2008-2017)	**61553**	**2.9**

38

Estimated Resident Population for Territorial Authority Areas, at 30 June(1996+) (Annual-Jun)										
Year	Kapiti Coast District	Porirua City	Upper Hutt City	Lower Hutt City	Wellington City	Masterton District	Carterton District	South Wairarapa District	Total population	Percentage change (%)
2008	48,600	51,100	40,100	101,100	190,800	23,300	7,550	9,290	471,840	
2009	49,100	51,700	40,400	101,300	192,500	23,500	7,700	9,400	475,600	0.8
2010	49,700	52,300	40,800	101,600	193,700	23,700	7,910	9,540	479,250	0.8
2011	50,200	53,000	41,300	101,700	195,400	24,000	8,130	9,690	483,420	0.9
2012	50,400	53,400	41,300	101,200	196,600	24,100	8,310	9,710	485,020	0.3
2013	50,700	53,700	41,300	101,200	197,500	24,100	8,490	9,800	486,790	0.4
2014	51,100	54,100	41,800	101,700	200,000	24,200	8,680	9,920	491,500	1.0
2015	51,400	54,500	42,000	102,000	203,800	24,400	8,790	10,000	496,890	1.1
2016	52,100	55,400	42,600	103,400	207,900	24,600	8,910	10,100	505,010	1.6
2017	52,700	56,100	43,200	104,700	212,700	25,200	9,050	10,250	513,900	1.8
% increase 2008 - 2017	**8.4**	**9.8**	**7.7**	**3.6**	**11.5**	**8.2**	**19.9**	**10.3**	**8.9**	

Building consents by territorial authority and selected wards (Monthly)



Appendix B: REBRI Contract Specifications for Waste Management[48]

The following are specifications that could be included in construction contract tender documentation between the principal and the contractor for a construction or deconstruction project.

Waste management goals for the project

[FOR CONSTRUCTION]

- The principal has established that this project shall generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimising over packaging and poor quantity estimating.
- Of the inevitable waste that is generated, disposal to landfills and cleanfills shall be minimised. This means maximising reuse and recycling of job site waste. At a minimum, the waste materials designated in this specification shall be reused and/or recycled.

[FOR DECONSTRUCTION]

- The principal has established that this project shall generate the least amount of waste possible and that processes shall be employed to ensure this is achieved, including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors.
- Of the inevitable waste that is generated, the waste materials designated in this specification shall be salvaged for reuse or recycled. Waste disposal in landfills and cleanfills shall be minimised. This means careful removal of building parts for reuse or recycling.

REBRI guidelines

In addition to other requirements specified herein, it is a requirement for the work of this project that the contractor is familiar with the REBRI Guide to Reducing Building Material Wastes – see www.rebri.org.nz.

Regulatory requirements

The contractor and any subcontractors shall:

- conform to applicable regulations for disposal and removal of common and hazardous waste
- handle and dispose of all hazardous and banned materials in accordance with national and local regulations – these hazardous and banned materials include but are not limited to asbestos, underground storage tanks, polychlorinated biphenyls (PCBs), abandoned chemicals (petrol, pesticides, herbicides, flammable and combustible substances), freon from cooling equipment, lead-based paints, smoke detectors and mercury-containing switches.

Submission of waste management plan

[48]BRANZ, rebri – Contract Specifications for Waste Management
https://www.branz.co.nz/cms_display.php?sn=240&st=1&pg=12505

Within 10 calendar days after receipt of notice of award of contract, or prior to any waste removal, whichever occurs sooner, the contractor shall submit to the principal and engineer a waste management plan. Attached is a sample format to aid the contractor in formulating the plan. The contractor may use this form or provide a custom form containing the same information.

The plan shall contain the following:

- ☐ Person(s) responsible for instructing workers and overseeing and documenting results of the waste management
- ☐ Waste avoidance or reduction at source measures that will be taken during the project
- ☐ Analysis of the proposed job site waste to be generated, including reusable, recyclable and waste materials (by volume or weight).
- ☐ Proposed alternatives to landfill and cleanfill disposal – a list of each material proposed to be salvaged, reused, or recycled during the course of the project and the destination. At minimum, the following materials shall be recycled:
  - ☐ concrete/brick/concrete block
  - ☐ asphalt
  - ☐ bricks, tiles and concrete blocks
  - ☐ all metal
  - ☐ plasterboard
  - ☐ vegetation
  - ☐ treated timber
  - ☐ untreated timber
  - ☐ corrugated cardboard
  - ☐ plastic and polystyrene
  - ☐ soil
  - ☐ any building components
  - ☐ insulation

[ADD FOR DECONSTRUCTION]

- ☐ treated and untreated timber lengths and panels
- ☐ heritage architectural elements such as mantle pieces, columns, mouldings etc
- ☐ cabinets and casework
- ☐ electric equipment and light fixtures
- ☐ plumbing fixtures
- ☐ windows, doors and frames
- ☐ hardwood flooring
- ☐ concrete – cast-in-place and precast
- ☐ exterior cladding.

Containers and signage: Description of bins/containers that will be used and the signage that will be used on the containers

Materials handling and storage procedures: Identification of measures to be taken to prevent contamination of materials to be reused or recycled and to ensure materials are consistent with requirements for acceptance by designated facilities.

Whether on-site separation will occur and how materials will be stored: Note that, where space permits, source separation is recommended. Where materials must be co-mingled they must be taken to a processing facility for separation off site.

Record-keeping: The contractor shall maintain a record of waste materials, recycled, reused and disposed of by the project using the REBRI Waste Management Plan and REBRI C&D Waste Transfer Form or a form generated by the contractor containing the same information. For each material recycled from the project, include the amount (in cubic metres or tonnes), or in the case of reuse state quantities by number, type and size of items, and the destination (i.e. recycling facility, used building materials yard). For each material landfilled include the amount (in cubic metres or tonnes) of material and the identity of the landfill, cleanfill and/or transfer station. If requested, the contractor should be able to submit to the engineer and/or principal the REBRI Waste Management Plan, REBRI C&D Waste Transfer Form(s) or bills, invoices and other documentation confirming that all materials have been received at the required locations.

Waste management plan implementation

Responsibility: The contractor shall designate an on-site party (or parties) responsible for instructing workers and overseeing and documenting results of the waste management plan for the project.

Distribution: The contractor shall distribute copies of the waste management plan to the job site foreman, each subcontractor, the principal, and the engineer.

Instruction: The contractor shall provide on-site instruction of appropriate separation, handling, and recycling to be used by all parties at the appropriate stages of the project.

[ALTERNATIVE CLAUSE FOR DECONSTRUCTION]

Instruction: The contractor shall provide on-site instruction of appropriate deconstruction techniques and handling and storage to maximise, quantity and quality of salvaged materials and to ensure materials meet any requirements for reuse.

Separation facilities: The contractor shall lay out and label a specific area to facilitate separation of materials for recycling and reuse. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials. The requirement for separation will only be waived if the contractor can demonstrate to the principal/engineer that there is insufficient room to accommodate it. If this is the case, the materials must be sent to a processing facility for separation off site.

Subcontractors: The contractor may engage a subcontractor and take responsibility for their waste or make each subcontractor responsible for their own waste. In any case compliance with these requirements is mandatory.

Note: Definitions of contractor, engineer and principal as per NZS 3910:2013 *Conditions of contract for building and civil engineering construction*.

Appendix C: Potential C&D waste plan bylaw requirements for territorial authorities.

Any person applying for a building consent for non-residential building work with an estimated value of $1,000,000 or higher must also submit a site waste management and minimisation plan to the council for approval.

A site waste management and minimisation plan must set out:

a The name of the client, principal contractor, and person who prepared the site waste management and minimisation plan;

b The location of the site;

c The estimated total cost of the building work;

d A description of each type of waste expected to be produced;

e An estimate of the quantity of each type of waste; and

f The proposed method of waste management for each type of waste (e.g. recovery, recycling, disposal).

While the building work is being carried out, the principal contractor will:

a Review the plan as necessary;

b Record quantities and types of waste produced; and

c Record the types and quantities of waste that have been:

i Reused (on or off site)

ii Recycled (on or off site)

iii Sent to other forms of recovery (on or off site)

iv Sent to landfill

v Otherwise disposed of.

Within three months of completion of the building work the principal contractor must add to the plan:

a Confirmation that the plan has been monitored and updated;

b A comparison of estimated quantities of each type of waste generated against the actual quantities of each waste type;

c An explanation of any deviation from the plan;

d (An estimate of any cost savings that have been achieved by completing and implementing the plan.

The principal contractor must ensure that a copy of the plan is kept on site, and that every contractor knows where it can be found. It must be available to any contractor carrying out any work described in the plan.

Appendix D: Christchurch City Council – Cleanfill and Waste Handling Operations Bylaw (2015)

CHRISTCHURCH CITY COUNCIL

CLEANFILL AND WASTE HANDLING OPERATIONS BYLAW 2015

Pursuant to the powers vested in it by the Local Government Act 2002 and the Waste Minimisation Act 2008, the Christchurch City Council makes this Bylaw.

1. SHORT TITLE

This Bylaw may be cited as the Christchurch City Council Cleanfill and Waste Handling Operations Bylaw 2015

2. COMMENCEMENT

This Bylaw comes into force on 1 December 2015.

3. PURPOSE

The purpose of this Bylaw is to:

a) Regulate and monitor operators collecting, managing, storing and using cleanfill and waste within the City through a licensing process;

b) Protect, promote and maintain public health and safety;

c) Provide comprehensive data and information for planning and waste management and minimisation purposes.

The following note is explanatory and is not part of the Bylaw: *Compliance with this Bylaw does not remove the need to comply with all other applicable Acts, regulations, bylaws, and rules of law, which may include the need to apply for a resource consent from the Council or from the Regional Council.*
This Bylaw does not (and cannot) cover any recycling activity. Some materials mentioned in this Bylaw can be recycled or reused and the Council encourages recycling and reuse of materials wherever possible.

4. INTERPRETATION

In this Bylaw, unless the context otherwise requires:

annual licence fee means:

- from the date this bylaw comes into force until 30 June 2016, the licence monitoring fee set out in Schedule C of the Christchurch City Cleanfill Licensing Bylaw 2008

- from 1 July 2016, the fee set out in Council's list of fees and charges that covers the administration and monitoring for licences granted under this or any former Bylaw

additional monitoring fee means the fee set out in Council's list of fees and charges that covers any additional monitoring carried out by the Council in relation to licences granted under this or any former Bylaw

cleanfill means material that, when buried, will have no adverse effects on people or the environment. Cleanfill material includes virgin natural materials, that are free of:

1. combustible, putrescible, degradable or leachable components;

2. hazardous substances;

3. products or materials derived from hazardous waste treatment, hazardous waste stabilisation, or hazardous waste disposal practices;

4. materials that may present a risk to human or animal health, such as medical and veterinary waste, asbestos, or radioactive substances;

5. liquid waste;

such as natural hardfill, other hardfill and cover material, but excluding hydro- excavation material.

The following note is explanatory and is not part of the Bylaw: *This definition is consistent with the definition of cleanfill in the Council's District Plan, the Regional Council's Land and Water Regional Plan, and the Ministry for the Environment's (MFE) 2002 document "A Guide to the Management of Cleanfills". The definition maintains a references to natural hardfill, other hardfill and cover material, as these terms have been used in Council's previous cleanfill bylaws. The definition does not allow 'conditionally acceptable materials' as cleanfill; these materials are not included within the MFE guidelines definition of cleanfill.*

cleanfill site means the land in respect of which the Council has granted the licensee a licence to allow the land to be used for the disposal of cleanfill

Council means the Christchurch City Council

cover material means uncontaminated topsoil used for cleanfill cover

disposal has the same meaning as in the Waste Minimisation Act 2008, and means the final (or more than short-term) deposit of waste into or onto land set apart for that purpose or the incineration of waste (being the deliberate burning of waste to destroy it, but not to recover energy from it)

handle in relation to waste includes any collection, sorting, consolidation, storage or processing of waste, but excludes transporting of waste

handling requirements means, in relation to each waste operation licence, the requirements for handling waste imposed by the Council pursuant to clause 8

hydro- excavation material means the suspended solids and/or mixture of solids and water derived from hydro excavation works

landfill site means land used for the disposal of waste

licence means a licence issued to a licensee under this Bylaw or any former bylaws repealed by this Bylaw or any former Bylaw

licence application fee means

- from the date this bylaw comes into force until 30 June 2016, the licence application fee set out in Schedule C of the Christchurch City Cleanfill Licensing Bylaw 2008, and the licence fee set out in Schedule A of the Christchurch City Licensed Waste Handling Facilities Bylaw 2007
- from 1 July 2016, the fee that must accompany an application for a licence, as set out in Council's list of fees and charges

licensee means the person to whom the Council has issued a licence

natural hardfill means uncontaminated soils, rock, gravels, sand, clay and other inorganic inert natural materials (natural hardfill that contains less than 2% by volume per load of vegetative matter or other hardfill is still classified as natural hardfill)

The following note is explanatory and is not part of the Bylaw: *In the definition of natural hardfill and other hardfill the references to 'less than 2% by volume per load' of vegetative matter represents the aim that as small amount as possible of vegetative matter should be included in any loads of natural hardfill or other hardfill, but recognises that it would be impossible to provide for zero vegetative matter.*

on truck in relation to the volume measurement of cleanfill, means the volume of cleanfill as measured in the means of conveyance when the cleanfill arrives at the cleanfill site

other hardfill means:

- Asphalt (cured)
- Bricks
- Ceramics
- Chip seal (cured)
- Reinforced concrete including exposed reinforcing rods of less than 1 metre in length
- Concrete, un-reinforced (including dried concrete slurry)
- Glass, excluding glass that contains any non-glass material such as laminating, wire reinforcing, rubber lining
- Masonry blocks
- Pavers (clay, concrete, ceramic)
- Pipes (clay, concrete, ceramic)
- Tiles (clay, concrete, ceramic)
- Vegetative matter less than 2% by volume per load

The following note is explanatory and is not part of the Bylaw: *The definition of 'other hardfill' in the Cleanfill Bylaw 2008 included 'Gib board, hardboard, MDF, particleboard, plywood, roofing iron and untreated timber – total less than 1% by volume per load'. The Council is taking a precautionary approach in removing these materials (which includes all*

plasterboard products) from the definition of other hardfill. The components in these materials could leach into the water table and could affect public health and safety. It is preferable that not even 1% of any cleanfill load includes these materials.

person includes a corporation sole, and also a body of persons, whether corporate or unincorporate

regional council means the Canterbury Regional Council, also known as Environment Canterbury, CRC and ECan

uncontaminated means material that does not contain concentrations of organic or inorganic substances in excess of current established human health or ecological soil contaminant standards or guideline values recognised as valid in New Zealand in accordance with Contaminated Land Management Guidelines No 2: Hierarchy and Application in New Zealand of Environmental Guideline Values

waste has the same meaning as in the Waste Minimisation Act 2008:

(a) means anything disposed of or discarded; and
(b) includes a type of waste that is defined by its composition or source (for example, organic waste, electronic waste, or construction and demolition waste); and
(c) to avoid doubt, includes any component or element of diverted material, if the component or element is disposed of or discarded

waste operation means:

(a) Land or buildings to which waste is delivered for consolidation or for compaction and consolidation before being taken away for disposal; or
(b) Any other land or buildings at which more than 50 tonnes of waste per annum is delivered and/or stored and then sent for disposal within the Council's district, or sent for further processing and/or disposal other than to Kate Valley Regional Landfill

working day means any day of the week other than:

(a) A Saturday, a Sunday, Waitangi Day, Good Friday, Easter Monday, Anzac Day, the Sovereign's birthday, Labour Day; and
(b) If Waitangi Day or Anzac Day falls on a Saturday or a Sunday, the following Monday;and
(c) A day in the period commencing with the 25th day of December in a year and ending with the 10th day of January in the following year

5. CLEANFILL SITES AND WASTE OPERATIONS REQUIRE LICENSING

(1) No person may allow any land owned or controlled by that person to be used for the disposal of cleanfill or for a waste operation unless:

(a) the Council has granted a licence to a person in relation to the use of that land for a cleanfill site or waste operation; and

(b) the cleanfill site or waste operation is undertaken in accordance with the terms and conditions of the licence.

(2) No licence is required for land used for the disposal of cleanfill where such disposal:

(a) consists solely of:

(i) natural hardfill and/or cover material; and/or

(ii) not more than 50 cubic metres, or such greater amount as the Council in its discretion may allow, of other hardfill measured over any continuous 12 month period; or

(b) is more than 50 cubic metres of other hardfill provided it is sourced directly from the same land where it is being disposed of and provided information is given to the Council about the type and quantities of the other hardfill.

6. LICENCE APPLICATIONS

(1) An application for a cleanfill or waste operation licence must be made to the Council on the form provided by the Council and be accompanied by a licence application fee.

(2) In considering whether to grant or refuse an application for a licence the Council will take into consideration the following factors:

(a) Any relevant resource consents administered, or that will be required, by the Council and the Regional Council in terms of the Resource Management Act 1991;

(b) Previous use of the proposed land;

(c) Previous compliance history of the applicant;

(d) Any other factor which the Council considers to be relevant having regard to the purposes of this Bylaw.

(3) A licence application will be processed, and a decision issued to the applicant, within 20 working days. If a licence application is refused, the Council will provide the applicant with written reasons for the Council's decision.

7. LICENCE TERMS AND CONDITIONS

(1) Every licence is subject to the following terms and conditions:

Conditions applicable to all licences

(a) Licences are not transferable to any other person or any other land.

(b) The licensee must pay an annual licence fee, in advance, on 1 July each year (which fee will be on a pro-rata basis where the licence is granted during the financial year).

(c) The licensee must pay any additional monitoring fee required by the Council for any additional monitoring it carries out at the cleanfill site or waste operation.

(d) The licensee must keep and maintain records on the data specified in Schedule A for 12 months after the date the records are provided to the Council by the licensee or any third party. The licensee must supply the records to the Council at such intervals, and in such form as the Council may from time to time specify, but is not required to supply any records to the Council where the Council has already received that information from a third party (for example, from the Kate Valley Regional Landfill).

(e) The Council has the right to take all reasonable steps, including:

(i) inspecting the cleanfill site or waste operation with or without notice; and

(ii) inspecting all relevant documentation held by the licensee (excluding invoices), for the purposes of auditing the licensee's performance and determining compliance with the terms and conditions of the licence; and

(f) Such other terms and conditions as the Council considers appropriate, having regard to the purposes of this Bylaw.

Conditions applicable only to Cleanfill site licences

(g) No material other than cleanfill may be disposed of at a cleanfill site.

The volume measurement of cleanfill is made on an on truck basis. Where loads comprise a mixture of natural hardfill and other hardfill it will be recorded as other hardfill irrespective of the volume percentage split between the groups. For those cleanfill sites using weight measurements, a weight to volume conversion figure of 1 cubic metre to 1.636 tonnes must be used to calculate the appropriate volumes for the purposes of data specified in Schedule A.

Conditions applicable only to Waste operation licences

(h) The licensee must comply with any relevant handling requirements determined by the Council under clause 8.

(i) The licensee must weigh all waste on a certified weighbridge for the purposes of the data specified in Schedule A

8. HANDLING REQUIREMENTS FOR WASTE OPERATIONS

(1) In determining the handling requirements for waste operations the Council may consider:

(a) The targets for waste minimisation contained in the Council's waste management and minimisation plan.

(b) The location of the proposed waste operation;

(c) The nature of the proposed waste operation;

(d) The quantity of waste to be handled by the proposed waste operation;

(e) The category or type of waste to be handled by the proposed waste operation;

(f) Industry best practice for waste handling operations in the nature of the proposed waste operation;

(g) Any practical considerations associated with the proposed waste operation;

(h) Any issues relating to the proposed waste operation raised in the application for the licence; and,

(i) Any other matter which the Council considers relevant.

(2) After having considered the matters listed in clause 8(1) and having consulted the applicant the Council may from time to time impose such handling requirements on the waste operation as the Council considers appropriate having regard to the purposes of this Bylaw.

9. REVIEW OF DECISIONS

(1) If any person is dissatisfied with any decision by an authorised officer made under this Bylaw, that person may, by notice delivered to the Chief Executive not later than 20 working days after the decision by the authorised officer is served upon that person, request the Chief Executive to review any such decision and such a decision will be final.

(2) Nothing in this clause will affect any right of appeal or review available at law.

10. AMENDMENT OF SCHEDULE A

The Council may in accordance with section 156 of the Local Government Act 2002 amend Schedule A of the Bylaw. The amendment will take effect from a date determined by the Council, with one month notice, or such longer period as the Chief Executive decides, being given to the public of the effective date of the amendment.

11. CHRISTCHURCH CITY GENERAL BYLAW

The provisions of the Christchurch City General Bylaw 2008 (as amended from time to time) are implied into and form part of this Bylaw.

12. OFFENCE AND PENALTY

Any breach of this Bylaw:

(a) is an offence punishable by a fine not exceeding $20,000.00 as provided for in section 242(4) of the Local Government Act 2002 and section 66 of the Waste Minimisation Act 2008, and/or

(b) may lead to the Council suspending or revoking the licence in accordance with clause 9 of the General Bylaw 2008.

13. REVOCATIONS AND SAVINGS

(1) This Bylaw revokes the Christchurch City Cleanfill Licensing Bylaw 2008 and the Christchurch City Licensed Waste Handling Facilities Bylaw 2007

(2) Despite the revocation in clause 13(1) the fees schedules of both bylaws are not revoked until 1 July 2016.

The initial resolution to make this Bylaw was passed by the Christchurch City Council at a meeting of the Council on the 28 day of May 2015 and was confirmed, following consideration of submissions by a resolution at a subsequent meeting of the Council on the 26 day of November 2015.

THE COMMON SEAL of the **CHRISTCHURCH**)
CITY COUNCIL was affixed in the presence of)

_____ Mayor/Councillor

_____ Authorised Manager

SCHEDULE A - INFORMATION

A **cleanfill site licensee** must keep records of the following minimum data for each load received for disposal:

- Date of receipt.
- Carrier and truck I.D.
- Location of source of the cleanfill.
- Type of activity generating the cleanfill (e.g. road construction, trenching, site clearance, etc).
- The cleanfill group type i.e. natural hardfill, other hardfill or cover material.
- Volume of natural hardfill, other hardfill and/or cover material.

Once a year, at the time of paying the annual licence fee, the licensee must send the Council a map of the area at the cleanfill site that has been filled in the previous year, and the location and type of cleanfill disposed of in that area.

A **waste operation licensee** must keep records of the following data for each consignment of waste handled by the licensee:

- Date of dispatch.
- Category or type of waste.
- Origin of waste.
- Destination of waste.
- Weight of waste.

Appendix E: REBRI Waste Management Plan Template

rebri
REDUCING BUILDING MATERIAL WASTES

REBRI WASTE MANAGEMENT PLAN

Project name:			Project number:	
Project type: (DELETE N/A)	construction	deconstruction	renovation	
Project commencement date:			Expected completion date:	
Site address:				
Site size (m^2):			Building size (m^2):	
Building type: (DELETE N/A)	residential	commercial/industrial	educational	Other:
Contractor name:				
Postal address:				Email:
Telephone:		Mobile:		Fax:

PERSON RESPONSIBLE FOR WASTE MANAGEMENT:

Name:	Mobile:

GOALS AND OBJECTIVES FOR WASTE AVOIDANCE OR REDUCTION www.nzgbc.org.nz has objectives for the minimisation of waste that may be useful.

	YES	NO	COMMENTS
☐ Eliminate waste as a priority.			
☐ Prefer suppliers who have waste minimisation/environmental plans/credentials.			
☐ Arrange with suppliers to reduce packaging			
☐ Use construction methods that allow for deconstruction.			
☐ Use products and materials that reduce waste.			
☐ Use products and materials that are low maintenance			
☐ Use salvaged/second-hand materials.			
☐ Use prefabricated materials and materials prepared off-site.			
☐ Schedule works to minimise time between delivery and installation			
☐ Recycle and reuse waste that is created on the job.			
☐ Set up dedicated recycling area using appropriate container and signage.			
☐ Provide detailed plans and instructions to staff and subcontractors.			
☐ Other:			

rebri
REDUCING BUILDING MATERIAL WASTES

WASTE MINIMISATION RECORD (Use the REBRI Resource Routing Calculator to determine the destination of materials.)

MATERIAL	Normal % sent to landfill	Target % sent to landfill	On-site recycling method or reuse	Waste destination – contacts and information	Actual quantity recycled, reused etc	Actual % sent to landfill	Actual cost or saving
Metals							
Aluminium							
Steel							
Brass							
Copper							
Various metals							
TOTAL							
Miscellaneous (cardboard and paper, glass, organic material, hazardous, insulation)							
TOTAL							
Concrete/masonry							
Concrete-based							
Clay-based							
Ceramic							
TOTAL							
Plasterboard							
TOTAL							
Plastics							
Grade 1							
Grade 2							
Grade 3							
Grade 4							
Grade 5							
Grade 6							
Grade 7							
Timber							
Treated							
Untreated							
TOTAL							
Soil							
TOTAL							
Building components for reuse							
TOTAL							
Other							
TOTAL							

MATERIAL	Normal % sent to landfill	Target % sent to landfill	On-site recycling method or reuse	Waste destination – contacts and information	Actual quantity recycled, reused etc	Actual % sent to landfill	Actual cost or saving
TOTAL FOR PROJECT							

Areas of the site for waste management (e.g. separation and storage of waste, centralised cutting areas, new materials storage). If possible, attach a site plan with areas marked

MATERIAL USE AND HANDLING	
Recycled and second-hand materials	**Special handling/storage measures to protect new and waste materials from damage**

COMMUNICATION AND TRAINING ABOUT WASTE MINIMISATION GOALS AND TECHNIQUES (attach any relevant documentation)

DECONSTRUCTION PROJECTS		
Deconstruction sequencing (attach any relevant documentation)	**Special deconstruction techniques/methods** (attach any relevant documentation)	**Special materials handling and removal procedures**

REVIEWING THE PROCESS		
Strengths	**Weaknesses**	**Suggested actions for future projects/implementation**

www.tonkintaylor.co.nz