



**CODE OF BEST PRACTICE
FOR WASTE PROCESSING IN THE
CONSTRUCTION & DEMOLITION
INDUSTRIES**

**Prepared by:
C&D WASTE PROCESSING NATIONAL
TECHNICAL COMMITTEE
WASTE MANAGEMENT ASSOCIATION OF AUSTRALIA**

TABLE OF CONTENTS

1.	INTRODUCTION _____	3
2.	DEVELOPMENT APPLICATION _____	4
3.	CONSTRUCTION AND DEMOLITION STAGES _____	6
4.	TRANSPORT OF MATERIALS FROM CONSTRUCTION AND DEMOLITION SITES TO RESOURCE RECOVERY FACILITIES _____	8
4.1	Differentiation between Construction and Demolition Sites _____	8
4.1.1	Demolition sites _____	8
4.1.2	Construction Sites _____	8
4.2	Loading of Materials at Origin _____	9
5.	CONSTRUCTION AND DEMOLITION PROCESSING FACILITY OPERATIONS _____	10
5.1	Approvals and Licensing _____	10
5.2	Environmental Management _____	10
5.2.1	Dust Management _____	10
5.2.2	Noise Management _____	12
5.2.3	Water Management _____	13
5.2.4	Material Storage _____	14
5.2.5	Hazardous Materials and Waste _____	14
5.2.6	Traffic Management _____	15
5.2.7	Community Consultation _____	16
5.2.8	Record Keeping _____	16
5.2.9	Hours of Operation _____	17
5.2.10	Fencing and Security _____	17
5.2.11	OH&S Management _____	17
5.2.12	Continuous Review and Revision _____	17

1. INTRODUCTION

A major priority in waste management is to reduce, where economically and technically viable, the amount of waste we produce. This follows the philosophy of sustainable development, which requires us to use scarce natural resources more efficiently and minimise the overall environmental impacts of waste management.

Construction and Demolition (C&D) waste historically has one of the highest recycling rates within the overall waste industry. This has been facilitated by the following key aspects: -

- Development of markets for recycled products;
- Ability to source-separate large quantities of C&D waste at the generator's site;
- Ability to sort "mixed" C&D waste at off-site facilities into reusable products.

WMAA is committed to ensuring that C&D waste is managed in an environmentally responsible way. To assist both operators and regulators, the Association has produced this Best Practice Guideline Document for C&D Processing throughout Australia. This Guideline addresses best practice within Australia noting that each state will have different regulatory requirements. It is intended as a document to be followed by currently approved operators as well as a document to guide regulators in assessing new proposals for C&D waste management.

This document is designed to increase awareness of risks involved in C&D waste management, and the need for best practice operators to assess potential impacts on infrastructure planning, air and water quality, community amenity, traffic, non-conforming waste, and tracking of recycled materials and waste, amongst many others.

There is no single solution for achieving best practice in C&D waste management. It is important to recognise that each project is and will always be different – for example in its location, proximity to neighbours, site design and type of material produced or processed.

The purpose of this Guideline **is not** to provide prescriptive rules on how to operate within the C&D area. Instead, the purpose of this Guideline is to set out the need for a site-specific, performance-based approach to enable operators and regulators to assess individual site needs, local regulations, and local community issues.

These Guidelines centre around four (4) distinct stages in C&D processing, namely: -

- Development Application for demolition of old structures and construction of new infrastructure;
- C&D phases of the development or project;
- Transport from the development or project site to a resource recovery facility, and
- Processing of C&D waste at a resource recovery facility.

The following sections of the Guideline address best practice goals for each of these stages. A particular project may not require reference to all sections, hence the dividing of the various stages to allow specific guidance for individual project needs.

2. DEVELOPMENT APPLICATION

In most cases, the approval process for demolition of existing structures and new construction will require planning and approval from a central authority. This may range from local government for small developments to state government departments, with various statutory authorities often having influence in the approvals process.

Whilst full regard and compliance must be given to the relevant statutory and regulatory requirements and obligations; be it local state or federal requirements many of the following areas have the possibility of enhancing the effectiveness and efficiency of capturing and re-processing C&D waste materials.

The aim is to achieve a timely and efficient framework with a philosophy of excellence.

Identifying Potential for C&D Recycling at the Planning and Design Stages

- In the case of capturing C&D material for eventual re-processing, planning prior to demolition and / or construction represents a crucial part of the process and is often overlooked. For waste minimisation strategies and /or maximising the use of recycled materials in new structures, fully scope out the issues with a suitably qualified and experienced consultancy team.
- Determine the planning issues relevant to the activity, including the level of assessment that the development will undergo (i.e. self assessment, local or industry codes or environmental impact studies). Whilst many developments likely to generate economic quantities of C&D waste will be impact assessable, there may be some councils that have them listed as code assessable.
- Develop and appoint a project team based upon the outcomes of the scoping exercise. Identify the approval stakeholders who will be interested in the development, particularly those who might have significant interests in C&D recycling. These may include local government waste departments, regional waste boards, environmental agencies, etc. These parties may provide valuable information regarding local best practice.
- Actively promote a platform for open communication throughout the consultation process with approval stakeholders (at a level that is commensurate with the size of the project) including council officers, politicians (local, state and federal if need be), and the community (both residential and industrial). Identify issues in either regulated or non-regulated areas to be addressed.
- Satisfy yourself and the approval stakeholders that the proposed activity is appropriate for the site, and in the event that C&D waste recycling is proposed, the materials can be secured in appropriate volumes and in a condition that is appropriate and economically viable for recycling. Also assess the likely requirements and restrictions that C&D recycling may have on the project. Consider deconstruction and decontamination of existing structures.

CONSTRUCTION AND DEMOLITION PROCESSING FACILITY OPERATIONS

- In the event that materials are to be recycled on site, determine that there is sufficient stockpiling, sorting, space and time to undertake this process. Also assess the impacts on the surrounding areas, particularly with regard to noise and dust. It may be more practical to transport the materials to an offsite recycler, back loading higher quality reprocessed materials to the site for use during the construction phase.
- If C&D recycling is demonstrated to be feasible off site, prepare an indicative waste management plan that clearly advocates recycling of materials, including likely volumes and methods of handling, sorting and disposal from the development site. Confirm that the materials identified are able to be recycled in a cost efficient manner and that local recyclers are prepared to take the materials.
- Ensure impact assessments are lodged with the application, providing evidence that C&D recycling will be undertaken and advocate the benefits of this initiative as a positive aspect of the development.

3. CONSTRUCTION AND DEMOLITION STAGES

The following points provide a practical guide to best practice on building and construction sites with the aim to recycle all of the waste produced throughout the project.

Demolition Phase

- Demolition and construction projects should only be undertaken by experienced licenced contractors to ensure compliance with both safety and environmental considerations.
- Preparation of a hazardous material report prior to demolition, identifying materials such as asbestos, lead, PCB, lead paint, tar, floor tiles and contaminated ground soils. Hazardous materials to be removed by a licenced contractor and a clearance certificate issued by an independent environmental consultant prior to demolition of the structure.
- The waste management plan written by the developer is to be reviewed to assess its viability and to maximise the recovery of all waste materials.



Example of recovery and recycling of bricks for re-use from a demolition site

- During any work carried out on the site, full consideration to be given to dust, noise and traffic disruption.
- Develop management plans for:
 - Maximisation of waste recycling;
 - Environmental controls; &
 - OH&S control.
- On larger projects, commit subcontractors to strategy of waste management plans and the requirement for compliance. This should be a key indicator of the contractor's / subcontractor's performance in the project.

Construction Phase

- Building contractors to review waste management plans for adequacy prior to commencement of the project.
- Consideration to be given to ensure there is appropriate space and time to undertake the recycling initiatives planned for the project.
- All trades must be made aware from the outset of the recycling protocols for the site. Dedicated bins or stockpiles for each material must be provided, or separation will not occur.



- Tracking of all materials to be documented to ensure that it is taken to a licensed resource recovery facility.
- Subcontractors to be contracted to comply with the project waste management plan. Best practice to be extended to all contractors and subcontractors and there is to be a key indicator of the contractor/ subcontractor performance in the project.
- Records to be kept detailing volumes of material recycled and disposal locations.

4. TRANSPORT OF MATERIALS FROM CONSTRUCTION AND DEMOLITION SITES TO RESOURCE RECOVERY FACILITIES

An important step in the process of C&D recycling is the safe and efficient transportation of materials from C&D sites to the resource recovery facility.

There are many factors which will influence transportation of materials from such sites:

- Time and cost constraints for removal of material from sites;
- Access to sites and sufficient space for loading and handling materials;
- Traffic management issues applicable to loading materials at the site of origin;
- The availability of suitable vehicles for transportation of materials;
- Selection of appropriate routes for transportation of materials to the recycling facility; and
- Traffic management relating to the C&D recycling facility to which the material is being taken.

4.1 Differentiation between Construction and Demolition Sites

4.1.1 Demolition Sites

Demolition sites generate the vast majority of materials for re-processing by the C&D recycling facilities. In most cases, particularly in CBD areas, time and space restrictions dictate that materials are directly loaded into trucks and transported off site. This is a common scenario and forms the basis for formulation of C&D waste transportation best practice.

4.1.2 Construction Sites

Similar practices are required on construction sites whether waste is mixed or pre-sorted in bins or removed in bulk unsorted.



Larger sites have capacity for multiple bins, maximising the opportunity for source separation.

4.2 Loading of Materials at Origin

In the event that C&D materials are to be transported off site to re-processing facilities, there are a number of best practice initiatives that can be adopted.

- Prepare a vehicle movement plan and risk assessment for safe movement of heavy vehicles into and out of the site, including selection of route, taking into account local road load limits and local traffic conditions;
- Vehicles engaged for transporting materials shall be registered and currently certified as roadworthy.
- The driver of the vehicle is to ensure the load is appropriately loaded within its safe working legal limit.
- The load is to be covered to minimise the loss of debris during transport.
- Prior to leaving site, the driver of the vehicle shall inspect the load to ensure that the risk of loss of debris during transport is eliminated and loaded within the manufacturers guidelines.



Drivers should always inspect their vehicles prior to leaving the construction or demolition site to ensure that loads are contained within the body and evenly distributed. Drivers should also assess whether the vehicle is loaded within its safe working limits.

- Site management to ensure vehicles follow nominated transport routes complying with the management plan.
- Vehicles are not to be loaded that fail to comply with the site environment management plan and transport management plan.

5. CONSTRUCTION AND DEMOLITION PROCESSING FACILITY OPERATIONS

These best practices are for the operation of a C&D resource recovery facility and include processing of waste materials typically found on C&D sites such as concrete, brick, asphalt as well as excavation materials. These materials may be source separated, however in some cases materials may be delivered to the facility as mixed wastes.

5.1 Approvals and Licensing

The operation of a C&D resource recovery facility will require the following: -

- Appropriate land zoning for the facility;
- Local government development and building approval;
- State Government development approval (designated development);
- EPA operational licensing if necessary.

The operation must abide by all the controls and regulations as stated in these approvals and licenses.

5.2 Environmental Management

Development consent will require the implementation of an Environment Management Plan (EMP) addressing the following issues: -

5.2.1 Dust Management

A resource recovery facility has the potential to produce dust generating from the following activities: -

- Receiving of Materials.
 - Tipping loads
 - Unprocessed material.
- Processing Materials
 - Pre-processing eg. pulverising or hammering of oversize feed material.
 - Loading plant
 - Operation of plant (transfer points)
 - Discharge points eg stockpile conveyors
- Vehicle/Traffic Movements
 - Vehicle and plant movements in the facility.
 - Loading of product into trucks
- Windblown dust from stockpiles
- Vehicles leaving the site without clean wheels or dust covers on loads.

Best Practice dust control methods to be considered to include: -

- Water sprays such as atomisers or sprinklers on stockpiles, conveyors and material transfer points – note that these systems can require large volumes of water;



Mist sprays at conveyor transfer points are an effective way of minimising dust emissions

- Water carts for dust suppression of roadways;



- Handheld hoses;



- Chemical additives;
- Dust extraction systems; and
- Ceasing work in extreme conditions.

A combination of the above will assist in minimising dust control.

5.2.2 Noise Management

Consideration has to be given to the amount of noise generated from a facility compared to the background noise around the location of the facility. The operation of the resource recovery facility is to have minimal adverse impact on the surrounding environment.

Noise generated during the operation of the facility should be managed so that it falls within the regulatory limits.

Noise is usually measured at the boundary of the nearest residence/premises. It may be necessary to undertake noise monitoring prior to establishment of a facility to determine existing conditions, followed by additional monitoring following commissioning.

Noise can be generated from the following: -

- Vehicles and plant movements, particularly reversing beepers;
- Loading trucks and hoppers;
- Processing equipment;
- Public address systems;
- Warning sirens.

Noise controls for consideration: -

- Arranging plant layout to minimise noise impacts;
- Installation of noise barriers such as fencing, mounding, stockpiles;
- Enclosing or shielding processing equipment;
- Use of low noise emissions plant;
- Restriction of noise when background noise reduces;
- Restriction on vehicle speed.

5.2.3 Water Management

A C&D resource recovery facility has the potential to impact surface water. A surface water waste management plan should be implemented to comply with regulatory requirements.

The following best practice water management issues and impacts are for consideration: -

- Water flows into and around the premises;
- Stormwater detention requirements;
- Sediment accumulation;
- Contamination of water with chemicals or pollutants;
- Impacts of discharge volumes into local watercourses;
- Recycling of stormwater contained within site for dust suppression uses;
- Treatment of stormwater prior to discharge from site to comply with environmental standards, including turbidity, acidity (pH) and the presence of contaminants.



Site water management includes suitably sized sedimentation and detention basins, oil / water separators, turbidity and pH control, and capability to contain and recycle all waste water generated within the site.

5.2.4 Material Storage

Consideration is to be given to the following when generating and managing stockpiles: -

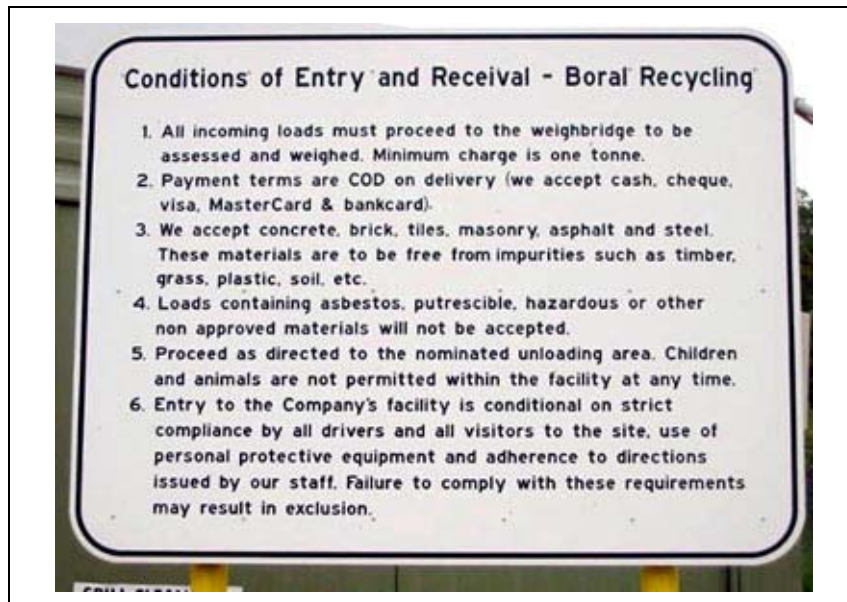
- Stockpiles may have a visual impact;
- Dust may be generated from stockpiles in adverse weather conditions;
- Safety issues relating to the stability of stockpiles;
- The volume of unprocessed material kept onsite should consider visual aspects, dust generation and OH&S issues;
- Stockpiles of mixed waste are more vulnerable to the effects of windblown litter and dust. Best practice of mixed waste stockpiles generally is to achieve in housed facilities.

5.2.5 Hazardous Materials and Waste

Each facility should develop and implement protocols and procedures to effectively identify the various wastes that are not permitted at that facility. Non-permitted waste materials should be rejected or immediately removed if inadvertently received.

There is the possibility of hazardous waste materials such as asbestos being bought into the facility with raw materials. Facility operators may have to implement measures to manage risks associated with such materials, including: -

- Development of material receipt (acceptance and refusal criteria);
- Signage detailing materials permitted and prohibited, and conditions of entry;



- Training of personnel on the processing plant to recognize and remove hazardous material;
- Inspection of loads by trained persons, before and after being tipped;



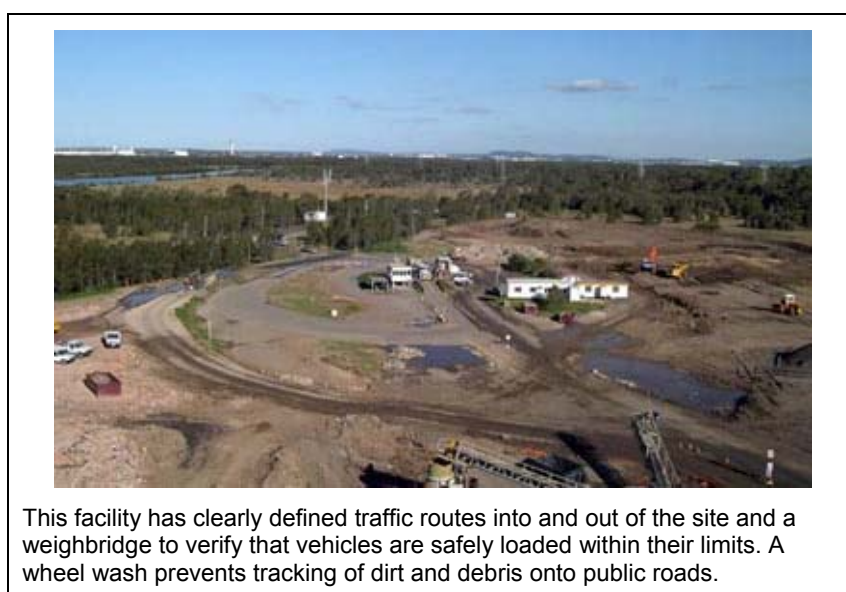
- Register/ record keeping of hazardous and unsuitable material rejected;
- Storage and removal procedures of any hazardous materials in accordance with statutory regulations.

5.2.6 Traffic Management

Traffic associated with construction and demolition materials recycling facilities will predominantly be trucks, therefore operators of such facilities must take care to minimise the impact of traffic to and from the facility, particularly if the site is located in or adjacent to residential precincts.

The following should be considered: -

- Vehicles using the facility shall use designated routes along appropriate transport corridors such that the impact of these vehicles on the surrounding area is minimised;
- Entrance and exit areas should be clearly signposted and designed to accommodate site traffic including queuing areas;



- An internal traffic management plan should be prepared for the site, including designated vehicle and pedestrian areas and appropriately signposted speed limits;
- If weighbridges are installed, these should be used to measure / verify the quantity of material delivered. In the event that a vehicle is found to be overloaded or unevenly loaded, the facility shall implement a procedure to assess and safely unload the vehicle;
- Repeated instances of overloading should be managed, including consideration of suspension of vehicles from the site and the vehicle owner and authorities notified;
- Management should implement appropriate measures to ensure that transporters use appropriate routes, are appropriately loaded, and use effective pollution minimisation measures;
- Consideration given to the use of the facility by the public (manual handling).



A dedicated unloading area for domestic C&D waste materials eliminates the risk of smaller vehicles coming into contact with larger trucks in restricted areas.

5.2.7 Community Consultation

Facility operators should endeavour to foster good relations with surrounding neighbours.

There should be clear signage at the front gate providing a telephone number for community complaints and the facility management should keep a complaints register.

5.2.8 Record Keeping

The following records should be kept: -

- The volume/tonnage of all incoming and outgoing loads;
- Rejected loads and reasons;
- Stock levels;
- Destination/ origin of incoming/ outgoing loads;
- All regulatory requirements;
- Complaints register.

5.2.9 Hours of operation

The facility should operate within the approved hours nominated by the regulating authority. The operating hours should be clearly displayed at the front gate.

5.2.10 Fencing and Security

A man proof boundary fence should be installed to prevent unauthorised access, displaying appropriate warning signage. All gates and other accesses to the site should be locked when not in use. Regular inspections of gates and fencing should be undertaken to detect deterioration or vandalism.

5.2.11 OH&S Management

There is significant potential within a construction and demolition operation for injury of personnel. Significant risks include: -

- Working around crushing operations, screens and conveyors;
- Working within confined spaces;
- Traffic movements, particularly heavy vehicles;
- Stability of tipping vehicles and rollover incidents;
- Stability of stockpiled materials;
- Manual handling and repetitive strain issues;
- Exposure to noise;
- Exposure to dust;
- Exposure to chemicals and contaminants;
- Safe unloading of vehicles by hand.

In order to effectively identify, manage and control risks such as those identified above, the facility should undertake a comprehensive risk assessment of operations and implement a Safety Management Plan (SMP) for the site. The SMP should generally comply with the requirements of the relevant state Workcover authority.

A Safety Management Plan should also include the following: -

- Induction, training and/or supervision of all personnel/visitors should take place before entering the facility;
- Appropriate personal protective equipment (e.g. high visibility vests, hearing protection, safety boots and protective eyewear) should be worn;
- An emergency response plan should be prepared to effectively deal with incidents on site.

5.2.12 Continuous Review and Revision

The EMP and additional management plans require regular review, assessment and revision to ensure compliance and relevance.