
Container Terminal Capacity Assessment

Revision 3

Lincoln Coe
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Introduction

The purpose of this short paper is to discuss the container terminal capacity and outline some of the options available to Port Otago Ltd to further develop throughput capacity at Port Chalmers. The 2008/2009 throughput at Port Chalmers was 219,000 TEU with approximately 200,000 TEU estimated for the 2009 / 2010 year.

Investigations Undertaken

In 2008 Port Togo Ltd commissioned TBA from the Netherlands to undertake a detailed evaluation of the Port Otago container operation to determine what options were available to increase the container throughput by better utilising the existing available land area and wharves. An important element of the study was assessing and considering modern types of equipment and technology solutions.

A separate and independent check of this work was provided by Moffat and Nichol in mid 2009 who applied a different approach to determine the potential development options and terminal capacities. Moffat and Nichol were involved in reviewing the Port Otago Ltd 20yr development plan as part of merger discussions with Lyttelton Port Company.

Wharf Availability / Capacity

By extending the Multipurpose Wharf, TBA have confirmed that there would be sufficient length of wharf to provide acceptable service levels for vessels (ie sufficient parking spots for vessels to discharge the required amount of cargo in the required time period). This includes sufficient capacity to accommodate for the cruise vessels and other trades as necessary.

Yard Capacity – straddle carrier operation

There are many options available to increase the throughput capacity of the container terminal being :-

1. reducing the numbers of empty containers on site.
2. reducing the dwell time of the empty containers on site.
3. increasing the density of the operation by gradually moving to 4 high straddle carriers compared with the existing 3 high straddles.
4. removing storage sheds B and C on the terminal side of the operation

Port Otago have a number of storage yards away from Port Chalmers that can be further developed to store greater volumes of empty containers away from the Port. These offsite storage yards can be used to achieve points 1 and 2.

Port Otago have purchased two 4 high straddle carriers that are due to arrive at Port Chalmers in December 2009. All future straddle purchases will be the 4 high model, and at a point in the future the greater stack height (on the 4th tier) will be able to be utilised across the whole of the yard.


Removing or relocating B and C sheds to an offsite location will free up valuable container terminal land that is immediately adjacent to the 2 main container wharves.

With all of these measures implemented will give the ability to increase the container terminal capacity to at least 550,000 TEU pa whilst still operating a straddle carrier operation on the container terminal footprint.

The following slide shows the key aspects of the development to this point, however it should be noted that the specific details and stages of development are not firm, and will be finalised as the demand for growth arrive.

Container Terminal

- up to 550k / 650 TEU pa
- 2 container vessel wharves, existing terminal footprint only
- straddle operation & flexibility
- key development aspects
 - to 1 over 3 straddle carrier operation
 - management of empties / depot
 - removal of existing sheds
 - development of offsite yard areas



The slide contains two diagrams. The top right diagram is a site plan of a container terminal, showing a central area with a pink highlighted section at the top, likely representing a new development or a specific operational zone. The bottom left diagram is a side-view illustration of a straddle carrier, showing its two sets of wheels and the overhead structure used for lifting and moving containers.

Yard Capacity - future increase

Following on from utilising the existing container terminal footprint with straddle carriers, there are further options to increase the container throughput capacity. In no particular order these options are :-

1. higher density stacking solutions utilising yard cranes which stack containers higher and more closely together.
2. further reclamation.

As the requirement for this volume of container throughput is likely to be greater than 20-25 years away, none of these options have been investigated in detail or presented and discussed here.

Summary

Work undertaken in the past 18 months has confirmed the adequacy of both number and length of the berths at Port Chalmers once the MP wharf is extended. The work has also identified the availability of many options to increase the throughput capacity of the container terminal to at least 550-650,000 TEU per annum with straddle carriers, with further options to increase capacity beyond that in the future