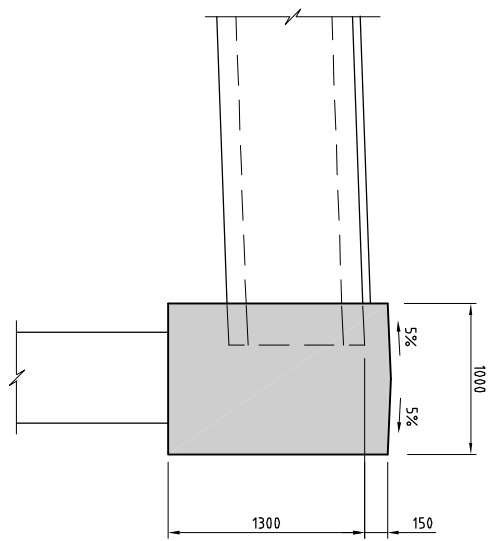
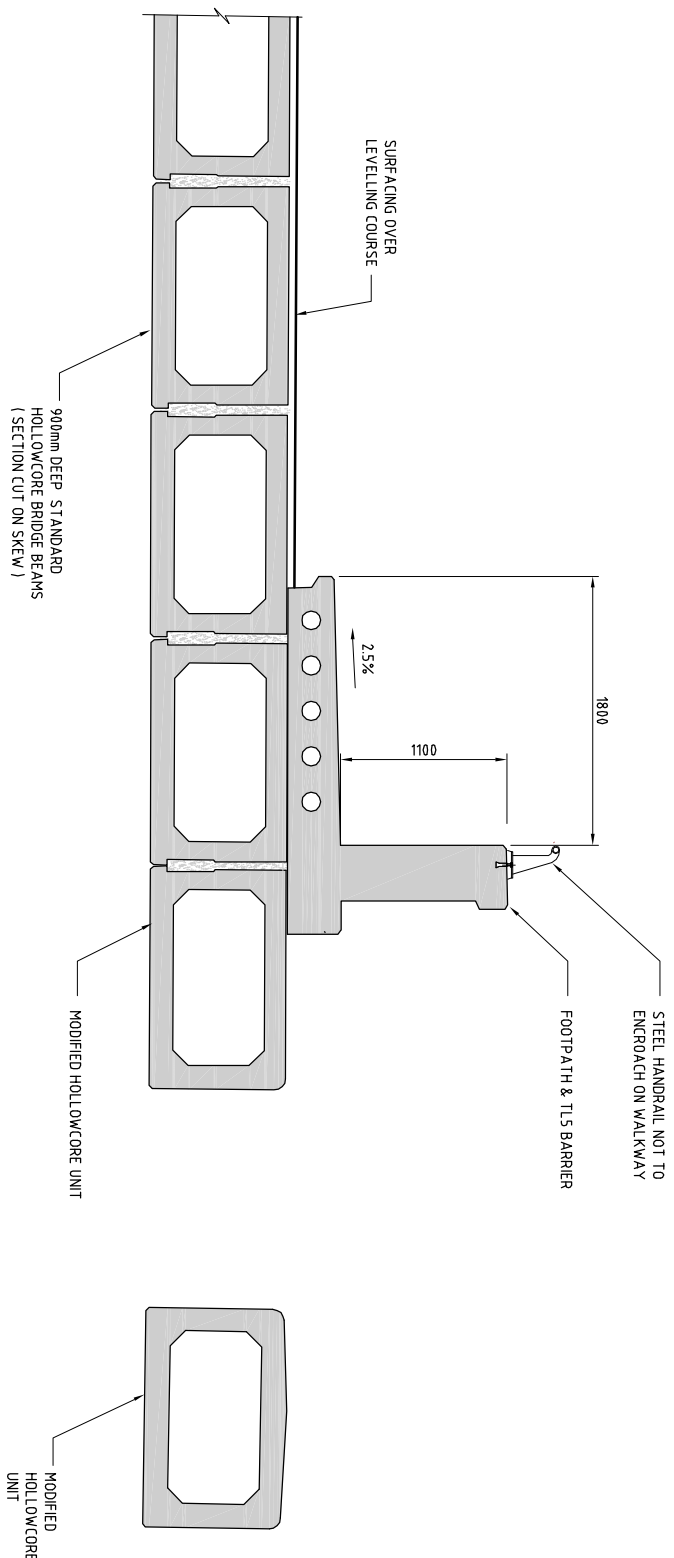


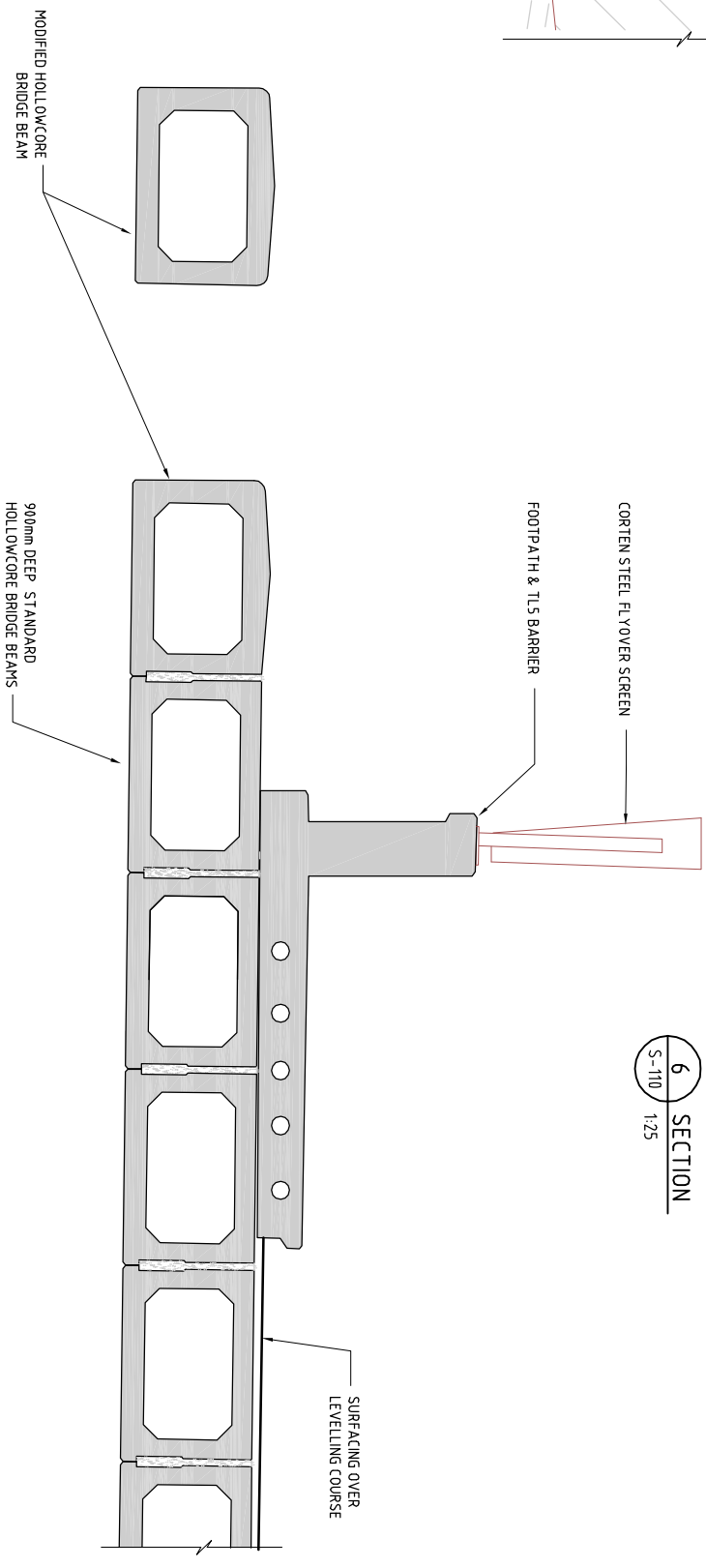
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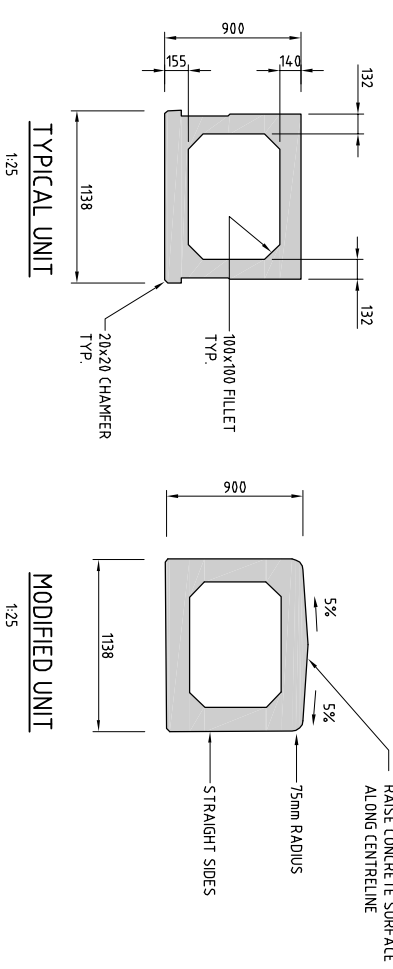
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7 SECTION  
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No.	Revision	By	Chk	Appd	Date
A	FOR CLIENT REVIEW - NOT FOR CONSTRUCTION	RAL	MP		

Original Scale (A1)	1:200	Design Drawn	MP	Approved For Construction	Apr'09
Reduced Scale (A3)	1:400	Design Drawn	RAL	Design Check	Apr'09
* Refer to Revision 1 for Original Signature					



Project: NEW LYNN (T.O.D.) TRANSIT ORIENTED DEVELOPMENT

Title: CLARK STREET OVERBRIDGE DETAILS

Discipline: STRUCTURAL  
Drawing No: 3121038-S-115  
Rev: A

**FOR CLIENT REVIEW**  
NOT FOR CONSTRUCTION

Report

# New Lynn TOD - Clark Street Extension Construction Methodology

**Prepared for Waitakere City Council (Client)**

**By Beca Infrastructure Ltd (Beca)**

19 October 2008

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## Revision History

Revision Nº	Prepared By	Description	Date
A	Phil Ison	draft	19 Oct 2008

## Document Acceptance

Action	Name	Signed	Date
Prepared by	Phil Ison		
Reviewed by			
Approved by			
on behalf of	Beca Infrastructure Ltd		

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## 1 Executive Summary

Construction of the Clark Street Extension involves a new bridge across the rail trench and approach embankments. Normal road and bridge construction methods and techniques will be used and construction is expected to have minimal impact on adjacent property and existing traffic. Design and construction of the works will be developed in co-ordination with Ontrack to minimise the impact on the rail operation.

## 2 Introduction

The Clark Street Extension consists of a new 4 lane arterial road that bypasses the existing section of Totara Ave and connects Clark Street with Great North Road. The new alignment allows the section of Totara Ave between Clark Street and Gt North Road to be returned to a pedestrian friendly town centre type environment.

The new alignment continues straight ahead from the existing Clark Street / Rankin Ave intersection. This section is parallel to the new rail trench and climbs up at a gradient of about 4% before crossing over the rail trench on a horizontal curve of 120m radius. The alignment then continues down steeply at a gradient of about 8% to meet Great North Road.

The physical features that need to be considered with regard to construction methodology include the proximity to the new rail trench, existing property including Cambridge Clothing, apartments in Ambrico Place, the existing car park behind the New Lynn Community Centre and commercial properties at the western end of Totara Ave.

The construction works for Clark Street Extension cross over the rail trench and are also constructed close to the existing rail tracks. The design and construction of the bridge will be undertaken in consultation with Ontrack with regard to works that may impact the rail operation.

Reference should be made to the preliminary design drawings for a more detailed description of the works.

## 3 Proposed Construction Methodology

The following is a description of the likely construction methodology, including construction plant and techniques to be used. The construction will use well understood and proven construction techniques and is simplified by being able to be constructed entirely "off line" from existing roads. Therefore the management of existing vehicle, pedestrian and cycle traffic a relatively straight forward exercise.

The methodology is divided into three sections – general site works, bridge over the rail trench and the bridge approaches, which each have different construction methods.

### 3.1 General Site Works

#### Site Compound and Security

A site compound for storage of plant and materials and site offices for use by the contractors staff will be provided on the site. The location of the compound will be agreed with WCC nearer the time

of construction. The site will be fenced off to provide a safe working environment and prevent public access to the construction site.

### **Site access**

Vehicle access to the construction site will be provided at both the Great North Road and Clark/Rankin intersection, ends of the site. Each access will have temporary traffic control in accordance with normal traffic management methods.

### **Demolition and Site Clearance**

Any small buildings, minor structures, underground services and trees (excepted protected trees) will be cleared and removed off site to allow the work to be constructed. The work requires some minor earthworks so silt control measures such as cess pit protection will be undertaken.

Features that require protection such as the Pohutakawa tree at the intersection of Great North Road and Clark Street Extension will be fenced off prior to works commencing in the vicinity of the tree.

## **3.2 Bridge over Rail Trench**

### **3.2.1 Description of the Bridge**

The new bridge crosses over the rail trench on a tight horizontal curvature. The bridge structure must not impart additional loads on the walls of the rail trench.

The new bridge structure consists of a single span bridge with 900mm deep double hollow core precast units spanning across the rail trench. These units are supported on bridge abutments set back about 4m from the rail trench walls and comprise bored concrete piles, concrete columns, cast in-situ concrete cap beam and precast concrete facing panels.

### **3.2.2 Bridge Abutments**

#### **Piling**

About 25 number, 900mm diameter bored concrete piles are required to support the bridge abutments on each side of the rail trench. This pile type is commonly used in building and bridge foundations. A medium size crawler crane with an auger will bore the pile holes. The excavated material from the piles will be loaded into trucks and removed from the site. A steel reinforcing bar (rebar) cage will be lifted into the hole and then the hole filled with the concrete. Each pile will take about 1 day to complete.

#### **Columns**

On completion of piling, concrete columns will be constructed. The columns are similar to the piles but are built above the ground using steel formwork, rebar and concrete.

#### **Cap Beam**

A reinforced concrete cap beam will be constructed in situ at the top of the piles. This will involve a small crane to lift the formwork, rebar and concrete materials.

## **Facing Panels**

The bridge abutment will have precast concrete facing panels on the rail trench side of the abutment. These will be manufactured off site and lifted into place using a medium size crane.

### **3.2.3 Bridge Deck**

#### **Precast Deck Beams**

The precast beams span between the two bridge abutments and form the bridge deck. About 45 double hollow core beams, 0.9m deep x 1m wide x 20m long, will be precast off site and trucked to the site. These will be installed using a large crane, during night time or weekend closures of the rail track.

#### **Bridge Barriers, Footpaths, Surfacing**

After installation of the deck beams, precast concrete barriers, in situ concrete footpaths and other minor works will be undertaken to finish the bridge superstructure. On completion of the bridge an asphalt surface will be installed on the road carriageway and street furniture such as street lights will be installed.

### **3.3 Bridge Approaches**

The bridge approaches are each about 140 m long and comprise embankments that ramp up to the bridge abutments. The embankments are formed of light weight, polystyrene fill with mechanically stabilised earth (MSE) vertical walls. The embankments have a maximum height of about 4.5m above the existing ground level, at the bridge abutments.

After excavation of weak surface soils a level, hard fill platform will be created on which to place the polystyrene fill. This fill will be imported to site in large blocks and can be easily man handled into place. The polystyrene blocks are then wrapped in a HDPE sheet. MSE walls are built at the edge of the embankment fill. A small in situ concrete capping beam is located at the top of the MSE walls at the perimeter of the embankments. Precast concrete barriers and a concrete footpath will then be constructed above the capping beam. The bridge embankment construction described above will involve small cranes and plant to move and lift materials.

A road pavement surface is constructed using normal road construction materials and plant, and finished with an asphalt surface layer. Installation of street lights, traffic signals, road markings and signage completes the approaches.

The embankment on the north west side of the rail trench includes a new access ramp to the Cambridge Clothing Company property. This ramp will be constructed using the same methodology as the main approach embankments.

## **4 Temporary Traffic Management**

Most of the construction works will be undertaken clear of existing roads and therefore the impact on existing traffic will be minimal. Temporary site vehicle access will be provided at both ends of the site and temporary site access to Cambridge Clothing will also be provided.

Access to the existing car park behind the Community Centre will be changed as part of the works. The car park will be reduced in size during construction and a new access to Totara Avenue is proposed.

## 5 Construction Duration

The Contractor and WCC will agree the final sequence and staging of the construction as detailed design and is developed and construction contracts are agreed. It is expected that the overall construction period for Clark Street Extension will be between approximately 12 and 15 months.

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DATE: 29 July 2009


PROJECT: **New Lynn TOD**  
**Clark Street Extension Low Level**  
**Bridge:**  
**Assessment of Noise Effects**

REPORT NO.: 2008487A 001 R05

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