

Arboricultural Assessment Report

Central Interceptor & Associated Works

Prepared For

Watercare
June 2012

Prepared By

Karl Burgisser
Arborlab Consultancy Services Limited

CONTENTS

| | | |
|---|--|----------|
| 1 | Executive Summary | Page 3 |
| 2 | Overall Plan | Page 5 |
| 3 | List of Sites Assessed | Page 6 |
| 4 | Estimated Summary Activities | Page 7 |
| 5 | General Comments | Page 8 |
| | Site 1A – Western Springs | Page 9 |
| | Site 1A/2 – Western Springs Depot | Page 13 |
| | Site 1B – Western Springs CSO Collector Sewer Site | Page 15 |
| | Site 2 – Mt Albert War Memorial Reserve | Page 18 |
| | Site 3 – Lyon Avenue | Page 22 |
| | Site 4 – Haverstock Road | Page 28 |
| | Site 5 – Walmsley Park | Page 32 |
| | Site 6 – May Road | Page 37 |
| | Site 7 – Keith Hay Park | Page 41 |
| | Site 8 – Pump Station 23 (Frederick Street) | Page 47 |
| | Site 9 – Kiwi Esplanade | Page 53 |
| | Site 9B – Ambury Park | Page 57 |
| | Site 10 – Mangere Pump Station | Page 60 |
| | Site 11 – Motions Road | Page 65 |
| | Site 12 – Western Springs Depot | Page 69 |
| | Site 13 – Rawalpindi Reserve | Page 71 |
| | Site 14 – Norgrove Avenue | Page 76 |
| | Site 15 – Pump Station 25 (Miranda Reserve) | Page 80 |
| | Site 16 – Miranda Reserve | Page 85 |
| | Site 17 – Whitney Street | Page 88 |
| | Site 18 – Dundale Avenue | Page 91 |
| | Site 19 – Haycock Road | Page 95 |
| | Site 20 – Kiwi Esplanade to Wilta Court | Page 97 |
| 6 | Recommendations | Page 101 |

1. Executive Summary

Watercare Services Ltd (Watercare) is planning to construct a new wastewater tunnel to collect wastewater flows from the Auckland isthmus area and transfer them across the Manukau Harbour to the Mangere Wastewater Treatment Plant (MWWTP). The Central Interceptor Project (the Project) arose out of the Three Waters Plan (2008) which identified the need to provide trunk sewer capacity to central Auckland to reduce wet weather wastewater overflows and provide capacity for growth.

The project extends across the Auckland isthmus from Western Springs in the north to the Mangere WWTP in the south.

Arborlab have been engaged to provide an arboricultural assessment report on the proposed Central Interceptor project for Watercare. This report will detail the trees within the area of the proposed work and outline the effects.

Karl Burgisser is the lead arboricultural consultant on the project. The assessment is based on the plan provided and the site initiation briefing undertaken with the project team.

Karl Burgisser has reviewed each site in relation to the proposed works and itemised the individual trees or groups of trees on a schedule and plotted these trees on an aerial. These plots have then been transferred onto plans.

Limitations

The trees have initially been plotted on to the plans by the assessing arborist. These plans will be accurately surveyed on by a surveyor.

The Haycock Ave site (L4S1) has been reviewed from the street and therefore the positions of trees may not be accurate. There is relatively unobstructed vision into the site so the estimations are likely to be reasonably accurate.

Tree sizes have been stated in round figures. Where there was any doubt of trees being protected or not these were measured to confirm dimensions and tree protection status.

Proposed Works

The overall concept proposed for the Central Interceptor is a gravity tunnel from the Western Springs area to the Mangere WWTP with various link sewers and connecting pipelines connecting the existing network to the main tunnel at key locations along this route.

The key elements of the project include:

- An approximately 13 km long 4.5 m diameter main tunnel from Western Springs to Mangere WWTP, up to 110 m below ground.
- Four link sewers connecting the main tunnel to the existing sewerage network.
- Associated connections to existing sewers.

- Associated structures at key sites along the route and at connections. At each site facilities include access shafts, drop shafts, and flow control structures. Grit traps, air intakes, air vents, or air treatment facilities are proposed at some sites.
- A limited number of overflow structures in nearby watercourses to enable the safe discharge of occasional overflows from the tunnel.
- A pump station located at the Mangere WWTP.
- Other associated works at and in the vicinity of the Mangere WWTP, including a rising main to connect to the WWTP and an emergency pressure relief structure to enable the safe discharge of flows in the event of pump station failure.

The main tunnel, link sewers, connection pipes and many of the associated structures will be underground. The tunnel and link sewers will be constructed by tunnelling methods, with access provided from around 19 surface construction sites. These surface construction sites include:

- Three major construction sites (at Western Springs, May Road and Mangere WWTP);
- 16 secondary construction sites to provide connections to the main tunnel and link sewers.

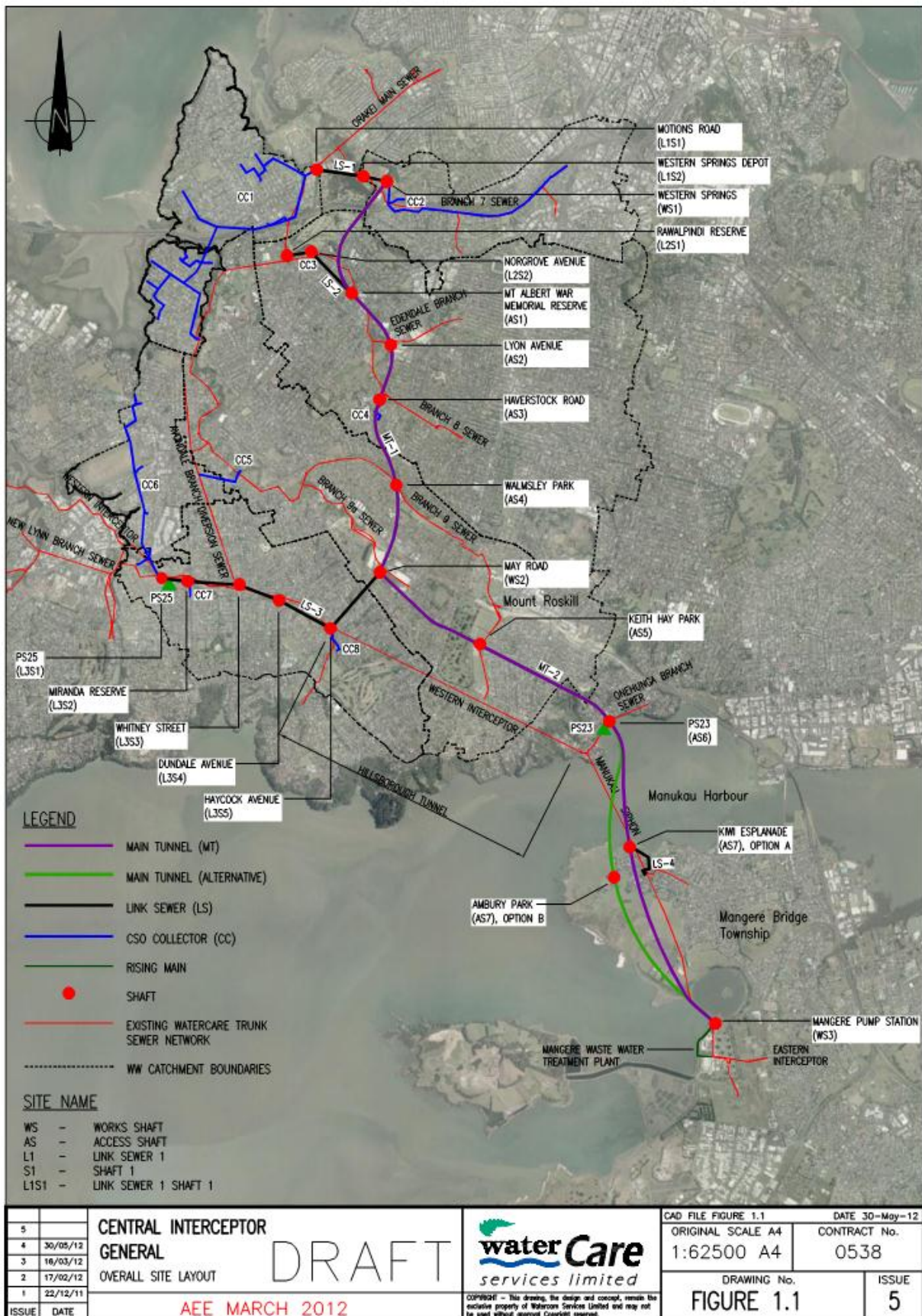
The primary construction sites will be used for launching or retrieving the tunnel boring machine and materials for tunnel construction would be delivered and stored, and tunnel spoil removed. Activities at the secondary sites on the main tunnel will include shaft sinking and the construction of surface facilities and at the link sewer sites will also include launching or retrieving the microtunnel boring machine

Other construction activities include removal of vegetation, service relocations, establishment of construction yards, lay down areas and site accessways, traffic management, earthworks and site reinstatement.

The duration of construction will range from generally around 3 to 5 years at the primary sites, and 6 to 18 months at the secondary sites. Due to the nature of construction at the secondary sites the total period of occupation will be longer than this (ranging between 2 and 5 years) with some periods of time where no active construction works will occur at the sites.

The project has been developed to a concept design stage. It is likely that some details may change as the project moves through the detailed design process. Detailed construction method will be determined following appointment of a construction contractor.

2. Overall Plan



3. List of Sites Assessed

| Site # | Name | Address |
|------------------|---|---|
| Site 1A | WS1 Western Springs | Bullock Track & Western Springs Main Entrance |
| Site 1A/2 | Western Springs Depot | |
| Site 1B | Western Springs CSO Collector Sewer Site | |
| Site 2 | AS1 Mt Albert War Memorial Reserve | Wairere Avenue |
| Site 3 | AS2 Lyon Avenue | Morning Star Place |
| Site 4 | AS3 Haverstock Road | Haverstock Road / ESR |
| Site 5 | AS4 Walmsley Park | Sandringham Road Extension |
| Site 6 | WS2 May Road | May Road / Roma Road |
| Site 7 | AS5 Keith Hay Park | |
| Site 8 | AS6 Pump Station 23 | Frederick Street |
| Site 9 | AS7 Kiwi Esplanade | Kiwi Esplanade |
| Site 9B | AS7 Ambury Park | Ambury Road |
| Site 10 | WS3 & MPS Mangere Pump Station in WWTP boundaries | Greenwood Road |
| Site 11 | L1S1 Motions Road | Motions Road |
| Site 12 | L1S2 Western Springs Depot | Western Springs |
| Site 13 | L2S1 Rawalpindi Reserve | Rawalpindi Street |
| Site 14 | L2S2 Norgrove Avenue | Norgrove Avenue |
| Site 15 | Pump Station 25 | Miranda Reserve |
| Site 16 | Miranda Reserve | Miranda Street Reserve |
| Site 17 | L3S3 Whitney Street | Mulgan Street |
| Site 18 | L3S4 Dundale Avenue | Dundale Avenue |
| Site 19 | L4S1 Haycock Avenue | Haycock Avenue |
| Site 20 | Wilta Court Muir Ave Connection | Wilta Court- Kiwi Esplanade |

4. Estimated Summary of Activities

| Site # | Name | Tree Removals / Tree Groups Removals | Tree / Tree Group Relocations | Trees / Tree Groups to be Retained |
|------------------|--|--|-------------------------------------|--|
| Site 1A | WS1 Western Springs | 8 | 0 | 9 |
| Site 1A/2 | Western Springs Depot | 16 | 0 | 0 |
| Site 1B | Western Springs CSO Collector Sewer Site | 16 | 0 | 0 |
| Site 2 | AS1 Mt Albert War Memorial Reserve | 22 | 0 | 7 |
| Site 3 | AS2 Lyon Ave | 167 | 0 | 0 |
| Site 4 | AS3 Haverstock Road | 90 | 0 | 1 |
| Site 5 | AS4 Walmsley Park | 7 | 0 | 4 |
| Site 6 | WS2 May Road | 8 | 0 | 7 |
| Site 7 | AS5 Keith Hay Park | 18 | 13 | 27 |
| Site 8 | AS6 Pump Station PS23 | 23 | 0 | 7 |
| Site 9 | AS7 Kiwi Esplanade | 17 | 0 | 5 |
| Site 9B | AS7 Ambury Park | 1 | 0 | 3 |
| Site 10 | WS3 & MPS Mangere Pumping Station in WWTP boundaries | 13 | 0 | 2 |
| Site 11 | L1S1 Motions Road | 3 | 2 | 3 |
| Site 12 | L1S2 Western Springs Depot | 0 | 0 | 9 |
| Site 13 | L2S1 Rawalpindi Reserve | 23 | 0 | 1 |
| Site 14 | L2S2 Norgrove Avenue | 28 | 0 | 4 |
| Site 15 | Pump Station 25 (Miranda Reserve) | 55 | 0 | 22 |
| Site 16 | Miranda Reserve | 1 | 0 | 3 |
| Site 17 | L3S3 Whitney Street | 10 | 0 | 5 |
| Site 18 | L3S4 Dundale Avenue | 0 | 10 | 0 |
| Site 19 | L4S1 Haycock Avenue | 2 | 0 | 0 |
| Site 20 | Wilta Court | 2 | 0 | 12 |

The project has been developed to a concept design level and the details may change as the design is further developed. The actual number of trees to be removed, relocated, and retained may therefore change. It should be also noted that the above numbers are estimated and where groups of trees have not been counted in the inspection they have been recorded as one.

5. General Comments

The proposed works involve setting out a working area on each of the sites as per the plans. Each site has a construction work plan drawing and a permanent work plan. In the construction phase a larger area will be required to accommodate the various activities. This will require a security type fence to be installed around the perimeter.

These sites will have intensive construction activities undertaken within the perimeters and therefore all vegetation within the site is required to be removed. The sites will have trucks and other vehicle movements to and from the site and therefore reasonable clearance along the accessways into the sites will be required. This is likely to require trees along the access points to be pruned to achieve an adequate clearance. In other circumstances trees adjacent to the accesses will need to be appropriately protected and guards put in place to ensure they are not damaged.

A large number of the sites are within Auckland Council reserves and although vegetation is required to be removed the majority of this vegetation is relatively small and minor. The exception to this is Lyon Avenue where a continuous area of established native vegetation is required to be removed. This area appears to have been planted approximately thirty to forty years ago and has now established to a continuous block of vegetation adjacent to the stream forming a break between the Mt Albert Grammar School and the adjacent commercial sites and residential apartments.

To help offset this loss a comprehensive landscaping plan will be required utilising large grade specimens to provide a level of coverage and screening.

In several of the reserves there are young established trees which could potentially be relocated and reutilised within the reserves. This has been suggested within the comments, however further assessment is required on feasibility. Factors that need to be considered include the soil type, as the presence of rock is likely to make relocation not viable. The final layout of the reserve may also determine whether these trees are usable in any future landscape.

Where possible, and where soil and other conditions allow, it is recommended that any of the existing young trees that are in good health should be relocated. This would require further assessment of individual trees prior to relocation.

This assessment includes the trees within the work area and adjacent to the work area. This has included the access points when this has been shown.

The assessing arborist has considered the potential effects of the works within the site area along with the potential effects to trees adjacent to the sites where excavations or works could directly or indirectly affect the healthy or stability of the trees.

Trees have been identified where it has been considered best practice to apply protection procedures around trees to reduce the risk of damage.

Site 1A Western Springs (WS1)

Proposed works

The proposed works require a compound area to be set up. This will require several fringe edge trees to be removed and pruned. The tree removals involve several Poplar trees, one Willow and several smaller natives.

These trees are not significant specimens however they do contribute to the general vegetative cover on the edge of the reserve.

Any effects from the tree removal could be partially mitigated by replanting suitable species and improving the landscaping over the long term.

The pruning proposed is minor and would not adversely affect the trees form or vigour.

It is proposed to create an entrance into the site off Stadium Road. To make this safe it is proposed to change the carparking and install a footpath along the western side of Stadium Road so tourist buses can park and drop visitors on that side of the road.

On the eastern side it is proposed to construct a new footpath and an access along that side of the road where trucks can travel and not interfere with the bus parking. The Cedar trees are significant trees along the edge of the open space and this row of trees contributes significantly to the amenity. They have a uniformed canopy and this ideally should not be altered to any great degree. Pruning of any lower sizable laterals has a high change of resulting in further branch breakages. If temporary clearance is required solutions such as very minor pruning and branch lifting utilising tiebacks should be employed. These trees are large mature trees and it is likely their rootzones will be throughout the footpath area. Any modifications to the grass and footpath area within the rootzone of these trees should be carefully considered and ideally not result in any root loss. Any modifications should also not result in any significant changes in water infiltration, soil moisture levels and gaseous exchange.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------|----------------------------|--------|--------|---------------------|--------------|-------------------------|----------|
| 1 | Ngaio | <i>Myoporum laetum</i> | 7 | 1200 | 4 | Early mature | | Prune |
| 2 | 3 x Poplar | <i>Populus sp</i> | 20 | 2000 | 10 | Established | On fringe | Prune |
| 3 | Ti Kouka | <i>Cordyline australis</i> | 6 | 1200 | 4 | Early mature | Protect | Retain |
| 4 | 2 x Poplar | <i>Populus sp</i> | 14 | 1200 | 7 | Early mature | Root system in area | Remove |
| 5 | Willow | <i>Salix sp</i> | 10 | > 2000 | 8 | Mature | Poor specimen - Decayed | Remove |
| 6 | Ngaio | <i>Myoporum laetum</i> | 5 | 400 | 2 | Early mature | Overhangs | Prune |

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------------------|------------------------|--------|-------|---------------------|--------------|--------------------------------------|--|
| 7 | Willow | <i>Salix sp</i> | 10 | 2000 | 8 | | Crown overhangs | Prune |
| 8 | Ngaio | <i>Myoporum laetum</i> | 4 | 400 | 2 | Early mature | | Prune |
| 9 | Area of native planting | | 1-6 | | | | Mixed Species | Remove approx. 5 fringe edge trees approximately 1m wide Retain & protect majority |
| 10 | Row of Cedar | <i>Cedrus sp</i> | 14 | 2400 | 8 | Mature | Significant trees on edge of reserve | Retain & Protect. Modify footpath and create accessway. Plan project to minimise disturbance to rootzone and minimise any pruning required |



Overall View



Willow 5 for Removal & Poplars



Native Area & Vegetation 5 to 9



- NOTES:**
1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

| | | | | | | | | | | | |
|-------|------|-----------------|----|-----------------|------|----------------------------|--|--|--|---------------|--|
| | | DESIGNED AC | | | | | | CAD FILE Figure 2 | | DATE 7-Oct-11 | |
| | | DES. CHECKED PR | | | | | | ORIGINAL SCALE A1 | | CONTRACT No. | |
| | | DRAWN AP | | | | | | 1:1000 A3 | | 0538 | |
| | | DWG. CHECKED AC | | | | | | DRAWING No. | | ISSUE | |
| | | REV'D P.MGR PR | | | | | | FIGURE 2 | | 1 | |
| | | APP'D P.DIR OC | | | | | | | | | |
| 1 | | 22/12/11 | | DRAFT AEE ISSUE | | AP PR | | | | | |
| ISSUE | DATE | AMENDMENT | BY | APPD. | DATE | ASSET MANAGER | | | | | |
| | | | | | | OPERATIONS | | SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT | | | |
| | | | | | | waterCare services limited | | CENTRAL INTERCEPTOR GENERAL | | | |
| | | | | | | AEE DECEMBER 2011 | | WESTERN SPRINGS (WS1) - WORK AREAS | | | |
| | | | | | | CONTINUED | | DRAFT | | | |

Site 1A/2 Western Springs

Proposed works

The proposed works involve installing a new manhole. This requires removing several young specimens on the edge of the reserve.

These are not significant trees and their removal could be mitigated with replacement trees and shrubs once the project has been completed. The adjacent retained trees should be protected from potential damage

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|--|----------------------------|--------|-------|---------------------|----------|---------------|----------|
| 1 | Ash | <i>Fraxinus sp</i> | 4 | 200 | 3 | Juvenile | In the Garden | Remove |
| 2 | Ti Kouka | <i>Cordyline australis</i> | 4 | 250 | 1 | Juvenile | In the Garden | Remove |
| 3 | Ash | <i>Fraxinus sp</i> | 4 | 400 | 2 | Juvenile | In the Garden | Remove |
| 4 | 2 x Ribbonwood | <i>Plagianthus sp</i> | 3 | 100 | 1 | Juvenile | In the Garden | Remove |
| 5 | Ash | <i>Fraxinus sp</i> | 4 | 250 | 2 | Juvenile | In the Garden | Remove |
| 6 | Mixed Hebe / Coprosma / Astelia (Approx. 10) | | 0.5 | 50 | 1 | Juvenile | In the Garden | Remove |





NOTES:

1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.



| | | | |
|--------------|------|---------------|--|
| DESIGNED | AC | | |
| DES. CHECKED | PR | | |
| DRAWN | AP | | |
| DWG. CHECKED | AC | | |
| REV'D P.MGR | PR | | |
| APP'D P.DIR | CC | | |
| BY | DATE | ASSET MANAGER | |

OPERATIONS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 AEE DECEMBER 2011



CENTRAL INTERCEPTOR
 GENERAL
 WESTERN SPRINGS DEPOT (L1S2) - WORK AREAS
 DRAFT

| | |
|-------------------------|-------------------|
| CAD FILE Figure 13.1 | DATE 7-Oct-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| DRAWING No. FIGURE 13.1 | ISSUE 1 |

Site1B Western Springs CSO Collector Sewer Site

Proposed works

It is proposed to undertake construction works and create a compound around the existing site. This will require the removal of vegetation within the work area to provide adequate area.

This site is adjacent to the Caltex Service Station and is predominately an open grass area adjacent to the motorway on and off ramp.

The vegetation and trees adjacent to the boundary of the Service Station provide some screening between the sites and help to screen off a cabinet and a cellular antennae compound on the site. The vegetation is typical hedging / screening plants, predominantly Pittosporum. The loss of vegetation will have a negligible effect on the environment and by replanting at the completion of the project with large grade plants any potential effects could be off set.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-----------------|------------------------------|--------|-------|---------------------|--------------|--|----------|
| 1 | 8 x Pittosporum | <i>Pittosporum sp</i> | 5 | 400 | 2 | Early mature | Located around cell tower complex | Remove |
| 2 | Wattle | <i>Acacia sp</i> | 6 | 700 | 5 | Early mature | Self seeded weed species | Remove |
| 3 | 5 x Pittosporum | <i>Pittosporum sp</i> | 6 | 400 | 2 | Early mature | Along edge of fence – Possibly screening for service station | Remove |
| 4 | Puka | <i>Griselinia littoralis</i> | 3 | 150 | 2 | Early mature | | Remove |
| 5 | Wattle | <i>Acacia sp</i> | 5 | 300 | 1 | Early mature | Weed species | Remove |



Small Vegetation within Site





| ISSUE | DATE | AMENDMENT | # | BY | APPRO. | # | BY | APPRO. | # | DATE |
|-------|----------|-------------|---|----|--------|---|----|--------|---|------|
| 1 | 20/12/11 | ISSUE NO. 1 | | | | | | | | |

| DESCRIPTION | DATE |
|-------------------|------|
| DESIGN CHECKED BY | |
| DRAWN BY | |
| CHECKED BY | |
| APPRO. BY | |
| APPRO. DATE | |

DATE: 19-DEC-11
CONTRACT NO. 0538

FIGURE NO. 1

ISSUE 1

ISSUE 1

ISSUE 1

ISSUE 1

ISSUE 1

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

BY

APPRO.

#

DATE

ISSUE

DATE

AMENDMENT

#

Site 2 Mt Albert War Memorial Reserve (AS1)

Proposed works

The proposed works will involve constructing a compound within the reserve. The compound has been located within the area that is likely to cause the least disturbance. The fence is set back from the residential boundaries therefore retaining the majority of the vegetation around the perimeter.

The vegetation within the compound area will require removal. This consists of clumps of young to early mature natives. This site has a large quantity of rock and therefore relocation is unlikely to be viable.

The vegetation loss will be minimal in context of the total vegetation coverage within the reserve and there will be vegetation retained around the perimeter. The removal of this vegetation could be offset by replacement planting.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------------------------------|---|--------|-------|---------------------|--------------|---------------------------------|------------------|
| 1 | Pittosporum | <i>Pittosporum sp</i> | 6 | 500 | 4 | | | Retain & protect |
| 2 | Ngaio | <i>Myoporum laetum</i> | 7 | 1200 | 5 | | | Retain & protect |
| 3 | 2 x Pohutukawa | <i>Metrosideros excelsa</i> | 4.5 | 400 | 2 | | | Retain & protect |
| 4 | Pohutukawa | <i>Metrosideros excelsa</i> | 8 | 1200 | 4 | | Against boundary | Retain & protect |
| 5 | 2 x Karaka | <i>Corynocarpus laevigatus</i> | 7 | 500 | 3 | Early mature | | Retain & protect |
| 6 | 7 x Puriri & Other small natives | <i>Vitex lucens</i> | 5 | 400 | 2 | Young | Established – Possibly relocate | Remove |
| 7 | 4 x Karaka | <i>Corynocarpus laevigatus</i> | 4.5 | 500 | 2 | Early mature | Established – Possibly relocate | Remove |
| 8 | 3 x Karaka | <i>Corynocarpus laevigatus</i> | 4 | 500 | 2 | Young | Established – Possibly relocate | Remove |
| 9 | Flax / 2 x Ti Kouka | <i>Phormium tenax / Cordyline australis</i> | 5 | 400 | 1 | Young | Established – Reutilise | Remove |
| 10 | 3 x Karaka | <i>Corynocarpus laevigatus</i> | 6 | 700 | 3 | Established | | Remove |
| 11 | Flax / 1 x Ti Kouka | <i>Phormium tenax / Cordyline australis</i> | 3 | 400 | 1 | Established | Reutilise | Remove |
| 12 | 1 x Small Native Planting / Astelia | | | | | | Reutilise | Remove |
| 13 | Puka (Hedge) | <i>Griselina sp</i> | 1 | 100 | 1 | | Poor specimens | Remove |



Trees 1-8 Southern Boundary Mt Albert War Memorial Reserve



Young Puriri (6) Possibly Relocate



Small Karaka Trees



NOTES:
 1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

| ISSUE | DATE | AMENDMENT | BY | APPROV'D | DATE |
|-------|----------|-----------------|----|----------|------|
| 1 | 22/12/11 | DRAFT A/E ISSUE | | | |

| DESIGNED | AC |
|--------------|----|
| DES. CHECKED | PR |
| DRAWN | # |
| ENG. CHECKED | AC |
| REV'D P.MGR | PR |
| APP'D P.DIR | CC |

OPERATIONS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 A/E DECEMBER 2011



CENTRAL INTERCEPTOR GENERAL
 MT ALBERT WAR MEMORIAL RESERVE (AS1) - WORK AREAS
 DRAFT

| | |
|----------------------|-------------------|
| CAD FILE Figure 3 | DATE 7-Oct-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| 1:1000 A3 | |
| DRAWING No. FIGURE 3 | ISSUE 1 |

Site 3 Lyon Ave (AS2)

Proposed works

It is proposed to create a compound within the northeast corner of this area. This will require the removal of the majority of vegetation within this compound area. The proposal has been modified to take into account the vegetation. The method of access has been changed so fringe edge vegetation can be retained maintaining screening and reducing vegetation loss. A Pohutukawa (1) in the north east corner will also now be retained which will assist in providing some screening for the adjacent apartments.

The vegetation is established and is predominantly mixed natives of a moderate size. This vegetation provides a buffer between the apartments and compound site and the Mt Albert Grammar School.

These trees contribute to the amenity of the area and therefore the retention of some of the vegetation will help to maintain the vegetative cover and screening.

The removal of the centre trees is likely to have no more than a minor effect. The level of replanting and size of replacement specimens will be important in helping to mitigate the effects of the tree removal.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|---|--|--------|--------|---------------------|--------------|--|----------|
| 1 | Pohutukawa | <i>Metrosideros excelsa</i> | 9 | > 2400 | 6 | Early Mature | Average vigour - Provides screening | Retain |
| 2 | Kohuhu | <i>Pittosporum tenuifolium</i> | 7 | 700 | 2 | Early Mature | | Remove |
| 3 | Totara | <i>Podocarpus totara</i> | 9 | 800 | 3 | Early Mature | | Remove |
| 4 | Totara | <i>Podocarpus totara</i> | 9 | 1200 | 5 | Early Mature | | Remove |
| 5 | Lemonwood | <i>Pittosporum eugenoides</i> | 9 | 1600 | 4 | Early Mature | | Remove |
| 6 | Karaka | <i>Corynocarpus laevigatus</i> | 7 | > 1600 | 4 | Early Mature | | Remove |
| 7 | Coprosma | <i>Coprosma sp</i> | 3 | > 1400 | 5 | Early Mature | | Remove |
| 8 | Kanuka | <i>Kunzea ericoides</i> | 7 | 1000 | 4 | Early Mature | | Remove |
| 9 | Sheoak | <i>Casuarina sp</i> | 20 | > 3000 | 7 | Early Mature | | Remove |
| 10 | 27 x Mixed Natives Puriri / Totara / Coprosma / Pittosporum | <i>Vitex lucens / Podocarpus totara / Coprosma sp / Pittosporum sp</i> | 6 | 800 | 3 | Early Mature | | Remove |
| 11 | Karaka | <i>Corynocarpus laevigatus</i> | 8 | 1000 | 4 | Early Mature | | Remove |
| 12 | Totara | <i>Podocarpus totara</i> | 8 | 700 | 3 | Early Mature | | Remove |

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|---|--|--------|-------|---------------------|--------------|--|--|
| 13 | 7 x Mixed Juvenile Natives | | 3 | 100 | 1 | Early Mature | | Remove |
| 14 | Totara | <i>Podocarpus totara</i> | 8 | 800 | 3 | Early Mature | | Remove |
| 15 | Puka | <i>Griselinia sp</i> | 6 | 1400 | 5 | Early Mature | | Remove |
| 16 | 3 x Lemonwood | <i>Pittosporum eugenioides</i> | 7 | 800 | 3 | Early Mature | | Remove |
| 17 | Lombardy Poplar | <i>Populus nigra 'Italica'</i> | 15 | 1200 | 2 | Early Mature | | Remove |
| 18 | Box Elder | <i>Acer negundo</i> | 8 | 2000 | 8 | Early Mature | | Remove |
| 19 | 2 x Kawaka | <i>Libocedrus plumosa</i> | 4 | 400 | 2 | Early Mature | | Remove |
| 20 | 3 x Lemonwood | <i>Pittosporum eugenioides</i> | 5 | 300 | 2 | Early Mature | | Remove |
| 21 | 8 x Mixed Natives | | 6 | 600 | 3 | Early Mature | | Remove |
| 22 | Totara | <i>Podocarpus totara</i> | 9 | 1100 | 5 | Early Mature | | Remove |
| 23 | Totara | <i>Podocarpus totara</i> | 8 | 1000 | 4 | Early Mature | | Remove |
| 24 | Norfolk Island Hibiscus | <i>Lagunaria patersonii</i> | 9 | 1200 | 5 | Early Mature | | Remove |
| 25 | Japanese Cedar | <i>Cryptomeria japonica</i> | 12 | 1200 | 5 | Early Mature | | Remove |
| 26 | 24 x Mixed Natives Nikau / Pittosporum / Ti Kouka / Coprosma | <i>Rhopalostylis sapida / Pittosporum sp / Cordyline australis / Coprosma sp</i> | 9 | 1000 | 4 | Early Mature | | Remove |
| 27 | Totara | <i>Podocarpus totara</i> | 10 | 900 | 4 | Early Mature | | Remove |
| 28 | 7 x Totara / Karaka & Other Natives | <i>Podocarpus totara/ Corynocarpus laevigatus & others</i> | 10 | 1400 | 5 | Early Mature | Established – | Retain and protect |
| 29 | 3 x Totara | <i>Podocarpus totara</i> | 12 | 1000 | 5 | Early Mature | | Retain and protect |
| 30 | Puriri | <i>Vitex lucens</i> | 12 | 1400 | 5 | Early Mature | | Remove |
| 31 | 23 x Mixed Natives Mahoe / Kanuka / Pittosporum / Coprosma & other natives | <i>Melicytus ramiflorus / Kunzea ericoides / Pittosporum sp / Coprosma sp & others</i> | 10 | 1000 | 4 | Early Mature | On the edge of the works – Remove some & Retain some | Remove / Retain – (Retain majority, potential removal of trees closest to fence) |
| 32 | 37 x Mixed Natives Mahoe / Kanuka / Pittosporum / Coprosma / Ti Kouka & other natives | <i>Melicytus ramiflorus / Kunzea ericoides / Pittosporum sp / Coprosma sp / Cordyline australis & others</i> | 10 | 1000 | 4 | Early Mature | On the edge of the works – Remove some & Retain some | Remove / Retain – Remove centre trees near works – Retain edge trees |
| 33 | Pohutukawa | <i>Metrosideros excelsa</i> | 7 | 1000 | 3 | Early Mature | | Remove |
| 34 | Holm Oak | <i>Quercus ilex</i> | 12 | 900 | 4 | Early Mature | | Remove |



Pohutukawa Tree 1



Understorey Vegetation



Understorey Vegetation



Understorey Mixed Vegetation with Newly Planted Vegetation



Understorey Mixed Vegetation with Newly Planted Vegetation



NOTES:

1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

Plot Date: 27-Mar-12 4:47 PM
 File path: F:\0508 - Central Interceptor\A3 Morning\AEE_Constr\Tree.Dwg

| | | | | | | | | | | |
|--------------|----------|-----------|----|-------|---|----|--|--------------------------------|----------------------|------------|
| DESIGNED | | AC | | | OPERATIONS SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT AEE JUNE 2012 | | CENTRAL INTERCEPTOR GENERAL LYON AVENUE (AS2) - WORK AREAS | CAD FILE Figure 4 DATE 7-03-11 | | |
| DES. CHECKED | | PR | | | | | | ORIGINAL SCALE A1 1:1000 A3 | CONTRACT No. 0538 | |
| DRAWN | | AF | | | | | | DRAWING No. FIGURE 4 | | ISSUE 1 |
| DWS. CHECKED | | AC | | | | | | | | |
| REV'D P.MGR | | PR | | | | | | | | |
| ISSUE | DATE | AMENDMENT | BY | APPD. | APP'D P.DIR | CC | BY | DATE | | |
| 1 | 22/02/11 | | AF | PR | APP'D P.DIR | CC | | | | |

Site 4 Haverstock Road (AS3)

Proposed works

The site is located behind residential houses within a research facility site (Plant & Food Research). The proposed works require a compound area to be set up along with access points from Haverstock Road and Camden Road. This will require the removal of several clusters of Willow and a group of Ti Kouka trees along with the removal of several trees in the road reserve at the end of the cul-de-sac on Camden Road. The Ti Kouka trees have been planted in rows and are likely to have been part of a test planting.

The trees proposed to be removed are not significant and it is possible the Ti Kouka trees could be relocated if necessary, however, some are showing signs of stress and decline.

The site is not easily observed from outside the site and there is established vegetation surrounding the proposed compound area. The loss of vegetation will have a negligible effect on the environment.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|--------------------------------|---------------------------------------|--------|-------|---------------------|--------------|---|------------------|
| 1 | Privet | <i>Privet sp</i> | 4 | 300 | 2.5 | | | Remove |
| 2 | Willow | <i>Salix sp</i> | 9 | 2000 | 5 | | | Remove |
| 3 | Willow | <i>Salix sp</i> | 12 | 2000 | 4 | | Large clump of Willows | Remove |
| 4 | Group of Ti Kouka (Approx. 80) | <i>Cordyline australis</i> | 5 | 600 | 1.5 | Early mature | Planting of approx. 80 trees in wetland area. Could be relocated however they are showing signs of stress and decline | Remove |
| 5 | Monkey Hand Tree | <i>Chiranthodendron pentadactylon</i> | 10 | 1400 | 6 | Early mature | | Retain & Protect |
| 6 | 4 x Ti Kouka | <i>Cordyline australis</i> | 9 | 1400 | 4 | Established | Road Reserve | Remove |
| 7 | Prunus & Others | <i>Prunus sp & Others</i> | 8 | 1000 | 5 | | Remove for access | Remove |
| 8 | Silky Oak | <i>Grevillea robusta</i> | 14 | 1600 | 6 | Established | | Remove |
| 9 | Olive | <i>Olea sp</i> | 8 | 900 | 4 | Established | | Remove |



View of site from Haverstock



View of site from Haverstock



Camden Road Access Point



- NOTES:**
- DESIGNATION BOUNDARY TO BE REDUCED UPON COMPLETION OF WORKS.
- LEGEND**
- MAIN TUNNEL
 - LINK SEWER
 - CSO COLLECTOR
 - CONNECTION PIPELINE
 - VENTILATION DUCTS
 - EXISTING RETICULATION SEWER
 - WC - EXISTING TRUNK SEWER
 - SW - EXISTING STORMWATER
 - PROPOSED DESIGNATION BOUNDARY
 - LID/STRUCTURE FLUSH WITH GROUND
 - LID/STRUCTURE ABOVE GROUND

Plot Date: 15-Mar-12 10:43 AM
 File path: P:\0208 - Central Interceptor\A3 - Drawing\A3_01_Main\AEE_Cover\Cover.dwg

| ISSUE | DATE | AMENDMENT | BY | APPD. | DESIGNED | CHK. | DATE |
|-------|----------|---------------------|----|-------|---------------|------|------|
| 3 | 16/02/12 | DRAFT AEE ISSUE - 3 | AP | PR | DESIGNED | JS | |
| 2 | 17/02/12 | DRAFT AEE ISSUE - 3 | AP | PR | DRAWN | AP | |
| 1 | 22/12/11 | DRAFT AEE ISSUE | AP | PR | APP'D P. DIR. | OC | |

OPERATIONS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 AEE FEBRUARY 2012

CENTRAL INTERCEPTOR GENERAL
 HAVERSTOCK ROAD (AS3) - PERMANENT WORKS PLAN
DRAFT

| | |
|--------------------------|-------------------|
| CAD FILE AEE-MAIN-4.1 | DATE 16-Dec-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| DRAWING No. AEE-MAIN-4.1 | ISSUE 3 |

Site 5 Walmsley Park (AS4)

Proposed works

It is proposed to install a compound within the reserve adjacent to Sandringham Road extension between the watercourse and the houses. This will require the removal of several established Sheoak trees from the reserve.

The proposed accessway is near the southern boundary which will encroach within the root zones of the trees located in the adjacent property. Protection measures will need to be implemented to ensure these trees are not adversely affected. Puriri trees are relatively sensitive to disturbance to their growing environment and therefore it is important to minimise any disturbance. A solid fence should be installed around the perimeter of the rootzone to eliminate accidental damage.

The trees within the reserve proposed for removal are not significant specimens. The loss of these trees could be offset by replanting new specimens.

Tree List

Walmsley Park

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|--------------|---------------------------------|--------|--------|---------------------|--------------|--------------------------------------|------------------|
| 1 | Pohutukawa | <i>Metrosideros excelsa</i> | 5 | 1000 | 4 | Early mature | | Remove |
| 2 | Magnolia | <i>Magnolia grandiflora</i> | 4 | 200 | 1.5 | Early mature | | Remove |
| 3 | Monkey Apple | <i>Acmena smithii</i> | 8 | > 2400 | 6 | Mature | | Remove |
| 4 | Kahikatea | <i>Dacrycarpus dacrydioides</i> | 4 | 50 | 1 | Juvenile | | Remove |
| 5 | Kahikatea | <i>Dacrycarpus dacrydioides</i> | 4 | 50 | 1 | Juvenile | | Remove |
| 6 | Sheoak | <i>Casuarina sp</i> | 12 | 2200 | 6 | Early mature | 3m from boundary | Retain & Protect |
| 7 | Puriri | <i>Vitex lucens</i> | 7 | 1600 | 4 | Early mature | 1m from boundary in private property | Prune & Protect |
| 8 | Sheoak | <i>Casuarina sp</i> | 12 | 1400 | 6 | Established | Damaged main leader. Poor form | Remove |
| 9 | Sheoak | <i>Casuarina sp</i> | 12 | > 2600 | 7 | Mature | | Remove |
| 10 | Sheoak | <i>Casuarina sp</i> | 12 | 1600 | 6 | Mature | | Retain & Protect |
| 11 | Willow | <i>Salix sp</i> | 10 | > 2400 | 7 | Mature | | Prune & Protect |



Willow Tree 11 – In Reserve



Casuarina Tree



Casuarina & Puriri – In Neighbours



Acmena



Magnolia



NOTES:

1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

| | | | |
|--------------|------|--|--|
| DESIGNED | AC | | |
| DES. CHECKED | PE | | |
| DRAWN | AP | | |
| ENG. CHECKED | AC | | |
| REV'D P.MGR | PE | | |
| APP'D P.DIR | OC | | |
| BY | DATE | | |

OPERATORS

SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT

ISSUED MARKED: **AAE DECEMBER 2011**



CENTRAL INTERCEPTOR GENERAL

DRAFT

WALMSLEY PARK (AS4) - WORK AREAS

| | |
|----------------------|-------------------|
| CAD FILE: Figure 6 | DATE: 3-Nov-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| 1:1000 A3 | |
| DRAWING No. FIGURE 6 | ISSUE 1 |

Site 6 May Road (WS2)

Proposed works

It is proposed to install a compound and access track into the site. This area is an undeveloped portion of commercial land. The area has a high occurrence of weeds throughout the site. The predominant coverage is Blackberry, Gorse, Pampass and the occasional Flax with a cluster of Wattle.

There is a line of planted Ngaio trees adjacent to the watercourse which are early mature. These are likely to require removal. The vegetation is not significant and the removal of this vegetation will not have any more than a minor effect on the amenity of the area.

Tree List

May Road

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------|------------------|--------|-------|---------------------|--------------|----------|----------|
| 1 | 7 x Wattle | <i>Acacia sp</i> | 8 | 900 | 6 | Early mature | | Remove |
| 3 | Spruce | <i>Picea spp</i> | 8 | 1000 | 4 | Early mature | | Remove |



Overview of Site



Overview of Site



NOTES:

1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

| | | | | | |
|--------------|------|----|------|----|------|
| DESIGNED | AC | | | | |
| DES. CHECKED | PR | | | | |
| DRAWN | AP | | | | |
| DWG. CHECKED | AC | | | | |
| REV'D P. MGR | PR | | | | |
| APP'D P. DIR | CC | | | | |
| BY | DATE | BY | DATE | BY | DATE |

OPERATIONS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 AEE DECEMBER 2011



CENTRAL INTERCEPTOR
 GENERAL
 MAY ROAD (WS2) - WORK AREAS

DRAFT

| | |
|----------------------|-------------------|
| CAD FILE Figure 7 | DATE 4-Nov-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| 1:1250 A3 | |
| DRAWING No. FIGURE 7 | ISSUE 1 |

Site 7 –Keith Hay Park (AS5)

Proposed works

It is proposed to install a compound on 20 and 22 Gregory Place. This will require the removal of the vegetation within the site and works within the rootzone of trees located in the reserve overhanging the site. It is also proposed to micro-tunnel a new 900mm diameter pipe adjacent to the walkway through the reserve. This will require exit and entry hole excavations for the micro-tunnel adjacent to the walkway which will be in proximity to trees.

Provided the trees adjacent to the proposed accessway are protected it is likely these trees along each side of the path can be retained.

The compound area requires the removal of several trees on the east side of the path. The small Plane trees within this area could be relocated however this may not be the best outcome and this needs further consultation with Auckland Council Parks.

The vegetation modification is very minor and would have a negligible effect on the overall amenity of the site.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|------------------------------|--|--------|-------|---------------------|--------------|------------------------------|----------|
| 1 | Mixed native Shrubbery | <i>Coprosma sp / Cordyline australis</i> | 5 | 400 | 1 | | | Remove |
| 2 | Plane | <i>Platanus sp</i> | 7 | 800 | 5 | Early mature | Reserve | Remove |
| 3 | Plane | <i>Platanus sp</i> | 7 | 500 | 3 | Early mature | | Remove |
| 4 | Queensland Box | <i>Lophostemon sp</i> | 7 | 600 | 3.5 | Early mature | Average vigour | Remove |
| 5 | 3 x Camphor | <i>Cinnamomum camphora</i> | 7 | >1600 | 6 | | Reserve Overhanging property | Remove |
| 6 | Pohutukawa | <i>Metrosideros excelsa</i> | 9 | >2400 | 6 | | Private Property | Remove |
| 7 | Japanese Cedar | <i>Cryptomeria japonica</i> | 15 | >2000 | 6 | | | Remove |
| 8 | 2 x Persian Lilac 2 x Prunus | <i>2 x Melia azederach 2 x Prunus sp</i> | 7 | 900 | 5 | | Reserve Overhanging property | Remove |
| 9 | Silky Oak | <i>Grevillea robusta</i> | 14 | 1600 | 6 | | Private land | Remove |
| 10 | Wonder tree | <i>Idesia polycarpa</i> | 7 | 800 | 6 | | Private land | Remove |

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|--|--|--------|-------|---------------------|--------------|-----------------------|-------------------|
| 11 | Water gum | <i>Tristaniaopsis sp</i> | 8 | >1200 | 5 | | Private land | Remove |
| 12 | Norfolk Island Hibiscus | <i>Lagunaria patersonii</i> | 8 | >900 | 5 | | Private land | Remove |
| 13 | Norfolk Island Pine | <i>Araucaria heterophylla</i> | 25 | >2200 | 6 | | Private land | Remove |
| 14 | Row of Plane (Approx. 13) | <i>Platanus sp</i> | 6 | 300 | 2.5 | Juvenile | Set back 4m from path | Possibly relocate |
| 15 | Row of mixed Trees (Approx. 16) | <i>Lophostemon sp / Eucalyptus sp</i> | 4.5 | 700 | 4 | | Set back 6m from path | Retain & Protect |
| 16 | Mixed Row of trees West of path (Approx. 10) | <i>Prunus sp / Alectryon excelsus / Sophora sp</i> | 8 | 1800 | 5 | Mature | Set back 5m from path | Retain & Protect |
| 17 | Norfolk Island Hibiscus | <i>Lagunaria patersonii</i> | 8 | 1600 | 5 | Early mature | 2m from path | Retain & Protect |





Trees Adjacent to Walkway



Trees Adjacent to Walkway



Trees Adjacent to Walkway



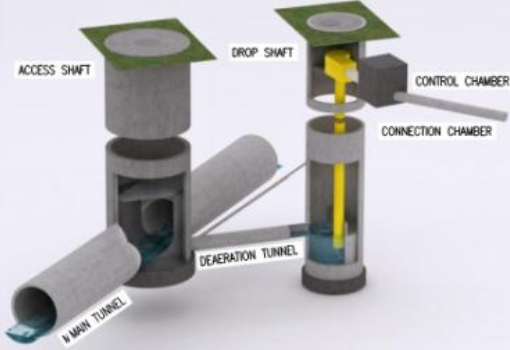
Trees Adjacent to Walkway



Trees 5 – 13



Trees 5 – 13



- LEGEND**
- MAIN TUNNEL
 - - - LINK SEWER
 - - - CSO COLLECTOR
 - - - CONNECTION PIPELINE
 - - - VENTILATION DUCTS
 - - - EXISTING RETICULATION SEWER
 - WC EXISTING TRUNK SEWER
 - SW EXISTING STORMWATER
 - PROPOSED DESIGNATION BOUNDARY
 - LID/STRUCTURE FLUSH WITH GROUND
 - LID/STRUCTURE ABOVE GROUND



Plot Date: 07-Nov-12 10:59 AM
 File Path: P:\0238 - Central Interceptor\A55 - Central Interceptor\A55 - Central Interceptor\Drawings\

| ISSUE | DATE | AMENDMENT | BY | APPD. | BY | DATE | ASST. MANAGER |
|-------|----------|---------------------|----|-------|-------------|------|---------------|
| 4 | | DRAFT | | | | | |
| 3 | 16/03/12 | DRAFT AEE ISSUE - 3 | AP | PR | | | |
| 2 | 17/02/12 | DRAFT AEE ISSUE - 2 | AP | PR | REV'D P.MGR | | |
| 1 | 22/12/11 | DRAFT AEE ISSUE | AP | PR | APP'D P.DIR | | |

DESIGNED: ML
 DES. CHECKED: JS
 DRAWN: AP
 DWG. CHECKED: ML
 REV'D P.MGR: JS
 APP'D P.DIR: CC

OPERATING

SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT

AEE FEBRUARY 2012



CENTRAL INTERCEPTOR GENERAL

DRAFT

KEITH HAY PARK (A55) - CONSTRUCTION WORKS PLAN

| | |
|----------------------------|-------------------|
| CAD FILE: AEE-MAN-7.2_ALT2 | DATE: 7-Oct-11 |
| ORIGINAL SCALE: A1 | CONTRACT No. 0538 |
| DRAWING No. AEE-MAN-7.2 | ISSUE 4 |

Site 8 Pump Station 23 (AS6)

Proposed works

It is proposed to undertake construction works and create a compound around the existing site. This will require the removal of vegetation within the work area.

There are several Pohutukawa trees numbered 9 and 10 on the fringe of the works adjacent to the foreshore which are established and contribute to the screening. The proposed works require the removal of these trees. There is also a medium sized early mature Pohutukawa Tree (12) beside the existing building which also requires removal.

The vegetation and trees adjacent to the drive overhang the accessway and some pruning is required.

These Pohutukawa trees contribute to the amenity of the Coastal area and therefore the removal of these trees will alter the level of vegetative cover and screening. Established Pohutukawa trees such as trees 9 and 10 form part of the Coastal forest.

The removal of these trees is likely to have more than a minor effect and therefore the level of replanting and size of replacement specimens will be important in helping to mitigate the effects of the tree removal.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|------------------------------|---|--------|--------|---------------------|--------------|---|-----------------|
| 1 | Oak | <i>Quercus sp</i> | 7 | 1000 | 5 | Early mature | | Prune & Protect |
| 2 | Coprosma & Pittosporum | <i>Coprosma sp / Pittosporum sp</i> | 4 | 600 | 3 | Early mature | | Prune & Protect |
| 3 | Coprosma & Wattle | <i>Coprosma sp / Acacia sp</i> | 3 | 400 | 2 | Early mature | Side of drive | Prune & Protect |
| 4 | Pohutukawa | <i>Metrosideros excelsa</i> | 6.5 | 900 | 4 | Early mature | | Remove |
| 5 | 4 x Karo / Karaka / Coprosma | <i>Pittosporum crassifolium / Corynocarpus laevigatus / Coprosma sp</i> | 3.5 | 400 | 1.5 | Juvenile | | Remove |
| 6 | Puriri | <i>Vitex lucens</i> | 8 | 1000 | 5 | Established | Prune to install fence | Prune & Protect |
| 7 | Puka | <i>Griselina sp</i> | 4 | 800 | 2 | Early mature | | Remove |
| 8 | Shrub | | 1 | 400 | 1.5 | | | Remove |
| 9 | Pohutukawa | <i>Metrosideros excelsa</i> | 8 | > 2400 | 7 | Established | On the coastal foreshore – One identity Group | Remove |
| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |

| | | | | | | | | |
|----|---|---|---|-------|---|--------------|---|------------------|
| 10 | Pohutukawa | <i>Metrosideros excelsa</i> | 8 | >2400 | 7 | Established | On the coastal foreshore – One identity Group | Remove |
| 11 | Puriri | <i>Vitex lucens</i> | 8 | 1200 | 5 | Early mature | | Retain & protect |
| 12 | Pohutukawa | <i>Metrosideros excelsa</i> | 6 | 2000 | 4 | Early mature | On the foreshore screening building | Remove |
| 13 | 2 x Privet | <i>Privet sp</i> | 6 | 900 | 5 | Early mature | | Remove |
| 14 | Coprosma Mahoe | <i>Coprosma sp / Melicytus ramiflorus</i> | 3 | 400 | 2 | Early mature | | Remove |
| 15 | Mixed Weeds with occasional self-seeded native (Approx. 10) | | 3 | 300 | 1 | | | Remove |



Trees on Upper Bank



Trees on Upper Bank



Pohutukawa Trees 9 & 10



Tree 12



Trees on Upper Bank



Trees Adjacent to Access



| | | | | | |
|--------------|----------|-----------------|----|-------|------|
| DESIGNED | AC | | | | |
| DES. CHECKED | PR | | | | |
| DRAWN | AP | | | | |
| DWG. CHECKED | AC | | | | |
| REV'D P.MGR | PR | | | | |
| APP'D P.DIR | CC | | | | |
| ISSUE | DATE | AMENDMENT | BY | APPD. | DATE |
| 1 | 22/12/11 | DRAFT A/E ISSUE | | | |

OPERATIONS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 AEE DECEMBER 2011



CENTRAL INTERCEPTOR
 GENERAL
 PS23 (AS6) - WORK AREAS

DRAFT

| | |
|----------------------|-------------------|
| CAD FILE Figure 9 | DATE 4-Nov-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| 1:1000 A3 | |
| DRAWING No. FIGURE 9 | ISSUE 1 |

Site 9 Kiwi Esplanade (AS7)

Proposed works

It is proposed to establish a compound within the Kiwi Esplanade Reserve around the existing toilet block. This will require the removal of a number of Pohutukawa trees and a Puriri tree. Several Pohutukawa trees and Puriri will be retained around the fringes of these works, this will maintain some screening.

The vegetation modification is very minor and would have a negligible effect on the overall amenity of the site. It will be important to protect the retained vegetation and the final construction layouts should consider the potential to retain trees where practical. . See Site 20 for the description of works between Kiwi Esplanade and Wilta Court.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|----------------|-----------------------------|--------|-------|---------------------|--------------|------------------|------------------|
| 1 | Pohutukawa | <i>Metrosideros excelsa</i> | 9 | 1600 | 5 | Early mature | Trench on fringe | Retain & protect |
| 2 | 3 x Pohutukawa | <i>Metrosideros excelsa</i> | 9 | 1600 | 5 | Early mature | | Remove |
| 3 | Puriri | <i>Vitex lucens</i> | 4 | 700 | 3 | Early mature | | Remove |
| 4 | Pohutukawa | <i>Metrosideros excelsa</i> | 8 | 2000 | 5 | Early mature | | Retain & protect |
| 5 | Puriri | <i>Vitex lucens</i> | 7 | 1400 | 5 | Early mature | | Retain & protect |
| 6 | 2 x Pohutukawa | <i>Metrosideros excelsa</i> | 9 | 2200 | 6 | Early mature | | Retain & protect |
| 7 | Pohutukawa | <i>Metrosideros excelsa</i> | 9 | 1800 | 6 | Early mature | | Remove |
| 8 | 5 x Pohutukawa | <i>Metrosideros excelsa</i> | 3 | 400 | 1 | Early mature | | Remove |
| 9 | 2 x Pohutukawa | <i>Metrosideros excelsa</i> | 7 | 1800 | 4 | Early mature | | Remove |
| 10 | 3 x Pohutukawa | <i>Metrosideros excelsa</i> | 5 | 400 | 1 | Early mature | | Remove |
| 11 | 2 x Pohutukawa | <i>Metrosideros excelsa</i> | 2 | 400 | 1 | Early mature | | Remove |



Trees 8, 9, 10 & 11 – North Side of Toilet



Trees 2, 3 & 7 – South Side of Toilet



Trees 3, 4, 5 & 6 – South Side of Toilet

Site 9 – Option B Ambury Park

Proposed works

It is proposed to establish a compound within Ambury Park on the northern side of the main access. The works are in general clear of the majority of vegetation on the site. The site fence and extent of works may encroach on some fringe vegetation and pruning and minor removal is likely.

The vegetation modification is very minor and would have a negligible effect on the overall amenity of the site. It will be important to protect the retained vegetation and the final construction layouts should consider the potential to retain trees where practical.

See Site 20 for the general description of works between Ambury Park and Wilta Court however this will vary slightly in the actual route but follow the same work methods and be installed in the carriageway in the upper portions of Muir Ave.

Tree List

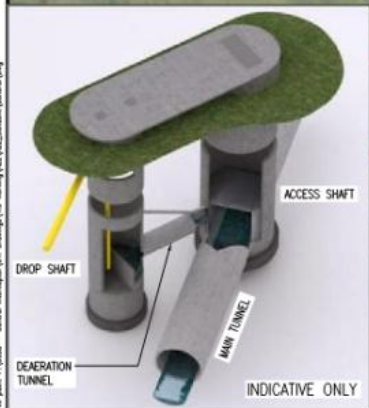
| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|---|--|--------|---------|---------------------|--------------|---|--|
| 1 | Mixed Row of Natives – Karo / Pohutukawa / Ti Kouka / Oleria / Ngaio / Coprosma | <i>Pittosporum sp / Metrosideros excelsa / Cordyline australis / Oleria sp / Myoporum laetum / Coprosma sp</i> | 5-8 | 200-800 | 1-5 | Early mature | Group of sub-canopy natives | Retain majority – Prune fringe edge with possible removal of some small fringe trees |
| 2 | Pohutukawa | <i>Metrosideros excelsa</i> | 8 | 1400 | 5 | | Average vigour | Retain & protect |
| 3 | 3 x Pohutukawa | <i>Metrosideros excelsa</i> | 8 | >2000 | 5 | Early mature | Average vigour – Maintain excavations to edge of road | Retain & protect |



Line of Vegetation – Trees 1, 2 & 3



Pohutukawa Tree 2



LEGEND

- MAIN TUNNEL
- LINK SEWER
- CSO COLLECTOR
- CONNECTION PIPELINE
- VENTILATION DUCTS
- EXISTING RETICULATION SEWER
- VC EXISTING TRUNK SEWER
- SW EXISTING STORMWATER
- PROPOSED DESIGNATION BOUNDARY
- LID/STRUCTURE FLUSH WITH GROUND
- LID/STRUCTURE ABOVE GROUND

P:\01 Date: 18-Aug-12 2:50 PM
 File path: P:\01038 - Central Interceptor\Gen - Central Interceptor\LS - Manukau\VC\VEL_Crosscut\General.dwg

| | | |
|--------------|------|--|
| DESIGNED | NL | |
| DES. CHECKED | ZS | |
| DRAWN | AP | |
| DWG. CHECKED | NL | |
| REV'D P.MGR | ZS | |
| APP'D P.DIR | CC | |
| BY | DATE | |

OPERATIONS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT

ASSET NUMBER: **AEE FEBRUARY 2012**



CENTRAL INTERCEPTOR GENERAL
 AMBURY PARK (AS7) - PERMANENT WORKS PLAN

DRAFT

| | | | |
|----------------|-------------------|--------------|---------------|
| CAD FILE | AEE-MAIN-27.1_ALT | DATE | 18-Dec-11 |
| ORIGINAL SCALE | A1 | CONTRACT No. | 0538 |
| 1:1000 A3 | | DRAWING No. | AEE-MAIN-27.1 |
| | | ISSUE | 1 |

Site 10 Mangere Pump Station (WS3 & MPS)

Works at this site will be undertaken within the existing designation and are therefore not addressed in this report.

Site 11 Motions Road (L1S1)

Proposed works

To undertake the works it is proposed to undertake the clearance of the fringe edge native vegetation and several Pohutukawa trees within the compound area. Two areas of vegetation will be removed from the compound down the bank to allow the installation of new pipes. These will be approximately 5m wide.

The area of native vegetation is a large continuous area and the removal of the fringe vegetation in several places and two strips down the bank will not greatly alter the benefits the vegetation provides.

Removal of fringe edge vegetation can have some adverse effects by exposing the remaining edge to winds and opening the ground area to sunlight. These factors can be addressed by mulching the ground, pruning the exposed trees, replanting the edge and instigating a weed management program.

The removal of this vegetation is not significant in relation to the quantity of vegetation within the area. This vegetation is young to early mature and would be easy to replant. The effect of this vegetation removal would be less than minor and minor effects can be offset by replanting and aftercare management.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-----------------------------|---|--------|--------|---------------------|----------------------|--|-------------------|
| 1 | Pohutukawa | <i>Metrosideros excelsa</i> | 4.5 | 500 | 2 | Young | | Relocate |
| 2 | Pohutukawa | <i>Metrosideros excelsa</i> | 4.5 | 500 | 2 | Young | | Relocate |
| 3 | 8 x various natives on edge | <i>Pittosporum / Hoheria / Coprosma</i> | 5 | 400 | 2 | Young | | Remove edge trees |
| 4 | 8 x various natives on edge | <i>Pittosporum / Hoheria / Coprosma</i> | 5 | 400 | 2 | Young | | Remove edge trees |
| 5 | Continuous Vegetation | <i>Hoheria / Pittosporum / Kunzea ericoides / Coprosma / Entelea arborescens / Cordyline australis / Melicytus ramiflorus</i> | 1-6 | 50-600 | 0.5-3 | Young – Early mature | Clear to provide new access and install 2 outflows | Remove |



Young Pohutukawa Trees 1 & 2



Area of Native Vegetation



Area of Native Vegetation



NOTES:

1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING LINK, SEWER, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

Plot Date: 16-Dec-11 3:04 PM
 File Path: P:\0538 - Central Interceptor (L1S1) - Work Areas\AEE\General\Work Area

| | | | |
|---------------|------|--|--|
| DESIGNED | AC | | |
| DES. CHECKED | PR | | |
| DRAWN | AP | | |
| DRWG. CHECKED | AC | | |
| REV'D P.MGR. | PR | | |
| APP'D P.DIR. | CC | | |
| BY | DATE | | |

OPERATIONS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 AEE DECEMBER 2011



CENTRAL INTERCEPTOR
GENERAL
 MOTIONS ROAD (L1S1) – WORK AREAS

DRAFT

| | |
|-----------------------|-------------------|
| CAD FILE Figure 12 | DATE 16-Dec-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| 1:500 A3 | |
| DRAWING No. FIGURE 12 | ISSUE 1 |

Site 12 Western Springs Depot (L1S2)

Proposed works

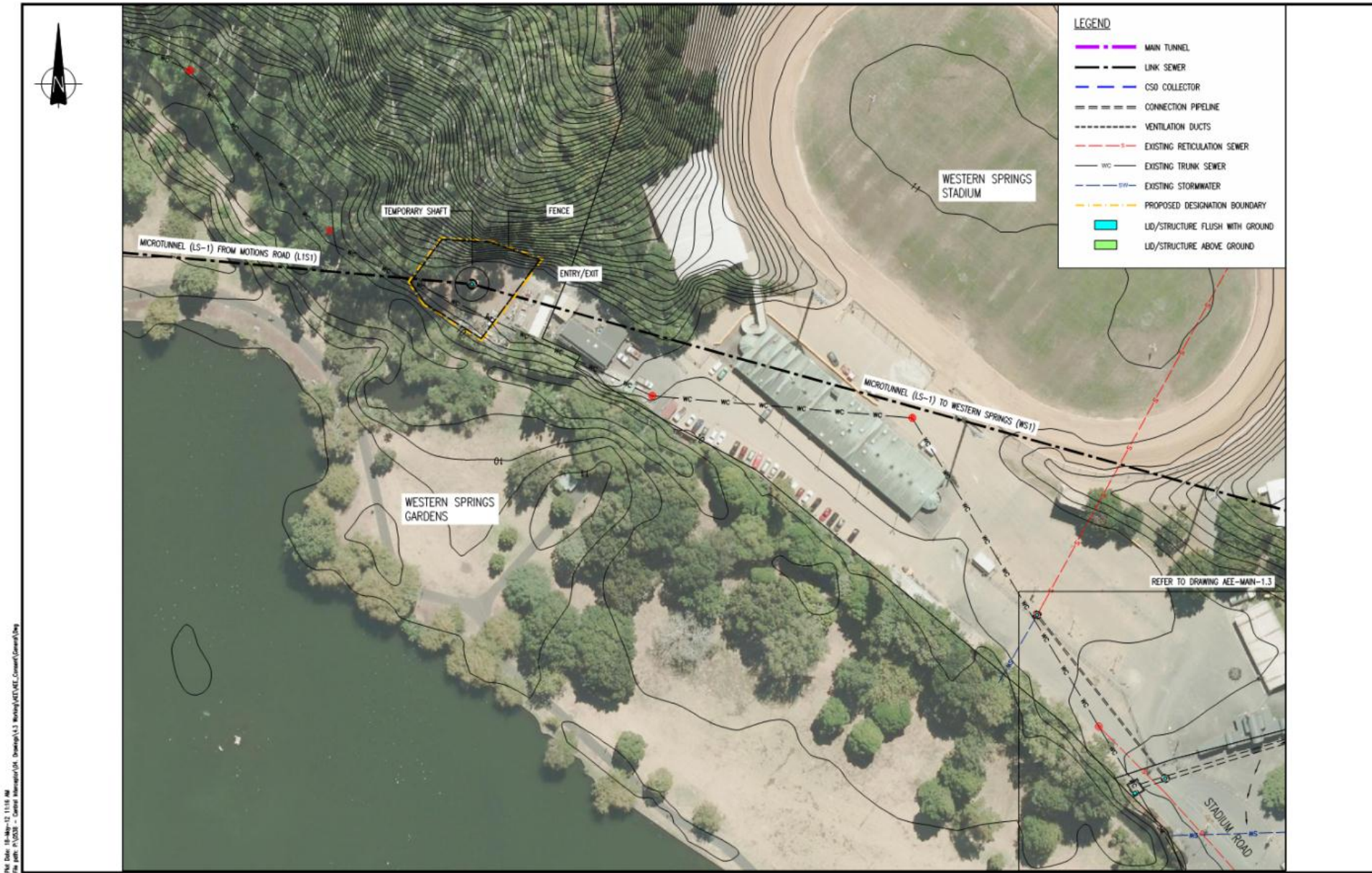
The trees are located around the perimeter of the site and primarily clear of the proposed works. Several trees overhang the site and are likely to require minor pruning. These works are not likely to adversely affect the health of the trees.

The finished surface of the compound area is mostly concrete. This, coupled with the adjacent trees being located up behind retaining walls and bank areas reduces the potential for root activity in the vicinity of the works. During the initial excavations and removal of the concrete an arborist should be present to confirm there are no roots and implement appropriate procedures if necessary.

The proposed work has been assessed and the evidence available at this time indicates the works will have a negligible effect on the adjacent trees.

Tree List

| Tree # | Common Name | <i>Botanical Name</i> | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------------------|-----------------------|--------|-------|---------------------|----------|------------------------|----------------|
| 1 | Mixed Natives & Exotics | | 12 | 800 | 4 | | Overhanging site by 3m | Retain & Prune |



File Date: 18-Mar-12 11:16 AM
 File Path: P:\2012 - Central Interceptor\04 - Design\1.2 Working\AEE_GENERAL\General.dwg

| ISSUE | DATE | AMENDMENT | BY | APPROV. | DATE |
|-------|----------|-----------------------|----|---------|------|
| 4 | | FINAL DRAFT AEE ISSUE | | | |
| 3 | 16/03/12 | DRAFT AEE ISSUE - 3 | JP | PR | |
| 2 | 17/02/12 | DRAFT AEE ISSUE - 2 | JP | PR | |
| 1 | 22/12/11 | DRAFT AEE ISSUE | JP | PR | |

| DESIGNED | ML |
|--------------|----|
| DES. CHECKED | JS |
| DRAWN | JP |
| DWG. CHECKED | ML |
| REV'D. P.MGR | JS |
| APP'D. P.DIR | CE |

OPERATIONS: SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT

ASSET NUMBER: AEE FEBRUARY 2012



CENTRAL INTERCEPTOR GENERAL

DRAFT

WESTERN SPRINGS DEPOT (L1S2) - CONSTRUCTION WORKS PLAN

| | |
|---------------------------|-------------------|
| CAD FILE: AEE-MAIN-12.2 | DATE: 16-Dec-11 |
| ORIGINAL SCALE: A1 | CONTRACT No. 0538 |
| DRAWING No. AEE-MAIN-12.2 | ISSUE 4 |

Site 13 Rawalpindi Reserve (L2S1)

Proposed works

It is proposed to undertake construction works and create a compound around the existing site. This will require the removal of vegetation within the work area.

This reserve is located down an accessway and the area is located away from the road. Due to the proposed earthworks vegetation will require removal.

This reserve has a very limited road frontage and the majority of the area is located behind the houses.

The vegetation within the proposed works area is a mixture of young to early mature with several large established trees in the private properties.

It is proposed to create a level area within the work area and therefore excavations are required along the western boundary. To install a retaining wall within the area it is proposed to remove the trees including Tree 13 in the adjacent site. The proposal also requires excavations within the adjacent property to provide connections to the network. This will require tree removals within the private property.

The removal of this vegetation is not significant in relation to the quantity of vegetation within the area. This vegetation is a mixture of young to early mature with several established trees. The effect of this vegetation removal would be less than minor and any effects can be offset by replanting and aftercare management.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------------------|--------------------------------|--------|-------|---------------------|--------------|------------------|-----------------|
| 1 | Lemonwood | <i>Pittosporum eugenioides</i> | 7 | 1800 | 4 | Early mature | On edge of drive | Prune & protect |
| 2 | Lemonwood | <i>Pittosporum eugenioides</i> | 7 | 1200 | 5 | Established | | Remove |
| 3 | Olive | <i>Olea sp</i> | 4 | 300 | 1 | Juvenile | | Remove |
| 4 | Olive | <i>Olea sp</i> | 4 | 300 | 1 | Juvenile | | Remove |
| 5 | Pittosporum | <i>Pittosporum sp</i> | 5 | 400 | 2 | Early mature | | Remove |
| 6 | Privet | <i>Privet sp</i> | 5 | 1000 | 4 | Early mature | In Neighbours | Prune or Remove |
| 7 | Flax | <i>Phormium tenax</i> | 2 | | | | | Remove |
| 8 | Monkey Apple | <i>Acmena smithii</i> | 9 | 1600 | 4 | Early mature | | Remove |
| 9 | Olive | <i>Olea sp</i> | 2 | 50 | 1 | | | Remove |
| 10 | Norfolk Island Hibiscus | <i>Lagunaria patersonii</i> | 3 | 50 | 1 | Juvenile | Poor specimen | Remove |
| 11 | Norfolk Island Hibiscus | <i>Lagunaria patersonii</i> | 3 | 50 | 1 | Juvenile | Poor specimen | Remove |
| 12 | Olive | <i>Olea sp</i> | 2 | 50 | 1 | | | Remove |

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|---------------------|-------------------------------|--------|--------|---------------------|--------------|--|----------|
| 13 | | <i>Morus sp?</i> | 8 | 1800 | 5 | Early mature | On boundary in neighbours overhanging site | Remove |
| 14 | Banksia | <i>Banksia sp</i> | 6 | 1200 | 4 | Early mature | | Remove |
| 15 | Ash | <i>Fraxinus sp</i> | 2.5 | 50 | 1 | Juvenile | | Remove |
| 16 | Brazilian Pepper | <i>Schinus sp</i> | 3 | 200 | 1 | Juvenile | | Remove |
| 17 | Monkey Apple | <i>Acmena smithii</i> | 10 | > 2000 | 5 | Established | | Remove |
| 18 | Flax | <i>Phormium tenax</i> | 2 | | | | | Remove |
| 19 | Willow | <i>Salix sp</i> | 12 | > 2600 | 10 | Mature | | Remove |
| 20 | Ash | <i>Fraxinus sp</i> | 2.5 | 50 | 1 | Juvenile | | Remove |
| 21 | Feijoa | <i>Acca sellowiana</i> | 4 | 400 | 3 | | Not protected – In private land | Remove |
| 22 | Rhododendron | <i>Rhododendron sp</i> | 4.5 | 800 | 2.5 | | In private land | Remove |
| 23 | Magnolia | <i>Magnolia grandiflora</i> | 14 | 2400 | 7 | Mature | In private land | Remove |
| 24 | Norfolk Island Pine | <i>Araucaria heterophylla</i> | 20 | >2500 | 7 | Mature | In private land | Remove |



Willow Trees & Vegetation in Residential Site



Willow Trees



Tree 1 – Pittosporum on Accessway



Banksia



Overview of site



NOTES:

1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

File Date: 19-Dec-11 2:59 PM
 File Path: P:\2008 - Central Interceptor\04 - Design\11.5 - Rawalpindi Reserve\04 - Work Areas\11.5 - Rawalpindi Reserve.dwg

| | | | | | | | | | | |
|--------------|----------|-----------------|-------------------|-------|--|------|--|--------------|--------------------|----------------|
| DESIGNED | | AC | OPERATORS | | SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT | | CENTRAL INTERCEPTOR GENERAL RAWALPINDI RESERVE (L2S1) - WORK AREAS | DRAFT | CAD FILE Figure 14 | DATE 16-Dec-11 |
| DES. CHECKED | | RR | ASSET MANAGER | | | | | | ORIGINAL SCALE A1 | CONTRACT No. |
| DRAWN | | AP | AEE DECEMBER 2011 | | | | | | 1:1000 A3 | 0538 |
| DWG. CHECKED | | AC | | | | | | | DRAWING No. | ISSUE |
| REV'D P.MGR | | RR | | | FIGURE 14 | 1 | | | | |
| APP'D. P.DIR | | CC | | | | | | | | |
| ISSUE | DATE | AMENDMENT | BY | APPD. | BY | DATE | | | | |
| 1 | 22/12/11 | DRAFT AEE ISSUE | AP | RR | | | | | | |

Site 14 Norgrove Avenue (L2S2)

Proposed works

It is proposed to install a compound at the end of the cul-de-sac and create a connection into the reserve. It will be necessary to remove trees at the end of the cul-de-sac and in the reserve adjacent to the watercourse. A street tree on the road reserve is required to be removed to provide access to 16 Norgrove Avenue.

The compound area requires the work to be very close to the base of the trees at the end of the cul-de-sac. To provide adequate work space these trees require removal.

There are several trees located further down the bank and therefore a level of screening will be maintained. To provide access into the reserve and install new connection points earthworks is required along with access into the reserve. Established trees require removal which will reduce the vegetative cover. Vegetation will be retained and therefore the loss of vegetation will not greatly affect the amenity of the area.

The removal of this vegetation is not significant in relation to the quantity of vegetation within the area. This vegetation is a mixture of early mature to established trees. The effect of this vegetation removal would be less than minor and any effects can be offset by replanting and aftercare management.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|---------------|--------------------------------|--------|-------|---------------------|--------------|--------------------------------------|----------|
| 1 | Pittosporum | <i>Pittosporum sp</i> | 3.5 | 300 | 2 | Early mature | Remove to provide access to property | Remove |
| 2 | Puriri | <i>Vitex lucens</i> | 8 | 900 | 5 | Early mature | | Prune |
| 3 | Puriri | <i>Vitex lucens</i> | 10 | 800 | 5 | Early mature | | Remove |
| 4 | Lemonwood | <i>Pittosporum eugenioides</i> | 9 | 1200 | 5 | Early mature | | Remove |
| 5 | Gum | <i>Eucalyptus sp</i> | 10 | 2400 | 6 | Early mature | | Protect |
| 6 | Willow | <i>Salix sp</i> | 14 | 2600 | 8 | Mature | | Remove |
| 7 | Hedge | | 4 | | | | | Prune |
| 8 | Jacaranda | <i>Jacaranda mimosifolia</i> | 6 | 500 | 3 | Early mature | | Retain |
| 9 | Willow | <i>Salix sp</i> | 15 | 1600 | 8 | Mature | | Remove |
| 10 | 3 x Lemonwood | <i>Pittosporum eugenioides</i> | 9 | 700 | 4 | | | Remove |
| 11 | Willow | <i>Salix sp</i> | 15 | 2600 | 8 | Mature | | Remove |
| 12 | 9 x Lemonwood | <i>Pittosporum eugenioides</i> | 10 | 800 | | Mature | | Remove |
| 13 | 2 x Puriri | <i>Vitex lucens</i> | 10 | 800 | 5 | Established | Poor form | Remove |

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|----------------|--------------------------------|--------|-------|---------------------|--------------|----------|----------|
| 14 | Lemonwood | <i>Pittosporum eugenioides</i> | 9 | 1400 | 4 | Early mature | | Remove |
| 15 | Queensland Box | <i>Lophostemon confertus</i> | 12 | 1600 | 5 | Early mature | | Remove |
| 16 | Queensland Box | <i>Lophostemon confertus</i> | 9 | 800 | 3 | Early mature | | Remove |
| 17 | Puriri | <i>Vitex lucens</i> | 7 | 800 | 5 | Early mature | | Remove |
| 18 | Phoenix Palm | <i>Phoenix canariensis</i> | 10 | 2400 | 5 | Early mature | | Remove |
| 19 | Poplar | <i>Populus sp</i> | 16 | 1800 | 8 | Early mature | | Remove |
| 20 | Poplar | <i>Populus sp</i> | 16 | 1800 | 8 | Early mature | | Remove |
| 21 | Poplar | <i>Populus sp</i> | 16 | 1800 | 8 | Early mature | | Remove |



Vegetation at End of Cul-de-sac and Street Tree to be removed



Pittosporum Trees at End of Cul-de-Sac



NOTES:

1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

CHAMBERLAIN PARK GOLF COURSE

NOISE BARRIER
AREA APPROX.
350m²

EX BRANCH B SEWER TO BE RETAINED

NOR GROVE AVENUE

VERONA AVENUE

| | | | | | |
|--------------|--------|------|------|------|------|
| DESIGNED | AC | | | | |
| DES. CHECKED | PR | | | | |
| DRAWN | HP | | | | |
| ENG. CHECKED | AC | | | | |
| REV'D. P.MGR | PR | | | | |
| APP'D. P.DIR | CC | | | | |
| BY | APPRO. | DATE | DATE | DATE | DATE |

OPERATIONS
SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT

ASSET MANAGER
AEE DECEMBER 2011



CENTRAL INTERCEPTOR
GENERAL
NOR GROVE AVENUE (L2S2) - WORK AREAS

DRAFT

| | |
|------------------------------|-------------------|
| CAD FILE Figure 15 | DATE 7-Oct-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| 1:500 A3 | |
| DRAWING No. FIGURE 15 | ISSUE 1 |

Site 15 - Pump Station 25 (Miranda Reserve)

Proposed works

It is proposed to install a compound around the site of the existing pump station. This requires the removal of the vegetation within the compound area. This part of Miranda Reserve is located down a long accessway and is not easily observed from the road.

Vegetation has been planted around the pump station and adjacent to the watercourse which is established. The vegetation within the work area requires removal. The reserve has continuous vegetation located along the edge of the watercourse and around the fringe of the proposed site. Although there will be vegetation cleared, a large area of vegetation will be retained and the general amenity will not be affected. The retained adjacent vegetation will need to be protected from potential damage. This can be achieved by adhering to the general tree protection methods.

The existing above ground sewer is to be removed as part of a separate project, prior to the Central Interceptor works. Therefore some of the vegetation, such as trees 6 to 9 identified in the table below, is likely to have already been removed.

Adjacent to the main access are semi established Pohutukawa trees. These have developed out over the accessway and some minor pruning is required. These trees will need to be protected from damage during the proposed work.

Removal of fringe edge vegetation can have some adverse effects by exposing the remaining edge to winds and opening the ground area to sunlight. These factors can be addressed by mulching the ground, pruning the exposed trees replanting the edge and instigating a weed management program.

The removal of this vegetation is not significant in relation to the quantity of vegetation within the area. This vegetation is young to early mature and would be easy to replant. Therefore the effect of this vegetation removal would be less than minor and minor effects can be offset by replanting and aftercare management.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|----------------------------|-----------------------------|--------|-------|---------------------|--------------|----------------------------|------------------|
| 1 | Mixed Natives (Approx. 20) | | 3-6 | 600 | 4 | Early mature | Branches overhang driveway | Prune |
| 2 | Pohutukawa | <i>Metrosideros excelsa</i> | 5 | 1200 | 3 | Early mature | Beside Drive | Retain & protect |
| 3 | Pohutukawa | <i>Metrosideros excelsa</i> | 6 | 1200 | 3 | Early mature | Beside Drive | Retain & protect |
| 4 | Pohutukawa | <i>Metrosideros excelsa</i> | 6 | 1200 | 3 | Early mature | Beside Drive | Retain & protect |
| 5 | Pohutukawa | <i>Metrosideros excelsa</i> | 6 | 1200 | 3 | Early mature | Beside Drive | Retain & protect |

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------------------|---|--------|---------|---------------------|--------------|--|---|
| 6 | Flax & Mixed Exotic | | 4 | 300 | 2 | Early mature | | Retain |
| 7 | Flax Clump | <i>Phormium tenax</i> | | | | Early mature | 3 to 5m square | Remove |
| 8 | Flax Clump | <i>Phormium tenax</i> | | | | Early mature | 3 to 5m square | Remove |
| 9 | Flax Clump | <i>Phormium tenax</i> | | | | Early mature | 3 to 5m square | Remove |
| 10 | Flax Clump | <i>Phormium tenax</i> | | | | Early mature | 3 to 5m square | Remove |
| 11 | Mixed Natives (50 plus) | <i>Myoporum laetum</i> / <i>Coprosma sp</i> / <i>Cordyline australis</i> / <i>Leptospermum scoparium</i> | 2-7 | 600 | 4 | | Weeds present also - Remove mulch and re-vegetate fringe edge – Continuous area | Remove |
| 12 | Mixed Natives | <i>Vitex lucens</i> / <i>Myoporum laetum</i> / <i>Leptospermum sp</i> / <i>Pittosporum sp</i> / <i>Coprosma sp</i> / <i>Griselinia sp</i> / <i>Phormium tenax</i> / <i>Myrsine australis</i> / <i>Meliccytus ramiflorus</i> / <i>Hoheria sp</i> / <i>Alectryon excelsus</i> / | 2-8 | 100-500 | 1-4 | Early mature | Mixed copse of early mature to established native plantings – Clear an area to deconstruct above ground sewer structure. Install new pipes approx. 8m wide in the vicinity of the structure. | To be addressed as part of separate project |



Pohutukawa Trees Adjacent To Access



Flax under Sewer



Area of Natives to be Cleared



Area of Natives to be Cleared



NOTES:

1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

| | | | |
|---------------|----------|-----------------|--|
| DESIGNED | ML | | |
| DES. CHECKED | FR | | |
| DRAWN | AP | | |
| DWG. CHECKED | ML | | |
| REV'D. P. MGR | FR | | |
| APP'D. P. DIR | CC | | |
| ISSUE | DATE | AMENDMENT | |
| 1 | 22/12/11 | DRAFT A&E ISSUE | |

OPERATORS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 A&E DECEMBER 2011



CENTRAL INTERCEPTOR
 GENERAL
 PS25 (L3S1) - WORK AREAS

DRAFT

| | | | |
|----------------|-----------|--------------|-----------|
| CAD FILE | Figure 16 | DATE | 7-Oct-11 |
| ORIGINAL SCALE | A1 | CONTRACT No. | 0538 |
| SCALE | 1:1000 A3 | DRAWING No. | FIGURE 16 |
| | | ISSUE | 1 |

Site 16 Miranda Reserve (L3S2)

Proposed works

It is proposed to install a work compound over the area of the playground and grass area. The compound is likely to encroach within the vegetation areas adjacent to the grassed area. Some minor pruning of the fringe trees will be required and possibly removal of some fringe trees.

This will have a minimal effect on the overall vegetation cover. Removal of fringe edge vegetation can have some adverse effects by exposing the remaining edge to winds and opening the ground area to sunlight. These factors can be addressed by mulching the ground, pruning the exposed trees and replanting the edge.

The vegetation modification is very minor and would have a negligible effect on the overall amenity of the site.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|----------------------------|---|--------|-------|---------------------|--------------|---|-------------------------------|
| 1 | Puriri / Karo (Approx. 30) | <i>Vitex lucens</i> / <i>Pittosporum sp</i> | 6 | 500 | 3 | Early mature | Approx 30 trees on fringe – Protect and prune, possibly remove some | Prune / Protect / Remove some |
| 2 | Pittosporum | <i>Pittosporum sp</i> | 5 | 600 | 3 | Early mature | | Prune |
| 3 | Ngaio | <i>Myoporum laetum</i> | 6 | 800 | 5 | Early mature | | Prune |



Area of Natives on Fringe to be Retained



Area of Natives on Fringe to be Retained



NOTES:
 1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

| | | | | | | | | | | | | | |
|-------|----------|-----------------|----|-------|--------------|--|----|--------------------------------------|--------------|--------------------|---------------|-------------|-------|
| | | DESIGNED | AC | | | OPERATIONS SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT | | CENTRAL INTERCEPTOR | | CAD FILE Figure 17 | DATE 7-Oct-11 | | |
| | | DES. CHECKED | PR | | | | | ORIGINAL SCALE A1 | CONTRACT No. | GENERAL | | 1:500 A3 | 0538 |
| | | DRAWN | AP | | | | | MIRANDA RESERVE (L3S2) - WORK AREAS. | | DRAFT | | DRAWING No. | ISSUE |
| | | DWG. CHECKED | AC | | | | | | | | | FIGURE 17 | 1 |
| 1 | 22/12/11 | DRAFT A/E ISSUE | AP | PR | APP'D P. DIR | CC | BY | DATE | ASSET MARKER | AEE DECEMBER 2011 | | | |
| ISSUE | DATE | AMENDMENT | BY | APPD. | | | | | | | | | |

Site 17 Whitney Street (L3S3)

Proposed works

It is proposed to install a work compound within the road reserve adjacent to 118-120 Whitney Street. To provide a work area one street tree will require removal. This tree is not a significant specimen and it is viable to replace this tree with an established specimen from the nursery at the completion of the works.

This site has been modified to minimise disturbance. Previously it was at the rear of the dairy on the corner and involved the removal of a Melia tree within the road reserve on Mulgan Street. This option involves the least disturbance to private properties and the Melia tree is in better form and health than the Lophostemon.

The vegetation modification is very minor and would have a negligible effect on the overall amenity of the general area.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|----------------|------------------------------|--------|-------|---------------------|-------------|---|------------------------|
| 1 | Queensland Box | <i>Lophostemon confertus</i> | 6 | 800 | 5 | Established | In grass road reserve – Remove for compound | Remove |
| 2 | Pohutukawa | <i>Metrosideros excelsa</i> | 5 | 400 | 2 | Established | In private property (120 Whitney St) Possibly prune | Prune Retain & Protect |

Site 18 Dundale Avenue (L3S4)

Proposed works

It is proposed to install a work compound within the area adjacent to the roadway. This area is predominately turf with the occasional semi established young to early mature specimen tree located throughout the area. The vegetation within the work area is proposed to be removed.

The trees have just become established however they are not significant specimens. The area adjacent to the stream has a large continuous area of vegetation cover. The removal of these ten specimens will not greatly alter the cover and the removal of trees could be partially offset by future planting. The initial assessment has indicated these trees could be relocated. Further more detailed assessment would need to be undertaken to evaluate if relocation is viable.

The vegetation modification is very minor and would have a negligible effect on the overall amenity of the area.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------|--------------------------|--------|-------|---------------------|----------|-------------------|----------|
| 1 | Puriri | <i>Vitex lucens</i> | 4 | 400 | 2.5 | Young | Possible removal. | Relocate |
| 2 | Puriri | <i>Vitex lucens</i> | 5 | 600 | 2.5 | Young | Possible removal | Relocate |
| 3 | Puriri | <i>Vitex lucens</i> | 1.5 | 300 | 1 | Young | Possible removal | Relocate |
| 4 | Puriri | <i>Vitex lucens</i> | 4 | 700 | 2.5 | Young | Possible removal | Relocate |
| 5 | Puriri | <i>Vitex lucens</i> | 4 | 600 | 2 | Young | Possible removal | Relocate |
| 6 | Kowhai | <i>Sophora sp</i> | 1.5 | 300 | 1 | Young | Possible removal | Relocate |
| 7 | Titoki | <i>Alectryon excelsa</i> | 5 | 600 | 3 | Young | Possible removal | Relocate |
| 8 | Titoki | <i>Alectryon excelsa</i> | 5 | 600 | 3 | Young | Possible removal | Relocate |
| 9 | Titoki | <i>Alectryon excelsa</i> | 5 | 600 | 3 | Young | Possible removal | Relocate |
| 10 | Kowhai | <i>Sophora sp</i> | 2 | 100 | 1 | Young | Possible removal | Relocate |



Young Puriri & Titoki for Relocation



Young Puriri & Titoki for Relocation



Young Puriri & Titoki for Relocation



NOTES:
 1. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.

| | | | | | |
|--------------|----------|-----------|----|-------|--|
| DESIGNED | AC | | | | |
| DES. CHECKED | PI | | | | |
| DRAWN | AP | | | | |
| DWG. CHECKED | AC | | | | |
| REV'D P.MGR | PI | | | | |
| APP'D P.DIR | CC | | | | |
| ISSUE | DATE | AMENDMENT | BY | APPD. | |
| 1 | 22/12/11 | | | | |

OPERATIONS
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 AEE DECEMBER 2011



CENTRAL INTERCEPTOR
 GENERAL
 DUNDALE AVENUE (L3S4) - WORK AREAS
 DRAFT

| | |
|-----------------------|-------------------|
| CAD FILE Figure 19 | DATE 7-Oct-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| 1:1000 A3 | |
| DRAWING No. FIGURE 19 | ISSUE 1 |

Site 19 Haycock Avenue (L3S5)

Proposed works

It is proposed to install a work compound at 4 Haycock Ave. This is located in a residential site and will require the removal of an established Liquidambar tree located at 6 Haycock Ave which overhangs 4 Haycock Ave. Liquidambar trees are relatively common and the size of the tree would indicate this tree is approximately 40 years old. Although it is established this Liquidambar tree is not individually significant.

The vegetation modification is very minor and would have a negligible effect on the overall amenity of the area.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|-------------|--------------------------------|--------|-------|---------------------|----------|---------------------------------------|----------|
| 1 | Sweet Gum | <i>Liquidambar styraciflua</i> | 16 | 2200 | 8 | Mature | Established tree located 1m from tree | Remove |



Liquidambar



LEGEND

- MAIN TUNNEL
- LINK SEWER
- CSO COLLECTOR
- CONNECTION PIPELINE
- VENTILATION DUCTS
- EXISTING RETICULATION SEWER
- EXISTING TRUNK SEWER
- EXISTING STORMWATER
- PROPOSED DESIGNATION BOUNDARY
- LID/STRUCTURE FLUSH WITH GROUND
- LID/STRUCTURE ABOVE GROUND

File Date: 27-Jun-12 8:50 AM
 File Path: P:\2012 - Central Interceptor\04 - Design\1.5 Main\AEE\AEE_Constr\General\DWG

| ISSUE | DATE | AMENDMENT | BY | APPRD. | DESIGNED | DES. CHECKED | DRAWN | DWG. CHECKED | REV'D P.MGR | APP'D P.DIR | DATE | REV# |
|-------|----------|-----------------------|----|--------|----------|--------------|-------|--------------|-------------|-------------|------|------|
| 5 | | | | | NL | JIS | | | | | | |
| 4 | 20/05/12 | FINAL DRAFT AEE ISSUE | AP | PR | | JIS | AP | | | | | |
| 3 | 16/03/12 | DRAFT AEE ISSUE - 3 | AP | PR | | NL | | | | | | |
| 2 | 17/02/12 | DRAFT AEE ISSUE - 2 | AP | PR | | JIS | | | | | | |
| 1 | 22/12/11 | DRAFT AEE ISSUE | AP | PR | | CC | | | | | | |

SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
AEE JUNE 2012



CENTRAL INTERCEPTOR GENERAL
 HAYCOCK AVENUE (L355) - CONSTRUCTION WORKS PLAN

DRAFT

| | |
|---------------------------|-------------------|
| CAD FILE AEE-MAIN-19.2 | DATE 28-May-12 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| DRAWING No. AEE-MAIN-19.2 | ISSUE 5 |

Site 20 Kiwi Esplanade to Witla Court

Proposed works

It is proposed to install a new 400mm pipe by open trench from Kiwi Esplanade Reserve to Witla Court via Yorkton Rise and Muir Avenue and install a new chamber in the Witla Court site.

The excavation within the reserve requires work within close proximity to one Pohutukawa tree. The trenching along the roads is within the vicinity of established street trees and therefore some pruning may be required and a careful tree protection and work method will need to be implemented.

Within the Witla Court site there are several established Pohutukawa trees which should be retained along with several Ti Kouka. A detailed tree protection method will be required for this site.

The vegetation modification is very minor and would have a negligible effect on the overall amenity of the area.

Tree List

| Tree # | Common Name | Botanical Name | Height | Girth | Crown Spread Radius | Maturity | Comments | Proposal |
|--------|---------------|-----------------------------|--------|--------|---------------------|--------------|------------------------|------------------|
| 1 | Ti Kouka | <i>Cordyline australis</i> | 6 | 800 | 2 | Early mature | Slightly sparse | Retain & protect |
| 2 | Ti Kouka | <i>Cordyline australis</i> | 7 | 1200 | 3.5 | Early mature | | Retain & protect |
| 3 | Pohutukawa | <i>Metrosideros excelsa</i> | 7.5 | > 2000 | 5 | Early mature | | Retain & protect |
| 4 | Pohutukawa | <i>Metrosideros excelsa</i> | 9 | > 2000 | 5 | Early mature | | Retain & protect |
| 5 | Willow Myrtle | <i>Agonis flexuosa</i> | 8 | > 2200 | 5 | | Located 0.5m from kerb | Retain & protect |
| 6 | Willow Myrtle | <i>Agonis flexuosa</i> | 8 | > 2200 | 5 | | Located 0.5m from kerb | Retain & protect |
| 7 | Willow Myrtle | <i>Agonis flexuosa</i> | 6 | 1200 | 4 | | Located 0.5m from kerb | Retain & protect |
| 8 | Pohutukawa | <i>Metrosideros excelsa</i> | 8 | 1400 | 4 | Early mature | | Remove |
| 9 | Banksia | <i>Banksia sp</i> | 8 | 1600 | 4 | Established | | Retain & protect |
| 10 | Banksia | <i>Banksia sp</i> | 8 | 1600 | 4 | | | Retain & protect |
| 11 | Pohutukawa | <i>Metrosideros excelsa</i> | 8 | 1500 | 4 | Early mature | | Retain & Protect |
| 12 | Banksia | <i>Banksia sp</i> | 6 | 700 | 3 | Early mature | | Retain & Protect |
| 13 | Banksia | <i>Banksia sp</i> | 6 | 700 | 3 | Early mature | | Retain & Protect |
| 14 | Pohutukawa | <i>Metrosideros excelsa</i> | 4 | 1000 | 3 | Early mature | | Remove |



Wilta Court Site



Muir Avenue



Yorkton Rise



File path: P:\2012 - Central Interceptor\01 - Design\A1\3 - Working\A1\A1_21.dwg

| | | | | | |
|--------------|----------|-------------|----|-------|-------------|
| DESIGNED | AC | | | | |
| DES. CHECKED | FR | | | | |
| DRAWN | AF | | | | |
| ENG. CHECKED | AC | | | | |
| REV'D P.MGR | FR | | | | |
| ISSUE | DATE | AMENDMENT | BY | APPO. | DATE |
| 1 | 22/12/11 | DRAFT ISSUE | AF | FR | APP'D P.D.R |

OPERATING
 SITE LAYOUT AND DESIGNS INDICATIVE ONLY AND SUBJECT TO CHANGE DURING DETAILED DESIGN DEVELOPMENT
 ASSET MANAGER
AEE DECEMBER 2011



CENTRAL INTERCEPTOR GENERAL
 WITLA COURT - WORK AREAS

DRAFT

| | |
|-----------------------|-------------------|
| CAD FILE Figure 21 | DATE 4-Nov-11 |
| ORIGINAL SCALE A1 | CONTRACT No. 0538 |
| 1:1000 A3 | |
| DRAWING No. FIGURE 21 | ISSUE 1 |

6. Recommendations

In general the vegetation within the compounds will be removed and therefore limited tree protection is required in these situations. However retained vegetation adjacent to the sites will require protection.

To ensure the adjacent vegetation is protected a detailed site specific tree protection plan should be prepared. This will outline the trees that require care, the risks that these trees are likely to be subjected to and how this will be controlled. This site specific tree protection plan should be in general accordance with the general tree protection measures outlined below.

If trees are to be relocated the works should be carried out by a competent contractor. Relocation should be undertaken in accordance with best practice and the relocated trees should have a two year aftercare maintenance period, post relocation. A detailed relocation plan which includes specifications and aftercare maintenance should be developed.

Tree Protection Plan

1. An independent supervising Arborist shall be appointed to undertake the role of the appointed arborist.
2. The consent holder shall develop a tree protection plan specific to the works and sites described in this report. This plan shall review activities and clearly identify trees for removal, trees for retention and specific tree protection requirements. The tree protection will be in general accordance with best arboricultural practice and be developed in consultation with the Auckland Council Arborist.
3. The overall tree protection plan will have a stepped monitoring and reporting process which is in general accordance to the following.

| Item | Reports |
|---|------------------------------|
| Develop a specific tree protection plan for works adjacent to trees including relocation and management plan. | Specific approval and report |
| Pre-commencement | |
| Tree protection in place, areas marked & tree removals correctly identified | Memo at start |
| Supervise excavations within rootzones | |
| Supervise and approve pruning and relocation | |
| Weekly inspection during initial excavations and critical work activities within the rootzone | |
| Monthly Inspection (or as agreed) - General Construction | |
| Final Inspection | Final Report |

If you have any queries, please contact the undersigned.

Yours sincerely,
Arborlab Consultancy Services Limited

A handwritten signature in blue ink, appearing to read 'Karl Burgisser', with a long horizontal flourish extending to the right.

Karl Burgisser
Director / Consultant Arborist