

APPENDIX I

Landscape and Urban Design Visual Assessment

PREFACE

The technical working papers for the proposed ILC at Enfield were prepared during the first half of 2005. These were prepared in response to the requirements for the preparation of an Environmental Impact Statement (EIS) under Part 4 of the Environmental Planning & Assessment Act, 1979 (EP&A Act). Specific requirements for the EIS were issued on 1 March 2005 by the (then) Director- General of Infrastructure, Planning and Natural Resources.

The EP& A Act was amended on 1 August 2005 by the creation of Part 3A of the Act, and the Department of Infrastructure, Planning and Natural Resources was dissolved on 26 August 2005 and replaced by the Department of Planning and the Department of Natural Resources.

The proposed ILC at Enfield has since been declared a major project, pursuant to SEPP (Major Projects) 2005 and Sydney Ports has subsequently lodged an application under Part 3A of the Act.

Editorial changes to the technical working papers to reflect the changes in legislation or changes in Government departments have not been made.

The following should be considered when reading the technical papers:

- The Director-General's requirements issued under Part 4 are now deemed to have been issued under Part 3A, and any reference to the Director-General's requirements should be read as a reference to Director-General's requirements issued under Part 3A;
- Any reference to an EIS under Part 4 of the Act should be read as a reference to an Environmental Assessment under Part 3A of the Act;
- Any reference to the Department of Infrastructure, Planning and Natural Resources should be read as a reference to either the Department of Planning or the Department of Natural Resources, as appropriate.

sydney ports corporation

intermodal logistics centre at enfield

Issue 5 June 2005



landscape & urban design report

21 June 2005

EDAW gillespies

CONTENTS

EXECUTIVE SUMMARY	1
1 BACKGROUND	2
2 SITE UNDERSTANDING	3
3 DESIGN PRINCIPLES	5
4 DESIGN STRATEGY	8
5 DESIGN TREATMENTS	10

FIGURES

Figure 1: Site Analysis - Topography and Landform

Figure 2: Site Analysis - Existing Land Uses

Figure 3: Site Analysis - Existing Site Character

Figure 4: Site Analysis - Existing Vegetation

Figure 5: Site Analysis - Access and Permeability

Figure 6: Site Analysis - Ecological and Recreational Connections

Figure 7: Concept Plan - Master Plan

Figure 8: Concept Plan - Landscape Structure

Figure 9: Concept Plan - Community and Ecological Area

Figure 10: Typical Cross Sections

Figure 11: Noise Wall Concept

EXECUTIVE SUMMARY

The site of the proposed Intermodal Logistics Centre at Enfield (ILC) has a history of rail uses and is currently mostly derelict with small areas leased as storage areas and rail locomotive repair operations. The landscape and urban design report aims to address the visual impacts of the proposed development whilst considering local amenity, ecological benefits and the need to define an appropriate visual character.

The site is highly modified with significant earthworks having taken place prior to SPC acquisition in 2001 and is crossed by Coxs Creek in a channelised form, a tributary of the Cooks River. The Cooks River / Castlereagh Ironbark Forest which once would have covered the site has completely disappeared and has over the years been replaced by invasive weed species. Green and Golden Bell Frogs were recorded on the site in 1995 and although there are pockets of suitable habitat, no frogs have been recorded since. There is at present no public access into the site.

The design vision is to integrate the site into the surrounding residential and industrial areas, to mitigate any impacts using vegetation, structures and landform and to create a functional and environmentally sustainable amenity that serves the wider community.

Landscape treatments for the site have been divided into eight main areas:

1. Visual Mitigation
2. Frog habitat area
3. Existing Mounding / Community Area
4. Edge Treatments and Entry Points
5. Internal Landscaped areas
6. Sound Attenuation Elements
7. Pedestrian Footpaths and Furniture.
8. Bridge Design

The overall planting strategy is to reintroduce native species back into the site, using species from the Cooks River / Castlereagh Ironbark Forest community where suitable. It is proposed to introduce new Green and Golden Bell Frog ponds, habitat and breeding areas and to assist linkages to neighbouring frog communities. The opportunity to utilise local community groups in both the establishment, maintenance and enjoyment of the site is one of the main desired outcomes of the design; this may include conservation / ecological volunteers in the maintenance of the frog habitat area, school groups learning from the site's ecological and historical content and other groups with a special interest in the site's industrial past.

1 BACKGROUND

The Landscape and Urban Design Report has been developed to provide a comprehensive landscape analysis of the proposed Sydney Ports Corporation Intermodal Logistics Centre at Enfield (ILC) and to recommend landscape treatments as key components of a strategy plan for the site. The overall landscape approach is aimed at:

- Protection of ecologically sensitive components; and
- Addressing potential negative visual impacts on the surrounding urban area.

The landscape design addresses both the degraded site context and the extensive visually prominent boundary interface with adjoining transport corridors, residential and light industrial areas.

The study area has a history of being modified and disturbed for railway uses, which effectively defines the existing landscape and visual character of the site. The soils, topography, drainage and natural vegetation on the site and surrounding areas are highly modified. With the exception of some minor lease areas, most of the site is derelict.

It is important to note that for the purposes of this strategy the term 'Urban Design' includes all elements that will comprise the setting of the ILC site, including landscape treatment, public access, noise attenuation structures and bridges but excluding building forms such as warehousing, offices, light industrial and commercial development.

The strategy has been structured to assess the site issues, mitigation or enhancement of visual impacts and to maximise the function and visual character of the project. The strategy is arranged as follows:

Site Understanding - including existing conditions and opportunities and challenges of this site

Design Principles – established through a vision statement and reviewed in relation to key design considerations

Design Strategy – developed and described in terms of treatment types, built structures, vegetation and ecology

Design Treatments – a more detailed investigation of the key elements of the design.

2 SITE UNDERSTANDING

2.1 TOPOGRAPHY AND LANDFORM *(Refer Figure 1)*

A significant portion of the site is flat, including the areas that are currently leased and in operation. Several mounds (up to 15 metres high) are located in the southern and western portion of the site. These mounds are stockpiles of fill material, constructed approximately ten years ago and are elongated in shape, running parallel to the long axis orientation of the site. Coxs Creek has been concrete lined and flows across the southern portion of the site between the mounds. The creek is channelled underground in its link through the site to the east.

A steep sided embankment runs along the north western edge of the ILC site, originally created as a cutting for the railway siding that runs north / south. Other minor embankments associated with this rail line exist along the site edge adjacent to Cosgrove Road.

2.2 EXISTING LAND-USE AND SITE CHARACTER *(Refer Figures 2 and 3)*

Current operational activities on the site include a container storage operation on land leased to Toll Transport, the DELEC facility and Australian Temporary Fencing Pty. Ltd. These areas are mainly used for car parking and storage of rail-related equipment and machinery. An existing wheel lathe area in the central eastern edge of the site will be retained but the existing rail line from the north to the wheel lathe is proposed to be relocated. The rail line to the south will be removed.

The remainder of the site is undeveloped with many areas used for stockpiling construction and rail materials.

The site is bounded by the new Enfield Marshalling Yards to the west and Cosgrove Road to the east. The northern end of the site is terminated by the intersection of the Hume Highway and Roberts Road, the southern end by the Punchbowl Road vehicular bridge. The areas immediately surrounding the site are predominantly light industrial to the east and west, with a former brick pit to the south-west. Towards the north-west the residential area of Greenacre is located in close proximity to the site, separated from the railway lines by Roberts Road. At the southern end of Cosgrove Road residential properties face directly onto the site. A small number of properties in the suburb of Greenacre near the former brick pit are also situated adjacent to the ILC site.

2.3 VEGETATION *(Refer Figure 4)*

In its undeveloped state, the site is likely to have been vegetated with native species including areas of Cooks River /Castlereagh Ironbark Forest. Due to its industrial history the site has been

largely cleared of any native vegetation and it is currently dominated by invasive weed species consisting mostly of grasses with only occasional scattered trees and shrubs. The southern stockpile mounds adjacent to Coxs Creek have denser shrub regrowth and some scattered trees.

The flora and fauna assessment carried out as part of this EIS has identified very little original vegetative habitat surviving on the site. Only a small area of remnant heath has been identified growing on the railway embankment near the DELEC maintenance sheds on the northern part of the site. Mature street tree planting along Cosgrove Road forms a well vegetated edge to the south, although the tree avenue becomes less consistent with some gaps in the northern section of the road.

2.4 ACCESS AND PERMEABILITY *(Refer Figure 5)*

The existing major entry is located in the centre of the eastern edge of the site with access from Cosgrove Road. This entrance leads to a network of unsealed paths and roads within the site. Cosgrove Road links to Liverpool Road (Hume Highway) to the north and Punchbowl Road / Juno Parade to the south.

The existing rail lines of the new Enfield Marshalling Yards extend approximately 100 to 200m wide along the western edge of the site, providing an impermeable barrier to all vehicular and pedestrian access to the site from Wentworth Street and Roberts Road.

2.5 ECOLOGICAL LINKAGES *(Refer Figure 6)*

Green and Golden Bell Frogs were recorded on the site in 1995, however flora and fauna surveys carried out since and as part of this EIS have found no threatened plants or animals on the site. Although no Green and Golden Bell Frogs were recorded, some areas near Coxs Creek to the south of the site have been identified as having ephemeral wetlands, which provide potential foraging habitat for these frogs. To the west of the site, Green and Golden Bell Frogs are present in constructed wetlands in Juno Parade Brick Pit, which is being managed to protect and promote their survival. Green and Golden Bell Frogs have also been recorded in the new Enfield Marshalling Yards site, where a frog habitat area was constructed to increase foraging habitat. There is also potential habitat within Coxs Creek Reserve.

Refer to the Flora and Fauna Working Paper for further detail.

3 DESIGN PRINCIPLES

3.1 Vision

The proposed ILC site will become an integrated component of the landscape and a significant element for both community identity and connectivity within the surrounding areas of Strathfield and Bankstown. The design for the site aims to achieve a sensitive landscape and environmental treatment that is compatible with the adjacent residential and commercial edge. The unique aspects of the site will be reflected in an urban design solution that is summarised as follows:

Integration

The design will be responsive to the form, colours and textures of the natural and cultural character of existing and proposed landscapes of the area. Integration, sensitivity and interpretation will result in a subtle yet high quality response.

Mitigation

The landscape treatments will be responsive to the need to provide visual and acoustic buffering in the form of vegetation, structures and landform.

Connection

Landscape treatment, introduced and constructed landform, signage, street furniture and built elements function as design tools that assist to create a legible and cohesive identity.

Identification

The design will function as a communication tool, expressing the character of the site through a sequence of edge treatments, that clearly signal the entry treatments and changing spatial characteristics relevant to the commercial and residential boundaries of the site.

Amenity

The provision of improved local amenity through effective landscape treatment, open space and creation of frog habitat areas.

3.2 DESIGN PRINCIPLES

The following principles create a framework for the landscape and urban design. They have been organised to respond directly to the main site considerations. Along with these principles strategies have been proposed that guide the concept design of the site towards meeting each principle.

CONSIDERATIONS	PROJECT RESPONSE
Landscape Landscape design will be integrated with the overall design.	Landscape will be used as a tool for creating a functional, legible and appealing experience. Maintenance requirements of landscape treatments will be considered at all times. Ensure the established form of landscape treatments do not impair safety conditions on the future uses of the site or adjoining land. Provide a clear structure to the planting types that respond to the functional and aesthetic requirements of the site and adjacent landowners.
Roadscape Internal roadscape elements will be integrated with the overall design	Ensure appropriate scale, placement, and character of roadscape elements.
Natural Systems Maximisation of ecological potential and the sustainability of natural ecosystems	Ensure design can be implemented sensitively through the construction and operational life of the project. Assist in the enhancement and integration of existing drainage corridors where possible Promote ecological linkages Be in accordance with DIPNR guidelines - <i>Southern Sydney Catchment Blueprint</i> and the Green Web Action Plan - <i>Habitat Requirements for New Developments</i>

<p>Local Character and Visual Amenity</p> <p>Ensure that the character of the local environment is protected</p>	<p>Protect and enhance the positive aspects of the local character including potential changes to views and noise levels.</p> <p>Proposed development will be sensitive to local character, existing and proposed land use patterns views, scale, and access patterns.</p> <p>Improve residential edges and protect current visual amenity.</p>
<p>Accessibility</p> <p>Well defined roadways and pathways for vehicles and pedestrians</p>	<p>Design for safe and comfortable movement for vehicles and pedestrians</p> <p>Provide clear and legible access connections</p>
<p>Noise control</p> <p>Noise impacts to be mitigated</p>	<p>Integrate noise control devices such as mounding and acoustic barriers within the landscape design elements of the site.</p>
<p>Traffic and Directional Signage</p> <p>Traffic and directional signage design and location to meet local Council and RTA standards.</p>	<p>Establish support structures that enable traffic and directional signs to be a part of a coordinated approach to furnishings that also complement the overall site network.</p> <p>Minimise the number of signs and support structures that are required.</p>
<p>Entry Points</p> <p>Provide entry point treatments to complement connection structure.</p>	<p>Provide intersection treatments that are appropriate to the development concept where the site access connects with Cosgrove Road and Wentworth Street.</p>
<p>Identity</p> <p>Provide a consistent and contemporary design style to create an identity and 'sense of place'.</p>	<p>Develop a consistent family of elements and forms within the ILC site.</p> <p>The design will be sensitive to local characteristics such as land use patterns, views, scale and access patterns</p>
<p>Legibility</p> <p>Facilitate clear and logical experiences within the site.</p>	<p>Clearly identify key intersections at user decision points within the site</p> <p>Reinforce the relative significance of gateways and internal roads through their design treatment.</p> <p>Create a well defined pedestrian pathway network within the community and ecological area</p>

4 DESIGN STRATEGY

The urban and landscape design strategy responds to the design principles and includes a conceptual arrangement of the elements, spaces and connections that will provide a successful integration of the SPC site into the wider environment.

The materials, construction systems and treatment selection for the site will be consistent with the principles of Ecologically Sustainable Development. The ecological impact of the development is to be reduced by incorporating the following principles:

- Minimise disturbance to site ecosystems during construction and operation
- Minimise erosion potential
- Plant indigenous flora
- Maximise the reuse on site of all rock and topsoil emanating from excavations work
- Maximise the use of recycled compost, soil conditioners and mulches

The overall strategy includes the use of visual cues, vegetation / regeneration, spatial structure and clear wayfinding. Following the outline of overall strategy elements a detail summary of the design elements has been outlined. An urban design and landscape concept plan outlines the approach and depicts treatment types for the site.

4.1 LANDSCAPE STRUCTURE *(Refer Figures 7 and 8)*

The landscape treatment of the site falls into five distinct areas:

1. The community and ecological area to the south comprising native regeneration of woodland combined with the creation of a frog habitat area. The community area incorporates existing and proposed mounding, new pedestrian walkways and planting of native woodland vegetation. It is possible that some minor modification may be made to the mound to allow for a pedestrian route up to a levelled lookout area. The ecological component comprises Green and Golden Bell Frog ponds and associated native vegetation. The landscape treatment of this zone would comprise wetland and grassland species conducive to Green and Golden Bell Frog foraging habitat, and it is proposed to extend this treatment along the Coxs Creek corridor and in the area of the proposed stormwater detention basins. Whilst not being accessible to the general public, the Community and Ecological area may be made accessible for controlled users such as school and community groups under supervised guidance. Community Consultation could be conducted to define these potential user groups.

2. Visual screening planting to the northern and southern ends of the site to mitigate visual issues identified in the visual and light spill assessment report.
3. Noise attenuation mounding and walling running adjacent to the frog habitat area parallel to Cosgrove Road, and walling along part of the new Enfield Marshalling Yards.
4. Internal areas of the site comprising planting adjacent to roads, within car parks, screening of buildings and vegetation of embankments.
5. Treatment of the Cosgrove Road frontage and entries into the site.

4.2 PLANTING STRATEGY

As a general principal the species selected for the site will be endemic to the area and sourced from local provenance. Cooks River / Castlereagh Ironbark Forest Community species will be used where suitable in combination with other locally endemic species. The revegetation of the mounds in particular is challenging due to the massive weed seed bank present in the soil and rubble, the lack of suitable topsoil, the hydrological constraints and high exposure levels.

Plants will be installed at sizes that maximise their chances of survival and species selected that will be robust and hardy, requiring relatively low maintenance and watering. The planting will be responsive to the local site conditions such as land-fill areas, excavated cuttings, drainage swales and depressions, wind exposure, soil types and vehicle emissions. Although very limited in its extent, existing indigenous vegetation will be retained wherever possible on the site, in particular within the community and ecological area. Vegetation linkages between the frog habitat area and the neighbouring frog ponds will be created by the use of indigenous wetland and grassland species.

New planting will be structured to include understorey and groundcovers to form viable habitat for flora and fauna, with some areas of dense shrubs to provide safe nesting areas for birds. Plant species shall include a range of flowering and fruiting trees and shrubs including some with thick furrowed bark such as *Eucalyptus fibrosa*. As a general principal leaf litter and fallen branches will be retained in appropriate areas as habitat and foraging grounds as well as shelter for smaller reptiles and insects. The use of fertilisers and irrigation is to be minimised to help control the re-infestation and spread of exotic weeds.

The opportunity to involve local bush care groups and volunteers will be investigated as part of the establishment and ongoing maintenance of the proposed community and ecological areas.

The planting strategy and design recommendations have been prepared in accordance with the *Green Web Action Plan - Habitat Requirements for New Developments* where possible.

5 DESIGN TREATMENTS

5.1 VISUAL MITIGATION *(Refer Figures 7 and 8)*

The visual and light spill assessment report identifies two locations where significant views are possible from the surrounding areas into the ILC site. Firstly, from the south via the Punchbowl Road overpass it is possible to see the tarpaulin shed, the existing southern mound and the western portion of the of the ILC site past the mound. The second view is afforded from the north-west via Roberts Road, particularly for south-bound motorists looking through existing trees over the new Enfield Marshalling Yards and into the main body of the ILC site.

To mitigate this visual impact it is proposed to plant a 50m wide belt of screening vegetation in the area between the Punchbowl Road overpass and the existing mound, at the southern end of the site. Additionally, a 10m wide belt of vegetation is to be located adjacent to the new Enfield Marshalling Yards on the western boundary of the site, running approximately 320m from the northern tip. Where this belt is clear of railway lines, planting will consist of tall tree species capable of growing to a height of 20m interdispersed with medium trees, which when mature will form a visually impenetrable barrier. This treatment will help mitigate views from Punchbowl Road, and the existing tree planting along Roberts Road in conjunction with the proposed screening and noise walls (see later section) will screen a proportion of potential views from the north-west.

There is also proposed a mound 2-5m high and approximately 17m wide set behind the proposed light industrial areas running parallel to Cosgrove Road, to be planted with trees, shrubs and native grasses. Although views from this edge are not seen to be significant there will be glimpses possible between buildings, and this planting will help to provide some screening of the proposed warehouses for users of Cosgrove Road.

TYPICAL SPECIES:

Canopy Trees:	<i>Eucalyptus crebra</i> <i>Eucalyptus fibrosa</i> <i>Corymbia gummifera</i>
Lower canopy Trees:	<i>Acmena smithii</i> <i>Melaleuca linariifolia</i> <i>Melaleuca decora</i> <i>Casuarina glauca</i>
Shrubs:	<i>Kunzea ambigua</i> <i>Banksia serrata</i> <i>Melaleuca ericifolia</i> <i>Allocasuarina littoralis</i>

5.2 FROG HABITAT AREA (Refer Figure 9)

A frog habitat area is proposed at the southern end of the site, to the north of the southern mound. Within this area the stormwater detention basins and specially designated Green and Golden Bell Frog ponds and foraging areas will be located. All ponds will have fluctuating water levels and will be fringed by open grassy areas suitable for frog habitat. The main criteria for frog habitat creation that need to be incorporated into the design of this area are as follows:

- Ponds will be a minimum of 400 square metres or more, be relatively steep sided and vary from 0.5 - 1m in depth
- Ponds to have varying water levels that can be drained if required for maintenance, frog control and possible control of predatory fish *Gambusia holbrooki*
- Provision of limited areas of macrophytes such as *Juncus sp.* and *Elaeocharis sp.*
- Open grassy foraging areas
- Winter hibernation areas and diurnal sheltering sites such as vegetation / rocks.

As mentioned previously, there are some neighbouring populations of Green and Golden Bell Frog and it is proposed that frog corridors be established to assist movement of frogs between the new habitat and the existing habitats at the New Enfield Marshalling Yards frog pond area and the Juno Parade site. These corridors shall be 5-10m wide and constructed with a central depression and groupings of rocks to encourage the collection of rainwater and formation of small temporary pools. Any existing damp spots and hollows are to be retained within this area where possible, and piles of rocks and sheltering vegetation will also be provided. The provision of frog ramps in and out of Coxs Creek may also be provided to assist in the migration of the frogs up and down stream. The final design of the frog habitat area is to be carried out in consultation with frog specialists.

TYPICAL SPECIES:

Foraging Area:

Lomandra longifolia
Entolasia stricta
Microlaena stipoides var stipoides
Themeda australis
Dillwynia tenuifolia
Pultenaea villosa

Daviesia ulicifolia
Eucalyptus fibrosa
Melaleuca stypheliodes
Melaleuca linariifolia
Melaleuca decora
Casuarina glauca

Pond margins:

Elaeocharis sp.
Juncus sp.

5.3 COMMUNITY AND ECOLOGICAL AREA *(Refer Figure 9)*

The existing earth mound to the south of the site is to be retained as a topographic feature as part of the community and ecological area, and in combination with new mounding along Cosgrove road also act as part of the noise attenuation barrier. At present this mound is overgrown by native and exotic weeds and needs to be treated due to its location as part of an environmental area. It is proposed that the mound be cleared of weeds in stages to maintain some shelter and nesting sites provided by the existing invasive plants. Weed suppressing mats may be needed around plants during their establishment years.

The mounds will be re-planted with native plants that are endemic to the area including fast growing, short lived species interdispersed with slower growing canopy trees. Dense woodland with interlocking canopies is proposed to be established in order to suppress new weed growth and to provide protection for smaller birds and mammals. Old logs and dead trees are to be retained where possible to provide nesting holes, hollows and perches, along with artificial sheltering structures such as piles of logs, rocks or pipes which can provide refuge from predators for reptiles and small mammals.

A number of different plant mixes are to be used, determined by aspect and slope gradient; the northern and western face of the mound will be planted with more heat tolerant species whilst the southern and eastern faces planted with more moisture dependent species. There may be some minor re-contouring of the mound to allow a footpath access, with a level area at the summit kept clear to create a viewing area.

TYPICAL SPECIES:

Northern and Western Face of Mounds:

Quick-growing Cover Plants:	<i>Acacia longifolia</i> <i>Acacia sophorae</i> <i>Acacia pubescens</i>
Base of Mound Canopy Trees:	<i>Melaleuca stypheliodes</i> <i>Melaleuca linariifolia</i> <i>Melaleuca decora</i> <i>Corymbia gummifera</i> <i>Eucalyptus crebra</i> <i>Eucalyptus fibrosa</i> <i>Casuarina glauca</i>
Higher Part of Mound:	<i>Kunzea ambigua</i> <i>Banksia serrata</i> <i>Allocasuarina littoralis</i>

Southern and Eastern Face of Mounds:

Quick-growing Cover Plants:	<i>Acacia parramattensis</i> <i>Acacia decurrens</i> <i>Acacia pubescens</i>
Base of Mound Canopy Trees:	<i>Melaleuca decora</i> <i>Melaleuca linariifolia</i>

	<i>Eucalyptus robusta</i>
	<i>Eucalyptus maculata</i>
	<i>Casuarina glauca</i>
Higher Part of Mound:	<i>Kunzea ambigua</i>
	<i>Banksia serrata</i>
	<i>Melaleuca ericifolia</i>
	<i>Allocasuarina littoralis</i>
<u>Top of Mound:</u>	<i>Lomandra longifolia</i>
	<i>Themeda australis</i>

5.4 EDGE TREATMENTS AND ENTRY POINTS *(Refer Figures 7 and 8)*

The treatment of the interface of the site with Cosgrove Road and to a lesser degree Wentworth Street is an important aspect of the design treatment. Along the Cosgrove Road frontage it is proposed to reinforce existing street trees by planting trees such as Brush Box (*Lophostemon confertus*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*) within the site boundary. To the front of new light industrial / commercial areas an edge treatment of fencing/walling, planting, and signage will help to create a legible and cohesive identity.

At the Cosgrove Road vehicular entry there is an opportunity to create a strong identity by introducing a structured planting style that references the visual style and planting character of traditional rail uses associated with the site. The use of semi-mature deciduous or flowering trees with bold understorey planting in conjunction with signage will be used to create an identifiable entry from both Cosgrove Road and Wentworth Street. At the end of the vehicular bridge on Wentworth Street the treatment of the abutment (to be decided in collaboration with Railcorp) will clearly define this entry point to the site.

TYPICAL SPECIES:

Street Trees:	<i>Lophostemon confertus</i>
	<i>Melaleuca quinquenervia</i>
Entry Planting:	<i>Fraxinus 'Raywood'</i>
	<i>Phormium tenax</i>
	<i>Gazania hybrida</i>
Industrial Edge:	<i>Westringia fruticosa</i>

5.5 INTERNAL LANDSCAPE AREAS *(Refer Figures 7 and 8)*

Aside from the Community and Ecological Area and edge treatments the remainder of the landscaped areas occur adjacent to roadways, within and surrounding car parking areas and on embankments where a change of level occurs. Adjacent to roads this will comprise tall, clear-stemmed tree planting with groundcovers, allowing clear sightlines yet providing some visual relief

from the bulk of the warehousing. In more inaccessible areas a denser mix of native shrubs and trees will be planted to increase habitat for native fauna.

TYPICAL SPECIES:

Trees:	<i>Eucalyptus maculata</i> <i>Eucalyptus fibrosa</i>
Shrubs:	<i>Kunzea ambigua</i> <i>Banksia serrata</i> <i>Melaleuca ericifolia</i>
Groundcovers:	<i>Lomandra longifolia</i> <i>Banksia sp.</i>

5.6 SOUND ATTENUATION ELEMENTS (Refer Figure 11)

The Noise Assessment carried out as part of this EIS has indicated a requirement for sound attenuation in the form of either mounding or walls in two key areas. The first location is along the north-western edge of the new Enfield Marshalling Yards, where a noise wall is proposed running approximately 430m parallel to the north-west boundary of the site. This wall is proposed to be located behind the belt of existing vegetation alongside Roberts Road thus reducing its visual impact, and run along the boundary of the new Enfield Marshalling Yards. Secondly, noise attenuation in the form of a landscaped mound is proposed within the community and ecological area alongside Cosgrove Road, linking up with the existing mound to provide mitigation for local residents. Sections of noise wall between the mounds will be required over the Cocks Creek culvert and over a sewer main, which will be screened by tree and shrub planting. The noise attenuation solutions for these areas will be considered in light of the likely impact on the visual amenity and user safety of both Roberts Road users, Cosgrove Road users and adjacent residential and industrial users/owners.

Noise Wall Design:

It is proposed that the noise walls will be 4-5m in height. Key urban design considerations driving the design of any noise attenuation associated with the ILC site are:

- Consistency in approach / design for all existing and proposed attenuation treatments.
- Strong relationship to the site.
- Reduction in the dominance of any built element.
- Minimisation of visual impact by careful location and the use of screen planting

Noise Mound Design:

Mounded slopes will be planted with native trees, shrubs and groundcovers. This will provide consistency in planting form and will help noise treatments to recede into the landscape setting. It is proposed that the mounding will be 4-5m high and at a maximum grade of 1:3 to provide a suitable surface for plant establishment.







5.7 PEDESTRIAN FOOTPATHS *(Refer Figure 9)*

A new pedestrian footpath is proposed within the Community and Ecological area, to possibly allow for future controlled access by community and school groups. The pathway would begin adjacent to the Tarpaulin Shed via a gated entry and would extend through the site and into the frog habitat area. Path construction would be of a low key design such as stabilised gravel in flatter areas, timber steps and exposed aggregate concrete in steeper sections. Nearer to the frog ponds, areas for viewing and seating with inclusion of interpretive signage relating to the Green and Golden Bell Frog habitat could be introduced. No access into the frog habitat area would be allowed, to prevent disturbance to frogs, with users limited to the designated footpaths by fencing. Pedestrian access may be provided to the top of the mound via a spiralling pathway / stairs. This could lead to a lookout area on the top of the mound with provision of a deck and associated seating. Interpretive signage regarding the past and existing uses of the site may be incorporated into this vantage point.

5.8 BRIDGE DESIGN

A bridge is proposed over the new Enfield Marshalling Yards which will connect the site to Roberts Road via Wentworth Street, and form the major entry point into the site. The design is of a simple concrete slab deck supported on slimline piers, with the intention of keeping lines simple and unobtrusive and emphasising the horizontal planes. The outer face of the bridge parapets are to be designed as smooth simple planes. Traffic barriers are to be incorporated into the parapet and are to be integrated with safety barriers in both form and function.

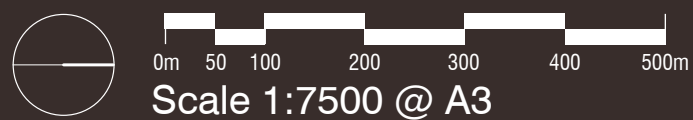
LEGEND

-  Large Mound
Approx. 15m or
Higher
-  Low Mound
Approx. 5m or
Lower
-  Cutting
-  Channelised
Creek
-  Piped Creek
(Below Ground)
-  Site Boundary



LEGEND

- Residential
- Open Space
- Industrial
- Railway
- Site Boundary



INTERMODAL LOGISTICS CENTRE AT ENFIELD - LANDSCAPE AND URBAN DESIGN REPORT

EXISTING LAND USES

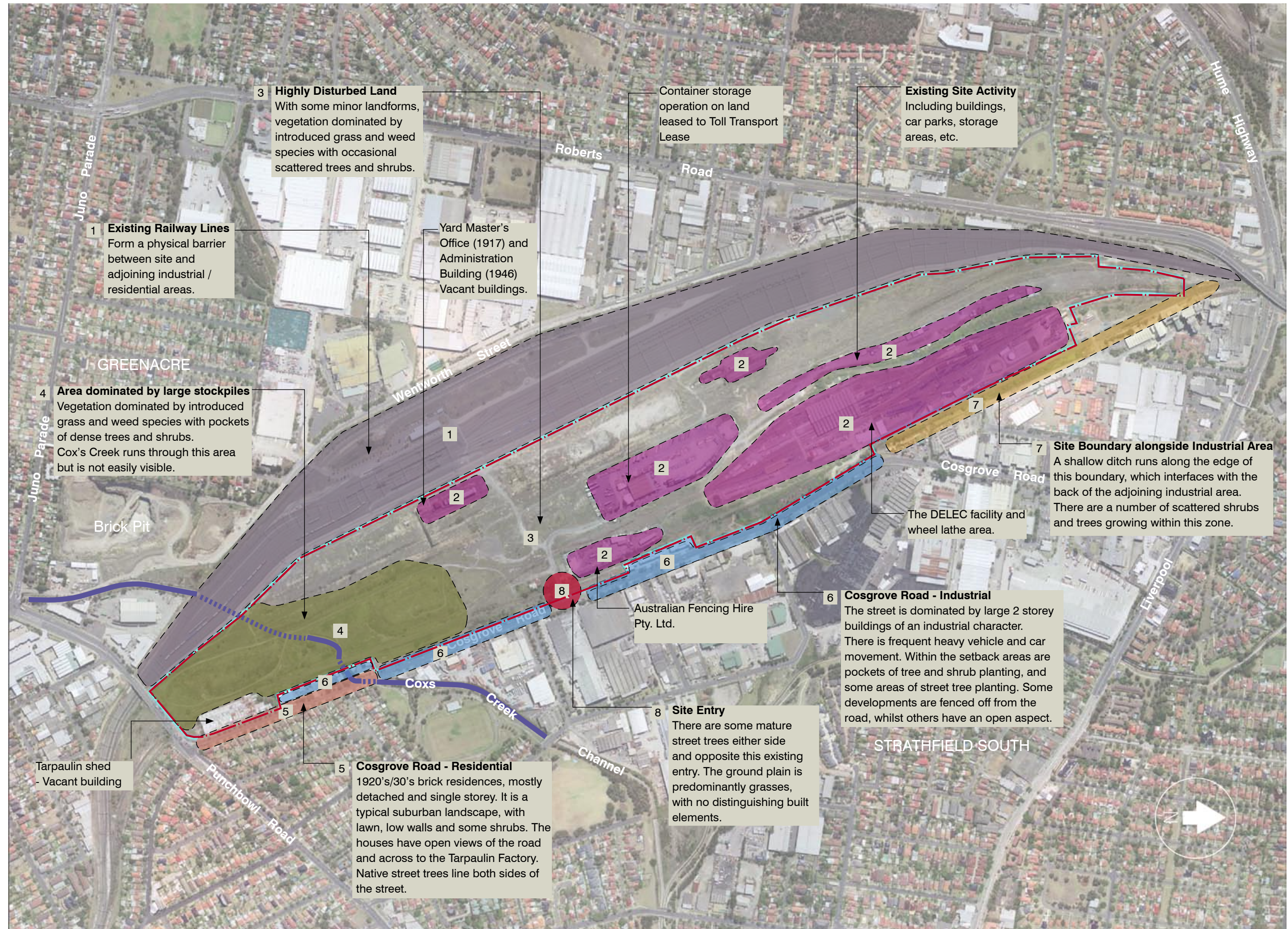
EDAW gillespies SKM

FIGURE 2

June 2005

LEGEND

- 1 Existing Railway Line
- 2 Existing Site Activity
- 3 Highly Disturbed Land
- 4 Area Dominated by Large Stockpile
- 5 Cosgrove Road - Residential
- 6 Cosgrove Road - Industrial
- 7 Site Boundary with Industrial Area
- 8 Site Entry
- Channelised Creek
- Piped Creek (Below Ground)
- Site Boundary



0m 50 100 200 300 400 500m
Scale 1:7500 @ A3

INTERMODAL LOGISTICS CENTRE AT ENFIELD - LANDSCAPE AND URBAN DESIGN REPORT




SITE ANALYSIS - EXISTING SITE CHARACTER

EDAW gillespies SKM

FIGURE 3

June 2005

LEGEND

-  Mostly grasses with occasional shrubs
-  Grasses with denser shrub regrowth and occasional trees
-  Shrubs and trees
-  Street tree planting
-  Site Boundary



0m 50 100 200 300 400 500m
Scale 1:7500 @ A3

INTERMODAL LOGISTICS CENTRE AT ENFIELD - LANDSCAPE AND URBAN DESIGN REPORT











SITE ANALYSIS - EXISTING VEGETATION

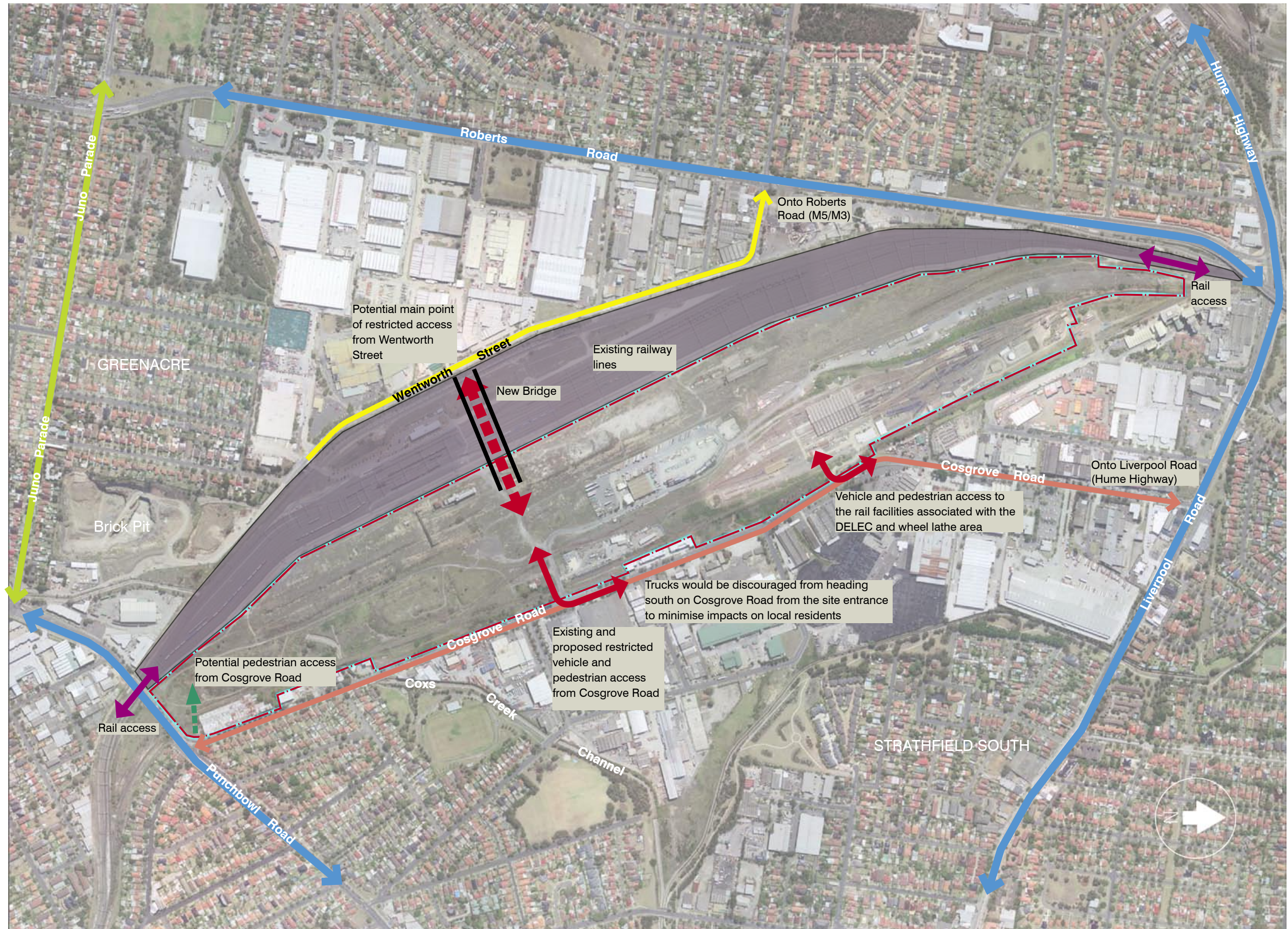
EDAW gillespies SKM

FIGURE 4

June 2005

LEGEND

-  Railway
-  Potential Major Access
-  Existing Access
-  Pedestrian Access
-  Rail Access
-  Local Road
-  Major Local Road
-  Secondary Road
-  Main Road
-  Site Boundary



0m 50 100 200 300 400 500m

Scale 1:7500 @ A3

INTERMODAL LOGISTICS CENTRE AT ENFIELD - LANDSCAPE AND URBAN DESIGN REPORT











SITE ANALYSIS - ACCESS AND PERMEABILITY

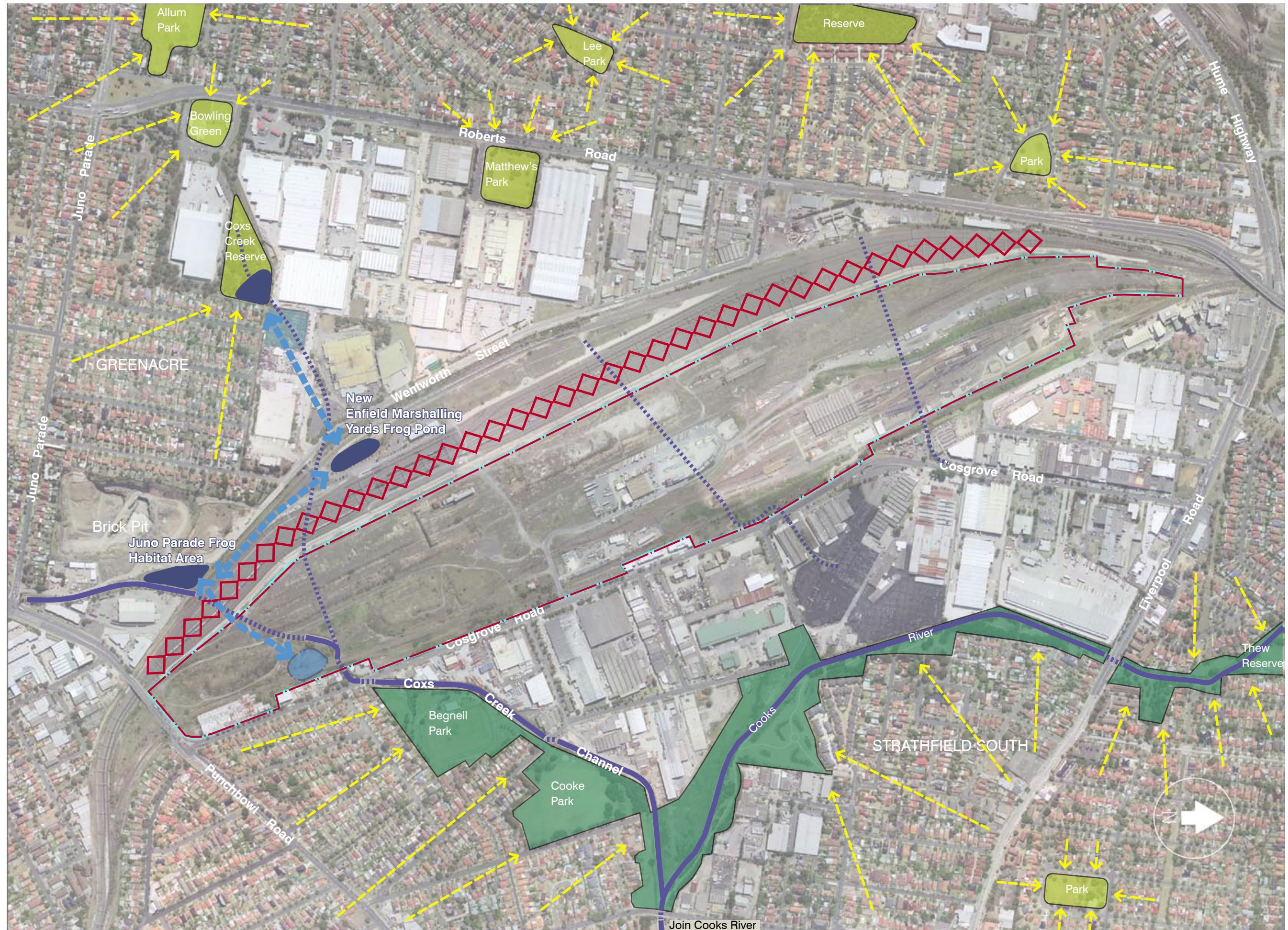
EDAW gillespies SKM

FIGURE 5

June 2005

LEGEND

-  Neighbourhood Park
-  Major Open Space Corridor
-  Potential Habitat for Green and Golden Bell Frog
-  Existing Habitat for Green and Golden Bell Frog
-  Major Barrier Formed by Railway
-  Potential Frog Connection
-  Channelled Creek
-  Piped Creek (Below Ground)
-  Open Space Catchment Area
-  Site Boundary



0m 50 100 200 300 400 500m
Scale 1:7500 @ A3

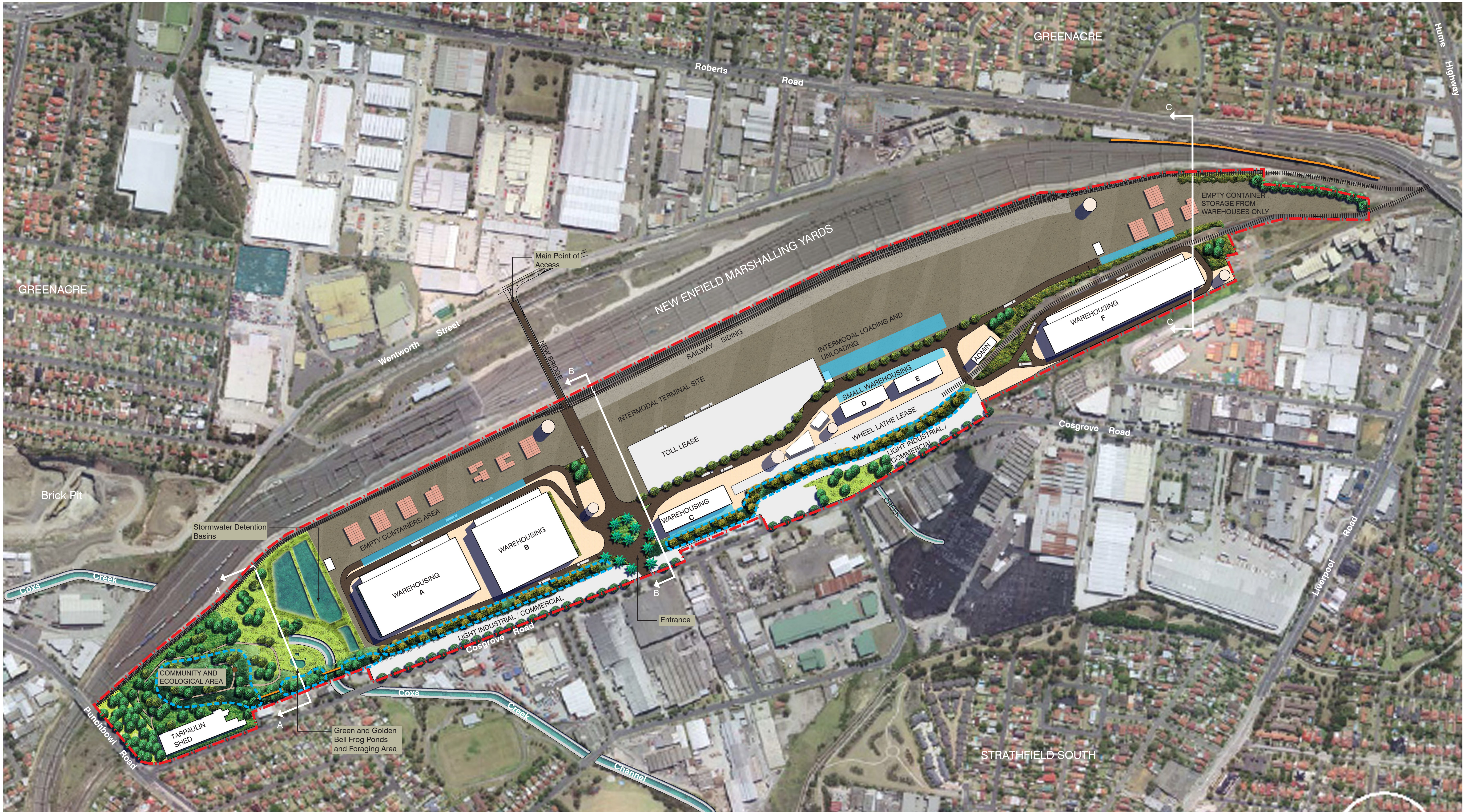
INTERMODAL LOGISTICS CENTRE AT ENFIELD - LANDSCAPE AND URBAN DESIGN REPORT

SITE ANALYSIS - ECOLOGICAL AND RECREATIONAL CONNECTIONS

EDAW gillespies SKM

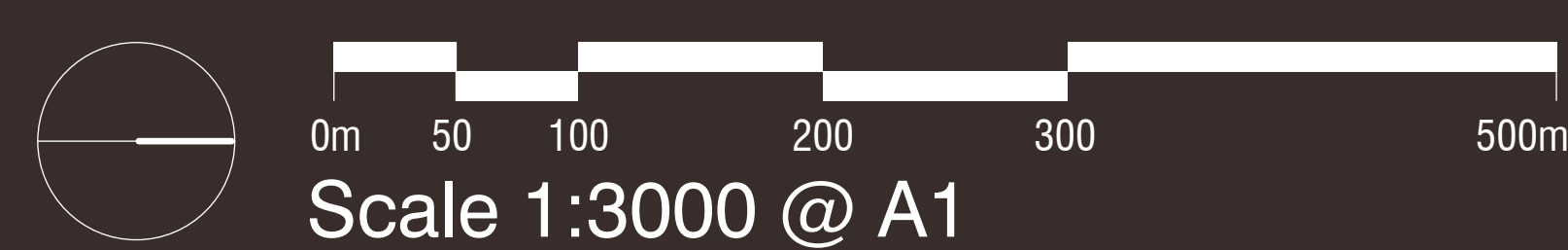
FIGURE 6

June 2005

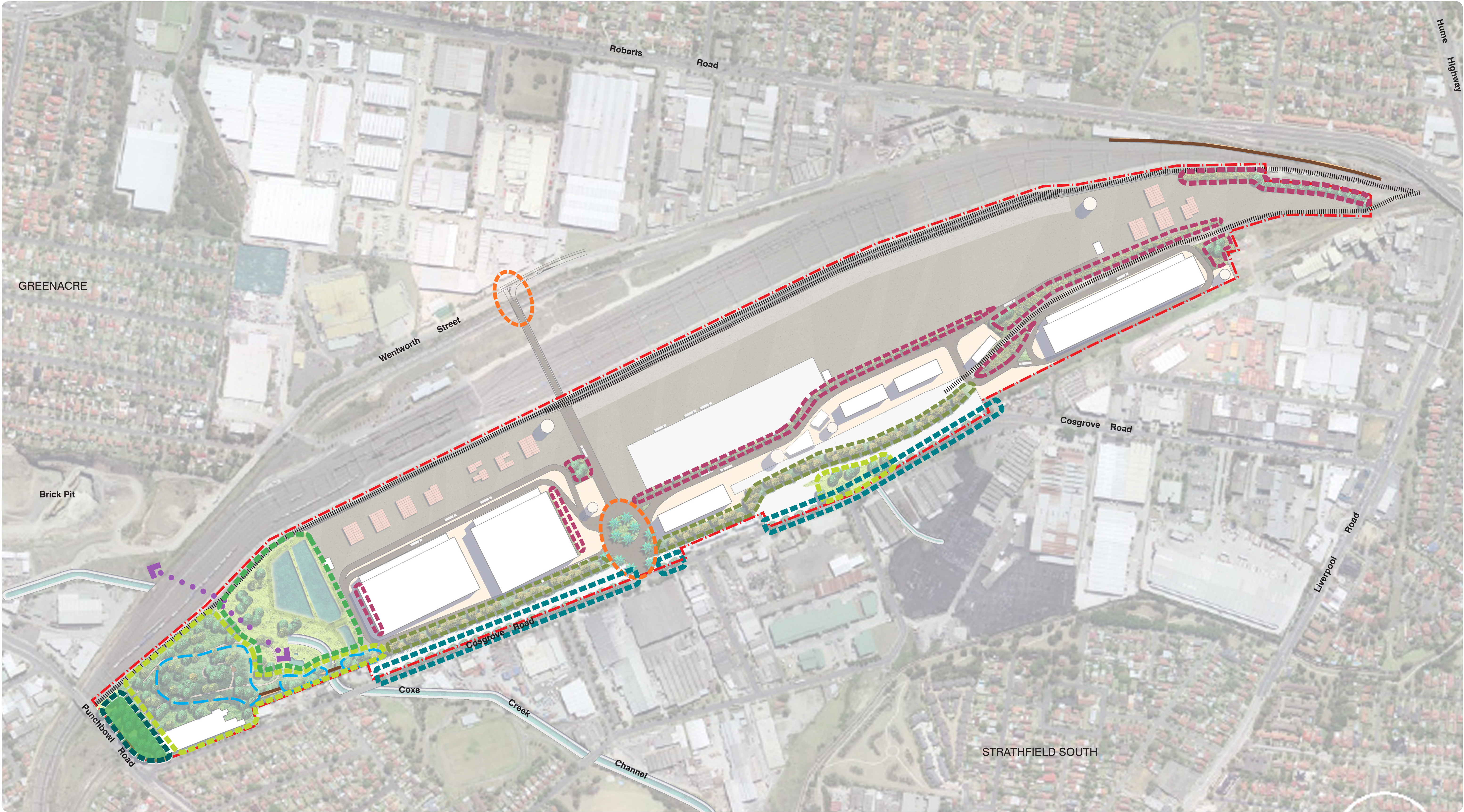


LEGEND











	Visual Screening planting		Woodland / Native Revegetation		Frog Habitat Area		Ornamental / Contextual Entry		Noise Wall 4~5m High		Site Boundary		Areas for truck parking / queuing
	Mound / Buffer planting		Internal Screening Planting		Pond / Basins		Pedestrian Walkway		Street Trees		Mounding		Rail line

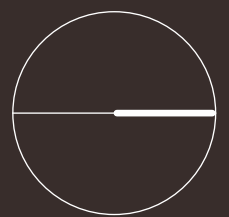


ENFIELD INTERMODAL LOGISTICS CENTRE LANDSCAPE AND URBAN DESIGN CONCEPT PLAN CONCEPT PLAN - MASTERPLAN



LEGEND

- | | | | | | |
|--|--|--|--|--|--|
|  Visual Screening planting |  Woodland / Native Revegetation |  Frog Habitat Area |  Potential Frog Movement Corridor |  Cosgrove Road edge treatment |  Noise Wall |
|  Landscaped Mound / Buffer |  Internal Screening Planting |  Ornamental / Contextural Entry |  Site Boundary |  Noise Mounding |  Rail Line |



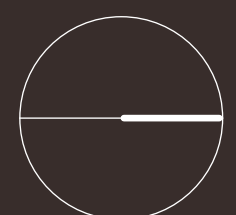
Scale 1:3000 @ A1

ENFIELD INTERMODAL LOGISTICS CENTRE LANDSCAPE AND URBAN DESIGN CONCEPT PLAN
CONCEPT PLAN - LANDSCAPE TREATMENT STRUCTURE



LEGEND

- | | | | | | |
|--|--|---|---|--|---|
|  Buffer / Screening planting |  Woodland / Native Revegetation |  Frog Habitat Area |  Ornamental / Contextual Entry |  Noise Wall 4~5m High |  Site Boundary |
|  Mound / Buffer planting |  Screening Planting |  Pond / Basins |  Pedestrian Walkway |  Street Trees |  Mounding |



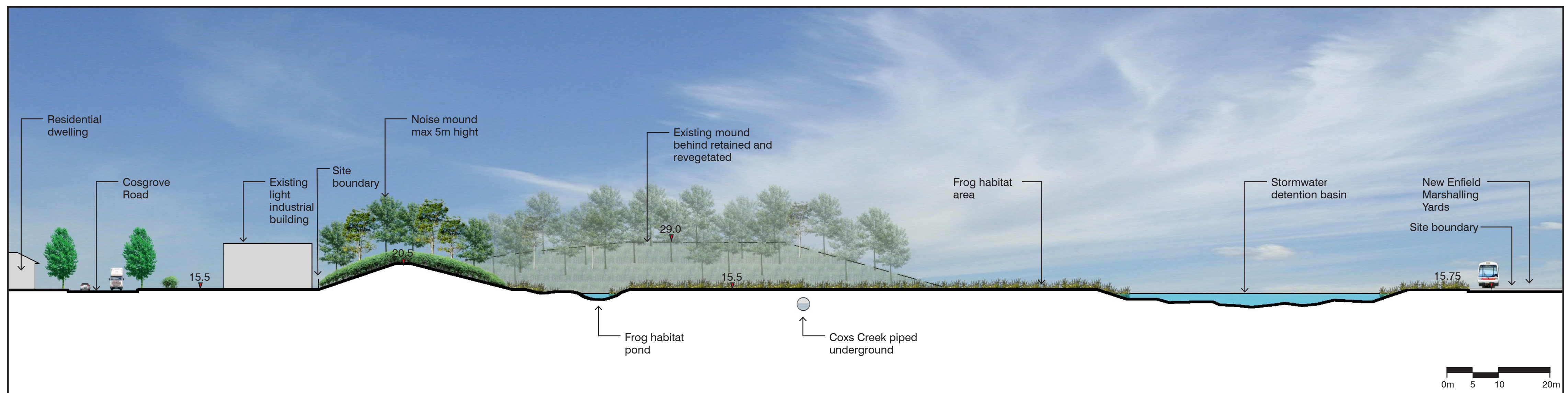
Scale 1:1000 @ A1

ENFIELD INTERMODAL LOGISTICS CENTRE LANDSCAPE AND URBAN DESIGN CONCEPT PLAN
CONCEPT PLAN - COMMUNITY + ECOLOGICAL AREA

EDAW gillespies SKM

FIGURE 9

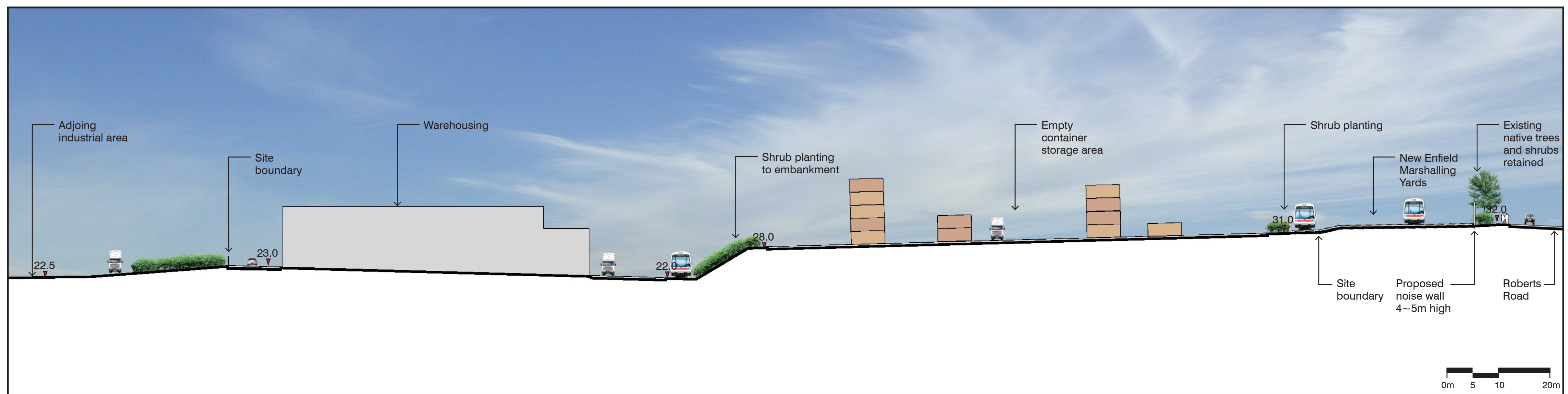
June, 2005



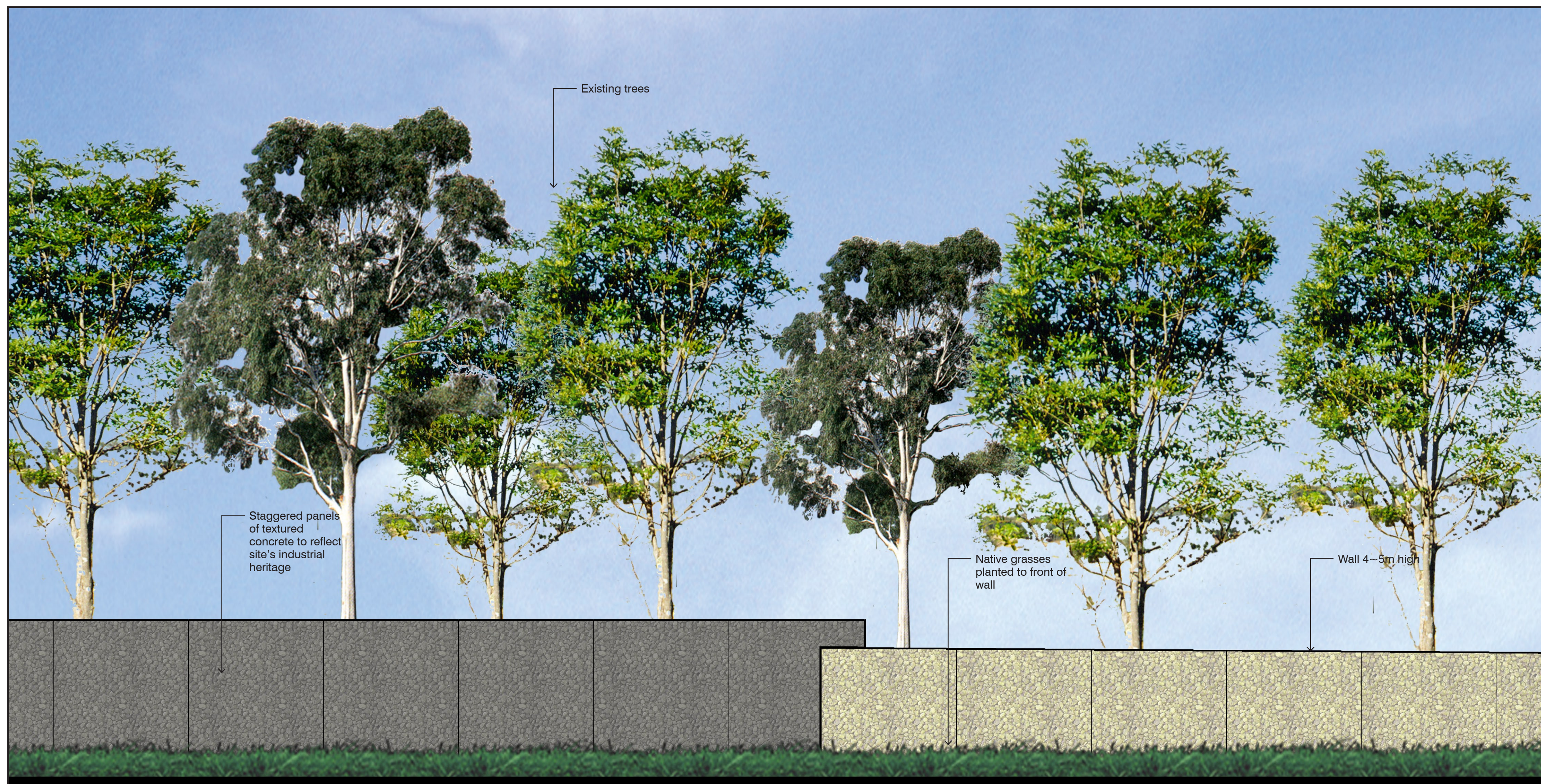
A-A SECTION SCALE: 1:500@A1



B-B SECTION SCALE: 1:1000@A1



C-C SECTION SCALE: 1:500@A1



TYPICAL ELEVATION: ROBERTS ROAD NOISE WALL

SCALE: 1:100@A1



TYPICAL BALLAST TEXTURE

Noise Wall Design:

It is proposed that the noise walls will be 4-5m in height. Key urban design considerations driving the design of noise attenuation associated with the ILC site are:

- Consistency in approach / design for all existing and proposed attenuation treatments.
- Strong relationship to the site.
- Reduction in the dominance of any built element.
- The need to be unobtrusive.