PART 29C RULE 29C – LIGHT INDUSTRIAL ZONE

For the avoidance of doubt, and notwithstanding the rules which follow**,** all activities (or applications for consent for such activities) must also comply with such other provisions as may affect the activity or site and which are specified in Parts 7, 8, 10, 11, 12, 15, 22, 26, 50, 51, 52, 53 and 54 of this Plan. Where the activity involves the use of a SIGN erected on private property, the SIGN shall be consistent with matters set out in Rule 15.4.

Network Utilities within the Drury South Structure Plan area are subject to the provisions in 15.1 NETWORK AND OTHER UTILITIES AND ESSENTIAL SERVICES and not the following provisions.

29C.1 PERMITTED ACTIVITIES – LIGHT INDUSTRIAL ZONE

The activities listed below are *Permitted*, and do not require a resource consent, if they comply in all respects with Rules 29C.5, 29C.6 and 29.8.

(NOTE: Within the following list, the words in CAPITALS are defined in Rule 50)

1. Throughout the Zone (except in the Drury South Structure Plan Area in Appendix 54.18A) the following are permitted activities provided they comply with Rules 29C.5, 29C.6 and 29.8:

    a) INDUSTRY: Manufacturing, processing, assembling and distribution of products.

    b) Storage, WHOLESALE and freight of goods.

    c) OFFICES associated with a permitted activity

    d) CAFÉS (accept for within the Kingseat Structure Plan Area).

    e) DAIRIES

    f) TAKEAWAYS

    g) VETERINARY CENTRES

    h) FITNESS CENTRES

    i) RETAILING of AGRICULTURAL and INDUSTRIAL motor vehicles and machinery

    j) TRADE SUPPLY OUTLET

    k) YARD-BASED ACTIVITY and GARDEN CENTRES

    l) Hire centres

    m) SERVICE STATIONS

    n) Additions and alterations increasing an existing BUILDING coverage by no more than 10% of building footprint.

2. On SITES, other than those located within 100 metres of the Industrial 2 Zone, the following are permitted activities (in addition to those above) provided they comply with Rules 29C.5, 29C.6 and 29.8:

    a) CHILD CARE AND LEARNING CENTRES

    b) SCHOOL

    c) ACTIVE RECREATION and Entertainment Facilities

    d) FUNERAL SERVICES PREMISES

    e) HEALTH CENTRES

    f) HOSPITALS

    g) COMMUNITY FACILITY

3. On SITES within the Drury South Structure Plan Area which are not located within the Commercial Services Precinct shown on the Drury South Structure Plan in Appendix 54.18A the following are permitted activities provided they comply with Rules 29C.5, 29C.6 and 29.8:

    a) INDUSTRY: Manufacturing, processing, assembling and distribution of products.

    b) Storage, WHOLESALE and freight of goods.

    c) RETAILING of AGRICULTURAL and INDUSTRIAL motor vehicles and machinery

    d) TRADE SUPPLY OUTLET

    e) YARD-BASED ACTIVITY and GARDEN CENTRES

    f) Equipment hire centres

    g) SERVICE STATIONS

h) The construction of any BUILDING except in the Motorway Edge Precinct shown on the Drury South Structure Plan where it shall be a controlled activity

i) Offices ancillary to another permitted activity

j) The use of land which has been acquired or vested in the Council for reserve purposes for activities which are permitted activities in Rule 34.1 (Recreation Zone)

k) Construction of stormwater management devices or flood mitigation works within the 100 year ARI modified flood plain that are to be vested in the Council, or otherwise approved by way of Stormwater Management Plan or Stormwater Discharge consent

l) Earthworks including fill and other landscape treatment that does not alter the configuration of an overland flow path

m) Fences located within or over an overland flow path that do not obstruct the overland flow path

4. On SITES within the Drury South Structure Plan Area which are located within the Commercial Services Precinct shown on the Drury South Structure Plan in Appendix 54.18A the following are permitted activities (in addition to the activities listed in 3 above) provided they comply with Rules 29C.5, 29C.6 and 29.8:

a) OFFICES

b) CAFÉS

c) DAIRIES

d) TAKEAWAYS

e) FITNESS CENTRES

f) CHILD CARE[1] AND LEARNING CENTRES[2]

g) HEALTH CENTRES[3] and beauty salons

h) VETERINARY CENTRES

Explanation
In the Drury South Structure Plan Area certain commercial service activities (offices, cafe's, dairies etc) are limited to defined commercial services precincts rather being able to disperse throughout the light industrial zone. This is to ensure that higher intensity uses are located close to the primary road network where they will support public transport modes and where, through clustering of like uses, higher amenity standards will be attained and reverse sensitivity effects on industry will be reduced. These activities are limited to the commercial services precincts to ensure that the amount of land available for Land Extensive Industrial Activities is maximised.

[1] Except within 500 metres of an Industrial 4 (Heavy Industry) Zone.
[2] Except within 500 metres of an Industrial 4 (Heavy Industry) Zone.
[3] Except within 500 metres of an Industrial 4 (Heavy Industry) Zone.

29C.2 CONTROLLED ACTIVITIES – LIGHT INDUSTRIAL ZONE

i. *Controlled* activities require a resource consent, but the consent *shall* be granted. An application must be submitted in the prescribed format (available from the Council).

ii. Applications will be assessed in terms of the matters set out in Rule 29C.7, and any conditions of consent will relate to those matters or such other matters as the Act allows.

iii. The information submitted with the application must be in terms of Rule 52 but only to the extent needed to enable a thorough assessment in terms of Rule 29C.7. The application must also clearly demonstrate compliance with the stated standards applicable to the activity.

iv. Except as provided for by Section 94C of the Resource Management Act 1991, applications for Controlled Activities will be considered without notification or the need to obtain approval of, or serve notice on, affected persons.

v. The activities listed below are *Controlled* activities in the *Light Industrial* Zone.

(NOTE: Within the list, the words in CAPITALS are defined in Rule 50)

1. The construction of any BUILDING that complies with RULE 29C.5 (Development Standards) in the Pokeno Structure Plan Area or within the Motorway Edge Precinct or the Commercial Services Precinct shown on the Drury South Structure Plan in Appendix 54.18A. In the case of the Drury South Structure Plan Area this rule does not include NETWORK AND OTHER UTILITIES which shall be Permitted Activities subject to compliance with Rule 15.1.2.

29C.3 RESTRICTED DISCRETIONARY ACTIVITIES – LIGHT INDUSTRIAL ZONE

i. *Restricted Discretionary* activities require a resource consent, and the consent may be granted or refused. An application must be submitted in the prescribed format (available from the Council).

ii. Applications will be assessed in terms of the matters set out in Rule 29C.7, and any conditions of consent will only relate to those matters (or other matters as provided by the Act).

iii. The information submitted with the application must be in terms of Rule 52 but only to the extent needed to enable a thorough assessment in terms of Rule 29C.7. The application must also clearly demonstrate compliance with any stated standards applicable to the activity.

vi. Except as provided for by Section 94C of the Resource Management Act 1991, applications for Restricted Discretionary Activities (except Rules 29C.6 and 29.8) will be considered without notification.

v. Except as provided for by Section 94C of the Resource Management Act 1991, applications for Restricted Discretionary Activities (except where required as a result of non-compliance with Rule 29C.5.1.2, 29C.5.2.2, 29C.5.3.2, 29C.6 and 29.8) will be considered without notification or the need to obtain approval of, or serve notice on, affected persons.

(NOTE: Within the list, the words in CAPITALS are defined in Rule 50)

1. Any Permitted or Controlled Activity, including a BUILDING located within 30 metres of a Residential, Residential 2, Rural-Residential, Village.

   Council has restricted its discretion to consideration of site layout, design and external appearance with regard to potential adverse effects on neighbouring residents.

   Refer 29C.8.4 for Assessment Criteria.

2. Any Permitted Activity or Controlled Activity not complying with one or more Development Standards or PERFORMANCE STANDARDS in Rules 29C.5 (except 29C.5.1.1) or 29C.6 or Rule 29.8.

   Council has restricted its discretion to consideration of the extent of the infringed standard and its specific effect, and may impose conditions in relation to these.

   Refer 29C.8.1, 29C.8.2 and 29B.6.5 – 29B.6.12 for Assessment Criteria, as relevant.

3. Any BUILDING with a HEIGHT exceeding 15 metres, as specified in 29C.5.1.1, but no greater than 20 metres.

   Council has restricted its discretion to consideration of the visual appearance of the building(s) as viewed from publicly accessible locations, and may impose conditions in relation to this.

   Refer 29C.8.3 for Assessment Criteria.

4. The construction of any BUILDING on a SITE within a Structure Plan Area, where the site existed at the date of notification of the relevant Plan Change (which introduced that Structure Plan) and where a structural element of a Structure Plan is located within that SITE.

   Council has restricted its discretion to consideration of potential adverse effects on the achievement of the relevant Structure Plan.

   Refer 29C.8.13 for Assessment Criteria.

5. In the Drury South Structure Plan Area;

   a) Stormwater management devices and flood mitigation works that are within the 100 year ARI modified flood plain that are not to be vested in council, or which have not been approved in a Stormwater Management Plan or Network Discharge consent.

b) Diverting the location/alignment or altering the capacity of any part of an overland flow path.

c) Any buildings (including retaining walls but excluding fences) located within or over an overland flow path).

d) Any permitted, controlled or restricted discretionary activity **not** storing hazardous substances including all associated buildings (but excluding car parking which is a permitted activity subject to compliance with Rule 29C.6.10(c) on land which is within the 100 year ARI modified floodplain

e) Placement of fill on land that is within the 100 year ARI modified flood plain

f) Piping of overland flow paths

6. CAFES within the Kingseat Structure Plan Area not exceeding a total of 400m^2 GROSS FLOOR AREA

29C.3A DISCRETIONARY ACTIVITIES – LIGHT INDUSTRIAL ZONE

i. *Discretionary* activities require a resource consent, and the consent may be granted (conditionally or unconditionally) or refused. An application must be submitted in the prescribed format (available from the Council).

ii. *Applications* will be assessed in terms of the matters set out in Rule 53, but the Council will first consider the standards and assessment criteria applicable to *Permitted*, *Controlled*, and *Restricted Discretionary* activities in the Zone.

iii. The *information* submitted with the application must be in terms of Rule 52.

iv. The activities listed below are *Discretionary* activities.

(NOTE: Within the list, the words in CAPITALS are defined in Rule 50)

1. OFFICES not associated with a permitted activity

2. PERSONAL AND COMMERCIAL SERVICES

3. In the Drury South Structure Plan Area any permitted, controlled or restricted discretionary activity storing hazardous substances on land which is within the 100 year ARI modified floodplain.

4. Cafes within the Kingseat Structure Plan Area exceeding a total of 400m^2 GROSS FLOOR AREA.

29C.4 NON-COMPLYING ACTIVITIES – LIGHT INDUSTRIAL ZONE

i. *Non-complying* activities require a resource consent, and the consent may be granted or refused. An application must be submitted in the prescribed format (available from the Council).

ii. Applications will be assessed in terms of the matters set out in Rule 53, and where consent is granted, conditions of consent may be imposed.

iii. The information submitted with the application must be in terms of Rule 52.

iv. The activities listed below are *Non-complying* activities in the *Light Industrial* Zone.

(NOTE: Within the list, the words in CAPITALS are defined in Rule 50)

1. Any activity not otherwise provided for by Rules 29C.1, 29C.2, 29C.3 or 29C.3A above.

In the Drury South Structure Plan Area:

All buildings and structures within 12 metres of the centreline of a National Grid Transmission line and 12 metres from the outer edge of a National Grid Transmission Line support structure except for buildings and structures for:

- Network utilities
- Lighting associated with car parking for nearby development that complies with NZECP34:2001
- Fences that complywith NZECP34:2001

Retail Activities not being a permitted activity or a prohibited activity

29C.4A PROHITED ACTIVITIES – LIGHT INDUSTRIAL ZONE

i. Resource consent applications cannot be made for *Prohibited* activities.

ii. The activity listed below is a *Prohibited* activity in the *Light Industrial* Zone within the Drury South Structure Plan area (see Drury South Structure Plan in Appendix 54.18A).

(NOTE: Within the list, the words in CAPITALS are defined in Rule 50)

Any RETAILING ACTIVITIES over 500m2 within the Drury South Structure Plan area (see Drury South Structure Plan in Appendix 54.18A)

29C.5 DEVELOPMENT STANDARDS FOR PERMITTED AND CONTROLLED ACTIVITIES – LIGHT INDUSTRIAL ZONE

i. All activities in the *Light Industrial* Zone shall comply with the standards set out below.

ii. In order to ascertain compliance, the Council may request such information and plans as may be necessary, including any technical data or expert assessment as is appropriate to the circumstances:

29C.5.1 HEIGHT

1. BUILDING HEIGHT

The maximum HEIGHT of BUILDINGS shall be 15 metres.

Refer to definitions of "BUILDING" and "HEIGHT", Rule 50.

Explanation

This standard maintains a scale of development compatible with the surrounding land uses and manages the visual impact of the Light Industrial Zone on more sensitive zones while maintaining opportunities for the development of industrial activities.

2. BUILDING HEIGHT RELATIVE TO BOUNDARIES

No part of any BUILDING or SIGN shall exceed a height of 3 metres plus the shortest horizontal distance between that part of the BUILDING and the nearest boundary of any SITE zoned Rural, Recreation, Residential, Residential 2, Rural-Residential, Village.

This rule shall not apply:

i. where the written consent/s of the owners and occupiers of the abutting sites or notional lots that would be directly affected by the encroachment have been obtained.

Explanation

This standard is intended to reduce any physical impacts arising from building bulk close to a boundary and to ensure adequate daylight or sunlight for adjoining properties.

29C.5.2 YARDS

1. FRONT YARD

A FRONT YARD of 7.5 metres shall be provided across the entire length of all ROAD boundaries.

Explanation
A front yard is required in order to avoid visual dominance of large scale industrial buildings over the street. In some instances a smaller scale or aesthetics of design of buildings, or the detailing of any planting in the front yard, may lessen or make this setback unnecessary.

2. Amenity YARDS

Where a SITE has a common boundary with any SITE zoned Recreation, Residential, Residential 2, Rural-Residential, Village, an amenity YARD of 5 metres shall be provided across the entire length of the boundary of the SITE.

Explanation
An amenity yard is required in order to avoid visual dominance of large scale industrial buildings over adjoining properties. In some instances a smaller scale or aesthetics of design of buildings, or the detailing of any planting in the amenity yard, may lessen or make this setback unnecessary.

3. Riparian YARD - Set Back From Water

The minimum distance between any BUILDING and the edge of a stream identified on the Structure Plan Map as "perennial stream requiring riparian margin" shall be 12 metres, and EARTHWORKS within the Riparian YARD shall not exceed a total volume of 25 cubic metres or a total area of 250 square metres.

Explanation
The Riparian YARD maintains separation of BUILDINGS from the streams identified on a Structure Plan as requiring riparian margins. The purpose of this YARD is to reduce the impact of activities on water quality and water flows and in particular to provide a permeable area between the streams and impermeable surfaces.

There may be circumstances where the Riparian YARD can be reduced due to site characteristics.

The earthworks standard is intended to avoid the adverse effects on water and the riparian environment. It may reduce the risk of damage from erosion or flooding.

29C.5.3 PLANTING

1. FRONT YARD

A FRONT YARD identified in Rule 29C.5.2.1 shall have a minimum depth of planted vegetation of 3 metres adjoining the road boundary across the entire frontage of the site excluding only those areas used for vehicle and pedestrian access. In the Drury South Structure Plan Area the front yard landscaping required by this Rule shall comprise a 3 metre wide continuous (except for those areas used for vehicle and pedestrian access) planting of multi-row phormium tenax (flax) planted at 1.5 metre centres in staggered rows on a grid **except** that this planting requirement shall not apply to sites within the Commercial Services Precinct or the Motorway Edge Precinct (see Drury South Structure Plan in Appendix 54.18A).

2. Amenity YARD

An Amenity YARD identified in Rule 29C.5.2.2 shall have a minimum depth of planted vegetation of 4 metres across entire length of the boundary of the SITE.

For the avoidance of doubt no storage of materials, loading or car parking shall occur within the amenity YARD.

3. Riparian YARD

A Riparian YARD identified in Rule 29C.5.2.3 shall have a minimum depth of planted vegetation of 10 metres from the edge of a stream across entire length of the Riparian YARD.

For the avoidance of doubt no storage of materials, loading or car parking shall occur within the riparian YARD.

4. Special Planting requirements for Drury South Structure Plan Area in Appendix 54.18A
All side boundaries in the Light Industrial zone shall be planted with a row of either Leyland Cypress, Casuarina (sheoak) or Macrocarpa at 3 metre centres located 1.5 metres in from the side or rear boundary and buildings shall be setback from the relevant boundary by a minimum of 3.5 metres accordingly. This requirement shall not apply to sites within the Commercial Services Precinct or the Motorway Edge Precinct.

In the case of sites with side or rear boundaries which abut the Southern Motorway (State Highway 1) within the Motorway Edge Precinct all such boundaries shall be planted with a double row of Leyland Cypress with 2 metres between rows and trees within each row planted at 3 metre centres. Tree rows are to be staggered and the first row is to be located 1.5 metres in from the side or rear boundary and buildings shall be setback from the relevant boundary by a minimum of 5.5 metres accordingly.. Any noise attenuation wall or fence designed / located to deflect noise arising from the Southern Motorway shall be fully screened by planting in views from the motorway.

Within the Motorway Edge Precinct of the Drury South Structure Plan Area no less than 30% of the net site area of each site is to be in permeable landscape area (including any on site storm water treatment). Where on site car parking adopts a layout fully conforming with the Fully Planted Permeable Carpark Design Layout detailed in Diagram 6 in Appendix 29C, the permeable landscape area may be reduced to no less than 20% of the site area.

Note: any tree planting in the Drury South Structure Plan Area in the vicinity of electricity lines must comply with the Electricity (Hazards from Trees) Regulations 2003.

5. A planting plan shall accompany any application for a building consent, compliance certificate or resource consent.

No activity which is otherwise permitted by this Plan shall be deemed to be lawfully established unless the required "planting plan" has been approved by the Chief Executive or officer(s) acting under delegated authority and the planting has been established to his/her satisfaction.

Effect Required in Amenity YARD: The planting must at maturity achieve a significant visual screening effect, and significantly soften the appearance of the building and any parking/loading/driveway areas.

Effect Required in FRONT YARD: The planting must at maturity achieve a significant amenity-enhancing effect, particularly if the site faces non-*Industrial* sites, and complements the design and significantly softens the appearance of the building or front yard and any parking/loading/driveway or service areas when viewed from the road.

Effect Required in Riparian YARD: The planting must at maturity enhance the stream habitat, assist in stormwater management and be in general accordance with an existing Catchment Management Plan or have reference to a regional technical publication.

Submit Plan: A planting/landscaping plan to scale must accompany any application for a building consent, or compliance certificate, resource consent or any other form of written application to the Council. It must clearly show the location and areas of the amenity planting areas and:

- The direction of fall of the land and approximate contours;
- The existing vegetation which may qualify as meeting this standard;
- Any proposed earth filling or cutting;
- Include a list of the plants proposed to be established, their botanical name, maturity height, width and density;
- A statement as to when the plants will be planted, how they will be nurtured to maturity and maintained thereafter.

Species: All plants must be pre-grown, long-life, and low maintenance species.

Planting: All required plants must be in the ground not later than August of the planting season following the date of building consent. A bond may be required to ensure that the work is completed and also maintained for up to two years thereafter.

Explanation
Planting in the front yard can significantly improve the streetscape and amenity value in industrial areas which may otherwise have a utilitarian appearance. The provision of a front yard landscaped with trees and shrubs can soften the appearance of the streetscape.

In some instances the smaller scale or aesthetics of design of buildings may lessen or make unnecessary the setbacks and planting.

The Council has targeted its landscaping requirements to protect the amenities of adjoining non-business areas and roads. The standard is as specific as it can be without completely restricting the options of individual businesses to achieve the Plan's amenity objectives. The Council acknowledges that the most attractive sites are where planting and landscaping are an integral part of the design of the development and where there is a commitment on the part of the owners/occupiers to achieve a 'smart' appearance for the good of the business as well as the locality. Specific planting requirements are imposed in the Drury South Structure Plan area to reflect the landscape patterns of surrounding rural land, to screen activities from state Highway 1 and to ensure a consistent result is achieved through most of the structure plan area although more discretion is provided within the Commercial Services and Motorway Edge Precincts to reflect the fact that building design and appearance, landscape design and site layout are controlled activities in that precinct.

29C.5.4 FENCES AND WALLS

Any fences erected within an area of planting required by Rule 29C.5.3.1 FRONT YARD shall be of a transparent nature. In the case of the Drury South Structure Plan area in Appendix 54.18A any required security fence throughout the structure plan area shall be setback a minimum of 3 metres from the front boundary and such fencing (whether in front yards or on rear or side boundaries) shall be 2 metre maximum height and shall not incorporate barbed or razor wire or an angled top. Fence posts and wire mesh are to be black coloured.

Explanation
Fencing is a likely requirement of many uses in the Zone, for reasons that include security, screening and containment of dust and noise. Within or at the front of an area of planting required by Rule 29C.5.3.1 FRONT YARD, fencing shall be of a transparent nature so that the landscaping can be viewed from the adjoining ROAD. Specific security fencing requirements are imposed in the Drury South Structure Plan area on front yards as well as rear and side boundaries to ensure a consistent visual result is achieved throughout the structure plan area.

In the Drury South Structure Plan Area fences and walls located within or over and overland flow path or 100 year ARI flood plain shall not obstruct the conveyance flood flows up to a 100 year ARI rain event:

- Fences within or over an overland flow path shall provide an opening equivalent to twice the area required to convey the 100 year ARI flow over the overland flow path and constructing the opening to minimise the changes of blockage of the overland flow path.
- Fences in the 100 year RRI flood plain shall be open structure such as post and wire fence, wire mesh fences, pool type fences where at least 90% of the surface area of the fence is open, not a solid structure.

29C.5.5 PARKING SPACES

1. Parking spaces (and associated manoeuvring/driveway areas) shall be provided on-site in accordance with Part 51:

2. (Construction): All parking and manoeuvring areas shall be formed, drained and maintained to at least a compacted metal (rock chip) surface, in accordance with accepted practice for "commercial" loadings, and such that:

    - Stormwater will in all circumstances leave the site in a controlled manner so as to have no potential to cause damage to roads, service lanes, or adjoining properties; and

- Metal will not be washed or carried onto any road, service lane or adjoining property.

3. Multi-modal Parking Requirements within the Drury South Structure Plan Area in Appendix 54.18A

   a) Activities which are required by the district plan to provide car parking areas shall also provide stands racks or rooms to accommodate bicycles on the site at the following minimum rates:

      i. Provision for 2 bicycles for car parking areas of 20 to 50 car parking spaces; and

      ii. Provision for 1 additional bicycle per 20 car parking spaces in car parking areas over 50 car parking spaces.

   b) Where bicycle stands, racks or rooms are provided in accordance with clause (a) a reduction of the car parking requirements of this district plan at the rate of 1 car parking space for every 10 bicycles accommodated in stands, racks or rooms, provided that the reduction is only available in respect of the minimum rates of bicycle parking specified in clause (a), is permitted.

   c) Activities which are required by the district plan to provide car parking areas shall also provide space specifically identified for motorcycle parking, as part of the overall parking space requirement, at the following minimum rates:

      i. 2 motorcycle parking spaces in car parking areas of 20 to 50 car parking spaces; and

      ii. 1 additional motorcycle parking space per 20 car parking spaces in car parking areas over 50 car parking spaces.

   d) Where motorcycle parking areas are provided in accordance with clause (c) a reduction of the car parking requirements of this district plan at the rate of 1 car parking space for every 3 motorcycle parking spaces, provided that the reduction is only available in respect of the minimum rates of motorcycle parking specified in clause (c), is permitted.

   e) Activities which are required by the district plan to provide car parking areas shall specifically identify those spaces closest to the building entrance for vehicles used for car or van pooling, as part of the overall parking space requirement, at the following rates:

      i. 2 identified car or van pooling spaces in car parking areas of 20 to 40 car parking spaces; and

      ii. 2 additional identified car or van pooling spaces per 20 car parking spaces in car parking areas over 40 car parking spaces.

29C.5.6 LOADING SPACES

1. Subject to the requirements of Rule 51, all activities shall, on the same site as that activity, have the number of loading spaces as determined in accordance with the following requirements:

   i. One space per site, but not less than two spaces for any site having a total building gross floor area of over 1000 square metres.

2. (Design): All loading spaces and associated manoeuvring areas shall comply with the following design requirements:

   i. No loading space may be sited in such a way that vehicles have no option but to reverse onto or off the site.

   ii. All loading spaces or areas shall not be less than 8 metres in depth, 4 metres in width, and 4.25 metres in height

   iii. All loading spaces or areas shall be provided with an access path that complies with Diagram 51.F.

3. (Construction): All loading and manoeuvring areas shall be formed, drained and maintained to at least a compacted metal (rock chip) surface, in accordance with accepted practice for "commercial" loadings, and such that:

   i. Stormwater will in all circumstances leave the site in a controlled manner so as to have no potential to cause damage to roads, service lanes, or adjoining properties; and

   ii. Metal will not be washed or carried onto any road, service lane or adjoining property.

   Explanation
   The provision of loading spaces is essential to the effective operation of the vast majority of businesses. These spaces must be designed and located on-site to be able to be used safely and efficiently.

29C.5.7 VEHICLE CROSSINGS AND DRIVEWAYS

Rule 29.5.8 applies.

29C.5.8 LPG STORAGE

Rule 29.5.9 applies.

29C.5.9 LOCATION OF FUEL DISPENSERS

Rule 29.5.16 applies.

29C.5.10 STORMWATER MANAGEMENT – VOLUME CONTROL

Rule 29.5.17 applies except in Kingseat Structure Plan where Rule 29C.5.10A applies.

29C.5.10A – STORMWATER MANAGEMENT – KINGSEAT STRUCTURE PLAN AREA

The following standards apply to all sites in the Kingseat Structure Plan Area:

On-site volume control

1) All sites must provide on-site retention (volume control) of stormwater for a 10mm event from:
   a) all new impervious areas 25m^2 or larger in area, and

   b) both existing and new impervious areas where new or redevelopment of existing impervious areas exceed 50 square metres on redeveloped sites.

In achieving the above standard, all stormwater run-off from roofs shall be directed to a rain tank providing for non-potable re-use; a planted infiltration pit or trench; permeable paving, or a combination.

2) In addition to 1) above, where stormwater from a site discharges directly to a stream or to land that drains to stream, stormwater management by on site devices or catchment-wide devices must be provided that meets the following:

   a) Detention (temporary storage) with a volume equal to the remainder of the 95th percentile event from all new impervious areas 25 square metres or larger in area, and for both existing and new impervious areas where new impervious areas exceed 50 square metres on redeveloped sites.
   b) The discharge must not result in, or increase, flooding of other properties in events up to 10 per cent AEP or the inundation of buildings in events up to the 1% AEP
   c) The discharge must not cause or increase scouring or erosion at the point of discharge or downstream. Discharges are to be dispersed prior to stormwater entering the stream or coastal marine area.

Provided that where the stormwater from a site discharges directly to the coastal marine area and not to a stream, on site stormwater management does not need to comply with (a) and (b) above.

On-site quality control

3) All buildings shall avoid the use of unpainted roofing or spouting materials containing zinc or copper to minimise contaminant runoff.

4) Stormwater runoff from high contaminant generating land uses is managed by devices that are designed to achieve the design effluent discharge requirements of table 1, except for where sites discharge directly to the coastal marine area and not to a stream, in which case the temperature requirement does not need to be met.

Table 1

Contaminant	Design Effluent Quality Requirement for stormwater run off from 90% of the annual rainfall
Metals	Total Zinc < 30 ug/L; total copper < 10 ug/L
Sediment	< 20 mg/l
Temperature	<25 ^{0}C

The above design effluent requirements shall be achieved using bio filtration devices.

For the purposes of this rule, high contaminant-generating land uses means:

- all road carriageways,
- parking areas and associated accessways that are exposed to rainfall and which carry more than 50 vehicles per day,

Industrial and Trade Activity (ITA) areas, as defined by the Auckland Regional Plan: Air, Land and Water are excluded from these provisions where they are located within the Light Industrial Zone. However, any additional impervious area outside of the ITA area but which are located within the same lot are subjected to these provisions.

29C.5.11 STANDARDS FOR VISUAL AMENITY WITHIN THE DRURY SOUTH STRUCTURE PLAN AREA

a) Within the Commercial Services Precinct of the Drury South Structure Plan Area ground floor stud heights of 4.5 metres are required to allow long term adaptive reuse of light industrial buildings for commercial services activities.

b) Within the Drury South Structure Plan area, in addition to and notwithstanding the rules relating to signs in Rule 15.4.2 of the District Plan, the following requirements apply:

i. Roof signs including direct painting of signs onto the roof are not permitted;

ii. Sandwich board signs are not permitted;

iii. Neon, flashing, strobe or moving signs are not permitted;

iv. One freestanding sign is permitted per site to accommodate information relating to all businesses on the site. Freestanding signs may be doublesided and must be between 3 and 5 metres in height and between 1.5 and 2 metres wide with signage limited to the upper 1-3 metres of the sign and the lower 2 metres left blank;

v. In the Motorway Edge Precinct, any signage and branding visible from the State Highway 1 (Southern Motorway) must comply with the requirements of the New Zealand Transport Agency, must be affixed to the building and be limited to the Company name and/or logo. Any free standing signage identifying the location of business activities in this Precinct is limited to the spine road or other adjacent road frontage from which the site is accessed.

29C.5.12 STANDARDS FOR ROOF GLARE, SOLAR GAIN AND STORMWATER CONTAMINANT CONTROL WITHIN THE DRURY SOUTH STRUCTURE PLAN AREA

All buildings within the Drury South Structure Plan Area are to have light (earthen) coloured painted roofs finished with a non-reflective surface to minimise solar gain, energy use and glare and shall avoid the use of unpainted zinc or copper roofing or spouting materials to minimise contaminant runoff.

29C.5.13 ACCESS TO SPINE ROAD IN DRURY SOUTH STRUCTURE PLAN AREA

Where any site with frontage to or from the Spine Road shown on the Drury South Structure Plan (Figure 54.18A) also has frontage to another road shown on that Structure Plan, vehicle access to or from the Spine Road will be subject to obtaining a resource consent as a restricted discretionary activity which will include assessment of the following matters:

a) Any adverse effect from the location and design of the access on the safe and efficient operation of the adjacent transport network, including public transport, cyclists and general traffic, having regard to:

   i. The number of other access points to or from the Spine Road in the vicinity of the proposed access;

   ii. Whether conflicts will be reduced by the prescence of a raised central median which prevents right turning in the vicinity of the site;

   iii. Visibility and safe sight distances particularly the extent to which vehicles entering/exiting the site can see, and be seen by, pedestrians, cyclists and other vehicles on the footpath and road carriageway;

   iv. Existing and future traffic conditions including speed, volume, type, current accident rate, and the need for safe manoeurvring in all weathers;

   v. Existing pedestrian numbers, and estimated future pedestrian numbers having regard to the level of development provided for in the District Plan; and

   vi. Existing community or public infrastructure located in the adjoining road, such as bus stops, bus lanes and cycleways.

b) Whether the access arrangements are practicable and adequate having regard to site limitations and layout, and arrangement of buildings and activities, users and operational requirements, and having regard to whether the site can reasonably be served by shared or amalgamated access with another site or sites on the Spine Road where the sites in question are held in the same ownership.

29C.6 PERFORMANCE STANDARDS FOR ALL ACTIVITIES – LIGHT INDUSTRIAL ZONE

i. All activities in the *Light Industrial* Zone shall comply with the standards set out below. In order to ascertain compliance, the Council may request such information and plans as may be necessary, including any technical data or expert assessment as is appropriate to the circumstances.

ii. Where a standard is not being achieved the person/s having responsibility for the activity or the generation of the effect shall immediately advise Council of the action to be taken and shall as soon as practicable take all necessary steps to ensure compliance. Nothing herein shall preclude the Council from taking any enforcement action that is deemed necessary and appropriate in the circumstances.

29C.6.1 NOISE

1. No activity within the Zone shall cause the following NOISE levels to be exceeded, for the stated times, at or within the boundary of any other SITE, where the other site is:

   a) Light Industrial Zone:

      65 dBA L_{eq}

      Provided that in the Light Industrial Zone within the Drury South Structure Plan Area this noise limit shall only apply between the hours of 7.00am - 10.00pm and from 10.00pm to 7.00am the noise limit shall be 55 dBA Leq with an Lmax of 75dBA.

      Provided also that within the Drury South Structure Plan Area all new roads shall be designed and constructed so as to comply with the provisions of the New Zealand Standard NZS6806:2010 "Acoustics –Road Traffic Noise – New and Altered Roads".

   b) Residential, Residential 2, Rural-Residential, Village or the notional boundary of any existing dwelling house in the Rural Zone (Note: the notional boundary is defined as 20 metres from any side of a dwelling house):

Area	The noise level measured within the boundary of a site within the area described in column 1 of this table shall not exceed the following limits:		
	7.00am – 10.00pm	10.00pm – 7.00am	
	(dBA L_{eq})	(dBA L_{eq})	dBA L_{max}
High Background Noise Area (refer Planning Maps 107)	55	45	75
All other areas	50	40	70

   c) Business Zone:

7.00am – 10.00pm	10.00pm – 7.00am	
(dBA L_{eq})	(dBA L_{eq})	dBA L_{max}
60	50	75

   d) Industrial 2 Zone

      70 dBA L_{eq}.

2. Clause 1 above does not apply to construction noise.

3. The NOISE levels shall be measured and assessed in accordance with the requirements of NZS 6801: 2008 Measurement of Environmental Sound and NZS 6802: 2008 Environmental Noise respectively, or any standards that supersede these standards.

4. The NOISE shall be measured by a sound level meter complying with the International Standard IEC (1979): Sound Level Meters, Type 1 or any standard that supersedes that standard.

Explanation
The main purpose of the noise controls is to protect Residential and Business Zones from the adverse effects of intrusive noise. As well as providing noise protection on Residential and Business Zone boundaries, it is also appropriate that some acoustic control is provided between sites within the Light Industrial Zone itself.

29C.6.2 ODOUR, DUST FUMES AND SMOKE

1. No activity shall cause an objectionable or offensive odour to the extent that it causes an adverse effect at or beyond the boundary of the site of that activity. In the event of an offensive or objectionable odour occurring to such an extent that it has, or is likely to have, an adverse effect on people, places or resources, such action shall be taken as may be necessary by the owner or occupier to remedy the situation to the satisfaction of the Council.

2. Activities, apart from those authorised by a resource consent for a discharge of contaminants to air, shall not create a dust, fume or smoke nuisance. A dust, fume or smoke nuisance will be deemed to have occurred if:

   a) There is visible evidence of suspended solids/particulate matter in the air beyond the site boundary; and/or

   b) There is visible evidence of noxious, dangerous, offensive or objectionable deposited particulate matter traceable from a dust source, settling on the ground, building or structure on an adjoining site or waterbody.

Explanation
The reason for adopting dust, fume, smoke and odour controls is to provide a practicable means of controlling situations which are not satisfactorily regulated by controls on air discharges.

Flexibility is needed so that various alternatives can be used to avoid or reduce the problem. The control adopted recognises both the subjective nature of the task and the need to provide for flexibility to take whatever action is needed to solve the problem.

29C.6.3 LIGHT SPILL AND GLARE

1. All exterior lighting must be designed, located and at all times directed, screened, adjusted and maintained to ensure that the direct luminance from the lighting shall not exceed:

   a) 10 lux (lumens per square metre) at or within the boundary of all affected residential sites between the hours of 10:00pm and 7:00am;

   b) 20 lux at or within the boundary of all affected residential sites at all other times when lighting is required.

Provided that in the Light Industrial Zone within the Drury South Structure Plan Area all references to “residential sites” or a “residential zone” in this rule shall also apply to rural sites and rural zones and the upward waste light ratio (UWLR) from any luminaire must not be more than 3%. The UWLR is defined as: *“The ratio of the light flux emitted above the horizontal by a luminaire to the total light flux emitted, expressed as a percentage, evaluated for the upcast angle”.*

2. For exterior lighting near to any residential zone, and in any other case where the applicant, or the Council is unsure as to the ability of the lighting to comply with these performance standards, the applicant shall provide the Council with a report from a Professional Illumination Engineer confirming that the lighting installation has been designed, installed and aimed in a manner that will ensure compliance with this RULE. In the case of a new installation, design information must be provided at the time of applying for a building consent.

   Explanation
   While sunlight is perceived in a positive way, other artificial sources of light, because of quantitative, directional or spectral features, can cause annoyance, discomfort, distraction, loss of sleep, loss of amenity or a reduction in the ability to see.

   The rules reflect the need to control these adverse effects of light spill and glare within residential environments.

29C.6.4 VIBRATION

1. No activity shall be permitted to create vibration levels which affect occupants of adjacent buildings by exceeding the provisions of International Standard ISO 2631 – 2: 1989 – Evaluation of human exposure to whole body vibration – Part 2 Continuous and shock induced vibration in buildings (1 to 80 Hz) or any standards that supersede these standards.

2. Annex A and Table 2 of ISO 2631 – 2: 1989 shall be used for the assessment of continuous, intermittent and transient (impulsive) vibrations or any standards that supersede these standards.

3. Instruments to measure such vibration and methods of measurement shall comply with Australian Standard AS 4273: 1987 and AS 2187.2: 1993 or any standards that supersede these standards.

4. In the Drury South Structure Plan Area no activity (other than the use of roads) shall be permitted to create vibration levels which affect occupants of adjacent buildings by exceeding the provisions of Table C.1 of International Standards Organisation ISO 10137:2007 “Bases for design of structures - Serviceability of buildings and walkways against vibrations”

   Explanation
   This standard is intended to alert business activities to the need to avoid sites, whether inside the Zone or not, where vibration is likely to be an issue, or to locate plant and machinery on-site where it is least likely to cause concern for neighbours. It is therefore a reinforcement of the general statutory duty to avoid, mitigate or remedy adverse effects.

29C.6.5 CONTAMINANTS

Rule 29.6.5 Applies.

29C.6.6 MAINTAINING AMENITY PLANTINGS

Rule 29.6.6 applies.

29C.6.7 VEHICLE SERVICING ACTIVITIES

Rule 29.6.8 applies.

29C.6.8 OUTDOOR STORAGE ACTIVITIES

1. Any outdoor storage or rubbish collection area visible from any adjoining land zoned Recreation, Residential, Residential 2, Rural-Residential, Village or adjoining a ROAD shall be screened

from public view by landscape design and/or the erection of a fence, to the satisfaction of the Council.

2. Those parts of any site which are or may be visible from any ROAD or from the zones identified in 1. above shall be maintained in a tidy condition.

3. No activity (except carparking and access in FRONT YARDS) or storage of goods, materials, refuse or refuse containers of any kind shall be permitted in any FRONT YARD.

4. This RULE does not apply to the placement of goods/machinery etc for sale or hire visible from any ROAD.

Explanation
Suitable screening can reduce any unsightliness from rubbish and storage areas.

29C.6.9 [INTENTIONALLY BLANK]

29C.6.10 FLOODING HAZARDS IN THE DRURY SOUTH STRUCTURE PLAN AREA TO ADDRESS DEVELOPMENT IN THE 100 YEAR ARI MODIFIED FLOOD PLAIN AND OVERLAND FLOW PATHS:

1. DEVELOPMENT IN THE 100 YEAR ARI MODIFIED FLOOD PLAIN

a) Any land modification to form the 100 year ARI modified flood plain must, in addition to any other standards:

i. Not reduce flood storage capacity in the Structure Plan Area,

ii. Not change the flood characteristics upstream or downstream of the Structure Plan Area for all flood events from the 2 year and up to the 100 year ARI flood event in ways that result in:

- Loss of flood storage;
- An increase in peak flood levels

b) No buildings or structures (other than lighting associated with carparks and yards)shall be built within the 100 year ARI modified flood plain. The only structures that may be placed within the modified flood plain are those associated with infrastructure that cannot locate elsewhere. Such infrastructure shall be designed to be resilient to the effects of flooding.

c) Stored goods and materials in the 100 year ARI modified flood plain shall not impede flood flows. Where capable of creating a safety hazard by being shifted by floodwaters, the stored goods and material are contained and secured in order to minimise movement in times of floods; and be stored in watertight vessels if they are hazardous substances.

2. DEVELOPMENT IN OVERLAND FLOW PATHS

a) Earthworks within or adjacent to an overland flow path must maintain the same entry and exit point of storm flows at site boundaries, and the volume and velocity of water flow is not altered at the exit point.

29C.7 ASSESSMENT OF CONTROLLED ACTIVITIES – LIGHT INDUSTRIAL ZONE

In assessing applications for consent to *Controlled* activities the Council will, in making a decision, restrict the exercise of its discretion to:

1. The construction of any BUILDING that complies with RULE 29C.5 (Development Standards).

    a) Whether the scale and form of the building avoids physical dominance over the character (or where this is not developed, the expected character) of the immediately surrounding area.

    b) Whether design features are incorporated into the façade of the building that enhance the appearance of the building and introduce variety and interest. Particular regard will be had to views of the building from roads or residential properties which adjoin the site, from public spaces, or within a town centre. Large unrelieved bland walls generally facing these locations should be avoided.

    c) Whether the location and design of architectural features incorporated into the façade promote passive surveillance from the building to publicly accessible places directly adjoining the SITE (i.e the extent to which windows overlooking public places are part of the design of the building).

    d) Whether the main visitor entry to the building can be discerned from the principal entry point to the SITE.

    e) Whether the roof design introduces variety and visual interest to the building form. Particular regard will be had to views of the building from publicly accessible locations that are located within the immediately surrounding area and from which the building can be easily viewed from above.

    f) In the case of the Motorway Edge Precinct and the Commercial Service Precinct within the Drury South Structure Plan (see Drury South Structure Plan in Appendix 54.18A) the Council will, in addition to the criteria set out in (a) to (e) above, assess the application against the design assessment criteria in Appendix 29C and will, in the case of sites adjoining the Strategic Freight Network shown on the District Plan maps, assess:

        - The extent to which proposed vehicle access to sites would conflict with safety and efficiency of the Strategic Freight Network; and

        - The extent to which CAFES, CHILDCARE AND LEARNING CENTRES and HEALTH CENTRES (being permitted activities which may be sensitive to heavy commercial vehicle traffic noise) have been designed to mitigate traffic noise effects. Mitigation measures may include acoustic treatment of buildings and arranging site layout so noise sensitive activities are screened from heavy traffic noise.

29C.8 ASSESSMENT OF RESTRICTED DISCRETIONARY ACTIVITIES – LIGHT INDUSTRIAL ZONE

In assessing applications for consent for *Restricted Discretionary* activities the Council will, in making a decision, restrict its assessment and the exercise of its discretion to the following matters as relevant:

1. Whether the DEVELOPMENT is consistent with the Policies of the Plan concerning industrial activities or concerning the particular area or road in which the activity is to be located;

2. Whether the infringement will result in any significant adverse effects, having particular regard to the purpose of the Development Standard or PERFORMANCE STANDARD as set out in its explanation, and to what extent the effects can be avoided, remedied or mitigated.

3. HEIGHT

   Where there is an infringement of Rule 29C.5.1.1, whether the area of additional height of the BUILDING significantly impacts publicly accessible views.

4. Activities Adjoining Certain Other Zones

   For any Permitted Activity located within 30 metres of a Residential, Residential 2, Rural-Residential, Village:

   a) Site Layout, Design and External Appearance

      Whether the SITE layout and BUILDING and external appearance will avoid or mitigate potential adverse effects on neighbouring residential sites, including the effects of overshadowing, visual dominance, NOISE and odours. Particular regard will be given to landscaping and screening at the residential interface and the location and orientation of storage areas, access points from the ROAD network, cooling and ventilation equipment or facilities. Where it is not practical to screen business activities from adjacent residential areas, consideration will be given to whether the design and external appearance of the BUILDING or structure is compatible in terms of scale and form with adjacent DWELLING HOUSES.

5. Vehicular and pedestrian access, crossings and driveways

   Whether vehicular access to the SITE provides for safe and convenient access, including regard to any effects on the safe and efficient operation of the ROAD network and the extent to which compliance with the access standards for state highways recommended by the New Zealand Transport Agency would avoid or minimise any adverse effects. Whether the proposed access has a minimal adverse effect on pedestrian access and safety.

6. Carparking and loading

   a) Whether the location and design of the carparking areas provides for convenience, a safe and efficient internal circulation pattern and the avoidance of the detrimental visual effects of large areas of sealed parking unrelieved by landscaping.

   b) Whether the proposal would adversely affect, to a more than minor extent:

      - The availability and convenience of parking and loading spaces in the locality;
      - The safe and efficient movement of vehicles on adjacent roads; or
      - The capacity of the site, once developed, to be used in the future for a wide range of activities.

7. Hours of Operation

Whether the proposed hours of operation have the potential to create a NOISE or lighting nuisance for adjoining residential properties. As a guide additional controls may be placed on activities, including servicing and deliveries, that operate between the hours of 10.00pm to 7.00am.

8. NOISE, Lighting

Whether measures designed to ensure that the NOISE and light spill and glare standards applicable are able to be met or whether limits on the hours of operation will be required to ensure that the amenity values of adjoining residential properties are protected.

9. LPG

The extent to which there are unacceptably high risks or potential impacts arising from some aspect of an LPG installation.

10. Planting

Whether there are some aspect/s of an activity or unusual characteristics of a locality or adjoining sites make that it unnecessary or inappropriate to provide amenity planting in full or in part.

11. Stormwater Management

The extent to which the following factors of the catchment and sites influence, inhibit or adversely affect the effective functioning of the stormwater management system, such that the stormwater has an adverse effect on any other site or property:

- The relationship of the individual site and stormwater system to the location of other sites and properties within the locality, and the location of the point of discharge into the public stormwater management system or the receiving environment;
- The change, from the site prior to development to the site once it has been developed, in the position of the point of discharge of the stormwater management system into the public stormwater management system;
- The change, from the site prior to development to the site once it has been developed, in volume and rate of stormwater discharged;
- The potential for an increase in impervious surface cover of the site/s;
- The stability of the site/s;
- Natural drainage conditions of the site/s and locality, such as ground levels, presence of natural watercourses, and soil soakage potential;
- The extent to which any modification of natural watercourses including overland flow paths maintains the continuity of water flows and maintains the capacity of the floodplain. Conditions of consent may be utilised to manage the location of fences, buildings and structures to avoid modification of overland flow paths.

In the Drury South Structure Plan Area whether earthworks:

a) Provides and maintains continuity of overland flow paths both within the site, as well as upstream and down stream; and where overland flow paths are diverted and/or altered how:
   - Potential effects on other properties from the diversion or alteration is avoided or mitigated.
   - Effects from scouring and erosion are mitigated
   - Further changes to the overland flow path will be limited, where appropriate through an easement in favour of Council

b) If located in the 100 year ARI flood plain, including formation of stormwater management devices such as wetlands and/or for necessary infrastructure (including associated landscaping and accessways), whether;

- The design of the device, including associated earthworks, landscaping and accessways avoids impeding flood flows or otherwise exacerbate flood risk upstream or downstream of the site, and how such effects can be avoided
- The design of the device or mitigation works is resilient to damage from the full range of flood events.
- Access to the device for maintenance is provided and maintenance plans address potential effects that may result from the proposed access route.

11A Stormwater Management in Kingseat Structure Plan Area

Activities infringing Rule 29C.5.10A Stormwater management - Kingseat Structure Plan Area will be assessed in relation to the following matters, and conditions of consent will only relate to these matters:

i. the extent of existing flooding within the catchment and avoiding creating or increasing existing flooding, including incremental adverse effects

ii. the extent to which the incremental and cumulative adverse effects of increased stormwater flows including on stream channels and stream health, natural character, biodiversity, erosion and stability and community and Mana Whenua values can be avoided, or if not avoided then otherwise adequately mitigated;

iii. the ability to reduce existing adverse effects

iv. whether a stormwater network is available and its capacity to cater for increased stormwater flows

v. whether stormwater flow is managed on-site or whether there are stormwater management devices in the catchment and their ability to accept and cater for increased stormwater flows to meet mitigation requirements

vi. the design of discharge points that ensures dispersal of flows before they enter a stream or the coastal area.

vii. the sensitivity of the receiving environment, including coastal waters, and its susceptibility to the adverse effects of stormwater contaminants

viii. the extent to which incremental and cumulative adverse effects of stormwater contaminants on receiving environments including on biodiversity, community and Mana Whenua uses and values can be avoided, or if not avoided then otherwise adequately mitigated;

ix. whether stormwater contaminants are managed on-site or whether there are stormwater management devices in the catchment that can accept and cater for increased stormwater contaminant loads to meet mitigation requirements.

12. HAZARDOUS SUBSTANCES QUANTITY THRESHOLDS

For any activity not complying with RULE 29.8 (HAZARDOUS SUBSTANCES QUANTITY THRESHOLDS)

a) The appropriateness of the assessment of environmental effects and risks and the accuracy and completeness of the presented information

b) The scale and significance of environmental effects and risks associated with the hazardous substances proposed to be used, stored, transported or disposed of including the potential for cumulative risks

c) The appropriateness of the proposed risk control and mitigation measures

d) The adequacy of proposed site management systems and plans in relation to hazardous substances

e) Proposed measures for the management and disposal of hazardous wastes

f) Scale and significance of off-site transport of hazardous substances, and proposed measures for control

g) The scope and suitability of the emergency management proposals.

h) Separation distances from site boundaries

13. The construction of any BUILDING on a SITE within a Structure Plan Area, where the SITE existed at the date of notification of the relevant Plan Change (which introduced that Structure Plan) and where a structural element of a Structure Plan is located within that SITE.

Whether the design and layout of the proposed BUILDING, access, Earthworks and associated DEVELOPMENT will prejudice the achievement of the structural element of the Structure Plan within that SITE or (where relevant) the connection or co-ordination of the structural element with development on adjoining sites.

14. Whether within the Kingseat Structure Plan Area the activity would avoid more than minor adverse effects, including cumulative adverse effects, on the development and/or viability, vitality or function of the Kingseat Town Centre

29C.9 ASSESSMENT OF DISCRETIONARY ACTIVITIES – LIGHT INDUSTRIAL ZONE

Applications for Discretionary Activity Resource Consent will be assessed with regard to the following matters (to the extent that they are relevant):

a) The assessment criteria for Controlled and Restricted Discretionary Activities (RULES 29C.7 and 29C.8 as relevant);

b) The relevant matters identified in Part 53 of the PLAN;

c) In relation to Rules 29C.3A.1 and 29C.3A.2, whether the activity would have any adverse effect on the viability, vitality or function of the Pokeno Business Centre (Business Zone).

d) Whether any adverse effects on the environment will be satisfactorily avoided, remedied or mitigated;

e) Whether the DEVELOPMENT is consistent with the objectives and policies of Part 19 of the Plan (to the extent that they are relevant);

f) Whether the DEVELOPMENT is consistent with the objectives and policies for a Structure Plan Area (refer Part 54);

g) Any other relevant matter under Section 104 of the Resource Management Act 1991.

APPENDIX 29C: DRURY SOUTH STRUCTURE PLAN AREA – MOTORWAY EDGE PRECINCT AND COMMERCIAL SERVICES PRECINCT ASSESSMENT CRITERIA

PURPOSE OF APPENDIX 29C

In the Motorway Edge Precinct and Commercial Services Precinct within the Drury South Structure Plan area buildings are listed as controlled activities if they also comply with the standards and terms specified in Rule 29C.5.

Rule 29.C.7 sets out controlled activity assessment criteria for all controlled activities in the Light Industrial zone and contains the following clause:

> *"In the case of the Motorway Edge Precinct and the Commercial Service Precinct within the Drury South Structure Plan (see Map 105F) the Council will, in addition to the criteria set out in (a) to (e) above, assess the application against the design assessment criteria in Appendix 29C."*

In addition, these criteria will also be used as appropriate in the consideration of restricted discretionary and discretionary activity applications involving the construction or alteration of buildings.

This Appendix sets out assessment criteria under a number of "Design Elements" for both the Motorway Edge Precinct and the Commercial Services Precinct.

The criteria listed under each Design Element are intended to give flexibility, enabling site responsive designs, while ensuring that development provides a positive contribution to the amenity of the Drury South Structure Plan Area.

The criteria are intended to guide development rather than prescribe exact design and layout. Most criteria are illustrated. The illustrations are intended to support the text and are representative of good design solutions, but are not necessarily intended to represent the only design solution.

Each Design Element includes an explanation, which summarises the rationale for the particular Design Element and expands on the individual criteria. The explanation may be used as further guidance in interpreting the intention of the criteria and assessing the extent to which the proposal accords with them.

INFORMATION REQUIREMENTS

The applicant shall provide a written assessment describing how the criteria for each Design Element are addressed. Applicants will have to demonstrate that the provisions of the criteria have been acknowledged. It is recognised that certain proposals will not achieve absolute accordance with all criteria. Where necessary, in regard to a criterion demonstrably not met, the applicant shall explain with reference to the explanation for the particular Design Element:

- Whether site constraints inhibit the ability to address the criterion, and/or;
- How the intention of the criterion is met by the proposal, and/or ;
- Whether the proposal represents a better design solution than that suggested by the criterion.

Applicants will also be required to provide a Landscape Concept Plan with sufficient detail to ensure that the relevant assessment criteria are able to be considered, identifying hard and soft landscaping treatment, large grade specimen trees (species and planting size), groupings of ground covers and shrubs with species schedule.

MOTORWAY EDGE PRECINCT DESIGN ASSESSMENT CRITERIA

The following criteria shall apply to building design and appearance, landscape design and internal site layout within the Motorway Edge Precinct where activities are listed as controlled activities.

Design Element – Internal Private Access Roads:

1. Specimen tree planting should be provided on all public and internal private access roads within the Motorway Edge Precinct.

Design Element – Existing Vegetation:

1. Where ever possible layouts should retain and protect existing mature trees, particularly those of indigenous species, where these contribute to the site character and amenity.

Design Element – Planting:

1. Planting should be designed to have a large scale landscape effect and combine native as well as appropriate exotic species to provide seasonal change and quality amenity.

2. Where reserve land adjoins the motorway boundary planting that creates a continuous visual barrier to eastward views from the SH1 (Southern Motorway) corridor should be avoided, however landscape design should emphasise the current sequence of intermittent views to the Hunua Ranges from the SH1 corridor and the pattern of variable depth of such views.

3. Where industrial sites adjoin the motorway boundary, a detailed rule applies requiring a double row of Leyland Cypress to create the appearance of a rural shelterbelt providing a continuous visual barrier defining the curve in the motorway alignment.

Design Element – Buildings:

1. Buildings should be located with design consideration for their visibility and reduced visual impact as viewed from the SH1, (Southern Motorway) corridor and the desirability of maintaining a sense of openness as seen from the motorway.

2. The visual mass of larger buildings should be minimised by employing the following methods:
   - Utilising subdued, recessive colours;
   - Providing variation in materials and finish for facades viewed from the motorway;
   - Creating variation of roof profiles with consideration given to the overall roofscape viewed from the motorway;
   - All rooftop servicing and plant should be designed as an integral part of the roofscape with particular consideration given to the view from the motorway.

Design Element – Parking Areas:

1. Parking areas should be designed to incorporate trees to break up the scale of hard surface areas.

2. Adoption of the Fully Planted Permeable Carpark Design Layout (refer Diagram 6) style of parking is advocated within the Motorway Edge Precinct.

Design Element – Internal Site layout:

1. Storage and waste management activities should be located and / or designed to be screened from view of the State Highway.

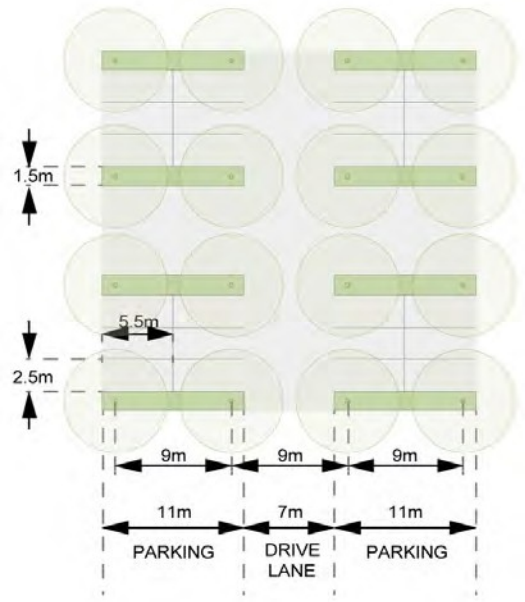


Diagram 6: Fully planted permeable carpark design layout - detail

COMMERCIAL SERVICES PRECINCT DESIGN ASSESSMENT CRITERIA

The following criteria shall apply to building design and appearance, landscape design and internal site layout within the Commercial Services Precinct where activities are listed as controlled activities.

Design Element – Block Size, Lot Type and Orientation:

1. Buildings on corner lots should be designed to provide for a quality architectural response to the corner. Appropriate design responses would be provision of additional height at the corner, windows and activities addressing both street frontages (avoidance of blank walls to one or both sides of the corner). Service activities such as loading docks or storage yards should not be located on corners or any site frontage.

Design Element – Street Interface Design:

1. Built development should front the street with a quality recognisable pedestrian entry to the street.

2. Parking should be provided on the road network adjacent to Commercial Service Precinct areas with on site parking layouts designed in accordance with the typical layout identified (refer Attachment 4).

Design Element – Signage:

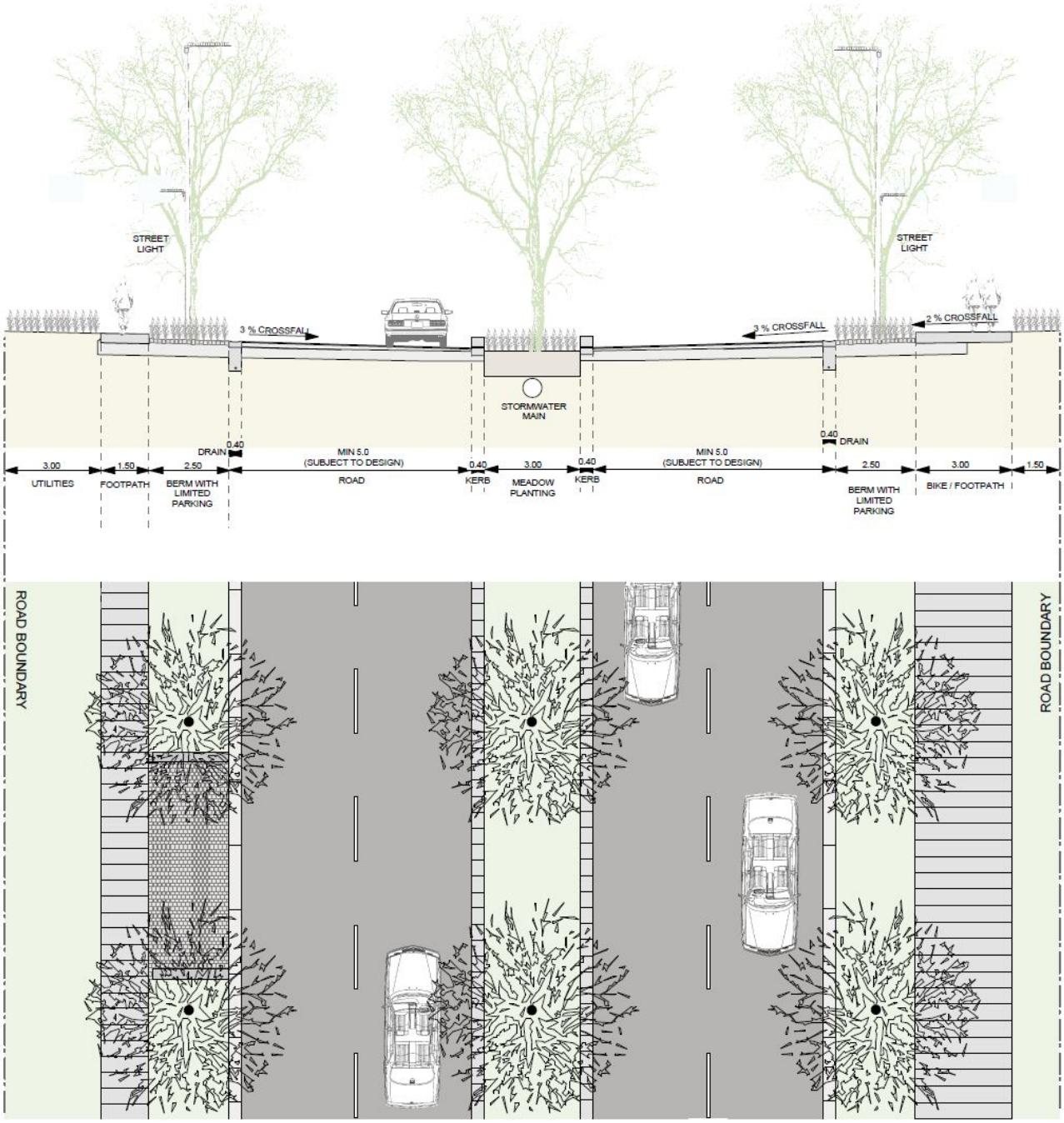
1. Signage for each Commercial Services Precinct development should be coordinated including the physical location of signs, their type face, style and content with a maximum of two signs per business, one located to address the street frontage and one to identify the building entry (a third sign is permissible where the service access is separate from building entry or there are multiple entries).

Design Element – Service Areas:

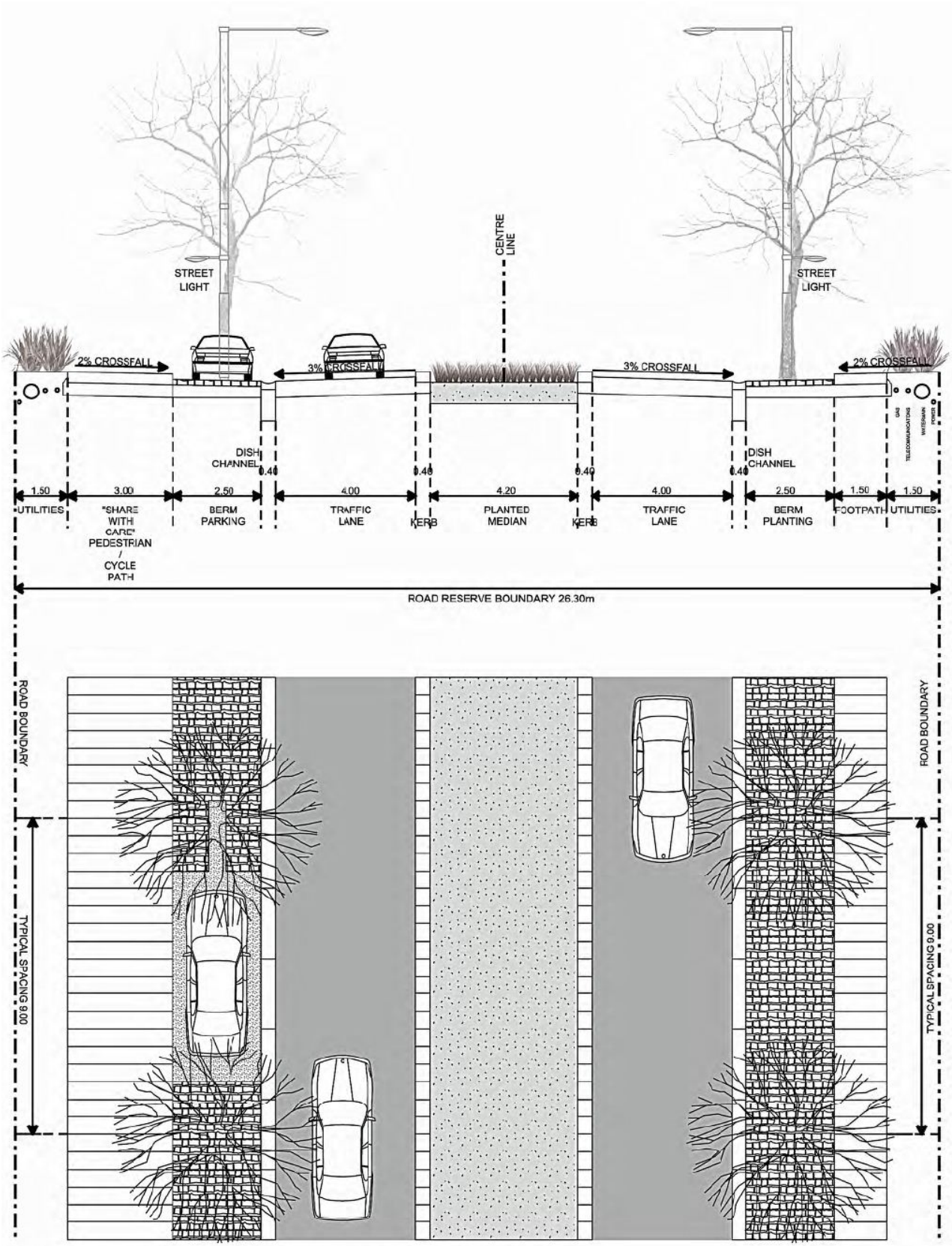
1. Service areas should be located so as to avoid observation from a public road with access either from a service lane, incorporation within the main building or full screening of service / storage and dock areas.

Attachment 1

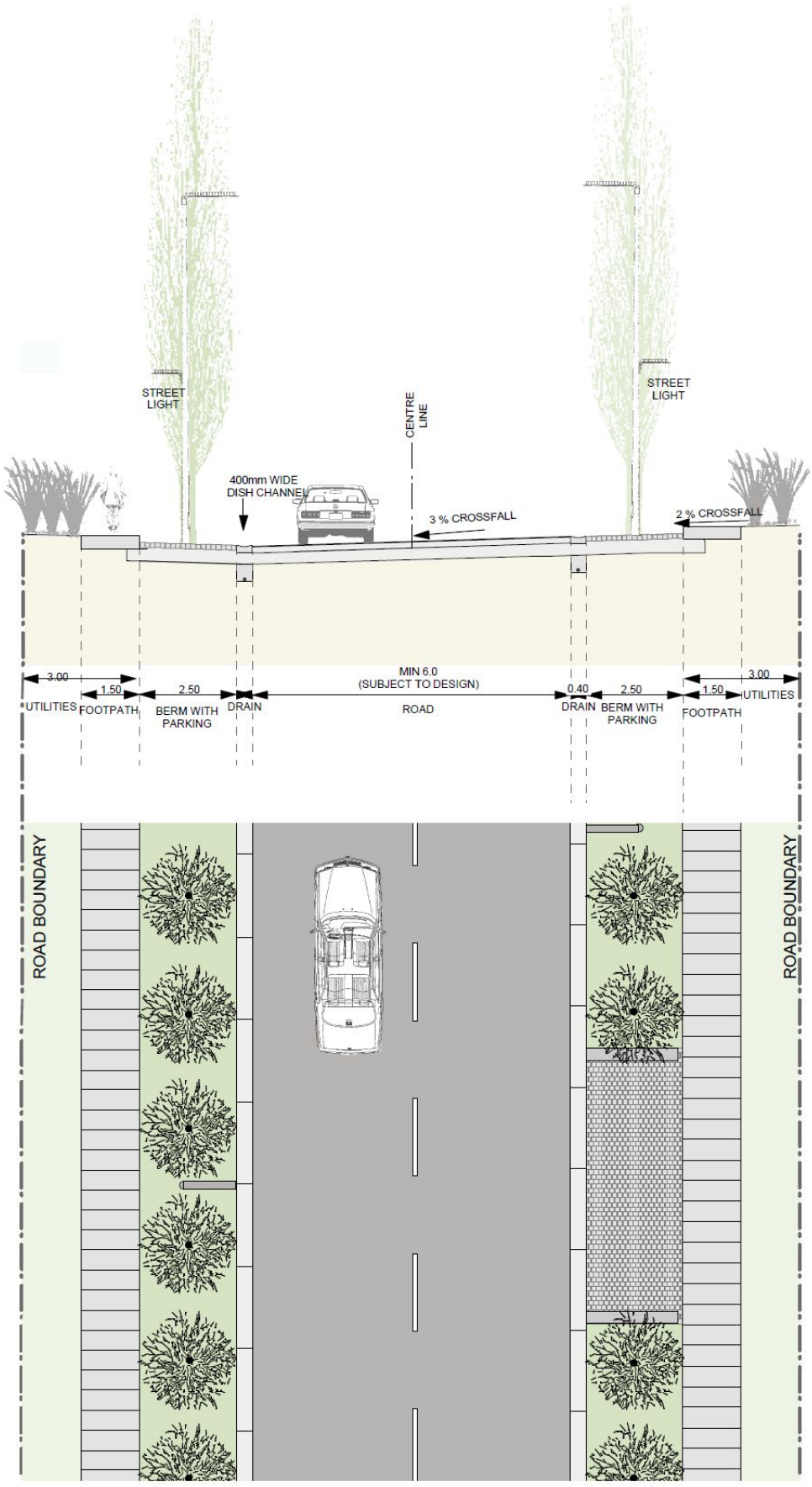
Typical Road Cross Sections



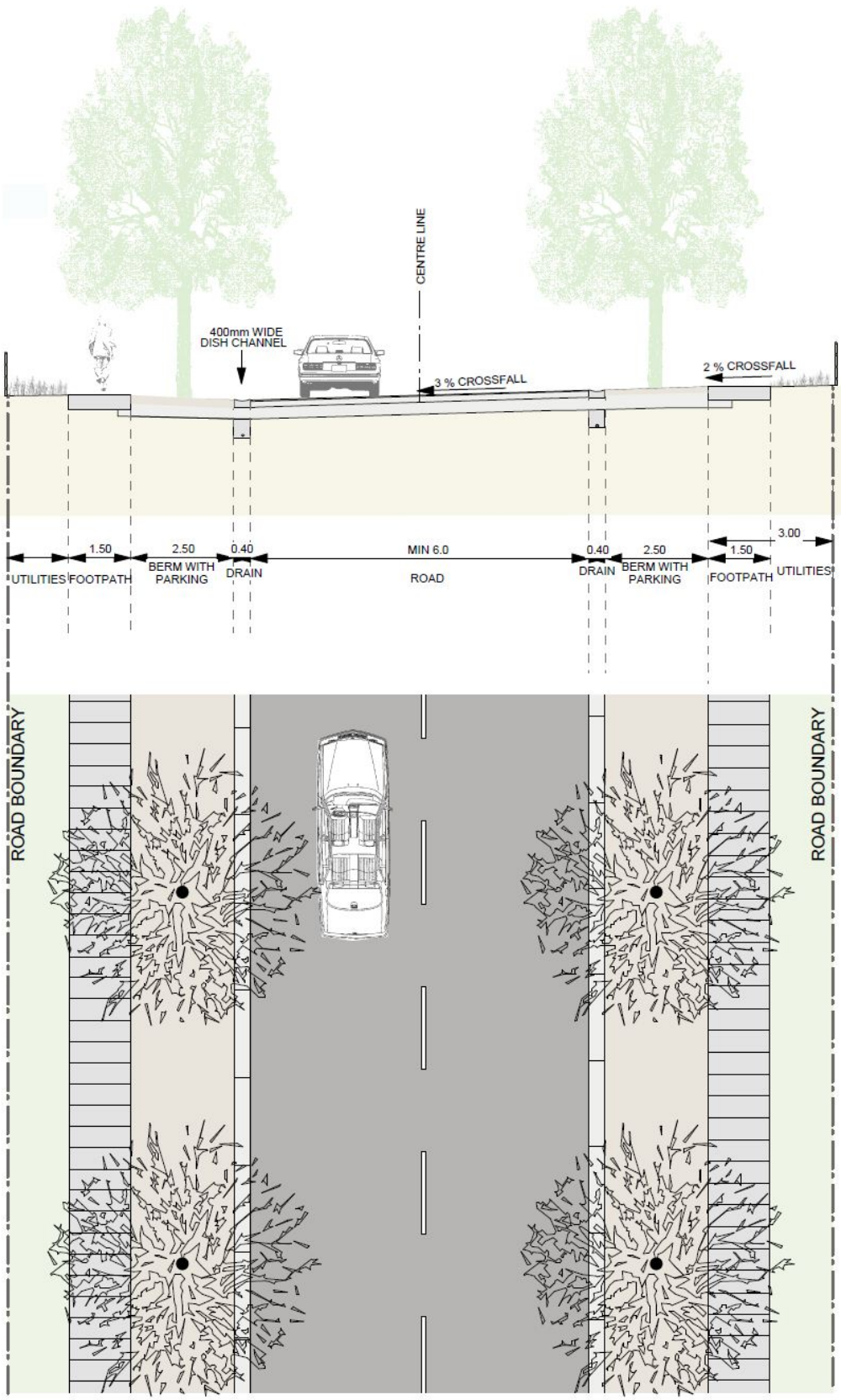
INDICATIVE ARTERIAL CROSS SECTION
(Spine Road)



INDICATIVE PARKWAY CROSS SECTION
(New Quarry Access Road)



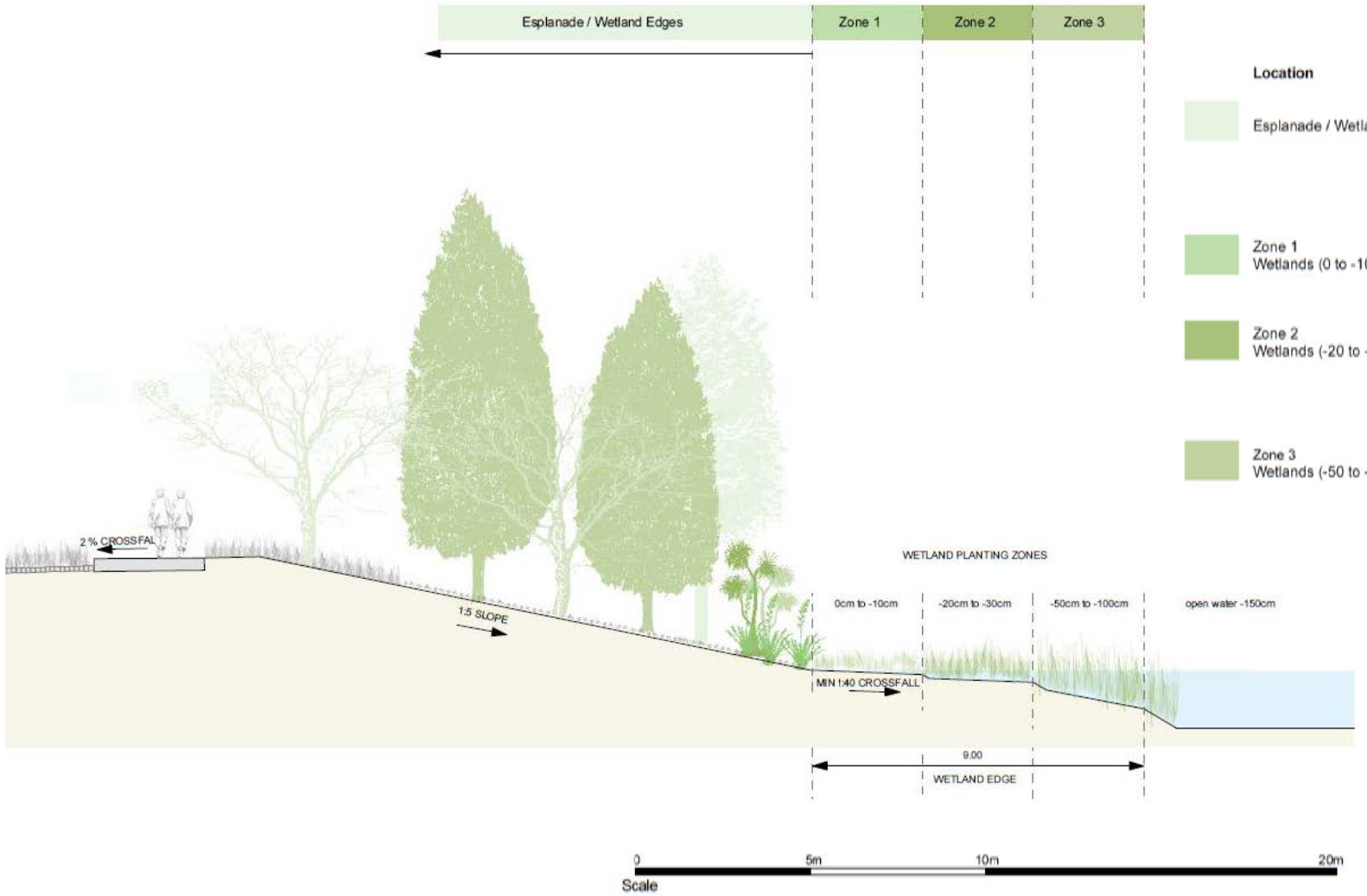
INDICATIVE ROAD CROSS SECTION



INDICATIVE MOTORWAY EDGE PRECINCT ROAD CROSS SECTION

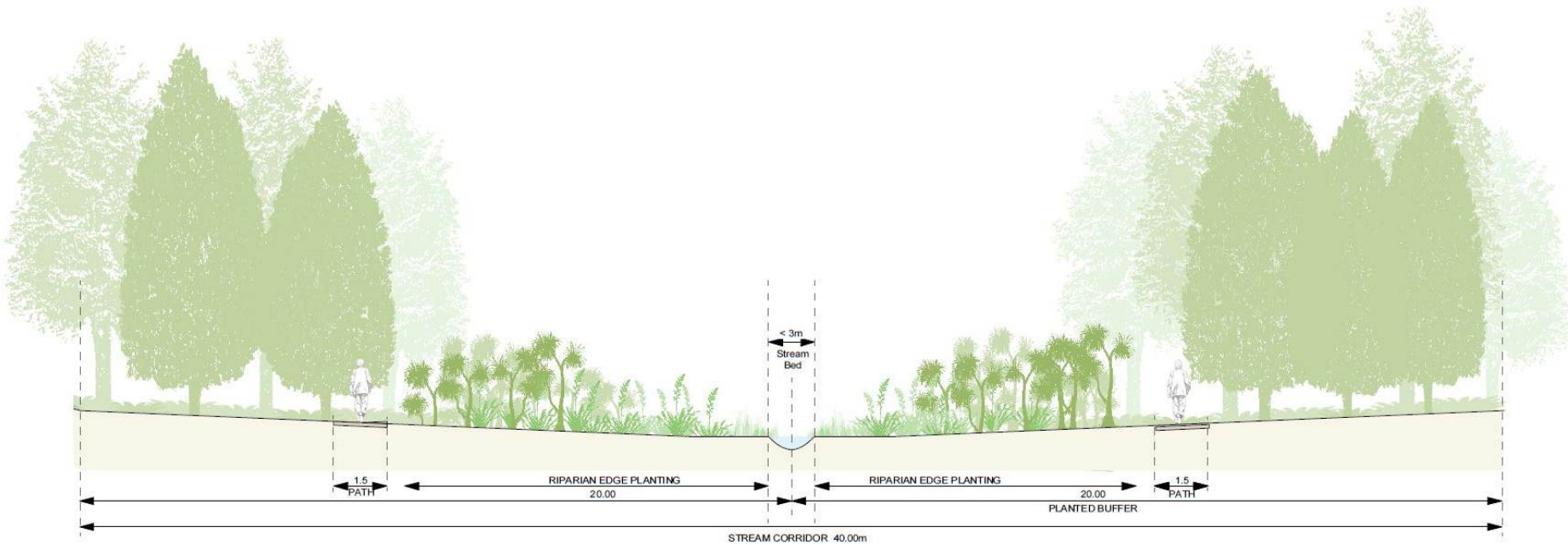
Attachment 2

Typical Wetland Stormwater Pond and Typical Stream Corridor Cross Sections



Location	Botanical Name	Common Name
Esplanade / Wetland Edges	*Salix babylonica*	Weeping Willow
	Dacrycarpus dacrydioides	Kahikatea
	Cordyline australis	Cabbage palm
	Anemanthele lessoniana	Wind grass
	Carex secta	Purei
	Carex testacea	
Zone 1 Wetlands (0 to -10cm)	Carex geminata	
	Cyperus ustulatus	
	Cordaderia fulvia	Toetoe
Zone 2 Wetlands (-20 to -30cm)	Schoenoplectus validus	Kopupu / kuta
	Eleocharis acuta	Spike rush
	Juncus gregiflorus	Wiwi rush
	Bolboschoenus fluviatilis	Ririwaka
	Leptocarpus similis	Oioi /Jointed Rush
Zone 3 Wetlands (-50 to -100cm)	Baumea rubiginosa	
	Baumea articulata	
	Baumea teretifolia	
	Eleocharis sphacelata	Ngawha / Great spike rush
	Juncus pallidus	Giant rush

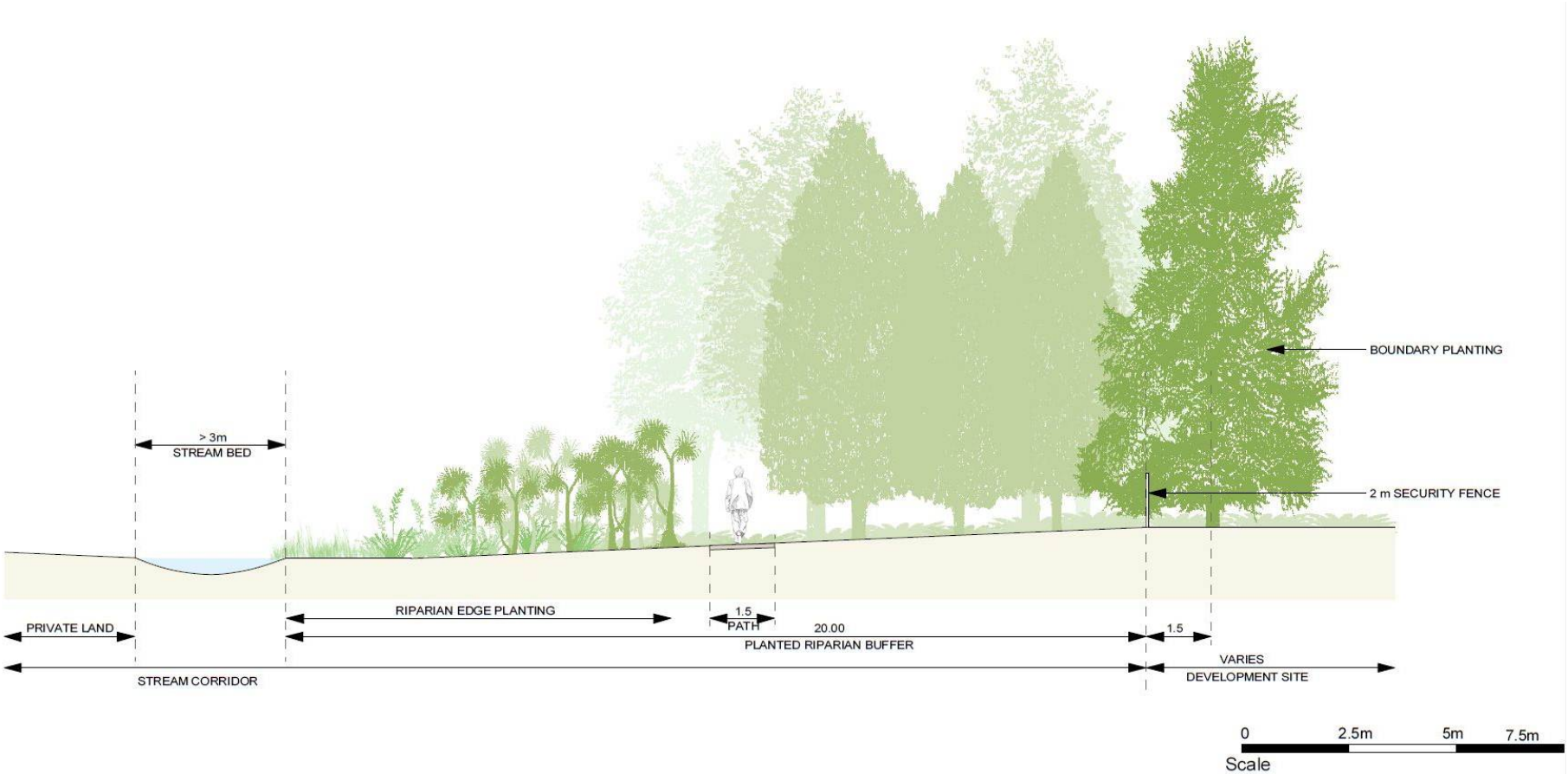
INDICATIVE WETLAND EDGE DETAIL



INDICATIVE 40m RIPARIAN BUFFER FOR STREAM BEDS LESS THAN 3m WIDE

0 2.5m 5m 10m
Scale

TYPICAL ONE SIDED RIPARIAN BUFFER FOR STREAM BEDS LESS THAN 3m WIDE



INDICATIVE ONE SIDED RIPARIAN BUFFER FOR STREAM BEDS 3m AND GREATER

Attachment 3

Drury South Structure Plan

Indigenous Species Plant List

Note: The species underlined are recognised as being rare/uncommon in the Auckland region.

Wetland Species	
Schoenoplectus tabernaemontani also Eleocharis sphacelata	Multiple Māori names include kukuta and kutakuta.
Carex virgata and Carex secta	Pukio
Baumea articulata	Jointed twig-rush
Typha orientalis	Raupo
Myriophyllum robustum	Stout water milfoil
Baumea tenax	
Isachne glabosa	Swamp grass
Phormiun tenax	Particularly the variety known to Maori as 'Muka" - soft for weaving

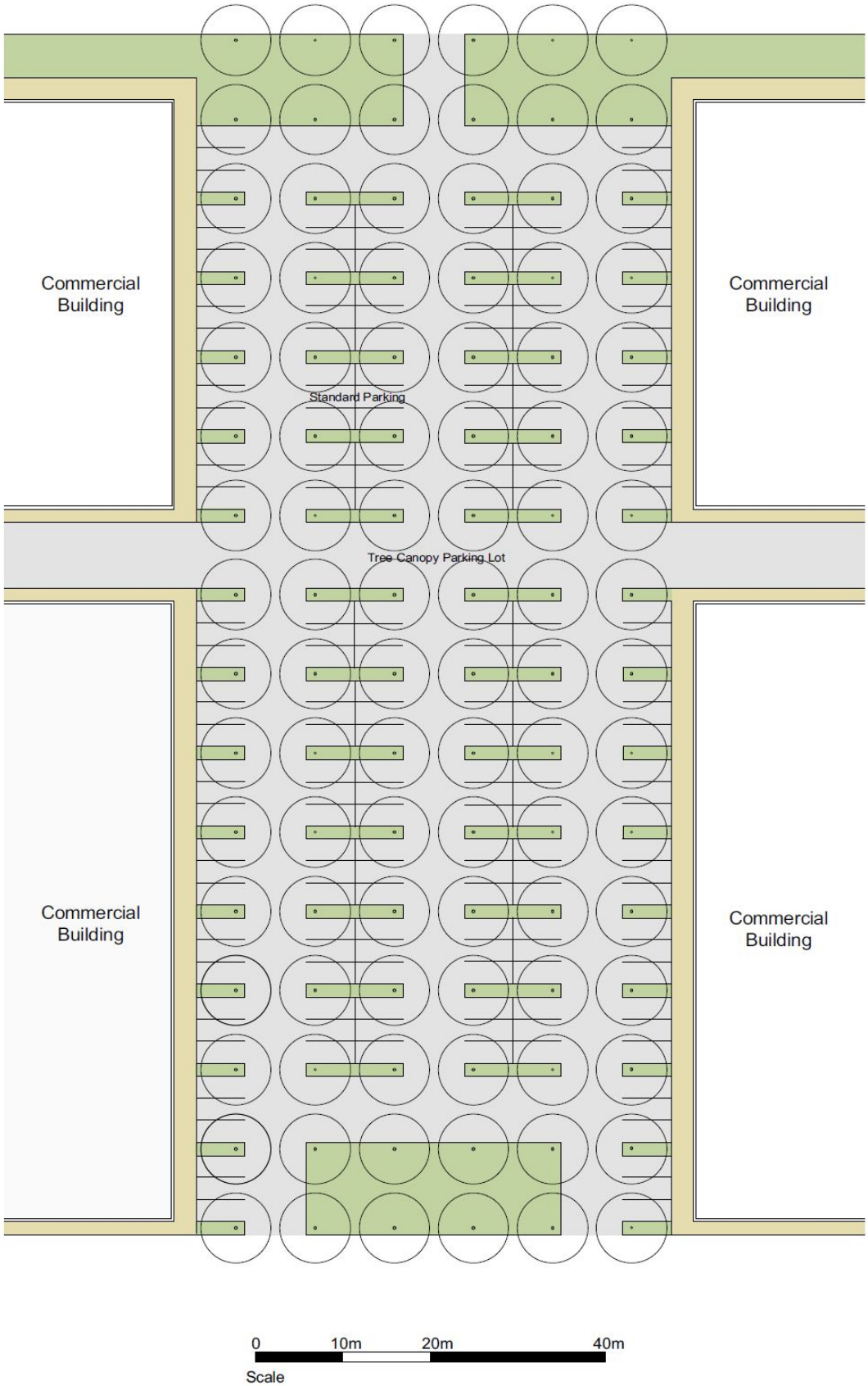
Riparian Marginal Species	
Freycinetia baueriana	Kie kei
Alectryon excelsa	Titoki
Vitex lucens	Puriri
Prumnopitys taxifolia	Matai
Sophora microphlla	Kowhai
Rhopalostylis sapida	Nikau
Hoheria populnea	Lacebark
Corynocarpus laevigatus	Karaka
Plagianthus betulinus	Manatu
Pennantia corymbosa	Kaikomako
Hedycarya arborea	Pigeonwood
Aristotelia serrata	Makomako
Kunzea ericoides	Kanuka

Cordyline australis	Ti whanake
Dysoxylum spectabile	Kohekohe
Coprosma grandifolia	Kanono
Streblus banksii	Towai
Streblus microphylla	Turepo
Myrsine divaricata	Weeping matipo
Marratia salicina	King fern

Swamp Forest Species	
Syzygium maire	Maire, tawake
Laurelia novae-zelandiae	Pukatea
Carpodetus serratus	Putaputaweta
Phormium tenax	Harakeke
Coprosma tenuicaulis	Hukihuki
Dacrycarpus dacrydioides	Kahikatea
Blechnum novae-zelandiae	Swamp kiokio
Cortaderia fulvida	Toetoe
Astelia grandis	Swamp astelia
Schefflera digitata	Pate
Podocarpus totara	Totara

Attachment 4

Typical Commercial Services Precinct Access and Car Park Layout



TYPICAL COMMERCIAL LAYOUT

Attachment 5

Drury South Structure Plan: Stream and Wetland Rehabilitation Guidelines (June 2013)

Drury South Structure Plan

Stream and Wetland Rehabilitation Guidelines

June 2013

Table of Contents

1.0 Introduction

1.1 Purpose of this Document

The Drury South Structure Plan (DSSP) Stream and Wetland Rehabilitation Guidelines provide a summary of proposed stream and wetland works associated with the DSSP project. This includes all stream corridors to be removed, realigned, or restored, and wetlands created associated with stormwater management. The purpose of this document is to achieve the following:

1. To provide technical input to the planning process (to be read in conjunction with the Ecological and Landscape Assessments, Assessment of Environmental Effects (AEE) and Infrastructure Assessment report (IAR).

2. To provide the project team with a set of principles for treatment of riparian (stream and wetland) areas within the DSSP area.

1.2 Proposed Stream and Wetland Rehabilitation Works

In line with the proposed Drury South Structure Plan, the existing Hingaia and Maketu streams will be protected and enhanced by corridors of riparian restoration 40 metres in width (20m on each bank). Dense riparian planting will also occur along SH1 in association with the Roslyn Stream realignment and along the northern boundary of the site in association with a newly formed northern stream realignment.

Some streams and farm drains within the DSSP area will be filled. Piped infrastructure or vegetated swales will direct these modified catchments to the Hingaia Stream. These systems, as well as stormwater runoff from business activities will be treated for water quality in extensive wetland areas associated with the Hingaia stream corridor. These wetland areas will function for stormwater quality and quantity, ecosystem function and values, landscape amenity, natural character, and recreation.

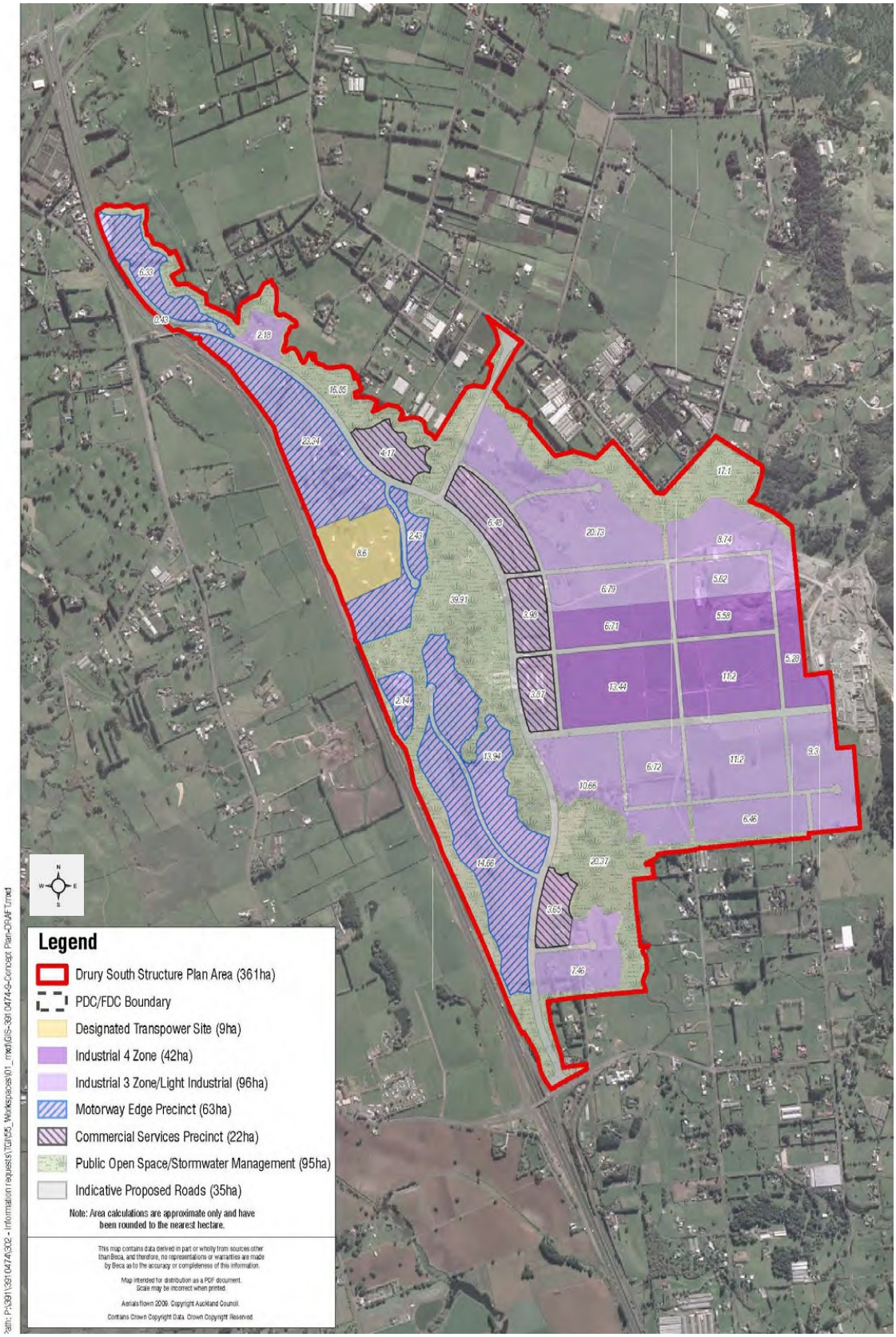


FIGURE 1: DSSP Concept Plan – December 2010 (Source: BECA Ltd)

2.0 Streams of the Project Area

2.1 Existing Streams and Proposed Mitigation

The Hingaia Stream flows through the DSSP area from south to north before continuing through the Drury Township to discharge to Drury Creek and eventually the Pahurehure Inlet to the Manukau Harbour. The Maketu Stream flows into the site at the south eastern corner of the DSSP area, and joins with the Hingaia Stream. The Roslyn Stream flows from the west under the State Highway and joins a further tributory to the Hingaia Stream. The remainder of streams traversing the site do not have officially recorded names, are smaller, highly modified, and in some cases have been piped.

An assessment of the existing surface water network and receiving environment has been carried out as part of the Hingaia Stream ICMP. This included a stream ecology study, "The Hingaia Catchment Environmental Assessment, Golder Associates, August 2009". This study included field survey of streams within the DSSP area with respect to water quality, and aquatic flora and fauna. Each stream potentially affected by the DSSP has been evaluated by the 'stream ecological valuation' method (SEV) in accordance with the technical publication ARC TP302:2008.

Existing watercourses and modified farm drains between Stevensons Quarry and SH1 will need to be filled or re-aligned to accommodate the DSSP earthworks footprint. This includes intermittent and permanent streams (refer Figure 2). Many of the existing overland flow paths are farm drains, constructed for active drainage. All streams to be affected by the proposed DSSP have been heavily modified by farming or roading operations, including dredging, spraying, straightening, and ongoing impact by stock. In general all of these streams have low to moderate functional values for stream ecology.

Proposed mitigation for stream loss includes the restoration of riparian zones along the length of the Hingaia and Maketu Streams within the DSSP Area. This includes a 40m wide planted riparian buffer along all streams. In addition, streams to be re-aligned will have an appropriate stream profile and riparian planting to provide for sustainable stream function.

One of many existing intermittent farm drains showing evidence of earthworks, spraying and access by stock

LOCATION A (FIGURE 2) – The northern stream is directed along Quarry Road in a highly constrained and modified environment, with low ecological values

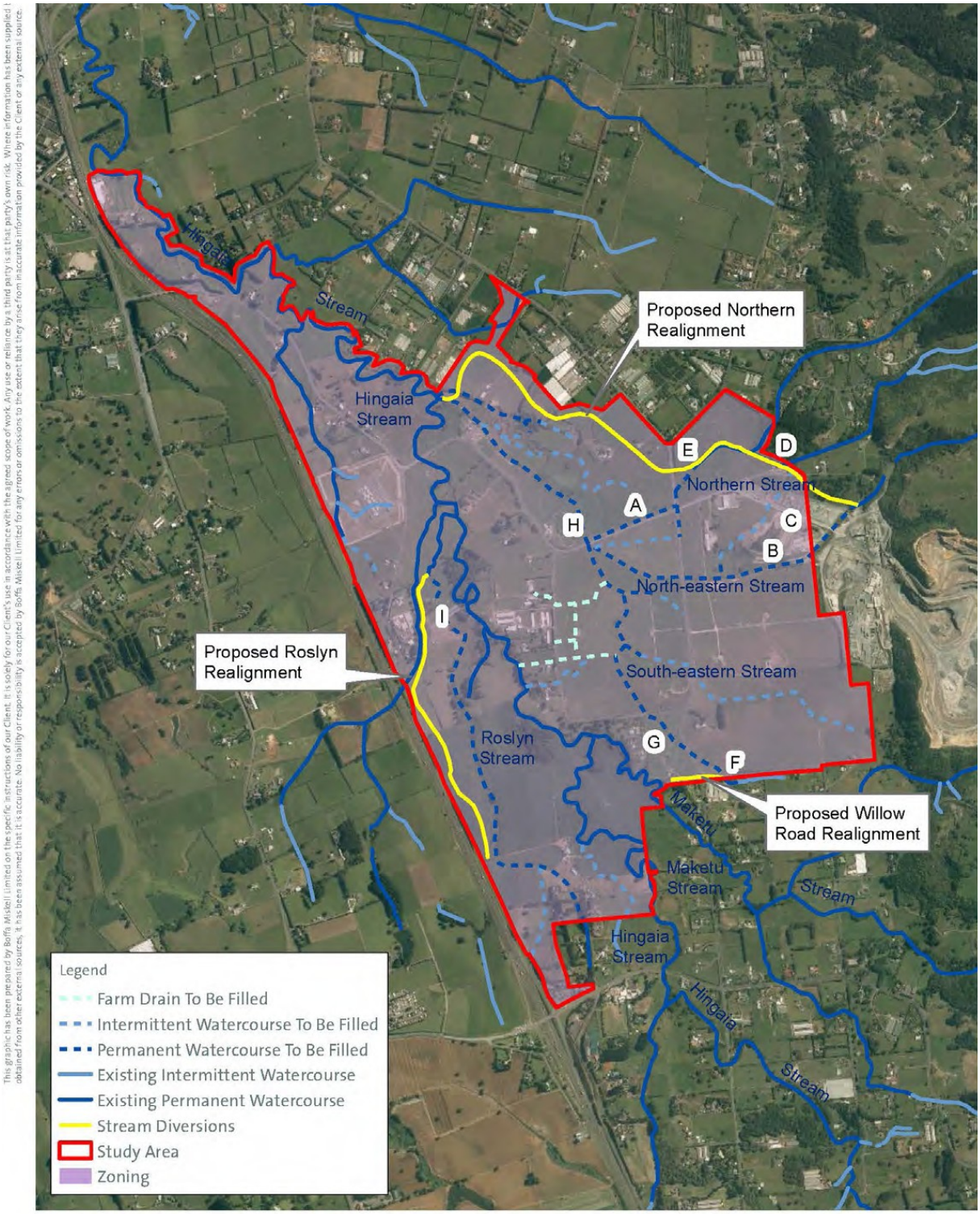


FIGURE 2: DSSP Existing and Proposed Water Courses (Source: BECA Ltd)

2.1.1 Northern Streams

A tributary to the northeast of Stevenson Quarry is currently dammed in its headwaters for quarry operations before being reticulated to a channel (refer Figure 2, Location B below). The northeastern stream also receives stormwater from the quarry via adjacent treatment facilities (Location C). As part of the works to accommodate the DSSP, the upper catchment of this stream will be directed to the existing northern stream corridor (Location D).

This northern stream will be rehabilitated with an enhanced stream profile, and restored streambank and floodplain vegetation. The northern re-alignment will be 1,800m in length, comprising 1,500m of new channel and 300m of rehabilitated channel.

LOCATION B (FIG 2) – The north-eastern channel flowing through mixed exotic vegetation

LOCATION C (FIG 2) – The north-eastern channel directed alongside the quarry settlement ponds

LOCATION D (FIG 2) – The existing northern stream channel will be enhanced to receive the re-aligned north-eastern tributary

LOCATION E (FIG 2) – The northern stream at the base of the northern escarpment will be rehabilitated as part of the proposed works

2.1.2 Southern Streams

The streams to be filled between the quarry and the Hingaia Stream are relatively small, with low gradient catchments that do not extend beyond the project area. A stream from the southeast of the site (refer Figure 2 and Photos Location F and G) conveys a number of intermittent stream tributaries from the centre of the project area, before joining with the existing northern stream and northeastern tributary previously mentioned (Location H). The southeastern stream and its tributaries have no vegetation cover beyond aquatic macrophytes and pasture species. These watercourses have been heavily modified by pastoral land use.

LOCATION F (FIG) 2 – The southeastern stream ponding behind a road culvert, 50 metres downstream of the proposed Willow Road Re-alignment

LOCATION G (FIG 2) – The southeastern stream wends through the middle of the project area before combining with the northern stream

At least 230 metres of the headwaters of the southeastern stream will be retained, enhanced, and linked westward to the Maketu Stream via an 180m section of new channel (the Willow Road Re-alignment). This realignment will be planted with a riparian buffer. The remaining watercourses between the Hingaia Stream and quarry will be filled.

2.1.3 Eastern Streams

The Roslyn Stream (Location I) to the west of the Hingaia Stream will be re-aligned toward the SH1 corridor. The current stream is an open farm channel with low summer flows and dense growth of the exotic reed sweet grass (Glyceria maxima). The re-alignment will include filling of 450m of the upper reach of this stream, and formation of 1,600m of newly aligned channel. The realigned channel will be formed with an appropriate profile and rehabilitated for enhanced ecological function, with a 20 metre wide riparian corridor on both sides.

LOCATION H (FIG 2) – The channel flowing to the Hingaia, containing the combined flows of the south-eastern, northern, and north-eastern streams following a rain event

LOCATION I (FIG 2) – The Roslyn Stream (mid-ground), a farm channel with lowflows, is to be realigned and rehabilitated

2.2 Existing Streambank Erosion

Stream bank erosion has been identified in the ICMP studies as an existing issue at a number of locations. The Hingaia Stream is subject to extensive bank erosion, identified near the Quarry Road bridge on the Hingaia Stream and near Davies Road Bridge on the Maketu Stream.

Stormwater wetlands prior to the Hingaia channel are proposed for the DSSP in order to detain any additional flows that may adversely impact stream erosion (refer Section 3.5). Riparian vegetation is proposed along the Maketu and Hingaia and for all re-aligned stream channels to stabilise banks in the short term and reach a sustainable stream equilibrium in the long term.

A lack of riparian vegetation and active erosion along the Hingaia channel

The Maketu channel with erosion scour at the outside bank

2.3 Existing Aquatic Ecology

As part of the Hingaia Stream ICMP, Golder and Associates undertook SEV surveys of representative stream reaches (Golder 2009). Most of the stream environments in the project area had poor functional values due to extensive modification by agriculture.

The Hingaia ICMP surveyed thirteen sites within the DSSP Area. The best quality site was on the Maketu Stream, with higher scores across all functional categories. Another site, located on the lower Hingaia Stream, also scored relatively high. The best value site for the tributaries was located on the northeastern quarry stream. Full descriptions of functional ecology values can be found in the DSSP Assessment of Ecological Effects (Boffa Miskell 2010).

A total of 6 species of fish were recorded across the project area. Shortfin eels were the most common species, with occurrences of longfin eel, common bully, inanga and cran's bully. Five of the seven tributary sites had no fish, or mosquitofish only. The mosquitofish is an exotic pest fish classified as 'Unwanted' under Biosecurity legislation. These sites had very low fish community values.

Macroinvertebrate communities indicated low environmental quality at most sites. Except for the northeastern stream, tributary sites were characterised by worms, dipteran flies, leaches, and flatworms, suggesting nutrient enrichment and fine sediment. The Maketu site had a notable portion of mayflies (Zephlebia spp.), possibly due to better water quality (e.g lower water temperature).

3.0 Stream and Wetland Rehabilitation

3.1 Rehabilitation Principles

The following rehabilitation principles are intended to inform the rehabilitation of streams and wetlands in the DSSP area. The principles have been prepared by an inter-disciplinary project team, including landscape architects, planners, ecologists, and engineers. Principles seek to enhance the landscape and ecology values of the riparian systems, while providing appropriate design responses for hydraulic flow and stormwater management.

3.1.1 Landscape Values

There is significant opportunity to improve the natural character values within the DSSP area. Stream and wetland environments will also be integrated within a wider open space network, providing opportunities for enhanced recreation and landscape buffers. The following landscape principles apply to proposed stream and wetland rehabilitation:

- Contribute to landscape amenity values
- Provide vegetated buffers to specific land use activities as appropriate
- Integrate stream and wetland rehabilitation with streetscape and open space planning
- Provide for visual and physical access to rehabilitated natural areas
- Optimise natural character values through the planting of representative native communities
- Provide a diversity of natural habitats and plant communities to achieve a variety of landscape and spatial character, and to demonstrate a legible sequence of habitat types.
- Structure riparian vegetation to screen/define undesirable views, offer broad views to wetland environments, and frame distant views to eastern Hunua hills from SH1
- Apply appropriate standards for CPTED and IPTED for public or maintenance access
- Place pedestrian bridges as necessary to ensure landscape connections, and investigate opportunities to use existing stream spans (infrastructure) for this function
- Identify opportunities to involve the community in stream restoration planting
- Liaise with relevant representatives and apply appropriate protocols for any archaeological sites or heritage elements associated with rehabilitation works
- Enhance Cultural Value through the re-establishment of indigenous species and investigating cultural harvest opportunities

3.1.2 Ecological Functions

Enhancing ecological functions within the DSSP area will require a combined response to aquatic and terrestrial environments, in order to restore target species, representative habitats, and ecological processes. The following ecology principles apply to stream and wetland rehabilitation:

- Plant stream margins, banks and floodplain areas to achieve not less than 40m total width (10m min width either side of stream corridor)
- Utilise species sourced from the Manukau Ecological District that are representative of natural vegetation communities as predicted by LENZ
- Restore representative in-stream heterogeneity, providing for pool, riffle, run and cascade sequences as appropriate.
- Provide fish passage to the extent possible, including bullies and inanga to within their natural range
- Preserve groundwater influence and inundation regimes for existing floodplain forest in proposed stream corridors
- Provide appropriate transitional edge vegetation to remnant mature vegetation
- Optimise site coalescence between remnant vegetation areas along the Hingaia Stream
- Provide for breeding populations of water and wetland birds species
- Provide for appropriate staging and construction techniques to avoid potential impacts to downstream environments and in-stream aquatic habitat.

3.1.3 Hydrology and Hydraulics (H&H)

Stream and wetland rehabilitation will provide opportunities for water quality treatment for the DSSP, and appropriate hydraulic flows, and hydrologic capacity for the catchment. The following H&H principles apply to the rehabilitation areas:

- Use biotechnical stream stabilisation to restore a sustainable streambank morphology
- Apply a cross sectional profile that resembles a natural staged channel, including a permanent flow channel, a stream channel based on a bankfull (approximate two year average recurrence interval (ARI)), and associated floodplains and berms to hold the one hundred year ARI.
- Provide for an appropriate stream meander patterns for the floodplain extent, longitudinal stream profile, flow velocities, and expected bankfull event.
- Provide for hydraulic connections and fish passage to stormwater wetlands wherever extended detention is not required
- Place all forebay devices for stormwater wetlands outside of the 5 year ARI flood extent.

FIGURE 3: DSSP Concept Planting plan. (Source Boffa Miskell and Source Design)

3.2 Open Space Network

The stream and wetland rehabilitation concepts (refer Figure 3) integrate with a broader open space network to optimise specific requirements for public use and access, to ensure diverse representative habitats, and to enhance environmental services for the DSSP.

The open space network reinforces existing features and patterns of the project area. The Hingaia Stream corridor will be reinforced by wide riparian margins of representative planting of early successional forest, as well as kahikatea floodplain forest. In the north a substantial open space buffer is set aside to reinforce the natural escarpment separating the DSSP basin from the Fitzgerald Road ridgeline. This occurs in conjunction with the northern stream realignment and associated riparian rehabilitation works. In the south west of the project area, riparian planting along the re-aligned Roslyn stream will form a landscape buffer to SH1.

Larger remnants of existing vegetation will be coalesced along the Hingaia Stream. Planting in association with stormwater wetland areas will further buffer and augment the conservation values of these remnants.

3.3 Stream Rehabilitation

The land use change associated with the DSSP provides a significant opportunity to restore the Hingaia Stream, a low gradient moderate order stream, which retains remnant kahikatea floodplain forest. The project also provides the opportunity to coalesce modified drainage channels across the site into a larger order stream channel and floodplain, with supporting streambank and floodplain vegetation. Stream rehabilitation proposals are the result of an iterative design process between ecologists, landscape architects, and engineers to optimise the principles of these guidelines.

3.3.1 Hingaia Stream

The Hingaia Stream is a significant watercourse, with a wide, actively meandering channel across the floodplain. The stream currently runs through pastoral and agricultural land uses, and receives runoff from existing farm drains in the project area. The rehabilitation of the Hingaia stream is a key objective of the DSSP, with a 40 metre vegetated buffer proposed along the corridor where it corresponds with the project area. The width of the riparian buffer would extend to accomodate a stormwater treatment swale proposed along a northern reach, and stormwater wetlands proposed within the Hingaia Stream's extended floodplain.

The rehabilitation of the Hingaia Stream will include:

1. The coalescence of the floodplain forest remnants (including significant natural areas) already occurring within Hingaia floodplain
2. The restoration planting of stream banks along the length of the stream within the Project Area, with the potential for specific interventions to restore the stream profile at erosion hot spots
3. The planting of banks and proposed riparian buffers with simple lowland plant communities with the expectation that these communities will secede with time to include more diverse species
4. Planting of feature areas of flax-cabbage tree and broadleaf species on extended floodplains
5. Hydrological connections and fish passage to stormwater wetlands where practical

3.3.2 Stream Realignments

A number of farm drains and watercourses will be replaced with overland flow paths and reticulated networks associated with the proposed development. In addition, some headwaters will be realigned to newly formed watercourses along the boundaries of the DSSP area. The Hingaia and the Maketu Streams will not be altered beyond restoration activities.

A detailed description of the potential effects on stream ecology and the proposed mitigation measures is presented in Boffa Miskell, 2010, "Drury South Business Project Assessment of Ecological Effects Associated with the Proposed Plan Change". These guidelines inform the potential design response to optimise the flood management function of the rehabilitated streams, and their landscape and ecology values.

3.3.2.1 Design Parameters

The profile of each re-aligned stream channel is based on the cross-sectional area to accommodate a 1.5 to 2 year average recurrence interval (ARI). This flow is traditionally associated with a 'bank-full' event with active stream erosion and re-deposition.

The morphology of realigned streams is also based on their substrate, longitudinal gradient, and association with their floodplain. These functions can be used to prescribe channel sinuosity and width to depth ratio (Rosgen 1994). The bankfull width is used as a function to predict the stream meander wavelength and the radius of curvature for bends (Leopold 2003 and Thorne et al 2003). Refer to Figure 4 below.

Proposed stream morphology is intended to minimise friction within the channel to prevent active erosion, and also to provide a floodplain width that can accommodate the stream in equilibrium.

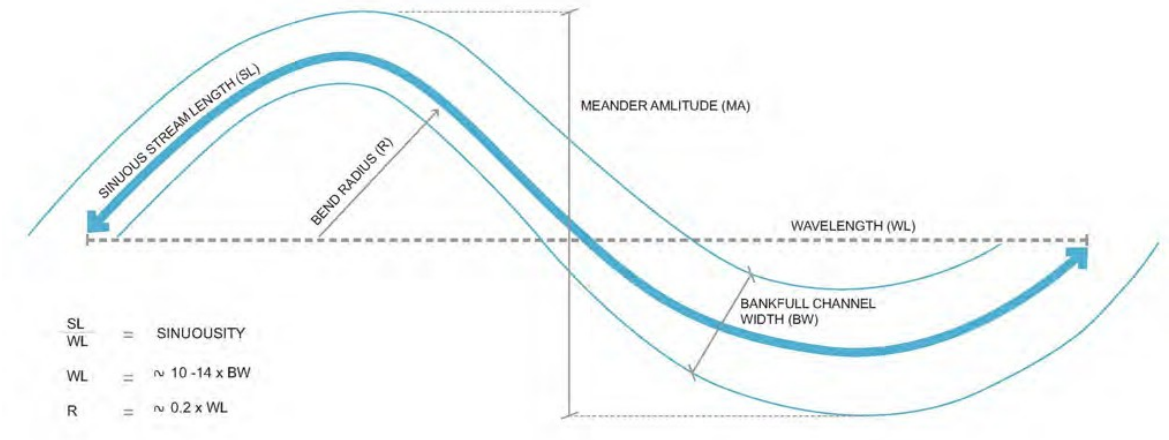


FIGURE 4: (above) The indicative relationship between channel width, and meander pattern

BELOW: A natural meander occurring as an overland flow event during flood conditions in the project area

3.3.2.2 Construction

Construction of the realigned channels is intended to occur off-line where possible, or to be staged to avoid potential impacts to downstream environments and in-stream aquatic habitat. Material selection is expected to be inert and where possible to be the equivalent of materials expected in these stream environments in their natural state.

It will be possible to utilize ‘natural‘ materials through the application of biotechnical construction, which utilises a combination of persistent and biodegradable materials to retain channel shape until plants can establish. In general biotechnical responses for stream stabilisation can include:

- Stream profiling to respond to specific flow events
- Floodplains to dissipate flood velocities
- Stabilised bank toe and outside bends with hard materials such as rock, root vanes etc
- Directing flows and forming riffles through rock vanes
- Reinforcement of stream banks through planting established in erosion control blankets
- Stabilising the crown of banks with appropriate vegetation
- Provision of appropriate pool-riffle-run sequences.
- Grade control structures that accommodate fish passage
- Specific biotechnical treatments to accommodate ‘nick’ erosion points and stormwater outlets

3.3.2.3 Planting

Plant species selection will provide ecological functional values and representative plant communities. Stream planting objectives may include:

- Shade for temperature moderation
- Weed suppression
- Slope stabilization
- Tolerance to inundation
- Growth form to accomodate/obstruct views
- Stature to accomodate hydraulic flow rates
- Inherent aesthetic or spatial qualities of single plants or grouping of vegetation.

Based on LENZ predicted natural vegetation layers, representative plant communities for the DSSP area include lowland alluvial floodplain species, generally consisting of kahikatea forest. Other communities include tawa and pukatea, while matai, rimu and totara are generally restricted to better-drained soils. Titoki and puriri are locally abundant, with the potential for other broadleaf such as taraire, occurrence of kauri on the flanks of the basin, and occasional rimu and pukatea.

The project area extending into the flanks of the project basin and the hills beyond would be expected to support kauri, kahikatea, rimu and/or totara emergent over a diverse canopy dominated by varying mixtures of taraire and kohekohe Other widespread tree species might include hinau, pukatea, rewarewa, and miro. Puriri is locally abundant at lower elevations, particularly on alluvial surfaces and tanekaha would be locally abundant, particularly on disturbed sites.

Where basalt occurs at the surface of the project area there may occur unique basalt forest environments, with an expected predominance of mahoe, karaka, kohekohe, totara, puriri, and titoki.

Until climax communities establish, it is expected that large areas of the riparian corridors will be planted with early succession and hardy species, such as riparian shrubs, kanuka, and totara to rapidly establish cover and to act as a nurse crop for later succession species. It is expected that certain low vegetation types will be applicable in places along the riparian corridors to accommodate hydraulic flows, to preserve view shafts, and provide useable open space areas. Such planting may involve mown grass areas, sedge-rushlands, and flax-cabbage tree communities.

3.3.3 Northern Stream

A stream is proposed along the northern boundary of the DSSP area at the base of the northern escarpment. An existing section of this northern stream receives flows from three tributaries. A fourth tributary, previously described as the 'northeastern stream' (refer Section 2.1.1 and Figure 2) will also be directed to this channel from the quarry zone. The northern stream will accommodate the flow from these four tributaries, as well as localised catchments before discharging to the Hingaia Stream west of the proposed Link Road.

A typical northern stream cross section is shown in Figure 5, where a 'bankfull' channel represents the 1.5 year ARI event, and the associated floodplain conveys a 100 year ARI event with 500mm freeboard to the proposed development. Detailed design will provide pool-riffle and run sequences with adapted profiles. Biotechnical construction techniques will form narrower riffle sections, shallower point bars, and steeper outside bends.

The proposed sinuosity of the northern stream is relatively high, close to 1.5 times the wavelength (refer Figure 7). This is appropriate, based on the cross section of the bankfull channel (with a low width to depth ratio) the longitudinal profile of the floodplain (a relatively flat lowland environment), and the general character of the bed materials and banks (being generally resistant but somewhat erodible).

The sinuosity is expected to reduce the longitudinal profile of the channel, reduce erosion of stream banks, provide strong connections to floodplain environments, and increase the overall length and diversity of stream habitat. Some stream reaches have constrained floodplains, where riffle sequences with local rock may be appropriate.

The northern re-alignment follows the northern boundary to combine stream environments with adjacent open space and to form a buffer to adjacent land use. The stream corridor and floodplain will be densely vegetated as indicated in figure 7. Planting will be dominated by early succession kanuka-totara forest. Kahikatea forest planting is proposed beside the Link Road entrance to act as a natural threshold at the DSSP entrance. Pockets of broadleaf forest are proposed to add diversity to the northern riparian corridor. Low areas of sedge-rushlands, grass areas, and flax-cabbage tree associations could provide views into the stream corridor from select locations.

3.3.4 Roslyn Stream Realignment

There is an existing watercourse running south to north through Roslyn Farm at the southwest corner of the project area, which picks up flow from two culverts. Site assessment also revealed an existing spring feeding the stream. This stream will be realigned for part of its length whilst retaining links the to existing spring and culvert inflows, the realigned corridor will provide a stronger vegetated element to adjacent to SH1 (refer Section 2.1.3 and Figure 2).

A typical Roslyn Stream diversion cross section is shown in Figure 6, where a dedicated 'bankfull' channel contains the 1.5 year ARI event, and the associated floodplain conveys a 100 year ARI event with 500mm freeboard to the proposed development. The Roslyn channel has a wide stream base with a lower depth to create a combined wetland/overland-flow-path appropriate for the small catchment, the low longitudinal gradient, and a strong groundwater influence.

Because the Roslyn channel is a lower energy environment than the northern re-alignment, with less likelihood of erosion, it is reasonable to expect a less sinuous character. Therefore a low sinuosity of 1.1 times the wavelength has been applied.

Planting along the Roslyn stream is proposed to be a combination of sedge-rushland planting and large swathes of flax-cabbage tree associations to create a wide wetland environment. Kanuka-totara forest may occur in existing knoll areas beside SH1 to frame views to the eastern Hunva foothills. Kanuka forest may continue along mid reaches of the stream and groups of kahikatea may occur alongside of a stormwater wetland to frame views from boardwalk locations and to shade permanent water features.

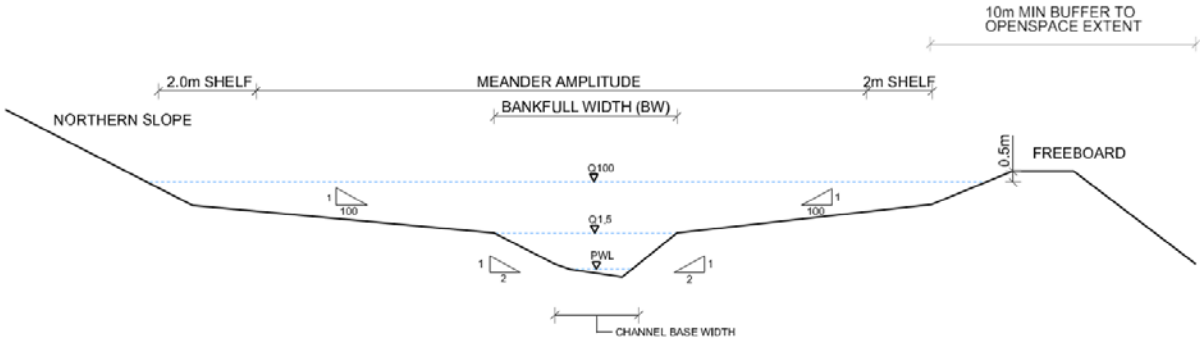


FIGURE 5: Typical section of the northern realignment in terms of flooding profiles

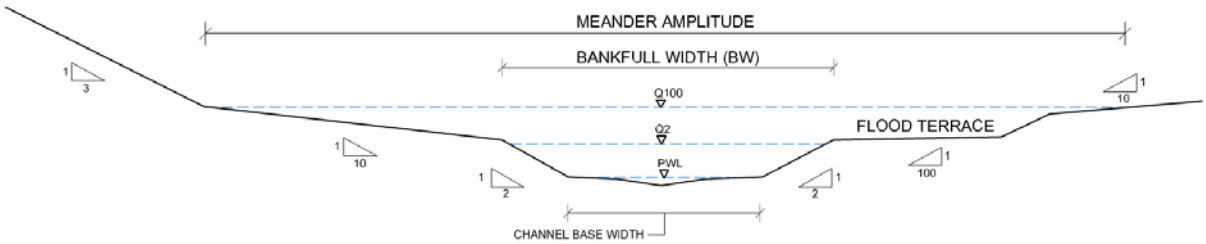


FIGURE 6: Typical section of the Roslyn Stream realignment in terms of flooding profiles

3.3.5 Willow Road Realignment

There is a small roadside drain running east to west along Willow Road. The stream currently crosses Willow Road through a culvert near the intersection with Ramarama Road and continues north through the proposed DSSP area, eventually joining the Hingaia Stream. As discussed previously, this stream is heavily modified by pastoral land use and is largely unvegetated. It is proposed to divert this roadside drain directly west to the Maketu Stream along a vegetated riparian corridor that provides for a 1.5 year stream profile and accommodates a 100 year ARI event.

FIGURE 7:Proposed DRAFTplanting plan for the Northern Re-alignment

FIGURE 8: Proposed DRAFT planting plan for the Roslyn Realignment

3.4 Riparian Revegetation Guidelines

3.4.1 Introduction

Riparian revegetation is proposed for the main stems of the Hingaia and Maketu Streams. In addition the Northern and Roslyn realignments will also be restored with riparian vegetation (as depicted in Figures 7 – 8). The progressive planting of these realignments as well as the present grasslands alongside the Hingaia and Maketu Streams will ultimately provide a greater extent of riparian bush, increasing the habitat opportunities and potential carrying capacity of the DSSP area as well as providing vegetated riparian corridors within the local landscape.

The following revegetation guidelines outline an accepted industry-wide approach to large scale revegetation programmes that should inform the development of the final detailed planting plans for the DSSP riparian margins.

3.4.2 General Procedure

The general procedure for the proposed revegetation plantings should be as set out below.

- Slope stabilization
- Seed should be sourced as is available from the Manukau Ecological District. However, notwithstanding the desire to use only genetic material sourced from this specific area in the revegetation programme, additional source material from the wider Auckland Ecological Region may be used.
- Planting of species into existing pasture should require pre-planting repeat herbicide applications to reduce the potential for grasses to compete with the seedlings planted.
- Blanket spraying in close proximity to the existing native bush areas needs to be avoided or very carefully managed so as to avoid by-kill. Herbicide should be carefully applied at least 2 weeks before planting.
- Where the earth has been previously compacted the areas to be revegetated should have a single treatment of earth tilling, in order to loosen the sub-soil and encourage successful rooting.
- Planting should be undertaken in favourable conditions, at the earliest opportunity during the planting season, preferably over the autumn months.
- The revegetation plantings should be supplemented with weed and browsing pest control to allow good establishment of the planted material. Ongoing weed control should be carried out until canopy closure is sufficient to suppress weed growth. Browsing pest control may be required over the longer term in order to allow the revegetated areas to progress in good health. However, once pest numbers are reduced to a minimal level, continued control should require a reduced effort.
- All planting and maintenance operations should be carried out by an approved contractor, experienced in native revegetation planting programmes.

3.4.3 Plant Material

- The plant material needs to be of the specified size and condition. All plants will have well developed root systems and a well-shaped stem and head free of disfigurements or injury, pests and disease.
- The plant material should have been sufficiently “hardened off” at the nursery prior to being passed on to the planting contractors.

3.4.4 Planting Methods

- Planting should follow an approved planting plan, indicating set-out, species, size, density and spacing.
- A dual system of planting is proposed, involving the establishment of a nurse crop of hardy pioneer species such as kanuka. These will be enriched with appropriate native tree species when the nurse crop has sufficiently established, which should be at approximately 3 years age.
- Nurse plant stock should be set out at appropriate spacing and percentages, and according to each species niche preferences.
- Once a good cover of the nurse plantings is established, enrichment plantings should be implemented. Enrichment species trees should be distributed (at wider centres) amongst nurse planting and according to site preferences in copses/groves spread further apart in subsequent seasons.
- The enrichment plantings may include the pruning or removal of modest numbers of nurse shrubs in order to create the necessary light wells.
- Plants should be set out and appropriately spaced in an informal manner avoiding straight lines and regular geometric patterns, while ensuring an even cover across the planting area. Species should be distributed at appropriate percentages and according to each species niche preferences, microclimate and ground conditions.
- Planting holes should be dug out to spade depth and seedlings located next to pre-dug holes in the correct species mix. Actual planting should be by hand only. The base of the planting hole should be filled evenly without compaction to a level where the top of the plant rootball is level with surrounding ground. The plant should be plumb and orientated so that the weathered face of the main stem faces north. When the backfilling is complete the plant should be gently firmed in. All plants should be encouraged to grow to maturity as naturally as possible to achieve their desired character and form, through sound management practices including weeding, and other accepted horticultural practises.
- Slow release fertiliser should be used within the proposed planting operation, with at least one tablet of 20-4-4 (N-P-K) that is designed to last at least 12 months (preferably 24 months). The controlled release fertilizer tablets need to be inserted into each planting hole approximately half way up the backfill material, ensuring placement of the fertiliser on the upper slope side of each plant
- Approved chipped tree mulch or post-peeling bark mulch could be spread around the base of individual plants used in the mass revegetation plantings, but only in areas outside of the floodplain (to avoid mulch being washed away in floods).

3.5 Stormwater Management

Stormwater design is discussed in greater detail in the DSSP Infrastructure Assessment Report (BECA 2010). The general approach is to utilise the large floodplains associated with the Hingaia Stream to accommodate stormwater wetlands. Each wetland would include a forebay and accommodate the water quality volume. There is also allowance for extended detention to limit potential effects of stormwater volumes on downstream erosion.

Wetlands have been placed above the stream invert to not unduly effect groundwater levels, and forebays have been placed above the 5 year flooding event to prevent re-suspension of contaminants stored in these areas.

Safety considerations have allowed for benching around the perimeter of each wetland and a reverse bench along each embankment. Appropriate maintenance access will be provided to forebays and to the base of wetlands for restorative maintenance if required.

Biotechnical approaches similar to those described for stream realignment works will be considered during detailed design, with specific consideration for the formation of access and outlets to the Hingaia, with fish passage possibile to wetlands that are not required to detain extended detention volumes.

Planting would be exclusively sedges, rushes, and small riparian shrubs around wetlands for water quality treatment, to stabilise the wetland profile, and to allow ease of maintenance. Trees and taller shrubs would be expected at the edges of wetlands, at their interface with stream environments, and around the northern edges of forebays for shade.

3.5.1 Stormwater Wetland One

Stormwater Wetland One has been designed as a landscape amenity feature through an iterative design process between landscape architects, engineers, and ecologists. This has driven the design of forebays, the shape and extent of the permanent pools and wetland planting, the integration of multiple public access structures, and a pedestrian circulation path that crosses the Hingaia stream corridor (refer figure 9). Wetland One has been tiered to suit the local topography and the bathymetric design directs flows along three separate treatment paths.

3.5.2 Northern Swale

A swale is proposed for stormwater management along the western edge of the lower Hingaia Stream. The total width of the swale and vegetated buffer contributes an additional 25m of vegetation to the riparian buffer. The length of swale is significantly longer than required for water quality and is expected to exceed regulatory expectations at the entry point to the Hingaia.

Planting will be selected with the ability to sustain temporary ponding and saturated soils, and will allow appropriate hydraulic flows and residence time.

FIGURE 9: Proposed Planting Plan for Stormwater Wetland One

4.0 Summary

The DSSP area is traversed by the main stems of the Hingaia and Markeu Streams and several other permanent and intermittent streams and farm drains. Watercourses other than the Hingaia and Maketu Streams will be modified or re-aligned in order to facilitate the proposed land use. Stormwater management will also lead to the creation of additional naturalised wetland areas in association with the Hingaia Stream corridor.

All streams affected by the proposed DSSP have been previously modified by farming or roading operations, including dredging, spraying, straightening, and ongoing impact by stock. Stream bank erosion has been identified in the Hingaia ICMP as an existing issue at a number of locations. In general all of these streams have low to moderate functional values for stream ecology. Five of the seven tributaries to the Hingaia were observed as having very low to absent fish community values.

The DSSP Stream and Wetland Rehabilitation Guidelines establish a set of principles to enhance the landscape and ecology values of riparian systems in the DSSP area. The document is intended to provide technical input to the planning process and to provide guidance to ongoing more detailed design and implementation. The guidelines apply an inter-disciplinary approach to riparian rehabilitation.

Stream rehabilitation is proposed for the length of the Hingaia and Maketu Streams within the DSSP Area, including a 40m wide planted riparian buffer along the streams. In addition, streams to be re-aligned will have appropriate stream profiles and riparian planting to provide for sustainable stream function. Riparian rehabilitation will contribute to a wider open space network and enhanced natural character.

5.0 References

ARC (2008a). Proposed Auckland Regional Plan; Air, Land and Water. Auckland Regional Council, Auckland. May 2008.

ARC (2008b). State of the Environment Monitoring. Freshwater Invertebrate Monitoring: 2003-2007. Analysis and Evaluation. October 2008. Auckland Regional Council Technical Report 2008/010.

BECA 2010. Draft DSSP Infrastructure Assessment Report. Prepared for Stevenson Group Ltd (Client) by Beca Infrastructure Ltd (Beca) 1 November 2010

BECA 2010. Drury South Business Project Earthworks Concepts. Prepared for Stevenson Group Ltd (Client) by Beca Infrastructure Ltd (Beca) 12 February 2010

Boffa Miskell 2010. Assessment of Ecological Effects Associated with the Proposed Plan Change. Prepared for Stevenson Group Ltd by Boffa Miskell March 2010

Golder Associates 2009. Hingaia ICMP report. Unpublished preliminary report.

Golder Associates 2009a. Hingaia Catchment Environmental Assessment. Draft report. Report No. PAPDC-PPK-003. Prepared for Papakura District Council. July 2009.

Hitchmough, R.; Bull, L.; Cromarty, P. (2007). New Zealand Threat Classification System list 2005. Department of Conservation, Wellington.

Leopold, L. A View of the River (2003). Harvard Press, USA 2003

Rosgen, David L. A classification of natural rivers. Catena 22 (1994): Wildland Hydrology

Thorne, C.; Hey, R.; and Newson, M. Applied Fluvial Geomorphology for River Engineering and Management. John Wiley and Sons, England 2003.

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