



Nga Puna Wai Sports Hub




Stage 1 Masterplan Concept Design Report

14 July 2015



Revision History

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1 Executive Summary

In its 2012/13 Annual Plan the Council set aside \$6.7M for an athletics track to replace the facilities lost at QEII in the earthquakes. Council asked officers to report back on a suitable location for a replacement track. Following strong support from the wider Christchurch recreational and sporting community, Council called for a report on the possibility of establishing a sporting hub at Nga Puna Wai using the athletics track as a key development **Figure 1-1**. Nga Puna Wai is a recreation reserve subject to the Reserves Act 1977 and covered by the Nga Puna Wai and Canterbury Agricultural Park Management Plan. In August 2013 the Design Team lead by Beca was engaged, in association with sport and community buildings specialist *Studio106 Architect* and sports facilities planners *Global Leisure Group* to develop a concept masterplan for a sports hub at Nga Puna Wai, beside the Canterbury Agricultural Park in south west Christchurch. The purpose of the masterplan was to test whether the area set aside for the sports hub was large enough to accommodate new athletics, hockey and tennis facilities lost in the 2010/11 earthquakes as well as ten grass sports fields for general use.

The Concept Masterplan provided a staged approach over the next 10-30 years that enabled the Concept to be constructed as demand and funds become available.

The Masterplan Report completed in November 2013 confirmed that the Nga Puna Wai site is large enough to accommodate the required sporting facilities and generally has the surrounding infrastructure to support it **Figure 1-2**.

The Masterplan was presented to Councillors on Thursday 31 July 2014, who then agreed to proceed with a Special Consultative Process to enable the community to have a say. From October to December 2014 the Council sought feedback on the key design features of the proposal and choice of site, and also on the changes that will be made to the Management Plan to incorporate a sporting hub (as a non-comprehensive review of the Management Plan under the Reserves Act 1977). The submissions were in overwhelming support of the sports hub and following the recommendation from the Hearings Panel in March 2015, Beca and *Studio106 Architect* were engaged to develop the Stage 1 Concept in further detail.

Global Leisure Group was engaged by Council to liaise with the Tier 1 stakeholders (Athletics Canterbury, Canterbury Hockey Association & Canterbury Artificial Surfaces Trust (CAST) and Canterbury Tennis) to establish what minimum facilities would be required from each sport to get the sports hub established. This facility specification was reconfirmed by the Design Team at a workshop with the Tier 1 stakeholders on 4 May 2015. An edited version of the specification can be found in **Appendix G**. At that time Council also advised that a regional base for Canterbury Rugby Football League (Rugby League) would need to be accommodated. Rugby League is currently played at the A&P showgrounds and Denton Park.

This report contains the background information from our 29 November 2013 report and has been updated to reflect the revised Stage 1 scope of work with an estimated budget of \$36.8 million consisting of;

- A single entry sealed Main Access road from Augustine Drive
- A Boulevard wide enough to set up stands for events and provide access and parking for day to day activities
- Avenue between Rugby League (RL) and Hockey (H2)
- One artificial surface athletics track with embankment, permanent covered seating, space for temporary seating, flood lighting and throwing areas (A1, AZ, GS1), all fenced
- Two artificial hockey turfs (H1, H2) with permanent covered seating and space for temporary seating and flood lighting. Both pitches fenced
- 12 outdoor tennis courts (T) with flood lighting and fenced
- One grass rugby league field with partial embankment, permanent covered seating and space for temporary seating, changing facilities, flood lighting and fenced (RL, GS2)
- A Sports Hub consisting of buildings to accommodate administration, café, changing facilities etc (SH)
- Attenuation ponds for filtering and detaining stormwater before discharging into the Wigram Basin or Heathcote River (SW1, SW2)
- Public amenities (PA)
- General carparking and associated swales (C1, C2, C5, C6)
- Bus drop off zone
- Construction of an Eco trail along an established track
- Construction of a new cycle trail
- Reconstruction of a permanent horse cross country jump on a revised equestrian trail
- Enhancement of an existing frog pond with endangered species
- New underground services for sewerage, water and stormwater and power and data to the new facilities from Templetons Road



Figure 1-1 : Location Map of Nga Puna Wai and surrounding area



Figure 1-2 : Concept Masterplan

2 Introduction

2.1 Background

Nga Puna Wai comprises 83 hectares of land beside Canterbury Agricultural Park in south west Christchurch (41.9ha under reserve – recreation and local purpose (esplanade) and 41.3ha of unreserved land). The area under consideration is the recreation reserve (32.3ha). Council staff and other stakeholders identified it as the preferred site for a new athletics track to replace the one lost at QEII Park in the earthquakes. Following strong support from the wider Christchurch recreational and sporting community Council engaged Beca to develop a Masterplan to test the possibility of establishing a sporting hub at Nga Puna Wai using the athletics track as a key development. In its 2012/13 Annual Three Year Plan the Council set aside \$6.7M for an athletics track. Hockey facilities at Porritt Park and tennis facilities at Wilding Park damaged in the 2010 and 2011 earthquakes also needed replacing.

Beca have teamed up with *Studio106 Architect* who are specialists in the design of sports and community facilities to form the Design Team for Stage 1.

At a sports hub, clubs and community groups combine resources to build, maintain and use shared facilities and services. When backed by sound business practice this model can cater for a wide variety of groups, foster club spirit, and lead to increased participation and membership rates. A Sports Hub Governance & Management Options Study report has been prepared by *Global Leisure Group* and *Maria Clarke Lawyer* and issued to Council and the Tier 1 stakeholders to assist in selecting the appropriate management model for Nga Puna Wai.

Sports hubs are widely recognized nationally and internationally as an effective and efficient way of providing sport and recreation facilities for communities. A sports hub is consistent with the planning principles of the Draft Metropolitan Sports Facilities Plan 2012 and the Spaces, Place and People Plan 2013. It also follows the Council practice of avoiding unnecessary duplication of facilities and encouraging co-operation between different sporting groups.

There is considerable population growth in the west of the city and a sports hub is an innovative way of providing much needed sports facilities and services. It also offers greater flexibility to accommodate changing patterns of sports participation.

A number of Council-owned reserves and parcels of land were assessed for suitability as a sports hub by Council. Factors considered included location, size, shape, geotechnical suitability, accessibility and current usage. Nga Puna Wai was chosen as the preferred location for further investigation for the following reasons:

- Council owned: the reserve is Council owned eliminating the need to purchase additional land.
- Sporting use: The reserve was vested in the Council for the purpose of recreation in 1977.
- Population Growth: The park is close to major south west growth areas of the city such as Aidanfield / Wigram Skies.
- Land stability: Geotechnical investigations show the southern half of the site to be more suitable for development of buildings (the equivalent of TC2) with a 19m deep layer of gravel. Although the northern half is not as good (TC3 equivalent), it could still be suitable for uses such as grassed playing fields or car parking if required.
- Zoning: The area is zoned Open Space 2 in the current City Plan which is suitable for recreation such as tennis courts, goal posts and toilets/changing rooms.
- Space: The shape of the land and the size of approximately 32ha (for recreation reserve area) lend itself to the sports hub concept with large open green space and the potential for future growth. Refer **Figure 2-1** dark green area **O2** (Open Space 2 zone) in the Operative City Plan Zoning map from the Nga Puna Wai Canterbury Agricultural Park Management Plan 2010.



Figure 2-1 : City Plan Zoning

- Easy to get to: There is potential for good linkage to the existing transport network such as the Christchurch Southern Motorway (CSM) and Wigram road.

The final size of the hub is yet to be determined however the brief for the overall Masterplan calls for an International Association of Athletics Federations (IAAF) standard artificial athletics track, International Hockey Federation (FIH) standard water turfs indoor and outdoor tennis courts and rugby league fields. Council will work with Athletics, Hockey, Tennis and Rugby League organizations, existing users and other stakeholders who wish to be involved. Further engagement with the wider community is ongoing.

There are no formal occupiers of the recreation reserve (and esplanade reserve) parts of Nga Puna Wai. Currently Nga Puna Wai is used by the general public for walking, cycling, running etc and for groups for activities such as polo, pony club activities and riding for the disabled. The Canterbury Agricultural and Pastoral Association has no ongoing formal right of use of the recreation reserve. Use of the site for car parking for the annual Canterbury A&P Show is by written permit under the Reserves Act 1977 Section 53, similar to Canterbury Cricket Parking on Hagley Park. These groups can continue to use the park and there would be full consultation about future access once the feasibility study of a sports hub is completed.

Site History

Nga Puna Wai means "many spring waters" and refers to the many springs that exist along a stretch of the upper Heathcote River/Opawaho 300m south of Templetons Road, making it a significant waterway for Ngai Tahu and an important habitat corridor for wildlife. The proposed development of the Masterplan is contained within the O2 zone and recognizes the importance of the buffer zone created by the C3 Conservation Zone along the river to protect and restore significant Tangata Whenua values.

Since 1997 the adjoining Canterbury Agricultural Park has hosted the annual A&P Show, run by the Canterbury Agricultural and Pastoral Association. The land on Nga Puna Wai has been used for informal parking on Show days.

2.2 Methodology

To gain an understanding of the key requirements to develop the Masterplan required consultation with the relevant stakeholders. These were already identified by Council during its search for a suitable site and include;

- Tier 1 Stakeholders - Canterbury Athletics, Canterbury Hockey/CAST and Canterbury Tennis
- External Stakeholders – A&P, MKT and current users such as Halswell Pony Club and nearby Resident Associations

- Internal Stakeholders – Those departments within Council that have an interest in Nga Puna Wai

The Design Team met with all these stakeholders except the current users and community/resident groups who have been consulted by Council.

2.2.1 Tier 1 Stakeholders

Having had the time since the 2010/11 earthquakes to review their specific requirements, the information provided by the original Tier 1 Stakeholders was very comprehensive and detailed. This assisted greatly in the development of the Masterplan.

Canterbury Football and Rugby League joined the Tier 1 Stakeholder group in May 2015 as part of this Stage 1 Report which was after the issue of the Sports Hub Governance & Management Options Study – Facility Specification for Stage 1, which is why their brief is separate. A copy of the Stage 1 briefs can be found in **Appendix G**.

2.2.2 Canterbury Agricultural and Pastoral Association (A&P)

The Canterbury Agricultural and Pastoral Association (A&P), through its sale yards company, owns land as an enclave in the Canterbury Agricultural Park. It has a 1 year round lease for an area around the sale yards. For the whole of the Canterbury Agricultural Park and the part of Nga Puna Wai that is not reserve, it has a license for 1 month of the year to operate the annual A&P Show.

Currently A&P use the Nga Puna Wai site to accommodate parking for the annual A&P Show days in November.

2.2.3 Mahaanui Kurataiao Ltd (MKT)

Ngai Tahu, through MKT, were extensively consulted as part of the *Nga Puna Wai and Canterbury Agricultural Park Management Plan* process resulting in Section 9.6 of the Plan. The areas of value to Ngai Tahu listed in the Park Management Plan refer primarily to the Esplanade Reserve along the Heathcote River, which is outside the area proposed for development. Further consultation will take place once Council has approved the Stage 1 Masterplan Report, particularly around the proposed Ecotrail.

2.2.4 Internal Stakeholders

The Internal Stakeholders were generally accepting of the proposed Sports Hub with the greatest concern being the scale of the buildings within an open green space.

The City Water & Waste Assets & Networks team were consulted to discuss the proposed Pressure Main route through the site. The Pressure Main is likely to be constructed prior to developing the Sports Hub.

CCC Greenspace team were consulted to discuss the requirements for discharging stormwater into the Wigram Basin and Heathcote River and the willingness to amend the designation boundaries for the basin.

2.2.5 Halswell Pony Club

The Halswell Pony Club (HPC) originally operated in Halswell Domain and relocated to Nga Puna Wai in 2004 where the club has created, amongst other things, a highly regarded (nationally) cross-country course (i.e. jumps) that runs through the proposed Sports Hub area of development Figure 2-2. The course is a principal source of income for the club via its HPC One Day Event which attracts over 160 entries. Stage 1 of the Masterplan includes the relocation of jumps 10 and 11, the reconstruction of jumps 14-17 and re-alignment of the course as indicated in Figure 2-3 where the white course is the original route and the green course the new route that is also shown on the Masterplan. Images of the jumps can be found in **Appendix G**.



Figure 2-2: Existing HPC cross country course



Figure 2-3: Proposed HPC cross country course

3 Master Planning

In developing the Masterplan there are many factors that influenced the plan over and above the space requirements of the facilities. Looking at the wider site context are the connections with the immediate neighbourhood, integration with the existing circulation routes, recognition of the existing ecological and environmental features such as the existing springs and frog pond and environmental factors such as wind and sun.

For Stage 1 the focus is to provide completed playing surfaces that meet the relevant sporting code standards with the maximum of player and spectator facilities within the established budget. As the existing site is a green field site, there is no existing services infrastructure such as power, water or sewerage. It is possible for future development to take place incrementally without re-work or compromising the overall Masterplan.

3.1 Brief

The **Needs Analysis** developed for the overall Masterplan identified the requirement for the following facilities to be accommodated on the site;

- 400m Athletics track with provision for a 200m warm up track that could be developed into a 400m track for future Class I events
- Grandstand for Athletics
- 3 Hockey turfs
- 12 outdoor tennis courts
- 2 Rugby League fields
- Grandstand for Rugby League
- Associated Administration facilities
- Parking for approx. 890 cars

In addition Council requested 7 general purpose grass fields.

The Stage 1 development is shown on the Stage 01.A Masterplan in **Appendix A** and based on the Tier 1 Stakeholders briefs in **Appendix G** which is reflected in the Schedule of Accommodation in **Appendix B** from which the High Level Cost Estimate was developed in **Appendix E**.

3.2 Orientation

Sports fields are generally oriented in a north-south direction based on best practice for sun impact to play activities. In the case of Nga Puna Wai, Athletics Canterbury requested a track orientation that is approximately 10 degrees west of north to allow the grandstand to act

as a windbreak from the predominant north-easterly wind that occurs all year round as opposed to the south-easterly that prevails in winter.

3.3 Buildings

The concept for the grandstand GS1 is to have Athletics seating to one side with change rooms to the eastern (hockey) side. This allows for future-proofing a second tier of seating for hockey above the change rooms, with associated public, media and social spaces in line with the Concept Masterplan. Seating for hockey is located on the eastern (boulevard) side which enables the hosting of events utilising the boulevard as an outdoor activity space.

Continuing the idea of shelter from the wind, the Sports Hub buildings have been located between the tennis courts and H1 hockey turf. This has the added benefit of being able to act as a viewing platform for these sports. The Sports Hub provides a consolidated building form with the following benefits;

- Shared facilities for offices, administration, meeting/conference/viewing lounges, catering facilities and ablutions
- Reduced vertical and horizontal travel distances within buildings
- Wind shelter
- Consolidated visual mass within the landscape. Although large in form, within the scale of the site this impact is reduced. There are existing trees that are similar in height
- Assist in way finding by acting as a landmark within the site

3.4 Proximity

With the clustering of the buildings and associated playing surfaces for athletics, hockey, tennis and rugby league we are starting to form a hub which has the associated noise from participants and spectators and light spill from night lighting. To minimize the impact on the surrounding residential neighbours, the hub has been located as far away as possible from the residential boundaries, resulting in a more or less central location within the site. Where possible, the general grass playing fields have been located between the hub and the residential zone to act as a buffer from noise and light spill from the centrally located flood lit playing areas.

3.5 Circulation

The site potentially has 4 points of entry for vehicles;

1. Augustine Drive from the southeast (Replacing Templetons Road)
2. McMahon Drive from the southwest

3. Wigram Road underpass from the northwest (with a 2.4m height restriction)
4. The unsealed road from the Agricultural Park from the northeast to Nga Puna Wai

For Stage 1 only the Main Access road from Augustine Drive is constructed. To enable future through traffic to flow through the site, connecting Augustine Drive with McMahon Drive is a natural solution. In discussing public transport routes with Environment-Canterbury the preferred route of travel is through rather than a dead end. A transports node at the hub acts to engage the community with the facility and minimise walking distances to community amenities. A future loop road around the perimeter provides access close to the various playing fields and buildings while reducing crossover conflict with pedestrians. A shared space Boulevard runs north-south along the Sports Hub buildings to allow service vehicles, staff, visitors and non-ambulant people near these buildings. The Boulevard also creates a view shaft across the wetlands to the north. This shared space can be closed off in event mode and provide space for registration, event HQ, exhibition and assembly space while the rest of the hub continues to operate as normal. The east-west Avenue to the north of Hockey 1 & 2 is aligned with the entry to the Sports Hub to assist in way finding and enable a formal approach during event mode for bus and VIP transport.

There are existing walking tracks in and along the western boundary and the Conservation Zone along the southern boundary. The Masterplan proposes to enhance the existing route with an eco trail and cycle trail and to extend this network through the sports hub to encourage those not participating in an activity at Nga Puna Wai to still feel free to travel through the hub via a network of footpaths that pass by Play Zones, stormwater ponds and public amenities, thus providing passive surveillance.

3.6 Parking

The majority of parking has been distributed along the Main Access road with smaller areas along the Boulevard, Avenue and along the future perimeter loop road. This enables easy access close to playing fields in day-to-day mode with concentrated parking in event mode when the Boulevard, Avenue and/or loop road may be closed off. Overflow parking can also be provided on selected general grass fields or areas outside the hub such as adjacent to the Polo Field to the north, as currently occurs on some occasions. There is also the opportunity for the hub to provide overflow parking for events at the A&P Show grounds.

3.7 Wayfinding

By creating a hierarchy of roads and pathways from wide to narrow and locating key buildings such as the Sports Hub buildings at intersecting nodes, natural wayfinding is created throughout the site. The buildings

act as a landmark that is assisted by sight lines and vegetation of different heights.

3.8 Staging

The Stage 01.A plan has been developed to enable the hub to be built as funding and certainty of “occupiers” becomes available. A copy of the Stage 1 plan can be found in **Appendix A**.

4 Site Review & Planning

4.1 Planning Approvals

A number of planning approvals are likely to be required for the proposed development. These include approvals under the Resource Management Act (both city and regional consents) and potentially the Reserves Act (Section 54 for leases/licenses required to be granted by Council for occupying “clubs”) and the Historic Places Act. These are outlined in further detail below.

We note that the advice below is based on the proposal as it stands within this report, and changes to the proposal may alter the advice contained in this section.

We recommend early engagement with Council planning officers to confirm the most appropriate consenting approach, information requirements and to discuss notification.

A Consultation Plan would assist in directing the consultation objectives, methods and outline how feedback will be taken into account.

4.2 Christchurch City Plan – Preliminary Assessment

Approval to use the land to establish a regional sports hub is required from Christchurch City Council (Council). This is because the scale of development proposed is of a greater scale than would be permitted “as of right” under the current zoning applied to the site by the Council City Plan. This does not mean that development is not necessarily inappropriate. It indicates that the development is of a nature or scale that warrants further scrutiny to ensure that any potential adverse effects will be appropriately avoided or mitigated.

4.2.1 Current zoning

Under the Operative City Plan, the site is zoned Open Space 2 which is described as follows:

Parks in the Open Space 2 Zone typically have substantial physical resources within them such as clubrooms, changing sheds and toilet facilities. As well as these, recreation facilities such as tennis courts, goal posts, cycle and walkways are common in this zone.

Open space 2 often has high levels of public use on weekends and weekday evenings and provisions are included to protect the surrounding community from the adverse environmental effects of public use. This includes factors such as lighting, noise, increased traffic and safety issues.

Comment

The types of activities proposed for Nga Puna Wai are generally consistent with the purpose of the zone: substantial physical resources,

clubrooms, recreation facilities with high levels of public use particularly in weekends and weekday evenings.

Potential effects on the surrounding community will need to be considered as part of a resource consent application.

4.2.2 Proposed zoning

Christchurch City Council is currently reviewing the Operative Christchurch City Plan and the Banks Peninsula District Plan, which will result in one plan – the Christchurch District Plan. All decisions on the replacement District Plan will be made by 9 March 2016. While it is anticipated that the plan may become operative at this time, some chapters may be subject to appeals to the High Court, and this timeframe is not guaranteed.

Under the Proposed Replacement District Plan the site is zoned **Open Space – Metropolitan Facilities Zone** which is described as follows:

Open Space – Metropolitan Facilities Zone accommodates public and private major sports facilities, including those for motorised craft, larger recreation facilities, and motorised sports facilities on sites that provide:

- Sufficient land area to accommodate large scale buildings, structures, car parking and, where necessary, buffer areas to minimise reverse sensitivity;
- Capacity for multifunctional use and provision for co-location of complementary or compatible activities, including community and ancillary commercial activities;
- Capacity to host city, regional, national and international events providing entertainment to residents and visitors, including Agribusiness activities associated with the A&P Show and Canterbury Sale Yards; and
- Revitalisation of Christchurch post earthquakes

The term ‘**major sports facility**’ is defined in the proposed plan as:

the same meaning as minor sports facility except that it additionally includes, but is not limited to, the following:

1. stadium (covered and open air);
2. indoor sports and recreation facility;
3. swimming pool complex/aquatic centre (covered and open air);
4. golf driving range and/or golf course;
5. equestrian raceway and showgrounds, including ancillary buildings, such as stables, and servicing facilities;
6. athletics facilities and structures, including running tracks;
7. accessory club room/clubhouse;

8. accessory spectator grandstands;
9. boat ramp, jetty and boat launching facility; and
10. boat storage, sheds and workshops.

The term ‘**minor sports facility**’ is defined as:

the use of land, buildings and/or structures principally for public or private minor sports activity, whether a charge is made for admission or not. Includes but is not limited to the following:

1. informal and formal playing fields, including ancillary structures such as goal posts;
2. ball courts and artificial playing surfaces;
3. golf driving range;
4. skateboard park;
5. BMX tracks;
6. mountain bike tracks;
7. accessory lighting, including support structures; and
8. accessory spectator seating.

Major sports facilities (P3) are a permitted activity in the Open Space Metropolitan Sports Facility zone.

Ancillary office activity (P11) is a permitted activity in the Open Space Metropolitan Sports Facility zone under the proposed replacement plan.

The activity specific standard states:

- a. *the combined floor area of all ancillary office activities shall not exceed 10% of the gross floor area of all buildings on the site.*

Also note **Community Activities and/or Community Facilities** (P16) are permitted and can be accessory to or co-located with major sports facilities on the same site (but exclude health care facilities).

There are also specified tree planting requirements in relation to parking.

Comment

The proposed development is of a nature and scale which is anticipated and provided for under this new proposed zoning. Page 78 of the Chapter 18 – Open Space Section 32 Report for the proposed Replacement Plan provides the rationale for the proposed policy and its generous specified maximum collective building site coverage (Buildings: 20% of all of site) and maximum impervious surfaces (30% of all site, excluding buildings):

Efficiency and Effectiveness

The Metropolitan Facilities Zone is intended to provide for large scale built recreation and associated or complementary outdoor recreation facilities. A number of metropolitan facility sites are privately owned and managed as golf courses, sports academies or race courses. Public facilities such as Jellie Park and Pioneer Stadium have the large built facilities needed for indoor sports and recreation activities. Generally metropolitan facilities are the most intensively used use open space zones and built coverage provisions recognise this.

Existing building footprint sizes –Measurements of existing structures within this zone indicate that there are no major structures smaller than 1000m². Major existing built structures range from 1000m² to 10,000m².

Site coverage. The District Plan review therefore recognises the size requirements of multi use sports facilities by increasing the maximum site coverage for built sports and recreation facilities and removing individual building size requirements (with the exception of Canterbury Agricultural Park). This also recognises the trend toward co-location of facilities (sports hubs) that the Council is aiming to achieve. Co-location is generally more cost and space efficient than spreading or duplicating facilities across the city. Removal of maximum building size limits and reliance on overall site coverage provides greater opportunity for the zone purpose to be achieved as well as reducing consent costs for building developments.

Impervious surface constraints have been maintained to provide a balance between the large area of hard surface infrastructure and green open space desirable to mitigate hard surfaces and to provide for outdoor activities. The aim is to maintain this balance in new and existing metropolitan facilities sites.

4.2.3 A Consentable Scale of Development

Each development needs to be assessed on its merits and with due regard to its context and scale of effects.

As outlined above, the proposed rules for the Open Space – Metropolitan Facilities zone are very enabling, with respect to the scale and scope of the Nga Puna Wai facilities.

However, while the thresholds for “permitted” (i.e. as of right) building footprints in the operative Open Space 2 zone are relatively small, this does not necessarily preclude larger, higher or multiple buildings at Nga Puna Wai from being consentable. As “discretionary activities” it indicates that this scale of development warrants greater scrutiny.

The following are mitigating factors that will support a greater footprint or scale of buildings on this site:

- Consideration of the policies and objectives relating to the proposed zoning, Open Space – Metropolitan Sports Facilities, which makes provisions for such sporting facilities on this site;
- The size of the site (at greater than 25ha) is such that, with appropriate landscaping and the proposed layout, a sense of openness will continue to prevail;
- The significant setback of the buildings from residential properties;

- Existing and proposed landscaping across the site;
- Any bunding or embankments; and
- The design, shape or orientation of any buildings (and their central location on the site).

Added to this, a resource consent application should direct decision makers to give weight to the appropriateness of this development for assisting in delivering the social, community and cultural outcomes sought by the Canterbury Earthquake Recovery Strategy.

A Landscape and Visual Assessment may assist in defining where the most sensitive sites to development are and for recommending what form of specific mitigation measures may be appropriate.

4.2.4 Wigram East Retention Basin Designation

The northeast of the site is designated for the Wigram East Retention Basin, as shown on Planning Map 45A of the Operative District Plan.

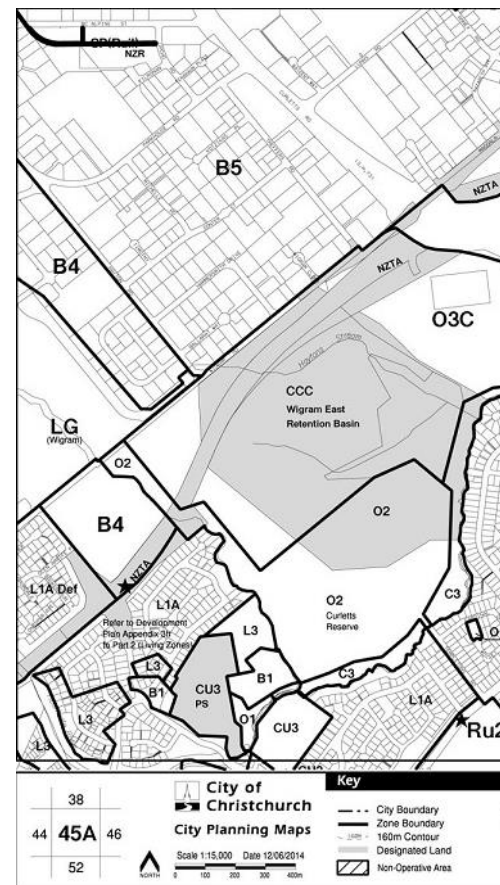


Figure 4-1 Map 45a of the Operative District Plan

Under the RMA [s176(1)(a)]:

no person, without the prior written consent of that requiring authority [in this case Council], may do anything in relation to the land that is subject

to the designation that would prevent or hinder a public work or project or work to which the designation relates, including:

- Undertaking any use of the land; and
- Subdividing the land; and
- Changing the character, intensity, or scale of the use of the land.

Comment

The current proposal for the regional sports hub includes the provision of sports fields over a portion of this designated retention basin. Written approval from the requiring authority (in this case, Council as the asset owner of the basin) would need to be submitted with any consent application to indicate their agreement for the development of this land for recreational purposes, and that it will not hinder current or future public works. Alternatively Council, in its capacity as requiring authority, could also remove their designation in part over the affected part of the site, having given consideration to the effect of the removal of part of a designation on the remaining designation as detailed in section 182 of the RMA.

Recent conversations with council officers have indicated that the capacity of the stormwater basin is unlikely to be compromised if the sports fields were situated on land located within the existing designation boundaries, but noted it is likely that works would need to be undertaken to increase the size and capacity of the existing pond located within the designation. Formal confirmation of the above from Council staff is required, and matters could be progressed under s176(1)(a) or s182 of the RMA as relevant.

Should the capacity of the stormwater basin in fact be compromised by locating sports fields on land within the existing designation boundaries (by hindering current or future public works associated with the designation), then an Alteration to Designation would be required to alter the boundaries of the designation. The boundaries of the designation would need to be altered to exclude the sports fields so they do not overlap the designation and to extend the designation to incorporate other land (e.g. to the north/west) to allow the stormwater retention basin to operate as intended.

4.2.5 Development controls

The relevant development controls in the Open Space 2 Zone and the proposed Open Space – Metropolitan Facilities Zone are set out in **Appendix D Planning Controls** for reference.

4.3 Current zoning

Under the operative City Plan the following resource consents are anticipated to be required for elements of the proposal that breach the development and community standards:

Development standards

Based on the Masterplan the proposal does not comply with the following development standards:

- Buildings in excess of 8m in height [assumed to be the grandstand at least]

The Masterplan appears to comply with the building setback from boundary, height in relation to boundary and landscape buffer requirements.

Community standards

Based on the Masterplan the proposal does not comply with the following community standards:

- Maximum area covered by any building is greater than 100m²;
- Maximum percentage of the net site area covered in a building is greater than 1%;
- Maximum percentage of the net site area covered in impervious surfaces (which will include the artificial turfs).

Other resource consent requirements

- Traffic generation (being an activity that generates more than 250 vehicle trips per day and/or provides more than 25 parking spaces).

As such, the key issues for any resource consent application are likely to be traffic generation and the degree of effects on the surrounding community in terms of visual amenity (built form) and the effects of the activities themselves (noise and glare).

4.4 Proposed zoning

Under the Proposed Replacement District Plan the following resource consents are anticipated to be required for elements of the proposal that breach the development and community standards:

Built Form Standards

Based on the Masterplan the proposal appears to comply with the built form standards.

Other resource consent requirements

- Traffic generation (being an activity that generates more than 250 vehicle trips per day (7.2.3.10 Rule 10 - High trip generators))
- Consent may be required if the proposal does not meet the rules for car parking/loading spaces/manoeuvring areas/access design/vehicle crossings (outlined in Rules in 7.2.3).

4.4.1 Information requirements

In addition to the necessary site plans, elevations and cross sections (and subject to confirmation from Council officers) any application for resource consent should be supported by:

- A Needs Assessment or similar background information which outlines why this facility is required, the key benefits and how it will address the impacts of the Canterbury earthquake on recreational facilities in the southwest of Christchurch;
- Written support from the community and sporting groups who propose to use Nga Puna Wai (if these are able to be obtained);
- An Integrated Traffic Assessment
- (including demonstration of compliance with the City Plan requirements in relation to access, manoeuvring, car parking, cycle parking or loading requirements);
- A Landscape Plan (conceptual);
- A Landscape and Visual Assessment;
- A Preliminary Contamination Assessment (to determine compliance with the National Environmental Standards: Soil Contamination);
- A Cultural Impact Assessment;
- Archaeological Assessment;
- Lighting assessment
- (modelling of floodlighting to show compliance with lux levels on residential and conservation zone boundaries); and
- Acoustic assessment
- (noting that the standards in Appendix D “do not apply to sports events that do not involve amplification”).

4.4.2 Conditions Framework

In order to avoid unnecessary capital expenditure, it is strongly recommended that a set of suggested consent conditions is drafted as part of any application that address:

- Monitoring of parking demand as facilities are progressively developed (in stages) to avoid unnecessary overprovision of car parks (but equally this allows for addressing any car parking shortfalls should they occur); and
- Monitoring of the effectiveness of traffic management measures, particularly around major events such that these can be refined over time.
- Noise in relation to potential staging of noise mitigation measures (should the acoustic assessment show that these are required).

4.5 Reserves Act

The proposed site is classified as a “Recreation Reserve” under the Reserves Act 1977.

The main purpose of Recreation Reserves, as defined by section 17 of the Reserves Act, is the provision of areas for recreation and sporting

activities. This is to provide for the physical welfare and enjoyment of the public and for protection of the natural environment and beauty.

The proposed development appears to be consistent with the status of the land as a Recreation Reserve given that its purpose remains as being for recreation and sporting activities. We assume that agreement to develop this part of the Reserve for active sporting uses will be resolved internally (within Council).

4.5.1 Reserve Management Plan

All of the land subject to this Masterplan is covered by the *Nga Puna Wai and Canterbury Agricultural Park Management Plan* which was completed in 2010. The Management Plan has been prepared in accordance with the functions of the Council under the Local Government Act 2002 (LGA). The Plan is to assist the Council in carrying out its functions under the Resource Management Act 1991 (RMA), LGA and for the reserved part of Nga Puna Wai the Reserves Act, by supporting the following things being done for Nga Puna Wai and Canterbury Agricultural Park:

- Managing and developing each part of Nga Puna Wai and Canterbury Agricultural Park in a way that complies with the City Plan zoning for that part.
- Managing the reserved parts of Nga Puna Wai for the purpose of their classification under the Reserves Act.
- Ensuring sustainable management of the natural and physical resources of Nga Puna Wai and Canterbury Agricultural Park.
- Integrating the financial planning (operational and capital works) for all parts of Nga Puna Wai and Canterbury Agricultural Park.
- Providing opportunities for effective public access for outdoor recreation, including spaces for organised sport and tracks for, for example, walking and cycling.

On the 12th of March 2015 amendments to the Management Plan were adopted following strong community support for the establishment of a sports hub at Ngā Puna Wai. The draft changes were approved by a panel of councillors and are summarised as follows:

- An additional policy (Policy 5.2) sets out the purpose of development and use of land for a major recreational and sporting hub facility development.
- An amendment to Section 6.3 Reserves Area (Open Space 2 Zone and Conservation 3 Zone) outlining the feasibility and requirement for the development of a new recreational and sporting hub facility to accommodate the displaced sports codes as a result of the earthquakes in 2010 and 2011.
- An additional appendix outlining the background and assessment of the proposed recreational and sporting hub concept at Ngā Puna Wai.
- Figure 15 illustrating an indicative recreational and sporting hub for Ngā Puna Wai Recreation Reserve

The management policies in the Management Plan have legal standing under the Reserves Act for the part of Nga Puna Wai classified as reserve. www.ccc.govt.nz/cityleisure/parkswalkways/ngapunawaiandcanterburyagriculturalpark

The compatibility with the Management Plan should be confirmed in discussions with the Administering Body (within Council).

4.6 Environment Canterbury Regional Consents

In addition to the approvals from Christchurch City Council, resource consents are likely to be required from Environment Canterbury (ECan) for matters relating to earthworking the land and in relation to water, particularly discharging of stormwater and the taking of groundwater.

Possible Activities Requiring Regional Consents

LAND USE CONSENTS

Excavation of land

Use of land to store or use hazardous substances

Construction and use of a bore

Earthworks within riparian margins (depending on proximity of works to nearby waterways)

Land use for consent within stream bed (depending on proximity of works to nearby waterways)

WATER AND AIR PERMITS

Discharge of stormwater to land during construction and operation

Discharge of water and contaminants associated with dewatering

Discharge of water and contaminants to land

Discharge of dust to air during construction

4.7 Suggested Consenting Strategy

4.7.1 Consenting under the District Plan

While the proposed Replacement District Plan may become operative any time from March 2016 onwards this is not certain (and depends on whether the relevant rules are subject to appeal). As such, the start date for project works could be delayed if consents are only lodged after the provisions of the proposed replacement district plan become operative. Accordingly, delaying all consents until the Replacement District Plan is in force is not recommended.

Given the current anticipated timeframes for the project, with initial works on site beginning as early as December 2015/early 2016, it is recommended that the necessary consents (for Stage 1 works at least) are applied for under the operative District Plan.

In preparing the consent applications under the Operative District Plan, it is appropriate to give consideration to relevant objectives and policies in the proposed replacement plan. However, until such time as the Proposed Replacement Plan is made operative, no consideration can be given to the rules of this plan. However, the objectives and policies for the land use zoning in the proposed replacement plan can be considered. The Open Space Metropolitan Facilities Zone anticipates the establishment of a metropolitan sports facility such as Nga Puna Wai on this site which will be supportive to the overall application.

4.7.2 Process and Staging

Staging

While it is possible to pursue consenting the overall development at the outset, seeking planning consents in stages may be advantageous to get initial stages established without delay, particularly if there is uncertainty around the scope of works for the later stages of the project and because the Replacement Plan zoning has objectives, policies and rules that more closely align with the larger aspects of the development proposal.

As it is likely that the sporting facilities will be constructed in stages, the required consents for Stage 1 could be applied for at the outset, with additional consents lodged at a later date for the subsequent stages of the project when sufficient scope and design details are determined.

It is recommended that the relevant consent applications are prepared and lodged with CCC and ECan as soon as relevant details are available for enabling works, such as earthworks, to minimise the risk of impacting on the start date for physical works.

Envelope Consent

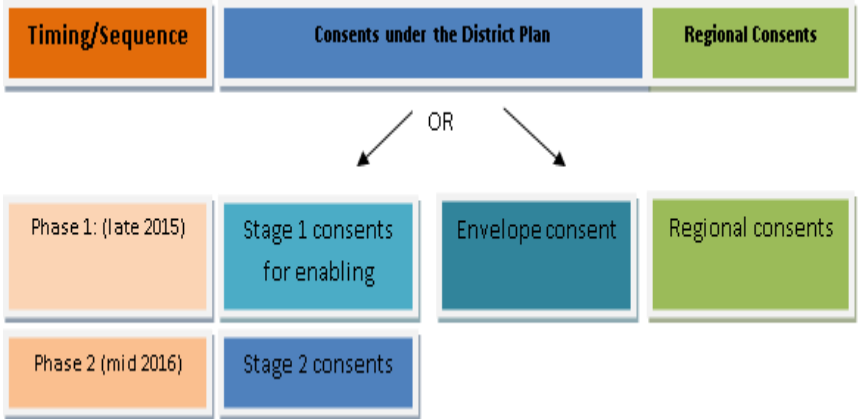
It is recommended that further consideration is given to seeking an “envelope consent” for stages 1 and 2 as an alternative to providing all the design information upfront. Obtaining all consents at the outset provides greater certainty and removes consenting risk.

An envelope consent would approve some parameters (e.g. the location of key buildings, a maximum building footprint and height) with further detail (i.e. the final design and form of those buildings) submitted for Council approval at a later date (potentially via the Urban Design Panel). This option should be discussed further with the Consents staff at Council prior to developing consent documentation.

4.7.3 Key steps and timeframes

The diagram below outlines two options for consenting. These should be discussed further with Council officers and will be dependent on the availability of design and scope details.

It could take approximately 3-6 months from the date of lodgement of the consents to get approval (refer to summary of key changes to the RMA from 3 March 2015 in **Appendix D**) if the consents are processed on a fully notified basis. If the application is notified a hearing will be required to hear submissions.



5 Geotechnical

5.1 General

A site specific geotechnical investigation was carried out by Beca during the last week of June, 2013. Geotechnical investigation comprised 5 machine boreholes and 20 test pits. The field investigation was directed on site by a Beca geotechnical engineer. Machine boreholes and test pits were drilled by Prodrill (Auckland) Ltd.

5.2 Subsurface Conditions

The subsurface conditions at Canterbury Agricultural Park Site are generally consistent with the regional geology. Based on the information obtained from the boreholes and test pits, the site can be broadly divided into 2 zones – the North Zone and the South Zone **Figure 5-1**.

The subsurface conditions encountered in the South Zone consist of predominantly medium dense to dense gravels starting from approximately 1.3m below ground level and extending down to 20m below ground level. The shallow depth at which this gravel layer occurs and its thickness (approximately 19m) makes the south zone relatively more conducive to developing the Concept Masterplan sports hub.

The subsurface conditions encountered in the North Zone consist of predominantly soft to loose soils. The low SPT N-values, the soft soils encountered in the test pits and the absence of dense gravel layer (at

shallow depths) make the north zone relatively less desirable for developing the Concept Masterplan sports hub.

5.3 Conclusion

Based on the information gathered in the current investigation, we recommend that all planned buildings be located in the South Zone. Until additional information is gathered, we recommend considering the North Zone of the site less suitable for the proposed sports hub

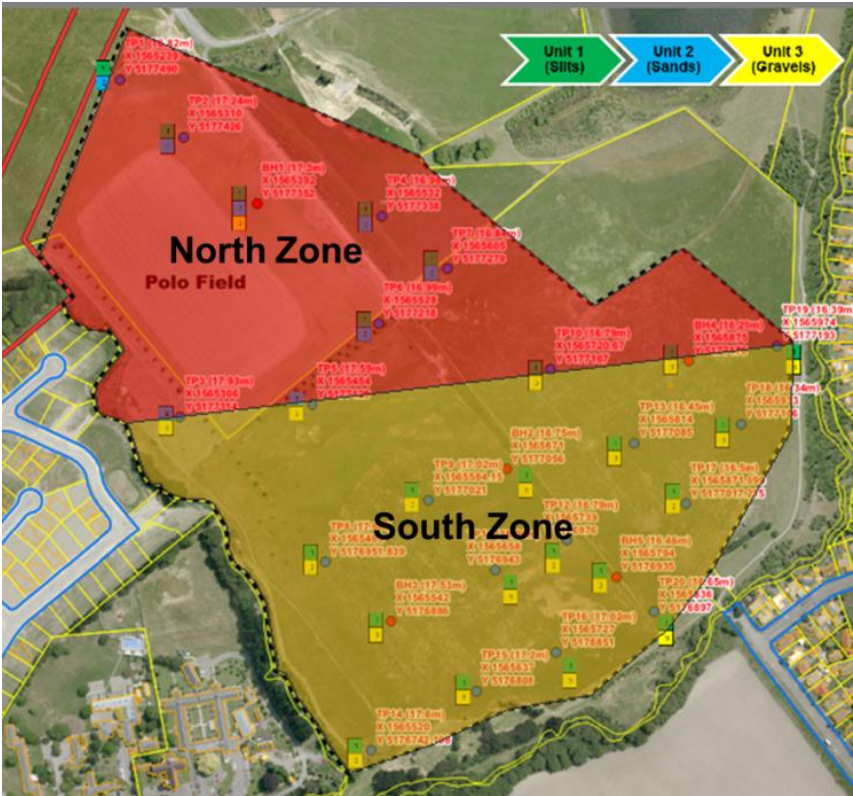


Figure 5-1: Approximate Limits of Various Zones

6 Transportation

6.1 Background

6.1.1 Project Overview

Nga Puna Wai is a grassed open space amenity area which is situated to the south of the A&P showgrounds to the south west of Christchurch City Centre. During most of the year, the A&P showgrounds sees a varied number of users on any given day. This includes livestock auctions and sporting activities including rugby league and Scout jamborees. In addition, the Riding for the Disabled Association (RDA) is based there along with the Halswell Pony Club and the Canterbury Polo Club.

The site is situated adjacent to the Aidanfield residential development, which is of significant size to the southwest and currently in the final stages of development. Development is on-going to the west at Wigram Skies with further residential development planned north of Wigram Road. In addition there is a new development (PC68) proposed to the south of the site off Halswell Road. These are illustrated on Figure 6-1.

Figure 6-1: Future Environment



6.2 Existing and Future Transport Network

6.2.1 Active Modes Network

There are currently four key walking and cycling access points into Nga Puna Wai. These are via; Halswell Road/Templetons Road, Wigram Road (via an underpass and gates), McMahon Drive and via the main A & P showgrounds entrance on Curletts Road.

Halswell Road to the south of the site is considered a key route for cycling on the Council Cycle Map and has on-road cycle lanes (Figure 6-2). There are footpaths either side of Halswell Road from the east of the site, which terminate at Templetons Road. There is no current formal pedestrian / cycle crossing facility in the vicinity of the site on Halswell Road.

Figure 6-2: Christchurch City Council Cycle Map



Curletts Road has a segregated shared use cycle path on the western side. This provides a link to a cycle path alongside Christchurch Southern Motorway (CSM) via the underpass to Wigram Road. In the future the Wigram-Magdala link road will provide cycle access to and from the east via the existing cycleway adjacent to CSM.

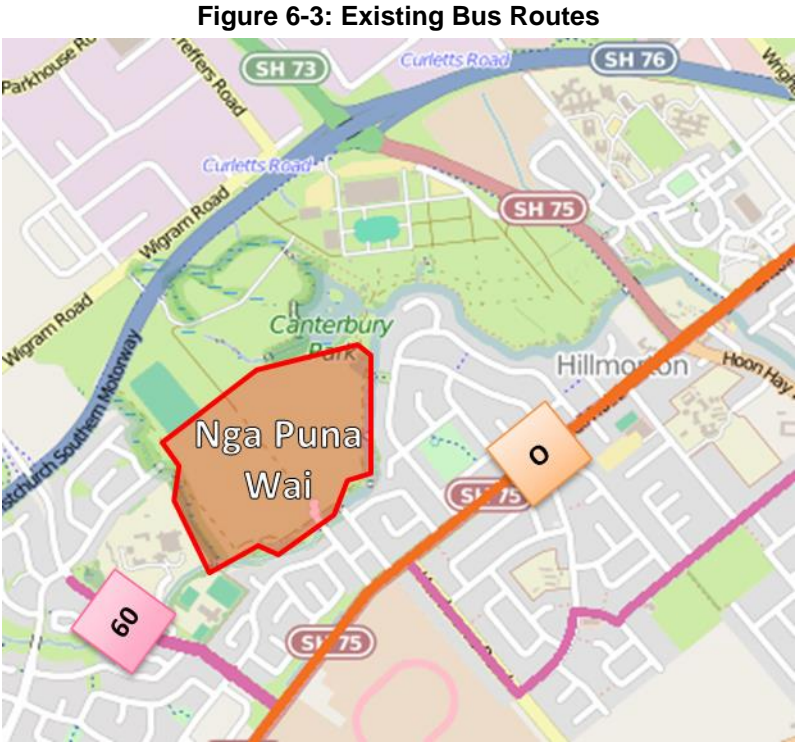
Wigram Road has a footpath on its northern side from Hayton Road eastwards. The cycling and walking access into Nga Puna Wai is via an underpass opposite Hayton Road. There are no current formal cycle facilities or crossing facilities provided in the vicinity of this access point.

6.2.1 Passenger Transport Network

The current bus services operated by ECan relevant to the site are detailed in Table 6-1 and Figure 6-3.

Table 6-1: Nearest Bus Stops to Nga Puna Wai Sports Hub

| Nearest Stop to Nga Puna Wai | Route | Service ID |
|--|----------------------------------|------------|
| Aidanfield Drive | Hillmorton to Southshore via CBD | 60 |
| Hendersons Road (near Templetons Road) | Halswell to Queenspark via CBD | Orange |



Source: www.metroInfo.co.nz

6.2.2 Road Network and Site Access

The main road network surrounding Nga Puna Wai includes the following State Highways:

- SH75 Halswell Road
- SH75 Curletts Road
- SH76 CSM (Note no direct access to site)

Other local road arterial roads include:

- Wigram Road
- Aidanfield Drive

CCC is currently constructing a new link road between Wigram Road and Magdala Place crossing CSM via an over bridge. Available Annual Average Daily Traffic (AADT) information is tabulated in Table 6-2. It should be noted that the next stage of CSM is anticipated to result in some changes in traffic patterns in the south-west area. Evening peak volumes have been extracted from Christchurch Assignment Simulation Traffic (CAST) model V06A and are shown in Table 6-3.

Table 6-2: Road Network Traffic Volumes

| Road | AADT | % Heavy Goods | Date | Source |
|------------------|--------|---------------|------------------|---|
| Halswell Road | 18,920 | 2.4% | 2012 | NZTA State Highway Traffic Volumes |
| Curletts Road | 35,737 | 8% | 2012 | NZTA State Highway Traffic Volumes |
| Wigram Road | 5,246 | - | 2011 | Council Traffic count database |
| Aidanfield Drive | 3,000 | - | 2013 (Published) | http://tmpforchch.co.nz/wp-content/uploads/2013/05/Road-Level-Classifications-20.2.13.pdf |

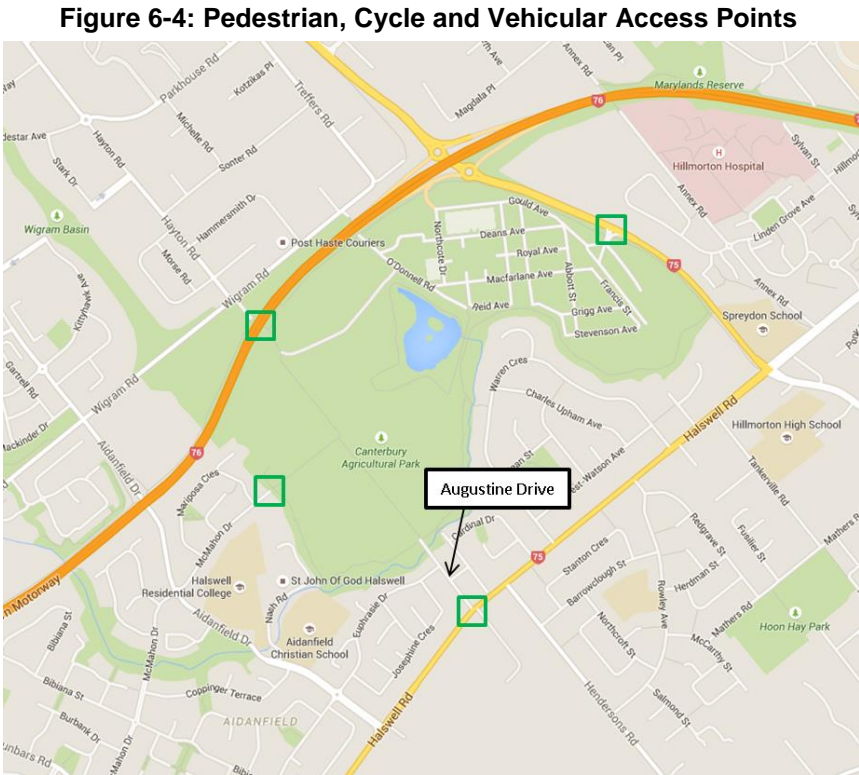
Table 6-3: 2021 CAST Evening peak hour and daily 2 way traffic volumes

| Road | 2021 Veh/hour | 2021 AADT |
|------------------|---------------|-----------|
| Halswell Road | 1866 | 14690 |
| Aidanfield Drive | 703 | 7240 |
| Augustine Drive | 78 | 190 |
| PC68 Access | 557 | 4870 |
| McMahon Drive | 55 | 600 |
| Bibiana St | 194 | 2050 |
| Euphrasie Drive | 7 | 70 |

There are four existing vehicular access points into the wider site Figure 6-4, however these do not currently provide for public access into the study area on a day-to-day basis.

These are as follows:

- Halswell Road via Augustine Drive
- McMahon Drive which is gated
- Wigram Road via an underpass which is gated and has a height restriction of 2.4m
- Curletts Road which provides access to the A&P showgrounds.



Halswell Road

Access from the southern side of the site is currently from SH75 Halswell Road and Augustine Drive. It is considered that the route via Halswell Road and Augustine Drive will be the primary access point to the site and as such will be the focus of traffic modelling to understand the effects of the development on the adjacent road network.

Halswell Road is currently a two-lane-two-way road. According to the CAST model Halswell Road between Curletts Road and Dunbar Road is likely to be upgraded to a four-lane-two-way road between 2021 and 2031. CCC has not allocated funding to this in the CCC Long Term Plan (2015-2025). However, funding has been allocated intersection improvements at the Halswell Road/Augustine Drive intersection in the 2019-2021. The NZTA NLTP gives this project a priority of 3 of 5 and has funding allocated for design of the project in 2017/2018. According

to the CAST model, the Halswell Road Four-Laning will change the Halswell Road/Aidanfield Road to a left-in-left-out intersection.

Wigram Road

Access from the north of the site is available from Wigram Road via an underpass opposite Hayton Road. While this is permanently open to pedestrians and cyclists, it is closed to vehicular traffic except in special circumstances. In addition, the underpass is currently unsealed with a 2.4m height restriction, shown in **Figure 6-5**. Pedestrians and cyclists access to Nga Puna Wai is currently via locked gates.

Figure 6-5: Wigram Road Access and Underpass



McMahon Drive

Access to the western side of Nga Puna Wai is through the Aidenfield sub-division on McMahon Drive. This access is currently gated and does not allow general vehicle access. McMahon Drive is a residential collector and has footpaths and on-street parking. This has the potential to be used for secondary vehicle access to the Sports Hub.

Curletts Road

The Curletts Road access provides a link to the A&P showgrounds and its existing internal road infrastructure. Currently, there is no route through to the location of the proposed Sports Hub to the south.

6.3 Proposed Development

The development of Nga Puna Wai Sports hub will be staged with Stage 1 of the Masterplan (**Figure 6-6**) involving the construction of the following facilities for day-to-day usage:

- Hockey fields (x2) with 320 seat grandstand
- Athletics Track (x1) with 320 seat grandstand
- Outdoor Tennis Courts (x12)
- Canterbury Rugby League field (x1) with 320 seat grandstand and embankment
- This includes the following facilities for events to be held at Nga Puna Wai
 - 320 temporary seats for the H1 Hockey Fields
 - 960 temporary seats next to Main Athletics Track
 - 640 temporary seats for Rugby League
 - 1000 temporary seats for Tennis

Figure 6-6: Stage 1 Masterplan Site Layout Concept



The access arrangements for Stage 1 are as follows:

- Vehicle access will be via Augustine Drive with a sealed main access road with unsealed internal roads to access other parts of the site
- The majority of parking will be provided in large unsealed parking lots at the southern end of the site with smaller parking areas closer to specific activities as required
- Buses will enter and exit from Augustine Drive with an internal loop and bus stop provided to allow buses to turn around
- Cycle access via shared paths on Augustine Drive and the main access road
- An unsealed shared path is provided around the perimeter of the site that connects to Templetons Road, the CSM underpass which connects to Wigram Road and the CSM cycleway

The Stage 2 (complete) Masterplan (**Figure 6-7**) is based on a multi-purpose venue that includes the following additional facilities:

- Hockey fields (x1)
- Athletics Training Track (x1)
- Outdoor Tennis Courts (to be determined)
- General Purpose Grass Sports Fields (x7)
- Canterbury Rugby League field(x1) and embankment for use during events
- Additional car parking as required

Figure 6-7: Stage 2 Masterplan Site Layout Concept



The access arrangements for Stage 2 are as follows:

- Vehicle access will be via Augustine Drive with the main access road with internal roads to access other parts of the site
- A road around the perimeter of the site to connect to smaller parking areas around the site
- The majority of parking will be provided in large parking lots at the southern end of the site with smaller parking areas closer to specific activities as required
- Buses will transit through the site on the main access road connecting McMahon Drive and Augustine Drive with a short localised diversion away to allow for a bus stop
- Cycle access via shared paths on Augustine Drive and McMahon Drive to shared paths on the main access road
- An unsealed shared path is provided around the perimeter of the site that connects to Templetons Road, the CSM underpass which connects to Wigram Road and the CSM cycleway

Special events are also likely and these have been considered in this concept stage, albeit it is considered that the transportation effects would be dealt with at a later stage by specific Event Management Plans for the specific scale and nature of these activities to support planning consents.

6.4 Assessment of Transportation Effects

6.4.1 Predicted Trip Generation

The trip generation has been determined based on the estimated peak visitor numbers from the 'Needs Analysis' conducted by Global Leisure Group for the proposed sports activities catered for within the hub. This includes allowance for overlapping activities with consideration to numbers of; players, supporters and officials during the 'peak' cross-over season.

For day-to-day attendance a vehicle occupancy ratio has been determined at 1.5 persons per vehicle for junior activities and between 1 to 1.25 for senior activities. This may be higher during school hours due to use of school buses, but is likely to be more representative of movements for after school events (during the evening peak). At those times users are travelling to their homes, rather than a single destination such as a school.

The majority of spectators are likely to arrive in the same vehicle as participants involved, particularly junior sports where the spectators are most likely to be parents. It is recognised that there will be additional traffic generated by spectators who do not arrive with participants. However, during the week, this is likely to result in little additional traffic generated as this is when training sessions are likely to occur. The Saturday peak will generate a larger number of additional vehicles by spectators, as this is when competitive fixtures are held, so there are likely to be spectators from visiting/opposition teams too.

For the purposes of the analysis, the following assumptions are also made:

- The weekday evening peak is likely to be the 'worst case' scenario in terms of combination of the activity trip generation and existing network movements
- All movements are assumed to be by car during the PM peak period
- An additional 5% of vehicles will be generated by spectators during the PM peak

The predicted traffic generation for the weekday evening peak during the summer and winter sporting seasons are summarised in **Table 6-4** and **Table 6-5**

Table 6-4 – Winter Weekday Evening Trip Generation by Activity Type

| Sport Activity | Stage 1 Masterplan | | Stage 2 Masterplan | |
|---|------------------------------------|---|------------------------------------|---|
| | Total Participants & Support Staff | Vehicle Trip Generation (weekday peak hour) | Total Participants & Support Staff | Vehicle Trip Generation (weekday peak hour) |
| Hockey (14-per-side) | 130 | 91 | 188 | 132 |
| Tennis minimum (4-per-court) | 13 | 11 | 13 | 11 |
| Covered courts max (4-per-court) | 0 | 0 | 50 | 42 |
| Sports fields (2 junior fields per field) (10-per-side) | 0 | 0 | 294 | 206 |
| Canterbury Rugby League field (Senior Training Only) + Office Staff | 44 | 31 | 79 | 55 |
| TOTAL | 187 | 133 | 624 | 457 |

Table 6-5 – Summer Weekday Evening Trip Generation by Activity Type

| Sport Activity | Stage 1 Masterplan | | Stage 2 Masterplan | |
|--|------------------------------------|---|------------------------------------|---|
| | Total Participants & Support Staff | Vehicle Trip Generation (weekday peak hour) | Total Participants & Support Staff | Vehicle Trip Generation (weekday peak hour) |
| Junior Athletics | 90 | 63 | 90 | 63 |
| Senior Athletics | 70 | 74 | 70 | 74 |
| Tennis minimum (4-per-court) | 50 | 42 | 50 | 42 |
| Covered courts max (4-per-court) | 0 | 0 | 50 | 42 |
| Sports fields (junior 11-a-side cricket) | 0 | 0 | 78 | 55 |
| Canterbury Rugby League Office Staff | 8 | 7 | 8 | 7 |
| TOTAL | 218 | 186 | 346 | 283 |

We have also determined the number of likely trips for special events and tournaments based on likely capacity of the various stadiums. These are based on combinations of numbers for various activities as detailed in **Table 6-6**. A higher vehicle to visitor ratio of 2.6 is considered appropriate due to likely use of team buses and groups of spectators likely to travel together. It has been assumed that scheduling of other day to day / weekend activities will be managed to minimise conflicts between these events and those at the A&P showgrounds.

Table 6-6 – Event Trip Generation by Activity Type

| Sport Activity | Stage 1 Masterplan | | Stage 2 Masterplan | |
|---------------------------------------|--------------------|---|--------------------|---|
| | Total persons | Vehicle Trip Generation (weekday peak hour) | Total persons | Vehicle Trip Generation (weekday peak hour) |
| Hockey international | 960 | 369 | 3,038 | 1,168 |
| Athletics Colgate South Island Champs | 1,500 | 577 | 2,500 | 962 |
| Athletics nationals | 1,050 | 404 | 1,050 | 404 |
| Athletics international event | 1,500 | 577 | 2,950 | 1,135 |
| Canterbury Rugby League Game | 1,000 | 385 | 5,000 | 1,923 |

The vehicle trip generation during events are assumed to occur during weekend with day-to-day activities occurring at other parts of Nga Puna Wai. The vehicle trip generation during events is shown in **Table 6-7**.

Table 6-7: Vehicle Trip Generation During Special Events

| Event Combination | Stage 1 Masterplan | Stage 2 Masterplan |
|---|--------------------|--------------------|
| International athletics + day to day cricket (Stage 2 only) + day to day tennis (Summer) | 674 | 1,395 |
| International hockey + day to day sports field activities (Stage 2 only) + day to day tennis (Winter) | 467 | 2,073 |
| Canterbury Rugby League Game +day to day sports field activities (Stage 2 only) + day to day hockey+ day to day tennis (Winter) | 513 | 2,830 |

6.5 Traffic Assessment

6.5.1 External Traffic Effects

The Stage 1 Masterplan provides for access solely via Augustine Drive (off Halswell Road). The Stage 2 Masterplan provides access via Augustine Drive (off Halswell Road) and McMahon Drive, with a central spine road linking these two accesses with a further secondary internal access road around the northern perimeter of the facility.

The primary access to the site in both instances will be via the Halswell Road/Augustine Drive intersection. For the Stage 2 Masterplan,

Halswell Road provides the most direct and convenient link with the northern, eastern and southern areas of Christchurch, from which the majority of users are likely to be drawn. McMahon Drive provides the most direct and convenient link to the western side of Christchurch. McMahon Drive links through to the residential areas via Dunbars Road and the new subdivisions on Halswell Junction Road. McMahon Drive will also provide access to users from the western side of the CSM via Aidanfield Drive.

Based on the predicted trip generation, traffic volumes and intersection layout extracted from the CAST model, SIDRA Intersection Software has been used to model the Halswell Road/Augustine Drive intersection. This has been based on the forecasted background traffic volumes and movements generated by the development during the evening peak. The following assumptions have been made:

Stage 1 Master Plan

- Stage 1 will be developed before PC68 is implemented with 75% of traffic heading east and 25% of traffic will head west
- When PC68 is developed the Augustine Drive/Halswell Road intersection will be upgraded to signals and 75% of traffic will head east, 20% will head west and 5% will go straight on into PC68
- For the purpose of the modelling, no reduction in trips has been taken into account for public transport and active mode trips. Therefore the number of a vehicle trips for the Sports Hub is higher than would be anticipated with the identified pedestrian, cycle and PT facilities.

Stage 2 Master Plan

- PC68 will be implemented prior to the Stage 2 of the masterplan, whereby it will be upgraded to a signalised intersection
- 75% of traffic entering and leaving Nga Puna Wai will be via the Augustine Drive/Halswell Road intersection with 85% of traffic heading east, 10% heading west and 5% going straight on into PC68 at this intersection
- For the purpose of the modelling, no reduction in trips has been taken into account for public transport and active mode trips. Therefore the number of a vehicle trips for the Sports Hub is higher than would be anticipated with the identified pedestrian, cycle and PT facilities..

a. Stage 1 Operational Assessment

The operational assessment of the Stage 1 development has been conducted at the Halswell Road/Augustine Drive intersection in 2021 and 2041, as this is the only access available during Stage 1. The upgrade of the Halswell Road/Augustine Drive to signals is due to be conducted 2019-2021. However, the timing of PC68 is currently unknown so this date could be subject to change. The operational assessment for Stage 1 will consider the performance of the intersection with and without the PC68 related changes. At this point, it is assumed that the Halswell Road 4-Laning project has not been completed as no funding has been committed by NZTA at this stage.

The results of the modelling for Stage 1 are shown in **Table 6-8** to **Table 6-10**. The letters in the tables refer to the level of service and are defined as follows:

- Control delay is minimal with many vehicles not required to stop at all.
- Control delay is not significant with more vehicles stopping than level of service A.
- Stable operation with a significant number of vehicles stopping, though many still pass through the intersection without stopping.
- Borders on a range where a small increase in flow substantially increases delay with many vehicles stopping and the proportion of vehicles not stopping declining.
- Significant delays and low travel speeds with queues frequently unable to dissipate
- High delay and significant queuing causing extremely slow speeds. This is considered **unacceptable** by most drivers

Table 6-8: Halswell Road / Augustine Drive 2021 PM Peak Intersection Performance without PC68

| Approach | Baseline without Nga Puna Wai | | With Stage 1 Development | |
|---|-------------------------------|-----------|--------------------------|-----------|
| | Delay (LOS) | 95% Queue | LOS | 95% Queue |
| Halswell Road Right Turn (SH75) [NE Approach] | 10s (B) | <1m | 11s (B) | 6m |
| Augustine Drive | 15s (B) | 2m | 22s (C) | 11m |

Table 6-9: Halswell Road / Augustine Drive 2021 PM Peak Intersection Performance with PC68

| Approach | Baseline without Nga Puna Wai | | With Stage 1 Development* | |
|------------------------------------|-------------------------------|-----------|---------------------------|-----------|
| | Delay (LOS) | 95% Queue | LOS | 95% Queue |
| PC68 Road | 60s (E) | 50m | 65s (E) | 60m |
| Halswell Road (SH75) [NE Approach] | 35s (C) | 250m | 40s (D) | 250m |
| Augustine Drive | 50s (D) | 4m | 65s (E) | 75m |
| Halswell Road (SH75) [SW Approach] | 35s (C) | 140m | 40s (D) | 170m |

*Signal Phasing Altered to Increase Intersection Performance

Table 6-10: Halswell Road / Augustine Drive 2041 PM Peak Intersection Performance with PC68

| Approach | Baseline without Nga Puna Wai | | With Stage 1 Development | |
|------------------------------------|-------------------------------|-----------|--------------------------|-----------|
| | Delay (LOS) | 95% Queue | LOS | 95% Queue |
| PC68 Road | 70s (E) | 115m | 80s (F) | 130m |
| Halswell Road (SH75) [NE Approach] | 50s (D) | 320m | 55s (D) | 380m |
| Augustine Drive | 55s (D) | 7m | 75s (E) | 95m |
| Halswell Road (SH75) [SW Approach] | 35s (D) | 20m | 40s (D) | 180m |

The modelling illustrates that the Halswell Road/Augustine Drive intersection will perform satisfactorily in 2021 with only a minor increase in delay on Halswell Road due to the proposed Stage 1 development both with and without the changes to the intersection associated with the completion of the PC68 development.

The modelling indicates there are potentially some issues with the implementation of Stage 2 in 2041. However, it is considered unlikely that this scenario will eventuate, as the Stage 2 development and the Halswell Road Four-Laning and Halswell Road/Augustine Drive intersection upgrades are highly likely to be completed prior to 2041, given the traffic growth on the Halswell Road corridor in that 20-year period between 2021 and 2041.

Therefore, it is recommended that CCC liaise with NZTA to ensure that as part of the Halswell Road Four-Laning and Halswell Road/Augustine Drive intersection upgrade projects allowance is made for the proposed Masterplan Stage 1. If sufficient capacity cannot be provided at the Halswell Road/Augustine Drive intersection for Stage 1, with the NZTA's planned upgrade projects, then alternative access arrangements could be investigated (e.g. the spine road connection to McMahon Drive, a secondary connection to Curletts Road).

b. Stage 2 Operational Assessment

The timing of the full development of PC68 and Stage 2 of the masterplan are currently unknown. Modelling for the Stage 2 has been undertaken for 2041 to represent the ultimate design scenario, when PC68, Halswell Road Four-Laning and Stage 2 of the masterplan are all likely to be completed. As with the Halswell Road/Augustine Drive intersection, SIDRA Intersection Software has also been used to assess the predicted operation of the McMahon Drive/Aidanfield Drive intersection with the additional traffic likely to be generated by Nga Puna Wai. The results of the modelling are shown in **Table 6-11** and **Table 6-12**.

Table 6-11: Halswell Road / Augustine Drive 2041 PM Peak Intersection Performance with PC68

| Approach | Baseline with PC68 | | With Stage 2 Development* | |
|------------------------------------|--------------------|-----------|---------------------------|-----------|
| | Delay (LOS) | 95% Queue | LOS | 95% Queue |
| PC68 Road | 70s (E) | 115m | 135s (F) | 180m |
| Halswell Road (SH75) [NE Approach] | 50s (D) | 320m | 135s (F) | 600m |
| Augustine Drive | 55s (D) | 7m | 170s (F) | 320m |
| Halswell Road (SH75) [SW Approach] | 35s (D) | 150m | 160s (F) | 380m |

*Signal Phasing Altered to Increase Intersection Performance

Table 6-12: Aidanfield Drive / McMahon Drive 2041 PM Peak Intersection Performance with PC68

| Approach | Baseline with PC68 | | With Stage 2 Development | |
|--------------------------------|--------------------|-----------|--------------------------|-----------|
| | Delay (LOS) | 95% Queue | LOS | 95% Queue |
| Aidanfield Drive [SE Approach] | 6s (A) | 5m | 7s (A) | 5m |
| McMahon Drive [NE Approach] | 9s (A) | 14m | 10s (B) | 20m |
| Aidanfield Drive [NW Approach] | 5s (A) | 14m | 6s (A) | 20m |
| McMahon Drive [SW Approach] | 10s (B) | 3m | 10s (B) | 3m |

It is anticipated that Stage 2 of Nga Puna Wai masterplan will create unacceptable delays in excess of 135 seconds at the Augustine Drive/Halswell Road intersection causing the intersection to not perform adequately. The modelling of the Augustine Drive/Halswell Road intersection was based on the layout shown in the CAST model. This layout has not been finalised and can be changed as part of the Halswell Road Four-Laning Project and/or intersection upgrades by CCC.

Therefore, it is recommended that CCC liaise with NZTA to accommodate Stage 1 & 2 of the master plan during the Halswell Road Four-Laning and Halswell Road/Augustine Drive intersection upgrade projects. If sufficient capacity cannot be provided at the Halswell Road/Augustine Drive intersection then alternative access arrangements should be investigated.

With the smaller catchment of users likely to use the McMahon Drive access, the additional traffic heading to and from Nga Puna Wai should not significantly affect the operation of the McMahon Drive/Aidanfield Drive intersection.

It is considered that larger events are more likely to occur at the weekend. However, it should be noted that there are currently no traffic volume forecasts available for weekends to be able to undertake modelling. Specific assessments for events would be required based on the type and scale of events. This would be addressed in an Event Transport Management Plan.

6.5.2 Internal Traffic Effects

During Stage 1 of the masterplan, there is only one access with a loop provided to accommodate u-turning traffic. The loop will primarily be used by buses when the Main Access road, connecting Augustine Drive and McMahon Drive is completed. This loop should be designed to accommodate turning vehicles (especially buses).

The Boulevard connects the main access to the tennis court and Canterbury Rugby League parking and as such, regular traffic is expected. Adequate spacing between the boulevard and loop exit should be provided to accommodate visibility between vehicles on the boulevard and the loop exit.

Once Stage 2 is developed, the Main Access road will assist in spreading traffic movements and reduces the need for any turning areas. The perimeter loop road around the north of the site will assist in spreading parking around the site, but may be subject to u-turning and additional traffic movements, if parking is unavailable adjacent to the individual venues. The section of this road starting near McMahon Drive has a long straight section that may encourage higher traffic speeds.

These matters would be subject to further review as the masterplan is developed beyond the concept, but in principle the overall layout approach is supported from a traffic operations perspective.

6.6 Parking Assessment

6.6.1 City Plan Parking Requirements

The minimum requirements for parking in the Christchurch City Plan have been reviewed and the corresponding totals for the Nga Puna Wai Sports Hub are detailed in **Table 6-13**.

Based on an assumption of 25m² per car parking space (including an allowance for access ways, landscaping and pedestrian walkways) and 1.2m² per cycle, it is estimated that 11,000m² will be required for car parking and 222m² will be required to accommodate cyclists for Stage 2 of the masterplan. It is estimated that 6,525m² will be required for car parking and 110m² will be required for cycle parking for Stage 1 of the masterplan. Based on a review of the concept masterplan, there is sufficient space available to meet the City Plan requirements.

Table 6-13: City Plan Minimum Parking Requirements

| Activity | Visitor car parking spaces | Staff car parking spaces | Cycle Parking Spaces | Loading /Unloading |
|--|----------------------------|----------------------------|----------------------------|--------------------|
| Sports courts for public and private use Stage 1 area 8,000m ² Stage 2 area 9,700m ² | 1 space / 50m2 court area | 1 space / 200m2 court area | 1 space / 150m2 court area | Nil |
| Sports fields for public or private use Stage 1 area 4ha Stage 2 area 12 ha | 15 spaces / ha pitch area | 1 space | 10 spaces / ha pitch area | Nil |
| Total spaces required for Stage 1 | 220 | 41 | 93 | Nil |
| Total spaces required for Stage 2 | 379 | 50 | 185 | Nil |

6.6.2 Predicted Parking Demand

a. Car parking Demand

The peak parking is likely to occur on Saturdays during the cross-over period where games are finishing and participants in the next game are to arriving. Based on the Needs Analysis conducted by Global Leisure Group, a maximum attendance on site for Stage 1 of the masterplan is 550 and 1,410 people for winter and summer respectively. By comparison, Stage 2 has a maximum day-to-day attendance on site of 3,110 and 1,880 people for winter and summer respectively. Based on this the following maximum car parking requirements are shown in **Table 6-14**.

Table 6-14: Maximum Parking Requirements

| | Weekend Day (Winter) | Weekend Day (Summer) | Events (assumed to occur during weekends) |
|---------|----------------------|----------------------|---|
| Stage 1 | 160 spaces | 400 spaces | 780 spaces |
| Stage 2 | 890 spaces | 540 spaces | 2,700 spaces |

b. Coach Parking Demand

Stage 1 of the masterplan has a maximum weekend day attendance of 1,410 people and a maximum attendance during events of 1,550 people. Stage 2 of the master plan has a maximum weekend day attendance of 3,110 people and a maximum attendance during events of 7,700 people.

The requirement for coach parking has been calculated based on the following assumptions;

- For weekend day activities 10% attendees will travel on coaches associated with visiting sporting teams (30PAX per coach).
- For weekend events 20% attendees will travel on coaches associated with visiting sporting teams (30PAX per coach).

The following coach parking spaces should be provided at each stage to accommodate coaches:

- For weekend activities, Stage 1 requires 5 coach parking spaces while the Stage 2 requires 10 coach parking spaces,
- For events, Stage 1 requires 11 coach parking spaces while Stage 2 requires 51 coach parking spaces.

c. Parking Summary

The concept design shows that there is sufficient space to accommodate this parking demand for private vehicles and coaches within the site for weekend day activities. The provision of parking for private vehicles and coaches during events would need to be identified as part of Traffic Management Plans for events.

6.6.3 Parking Distribution

The parking for Stage 1 and Stage 2 is predominantly provided in the southern third of the site in larger car parking areas. The remainder is distributed in smaller car parks adjacent to the various sports field and courts.

In order to ensure efficient traffic circulation, there will need to be an adequate supply of parking in the vicinity of each pitch or court. To support this, a clear way-finding strategy will be necessary to avoid unnecessary movements within the site.

If inadequate parking is provided on-site then parking overflow is most likely to occur on and around Augustine Drive for Stage 1 of the development. Whereas, parking overflow is most likely to occur on and around Augustine Drive and McMahon Drive during Stage 2. If parking overflow is a regular occurrence, residents on streets affected by parking overflow are unlikely to support the development.

During events for Stage 1 and Stage 2, additional car parking space can be provided as required on the grass field to the north of the site that can be accessed via Wigram Road. However, due to the height of the CSM underpass only vehicles less than 2.4m high are able to use this access. An alternative access to this parking area is potentially available from Curletts Road via the Canterbury A&P site. This will require agreement with the Canterbury A&P association.

The location of coach parking has not been determined within the concept. It is considered that there is sufficient space to accommodate this and turning facilities near the main car park for weekend day activities during Stage 1 and Stage 2. Car parking could be re-allocated, particularly in the larger car parks, during weekend activities and special events when a greater number of coaches would be anticipated. If the coach parking demand during events cannot be safely located on-site, off-site coach parking facilities should be considered in Traffic Management Plans.

6.7 Passenger Transport and Active Modes Review

6.7.1 Overview

The assessment of the performance of the transport network does not include a mode shift from cars to passenger transport or active modes. It is important to consider the provision of a high quality passenger transport service and support for active modes to encourage less reliance on cars and potentially reduce the number of vehicles generated by the proposed facility. Reducing the number of vehicles generated by the development, improves road network performance and provides an opportunity to reduce the number of car parks provided within the proposed facility.

6.7.2 Passenger Transport (PT)

During Stage 1, the only route available for buses is to enter and exit is via Augustine Drive as shown in **Figure 6-8**. The Stage 2 masterplan can accommodate a bus route through site via the main access, McMahon Drive and Augustine Drive.

Feedback on the proposed masterplan was obtained from the Public Transport Operations planner at ECan. ECan are unlikely to consider a bus service to the proposed facility without the access road connecting Augustine Drive and McMahon Drive. Therefore, ECan are unlikely to consider providing a bus service to the facility during Stage 1, while they may consider providing a bus service during Stage 2.

If a bus route is to be provided to the proposed facility, ECan prefer the bus stops on the main road access road rather than the loop. The loop, to be constructed as part of Stage 1, can be retained for pick-up/drop-off and coach drop-off during events.

Once the Halswell Road Four-Laning project is completed, the Halswell Road/Aidanfield Road intersection will become left-in / left-out only, which may limit the effectiveness of the number 60 route in the Aidanfield Area. To maintain the effectiveness of the number 60 bus route, Main Access road connecting Augustine Drive and McMahon Drive is likely to be required to improve services to Aidanfield and Nga Puna Wai.

A specific PT access strategy for events and associated additional coach parking should be considered as part of a specific event transport management plan.

6.7.3 Active Modes

There are internal formal walking/cycling tracks proposed to run around the southern perimeter of the site that would formalise the existing unsealed paths. Consideration will need to be given to user safety at the points where the vehicle access points at Augustine Drive and McMahon Drive cross the shared path.

The Main Access road between Augustine Drive and McMahon Drive provides the opportunity for an adjacent off-road shared use cycle/footpath facility. The loop road around the northern-most part of the facility should be a low speed environment allowing on road cycle access to the facilities.

There is opportunity to provide improved cycling and walking access between the proposed PC68 development and the commercial areas to the north through the Sports Hub, encouraging more activity through the area and passive surveillance. A direct link could be provided between the Sports Hub and Wigram Road via the CSM underpass. This link should be as direct as possible to provide a high-quality facility with lighting between Wigram Road and the Sports Hub.

The closure of the vehicular access via Templetons Road will provide an opportunity for a 'green access' corridor into the park along with the existing access from Wigram Road via the CSM underpass.

Cycle racks will need to be provided around the site in proportion to expected demand for each distinct sporting area.

6.8 NZTA Feedback

Mark Newsome (Safety Engineer) from NZTA has provided feedback on the proposed development. NZTA are satisfied with the performance of the Halswell Road/Augustine Drive and that it will operate satisfactory as a priority intersection following the completion of Stage 1. The only comments NZTA has for Stage 1 is to consider redistributing parking to

encourage a more even distribution of traffic from all available access points in anticipation of Stage 2.

Once Stage 2 starts, the traffic analysis has indicated that the Halswell Road/Augustine Drive intersection will come under increasing pressure with the proposed signals and traffic from PC68. NZTA has suggested that this could be alleviated if there was a wider distribution of traffic across a number of access points.

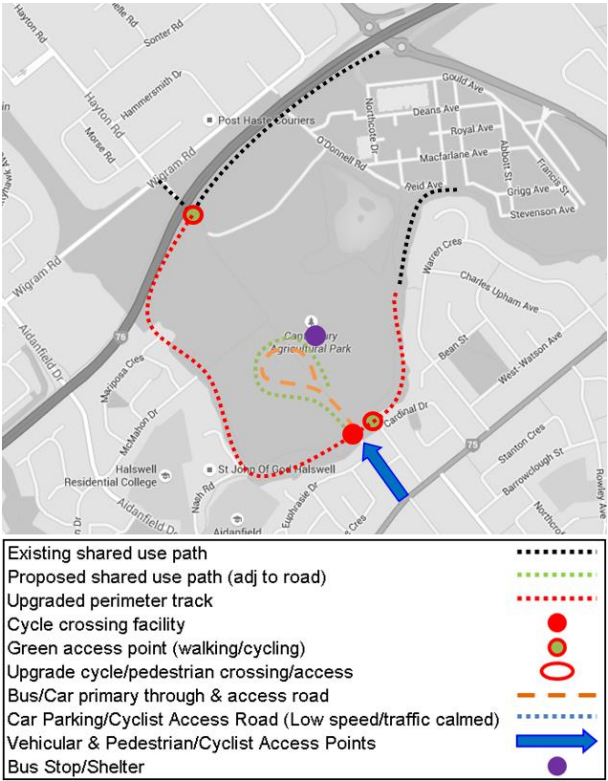
6.9 Masterplan Strategy

The transportation review of the proposed concept masterplan comprises:

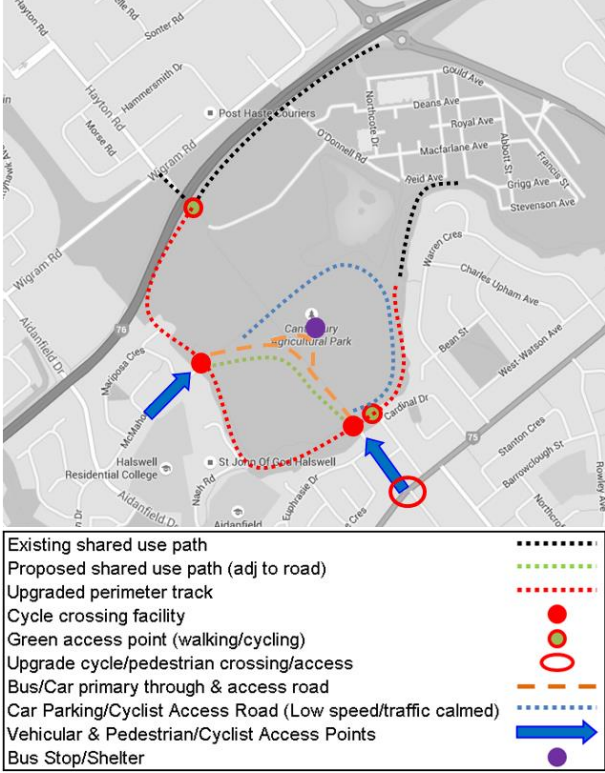
- Review of existing and proposed land use and transport context
- Discussion of the understanding of the proposed and estimated trip generation
- Assessment of the effects on the transport network
- Review of the concept masterplan layout.

The concept transport strategy for Stage 1 and Stage 2 of the development is shown in **Figure 6-8**.

Figure 6-8: Concept Transport Strategies



Stage 1 Masterplan Concept Transport Strategy



Stage 2 Masterplan Concept Transport Strategy

6.9.1 Vehicle Access Strategy

The vehicle access strategy for Stage 1 will take vehicle access from Augustine Drive (off Halswell Road) only. Bus routes can be accommodated on the site, however buses will be required to enter and exit via Augustine Drive. The Halswell Road/Augustine Drive intersection should perform sufficiently with and without PC68. With further traffic growth along the Halswell Road corridor toward 2041, the intersection operation deteriorates. However, it is considered that during this period the Halswell Road Four-Laning and Halswell Road/Augustine Drive intersection upgrades are highly likely to be completed, which should alleviate this situation.

The vehicle access strategy for Stage 2 includes access via Augustine Drive (off Halswell Road) and McMahon Drive. This will facilitate the opportunity for bus routes through the Sports Hub in the future (see below), provide improved access for emergency vehicles and spread general traffic access via two routes to distribute everyday traffic demands. The McMahon Drive/Aidanfield Drive intersection will perform adequately upon completion of Stage 2 of the masterplan, however, the Augustine Drive/Halswell Road intersection will not perform sufficiently based on the layout currently in the CAST model. This layout has not been finalised and can be changed as part of the Halswell Road Four-Laning Project and/or intersection upgrades by CCC. Therefore, it is recommended that CCC liaise with NZTA to accommodate the Stage 2 during the Halswell Road Four-Laning and Halswell Road/Augustine

Drive intersection upgrade projects. If sufficient capacity cannot be provided at the Halswell Road/Augustine Drive intersection then alternative access arrangements should be investigated

A low speed environment is recommended within the site to access parking areas including for the secondary internal loop road, which would reduce safety conflicts between vehicles, pedestrians and cyclists.

6.9.2 Parking Strategy

The parking will be spread around the site with the majority of parking located in the southern part of the site in Stage 1 and Stage 2. The parking includes provision for coaches. This is intended to reduce the need for vehicles to circulate through the areas where sports activities will be occurring, encouraging people to walk to these areas from the carparks and bus stops or cycle for those who have travelled to the site by that transport mode.

Some smaller car parks will be spread around the site with sizes relative to the anticipated demand of the nearby sporting facilities. A clear wayfinding system will be in place to avoid unnecessary traffic movements within the site.

It is anticipated that the concept for the Stage 1 and Stage 2 masterplans provides sufficient parking areas to meet the anticipated parking demands for everyday weekday and weekend activities, plus also the Christchurch City Plan parking requirements.

6.9.3 Passenger Transport Strategy

During Stage 1, bus routes will be required to enter and exit via Augustine Drive as shown in **Figure 6-8**. The Stage 2 masterplan can accommodate a bus route through the site via the Main Access, McMahon Drive and Augustines Drive.

ECan will only consider providing a bus route if the Main Access road connects Augustine Drive with McMahon Drive. Therefore, a bus route will not be considered during Stage 1 but will be considered for Stage 2. ECan prefer bus stops to be on the Main Access road rather than the loop constructed during Stage 1. The provision of bus services in Stage 2 will reduce the traffic effects assessed in this report, which has assumed no travel by public transport.

Once the Halswell Road Four-Laning project is completed, the Halswell Road/Aidanfield Road intersection will become left-in-left-out. This may require the Main Access road connecting Augustine Drive and McMahon Drive to be constructed before Stage 2 to maintain an adequate level of service for buses in Aidanfield.

A specific PT access strategy for events and associated additional coach parking should be considered as part of a specific event traffic management plan.

6.9.4 Active Modes Strategy

People will want to walk or cycle directly between the residential areas to the south of Nga Puna Wai and the commercial areas north of Wigram Road. A cycle track following the existing walking tracks around the perimeter of Nga Puna Wai has been proposed, and is shown in **Figure 6-9**.

A high standard of shared use facility, suitable for leisure and commuting use is proposed around the perimeter of the Sports Hub providing linkages between the north, south and west sides of the site. A shared use facility is proposed through the Main Access road with suitable crossing points where required, complementing the low-speed traffic environment. Other minor access roads and internal routes are proposed to be low speed 'shared space' environments.

Access into Nga Puna Wai for walking and cycling will be accommodated through the proposed vehicular access points at McMahon Drive and Augustine Drive, as well as via 'green' access points at the existing vehicle access at Templetons Road and from Wigram Road via the CSM underpass as shown in **Figure 6-9**. A direct walking and cycling link between the Sports Hub and Wigram Road via the CSM underpass should also be considered. This link should be as direct as possible to provide a high-quality facility with lighting between Wigram Road and the Sports Hub. This will connect to the external active mode networks on the different sides of the Nga Puna Wai site, facilitating movement between them and also to the Sports Hub.

Improved crossing and access facilities for pedestrians and cyclists will be required on Halswell Road in the vicinity of Templetons Road.

6.9.5 Event Management Plan

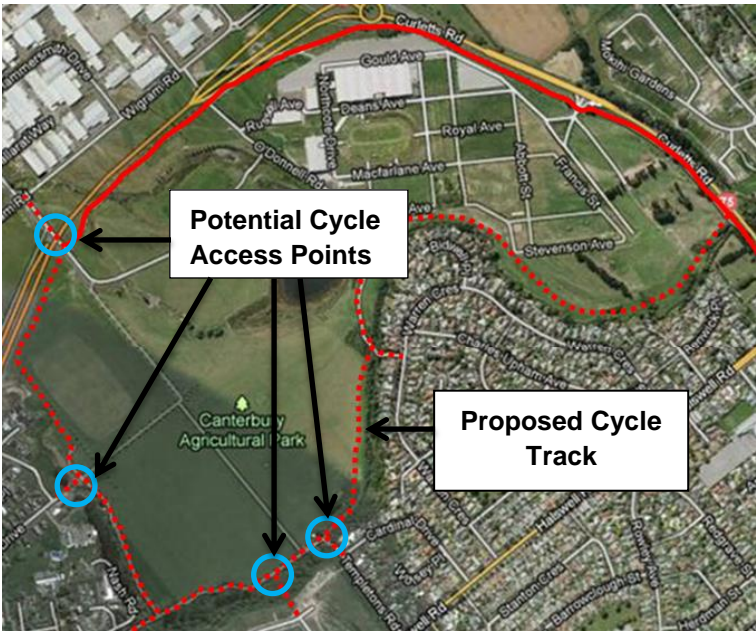
Based on the Needs Analysis conducted by Global Leisure Group, the estimated peak visitor numbers, the equivalent of around 800 parking spaces during Stage 1 and 2,830 parking spaces during Stage 2 will be required. This available parking areas within the site exceeds required space for the projected day-to-day parking demand and is sufficient for the maximum everyday use.

It is understood that the area adjacent the Polo Field may be available for over-flow parking. This area could be used as additional car parking, while some of the sealed parking could be utilised to accommodate the expected additional coach demand. It is expected that enhanced bus services could be arranged as well as the addition of a park and ride service as required.

A specific Event Management Plan to manage transport and traffic issues would need to be developed separately once further information is known on the likely type, scale and frequency of events. This would need to consider the potential traffic and parking management measures that would need to be implemented on the local road network and at the site accesses.

It is anticipated that any events at the Sports Hub would be scheduled to avoid coinciding with the A&P show. This may also present the opportunity for the Sports Hub and A&P show to work collaboratively to share their respective parking provisions during events at the respective venues.

Figure 6-9: Proposed Cycle Track within Nga Puna Wai. (Source: Council)



7 Civil Engineering

7.1 Introduction

To determine the infrastructure required for the proposed Sports Hub a high-level civil concept design was carried out based on the Concept Masterplan, to assist the production of a high level cost estimate. As design details will vary during further design stages appropriate quantity and cost contingencies should be applied.

7.2 Concept Drawings

The following concept civil drawings are included in **Appendix C**.

- 4222679-CE-SK001, 1 in 50 Year Wigram Basin Flood Level Plot
- 4222679-CE-SK002, Site Levels
- 4222679-CE-SK003, Required Earthworks
- 4222679-CE-SK004, Stormwater Catchment Zones
- 4222679-CE-SK005, Proposed Stormwater Layout Catchments 1, 2, 3, & 4 (Sheet 1 of 2)
- 4222679-CE-SK006, Proposed Stormwater Layout Catchments 5, 6, 7, & 8 (Sheet 2 of 2)
- 4222679-CE-SK008, Proposed Water Supply and Wastewater Layout.

7.3 Site Description

The existing levels used for this concept analysis have been obtained from LiDAR data and all stated levels relate to Council Datum. The site grades gently from approximately 27.0mRL at the western side down to 25.5mRL at the east side. The western half of the site is relatively flat, but the eastern half is gently undulating.

Dry Stream runs along the western boundary, the Heathcote River runs along the south boundary and the Wigram Stormwater Basin sits immediately to the east. The development is contained within Council's Southwest Area Plan and as such, is subject to the requirements set out in the plan.

7.4 Flood Risk

The Geotechnical Report, carried out by Beca 17 July 2013, provides a flood risk assessment of the Heathcote River and Wigram Basin. The report contains 2%AEP (1 in 50 year) flood levels for the Heathcote River and Wigram Basin. The flood assessment information was acquired from the CCC Asset and Network Planning Team and CERA's Flood Management Areas website.

The Heathcote River catchment is part of the ongoing city wide hydraulic modelling project. However, the results of this modelling will not be available until November 2015 this year. As such, the flood

assessment, contained in the 17 July 2013 Geotechnical report is the latest information available for flood levels of the Heathcote River and Wigram Basin.

The Heathcote River 2% AEP flood level is 23.6mRL, which does not affect the development proposed for the site.

However, the Wigram Basin 2% AEP flood level of 25.75mRL encroaches onto the eastern side of the development. This flood level is plotted on drawing 4222679-CE-SK001. It will be necessary to raise the level of this end of the development above this flood level.

7.5 Fields & Courts Construction Standards

Drawing 4222679-CE-SK002 provides a naming convention for the fields and car parks. The following field construction types have been assumed based on discussion with Council stakeholders.

- High quality construction – constructed to FIFA / NRL standards. Natural turf underlain with sand carpet and lateral under field drains connecting to stormwater pipes.
- Standard quality construction – natural turf constructed to a gentle gradient, allowing surface runoff to dissipate to subsoil drains / swales at the field edge. Council may want the design to provide flexibility to upgrade any of the secondary fields G1 to G7 to a high level of construction at a later stage in the future.

The primary fields A1 and A2 will be high quality construction. Also, two of the seven secondary fields, G1 to G7, will be high quality construction (assumed to be fields G1 and G3 for this report). The rugby league field (RL) will be high quality construction and the future rugby league field (FRL) has been assumed as standard quality construction.

Two of the hockey fields (assumed to be H1 and H2) will be water based artificial turf. The third field (H3) may be a shared field and may be constructed with a natural turf.

The tennis courts will be artificial turf.

A summary of the field construction standards is provided in **Table 7-1**;

| Field Name | Construction |
|----------------------|-------------------------------|
| A1, A2 & RL | High quality construction |
| G1 & 3 | High quality construction |
| H3 | Natural Turf |
| G3, 4, 5, 6, 7 & FRL | Standard quality construction |
| H1 & 2 | Water – based Artificial Turf |
| Tennis Courts | Artificial Turf |

Table 7-1: Summary - Construction Standards

7.6 Earthworks

Indicative site levels for the access roads, car parks and fields are provided on drawing 4222679-CE-SK002. The estimated volume of earthworks required for Stage 1 is illustrated on drawing 4222679-CE-SK003. The major earthworks operations are described below:

- The existing topsoil will need to be stripped from the majority of the Stage 1 site to allow cut to fill operations. This will require stripping, temporary stockpiling and re-application. The existing topsoil depth is approximately 300mm as found in the Beca Geotechnical Investigation.
- It is assumed that the topsoil can be re-spread later on field surfaces 250mm thick. Any remaining soil can be used to construct features, such as bunds and swales.
- The Stage 1 area will require shallow cut to fill to reshape and grade the site to the proposed levels for fields and roads. It is estimated that there will be approximately 11,000m³ of cut to fill to shape this area.

The Earthworks volumes for Stage 1 are summarised in **Table 7-2**.

| Activity | Volume (m ³) |
|----------------|--------------------------|
| Volume of Cut | 6,500 |
| Volume of Fill | 11,000 |

Table 7-2: Stage 1 Earthworks Volumes

As such, there is a theoretical shortfall for the Stage 1 fill requirements. This surplus could be borrowed locally to achieve a cut fill balance.

With respect to the entire site and later stages of development, the northern most point of the development should be filled to 26.25mRL, to be 500mm above the Wigram Basin 2% AEP flood level.

Additionally, the volume of the Wigram Basin will be increased to meet stormwater attenuation requirements and to offset the volume lost through the filling described below (please refer section **7.7 Stormwater Drainage**) generating material potentially suitable for fill (if suitable quality). This is illustrated on drawing 4222679-CE-SK003.

The Earthworks volumes predicted for the entire site are summarised in **Table 7-3**.

| Activity | Volume (m ³) |
|----------------------------------|--------------------------|
| Topsoil Strip | 95,000 |
| Volume of Cut | 19,000 |
| Volume of Fill | 32,000 |
| Available Fill from Wigram Basin | 21,500 |
| Surplus Fill | 8,000 |

Table 7-3: Earthworks Volumes

The earthworks calculation is subject to further design refinement at later stages and it is anticipated that that a cut to fill balance is achievable. However, based on this concept design, we recommend that an allowance is made for 8,000m³ of material to be removed from site.

7.7 Stormwater Drainage

The stormwater drainage concept design is set out on drawings 4222679-CE-SK004, SK005 and SK006. The site is over 32Ha in area, consisting of natural turf, artificial turf, car parking, road and roof areas. The following key design requirements have been specified by the Council;

- Stormwater from hard stands (roads and car parks) will be treated with new facilities within the development
- Full flood attenuation is required to capture all runoff resulting from a 2% AEP, 36 hour storm with a slow release over 96 hours
- Swales will be acceptable to treat temporary gravelled parking areas. However permanent hard surfaces will require treatment by rain gardens or other treatment devices to meet the requirements of the CCC stormwater management plan.

To meet these requirements the following stormwater design concepts are suggested;

- A primary (piped / swale) stormwater system to convey a 10% AEP storm from the facilities, discharging to Dry Stream, the Heathcote River or the Wigram Stormwater Basin. Disposal by soakage to ground is not considered suitable in this area due to high groundwater levels
- Secondary overland flow paths to convey runoff from larger storms (up to the 2% AEP storm) safely without flooding buildings
- Stormwater attenuation (basins) to store runoff from the site (nominally for a 2% AEP 36 hour storm event, with a slow release over 96 hours).
- Stormwater runoff from car parking, roads and other vehicular areas will require treatment prior to discharge; other areas will not be treated. Treatment of permanent hard surfaces will be provided by rain gardens or a first flush basin.

Drawing 4222679-CE-SK004 illustrates the sub catchment divisions. The philosophy of division is to segregate pervious surfaces from impervious, where possible.

A tabular summary of the stormwater drainage network for each catchment is provided in **Table 7-4**;

| Catchment | Treatment | Attenuation |
|-------------|--|--|
| Catchment 1 | Reticulate via swale to First Flush Basin and discharge to Heathcote post treatment. | Basin Number 2 – Discharge to Heathcote and Wigram Basin |
| Catchment 2 | Direct Discharge to Heathcote River. | Not required |
| Catchment 3 | Treatment via rain garden and discharge to Heathcote River | Wigram Basin |
| Catchment 4 | Reticulate via piped network and rain gardens discharge direct to Wigram Basin. | Wigram Basin |

Table 7-4: Catchment Drainage

7.7.1 Attenuation

Based on the above requirements, the attenuation requirements for Catchments 1, 2, 3 and 4 are estimated to be 16,000m³. Approximately 4,000m³ can be accommodated on site which will require further detailed assessment. This leaves 12,000m³ to be provided by the Wigram Basin.

As shown on drawing 4222679-CE-SK004, there are two catchments that will be constructed in the future. The catchment to the west side of the site can be attenuated and discharged to the Heathcote River. Attenuation volumes for the catchment to the east side of the site will be 1000m³. This will be provided by the Wigram Basin totalling 13,000m³ of additional storage to be provided by the Wigram Basin.

Raising the north eastern area of the site above flood levels (please refer section **7.6 Earthworks**), reduces the storage volume of the Wigram Basin by approximately 8,500m³. We understand that the basin would need to be enlarged at an appropriate location to compensate for the area filled and the extra stormwater runoff from the development. As such, the basin will need to be enlarged by 21,500m³ at an appropriate location to be determined. The area of impact is shown on drawings 4222679-CE-SK003.

7.7.2 Drainage and Treatment

Drawing no.'s 4222679-CE-SK005 and SK006 illustrates the stormwater drainage for each of the four catchments. Key design features include;

- Fields A1, A2 and RL, drained via sand carpet and shallow swales with subsoil drains connected to longitudinal gravity stormwater pipes.

- Running track will be drained with Slot drains feeding to gravity pipe.
- Fields G2, G4-G7 drained via shallow swales with longitudinal subsoil drains.
- Fields G1, G3, drained via sand carpet and shallow swales with subsoil drains connected to longitudinal gravity subsoil drains.
- Hockey fields (H1 and H2) and Tennis courts drained via a system of Slot drains and gravity pipes.
- Access Roads and Car Parks are drained via a system of swales to stormwater attenuation / First Flush basins.

A tabular summary of the various catchment surfaces and associated means of treatment is provided in **Table 7-5**;

| Catchment | Surface | Treatment |
|-------------|--|--|
| Catchment 1 | Car Parks and Access Roads | First Flush Basin |
| Catchment 2 | Fields G2, G4 and G5 | Not required |
| Catchment 3 | Fields RL and H2 | Not required |
| Catchment 4 | Fields A1, A2, H1, Tennis Courts, future Tennis Courts, Car Parks and Access Roads | Not required for fields and Tennis Courts. Car Parks and Access roads treated via swales and rain gardens. |

Table 7-5: Catchment Drainage

7.8 Groundwater

The Geotechnical investigation carried out in July 2013 indicated groundwater levels to be approximately 2.5m to 3m deep. The extent to which groundwater rises and falls is unknown, however it is possible that groundwater could rise above this level, which may reduce the depth of the basins decreasing the ability to treat and attenuate to Council requirements. As such, the stormwater concept is subject to further groundwater investigations at detailed design.

7.9 Wastewater

The wastewater from the stadia and public toilets will reticulate, via gravity, to a 1050mm diameter pump chamber. The gravity pipes will be 100mm diameter laid at a fall of 1 in 80. The pump will pump effluent to the nearby gravity wastewater network on Templetons Road.

Council plans to construct a wastewater pumping main through the site. The preliminary location of the proposed pressure main is illustrated on drawing 4222679-CE-SK008. Presently the pressure main is shown to run through the centre of the development however, this is based on the Preliminary Design provided by Council and thus may still change.

It will be possible to coordinate a route through the development with Council and simultaneously plan the Sports Hub waste water drainage to integrate with Council's plans.

7.10 Water Irrigation Supply

Preliminary irrigation demands were estimated based on the following assumptions:

- All grass fields are irrigated with 5mm per night on average (over a 10 hour irrigation cycle)
- The wet turf hockey fields are irrigated with 5mm during the day.

The calculated demands are provided in **Table 7-6**.

| Field Type | Area (m ²) | Demand (l/s) | Comments |
|------------------------|------------------------|--------------|-----------------------------|
| Grass Fields | 64,000 | 9 | 5mm delivered over 10 hours |
| Wet Turf Hockey Fields | 11,000 | 15 | 5mm delivered over one hour |
| Tennis Courts | varies | N/A | No water requirements |

Table 7-6: Irrigation Demand

Based on discussions with Council we understand it is possible to obtain irrigation demands from the nearby water mains. Alternatively, the irrigation supply could be supplied from a well or wells. This decision could be made at a later stage. The concept water main layout is based on a well supply illustrated on drawing no 4222679-CE-SK008.

To limit environmental effects, such as stream depletion and well interference effects, which may restrict the consented rate of take; it may be prudent to install any water supply bore in a deeper aquifer some 50 to 85 m depth.

The bore supply would require some surface storage, potentially an above ground 20,000 litre water storage tank with an irrigation pump station to pump the water to the fields. An additional bore might be required in the later stages of development.

7.11 Potable Water and Fire Supply

It is estimated that the peak domestic water demand will be less than 10 litres/second and fire flows will be up to 100 litres/second.

Based on discussions with Council, it is proposed to extend a 200mm diameter water main from McMahon Drive initially, which will be extended to create a loop through to Templetons Road after rezoning of the Templetons Road area is carried out. A 150mm diameter branch water main will extend from the loop main to serve the buildings.

Stage 1 will consist of a single connection to Templetons Road and the 150mm branch to serve buildings. The connection to McMahon Drive will happen in a later stage.

The proposed water main layout is illustrated on drawing no 4222679-CE-SK008.

7.12 Power and Telecommunications

Enable propose to serve the site with fibre from a local network cabinet on McMahon Drive. Enable will extend existing ducting from the network cabinet towards the boundary. From the boundary 2 lateral fibre runs will be provided to the Sports Admin block within the Sports Hub.

The maximum power demand for the Sports Hub has been estimated at 1100kVA and is based on the full lighting load of the facility. A new 500 kVA transformer is proposed to serve the facility as it has been assumed that no major events will be held simultaneously. Plug-in generator connections will be provided at the main switchboard (MSB) for the purpose of multiple events being held simultaneously and to serve as a backup supply option.

The substation will be sized to accommodate a 1000 kVA transformer catering for future development with a 500 kVA transformer being installed initially. The substation is located centrally within the hub under grand stand 1 (GS1) or located in the sports hub (SH). The HV supply to the Orion substation is anticipated to come from Templetons Road in a shared services trench. Further discussion with Orion will be held in the next design phase.

Three distribution areas are proposed to serve the facility,

- next to the substation with in the MSB room
- under grand stand 2 (GS2) next to RL
- between the main carparks C1 and C2.

The distribution areas are to be supplied by the MSB located next to the substation.

Table 7-7 lists the estimated lighting load of each sports field and the intended use of the field.

| Area | Load (KW) | Intended Use |
|-----------|-----------|------------------------|
| H1 | 100 | International |
| H2 | 100 | International |
| FH | 20 | Practice |
| T | 150 | International |
| FT | 30 | Practice |
| RL | 70 | International |
| FRL | 14 | Practice |
| A1 | 70 | International |
| A2 | 14 | Practice |
| G1 | 14 | Practice |
| G2 | 14 | Practice |
| G3 | 14 | Practice |
| G4 | 14 | Practice |
| G5 | 14 | Practice |
| G6 | 14 | Practice |
| G7 | 14 | Practice |
| C1-9 | 50 | Lighting 11b (7 lux) |
| SPORT HUB | 100 | General Power/Lighting |
| RING ROAD | 20 | Lighting P3 (1.3 Lux) |
| BOULEVARD | 25 | Lighting P6 (21 Lux) |
| AVENUE | 25 | Lighting P6 (21 Lux) |
| MAIN ROAD | 20 | Lighting P3 (1.3 Lux) |

Table 7-7: Estimated lighting load