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Harvey Road Sports and Events Precinct

Final Feasibility Assessment



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Executive Summary

Burchills Engineering Solutions were engaged by Gladstone Regional Council (GRC) to prepare a Final Technical Feasibility Assessment for the Harvey Road Sports and Events Precinct. This report builds upon preliminary technical investigations and engineering assessments undertaken as part of the Technical Feasibility Assessment (completed as part of Stage 1 of the project), which assessed the feasibility of three (3) concept plan options (Northern, Central and Southern options).

Ultimately, the Technical Feasibility Assessment determined that the Central design option was the most feasible of the options assessed. As a result, GRC resolved to progress the Central design option, refining technical assessments and cost estimates based upon this design option alone. The findings of the technical investigations and cost estimates are to be used to inform a Business Case for the redevelopment of the Harvey Road Sports and Events Precinct.

This report contains preliminary technical investigations undertaken across a number of engineering and environmental disciplines critical to the redevelopment of the sports precinct. These reports have been refined as part of the Final Feasibility Assessment, to assess the merits of the selected central design option.

The technical assessments generally identified that no severe risks existed which would compromise the delivery of the proposed project.

The impacts of environmental risks which exist on site (flooding and endangered regional ecosystem) can be mitigated through the detailed design of the selected option. Additional flood modelling undertaken as part of the Flooding and Stormwater Assessment determined that the preliminary civil design did not have adverse hydraulic impacts upon private property external to the site and generally maintains the hydraulic characteristics of Briffney Creek.

The traffic assessment concluded that sufficient capacity existed within the Dawson Highway / Harvey Road corridors to accommodate traffic volumes generated by event traffic and that any future development would be required to provide carparking to cater for increased event demand. The development of major event management plans was also recommended. SIDRA analysis of the existing Northern and proposed Southern carpark intersection to Harvey Road in both pre and post game scenarios performed within the maximum parameter values.

The conditions assessment of existing structures identified buildings in various conditions and compliance with current standards. The state of structures ranges from no issues for the more modern, recent structures to more serious issues related to best practice for the Marley Brown grandstand in particular which would be of a significant cost to remedy.

The Preliminary Noise Impact Assessment identified that the central concept design option (giving consideration to all possible potential noise generating sources) would be able to comply with relevant noise criteria at nearby residential areas so long as mitigation measures and strategies were implemented within the complex. These measures included the development of a noise management plan, directing PA speakers away from sensitive receptors, having restricted hours of operation etc.).



Technical reporting and a risk assessment completed for each of the three concept design options determined that the southern option was the most constrained option. This was primarily due to:

- The splitting of the touch fields across two separate locations on either side of the premier field;
- The encroachment of touch fields located on lot 25 into environmentally sensitive areas;
- The susceptibility of sporting fields (touch and rugby union fields) to flooding from storm events; and
- The ability to successfully manage the facility during a sporting carnival.

The sports assessment determined that both the north and central concept design options had merit, providing differing opportunities while also being somewhat constrained while the southern option was discounted moving forward. The north option provides ample space for the siting of the premier field and grandstand facility while providing space for event management and warming up. However, this option is constrained by the amount of fill material that will need to be imported for the creation of the premier field and grandstand. The north option will also only result in the creation of one additional rugby league field (excluding the premier field).

The Central option is spatially constrained, with the location of the premier field and grandstand between the existing carpark and the Briffney Creek corridor containing mapped endangered regional ecosystem. To ensure that the premier field provides sufficient space to accommodate the grandstand and crowds, it will be necessary to encroach upon existing parking facilities and demolish the existing touch football clubhouse. This option is preferable from a sports management perspective, providing fields consolidated by code (rugby league, rugby union and touch football) and provides an additional two full sized rugby league fields (not including the premier field / Marley Brown Oval).

The Marley Brown Grandstand is recommended for removal, to avoid ongoing maintenance costs in retention of a substantially non-compliant structure. Marley Brown playing field is recommended to be rejuvenated by removing the existing grass surface, re-setting the sprinkler heads, installing a subsoil drain network, and finally, scarification of the existing topsoil surface prior to placement of a new conforming topsoil and turf.

Based upon the recommendations of the Technical Feasibility Assessment, GRC resolved to progress the Central Design option through to the second stage of the project, the Final Feasibility Assessment

Investigation undertaken as part of the Technical Feasibility and Final Feasibility Assessments were used to inform the civil and architectural design of the project which were used as a basis for developing a high level cost estimate. A summary of project costs associated with the Central Design Option (as per the Civil Engineering and Sporting Concept Design Technical Assessment prepared by JPS Engineering Consultants) is provided in Table 1.1 below.



Table 1.1 Project Cost Estimate Summary

Item #	Component	Probable Cost (ex GST)
1	MBO	\$ 1,705,215
2	JRL Fields and North East Field	\$ 3,619,358
3	Premier Grandstand	\$ 18,715,220
4	Premier Field	\$ 2,910,982
5	Central Carpark	\$ 682,060
6	Touch Field	\$ 2,507,805
7	New Car parking - South	\$ 758,459
8	New Traffic Signals at Carpark south-Sundowner Road Intersection	\$ 816,284
9	Others	\$ 512,533
10	Margins and Adjustments	
	<i>Contingency (30%)</i>	\$ 5,598,354
	<i>Allowance for Increase in Mark Rate Costs due to frequent fluctuations in material costs</i>	\$ 1,108,300
	<i>Allowance for Insurances</i>	\$ 55,500
	<i>Professional Consultant Fees</i>	\$ 2,008,735
	<i>Location Factor for Gladstone (Freight on Materials, Increased Local Labour Costs, Travel and Accommodation for Specialist Trades etc)</i>	\$ 1,818,002
	<i>Construction Project Management</i>	\$ 2,503,330
	<i>Construction Preliminaries and Sundries</i>	\$ 4,726,109
	<i>Qleave Levy (0.575%)</i>	\$ 398,808
	<i>Planning and Statutory Approvals</i>	\$ 55,320
	Subtotal (ex GST)	\$ 18,272,459
	Total Rounded (excl. GST)	\$ 50,501,000

Note: Please refer notes associated with the Cost Estimate included in Section 4 and within the included in Civil Engineering and Sporting Concept Design Technical Assessment prepared by JPS Engineering Consultants, Appendix L.



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1. Introduction

Burchills Engineering Solutions were engaged by GRC to prepare a Final Feasibility Assessment for the Harvey Road Sports and Events Precinct. This report builds upon preliminary technical investigations and engineering assessments undertaken as part of the Technical Feasibility Assessment (completed as part of Stage 1 of the project), which assessed the feasibility of three (3) concept plan options (Northern, Central and Southern options).

Ultimately, the Technical Feasibility Assessment determined that the Central design option was the most feasible of the options assessed. As a result, GRC resolved to progress the Central design option, refining technical assessments and cost estimates based upon this design option alone. The findings of the technical investigations and cost estimates are to be used to inform a Business Case for the redevelopment of the Harvey Road Sports and Events Precinct.

This report contains preliminary technical investigations undertaken across a number of disciplines critical to the redevelopment of the sports precinct. These reports have been refined as part of the Final Feasibility Assessment, to assess the merits of the selected central design option. Summaries of the findings of each investigation undertaken are provided within this report, while the refined preliminary investigations are included in full within the appendices of the report.

A risk assessment and high-level cost estimate have also been developed for the central design option based upon the findings / recommendations of each investigation.

1.1 Background

The Harvey Road Sports and Events Precinct includes Marley Brown Oval, the junior rugby league fields and touch football fields. The redevelopment of the Harvey Road Sports and Events Precinct is focused on the development of the site to deliver a new sports precinct including a premier field and grandstand with improved capacity for events and high-level competition matches including broadcast games. GRC are seeking to redevelop site, delivering a facility that is:

- Well designed and functional for both everyday use and occasional large event use in line with current leading practice in modern contemporary sports facility design
- Well utilised by existing and occasional users because it is fit-for-purpose, flexible and easy to maintain
- Of a suitable size and layout to accommodate existing participation and attendance but also the anticipated growth likely to occur within the facility's useful life
- Supported by a community; and
- Feasible.

The eventual design solution will be required to maximise the use of the site, satisfying GRC and stakeholder requirements in terms of capital costs and life cycle expenditure, while achieving triple bottom line outcomes for the city and region.

GRC commissioned Otium Planning Group to undertake the Harvey Road Sports and Events Precinct Master Plan with works completed in August 2019. The current phase of the project is to undertake a Business Case to investigate whole-of-life costs, options, risks and benefits to ensure



they are thoroughly understood before proceeding with developing a Major Multi-Purpose Sports and Events Complex within the Gladstone Region.

The Technical Feasibility Assessment prepared in Stage 1 built upon the previous works completed by Otium Planning Group completing technical investigations to inform the design of the current Masterplan Concept Options development by CPR Group.

The Final Feasibility Assessment builds upon technical reporting completed as part of the Technical Feasibility Assessment, assessing in greater details the impacts that the GRC preferred option (Central concept design) could potentially have upon the surrounding built and natural environments, and determine associated project costs.

1.2 Site Description

The subject site comprises of four individual properties, which are properly described as Lot 2 SP218092, Lot 22 CTN1622, Lot 25 C15493 and Lot 176 SP 294310. The four lots have a total area of 191,030m².

The two northern lots (Lot 2 SP218092, Lot 22 CTN1622) are currently utilised as sporting fields, containing current rugby league, rugby union and touch football fields and ancillary facilities (club houses, amenities, parking, storage sheds etc). The two southern lots (Lot 25 C15493 and Lot 176 SP 294310) currently remain undeveloped, containing vegetation across the majority of the two lots.

Figure 1.1 below provides a locality plan detailing the extents of the subject site while figure 1.2 shows an aerial photograph of the site in its current state.



Figure 1.1 Site Locality Plan (Courtesy: DAMS)





Figure 1.2 Site Aerial Photograph (Courtesy: DAMS)

1.3 Concept Design Options

The Technical Feasibility Assessment was compiled to identify existing site constraints and how these constraints would impact upon the three CPR Concept Plan Options. The three design options consisted of a North, Central and South option.

These options were further developed during the conceptual design investigation phase, with fully scaled version of the identified masterplan options developed in order to identify:

- Spatial constraints;
- Civil design constraints;
- Potential encroachment into mapped environmental / flood constrained areas; and
- Conflicts with existing facilities and services.

Figure 1.3 provides an extract of the developed north option. For further details regarding the developed conceptual designs, please refer to Appendix A of this report.

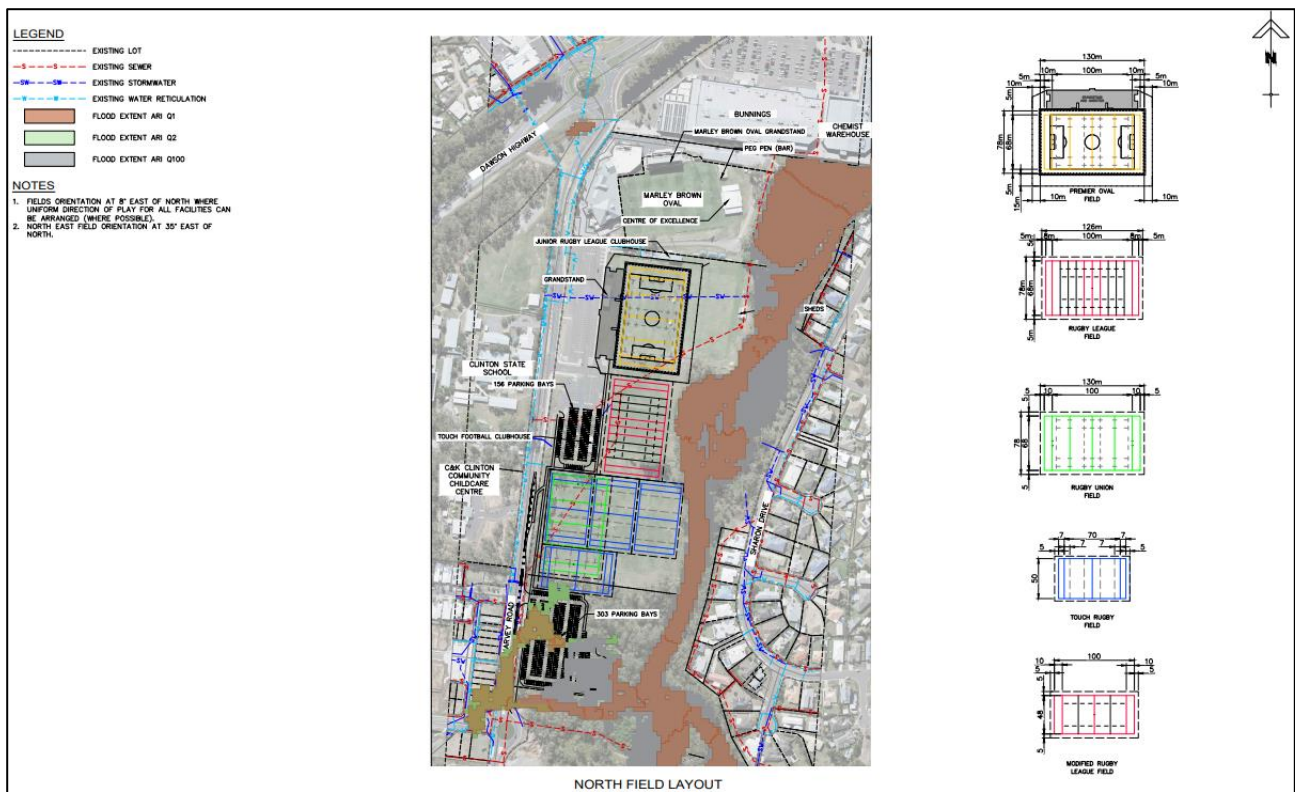


Figure 1.3 North Concept Option

1.4 Endorsed Concept Design Option

The Technical Feasibility Assessment identified that of the three concept options, the central design option was optimal. Based upon the findings of the Technical Feasibility Assessment, GRC endorsed the central design option for further conceptual development.

The central design option was selected as:

- The option provided a central management hub in the form of a grandstand, suited to managing carnival scenarios;
- It provides fields consolidated by code (rugby league, rugby union and touch football are accommodated in distinct locations);
- The option of licencing different areas of the facility to different users;
- The option provided two additional full sized rugby league fields (not including the premier field / Marley Brown Oval), supporting the future growth of the sport in area; and
- It maintained the operational status quo (touch football and rugby league uses will occupy the same general locations as per current arrangements).

Based upon the selection of the central design option, both the design and technical reporting has been refined where required to address specific matters raised by GRC during their review of the Technical Feasibility Assessment. Figure 1.4 below provides an extract of the selected Central Concept Design Option.



For further details regarding the civil design drawings prepared as part of this assessment, please refer to the Civil Engineering Drawings contained in Appendix P of this report.

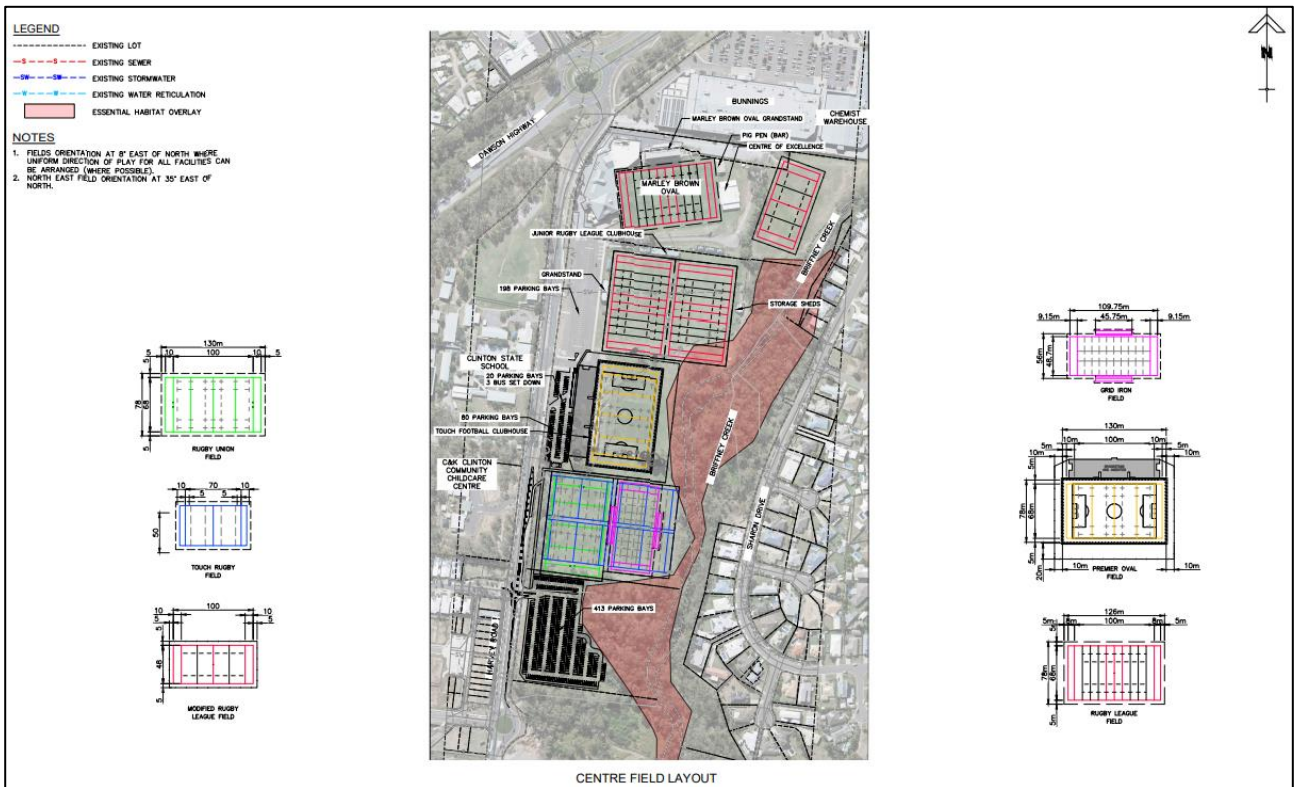


Figure 1.4 Central Design Option

1.5 Architectural & Civil Design

Following Gladstone Regional Council’s decision to progress the Central Concept Option, both civil and architectural concept design drawings have been advanced sufficiently to inform the business case and preliminary project cost estimates. Figure 1.5 below provides an extract of an architectural render of the grandstand and premier field produced by BSPN Architects.



Figure 1.5 Architectural Render of Grandstand and Premier Field (Courtesy: BSPN)

For further details regarding architectural design drawings prepared by BSPN architects, please refer to Appendix Q of this report.



2. Technical Investigations

2.1 Ecological Assessment

Burchills Engineering Solutions undertook an Initial Assessment of the sites Environmental Constraints in relation to the three (3) concept designs. The assessment included a desktop assessment of mapped environmental constraints (local / state government resources) and a site inspection to verify on-ground conditions in areas of the mapped constraints.

The initial investigations detailed the following findings:

- The existing use extends to the boundary of the Endangered vegetation;
- The proposed works will not substantially change the intensity of use, it is not expected that additional buffering provided to the riparian area and mapped Endangered vegetation is required;
- All concept options include some incursion into and clearing of the mapped Endangered remnant vegetation. It is not clear from the concept plans whether disturbance to the high bank of Briffney Creek would be required; and
- The balance of the mapped area does meet the criteria for remnant Endangered RE12.3.3 and there are some areas that are mapped and are devoid of vegetation.

The initial assessment made the following recommendations:

- The preferred option avoid works that would result in disturbance to and beyond the high bank of Briffney Creek;
- The preferred option limits works to the existing disturbance footprint in this area;
- To avoid impacts on tree protection zones (TPZ) of trees adjacent to the sports field and within the mapped Endangered vegetation;
- Additional site surveys are recommended following the adoption of the preferred option should incursion into mapped Endangered vegetation be required;
- Consultation with SARA is recommended via the pre-lodgement advice request process to determine whether clearing of mapped Endangered vegetation for the project would constitute prohibited development under the *Planning Act 2016*;
- Advice should also be sought on permit requirements for works within Briffney Ck if applicable; and
- All works should be undertaken in accordance with the recommendations of a licensed spotter catcher, an AQF level 5 Arborist (for tree clearing) and an approved Environmental Management Plan.

Following the selection of the preferred option, Council requested that Burchills liaise with SARA via the lodgement of a pre-lodgement advice request to verify permits and approvals which may be required to facilitate the proposed development. The pre-lodgement advice received from SARA confirmed that a number of permits / approvals may be required to facilitate development works. This was primarily due to the proximity of development works to Briffney Creek, mapped watercourse located on Lot 25 and vegetation mapped as *Endangered Remnant Regional Ecosystem*. Of specific note was the recommendation that a Property Map of Assessable Vegetation (PMAV) application be



lodged to amend regional ecosystem mapping which incorrectly represents mapped vegetation onsite. The pre-lodgement advice received from SARA has been attached to the revised preliminary Ecological Assessment.

For further details regarding the preliminary Ecological Assessment, please refer to Appendix B of this report. The pre-lodgement advice provided by SARA in relation to the project has been included in Appendix C.

2.2 Flooding & Stormwater Assessment

Burchills Engineering Solutions undertook a desktop flood assessment of the subject site to identify site conditions during the design flood events. The assessment utilised a TUFLOW model provided by GRC to determine modelled maximum water level, depth and velocity for several design flood events experienced at the site. The assessment determined:

- Flooding at the subject site is caused by the overtopping of Briffney Creek, which result in the slight inundation of the site's eastern perimeter;
- Flow is generally confined to the banks of the Briffney Creek, where water depths and velocity are at their greatest;
- Major flooding is predicted for the north-eastern field, where flooding is expected to be approximately 1 m in the 1% AEP scenario and approximately 0.25 m for the 1EY (Q1) scenario. The major flooding in this part of the subject site is due to the overtopping of the Briffney Creek. Because of the flooding characteristics of this area, it is a critical flood storage area for the local catchment;
- The north-eastern field, is predicted to have the most significant flooding, has a modelled velocity in the range of 0.2 – 0.6 m/s. Velocities in Briffney Creek and upstream areas are far greater than that of the sports fields, often exceeding 3 m/s; and
- Local runoff from Harvey Road and other developments surrounding the subject site, with exception to those upstream, will not be a major constraint for development in this area.

The assessment determined risks and opportunities posed by the project in relation to flooding. Risks identified related to the loss of flood storage, loss of conveyance capacity and potential adverse flood impact upon provide property. Also identified during the assessment was that recent development activities had resulted in an upstream inflow being modified. The inflow location was amended in the flood model, reducing conveyance over the sports fields.

The initial flooding and stormwater assessment has been further refined following the selection of the central option as the preferred concept design and in response to technical comments received from Council Officers. In particular, the Auckland Creek flood model was rerun using the digital elevation model developed as part of the civil earthworks design task, to identify the offsite impacts that the proposed development may have upon the floodplain (loss of flood storage / conveyance capacity, adverse flood impact on private property). Modelling (including climate change scenarios) determined that the preliminary civil design did not have adverse hydraulic impacts upon private property external to the site and generally maintains the hydraulic characteristics of Briffney Creek.



Commentary was also provided in relation to the management of stormwater onsite and the potential need to provide stormwater detention or quality improvement devices to satisfy water quality objectives prescribed by the GRC Planning Scheme.

For further details regarding the preliminary Desktop Flood Assessment, please refer to Appendix D of this report.

2.3 Traffic Assessment

Burchills Engineering Solutions undertook an Initial Assessment of Transport Constraints and Opportunities for Preliminary Technical Assessment in relation to the proposed development. The report was prepared using road and traffic data provided by GRC to complete the assessment.

An integrated approach to transport for the selected master plan option is proposed involving provision for car spaces that encourage other forms of Mode share transport including Public Transport, minibuses, coaches, walking and cycling. Additional car spaces are recommended, providing a total of 640 estimated for crowds up to 2,000 spectators + 75 spaces for players / coaches / referees. Overflow parking where space is available for a proportion of the car parking requirement and higher parking demands is recommended. The layout of the car parking should provide for taxi and ride share companies, bus stops, VIP parking, turning provisions for buses, lay-by areas for buses, access for service vehicles, food vans and bicycle racks.

The design of large car parking modules result in a more efficient form and centralising car parking in distinct areas is recommended which suits the proximity to the fields, grandstand, disabled parking spaces and administrative areas. A layout that maximises car and pedestrian safety by containing passenger loading / unloading within the confines of the car park in close proximity to the fields without indiscriminately crossing public roads provides for the safer outcomes.

Previous assessment of the Harvey Road / Dawson Highway roundabout showed that the roundabout operating at an average of 40% capacity with a maximum of 60% (in 2014) indicating that the roundabout has spare capacity for the anticipated traffic generated by the proposed modest scale events. For the large 10,000 crowd events an Event Management Plan is recommended.

Other modes of transport including public transport, walking and cycling are also recommended. Paths are recommended for inclusion and should follow the overall master plan as detailed for the GRC Pedestrian and Cycle Strategy, A network of pathways within the final layout is also recommended connecting the various purposes and fields.

The Traffic Assessment was updated following the adoption of the Central Concept Design Option by GRC. The assessment was updated to include a SIDRA analysis assessing the capacity of both the existing northern intersection and proposed southern intersection on Harvey Road for both the base case and the design peak period. The assessment determined that both Northern and Southern carparks in both pre and post-game scenarios performed within the maximum parameter values.

In addition to the sidra analysis, a cost estimate for works associated with the new signalised intersection for the Harvey Road / Southern Carpark intersection (on Lot 25) was also undertaken. The preliminary feasibility cost estimate identified that works associated with the upgrade were approximately \$1million dollars.



For further details regarding the preliminary Traffic Assessment, please refer to Appendix E of this report.

2.4 Town Planning Assessment

Zone Planning Group undertook an assessment of the key planning requirements associated with the redevelopment of the Harvey Road Sports and Events Precinct. The assessment concluded the following in relation to the development potential of the subject site.

- The subject site is dual zoned, Lot 2 RP218092 and Lot 22 CTN1622 are within the *Sport and Recreation Zone* while Lot 25 C15493 is within the Low-Density Residential Zone;
- A sports complex can be defined as either an *Outdoor Sport and Recreation Facility* or *Major Sports, Recreation and Entertainment Facility*, dependent upon the developments scale. In this instance it is considered that the *Outdoor Sport and Recreation* is more applicable;
- The *Outdoor Sport and Recreation* land use within the Sport and Recreation Zone is listed as an Accepted Development subject to Requirements;
- The *Outdoor Sport and Recreation* use within the Low-Density Residential Zone will trigger Impact Assessment;
- The *Major Sports, Recreation and Entertainment Facility* use will also trigger Impact Assessment within the Low-Density Residential Zone;
- A Code Assessable application development application will take approximately 3-4 months to be assessed by Council;
- An Impact Assessable development application will take approximately 6 months for Council to assess and decided by Council once lodged;
- The site is subject to a number of Overlays, some of which increase the level of assessment for an *Outdoor Sport and Recreation* use to Code Assessable development. Design of the development should give consideration to maintaining compliance with the requirements outlined within the relevant overlay codes; and
- The site contains a number of Matters of State Environmental Significance (regulated vegetation / waterways for waterway barrier works) which may trigger referral to the Department of State Development, Infrastructure, Local Government and Planning should they be impacted.

For further details regarding the preliminary Planning Technical Memo prepared by Zone Planning Group, please refer to Appendix F of this report.

2.5 Bushfire

As per our discussions, the State Planning Policy establishes mapping criteria which defines categories in associated map layers. The Bushfire Resilient Communities document prescribes the criteria for establishing bushfire categories for hazard mapping.

- Potential Impact Buffer Area: All land within 100m from Medium Impact Area;
- Medium Bushfire Hazard: 4,000 – 20,000 kW/m potential fire line intensity;
- High Bushfire Hazard: 20,000 – 40,000 kW/m potential Fireline intensity; and
- Very High Bushfire Hazard Area: 40,000+ kW/m potential fire line intensity.



Bushfire Attack levels are a means of measuring the severity of buildings potential exposure to ember attack, radiant heat and direct flame contact. There are essentially 6 BAL ratings:

- BAL – Low: There is insufficient risk to warrant specific construction requirements
- BAL – 12.5: Ember attack (heat flux up to 12.5 kW/m);
- BAL – 19: Increasing levels of ember attack and burning debris ignited by windborne embers, together with increasing heat flux (heat flux up to 19 kW/m);
- BAL – 29: Increasing levels of ember attack and burning debris ignited by windborne embers, together with increasing heat flux (heat flux up to 29 kW/m);
- BAL – 40: Increasing levels of ember attack and burning debris ignited by windborne embers, together with increasing heat flux (heat flux up to 40 kW/m) and with increased likelihood of exposure to flames; and
- BAL – FZ: Direct exposure to flames from fire, in addition to heat flux (heat flux greater than 40 kW/m) and ember attack.

Where development is greater than 100m from any classified vegetation the BAL rating will be BAL–LOW and will not require any special construction requirements. Where there is a risk or potential that ember attack could affect a development a BAL – 12.5 is applied.

During the detailed design stage, it is recommended that a Bushfire Assessment is undertaken by a qualified bushfire consultant to inform design measures.

2.6 Heritage

2.6.1 European Cultural Heritage

A search of the DAMs Mapping and GRC local heritage register was undertaken. No items of cultural heritage value were listed in the vicinity of the subject site.

2.6.2 Aboriginal Cultural Heritage

A search of the Aboriginal Cultural Heritage mapping was undertaken in order to identify any mapped sites of aboriginal cultural heritage within the vicinity of the subject site. A search of the Aboriginal and Torres Strait Islander cultural heritage register was also undertaken for Lot 2 SP218092, Lot 22 CTN1622 and Lot 25 C15493. The searches identified that the lots were not recorded on the register as containing matters of Aboriginal Cultural Heritage.

For further details, please refer to Appendix G which contains searches of the Aboriginal Cultural Heritage Register.

2.7 Geotechnical Investigations

A geotechnical investigation was undertaken by Butler Partners in order to identify subsurface conditions at the subject site which included the sinking of six shallow bores within the existing sporting fields.

Broadly the report identified subsurface conditions at possible grandstand locations generally comprising of 20mm – 50mm thick bituminous concrete surface layer, underlain by pavement gravel and clayey sandy gravel fill to between 0.2m and 1.2m depth, underlain in turn by stiff to hard sandy



/ gravelly clay and medium dense clayey gravelly sand to between 2m and 7.5m depth. Very low strength breccia (rock) was encountered underlying the fill and soil in all bores.

Subsurface conditions encountered at shall bore locations within the existing playing fields comprised clayey / silty sand fill to the bore termination depth of 0.3m, which was placed as topsoil for the sporting fields.

Groundwater was encountered at a depth of 4.5m and is expected to be seasonal and affected by prevailing weather conditions.

Soils encountered in the bores included zone that were acidic. However, based on the site geology, surface elevation and appearance of soils, these soils are not considered to be ASS. As such an ASS management plan will not be required. However, it is strongly recommended that additional ASS testing be completed as part of geotechnical investigation prior to the detailed design phase of the development.

Foundation selection for the grandstand will be dependent upon structural loadings, tolerance to movement, type and magnitude of loading, groundwater conditions at the time of construction etc. Local variations in soil strength could be expected to occur over the site and it is suggested that the foundation design and construction pricing methodology adopted for the project be such that footing sizes/founding depths can be readily adjusted if required during construction without, significant time/cost penalties being incurred.

The bearing capacity of the existing substrate encountered has been estimated to the following values.

Material	Strength/Density	Maximum Working Bearing Capacity ⁽¹⁾ (kPa)
Existing Fill	-	not recommended
Controlled Fill (refer Section 6.2.6)	-	100
Sandy Clay	stiff	100
	very stiff	150
	hard	250
Clayey Gravelly Sand ⁽²⁾	medium dense	150
Breccia (rock)	extremely low	450
	very low	700

⁽¹⁾ Not underlain by 'softer' material
⁽²⁾ Preliminary only – subject to footing dimensions, depth and groundwater level, etc.; values given are for no disturbance

Figure 2.1 Site Bearing Capacity Values (Courtesy: Butler Partners)

Weathered breccia (rock) was encountered in the borehole drilled in the central option's grandstand location at a shallower depth to that for the other two options. As the allowable bearing pressure is greater at a shallower depth in this location, footing design would be very marginally less substantial than the northern or southern options.

For further details regarding the Geotechnical Assessment, please refer to Appendix H of this report.



2.8 Existing Building Conditions Report

BSPN Architects prepared an Existing Building Conditions Report for the Harvey Road Sports and Events Precinct. The report details the condition of a number of existing structures and buildings of varying types and ages. The report detailed the following findings:

Marley Brown Oval and Grandstand

The Marley Brown Oval and associated Grandstand building have a number of fundamental issues in relation to their original design, which hinder their potential use as a regional football facility, as well as containing a number of fundamental equitable access, and NCC compliance issues. In principle the orientation of the field and grandstand is not considered generally acceptable for a facility and sports field of its type. It is currently unsuitable for televised broadcast, and also has little consideration in its design for equitable access for fans and patrons. It would not currently comply with the requirements of the Disability (Access to Premises Standard) - 2010 and the National Construction Code.

It would be difficult to refurbish Marley Brown Grandstand in a practical sense to be compliant with current design standards. The installation of a lift in order to provide disabled access would prove futile as the current structure does not allow for equitable movement. The existing design of the grandstand will also not cater for the implementation of more permanent solutions which would address existing design issues. And while there are matters which may be addressed easily, these are only minor in nature and will not achieve meaningful outcomes for the grandstand in terms of its compliance or performance.

The newly constructed “Centre of Excellence” building constructed on the eastern side of the field has been recently completed, the building is of good condition and compliant with current codes and standards.

Junior Football Club

The Junior Football Club buildings are of an indeterminate age and appears to have had a number of extensions over the years. However, in general the buildings are of reasonable condition despite some recommendations for compliance upgrades.

Gladstone Touch Association Buildings

The Gladstone Touch Association buildings have had a number of extensions and building works carried out over a variety of periods, with some components substantially older than others. There are some compliance issues that should be reviewed and addressed as part of ongoing operations

Across the site, the existing structures are in various states of repair and compliance with current standards. Ranging from no issues identified in the more modern and recent structures to more serious issues related to best practice for the Marley Brown grandstand in particular. In addition, consideration would need to be given to the ongoing use of the current Grandstand structure if it is to be considered for use as a regional or NRL facility as it does not meet many, of what would be considered current minimum, requirements for a facility of its type.



For further details regarding the Existing Building Conditions Report prepared by BSPN Architects, please refer to Appendix I of this report.

2.9 Acoustic Engineering Report

A Preliminary Noise Impact Assessment was prepared by ATP Consulting Engineers for the selected central concept design option Harvey Road Sports and Events Precinct. Noise modelling was undertaken giving consideration to all possible potential noise generating sources including the use of the sports fields, spectators, whistles, vehicle movements, public address system and mechanical equipment.

The report concluded that to comply with relevant noise criteria at nearby residential areas, mitigation measures would be required to be implemented within the complex. These mitigation measures included:

- The development of a Noise Management Plan for large sporting events with more than 1000 people;
- Orientating public address speakers away for nearby sensitive receptors (residential dwellings) and limiting the level of emissions to 83dB(A) or 86dB(C);
- Limiting the use of the public address system to between 7am and 10pm;
- The use of designated pick up / drop off areas for buses and coaches; and
- Recommendations regarding the design and installation of mechanical plant equipment.

For further details regarding the Preliminary Noise Impact Assessment report prepared by ATP Consulting Engineers, please refer to Appendix J of this report.

2.10 Electrical Services Engineering Report

A preliminary Electrical Services Budget was prepared by Peter Eustace Consulting Engineers for the for the Harvey Road Sports and Events Precinct. The budget was prepared to identify costs associated with provision of electrical services infrastructure suitable for the Harvey Road Sports and Events Precinct. The budget was prepared using publicly available data (dial-before-you-dig, google street view) and site photos provided by Burchills Engineering Solutions and GRC.

The assessment determined that the provision of electrical services infrastructure suitable for servicing the Harvey Road Sports and Events Precinct would cost in \$2.97 million. Costs provided as part of this document have been incorporated into the preliminary project costings detailed Section 4 of this report (Table 4.2).

For further details regarding the Electrical Services Budget document prepared by Peter Eustace Consulting Engineers please refer to Appendix K of this report.

2.11 Civil Engineering & Sports Assessment

The Civil Engineering and Sports Assessment prepared by JPS Engineering Consultants gave consideration to the findings of all technical disciplines when assessing the concept options with recommendations regarding each option made from a civil engineering and sports design perspective. The findings and recommendations regarding each option are summarised below.



Southern Option

The southern option is the most constrained layout, despite providing a reasonable area for the premier field. The touch fields are not able to be situated on the site without either encroaching into environmental habitat areas or being inundated in a minor storm event. The south option also lacks continuity with touch fields separated by the premier field facility inhibiting management during large touch football events. The rugby union field will also be located within a flood prone area.

Parking provided to the premier field is excellent with equitable access and the ability to provide two full sized rugby league fields to the north of benefit to this option (although is also provided in the central option). Due to the constrained nature of the south option, it is recommended that this option is discounted from further investigations.

Central Option

The Central option provides a layout which consolidates fields by discipline, with all touch football fields and rugby league fields adjacent each other. This is preferable from a sports management standpoint.

The Central option is limited however, constrained spatially (east-west), providing limited width to accommodate the grandstand and premier field, whilst allowing flexibility in additional spectator space to the west of the field. Spatial constraints are due to the presence of mapped endangered regional ecosystem / flood extents both situated within the Briffney Creek corridor. The siting of the premier facility to the east (encroaching upon existing car parking facilities) to avoid mapped constraints provides the only option for the Central concept. Two full sized rugby league fields can be provided to the north of the site, which cannot be provided in the north option.

North Option

The north option provides a large area for the premier field and associated facilities adjacent to the existing car park. A large area to the west of the premier facility (once sited) remains, which can be used for various uses (crowd / event management or warm up area). While this area may be considered too large for these uses, this space is too small to accommodate another full-sized field.

Access for maintenance / emergency vehicles and disability access, will require the import of a large volume of fill material (in comparison with other options) to provide equitable transitional grades between the existing car park and the grandstand/field, where a 2.5m difference in level exists.

This option also only provides for one additional full sized rugby league field (not including the premier field or Marley Brown Oval). Despite these limitations, the north field option provides adequate area to accommodate the premier field facility and a greater number of parking spaces to service the precinct and allows for the Junior Rugby League Clubhouse to be retained if desired.

The report recommends that both the north and central options are compared carefully, with the limitation / constraints of each option considered in relation to the opportunities provided.

Following the delivery of the Technical Feasibility Assessment and engagement with stakeholders, Council chose the Central Field Option as the preferred concept design, with preliminary civil designs



and cost estimate prepared. A summary cost estimate for the project is provided in section 4 below, while civil design drawings developed for the Central field option are included in Appendix P.

For further details regarding the Civil Engineering and Sports Report prepared by JPS Consulting Engineers, please refer to Appendix L of this report.

3. Risk Assessment

A risk register has been developed detailing potential project risks identified by the individual technical assessments completed as part of this report. Risks within the register have been grouped based upon their technical discipline. An assessment of each of the three concept designs (North, Central and South) has been undertaken against each project risk.

3.1.1 Description

This assessment has been conducted in accordance with AS/NZS ISO 31000:2009 (Standards Australia/Standards New Zealand, 2009).

3.1.2 Risk Management Objectives

The objectives of this risk management strategy are as follows:

- To identify potential risks and hazards associated with the development of each of the concept design options.

3.1.3 Risk Identification

All risks identified within the risk register have been identified by individual technical assessments undertaken during the conceptual design phase of this project.

3.1.4 Risk Analysis

Evaluation Parameters

The following tables highlight the parameters used to evaluate the risks described associated with each of the three concept options.

Table 3.1 Ranking Matrix for Risk

<i>Likelihood</i>	<i>Consequence</i>				
	Negligible	Low	Medium	High	Extreme
Almost Certain	Significant	Major	High	Severe	Severe
Likely	Moderate	Significant	Major	High	Severe
Moderate	Low	Moderate	Significant	Major	High
Unlikely	Negligible	Low	Moderate	Significant	Major
Rare	Negligible	Negligible	Low	Moderate	Significant

Table 3.2 Qualitative Measures of Likelihood or Frequency

Scale	Criteria to be used to establish rating
Almost Certain	Will occur. Circumstances or situations are likely to arise often throughout the operational / project period in which provide the opportunity for crystallisation of risk. Expect frequent, regular occurrences.



Scale	Criteria to be used to establish rating
Likely	Likely to occur more than once in the operational period but not an 'everyday' occurrence. Preconditions will arise at times throughout the period.
Moderate	Likely to occur at least once but not expected to occur much more than this in the operational period.
Unlikely	Not likely to occur in the operational period. A small, but remote chance of occurrence due to circumstances/situations that could arise.
Rare	Would only occur in highly exceptional circumstances that are unlikely to exist in any operational period. Extremely remote chance of occurrence in operational period. 'Once in a lifetime' event.

Table 3.3 Qualitative Measures of Impact – Consequence Severity

Scale	Consequence Criteria
Extreme	Near impossible to develop subject site and expected development viability is very low. E.g.: Significant protected habitat, major floodway within site etc. Requires comprehensive development viability analysis and specialist input ³ .
High	Very difficult to develop subject site and expected development viability is low, will involve significant investigations, very expensive major service relocations, significant environmental habitat areas etc. Requires development viability analysis and specialist input as required.
Medium	Challenging to develop subject site, expected development viability is adequate, will involve further investigations, service relocations, enabling infrastructure, addressing environmentally sensitive areas etc. Specialist input as required.
Low	Relatively simple challenges to develop site, expected development viability is good. Minor upgrades to existing services and infrastructure are required to develop site.
Negligible	No challenges or risk to program in developing site.

For further details regarding the risk assessment undertaken by Burchills Engineering Solutions, please refer to Appendix M of this report.



4. Preliminary Costings

Preliminary high-level costings have been developed for both the North and Central concept options. As per the findings of the Civil Engineering and Sports Report by JPS Consulting Engineers and discussions during the Stakeholder Engagement meeting on Thursday 14 October, a costing has not been prepared for the South concept option as this option is deemed sub optimal.

The preliminary costings have been developed using standard industry rates for materials and services. As per the project scope of works, the estimates provided are high level only and will be subject to refinement during the next phase of the project.

Cost estimates associated with both the North, Central and Southern options and the removal of Marley Brown Oval are detailed below in Table 4.1.

Table 4.1 Initial Preliminary Cost Estimate for Comparison Purposes Only

Description	North Option	Central Option	South Option
Sports Field and Civil	\$14,760,000	\$14,360,000	\$13,980,000
Demolition and Offsite Disposal*	\$450,000	\$450,000	\$450,000
Sub-total	\$15,210,000	\$14,810,000	\$14,430,000
Proposed Grandstand**	\$20,000,000	\$19,000,000	\$20,000,000
Marley Brown Oval - Field upgrade	\$1,570,000	\$1,570,000	\$1,570,000
Marley Brown Oval - Grandstand Disposal	\$200,000	\$200,000	\$200,000
Grand Total	\$36,980,000	\$35,580,000	\$36,200,000

*Accounts for demolition of Existing Grandstand, Junior Football and Touch Football Clubhouses.

**Estimated grandstand construction costs associated with central option 5% cheaper due to subsurface conditions (rock at a shallower level).

Cost estimates are inclusive of a 30% contingency and GST

In line with the Project Brief, the accuracy of this cost estimate is at a level of -50% to +100%. The cost estimate will be refined in the next stage of work.

Following GRC's decision to select the Central Field Option as the preferred development concept, a more detailed cost estimate was developed for the preferred option. The cost estimate produced utilised cost estimates developed by specialists of their respective fields. Detailed cost estimates produced by technical specialists have been included in Appendix N. A summary of project costs associated with the preferred Central Option is provided in the Table 4.2 below.



Table 4.2 Preliminary Cost Estimate of Preferred Option

Item #	Component	Probable Cost (ex GST)
1	MBO	
	Field upgrade- Soil remediation, drainage and field infrastructure	\$ 781,669
	Field upgrade- Irrigation	\$ 130,074
	Field upgrade - New fencing	\$ 203,241
	Field upgrade - New electrical and lighting	\$ 294,614
	Demolition of MBO Grandstand	\$ 295,617
	Subtotal (ex GST)	\$ 1,705,215
2	JRL Fields and North East Field	
	Accessibility Upgrade Junior Football Building	\$ 16,288
	Field upgrade- Soil remediation and field infrastructure	\$ 2,292,427
	Field upgrade- Irrigation & table drain upgrade	\$ 524,663
	Fencing (security)	\$ 196,750
	Lighting and electrical	\$ 589,229
	Subtotal (ex GST)	\$ 3,619,358
3	Premier Grand Stand	
	Demolition of existing Touch field building	\$ 63,582
	Earthworks	\$ 177,320
	Building construction including all services to the building ⁺	\$ 17,428,718
	External services relocation/connection	\$ 750,000
	Lighting and electrical	\$ 295,600
	Subtotal (ex GST)	\$ 18,715,220
4	Premier Field	
	Civil Works and Field of Play including field infrastructure	\$ 1,786,212
	Topsoil mounds/bleachers	\$ 108,070
	Field Irrigation system	\$ 225,584
	Fencing (perimeter and security)	\$ 201,887
	Electrical services*	\$ 589,229
	Subtotal (ex GST)	\$ 2,910,982
5	Central Carpark	
	Car park at rear side of Premier Grandstand all inc	\$ 376,310
	Footpath connection from southern car park to Premier Field	\$ 254,950
	Lighting and Electrical	\$ 50,800
	Subtotal (ex GST)	\$ 682,060
6	Touch Field	
	Field upgrade- Soil remediation and field infrastructure	\$ 1,781,279
	Field upgrade- Irrigation	\$ 284,604
	Lighting and electrical	\$ 441,922
	Subtotal (ex GST)	\$ 2,507,805
7	New Car parking - South	



	Earthworks	\$	91,537
	Car park area pavement all inc	\$	590,823
	Lighting and electrical	\$	76,100
	Subtotal (ex GST)	\$	758,459
8	New Traffic Signals at Carpark South-Sundowner Road Intersection		
	Services Relocation	\$	51,720
	Changes and widening of pavement	\$	707,804
	Traffic Signal	\$	17,381
	Lighting and Electrical	\$	39,380
	Subtotal (ex GST)	\$	816,284
9	Others		
	Sewer augmentation and relocation	\$	410,128
	Bio-retention swales for carpark	\$	37,521
	Disabled access ramps	\$	56,031
	Soil storage bins	\$	8,852
	Subtotal (ex GST)	\$	512,533
10	Margins and Adjustments		
	Contingency (30%) for Items 2, 4, 5, 6, 7, 9	\$	2,957,750
	Allowance for Increase in Mark Rate Costs due to frequent fluctuations in material costs for Items 2, 4, 5, 6, 7, 9	\$	985,920
	Allowance for Insurances for Items 2, 4, 5, 6, 7, 9	\$	49,300
	Subtotal (ex GST)	\$	3,992,970
	Contingency (30%) for Item 1	\$	367,140
	Allowance for Increase in Mark Rate Costs due to frequent fluctuations in material costs for Item 1	\$	122,380
	Allowance for Insurances for Item 1	\$	6,200
	Subtotal (ex GST)	\$	495,720
	Contingency (10%) for Item 8	\$	78,620
	Subtotal (ex GST)	\$	78,620
	Professional Consultant Fees on all Items Except 3	\$	976,320
	Subtotal (ex GST)	\$	976,320
	Location Factor for Gladstone (Freight on Materials, Increased Local Labour Costs, Travel and Accommodation for Specialist Trades etc) on Item 3	\$	1,818,002
	Builder's Work In Connection with Services/Sundries on Item 3	\$	128,884
	Design Development Contingency on Item 3	\$	1,032,415
	Building Contractor Preliminaries and Supervision on Item 3	\$	3,844,339
	Building Contractor Overheads and Profit on Item 3	\$	1,058,457
	Construction Contingency on Item 3	\$	1,376,199
	Professional Consultant Fees on Item 3	\$	1,444,873
	Loose FF&E (PC Sum) on Item 3	\$	342,222
	Audio Visual (PC Sum) on Item 3	\$	136,888
	Public Address System (PC Sum) on Item 3	\$	136,888
	ICT Equipment (PC Sum) on Item 3	\$	136,888



Project Contingency/Reserve on Item 3	\$	818,645
Subtotal (ex GST)	\$	12,274,701
Qleave Levy (0.575%) on all Items	\$	398,808
Material Change of Use Application for a Major Sport, Recreation and Entertainment Facility (Impact Assessable)	\$	5,295
Operational Works Application (Facility)	\$	22,727
Operational Works Application Southern Intersection	\$	13,099
Operational Works Application Northern Intersection	\$	9,091
DTMR Referral	\$	1,558
PMAV Referral	\$	432
Waterway Barrier Works Application	\$	3,118
Subtotal (ex GST)	\$	55,320
Total Rounded (excl. GST)	\$	50,501,000

Notes:

- + Rider Levett Bucknall Location Factor has been reduced to 5%
- + Rider Levett Bucknall Design Development contingency has been reduced to 3%
- + Rider Levett Bucknall Professional Consultant Fee has been reduced to 5%
- 1 All above subtotals are only provided for clarity of inclusions in the cost estimate. They are not priced as standalone packages of work, with the exception of MBO and intersection works.
- 2 This estimate is based on preliminary concept sketches prepared by Burchills and PE Consulting Engineers dated March 2022.
- 3 This preliminary feasibility estimate is based on current costs for similar works and has been prepared in order to provide an initial broadscale assessment of indicative development costs only. The estimate is subject to additional geotechnical investigations and reporting, hydraulic modelling, detailed civil designs, environmental investigations and relevant authority approvals.
- 4 No detailed design has been undertaken at the time of this feasibility estimate.
- 5 Site earthworks allowances shown are indicative (broadscale) only and are subject to detailed earthworks modelling and full geotechnical assessment.
- 6 No allowance has been made in the estimate for Acid-Sulfate Soils testing or treatment as geotechnical report indicated no acid-sulfate soils detected.
- 7 Some allowance has been made in the estimate for excavation/trenching in rock for installation of deep services (subject to confirmation by geotech).
- 8 Allowances shown in the estimate for relocated and new stormwater drainage works and modifications to existing stormwater pipes are nominal allowances only and are subject to development of schematics and detailed investigations/designs.
- 9 Allowances shown in the estimate for relocated and upgraded sewer works and modifications to existing sewer pipes are nominal allowances only and are subject to development of schematics and detailed investigations/designs.
- 10 No allowances have been made in this estimate for any external upgrades or improvements to existing roadworks, traffic or pedestrian infrastructure.
- 11 This estimate assumes that connections to the existing water mains network are possible at the site boundary.
- 12 This estimate assumes that connections to the existing sewerage network are possible at the site boundary.
- 13 No allowance has been made for any upgrades to existing water infrastructure.
- 14 Security fencing has only been allowed for the premier field



- 15 Costs shown for landscaping near environmentally sensitive areas are indicative only and subject to confirmation by landscape consultants.
- 16 Allowance for site establishment is based on these two stages of work being separate, standalone civil contract packages.
- 17 Fees associated with the Planning/DA process were calculated using the Operational Works maximum fee for the facility and are calculated at 1.5% of the total cost of works. Referral fees are based on SARA Prelodgement Advice. DA fee as per the Zone Planning Technical Memo.
- 18 Upgrade to the Junior Football Building is a best guess on visual inspections only and is proposed purely to guide the formation of a budget for further review.
- 19 This estimate does not allow for any external infrastructure upgrade works along the Harvey Road site frontage, for either water reticulation, sewerage or electrical infrastructure.
- 20 Allowance shown for traffic control is a nominal allowance only and is subject to finalisation of designs and work extents, detailed traffic provisions analysis, timeframes assessment etc.
- 21 No allowance has been made for re-sheeting of existing wearing surfaces or pavements modification on the existing pavements on Harvey Road. This estimate is essentially based on a widening of the existing road formation.
- 22 No allowance has been made for any special feature pavements or entry statement to intersection/site entrance.
- 23 No allowance has been made for landscaping or streetscaping works.
- 24 Boom Gates / Carpark Management Systems to external carparks are excluded.
- 25 All effects associated with COVID-19 are excluded from this cost estimate.

DISCLAIMER

These costs are preliminary in nature and should not be relied upon for detailed business case development. The costing is based on estimates, assumptions and other information developed by Burchills Engineering Solutions or its subsidiary companies from its independent research effort and general knowledge of the industry. Please note that a preliminary development concept plan or development estimate produced by Burchills Engineering Solutions or its subsidiary companies for a given parcel of land has been produced to provide an indication of the possible development outcome based on a preliminary appraisal of the facts and constraints relating to the parcel, but without the benefit of detailed technical assessment of the town planning constraints or detailed design. The appraisal process which involves preparation of technical reports, responding to the Council information requests and information requests from State and Federal referral agencies and finally receipt of a decision notice from Council will involve many changes to the development proposal to take account of a range of constraints and requirements of a range of legislation, guidelines and town planning outcomes. The information thus so given is for preliminary feasibility purposes only and shall not be relied upon as a definitive statement of the development rights or suitability of the land.



5. Preliminary Design Drawings

5.1 Civil Design Drawings

As part of the Final Feasibility Assessment, Burchills Engineering Solutions have developed Preliminary Civil Design Drawings. Table 5.1 below provides a list of civil design drawings prepared for the central design option. For further details, please refer to the full civil design drawing package prepared by Burchills Engineering Solutions included in Appendix P if this report

Table 5.1 Schedule of Civil Design Drawings

Harvey Road Sports and Events Precinct – Civil Works Drawings		
DRAWING NUMBER	REVISION	DRAWING TITLE
BE210217-01-C000	A	Cover Sheet, Locality Plan, Drawing Index and Notes
BE210217-01-C001	A	Legend and Notes
BE210217-01-C101	A	Overall Site Layout Plan
BE210217-01-C201	A	Earthworks Cut and Fill Layout Plan
BE210217-01-C211	A	Earthworks Layout Plan – Sheet 1
BE210217-01-C212	A	Earthworks Layout Plan – Sheet 2
BE210217-01-C221	A	Earthworks Cross Sections
BE210217-01-C251	A	Erosion and Sediment Layout Plan – Sheet 1
BE210217-01-C252	A	Erosion and Sediment Layout Plan – Sheet 2
BE210217-01-C253	A	Erosion and Sediment Control Notes
BE210217-01-C301	A	Field and Service Layout Plan – Sheet 1
BE210217-01-C302	A	Field and Service Layout Plan – Sheet 1
BE210217-01-C351	A	Intersection Layout Plan – Sheet 1
BE210217-01-C352	A	Intersection Layout Plan – Sheet 2
BE210217-01-C353	A	Intersection Layout Plan – Sheet 3
BE210217-01-C361	A	Carpark Layout Plan – Sheet 1
BE210217-01-C362	A	Carpark Layout Plan – Sheet 2
BE210217-01-C401	A	Stormwater Catchment Layout Plan
BE210217-01-C411	A	Stormwater and Subsoil Drainage Layout Plan – Sheet 1
BE210217-01-C412	A	Stormwater and Subsoil Drainage Layout Plan – Sheet 2
BE210217-01-C421	A	Flood Model Layout Plan
BE210217-01-C431	A	Stormwater Longitudinal Section
BE210217-01-C441	A	Stormwater Notes and Details
BE210217-01-C451	A	Bioretention Pod Details
BE210217-01-C501	A	Services Reticulation Layout Plan – Sheet 1
BE210217-01-C502	A	Services Reticulation Layout Plan – Sheet 2
BE210217-01-C601	A	Lighting and Electrical Layout Plan – Sheet 1
BE210217-01-C602	A	Lighting and Electrical Layout Plan – Sheet 2



5.2 Architectural Design Drawings

As part of the Final Feasibility Assessment, BSPN Architects have developed preliminary Architectural Design Drawings for the proposed grandstand. Table 5.2 below provides a list of architectural design drawings prepared for the grandstand and renders for the central design option. For further details, please refer to the full architectural design drawing package prepared by BSPN Architects included in Appendix Q if this report

Table 5.2 Schedule of Architectural Design Drawings

BSPN Architectural Design Drawings		
DRAWING NUMBER	REVISION	DRAWING TITLE
A1.21	4	Ground Floor Plan
A1.22	2	Level 1
A1.23	1	Level 2
-	-	Gladstone Drone View – Close Up
-	-	Gladstone Drone View – Overall
-	-	Gladstone Sports Complex – Entry Front View Roof Fix
-	-	Gladstone Sports Complex – Entry Side View Roof Fix
-	-	Gladstone Sports Complex – Field Front View Structure Fix
-	-	Gladstone Sports Complex – Field Side View Structure Fix



6. Findings & Recommendations

This Final Feasibility Assessment undertaken for the Harvey Road Sports and Events Precinct on the behalf of the GRC has identified that there are no severe risks that exist which would compromise the delivery of the project.

The impacts of environmental risks which exist on site (flooding and endangered regional ecosystem) can be mitigated through the detailed design of the selected option. Additional flood modelling undertaken as part of the Flooding and Stormwater Assessment determined that the preliminary civil design did not have adverse hydraulic impacts upon private property external to the site and generally maintains the hydraulic characteristics of Briffney Creek.

The traffic assessment concluded that sufficient capacity existed within the Dawson Highway / Harvey Road corridors to accommodate traffic volumes generated by event traffic and that any future development would be required to provide carparking to cater for increased event demand. The development of major event management plans was also recommended. Sidra analysis of the existing Northern and proposed Southern carpark intersection to Harvey Road in both pre and post game scenarios performed within the maximum parameter values.

The conditions assessment of existing structures identified buildings in various states of repair and compliance with current standards. The state of structures ranges from no issues for the more modern, recent structures to more serious issues related to best practice for the Marley Brown grandstand in particular which would be of a significant cost to remedy.

The Preliminary Noise Impact Assessment prepared by ATP Consulting Engineers identified that the central concept design option (giving consideration to all possible potential noise generating sources) would be able to comply with relevant noise criteria at nearby residential areas so long as mitigation measures and strategies were implemented within the complex. These measures included the development of a noise management plan, directing PA speakers away from sensitive receptors, having restricted hours of operation etc.).

The civil engineering and sports report and the risk assessment completed for each of the three concept design options determined that the southern option was the most constrained option. This was primarily due to:

- The splitting of the touch fields across two separate locations on either side of the premier field.
- the encroachment of touch fields located on lot 25 into environmentally sensitive areas.
- The susceptibility of sporting fields (touch and rugby union fields) to flooding from storm events; and
- The ability to successfully manage the facility during a sporting carnival.

For this reason, it was determined that the south option be discounted as an option moving forward.

The sports report determined that both the north and central concept design options had merit, providing differing opportunities while also being constrained. The north option provides ample space



for the siting of the premier field and grandstand facility while providing space for event management and warming up. However, this option is constrained by the amount of fill that will need to be imported for the creation of the premier field and grandstand. The north option will also only result in the creation of one additional rugby league field (excluding the premier field).

The Central option is spatially constrained, with the location of the premier field and grandstand between the existing carpark and the Briffney Creek corridor which contains mapped endangered regional ecosystem. To ensure that the premier field provide sufficient space to accommodate the grandstand and crowds, it will be necessary to encroach upon existing parking facilities and demolish the touch football clubhouse. This option is preferable from a sports management perspective, providing fields consolidated by code (rugby league, rugby union and touch football) and provides an additional two full sized rugby league fields (not including the premier field / Marley Brown Oval).

The Marley Brown Grandstand is recommended for removal, to avoid ongoing maintenance costs in retention of a substantially non-compliant structure. Marley Brown playing field is recommended to be rejuvenated by removing the existing grass surface, re-setting the sprinkler heads, installing a subsoil drain network, and finally, scarification of the existing topsoil surface prior to placement of a new conforming topsoil and turf.

As part of the Central option, the Junior Football Clubhouse and the storage shed near the northern rugby fields are to remain, however, the existing grandstand seating and the touch football clubhouse are to be demolished and removed.

Future procurement of the project is recommended to be a design and tender process. Due to the size of the project and unknowns in relation to costs and potential latent conditions, staging of the works can be easier in this process, without obligation to proceed with certain packages. A design and construct model may present cost savings and less chance of cost blowout, although, this can be managed during the design process under the former model. Innovation clauses with contractor cost sharing can also be included in the tender documentation in a design and tender process, mitigating the risk of overengineered solutions.

Based on the recommendations of the Technical Feasibility Assessment and following consultation with relevant stakeholders, Council to progress the Central option to the Final Feasibility Assessment.

Investigation undertaken as part of the Technical Feasibility and Final Feasibility Assessments were used to inform the development of the civil and architectural design of the project which were used as a basis for developing a high-level project cost estimate. The cost estimate produced for the central option identified that as a whole, the project would have an overall cost of approximately \$46,732,633 (refer Table 1.1 for further detail).

The findings and costings presented in this report can be used to inform the business case which is currently being developed by CPR Group in order to attain funding for the delivery of the project. Once funding is secured, preliminary technical assessments and drawings completed as part of this report can be used as a base for the development of a development application package to attain all necessary permits and approvals. Following this, detailed investigations and designs can be completed to enable construction of the project.



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Appendix A – Conceptual Design Drawings (Burchills)



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Appendix B – Ecological Site Assessment (Burchills)



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Appendix C – SARA Prelodgement Advice



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Appendix D – Preliminary Flood Assessment (Burchills)



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Appendix E – Preliminary Traffic Assessment (Burchills)



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Appendix F – Town Planning Tech Memo (Zone Town Planning)



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Appendix G – Aboriginal Cultural Heritage Register Searches



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Appendix H – Geotechnical Investigation (Butler Partners)



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Appendix I – Existing Building Conditions Report (BSPN Architecture)



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Doc Title: Technical Feasibility Assessment

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Appendix J – Acoustic Engineering Report (ATP Consulting Engineers)



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Appendix K – Electrical Services Engineering Report



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Appendix L – Civil Engineering & Sporting Initial Technical Assessment (JPS Engineering Consultants)



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Appendix M – Risk Register



The experience **you deserve** 

Appendix N – Conceptual Design Preliminary Cost Estimates



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Appendix O – Swept Path Analysis



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Appendix P – Civil Design Drawings by Burchills Engineering Solutions



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Appendix Q – Architectural Drawings by BSPN Architects



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Appendix R – Meeting Minutes 14 October 2021





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