



CHARLES BEAN OVAL SYNTHETIC SURFACES REVIEW



Prepared for:



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ACKNOWLEDGEMENTS

Acknowledgements

This Smart Independent Assessment has been prepared by Smart Connection Consultancy on behalf of the Ku-ring-Gai Council (Client).

Assumptions

All recommendations and considerations identified by Smart Connection Consultancy are based on data and information provided by Council, and Smart Connection Consultancy has relied on such information being correct at the time this report was prepared.

The information within this report is provided with good faith. Whilst Smart Connection Consultancy has applied its experience to this Assessment, we have relied upon information and views expressed by Client staff or other stakeholders involved in the project.

Readers should be aware that in the preparation of this report it has been necessary to provide commentary on future projections that may be inherently uncertain, and that our opinion is based on the underlying assumptions at this point in time – which has been influenced by the information provided in good faith.

We do not express an opinion as to whether actual results will achieve our estimates, or underwrite or guarantee the achievability of the projections or value assumptions which are based on future events.



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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Ku-ring-gai Council is faced with an important decision regarding the future of **Charles Bean Oval**. With increasing demand for sporting facilities across the municipality, particularly for football (soccer), Council must determine whether to reinvest in a **new-generation synthetic turf system** or revert the site to natural grass.

After detailed analysis, this assessment demonstrates that replacing the existing synthetic surface provides significantly greater value for Ku-ring-gai Council and its community than reverting to natural turf.

1. Meeting Growing Participation Demand

Football is Ku-ring-gai's fastest growing sport, with registered player numbers increasing by more than 20% in recent years, especially among juniors and women. Synthetic fields are uniquely capable of handling this growth:

A natural grass field at Charles Bean Oval could support a maximum of **20–25 hours per week** and even at best may be able to cope with 30 hours but will need additional maintenance and end of year renovations. This type of field can only cope with around 25 players per hour as well.

A new synthetic system will reliably accommodate 60–80 hours per week, tripling access and ensuring Council can keep pace with community demand. The intensity can also cope with over 60 players per hour, therefore multiplying the comparison between both surface types.

This additional capacity reduces pressure on other overused grass fields and provides a reliable venue for training, competition, and school programs.

2. Reliability and Community Access

The existing synthetic surface at Charles Bean Oval has demonstrated the importance of all-weather resilience. Unlike natural grass, which is highly susceptible to wear, compaction, and weather-related closures, synthetic turf enables uninterrupted community access year-round. This reduces cancellations, relocations, and community frustration — and guarantees equitable access for priority groups such as juniors, schools, and female programs.

3. Financial Sustainability

Although natural grass has a lower initial cost (circa \$0.9m), synthetic turf (circa \$1.4m) delivers superior **lifecycle value** for Council with the hourly rate of usage being \$65.30(natural) compared to \$48.89(synthetic):

Avoids annual maintenance costs of mowing, irrigation, topdressing, and re-turfing.

Prevents the loss of tens of thousands of dollars each year associated with cancelled fixtures, reduced canteen revenue, and displaced competitions.

Provides greater certainty for long-term bookings by schools and clubs, generating consistent revenue streams.

Over its 10–12 year lifespan, the synthetic field represents a better return on investment and ensures Council assets are optimised for maximum community benefit.

4. Environmental and Sustainability Outcomes

A shift back to natural grass would require significant water input — **5–7 megalitres per year** for a field the size of Charles Bean Oval — and heavy use of fertilisers and pesticides to maintain playing quality under high traffic. By contrast, a modern synthetic system:

- Utilises organic infill rather than rubber crumb, avoiding legacy concerns about microplastics.
- Incorporates closed-cell drainage with filtration, ensuring water quality is protected and contaminants are captured.
- Includes recyclable system components (shockpads, drainage cells), aligning with NSW Circular Economy Strategy 2041.

This represents a forward-looking approach to both community sport and environmental stewardship.

5. Strategic and Community Legacy

Charles Bean Oval already functions as a key hub for football in Ku-ring-gai, supporting grassroots participation, development pathways, and community events. Maintaining the site as synthetic:

- Ensures it remains a regional-standard venue, attracting school carnivals, representative football, and broader community use.
- Aligns with Council's Sportsground Strategy, which identifies synthetic turf as critical to addressing capacity shortfalls.
- Supports the long-term health, wellbeing, and social cohesion benefits of increased sporting participation.
- Reverting to grass would compromise this role, constrain community access, and undermine Council's strategic investment in sporting infrastructure.



Conclusion

Replacing Charles Bean Oval with a new synthetic turf surface is the only option that meets participation demand, provides reliable and equitable access to the broader community without limiting hours of use , delivers lifecycle cost efficiency, conserves environmental resources, and secures Ku-ring-gai's long-term sporting future.

Reverting to natural turf would limit playing capacity, increase operating costs, consume large volumes of water, and fail to deliver on community expectations for modern sporting infrastructure.

The evidence strongly supports Ku-ring-gai Council reinvesting in a new-generation synthetic field at Charles Bean Oval as the most responsible, future-proof, and community-beneficial choice.



SECTION 1: INTRODUCTION & SCOPE

The importance of a Smart Synthetic Field Health Check explores the status of the field against its expected performance; the maintenance being carried out and the expected life expectancy

1 INTRODUCTION & SCOPE

1.1 Introduction

Council has allocated funding for the proposed replacement of Charles Bean Oval synthetic playing surface, as the current field has reached the end of its useful life.

Charles Bean Oval was handed over to Council as part of an agreement with Defence Housing Australia (DHA) in lieu of developer contribution payments to Council. As part of that agreement, it was negotiated that the field be changed from a natural turf surface to a synthetic turf surface. The project was managed and funded by DHA and the completed field was handed over to Council in 2013. It was built to FIFA standards at the time and was Ku-ring-gai's first synthetic field.

In recent times, there has been increasing general concern in the community around synthetic surfaces and their impact on the environment, including the release of microplastics and localised heat island effect. In addition to this, there has also been significant concern with the effects of synthetic surfaces on human health, also relating to microplastics and the use of crumbed rubber infill.

The NSW Government has undertaken significant study in this area, and following a report from the Chief Scientist, they developed the "Best-practice guidelines for sporting fields" see link: [Best-practice guidelines for sporting fields](#) as well as "Synthetic turf sports fields in public open space" see link: [Synthetic turf for sports fields | Planning](#)

A considered community consultation process is required to ensure project scope considers the expectations of all stakeholders and we will be seeking recommendations and opinions from industry experts to include in the consultation.

Council is seeking an assessment report from Smart Connection Consultancy for the replacement of the Charles Bean Oval with a synthetic or hybrid surface.

1.2 Scope of Project

Council has requested that as a minimum the report should include the following:

- An assessment of existing site conditions and suitability of existing infrastructure for replacement with synthetic surface and inclusion of engineering or other measures to reduce/eliminate negative environmental and amenity impacts
- Surface recommendation to include no rubber infill
- Maintenance specifications
- High level cost of construction
- High level indication of maintenance costs
- High-level life cycle cost

- An assessment of the level and intensity of use that the field could sustain (hours and attendees/week or year)
- A comparison of the level and intensity of use versus existing level and intensity of use
- Any considerations or comments regarding flow on effect to other facilities should existing hours booked not be able to be achieved
- We would also suggest that the report considers the following aspects:
- The changes in synthetic surface manufacturing, field design and management to reduce the perceived or actual impact on the environmental footprint
- How the "new generation" of design, installation and management of synthetic surfaces can address any negative aspects identified within the Chief Scientist and Engineers or the Department of Planning, Housing and Infrastructure Guidelines
- Identify specific gaps in the current synthetic system compared to issues raised in 10 and 11 above

1.3 Project Methodology

Smart Connection Consultancy is a specialist sports management consultancy who support local government and sports organisations in the planning, design, procurement and management of sports assets. These include natural, hybrid, synthetic, rubber and acrylic sports surfaces for hockey, athletics, multi-sport and all of the football codes.

Our commitment to creating environments that can be promoted to encourage more people, and especially children, to be more active is based on the following:

- How can natural grass be enhanced to cope with the type and intensity of desired usage, through improvements to drainage, irrigation, grass type and profile enhancements etc
- Embracing hybrid technology to reinforce high wear areas in a manner that can allow greater intensity of use of the field
- Only when there are two options exhausted, do we explore the ability of synthetic sports surface technology to be used. The challenge with football (soccer especially) is that as the population density grows, combined with the moving to a 12 month a year sports program, many natural turf fields can't either accommodate the intensity of usage or indeed the recovery needed at the end of the winter season.

Synthetic sports turf fields are able to complement the natural turf fields, allowing for greater usage, while resting the natural surfaces to reduce the

intensity of usage, providing a more consistent performance surface.

We would recommend the following methodology be considered

Report Inclusion	Methodology
1. Site Assessment An assessment of existing site conditions and suitability of existing infrastructure for replacement with synthetic surface and inclusion of engineering or other measures to reduce/eliminate negative environmental and amenity impacts. Identify specific gaps in the current synthetic system compared to issues raised in 10 and 11 above.	Visit site Explore the design, review the As Built Drawings and provide a high-level overview of the opportunities to improve the design to meet the contemporary design and needs of a typically modern field. Review the current design against global good practice, and the NSW Guidelines / Chief Scientist Guide – with recommendations.
2. Future Proofing the Site Identify for Councils consideration, recommendations that are needed for future proofing the site with contemporary design, procurement and management including: • Surface recommendation to include no rubber infill. • Maintenance specification recommendations to increase the probability of achieving the expected life of any future facility. • High level cost of construction for the replacement of the current surface (including recycling) • High level indication of maintenance costs High level life cycle cost (Whole of Life Costs – and per hour of usage)	Development of high-level specification principles that should be considered for the future. These will identify how each aspect of a next generation surface that would meet the needs of a more Sustainable outcome for the community, including: • Planet (Environmental) sustainability – to meet the requirements and perceptions of environmental concerns. • People (Community) sustainability – exploring the current needs (people and hours) • Prosperity (Economic) Sustainability – exploring the whole of life costs for the field (over 30 years) and the cost per hour of usage. • Performance (Fit for purpose) Production of a Report that explores all of the above in a manner that

3. Impact of Change To explore the potential impact of a change from the current surface to either natural turf or hybrid turf, including: • An assessment of the level and intensity of use that the field could sustain (hours and attendees/week or year) • A comparison of the level and intensity of use versus existing level and intensity of use 3. Any considerations or comments regarding flow on effect to other facilities should existing hours booked not be able to be achieve	Within the Report, have a chapter that can explore and clearly identify and where possible model, the impact of the field was to be changed to Scenario 1: Natural turf field at the highest level to accommodate high intensity of use Scenario 2: Hybrid reinforced natural turf field that will accommodate a further 5- 10 hours per week Explore possible flow on effects to other fields in area and or to the current users – including the schools
4. Impact of Design Improvements to Meet Best Practice • The changes in synthetic surface manufacturing, field design and management to reduce the perceived or actual impact on the environmental footprint • How the “new generation” of design, installation and management of synthetic surfaces can address any negative aspects identified within the Chief Scientist and Engineers or the Department of Planning, Housing and Infrastructure Guidelines	Chapter in report (And Appendix) that identifies all the aspects that the NSW Chief Scientist and the Dept. PHI has identified as good practice for synthetic fields. Assessment of the current field against these components and then the alignment of the proposed specification changes and how they would create a better impact for Council against these components etc.

Table 1: Methodology



SECTION 2: FINDINGS



The ability to achieve the life expectancy is linked strongly to the investment in the maintenance of the field of play and to program management

2 FINDINGS

2.1 Site Assessment

A site assessment was conducted by Martin Sheppard, Managing Director, Smart Connection Consultancy, on Tuesday, the 5th of August, where the weather was fine and dry, after a week of heavy rain. Although there was still water weeping from the rocks by the pavilion, the field was in a very satisfactory condition to play sport.

The assessment explored what condition the site was in and if Council was to upgrade the surface and future proof it, what would be needed. A QA project plan was conducted, which identified key aspects that should be considered if the surface was upgraded, and they can be explored through a Multiple Bottom Line as detailed below.



Photo: 1. Seeping from the rocks with the remnants of the heavy rains will need to be addressed in any future design



Photo: 2 Open grills allow microplastics and other rubbish access to the storm water system

2.1.1. Planet (environmental) sustainability considerations

When the field was originally commissioned it's unlikely that the environmental considerations were so important. The contemporary aspects that should be considered now include:

- Under surface drainage, not the current spoon drain that is around the field should be considered.

- No rubber/plastic infill - with organic infill being used, or consideration to "4G" fields that have very little infill.



Photo: 3: Three examples of organic infill from one of the Australian companies

- Extra durability for the yarn, with stricter U.V. degradation standards over and above FIFA requirements, to cope with significant use.
- Tensile Strength improvements of yarn to reduce breaking of young.
- Containment strategy for infill and any microplastics within the site.
- Use of recycled rubber for the shock pad.
- Increase of shade through use of additional tree canopy around the site.

2.1.2. People (community) sustainability

- The extensive used by school and community (70+ hours) indicates that a very durable synthetic field will need to be specified over under both the normal standard synthetic system, 42 hours per week, to achieve what's needed.
- The single field is traditionally marked out currently but could be enhanced with half and quarter field markings, and in the warm-up area, 'boxes' could be painted on to allow school games and technical drills for football.

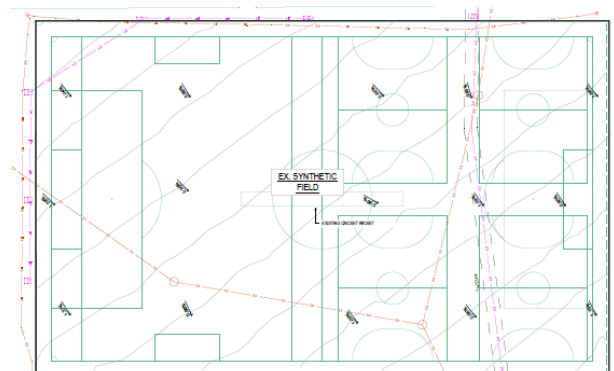


Figure 1: example of a football field with a half field and 5-a-side field areas

- As the standard usage of a FIFA would be 40 hours per week, and an expected two teams of players (suggest 25), but with the additional durability standards proposed, it should be able

to cope with over 40 players per hour. This increases the usage hours from 2,080 annually to 3,120, and player hours from 52,000 to 124,800 people hours per annum. By comparison, natural grass would also accommodate 25 players per hour, but for an expected 40-week year of 30 hours, equates to 30,000 people hours/annual. Synthetics providing an additional 94,800 player hours annually

2.1.3. Prosperity (economic) sustainability

- The cost to replace the current setup is detailed in Section 3 of this report, is estimated to be \$1.334m .
- By exploring the Whole of Life costs over the next 30 years, which is the expected life of the pavement base, the shockpad (25 year warranty) and two further replacement the total capital cost would expect to be \$3.354m (including this one)
- By including the annual maintenance costs over the next 30 years the cost for maintenance could be \$1.383(average of \$46k annually- inc CPI calculations)
- Assuming a 70 hour a week usage over 50 weeks the Whole of Life costs equates to an hourly rate of \$50.40 and purely a Replacement and Maintenance amortised cost would be \$34.65. (Appendix 4 has the details – incl CPI annual rises).

2.1.4. Performance (Fit for Purpose) surface

For the surface to both be fit for purpose for extensive school usage, sport needs for community sport, environmental good management and to achieve value for the future design. The following performance suggestions are made:

- Consider a “4G” field that can achieve the FIFA Quality mark and has a 12-year warranty (2 companies provide this in Australia currently).



Photo: 4. 4G Football turf, side on picture, which can be plaid with no infill (not certified) or with some small amount of infill - sand and olive pips and has certification, and a 12-year warranty

- Request additional durability standards around porosity, intensity of use, UV degradation, dual-use yarn and ‘non-floating’ organic infill.
- Ensure certification is achieved once procured to ensure that the surface performs to the required levels (Fit for Purpose).

- The warranties need to address the usage (70+ hours a week) for the surface and shockpad.
- Ensure resources are allocated to maintenance tasks and an annual renovation to increase the probability of meeting its life expectancy.

2.2 Design Review

When reviewing the current design against the components of the NSW Department of Planning, Housing and Infrastructure (DPHI) with good practices from global learnings the following key aspects are summarised from the Assessment Report (Appendix 2).

2.2.1 Planning stage

- There is no known natural grass solution to be able to cater for 70+ hours a week usage. Indeed, the intensity of usage purely by the school (both hours per week and participants) could not be accommodated by natural grass without a reduction in accessibility.
The new apartments being built within 500m of the oval will mean increased facility usage further.
- Sport-specific needs from the Football Association warrant a synthetic field (30+ hours a week), which, if it weren't there, could not be accommodated at other natural turf fields due to current capacity issues at them, according to Council staff.
- Consideration as to other solutions of natural turf or natural/hybrid turf solution still has a shortfall of more than 30+ hours.
- The current As-built drawings will be used for the upgrade process.

2.2.2 Design review

- The field standards will reflect FIFA Quality requirements, Football NSW overlays and additional standards for durability, porosity, UV degradation, environmental best practice, and any safety and health good practices within the specification.
- The field size will reflect the current design, with additional line marking for half and quarter fields, as well as drill areas/ play skill space on the warm-up space.
- Introduce a shock pad to the field, with organic infill (that is less likely to float) and explore “4G” innovation fields that can pass the field FIFA standards.



Photo: 5. Example of shock and, 3G carpet and organic infill

- Introduce more native trees on the banks of the road and carpark side to provide greater shade and increase evaporation cooling around the field.

2.2.3 Procurement review

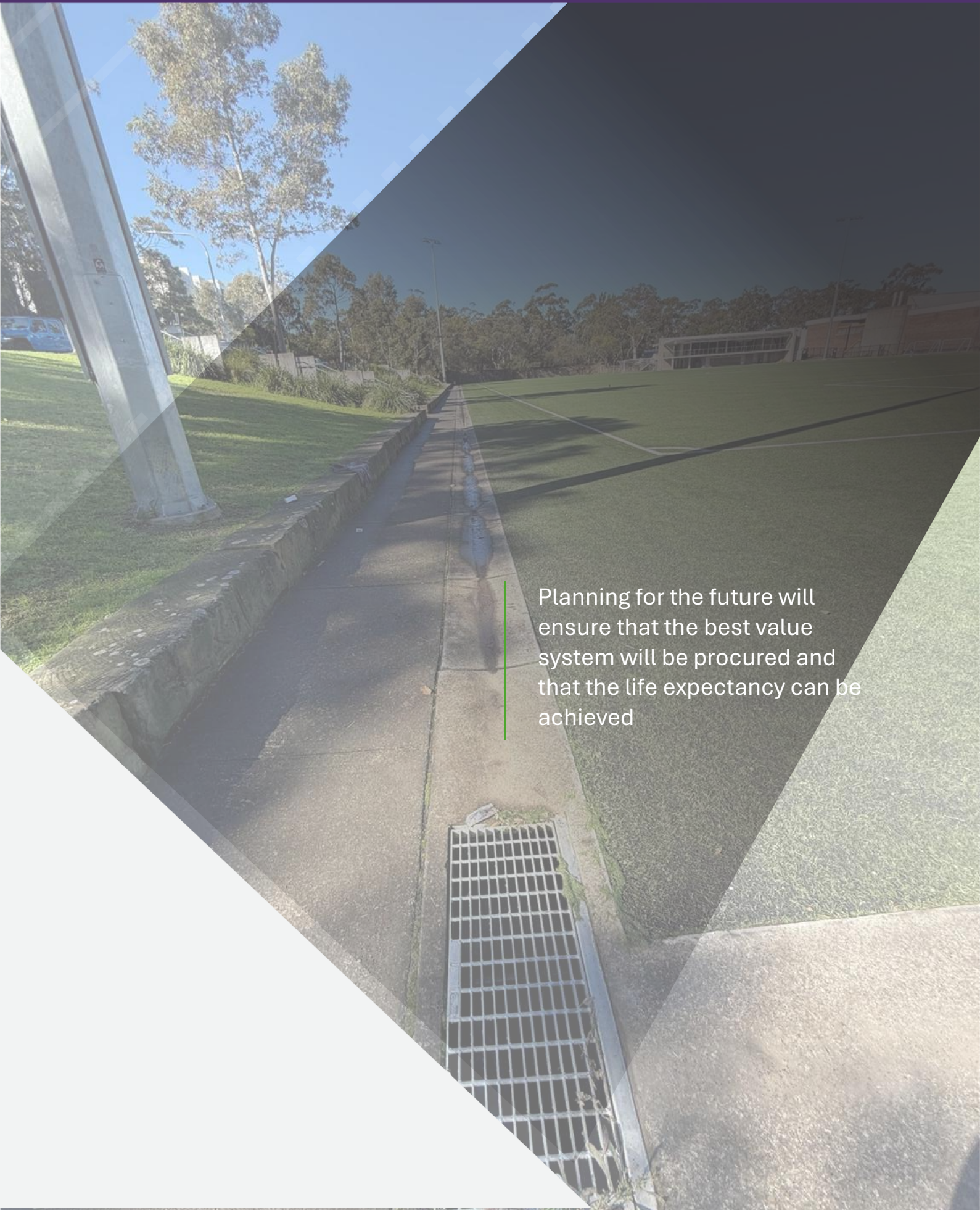
- The procurement process will follow Council's protocols to ensure transparency and rigour to the process, to secure a contractor who has the capability, capacity, experience and quality of offer for this specific project.
- Certification standards will be employed at each stage of the procurement, construction and handover process.

2.2.4 Management

- A maintenance and renovations specification will be utilised at the Tender phase to ensure that the life expectancy and performance can be achieved.
- Monitoring the fields success through Smart Technology and the use of KPI's is recommended.



SECTION 3: FUTURE PROOFING THE SITE



Planning for the future will ensure that the best value system will be procured and that the life expectancy can be achieved

3 FUTURE PROOFING THE SITE

3.1 Introduction

The changes in the technology reflect the community's drive for additional intensity of use (more people per hour of use) together with the environmental management narrative, and with an affordability consideration.

Section 2 of this report explores improvements to the current site design and condition. This section explores a number of specific considerations against a sustainability lens.

3.2 Prosperity (Economic) Lens

Council recently rebuilt a natural turf sports field a cost of \$900,000 (actual) compared to the rebuild of this field being approximately \$1.4m (inc. 20% contingency), including the recycling costs.

The maintenance costs provided by Council for a typical football field annually would be circa \$20,000 compared to the expected synthetic field costs of \$25,000 to \$30,000.

Renovations of natural turf fields are completed at the end of each season and dependent upon the usage and impact on the turf that would result in the type and range of renovation needed. It is expected that from years 3 – 10 of a synthetic turf field that infill will be needed depending upon the solution. This could be in the range of \$10,000 to \$20,000 depending upon the infill and carpet type. Interestingly the 4G innovative system proposes that no top-up is needed and that maintenance would be minimal. The system in question (manufactured by Tencate and offered by Synergy Turf (NSW), Tiger Turf (VIC) and Limonta (SA), also has a 12 year warranty compared to a standard 5-8 offered for all 3G fields.

When all the costs are taken into account a comparison between a natural turf field, hybrid, and 2 levels of synthetic the financial comparisons are:

	Natural	Hybrid reinforcement	Synthetic – FIFA Quality	Synthetic - Smart
Initial Capital Cost	\$900k	\$900k	\$1.2m	\$1.4m
Maintenance Costs	\$30k	\$35k	\$25k	\$20k
Whole of Life costs (30 yrs)	\$2.4m	\$2.4m	\$3.8m	\$44m
WoL Performance of Usage	\$65.30ph	\$58.04ph	\$59.52ph	\$48.89ph

Table 2: Cost comparison

By considering the 4G field, although this would increase the cost by circa \$100,000 at capital cost, the maintenance is reduced (by 50%), the top-ups are now

zero and the warranty stipulates 12 years (33%) more than the 3G fields, which would bring the costs down further.

3.3 Planet (Environmental) Lens

To future-proof the field the following is encouraged, regarding environmental good practice:

i. Longer life of system, therefore reducing waste

- Additional durability standards
- Increased UV stabiliser to reduce breakage of yarns
- Use of dual yarn systems to increase durability
- Extended manufacturer warranties for key system components
- Explore innovations e.g. 4G field systems
- End of life ability to be 100% recycled or reused.

ii. Reduce environmental footprint

- Increase tree canopy around site
- Require Environmental Footprint Impact as part of procurement
- Procure 'ANZ' product only/priority
- Organic infill
- Non-oil-based polymer / recycled grass yarn use / recycled shockpad / 100% recycled end of life
- Water filtration through 'closed/ below ground' drainage strategy.

iii. Circular economy

- Recycled components in make-up of system
- 100% recyclable components or repurpose (organic)
- Extended life of system (e.g. shockpad to 25 years and grass to 12 years) to reduce waste

iv. Reduced impact on local environment

- Increased tree canopy for cooling of Urban Heat Island Impact and cooling of area with increased evaporation cooling from the Canopy
- Reduced microplastics into water waste systems through redesign of drainage to be sub-surface only.

3.4 People (Community) Lens

To encourage greater usage, with purpose, for the field the design of the field could include for each category of users:

i. School

- Provide multi-sport markings on the field of play, including half and quarter field sizes.
- Develop games areas handball boxes etc, that could be used for informal games and skills drills on the warm-up areas.

- Lines on field painted for fitness drills etc.

ii. Football

- Provide half / quarter field markings.
- On warm-up area, goal area and penalty spot for additional space for drills.
- Drill design areas on the warm-up area.
- Provide more trees on the inclined embankment, behind the goals and on the coaches box side for shade and tree canopy.

iii. Community

- Review the drainage around the field and convert it and the current concrete path into a walkway/jogging track around the outside of the field.
- Explore easier access for people with disability and appropriate directional signage.



SECTION 4: CONCLUSION & RECOMMENDATIONS



4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusion

This 13 year old field is satisfying three primary groups of users:

- The school (40 hours per week on school days).
- The local Football Association (30+ hours weekly all year round).
- Local community (casual usage for exercise including walking, recreation (kick with kids) and participation in community sport (through the local football teams and academies).

The expected usage (70+ hrs) is at the upper edge of the current synthetic technology ability to cope, and additional requirements will need to be specified to meet these intensive levels.

Even if a natural turf field was constructed with the best technological solutions for grass type, growing medium, irrigation and drainage, as well as a carefully orchestrated fertiliser application, maintenance and renovation programme, it would not be able to cope with either the hours of use (70+) and/or the number of participants per hour that a synthetic field can.

The current field was designed 13 years ago with the standard design of the day and doesn't meet the environmental expectations of today's climate, which can be retrospectively 'fitted' for the next generation of systems.

The next generation of sports surface manufacturing, design, procurement and management are already here and the opportunity to specify these innovations and now standard practices will have a significant impact on the environmental lens and also the ability of councils to meet the NSW Department of Planning, Housing and Infrastructure Guidelines. This would seem to be the only way that the intensity of use can be accommodated at Charles Bean.

The conclusion is that the only way that the 70 hours usage that can be accommodated on site is to retain the synthetic surface infrastructure and replace the current carpet with state of the art environmental friendly organic infill system that can be 100% recycled at the end of its life. Specific recommendations are listed below.

4.2 Recommendations

The key recommendations are highlighted for Councils consideration

4.2.1. People (community) recommendations

1. Retain the synthetic sports surface subsystem and replace the carpet surface with a system that can cope

with the 70+ hours and the intensity of over 50 people using it per hour.

2. Enhance the markings of the field for greater usage by the community (e.g. walking path around field), school/ drills and exercise marks and the football community (half, quarter field markings and drill areas on warm up space).
3. Ensure design can cope with the intensity of usage for durability.
4. Plant more trees around the site to create shade and more evaporative cooling.
5. Ensure that the surface procured meets FIFA quality standards and more to allow a longer life than usual.

4.2.2. Planet (environmental) recommendations

6. The current synthetic system (carpet, rubber infill and sand) should be recycled and repurposed at Australia's only centre for synthetic services at RE4ORM in Barnawartha.
7. The design and procurement of the new systems should be made from, and where possible, recycled or repurposed materials (e.g. carpet, shockpad and infill). The synthetic surface should 100% be able to be recycled (carpet/yarn) or repurposed (infill) at the end of life.
8. The procurement should consider the new systems impact on the environment, from a logistics/ transport, manufacturing, installation, management and end of life perspective.
9. The new design should consider the specific aspects that will reduce Urban Heat Island (UHI) impact and impact on the environment and include lowering UHI impact with organic infill, increased tree canopy, heat retarding technology within the yarn carpet.
10. Lowering environmental impact – 'closed drainage' strategy, including a water filter to capture any debris from the field, expansion of tree canopy, use of LED lights. Reduction of diesel/ petrol maintenance machinery and explore innovative solutions to design synthetic systems to reduce maintenance needs.

4.2.3. Prosperity (economic) sustainability

Explore benefits of innovative systems that could reduce the WoL costs such as 4G certified systems that could extend life cycle expectations to 12 years.

Request innovative options that may reduce maintenance costs over the life cycle of the surface.

Ensure that key aspects of the system can be reused (e.g. shockpad) for 2-3 cycles (25+ years).

Design the specification that rewards the Contractors/ Tenderers with longer term manufacturer warranties.

Appendix 1: QA Action Plan for Spec and Drawings

See attached document

Appendix 2: Charles Bean Site Assessment to NSW DPHI Guidelines

Sports Surface Component Considerations	Benchmarked Solution and Preferences	Assessment Result for Charles Bean Oval
1. PLANNING		
Identify Sports Uses and Needs		
Provision and Capacity	Complete a demand assessment analysis, agreed with the Sports SSA, to justify the need for new facilities and/or upgrade existing ones. This should consider recreational needs, training, and competition needs	The school needs access to the field for PE Lessons, school breaks and for sport, of circa 40 hours per school week. The Football Association need circa 30 hours a week during evenings and weekends for competition. Additional housing being built will only place more stress and relevance of this in the network of sports fields for Council The site is already in place and it is estimated that if the site was to be rebuilt from its current state and removal of the sub-base, pavement and drainage strategy to allow for a sand based natural field, with irrigation and drainage, the costs would be in excess of \$2.2million
	Ensure justification considers any internal or external organisations strategy, policy, or management plans	
	Community consultation at an early stage to reflect the whole community, including all (potential) users, key stakeholders, and the community who may be impacted by the development potentially from increased usage, traffic, noise, or lights.	
	There is a need to quantify current and future needs for participants and the surface type as well as identify the right site	
Sports specific needs	Certain sports have requirements for the surface types and performance criteria and most are linked to the level of play, from multi-sport to training, community, regional, state, national, and international; play requirements. Work with local SSA to identify the actual standards and type of surface needed for the field of play, not just the aspirational needs	A FIFA Quality standard is recommended with additional performance criteria for durability, porosity, UV impact, safety standards and environmental good practices.
Strategic Considerations	Consult and confirm any strategic needs and how this planning request will fit into State/Territory, Commonwealth, and local government strategies, both within this location and the neighbouring ones. Strategic decision-making will impact the viability and needs of the planned facilities and needs to be contextualised Consider the Open Space, Recreation needs, and sporting facilities strategies as well as the SSA needs studies.	Alignment with PlayWell – the Commonwealth Governments strategy to encourage more people to be active and participate in sport and recreation, through sporting clubs and at schools
Site assessment	Justification that the current site cannot accommodate the current or future demand without such technological improvements	The 70 per week needs during school time and the 30+ hours a week the rest of the year plus community usage, is critical to the surface type to ensure: 1. Safety of the players 2. Consistency of the surface performance 3. Reduction in cost of maintenance and renovation of natural turf v hybrid v synthetic
	A municipal-wide geographical assessment should consider which is the best site and encourage broad community usage	According to Council all the nearby natural turf sites are at capacity currently and could not accommodate the additional load
	Number of synthetic fields of play in the area and how does the proposed one complement others and are	Council has 1.5 other synthetic fields at North Turramurra Recreation Area. This is 12.1km or a good 25m car travel, which is unlikely to

Sports Surface Component Considerations	Benchmarked Solution and Preferences	Assessment Result for Chrles Bean Oval
	part of a network solution to address capacity issues in the area	allow the school or local community to travel to the other.
	Exploration of other options (e.g. natural surface upgrade with drainage & irrigation system improvements or use of hybrid technology)	Natural turf, if all the right circumstances were in place including drainage, irrigation, the right grass, growing medium and maintenance could accommodate 25 people playing and training for circa 30 hours. With hybrid grass reinforcement that could then be extended to 35 hours. For the intensity of use for the number of students at the school the level of maintenance and renovation would need to be significantly increased.
	Exploration of flooding, bushfire, environmentally or residentially sensitive areas) prior to the agreement of the site	None identified
Planning - Civil Engineering Considerations and Site Design		
The whole of Site design	Exploration of a whole of parkland masterplan should be considered to ensure that any field of play design is aligned with the strategic needs of the site.	The field is already in place – and has been for the past 13 years
	Impact of the field of play for the whole site - including tree canopy, fauna, flora, water harvesting, parking, lights, etc)	
	Placement of field of play – to minimise the impact of the field on other environmentally or community-sensitive areas (e.g. waterways, bushfires, etc)	There is opportunity to improve the environmental management of the field include, subsurface drainage plan, increase the number of native trees on the site, and address the current microplastic migration
	Climate change impact - has the design embraced the Australian Institute of Landscape Architects, Climate Positive Design(Vol 1-3) Guidance	Increased trees for shade Adoption of an organic infill strategy and ensure that the FIFA Heat test results are 1-2
	Tree planting – to reduce climate challenges and carbon sink and possible impacts to Urban Heat Island (UHI) impacts.	There is ample space for more trees to be planted on the street side embankments
	Active, Passive recreation impact – will the new facility have a significant impact on passive recreation in the area? Will it significantly impact the hours of play in a manner that will impact the local community	With the additional housing being created currently this will be their “home field” to play and actively recreate on
	Accessibility – Consider whether the new facility will impact people using the site, accessing the site and whether it will be perceived as being safe and accessible by all	Has been in place for over 13 years and only the conversion of the site back to natural grass would impact significantly the ability for the school, the Football Association and the community to recreate and participate in community sport.
Planning approval process	New facilities, where a Development Application, is required will need to adhere to the new Territory Plan, which includes a range of statutory documents and additional reference documents (e.g. District and Zone policies, Technical Specifications, Design Guides, District Strategies	NA
Preliminary Site	The project needs to conduct at least the following:	Already in place – no other engineering works needed

Sports Surface Component Considerations	Benchmarked Solution and Preferences	Assessment Result for Chrles Bean Oval
engineering solutions	Site geotech report - to ascertain the ability of the site to accommodate the pavement base, and in what form to ensure that it can be built for a minimum of 20 years	
	Site environment assessment – to consider all soil health issues	NA
	Flood report – that may impact the site longevity and ability to construct as flooding needs strategic engineering solutions for certain types of flooding	NA
	Site survey – to be able to design and build the site to its optimal performance	NA
	Tree management report – in relation to any trees impacting the field of play and also how the tree canopy can be expanded with the careful planting of additional trees, for shade, reduce surface heat, and offset any UHI impact. Need to consider new legislation - Urban Forest Act 2023	NA – additional tree planting strategy should be considered
	Review of the whole of site access – to ascertain pedestrian and vehicle travel around the site from the development and during the development, reducing the impact on the community.	Works well currently
	Site overlays – has the site any overlays such as heritage importance, restrictive zoning, previous landfill, existing easements etc	NA
Pavement base	20-year minimum design and preference is for 30 years to ensure that the investment can make a difference to generations of children and sports players Geotech site assessment is needed to ascertain the ability of the site to accommodate the pavement base, and in what form to ensure that is can be built for a minimum of 20 and preferably 30 years	Design parameters are shown on the ASBults from McMahons Civil engineers and from the site assessment there are no “soft spots” and the pavement may need to minor rectification at replacement time as expected.
Drainage strategy	Drainage strategy – to address a 1 in 20-year ARI event of approx 20 mins is allowed for and preferably 1 in 50-year ARI. It is important that the drainage can disperse the water after heavy rainfall and for the sport to resume within an acceptable period.	There has been no issues raised that Council are aware of re drainage. It is recommended that the drains are flushed and checked with a camera to ensure that there will not be any other unforeseen challenges during the next carpet life
	Water harvesting – where affordable should be considered to provide a benefit back to the whole parkland	NA
2. DESIGN		
Field of Play Standards		
Sports Performance standards	The fields of play should be designed according to the International Federation standards for community sport, namely: - Football - FIFA Quality mark - Rugby Union – World Rugby, Regulation 22 - Rugby League – NRL, Community Standard	Designed currently for football and used for PE games as well. Suggest the field is remarked for school needs in the “warm up area” and that half and quarter fields are marked on the proposed new surface.

Sports Surface Component Considerations	Benchmarked Solution and Preferences	Assessment Result for Chrles Bean Oval
	Australian Rules – AFL/CA Community Standard The International Federation surface standards are the starting point and additional performance standards are needed for Australia due to our intensity of use, the environmental conditions, and the community's concern about health and safety	
Field sizes	Ensure that the field size is linked to the level of play that is going to be held on the field, as the difference for an aspirational-sized field may add a further 25% to the costs.	The field size will remain as it is currently
Line marking	The line marking should meet the appropriate sports standards (e.g. state, national sports organisation, and that of the International Federation) depending upon the jurisdiction.	Suggest the field is remarked for school needs in the “warm up area” and that half and quarter fields are marked on the proposed new surface
System design – Yarn	Dual yarn of monofilament and fibrillated tape with additional durability testing (Lisport test 2012 – over 100,000 cycles) to allow it to stand up to the intensity of use in Australia Reduce ball splash and migration of infill, more durable combination and reducing the maintenance needs. Also reduces the likely migration of infill outside of the field of play The design of the Field of Play needs to be designed to achieve AS TR CEN 17519:2021 Surfaces for Sports Areas – Synthetic turf facilities – Guidance on how to minimise infill dispersion into the environment	Yes as suggested – all to be adopted
System design – infill	Organic infill options with a preference for limited floating Heat level of 1-2 on the FIFA scale as opposed to rubber was 2.5 to 3 (40% heat reduction) Environmentally positive as it removes the rubbers from the system and the possible migration from the field. It will reduce the heat impact significantly and positively impact the perceptions of the community. This will address the perceived issue with some of the community who fear the rubber may have negative health impacts – which although not proven at any level –will stop this narrative	Organic is recommended to meet these criteria
Shockpad	Every system should have a shockpad that meets the European standard (EN 15330-4 (2022) Surfaces for sports areas (Part 4) and has been tested to the Sports International Federation standard The shockpad should have a manufacturer (not supplier) warranty of a minimum of 20 years and for a minimum of 60 hours and not the normal 40 hours per week The environmental preference is for the shockpad to be constructed from recycled products	Introduce a shockpad

Sports Surface Component Considerations	Benchmarked Solution and Preferences	Assessment Result for Chrles Bean Oval
Environmental standards	The following SMART standards should be embraced for environmental good practice: • Infill and yarn should be tested to AS/NZS 2111.18 (1997) AS/ISO 9239-1 Flammable / melting point is acceptable • The Heat Indices (FIFA Quality manual) should be within a 1-2 score • All drainage should be under the field of play and achieve the AS Standards for Mitigation of Microplastic's • European REACH regulations, Annex. XVIII entry 50: 2021 if rubber infill used • EN71.1 Safety of Toys – part 3 Mitigation of Certain elements, table 2 – category III (Scraped off material) or US standard ASTM F3188-16 • The carpet system needs to be tested for additional durability for Australia (FIFA 2012 Quality manual – Lisport test with a minimum of 100,000 cycles and the higher the better, with some systems now offering over 300,000 cycles	All these recommendations are endorsed to be included
Climate Action good practice	Has the design embraced the Australian Institute of Landscape Architects, Climate Positive Design(Vol 1-3) Guidance	With limited free space the tree canopy is the critical aspect and utilisation of the banks for native vegetation increase
Warranty standards	The performance system should have a manufacturer (not a supplier) warranty of 8 years (min) against a minimum of 60 hours of usage per week for 50 weeks a year (3,000 hours per annum)	This is critical and will be stated in the specification
Supporting infrastructure and equipment standards		
Pathway standards	The width of the pathways should be a minimum of 1.8m and preferably 3m, linked to the expected number of spectators while still allowing 1.8m outside of the spectator's 'line'	Paths and infrastructure already in place
Equipment standards	International and SSA Sports standards need to be embraced Goal posts should be procured as aligned with the Australian standards compliance obligations, AS4866.1: Playing Field Equipment – Soccer goals Identify the standard of play that the field is primarily used for (not the aspirational level) and align the size of posts (e.g. AFL, Rugby, etc) as the post heights differ between local, district, and state-level competition	Any equipment will be specified to the AS standards Community and school usage will be specified and the additional durability needs will be reflected in the Specification
Lighting standards	The light system should be LED, and have smart technology that allows for various settings including 'warmup/down', training, and competition (Various levels) to optimize costs and performance needs The standards should be specified against the various Australian Standards and aligned with the various sports needs • AS 2560.1 Sports Lighting, Part 1: General Principles	Not as part of the project currently

Sports Surface Component Considerations	Benchmarked Solution and Preferences	Assessment Result for Chrles Bean Oval
	- AS 2560.2 Sports Lighting Part 2: Specific Applications - AS/NZS 4282:2019 Control of obtrusive effects of outdoor lighting (general and specifically appendix C)	
Fence standards	Fencing and netting need to balance the role between safety (keeping the ball within the field of play and reducing the opportunity of interaction with spectators or passers-by) and keeping spectators out of the field of play while balls are being used AS 1725.5 – 2010 (reconfirmed 2020) Chain link fabric fencing Sports ground fencing – general requirements Higher fencing should be considered at key points around the field of play to reduce the ball entering roads, high-use pedestrian areas and to protect other buildings, etc	No fence around the site. The rear fence could have the mesh replaced to AS standards
Pedestrian and vehicle entry points	There should be adequate gates open continually for pedestrians to enter the field at key points around the field. Vehicles, including emergency vehicles, should have a quick entry point from the main road to allow quickness and ease of access All-access points should have embedded grills to stop infill being taken out on shoes or tyres	Entrance through the side of the pavilion for vehicles and disability needs
Parking and transport	Public transport should be considered for access to fields. If this is difficult then there should be adequate parking for peak times and turnover of participants etc Conversion of current facilities needs Ensure adequate parking is available Explore the ease of public transport Lighting in parking areas to ensure that there is safety of users	Limited parking on Shout Ridge and Dunstan Grove. After 13 years the users are aware of this and as the majority of usage is by the school walking through onto the field during the day.
3. PROCURE		
Procurement Process		
Transparent procurement	A procurement program is needed to ensure transparency and rigor to secure fit for the for-purpose field of play Council procurement program should be used where possible to ensure transparent and rigorous procurement protocols are followed	Council procurement protocols will be followed
Tenderer suitability	The tenderer chosen must have experience in the construction of these standard fields and the surfaces must be certified and approved by the Sports International Federation Tenderers/suppliers of such sports surfaces must be a licensed or preferred provider of the International Federation or an Agent of such an organisation and can supply a sports system that has been tested and	Each tenderer will have to demonstrate many aspects including: - Capability – experience of uplifting a current field, the logistics of transport of the ‘waste’ and replacing it with a state of the art environmentally friendly synthetic system - Quality of offer – environmentally friendly synthetic system that has an organic infill,

Sports Surface Component Considerations	Benchmarked Solution and Preferences	Assessment Result for Chrles Bean Oval
	has been certified by them to meet the IF's performance standards.	durability, porosity and UV degradation, microplastic migration reduction Capacity – can do it on time and within budget
Procurement design strategy	The common Design and Construct (D&C) procurement strategy is fraught with dangers and although may present as a cheaper option in the short term will be more costly in the whole of life of the field. Chose either a Design Finalisation and Construct (DF&C) or a Detailed Design (DD) strategy	Suggest that a Design Finalisation strategy is embraced
Innovation strategy	Encourage innovation in the system options to demonstrate best value for the community and users A DF&C offers the best option for innovation together with an RFT option of Value Engineering	Explore and encourage innovation through the procurement process that may include the use of non-oil based polymers in the grass, non-floating organic infills, 4G systems and other options
Procurement documentation	Where possible utilise the Government's standard documentation specifically amended for this type of contract	Council procurement protocols will be followed
Certification standards	Certification to the International and Australian Sports standards once complete and ongoingly All sports fields need to be procured in a manner that ensures that the International Sports Federations' performance standards are achieved as a minimum, plus Australian-specific needs as per the Design Guide (e.g. UV radiation, water porosity, etc)	Football NSW standards / guidelines will be embraced
Construction		
Project management	Ensure sufficient time is allowed for each stage, for wet days, and a contingency is built in A detailed project plan will bring together all parties and ensure an aligned timeline that reduces the probability of overrun and additional costs	Project management around school terms and football seasons will be considered when developing the delivery strategy
Quality control	Assuring the quality is crucial throughout the project and once it has been installed.	A thorough Critical Hold and Witness Point schedule will be used, in addition to a methodology statement and project plan to be provided at the Tendering stage. In addition, specific quality systems are required as well as specific warranties for the intensity of usage
	There should be Critical Hold Dates that allow for independent assessment before the next stage continues, around project management, construction steps, and completion.	
	The field should be certified by an approved International Federation approved assessment company to ensure that the surface performs to the levels specified	Certification to FIFA Quality will be required
	There should be a default handover period, normally 12 months so if anything goes wrong then the tenderer corrects it at no cost to the sport or the purchaser	Default handover and rectification period will be specified
4. MANAGE		
Whole of Life Management		
Maintenance	Maintenance is needed for the surface and should be planned with external suppliers Maintenance of the sports grounds should be conducted in a manner to extend the life of the	A maintenance program will be built into the Specification that addresses routine maintenance, annual infill top up and any renovations as the field ages

Sports Surface Component Considerations	Benchmarked Solution and Preferences	Assessment Result for Chrles Bean Oval
	sportsground while reducing the environmental footprint.	
Annual review	Annual maintenance reports (independent) should be expected that provide the council with the confidence that the fields are being managed adequately	
Smart technology	Consider the embracement of Smart Technology, such as Intelligent Play or similar to monitor programming, usage, maintenance needs, and security.	Council to consider the use of Intelligent Play technology to monitor usage and impact on maintenance
Replacement	The anticipated replacement date should be calculated annually to ensure that the field can achieve its life expectancy, which will be determined by the type and intensity of usage with the maintenance program to reduce the impact of the usage. From the annual review consider when the field of play needs to be replaced and ensure that there is a sinking fund in place to be able to afford its replacement	The specification will ensure that the future synthetic system will be able to be 100% recycled and or re-used It is recommended that the current field be recycled as part of the change over of synthetic carpet etc
Measure impact	To create a community impact focused on growing participation can be created by additional hours for children and adults to have access to more sports fields. Measuring this impact will quantify the effects that technology can have on actual participation Identify key measures to justify the impact that the new sports facility is having on the community by collecting the data that should include: • Club members – annual before and after • Usage – the number of hours per week/year • Usage – the number of players (adults/Children) • Hours of maintenance/hours of use ratio • Cost of maintenance per annum • Hectares of synthetic v natural turf fields in the municipality • Amount of water used before and after installation	These KPI's are suggested for Council to consider adopting and monitoring to demonstrate the impact that the field is making on the school students, the football association and the broader community

Appendix 3: Estimated Replacement and Site Enhancement costs

Table 11: Initial Capital Cost of Synthetic Surface Installation			
1. Type of synthetic field of play (sports name)			Charles Bean Football Field
2. Size of area of field			9,210
3. Field Planning and Procurement Costs	Variable costs (per m ² / lin. Metre)	Fixed costs	Total cost of field
Detailed site survey		\$0.00	\$0.00
Geotechnical investigation		\$0.00	\$0.00
Technical Specification and Design Package		\$35,000.00	\$35,000.00
Procurement		\$8,000.00	\$8,000.00
Project Management		\$0.00	\$0.00
Approvals i.e. Development Approval		\$0.00	\$0.00
Field Planning and Procurement Costs Sub-total			\$43,000.00
4. Synthetic Field Direct Costs			
Site establishment, documentation & project management		\$100,000.00	\$100,000.00
Disposal of spoil	\$75.00		\$75,000.00
Sub grade works	\$0.00		\$0.00
Drainage, gutters and concrete works		\$0.00	\$0.00
Base pavement (e.g. road base)	\$0.00		\$0.00
Additional costs to offset site challenges (see Part 2 Section 6)	\$0.00	\$0.00	\$0.00
Synthetic sports surface and infill	\$85.00		\$782,850.00
Shock pad installation	\$30.00		\$276,300.00
Other - drainage upgrade and additioanl trees		\$100,000.00	\$100,000.00
Pitch Sub-total			\$1,334,150.00
5. Synthetic Field Indirect Costs			
Field fencing / gates	\$0.00		\$0.00
Field lighting		\$0.00	\$0.00
Player benches / shelter		\$0.00	\$0.00
Equipment (i.e. shoe cleaning)		\$0.00	\$0.00
Retractable Netting	\$0.00	\$0.00	\$0.00
Spectator Seating	\$0.00	\$0.00	\$0.00
Pathways	\$0.00		\$0.00
Goals		\$4,000.00	\$8,000.00
Maintenance machinery		\$0.00	\$0.00
Marketing and Communications		\$0.00	\$0.00
Other (e.g. drinking water etc.)	\$0.00	\$0.00	\$0.00
Ancillary costs Sub-total			\$8,000.00
Investement without Contingency (Pitch + Ancillary costs)			\$1,342,150.00
Contingency Allowance		15.0%	\$207,772.50
PM Costs		5.0%	\$69,257.50
Total investment			\$1,662,180.00

Table 12: Annual Maintenance Costs			
Maintenance costs compared to usage expectations			
Component	Aus. \$ cost		
Field of Play Maintenance Costs	under 40 hours	40 - 60 hours	Over 60 hours
Routine grooming	\$13,000	\$15,000	\$17,000
Professional service grooming	\$9,000	\$9,000	\$9,000
Algaecide / Herbicide application	\$3,000	\$3,000	\$3,000
Visual inspection	\$2,000	\$2,000	\$2,000
Field performance testing	\$0	\$0	\$0
Other (please list)	\$0	\$0	\$3,000
Pitch Sub-total	\$27,000	\$29,000	\$34,000

Table 15: Average hourly cost need to meet WOL costs based on hours used per week (for 50 wks. p.a.)			
ical example scenarios to consider offsetting the WOL costs	10yrs	20yrs	30 yrs
Scenario 1: 20 hours a week - Stadium Use (5 hours per weekend day use and 2 hours per week day night training)	\$203.22	\$181.98	\$180.75
Scenario 2: 30 hours a week - Club Use for weekend matches (5 hours a day) and 4 hours training per week night	\$135.48	\$121.32	\$120.50
nario 3: 40 hours a week - Heavy club use and limited school programmed time	\$102.61	\$92.02	\$91.73
nario 4: 50 hours a week - Heavy Club Usage with development program and limited school use	\$82.09	\$73.62	\$73.39
nario 5: 60 hours a week - Programmed Facility with external clubs but no commercial soccer	\$68.41	\$61.35	\$61.15
Scenario 6: 70 hours a week - Comprehensively Programmed Facility with external clubs; Commercial Soccer leagues and Coaching programs	\$57.21	\$51.11	\$50.48

Table 16: Average hourly cost need to meet maintenance & replacement costs based on hours used per week (for 50 wks. p.a.)			
ical example scenarios to consider offsetting the maintain and replacement costs	10yrs	20yrs	30 yrs
Scenario 1: 20 hours a week - Stadium Use (5 hours per weekend day use and 2 hours per week day night training)	\$37.00	\$98.87	\$125.34
Scenario 2: 30 hours a week - Club Use for weekend matches (5 hours a day) and 4 hours training per week night	\$24.67	\$65.91	\$83.56
nario 3: 40 hours a week - Heavy club use and limited school programmed time	\$19.50	\$50.47	\$64.03
nario 4: 50 hours a week - Heavy Club Usage with development program and limited school use	\$15.60	\$40.38	\$51.22
nario 5: 60 hours a week - Programmed Facility with external clubs but no commercial soccer	\$13.00	\$33.65	\$42.69
Scenario 6: 70 hours a week - Comprehensively Programmed Facility with external clubs; Commercial Soccer leagues and Coaching programs	\$9.71	\$27.36	\$34.65

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