Charles Bean Surface Renewal Community Forum
3 December 2025

On behalf of Council I would like to acknowledge the traditional owners and custodians of the lands on which we meet today. I pay my respects to their Elders, past and present.

Agenda

6:30pm – Welcome, intro and session rules – KRG Council

6:35pm – Project overview and intro to speakers – KRG Council

6:45pm – Expert presentation 1 – Dr Mick Battam

7:05pm – Expert presentation 2 – Martin Sheppard

7:25pm – Q&A

8:00pm – Close

NOTE WE ARE RECORDING THE SESSION TODAY

RULES/CONDUCT

- Only one person talks at a time - do not talk over another participant, speaker/staff member who is addressing and/or responding to a question.
- Mutual respect - everyone's opinion counts – there is no wrong or right answer
- Keep to time please

DOES EVERYONE AGREE?

Why we're here today

The current synthetic turf surface at Charles Bean Oval is nearing the end of its useful life and requires renewal. Council is seeking community feedback on how the playing surface should be renewed:

- Option 1: New synthetic turf surface
- Option 2: Convert to natural turf

About Charles Bean Oval

History

Transferred to Council in 2013 from Defence Housing Australia - built to FIFA standards as Ku-ring-gai's first synthetic turf sportsfield

Current use

- Community sporting groups (competitions and training)
- Lindfield Learning Village (playground and sports activities)
- Casual hirers for training and sports activities
- General public for passive recreation

Key fact: One of Ku-ring-gai's busiest sport spaces

What's been done so far

Expert reports commissioned - Council has engaged two industry experts to provide independent opinions on synthetic turf and natural turf playing surfaces

Background information provided - Current site usage, booked hours, and indicative cost estimates for renewal options

Community engagement - Survey and consultation period open until 5pm, Tuesday 16 December 2025

Expert presentations

1) Dr Mick Battam and Martin Sheppard will present their findings
2) Question and answer session - Opportunity to ask questions and seek clarification
3) Your feedback - Share your views through the survey or written submission

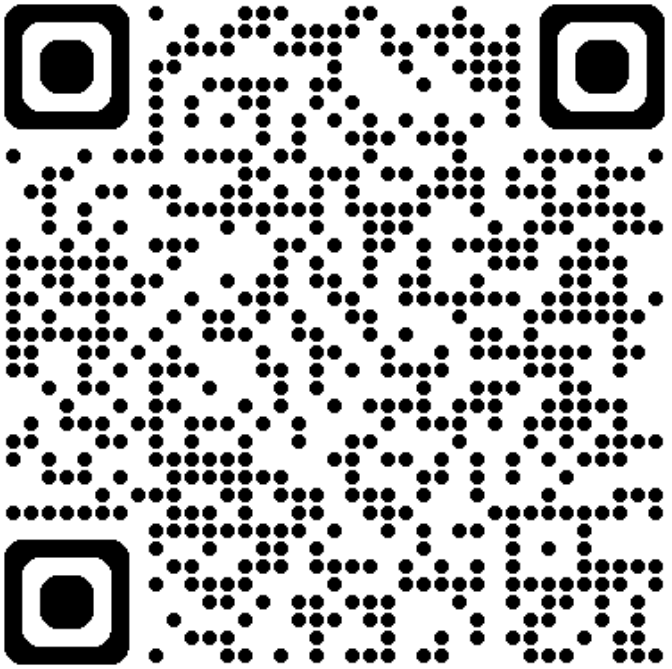
How to have your say

Submissions close: 5pm, Tuesday 16 December 2025

Online survey - complete the survey at yoursay.krg.nsw.gov.au/charles-bean-oval or complete tonight on paper

Email - Send your submission via email

Post - Ku-ring-gai Council, Locked Bag 1006, Gordon NSW 2072



Thank you

Thank you for being here

Your input is valuable in helping Council make an informed decision about the future of Charles Bean Oval

Let's hear from our experts

Converting Charles Bean Oval to Best Practice natural turf

Dr Mick Battam

(Certified professional soil scientist and irrigation agronomist)

AgEnviro Solutions

2025_09 AgEnviro memo on converting Charles Bean Oval to a best practice natural turf v8 (18th September 2025)

AgEnviro Solutions
30 Equinox Dr Box Hill 2765
Phone: 0425 363 161
ABN: 98 919 877 543
mick@agenviro.com

Matthew Drago
Acting Manager Assets & Technical Services, Ku-ring-gai Council
818 Pacific Highway, Gordon NSW 2072

18th September 2025
Re: Converting Charles Bean Oval to a best practice natural turf field

Matt,

Construction cost estimates

Based on the high-level evaluation, the cost to complete the construction of Charles Bean Oval as a best practice natural turf field is around $2.2 million (includes 20% contingency).

Lifecycle costs

The potential financial commitment over 30 years is provided in Table E.1. Key points to note:

- the best practice natural turf field will be functional at year 30 (if well maintained). Hence its year 30 net present value (NVP) would equal to its newly constructed value, with asset replacement for the synthetic field at year 30 is needed for a like for like comparison
- periodic works on the irrigation and drainage systems have been allowed for in the annual maintenance costs for a best practice natural turf field
- both best practice natural turf fields and synthetic fields can handle considerably higher wear levels than those currently occurring on the field, but as wear levels increase:
  - **natural turf:** condition of the field will become thinner by the end of the winter sport season (recover in spring), especially if wear levels were increased by more than 75%
  - **synthetic turf:** lifespan will be reduced in proportion to increased wear levels, requiring carpet replacement every 5 to 7 years for high wear levels (see product warranty).

For hybrid field built and maintained according to best practice an additional $1.4 million should be added to the construction (and lifecycle) costs of the best practice natural turf option.

Table E.1: Summary of expected lifecycle costs for best practice natural turf and synthetic fields

Item	Best Practice Natural Turf	Synthetic Turf	Notes
Estimated costs to complete construction	$2.2m[1]	TBC[1]	20% contingency included in the best practice natural turf field
Total maintenance costs	$1.25m	$0.78m[2]	Over 30-year period
Total asset renewal costs	Nil	$2.75m	Year 10 and 20 for the synthetic field
Asset replacement at Year 30[3]	Nil	$1.38m[3]	Synthetic field needs replacing at year 30 to be a functional facility[3]
Total financial commitment	**$3.45m[1]**	**$4.91m + construction cost[1]**	**Includes end of life replacement at year 30 for the synthetic field**

1 Includes 20% contingency
2 Excludes costs for maintaining synthetic turf stormwater treatment measures (filters/biofilters) as currently occurs, see Ausmap, 2024
3 at year 30 the synthetic (end of its useful life) requires complete replacement (shock pad, carpet, infill etc) so it remains a functional field

Filtration system

The current filtration system at Charles Bean Oval is inadequate at preventing turf fibre and infill losses from the site (Ausmap, 2024). The synthetic field design for nearby Norman Griffith Oval for example has a flat surface (0% fall), a surrounding plinth and a biobasin to treat the synthetic field stormwater.

A best practice natural turf field should comply with council's stormwater water quality targets if:

- a suitable (not excessive) fertiliser program is implemented
- appropriate maintenance practices are implemented (Section 3.2)

Weather cancellations

Sport can be cancelled due to adverse weather such as:

- **heat:** in addition to high temperatures, players can struggle at moderate temperatures if the humidity is high (NSW Football, 2023). Natural turf fields have fewer heat cancellations then synthetic because they can dissipate the suns radiation via photosynthesis & evaporative cooling. Synthetic fields with organic infill often exceed 55°C when the air temperature rises above 30°C (McKechnie, 2024)
- **intense rainfall:** can dislodge the synthetic infill so the surface needs re-grooming (and possibly topping up) before it can be played on. Intense rain can cause waterlogging on natural turf fields
- **other rain events:** can cause waterlogging on natural turf fields, with less interruptions on fields that have an effective drainage system that are built and maintained according to best practice. Aside from intense rain, other rain events typically have minimal impact on synthetic fields.

Based on modelling of 15 years of weather data a synthetic field with organic infill will have about 23 school days per year (this exclud… mostly associated with heat (Figur… to have about 9 school days per y… causing more cancellations for nat…

During the regular football seasc… synthetic field (organic infill) and… weather for pre-season, summer futsal and the summer break are provided in Section 4.4.

fields in Ku-Ring-Gai. If Charles Bean Oval was converted to best practice natural turf it would be capable of handling more than 2000 hours of annual usage i.e. similar to other intensely used best practice natural turf fields in the Sydney Basin. Due to the timeframes when students are available for

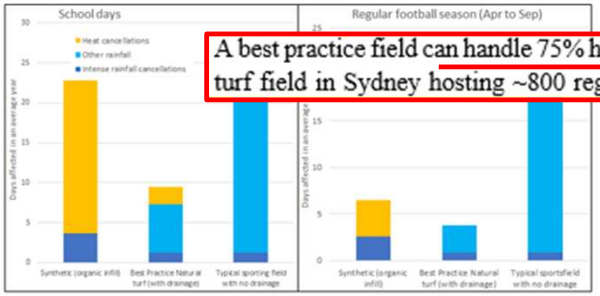


Figure E.1: Average days where adverse weather could impact on play. These are indicative measures of impact only, with actual impact depending on the time of the weather event relative to play times. Weather varies from year to year, with some years being hotter and drier (drought years) and other years being wetter.

A best practice field can handle 75% higher wear then current levels, with the most intensely used natural turf field in Sydney hosting ~800 registered players per week and sport from 3 schools. Whilst these

Topics

1) Steps to create a best practice field
2) Cancellations (soccer vs school impacts)
3) Carrying capacity vs current usage
4) Lifecycle costs

Provided advice for:

- **2000 sports fields**
- **25 Golf Courses**
- **60 Feature parks (Barangaroo, Hyde)**
- **5 Racetracks (Royal Randwick)**

Authored:

- **Hunter & Sydney Best practice guidelines**
- **Love your garden (26,000 houses)**
- **Darwin ultimate irrigation guideline**
- **Healthy home lawns factsheet**

www.agenviro.com **4 videos**

Acceptable grass cover
Minimal cancellations

Safe

1. even
2. not hard
3. grip

Safe

Charles Bean Oval (Ausmap):

- Rubber infill (recycled tyres): lead, Arsenic, zinc, PAHs

Test the infill for contaminants

- Synthetic fibres: PFOS, PFHxS (banned compounds)

All materials must adhere to IChEMS 2022 instrument

Safe

4. No player exposure to contaminants

- Natural turf: Asbestos, (heavy metals)

Any imported soil must adhere to AS 4419

Topics

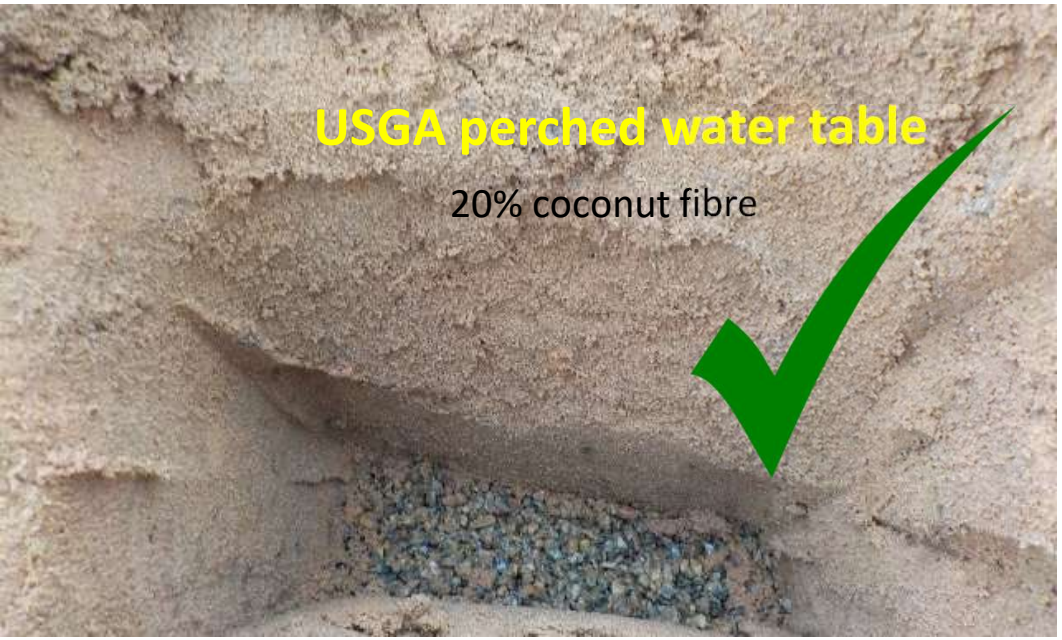
1) Steps to create a best practice field
    a) Suitable soil


USGA perched water table
20% coconut fibre


Sand over soil (SOS)


Cannot handle >250 players per week
(cannot handle >20hours per week)


Built in 2023

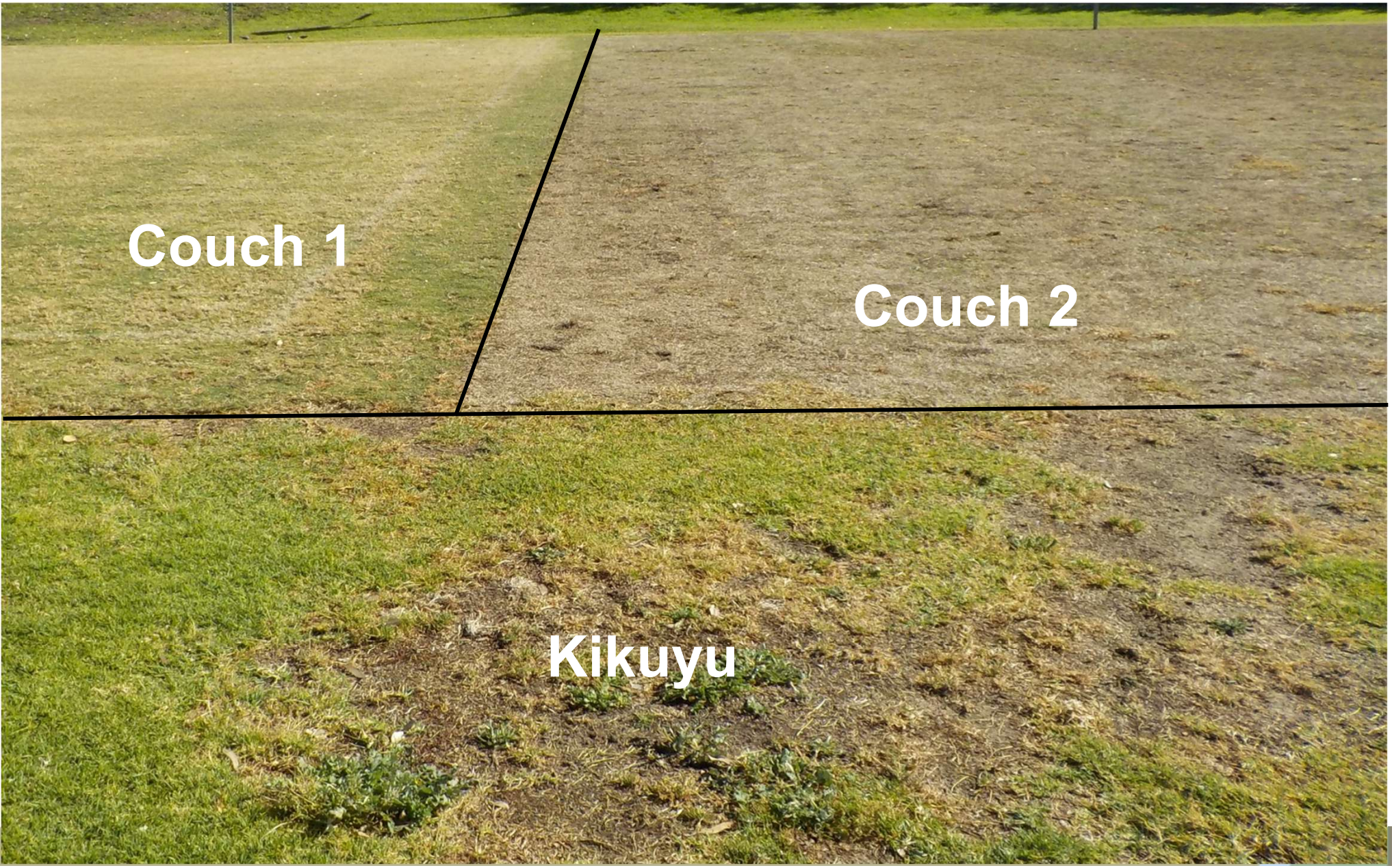

USGA perched water table
20% coconut fibre


Sand over soil (SOS)


Soil (OM amended)

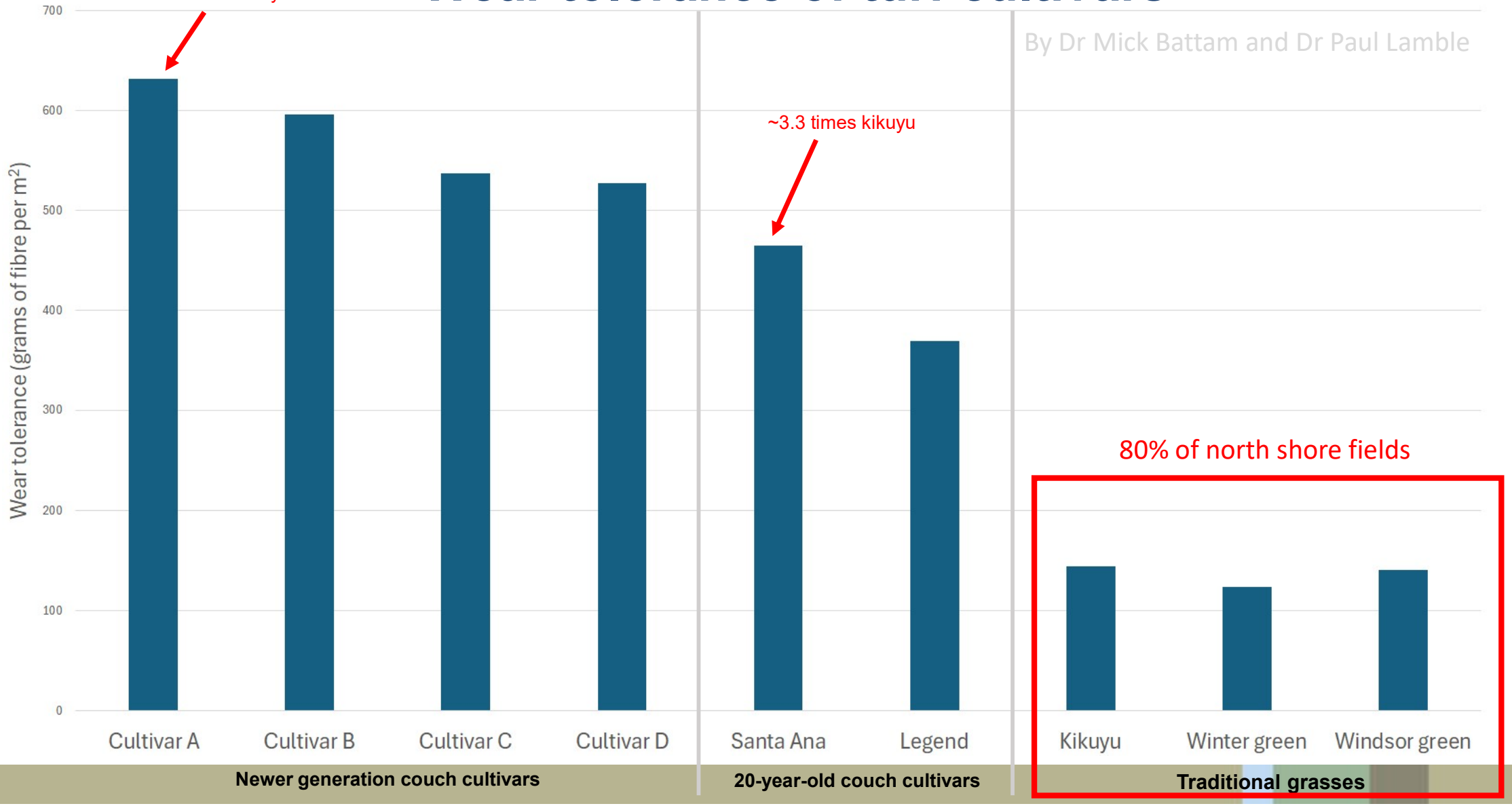
Topics

1) Steps to create a best practice field
    a) Suitable soil
    b) Suitable turf


Couch 1
Couch 2
Kikuyu

Wear tolerance of turf cultivars

By Dr Mick Battam and Dr Paul Lamble



Topics

1) Steps to create a best practice field
    a) Suitable soil
    b) Suitable turf
    c) Good drainage

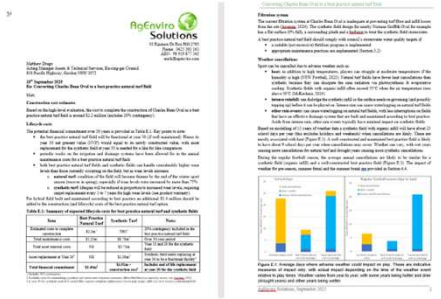
Layering

2 m spacing


https://westernweekender.com.au/2024/04/stakes-high-as-panthers-and-tigers-do-battle-in-bathurst/
OAK
OAK

Topics

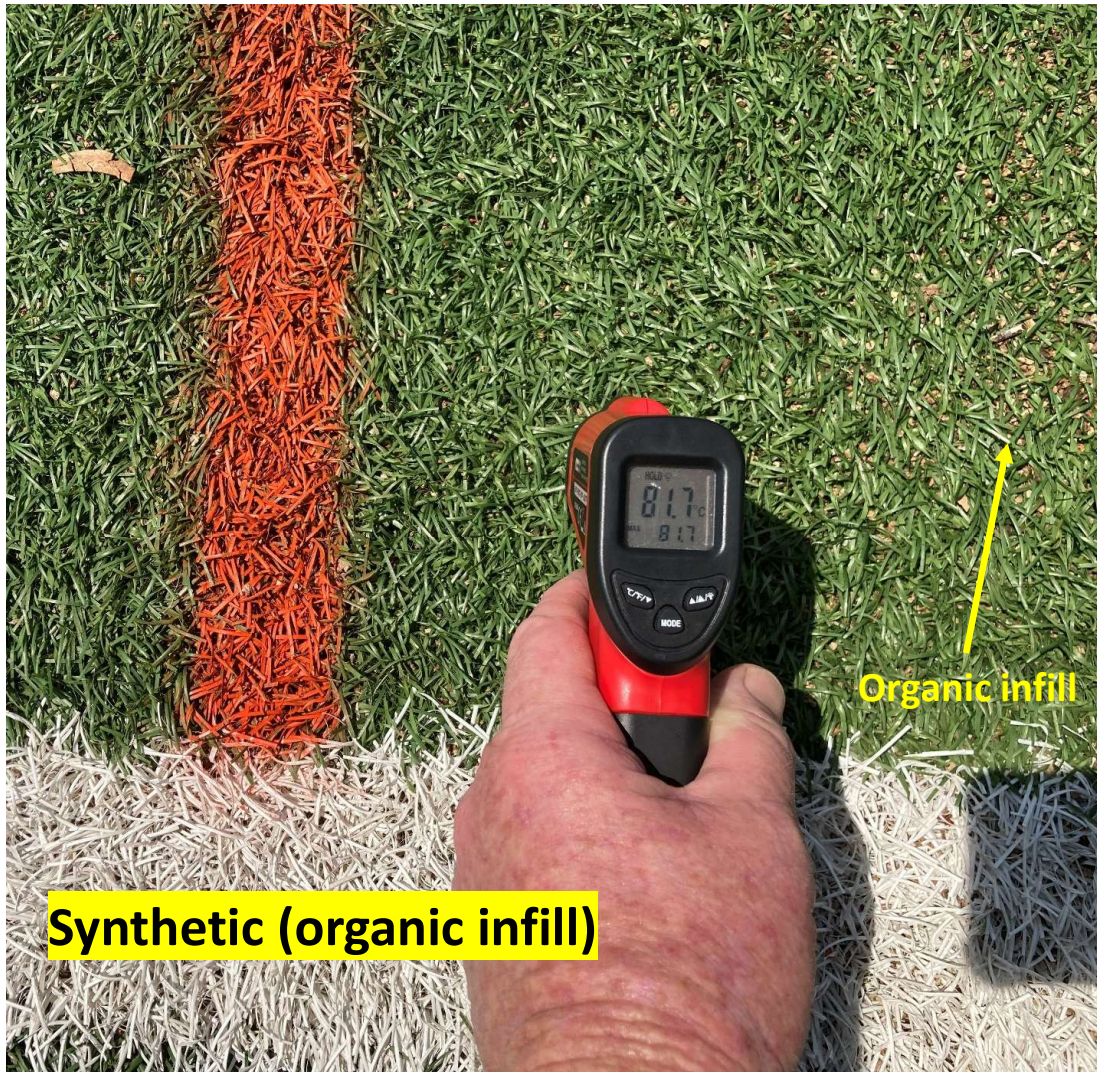
1) Steps to create a best practice field
2) Cancellations (soccer vs school impacts)



	Density (g/cm3)
Cork	0.11
Coconut	0.21
Brockfill (light wood)	0.25
Rubber crumb	0.42
TPE (thermo plastic elastomers)	0.65
Safe shells (walnut shells)	0.66
Zeolite	0.78
Envirofill (thermo plastic coated sand)	1.44
Sand	2.65

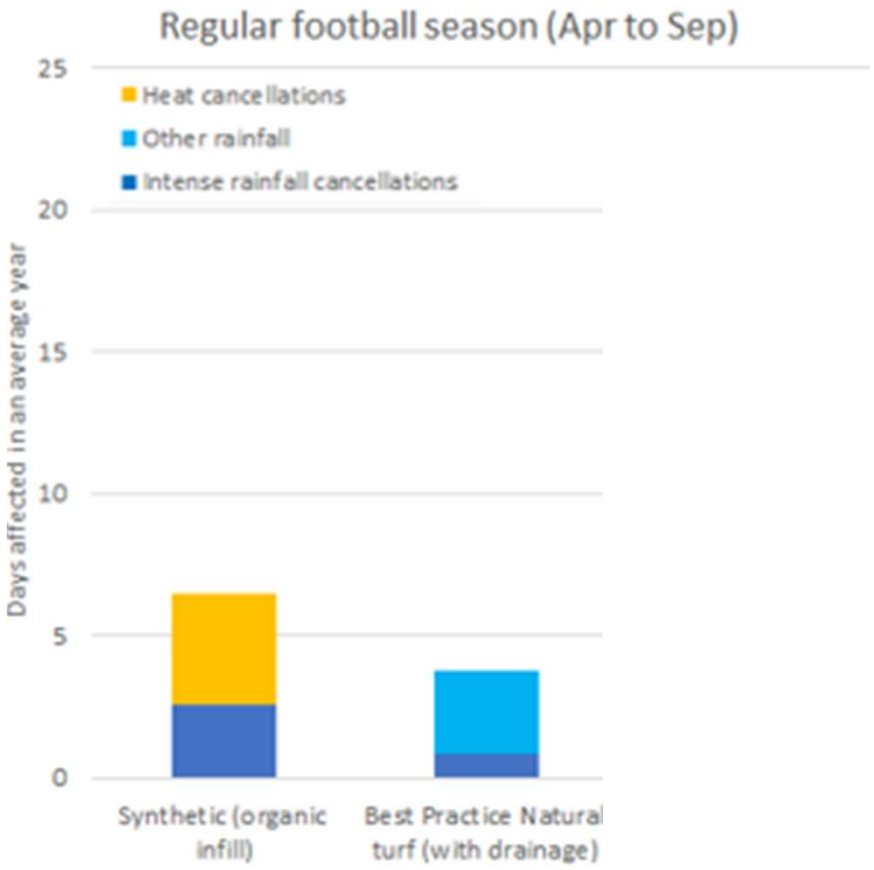
0.65 g/cm^3

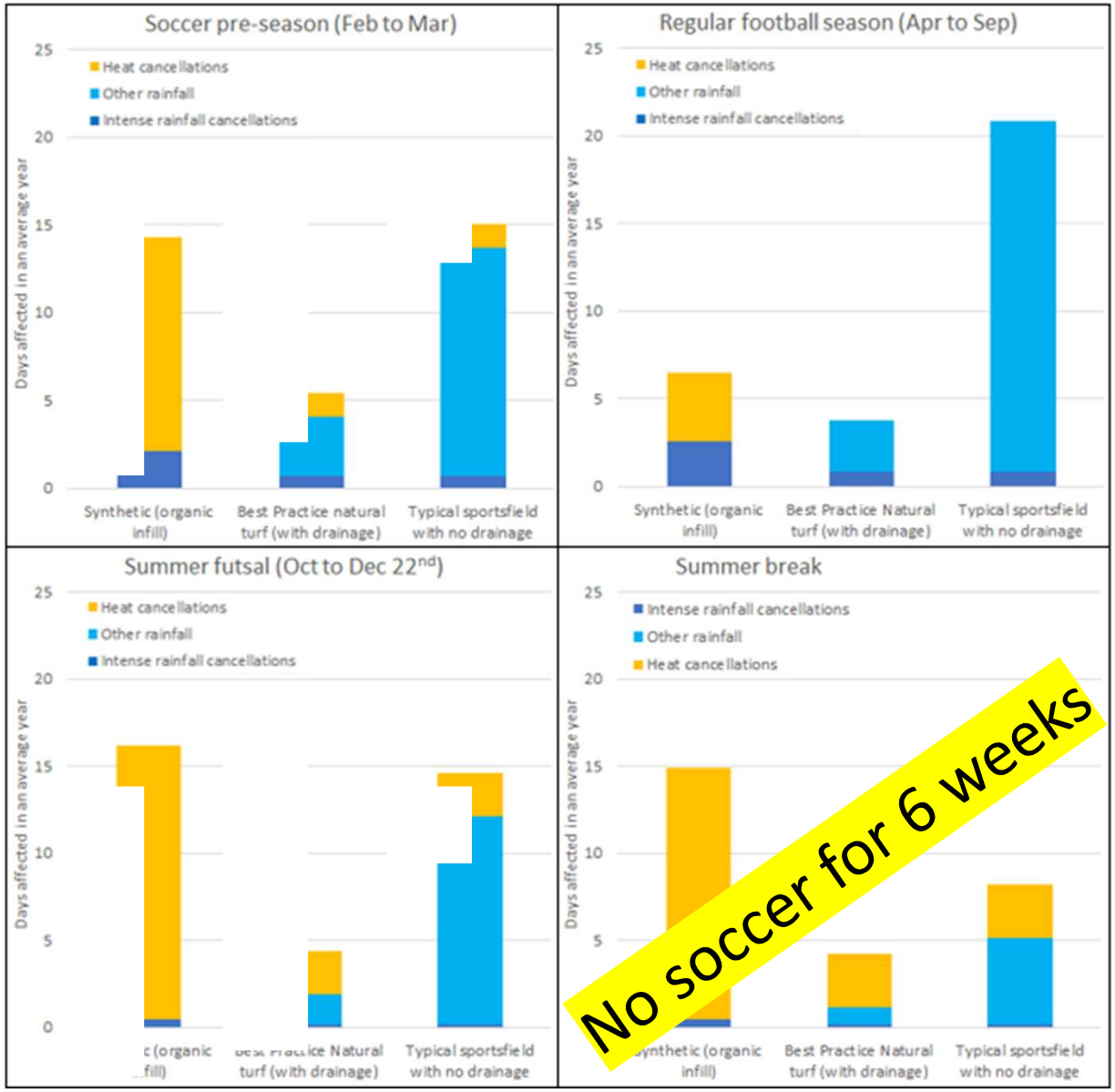
Western Sydney



20 years of daily weather data (rain, temp, radiation, etc)

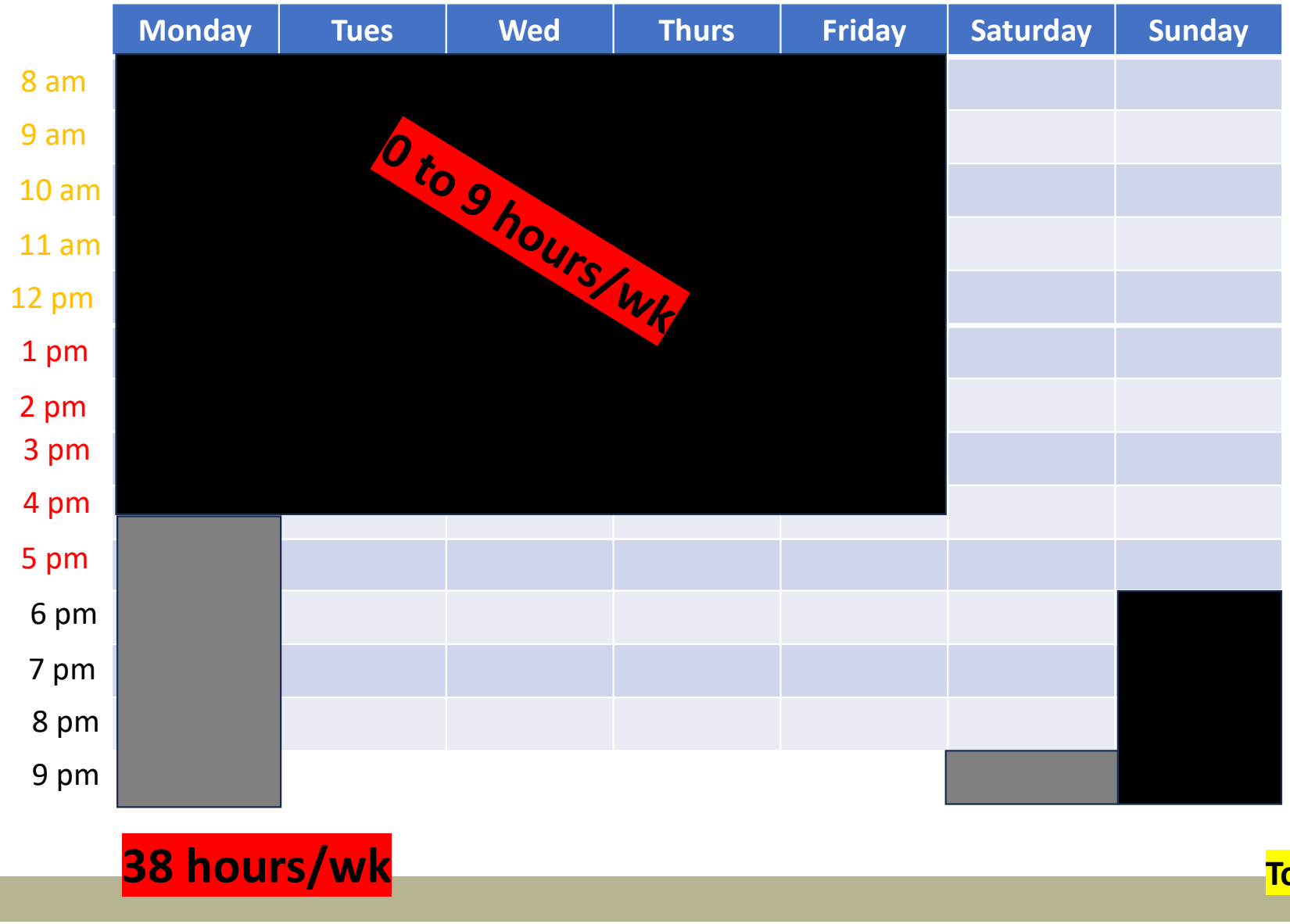
Cancellations




Soccer pre-season (Feb to Mar)
Heat cancellations
Other rainfall
Intense rainfall cancellations
Days affected in an average year
25
20
15
10
5
0
Synthetic (organic infill)
Best Practice natural turf (with drainage)
Typical sportsfield with no drainage
Regular football season (Apr to Sep)
Heat cancellations
Other rainfall
Intense rainfall cancellations
Days affected in an average year
Synthetic (organic infill)
Best Practice Natural turf (with drainage)
Typical sportsfield with no drainage
Summer futsal (Oct to Dec 22nd)
Heat cancellations
Other rainfall
Intense rainfall cancellations
Days affected in an average year
turf (with drainage)
Typical sportsfield with no drainage
Summer break
Intense rainfall cancellations
Other rainfall
Heat cancellations
Days affected in an average year
Best Practice Natural turf (with drainage)
Typical sportsfield with no drainage
No soccer for 6 weeks

Topics

1) Steps to create a best practice field
2) Cancellations (soccer vs school impacts)
3) Current usage vs carrying capacity



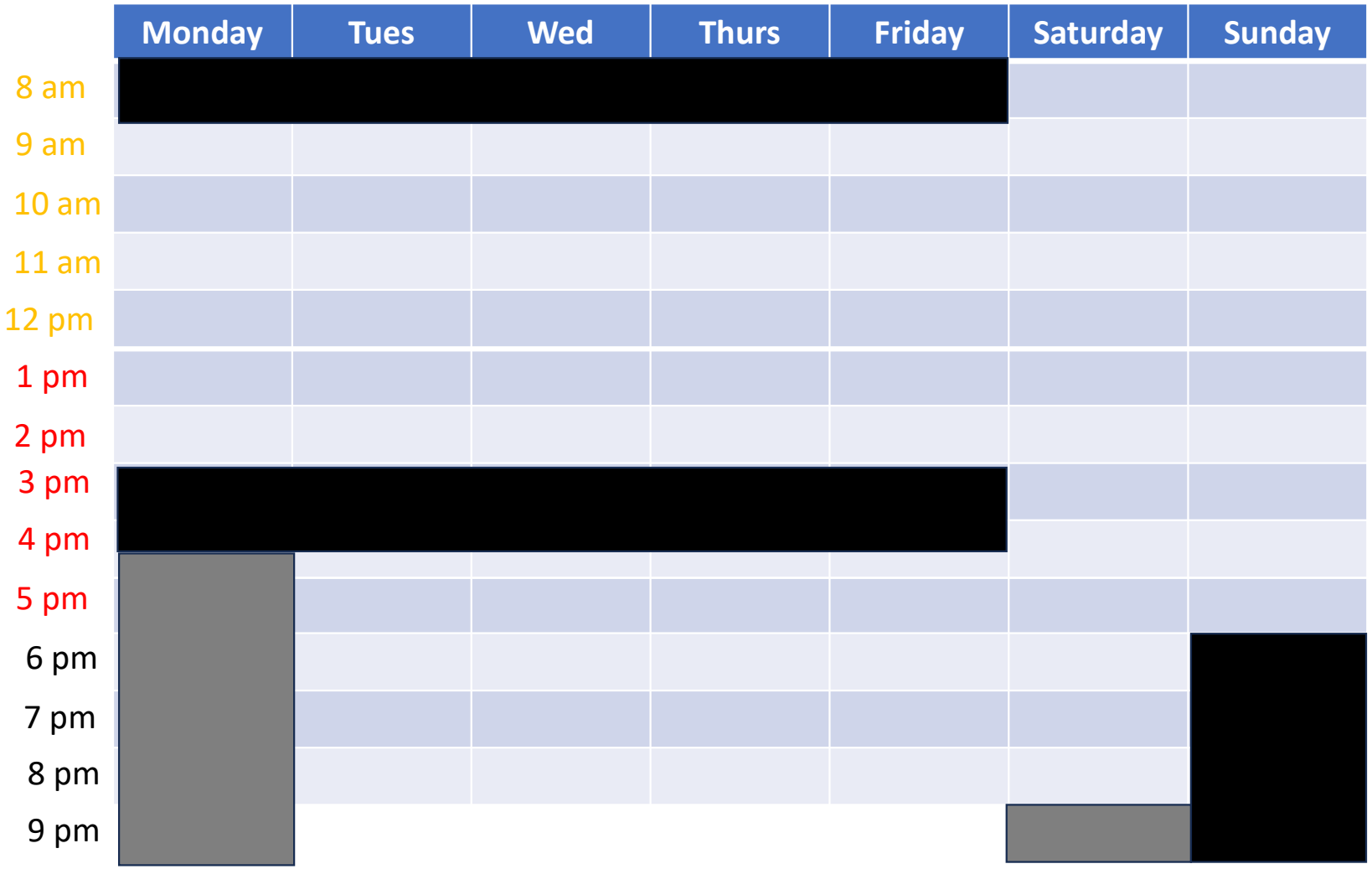
Pre-season (Feb to March)
= 20 hours/wk x 8 weeks
= 160 hours/year

Football season (April to Sept)
= 38 hours/wk x 23 weeks
= 874 hours/year

Summer futsal (Oct to 22nd Dec)
= 20 hours/wk x 8 weeks
= 160 hours/year

School use (39 weeks/year)
= 0 to 9 hours/wk x 39 weeks
= 0 to 351 hours/year

Total: 1200 to 1545 hours/year



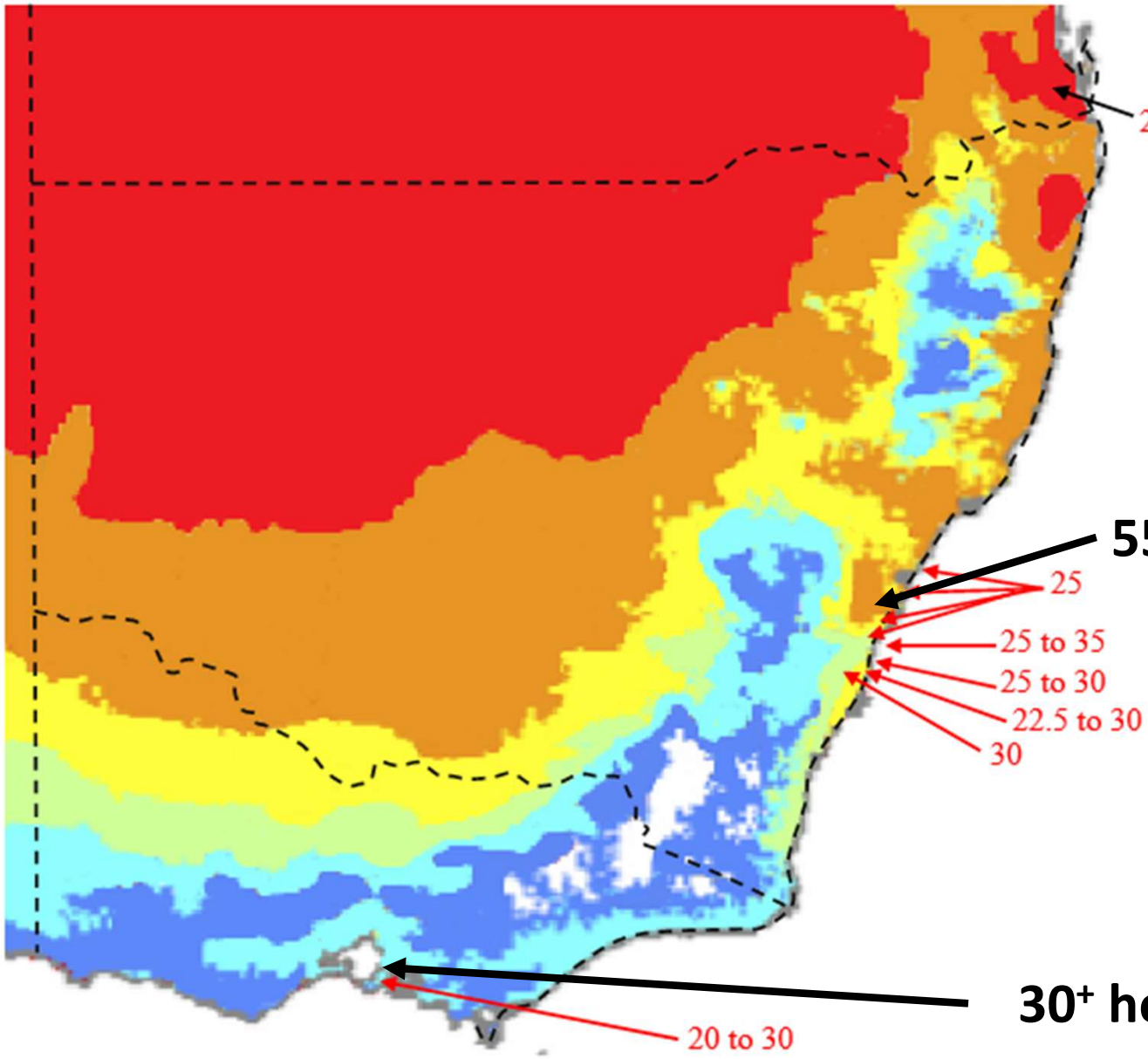
Pre-season (Feb to March)
= 20 hours/wk x 8 weeks
= 160 hours/year

Football season (April to Sept)
= 38 hours/wk x 23 weeks
= 874 hours/year

Summer futsal (Oct to 22nd Dec)
= 20 hours/wk x 8 weeks
= 160 hours/year

School use (38 weeks/year)
= 30 hours/wk x 38 weeks
= 1140 hours/year

Total: 2334 hours/year



Sydney Turf growth = Melbourne x 1.5

2500 hours/yr

Charles Bean (280 to 330 players per week)

Santa Ana couch


New generation couch
Santa Ana couch
www.agenviro.com

Topics

1) Steps to create a best practice field
2) Cancellations (soccer vs school impacts)
3) Usage vs carrying capacity
4) Lifecycle costs

In 2025 dollars:

Latest synthetic guide ($1.6 Million/ha)

Gardiners Park ($3.5 Million/ha): ($2.47Million for 0.7 hectares in 2021)

Norman Griffiths (>$12 Million/ha)

30-year life cycle costs

- 

Resurface

Latest synthetic guide ($1.2 Million/ha)

Moore park ($1.7 Million/hectare): ($1.5 Million for 0.9 ha in 2024)
Blackman park ($1.5 Million/hectare): ($2.5 Million for 1.7 ha in 2024)
Cromer park ($1.4 Million/hectare): ($1.25 Million for 0.9 ha in 2022)

30-year life cycle costs

- 

Resurface

$1.5 Million+

Filter baskets are inadequate

15,000 pieces of rubber in ~ 3kg

3,905 pieces of plastic in two rain events

Norman Griffith synthetic design:

- Flat field
- Plinth
- biofilter

30-year life cycle costs

Resurface Charles Bean	$2.2 Million (includes 20% contingency)	**$1.5 Million+**
Rebuild after 10 years	$0	**$1.5 Million**
Rebuild after 20 years	$0	**$1.5 Million**
Rebuild at 30 years	$0	**$1.5 Million**
Maintenance for 30 years	$1.25 Million	**$0.75 Million**
	$3.45 Million	**$6.75 Million**

30-year life cycle costs

Resurface Charles Bean	$2.2 + $1.4 Million (includes 20% contingency)	**$1.5 Million+**
Rebuild after 10 years	$0	**$1.5 Million**
Rebuild after 20 years	$0	**$1.5 Million**
Rebuild at 30 years	$0	**$1.5 Million**
Maintenance for 30 years	$1.25 Million	**$0.75 Million**
	$4.85 Million	**$6.75 Million**

Acknowledgements

Funded by: DCCEEW

Written by: Dr Mick Battam & Dr Paul Lamble

Contributions by:

Graeme Logan (formerly head curator ANZ stadium, Parramatta Stadium)

Peter McMaugh AM (named Sir Walter, turf breeder, built polo fields for Kerry Packer)

Dr Peter Martin (oversaw Wembley stadium rebuild, trained PhD turf science students)

67-page document

PEAK WATER CONSULTING

AgEnviro Solutions


49
hours per week
of football


14
hours per week
of football


Wave canyon (Wollemi National Park)

Question session is later

Dr Mick Battam
0425 363 161
mick@agenviro.com
www.agenviro.com

AgEnviro Solutions

Charles Bean Oval Synthetic Surfaces Review

Summary for community discussion by Martin Sheppard


I would like to acknowledge the traditional owners and custodians of the lands on which we meet today. I pay my respects to their Elders, past, present & emerging
Adnate.com

Martin Sheppard - My Background…

CONSULTANCY

- *Managed Community Sport and Leisure Facilities* (1982-1997 – UK, CoM 1999-2002)…including all parks and sports fields
- Consultancy advice to sport, government and education on participation and facilities
- Technical Consultant – Hockey Australia, NRL, Rugby Australia, Football Australia, Football NSW, Vic, AFL Technical Group
- Chair – International Association of Sport & Leisure Facilities (IAKS) Expert Circle on Sports Surfaces

EVENTS BUSINESS

- NSC to encourage more people to move, play, recreate and participate in community sport….
- Connect stakeholders who want to encourage more people to play sport

INVESTMENT

- Tech companies to help sport manage better

PHILANTHROPY

- Donations to WSYD Moving
- Children's Cancer Charity
- Brisbane ‘32 Athlete Development Fund

Why we are here?

- Charles Bean Oval synthetic field is at the end of its life (installed 2013).
- Council must decide: replace with new synthetic turf or return to natural grass.
- We were asked to independently assess options and impacts.

Who Uses Charles Bean Oval?

- **Local school** – around 40 hours per school week for PE, sport and breaks. (36x40 = 1,400)
- **Football Association** – 30+ hours per week for training and competition. (30x50=1500)
- **Local community** – casual play, walking, recreation throughout the year.

Consider the hours and the intensity (no of people)

The Decision in Simple Terms

- **Option 1** – Retro-fit as a modern environmentally friendly synthetic football field.
- **Option 2** – Remove synthetic and rebuild as natural or hybrid grass.

- The review compared 4 options on use, cost, environment and community impact

How the Assessment Was Done

- Site inspection after heavy rain to check condition and drainage.
- Reviewed original design and “as built” drawings.
- Measured against NSW Chief Scientist & NSW DPHI synthetic turf guidelines.
- Assessed through People, Planet and Prosperity, and performance lenses.

What We Found on Site?

- Field still playable but carpet is worn and at end of life
- Some water seeping from rock face near pavilion.
- Open surface drains and grills allow litter and infill to reach stormwater.
- Design reflects 2012 standards – does not fully meet today's environmental expectations.
- The usage is exceptionally high

How Much Use Can Each Option Take?

- Natural grass (best case): about 30 hours per week, ~30,000 player hours per year. (25x30x40)
- Current synthetic field use: 70+ hours per week.
- New synthetic design: 60–80 hours per week, up to ~175,000 player hours per year. (50x50x70)
- Synthetic provides around 145,000+ extra player hours annually compared with natural grass.
- If converted back other local fields will have to also be updated to cope with the demand

Reliability and Access

- Natural grass wears out under heavy use and needs rest and renovation.
- Wet weather often closes grass fields, cancelling games and training.
- Synthetic turf is all-weather and far more reliable for schools and clubs.
- Fewer cancellations and relocations = less frustration and more participation.

Financial comparison – big picture

- Natural turf rebuild: about $0.9 million initial cost…plus taking away current top… allowed $0.7m = $1.6m
- Synthetic rebuild (new system): about $1.4 million initial cost (including recycling old surface).
- Over 30 years, considering replacement and maintenance, synthetic delivers a lower cost per hour of use.
- Estimated cost per hour: natural ~$65; synthetic “smart” system ~$49 per hour of use.

Future-proofing: Prosperity (economic)

- Design pavement and shockpad to last 30 years.
- Plan for two carpet replacements over that time.
- Specify systems that minimise maintenance and top-up costs.
- Explore innovative 4G systems with 12-year warranties and reduced maintenance.

Future-proofing: Planet (environment)

- No rubber crumb infill – move to organic infill that does not create microplastics.
- Closed, below-ground drainage with filtration to stop infill entering stormwater.
- Use recycled materials in shockpad and carpet where possible.
- Design for 100% recycling or reuse of components at end of life.
- Retrofit for environmental best practice
- Recycle current carpet and infill

Reducing Local Environmental Impacts

- Increase tree canopy around the oval to provide shade and cooling.
- Select turf systems that run cooler (heat-reducing yarns and organic infill).
- Closed drainage strategy that captures and filter runoff before it reaches drains.
- Use LED lighting and efficient maintenance equipment where possible.
- Increased durability standards
- Increased environmental standards – ingestion, heavy metals, PFAS etc

Future-proofing: People (community)

- Mark out half and quarter fields to support more junior and small-sided games.
- Create warm-up and skills areas with simple line markings and ‘boxes’.
- Provide a walking/jogging path around the field where possible.
- Improve accessibility and wayfinding for people with disability.

Safety and performance

- Field to meet FIFA Quality standards plus extra Australian durability requirements.
- Include a shockpad under the turf to improve player safety.
- Stricter standards for UV stability and yarn strength to cope with heavy use.
- Clear maintenance and renovation program to keep the field safe over its life.

If we went back to grass…

- Would need heavy investment in drainage, irrigation, and renovation every year.
- Could not sustain 70+ hours per week – some users would lose access.
- Would need 5–7 megalitres of irrigation water each year for this size field.
- More wear-and-tear, more closures, more costs spread over fewer hours of use.
- Wouldn’t cope with all year around
- Negative impact on sport of football

Key Recommendation – Surface type

- Retain Charles Bean Oval as a synthetic field with upgraded with contemporary environmental design.
- Replace the old carpet and infill with a new organic-infill system.
- Design specifically to cope with 70+ hours per week, 50b weeks a year and 50 player per hour…
- Ensure the system can be fully recycled or repurposed at end of life.

Recommendations – People (community)

- Enhance line marking for school activities, drills and small-sided games.
- Create a perimeter path for walking and jogging.
- Plant more trees around the oval for shade and comfort.
- Monitor use and participation to demonstrate community benefit over time.

Recommendations – Planet (environment)

- Recycle the existing carpet and rubber infill through a specialist Australian facility.
- Use recycled or repurposed materials in the new system where possible.
- Adopt a closed drainage and filtration strategy to protect waterways.
- Include UHI-reducing features – organic infill, tree canopy, cooler yarn technology.

Recommendations – Prosperity (economic)

- Use long-life components (pavement, shockpad) to reduce future waste and costs.
- Seek systems with extended manufacturer warranties tied to high usage.
- Budget for regular maintenance to protect the investment.
- Track cost per hour of use to demonstrate value for money over the life of the field.

What this means for the community

- A safe, reliable, all-weather field for school, clubs and casual users.
- Space for more kids, more women and girls, and more local teams to play.
- Environmentally improved design that addresses heat, microplastics and recycling.
- A long-term investment in local health, wellbeing and community connection.
- No impact on other sports fields
- A Far cheaper option over the Whole of Life

Questions