Artificial Grass For Sport

Part 8 of 8

Appendix 4

Sample Questionnaire for Use When Interviewing Proposed Contractor

Prior to formally engaging the preferred contractor, it is prudent to interview the contractor and clarify as many issues about the project as possible.

The questionnaire shown here ('Notes' added by editor) is reproduced with the permission of the Footscray Hockey Club Inc, and consulting engineer Douglas Golder. Their project included the re-development/re-surfacing of a full-sized pitch, plus the construction of a new, artificial grass surfaced junior training area.

Note that **questionnaires need to be designed to be project specific**. The following document is reproduced purely as an example of a check-list/agenda for clarifying matters prior to committing to a contract.

Footscray Hockey Centre Upgrade		
Item	**Aspect of project**	**Response**
1	**General**	
1.1	Have you allowed for all items in the tender documents in your tender submission?	
1.2	Are there any aspects or items of the project that are unclear to you and needs clarification?	
2	**Eastern Pitch Re-Development**	
2.1	Have you allowed for the removal all of the old synthetic grass and shock pad from the pitch?	
	Notes: *- For lifting and removal, the contractor should be asked about methods to be utilised, and contingency for any damage to the subsurface (remembering that the shockpad should last more than one carpet lifetime). The shockpad can easily be damaged by heavy machinery lifting the carpet – especially if the infill is wet and extra heavy. Damage can also be done to the asphalt or base layers by tracking laden fork lifts/dumper trucks across the surface.* **Your site agent should take photos for supporting reinstatement damage, etc.**	
2.2	Have you allowed in your tender for the disposal of this redundant surface and pad?	
	Notes: *- how will this be done?* *- what equipment will be used?* *- how will the integrity of the existing shockpad be ensured?* *- what methods will be used to ensure the integrity of the subsurface/asphalt layer?*	
2.3	What is your dump site?	
2.4	Have you allowed for the full reconstruction and regrading of base to comply with the nominated International Hockey Federation (FIH) requirements?	
2.5	Will the resultant surface profile satisfy current FIH requirement?	
2.6	How do you propose to regulate the base?	
2.7	Have you allowed for the reinstatement of the bituminous spray to the base pavement?	
2.8	Have you allowed for installation of the root barrier to three sides of the pitch?	

2.9	Have you allowed for installation of the root barrier to three sides of the pitch?	
2.10	Have you allowed for the backfill of the root barrier trench with stabilised sand and disposal of excavated spoil?	
2.11	Have you allowed for the regrading of the perimeter concrete invert?	
2.12	In this regrading works have you allowed for any associated adjustment of fencing and the maintenance of any drainage paths from adjoining areas?	
2.13	Have you allowed for the modification of the fencing for the installation of the backdrop netting post behind the four practice circles?	
2.14	Have you allowed for the installation of the four panels of back drop netting?	
2.15	Who is your supplier of the netting?	
2.16	Have you allowed for the complete cleaning and flushing of the underground drainage system from the NW corner of the eastern pitch to the outlet in Fogarty Road, including disposal of all spoil?	
3	**Junior Practice Area**	
3.1	Have you allowed for the full extended length as nominated in the tender addendum?	
3.2	Have you allowed for the full excavation of the topsoil from the complete area of junior the practice area including disposal of surplus material from site?	
3.3	Have you allowed for the removal of the redundant concrete paving at the western end of the practice area?	
3.4	Have you allowed for the grading of the base of the junior practice area to an even and uniform profile matching the adjacent paving levels?	
3.5	Have you allowed for the relocation of water meter and the installation of protection for the extended pipe work?	
3.6	Have you allowed for the modification of the wet pitch goal storage area and foot wash enclosure affected by the nominated works?	
3.7	Have you allowed for the installation of the formed, angled concrete kerb up-stand to three sides of the junior practice area?	
3.8	Have you allowed for all fencing to fully enclose the junior practice area, as nominated?	
3.9	Have you allowed for the modification of the existing gates?	
3.10	Have you allowed for the construction of the base to the full extent of area of the junior practice area?	
4	**Synthetic Surfaces**	
4.1	Does the nominated surface system have FIH accreditation?	
4.2	Is this accreditation for the same surface/shock pad combination?	
4.3	What is your source of yarn?	
4.4	What is the warranty on the yarn product?	
4.5	Where is the synthetic surface manufactured?	
4.6	Is there any lead content in the yarn?	
4.7	What is the warranty on the shock pad?	
4.8	What is the warranty on the synthetic surface?	
4.9	Which parties provides the warranty?	
4.10	Do you acknowledge the yarn face weight calculation in the tender documents and understand that this is the minimum to be provided under the contract and deductions will be made from payments for products that fail to achieve the agreed minimum?	

4.11	Who provides the warranty?	
4.12	If the synthetic surface fails, say after three years, what would be the club's contribution to its replacement?	
4.13	If the project cost was, say $400,000 and the surface component was $200,000, how would this relate to the club's contribution?	
4.14	Have you allowed for the insertion of all line marking to FIH requirements including practice circles?	
4.15	How do you propose to insert the curved line marking?	
4.16	What is the type and source of the glue proposed to be used?	
4.17	What is the composition of the nominated shock pad?	
4	**Synthetic Surfaces (Cont.)**	
4.18	What is the percentage of binder?	
4.19	What is the product and source of binder?	
5	**Subcontractors**	
5.1	Who do you propose to employ for the following works?	
5.1.1	Civil, base works?	
5.1.2	Fencing?	
5.1.3	Concrete works?	
5.1.4	Shock pad installation?	
5.1.5	Surface installation?	
5.1.6	Sand supply?	

Record of response:

Signed:_____ on behalf of tenderer.

Appendix 5
Construction Costs and Whole-of-Life Costings

The following analysis sheets provide an indication of facility construction costs – as at early 2009, as well as providing whole-of-life costings (construction, maintenance, replacement) for soccer and hockey pitches, lawn bowling greens and tennis courts.

This is taken from information prepared by Smart Connection for the City of Boroondara (2009).

The information is provided as a starting point for the debate about the long-term value of artificial grass surfaces versus natural turf surface.

Note:

- **These figures are not meant to be current. This analysis is provided purely to demonstrate how to undertake a whole-of-life cost comparison.**
- All of these figures include GST, but they relate to 2009 dollar values. They do not include allowance for inflation, compound interest, etc. Refer to Section 1.10, and Appendix 7, for commentary on the importance of developing these business planning models using discounted cash flows – that is allowing for the real value of dollars over time.
- Remember that in many club scenarios, where quality volunteer work can be relied upon, the maintenance figures can be significantly discounted.
- Revenue figures can be added to these models to develop preliminary business plans.
- All costings are in Australian dollars.

Multi-sport pitch in Wellington, New Zealand

Ivanhoe Grammar School

Soccer

Whole of life costing

Dimensions: 105m x 68m + 3m run offs = 111m x 74m = 0.82 ha

Construction - Natural Turf

Item	Turf
Earthworks	$40,000
Drainage (5m spacing)	$40,000
Irrigation	$50,000
Concrete works, spoon drain	$8,000
Topsoil supply, placement and shaping	$140,000
Amendments	$5,000
Grassing	$11,000
Grow in (12 weeks)	$11,000
Total Cost	**$305,000**

Construction - Synthetic Turf

Item	Synthetic
Earthworks	$76,994
Base construction works	$138,844
Synthetic grass (including infill)	$355,158
Total Cost	**$570,996**

* Average cost of key suppliers for FIFA 1 Star pitch
Lights, fencing, goals & accessories not included.

Annual Maintenance – Natural Turf

Item	Turf
Mowing (x 70 cuts)	$14,000
Fertilising (x 8)	$8,000
Pest control (weeds, insects: x 3)	$3,000
Aeration (verti drain x 2, slicing x 4)	$5,000
Irrigation (3 ML/year)	$3,000
Overseeding	$2,000
Topdressing	$7,000
Surface repair, sod goals (500m2)	$5,000
Repair - irrigation system	$2,000
Miscellaneous	$2,000
Total Cost	**$51,000**

Annual Maintenance - Synthetic Turf

Item	Synthetic
Weekly cleaning	$10,000
Monthly grooming	$8,000
Annual surface treatment	$2,000
Miscellaneous	$1,000
Total Cost	**$21,000**

Replacement – Natural Turf

Item	Turf
Earthworks, levelling, minor drainage	$27,000
Amendments	$6,000
Grassing	$11,000
Grow in	$11,000
Total Cost	**$55,000**
Lifespan (years)	15 years
Replacement cost per year	**$3,667**

Natural turf has an indefinite lifespan if properly maintained, generally resurfaced between 10 and 20 years

Replacement - Synthetic Turf

Item	Synthetic
Uplift existing surface	$11,000
Disposal of existing surface	$11,000
Minor base repairs	$16,000
Synthetic grass	$200,000
Infill	$110,000
Total Cost	**$348,000**
Lifespan (years)	10 years
Replacement cost per year	**$34,800**

Synthetics need to be replaced every 8 - 12 years

Total cost of ownership: 10 years

Cost of Ownership	Turf	Synthetic
Construction	$305,000	$570,996
Maintenance	$510,000	$210,000
Surface Replacement	$36,667	$348,000
Total Cost of Ownership	**$851,667**	**$1,128,996**

Total cost of ownership: 25 years

Cost of Ownership	Turf	Synthetic
Construction	$305,000	$570,996
Maintenance	$1,275,000	$525,000
Surface Replacement	$91,667	$870,000
Total Cost of Ownership	**$1,671,667**	**$1,965,996**

Inflation has not been factored into any of these calculations. All costs were calculated in 2009 and are GST inclusive.

Lawn Bowls

Whole of Life Costing

Dimensions: 40m x 40m = 1.6 ha

Construction - Natural Turf

Item	Turf
Earthworks	$40,000
Drainage	$5,000
Aggregate	$15,000
Irrigation	$10,000
Ditches	$10,000
Topsoil supply, placement and shaping	$20,000
Amendments	$5,000
Consolidation / levelling (x2)	$5,000
Grassing	$2,000
Grow in (12 weeks)	$12,000
Total Cost	**$124,000**

Construction - Synthetic Turf

Item	Sand filled	Non sand filled
Geo tech survey, site management	$5,000	$5,000
Earthworks	$7,000	$7,000
Drainage	$11,000	$11,000
Plinth work	$5,500	$5,500
Ditch construction	$33,000	$33,000
Base construction	$43,000	$43,000
Synthetic grass	$100,000	$72,000
Ditch coverings	$4,500	$4,500
Site clean	$1,000	$1,000
Freight	$4,000	$4,000
Total Cost	**$214,000**	**$186,000**

Annual Maintenance – Natural Turf

Item	Turf
Mowing (x 110 cuts)	$6,000
Fertilising / Pesticides	$12,000
Aeration (verti drain x 2)	$1,500
Irrigation (0.6 ML/year)	$600
Renovation	$2,000
Miscellaneous	$1,500
Total Cost	**$23,600**

Annual Maintenance - Synthetic Turf

Item	Sand filled	Non sand filled
Weekly cleaning	$6,000	$8,500
Quarterly grooming	$1,200	-
Mould treatments	$1,600	$1,600
Annual shampoo	-	$3,000
Miscellaneous	$1,000	$1,000
Total Cost	**$9,800**	**$14,100**

Replacement – Natural Turf

Item	Turf
Surface removal, amendments, levelling & grassing	$15,000
Total Cost	**$15,000**
Lifespan (years)	9 years
Replacement cost per year	**$1,667**

Natural turf has an indefinite lifespan if properly maintained, generally resurfaced between 8 and 10 years

Replacement - Synthetic Turf

Item	Sand filled	Non sand filled
Uplift existing surface	$2,000	$2,000
Disposal of surface	$800	$1,600
Plinth adjustment	$1,300	$1,300
Re-level base	$8,500	$8,500
Install new carpet	$100,000	$72,000
Site clean	$1,000	$1,000
Freight	$4,000	$4,000
Total Cost	**$117,600**	**$90,400**
Lifespan (years)	10 years	10 years
Replacement cost per year	**$11,760**	**$9,040**

Replacement is between 8 and 12 years depending on maintenance and usage.

Total cost of ownership: 10 years

Item	Turf	Sand Filed	Non sand filled
Construction	$124,000	$214,000	$186,000
Maintenance	$236,000	$98,000	$141,000
Surface Replacement	$16,667	$117,600	$90,400
Total Cost of Ownership	**$376,667**	**$429,600**	**$417,400**

Total cost of ownership: 25 years

Item	Turf	Sand Filed	Non sand filled
Construction	$124,000	$214,000	$186,000
Maintenance	$590,000	$245,000	$352,500
Surface Replacement	$41,667	$294,000	$226,000
Total Cost of Ownership	**$755,667**	**$753,000**	**$764,500**

Inflation has not been factored into any of these calculations. All costs were calculated in 2009 and are GST inclusive.

Hockey

Whole of Life Costing

Dimensions: 91m x 55m + 5m run offs = 101m x 65m = 0.66 ha

Notes 1: The figures shown below are based on high quality sporting surfaces (sand dressed artificial grass and its natural turf equivalent).

Notes 2: On the Artificial Grass side of the page, Column 1 shows the 'worst case' scenario for maintenance - all undertaken at commercial cost. Column 2 figures reflect most of the maintenance being undertaken by club volunteers.

Notes 3: These figures represent 2010 costings, but are for 'indicative' purposes only. Therefore detailed cost breakdowns have not been sought.

Construction - Natural Turf

Item	Cost
Earthworks	-
Drainage	-
Irrigation	-
Concrete works, spoon drain	-
Topsoil supply, placement and shaping	-
Amendments	-
Grassing	-
Grow in (12 weeks)	-
Total Cost	**$400,000**

Lights, fencing, goals and accessories not included

Construction - Artificial Grass

Item	Column 1 Cost	Column 2 Cost
Earthworks	-	-
Base construction	-	-
Synthetic grass/infill & shockpad	-	-
Total Cost	**$670,000**	**$670,000**

Lights, fencing, goals and accessories not included

Annual Maintenance – Natural Turf

Item	Cost
Mowing	-
Fertilising	-
Pest control	-
Aeration	-
Irrigation	-
Overseeding	-
Top Dressing	-
Surface repair, re-sod goals	-
Repair irrigation system	-
Miscellaneous	-
Total Cost	**$40,000**

Annual Maintenance – Artificial Grass

Item	Commercial Maintenance	Club Maintenance
Weekly cleaning	-	-
Monthly grooming	-	-
Annual surface treatment	-	-
Miscellaneous	-	-
Total Cost	**$20,000**	**$5,000**

Replacement – Natural Turf

Item	Cost
Earthworks, levelling, minor drainage	-
Amendments	-
Grassing	-
Growing in	-
Total Cost	**$55,000**

Replacement – Artificial Grass

Item	Column 1 Cost	Column 2 Cost
Uplift and dispose of surface	-	-
Base and shockpad repair	-	-
Sythetic surface system	-	-
Total Cost	**$350,000**	**$350,000**

Natural Turf
Total Cost of Ownership: 30 Years

Item	Cost
Construction	$400,000
Maintenance - $40,000 x 30 Years	$1,200,000
Surface Replacement - $55,000 at yrs 15 & 30	$110,000
Total Cost	**$1,710,000**

Artificial Grass
Total Cost of Ownership: 30 Years

Item	Column 1 Cost	Column 2 Cost
Construction	$670,000	$670,000
Maintenance $20,000 x 30 Years	$600,000	-
Maintenance $5,000 x 30 Years	-	$150,000
Surface Replacement	1,050,000	1,050,000
Total Cost	**$2,320,000**	**$1,870,000**

Inflation has not been factored into any of these calculations. All costs were calculated in 2010 and are GST inclusive. Hockey Tables updated by Sport and Recreation Victoria.

Tennis

Whole of Life Costing

Dimensions: 34.8m x 17.1m
(including 5.5m back runs & 3.05m from side fence) = 0.6 ha

Construction – Hard court

Item	Hard court
Minor earthworks/Base construction	$45,000
Non-cushioned surface (acrylic)	$10,000
Total Cost	**$55,000**

Construction – Artificial Grass

Item	Artificial Grass
Minor earthworks/Base construction	$45,000
Surface (sand filled)	$17,000
Total Cost	**$62,000**

Annual Maintenance – Hard court

Item	Hard court
Weekly cleaning (20 minutes/week)	$1,000
Total Cost	**$1,000**

Annual Maintenance – Artificial Grass

Item	Artificial Grass
Moss/Algae control, regular brushing	$1,750
Total Cost	**$1,750**

Replacement - Hard Court

Item	Hard Court
Remove old surface	$3,500
Non cushioned surface (acrylic)	$4,500
Total Cost	**$8,000**
Lifespan (years)	8 years
Replacement cost per year	**$1,000**

Replacement - Artificial Grass

Item	Artificial Grass
Remove old surface	$3,500
Replacement carpet	$16,500
Total Cost	**$20,000**
Lifespan (years)	12 years
Replacement cost per year	**$1,667**

Total cost of ownership: 10 years

Cost of Ownership	Hard court	Artifical Grass
Construction	$55,000	$62,000
Maintenance	$10,000	$17,500
Surface Replacement	$10,000	$16,670
Total Cost of Ownership	**$75,000**	**$96,170**

Total cost of ownership: 25 years

Cost of Ownership	Hard court	Artifical Grass
Construction	$55,000	$62,000
Maintenance	$25,000	$43,750
Surface Replacement	$25,000	$41,675
Total Cost of Ownership	**$105,000**	**$147,425**

Inflation has not been factored into any of these calculations. All costs were calculated in 2010 and are GST inclusive.

Appendix 6: Accredited Testing Laboratories

Accredited Laboratories:

Quality and Durability Testing

Qualspec
Contact Details: Level 1, 200 Kingsgrove Road
Kingsgrove, NSW 2208
P: (02) 9150 5531
E: david@qualspec.com.au
W: www.qualspec.com.au

Surface Characteristic and Performance Testing

Acoustoscan
Contact Details: 2 - 4 Bedford Street, Surry Hills, NSW 2010
P: (02) 9699 4092
E: admin@acoustoscan.com.au
W: www.acoustoscan.com.au

University of Ballarat
Contact Details: School of Human Movement and Sports Sciences
PO Box 663 Ballarat, Vic 3353
P: (03) 5327 9062
E: hmms.enquiries@ballarat.edu.au
W: www.ballarat.edu.au/ard/hmss

AFL/Cricket Association Note:
A lab must be able to conduct tests for durability, weathering, ball to surface and player to surface characteristics against the AFL/CA's performance characteristics and standards using internationally-recognised testing methods and apparatus and must have accreditation to the highest National or International level.

Appendix 7: Surface Evaluation Model

Introduction

The electronic version of this guide is available at www.sport.vic.gov.au and it includes an interactive template that allows the user to undertake two sports field planning exercises:

1. To analyse the comparative costs between a natural turf field and an artificial grass field over a given lifecycle, and
2. To calculate potential sinking-fund requirements for your pitch/court/green over a given period of time.

A printed copy of this template is shown on the next page.

The model provided is based upon 'discounted' cash flow – in other words it factors in both costs and revenue so that it allows for the real value of the dollar over time. It acknowledges that the value of a dollar over time is not the same as it is today, and that sinking funds set up today need to contain the right amount of dollars in five/10/15 years depending on your project.

In other words, rather than just taking a field's replacement cost in 10 years time and dividing it by 10 to get your annual banking requirement, the discounted cash flow method requires you to allow for factors such as compound interest, and inflation (if you choose to include it) in the model, to give you a more accurate end figure/annual saving rate.

Here's an example: let's say that it costs $360,000 to resurface an artificial grass soccer pitch. Based on a 3% inflation rate, the current day cost of $360,000 equates with just over $590,000 in 10 years time. To achieve this figure, and assuming a compound interest rate of 5%, a monthly contribution of $3,800 ($45,600 per annum) is required every month from the first month of the pitch's life.

Of course such business plans need to incorporate allowances along the way (say, $50,000 in year five) for a major rejuvenation of the pitch, (an extra $735 per month), an allowance for floodlight system refurbishment, and so on.

The Model

The model is designed to enable simple evaluations to be undertaken by people preparing business cases for artificial grass and natural turf pitches, and it allows them to plan for the replacement of their pitches as well - from the time of project inception. It requires a minimal number of inputs in the designated green areas.

This is provided as a guide only and should not be expressly relied upon by project proponents.

Some of the assumptions/options built in to the model are:

- Artificial grass fields have three times the use capacity of turf fields.
- The real discount rate is 2%, which is the risk-free rate of return after inflation, including an allowance for the community benefits associated with such expenditures.
- An inflation rate of 3%.

Note the discount rate and inflation rates can be adjusted if necessary.
The rates used reflect the upper limit of the Reserve Bank of Australia's annual inflation target and a real discount rate of 4% which is currently required by the Victorian Department of Treasury and Finance for these types of evaluations.

Appendix 8
Surface Evaluation Model (copy of website template)

SURFACE EVALUATION MODEL
Cost and benefits of operation of a single facility over 30 years
Based on a single facility receiving use determined by capacity of natural turf and 3 times this rate for synthetic turf

INSERT DATA IN GREEN CELLS ONLY	Assumptions		
Sport type	Soccer		
Inflation	3.0%		Only input if you wish to include inflation in the analysis, otherwise set to zero
Discount rate	6.0%		Real discount rate includes allowance for inflation, if current value method is preferred only change if necesssary.
Pitch type	Natural	Synthetic	Discount rate is based on risk free interest rate i.e best risk free alternative investment
Construction costs	$350,000	$500,000	
Maintenance costs	$40,000	$20,000	
Replacement cost (year 0)	$55,000	$350,000	
Replacement frequency years	15	10	
Ground rental per hour	$70.00	$70.00	
Weeks in use games annually	26	26	
Weeks in use training annually	32	32	Insert appropriate weeks depending on summer/winter use of all year round
Hours of use games daily	6	18	Insert appropriate weeks depending on use more than 52 if sports double up in preseasons
No game days per week	2.5	2.5	Insert likely daily capacity of natural turf fields assume synthetics capacity equals 3 times
Hours of use training weekly	10	15	
No of game hours per annum	390	1,170	Insert number based on estimated capacity and demand
Training hours per annum	320	480	
Annual use hours	710	1,650	

Results	Natural	Synthetic	
Value of cash flows			
Undiscounted	$93,861.67	$2,227,704.24	
Discounted	-$216,708.51	$785,492.03	
Break even charge / hr	$102.43	$47.16	See Cell B56 and C56
Annual revenue required to break even	$72,725	$77,814	

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
NATURAL TURF																																
COSTS																																
Construction	-$350,000																															-$350,000
Maintenance		-$41,200	-$42,436	-$43,709	-$45,020	-$46,371	-$47,762	-$49,195	-$50,671	-$52,191	-$53,757	-$55,369	-$57,030	-$58,741	-$60,504	-$62,319	-$64,188	-$66,114	-$68,097	-$70,140	-$72,244	-$74,412	-$76,644	-$78,943	-$81,312	-$83,751	-$86,264	-$88,852	-$91,517	-$94,263	-$97,090	-$1,960,107
Replacement costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	-$85,688	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	-$133,499	-$219,188
Total costs	-$350,000	-$41,200	-$42,436	-$43,709	-$45,020	-$46,371	-$47,762	-$49,195	-$50,671	-$52,191	-$53,757	-$55,369	-$57,030	-$58,741	-$60,504	-$148,007	-$64,188	-$66,114	-$68,097	-$70,140	-$72,244	-$74,412	-$76,644	-$78,943	-$81,312	-$83,751	-$86,264	-$88,852	-$91,517	-$94,263	-$230,590	-$2,529,295
REVENUE																																
Game revenue		$28,119	$28,963	$29,831	$30,726	$31,648	$32,598	$33,576	$34,583	$35,620	$36,689	$37,790	$38,923	$40,091	$41,294	$42,533	$43,808	$45,123	$46,476	$47,871	$49,307	$50,786	$52,310	$53,879	$55,495	$57,160	$58,875	$60,641	$62,460	$64,334	$66,264	$1,337,773
Training revenue		$23,072	$23,764	$24,477	$25,211	$25,968	$26,747	$27,549	$28,376	$29,227	$30,104	$31,007	$31,937	$32,895	$33,882	$34,898	$35,945	$37,024	$38,135	$39,279	$40,457	$41,671	$42,921	$44,208	$45,535	$46,901	$48,308	$49,757	$51,250	$52,787	$54,371	$1,097,660
Total revenue	$0	$51,191	$52,727	$54,309	$55,938	$57,616	$59,344	$61,125	$62,958	$64,847	$66,793	$68,796	$70,860	$72,986	$75,176	$77,431	$79,754	$82,147	$84,611	$87,149	$89,764	$92,457	$95,230	$98,087	$101,030	$104,061	$107,183	$110,398	$113,710	$117,121	$120,635	$2,435,433
Net Cash flow	-$350,000	$9,991	$10,291	$10,599	$10,917	$11,245	$11,582	$11,930	$12,288	$12,656	$13,036	$13,427	$13,830	$14,245	$14,672	-$70,576	$15,566	$16,033	$16,514	$17,009	$17,519	$18,045	$18,586	$19,144	$19,718	$20,310	$20,919	$21,547	$22,193	$22,859	-$109,955	-$93,862
Discounted value costs	-$350,000	$9,425	$9,159	$8,900	$8,648	$8,403	$8,165	$7,934	$7,709	$7,491	$7,279	$7,073	$6,873	$6,679	$6,489	-$29,449	$6,127	$5,954	$5,785	$5,622	$5,463	$5,308	$5,158	$5,012	$4,870	$4,732	$4,598	$4,468	$4,342	$4,219	-$19,144	-$216,709
Net Present Value	-$216,709																															-$216,709

ARTIFICIAL GRASS																																
COSTS																																
Construction	-$500,000																															-$500,000
Maintenance		-$20,600	-$21,218	-$21,855	-$22,510	-$23,185	-$23,881	-$24,597	-$25,335	-$26,095	-$26,878	-$27,685	-$28,515	-$29,371	-$30,252	-$31,159	-$32,094	-$33,057	-$34,049	-$35,070	-$36,122	-$37,206	-$38,322	-$39,472	-$40,656	-$41,876	-$43,132	-$44,426	-$45,759	-$47,131	-$48,545	-$980,054
Replacement costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	-$470,371	$0	$0	$0	$0	$0	$0	$0	$0	$0	-$632,139	$0	$0	$0	$0	$0	$0	$0	$0	$0	-$849,542	-$1,952,052
Total costs	-$500,000	-$20,600	-$21,218	-$21,855	-$22,510	-$23,185	-$23,881	-$24,597	-$25,335	-$26,095	-$497,249	-$27,685	-$28,515	-$29,371	-$30,252	-$31,159	-$32,094	-$33,057	-$34,049	-$35,070	-$668,261	-$37,206	-$38,322	-$39,472	-$40,656	-$41,876	-$43,132	-$44,426	-$45,759	-$47,131	-$898,087	-$3,432,105
REVENUE																																
Game revenue		$84,357	$86,888	$89,494	$92,179	$94,945	$97,793	$100,727	$103,748	$106,861	$110,067	$113,369	$116,770	$120,273	$123,881	$127,598	$131,425	$135,368	$139,429	$143,612	$147,921	$152,358	$156,929	$161,637	$166,486	$171,480	$176,625	$181,924	$187,381	$193,003	$198,793	$4,013,319
Training revenue		$34,608	$35,646	$36,716	$37,817	$38,952	$40,120	$41,324	$42,563	$43,840	$45,156	$46,510	$47,906	$49,343	$50,823	$52,348	$53,918	$55,536	$57,202	$58,918	$60,685	$62,506	$64,381	$66,313	$68,302	$70,351	$72,461	$74,635	$76,874	$79,181	$81,556	$1,646,490
Total revenue	$0	$118,965	$122,534	$126,210	$129,996	$133,896	$137,913	$142,050	$146,312	$150,701	$155,222	$159,879	$164,675	$169,616	$174,704	$179,945	$185,344	$190,904	$196,631	$202,530	$208,606	$214,864	$221,310	$227,949	$234,788	$241,831	$249,086	$256,559	$264,256	$272,183	$280,349	$5,659,809
Net Cash flow	-$500,000	$98,365	$101,316	$104,355	$107,486	$110,711	$114,032	$117,453	$120,977	$124,606	-$342,027	$132,194	$136,160	$140,245	$144,452	$148,786	$153,249	$157,847	$162,582	$167,460	-$459,655	$177,658	$182,988	$188,478	$194,132	$199,956	$205,954	$212,133	$218,497	$225,052	-$617,738	$2,227,704
Discounted value costs	-$500,000	$92,797	$90,171	$87,619	$85,139	$82,729	$80,388	$78,113	$75,902	$73,754	-$190,986	$69,638	$67,667	$65,752	$63,891	$62,083	$60,326	$58,619	$56,960	$55,348	-$143,323	$52,259	$50,780	$49,343	$47,946	$46,589	$45,271	$43,990	$42,745	$41,535	-$107,554	$785,492
Net Present Value	$785,492																															$785,492

	Natural	Synthetic
Net Present Value	-$216,709	$785,492

Hourly charge to break even $100.71 Estimate by using Tools, Goal Seek function based on cells B39 being set to 0 and changing cell B14 for the natural turf and B53 if set to 0 and changing cell C14 for synthetic turf
Enter the values calculated by the Goal Seek function in cells B57 and C57 as hard numbers

Glossary

Inflation	The overall general upward price movement of goods and services in an economy, usually as measured by the Consumer Price Index
Discount Rate	A rate which reflects the difference in value of cash an investor would want in a years time in lieu of an equivalent cash payment today. The discount rate typically includes risk free rate of return (eg bank interest for a club) plus a premium for the risk of not being repaid in a years time.
Net Cash Flow	The value of cash flows after deducting costs from revenues in a given period (one year in the above example)
Discounted cash flow	The value of the net cash flows for period years expressed in terms of their current value to an investor.
Net Present Value	The value in current dollar terms of a series of cash flows over a series of time periods (years)

Annual Contribution Calculator

Supplementary Information

This only provides an indicative model

This section provides an estimate of the funds which an organisation will needto raise to fund the replacement of the surfaces on a continuing basis.

The values represented are provided in estimated dollar values for the year in which the funds are raised.

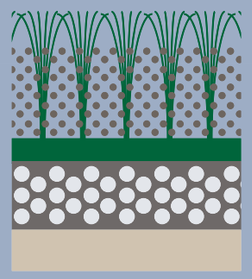
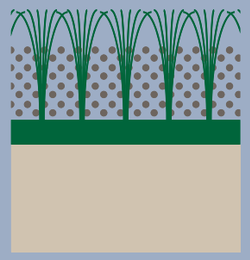
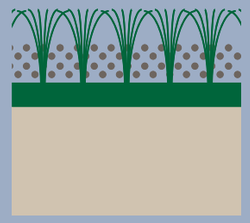
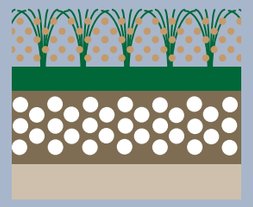
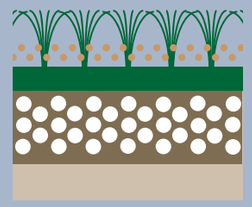
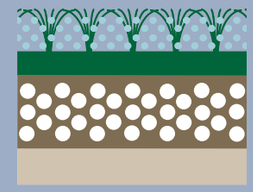
The interest rate for funds invested is equivalent to the discount rate

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Natural surface replacement costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$85,688	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	######	$219,188
Annual capital contribution	4,607	4,745	4,888	5,034	5,185	5,341	5,501	5,666	5,836	6,011	6,192	6,377	6,569	6,766	6,969	7,178	7,393	7,615	7,843	8,079	8,321	8,571	8,828	9,093	9,365	9,646	9,936	10,234	10,541	10,857	219,187
Adj factor natural	1.22																														

Synthetic surface replacement costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	######	$0	$0	$0	$0	$0	$0	$0	$0	$0	######	$0	$0	$0	$0	$0	$0	$0	$0	$0	######	########
Annual capital contribution	41,031	42,262	43,529	44,835	46,180	47,566	48,993	50,463	51,976	53,536	55,142	56,796	58,500	60,255	62,063	63,924	65,842	67,817	69,852	71,948	74,106	76,329	78,619	80,978	83,407	85,909	88,486	91,141	93,875	96,692	1,952,052
Adj factor syn	1.14																														

Appendix 9
Categories of Artificial Grass Pitches (AGPs)

Table reproduced with the permission of Sport England with alterations to suit Australian circumstances.
The artificial grass specified for Australian rules football/cricket ovals is a variation on the 40mm long pile turf.
It typically has a medium level sand infill and a shockpad (possibly rubber crumb infill also)

Pitch type	Rubber crumb type			Sand type		Water type
Category	Long Pile 3G (65mm with shock pad)	Long Pile 3G [1] (55-60mm)	Short Pile 3G [1] (40mm)	Sand Filled [1] (With Shock Pad)	Sand Dressed [1] (With Shock Pad)	Water based [1] (With Shock Pad)
						
Comments on sports surfaces	Rugby surface	Preferred soccer surface	Acceptable surface for some competitive soccer and hockey	Acceptable surface for competitive hockey and suitable for soccer training	Preferred surface for competitive hockey and suitable for soccer training	High level competitive hockey and suitable for soccer training if pitch irrigated
Sport						
Hockey	○○○○○○	○○○○○○	●●●○○○ [2]	●●●●○○ [2]	●●●●●○ [2]	●●●●●● [2]
Rugby League	●●●●○○ [3]	●●●●○○ [3]	●●○○○○ [4]	●○○○○○ [5]	●○○○○○ [5]	●○○○○○ [5]
Rugby Union	●●●●●● [6]	●●○○○○ [7]	●○○○○○ [5]	●○○○○○ [5]	●○○○○○ [5]	●○○○○○ [5]
Soccer	●●●●●● [8]	●●●●●● [8]	●●●○○○ [8]	●○○○○○ [9]	●○○○○○ [9]	●○○○○○ [9]

Key

○○○○○○	Not suitable for use
●○○○○○	Surface for modified games/training on but not suitable for serious training / competiton
●●○○○○	Surface for training/recreational use
●●●○○○	Surface for training and for some competition
●●●●○○	Surface for competition and training
●●●●●○	Surface for competition and training (regional / national)
●●●●●●	Surface for high level competition/training (national/international)

1 Shockpad optional: often needed to meet appropriate performance requirements
2 Surface must comply with FIH Standard (insitu tested)
3 Currently evaluating surface standard - see their website for latest information
4 No full contact
5 Can only be used for Tag and Touch Rugby / Handling skills
6 Surface must comply with IRB type 22 with enhanced HIC requirement
7 RFU currently evaluating surface standard - see their website for latest information
8 Surface must comply with FIFA 1 star or IATS equivalent approval required
9 Surface must comply with BSEN 15330-1 (2007)

Note: All users should refer to the individual national governing body for specific information on the preferred categories

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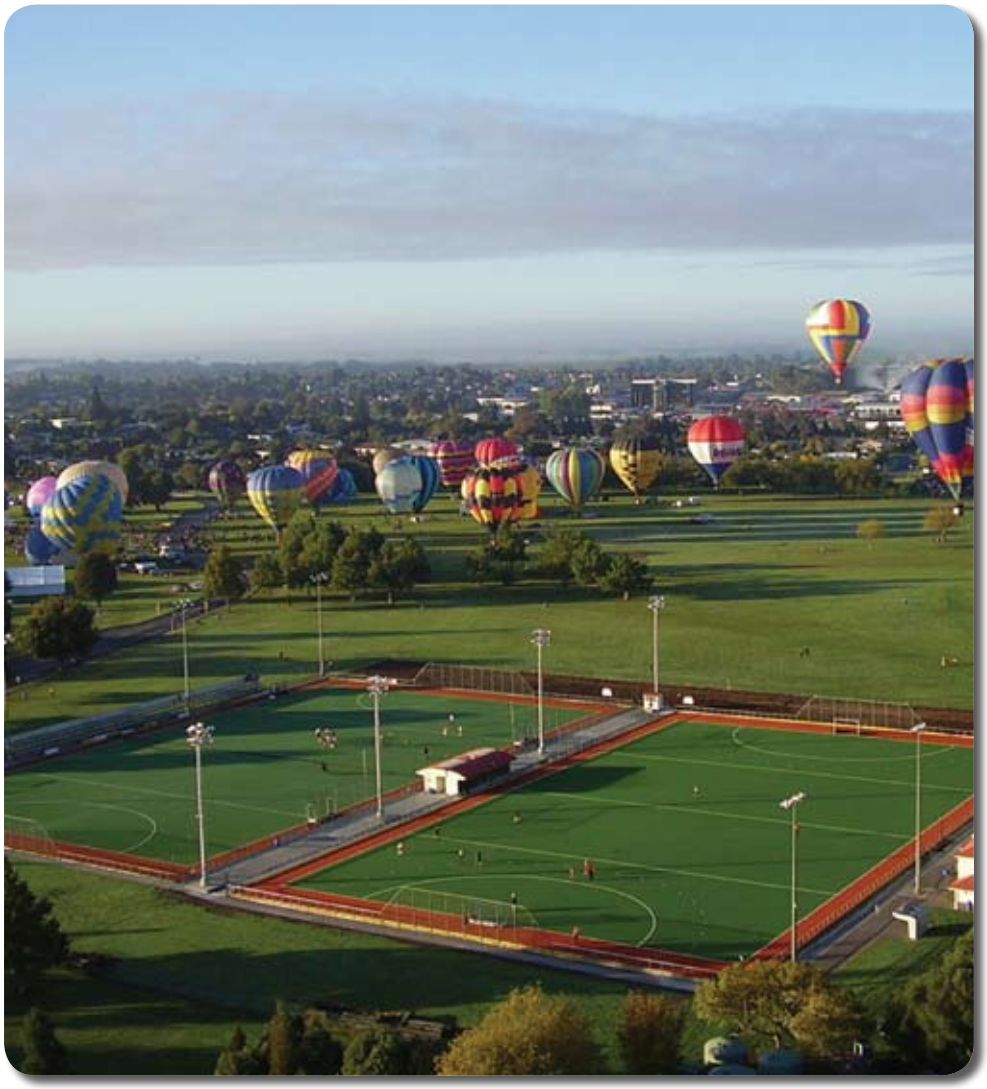
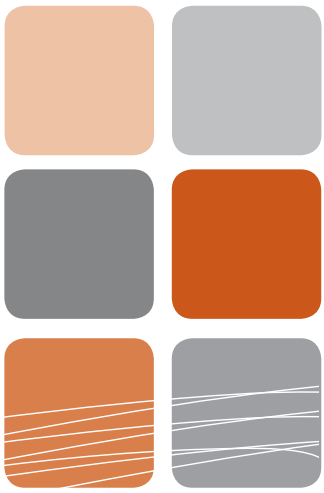
Tennis Victoria
Baseball Victoria
Football Federation of Victoria
Hockey Victoria
Victorian Golf Association
Lacrosse Victoria
Victorian Rugby Union
Touch Victoria





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Greenfields Sports Turf Systems
p21: Somerville Secondary College
p108: Artificial Clay Infill

Hockey Victoria
p56: State Hockey Centre, Royal Park
p70: Pop-Up Sprinklers
p93: Hockey player

Grassports Australia
p83: Caroline Springs College
p140: Brighton Primary School (x2)

City of Maribyrnong
p78: Footscray Hockey Centre

City of Whittlesea
p18: Mill Park Secondary College
p127: Mill Park Secondary College

City of Melbourne
p128: J J Holland Reserve, Kensington

Sports Turf International (STI)
p22: Soccer field

Tiger Turf
p27: Seymour Shaw Park
p28: Rugby players
p32: Tennis players
p34: Lawn bowlers
p35: Monmia Primary School
p36: Wembley Primary School (+p77)
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