



May 2, 2016

**TO:** Park Board Chair and Commissioners  
**FROM:** General Manager - Vancouver Board of Parks and Recreation  
**SUBJECT:** Synthetic Turf Field Replacement Contract - Oak Meadows & Kerrisdale Parks

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## RECOMMENDATION

- A. THAT, subject to Recommendations C, D and E, the Vancouver Park Board enter into a contract with Carpell Surfaces Inc. in the amount of \$799,661.16 for the installation of synthetic turf and an elastic layer at Oak Meadows Park, for PS20160293 - Supply and Install of Synthetic Turf at Oak Meadows Park and Kerrisdale Park as detailed in this report;
- B. THAT the Vancouver Park Board select infill product Option i,ii,or iii and enter into a contract with Carpell Surfaces Inc. for a 60mm synthetic turf with the selected option for Kerrisdale Park, and with a bundled savings of \$10,000, for PS20160293 - Supply and Install of Synthetic Turf at Oak Meadows Park and Kerrisdale Park as detailed in this report and subject to Recommendations C, D and E;
  - i) Infill Product: Greenplay Organic Infill (cork) for \$726,274.94, subject to an approved capital budget increase of \$126,678;
  - ii) Infill Product: Recycled Crumb Rubber and sand for \$599,596.94; or
  - iii) Infill Product: Thermoplastic Elastomer (TPE) infill for \$859,862.08, subject to an approved capital budget increase of \$260,265.
- C. THAT the contract be on the terms and conditions outlined in this report and on such other terms and conditions as are approved by the General Manager of the Vancouver Park Board in consultation with the Director of Legal Services;
- D. THAT, upon approval of the contract by the General Manager of the Park Board in consultation with the Director of Legal Services, the General Manager of the Vancouver Park Board be authorized to execute the contract on behalf of the Board; and
- E. THAT no legal rights shall arise hereby, and none shall arise until execution of the contemplated contract, and the Board reserves the right to rescind this resolution at any time up to the execution and delivery of the contemplated contract by the General Manager of the Park Board.

## **POLICY**

The City's Procurement Policy requires that contracts with values over \$500,000 and less than \$2,000,000 require approval by the Vancouver Park Board, with Bid Committee and Chief Purchasing Official (CPO) concurrence.

## **BACKGROUND**

The first synthetic turf field in Vancouver is a field hockey surface that was built in 1987 at the Oak Meadows Park/Eric Hamber Secondary School site in partnership with the Vancouver School Board (VSB). A synthetic turf field can absorb 4-6 times more play than a grass field, without weather closures, and the Vancouver Field Sports Federation and Vancouver Sport Network support the upkeep and growth of the synthetic turf field inventory.

The synthetic field surface at Oak Meadows Park was last replaced in 2003, and the synthetic field in Kerrisdale Park was replaced in 2006. Both of these fields are due for renewal: the average life of a synthetic field surface is approximately 10 years, with some possibility of extension through repairs and patching. New and greener synthetic turf products are becoming available in the industry and there is an opportunity for a more sustainable approach in this renewal process.

Project communications have been through community engagement initiatives (stakeholder meetings and site signs) and dialogue with the VSB.

### **Synthetic Turf Field Inventory**

As shown on the map in Appendix A, which also notes the year of turf installation and target year for replacement, there are 11 synthetic fields in the Park Board inventory:

- Oak Meadows Park (Eric Hamber Secondary, Field Hockey)
- Kerrisdale Park (Point Grey Secondary)
- Jericho Beach Park
- Andy Livingstone Park
- Trillium park site (2 fields)
- Vancouver Technical School
- Memorial South Park
- Empire Fields (2 fields)
- Hillcrest Park (¾ size) - scheduled to open in the fall of 2016

With one exception, these fields are an infill style synthetic turf filled with recycled crumb rubber (from vehicle tires) and sand for shock attenuation and ballast. The field at Oak Meadows Park (Eric Hamber Secondary) is a short pile style synthetic carpet without infill. This field sits on top of an elastic layer. Field hockey fields are wetted before play in keeping with international federation of field hockey requirements.

The Park Board works collaboratively with the VSB to share spaces to benefit residents and students alike. Joint use agreements are in place with the VSB for the Point Grey, Eric Hamber, and Vancouver Technical Secondary school fields. These fields were developed on VSB land with funding and construction oversight by the Park Board. Conversations about joint use agreements for the new VSB field at Kitsilano Secondary School and other secondary school locations are underway.

## **2016 Replacement Projects**

The 2015-18 Capital Plan provides \$2.0 M in funding to replace the surfaces at Oak Meadows Park (Eric Hamber Secondary School) and at Kerrisdale Park (Point Grey Secondary School). Engagement has occurred with field users, the Vancouver Sport Network (VSN), Vancouver Field Sport Federation (VFSF), and VSB. These organizations are supportive of replacing the current field surfaces with like surfaces.

## **2015-18 Capital Plan - New Synthetic Turf Field**

The Capital Plan also provides \$2M in funding for one new synthetic turf field. This location for a new synthetic turf field will be determined through engagement with field users, the VSN, VFSF, VSB, and residents. It is not contemplated in this report.

The purpose of this report is to request approval to award the Supply and Install of Synthetic Turf at Oak Meadows Park and Kerrisdale Park project to Carpell Surfaces Inc. and to determine an appropriate infill product for the Kerrisdale synthetic turf field .

## **DISCUSSION**

### **Strategic Analysis**

This project builds on the legacy of the 2010 Olympic and Paralympic Games by aligning with the Vancouver Sport for Life: Vancouver Sport Strategy. The facilities are built for excellence and sport hosting to serve regional needs; the design and development is informed by a solid understanding of the sport context and its requirements.

The Park Board Strategic Plan also directs staff to provide Well Managed Infrastructure: the fields will be built with quality for durability and low maintenance.

### **Health and Environment**

Concerns have been raised about health and environmental impacts of recycled crumb rubber infill found in synthetic fields and there is widespread information and opinion about these topics in many sources.

Recycled crumb rubber infill has been used for many years in recreational products such as running tracks, playground surfacing, resilient flooring, and training mats. Recently, US National news outlets released stories concerning the health effects of crumb rubber in synthetic turf and a possible link between crumb rubber and cancer. Staff are very concerned about these stories, and have appealed to reputable sources for information to form a basis for recommendations, including a synthetic turf consultant and the Chief Medical Health Officer (CMHO) for Vancouver Coastal Health.

The General Manager appealed to the CMHO for advice, and she provided the following statements in March:

- “Serious health risks, including cancer, are not increased from playing on synthetic turf fields with crumb rubber infill”
- “There is no public health reason for discontinuing the use of synthetic turf”

A copy of the letter containing these statements is attached as Appendix B to this report.

### Synthetic Turf Infills

Demand for synthetic turf has increased and there are now over 12,000 multi-use synthetic turf sites in North American schools, colleges, parks, and professional sports stadiums. Presently, the most popular synthetic field infill is recycled crumb rubber; approximately 98% of synthetic fields are infilled with crumb rubber in North America. Locally, only two municipalities have organic infill synthetic turf fields: Bowen Island has an 8-year old cork and coconut fibre infill field, and Port Coquitlam has a 3 year old cork infill field. Shock attenuation testing results are not available for the Bowen Island field, and the Port Coquitlam field has received positive comments from players, although it does require additional maintenance and annual cork infill material top up

The City aspires to be the Greenest City by 2020 and the Park Board is a Leader in Greening. With these goals in mind the Request for Proposals (RFP) for the Oak Meadows and Kerrisdale parks projects provided an opportunity to explore synthetic turf infill alternatives. Vendors for this RFP were requested to submit pricing for not only crumb rubber infill but also for alternative infills such as Thermoplastic Elastomer (TPE) and organic (cork only mix or cork and coconut fibre blended mix) for the Kerrisdale Park field.

A complete description of these infill products and the advantages, disadvantages, recycling factors, and risks is summarized in Table C1 of Appendix C and there is much to consider in the infill product selection.

### Infill Life Cycle Cost and Operations

The Park Board Operations team is currently at the tipping point of needing another regular full time staff person and additional equipment to maintain the growing inventory of synthetic fields and to maintain the new synthetic field proposed in this capital plan. A synthetic field that contains organic infill requires higher maintenance than a synthetic field containing crumb rubber infill, (e.g. additional infill replacement materials and more frequent grooming); therefore, an investment of \$150K in staff and machinery would be necessary to satisfy the minimum maintenance requirements of an organic infill field and the new field. This funding is not presently available in the operating budget.

A summary of the life cycle costs for each infill product received from this RFP is included in Table C2 of Appendix C. An overview comparison of the one-time capital costs and annual operating costs are summarized in the following table:

INFILL PRODUCT	CAPITAL COST (rounded to dollar)	ANNUAL OPERATING COST (materials + maintenance)	TOTAL COST YEAR ONE (projected)
i. Cork	\$726,275 (additional \$126,000*)	\$19,000 (\$11K + \$8K)	\$745,275
ii. Crumb rubber & sand	\$599,597 (within existing budget)	\$8,000 (\$5.5K + \$2.5K)	\$607,597
iii. TPE & sand	\$859,862 (additional \$260,000*)	\$10,500 (\$5.5K+\$5K)	\$870,362

\*requiring Capital Budget increase approvals

Staff request that the Board review this summary and the Appendix tables, and recommend an infill product for this contract award.

### **Engagement**

Staff met with the field user representatives for the Oak Meadows Park project on three occasions, and met with field user representatives for the Kerrisdale Park project on two occasions. Field users are interested in turf products that are durable and low maintenance and that will provide 10 or more years of uninterrupted play. Furthermore, the Kerrisdale Park field user representatives indicate support for the continued use of rubber infill products for this location.

Alternate infill products were also reviewed in the engagement process, including tours in March of a cork and coconut mixed fibre infilled field on Bowen Island, and a cork only infilled field in Port Coquitlam. Organic infill decomposes and is prone to compaction, requiring additional ongoing maintenance. Long term performance is uncertain, but players report it feels more natural to play on. Based on these tours and user feedback, staff felt a cork only infilled field was worthy of consideration.

### **Schedule**

Warm and dry weather is essential for installing the elastic layer at the Oak Meadows Park site, and the contract schedule provides for removals from June to mid-July and turf replacement from mid-July to September 2016. The RFP specifies that construction at Oak Meadows Park must begin on July 18, 2016, and both sites shall have testing complete by August 31, 2016, with field re-openings scheduled for September.

### **PROCUREMENT**

A Request for Proposal (PS20160293) was issued on February 26, 2016, for the Supply and Installation of Synthetic Turf at Oak Meadows and Kerrisdale parks. Four (4) submissions were received. Carpell Surfaces is the only vendor offering organic alternative infills and additionally offers bundle savings of \$10,000. Staff and the consultant on the RFP evaluation committee, and subsequently the Bid Committee, considered the submissions received and on the basis of overall best value, staff recommended that Carpell Surfaces Inc. be awarded a contract for this project.

All contractors submitted pricing for Oak Meadows Park and Kerrisdale Park. The consultant conducted a technical evaluation with input from staff and stakeholders. Carpell Surfaces Inc. submitted pricing for all alternative infill products and had the highest technical score for traditional products at both Kerrisdale Park and Oak Meadows Park. This company is a proven turf supplier and installer; they have installed 32 FIFA certified fields in Canada, 12 of which used TPE infill.

The proposed product for Oak Meadows Park is Xtreme Turf NFH 13 MF ET Decke 35. This product contains texturized polyethylene fibres and is rated FIH (International Hockey Federation) Global. This turf is installed without adhering to the elastic layer, allowing the elastic layer to be potentially reused in the next field renewal. The turf is made with a primary class of backing; thus, annual stretching is not required to keep the field surface free of deformations or wrinkles.

The proposed turf product for Kerrisdale Park is the Xtreme Turf Premiere DX60. It is a FIFA 1 Star rated polyethylene monofilament turf. The turf fibre withstands 140,000 lisport cycles - it is 5 times more durable than the competitor's turf. Staff request that the Board determine the preferred infill to accompany this turf for Kerrisdale Park.

The following base prices were received from the contractors for synthetic turf with an elastic layer at Oak Meadows and for synthetic turf with crumb rubber and sand infill:

Company	Price
Carpell Surfaces Inc.	\$1,389,258.10
Davan Group Inc.	\$1,156,135.00
AstroTurf West Distributors Ltd.	\$1,545,000.00
Field Turf Inc.	\$1,873,839.00

The Bid Committee will consider Carpell Surfaces Inc. as the successful proponent at an upcoming meeting.

#### SUMMARY

Staff have considered the stakeholder input, consultant recommendations, literature, turf types available through this RFP, life cycle cost analysis, information from the Chief Medical Health Officer, and operating impacts. As a result, staff propose replacing the synthetic turf surface at Oak Meadows Park with like surfaces and request that the Board recommend an infill product for the Kerrisdale Park field.

Staff recommend that PS20160293 - Supply and Install of Synthetic Turf and an elastic layer at Oak Meadows Park be awarded to Carpell Surfaces Inc. for the sum of \$799,661.16.

Staff further recommend that PS20160293 - Supply and Install of Synthetic Turf at Kerrisdale Park be awarded to Carpell Surfaces Inc. for an Xtreme Turf Premiere DX60 synthetic turf, including the Board's selected infill product.

Carpell Surfaces Inc. offers a bundled savings of \$10,000. Funds are available from the 2015-2018 Capital Plan for the synthetic turf, with additional funding required for the TPE or cork infill options. This funding is subject to a Capital Budget adjustment.

General Manager's Office  
Vancouver Board of Parks and Recreation  
Vancouver, BC

Prepared by:  
Rosaline Choy & Tiina Mack, Park Development

tm/rc/jk/clc

Synthetic Turf Field Locations

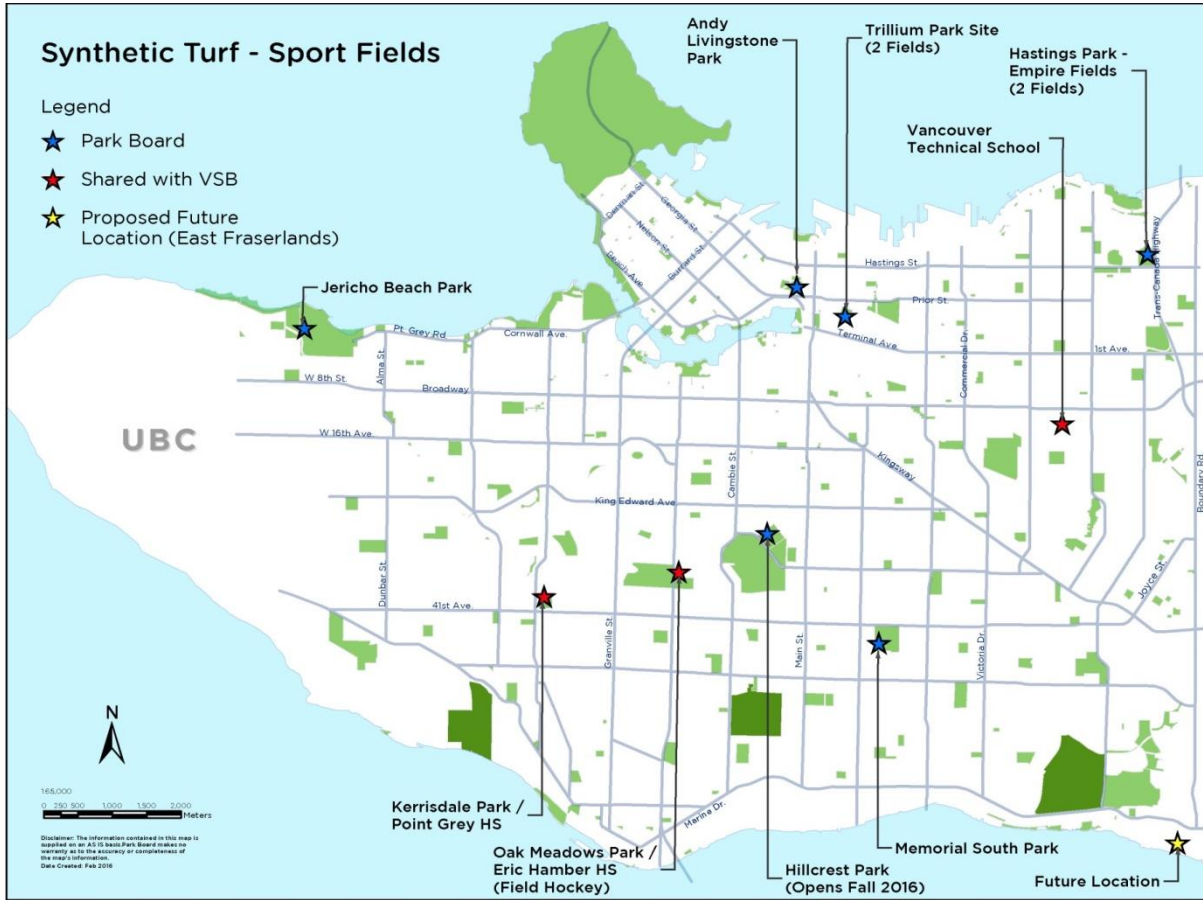


Figure A1: Location of VPB Synthetic Fields

Park Location	Year Open	Comments	Replacement Year (Target)
Oak Meadows Park (Eric Hamber Secondary School)	1987/ 2003	2003 - replaced turf only (field hockey turf with e-layer)	2016
Kerrisdale Park (Point Grey Secondary School)	2006		2016
Vancouver Technical School	2008	Goal and centre field wear noted	2019
Andy Livingstone	1995/ 2009	turf surface replaced in 2009 drainage issues	2019 (or coordinated with new parks & renewals)
Jericho Beach Park West Field	2010		2020
Memorial South West Field	2010		2020
Trillium Park Site (2 fields)	2010		2020
Hastings Park - Empire Fields (2 Fields)	2015		2025
Hillcrest Park	2016	Youth Field	2026

Table A1: Synthetic Field Inventory

Letter from Chief Medical Health Officer



Office of the Chief  
Medical Health Officer

#800 - 601 West Broadway  
Vancouver, BC V5Z 4C2

March 24, 2016

Mr. Malcolm Bromley  
General Manager,  
Vancouver Board of Parks and Recreation  
2099 Beach Avenue  
Vancouver, British Columbia  
Canada V6G 1Z4

Dear Mr. Bromley,

**Re: Synthetic Turf**

I am writing in response to your letter dated February 26, 2016. In the letter you asked for updated Public Health recommendations regarding synthetic turf fields. My staff recently reviewed the existing evidence with respect to synthetic turf and health risks, particularly given the recent public interest about the use of recycled crumb rubber for these turfs. We came to the following conclusions and recommendations in light of current information:

- Serious health risks, including cancer, are not increased from playing on synthetic turf fields with crumb rubber infill
- There may be more burns, cuts and scrapes, and ankle injuries from playing on synthetic turf compared to natural turf
- On hot days, synthetic turf can get extremely hot which may cause heat related symptoms in players
- There is no public health reason for discontinuing the use of synthetic turfs

There are potential public health benefits associated with synthetic turf fields. Synthetic turf provides more total available playing hours than natural fields, as it can be used all year round in all-weather situations. This could increase community access and opportunities for physical activity. This can be very important since most of the residents in our region, including children, do not achieve the daily recommended levels of physical activity.

In our review, we also became aware however of the possibility that synthetic turfs may act like urban heat islands in the summer. While this evidence comes from places that typically have hotter summers than Vancouver, and there is no local data, it is something the Board may consider as our region experiences climate change.

Given the present knowledge, we recommend the following to address the potential concerns associated with synthetic turf, as well as to minimize exposure to the crumb rubber and other components of the synthetic turf:

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**1. For players (or for parents to monitor)**

- Stay well hydrated on hot days and stay in the shade when possible to reduce the risk of heat related illness
- Properly clean any skin wounds or abrasions, including removing any pieces of crumb rubber, and seek appropriate treatment when necessary
- Wash hands and shower after playing on synthetic turf
- Do not eat on synthetic turf
- Remove crumb rubber pellets as much as possible from shoes, socks and uniforms after playing

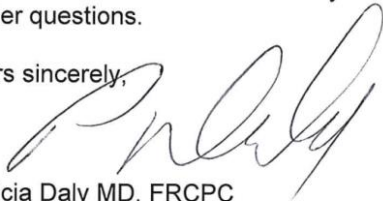
**2. For Sports Organizations, Facility Operators, Spectators, Families**

- Ensure vegetation and tree canopy are maximized when landscaping areas surrounding synthetic turf fields
- On extremely hot days, water the synthetic turf to reduce the temperature of the playing field
- Provide a shaded area for players on hot days
- Ensure players and spectators have easy access to drinking water
- Maintain proper ventilation for indoor fields
- Purchase new turf with the lowest lead content available on the market
- Ensure small children, either players or spectators, do not eat pieces of the synthetic turf or crumb rubber
- Regularly inspect, maintain, repair and replace synthetic turf fields as they show wear and damage and in accordance with manufacturers' recommendations.

We are aware that the State of California Office of Environmental Health Hazard Assessment (OEHHA) is currently conducting additional synthetic turf studies to supplement previous OEHHA studies conducted in 2007 and 2010. Recently the U.S. Environmental Protection Agency, Centers for Disease Control, and Consumer Product Safety Commission also launched a joint study on synthetic turfs. It is expected some results from these ongoing studies will be released by the end of 2016. Vancouver Coastal Health will continue to monitor and review the new scientific evidence as they become available.

I hope this information is useful to you. Please do not hesitate to contact us again if you have further questions.

Yours sincerely,



Patricia Daly MD, FRCPC  
Vice-President, Public Health and Chief Medical Health Officer  
Vancouver Coastal Health

CC: Randy Ash, Manager Health Protection, Healthy Built Environment, Health Protection,  
Vancouver Coastal Health

*Promoting wellness. Ensuring care. Vancouver Coastal Health Authority*

Infill Summary

Table C1: Summary of Infill Products for the Kerrisdale Park field

Greenplay Organic Infill (cork)			
Description	Advantages	Disadvantages	Risks
<ul style="list-style-type: none"> <li>▪ Harvested from organic components such as natural cork or natural cork mixed with ground coconut fibers</li> <li>▪ Staff, consultant, &amp; VFSF visited Bowen Island’s 8 year-old coconut fiber/cork infill field, and Port Coquitlam’s 3 year-old cork infill field</li> </ul>	<ul style="list-style-type: none"> <li>▪ Natural product from renewable source</li> <li>▪ No health concerns</li> <li>▪ Players comment it feels more natural to play upon</li> <li>▪ Lower surface temperature</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cork floats and migrates during periods of intense rain</li> <li>▪ Prone to compaction; organic products decompose</li> <li>▪ Susceptible to freezing due to low water permeability (low risk for Vancouver)</li> <li>▪ Higher capital &amp; maintenance costs</li> <li>▪ Uncertain life span before replacement</li> </ul>	<ul style="list-style-type: none"> <li>▪ Unproven product</li> <li>▪ Proponent does not have experience with this product</li> <li>▪ A large high use field: 30% larger than standard soccer; year round use (2005 hours VPB and PE by VSB)</li> </ul>
Recycled Crumb Rubber and Sand Infill			
Description	Advantages	Disadvantages	Risks
<ul style="list-style-type: none"> <li>▪ Rubber derived from recycled materials like used tires or running shoes</li> <li>▪ Produced by shredding or cryogenic (freezing) process</li> <li>▪ Often includes sand in the infill mix for ballast</li> <li>▪ All ten of Park Board’s infill style synthetic fields use this material; only exception is the short pile turf field at Oak Meadows Park.</li> <li>▪ Tested for toxicity to meet BC Ministry of Environment’s soil characterization limits (Commercial for PAH’s and Urban Park for all other components)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fewer tires are dumped in the landfill</li> <li>▪ Carbon footprint - less greenhouse gases are produced to create this product than some other infills</li> <li>▪ Cost and availability</li> <li>▪ Can be washed and reused as infill when the synthetic field is renewed</li> <li>▪ Can be repurposed for backfill or in asphalt</li> </ul>	<ul style="list-style-type: none"> <li>▪ Not organic</li> <li>▪ Surface temperature of synthetic fields with crumb rubber infill is higher than natural grass or organic infills</li> <li>▪ Off gas odour</li> </ul>	<ul style="list-style-type: none"> <li>▪ Health risks cited in the media</li> </ul>

Table C1: Summary of Infill Products for the Kerrisdale Park field

Thermoplastic Elastomer (TPE) Infill			
Description	Advantages	Disadvantages	Risks
<ul style="list-style-type: none"><li>▪ Thermoplastic elastomer</li><li>▪ Man-made origin guaranteed and first-use raw materials</li><li>▪ Used in reusable food storage containers like water bottles</li><li>▪ Used at and Mulgrave School</li><li>▪ Considered a Green alternative to crumb rubber in the US.</li><li>▪ California's Proposition 65 compliant</li></ul>	<ul style="list-style-type: none"><li>▪ Recyclable and can be reprocessed at the end of its life cycle</li><li>▪ Contains no cancer causing PAH's or heavy metals</li><li>▪ Low maintenance</li><li>▪ High performance</li><li>▪ Minimal 'spray'</li><li>▪ Cooler than crumb rubber</li><li>▪ No compaction of infill</li><li>▪ Can be washed and reused as infill when the synthetic field is renewed</li></ul>	<ul style="list-style-type: none"><li>▪ Not organic</li><li>▪ High cost - field is 30% larger than a standard soccer field</li><li>▪ Surface temperature is higher than organic</li></ul>	<ul style="list-style-type: none"><li>▪ No known risks</li></ul>

**Table C2: Infill Life Cycle Cost for this RFP**

Infill	Cork	Cork & coconut	Crumb rubber & sand	TPE**	33/67 TPE & sand	50/50 TPE & sand
Turf pile height	60mm	60mm	60mm	45mm	60mm	60mm
Capital cost to upgrade	\$126,678	\$126,678	included in base price	\$70,586	\$260,265	\$348,277
Maintenance & grooming for 10 years (excludes debris removal)	\$109,200	\$109,200	\$54,600	\$54,600	\$54,600	\$54,600
Supply & install top-up material for 10 years	\$80,000	\$300,000	\$25,000	\$40,000	\$49,000	\$49,000
Removal	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Recycle, repurpose or dispose	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
<b>TOTAL</b>	<b>\$350,878</b>	<b>\$570,878</b>	<b>\$114,600</b>	<b>\$200,186</b>	<b>\$398,865</b>	<b>\$486,877</b>

*\*costs rounded to nearest dollar*

*\*\* infill pricing based on using shorter turf that is not suitable for VSB's rugby program at Kerrisdale Park.*