Appendix C
Performance Specifications

1. Summary of Requirements

1.1. The City proposes to engage the services of a qualified and experienced synthetic turf system contractor to replace the existing synthetic turf field at Dr. Charles Best Secondary School, 2525 Como Lake Ave, Coquitlam BC, in accordance to the performance specifications described herein.

1.2. The proposed synthetic turf system shall, in accordance with the specified test methods and performance specifications:

a. be a vertically draining, non-directional tufted hybrid slit film (110 micron fibre) and monofilament (330 micron fibre) synthetic turf product;
b. be a minimum 64mm pile height;
c. meet or exceed FIFA Quality and FIFA Quality Pro Rating as verified by a FIFA Laboratory Report naming the exact turf product used; and
d. meet or exceed World Rugby Turf Performance Specification as may be verified by a World Rugby Accredited Test Institute.

1.3. The synthetic turf manufacturer shall be a current FIFA Licensee at the time the FIFA Laboratory Report was performed, for the exact product to be used in the Work.

1.4. The Contractor must provide a FIFA Laboratory Test Report that confirms the proposed synthetic turf product satisfies the requirements of FIFA Quality Pro.

1.5. The Contractor shall provide a Warranty compliant with the performance specifications herein.

2. Project Background

2.1. The field was originally constructed in 2005 and later resurfaced in 2015. The existing Powerblade Elite 50-S turf and Schmitz ProPlay 23D turf system covers an area of approximately 9,576 square meters over a gravel base. The turf is secured to a perimeter FRP nailing strip.

2.2. The project aims to replace the existing turf which has reached end of expected service life within the specified schedule. High school uses during the day and bookable evening hours result in a tight schedule requirement to minimize impact to operations revenues.

3. Work Requirements

The Contractor is required to provide the Work as outlined below:

3.1. Removal and storage of existing crumb rubber and sand infill and removal and recycling of the existing synthetic turf carpet;

3.2. Design, manufacture, deliver and install synthetic turf product to include game lines and markers;

3.3. The Contractor must provide all submittals, including signed warranty, prior to award of Substantial Performance; and
3.4. Coordinate with School District and City of Coquitlam activities

4. Operations and Maintenance Data

4.1. Provide data stating approved activity usage for the synthetic turf and any prohibited activities as related to maintaining Warranty.
4.2. Provide descriptions of any equipment required for maintenance and repair, citing specific vendors for equipment unit.
4.3. Provide data on all materials installed with their characteristics, general maintenance, small repair procedures, minor seam repair procedures, and full specifications / safety data sheets.
4.4. Provide as-built version of the shop drawings, confirming actual measured dimensions of the installed system, inclusive of lines and markings.
4.5. All Work must be completed in accordance to the specifications of the manufacturers of all products used.

5. Superintendence

5.1. The Contractor shall provide an experienced superintendent skilled in the workmanship required to complete the Work. The Superintendent must be named prior to mobilization and shall oversee all construction activities through Total Performance.
5.2. The Superintendent shall have the authority to make decisions for the Contractor, including decisions overseeing personnel on the worksite and as related to the Contractor's performance of the contract requirements.

6. Schedule

6.1. The Contractor shall submit a project schedule in accordance to the performance specifications herein, prior to issuance of purchase order.
6.2. The earliest mobilization permitted shall be no earlier than June 20, 2025.
6.3. The Contractor shall perform the Work and achieve Substantial Performance no later than August 15, 2025.

7. Pre-Shipment Product Testing

7.1. The Contractor shall provide testing from product manufactured specifically for the Work. The pre-shipment lab report identify from which panel/rolls samples were extracted, and the date samples were extracted.
7.2. The Contractor must provide material test reports for all proposed synthetic turf products from an independent lab specializing in synthetic turf surfacing for the following American Society for Testing and Materials ("ASTM") standards and procedures:
    a. Yarn Type (product identification)

b. ASTM D1335 for tuft bind (excluding infill);
c. ASTM D1577 for yarn denier;
d. ASTM D2256 for fibre tensile strength;
e. ASTM D789 for yarn melting point;
f. ASTM D3218 for tape thickness;
g. ASTM D5034 for grab tear strength;
h. ASTM D5823 for pile height;
i. ASTM D5793 for gauge and no. of stiches;
j. ASTM D5848 for pile weight and total weight;
k. ASTM D2256M-10 for yarn breaking strength/elongation
l. ASTM F2765 for total lead content;
m. ASTM D2859 for PILL Burn (Pass/Fail);
n. ASTM F2898 for permeability;
o. ASTM D355 for impact attenuation; and
p. ASTM D5644 for particle size distribution of the proposed infill (if any).

7.3. The test results shall be submitted directly from the testing company to the City's representative.

8. Site Protection and Security

8.1. The Contractor shall be responsible for erecting and maintaining a 1800 mm high temporary construction fence enclosing all areas where Work shall be performed, including the entire field surface, material storage areas, and key access corridors.

8.2. The Contractor shall take reasonable and adequate precaution to ensure that existing facilities and utilities are protected from construction activities, and shall be responsible for any damages to such property if as a result of construction activities.

8.3. If equipment is to be used in the installation that must remain stationary for over 30 minutes, or if such equipment generates heat,, a sheet of 19mm minimum thickness plywood must be placed under such equipment.

8.4. Acceptance of any repairs is at the sole discretion of the City, and shall be completed prior to substantial performance of the Work being granted. In the case that substantial performance has already been awarded, repairs must be undertaken prior to release of any remaining deficiency holdback amount.

8.5. Deficiency holdbacks shall be calculated at three times the actual value of the labour and materials required to remedy such damages.

9. Access and Traffic Management

9.1. The Contractor shall provide an access plan for approval by the City.

9.2. The Contractor shall perform the services in a manner as to avoid unnecessary interference to existing traffic and pedestrian circulation.
9.3. Access to emergency access and fire lanes, roadways, alleys, and building access points shall not be encumbered for any reason.

10. Preparation Requirements

10.1. The Contractor shall verify site conditions, and ensure an adequate quantity of product is ordered for install, testing, and repairs, as required.
10.2. The Contractor shall be responsible for layout and planarity.
10.3. Deliver products with original labels and packaging.
10.4. Store products and materials according to the original manufacturer's procedures and requirements, in a manner where they shall be protected from construction activities, weather, theft, vandalism, and other damage.
10.5. Stockpiles of infill shall be protected from rain and wind.
10.6. Onsite stockpiling and staging locations must be approved by the City, and executed in a manner that shall not impede existing drainage patterns, damage soft landscape, or create unsightly conditions including dirt, debris, oil, and tracking.

11. Pre-Installation Requirements

11.1. Following removal and disposal of the existing synthetic turf carpet, the Contractor shall inspect the existing aggregate base and shock pad for defects as may be related to the completed synthetic turf field system.
11.2. The Contractor is not expected to undertake repairs to the existing aggregate base if defects are observed, and instead, shall report to the City specific locations and deficiencies such that the City can remedy conditions for the Contractor to proceed with shock pad and turf installation.
11.3. The Contractor shall perform repairs to the existing shock pad, as required, to satisfy the performance specifications of finished playing surfaces.
11.4. The Contractor shall provide a Letter of Acceptance confirming that the existing prepared granular base and existing shock-pad are in general conformity with the contract documents, such that the Contractor will be able to satisfy the performance specifications described herein.
11.5. The Contractor shall not be held responsible for hidden conditions such as failing drainage or base infrastructure. The Contractor shall remain responsible for verifying visible and measureable conditions at time of review for Letter of Acceptance, including planarity and drainage.
11.6. Work is to commence and continue only if the environmental and site conditions are in accordance with the manufacturer's recommendations for each product placement, such as carpet, glues, sewing, and infill.

12. Underlayment Shock Pad Products

12.1. Any shock pad product used for repairs shall meet the performance specification of the existing shock pad product:
   a. ASTM F355 shall conform to a maximum average G-max rating of 95 over three drops;
   b. ASTM F2898 test method shall confirm a minimum permeability of 500mm/hr;
   c. Product thickness to be uniform without deviations greater than 1 mm;
   d. Product can be installed as interlocking panels or seamed rolls, and must must exhibit uniformity of density in all areas supplied and installed;

12.2. The product shall be expansion and contraction characteristics to ensure that the product remains level and flat under the entire synthetic turf surface in normal service temperature limits ranging from minus 20 degrees Celsius to plus 40 degrees Celsius.

13. Installation of the Shock Pad

13.1. Place individual sheets directly onto granular field surface and interlock or seam adjacent panels, completing the installation according to the manufacturers' installation requirements.

13.2. Allow enough material to overlap edges of the field such that any shock pad shrinkage that occurs does not result in voids and gaps. Trim excess pad material.

13.3. Do not exceed the manufacturer's recommendations for acceptable loads on any shock pad material.

13.4. The product shall be placed as to ensure a smooth surface that meets the planarity tolerances specified herein.

13.5. There shall be no gaps between panels that exceed 6mm. Any adjacent panels must have their top surfaces level with no adjacent panels deviating more than 1mm.

13.6. Cut and otherwise modify the material to conform to the edge of the field nailing strip / field perimeter edge and goal post footing covers. Ensure that cuts and modifications form either a straight and true edge or consistent curved radius, depending on the edge condition.

14. Synthetic Turf and Infill Products

14.1. The synthetic turf product shall provide the finished appearance and feel of natural grass.

14.2. The synthetic turf backing shall be uniformly perforated with 5mm diameter clear openings, spaced at a maximum of 100mm on-centre.

14.3. The synthetic turf product shall be supplied and installed in minimum 4500mm (15 ft.) widths with no longitudinal or transverse seams.
14.4. The coloured turf used for game lines and markings shall be manufactured of the same batch and quality as the primary (green) synthetic turf product.
14.5. The surface must accommodate temporary rubber-based line markings.
14.6. The fibres of the synthetic turf shall be manufactured to be resistant to UV degradation, rot, mildew, and fungus. The materials shall be inert, non-toxic and non-allergenic.
14.7. The synthetic turf product shall be FIFA Quality Pro certified under the FIFA Quality Programme, whereby a pass is also required for the 6,000 cycle Lisport XL test and shall meet the performance specifications herein.
14.8. Permeability of the completed surface, inclusive of shock pad underlayment and installed infill, and as measured by ASTM F2898, shall be a minimum of 500 mm/hour, provided that the permeability of the prepared granular base also meets the same performance standard.
14.9. The products and materials used shall meet the Synthetic Turf Council and BC Ministry of Environment ('Urban Park') standards and guidelines for aromatic hydrocarbons/PAH's and heavy metals, and shall continue to meet such standards throughout the life of the Warranty.

15. Installation of the Synthetic Turf:

15.1. When placing synthetic turf rolls onto the shock pad, the Contractor must meet the following requirements:
   a. Ensure the wheel path of the delivery and installation equipment is protected with two layers of 19mm minimum thickness plywood, staggered, and placed in a manner as to not damage the shock pad; and
   b. Use only four-wheeled pneumatic tired vehicles with a maximum non-loaded weight of 4,500 kg, or as specified by the shock pad and synthetic turf product manufacturers, whichever is more stringent.
15.2. All rolls must be straight and true when laid out, parallel (or perpendicular) with the field edge perimeter. Each roll must form a common straight and true edge with the adjacent roll and no fitted pieces will be permitted. Any roll that does not follow the straight and true edge of the field shall be rejected.
15.3. Cross seams are not permitted except for sideline panels. Material that has permanent wrinkles must be cut out, with the cut extending the entire width of the roll.
15.4. Synthetic turf shall be fastened to the perimeter edge nailing strip.
15.5. The width between the fibre rows at the seam locations shall not exceed that of the tufting gauge of the turf materials.

15.6. Seams must be secure and capable of remaining secure for the duration of the Warranty period. Seams that have spillage of glue on the surface of the fibres will be rejected. All sewn seams must be picked to free any turf fibres that have been trapped by sewing threads.

15.7. The installation procedures for all materials employed in the synthetic turf sport surfacing system must provide for a permanent, tight, secure and hazard-free playing surface, in accordance with manufacturer specifications.

16. Infill Placement

16.1. Infill should be installed when the synthetic turf is dry.

16.2. Regardless of the manufacturer's recommended infill levels, the finished infill must be installed within 13mm of the top of the turf fibres as measured when the infill has settled.

- The installed infill will require water settlement as measured by a minimum of 20 mm of water applied through natural rain or by manual application.

16.3. All infill is to be worked into the profile of the synthetic turf product. No infill is to remain on the finished surface of the synthetic turf.

16.4. The Contractor shall ensure the installed infill depth does not vary by more than 5mm compared to the average, with no areas uniformly high or low.

16.5. When placing infill onto the synthetic turf product, the Contractor must meet the following requirements

a. Four wheel equipment with a loaded-weight of up to 1,360 kg must have pneumatic turf tires with a minimum of 100mm by 200mm contact area for each tire;

b. Loaded vehicle weights of 1,360 kg or more shall not be used until infill levels in the turf area meet a minimum of 50% of intended install depth;

c. Alternate or stagger infill installation paths across the field as to avoid damage from equipment crossing the same path repeatedly; and

d. Equipment must make gradual (wide) turns. Stationary wheel turns, or dry steering, is not permitted on shock pad or synthetic turf product surfaces. Do not park or leave equipment on shock pad or synthetic turf surfaces when neither in-use or in motion.

17. Post-Construction Testing

17.1. The Contractor shall perform in-situ testing for:

a. Yarn Type (product identification)
b. ASTM D1335 for tuft bind (excluding infill);
c. ASTM D1577 for yarn denier; and
d. ASTM F355 for Gmax, in accordance with ASTM F1936.

17.2. The Contractor shall use one of the named testing agencies below:
- Labosport Canada, 5661, rue de Lanaudiere, suite 200, Montreal, QC H2G 3A5, Canada. Tel: (514) 277-9111

18. Extra Materials

18.1. The Contractor shall provide:
a. 100 square meters (20m x 4.5m) of turf product in green;
b. 30 lineal meters of 100mm wide white lines;
c. 30 lineal meters of 100mm wide yellow lines; and
d. 30 lineal meters of 100mm wide blue line.

19. Lines and Markings:

19.1. Field lines and markings shall include:
a. International Football Association Board (i.e. soccer) with white lines and 100mm blue square goal post markers including technical (coaches) boxes;
b. World Rugby regulation size rugby playing field with yellow lines; and
c. Two BC Soccer regulation size Super-8s (i.e. small-sided soccer) with blue lines including square goal markers. The field markings shall be rotated such that the small-sided soccer goal line is parallel to the regulation sized soccer field's touch lines.

19.2. When installing game lines and markings, the Contractor must meet the following requirements:
a. All lines and game markings shall be straight and true without distortions, vertically or horizontally;
b. Deviations greater than 3mm over a 3m straight edge shall be remedied with fine trimming and levelling;
c. No fitted or fill pieces are permitted;
d. Errors with line and marking installation shall be repaired by cutting out a section of adjacent turf 50mm wider than the error, and replacing both the line and the surrounding turf in the repair area with new product;
e. Lines shall be tufted-in during manufacturing wherever feasible, in accordance with the agreed shop drawings;
f. All inlaid lines and event markings are to be completed by removing synthetic turf product and placing in the line, which is backed by scrim and glue and/or seaming tape. Line installation by shaving the synthetic turf is only allowed if the fibre height of the line meets the design elevation of the adjacent playing surfaces; and
g. The pile direction of the lines must match the pile direction of the synthetic turf rolls.

20. Order of Precedence

20.1. Where there may be a conflict in specifications, the following order of precedence shall apply:
   a. Appendix C – Performance Specifications;
   b. Appendix B – Drawings; and
   c. Synthetic Turf Council Suggested Guidelines.

21. Clean-Up

21.1. The Contractor shall inspect and leave the worksite in a clean and orderly condition at the end of each day, performing a perimeter sweep and removing any accumulated litter, infill, cuttings, and debris within or along the perimeter construction fence.

21.2. The Contractor, upon completion of the Work, shall leave the site in a clean and orderly condition ready for use by the City.

22. Recycling

22.1. The Contractor shall provide a third-party recycling certificate of compliance. This certificate shall identify how much material (in tonnage) was received by the recycling facility, where the facility is located, and how much material will be recycled.

23. Warranty

23.1. The Product and Installation Warranty (the "Warranty") shall cover all materials and products from defects in manufacturing, and guarantee from deficiencies all materials and workmanship related to the synthetic turf system, including the synthetic turf product, seams, glues, fasteners, tapes, sewing, infill, and any other permanent components form the completed playing surfaces.

23.2. The Warranty shall be provided for an 8-year warranty period, starting from the date of Substantial Performance, accommodating a minimum of 3,000 hours annually of scheduled organized sport and unorganized community recreation and physical education uses.

23.3. The Warranty shall guarantee, for the duration of the warranty period, that:
- all seams and edges shall not separate or become unattached to the overall system as a result of normal use;
- the appearance of the synthetic turf products do not fade or suffer from non-uniform colour change; and
- the face weight of the yarn and the length of the yarn does not decrease by more than 10% per year according to ASTM D418 nor decrease a total of 50% or more.

23.4. Infiltration rate shall meet 90% of the specified infiltration rate throughout the duration of the warranty period.
23.5. Repairs and replacement shall be performed at the sole cost of the Contractor using only new materials of equal or greater quality.
23.6. The Contractor shall ensure minor repairs are completed within five (5) business days and major repairs are completed within one (1) year that notice of a defect is provided.
23.7. The Contractor shall be responsible for providing FIFA Quality testing by an independent lab three (3) years after the installation to ensure the work remains compliant to performance specifications.
23.8. Notice shall be provided in writing to those named on the Form of Warranty
23.9. If the manufacturer and the installer are not the same entities, the Warranty shall be co-signed by each legal business entity, and both entities shall be jointly liable for any such commitments.
23.10. The Warranty shall be signed by someone capable and authorized to make and enter contracts at the time the Warranty agreement is executed.
23.11. The Warranty shall constitute a Contract made in the Province of British Columbia and shall be governed by the laws thereof.

24. Submittals

24.1. The Contractor shall provide the following submittals for City review and approval:
   a. Project schedule outlining key milestones;
   b. Field layout shop drawings inclusive of game lines, markings, roll/panel layout, goals, dimensions, and reference standards;
   c. Product sheets for all new products added to the system, such as crumb rubber, silica sand, and shock pad;
   d. Pre-shipment product test results;
   e. Signed Letter of Acceptance confirming the Contractor has reviewed and agree to installing the synthetic turf product over existing granular base and shock pad;
   f. Operations and Maintenance package;
   g. Signed Form of Warranty; and
   h. Recycling certificate.

25. City Provided

25.1. The City shall provide power and water where reasonably accessible from existing infrastructure.
25.2. The City shall provide infiltration testing on the existing shock pad. The Contractor shall accommodate schedule for the City's testing personnel to perform such testing.