

TECHNICAL SPECIFICATIONS

SYNTHETIC TURF SPORTFIELD SURFACE

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Appendix E FORM OF WARRANTY SYNTHETIC TURF SYTEM

PART 1: GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts.

1.2 DESCRIPTION

- .1 Supply all products, labor, equipment, and services necessary to install synthetic turf sports field surface as indicated in the contract documents.
- .2 The supply and installation of all new material of approximately 1087.7m² of synthetic turf playing field surfacing, incorporating slit film fibers. The product is to have a pile height of 45mm. The supply and installation of the synthetic turf field is to include all infill, game lines, and event markings. The synthetic turf surface is to be installed over a shock pad.
- .3 Installation of infill material one year from the date of Substantial Performance. This infill is to be the same as the infill installed, including being from the same manufacturer. It is to be installed and groomed to meet specifications.
- .4 Accurate surveying and layout of the specified work program, including game lines and event markings as per the specifications and drawings herein. Verify field dimensions on site prior to shipping materials.
- .5 The provision of all Samples and Submittals as described herein.
- .6 The provision of all required testing as described herein.
- .7 The supply to the Owner, for post-installation maintenance use, the following items.
 - .1 All remaining remnants of the new synthetic surface as selected by the Owner. Remnants that are rejected by the Owner are to be disposed of as waste material as directed by this specification.
 - .2 One (1) 20-liter pail of turf adhesive.
 - .3 One (1) 10 l.m. of continuous white lines having thickness equal to the installed line widths.
- .8 On the date of the Substantial Performance review, the Contractor must conduct an on-site one-hour maintenance seminar with the Owner's maintenance staff demonstrating maintenance and repair procedures and maintenance machine operations using the Owner's maintenance machinery.
- .9 Prior to Substantial Performance being granted the Contractor is to provide a company warranty and separate product warranty as part of the required project binder as per the requirements herein.

1.3 RELATED WORK

- .1 Synthetic Turf Sports Field Shock Pad Section 32 18 23.31

1.4 REFERENCE STANDARDS

- .1 Standard specifications for testing materials:
- .1 American Standard Testing Materials (ASTM)
 - .2 Synthetic Turf Council - Suggested Guidelines for the Essential Elements of Synthetic Turf Systems
 - .3 European Standards/European Norms (EN)
 - .4 FIFA - Quality Programme for Football Turf - Test Manual I & II (2024 Editions)

1.5 INSPECTION

- .1 The Contractor shall notify the Owner's Representative at least 48 hours before any requested inspection.

1.6 TESTING AND APPROVALS

- .1 Prior to shipment of the synthetic turf material for the field, to the job site, synthetic turf material from every sixth roll should be randomly sampled and then tested by an independent testing laboratory experienced with testing synthetic turf materials. The testing laboratory should be completely independent with no ties to the turf manufacturer. Official test results shall be forwarded to the City and Consultant from the testing laboratory. The synthetic turf material shall not be shipped to the site without written authorization from the Consultant after the City and Consultant have approved the test results.

- .1 Approved testing laboratories are as follows:

- .1 Labosport Canada
- .2 Testing Services Inc.
- .3 Sports Labs
- .4 Firefly Sports Testing

- .2 The tests that must be performed on the samples from each roll are as follows:

- .1 Pile Height - ASTM D5823-13
- .2 Turf Bind (without infill) - ASTM D1335
- .3 Grab/Tear Strength - ASTM D5034-09
- .4 Shock Attenuation - ASTM D355-A
- .5 Infiltration Rate through turf materials - ASTM WK22081 (or approved in-lab test)
- .6 Yarn Denier - ASTM D1577

- .7 Yarn Break Strength - ASTM D2256
 - .8 Yarn Melting Point - ASTM D789
 - .9 Pile Yarn Type - FTIR Spectrograph
 - .10 Pile Weight - ASTM D5848
 - .11 Total Weight - ASTM D5848
 - .12 Pill Burn Test - ASTM D2859
 - .13 Fiber Thickness - ASTM D3218
 - .14 Fiber Tensile Strength - ASTM D2256-15
 - .15 Lisport XL test to - 6000 cycles
 - .16 Total lead Content - ASTM F2765-09
- .2 Provide a gradation analysis of the infill only to ASTM D5644-01 (2008)
 - .3 The Contractor is responsible for all testing costs.

1.7 **QUALITY CONTROL**

- .1 The Contractor is responsible for all testing costs.
- .2 Official test results shall be forwarded to the City and Consultant from the testing laboratory.

1.8 **SUBMITTALS**

- .1 Provide with the proposal the complete product specifications, which include:
 - .1 Product cut sheets.
 - .2 Manufacturer's standard specifications for material construction and installation.
 - .3 Manufacturer's maintenance instructions.
 - .4 Warranty.
 - .5 Third party test results demonstrating compliance with the specifications for the products used on this project
 - .6 FIFA Lisport XL test (meeting or exceeding 6,000 cycles). Test to include a pre and post Lisport XL shock attenuation test, and the results must meet the FIFA Quality Pro requirements.
 - .7 Key personnel of the project team, including the project manager and project superintendent. Include the credentials and experience of each person.
- .2 Within fourteen (14) days after contract execution, submit to the Consultant shop drawings, which include:
 - .1 Total infill depth.
 - .2 Seam details and layout.
 - .3 Gluing patterns.
 - .4 Roll layout plans.
 - .5 Attachment details showing edge conditions consistent with design documents.
 - .6 Dimensional shop drawings showing the layout of game lines, numbers, letters, and logos. Indicate application method of each line and marking.

- .3 Within fourteen (14) days after contract execution, submit to the Consultant samples for each type of synthetic grass surfacing.
- .4 Within fourteen (14) days after contract execution, submit to the Consultant the Safety Data Sheets for all products to be used for the installation.
- .5 At the time of completion of the field's granular base, review the granular base in the presence of the Consultant and submit to the Owner a letter of acceptance of the granular base. The Turf Contractor will not be held responsible for any hidden substandard field subgrade and base conditions, or for the repair of the field subgrade and base work installed by others outside of the Contract (unless expressly provided for in the Contract).
- .6 Within fourteen (14) days of the Notice of Substantial Performance being granted, submit to the Consultant for review a set of marked-up drawings noted as, "Project Record Copy," showing all changes made to the work during the installation period.
- .7 Within fourteen (14) days of the Notice of Substantial Performance being granted, submit one electronic copy of a Project Manual. The manual is to include a cover page indicating the project, date of Substantial Performance, and company contact information, as well as a table of contents. Organize contents into applicable categories, including:
 - .1 Maintenance manual (with detailed maintenance methods, maintenance schedules, product repair materials, and methods of repair, referencing any equipment required to carry out maintenance and repairs).
 - .2 Shop drawings.
 - .3 Reduced size marked-up record drawings.
 - .4 The product Safety Data Sheets.
 - .5 The company and product warranty for the turf.

1.9 QUALIFICATIONS

- .1 The synthetic turf manufacturer must be a FIFA certified manufacturer.
- .2 Approved synthetic turf system shall be manufactured, sold and warrantied by a single manufacturer. Manufacture of the synthetic turf system shall include, at a minimum, assembly of the constituent components.
- .3 The synthetic turf manufacturer shall provide written documentation, in the form of a signed affidavit, certifying the source of the fiber used in the manufacturing of the synthetic turf system, including any other fiber colors used for lines and/or markings sewn in during or added after manufacturing of the synthetic turf system.
- .4 The manufacture of the synthetic turf system must have produced a minimum of five (5) successful full sized, outdoor, Slit film/Hybrid, sand & crumb rubber or sand & EPDMIn-filled fields within the past two (2) years.

1.10 TURF SYSTEM HOLD HARMLESS

- .1 The synthetic turf manufacturer and installer shall not infringe upon any current or pending patents held by other synthetic turf manufacturers or installers or infill material suppliers.
- .2 The Turf Contractor shall hold the Owner and the Consultant harmless from infringement of any current or future patent issued for the synthetic turf system, pad system, installation methods and vertical draining characteristics.

1.11 WARRANTIES

- .1 Provide an installation company non-pro-rated warranty covering the synthetic turf installation that shall endure for eight years starting from the date of Substantial Performance of the Work that covers quality of workmanship, delamination of glued seams, separation of sewn seams, and any other installation feature that is deemed to not be caused by ordinary wear on a synthetic turf playing field surface. The Warranty must specifically state that all seams that come apart will be repaired within ten (10) working days of being notified by the Owner. The installation company is responsible for all costs associated with ensuring a successful repair, even under inclement weather conditions. The Owner's testing agency shall be accepted for any materials testing related to the repairs and all costs related to that testing. The warranty must specifically state that the Contractor shall pay for the removal and disposal of any materials that are to be removed to complete the warranty work.
- .2 Provide a synthetic turf manufacturer's non-pro-rated warranty covering the proposed product that shall endure for eight years starting from the date of Substantial Performance of the Work that covers defects in materials, excessive fiber loss, excessive color change, non-uniform color change, UV degradation, excessive loss of porosity, and any other feature that is deemed to not be ordinary product performance for a synthetic turf playing field surface.
- .3 The installation company and the synthetic turf manufacturer must provide that their warranties accept the use of the field for the following activities: soccer, lacrosse, football, rugby, baseball, softball, marching band, physical exercises, physical education activities, pedestrian traffic, ceremonial and entertainment events with portable floor coverings, pneumatic rubber-tired maintenance and service vehicles as normally required for the above uses and to conduct normal maintenance of the synthetic surfaces. The warranties must accept the use of athletic shoes with spikes or other protrusions that are intended for use on synthetic turf fields.
- .4 The product manufacturers and installation company shall promptly replace or repair, to the specifications herein, any areas of the synthetic turf playing field system that are not

performing to the standards of the specifications and warranty at the sole expense of the Contractor and the product manufacturers.

- .5 In addition to the synthetic turf manufacturers' standard warranty the following items shall be included and indicated in the provided warranty.
 - .1 The impact attenuation of the synthetic turf system must maintain an average G-Max of less than 100 over three randomly located test drops following Substantial Completion, with no individual test exceeding 100 at any location, and shall maintain a G-Max value of no more than 110 G's throughout the warranty period as per ASTM F1936-98 and ASTM F355-A testing methods.
 - .2 Synthetic turf must maintain a minimum infiltration rate of 500mm of precipitation per hour without visible surface ponding throughout the warranty period.
 - .3 Synthetic turf surface above the infill material must not decrease by more than 10% per year or exceed 50% during the Warranty period.
 - .4 The warranty shall be third party insured by an A+ rated or better carrier.
 - .5 The warranty shall not restrict the hours of use or exclude high wear areas.

1.12 COORDINATION

- .1 Coordinate schedule and installation of synthetic turf with General Contractor. Provide submittals to the consultant with adequate time for review and approval while conforming to General Contractors schedule.
- .2 The Turf Contractor is to coordinate all traffic with the onsite Civil contractor.
- .3 The Turf Contractor is to ensure the safety of all people on and off the site. Provide flag persons as required.
- .4 The Turf Contractor shall not obstruct any relevant fire lane, access, alley, or road as required by the fire department having jurisdiction.

1.13 DELIVERY AND STORAGE

- .1 The Turf Contractor is to pack, deliver, and store all materials in accordance with the manufacturer's requirements. Products should not be opened prior to arriving at the project site.
- .2 The Turf Contractor is to coordinate with the Civil Contractor, Track Contractor, and the Owner to select an appropriate staging area for the turf materials.

PART 2: PRODUCTS

2.1 GENERAL

- .1 Products shall satisfy the requirements of the standard unless otherwise specified herein or in the drawings.
- .2 The complete synthetic turf installation shall be a vertical-draining permeable synthetic turf

- system. The turf shall consist of a synthetic grass-like surface pile, which shall be tufted into a synthetic backing.
- .3 All backing layers and coating shall be firmly bonded together. Coating materials must be completely cured and bonded to the other backing layers. Synthetic turf panels or rolls that do not meet this requirement will be rejected.
 - .4 The entire synthetic turf installation shall be resistant to moisture, rot, mildew, bacteria, fungus growth and ultraviolet ray degradation at all field locations. It should resist damage from wear and tear during athletic and recreational usage. All components should be non-toxic and not cause commonly known allergic reactions.
 - .5 Deliver and store the products in the original manufacturer's packaging with labels intact and store the products where they will be protected from damage, theft, and vandalism. All materials must be kept dry prior to installation. Infill containers that are damaged must be repaired to protect the infill from getting wet.

2.2 MATERIALS

- .1 The area of synthetic surfacing is approximately 1087.7m².
- .2 The product incorporates slit film fibers and has a pile height of 45mm.
- .3 The product must meet following minimum ASTM test results. No plus or minus ranges are allowed for these test results.
 - .1 ASTM D5823 min. pile height – 45mm
 - .2 ASTM D1335 tuft bind – 9 lb
 - .3 ASTM D5848 Pile face weight – 42oz/yd²
 - .4 ASTM D3218, Tape Thickness – 300 microns
 - .5 ASTM D2256–15, Avg. Yarn Breaking Strength, Elongation – 15 lbs.
- .4 The complete synthetic turf installation (turf, pad, and infill) shall drain vertically at a minimum of 500 mm precipitation per hour without visible surface ponding.
- .5 All rolls of material must exhibit uniform characteristics, including, but not limited to, colour, roll width, pile direction, and pile height. Any roll that does not meet this standard will be rejected for use. Any material that has permanent wrinkles will be rejected for use. Rolls shall be at least 4.57m in width.
- .6 All materials, such as turf, scrim, glue, seaming tape, infill rubber, etc. that are employed in the Work and which become a permanent part of the synthetic turf system, are to be resistant to weather, insects, rot and mildew, fungus, and be non-toxic and resist ultraviolet degradation.
- .7 Manufacturer shall guarantee that synthetic turf is adaptable to painted lines in the event painting is utilized in the future.

- .8 Wherever possible, all lines and event markings are to be inlaid during manufacturing. All other lines are to be glued-in on site during the synthetic turf installation. The shave and glue method will not be allowed for line installation unless the line material has a pile height that is minimally 6mm shorter than the pile height of the turf panels. The pile direction of the lines must match the pile direction of the field wherever possible.
- .9 No fitted or fill pieces are allowed. Over-cuts or over-shaving by more than the stitch row spacing, non-true edge cuts, non-true shaving, and other errors in the cutting or shaving of the line position are to be repaired by cutting out a section of turf 500mm wider than the line and replacing both the line and the surrounding turf in the repair area with new material.
- .10 The colours for the line markings shall be as follows.
- .1 White.
- .11 The colours for the field shall be as follows.
- .1 Green.
.2 Red.
- .12 This project has no logos or lettering as part of the work.
- .13 Fasteners that are to be employed in fastening the edges of the turf must be manufactured as to prevent corrosion while in use over the life of the Warranty period.
- .14 Infill material to be composed of a combination of crumb rubber and sand or EPDM and sand. Contractor to provide pricing for both alternatives.
- .1 Any sand used in the infill must meet the following sieve criteria, as well as having a turbidity of less than 100, be of non-crushed, sub-round to round (roundness = 0.6 to 0.7, sphericity = 0.65 to 0.85) silica sand only and have a hardness (Moh) of 7. Product size must meet the following sieve specifications.

MILLIMETERS	MESH SIZE	% RETAINED
1.180mm	16	0%
0.850mm	20	0 – 20%
0.600mm	30	45 – 65%
0.425mm	40	20 – 30%
0.300mm	50	5 - 15%
0.075mm	200	0 – 3%

- .2 The rubber granules are to be processed, sulfur cured SBR (Styrene Buterdyne

Rubber) rubber granules that are predominantly black in colour. The product must be made from recycled tires. The rubber granules are to be cleaned as to ensure that the granules contain no traces of steel, fabric, rubber dust, stones, sand, and other foreign material. The rubber granules may be ambient or cryogenically chipped and must be graduated to the gradations noted in the table below.

MILLIMETERS	MESH SIZE	% RETAINED
2.000mm	10	0 – 15%
1.700mm	12	0 – 30%
1.180mm	16	40 – 70%
0.850mm	20	15 – 35%
0.600mm	30	0 - 15%
0.425mm	40	0 – 1%
PAN	PAN	0 – 1%

.3 Crumb rubber infill shall:

- .1 Be derived from used whole vulcanized truck tires produced in compliance with North American tire manufacturing specifications.
- .2 Have a specific gravity greater than 1.1 and less than 1.2 as per ASTM D297.
- .3 Have an ash content of between 5% and 15% as determined by ASTM D297.
- .4 Not contain more than 0.01% liberated fiber (no more than 0.2 lbs per ton) tested per ASTM D5603. The liberated fiber remaining in the CRI shall be free flowing and not agglomerated into clumps of fiber as received at the job site.
- .5 Be dry and free flowing.
- .6 Be produced cryogenically or ambiently.
- .7 All infill and sand blended fields to have silica sand (silt free). Contractor to provide sieve sample for all proposed sand and ratio of sand to rubber infill.
- .8 Infill material shall be clean and not include any metal or fibre glass.

.4 EPDM (Ethylene Propylene Diene Monomer) Rubber infill shall:

- .1 Be odourless.

- .2 Be black in colour.
- .3 Have a gravity of 1.45 – 1.70.
- .4 Be free of the 6PPD quinone particle.
- .5 Product size must meet the following sieve specifications:

MILLIMETRES	MESH SIZE	% RETAINED
2.000mm	10	0 – 5%
1.700mm	12	20 - 30%
1.180mm	16	55 - 70%
0.106mm	18	5 – 20%
0.850mm	20	15 - 35%

2.3

- .1 Synthetic turf with tufted fibres and a coated backing must include perforations in the backing for vertical drainage. The minimum infiltration rate is stated above.
- .2 Perforations in turf backing to be a minimum of 5mm diameter clear opening and shall be a maximum of 100mm uniformly on centre.
- .3 If a permeable backing is utilized, perforations are not required. Certified independent test results indicating a minimum drainage rate of 500 mm per hour must be provided for the permeable backing and infill material.
- .4 The synthetic turf backing shall be perforated with a minimum of 95% integrity over the entire surface. Holes must be full diameter, completely through the underside of the turf backing with no material residue or fragmented fibres remaining.
- .5 Non-permeable backing material shall not exceed 300mm in width. If overlapping backing materials are utilized (including inlaid lines and markings) resulting in a non-permeable surface more than 200mm wide, then the backing material shall be manually perforated using a hot iron or drill with a minimum of 5mm diameter clear opening and shall be spaced a maximum of 100 mm uniformly on centre. Perforations shall be drilled from the surface after the adhesive has set, but prior to installation of the infill material.
- .6 The Consultant shall approve the turf perforations prior to shipment, upon shipment on-site, or during on-site perforation operations as applicable.
- .7 Any rolls delivered to the site that lack sufficient perforations or have incomplete perforations shall be remediated or replaced with a roll that meets the requirements. Replacement will be of full rolls only (not partial rolls or sections of turf). Remediation measures include on-site manual perforations using a drill or hot iron capable of producing a 5 mm diameter clear opening at a maximum spacing of 100 mm uniformly on

centre.

PART 3: EXECUTION

3.1 GENERAL

- .1 All phases of synthetic turf installation work shall be in accordance with the standard unless otherwise specified herein or on the drawings. Workers who are skilled and experienced in their trade shall do the work.

3.2 GRANULAR BASE PLANARITY ACCEPTANCE

- .1 The Turf Contractor is to complete a planarity review of the existing granular base in the presence of the Consultant. The planarity review shall verify that the surface of the granular base meets the planarity requirements herein.
- .2 The Turf Contractor shall provide a two-person crew, string line, straight edge and marking paint to complete the planarity review of those items in the presence of the Consultant.
- .3 The planarity requirements for the permeable granular base are to be 4mm or less of deformity under a 4-meter straight edge and 10mm or less of deformity under a 20-meter string line, and neither uniformly high nor low, at all tested locations.
- .4 The costs associated with this review are the responsibility of the Turf Contractor.
- .5 The synthetic turf installation cannot commence until all of the above requirements have been confirmed and the granular base is accepted in writing by Notarized Letter from the Turf Contractor and the consultant as meeting the specifications and as being suitable for the successful installation of the synthetic turf system as per the specifications herein.

3.3 INSPECTION OF MATERIALS

- .1 Prior to installation, and immediately upon delivery of synthetic turf system materials to the project site, the Turf Contractor shall inspect the materials as follows:
 - .1 For damaged or defective items.
 - .2 Measure turf pile height and thickness of each roll.
 - .3 Measure backing perforation diameter and spacing.
 - .4 Reject damaged materials and all materials out of tolerance with this specification.

3.4 PROTECTION

- .1 The Contractor is responsible for the protection of all new and existing facilities from damage and/or disfiguration from the processes of the Work AND from vandalism. Any damage or disfiguration must be repaired promptly and to the original condition of the facility prior to the damage.

- .2 If equipment is to be used in the installation that must remain stationary on the synthetic turf for over 30 minutes, or if equipment is to be used in the installation that generates heat, a sheet of 19mm plywood must be placed under such equipment.
- .3 Acceptance of the repair work is at the sole discretion of the Consultant. All repairs must be completed and accepted prior to Substantial Performance of the Work being granted and before the release of any deficiency holdback amount.

3.5 PREPARATION

- .1 Accurately survey and layout the specified work program according to the specifications and drawings herein.
- .2 The game lines are to be centered across the width of the field.
- .3 Clean off dirt, oils, and other debris that may inhibit the application, adherence, and surface texture of the synthetic turf system and the on-site line and event marking installation.
- .4 The installation procedures for all materials must be in strict accordance with the manufacturer's specifications, meet the requirement of this specification, and provide for a long-term successful installation of all materials.

3.6 SYNTHETIC TURF INSTALLATION

- .1 Care should be taken during installation to account for rapid fluctuations in temperature to avoid expansion and/or contraction which can affect the final installation. Temperature extremes should be carefully monitored. The carpet should never be rolled or unrolled when frozen. Adhesive materials should not be used during the rain or when the ambient air temperature or the material temperature is less than 5 °C. The turf shall be installed in appropriate moisture conditions as stated by the manufacturer.
- .2 Immediately prior to application of synthetic turf, the base shall be thoroughly cleaned of all foreign material, soil, or any other substances that may be detrimental to permeability and the installation of the turf system.
- .3 The fabric surface shall be constructed and installed in 4.57m minimum widths with no longitudinal or transverse seams, except for head or tee seams at field boundaries and inlaid lines within a finished roll assembly. The seams should be spaced at 4.57m.
- .4 Rolls that do not lay evenly and with full dimension width will be rejected.
- .5 The bonding or fastening of all system material components shall provide a permanent, tight, secure, and hazard-free athletic playing surface.
- .6 Turf shall be fastened to the perimeter with 50mm galvanized steel nails at 300mm on center. Contractor to ensure all nails are removed from site if not used as fasteners for

the perimeter board.

.7 Seams:

- .1 All turf seams shall be sewn with high strength polyester fiber cord or nylon.
- .2 Backing layers must lie flat on the field base to provide a uniform pile surface.
- .3 The width between fiber rows at the seam locations shall not exceed 12.5mm.
- .4 All sewn seams shall be brushed to free any trapped fibers and provide full coverage over the thread.
- .5 All cemented seams shall be brushed to remove any adhesive material from the fibers.

3.7 **INFILL INSTALLATION**

- .1 The infill material shall be applied in a dry condition and when the synthetic turf is dry.
- .2 The sand and rubber infill system shall be installed with a minimum of 6 applications.
- .3 The infill installation shall not result in fiber material trapped below the surface of the infill material. If fiber is trapped below the surface, a portion or all the infill material must be removed and reinstalled.
- .4 The infill material shall be installed at a uniform depth across the entire field area. Infill depths shall not vary more than 5mm across each field area.

3.8 **OWNER'S TEST**

- .1 The Owner may have samples of the turf submitted and tested for verification of conformance to specifications in addition to the required testing to be completed by the Turf Contractor. The Synthetic Turf acceptance is subject to the result of these tests.
- .2 Any material tested and found not conforming to the specifications will be rejected and replaced with material conforming to the specification at the Turf Contractor's expense. Re-submittal shall be required.

3.9 **CLEANING**

- .1 Remove all excess materials of all types, equipment, debris, etc., from the site immediately after completion of the work. Remove all stains and other blemishes from all finished surfaces. Leave work in clean, new appearing condition, ready for use by the Owner.
- .2 The Turf Contractor shall inspect the entire field area with a hand-held metal detector to identify any construction materials or tools left on the field. All such materials shall be removed prior to Owner occupancy of the field.
- .3 Upon completion of the Work the Contractor is to ensure the project site is free of loose material around the site. Loose material is to include infill materials, turf fibers, or any other materials related to the work. The Contractor is to ensure all equipment is removed

from the site upon completion of the work.

END OF SECTION 32 18 23.29

PART 1: GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Refer to Division 1, General Requirements.
- .2 This section of the specification forms an integral part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts.

1.2 DESCRIPTION

- .1 Supply all products, labor, equipment, and services necessary to install synthetic turf sports field shock pad as indicated in the contract documents.
- .2 The supply and installation of all new material of drainage & shock pad layer over a granular surface as per the drawings and specifications.
- .3 Attend the site to review and accept in writing, in the presence of the Consultant, the synthetic turf surfacing granular base and nailing strip.
- .4 Accurate surveying and layout of the specified work program, as per the specifications and drawings herein. Verify field dimensions on site prior to shipping materials.
- .5 The modifying of the shock and drainage pad as necessary to conform to the field dimensions and required footings.
- .6 The provision of all Samples and Submittals as described herein.
- .7 The supply to the Owner, for post-installation maintenance use all remaining remnants of shock & drainage pad as selected by the Owner. Remnants that are rejected by the Consultant or the Owner are to be disposed of as waste material as directed by this specification.
- .8 Complete site clean-up is required daily and upon Work completion.
- .9 The Contractor is to sign the "Form of Warranty of Synthetic Turf System" and include it as part of their RFP/tender submission. Refer to the "Form of Warranty of Synthetic Turf System" for the detailed requirements of the synthetic turf system warranty.

1.3 RELATED WORK

- .1 Synthetic Turf Sports Field Surface Section 32 18 23.29

1.4 REFERENCE STANDARDS

- .1 American Standard Testing Materials (ASTM)
- .2 Synthetic Turf Council - Suggested Guidelines for the Essential Elements of Synthetic Turf

Systems

- .3 European Standards/European Norms (EN)
- .4 International Organization for Standardization (ISO) Standards
- .5 FIFA - Quality Programme for Football Turf - Test Manual I & II (2024 Editions)

1.5 **INSPECTION**

- .1 The Contractor shall notify the Owner's Representative at least 72 hours before any requested inspection.

1.6 **SUBMITTALS**

- .1 Provide with the Proposal the complete product specifications, which include:
 - .1 Product cut sheets.
 - .2 Manufacturers standard specification for material construction and installation.
 - .3 Manufacturers maintenance instructions.
 - .4 Warranty.
- .2 Within fourteen (14) days after contract execution, submit to the Consultant 300 x 300 mm sample of the product.
- .3 Within fourteen (14) days after contract execution, submit to the Consultant the Safety Data Sheets for all products to be used for the installation.
- .4 Within fourteen (14) days after contract execution, submit to the Consultant shop drawings for the proposed product showing a typical layout pattern.
- .5 Send a sample to the Consultant of the product the same size as the turf sample being sent for the required tests.
- .6 All test results as required in Specification Section 32 18 23.29, Synthetic Turf Sports Field Surface.

PART 2: PRODUCTS

2.1 **GENERAL**

- .1 Products shall satisfy the requirements of the contract documents unless otherwise specified herein or on the drawings.

2.2 **MATERIALS**

- .1 Provide porous, resilient, drainage and shock pad designed specifically for use with synthetic turf. The material must have both impact absorption and drainage properties that meet the following performance requirements:

- .1 Shock Absorption – in combination with the infilled synthetic turf to be used on the project provide an average G-Max of less than 100 over three randomly located test drops following Substantial Completion, with no individual test exceeding 100 at any location, and shall maintain a G-Max value of no more than 130 G's throughout the warranty period as per ASTM F1936-98 and ASTM F355-A testing methods.
 - .2 Shock pad must maintain a minimum infiltration rate of 500mm of precipitation per hour without visible surface ponding throughout the warranty period.
 - .3 All materials that are employed in the installation and which become a permanent part of the drainage mat system are to be resistant to weather, insects, rot and mildew, fungus, and be non-toxic and resist ultraviolet degradation.
 - .4 All materials that are employed in the installation and which become a permanent part of the drainage mat system must exhibit uniform characteristics, including, but not limited to, color, panel width, and thickness. Any panel that does not meet this standard will be rejected for use.
 - .5 The product must have expansion and contraction characteristics that will keep the product laying flat under the synthetic turf in temperatures ranging from minus 20 degree Celsius to plus 40 degrees Celsius.
- .2 Product shall be installed using interlocking panels.
 - .3 Thickness: 20mm. The product must exhibit complete uniformity of thickness (within plus or minus 1mm) for all product supplied and installed.
 - .4 Density: The product must exhibit complete uniformity of density in all areas for all product supplied and installed.
 - .5 Expansion/Contraction Properties: The product must have expansion and contraction characteristics that will keep the product lying flat under the synthetic turf in temperatures ranging for minus 20 degrees Celsius to +40 degrees Celsius Acceptable.
 - .6 Manufacturers/Suppliers are as follows. No alternates are allowed unless approved by Owner and Owner's representative. The Contractor is responsible for ensuring that the drainage and shock pad supplier provides the correct product type that meets all specifications herein.
 - .1 Brock Powerbase Pro.
 - .2 Schmitz Foam ProPlay 20D.

PART 3: EXECUTION

3.1 GENERAL

- .1 All phases of shock pad installation work shall be in accordance with the manufacturer's recommendation and contract documents, unless otherwise specified herein or on the drawings. Workers who are skilled and experienced in their trade shall do the work.

3.2 GRANULAR BASE PLANARITY ACCEPTANCE

- .1 As per Specification Section 32 18 23.29, Synthetic Turf Sports Field Surface and Section 32 18 23.33, Synthetic Turf Sportsfield aggregates, ensure the field's granular base complies with the requirements before installation begins. All costs for this review are the responsibility of the Turf Contractor.

3.3 INSPECTION OF MATERIALS

- .1 Prior to installation, and immediately upon delivery of shock pad to the project site, the Contractor shall inspect the materials as follows:
 - .1 For damaged or defective items.
 - .2 Measure the thickness of materials from each pallet.
 - .3 Reject damaged materials and all materials out of tolerance with this specification.
- .2 After shock pad installation, the consultant shall review prior to carpet installation.

3.4 PROTECTION

- .1 The Contractor is responsible for the protection of all new and existing facilities from damage and/or disfiguration from the processes of the Work AND from vandalism. Any damage or disfiguration must be repaired promptly and to the original condition of the facility prior to the damage.
- .2 If equipment is to be used in the installation that must remain stationary on the pad for over 30 minutes, or if equipment is to be used in the installation that generates heat, a sheet of 19mm plywood must be placed under such equipment.

3.5 PREPARATION

- .1 Ensure that all application surfaces are clean and free of debris.
- .2 Accurately survey and layout the specified work program according to the specifications and drawings herein.
- .3 The installation procedures for all materials must be in strict accordance with the manufacturer's specifications, meet the requirement of this specification, and provide for a long-term successful installation of all materials.

3.6 ENVIRONMENTAL CONDITIONS

- .1 Work is to commence and continue only if the environmental and site conditions are in accordance with the manufacturer's recommendations for product placement.

3.7 PLACEMENT

- .1 Place individual sheets directly onto granular field surface and interlock adjacent panels. Complete installation of the material under the direction of the installation superintendent and, where not specified herein, according to the manufacturer's installation instructions. Allow enough material to overlap the edges of the field such that if any shrinkage occurs the product remains overlapping the edges of the field. Trim excess pad material after laying out turf panels.
- .2 Do not exceed the manufacturer's recommendations for the acceptable loads for on-pad vehicle operation prior to installation.
- .3 The product shall be placed as to ensure a smooth surface that meets the tolerances of a maximum deviation from a level plane of 4mm under a 4000mm straight edge and 13mm under a 20,000mm string line.
- .4 There are to be no gaps between panels that exceed 6mm. Adjacent panels must have their top surfaces level with each other, with no adjacent panels being more than 1mm higher or lower than an adjacent surface of the same material.
- .5 Cut and otherwise modify the material to conform to the edge of the synthetic turf nailing strip/field perimeter edges and the goal post footing covers. Ensure that cuts and modifications form a straight and true edge or radius.

END OF SECTION 32 18 23.31

APPENDIX E – FORM OF WARRANTY OF SYNTHETIC TURF

Warranty jointly provided by:

Synthetic Turf Contractor:	Turf Manufacturer (if not Contractor):
Name:	Name:
Address:	Address:
Contact:	Contact:
Tel:	Tel:
Fax:	Fax:
Email:	Email:

Warranty provided to:

Owner:	Location of Installation:
Name:	Facility:
Address:	Address:
Contact:	
Tel:	
Fax:	
Email:	

PART 1: GENERAL

1.1 The Warranty shall cover, in general, the usability of the turf surface, accessories, use characteristics, and suitability of the installation. The field is to perform as a high capacity, multi-use sports field accommodating in the order of 3,000 hours of physical education and organized sport related use per year. All items covered by the Warranty are to be replaced or repaired with new materials, including installation at the sole expense of the warranting Contractor for the period of eight (8) years following substantial performance. The designated uses are enumerated as follows:

- .1 Soccer
- .2 Football
- .3 Lacrosse
- .4 Ultimate (Frisbee)
- .5 Field Hockey

- .6 Rugby
 - .7 Baseball
 - .8 Softball
 - .9 Marching band
 - .10 Physical exercises
 - .11 Physical education activities
 - .12 Field cover for special events
 - .13 Pedestrian traffic and similar uses
 - .14 Pneumatic rubber-tired maintenance and service vehicles
 - .15 Other miscellaneous community, sport and recreation activities
- 1.2 Any products replaced or repaired under warranty shall have the warranty period renewed, starting from the date that the warranty works have been tested and are accepted by the Owner.
- 1.3 The Warranty shall cover other additional physical education, sport, and training related activities, including new sports that are developed, except where the Contractor, acting reasonably, has provided written notice to the Owner prohibiting any such activity.
- 1.4 The Warranty shall be signed by a principal of the applicable firm(s), duly authorized to make contracts.
- 1.5 The term "Contractor" contained in the Warranty means the firm furnishing the Warranty. "Owner" is the government body, individual, corporation or other entity indicated on the first page of this document.
- 1.6 If the firm manufacturing and supplying the synthetic turf system is not the same entity as the Contractor, the Warranty shall be co-signed by the turf manufacturer/supplier. Should the Warranty be co-signed by the turf manufacturer/supplier, both the Contractor and the turf manufacturer/supplier will be jointly and equally liable for all commitments made under the Warranty.
- 1.7 All claims by the Owner under this Warranty must be made in writing to Contractor's address within 60 days after the Owner learns of the defect giving rise to the claim. This Warranty shall constitute a Contract made in the Province of British Columbia and shall be governed by the laws

thereof.

PART 2: FORM OF WARRANTY

- 2.1 Contractor hereby warrants to the Owner, subject to the limitations and conditions set forth below, that its synthetic turf system consisting of synthetic turf described as _____, and the adhesives and underlying shock pad (if applicable) described as _____ used in the installation, are free from defects in material and workmanship and shall, remain serviceable over the length of the warranty.
- 2.2 Contractor warrants to the Owner that its synthetic turf materials shall not fade, fail, shrink, wrinkle, or reflect excessive wear. Contractor shall, at the Contractor's sole expense and cost, repair or replace such areas of the synthetic turf system not performing to these standards for the life of the Warranty.
- 2.3 Definitions
- .1 The term "not fade" in the context of this Warranty shall mean that the synthetic turf material(s) shall remain a uniform shade of green, or other colors installed, with no significant loss of color.
- .2 The term "not fail" or "excessive wear" as used in the context of this Warranty shall mean that the length and weight of the face yarn or pile material in the synthetic turf surface(s) above the infill materials shall not have been decreased by more than 10% per year according to ASTM D418, D1335, and D5848, nor exceed 50% during the Warranty period. If the synthetic turf system does not retain fiber volume, pile height, pile weight, and shock absorbency, the Contractor shall, at the Contractor's sole expense, replace such portion of the system.
- .3 The term "serviceable" in the context of this Warranty shall mean that the synthetic turf system shall have a maximum "G" value according to ASTM F1936-98 and Procedure A, ASTM F355, not to exceed 100G's at any location upon installation and shall not exceed 130G's throughout life of the Warranty period.
- 2.4 Where applicable, the fabric seams shall remain attached to the underlying surface over the Warranty period and shall not separate or become unglued or unattached, as applicable.
- 2.5 Contractor warrants to the Owner that the permeable synthetic system shall drain vertically a minimum of 500 mm of precipitation per hour without visible surface ponding or saturation of the

- infill material.
- 2.6 Contractor warrants to the Owner that the synthetic turf system (synthetic turf fiber, backing, infill, shock pad (if applicable), adhesives and all other components) will meet all Canadian environmental regulations (for public sports field/playground use) with respect to contaminants such as lead and other hazardous materials upon installation and throughout the life of the Warranty.
- 2.7 Contractor shall replace with new materials, at their sole expense, any damage to the synthetic turf system(s) that extends more than 1 meter beyond the location of foreign combustibles, which may ignite and fire-damage the synthetic turf system.
- 2.8 The Contractor shall not be held liable for any incidental or consequential damages. These warranties and the Contractor's obligations here-under are expressly conditioned upon:
- .1 The Owner maintaining and properly caring for the synthetic turf system in accordance with the Contractor's maintenance manual and instructions;
 - .2 The Owner complying with the dynamic and static load specifications established by the Contractor.
- 2.9 The Warranty is not to cover any defect, failure, damage, or undue wear in or to, the synthetic turf system caused by, or connected with, abuse, neglect, deliberate acts, act of God, casualty, static or dynamic loads exceeding Contractor's recommendations, footwear having metal spikes, or similar projections other than conventional sport shoes, or use of improper cleaning methods.
- 2.10 The Contractor shall be allowed to examine the synthetic turf system regarding any claim that the Owner makes, to be present at any time, to analyze the results of all tests conducted by the Owner or others, and to conduct such tests of their own. Except where expressly provided for in the Warranty, the Contract or other binding agreement between the Contractor and the Owner, the Contractor shall not be responsible for any costs or expenses incurred by the Owner or others with respect to such tests, except the Contractor shall pay for costs of all tests and analysis conducted or directed by their representative.
- 2.11 In the event the Contractor does not respond to the Owner's written notice within 10 days of receipt of notice or does not submit, schedule and execute corrective work within 30 days of receipt of notice, the Owner has the option of having the Work performed at the expense of the Contractor. The work will not unreasonably affect the original warranty of the overall synthetic

surface due to the Owner undertaking the work.

- 2.12 The Warranty included herein is the form to be used by the Contractor. Manufacturer's standard form of Warranty will not be acceptable. Any amendments, exclusions or additional conditions proposed to the form of Warranty by the Contractor must be submitted in writing for the Owner's consideration and approved by the Owner in writing within seven (7) days of being notified of the Owner's intent to award the Contract.

PART 3: WARRANTY TESTING

- 3.1 The Contractor must accept the use of the Owner's selected experienced independent licensed testing agencies, as noted in the performance specification for all testing noted herein. The Turf Contractor is to instruct the testing agency to deliver the testing results directly to the Owner.
- 3.2 The turf is to be tested prior to substantial completion, at the Contractor's expense, for dynamic cushioning ("G" Test), and infiltration.
- 3.3 The Owner may choose to complete additional dynamic cushioning tests at the Owner's expense.
- 3.4 If test results from the Warranty tests or any additional tests completed by the Owner indicate that the conditions of the Warranty are not met, the Contractor has the option of corrective work or replacement. In the event corrective work does not meet the requirements of the Warranty after a second attempt to bring the system within these limits, then the Contractor is to replace non-conforming areas or sections, solely at the Owner's discretion and direction.
- 3.5 Dynamic cushioning tests shall be performed prior to substantial completion in accordance with ASTM F-1936-98 and F355. Test locations as designated in F-1936-98, Paragraph 8.1. Included in the report shall be the measured depth of the infill material at all test locations.
- 3.6 Infiltration tests shall be performed prior to substantial completion to ASTM F2898.
- 3.7 All costs for testing shall be paid by the Contractor unless specifically noted otherwise.
- 3.8 After the completion of corrective work arising out of failed testing, the Contractor shall re-test the field in the area of the corrective work within 10 days of the corrective work being completed. The re-testing shall be completed to the same standards as the Warranty testing requirements. All costs for re-testing shall be paid for by the Contractor.
- 3.9 If the Contractor does not have the tests performed within 10 days of specified time(s) listed, the

Owner has the option of ordering the testing work at the expense of the Contractor.

AS EVIDENCED WHEREOF, the Contractor has executed this Warranty:

For the Contractor:

Signature of Contractor (Signing Officer)

Date

Name and Title (please print)

For the Turf Manufacturer/Supplier:

Signature of Contractor (Signing Officer)

Date

Name and Title (please print)

For the Owner:

Substantial Completion Date (Effective Date)