

APPENDIX A - Swimming Pool PVC Membrane System & Related Works

E2. SPECIFICATIONS - PVC MEMBRANE SWIMMING POOL LINING SYSTEM

E2.1 GENERAL

- .1 The following Tender/Contract is for the replacement of a manufactured, 60 mil. thick, 65" wide, 2-ply reinforced textured PVC pool membrane. The specified product includes, but not limited to the following, a sealed encapsulated machine edge, a wick-proof polyester scrim reinforcement and special additives designed to provide maximum UV and chlorine fade resistance. This specification is to establish a level of material quality and to define the installation technique, and experience levels required to perform the necessary Work.
- .2 The individual components and installation criteria described herein consists of a complete polyester scrim reinforced PVC membrane liner to be installed in accordance with the pool liner manufacturer's specifications and drawings. Material rolls of reinforced PVC membrane shall be custom fit and fuse welded together using hot-air hand welders and machine welders. The pool lining system shall provide a waterproof lining on the existing pool tank walls and floor over the poly felt substrate, complete with all necessary hardware, fittings, attachments, flanges, gaskets and all appropriate inside pool lanes/markings, as required to meet the current 2025 City of Winnipeg Accessibility

Design Standards (WADS), Manitoba Health Swimming Pools and Other Water Recreational Facilities Regulation (MR 132/97), and the local authority having jurisdiction.

E2.2 SUBMITTALS

- .1 Shop Drawings: Show fabrication and connection details to existing pool substrate.
- .2 Provide standard catalogue product sheets and installation instructions for each item.
- .3 Provide 2' x 2' mock samples of 60 mil. PVC membrane and 11 oz. felt, PVC coated stainless steel, countersunk flange fasteners, marking samples and 1' x 1' mock sample of the adhesive attaching the PVC to the felt under layer.
- .4 Provide contract close-out submittals:
 - (i) Operation and Maintenance Manuals;
 - (ii) Provide copies of the pool membrane manufacturer's and supplier's written warranties and/or guarantees for material and labor; and
 - (iii) Provide written certification for final completion approvals in electronic PDF format.

E2.3 QUALITY ASSURANCE

- .1 Pool material supplier and pool membrane manufacturer shall have been engaged in the manufacture of PVC membranes for use in outdoor swimming pools for a minimum of ten (10) years. Manufacturer shall employ only 100% virgin vinyl throughout the manufacturing process. All PVC membrane components shall be from the same manufacturer. Products manufactured using recycled materials will not be allowed.
- .2 Contractor to provide evidence of pool projects of similar nature, size, quality and site conditions utilizing reinforced PVC membrane materials as specified.
- .3 Installer shall be certified in installing PVC membrane materials and shall have minimum of three (3) years experience welding PVC membranes for pool applications.

E2.4 DELIVERY, STORAGE AND HANDLING

- .1 All materials for this project shall be delivered to the project site at St. Vital Outdoor Pool located at 5 Des Meurons Street, Winnipeg.
- .2 The Contractor and Contract Administrator shall be at the site to receive, inspect and approve or disapprove the delivery of the pool materials.
- .3 Materials shall be delivered in unopened packaging, and no hooks or forklifts shall be permitted for unloading.
- .3 Materials shall be stored in a designated area on the job site that is flat and dry.

E2.5 PROJECT SITE CONDITIONS

- .1 The pool tank restoration Works and the preparation of the existing concrete pool tank substrate surfaces (to be completed by Others) will be in the good condition and must meet the requirements, standards and approval of the pool membrane manufacturer's (RenoSys Incorporated) specifications, prior to installation of the new pool membrane.

E2.6 WARRANTY

- .1 The 60 mil PVC RenoSys pool membrane shall be warranted by the Contractor for workmanship, materials, delamination, pitting, cracking, sealing, tearing, or become structurally unsuitable for its intended purpose for a period of ten (10) years.

- .2 The Contractor shall warrant against delaminating at all heat seams and racing lanes for a period of ten (10) years. In the event the material should become unusable during this period, the manufacturer and contractor agree to repair and/or replace the defective sections.
- .3 All other products such as fasteners, caulking, fittings, etc. shall carry a one (1) year warranty.

E2.7 PRODUCTS

- .1 **Acceptable Product:** RenoSys Incorporated Endura Series PVC Pool Membrane: polyester reinforced PVC membrane system. Reinforcing shall be non-wicking polyester scrim fabric 1000 Denier yarn 9 x 9 per inch count, or “an approved equal” in accordance with Bidding Procedures Clause B7. Substitutes.
- .2 Material Specifications shall be provided that meet or exceed the following Physical Properties/Characteristics of the specified acceptable product:

Properties	Units	Requirements	Test Method
Aspect		No visible defects. Color conforms to the reference	EN 1850-2
Individual val. Thickness	mm	1.5 ± 8%	EN 1849-2 c), d)
Flatness	mm	0	EN-1848-2
Tensile strength	N/5cm	≥ 1100	EN 12311-2 Method A
Tear strength	N MD TD	≥ 250	EN 12310-2 Trapezoid
Elongation	%	Between 15 and 30	EN 12311-2 Method A
Resistance to Delamination	N/50mm	≥ 80	EN 12316-2
Dimensional stability	%	≤ 0.5	EN-1107-2
Hot air Welding strength	N/50mm	≥ 100	EN 12316-2
Resistance against slip		RANK C	ASTM D-752
Supper chlorination Resistance	Change of color, Gray scale ≥3	4	NF T 54-803-2 Appendix C 20ppm
Resistance to micro-organism Soil burial		Δm/m≤5% (std.) Δm/m≤1% (Supper.)	ISO 846:1997 Method D
Resistance to Bacteria		No stains	ISO 846:1997 Method C

Testing Agency: ASTM – American Society for Testing and Materials
Test Method Definitions: MD – Machine Direction; TD – Transverse Direction

.3 SYSTEM COMPONENTS

- a) Pool lining membrane shall be flexible roll goods 65" wide x 25 meters long x 60 mil thick, 100% virgin 3-ply PVC material, fully UV and chlorine stabilized, reinforced with a wick proof scrim. Reinforcing scrim shall consist of a tightly woven polyester 9 x 9 thread spacing per inch, 1,000 Denier thread for tear and puncture resistance. The scrim shall be offset approximately $\frac{3}{4}$ " from the edge and shall be fully machine edge encapsulated. The material shall be applied with slip-resistant textured side "out", as required. The floor area, the gutter perimeter, ramps and step areas to be provided with a slip-resistance surfaces. All welds shall be accomplished using hot-air welding. A continuous air entrapment weld shall be applied on all welds, and then a minimum $\frac{3}{4}$ " wide final weld shall be installed.
- b) Racing lanes, targets and marking strips shall be provided by the Contractor and colored black on the textured side and light blue on the reverse side to prevent bleeding along the weld zone. All markings shall be in conformance with 2015 WADS and Manitoba Health Swimming Pools and Other Water Recreational Facilities Regulation (MR 132/97).
- c) An anti-microbial product as recommended by the RenoSys Manufacturer, that is fully compatible with the PVC membrane shall be sprayed-on or rolled-on under the felt material.
- d) Adhesives as recommended by the RenoSys Manufacturer, and suitable for bonding to the PVC material and the felt layer shall be provided and that are designed to chemically bond to the PVC materials and to fully attach the geotextile fabric to the pool walls and floor.
- e) An underlayment of 115 mil (10.5 oz.) felt/fleece shall be installed, fully adhered with the specified adhesive throughout the entire pool.
- f) PVC coated stainless steel or aluminum metal shall be installed, as required, to make for a satisfactory installation. Galvanized PVC coated steel will not be acceptable for use on this project.
- g) Trim away polyester felt material and compress liner around perimeter as specified in RenoSys Manufacturer's installation instructions.
- h) Flanges at all penetrations shall be constructed of Type I exterior grade hard PVC sheet and custom fabricated to fit close to existing pool fittings. All bolts used to fasten any compression bar shall be countersunk to allow for a flush installation. All metal fasteners employed shall be of 18-8 stainless steel.
- i) Stainless steel 25-gauge plate or 4" to 6" wide plastic shall be fastened on one side to the substrate over all active expansion joints and working cracks. Galvanized steel will not be acceptable.
- j) Caulking shall be installed where required by installation details or instructions and shall be underwater grade caulk or an approved equal in accordance with Clause B7. Caulking shall only be used at pool penetrations and terminations and shall not be used for joining seams.
- k) Contractor shall provide O&M manuals, PVC underwater patch kit, and additional or extra 60 mil PVC membrane and felt material for maintenance purposes (1 complete roll).

E2.8 EXECUTION AND INSTALLATION

- .1 The existing outdoor pool tank concrete substrate surfaces and fittings (walls, coping, floor, ramp, stairs, etc.) shall be prepared to accept and accommodate the RenoSys

Endura Series PVC 60 mil. pool membrane and associated products, in accordance with RenoSys Manufacturer's written specifications and installation instructions.

- .2 The Contractor and Contract Administrator shall inspect all the pool surfaces at the completion of the necessary preparation work prior to issuing approval for commencement of application/installation of new pool membrane.