

BULLETIN

News from SubTerra, Inc.®

Underground Sports Court Water Proofing Evaluation Lake Oswego, Oregon

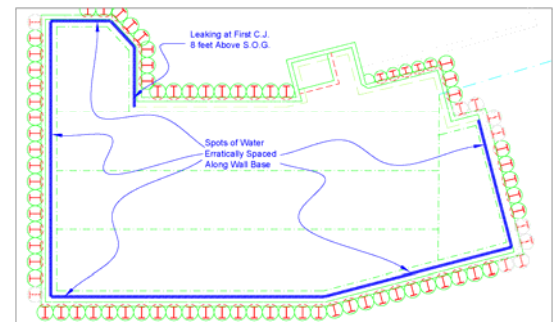
SubTerra, Inc was retained by Bullivant, Houser, Bailey to evaluate the construction and repair history of an underground basketball court constructed in Lake Oswego, Oregon. The original focus of this work was to determine how, and to what extent, the project waterproofing had been compromised and what could be done to remediate the existing conditions. A critical part of the work also involved working with the Project Team to develop a course of action that would correct existing deficiencies and provide the Owner with the product they originally contracted for

SubTerra's scope of work included:

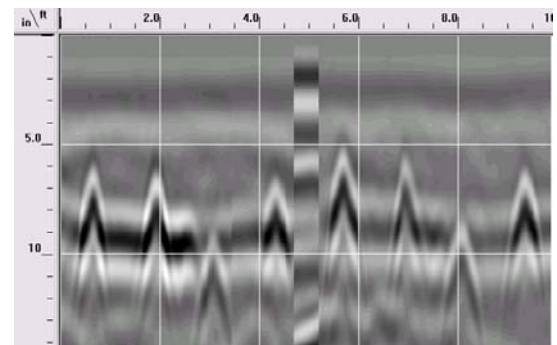
1. Collect and analyze project records describing the original construction and subsequent remedial work.
2. Develop recommendations for structural repairs if required.
3. In conjunction with a waterproofing specialist, determine whether existing and proposed remedial actions would provide sufficient waterproofing to meet the project goals.

Structurally, the design relied on tangent piles supported by cross-beams during construction then braced by ceiling beams and the floor structure. The design required that the outer piled support be separated from an inner shotcrete wall by a two component waterproofing system consisting of a drainage layer and a bentonite mat. The inner shotcrete wall was not designed to be waterproof or subject to external hydrostatic loading, due to the presence of the drainage layer. Nelson Studs

welded to the "I" beams in the pile wall supported the inner shotcrete wall from the piled wall.



A detailed review of the project history was followed by several site visits to: (1) conduct a radar survey and profile of the walls, (2) observe and document the results of an extensive wall coring program, (3) meet with the Project Team, and (4) orient one of two specialist, chemical grouting companies that could become involved with waterproofing the West and North Walls



Characterization of the as built wall and floor conditions buttressed opinions regarding the probable cause(s) of waterproofing failure and methods required for repair.