



**TESTING SERVICE CORPORATION**

Local Office  
Carol Stream, Illinois

*Local Office:*

457 E. Gundersen Drive, Carol Stream, IL 60188-2492  
630.653.3920 • Fax 630.653.2726

June 2, 2011

*Corporate Office:*

360 S. Main Place, Carol Stream, IL 60188-2404  
630.462.2600 • Fax 630.653.2988

Mr. Travis Parry  
Christopher B. Burke Engineering, Ltd.  
9575 W. Higgins Road, Suite 600  
Rosemont, Illinois 60014

Re: L-76,501  
Gymnasium Floor  
Orland Park Sportsplex  
11351 W. 159<sup>th</sup> Street  
Orland Park, Illinois

Dear Mr. Parry:

This report presents results of testing performed in connection with the gymnasium floor at the Orland Park Sportsplex. These geotechnical services are being provided in accordance with TSC Proposal No. 46,326 dated January 11, 2011 and the attached General Conditions, incorporated herein by reference. It is understood that the hardwood floor in the gymnasium is exhibiting signs of distress, i.e. warping and splintering of the floor boards.

The Sportsplex is located at 11351 W. 159<sup>th</sup> Street in the Village of Orland Park. The gymnasium is located in the southeast wing of the building, consisting of a 1-story slab-on-grade structure. It contains three (3) basketball courts, with the hardwood floor for them installed in 2002 and placed on the P.C. concrete slab.

Three (3) approximate 2' x 3' cuts were made in the floor, to expose the underlying concrete slab for testing. They were located in the center court of the gymnasium, at the north, center and south sides of the floor. The test locations are summarized in the following table:

Floor Cut	Center Court Location
1	85' West and 12' South of Northeast Building Corner (North Key)
2	112' West and 48' South of Northeast Building Corner (West Sideline at Half Court)
3	85' West and 91' South of Northeast Building Corner (South Key)

Moisture vapor emission rates were initially measured at each of the floor cuts. Upon completion, cores were also taken of the concrete slab along with subgrade samples. Results of these tests and related comments are summarized below.

#### Moisture Vapor Emission Rates

Moisture vapor emission rates (MVER) were measured using anhydrous calcium chloride in accordance with ASTM F1869. As part of it, moisture vapor emission kits were placed on the gymnasium's concrete slab, i.e. calcium chloride crystals exposed to evaporating moisture. Test results are expressed in pounds of water radiating from 1000 square feet of floor slab per 24-hour period. The following is a summary of test results; the room temperature over the test period was at approximately 71° F.

Floor Cut	pH	Weight of Water Vapor per 1000 sf per 24 Hours (pounds)
1	9	3.13
2	9	2.97
3	12	3.79

Acceptable MVER levels are usually based on manufacturers specifications for the type of wood and sealers used. Values of 3.0 pounds or less are in our experience often specified for wood flooring. This value was met or nearly met at Cuts 1 and 2, with the MVER at Cut 3 being slightly higher. That said, the measured values are considered to be relatively low for slab-on-grade construction in this area (with typical clay subgrade as discussed below).

#### Concrete Cores

Concrete cores were also taken at each of the test locations. They were obtained using an electric drill with 4-inch diameter core barrel. Auger samples were also taken of the underlying granular base course, as well as a split-spoon sample of subgrade soils to a depth of approximately 3.0 feet below the top of slab.

Results of the concrete cores are summarized in the following table. They include the thickness of the P.C. concrete slab and underlying granular base course materials, with the presence of a visqueen vapor barrier at the base of the concrete core also confirmed. A Soil Test Data sheet is also attached giving soil descriptions and laboratory test data for the subgrade samples.

Floor Cut	P.C. Concrete Thickness (in.)	Visqueen Vapor Barrier	Sand and Gravel Base Course Thickness (in.)
1	3.2	Y	5
2	4.4	Y	5
3	3.3	Y	6

The concrete cores ranged in thickness from 3¼ to 4½ inches. A visqueen vapor barrier was present at the base of the concrete slab in all cases. The underlying sand and gravel base course was 5 to 6 inches thick at the core locations.

A relatively high compressive strength of 7510 psi was determined for Core 2, the thickest of the P.C. concrete slab sections. The maximum particle size of the concrete aggregate was approximately 1" although typically ¾" or less. The aggregate appeared to consist of crushed limestone (common in the area), with no pea gravel or river stone noted. Welded wire fabric was noted in Cores 2 and 3 at 3½" and 2½" below the top, respectively (about 1" off the bottom in both cases).

The upper subgrade at the core locations consisted of silty clay materials, possibly fill or disturbed native subgrade. Test samples had moderate moisture contents and dry unit weights on the order of 19 percent and 112 pounds per cubic foot (pcf), respectively. Pocket penetrometer readings were in all cases 4.5+ tons per square foot (tsf), providing a stable subgrade for slab-on-grade construction. While the silty clay materials were considered to be in a moist condition, no free water was encountered in the core holes.

In summary, the concrete slab was relatively thin at the core locations, i.e. approximately 3¼" to 4½ inches thick. However, it had a relatively high compressive strength and did not contain pea gravel or river stone as aggregate. Underlying base course and subgrade materials were fairly typical of local construction, with the silty clay subgrade being in a hard condition. A visqueen vapor barrier was found underlying the concrete slab in all cases, with no free water noted. Measured MVER values (i.e. moisture vapor emission rates) are considered to be relatively low.

Based on the results of the testing, there is no evidence of high levels of moisture in or below the concrete slab in the Sportsplex gymnasium. Please call if there are any questions or if we can be of further service.

Respectively submitted,

TESTING SERVICE CORPORATION



Michael V. Machalinski  
Vice President  
Registered Professional Engineer  
Illinois No. 062-038559

MVM:cn  
Enc.



## TESTING SERVICE CORPORATION

# GENERAL CONDITIONS

## Geotechnical and Construction Services

**1. PARTIES AND SCOPE OF WORK:** If Client is ordering the services on behalf of another, Client represents and warrants that Client is the duly authorized agent of said party for the purpose of ordering and directing said services, and in such case the term "Client" shall also include the principal for whom the services are being performed. Prices quoted and charged by TSC for its services are predicated on the conditions and the allocations of risks and obligations expressed in these General Conditions. Unless otherwise stated in writing, Client assumes sole responsibility for determining whether the quantity and the nature of the services ordered by Client are adequate and sufficient for Client's intended purpose. Unless otherwise expressly assumed in writing, TSC's services are provided exclusively for client. TSC shall have no duty or obligation other than those duties and obligations expressly set forth in this Agreement. TSC shall have no duty to any third party. Client shall communicate these General Conditions to each and every party to whom the Client transmits any report prepared by TSC. Ordering services from TSC shall constitute acceptance of TSC's proposal and these General Conditions.

**2. SCHEDULING OF SERVICES:** The services set forth in this Agreement will be accomplished in a timely and workmanlike manner. If TSC is required to delay any part of its services to accommodate the requests or requirements of Client, regulatory agencies, or third parties, or due to any cause beyond its reasonable control, Client agrees to pay such additional charges, if any, as may be applicable.

**3. ACCESS TO SITE:** TSC shall take reasonable measures and precautions to minimize damage to the site and any improvements located thereon as a result of its services or the use of its equipment; however, TSC has not included in its fee the cost of restoration of damage which may occur. If Client desires or requires TSC to restore the site to its former condition, TSC will, upon written request, perform such additional work as is necessary to do so and Client agrees to pay to TSC the cost thereof plus TSC's normal markup for overhead and profit.

**4. CLIENT'S DUTY TO NOTIFY ENGINEER:** Client represents and warrants that Client has advised TSC of any known or suspected hazardous materials, utility lines and underground structures at any site at which TSC is to perform services under this agreement.

**5. DISCOVERY OF POLLUTANTS:** TSC's services shall not include investigation for hazardous materials as defined by the Resource Conservation Recovery Act, 42 U.S.C. § 6901, et seq., as amended ("RCRA") or by any state or Federal statute or regulation. In the event that hazardous materials are discovered and identified by TSC, TSC's sole duty shall be to notify Client.

**6. MONITORING:** If this Agreement includes testing construction materials or observing any aspect of construction of improvements, Client's construction personnel will verify that the pad is properly located and sized to meet Client's projected building loads. Client shall cause all tests and inspections of the site, materials and work to be timely and properly performed in accordance with the plans, specifications, contract documents, and TSC's recommendations. No claims for loss, damage or injury shall be brought against TSC unless all tests and inspections have been so performed and unless TSC's recommendations have been followed.

TSC's services shall not include determining or implementing the means, methods, techniques or procedures of work done by the contractor(s) being monitored or whose work is being tested. TSC's services shall not include the authority to accept or reject work or to in any manner supervise the work of any contractor. TSC's services or failure to perform same shall not in any way operate or excuse any contractor from the performance of its work in accordance

with its contract. "Contractor" as used herein shall include subcontractors, suppliers, architects, engineers and construction managers.

Information obtained from borings, observations and analyses of sample materials shall be reported in formats considered appropriate by TSC unless directed otherwise by Client. Such information is considered evidence, but any inference or conclusion based thereon is, necessarily, an opinion also based on engineering judgment and shall not be construed as a representation of fact. Subsurface conditions may not be uniform throughout an entire site and ground water levels may fluctuate due to climatic and other variations. Construction materials may vary from the samples taken. Unless otherwise agreed in writing, the procedures employed by TSC are not designed to detect intentional concealment or misrepresentation of facts by others.

**7. DOCUMENTS AND SAMPLES:** Client is granted an exclusive license to use findings and reports prepared and issued by TSC and any sub-consultants pursuant to this Agreement for the purpose set forth in TSC's proposal provided that TSC has received payment in full for its services. TSC and, if applicable, its sub-consultant, retain all copyright and ownership interests in the reports, boring logs, maps, field data, field notes, laboratory test data and similar documents, and the ownership and freedom to use all data generated by it for any purpose. Unless otherwise agreed in writing, test specimens or samples will be disposed immediately upon completion of the test. All drilling samples or specimens will be disposed sixty (60) days after submission of TSC's report.

**8. TERMINATION:** TSC's obligation to provide services may be terminated by either party upon (7) seven days prior written notice. In the event of termination of TSC's services, TSC shall be compensated by Client for all services performed up to and including the termination date, including reimbursable expenses. The terms and conditions of these General Conditions shall survive the termination of TSC's obligation to provide services.

**9. PAYMENT:** Client shall be invoiced periodically for services performed. Client agrees to pay each invoice within thirty (30) days of its receipt. Client further agrees to pay interest on all amounts invoiced and not paid or objected to in writing for valid cause within sixty (60) days at the rate of twelve (12%) per annum (or the maximum interest rate permitted by applicable law, whichever is the lesser) until paid and TSC's costs of collection of such accounts, including court costs and reasonable attorney's fees.

**10. WARRANTY:** TSC's professional services will be performed, its findings obtained and its reports prepared in accordance with these General Conditions and with generally accepted principles and practices. In performing its professional services, TSC will use that degree of care and skill ordinarily exercised under similar circumstances by members of its profession. In performing physical work in pursuit of its professional services, TSC will use that degree of care and skill ordinarily used under similar circumstances. This warranty is in lieu of all other warranties or representations, either express or implied. Statements made in TSC reports are opinions based upon engineering judgment and are not to be construed as representations of fact.

Should TSC or any of its employees be found to have been negligent in performing professional services or to have made and breached any express or implied warranty, representation or contract, Client, all parties claiming through Client and all parties claiming to have in any way relied upon TSC's services or work agree that the maximum aggregate amount of damages for which TSC, its officers, employees and agents shall be liable is limited to \$50,000 or the total amount of the fee paid to TSC for its services performed with respect to the project, whichever amount is greater.

In the event Client is unwilling or unable to limit the damages for which TSC may be liable in accordance with the provisions set forth in the preceding paragraph, upon written request of Client received within five days of Client's acceptance of TSC's proposal together with payment of an additional fee in the amount of 5% of TSC's estimated cost for its services (to be adjusted to 5% of the amount actually billed by TSC for its services on the project at time of completion), the limit on damages shall be increased to \$500,000 or the amount of TSC's fee, whichever is the greater. This charge is not to be construed as being a charge for insurance of any type, but is increased consideration for the exposure to an award of greater damages.

**11. INDEMNITY:** Subject to the provisions set forth herein, TSC and Client hereby agree to indemnify and hold harmless each other and their respective shareholders, directors, officers, partners, employees, agents, subsidiaries and division (and each of their heirs, successors, and assigns) from any and all claims, demands, liabilities, suits, causes of action, judgments, costs and expenses, including reasonable attorneys' fees, arising, or allegedly arising, from personal injury, including death, property damage, including loss of use thereof, due in any manner to the negligence of either of them or their agents or employees or independent contractors. In the event both TSC and Client are found to be negligent or at fault, then any liability shall be apportioned between them pursuant to their pro rata share of negligence or fault. TSC and Client further agree that their liability to any third party shall, to the extent permitted by law, be several and not joint. The liability of TSC under this provision shall not exceed the policy limits of insurance carried by TSC. Neither TSC nor Client shall be bound under this indemnity agreement to liability determined in a proceeding in which it did not participate represented by its own independent counsel. The indemnities provided hereunder shall not terminate upon the termination or expiration of this Agreement, but may be modified to the extent of any waiver of subrogation agreed to by TSC and paid for by Client.

**12. SUBPOENAS:** TSC's employees shall not be retained as expert witnesses except by separate, written agreement. Client agrees to pay TSC pursuant to TSC's then current fee schedule for any TSC employee(s) subpoenaed by any party as an occurrence witness as a result of TSC's services.

**13. OTHER AGREEMENTS:** TSC shall not be bound by any provision or agreement (i) requiring or providing for arbitration of disputes or controversies arising out of this Agreement or its performance, (ii) wherein TSC waives any rights to a mechanics lien or surety bond claim; (iii) that conditions TSC's right to receive payment for its services upon payment to Client by any third party or (iv) that requires TSC to indemnify any party beyond its own negligence. These General Conditions are notice, where required, that TSC shall file a lien whenever necessary to collect past due amounts. This Agreement contains the entire understanding between the parties. Unless expressly accepted by TSC in writing prior to delivery of TSC's services, Client shall not add any conditions or impose conditions which are in conflict with those contained herein, and no such additional or conflicting terms shall be binding upon TSC. The unenforceability or invalidity of any provision or provisions shall not render any other provision or provisions unenforceable or invalid. This Agreement shall be construed and enforced in accordance with the laws of the State of Illinois. In the event of a dispute arising out of or relating to the performance of this Agreement, the breach thereof or TSC's services, the parties agree to try in good faith to settle the dispute by mediation under the Construction Industry Mediation Rules of the American Arbitration Association as a condition precedent to filing any demand for arbitration, or any petition or complaint with any court. Paragraph headings are for convenience only and shall not be construed as limiting the meaning of the provisions contained in these General Conditions.



SOIL TEST REPORT

TESTING SERVICE CORPORATION

457 EAST GUNDERSEN DR. · CAROL STREAM, ILLINOIS 60188-2492 · FAX: (630) 653-2726 · TEL: (630) 653-3920

Client: Christopher B. Burke Engineering, Ltd., Rosemont, IL

Date Tested	04/16/2011
Job Number	76501
Page Number	1 of 1

Project: Orland Park Sportsplex, Orland Park, IL

Test Data					
Location	Depth / Elevation	Moisture	$\gamma$ Dry	Qu*	Soil Description
Core 1	0.7	18.6	112	4.5+*	Brown silty CLAY, little sand and gravel, moist (CL)
Core 2	0.8	19.7	110	4.5+*	Brown silty CLAY, little sand and gravel, moist (CL)
Core 3	0.8	18.4	113	4.5+*	Brown silty CLAY, little sand and gravel, moist (CL)

Depth/Elevation = Depth in Feet below footing or final subgrade or expressed as elevation

Qu = Unconfined compressive strength in tons per square foot based on readings with a calibrated pocket penetrometer

Comments

Subgrade samples taken at core locations to approximate depth of 3.0 feet. Core number is referenced to floor cut location. Depth indicated is subgrade level measured from top of concrete.

Field Technician		Reviewed By
F. Guillen		M. Machalinski