



KEBS Quarterly News

Land Planning · Engineering · Surveying
Soils Testing · Wetlands Planning

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New 3-D Laser Scanning

KEBS is now providing 3D Laser Scanning to all of its clients. We have purchased the Trimble GX 3D scanner which is an advanced surveying instrument that uses high speed laser and video to capture coordinates and image data. The scanner can be used inside or outside on all types of projects from complex refinery piping systems to volumes of gravel pits. At the present time, we are using it for topographical surveys for Hartland Schools, location of columns and ceilings in a factory, and a volume of a gravel pile. The uses for a 3D scanner are unlimited and the time it can save you on your project makes it a win-win situation. Give us a call to discuss how 3D scanning can benefit you. Also visit our website to learn more about the 3D scanner—www.kebs.com

Submitted by: Larry Bryan, President

An image of a front-end loader and sand pile (below) as scanned by the laser.

3D mesh and geometries created from Trimble GX 3D

This image of Schroeder Pit was taken using the Trimble GX 3D Scan. Over 7 million data points collected in ±63 acres of area with only 7 setup stations.

Concrete and Cold Weather

The appearance of winter temperatures seems to bring along with it a recurring series of questions about appropriate concrete construction methods. The American Concrete Institute (ACI) defines cold weather as "a period when for more than 3 successive days the mean daily temperature drops below 40°F." The placement of concrete can occur throughout the winter months with some extra planning and follow-up care. The following recommendations are not all-inclusive, but are just an overview of the more common concerns that reach us through the Soils office.

The first thing to consider before placing concrete in the winter is frost development in the subgrade soils. Concrete that is placed on frozen ground will settle when the subgrade thaws. A thin layer of frost that can develop on a granular base material when the overnight temperature drops to around 30ºF, will not likely cause much trouble. If that sand is wet, or if the daytime temperatures stay in the 20's or lower, then the freezing process will create enough swelling to cause future problems. Covering the subgrade with plastic, insulating blankets, or using heating pads can help prevent this condition.

The next precaution is with batching of the concrete mix. The temperature of the mix affects the rate of hydration in the cement. The colder the plastic concrete is, the lower the heat of hydration, and the slower the strength gain. The concrete should be placed and maintained at a minimum of 55ºF during the initial curing period to protect the fresh concrete. Hot water should therefore be used for the mixing water. If the aggregate is too cold for hot water to sufficiently raise the temperature of the mix, pre-heating the aggregate may be necessary prior to loading. Automotive antifreeze should not be used.

Air-entrainment should be used for any concrete exposed to freeze/thaw cycles. This also applies to floor slabs that are not enclosed in a heated space during construction. An accelerating admixture may be beneficial for the development of early strength and reduced protection time. A non-chloride accelerant should be chosen if there is any reinforcement steel embedded in the concrete. High-early strength cement (Type III) can also be used to speed the initial strength as well as a providing additional heat from hydration. Field-cured concrete test specimens may be used to verify the initial strength gains.

The initial curing period is critical for concrete immediately exposed to sub-freezing temperatures. If the concrete freezes before an initial strength gain of about 500 psi, then the ultimate strength will be reduced significantly. Covering the fresh concrete with insulated blankets or providing temporary heat is usually sufficient. As always, moist curing will minimize curling of the slab as well as improving the strength and durability of the final product.

Cold weather construction takes some extra preparation and time to meet the requirements of many projects in Michigan. KEBS can provide more detailed recommendations for a particular project, as well as perform the necessary field and laboratory testing services specific to these conditions.

Submitted by: Brian Swenson, Senior Construction Technician, Soils/Wetlands Office

Final Plat Recorded

After approximately 15 years and 3 companies later, the plat of Braemoor Subdivision was recorded at the State on November 16, 2006. Started in the early 1990's by Dick Steadman (Steadman and Associates), the proposed plat encountered numerous obstacles such as title issues, bankruptcy, drainage, and soils. KEBS Inc. along with the others listed below, continued the battle moving the plat through the final recording process. It was a great sense of accomplishment when Larry Bryan (KEBS, Inc.) called Dick Steadman to let him know the job reached completion.

Thanks go out to Randy Kleiman, (Oade, Stroud & Kleiman), Mark Clouse (Eyde Company) Gail Oranchak (Meridian Township), Dave Love (Ingham County Drain), Francisco J. Llinas (Ingham County Road), Mark Banghart (Ingham County Health) whose assistance is greatly appreciated in guiding this plat through its final stages.

Submitted by: Matt Ottinger, Subdivision/Condominium Manager

KEBS' Client Recognized

Home builder, Mayberry Homes in Lansing, has been named the number 1 builder in North America in "customer experience" among builders of fewer than 100 closings annually, by NRS Corp. and Professional Builder magazine. Robert Schroeder and Karen Schroeder own Mayberry Homes. Mayberry Homes is a continuous client of KEBS, Inc. We would like to congratulate Bob and Karen on their award.

Source: Lansing State Journal, December 4, 2006

Underground Stormwater Storage

With the ever-increasing requirements for stormwater runoff storage, underground storage is becoming a popular alternative. Many developers are looking to this system for other reasons as well, such as increased developable land use, ease of installation, and the possibility of water infiltrating into underlying soil. A recent example of such an application is Clinton Street Place in Grand Ledge, MI. This project consists of a 24,500 sf single story building housing 24 senior citizen apartments and financed by MSHDA. The most constraining aspect of the project site was the small size of the site, 1.75 acres. Due to little space being available for a typical detention basin, and MSHDA concerns regarding such a basin, underground detention was the preferred alternative.

The Engineers at KEBS, Inc. chose ADS Stormtech underground storage chambers after researching several products. Stormtech Chambers are produced in two sizes, SC-310 being 16"h x 34"w, and SC-740 being 30"h x 51"w, which are especially suitable for minimal depth situations. Some features of the Stormtech chamber system include the ability to capture Total Suspended Solids (TSS) in low flow events, the products light weight, and the multitude of configuration choices.

As with any complex system such as underground storage, come various obstacles. Inverts involved in the system are very specific and control the inletting and outletting of stormwater. Many pieces of the Stormtech chamber system are prefabricated and contain exact dimensions that must be configured in a way to fit the project site. Also, to save cost on the underground system, contractors have requested to use crushed concrete for fill material, in lieu of the specified ¾"-2" washed angular stone. The Engineers at KEBS researched this possibility, found it acceptable, and can provide specifications recommended by ADS Stormtech.

As these systems are becoming more popular, the number of products is increasing. They vary in height and size, material, and of course cost. The Engineers at KEBS, Inc. look forward to working with you in determining if an underground stormwater detention/retention system will benefit your project.

Submitted by: Jason Hall, EIT, Charlotte Office

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Check us out on the Web!
www.kebs.com

KEBS' Mission

Working together to provide professional engineering and surveying services that sets the highest standards, while enhancing the quality of life for our employees, clients, and communities.

NEW!!! MDEQ Pre-application Meetings

In November 2006, the Michigan legislature amended Part 303, *Wetlands Protection*, and set up a new process that will allow pre-application meetings with the Land & Water Management Division (LWMD) staff. The pre-application process will allow a landowner, or person authorized by a landowner, to obtain information about a proposed project that may impact wetlands early in the planning process in order to minimize planning costs and delays.

Initiating the process requires filling out and submitting a pre-application request form and fee (based on acreage). The form is short, only requiring basic contact and site information and the preferred meeting place – either at the district office or the project site.

During the meeting, the LWMD staff will provide any information that they have about the site based on existing maps and information stored in the DEQ's databases, they will discuss what aquatic resources appear to be present on the site, and may provide a written statement regarding the need for a permit for the project. They will not delineate or confirm wetland boundaries and will not indicate whether or not a permit will be issued.

After the meeting, the landowner or requestor will be provided with a written copy of the DEQ's findings regarding the need for a permit for the project, along with any other written comments or suggestions. This written determination regarding the need for a permit is binding upon the DEQ for 2 years and will be sent within a few days of the meeting. In addition to the letter, a project file will be established in the LWMD's tracking system to expedite future processing of the final permit application.

For more information regarding the pre-application process, or for a copy of the request form, please contact Doug Longpre at (517) 721-0106.

Submitted by: Doug Longpre, Wetland and Environmental Specialist