by Shane Holthaus

Measuring up: KRWA helps with first steps to building success

For KRWA's KAN STEP staff, many construction projects are starting this spring. KRWA staff will be working on projects in Agra, Bunker Hill, Selden, Grinnell, and 10 to 12 others. KRWA will provide technical assistance and inspection services for local volunteers working on water systems and community facilities. The first, most primary and very essential service the KRWA staff provides for each new building project is to get the site measured, marked and "square to the world." The cornerstone of each is literally that – setting the building correctly with exact measurements from plans transferred to the site for the construction of the foundation or concrete slab.

Shane Holthaus
KAN STEP Tech

Starting right, measure for success

With the foundation finished and perfectly "square," savings are realized throughout the balance of construction. Being square allows more material cuts to fall on an even mark or on the same mark, saving re-measurements on cuts across a long span. Materials will more easily butt up flush, adding strength, and sidestepping odd cut dimensions to make a flush fit. All of this precision not only results in time and material saved but is quite a stress reliever for those doing the construction.

Squaresville

Using the laser transit for setting "batter boards" will assist in getting started on this critical first step. Batter boards are no more than short pieces of lumber set to the elevation of the slab using two stakes (see picture below). Eight of these will layout a simple square or rectangular building – more complex buildings are delineated with additional boards completing a dimensional map of the structure's footprint. Using measuring tapes and a laser transit in transferring these layout lines from the architect's plan to the ground starts with getting a square measurement, and setting the building perpendicular to, or in parallel with a road, street or existing building. This first step may sometimes be in conflict with existing buildings, sidewalks or roadways, as they may not be square to other structures around them. All things must be considered at this point and judgments rendered that satisfy most building placement goals. A building can't be "skooched over" a foot or two after construction is half complete. The proper thing to do is always start with an elevation that is preferred to be parallel with a street or existing building and

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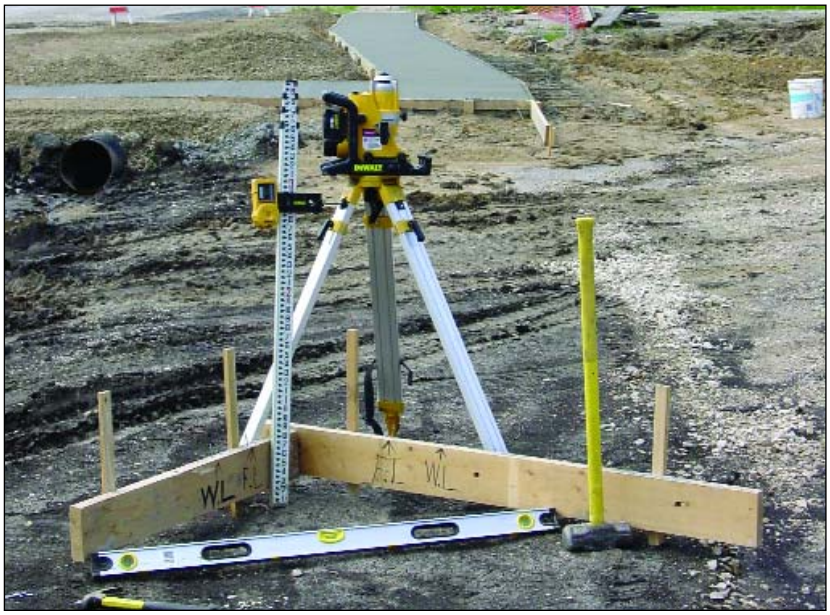


A set of batter boards is shown here marking a corner of the building layout. The laser transit seen in the picture helps locate the preliminary structures during this important first phase of construction. Note markings on batter boards,"WL" and "FL." Strings stretched from nails at these points will delineate the "wall line" and "floor line" of each of the building's elevations.

always retain that line. Move the batter board at the opposite end of the string one way or the other to achieve a square measurement. This will ensure that the straight line of the elevation you have chosen will remain constant.

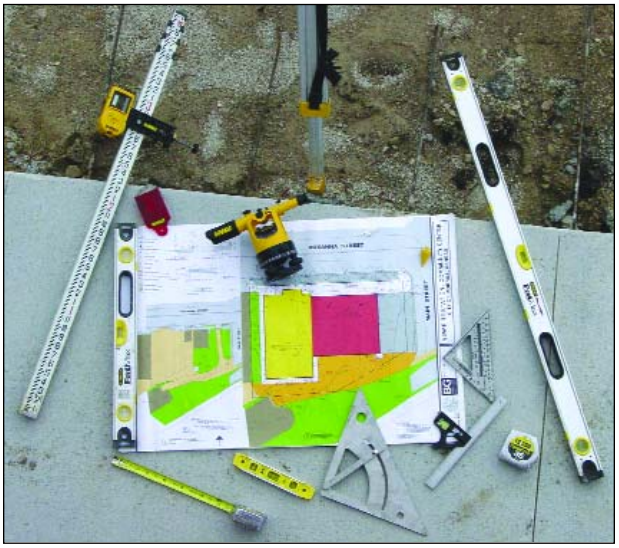
Measuring sticks

From man's early construction days working with stone, progressing on to the building of today's modern integrated material structures, there has been an abundance of advancements in measurement technology. Commonly used tools for determining distance or measurements can be found in a large variety of styles and prices. Many times they are available in either a mechanical or electronic form. Tape measures come in many lengths, styles or sizes; some have memories or other sophisticated electronic and laser capabilities. Modern methods for measuring greater distances using laser equipment, radio and sound waves are also common at the construction site. For KAN STEP projects, laser transits are now the preferred tool for the projects. Lasers have proven to be much more efficient then the older eyesight transit. Laser transits can be operated by one person instead of two, utilizing a laser unit mounted on a tripod, laser receiver and an adjustable stick. Even with this advancement of technology in measuring tools, the basic construction needs remain the same – they were the same for a row of houses in ancient Egypt as they are for our Kansas KAN STEP projects of today.

Measure of a professional

Many measurements are taken in the course of a KAN STEP project – from top to bottom, side to side. The old adage is often heard, "measure twice and cut once." There's a lot of truth to be learned from that statement and some more from this one, "everyday is earth day." That is a new version of "waste-not-want-not," but what it means is that materials are expensive and a good habit of thinking ahead a step or two can save a lot of time and money. "Don't cut a 16-foot

The strings mark the building corner allowing footings to be formed "square" with adjacent structure and perpendicular to the road at top. Batter boards are seen at the top of the footing trench.



Shown in the picture are many "measuring sticks" used on KAN STEP projects. They include from left: transit grade stick, medium level, sight transit, torpedo level, square with angle-finder, architect's plan, swanson speed square, "T" square, tape measures and framing level.

board when you need a board 3-foot long," is advice given by our staff. "Look for something shorter and use it instead." The importance of "getting it right the first time" rings true in many professions but none as important as in the construction industry. Without universal units of measurement and measurement tools to ensure accuracy, the construction industry would not be where it is today.

In KAN STEP projects, building construction has been divided into two different sets of professions – the design team and the construction team. Cost, economy and efficiency have become driving forces in the construction industry today, necessitating these two aspects work well together. The KRWA KAN STEP construction professionals build a communication bridge between the architectural firms and the volunteer community work teams at work on their community projects.

Over the years, building construction has become increasingly specialized with more and more professions adding to the value and efficiency of the overall building design and construction. As KAN STEP projects are being finished across the state (16 to date,) community project volunteers with assistance from the architectural design team and the KRWA inspection and assistance team are also bringing value and efficiency to new buildings and water projects in rural communities across Kansas.

For more information on the KAN STEP non-competitive, open-cycle, community grants contact Becky R. Kester, economic development representative, Kansas Department of Commerce, 1000 S.W. Jackson Street, Suite 100, Topeka Kansas 66612-1354 or Phone: (785) 296-3590, Fax: (785) 296-0186, TTY (Hearing Impaired): (785) 296-3487 or e-mail: bkester@kansascommerce.com.