## THE LAYOUT ISSUE – Featuring: Stabila, Trimble, Keson, and Topcon

# "News and Views That Are Out Of This World"

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## The Art of Squaring

#### 

Every project begins with the most critical part of the entire construction process, the layout. You may have heard the saying "start square, finish square" as any mistake in the foundation will lead to far greater issues as the project carries on. So how do you start square? There many ways using means and methods to establish a square, such as the traditional 3-4-5 (or 30-40-50) method. This requires two men, traditionally with a long reel tape, to establish control points then run the tape 30' down your first control line (north/south).



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From there, a second line is run 40' (east/west) forming a 90-degree layout. Once you've established both lines, the final step is to confirm that the distance from end point to end point is 50' giving you a perfect square thanks to the Pythagorean theorem (aren't you glad you paid attention in Geometry class)!

To eliminate errors, you want to use a high-quality steel blade tape. As part of **STABILA**'s brand new line of tapes, a 165' or 330' open-reel tape with steel blades is perfect for long



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Hello Sphere 1 Family,

Well, just like my message this summer, Sphere 1 is rolling through Q3. Even dealing with so many issues in the industry, our organization is experiencing exceptional growth versus 2020.

As a group, we are on the cusp of something unprecedented. Through the 1<sup>st</sup> half of 2021, we were up more than 33% in both member spend and dividends to our members. The 3<sup>rd</sup> quarter looks to be no different with numbers again exceeding more than a 30% increase versus the same quarter of 2020. As I stated in my July message, these numbers are in play even with members and suppliers dealing with supply chain issues, increasing costs, etc. It continues to amaze me, the resiliency of our membership with all we are accomplishing. It's important to note that if the 4<sup>th</sup> quarter finishes off our year the way it looks like it can, we will have accomplished something truly amazing. Stay tuned.

While the growth we're experiencing is substantial, I feel I must put this into some perspective. Simply, if we strip away things like price increases, as well as other inflationary items that have impacted our values to date in 2021, we are still up more than 15% overall in our spend and member dividends. This value is four times what we forecasted for Sphere 1 in 2021. Again, outstanding for Sphere 1.

Also of note, our annual meeting preparation for next May 2022 is in full swing. Our leadership visited the Gaylord property in Denver this past August and I can't begin to tell you how wonderful this property is. We expect our registration information will be deployed by mid January. Mark your calendars for the week of May 2<sup>nd</sup>. This will be an epic meeting. We have so much planned for you. Can't wait to share more and get back to being with everyone next may in Denver.

Our survey is now complete, the data is being worked through, and we are excited to use this to help build on Sphere 1's future. As stated in the past, we will use this to grow organically, as well as see where we can build a more sustainable cooperative. A key component to this is our planning platform – Gateway for Growth (GFG). Through some in depth review of the platform with our Board of Directors, as well as our 2021's Supplier Advisory Team, we found ways we can take this successful program and make it even better. Please look for updates on this and what you can do as a membership to take advantage of this exceptional opportunity. Thank you to our members for investing the time in the completion of this survey. We know it's asking a lot for you to do this, so again, THANK YOU!

Well, that's all I have. I pray you all have a safe and enjoyable holiday season. Stay well, stay safe and enjoy all those you work so hard for each and every day.

All the Best, *Rob* 

#### **STABILA** Continued from page 1

layouts and establishing perfect square. One major obstacle that you might encounter in using tapes is if there are any structures or materials in the way. This method requires clear paths to obtain the most accurate measurements possible. However, moving structures or materials can be quite cumbersome or impos-



sible altogether. So, what then?

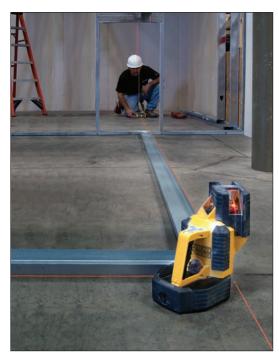
This is where lasers have the major advantage. Rotary lasers can go vertical/horizontal/square without

you having to clear pathways like you would with tapes. To shoot long-range control lines, simply lay the laser on its side and adjust to where you need to be. STABILA manufactures two rotary lasers, the LAR 160 G and the LAR 350, that are capable of doing vertical, horizontal and square. The LAR 160 G allows you to manually square. With the LAR 350, remote control capabilities give you the ability to steer the laser left or right establishing your square on your control points. Both lasers allow you to establish perfect 90-degree layout at working ranges exceeding 2000'.

The leader in the class of long-range layout is STABILA's LA 180 L Layout Station. This

revolutionary layout tool uses STABILA AUTO ALIGNMENT technology. With one press of a button, the laser communicates with the receiver and automatically adjusts to give you a perfect 90. The LA 180 L is the perfect all-around laser for long range residential and commercial layout and big job site work with guaranteed accuracy within 3/32" at 100', making the Layout Station the industry's most accurate line laser.

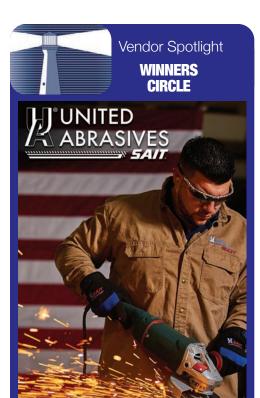
From the very start of the construction process, laying out foundations and footings, it is critical to find perfect square. When you are doing foundations with forms, as in a basement, lines are transferred from surveyor pins which are above grade. To establish the footings and walls, string lines are run from the survey pins and those marks are transferred down into the footings before you can begin laying out the walls. In masonry,



the process of establishing square for both footings and block walls is the same. The framer then comes in and starts their scope of work once they can verify the foundation is square. This critical step ensures that the rest of the project finishes square. Remember, "start square, finish square." Building on a foundation that is out of square will have a negative impact on every additional process along the way from framing to finish.

Maintaining square can get complicated when you have an English or walkout basement. Traditionally with these builds, the elevation of the rear of the house is much lower than the front of the house. The reason for this is to establish maximum light into the basement with windows or doors. The doors that exit out at ground level can be very complicated and time consuming to square. However, by using the Layout Station you can mount the laser unit on back (lower) wall and shoot a perfect 90-degree line up hill to the higher elevation. For this and many other reasons, the LA 180 L has become the industry's favorite layout laser due to its unmatched accuracy and time saving capabilities.





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#### Welcome New Sphere 1 Members



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Various construction applications now use lasers in a myriad of applications, but they can be broken down into two basic categories of interior construction and exterior construction. Many Spectra Precision laser products are used in both applications.

#### Interior Construction Lasers

Interior lasers are visible lasers and used for various positioning projects in the commercial construction, residential, and remodeling industries. The laser tools are used to reference level, plumb, square and various alignment and layout tasks.

Lasers are used in lieu of string lines, plumb bobs, levels, optical instruments and other tools so the user's hands are free to perform the work required and increase productivity. The accuracy built in to lasers is also considerably more reliable than the old-fashioned tools.

Laser types include pointers, line lasers, combinations of these and rotating lasers. An example of a combination product is the **Spectra Precision** LT52G Laser Tool that combines two tools in one a horizontal and vertical green beam crossline laser with a 5-beam laser pointer. The points and lines can be operated independently or together.

Interior lasers are also available in green or red beams.

Green beams are up to four times more visible to the human eye and are ideal for interior construction projects where there is bright ambient light. Red beam lasers offer value proposition of a lower initial price and typically have longer battery life.

Although green beams do have the physical properties of being four times brighter to the human eye, that does not necessarily translate to working at four times the distance as a red beam laser, in spite of some mixed marketing messages from some manufacturers. The green beams typically can be seen further in bright conditions, but





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#### **Trimble-Spectra Precision** Continued from page 5

not four times the distance. Green lasers are especially vibrant in dark environments -a laser light show on the walls and ceilings!

Laser productivity increases most benefit interior construction professionals such as ceiling installers, mechanical, electrical and plumbing trades, framers, drywall contractors, carpenters, shop fitters, general contractors and anyone with positioning requirements.

#### **Exterior Construction Lasers**

Exterior lasers are not necessarily visible. They are grouped into flat-only lasers, vertical lasers, grade lasers and various combinations. All of these lasers are capable of flat work. Exterior lasers are typically rotation





Spectra Precision HL760 Digital Readout Reciever

lasers and use a laser receiver to complete the system, as they are not designed to be seen with the naked eye in bright sunlight. The laser itself can be a visible diode laser or be in the invisible infrared spectrum.

Common features of the lasers are rugged designs to withstand the common harsh on-the-job conditions including rain, humidity, mud, and even brief immersion. Clumsy handling will not harm Spectra Precision products as they are built with drop specifications for real world reliability.

Flat lasers are most common, but if you dive a little deeper, and ask the right questions, you will find that most contractors do have grade applications where a laser capable of grade would be of benefit.

For best results in the field, ensure that your grade lasers are electronic automatic self-leveling in their grade range. Some grade lasers are manually set, and though these may be useful in some applications such as driveways and landscaping, they are not suited for jobsites that require engineered grades.

Grade lasers are available in single

#### Trimble-Spectra Precision Continued from page 6

grade models and dual grade models. We offer a GL400 series that is ideal for grades less than 10%. The GL422N is a dual slope laser that is automatically self-leveling in two axis and in the vertical plane as well as horizontal. Our GL600 series has automatic self-leveling grades up to 25%. A highly accurate GL700 model is available for machine guidance applications where accuracy is of the utmost importance such as with automatically controlled concrete laser screeds.

The receivers used with exterior lasers are a critical part of the system, as this is where the grade information is displayed. All our GL series lasers and several flat laser models include the HL760 digital readout receiver that has patented technology for high accuracy and provides a digital readout of distance from grade in addition to the high and low arrows, beeper and LEDs. They are designed to withstand a ten-foot drop.

Specialty lasers are also part of the Spectra Precision portfolio. Pipe lasers are designed for pipe laying where a beam is typically aligned through the pipe at an en-

Vendor Spotlight

POLE POSITION gineered grade for gravity flow applications. There are also machine mounted display laser receivers for attaching to grading and excavating machinery that put a grade checker on board the machine, increasing productivity and safety.

#### **About Spectra Precision**

Spectra Precision continues to manufacture lasers at the same Dayton, Ohio location where the first commercial laser company was established and where we invented the first rotating laser in 1965. Our division has always maintained a laser focus on innovation in laser products. We are proud to say we invented this business and focus on maintaining our leadership position by understanding what our customers want and need by listening to them.

Our laser products provide control for elevation, grade, vertical alignment, 90-degree layout and plumb for both the interior and exterior construction markets. Please visit www.spectralasers.com to view our entire portfolio of productivity enhancing lasers.

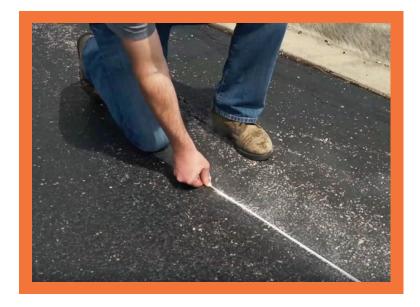








## On Chalk and Chalk Line Reels



#### We love straight lines.

Streets, sidewalks, sports fields, decks, foundations, you name it, straight lines are found everywhere we build. However, we are terrible at drawing straight lines unaided. Try it! I would be very impressed if you made it a foot and were confident with the result. To make it three feet from point A unaided, drawing a straight line, free hand is next to impossible. If you were to cut exactly along such a line, you would have a hard time. What's more you would notice quickly that it wasn't straight (and if you didn't notice, the person you were working with would be sure to tell you!). This is why we have built so many machines to help us make straight. Up there with the best of these tools is the chalk line. For price, it can't be beat.

At its simplest a chalk line works like this: A string, coated with colored dirt, is pulled taut between two. The string is drawn up off the surface to be marked, like a bow string without the arrow, and released. The string snaps down on the surface, some of the dirt falls off, marking a straight line.

#### **KESON** Continued from page 8

The string is stored and removed from a container in which more colored dirt coats it. For pennies in cost and usually seconds of time you get one of the most essential things on a jobsite: a perfectly straight line that will last when you walk away, be there when you return and eventually wear away. No batteries needed, no squinting to see it, no doubt about where it begins or ends, or if it moved from yesterday to today. It's right where you left it.

#### We are going to cover the three basic components of the chalk line marking system:

1. Chalk Line (the string, or cord, that picks up and lays down the chalk)

- 2. Chalk (the colored dirt that marks the straight line)
- 3. Chalk Line Reels (the tool which brings those two elements together)

#### Chalk line, aka "the string"

Since about 2000, string has become the biggest story in the chalk line reels. When shopping for a chalk line, be mindful of the marketing. What is defined as "thin", "precision" or "fine" string for one will NOT be the same for another. There is a LOT of proprietary wording when it comes to chalk line reels. Each manufacturer has their own system, marketing story and materials. So, what is "Ultra Bold" line for one manufacturer, is "standard" line for another, etc.

Why so many options? It depends on the work being done and on the worker. A precision line will look more like a pencil line while a giant line will look like a magic marker line. The former is great for flooring where precision is paramount, the latter for cutting concrete where visibility and duration of the line are key. If you have poor eyesight a thicker line might be easier. If you are working with a circular saw cutting right along the line, thinner might be better. If you're standing behind a concrete cutter, you might welcome the fattest line you can get.

Here is our chart for string types. Standard is by far the best seller (70% of the lines sold are standard lines).

String Thickness	Precision <	Standard <	BOLD <	<b>GIANT</b>	
Width of snapped line	<0.99mm	1.00-1.25mm	1.26-2.00mm	>2.00mm	
1X SKUs					
		к1, к1х	P100, G150BOLD (formerly G140FL)	G100, G110 G130, G150 G100C G150C	
3X SKUs					
	K3XPro	K3X, GB1	G3X150BOLD	G3X	



#### What to consider when selecting a chalk line (regardless of the reel)

Your chalk line will come with a variety of attributes. Many builders don't know that there are different strings available that perform differently. In many cases they will use what they have seen others in their field use. There may be a better line for what your customers are doing. By providing different options you can meet needs they didn't recognize.



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#### Chalk

#### Color

We once asked a wizened carpenter about which color chalk he used. He said, "Red." We asked why. He shrugged and said, "That's what my first boss told me to use." As far as we have been able to ascertain from market surveys, there is not standard usage for the color of chalk. This is true across trades, geographies, etc. There are preferred colors: Red is slightly more common than Blue > White > Glo Orange > Black. These are the big movers. There are those who swear by the brighter Yellow and Green, and who are we to judge?

#### **Pigment Concentration**

In inclement environments (wet, windy, high traffic) OR when the chalk line will not be seen (footers, wall layout, roofing) more permanent colors are rising in popularity. This is because a line that lasts is preferable to one that cleans ups easily. All chalk lines are impermanent, eventually they will all wear away. Most of the industry has aligned around a numbering system.

#### Levels

- 1. standard temporary use (same day),
- 2. hi-vis color (1-3 days),
- 3. semi-permanent, weather/wear resistant (3-7 days),
- 4. permanent or "weatherproof" (>7 days),
- 5. ultimate or dye, almost pure colorant

There are several variables that will dictate how visible/usable a chalk line will be and how long a struck line will last.

Permanency	Standard		High-Visibility		Semi-Permanent		Permanent		Ultimate Dye			
Colors	Blue	White	Lime	Orange	Yellow	Black	Red	Black	Blue	Red	Blue	Red
Permanence Rank	1		2		3		4		5			
Best for	Interior,	/Exterior	Exterior		Exte	Exterior		Exterior		Exterior		
Applications Include:	Interior Layout, Roofing, Siding, Paneling		Corrections, Plumbing, Electrical, Roofing, Masonry		Exterior Layout, Concrete Layout, Roofing, metal Fabrication		Exterior Layout, Concrete Layout, Extreme Conditions, Long- Term Applications		Exterior Layout, Concrete Layout, Extreme Conditions, Long- Term Applications			





#### **KESON** Continued from page 11

**Amount of pigment in the chalk.** Level 3 and especially Levels 4 and 5 have a high dye to carrier ratio, providing a richer, longer lasting, less impacted by the environment color. We know of some masons who spike their standard level 1-3 chalk with concrete dye. It is cheaper, more consistent, and much more efficient to simply buy more permanent chalk levels (4 & 5).

**Contrast of** chalk color to surface color. Blue on grey concrete stands out MUCH less after a few days than red, for example. AND if you're painting over the lines, make sure you choose a color that won't bleed through.

Surface material. Colors perform differently on concrete vs. wood vs. asphalt.

**Technique of the user.** Some can coax 4-6 usable strikes out of single chalk line before it has to be reloaded with chalk. A simple tip: raise your line two inches for the first strike and an additional inch for each strike after.

**Thickness of the string.** A thicker string like a bold or a giant carries and releases way more chalk than a piano-wire thin precision line.

**Tip:** It is too much trouble to remove chalk from a chalk line reel to introduce a second color to a job site. If a second color is required (to correct an errant snapped line for instance), have a second chalk line reel for the second color.

#### **Chalk line reels**

This is the tool to make using chalk lines less messy (they are still messy!), more consistent and more convenient. Reel housings typically come in two sizes: 1. standard the entire reel fits in the palm of your hand, and 2. what we call Giant, which have a grip for holding in your palm with a chalk reservoir and reel system that hang below.

About 80% of chalk line reels sold in North America are standard size, with standard

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Continued on page 13
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string and little hook on the end. Of these there are two primary types. 1. 1x rewind chalk line reels, which means there's no gear, so there is very little that can go wrong with this chalk line reel. 2. 3x rewind chalk line reels employ a gear to speed the rewind, saving you 10-15 seconds of rewind time on a 50foot line retraction. There are some 6x

chalk line reels sold. An addition 3-6 seconds can be saved with a 6x rewind.

For our money, a 3x chalk line reel makes sense, 6x is unnecessary. Most chalk lines that are snapped are nowhere near the 100 feet available in a chalk line reel. Why so much string? As chalk lines wear out or break, most users simply begin the next section of the line by tying the hook to the line remaining.



**Tip:** To load a chalk line for the first time, pull all the line out of the reel. Fill the chalk line reel with an ounce of chalk (about a tablespoon). Wind the string back in tapping the reel with your winding hand often. The objective is to run the string through the chalk in the reel, coating it. Add more a little more chalk every 20-30 feet. Some users will repeat this process before they strike their first line.

#### Conclusion

Know that there are options out there for string types and chalk variations beyond color. We are grateful to be able to supply USA-made chalk and chalk line reels to assist in your efforts!

Visit us at www.keson.com for more information.



## ΤΟΡΟΟΛ



### **Taking Layout to the Next Level**

**Topcon**, a leader in the global positioning market, is committed to bringing its LN-150 Layout Navigator, one of the most cost-effective and easyto-use layout systems available today, to a much broader audience.

Sphere 1's dealers and customers are more than likely already aware of the value a powerful layout solution can bring to traditional job sites — those of concrete contractors, MEP professionals, homebuilders, etc. Those trades quickly learned that an effective layout solution can dramatically streamline their workflow and, in the process, improve the bottom line.

Consider this bit of reflection from Les DenHerder, president of California-based HPS Mechanical, about a project to construct student housing near San Diego. "This project would have easily taken four to five times as long [without the LN]. But more importantly, it would have been a manpower issue; we would have needed six or seven guys up here laying out tapes in areas that would have needed to be sectioned off. Compare that to what we are doing here now. Working alone, our rod man has located more than 300 points today. And, unless something interrupts the workflow onsite, that's a typical day's work for him."

#### Sharing the Wealth

It makes sense then, that the combination of ease of use, high degree of accuracy, increased efficiency and return on investment could be effectively applied to other areas outside of the mainstream trades. According to **Darcy Shunk**, Topcon director of sales, building construction, the time is



right for other professionals to reap those same benefits.

"We've had tremendous success positioning the LN-150 with traditional contractors like concrete companies, MEP professionals, and so on," he said. "What is amazing to me, however, is how many other markets have found it so useful and how quickly it is gaining acceptance in unexpected markets."

A great example of this newfound applicability is a Greenville, South Carolina company that designs and installs custom swimming pools. Seeking to improve their layout process, the company, **Signature Pools**, turned to an LN-150 robotic layout navigator. Doing so, not only shortened layout times and improved accuracies, it also opened doors to additional areas in which the instrument might pay future dividends.

#### **Outdated Approach**

Signature is a family-owned business specializing in custom design/build pools and spas. The company, currently employs



about 50 people, but has managed to keep a family feel within the business despite the fact that they have an impressive number of projects either being built or in the design phase.

Until recently, such a heavy workload, while manageable, nevertheless raised the stress level of the company's design/estimating team. However, the purchase of the LN-150 replaced a layout process that was time-consuming, labor-intensive and prone to error or oversight.

"In the past, we'd measure off the corner of the house, and every 10 to 15 feet, use a laser transit to hit an elevation point, manually noting it," said **Joe Gatas**, manager of design and estimating, "Then we'd come back, interpret the data, log the points into CAD, calculate the difference between them and our benchmark, and enter that into the system."

#### **Points to Success**

Today, the LN-150 easily and accurately obtains both horizontal dimensions and vertical elevations anywhere within its









#### **TOPCON** Continued from page 15





layout zone. Working with the instrument, a prism pole and a touch-screen controller, Signature's team can quickly obtain as many layout points as they need.

"With the new robot we can just go out and take measurements at random," said **Chris Davis**, lead designer. "We then transfer everything to a thumb drive, put it on the computer and I have all my data. There is no more manual data entry — which greatly lowers the risk of inaccuracy. I can immediately start designing."

The overall time savings can be substantial, said designer/draftsman **Sean Potoniak**. "Gathering points for a curvilinear pool, we can save up to three hours over the previous method. We can easily get 200 points in half the time it used to take us to get just 20."

#### **All About Easy**

The instrument's appeal, in addition to its ability to streamline the layout process is its ease of operation. The user simply places the LN-150 anywhere on a project site - on a tripod, column or even on the ground – and presses one button. Much like a rotating laser, the unit self-levels, the operator turns on the wireless tablet controller and performs a quick setup routine before getting to work. To lay out points, the operator calls up point files or CAD drawings. He or she can then display the design point or line that needs to be staked out on the color touch-screen collector, select it on screen, and the LN-150's locates it on the site. The system also ensures a seamless flow of project data from the design to the field through the integration

Continued on page 17



#### **TOPCON** Continued from page 16

of the LN-150 with field and office software.

"With the new robot we can just go out and take measurements at random," said Davis. "Is there a berm there? No problem, we can go right along the top or edge of that berm and get those measurements. If there's a tree, we can hit a few marks around that tree to tell us where it is."

#### **Templates for Success**

Also impacted for Signature, was creation of the template, a document that solidifies the as-built design and includes a topographic representation of the property. In the past, that function was subbed out to a thirdparty company which put the pool designer's project at the mercy of someone else's timeline.

"It was a lengthy process and a costly one, both monetarily — a typical template could cost \$2,000 to \$3,000 — and in lost time," said Gatas. He said they now go out with the robot and within 30 minutes, gather the data, bring it back and create the template. "Based on those savings alone, we will probably get our investment in the robot back in a year and a half, maybe sooner. By improving efficiencies, the robotic solution is allowing us to do improve the bottom line — without having to take on more projects."

#### Sky's the Limit

Topcon's Shunk sees the LN-150's success with users like Signature as just the tip of the iceberg for prospective new users.

"We have already seen it paying big dividends for homebuilders to lay out footings and pads for new homes," he said. "I can envision the same degree of success with other contractors as well — those who might not have thought of going that route: landscaping firms, parking lot striping businesses, underground utilities, the possibilities are almost endless."

And, as the previously quoted DenHerder can attest, the payback is definitely there. "On the five buildings we just completed, we probably saved close to \$200,000 in labor. The instrument cost us less than 1/10 of that — in anybody's book that's an impressive return on investment."

Adds, Shunk, "There are a lot of small- to midsized companies out there — in a host of different markets — that can realize an equally impressive level of savings through the boost in productivity. It's an exciting opportunity for them to take their operations to the next level."

