



Concrete Plant International North America Edition



APRIL
2013 **2**

SPECIAL PRINT | CONCRETE PRODUCTS

StoneBilt Concepts chooses flexible, consistent batch plant to meet market demand for quality hardscape and architectural products



SPECIAL PRINT
CPI 13/02



Advanced Concrete Technologies, Inc., Greenland, New Hampshire, 03840, USA

StoneBilt Concepts chooses flexible, consistent batch plant to meet market demand for quality hardscape and architectural products

The increasing demand for high quality precast hardscape and architectural products is driven by many factors, including the desire for environmentally friendly landscapes, LEED certification points, storm water management requirements, a national uptick in home sales, increased construction starts, and slow but steady job growth. In the Denver, Colorado area, high end construction, and more recently, the cost-conscious do-it-yourself market—served by large retailers such as Lowe’s home improvement stores continue to drive demand for top-quality hardscape products, especially those that offer exceptional value.

■ Hank Giles,
Advanced Concrete Technologies (ACT), USA ■

Precast Concepts is one company that recently made an investment to serve the demand for high quality hardscape precast products. Based in Commerce City, north of Denver, the firm built a new facility in 2012

to house its StoneBilt Concepts division, which is dedicated to the production of wet cast value-added hardscape and architectural products. The range of products produced by the division includes natural-looking stone textured paving slabs, retaining walls, architectural accessory elements, signs, and other custom precast concrete

products (see figure 1). Founded in 2004 by Ed Anderson and his wife Roxanne, Precast Concepts enjoyed immediate success producing precast reinforced concrete pipe, box culverts, storm water detention systems, and custom products for the pre-recession municipal construction market. In 2007, the Andersons began researching and plan-



1a -- Simulated stone wall caps for a bridge project in Arvada, Colorado.



1b -- Sandstone textured pedestal pavers – Childrens Hospital – Aurora, Colorado



1c -- Custom stair riser and tread components for Colorado Academy High School.



1d -- Almost any natural looking texture and earthtone colors can be accurately captured by StoneBilt Concepts’ wet cast system.



Flexible, Reliable and Profitable



**ADVANCED
CONCRETE
TECHNOLOGIES®**

WE ADD PROFITABILITY TO THE MIX.

American division of Wiggert+Co. and Würschum

603.431.5661
info@concretebiz.com
www.concretebiz.com

bauma
2013
B1.103/202

At ACT we work hard to provide you with the industry's most flexible and proven solutions for producing high quality concrete.

Contact us whether you require a new plant or are upgrading an existing facility and find out how our innovative plant solutions can greatly increase your profitability.





1e -- Lock+Load™ retaining wall for retail store in Centennial, Colorado.



1f -- Median precast elements by StoneBilt Concepts are a key component along Colfax Avenue outside Denver's new Justice Center.

Figure 1 -- Six-photo series features StoneBilt wet cast hardscape products, which are available in a range of natural looking stone textures taken directly from nature. Almost any earth tone color can be produced using the facility's advanced concrete batching and color metering systems from ACT. The new facility, completed in mid-2012, has helped parent Precast Concepts diversify its product offerings and expand its market.

ning for ways to broaden their product line and grow sales.

Despite and, in part, because of the 2009 recession, Precast Concepts established the StoneBilt Concepts division by purchasing a Slab-flex automated wet cast production system from BFS and locating the new system adjacent to its dry cast pipe production line. The positioning of equipment allowed the individual lines to share a single concrete batching system.

The company's first batching system—a MobilMat Mo3750-4-PCS from Advanced Concrete Technologies (ACT)—was used

primarily to provide dry cast mix for Precast Concepts' Besser BiDi Advantage packer-head pipe system and Mid-America Eagle Tri-Max large diameter pipe system. However, the versatile MobilMat system was adapted to serve the needs of both Precast Concepts and the StoneBilt division.

To provide the earth tones required by the new hardscape products produced by the StoneBilt division, the firm added an ACT/Würschum TFW 90 dry-powder color metering system (see figure 2). ACT is the North American division of Wiggert & Co and Würschum.

Overcoming logistical challenges

"We wanted to diversify our product offering by adding natural-looking stone textured wet cast products," notes Ed Anderson, StoneBilt co-founder and president (see figure 3). "Initially, we produced the StoneBilt products in the same facility as our precast pipe, but our early success made that increasingly difficult from a logistical standpoint. We had to look at building a dedicated facility for StoneBilt. Even with the recession still lingering, we needed to be positioned to serve our current customers and prepare for the economic recovery that



Figure 2 -- Above, an operator loads the ACT/Würschum TFW 90 dry-powder color metering system with a 2,000 lb super sack of pigment. With four basic colors, StoneBilt can reproduce any natural earth tone for its wet cast retaining wall and paver hardscape products. The color metering system is integrated with the ACT PCS programmable controls, providing high accuracy and consistency in color and recipe reproduction. Dry pigment is "slurrified" and pneumatically conveyed to the appropriate mixer. Moisture content is continuously monitored and automatically adjusted by the ACT Hydromat microwave probe in each mixer.



Figure 3 -- Vice President of Manufacturing, Geoff Parrington (at left) and co-founder and President Ed Anderson stand on the dual-mixer platform of the new ACT concrete batch plant within the new StoneBilt facility in Commerce City, Colo., opened in mid 2012. The new plant is dedicated to producing value added wet cast hardscape and architectural products for the Denver metro market and Mountain States region.

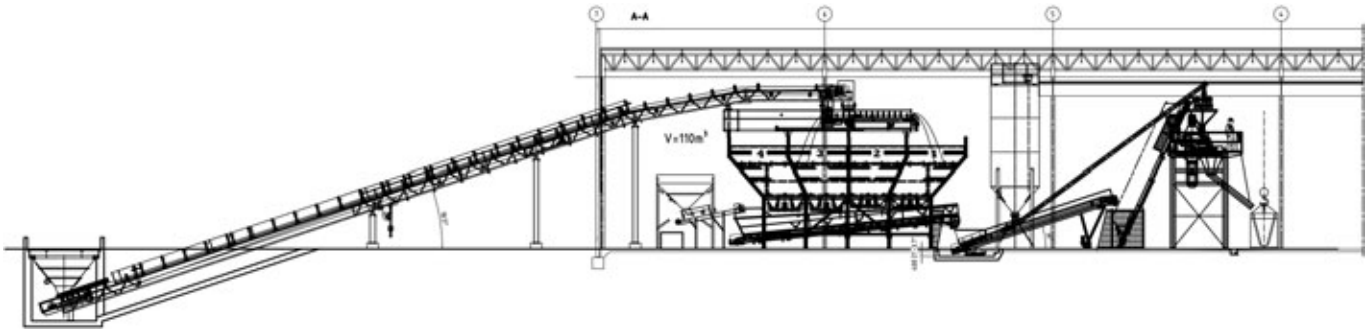


Figure 4 -- In this elevated view of the new StoneBilt wet cast hardscape and architectural products production facility in Commerce City, Colo., the drive-over loading hopper is shown at left, with aggregates conveyed up to a 4-bin aggregate storage area with automated shuttle sorter, a separate “day bin” is just to the left of the main aggregate bins, three cement silos are located just to the right of the aggregate bins, skip hoist loaders receive and lift the dry mix to the dual-mixer platform and a fourth super-sack style cement screw. At left, is the twin mixer platform, equipped with two ACT HPGM 750 planetary counter-current mixers, which each feed a separate production area: one for the Slab-flex paver line and one for the Lock+Load retaining wall products.

seemed to be coming.” Throughout 2011, Anderson and his staff worked closely with ACT engineers and the building architect to ensure the correct layout for the new facility (see figure 4). This tight collaboration enabled the team to dovetail the pre-existing equipment and the new ACT concrete batching system to create a perfect fit for the new plant. “We looked at several different systems from other vendors, primarily to be sure we were selecting the right type of equipment, but we knew all along we were going to go with an ACT MobilMat plant again for the new facility,” Anderson explains. “The mix accuracy and efficiency of the ACT MobilMat and PCS controls were essential for our StoneBilt products. The fact that the ACT/Würschum color metering system is tightly integrated with the rest of the batching system was critical. Color accuracy is everything. You can’t have color variation from batch to batch and tight moisture control is vital for both color and SCC mix consistency. We get that with the ACT/Wiggert MobilMat plant.”

Flexible, accurate MobilMat selected...again

Anderson and his team chose the Twin Mixer Mo750-4-PCS batching plant for the new StoneBilt facility (see figure 5&6). The system features a twin-mixer platform equipped with dual HPGM 750 high shear planetary counter-current mixers, each capable of producing up to 0.6 cubic yard per batch. The Würschum TFW 90 color metering system was transferred from the original set-up to the new plant. Each of the mixers in the new plant supplies a separate production line: the Slab-flex paving stone line and the Lock+Load™ retaining wall line. The mixers share a common support infrastructure which includes:

- Four-compartment aggregate bins with 106-ton capacity charged from outside the building via a drive over dump hopper and a conveyor from outside to inside.



Figure 5 & 6 -- The new StoneBilt facility in Commerce City, Colo., specializes in natural-looking stone textured wet cast hardscape products, including the Lock+Load retaining wall system and Slab-flex pavers, as well as numerous specialty and custom products. Above, the dual-mixer platform of the ACT batching system can be seen at far left, Three cement silos are located in the middle with an optional fourth station for super sacks of specialty cement. The large orange bins near center provide 106 tons of out-of-the-weather aggregate storage. Foreground right is the 4-sack color metering system and center foreground is the Slab-flex paving stone system. This efficient layout supports two separate production lines in addition to a wet cast production area via a crane bucket.



Figure 7 -- Vice President of Manufacturing Geoff Parrington checks the screens of the ACT PCS programmable control system used to operate the batching systems supporting both paving stone and retaining wall production operations.

- A single “day bin” that can be loaded with specialty aggregates for use on custom or limited projects (e.g., white quartz for an entry sign, etc.).
- Three main cement silos for white cement, gray cement, and fly ash for more economical SCC production.
- A single super-sack style cement “silo” with separate screw conveyor for specialty projects (e.g., refractory cement for fire proof pavers, etc.).
- Ground-mounted 1,300 CFM dust collection serves centrally located cement silos and mixers enabling easier installation and ensuring clean plant operation..
- Automatic high pressure mixer cleaning system in each mixer to reduce cleanout time and extend mixer life—essential to allow seamless transition from one color to another.
- PC-based PCS Control system (see figure 7) with user-friendly interface and remote call station provide flexible control, maintenance reminders, recipe recall, complete production history, and real-time batch control.
- ACT/Würschum TFW automatic color metering system is integrated with the PCS main controls and uses four primary colors for StoneBilt to create virtually any earth tone. Dry pigments are loaded via super sacks and pigment is “slurrified” then pneumatically conveyed to each mixer as needed for fast dust-free operation.
- Hydrotester aggregate moisture probe located in sand bin automatically adjusts batch weight in order to maintain mix design and batch yield.
- Hydromat microwave mixer probes automatically read mix moisture and correct final batch water quantity to maintain perfectly consistent W/C ratio for each batch.

Efficiency, flexibility key goals for new layout

“We designed our new StoneBilt plant around the new ACT batching system since the Slab-flex was a fixed design and we had greater flexibility with the ACT plant layout,” Anderson notes. “We went through a lot of hand sketches and then CAD drawings with ACT until we got everything laid out to what we felt was the perfect layout from an efficiency and flexibility standpoint.”

The new 48,000 sq. ft. StoneBilt facility was built near the original 75,000 sq. ft. Precast Concepts building. When the new ACT batching system was in place, it was a short move to transfer the wet cast Slab-flex, Lock+Load production systems, and the ACT/Würschum color metering system.

Each of the two mixers in StoneBilt’s ACT MobilMat concrete batching system is equipped with a skip hoist for a compact plant footprint. Each can be pre-charged with the dry mix, staged above the mixer, and be ready to load each mixer once the mixer clears the last batch. The entire batching system is fully automated and batches can be ordered from a remote call station by a production system operator and delivered via crane bucket or direct feed chute to any production area (see figure 8). Up to eight pre-programmed buttons are available, each representing a different recipe, batch size or color selection. This enables an operator to prepare in advance for all of the recipes that may be needed during a shift or day of production.

The new StoneBilt facility was completed in mid-2012. In the years before moving to the dedicated facility, the StoneBilt operation shared the Precast Concepts’ ACT HPGM 3750 planetary counter-current mixer which produced dry cast and wet mixes—often alternating wet/dry from batch to batch. That mixer used a similar PCS programmable control system as the new StoneBilt plant, so training personnel and operating the new ACT batching system was effortless. “Our operators were already familiar with the ACT control system and mixer operation, so moving to the new plant was easy,” Anderson confirms. “There were a few differences since the equipment was newer and it was a two-mixer platform, but it was basically the same. And, we are using the same Würschum color metering system we began with so no difference there—same accuracy and consistency.”

Enhanced consistency and strength is differentiator

One area where the ACT batching system’s extreme moisture accuracy has paid dividends is in strength. “We need 8,000 psi as minimum for some of our paving products, particularly pedestal pavers,” Anderson notes. Pedestal pavers are often used to create a durable surface such as walkways and plazas above membrane roofs and other areas. The pavers, measuring up to 24 inches square and are typically supported at the corners on risers. “We regularly get 10,000 psi in our pedestal pavers. Our customers love the natural looking wet cast stones we can produce at a competitive cost.”

StoneBilt’s production systems also have to account for the “mile high” altitude, cold dry winters, hot dry summers and a wide range of colors, sizes and shapes. In addition to extreme mix accuracy provided by the ACT batching/mixing system, cured concrete strength gain and color is further ensured by state-of-art Quadrix curing chambers from Kraft Energy Systems, a Besser company. Temperature and humidity play a major role in color formation and early strength gain. The StoneBilt curing system provides balanced curing, allowing product to be demolded and packaged quickly and still provide consistent color and strength.

An added advantage of consistency and accuracy in batching is the need for less cement and thus a “greener” operation. “Our con-



Figure 8 -- An operator remotely calls concrete batch and controls the release of fresh mix into a crane bucket at the base of one of the discharge chutes coming from one of the ACT HPGM 750 planetary counter-current mixers. The dual-mixer platform, which feeds two separate production operations, is fed from a common support infrastructure of cement silos, aggregate bins, and conveyors.

tinuous monitoring and correction for moisture in our aggregates and mixers helps us produce consistent color and high strength with almost no waste, so the most efficient mix design is possible," Anderson says. "We also capture and recycle our grey process water from the ACT automatic washout system, which is something we can brag about when the conversation turns to the greenness of our process. From local sourcing fly ash, grey process water recycling, and overall low energy consumption using solar energy panels, we are about as green as we can be at the moment."

The StoneBilt division has helped Precast Concepts successfully diversify its operations and extend its market opportunities into new areas and projects. "We are now able to not only supply specialty landscape retailers and contractors, but also larger market customers such as Lowe's home improvement stores," Anderson explains. "We have a contract with Lowe's for a multi-state region. They like our pavers with the natural looking stone texture and color because it provides high end look at an affordable price compared to natural stone. The Lowe's customer appreciates the value our product provides and our new facility enables us to meet production demand requirements."

The special features of StoneBilt's ACT batching plant, including the day bin for aggregates and specialty cement super sacks, helps the firm meet special custom orders as well. One of the company's specialties is custom entry signs with embedded logos and other custom details for industrial parks, municipal buildings, schools, and retail projects. For instance, the company recently created an entry piece for Colorado Academy, a local high school (see figure 9).

"Our investment in a dedicated production facility for our StoneBilt division is helping us to differentiate ourselves from other precasters," Anderson observes. "Many precasters try to find success with colored hardscape products, but they can't achieve the consistency that we can in our wet cast process. We can produce any natural stone texture using the Slab-flex polyurethane mold system and match that to virtually any earth tone using our ACT batching system and integrated color metering. And, we can do it consistently and cost effectively, which is critical no matter who the customer is. Consistent color, strength and quality set us apart from the rest and that's why we win business and continue to grow."



Figure 9 -- Ed Anderson and Sales Manager of StoneBilt Concepts, Dion DeMeyer, inspect a new entry sign for the Colorado Academy, a Denver-area high school. The sign was created using white quartz supplied from the optional "day bin" specialty aggregates system included in its ACT batching system. This capability helps the firm to meet exact architectural needs for quality custom products at affordable prices.

FURTHER INFORMATION



Advanced Concrete Technologies, Inc.
 300 Portsmouth Avenue
 Greenland, New Hampshire, 03840, USA
 T +1 603 4315661
 F +1 603 4315547
info@concretebiz.com
www.concretebiz.com

