

# Land Unlocked

Rising property values and light rail system build out, coupled with municipal planning measures promoting conversion of industrial to mixed use zoning and transit-oriented development, have spurred a pattern in and around the Colorado capital: A manufactured-concrete operator vacates a legacy site within or bordering the Mile High City in favor of a greenfield parcel on the outskirts.

The top independent block & hardscape unit source west of the Mississippi, Basalite Concrete Products is also the third producer in less than a decade to transition from a Denver site that was either an eminent domain candidate, perceived as “too valuable” for molding or casting zero to high slump concrete mixes, or simply land locked. Following its neighbors in precast, prestressed production—Rocla Concrete Tie, Denver to Pueblo, Colo., 2014; Wells Concrete, Denver to Brighton, Colo., 2020—Basalite has moved from a 15-acre city property to a 60-acre site 20 miles north in Fort Lupton, just beyond Brighton. Steps from a new Denver Regional Transit District rail station, the old plant site lies in the expanding Western National Complex corridor, home to the National Western Stock Show, plus livestock and equestrian facilities on the drawing board. Basalite Colorado’s new flagship charters a Fort Lupton parcel abutting a secondary rail line and bordered by County Roads 8 and 10. The former accesses U.S. Highway 85, the primary north-south thoroughfare to Denver and key delivery or shipping routes.

“This is built on a one-plant concept: One building to house two concrete masonry production lines, curing chambers and batch plants, aggregate storage and future wet cast line,” says Basalite Colorado General Manager Joe Kerrigan. “It is not easy fitting into one building.”

Ranking among the most ambitious of its kind in North America, the plant brings Architectural and Landscape lines under a functional, aesthetic enclosure exceeding four acres of gently sloping roof. To elevate team member safety and morale, the Architectural and Landscape lines are bathed in natural lighting from a clerestory at a roof step up—hovering aggregate storage and concrete batching levels—plus translucent panels spanning each elevation. Block, paver and segmental retaining wall unit output hums on the shoulders of Standley Batch Systems, Besser Co., Quadra USA, Pathfinder Systems and Rotho workhorses: Twin, three-level batch plants with ample aggregate and cementitious materials storage; Servopac Select six-at-a-time and Q12 HP 12-at-a-time product machines; Tiger cuber, de-cuber and unit conveyance systems; GMM grinding and polishing, plus Cogeim shotblasting machinery; and, single room curing kilns.

Basalite Colorado chose the equipment and machinery to seamlessly pick up its existing site’s block, paver, slab SRW unit capacity,

bearing primarily on two seasoned Besser V3-12s; enable production of new units or shapes proven in sister California, Idaho, Nevada, Washington, Alberta and British Columbia plants; and, support product development that will keep its brand front and center with Intermountain Region building masonry and hardscape dealers.

“We had reached our capacity at the old plant, and have a lot of confidence in this industry and wanted to make the investment,” affirms Basalite Concrete Products President Erik Absalon, based at Roseville, Calif. headquarters. He and his colleagues’ outlook for the immediate Denver and Front Range market, plus future Intermountain State business, has solid footings. New U.S. Census figures show Colorado population climbing 14.8 percent from 2010-2020—just shy of 750,000 new residents. The seven states sharing a border with Colorado saw a 7.3 percent average population increase over that period. Closer to home, Fort Lupton is within the Census Bureau’s Greeley, Colo. metropolitan area; a 2010-2019 population spike of 28.3 percent placed it at #6 spot in nation’s top 10 areas for growth.

*Continued on pages 44-49*



The Basalite Colorado hardscaping plan phase one entailed installation of 50,000 sq. ft. of Spec Pave 100 permeable pavers across parking area for 200-plus cars. Extensive landscaping and retention pond excavation will follow in future phases. An apron on the east, north and west (rear, above) elevation affords expansive storage for Architectural and Landscape line output. Up to 90 feet at its widest points, the concrete service pavement provides designated lanes for dump, tanker and tractor trailer drivers.



SITE, PLANT PHOTOS: Basalite Concrete Products



PHOTOS: Standley Batch Systems



PHOTO: Wurschum North America

Basalite Colorado's product development plan calls for maximum color versatility in mix batching and blending. It hinges on a Wurschum weighing and blending station for Bayferrox granulated pigments (above) with four-hopper Standley Batch dispensing assembly (left), programmable for specific or random colored mix feeds. The weighing and dispensing equipment serves both Architectural and Landscape lines.

Early in Fort Lupton site planning, Basalite Colorado management factored Denver operation downtime rooted in outdoor aggregate handling and storage, plus quality control concerns tied to moisture levels of saturated or frozen sand and gravel. The greenfield plant afforded opportunity to bring aggregate storage under roof, with bins and twin, three-level batch plant structures placed along an efficient axis paralleling the plant enclosure's west elevation—behind Architectural and Landscape production areas.

Aggregate is unloaded at Fort Lupton in one of two drive over hoppers positioned along a main service drive (opposite page) trafficking dump trucks and building or hardscape unit trailers. The hoppers charge two galvanized panel-shielded incline belts feeding twin shuttle conveyors that serve 20 different aggregate bins, each equipped with individual WAM dust collectors and Hydronix moisture probes. The only materials at Fort Lupton stored in outdoor structures are cementitious. Standley Batch tailored three silos for each batch plant (opposite page). The silos are grouped along the west elevation, sufficiently separated from the aggregate bunker so dump and tanker truck drivers do not interfere with each other. The silos extend 67.5 ft., a height at which they are concealed from east, north and south elevations due to a 72-ft. eave height on the enclosure bay spanning the batch plant structures, conveyors and aggregate bins.



PHOTOS: Standley Batch Systems, Skako Inc.



AM3750



RTX750

Standley Batch Systems engineered the aggregate bins to feed weigh belts charging two conveyors, one each for Architectural and Landscape line batch plants—the latter shown here. Anchored by Skako AM 3750 mixers, the plant structures have batching, mixing and charging levels. A Skako Rotoconix RTX750 model, equipped with whirler and auger components for high intensity mixing, runs in tandem with the Landscape AM3750. The larger mixers have multiple discharge gates feeding up to three hoppers as color mix sequencing requires.

## ARCHITECTURAL LINE



Anchoring the Basalite Colorado Architectural line is a six-at-a-time Select, one of three models in the Servovac family of machines Besser Co. debuted in 2007 to provide enhanced safety mechanisms and production versatility, plus expedited height and mold changes. The Fort Lupton Servovac Select runs 20-1/2- x 55-in. (521 x 1400 mm) steel pallets and is housed in an 8- x 16-in. concrete block enclosure. Engineered to operate using hydraulic actuators and proportional controls, the Select features easy and quick changes for almost all machine settings from the HMI, eliminating mechanical changes. Capabilities include the ability to increase and decrease the height of the product in 1 mm increments, create set points for different products which are saved with each recipe to facilitate quick mold and height changes, and controlling acceleration and deceleration of feedbox, pallet receiver and stripper head operation to produce consistently precise concrete masonry units.



This Basalite plant is equipped with a mold package from Besser, including some big board molds that run on the Landscape line's Quadra machine. The package includes a mold for large format masonry 8- x 32- in. units. Besser provided Basalite with adapters for running its existing inventory of molds, including ones from machinery competitors plus three-at-a-time Besser molds that ran on the former Denver plant's twin V3-12 machines. An integrated core puller gives Select operators the flexibility to produce a full range of product requiring core holes in them.

A mold rack and rail-guided transfer device are installed to the right of the Select. Mold changeover is quick, as machine operators push a button to clamp the head before the vibrator motors are disengaged. The safety features accompanying mold changeover are mirrored in the Servovac Select clean mode. Upon activation, it locks the pallet receiver down and the head up, guaranteeing the latter device will not lower during routine maintenance or feedbox checks.



On the dry side, units travel to dual splitting and cubing lines. The former has an S63, 24-in. primary splitter plus two Quicksplit II splitters for specialty block products. They include corner split units, which are lifted from center split position, pivoted 90 degrees, then set for the second splitting and automatic return to the main line for cubing. Twin automatic cubers, featuring proportional hydraulic controls, a powered infeed conveyor, triple turntable patternmaker and overhead side feed, are fed by an overhead wood pallet dispenser. A unique combined cube run-out incorporates dual 90-degree cube transfers. This cube outfeed system receives ground and polished units as well from other sources.



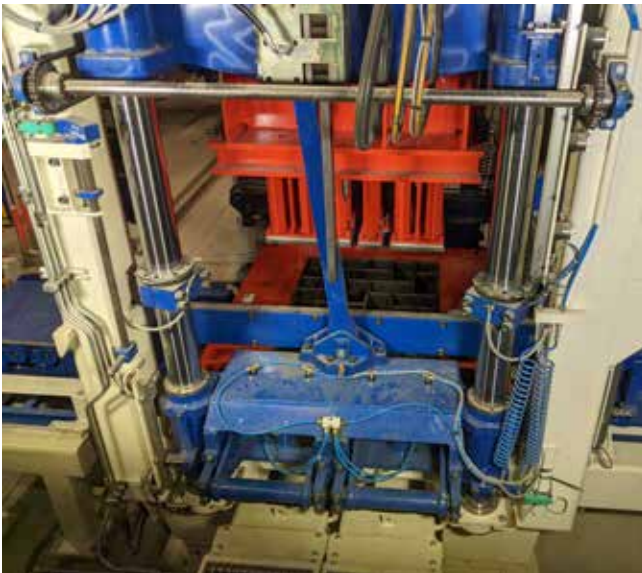
Basalite Colorado marks the Besser Pallet Transport System (PTS) debut. The new car sports four-wheel drive, along with fully electro-mechanical design to assure consistently gentle and precise product handling. The Architectural line has the 60,000-lb. PTS, the largest of three models engineered in 20,000-lb. increments. Each can service kilns regardless of their configuration within a plant thanks to a speed-controlled turntable, located on the car and equipped to precisely position the crawler to load the kilns. The crawler is outfitted with eight wheels, four of which are driven, and an electric, cam-driven lift mechanism for smooth handling of green and cured product. Doubling shelves provide an additional degree of functionality; 12-in. tall product can be accommodated when employed. An encoder and floor located actuators allow for precise product placement on kiln shelves.

The PTS has crawler and car remote controls; a 15-in. touchscreen enables travel speed and unit profile settings plus diagnostics. The equipment is especially geared for Fort Lupton, as it can be set up to handle a wide variety of concrete unit sizes, shapes, and weights, including slabs, paving stones, brick, standard and architectural block, plus segmental retaining wall and curb products.



Through North American representative ISI, Germany's Rotho built two Big Chamber model kilns for the Basalite Colorado plant. Temperature and moisture levels are independently controlled for Architectural and Landscape product curing. Rotho engineers customize the Big Chamber design and add seismic provisions as warranted. Each Fort Lupton plant chamber has ProCure heating and humidification systems to support the best curing climates throughout the year, owing especially to powerful aluminum or coated fans and high air exchange rates. A two-step humidification assembly, the Delta-T Control, uses only as much power as required for curing target. Additional energy-saving aspects include stainless steel doors with heated frames and air curtains at kiln openings.

## LANDSCAPE LINE



Quadra, a French manufacturer of all types of concrete products manufacturing equipment and a specialist in robotic handling, has installed over 300 plants throughout the world. The Basalite Colorado Landscape production line marks the company's U.S. premier. Quadra USA Inc., the domestic subsidiary launched in 2017, and U.S. representative GMS Molds in Carson, Calif., delivered Fort Lupton a complete Quadra Q12 HP plant running 1,400 x 1,100 steel pallets. Basalite Colorado can extend its paver and segmental retaining wall offering thanks to the output potential of the 12 at-a-time machine—housed in a concrete masonry enclosure adjacent to the Architectural line.

The Q12 HP features open architecture for easy maintenance access and cleaning ease at and below molding level, and the machine bears on hard rubber pads to minimize stress and limit floor vibration. The machine's vibrator shafts run side to side versus from back to front. That feature allows the operator to control vibration differently in the front of the mold from the back for proper material distribution throughout, and assures consistency in paver or wall unit height and density. A controllable agitator which agitates independently within the feed box further promotes optimal mix distribution.

At the front of the Q12 HP, three static bars hold the pallet in place with the mold and operate alongside mechanical stops to ensure product height accuracy. These static bars move away from the pallet during the fill cycle, allowing for free movement of the mold and higher amplitude of vibration. The machine tamper head always returns to the same spots, stopping on four columns, regardless of the height of the product being made. Automatic height controls adjust cycle to cycle.

The Quadra Q12 HP is equipped for speedy mold change, quality control convenience and safety. The machine automatically releases a mold to a car, which transfers it to a rack, then retrieves the new mold and secures it with quick release clamps. The feed box is automatically adjusted during mold transfer. A camera accompanies the Q12 HP quality control station to provide the option of visual product tracking. Basalite Colorado Landscape line operators wishing to spot check units can also have a pallet lift up from the conveyor with the push of a button, while normal production continues.



PHOTOS: Quadra USA



To attain the automation level Basalite Concrete Products envisioned at Fort Lupton, Quadra USA designed a product handling and packaging line utilizing five robots: one depalletizing robot, two for pattern making and turning, a tier cubing robot and a wood pallet placement robot. Products can travel down one of three lines, two lines take products to two separate splitters and a central line takes non-split products straight to the cubing robot.



## SURFACE TREATMENT



Pathfinder Systems built the Fort Lupton surface treatment line perpendicular to Architectural product transfer and handling (upper right), supplying Tiger Machine Cuber, De-Cuber and Conveyance equipment, plus a GMM grinding and polishing machine and Cogeim shot blaster. The full system was designed and conceptualized by Pathfinder in partnership with Basalite Colorado's team as well as the partners that Pathfinder represents. The surface treatment line is equal to block, pavers and slabs; each machine and handling device is equipped for automated height change.



The GMM machine features fully automated de-cubing and layer separation for multiple product line handling; 48-in. grinder to process a full layer or up to six 8-in. concrete masonry units; two flippers for processing both the top and bottom of the product; four diamond wheels for calibration and basic grinding; multiple polishing heads for a high-end finish; infrared and heating dryer for quality control; and, shot blaster that is capable of rolling in and out of line to create stand-alone shot blasting units or units with a combination of processing types.



PHOTO: Pathfinder Systems

## WATER RECYCLING: A PRICE OF ENTRY AT FORT LUPTON

The Fort Lupton plant team prioritized process water management. A closed-loop recycling system would address concerns of long-term fresh water consumption and costs, and convey a more immediate environmental stewardship message bolstering community relations. The system will recycle the new operation's process water, including mixer wash out, along with Architectural line grinding station slurry.

The Basalite Colorado team opted for a Water Treatment Solutions "chemical free" filter press based system. It includes a 25-cubic-foot "J-Press" filter press with 50 800-mm plates, 8,250-gal. pre-press gray water cone bottom storage tank, and 9,000-gal. post-press clear water storage tank. Operating cycles are automated with a remote alarm notification telemetry that flags operators and management via text message or email when an anomaly or service point is required. Water Treatment representatives can also access this control module remotely to modify system parameters.

An integral part of Basalite Colorado system design is an environmentally friendly, carbon dioxide based, pH adjust system that automatically lowers pH without the use of mineral acids—from 12.5 into the neutral 6.5-7.5 pH range, without any carbon dioxide emissions.



PHOTO: Water Treatment Solutions

## COMMUNITY BUILDER

Industry veterans previously accustomed to crossing the Atlantic Ocean for the best plant design, automation and equipment ideas will see the new Basalite Colorado flagship as another reminder that Europe is no longer the exclusive domain for advanced concrete masonry molding, finishing and packaging. The producer harnesses the latest in block, paver, slab and SRW production safety, flexibility, energy conservation and uptime provisions at Fort Lupton:

- Red and green blinking lights respectively indicate running and idle machines;
- Pull cords afford instant conveyor shut down along product handling areas where team members are in close proximity;
- Abundant rows of LED fixtures augment the clerestory and side panel daylighting, leaving no area of machine operation or equipment trafficking in the dim or dark;
- Pallet handling devices are configured to ensure Architectural and Landscape line wet and dry sides run independently, eliminating idle intervals such as those when an accumulator awaits machine cycle completion; and,
- A touchscreen monitor for the kiln codes product by green or gray status, replacing a traditional white board and grease markers used to locate racks or rows of cured building or hardscape units.

Safety and efficiency details continue on the exterior: Dump, tanker or tractor-trailer drivers dispatched to the Fort Lupton plant have ample room to stay in their own lanes. With an eye to fast delivery and loading intervals, but minimal collision risk, Basalite management tasked Fort Lupton site engineers with a concrete service pavement and asphalt plant enclosure apron. Placed in a sweeping U pattern, the truck pavement reaches 90 feet at its widest and ensures that aggregate and cement delivery, plus block, paver or SRW loading, proceed in a timely manner, even at traffic peaks. Early measurements suggest that unloading or loading cycle times have improved upward of 25 percent against Denver plant metrics.

The Fort Lupton plant lies along a three-lane (first phase) thoroughfare the producer helped build: South Rollie Ave., 1.2 miles long and connecting County Roads 8 and 10. The best point of reference

for many plant-bound visitors wise to concrete production is a cement silo. Excepting U.S. 85 one mile to the west, Basalite Colorado doesn't give up that aspect from most angles—thanks to plant enclosure architecture. The 189,000-sq.-ft. structure is efficiently configured to align aggregate storage, transfer and batch plants along the rear, or west, elevation; and, center-situated Landscape and Architectural lines sandwiching dedicated kilns.

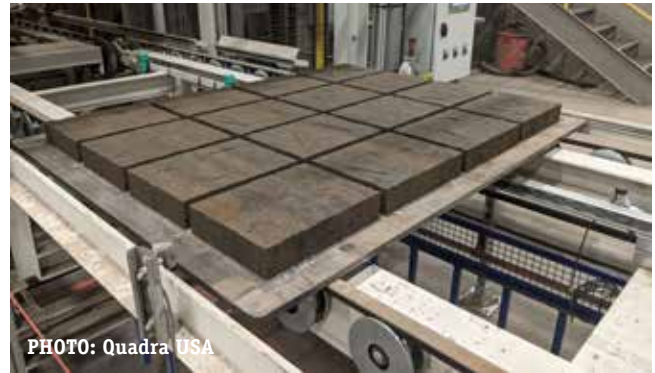


PHOTO: Quadra USA



PHOTO: Besser Co.



PHOTO: Basalite Concrete Products