



# Concrete Plant International North America Edition

**NEWS** Towards sustainable civil engineering works using precast concrete solutions  
**CONCRETE TECHNOLOGY** Modernized Jessup plant strengthens CP&P regional position  
**CONCRETE PRODUCTS** Solar Reflectance Index (SRI) of Concrete **CONCRETE PIPES AND MANHOLES** Concrete pipe with HDPE lining and plug connection instead of weld is internationally successful on construction sites **PRECAST CONCRETE ELEMENTS** Increasing productivity by factor 10 using automated carousel operations



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## Plant – Product – People

Concrete pipe associations and their corporate members understand that successful concrete pipe production facilities are largely dependent upon modern plants, products that can be easily specified in a highly competitive marketplace, and well-trained people who can produce pipe and other precast products to Standards that are accepted industry-wide. The staff complement consists of a range of professionals from skilled production workers to management. All are trained in teamwork paradigms, and health and safety protocol. Successful operations are fully integrated with in-house personnel and outsourced material suppliers and service providers.

■ Matt Childs, P.E.,  
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### Plant

The shift in production technology is to robotic plants characterized by hoppers passing almost silently on overhead tracks; machines placing pallets, cores, reinforcement, and jackets; moving floors; multiple-diameter pipe sizes being produced simultaneously from a single pipe plant; hard and soft walled curing rooms; mechanical arms; and devices preparing pipe for cleaning and labelling, while it is moved in

stages to the yard. Robots and automated systems produce pipe with precise tolerances in mix design, shape, and strength. There are, however, critical considerations when upgrading plant automation. Each step of a plant's automation needs to be assessed on a cost/benefit basis and return on investment. Among the first areas to be upgraded would be the point where concrete is fed into the forms. This improves quality and reduces operator fatigue. Areas that cost the company the most, such as increased insurance premiums related to worker's compensation, lost production time, and areas of greatest risk to the

employee's health and safety are foremost for upgraded automation. And, automation needs to be reasonable for the work station. The cost of automation versus the payback is an exponential curve. At the steep end of the curve, a high price is paid for little gain in cost savings. Each pipe producer needs to find this point for the operation to become profitable. In addition, it is good practice to examine the critical path of operations and recognize where automation improvements are not needed, or interferes with production. Most automation improvements focus on activities that are repetitive or prevent employees from get-



Georgia Department of Transportation educational tour of Rinker Materials facility in Stockbridge, Georgia, 2014 (Photo: Scott Jordan, P.E., Georgia Engineer, American Concrete Pipe Association)

ting in harm's way. One of the less obvious benefits of improved automation and full-scale use of plant robotics is the attraction of youth into the industry who are seeking long-term technology careers in workplaces that are safe and clean.

## Product

Competition among concrete pipe producers continues to accelerate while they work with clients to develop products to meet federal, state and municipal policies on sustainable development and changing weather patterns due to climate change, and to provide alternatives to product offerings of manufacturers of thermoplastic and corrugated steel drainage systems. The rapid shift by policy makers to the recognition that storm and sanitary pipeline systems and culverts are critical infrastructure that needs to be resilient to natural and man-made calamities is opening opportunities for new precast products. Competition is heightened by the introduction of materials for gravity sewer pipe and the relentless drive by manufacturers of thermoplastic and corrugated metal conduit products to capture market share from concrete pipe producers and hold that share. Concrete pipe producers are pushing back relentlessly and opening new markets by introducing innovative applications for standard concrete pipe and precast box products, improving Standards and working with pipeline system designers and specifiers to include concrete pipe and precast boxes on projects.

There are ASTM and AASHTO Standards for concrete pipe design, joints and gaskets. The versatility of joints allows the designer to match project requirements with an appropriate joint and seal. Soil-tight and water-tight joints have the ability to accommodate lateral or longitudinal movement with options that include mortar, flexible joint sealants, rubber gaskets and external sealing bands. ASTM Standards for admixtures help reduce the cost of concrete construction, help achieve certain properties in concrete more effectively than by other means, and maintain the quality of concrete during the stages of mixing, transporting, placing, and curing in adverse weather conditions. Innovation in mix design and equipment allows a wide range of pipe sizes up to 144 inches in diameter. Concrete pipe can be supplied as either

reinforced or non-reinforced, using mixes that have strength and durability properties that give choices to pipeline system designers and specifiers. With consistency in three-edge bearing tests, absorption, density, and pipe joint performance, the outcome is products that meet stringent infiltration and air testing targets in the field.

## People

Production and management teams must have the ability to adapt to constantly-changing advances in plant technology and business practices. In addition to a complete understanding about the design of concrete pipe, employees have to demonstrate mechanical, electrical and computer systems aptitudes to operate and maintain an automated plant. Continuous training and retraining is essential to successful concrete pipe production facilities. Over its 107-year history, ACPA has been instrumental in building knowledge about concrete and the behavior of precast pipe and other precast products. Today, a variety of short, medium, and long-term education programs ensure a strong knowledge-based industry and successful careers for professionals in the employ of concrete pipe producers.

There are immediate needs for information and knowledge that are met by ACPA's Pipe School, Quality School, webinar series, and Newscast. Each has a unique delivery means, but a common goal is to help members be more effective in increasing the market share of precast concrete pipe and boxes. Pipe School offers seminars on marketing, engineering, production and safety that address issues of the day, innovation, and refreshers to sharpen the knowledge and skills of attendees. Webinars are information updates and overviews of technology and marketing/sales. Newscast is the ACPA's monthly e-newsletter that details regional activities and current events with contacts and links.

ACPA's medium-term education programs include P3 training, an installation program that is delivered locally for contractors, and plant tours by producer members to selected audiences, so that information and knowledge-sharing is tailor-made. The P3 program focuses on technical, sales and marketing training.



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There is a need for a long-term education program for people interested in careers in the concrete industry, or advancing their knowledge gained through experience. ACPA fulfills that need through a partnership with Middle Tennessee State University and its Concrete Industry Management (CIM) department. The school now offers an executive MBA degree in CIM through the Jennings A. Jones College of Business at Middle Tennessee State. CIM is the home of the program that trains future leaders of the concrete industry. CIM graduates work for manufacturers, material suppliers, ready-mixed concrete companies, contractors, testing labs, trade associations, home builders and developers.

Modern automated plants, precast concrete drainage products that fulfill the needs of a 21st Century America, and knowledgeable people trained and retrained in technology, health and safety and teamwork are the three pillars of successful precast concrete enterprises. The outcome is a sustainable concrete pipe industry and a well-trained workforce. ■

## FURTHER INFORMATION



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