

Prestressed Concrete Plant Innovations

Troy M Jenkins, P.E.

Chief Engineer

Northeast Prestressed Products, LLC

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- ▶ Major Prestressed Bridge Beam and Bridge Component Manufacturer in Mid-Atlantic and North East of America
 - ▶ Located in Cressona, PA
 - ▶ 80,000 sqft production area on 28 acre property
 - ▶ Founded in 1950, formerly known as Schuylkill Products
 - ▶ 2009 - Purchased by Glenn O. Hawbaker
 - ▶ Provides product from KY to VT

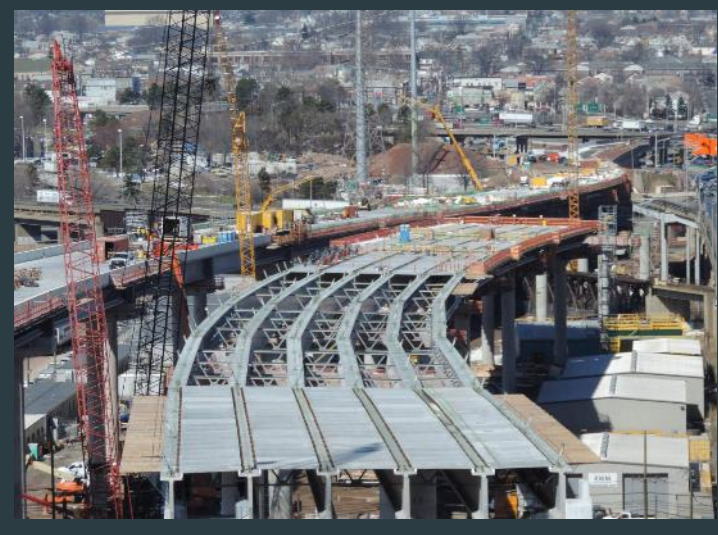
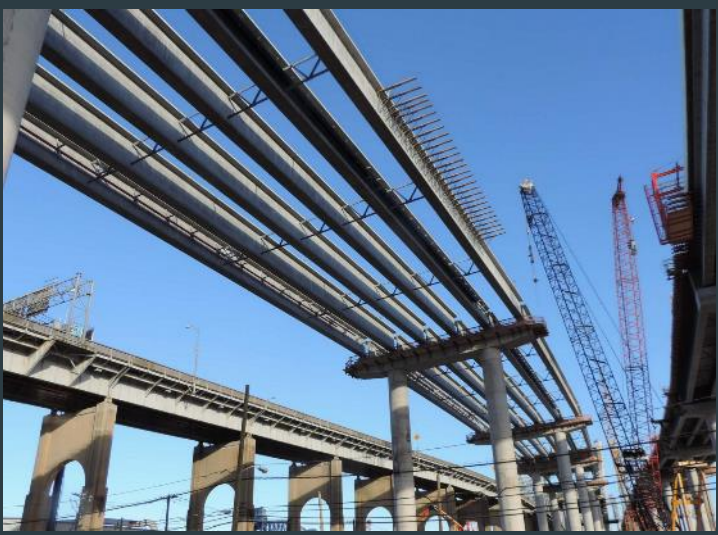
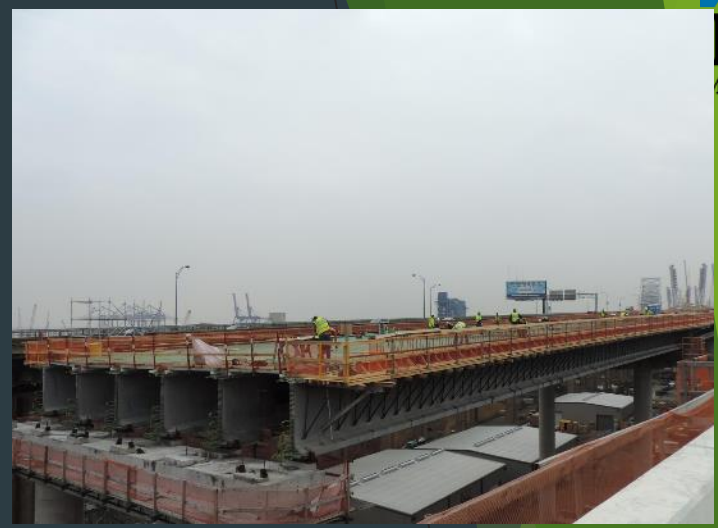
\$8,000,000 Upgrade Program

Panama Canal



Goethals Bridge

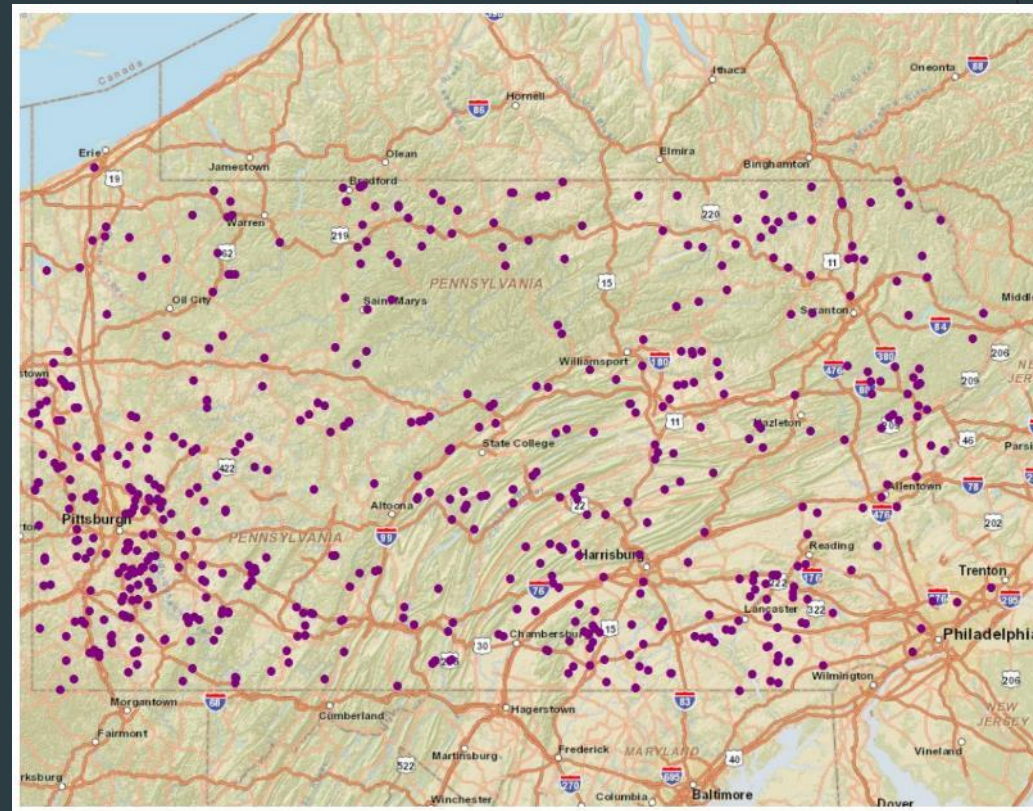




\$8,000,000 Upgrade Program

Act 89

PA Rapid Bridge Replacement Project



ABCD Susquehanna Chapter 2017 Technical Conference, Sept. 6, 2017



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\$8,000,000 Upgrade Program

Goethals

- ▶ 398 Prestressed Girders up to 178ft long and 112 Tons
- ▶ 6500 Partial Depth Deck Panels
- ▶ 600 Flanking Span Panels

P3

- ▶ 400 +/- precast bridges
 - ▶ Unknown what will be designed
 - ▶ Some total precast
- ▶ What we know Today - 335 NPP Bridges:
 - ▶ 1715 Box Beams (118,409 LF)
 - ▶ 95 BT Beams (10,721 LF)
 - ▶ 213 Precast Members for 6 bridges
 - ▶ Adding bridges every month...

Improvements

Hauling and Yard Equipment

- ▶ 9 - 8 Axle Steerable Nelson Dollies
 - ▶ Air bags keep load level
 - ▶ 18" Power Tower in rear
 - ▶ Turning Radius improved
 - ▶ Designed for 1200 Ton Product
- ▶ 9 - 4 Axle Jeep Dollies
- ▶ 1 - 70 Ton Mi-Jack Straddle Carrier



Improvements

Form Work

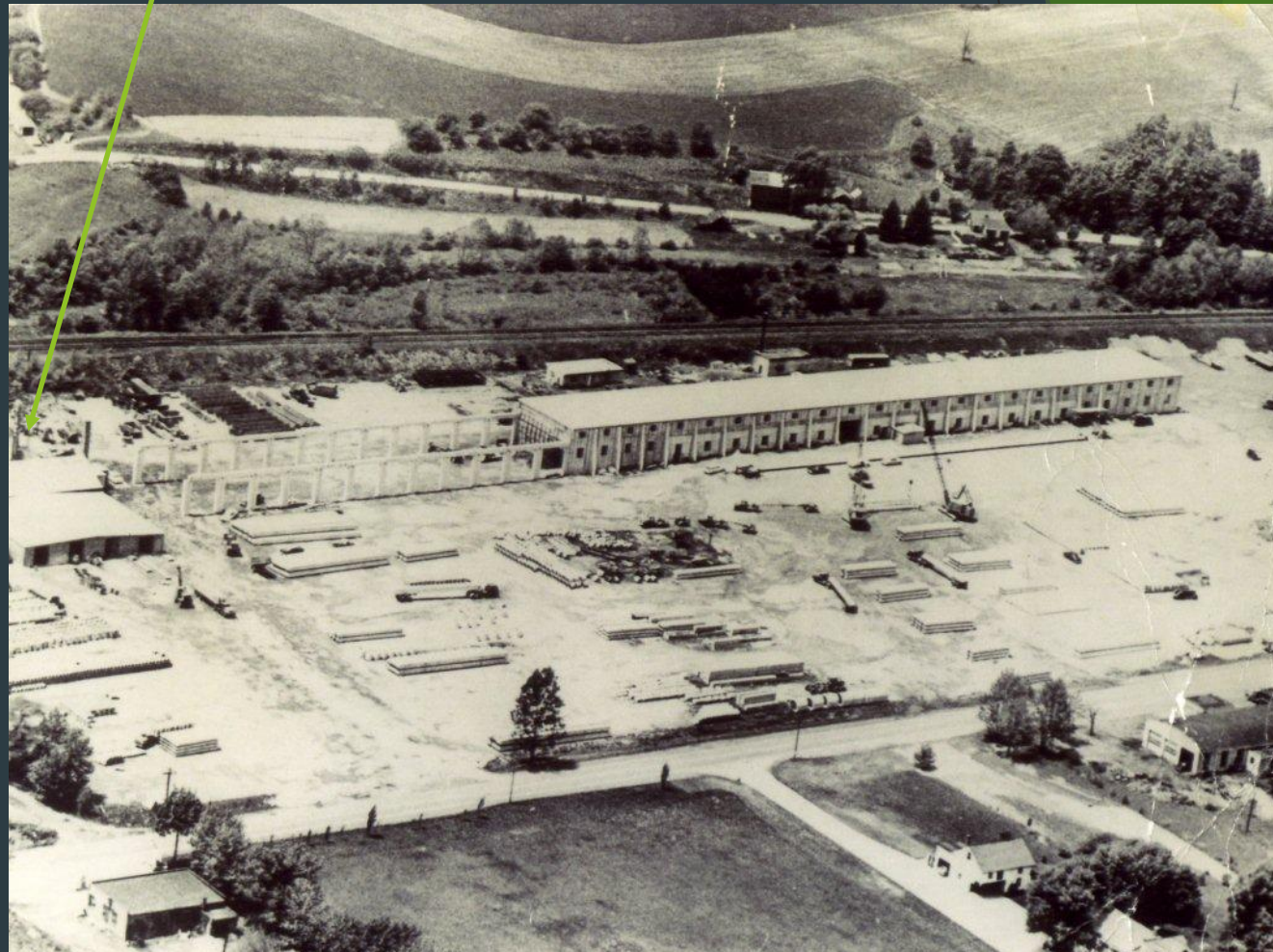
- ▶ 2 new 305ft long box beam forms
 - ▶ Bed 1 - 27" and under
 - ▶ Bed 3 - 48" and under
- ▶ 90 LF 33X31 PABT form
- ▶ 2 Vertical Precast abutment wall forms - Battered wall on any slope.
- ▶ 280 LF of Self Stressing Deck Panel bed.
 - ▶ Automated
 - ▶ Cleaning and oiling
 - ▶ Stranding
 - ▶ Concrete screed and tine
 - ▶ Tarping



Agg Storage

New Batch Plant Requirements

- Move plant outside to free up indoor space for new deck panel product line
- Protect batch plant and material storage from weather
 - Includes heating aggregate
- Provide significantly more storage for raw materials.
- High shear mixer capable of producing HPC, SCC and consistent 4 CY batches
- Reduce batch cycle time and provide flexibility and increased mix distribution
- Provide higher level of system automation
 - Microwave moisture technology
 - Maintenance reminders
 - Automated inventory tracking and reordering
- Reduce or eliminate overtime hours for batch cleanup.



New Batch Plant Requirements

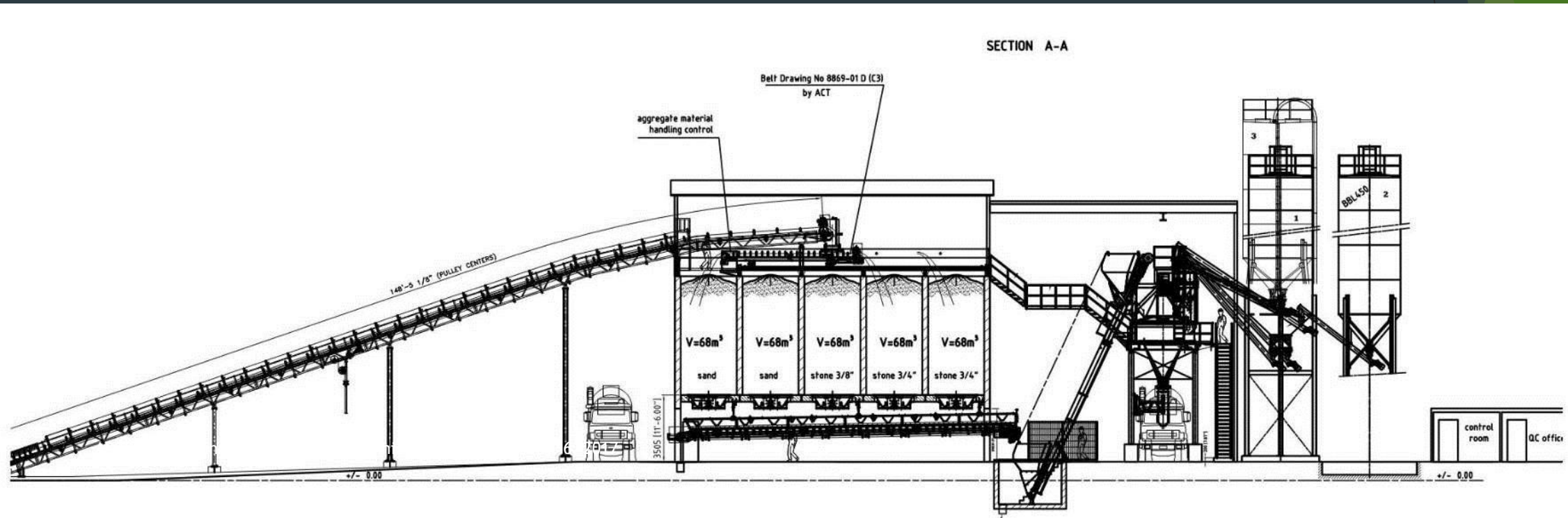
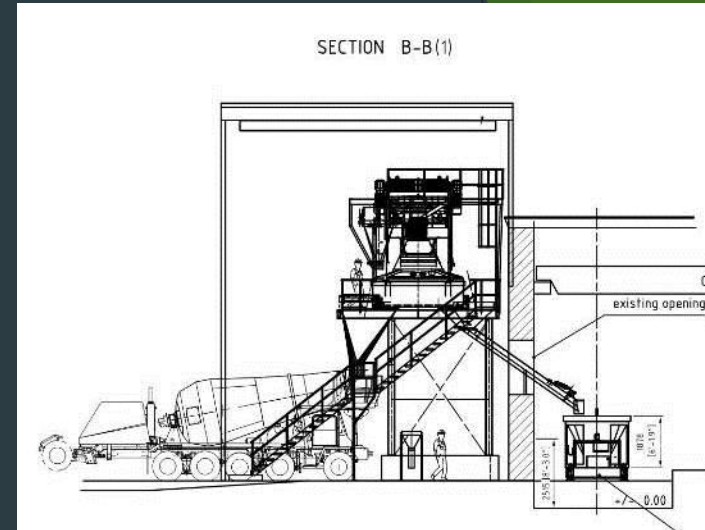
- Meet requirements of 9 current State Agencies Precast/Prestressed Specification
- Prove to State DOT's that mix designs are still valid.
- **LIMIT NPP PLANT DOWN TIME for transition to new plant to 5 days (over a 3 day holiday weekend.)**



Project Team

- ▶ Contractor - Kinsley Construction; York, PA
 - ▶ Engineering Sub - C.S Davidson; PA
- ▶ Batch Plant Design - Advanced Concrete Technologies; Greenland, NH
- ▶ Batch Plant - Wiggert+Co. Kabag; Karlsruhe, Germany
- ▶ Heating Control system - James Craft & Son, Inc ; Manchester, PA
- ▶ Aggregate Building Design - EnCon United; Colorado
 - ▶ Engineering Sub - DRL Drafting & Design; Wisconsin
- ▶ Aggregate Panel Manufacturer - NPP

Schematic



Aggregate Storage



- Removed triple handling material
- Sensors prevent overfilling
- 600 Tons of storage capacity



Aggregate Storage



- Computer controlled heat and mist
- Arrow shows Hydrotester microwave moisture sensor
 - Real time moisture of Sand and automated weight correction when permitted
- Weigh belt transfers material to skip hoist.

Mixer

- ▶ ACT/Wiggert MobilMat Mo4500-5-WCS
- ▶ 4.0 CY planetary countercurrent pan mixer
- ▶ Dual Discharge
 - ▶ Inside production facility
 - ▶ Sample test chute that can load trucks as well
- ▶ WCS Control System - Fully automated can run preprogrammed without operator.
- ▶ Hydromat microwave moisture measuring in plant
 - ▶ Adjust batch water based on density of water in sand and stone for precision concrete.
- ▶ Automated Washout system
- ▶ Dust collection system





Success...

- ▶ Reclaimed about 3000 SQFT of valuable production space
- ▶ Improved Mix design strengths, which will lead to lower cement demands as we redesign mixes.
- ▶ Greater output - can do in 8 hours what used to take 12...
- ▶ Increased flexibility - not only can we work faster but can cast two different projects at the same time by alternating buckets.
- ▶ Reduced overtime
- ▶ Improved accuracy and consistency - reduction of rejected concrete
- ▶ Improved safety
- ▶ **DID IT IN LESS THAN 5 DAY SHUTDOWN!!!**

Questions?

- ▶ Troy M Jenkins
- ▶ tmjenkins@npp-llc.com
- ▶ 570-385-2352

