New High Rise Bridge
The Largest Design-Build Project in VDOT History

PRESENTED BY GARY SHRIEVES

COASTAL PRECAST SYSTEMS
WWW.CPSPRECAST.COM
WILMINGTON • CHESAPEAKE • CAPE CHARLES
1946  John “Jack” Ogorchock in 1946 as a trucking company in Brookeville, PA. His company expands into supplying concrete materials and ready-mix concrete, opening a plant in DuBois. DuBrook Concrete is born.

1970’s-80’s  DuBrook expands in Pennsylvania; opens new locations in Texas and Northern Virginia

1985  Concrete Precast Systems (a DuBrook division) produces its first precast job- 250,000; of barrier

1991  Concrete Precast Systems produces 1,000,000 sf of sound wall in Chesapeake, VA

1993  Absorptive sound wall, Whisper Wall ™, is created/patented by Paul.

2007  Coastal Precast Systems secures first large project, $25M Washington Bypass for NCDOT (1,000 girders and 1,200 30” pile).

2014  CPS expands to Wilmington, NC

2019  CPS expands to Cape Charles, VA
5 YEARS AGO
Cape Charles
- 90 Acres
- 2 Docks for Loading Barges:
  - One 220’ x 60’ Pier
  - One 650’+ Dock-able Bulkhead
  - Two American Cranes, Two 150-ton MiJacks
- 120 CY per Hour Concrete Batch Plant

Chesapeake
- 50 Acres
- 160,000 SF Indoor Manufacturing Facility
- 4 Docks for Loading Barges:
  - Two 160’ & Two 270’ long piers.
  - Can accommodate up to 75’ x 300’ barge with 14-ft draft.
  - 400-ton maximum capacity Pier Crane
- Railroad Delivery Capabilities
- 150 CY per Hour Concrete Batch Plant

Wilmington
- 40 Acres
- 200+ CY per Hour Concrete Batch Plant
- Convenient access to interstate highways
- Seven Prestressing Beds
STATE AND FEDERAL CLIENTS:
## CPS MAJOR PROJECTS

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>OWNER</th>
<th>PRECAST VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Rise Bridge</td>
<td>VDOT</td>
<td>$20M</td>
</tr>
<tr>
<td>New Bonner Bridge (Marc Basnight Bridge)</td>
<td>NCDOT</td>
<td>$55M</td>
</tr>
<tr>
<td>Washington Bypass (Hwy 17)</td>
<td>NCDOT</td>
<td>$25M</td>
</tr>
<tr>
<td>Silver Line (Dulles Metro)</td>
<td>WMATA</td>
<td>$30M</td>
</tr>
<tr>
<td>Wilmington Bypass (NC-17)</td>
<td>NCDOT</td>
<td>$27M</td>
</tr>
<tr>
<td>Tappan Zee Bridge</td>
<td>NY Thruway</td>
<td>$30M</td>
</tr>
<tr>
<td>Rodanthe Bridge</td>
<td>NCDOT</td>
<td>$24M</td>
</tr>
<tr>
<td>Charleston Terminal &amp; Port Access Road</td>
<td>SCDOT</td>
<td>$25M</td>
</tr>
</tbody>
</table>
NEW HIGH RISE BRIDGE/I-64 SOUTHSIDE
BID AWARD

**Project Award:** Granite Parsons Corman Joint Venture

**Estimated Cost:** $409.6 million

(unded by Hampton Roads Transportation Accountability Commission, VA’s Smart Scale Program, and Federal Highway Administration).

**Project Footprint:** Approx. 9-miles of I-64

**Benefits:**
- New High Rise Bridge (fixed span w/ 100-ft vertical clearance)
- Increased Capacity and Safety for Traffic
- Additional Lanes (express lanes each direction)
- Realignment of Great Bridge Blvd. Bridge
- Drainage Improvements
- Asphalt Overlay
NEW HIGH RISE BRIDGE/I-64 SOUTHSIDE
PROJECT OVERVIEW

PROJECT START: Bowers Hill (I-264 Intersection)

New Construction: New High Rise Bridge (South of Existing Bridge)
Bridge Widening(s): Shell Road (29” PCBT), Yadkin Road (29” PCBT & 37” PCBT)
Bridge Replacement(s): Great Bridge Blvd. (85” PCBT)

PROJECT END: Battlefield Blvd. (Chesapeake Expressway)
NEW HIGH RISE BRIDGE
PRE-STRESS/CAST MEMBERS

PILES
- 18” Sq. Pile
- 24” Sq. Pile
- 36” Sq. Pile
- 66” Cylinder Pile

GIRDERS
- 77” PCBT
- 93” PCBT
- 95” PCBT

MISC.
- Pile Tubs
- Pile Collars
- Sheet Pile
- Deadman Blocks
NEW HIGH RISE BRIDGE
STEEL REINFORCEMENT LOCATIONS

BLACK UNCOATED REBAR

CARBON FIBER (CFRP)

STAINLESS STEEL REBAR

ABUT A

PIERS 1-9

PIERS 10-19

PIERS 20-31

PIERS 32-36

ABUT B
NEW HIGH RISE BRIDGE
66” STATIC CAST CYLINDER PILE

- **QTY Produced:** 88
- **Pile Length:** 75’ to 139’ (avg. 108’)
- **Wall Thickness:** 6 ¾” (54 of 88 pile produced with 12” wall at tip)
- **Weight:** 1,387 #/LF (139’ = 96.4 tons)
- **Concrete Strength:**
  - 28-day: 7,000 psi
  - Release 4,900 psi
- **Stainless Steel Reinforcement:**
  - Strand: (36) 0.6” dia. 250 ksi low lax
  - Spiral: (Avg. 411 turns) W11 (#3 Bar/Grade 75)
  - Rebar: (68) #5 Bar/Grade 75
NEW HIGH RISE BRIDGE
MODIFIED 12" TIP WALL

ELEVATION

CLEAN 15'-0" OF INSIDE SURFACE OF PILE HEAD W/ HIGH PRESSURE WATER BLAST (3000 PSI MIN.)
NEW HIGH RISE BRIDGE
66” STAINLESS STEEL CYLINDER PILE

**STATIC CAST PROCESS**

1) Form prepped, strand and spiral pulled down bed.

2) Spiral tied and strand tensioned to required capacity and inspected.

3) Formed closed, self-consolidating concrete poured and vibrated. Mix inspected throughout pour, cylinders taken.

4) Once concrete release strength reached, strands cut down and pile stripped from form, inspected.

5) Final inspection then pile loaded for delivery.
NEW HIGH RISE BRIDGE
STAINLESS STEEL 36” SQUARE PILE

36” Square Stainless Steel Pile were exclusively used for Pier 19 (near Bainbridge Rd.).

Pictured below is the first pile to arrive at the High Rise jobsite:
NEW HIGH RISE BRIDGE
CARBON FIBER REINFORCED POLYMER (CFRP)

Components required to tension CFCC:

1. Sleeve for CFCC
2. Wedges for CFCC
3. Coupler for CFCC
4. Conventional multiple splice chuck of steel cable

Pre-tensioning anchorage devices for 1x7 15.2 Ø

Packaging of CFCC:

*Diagrams & pictures courtesy of Tokyo Rope USA
NEW HIGH RISE BRIDGE
36” SQUARE PILE CFRP

- **QTY:** 112
- **Pile Length:** 98’ – 120’
- **Total LF:** 11,320’
- **Strand Count:** 36 (0.6” CFRP)
- **Concrete Strength:**
  - 6,000 psi (28-day)
  - 4,200 psi (release)
NEW HIGH RISE BRIDGE
66” PILE PRECAST TUBS & STRUTS

Steel Reinforcement: MMFX
Cubic Yards per Piece: 40 CY
Weight: 81 Tons
NEW HIGH RISE BRIDGE
36” PILE PRECAST TUBS & COLLARS

Steel Reinforcement: MMFX

Cubic Yards per Piece: 20.6 (5-pile tub) / 31.4 (7-pile tub)

Weight: 41.8 Tons (5-pile tub) / 63.7 Tons (7-pile tub)
NEW HIGH RISE BRIDGE
PCBT GIRDERS

95” PCBT
- **QTY:** 72
- **Beam Length:** 193’ – 196’
- **Total LF:** 14,025’
- **Strand Count:** 64 (0.6”)
- **Concrete Strength:**
  - 9,000 psi (28-day)
  - 7,800 psi (release)

93” PCBT
- **QTY:** 200
- **Beam Length:** 146’ – 159’
- **Total LF:** 29,840’
- **Strand Count:** 46 (0.6”)
- **Concrete Strength:**
  - 9,000 psi (28-day)
  - 7,800 psi (release)

77” PCBT
- **QTY:** 32
- **Beam Length:** 133’ – 136’
- **Total LF:** 4,360’
- **Strand Count:** 40 (0.6”)
- **Concrete Strength:**
  - 8,000 psi (28-day)
  - 6,400 psi (release)

*All MMFX & Black Steel Reinforcement*
NEW HIGH RISE BRIDGE

95” PCBT GIRDERS SPAN
ESTIMATED COMPLETION
JULY 2021
COASTAL PRECAST SYSTEMS
WWW.CPSPRECAST.COM
WILMINGTON • CHESAPEAKE • CAPE CHARLES

Photos/Content Courtesy of:

Virginia Department of Transportation
www.64highrise.org
Virginia Pilot
Tokyo Rope USA
Granite Parsons Corman JV