



# New High Rise Bridge

The Largest Design-Build Project in VDOT History



PRESENTED BY GARY SHRIEVES

# COASTAL PRECAST SYSTEMS

[WWW.CSPRECAST.COM](http://WWW.CSPRECAST.COM)

WILMINGTON • CHESAPEAKE • CAPE CHARLES



# 70+ YEARS OF EXPERIENCE

**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

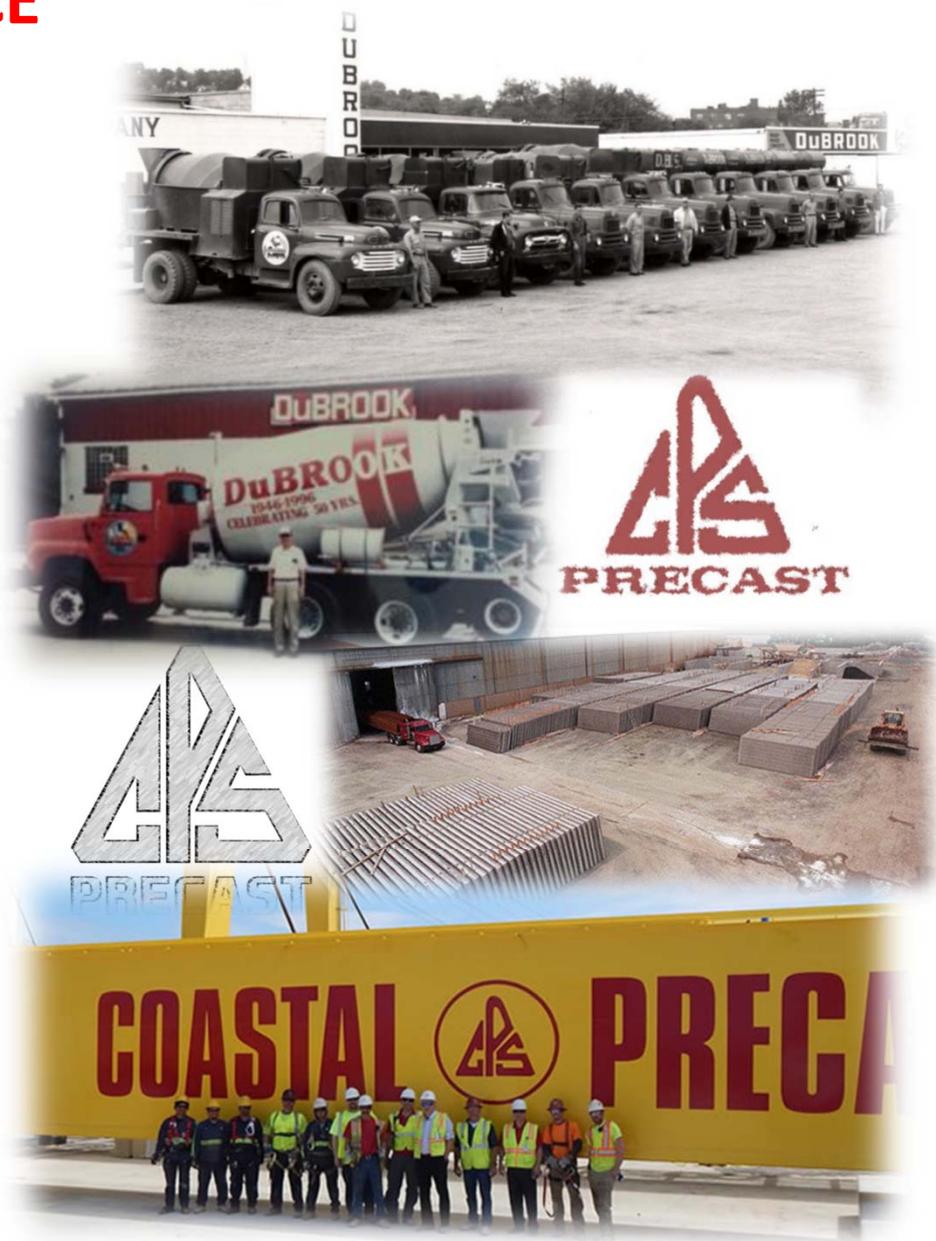
**1991** Concrete Precast Systems produces 1,000,000 sf of sound wall in Chesapeake, VA

**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:



US Army Corps  
of Engineers®



THE PORT OF  
VIRGINIA



Delaware Department  
of Transportation



Maryland



New York State  
Department of Transportation



# CPS MAJOR PROJECTS

PROJECT	OWNER	PRECAST VALUE
High Rise Bridge	VDOT	\$20M
New Bonner Bridge (Marc Basnight Bridge)	NCDOT	\$55M
Washington Bypass (Hwy 17)	NCDOT	\$25M
Silver Line (Dulles Metro)	WMATA	\$30M
Wilmington Bypass (NC-17)	NCDOT	\$27M
Tappan Zee Bridge	NY Thruway	\$30M
Rodanthe Bridge	NCDOT	\$24M
Charleston Terminal & Port Access Road	SCDOT	\$25M

# NEW HIGH RISE BRIDGE/I-64 SOUTHSIDE

## BID AWARD



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

**Estimated Cost:** \$409.6 million

*(funded 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

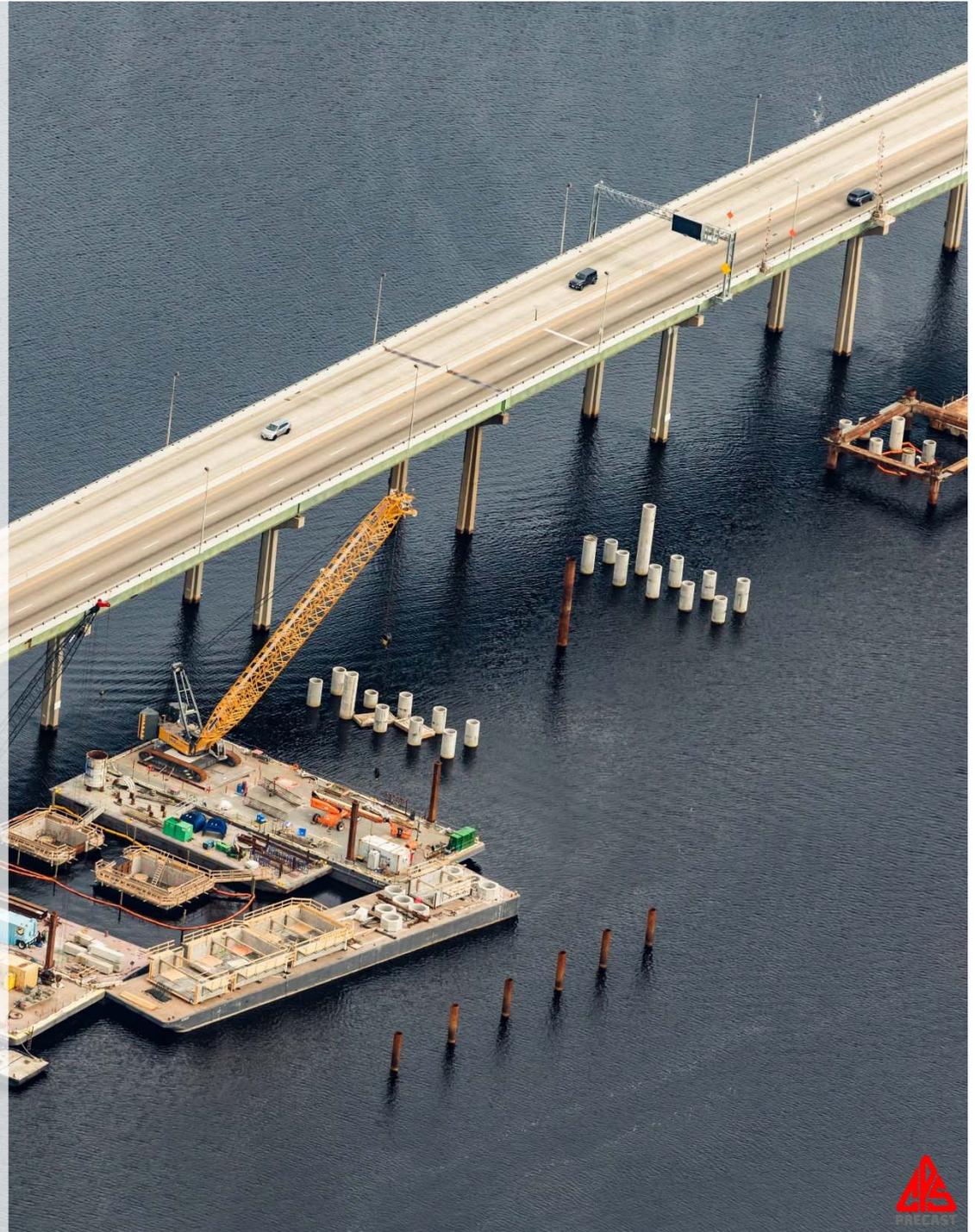
- 18" Sq. Pile
- 24" Sq. Pile
- 36" Sq. Pile
- 66" Cylinder Pile

### GIRDERS

- 77" PCBT
- 93" PCBT
- 95" PCBT

### MISC.

- Pile Tubs
- Pile Collars
- Sheet Pile
- Deadman Blocks



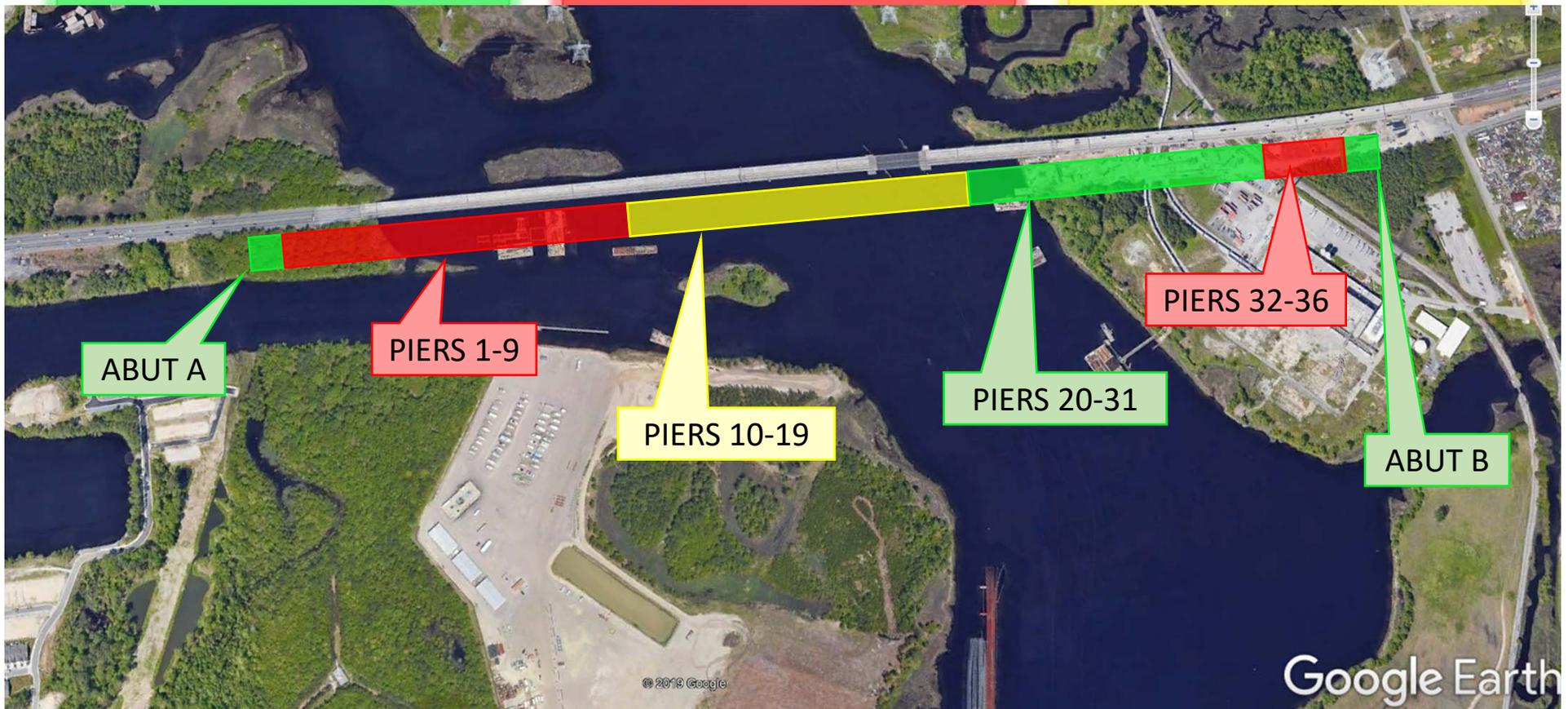
# NEW HIGH RISE BRIDGE

## STEEL REINFORCEMENT LOCATIONS

BLACK UNCOATED REBAR

CARBON FIBER (CFRP)

STAINLESS STEEL REBAR



# NEW HIGH RISE BRIDGE

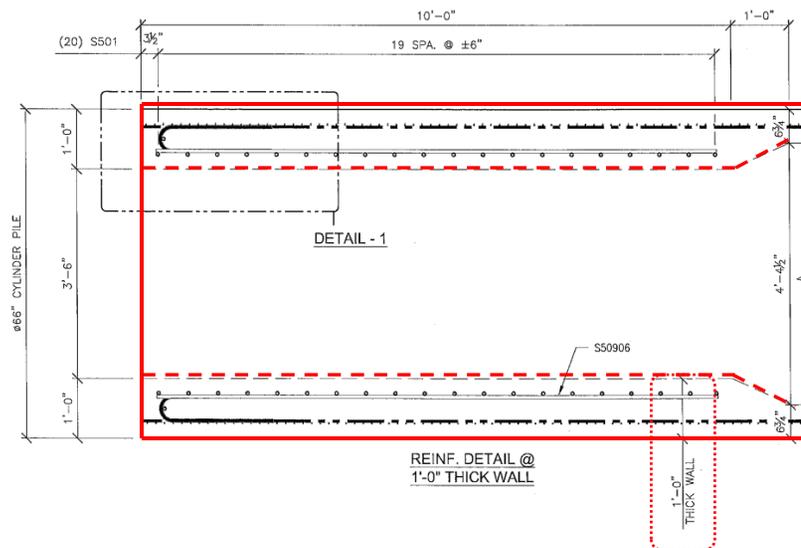
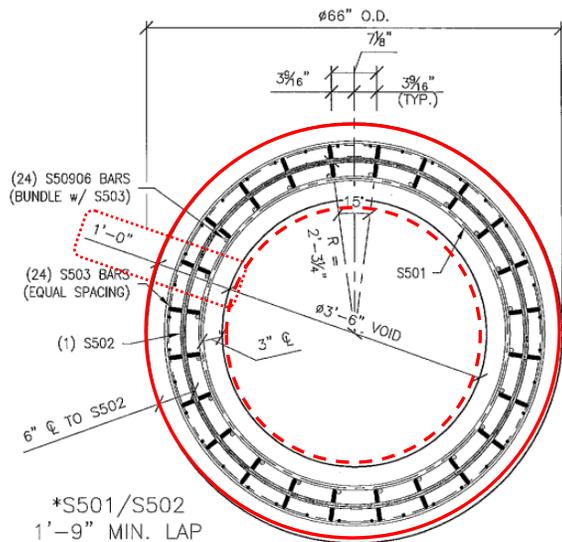
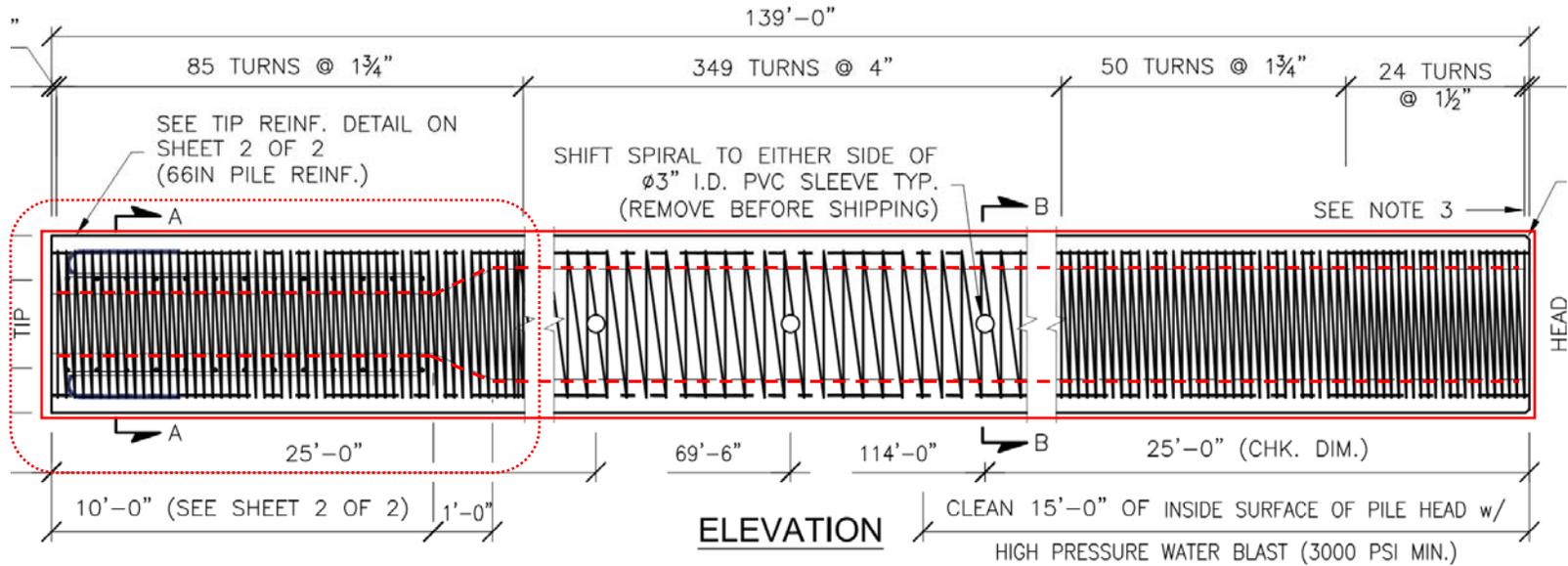
## 66" STATIC CAST CYLINDER PILE

- **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



# NEW HIGH RISE BRIDGE

## 66" STAINLESS STEEL CYLINDER PILE

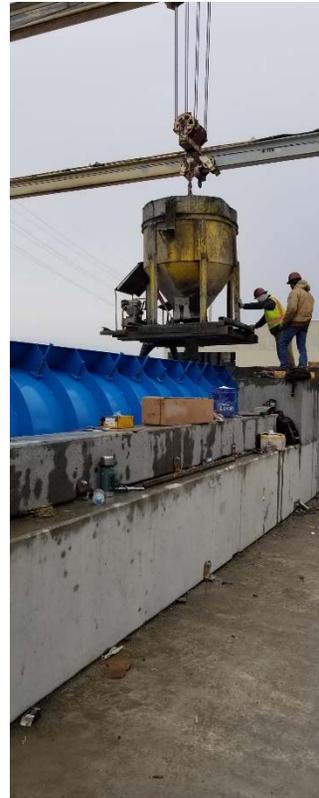
### STATIC CAST PROCESS



**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.



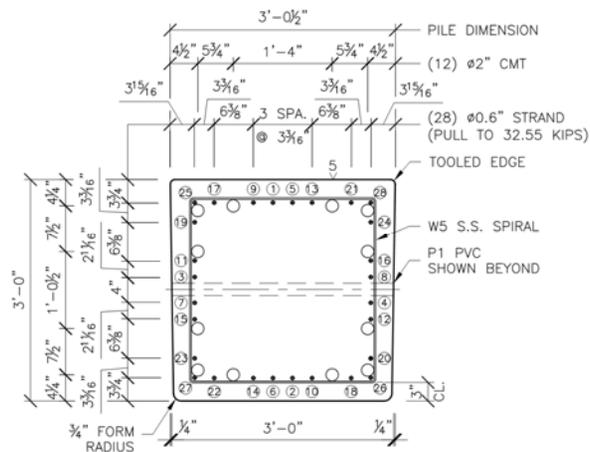
# NEW HIGH RISE BRIDGE

## STAINLESS STEEL 36" SQUARE PILE



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

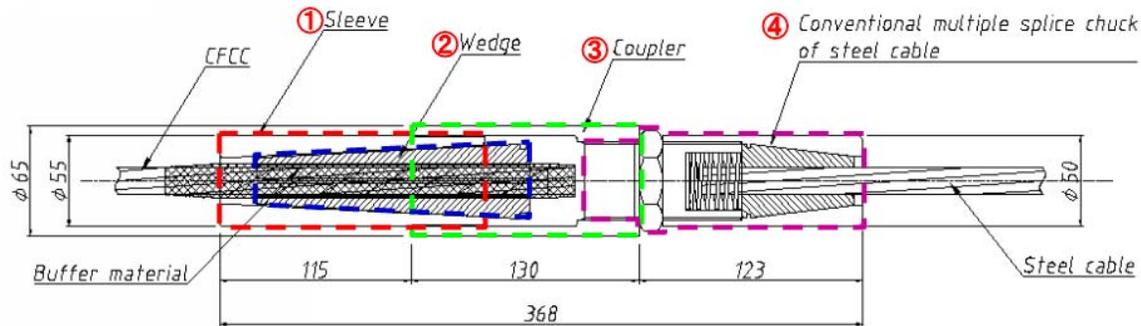
Pictured below is the first pile to arrive at the High Rise jobsite:



# NEW HIGH RISE BRIDGE

## CARBON FIBER REINFORCED POLYMER (CFRP)

Components required to tension CFCC:



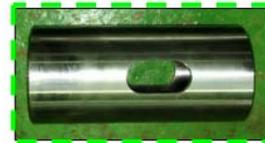
① Sleeve for CFCC



② Wedges for CFCC



③ Coupler for CFCC



Pre-tensioning anchorage devices for 1x7 15.2 Ø



Packaging of CFCC:

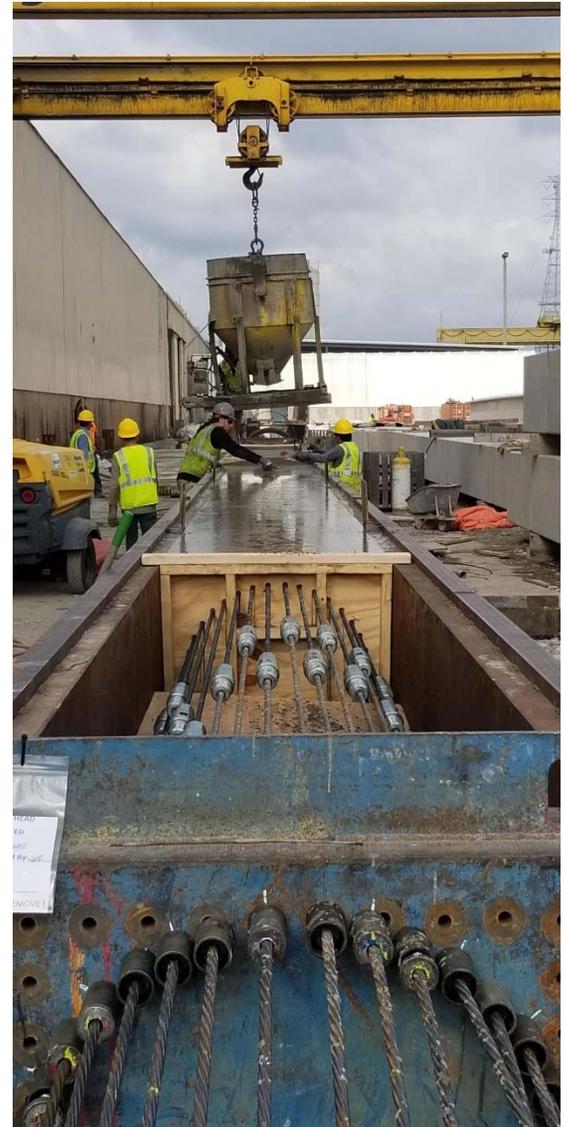
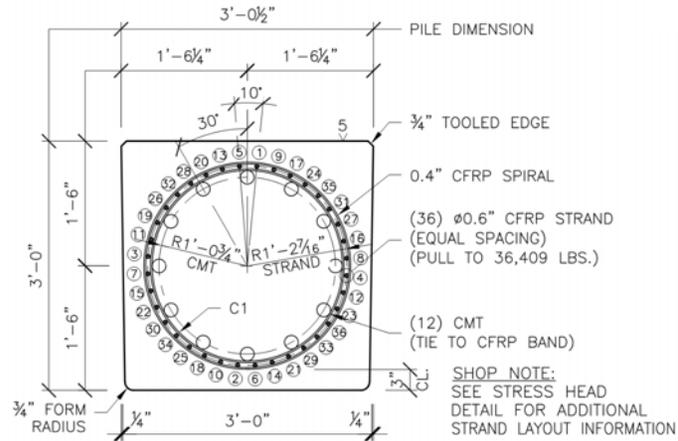


\*Diagrams & pictures courtesy of Tokyo Rope USA

# 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)



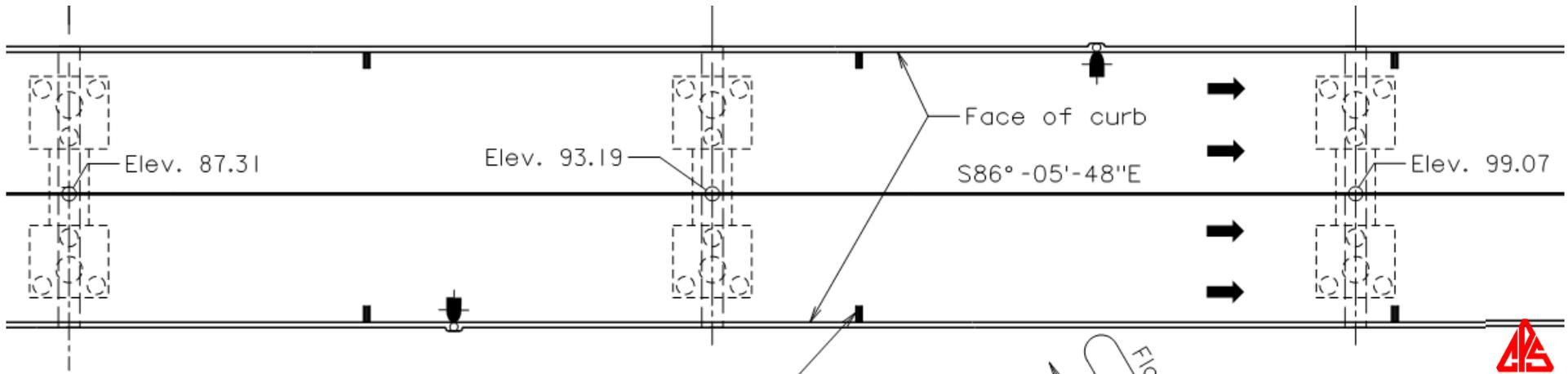
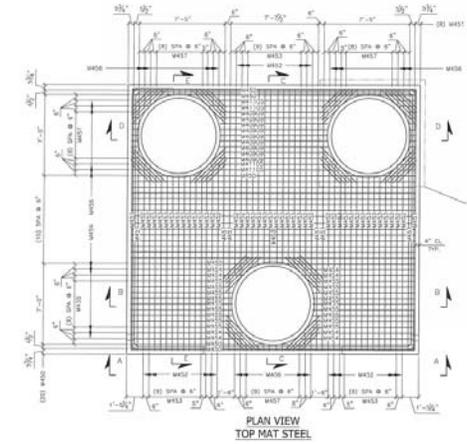
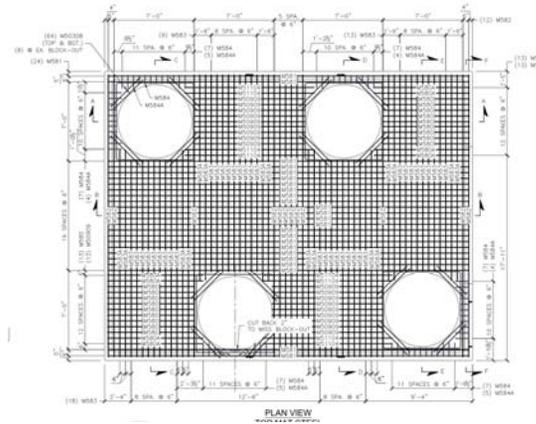
# NEW HIGH RISE BRIDGE

## 66" PILE PRECAST TUBS & STRUTS

**Steel Reinforcement:** MMFX

**Cubic Yards per Piece:** 40 CY

**Weight:** 81 Tons



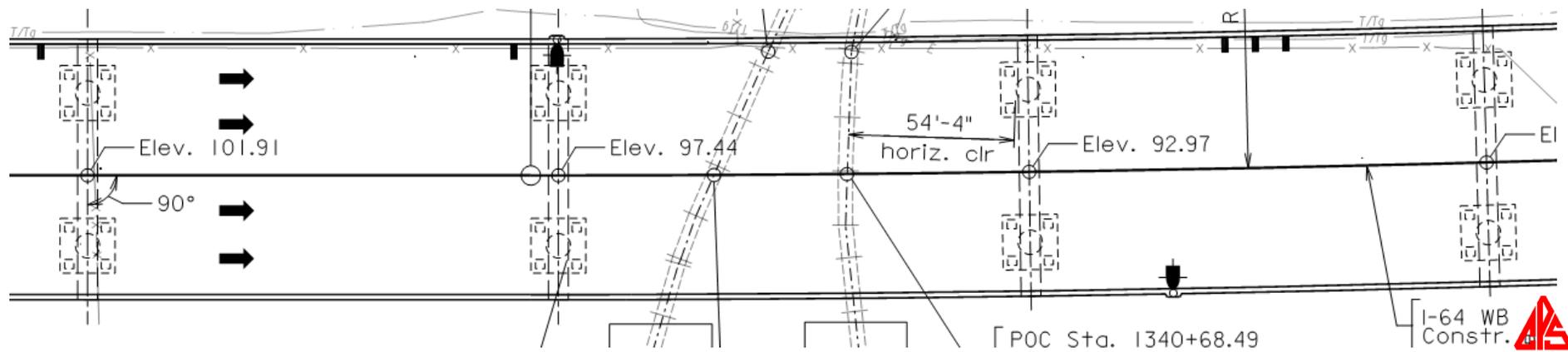
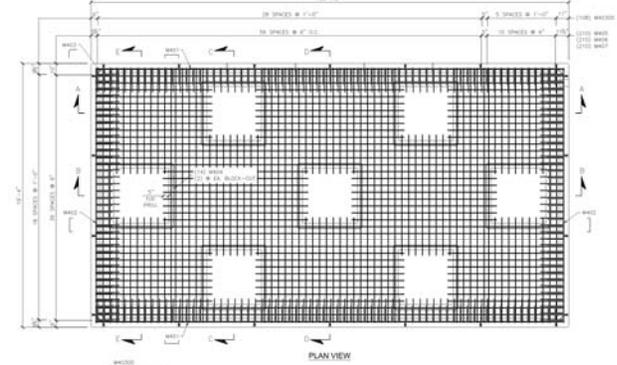
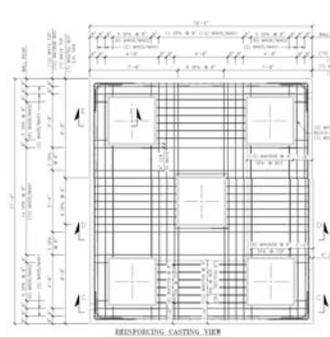
# NEW HIGH RISE BRIDGE

## 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

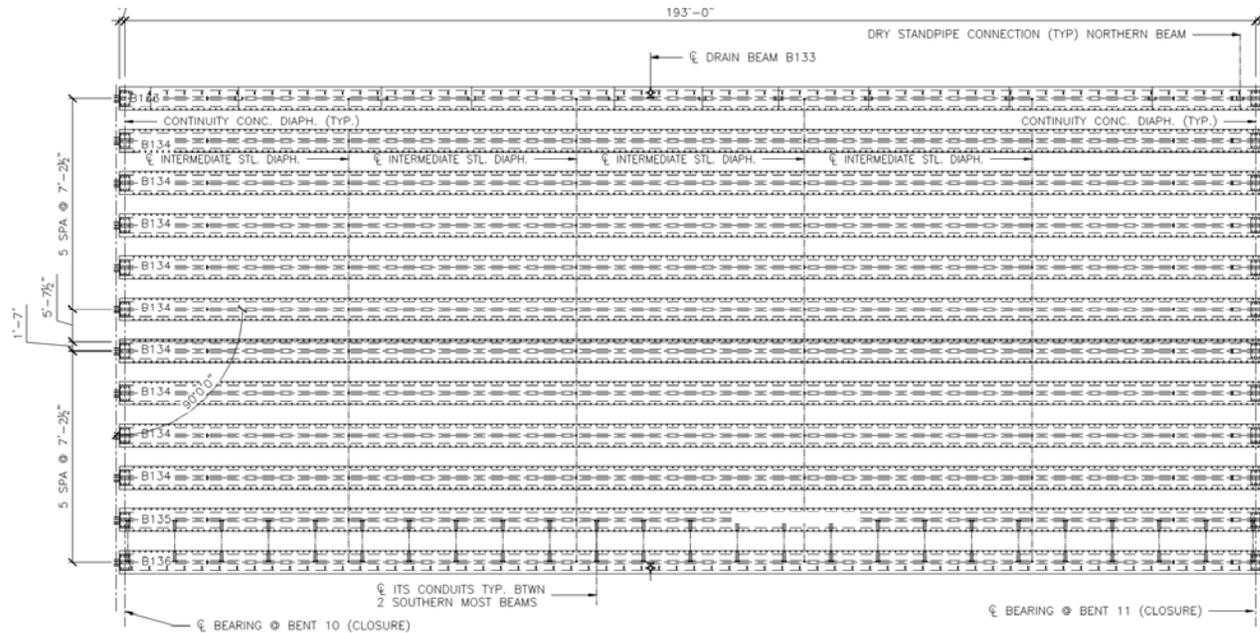
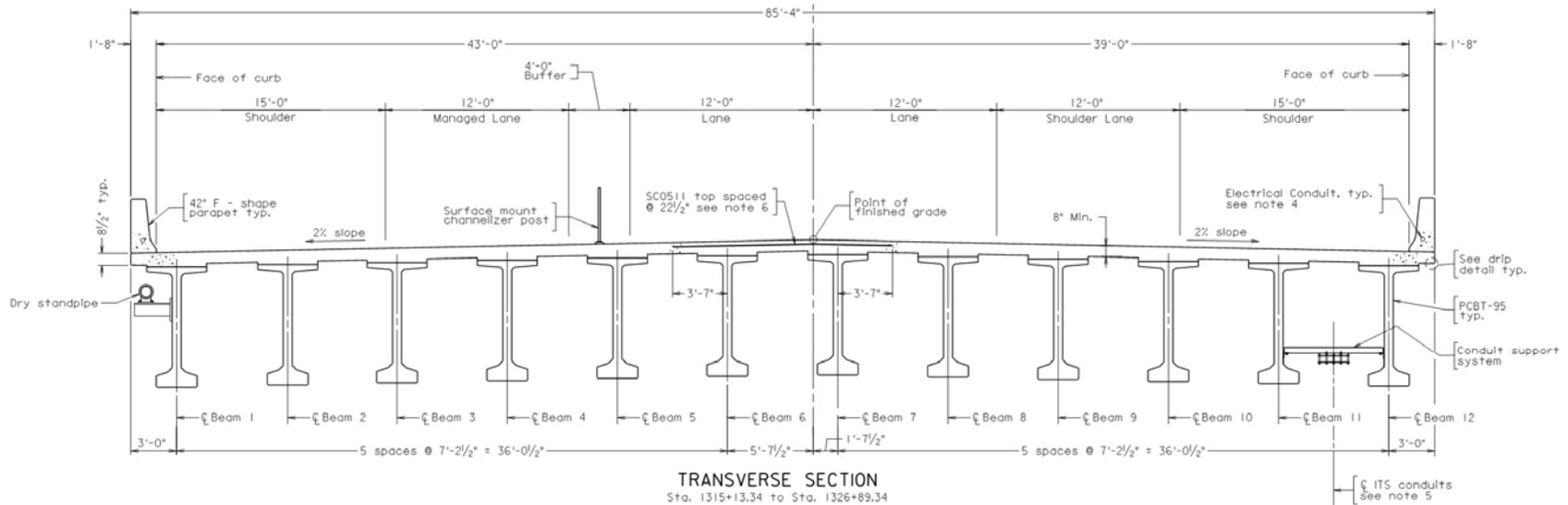


196' PCBT (95") Weighs Approximately **120 Tons**



# NEW HIGH RISE BRIDGE

## 95" PCBT GIRDERS SPAN



**ESTIMATED COMPLETION**  
**JULY 2021**



# COASTAL PRECAST SYSTEMS

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