



# TRANSPORTATION SYMPOSIUM

June 2019

## Halls River Bridge Lessons Learned

Bren George-Nwabugwu Sr. (FHWA), Zach Stringer (FDOT), & Michael Ojo (FDOT)

**MICHAEL O. OJO, P.E. (FDOT D-7 Design)**

# PROJECT OVERVIEW

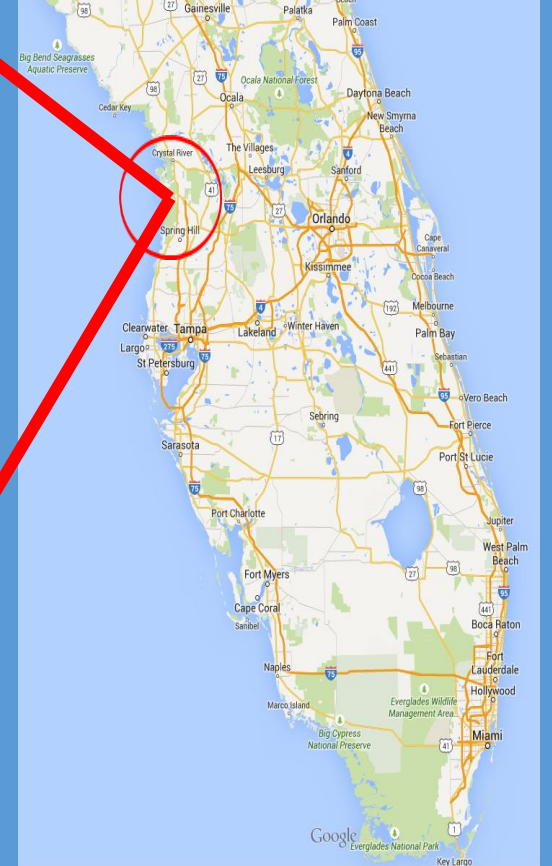
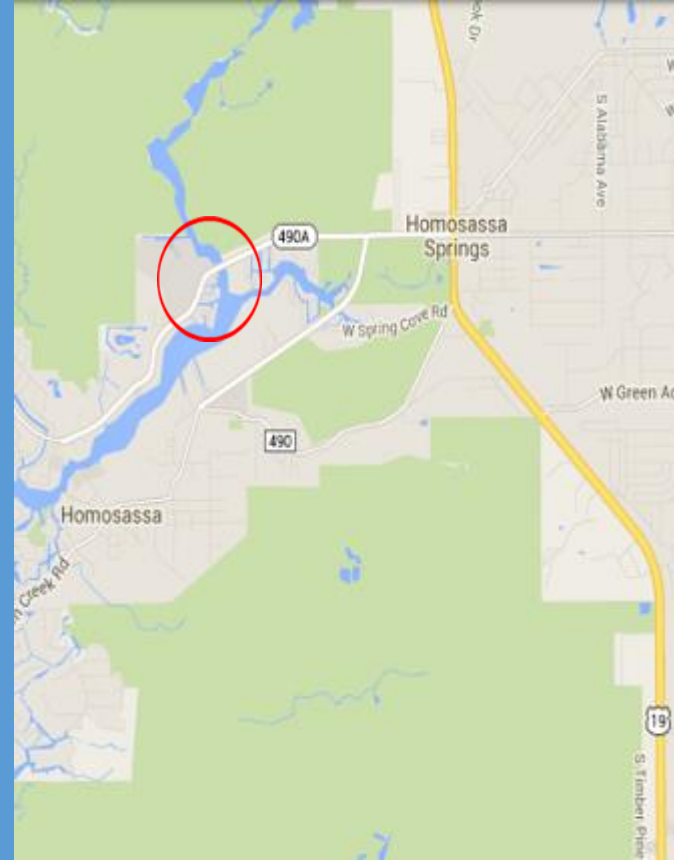
## ❑ Type of Project

## ❑ Length of Project:

- 185 FT bridge
- 1600 FT approaches

## ❑ Construction Cost = \$6.1M

## ❑ Original Contract Time = 310 days



# OUTLINE

☐ **Proprietary Materials**

☐ **Location Challenges**

☐ **Maintenance Agreement**

☐ **Innovative Materials**

☐ **Site Conditions**

☐ **Variability in Riverbed Strata**

☐ **Excavation for Sheet Piles**

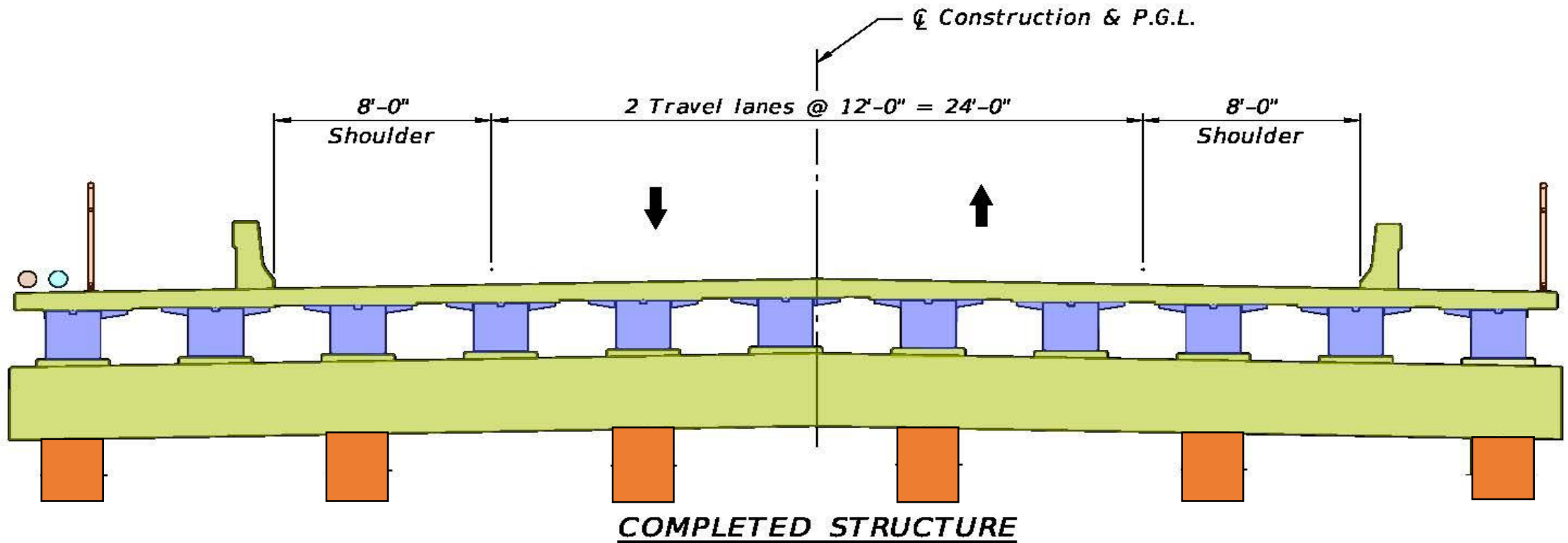
☐ **Changes between Design phase  
and Construction**

# BRIDGE COMPOSITION (BEFORE)





# BRIDGE COMPOSITION (AFTER)



GFRP

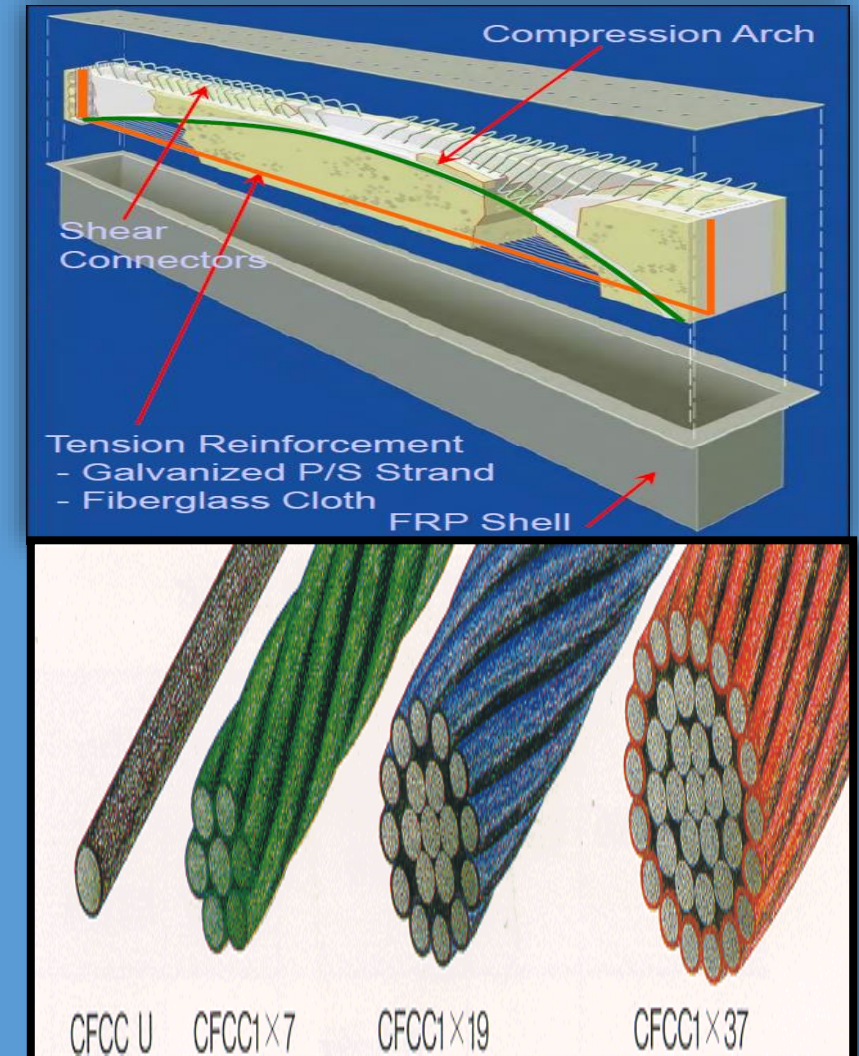
HCB

CFCC

# USE OF PROPRIETARY MATERIALS

## Two Sole Source Items

- ❑ **Hybrid Composite Beam (HCB)**  
with **HC Bridge Company**
- ❑ **Carbon Fiber Composite Cable (CFCC)**  
with **Tokyo Rope, Japan**



# ISSUES

- ❑ **Material (CFCC) from Japan**
- ❑ **Long lead time after purchase order**
- ❑ **Need for additional pile length**





# SUGGESTIONS

- ☐ **Official commitment from the producer or supplier**
- ☐ **More geotechnical information – additional soil boring**
- ☐ **Possibility of separate contract for the materials**
- ☐ **If possible, avoid proprietary materials**

# PROJECT LOCATION

- ☐ **Moderate daily traffic**
- ☐ **Limited right of way**
- ☐ **Off-system roadway**
- ☐ **No alternate route**



# ISSUES

- ❑ **Traffic Control Approach**
- ❑ **Emergency vehicles**
- ❑ **Coordination with law enforcement and schools**
- ❑ **Limited right of way**
- ❑ **ACROW bridge vs phased const.**
  - **ROW purchase/ TCE**
  - **Wetland**
  - **Permit requirements**





# SUGGESTIONS

## ❑ Consider the unforeseen in the equation



**Osprey on top of the crane**



**Osprey relocation**



**Crash**

# SUGGESTIONS

- ❑ **Use of ACROW bridge**
- ❑ **Location consideration**
- ❑ **Law enforcement and emergency personnel**





# MAINTENANCE AGREEMENT

## ☐ Two parts of Maintenance Agreement

- Maintenance after construction
- Off system Construction agreement

## ☐ Project funding

- No State money
- FHWA pays 100% of participating items
- FHWA pays 0% of non participating items/work

### OFF SYSTEM CONSTRUCTION AND MAINTENANCE AGREEMENT ("Agreement")

Between

STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION  
("FDOT")

and

CITRUS COUNTY, FLORIDA a political subdivision of the State of Florida  
("LOCAL GOVERNMENT")

WHEREAS, the State of Florida Legislature has approved and mandated the FDOT to complete the various projects included in the FDOT's Work Program; and

WHEREAS, included in the FDOT Work Program is Project Number FM 430021-1-52-01 (County Road 490A (Halls River) from west of Halls River to east of Halls River) located in Citrus County, Florida, ("Project"), which is not located on the State Highway System; and

WHEREAS, the parties agree that it is in the best interest of each party for the FDOT to undertake and to complete all aspects of the Project, including but not limited to the design, construction, construction inspection, utilities, permits, and other associated tasks; and

WHEREAS, the LOCAL GOVERNMENT shall maintain the Project upon notice from the FDOT as set forth in this Agreement; and

WHEREAS, the FDOT will, upon approval of federal participation by the Federal Highway Administration ("FHWA"), undertake the Project.

# MAINTENANCE AGREEMENT

## ☐ FHWA requirement

☐ To be executed before letting

## ☐ Coordination with the county

☐ Begin as early as possible

**CONTRACT FILE INDEX**

Financial Project ID \_\_\_\_\_ Proposal/Contract ID \_\_\_\_\_

**ATTACHMENTS** (check if included or list expected date of transmittal to Central Office)

<input type="checkbox"/>	Calendar Days Recommendation
<input type="checkbox"/>	Preliminary Engineering Certification*
<input type="checkbox"/>	Utility Certification
<input type="checkbox"/>	Status of Environmental Certification (Form 650-050-13 (Federally-Funded Project) or 650-050-14 (State-Funded Project))
<input type="checkbox"/>	Permit Transmittal Memo**
<input type="checkbox"/>	Railroad Clear Letter
<input type="checkbox"/>	FDOT/FGT Encroachment Agreement
<input type="checkbox"/>	Certificate for Construction (Form 575-095-05)
<input type="checkbox"/>	Executed copy of MMOA for Projects with Patterned Pavement
<input type="checkbox"/>	Approval if SP0080701B Computation of Contract Time is used.
<input type="checkbox"/>	Landscape Exception Approval per Engineering and Operations Bulletin 13-1

☐ No ☐ Yes Project exempt from FHWA oversight under agreement dated November 15, 2012\*

☐ No ☐ Yes Right of Way Certification was mailed to State R/W Administrator

☐ No ☐ Yes ☐ N/A Local Funds Agreement sent to Office of Comptroller

☐ No ☐ Yes ☐ N/A Local Funds Sent to Office of Comptroller

☐ No ☐ Yes ☐ N/A Project is Federally Funded off the State Highway System, requiring a Maintenance Agreement.  
If yes, a Maintenance Agreement (Number \_\_\_\_\_) was executed on \_\_\_\_\_. A copy is available upon request.

\* Include if federally funded.  
\*\* Must have District Secretary Approval if Permits are not received by Authorization (Federally Funded Projects Only).

Note: If project is federally funded and has a state funded "Goes With", please provide the same documentation as required for a federally funded project.

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
(Print Name of Project Manager/Other Title)

Zachary W. Stringer, FDOT D-7 Construction PM

# CONSTRUCTION – INNOVATIVE MATERIALS

---

- Consider a Mandatory Pre-bid to discuss
  - Cost and time frames for additional testing – GFRP
  - Long lead items – Tokyo Rope CFRP – Implications on pile casting
  - Unforeseen potential costs to producers – Rental for tensioning device - CFRP

# CONSTRUCTION – INNOVATIVE MATERIALS

---







# Construction – Innovative Materials

---





## **Construction – Innovative Materials**



# SITE CONDITIONS

---





# **Site Conditions**

## **Outstanding Florida Waterway**

# OUTSTANDING FLORIDA WATERWAY

- Strict Permit Conditions
  - Mixing Zone of 41 NTUs beyond background readings and 1 NTU outside of that
  - Plans only allowed for floating turbidity curtain
  - Preformed holes for piles and excavation for sheet wall required additional measures



# OUTSTANDING FLORIDA WATERWAYS

---







# **Outstanding Florida Waterway**

# VARIABILITY IN RIVERBED STRATA

---

- Pile depths
  - Plans and two additional sets of SPTs all indicated that we shouldn't need any pile longer than 85' however we had four adjacent piles with the following driven lengths (141 LF, 37 LF, 127 LF, and 67 LF) each spaced 10' 4.5" apart.





# Pile Depths

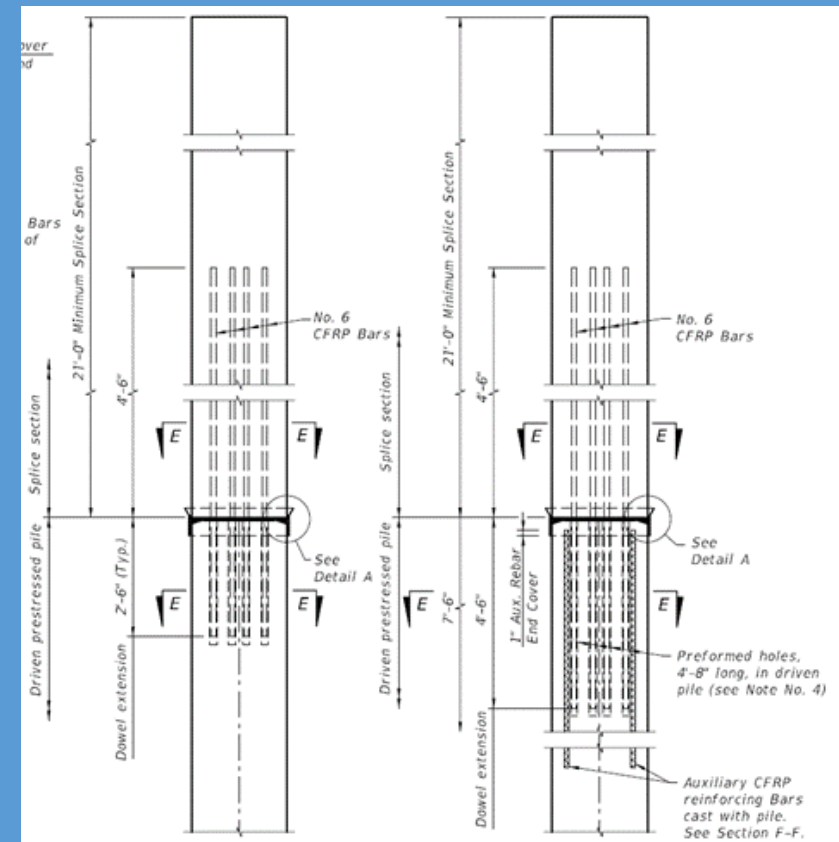
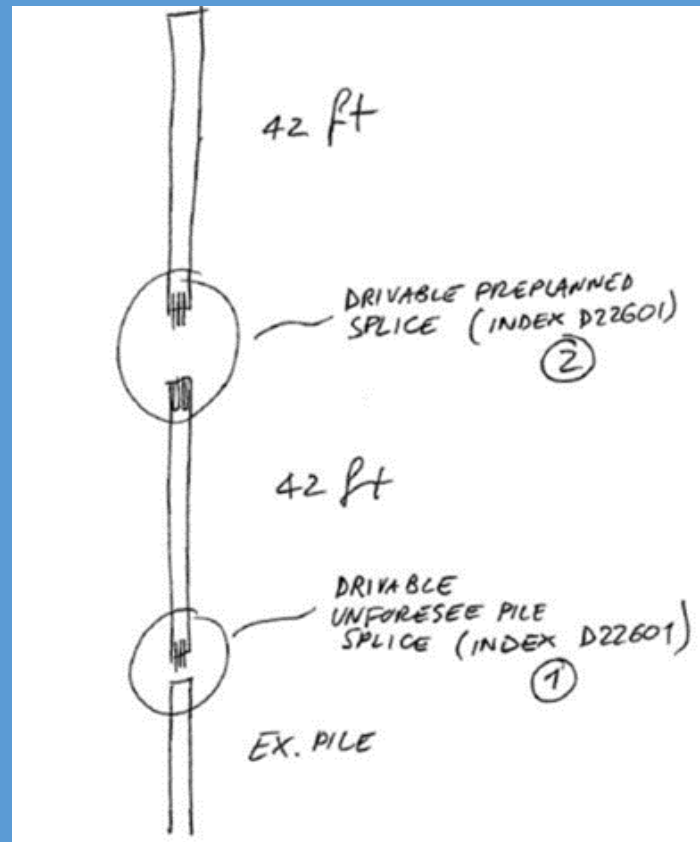
# PILE DEPTHS

---

- Innovative Materials
  - Splice materials
    - Index called for CFRP Dowels but no approved producers
    - No mechanical splice approved for CFRP Piles

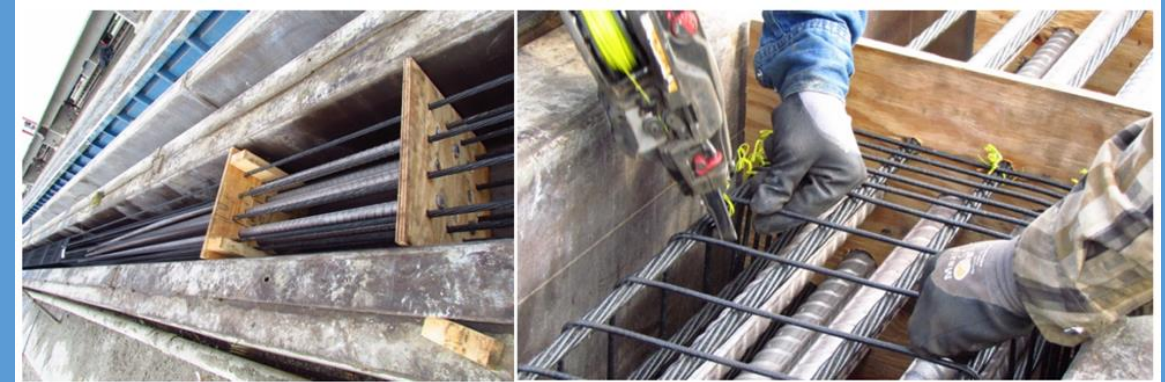


# PILE SPLICES



# PILE SPLICES

---







**Pile Splices**

# EXCAVATION FOR SHEET PILE

---

- Limited Right of Way prevented large equipment
- Innovative materials influenced design decisions
  - No tie-back system without carbon steel
- \$650K Change Order for redesign



# EXCAVATION FOR SHEET PILE

---







**Deadman and Anchor Seawall**





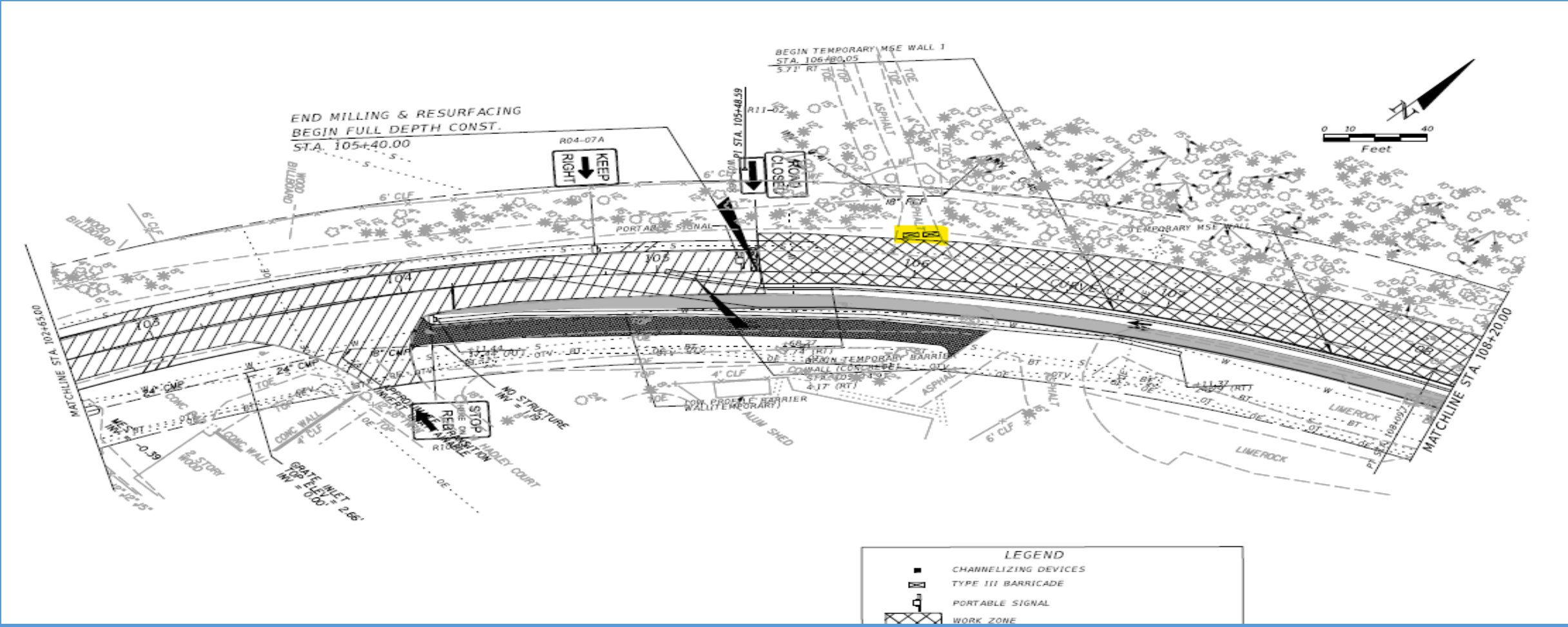
# **Changes Between Design and Construction**



# CHANGES BETWEEN DESIGN AND CONSTRUCTION

---

- Margarita Grill resumed construction and opened in September of 2017
  - Additional drainage installed prior to construction needed incorporated into the proposed system in the area
  - Access needed to be maintained for increased traffic which was not anticipated during design



# Changes Between Design and Construction

# Questions???