

Innovative Strategies for Bridge Preservation:

A Case Study on Pile Jackets in Cape Cod

Charles Packer, PE





Architecture
Engineering
Environmental
Land Surveying

AGENDA

Design Bid Build Process – Case Study

Lessons Learned

Fabrication

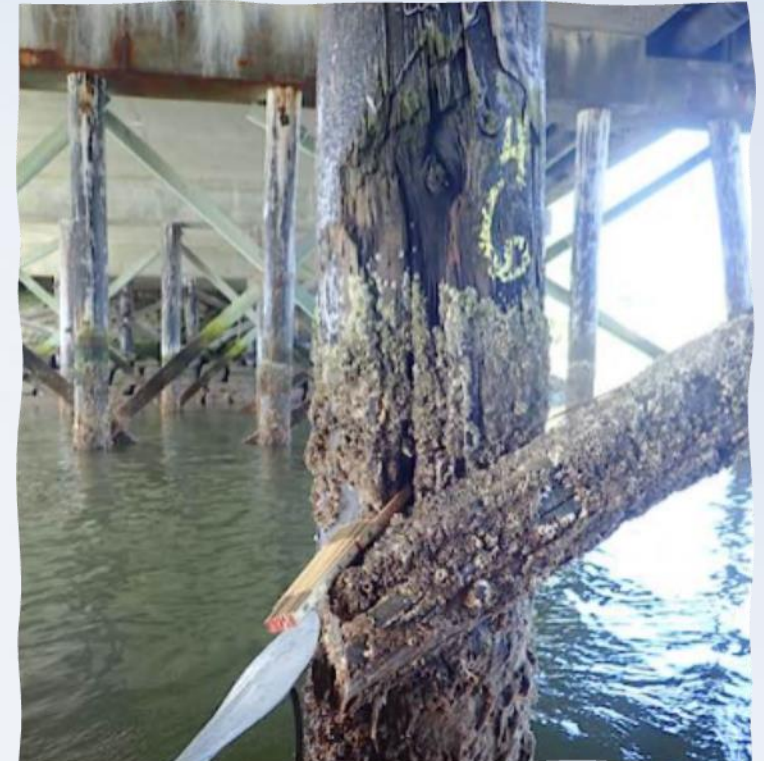
Technical Information

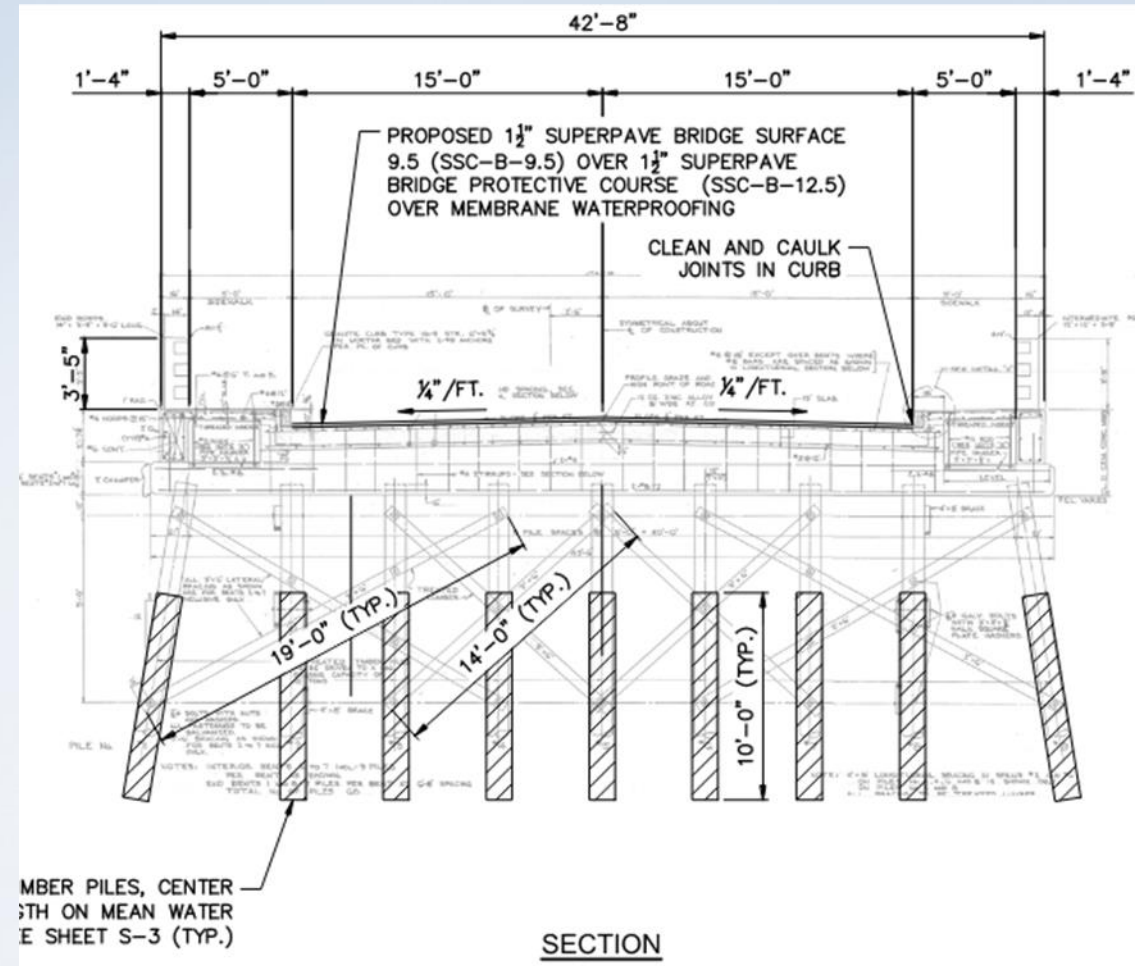
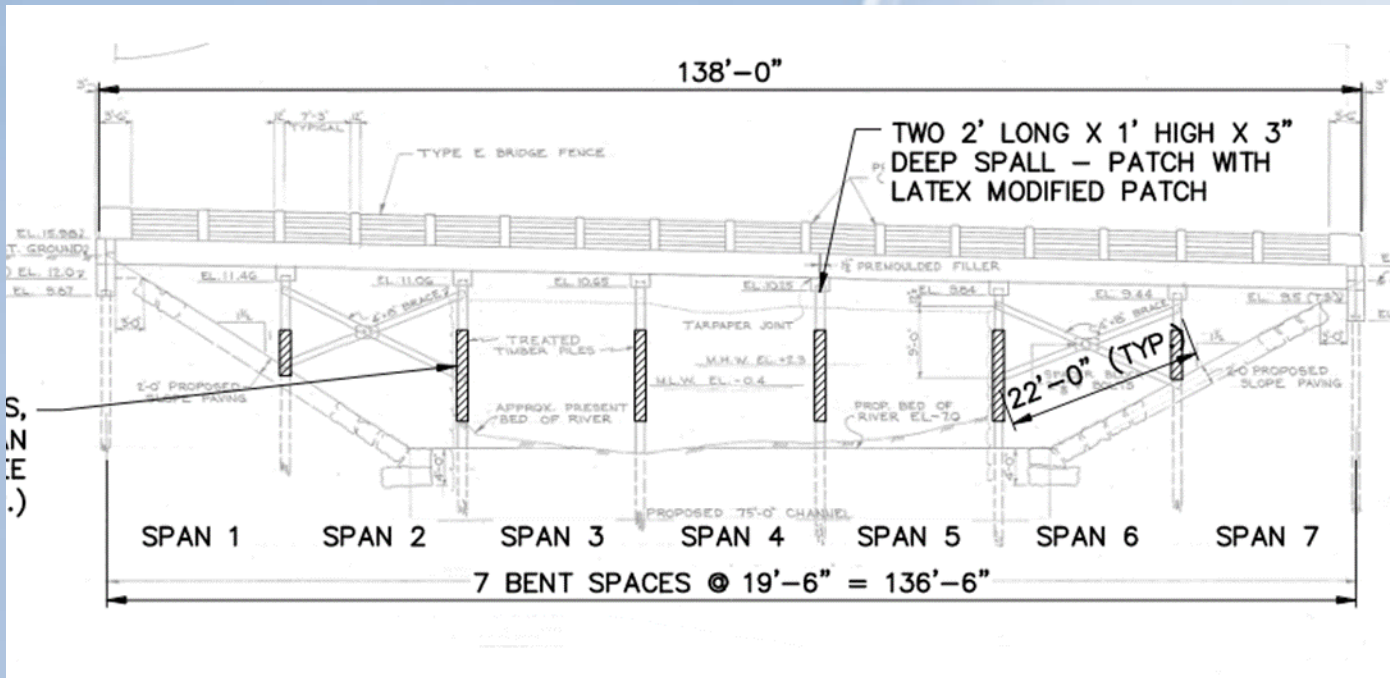
Future research and Considerations

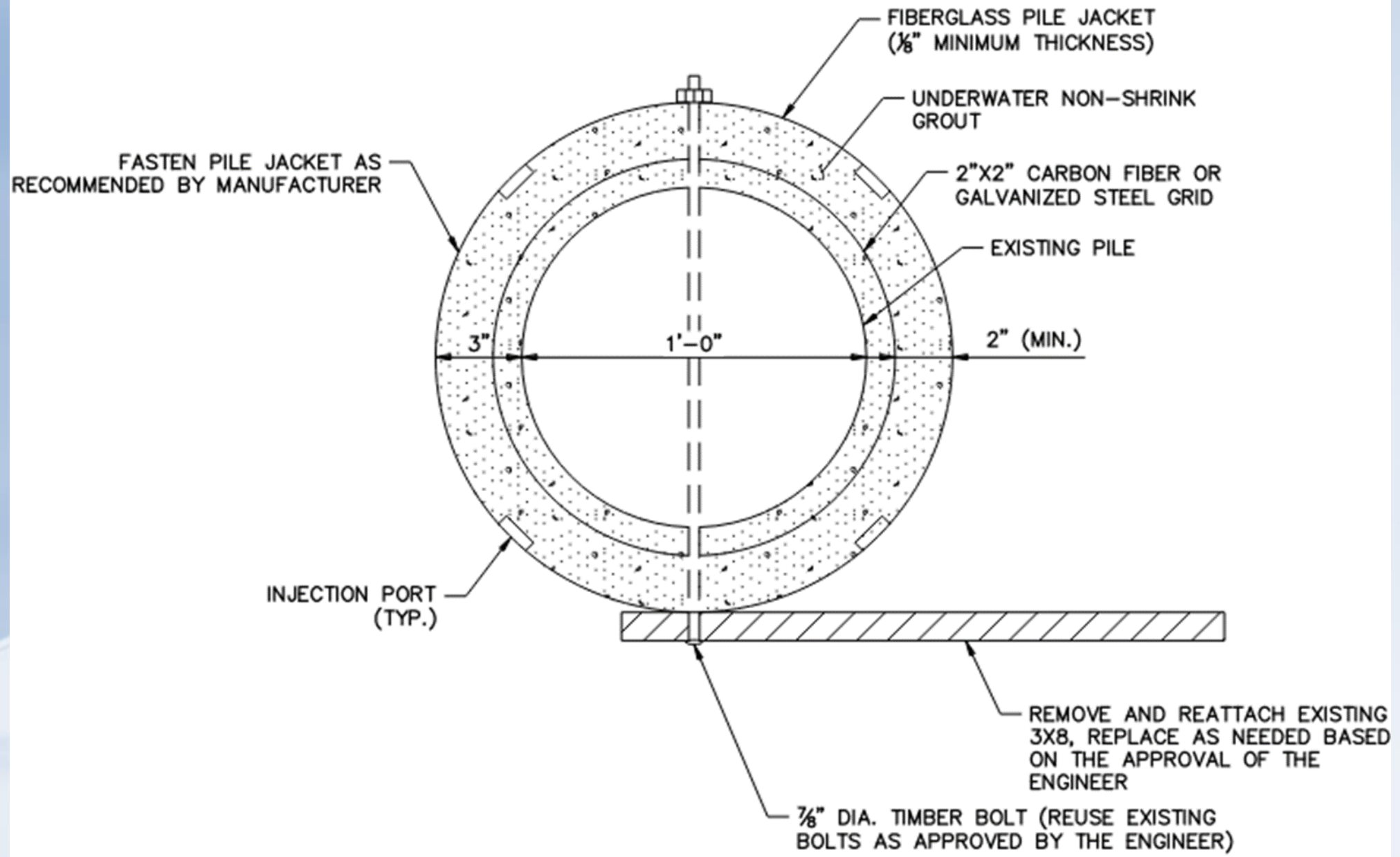
South Main Street over Bumps River, Barnstable Case Study



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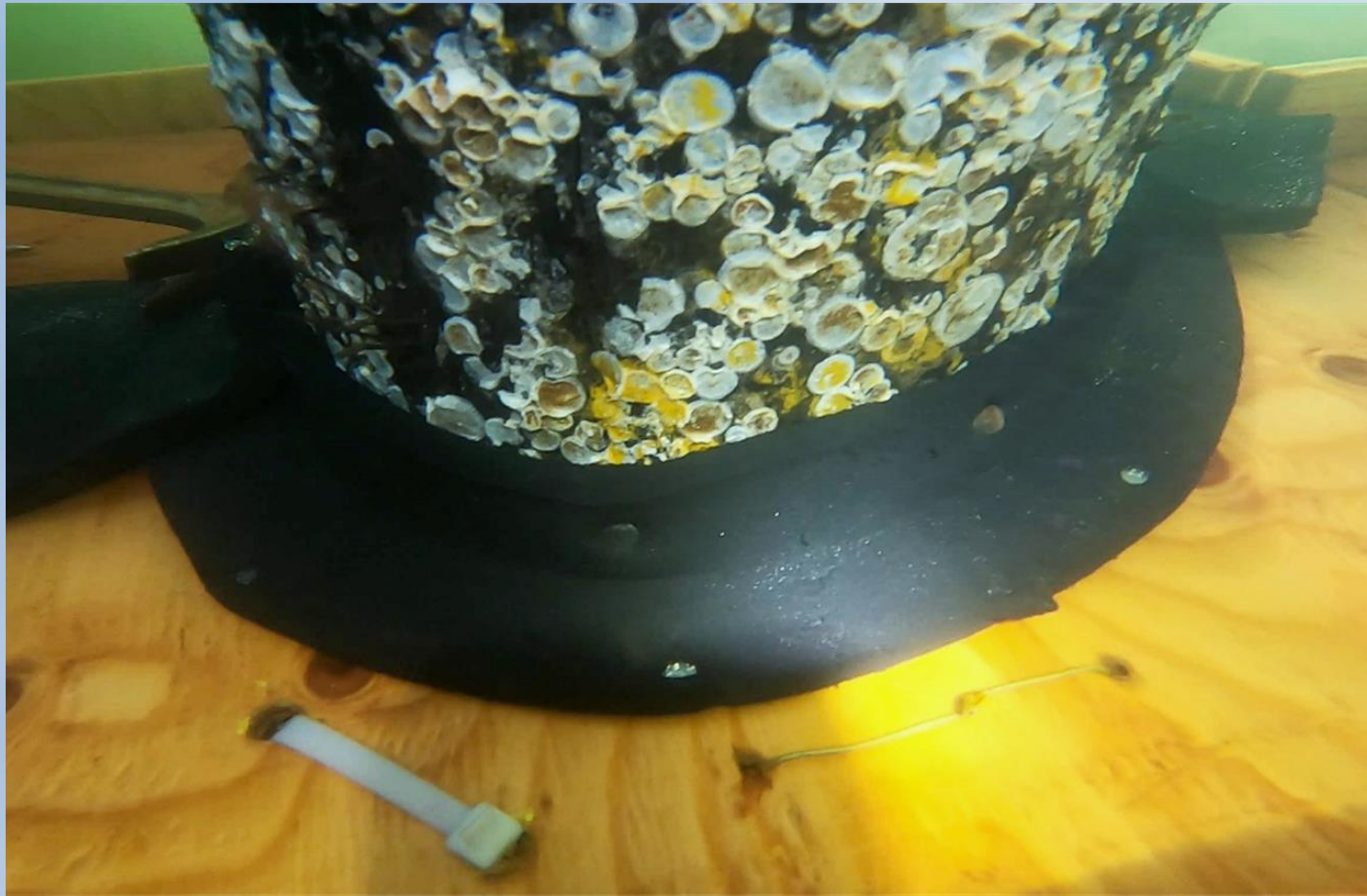
Bid Results 9-29-2020

Contractor 1 Awarded Contract Based on Overall Bid

| | UNIT | QUANTITY | CONTRACTOR 1 | CONTRACTOR 2 | CONTRACTOR 3 |
|-------------------------------|------|----------|-----------------|-----------------|-----------------|
| REPAIRS TO TIMBER PILES | LF | 540 | \$626.4 K | \$588.6 K | \$275.4K |



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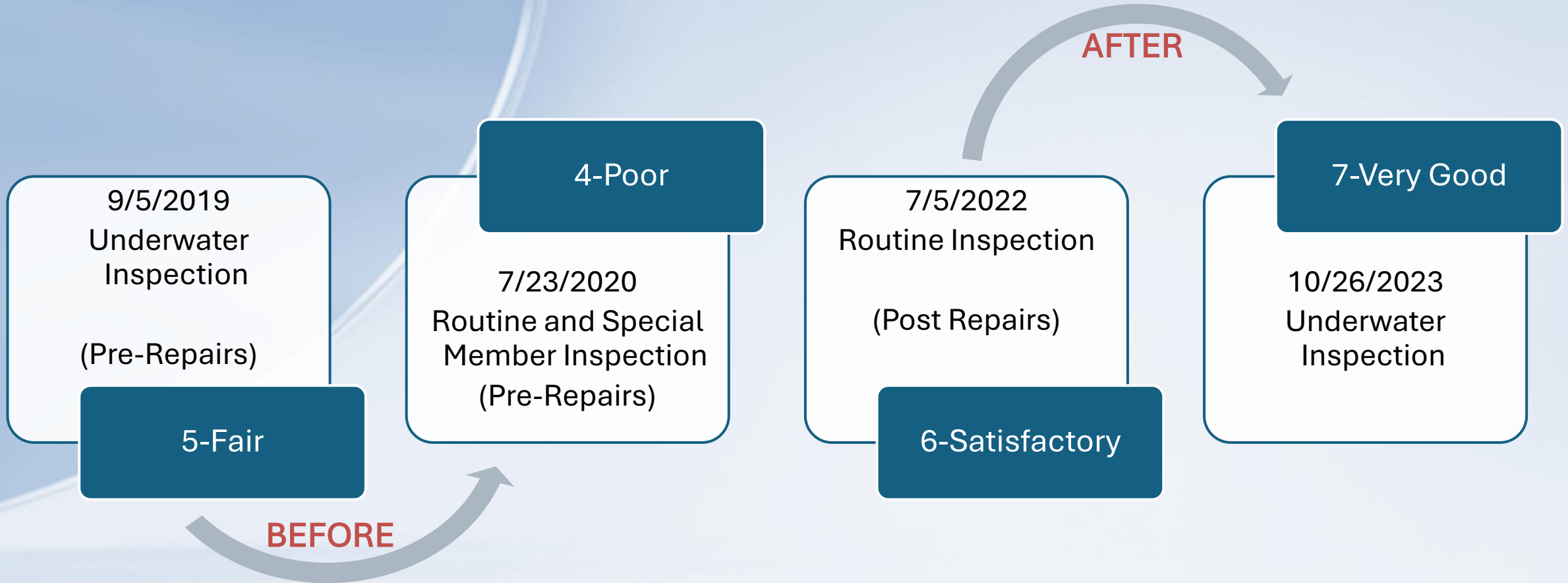
South Main Street over Bumps River, Barnstable

Case Study

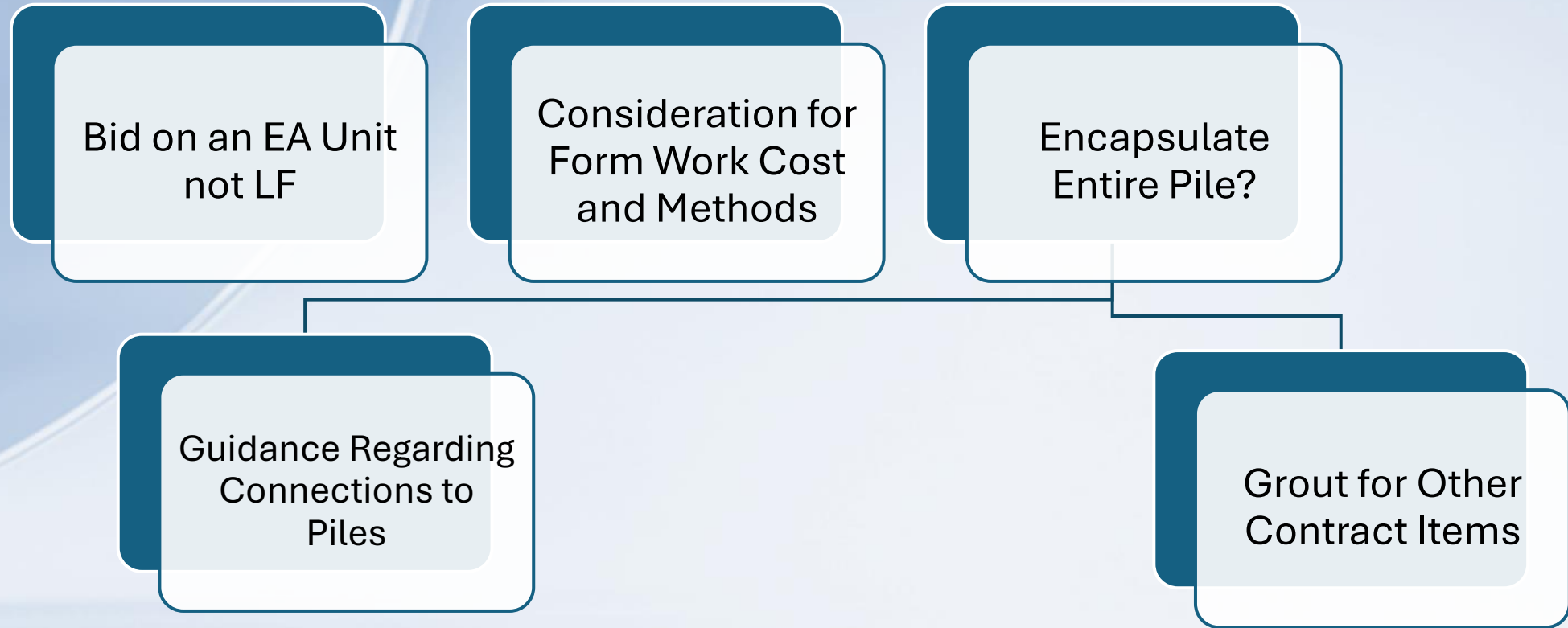


South Main Street over
Bumps River, Barnstable
Case Study

Substructure Condition Rating



Lessons Learned



FABRICATION



FABRICATION



Technical Information

Axial Compression



Technical Information

| | ADDED DIAMETER (INCLUDING JACKET) | GROUT TYPE | MAX STRESS (KSI) | PERCENT INCREASE |
|-------------------------------|-----------------------------------|--|------------------|------------------|
| Control (8.75" Timber) | NA | NA | 2.10 | NA |
| Specimen 1 | 5.50 in. | Seashield 510 U/W Grout (9ksi-28 day) | 2.71 | 29% |
| Specimen 2 | 5.56 in. | Seashield 510 U/W Grout (9ksi-28 day) | 2.5 | 19% |
| Specimen 3 | 3.75 in. | Seashield 550 Grout (9.9ksi-11.2 - 28 day) | 3.5 | 66% |
| Specimen 4 | 3.88 in. | Seashield 550 Grout (9.9ksi-11.2 - 28 day) | 3.73 | 77% |



Technical Information

Bending

Technical Information

Bending

| | Added Diameter (Including Jacket) | Grout Type | Max Load (Kips) |
|------------------------|--------------------------------------|--------------------|-----------------|
| Control (~8" Diameter) | NA | NA | 9.05 |
| Specimen 1 | 4 in. | Epoxy Grout | 20.5 |
| Specimen 2 | 4 in. | Cementitious Grout | 23.5 |



Future Research and Considerations Standardized Bolted Connection Detail



Future Research &
Considerations
Standardized Forming Detail



Future Research &
Considerations
Standardized Temporary Bracing

Future Research & Considerations

Ability to Increase Unbraced Lengths



NATIONAL BRIDGE PRESERVATION CONFERENCE 2024
Innovation for Infrastructure Resiliency