



moffatt & nichol TETRA TECH

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# Lock and Dam 1, 2 & 3 Fish Passage Update

May 2018



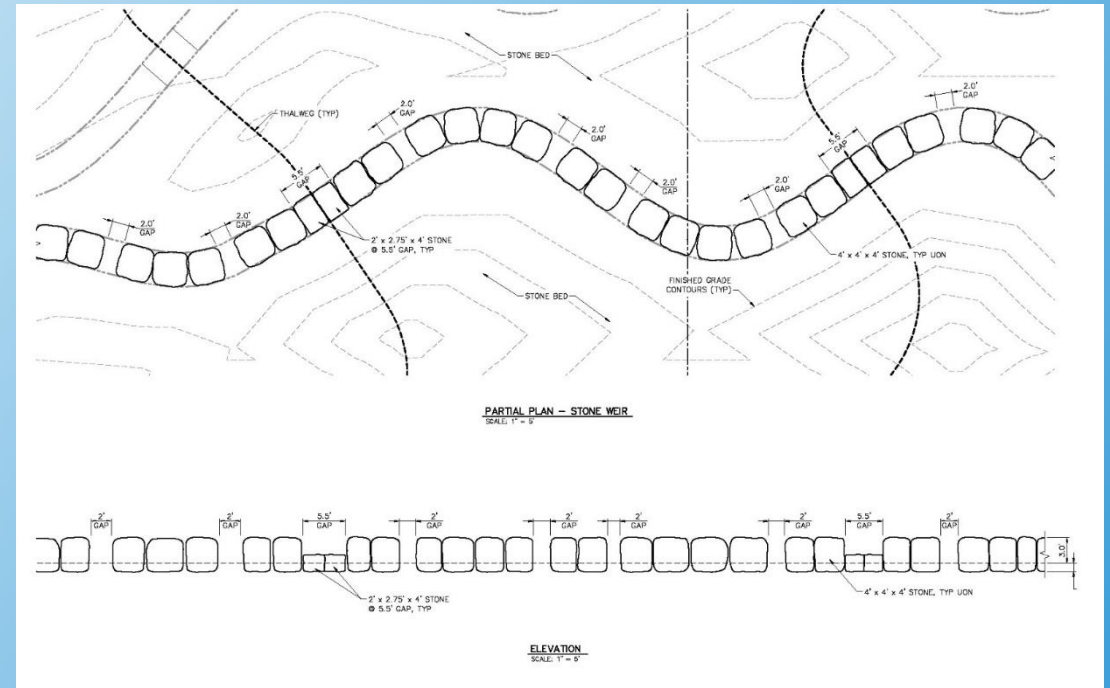
# Cape Fear Lock and Dam #2 Scour Hole Repair

- Contract awarded Fall 2017
- Work commenced December 2017
- No in-water work March 15<sup>th</sup> through June 1
- Anticipated to be completed in late Summer 2018



# Cape Fear Lock and Dam #2 & 3

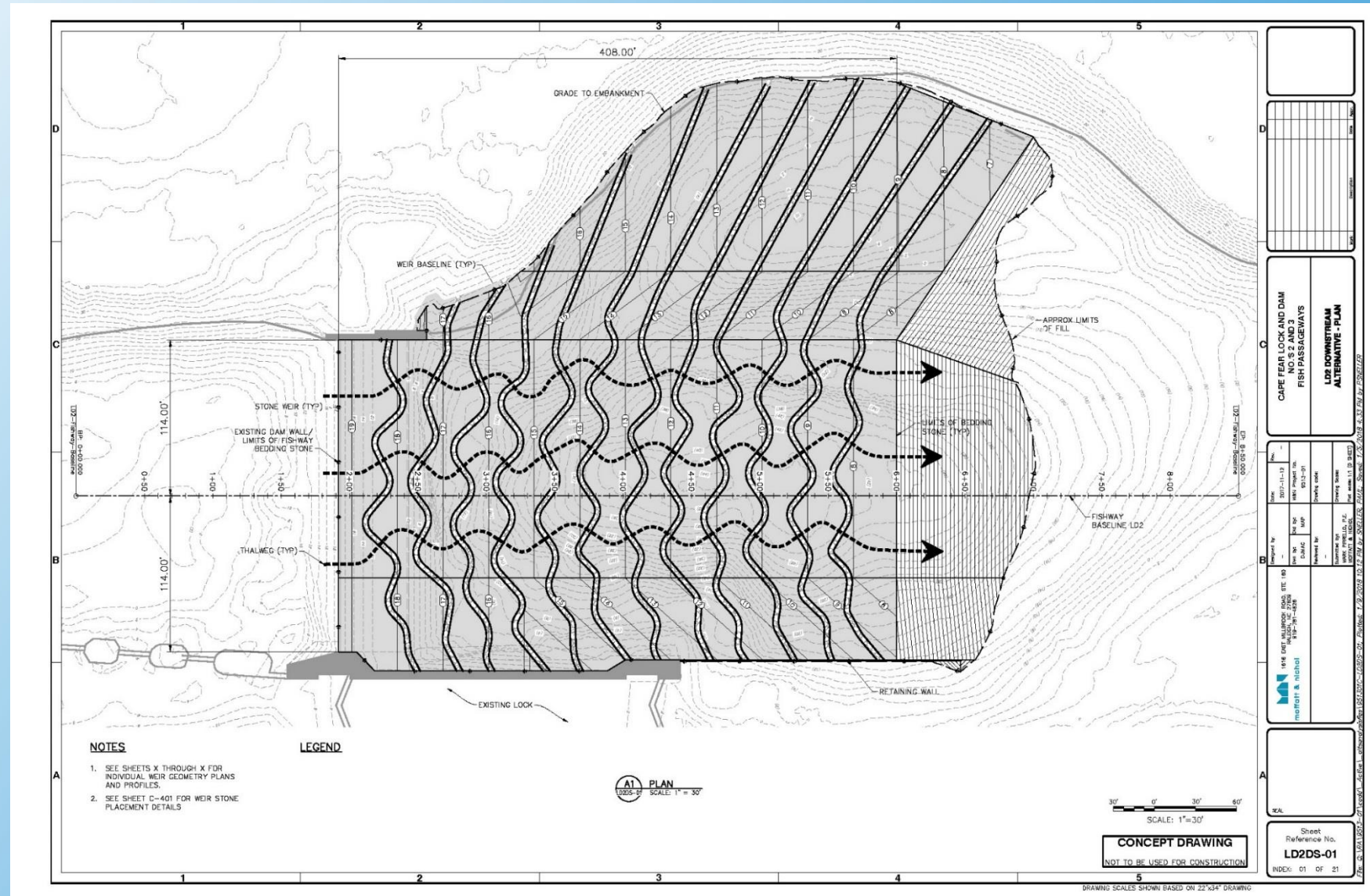
- Basis of Design Completed
- Preliminary Hydrologic and Hydraulic studies completed
- Preliminary Engineering Completed
  - Major and minor flow paths
  - Weir elevations and gap widths
  - Pool depths
  - Lock/Dam Modifications
- Alternatives Developed
  - Upstream and Downstream
  - Bypass
  - Interior Locking
  - Dam Removal
  - No Action





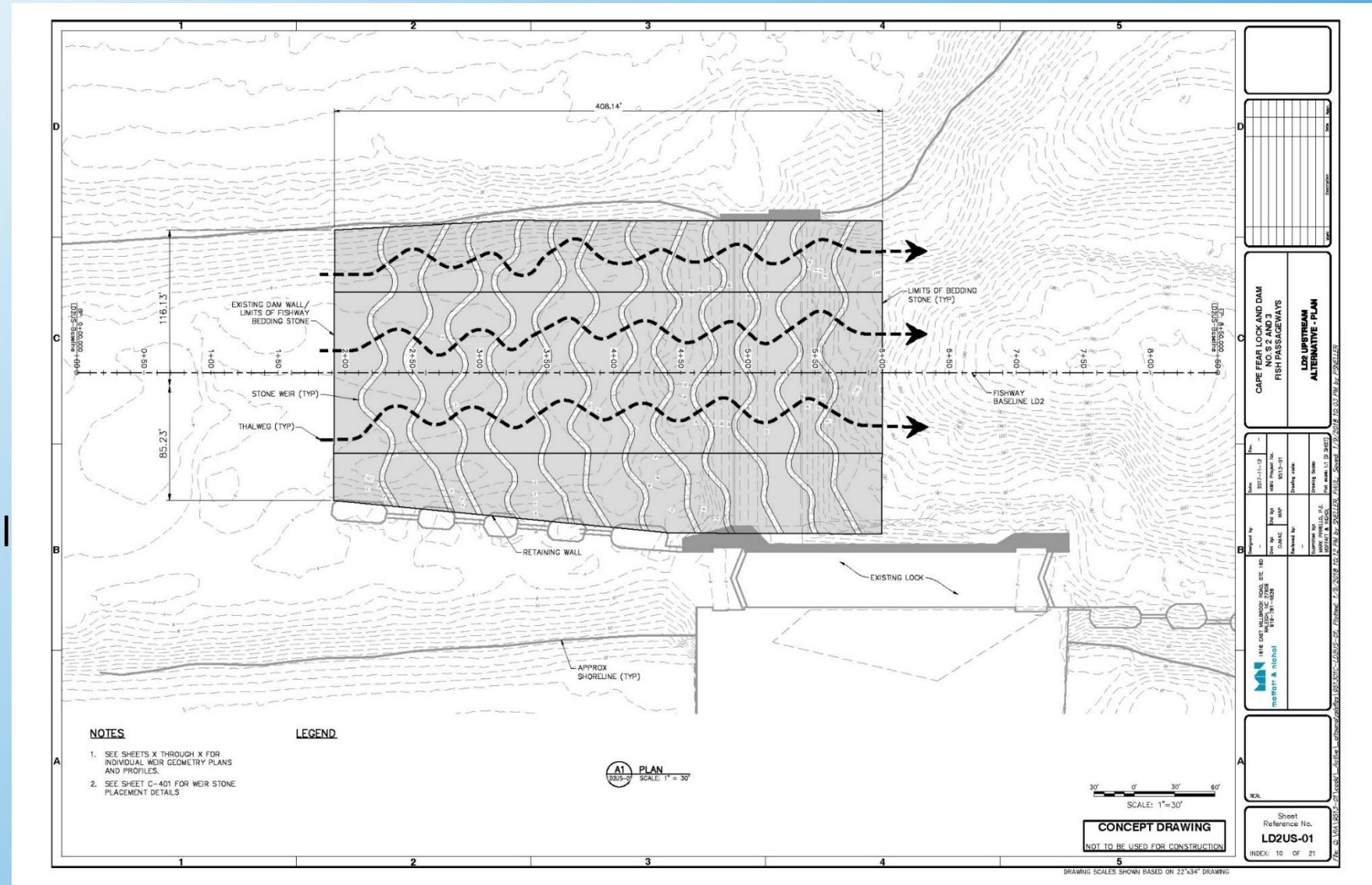
# Downstream Alternative @ CFLD2

- Overall Dimensions
  - 500 LF including transition
  - 228 LF width
  - 2,900 LF Weir
- Total Volume
  - ~190,000 Tons
- Structural Improvements
  - 220 LF Retaining Wall
  - No lock wall improvements
- Construction Cost
  - ~\$22.5M
  - ~7M savings USACE scour hole project



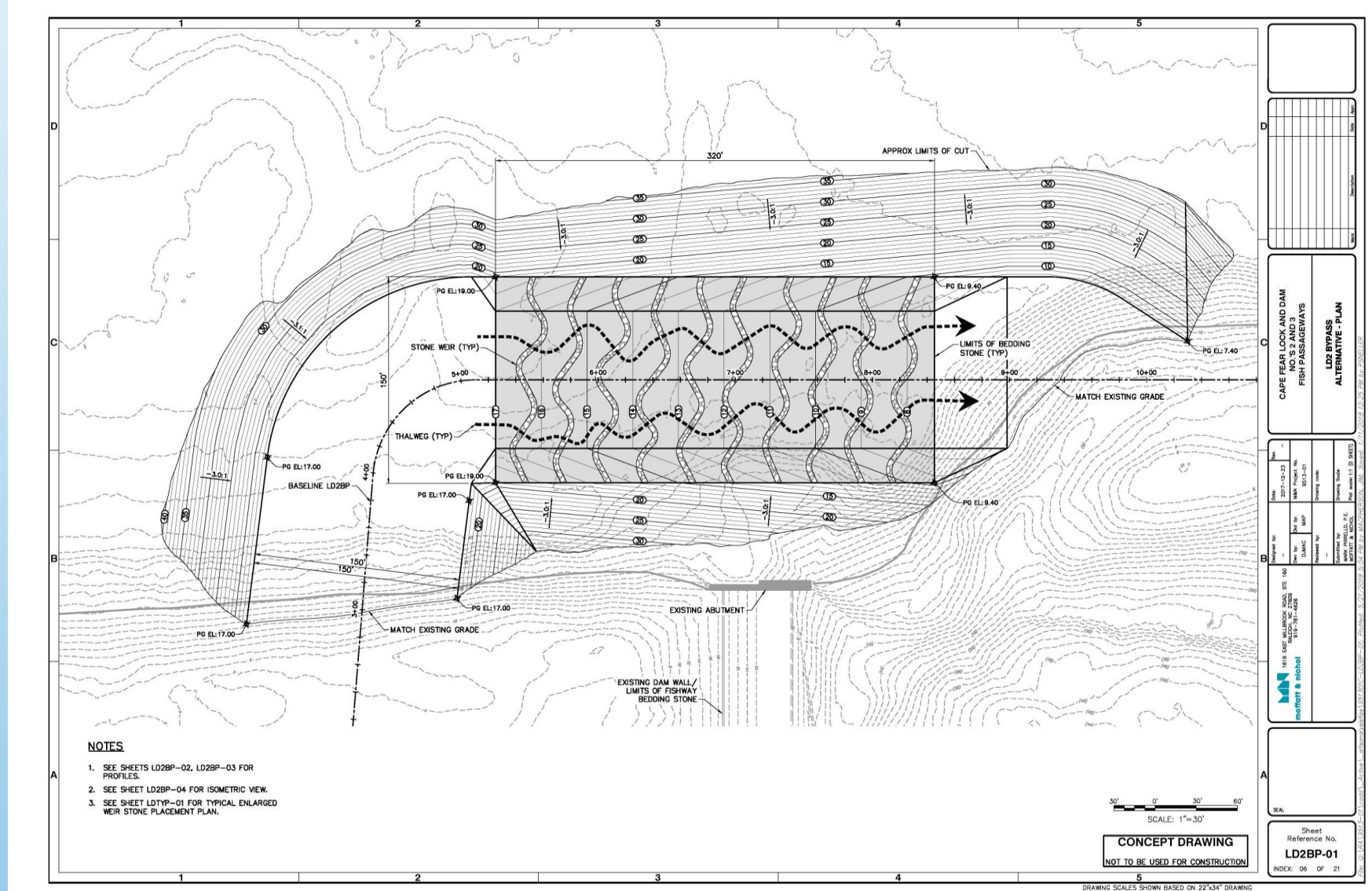
# Upstream Alternative @ CFLD2

- Overall Dimensions
  - 450 LF including transition
  - 200 LF width
  - 1,800 LF Weir
- Total Volume
  - ~70,000 Tons
- Structural Improvements
  - 500 LF Retaining Wall
  - No lock wall improvements
  - Dam Removal
- Construction Cost
  - ~\$15M



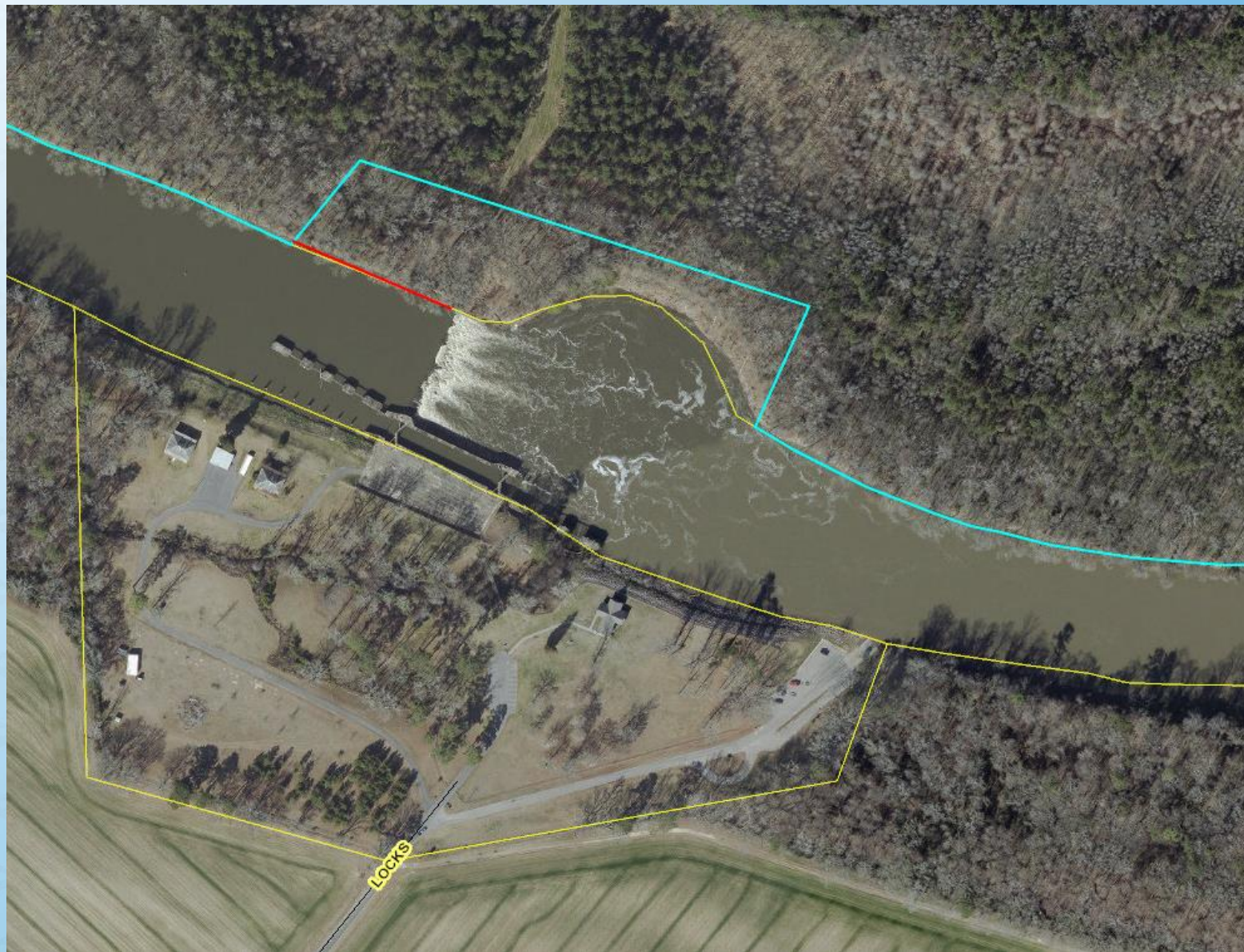


- Overall Dimensions
  - 400 LF including transition
  - 150 LF width
  - 1,200 LF Weir
- Total Volume
  - ~80,000 Tons
- Structural Improvements
  - 300 LF Weir Wall
  - Bank Stabilization
- Construction Cost
  - ~\$12M
  - Excludes Property Acquisition





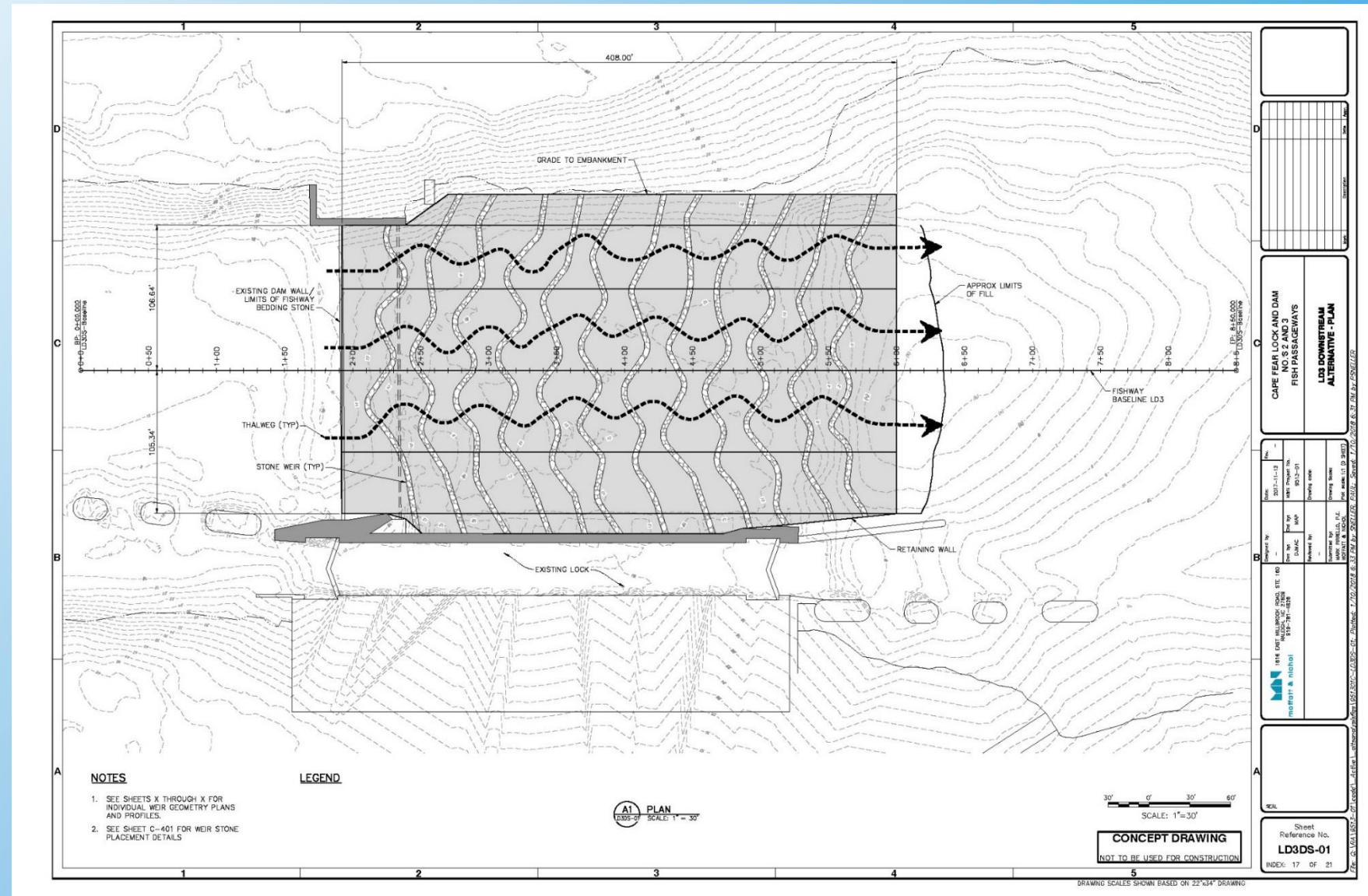
# Bypass Alternative@ CFLD2





# Downstream Alternative @ CFLD3

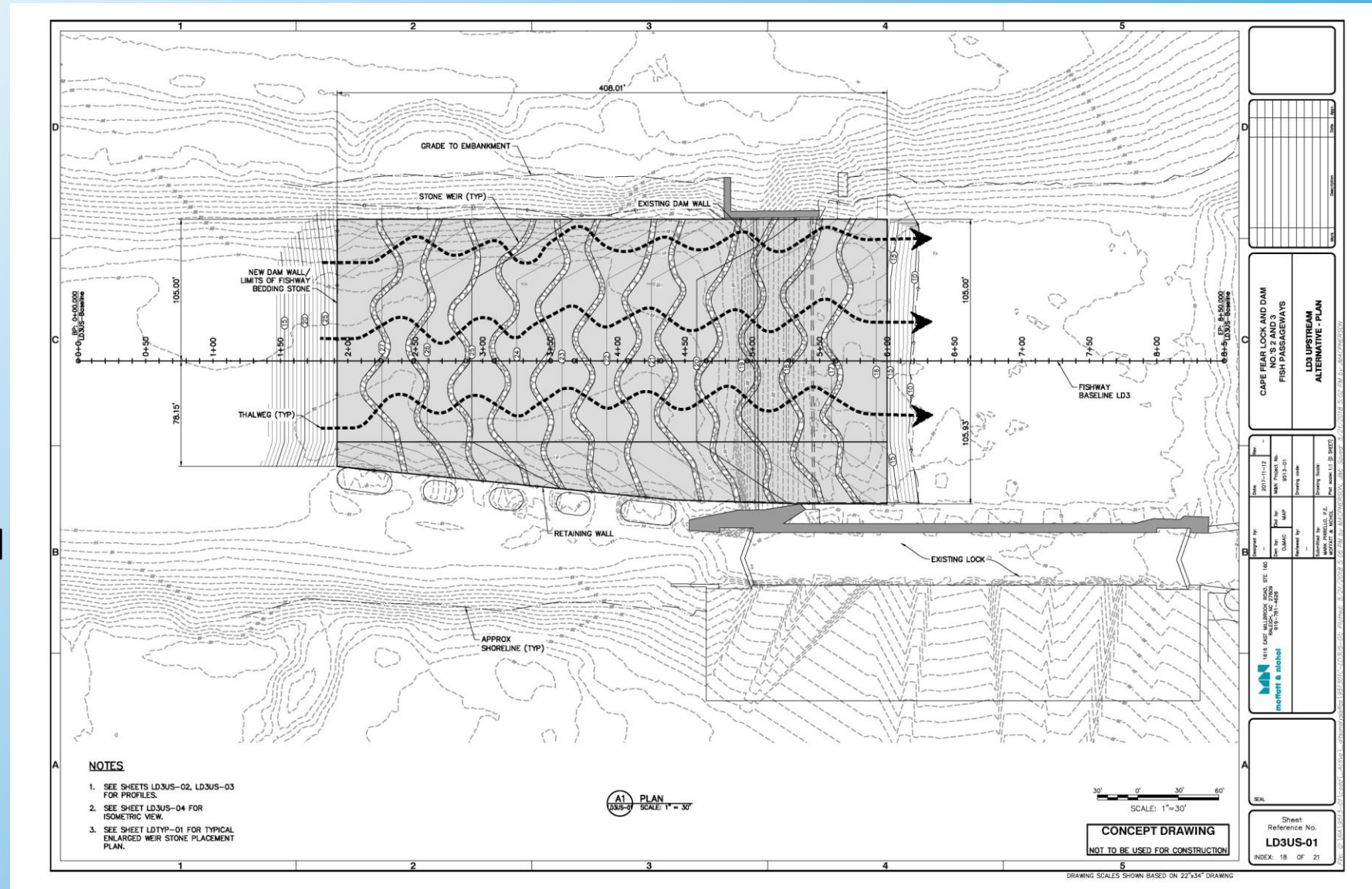
- Overall Dimensions
  - 475 LF including transition
  - 1210 LF width
  - 1,930 LF Weir
- Total Volume
  - ~100,000 Tons
- Structural Improvements
  - 125 LF Retaining Wall
- Construction Cost
  - ~\$13M





# Upstream Alternative @ CFLD3

- Overall Dimensions
  - 430 LF including transition
  - 185 LF width
  - 1,650 LF Weir
- Total Volume
  - ~70,000 Tons
- Structural Improvements
  - 550 LF Retaining Wall
  - No lock wall improvements
  - Dam Removal
- Construction Cost
  - ~\$15M





# Cape Fear Lock and Dam #2&3– Status Update

- Alternatives Analysis - Purpose and Need
  - Restore passage to historic spawning ground for anadromous fish
  - Maintain authorized use of LD2 & LD3, i.e. navigation
  - Sustain pool elevations for water supply
  - Enhance recreational fishing opportunities
  - Minimize maintenance to structure
- Selection of Preferred Alternatives – Methodology for Evaluation
  - Anticipated Design Performance (fish attraction, passing efficiency)
  - Dam/Lock Modifications
  - Sedimentation/Debris Accumulation
  - Construction Complexity
  - Project Cost (including USACE efforts for LD2 Stabilization)



# Cape Fear Lock and Dam #2&3– Status Update

- Alternatives Analysis – Preliminary Findings
  - Preferred Alternative @ LD2 – Upstream Fish Passage Structure
  - Preferred Alternative @ LD3 – Downstream Fish Passage Structure
  - Draft Alternative Analysis to QA/QC team June 2018
  - Alternative Analysis complete August 2018
- Next Steps
  - Field Investigations - Velocity/Flow Measurements and Geotechnical Investigations
  - CFD Modeling to refine hydraulics and geometry of fish passage structures
  - Design refinement of structural components
  - Environmental Assessment
  - Submit Section 408 package



# Schedule

- Alternatives Analysis – August 2018
- Velocity/Flow Measurements – Summer 2018
- CFD Modeling – Summer 2018
- Environmental Assessment – Summer 2018
- Permit Applications – Fall 2018
- Section 408 Package Submittal – September 2018
- Fish Egg Sampling – March to May 2019
- Final Design – Summer/Fall 2018



# USACE Lock and Dams Disposition Study

- Section 216 – deauthorize and dispose of outdated infrastructure in which the financial burden of upkeep to satisfy authorized purpose is in question
  - Analysis of positive and negative benefits, costs and impacts (i.e. water supply, recreation)
  - Real estate evaluate marketability of the project in total or separate elements
  - Dam safety analysis (Lock and Dam 2 scour hole repair)
  - Timeframe is 12 – 18 months plus Congress authorization
- Alternatives could include: dam removal (least likely), permanently close lock chamber, sell all elements together or separate
- USACE to make determination to move forward with de-authorization shortly

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- Alternatives could include: dam removal (least likely), permanently close lock chamber, sell all elements together or separate
- USACE to make determination to move forward with de-authorization shortly
- Section 216 Study – Approximately 12 to 18 months
- USACE may review/consider Section 408 applications but will not make final determination during Section 216 study



# Recommendations on Section 216 Disposition Study

- Engage with state and federal legislators to ensure stakeholder interests are upheld during disposition study
  - Interests include: water supply, recreation, public water access, and fish passage
- Request stakeholder engagement with the COE during disposition study
- Continue to support fish passage efforts at Lock and Dams 1, 2 and 3 as projects move forward