

From Fish Farm to Floodplain

A Story of Relocation and Restoration

Kimley»Horn

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Project Overview

Project Goals

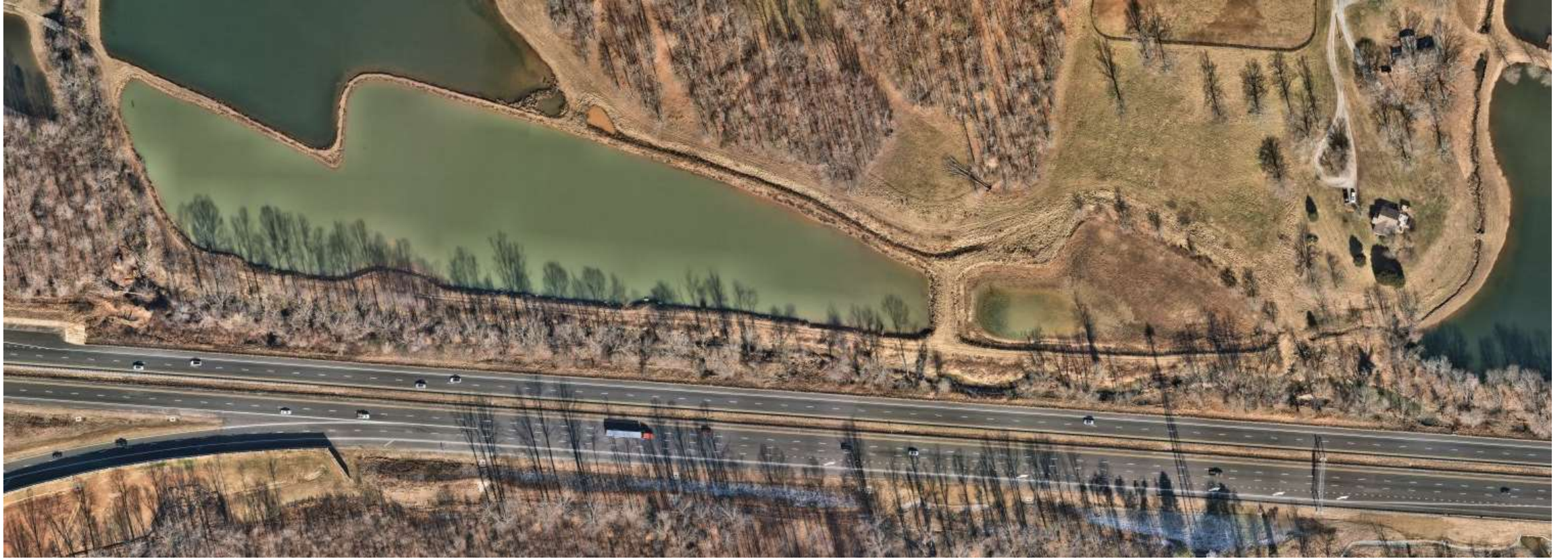
Design Considerations

Construction Challenges

Final Design













Project Goals

- Widen Business I-40 / 421
- Protect Existing/Proposed Infrastructure
- Restore Existing Conditions to Natural Conditions

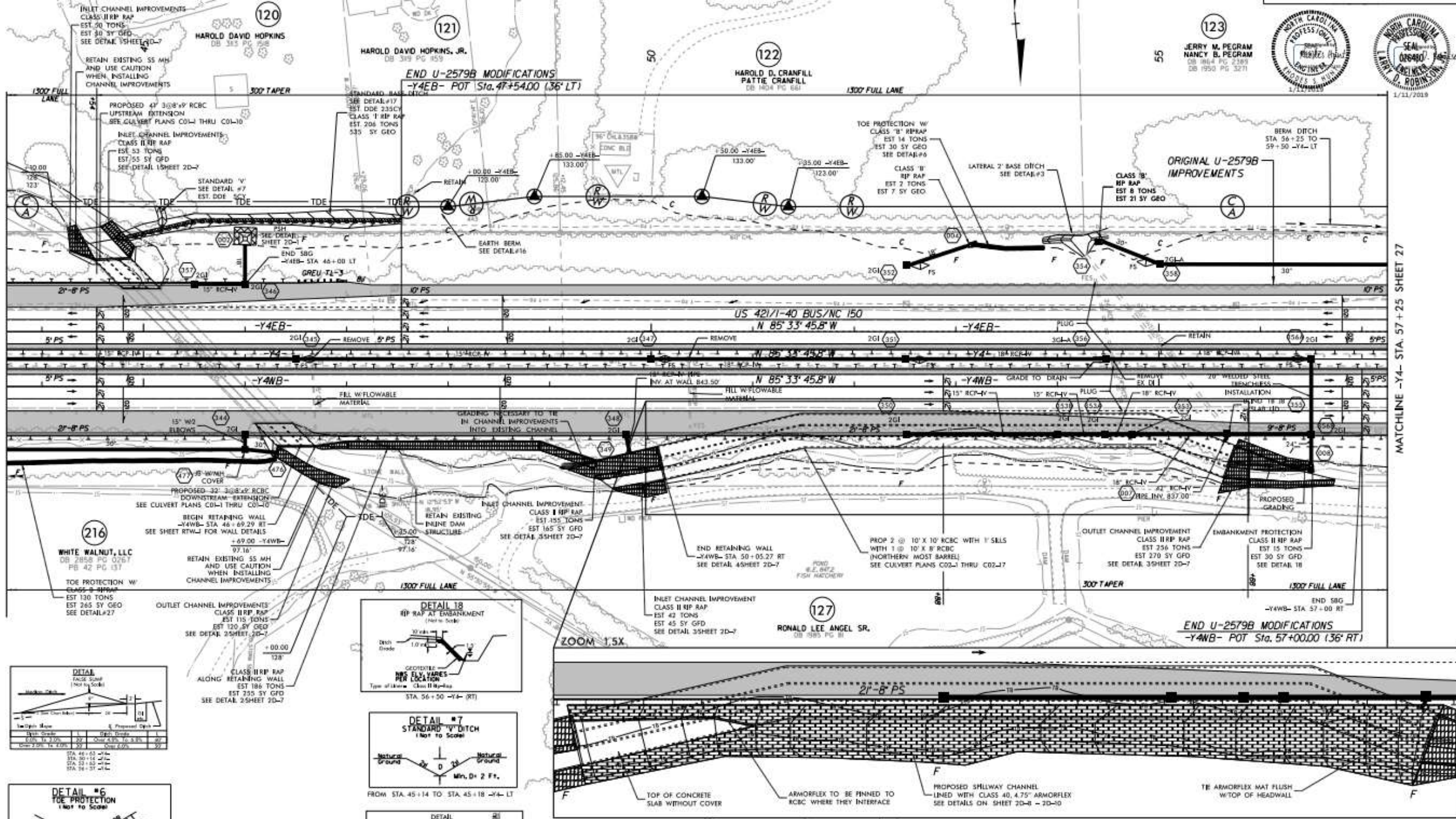
Design Considerations

- Can we purchase the neighboring ponds?
 - Existing Fish Farm - No
- Design Considerations to be continued....



MATCHLINE -Y4- STA. 43+65 SHEET 25

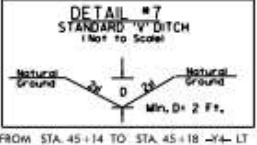
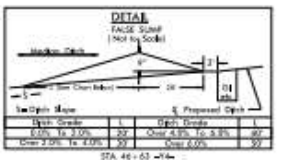
MATCHLINE -Y4- STA. 57+25 SHEET 27



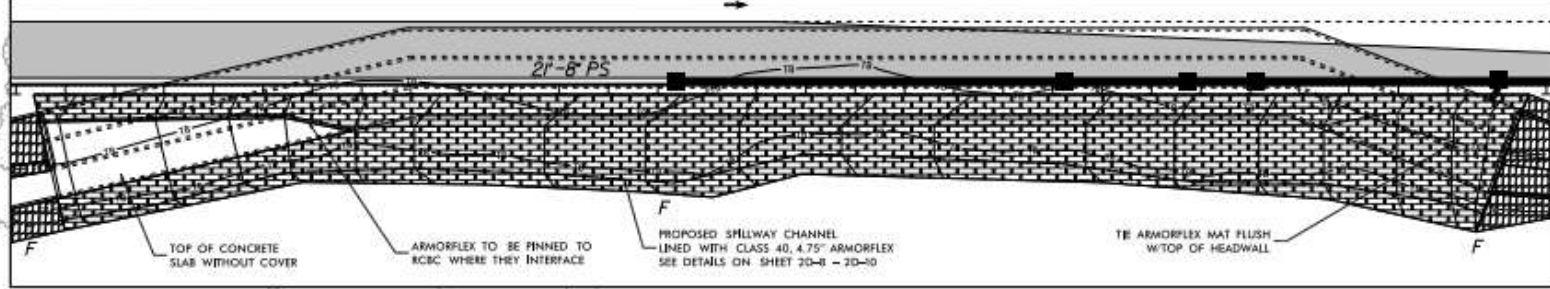
END U-2579B MODIFICATIONS
-Y4EB- POT Sta. 47+54.00 (36' LT)

ORIGINAL U-2579B IMPROVEMENTS

END U-2579B MODIFICATIONS
-Y4WB- POT Sta. 57+00.00 (36' RT)

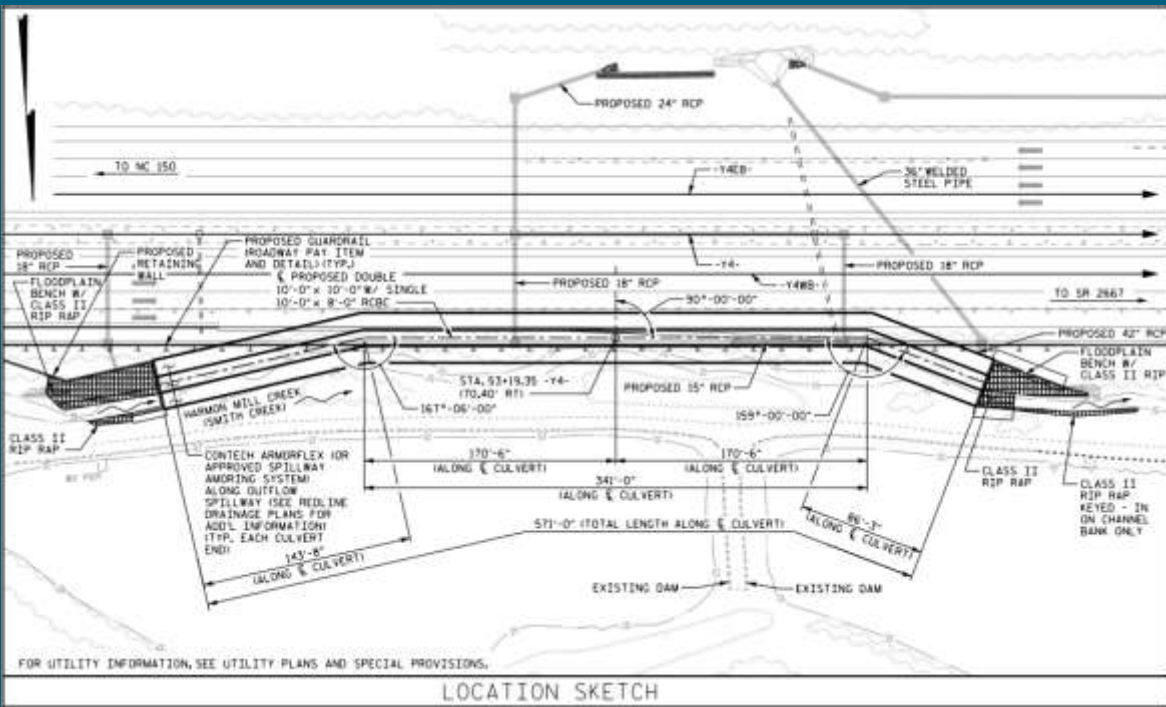


ZOOM 1.5X

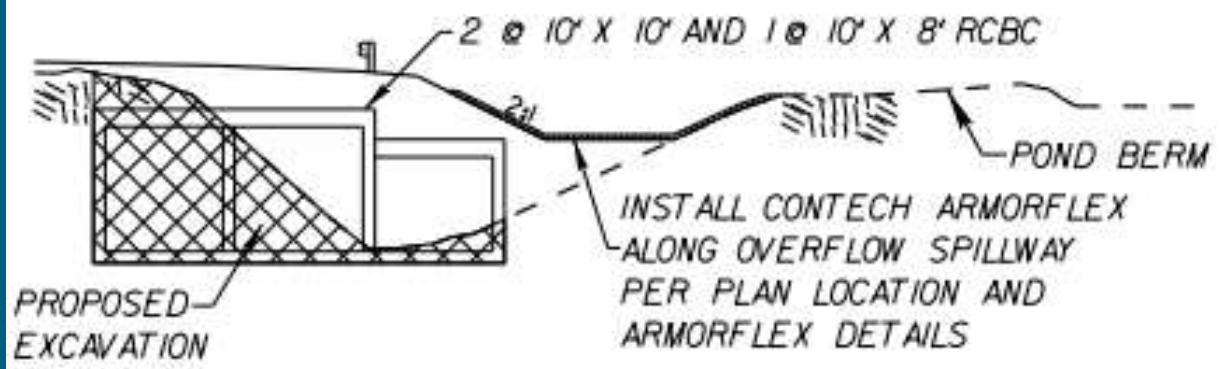


WHITE WALNUT, LLC
DB 2858 PG 0267

PAVED SHOULDER



CULVERT UNDER ROADWAY LOOKING DOWNSTREAM



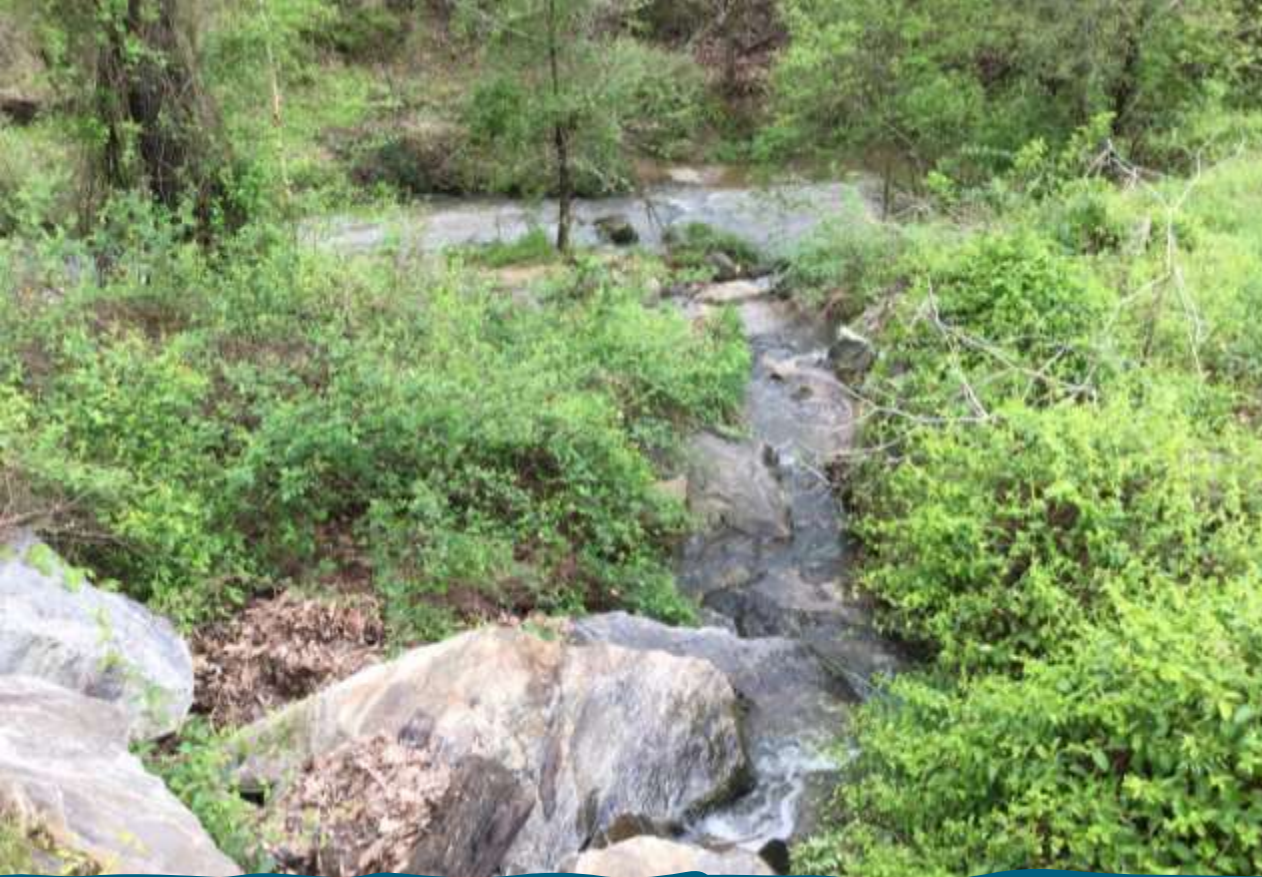
Design Considerations

- Can we purchase the neighboring ponds?
 - Existing Fish Farm - Yes

Design Considerations

Ponds used to feed
downstream ponds



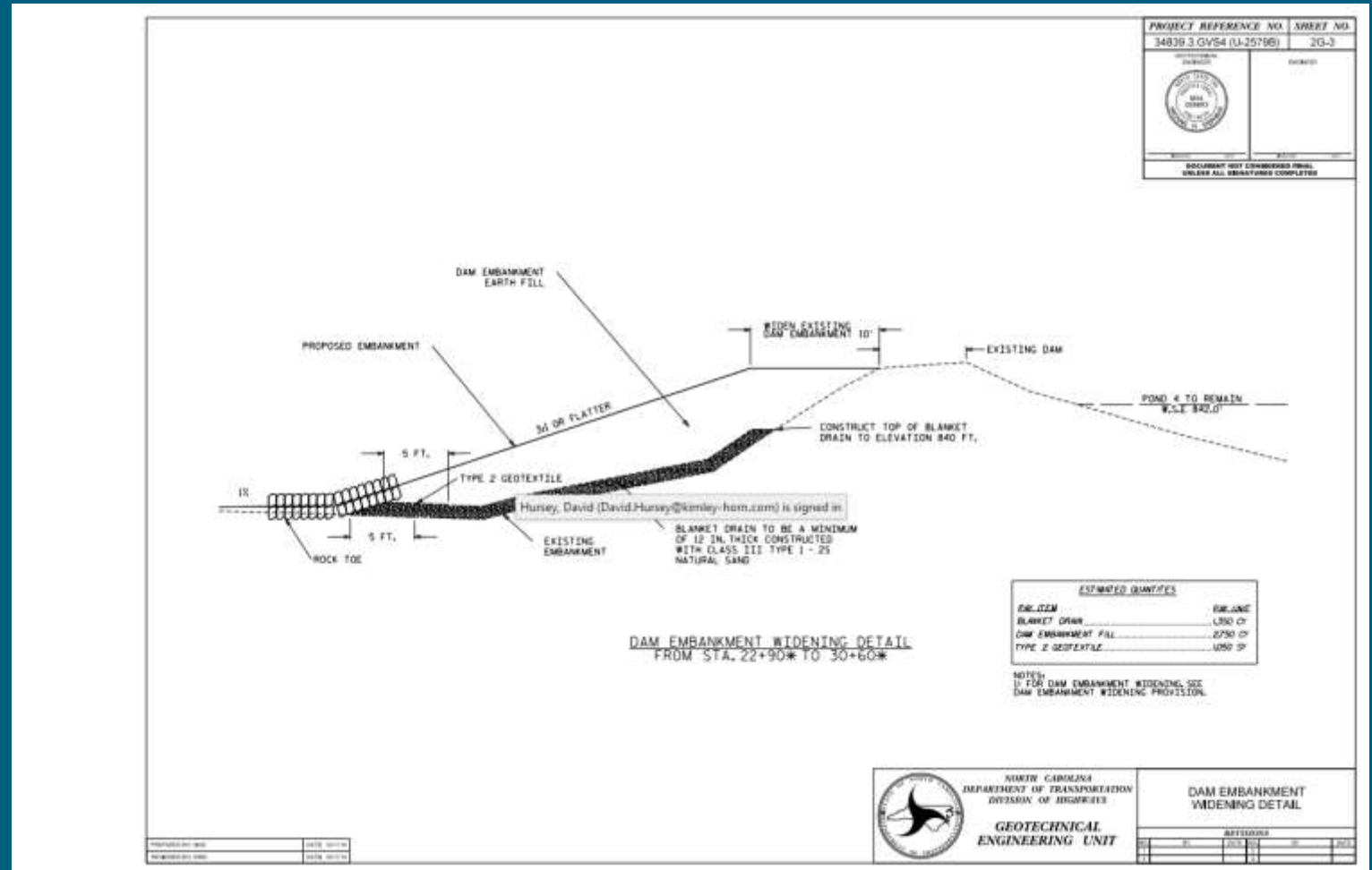


Design Considerations

Unnamed Tributary 15
FT higher than existing
stream

Design Considerations

Embankment concerns on adjacent pond



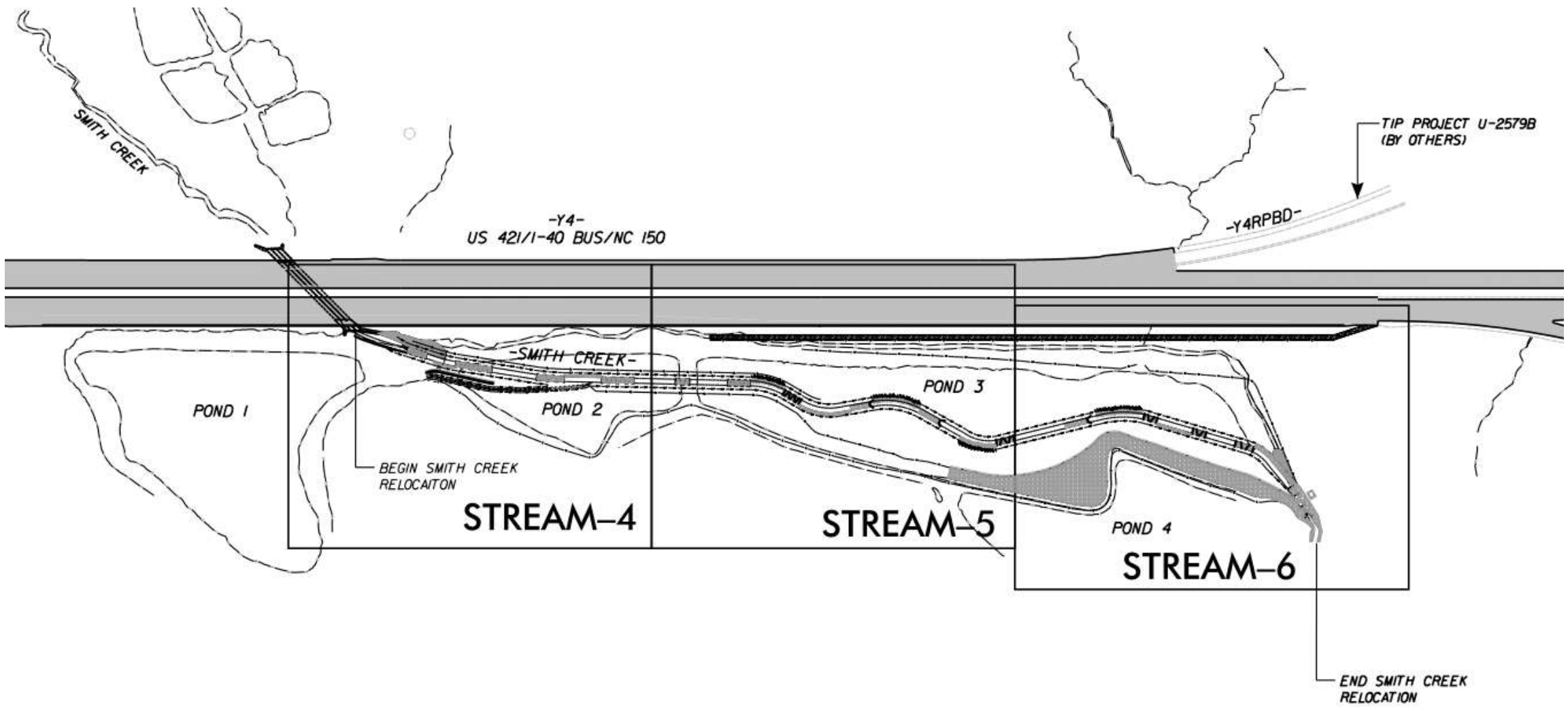


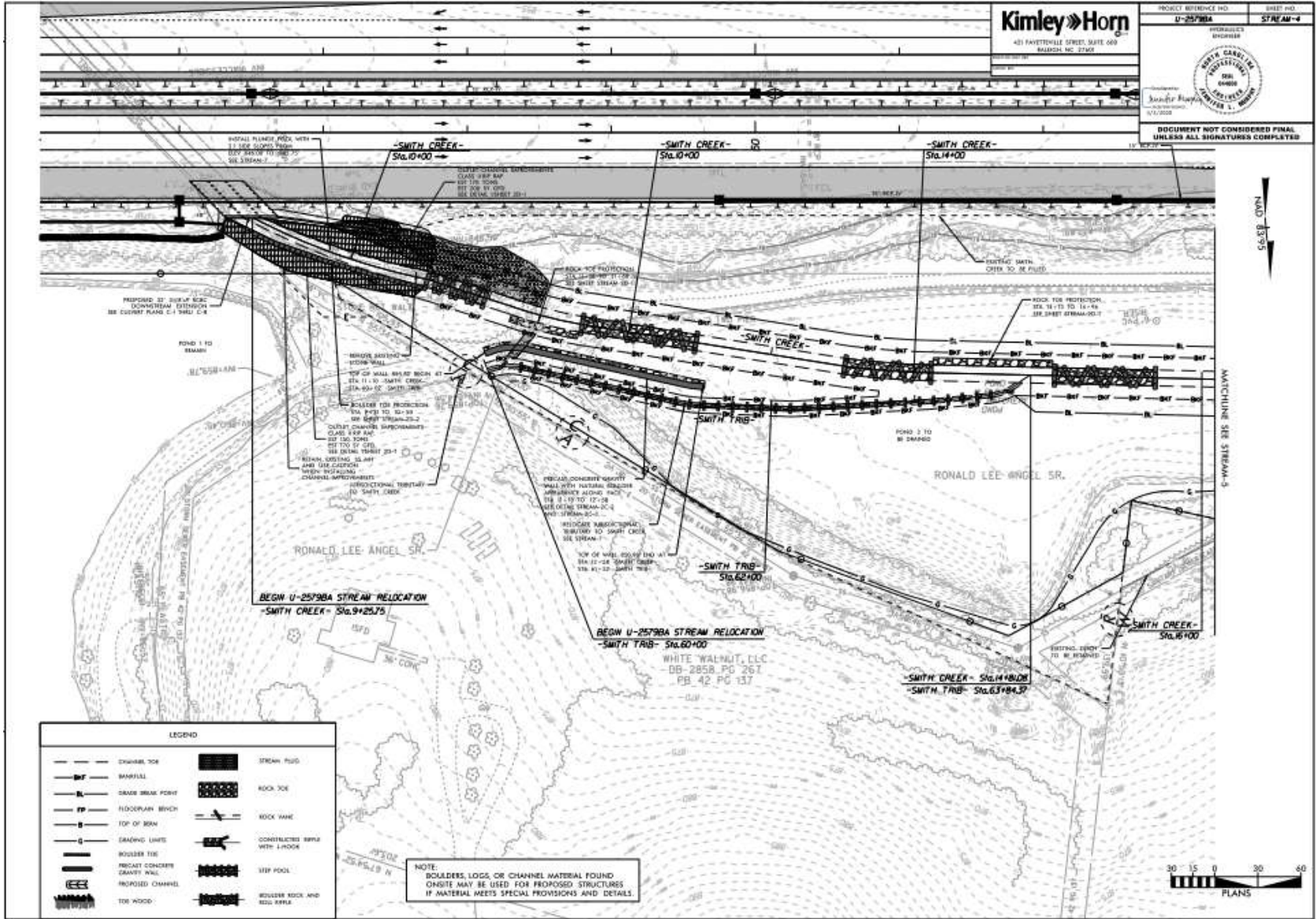
Design Considerations

Condition of Pond Bottom

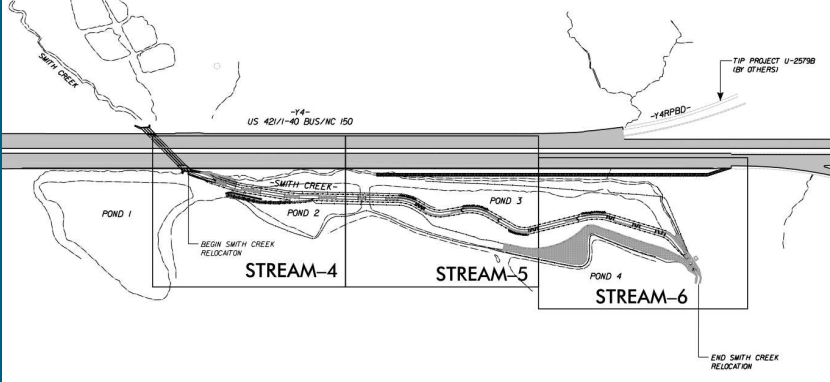
Construction Challenges / Final Design



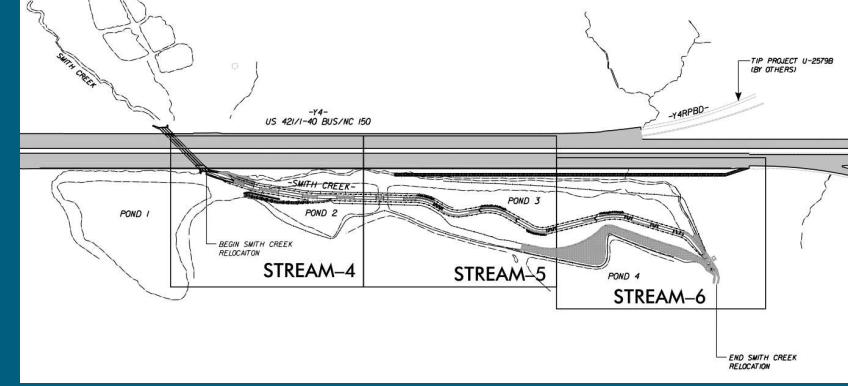


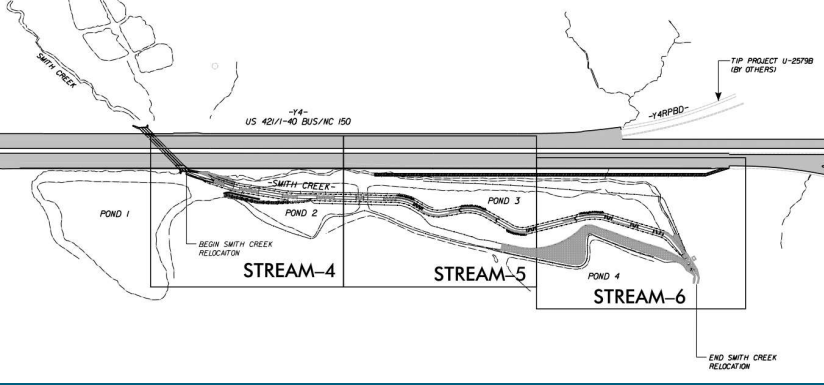


Tributary Construction with a retaining wall?

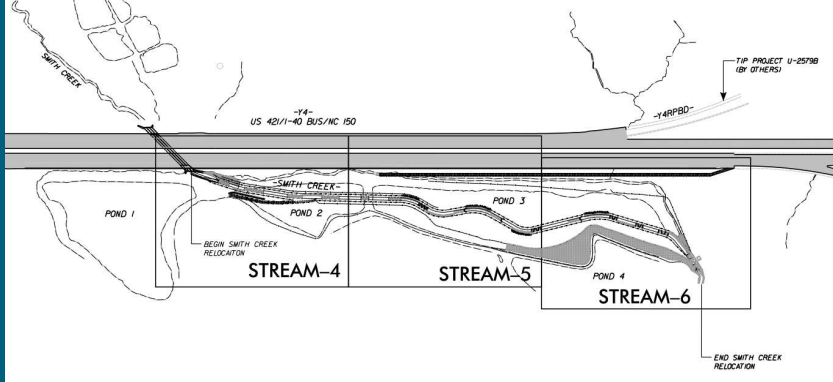


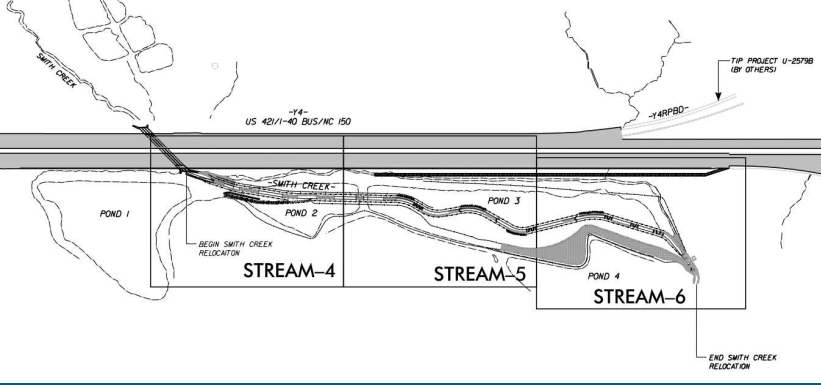
How much is too much rip rap?





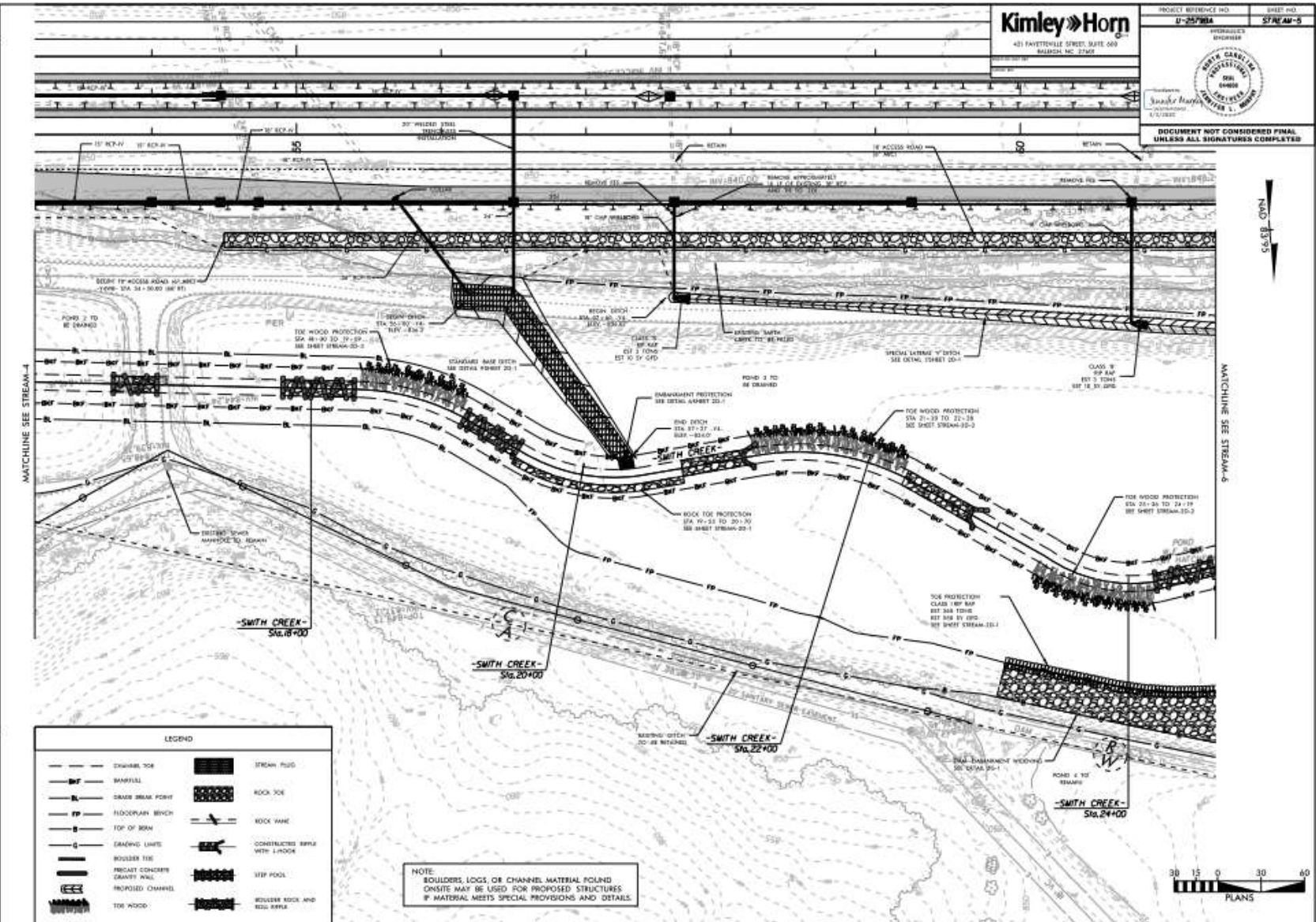
Always have an erosion plan!





Protect Infrastructure & Work with Existing Environment

PROJECT REFERENCE NO.	SHEET NO.
U-25/200A	STREAM-5
HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE SEE STREAM-4

MATCHLINE SEE STREAM-6

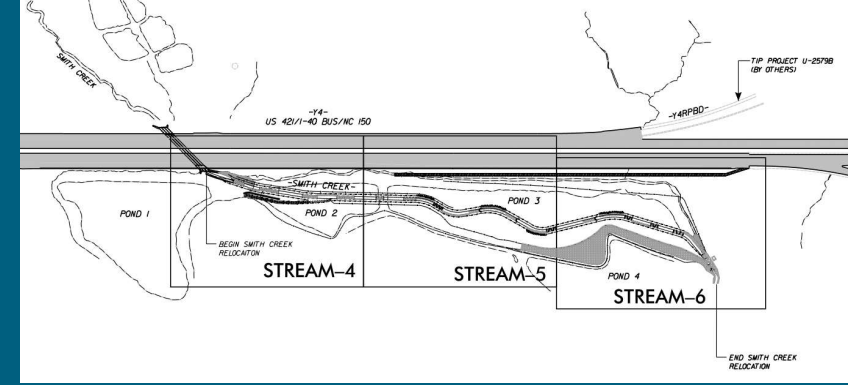


LEGEND	
	EMBANKMENT TOE
	BARFILL
	CROSS STREAM POINT
	FLOODWAY BENCH
	TOP OF BANK
	EASEMENT LIMITS
	BOULDER TOE
	PRECAST CONCRETE GRANITE WALL
	PROPOSED CHANNEL
	TOE WOOD
	STREAM PILE
	ROCK TOE
	ROCK PILE
	CONSTRUCTED BAFFLE WITH 1-FOOT LOGS
	STEP POOL
	BOULDER ROCK AND ROLL BAFFLE

NOTE:
BOULDERS, LOGS, OR CHANNEL MATERIAL FOUND ON-SITE MAY BE USED FOR PROPOSED STRUCTURES IF MATERIAL MEETS SPECIAL PROVISIONS AND DETAILS.

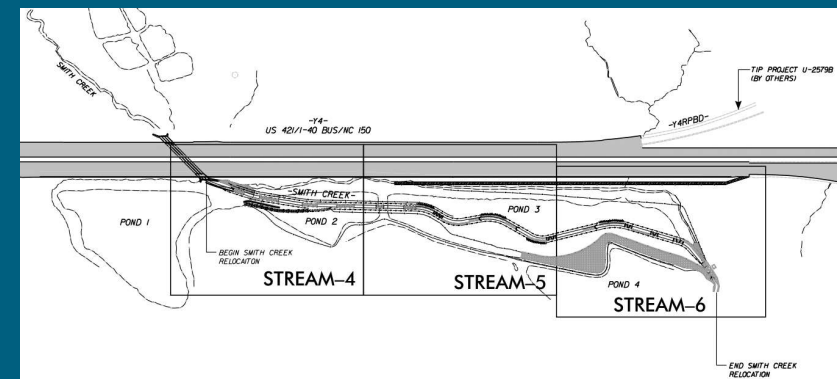


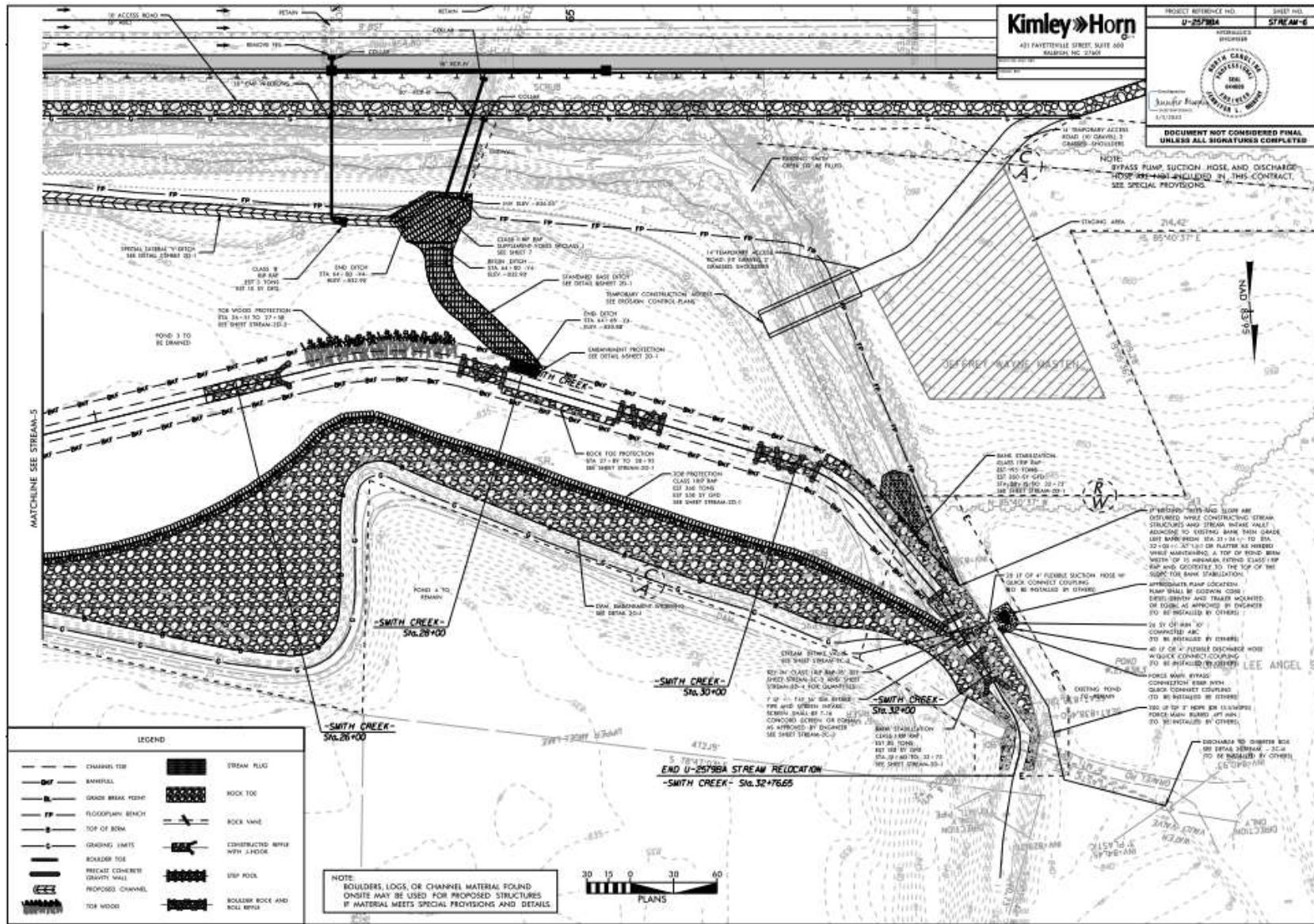
Use materials on-site





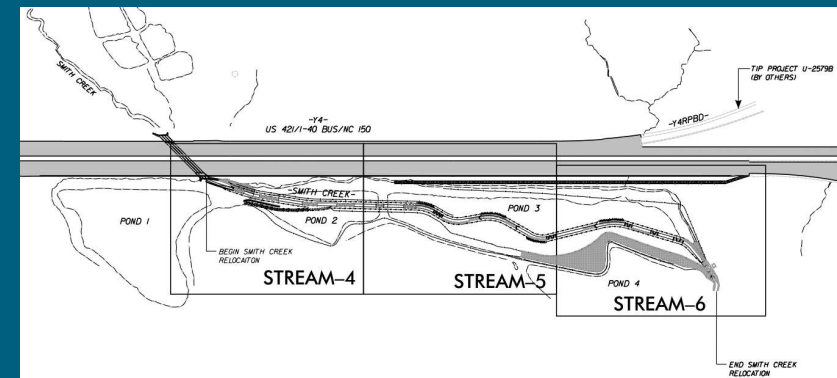
Transition stream classifications

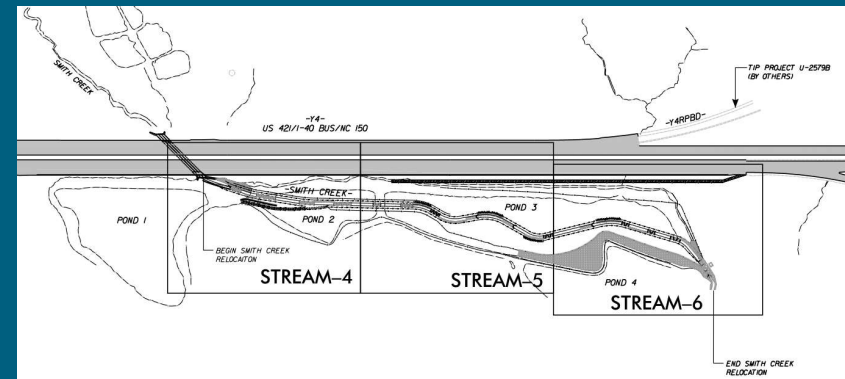






Jack and bore
doesn't always go
to plan

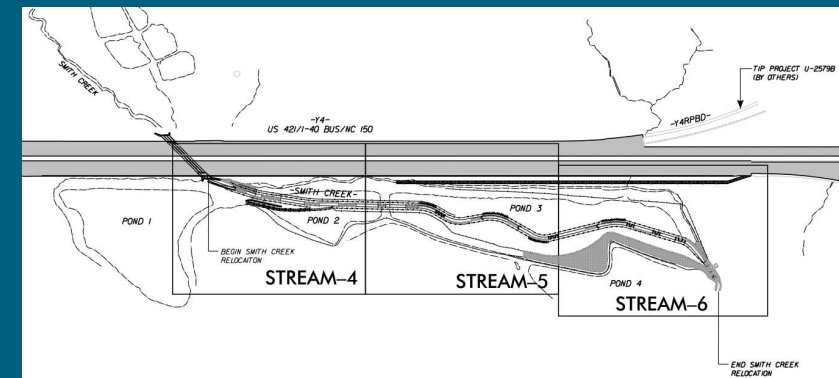






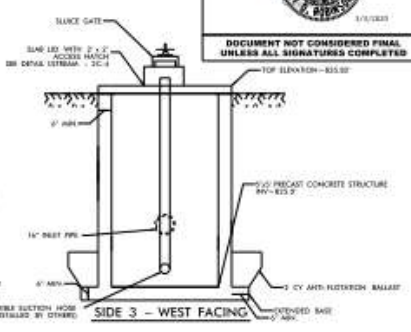
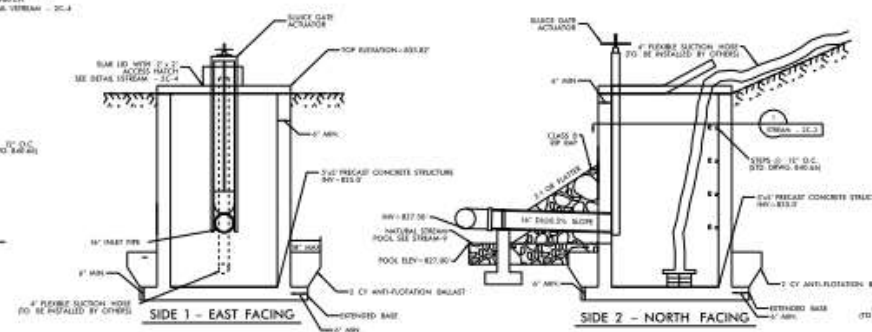
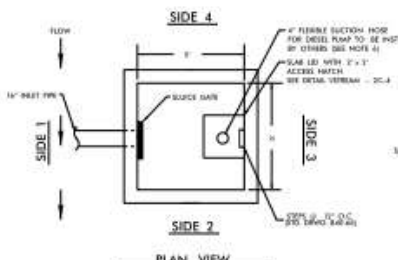
Use the existing stream location to your advantage

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DETAIL STREAM INTAKE VAULT (SEE SPECIAL PROVISIONS)

(NOT TO SCALE)



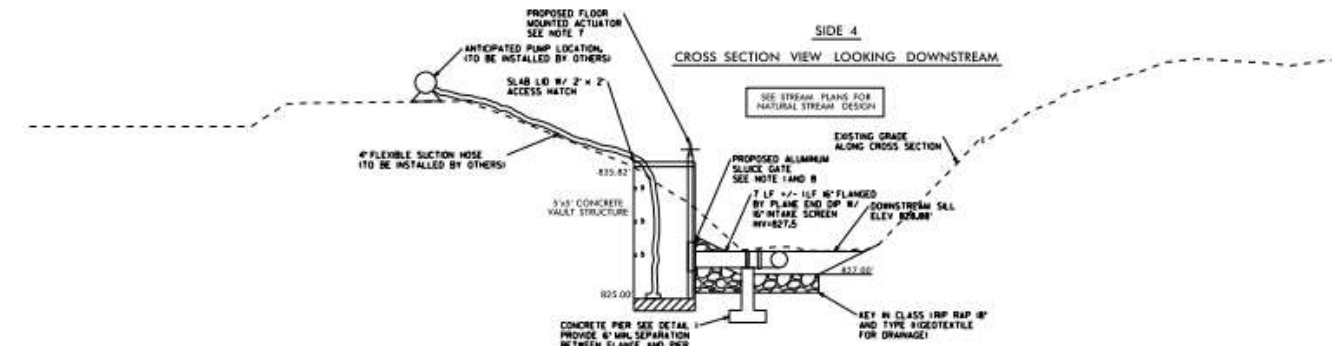
1 ACCESS HATCH
STREAM - 2C-3
SCALE: N.T.S.

2 CONCRETE VAULT STRUCTURE
STREAM - 2C-3
SCALE: N.T.S.

3 CONCRETE VAULT STRUCTURE
STREAM - 2C-3
SCALE: N.T.S.

4 CONCRETE VAULT STRUCTURE
STREAM - 2C-3
SCALE: N.T.S.

- NOTES:**
1. SLUICE GATE IS FOR INFLATE VAULT AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION.
 2. SLUICE GATE SHALL PROVIDE WATER-TIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR INTAKE VAULT OPERATION.
 3. SELECT ROV STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND SLAB L&B WITH ACCESS HATCH.
 4. ENSURE ACCESS HATCH OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
 5. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTTATION ANTI-FLOTTATION BALLAST IS REQUIRED AND SHALL BE CONCRETE. MET WALL STRUCTURE MAY BE SUBSTITUTED. SHOP DRAWINGS MUST BE SUBMITTED FOR APPROVAL BY ENGINEER.
 6. BYPASS PUMP, SUCTION HOSE AND DISCHARGE HOSE NOT BY CONTRACT. SEE SPECIAL PROVISIONS.
 7. SLUICE GATE SHALL BE WALL MOUNTED. PROVIDE A 1/2\"/>



5 ACCESS HATCH
STREAM - 2C-3
SCALE: N.T.S.

431 FAYETTEVILLE STREET, SUITE 400
Raleigh, NC 27601

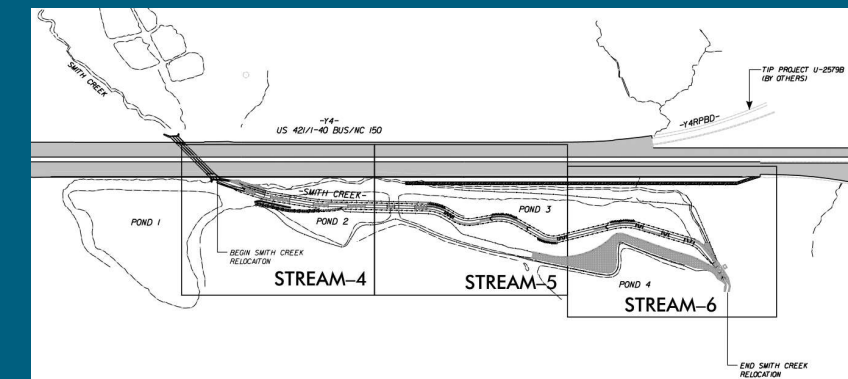
PROJECT REFERENCE NO.	SHEET NO.
U-25798A	STREAM - 2C-3
DW SHEET NO.	DESIGNER
HYDRAULIC DESIGN	SHEPHERD

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TOP ELEVATION - 825.00'

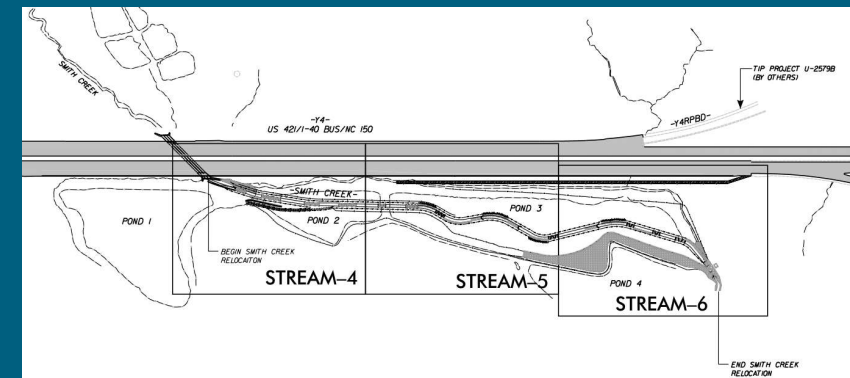


Get creative with solutions...





...to incorporate hard structures with natural features



Continuous Quality Improvement

- Be ready to change project direction at any time
- Learn your clients' preferences
- But don't be afraid to try new techniques
- Use the floodplain to your advantage



Questions?

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