
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS
DISTRICT
SERVING THE ARMY...SERVING THE NATION

Comite River Diversion Project

Presented to

NDIA Tri-Services Infrastructure Conference

4 August 2005

Picture of the Comite River, Louisiana in Flood Source: T. Davison 1983

Project Sponsors

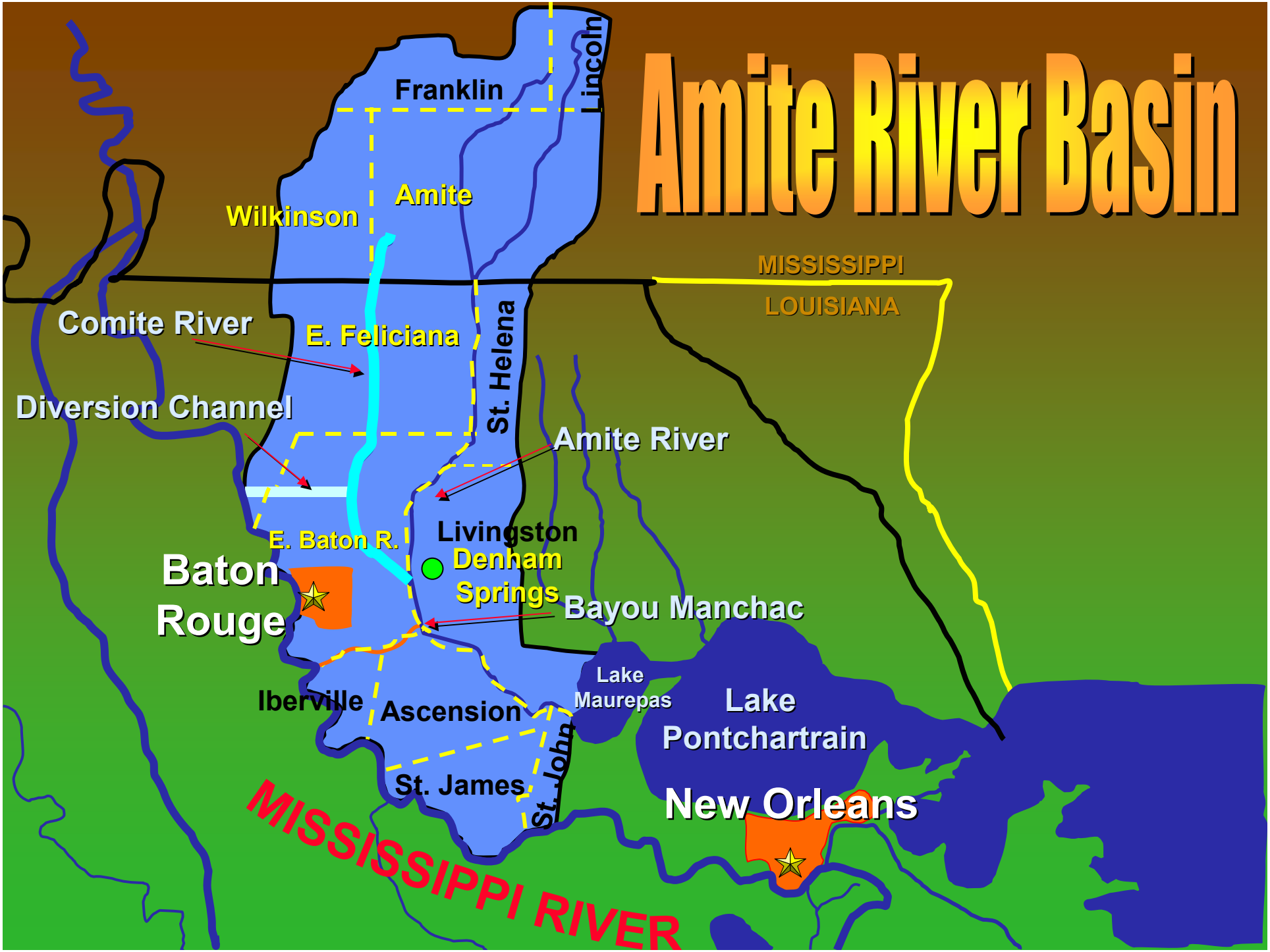
Non-Federal Sponsors

Louisiana Department of Transportation and Development (LADOTD)

City of Baton Rouge, Parish of East Baton Rouge (CITY-PARISH)

Amite River Basin and Water Conservation District (ARBC)

Project Location


Amite River Basin
Franklin
Lincoln
Wilkinson
Amite
MISSISSIPPI
LOUISIANA
Comite River
E. Feliciana
St. Helena
Diversion Channel
Amite River
E. Baton R.
Livingston
Denham Springs
Baton Rouge
Bayou Manchac
Lake Maurepas
Lake Pontchartrain
Iberville
Ascension
St. James
St. John
New Orleans
MISSISSIPPI RIVER

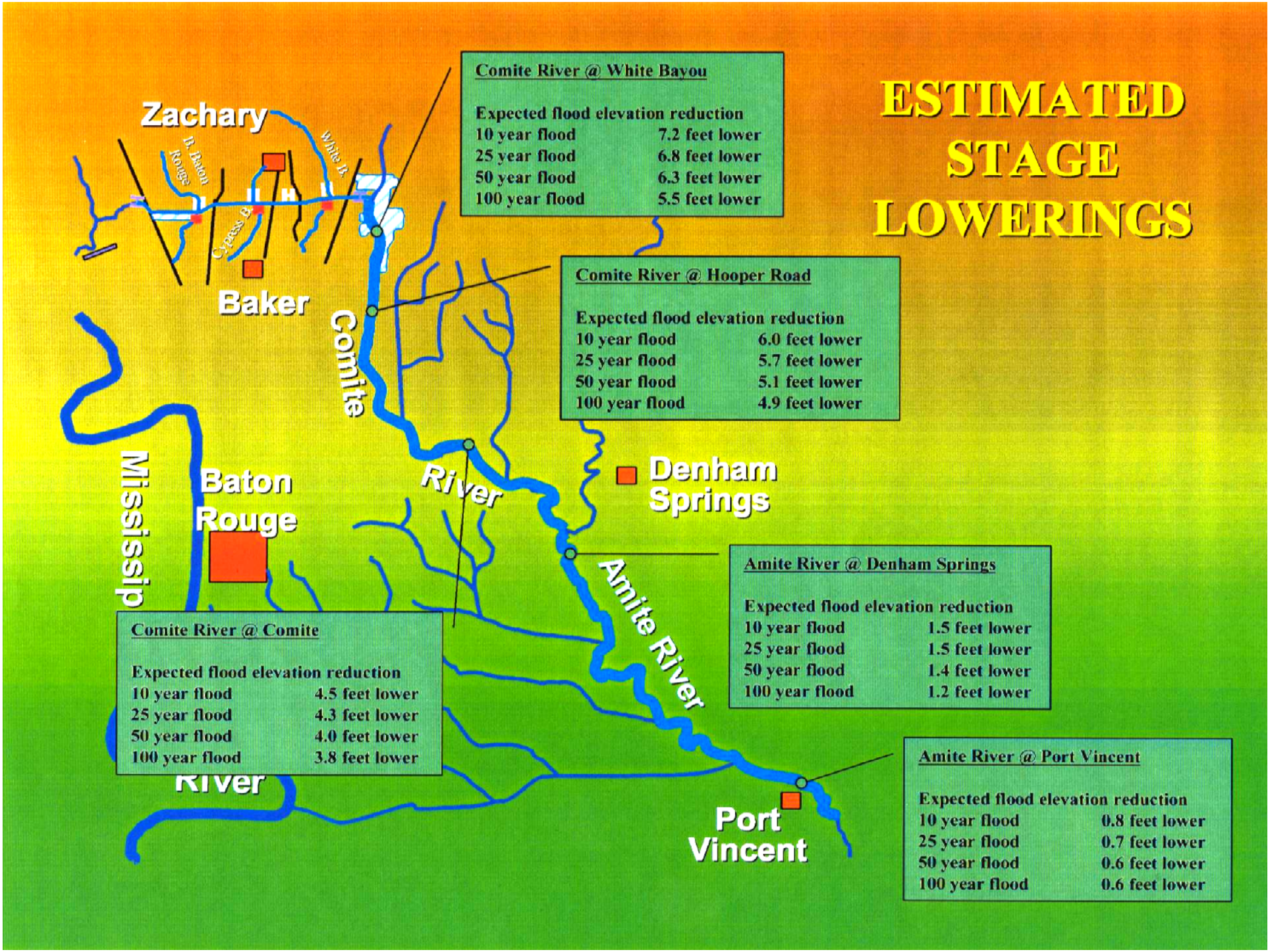
Project Purpose

Project Purpose

- To provide flood protection for the residents of the Comite and Lower Amite River Basins

- The authorized project will reduce stages:
  - On the Comite River from the diversion point to the confluence with the Amite River
  - On the Amite River from the confluence with the Comite River near Denham Springs to Port Vincent
  - On White Bayou, Cypress Bayou, and Bayou Baton Rouge

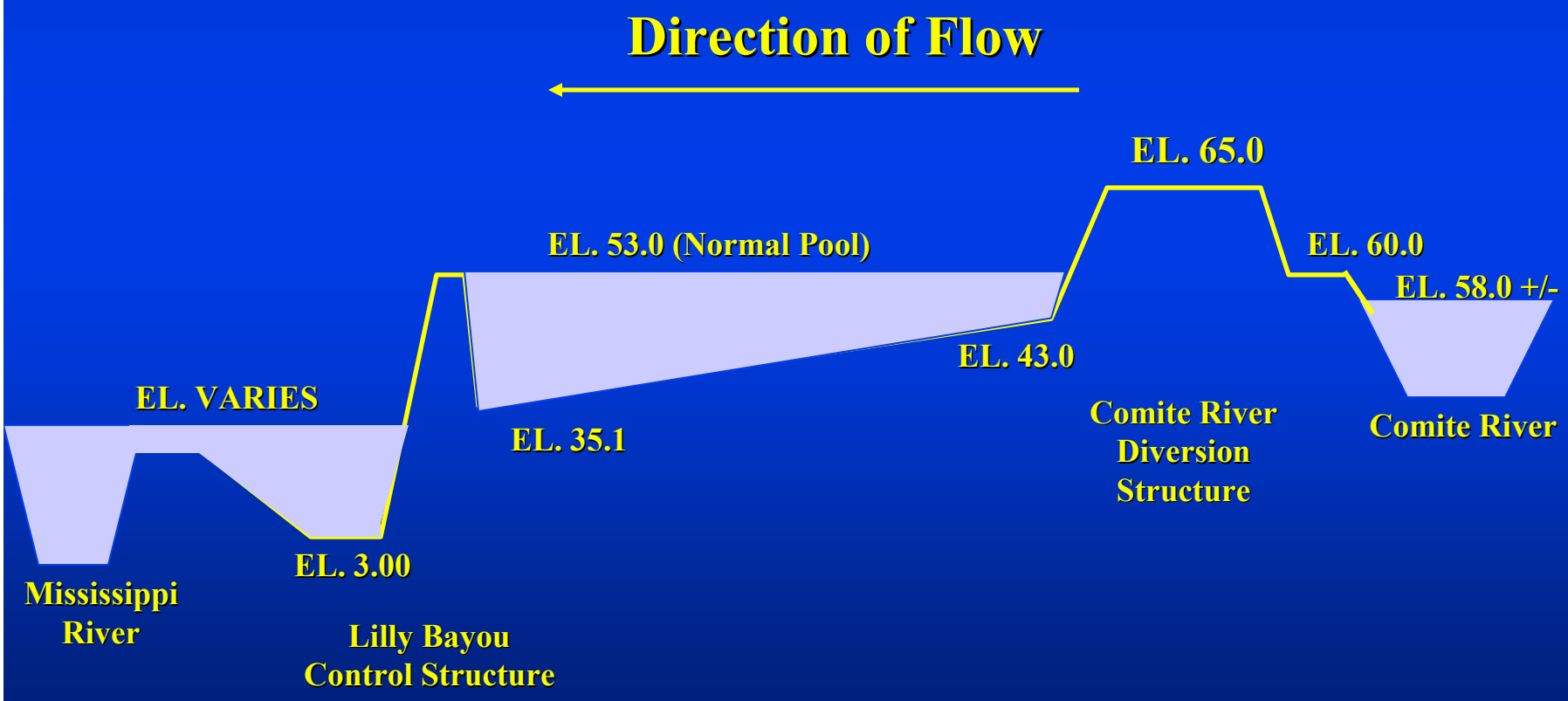
- Total Cost = $165 million


ESTIMATED STAGE LOWERINGS
Comite River @ White Bayou
Expected flood elevation reduction
10 year flood 7.2 feet lower
25 year flood 6.8 feet lower
50 year flood 6.3 feet lower
100 year flood 5.5 feet lower
Comite River @ Hooper Road
Expected flood elevation reduction
10 year flood 6.0 feet lower
25 year flood 5.7 feet lower
50 year flood 5.1 feet lower
100 year flood 4.9 feet lower
Amite River @ Denham Springs
Expected flood elevation reduction
10 year flood 1.5 feet lower
25 year flood 1.5 feet lower
50 year flood 1.4 feet lower
100 year flood 1.2 feet lower
Comite River @ Comite
Expected flood elevation reduction
10 year flood 4.5 feet lower
25 year flood 4.3 feet lower
50 year flood 4.0 feet lower
100 year flood 3.8 feet lower
Amite River @ Port Vincent
Expected flood elevation reduction
10 year flood 0.8 feet lower
25 year flood 0.7 feet lower
50 year flood 0.6 feet lower
100 year flood 0.6 feet lower
Zachary
Baker
Comite
River
Baton Rouge
Denham Springs
Amite River
Port Vincent
River

Overview of Project Features

COMITE RIVER DIVERSION PROJECT FEATURES

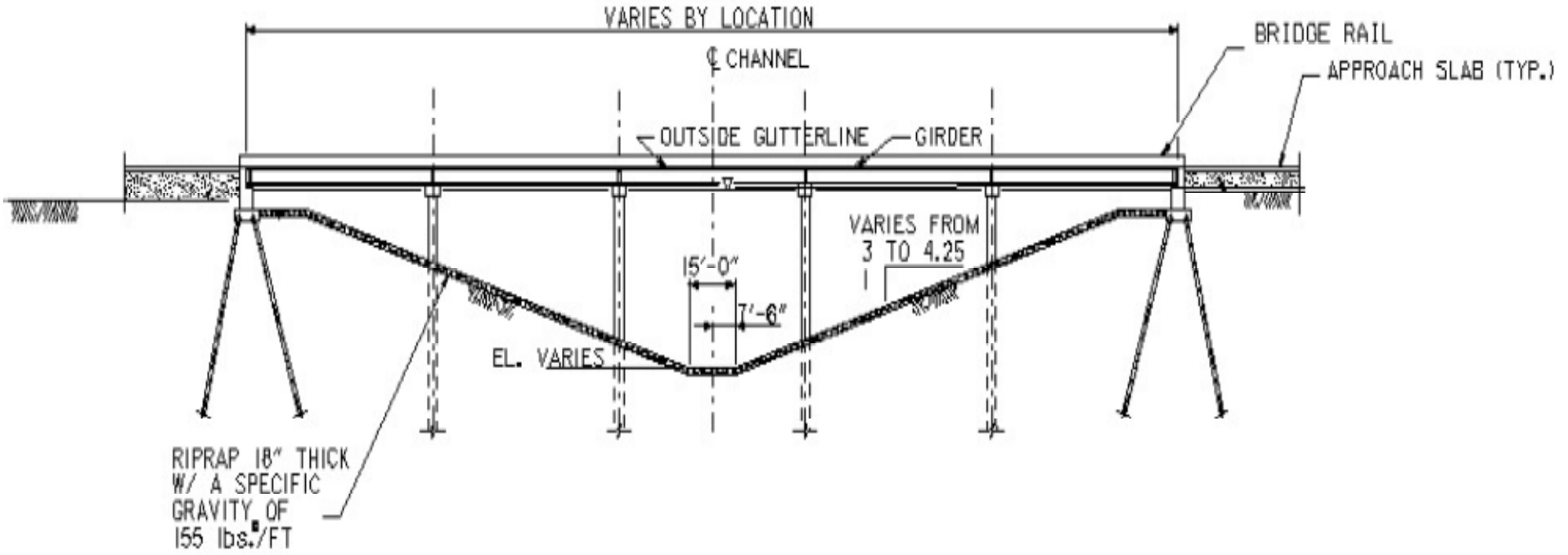
Comite River Diversion Channel
Channel Profile



Comite River Diversion Channel

- Drainage Area of Approximately 308 Square Miles
- "Wet" Channel
- Area of Impoundment of Approximately 102 Acres (At Normal Pool)
- Reason for a "Wet" Channel:
  - Improved Slope Stability
  - Less Maintenance

Comite River Diversion Channel



CHANNEL CROSS-SECTION

Lilly Bayou Control Structure

Purposes of the Lilly Bayou Control Structure

1. To dissipate energy resulting from substantial drops in both water surface elevation and channel invert to minimize costs of erosion protection downstream.

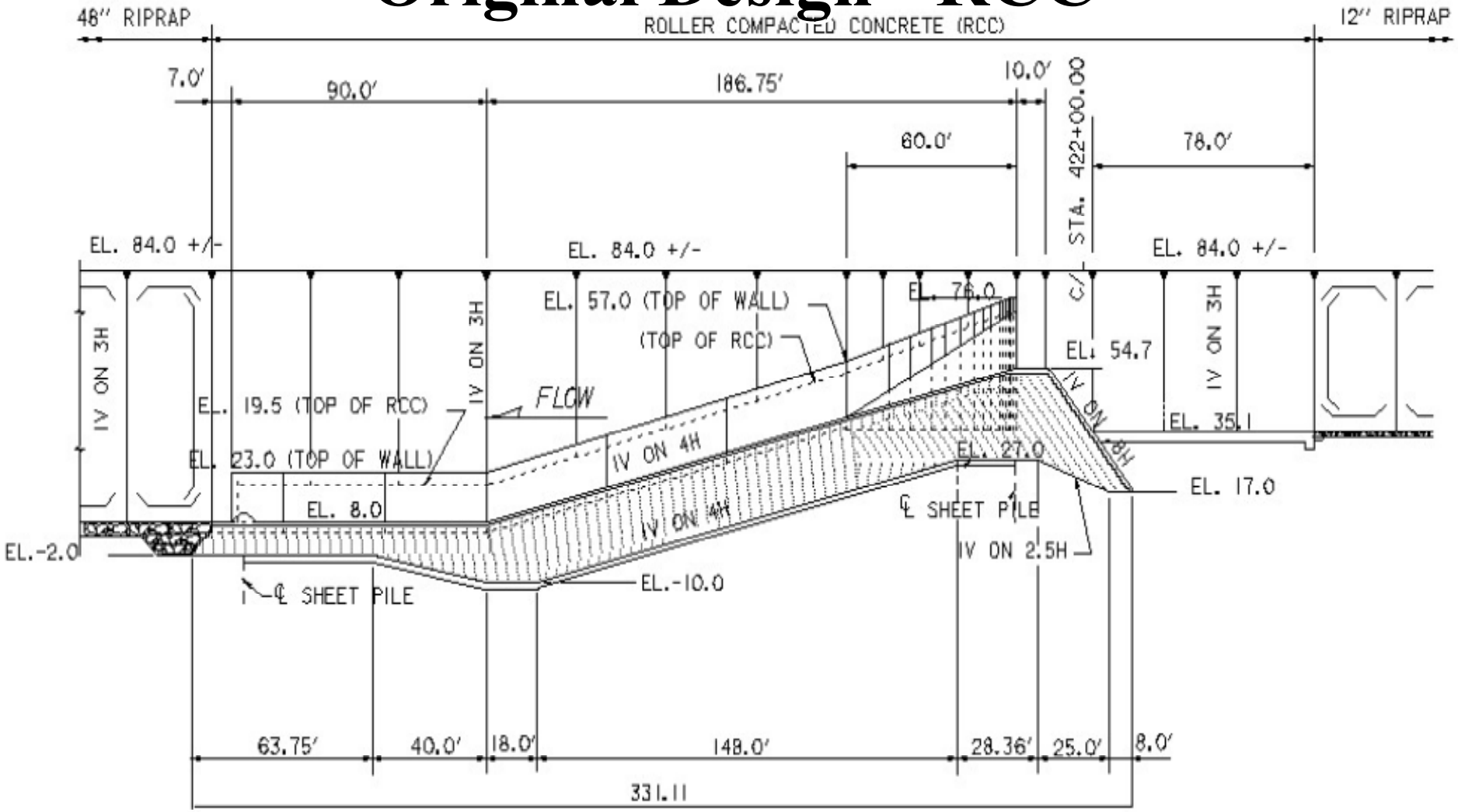
2. To provide a hard point at which head-cutting erosion is prevented from moving further upstream.

3. To limit the velocity of flow of the Comite River Diversion Canal to acceptable levels during design floods.

4. To impound water in the Comite River Diversion Canal to prevent slope failures

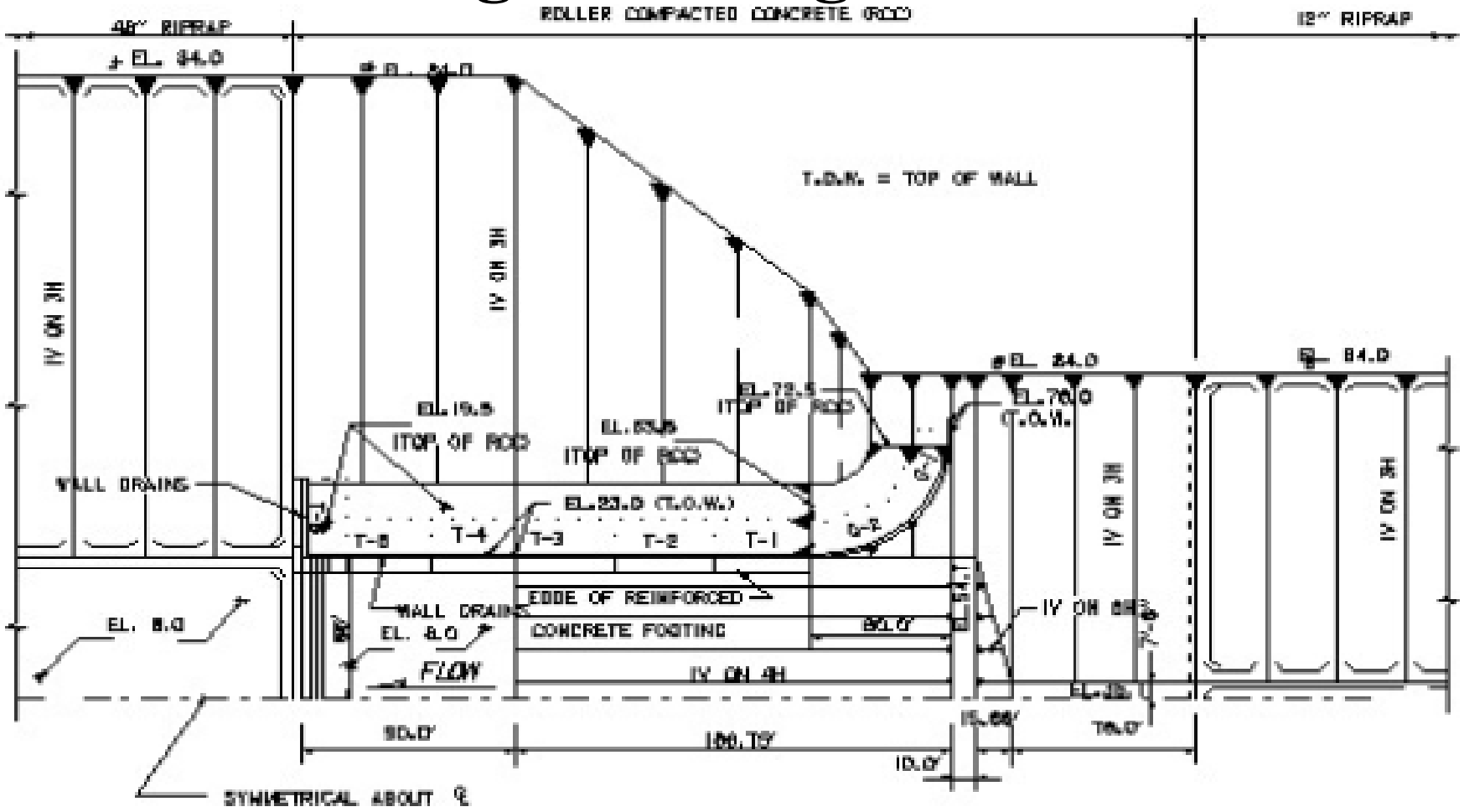
5. To prevent the intrusion of Mississippi River floodwaters into the Comite River Diversion Canal

Lilly Bayou Control Structure
Original Design - RCC



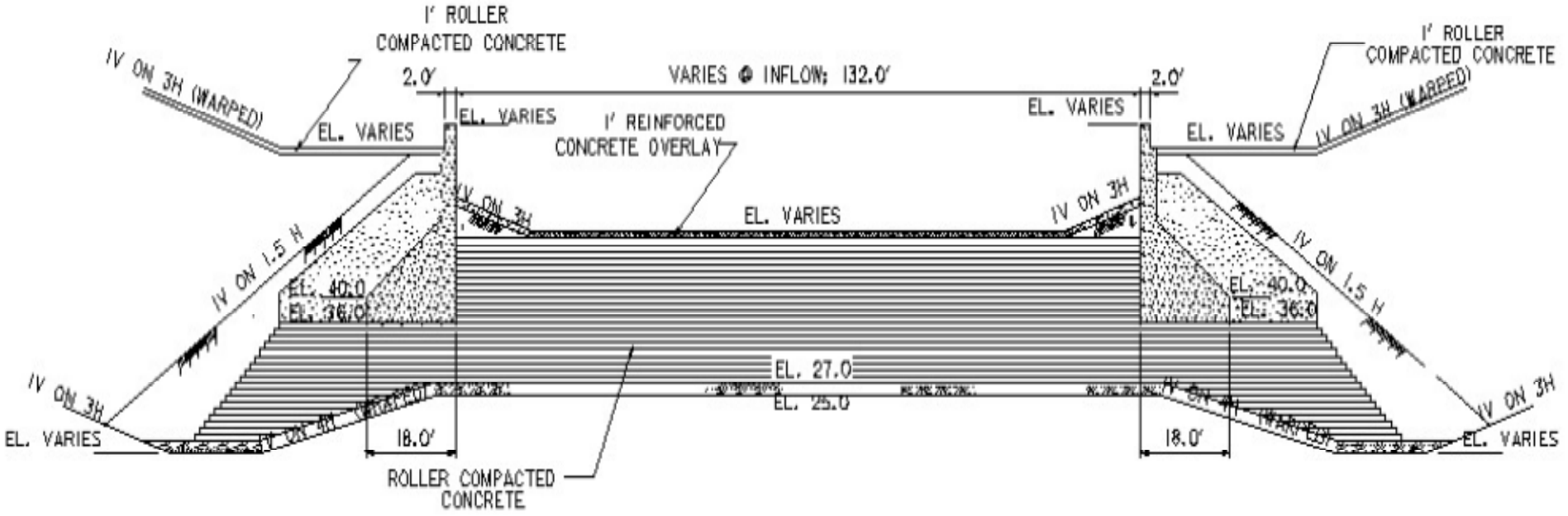
CENTERLINE PROFILE

Lilly Bayou Control Structure
Original Design - RCC



HALF PLAN

Lilly Bayou Control Structure
Original Design - RCC



SECTION

Lilly Bayou Control Structure: From RCC to CIP

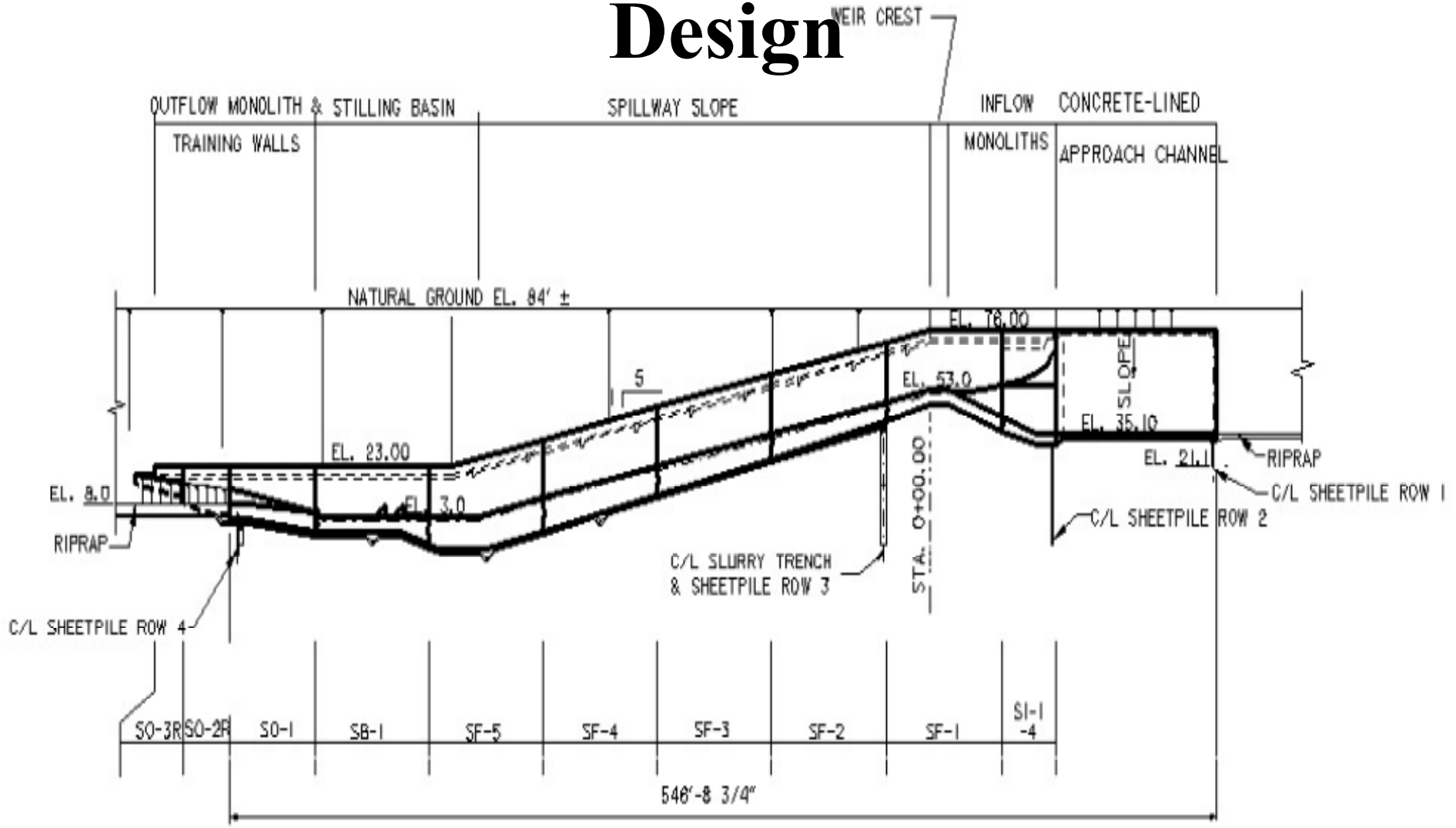
- Not typical application of RCC:
  - Atypical RCC structure geometry
  - Highly-erodible soil foundation (not rock)
  - RCC not widely used in this region
  - Relatively "thin" for an RCC structure
    - Concerns with cracking causing loss of foundation material, risking failure of structure
- Costs
  - Seepage-prevention measures between lifts increased costs
  - No in-situ aggregates available for mixture, so not optimum site for RCC (i.e. limestone would have to be hauled in)

Lilly Bayou Control Structure: From RCC to CIP

- **Major Concerns: Uplift and Slope Stability**

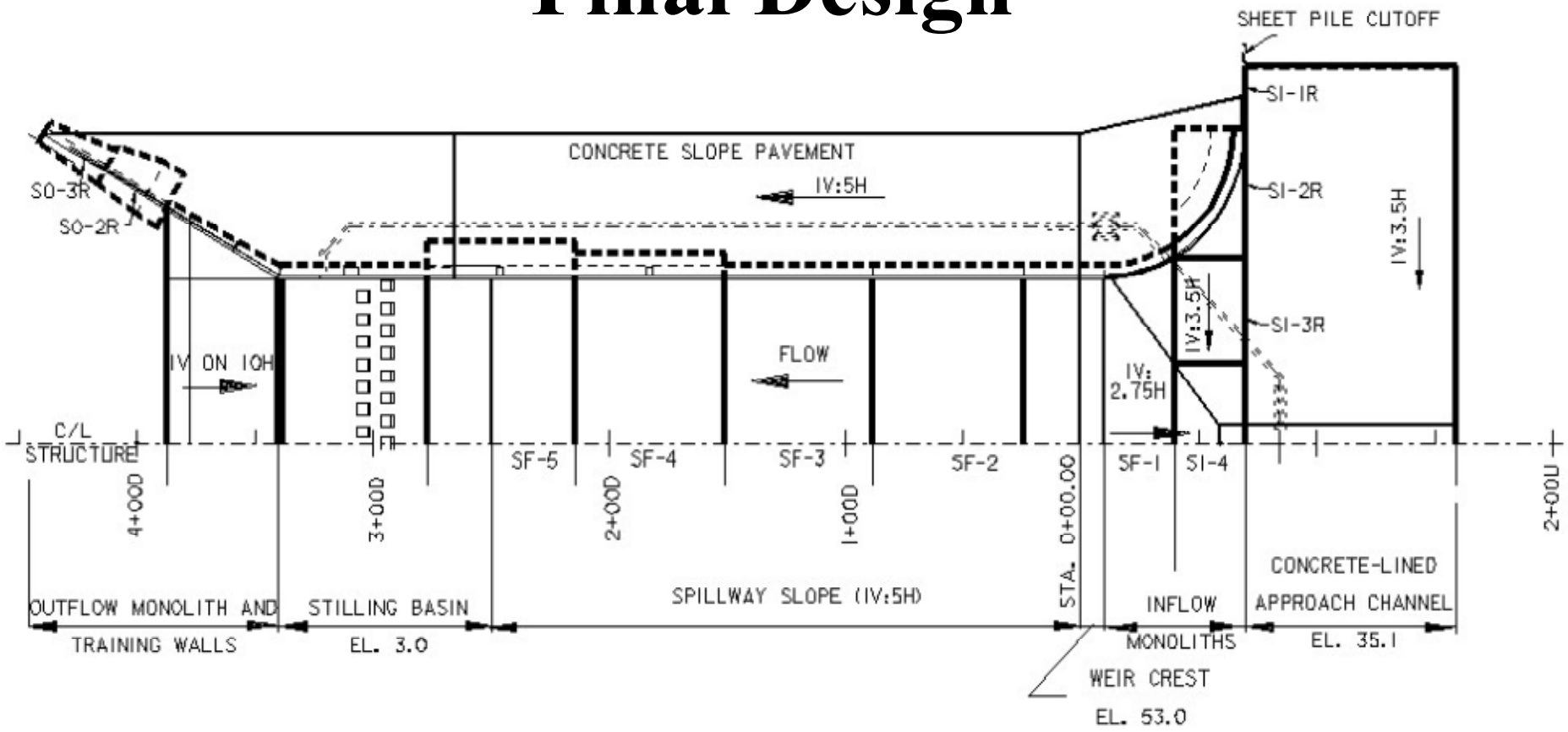
- **Alternatives investigated:**
  - Piles or Drilled Shafts
  - Ground Anchors
  - Heavy-Weight Concrete (250 pcf)

Lilly Bayou Control Structure Final Design



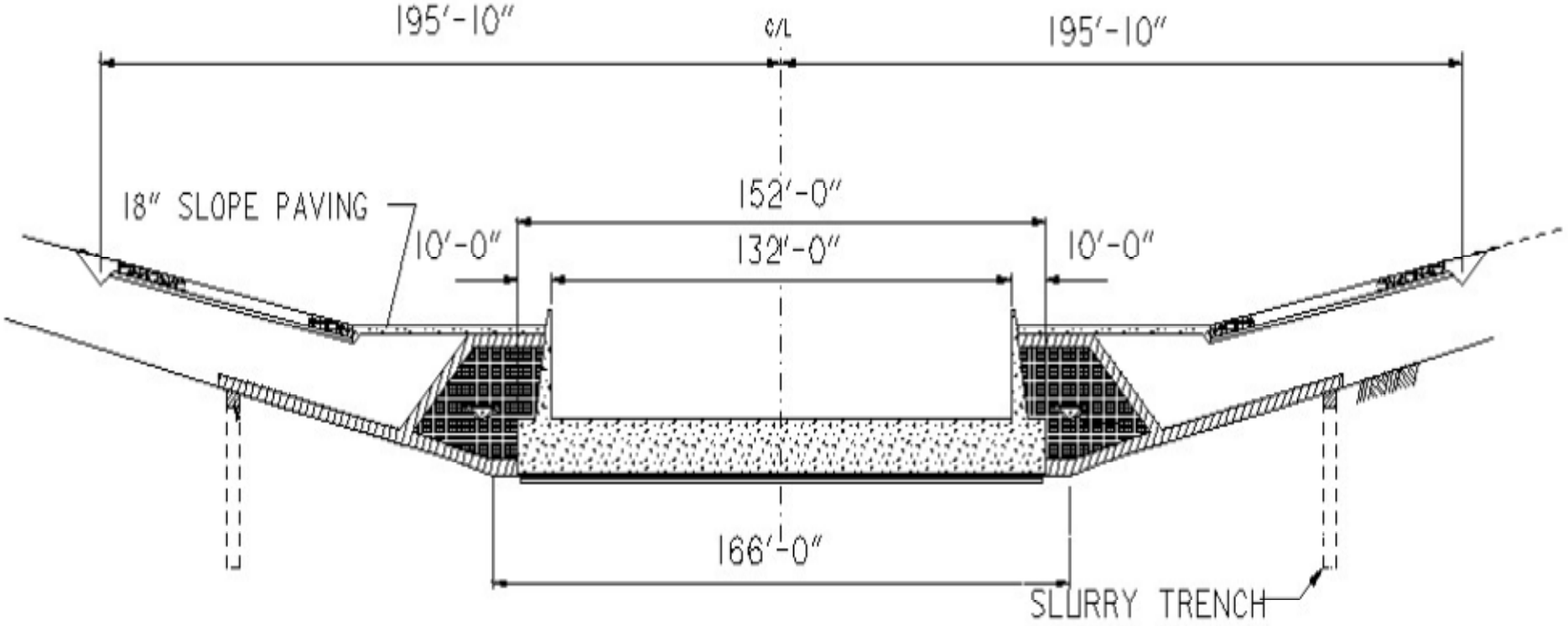
CENTERLINE PROFILE

Lilly Bayou Control Structure
Final Design



HALF PLAN

Lilly Bayou Control Structure
Final Design



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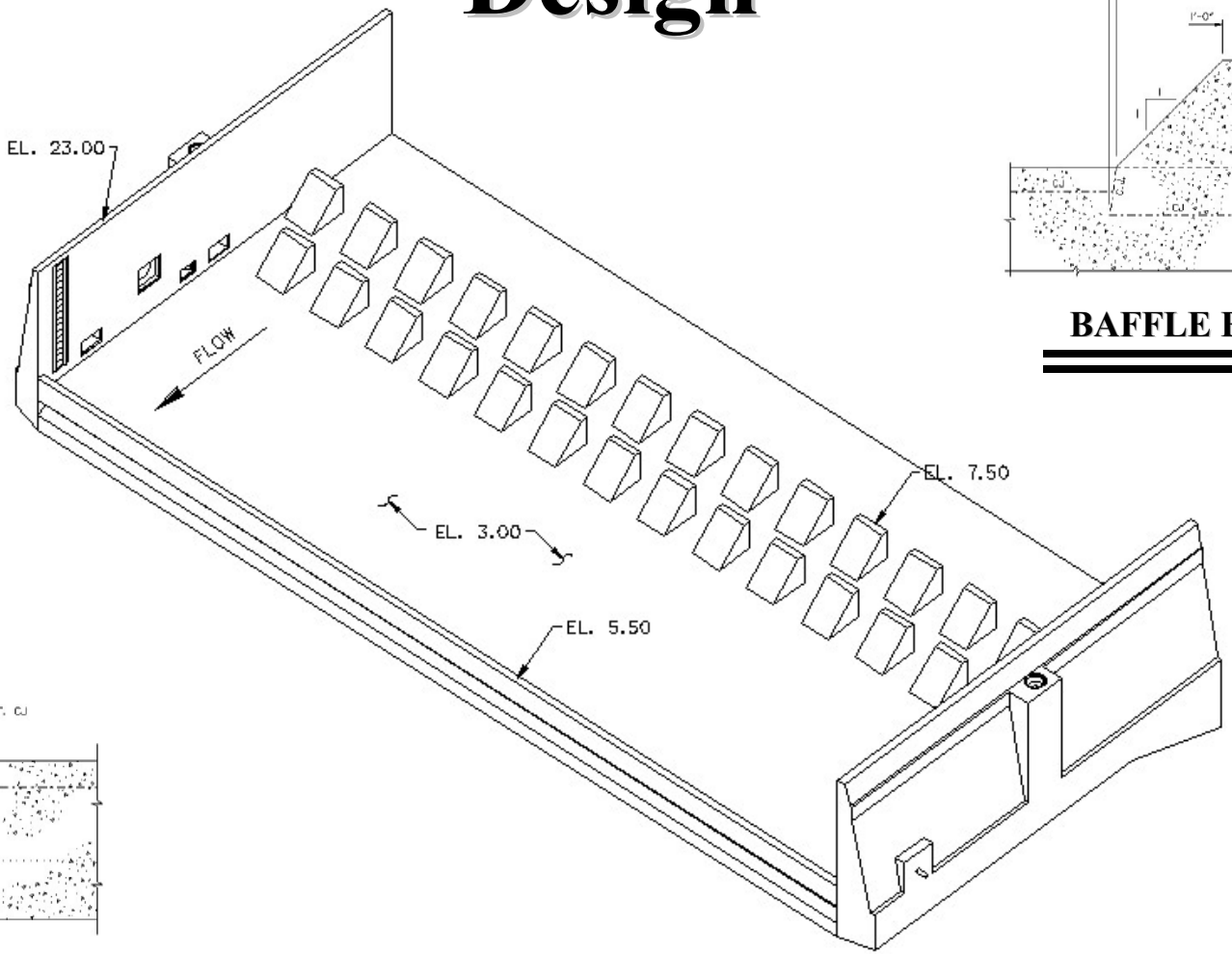
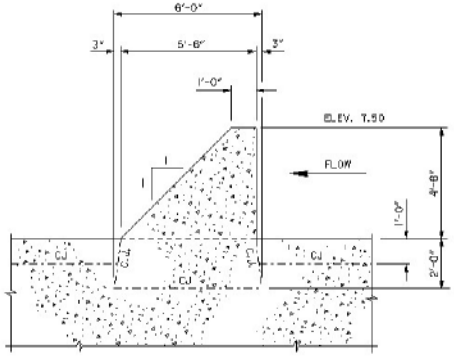
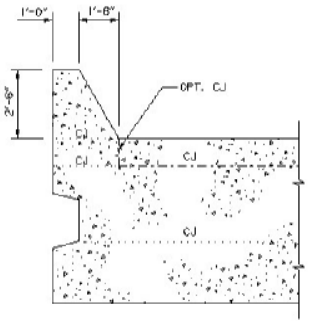
SECTION

Lilly Bayou Control Structure Final Design





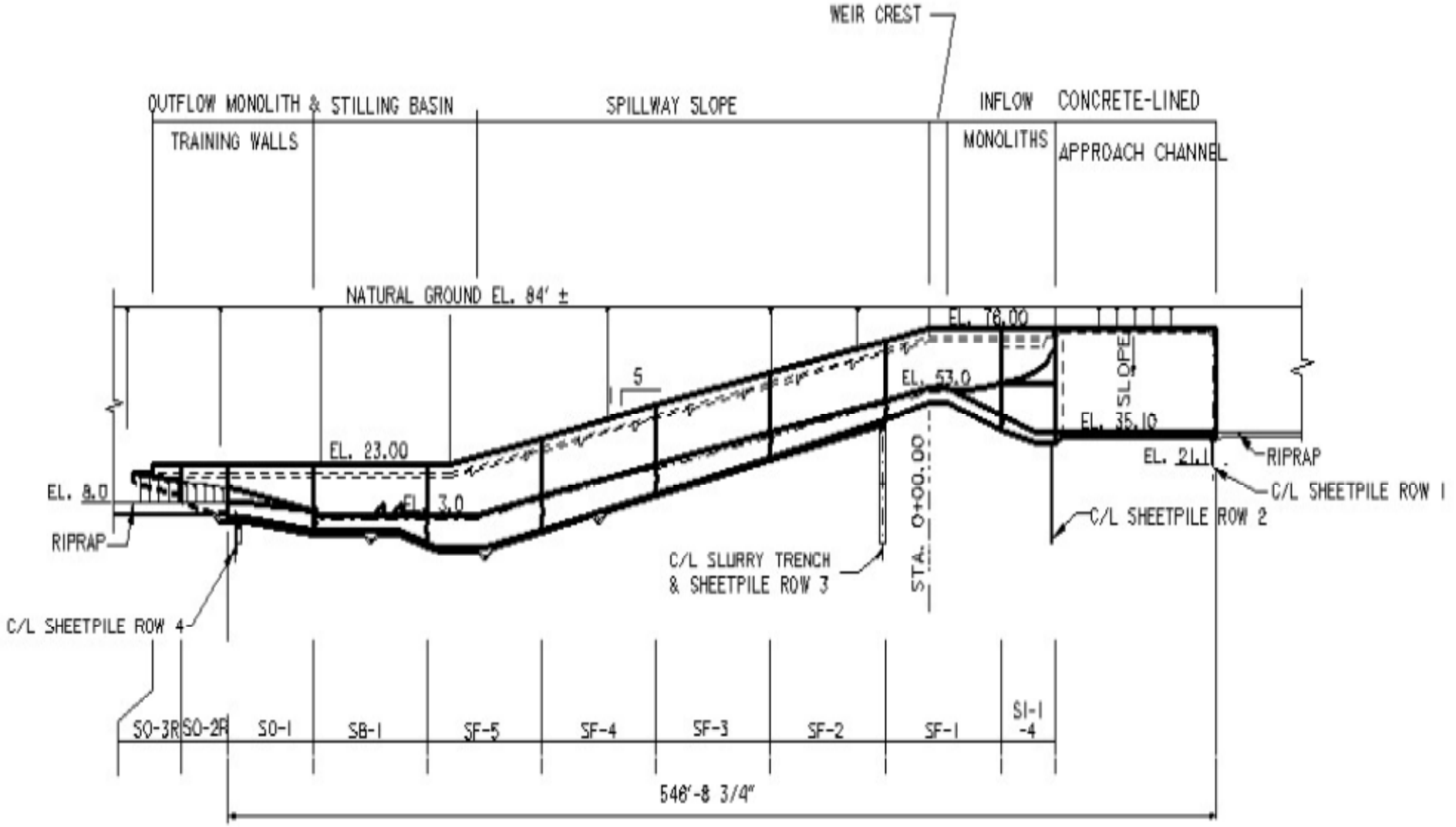
BAFFLE BLOCKS



END SILL

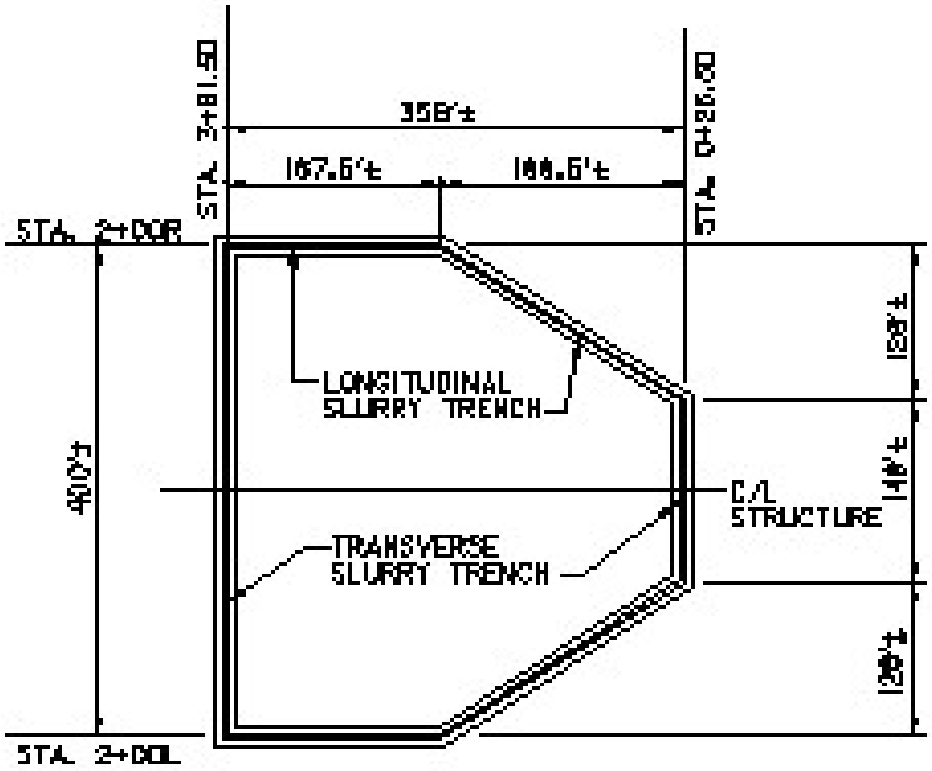
STILLING BASIN

Flotation Stability



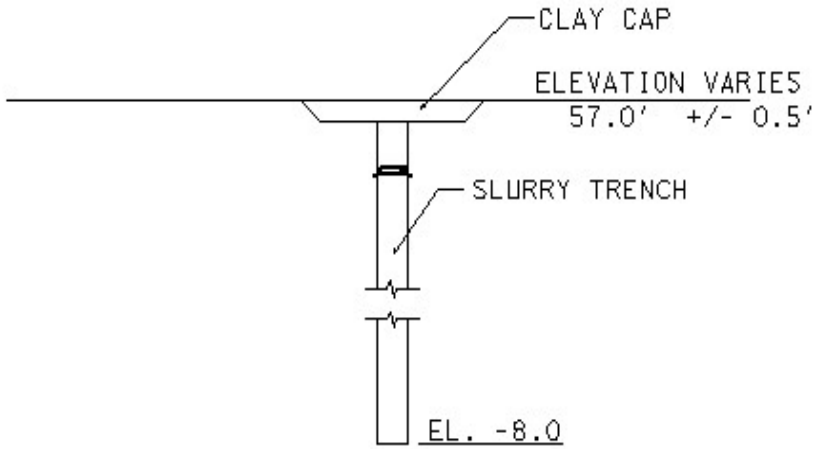
CENTERLINE PROFILE

Flotation Stability

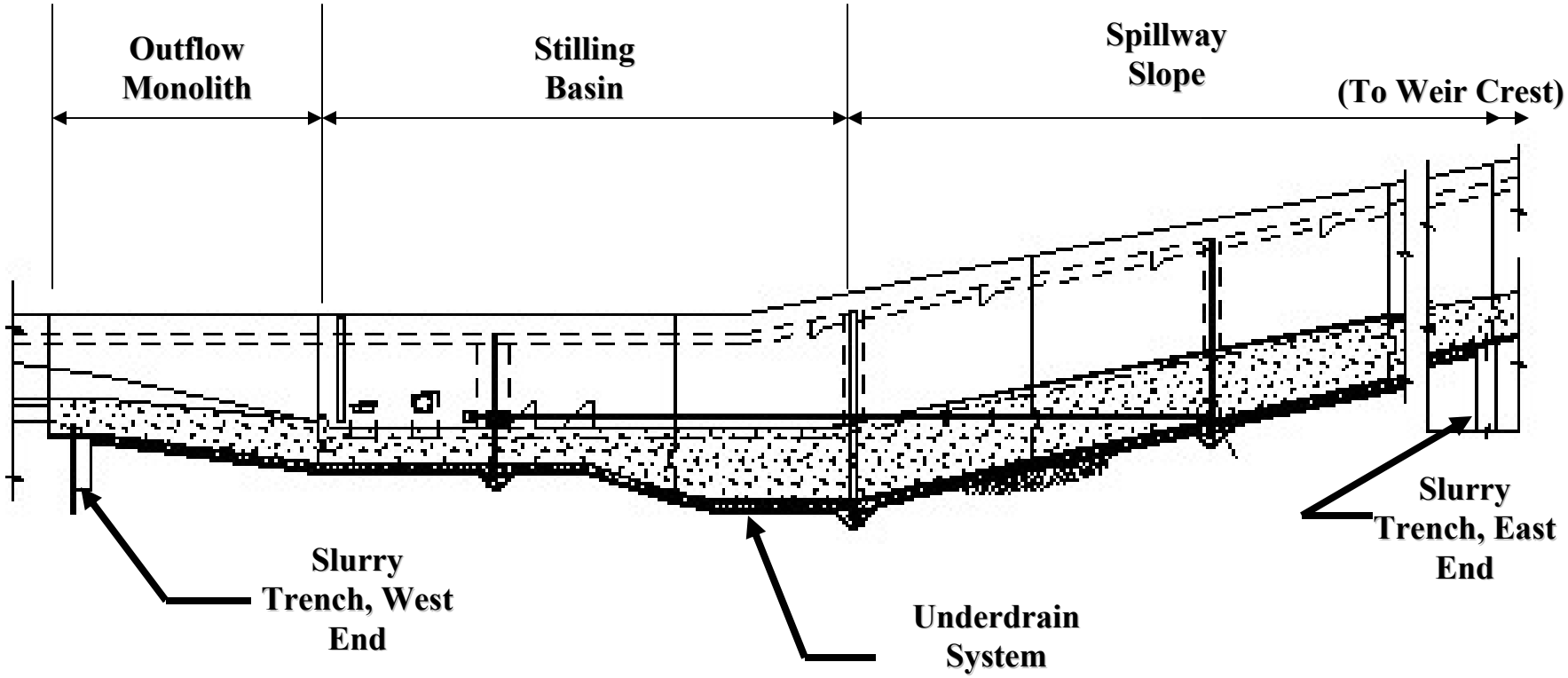


SLURRY TRENCH DETAIL

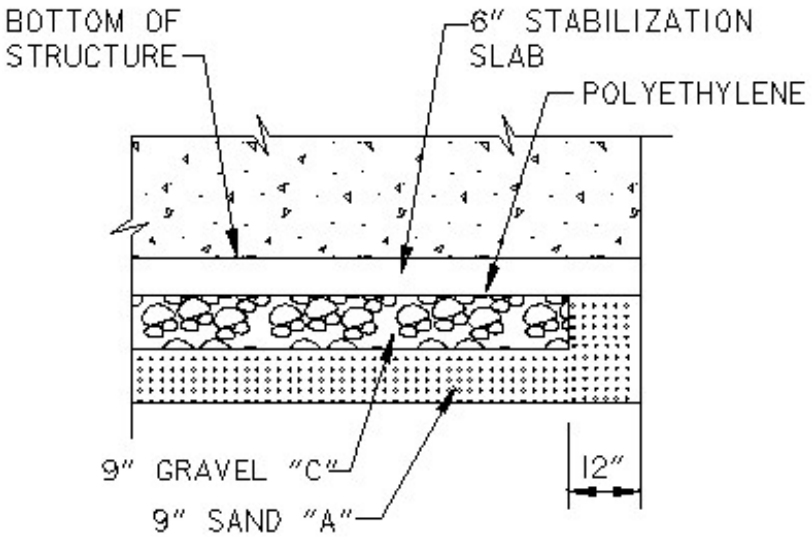
N.T.S.



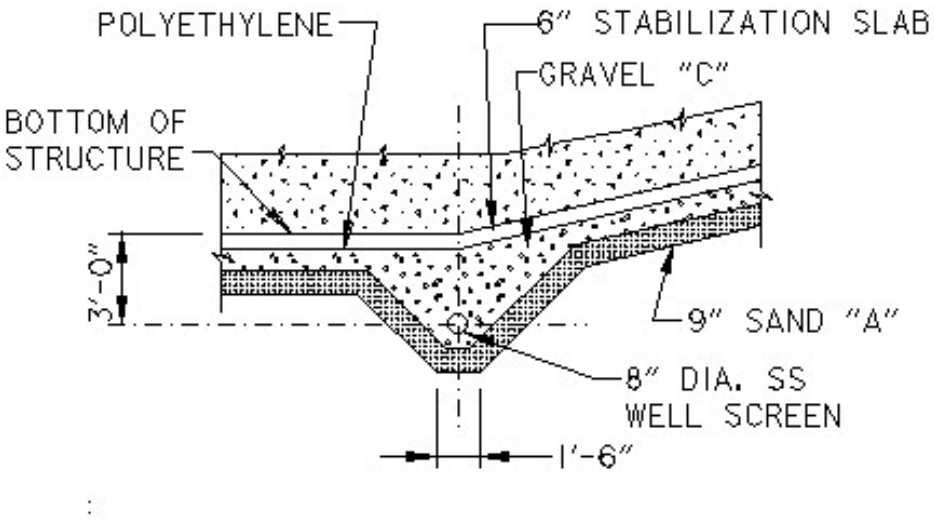
Flotation Stability



Flotation Stability



Section at Edge of Monolith

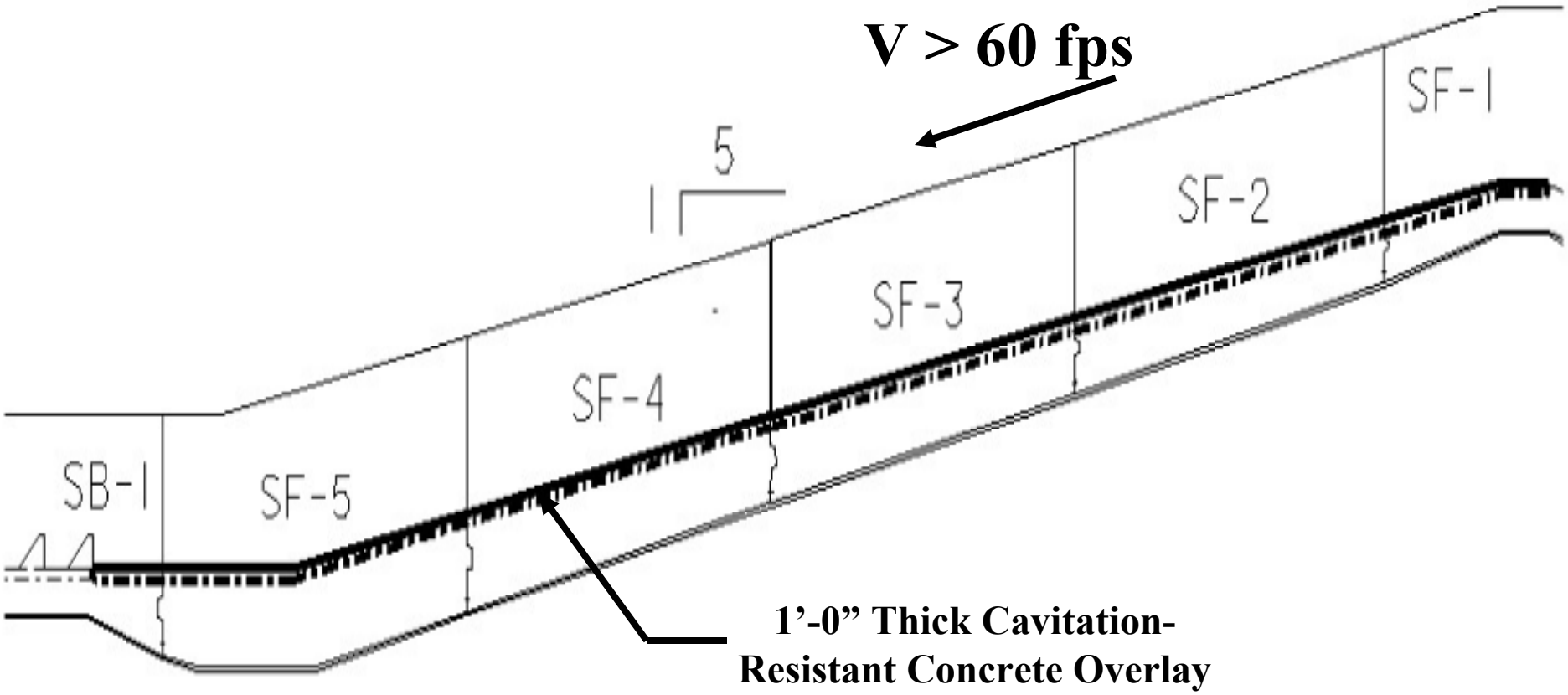


Section at Well Screen

Concrete Considerations

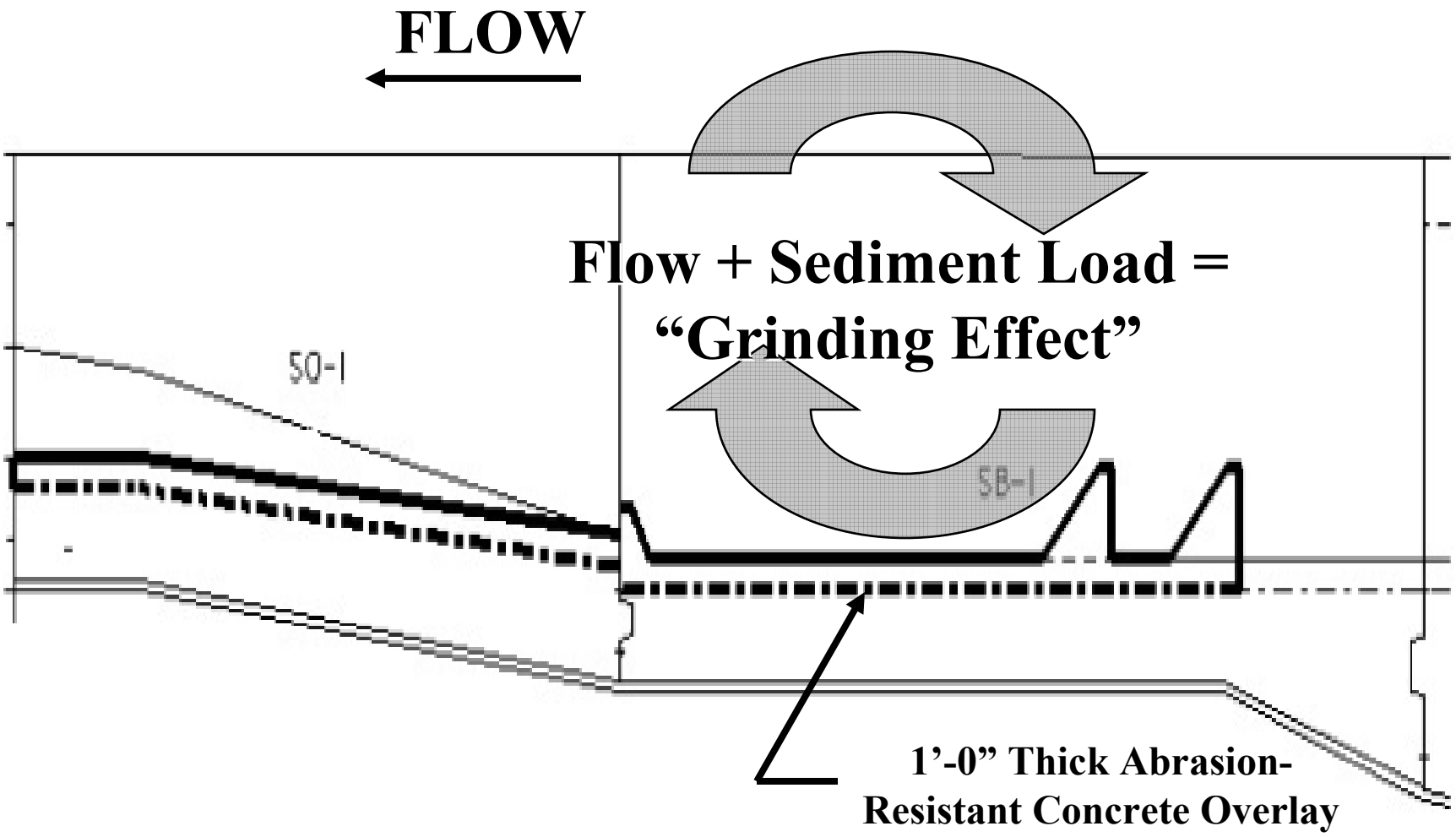
- Mass Concrete
  - Some base slabs in excess of 10 feet thick
  - Thermal cracking a concern
  - ERDC performed materials investigation and thermal study
  - To assist in providing the “coolest” mix possible:
    - Design f’c = 3000 psi
    - Limestone required for aggregate
    - Combination of GGBF Slag and Fly Ash required

Cavitation-Resistant Concrete



CENTERLINE PROFILE

Abrasion-Resistant Concrete



CENTERLINE PROFILE

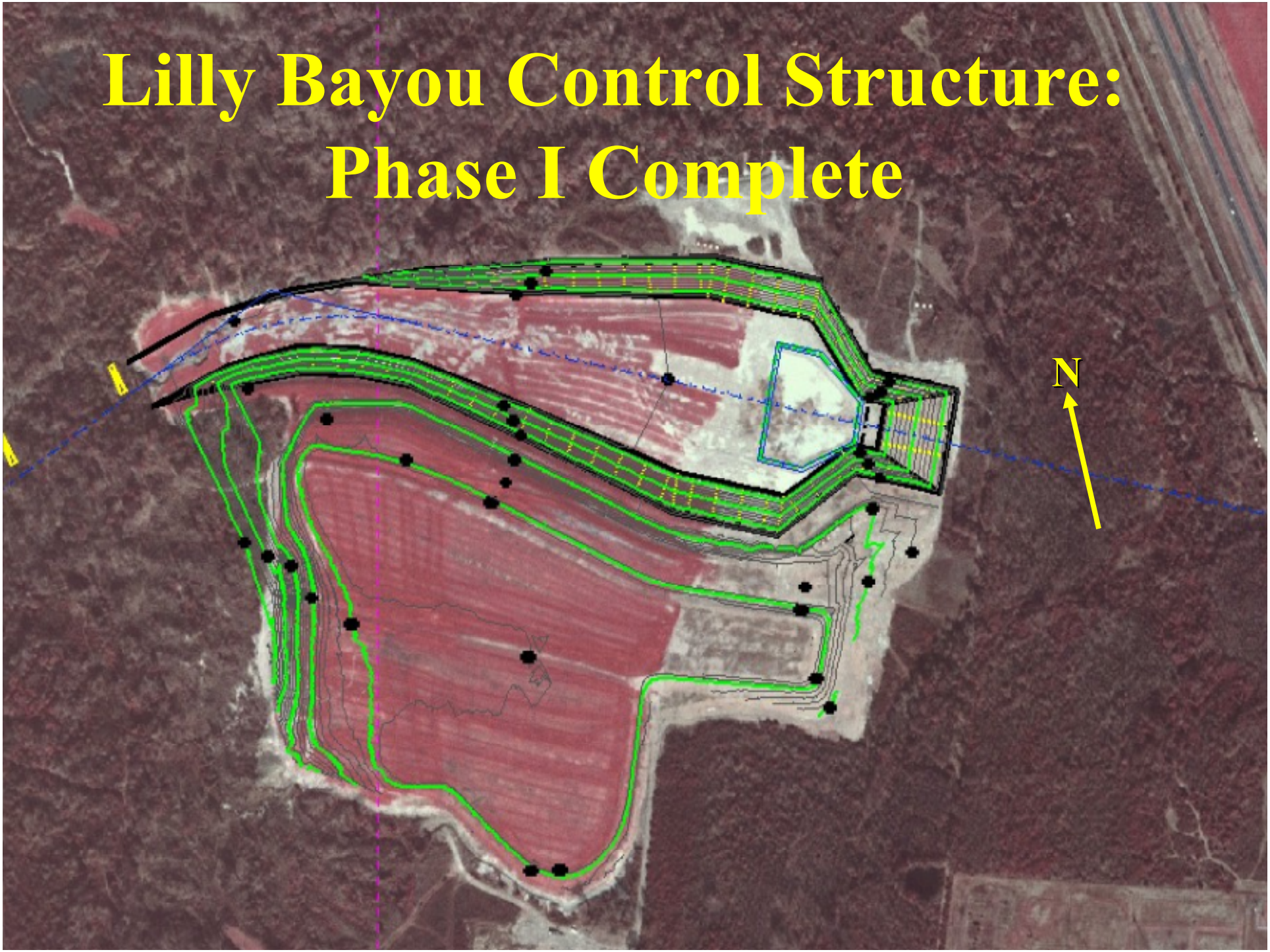
Lilly Bayou Control Structure

- Construction proceeding in two phases:
- Phase I
  - Consisted of site grading, initial excavation and slurry wall construction
  - Awarded March 2003 to James Construction Group, Inc for $2.4 Million
  - Completed in December 2003
- Phase II
  - Consists of completing the excavation and constructing all remaining features
  - Design complete
  - Awarded September 2004 to B&K Construction, Inc., for $27.6 Million

Lilly Bayou Control Structure: Phase I

Lilly Bayou Control Structure: Phase I

Lilly Bayou Control Structure: Phase I Complete



Lilly Bayou Control Structure: Phase II

Lilly Bayou Control Structure: Phase II

Lilly Bayou Control Structure: Phase II

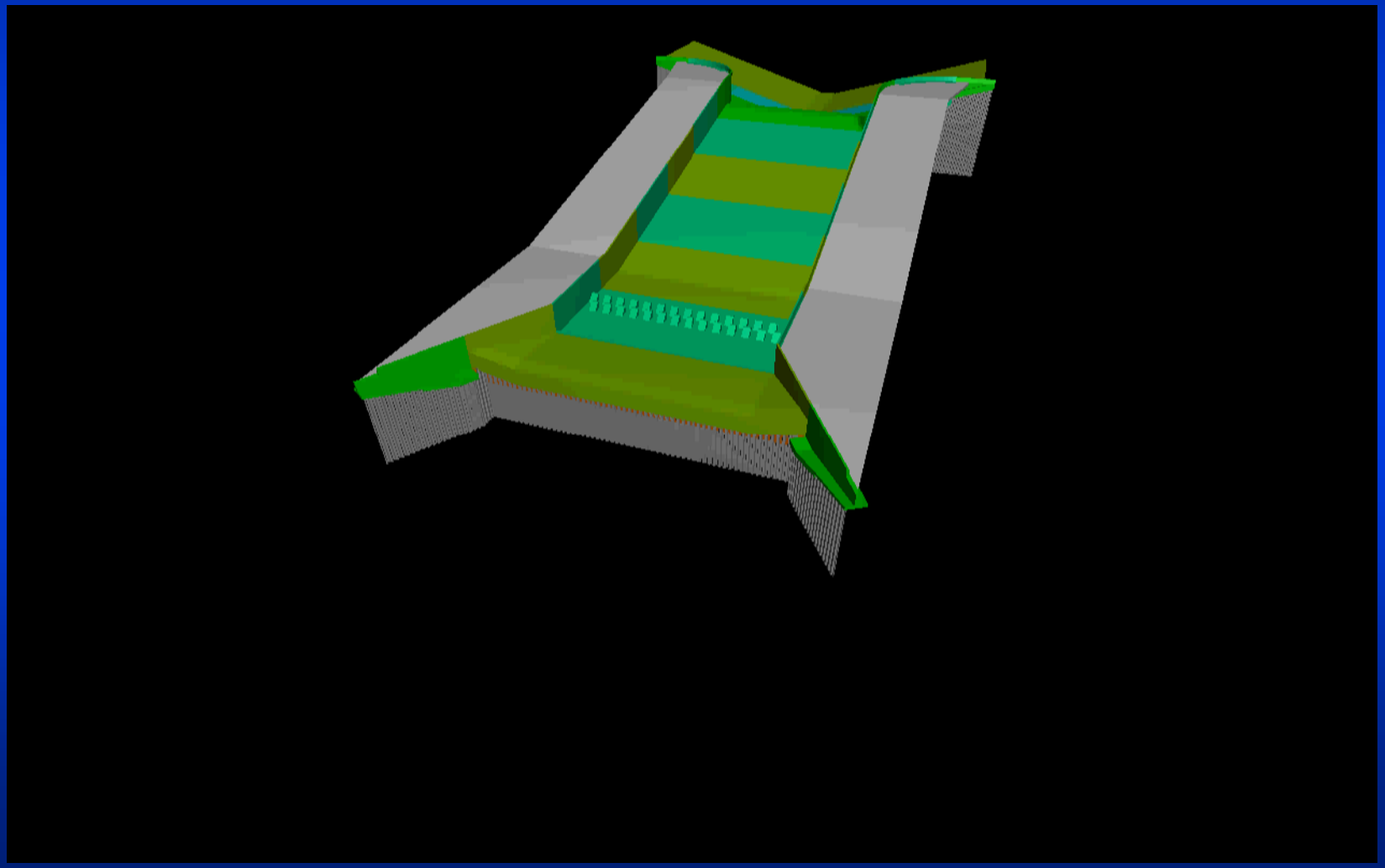
Lilly Bayou: Lessons Learned

Lilly Bayou Control Structure Design Team

Some Lessons Learned: Virtual Teaming & Other "Stuff"

- Communicate, Communicate, Communicate
- Virtual Teaming Software (Groove, etc.)
- Drafting Contracts
- Maintain independence of ITR Team and ensure ITRs performed in timely manner
- Start materials investigations as early as practicable
- Keep PDT engaged

Questions?




THANK YOU