

Using a Tieback Wall to Stabilize a Railroad Embankment on a Bridge Replacement Project

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Presentation Overview

General Project Information & Scope

Pre-Construction Conditions

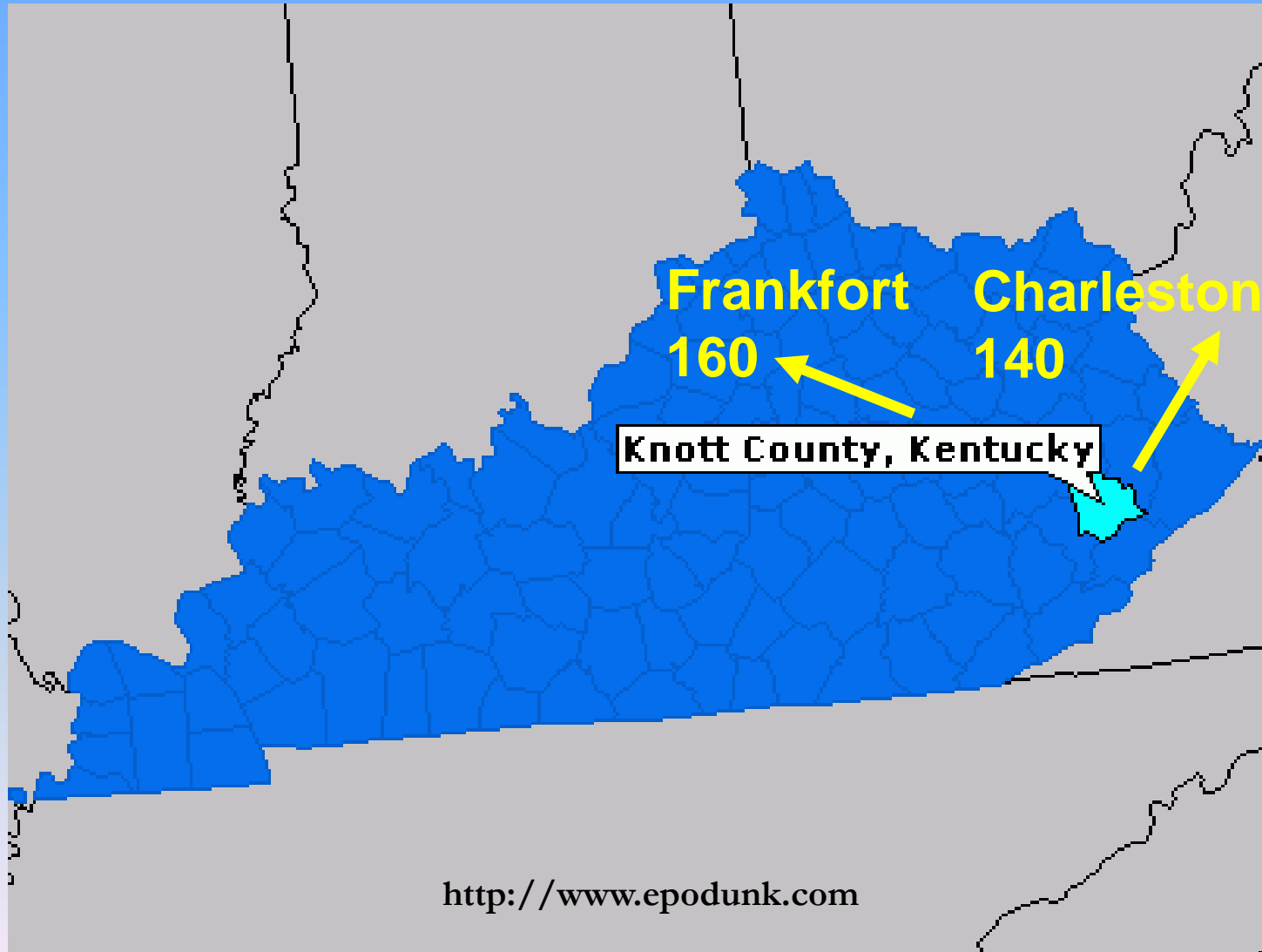
Design Considerations

Tieback Retaining Wall

Construction Cost

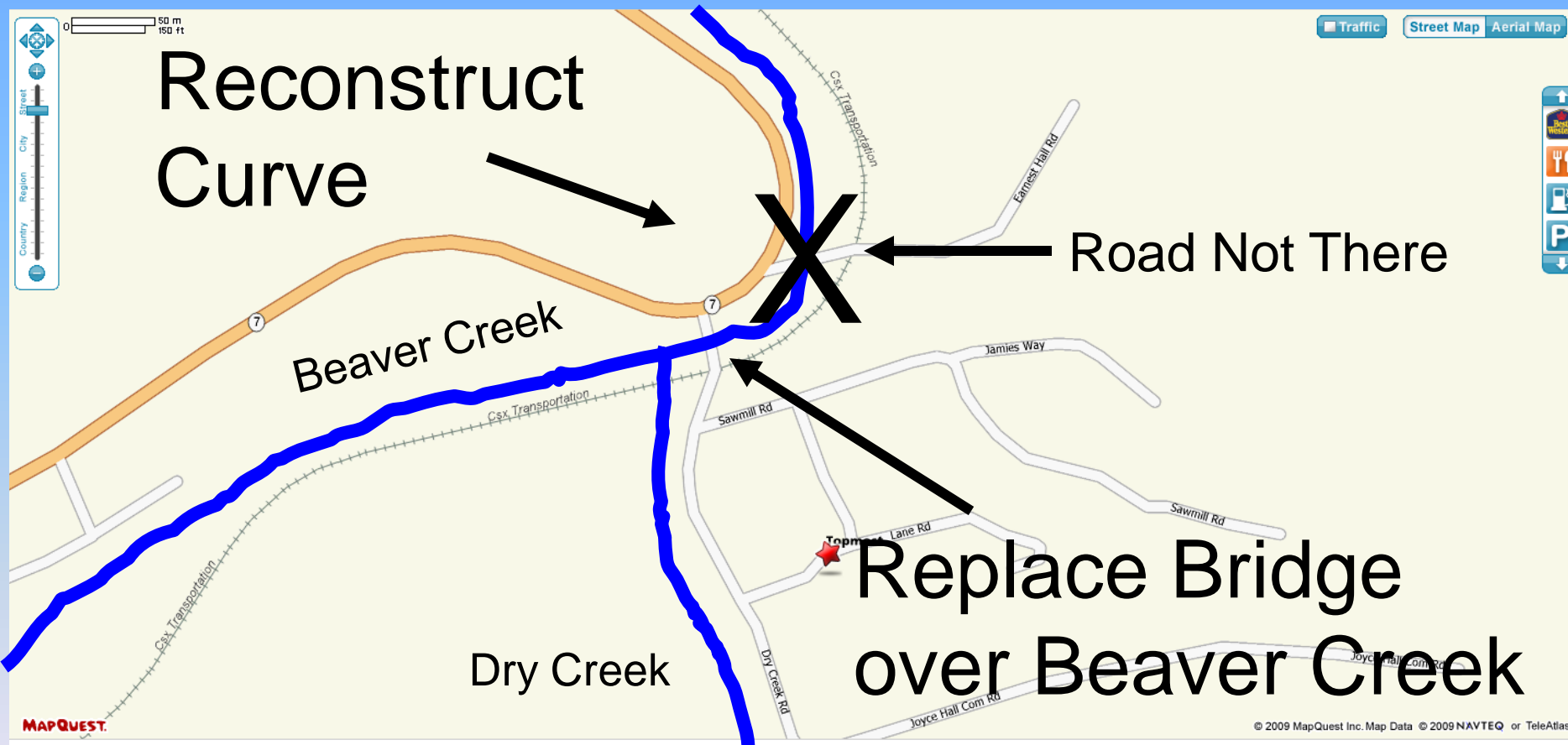
Post - Construction Conditions

Project Location



<http://www.epodunk.com>

Project Scope



Pre-Construction Conditions



Pre-Construction Conditions



Some Major Design Considerations

Cost

Railroad

Grade on Bridge

Hydraulics

High flows in Dry Creek
would overtop Dry Creek Road.

Concerns of Local Residents

Relocation of Property Owners

Location of Bridge

Numerous Alternates Considered

- Alternate 1
- Alternate 1A
- Alternate 2
- Alternate 3
- Alternate 4
- Alternate 5
- Alternate 6
- Alternate 6A
- Alternate 7
- Alternate 7A
- Alternate 8
- Alternate 9
- Alternate 10
- Alternate 10A

Proposed Bridge Location



Retaining Wall Needed at End Bent

Hydraulic Design Considerations

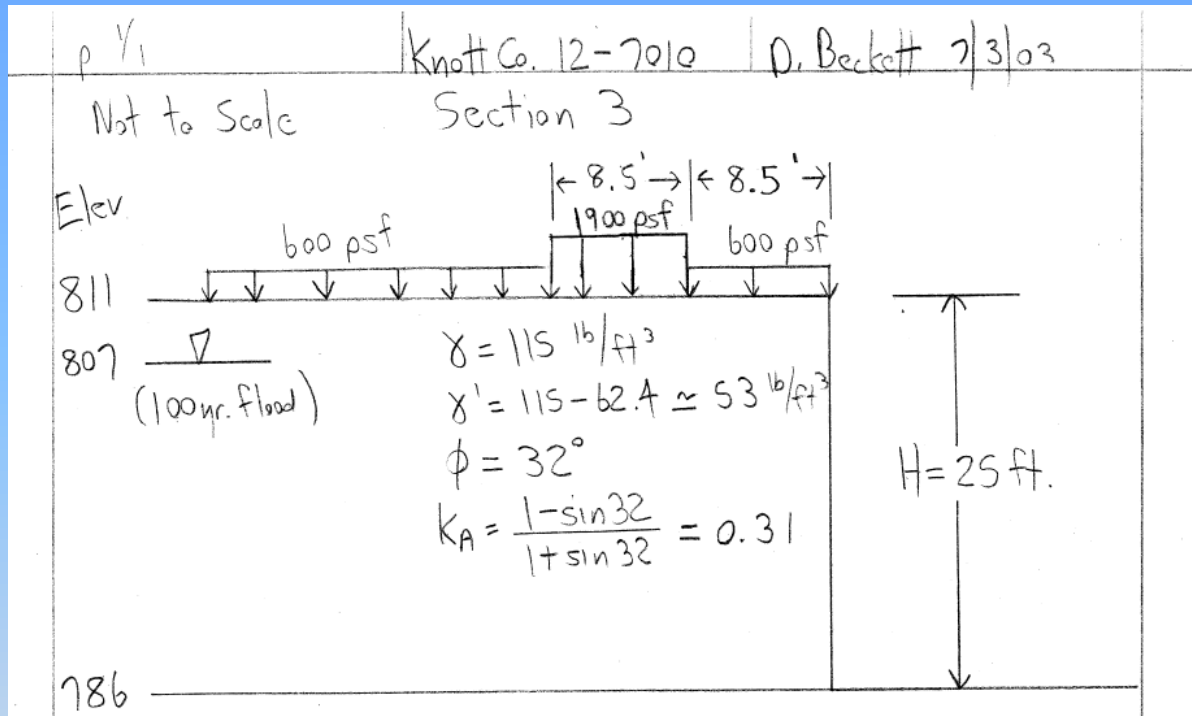
Stabilize Railroad Embankment

Tieback Wall Selected





Tieback Wall Design Loads

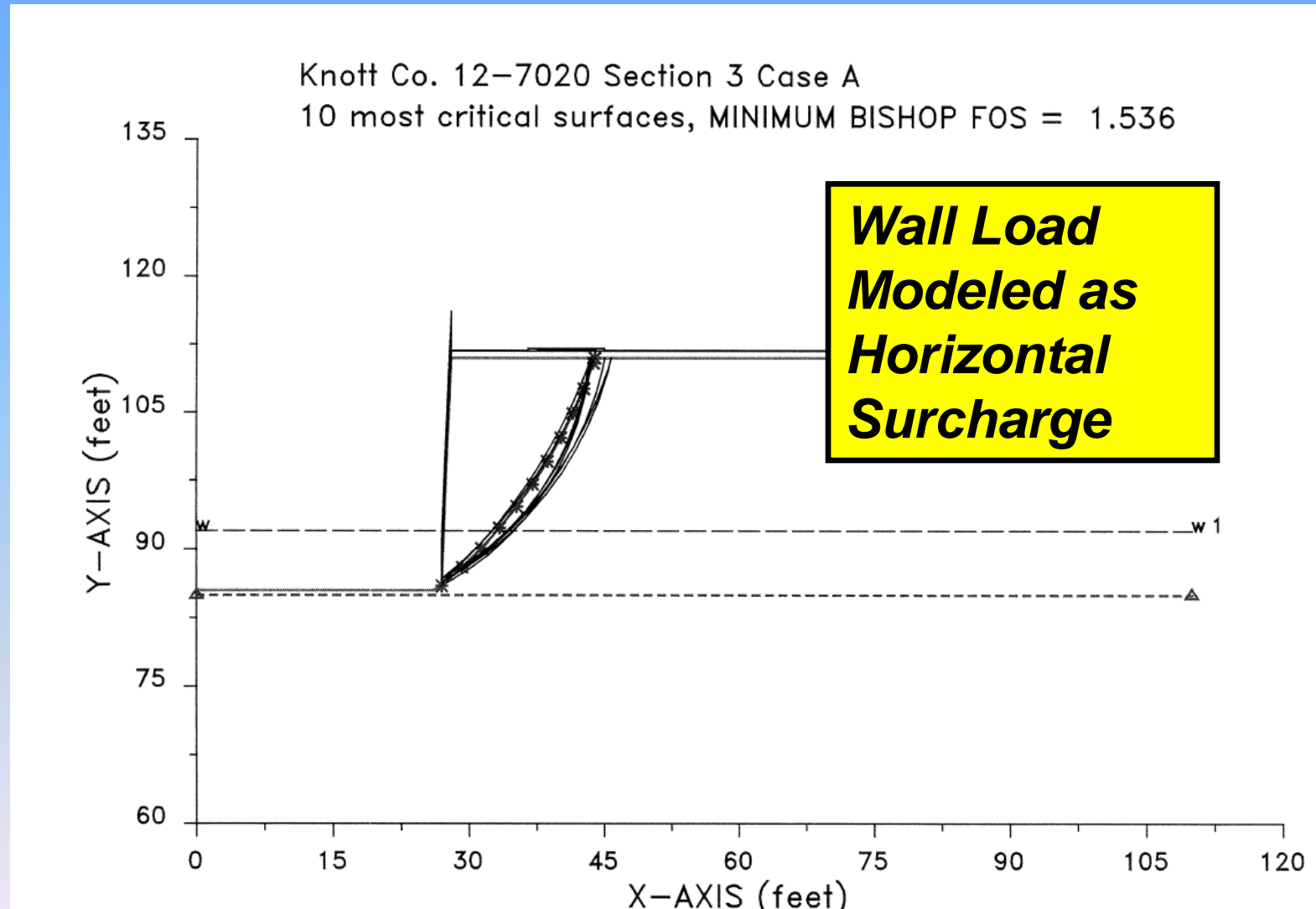


Earth Pressure (Assuming Fully Scoured to Bedrock)

Surcharge (RR + Construction/Maintenance)

Hydrostatic

Design Loads Checked Using Limit Equilibrium



Limit Equilibrium Summary

Table 6
Summary of Limit Equilibrium Analyses
Wall Section 3

Loading Combination	Ground Water Case	Total Load (kips/ft.)	Factors of Safety	
			Bishop Method	Janbu Method
Earth (Dry)	A	14.5	1.26	1.49
Earth (Dry) + Surcharge	A	26.0	1.31	1.40
* Earth (Buoyant) + Hydrostatic + Surcharge	A	30.0 *	1.54	1.67
* Earth (Buoyant) + Hydrostatic + Surcharge	B	30.0 *	1.04	1.24

* Controlling loading combination; other loads analyzed only for comparison.



What will happen when we remove this bridge?

Approximate
Top of Wall



4/8/2003

Temporary Support System

Richard Goettle Inc.

12071 Hamilton Avenue
Cincinnati, Ohio 45231
Phone (513) 825-8100

ARCH/ENG _____

KTC - ITEM 12-7010.0

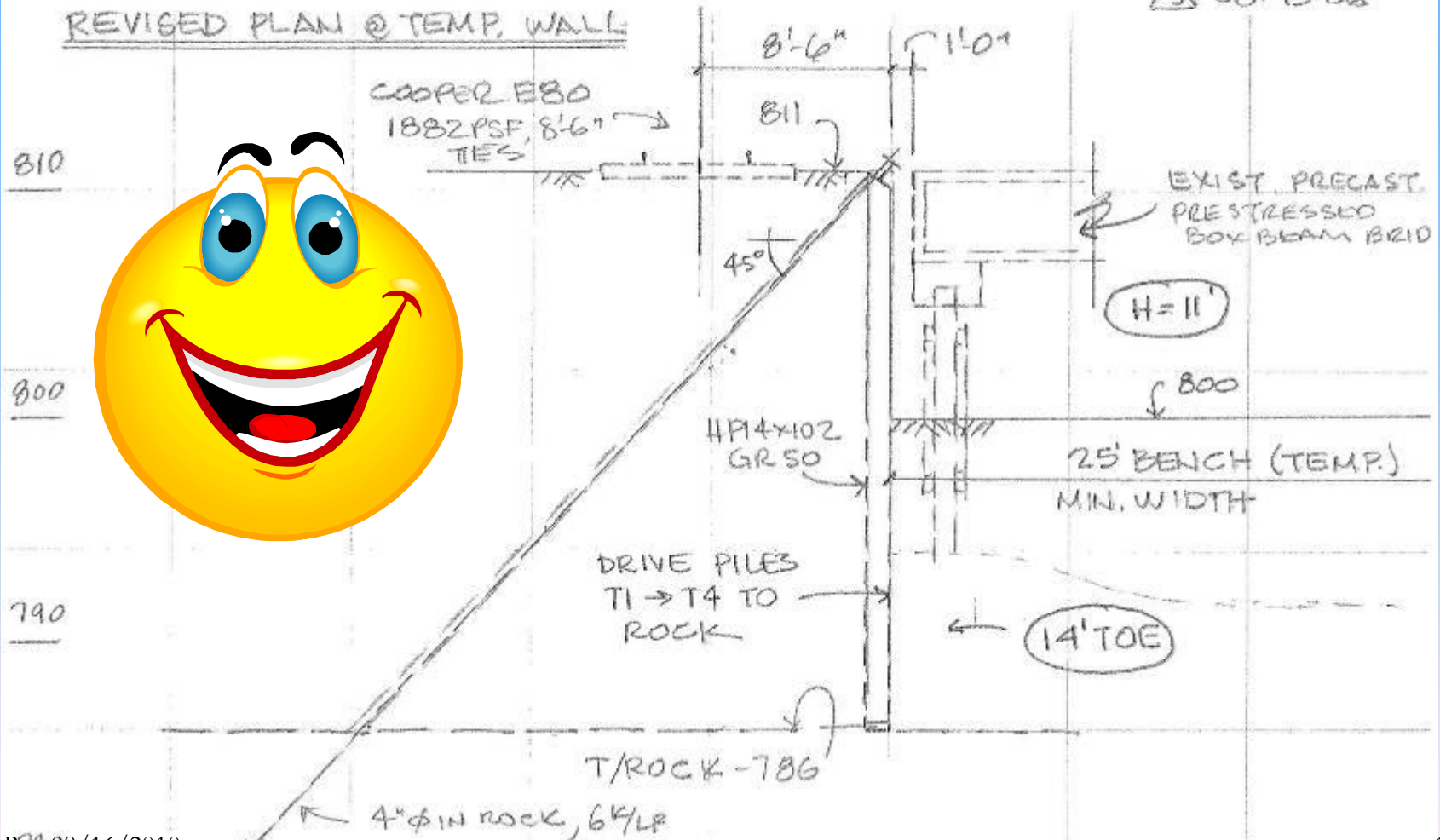
DATE 8/15/06

GEN.CONT. _____

BY FWS

3 08-15-06

REVISED PLAN @ TEMP. WALL





Construction Cost

Original Project Estimate \approx \$1.85 M

Bid Price \approx \$ 2.8 M

Final Pre-Bid Estimate \approx \$2.5 M

Wall & Related Items Bid \approx \$ 0.5 M

Construction Cost

PITA Project → Only 2 Bidders

P = Pain

Bridge Contractor at Pre-Con Meeting:

“You’re lucky anybody bid on this project.”



Was New Wall Overdesigned?



