Geotechnical Engineering
2023 CFL Annual A/E Meeting

Geotech Topics

- CFL Geotechs – who we are
- SOW Revisions
- FLH Geotech Website
  - WIP PDDM TGM
  - USMP A-GaME Toolbox
- Specifications & FP-NEW
- Project Trends

CFL Geotech Team

James Arthurs P.E, PhD., Acting Team Lead

13 yrs exp.
ERFO, GRS & MSE Walls
Drilled Shafts

Dominic Monarco

12 yrs exp.
GRS-IBS, Piles, Rockeries, Rockfall

Devin Dixon, P.E.

8 yrs exp.
Bridge Foundations, Micropiles, CDP Mentor

Brendan McGarity, E.I.

3 yrs exp.
Subsurface Investigations, Soft Soils Eng., Geotech Risks, Thermal modeling

Rebecca Borst

6 yrs exp.
Complex Investigations, Soil Nail Walls, Rock Slopes

Aaron Baukus

Career Development Program (through March 2023)
Geosynthetics

Scope of Work Revisions

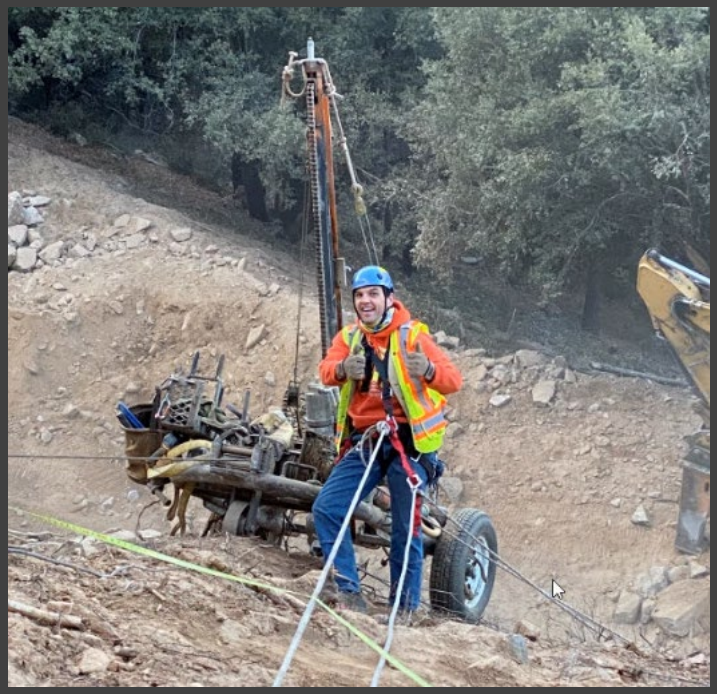
- Investigations
  - w/o Bridge – prior to 30%
  - Walls – after layout from design
  - Bridges – immediately after TS&L (around 30%)
- Draft Report
  - 50% target
- Final Report
  - 70% target

Specifications

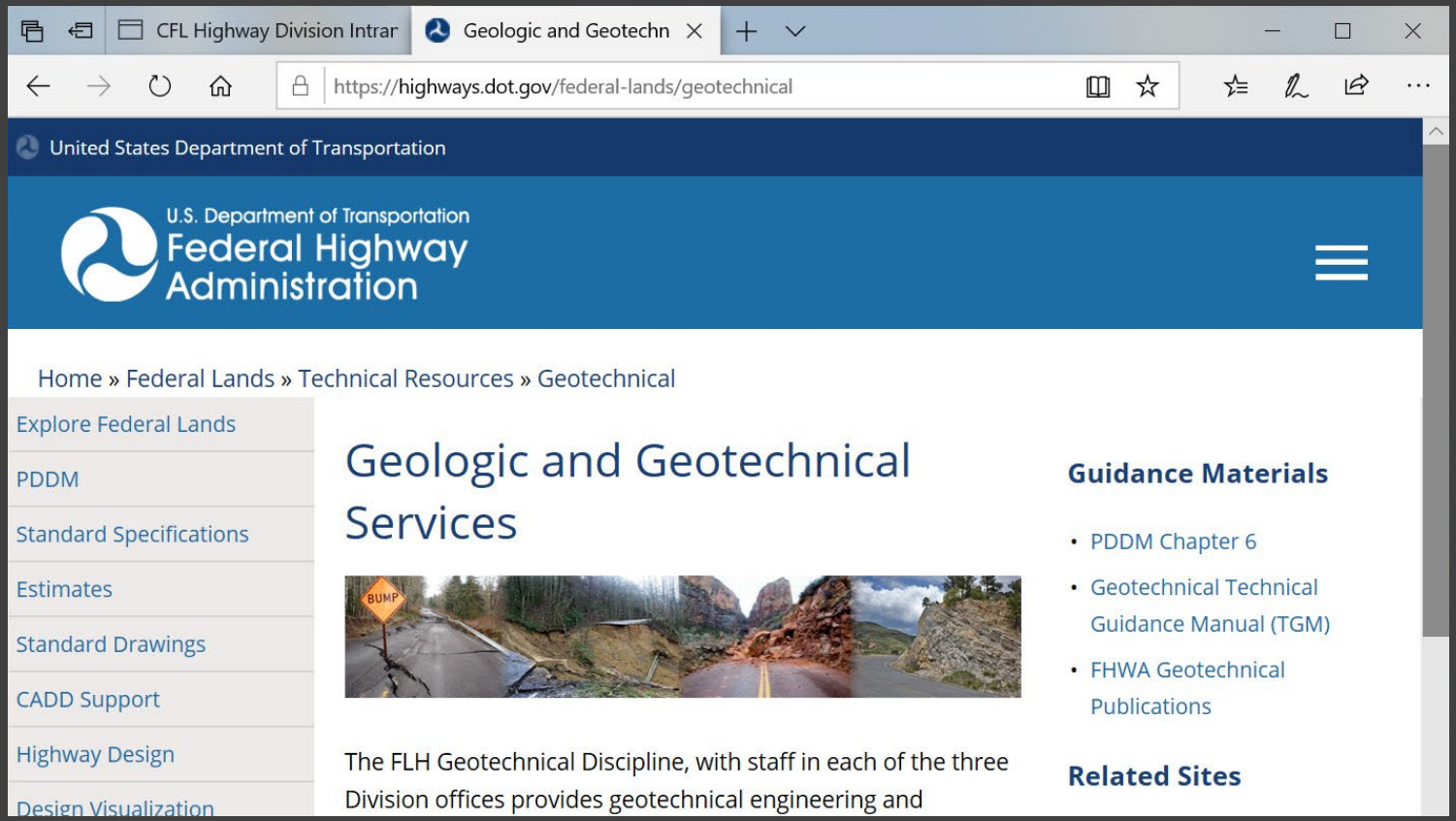
- SOW time added to work on specs
- Draft outline at 30%?
- Sooner the better, especially for CFL Geotech input from our other project input on complex projects

Construction

- AE Geotech Engineer of Record should be on post-design task orders
- CFL Geotech assists with questions
  - Clarifies design questions
  - Support timely response
  - Answers from CFL project history/experience
  - Documentation
  - Can offer options/discussion
  - NOT overwriting AE Geotech



FLH Geotech Website



FLH Geotech Website

- PDDM
- Standard Specifications
- Estimates
- Standard Drawings
- CADD Support
- Highway Design
- Design Visualization
- Construction
- Materials
- Project Management
- Survey and Mapping
- Right-of-Way and Utilities
- Geotechnical
- Hydraulics
- Safety
- Structures

Geologic and Geotechnical Services

The FLH Geotechnical Discipline, with staff in each of the three Division offices provides geotechnical engineering and engineering geology services for geologic and geotechnical related aspects of design, emergency response, and construction support. The discipline is comprised of in-house geotechnical engineers and engineering geologists, collectively named 'Geotechnical Professionals'. The state-of-the-practice of the geotechnical and engineering geology field involves comprehensive investigations, analysis, and design, teamed with geologic and engineering judgment to provide the most efficient and economical geotechnical recommendations in support of the FLH mission. In addition to the development of traditional recommendations, it is important to recognize the variability of FLH projects, geologic terrains, climates, and the individual resource missions of our partner agencies that require flexibility and resourcefulness with a strong focus on providing context sensitive solutions.

Guidance Materials

- PDDM Chapter 6
- Geotechnical Technical Guidance Manual (TGM)
- FHWA Geotechnical Publications

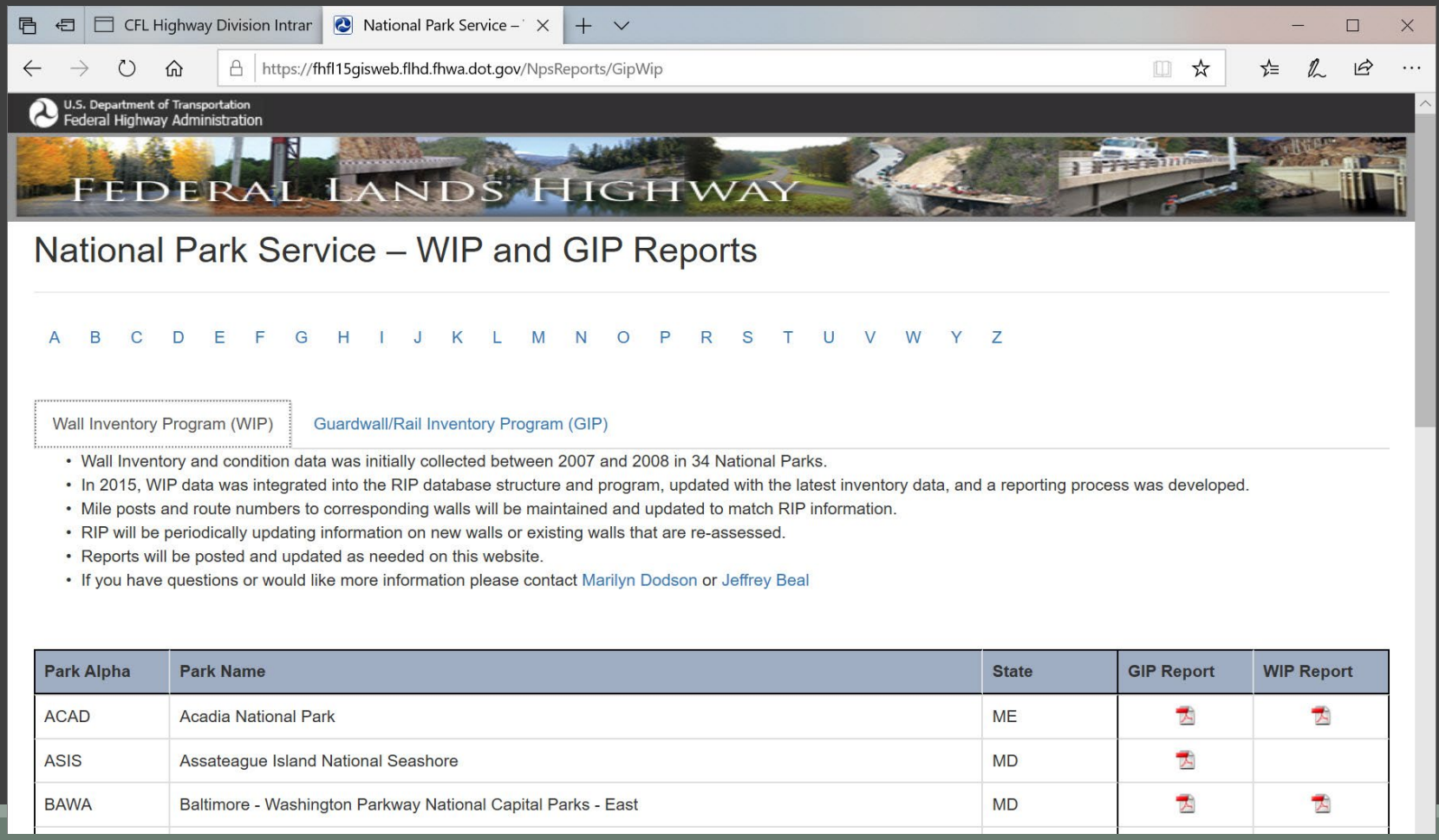
Related Sites

- FHWA Geotech
- GeotechTools
- NPS Wall Inventory Program (WIP)
- Context Sensitivity

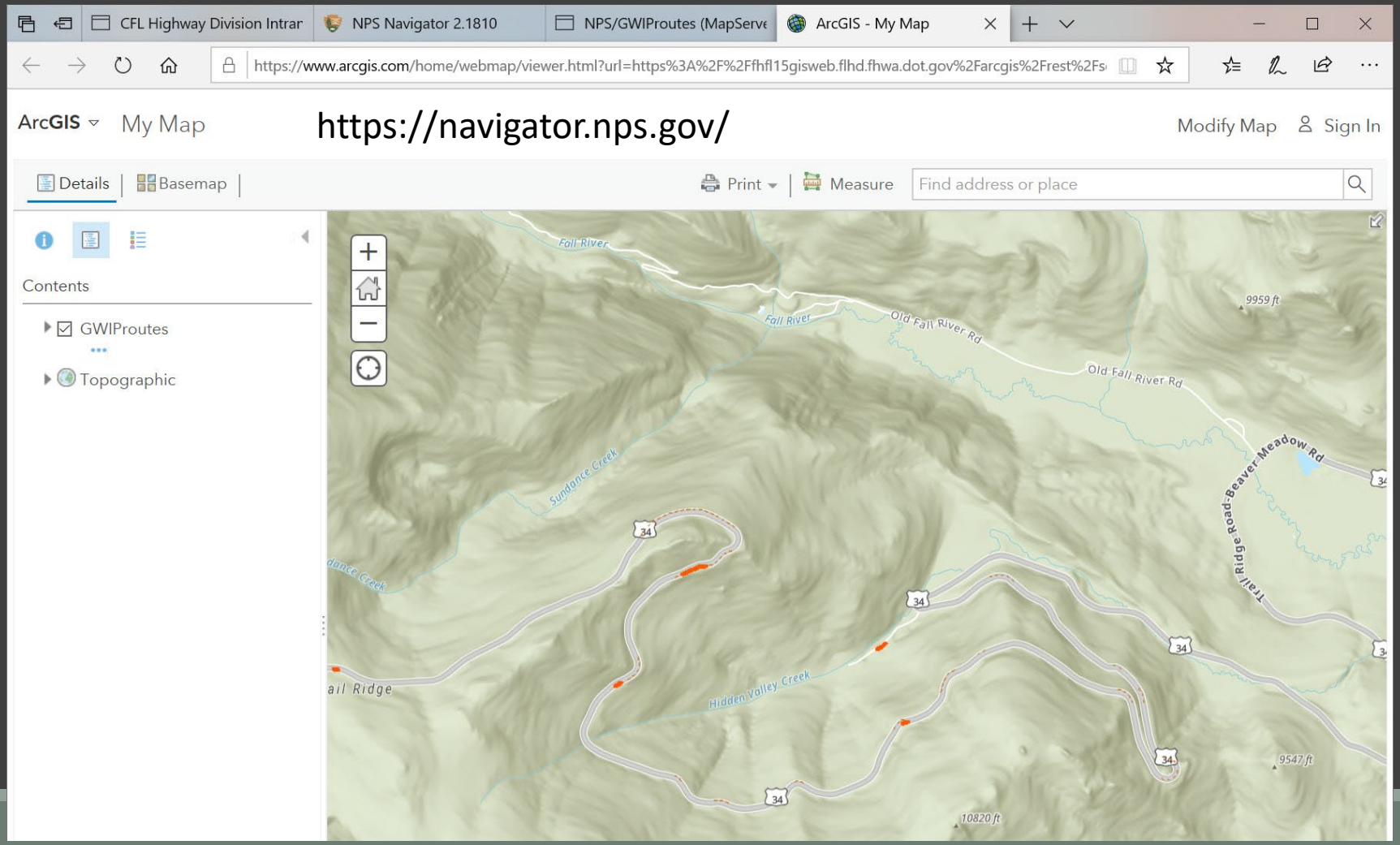
Contact Us

Office of Federal Lands
United States Department of Transportation Federal Highway Administration
1200 New Jersey Avenue, SE
Washington, DC 20590
United States

WIP Report Access



WIP Report Access



FLH Geotech Website

Recent/Upcoming Publications

- MSE – LASR: Mechanically Stabilized Earth Walls – Local Available Sustainable Resources (FHWA-HIN-21-002)
- Geosynthetic Installation Field Guide – Smartphone App

PDDM: Geotech Chapter 6

- Draft under review
  - Risk – same philosophy
  - Roles and Responsibilities
  - Added: CSS,GAM, Geohazards, Extreme Weather Events, Resilience, Mitigation Strategy Evaluation
- PDDM="Why" &"What" we do work
- TGM= "HOW" to do work, primary references

PDDM: Geotech Risk

"The evaluation of potential benefits of a geotechnically-based risk is not solely a Geotechnical Discipline responsibility as it is an interdisciplinary process requiring involvement of the Project Manager and other disciplines that have knowledge of other project aspects and different perspectives on the value of a potential benefit. The responsibility of the Geotechnical Discipline is to inform and educate the Project Manager, and other team members and stakeholders, as appropriate, of risk based on geotechnical issues and to participate in evaluation of the tolerability of that risk. Every project has unique risks that need to be tailored, adjusted from prior projects, or extended to new situations."

Geotech TGM

- Internal memo
- Revisions on hold until FY23 or FY24 (after FP)
- All design should be LRFD
- ASD language= outdated (not required)

EDC 5: A-GaME

- Advanced Geotechnical Exploration Methods
- Mitigate risks and improve reliability by optimizing geotechnical site characterization with proven, effective exploration methods and practices.
- Institutionalized 12/31/2020
  - Assume considerations in standard practice
  - Right tool for each project
  - NCHRP Synthesis 484

EDC 5: A-GaME

Advanced Geotechnical Exploration Methods

Mitigate risks and improve reliability by optimizing geotechnical site characterization with proven, effective exploration methods and practices.

Table 1. Featured geotechnical exploration methods.

Seismic	Seismic Refraction or Seismic Refraction Tomography
	Seismic Reflection
	Full Waveform Inversion
	Spectral Analysis of Surface Waves
	Multi-channel Analysis of Surface Waves
	Refraction Microtremor
	Crosshole Seismic Test
	Downhole Seismic Test
	P-S Logging
Electrical	Electrical Resistivity
	Induced Polarization
	Self-Potential
Televiewers	Optical Televiewer
	Acoustic Televiewer
Cone Penetration Testing (CPT, sCPT, CPTu)	
Measurement While Drilling (MWD)	

FP-NEW Geotech

- New Sections
  - Rock Slope Protection
  - Scaling
  - GRS-IBS
  - GRS Walls (On hold)
  - Soldier Pile Walls
  - Helical Piles

FP-NEW Geotech

- Minor revisions to most FP-14 Geotech
- Major revisions
  - Blasting
  - Horizontal Drains
  - Rockeries
- Coordinating with Standard Drawings
- Pay Items

Trends in Projects

- Wildfires
  - Slope Stability and Erosion
  - Direct damage to assets
- Multimodal Access


Questions?