

Geotechnical Services Division

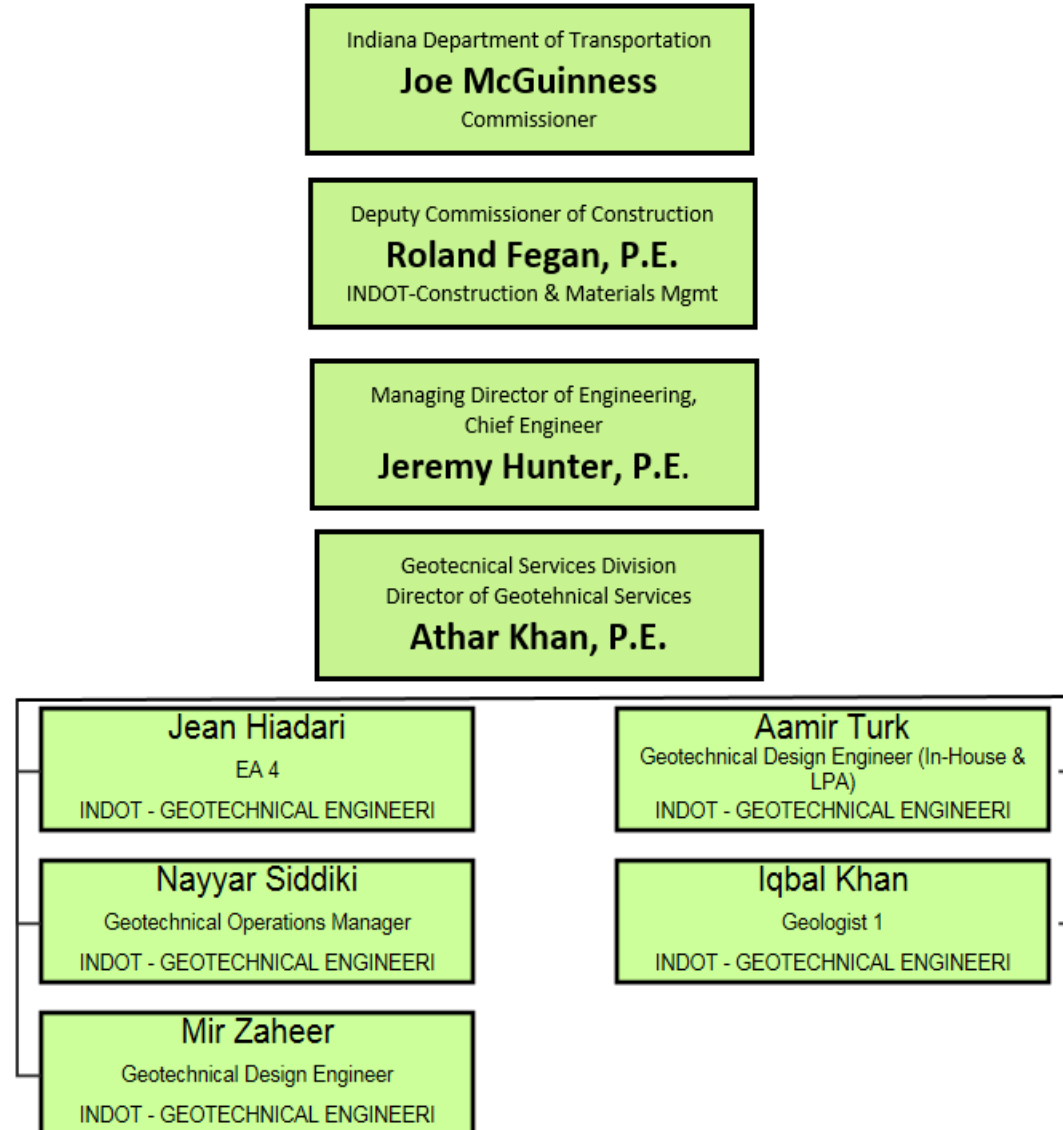
Athar Khan, P.E., Director

January 28, 2020

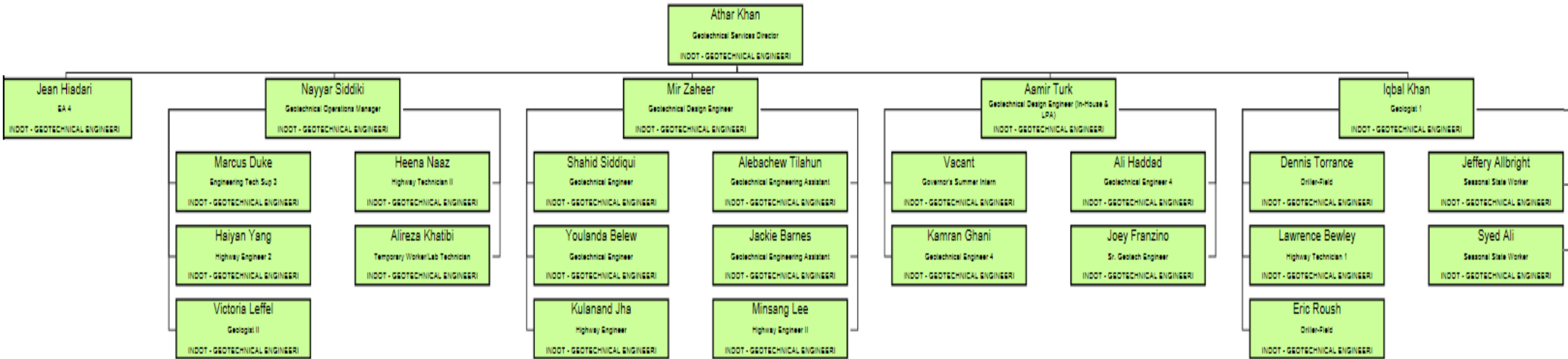
Mission Statement

“The primary mission of the Geotechnical Services Division is to deliver our customers the most accurate and cost-effective Geotechnical recommendations for the design of Hoosier highways and bridges, in a timely manner.”

INDOT Organizational Chart



Geotechnical Division Organizational Chart



Geotechnical Services Division

Responsible for Providing the following:

- Geotechnical Field Drilling & Testing
- Geotechnical Field Instrumentation & Monitoring
- Pavement Coring
- Geotechnical Laboratory Testing
- Geotechnical Engineering Services
- Geotechnical Construction & Technical Support
- Retaining Structures Assessment & Collecting Inventory
- Landslides Assessment & Monitoring Services
- Implement JTRP & Other Innovations



Geotechnical Services Division

Primarily provides the foundation design recommendations for the following INDOT Features:

- Roadways
- Bridge Structures
- Pavements
- Retaining Structures
- Traffic Sign, Wire Rope Barrier & Communication Towers
- Drainage Structures
- Landslide Corrections

Our Customers/Partners

- Division of Planning
- Division of Pavement
- Division of Bridge Design
- Division of Road Design
- Traffic Design
- District Design
- District Maintenance
- District Construction
- Toll Road
- Other State agencies such as DNR, IDEM, State Police, etc....
- Local Agencies



Geotechnical Services Division Tracking System

Geotechnical - Internet Explorer

1400234 - Maintenance

Project Header

Des / Alt #: 1400234	Contract: R-36689	Designed By: Crawfordsville District	Status: Active
Project Manager: McMullen, Kenneth	County: White	District: Crawfordsville	RFC Date: 01/03/2018
Road: I 65	Work Type: Small Structure Replacement	From To: 193+040 193+040	How many days until you reach 60%: 0
Location: 0.01 mi N of US 231		Letting Fiscal Year: 2018	Letting Date: 03/14/2018
Geotechnical Subsurface Status:	Soil Investigation Status:	Pavement Design Finish Date:	Design Finish Status: Design Analyses Complete










Geotechnical - 1400234 [\[EDIT\]](#)

- ▼ Project(A)
 - ▼ Documents (2)
 - ▼ **Geotechnical Engineering Report (A)**
 - ▶ Purchase Order
 - ▶ Activities (4)
 - ▶ Field Work (1)
 - ▶ Laboratory Work (9)
 - ▶ Construction Support (A)

Documents

Filter: 

Document Type	Initiation Date	Completion Date	Project Engineer	Consultant	Design Consultant	Contractor	Status	
Geotechnical Engineering Report	06/15/2017	10/05/2017	Belew, Youlanda	INDOT Geotechnical Engineering	Michael Baker International, Inc.		Active	  

Showing 1-1 of 1 Items Per Page Prev Next

* This color background fields are mandatory.

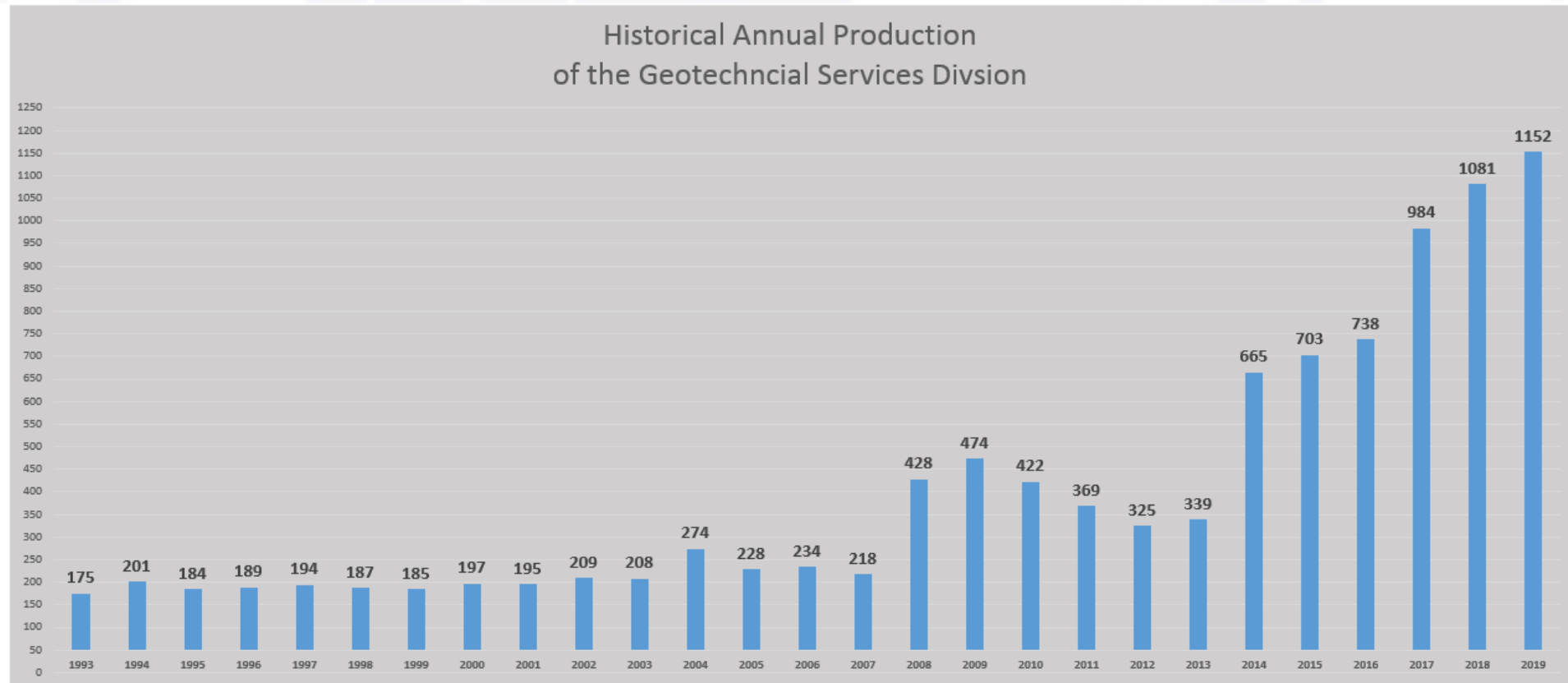
Indiana Department of Transportation 2.2.0.0

Work Load

- Historically: 350 to 400 projects per year
- Recently: 1100 to 1250 projects per year
- Division's In-House Capability: 100 to 150 projects per year
- Geotechnical Consultants are used for most state and LPA projects



Historical Annual Production 1993-2019



Project Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Projects	175	201	184	189	194	187	185	197	195	209	208	274	228	234	218	428	474	422	369	325	339	665	703	738	984	1081	1152
In-House	78	93	93	111	112	111	112	106	85	107	66	95	89	79	80	120	99	68	89	67	66	65	84	75	73	158	167
OEA	17	20	16	6	18	19	41	42	61	51	73	115	64	84	65	198	172	220	131	37	36	36	18	69	238	326	371
LPA	80	88	75	72	64	57	32	49	49	51	69	64	75	71	73	101	85	57	62	60	61	51	85	75	94	44	3
Geotech-Design																8	49	4	20	94	23	52	68	113	147	172	164
Pavement Design Parameters																								106	36	18	0
Soils Waiver																1	69	73	67	67	153	461	448	300	396	363	447
Total Projects	175	201	184	189	194	187	185	197	195	209	208	274	228	234	218	428	474	422	369	325	339	665	703	738	984	1081	1152

Projects Management

- Since In-House capability is not enough, we depend on consultants for about 90% of geotechnical work
- Type of geotechnical contracts: Unit price based contracts
- Open end Contracts (OEA) Currently 12 active contracts (11 + 1)
- Geotech consultant works as a sub to a design consultant

Duration for Geotechnical Investigation

- **Total time needed:** 120 calendar days
- **Field work:** 50 calendar days
(which includes POs, coordination with property owners, utilities, field checks, marking borings, scope approval, and actual drilling)
- **Laboratory Testing:** 20 calendar days
- **Engineering:** 50 calendar days
(which includes INDOT review time)

Construction Support

- Compaction Control using DCP & LWD
- Mix Design for Chemical Modification
- MSE Wall Design Review
- Review & Approve Pile Driving System
- Perform Pile Load Tests
- Drilled Shaft Construction Inspection
- Instrumentation



Technical Support

- Develop New guidelines
- Develop New Specification
- Develop Unique Special Provisions (USP)
- Develop Indiana Test Method (ITM)
- Revise Geotechnical manual
- Revise Contract Documents (Appendix “A” & “D”)
- Revise Frequency Manual
- Review & Approve New Consultants & Laboratories
- Review & Approve New Materials & Systems



Utilization of Recycled Material

- Coal Ash
- Foundry Sand
- Tire Shreds
- Crushed Glass
- Lime Kiln Dust
- Steel Slag



Innovation

- Geofam-Expanded Polystyrene (EPS)
- Open Ended Large Diameter Pile
- Utilization of LWD
- Utilization of DCP
- Microwave Moisture
- QC/QA for Embankment & Subgrade
- Soil Stabilization Using Cement
- Geophysical Application
- Use of Geosynthetics
- Intelligent Compaction



Future Plan for Next 24 months

1. Complete Retaining Walls Inventory Statewide
2. Complete Landslide Inventory Statewide
3. Develop Geotechnical Asset Management Plan
4. Explore QC/QA application on other geotech work
5. Update our existing manuals and guidelines to reflect the latest changes
6. To prepare training materials for Geotechnical personnel
7. To continue the development of GIS based Geotechnical Data base.

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