



# INDIANA DEPARTMENT OF TRANSPORTATION

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**Eric Holcomb, Governor**  
**Michael Smith, Commissioner**

## GEOTECHNICAL DESIGN MEMORANDUM 24-01

September 3, 2024

TO: All Design, Operations, District Personnel and Consultants

FROM: Athar Khan, Director, Geotechnical Engineering Division

SUBJECT: Relaxation of Pile Capacity in Shale

EFFECTIVE: Immediately

### Relaxation of Pile capacity in Shale

When designing piles, the geotechnical designer should add, loss of capacity due to relaxation to the nominal resistance  $R_n$  in calculating the  $R_{ndr}$  based on the values given in the table below. These are preliminary design values and INDOT Geotechnical Engineering Division may change these numbers based on the geology of the area and future research.

The estimated preliminary values of relaxation for piles seated in shale shall be as follows:

HP Pile Size*	Relaxation (Kips)
10 X 57	75
12 X 53	75
12 X 74	100
14 X 73	100
14 X 89	100

\* For other pile sizes the Geotechnical Engineering Division shall be contacted.

Relaxation values shall be added to the nominal resistance  $R_n$ , in the pile load tables during design stage and in the foundation review form to come up with the nominal driving resistance  $R_{ndr}$ , based on the pile size selected by the designer.

All piles seated in shale shall be spaced at greater of the 6.0 ft or 6 times the pile diameter.

MZ/jh  
File

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