4550510DB – STRUCTURES FOUNDATIONS (DESIGN BUILD) – OPTIONAL SOIL SET-UP APPROACH

COMMENTS FROM INTERNAL/INDUSTRY REVIEW

Keith A. Waugh
352-787-1616
kwaugh@lewarecc.com

Comment: (8-2-13, Internal Review)
The added column for 100% Dynamic Testing is needed but the resistance factors should be at least .10 more than blow count criteria factors. The small benefit of only .05 more doesn't compensate for the added cost.

Response:

****

JC Miseroy
JC.Miseroy@gcinc.com
Mohamad with GRL
MHGRLFL@aol.com

Comment: (8-4-13) Internal Review
Please see information from Mohamad with GRL below.
His approach has merit and should reduce installation costs while still providing certainty of pile capacities.
JC
In a message dated 8/2/2013 8:51:06 A.M. Eastern Daylight Time, MHGRLFL@aol.com writes:
Good morning JC,
Yes, one can make a few comments to improve the approach. In many cases, utilizing the beneficial time-dependent soil setup (also known as pile freeze) to achieve the geotechnical pile load bearing capacity significantly improves the economics of the project by reducing the $/ton of pile support cost. There are many documented cases where soil set up has been observed and measured in Florida (I have published several technical papers on the topic (see attached for a sample), as well as other also).
However, the proposed approach in what you sent me can be made more effective. The proposed phi-factors seem too low for the purpose, can probably be raised by 0.05 or 0.1 and still be within reasonable ranges.

There is still confusion regarding the 100% dynamic testing. First, it should not be dictated for the initial drive and testing of all blows. This is not needed for steel piles, for example. Testing the entire drive of a steel pile does not provide useful data, there is no critical information that can be gained by it. Even for concrete piles, no need to test each and every blow, especially if, like in this case, only the very end of driving information is what is needed. The proposed Table gives only a 0.05 added phi-factor credit for testing each and every blows of each and every pile during initial driving over just using a blow count driving criteria. In cases where setup is a part of the pile design, testing during initial driving is then mainly done for structural integrity monitoring since the required ultimate pile capacity (NBR) by definition will not be there initially.

An important addition that can be made to significantly improve the approach's applicability would be to include an item that address driving the piles initially to a certain capacity (say 1.1 times factored design load) with, or without testing, then 100% dynamic testing of all piles in a given foundation unit during restrike (at a time determined by the design engineer taking into consideration the contractor's construction schedule at any given foundation unit location). This would be the best application of testing since it verifies the geotechnical pile load bearing capacity and structural integrity all at once giving the owner the most benefit and value. It also provides the engineer the means and basis to certify the foundation unit. And to the contractor it expedites the work since it eliminates the need (and potential associated delays) for VT testing. In my opinion, this approach warrants the use of a phi-factor of 0.8 (and probably not less than 0.75) since testing each and every pile in restrike pretty much eliminates the unknowns regarding the individual piles. There will still be a 0.2 cushion (to get to one) to account for various factors that the Department may want to have covered (e.g., uncertainty in the testing method, etc.).
I hope these comments are helpful, please let me know if you would like to discuss it further.
Please feel free to share it with Bob, Randy, Keith, Andy, and Pete.
Regards,
Mohamad

Response:

****

Neil Monkman
neil.monkman@wrightg.com

Comment (10-3-13):
Thank you to all those that participated in this proposed revision to the specification. Very well written and an overall EXCELLENT improvement for DBF's. Again, Thank you.

Response:

****