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Effect of soil properties and pile dimension on bored pile using Allpile software

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بَسمِ اللهُ الرحمنَ الرحِيمَ

((يَرْفَعِ اللهُ ٱلَّذِين آمَنُوا مِنكُمْ وَٱلَّذِينَ أوتُوا العِلمَ دَرَجَاتٍ وَاللهُ بِمَا تَعْمَلونَ خَبِيرٌ))

صدق الله العظيم

سورة المجادلة آية 11

الاهداء

يامن ضحت بالروح والشباب لاجل عيني .....

ويامن تحملت العناء والحزن والعذاب لاجل عيني .....

ويامن ذرفت الدموع وخاضت الصعاب لاجل عيني .....

لاجل عينيك اهديك ثمرة جهدي وانحني لك حبا واحترام .

(امي الحبيبة ..)

الى من تعشق رؤيتهم عيني .....

وتغرم بأصواتهم أذني .....

وتسعد بلقائهم جوارحي .....

وتطمئن بهم نفسي .....

(اهلي واصحابي ..)

شكر وتقدير

اللهـــــم ربنا لك الحمد حمداً مع دوامك ..

وشكراً لا ينبغي إلا لكَ وحدكَ لاشريك لك

ولا رب سواك .. اللهـــــم كما مننت عليَّ بالنعم

فمنّ عليّ بالشكر لك

اتقدم بجزيل الشكر والامتنان الى الاستاذ الفاضل

أ.د. قيس طه شلاش على انجاز هذا العمل

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1-1 Definition:

Deep foundation is a Part of a structure used to carry and transfer the load of structure to the bearing ground located at some depth below ground surface. There are two types of deep foundation: Pile foundation and caissons. A pile foundation or a pile is statically indeterminate to a high degree hence empirical methods are used to analyze and solve its capacity.

Piles are used when:

1- When the load imposed by a building cannot he spread sufficiently over the available ground area and exceeding the bearing capacity of the soil .
2- When settlement would be greater than the acceptable values or Unpredictable and hard soil or reek can be reached economically.
3- When the building has to he founded on soils liable to shrinkage and swelling.
4- When building over water.
5- When there are tensional forces lending to overturn or lift the structure.
6- To resist lateral forces.
7- To underpin or strengthening existing foundations such as stiffening bridge, abutments and/ or piers.

1-2 Classification of Piles:

- **Material:**

1. Steel piles
2. Concrete piles
3. Timber piles
4. Composite piles

- **Load Transfer Mechanism:**

1. Point (End) bearing piles
2. Friction piles
3. Compaction piles

- **Effect on Surrounding Soils**

1. Driven piles (displacement piles)
2. Bored piles (non-displacement piles)

1-3 AllPile Software:

is a Windows-based analysis program that handles virtually all types of piles, including steel pipes, H-piles, pre-cast concrete piles, auger-cast piles, drilled shafts, timber piles, jetted piles, tapered piles, piers with bell, micropiles (minipiles), uplift anchors, and shallow foundations.

One of the major advantages AllPile has over other pile software is that it combines most pile analyses in a single program. It calculates compression (with settlement), uplift, and lateral capacity all together. Users only need to input the data once instead of several times in different programs. AllPile makes pile analysis both economical and time-efficient. AllPile is suitable for all engineers, even those without too much pile analysis experience. It helps structural engineers choose soil parameters, and geotechnical engineers choose pile properties.

CHAPTER TWO

PILE FOUNDATION