31st March, 2014

Mr. Maksimul Islam

Ms. Shamsunnahar Suchana

The course teachers of CE-200
Department of Civil Engineering,
BUET, Dhaka-1000

Subject: Submission of report regarding "Shore Piling".

Dear Teachers,

We are glad to submit our presentation and report on "Observing the process and writing a report on Shore Piling" that was assigned to us by you. We tried our best to give a clear view on our assigned topic.

We thank you for your help and timely advices that helped us to perform our task with greater efficiency.

We would also like to mention that any mistake on our behalf was totally unintentional and hope you would consider it with a soft corner.

Sincerely,

Student No:	1104082	1104083
	1104084	1104085
	1104086	1104087
	1104088	1104089
	1104090	1104091
	1104092	1104093
	1104094	1104095
	1104096	1104097

Department of Civil Engineering,

BUET, Dhaka - 1000

PREFACE

This report has been prepared to show the Details of Construction of "Observing the process and writing a report on Shore Piling". Observation of "Shore Piling" was assigned to us (Group 2) by our respected teachers to make us know better about the detailed construction procedure of these basic criteria for structure.

To prepare this report we had to visit so many sites for perfect concept about our topics, to know the differences of works, varieties of materials used in the purpose, quality control process etc. After visiting the sites we gained a clear view about our assigned topic, which helped us to prepare this report. This report contains all our theoretical knowledge, practical views and project details of "Shore Protection" which made this report a complete one. It contains the full details we were able to collect from our site survey & theoretical conception. Hopefully, our fervent and sincere effort will exhibit the full view of our works to our honorable teachers.

Students of group #2

ABSTRACT

Knowledge loses its perfection unless it is observed in real world especially in civil engineering practices. To be a good Civil Engineer it is necessary to acquire both theoretical & practical knowledge. This assignment has provided us a great opportunity to get familiar with such an uncommon topic.

This report contains a brief description of our practical experience of observing the construction process of **"Shore Piling"**, their importance in structure etc. Hopefully we can say that this report will give a clear conception about our assigned topic. Thanks.

At the end we would like to thank every worker of the site who in different phases demonstrated us the different steps of the construction, helped us knowing the working process very easily.

SHORE PILING

DEFINITION

Shore Piling is a measure to prevent ground subsidence while excavating for deep foundation of a super structure. Again shore piling else termed as shoring may be denoted as temporary bracing used to prevent something, such as a tunnel, trench, soil or wall from collapse. The piles may be placed separately or they may be placed in the form of cluster throughout the edge of the area.

Figure 1: Shore Piling

PURPOSE

- When the walls of a building develops signs of bulging or leaning outwards, shoring is necessary to prevent further development of the defect.
- When defective walls of a building are to be dismantled and rebuilt, shoring is restored to for supporting the floors or roofs connected to that wall.
- Shoring may be essential to give support to the walls of two adjacent buildings when the intermediate building is to be pulled down or rebuilt.
- Concrete structures shoring, in this case also referred to as false work, provides temporary support until the concrete becomes hard and achieves the desired strength to support loads.
- When raft foundation is provided, a large hole is excavated. So, shore pile is needed to protect the sides from breaking down.
- Shoring is commonly used when installing the foundation of a building. Shore piles will support the surrounding loads until the underground levels of the building are constructed

SCENARIO OF DHAKA CITY

Dhaka, the capital city of Bangladesh, is experiencing one of the highest rates of urbanization in the world. Over the years, the city has had inconsistent transformation of land use and organic development; which in turn created crisis in residential areas or neighborhoods and affected the city life adversely. About 7 million people live here over only 590 sq.km area. So it's been found difficult to construct high rise building in a small land as possibilities of finding surrounding constructions is greater. Hence it becomes a great challenge for the builders to construct a superstructure without interrupting the surroundings.

As many buildings raise within a very small area here shore protection is quite important for the foundation of a building which is under construction as the surrounding buildings cannot transfer the loads to the soil that has been excavated.

Again here in Bangladesh hard strata is difficult to be found. So bearing capacity of soil is low. Consequently raft foundation is used for bearing large loads. Raft foundation requires an entire excavation of the land. As a result there is a great possibility of damaging the surrounded buildings because of the excavation. Hence it hardly demands to say that shore protection is very much important in the context of Bangladesh to protect these surrounded buildings.

PROJECT PROFILE

Location: Shatmasjid road, Mohammadpur

Developer Company: , Abeda Nur Charity Foundation

Area: 6000 sq. ft. (approximate)

Purpose: both residential and commercial

Building height: 15 storeyed building

Surrounding Constructions

East side: 10 storeyed English Medium school (ACADEMIA)

West side: 3 storeyed residential building

North side: some tin shaded house

South side: Shat masjid road.

PROCEDURES

1. **Digging up the pits**: At first, pits are dug for pilling with the help of wash boring on the border line of the area. The pits are 55 ft. high.

2. **Reinforcement formation**: The reinforcement is made and inserted in the pits. The number of rods, stirrups and the diameter of the rods totally depend upon the design of the foundation.

Figure 3: preparation of reinforcement

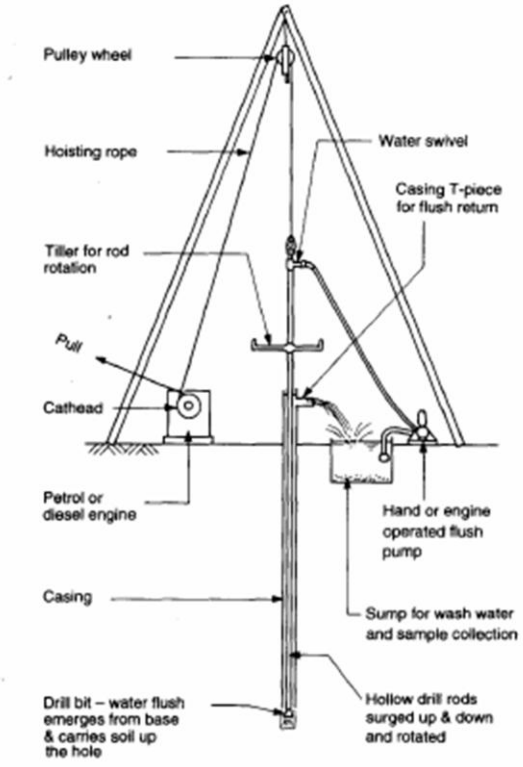
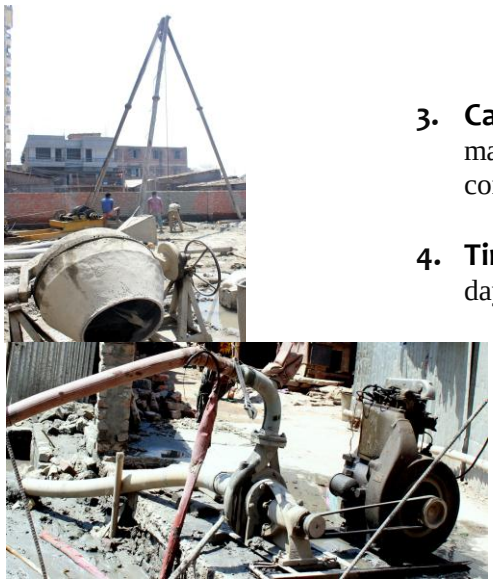


Figure 2: Process of wash boring



3. **Casting of piles:** After that, pile is casted on the pits. It may be cast-in-situ or precast pile which depends on construction area and the budget.

4. **Time for Setting:** Now the piles are left for setting for 18 days.

Figure 4: Casting machine on pit

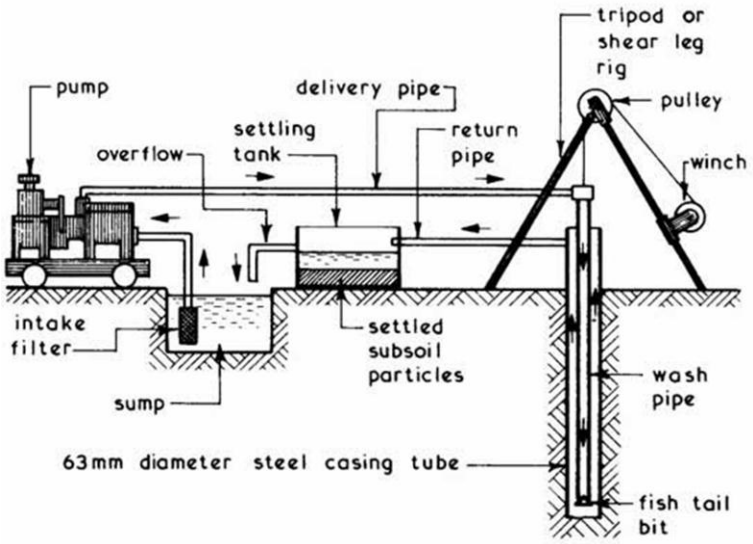


Figure 5: Cross section of operating process

5. **Construction of Tie Beam:** After that, a tie beam is constructed on the piles to join all the piles of the boundary line.

Figure 6: Tie Beam above the pile

6. **Excavation work:** After that excavation is done. At first excavation is done vertically 7 feet below the surface. Then horizontally 5 feet long surface from the boundary is kept and then the second excavation is started. This time the excavation is inclined such that the end point is 15.5 feet long horizontally from the boundary. The total excavation is 19 feet high from the top surface.

Figure 7: Half-done excavation

7. **Adding up the Joist:** After that joist is added. It is laid on the bottom of the first excavation. There are joist in the boundary line and on the excavated area. The boundary joists are hanged with wire from the tie beam. The distance between two joists in the excavated are is 15 feet. After laying a set of joists in one side another set of joists is laid perpendicular to the first set. The thickness and width of the joist is dependent upon the design of the structure.

Figure 8:

a. **Addition of joist**
b. **Extra joist**
c. **Joist ties with beam**

8. **Adding up vertical joist in the intersection:** At the intersection of two joists, a vertical joist is placed two supports the horizontal layer of joists.

9. **Making ready for the foundation:** After that the whole area is made ready for the foundation work.

Figure 9: Vertical joist to support horizontal joists

BENEFITS OF SHORE PILING

- **Protection for the neighboring structure:** Shore pile protects the neighboring structures from forming cracks due to the excavation or for the vibration of pile driving at the construction site.

- **Protection from Vibrations:** Shore piling protects the building from the vibrations created due to many reasons during the soil being excavated. If there is a road running beside the construction site the soil under the roads may enter into the site creating a hazardous situation due to the running cars, buses or trucks.

- **Protection from Seismic waves**: In the soil vibrations are created due to many reasons like earthquake, seismic waves, various changes in the soil etc. Shore piles give protection to the building by saving the buildings from these vibrations created in the soil.

- **Supporting the Super-Structures**: Shoring is necessary to support the super-structure when large openings are required to be made in the main walls.

- **Safety for the Workers**: During excavation, shoring systems provide safety for workers in a trench and speed excavation.

DRAWBACKS

- **Expensive:** Relatively costlier but free of risk. If there is no shore pile and then there anything happens unusual to the surrounding construction it would penalize more. So it is preferable to work risk free.

- **Noisy driving:** it seems tougher to drive piles precisely in the edge of the boundary and also emerges huge noise.

- **Decay Prevention:** May require treatment to prevent decay, insects and borers from damaging the pile. It gets easily damaged during hard driving and quiet inconvenient to splice.

- **Difficulties in casting:** Handling, splicing and transportation seems difficult for precast piles and soil caving is found tougher in cast in-situ piles.

CONSIDERATIONS FOR SHORE PILING

- **Different piling techniques:** Different piling techniques have been devised to suit different ground conditions. Also there are various legal ramifications regarding safety issues of foreman & labors while excavating ground for piling & foundation. Some factors are presented below-

- **Presence of Alluvium:** If the sub-soil consists of silt on alluvium for an appreciable depth, the shore piles will function as pile. Depending upon load, suitable pile, such as vibro pile, vibro-expanded pile or a tapered pile may be used in such situations.

- **Weak Ground:** In case the ground is very weak or loose and it is intended to use cast in-situ pile, casing will be required to prevent the inflow of the soil into the pile hole.

- **Strong Ground Water Flow:** In adverse conditions, where the ground water flow is strong, pile with permanent casing should be used. Alternatively, pre-cast piles may be used.

- **Firm Stratum:** In case the stratum is comparatively firm uncased cast in-situ pile or pre cast pile may be selected.

FEW WORDS

To maintain habitable quality of Dhaka city, it is the utmost necessity to prevent the inconsistent land use transformation and the natural development in the Dhaka city. It is high time to create the best livable environment within residential areas by proper planning, implementation of plans and provision of sufficient community facilities and utility services. Again this city is undergoing the most alarming earthquake zone. Hence to have a stable structure challenging all difficulties and without any interruption to other properties; shore piling has hardly any alternative. It is quite preferable to do shore protection rather than taking a risk of surrounding construction.

ACKNOWLEDGEMENT

At the proper completion of the presentation given by our respected teacher on **"Shore Piling"**, we would like to thank some people to whom we are really grateful and without them this would not be possible to accomplish the job successfully.

At first we would like to thank our course teachers for giving us the job. We would like to thank Mr. Khairuzzaman (Site Engineer), Mahfuz Islam(Supervisor), Md. Muzibur Rahman (Fore man), who shared their knowledge with us at every step of our stay at the site. And much thankful to Navana Real Estate Limited, Abeda Nur Charity Foundation for allowing us to observe the construction sites.

CONCLUSION

Though only "***Shore Piling"*** was our topic in the construction site, we found it available to observe other portions of construction which eventually, expanded our horizon of knowledge about and interest for civil engineering practices.

REFERENCE

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THANK YOU