

Alliance for Bangladesh workers safety project: Structural integrity assessment

EIMS has been selected as QAF by Alliance to assess structural integrity of garment manufacturing factories in Bangladesh, which are mostly located in Dhaka, Savar, Gazipur and Chittagong. Within a short period of time EIMS has completed integrity assessment of 37 garments factories. The assessment was conducted by renowned professional engineers and academicians of the country's top engineering universities to have the best quality output and customers satisfaction. EIMS is also performing Detailed Engineering Assessment (DEA) of several export

oriented garments buildings which have been visually inspected by many international groups such as ILO, Accord,

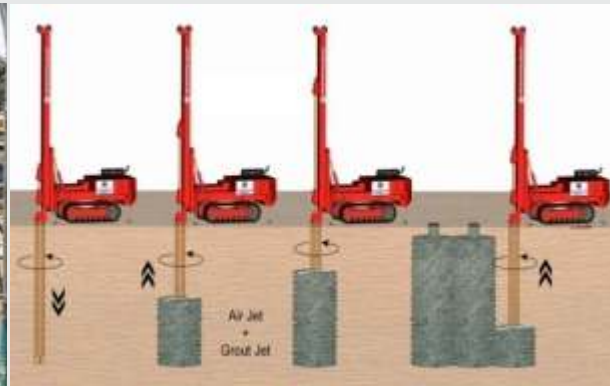
ARUP etc. Within a short period of time EIMS has proved itself and gained trust of its customer to deliver quality product in time in the field of Structural Design & Check, building inspection and detailed engineering assessment.



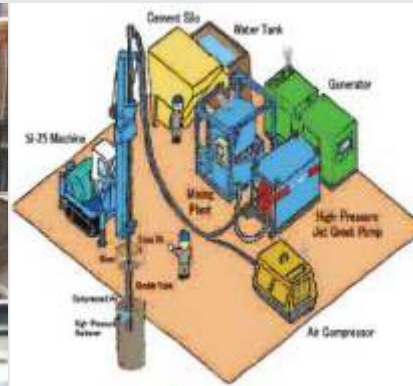
Building (a) before and (b) after retrofitting



Grouting Machine



High Pressure Jet Grout Pump System



Jet Grout Technology

Construction Methodology

Jet grout piles are installed by initially drilling a small hole, typically 100 mm in diameter to the required depth. In the double fluid system, the grout is encased within a shroud of compressed air. The air acts as a buffer between the groundwater and the grout, greatly increasing the cutting efficiency. It also creates turbulence in the waste spoil, improving the efficiency of its removal. In this method a special coaxial drill string and jet monitor has been used. The cutting jets are located above the grout supply, which allows a nearly complete replacement of the soil with grout

as the monitor is withdrawn. The double fluid jet grouting system used for this project is shown in Figure 5. Double fluid jet grouting is typically constructed from the bottom upwards. Column size is dependent on parameters such as rotation rate, lift rate, injection pressure and grout flow rate. Selection and control of these parameters are the main task in construction stage to attain desirable results for the structure.

JET Grouting Scheme

Jet Grouting is a technique characterized by the use of pressurized fluid jet to hydraulically either before or concurrent with the addition of the grout material to form a solidified in situ element known as Soilcrete (specialized cementitious slurry mixture designed specifically for soil stabilization / modification). Jet grouting as a soil improvement technique is currently utilized throughout the world from its conception in Japan in 1973.

It is one of the effective solution against liquefaction which occurs due to earthquake in liquefiable sandy soil. So it is a great technology for building a safe structure in a earthquake prone country like Bangladesh.

Operational parameter

In JGP construction, the operational parameters are injection pressure, number and diameter of nozzles, rotation and lifting speed of the rods and flow rates. These parameters have been set according to appropriate calculation and as a result of required diameter according to the design. Following factors may affect the selection of operational parameter: subsoil condition, desire pile diameter, desire soilcrete bearing capacity, applied jet grouting technique. For this project, operational parameter has been determined by a field trial.

Jet Grouting Technology

Efficiency and Advantage over Traditional Technology

- Suitable for all kind of soil;
- Grout Pile installation is quick process (grout pile may be installed per day);
- Strengthening of soil beneath existing foundation is possible (retrofitting purpose);
- Also act as deep foundation itself, so reduction of foundation cost.

Efficiency and Advantage over Traditional Technology

Efficiency and Advantage over Traditional Technology

- Suitable for all kind of soil
- Grout Pile installation is quick process (6 grout pile may be installed per day)
- Strengthening of soil beneath existing foundation is possible (retrofitting purpose)
- Also act as Deep foundation itself, so reduction of foundation cost

USE OF JET GROUTING

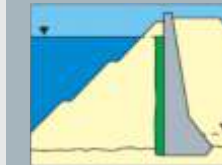
River Training Purpose: Soilcrete column provide resistance against Higher Mechanical Strain by shear force. Also provide impermeable curtain



Column walls

In the event of higher mechanical strain by shearforce, danger of undetermining or of a high impermeability requirements, cut off walls of intersecting Soilcrete columns may be constructed.

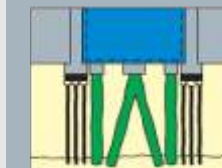
Repair dam cores or to Enlarge Cut-off wall



Dam Sealing

Soilcrete may be used to repair dam cores or enlarge cut-off walls in or below dams.

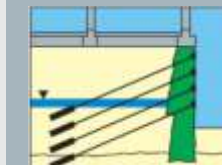
Deep Foundation (Retrofitting)



Deep foundation

Soilcrete is used for new foundations which require special care in view of nearby existing structures such as historical buildings or computer centers.

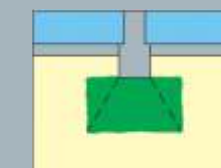
Shore protection/ Seepage Barrier



Underpinning

Underpinning by means of low deformation gravity walls sometimes also used as a ground water seepage barrier, may safely constructed even from confined working areas.

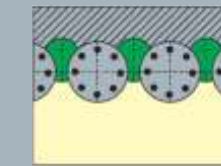
Foundation Modification



Foundation modification

Changes in utilisations or modifications of buildings often require an enlargement or alteration of the foundation. Soilcrete is an economical and flexible solution for this task.

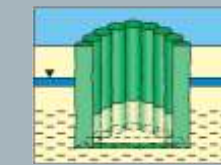
Joint Sealing : Sheet Pile



Joint Sealing

For sealing of joints between piles, sheet piles or other construction parts in the ground the Soilcrete wing-jet is applied.

Shaft Support



Shaft Supports

Shafts with intersecting Soilcrete columns are constructed if a vibration free installation is required and/or the shafts enter into ground water bearing strata.

Tunneling using Jet Grout

