Why carry out site investigation construction essay

Design

The intent of a site probe is to place the land conditions which might impact the proposed development.

It enables better apprehension of the site and immediate milieus, which will enable safe and economic developments. They are a common demand of the investors every bit good as the regulative governments. In the broadest sense, the land conditions are understood to include non merely the underlying dirts and stones but besides the groundwater government, any taint and effects of any old utilizations of the siteThe intent of a site probe is to place the land conditions which ma, any taint and the effects o

1. 1. 1 The graduated table of job

Assorted studies over the past 25 old ages have shown that the largest component of proficient and fiscal hazard usually lies in the land. Ground related jobs have led to late completions and high cost overproductions on the national graduated table. In an analysis of 8000 edifice undertakings, National economic Development office (NEDO) stated that one tierce of the undertakings overran by more than a month, a farther one tierce overran up to a month due to holds due to unanticipated land conditions. Work in groups or braces, note down a few points on

Why carry out site probe?

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2 Why carry out site probe?

The word picture of land conditions whether for a ‘ greenfield ‘ or a antecedently developed ‘ brownfield ‘ site will include both the geotechnical and the geo-environmental issues. Site probes can be required for both

geotechnical and geo-environmental intents and for many undertakings it would be advantageous to unite the probes with ensuing economic sciences in cost, clip and site break. The probes should let a comprehensive hazard appraisal of the land conditions to be made from which a programme of hazard direction can be developed, The hazards which may be defined can be wellness hazards (from old taint of land) , technology hazards (posed by hard land conditions) , regulative hazards or fiscal hazards, all of which may originate from unanticipated land conditions and liabilities.

The object of the site probe is to qualify the land conditions sufficiently to let safe and economic design to be developed and to cut down, every bit far as possible, the happening and impact of unanticipated conditions.

Aims of Site Investigation

The chief inquiries for site Investigation would be as follows: Suitability: Are the site and milieus suited for the undertaking? Design: Obtain all the design parametric quantities necessary for the plants. Construction: Are at that place any possible land or land H2O conditions that would impact the building? Contamination: Any possibilities of the site being contaminated? Materials: Are at that place any stuffs available on site, what measure and quality? Consequence of alterations: How will the design affect next belongingss and the land H2O? In add-on to these, it is necessary to look into bing characteristics of the natural land. hypertext transfer protocol: //books. google.

co. uk/books? id= 8HfURxCjPlkC & A ; pg= PP15 & A ; lpg= PP15 & A ; dq= site+investigation+case+studies & A ; source= web & A ; ots= plbbDn_SdM

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What does site probe involve?

Site Investigation is the assemblage of information about the proposed location of the project. The procedure of site probe can be separated into the undermentioned countries: Aims of Site Investigation (SI)Desk surveyPlaningLand probe (GI)Trial PitsBoreholesSamplingReportingThe sequence of a site probe is as follows: Desk StudySite Reconnaissance -Walk-over surveyPreliminary study or feasibleness surveyPreliminary Ground Investigation – Planning of chief GIPreliminary studyMain Ground InvestigationLab provingConcluding studyOn-site Groundbreaking WorkTrial cavities – by manus or excavator'Lightweight ' and ' Heavyweight ' drilling and proving equipmentLaboratory dirt proving (eg. malleability of Claies

1. 3. 1 Desk Study

Harmonizing to the NHBC criterions chapter 4. 1, all sites must be assessed by a Desk Study and Walkover Survey (Clauses D1-D3) . Desk Study should be carried out for every development prior to any intrusive site probe.

The desk survey is work taken up anterior to get downing the work on site and the Ground Investigation. It should ever be the first phase of the Site Investigation and is used to be after the Ground Investigation. The work involves researching the site to derive as much information as possible, both geological and historical. The desk survey examines and pull together bing information from a assortmentof beginnings to organize an initial assessment of possible land conditions and tosee past utilizations and

current position of a site. This provides a preliminary appraisal of the geotechnical and geo-environmental hazards which may be associated with the site.

Records of Previous SI studies are besides helpful in a desk survey. The many beginnings of SI informations include old company studies, Servicess records are besides an indispensable portion of the desk survey, necessary to turn up concealed services such as electricity overseas telegrams, cloacas and telephone wires. This in formation is normally provided free of charge by the relevant service supplier. A suggested list of beginnings is: Local Authority ; British Telecom ; Electricity Company ; British Gas ; Water Companies. It is besides indispensable to look into for the location of former mine workings as these can well impact building and lead to cost additions.

The location of these mines may be hard but assist can be found from the Divisional Plans Record Offices of the National Coal BoardIt is indispensable when carry oning a desk survey that every bit much information as possible is obtained. Work at this phase of the Investigation saves much clip later and immensely improves the planning and quality of the Investigation. 1. 3. 2 Walk -over study -Walk -over study of a site can give valuable penetration into possible land status jobs (for illustration incline instability or shoal groundwater) and taint issues. Such site visits frequently give rise to anecdotal parts by local occupants. The Site Reconnaissance stage of a site probe is usually in the signifier of a walk over study of the site.

Important grounds to look for is: Hydrogeology: Wet marshy land, springs or ooze, ponds or watercourses and Wells. Slope Instability: Signs of incline

instability include set trees, knolls on the land and displaced fencings or drains. Mining: The presence of excavation is frequently marks of remission and perchance disused mine shafts. Open dramatis personae excavation is indicated by amused watercourses replaced or removed fence/hedge lines. Entree: It is indispensable that entree to the site can be easy obtained. Possible jobs include low overhead overseas telegrams and watercourses

The combination of desk survey and walk-over study is an highly cost-efficient

foremost phase in an probe. It provides early warning of possible

jobs and a sound footing for the range of intrusive probe which is to

follow.

The desk survey and walk-over study can besides supply early acknowledgment of siteissues such as ecology and archeology which may hold profound deductions in both programme and fiscal footings.

1. 3. 2 Planing a Site Probe

Dumbleton And West2 have discussed the planning and way of site probes.

They province that “ the chief probe is the full probe of the site utilizing boreholes and test cavities and includes the readying of the site-investigation study with revised programs and subdivisions, reading and recommendations for design. ” They consider that there are two facets to the site probe. The geological construction and character of the site andthe testing of the dirt both in the research lab and in-situ. They suggest that the

planning should see the undermentioned inquiries. Is the sequence of strata known over the whole site and is there correlativity across the whole site known? Are the different strata reasonably homogenous over the site or make local fluctuations exist? Are at that place more complex countries of strata that require probe or closer scrutiny during building? Will at that place be countries where the excavated stuff will be unsuitable for fill and will necessitate to be replaced? Are there countries where demands to be assessed to determine working methods? Will any portion of the site be capable to deluging? What contact will at that place be with H2O bearing strata and will anchor H2O take downing methods be required during building? Do demands for the transporting out of particular unmoved trials or the pickings of undisturbed samples affect the behavior of the qualitative probe? For illustration, with forethought a individual test cavity may be made to function both for analyzing land stuffs and construction, and for the unmoved testing and the pickings of block samples.

1. 4 Ground Investigation

Land probe is taken to be that other than the information available from the walk over study as discussed antecedently. There are two chief methods of look intoing the land conditions, test cavities and boreholes.

In add-on, the reader should be cognizant of geophysical techniques such as seismal studies, which are non discussed here.

1. 4. 1 Trial Pits

Trial cavities are shallow diggings traveling down to a deepness no greater 6m. The test cavity as such is used extensively at the surface for block

sampling and sensing of services prior to borehole digging. DepthExcavation Method0-2mBy Hand2-4mWheeled Back Hoe4-6mHydraulic ExcavatorAn of import safety point to observe is that ALL pits below a deepness of 1.

2m must be supported. In add-on attention should be taken as gases such as methane and C dioxide can construct up in a test cavity. Breathing setup must hence be used if no gas sensing equipment is available.

Support for a test cavity by and large takes one of three signifiers: TimberingSteel frames with hydraulic knucklebonessBattered or tapered sidesThree types of sample can be taken from a test cavity: Disturbed Sample – Samples where the soils unmoved belongingss are non retained. Block Sample – A sample that is non undisturbed but retains some unmoved properies. Push in tubing sample – Tube samples of the dirt in a test cavity. When fixing a test cavity log, the undermentioned information should be included. The location, orientation and size of the cavity ; studies of faces ; depth graduated table ; root structur ; H2O degree ; ooze.

In addidtion the conditions at the clip of trying should be noted as many dirts are upwind dependent. It is highly of import when finished to reinstate the test cavity every bit good as possible.

1. 4. 2 Boreholes

A borhole is used to find the nature of the land (normally below 6m deepness) in a qualitative mode and so retrieve undisturbed samples for quantitative scrutiny. Where this is non possible, for in gravelly dirts below the H2O tabular array, unmoved testing methods are used. Obviously the information gained from a borehole is an highly limited image of the

subsurface construction. It is hence indispensable to compare the consequences obtained with those that could hold been expected from the desk survey.

The greater the figure of boreholes the more certain it is possible to be of the correlativity and therefore to swear in the consequences. The two chief types of drilling machine used for Site Investigation in the United Kingdom are light percussive and drilling machines. Light Percussive is the procedure of doing boreholes by striking the dirt so taking it and the most common method is the shell and plumber’s snake. This is a general term to depict assorted tools suspended from a triangular tripod integrating a power windlass. The tools are repeatedly dropped down the borehole while suspended by wire from the power windlass. The different tools used include: Clay Cutter – Used in cohesive stuffs and is raised and lowered, utilizing it ‘ s ain weight to cut into the stuff.

Shell – Used for tiring in silts and littorals. Similar to the clay cutter, but has a trap door at the underside to catch stuff. Chisel – Used for interrupting up difficult stuff such as bowlders or stones. Extra payment is required for cheating as per the Bill of Quantities and permission is usually required from the Resident Engineer before work can get down. Drilling is the procedure of tiring usually by utilizing a combination of a revolving action and a hydraulic random-access memory. There are many different types of rig depending on entree and type of land expected. Hollow boring rods enable a flower of H2O, air, froth or clay which is used to transport the film editings to the surface every bit good as lubricating and chilling the drill spot.

The three chief types of drill spot are: Double tubing is where the outer tubing rotates and allows for the remotion of the film editings while the interior tubing is stationary and prevents the nucleus from shearing. There are different designs of tubing changing the location of the flush discharge so as to forestall sample eroding. It is necessary for the hole to be bigger than the tubing and so the diamond spots are attached to the exterior of the hole, therefore leting the flower to return to the surface. Ternary tubing in corporates a 3rd tubing to protect the nucleus even further during bulge and can hold either a split tubing, which is removed, or a fictile tubing to supply longer term protection. A less effectual option is to integrate a nylon line drive in a dual tubing. Retractable ternary tubing is a fluctuation where the inner tubing is attached to a retractor and can widen beyond the film editing border. This gives complete protection to the nucleus in softer stone whilst in harder stone where this is non necesary, it retracts to go a standard three-base hit tubing. This is used in jumping soft/hard stone, typical of a weather-beaten profile.

Core spots are normally diamond tipped and are either surface set, where diamonds are mounted into a matrix, or impregnated where a all right diamond dust is used in the matrix. In softer stones, the film editings can choke off up the matrix so the softer the stone, the larger the diamonds need to be. Tungsten carbide spots can besides be used in the softer stones.

Sampling

Sampling can be either undisturbed, of which unmoved testing is a signifier, or disturbed. The chief sampling methods used in boreholes are: SPT trial: This is a dynamic trial as described in BS1377 (Part 9) and is a step of the

denseness of the dirt. The trial incorporates a little diameter tubing with a cutting shoe known as the ‘ split barrel sampling station ‘ of about 650mm length, 50mm external diameter and 35mm internal diameter.

The sampling station is forced into the dirt dynamically utilizing blows from a 63. 5kg cock dropped through 760mm. The sampling station is forced 150mm into the dirt so the figure of blows required to take down the sampling station each 75mm up to a deepness of 300mm is recorded. This is known as the “ N ” value. For harsh crushed rocks the split barrel is replaced by a 60 grade cone. Core Sample: Core samples must be sealed with parafin to keep the H2O conditions and so stop sealed to forestall physical interferance. The mpst common of these is the U100 (see below) although other sizes from 54mm to 100mm diameter are used.

The standard U100 has a sample country ratio of 30 % so big ammounts of dirt are displaced. A thin walled Piston Sampler reduces this to 10 % . The sample is pushed or jacked into the land as opposed to a dynamic action. U100: This is a 450mm long, 100mm diameter undisturbed sample. The tubing has a cutter at one terminal and the impulsive equipment at the other.

Behind the cutter is a nucleus backstop, integrating 3 weaponries that go into the sample as it is withdrawn, to forestall the sample from falling out. Care should be taken to guarantee that the cutting shoe is as clean and crisp as possible. Bulk Samples: Normally taken from test cavities or in dirts where there is small or no coherence. Often called block samples. WaterSamples: Water samples should be taken every bit shortly as H2O is first struck and

the deepness recorded. After a suited period of clip (normally 10-15 mins) the deepness should be re-recorded and a farther sample taken.

A concluding sample should be taken at the terminal of the borehole and the deepness to H2O on a regular basis recorded. The sample is taken utilizing a device known as a bailer, made from Teflon or plastic it incrporates a float to pin down the H2O and should be cleaned after each sample. The sampling process varies harmonizing to the type of strata in which the probe takes topographic point. A reccomended sampling process is listed below. Claies: Normally necessitate undisturbed samplesU100 every 1. 5m or alteration of stratum.

Blow count and incursion should be noted. If unable to obtain a U100 so bulk samples as above. If U100 does non full penetrate SPT trial is required. Sands & A ; Gravels: Undisturbed samples are non practical due to the deficiency of coherence. SPT every 1m or alteration of stratum. Number of siting blows should besides be recorded.

Bulk samples to be taken between SPT ‘ s. Silts: Alternate SPT and U100 samples at 0. 75m intervals

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5 Reporting

The Site Investigation study should reply all the inquiries set out in the planning stage of the Investigation This should include an appraisal of the viability of the proposed undertaking. Included in the study should be a location of all the boreholes, test cavities, other diggings and their logs.

These logs should give as much information as possible on the dirt and stone construction as it is possible to obtain.

Case surveies

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