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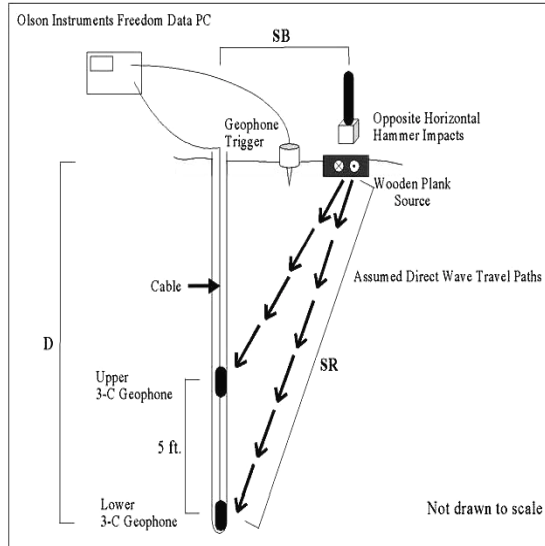
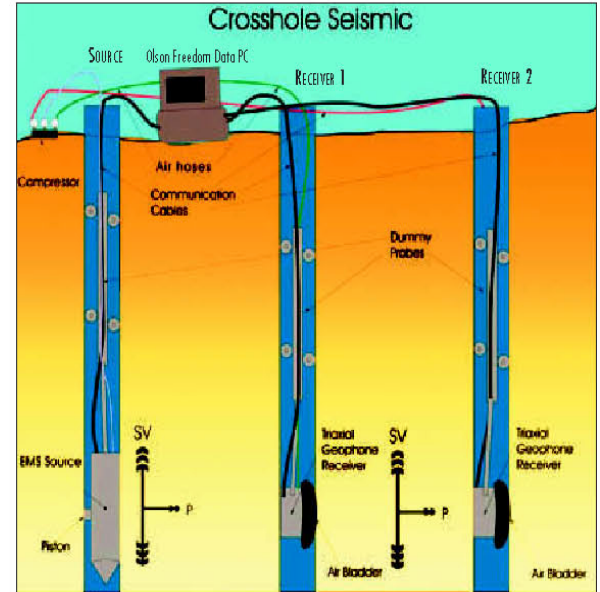
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Crosshole / Downhole Seismic [CS / DS]

APPLICATION

CROSSHOLE SEISMIC(CS) investigations are performed to provide information on dynamic soil and rock properties for earthquake design analyses for structures, liquefaction potential studies, site development, and dynamic machine foundation design. The investigation determines shear and compressional wave depth versus velocity profiles. Other parameters such as Poisson's ratios and moduli, can be easily determined from the measured shear and compressional wave velocities. In addition, the material damping can be determined from CS tests. The CS method is a downhole method for the determination of material properties

of soil and rock. A source capable of generating shear and compressional waves is lowered in one of the boreholes, and a pair of matching three component geophone receivers are lowered to the same depth in two additional boreholes set at evenly spaced increments (3-4 meters) in a line, as shown in the figure above. The receivers are positioned on the side of the borehole casing to allow detection of the passage of shear and compressional waves.



DOWNHOLE SEISMIC (DS) investigations are similar to the CS method, but require only one borehole to provide shear and compressional velocity wave profiles. The DS method uses a plank source at the surface to generate shear and compressional waves. A pair of matching three component geophone receivers are lowered downhole spaced 1.5 m apart to sense the P- and S- wave energy.

STANDARDS

- (1) IS:14893: 2001, "Non-Destructive Integrity Testing of Piles (NDT)- Guidelines".
- (2) ASTM D5882-00, "Standard Test Method for Low Strain Integrity Testing of Piles"



EQUIPMENT LIST FOR DOWN-HOLE SEISMIC TEST

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|-----|---|---|--------------------|
| 1. | Freedom data PC with Wingeo software | - | 1 No. |
| 2. | Geophones | - | 2 Nos. |
| 3. | Dummy Probe | - | 3 Nos. |
| 4. | AC Charger | - | 1 No. |
| 5. | Car Battery Charger | - | 1 No. |
| 6. | Manifold | - | 1 No. |
| 7. | Air Pump | - | 1 No. |
| 8. | Automatic Pump | - | 1 No. |
| 9. | Extension Board | - | 1 No. |
| 10. | Wire Bucket (Geophone Airline+Cable)
with connectors | - | 2 Nos. |
| 11. | PC – Bucket Cable connectors | - | 7 +2 Nos. |
| 12. | Nylon rope | - | 3 Rolls |
| 13. | Nylon rope | - | 3 bundle (150 mtr) |
| 14. | Rope Clamp | - | 3 Nos. |
| 15. | Tool Box | - | 1 No. |
| 16. | Wireline | - | 3 No. |
| 17. | Accelerometer (3 Pieces including white wire) | - | 1 No. |
| 18. | Connecting Links | - | 2 Nos. |
| 19. | Accelerometer | - | 1 Box |
| 20. | Accelerometer Cable | - | 1 No. |
| 21. | Wooden Plank | - | 1 No. |
| 22. | Hammer 2 ½ kg | - | 1 No. |

(i) 1 Plyer, (ii) 2 Screwdrivers, (iii) 1 Hexa Blade, (iv) 1 Cutter, (v) 10 Insulation tapes, (vi) 3 Teflon Tapes, (vii) 4 Rubber caps, (viii) 1 Measuring tape, (ix) 1 Marker Pen, (x) 1 Scissor, (xi) LN Key Spanner set, (xii) 1 Spanner 12/13, (xiii) source Spacers (xiv) Geophone Spacers, (xv) Racing cycle tubes (xvi) Varnier caliper, (xvii) Cycle tube solution, (xviii) Various types of Screws, (xix) Source air pipe fennels, (xx) Motorcycle wheel adapter (xxi) Silicon grease

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