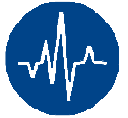


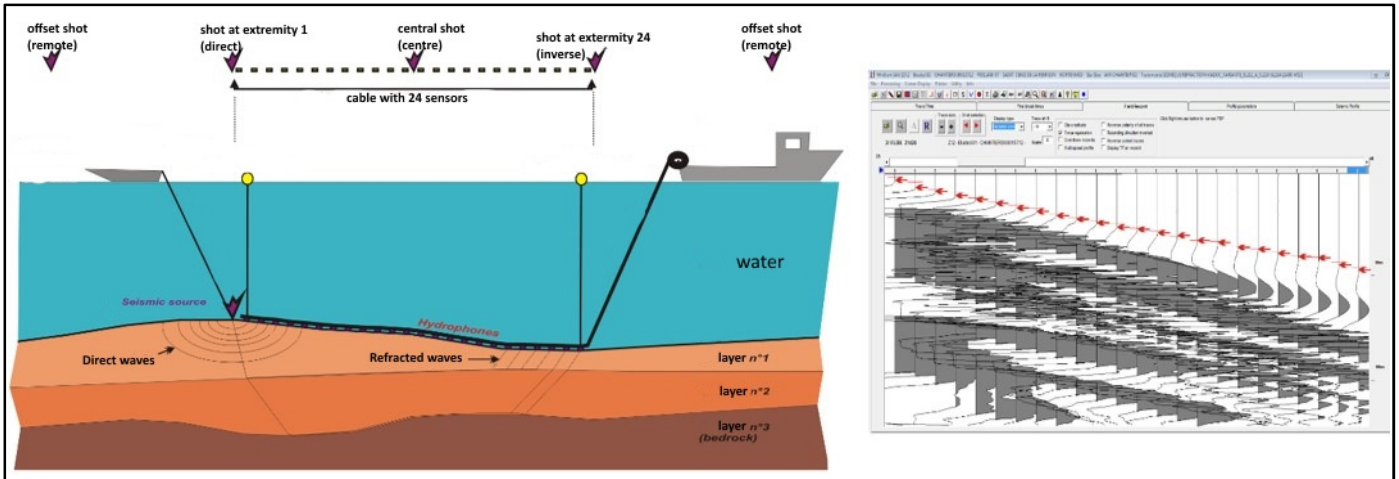


SOLDATA
GEOPHYSIC

MARINE SEISMIC REFRACTION



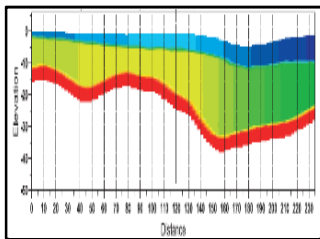
AGAP Approval of Quality: Seismic Refraction
ASTM Standard D5777



Marine seismic refraction is a non-destructive survey method for defining the quality of ground and the depth of bedrock under a layer of sediment in a river, lake or sea setting by analysing variations in seismic shock wave velocities.

Applications

- Geology
- Structures (bridges, port facilities)
- Cables passing under watercourses
- Deposits - Quarries
- Geotechnical - Foundations



The principle is the same as for land seismic refraction (SRT), but with water replacing the air.

The method relies on the transmission of a seismic wave in the ground. The shock is generated using an artificial source (air-gun, explosives), the waves are refracted in the ground, from one layer to another, and their propagation is changed. A series of highly sensitive sensors (hydrophones) records the echo of the waves at the surface (seabed, riverbed or lakebed).

Measuring the arrival times of the compression waves (P) allows a time-distance diagram, or dromochrone, to be constructed.

The interpretation of this dromochrone allows the velocity model, thickness, depth and dip of the geological layers present in the ground to be estimated.

Seismic velocities can be used to define the quality of the materials, and to provide information on their compactness, permeability and density with the use of reference tables.



Legend

1. Schematic diagram of principle with data processing
2. Seismic sources: air-gun and explosive
3. Results of seismic velocities – probable structures and top of bedrock

Key figures

- Depth of investigation from 0m to 40m depending on the site geology and the length of the measuring device
- The unit used for seismic velocity is metres / second (m/s) or kilometres / second (km/s)
- This method achieves an accuracy ≤ 10%

SDG Equipment

- Sismograph (Geometrics / Seismic Source 24 channels)
- Multiconnector cables with hydrophones spaced 1 to 5m
- Seismic source: air-gun, explosive with radio-link