

## SU - jpq - 15/09/06

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Items considered in the cost estimate for Survey and Alignment presented at Vancouver

Infrastructure and general equipment

- Internal 100m long calibration facility
- External 1km long external facility
- Workshops for mechanics and electronics

Geodesy

- Determination of the shape of the geoid
- Build and determine of the geodetic reference networks (external and underground)
- Equipment and software for data processing

Civil engineering

- Measurements controls and as built on all the tunnels
- Theoretical calculation controls for setting points
- Measurement and controls of surface infrastructures
- Equipment purchased
- Dedicated galleries for final focus and additional pits not included

Metrology on the elements

- Control the internal geometry of the assemblies
- Purchase and maintain survey equipments for internal metrology controls

• Perform quality control

Installation and alignment of the beam lines

- data management and quality control
- Integration
- Purchase and maintain standard alignment equipment
- Marking phase, Alignment of the supports of the assemblies
- 1st Alignment of the assemblies
- Final alignment for beam lines and for final focus

Computing

- Purchase informatics equipment
- Set up database and interfaces
- Write processing software
- Set up the GIS

Metrology of the experiments

- Study the integration of the survey equipment
- Perform as-built measurements and quality controls
- Internal metrology of the detectors
- Alignment of the detectors