

- A. The Contractor's choice of CCTV survey equipment shall take into account the diameters of pipes to be surveyed, type and frequency of access points to pipelines, size and frequency of bends on pipeline and conditions within the pipeline.
- B. The CCTV camera and deflection measurement profiler shall be of the most modern and advanced equipment available and shall comprise of, but not be limited to the following:
- i. CCTV camera, and deflection measurement profiler which shall be suitable for mounting on the same trolley as and when required.
 - ii. Colour TV camera with pan and tilt able to focus on points of interest.
 - iii. Camera light head assembly with sufficient illumination for pipes of varying sizes from 200mm to 2200mm in diameter.
 - iv. Cable reel of minimum 200m cable length with fully automatic and microprocessor controlled cable handling facility.
 - v. Colour TV monitor.
 - vi. Recording system with audio information system. The recording shall be provided in CD format. If necessary the recording can be done on video tape and then transferred to CD.
 - vii. All standard and optional accessories recommended by the manufacturers.
- C. The camera shall be capable of taking clear and close pictures in any direction i.e. 90 degrees to the left and 90 degrees to the right (total 180 degrees in horizontal axis) and also 360 degrees in the circumference of the pipe without using extra revolving mirror attachment.
- D. The camera shall continuously transmit distance at each meter length, electronically matched to the movement of the camera with a maximum tolerance of $\pm 0.1\%$ or 0.3m whichever is the greater on the control TV monitor and the resultant recordings.
- E. The recording system shall be provided to accurately record any transmission from the CCTV and deflection measurement control unit. In the central control unit the operator shall have remote control facilities to drive the camera in the forward and stop, steer left and right and to control the cable drum and power winch.
- F. Each survey unit shall carry a sufficient number of guides and rollers such that when surveying, all cables and/or lines used to measure the camera location are supported away from pipe and manhole structures and are maintained in a taut manner and set at right angles where possible, to run through or over the measuring equipment.
- G. An approved test device shall be provided and be available on site throughout the Contract, enabling the specified tests to be carried out.