

purposes of making a connection of the pipe end or testing the pipeline. The plugs or cap shall be replaced immediately on completion of the test.

- J. Protect bolted connections by an approved heat shrunk PVC sheath. Wrap the PVC sheath with a protective wrapping tape prior to backfilling in accordance with the specification.
- K. Excavation for or laying of GRP shall not proceed until an approved device for gauging pipe deflections is on site.

- i. Use a suitable mechanized device to the approval of the Engineer for gauging pipe deflections. Maintain devices for gauging pipe deflections in good working order. Submit calibration certificates before every period of use.

For pipes of less than 600mm diameter: Diametric dimensional measurement of the pipe, both vertically and horizontally shall be made and recorded. Each deflection measurement taken along the length of the pipeline shall be identified and recorded. Provide a continuous print out or a visual display of the measurements on a remote monitor. The device shall be calibrated before each pipe length is tested.

For pipes of 600mm diameter and greater. Measure deflection by physical entry into the pipes. Use a regularly calibrated telescopic spring loaded graduated rod to measure percentage deflections in each diameter. Provide a suitable trolley to facilitate access into the pipe. Record all measurements.

Form cut-off walls or barriers in granular bedding and/or surround to pipes to prevent the bedding acting as subsoil drainage. Provide barriers at suitable locations along the length of the pipeline and at manholes or chambers. Ensure that the maximum spacing is 50m. Use concrete barriers of Class C concrete installed across the full cross section of the granular bedding. Provide concrete barrier of at least 300mm in length along the axis of the pipelines. Pipe wrap placed around pipe at stanks shall be self advisable water proof membrane or other self adhesive tape as approved by the Engineer.

### **18.3.2 Mandatory Installation Monitoring**

It shall be absolutely mandatory for the manufacturer to give proper training with certification to educate contractor's representative (name of the person and copy of the certificate to be provided) for installation procedures for their