The rigid mandrel shall be constructed of a metal or rigid plastic material that can withstand a force of 1380 kPa (200 psi) without being deformed. The mandrel shall have nine or more "runners" or "legs" as long as the total number of legs is an odd number. The barrel section of the mandrel shall have a length of at least 75% of the inside diameter of the pipe. A proving ring shall be provided and used for each size mandrel in use. Adjustable or flexible mandrels are prohibited.

e) In the case of large diameter pipelines in which a laser profiler cannot be used (presently above 1200 mm dia.). Deflection measurements in both the vertical and horizontal axis shall be taken manually 0.5 m either side of each joint with equipment an accuracy of +/- 0.25% of the pipe nominal diameter.

f) Immediately prior to the issue of a Provisional Acceptance Certificate, the final pipe deflection measurement of all the pipelines installed under the contract shall be undertaken to check that they have not exceeded the permitted long term deflection value at any point. These final measurements shall be undertaken in the same manner as the initial deflection measurements.

g) All deflection testing and reporting shall be undertaken by an independent 3rd party employed by the Contractor. The 3rd party shall be a company specialized in the inspection of sewers, employing approved inspection and measurement equipment.

h) The 3rd party staff undertaking the testing shall be trained and certified by a separate organization in the inspection and assessment of sewers in accordance with the requirements of EN 13508 and associated publications such as the WRc Sewer Condition Classification manual and DWA-M149 “Condition assessment and evaluation of drainage systems outside buildings”.

i) Should any of these tests indicate that the deflection has exceeded the permitted values, the contractor and pipe manufacturer shall submit a report detailing the effect of the deflection on the performance of the system and remedial works, if any. The Engineer shall review the report and decide whether to accept its recommendations. If the Engineer decides that any deflection is excessive and will significantly impact on the performance of the system they reserve the right to instruct the contractor to replace the defective pipes, which shall be removed from site and shall not be incorporated in part of the permanent works