troweled flush with the surface of the manhole walls or other surfaces. The mortar used shall be of the fast set type with “nonshrinking” characteristics.

D. After the manhole sealing operation has been completed, the manhole shall be visually inspected for the elimination of excessive infiltration by the Contractor in the presence of the Engineer. In addition, the Contractor will be required within one year to visually inspect the manholes that were sealed. Any sealing work that has become defective shall be resealed by the Contractor at no additional expense to DMAT.

E. Where the points of leakage are extensive but the manhole is structurally sound the leaks shall be repaired.

29.3.5 Drainage Pipe Joint Sealing

A. Drainage pipe joints shall be sealed utilising the internal joint sealing method. It is realised that this method may only be used on drainage pipe sections in sound physical condition. Longitudinally cracked or broken pipe will not be sealed. When bell cracks or chips are evident from pipe section offset, sealing may be undertaken where the offset is small enough to allow proper seating of the sealing packer on both sides of the joint to be sealed.

B. The basic equipment shall consist of a closed-circuit television system, necessary chemical sealant containers, pumps, regulators, valves, hoses, etc., and joint sealing packers for the various sizes of drainage pipes. The packer shall be cylindrical and have a diameter less than the pipe size and have cables attached at each end to pull it through the line. The packer device shall be constructed in a manner to allow a restricted amount of drainage to flow. Generally, the equipment shall be capable of performing the specified operations in lines where flows do not exceed the maximum line flows for joint testing/sealing.

C. Joint sealing shall be accomplished by forcing chemical sealing materials into or through faulty joints by a system of pumps, hoses, and sealing packers. Jetting or driving pipes from the surface that could damage or cause undermining of the pipelines shall not be allowed. Uncovering the pipe by excavation shall not be allowed. The packer shall be positioned over the faulty joint by means of a measuring device and the closed-circuit television camera in the line. It is important that the procedure used by the Contractor for positioning the packer is accurate to avoid overpulllng the packer and thus not effectively sealing the intended joint. The packer ends shall be expanded using controlled pressure. The expanded ends shall seal against the inside periphery of the pipe to form a void area at the faulty joint, now completely isolated from the remainder of the pipeline. Into this isolated area, sealant materials shall be pumped through the hose system at controlled pressures which are in excess of groundwater pressures. The pumping unit, metering