

## **505 MANHOLES**

Standard Drawings C-18.10 shows several types of manhole installations including special details for adjusting rings, manhole covers, pavement cut sections, etc.

All materials must be tested and approved and all required certifications must be in the project files before materials are incorporated into the work.

It should be noted that the sand required for use in the mortar is not the same as the sand used in Class S concrete. It must conform to ASTM C 144. Requirements of this specification may be obtained from the Materials Group or Regional Lab.

Often, when the forms are stripped from around the area where the pipes meet, the manhole will not have the desired smooth, rounded edges. Finishing is usually necessary to give this the desired look. The Engineer and Inspector are cautioned that the use of mortar to achieve this is not allowable. To avoid the history of flaking of these areas, the Contractor must be required to use an approved epoxy compound, either as the patch or as a bonding layer, per Specification 505-3.01.

Joints in precast sections are required to be water tight and should be finished smooth and neat on the inside.

Care must be taken in the backfilling operations so that no damage will occur to the manhole. The backfill material must be thoroughly compacted, in level 8 inch layers, around the manhole and out until it notches into firm material.

The frame of the manhole should be set very carefully to the grade and slope of the pavement so that there will be no roughness in the pavement because of the manhole. Frames and covers should be inspected to see that the covers fit, in any position, without rocking.

Testing of the pre-cast units will be conducted by the Materials Group for dimensional compliance and compressive strength requirements, as determined by the rebound hammer (ASTM C 805). Test results are shown on a test card that is sent to the project. All pre-cast units tested and approved by Materials Group will be stenciled "ADOT" in black letters. Project personnel are to verify that the ADOT stencil is authentic by contacting the Materials Group.

Engineers, Inspectors, and Contractors should be aware of hazards involved when working in confined spaces and take necessary precautions to prevent accidents. The Engineer should keep personnel current on safety, and anyone involved in the inspection of manholes should have "Confined Space Entry" training.

Some important inspection points for manholes are:

- Do the materials conform to the Project Plans and specifications, and are there material certifications available for those items requiring them?
- Is the bearing face of the frame and cover machined so that the cover will lay flat in any position in the ring and has a uniform bearing throughout its entire circumference?
- Are the bricks wetted before use?
- Is the mortar mixed as specified, and is it used before the specified time limit?
- Are approved patching materials being used for all patching done to bevel pipe/wall junctions?
- Is the backfill material placed in layers not over 8 inches (200 mm) before compaction, and notched into firm material?
- Are the frames and covers set after the top course of asphalt pavement has been placed?

- Will there be any appreciable roughness in surface due to the setting of the ring and cover?
- Are pedestrians and traffic protected from the manhole excavation when the Contractor is not working?
- Are all necessary precautions being taken to prevent the water pumped from manholes from flooding the streets, alleys, sidewalks, and private property?
- Is fresh concrete properly protected from all traffic?
- If the manhole cover has an ADOT logo, ensure that it is the most current design.