Manholes are infrastructure facilities, and most of them are inspected manually. We have developed a technique to acquire whole images of the upper floor slab (ceiling) of manholes using robotics technology without human entry. We can automatically acquire high-resolution images for various sizes of manholes that enable cracks as small as 0.4 mm in width to be identified.

**Features**

- We have automated the process of acquiring whole images of the upper floor slab, which are necessary to inspect manholes with precision in order to determine their soundness.
- One operator can conduct the imaging of the upper floor slab in a manhole.
- High-resolution images can be acquired of the entire surface of the upper floor slab with no restrictions on manhole size.
- The equipment can be operated from a personal computer that is set above ground of the manhole. The operator does not need special skills.
- The equipment can be easily assembled by combining a pedestal and an L-shaped guide and a robot arm at the field site...

**Application Scenarios**

- Monitoring cracks and creating a database of historical images by acquiring images of the upper floor slab in manholes.
- Remote monitoring of the inside state of infrastructure facilities (e.g., tank structure, duct line). Gas and water inside manholes pose a potential danger. Moreover, manholes are deep and have very small entrances, making it difficult for human inspectors to enter. Our technique solves this problem.

Field tests are being performed at the NTT.