TECH TIPS FROM NASSCO

Tech Tips by NASSCO is a bi-monthly article on trends, best practices and industry advice from NASSCO's Trenchless Technology Membership professionals.

CCTV QUALITY

By NASSCO member Clayton P. Muenchmeyer, Equipment Coordinator, Heitkamp Inc.

CCTV (Closed Circuit Television) technology in the sewer has come a long way since the days of the straight line black and white cameras. When color cameras were first introduced, the question was asked: Why do we need to see the sewer in color? This will never catch on! Now we have high definition (HD) which not only shows the sewer in color but also in extreme detail. The current technology can produce high quality video, identify more defects, and collect much more data. This being said, there are still elements, during inspection, that impact the quality of the video being produced. Operation of the equipment can also affect the quality of the resulting video. Here are some basic solutions and ideas to improve CCTV Quality.

THE ELEMENTS:

Cold weather can cause problems

Clear the Fog. The temperature of a sewer system remains about the same temperature throughout the year. When a manhole is opened in cold weather, the much colder outside air mixes with the warmer air in the manhole and sewer pipeline, creating fog. The fog will dissipate when the two temperatures equalize. However, this takes time. To speed up this process an air blower can be used to move the air through the manhole and pipeline. Typically, the blower is installed at the manhole where the inspection will begin while removing the manhole lid at the terminating manhole, causing the air to move through the pipeline. Another option would be to have a water jetter placed at the downstream manhole with the hose and nozzle just inside the pipeline set at normal jetting pressure. This action will create sufficient vacuum to move the fog out of the pipeline and clear the camera lens.

Keep the camera warm. If the camera is just as cold as the outside air, the lens will fog up when placed in the pipeline and condensation will collect on the equipment. Prior to use, the camera should be located where it can be maintained at a temperature similar to the inside of the pipeline (such as the heated cab of a truck). If the camera is equipped with lights that generate heat, they should be turned on in advance of televising the pipeline. This will keep the camera lens warmer and prevent it from fogging up.

Pipe line condition

Reduce high flows. Heavy flow in the pipeline should be temporarily reduced or bypassed. A good quality CCTV inspection will show the entire circumference of the pipeline.

Prepare the lens. The camera lens should be treated to repel debris that can obstruct the view of the camera. Anti-fog windshield treatment works well to reduce condensation on the camera lens. A thin coating of commercially available grease cutting dishwashing liquid on the camera lens works well to dispel grease.

OPERATION:

Keep your area well lit for best results

Lighting

Provide proper illumination. The camera should always have sufficient light for the size and color of the pipeline to be televised. Lack of sufficient light reduces clarity and may result in a grainy video image. Pipelines and liners consist of many different materials that are manufactured in many different colors. Darker pipeline colors may require extra lighting (such as black HDPE). The newer camera technologies are designed to illuminate both small diameter and large diameter pipelines without extra lighting required. The camera manufacturer can typically verify the size pipeline their camera is capable of adequately illuminating so that extra lighting can be provided if applicable.

Use the appropriate lighting angle. The camera should always have a ratio of wide angle and narrow angle lighting. Typically, when using only narrow angle lights, they will illuminate the length of the pipeline but may also produce "hot spots" or "bright spots" when inspecting a pipeline condition or defect close-up. On the other hand, if all wide angle lights are used they will illuminate the close up inspection but may not adequately light-up the length of the pipeline.

Maintaining the cable

Protect the cable. The CCTV cable, connecting the camera to the control unit in the TV truck, is an important component contributing to high video quality. When pulling the cable through a manhole and into the pipeline, always use guide rollers or cable guards to prevent damage to the cable during operation.

Repair damaged cable. If a cut or abrasion is observed on the cable, seal it immediately or re-terminate the end to eliminate the cut in the cable. When moisture penetrates the protective outer coating of the cable it greatly increases the chances of noise or interference, resulting in a poor quality video.

The speed of the inspection

Slow down when conditions dictate. When performing a CCTV inspection, the camera should be moved through the pipe at a speed that allows the operator sufficient time to document, in PACP format, all conditions observed. NASSCO's general rule of thumb is 30 feet per minute. However, there are many circumstances which will decrease the speed of inspection such as condition and size of the pipeline, type of and user-friendliness of software. The scope and detail of the CCTV specification may also dictate the appropriate speed.