
MEMORANDUM

TO: BOARDS OF SUPERVISORS OF NON-FEDERAL LEVEE DISTRICTS
FROM: JOSEPH B. GIBBS, PE
SUBJECT: VIDEO CAMERA INSPECTION OF LEVEE DRAIN PIPES
DATE: 3/16/2018

---- I had the personal experience in 2010 with DVD video camera inspection of corrugated metal and smooth steel drainage drain pipes through levees. When contracting for these services, the following items need to be addressed.

Video camera inspection equipment is usually transported to the site in a 1 ton dual wheel non-four wheel drive van body type truck which will have a minimum of under carriage clearance with saddle fuel tanks and side mounted electric generators. Such a truck will need ideal ground conditions for traveling to pipe sites and will have difficulty traveling in crop fields and soft areas. It is therefore advised that access be provided to the pipes by having the truck drive on top of cleared and mowed levees. In this case the ground conditions will have to be dry to keep the truck from bogging down. A minimum of 10 feet of levee crown width is recommended to keep the truck's axle from dragging on the levee. With this method of access to the pipes, a truck of this type will remain on top of the levee. From this position, the cable and camera equipment will have to be carried up and down the slope of the levee. A 400 foot camera cable is sufficient for a 20 foot high levee with 3 horizontal to 1 vertical side slopes and a 160 pipe. Always pre-measure these distances for contracting purposes.

Operation of the equipment is quite easy and one travel through the pipe takes less than 20 minutes. The camera will travel through water and sloppy mud; however, when these conditions are encountered, the camera will not produce a visual image of the interior of the pipe in these locations. Even clear water trapped in the pipes prevents the camera from providing an image. High water during 2010 kept flap gates from releasing trapped water in the pipes and the camera equipment had to return to the district several times over 8 months to get all of the pipes inspected. Even with ideal ground conditions, for a district with several pipes the contractor will have to come to the site several days to complete the project.

When river stages permitted release of trapped water through the flaps, sediment had settled and coated the interiors of the pipes. Under these conditions the pipes had to be "jetted out" to provide a desirable camera image of the interior of the pipe. Wildlife, stones, mud, sticks and other debris were encountered during the 2010 inspections. It is suggested that "jetting" services be a must for contracted camera inspection services and provided on a unit per pipe basis. These services are usually provided from a different truck loaded with sufficient water for several pipes. These are heavy trucks with water tanks and desirable ground conditions apply for them too.

Mapping of the district provided by the District showing the locations of the pipes is necessary for contractual purposes and record keeping. The pipe locations should be indicated on the map by footage numbers from a beginning point along the levee. For District record purposes, DVD camera images must clearly show for each pipe the interior of the pipe, indicate inspection date, pipe location number and footage indicated on the video image along the interior length of the pipe. It is necessary that remotely

controlled DVD cameras have multi-directional viewing lens to provide images and details of the interior circumference surfaces of the pipes.

For pipes large enough for personnel entry, still cameras that imprint the date on photos can be utilized. The mapping, interior pipe conditions and the requirements of what the photos must show are the same as those for DVD camera images in the smaller pipes. The flash of a camera is generally effective for approximately 9 feet. Several photos will be needed to photograph the interior conditions of long pipes. Signage imprinted in each photo or an alternative record keeping method indicating location along the interior of the pipe will be necessary. A measuring tape of sufficient length and sufficient signage to reach the end of each pipe will be necessary.

Exterior still photographic images were taken for record keeping purposes of each pipe showing the flaps and the levee at the outlet end and the levee and inlet ends of the pipes. Portable signage was utilized for pipe location on the map with a digital camera that imprinted the date on the photo.

NOTE: See INSPECTION OF PIPES and LEVEE SYSTEMS LOWER THAN 100 YEAR FLOOD EVENT for more information on internal pipe inspections.

---- This information, notices and recommendations are offered only as of the effective date of this MEMO and the information, requirements, Specifications and recommendations can change without notice.