

## Digital Panoramic Sewer Pipe Inspection As Provided By RapidView

Overview: The City is contracting professional inspection service providers to proactively inspect the sanitary / storm sewer pipelines to determine the detailed condition and to collect data of every notable feature, defect, or other important information. The inspection shall be complete in a two-step process consisting of Data Collections and Data Review, Reporting, and Delivery. Contractor must perform a quality inspection utilizing a digital sewer pipe inspection system that can operate at a high rate of inspection speed while providing superior imagery as compared to traditional CCTV. The inspection system used by the selected contractor shall meet all the following specifications:

### Data Collections

- ❑ Contractor shall reduce the flow by use of pipe plugging or bypass pumping when necessary. The contractor must display at least 75% of the pipe wall at all times during inspection so that defects, features, and other notable information can be collected.
- ❑ Either the contractor or City shall clean all inspected pipeline using an approved method. Cleaning must be done so that at least 90% of the pipeline is free of solids, sediment, or debris.
- ❑ The inspection camera system must be 100% digital. Any analog or NTSC video camera will be deemed unacceptable.
- ❑ The inspection camera system must have two independently or simultaneously controlled digital cameras, one facing in the forward direction and one facing in the rear direction. Each camera must have a minimum of 185 degree field of view.
- ❑ The inspection camera system must illuminate the interior of the pipeline using a xenon strobe light. The light shall be positioned 360 degrees around the camera lens to distribute the light evenly onto the pipe walls. The lighting must be able to illuminate pipeline from 8” to 48” in diameter without the need of any auxiliary lighting. Any systems not using strobe light technology will be deemed unacceptable due to motion blur during imaging recording.
- ❑ The inspection system shall produce individual images or frames with no more than 0.001 inches of tractor movement during image or frame exposure to produce crisp, clear images.
- ❑ The inspection camera system must provide a minimum of 3000 line of vertical resolution in the side view and a minimum of 500 lines in the perspective view.
- ❑ Inspection speeds must be no more than 70 feet per minute and no less than 35 feet per minute to ensure maximum production per day with each inspection system and to minimize the time at each location to reduce the chance of backups from plugging, maintain traffic flow, reduce safety concerns of contractor’s employees.
- ❑ The inspection robot shall have a remotely controlled camera elevating device to center the camera in pipeline from 8” to 42” in diameter.

- ❑ The inspection system must be able to collect all necessary data in either the forward or reverse tractor direction. Systems collecting data only in the reverse direction will be deemed unacceptable.
- ❑ The inspection system used by the contractor must be a proven technology with at least 100 systems in use throughout the world. Systems with less user base will be deemed unacceptable.
- ❑ Collected digital film files and header files shall be recorded onto a hard drive and original un-edited data shall be archived for a minimum of 5 years after project complete in the event the City request copies for internal use.

#### Data Review, Reporting, and Delivery

- ❑ Contractor is responsible for reviewing collected data, coding observations, and completing a full PACP evaluation of each inspected pipeline, however the City must have the ability to view the digital film file in the way that the contract can view them, including full control of the virtual pan and tilt.
- ❑ The digital film files must include an unfolded view of the pipeline with a minimum of 3000 lines of vertical resolution.
- ❑ The digital film files must include an unfolded view overview of the entire pipeline to view entire pipe segment at one time.
- ❑ The digital file files must include a distortion-free virtual pan and tilt allowing the review and the City to view 100% of the pipe wall from any perspective. The virtual pan and tilt must be able to view 360 degrees in any direction while maintaining an always-upright image. The virtual pan and tilt must consist of views from the front and rear camera, any virtual pan and tilts that artificially create this view from a single camera will be deemed unacceptable due to distorted images on the direct side viewing and inability to view into laterals and other observations.
- ❑ The virtual pan and tilt and forward / reverse direction of the images must be able to be controlled from a computer mouse.
- ❑ The virtual pan and tilt and unfolded views must be able to be viewable by the City without the need of purchasing addition software. Film files must be able to be integrated into City's other databases.
- ❑ The Contractor must use digital panoramic compatible software with PACP templates for feature and defect coding. The panoramic module must also be used to ensure that film files are properly reviewed with the highest accuracy possible.
- ❑ The contractor must review the film files using PACP certified personnel.
- ❑ The contractor must supply the City with single or dual layer DVD's, a removable hard drive, or other pre-approved media supporting panoramic film files and displaying the panoramic module. The City must have access and the ability to control the unfolded view, the front or rear view of the cameras, an overview of the entire pipeline, and the distortion free virtual pan and tilt.
- ❑ All deliverables must be supplied to the City within 5 days of completion of fieldwork.