CCTV Requirements for Sewer/Storm Conveyance Assets to be Accepted by the City
Dated December 2022

CCTV inspections are required for new, rehabilitated, or otherwise modified sewer conveyance assets due to redevelopment, in-fill development or other construction by outside entities. All CCTV inspections must comply with the following requirements for their review and use by the SFPUC for quality assurance purposes related to the construction work.

All video surveys of sewer assets, including, but not limited to gravity sewer pipe, storm drain pipes, force mains, laterals, manholes, boxes, tunnels, etc., must comply with and be produced in accordance with version 6 (or greater) of NASSCO standards. This includes NASSCO PACP, LACP, and MACP.

All assets shall be thoroughly cleaned prior to inspection and generation of the condition assessment video inspection as the intention is to assess the structural condition of the assets and we will need an unobstructed view.

All video surveys shall be NASSCO compliant and shall be submitted in **NASSCO Exchange Database Standard format with referenced media files and a cover letter stating the expected contents including asset IDs and a marked-up drawing/map of assets included in the submittal**. Files in NASSCO standard format can then be imported into any brand of software, including PIPELOGIX, WinCan, etc.

Only one asset shall be inspected per video survey.

All video inspections must have the SFPUC asset numbers correctly identified as specified below. Asset numbers will be provided by our GIS data stewards, which is currently Public Works Hydraulics Section but will transition to PUC Wastewater Enterprise at some point in the future. In order to provide asset ID's, these assets will need to first be reflected in our GIS. **Please be sure that the latest plan sets, reflecting any IB's or field modifications that change quantity or locations of the assets, are provided to the GIS data stewards well in advance of request for asset numbers to be used during CCTV inspection**. Additionally, in these correspondences, please identify which sewer assets have already been constructed and you intend to inspect. Asset ID's can be provided in the form of GIS shapefiles or labeled PDF maps.

Final CCTV inspections should only be performed after the assets are completely backfilled, trenches compacted and paved. Post construction video inspection will be reviewed by the City Representative to validate contractor workmanship of the newly constructed sewer facilities, installed in place after necessary backfill and compaction of the trench excavation has been performed. Video inspections of newly constructed sewer facilities performed prior to necessary backfill and compaction of the trench excavation will not be accepted or used by the City Representative to validate contractor workmanship.

The intention of these CCTV inspections is to confirm the quality of assets being delivered. If the CCTV inspections do not provide adequate information to make this determination, you will be asked to re-inspect.

Sewer/Storm Main CCTV

Personnel on the job are required to be trained and NASSCO PACP certified. Minimum PACP guidelines for any sewer or storm main CCTV inspection will be enforced. Inspections shall not exceed 0.5 feet per second and shall stop, pan and zoom all around all joints, lateral connections, culvert connections, and

any visible irregularities or defects. Video quality shall be minimum 1080p resolution (1920x1080 pixels) with adequate lighting to illuminate the pipe interior wall. The camera setup shall include a 1" diameter weighted target, preferably a ball, in front of the camera and measured at the beginning of the video to confirm its size.

The Contractor shall record by color video picture and voice recording, the main sewer and locations of the side sewer connections. **The video shall have the project name, limits of the sewer being televised, Maximo Asset ID, and the upstream and downstream manhole numbers (the Start_Node and End_Node fields from the pipe's GIS) superimposed on the beginning of each inspection**. The camera shall travel through the sewer at a speed at or below half of a foot (0.5 feet) per second. A continuous counter in feet measurement shall be superimposed at the bottom of the screen to show the distance from the starting manhole or a reference point to an exit manhole or reference point. The date of the video recording shall be superimposed on the screen. There shall be sufficient artificial light in the interior of the sewer to produce a clear well-focused picture and illuminate the pipe interior wall.

Exports to NASSCO Exchange Database format should result in the pipe's Maximo Asset ID (MXASSETNUM) being in the Pipe_Segment_Reference field and the Start_node value from the pipe's GIS in the NASSCO Upstream_MH field and the End_Node value from the pipe's GIS for the Downstream_MH field.

During the inspection, stop the tractor, pan and zoom at defects and irregularities in or on the pipe surface. Irregularities are defined as anything other than a uniform pipe wall material and includes scuffs, cobwebs, discoloration, or any NASSCO defined observation code. Pause and turn camera view at each lateral/culvert connection point. Code all observations such as defects, locations of lateral connections, change in pipe alignment, unusual conditions, and other discernible features, as defined in the NASSCO PACP observation codes. End inspection at FINISH manhole or other non-manhole junction (connection to another main sewer or change in pipe size as identified per sewer line shape file). Each inspection should only include one video.

Culvert CCTV Inspections

Personnel on the job are required to be trained and NASSCO PACP certified. Minimum PACP guidelines for any sewer culvert CCTV inspection will be enforced. Inspections shall not exceed 0.5 feet per second and shall stop at all joints, and any visible irregularities or defects. Video quality shall be high resolution (minimum 640x480 pixels) with adequate lighting to illuminate the pipe interior wall. The camera setup shall include a 1" diameter weighted target, preferably a ball, in front of the camera and measured at the beginning of the video to confirm its size.

The Contractor shall record by color video picture and voice recording, the culvert sewer. **The video shall have the project name, limits of the sewer being televised, Maximo Asset ID, and the upstream and downstream manhole numbers (the Start_Node and End_Node fields from the pipe's GIS) superimposed on the beginning of each inspection**. The camera shall travel through the sewer at a speed at or below half of a foot (0.5 feet) per second. A continuous counter in feet measurement shall be superimposed at the bottom of the screen to show the distance from the starting manhole or a reference point to an exit manhole or reference point. The date of the video recording shall be superimposed on the screen. There shall be sufficient artificial light in the interior of the sewer to produce a clear well-focused picture and illuminate the pipe interior wall.

Exports to NASSCO Exchange Database format should result in the pipe's Maximo Asset ID (MXASSETNUM) being in the Pipe_Segment_Reference field and the Start_node value from the pipe's GIS in the NASSCO Upstream_MH field and the End_Node value from the pipe's GIS for the Downstream_MH field.

During the inspection, stop the camera at defects and irregularities in or on the pipe surface. Irregularities are defined as anything other than a uniform pipe wall material and includes scuffs, cobwebs, discoloration, or any NASSCO defined observation code. Code all observations such as defects, change in pipe alignment, unusual conditions, and other discernible features, as defined in the NASSCO PACP observation codes. End inspection at FINISH access point or other non-manhole junction (connection to another main sewer or change in pipe size as identified per sewer line shape file). Each inspection should only include one video.

Lateral CCTV Inspections

Personnel on the job are required to be trained and NASSCO LACP certified. Minimum LACP guidelines for any sewer culvert CCTV inspection will be enforced. Inspections shall not exceed 0.5 feet per second and shall stop at all joints, and any visible irregularities or defects. Video quality shall be high resolution (minimum 640x480 pixels) with adequate lighting to illuminate the pipe interior wall.

The Contractor shall record by color video picture and voice recording, the culvert sewer. **The video shall have the project name, limits of the sewer being televised, Maximo Asset ID, and the upstream and downstream manhole numbers (the Start_Node and End_Node fields from the pipe's GIS) superimposed on the beginning of each inspection**. The camera shall travel through the sewer at a speed at or below half of a foot (0.5 feet) per second. A continuous counter in feet measurement shall be superimposed at the bottom of the screen to show the distance from the starting manhole or a reference point to an exit manhole or reference point. The date of the video recording shall be superimposed on the screen. There shall be sufficient artificial light in the interior of the sewer to produce a clear well-focused picture and illuminate the pipe interior wall.

Exports to NASSCO Exchange Database format should result in the pipe's Maximo Asset ID (MXASSETNUM) being in the Lateral_Segment_Reference field and the Start_node value from the lateral's/main sewer pipe's GIS in the NASSCO Upstream_MH field and the End_Node value from the lateral's/main sewer pipe's GIS for the Downstream_MH field.

During the inspection, stop the camera at defects and irregularities in or on the pipe surface. Irregularities are defined as anything other than a uniform pipe wall material and includes scuffs, cobwebs, discoloration, or any NASSCO defined observation code. Code all observations such as defects, locations of other lateral connections, change in pipe alignment, unusual conditions, and other discernible features, as defined in the NASSCO LACP observation codes. End inspection at FINISH access point. Each inspection should only include one video.