

Stormwater System Repair



Project Name: Propex
Method Used: CIPP Lining with Tunnel Liner Plates
Original Pipe Material: Corrugated Metal Pipe

Project Details:

Mr. Joel Manacop, Plant Facilities Engineer with Propex located in Nashville, Ga. contacted us to help him determine why, during a moderate to heavy rainfall, water would gush from the concrete floors of the plant and flood a significant portion of their building.

The obvious problem was the stormwater piping system which was located beneath the concrete floor. We dispatched one of our CCTV and Cleaning crews to clean and televise the piping system. A seemingly routine project turned out to be almost synonymous with an NCIS investigation since the engineering drawings were not accurate, there were multiple catch basins that had been covered with concrete during a plant expansion approximately 20 years ago, and there were machines directly above several of the basins. Compounding the difficulty was the amount of debris, partial collapses, and in some cases, complete collapses.

Thirty-five sections outside the plant and twenty-two sections inside the plant were inspected. Inspections revealed corrugated metal pipe full of debris, some partially collapsed, and some completely collapsed.



Collapsed Lines Inside the Plant

Of the three collapsed lines, 2 were outside the building and 1 inside. Catch basins were covered inside the building, and the pipes deformed. Inspections continued, but the collapsed lines became the priority. Propex decided to repair the outside collapses, while SPS began formulating a strategy to deal with the problem on the inside of the building.



Along with the collapse, there was a 10' to 15' void underneath the floor. The real concern for Southeast Pipe was finding a solution to repair a collapse in a location where excavation could not be done. The first priority was to repair the collapse and open the pipe up for water to flow through. After brainstorming, SPS construction managers found tunnel liner plates with CIPP (cured-in-place pipe) to be the best option. SPS proposed to install tunnel liner plates from CB3 going downstream until good pipe was found to tie into. Once the tunnel liner plate was installed, the remaining line could be inspected for further possible deformation.



Propex approved the plan. The cleaning and inspection crew proceeded with cleaning in other areas of the plant while the construction crew began installation of the tunnel liner plate. After 2 weeks of hand digging in mud, the tunnel liner plate was complete.

Partially Collapsed Lines Inside the Plant

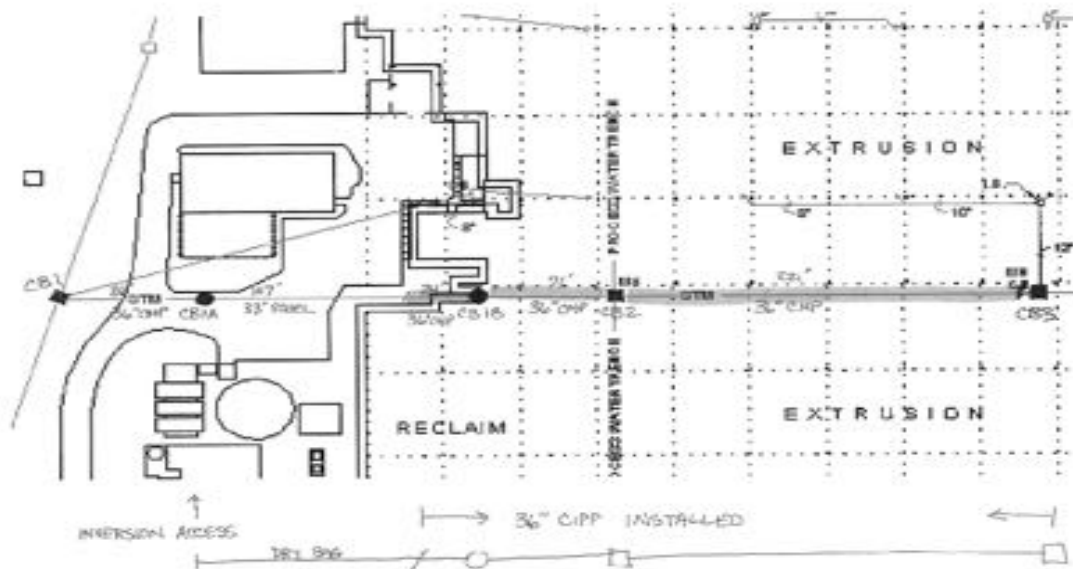
The cleaning crew then focused on a 36" pipe and the remaining line segments inside the building. They cautiously cleaned the pipes and were able to verify what was feared. The next line segment was deteriorated to the extent of possible collapse.



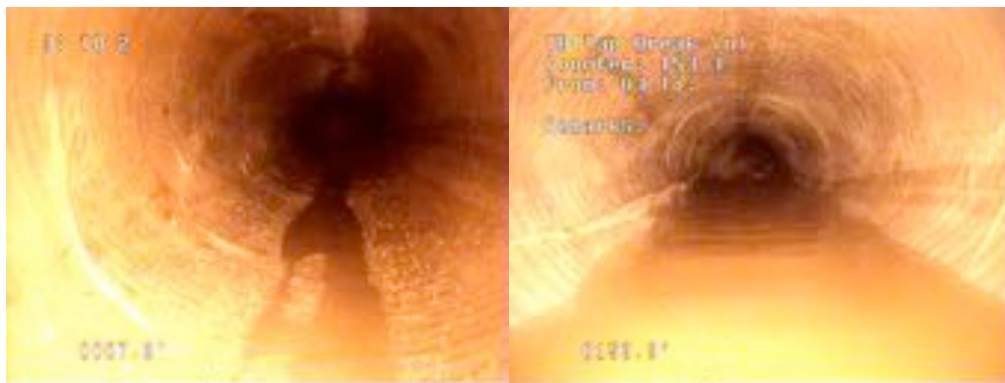
CIPP was the only solution. Measurements were taken to verify pipe size and lengths. An order was placed with Daystar Composites (manufacturer of the liner) with the specific dimensions and lengths.

While the liner was being manufactured, the cleaning crew proceeded with cleaning the lines inside the building. This was a slow process. Each time a line was inspected, a buried catch basin was discovered. Propex moved machinery inside the plant to expose the buried catch basins for further cleaning and inspections. This went on for the remaining segments inside the building. The remaining pipes were in the same deteriorated condition. Lining will be the solution to eliminate further deterioration and possible collapses inside the building.

When the liner was delivered, SPS set up and installed the liner from CB 1A, which is the only access for installation outside of the building.

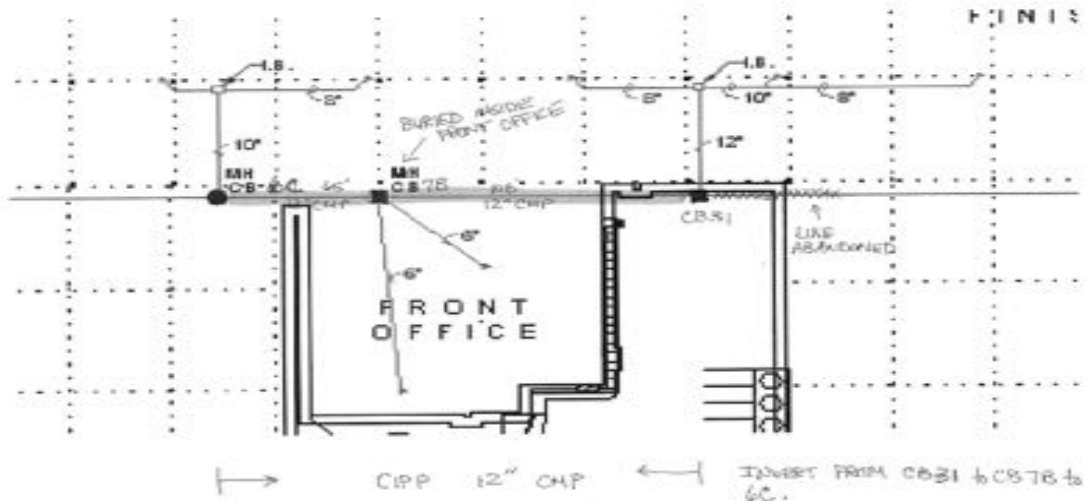


The inversion started at CB 1A. Dry bag was installed to the 107' mark and the CIPP liner started from there to CB 3. The liner went through 2 catch basins to get to its destination at CB 3. The liner was cured and the catch basins and the ends were cut out.



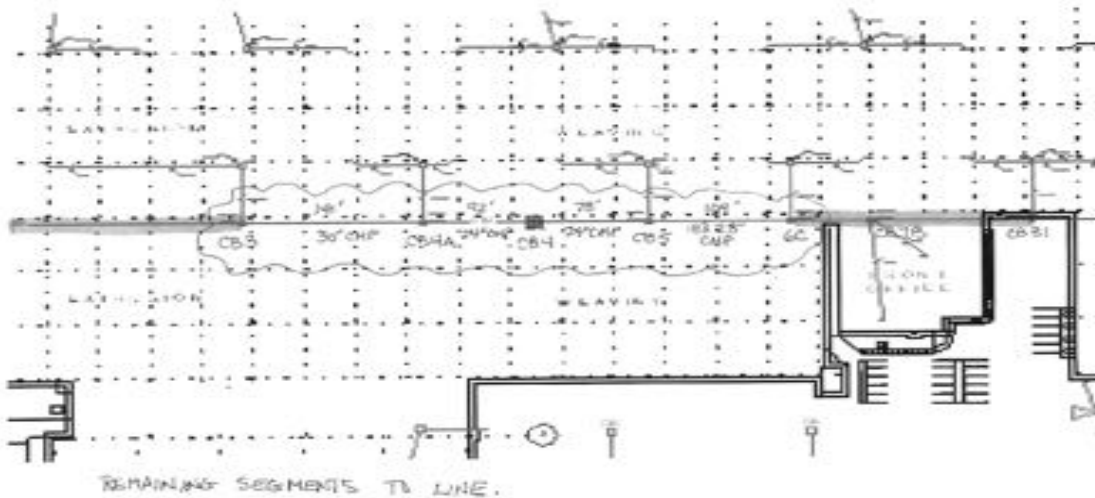
The liner looked great, the collapse was repaired and the possible collapse was eliminated. The void was then pumped with cellular grout to fill in the voided area around the pipe and to the concrete floor above the repaired corrugated metal pipe storm drain.

The next step was to line the remaining line segments inside the building. Again, careful measurements were taken and the liner was ordered. The first install was 2 - 12" corrugated metal pipe that had no bottom.



The line segment ran under the front office where excavation was not possible. The CCTV crew tried several times to inspect the line segments with the camera mounted on the transporter. Attempts continually failed because when the camera tractor would fall into holes in the pipe. There is no bottom to the pipe.

Southeast Pipe devised a sled, mounted the camera inside, stung cable through the line and pulled the sled through the line with a winch. This enabled the 2 line segments to be properly inspected. The CCTV crew was able to provide accurate measurements for the CIPP liner. The liner was successfully installed from the outside catch basin.



There remains 4 line segments that are located inside the building in-between the upstream lines and the downstream lines that have be rehabilitated. Since there is no access for the equipment inside the building, there is only one option for rehabilitating the remaining sections. Invert from CB 1A.

Careful measurements were taken and Daystar Composites manufactured the liners. The next upstream line was inverted from CB 1A. Dry liner inverted up to CB 3. Then the CIPP started and ended at CB 4. Once the line cured, the ends were cut. The next 3 lines had to be done the same way. Inverted from CB 1A.

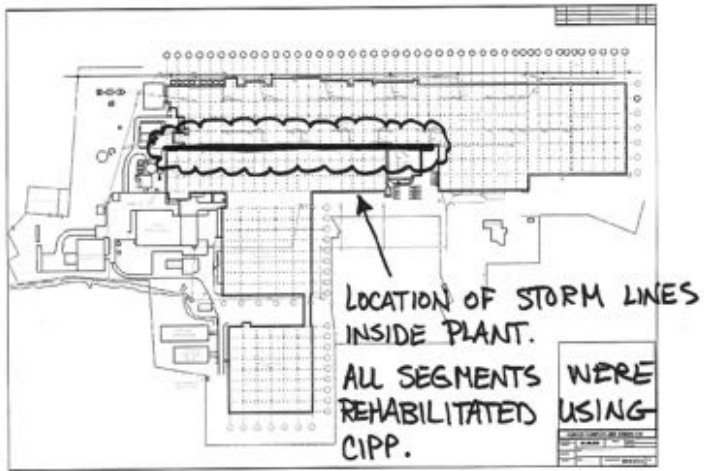


(Photo: 24" being installed thru 30" CIPP)

The storm sewer from the main office going west to the extrusion area, underneath the floor will have been rehabilitated using the cured-in-place method.

The only excavation required inside the building was to uncover the catch basins as they were located by the CCTV inspection crew.

The Propex project was a challenging one. The plant did not realize how severe the condition of the pipe had gotten until the inspection was implemented. Once the video was reviewed, the severity of the corrugated metal pipe was a surprise to all involved. Many obstacles had to be overcome. Southeast Pipe generated a plan of rehabilitation and presented it to Propex. Propex approved the plan and the process proceeded with great success.



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