Addressing infiltration after relining a gravity pipe

Cured In Place Pipes (CIPP) are custom fabricated, resin-impregnated felt or fiberglass tubes that are typically installed through inversion or a winching technique inside the existing sewer. In some cases, these liners are pulled through the deteriorated pipe. Once in place, the liner is cured with heated water, steam or ultraviolet light. This rehabilitation method is used most often in the City of Toronto's trunk sewer rehabilitation program. A section of the City of Toronto's West Don Sanitary Trunk Sewer (STS) showed signs of heavy infiltration and deterioration and was identified for sewer rehabilitation as part of a larger rehabilitation program. After completion of the rehabilitation design and tendering, the contractor started to install the liners. However heavy infiltration caused problems with the liner installation in one of the 1200 mm diameter sewer lines located inside the golf course and upstream of the West Don River crossing. The fully cured liner was still leaking. Additional structural liner tests confirmed that the liner was indeed fully cured and structurally sound but showed pinholes in the felt that allowed infiltration. Three potential options were considered to make good the shown defects:

1- Install a second liner inside the existing liner
2- Patch the leaking liner sections
3- Cut and remove the existing liner and install a new liner

In an initial step to confirm that all options are viable, a hydraulics check was made to ensure that further narrowing the cross-sectional area of the existing pipe will not cause flooding issues that would be made worse than the existing scenario. It was decided to use a second liner due to economic benefits and technical feasibility.