

Following down the Tuscarawas Trunk in the same manner it will be found that the addition will not be effective to cause any overload.

The conclusion is that the contemplated extension of city area at the north end can be readily served by existing sewerage. It is further apparent that the North End Trunk, itself, can accept drainage to a still greater amount--perhaps 100 acres. Beyond this, however, there would have to be compensating decreases from other districts.

Explanation of the occurrence of surplus capacity in the North End Trunk lies in the fact that the smaller sizes were chosen arbitrarily, ^{and} established from judgement as minima. Elsewhere the discrepancy between theoretical demand and commercial sizes available yields a variable surplus. This element is characteristic of the upper end of all the trunk sewers and offers a factor of safety where the effect of the sewage wave is most felt.

It is pertinent here to record the computed concentration intervals for the three major trunks as determined with the Tuscarawas Trunk at Charles Street as zero.

Sippo Trunk	49.1 minutes
North End Trunk	66.4 minutes
Wooster Trunk	68.7 minutes

These intervals apply to the sewers of original designs and not to the extensions in this report. With these latter included, the differences would be somewhat more marked.

These time intervals signify that a wave from Wooster Trunk reaches Charles Street (the 48-inch Sewer size) about 20 minutes later than one from the Sippo Trunk. Inasmuch as the sewage flow varies with the hour of the day, this time difference results in a lag between maxima from the various branches. In other words, whereas the sewer sizes are determined upon the assumption that the peak discharge of one subarea is added to that from a second district, such simultaneity does not, in fact, occur except where the time of travel is similar in both cases.

This investigation of concentration periods was undertaken during the design of the Tuscarawas Trunk to ascertain any possible reduction in size. It was concluded that any compensation was less than the probable error in the estimate of sewage quantities. However, this factor is one of reserve capacity in the larger sizes as are certain other elements of the designs. This statement is not to be construed as justifying overload of sewers.