Sump Pump Discharge System Project: City of Waterloo

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Project Scope

The City of Waterloo is still having problems with sump pump discharge entering the sanitary sewer system that is causing sewer overflows onto streets and basement backups into people's homes. Our team worked to solve this problem in the south-central portion of the community.
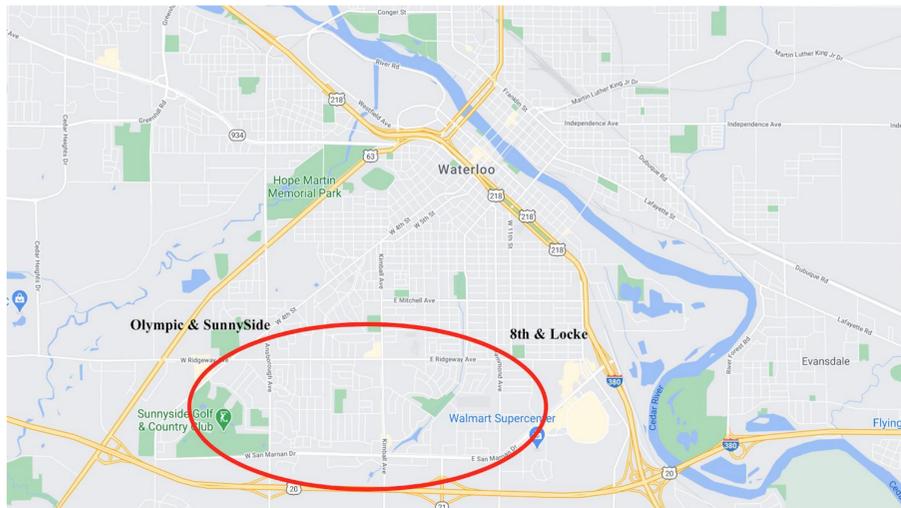

Figure 1. Site Location

Overview

Our team has worked to provide a variety of incentives for homeowners to disconnect their sump pumps and solutions for the excess flow. Shown below the difference between an improper and proper sump pump connection.

Figure 2. Improper and proper sump pump connection

Final Design

We have proposed installing drainage tile where there isn't an existing storm sewer. The drainage tile will route the discharge from the sump pumps to the nearest storm sewer or acceptable outlet. For isolated properties we have proposed installing raingardens, which will manage the discharge from the sump pump much better than simply dumping in the yard. For homeowners that only connect their sump pump we recommend an area between 25-80 square feet and for homeowners that connect their sump pumps and downspout we recommend an area between 80-320 square feet.
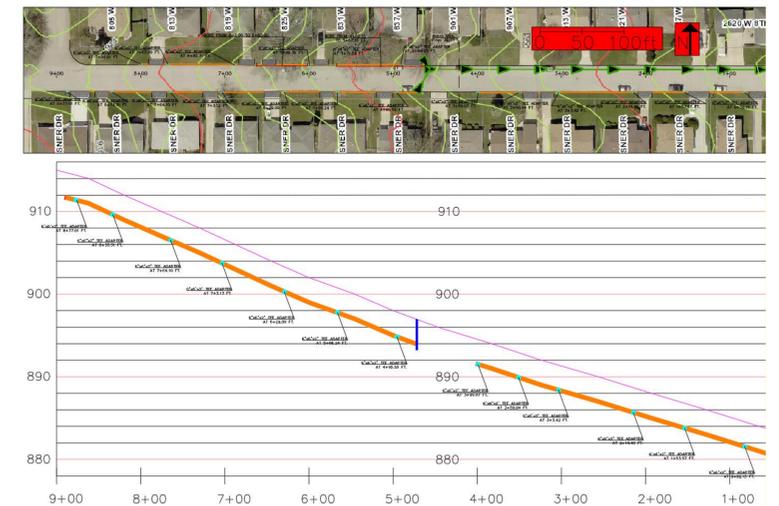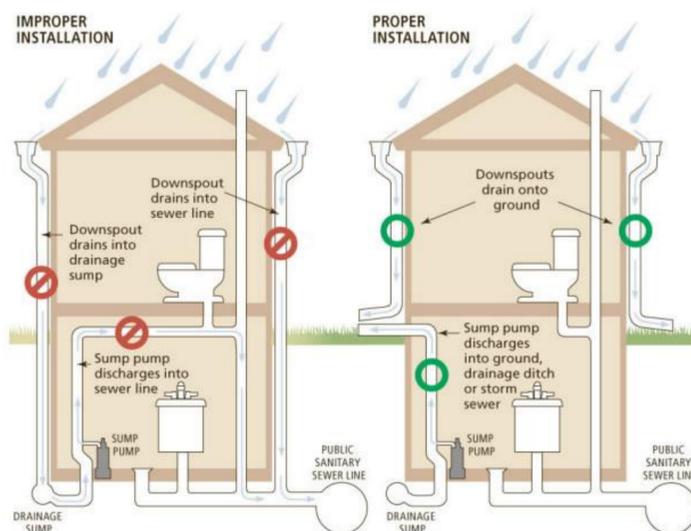

Figure 3. Rain Garden Design Examples

Figure 4: Drainage Tile Design for Wisner Dr

Conclusion

We have concluded that drainage tile should be installed where there isn't an existing storm sewer, and a raingarden would be appropriate for isolated properties that are not next to an existing outlet or nearby creek. The cost of installing the drainage tile for all areas will range from $900,000 with boring techniques to about $1.2 million with open cut techniques. Installing a rain garden will range from $1-$5 per square foot, this does not include the cost for the homeowner to reroute the sump pump.

References

Waterloo GIS Database

SUDAS design manuals

THE UNIVERSITY OF IOWA
College of Engineering