

DRAINAGE & FLOOD CONTROL



Groundwater Related Flooding - Captains Village Area



Groundwater Related Flooding - Anastasia Street Area

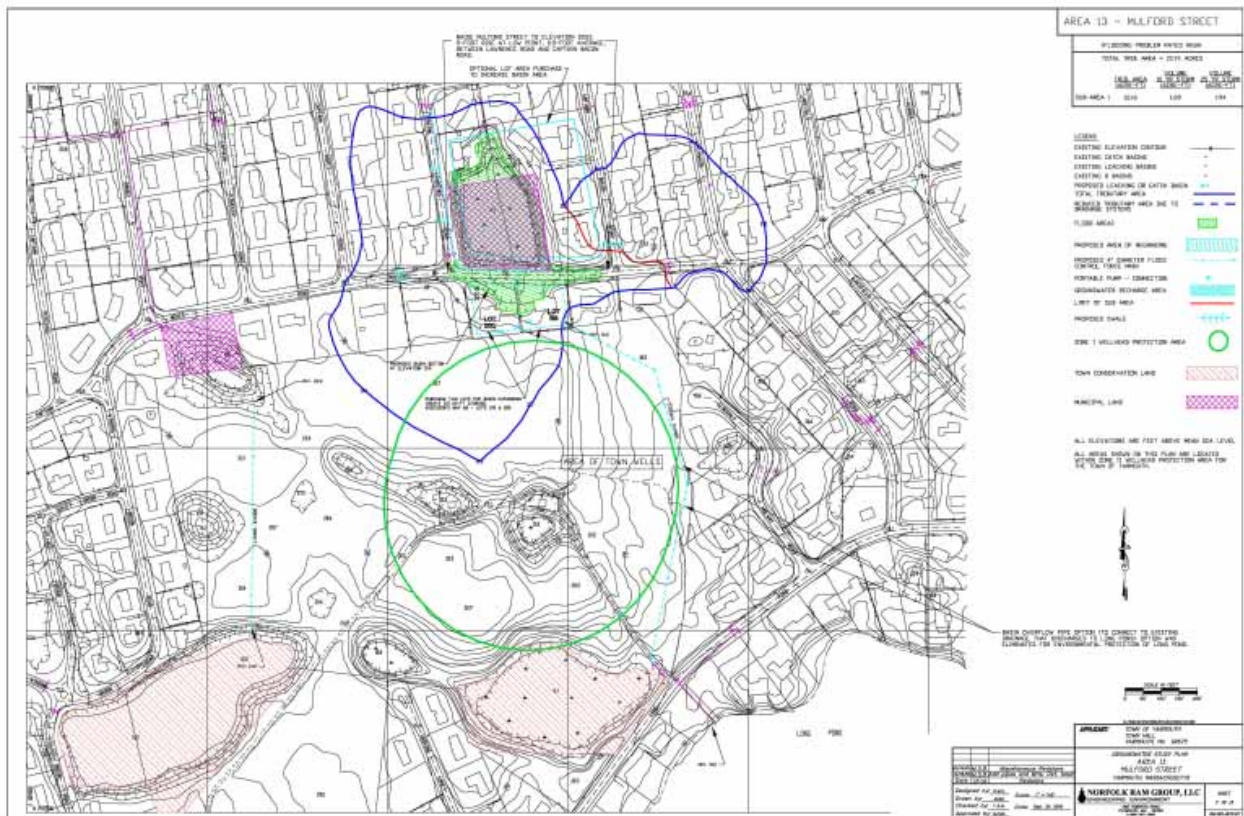
Groundwater Related Flooding Study, Town of Yarmouth, MA

Norfolk Ram Group, LLC (Norfolk) conducted extensive research and analysis to prepare an engineering feasibility study for the remediation of groundwater related flooding in the Town of Yarmouth. Neighborhood flooding is a serious inconvenience to the public, and it has the potential for creating adverse affects on the environment, public health and safety, and on town investments in roads and drainage systems. In addition to cost, there are significant environmental and regulatory constraints, which needed to be considered when determining if any practical solutions existed, and if so, were the solutions cost-effective and achievable. This town-wide study involved an inventory of existing groundwater and drainage conditions for 21 drainage districts within the town, which were experiencing high groundwater, and/or stormwater related flooding. The study was based upon a review of the nature of the flooding problems, a review of previous studies and a practical analysis of the possible technical solutions. A detailed Study Area Plan was created for each problem area (see example reduced copy on the reverse side), in order to show the various drainage tributary zones, the existing town drainage systems and the proposed improvements. Also, using these plans, stormwater volumes were calculated, and were used to check the reported severity, as well as to evaluate the possible engineering solutions for the flooded areas. Based upon an engineering review, and the prioritizing of the problem districts (based upon the severity of the problem and the potential for a solution), Norfolk evaluated alternative solutions for engineering feasibility, effectiveness in solving (and not transferring) the problem, constructability, probable cost, and environmental impact, and developed recommendations for infrastructure upgrades and long-term municipal stormwater management.

The recommendations basically fell into three categories of improvements: (1) the installation of catch basin-leaching structures in outlying areas used to reduce the influx of stormwater to low lying areas, (2) the construction of new, and the expansion of existing, stormwater detention basins to provide off-street storage of floodwater (this included the raising of adjacent road grades in several cases), and (3) emergency pumping facilities to pump excess floodwater to new storage/recharge facilities. Options that were considered but eliminated as not feasible or cost-effective included: the area-wide lowering of the water table, basement pumping with low-pressure sump-pump sewer systems and the installation of relief wells. Other General Recommendations included:

- Adoption of a Town-wide Stormwater, Grading and Drainage Control bylaw.
- Public education and financial assistance outreach programs to encourage homeowners to adopt low impact re-development solutions, which prevent stormwater from reaching town streets (*e.g.*, use landscaping and features such as rain gardens, rain barrels and the reduction of impervious surfaces).
- A Land Bank purchase strategy for the acquisition of lots in low-lying flooded areas, so that these areas could be converted to natural open space wetlands, in order to provide storage for floodwaters.
- Acquisition of portable emergency pumps, in order to facilitate a rapid response by the Town for problem area flooding.

Norfolk also provided public outreach services, which included a series of four neighborhood meetings, one town-wide meeting and two meetings with the Board of Selectmen (one prior to the neighborhood meetings and one at project closure).



*Example of Study Area Plan Used to Evaluate Problems and Solutions
Town of Yarmouth Groundwater Related Flooding Study*

Contact Information: For more information regarding Norfolk’s drainage and flood control services, please contact Mark S. Bartlett, P.E. at 508-747-7900, extension 131, or via email at mbartlett@norfolkram.com, or visit us on the internet at www.norfolkram.com.

Norfolk Ram Group Services

Norfolk is an engineering, consulting and project management firm specializing in comprehensive environmental management for industrial and real estate clients, municipal and government agencies, and the military. The company’s capabilities include environmental site assessments, risk characterizations, remedial investigations and design, and civil/environmental engineering for site development, including water and wastewater services. Norfolk’s primary goal is to provide clients with full-service commitment, immediate response, high quality consulting, and cost-effective solutions to engineering and environmental concerns.

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