

# Stormwater Management

## Old Lyme Shores

January 23, 2021

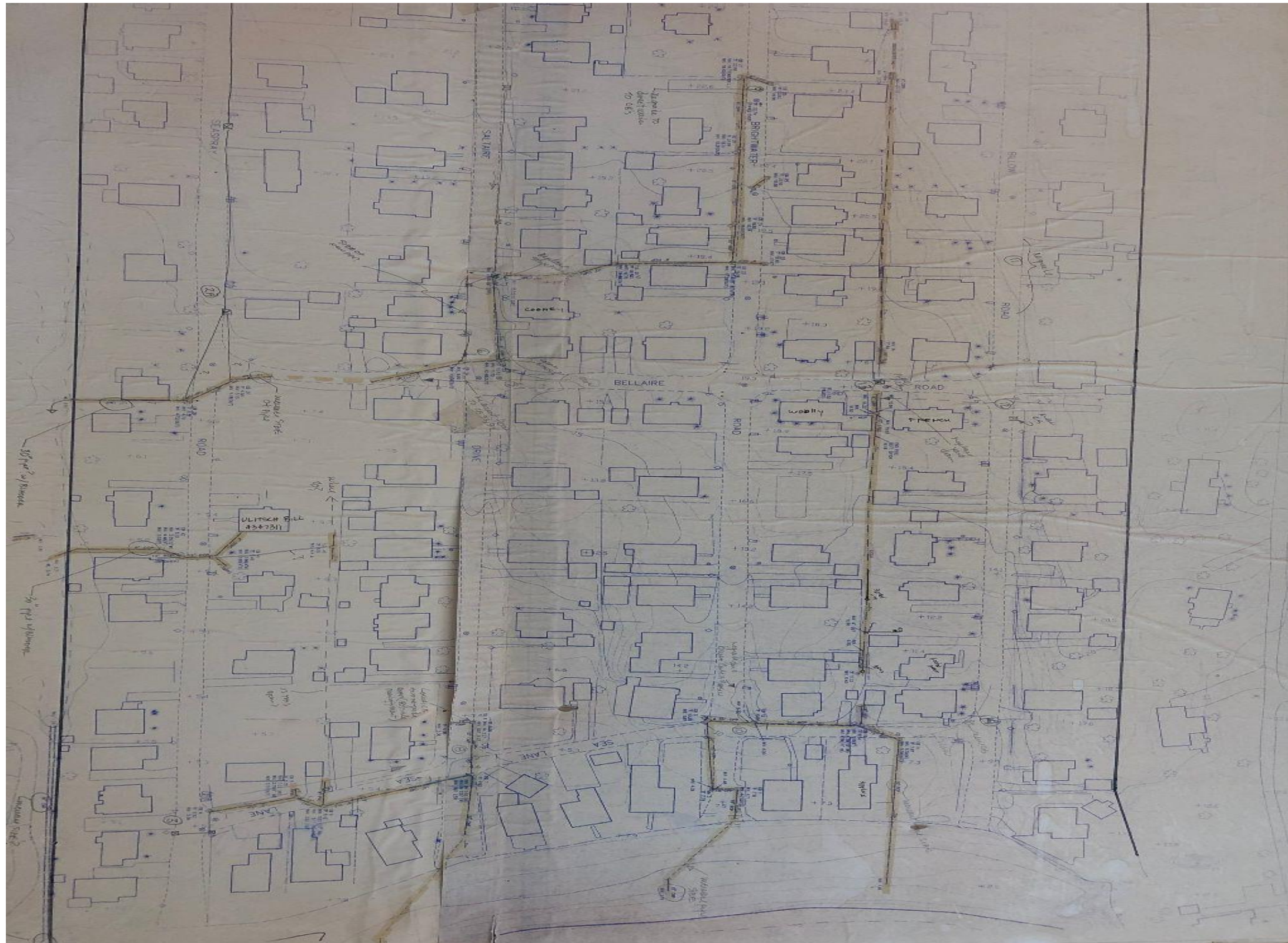
# Why Stormwater Management

- Old ineffective, incomplete, undersized and disjointed existing drainage system that doesn't have the capacity to convey the rate and volume of runoff that is generated by rainfall.
- Rainwater regularly floods streets and private properties
- Frequently inundated catch basins particularly along Sea Lane and at intersection of Saltaire Drive
- Lacking stormwater infrastructure along Sea Spray Rd and Billow Rd
- Influences from tidal fluctuations

# Tidal Surge with Inadequate Stormwater Management



# Existing Drainage System?



## Additional Benefits

- Helps to address long-standing issues with standing water, flooding, and damaging flows from runoff
- Cost-containment synergies associated with completing these improvements in coordination with the sewer installation and final road repairs - substantially more costly and disruptive if done at a later date
- Reduces areas of standing water which are breeding grounds for insects
- Mitigates potential for property damage associated with erosion exacerbated by storm water infiltration into natural underground streams

## Private Property Issues

- An undersized open channel and small culvert system that runs through the backyards between Billow Road and Brightwater Road.
- These backyard “systems” were constructed over 50+ years ago with substandard materials and methods that reduced their service life and are the responsibility of homeowners to maintain.
- Basement sump discharges from private properties run frequently
- Yard drains channel water to antiquated system with undersized and corroded pipes

# Private Property



# Private Property





# Corrosion

- Significantly undersized drainage pipes throughout the project area don't have the capacity to convey the rate and volume of runoff.
- Existing stormwater pipes are old and not working properly because of corrosion



# Corroded and Disconnected Drainage Pipe



# Beach Issues

- Two of the three existing storm drain outfalls on the beach are routinely blocked with sand (Billow Rd & Brightwater Rd )
- Homeowners have been digging out the clogged pipes for years! Sand is transported from west to east to OLS beach, which is in an accretion zone.
- OLS has been removing up to 50+ truck loads of sand
- Manhole for Crabbing Rocks outfall must be replaced



# Stormwater Drainage Analysis

- A stormwater model was prepared using Computational Hydraulics International PCSWMM software to assess runoff and stormwater flows
- Analyses of the existing stormwater drainage system and the proposed improvements have been completed to allow a comparison of the potential reduction of surface flooding in the OLSBA neighborhood.
- The analyses included the 1-, 2-, and 10-year storm events concurrent with Mean High Water (MHW) and High Tide (HTL) conditions on the Long Island Sound.
- Surface flooding was evaluated in terms of the physical extent, depth, and duration of flooding.
- Results of existing conditions model showed peak flooding at four critical locations
  - Catch basin at the intersection of Sea Lane & Saltaire Drive
  - Catch basin at the intersection of Sea Spray Road and Bellaire Road
  - Open channel system in the yards of private properties along Billow Road
  - Catch basin in the vicinity of 42 Brightwater Road

# Test Pits

- 6 Test Pits were dug in the upper area of OLS to determine the infiltration run off of groundwater
- The measured depths to groundwater ranged between 2.5 feet and 5 feet - the high groundwater eliminated the stormwater alternative of infiltration



# Stormwater Drainage Improvements

- The objective of the rainfall mitigation is to channel the runoff from the northern ends of the OLS streets to new and additional catch basins and larger diameter pipes.
- A collector pipe will be installed along Bellaire Road to channel the drainage to a larger outfall pipe on the crabbing rocks.
- Installation of larger diameter outfall at the crabbing rocks with check valves to limit high tides from backing up through the drainage system. Note: the current locations of the outfalls will not be changed.
- Installation of an additional outfall that will discharge to the nearby Sheffield Brook rock outfall channel.

# New Stormwater System

- Replace existing storm piping with new larger diameter pipes
- Install catch basins and piping on portions Billow Road south of Shore Rd
- Install 3-inch Cape Cod style curbing south of Shore Road (CT 156) where necessary to direct stormwater to the new catch basins
- Install additional catch basins and twin 18-inch pipes along Sea Spray Road
- Install a new 24-inch outfall at the crabbing rocks and a new manhole on the beach to service the outfall as primary drainage
- Install a new 12-inch outfall connected to the Sheffield Brook outfall area
- Install tide gates/check valves on the existing & new drainage outfalls

# Stormwater Drainage Improvements

- The improvements will reduce frequency, extent and depth of surface flooding in the neighborhood that currently occurs due to the lack of adequate stormwater drainage systems on the roadways.
- The stormwater improvements are a balance of optimizing the drainage system performance while accommodating budgetary constraints and the physical constraints of the neighborhood.
- Physical constraints include the potential utility conflicts with proposed water/sewer lines, shallow bedrock and limited area due to the narrow streets and dense development in the neighborhood. As such, installing larger stormwater pipes while maintaining the required offsets from water and sewer lines is not feasible in some locations.



# What is OLSBA's Investment

- \$30,000 Removal of existing stormwater pipes, catch basins, etc.
- \$426,000 4195 L.F. of new stormwater pipes (8", 12", 18" & 24")
- \$156,000 42 new new catch basins & manholes
- \$107,000 New outfalls into Long Island Sound & check valves
- \$139,000 1,925 L.F. of Curbs and temporary road repair
- **\$858,000 Total estimated construction cost**