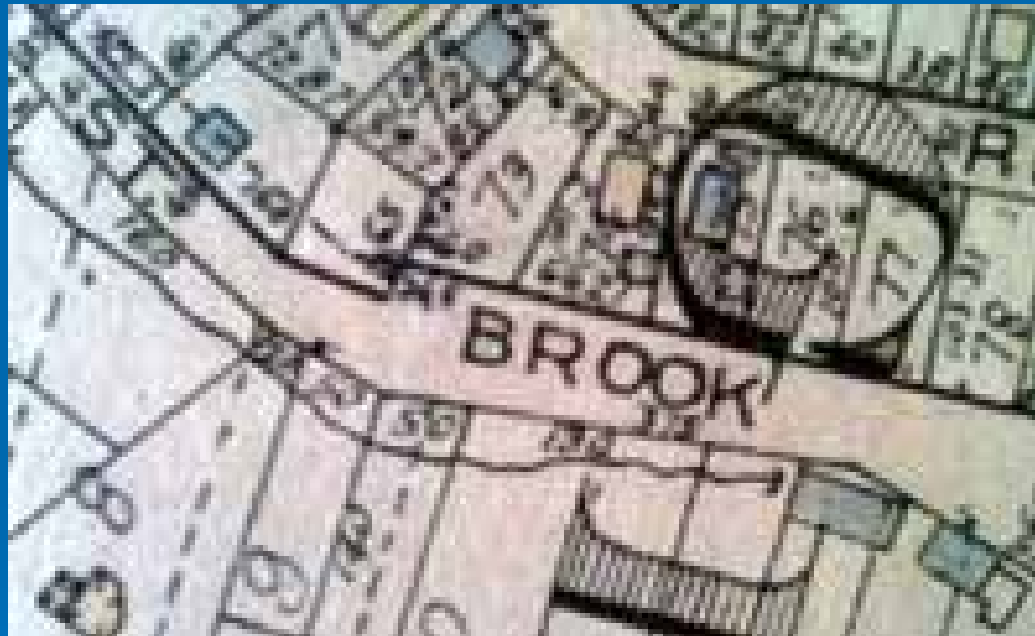


Why Do You Think They Call it Brook Street?



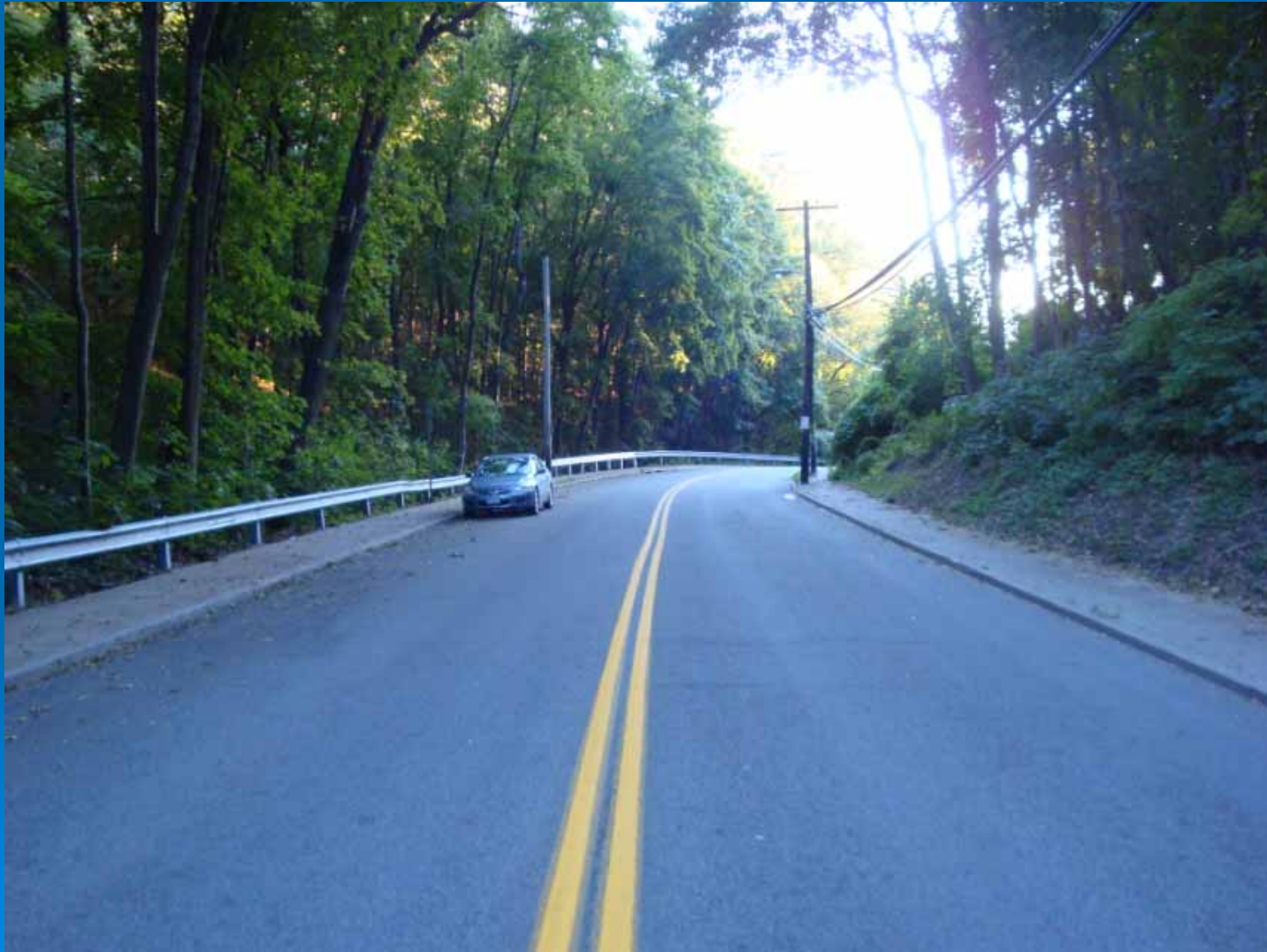
Friends of History Presentation – Croton Free Library
Daniel O'Connor, P.E. Village Engineer

Date: 9/16/10

Upper Brook Street



Middle Brook Street



Lower Brook Street

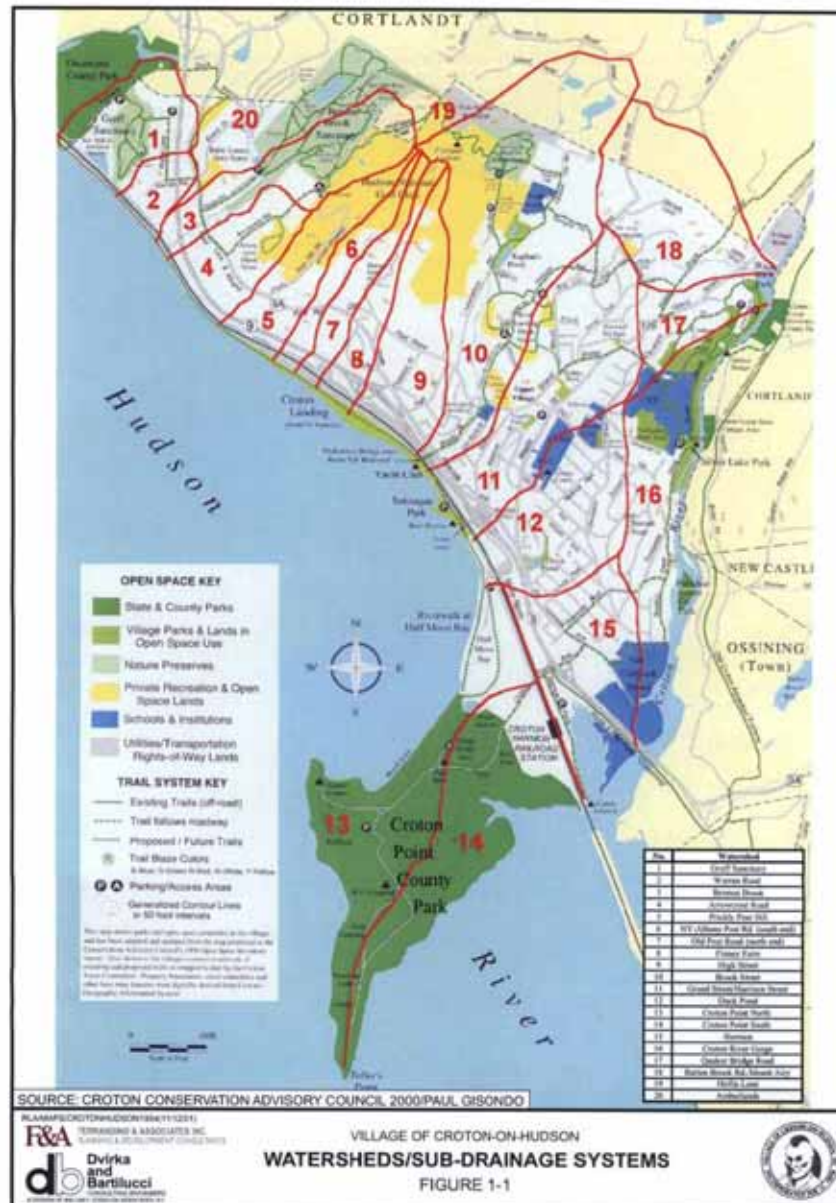


Storm Events

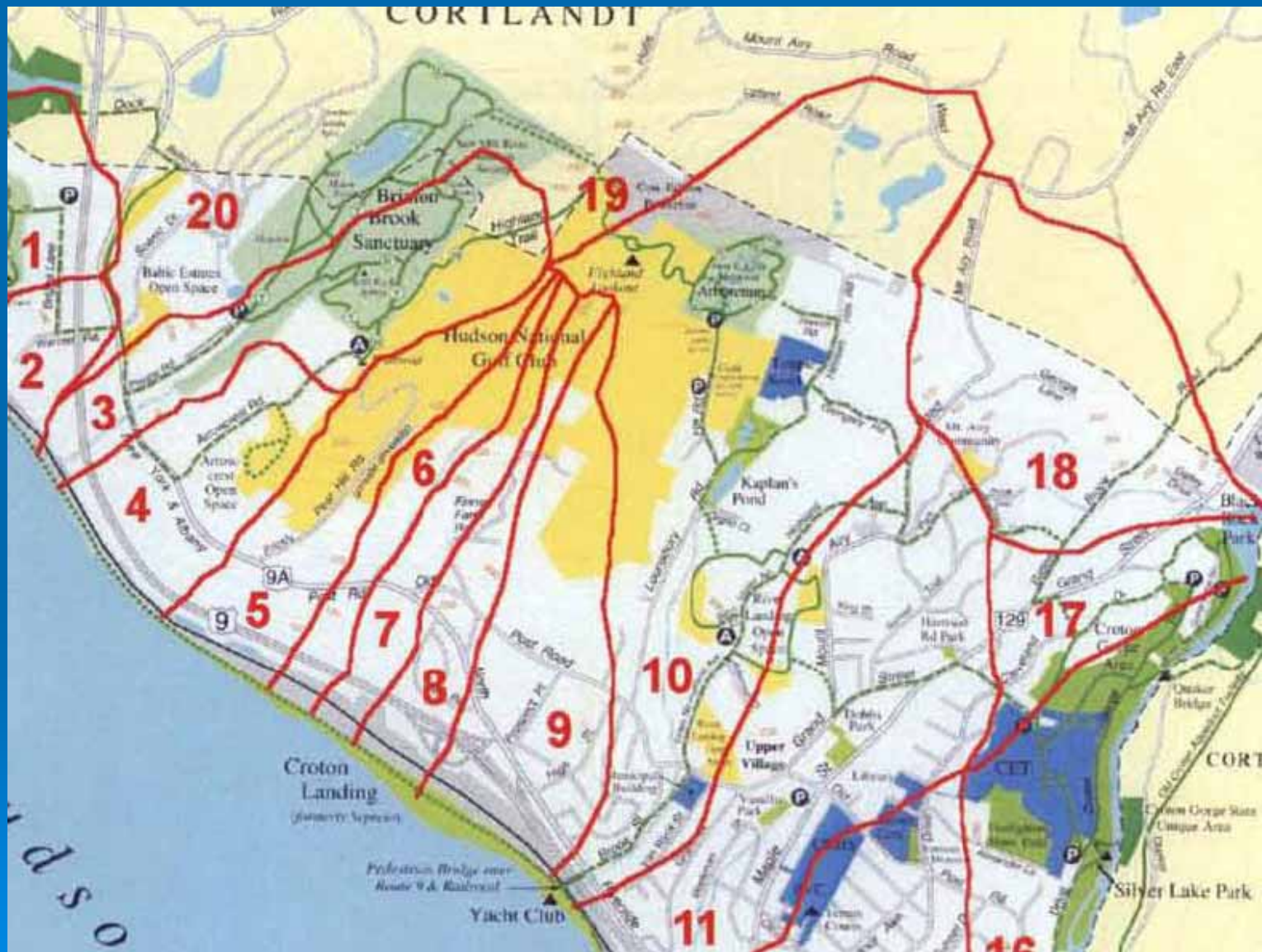
- Sept 1999 Hurricane Floyd 7.2"(24Hr), 100Year Storm
- June 2001 Father's Day Storm 4.9"(24Hr), 10Year Storm



Village Watersheds



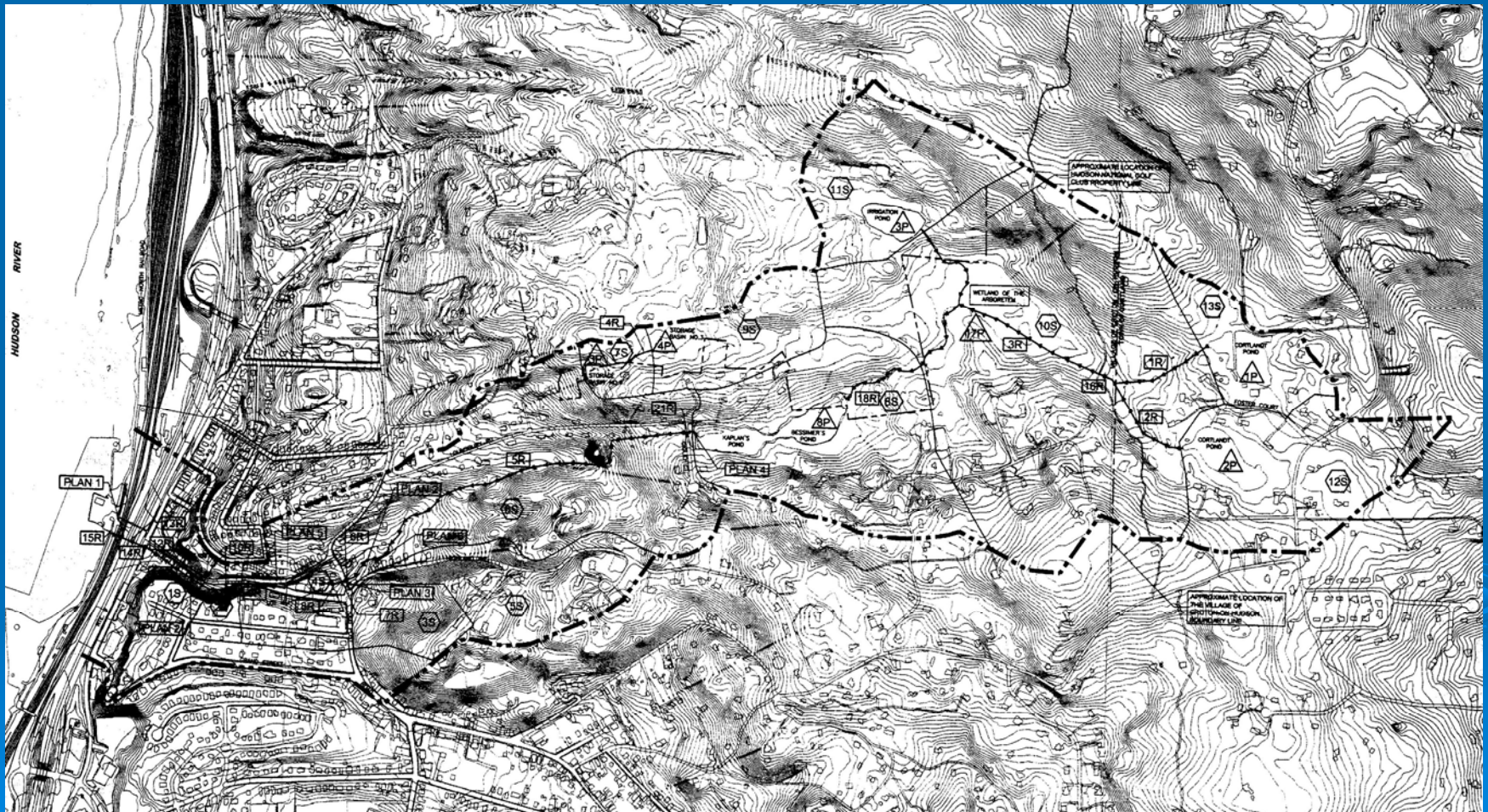
Village Watersheds



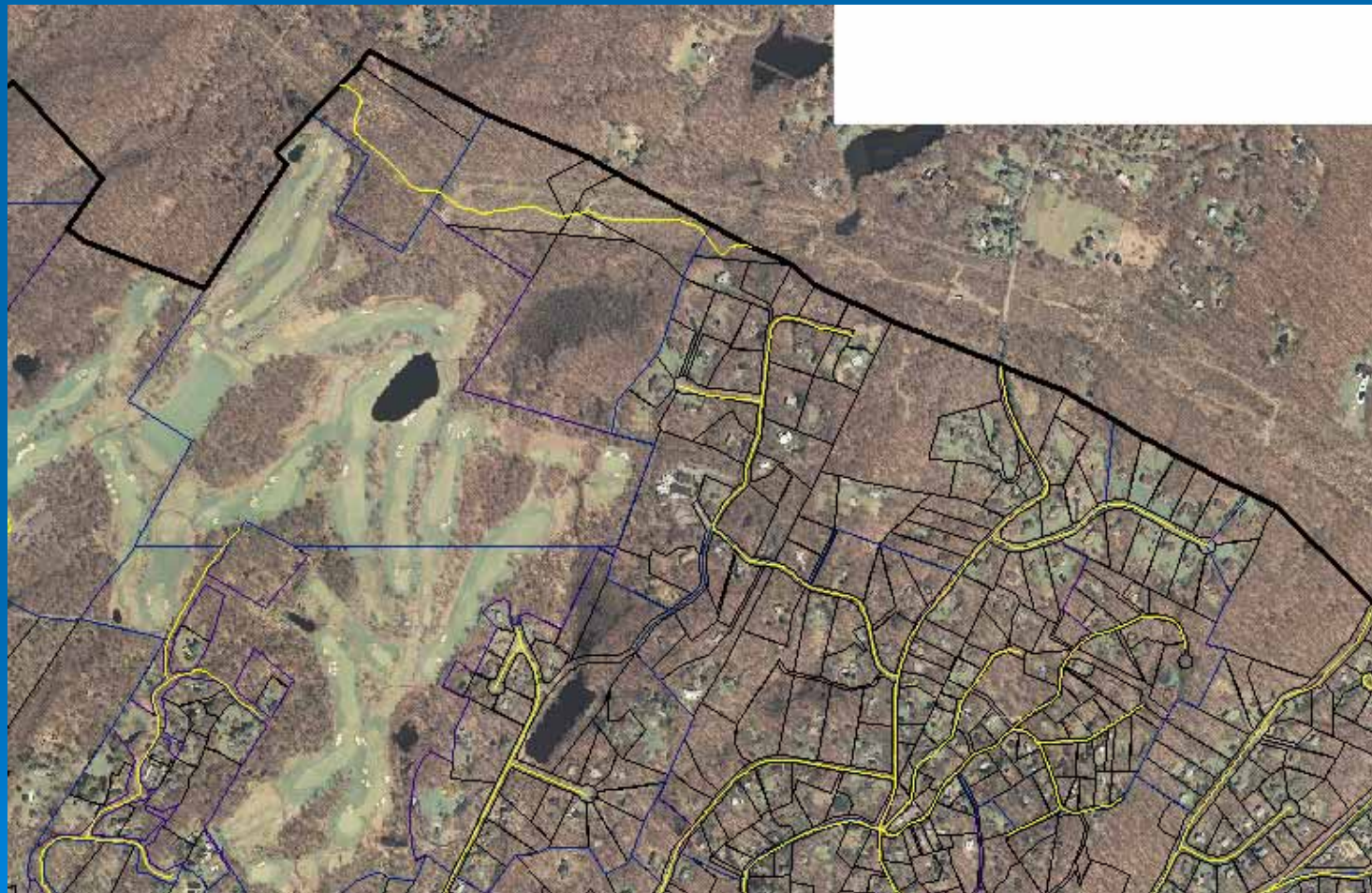
Watershed Data

- 442 Acres (342 acres in Village)
 - 12,038 feet long
 - Max. Elevation 603 ft.
 - Receiving Waters: Hudson River
 - Peak storm flows
 - 2 yr. storm – 91 CFS
 - 5 yr. storm – 164 CFS
 - 10 yr. storm – 204 CFS
 - 100 yr. storm – 367 CFS
 - No Official Stream Name (USGS, NYSDEC, unnamed tributary)
- 

Computer Model



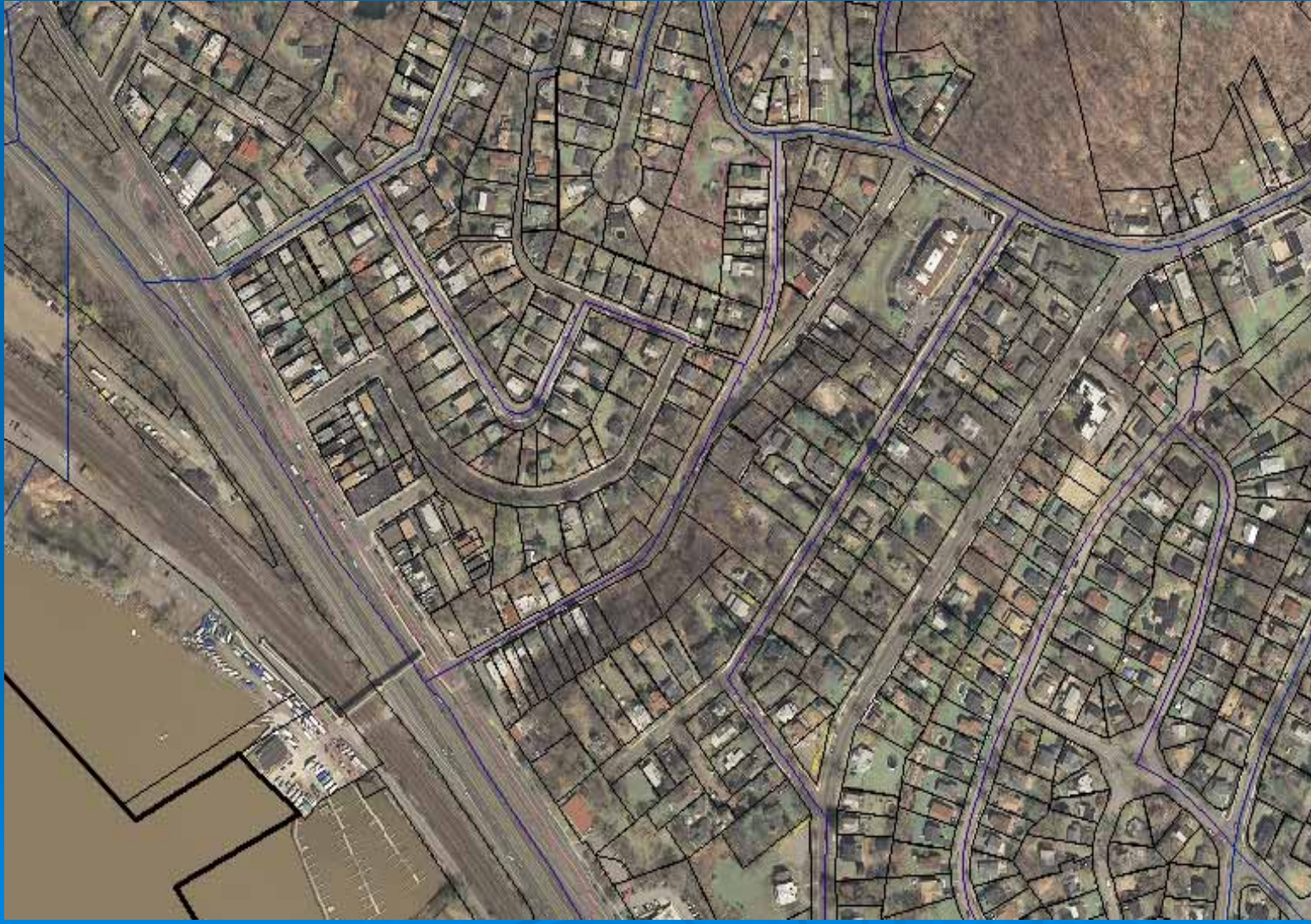
Upper Watershed Area



Middle Watershed Area



Lower Watershed Area



Lower Watershed Storm Sewers



Upper Section of Lower Watershed



Middle Section of Lower Watershed



Lower Section of Lower Watershed



History of Development

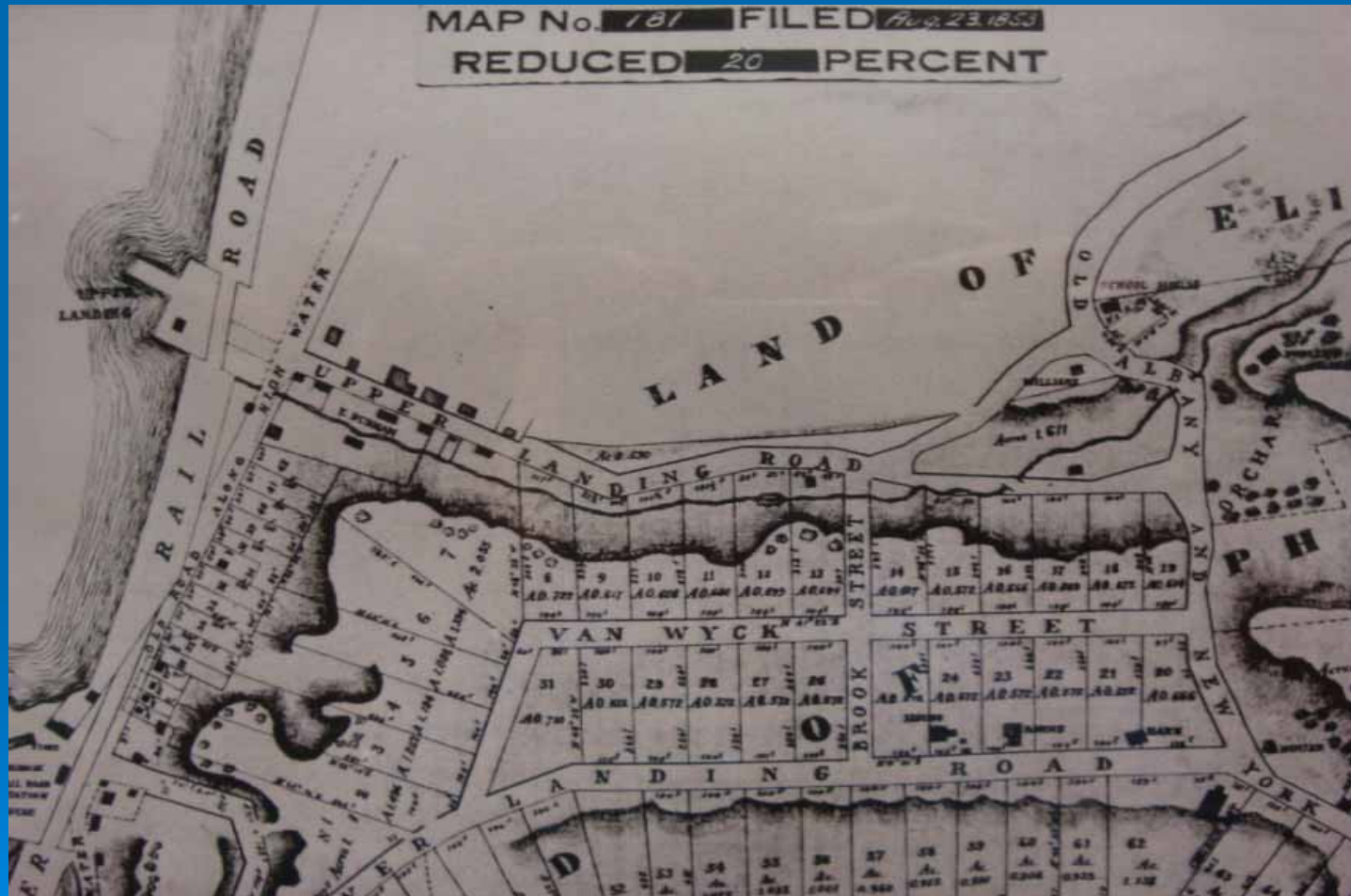
- Various maps starting from 1757 to 1937 show the historical development of Brook Street and how the stream was considered.



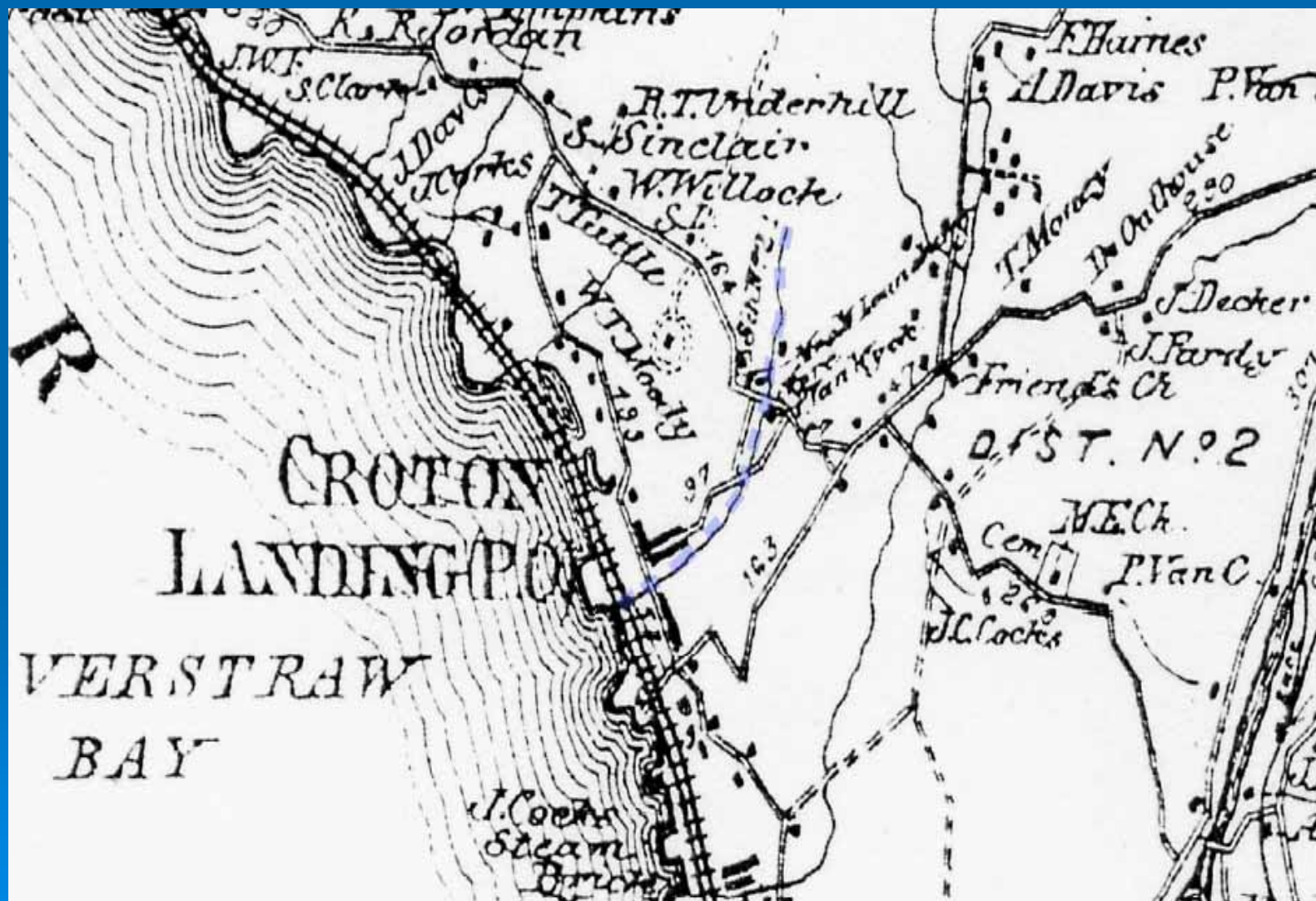
1797 Map of Cortlandt, York Town and Stephen Town



1853 Map of Lands of Phillip Van Wyck



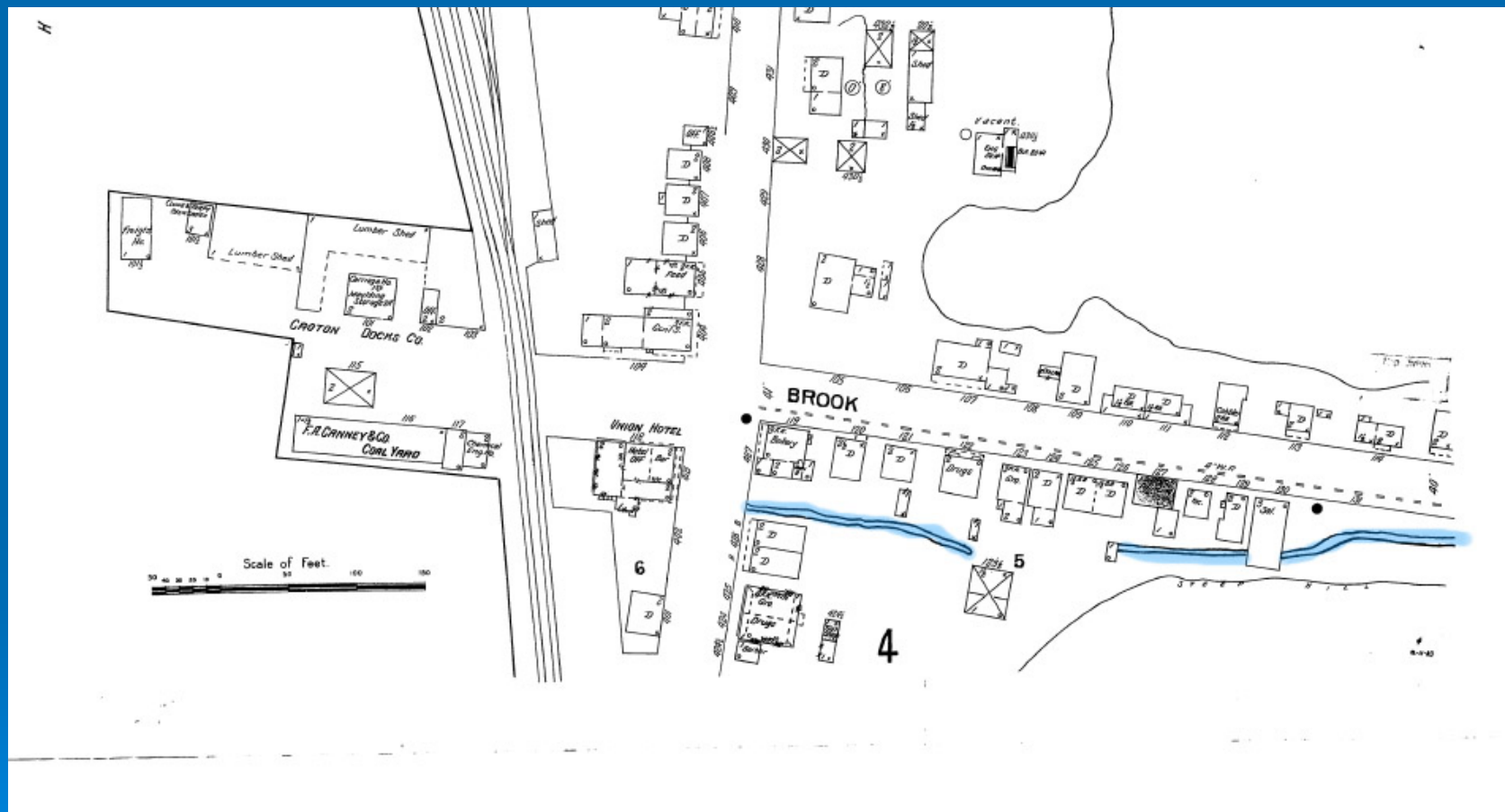
Beer's Atlas 1868



Sanborn Map 1897

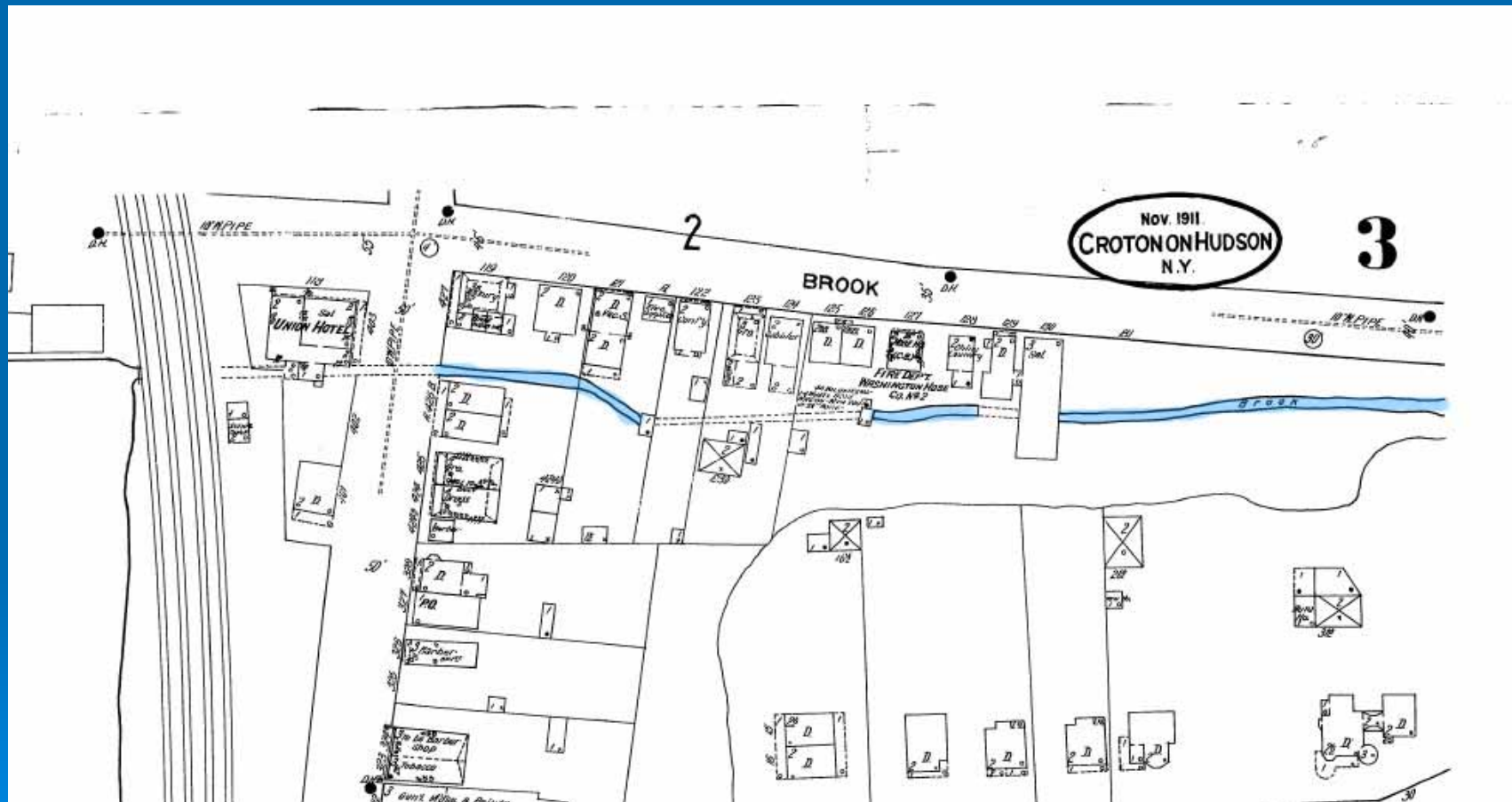


Sanborn Map 1903



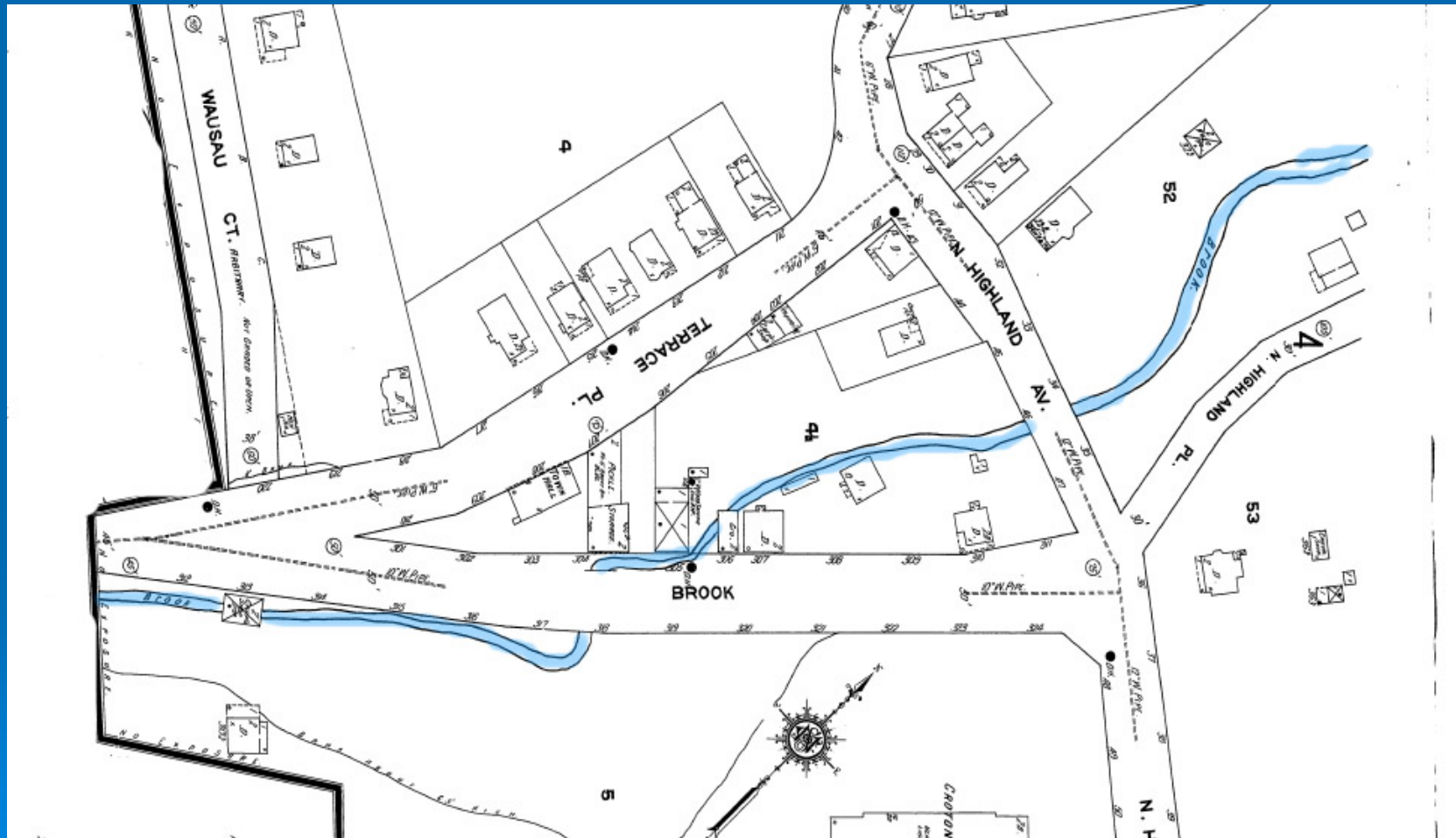
Sanborn Map 1911

Lower Brook St



Sanborn Map 1911

upper Brook St



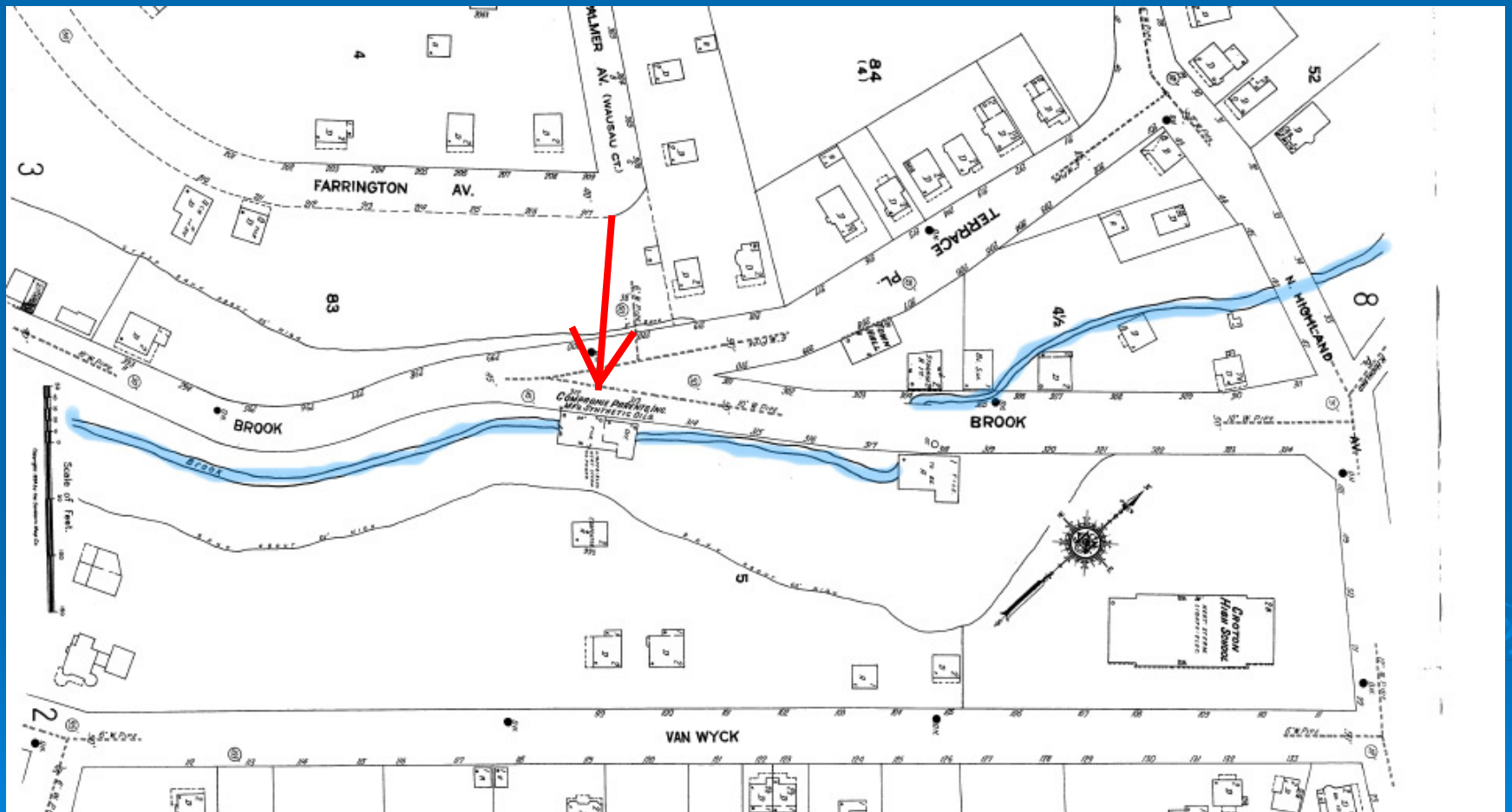
Sanborn Map 1924

Lower Brook St



Sanborn Map 1924

Upper Brook St



Sanborn Map 1934 (w/updates) Lower Brook St



Sanborn Map 1934 (w/updates)

Upper Brook St



1937 Topographical map Lower Brook Street



Images of the Watershed

- Images of the watershed and infrastructure start from the upper watershed area and lead to the Hudson River



Arboretum HNGC – Base Flow Supply



Arboretum HNGC – Base Flow Supply



Kaplan's Pond



Kaplan's Pond (~2Ac)



Kaplan's Pond: Former Outlet Structure



Kaplan's Pond: Former Outlet Structure



Kaplan's Pond: New Outlet Structure



Kaplan's Pond: New Outlet Structure



Kaplan's Pond: New Outlet Structure



Kaplan's Pond - Turtle



Kaplan's Pond: Drain Pipe



Typical stream valley between Kaplan's Pond and Old Post Rd No.



Culvert Outlet at West side of Old Post Road North

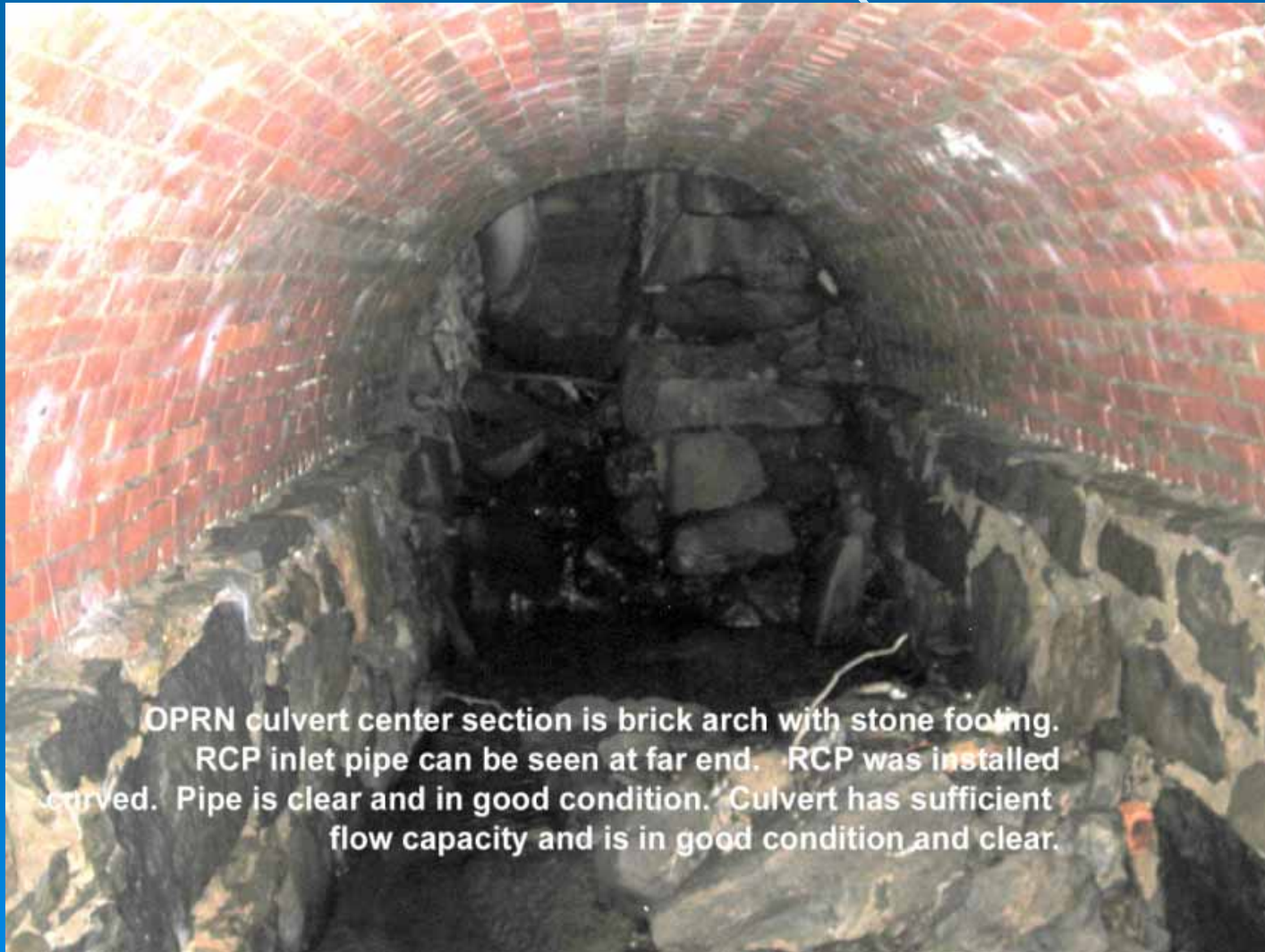


Culvert Outlet at West side of Old Post Road North (inside view)



OPRN culvert looking west. Outlet end is a box culvert with sufficient capacity.

Culvert Outlet at West side of Old Post Road North (inside view)



OPRN culvert center section is brick arch with stone footing. RCP inlet pipe can be seen at far end. RCP was installed curved. Pipe is clear and in good condition. Culvert has sufficient flow capacity and is in good condition and clear.

Culvert Inlet at East side of Old Post Road North (inside view)



Culvert Outlet at West side of Old Post Road North (inside view)



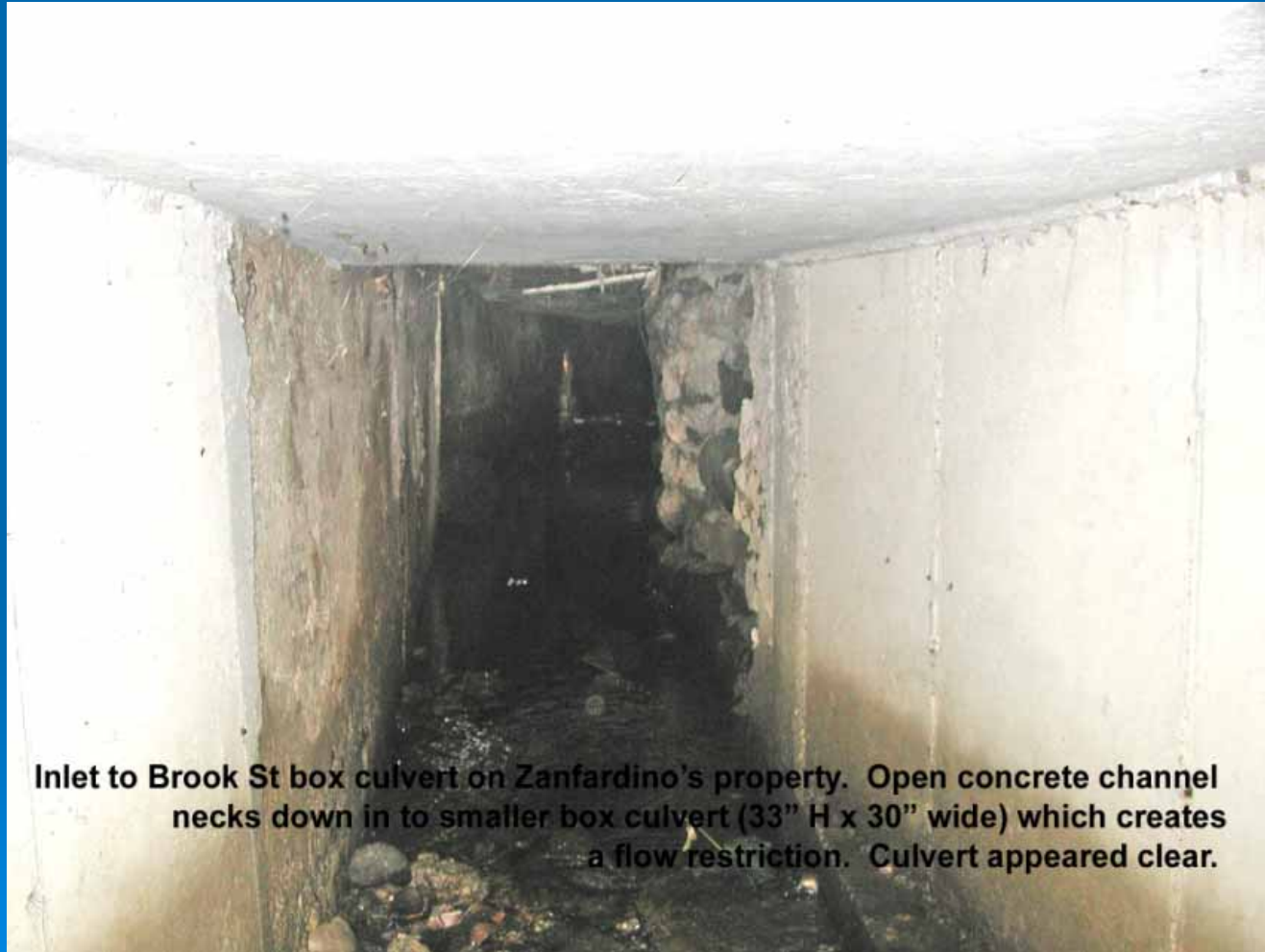
Stream below Old Post Road North



Stream below Garage on Brook St

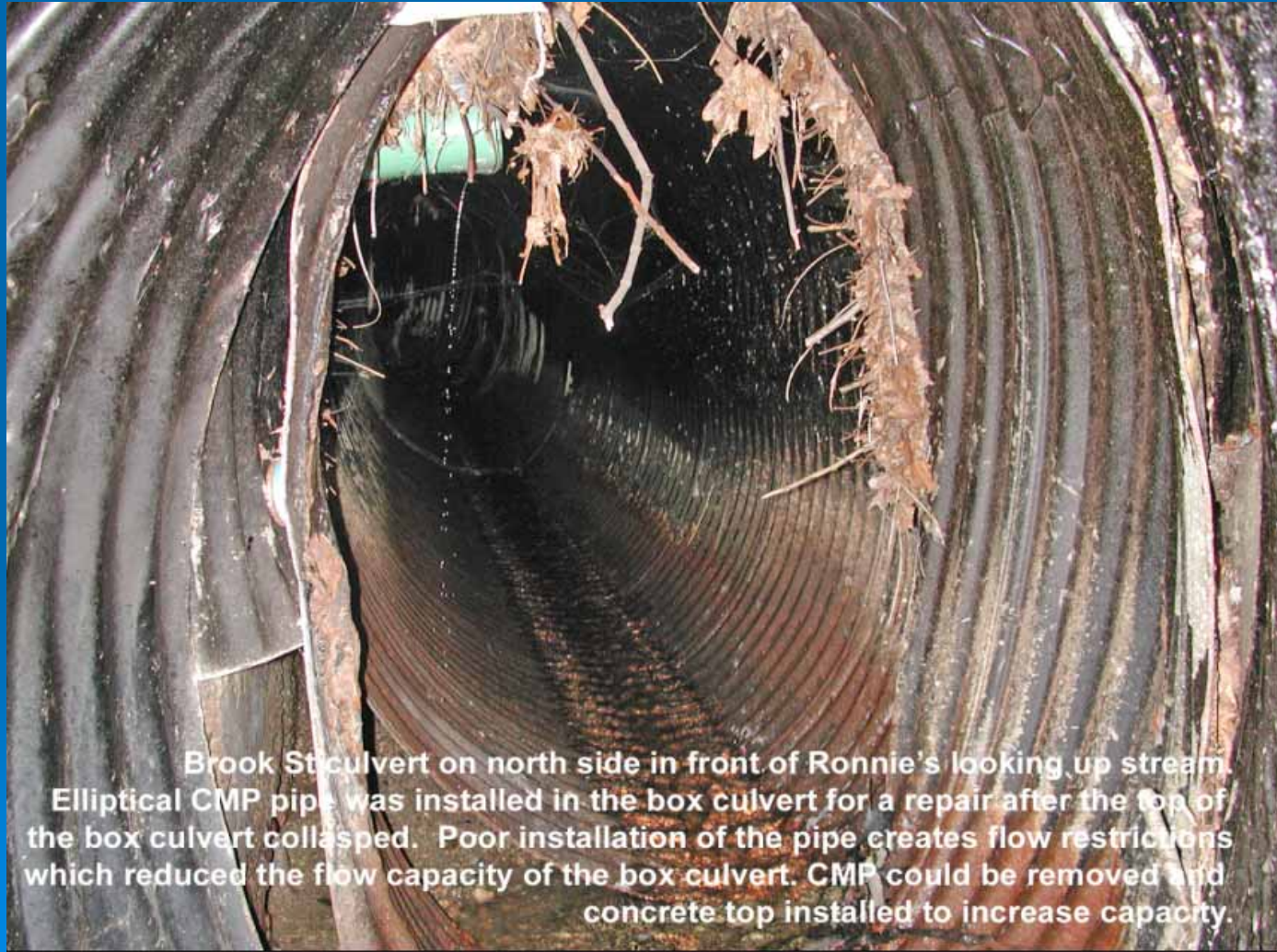


Entrance to box culvert below garage



Inlet to Brook St box culvert on Zanfardino's property. Open concrete channel necks down in to smaller box culvert (33" H x 30" wide) which creates a flow restriction. Culvert appeared clear.

Storm Pipe on Brook Street

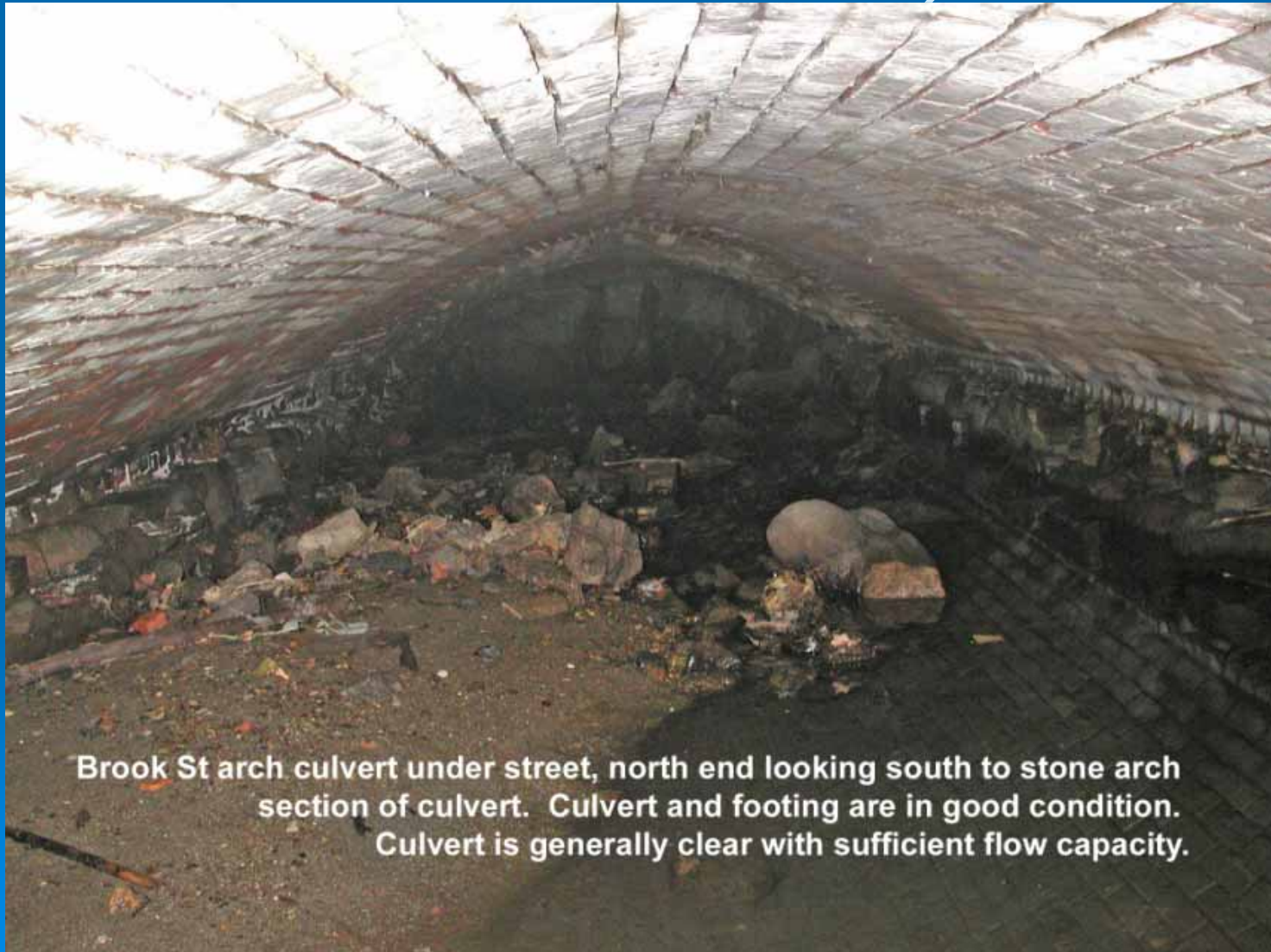


Brook St culvert on north side in front of Ronnie's looking up stream. Elliptical CMP pipe was installed in the box culvert for a repair after the top of the box culvert collapsed. Poor installation of the pipe creates flow restrictions which reduced the flow capacity of the box culvert. CMP could be removed and concrete top installed to increase capacity.

Metal Culvert connection to arch culvert under Brook Street

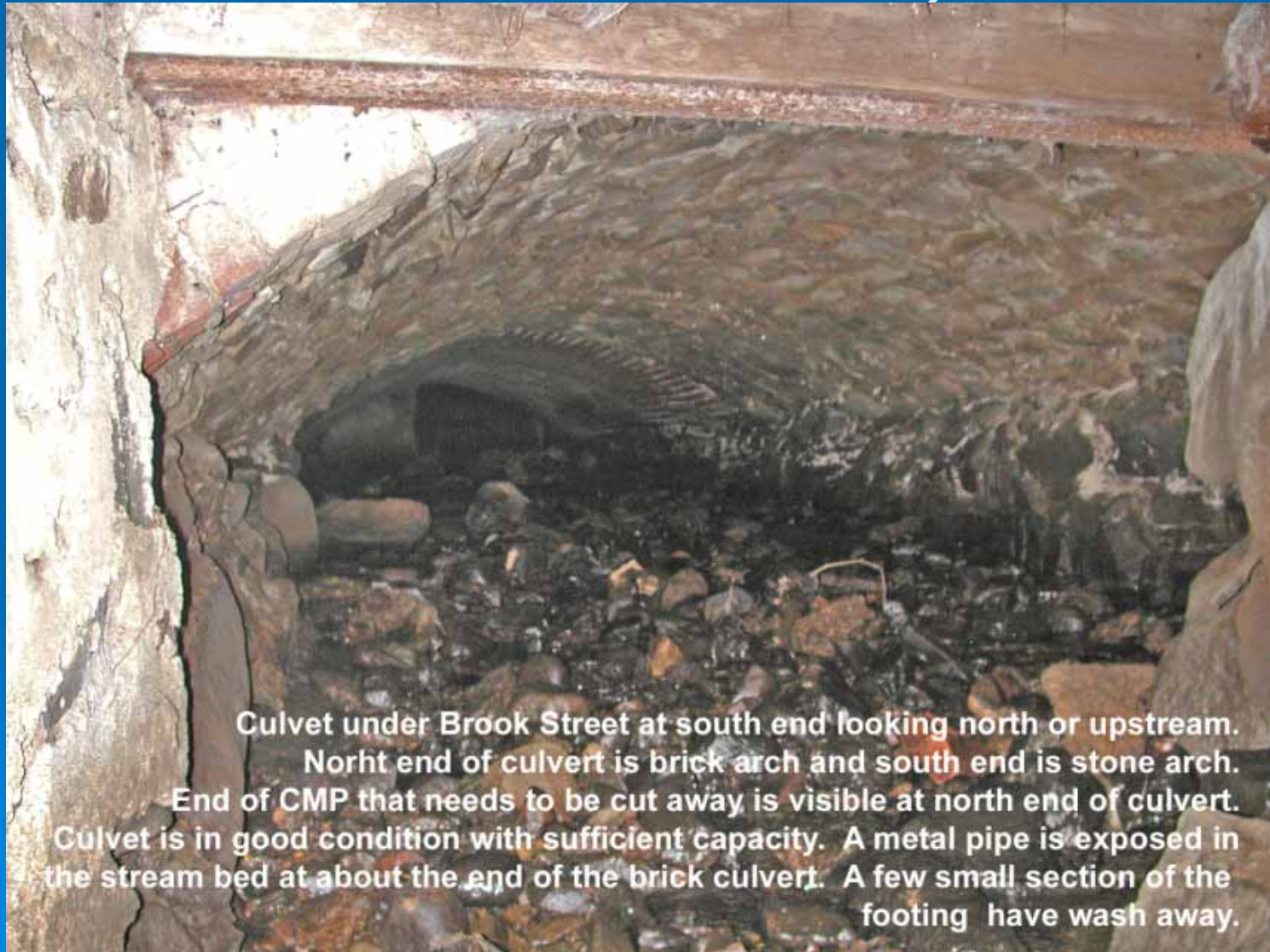


Culvert under Brook Street (arch: brick and stone)



Brook St arch culvert under street, north end looking south to stone arch section of culvert. Culvert and footing are in good condition. Culvert is generally clear with sufficient flow capacity.

Culvert under Brook Street (arch: brick and stone)



Culvert under Brook Street at south end looking north or upstream.

North end of culvert is brick arch and south end is stone arch.

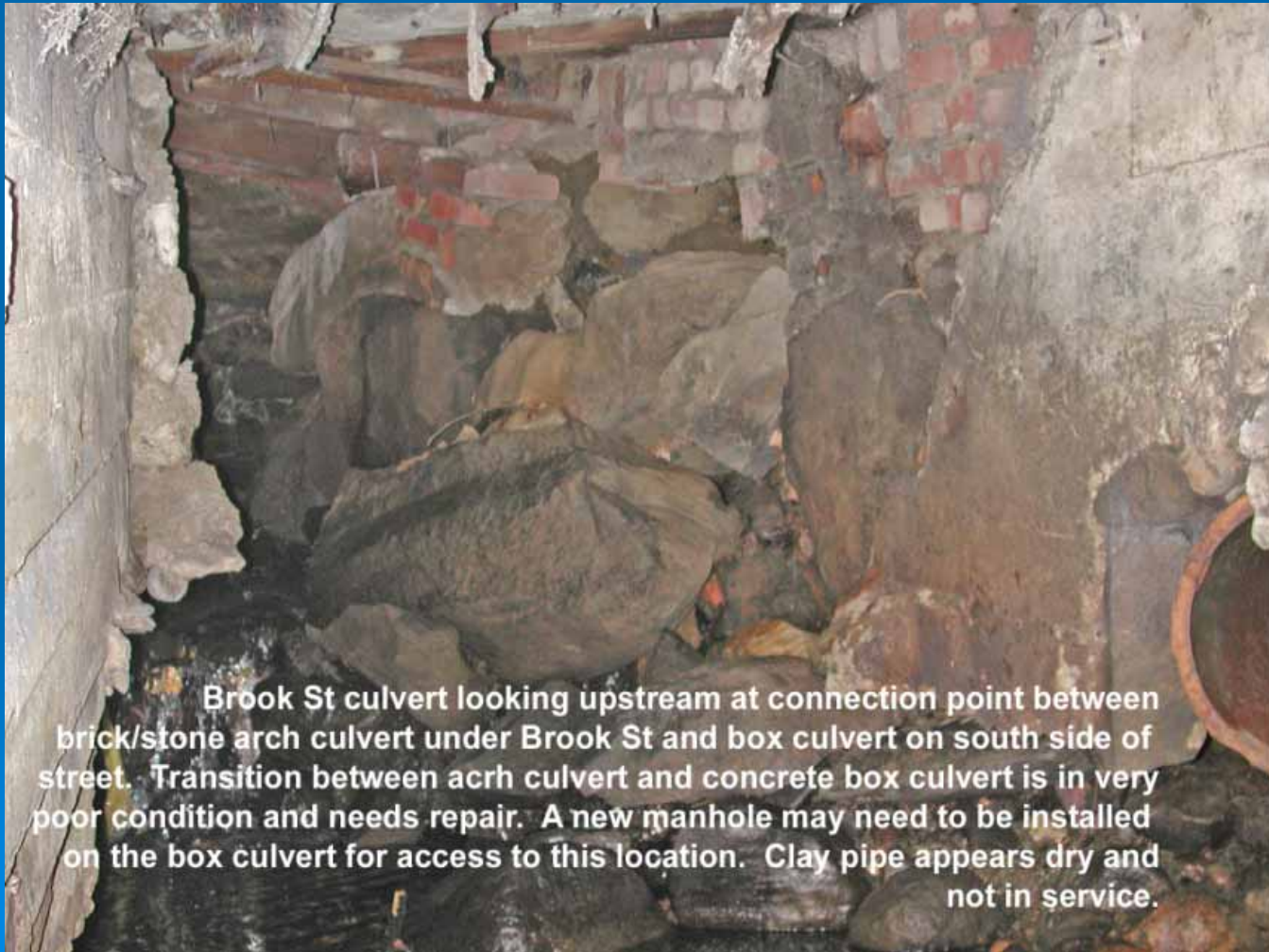
End of CMP that needs to be cut away is visible at north end of culvert.

Culvert is in good condition with sufficient capacity. A metal pipe is exposed in the stream bed at about the end of the brick culvert. A few small sections of the footing have washed away.

Culvert under Brook Street (arch: brick and stone)



Culvert under Brook Street connection to box culvert south side of Brook St



Brook St culvert looking upstream at connection point between brick/stone arch culvert under Brook St and box culvert on south side of street. Transition between arch culvert and concrete box culvert is in very poor condition and needs repair. A new manhole may need to be installed on the box culvert for access to this location. Clay pipe appears dry and not in service.

Start of box culvert on south side of Brook Street



Inside box culvert on Brook St, looking west just upstream from catch basin on south side of Brook St. near Luposello's. Almost the entire original concrete bottom of the culvert is missing. Bottom of culvert is cobbles and some masonry items. Culvert is generally clear some undermining of the walls is present. This undermining likely caused the sink hole down stream. 7/26/07

Box culvert on south side of Brook Street



Brook St box culvert looking west about 20 feet west of CB on Luposello's lot. Portion of concrete bottom is still present. Culvert is generally clear. 7/26/07

Middle Brook Street: location of sink hole



Sink Hole Forms



Sink Hole Enlarges



Sink Hole: Box Culvert



Stream: culvert to open channel



Trash Rack in front of headwall near Conti Electric



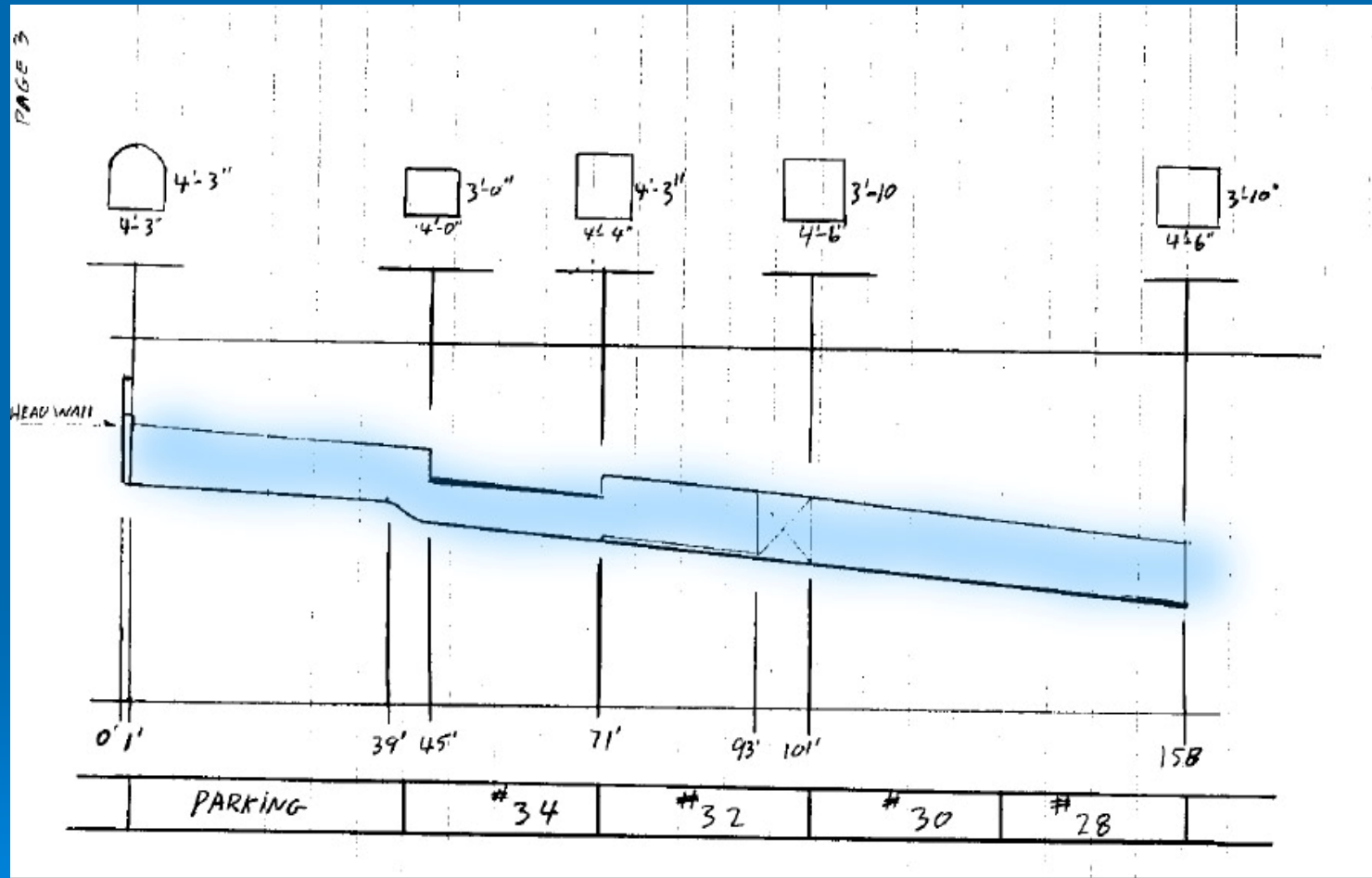
Trash Rack in front of headwall near Conti Electric



View of Trash Rack at headwall near Conte's Electric (inside)



Old Culvert Profile at Lower Brook Street



Stream below building at Lower Brook St



Stream below building at Lower Brook St



Lower Brook Street New Box Culvert



Lower Brook Street New Box Culvert (sediment)



Stream Flowing into start of NYSDOT Culvert



Discharge of NYSDOT Culvert into Metro North Culvert and Hudson River



Stream Discharge to Hudson River at Croton Yacht Club



Outfall to Hudson River at Croton Yacht Club



Culvert Under Rt 9 - Sediment



Culvert Under Rt 9 - Sediment



Dredging of Yacht Club Marina Hydraulic Dredge in Operation



Dredging of Yacht Club Marina Settling/Dewatering Pond at Croton Landing



Dredging of Yacht Club Marina Dewater Pond at Croton Landing



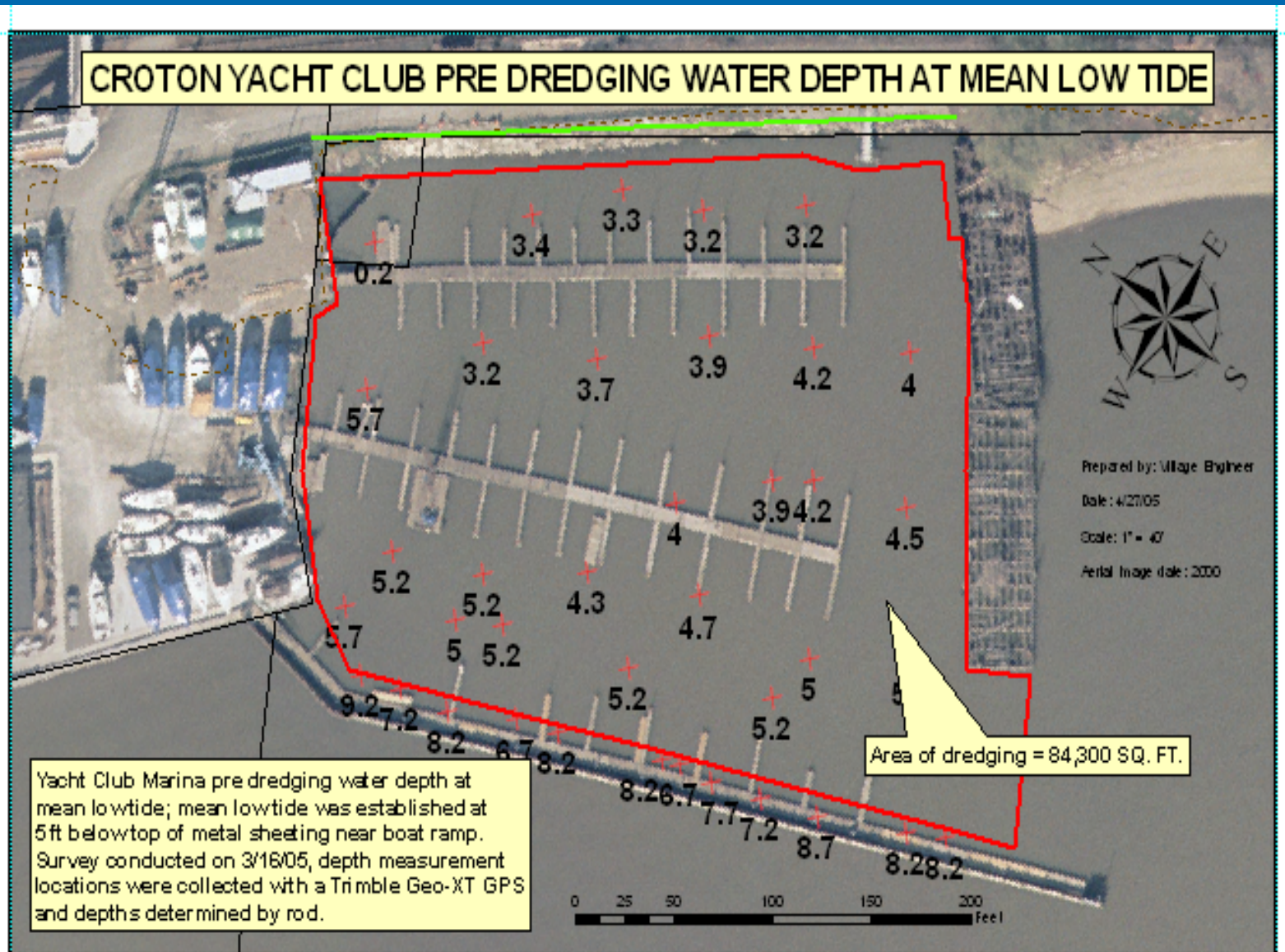
Yacht Club Marine dredge material being reused at Croton Landing



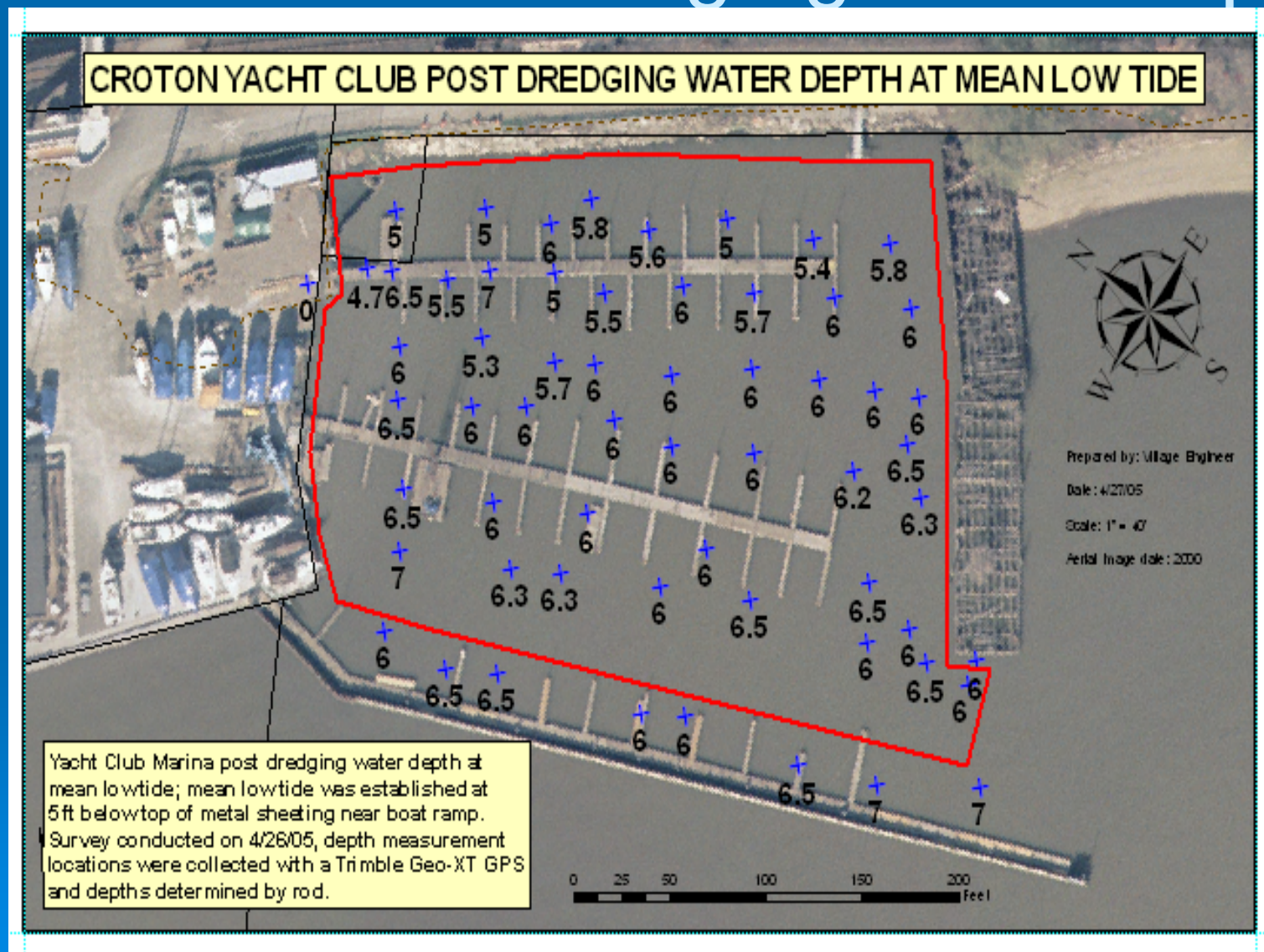
Landscape berm at Croton Landing



Yacht Club Pre-dredging water depths



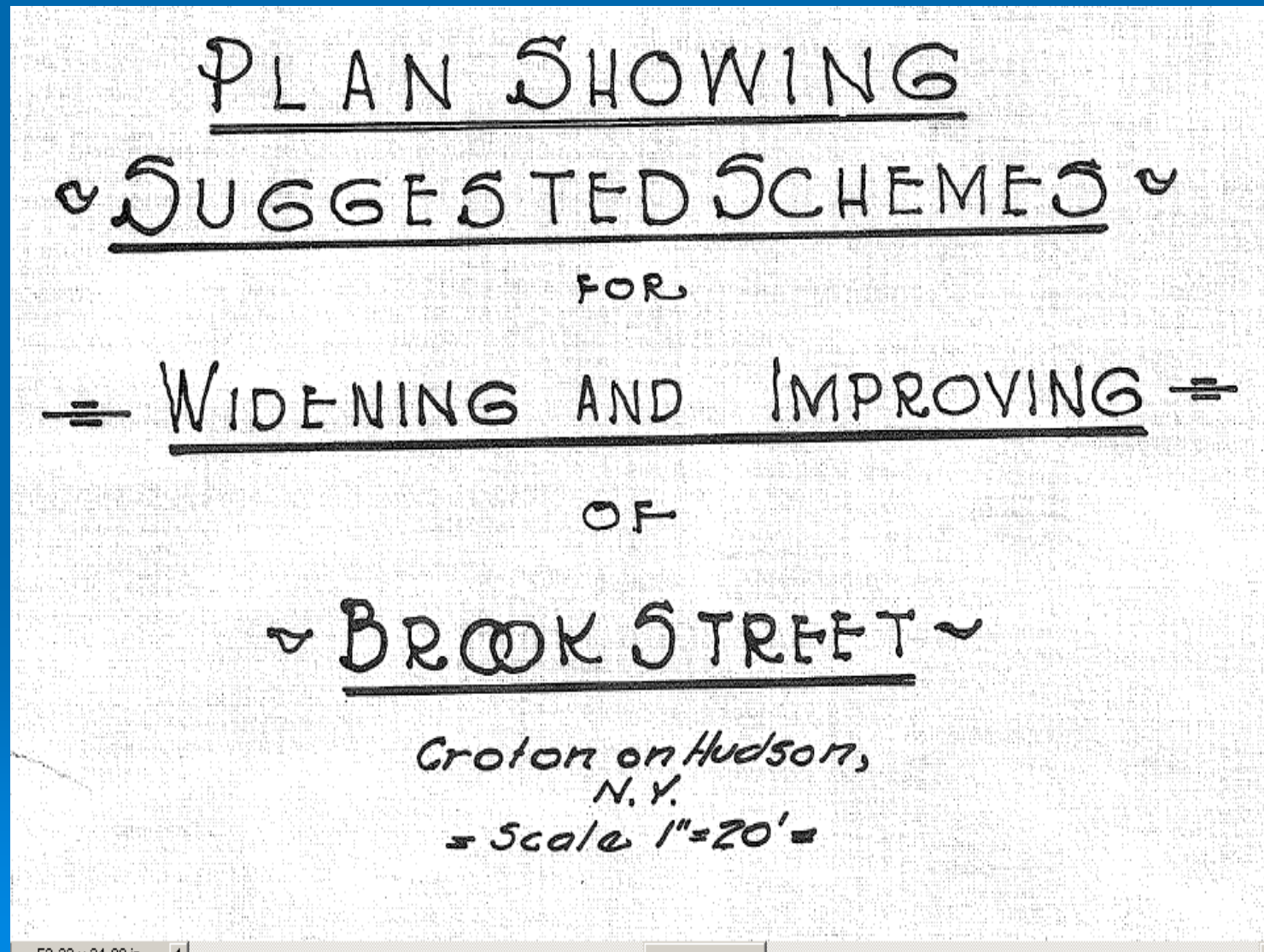
Yacht Club Post-dredging water depths



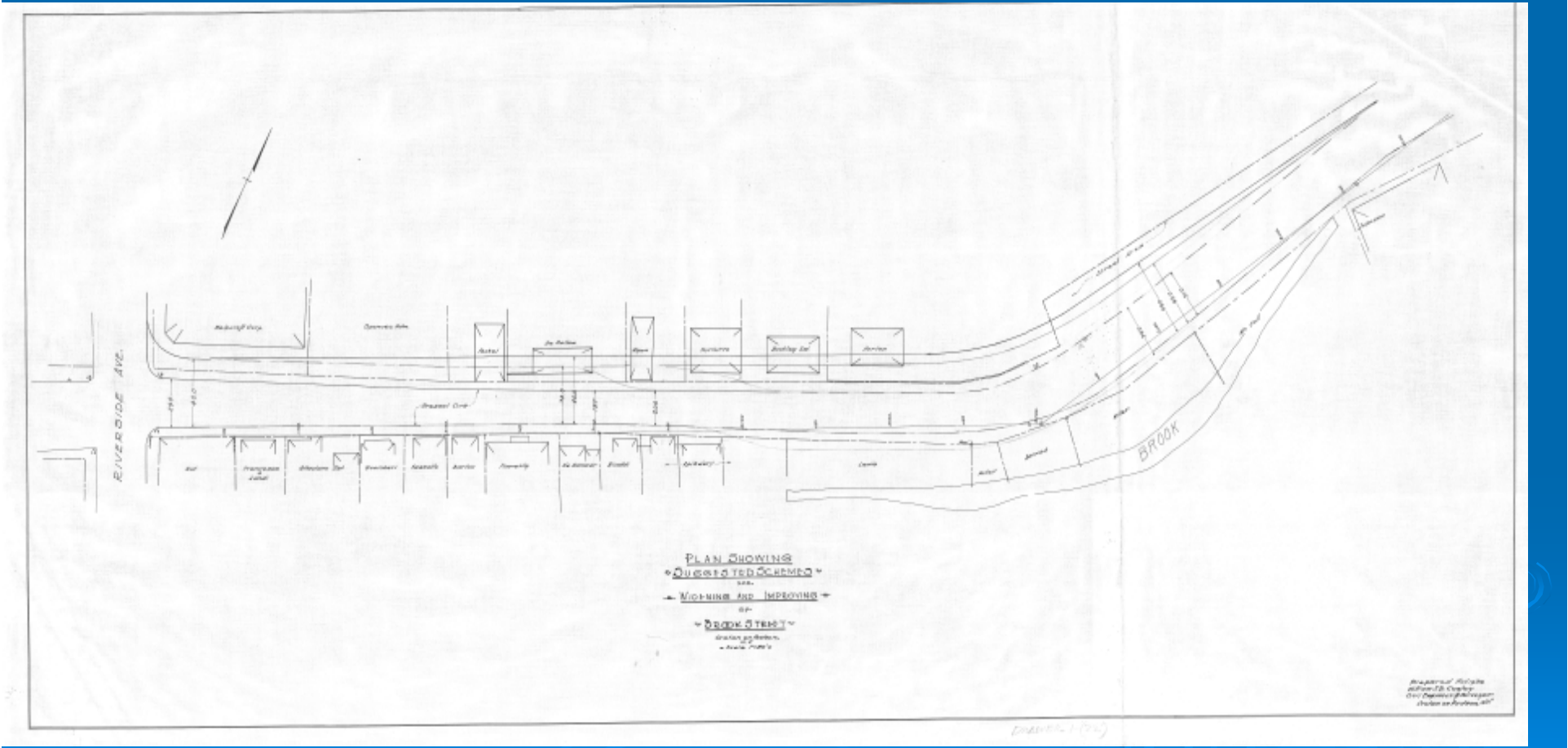
House on Lower Brook St supply of sand bags



Brook Street Widening Schemes 1936



Brook Street Widening Schemes 1936



The End

