

FARMS ROAD RECONSTRUCTION

Connecticut Association of Flood Managers Annual Conference, December 9, 2021

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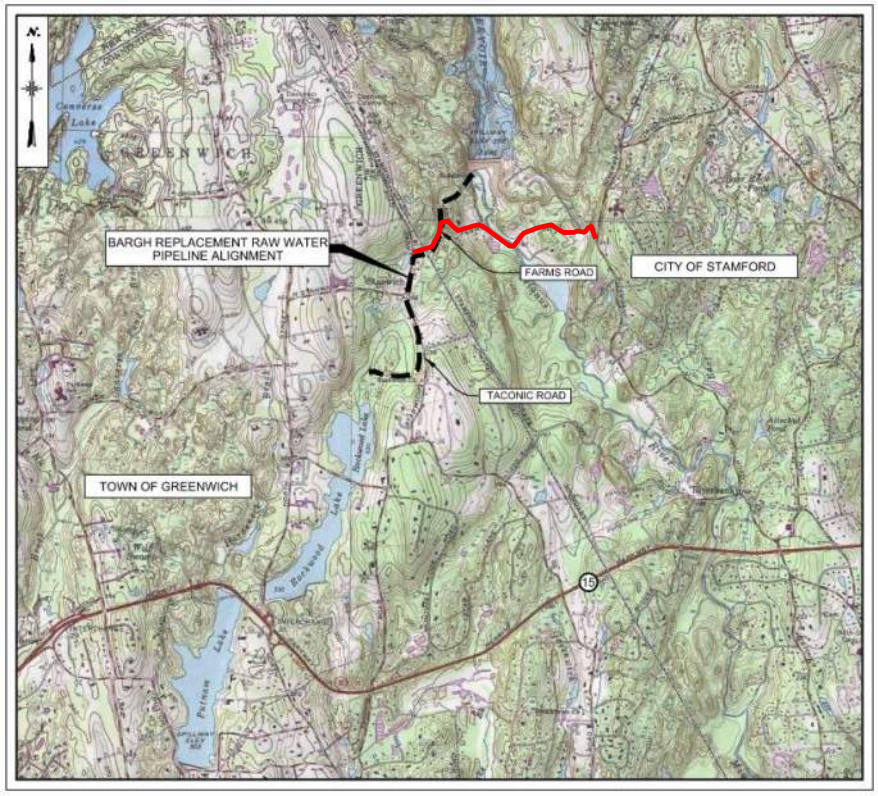
BEFORE THE STORM

- Aquarion replacing an interconnect between Bargh Reservoir in Stamford and Rockwood Lake in Greenwich
- Existing interconnect was constructed in 1905 - 1906
- Approximately 1,400 LF of new 24” interconnect water main was installed in Farms Road



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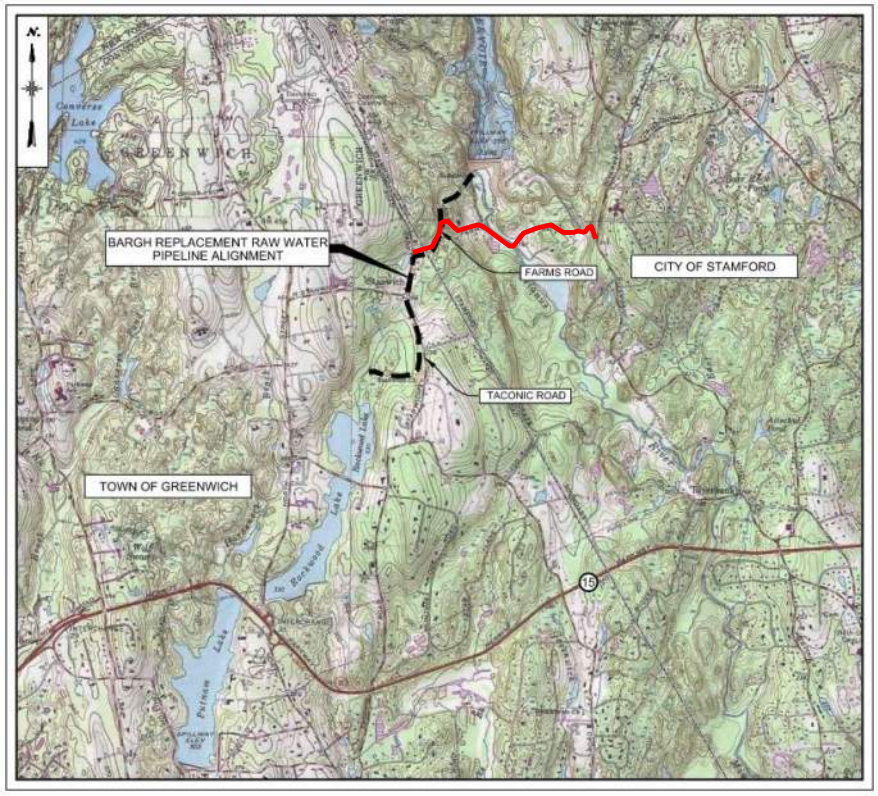
BEFORE THE STORM

- New interconnect was installed, temporary pavement had been placed on Farms Road
- Interconnect undergoing leak testing
- Construction continuing on cross-country alignment in Greenwich



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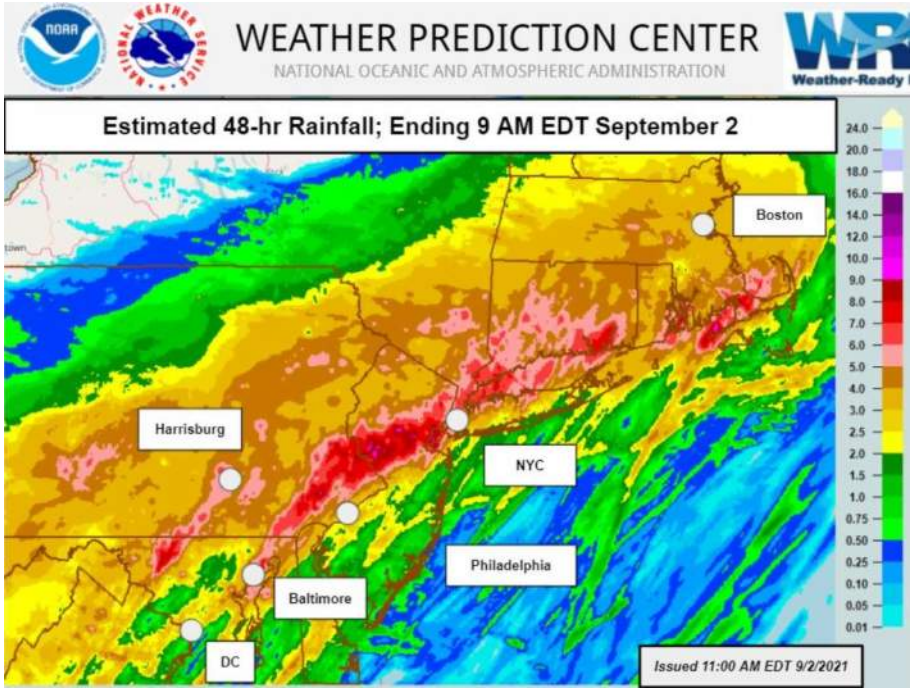
THE STORM

- September 1 – 2, 2021 remnants of Hurricane Ida made its way to New England
- North Stamford received 8 inches of rain in about 9 hours
- Pond at west end of Farms Road reportedly overtopped by 4 feet
- Topography funneled the water down Farms Road



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THE DAMAGE

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THE DAMAGE

- About 1,000 feet of roadway was washed out
- Floodwaters churned and tore up the temporary pavement
- “Cut through route” between North Stamford and Greenwich / Merritt Parkway closed to traffic
- Detour route ~ 4.5 to 5 miles

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THE RESPONSE

- Aquarion and the City of Stamford took the reconstruction on as a joint project
- Tighe & Bond served as the City's reconstruction engineer
- Tata & Howard served as Aquarion's construction inspector
- Contractor: Burns Construction

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AS BAD AS IT WAS, IT COULD HAVE BEEN WORSE

- No one was injured
- Homes were not flooded
- Only one house driveway access impacted, which also had access to an undamaged part of the road
- The culvert did not wash out, but was overtopped
- The 1905 and 2021 water interconnects were not damaged

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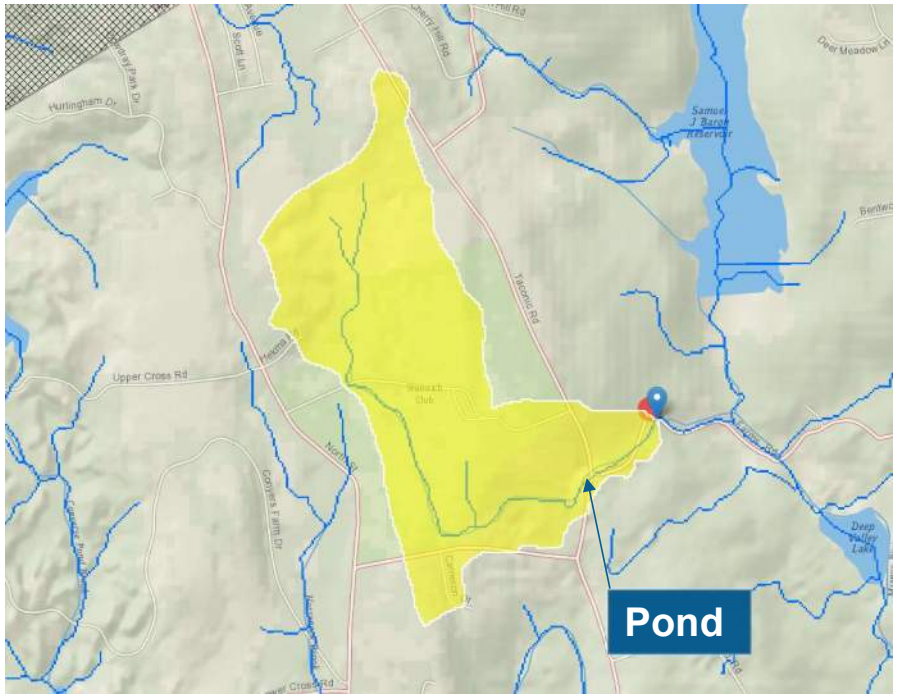
THE WATERSHED

- Unnamed tributary to the Mianus River
- Watershed area 390 acres (0.6 square miles +/-)
- Generally good soils HSG C, C/D, and D < 1% of area
- Not in a flood zone



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IMMEDIATE CHALLENGES

Open the road quickly – political pressure, emergency access, avoid detour

How to construct the failed embankment

Reconstruction strategy – temporary vs permanent

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IMMEDIATE CHALLENGES

What to improve - Road does not meet design standards, tight turns, width only 16 feet in places

Responsibility – City vs Aquarion

Permitting

Supply chain

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RESPONDING TO THE CHALLENGES

- Coordinate with Inland Wetlands Agency, document measures as they are installed
- Aquarion committed to getting another Contractor on board
- Drainage problem becomes a geotechnical problem, repair engineered "on the fly", using boring data from water main project
- Spend long nights trying to stay ahead of Contractor

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OPPORTUNITIES FOR IMPROVEMENT

- Look for opportunities to improve the roadway, “low hanging fruit”
- Replaced areas of organic fill
- Superelevated portions of the roadway where drainage would sit in the gutter
- New signage, remove problem trees
- Added guiderail in areas where it was warranted

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EXPECT THE UNEXPECTED

- **Documenting what was there before:**
  - LiDAR, Aerial Photos, Google Street View, Pre-Project Photographs
- **Detailed culvert inspection revealed serious condition with roof slab**
- **Unforeseen conditions**
- **The weather**

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RECONSTRUCTING THE ROAD

Removal of loose debris and stones east of hairpin turn, at bottom of hill

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RECONSTRUCTING THE ROAD

Sediment and erosion controls at toe of slope

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RECONSTRUCTING THE ROAD

Sediment and erosion controls at toe of slope

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RECONSTRUCTING THE ROAD

Stockpiled Boulders removed from failed slope to create new toe

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RECONSTRUCTING THE ROAD

Boulders placed to create toe for riprap armored slope

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RECONSTRUCTING THE ROAD

Removal of existing guiderail to facilitate construction

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RECONSTRUCTING THE ROAD

Boulder placement to protect 1930s era culvert

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TIMELINE

1
Hurricane Ida

7
City + Aquarion Meeting

22
Embankment construction complete

4
Development of contingency traffic control plans

1 - 5
Paving

29 - 30
Roadway subbase fine grading

13 - 17
Guiderail?

Sept. | **Oct.** | **Nov.** | **Dec.**

23
City secures permission to construct on private property

27
Start embankment reconstruction ZOOM Meeting with neighbors

29
Drainage swales and additional drainage work. (New underdrain)

12
Culvert inspection completed

19
Culvert deck repair designed

20 - 24
Culvert repair

25

Gift of a functional road

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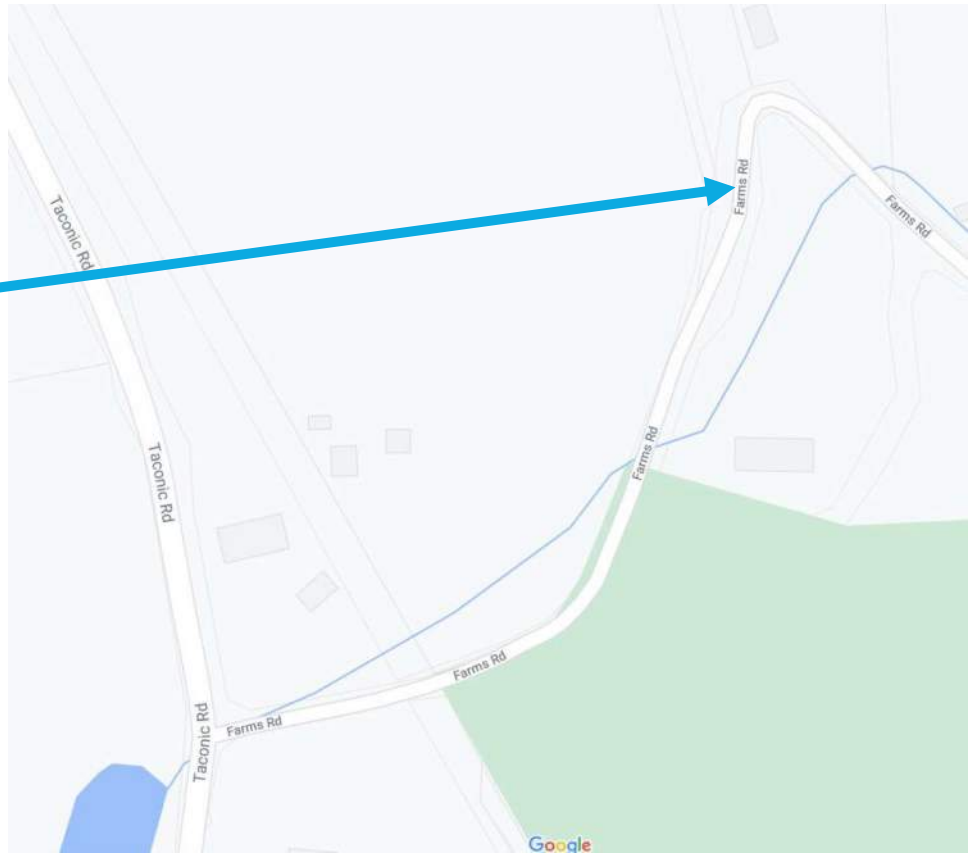
THE ROAD TO RECOVERY



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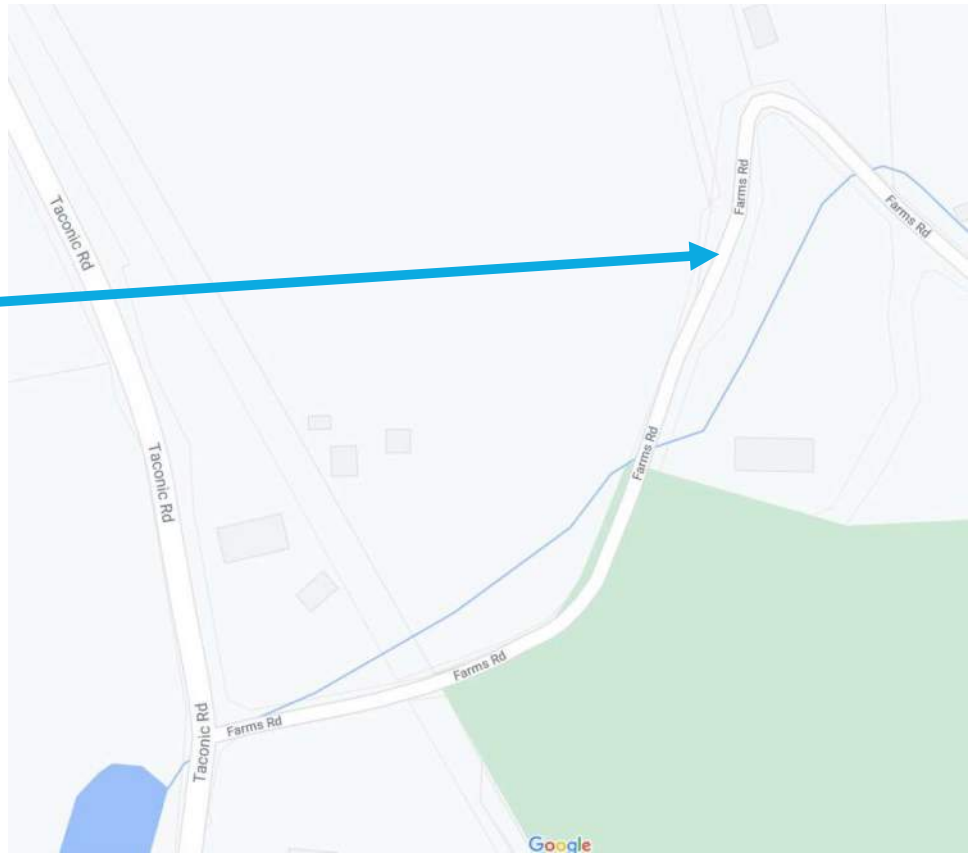

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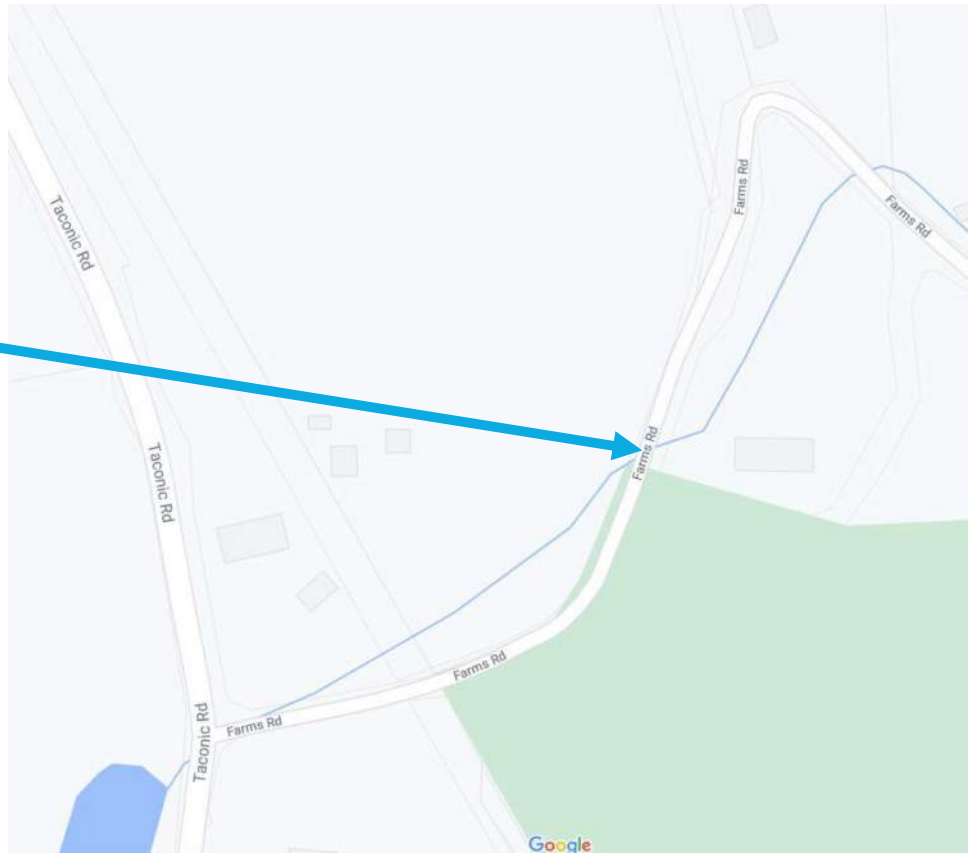

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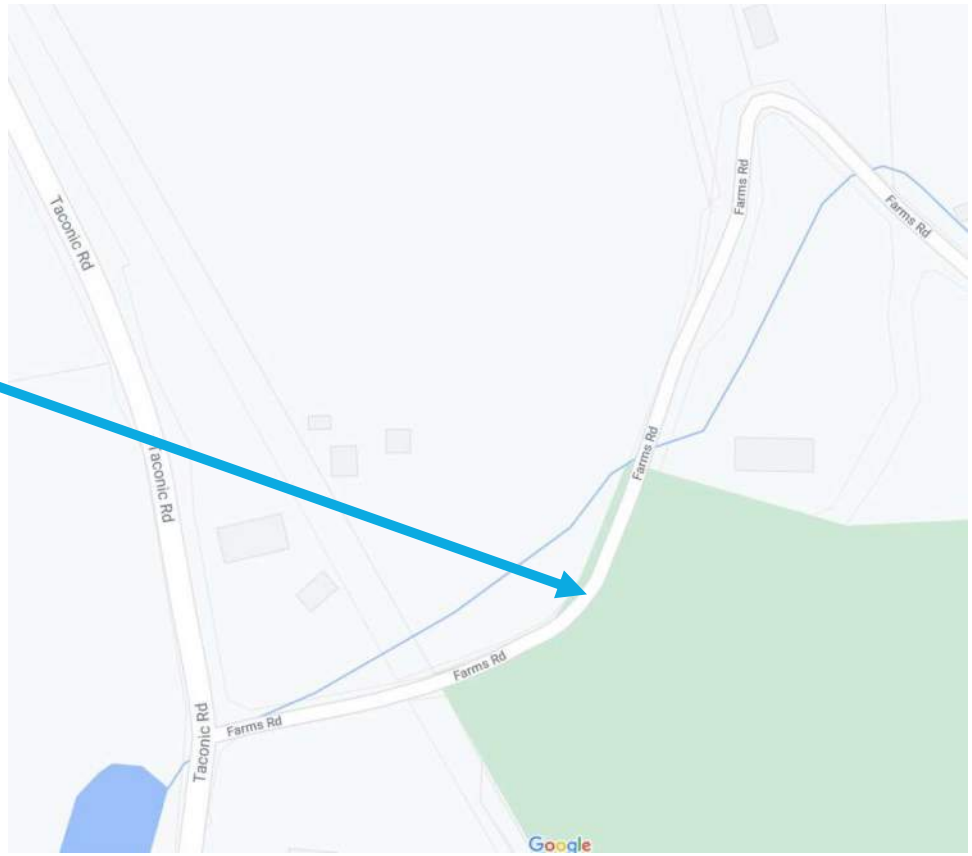

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LESSONS LEARNED

- Change is constant, be prepared to react quickly
- Communication with area residents is key
- Think contingency plans in the event of material not being available
- Be flexible in material choices, specify multiple choices if possible
- Document decisions

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THANK YOU!

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