TOWN OF SOUTH BETHANY
YORK BEACH PHASE II
FLOOD MITIGATION ASSESSMENT AND CONCEPTUAL SOLUTIONS

SOUTH BETHANY RESILIENCY COMMITTEE

NOVEMBER 18, 2026

AECOM

BACKGROUND

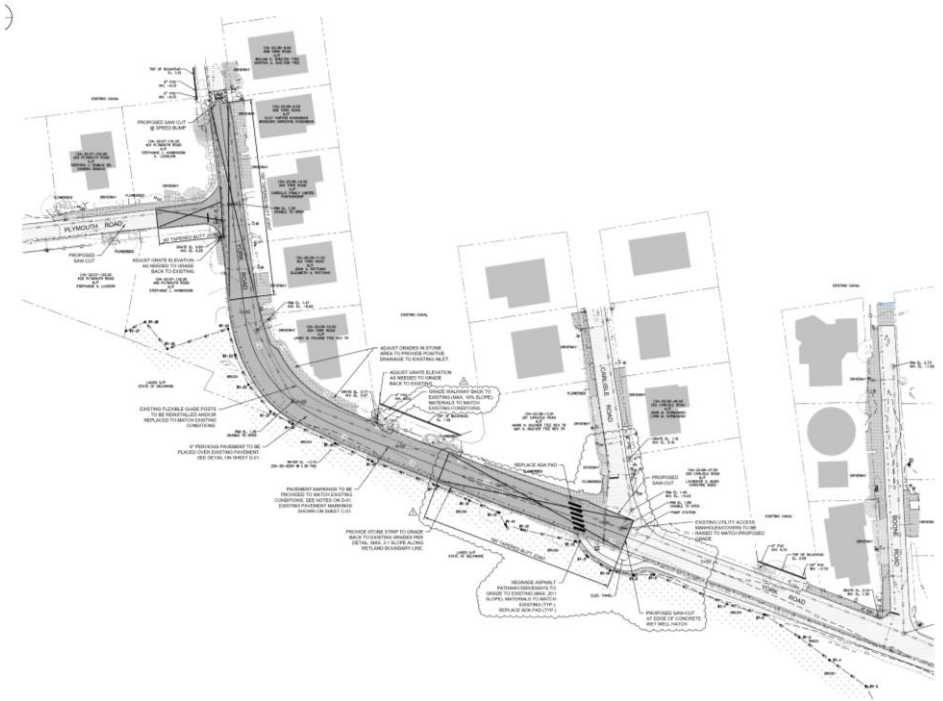
- Purpose of Assessment: Identify potential alternatives and beneficial solutions to reduce or eliminate flooding on the secondary roads of York Beach. The Town desires practical, scalable and cost-conscious approaches that can be implemented over time.
- Jefferson Creek Tidal Station located at the terminus of West 1st Street in South Bethany was utilized to obtain recorded water level data.
- Historic water level data were reviewed between the dates of September 1, 2021 – August 31, 2026.
- Those days where the water level exceeded 1.50' NAVD88 were pulled from the historical data set.
- Justification for water levels of 1.50' NAVD88 being extrapolated is due to the average road elevations of Bristol, Carlisle, Plymouth, Victoria, and York Roads being around 1.50' NAVD88 +/-.
- Recorded days where the water level exceeded 1.50' NAVD88 would have resulted in roadway inundation and presence of water on the streets.
- York Road Phase 1 Improvements implemented May 2026. Improvements generally consisted of 6" permeable pavement overlay

PROJECT STUDY AREA



BACKGROUND – YORK ROAD PHASE 1

- The Town of South Bethany has already undertaken and implemented the York Road Phase I Flood Mitigation & Design Study as the first part of a multi-phased approach that seeks to address the ongoing flooding issues within this portion of its municipal limits.
- Improvements generally consisted of raising 750 LF+/- of York Road 6” using permeable pavement.





BACKGROUND CONT'D

Date Ranges over Past 5-Years	# of Days Water Elevation > or = 1.5 ft. NAVD88
September 1, 2021 – September 1, 2022	17
September 2, 2022 – September 1, 2023	36
September 2, 2023 – September 1, 2024	70
September 2, 2024 – September 1, 2025	37
September 2, 2025 – August 31, 2026	36

- The table to the left shows the number of days where the water level exceeded 1.50' NAVD88.
- A total of 196 days over the course of the 5-year period registered water elevations higher than 1.50' NAVD88.
- If Bristol, Carlisle, Plymouth, Victoria, and York Roads were elevated by 6 inches to a new average elevation of 2.10' – 2.20' NAVD8 +/-, then 163 of the 196 or 83% of days where water levels exceeded the average elevation of the roadways would have been prevented.

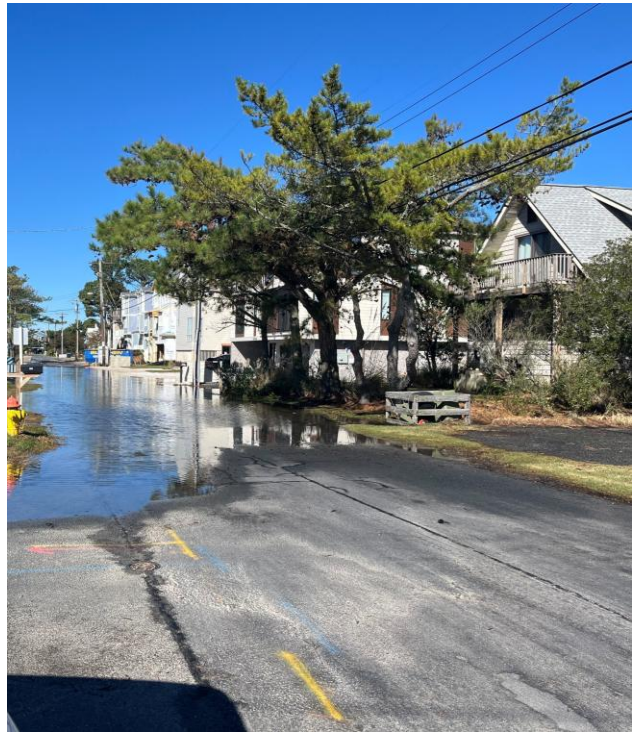
DESIGN SCENARIO #1

- Raise low sections of York Road, Victoria Road, Bristol Road, Plymouth Road and Carlisle Road by 6” to bring the minimum centerline of road elevation 2.00’ NAVD88.
- The roadway would be constructed using porous pavement.
- Approximately 2,700’ of roadway would be elevated.
- This design is economical and if needed, additional paving could occur later to prevent inundation of York Road.







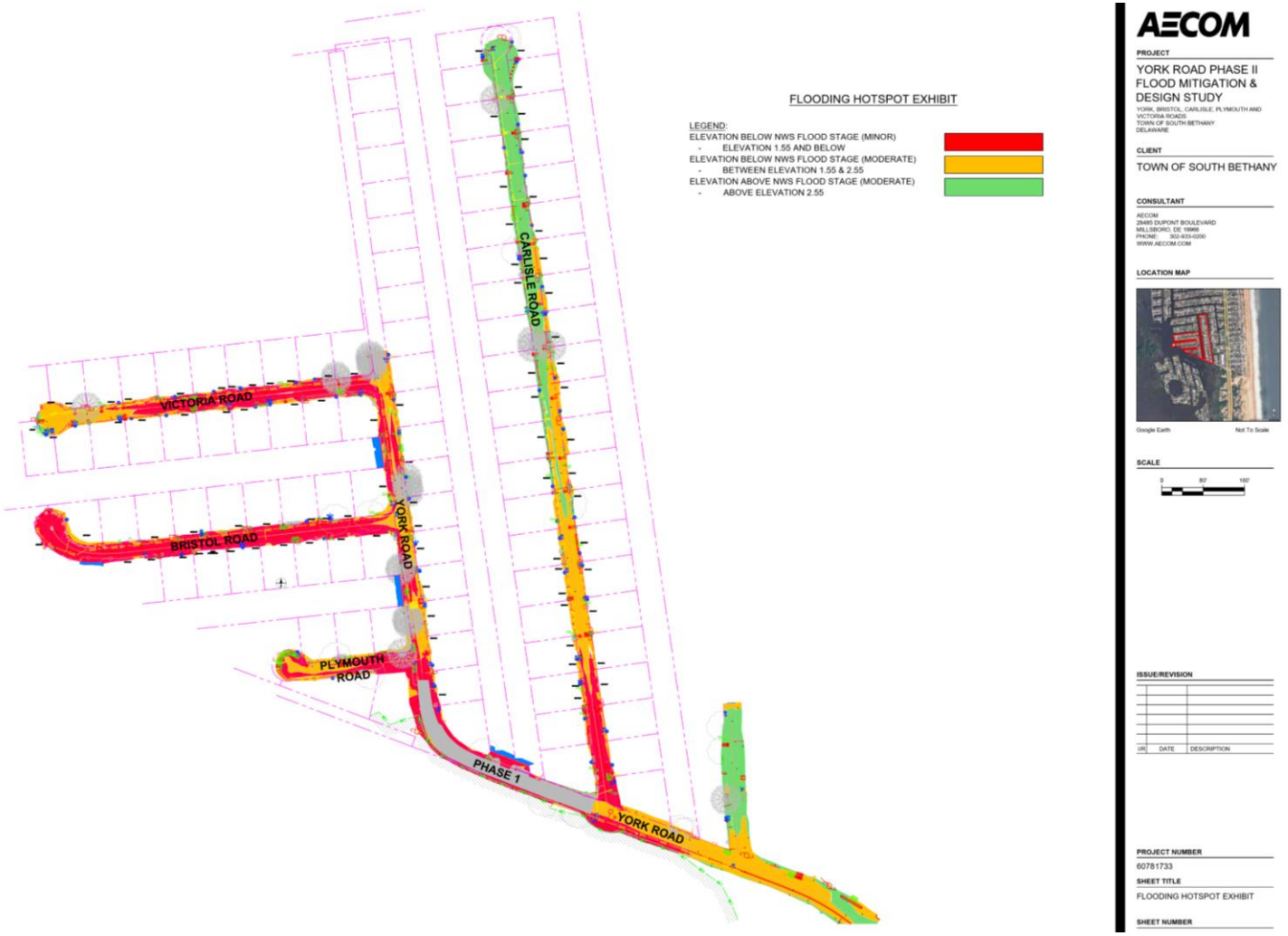


DESIGN SCENARIO #1 – EXISTING CONDITIONS PHOTOS



DESIGN SCENARIO #1 FLOODING EXHIBIT

- Minor Flooding–minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding –some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.

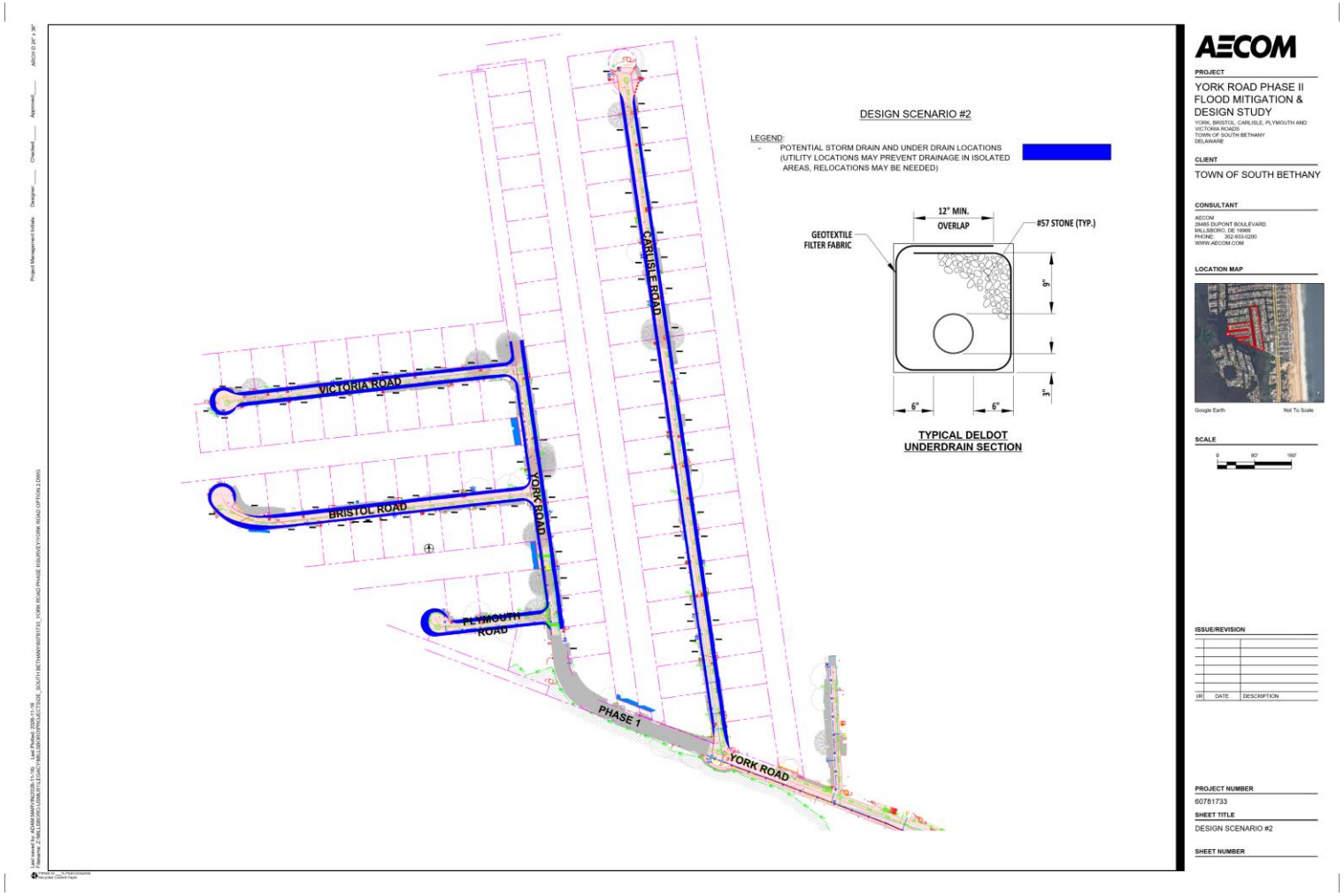


DESIGN SCENARIO #1

- Raising the overall road elevations will reduce the frequency of road inundation resulting from tidal events. There is no guarantee that flooding would be fully mitigated.
- Utility impacts are minimal.
  - Sanitary sewer manhole frame adjustments will be required.
  - Utility relocation would most likely not be required.
- Tie into residential driveways and landscaping features will need to be considered.
  - Phase 1 used uniform stone material along edges to address grade tie in.
  - Paver driveways could be provided apron at right-of-way.
- Average road elevation breakdown.
  - Bristol Road – Elev 1.44
  - Lower portion of Carlisle Road – Elev 1.53
  - Plymouth Road – Elev 1.57
  - Victoria Road – Elev 1.64
  - York Road – Elev 1.65
- Road elevation/paving project could be an interim step to "buy time" until large or additional efforts can be planned, funded and implemented.

DESIGN SCENARIO #2

- Expand closed storm drain system to increase consistent drainage.
- Backflow prevention would be required to prevent tidal impacts being conveyed through the storm drain system.
- Perforated pipe/underdrain can be utilized in conjunction with porous pavement to provide continuous drainage along edge of pavement.







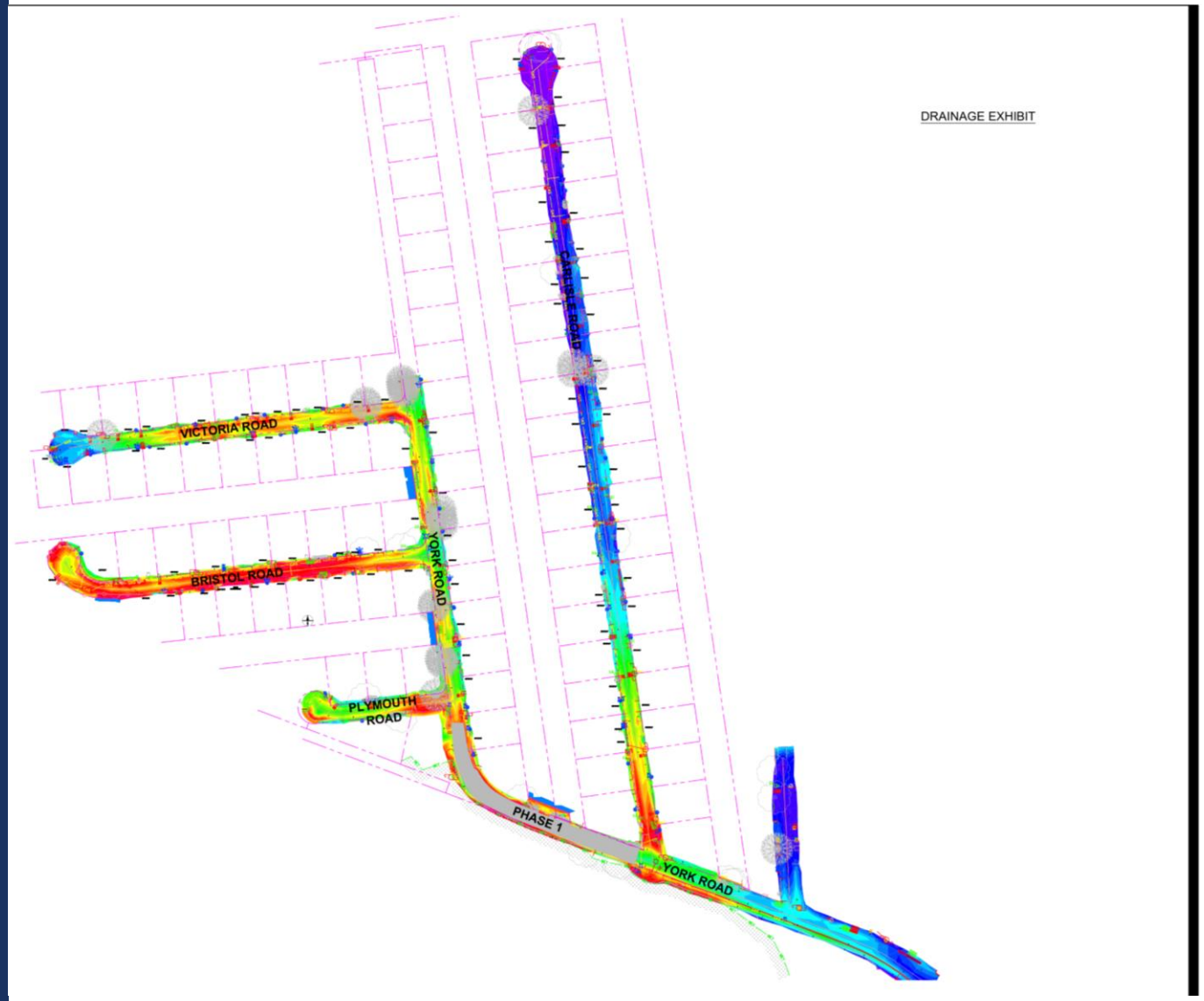


DESIGN SCENARIO #2 – EXISTING CONDITIONS PHOTOS



DESIGN SCENARIO #2

DRAINAGE EXHIBIT



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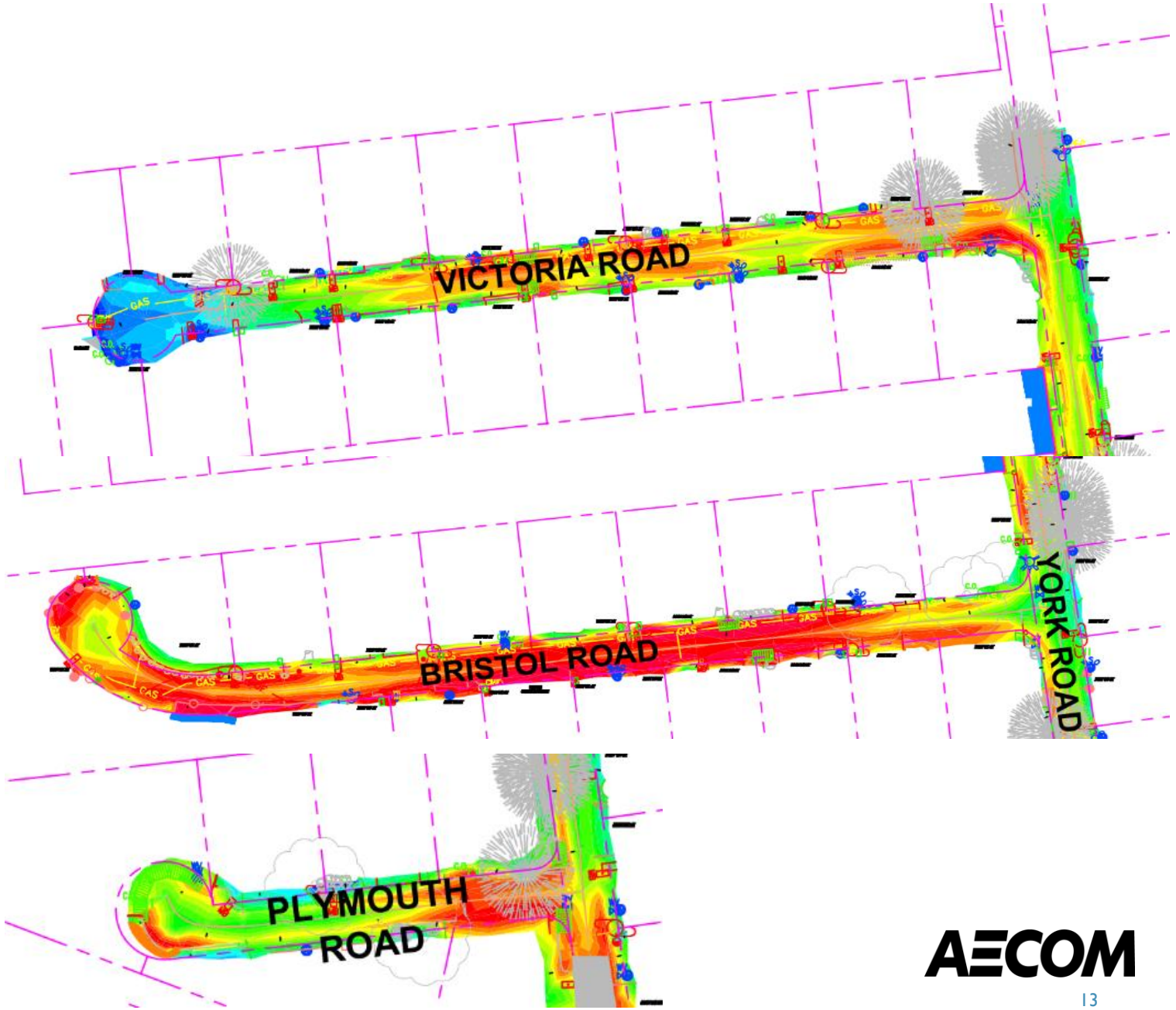
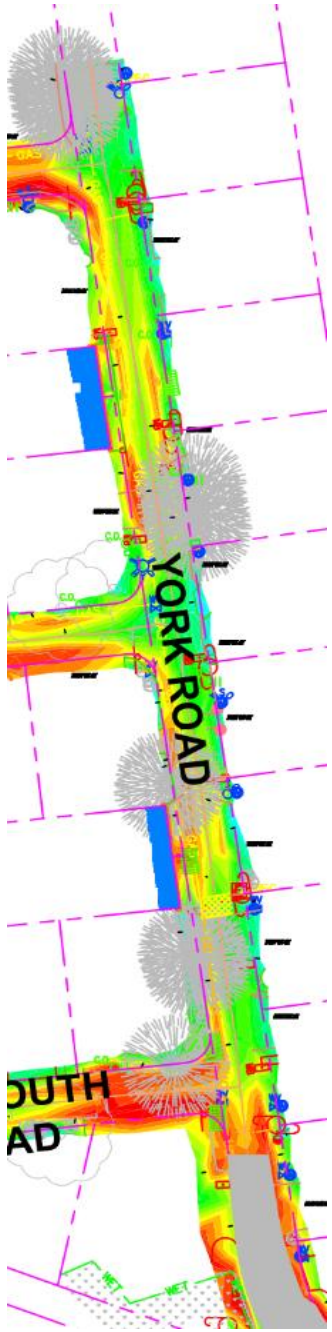
DESIGN SCENARIO #2

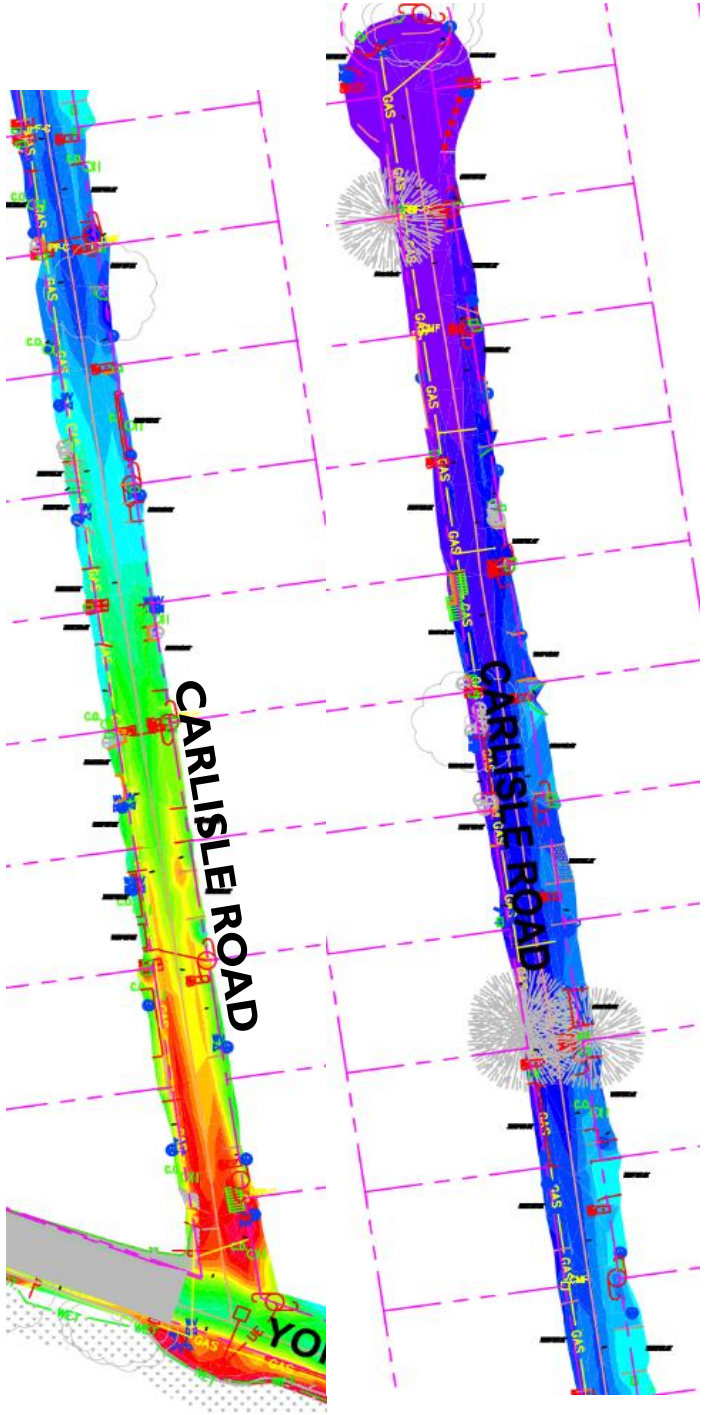
DRAINAGE EXHIBIT



DESIGN SCENARIO #2

DRAINAGE EXHIBIT





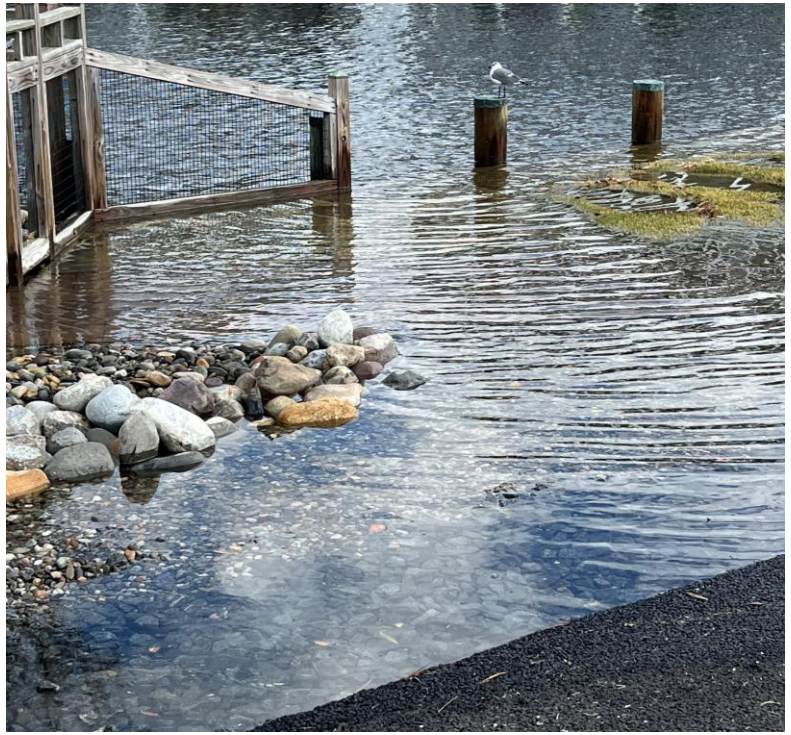
DESIGN SCENARIO #2

- Drainage option can be used as a stand-alone improvement to aid in drainage but will not aid during tidal flooding events. It is recommended to pair drainage infrastructure with Design Scenario #2.
- Limited discharge locations exist. Easements with private landowners will be required.
- Design would require limited pipe sizes and slopes. Additional hydraulic and hydrologic modeling will be required.
- A combination of additional catch basins, stormwater piping, underdrain system and improved/new outfalls with tide valves can be added to improve drainage.
- Existing utilities will limit the design layout. Minor relocations may be needed.

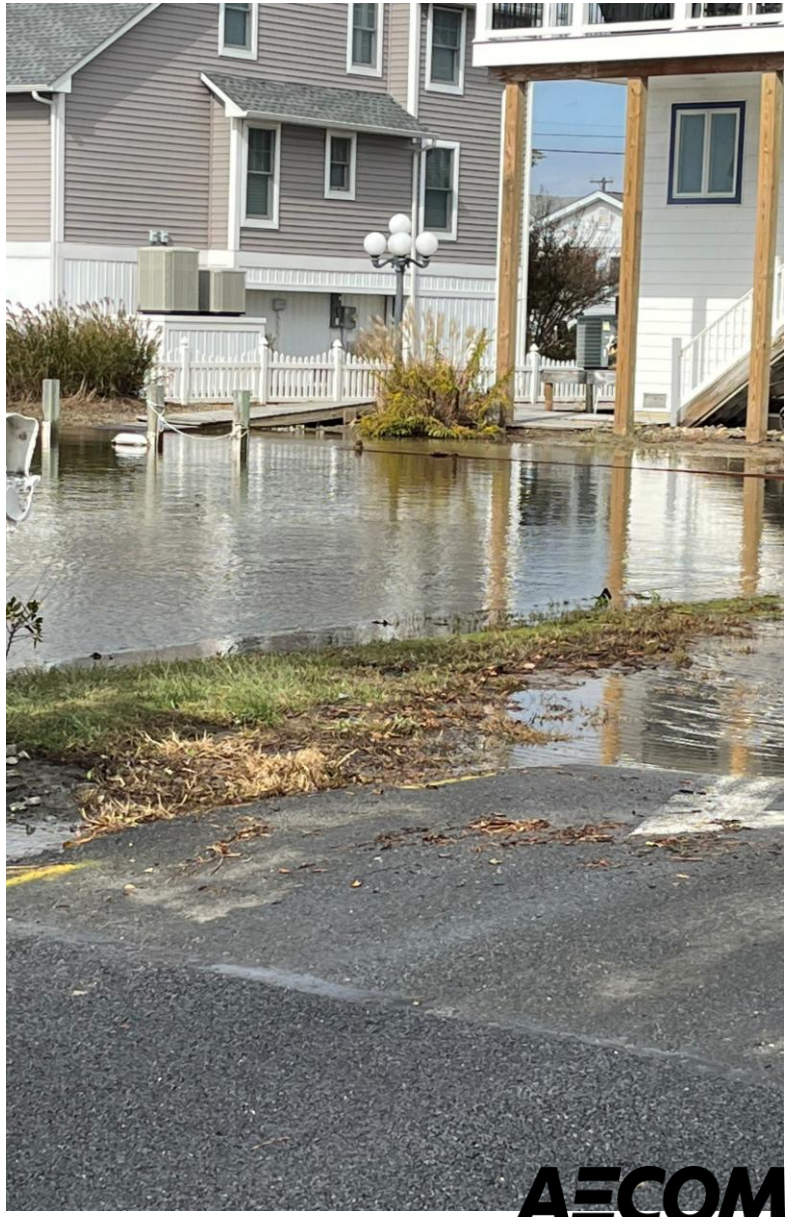
DESIGN SCENARIO #3

- Raise elevations adjacent to low lying bulkheads along York Road, boat ramps and the section of York Road immediately adjacent to Jefferson Creek.
- This option would increase elevation in lower areas being inundated with tidal flooding during early stages.
- Grading feature elevation would target consistency with private bulkhead and yard elevations around elevation 2.25.









DESIGN SCENARIO #3 – EXISTING CONDITIONS PHOTOS

DESIGN SCENARIO #3

- Closed drainage system improvements will be required with grading features noted in Design Scenario #3.
- Coordination and easements with private landowners will be required. This method would not be appropriate if the proposed earthwork did not tie in-to higher elevations located on adjacent properties. Effectiveness will be contingent on the tie-in elevation.
- Raising elevations at the shown locations will prevent drainage if the grading features are breached. Relying on the storm drain system to drain the trapped tidal pooling left by receding tides.
- Periodic maintenance may be needed as the berms would be subject to erosion during storms or other events breaching the grading features.

COMMENTS AND QUESTIONS