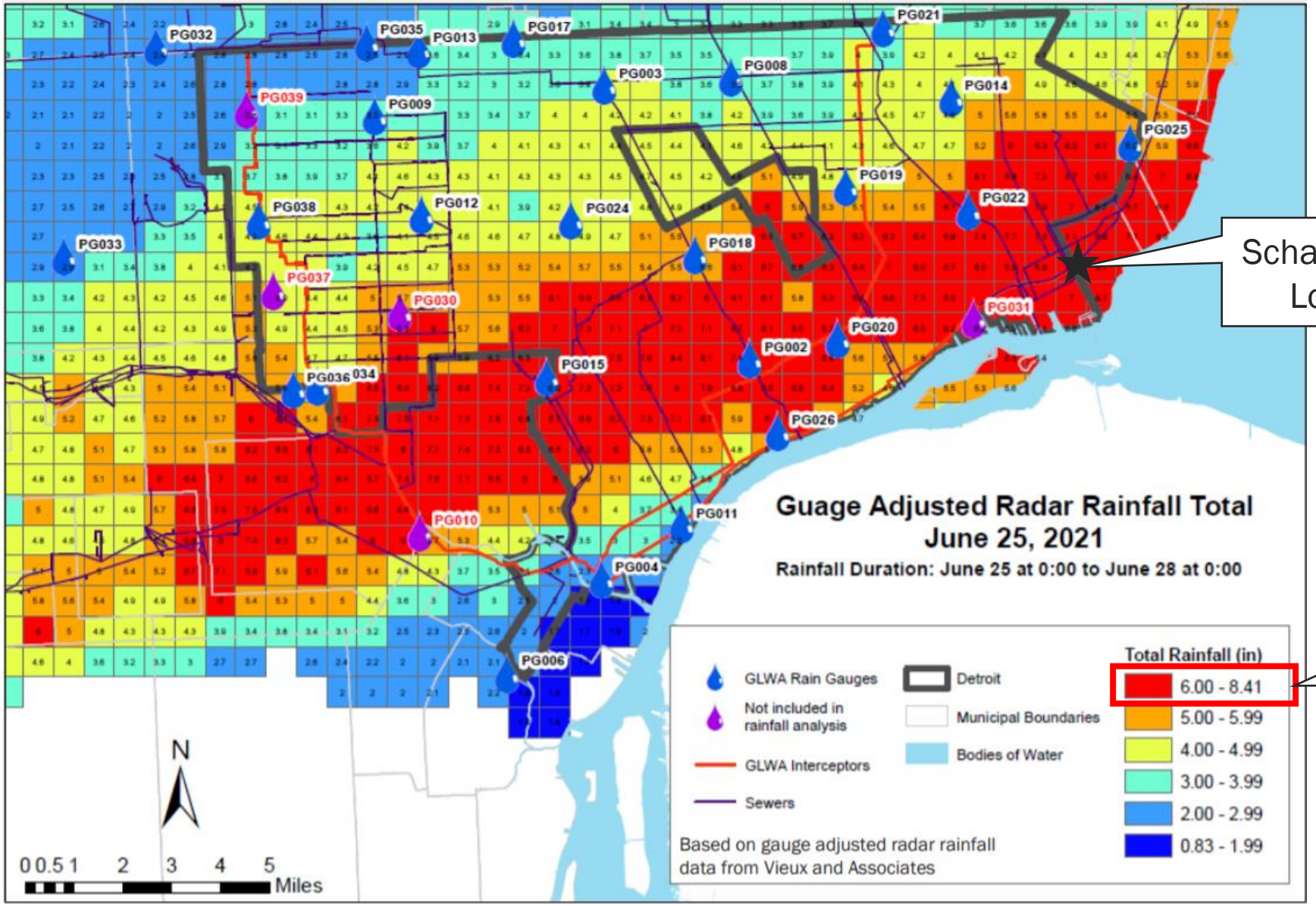
Schaap Center Flooding Risk Evaluation

September 17, 2021

June 25, 2021 Event Rainfall



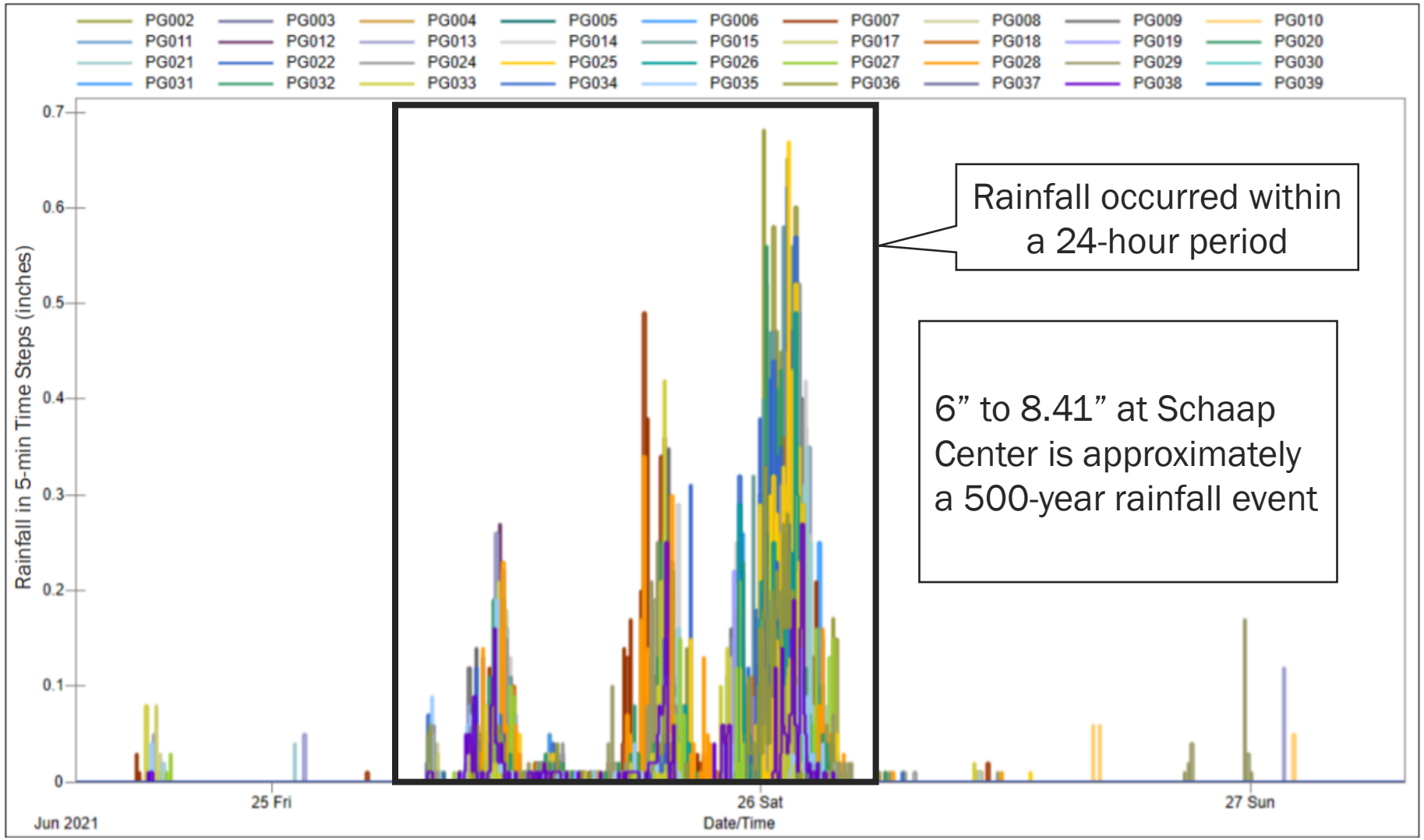
Schaap Center Location

6.00” – 8.41” Total Rainfall

From GLWA Board of Directors Meeting September 2021

June 25, 2021 Event Return Frequency

- NOAA Rainfall Atlas 14: 500-yr, 24-hour Rainfall = 6.63”



From GLWA Board of Directors Meeting September 2021

Flooding Risk

Subsurface Connected to Storm Sewer

- Floor drains – Design includes a connection to sump pump
- Footing drains – Design includes connection to sump pump

Subsurface Connected to Combined Sewer

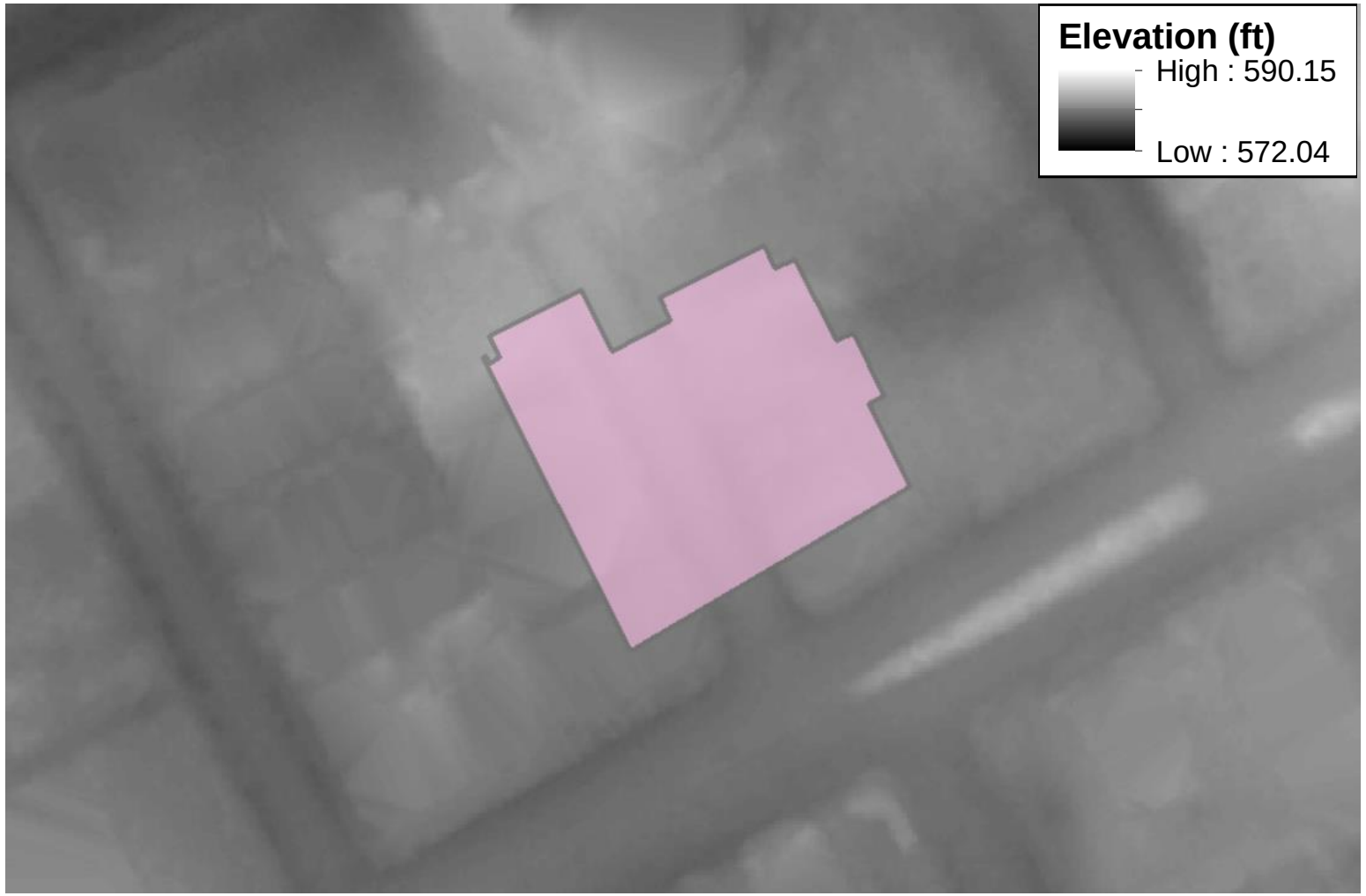
- Sanitary – No source of sanitary flow below ground level

Surface

- Investigate risk of overland flow entering the building

LiDAR Data from SEMCOG

- Light Detection and Ranging (LiDAR) data from Southeast Michigan Council of Governments (SEMCOG)
- LiDAR Data used to create a surface model of the area

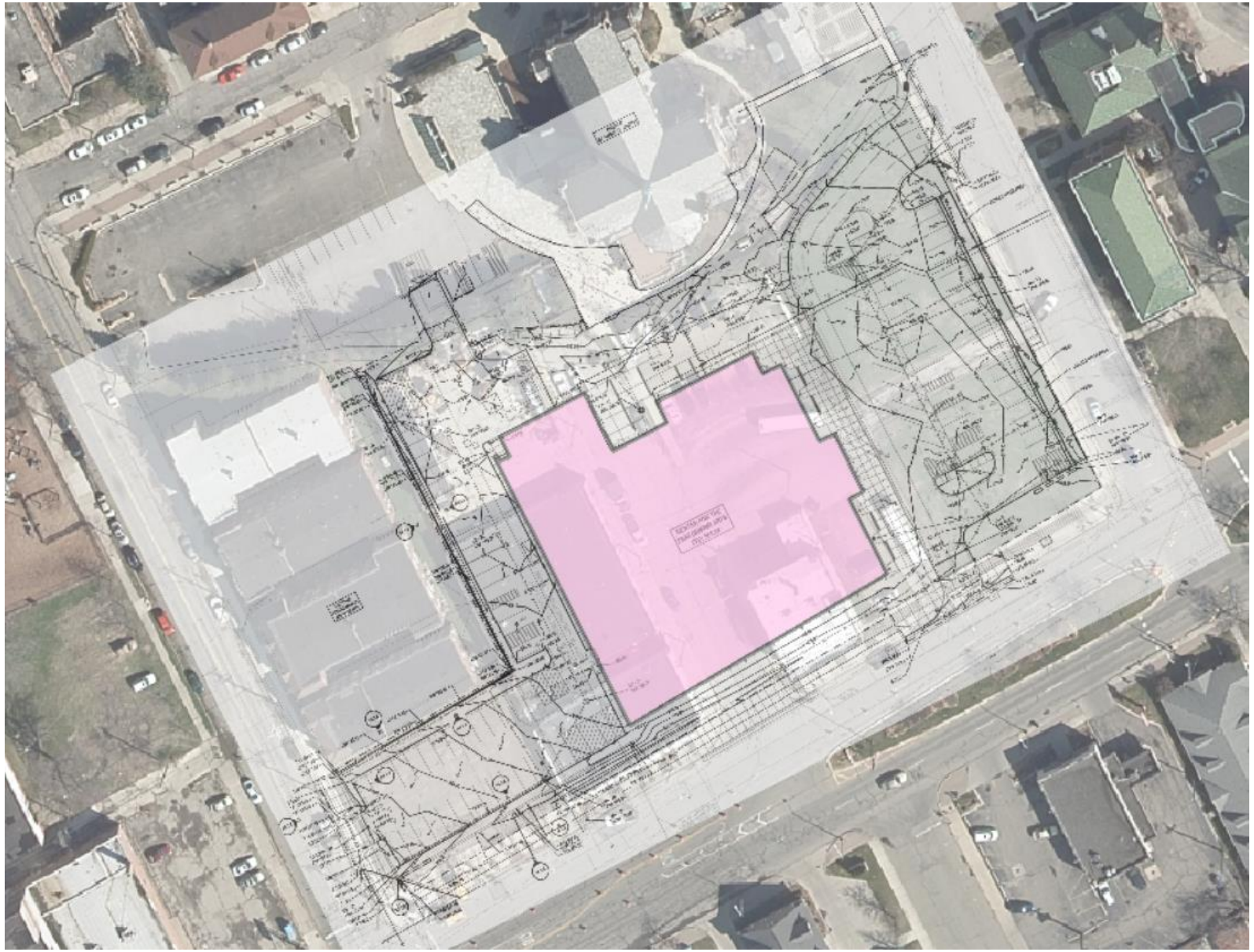


Spot Elevations Check

- LiDAR data was checked against surveyed spot elevations
- Elevation differences ranged from 0-ft to 0.5-ft
- LiDAR data trended higher than survey data

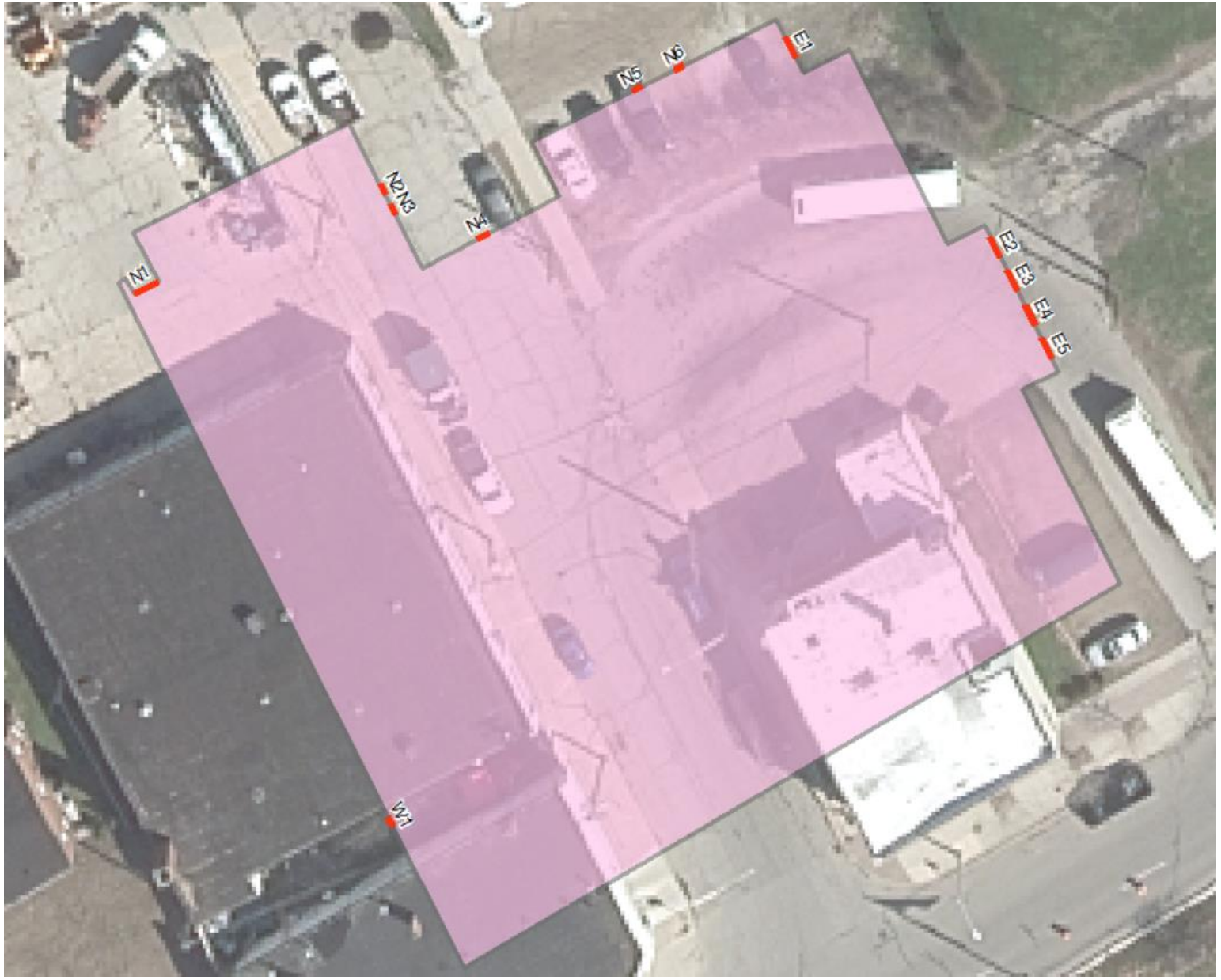
Building Footprint Location on Site

- Location of proposed building footprint was developed using plans



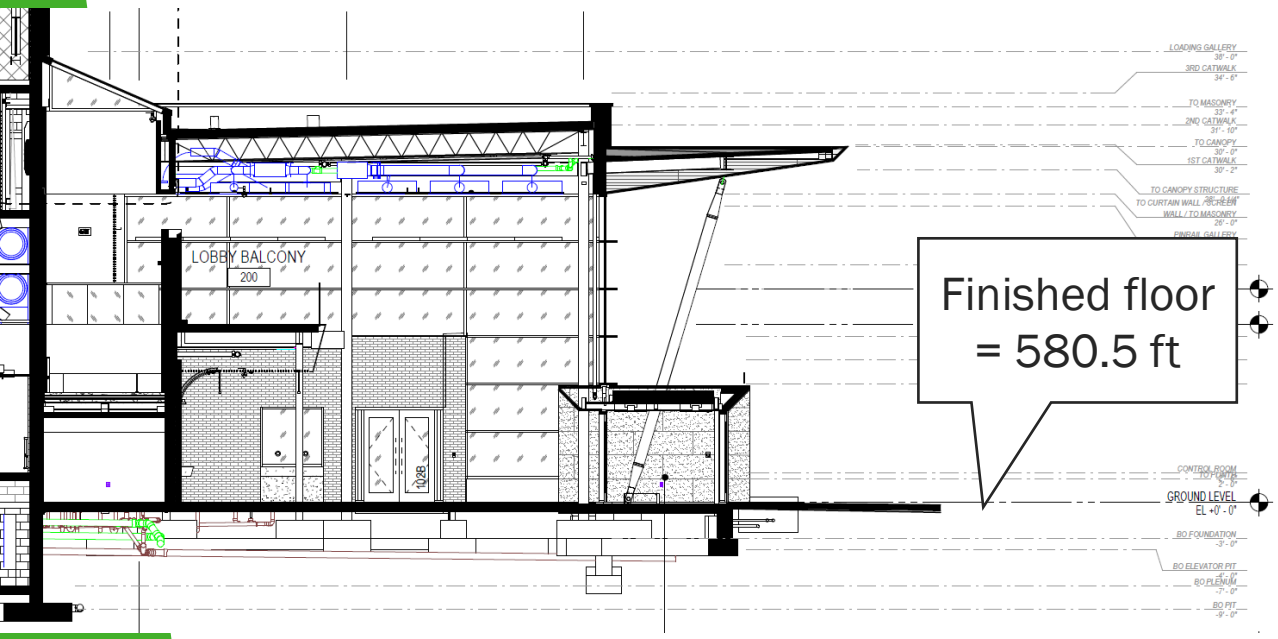
Door Locations

- Entrances to building were identified based on plans



Door Elevations Relative to Existing Ground Surface

Ground is higher than floor at North entrances



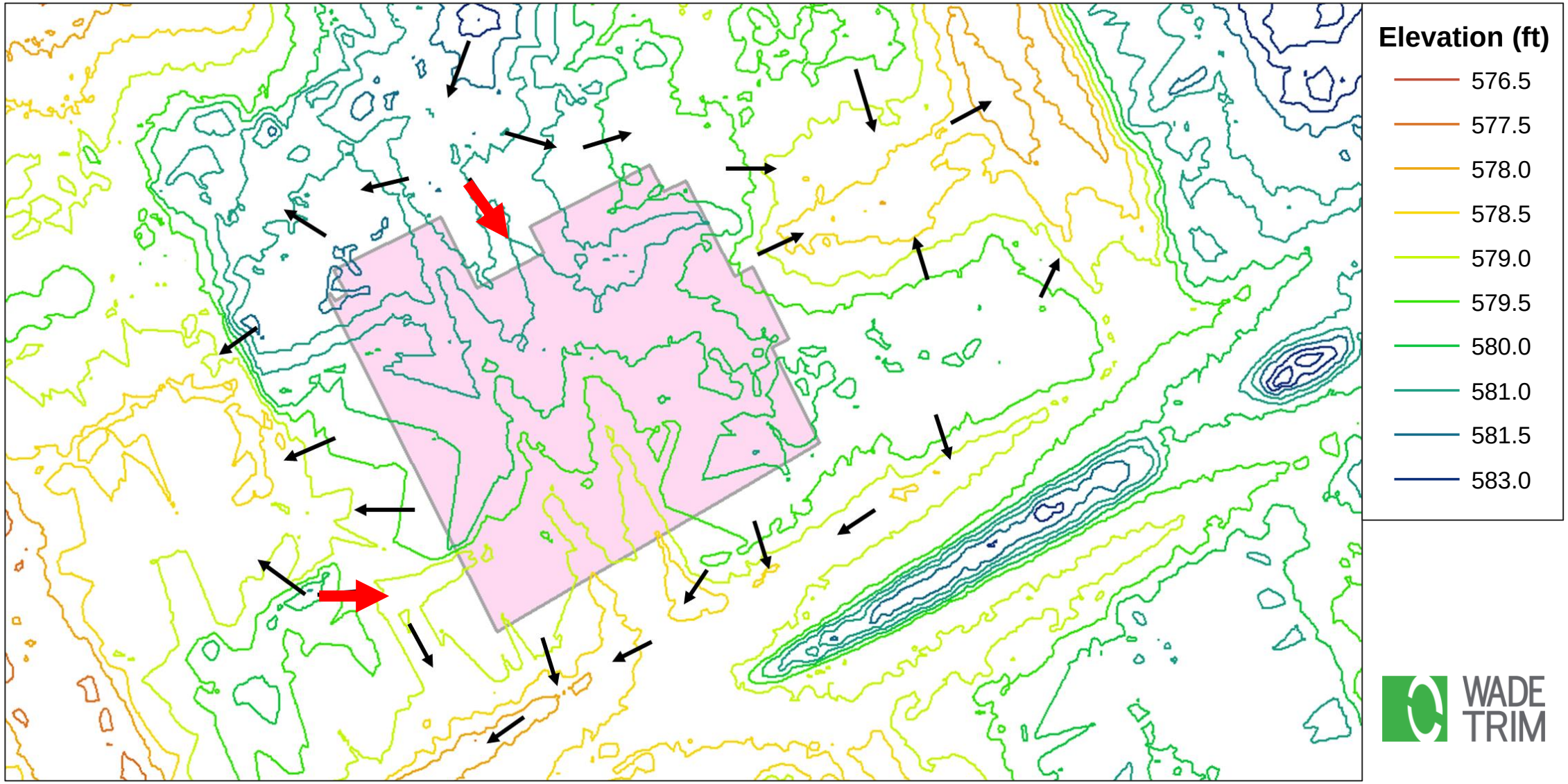
Entrance	LiDAR Elevation (ft)	Adjacent Ground above finished floor (ft)
W1	578.85	-1.65
N1	581.65	1.15
N2	581.09	0.59
N3	580.97	0.47
N4	580.81	0.31
N5	580.24	-0.26
N6	580.12	-0.38
E1	579.76	-0.74
E2	579.37	-1.13
E3	579.46	-1.04
E4	579.68	-0.82
E5	579.81	-0.69

- Finished floor = 580.5 ft

6” Contours From LiDAR Data

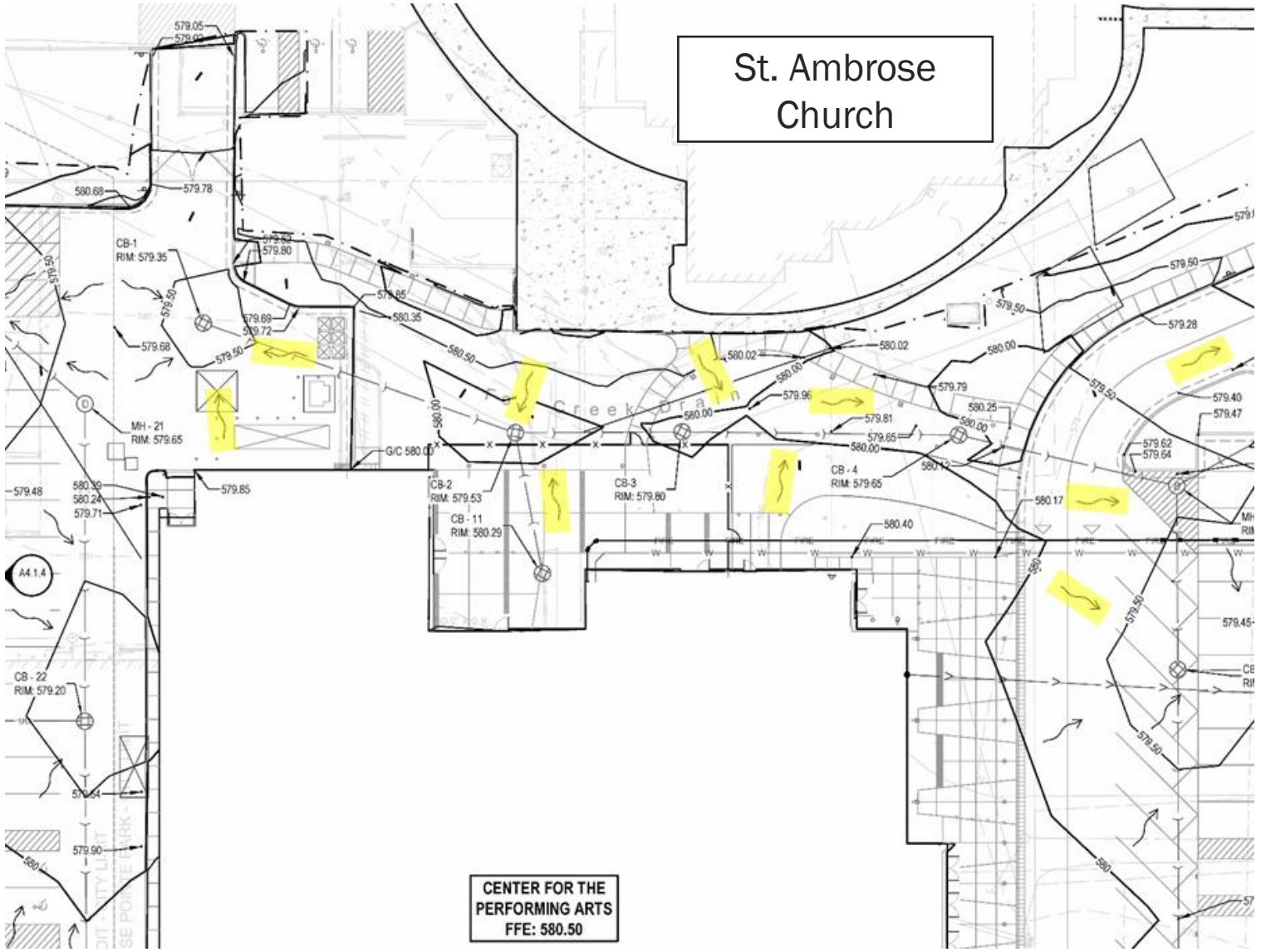
- Contours generated from LiDAR data
- Blue = High Elevation
- Red = Low Elevation

Surface Flow Directions (Existing Grade) (Majority of surface flow is away from building)



Surface Flow Directions (Proposed Grading)

- Proposed grading is lower than door thresholds
- Flow is directed toward proposed catch basins
- Surface grading does not increase flow toward St. Ambrose Church



June 25, 2021 Flooding Analysis

- Photo used to estimate flood level and extent of flooding for June 25, 2021 event

St. Ambrose Parish Photo Album: Flood – June 26, 2021

June 25, 2021 Estimated Extent of Flooding

- Flood elevation was determined to be 578.5’ based on photo and LiDAR data
- Areas below 578.5’ are shaded in orange
- Flooded area is not overlapping with Schaap Center footprint

Conclusions

1. The design protects floor drains from storm sewer backwater using a sump pump.
2. The design protects footing drains from storm sewer backwater using a sump pump
3. Sources of sanitary flow are above the ground surface and will be able to enter the combined sewer via gravity during sewer backwater conditions
4. Surface water generally flows away from the building
5. There may be some risk from surface flooding on the North side of the building and at the SW door.
6. The propose grading is not expected to increase the risk of flooding on the St. Ambrose Church property or adjacent properties.

Next Steps

1. Review design to verify capacity of sump pump
2. Investigate incorporating backflow prevention into the storm and sanitary connections
3. Verify grading plan on North side of building directs surface flow toward Maryland St. during extreme storm events
4. Verify grading plan diverts flow away from building at the Southwest door.

Questions?