



INTEROFFICE MEMORANDUM

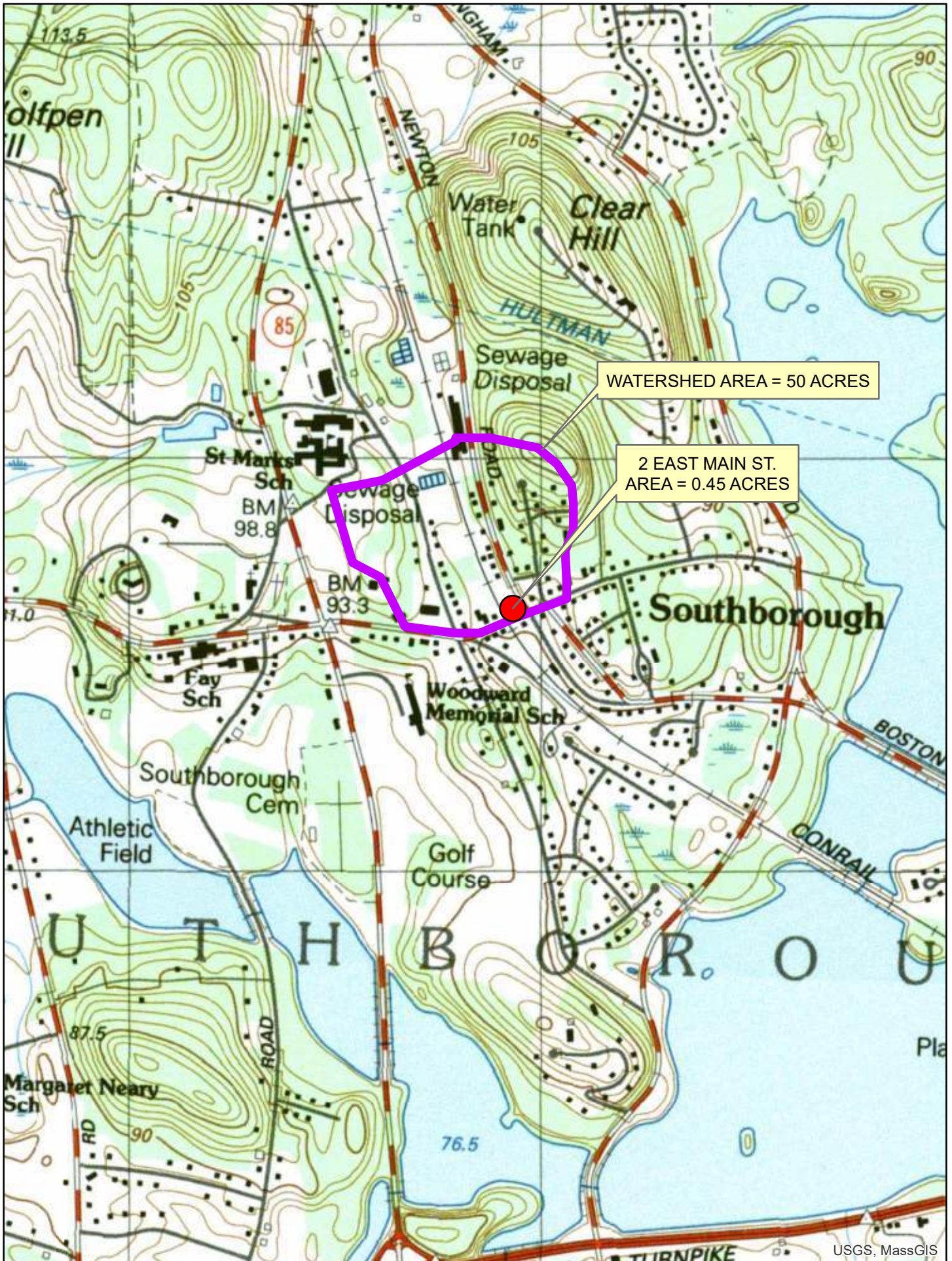
To: Southborough Planning Board
From: William J. Cundiff, P.E. , DPW Superintendent
Date: January 9, 2025
RE: MSPA & Special Permit Application (2 East Main St.)

The Town Planner forwarded a copy of the above-mentioned application, requesting input on the Stormwater Design, particularly as it may pertain to, or impact, the Street Drainage System. The proposal is to redevelop the approx. 0.45 Ac. site located immediately northwest of the Newton Street and East Main Street Intersection. The site has the CSX Railroad along its entire westerly boundary and residential property to the north. Street Drainage systems are located both along East Main Street and along Newton Street. Each of these drainage systems appear to discharge stormwater south of East Main Street, west of Boston Road, and East of the CSX Railroad. The watershed area (highlighted on the attached USGS Map) collects water from approximately 50 acres which currently feeds the surface water into two open-ended culvert pipes located on either side of the railroad tracks, at the north side of East Main Street. Meaning, this is the low point of the watershed area, and this is where the stormwater discharge from the site will flow. The proposed area of disturbance is approximately 1/100th of the overall watershed area, conservatively.

Although the culvert(s) located along the railroad tracks collect water and discharge into the Municipal street drainage system, it is my opinion that these are not Town-Owned pipes. I expect that these pipes were installed as part of railroad construction. Maintenance associated with these pipes, and their inlets, does not fall with the Town.

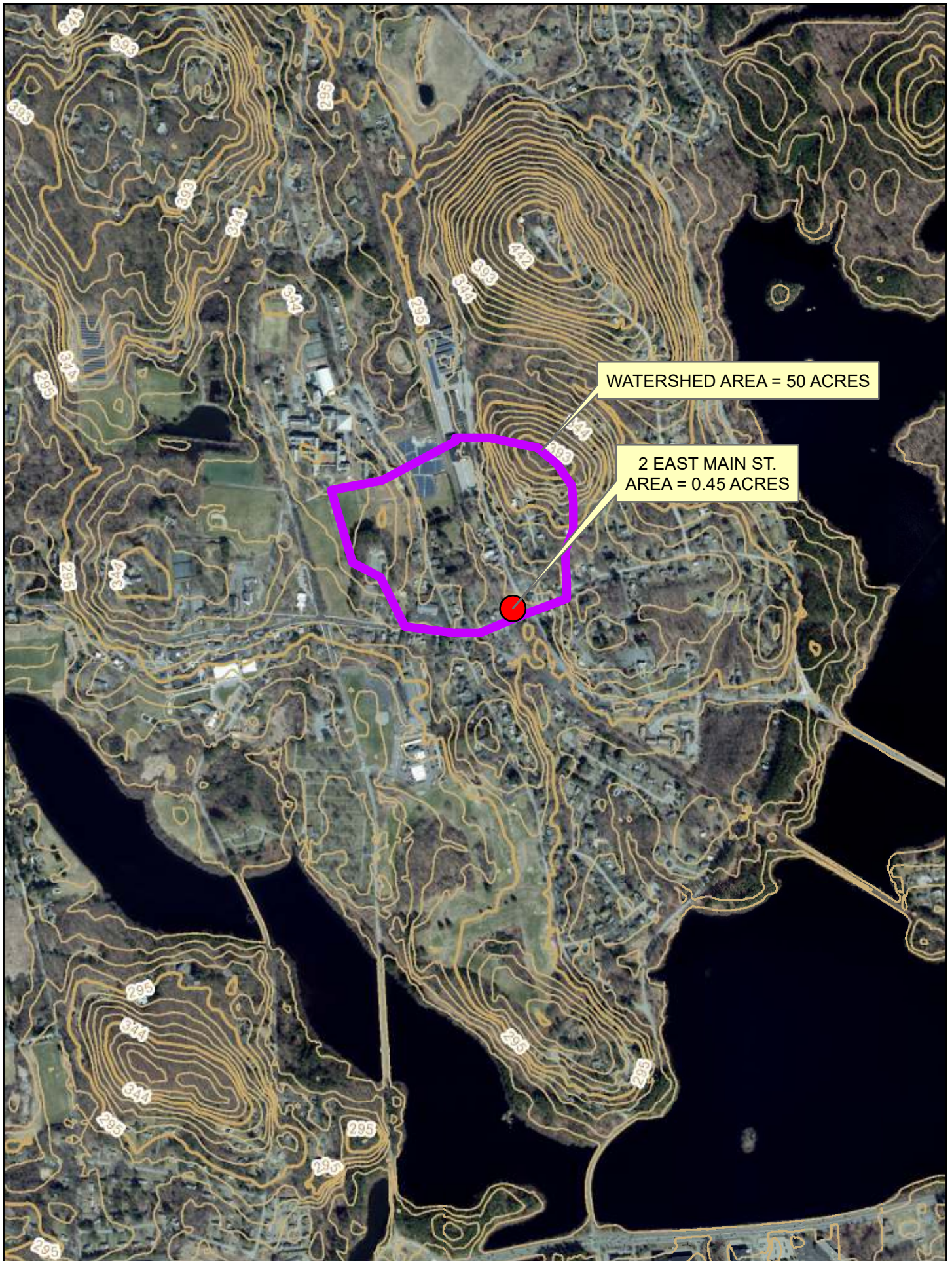
An 18-inch Diameter Corrugated Metal Pipe at a slope of 3.4% has a flow capacity of 7.09 cfs (This is the downstream outlet pipe). This appears to be the limiting factor in the street drainage system for flow from the site. This street drainage system collects runoff. A quick streamstats analysis shows that there is a 20% Annual Exceedance Probability (AEP) flood value of 7.59 cfs. In other words, there is approx.. a 20% chance in a given year that the street drain system will be at its capacity. See attached stream stats. This may cause a surcharge of water in the upstream pipes and inlets. Please note that this is a cursory review and not a detailed hydraulic analysis.

I visited the site with a few property abutters and they mentioned that in addition to poor local drainage, their concern was sight distance for vehicles leaving Newton Street (travelling south). As you know, the proposed building is located close to the intersection of East Main Street and Newton Street, so I quickly reviewed this. AASHTO calculations for cornering sight distance (leaving Newton Street looking for cars travelling eastbound on Main Street). The driver would be located 10 feet back off the travel lane (I conservatively carried 14 – feet), needs to see a car at 90 feet away (when in a 20 mph zone). See attached AASHTO Exhibit 9-51 and the plan view figure of the intersection attached to this memo. Based upon my analysis, the proposed building does not impede sight distance at the intersection. Note: We do NOT measure from the stop line for cornering sight distance.



1 inch = 1,000 feet

LOCUS MAP
2 EAST MAIN STREET

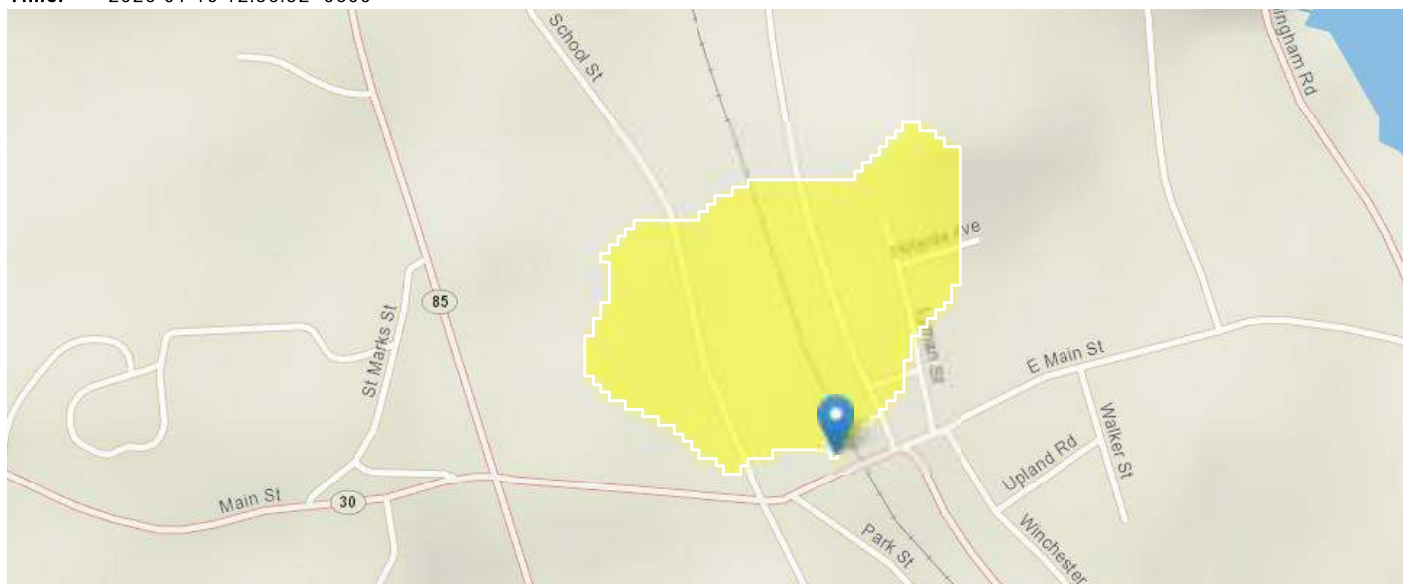


1 inch = 1,000 feet

LOCUS MAP
2 EAST MAIN STREET

StreamStats Report

Region ID: MA
 Workspace ID: MA20250110173504694000
 Clicked Point (Latitude, Longitude): 42.30609, -71.52387
 Time: 2025-01-10 12:35:32 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.049	square miles
ELEV	Mean Basin Elevation	321	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	0	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.049	square miles	0.16	512
ELEV	Mean Basin Elevation	321	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	0	percent	0	32.3

Peak-Flow Statistics Disclaimers [Peak Statewide 2016 5156]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Peak Statewide 2016 5156]

Statistic	Value	Unit
50-percent AEP flood	4.36	ft ³ /s

Statistic	Value	Unit
20-percent AEP flood	7.59	ft ³ /s
10-percent AEP flood	10.3	ft ³ /s
4-percent AEP flood	14.3	ft ³ /s
2-percent AEP flood	17.6	ft ³ /s
1-percent AEP flood	21.3	ft ³ /s
0.5-percent AEP flood	25.4	ft ³ /s
0.2-percent AEP flood	31.3	ft ³ /s

Peak-Flow Statistics Citations

Zarriello, P.J., 2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016–5156, 99 p. (<https://dx.doi.org/10.3133/sir20165156>)

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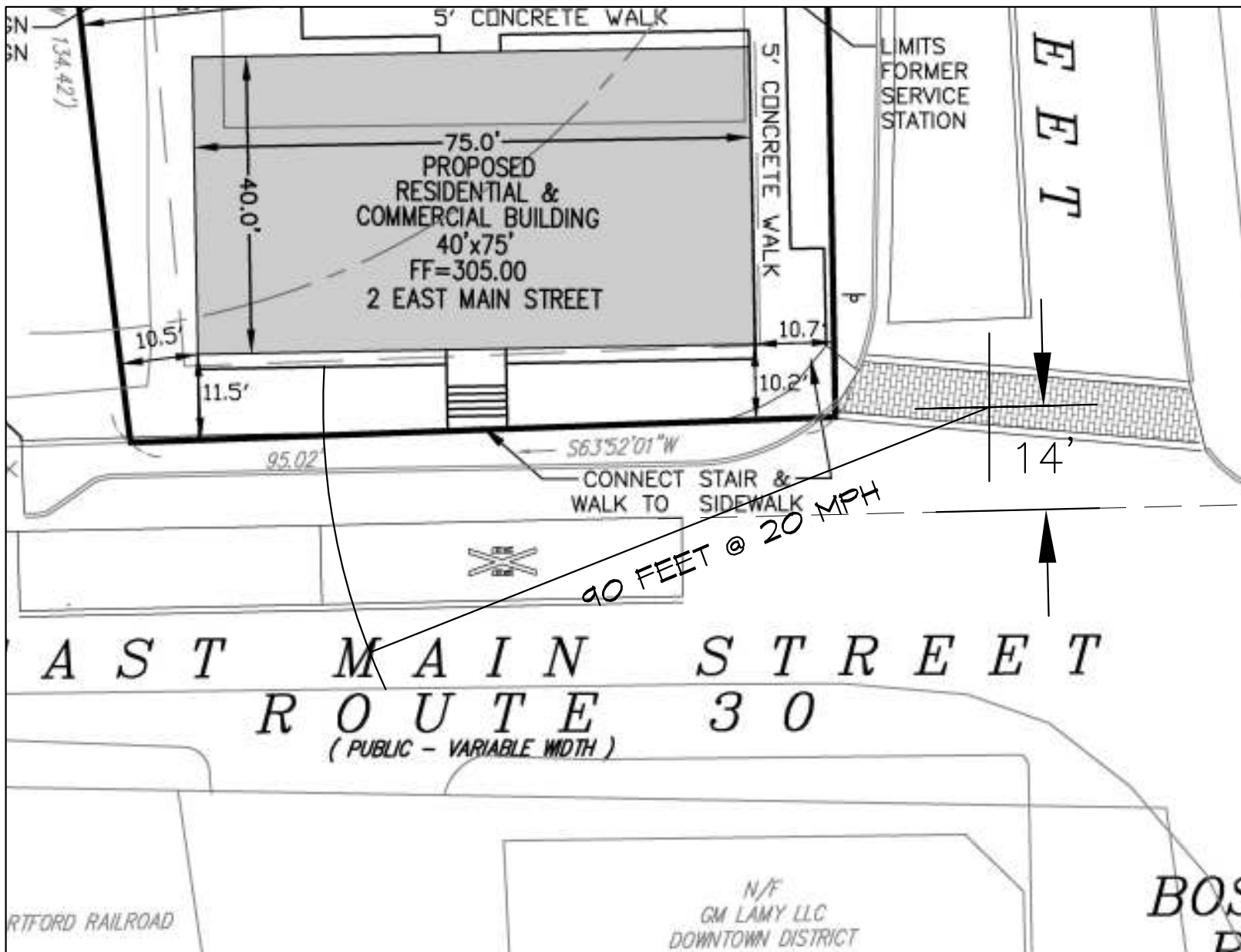
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Application Version: 4.25.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1



2 Main St.
Sight Dist.

Metric		US Customary	
Design speed (km/h)	Length of leg (m)	Design speed (mph)	Length of leg (ft)
20	20	15	70
30	25	20	90
40	35	25	115
50	45	30	140
60	55	35	165
70	65	40	195
80	75	45	220
90	90	50	245
100	105	55	285
110	120	60	325
120	135	65	365
130	150	70	405
		75	445
		80	485

Note: For approach grades greater than 3%, multiply the sight distance values in this exhibit by the appropriate adjustment factor from Exhibit 9-53.

Exhibit 9-51. Length of Sight Triangle Leg—Case A—No Traffic Control