May 21, 2021

MEMORANDUM

INFORMAL DISCUSSION
MEETING OF 05-27-21

To: Conservation Commission/Inland Wetlands and Watercourses Agency

From: Tom Mocko, Environmental Planner

Re: **Proposed 3-lot Churchill Subdivision** – 3 frontage lots including an **existing house** at **31 Hopewell Road** (north side) on 0.94 acre – Village Residential Zone and Groundwater Protection Zone 1 – Megson, Heagle & Friend, C.E. & L.S., LLC – **Contrail, LLC (c/o Bradley Churchill), landowner/applicant**

LOCATION: Refer to the location map that appears on the cover sheet of site plans within your packet.

PROPOSAL: To subdivide this nearly one-acre residential property (with a 1926-built Cape located within the western portion of this parcel) into three lots, thus creating two new building lots. Public MDC water supply and sanitary sewers are available. There are no wetlands, watercourses or regulated upland review areas on the site or anywhere close by.

REVIEW: Within your packet is the submitted set of site plans. Please note that the proposed corners of the houses and centerlines of driveways represented on the plans should be staked and labelled for your site review.

Following this memorandum are: a letter dated May 12, 2021 addressed to the Assistant Town Engineer from the project engineer Mark Friend; and four GIS-generated maps that may be useful to you. Said letter provides details of the proposed stormwater management measures and demonstrated compliance to the Ground Protection Regulations (Section 20 of the Town's Zoning Regulations). All of this information is generally acceptable to staff.

The site falls within the Village Residential Zone in which covers a rather small, limited area in town and we infrequently deal with. The minimum zoning requirements for this zone are:

- 10,000 square feet lot area;
- 75 feet of frontage;
- 20 foot front yard setback;
- 30 foot rear yard setback; and
- 10 foot side yard setbacks.

According to the soil survey information, the site's soils are:

- Predominantly the well-drained Haven and Enfield silty loam soils on 3 to 8 percent slopes; and
- The excessively-drained Manchester gravelly sandy loam soil on 15 to 45 percent slopes limited to the steeper sloped area on the site's northeast corner.

All soils are underlain by coarse-grained stratified drift deposits. The Haven and Enfield soil are finer-textured and less permeable in the upper soil horizon than the Manchester soil.

This nearly one-acre site can be characterized as an overgrown and neglected vacant residential property. Flowers and ground covers are still evident amongst the currently overgrown vegetation throughout the site. Some tall evergreen tress exist in the northeast portion of the site (within proposed Lot 3) and are identified on the plans as pines; I believe that they are not all pines as one is a cedar and one is likely a Norway Spruce. Invasive plant species exist on the site (Japanese barberry, multi-flora rose, burning bush and oriental bittersweet vine were spotted.) **Be CAREFUL of the POISON IVY when visiting the site!**

In the site's northeast corner and on the steeper slopes and amongst the dense vegetation are the remains of a small, cabin-like structure with a stone masonry fireplace and chimney.

This subdivision proposal is rather basic and primarily involves house lot construction activities for two modest-sized houses; no on-site septic systems and water wells are needed. The land's grades are manageable where construction is proposed; Lot 3's house is the most challenging where the slope is nearly at 17 percent. The submitted soil erosion and sediment control plans will suffice for the proposed construction given the small scale of the project and the site characteristics.

The site's impervious coverage is currently at 4.9 percent and proposed post-development coverage is 17.7%. The small site and project does not require any stormwater detention for mitigation of the increased runoff, but **water quality mitigation** measures are required. Rain gardens for all three lots and underground infiltration structures for the roof runoff from the two, new houses are the proposed water quality mitigation measures. The Engineering Department is conceptually in agreement with the project's proposed stormwater management plan. The plans should be further revised to make certain as much of the proposed driveways' runoff is directed into the proposed rain gardens (e.g. provide a detail of the proposed drives that are cross-sloped toward their receiving rain gardens and not crowned or otherwise designed to promote draining onto Hopewell Road).

No sidewalks are proposed here; the subdivision regulations require that either sidewalks be proposed/designed or a sidewalk waiver be obtained by the Town Plan & Zoning Commission. I understand that this area of town along Hopewell Road calls for sidewalks within the Master Sidewalk Plan of the town.

It's somewhat uncertain as to which trees along Hopewell's road frontage should or could be saved as desired specimens. Do keep in mind that: our subdivision regulations do not require street trees be planted; and our Tree Warden's permission is required to remove trees within the road right-of-way along the project's frontage.

TM:gfm

MEGSON, HEAGLE & FRIEND
CIVIL ENGINEERS & LAND SURVEYORS, LLC
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GLASTONBURY, CONNECTICUT 06033
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May 12, 2021

Mr. Steve Braun, PE
Assistant Town Engineer
Glastonbury Town Hall
2155 Main Street
PO Box 6523
Glastonbury, CT 06033

Re: Stormwater Management and
Nitrogen Loading Report
Churchill Subdivision
31 Hopewell Road
Glastonbury, CT

Dear Steve;

The purpose of this letter report is to summarize the calculations performed to substantiate the design of the water quality measures incorporated into the plans as well as demonstrating compliance with the Town of Glastonbury's MS4 Permit. The calculations also demonstrate compliance with the nitrogen loading requirements of Section 20.13.1 and maintenance of water infiltration potential requirements of Section 20.13.3 of the Glastonbury Building Zone Regulations.

In general, the project is a proposed three lot residential subdivision situated on 0.936 acres of land with frontage on Hopewell Road. The land falls in both Village Residential and GW-1 zones. An existing residential house is located on the property which is proposed to remain.

The main goals of the design of the stormwater management measures are to avoid stormwater quality impacts to surrounding properties, water resources and municipal drainage facilities. Fortunately, the project has a very limited scope. The fact the project is limited to two new residential houses with relatively short drives makes any potential drainage impacts manageable to resolve. Avoiding stormwater impacts are primarily achieved by directing storm runoff from the paved driveways and lawns into individual rain gardens and roofs to underground recharge units.

STORMWATER MANAGEMENT DESIGN GOALS AND PRACTICES

The design goals of the stormwater management system are as follow:

- Design to be consistent with the Town of Glastonbury Standards for Public Improvements Section 4.0 Stormwater Management Design Standards.
- Design to avoid exceeding 10 mg/l of nitrogen loading and be in compliance with the Nitrogen Loading requirements of Section 20.13.1 of the Glastonbury Building Zone Regulations.
- Design to avoid exceeding a 50% loss of water infiltration potential and be in compliance with the requirements of Section 20.13.3 of the Glastonbury Building Zone Regulations.
- Design to be consistent with National Pollutant Discharge Elimination System (NPDES).
- Design to be consistent with the 2004 Connecticut Stormwater Quality Manual
- Design to be consistent with the 2002 Connecticut Guidelines For Soil Erosion and Sediment Control
- Incorporate Low Impact Development (LID) practices.
- Incorporate Best Management Practices (BMP's).
- Remove at least 80% of the total suspended solids & floatable pollutants before discharge to a surface water or wetland.
- Minimize loss of long term recharge during low flow periods.
- Retain 100% of the Water Quality Volume for the site in conformance with the Town of Glastonbury MS4 Permit.

LOW IMPACT DEVELOPMENT (LID) TECHNIQUES

Every effort has been made to minimize both the short term and long term environmental impacts caused by the proposed activities. The methods incorporated into the plans specifically include the following:

- Minimizing tree clearing.
- Construction of raingardens to treat runoff and improve water quality.
- Directing roof runoff to subsurface recharge units.
- Directing flows from paved areas to stabilized vegetated areas.
- Encouraging sheet flow through vegetated areas.
- Locating impervious areas so that they drain to permeable areas.
- Maximizing overland sheet flow.
- Maintaining existing topography and drainage divides.

NITROGEN LOADING CALCULATIONS

PARCEL AREA: 40,802 SF = 0.936 AC.

IMPERVIOUS SURFACES

ROOF AREA = 4,100 SF

PAVEMENT = 3,130 SF

PERVIOUS SURFACES

LAWN AREA = 24,000 SF

NATURAL AREA = 33,572 SF

CONNECTICUT RAINFALL = 44 IN./YR

LOADING FACTORS:

CAPE COD TECH BULLETIN 91-001

ROOFS – 0.75 mg/L

DRIVES – 1.5 mg/L

LAWNS – 3 LBS / 1000 SF @ 20 % LEACHING

NATURAL AREA INFILTRATION – 20%

WQV CALCULATIONS

The WQV for lot 1 is calculated as follows:

WGV = (1")(R)(A)/12 Where: R = 0.05 + 0.009(I)
I = % Impervious Cover
A = Area in Acres

A = 0.09 AC = 4,300 SF

Impervious area = 900 SF

I = 900/4300 = 20.9%

R = 0.05 + 0.009(20.9) = 0.24

WQV = (1")(0.09)(0.24)/12 = 0.0018 ac-ft = **78 CF**

Roof leaders will be directed to subsurface recharge units. Roof area is 1,100 sf 1" of rain from each roof will be:

1,100 s.f. x 1ft/12" = **92 c.f.**

The WQV for lots 2 & 3 is calculated as follows:

WGV = (1")(R)(A)/12 Where: R = 0.05 + 0.009(I)
I = % Impervious Cover
A = Area in Acres

A = 0.08 AC = 3,350 SF

Impervious area = 1,115 SF

I = 1,115/3,350 = 33.3%

R = 0.05 + 0.009(33.3) = 0.35

WQV = (1")(0.35)(0.08)/12 = 0.002 ac-ft = **102 CF**

Roof leaders will be directed to subsurface recharge units. Roof areas estimated to be 1500 sf ea. 1" of rain from each roof will be:

1500 s.f. x 1ft/12" = **125 c.f.**

ESTIMATED LOADING

WASTEWATER:
N/A: Public Sewer

ROOF AREA:
4,100 SF X 44 IN/YR X 1 FT/12 IN X 1 YR/365 D X 28.32 L/CF
= 1,166 L/D X 0.75 mg/L = 875 mg/D

PAVED AREA:
3,130 SF X 44 IN/YR X 1 FT/12 IN X 1 YR/365 D X 28.32 L/CF
= 890 L/D X 1.5 mg/L = 1,336 mg/D

LAWN:
24,000 SF X 3 LBS/1000 SF/YR X 1 YR/365 D X 454,000 mg/LB X 0.2
= 17,911 mg/D

NATURAL AREA:
33,572 SF X 44 IN/YR X 1 FT/12 IN X 1 YR/365 D X 28.32 L/CF X 0.2
= 1,910 L/D

SUMMARY:
CONCENTRATION/DILUTION

ROOF AREA	+	PAVED AREA	+	LAWNS
875 mg/D		1,336 mg/D		26,867 mg/D
1,166 L/D		2,865 L/D		890 L/D
ROOF AREA	+	NATURAL AREA	+	PAVED AREA

= (29,078 mg/D) / (4,921 L/D) = **5.07** mg/L

THIS SITE IS LOCATED IN A GW-1 ZONE

NITROGEN LOADING OF **5.07** mg/L IS WITHIN THE ACCEPTABLE RANGE OF SECTION 20.13.1 OF THE GROUNDWATER PROTECTION REGULATIONS.

REDUCTION OF WATER INFILTRATION CALCULATIONS

PRE DEVELOPMENT

- TOTAL AREA = 40,802 SF
- IMPERVIOUS AREA = 2000 SF
- ROOF AREA INTO INFILTRATION = 0 SF
- LAWN/VEGETATED AREAS = 38,802 SF

WEIGHTED COEFFICIENT OF IMPERVIOUSNESS

$$\frac{(.9)(2{,}000\ SF) + (.3)(38{,}802\ SF)}{40{,}802\ SF} = 0.32$$

POST DEVELOPMENT

- TOTAL AREA = 40,802 SF
- IMPERVIOUS AREA = 4,230 SF
- ROOF AREA INTO INFILTRATION = 3000 SF
- LAWN/VEGETATED AREAS = 33,572 SF

WEIGHTED COEFFICIENT OF IMPERVIOUSNESS

$$\frac{(.9)(3{,}130\ SF) + (.3)(33{,}572\ SF)}{40{,}802\ SF} = 0.34$$

A 6% LOSS OF INFILTRATION WILL OCCUR AS A RESULT OF THIS SUBDIVISION – 50% IS ALLOWED

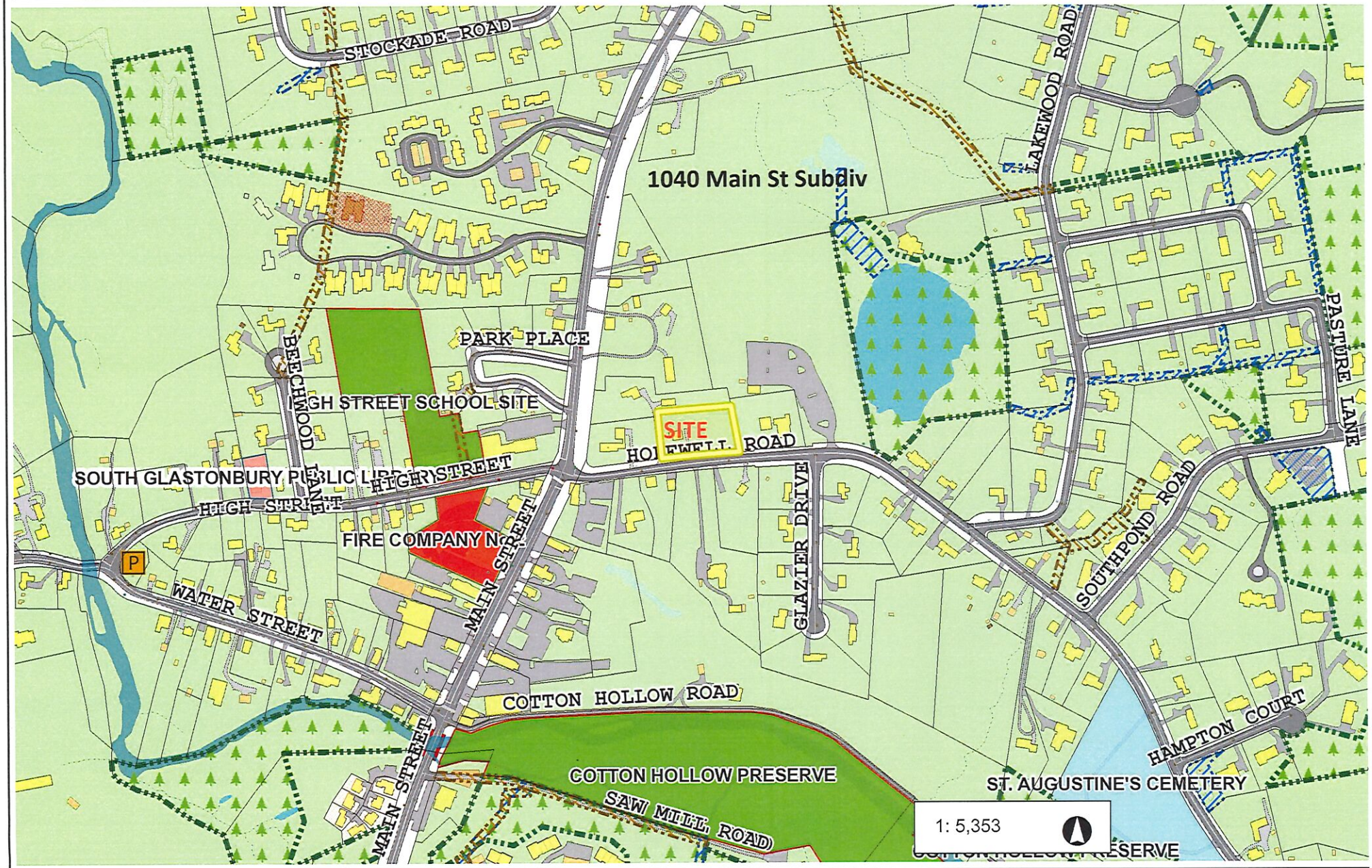
In summary, the incorporation of the above stormwater management practices will mitigate stormwater quality impacts from the proposed subdivision. The Water Quality Volume will be retained and infiltrated which will meet the requirements stated elsewhere in this report.

If you have any question, please feel free to call.

Sincerely,

Mark W. Friend, P.E. Soil Scientist
LEED AP

Town of Glastonbury GIS



892 0 446 892 Feet

NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

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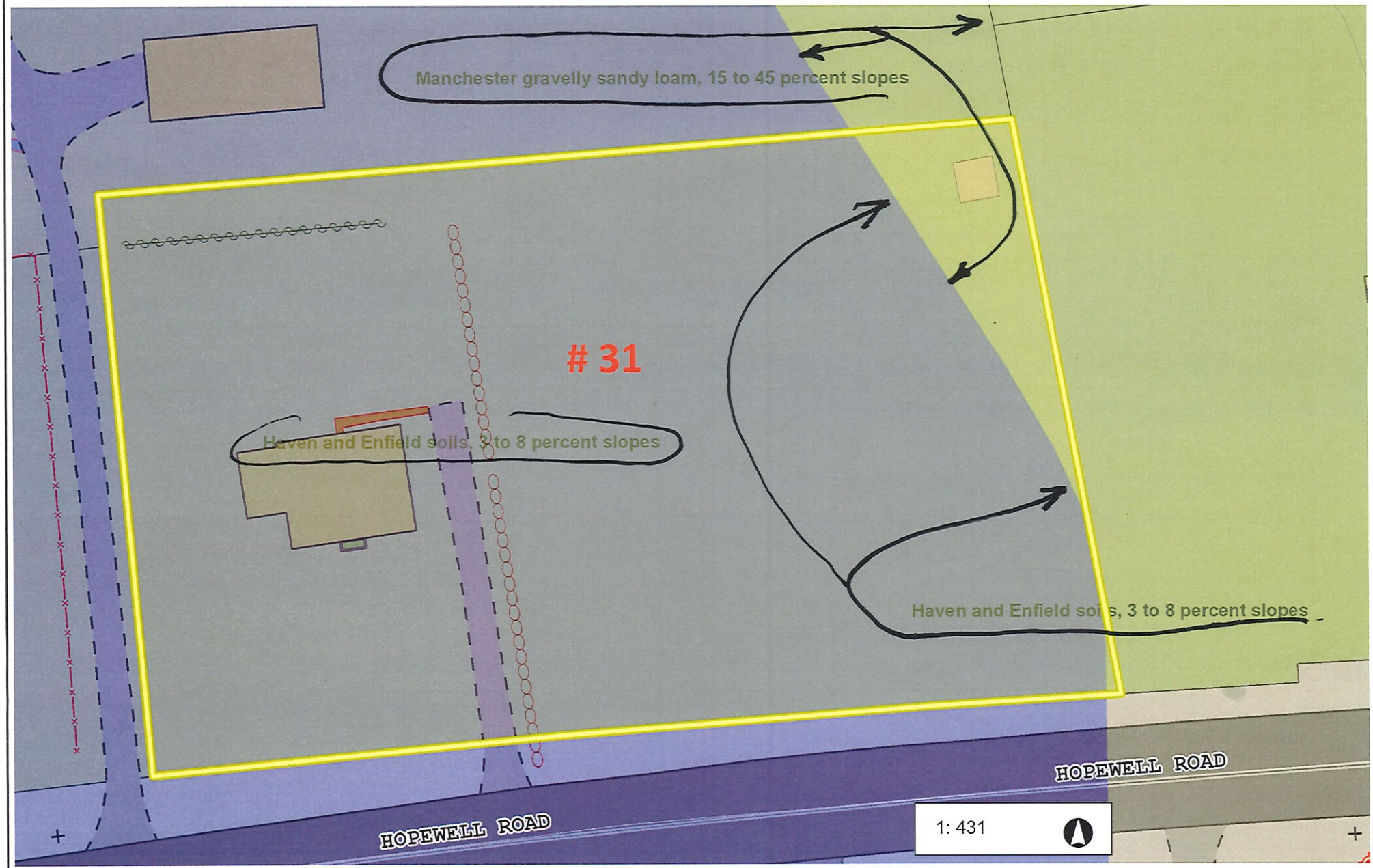
Town of Glastonbury

Soils Information



72 0 36 72 Feet

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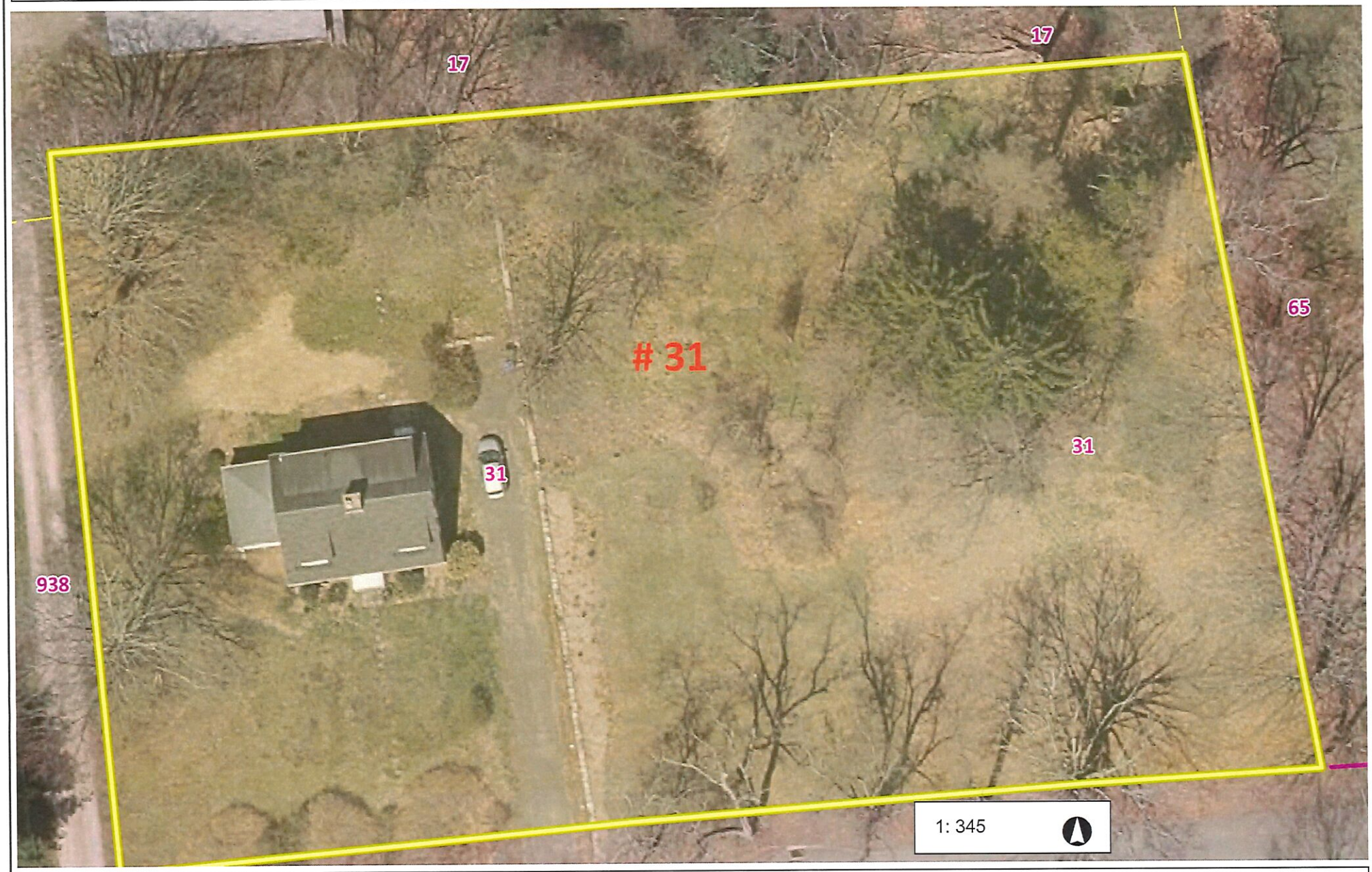
Town of Glastonbury

2016 Aerial Photo



58 0 29 58 Feet

NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

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Town of Glastonbury

2009

71 0 36 71 Feet

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