1.5

TOWNSEND WATER DEPARTMENT

540 Main Street West Townsend, Massachusetts 01474

Nathan Mattila, *Chairman* — Todd Melanson, *Vice-Chairman* — Michael MacEachern, *Clerk*

David Vigeant, Superintendent — (978) 597-2212 — Email water@townsendwater.org

WATER COMMISSIONERS MEETING MINUTES

January 5, 2021 – 6:00 P.M.

Water Department 540 Main Street, Meeting Room

mm

NOTE REGARDING ACCESS AND PARTICIPATION

Governor Baker declared a State of Emergency to respond to COVID-19 on March 10, 2020 and ordered a suspension of certain provisions of the Open Meeting Law M.G.L. c. 30A, s 20 on March 12, 2020. The Board of Selectmen closed the town offices, including boards and committee meetings consistent with the Governor's March 12th order, to public access to promote social distancing and reduce the spread of COVID-19. The Board of Water Commissioner's meetings will not be open to the public for physical attendance until further notice. The meeting will be available on Zoom.

Join Zoom Meeting

https://us02web.zoom.us/j/81315088812?pwd=OGhhSVg4Y2ZEeFI5SEMxUnhnRlc5dz09

Meeting ID: 813 1508 8812 Password: 401697 Log on *Tuesday January 5, 2021 at 6:00 P.M.* to participate.

I. **PRELIMINARIES:**

1.1 NM called the meeting to order at 6:01P.M. 540 Main Street.

1.2 NM announced that the meeting is being audio recorded and recorded on Zoom.

1.3 Roll Call Showed Members Present: Nathan Mattila (NM)-Chairman, Todd Melanson (TM)-Vice-Chairman, Michael MacEachern (MM)-Clerk. Roll call showed citizens present: David Vigeant (DV)-Water Superintendent, Ryan Lapierre, Kevin Keefe, Brenda Boudreau-Office Administrator.

1.4 Chairman's additions or deletions. None.

1.6 Review correspondence. None.

II. **WORK SESSION-VOTES MAY BE TAKEN**

2.1 Review/Discuss Master Plan.

2.2 Review/Discuss Rate Increase.

2.3 Review/Discuss Job Descriptions.

DV submitted the attached report, listing the concerns and resolutions for the Townsend Water Department (Attached). The Board listened to DV presentation and reviewed the document he presented. After the presentation, the Board entered into a lengthy discussion and asked many questions which DV answered confidently.

Some questions asked were: NM made a comment that the Board had previously voted not to have a tiered system. DV told NM it would not be up to the BOWC as it would be a decision of the DEP. TM asked DV to explore the M36 Water Audit that will show you were the water loss is in the distribution system, is as it is free. TM and MM suggested separating irrigation meters. MM stated there may possibly still be a leak on the left side of the road on Beech Street to investigate. The Board asked DV to create a water conservation flyer to attached with our April water bills outlining our program and listing the cost of the fines. Other topics discussed Updated Billing system to Vadar, Main St/South Street upgrade, Chlorination of water tanks, Meter replacement program, and underpaid office staff. DV mentioned changing the connection charge on existing homes to pay either the $2,500.00 or defer their payment to a set amount each quarter until their obligation is fulfilled. Dave will be bringing that up at the next meeting.

At the end of the work session the BOWC commended DV for conveying to the Board his concerns and solutions and thank the staff for their dedication. The BOWC does not want to fault anyone for past inaccuracies they just want to correct the issues and move forward.

1.5

ADJOURNMENT:

NM motioned to adjourn the BOWC work session at 8:52 P.M. MM seconded. Unanimous vote.

Respectfully submitted,

Brenda Boudreau

Brenda Boudreau
Office Administrator
Townsend Water Department

1.5

Water Department
Concerns

1. 80 percent of all water supplied today in Townsend comes from Harbor Trace and Witches Brook and there is only one way for water to exit the area and that is across South St. South St is a Dam! Lose South St lose 80 percent of the towns supply of water.
2. Cross St Well is Down due to Iron and Mag. Upon finding the reports, When the well is used more there is less iron due to dilution.
3. Main St Well, operating at 200 gallon per minute. Permitted with new well at 604 GPM. Was dropped due to Witches Brook Permit
4. Horseshoe Dr., well is in place and testing was done with good results. Was dropped at the purchase of Witches Brook.
5. West Meadow and other higher elevation in town trouble with pressure and no town water.
6. Lack of a proper accounting/Billing system. We lose about $130,000 a year in revenue. Due to the split Gallon/Cu foot system $85,000 and meter age not being able to track it. And there are over 500 or more meters of over.
7. Chlorination and care of tanks.
8. Under paid clerical department.
9. Lack of adequate infrastructure records.
10. Main and material age.
11. Fire flows town center.
12. Summer Watering Stressing the system.

Solutions

1. Main at South St upgrade see map change 8 in section of main to 12 inch, Summer 2021. South Harbor to Emery water loop 9500 feet of 8 inch HDPE pipe (great C factor) this gives a second egress from Witches Brook, a more direct path from the tank, allows for 65 more homes to install town water, and allows for more water flow from the area allowing Harbor Trace well to pump to capacity.

2. Run to waste, test, and do one of two things Chlorinate (which is an oxidizer) or add a filter as shown in hand out.
3. Main St well. Verify/renew Permit with DEP, 2021-2022 install generator replace doors and windows 2022-2023, any additional testing or upgrades 2023-2024. Install Well 2024-2025. Put in service 2025. Loans ending for water department. Item 5920 and 5921 $11,000 per year ending July 2024, item 5910 about $38,000 per years ending July 2025, item 5911 about 54,000 per year ending July 2026 and the ban note $120,000 per year July 2029.
4. Explore the permitting process to put in place for 2035.
5. Tank costs for a 250,000-gallon tank, are $174,000 per tank. West Meadow Rd, to be installed by contractor for 110 west Meadow Rd at The West Meadow Estates. In 2029, 139 Lunenburg Rd tank to be installed with 13000 feet of 8in HDPE pipe. Roads involve Bayberry Rd and Lunenburg Rd Tank to West Elm and a boaster pump to fill the tank. In 2039, Warner rd tank to be installed. 12,000 feet 8-inch HDPE pipe, Meadow Rd to Wallace Hill, Wallace Hill to Highland Rd and Warner Rd to Tank. Boaster Pump at Highland Tank.
6. Change system to Vadar line item 5902-18. Introduce smart meter system.
7. Paint Highland tank install a building/shed over pit extend chlorination port and water sampling out of pit and into shed. OSHA confined space entry laws prohibit a worker form entering a manhole without a series of steps happening first and never without two men. No worker should be on an ice-covered tank in the winter and never on a tank without safety equipment. Paint and paint supplies $7700 dollars, power washer/ generator $2000, and building $10000 for $19700 total $5000 for unforeseen costs. Line item 5809-17 for $75000, $50,000 transferred to Tank maintenance. For next year install building at Fitchburg Rd Tank 2021-2022.
8. The Clerical staff need to be in the Water Workers union. Both staff are paid $19 an hour. The bottom of the Water Workers union is $21 Both staff are currently in school one for basic water D1/T1 and the other procurement and will switch places and take the other course. Both staff need to be

looked at as equals with the other staff members of the department and every employee understanding what a water department is. We all speak one language. Pay should be one pay scale with certifications/merit/Licenses being the determining factor for steps in the pay scale. Also, it give the impression woman in the work force are not treated as equals. See Job Descriptions and flow chart.

9. Create a GIS system, online mapping and adequate gate prints tie cards and scanning of maps. Purchase a plan scanner. Ipad mapping

10. Update mains and finish loops more work on Main St as shown in hand outs.

11. See item 10 above.

12. Go to a tiered water rate system, no rate change for the average user. The water system is maxed in the summer major upgrade work needs to be done summer water use (lawn Irrigation) is the stressing factor. Tier two is 10 percent over tier one. Tier three another 10 percent. This will either slow summer watering or give additional revenue for upgrades. Leak detection in March- April. Go to monthly billing for the 129 commercial accounts. Smarts meters to help customer with water leaks.

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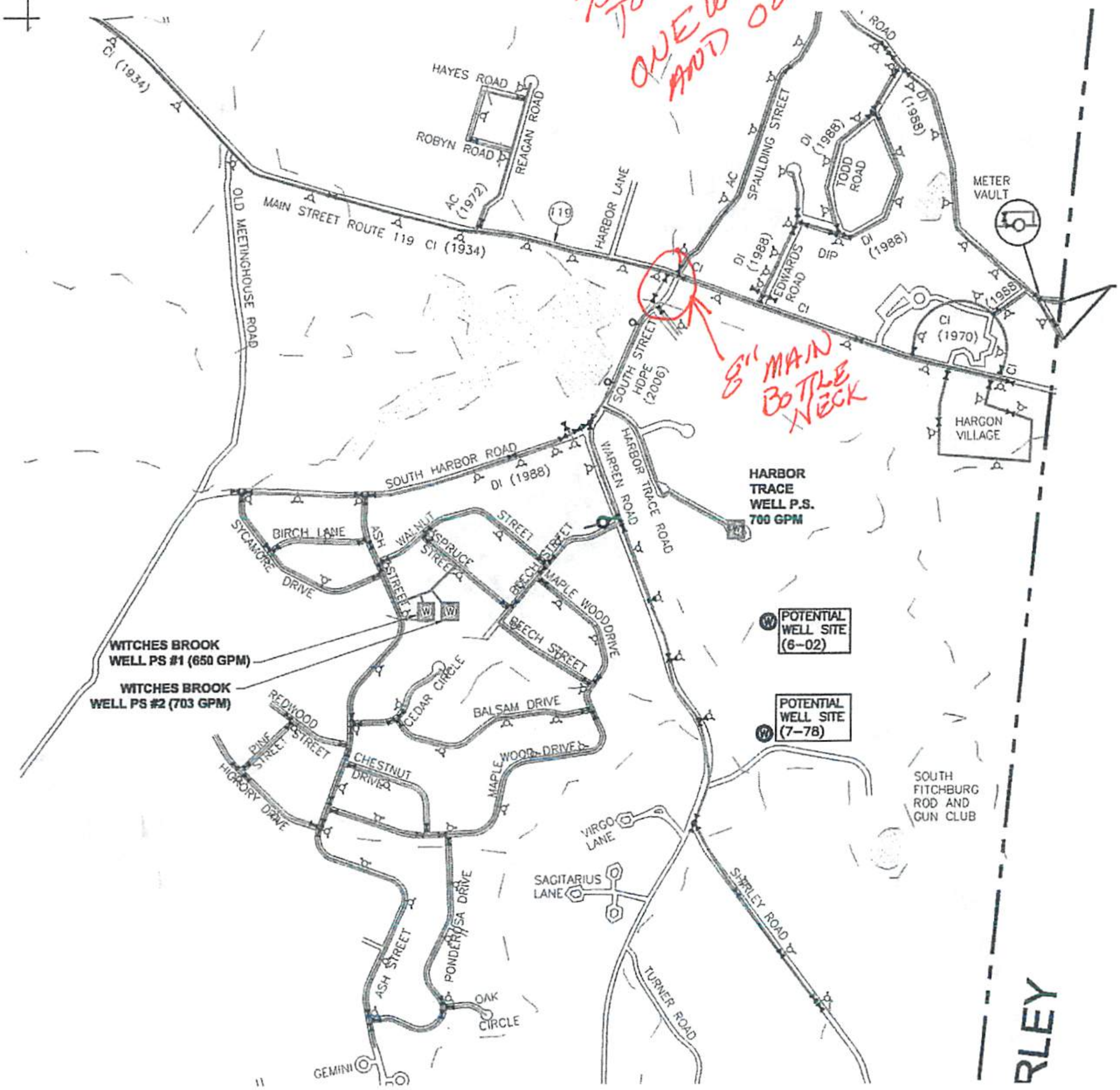
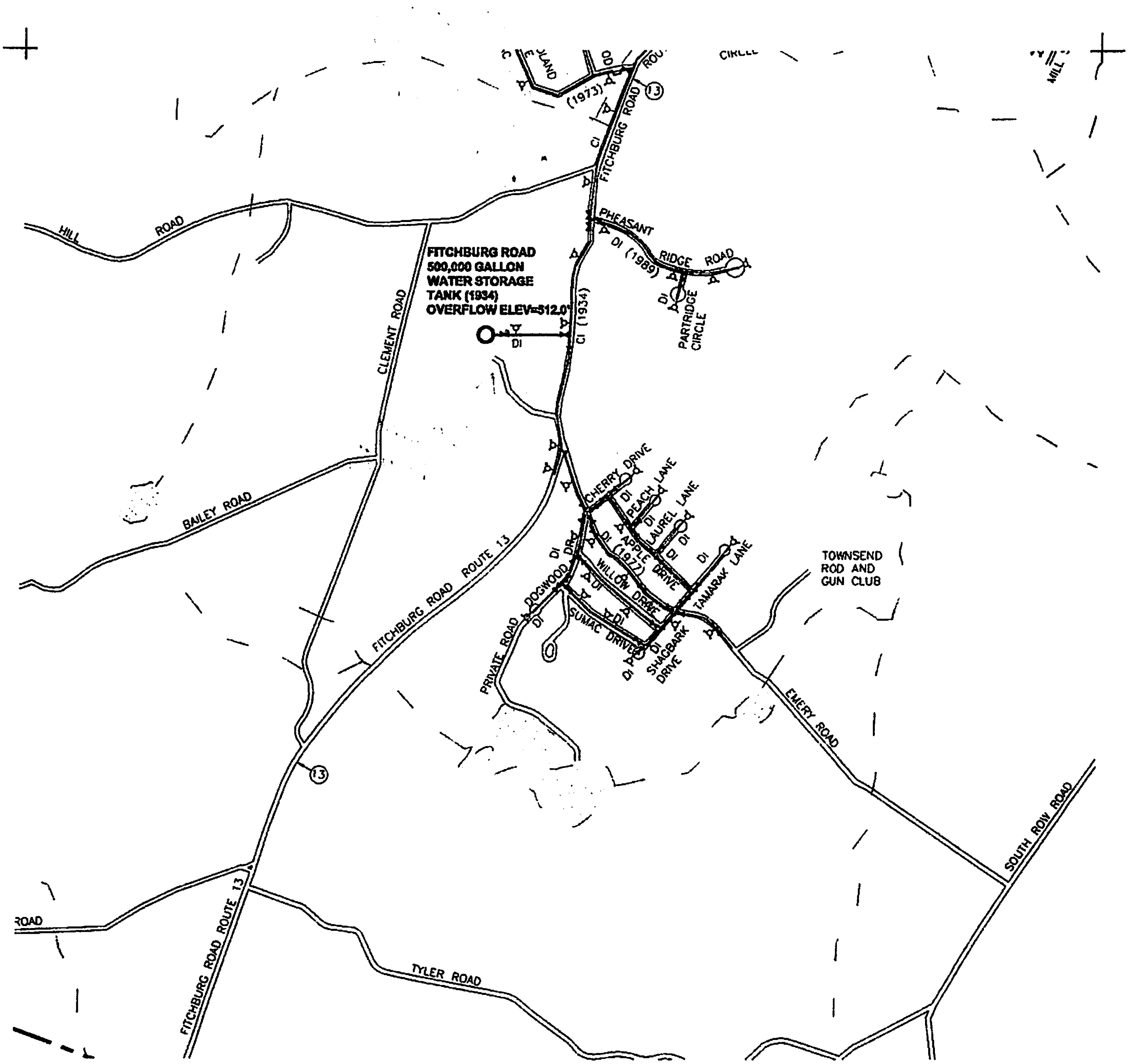
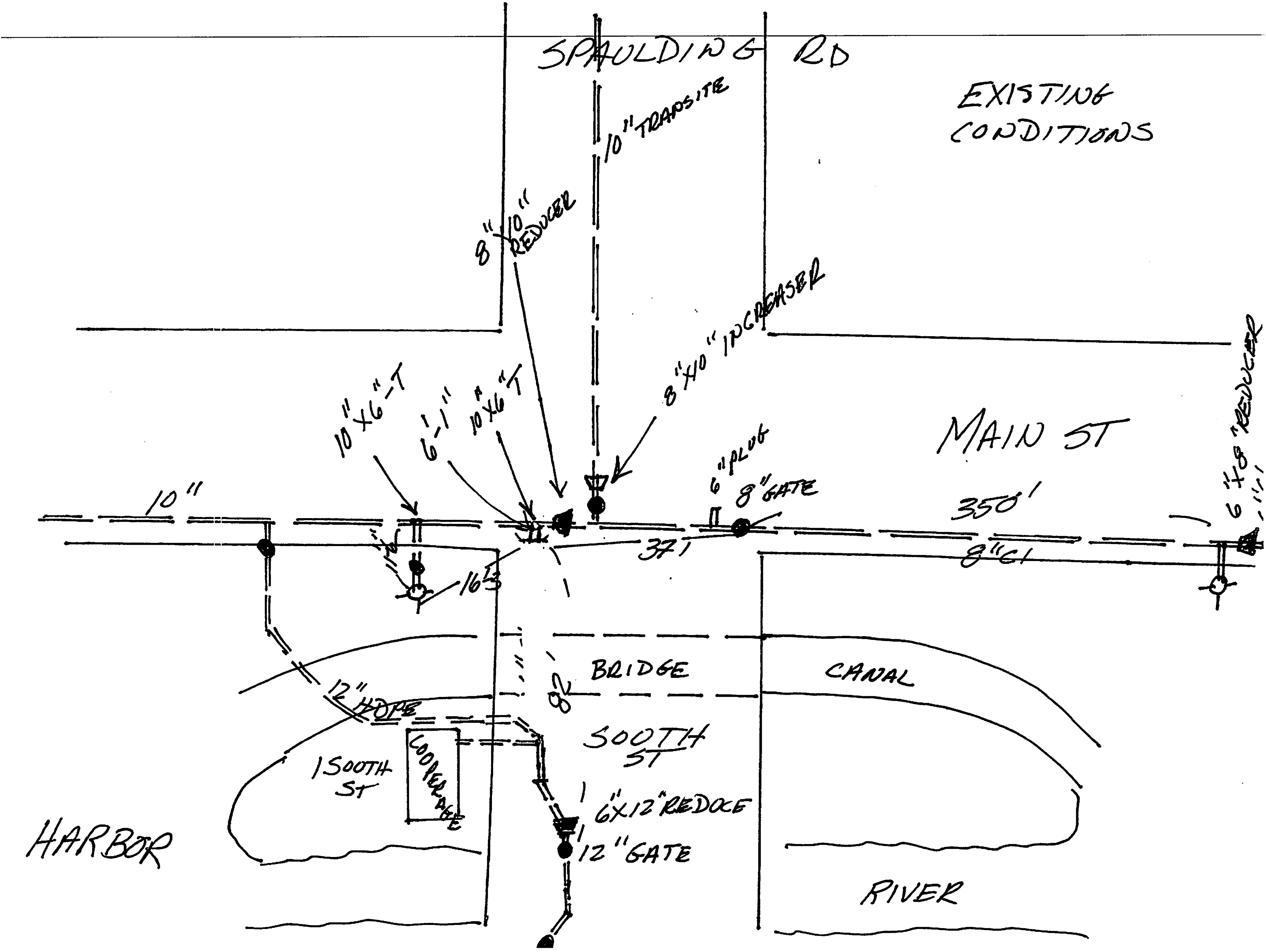
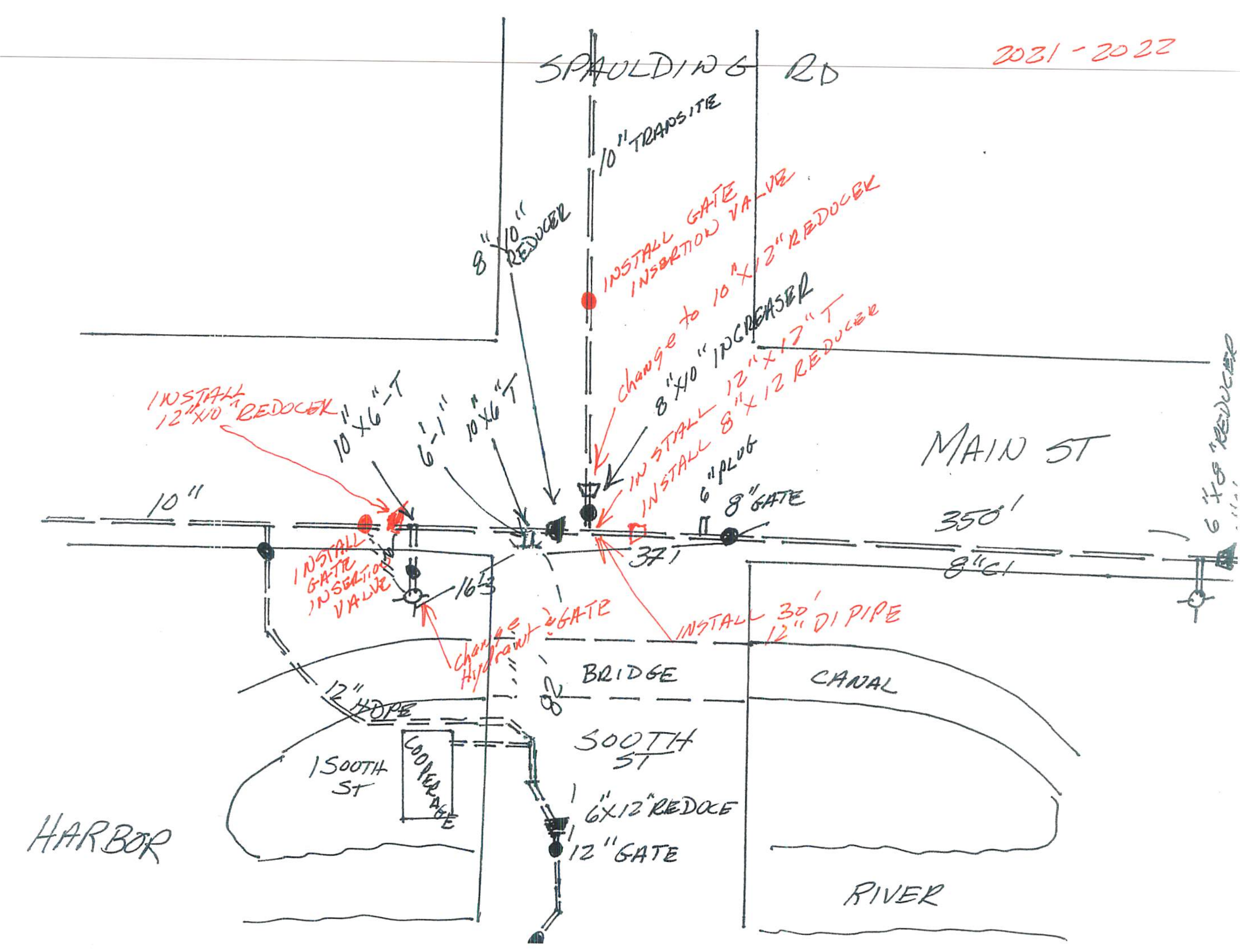


(1,3) -1- Townsend-Water-Distribution-Maps-MAP (36X48).pdf 5/13/2011 3:00:51 PM

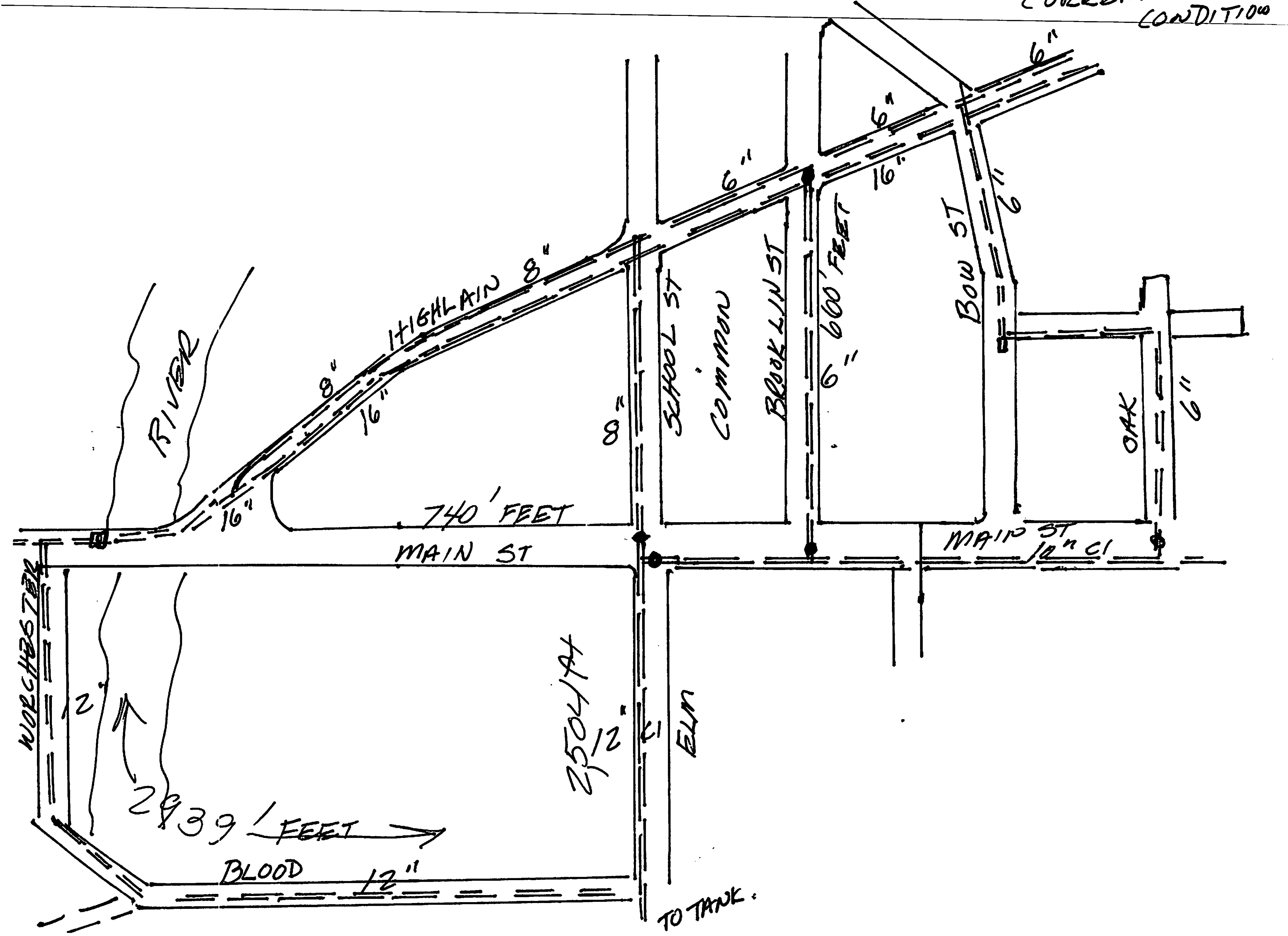

FITCHBURG ROAD
500,000 GALLON
WATER STORAGE
TANK (1934)
OVERFLOW ELEV=512.0'
FITCHBURG ROAD
(1973)
CI
PHEASANT
DI (1989)
RIDGE
ROAD
PARTRIDGE
CIRCLE
CI (1934)
DI
HILL
ROAD
CLEMENT ROAD
BAILEY ROAD
FITCHBURG ROAD ROUTE 13
CHERRY DRIVE
PEACH LANE
LAUREL LANE
APPLE DRIVE
(1977)
WILLOW DRIVE
DOGWOOD DRIVE
SUMAC DRIVE
SHAGBARK DRIVE
TAMARAK LANE
PRIVATE ROAD
TOWNSEND
ROD AND
GUN CLUB
EMERY ROAD
SOUTH ROW ROAD
TYLER ROAD
ROAD
FITCHBURG ROAD ROUTE 13
13
CIRCLE
MILL

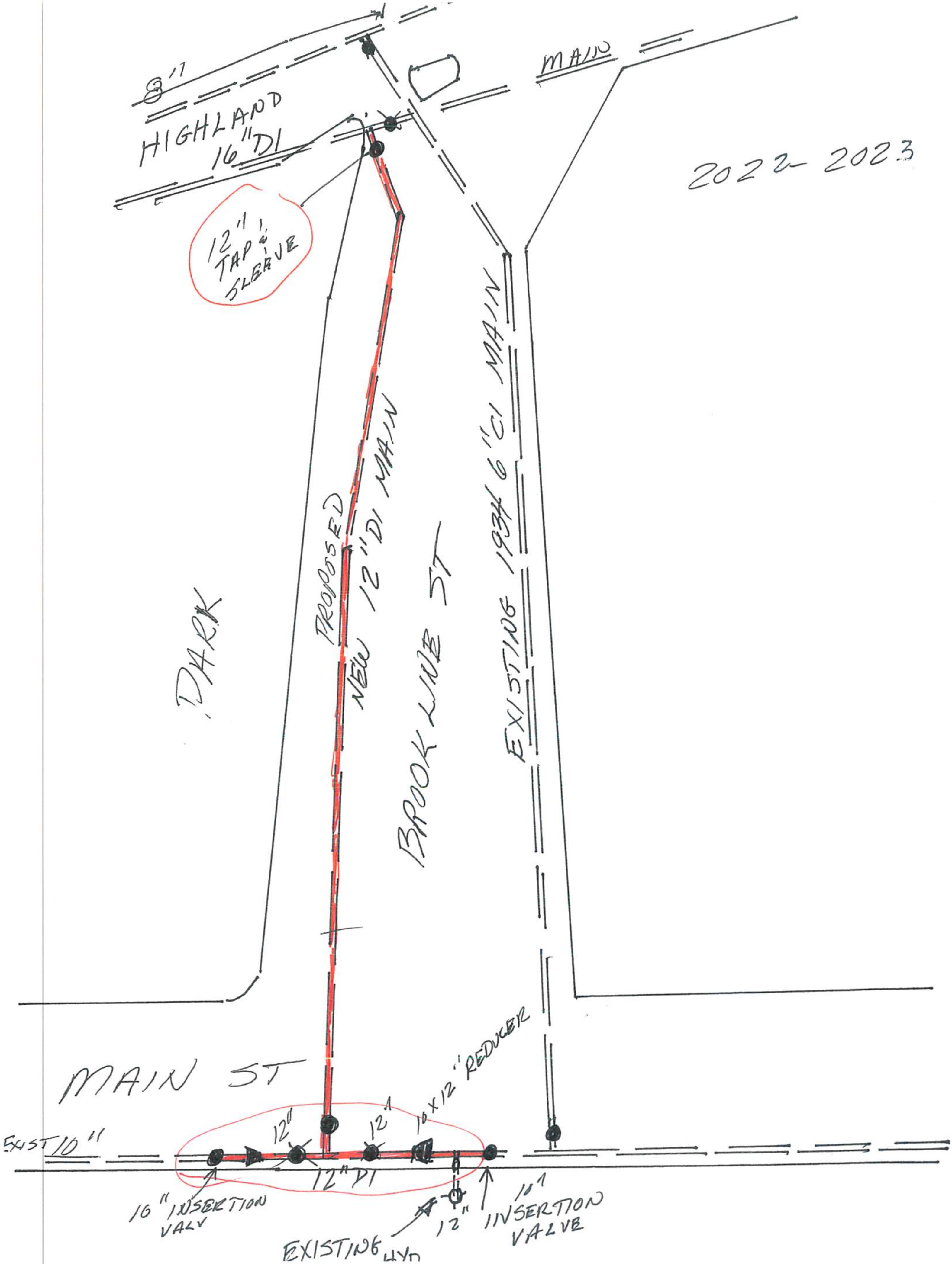

SPAULDING RD
EXISTING CONDITIONS
10" TRANSITE
8"X10" REDUCER
8"X10" INCREASER
MAIN ST
10"X6"-T
6"-1"
10"X6"T
6" PLUG
8" GATE
10"
350'
8" CI
6"X8" REDUCER
37'
16'
BRIDGE
CANAL
8"
12" HDPE
SOOTH ST
1 SOOTH ST
COOPERAGE
6"X12" REDUCE
12" GATE
HARBOR
RIVER



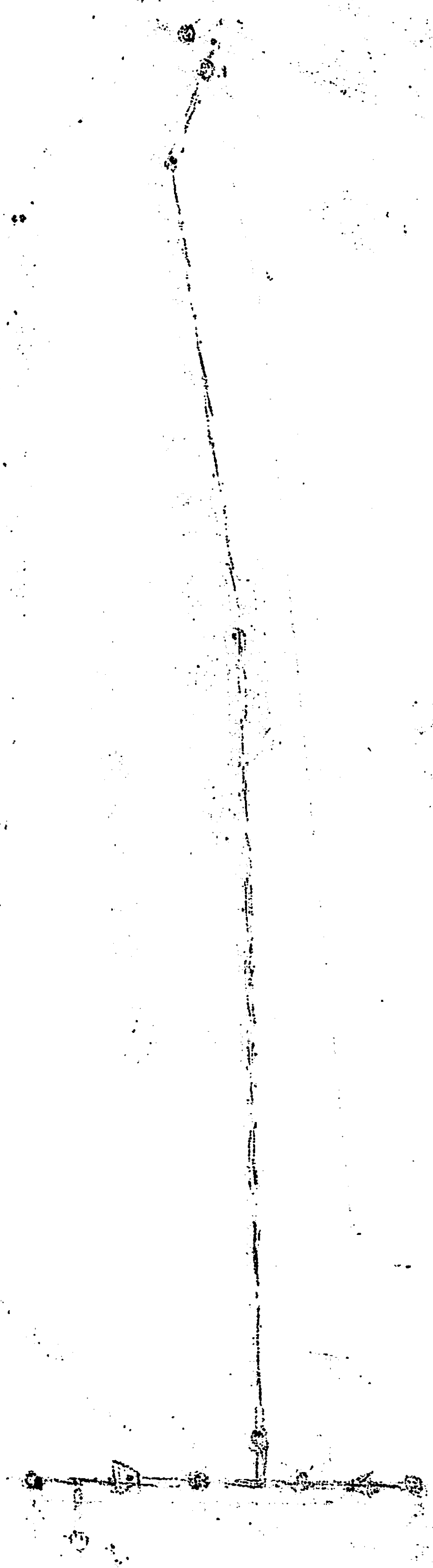
2021 - 2022
SPAULDING RD
10" TRANSITE
8"x10" REDUCER
INSTALL GATE INSERTION VALVE
change to 10"x12" REDUCER
8"x10" INCREASER
INSTALL 12"x12" T
INSTALL 8"x12 REDUCER
6" plug
8" GATE
MAIN ST
350'
8" CI
6"x8" REDUCER
INSTALL 12"x10" REDUCER
10"x6" T
6"-1"
10"x6" T
10"
37'
16'3
INSTALL GATE INSERTION VALVE
change Hydrant & GATE
INSTALL 30' 12" DI PIPE
BRIDGE
CANAL
8"
12" HDPE
SOOTH ST
1 SOOTH ST
COOPERAGE
6"x12" REDUCE
12" GATE
HARBOR
RIVER

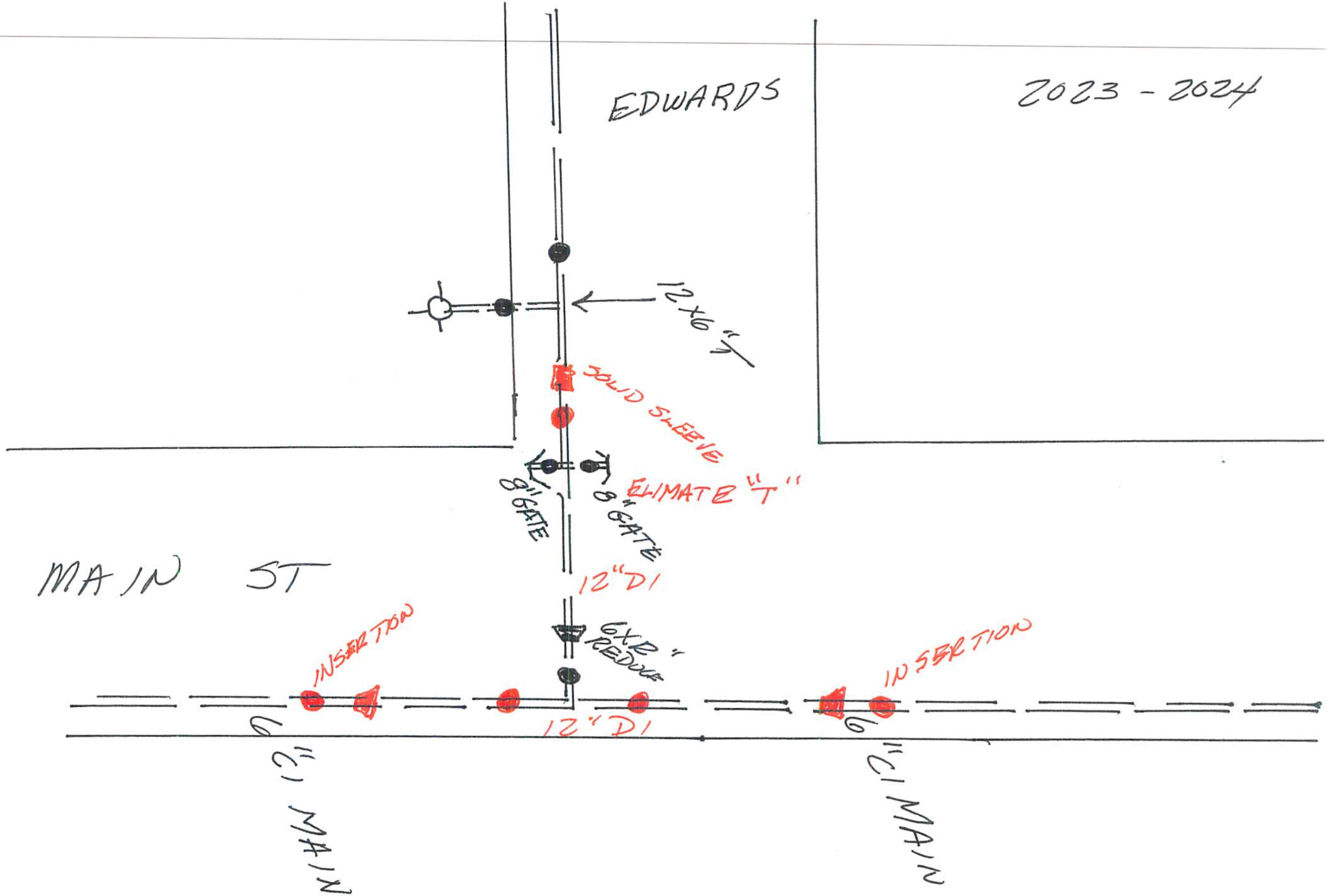
CURRENT CONDITION



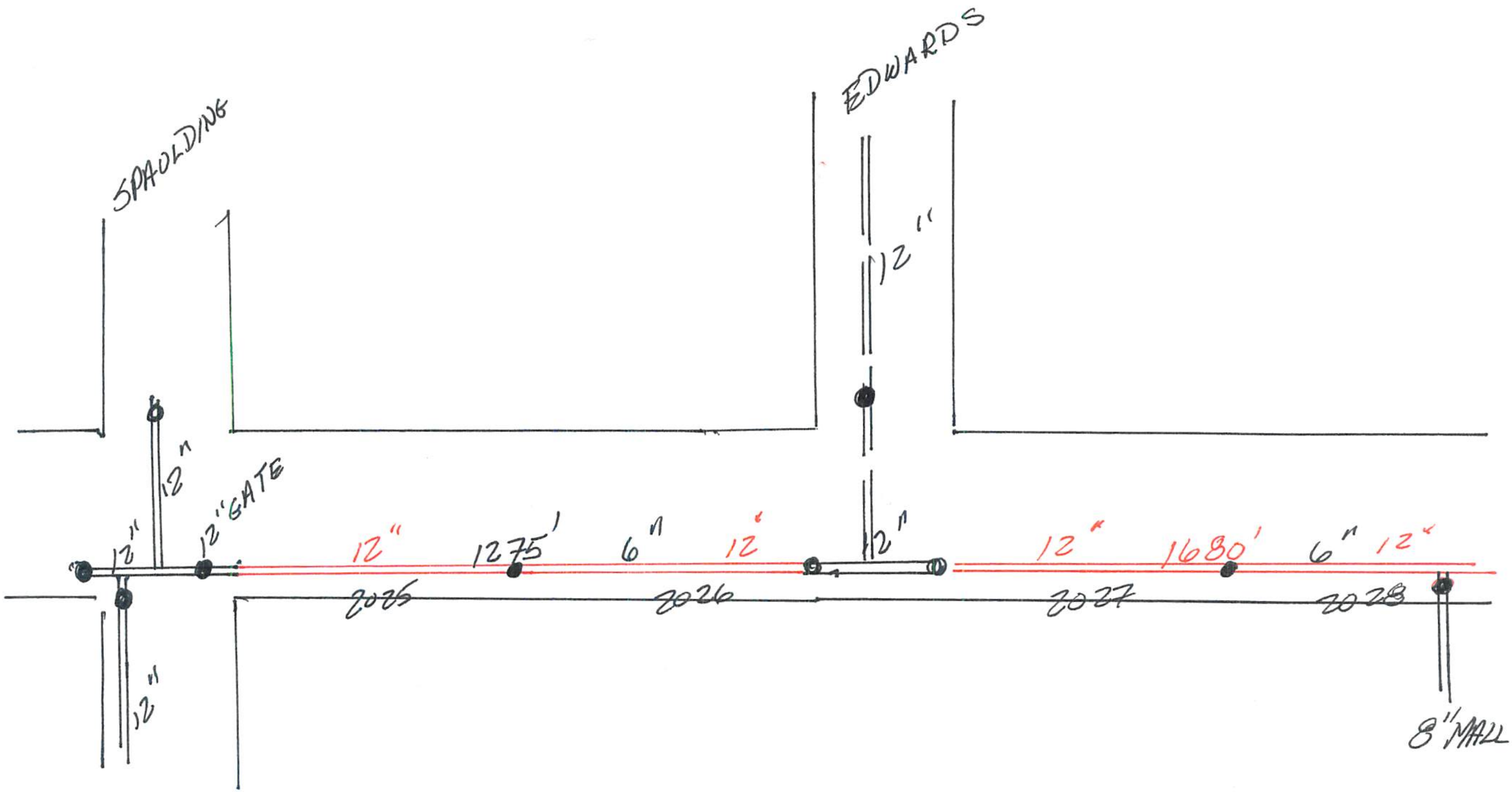


8"
HIGHLAND
16"DI
MAIN
2022 - 2023
12" TAP & SLEEVE
PARK
PROPOSSED NEW 12"DI MAIN
BROOKLINE ST
EXISTING 1934 6"CI MAIN
MAIN ST
EXIST 10"
12"
12"
10X12" REDUCER
12"DI
16" INSERTION VALV
EXISTING HYD
12"
10" INSERTION VALVE




2023 - 2024
EDWARDS
12X6" T
SOLID SLEEVE
ELIMATE "T"
8" GATE
8" GATE
12" DI
6X8" REDUCE
MAIN ST
INSERTION
INSERTION
12" DI
6" CI MAIN
6" CI MAIN

2025 -2029



SPAOLDING
EDWARDS
12"
12"
12"
12"GATE
12"
12"
1275'
6"
12"
12"
12"
1680'
6"
12"
2026
2026
2027
2028
8" MALL

Nashoba Analytical, LLC Tel: 978-391-4428 Fax: 978-391-4643 LabNumber: **156313**

31A Willow Road, Ayer MA 01432 Website: http://www.NashobaAnalytical.com Use this number with all correspondence

Client:

Townsend Water Department
540 Main St
Townsend, MA 01474

ReportDate: 6/12/2015

RECEIVED
JUN 18 2015
By____

Certificate of Analysis

TOWNSEND WATER DEPARTMENT (TOWNSEND)

Parameter	Method		Result	MCL	MRL	Date of Analysis	Analyst
- Cross St. Station (Raw)							
Sampled: 6/11/2015 10:30:00 AM by M. MacEachern							
Iron, MG/L	EPA 200.7	#	0.34	0.3	0.003	6/12/2015	M-MA1118
Manganese, MG/L	EPA 200.7	#	0.071	0.05	0.002	6/12/2015	M-MA1118

Cross St

MCL=Maximum Contaminant Level (EPA Limit), MRL = Minimum Reporting Level
Sodium Guidelines- Mass 20, EPA 250, # = Result Exceeds Limit or Guideline
ND = None Detected (<MRL), * = Background Bacteria Noted

Massachusetts Certified
Laboratory #M-MA1118

David L. Knowlton
David L. Knowlton
Laboratory Director

Nashoba Analytical, LLC Tel: 978-391-4428 Fax: 978-391-4643
31A Willow Road, Ayer MA 01432 Website: http://www.NashobaAnalytical.com

LabNumber: **154251**
Use this number with all correspondence

Client:
Townsend Water Department
540 Main St
Townsend, MA 01474

ReportDate: 4/9/2015

RECEIVED
APR 14 2015
By

Certificate of Analysis

TOWNSEND WATER DEPARTMENT (TOWNSEND)

Parameter	Method		Result	MCL	MRL	Date of Analysis	Analyst
Raw- Cross Street Well #2							
Sampled: 4/7/2015 12:30:00 PM by M MacEachern							
Iron, MG/L	EPA 200.7	#	0.34	0.3	0.003	4/9/2015	M-MA1118
Manganese, MG/L	EPA 200.7	#	0.069	0.05	0.002	4/9/2015	M-MA1118

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Massachusetts Certified
Laboratory #M-MA1118

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Nashoba Analytical, LLC Tel: 978-391-4428 Fax: 978-391-4643
31A Willow Road, Ayer MA 01432 Website: http://www.NashobaAnalytical.com

LabNumber: **153430**
Use this number with all correspondence

Client:

Maher Services
71 Concord Street
North Reading, MA 01854

ReportDate: 3/2/2015

Certificate of Analysis

Cross Street Well, Townsend, MA

Parameter	Method		Result	MCL	MRL	Date of Analysis	Analyst
- Well Head							
Sampled: 2/26/2015 1:30:00 PM by A. Proctor							
Iron, MG/L	EPA 200.7	#	0.85	0.3	0.003	3/2/2015	M-MA1118
Manganese, MG/L	EPA 200.7	#	0.092	0.05	0.002	3/2/2015	M-MA1118

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Nashoba Analytical, LLC Tel: 978-391-4428 Fax: 978-391-4643 LabNumber: **153354**

31A Willow Road, Ayer MA 01432 Website: http://www.NashobaAnalytical.com Use this number with all correspondence

Client:

Maher Services
71 Concord Street
North Reading, MA 01854

ReportDate: 2/25/2015

Certificate of Analysis

Cross Street Well, Townsend, MA

Parameter	Method		Result	MCL	MRL	Date of Analysis	Analyst
- Well Head							
Sampled: 2/24/2015 12:00:00 PM by Client							
Iron, MG/L	EPA 200.7	#	1.8	0.3	0.003	2/25/2015	M-MA1118
Manganese, MG/L	EPA 200.7	#	0.12	0.05	0.002	2/25/2015	M-MA1118

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Massachusetts Certified
Laboratory #M-MA1118

David L. Knowlton
Laboratory Director

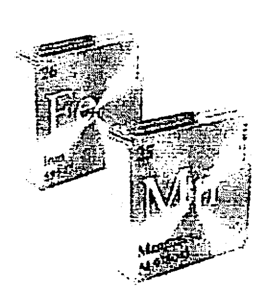
Cross St

Iron and Manganese Removal Handbook

Second Edition

American Water Works Association

4



Overview of Treatment Technologies

Several treatment methods may be used to remove iron and manganese from drinking water supplies. This chapter provides an overview of treatment options that should be considered for iron and manganese removal and includes guidance regarding selection of treatment methods for a particular application.

Over the past decade or so, advances in treatment technologies have allowed systems to be constructed in less space, produce fewer residuals, and treat multiple contaminants.

This chapter addresses two key questions:

1. Why consider new technologies?
2. When should traditional technologies be used?

A few years ago, a utility discovered that a well with elevated iron (10 mg/L) and manganese (0.5 mg/L) also showed evidence of surface water contamination. Traditional treatment methods would have included the use of clarification, oxidation, coagulation, and filtration. Instead, the utility was able to use an ultrafiltration (UF) membrane to accomplish the removal of the iron, manganese, and pathogens. No clarification or coagulation was needed. The use of membranes was—and in some cases still is—considered to be an innovative treatment technology. The use of membranes resulted in significant savings for the owner. Figure 4-1 describes the traditional and newer technologies that can be used to remove iron and manganese.

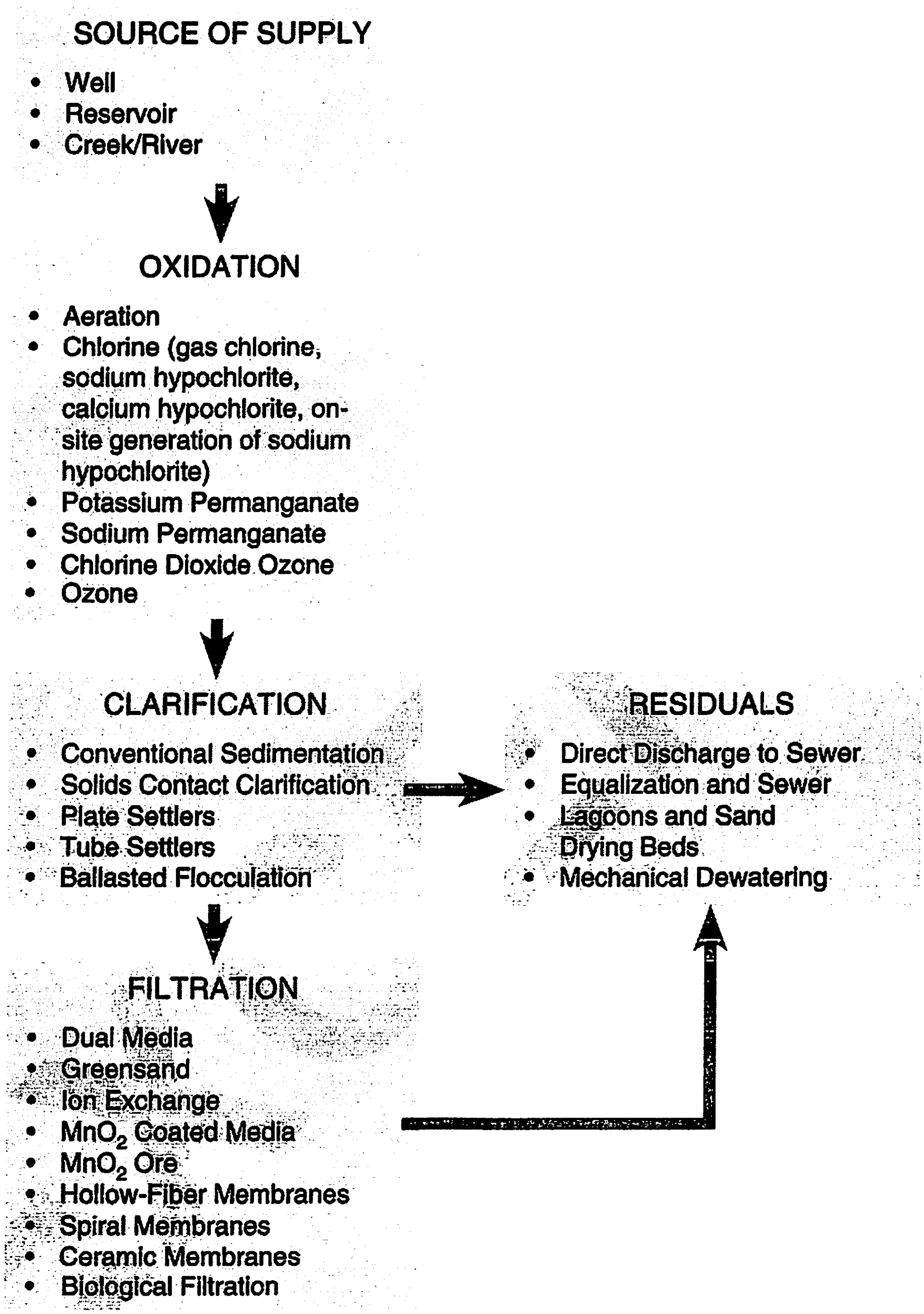


Figure 4-1 Technologies for iron and manganese removal
Source: Hatch Mott MacDonald

OVERVIEW OF TECHNOLOGIES

The treatment for iron and manganese typically involves multiple unit processes. The answer to the question "When should traditional technologies be used?" can be found in the properties of iron and manganese that are encountered in source waters.

As discussed in chapter 1, iron and manganese are often found in water supplies in their dissolved state. Traditional technologies involve converting these dissolved forms to a particulate form that can be clarified and filtered. The conversion from dissolved to particulate forms requires the use of an oxidant. Traditional forms of oxidation are well understood and can be successfully employed.

Conventional sedimentation and filtration technologies are well suited for the removal of particulate forms of iron and manganese. Traditional technologies are typically simple to operate and generally do not employ the use of proprietary treatment technologies.

Innovative technologies may be beneficial for small sites or in situations that have multiple contaminants. Nontraditional technologies may warrant consideration for systems with the following conditions:

- High concentrations of radionuclides
- Wells under the influence of surface water
- Wells with high iron/manganese and limited space
- Sites where disposal of residuals is problematic
- Sites where very high backwash volumes would impact water production

The nontraditional treatment methods for the removal of iron and manganese include the following:

- Ballasted flocculation
- Membrane filtrationBiological filtration

When selecting and designing a process for iron and manganese treatment, the quality of the source water should be analyzed comprehensively, because some contaminants can affect the operation of the system. For example, radiological contaminants may be removed by some types of filter media, but the media may become radioactive, resulting in safety concerns and increased cost for media disposal. In most cases, separate treatment for radiological contaminants may result in a lower life-cycle cost.

SEQUESTRATION

Sequestration is a form of treatment in which a chemical, known as a sequestrant, is added to groundwater. The chemical forms a bond with iron and manganese ions, allowing them to remain in solution. Sequestration for drinking water treatment of iron and manganese is generally limited to sources where the iron is less than 0.6 mg/L and the manganese is less than 0.1 mg/L. Sequestration of source water concentrations above these values may result in aesthetic issues in the distribution system and is generally not allowed by regulators.

OXIDATION, CLARIFICATION, FILTRATION

Most iron and manganese removal treatment processes incorporate oxidation to convert the dissolved forms of the metals to a solid, followed by a filtration process. When concentrations in the source water are above 8 to 10 mg/L combined iron and manganese, a clarification step is typically required prior to filtration. A combined iron and manganese concentration of 8 mg/L will generally result in a filter run time of less than 24 hours for sand/anthracite filters as well as greensand-type filters.

The clarification process reduces the amount of solids that must be removed by the filters, which results in longer filter run times before backwashing is required. Clarification may be achieved using any number of technologies, such as conventional sedimentation, plate or tube settlers, solids-contact clarifiers, dissolved air flotation, or ballasted flocculation. The type of filtration used in this treatment approach may be a conventional dual-media anthracite-and-sand filter, a mono-medium sand or anthracite filter, glauconite, manganese dioxide–coated sand media, or manganese dioxide ore.

OXIDATION, MANGANESE DIOXIDE-COATED MEDIA FILTRATION

Filtration using manganese dioxide–coated and ore-type catalytic media, such as manganese greensand, has historically been used for iron and manganese removal. In recent years advances have been made in the types of manganese dioxide media, allowing for higher loading rates and reducing backwash requirements.

Several different types of proprietary manganese dioxide–coated media filtration systems are available for iron and manganese removal. Although the mechanics vary, the basic treatment provided is oxidation of iron and manganese with the addition of chlorine or potassium permanganate followed by filtration of precipitates. Manganese dioxide coating on the filter media acts as a catalyst for the oxidation and reduction of iron and manganese.

Some of the proprietary media on the market include the following:

- Ferrosand® manganese greensand produced by Hungerford and Terry
- GreensandPlus™ synthetic manganese greensand produced by Hungerford & Terry
- LayneOx™ produced by Layne Christensen Company
- ANTHRA/SAND™ produced by WesTech

These media can be classified into two groups: manganese dioxide–coated sand and manganese dioxide ore. All these media are similar in that they use a combination of chemical oxidation and catalytic media to remove iron and manganese in water. Different proprietary media have different specific mechanics, loading rates, backwashing requirements, and removal efficiencies.

Design of the manganese dioxide–coated media systems is discussed in further detail in chapter 7.

OXIDATION, MEMBRANE FILTRATION

Membranes are often used for removal of turbidity and pathogens from surface water and groundwater under the direct influence (GUDI) of surface water. Membranes are also used for iron and manganese removal. Membrane treatment is often a viable option for GUDI wells that require treatment for iron and manganese. Membranes may be considered as a treatment option when the source water is non-GUDI groundwater, but typically are not the most cost-effective treatment solution in this situation.

Membrane systems operate by straining out particles that are larger than the pore size of the membrane. Microfilters are generally classified as having openings between 0.05 and 1.0 microns, whereas ultrafilters are generally classified as having openings between 0.005 and 0.05 microns. Dissolved iron and manganese converted to particulate form via conventional oxidation can be subsequently strained out on the membrane.

Several manufacturers of micro/ultrafilters have experience in treating water for iron and manganese. Each system uses a unique membrane and operates slightly differently in terms of backwashing and cleaning. Pressurized and immersed membrane systems are available.

BIOLOGICAL FILTRATION

Hydraulically, the biological filtration process operates similarly to a pressure filter in that raw water is pumped through a pressure vessel containing a granular media. However, unlike most other pressure filtration systems, which rely on the formation of a chemical precipitate and subsequent filtration, biological processes do not require any chemical oxidants.

Instead, conditions are established in the pressure vessel that foster the growth of bacteria. These bacteria oxidize the iron and manganese in the raw water, which is then retained within the filter in the form of dense precipitates. These precipitates are more compact than the amorphous precipitates formed during chemical oxidizing processes. Therefore the biological filter has a higher iron and manganese retention capacity (up to five times higher). The increased metal retention capacity allows the system to achieve long filter run times. Air is continuously injected into the raw water to provide the proper growth environment for the bacteria.

It is important to note that the required environmental conditions for biological iron removal are different than those for biological manganese removal. Therefore, where both iron and manganese are present, two stages of biological filtration are required: one for biological removal of iron and one for biological removal of manganese.

Biological filtration processes for removal of iron and manganese are proprietary patented systems manufactured by Infilco Degremont, Inc., marketed under the names Ferazur® and Mangazur®. Design of biological filtration systems is discussed in further detail in chapter 7.

RESIDUALS

All iron and manganese removal processes generate residuals. The requirements for residuals treatment will differ at each site depending on land available, the viability of disposal of waste to a sanitary sewer, the feasibility of recycling to the head of the plant, and other factors. The residuals generated by the treatment process and the options for treatment should be considered when selecting an iron and manganese removal process.

Some residuals treatment processes that may be considered include the following:

- Direct sewer discharge
- Equalization followed by sewer discharge
- Batch settling with decant recycle and solids discharge to sewer

- Equalization followed by treatment using plate settlers with decant recycle
- Lagoons
- Mechanical dewatering

Chapter 8 provides a discussion of residuals handling.

EVALUATION AND SELECTION CRITERIA FOR OPTIMUM TREATMENT

The process of evaluating and selecting a treatment option involves quantifying the iron and manganese concentrations in the source water, identifying other water parameters that require or impact treatment, and establishing the finished water quality goals.

Understanding the project constraints, such as site conditions, sewer availability, and regulatory acceptance will inform the selection process. Initial technologies should be screened for their potential feasibility and a subset of unit processes established for further evaluation. The evaluation generally consists of the preparation of concept-level designs for each option, including the development of a flow schematic, building floor plan, section, and site plan. These drawings are then used to develop construction, operating, and life-cycle costs.

In addition to the cost estimates, other factors should be considered. The technical and financial feasibility of a treatment option should be the primary criteria, but qualitative issues should also be weighed where more than one viable treatment option exists. Some qualitative considerations may include sustainability, operational flexibility, maintenance requirements, ease of integration into an existing facility, complexity of the process, track record of the proposed technology on similar applications, and location of service technicians.

The full list of qualitative issues that should be considered will vary from site to site and client to client. An example evaluation methodology (qualitative ranking matrix) is presented in Table 4-1. In order to develop a collaborative input/output for the qualitative analysis, the project team should consider completing the ranking matrix with the input of the owner and operations staff to establish the relative weight and rating components.

Table 4-1 Qualitative ranking matrix for determining suitability of an iron and manganese removal system

Criteria	Relative Weight (0–5)	Rating (1–5)	Weighted Rating
Overall system criteria			
Confidence in technology for iron and manganese removal			
Confidence of the technology for crenoform removal			
Equipment complexity—number of pumps and compressors			
Location of service technicians			
Operating costs			
Residuals			
Residuals generation as percent of overall plant output			
Impact of residuals recycling on plant performance			
Level of treatment required for residuals			
Ability to send residuals to sanitary sewer			
Operational criteria			
Level of operator attention required			
Ease of maintenance			
Experience in treatment chemicals used			
Ease of startup and shutdown of system			
Layout-related criteria			
Ease of integration with existing facilities			
Layout flexibility—restrictions on equipment location			
Total Weighted Rating			

TREATMENT SYSTEM DESIGN ELEMENTS AND WORK FLOW

The design of an iron and manganese treatment system begins with the process engineer defining the water quality and flow rate requirements of the system. This is followed by a conceptual evaluation phase and subsequent preparation of a basis of design report, which is followed by preparation of the design documents. The following sections present a suggested design sequence and description of the major design elements.

Conceptual Design

Define the concentration of contaminants in the raw water and develop minimum, average, and maximum concentrations. For surface water supplies, seasonal variations should be considered and data obtained. The concentration of all primary and secondary regulated contaminants should be obtained in order to ensure that all of the potential regulatory issues are addressed.

In addition to iron and manganese, analyses of the following constituents are also recommended, since they could impact the design and operation of the system:

- Hydrogen sulfide (H_2S)
- Silicon dioxide (SiO_2)
- Ammonia
- Radionuclides including radium, and uranium. Note that even if these values are below the MCL, some treatment media can remove these contaminants and the media may become radioactive.
- Contaminants that may be regulated by USEPA or are regulated by some states, e.g., perchlorate and methyl-*tert*-butyl-ether (M*t*BE)

In addition, for well water systems, a microscopic particulate analysis (MPA) should be conducted to assess if the groundwater is under the direct influence of surface water.

Define the treatment capacities of the system: minimum, average and maximum. Also establish any seasonal variations in capacity.

Define the treatment goals and regulatory requirements. For example:

- Is satisfying the secondary MCL acceptable, or are lower concentrations desirable?
- What are the regulatory requirements regarding loading rate? Is a waiver needed for the use of higher loading rates?

Define the site constraints including the following:

- Are there constraints on exposed vessels?
- Is the space site limited, requiring high-rate processes?

Define residuals-handling constraints including the following:

- Are sewers available, and do they appear to have sufficient capacity for iron and manganese liquid residuals?
- Is there sufficient space for sand drying beds?
- Are residuals required to be hauled off-site or recycled because of the lack of sewers?
- Is recycling of decanted residuals needed to minimize water consumption?

Based on these considerations, develop a set of treatment options for conceptual evaluation.

Perform a conceptual treatment evaluation that provides the following:

- Process floor plan showing overall equipment dimensions and orientation
- Site plan with concept contours and piping
- Estimate of electrical loads
- Capital, operating, and life-cycle costs based on process layouts
- Evaluation of noneconomic issues such as ease of operation and reliability

Discuss the evaluation with the owner, and provide a recommendation for final design.

Perform pilot testing if the process requires a loading rate higher than is permitted by regulations, if competing treatment technologies are being evaluated, or if there are site-specific water quality issues.

Detailed Design

Develop the basis of design report (BDR) that defines the design criteria for the treatment processes along with the design requirements for the support design disciplines (i.e., structural, architectural, electrical, etc.).

The BDR should include the following:

Design criteria

- Process and instrumentation diagram (P&ID). The equipment and piping portion of the P&ID should be included.
- A functional description of the control approach

- Process mechanical floor plan section completed to approximately 30 percent
- Site plan completed to approximately 30 percent
- A construction cost estimate

If permitted by regulatory agencies, consider submitting permit applications using the 30 percent drawings provided with the BDR. Discuss the BDR with the owner, and use it for development of the plans and specifications.

Design drawings

- Distribute the mechanical plan and section to other design disciplines and proceed with developing structural; architectural; plumbing; heating, ventilation and air conditioning (HVAC); and control design.
- Revise the process mechanical layout as needed.
- Develop technical specifications.
- Submit design drawings to the owner for review at the 60 percent, 90 percent, and 100 percent levels of design completion.

SUMMARY

The ultimate goal of an iron and manganese treatment system is to have a facility that does the following:

- Achieves the treatment objectives
- Is cost effective
- Is sustainable
- Allows for straightforward operation
- Is not complex and costly to maintain
- Enables comprehensive data collection along with the systems to analyze and interpret the data
- Is flexible enough to address future changes in regulations
- Will meet system needs with minimal upgrades for 20+ years

Satisfying these objectives will involve a project team consisting of design engineers, regulators, operators, and the owner. For the project to succeed especially in the long term, active participation of the owner and operators during the design is vital. These people have institutional knowledge regarding issues such as changes in source water quality, site conditions, and preferences regarding equipment operation and maintenance.

Throughout the design process, all the stakeholders should actively communicate by assessing and as necessary challenging the design decisions, equipment selection, and layout. Approaching the project design in a collaborative and open fashion will foster project success.

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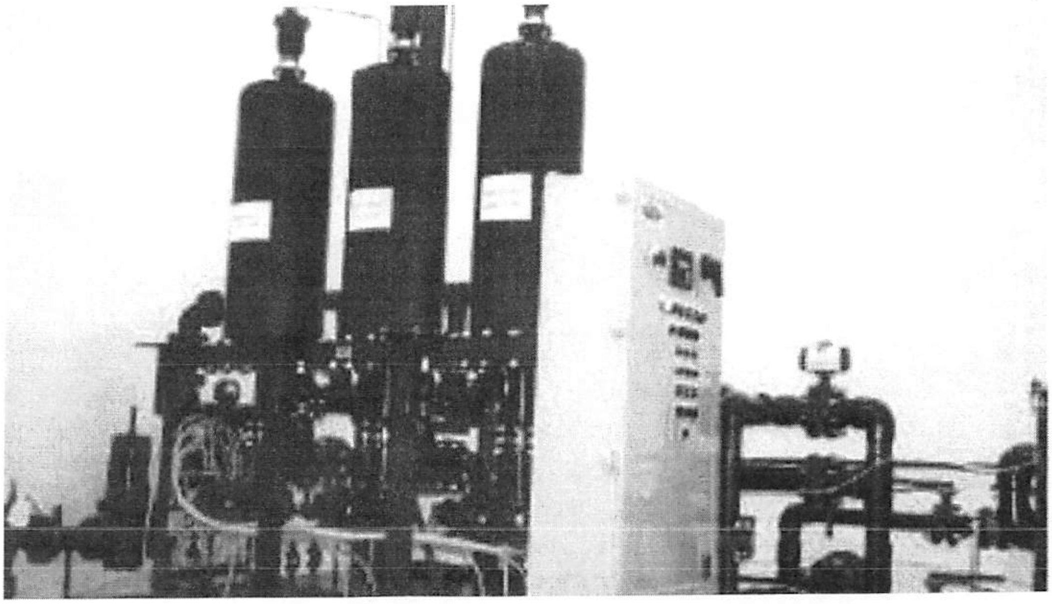
WaterWorld



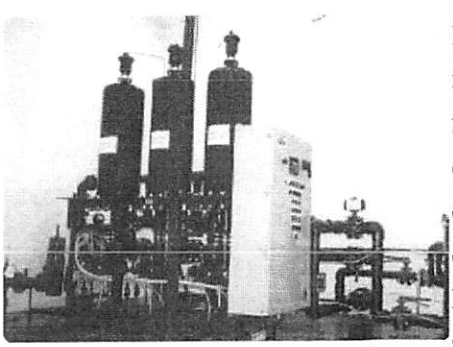
TECHNOLOGIES

New System Removes Iron, Manganese from Well Water

The Smith & Loveless IronMan System - an iron and manganese removal system that combines the Fibrotex filter with an integrated oxidation system - is designed for municipalities that rely on well water sources for potable water.

May 1st, 2001

The Smith & Loveless IronMan™ System - an iron and manganese removal system that combines the Fibrotex® filter with an integrated oxidation system - is designed for municipalities that rely on well water sources for potable water.



Click here to enlarge image

High levels of iron and manganese can create problems for both the water utility's distribution system and customers' plumbing and water quality. Although not toxic at the levels normally found in water supplies, iron and manganese can contaminate well water sources to varying degrees. The problem is not simply a matter of concentration; it depends partly on the chemical form in which the metals exist. In well waters, these contaminants are normally found as soluble salts.

Depending on the nature and degree of the contamination, the IronMan system uses various oxidation techniques to convert the soluble metals to an insoluble form. For example, when manganese occurs as an unbound inorganic salt, it can readily be oxidized and precipitated from solution. At higher concentrations, oxidation can be achieved by dosing the water with potassium permanganate. At lower levels, other methods may be selected.

The choice of oxidant used in the IronMan system will depend on site specific considerations, including concentration of iron, the presence or absence of manganese, water temperature and water pH. Consideration also must be given to the potential for formation of chlorinated hydrocarbons, and so the use of chlorine may be limited in certain cases.

Once the oxidation phase is complete, the precipitated manganese can then be removed from the water by filtration, using the Fibrotex filter. Whereas conventional depth filters have a high solids-holding capacity and are usually backwashable, they suffer from the disadvantage of having a relatively coarse nominal filter rating. Cartridge filters, on the other hand, have a fine filtration rating but have a low solids capacity and are generally not self-cleaning.

The IronMan Fibrotex system represents a combination of both types of filter in that it is an automatic backwashable depth filter with a higher solids capacity and a fine filtration rating.

A key feature of the technology is the marriage of an expandable-bed fibrous filter element with a Programmable Logic Control (PLC) system. It is this coupling of technologies that enables the filter both to backwash itself automatically when fully loaded with solids, and to achieve exceptionally fine levels of filtration.

The configuration of the element is governed by rotational and vertical air motors driven by the PLC. In the filtration mode, the PLC directs the control motors to wind and compress the fibers into a tight coil capable of capturing particulates from the inward-flowing feedstream; clarified filtrate leaves the element via the central core.

Yarn comprises the fibrous filter element. The most widely used materials are nylon or polyester. Acrylic polymers are also used in certain cases. Each strand of the material used to make the element consists of many fine, crimped fibers. The strands are cross-woven at the ends to form a cloth, and the filter element is made by winding the cloth around the endplates of the central spring to which it is then sealed. In the filtration mode, the strands of yarn are packed together, eliminating the spaces between them, to form an effective filter medium. Particles are captured in the crimped fibrous network within the strands of yarn.

Once the element is fully saturated with solids, the system automatically comes off-line and enters the backwash cycle. Backwashing can be triggered after a preset time interval, when the pressure differential rises to a critical level, or by the quality of the filtrate. The PLC commands the motors to uncoil and stretch the fibers, which are then twisted alternately clockwise and counter-clockwise in a wringing action as the particles are flushed outwards by the backwash water.

The expulsion of the particles depends primarily on the mechanical action of the element during backwashing. Alternate tensioning and relaxation of the crimped fibers causes particulates to be displaced during the self-cleaning process. Backwash water acts as a carrier to remove the displaced particulates rather than as the primary cleaning agent as in other backwashable depth filters. As a result, backwashing is highly efficient and requires a low volume of backwash water. Backwash rates are typically less than 2% of the filtrate and last only for a few minutes.

A single filter unit can handle flow rates up to 125 gpm from well water sources. Multiple units can be configured in parallel for higher flow rates. Employing multiple units allows for continual flow and operation 24 hours a day with standby capacity available - even during backwash cycles.

The Fibrotex filter system features a small footprint. Generally, they require only 25% of the floor space of a comparable multi-media filter. This is particularly suited for small to medium-sized communities that have space concerns at existing water utilities.

Source URL: https://www.waterworld.com/technologies/article/16192051/new-system-removes-iron-manganese-from-well-water

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

JAN 22 2001
TOWNSEND WATER DEPT.

ARGEO PAUL CELLUCCI
Governor

JANE SWIFT
Lieutenant Governor

BOB DURAND
Secretary

DAVID B. STRUHS
Commissioner

Paul Rafuse, Superintendent
Townsend Water Department
512 Main Street
PO Box 17
Townsend, MA 01469

TOWNSEND
Transmittal #'s W015497, PWSID # 2299000
RE: New Source Approval ≥ 70 gpm, BRPWS19 Pumping Test Report and Zone II **Approval**
AT: Well Site 3-98, Main Street Well Field

Dear Mr. Rafuse:

The Technical Services Section of the Drinking Water Program has completed its review of the above referenced submittal with regard to its compliance with the criteria set forth in the Division's Guidelines and Policies for Public Water Systems (amended 1996). We have reviewed this document for the siting of a new public water supply, as well as, the conductance of a long term pumping test for a well pumping over 70 gallons per minute (gpm).

Siting – Well Site 3-98 is located approximately 300 feet south of Townsend's existing Main Street wellfield. The site is located east of Pearl Hill Brook, a north-flowing tributary of the Squannocook River that drains over five square miles. A smaller north flowing perennial unnamed brook flows parallel to Pearl Hill Brook and is located approximately 400 feet east of Well Site 3-98.

Two prolonged pumping tests were conducted to evaluate well yield, water quality, potential well interference and impacts to sensitive receptors. The first test was conducted for three days. Water levels in six observation wells were measured in an attempt to estimate aquifer parameters. Stream flow and seepage meter measurements were made to evaluate induced infiltration. The Main St. wellfield was off-line for the duration of this test. The second test was conducted for ten days during which Well 3-98 and the Main St. wellfield were simultaneously pumped. Thirteen observation wells, twelve shallow well points, stream flows and seepage meters were measured to determine the safe yield of the well and any potential impacts on sensitive receptors. The twelve shallow well points were hand driven and ranged in depth from 3 to 9 feet. Three pairs were installed along Pearl Hill Brook and three pairs were installed along the unnamed brook to evaluate the impact of pumping on these surface water features. **The locations and distances of the observation wells are appropriate to calculate aquifer parameters.**

Land uses within one-half mile of Site 3-98 were determined from MassGIS databases and windshield surveys. The largest land uses are forest, agricultural and residential. State forests occupy much of the land in the Zone II and III. Residences are assumed to have on-site septic systems since Townsend does not have a sewer system. The Zone I consists mainly of cleared grassland with the remainder woodland or wetlands. A transmission line easement exists approximately 300 feet south of the well site. It is reported that the transmission line is maintained without the use of pesticides. Machine or manual cutting controls brush and other growth. The area around Site 3-98 is currently hayed and fertilized annually. Low levels of nitrate (0.40 mg/l were detected in Test well 3-98. **The Department is not concerned with the continued haying of the fields surrounding the proposed well, but application of fertilizer would not be allowed, if this land use is to continue.**

Pumping Test – Two prolonged pumping tests were conducted to evaluate the suitability of Test Well Site 3-98 as a new source of water supply. In the first test, an 8-inch diameter test well was continuously pumped for three days to obtain data sufficient to determine aquifer hydraulic characteristics. The existing tubular wells remained out of service during the first test. In the second test, site 3-98 and the tubular wellfield were pumped simultaneously to evaluate well yield, well interference, water quality and environmental impacts. Acceptable methodologies were utilized to analyze the pumping test data for aquifer parameters. Evaluation of the time-drawdown plots does reflect a recharge event during the second day of the test that complicated analysis of the late time-drawdown data. Analysis of the drawdown and recovery data generated transmissivity values that ranged from 5,200 to 22,300 ft^2/day. The authors found a cluster of values in the range of 10,000 to 14,000 ft^2/day. These transmissivities translate into hydraulic conductivity values of about 130 to 220 ft/day. **These values seem reasonable and are reflective of the aquifer materials evidenced in the boring logs.**

Potential Impacts on Sensitive Receptors – A Certificate from the Secretary of Environmental Affairs was issued on August 21, 1998. The certificate expresses some concern about a wetlands and two turtle species that could be potentially impacted as a result of long term pumping of Well 3-98. The report states that the pumping of Well 3-98 in comparison to impacts experienced from the pumping of the tubular wellfield will not significantly exacerbate impacts to the wetlands. This is primarily due to the fact that Well 3-98 will function in a redundancy capacity and will not significantly increase the total yield from the Well 3-98/tubular wellfield area. Relative to the potential impact on the Wood and Blanding's Turtle, the report states that based on the pumping test, significant drawdown may occur along a reach of Pearl Hill Brook about 600 feet upstream and 300 feet downstream of Well Site 3-98. The most significant impacts would normally be felt in late summer and early fall when stream flows are at a minimum. The report also states that significant reduction of stream flow at any time of the year would negatively impact both species of turtle since the young require year around aquatic habitat until they reach sexual maturity (around twelve years). The report concludes that since Well Site 3-98 will function primarily as a redundant source, representing no significant increase in withdrawal, it is unlikely that the new well will markedly change the existing stream flow conditions and increase the potential to negatively impact the turtle habitat. **Given the fact that some drawdown may occur in the vicinity of the surface water features located near the well, it is imperative that the potential impacts that could result from these drawdowns be addressed as part of the Water Management Act Permit.**

Monitoring Well Program – The proposed monitoring well program seems reasonable. Very few land uses within the protective zones of Test Well Site 3-98 present any concern. The recommended monitoring wells of OW-1-99, OW-2-99 and TW6-98 are all located upgradient of the site and should provide adequate advanced warning of contamination. **We agree that a monitoring well should be installed along Route 119. A sampling schedule that would annually monitor for VOCs and general chemistry would be adequate.**

Safe Yield – The pumping test was conducted at 302 gpm. Based on this rate, a specific capacity of 29.7 gpm/ft and an available water column of 52 feet, a safe yield of 1,160 gpm is theoretically possible. Since the pumping test was conducted at 302 gpm on a test well, the approved rate can be as much as twice this rate or 604 gpm. **With the following conditions, the well is approved at the requested rate, 600 gpm:**

1. **Do not apply fertilizer, if haying of the fields surrounding the proposed well continues.**
2. **Install a monitoring well will along Route 119.**
3. **As part of the Water Management Act Permit address the potential impacts that may occur from drawdowns in the vicinity of the surface water features located near the well.**
4. **Monitor for VOCs and general chemistry annually.**

Zone II – The Zone II was delineated using a combination of conceptual and analytical techniques. The downgradient extent of the Zone II was determined using pumping volumes for both the Main St. Wellfield and Site 3-98. Based on the results of this analysis, the downgradient limit was extended to account for hydrogeologic uncertainties associated with flow patterns near the valley walls and the convergence of Pearl Hill Brook and Willard Brook. Based on these uncertainties, the downgradient limit of the Zone II was extended from 470 to 800 ft. The downgradient boundary was then extended westerly along Willard Brook and then upgradient to the aquifer boundary. This is a valid assumption since Willard Brook probably acts as a hydrologic boundary in this area. The lateral boundaries coincide with the aquifer boundaries and in lieu of a more sophisticated method of delineation are a good conservative approximation of the Zone II boundaries in this area. The upgradient extent of the Zone II terminates at wetlands in the southwestern-most corner of Townsend. In consultation with Earth Tech it was agreed that the aquifer narrows and probably thins in this area and that groundwater discharges to the wetlands or to Pearl Hill Brook, forming an appropriate upgradient boundary of the Zone II. Our review has determined that appropriate methodologies were employed in the delineation of the Zone II for Site 3-98 and the Main St. Wellfield. **With the following condition, the Zone II is approved as delineated in Figure 5-1 of the report: Submit to this office a copy of Figure 5-1 with the Water Purveyor's and the Consultant's signatures.** If this source does not go on-line within five years of this date and DEP receives a written request in accordance with Policy 97-01 "Zone II Status" to evaluate the status of the Zone II, DEP may decide to rescind the Zone II approval.

Please note that this approval does not relieve you of your obligation to comply with all other applicable rules and regulations or to obtain any other necessary permits. The next permit application, BRPWS20, Construct Source, shall be prepared by your engineer and submitted to DEP to complete the new source approval process. If you have any questions or wish further comment on related matters, please feel free to contact Paul Blain, Senior Hydrogeologist, DWP, Boston at (617) 292-5948 or Tom Aquino of this office at (508) 792-7650, extension 3701.

Very truly yours,

Robert A. Kimball

Jan. 17, 2001

Robert A. Kimball, P.E.
Environmental Engineer
Bureau of Resource Protection

Date

TA/hs -w:\ws\taquino\BRPWS19\29900001

cc: Mr. Richard Williams, Board of Health, P.O. Box 669, Townsend, MA 01469
Douglas R. DeNatale, Earth Tech, 196 Baker Avenue, Concord, MA 01742-2167
Dana Samuelson, Permit Coordinator, CERO
Bruce Bouck, DWP, DEP, Boston
Paul Blain, Senior Hydrogeologist, DWP, DEP, Boston
Dave Terry, DWP, DEP, Boston

NOTED 3-20-01 DAP
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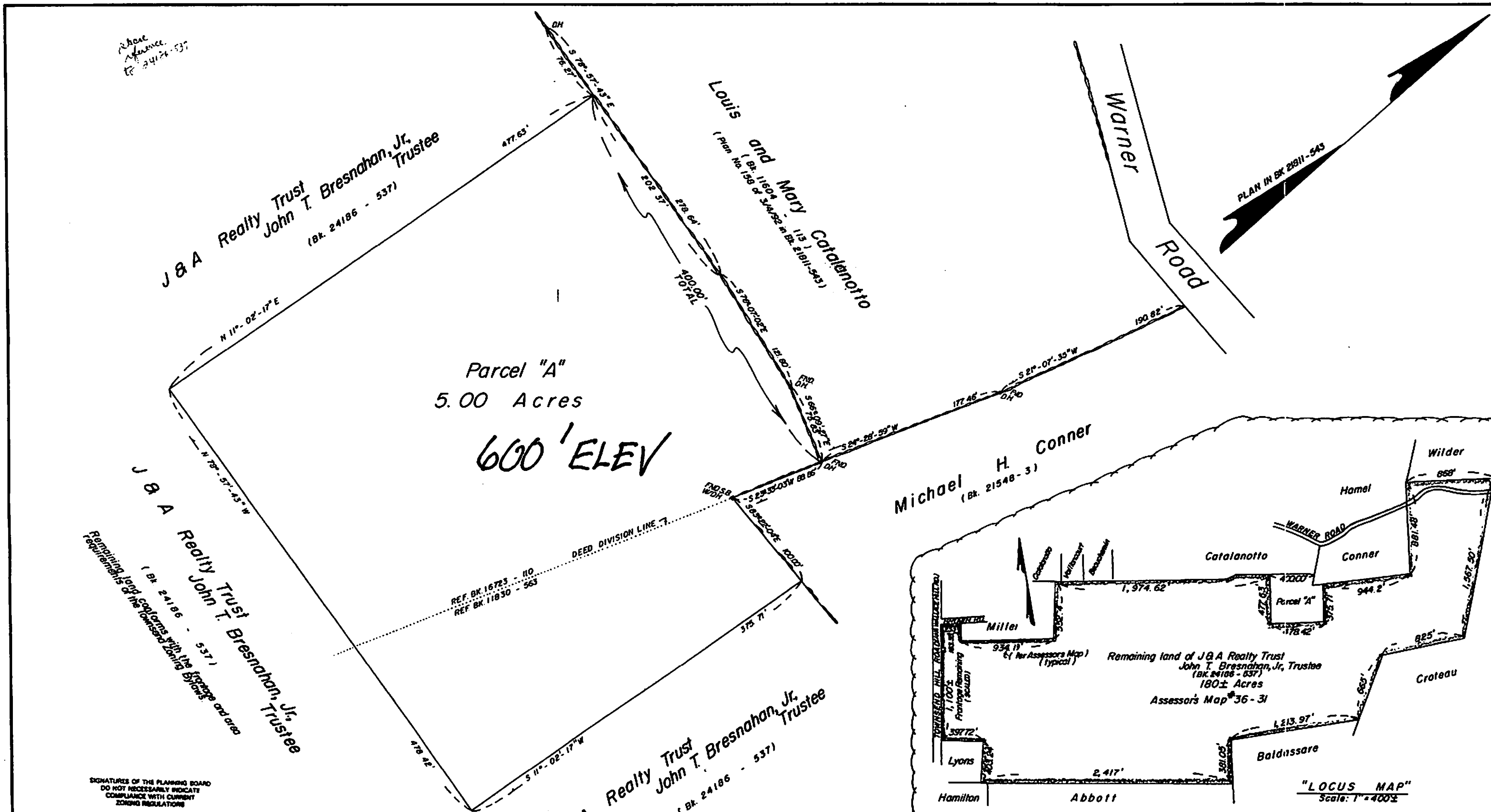


SIGNATURES OF THE PLANNING BOARD DO NOT NECESSARILY INDICATE COMPLIANCE WITH CURRENT ZONING REGULATIONS

Townsend Planning Board

APPROVAL UNDER SUBDIVISION CONTROL LAW NOT REQUIRED. C 41 S 81-P

DATE: 8.7.95

Middlesex Registry of Deeds, Southern District
Cambridge, Massachusetts
Plan No. 698 of 19 95
Rec'd 8-14 19 95
at 8 h 26 m A m Doc No. 9
Rec'd, Bk 25564 Page 243
Attest
Register

NOTE

PARCEL "A" IS A PORTION OF THE PREMISES DESCRIBED IN A DEED TO J & A REALTY TRUST - JOHN T BRESNAHAN, JR, TRUSTEE RECORDED IN BK. 24186 - 537 AT THE MIDDLESEX SOUTH DISTRICT REGISTRY OF DEEDS.

PARCEL "A" IS NOT A BUILDING LOT, BUT IS TO BE CONVEYED TO THE TOWN OF TOWNSEND WATER DEPARTMENT.

ZONING DISTRICT: RB Residential.

Record Owner:
J & A Realty Trust
John T. Bresnahan, Jr., Trustee
280 Great Road - Shirley, Mass. 01464

1" = 40'
0 20 40 60 80 100 120 FEET
0 5 10 15 20 25 30 35 METERS

I CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

7/24/95
DATE
SURVEYOR

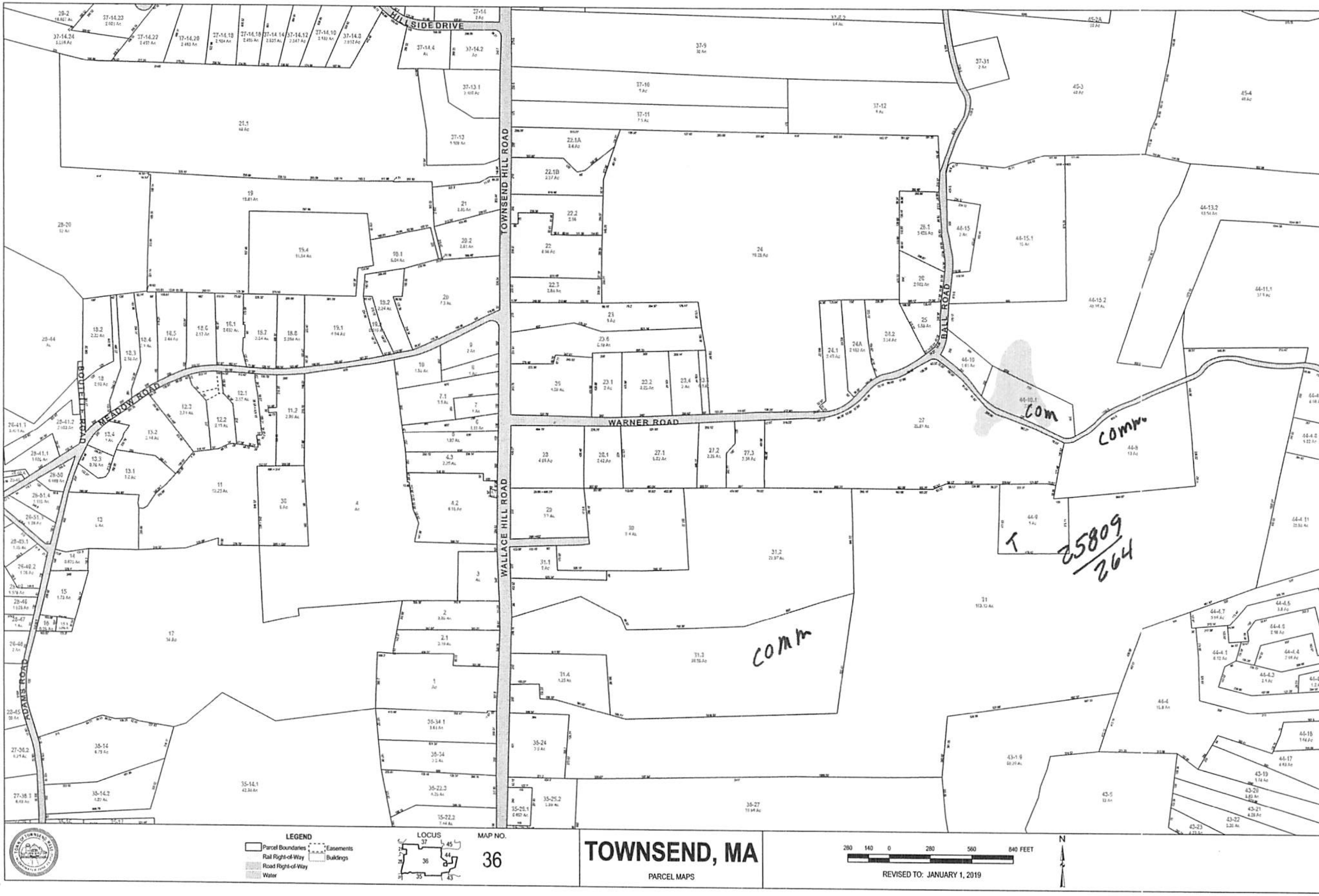
LAND IN
Townsend, Mass.
SURVEYED FOR
J & A Realty Trust
SCALE: 1" = 40' JULY, 1995

David E. Ross Associates, Inc
CIVIL ENGINEERS
LAND SURVEYORS
ENVIRONMENTAL CONSULTANTS
P.O. BOX 361 - 17 W. MAIN ST - AYER, MASS. 01432
(TEL. NO 508-772-6232)

JOB NO. 7291 PLAN NO. L-3274

SURV.: S.B.H	CALC. M.D.M	DRAFTED P.J.T	CK'D. M.D.M	NB.102-82139-94	DEED BK. 24186-537	REF.: L-777

698


HILLSIDE DRIVE
TOWNSEND HILL ROAD
WALLACE HILL ROAD
WARNER ROAD
BALL ROAD
MEADOW ROAD
BOUTELLE ROAD
ADAMS ROAD
COMM
COM
COMM
COMM
T
25809
264
LEGEND
Parcel Boundaries
Easements
Rail Right-of-Way
Buildings
Road Right-of-Way
Water
LOCUS
MAP NO.
36
TOWNSEND, MA
PARCEL MAPS
280 140 0 280 560 840 FEET
REVISED TO: JANUARY 1, 2019
N

1E

MSD 11/13/95 08:31:57 18 25.00

Off Warner Rd Townsend

QUITCLAIM DEED

John T. Bresnahan Jr. Trustee of J&A Realty Trust u/d/t dated May 10, 1965 and recorded with the Middlesex South Registry of Deeds at Book 10815, Page 392, as amended, said amendment being recorded with said Deeds at Book 13392, Page 606 of 280 Great Road Shirley, Middlesex County, Massachusetts, for consideration paid of $1 and other good and valuable consideration

Grant to The Town of Townsend Massachusetts

with Quitclaim Covenants

A certain tract of land with any improvements thereon as described as Parcel "A" on a plan entitled "Land in Townsend Ma., surveyed for J&A Realty, scale 1"= 40', July 1995, David E. E. Ross Associates Inc., Civil Engineers, Land Surveyors,, Environmental Consultants, P.O. Box 361, 17 W Main St. Ayer Mass. 01432 and as such plan is recorded with the Middlesex South Registry of deeds as Plan Number 698 of 1995 and in Book 25564, Page 243, be all or any of the measurements as shown on said Plan.

Containing 5 acres according to said Plan.

Being a portion of the premises as described in deed to Grantor herein and recorded with said Deeds at Book 24186 , Page 537.

Executed as a sealed instrument this 9th day of Nov. 1995.

Witness

John T. Bresnahan Jr. Trustee

Commonwealth of Massachusetts
Middlesex ss
Nov. 9 1995

Then personally appeared the above named John T. Bresnahan Jr. Trustee as aforesaid and did acknowledge his execution of the foregoing instrument to be his free act and deed before me,

Notary Public

My commission expires: 8/8/97

BK 14477 PG 248

CP 25 —

I, Ralph A. Hayward

139 Luneburg

of Erving Franklin County, Massachusetts.

in consideration of $15,000.00

grant to The Inhabitants of the Town of Townsend, a municipal corporation,

of Townsend, Middlesex County, Mass.

with quitclaim covenants

xxxxxxxx A certain tract of land with the buildings thereon situated in the south-westerly part of said Townsend, on the westerly side of Lunenburg Road, containing 4.19 acres, and bounded and described as follows:

Beginning at the southeasterly corner thereof at a set iron pin in the westerly side line of Lunenburg Road and at a corner of land of Donald J. and Grace C. Millers;

thence N 82° 4' 44" W 190.98 feet to a pole;

thence N 73° 47' 16" W 54.36 feet to an angle;

thence N 78° 18' 12" W partly by a stone wall and partly by a fence 126.65 feet to an iron pin in stones;

thence continuing on the same course 25.80 feet to a point in a stone wall at land now or formerly of Stephen H. Smith;

thence N 34° 8' 47" E 44.75 feet to a drill hole in a corner of walls forming the northeasterly corner of said Smith land;

thence N 2° 47' 18" W by land now or formerly of Ralph A. Haywood and Isabel C. Arthur 464.98 feet to a corner of walls at land now or formerly of the estate of Lila M. Hayward, said corner marked by a made drill hole in the walls;

thence S 81° 48' 9" E by land now or formerly of Clifford and Dorothy Greeke by the stone wall 364.89 feet to an iron pin set in the westerly side line of Lunenburg Road;

thence southerly by the westerly side line of Lunenburg Road 524.49 feet to the place of beginning.

These premises are shown on a certain plan entitled "Land in Townsend, Massachusetts, surveyed for Townsend Water Department, scale: 1"=50 feet, October, 1978" by Charles A. Perkins Co., Inc., Civil Engrs. and Surveyors, 44 High Street, Clinton, Massachusetts 01510, and are denominated "4.19" acres (part of Book 7341-314)" thereon.

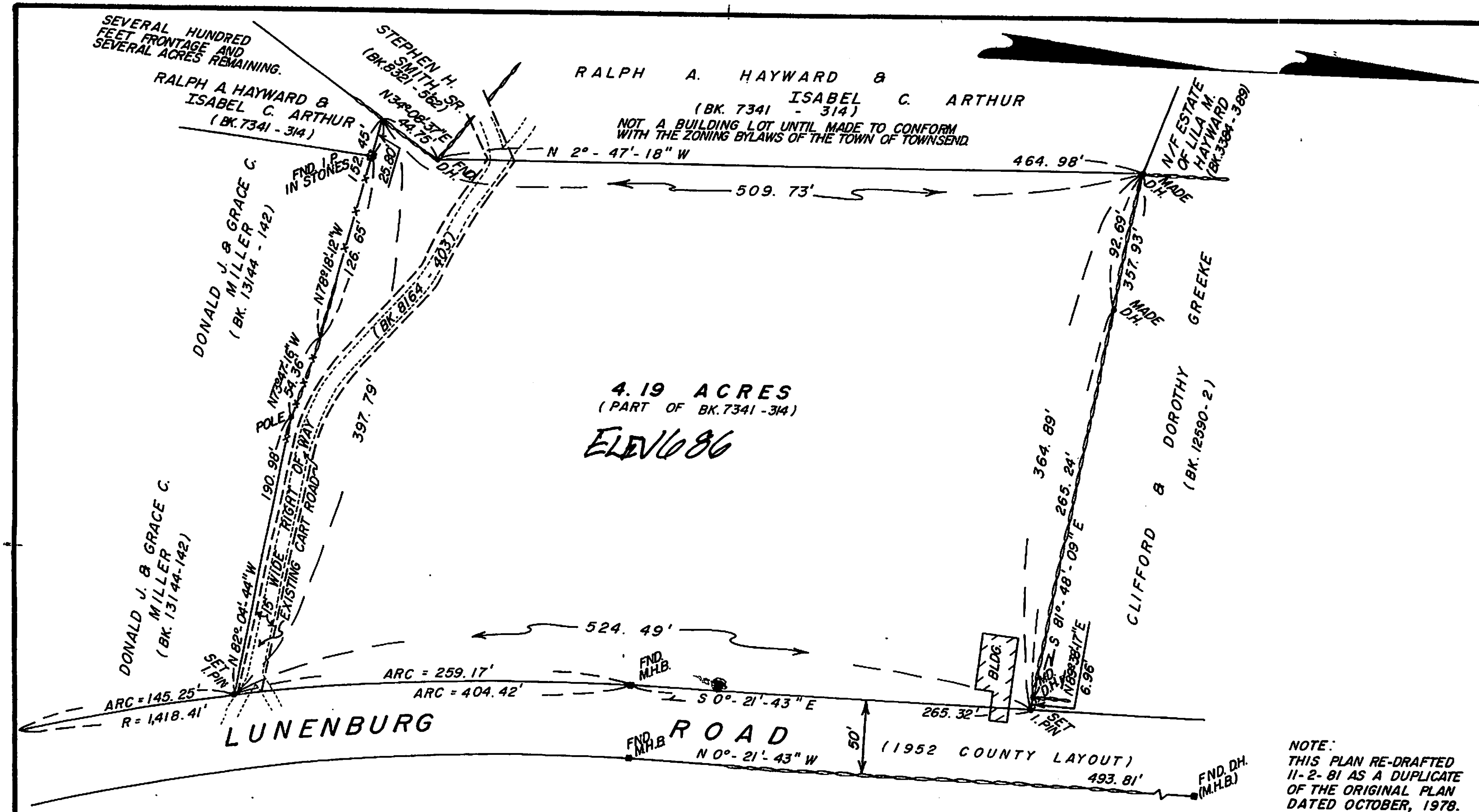
Being a portion of the same premises conveyed to Ralph A. Hayward and Isabel C. Arthur, as joint tenants and not as tenants in common, by deed of Benjamin Flaum, Commissioner, dated September 8th, 1948 and recorded in Middlesex Southern District Registry of Deeds, Book 7341, Page 315.

This conveyance is made subject to any and all existing rights of way that may be of record and which may now be in force and applicable.

The, Grantor reserves to himself, his heirs and assigns the right to pass and repass over a 15 foot strip (a now existing gravel road) of land on the southerly line of the granted premises for ingress and egress from Lunenburg Road westerly to his other remaining premises.

Lunenburg Road, Townsend, Mass.

14477 PAGE 248



NOTE:
THIS PLAN RE-DRAFTED 11-2-81 AS A DUPLICATE OF THE ORIGINAL PLAN DATED OCTOBER, 1978.

TOWNSEND PLANNING BOARD

APPROVAL UNDER SUBDIVISION CONTROL LAW
NOT REQUIRED. C 41 S 81-P
DATE: 2 OCT 81

Hugh Fowler
Martha M. Dorison
Jonathan Smith
Elaine M Cavanaugh
David W. Mathews

PLAN NUMBER 1324 OF 1981

Middlesex Registry of Deeds, So. Dist.
CAMBRIDGE, MASS.
Plan Number 1324 of 1981
Rec'd Nov. 27, 1981 at 12 h 2 m P.m
With DEED Doc. No. 120
RALPH A. HAYWARD
THE INHABITS. OF THE TOWN OF TOWNSEND
Recorded, Book 14477 Page 248
Attest: John F. Zamparelli Register
SEE PLAN BY SIW

1" = 50'
0 25 50 75 100 125 150
FEET
0 10 20 30 40
METERS

I CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

AUG. 3, 1981
DATE

Edward P. Downing
SURVEYOR #29423

COMMONWEALTH OF MASSACHUSETTS
EDWARD P. DOWNING
No. 29423
REGISTERED LAND SURVEYOR

SURV: T.J.C.	CALC: D.J.J.	TRACED: P.J.T.	CK'D:	NB. 428-106
DEED: BK. 7341 - 314		REF:		

LAND IN
TOWNSEND, MASS.
SURVEYED FOR
TOWNSEND WATER DEPT.

SCALE: 1" = 50' OCTOBER, 1978

CHARLES A. PERKINS CO. INC.
CIVIL ENGINEERS & SURVEYORS
444 HIGH ST. - CLINTON, MASS. 01510

JOB NO. 5838
PLAN NO. M - 3676

Executed as a sealed instrument this 5th day of August 19 80

C. Dudley Bagley Ralph A. Hayward

BAGLEY, BAGLEY & McDUFFEE
Attorneys at Law
Traffic Circle - E. Pepperell, Mass.

The Commonwealth of Massachusetts

Franklin ss. August 5th 19 80

Then personally appeared the above named Ralph A. Hayward

and acknowledged the foregoing instrument to be his free act and deed,

Before me, Hannah H. Atkinson
Hannah H. Atkinson Notary Public
My commission expires 1/29/81 19

COMMONWEALTH OF MASSACHUSETTS
DEEDS EXCISE
Cancelled
NOV 21 '80
$4.20

7341

314

and I, Florence M. McKinnon, ~~husband~~ wife of said grantor,

release to said grantee all rights of ~~tenancy by the curtesy~~ dower and homestead and other interests therein.

Witness our hand and seal this 14 day of August 1948

M. Aronsberg as to Charles H. McKinnon — Charles H. McKinnon

John J. Bristol — Florence M. McKinnon

State of New Jersey ~~The Commonwealth of Massachusetts~~

County of Hudson ss. August 14 1948

Then personally appeared the above named Charles H. McKinnon

and acknowledged the foregoing instrument to be his free act and deed, before me,

M. Aronsberg
Notary Public ~~Justice of the Peace~~

My Commission expires Oct 29th 1950.

Rec'd & entered for record Sept. 24, 1948 at 10h. 11m. A.M. #76

I, Benjamin Flaum, of Fitchburg, Worcester County, Massachusetts

— COMMISSIONER

by power conferred by virtue of a Warrant of the Probate Court for the County of Middlesex, dated July 21, 1948, in the Partition of Real Estate by Sale of the land of Ralph A. Hayward and others

and every other power, for Two Thousand Two Hundred and Fifty Dollars paid, grant to Ralph A. Hayward of Townsend and Isabel C. Arthur, of Arlington, both of Middelsex County, Massachusetts, as joint tenants and not as tenants in common

A certain parcel of land situated in the southwesterly part of Townsend on the westerly side of Bayberry Hill Road, and bounded:

Beginning at the northeasterly corner thereof at a point on the westerly side line of said Bayberry Hill Road at land of one Emil Johnson; thence westerly by land of said Emil Johnson and land of Ralph A. Hayward et al. 38.60 rods, more or less, to land of one Koskela; thence southerly by said Koskela land 17½ rods, more or less, to a corner; thence easterly by said Koskela land 33.48 rods to a corner; thence southerly by said Koskela land 36½ rods to a corner; thence easterly by said Koskela land 1 rod to a corner; thence southerly by land formerly of Stickney 38 rods to a corner; thence easterly by land formerly of Stickney and Bruce 30½ rods to a corner; thence northerly by land formerly of Stickney and Bruce 3.88 rods to a corner; thence easterly 20½ rods to a corner; thence easterly by land formerly of John Coffey 27 rods; thence southerly 5.40 rods to a corner; thence easterly 6 rods to a corner at said road; thence northerly by the westerly line of said Bayberry Hill Road to the place of beginning. Containing 28 acres, more or less.

Being a part of the premises as were described in deed of Earl H. Farwell to Lila M. Hayward, dated June 6, 1908 and recorded with Middlesex (So. Dist.) Deeds, Book 3384, Page 389.

Book 14477 Page 246
Book 14349 Page 099

Conveyed subject to any and all unpaid taxes, municipal liens and assessments thereon.

DOCUMENTARY 2 2 — DOCUMENTARY 50 — DOCUMENTARY 25

Witness my hand and seal this 8th day of September 1948.

Benjamin Flaum

Commissioner

The Commonwealth of Massachusetts

Worcester, ss. September 8, 1948.

Then personally appeared the above named Benjamin Flaum

and acknowledged the foregoing instrument to be his free act and deed, before me

Burton M. Stevens
Burton M. Stevens Notary Public

My commission expires July 9, 1954

Rec'd & entered for record Sept. 24, 1948 at 10h. 17m. A.M. #77

SUFFOLK SAVINGS BANK FOR SEAMEN AND OTHERS, mortgagee and present holder of mortgage from Wendell H. Vidito and Edith R. Vidito to said Suffolk Savings Bank for Seamen and Others, dated June 21, 1945 recorded with Middlesex South Deeds, in Book 6867, Page 507, acknowledges satisfaction of the same.

In Witness Whereof, the said Suffolk Savings Bank for Seamen and Others has caused its corporate seal to be hereto affixed and these presents to be signed in its name and behalf by Sherman H. Peppard, its Treasurer, this twenty-third day of September A.D. 1948.

SUFFOLK SAVINGS BANK FOR SEAMEN AND OTHERS
by Sherman H. Peppard
Treasurer

The Commonwealth of Massachusetts

Suffolk, ss. September 23, 1948

Then personally appeared the above named Sherman H. Peppard and acknowledged the foregoing instrument to be the free act and deed of Suffolk Savings Bank for Seamen and Others,

before me, William M. Meikle
William M. Meikle Notary Public
My commission expires April 17 1953

Mtge. # 409822

Rec'd & entered for record Sept. 24, 1948 at 10h. 20m. A.M. #78

Card 1 of 1

Location 139 LUNENBURG RD	Property Account Number	Parcel ID 8 15 0

Old Parcel ID 525 --

Current Property Mailing Address

Owner TOWN OF TOWNSEND (WATER DEPT/COMM TOWER) Address MAIN ST P.O. BOX 17	City TOWNSEND State MA Zip 01469 Zoning RB2

Current Property Sales Information

Sale Date 11/27/1981 Sale Price 15,000	Legal Reference 14477-248 Grantor(Seller) HAYWARD

Current Property Assessment

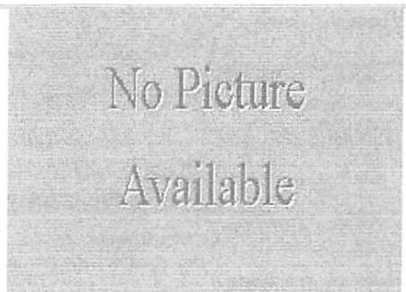
	Card 1 Value
Year 2021	Building Value 0
	Xtra Features Value 0
Land Area 4.190 acres	Land Value 77,000
	Total Value 77,000

Narrative Description

This property contains 4.190 acres of land mainly classified as MUNICPL with a(n) N/A style building, built about , having N/A exterior and N/A roof cover, with 0 unit(s), 0 total room(s), 0 total bedroom(s), 0 total bath(s), 0 total half bath(s), 0 total 3/4 bath(s).

Legal Description

Property Images



Telephone (978) 597-2212
FAX (978) 597-5611

TOWN OF TOWNSEND
WATER DEPARTMENT
P. O. Box 17
TOWNSEND, MASSACHUSETTS 01469-0017

Fax

To:	DOUG DENATALE	From:	PAUL RAFUSE
Fax:	508-371-2468	Pages:	7
Phone:		Date:	APRIL 8, 2002
Re:	OBSERV.,TEST & DRIVE POINT WELL RDGS.	CC:	

Urgent X For Review   Please Comment   Please Reply   ☐ Please Recycle

If there is a problem with this FAX transmission, please call (978) 597-2212

DOUG,

HERE ARE THE OBSERVATION, TEST, AMBIENT & DRIVE POINT WELL READINGS YOU REQUESTED. I PUT THEM ON COMPUTER, THIS SHOULD WORK OUT BETTER FOR BOTH OF US. ANYTHING ELSE LET ME KNOW.

THANKS

PAUL

Faxed 4-8-02
Supt.

TOWNSEND WATER DEPT.
MAIN ST. WELL

2002 WATER LEVEL FLUCTUATIONS **2002**

OBSERVATION WELLS & DRIVE POINTS

WATER LEVELS (ft) BELOW TOP CASING

DATE	WEATHER	WELL # 3-98	WELL # 1-98	WELL # 1-84	WELL # 6-98	WELL AMBIENT WELL # 5-98 HORSESHOE DR.	DRIVE POINT(3)STREAM INSIDE	DRIVE POINT(3)STREAM OUTSIDE	DRIVE POINT # 4	DRIVE POINT(7)STREAM INSIDE	DRIVE POINT(7)STREAM OUTSIDE	DRIVE POINT # 8
1/8/02	sunny/cool	4.23	3.48	6.23	6.69	13.89	2.98	dry	3.6	2.56	frozen	1.89
1/23/02	sunny/cool	4.65	4.73	6.48	6.81	13.9	3.23	dry	3.98	3.06	frozen	2.48
2/4/02	cloudy/cold	4.31	4.23	6.15	6.56	13.73	2.98	dry	3.65	2.56	frozen	1.9
2/19/02	cloudy/mild	4.23	4.56	6.15	6.56	13.9	2.98	dry	3.65	2.65	frozen	1.98
3/1/02	clouds/sun/cool	4.4	4.4	6.54	6.35	13.75	3.02	dry	3.73	2.98	1.4	2.31
3/22/02	clouds/sun/cold	4.23	4.54	5.98	6.31	13.56	2.88	dry	3.56	2.85	1.29	2.23

TOWNSEND WATER DEPT.
MAIN ST. WELL

2001 WATER LEVEL FLUCTUATIONS **2001**

OBSERVATION WELLS & DRIVE POINTS

WATER LEVELS (ft) BELOW TOP CASING

DATE	WEATHER	WELL # 3-98	WELL # 1-98	WELL # 1-84	WELL # 6-98	WELL AMBIENT WELL # 5-98 HORSESHOE DR.	DRIVE POINT(3)STREAM INSIDE	DRIVE POINT(3)STREAM OUTSIDE	DRIVE POINT # 4	DRIVE POINT(7)STREAM INSIDE	DRIVE POINT(7)STREAM OUTSIDE	DRIVE POINT # 8
1/8/01	cloudy/sun/cold	4.23	3.23	5.94	6.35	13	ice	ice	3.48	2.06	ice	1.65
1/23/01	clear/sun/cold	4.81	3.71	6.4	6.48	13.23	ice	ice	3.94	2.27	ice	2.48
2/5/01	cloudy/sun/cold	4.9	4.85	6.75	6.52	13.08	ice	ice	4.1	3.31	ice	2.69
2/20/01	cloudy/cold	4.4	3.4	6.15	6.48	13.06	ice	ice	3.6	2.48	ice	1.85
3/19/01	cloudy/sun/cold	4.75	4.77	6.31	6.23	12.77	ice	ice	3.9	3.06	1.31	2.48
4/6/01	clouds/sun/cold	3.48	3.73	5.65	5.44	12.06	2.15	1.56	2.81	"brook	to high"	1.23
5/7/01	clear/sun/warm	4.21	4.6	5.71	5.62	13.29	2.79	dry	3.46	3	1.58	2.35
5/21/01	clear/sun/warm	4.54	4.92	6.1	5.96	13.67	3.05	dry	3.79	3.27	1.35	2.62
6/4/01	cloudy/warm	4.1	4.08	5.56	5.65	12.96	2.6	sand build up	3.29	2.31	1.12	1.31
6/25/01	sunny/warm	4.15	4.35	5.75	5.83	13.46	2.75	sand build up	3.42	2.56	1.29	1.88
7/9/01	sunny/warm	4.31	4.5	5.98	6.1	13.81	2.98	sand build up	3.6	2.65	1.4	2.06
7/20/01	sunny/warm/	4.73	4.9	6.4	6.48	14.1	3.48	sand build up	4.06	3.1	1.48	2.48
8/7/01	hazy/hot/humid	5.08	5.48	6.92	6.69	14.05	3.65	dry	4.42	3.85	1.58	3.21
8/27/01	cloudy/warm	5.31	5.48	7.15	7.02	14.23	3.98	dry	4.65	3.94	dry	3.31
9/20/01	ovrcst/cool	5.06	5.23	7.02	6.94	15.31	3.73	dry	4.44	3.9	dry	3.23
10/3/01	sunny/cool	4.6	4.06	6.48	6.65	14.06	3.31	dry	3.9	2.98	1.73	2.31
10/16/01	sunny/cool	4.06	3.48	6.15	6.56	14.1	2.77	dry	2.44	2.85	1.81	2.23
10/30/01	sunny/cool	4.15	4.23	6.15	6.56	14.15	2.79	dry	3.4	2.81	1.77	2.15
11/12/01	sunny/cool	4.48	3.98	6.52	6.71	14.06	3.15	dry	3.85	3.23	1.73	2.65
11/26/01	sunny/mild	4.31	3.73	6.4	6.62	14.06	3	dry	3.65	3.05	1.67	2.4

TOWNSEND WATER DEPT.
MAIN ST. WELL

2001 WATER LEVEL FLUCTUATIONS **2001**

OBSERVATION WELLS & DRIVE POINTS

WATER LEVELS (ft) BELOW TOP CASING

DATE	WEATHER	WELL	WELL	WELL	WELL	WELL	DRIVE POINT(3)STREAM		DRIVE POINT	DRIVE POINT(7)STREAM		DRIVE POINT
		# 3-98	# 1-98	# 1-84	# 6-98	AMBIENT WELL # 5-98 HORSESHOE DR.	INSIDE	OUTSIDE	# 4	INSIDE	OUTSIDE	# 8
12/10/01	sunny/cool	4.6	3.98	6.65	6.81	14	3.23	dry	3.9	3.06	1.73	2.56
12/26/01	sunny/cool	4.05	3.4	5.98	5.48	13.73	2.81	dry	3.4	2.31	1.48	1.73

TOWNSEND WATER DEPT.
MAIN ST. WELL

2000 WATER LEVEL FLUCTUATIONS 2000

OBSERVATION WELLS & DRIVE POINTS

WATER LEVELS (ft) BELOW TOP CASING

DATE	WEATHER	WELL # 3-98	WELL # 1-98	WELL # 1-84	WELL # 6-98	WELL AMBIENT WELL # 5-98 HORSESHOE DR.	DRIVE POINT(3)STREAM INSIDE	DRIVE POINT(3)STREAM OUTSIDE	DRIVE POINT # 4	DRIVE POINT(7)STREAM INSIDE	DRIVE POINT(7)STREAM OUTSIDE	DRIVE POINT # 8
1/5/00	clear/sun/cold	4.31	4.31	5.98	6.06	12.15	2.98	1.81	3.56	2.65	1.06	1.98
2/8/00	clear/sun/cold	4.73	4.81	6.44	6.4	12.65	3.23	iced over	3.94	3.15	iced over	2.52
2/25/00	cloudy/rain	4.15	4.31	5.81	5.94	12.4	2.65	1.6	3.31	2.56	1.06	1.94
3/14/00	cloudy/sun/cool	3.65	3.81	4.98	5.46	11.85	2.4	1.65	2.9	1.81	1.15	1.15
3/27/00	sunny/cool	4.02	4.31	5.48	5.73	not read	2.56	1.94	3.23	2.4	1.23	1.77
4/10/00	sunny/cool	3.79	3.94	5.23	5.38	12.06	2.4	1.73	2.94	2.06	1.23	1.4
4/25/00	sunny/cool	3.15	3.44	4.52	4.85	11.48	1.81	1.48	2.48	1.52	1.15	10.06
5/9/00	sunny/hot	3.9	4.15	5.31	5.52	12.62	2.52	dry	3.19	2.31	1.4	1.73
5/23/00	cloudy/cool	4.1	4.27	5.69	5.69	13.21	2.69	dry	3.4	2.58	1.35	1.98
5/12/00	cloudy/rain/warm	3.81	4.06	5.23	5.4	12.9	2.4	1.9	3.31	2.23	1.31	1.65
7/3/00	clouds/sun/warm	4.31	3.06	5.98	6.21	13.65	2.85	dry	3.44	2.46	1.19	1.98
7/17/00	clouds/cool	4.44	3.73	6.15	6.31	13.56	3.06	dry	3.73	2.73	1.46	2.06
7/31/00	cloudy/rain	3.65	3.81	5.23	5.4	12.65	2.23	1.56	2.9	1.9	1.1	1.23
8/15/00	cloudy/rain	4.31	4.4	5.98	6.15	13.31	2.98	dry	3.65	2.65	1.44	2.02
8/31/00	clear/sun/warm	4.85	4.9	6.71	6.73	13.23	3.44	dry	4.15	3.23	1.48	2.65
9/19/00	clouds/sun/warm	5.12	5.25	6.85	6.6	13.15	3.65	dry	4.44	3.54	2.48	2.98
10/3/00	clear/sun/cool	5.23	5.31	6.94	6.81	13.35	3.73	dry	4.46	3.65	1.67	2.98
10/16/00	cloudy/rain/cool	5.29	5.44	6.9	6.77	13.23	3.73	dry	4.48	3.65	1.65	3.02
10/31/00	cloudy/rain/cool	5.15	5.19	6.98	6.73	12.94	3.65	dry	4.35	3.6	1.65	2.98
11/29/00	clear/sun/cool	4.31	3.48	6.06	6.31	12.73	2.9	dry	3.56	2.48	1.56	1.85
12/12/00	cloudy/rain/cool	4.94	5.06	6.65	6.56	13.15	3.44	dry	4.15	3.48	1.4	2.81

TOWNSEND WATER DEPT.

MAIN ST. WELL

1999 WATER LEVEL FLUCTUATIONS **1999**

OBSERVATION WELLS & DRIVE POINTS

WATER LEVELS (ft) BELOW TOP CASING

DATE	WEATHER	WELL # 3-98	WELL # 1-98	WELL # 1-84	WELL # 6-98	WELL AMBIENT WELL # 5-98 HORSESHOE DR.	DRIVE POINT(3)STREAM INSIDE	DRIVE POINT(3)STREAM OUTSIDE	DRIVE POINT # 4	DRIVE POINT(7)STREAM INSIDE	DRIVE POINT(7)STREAM OUTSIDE	DRIVE POINT # 8
1/11/99	cloudy/sun/cold	4.65	4.56	6.23	6.23							
1/28/99	cloudy/snow/cold	4.06	4.06	5.65	5.81	11.81						
2/8/99	clear/sun/cold	4.1	4.15	5.56	5.73	11.81						
2/22/99	clear/sun/cold	using well dev. 8" test well	3.31	5.48	5.73	12.15						
3/9/99	clear/sun/cold	4.06	4.4	5.56	5.73	12.35						
3/22/99	cloudy/rain/cool	2.98	3.4	4.65	4.73	11.81						
4/7/99	clear/sun/cool	4.15	4.31	5.56	5.65	12.48	2.65	1.9	3.31	2.52	1.44	1.94
4/21/99	clear/sun/cool	4.31	4.6	5.9	5.9	12.65	2.85	2.15	2.56	2.81	1.48	2.23
5/5/99	cloudy/shwrs/cool	4.4	4.48	5.98	6.06	12.48	2.85	2.15	3.65	2.1	1.56	2.06
5/17/99	clear/sun/warm	5.06	5.48	6.73	6.4	12.56	3.54	2.31	4.27	2.4	3.81	3.23
6/1/99	clear/sun/warm	5.48	5.19	6.56	6.4	12.42	3.42	2.23	4.15	3.52	1.33	2.9
6/14/99	cloudy/sun/warm	5.4	5.75	7.15	6.67	12.56	3.85	2.4	4.6	4.15	1.56	3.56
6/28/99	hazy/hot/humid	5.65	6.02	7.48	6.9	12.6	4.06	to low	4.88	4.6	1.85	3.98
7/12/99	hazy/hot/humid	5.31	5.56	7.06	6.9	12.48	3.81	to low	4.56	3.81	1.73	3.23
7/26/99	cloudy/sun/shwrs	5.35	5.48	7.21	6.9	12.73	3.9	2.4	4.6	3.98	1.69	3.35
8/9/99	clear/sun/hot	5.5	5.65	7.4	7.06	13.12	3.98	to low	4.67	4.06	1.48	3.48
8/23/99	clouds/sun/warm	5.48	5.65	7.31	7.06	13.06	3.98	to low	4.73	4.02	1.73	3.44
9/7/99	sunny/hot	5.38	5.4	7.23	7.06	12.98	3.88	to low	4.65	3.73	1.67	3.15
9/20/99	clear/sun/warm	4.02	3.98	5.56	6.06	12.4	3.73	2.19	3.31	1.9	1.52	1.31
10/6/99	clear/sun/warm	4.31	3.71	5.98	6.23	not read	2.9	2.29	3.56	2.56	1.48	2.98

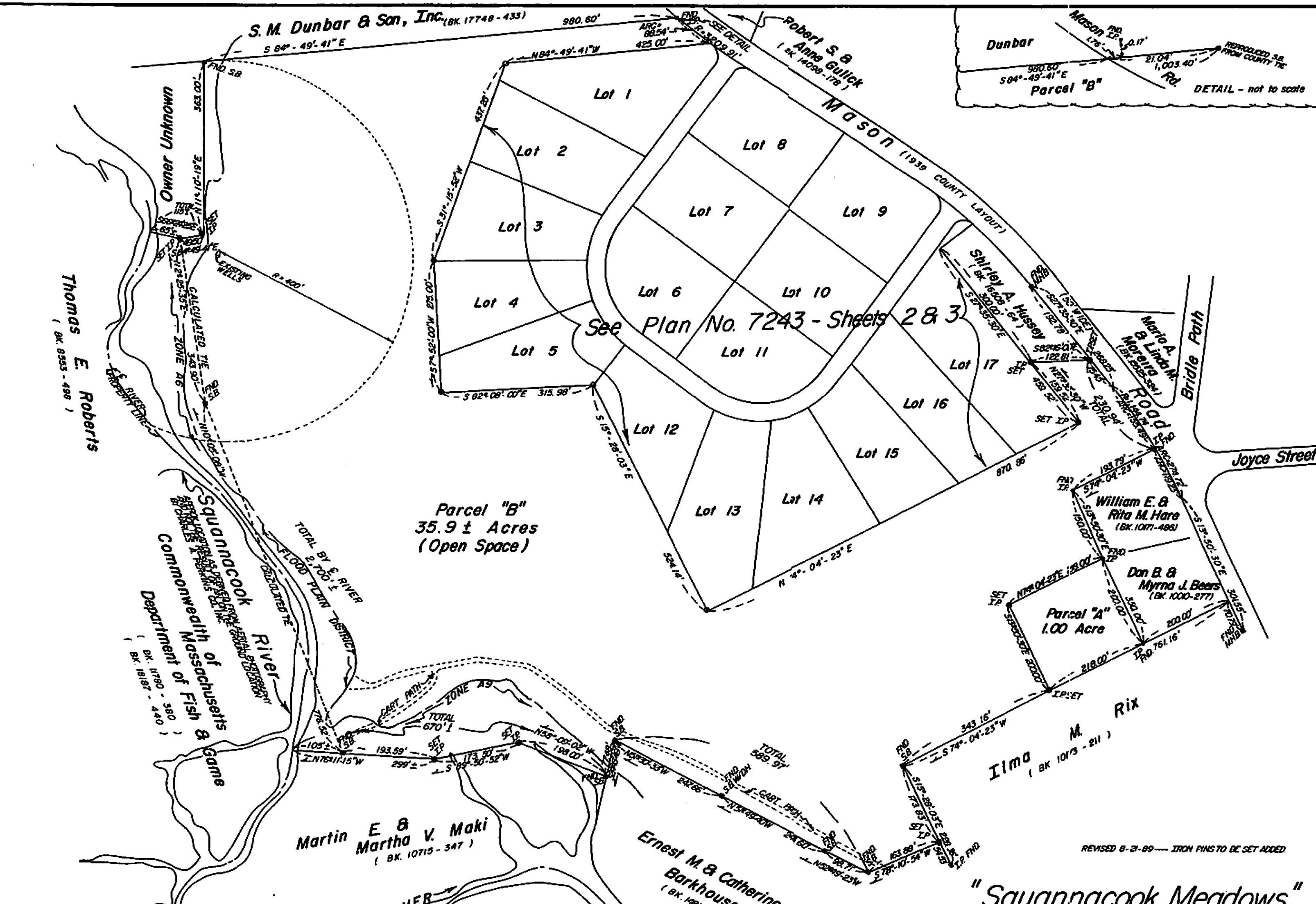
TOWNSEND WATER DEPT.
MAIN ST. WELL

1998 WATER LEVEL FLUCTUATIONS **1998**

OBSERVATION WELLS & DRIVE POINTS

WATER LEVELS (ft) BELOW TOP CASING

DATE	WEATHER	WELL # 3-98	WELL # 1-98	WELL # 1-84	WELL # 6-98	WELL AMBIENT WELL # 5-98 HORSESHOE DR.	DRIVE POINT(3)STREAM INSIDE	DRIVE POINT(3)STREAM OUTSIDE	DRIVE POINT # 4	DRIVE POINT(7)STREAM INSIDE	DRIVE POINT(7)STREAM OUTSIDE	DRIVE POINT # 8
1/22/98	cloudy/cold/snow	3.85										
6/29/98	cloudy/warm/rain	3.27										
10/28/98	clouds/sun/cool	5.1	5.06	6.69	6.56							
11/12/98	clouds/sun/cool	5.15	5.15	6.44	6.48							
12/14/98	clear/sun/cool	5.06	4.73	6.65	6.73							
12/28/98	cloudy/cool	5.23	5.65	6.56	6.65							



NOTE:

THE LOCATION OF THE FLOOD PLAIN DISTRICT SHOWN HEREON IS BASED UPON AERIAL TOPOGRAPHY DATED NOV. 30, 1986 AND FLOOD INSURANCE RATE MAPS 1B & 4B FOR COMMUNITY NO. 250219 DATED AUG. 2, 1982 AND IS NOT THE RESULT OF AN "ON THE GROUND" LOCATION BY CHARLES A. PERKINS CO., INC.

REINFORCED CONCRETE OR GRANITE BOUNDS OF NOT LESS THAN 6" X 6" X 48" WITH A 3/8" DRILL HOLE IN THE CENTER SHALL BE SET ON BOTH SIDELINES AT ALL POINTS OF CHANGE IN DIRECTION OR CURVATURE OF STREETS, AND POINTS OF TANGENT. THEY SHALL ALSO BE SET AT THE INTERSECTION OF THE SIDELINES AND SIDELINES OF EXISTING STREETS.

□..... INDICATES MONUMENT TO BE SET.

BUILDING UPON OR CONVEYANCE OF THE LOTS SHOWN HEREON IS SUBJECT TO A COVENANT TO BE RECORDED HEREWITH IN ACCORDANCE WITH CHAPTER 41, SECTION 81-U OF THE SUBDIVISION CONTROL LAW.

PARCEL "A" IS NOT A BUILDING LOT, BUT IS TO BE CONVEYED TO AND ANNEXED WITH ADJOINING LAND OF DON B. & MYRNA J. BEERS

ZONING DISTRICT: RA

Aug 25, 1989
DATE

I, Marilyn C. MacEachern CLERK OF THE TOWN OF TOWNSEND, HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE, AND NO NOTICE OF APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE.

Marilyn C. MacEachern
TOWN CLERK

○..... INDICATES IRON PIN TO BE SET.

Townsend Planning Board

DATE OF APPROVAL: July 19, 1989
DATE OF ENDORSEMENT: Nov. 6, 1989

[signatures]
Elaine McCavanaugh

Middlesex Registry of Deeds, Southern District
Cambridge, Massachusetts
Plan No 84(1-3) of 1990
Rec'd 1-26 1990
at 11h 52m Am Doc No. 386
Rec'd, Bk 20345 Page 94
Attest
Register

"Squannacook Meadows"

DEFINITIVE SUBDIVISION OF LAND IN
Townsend, Mass.
PREPARED FOR
The Co-operative Bank of Concord

SCALE: 1" = 100'
JANUARY, 1989

1" = 100'
0 50 100 150 200 250 300 FEET
0 20 40 60 80 METERS

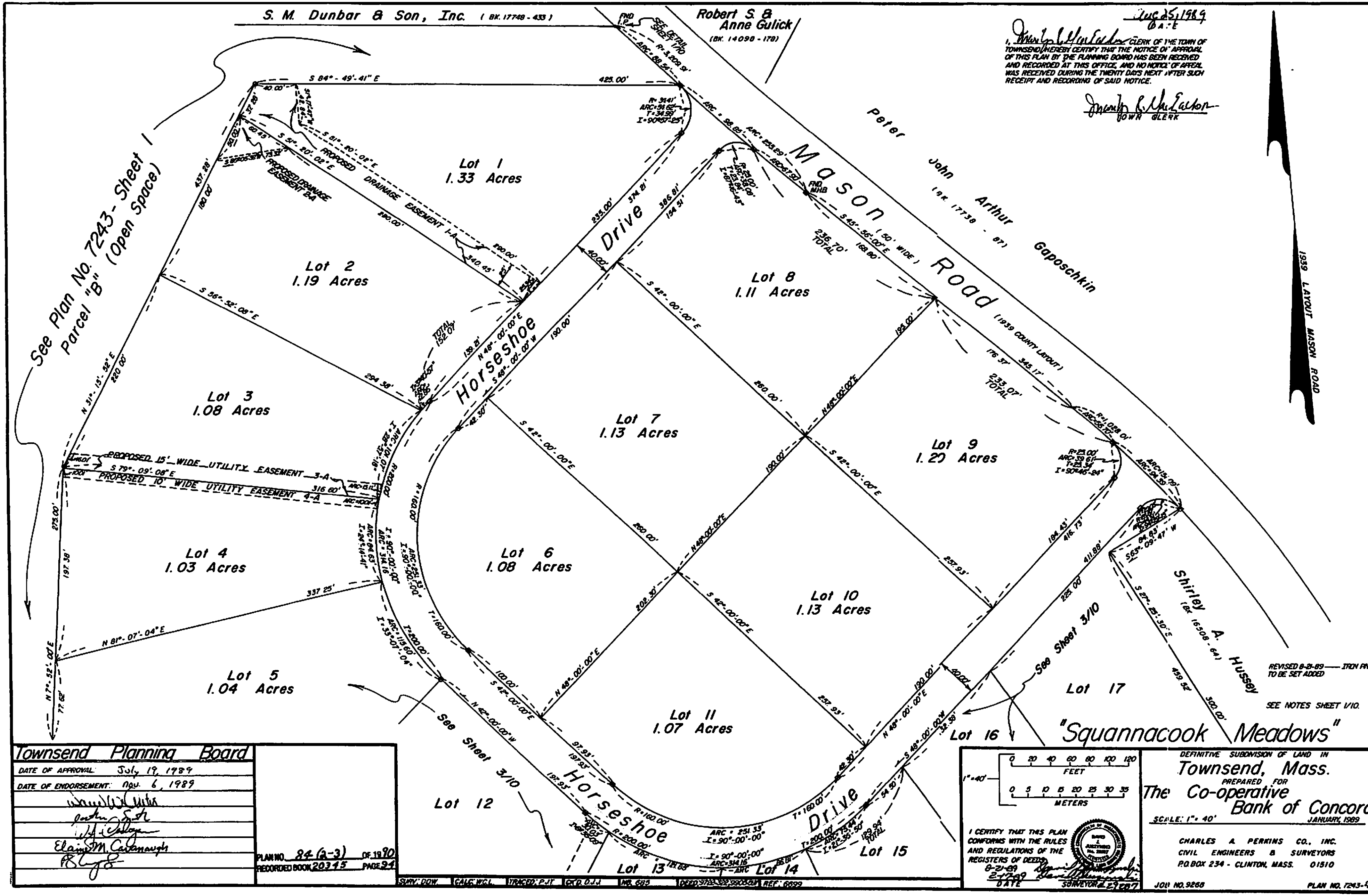
I CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.
8-21-89
2-17-89
DATE
SURVEYOR 29287

CHARLES A. PERKINS CO., INC.
CIVIL ENGINEERS & SURVEYORS
P.O. BOX 234 - CLINTON, MASS. 01510

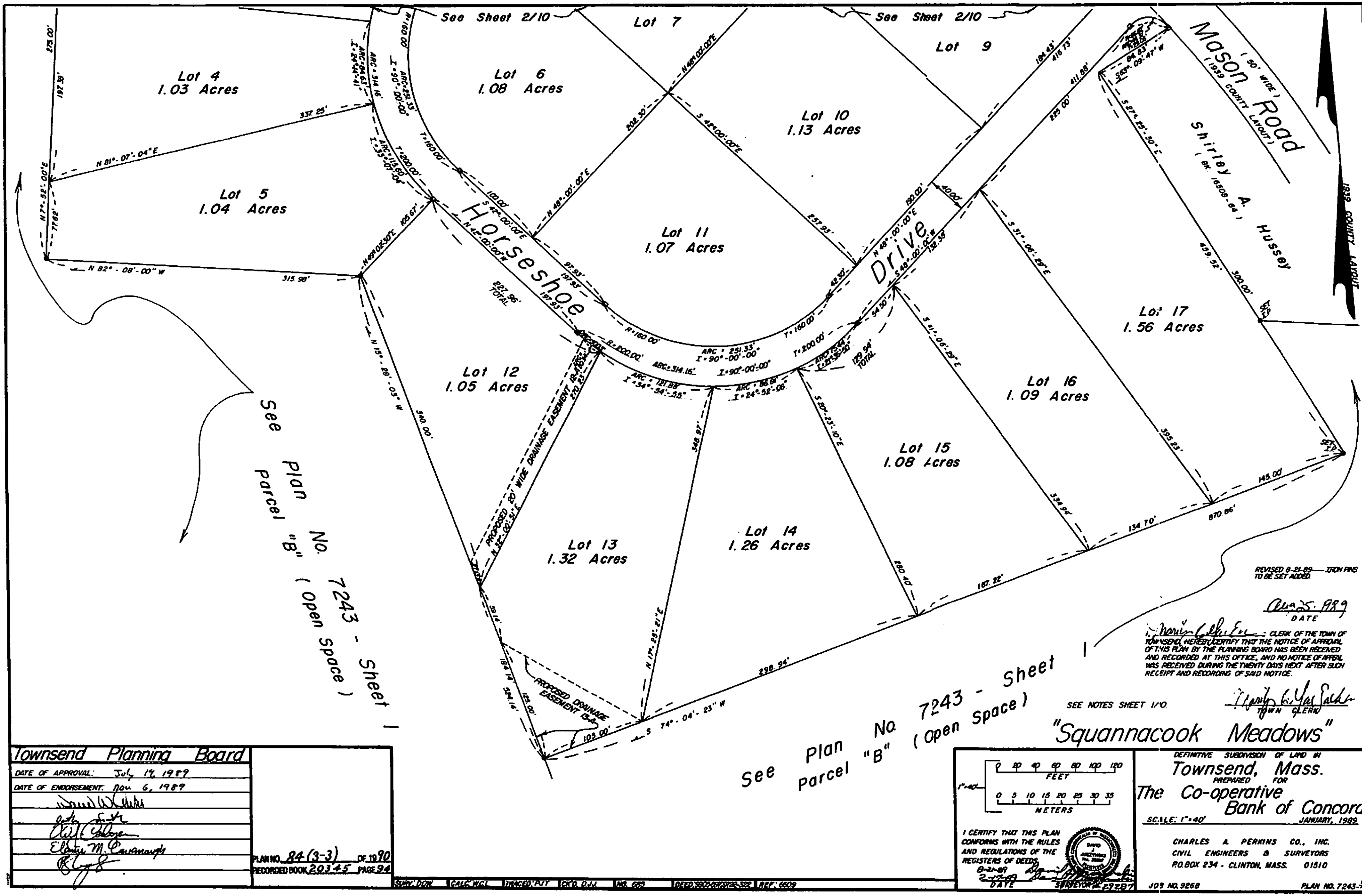
JOB NO. 9268
PLAN NO. 7243 1/10

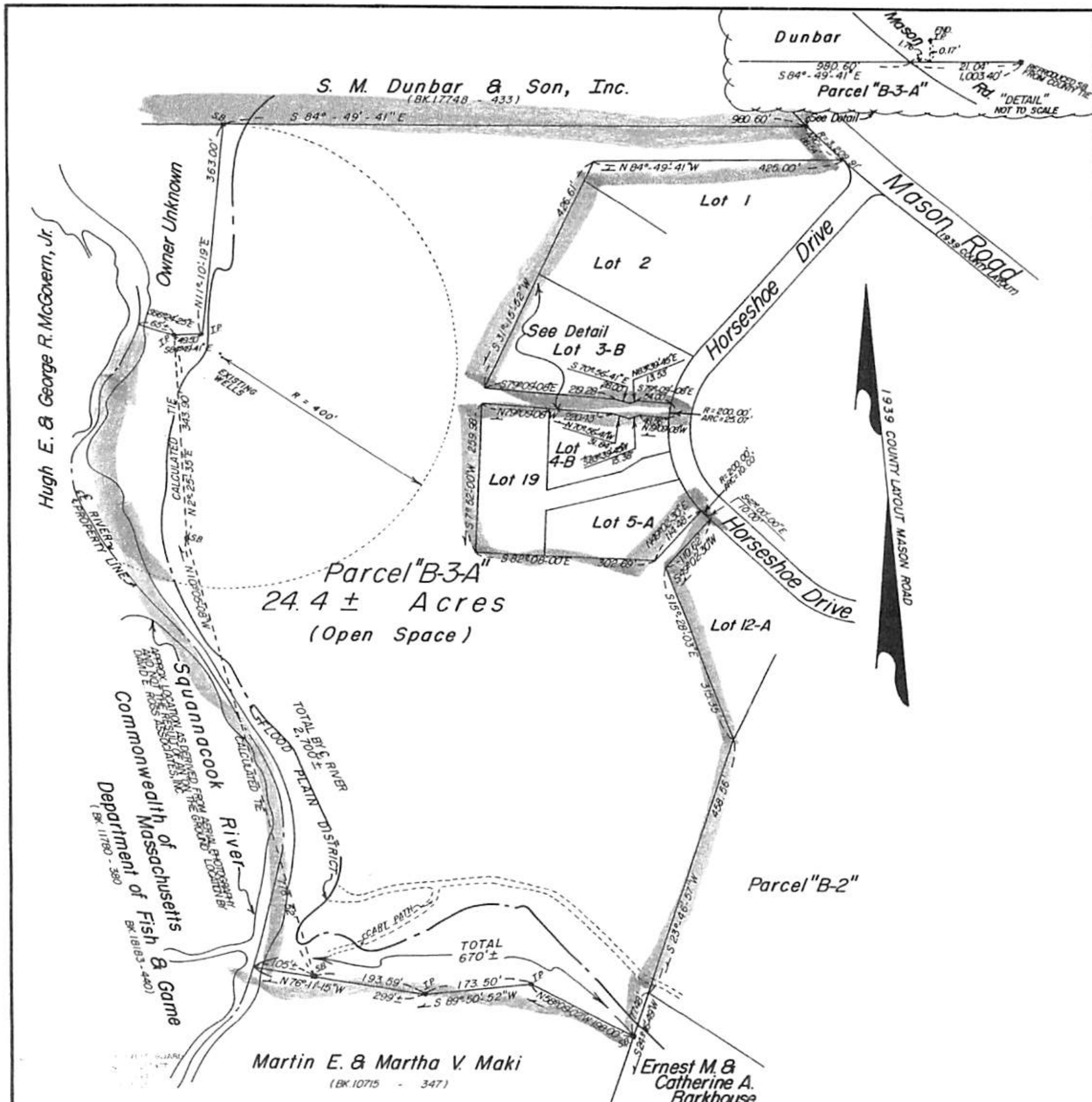
SURV. D.O.W.	CALC. W.C.L.	TRACED P.J.T.	CK'D W.C.L.	NB. 685	DEED 3722-322 9905-591	REF. 6669

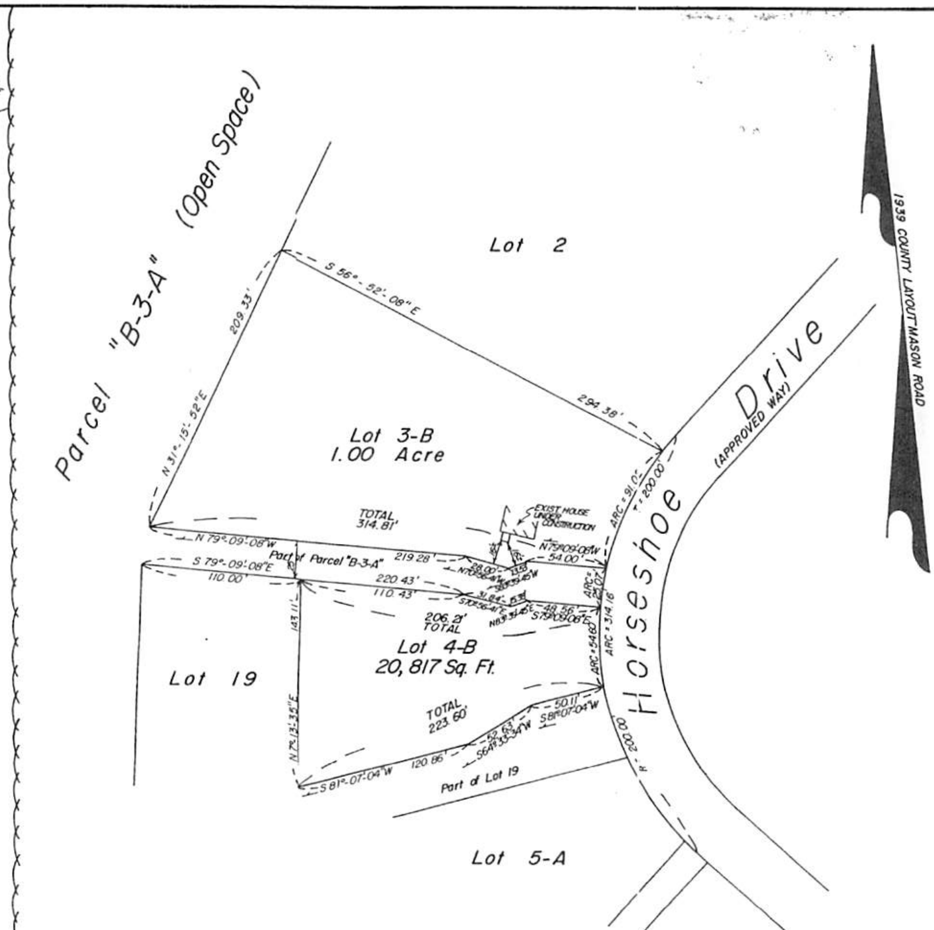
01/26/90 PLAN NUMBER: 00000084 TSD 01/26/90 11:52:13 234 75.00



S. M. Dunbar & Son, Inc. (BK. 17748 - 433)
Robert S. & Anne Gulick (BK. 14098 - 178)
Peter John Arthur Gaposchkin (BK 17738 - 87)
Mason Road (50' WIDE)
(1939 COUNTY LAYOUT)
1939 LAYOUT MASON ROAD
Shirley A. Hussey (BK. 16508 - 64)
See Plan No. 7243 - Sheet 1 Parcel "B" (Open Space)
Lot 1 1.33 Acres
Lot 2 1.19 Acres
Lot 3 1.08 Acres
Lot 4 1.03 Acres
Lot 5 1.04 Acres
Lot 6 1.08 Acres
Lot 7 1.13 Acres
Lot 8 1.11 Acres
Lot 9 1.20 Acres
Lot 10 1.13 Acres
Lot 11 1.07 Acres
Lot 12
Lot 13
Lot 14
Lot 15
Lot 16
Lot 17
Horseshoe Drive
PROPOSED DRAINAGE EASEMENT 1-A
PROPOSED DRAINAGE EASEMENT 2A
PROPOSED 15' WIDE UTILITY EASEMENT 3-A
PROPOSED 10' WIDE UTILITY EASEMENT 4-A
See Sheet 3/10
See Sheet 3/10
SEE DETAIL SHEET 1/10
I, Josephine C. McEachen CLERK OF THE TOWN OF TOWNSEND, HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE, AND NO NOTICE OF APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE.
Aug 25, 1989 DATE
TOWN CLERK
REVISED 8-21-89 — IRON PINS TO BE SET ADDED
SEE NOTES SHEET 1/10.
"Squannacook Meadows"
DEFINITIVE SUBDIVISION OF LAND IN Townsend, Mass.
PREPARED FOR The Co-operative Bank of Concord
SCALE: 1" = 40'
JANUARY, 1989
CHARLES A. PERKINS CO., INC.
CIVIL ENGINEERS & SURVEYORS
P.O. BOX 234 - CLINTON, MASS. 01510
JOB NO. 9268
PLAN NO. 7243-9/10
I CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.
8-21-89
DATE
SURVEYOR
Townsend Planning Board
DATE OF APPROVAL: July 19, 1989
DATE OF ENDORSEMENT: Nov. 6, 1989
Elaine M. Cavanaugh
PLAN NO. 84 (2-3) OF 1990
RECORDED BOOK 20345 PAGE 94
SURV: DOW
CALC: W.G.L.
TRACED: P.J.T.
CK'D: D.J.J.


"Squannacook Meadows"
DEFINITIVE SUBDIVISION OF LAND IN
Townsend, Mass.
PREPARED FOR
The Co-operative Bank of Concord
SCALE: 1"=40'
JANUARY, 1989
CHARLES A. PERKINS CO., INC.
CIVIL ENGINEERS & SURVEYORS
P.O. BOX 234 - CLINTON, MASS. 01510
JOB NO. 9268
PLAN NO. 7243-3/10
FEET
METERS
I CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.
8-21-89
DATE
SURVEYOR
Townsend Planning Board
DATE OF APPROVAL: July 17, 1989
DATE OF ENDORSEMENT: Nov 6, 1989
PLAN NO. 84 (3-3) OF 1990
RECORDED BOOK 20345 PAGE 94
REVISED 8-21-89 — IRON PINS TO BE SET ADDED
Aug 25, 1989
DATE
I, CLERK OF THE TOWN OF TOWNSEND, HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE, AND NO NOTICE OF APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE.
TOWN CLERK
SEE NOTES SHEET 1/10
See Plan No. 7243 - Sheet 1
Parcel "B" (Open Space)
See Sheet 2/10
Mason Road
(50' WIDE)
(1939 COUNTY LAYOUT)
Shirley A. Hussey
(BK. 16508-64)
1939 COUNTY LAYOUT
Horseshoe Drive
Lot 4
1.03 Acres
Lot 5
1.04 Acres
Lot 6
1.08 Acres
Lot 7
Lot 9
Lot 10
1.13 Acres
Lot 11
1.07 Acres
Lot 12
1.05 Acres
Lot 13
1.32 Acres
Lot 14
1.26 Acres
Lot 15
1.08 Acres
Lot 16
1.09 Acres
Lot 17
1.56 Acres
PROPOSED 20' WIDE DRAINAGE EASEMENT
PROPOSED DRAINAGE EASEMENT
S 74°-04'-23" W
N 82°-08'-00" W
N 81°-07'-04" E
N 7°-52'-00" E
N 15°-28'-03" W
N 17°-25'-21" E
S 80°-23'-10" E
S 81°-06'-29" E
S 31°-06'-29" E
S 27°-25'-30" E
S 63°-09'-47" W
N 48°-00'-00" E
S 48°-00'-00" W
S 42°-00'-00" E
N 42°-00'-00" W
870.86'
298.94'
315.98'
337.25'
340.00'
348.97'





"Detail"
Scale: 1" = 40'

Scale: 1" = 100'

NOTE:

LOTS 1, 2, 5-A, 12-A, 19, PARCEL "B-2" AND HORSESHOE DRIVE APPEAR IN THEIR ENTIRETY ON A PLAN ENTITLED "DEFINITIVE SUBDIVISION OF LAND IN TOWNSEND, MASS. PREPARED FOR JAMES F. CRAVEN" DATED NOV. 892 BY DAVID E. ROSS ASSOCIATES, INC. — PLAN NO. L-1691 AND ENDORSED BY THE TOWNSEND PLANNING BOARD AUG. 30, 1993.

LOTS 3-B, 4-B AND PARCEL "B-3-A" ARE A REDIVISION OF LOTS 3-A, 4-A AND PARCEL "B-3" SHOWN ON THE ABOVEMENTIONED PLAN.

THE LOCATION OF THE FLOOD PLAIN DISTRICT SHOWN HEREON IS BASED UPON AERIEL TOPOGRAPHY DATED NOV. 30, 1986 AND FLOOD INSURANCE RATE MAPS 18 & 4B FOR COMMUNITY NO. 250219 DATED AUG. 2, 1982 AND IS NOT THE RESULT OF AN "ON THE GROUND" LOCATION BY DAVID E. ROSS ASSOCIATES, INC.

ZONING DISTRICT: RA

Townsend Planning Board

APPROVAL UNDER SUBDIVISION CONTROL LAW NOT REQUIRED. C 41 S 81-P

DATE: Nov 1, 1993

Elaine M. Cavanaugh

THREE MEMBERS CONSTITUTE A MAJORITY.

Middlesex Registry of Deeds, Southern District
Cambridge, Massachusetts
Plan No. 385 of 19 94
Rec'd 4-29 19 94
at 9 h 55 m A.M. No. 219
Rec'd. Bk 24494 Pag. 252
Attest
Register

I CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

11/1/93
DATE

SURVEYOR

PLAN OF LAND IN
Townsend, Mass.
PREPARED FOR
James F. Craven

SCALE: 1" = 40'   NOVEMBER, 1993

David E. Ross Associates, Inc.
CIVIL ENGINEERS
LAND SURVEYORS
ENVIRONMENTAL CONSULTANTS
P.O. BOX 361 - 17 W. MAIN ST. - AYER, MASS. 01432
(TEL. NO. 508-772-6232)

JOB NO. 3121   PLAN NO. L-2277

SURV.	CALC. M.D.M.	DRAFTED P.J.T.	CK'D. M.D.M.	NB 76-146	DEED 20345-117	REF. L-1691, L-535

385

MuniMapper: Townsend, MA

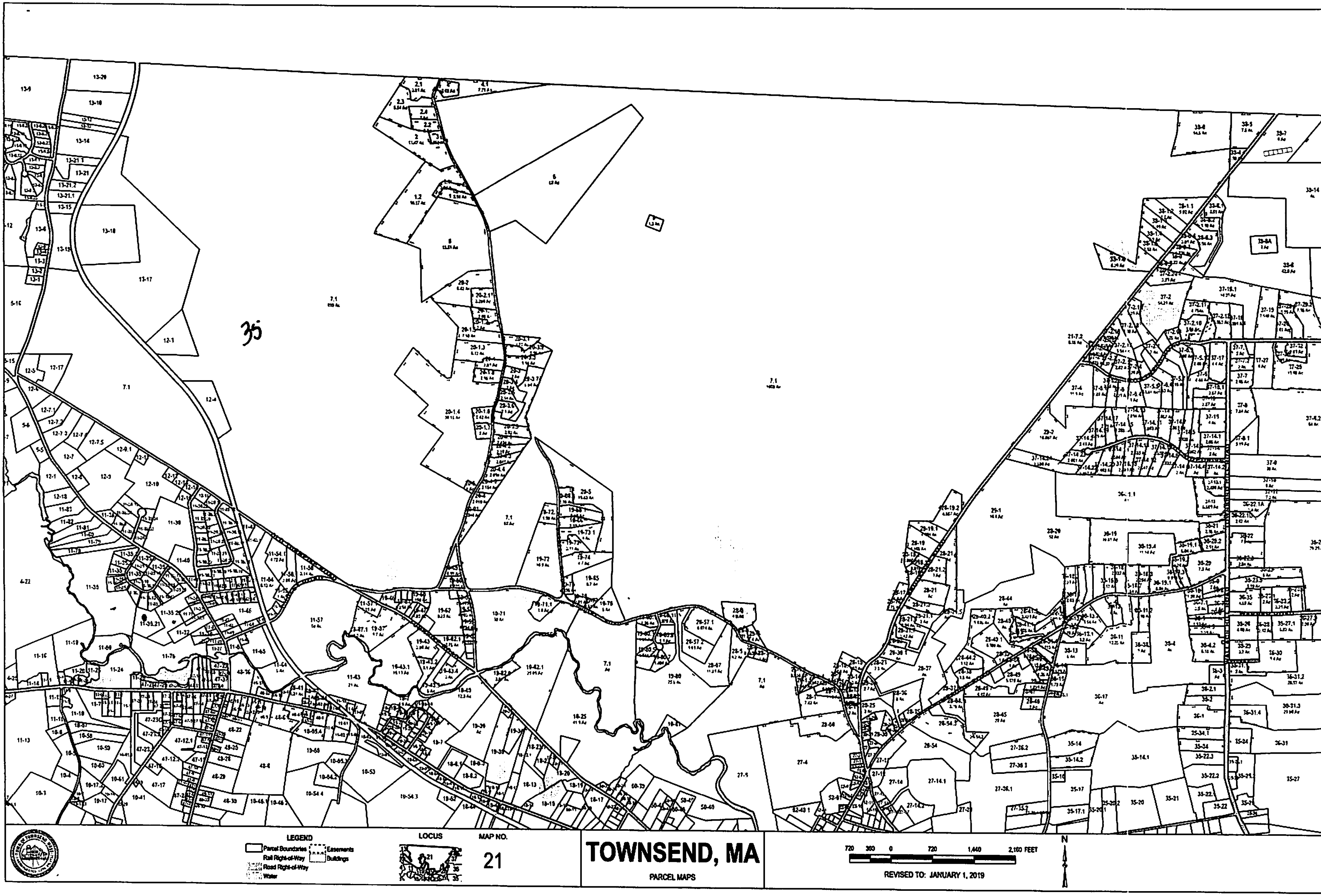
Town of Townsend Web Site

Disclaimer

MUNICIPAL EOTSS MAPPER

Search for a location

2.87 ft



35-21 41569 181

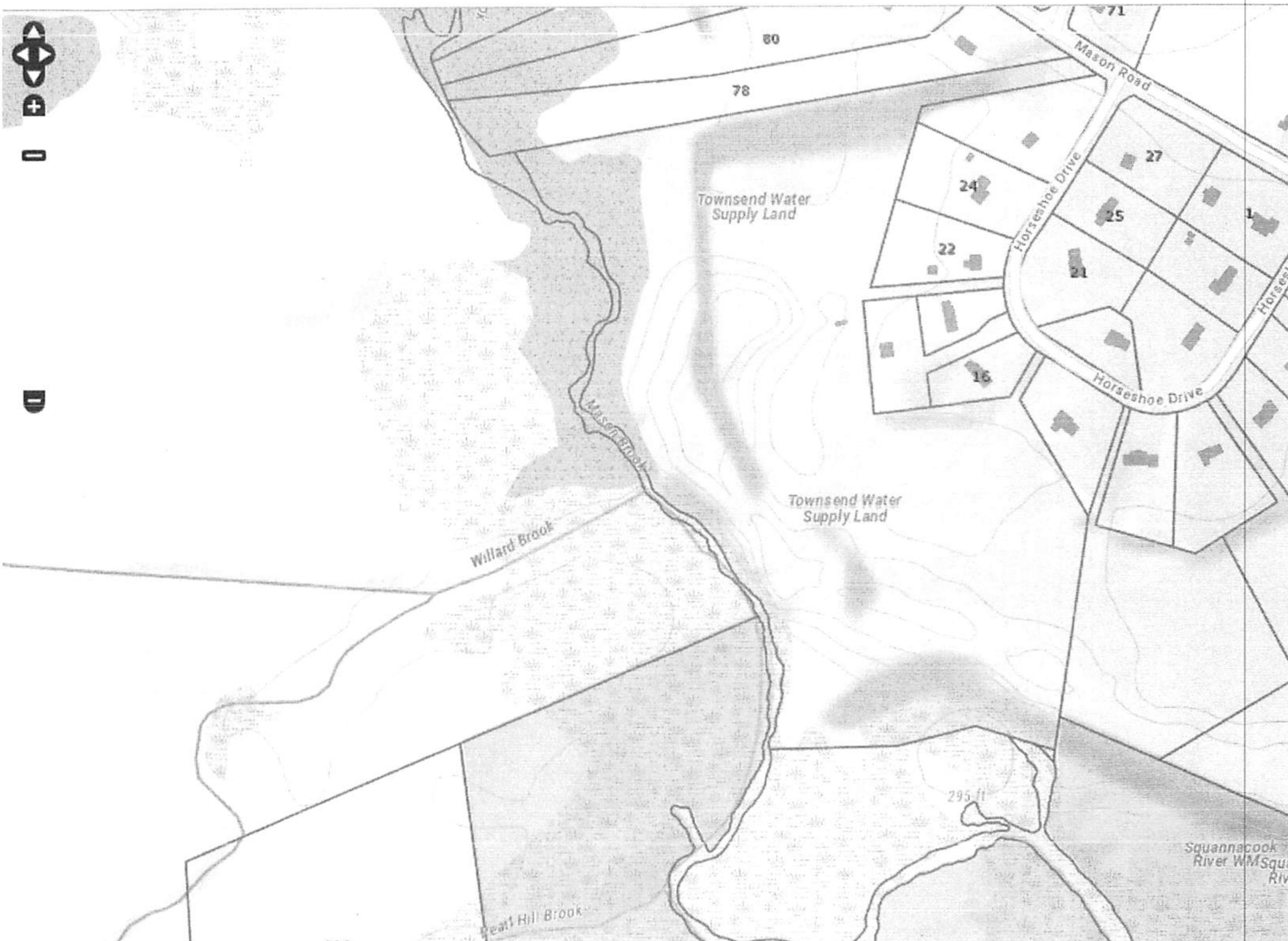
MuniMapper: Townsend, MA

Town of Townsend Web Site

Disclaimer

MUNICIPAL EOTSS MAPPER

Search for a location



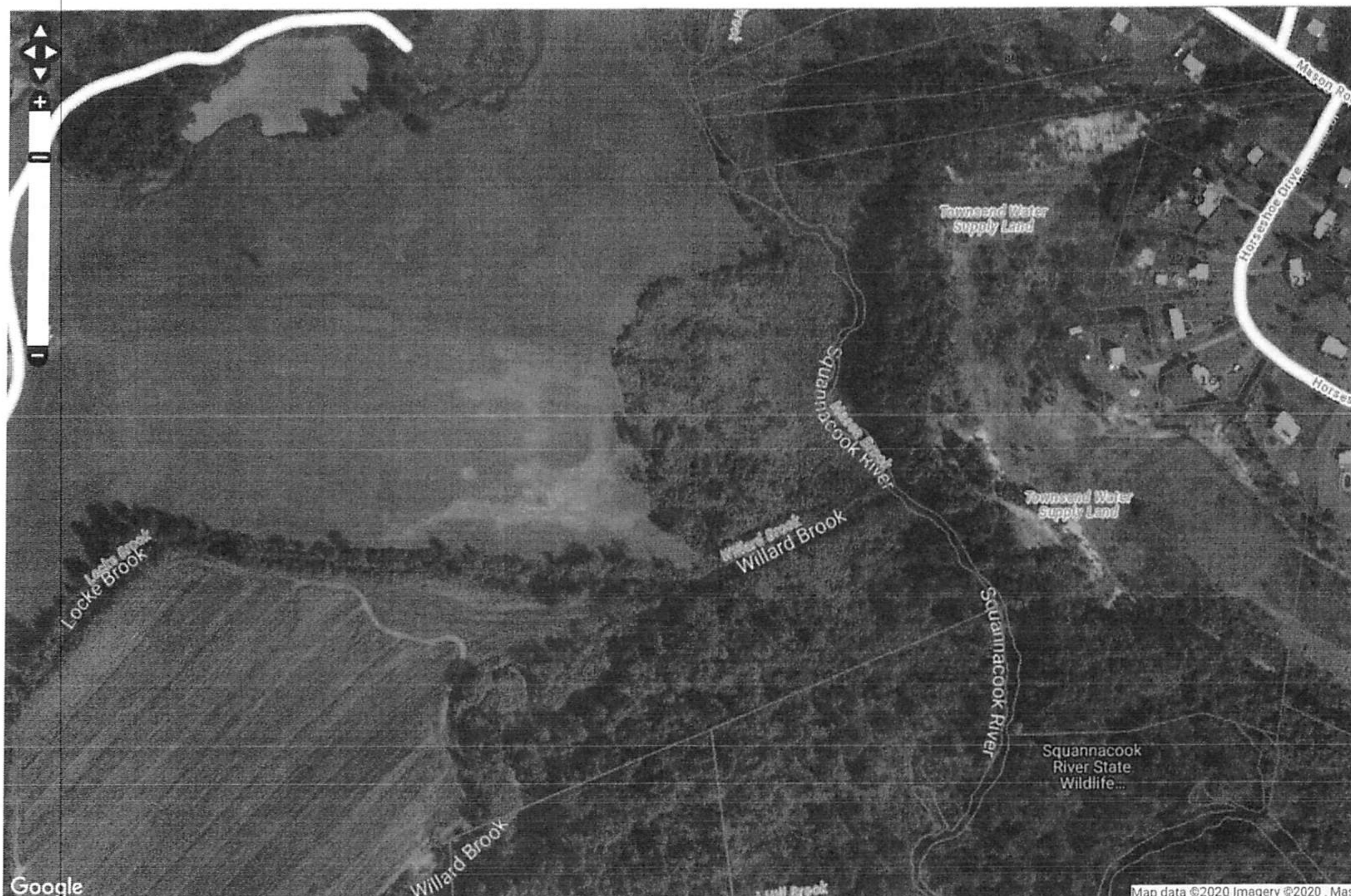
47.96 ft

MuniMapper: Townsend, MA

Town of Townsend Web Site

Disclaimer

Search for a location



0 m

Return to:
Riddle & Associates 2-
603 Mass Ave
Lunenburg MA 01462

Bk: 41569 Pg: 181
Recorded: 12/08/2003
Document: 00000124 Page: 1 of 2

QUITCLAIM DEED

I, JAMES F. CRAVEN, TRUSTEE SQUANNACOOK MEADOW TRUST under declaration of Trust dated January 25, 1990 recorded in Middlesex South Registry of Deeds Book 20345 Page 106, and James F. Craven, individually of 22 West Meadow Road, Townsend, Middlesex County, MA 01469

In consideration of ONE DOLLAR ($1.00) paid

134 Baker Hill Rd, Townsend

Grant with *QUITCLAIM COVENANTS* to the inhabitants of the TOWN OF TOWNSEND, a municipal corporation located in Middlesex County, acting by and through its Board of Selectmen all of my right, title and interest both as Trustee and individually to the following described premises:

Three Certain parcels of land shown on a plan entitled Definitive Subdivision of Land in Townsend, MA prepared for James F. Craven, David E. Ross Associates, Inc., Plan # L-1691-1/10 in Middlesex South District Registry of Deeds Plan Book 24449 Page 249 on April 12, 1994

Parcel number 1. The parcel shown on said Plan as Parcel "B-2", containing 4.65 acres, and

Parcel number 2. The parcel shown on said Plan as Parcel "B-1", Open Space containing 7.67 acres; and

Parcel number 3. The parcel shown on said Plan as Parcel "D" Open Space containing 3.30 acres.

And a fourth parcel shown as Parcel "B-3-A" (Open Space) containing 24.4 acres more or less as shown on a plan entitled "Plan of land in Townsend, Mass prepared for James F. Craven by David E. Ross Associates, Inc., Plan No L-2277in Middlesex South Registry of Deeds.

That portion of Parcel "B-3A" shown on the Plan as "existing wells" and within a 400 ft radius of the existing wells and the access strip from Mason Road, may be used by the Townsend Water Department as the site of a future well and access and egress therefrom. The remaining portions of Parcel B-3 and Parcels B-2 and B-1 shall be known as "Holly's Playground".

The exact metes and bounds of the above described parcels shall be determined by reference to the recorded plan.

EXECUTED THIS 25 day of November, 2003

James F. Craven, Trustee
Squannacook Meadow Trust

James F. Craven, individually

COMMONWEALTH OF MASSACHUSETTS

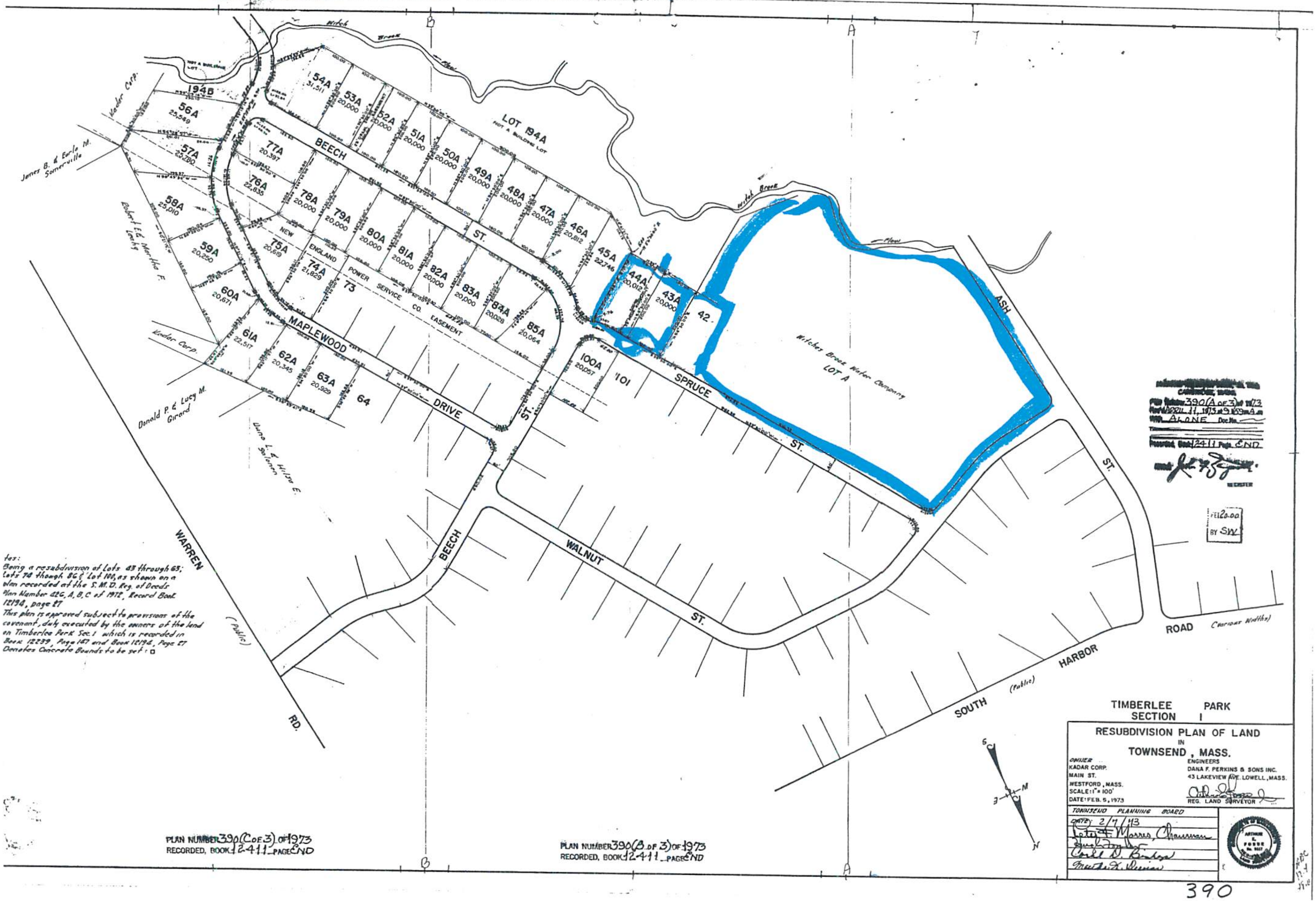
Middlesex, ss

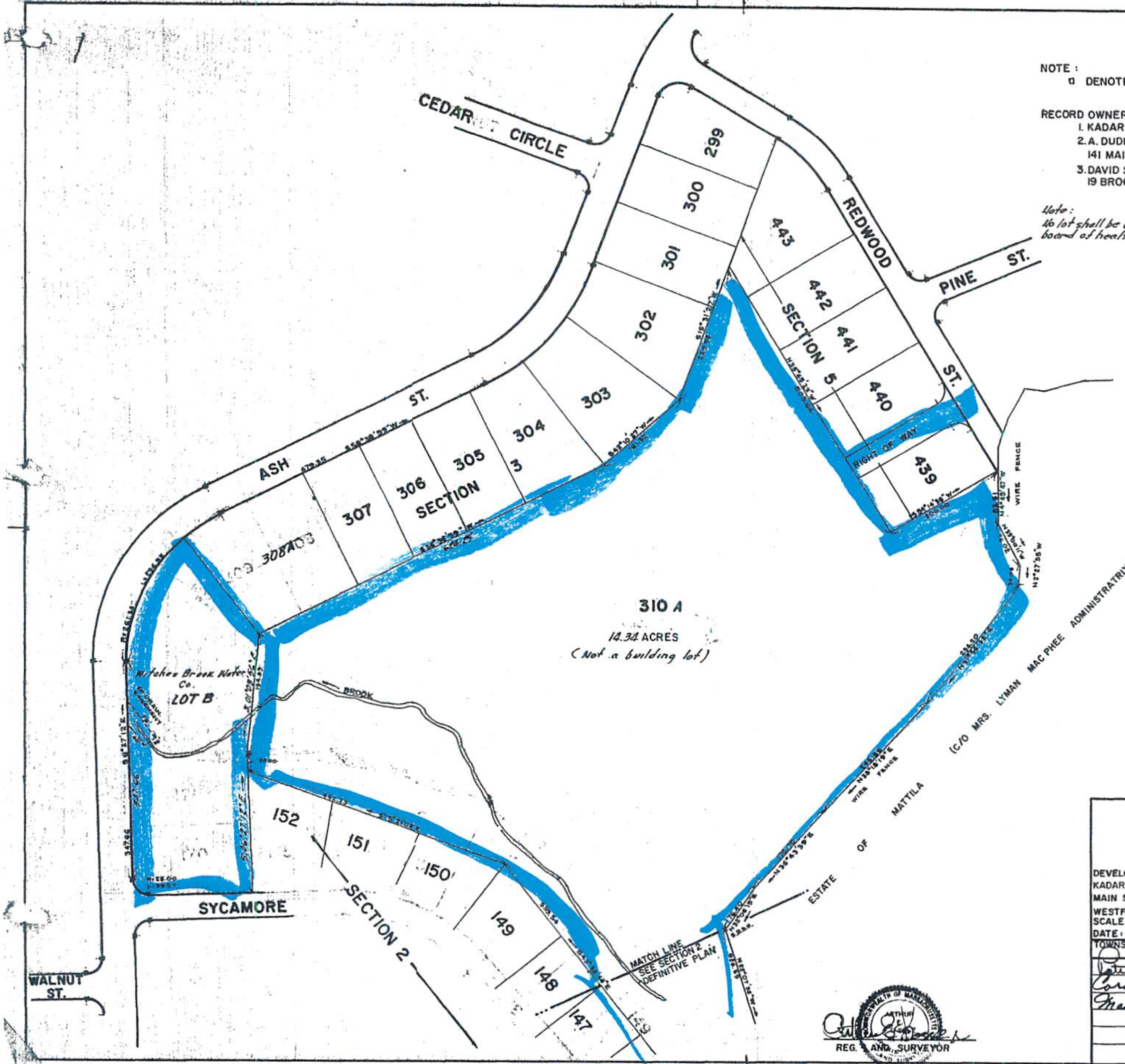
Nov. 25, 2003

Then personally appeared the above named, JAMES F. CRAVEN, Trustee of Squannacook Meadows Trust and James F. Craven, individually and acknowledged the foregoing instrument to be his free act and deed, before me.

Susan A. Furnaiole
Notary Public Susan A. Furnaiole

My Commission Expires 10/17/2008


TIMBERLEE PARK
SECTION I
RESUBDIVISION PLAN OF LAND
IN
TOWNSEND, MASS.
OWNER
KADAR CORP.
MAIN ST.
WESTFORD, MASS.
SCALE: 1" = 100'
DATE: FEB. 5, 1973
ENGINEERS
DANA F. PERKINS & SONS INC.
43 LAKEVIEW AVE. LOWELL, MASS.
REG. LAND SURVEYOR
TOWNSEND PLANNING BOARD
DATE: 2/7/73
Chairman
PLAN NUMBER 390(C of 3) of 1973
RECORDED, BOOK 12411 PAGE END
PLAN NUMBER 390(B of 3) of 1973
RECORDED, BOOK 12411 PAGE END
Plan Number 390(A of 3) of 1973
April 11, 1973
ALONE
Recorded, Book 12411 Page END
REGISTER
FEE 20.00
BY SW
390
Being a resubdivision of Lots 43 through 63; Lots 74 through 86 & Lot 100, as shown on a plan recorded at the S. M. D. Reg. of Deeds Plan Number 426, A, B, C of 1972, Record Book 12194, page 27
This plan is approved subject to provisions of the covenant, duly executed by the owners of the land on Timberlee Park Sec. I which is recorded in Book 12239, Page 167 and Book 12194, Page 27
Denotes Concrete Bounds to be set: □
Witches Brook Water Company
LOT A
LOT 194A
NOT A BUILDING LOT
194B
Witch Brook
Flow
ASH ST.
SPRUCE ST.
BEECH ST.
WALNUT ST.
MAPLEWOOD DRIVE
SOUTH HARBOR ROAD (Public)
WARREN RD. (Public)
NEW ENGLAND POWER SERVICE CO. EASEMENT
42
43A 20,000
44A 20,012
45A 22,746
46A 20,812
47A 20,000
48A 20,000
49A 20,000
50A 20,000
51A 20,000
52A 20,000
53A 20,000
54A 31,511
56A 25,549
57A 25,780
58A 25,010
59A 20,250
60A 20,671
61A 22,517
62A 20,345
63A 20,929
64
73
74A 21,829
75A 20,619
76A 22,835
77A 20,397
78A 20,000
79A 20,000
80A 20,000
81A 20,000
82A 20,000
83A 20,000
84A 20,028
85A 20,064
100A 20,057
101
Kadar Corp.
James B. & Earle M. Somerville
Robert E. & Martha F. Leahy
Donald P. & Lucy M. Girard
Uuno L. & Hilja E. Salonen



NOTE :
▫ DENOTES CONCRETE BOUND TO BE SET

RECORD OWNERS:
1. KADAR CORP. 124 MAIN ST. WESTFORD, MASS.
2. A. DUDLEY & ANNIE L. BAGLEY
141 MAIN ST. TOWNSEND, MASS.
3. DAVID S. HUSE
19 BROOKLINE ST. TOWNSEND, MASS.

Note:
No lot shall be constructed upon without board of health approval.

FEE 31.00
BY JJF

Middlesex Registry of Deeds, So. Dist.
CAMBRIDGE, MASS.
Plan Number 808 (A OF 4) of 1973
Rec'd JULY 2, 1973 at 2:58 P.M.
With AGREEMENT Doc. No. 430
KADAR CORP.
TOWN OF TOWNSEND
Recorded, Book 12469 Page 555

Attest: John F. Zazzuolli
REGISTER

SHEET 2 OF 2

SECTION 3
DEFINITIVE PLAN
TIMBERLEE PARK

SUBDIVISION PLAN OF LAND
IN
TOWNSEND, MASS.

DEVELOPER
KADAR CORP.
MAIN ST.
WESTFORD, MASS.
SCALE: 1" = 100'
DATE: DEC. 3, 1971

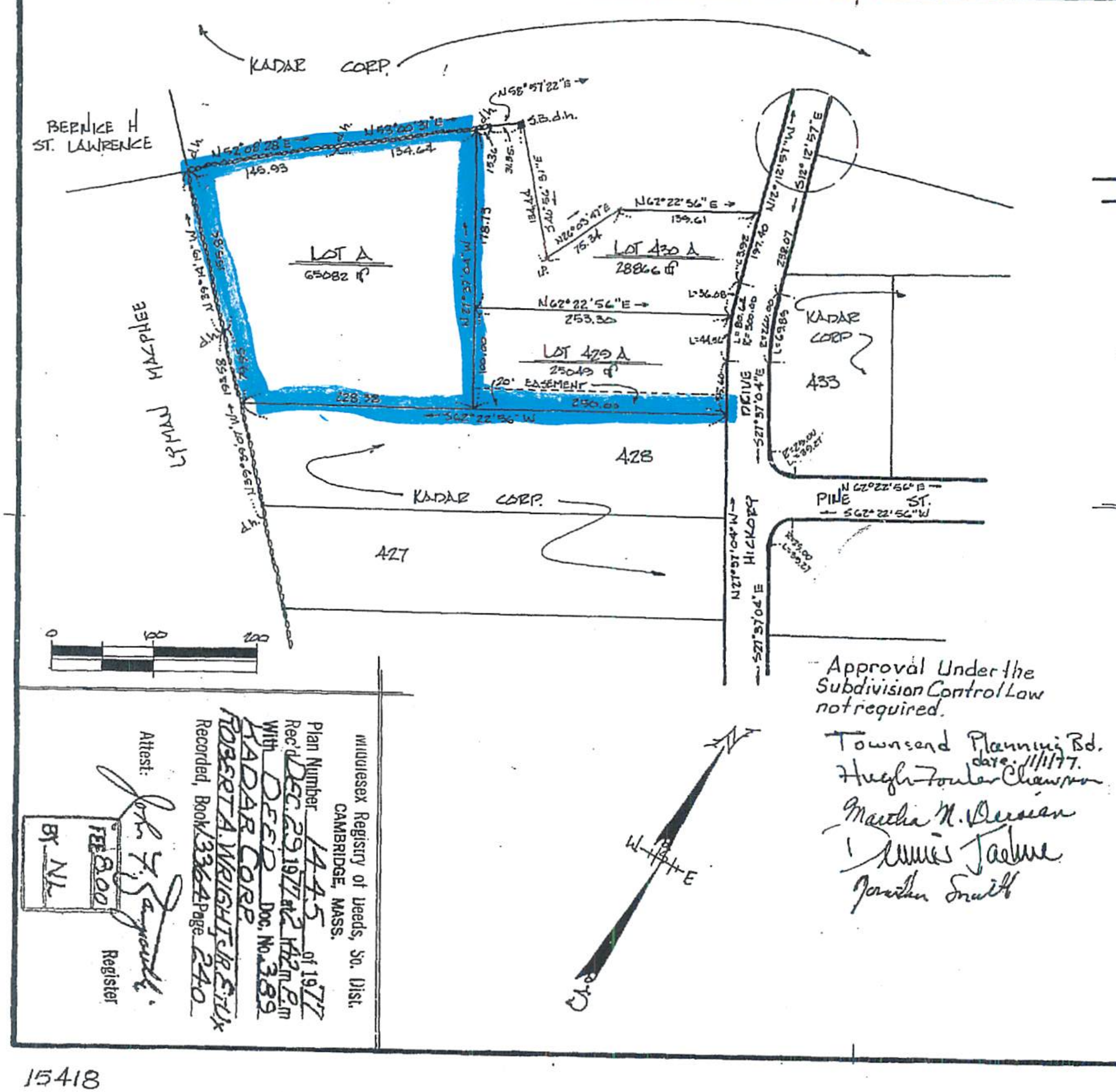
ENGINEERS
DANA F. PERKINS & SONS INC.
43 LAKEVIEW AVE. LOWELL, MASS.
REG. PROFESSIONAL ENGINEER

REG. LAND SURVEYOR

TOWNSEND PLANNING BOARD		
	PETITION FILED	
	FINAL PLAN FILED	
	HEARING DATE	
	PLAN APPROVED	January 14, 1973

A 17.V- 30.0tt 808

808-2



SUBDIVISION

PLAN OF LAND
"TIMBERLEE PARK SEC V"
IN
TOWNSEND, MASS.

SCALE 1"=100'   OCT 25, 1977

DANA F. PERKINS & SONS INC.
CIVIL ENGINEERS & SURVEYORS
LOWELL & READING, MASS.

OWNER: KADAR CORP.
124 MAIN STREET
WESTFORD, MASS.

NOTES:

THIS PLAN BEING A PORTION OF A PLAN RECORDED AT S.M.D.R.D. PLAN 809 OF 1973 BOOK 12469 PG. 556
SEE COVENANT RECORDED BOOK 12469 PG 555 DOC. 808

NO LOT SHALL BE CONSTRUCTED UPON WITHOUT BOARD OF HEALTH APPROVAL.

LOT A TO BE DEEDED TO WITCHES BROOK WATER CO. FOR WATER RESERVOIR USE ONLY.

I CERTIFY THAT I HAVE CONFORMED WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS IN PREPARING THIS PLAN OF LAND

DATE: OCTOBER 25, 1977

Arthur E. Fosse

ARTHUR E. FOSSE R.L.S.

COMMONWEALTH OF MASSACHUSETTS ARTHUR E. FOSSE No. 9317 REGISTERED LAND SURVEYOR

PLAN SHOWING PROPERTY
OF
WITCHES BROOK WATER CO.
IN
TIMBERLEE PARK
TOWNSEND , MASS.

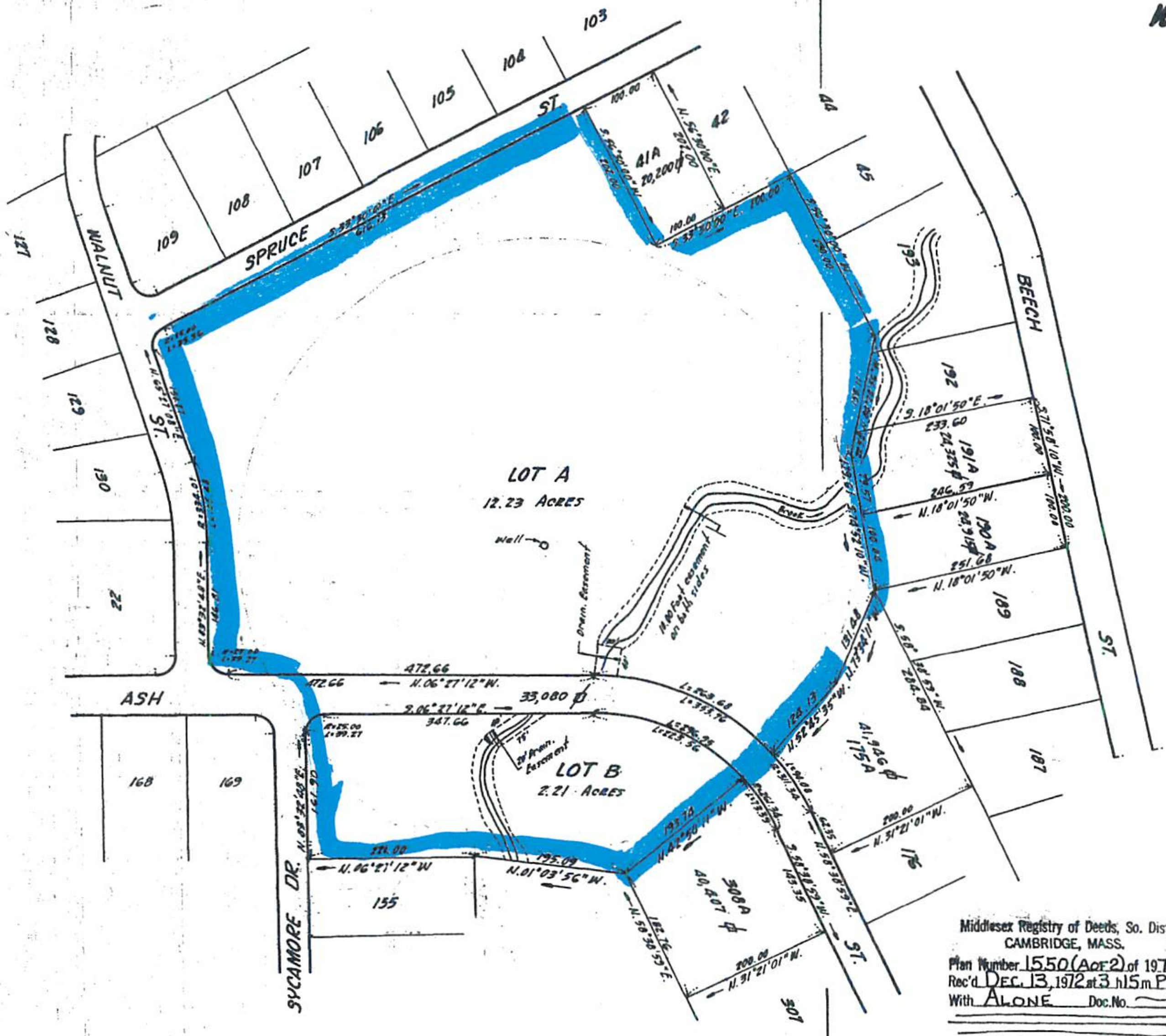
Scale: 1" = 100'   August 22, 1972

Dana F. Perkins & Sons, Inc.
Civil Engineers & Surveyors
Lowell-Reading , Mass.

COMMONWEALTH OF MASSACHUSETTS
ARTHUR E. FOSSE
No. 9317
REGISTERED LAND SURVEYOR

Arthur E. Fosse

FEE 11.00
BY P



Approval under subdivision control rules not required, but in accordance with the notes below:

1. This plan supercedes the previous plan for this area of Timberlee Park.
2. The area shown on this plan as lots A + B is to be used for water resources only. The area is not to be resubdivided without approval from the Planning Board.

10/18/72

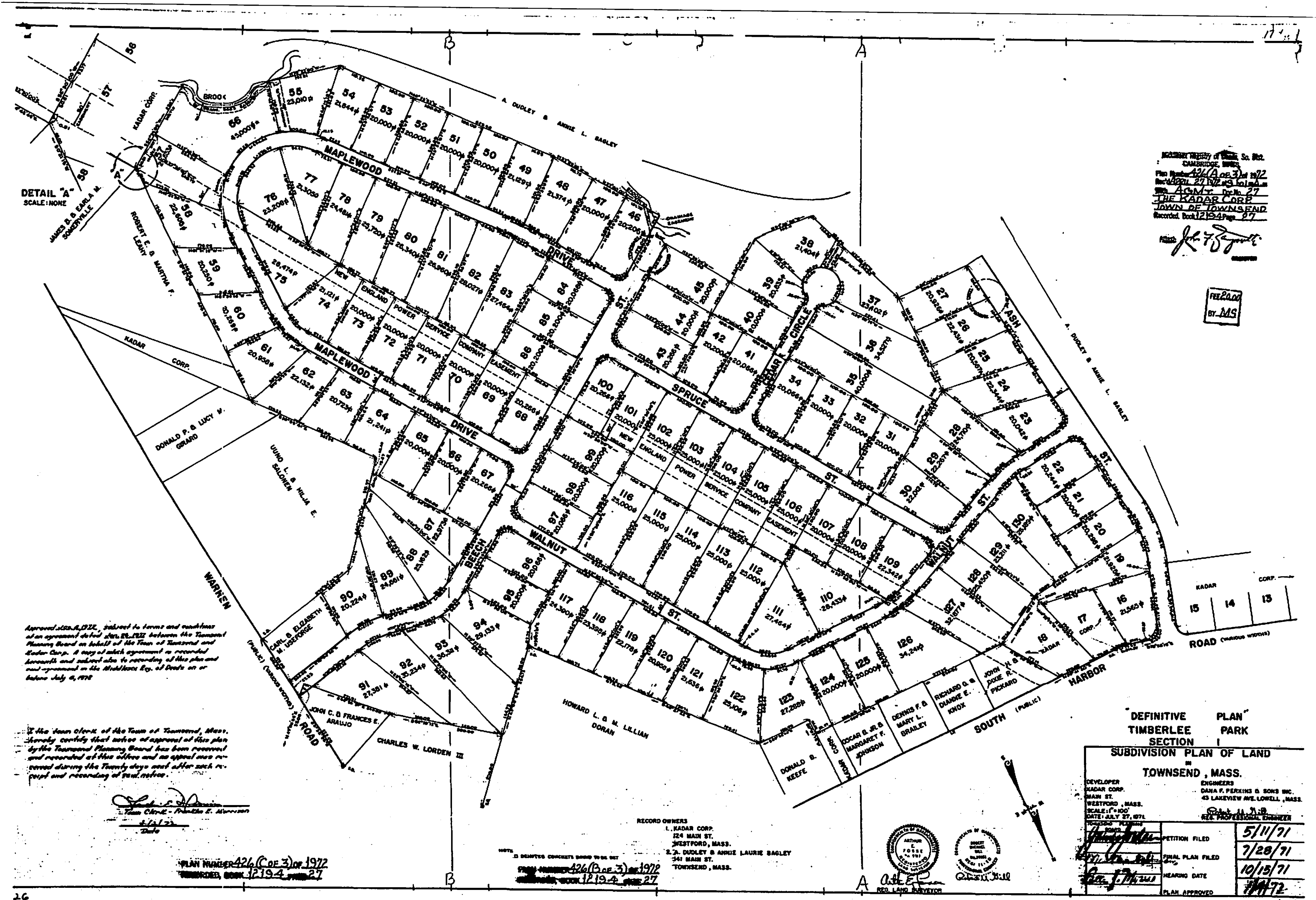
James Jordan, Chairman
John V. Aho
Martha M. Devoisin
Peter F. Morris
Paul Phinney

Middlesex Registry of Deeds, So. Dist.
CAMBRIDGE, MASS.
Plan Number 1550 (A of 2) of 1972
Rec'd Dec. 13, 1972 at 3 h 15 m P.m
With ALONE Doc. No. —
Recorded, Book 12346 Page END
Attest: John F. Zamparelli
REGISTER

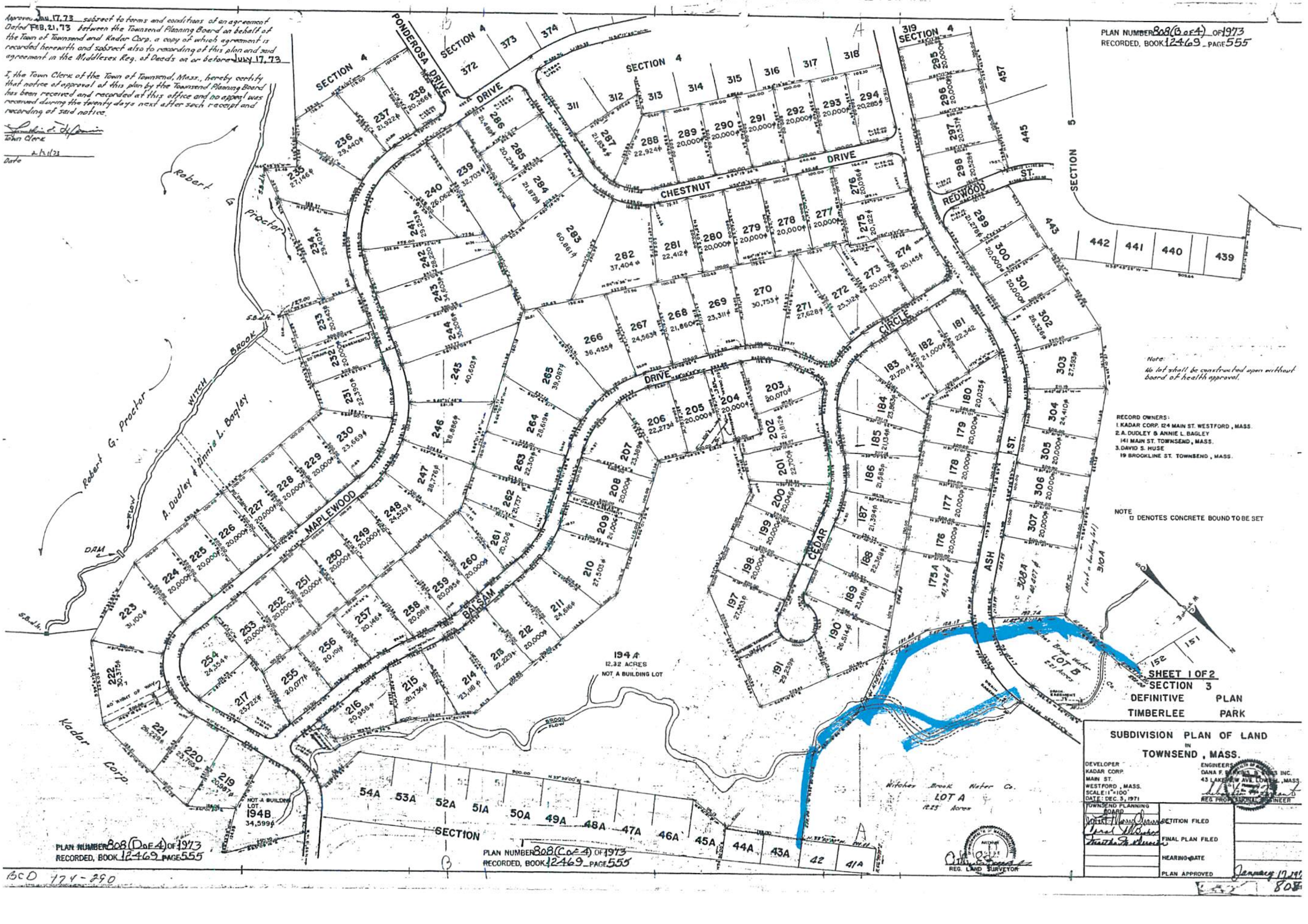
PLAN NUMBER 1550 (B of 2) OF 1972
RECORDED, BOOK 12346 PAGE END

15418 1550

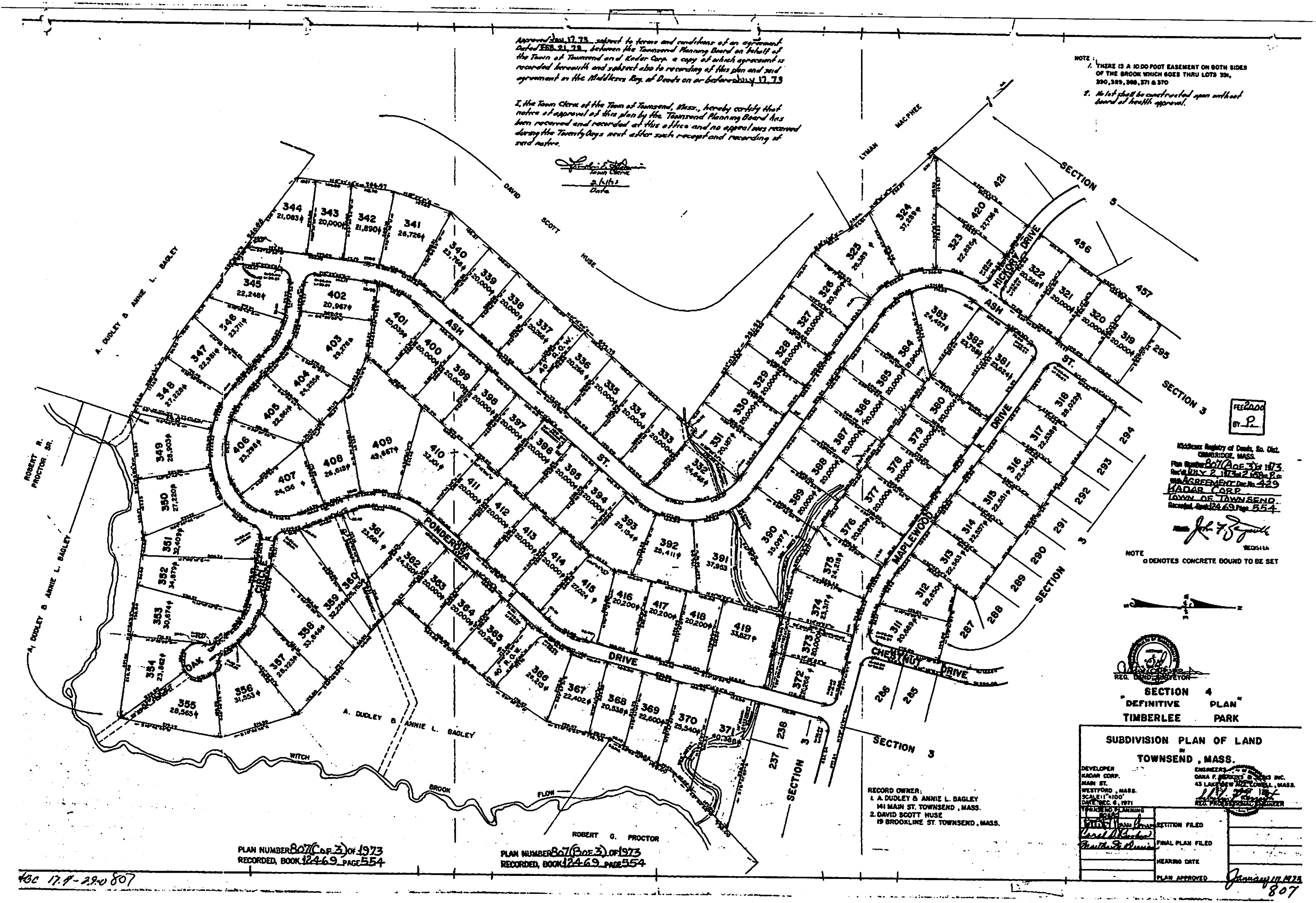
390 1550



"DEFINITIVE PLAN"
TIMBERLEE PARK
SECTION I
SUBDIVISION PLAN OF LAND
in
TOWNSEND, MASS.
DEVELOPER
KADAR CORP.
MAIN ST.
WESTFORD, MASS.
SCALE: 1" = 100'
DATE: JULY 27, 1971.
ENGINEERS
DANA F. PERKINS & SONS INC.
43 LAKEVIEW AVE. LOWELL, MASS.
REG. PROFESSIONAL ENGINEER
PETITION FILED 5/11/71
FINAL PLAN FILED 7/28/71
HEARING DATE 10/15/71
PLAN APPROVED 72
RECORD OWNERS
1. KADAR CORP.
124 MAIN ST.
WESTFORD, MASS.
2. A. DUDLEY & ANNIE LAURIE BAGLEY
341 MAIN ST.
TOWNSEND, MASS.
REG. LAND SURVEYOR
Middlesex Registry of Deeds, So. Dist.
CAMBRIDGE, MASS.
Plan Number 426 (A of 3) of 1972
Rec'd April 27 1972
AGMT. Doc. No. 27
THE KADAR CORP
TOWN OF TOWNSEND
Recorded Book 12194 Page 27
Attest:
FEE 20.00
BY MS
PLAN NUMBER 426 (C of 3) of 1972
RECORDED, BOOK 12194 PAGE 27
PLAN NUMBER 426 (B of 3) of 1972
RECORDED, BOOK 12194 PAGE 27
I the town clerk of the Town of Townsend, Mass. hereby certify that notice of approval of this plan by the Townsend Planning Board has been received and recorded at this office and no appeal was received during the twenty days next after such receipt and recording of said notice.
Town Clerk - Franklin E. Morrison
Date
DETAIL "A"
SCALE: NONE
MAPLEWOOD DRIVE
SPRUCE ST.
CEDAR CIRCLE
ASH ST.
WALNUT ST.
BEECH DRIVE
WARREN (PUBLIC) ROAD
SOUTH HARBOR (PUBLIC) ROAD
NEW ENGLAND POWER SERVICE COMPANY EASEMENT
BROOK
DRAINAGE EASEMENT
A. DUDLEY & ANNIE L. BAGLEY
KADAR CORP.
DONALD P. & LUCY M. GIRARD
UUNO L. & HILJA E. SALONEN
ROBERT E. & MARTHA F. LEAHY
JAMES B. & EARLA M. SOMERVILLE
CARL B. ELIZABETH M. USEFORGE
JOHN C. & FRANCES E. ARAUJO
CHARLES W. LORDEN III
HOWARD L. & M. LILLIAN DORAN
DONALD B. KEEFE
OSCAR B. JR. & MARGARET F. JOHNSON
DENNIS F. & MARY L. BRAILEY
RICHARD O. & DIANNE E. KNOX
JOHN H. & DIXIE R. PICKARD



Approved Jul. 17, 73 subject to terms and conditions of an agreement Dated FEB. 21, 73 between the Townsend Planning Board on behalf of the Town of Townsend and Kadar Corp. a copy of which agreement is recorded herewith and subject also to recording of this plan and said agreement in the Middlesex Reg. of Deeds on or before JULY 17, 73
I, the Town Clerk of the Town of Townsend, Mass., hereby certify that notice of approval of this plan by the Townsend Planning Board has been received and recorded at this office and no appeal was received during the twenty days next after such receipt and recording of said notice.
Town Clerk
Date
PLAN NUMBER 808 (B of 4) OF 1973
RECORDED, BOOK 12469 PAGE 555
SECTION 4
SECTION 5
PONDEROSA DRIVE
CHESTNUT DRIVE
REDWOOD ST.
ASH ST.
CEDAR CIRCLE
DRIVE
MAPLEWOOD
BALSAM
WITCH BROOK
Robert G. Proctor
A. Dudley & Annie L. Bagley
Kadar Corp.
DAM
194 A
12.32 ACRES
NOT A BUILDING LOT
194B
34,599
NOT A BUILDING LOT
LOT A
Witches Brook Water Co.
LOT B
Note:
No lot shall be constructed upon without board of health approval.
RECORD OWNERS:
1. KADAR CORP. 124 MAIN ST. WESTFORD, MASS.
2. A. DUDLEY & ANNIE L. BAGLEY
141 MAIN ST. TOWNSEND, MASS.
3. DAVID S. HUSE
19 BROOKLINE ST. TOWNSEND, MASS.
NOTE
DENOTES CONCRETE BOUND TO BE SET
SHEET 1 OF 2
SECTION 3
DEFINITIVE PLAN
TIMBERLEE PARK
SUBDIVISION PLAN OF LAND
IN
TOWNSEND, MASS.
DEVELOPER
KADAR CORP.
MAIN ST.
WESTFORD, MASS.
SCALE: 1" = 100'
DATE: DEC. 3, 1971
ENGINEERS
DANA F.
43 LAKEVIEW AVE. LOWELL, MASS.
REG. PROFESSIONAL ENGINEER
TOWNSEND PLANNING BOARD
PETITION FILED
FINAL PLAN FILED
HEARING DATE
PLAN APPROVED
January 17 197
808
REG. LAND SURVEYOR
PLAN NUMBER 808 (D of 4) OF 1973
RECORDED, BOOK 12469 PAGE 555
PLAN NUMBER 808 (C of 4) OF 1973
RECORDED, BOOK 12469 PAGE 555
SECTION 1
BCD 174-290



Approved Jan. 17, 73 subject to terms and conditions of an agreement dated Feb. 21, 73 between the Townsend Planning Board on behalf of the Town of Townsend and Kadar Corp. a copy of which agreement is recorded herewith and subject also to recording of this plan and said agreement in the Middlesex Reg. of Deeds on or before July 17, 73
I, the Town Clerk of the Town of Townsend, Mass., hereby certify that notice of approval of this plan by the Townsend Planning Board has been received and recorded at this office and no appeal was received during the Twenty Days next after such receipt and recording of said notice.
Town Clerk
Date
NOTE:
1. THERE IS A 10.00 FOOT EASEMENT ON BOTH SIDES OF THE BROOK WHICH GOES THRU LOTS 331, 330, 389, 388, 371 & 370
2. No lot shall be constructed upon without board of health approval.
Middlesex Registry of Deeds, So. Dist. CAMBRIDGE, MASS.
Rec'd JULY 2, 1973
AGREEMENT
KADAR CORP.
TOWN OF TOWNSEND
Recorded Book 12469 Page 554
NOTE
○ DENOTES CONCRETE BOUND TO BE SET
SECTION 3
SECTION 5
SECTION 4
"DEFINITIVE PLAN"
TIMBERLEE PARK
SUBDIVISION PLAN OF LAND
IN
TOWNSEND, MASS.
DEVELOPER
KADAR CORP.
MAIN ST.
WESTFORD, MASS.
SCALE: 1"=100'
DATE: DEC. 6, 1971
ENGINEERS
DANA F. PERKINS & SONS INC.
43 LAKEVIEW AVE. LOWELL, MASS.
REG. PROFESSIONAL ENGINEER
REG. LAND SURVEYOR
TOWNSEND PLANNING BOARD
PETITION FILED
FINAL PLAN FILED
HEARING DATE
PLAN APPROVED
January 17, 1973
807
RECORD OWNER:
1. A. DUDLEY & ANNIE L. BAGLEY
141 MAIN ST. TOWNSEND, MASS.
2. DAVID SCOTT HUSE
19 BROOKLINE ST. TOWNSEND, MASS.
ASH ST.
MAPLEWOOD DRIVE
HICKORY DRIVE
CHESTNUT DRIVE
PONDEROSA DRIVE
OAK CIRCLE
DAVID SCOTT HUSE
LYMAN MACPHEE
A. DUDLEY & ANNIE L. BAGLEY
ROBERT R. PROCTOR SR.
ROBERT G. PROCTOR
WITCH BROOK
FLOW
PLAN NUMBER 807 (C of 3) OF 1973
RECORDED, BOOK 12469 PAGE 554
PLAN NUMBER 807 (B of 3) OF 1973
RECORDED, BOOK 12469 PAGE 554
FEE 2.00
ST. 2
BC 17.7-29.0 807

APPROVED JAN. 17, 73 SUBJECT TO TERMS AND CONDITIONS OF AN AGREEMENT DATED FEB. 21, 73 BETWEEN THE TOWNSEND PLANNING BOARD ON BEHALF OF THE TOWN OF TOWNSEND AND KADAR CORP. A COPY OF WHICH AGREEMENT IS RECORDED HEREWITH AND SUBJECT ALSO TO RECORDING OF THIS PLAN AND SAID AGREEMENT IN THE MIDDLESEX REG. OF DEEDS ON OR BEFORE JULY, 17, 1973

I, THE TOWN CLERK OF THE TOWN OF TOWNSEND, MASS., HEREBY CERTIFY THAT NOTICE OF APPROVAL OF THIS PLAN BY THE TOWNSEND PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE

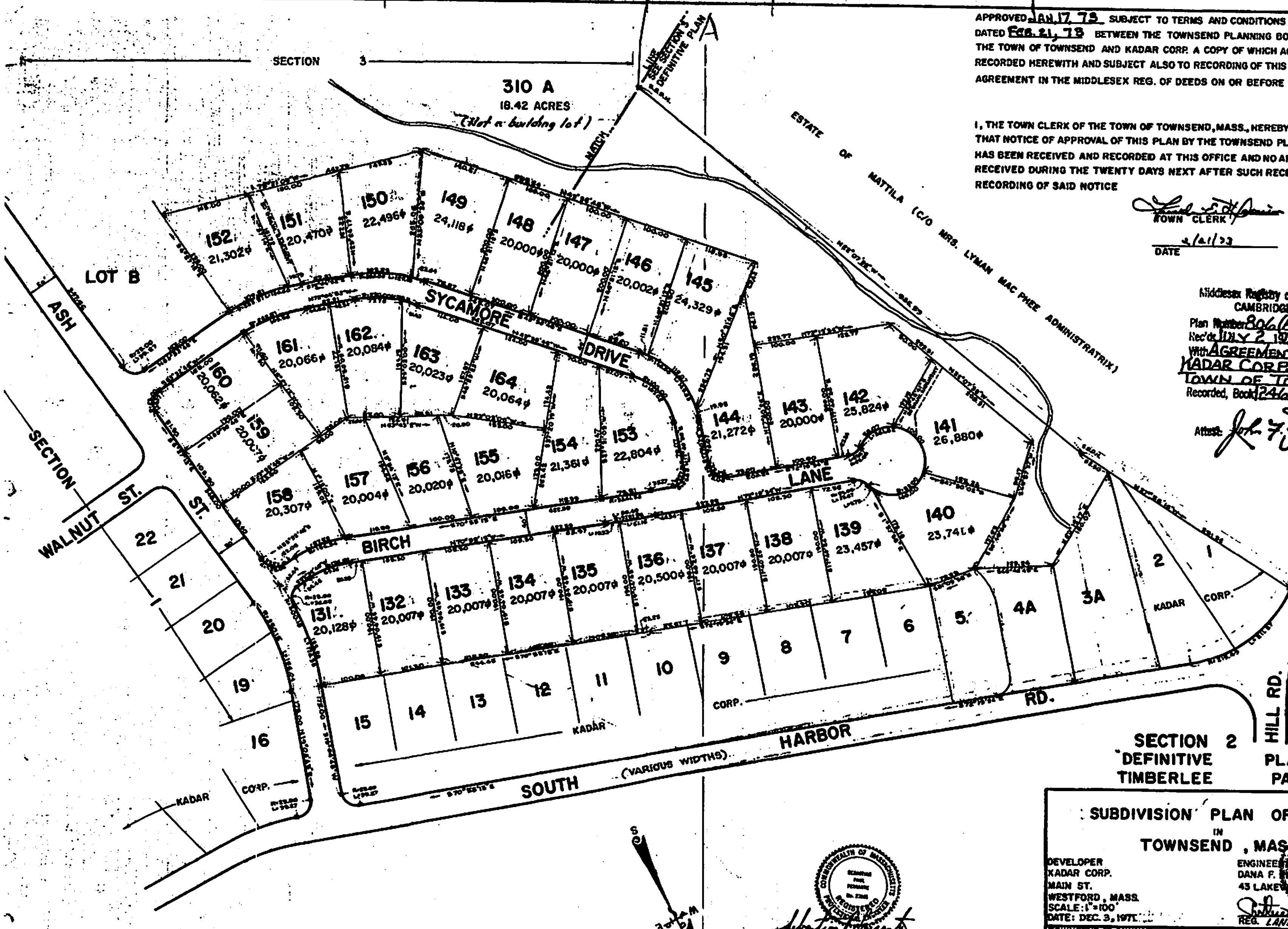
TOWN CLERK

2/21/73
DATE

FEE $1.00
BY P.

Middlesex Registry of Deeds, So. Dist.
CAMBRIDGE, MASS.
Plan Number 806 (A of 2) of 1973
Rec'd JULY 2, 1973 at 2:15 P.M.
With AGREEMENT Doc. No. 428
KADAR CORP.
TOWN OF TOWNSEND
Recorded, Book 12469 Page 553

Attest: John F. Zamparelli
REGISTER



SECTION 2
"DEFINITIVE PLAN"
TIMBERLEE PARK

SUBDIVISION PLAN OF LAND
IN
TOWNSEND, MASS.

DEVELOPER
KADAR CORP.
MAIN ST.
WESTFORD, MASS.
SCALE: 1"=100'
DATE: DEC. 3, 1971

ENGINEERS
DANA F. PERKINS & SONS INC.
43 LAKEVIEW AVE. LOWELL, MASS.

REG. LAND SURVEYOR

REG. PROFESSIONAL ENGINEER

RECORD OWNER
1. KADAR CORP. 124 MAIN ST. WESTFORD, MASS.
2. A. DUDLEY & ANNE I. BAGLEY 141 MAIN ST. TOWNSEND, MASS.

NOTE: NO LOT SHALL BE CONSTRUCTED UPON WITHOUT BOARD OF HEALTH APPROVAL

□ DENOTES CONCRETE BOUND TO BE SET

TOWNSEND PLANNING BOARD	PETITION FILED	
	FINAL PLAN FILED	
	HEARING DATE	
	PLAN APPROVED	January 17, 1973

PLAN NUMBER 806 (B of 2) of 1973
RECORDED, BOOK 12469 PAGE 553

B 145-290

806

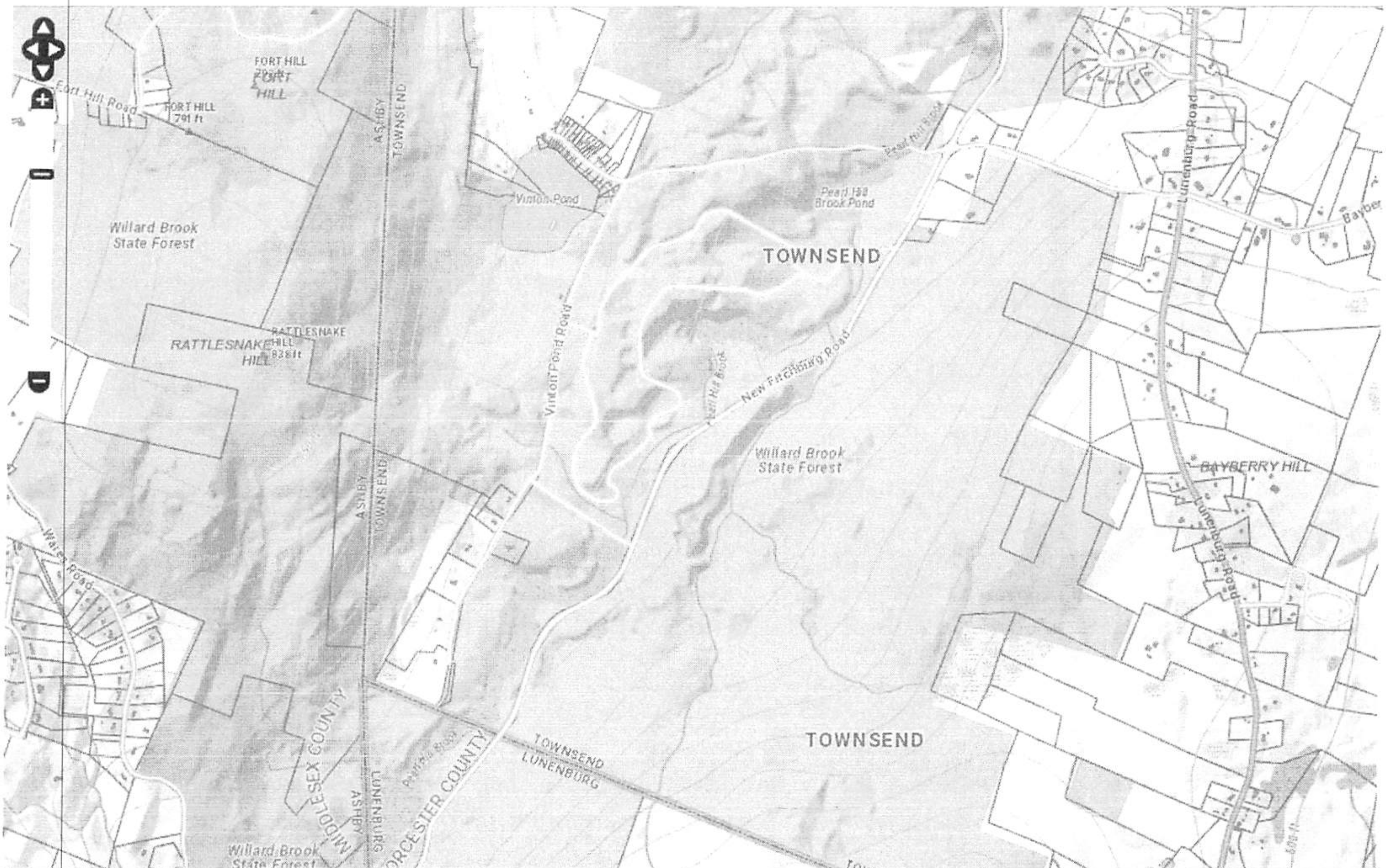
MuniMapper: Townsend, MA

Town of Townsend Web Site

Disclaimer

MUNICIPAL MAPPER

Search for a location



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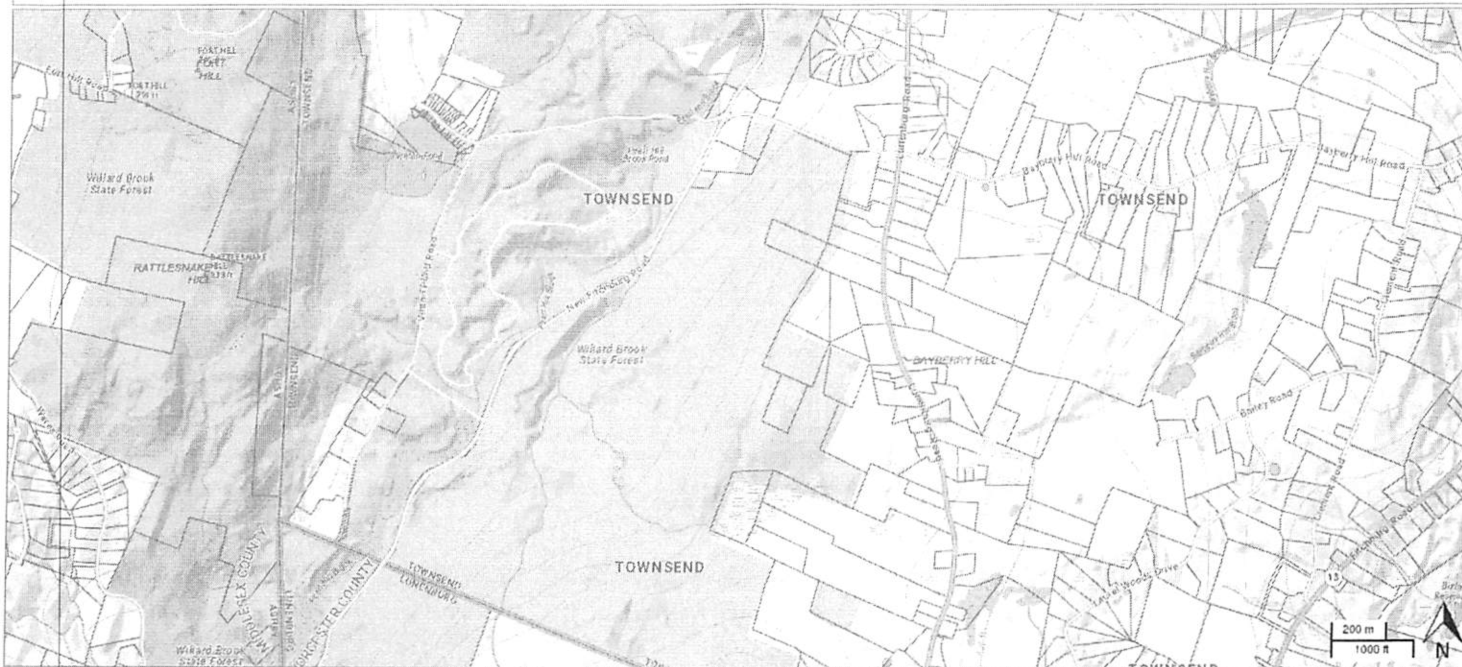


Tax Parcels for C

Detailed Feature

Tax Parcels for D

MassGIS Statew
MassGIS Topog

I, Marilyn, Clerk of the Town of Townsend, Mass. hereby certify that notice of approval of this plan by the Planning Board has been received and recorded by this office and no appeal was received during the twenty days next after such receipt and recording of said notice.
Marilyn J. [illegible]
Town Clerk
6-6-79

I HEREBY CERTIFY THAT I HAVE CONFORMED WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS IN PREPARING THIS PLAN OF LAND.
10/19/78 — DATE
ARTHUR E. FOSSE ELS

NOTE:
PARCEL "A" IS A PORTION OF A 31.6 ACRE± LOT SHOWN ON A PLAN RECORDED AT THE SO. DIST. M.R. of D. BOOK 9937, PG. 304 PREPARED BY NELSON ENGINEERING & SURVEY SERVICE

DEFINITIVE PLAN TIMBERLEE PARK
SECTION 6

SUBDIVISION PLAN IN PLAN OF LAND
TOWNSEND, MASS.

OWNER:
KADAR CORP.
124 MAIN ST. WESTFORD, MA.

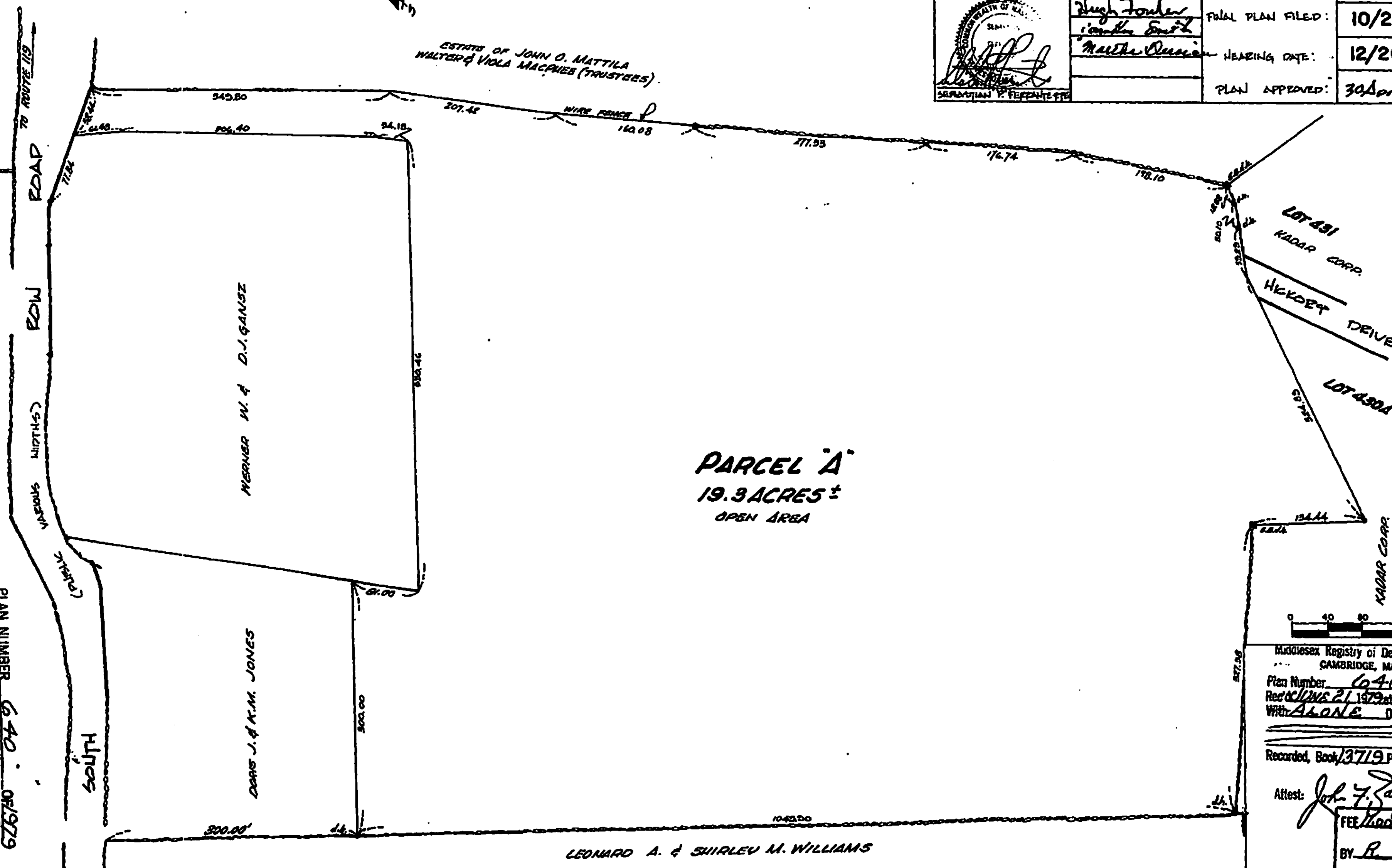
ENGINEERS
DANA F. PERKINS & ASSOC, INC.
43 LAKEVIEW AVE, LOWELL, MA.

DATE: OCT 10, 1978 — SCALE: 1" = 80'

ARTHUR E. FOSSE - E.L.S.

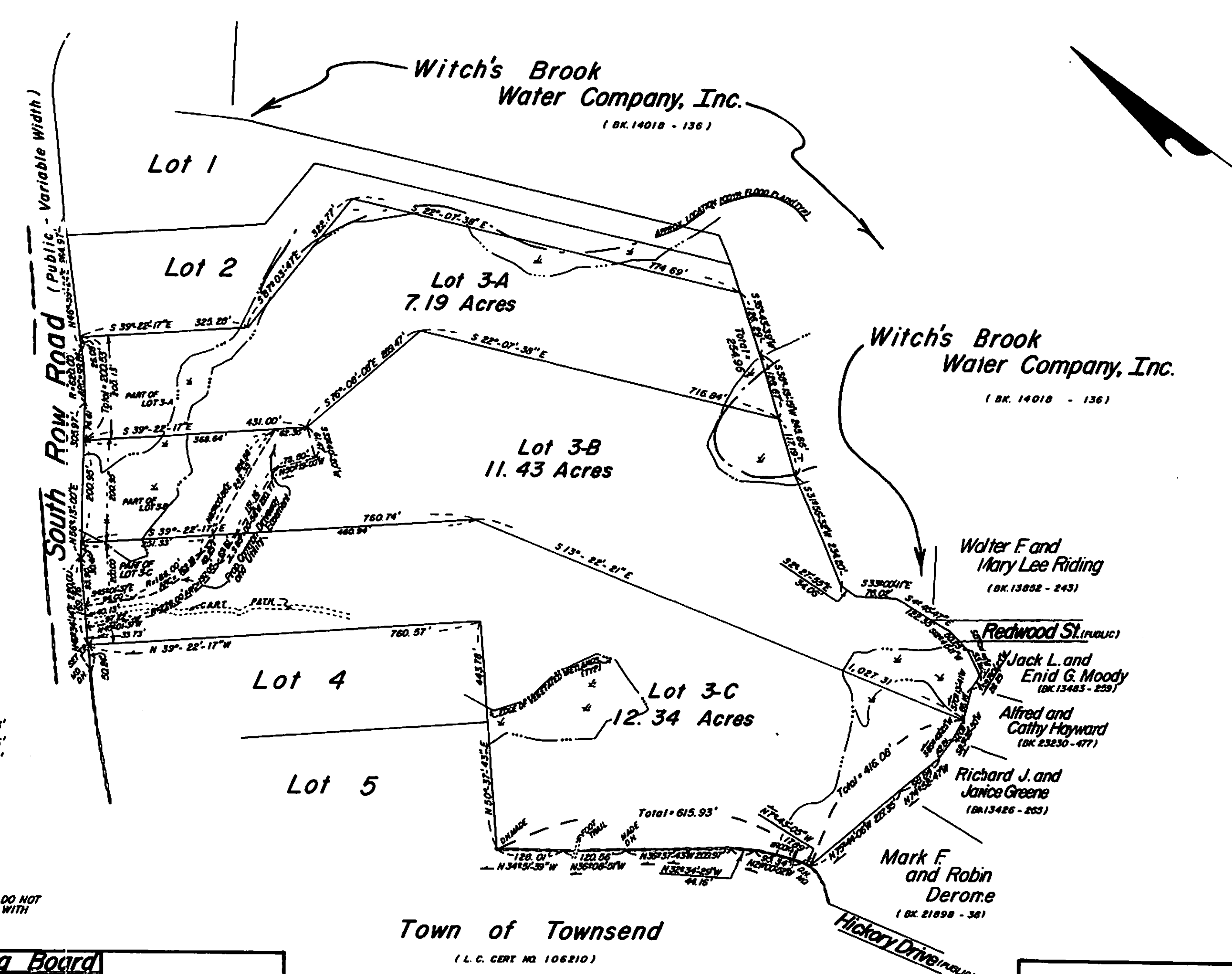
SEBASTIAN F. FERRANTE

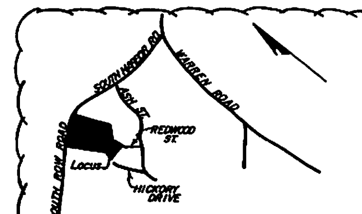
TOWNSEND PLANNING BOARD		
Hugh Fowler	PETITION FILED:	3/21/78
Jonathan Smith	FINAL PLAN FILED:	10/21/78
Martha Duncan	HEARING DATE:	12/20/78
	PLAN APPROVED:	30 April 1979



Middlesex Registry of Deeds, So. Dist.
CAMBRIDGE, MASS.
Plan Number 640 of 1979
Rec'd JUNE 21 1979 at 2 h 41 m P m
With ALONE Doc. No. ~
Recorded, Book 13719 Page END
Attest: John F. Zamparelli
Register
FEE 4.00
BY R

PLAN NUMBER 640 OF 1979
RECORDED, BOOK 13719 PAGE END





"Locus Map"
Scale: 1" = 2,000'

TOTAL FRONTAGE:
LOT 3-A = 200.53'
LOT 3-B = 200.95'
LOT 3-C = 200.17'

NOTE:
LOTS 1, 2, 4 AND 5 APPEAR IN THEIR ENTIRETY ON A PLAN ENTITLED "PLAN OF LAND IN TOWNSEND, MASS. PREPARED FOR SEVEN C's REALTY TRUST" DATED SEPTEMBER, 2000 BY DAVID E. ROSS ASSOCIATES, INC. PLAN NO. L-6519 — ENDORSED BY THE TOWNSEND PLANNING BOARD SEPTEMBER 18, 2000.
LOTS 3-A, 3-B AND 3-C APPEAR AS LOT 3 ON THE ABOVEMENTIONED PLAN.

LEGEND:
EDGE OF VEGETATED WETLANDS
APPROX. LOCATION 100YR. FLOOD PLAIN
DRILL HOLE •D.H.
IRON PIN •I.P.
STONE WALL

RECORD OWNER:
ESTATE OF HILMA MATTILA
c/o ATTY. MICHAEL J. RING
9 MIRIAM ST. - SUITE 21
LEXINGTON, MASS. 02173

APPLICANT:
SEVEN C's REALTY TRUST
435 KING STREET
LITTLETON, MASS. 01460

ZONING DISTRICT: RA

PLANNING BOARD NOTE:
SIGNATURES OF THE PLANNING BOARD DO NOT NECESSARILY INDICATE COMPLIANCE WITH CURRENT ZONING REGULATIONS.

Townsend Planning Board
APPROVAL UNDER SUBDIVISION CONTROL LAW
NOT REQUIRED. C 41 S 81-P
DATE: Nov. 20, 2000
THREE MEMBERS CONSTITUTE A MAJORITY.

Middlesex Registry of Deeds, Southern District
Cambridge, Massachusetts
Plan No. 1304 of 2000
Rec'd 11-22 2000
at 2 h 41 m P m Doc No. 870
Rec'd Bk. 32058 Page 373
Attest
Register

1"=100'
0 50 100 150 200 250 300 FEET
0 20 40 60 80 METERS

I CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.
11/14/00
DATE
SURVEYOR

PLAN OF LAND IN
Townsend, Mass.
PREPARED FOR
Seven C's Realty Trust
SCALE: 1"=100' NOVEMBER, 2000
David E. Ross Associates, Inc.
CIVIL ENGINEERS
LAND SURVEYORS
ENVIRONMENTAL CONSULTANTS
P.O. BOX 368 - 111 FITCHBURG RD. AYER, MASS. 01432
(TEL. NO. 978-772-6232)
JOB NO. 14300
PLAN NO. L-6519-A

SURV: S.B.R.	CALC: W.F.R.	DRAFTED: R.J.T.	CK'D: M.D.M.	NB 221-2	DEED: BK. 4732-43	REF: L-6519, M-1170, L-5366

1304

David Vigeant

From: Mass Rural Water Association <no-reply@wufoo.com>
Sent: Monday, January 4, 2021 6:46 AM
To: David Vigeant
Subject: Basics of a Chemical Feed System

Thank you for submitting your registration for MassRWA's Basics of a Chemical Feed System (#2021-01 & #2021-02). You will be added to the Class Roster shortly. You will receive a confirmation/reminder a few days prior to class with instructions on connecting to the Zoom call. Thank you signing up and for your support! - Mass Rural Water Association

Basics of a Chemical Feed System

Attendee Name *	kevin keefe
System/Company Name *	Townsend Water Dept.
System/Company Address *	540 Main St WEST TOWNSEND, Massachusetts 01474 United States
Attendee Mobile Number *	(897) 877-3174
Attendee Email *	Dvigeant@townsendwater.org
Date *	January 20, 2021 (#2021-02)
Class Fee *	FREE (MassRWA Member)

EXHIBIT A

Two certain parcels of vacant land situated on Ash Street, Townsend, Middlesex County, Commonwealth of Massachusetts, being shown as Lot A containing 12.23 acres and Lot B containing 2.21 acres as shown on plan entitled "Plan Showing Property of Witches Brook Water Co. in Timberlee Park Townsend, Mass." dated August 22, 1972, Dana F. Perkins & Sons, Inc., Civil Engineers & Surveyors, recorded with Middlesex South District Registry of Deeds as Plan No. 1550 of 1972, End of Book 12346, to which plan reference is hereby made for a more particular description of said lots;

Lot A situated West of Hickory Drive in said Townsend, shown as containing 65,082 square feet of land on a plan of land entitled "Subdivision Plan of Land 'Timberlee Park Section V' in Townsend, Mass." dated October 25, 1977, by Dana F. Perkins & Sons Inc., recorded with Middlesex South District Registry of Deeds, as Plan No. 1445 of 1977, Book 13364, Page 240, together with the right to use the twenty foot (20') easement area as shown on said plan as running over Lot 429A for passage by foot or vehicle, and for the installation, maintenance, repair, and renewal of all utilities in, under, and over the same;

Lot 310A situated east of Redwood Street and south of Ash Street in said Townsend, shown as containing 14.34 acres on a plan of land entitled "Section 3 Definitive Plan Timberlee Park Subdivision Plan of Land in Townsend, Mass." dated December 3, 1971, by Dana F. Perkins & Sons, Inc., duly recorded in two sheets with said Deeds, Book 12469, Page 555. Together with the right to use the "Right of Way" between lots 440 and 439 as shown on said plan for all purposes for which ways now or hereafter may be commonly used in the Town of Townsend;

Lot 194B shown on said last mentioned plan as containing 34,599 square feet, and situated at the intersection of Maplewood Drive and Balsam Drive as shown on said plan in said Townsend;

Lot 194A containing 12.32 acres as shown on a plan entitled "Section 3 Definitive Plan Timberlee Park Subdivision Plan of Land in Townsend, Mass." dated December 3, 1971, by Dana F. Perkins & Sons Inc., recorded with said Deeds, Book 12469, Page 555, Sheet 1 of 2;

Lots 44A and 43A on Spruce Street in said Townsend, shown on a plan entitled "Timberlee Park Section I Resubdivision Plan of Land in Townsend, Mass." dated February 5, 1973, by Dana F. Perkins & Sons Inc., recorded with said Deeds as Plan No. 390 of 1973, Book 12411, End; Lot 42 on said Spruce Street as shown on a plan entitled "'Definitive Plan' Timberlee Park Section I Subdivision Plan of Land in Townsend, Mass." dated July 27, 1971, by Dana F. Perkins & Sons Inc., recorded with said Deeds, Book 12194, Page 27, containing 20,200 square feet according to said plan;

Lot 41A on said Spruce Street as shown on a plan entitled "Plan Showing Property of Witches Brook Water Co. in Timberlee Park Townsend, Mass." dated August 22, 1972, by Dana F. Perkins & Sons, Inc., recorded with said Deeds, Book 12346, End, containing 20,200 square feet of land according to said plan.

Eugene C. Brune

Attest Middlesex S. Register

1B

2007 00140241
Bk: 49851 Pg: 527 Doc: DEED
Page: 1 of 4 07/27/2007 03:18 PM

QUITCLAIM DEED

Witch's Brook Water Company, Inc., a Massachusetts corporation, with offices at 124 Main Street, Westford, MA 01886 (hereinafter referred to as "Grantor"), for consideration paid of Five Hundred Thousand and 00/100 Dollars ($500,000.00), grants to the Town of Townsend, acting by and through its Board of Water Commissioners, having an address of 272 Main Street, Townsend, MA 01469 (hereinafter referred to as "Grantee") with QUITCLAIM COVENANTS the real property described in Exhibit A attached hereto and incorporated herein (the "Property"), together with any and all servitudes, easements, rights-of-way, licenses and other rights in real property appurtenant thereto, and all improvements located thereon.

Being the premises conveyed to Grantor by deed recorded with Middlesex South District Registry of Deeds in Book 12389, Page 167 and a portion of the premises conveyed to Grantor by Deed recorded with said Deeds in Book 14018, Page 136.

This conveyance constitutes a conveyance of all or substantially all of the assets of the Grantor in the Commonwealth of Massachusetts.

The undersigned certifies that G.L. c. 7, §40J has been complied with.

No deed stamp taxes are due on this conveyance pursuant to G.L.c.64D, §1.

Ash St., Hickory Dr., Townsend

Laura H. Pawle, Esq.
KOPELMAN AND PAIGE, P.C.
101 ARCH STREET
BOSTON, MA 02110

IN WITNESS WHEREOF, the said Witch's Brook Water Company, Inc. has caused its corporate seal to be hereto affixed this 25TH day of July, 2007.

WITCH'S BROOK WATER COMPANY, INC.

By: Genevieve M Hicks

Genevieve M. Hicks,
President and Treasurer

Eugene C. Brune
Attest Middlesex S. Register

THE COMMONWEALTH OF MASSACHUSETTS

Middlesex SS.

On this 25TH day of JULY, 2007, before me, the undersigned Notary Public, personally appeared Genevieve M. Hicks, President, Witch's Brook Water Company, Inc., and proved to me through satisfactory evidence of identification, which was MA DRIVER'S LICENSE, to be the person whose name is signed on the preceding document, and acknowledged to me that she signed it voluntarily as President and Treasurer of Witch's Brook Water Company, Inc., for its stated purpose.

Heather Maddox

Notary Public HEATHER MADDOX
My commission expires: 7-14-11

320933/TOWNWATR/0004