

William T. Noble

Licensed Site Evaluator / Certified Soil Scientist

RFD 3, Box 186
Augusta, Maine 04330
Tel.: 547-3252

town copy

May 18, 1991
Job No. 91008

Ellen Szela
RFD 3, Box 728
Augusta, Maine 04330

Re: Investigation of Malfunctioning Subsurface Wastewater Disposal System, Szela Property, Bog Road, Augusta, Maine.

Dear Mrs. Szela,

On May 9, 1991, an on-site inspection was made to determine the cause of the malfunction of your subsurface wastewater disposal chamber system, which I designed in November, 1988. Evidence of the malfunction consisted of surfacing of wastewater on to the ground surface at the end of the last row of the disposal chambers, that were designed and installed in a serial distribution arrangement.

In attendance at this on-site investigation were several professionals, of varied backgrounds and interests, with expertise in subsurface wastewater disposal system site evaluation, design and construction. Among these persons were myself, Jay Hardcastle of the DHS Division of Health Engineering, Gary Fuller of the Code Enforcement Office of the City of Augusta, J. Bruce Johnson of Eco-Tec, Inc., distributors of Infiltrator® disposal chambers, David Rocque, State Soil Scientist, Eugene Dube, site evaluator and septic tank pumper, and Paul McNaughton, disposal system contractor/installer.

Conclusions/Discussion

After viewing the interior of the chamber rows at one end, and the fill material that was installed beneath and around the sidewalls of the chambers, my understanding is that the general consensus for the reason the disposal area is malfunctioning is the fine texture of the fill, combined with a carryover of solids (e.g. fats, grease) into the disposal area.

The texture of the fill observed varies from sandy loam to loamy fine "dead" sand. While soils with these textures can, and do, transmit liquid, the pore spaces between the mineral grains are small and are more susceptible to clogging than are larger-grained materials, such as coarse sand and gravel. The solids that were seen inside the disposal chambers evidently caused the absorptive capacity of the loamy fill to become reduced to the point that the majority of the wastewater now flows to the end of the disposal area, which then surfaces on to the ground.

The amount of solids present within the disposal area was not considered to be excessive. However, minimizing or eliminating the carryover of solids into a disposal area is a very important factor in its long-term functioning. The volume of laundry waste generated of one load per day is also not excessive, but considering the size of your family, it is quite likely that the overall use of the disposal system is at or near its design flow of 270 gallons per day.

It should be noted that the type of fill installed by the contractor around and beneath the disposal chambers was as specified in the design plans. The Maine Subsurface Wastewater Disposal Rules require the use of "sandy loam or coarser" fill for disposal areas, and specifically require, in Section 10.E.c, the use of a loam liner for disposal areas utilizing serial distribution with the type of soil (Profile 5) present at the disposal area location. In addition, the informational documents provided by the distributor of Infiltrator® chambers describe them as the "no stone leaching field", and also recommend the use of sandy loam or coarser fill, or even excavated on-site native material. Experience is showing that coarser-grained fill material, such as loamy coarse sand to fine gravel is necessary for satisfactory, long-term performance of these type of chambers.

Also during the inspection it was found that one or two of the chambers were cracked or crushed, and that some fill material had entered the system. However, these damaged chambers were not considered to be a factor in the malfunctioning of the disposal area.

Recommendations

Based on the on-site discussion among the investigators, the following steps are recommended for correction and improvement of the malfunctioning subsurface wastewater disposal chamber system:

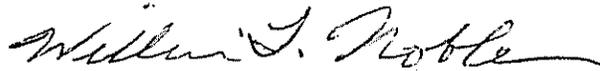
1. Remove all existing chambers and thoroughly clean the units, particularly the sidewall slots. Discard any damaged chamber units and replace with new units.
2. Remove existing fill between chamber rows and at least 1 foot beyond the outside edges of the rows, and to a minimum depth of 1 foot below the base grade of the chambers.
3. Rake sidewalls of the fill that remains in place to provide a rough surface to bond with the new replacement fill, and "rototill" the subgrade of remaining fill and/or original soil beneath each chamber row.
4. Install new loamy coarse "sharp" sand to "pea" gravel in the bottoms of the chamber rows, up to original base grade.
5. Reset chambers in original position and install loamy coarse "sharp" sand to "pea" gravel around the sides and between the chamber rows.
6. Expand the disposal area by the addition of 2 chambers to each of the 3 existing rows (total of 6 new chambers). This will enable the disposal area to better accommodate peak daily flows. An application for an expanded subsurface wastewater disposal area is included with this report.
7. Cover the entire (existing and expanded) disposal area with a minimum of 8 inches of fill. The top 2 to 3 inches of the fill should be suitable to sustain vegetation (e.g. loamy topsoil).
8. Install a Zabel® filter, or equivalent, at the outlet of the septic tank. Although excessive grease or other solids buildup within the disposal area was not considered to be a problem, as a precautionary measure, this type of filter will eliminate any solids carryover to the disposal area. Eugene Dube is a distributor of the Zabel® filter, and can explain about its installation and maintenance.
9. Although also not considered to be a problem in this case, it should be noted

that large quantities of solids or chemicals should not be introduced to the disposal system, such as grease, fats, paint thinner, solvents, cigarette butts, sanitary napkins, coffee grounds, food, etc.

10. The septic tank should be pumped out and inspected regularly. It is recommended that the first pumping/inspection be made one year from the date the expanded system is put into use. At that time, the septic tank pumper should be able to recommend when the next pumping/inspection will be necessary.

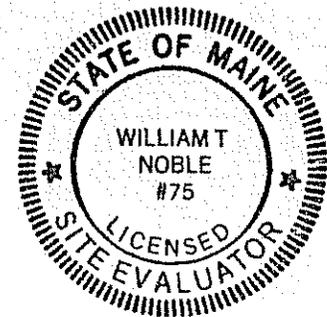
If you have any questions or comments in regard to this report, or on the expanded disposal system design, please do not hesitate to contact me.

Sincerely,



William T. Noble, S.E.
Licensed Site Evaluator #75

cc: J. Hardcastle, DHS Div. of Health Engineering
G. Fuller, CEO, City of Augusta
B. Johnson, Eco-Tec, Inc.
P. McNaughton, McNaughton Construction



SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Department of Human Services
Division of Health Engineering
(207)289-3826

PROPERTY ADDRESS

Town Or Plantation: Augusta
Street Subdivision Lot #: Bog Road

PROPERTY OWNERS NAME

Last: Szela First: Ellen

Applicant Name: Ellen Szela

Mailing Address of Owner/Applicant (If Different): RFD 3, Box 728 Augusta, Maine 04330

Caution: Permit Required

AUGUSTA Subsurface Wastewater Disposal 2166 00 TOWN COPY

Date Permit Issued: 5/31/91 \$ 1300.00 FEE Double Fee Charged

Local Plumbing Inspector Signature: Jay R. Noble L.P.I. # 850

Owner/Applicant Statement

I certify that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Local Plumbing Inspector to deny a Permit.

Ellen Szela 5/29/91
Signature of Owner/Applicant Date

Caution: Inspection Required

I have inspected the installation authorized above and found it to be in compliance with the Subsurface Wastewater Disposal Rules.

Jay R. Noble 6/27/92
Local Plumbing Inspector Signature Date Approved

PERMIT INFORMATION

<p>THIS APPLICATION IS FOR:</p> <p>1. <input type="checkbox"/> NEW SYSTEM 2. <input type="checkbox"/> REPLACEMENT SYSTEM 3. <input checked="" type="checkbox"/> EXPANDED SYSTEM 4. <input type="checkbox"/> EXPERIMENTAL SYSTEM</p>	<p>THIS APPLICATION REQUIRES:</p> <p>1. <input checked="" type="checkbox"/> NO RULE VARIANCE *See Note Below 2. <input type="checkbox"/> NEW SYSTEM VARIANCE Attach New System Variance Form 3. <input type="checkbox"/> REPLACEMENT SYSTEM VARIANCE Attach Replacement System Variance Form a. <input type="checkbox"/> Requiring Local Plumbing Inspector Approval b. <input type="checkbox"/> Requires State and Local Plumbing Inspector Approval 4. <input type="checkbox"/> MINIMUM LOT SIZE VARIANCE</p> <p>NOTE: May need variance to Sec. 10 E.C. of the SSWD Rules.</p>	<p>INSTALLATION IS:</p> <p>COMPLETE SYSTEM</p> <p>1. <input type="checkbox"/> NON-ENGINEERED SYSTEM 2. <input type="checkbox"/> PRIMITIVE SYSTEM (Includes Alternative Toilet) 3. <input type="checkbox"/> ENGINEERED (+ 2000 gpd)</p> <p>INDIVIDUALLY INSTALLED COMPONENTS:</p> <p>4. <input type="checkbox"/> TREATMENT TANK (ONLY) 5. <input type="checkbox"/> HOLDING TANK _____ GAL 6. <input type="checkbox"/> ALTERNATIVE TOILET (ONLY) 7. <input checked="" type="checkbox"/> NON-ENGINEERED DISPOSAL AREA (ONLY) 8. <input type="checkbox"/> ENGINEERED DISPOSAL AREA (ONLY) 9. <input type="checkbox"/> SEPARATED LAUNDRY SYSTEM</p>
<p>SEASONAL CONVERSION n/a</p> <p>to be completed by the LPI</p> <p>5. <input type="checkbox"/> SYSTEM COMPLIES WITH RULES 6. <input type="checkbox"/> CONNECTED TO SANITARY SEWER 7. <input type="checkbox"/> SYSTEM INSTALLED - P# _____ 8. <input type="checkbox"/> SYSTEM DESIGN RECORDED AND ATTACHED</p>	<p>DISPOSAL SYSTEM TO SERVE:</p> <p>1. <input checked="" type="checkbox"/> SINGLE FAMILY DWELLING 2. <input type="checkbox"/> MODULAR OR MOBILE HOME 3. <input type="checkbox"/> MULTIPLE FAMILY DWELLING 4. <input type="checkbox"/> OTHER _____ SPECIFY</p>	<p>TYPE OF WATER SUPPLY</p> <p>existing drilled well</p>
<p>IF REPLACEMENT SYSTEM: n/a</p> <p>YEAR FAILING SYSTEM INSTALLED _____</p> <p>THE FAILING SYSTEM IS:</p> <p>1. <input type="checkbox"/> BED 3. <input type="checkbox"/> TRENCH 2. <input type="checkbox"/> CHAMBER 4. <input type="checkbox"/> OTHER: _____</p>	<p>SIZE OF PROPERTY: 22.2± acres</p> <p>ZONING: rural</p>	

DESIGN DETAILS (SYSTEM LAYOUT SHOWN ON PAGE 3)

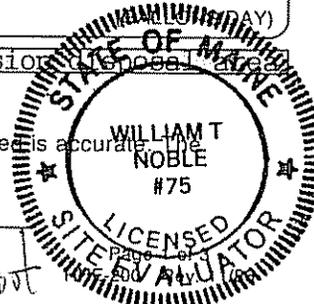
<p>Existing TREATMENT TANK</p> <p>1. <input checked="" type="checkbox"/> SEPTIC: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> Low Profile 2. <input type="checkbox"/> AEROBIC</p> <p>SIZE: 1000 GALS.</p>	<p>WATER CONSERVATION</p> <p>1. <input checked="" type="checkbox"/> NONE 2. <input type="checkbox"/> LOW VOLUME TOILET 3. <input type="checkbox"/> SEPARATED LAUNDRY SYSTEM 4. <input type="checkbox"/> ALTERNATIVE TOILET SPECIFY: _____</p>	<p>PUMPING</p> <p>1. <input checked="" type="checkbox"/> NOT REQUIRED 2. <input type="checkbox"/> MAY BE REQUIRED (DEPENDING ON TREATMENT TANK LOCATION AND ELEVATION) 3. <input type="checkbox"/> REQUIRED DOSE: _____ GALS.</p>	<p>CRITERIA USED FOR DESIGN FLOW (BEDROOMS, SEATING, EMPLOYEES, WATER RECORDS, ETC.)</p> <p>Disposal area expansion as part of reconditioning of malfunctioning system</p> <p>Based on 3-bedroom, single family dwelling</p> <p>Minimum design flow plus 50% DESIGN FLOW: 405 gpd</p>				
<p>SOIL CONDITIONS USED FOR DESIGN PURPOSES</p> <table border="1"> <tr> <th>PROFILE</th> <th>CONDITION</th> </tr> <tr> <td>5</td> <td>C</td> </tr> </table> <p>DEPTH TO LIMITING FACTOR: 15</p>	PROFILE	CONDITION	5	C	<p>SIZE RATINGS USED FOR DESIGN PURPOSES</p> <p>1. <input type="checkbox"/> SMALL 2. <input checked="" type="checkbox"/> MEDIUM 3. <input type="checkbox"/> MEDIUM-LARGE 4. <input type="checkbox"/> LARGE 5. <input type="checkbox"/> EXTRA LARGE</p>	<p>DISPOSAL AREA TYPE/SIZE</p> <p>1. <input type="checkbox"/> BED _____ Sq. Ft. 2. <input checked="" type="checkbox"/> CHAMBER 525 Sq. Ft. <input type="checkbox"/> REGULAR <input type="checkbox"/> H-20 3. <input type="checkbox"/> TRENCH _____ Linear Ft. 4. <input type="checkbox"/> OTHER: _____</p>	
PROFILE	CONDITION						
5	C						

from TP 3 of original installed design, includes existing & expansion of disposal area.

SITE EVALUATOR STATEMENT 11-15-88

On 5-9-91 (date) I conducted a site evaluation for this project and certify that the data reported is accurate to the system I propose is in accordance with the Subsurface Wastewater Disposal Rules.

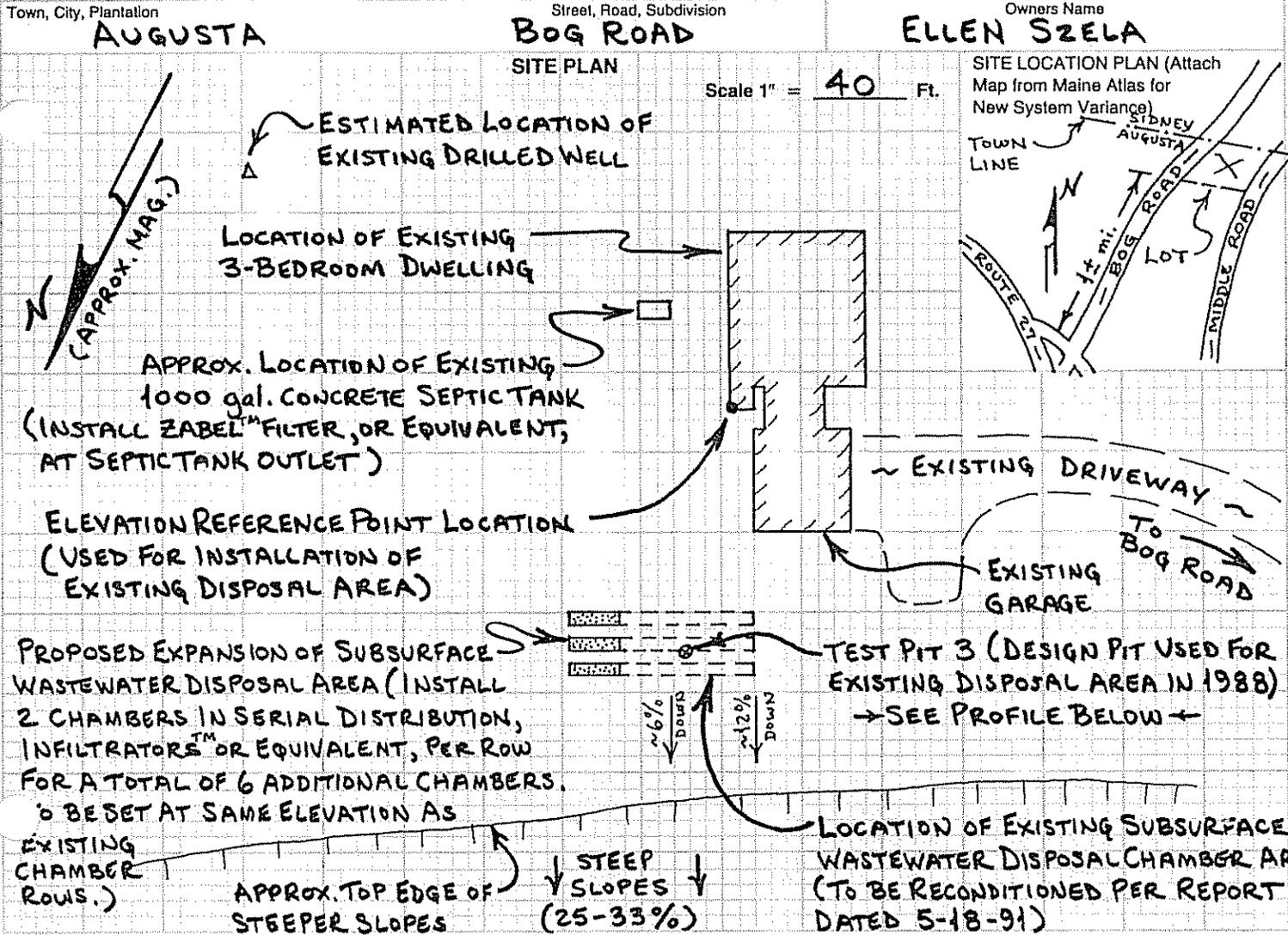
William J. Noble 75 5-19-91
Site Evaluator Signature SE# Date



(Local Plumbing Inspector's Signature if permit is for Seasonal Conversion.)

5/31/91 Jay Handcastle said okay without loam liner

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION



SOIL DESCRIPTION AND CLASSIFICATION				(Location of Observation Holes Shown Above)			
Observation Hole <u>3</u>	<input checked="" type="checkbox"/> Test Pit	<input type="checkbox"/> Boring	Depth of Organic Horizon Above Mineral Soil	Observation Hole _____	<input type="checkbox"/> Test Pit	<input type="checkbox"/> Boring	Depth of Organic Horizon Above Mineral Soil
<u>NONE</u>				_____			
Texture	Consistency	Color	Mottling	Texture	Consistency	Color	Mottling
0		DARK BROWN		0			
6		BROWN		6			
10		OLIVE BROWN		10			
15	VERY FRIABLE	PALE OLIVE	COMMON FAINT	15			
20	LOAMY SAND			20			
30				30			
40	SOMEWHAT FIRM (FRIABLE WHEN DISTURBED)	OLIVE		40			
50	SANDY LOAM	OLIVE BROWN	MANY PROMINENT	50			
Soil Profile <u>5</u>	Classification Condition <u>C</u>	Slope <u>6-12%</u>	Limiting Factor <u>15</u>	Soil Profile _____	Classification Condition _____	Slope _____%	Limiting Factor _____
<input checked="" type="checkbox"/> Ground Water <input type="checkbox"/> Restrictive Layer <input type="checkbox"/> Bedrock				<input type="checkbox"/> Ground Water <input type="checkbox"/> Restrictive Layer <input type="checkbox"/> Bedrock			

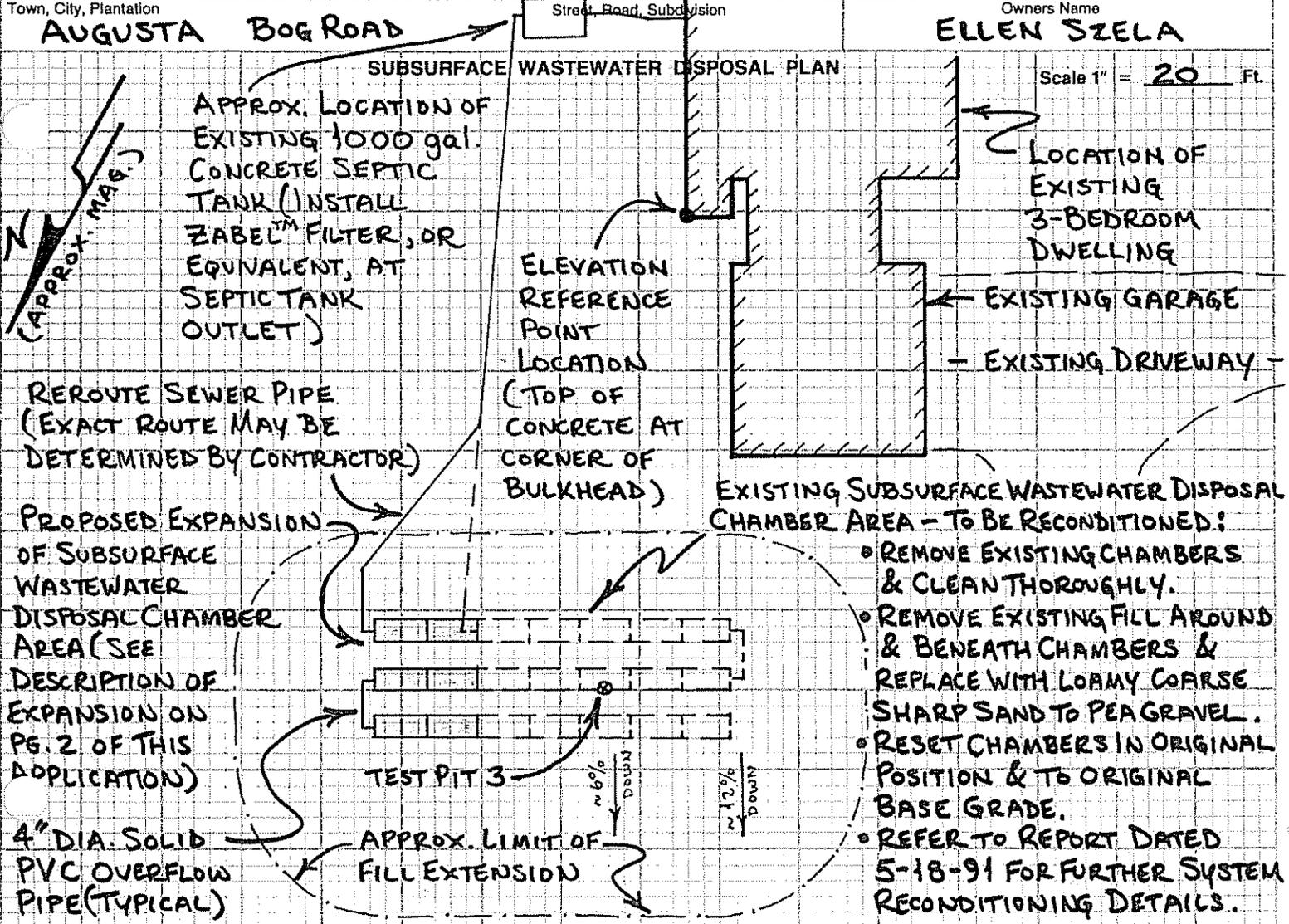
NOTE:
TEST PIT 3 WAS USED FOR THE DESIGN OF THE EXISTING SUBSURFACE WASTE-WATER DISPOSAL (SSWD) CHAMBER AREA. REFER TO SSWD SYSTEM APPLICATION DATED 5-13-88, REVISED 11-15-88, FOR FURTHER DETAILS ON SOIL CONDITIONS AND ORIGINAL SSWD SYSTEM DESIGN.

William J. Noble
Site Evaluator Signature

75
SE#

5-19-91
Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION



FILL REQUIREMENTS

Depth of Fill (Upslope) **40"**

Depth of Fill (Downslope) **44±"**

(SEE NOTE 5 BELOW)

CONSTRUCTION ELEVATIONS

Reference Elevation is **0.0"**

Bottom of Disposal Area (SEE CROSS-SECTION BELOW)

Top of Distribution Lines or Chambers

ELEVATION REFERENCE POINT LOCATION & DESCRIPTION

TOP OF CONCRETE AT CORNER OF BULKHEAD

- NOTES:**
1. INSTALL CHAMBERS AS DIRECTED BY MANUFACTURER/DISTRIBUTOR AND AS SPECIFIED IN THESE PLANS.
 2. PERIMETER FILL TO BE LOAMY COARSE SHARP SAND IN TEXTURE - 2" TO 3" OF FILL OVER TOP OF CHAMBERS TO BE LOAMY (TOPSOIL) IN TEXTURE TO SUPPORT VEGETATION.
 3. GRADE LAND AROUND CHAMBERS TO DIVERT ANY SURFACE WATER FROM THE AREA.
 4. REMOVE ANY ORGANIC LAYER & SCARIFY THE SOIL SURFACE BEFORE INSTALLING FILL.
 5. REQUIRED FILL DEPTHS MAY VARY FROM THOSE SHOWN - SET NEW CHAMBERS AT SAME ELEVATION AS EXISTING CHAMBERS.
 6. REFER TO SECTIONS 11 & 12 IN SSWD RULES FOR FURTHER DISPOSAL AREA INSTALLATION DETAILS.

