



# Town of Warren

Land Use Office  
50 Cemetery Rd  
Warren CT 06754  
860-868-7881

\$ 200.00

CR #1886

## PLANNING AND ZONING COMMISSION

APPLICATION# \_\_\_\_\_

DATE: 2/5/2020

( ) ZONE CHANGE

(✓) SPECIAL EXCEPTION

(✓) SITE PLAN APPROVAL

### 1. APPLICANT

NAME: Paul Szymanski, PE C/o Arthur H Howland & Associates, PC PHONE#: 860-354-9346

ADDRESS: 143 West Street, Suite E New Milford 06776

EMAIL: pszymanski@ahhowland.com

Interest in property if not owner: Civil Engineer

### 2. OWNER(S) OF RECORD

NAME: Theodore & Mary Theodorsen Tr PHONE#: \_\_\_\_\_

ADDRESS: 56 Old Ox Road, Manhasset, NY 11030

### 3. DESCRIPTION OF PARCEL

Location Route 341(Kent Road) & Brick School Road

Size 39.95 +/- acres Lot Frontage 536.32'

Assessor's Map# 21/27 Parcel# \_\_\_\_\_ Zone North

Present Use: Vacant land

Within 500 feet of Town border? \_\_\_\_\_ Yes X No

Has approval been received from the Torrington Area Health District (if applicable)? ☐ Yes ☒ No

Has approval been received by the Inland Wetlands & Conservation Commission (if applicable)? ☐ Yes ☒ No

Is the proposed use to occur within a Regulated Flood Plain Area? ☐ Yes ☒ No

### OFFICE USE ONLY

Date submitted to adjacent town(s): \_\_\_\_\_

Date submitted to Regional Planning Association: \_\_\_\_\_

Received P+2  
2/5/2020

Ex 1



# Town of Warren

Land Use Office  
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## 4. REQUESTED ACTION

A. ( ) ZONE CHANGE: This applicant hereby requests that said premises be changed from Zone \_\_\_\_\_ to Zone \_\_\_\_\_.

B. (✓) SPECIAL EXCEPTION: This applicant hereby requests a Special Permit to: \_\_\_\_\_  
Our client is proposing to construct a 50' x 80' sq ft barn/office to store equipment per section 24 of the Warren Zoning Regulations. The barn will have an office and a bathroom. A driveway, well sanitary system and related grading are also proposed.

C. (✓) SITE PLAN APPROVAL: This applicant hereby requests Site Plan Approval to: \_\_\_\_\_

Proposed construction of a 50'x80'sq ft barn/office to store equipment. The barn will have an office and a bathroom. A sanitary system, well, driveway, grading and related appurtenances are also proposed

Agents (if any) are representing the applicant who may be directly contacted regarding this application:

NAME: Paul Szymanski, PE C/o Arthur H Howland & Associates, PC PHONE#: 860-354-9346

ADDRESS: 143 West Street, Suite E New Milford 06776

EMAIL: pszymanski@ahhowland.com

Involvement (Legal, Engineering, etc...) Engineering

NAME: PHONE#:

ADDRESS:

EMAIL:

Involvement (Legal, Engineering, etc...) \_\_\_\_\_

The undersigned applicant hereby consents to necessary and proper inspections of the above mentioned property by the members and/or representatives of the Warren Planning and Zoning Commission, at reasonable times, both before and after the permit in question has been granted by said Commission. **In addition, the applicant is solely responsible to know, understand and adhere to the requirements of the Zoning Regulations for the Town of Warren.** The undersigned attest that the information supplied in this application is accurate and complete to the best of his/her knowledge and belief.

2/5/2020

APPLICANT

DATE

Mary Irene Theadorsen

2/5/2020

PROPERTY OWNER

DATE

Received P+2 2-5-2020

January 30, 2020

Mary Irene Theodorsen, as Trustee for The Living Trust of  
Theodore E. Theodorsen and Mary Irene Theodorsen  
56 Old Ox Road  
Manhasset, New York 11030

To Whom It May Concern:

Please be advised that the office of Arthur H. Howland &  
Associates, P.C. is authorized to represent me before any and all  
agencies and commissions of the Town of Warren for the purpose  
of obtaining approval of any and all land use applications and  
approvals at the property located on Route 341 and Brick School  
Road, Warren, Connecticut.

Sincerely Yours,

*Mary Irene Theodorsen*

Mary Irene Theodorsen, as Trustee for The Living Trust of  
Theodore E. Theodorsen and Mary Irene Theodorsen

Owner

Received P#2 2-5-2020

Ex2

ADJOINING PROPERTY OWNERS  
PREPARED FOR  
PLUMB/LOZMAN  
RT 341  
WARREN, CT

ASSESSOR'S #	OWNER'S ADDRESS	SUBJECT PROPERTY
21/27	THEODORE E TR & MARY THEODORSEN 56 OLD OX ROAD MANHASSET, NY 11030	
21/26	CYNTHIA & STEPHEN WARSHAW 219 KENT ROAD WARREN, CT 06754	
21/26.1	BERTRAND G & DEBORAH L OULLETTE 9 HIGH POINT CT WOODBURY, CT 06798	
21/25	LEONARD & CELIA UCCIARDO 31 BRICK SCHOOL ROAD WARREN, CT 06754	
21/24.02	TERRY SHOOK & CYNTHIA STILSON SHOOK 268 BRICK SCHOOL ROAD WARREN, CT 06754	
21/24.01	TERRI SHOOK & CYNTHIA STILSON SHOOK 268 BRICK SCHOOL ROAD WARREN, CT 06754	
26/16.03	WAYNE P WILSON TRUSTEE 31 LAUREL MTN ROAD WARREN, CT 06754	
21/28	JACK J BARON & ELLEN YOUNG 187 KENT ROAD WARREN, CT 06754	
21/35.06	ANDREW KANDEL & JACLYN LEVIN 300 E 54 <sup>TH</sup> ST. APT 19J NEW YORK, NY 10022	
21/35.04	LEONARD S & ROBIN B FLEET 202 KENT ROAD WARREN, CT 06754	
21/34.01	BRUCE S & DENISE BLOCK 196 KENT ROAD WARREN, CT 06754	
21/34	ESTATE OF LAWRENCE R RUMBLE JR	

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Ex 3



C/O CLINTON RUMBLE  
125 KENT ROAD  
WARREN, CT 06754

21/20 ROBERT & CHERYL BOYHERN  
24 BRICK SCHOOL ROAD  
WARREN, CT 06754

21/21 JAY & JOHANNE WILSON  
29 BRICK SCHOOL ROAD  
WARREN, CT 06754

21/19 THODORE & JILL SEAVEY  
14 BRICK SCHOOL ROAD  
WARREN, CT 06754

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2017.



## TOWN OF **Warren** CONNECTICUT

Information on the Property Records for the Municipality of Warren was last updated on 1/29/2020.

### Parcel Information

Location:	KENT RD	Property Use:	Vacant Land	Primary Use:	Residential
Unique ID:	98101789	Map Block Lot:	21/27	Acres:	39.95
490 Acres:	39.95	Zone:	R2	Volume / Page:	0085/0598
Survey Map:		Census:			

### Value Information

	Appraised Value	Assessed Value
Land	300,541	27,960
Buildings	0	0

**Ex. 4**

	Appraised Value	Assessed Value
Detached Outbuildings	0	0
Total	300,541	27,960

### Owner's Information

#### Owner's Data

THEODORSEN THEODORE E TR & MARY IRENE TR  
56 OLD OX RD  
MANHASSET, NY 11030

### Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
THEODORSEN THEODORE E TR & MARY IRENE TR	0085	0598	04/07/2014		No	\$0
THEODORSEN THEODORE E & MARY IRENE	0041	0217	03/11/1991		No	\$0

Information Published With Permission From The Assessor

Sawing High Climbers, LLC  
69 Davis Road  
South Kent CT 06785

860-801-0100  
Business Reg #B-3194  
www.SawingHighClimbers.com



Planning & Zoning Commission  
Town of Warren  
50 Cemetery Road  
Warren, Connecticut

Dear Commission,

Sawing High Climbers will be applying in the future for a Special Exception to build a professional office and barn-style warehouse at a lot located on 39.95 acres on Kent Road/Rt 341 (Volume 85, Page 598 MBL 21/27). We respectfully submit the following information to identify our planned compliance with the Warren Zoning Regulations, Section 24, Manufacturing, Professional Offices and Warehouses.

Below please find each Section of 24.1 in bold followed by our explanation of proposed compliance:

**24.1 Manufacturing, professional offices and warehouses may be allowed by special exception in the North Zone provided all of the following conditions are met.**

Sawing High Climbers, LLC (<https://www.sawinghighclimbers.com/>) is a family-owned and operated, fully insured tree services firm providing the highest quality tree care throughout Litchfield County (business reg #B-3194). We are members of the Tree Care Industry Association, the New England chapter of the International Society of Arboriculture, and the Connecticut Tree Protective Association. We work closely with the Kent Land Trust to help protect Northwest Connecticut's natural beauty and resources.

Our services include pruning, cabling and bracing, lightning protection installation, insect and disease diagnosis and treatment, fertilizing, and removals. Our arborists are licensed by the Connecticut Tree Protective Association to perform these services. The Connecticut Arborist License, issued by the Connecticut Department of Energy and Environmental Protection, is not only required in the state of Connecticut to perform the breadth of services that we offer, it also speaks to our proficiency in these areas. We do not conduct any business other than tree services.



Received P+2 2-5-2020



Sawing High Climbers, LLC  
69 Davis Road  
South Kent CT 06785

860-801-0100  
Business Reg #B-3194  
www.SawingHighClimbers.com



Sawing High Climbers was founded in 2011 out of our home in South Kent, and at that time our arborist Russell Plumb already had nearly 15 years of experience caring for trees all over the world. Russell is an ISA Certified Arborist (NE-6781A), a CT-Licensed Arborist (S-6243), and an NPTC-qualified arborist (UK) with 23 years' experience. He is a Certified Treecare Safety Professional (02439) with the Tree Care Industry Association and is committed to a culture of safety at Sawing High Climbers. He also holds EHAP certification (Electrical Hazards Awareness Program) with TCIA, confirming his knowledge of electrical hazards and the special techniques used to work safely near electrical conductors. He is ISA Tree Risk Assessment Qualified, a credential which demonstrates that he is qualified to provide tree owners with the necessary information to make informed decisions to enhance tree benefits, health, and longevity. He is CPR & AED certified (American Heart Association, 2019). And he is the 2017 New England Tree Climbing Champion.

Russell operates Sawing High Climbers with his wife Emma Lozman (Plumb), who owns the company. Emma holds both a bachelor's and a master's degree from Stanford University. She provides all administrative support for the company, including accounting, marketing, and web design/development.

We, Russell and Emma, have many friends in Warren, and our daughter has been part of the Warren Soccer Tots program since she was two years old. We are excited to join the Warren community and look forward to contributing to the town in a positive and respectful manner.

**24.2 The minimum area requirements, except where otherwise noted, shall be:**

**Area: 10 acres**

Property is 39.95 acres.

**Frontage: 400 feet**

The frontage along Route 341 is 830 feet.

**Front Yard: 150 feet**

The building is proposed to be set back 760 feet from the front property line.

**Side Yard: 150 feet**

The building is proposed to be set back 330 feet from the nearest side property line.



**Rear Yard: 150 feet**

The building is proposed to be set back 840 feet from the rear property line.

**Building Height: 35 feet (maximum)**

The building as proposed will not exceed 35 feet.

**Minimum Square: 400 feet**

The minimum square can easily fall within the property.

**24.3 The lot must have its minimum frontage on either Route 45 or Route 341.**

The minimum frontage requirement along Route 341 is met as 830 feet of frontage exists.

**24.4 All driveways serving the lot shall be on either Route 45 or Route 341. No access shall be allowed from any Town-owned road.**

The driveway serving the lot will be from Route 341.

**24.5 No structure, parking or storage shall be located within the front, side or rear yard setbacks.**

No structure, parking or storage will be located within the front, side or rear yard setbacks. The proposed site development area is over 300 feet away from the nearest home.

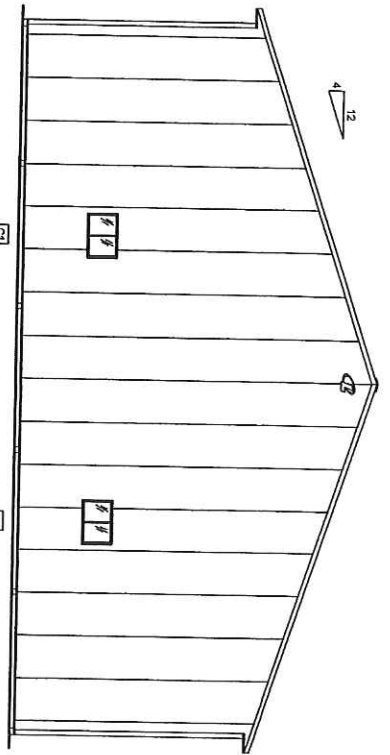
**24.6 No dwelling units are permitted on the lot.**

No dwelling unit will be built.

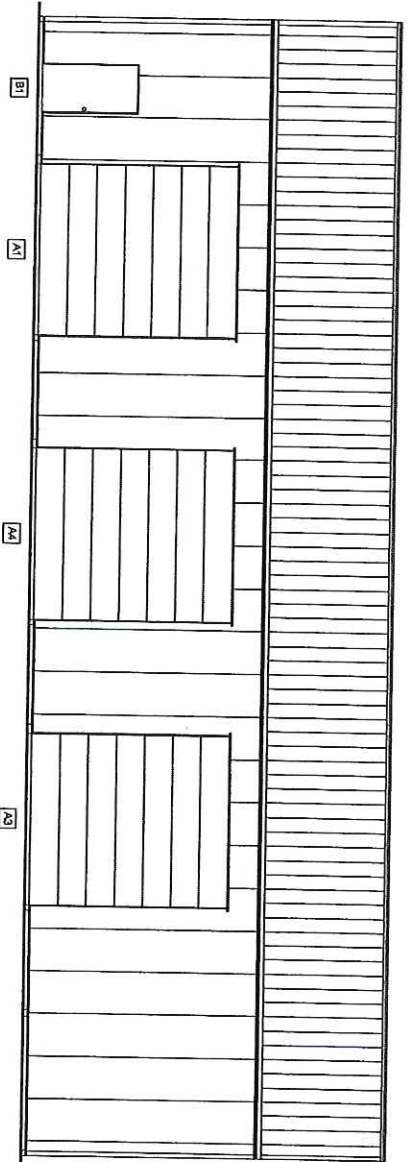
**24.7 The visibility of the buildings, parking area and storage areas from the adjoining properties and the right of way is to be kept to a minimum. As a condition of the special exception, the Commission may require screening of the buildings, parking areas and storage areas. The screening may consist of landscaping, fencing or other means.**

As the proposed site development area is over 400 feet from the nearest existing home and 650 feet from Route 341 the existing vegetation and topography serves as a functional buffer. Sawing High Climbers will comply with all Commission requirements to ensure minimal visibility if you deem that additional screening is necessary.

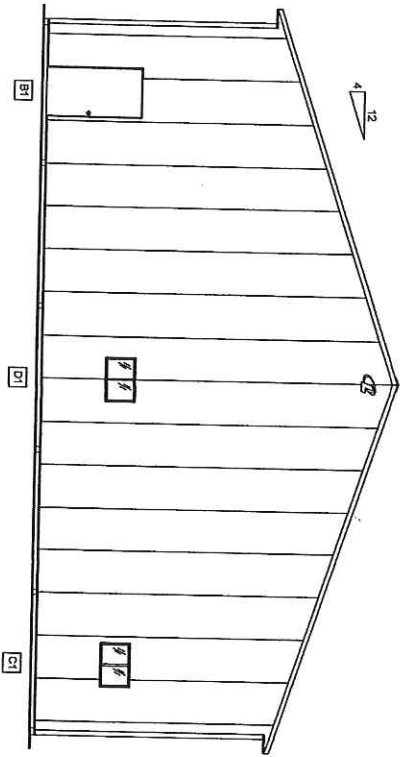
In conclusion, I would like to thank you for your time and we look forward to being part of the Warren Community.



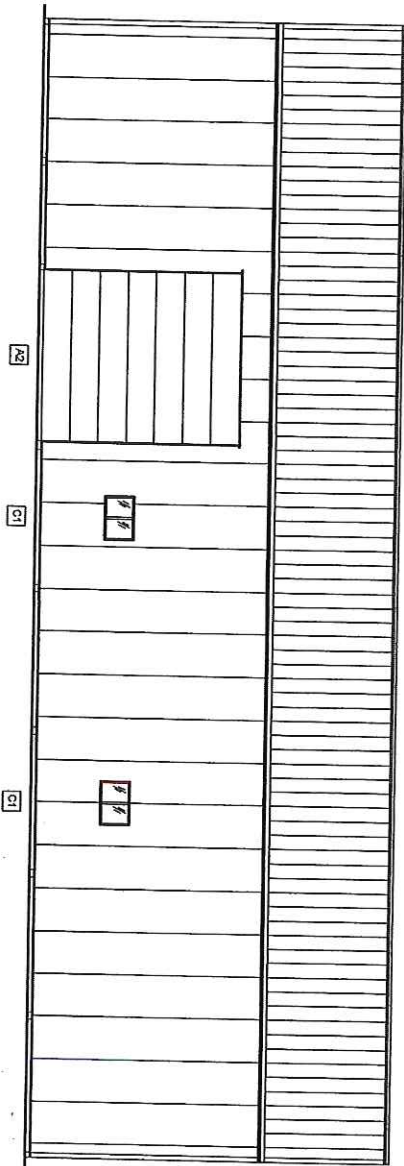
A2 ENDWALL 1 ELEVATION



B2 SIDEWALL 1 ELEVATION



C2 ENDWALL 2 ELEVATION



D2 SIDEWALL 2 ELEVATION

OPENING SCHEDULE ☐

ID	MODEL	DESCRIPTION	FINISH
A1	14' HIGH OVERHEAD DOOR OPENING	144x180	WOOD
A2	14' HIGH OVERHEAD DOOR OPENING	144x180	WOOD
B1	14' HIGH OVERHEAD DOOR OPENING	144x180	WOOD
B2	14' HIGH OVERHEAD DOOR OPENING	144x180	WOOD
C1	WALK DOOR 5'00" SOLID	36x48	WOOD
C2	WALK DOOR 5'00" SOLID	36x48	WOOD
D1	WALK DOOR 5'00" SOLID	36x48	WOOD
D2	WALK DOOR 5'00" SOLID	36x48	WOOD

**Ex. 6**

Received P&T  
2-5-2000



DEALER INFO.

Pine Ridge Pole Barns  
31 Bentley Circle  
Goshen, CT 06756

CUSTOMER INFO.

Saving High Climbers  
69 Davis Rd.  
South Kent, CT 06785

BUILDING DESCRIPTION

50'-0" x 80'-1" x 16'-0"  
Uni-Frame Embedded  
QP011620

Customer Approval

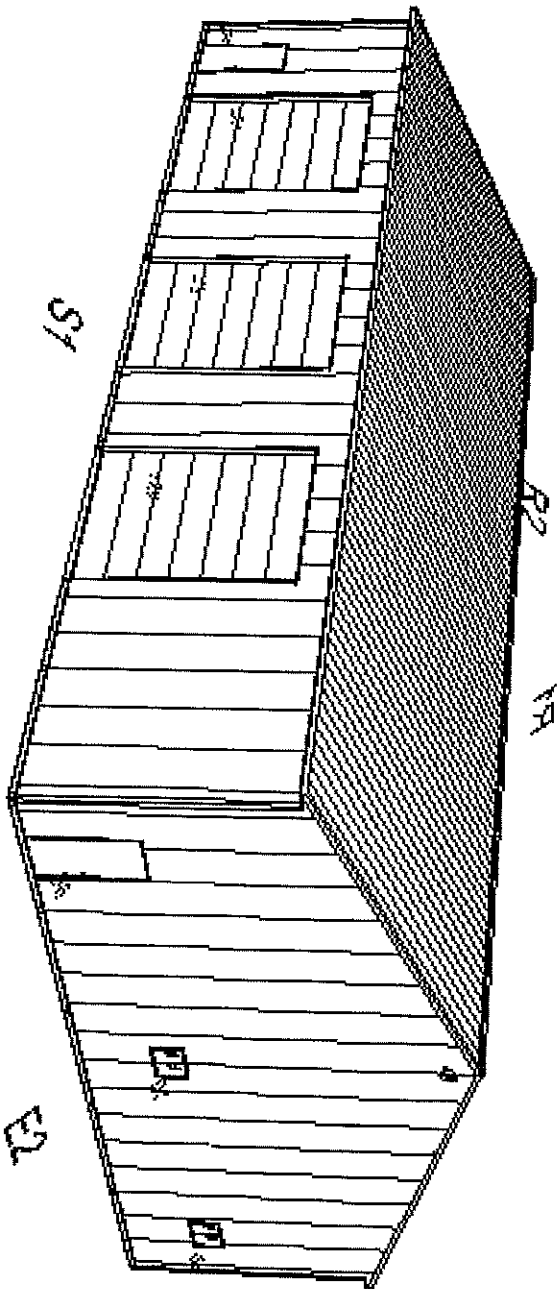
DATE: \_\_\_\_\_

Bldg Direction



(Mark North)

PROJ: Q55A-15160-01-00  
PROPOSAL DRAWINGS ONLY  
Not Intended for Construction Purposes  
The information presented in this drawing is based on a preliminary design using the input provided. The final design is subject to Lester Engineering review.  
\*NOT TO SCALE\*



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DATE: \_\_\_\_\_  
(initials)

PROJ: Q55A-15160-01-00

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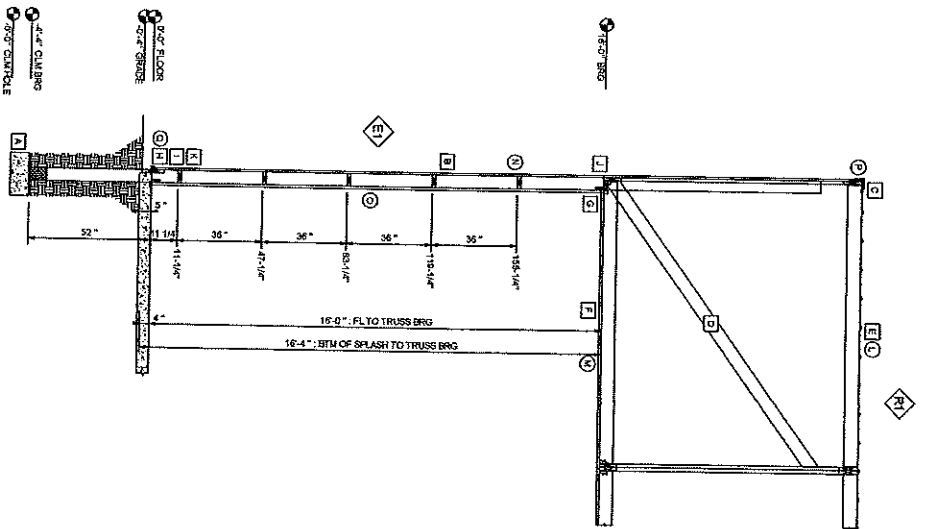
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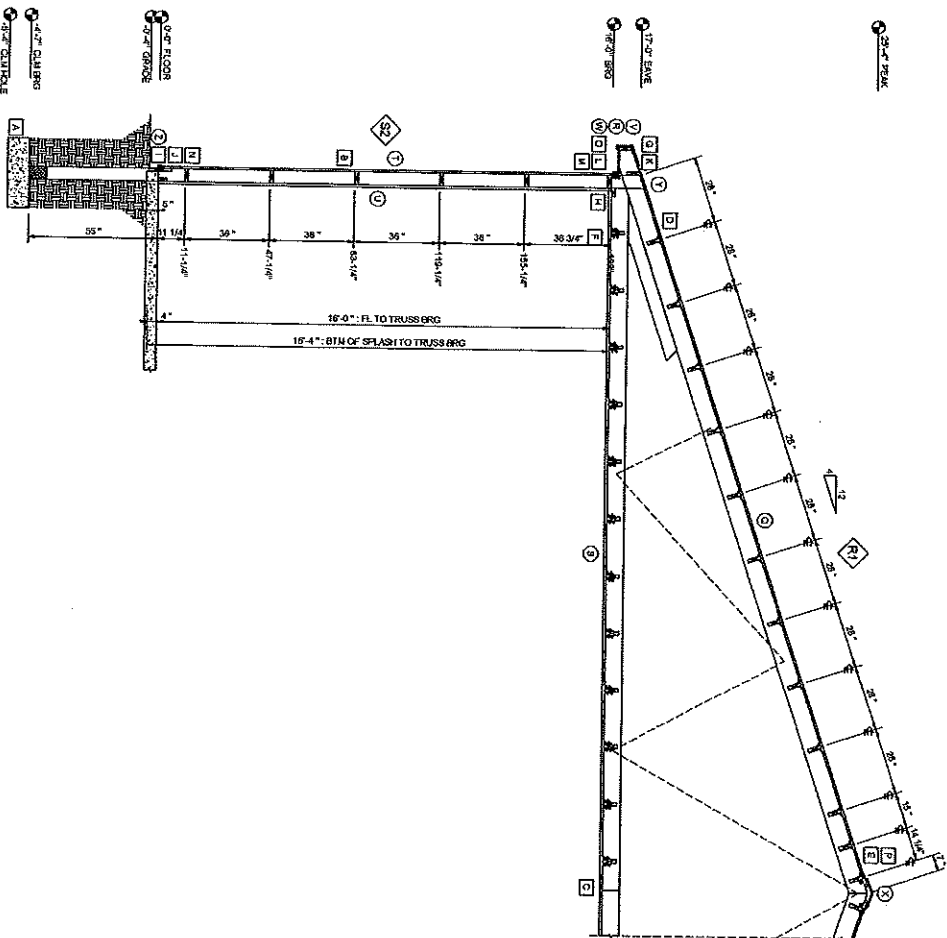
\* NOT TO SCALE \*

Received P+2  
2-5-2020





A4 ENDWALL E1 SECTION  
24' FROM CL



B4 SIDEWALL S2 SECTION  
41'-0" FROM CL

A4 - ENDWALL E1 SCHEDULE ☐ ☐

NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
1	CONCRETE	1.00	CU YD	120.00	120.00
2	REINFORCING	1.00	LB	1.00	1.00
3	BRICK	1.00	CU YD	120.00	120.00
4	ROOFING	1.00	SQ YD	120.00	120.00
5	FLASHING	1.00	LB	1.00	1.00
6	SHIM	1.00	LB	1.00	1.00
7	BRICK	1.00	CU YD	120.00	120.00
8	ROOFING	1.00	SQ YD	120.00	120.00
9	FLASHING	1.00	LB	1.00	1.00
10	SHIM	1.00	LB	1.00	1.00
11	BRICK	1.00	CU YD	120.00	120.00
12	ROOFING	1.00	SQ YD	120.00	120.00
13	FLASHING	1.00	LB	1.00	1.00
14	SHIM	1.00	LB	1.00	1.00
15	BRICK	1.00	CU YD	120.00	120.00
16	ROOFING	1.00	SQ YD	120.00	120.00
17	FLASHING	1.00	LB	1.00	1.00
18	SHIM	1.00	LB	1.00	1.00
19	BRICK	1.00	CU YD	120.00	120.00
20	ROOFING	1.00	SQ YD	120.00	120.00
21	FLASHING	1.00	LB	1.00	1.00
22	SHIM	1.00	LB	1.00	1.00
23	BRICK	1.00	CU YD	120.00	120.00
24	ROOFING	1.00	SQ YD	120.00	120.00
25	FLASHING	1.00	LB	1.00	1.00
26	SHIM	1.00	LB	1.00	1.00
27	BRICK	1.00	CU YD	120.00	120.00
28	ROOFING	1.00	SQ YD	120.00	120.00
29	FLASHING	1.00	LB	1.00	1.00
30	SHIM	1.00	LB	1.00	1.00
31	BRICK	1.00	CU YD	120.00	120.00
32	ROOFING	1.00	SQ YD	120.00	120.00
33	FLASHING	1.00	LB	1.00	1.00
34	SHIM	1.00	LB	1.00	1.00
35	BRICK	1.00	CU YD	120.00	120.00
36	ROOFING	1.00	SQ YD	120.00	120.00
37	FLASHING	1.00	LB	1.00	1.00
38	SHIM	1.00	LB	1.00	1.00
39	BRICK	1.00	CU YD	120.00	120.00
40	ROOFING	1.00	SQ YD	120.00	120.00
41	FLASHING	1.00	LB	1.00	1.00
42	SHIM	1.00	LB	1.00	1.00
43	BRICK	1.00	CU YD	120.00	120.00
44	ROOFING	1.00	SQ YD	120.00	120.00
45	FLASHING	1.00	LB	1.00	1.00
46	SHIM	1.00	LB	1.00	1.00
47	BRICK	1.00	CU YD	120.00	120.00
48	ROOFING	1.00	SQ YD	120.00	120.00
49	FLASHING	1.00	LB	1.00	1.00
50	SHIM	1.00	LB	1.00	1.00
51	BRICK	1.00	CU YD	120.00	120.00
52	ROOFING	1.00	SQ YD	120.00	120.00
53	FLASHING	1.00	LB	1.00	1.00
54	SHIM	1.00	LB	1.00	1.00
55	BRICK	1.00	CU YD	120.00	120.00
56	ROOFING	1.00	SQ YD	120.00	120.00
57	FLASHING	1.00	LB	1.00	1.00
58	SHIM	1.00	LB	1.00	1.00
59	BRICK	1.00	CU YD	120.00	120.00
60	ROOFING	1.00	SQ YD	120.00	120.00
61	FLASHING	1.00	LB	1.00	1.00
62	SHIM	1.00	LB	1.00	1.00
63	BRICK	1.00	CU YD	120.00	120.00
64	ROOFING	1.00	SQ YD	120.00	120.00
65	FLASHING	1.00	LB	1.00	1.00
66	SHIM	1.00	LB	1.00	1.00
67	BRICK	1.00	CU YD	120.00	120.00
68	ROOFING	1.00	SQ YD	120.00	120.00
69	FLASHING	1.00	LB	1.00	1.00
70	SHIM	1.00	LB	1.00	1.00
71	BRICK	1.00	CU YD	120.00	120.00
72	ROOFING	1.00	SQ YD	120.00	120.00
73	FLASHING	1.00	LB	1.00	1.00
74	SHIM	1.00	LB	1.00	1.00
75	BRICK	1.00	CU YD	120.00	120.00
76	ROOFING	1.00	SQ YD	120.00	120.00
77	FLASHING	1.00	LB	1.00	1.00
78	SHIM	1.00	LB	1.00	1.00
79	BRICK	1.00	CU YD	120.00	120.00
80	ROOFING	1.00	SQ YD	120.00	120.00
81	FLASHING	1.00	LB	1.00	1.00
82	SHIM	1.00	LB	1.00	1.00
83	BRICK	1.00	CU YD	120.00	120.00
84	ROOFING	1.00	SQ YD	120.00	120.00
85	FLASHING	1.00	LB	1.00	1.00
86	SHIM	1.00	LB	1.00	1.00
87	BRICK	1.00	CU YD	120.00	120.00
88	ROOFING	1.00	SQ YD	120.00	120.00
89	FLASHING	1.00	LB	1.00	1.00
90	SHIM	1.00	LB	1.00	1.00
91	BRICK	1.00	CU YD	120.00	120.00
92	ROOFING	1.00	SQ YD	120.00	120.00
93	FLASHING	1.00	LB	1.00	1.00
94	SHIM	1.00	LB	1.00	1.00
95	BRICK	1.00	CU YD	120.00	120.00
96	ROOFING	1.00	SQ YD	120.00	120.00
97	FLASHING	1.00	LB	1.00	1.00
98	SHIM	1.00	LB	1.00	1.00
99	BRICK	1.00	CU YD	120.00	120.00
100	ROOFING	1.00	SQ YD	120.00	120.00

Received P+L  
2-5-2000



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Pine Ridge Pole Barns  
31 Bentley Circle  
Goshen, CT 06756

CUSTOMER INFO.

Sawing High Climbers  
69 Davis Rd.  
South Kent, CT 06785

BUILDING DESCRIPTION

50'-0" x 80'-1" x 16'-0"  
Uni-Frame Embedded  
QP011620

Customer Approval

(Initials)  
DATE:

Bldg Direction



PROJ: Q55A-15160-01-00  
PROPOSAL DRAWINGS ONLY

Not intended for Construction Purposes  
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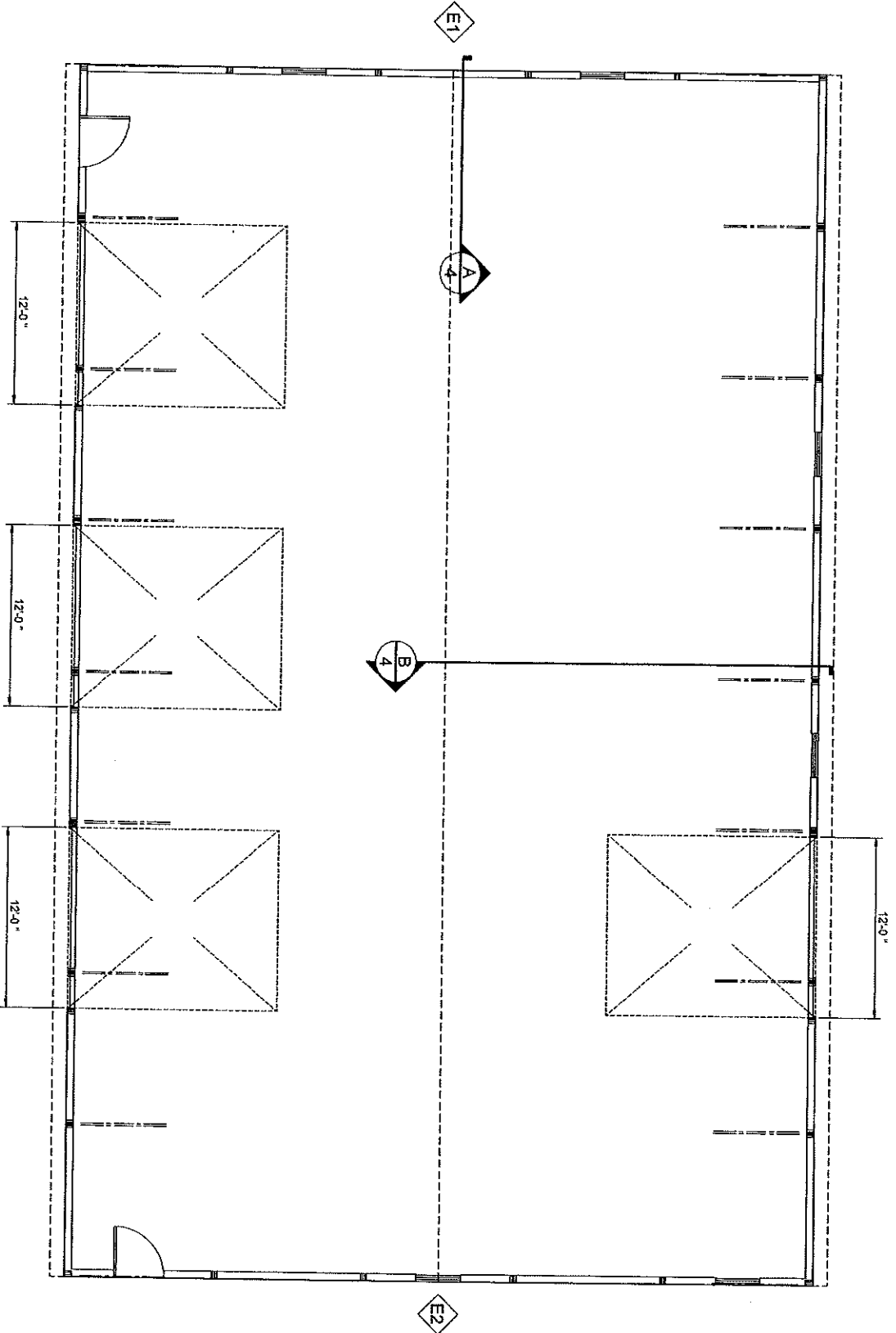


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A3 FLOOR PLAN



Received P+2  
2-5-2020



## LIMITED WARRANTY

Lester Building Systems, LLC

Lester Building Systems, LLC ("LESTER") provides the limited warranties and statement of limited warranties described in this Limited Warranty to the Owner ("OWNER") and subject to the terms, conditions and limitations set forth below. The warranty protection herein, is based on the design parameters specified for this project, as follows:

Owner: Sawing High Climbers		Building Code: IBC-2018
Structure: Uni-Frame Embedded 50'-0" x 80'-0" x 16'-0"		Allowable Roof Snow Load: 35 psf
End Use Code: Other Business		Allowable Roof Dead Load: 4 psf
Improv #: Q55A-15160-01-00		Allowable Ceiling Load: 10 psf
Project Number:	Order Date:	Allowable Wind Load: 90.9 mph; Exp.: B

### Structural Design - Lifetime

LESTER warrants that the building designed by LESTER will not experience an occurrence of structural failure\* due to structural design, due to weather conditions, such as wind, ice and snow, so long as Allowable Loads noted above have not been exceeded. The foregoing warranty is limited to fifty (50) years with respect to the OWNER which is not a natural person.

*\* Loss of load-carrying capacity of a component or member within a structure or of the structure itself. Structural failure is initiated when the material in a structure is stressed to its strength limit, thus causing fracture or excessive deformations.*

### Preservative-Treated Lumber - 50 Years

Preservative-treated lumber, including preservative-treated structural columns, are warranted by the original wood preservative supplier against failure due to fungal decay and termite infestation for a period of fifty (50) years from the date of purchase.

### Steel Panel Paint System

The painted roofing and/or siding product, Lester Uni-Rib™ and/or Lester Eclipse Roof System®, is warranted by the original paint manufacturer per the following schedule:

Sherwin-Williams Paint System	Film Integrity <sup>1</sup> Checking, cracking & loss of adhesion (peeling)	Chalk ASTM D-4214-98 Method AD659 rating standard	Fade <sup>2</sup> ASTM D-2244-02 Hunter delta-E units rating standard	Red Rust <sup>3</sup> Not to exceed 1/2" accumulation or more
WeatherXL™ Siliconized Polyester	40 Years	30 Years Roof: not to exceed 6 rating Walls: not to exceed 8 rating	30 Years Roof: not to exceed 7 units of color Walls: not to exceed 5 units of color	10 Years (G90) N/A (AZ50)
Fluoropon® PVDF	40 Years	30 Years Roof: not to exceed 7 rating Walls: not to exceed 8 rating	30 Years Roof and Walls: not to exceed 5 rating	5 Years (G60) N/A (AZ50)

1. Excludes micro-fracturing which may occur during proper steel panel fabrication or failure due to substrate corrosion.

2. Color changes may not be uniform on surfaces that are not equally exposed to the sun.

3. Applies to non-vertical installations and normal outdoor atmospheric conditions, including acid rain. The Red Rust warranty applies only to products with a galvanized substrate and is not applicable (N/A) to products with a Galvalume® substrate.

# ***Infiltration Analysis based on a 100-yr Storm***

*Prepared for Office & Barn, Sawing High Climbers, Route 341, Warren, CT*  
2/1/20

**Calculate proposed impervious surfaces and weighted 'c' value:**

Proposed Area	Area		c' Value
Office/Barn	4000	sf	0.90
			0.90
<b>Total</b>	<b>4000</b>	<b>sf</b>	<b>0.90</b>

**Calculate increase in runoff due to additional impervious surfaces:**

$Q = c * I * A$  where Q = peak flow, c = runoff coefficient, I = intensity (in / hr) & A = area (sf)

**For this analysis, the 100-yr storm event is examined:**

Existing 'c' = 0.2  
Proposed 'c' = 0.90  
Difference in 'c' = 0.70  
I = 6.9 in / 24 hrs  
A = 4,000 sf

Note: Intensity calculation is conservative. It was calculated by assuming a 100-yr storm, 24 hour period rainfall of 6.9 in. falling in a 24 hr period.

$Q = 0.7 * 6.9 \text{ in / 24 hrs} * (1 \text{ ft / 12 in}) * 4000 \text{ sf}$   
 $Q = 1,610 \text{ cf / 24 hrs}$

**Calculate infiltration and storage capability of Recharger® 330XLHD:**

**Surface Area:**

= 7 ft x 4.33 ft = 30.3 sf / unit

**Percolation Rate:**

= 10 min / in = 0.5 ft / hr

Note: Percolation rate taken from actual perc tests in location of proposed infiltration.

**Absorption:**

= 30.3 sf / unit \* 0.5 ft / hr \* 24 hrs = 363.6 cf / unit / 24 hrs

**Storage:**

= (Per Specifications) = 79.2 cf / unit / 24 hrs

**Total Storage & Absorption:**

= (363.6 cf / unit / 24 hrs) + (79.2 cf / unit / 24 hrs) = 442.8 cf / unit / 24 hrs

**Calculate number of Recharger® 330XLHD's required:**

= (1610 cf / 24 hrs) / (442.8 cf / unit / 24 hrs)

= **3.6 Recharger® 330XLHD's Required**

= **4.0 Recharger® 330XLHD's Provided**

Received P+2 commission 2.7.2020

**Ex. #17**



# Water Quality Volume for Proposed Rain Garden Drive

Sawing High Climbers, Route 341, Warren

2/1/2020

## Water Quality Volume:

$$WQV = \frac{(1')(R)(A)}{12}$$

where:

WQV = water quality volume (ac-ft)

R = volumetric runoff coefficient =  $0.05 + 0.009 * I$

I = percent impervious cover\*

A = site area in acres

## For Area draining to Rain Garden:

I = 28.6 percent (calculated based on proposed conditions)

R =  $0.05 + 0.009 * 28.6 = 0.31$

A = 0.12 acres

$$WQV = [(1)(0.31)(0.12)] / 12$$

$$WQV = 0.003 \text{ ac-ft}$$

$$WQV = 135 \text{ ft}^3$$

## Rain Garden Volume Required:

$$V = 135 \text{ ft}^3$$

## Storage Volume of Rain Garden

Elevation	Contour Area	Incremental Storage	Cumulative Storage
505	240		
505.5	488	182	182

WQV Provided:

182

Therefore, sufficient volume has been provided in regards to Water Quality Volume (WQV.)

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Ex. #18