

August 7, 2012

**Plainfield Planning Board
Site Plan Review Notice**

You are hereby notified that **Kimball Union Academy** has filed an application for a site plan review concerned with a 99' tall wind powered generating system to be located behind the Miller Centennial Building. The project received Zoning Board approval in case 2012-01. This is the final step in the local land use approval process for the project.

A public hearing on the proposal will be held:

**Monday August 20th 2012
7:00pm at the
Meriden Town Hall
110 Main Street Meriden Village**

Note: This hearing is to be held in order to comply with a legal requirement of law (RSA 676:4). Abutters are invited to attend for their own benefit and information, they are not required by law to attend. The application materials are available at the town office and are posted up on the town's website.

TOWN OF PLAINFIELD

APPLICATION FOR SITE PLAN REVIEW

Applicant's name: Kimball Union Academy
address: PO Box 188
Meriden, NH 03770

Location of property
(if different than above): 57 Main Street

Describe development and/or alteration:

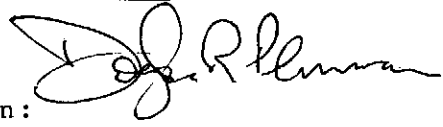
Follow-up to ZBA Case 2012-01
KVA Wind Turbine
(See Attached)

Preliminary Consultation: 8/7/12
(date)

Formal submission of application: _____

Final Review: _____

Fee Paid:

Filing fee \$100 Notification fee \$51 Additional fee \$50 ^{Ad}
\$201.50
For KVA 

Plainfield Planning Board Action:

Approval: _____
(Planning Board Chairman and date)

Disapproval: _____

Conditions: _____

PLAINFIELD ZONING BOARD OF ADJUSTMENT
NOTICE OF DECISION

Kimball Union Academy
PO Box 188
Meriden, NH 03770

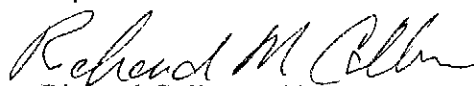
You are hereby noticed that the appeal by **Kimball Union Academy**, for a modification to a previously approved (special exception #23) wind powered generating system (case 2011-02) has been granted by the affirmative vote of at least three members of the Zoning Board of Adjustment. The previous application was a 2.5 kw/hr generating system with a maximum tower height of 66' to be located behind the Miller Centennial Building. As modified, the turbine size has been increased to 5 kw/hr and the maximum height of the unit measured from the ground to the tip of a blade in the full upright position is to be no higher than 99'. In approving these modifications, the Zoning Board has relied on the materials and presentation provided by the applicant. Based on this information the board made the following **findings**:

1. This decision includes by reference and supersedes the decision rendered for case 2011-02.
2. As viewed by the Board, and compared to the school's existing heating plant smoke stack (represented by the applicant to be 80' tall), the increase height of the new unit does not significantly change the visual impact of the project.
3. By selecting a tower type that does not include a permanently attached access ladder the risk of trespass is significantly reduced.
4. As advertised by the product's specification sheet the emitted sound level of the larger unit is below the maximum 60 decibels measured at 60 meters from the unit that was approved for the initial application.

In granting this approval, the board establishes the following **conditions**:

1. Completion of Site Plan Review with the Planning Board.
2. The applicant shall not significantly reduce the vegetative screening to the southwest that exists between the tower site and the Baynes Road residential neighborhood.
3. Whereas the information provided indicates that this tower will **not** produce obnoxious levels of sound or reflective light flash, if the actual turbine does create a negative impact on abutters from either noise or flash the applicant is required to take remedial actions.
4. The generating unit tower may not be used for any additional purpose without review by the Board of Adjustment.
5. When the generating unit is retired from use the tower and turbine must be removed within 90 days.
6. All submitted materials and representations by the applicant become part of this approval and form the basis for this decision.

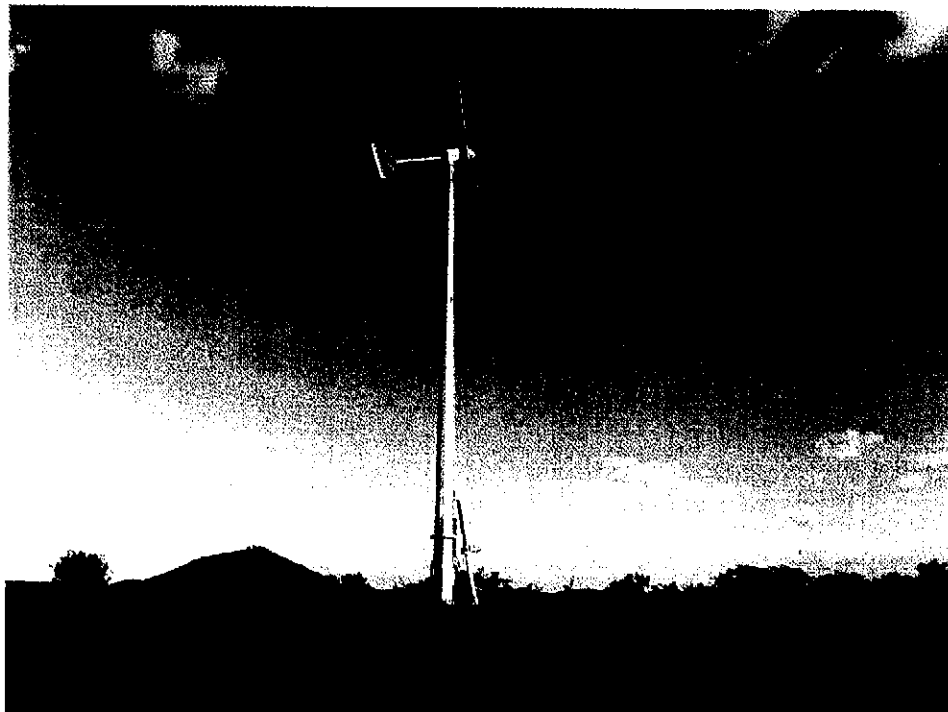
In granting this approval the board has determined that the application continues to meets the general requirements for all special exceptions has outlined in section 5.6 of the Zoning Ordinance as well as the specific requirements for WPGS as outlined in section 3.17 of the zoning ordinance.

 20 July 2012
Richard Colburn, Chair
Plainfield Zoning Board of Adjustment

Kimball Union Academy Wind Turbine

Prepared for the Plainfield NH Zoning Board

Date: July 3, 2012



BERGEY EXCEL 5

The wise choice for Performance, Reliability, and Ruggedness

The new Bergey Excel 5 is ideal for smaller and more efficient homes, farms, and small businesses. Its extra large rotor and ultra-low cut-in wind speed give it exceptional performance, out producing all other turbines in its class. More energy means greater savings and a quicker payback.

The Wise Choice
30 years ago Bergey pioneered the radically-simple "three moving parts design" that has proven to provide the best reliability, service life, and value of all of the hundreds of competitive designs that have come and gone in that time. A small wind turbine is a big investment and Bergey is clearly the wise choice.

Advanced Technology:

- BW-7 Proprietary Low Noise Airfoil
- PowerFlex: Super High-Strength Blades
- Neo-5 Direct-Drive Permanent Magnent Alternator
- AutoFurl: Storm Protection
- 6 kW Powersync II Inverter
- Remote Monitoring (optional)



BERGEY
WINDPOWER

2200 Industrial Blvd.
Norman, OK USA 73069
Tel: 405-364-4212
sales@bergey.com
www.bergey.com

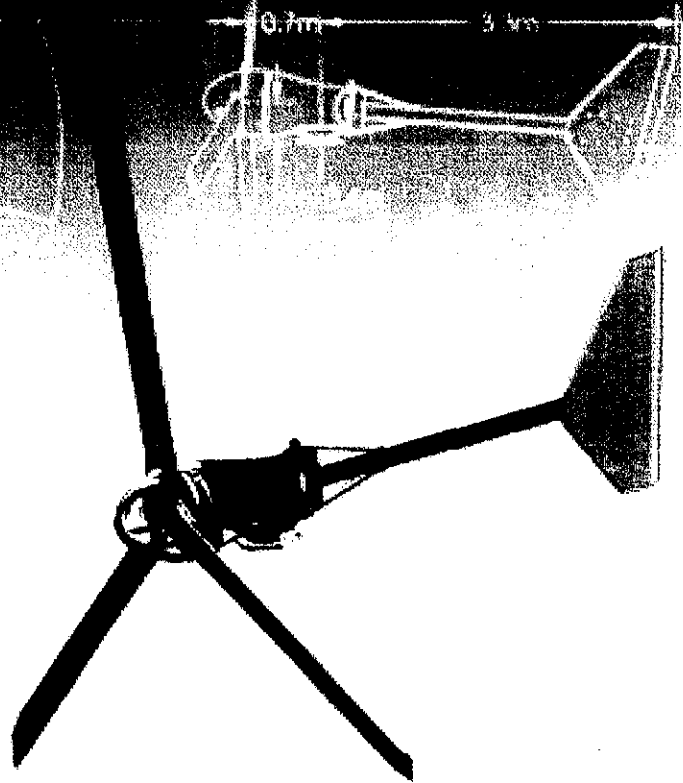
BERGEY EXCEL 5

Performance

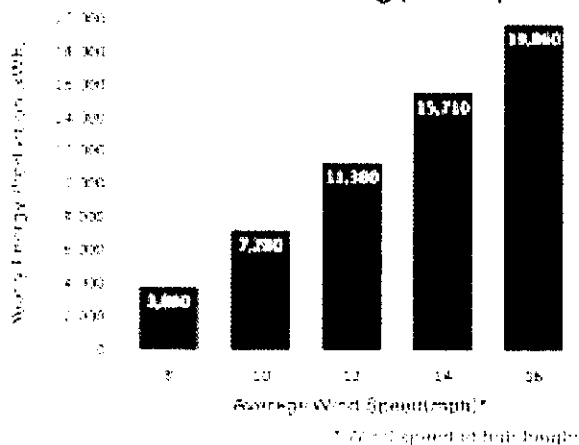
- APPROXIMATE WIND SPEED @ 200 FT: 12 mph
- PEAK WIND SPEED: 15 mph
- AREA ANNUAL ENERGY: 8,800 kWh @ 11 mph (10m/s Average)
- CUT-IN WIND SPEED: 4.5 mph (2 m/s)
- CUT-OUT WIND SPEED: None
- FURLING WIND SPEED: 31-45 mph (14-20 m/s)
- MAX DESIGN WIND SPEED: 134 mph (60 m/s)
- NOMINAL ROTOR SPEED: 0-400 rpm

Mechanical

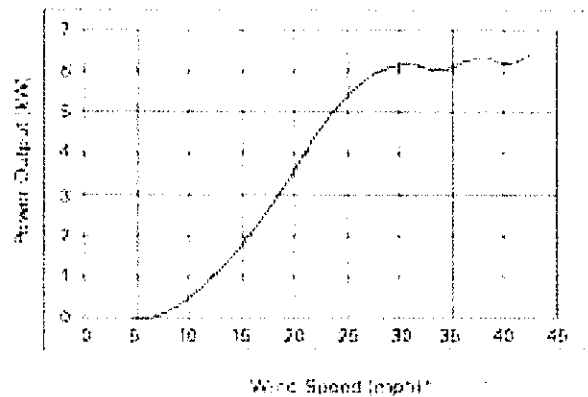
- TYPE: 3-Blade Upwind, Horizontal Axis
- ROTOR DIAMETER: 30.2 ft. (9.2 m)
- WEIGHT: 770 lb. (350 kg)
- GEARBOX: None
- OVERSPEED PROTECTION: Aerofurl™
- TEMPERATURE RANGE: -40 to 140 F (-40 to 60 C)
- TOWERS: Guyed and Non-Guyed 60 - 160 ft. (24-49 m)
- ALTERNATOR: 50 Neo Permanent Magnet
- INVERTER: 50W Powerwind™ (Optional) Rated NEMA 3R Enclosure
- IN MICE: Monitoring Vis. Panel & Smart Phases (Optional)



Annual Energy Output



Power Curve



Testimonials.

"I installed my Bergey 10 kW in 2001. I haven't paid an electric bill since and the turbine has paid for itself. It's the best investment I ever made." **G. Sansone, Oak Hills, CA**

"I replaced a broken Whirlwind Power turbine with a Bergey 10 kW in 1988. I should have bought the Bergey in the first place."
R. Bohl, Phillipburg KY

"My first Bergey 10 kW installation has operated for over 26 years with insignificant maintenance costs and has had a 100% availability factor. It couldn't be more reliable."
S. Chase, Shokan NY.

"I made a big mistake when I used a Chinese turbine with an American sounding name. It just didn't hold up. What a difference in the Bergey equipment." **S. Jackson, Chico, CA**

Specifications.

Reference Rated Power: 10 kW.
AWEA Rated Power: 8.2 kW at 25mph.
AWEA Rated Annual Energy: 13,200 kWh at 11 mph average.
AWEA Rated Sound Level: 54.7 dBA.
Cut-in Wind Speed: 5 mph.
Cut-out Wind Speed: none.
Peak Power: 12.5 kW at 28 mph.
Max. Design Wind Speed: 135 mph.
Design Operating Life: 30-50 years.
Turbine Rotor Diameter: 23 ft.



Buying a Bergey turbine.

The best candidates for a Bergey 10 kW wind turbine are those with a residential or commercial property of at least 1 acre, an electric bill averaging over \$150 per month, and a wind resource of at least 10 mph. Each project is a little different so a site survey and quotation are necessary. The typical steps in buying a Bergey wind turbine are:

1. Contact a local Bergey dealer. For assistance, see the Dealer Lists page at www.bergey.com.
2. Purchase a site survey from the dealer. Following the survey you will receive a quotation and a projection of performance and payback.
3. Purchase the system. Your Bergey dealer will apply for the necessary permits and available rebates, contact your utility company, get your Bergey wind equipment shipped, and provide you with a preliminary schedule for the work at your home or business.
4. Once the permits and equipment are in hand, your Bergey dealer will schedule your installation. This will involve several visits for foundations, wiring, and turbine installation.

Typically, getting the permits to install the 80 - 140 ft towers we recommend is the biggest obstacle you and your BWC dealer will face. Few cities or counties have ordinances that favor small wind turbines.

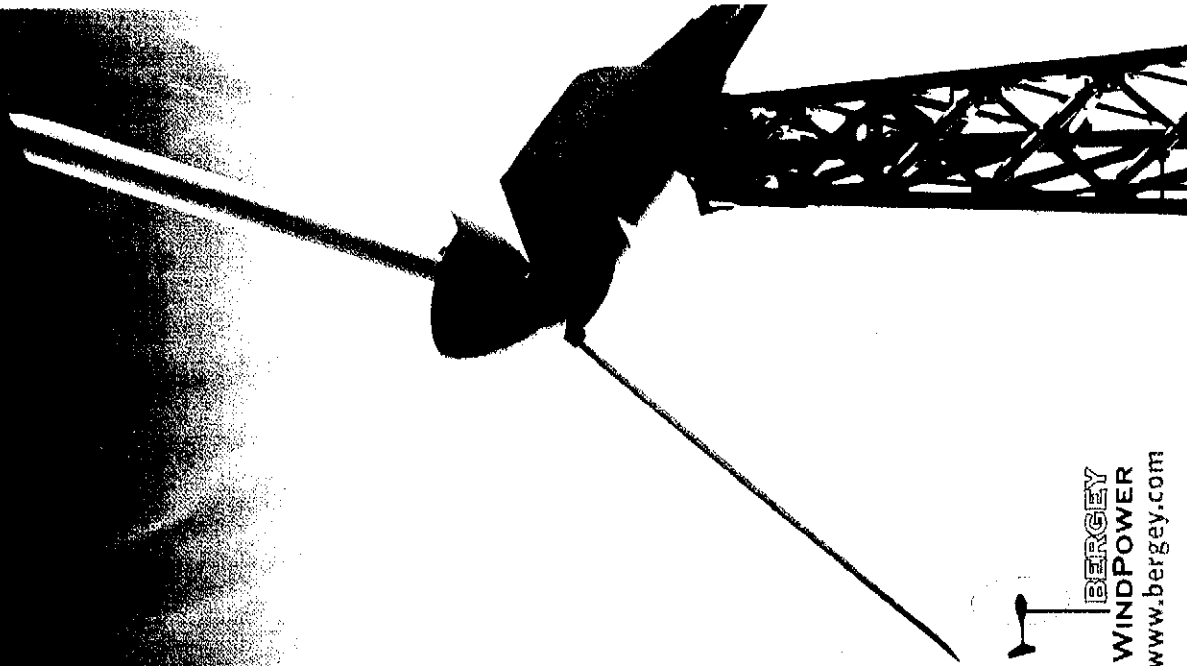
For information on the permitting issues we recommend the AWEA guide available at:

www.awea.org/smallwind/pdf/InThePublicInterest.pdf

You will also find additional information at:

www.bergey.com

Power your dream with the wind



BERGEY
WINDPOWER
www.bergey.com

Why buy a small wind system?

A Bergey wind turbine is a smart investment that will lower your monthly expenses, increase your net worth, and help support American manufacturing jobs. At the same time it will help clean the air, slow climate change, and move us towards energy independence.

You will also enjoy watching your utility meter turn backwards and the lively interaction between the wind and your Bergey turbine. Finally, it will totally change your view of wind – you will start appreciating windy days.

For those fortunate enough to have a windy site of at least one acre, a Bergey wind system will be substantially less expensive than a comparable solar system, it will take up less space, and its performance won't degrade over time.

It's like buying vs. renting a home.

Over the next 10 years a typical homeowner or small business will pay \$18,000 to over \$50,000 in electric bills, at rates that often increase faster than inflation. When you choose a Bergey wind system you take the same monthly expense and invest it in a tangible asset. Once your Bergey turbine is paid off, you will enjoy more money in your pocket every month for the next 20 - 40 years.

A Bergey wind turbine is an excellent investment. It will typically provide a rate of return of 6% - 25%, much better than traditional investments.

Tax credits and rebates make it affordable.

Small wind turbines qualify for a 30% federal tax credit and, for businesses, accelerated depreciation. USDA grants are available for farmers, ranchers, and rural businesses. Many states offer additional incentives (see www.dsireusa.org). These incentives make owning a Bergey wind turbine surprisingly affordable.

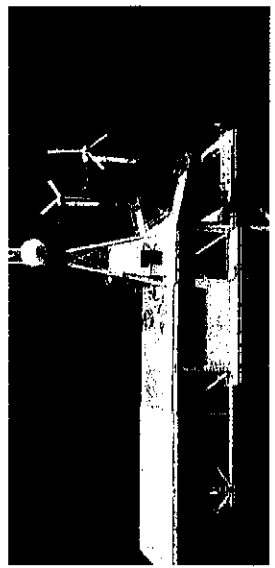
Why a Bergey wind turbine?

Bergey Windpower is the oldest and most experienced manufacturer of residential-sized wind turbines in the world. Thirty years ago Bergey pioneered the radically-simple "Bergey design" that has proven to provide the best reliability, performance, service life, and value of all of the hundreds of competitive products that have come and gone in that time. With only three moving parts and no scheduled maintenance necessary, the Bergey 10 kW has compiled a service record that no other wind turbine can match. We back it up with the longest warranty in the industry.

There are now many new small wind products on the market. Though sometimes heavily promoted, these new entrants lack the track record that provides confidence as a sound investment. Over the years Bergey wind turbines have often replaced unsuccessful competitive products. The bottom line is that wind turbines are a big investment, and Bergey is the wise choice.

Bergey turbines are simple, but they also incorporate sophisticated technology that has been refined over more than a quarter-century. From its custom airfoil to its "super magnet" low speed alternator to its custom inverter, there's no more advanced technology in the industry. The result is exceptional low wind speed performance, robust storm protection, and almost silent operation.

Finally, Bergey offers more tower options than any other small turbine manufacturer. We have Guyed-Lattice, Self-Supporting Lattice, Tubular Self-Supporting, and Guyed Tilt-up Lattice towers in heights from 60 ft to 160 ft.



Bergeys are built on strong basics:

1.2.3

Simplicity:

The only moving parts are the parts you see moving.



Reliability:

Developed in "Tornado Alley", proven in critical military applications, and backed by our exclusive 10-year warranty.



Performance:

Low start-up (5 mph), continuous operation in high winds, and extremely quiet.

Our technology makes it happen!

PowerFlex Blades

Our exclusive "full length reinforcement" fiberglass blades are stronger than steel and the strongest in the industry.

BW-7 Airfoil

Our custom designed airfoil (blade shape) is quieter and more efficient than the "catalog airfoils" others use.

Neo-10 Alternator

Our custom designed very-low-speed "super magnet" alternator also serves as the blade mounting hub, integrating what are typically two separate assemblies.

Autofurl Storm Protection

Our uniquely simple passive, fully automatic, high wind protection is hurricane proven.

Powersync II Inverter

Our custom designed third-generation power converter is UL-certified and extremely rugged.

PLAINFIELD ZONING BOARD OF ADJUSTMENT
APPLICATION FOR APPEAL

PLEASE READ: This form should be completed after discussions with the town's zoning administrator about the proposal. If you have not already done so, please contact the zoning administrator (469-3201).

Applicant's name: Kimball Union Academy
Mailing address: ~~PO Box 100, Meriden, NH 03770~~
Property Street address: Behind 57 Main St.
Tax Map / Lot Number: Map 103 - Lot 7
Zoning district: VR
Property owner of record: Kimball Union Academy

Type of appeal (check one):
 variance
 special exception # 23 Wind Powered
 administrative decision

Applicants signature: For KUA - [Signature]

Required Attachments: a) applicant signed description of the proposal.
b) site map(s) exterior/interior.
c) abutter list with mailing addresses.

Fee: application \$ 155.00 202658
notification \$ Total \$

Hearing Date: July 17th Tuesday

In order to be on the meeting agenda for the above date, your paid application must be received at the town office no later than Monday _____ (ZBA rule 9.3).

Office Use

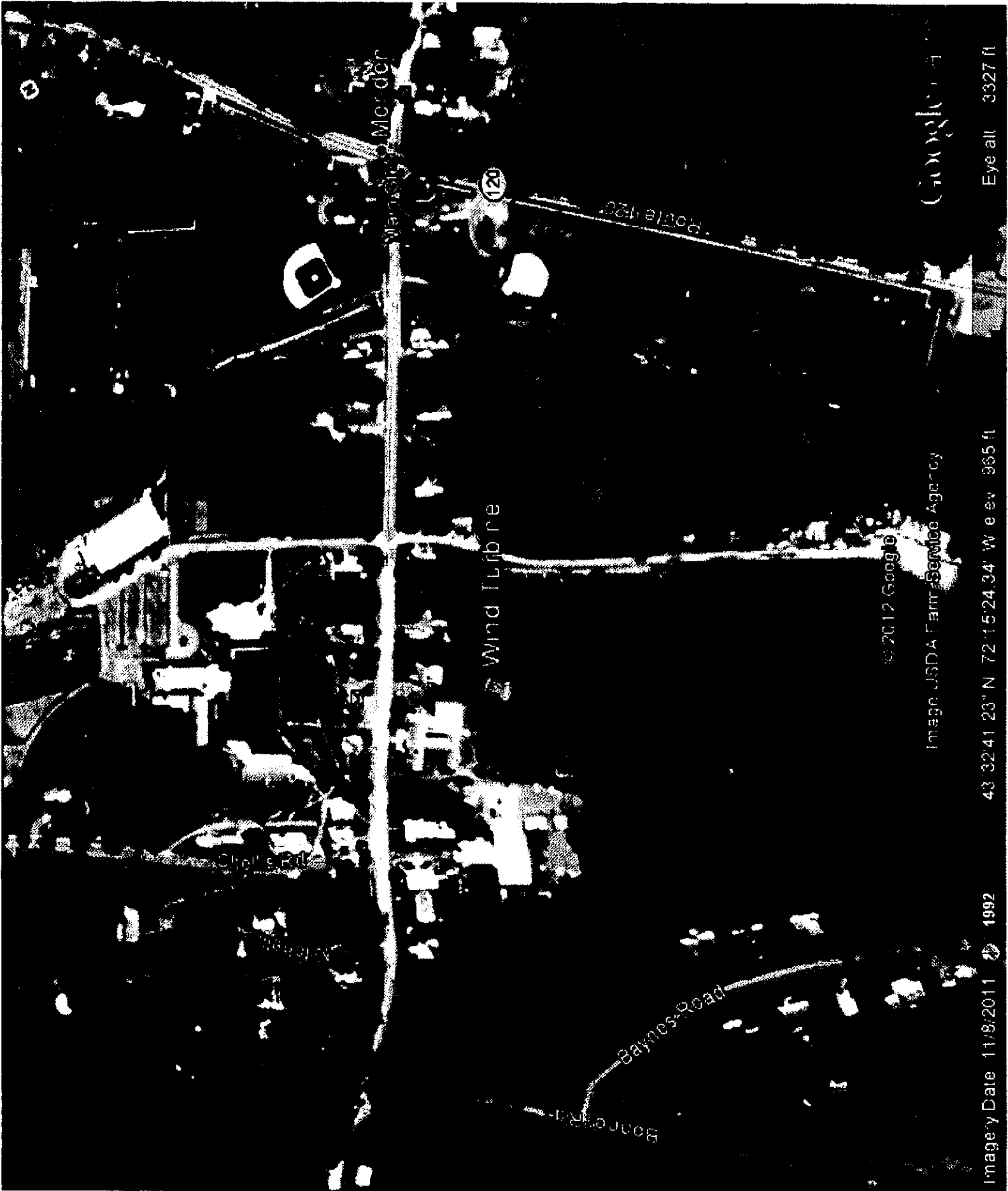
date filed: 7/6
case number: 12-01 value 7/6
attachments: Y y/n
fee paid: Y y/n

Standards to be met:

- a. **Setback:** The height of the tower when measured from ground level at the base of the tower to the tip of one of the blades when in the vertical position will be 95' ±2'. The distance from the base of the wind turbine to the closest part of the closest building is 150ft. leaving 55' if the wind turbine were to fall over.
- b. **Height:** The height of the WPGS is 95' when measured from ground level at the base of the tower to the tip of one of the blades when in the vertical position. The WPGS is located in the middle of a large field with trees along the woods line, which reach 60 to 70 feet tall.
- c. **Signs:** This tower structure will not be used for any other purpose or display of banners other than those necessary for safety.
- d. **Lighting:** No lighting shall be used on the tower.
- e. **Sound Level:** The WPGS will not exceed 60 decibels.
- f. **Vibrations:** The WPGS will not cause vibrations through the ground that are perceptible beyond the property line on which it is located.
- g. **Reception Interference:** Small wind generators have no effect on TV or communications signals, as their blades are made from materials (wood, fiberglass, and plastic) that signals can pass through. Nor do small wind generators electromagnetically interfere with telecommunications or radio waves. In fact, one of the major markets for small wind generators is powering military and remote telecommunications sites.
- h. **Visual Analysis:** Small wind generators are installed on towers commonly accepted in communities across the country. They don't look much different than a common light pole or radio tower. An example for what the Bergey WPGS looks like is on the front of this application.
- i. **Code Compliance:** This WPGS will be designed and built to satisfy local codes and nationally accepted design standards.
- j. **Blade Clearance:** The minimum clearance from blade to tip to ground is twenty feet. The tower height for this particular turbine is 80 feet leaving 70 feet of clearance with a 10-foot blade.
- k. **Guy Wires:** This Wind Turbine will be a single standing pole, and therefore will have no guy wires.
- l. **Access:** There will be a fence surrounding the tower and the bottom access steps will be removed to prevent unauthorized access.
- m. **Connections:** For site 1 (miller) all the power lines will be underground. The wind turbine is 200 feet away from the electrical panel.
- n. **Visual Tests:** Unless specifically waived by the Zoning Board of Adjustment, we will require a three-foot diameter balloon for a period of three days at the maximum height of the proposed facility within 50' of the proposed location, to be raised into the air.
- o. **Decommissioning:** If this facility is no longer in use, it will be completely removed from the site within ninety days.

Hazard Mitigation Plan:

The WPGS is located approximately 150' away from the closest building and about 100' away from the nearest parking lot. The location has no foot traffic. Therefore if the WPGS falls over it will not hurt any buildings, cars, or people. During the winter months when ice sheer is a possibility, stakes will be placed with warning signs around the throw zone. In the event of a fire, the response time for the Meriden Fire Department would be well below the average due to its proximity. The WPGS will have a fence surrounding the tower and the bottom access steps will be removed to prevent unauthorized access. In the event of a power failure we would use a circuit breaker in order to make the power lines safe to work on.



Wind Libre

Chapel Hill

Baynes Road

Route 120

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Image USA Earth Satellite Agency

Google

Image Date 11/8/2011 1992

43 32'41" 23" N 72 15'24" 34" W e ev. 365 ft

Eye alt 3327 ft