

CERTIFIED MAIL

February 23, 1983

Mr. Will J. Hancock  
Business Manager  
P. O. Box 428  
Kamuela, HI 96743

Dear Mr. Hancock:

Variance Application (V82-49)  
Applicant: Hawaii Preparatory Academy  
Maximum Allowable Height Limit  
Tax Map Key 6-5-01:33

Upon review of your application, the Planning Director has determined that it is warranted; and therefore, certifies the approval of the variance to allow the construction of four windmills at heights of 116'-6" in lieu of the maximum height limit of 45 feet at the Hawaii Preparatory Academy Complex, Waimea, South Kohala, Hawaii, TMK: 6-5-01:33.

The approval is based on the following:

VARIANCE CRITERIA NO. 1

There are special or unusual circumstances applying to the subject real property which exist either to a degree which deprives the owner or applicant of substantial property rights that would otherwise be available or to a degree which obviously interferes with the best use or manner of development of that property.

The unusual circumstances consist of the topographical, atmospherical and locational conditions of the specific site with respect to its intended use as a site to erect a windmill system. These systems are primarily dependent on wind velocity at the site. The wind pattern itself is affected by terrain, slopes, contours, size and composition of the vegetation, temperatures and climatic conditions.

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Additionally, today's energy conscious society and world focuses on alternate energy systems such as windmills as viable energy options. This is evidenced by the fact that there are ongoing National and global efforts in becoming less dependent on oil and diversifying the dependence of energy to other resources. The concerted efforts being directed into fields of solar energy, biomass, wind energy, geothermal and ocean thermal systems, etc. are strong evidence as to the viability and need for these systems.

Unusual circumstances applies to the subject property which does not generally apply to similar surrounding properties. The subject property is situated on the hillside of the Kohala Mountain range. The terrain of the area is sharply sloping and the prevailing wind direction is predominately from the top of the hill flowing downhill. The windbreak stand of trees mauka (and north) of the receiving area interrupt the windflow where it is swept upward. Additionally, the topography of the mountain range and the direction of the prevailing winds off-site directly affect any siting and location of windmills on the property. Because of the sloping terrain, a site for the windmill outside of the windbreak would require an even taller tower height in order for the blades of the windmill to effectively generate sufficient power, by "catching" the clear flow. Further, a tower placed outside the trees in a relatively clear space would still have to extend higher to receive the smoother windflow because of the presence of the trees. To remove the trees would have the negative effect of losing the windbreak and destroying one of the more visually attractive and natural elements of the area. Wind Energy units are completely dependent upon the flow and constant speed of the wind to operate and a clear zone above tree tops or other obstructions is needed for the unit's blades to function effectively.

The petitioner has submitted data in evidence that the previously granted 55 foot height limit is not sufficient or efficient. The experience and the data shown by the existing windmill indicates that at the 55-foot height limit, turbulence still exist and that this turbulence reacts negatively on the effectiveness of the system. The data shows that the smooth wind patterns occur at the 100- to 120-foot height level. This has been determined by studies conducted by Enercon Inc., a wind survey consulting firm based in Honolulu. Their kite wind turbulent study of the subject site conducted in 1981, resulted in identifying that the smooth area stream of wind begins at the 100- to 120-foot height level.

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All of the above information provides evidence that there are off-site influencing factors in the siting of a windmill system. This is so with the Hawaii Preparatory Academy proposal, as indicated by the wind gauging tests done by Enercon Inc. at the subject site.

In this particular application, while there are limited circumstances which relate to the subject land, the uniqueness of the wind resource, is the off-site influencing factor relevant to the request for the additional height. Because of these off-site characteristics, these factors do apply to the subject property as they affect the way that alternatives have to be looked at in terms of establishing a windmill on the property.

Based on the foregoing conditions, the special circumstances relating to the wind patterns in conjunction with the maximum allowable height in the Zoning Code, interferes with the best manner of development of the subject property as the available wind power above the site cannot be otherwise be more fully utilized.

#### VARIANCE CRITERIA NO. 2

There are no other reasonable alternatives that would resolve the difficulty.

The alternative of denying the variance is not a reasonable one in that the efficiency of the facility would be further diminished and its utility would be voided. As such, because the requested additional height is needed to ensure or increase the efficiency of the facility to serve the school complex, we have determined that the most reasonable alternative is in granting the variance. Any other solutions would cause excessive or undue hardships on the petitioner in enhancing the efficiency and utility of the windmill, when a more reasonable solution is available.

The petitioner's intend to use the power generated by the windmills to supply the Hawaii Preparatory Academy complex's electrical demands. The windmills must be sited relatively close to the campus for efficiency purposes. Alternate locations throughout the subject property are limited because of the mountain range and the lower elevation levels of the rest of the campus in relation to the wind patterns in this area. If the subject terrain were level, smooth and "unobstructed," the necessary height calculation would have determined that the present maximum forty-five (45) height limit would be sufficient.

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### VARIANCE CRITERIA NO. 3

The variance shall be consistent with the general purpose of the zoning district, the intent and purpose of the Zoning and Subdivision Codes, and the County General Plan and will not be materially detrimental to the public welfare or cause substantial, adverse impact to an area's character or to adjoining properties.

The approval of the request would be consistent with the County General Plan's "Energy" element and with State and National goals which encourage the development and use of alternate energy sources. The proposed windmills will be utilized in assisting in the educational sector of the community.

In assessing the requests for height variances for windmills, the three basic elements that are primarily evaluated are the visual impact, the physical impact, and the need for the additional height. The proposed windmills must be reviewed in terms of its visual and physical impact in the area to ensure that the spirit and intent of the height limits are not violated. The location of the proposed windmills is located approximately 2,100 feet from the Kawaihae Road and approximately 1,400 feet from the Kohala Mountain Road.

The location of the campus on the hillside of the mountain range and the blending of the architectural design into the landscape together with the natural elements such as the tree windbreak, create various view corridors from the roadway systems in this area. At the location of the tree windbreak, the lands slope steeply in the makai direction. This physical characteristic along with the distances of the windmills from the public roadways and the special earth tone color paint to be used on the windmill, will serve to minimize the visual and physical impact of the windmills in this area. As such, the granting of the variance will not compromise the physical and visual issues for this area.

The distances from the visual corridors will ensure that both the visual and physical impacts will be minimized to the point where it should have a minor rather than a major impact in the area in light of the additional height being granted in this variance. Therefore, this analysis has also concurred that the issues involved also complement or implement the goals, policies and courses of actions of the Natural Beauty, Natural Resources and Public Utilities elements of the General Plan.

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Based on the foregoing, we have determined that the granting of the variance shall be consistent with the general purpose of the Zoning District, the intent and purposes of the Zoning Code and the General Plan. The analysis of the above issues also has concurred that that granting of the variance will not be materially detrimental to the public's welfare nor cause any substantial or adverse impact to the area's character or to adjoining properties.

The variance request is approved subject to the following conditions:

1. That the petitioner or authorized representative shall be responsible for complying with all stated conditions of approval.
2. That precise siting of the windmill towers shall conform to the site plan submitted with the variance application.
3. Plans and construction of the total structures must be approved by a Structural Engineer or Architect registered in the State of Hawaii.
4. That plans for the proposed windmills, including a color scheme which will blend in with the background landscape of the area, be submitted to the Planning Department for Plan Approval within one (1) year from the effective date of approval of the Variance Permit. Further, one of the windmills shall be painted with the approved color scheme. Prior to proceeding with the painting of the other windmills, further review of the appropriateness of the color scheme shall be done by the Planning Department.
5. The petitioner or authorized representative shall be responsible for providing the appropriate safeguards on their system to prevent TV and/or Radio interference to the adjoining property owners notified through this variance application.
6. The petitioner or authorized representative shall comply with all other Federal, State and County rules, regulations and requirements.

Should any of the foregoing conditions not be met, the Variance Permit shall be automatically voided.

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If you have any questions on this matter, please feel free to contact us.

Sincerely,

  
SIDNEY FUKU  
Planning Director

NH:gs  
cc: Planning Commission  
James Gowney, Pres., WKCA  
Charles Campbell  
Nelson Doi