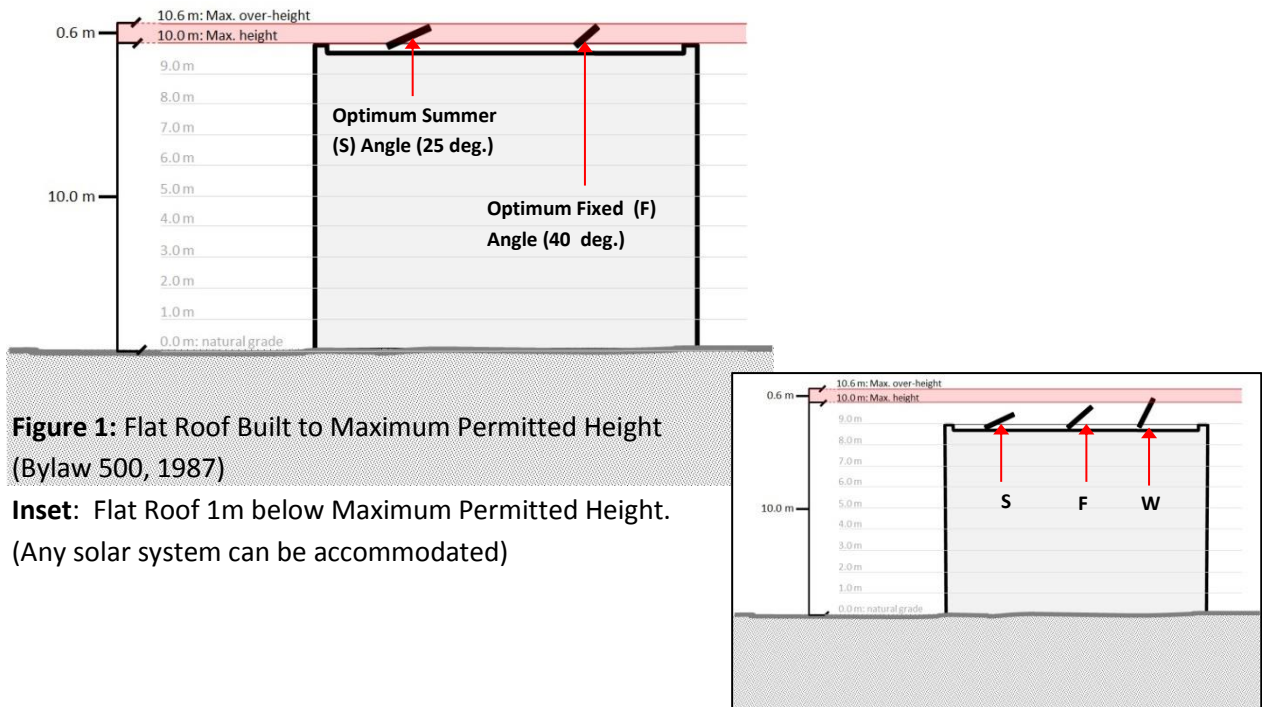


# Bylaw 500 Amendment Diagrams

## Solar Systems: Height Exemptions

**Scenario 1:** Flat roof built to the maximum permitted height.

Solar systems are tilted to optimize the amount of energy derived from the sun. The optimum tilt angle varies seasonally. At 49.2 degrees north latitude (City of Nanaimo), the optimum summer angle is approximately 25 degrees, the optimum winter angle is up to 62 degrees and the optimum angle for a fixed system, is approximately 40 degrees. Professional installers have suggested that a fixed angle of 30 degrees is acceptable. A building with a flat roof at the maximum permitted height is the most constrained scenario.

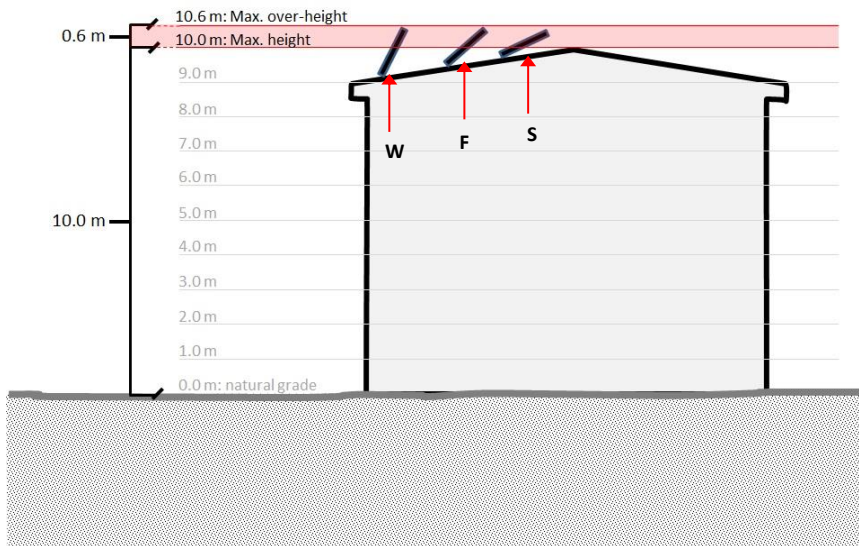


**Figure 1:** Flat Roof Built to Maximum Permitted Height (Bylaw 500, 1987)

**Inset:** Flat Roof 1m below Maximum Permitted Height. (Any solar system can be accommodated)

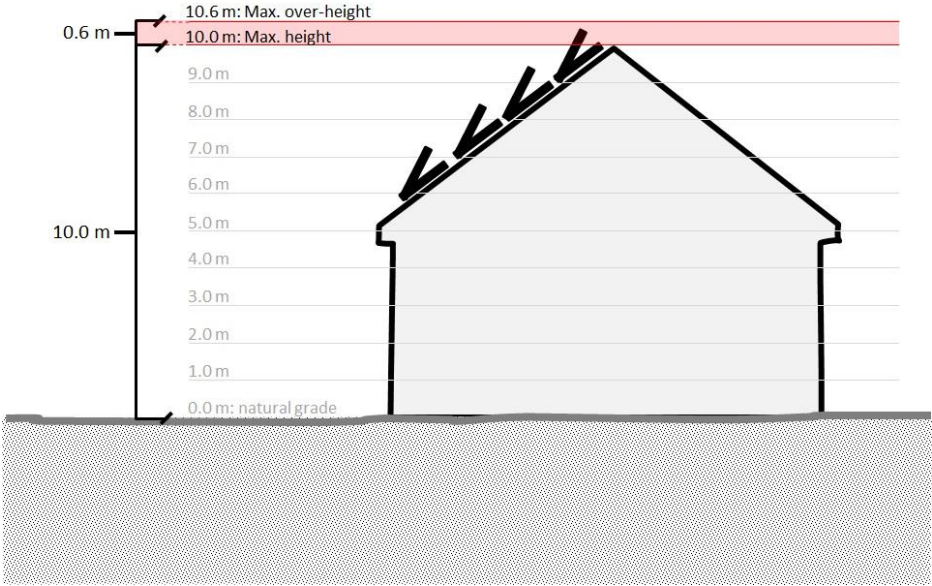
**Scenario 2: Gently Sloped Roof Built to the Maximum Permitted Height.**

Gently sloped roofs are a relatively common form in the Regional District of Nanaimo because such structures allow for the conventional residential appearance of a pitched roof, but also maximize the interior volume of the building. Figure 2 illustrates that for buildings with gently sloped roofs built to the maximum permitted height, solar thermal and photovoltaic systems can be accommodated within the additional 60 cm afforded by the proposed height exemption. Some planning to locate the system appropriately along the roofline will be necessary to accommodate solar thermal systems tilted at either the optimum fixed angle, or at the optimum winter angle.



**Figure 2: Gently Sloped Roof Built to Maximum Permitted Height (Bylaw 500, 1987)**

**Scenario 3: 9-12 Pitch Roof Built to Maximum Permitted Height**

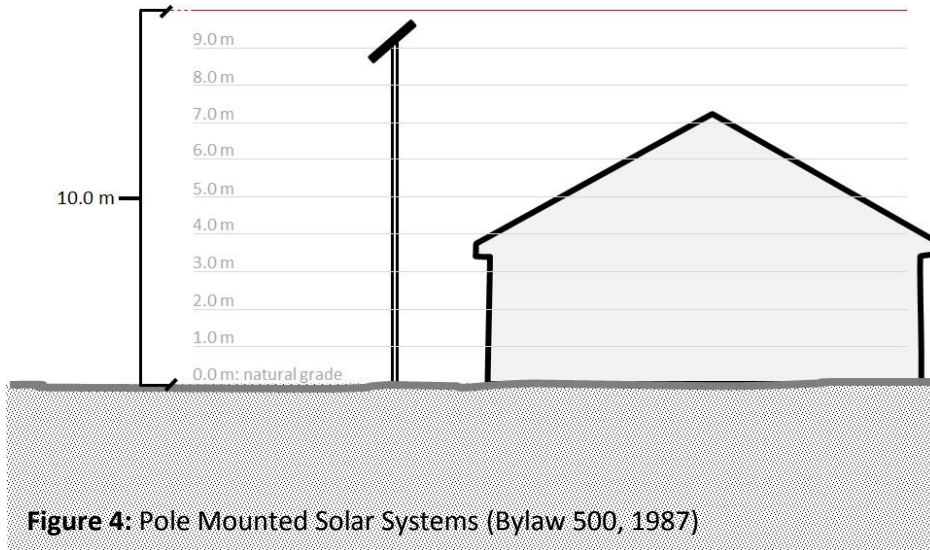


**Figure 3: 9-12 Roof Built to Maximum Permitted Height (Bylaw 500, 1987)**

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#### Scenario 4: Pole Mounted Solar Systems

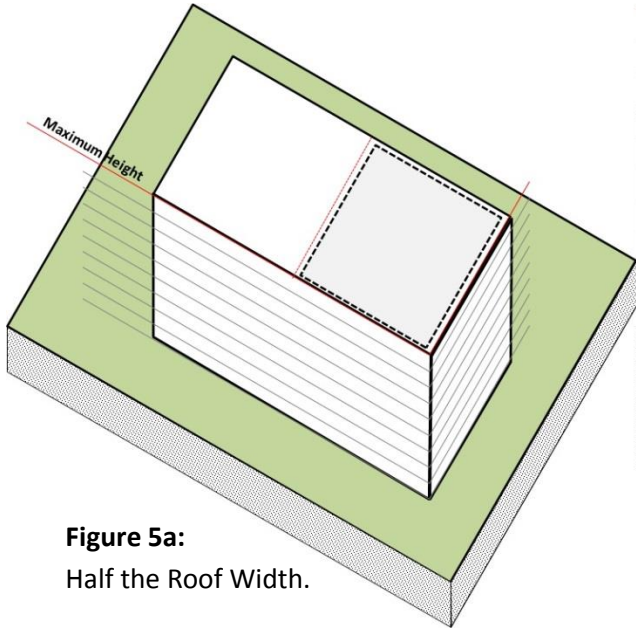
Pole mounted solar systems are required to meet the maximum permitted height requirements for a given zone, as well as setback requirements.



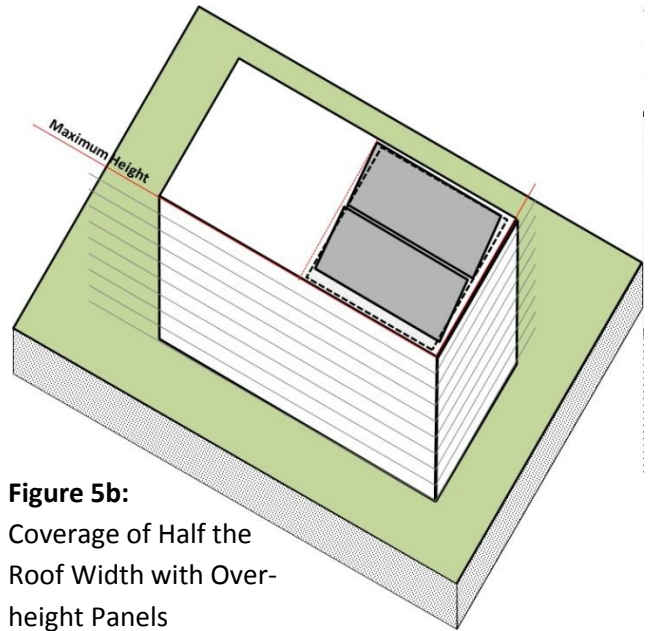
**Figure 4: Pole Mounted Solar Systems (Bylaw 500, 1987)**

**Scenario 5: Parcels Less than 5,000 m<sup>2</sup>**

To minimize obstruction of views, it is proposed that while solar systems are permitted to exceed maximum permitted heights by up to 60 cm, for smaller lots where visual impacts on neighbours is more likely, this height exemption is only permitted to cover up to half the width of the roof to which the system is attached.

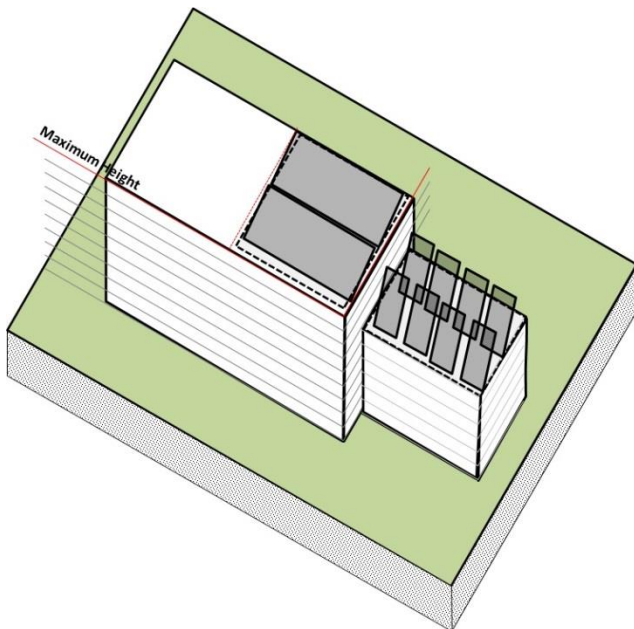


**Figure 5a:**  
Half the Roof Width.



**Figure 5b:**  
Coverage of Half the  
Roof Width with Over-  
height Panels

For areas of roof where solar systems do not project beyond the maximum permitted height, there are no restrictions on roof coverage of solar systems.

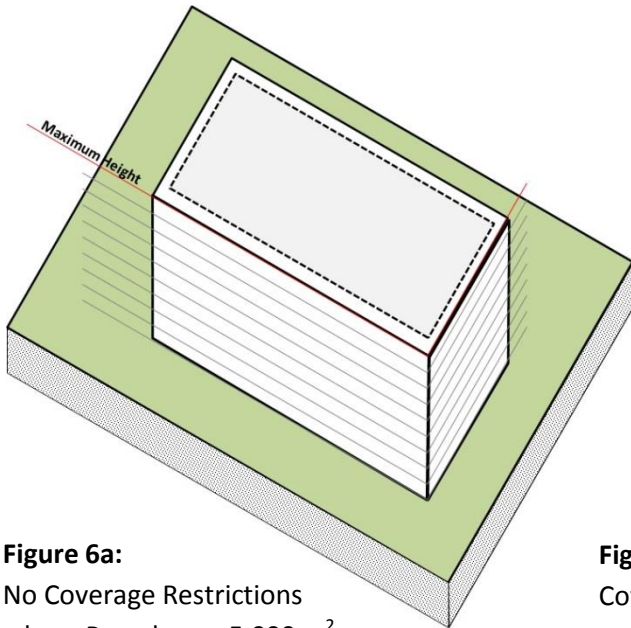


**Figure 5c:**  
No Coverage Restrictions where Panels are  
Below Maximum Permitted Height

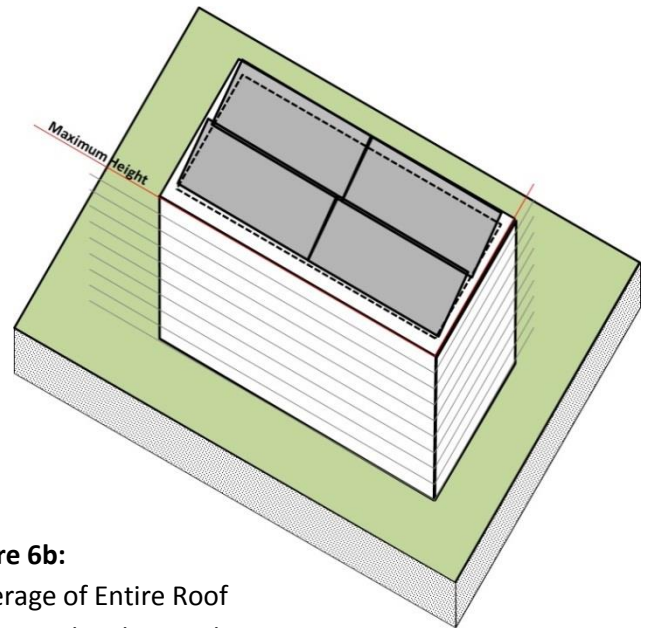
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**Scenario 6: Parcels 5,000 m<sup>2</sup> or Greater**

There are no roof coverage restrictions on parcels 5,000 m<sup>2</sup> or greater. This is because buildings on larger lots will be further away from one another, and view obstructions associated with a solar system projecting 60 cm beyond the maximum permitted height are anticipated to be minimal.

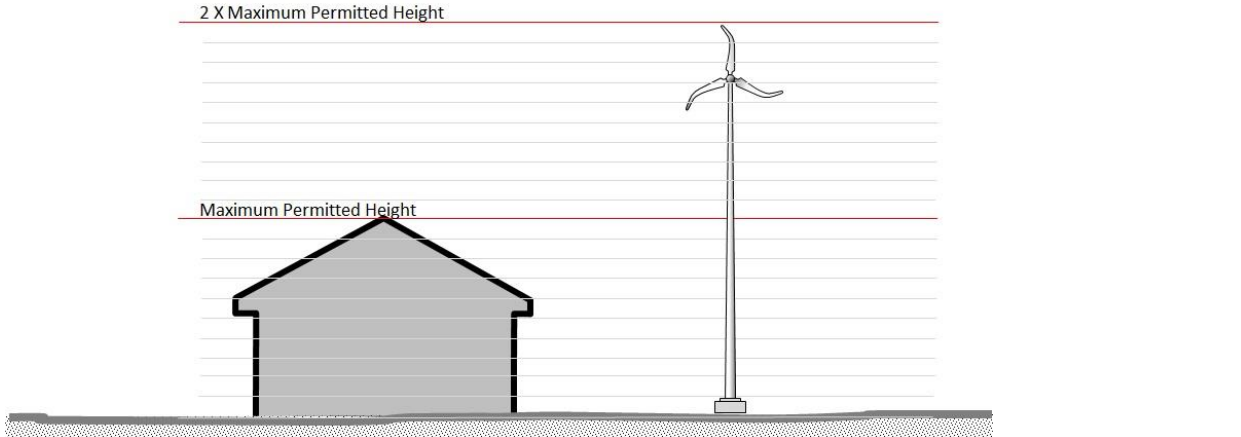


**Figure 6a:**  
No Coverage Restrictions  
where Parcels are 5,000 m<sup>2</sup>  
or more.



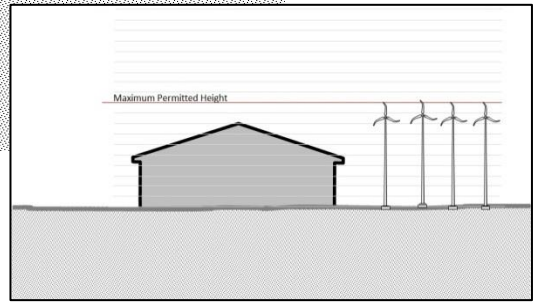
**Figure 6b:**  
Coverage of Entire Roof  
with Over-height Panels

# Micro Wind Turbine Systems: Height Exemptions

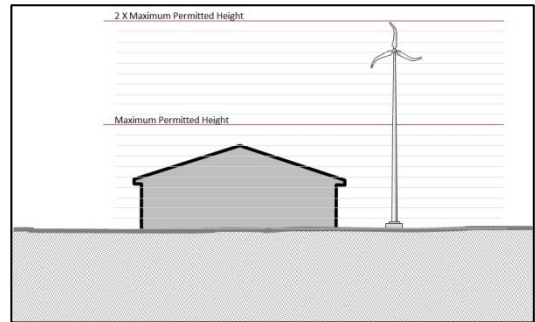


**Figure 7a:** Maximum Micro Wind Turbine Height is Twice the Maximum Permitted Height.

**Inset:** Maximum Micro Wind Turbine Height Exemption Applies Irrespective of Actual Building Height.



**Figure 7b:**  
No Restriction on the Number of  
Turbines Below the Maximum  
Permitted Height Allowed By Zoning.





## Micro Wind Turbine Systems: Setbacks

### Scenario 1: Freestanding Micro Wind Turbine

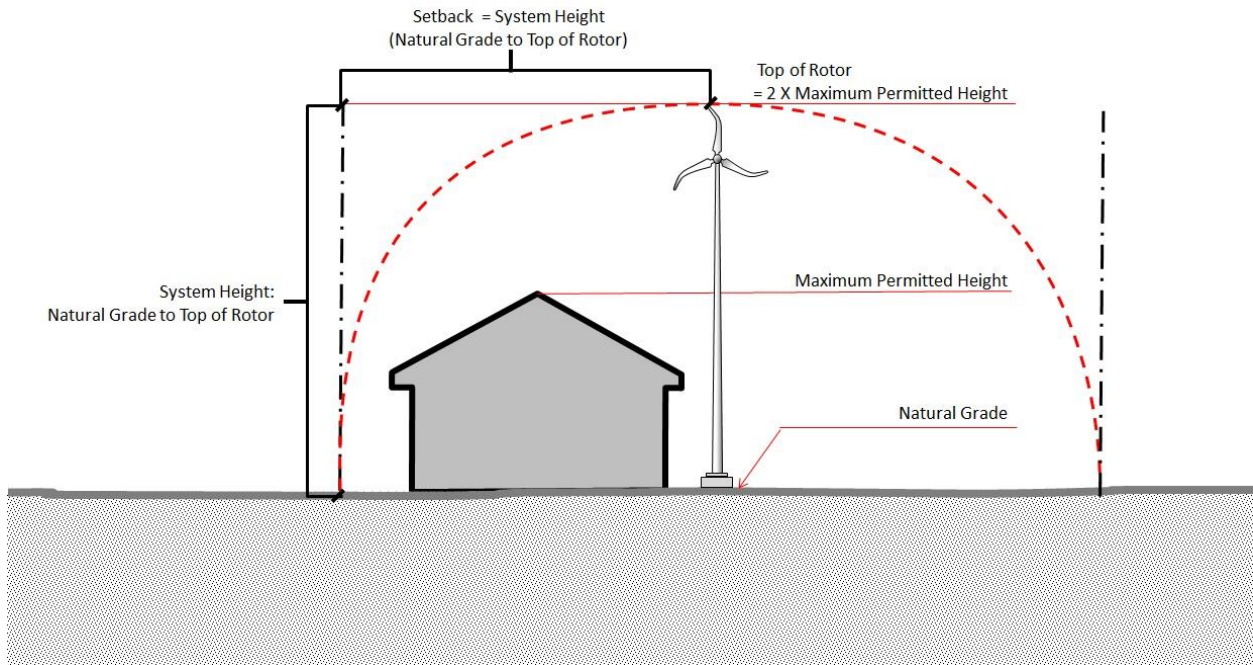


Figure 8: Setback for Freestanding Micro Wind Turbine

### Scenario 2: Micro Wind Turbine Affixed to the Side of a Building

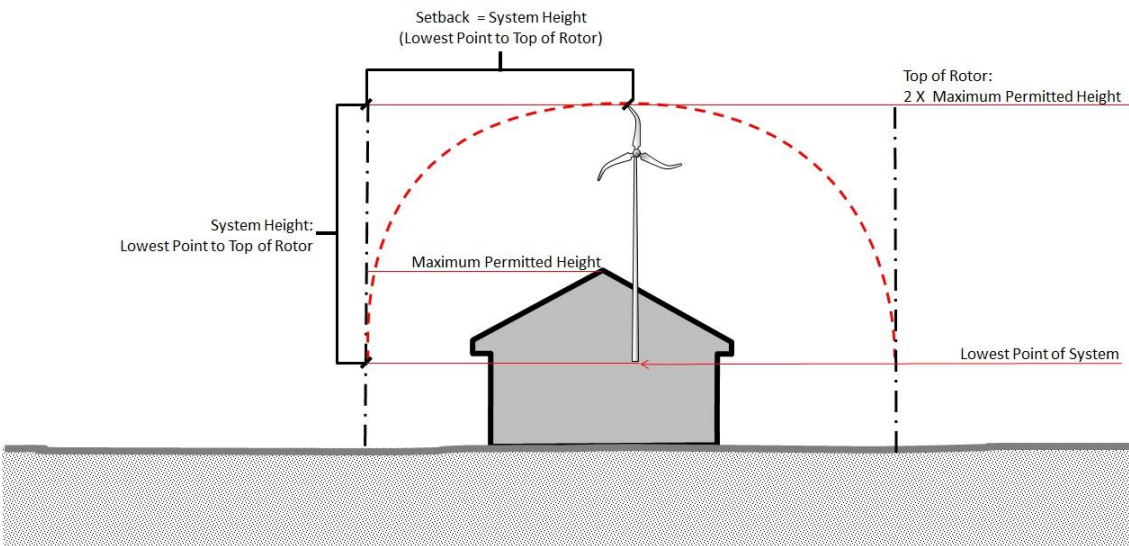
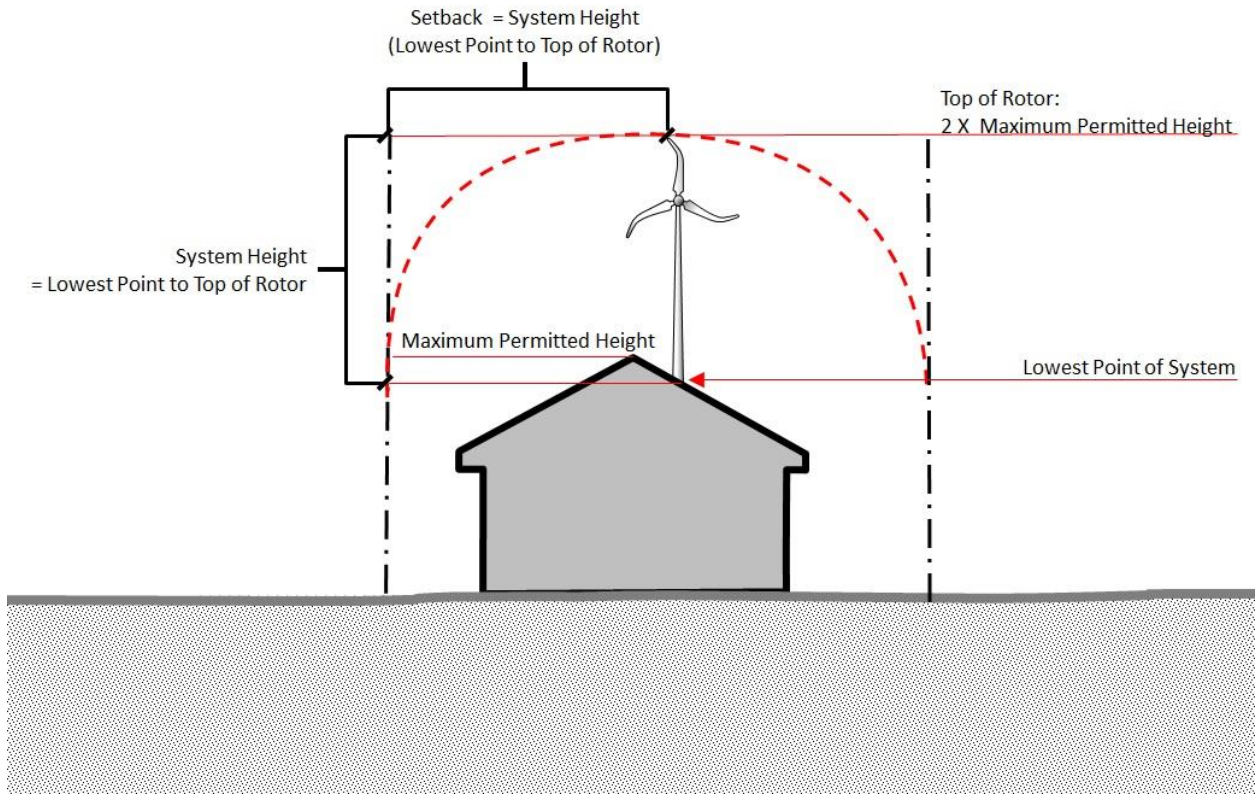


Figure 9: Setback for Micro Wind Turbine Affixed to Side of Building

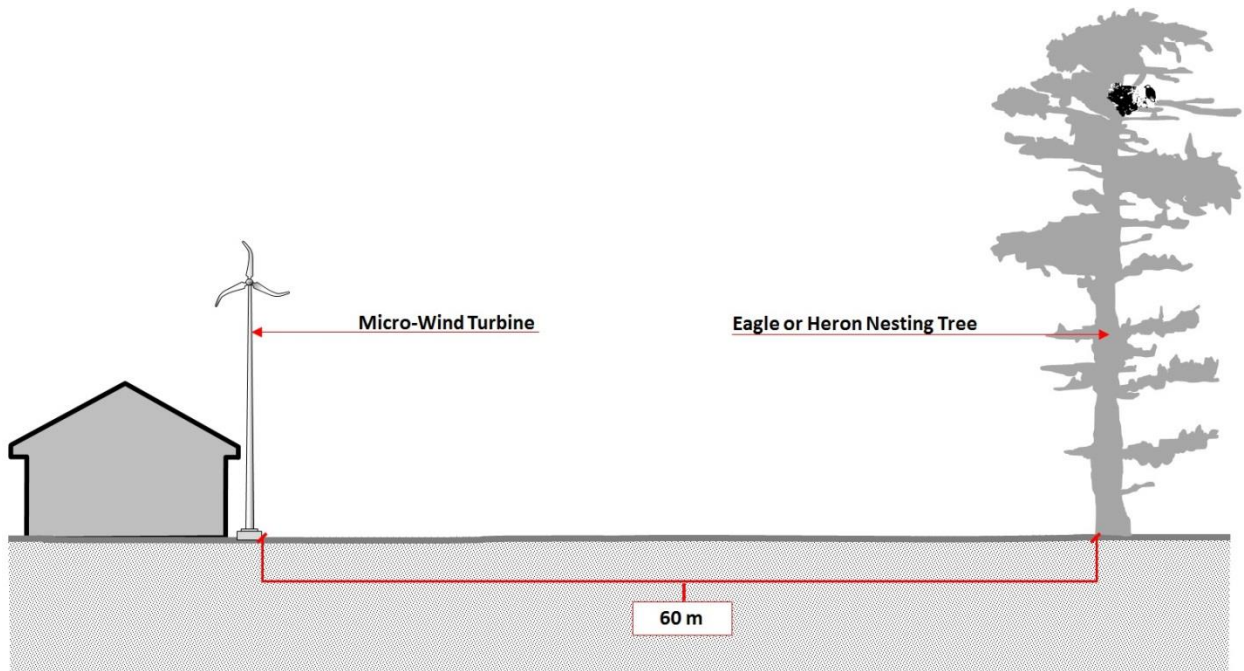


**Scenario 3: Micro Wind Turbine Affixed to the Roof of a Building**



**Figure 10: Setback for Micro Wind Turbine Affixed to Roof of Building**

**Scenario 4: Micro Wind Turbine in the Vicinity of an Eagle or Heron Nesting Tree**



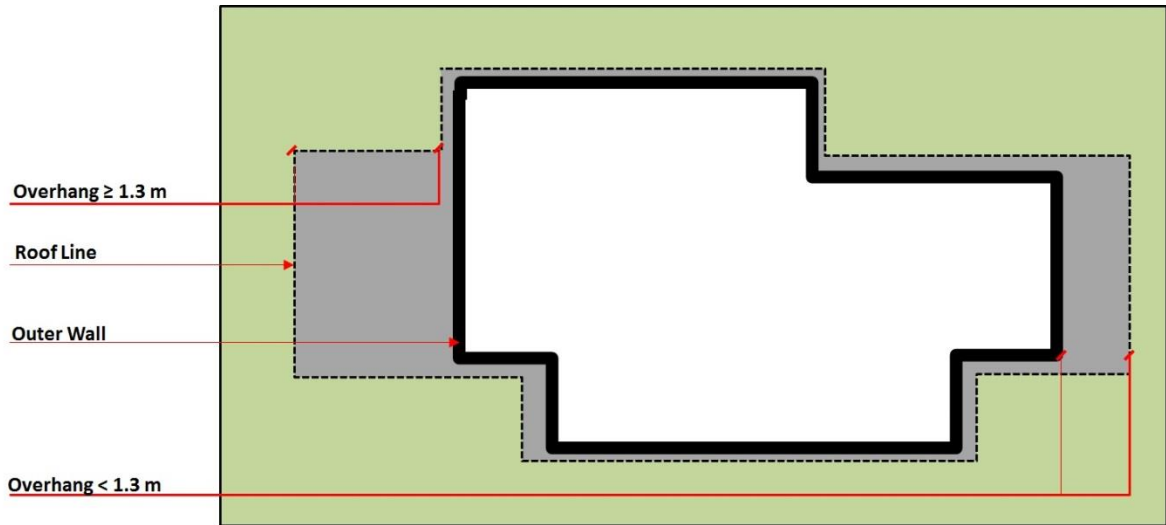
**Figure 11: 60 m Setback for Micro Wind Turbine From Eagle or Heron Nesting Tree**

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## Floor Area

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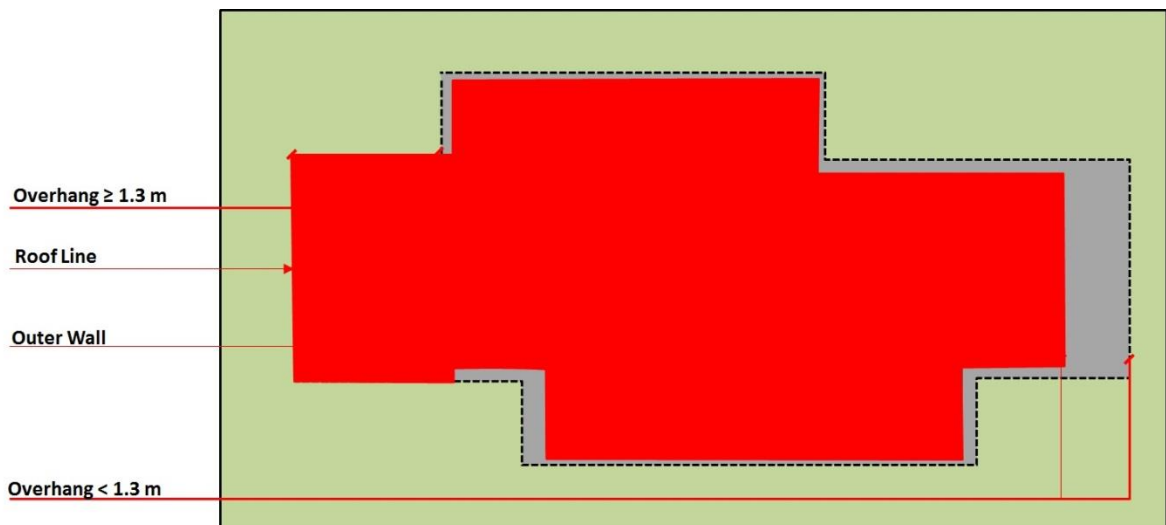
### Scenario 1: Hypothetical Dwelling with Large Overhangs



**Figure 12:** Diagram of Hypothetical Dwelling and Roofline

### Bylaw No. 500: Floor Area for Scenario 1 Dwelling

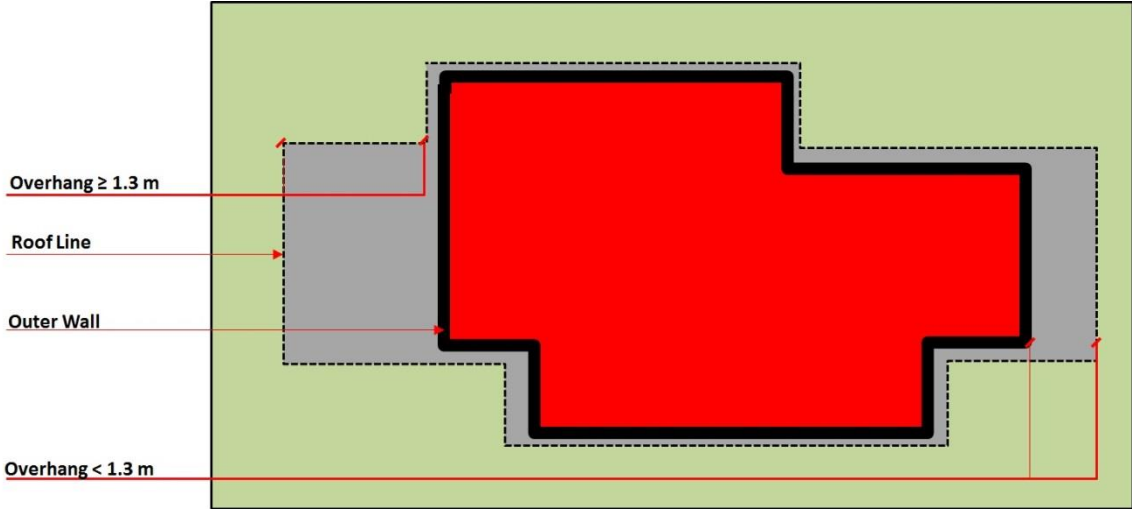
*Floor area means the sum total of the gross horizontal area of each floor of a building as measured from the outermost perimeter of a building, excluding roof overhangs of less than 1.3 metres.*



**Figure 13:** Diagram of Floor Area (Bylaw No. 500, 1987)

**Proposed Revision: Floor Area for Scenario 1 Dwelling**

*Floor area means the sum total of the gross horizontal area of each floor of a building as measured from the inside surface of outermost exterior walls.*



**Figure 18:** Diagram of Floor Area (Proposed)