

## **BASIC TOWER REQUIREMENTS for the BWC EXCEL 5 WIND TURBINE**

Customer supplied towers for the BWC EXCEL should meet the following requirements:

|                               |   |
|-------------------------------|---|
| <b>Tower Height:</b>          | 60 ft (18 m) minimum, 80 ft (24 m) or higher recommended  |
| <b>Design Wind Speed:</b>     | 120 mph (54 m/s)  |
| <b>Turbine Weight:</b>        | 775 lb (350 kg)   |
| <b>Turbine Thrust Load:</b>   | 1850 lb (840 kg) @ any wind $\geq$ 40 mph (18 m/s)  |
| <b>Yaw-Induced Moment:</b>    | 4500 ft-lb (6100 N-m)   |
| <b>Blade Clearance:</b>       | The top 9 ft (2.75 m) of the tower must not extend beyond a 15 inch (0.38 m) radius from the tower centerline.  |
| <b>Blade Flap Frequency:</b>  | 3.65 Hz   |
| <b>Tower Plumb Tolerance:</b> | Up to 0.25° tolerance from plumb allowed.   |
| <b>Tower Stiffness:</b>       | Tilt at the top of the tower should be no more than 2.0° for consistent furling. Deflection of monopole towers at 50 mph should be no more than 1.0% of tower height; at 120 mph no more than 2.5% of tower height. (For a 120 ft tower this would be 14.4 in and 36.0 in, respectively.) Overly flexible towers can cause vibration and/or fatigue problems. An engineer should approve the tower. |

### **Turbine Mounting:**

- Provisions shall be made for mounting strain relief for tower wiring, tower climbing anti-fall equipment and access holes where appropriate.
- The top of the tower shall be designed to allow the connection of the power cable to the turbine in the turbine's tower adapter plate.
- Tower connection adapter shall be made using the pattern illustrated below:

