

## ITEM OPPORTUNITY SYNOPSIS:

Item to be Scouted

Supplier Scouting Number

NAICS Code, if known

<b>TECHNICAL INFORMATION:</b>	<b>1. Describe the Item:</b>	
		<b>Please describe the item application/ the end use of item.</b>
	<b>Provide the item number <u>if applicable</u>: (N95 Mask vs Protective Mask).</b>	
	<b>2. Summary of Technical Specifications and Performance Requirements:</b>	<b>a. Provide dimensions / size / tolerances / performance specifications for the item.</b>
		<b>b. List required materials needed to make the product, including materials of product components, if applicable.</b>
		<b>c. Are there applicable certification requirements to supply this item? (i.e. ISO certification) Are there any applicable regulations that apply to the production of this item? (i.e. FDA regulations or EPA regulations) Are there any other standard requirements? (i.e. ASME Standard, IEEE Standard) Please specify.</b>
<b>d. Describe the manufacturing processes (elaborate to provide as much detail as possible).</b>		
<b>f. Additional Comments: Is there other information that would impact the item's performance or usefulness? Please explain.</b>		

<b>BUSINESS INFORMATION:</b>		<b>Potential Business Volume Estimate (i.e., # Units Per Day, Month, Year):</b>
		<b>Target Price / Unit Cost Information:</b>
<b>Delivery Requirements:</b>		<b>When is it needed by? (Immediate, 30 Days, 6 months, etc.)</b>
		<b>Describe packaging requirements (i.e., individually/ group packaging).</b>
		<b>Where is this opportunity located? Is there a preferred shipping proximity - if applicable?</b>
<b>Additional Comments:</b>		<b>Opportunities will be posted for 30 days unless another timeframe is given below</b>
		_____ days
		<b>Is there other information you would like to include?</b>

Photos or diagrams of the item (helpful but not required).

## Summary

Estimates of the loads on the ducted turbine designed at Clarkson University and installed on the roof of the TAC building at Clarkson have been determined to provide information for roof mount and ground mount monopole installations.

Three operating cases were considered:

- a) Normal Operating Conditions – up to approximately 11 m/s (25 mph)
- b) Stopped Rotor Condition – for wind speeds of 11 m/s to 60 m/s (25 to 133 mph)
- c) Duct at 90° to the oncoming wind – up to wind speeds of 60 m/s (133 mph)

The ducted turbine unit has a diameter of 3.7 m (12 feet) and a description of the geometry is included in this document. It can be ground mounted on a suitable tower, such as a standalone monopole, or roof-mounted on a tilt-up, guyed tower.

The loads were calculated in several ways to provide redundant sanity checks, including CFD, simple approximation estimates and fundamental analysis. FEA has also been conducted to look for any outstanding load point concentrations. Details of these load calculations can be found in the following document. These results are summarized below.

To accommodate a Class II wind rating of 59.5 m/s (133 mph), the maximum forces are:

- a) Horizontal forces ( $F_x$ ) acting on the hub centerline:

Normal operation: 10.2 kN (2293 lbs)

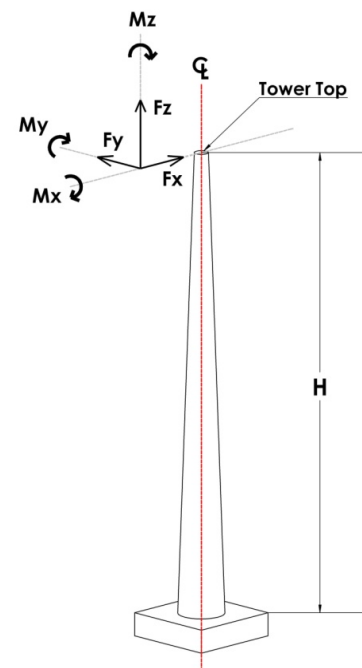
90° condition: 9.7 kN (2181 lbs)

- b) Moment Loads at Tower Bearing ( $M_y$ ):

Normal operation: 19.2 kNm (14,161 ft lbs)

- c) Gravitational Static Loads ( $-F_z$ ):

Turbine and duct weight (yaw bearing up): 2.1 kN (480 lbs)



The following document is divided into four sections:

1. Geometry
2. Loading Conditions and Analysis
3. Configurational Loads
4. TAC Tower Details