

# AEROACOUSTIC REMEDIATION

## In Situ: On - Site & On – Line

### TELECOM Equipment Shelter Application Note

#### THE HISTORY:

A major telecommunications company secured an “ideal location” for a cell site. Unfortunately, the proposed site was centered within an urban residential area. The surrounding community had been established long before the cell site was contemplated. Generally, in situations where a community has historical sites, documented building codes and/or county ordinances, obtaining a **NOISE** variance is usually difficult!

#### THE PROBLEM:

Wanting to be a good neighbor, the site owner was pro-active and addressed the anticipated **NOISE** in the planning phase, before it became an issue! Near proximity of equipment shelter to property line and multi-family dwelling (NAC Class-1 Residential Land Use) did not provide sufficient acoustical divergence to reduce equipment **NOISE** levels (reference Figure Number 1). Computer simulations indicated, simple turn-hoods would not only be ineffective but actually aggravate both acoustics and aerodynamics. On a cell site, the enclosed engine-generator (EnGen) is, usually, a primary source of **NOISE**. For Critical site locations, a shelter’s exterior wall mounted air-conditioning systems will also require acoustic attenuation (HVAC, reference Figure Number 1 & 3).

#### THE SOLUTION:

The site operator contacted Aeroacoustic Engineering Consultants (AEC) to provide an in situ fix. Drawing on a proprietary data base, AEC accomplished an aeroacoustic computer simulation of the installation and site topography based on client furnished data (no AEC site visit required).

Through rapid computer simulations utilizing inherent acoustic containment features of the shelter construction, AEC evolved a modular aeroacoustic system, based on empirical test data, which could be quickly installed in the existing openings for EnGen Air Intake and Radiator Discharge (reference Figure Number 2).



Figure 1



Figure 2



# ACOUSTICS, AERODYNAMICS & SITE TOPOGRAPHY ARE COMPUTER SIMULATED & SYSTEM INTEGRATED

Silencer modules may be mounted to the shelter's exterior surfaces as depicted in Figure Numbers 1 and 2, totally enclosed within the shelter's interior (space permitting) or divided into any combination of interior and exterior mountings as required (partial penetrations).

AEC modular design permits phased implementation, if desired, to assure a cost effective installation. With either a complete or phased system installation, AEC fully guarantees both acoustic and aerodynamic performance.

Should the HVAC system **NOISE** also exceed acoustic criteria, a modular sound attenuator system is available that has been aerodynamically sized for each application. Each attenuator system utilizes existing air intake and discharge grille bolt holes for a rapid installation (reference Figure #3). The pictured attenuator system will reduce HVAC **NOISE** by a nominal **20-dBA**. More attenuation is available with longer silencers.

## THE RESULTS:

After installing AEC's modular aeroacoustic system, the client conducted acoustic site tests. Client's e-mail to AEC stated, "AWESOME! We can only hear wind noise. It is difficult to get a good reading...lots of ambient noise but it looks like a minimum 25-dBA noise reduction!"

## THE CHALLENGE:

If you have an existing noise problem that requires rehabilitation or are embarking on a proposed project with an acoustic criteria, contact AEC for assistance starting with a "**FREE**" telephone consultation. From engineering services to noise abatement systems and aerodynamics through system installation, select any or all from the AEC "aeroacoustic supermarket." Just give us a call and let a qualified AEC engineer assist you to establish an effective, guaranteed solution. Tell us about your noisy problems then, let our over 30 years of experience with noise make your job easier.

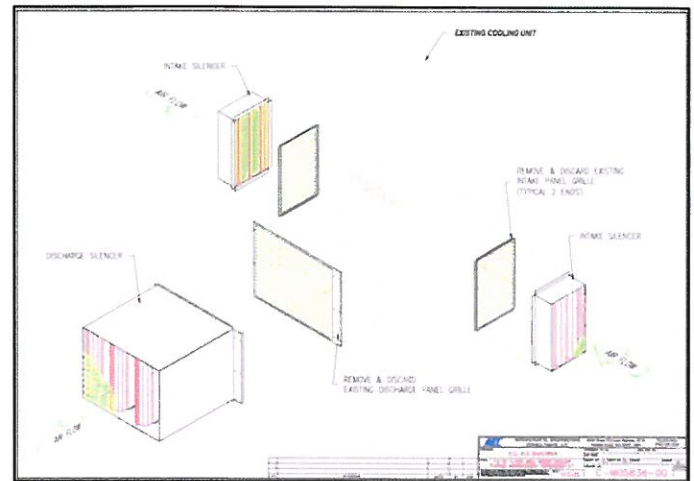


Figure 3



Figure 4



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