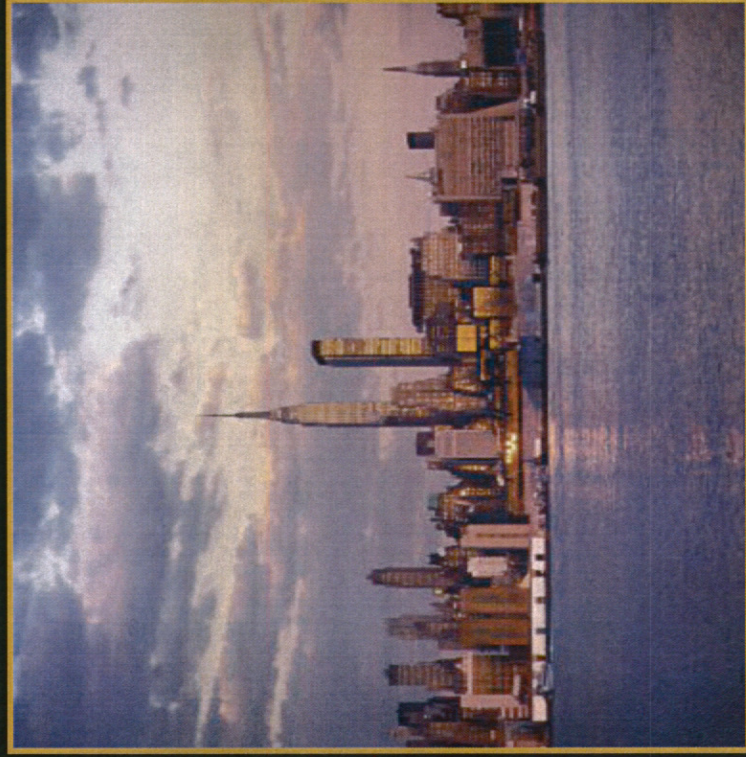


Buy Quiet in Construction

NIOSH Meeting, 9-10 November 2011

NYC DEP's Construction Noise Control Products & Vendor Guidance Sheet



Erich Thalheimer

INCE Board Certified

Senior Noise Engineer

Parsons Brinckerhoff (PB)

(617) 960-5039

Thalheimer@pbworld.com

CITY NOISE

SOURCES

TRAFFIC

Automobiles
Trucks
Buses
Motorcycles
Horns
Brakes
Cut-outs
Gears
Defective--
Mufflers
Exhaust
Whistles
Rattling--
Parts
Rattling--
Loads
Sirens
Bells
Doormen's
-Whistles

TRANSPORTATION

Trolley Cars
Trains ---
Subway
Elevated
Railroads
Turnstiles
Brakes
Rattling--
Wheels
Bodies
Defective--
Switches
Joints
Wheel Impact
Whistles
Bells
Steam & Other
-Exhausts
Shifting--
Cars

BUILDING OPERATION

Pneumatic
Drills &
Riveters
Exhausts from
Steam &
Gasoline-
Hoists -
Shovels -
Pile ---
Drivers
Blasting
Unloading
Loading
Shouting
Compressors

HOMES

Loud --
Speakers
Pianos
Phonographs
Musical --
Instruments
Late
Parties
Barking Dogs

STREETS

Radio &
Music --
- Stores
- Peddlers
Loiterers &
Garage &
- Taxi -
Stands

HARBOR & RIVER

Whistles
Bells
Sirens
Motor --
- Exhausts
Horns

COLLECTION DELIVERIES

Ash
Garbage
Milk
Papers
Food
Mail
Express

MISCELLANEOUS

Airplanes
Factories
Restaurants
Amusement
-Halls

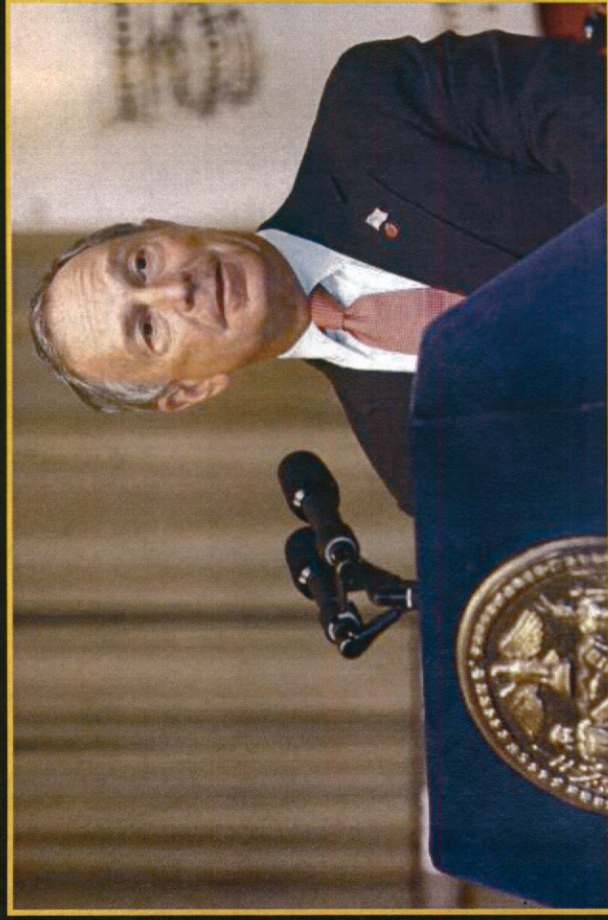


City of New York
Department of Health
Bureau of Health Statistics
Noise Abatement Commission
Staff - Artist

1939 New York City Noise Card

Initiative Announcement

First update of NY City's Noise Code in 30 years



~ Mayor Michael Bloomberg, Oct 2002

"Operation Silent Night aims to effectively fight and control the loud, excessive noise that plagues too many neighborhoods throughout the five boroughs. This coordinated, multi-agency initiative will specifically target those locations where noise adversely affects our everyday lives so New Yorkers may live, work, and enjoy the City in peace."

Noise Regulation Developers



New York City Department of Environmental Protection

- Oversees services for 8 million residents
- Air, water, noise, hazmat pollution
- Charles Shamoon, Assistant Counsel
- www.NYC.gov/dep



Parsons Brinckerhoff (PB)

- Worldwide Engineering Firm
- Transportation and Infrastructure
- Nearly 125 years old; 55,000 staff
- www.PBworld.com

Prior Work Leading to Regulations



Central Artery/Tunnel Project

Noise Control Program (1995-2005)

Noise Specification 721.560

Federal Highway Administration

Roadway Construction Noise Model (RCNM)

Highway Construction Noise Handbook (2006)



Equipment Description	Lmax Noise Limit at 50 ft, dBA, slow	Equipment Description	Lmax Noise Limit at 50 ft, dBA, slow
All other equipment > 5 HP	85	-- continued --	-- continued --
Auger Drill Rig	85	Grader	85
Backhoe	80	Horizontal Boring Hydraulic Jack	80
Bar Bender	80	Hydra Break Ram	90
Blasting	94	Impact Pile Driver	95
Boring Jack Power Unit	80	Insitu Soil Sampling Rig	84
Chain Saw	85	Jackhammer	85
Clam Shovel	93	Mounted Hammer (hoe ram)	90
Compactor (ground)	80	Paver	85
Compressor (air)	80	Pickup Truck	55
Concrete Batch Plant	83	Pneumatic Tools	85
Concrete Mixer Truck	85	Pumps	77
Concrete Pump	82	Rock Drill	85
Concrete Saw	90	Scraper	85
Crane (mobile or stationary)	85	Slurry Plant	78
Dozer	85	Slurry Trenching Machine	82
Dump Truck	84	Soil Mix Drill Rig	80
Excavator	85	Tractor	84
Flat Bed Truck	84	Vacuum Excavator (vac-truck)	85
Front End Loader	80	Vacuum Street Sweeper	80
Generator (25 KVA or less)	70	Vibratory Concrete Mixer	80
Generator (more than 25 KVA)	82	Vibratory Pile Driver	95
Gradall	85	Welder	73

NYC DEP Noise Control Strategy



Proactive

- Proactive Avoidance of Noise
- Noise Mitigation Plans
- Technical Assistance Available
- **Products & Vendor Guidance Sheet**

To guide and assist contractors in finding and selecting quieter equipment and control methods



Reactive

- Reactive Enforcement Ability
- Noise Compliance Limits (FHWA RCNM)
- Stop Work Orders / Possible Fines

Products & Vendor Guidance Sheet

http://www.nyc.gov/html/dep/pdf/construction_guidance.pdf

Construction Noise Control Products and Vendor Guidance Sheet

23 March 2007

Distributed by:
New York City Department
Of Environmental Protection

The following is intended to provide guidance to construction contractors with respect to finding and selecting suitable noise control products. These products and vendors may be helpful to contractors for achieving compliance with the New York City Noise Regulations. These items are provided only as suggestions for contractors to consider and should not be construed as an official endorsement of any product and/or vendor by the City of New York. Contractors are free to choose other products/vendors that meet the requirements of such Code. This sheet will be updated from time to time as new noise control technologies gain acceptance.

ACOUSTICAL WINDOWS

- Harvey Industries
- Acoustical Windows
- Peerless Products
- Quiet Window
- Acoustic Standards
- Soundproof Windows
- Soundproof Windows

WHITE NOISE MACHINES

- Marpac
- Sound Screen
- Speech Privacy Systems
- Sonet System

PILE DRIVERS

- Ken-Jet
- Silent Piler

DOZERS

- John Deere
- 450H, 550H
- D6R III

LOADERS

- L50E
- Volvo
- 444J
- 950

GRADERS

- Caterpillar
- 14H, 12E, 12F, 140

SCAPERS

- Caterpillar
- 613

BACKHOES

- Caterpillar
- 420D, 416D
- John Deere
- 410G
- Case
- 680C

EXCAVATORS

- John Deere
- 35D
- Caterpillar
- 307C

TRACTORS

- John Deere
- 2101E
- Caterpillar
- 621G

HOE RAMS

- Chicago Pneumatic
- CP 100, CP 400
- Allied
- Hammer Head
- Allied-Rammer
- City Series

SKID STEERS

- Caterpillar
- 246B, 226B

DUMP TRUCKS

- John Deere
- 250C, 400C

ROLLERS

- Multiquip
- AR20-2

CRANES

- Link-Belt
- 218-HSL
- American
- 5299
- Bucyrus Erie
- 308

GENERATORS

- Multiquip
- G629R, G636HA
- Atlas
- VSS-1250d, VSS-1700d

STREET SWEEPERS

- Elgin
- GeoVac
- A-7000
- Schwarze

BACKUP ALARMS

- Preco Electronics
- Ecco Group
- Grota Industries
- Brigade Electronics
- 200 Series, 45 Series, 6000 Series
- Smart Alarms, 500 Series, 700 Series
- Model 73040
- BBS-TEK Series

JACKHAMMERS

- Better World
- Atlas Copco
- Chicago Pneumatic
- Makita
- Gentle Jack
- TEX PE Series
- CP 1240-S
- Makita HM1810

VACUUM EXCAVATORS (VAC-TRUCKS)

- Guzzler
- GapVax
- LR ACE
- HV Series
- www.precor.com
- www.eccolink.com
- www.grota.com
- www.bbs-tek.com
- www.bvannetwork.com
- www.alliasorb.com
- www.cd.com
- www.makita.com
- www.guzzler.com
- www.gapvax.com
- www.carsonite.com
- www.soundfighter.com
- www.kineticnoise.com
- www.soundseal.com
- www.illbruck-sonex.com
- www.mccullainsilence.com
- www.universalsilencers.com
- www.burgessmanning.com

NOISE BARRIERS

- Carsonite
- Sound Fighter
- Kinetics
- one inch plywood is rated at 30 STC.
- Sound Barrier
- LSE Sound Barrier
- Noise Block

NOISE CURTAINS

- Sound Seal
- Illbruck Acoustic
- McCullin Ai-Silence
- BBC-13-2
- SONEX Curtain
- Fibersorb Curtains

SILENCERS & MUFFLERS

- Universal Silencers
- Burgess Manning
- Silencers
- Silencers

How to get on “the list”

Any construction equipment may be used in NYC providing it meets DEP’s noise emission limits

1. Have equipment Lw or Lp tested in accordance with standards
2. Submit results to Charles Shamoon (NYC DEP) or Erich Thalheimer (PB)
3. Will be rank ordered by Lw or Lp
4. Quietest several will be featured on the Products & Vendor List
5. List updated as appropriate



Equipment Sound Level Standards

Standard	Description
SAE J88	Society of Automotive Engineers Standard J88 Sound Measurement of Off-Road Work Machines
SAE J1805	Society of Automotive Engineers Standard J1805 Sound Power Level Measurements of Work Machines
EU 2005/88/EC	European Union Directive 2005/88/EC Noise Emission in the Environment by Equipment for use Outdoors
ISO 3744	International Standards Organization 3744 Determination of sound power levels using sound pressure
ISO 4872	International Standards Organization 4872 Measurement of noise emitted by construction equipment used outdoors
ISO 6395	International Standards Organization 6395 Measurement of exterior noise emitted by earth-moving machinery
ANSI S12.23	American National Standards Institute S12.23 Method for determination of sound power emitted by machinery/equipment
ANSI S12.51 – S12.57	American National Standards Institute S12.51 – S12.57 Determination of sound power levels of noise sources using sound pressure [Various Methods: anechoic, hemi-anechoic, reverberant, comparison]

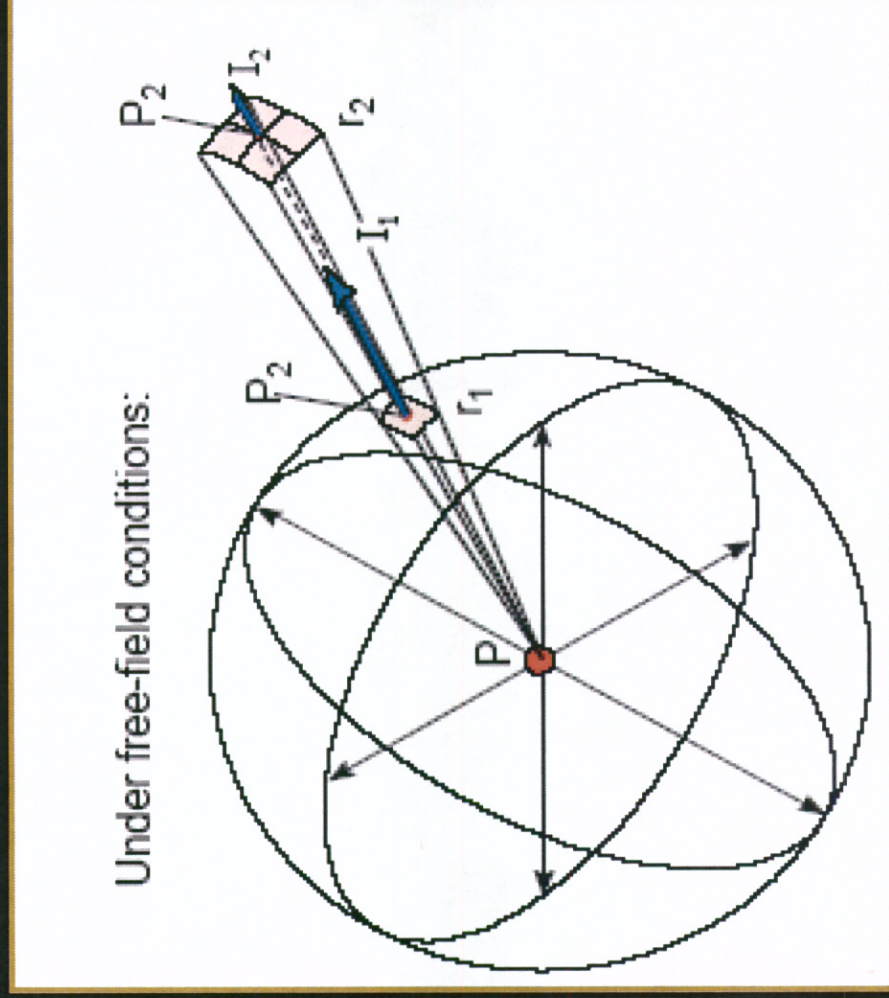
Sound Level Metrics

- **L_w - Sound Power Level**
 - Characteristic of the source
 - Independent of environment
$$L_w = 10 \text{ Log } (W/W_0) \quad W_0 = 1pW$$

- **L_I - Sound Intensity Level**
 - Power per unit area
 - Vector quantity with magnitude and direction
$$L_I = 10 \text{ Log } (I/I_0) \quad I_0 = 1pW/m^2$$

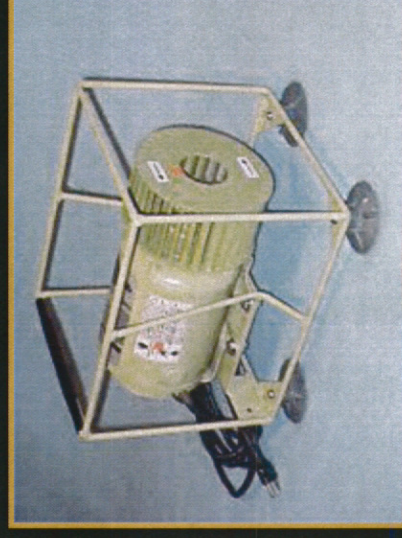
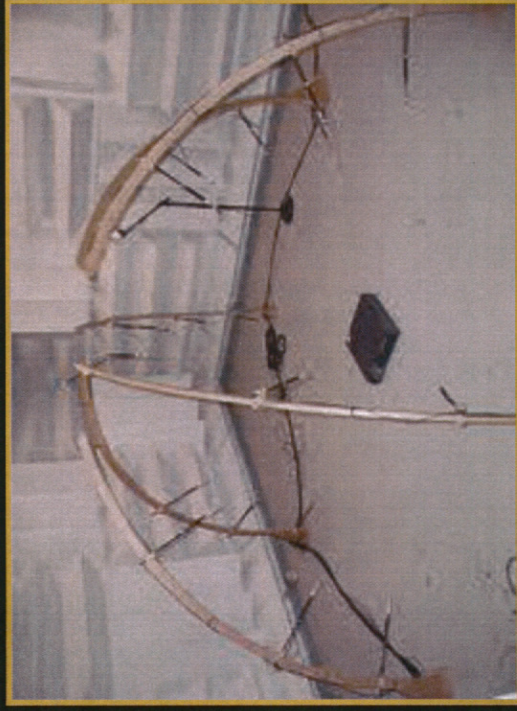
- **L_p - Sound Pressure Level**
 - What humans hear
 - Depends on environment
 - Measurable

$$L_p = 10 \text{ Log } (P/P_0)^2 \quad P_0 = 20\mu Pa$$



Sound Power Determination

- Able to compute sound POWER from PRESSURE measurements
- Controlled acoustic environment
- Anechoic or Reverberant
- Multiple Lp measurements averaged over surface area
- Or comparison to a Reference Sound Power Source (fan)



Benefits of "the list"

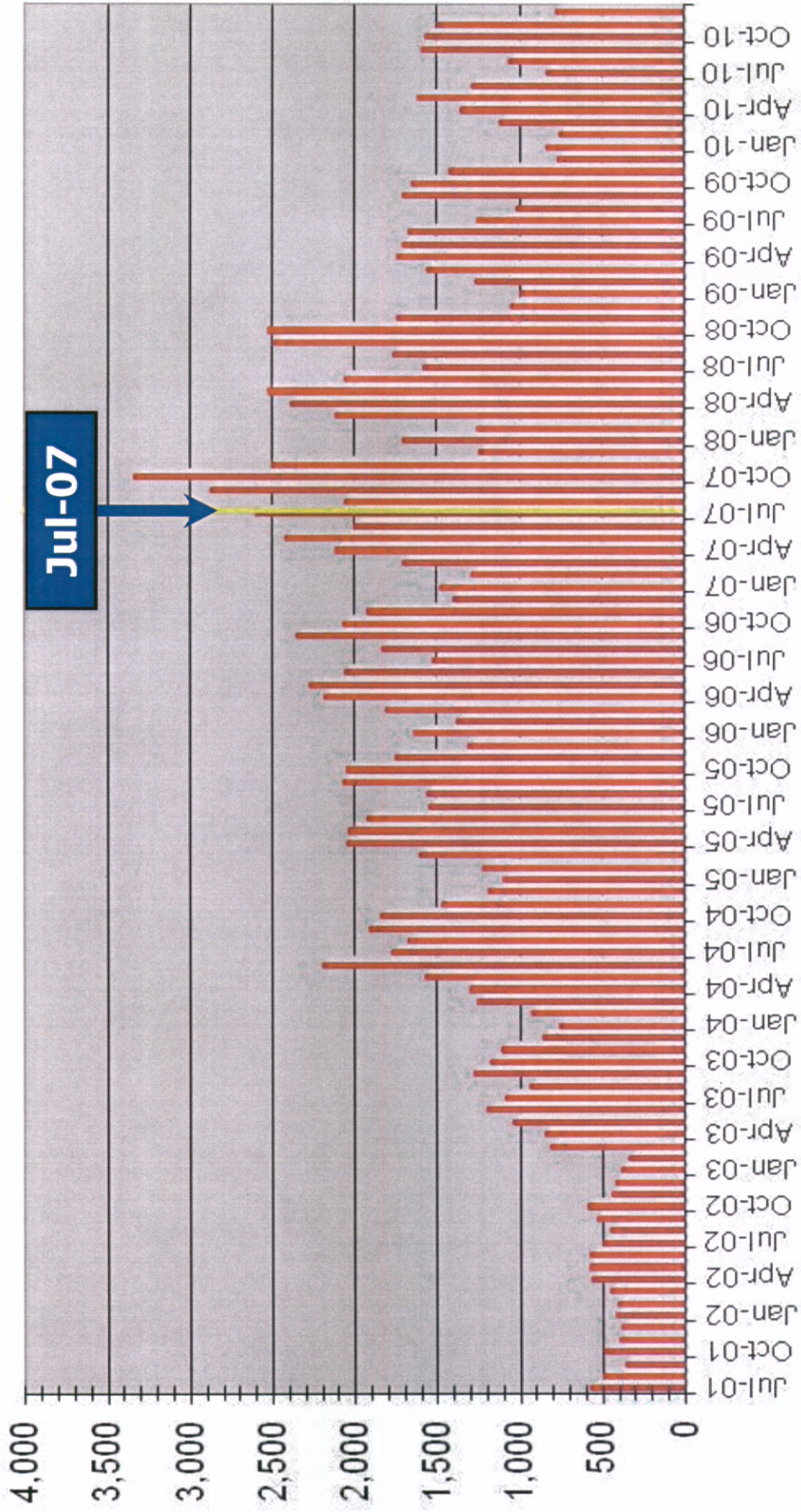


- Provides a good starting place for contractors to find quieter equipment and noise control products
- A positive example of NYC DEP working constructively with those affected by noise regulation
- Eliminates contractor's excuse of "no such equipment exists"
- Provides competitive commercial pressures for manufacturers to make quieter equipment to be seen on "the list"



NYC Construction Noise Complaints

NYC DEP 311 Construction Noise Complaints
Per Month, Jul-01 through Dec-10



Industry and Public Reaction



✓ Winner - 2010 NIOSH/NHCA Safe-In-Sound Award




✓ Winner - 2009 ACEC Silver Award
Hundreds of articles in the US, Britain, India, Russia, China



✓ Television, Radio, Internet press
✓ *Technology for a Quieter America*
National Academy of Engineering

InterNoise 2012 will be in NYC

- *Quieting the World's Cities*
- Plenary Session featuring NYC Noise Code
- August 19 - 22, 2012
- Marriott Marquis in Times Square
- Website: www.internoise2012.com



inter.noise
2012
august 19-22
new york city. usa

Quieting the World's Cities

