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New York City: the (E) designation and restrictive declaration

Benjamin H. Sachwald^{a)}
AKRF, Inc.
440 Park Avenue South, 7th Floor
New York, NY 10016 USA

Urban areas are typically associated with high noise levels. With a population of more than eight million and growing, New York City is one of the largest cities in the world. In New York City, because of the population density and the wide variety of land uses (ex: residential, commercial, transportation, manufacturing and industrial) that exist in close proximity, it is common for a residential building to be located in an area with ambient noise levels that would be considered unsuitable for residential use. To protect inhabitants of a planned building to be located in an area with high ambient noise levels, an (E) designation or a Restrictive Declaration may be used to ensure that the building's interior environment meets a certain acoustical design criterion. In this paper, the (E) designation is defined, its regulatory process is outlined, the acoustical design criterion is discussed, and examples of common mistakes for noise (E) designation projects are listed.

1 INTRODUCTION

Urban areas contain a wide variety of noise sources: vehicular, rail and aircraft traffic; manufacturing and industrial uses; outdoor mechanical equipment; business and commercial uses, nightclubs, etc. Consequently, urban areas are typically associated with high noise levels. Often these high noise levels exist during the majority of the day and/or night (sometimes they even exist 24 hours a day, 7 days a week). With a population of more than eight million and growing, New York City is one of the largest cities in the world. As a result of the population density and the wide variety of land uses (ex: residential, commercial, transportation, manufacturing and industrial) that exist in close proximity, it is common for a residential building to be located in an area with ambient noise levels that would be considered unsuitable for residential use. When the City rezones an area or when an Applicant proposes a development which requires discretionary action (ex: proposed development does not conform to existing zoning, funding is provided by a city, state or federal agency, etc.) the New York City environmental review process requires a noise study. Based on the noise study results, an (E) designation or a Restrictive Declaration may be used to protect inhabitants of a planned building which would be located in an area with high ambient noise levels by ensuring that the building's interior environment meets a certain acoustical design criterion. The main difference between an (E) designation and a Restrictive Declaration is the following: an (E) designation is used when there is no Applicant who controls/owns a site to be rezoned, while a Restrictive Declaration is

^{a)} Email address: bsachwald@akrf.com

used when there is an Applicant who controls/owns a site to be rezoned. Other than that, an (E) designation and a Restrictive Declaration function similar and share a common noise-related goal: to ensure that the building's interior environment meets a certain acoustical design criterion. The regulatory processes for an (E) designation and Restrictive Declaration are very similar, but for purposes of this paper, the focus will be on the (E) designation. In this paper, the (E) designation is defined, its regulatory process is outlined, the acoustical design criterion is discussed, and examples of common mistakes for noise (E) designation projects are listed.

2 WHAT IS AN (E) DESIGNATION¹?

An (E) designation is a zoning map designation that provides notice of the presence of an environmental requirement on a particular tax lot. (E) designations are established as part of a change in zoning that would allow additional development to occur on property, or would permit uses not currently allowed. In New York City, a zoning change is a discretionary action that is subject to an environmental review pursuant to state and local law (ex: City Environmental Quality Review [CEQR]). For example, if an area is proposed to be rezoned, and the accompanying CEQR environmental analysis concludes that development on a specific tax lot may be affected by a site-specific environmental condition, then the City Planning Commission and City Council will most likely establish an (E) designation (or Restrictive Declaration) on the Zoning Map (see Figure 1).

In New York City, there are three types of (E) designations: air quality (i.e., exhaust stack location limitations, fuel type restrictions), hazardous materials (i.e., tax lot was used as or is in close proximity to a gas station or some other underground fuel oil tank, located in or adjacent to a manufacturing district or an area with a history of manufacturing uses), and noise (i.e., tax lot located near a heavily trafficked roadway/railroad/airport). Often an (E) designation is established when a tax lot has some other environmental condition on the property or nearby that is a cause for concern (ex: a dry cleaning business once occupied a tax lot, stationary source of noise adjacent to a tax lot, etc.). The purpose of an (E) designation is to guarantee that appropriate testing and remediation, if necessary, occur on a rezoned property prior to development. If the zoning of a particular tax lot is changed and an (E) designation is assigned to the tax lot², the owner of the tax lot may continue to use their property in any legal manner (i.e., the same as was done before establishment of the (E) designation) for an unlimited duration. However, in general, before any new construction or change in use can take place on an (E) designation property, the environmental requirements of the (E) designation must be satisfied. This paper focuses on the noise (E) designation.

3 NOISE (E) DESIGNATION ACOUSTICAL DESIGN CRITERION

AKRF worked with the City to develop the noise portion of the CEQR Technical Manual which sets interior noise level requirements for buildings. The goal of a noise (E) designation is to provide an interior noise level of 45 dBA L₁₀₍₁₎ or less for residential, school, hospital, etc. uses; for commercial office, retail, etc. an interior noise level of 50 dBA L₁₀₍₁₎ or less is permitted. To meet this design goal, a closed-window condition is required. Consequently, a

¹ An (E) designation is often referred to as a "little 'e' designation." The New York City Department of City Planning (NYC DCP) and AKRF use the following nomenclature: (E) designation. For example: the tax lot contains a noise (E) designation.

² When there is a merger or subdivision of tax lots or zoning lots with an (E) designation for either improved or unimproved properties, the (E) designation will apply to all portions of the tax lots or zoning lots.

means of alternate ventilation (i.e., central air conditioning, Package Terminal Air Conditioning [PTAC] units, etc.) is required.

4 THE CEQR PROCESS

When a change in zoning is proposed, noise monitoring is performed as part of the CEQR process. Usually, due to the size of the area to be rezoned, uncertainty in the specific location of potential development sites, and time/budget constraints, noise monitoring is not performed at every tax lot in the rezoning area. Instead, representative noise monitoring locations are selected to provide geographic coverage of the rezoning area and to identify any notable site-specific noise conditions (ex: elevated subway line). Currently, the CEQR process assigns noise (E) designations in 5 dBA increments starting at 30 dBA (ex: 30 dBA, 35 dBA, 40 dBA, 45 dBA, etc). For example, if the maximum measured $L_{10(1)}$ value at a site is 78 dBA, 35 dBA of attenuation would be required for residential development. A site with a noise (E) designation of 35 dBA means that a building façade design must provide 35 dBA of composite window/wall attenuation and a means of alternate ventilation. Since the Sound Transmission Class (STC) rating does not account for low frequency transportation noise below 125 Hz, the STC rating is not an appropriate metric for urban building façade acoustical design. The Outdoor-Indoor Transmission Class (OITC) rating was designed to evaluate building elements by their ability to reduce the overall loudness of ground and air transportation noise. Consequently, the City uses the single number OITC rating to evaluate whether a building façade design satisfies the noise (E) designation requirements. To satisfy a site's noise (E) designation requirements, the composite OITC rating of a building façade's walls, doors, glazing, louvers, and combinations thereof must be greater than or equal to the attenuation requirements listed in the noise (E) designation.

5 WORKING ON A PROJECT WITH A NOISE (E) DESIGNATION

An important member for a project team is a qualified acoustical consultant with both the technical expertise in architectural acoustical design and the ability to navigate the (E) designation process. AKRF's technical expertise in architectural acoustical consulting and experience with (E) designation projects has resulted in a long history of helping clients and their architects through the New York City (E) designation process. Additionally, AKRF has worked on a large portion of the New York City Environmental Impact Statements (EIS) which establish (E) designations. When an acoustical consultant is contacted about a potential project to be located on a site with a noise (E) designation, it is important to identify the following information:

1. What level of attenuation does the (E) designation delineate? The cost of glazing that provides 35 dBA or more of composite window/wall attenuation is significantly greater than glazing that would provide 30 dBA of composite window/wall attenuation. Additionally, if 35 dBA or more composite window/wall attenuation is required, central air conditioning would be required to prevent a direct path for sound via an outdoor-to-indoor mechanical connection (i.e., PTAC unit) since noise takes the "path of least resistance."
2. Were site-specific measurements performed as part of the environmental review process (and if so, how old is the data)? If not, typically measurements are recommended to update/fine-tune a site's specific attenuation requirements.

3. What type of uses would the proposed building contain? This is important because it establishes whether the acoustical design goal for the proposed building/specific elevations of the proposed building is an interior noise level of 45 dBA $L_{10(1)}$ or 50 dBA $L_{10(1)}$.
4. What are the specifics of the proposed building design? Are there facades that will not contain glazing? Are there any setbacks that would increase the distance/shield sensitive uses from the major sources of noise? What is the proposed height of the building? Computer modeling may be used to demonstrate that less attenuation is required for the higher elevations.

Items 1 through 4 listed above and discussions with the developer/architect are used to formulate a game plan to address the noise (E) designation requirements. The acoustical consultant should work closely with their client to understand the intended use of each space and identify important factors necessary to achieve a successful acoustical design that satisfies both the noise (E) designation requirements and the architect's design goals. In addition to working with the architect on the acoustical design of the proposed building façade, the acoustical consultant should act as a liaison with the City Agency responsible for (E) designation enforcement. In addition to our technical expertise and experience in architectural acoustical design, AKRF has developed an excellent rapport with the City agency responsible for enforcing (E) designations which is invaluable to a client.

6 (E) DESIGNATION REGULATORY PROCESS

Until the beginning of 2009, the New York City Department of Environmental Protection (NYC DEP) had the responsibility of enforcing (E) designation requirements. Now the responsibility of enforcing (E) designation requirements has been transferred to the Mayor's Office of Environmental Remediation (OER). As previously mentioned, site-specific measurements or computer modeling may be performed as part of the proposed building façade acoustical design. Prior to performing any measurements or modeling, a protocol outlining the measurement/modeling plan should be developed and submitted to OER for their review³. Upon approval of the protocol, the measurements/modeling can commence. Starting work prior to OER protocol approval may result in an acoustical design that will not get (E) designation approval or the need to redo measurements. When dealing with a site that contains a noise (E) designation, there are two milestones related to (E) designation approval: the Notice to Proceed (NTP) and the Notice of Satisfaction/Notice of No Objection (NOS/NNO). To obtain an NTP from OER, it must be demonstrated that the proposed building facade acoustical design will satisfy the interior noise level criterion. An NTP is one of many documents/permits that must be obtained prior to the commencement of most construction activities. After the NTP is obtained, OER must approve any acoustics-related changes to the building façade design (ex: if a different glazing is selected). When the construction of the building façade elements and installation of alternate ventilation is complete, an NOS⁴ should be sought. In order to achieve an NOS, it must

³ When a proposed project to be located on a tax lot with a noise (E) designation goes through the environmental review process (ex: CEQR) and site-specific noise monitoring is performed, OER will adjust a tax lot's attenuation requirements based on the results of this site-specific noise monitoring and consequently an OER approved protocol for site-specific measurements is typically not required.

⁴ An NOS is for when a Certificate of Occupancy is sought, and an NNO is for when a Temporary Certificate of Occupancy is sought (ex: when the first 15 floors of a building are complete, but higher elevations are still under construction).

be demonstrated to OER that the commitments delineated in the NTP have been satisfied. An NOS is required to obtain a Certificate of Occupancy from the Department of Buildings.

7 COMMON MISTAKES FOR NOISE (E) DESIGNATION PROJECTS

A common error for projects that contain a noise (E) designation is the use of the STC metric to design the building façade. In New York City, the average non-masonry exterior wall façade has an approximate OITC value in the 30s, while the average masonry exterior wall façade typically has an OITC value of at least 40. Consequently, the composite OITC rating of a building façade is often driven by the glazing selection. As shown in Table 1, the OITC rating is typically less than the STC rating. This is due to the fact that the OITC rating, unlike the STC rating, accounts for low frequency energy between 80 Hz and 125 Hz; for most glazing assemblies, transmission loss values are often much less at lower frequencies than transmission loss values at frequencies greater than 250 Hz. Therefore, if glazing with an STC rating of 35 was selected (instead of a glazing with an OITC rating of 35) the OITC rating will almost always fall short of the design goal. In these cases, one of the following scenarios is likely to occur:

1. The project budget is established based on the purchase of glazing selected by the STC rating but the glazing has not yet been installed. Purchasing a window with the appropriate OITC rating typically adds additional unforeseen cost. Costly project delays might also result if the incorrect glazing has already been ordered.
2. Glazing is purchased based on the STC rating and has already been installed. In this situation, it is often cost prohibitive to replace the glazing. For these cases, as a first step, it is typically recommended that the acoustical consultant perform a series of 24-hour continuous noise measurements to determine if the interior noise level goal of 45 dBA $L_{10(1)}$ / 50 dBA $L_{10(1)}$ was achieved.

The two situations described above have the potential for cost implications and can result in delays for a project with a noise (E) designation. Since it is usually more expensive to fix an acoustical problem after the fact, properly addressing noise (E) designation issues early in the design process is critical for a successful project. Additionally, by adding a qualified acoustical consultant to a project's design team, the two situations described above can be avoided, saving a project both time and money.

8 CONCLUSIONS

In the urban environment, it is common for a noise-sensitive (i.e., residential, school, etc.) building to be located in an area with ambient noise levels that would be considered unsuitable for a residential/school/etc. development. In New York City, to protect inhabitants of a planned building to be located in an area with high ambient noise levels, an (E) designation or a Restrictive Declaration may be used to ensure that the building's interior environment meets a certain acoustical design criterion. The honorable goal of a noise (E) designation or Restrictive Declaration is clear: to provide an interior noise level of 45 dBA $L_{10(1)}$ or less for residential, school, hospital, etc. uses (for commercial office, retail, etc. an interior noise level of 50 dBA $L_{10(1)}$ or less is permitted). A qualified acoustical consultant who can successfully guide a project through the (E) designation (or Restrictive Declaration) process is an important member for a project's design team and, as described above, typically saves a project both time and money.

Table 1 – Comparison of OITC and STC ratings for various glazing compositions

Glazing Composition	OITC	STC	Difference (STC minus OITC)
3mm glass ply – 6mm air space – 3mm glass ply	26	28	2
6mm glass ply – 13mm air space – 6mm glass ply	30	35	5
6mm glass ply – 13mm air space – 8mm glass ply	33	38	5
8mm glass ply – 13mm air space – 10mm glass ply	35	41	6
6mm glass ply – 25mm air space – 5mm glass ply – 0.76mm pvb layer – 5mm glass ply	34	42	8
5mm glass ply – 17mm air space – 10mm glass ply – 0.76mm pvb layer – 5mm glass ply	35	43	8
6mm glass ply – 19mm air space – 5mm glass ply – 1.52mm pvb layer – 5mm glass ply	36	44	8
6mm glass ply – 1.52 mm pvb layer – 6mm glass ply – 19mm air space – 3mm glass ply – 0.76mm pvb layer – 3mm glass ply	37	44	7
13mm glass ply – 1.52mm pvb layer – 6mm glass ply – 100mm air space – 3mm glass ply	40	49	9

Source: Viracon

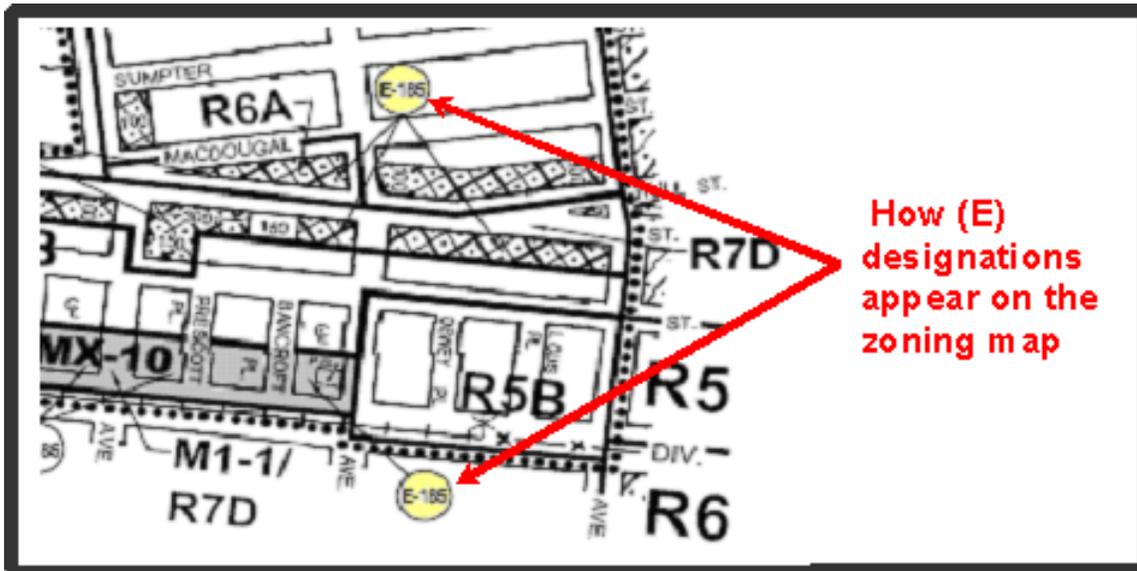


Figure 1 – How (E) designations appear on a zoning map