DISH Wireless LLC • Proposed Base Station (Site No. LALAX04397B)
800 South Main Street • Burbank, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of DISH Wireless LLC, a personal telecommunications carrier, to evaluate its proposed base station (Site No. LALAX04397B) to be located at 800 South Main Street in Burbank, California, for compliance with appropriate guidelines limiting sound levels from the installation.

Executive Summary

DISH proposes to install antennas and equipment at the three-story office building located at 800 South Main Street in Burbank. Noise levels from the equipment operations will comply with the City's pertinent noise limits.

Prevailing Standard

The City of Burbank regulates noise in Title 9, Chapter 3 of its Municipal Code, permitting a 5 dBA increase in noise above the existing ambient level at the property line of the subject parcel. Section 9-3-208(B) establishes the following base ambient levels for three different land-use zones, as follows:

Zone	Daytime	Nighttime
	7 am to 10 pm	*10 pm to 7 am*
Residential	55 dBA	45 dBA
Commercial	65 dBA	65 dBA
All other zones	70 dBA	70 dBA

Figure 1 attached describes the calculation methodology used to determine applicable noise levels for evaluation against the prevailing standard.

General Facility Requirements

Wireless telecommunications facilities ("cell sites") typically consist of two distinct parts: the electronic base transceiver stations ("BTS" or "cabinets") that are connected to traditional wired telephone lines, and the antennas that send wireless signals created by the BTS out to be received by individual subscriber units. The BTS are often located outdoors at ground level and are connected to the antennas by coaxial cables. The BTS typically require environmental units to cool the electronics inside. Such cooling is often integrated into the BTS, although external air conditioning may be installed, especially when the BTS are housed within a larger enclosure.

Most cell sites have back-up battery power available, to run the base station for some number of hours in the event of a power outage. Many sites have back-up power generators installed, to run the station during an extended power outage.

Site & Facility Description

Based upon information provided by DISH, including zoning drawings by SureSite Consulting Group, LLC, dated November 2, 2021, that carrier proposes to install six directional panel antennas and twelve Fujitsu radios – six each Models 604 and 605* – in three groups behind two view screens to be constructed near the northwest and southeast sides of the roof of the three-story office building at 800 South Main Street in Burbank. DISH also proposes to install two equipment cabinets, assumed to be Ericsson Model 6160 cabinets for the purpose of this study, behind the view screen closer to the center of the roof.

From the equipment platform, the nearest property line of the subject parcel is about 30 feet to the west, at South Main Street, and the nearest residential property line is located about 90 feet to the northeast.

Study Results

The antennas are passive, generating no noise. Ericsson reports that the maximum noise level from one Model 4408 radio is 42.2 dBA† and that the maximum noise level from one Model 6160 cabinet is 64.3 dBA, both at a reference distance of 5 feet. The maximum calculated noise level at the nearest property line, for the simultaneous operation of all twelve radios and both cabinets, is 51.9 dBA, which would raise the applicable commercial base ambient noise level of 65 dBA to 65.2 dBA, an increase of 0.2 dBA, well below the City's allowed increase of 5 dBA. The maximum calculated noise level at the property line closest to a residential property is 42.4 dBA, which would raise the applicable residential, nighttime base ambient noise level of 45 dBA to 46.9 dBA, an increase of 1.9 dBA, also well below the City's allowed increase of 5 dBA.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the operation of the DISH Wireless LLC base station proposed to be located at 800 South Main Street in Burbank, California, will comply with that City's requirements for limiting acoustic noise emission levels.

---

* Assumed to have the same noise rating as the Ericsson Model 4408 radio, for the limited purpose of this study.

† Adjusted to reflect the record high temperature of 114°F in Burbank.

Authorship

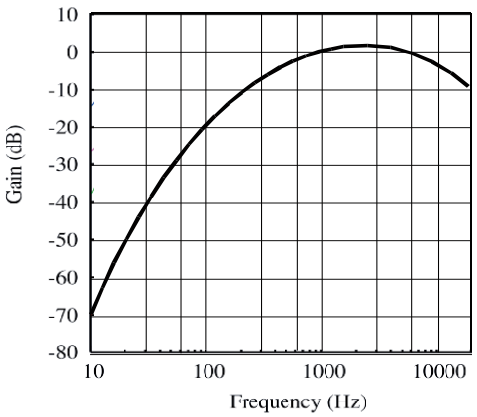
The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2023. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

William F. Hammett, P.E.
707/996-5200

March 17, 2022

Noise Level Calculation Methodology

Most municipalities and other agencies specify noise limits in units of dBA, which is intended to mimic the reduced receptivity of the human ear to Sound Pressure ("L_P") at particularly low or high frequencies. This frequency-sensitive filter shape, shown in the graph to the right as defined in the International Electrotechnical Commission Standard No. 179, the American National Standards Institute Standard No. 5.1, and various other standards, is also incorporated into most calibrated field test equipment for measuring noise levels.



30 dBA	library
40 dBA	rural background
50 dBA	office space
60 dBA	conversation
70 dBA	car radio
80 dBA	traffic corner
90 dBA	lawnmower

The dBA units of measure are referenced to a pressure of 20 µPa (micropascals), which is the threshold of normal hearing. Although noise levels vary greatly by location and noise source, representative levels are shown in the box to the left.

Manufacturers of many types of equipment, such as air conditioners, generators, and telecommunications devices, often test their products in various configurations to determine the acoustical emissions at certain distances. This data, normally expressed in dBA at a known reference distance, can be used to determine the corresponding sound pressure level at any particular distance, such as at a nearby building or property line. The sound pressure drops as the square of the increase in distance, according to the formula:

$$L_P = L_K + 20 \log(D_K/D_P),$$

where L_P is the sound pressure level at distance D_p and L_K is the known sound pressure level at distance D_K.

Individual sound pressure levels at a particular point from several different noise sources cannot be combined directly in units of dBA. Rather, the units need to be converted to scalar sound intensity units in order to be added together, then converted back to decibel units, according to the formula:

where L_T is the total sound pressure level and L_1, L_2, etc are individual sound pressure levels.

$$L_T = 10 \log \left(10^{L_1/10} + 10^{L_2/10} + \ldots\right),$$

Certain equipment installations may include the placement of barriers and/or absorptive materials to reduce transmission of noise beyond the site. Noise Reduction Coefficients ("NRC") are published for many different materials, expressed as unitless power factors, with 0 being perfect reflection and 1 being perfect absorption. Unpainted concrete block, for instance, can have an NRC as high as 0.35. However, a barrier's effectiveness depends on its specific configuration, as well as the materials used and their surface treatment.