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March 13, 2026 *revised April 22, 2026 revised May 12, 2026*

Jason Green, COO
RAEDEN

RE: Project Taurus Mechanical Noise – Exterior Noise Design Analysis rev. B – Project Taurus Comprehensive Exterior Noise and Acoustical Design Analysis and Impact

Dear Jason:

This is a revised acoustic report related to the new mechanical (cooling) and backup power (generator) equipment planned to be added to support the new Project Taurus data center in Colorado Springs. Revisions to the 4/22/2026 revised report are intended to respond to comments received since that report was issued, and includes considerations and concerns identified during the first Community Meeting, and in subsequent emails and messages sent to various City of Colorado Springs departments and agencies.

Please note, the analysis of the Project Taurus Development Plan involves direct inputs regarding power equipment, cooling equipment, and various other site development materials and solutions without bias. We simply inputted the Development Plan details into a computer model solely intended to consider every conceivable element of the Project Taurus site location and project.

Compliance with all other applicable codes should be reviewed by qualified personnel.

The Computer Model – Defined

Understanding the definition of "noise" requires the input and consideration of numerous factors, especially when considering multiple devices operating concurrently and large areas of space. The computer model allows for comprehensive incorporation of every conceivable aspect of the Project Taurus Development Plan, specifically precise manufacturer performance and operations data for the power and cooling devices proposed to the City of Colorado Springs for installation and operations to support the data center.

Key Terminologies applied to the model include:

- **Sound Power Data** – Effectively defined as "the cause" of the sound or noise being considered, meaning the total energy generated as sound from a machine.
    - Sound Power Data is supplied by the manufacturer of each specific device and represents the factory-validated measurements of that device. This data is used, as supplied, to generate the noise model.
- **Decibels, A-Weighted (dBA)** – The single-number measurement of airborne sound or noise, also known as **Sound Pressure**, adjusted using a weighted scale for judging loudness that corresponds to the hearing threshold of the human ear.
    - Means the actual sound level present at a listener position (human or microphone) some distance from the sound source.

- **Distance** – The physical distance from each element of consideration of the model.
- **Interference** – Physical or other means capable of reflecting or absorbing airborne sound at a given distance.

Simple explanation of the Key Terminologies:

- **Sound Power Data** (in Decibels – dBA) = **Wattage of a Light Bulb**
  - If a chiller in operation "causes" sound at 85dBA at 100% operational use the chiller will ALWAYS generate 85dBA of sound at 100% operational use.
  - A 100-watt light bulb will always emit 100 watts of light when turned completely on, regardless of the distance of the observer.
- **Sound Pressure (dBA) = Relationship (distance) From The "Cause" (Source of Sound)**
  - The closer the listener position to the "source" of the sound, the closer the dBA level will appear to the actual Sound Power Data for the device, or "source".
  - This means that if one stands directly adjacent to a Chiller rated at 85dBA, the airborne noise level as measured by a sound level meter will also be 85 dBA.
  - However, if one stands 100 yards away from an 85dBA rated Chiller, the distance (and other considerations) may make the same chiller sound like 55dBA.
- **Light bulb Distance Analogy**
  - Standing next to a 100-watt light bulb will feel as bright as the light bulb can appear.
  - At a distance of 25 feet from a 100-watt light bulb, the light will appear much less bright because of the increased distance.
  - The distance between source and observer affects the perceived intensity of the light bulb, just as the same distance relationship affects the perceived noise level of a device.

Noise Study Methodology

In general, the strategy used in developing the noise model was to map out all aspects of the site in software designed to calculate a noise model based on industry standards. This included topography using available maps, building locations and heights, existing elements such as the screen wall south of the existing paved area, and finally, the sizes and locations of all the new equipment, as well as the barriers intended to control noise from the new equipment.

The software used for the noise model can be found at https://dbmap.net. All procedures used to generate the model are features provided by that website in modeling noise propagation.

Site Layout - Topography

The topography of the site can affect the way noise propagates through the area. The software includes a Ground Height tab, with which topographical contours can be added to the model based on available topographical maps. A sample of this mode can be seen below, with the contours represented by the black-and-white dotted lines. Note that all dimensions in the software are stated in meters, and the topo map is based on a datum set at an elevation of 6300 feet above sea level. For example, the 15.2m contour in the model is 15.2 meters above 6300 feet, or 6350 feet above sea level, as can be seen on the underlying topo map.

This portion of the model includes all elements present on the topographical maps, which includes gradual grade changes, such as those leading down to the concrete culvert to the north and south, and more severe grade changes, such as the sides of the culvert itself. The model includes the acoustic effects of all these elements in calculating noise propagation.

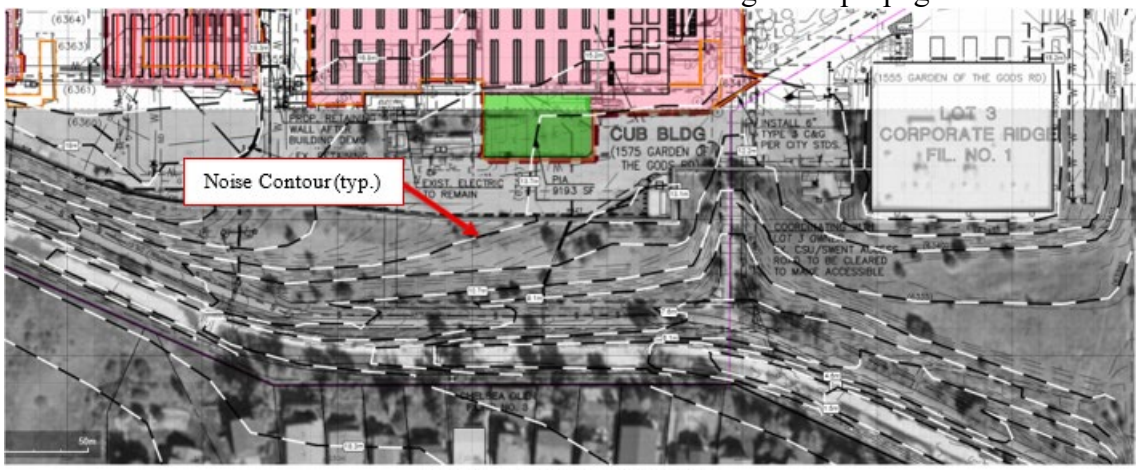


Figure 1. Ground Height Modeling

Site Layout – Buildings and Screen Wall

Once the topography is set, the site is populated with the surrounding buildings and other built elements that will be in place after site modifications are complete and will affect the way sound travels throughout the site. Using the Normal Mode of the software, buildings are added as objects, setting their plan dimensions and roof height using the Add Object dialog box. All heights for objects are based on the surrounding ground height, set in the previous step. The type of roof (flat, sloped, peaked, etc.) is set, as well as the acoustic properties of the building. In general, buildings are modeled as being highly sound reflective, although exterior building materials do generally exhibit some minor sound absorption.

The same process is used to add any other objects that are large enough to affect propagation of noise. For this model, only the existing screen wall at the south side of the paved area was included, as no other site elements were deemed substantial enough to affect the noise model.

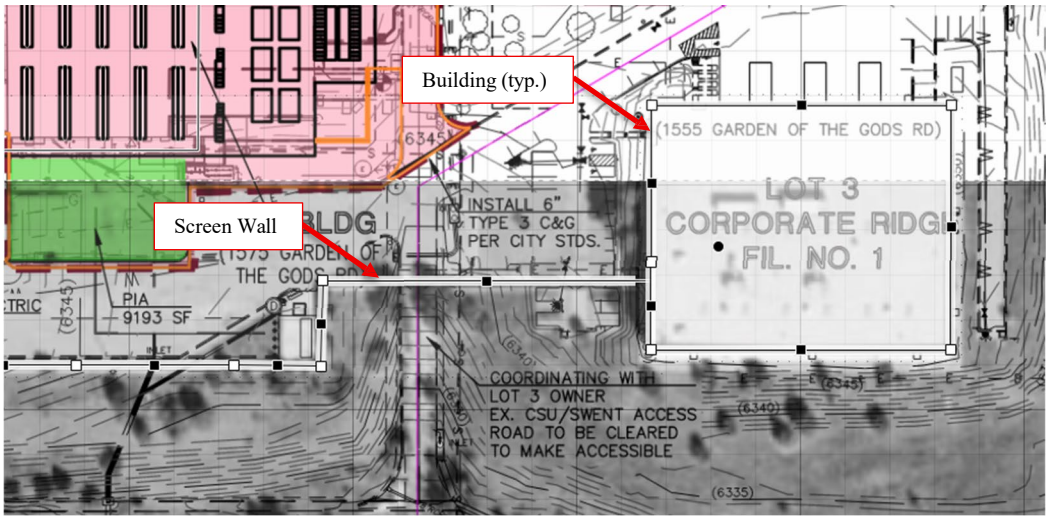


Figure 2. Site Object Entry – Buildings and Screen Wall

Site Layout – Noise Sources

Once the buildings and other permanent architectural elements are added to the model, the noise sources are added. Using the equipment layouts from the mechanical engineer, noise source objects are added to the model. In this case, the sound sources, chillers and generators, are much longer than they are wide, so they are modeled as line sources, with noise generated along their entire lengths, and not just from a single point, as a smaller noise source would be modeled.

The noise levels produced by the equipment are assigned to each individual noise source based on sound power data provided by the mechanical engineer. This data is provided in octave-band form, with the noise generated at each frequency band included, not just the overall dBA level. Sound power is typically determined using an industry standard, AHRI 370: Sound Performance Rating of Large Air-Cooled Outdoor Refrigerating and Air-Conditioning Equipment. This standard only covers frequencies from 63 Hz to 8000 Hz. **While equipment produces sound in higher and lower frequencies, the levels are typically not high enough to require inclusion in the model.**

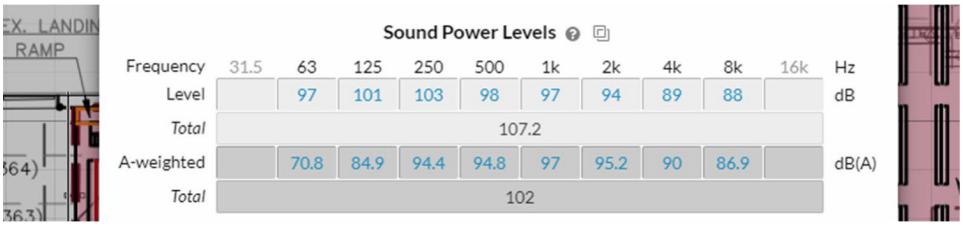


Figure 3. Noise Source Sound Power Entry

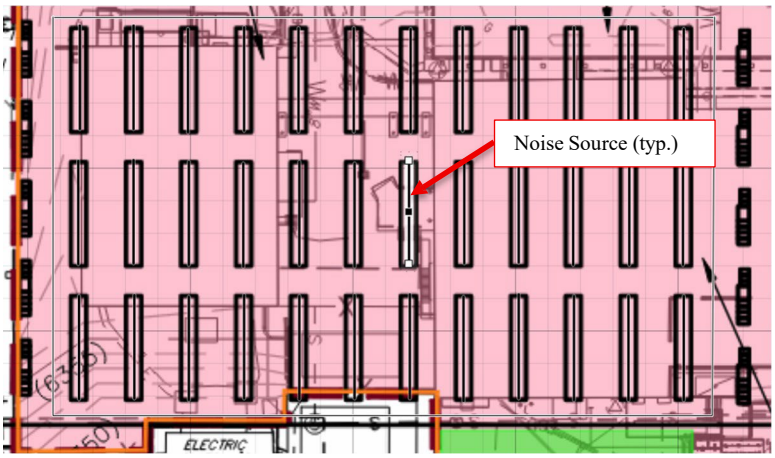


Figure 4. Noise Source Layout

Site Layout – Acoustic Barriers

To determine what additional sound mitigation measures would be required at the equipment yards, acoustic barriers are added around the noise sources in the computer model. Similar to other objects in the model, the barrier dimensions and heights are set using a dialog box. In addition, the acoustic characteristics of the barrier are set. In this case, the planned barriers are sound absorptive on the side facing the equipment, so the octave-band sound absorption values provided by the barrier manufacturer were included for each barrier object within the model.

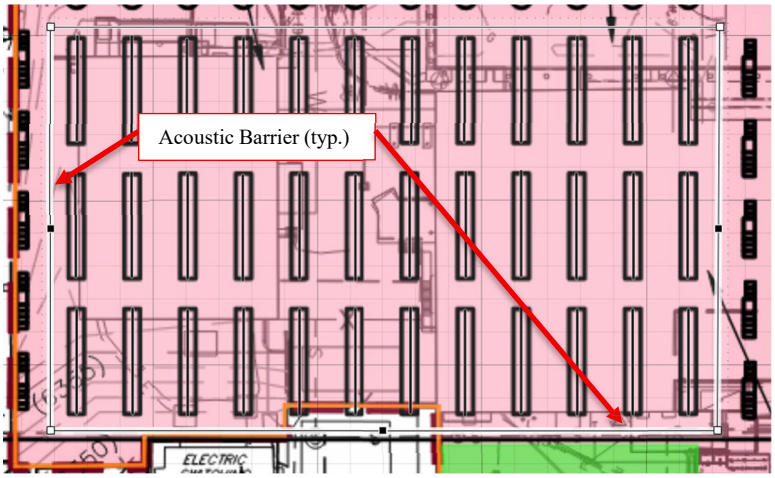


Figure 5. Acoustic Barrier Layout

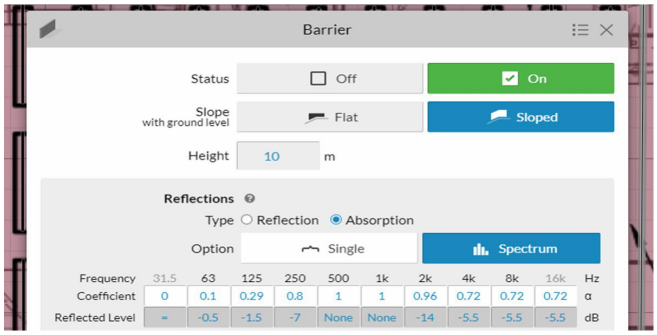


Figure 6. Acoustic Barrier Properties

Note that the model assumes not only the sound absorptive properties of the barrier, but also the effect of the barrier's mass in blocking noise. The model assumes a minimum barrier surface density of 10 kg/m^2. The barrier product selected for use on this project has a surface density of approximately 36 kg/m^2, according to the panel manufacturer's technical data.

Noise Modeling - Calculation

Once all the site parameters have been entered into the model, the software generates a noise map based on the interaction of the noise sources with all the elements on the site (barriers, buildings, topography), color coded by dBA level. Calculations are performed by the software in accordance with ISO 9613-2:2024 – Engineering method for the prediction of sound pressure levels outdoors. This model includes parameters for temperature, wind speed, humidity, and ground type (paved vs. grass). Sample receiver positions can be placed to check noise levels at specific points within the model, set at 1.5m above ground height.

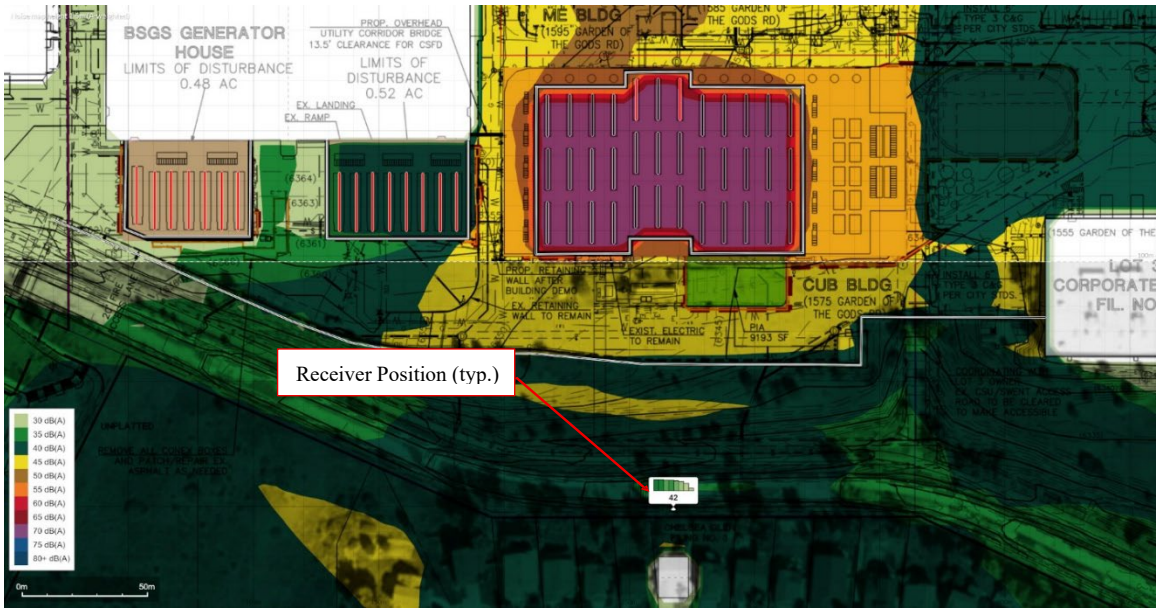


Figure 7. Final Noise Model Map

Background and Requirements

DLAA conducted a study concerning the anticipated exterior noise levels from backup power (generators) and mechanical (cooling – chillers) equipment planned to be installed at the Project Taurus site. The equipment consists of several back-up diesel generators installed in sound attenuation enclosures, as well as numerous new air-cooled chillers. **To ensure the noise mitigation measures provided the appropriate amount of noise control for any situation, we modeled the most extreme operational condition possible.** That is, the model assumed that every chiller and every generator installed at the exterior of the data center would be operating simultaneously at 100% capacity. The goal was to determine what site improvements, designs, engineering, products, and implementation measures were necessary to allow the new power and cooling equipment to comply with the designated maximum allowable noise level (55 dBA 7a-7p, 50dBA 7p-7a), as dictated by the City of Colorado Springs noise code. In particular, we looked at the construction required for several acoustic barriers that would surround the new equipment and block noise to surrounding noise-critical areas, particularly the residential area to the south of the Project Taurus site.

Mechanical (Cooling) and Electrical (Backup Generator) Noise Calculation

Baseline: The model includes and considers the entire area surrounding the chillers and generators as identified in the Project Taurus Development Plan and directly incorporates all the sound power data for all equipment, as provided by the mechanical engineer, to determine the expected exterior noise levels throughout the project site, including at the south property line of the project site, and in the neighborhood to the south.

The model was run with multiple scenarios, to demonstrate various anticipated operating conditions of the equipment, even those that are not expected to ever occur. In all cases, the scenarios were set up to model the worst case, with operational equipment chosen to be as close to neighboring residences as possible, even in cases where this would not normally be true. The scenarios are as follows:

1. **Scenario 1 - 100% "worst-case" emergency condition**: This scenario represents emergency operation, where site conditions (e.g., extreme weather) have caused on-site power to be lost. In this scenario, all 30 generators and all 36 chillers are operating simultaneously at 100% utilization. Though Project Taurus **cannot** operate all chillers and all generators at the same time under any condition, due to equipment limitations, we included this scenario to illustrate the highest sound levels possible.

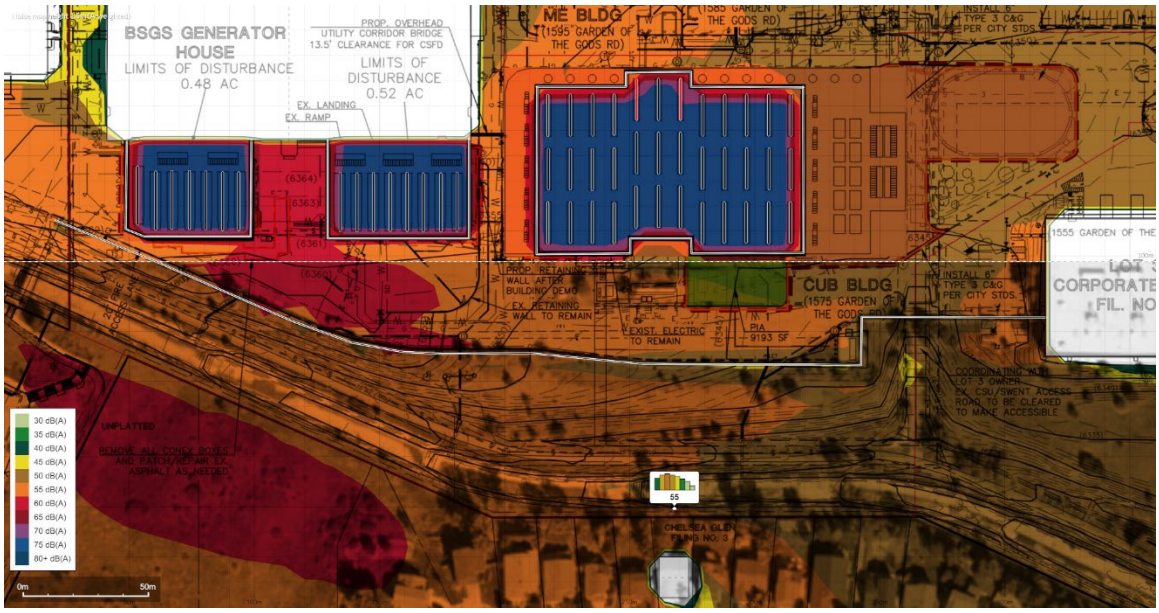


Figure 8. Scenario 1 Noise Model Map

2. **Scenario 2 - Normal operation**: This scenario represents the most realistic day-to-day mode of operation for the data center. Due to actual power requirements and equipment redundancies, the typical operating condition consists of 34 of 36 chillers running at 75% capacity, and zero generators.

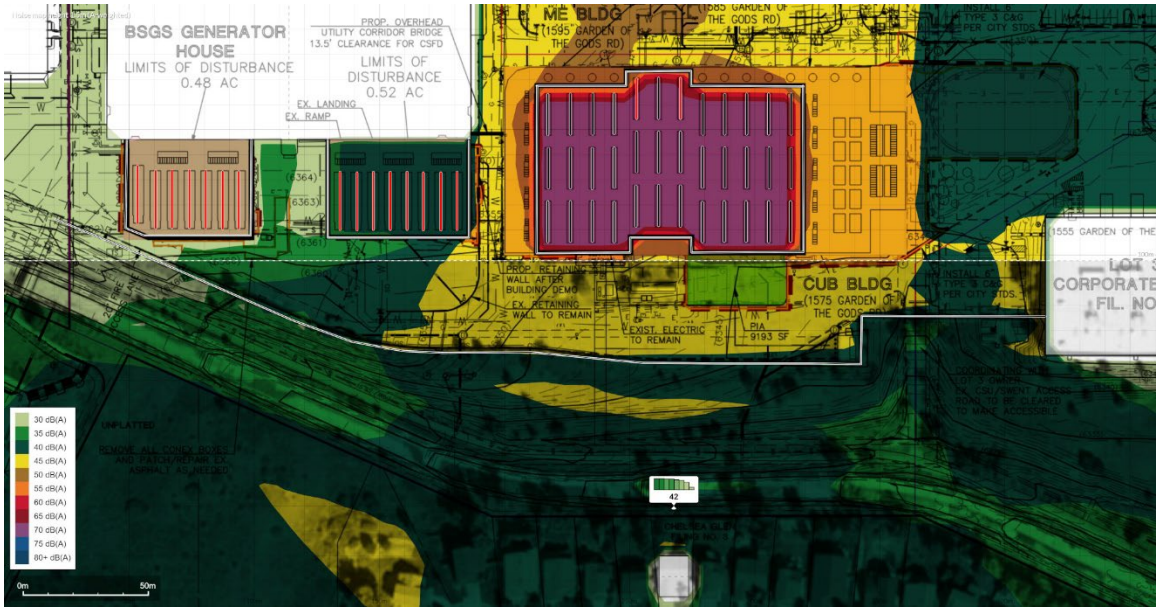


Figure 9. Scenario 2 Noise Model Map

3. **Scenario 3 - Generator testing**: This scenario represents an example of the sound levels anticipated during monthly daytime generator testing. As with normal operation, 34 chillers will be running during generator testing. Generators are tested in groups, not all at once, so this scenario includes five (5) total generators running at 100%. For purposes of this report, the five (5) generators closest to neighboring residences have been selected, though in reality, the tested generators would be spread throughout the two yards.



Figure 10. Scenario 3 Noise Model Map

4. **Scenario 4 - Emergency condition, equilibrium**: This scenario represents the same conditions as the first, but with all equipment in actual emergency mode, which does not require all equipment running at 100% capacity. While startup sound levels may be higher, the equipment would quickly settle into this lower operating condition. For this scenario, 34 of 36 chillers are running at 75% capacity, and 25 generators are running at 75% capacity.



Figure 11. Scenario 4 Noise Model Map

5. **Scenario 5 - Nighttime "Free Cooling" Operation – Standard Operations:** In cooler months, at night, because of the lower ambient temperatures on site, the chillers can utilize the air temperature to assist in cooling, which will allow them to run at lower utilization. This scenario assumes 34 chillers running at 50% capacity, and zero generators running. This reduced operational mode of the chillers results in a 3 dBA reduction in overall noise level at the property line. While this is not a dramatic change perceptually, it is a 50% reduction in sound energy being transmitted to the area surrounding the chiller yard.

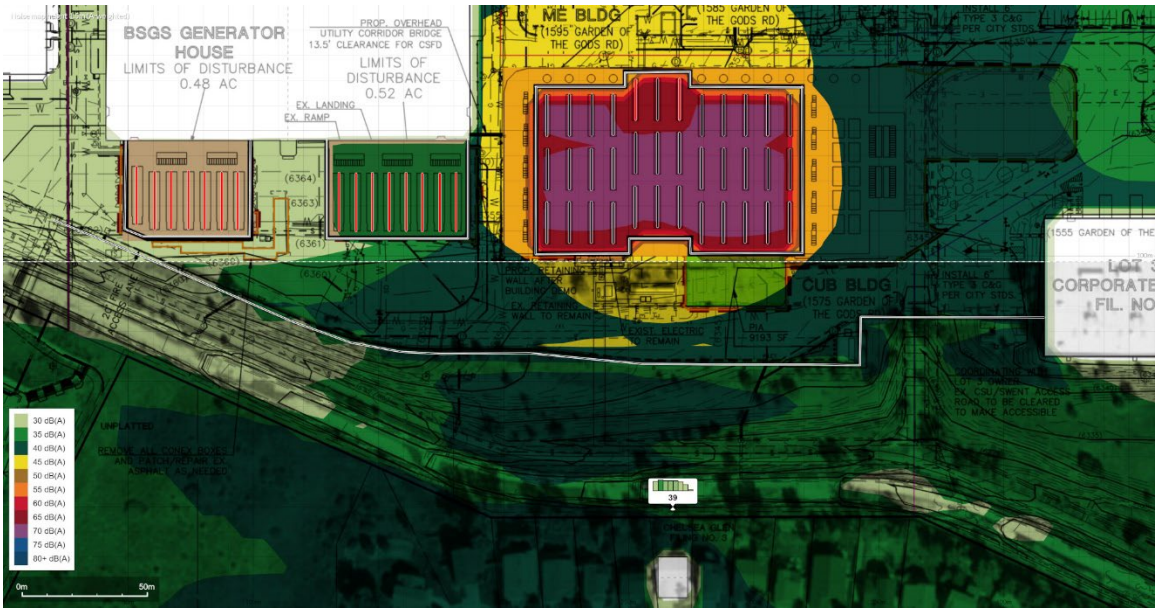


Figure 12. Scenario 5 Noise Model Map

Device Installation and Operations Criteria: The Development Plan identifies generators and chillers installed discreetly on the property. This means that Project Taurus will install all the generators in a specific defined area of the property, while Project Taurus will install all the chillers in a separate defined area of the property. The term "yard" will apply such all the generators will reside in the Generator Yard and all the chillers will reside in the Chiller Yard.

- Generators individually produce higher noise levels than chillers but reside in the Generator Yard further away from the Residential Area than the Chiller Yard.
- Chillers produce less noise per unit than generators, but the Development Plan identifies more installed chillers than generators, and the Chiller Yard will be closer to the Residential Area than the Generator Yard.
- Project Taurus will install 30 double-stacked and enclosed diesel generators.
- "Enclosed" means that Project Taurus has specified generators installed inside of a prefabricated sound-attenuated "box," whose physical properties significantly reduce generator noise levels.
- Project Taurus will install 36 air-cooled chillers mounted on raised steel platforms.
- Generators will operate only in emergency stand-by situations should the utility (Colorado

Springs Utility) lose power, as well as during standard monthly testing.

- Testing will typically occur for a maximum of five (5) of the generators at one time, and testing will last no longer than 30 minutes.
- Chillers will not typically run at full utilization, but will instead operate under conditions to match the performance of the computers operating inside of the main building (data center), which is simulated in scenarios 2 and 5 above.

Ground Height and Topology Considerations: The noise model incorporated the ground height throughout the project site, and along the north side of the nearby residential neighborhood, based on local topographical maps.

- Significant changes in elevation appear throughout the area.
- Despite elevation changes, the model does not indicate any negative effects of sound from Project Taurus to or through any of the surrounding areas, specifically the Residential Area.
- Inclusion of the Development Plan sound mitigation solutions defined as "acoustic barriers" further mitigates the presence of any negative sound effects.
- Height of the proposed "acoustic barriers" (sound walls around each Generator and Chiller Yard) will exceed the height of the installed devices, meaning no linear or direct path exists between mechanical equipment and listener positions at neighboring properties, further mitigating any impact of site elevation.

Existing Building Sound Impact: The model also incorporated the buildings surrounding the Generator and Chiller Yards, to determine their effect on the noise radiated by the generators and chillers. The existing screen wall along the south edge of the paved area to the south of the mechanical equipment was also included in the model.

- The proposed Generator Yard incorporates the existing south wall of the main building, which could reflect a portion of the noise produced by the generators, a factor considered in the model.
- All other buildings represent reflection considerations for noise from each Yard.
- The model also includes all existing physical elements on the property not removed as part of the Development Plan.

New Acoustic Barriers (walls): The final model includes the effect of acoustic barriers erected around the three main yards containing noise-generating mechanical equipment.

- The barriers run along the west, south, and east sides of each generator equipment yard, with the ends of each barrier abutting the existing building, and around all four sides of the chiller yard.
- The attached diagram shows the acoustic barrier layout for each mechanical yard, including maximum barrier heights.

Summary: Based on the results of the noise model, the cooling and electrical equipment to be installed at Project Taurus will not exceed local noise codes during normal operation, or during generator testing. **The expected maximum noise level on site during normal operation (Scenario 2) will be approximately 42 dBA, and the expected maximum noise level on site**

during generator testing (Scenario 3) will be 46 dBA. In an emergency scenario, with all necessary generators running to maintain power (Scenario 4), the expected maximum noise level on site will be 51 dBA. This condition is expected to be rare. **At times of year with cooler nighttime temperatures, when cooling equipment can run with reduced utilization (Scenario 5), the expected maximum noise level on site will be 39 dBA.** See graph below for a comparison of calculated background noise levels for the scenarios described above.

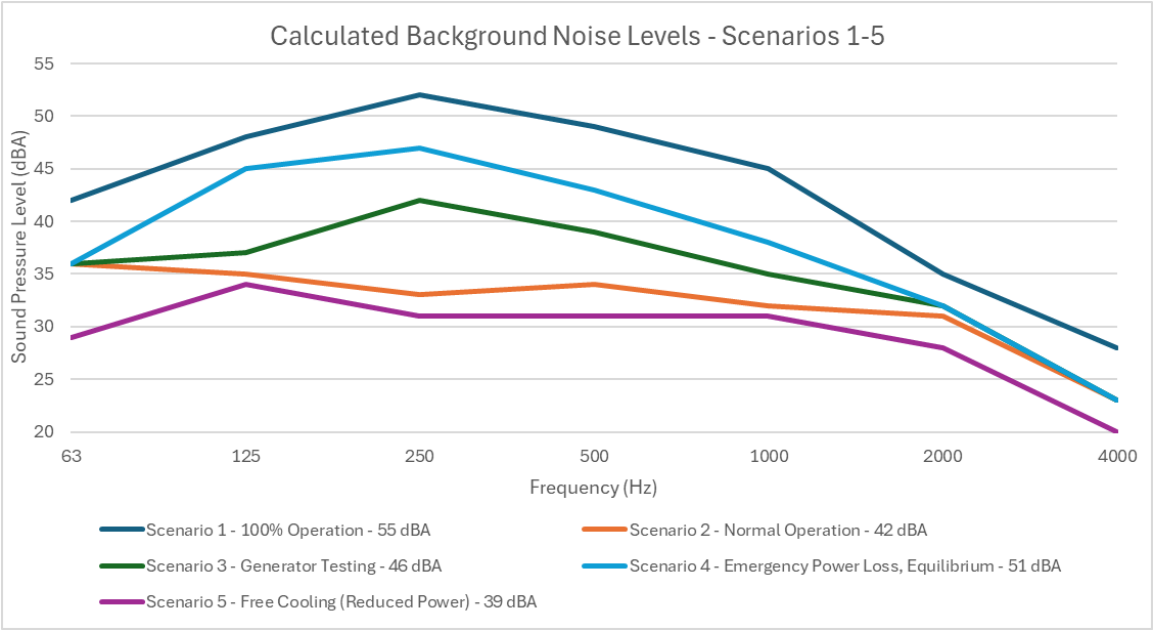


Figure 13. Calculated Noise Levels – All Scenarios

Acoustic Barriers – Benefits and Design

Effective acoustic barriers incorporate many helpful design features. All of the properties of acoustic barriers combine to produce an overall amount of noise reduction which, when included in the model, helps accurately predict noise levels at any chosen receiver position.

Breaking line-of-sight to the noise source is important, as this reduces noise levels at the receiver (or listener) position by requiring noise generated by the equipment to travel further over the top of the barrier. In addition, visually hiding the noise source reduces the perception of loudness on the part of the listener, in that a noise source that is not plainly visible tends to be perceived as less loud. Breaking line-of-sight is accomplished not only by setting the correct barrier height, but also by locating the barrier either close to the listener, or (as is the case with this project) close to the source, rather than somewhere in between.

Another property of an effective acoustic barrier is its mass, which blocks the path of direct noise. As a secondary effect, the barrier can be designed to absorb a portion of this noise using sound absorptive infill incorporated within the panel itself, behind a perforated face layer.

Our site noise model indicates that as long as each acoustic barrier is sufficiently tall, a prefabricated acoustic barrier system will be sufficient to provide the necessary noise reduction, with no need for heavier construction materials such as tilt-up concrete. We typically recommend a system that includes sound absorptive material within the panels, to maximize the benefit of the noise barrier, by absorbing a portion of the noise within each mechanical yard before it can travel outside its confines. For this project, the basis of design is the Silent Protector Plus product from

AIL Sound Walls. This product not only provides the appropriate degree of acoustic performance but is also customizable to match the appearance of the existing building, reducing the visual impact of the new equipment, and increasing the psychological benefit of hiding the noise source. See attached cut sheets, and photos below, for examples of the appearance of acoustic barriers built using this product surrounding similar installations.

Installation Photos





Acoustic Barriers – Performance

Acoustic barriers are typically specified in terms of their Sound Transmission Loss (TL) values, which is a measure of the reduction in sound energy from one side of the barrier to the other. It is controlled primarily by the mass of the panel material, with heavier materials blocking more noise than lighter ones. The sound absorption of the panel provides other benefits but typically does not affect the overall TL of the panel.

Typically, we would recommend that the barrier be completely solid, starting at ground level, to avoid leaks or openings that would reduce the overall performance of the barrier. For this project, our understanding is that a certain amount of airflow through the barrier is important for the ventilation of the mechanical equipment. We will therefore need specialty acoustic louvers along the bottom of the barriers. These louvers, like the barrier panels, are specified in terms of TL values. Because their performance is controlled by their depth, the louvers will be thicker than the barrier panels (12” for the louvers vs. ~6” for the barrier panels). Which side of the barrier the louver sticks out from is not critical acoustically.

We recommend a product such as the IAC Slimshield Type SL-12; see attached cut sheet. The best location for these louvers is close to ground level, ideally in sections of the barrier not directly facing south. The total square footage of acoustic louvers should be minimized. Note that it is possible to provide louvered doors for access through the acoustic barrier, as shown in the attached cut sheet. These doors do not reduce the acoustic performance of the barrier.

The TL of each element in the acoustic barriers should be as follows:

Element	Sound Transmission Loss (dB)						
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Barrier Panel	N/A*	30	28	34	43	45	49
Acoustic Louver	6	7	10	12	18	18	14

*Basis-of-design manufacturer does not have TL data at this frequency, which is common for this type of product.

Site Survey – Generator Testing

DLAA conducted an extended measurement of the existing sound levels at the site, caused by various existing noise sources (mechanical equipment, surface traffic, etc.), from February 18, 2026 to February 23, 2026. We anticipated that the average site noise levels would be well below the upper limit set by local noise code, which the measured data verifies. However, the generators do need to be tested regularly. The measured background noise data was analyzed to determine the noisiest times of the week; scheduling testing during any regularly noisy time period will reduce the impact on the nearby residences.

We determined that no particular day during the week had average background noise levels that were, on average, higher than on any other day, but that in general, the noisiest period of the day coincides with rush hour, or from 3pm-6pm. We would therefore recommend scheduling any generator testing during this time window. Generators will be tested individually, not all at once, so the increase in noise levels during testing will be minimal.

While we measured data for several days, weather conditions, primarily sustained high-speed wind, caused elevated noise levels during a portion of the test period. The levels on the 20th and 21st are most representative of the existing background noise level on the project site, near where the chiller yard will be situated. However, all levels were included in the table below for completeness' sake. All levels are expressed in terms of L90, which is the noise level in dBA that is exceeded for a maximum of 10% of the test period (by louder, infrequent noises, like loud trucks, aircraft, etc.). The L90 is generally deemed to be a good representation of the "average" noise level in a particular location.

Time Period	L90, Background Noise Level (dBA)					
	2/18	2/19	2/20	2/21	2/22	2/23
Day (7a-10p)	41.8	42.1	39.5	39.4	38.8	41.2
Night (10p-7a)	43.8	39.8	39.8	39.4	41.3	41.2

The noise code of the City of Colorado Springs does allow for periods of "permissible increase", which is to say that the 55dBA daytime limit in residential zones is relaxed by 10dBA (up to 65dBA) during a period of up to 15 minutes in any one-hour period. If the generator testing does not exceed 15 minutes in duration, this allowance would greatly increase the opportunity for performing the tests without violating noise code.

Responses to Specific Public Comments

After the initial issuance of this report, several comments were received regarding noise from mechanical equipment, some specifically about our calculations, and some more general regarding the effects of noise.

Noise Codes and Background Noise Levels

Noise codes are not intended to provide inaudibility of all noise sources at property lines. Setting such a constraint would likely make all new construction prohibitively expensive and/or difficult to impossible. The purpose of noise codes is to prevent sustained noise sources that would cause discomfort or disruption to the average listener, depending on the zoning of the site and the time of day. 50 dBA, which is the nighttime noise limit for residential zones in Colorado Springs, is

very quiet. It is likely that common residential noise sources (air conditioners, street traffic, household appliances, etc.) would all exceed this noise level. The following table lists several common noise sources, and their approximate dBA levels, for reference:

dBA Level	Example Sources	dBA Level	Example Sources
0-10	Threshold of hearing, Normal breathing	60-70	Normal conversation, Dishwasher
10-20	Whispering at 5 feet, Quiet natural area w/no wind	70-80	Freeway traffic, Whistling kettle
20-30	Leaves rustling, Soft whisper	80-90	Food processor, Semi truck
30-40	Quiet office, Library, Desktop computer	90-100	Power saw, Subway train at 200’
40-50	Living room, Moderate rainfall, Refrigerator	100-110	Loudest shouting, Leaf blower
50-60	Microwave, Sewing machine, Bathroom exhaust	110-120	Thunder, Chainsaw

Site Elevation and Barrier Height

Concern has been raised regarding the relative heights of the project site and the houses overlooking it. As discussed above, acoustic barriers work best when the line of sight is blocked between the noise source and the listener. Therefore, the relative heights of source and receiver positions have been taken into account when setting the heights of the acoustic barriers shown in the attached barrier plan.

Health Effects of Infrasound

Concern was raised regarding the effects of infrasound, or sound below the frequencies humans can hear, on the health and wellbeing of those nearby. There is evidence that sufficient levels of this low-frequency sound can cause adverse health effects on those subjected to it. However, because the wavelengths of this sound are so long, only extremely large objects, such as wind turbine blades, can typically produce it in levels high enough to cause these adverse health effects. **The cooling and power generation equipment planned for installation as part of this project does not produce infrasound at high enough levels to adversely affect the health of people at neighboring properties.**

Drainage Culvert

Concern has been raised regarding the concrete drainage culvert running along the southern edge of the project site, and its effects on the propagation of noise. While the shape of objects like the culvert can affect noise propagation, the effect would be most apparent for noise generated within the culvert itself, similar to the way the concave shape of an amphitheater helps reflect sound into audience areas. For noise generated outside the culvert, especially the relatively diffuse sound reaching the culvert over the tops of the acoustic barriers, the effect on propagation would be minimal, if any.