

Mitchell Education Building Renovation and Addition
Project No. 2022-7380
1025 The Dalles Avenue
Sunnyvale, CA

NOISE IMPACT REPORT

Prepared by:



2055 Junction Avenue, Ste. 205
San Jose, California 95131

Prepared for / Project Applicant:

Saint Luke Lutheran Church of Sunnyvale
1025 The Dalles Avenue
Sunnyvale, California 94087

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List of Acronyms, Abbreviations, and Symbols	
Acronym / Abbreviation	Full Phrase or Description
ACP	Amazing Creations Preschool
APN	Assessor's Parcel Number
BMPs	Best Management Practices
Caltrans	California Department of Transportation
CCNS	Cupertino Cooperative Nursery School
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
D	Distance
dB	Decibel (unweighted)
dBA	Decibels, A-Weighted
DNL / L _{dn}	Day-Night Noise Level
FHWA	Federal Highway Administration
HVAC	Heating, Ventilation, Air Conditioning
Hz	Hertz
In/sec	Inches per Second
kH	Kilohertz
L _{eq}	Average / Equivalent Noise Level
L _{max}	Maximum Noise Level
L _{min}	Minimum Noise Level
LT	Long-term
PF	Public Facilities
PRC	Public Resources Code
PPV	Peak Particle Velocity (inches/second)
R	Receiver
Report	Noise and Vibration Impact Report
SCLC	Sunny Chinese Learning Center
SR	State Route
ST	Short-term
STC	Sound Transmission Class
UF	Usage Factor
U.S. EPA	United States Environmental Protection Agency
VdB	Velocity Decibels

List of Acronyms, Abbreviations, and Symbols	
Acronym / Abbreviation	Full Phrase or Description
§	Section
%	Percent

EXECUTIVE SUMMARY

This Noise Impact Report (Report) evaluates and documents noise levels associated with a Use Permit modification for the Mitchell Education Building Renovation and Addition Project (proposed Project) at the Saint Luke Lutheran Church of Sunnyvale property at 1025 The Dalles Avenue, Sunnyvale, California. The proposed Project would resume, enhance, and support preschool and church-related services historically provided at Saint Luke's. This Report is intended to assist the California Environmental Quality Act (CEQA) Lead Agency (City of Sunnyvale) with its review of the proposed Project's potential noise and vibration impacts in compliance with the State CEQA Statutes and Guidelines, particularly with respect to the noise and vibration issues identified in Appendix G of the State CEQA Guidelines.

S.1 PROPOSED PROJECT DESCRIPTION

Saint Luke Lutheran Church of Sunnyvale (Saint Luke's, or the church) has applied to the City of Sunnyvale for a use permit modification for its proposed Mitchell Education Building Renovation and Addition Project. The proposed Project would be located at 1025 The Dalles Avenue and involve renovations and a minor addition (approximately 500 square feet) to the church's existing Mitchell Education Building, the construction of a new, approximately 960-square-foot church administration building, and other minor site improvements. The proposed improvements would resume, enhance, and support preschool and church-related services historically provided at Saint Luke's. If implemented, the proposed Project would increase preschool services at the Saint Luke's property, as summarized in Table S-1.

Characteristic	Amazing Creations Preschool	Cupertino Co-op Nursery School	Sunny Chinese Learning Center
Currently At Site?	No	No	Yes
December 2022 Enrollment	-	48	50
Max Historical Enrollment	50	48	100
Age Range	18 months to 5 years	2 years to 5 years	6 years to 12 years
Year-round or School Year	Year Round	September to June	September to June
Operations	Monday to Friday	Monday to Friday	Monday to Friday
Daily Hours	7 AM to 6 PM	8:30 AM to 3:30 PM	2:30 PM to 6:30 PM
Yard / Play Hours	9:30 AM to 11:30 AM 3:00 PM to 5:00 PM	8:45 AM to 11:30 AM 12:00 PM to 3:30 PM	3:00 PM to 6:00 PM

The proposed Project would be implemented in two (2) phases. Phase 1 Project modifications include exterior and interior renovations to the Mitchell Education Building, minor expansion of the building (499 square feet), installation of new play equipment, and restriping of an existing parking area. Phase 1 of the Project is anticipated to begin in the 1st or 2nd quarter of 2023 and last between three (3) and five (5) months in total. Phase 2 of the Project would include the construction of a small (960 square feet) church administration building. Phase 2 could begin as soon as the summer of 2023 and last approximately one (1) to three (3) months in total.

S.2 POTENTIAL CONSTRUCTION NOISE AND VIBRATION IMPACTS

The proposed Project would consist of exterior and interior building renovation and construction activities, play equipment installation, and other minor activities. Much of the activity would be performed by hand, but material deliveries and some building renovation and construction activities could require the use of large delivery trucks and equipment such as a forklift or material lift, a backhoe, a compressor etc. Construction activities would generally take place along the western side of the church property, at least 35 feet from any residential property line. At this distance, the noise levels associated with minor construction activities are expected to be 79 dBA L_{eq} to 83 dBA L_{eq} . These noise levels would occur for a short period during peak construction activities when equipment is in use (estimated to be less than one (1) month in total). While construction activities would be short in duration, they would be audible at residences that border the church to the west and northwest.

The Sunnyvale Municipal Code does not establish numerical noise limits for construction activities; however, the Municipal Code (Section 16.08.030) does restrict commercial construction activities to the hours of 7:00 AM to 6:00 PM, Monday through Friday, and 8 AM to 5 PM on Saturday. The Municipal Code also prohibits certain construction activities that may cause a nuisance, including the use of air compressors without mufflers, continuously running motors or generators, and loudly playing music or radios. The proposed Project has incorporated best management practices (BMPs) into the Project design that restrict work hours in accordance with the Municipal Code, require staging and stationary noise sources to be located as far from neighboring land uses as possible, and require construction equipment include standard noise attenuation features such as engine shields and mufflers (see Section S.5). These BMPs are included as part of the Project and would ensure the proposed Project construction activities comply with the City's Municipal Code and do not result in construction noise levels that exceed City standards. The proposed Project, therefore, would not result in a significant construction noise impact.

The proposed Project would not involve large, vibration-inducing equipment operations. Construction activities would not create disturbing, excessive, or offensive ground-borne vibration because equipment operations would be intermittent (equipment operations would last only a few hours each day), short in duration (construction equipment is estimated to be used no more than one (1) month in total), and occur during the allowable daytime hours set forth in the City's Municipal Code (when people are less sensitive to vibration levels). The proposed Project, therefore, would not result in a significant construction vibration impact.

S.3 POTENTIAL OPERATIONAL NOISE IMPACTS

The proposed Project would generate noise from children's play, heating, ventilation and air conditioning (HVAC) equipment, on-site vehicle travel and parking, and off-site vehicle travel. Based on ambient noise measurements collected at an existing preschool facility (Cupertino Co-op Nursery School) and the existing after school care facility currently operating at Saint Luke's (Sunny Chinese Learning Center), the proposed Project is estimated to generate an hourly noise level between 42.0 dBA L_{eq} and 57.8 dBA L_{eq} at adjoining residential property lines. These daytime noise levels would be below the City's 60 dBA L_{eq} daytime noise standard established in Municipal Code Section 19.42.030 (the Project would not involve nighttime operations). The low magnitude of the Project's potential hourly noise levels, particularly noise from children's play, is primarily a function of the number of children in any one play area (no more than 50), the age of the children (18 months to 12 years old), and the distance between play areas and share property lines (between 40 feet and several hundred feet away from play areas). In addition, the proposed Project is estimated to result in less than 1 dBA change in 24-hour noise exposure levels at the Saint Luke's property, from 59.6 dBA DNL to

60.0 dBA DNL, which would meet but not exceed the City's normally acceptable residential noise limit of 60 DNL. The proposed Project, therefore, would not result in a significant operational noise impact.

Although the proposed Project's noise levels would not exceed applicable City standards, the noise generated by children playing, including yelling, shouting, balls bouncing, equipment squeaking, etc., would be audible at adjacent property lines even if standards are not exceeded. In particular, based on monitoring of children's play at Saint Luke's and other childcare facilities, discrete events like children yelling and shouting can generate noise levels up to 77 dBA at 3 feet, which would attenuate to between 47 dBA L_{max} to 55 dBA L_{max} at adjacent property line locations. Therefore, the potential noise from preschool and after school play activities would be audible in the exterior rear yards of adjacent residential receptors. Children's play is currently, and has historically been, a common source of noise emanating from the Saint Luke's property. The proposed Project would increase preschool services at Saint Luke's but would not generate substantial noise levels that would be likely to disturb or annoy adjacent land uses. Nonetheless, the proposed Project has incorporated BMPs into the Project design that require acoustically soft surface treatments, placement of areas where children congregate away from adjoining property lines, and maintenance of equipment (see Section S.5). These BMPs are included as part of the Project and would further reduce potential Project noise levels from play areas.

S.4 AIRPORT NOISE-RELATED IMPACTS

CEQA requires the analysis of airport noise on people working or living in a proposed project area. The proposed Project is not located near any public or private airports. The closest airport is San Jose International Airport, approximately seven (7) miles east of Saint Luke's. The Project, therefore, would not expose children visiting or people working at Saint Luke's to excessive airport-related noise levels.

S.5 NOISE CONTROL BEST MANAGEMENT PRACTICES INCORPORATED INTO THE PROJECT

The proposed Project is including the following noise control BMPs into the Project design to reduce potential Project noise levels.

Construction Noise Control Best Management Practices. To reduce potential noise levels associated with construction of the proposed Project, the Applicant and/or its designated contractor, contractor's representatives, or other appropriate personnel shall:

- *Restrict work hours/equipment noise.* All work shall be subject to the requirements in Sunnyvale Municipal Code Section 16.08.030, Hours of Construction – Time and Noise Limitation, including deliveries, which permits construction activity between 7 AM and 6 PM Monday to Friday and 8 AM to 5 PM on Saturday. No construction shall occur on Sunday or federal holidays when city offices are closed. The Applicant and/or its contractor shall post a sign at all entrances to the construction site informing contractors, subcontractors, construction workers, etc. of this requirement. The sign shall also provide a name (or title) and phone number for an appropriate on-site and City representative to contact to submit a noise complaint.
- *Construction equipment selection, use, and noise control measures.* The following measures shall apply during construction activities:
 - Contractors shall use the smallest size equipment capable of safely completing work activities.

- Construction staging shall occur as far away from Project property lines as possible.
- Heavy equipment engines shall be covered, and exhaust pipes shall include a muffler in good working condition.
- Compressors and other pneumatic tools shall include a noise suppression device on the compressed air exhaust.
- No radios or other amplified sound devices shall be audible beyond the property line of the construction site.

Preschool/After School Noise Control Best Management Practices. To reduce potential noise levels from children's play areas, the Project shall:

- *Use soft materials for playscape surfaces.* The Project shall use soft materials (e.g., grass, wood chips, rubber mats) instead of concrete or brick in any new ACP or CCNS playscape surfaces.
- *Design CCNS play yard with potential areas of congregation on the east side of the play yard.* The Project shall design the CCNS play yard to place potential areas where children are intended to congregate (e.g., picnic tables, slides or climbing structures, ball play areas) away from the western fence as much as possible.
- *Maintain play equipment in good working order.* The Project shall maintain all play equipment in good working order. Swing sets, trampolines, tricycles, and other equipment with hinges, chains, springs, bolts, etc. should be lubricated regularly to avoid creaking, squeaking, and grinding noises.

The construction noise control BMP's incorporated into the proposed Project require the use of construction management and equipment controls to reduce potential noise from construction activities. These BMPs restrict work hours in accordance with the Municipal Code, require staging and stationary noise sources to be located as far from neighboring, sensitive land uses as possible, and require equipment to include standard noise attenuation features such as engine shields and mufflers. These BMPs would ensure the proposed Project construction activities comply with the City's Municipal Code and do not result in a substantial, temporary increase in the ambient noise levels that exists in the vicinity of the Project.

The operational noise control BMPs incorporated into the proposed Project aid in reducing noise levels from children's play areas that could annoy, disturb, or otherwise result in a nuisance to owners, occupants, and users of adjacent properties.

1 INTRODUCTION

Saint Luke Lutheran Church of Sunnyvale (Saint Luke's, or the church) has applied to the City of Sunnyvale for a use permit modification for its Mitchell Education Building Renovation and Addition Project (proposed Project). The proposed Project would be located at 1025 The Dalles Avenue, Sunnyvale, California and involve renovations and a minor addition (approximately 500 square feet) to the church's existing Mitchell Education Building to resume and enhance preschool services, the construction of a new, approximately 960-square-foot church administration building, and other minor site improvements.

MIG, Inc. (MIG) has prepared this Noise Impact Report (Report) to evaluate the potential construction and operational-related noise impacts of the proposed Project. MIG has prepared this Report using Project-specific information contained in the use permit application, as well as additional information provided by the Applicant. Where necessary, MIG has supplemented available information with site-specific data and standardized sources of information, such as field noise measurements, reference data for construction equipment noise levels, and assumptions pertaining to sound propagation. In general, this Report evaluates the potential "worst-case" conditions associated with the proposed Project's construction and operational noise levels.

This Report is intended for use by the City of Sunnyvale to assess the potential noise and vibration impacts of the proposed Project in compliance with the California Environmental Quality Act (CEQA; PRC §21000 et seq.) and the State CEQA Guidelines (14 CCR §15000 et seq.), particularly with respect to the noise and vibration issues identified in Appendix G of the State CEQA Guidelines.

1.1 REPORT ORGANIZATION

This Report is organized as follows:

- **Chapter 1, Introduction**, explains the contents of this Report and its intended use.
- **Chapter 2, Project Description**, provides an overview of construction and operational activities associated with the proposed Project.
- **Chapter 3, Noise Fundamentals**, provides pertinent background information on the measurement, propagation, and characterization of noise levels.
- **Chapter 4, Environmental Setting and Regulatory Framework**, describes the existing noise and setting of the proposed Project and provides information on the federal, state, and local regulations that govern the Project setting and potential noise impacts.
- **Chapter 5, CEQA Noise and Vibration Impact Analysis**, identifies the potential operational noise impacts of the proposed Project and evaluates these effects in accordance with Appendix G of the State CEQA Guidelines.
- **Chapter 6, Report Preparers and References**, list the individuals involved, and the references used, in the preparation of this Report.

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2 PROJECT DESCRIPTION

Saint Luke's is proposing a series of minor building and site improvements to its existing property at 1025 The Dalles Avenue, Sunnyvale, CA. The improvements will resume, enhance, and support preschool and church-related services historically provided at Saint Luke's. This chapter describes the proposed Project location, existing site conditions and operations, and proposed construction and operational characteristics.

2.1 PROJECT LOCATION

Saint Luke's is located at 1025 The Dalles Avenue, in the southwestern part of the City of Sunnyvale (see Figure 2-1: Proposed Project Location). The church property consists of a single parcel of land (Assessor's Parcel Number (APN) 32011010) that occupies approximately 4.4 acres. It is bound by existing single-family residences to the north and west, Wright Avenue to the east, and The Dalles Avenue to the south. State Route (SR) 85 is located approximately 750 feet west of the church property.¹

2.1.1 SITE LAND USE DESIGNATION AND ZONING

The City's General Plan and Zoning Map designate the Saint Luke's property as Public Facilities (PF; City of Sunnyvale, 2022).

2.1.2 SURROUNDING LAND USES

In general, Saint Luke's is surrounded by residential land uses. Single-family residences border the church property to the north and west and are located to the east (across Wright Avenue) and south (across The Dalles Avenue). The City's General Plan and Zoning Map designates the properties surrounding Saint Luke's as low-density residential land uses (City of Sunnyvale, 2022).

2.2 EXISTING SITE DESCRIPTION AND OPERATIONS

Saint Luke's is an active church property that supports and provides religious, community, and other related services, including after school care. The property includes five existing buildings, a storage trailer, secured children's playground/play areas, grass/lawn areas, landscaping and garden areas, 167 total parking spaces, and a 20-foot-wide drive aisle/perimeter road that connects to The Dalles Avenue and Wright Avenue and provides access to the interior of the site (see Figure 2-2: Aerial View of Project Site).

Most of the site's parking is located along the northern part of the site (136 of 167 parking spaces), which is accessed via driveways on Wright Avenue and The Dalles Avenue; the remaining parking (31 of 167 parking spaces) is in the center of the site and is accessed via a driveway on The Dalles Avenue.

The five existing buildings at the site are summarized in Table 2-1.

¹ This distance is as measured between the church property line and the estimated SR 85 right-of-way.

Figure 2-1: Proposed Project Location

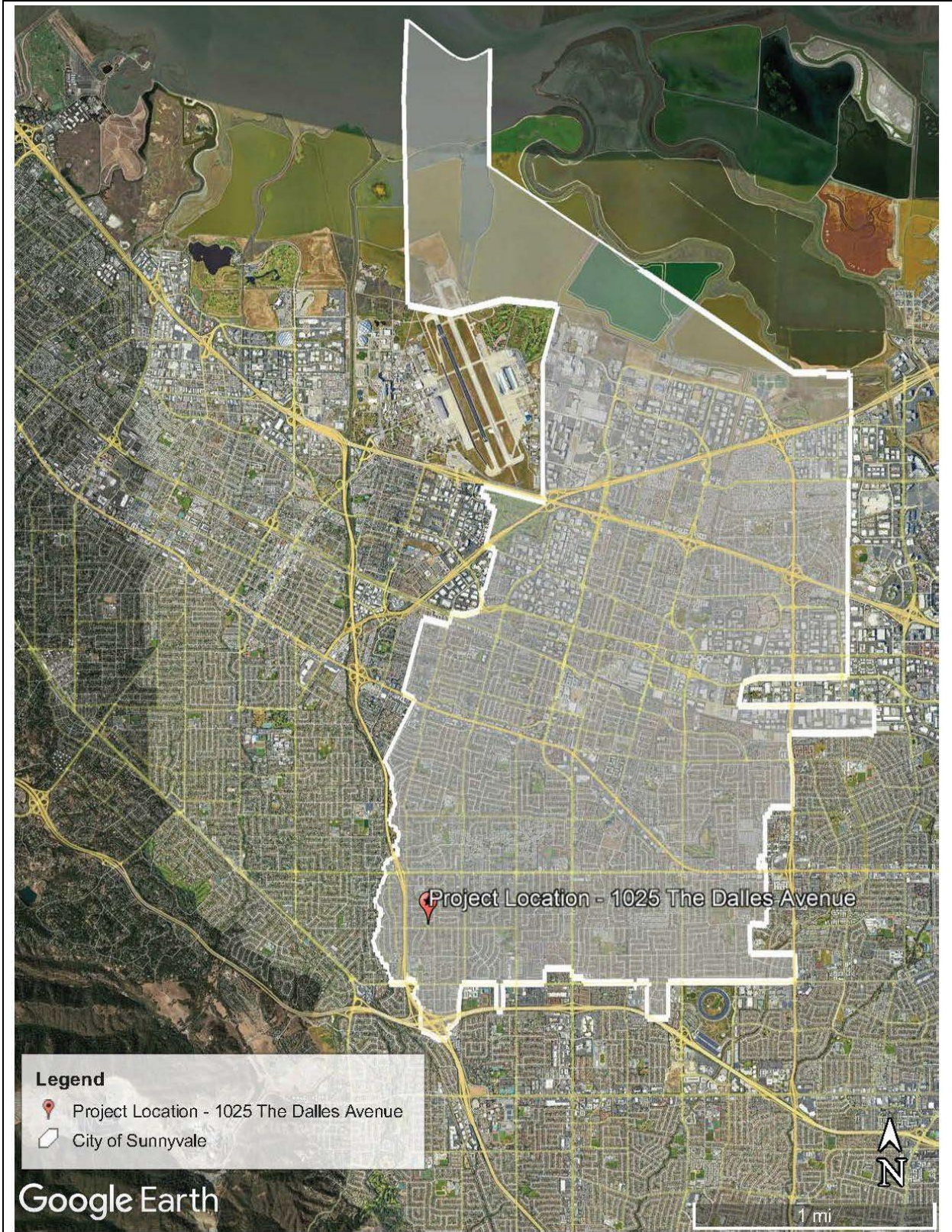
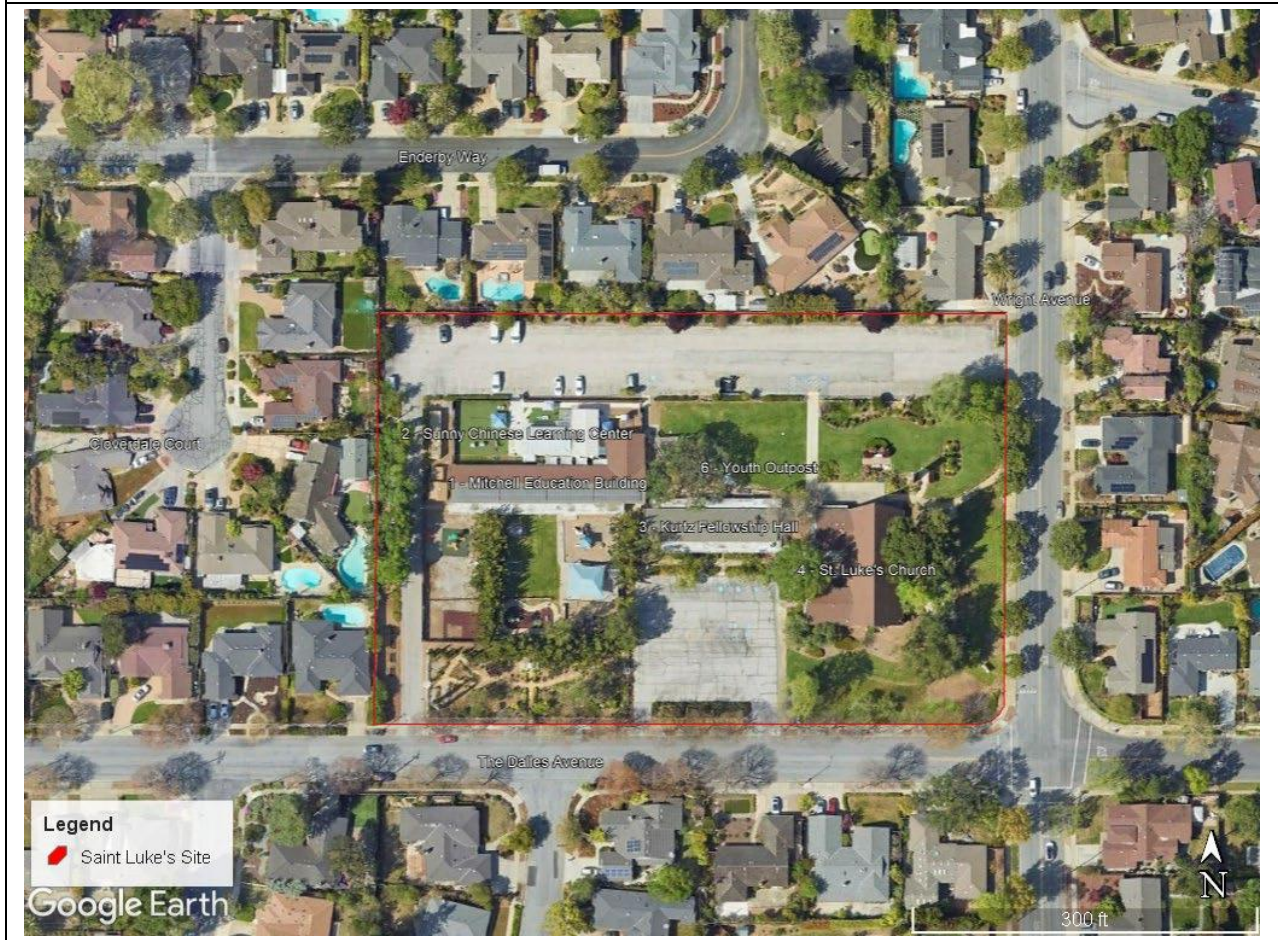


Figure 2-2: Aerial View of Project Site



Building(A)	Size	Existing Use
1 - Mitchell Education Building	5,206 Square Feet	Preschool education (vacant since March 2020)
2 - Sunny Chinese Learning Center	1,920 Square Feet	After school care
3 - Kurtz Fellowship Hall	2,496 Square Feet	Church-related services
4 - Saint Luke Lutheran Church Building	6,524 Square Feet	Religious services
6 - Youth Outpost	357 Square Feet	Church-related youth services
(A) There are five existing buildings at the Saint Luke's property. The proposed Project would add a new building (#5), increasing the total number of buildings at the site to six (6) buildings.		

2.2.1 MITCHELL EDUCATION BUILDING

Saint Luke's existing Mitchell Education Building includes four (4) classrooms totaling 5,206 square feet and two yard/play areas that total approximately 20,675 square feet in size. The building has

historically been used for preschool, nursery school, and other children's education and church administration services.

2.2.1.1 Amazing Creations Preschool Operations

Amazing Creations Preschool (ACP) historically operated at Saint Luke's until March 2020, when the preschool closed due to COVID. The preschool occupied three (3) of the four (4) rooms in the Mitchell Education Building. Prior to its closure, the preschool operated year-round, Monday to Friday, from approximately 7:30 AM to 6:00 PM. The preschool's typical enrollment consisted of approximately 50 children between 18 months and 5 years of age. Exterior play times typically occurred for one hour between 9:30 AM and 10:30 AM (children 18 months to 3 years old), 10:30 AM to 11:30 AM (3.5 years old and 4 years old), and 3:00 PM to 5:00 PM (2.5 years old to 5 years old). Up to 50 toddlers and preschool-aged children could be outside during play periods. The exterior play areas included small play equipment (e.g., slide structures), a sandbox, a lawn area, and other play/activity areas.

As described in more detail in Section 2.3, the proposed Project would make minor modifications to existing preschool building that result in the resumption of ACP services at the Mitchell Education Building.

2.2.2 SUNNY CHINESE LEARNING CENTER

Sunny Chinese Learning Center (SCLC) currently provides after school care services to kindergarten thru 6th grade students. At its peak, the center has served approximately 100 students; however, current enrollment (as of December 2022) is approximately 50 children between approximately 6 and 12 years of age. The center operates Monday to Friday during the traditional school year (typically mid-September to early June), from approximately 2:30 PM to 6:30 PM. The center includes an exterior play area surrounded by a six-foot high wooden fence. Students also have access to the grassy area north of Kurtz Fellowship Hall.

The proposed Project does not include modifications to the Sunny Chinese Learning Center building or its operations.

2.2.3 SAINT LUKE LUTHERAN CHURCH FACILITIES AND OPERATIONS

Saint Luke Lutheran Church provides religious and other church/community-based services. The proposed Project would not modify the existing church building, fellowship hall, or church/community-based services; however, as described in more detail in Section 2.3, the proposed Project would add a new small church administration building within the ACP play yard and restripe the northern parking area.

2.3 PROPOSED SITE DEVELOPMENT AND OPERATIONS

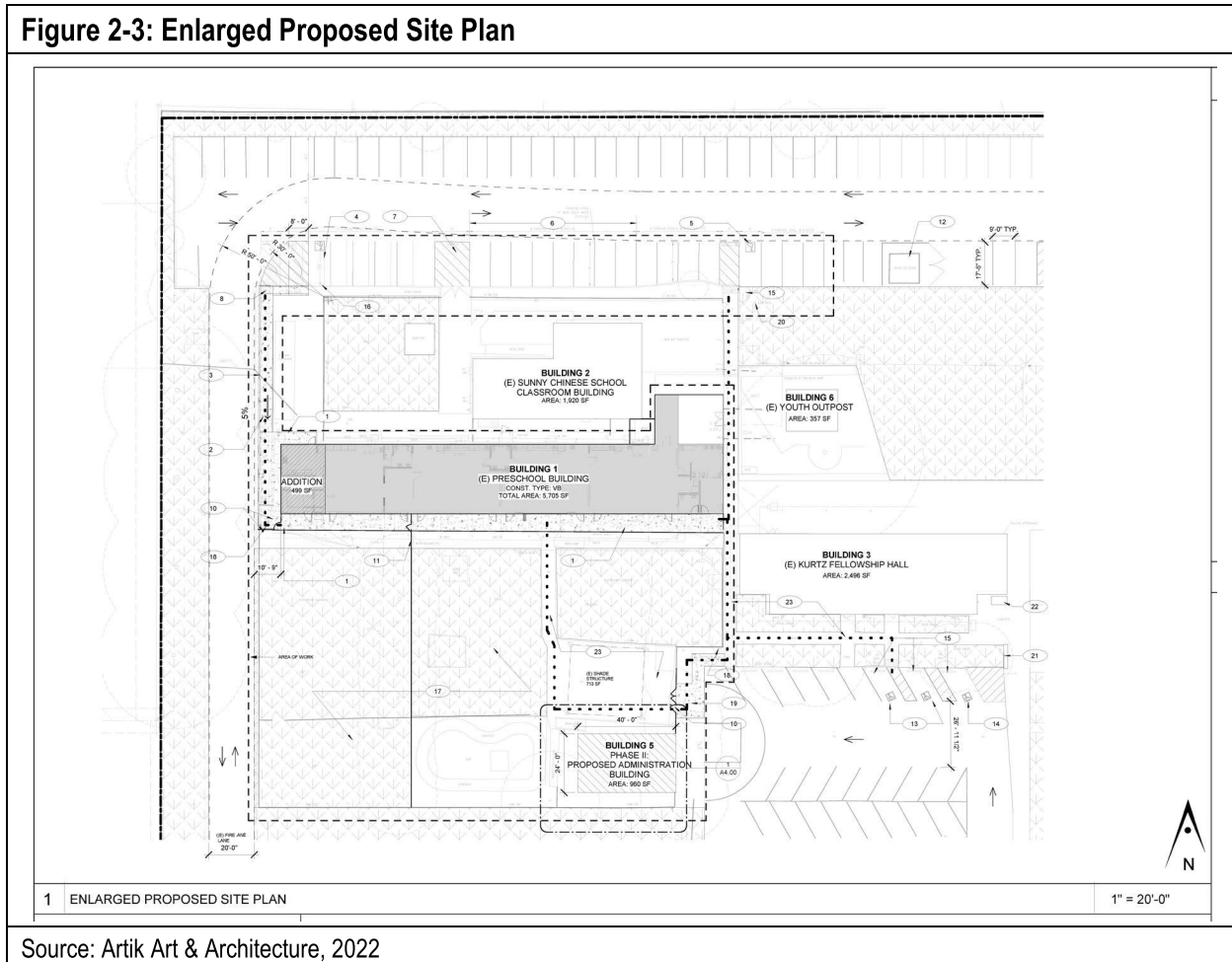
The proposed Project would be developed in two phases involving the following activities:

- Phase 1 Development
 - Minor exterior and interior renovations to the Mitchell Education Building to support the resumption of historical ACP services at the Saint Luke's property
 - Minor expansion (499 square feet) of one classroom in the Mitchell Education Building to support the relocation of Cupertino Cooperative (Co-op) Nursery School (CCNS) from the Fremont High School campus to the Saint Luke's property
 - Install new CCNS play equipment

- Restripe existing parking area
- Phase 2 Development
 - Construct a new, 960 square-foot church administration building

The proposed site plan is shown in Figure 2-3: Enlarged Proposed Site Plan. As indicated, the proposed Project would not modify existing operations associated with Saint Luke Lutheran Church or the SCLC.

Figure 2-3: Enlarged Proposed Site Plan



Source: Artik Art & Architecture, 2022

2.3.1 MITCHELL EDUCATION BUILDING RENOVATION AND EXPANSION

The proposed Project includes minor renovations to the existing Mitchell Education Building. Renovations would include interior modifications to all four classrooms to update, refresh, and modernize the classrooms. Renovations would also include exterior modifications to replace and repair building façade components as needed. These renovations would support the resumption of ACP services that were provided at the Saint Luke's property until March 2020 (see Section 2.3.1.1). The expansion of the Mitchell Education Building would occur on the west side of the building and increase the building from 5,206 square feet to 5,705 square feet in size. Two small sheds (less than 500 square feet) would be removed to make way for the building expansion. The expansion of the classroom building would support the relocation of CCNS from the Fremont High School campus to the Saint Luke's property.

2.3.1.1 Resumption of Amazing Creations Preschool Services

Once renovated, three (3) of the four (4) classrooms at the Mitchell Education Building would resume ACP services, which operated at Saint Luke's until March 2020. There would be no change to the ACP enrollment and operating schedule described in Section 2.2.1.1. ACP children would only have access to the eastern part of the building's exterior play yard (see Figure 2-4: Saint Luke's Property School Yards/Play Areas). There are no changes proposed to this part of the play yard, which is approximately 13,570 square feet in size.

2.3.1.2 Cupertino Co-op Nursery School

The renovation and expansion of the Mitchell Education Building would support the relocation of CCNS from the Fremont High School campus (563 West Fremont Avenue in Sunnyvale) to one (1) of the four (4) classrooms in the building. CCNS is an existing nursery school that has operated at the high school campus for approximately 36 years but must vacate the campus by Summer 2022. The preschool occupies approximately 0.36 acres of the campus, consisting of an approximately 1,630 square-foot preschool building and a 14,030 square-foot exterior play area that includes a swing set, play structures, tricycle track, sandbox, chicken coop, and a garden area. CCNS enrollment (as of December 2022) is 48 children between approximately two (2) and five (5) years of age. Services are provided by age with younger children and toddlers (approximately 2 - 4 years old) on site during the morning and preschool children (approximately 4 - 5 years old) on site in the afternoon. The center operates Monday to Friday during the traditional school year (typically mid-September to early June), from approximately 8:30 AM to 3:30 PM. Children have access to the exterior play area throughout the day (i.e., there is no set exterior play time or schedule).

CCNS' existing operations are summarized in Table 2-2. There would be no change to the CCNS enrollment and operating schedule shown below. CCNS children would only have access to the western portion of the Mitchell Education Buildings play yard, which is approximately 7,105 square feet in size (see Figure 2-4). CCNS' conceptual play yard plan is shown in Figure 2-5: CCNS Conceptual Play Yard Plan.

Table 2-2: Summary of CCNS Operations				
Day/Period	Operating Hours^(A)	Age Group	Max Number of Children	Teachers and Volunteers
<i>General Daily Operations</i>				
Monday to Friday	8:30 AM to 3:30 PM	2 to 5 years	48	13
Saturday and Sunday	Closed	--	--	--
<i>Typical Morning Operations</i>				
Monday, Wednesday, Friday	8:45 AM to 11:30 AM	3 to 4 years	24	9
Tuesday and Thursday	8:45 AM to 11:30 AM	2 to 3 years	24	13
<i>Typical Afternoon Operations</i>				
Monday to Thursday	12:00 PM to 3:30 PM	4 to 5 years	24	8
Friday	Closed	--	--	--
(A) Hours are for facility opening/closing (for general operations) and class start/end (for morning and afternoon sessions).				



2.3.1.3 Summary of Preschool/After School Services

If implemented, the proposed Project would increase preschool services at the Saint Luke's property. The preschool and after school services that would be provided at Saint Luke's are summarized in Table 2-3.

Table 2-3: Summary of Proposed Preschool / After School Services

Characteristic	ACP	CCNS	SCLC
Currently At Site?	No	No	Yes
December 2022 Enrollment	-	48	50
Max Historical Enrollment	50	48	100
Age Range	18 months to 5 years	2 years to 5 years	6 years to 12 years
Year-round or School Year	Year Round	September to June	September to June
Operations	Monday to Friday	Monday to Friday	Monday to Friday
Daily Hours (General)	7 AM to 6 PM	8:30 AM to 3:30 PM	2:30 PM to 6:30 PM
Yard / Play Hours	9:30 AM to 11:30 AM 3:00 PM to 5:00 PM	8:45 AM to 11:30 AM 12:00 PM to 3:30 PM	3:00 PM to 6:00 PM

Figure 2-5: CCNS Conceptual Play Yard Plan



2.3.2 PARKING LOT RESTRIPIING

The proposed Project would result in the net loss of three (3) parking spaces at the Saint Luke's property. These spaces would be removed to provide a better line of site and rounding of the drive aisle in the northwest corner of the property (see Figure 2-3). With this action, parking at the site would decrease from 167 parking spaces to 164 parking spaces, with 133 of the 164 spaces located along the norther part of the property and 31 of the 164 parking spaces located in the center of the site. This action would necessitate restriping of a small part of the parking area in the northwest corner of Saint Luke's.

2.3.3 NEW ADMINISTRATION BUILDING (PHASE 2)

The proposed Project includes the construction of a new, small (960 square feet) church administration building near the center of the Saint Luke's property. This would occur as part of Phase 2 of the proposed Project, which could occur as soon as Summer 2023. The administration building would remove some of the ACP exterior yard/play area from use.

2.3.4 PROJECT CONSTRUCTION

Phase 1 of the proposed Project would involve minor construction activities, including removal and relocation of small structures (e.g., shed, storage trailer), interior and exterior building modifications, and installation of new play structures and planters. Apart from material deliveries, the proposed Project is not anticipated to require the use of large trucks or prolonged heavy equipment use on-site. Phase 1 Project modifications are anticipated to begin in the 1st or 2nd quarter of 2023 and last between three (3) and five (5) months in total. Phase 2 of the proposed Project is likely to include minor foundation work (leveling and pouring a concrete pad) and construction of the small administration building. This phase is not anticipated to require the prolonged use of heavy construction equipment; however, a small lift or crane may be needed to assist with installation of a prefabricated building.

2.4 NOISE CONTROL BEST MANAGEMENT PRACTICES INCLUDED IN THE PROJECT DESIGN

In addition to limiting the number of students enrolled at the ACP, CCNS, and SCLC facilities, Saint Luke's is including the following BMPs in the proposed Project design to help reduce potential noise generated by the construction and operation of the Project.

Construction Noise Control Best Management Practices. To reduce potential noise levels associated with construction of the proposed Project, the Applicant and/or its designated contractor, contractor's representatives, or other appropriate personnel shall:

- *Restrict work hours/equipment noise.* All work shall be subject to the requirements in Sunnyvale Municipal Code Section 16.08.030, Hours of Construction – Time and Noise Limitation, including deliveries, which permits construction activity between 7 AM and 6 PM Monday to Friday and 8 AM to 5 PM on Saturday. No construction shall occur on Sunday or federal holidays when city offices are closed. The Applicant and/or its contractor shall post a sign at all entrances to the construction site informing contractors, subcontractors, construction workers, etc. of this requirement. The sign shall also provide a name (or title) and phone number for an appropriate on-site and City representative to contact to submit a noise complaint.

- *Construction equipment selection, use, and noise control measures.* The following measures shall apply during construction activities:
 - Contractors shall use the smallest size equipment capable of safely completing work activities.
 - Construction staging shall occur as far away from Project property lines as possible.
 - Heavy equipment engines shall be covered, and exhaust pipes shall include a muffler in good working condition.
 - Compressors and other pneumatic tools shall include a noise suppression device on the compressed air exhaust.
 - No radios or other amplified sound devices shall be audible beyond the property line of the construction site.

Preschool/After School Noise Control Best Management Practices. To reduce potential noise levels from children's play areas, the Project shall:

- *Use soft materials for playscape surfaces.* The Project shall use soft materials (e.g., grass, wood chips, rubber mats) instead of concrete or brick in any new ACP or CCNS playscape surfaces.
- *Design CCNS play yard with potential areas of congregation on the east side of the play yard.* The Project shall design the CCNS play yard to place potential areas where children are intended to congregate (e.g., picnic tables, slides or climbing structures, ball play areas) away from the western fence as much as possible.
- *Maintain play equipment in good working order.* The Project shall maintain all play equipment in good working order. Swing sets, trampolines, tricycles, and other equipment with hinges, chains, springs, bolts, etc. should be lubricated regularly to avoid creaking, squeaking, and grinding noises.

3 NOISE AND VIBRATION FUNDAMENTALS

3.1 DEFINING NOISE

“Sound” is a vibratory disturbance created by a moving or vibrating source and is capable of being detected. For example, airborne sound is the rapid fluctuation of air pressure above and below atmospheric pressure. “Noise” may be defined as unwanted sound that is typically construed as loud, unpleasant, unexpected, or undesired by a specific person or for a specific area.

3.1.1 SOUND PRODUCTION

Sound has three properties: frequency (or pitch), amplitude (or intensity or loudness), and duration. Pitch is the height or depth of a tone or sound and depends on the frequency of the vibrations by which it is produced. Sound frequency is expressed in terms of cycles per second, or Hertz (Hz). Humans generally hear sounds with frequencies between 20 and 20,000 Hz and perceive higher frequency sounds, or high pitch noise, as louder than low-frequency sound or sounds low in pitch. Sound intensity or loudness is a function of the amplitude of the pressure wave generated by a noise source combined with the reception characteristics of the human ear. Atmospheric factors and obstructions between the noise source and receptor also affect the loudness perceived by the receptor.

The frequency, amplitude, and duration of a sound all contribute to the effect on a listener, or receptor, and whether or not the receptor perceives the sound as “noisy” or annoying. Despite the ability to measure sound, human perceptibility is subjective, and the physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as “noisiness” or “loudness.”

3.1.2 MEASURING SOUND

Sound pressure levels are typically expressed on a logarithmic scale in terms of decibels (dB). A dB is a unit of measurement that indicates the relative amplitude (i.e., intensity or loudness) of a sound, with 0 dB corresponding roughly to the threshold of hearing for the healthy, unimpaired human ear. Since decibels are logarithmic units, an increase of 10 dBs represents a ten-fold increase in acoustic energy, while 20 dBs is 100 times more intense, 30 dBs is 1,000 times more intense, etc. In general, there is a relationship between the subjective noisiness or loudness of a sound and its intensity, with each 10 dB increase in sound level perceived as approximately a doubling of loudness. Due to the logarithmic basis, decibels cannot be directly added or subtracted together using common arithmetic operations:

$$50 \text{ decibels} + 50 \text{ decibels} \neq 100 \text{ decibels}$$

Instead, the combined sound level from two or more sources must be combined logarithmically. For example, if one noise source produces a sound power level of 50 dBA, two of the same sources would combine to produce 53 dB as shown below.

$$10 * 10 \log \left(10^{\left(\frac{50}{10}\right)} + 10^{\left(\frac{50}{10}\right)} \right) = 53 \text{ decibels}$$

In general, when one source is 10 dB higher than another source, the quieter source does not add to the sound levels produced by the louder source because the louder source contains ten times more sound energy than the quieter source.

3.1.3 CHARACTERIZING SOUND

Although humans generally can hear sounds with frequencies between 20 and 20,000 Hz most of the sound humans are normally exposed to do not consist of a single frequency, but rather a broad range of frequencies perceived differently by the human ear. In general, humans are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. Instruments used to measure sound, therefore, include an electrical filter that enables the instrument's detectors to replicate human hearing. This filter known as the "A-weighting" or "A-weighted sound level" filters low and very high frequencies, giving greater weight to the frequencies of sound to which the human ear is typically most sensitive. Most environmental measurements are reported in dBA, meaning decibels on the A-scale. Most environmental measurements are reported in dBA, meaning decibels on the A-scale. A list of common noise sources and their associated A-weighted noise level is provided in Table 3-1. Other weightings include the B-, C-, and D-weighting, but these scales are not commonly used for environmental noise because human annoyance correlates well with the A-weighting and these weighting scales are not incorporated in typical environmental noise descriptors

Sound levels are usually not steady and vary over time. Therefore, a method for describing either the average character of the sound or the statistical behavior of the variations over a period of time is necessary. The continuous equivalent noise level (L_{eq}) descriptor is used to represent the average character of the sound over a period of time. The L_{eq} represents the level of steady-state noise that would have the same acoustical energy as the sum of the time-varying noise measured over a given time period. L_{eq} is useful for evaluating shorter time periods over the course of a day. The most common L_{eq} averaging period is hourly, but L_{eq} can describe any series of noise events over a given time period.

Variable noise levels are the values that are exceeded for a portion of the measured time period. Thus, the L_{01} , L_{05} , L_{25} , L_{50} , and L_{90} descriptors represent the sound levels exceeded 1%, 5%, 25%, 50%, and 90% of the time the measurement was performed. The L_{90} value usually corresponds to the background sound level at the measurement location.

When considering environmental noise, it is important to account for the different responses people have to daytime and nighttime noise. In general, during the nighttime, background noise levels are generally quieter than during the daytime but also more noticeable due to the fact that household noise has decreased as people begin to retire and sleep. Accordingly, a variety of methods for measuring noise have been developed. The California General Plan Guidelines for Noise Elements identifies the following common metrics for measuring noise (OPR 2017):

- **L_{dn} (Day-Night Average Level):** The average equivalent A-weighted sound level during a 24-hour day, divided into a 15-hour daytime period (7 AM to 10 PM) and a 9-hour nighttime period (10 PM to 7 AM). A 10 dB "penalty" is added to measure nighttime noise levels when calculating the 24-hour average noise level. For example, a 45-dBA nighttime sound level (e.g., at 2 AM) would contribute as much to the overall day-night average as a 55-dBA daytime sound level (e.g., at 7 AM).
- **CNEL (Community Noise Equivalent Level):** The CNEL descriptor is similar to L_{dn} , except that it includes an additional 5 dBA penalty for noise events that occur during the evening time period (7 PM to 10 PM). For example, a 45-dBA evening sound level (e.g., at 8 PM) would contribute as much to the overall day-night average as a 50-dBA daytime sound level (e.g. at 8 AM).

Table 3-1: Typical Noise Levels		
Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet flyover at 1,000 feet	105	
	100	
Gas lawn mower at 3 feet	95	
	90	
Diesel truck at 50 feet at 50 mph	85	Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noise urban area, daytime	75	
Gas lawnmower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area	65	Normal speech at 3 feet
Heavy traffic at 300 feet	60	
	55	Large business office
Quiet urban daytime	50	Dishwasher next room
	45	
Quiet urban nighttime	40	Theater, large conference room
Quiet suburban nighttime	35	
	30	Library
Quite rural nighttime	25	Bedroom at night
	20	
	15	Broadcast/recording studio
	10	
	5	
Typical threshold of human hearing	0	Typical threshold of human hearing

Source: Caltrans, 2013

The artificial penalties imposed during L_{dn} and CNEL calculations are intended to account for a receptor's increased sensitivity to noise levels during quieter nighttime periods. As such, the L_{dn} and CNEL metrics are usually applied when describing longer-term ambient noise levels because they account for all noise sources over an extended period of time and account for the heightened sensitivity of people to noise during the night. In contrast, the L_{eq} metric is usually applied to shorter reference periods where sensitivity is presumed to remain generally the same.

Federal and State agencies have established noise and land use compatibility guidelines that use averaging approaches to noise measurement. The State Department of Aeronautics and the California Commission on Housing and Community Development have adopted the CNEL for evaluating community noise exposure levels.

3.1.4 SOUND PROPAGATION

The energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out and travels away from the noise generating source. The strength of the source is often characterized by its “sound power level.” Sound power level is independent of the distance a receiver is from the source and is a property of the source alone. Knowing the sound power level of an idealized source and its distance from a receiver, sound pressure level at the receiver point can be calculated based on geometrical spreading and attenuation (noise reduction) as a result of distance and environmental factors, such as ground cover (asphalt vs. grass or trees), atmospheric absorption, and shielding by terrain or barriers.

For an ideal “point” source of sound, such as mechanical equipment, the energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out in a spherical pattern and travels away from the point source. Theoretically, the sound level attenuates, or decreases, by 6 dB with each doubling of distance from the point source. In contrast, a “line” source of sound, such as roadway traffic or a rail line, spreads out in a cylindrical pattern and theoretically attenuates by 3 dB with each doubling of distance from the line source; however, the sound level at a receptor location can be modified further by additional factors. The first is the presence of a reflecting plane such as the ground. For hard ground, a reflecting plane typically increases A-weighted sound pressure levels by 3 dB. If some of the reflected sound is absorbed by the surface, this increase will be less than 3 dB. Other factors affecting the predicted sound pressure level are often lumped together into a term called “excess attenuation.” Excess attenuation is the amount of additional attenuation that occurs beyond simple spherical or cylindrical spreading. For sound propagation outdoors, there is almost always excess attenuation, producing lower levels than what would be predicted by spherical or cylindrical spreading. Some examples include attenuation by sound absorption in air; attenuation by barriers; attenuation by rain, sleet, snow, or fog; attenuation by grass, shrubbery, and trees; and attenuation from shadow zones created by wind and temperature gradients. Under certain meteorological conditions, like fog and low-level clouds, some of these excess attenuation mechanisms are reduced or eliminated due to noise reflection.

3.1.5 NOISE EFFECTS ON HUMANS

Noise effects on human beings are generally categorized as:

- Subjective effects of annoyance, nuisance, and/or dissatisfaction
- Interference with activities such as speech, sleep, learning, or relaxing
- Physiological effects such as startling and hearing loss

Most environmental noise levels produce subjective or interference effects; physiological effects are usually limited to high noise environments such as industrial manufacturing facilities or airports.

Predicting the subjective and interference effects of noise is difficult due to the wide variation in individual thresholds of annoyance and past experiences with noise; however, an accepted method to determine a person’s subjective reaction to a new noise source is to compare it to the existing environment without the noise source, or the “ambient” noise environment. In general, the more a new noise source exceeds the ambient noise level, the more likely it is to be considered annoying and to disturb normal activities.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are

generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness that would almost certainly cause an adverse response from community noise receptors.

When exposed to high noise levels, humans may suffer hearing damage. Sustained exposure to high noise levels (e.g., 90 dBs for hours at a time) can cause gradual hearing loss, which is usually temporary, whereas sudden exposure to a very high noise level (e.g., 130 to 140 dBs) can cause sudden and permanent hearing loss. In addition to hearing loss, noise can cause stress in humans and may contribute to stress-related diseases, such as hypertension, anxiety, and heart disease (Caltrans 2013).

3.1.6 GROUND-BORNE VIBRATION AND NOISE

Vibration is the movement of particles within a medium or object such as the ground or a building. Vibration may be caused by natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or humans (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources are usually characterized as continuous, such as factory machinery, or transient, such as explosions.

As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency; however, unlike airborne sound, there is no standard way of measuring and reporting amplitude. Vibration amplitudes can be expressed in terms of velocity (inches per second) or discussed in dB units to compress the range of numbers required to describe vibration. Vibration impacts to buildings are usually discussed in terms of peak particle velocity (PPV) in inches per second (in/sec). PPV represents the maximum instantaneous positive or negative peak of a vibration signal and is most appropriate for evaluating the potential for building damage. Vibration can impact people, structures, and sensitive equipment. The primary concern related to vibration and people is the potential to annoy those working and residing in the area. Vibration with high enough amplitudes can damage structures (such as crack plaster or destroy windows). Ground-borne vibration can also disrupt the use of sensitive medical and scientific instruments, such as electron microscopes. Potential human annoyance associated with ground-borne velocity is typically assessed using velocity decibel (VdB) notation.

Ground-borne noise is noise generated by vibrating building surfaces such as floors, walls, and ceilings that radiate noise inside buildings subjected to an external source of vibration. The vibration level, the acoustic radiation of the vibrating element, and the acoustical absorption of the room are all factors that affect potential ground-borne noise generation.

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4 ENVIRONMENTAL SETTING AND REGULATORY FRAMEWORK

This chapter provides information on the environmental and regulatory noise setting of the proposed Project.

4.1 PROJECT LOCATION AND SITE DESCRIPTION

The proposed Project is located at 1025 The Dalles Avenue in the City of Sunnyvale. Refer to Section 2.1 for a description of the Project site and its surroundings.

4.2 EXISTING NOISE ENVIRONMENT

Saint Luke Lutheran Church is in the southwestern part of the City of Sunnyvale, approximately 750 feet west of SR 85. The Sunnyvale General Plan Noise Element identifies that transportation facilities are a major source of noise in the city (City of Sunnyvale, 2011). Traffic noise modeling conducted for the City's General Plan Land Use and Transportation Element update indicates SR 85 produces a DNL of 75.8 dBA at a distance of 125 feet from the road centerline (City of Sunnyvale, 2016, p. 3.6-30). At a distance of 750 feet, SR 85 noise would theoretically attenuate to approximately 68 DNL at Saint Luke's.

MIG conducted ambient noise monitoring at Saint Luke's and the CCNS site at Fremont High School to:

- Provide direct observations and measurements of existing noise levels at the Saint Luke Church property, including SCLC operations;
- Provide direct observations and measurements of existing noise levels associated with CCNS operations; and
- Evaluate potential Project noise levels at nearby sensitive receptors (see Section 4.2.3).

The ambient noise monitoring surveys are described in more detail below, including a summary of each survey's results. Refer to Appendix A for detailed ambient noise monitoring survey results. MIG notes all references to noise levels are presented in terms of the A-weighted decibel scale, or dBA.

4.2.1 AMBIENT NOISE LEVELS AT SAINT LUKE LUTHERAN CHURCH PROPERTY

MIG, Inc. conducted ambient noise level monitoring at the Saint Luke Lutheran Church property from 5:00 PM on Tuesday, November 29, 2022, to approximately 5:30 PM on Wednesday, November 30, 2022 (see Appendix A). The ambient noise levels were digitally measured and stored using three (3) Larson Davis sound level meters that meet American National Standards Institute requirements for a Type 1 integrating sound level meter. Each sound meter was calibrated immediately before and after the monitoring period using a reference one-kilohertz (1kHz) check frequency and 114 dB sound pressure level and found to be operating within normal parameters for sensitivity. Measurements were continuously collected during the survey period in 1-minute intervals. This interval was selected to capture short-term noise events and increases in noise levels above typical background conditions. Weather conditions during the monitoring were generally clear and sunny during the daytime. Temperatures ranged from the low 40's (overnight) to the low 60's (in the afternoon). Winds were generally light and variable and ranged from calm conditions during the nighttime and morning to approximately 5 to 10-miles per hour during the later afternoon periods.



The ambient noise monitoring conducted at the church property included one (1) long-term (LT) measurement and four (4) short-term (ST) measurements as described below and shown on Figure 4-1: Ambient Noise Monitoring Locations.

- **Location LT-01** was on the northern property line, approximately 70 feet from the fence surrounding the SCLC, perpendicular to a play area on the east side of the learning center. Ambient noise levels at this location were measured from 5 PM on Tuesday, November 29, 2022, to 5:30 PM on Wednesday, November 30, 2022.
- **Location ST-01** was on the northern property line, approximately 70 feet from the fence surrounding the SCLC, perpendicular to a play area on the west wide of the learning center. Ambient noise levels at this location were measured from 2:57 PM to 4:37 PM on Wednesday, November 30, 2022.
- **Location ST-02** was on the west side of the property, approximately 15 feet from the western property line and 50 feet from the fence surrounding the SCLC. A temporary storage trailer was present between the learning center and ST-01. Ambient noise levels at this location were measured from 2:47 PM to 3:10 PM and from 4:42 PM to 5:30 PM on Wednesday, November 30, 2022.
- **Location ST-03** was next to the grass/lawn area north of the Kurtz Fellowship Hall, approximately 67 feet from the northern property line. Ambient noise levels at this location were measured from 3:19 PM to 4:50 PM on Wednesday, November 30, 2022.
- **Location ST-04** on the northern property line, approximately 70 feet from the fence surrounding the SCLC, perpendicular to a play area in the center of the learning center. Ambient noise levels at this location were measured from 4:51 PM to 5:30 PM on Wednesday, November 30, 2022.

During the ambient noise monitoring, the existing noise environment at Saint Luke's included SR 85 background noise, aircraft overflights, cars accessing the church property, HVAC equipment associated with the SCLC building, and children's play.

Table 4-1 summarizes the long-term ambient noise monitoring results at Saint Luke's. Measured ambient noise levels were relatively consistent and quiet. During all hours, the average noise level was below 60 dBA L_{eq} and the 24-hour noise exposure level was calculated to be 59.6 dBA DNL, which is below the City's normally acceptable noise level limit of 60 dBA DNL. The highest measured instantaneous noise level was 74.7 dBA L_{max} . Based on the long-term monitoring, the ambient noise levels at Saint Luke's are primarily a function of hourly traffic conditions on SR 85. Measured hourly L_{eq} values generally rise during the afternoon commute (generally 3 PM to 7 PM), decrease through the evening and nighttime period, rise again during the morning commute (generally 5 AM to 9 AM), and then decrease again through the morning and early afternoon. The highest hourly average noise levels occurred at 6 AM (57.3 dBA L_{eq}) and 7 AM (59.3 dBA L_{eq}), during the AM peak hour commute period, when the church does not have religious service and the SCLC is not in session.

Figure 4-1: Ambient Noise Monitoring Locations (Saint Luke's)

4.2.1.1 Measured Noise Levels During Sunny Chinese Learning Center Operations

On November 30, 2022, the SCLC provided after school care to 49 children in 1st to 5th grade (approximately 6 to 11 years old). In general, children arrived individually by car or in a group van between about 2:45 PM and 3:30 PM and left individually or in groups by car between about 5:30 PM and 6:30 PM. During the ambient noise monitoring, children were present inside and outside the learning center building, with exterior play beginning at approximately 3 PM and ending at approximately 4:45 PM when the sun set and darkness encroached. Most exterior play occurred in the grass/lawn area near the Youth Outpost building, north of the Kurtz Fellowship Hall. Between 3 PM and 4:45 PM, approximately 20% of the total daily attendance (approximately 10 of 50 kids) were in this area playing, talking, engaging in group conversation, etc. Up to three supervisors were also present in this area at this time. Table 4-2 summarizes the results of the short-term monitoring during SCLC operations.

Table 4-1: Summary of Long-Term Ambient Noise Levels at Saint Luke's

Day / Site	Total Hours Monitored	L _{min}	L _{max}	Measured Hourly L _{eq} Range (dBA) ^(A)		24-Hour DNL ^(B)
				Daytime (7 AM to 7 PM)	Nighttime (10 PM to 7 AM)	
Tuesday, November 29, 2022, to Wednesday, November 30, 2022						
LT-01	24-Hours	33.3	74.7	43.5 – 59.3	48.1 – 57.3	59.6

Start: 5 PM, Tuesday, 11/29/22 End: 5 PM, Wednesday, 11/30/22

— Hourly Leq — Lmax — Calculated DNL

Source: MIG (See Appendix A)
 (A) Values are the lowest and highest measured average hourly values during the listed time period.
 (B) DNL data is presented for the period from 5 PM on November 29, 2022, to 5 PM on November 30, 2022.

Table 4-2: Summary of Short-Term Ambient Noise Levels During SCLC Operations

Day	Time	Duration	Site / Measured Noise Level Range (dBA L _{eq}) ^(A)				
			LT-01	ST-01	ST-02	ST-03	ST-04
11/30/22	2:47 PM – 3:10 PM	23 minutes	52.0	52.1	50.7	-	-
11/30/22	3:19 PM – 4:19 PM	1 hour	52.3	52.6	-	54.8	-
11/30/22	4:19 PM – 4:39 PM	20 minutes	54.3	54.2	-	58.6	-
11/30/22	4:42 PM – 4:50 PM	8 minutes	52.9	-	53.2	52.8	-
11/30/22	4:51 PM – 5:30 PM	40 minutes	53.1	-	52.5	-	52.2

Source: MIG (See Appendix A)
 (A) Values are the average noise level for the listed time period.

As shown in Table 4-2, the measured ambient noise levels at Saint Luke's during active SCLC operations ranged from approximately 50 dBA L_{eq} to 59 dBA L_{eq} . Noise levels were lowest on the west side of the church property (ST-02) because the existing Mitchell Education Building is currently unoccupied and there is a storage trailer located between the learning center and the western property line that serves to shield noise coming from the learning center. Noise levels along the northern property line (LT-01, ST-01, ST-04) were not shielded and were consistently in the range of 52 dBA L_{eq} to 54 dBA L_{eq} . Measured noise levels were highest adjacent to the grass play area north of the Kurtz Fellowship Hall (ST-03), between approximately 55 dBA L_{eq} to 59 dBA L_{eq} . The noise levels measured during active SCLC operations indicate that the SCLC does not generate substantial prolonged noise levels.

Although SCLC operations do not substantially contribute to overall noise levels at and near Saint Luke's, exterior play activities are audible and part of the local noise environment. As shown in Table 4-3 and Figure 4-2: Measured Noise Levels During SCLC Active Play Period, the measured noise levels during a particularly active play period were similar for children's play, aircraft overflights, and vehicles traveling along the site drive aisle. Overall noise levels during this period were, at times, approximately 4 dBA higher next to the grassy area (58.6 dBA L_{eq}) than at the property line (54.3 dBA L_{eq}). During this period, most play occurred in a dispersed nature throughout the grassy area. At times, play occurred within 10 feet of the noise meter (e.g., at 4:23 PM and at 4:30 PM), resulting in measured noise levels of approximately 70 dBA L_{max} .

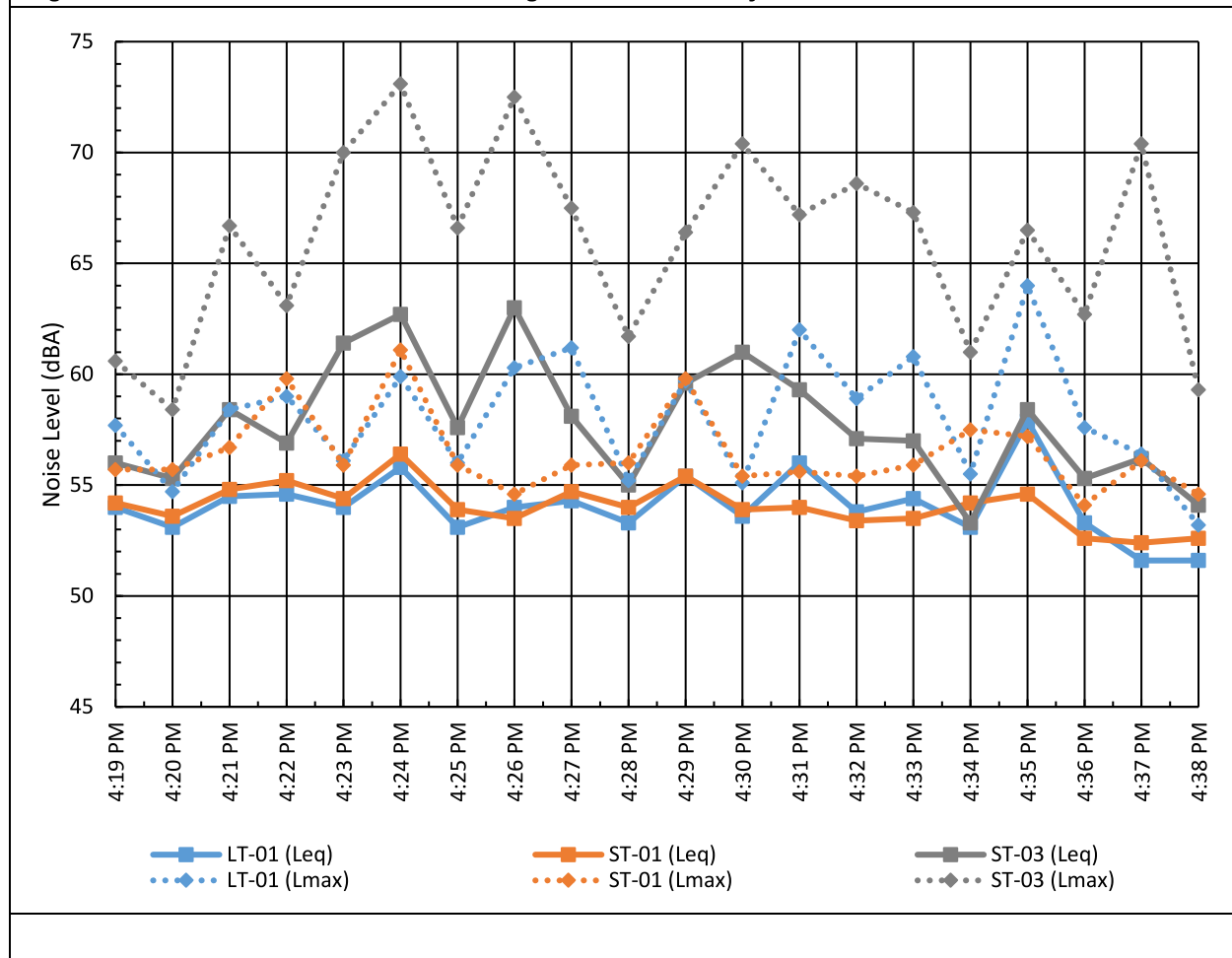
4.2.2 AMBIENT NOISE LEVELS AT CCNS FACILITY

MIG, Inc. conducted ambient noise level monitoring at the CCNS facility from 9:00 AM to approximately 2:00 PM on Wednesday, November 30, 2022 (see Appendix A). The monitoring was conducted using the same methodology as described in Section 4.2.1. The ambient noise monitoring conducted at the CCNS facility included four (4) ST measurements as described below and shown on Figure 4-3: Ambient Noise Monitoring Locations (CCNS).

- **Location CCNS-01** was fixed in the center of the exterior play area. Ambient noise levels at this location were measured from 9 AM to 2 PM on Wednesday, November 30, 2022.
- **Location CCNS-02** was on the east side of the exterior play area. Ambient noise levels at this location were measured from 9:24 AM to 9:43 AM and from 1:37 PM to 2:00 PM on Wednesday, November 30, 2022.
- **Location CCNS-03** was on the west side of the exterior play area. Ambient noise levels at this location were measured from 9:47 AM to 9:59 AM on Wednesday, November 30, 2022.
- **Location CCNS-04** was on the north side of the exterior play area. Ambient noise levels at this location were measured from 10:01 AM to 1:34 PM on Wednesday, November 30, 2022.

Day	Time	Primary Noise Contributor at Site ST-3 Grass Lawn	Measured 1-Minute Noise Level					
			Average (dBA L _{eq})			Maximum (dBA L _{max})		
			LT-01	ST-01	ST-03	LT-01	ST-01	ST-03
11/30/22	4:19 PM	~ 10 kids at play	54.0	54.2	56.0	57.7	55.7	60.6
11/30/22	4:20 PM	~ 10 kids at play	53.1	53.6	55.3	54.7	55.7	58.4
11/30/22	4:21 PM	~ 10 kids at play	54.5	54.8	58.4	58.4	56.7	66.7
11/30/22	4:22 PM	~ 10 kids at play + Jet plane	54.6	55.2	56.9	59.0	59.8	63.1
11/30/22	4:23 PM	~ 6 kids playing tag near meter	54.0	54.4	61.4	56.1	55.9	70.0
11/30/22	4:24 PM	6 kids playing tag + propellor plane	55.8	56.4	62.7	59.9	61.1	73.1
11/30/22	4:25 PM	6 kids playing tag	53.1	53.9	57.6	56.0	55.9	66.6
11/30/22	4:26 PM	Loud laugh, 4 kids shouting	54.0	53.5	63.0	60.3	54.6	72.5
11/30/22	4:27 PM	5 kids playing "red light green light"	54.3	54.7	58.1	61.2	55.9	67.5
11/30/22	4:28 PM	5 kids playing red light green light	53.3	54.0	55.0	55.2	56.0	61.7
11/30/22	4:29 PM	5 kids playing red light green light	55.4	55.4	59.6	59.7	59.8	66.4
11/30/22	4:30 PM	5 kids playing red light green light	53.6	53.9	61.0	55.1	55.4	70.4
11/30/22	4:31 PM	Electric car pass by	56.0	54.0	59.3	62.0	55.6	67.2
11/30/22	4:32 PM	Auto pass by	53.8	53.4	57.1	58.9	55.4	68.6
11/30/22	4:33 PM	2 kids playing red light green light	54.4	53.5	57.0	60.8	55.9	67.3
11/30/22	4:34 PM	2 kids playing red light green light	53.1	54.2	53.3	55.5	57.5	61.0
11/30/22	4:35 PM	SUV pass by + Auto pass by	57.9	54.6	58.4	64.0	57.2	66.5
11/30/22	4:36 PM	Hybrid auto pass by	53.3	52.6	55.3	57.6	54.1	62.7
11/30/22	4:37 PM	Auto pass by	51.6	52.4	56.2	56.4	56.1	70.4
11/30/22	4:38 PM	No kids at play	51.6	52.6	54.1	53.2	54.6	59.3
Period Average / Maximum Noise Level			54.3	54.2	58.6	64.0	61.1	73.1
Source: MIG (See Appendix A)								
(A) Values are the lowest and highest measured average hourly values during the listed time period.								
(B) DNL data is presented for the period from 5 PM on November 29, 2022 to 5 PM on November 30, 2022.								

Figure 4-2: Measured Noise Levels During SCLC Active Play Period



During the ambient noise monitoring, the existing noise environment at the CCNS facility included background high school and parking lot noise, aircraft overflights, construction/maintenance activities on and near the high school, and children’s play. Table 4-4 summarizes the hourly average noise levels at the CCNS facility (as measured at site CCNS-01). Similar to the Saint Luke’s site, the measured ambient noise levels at CCNS were relatively consistent and quiet. Hourly noise levels during the morning and early afternoon periods were all less than 60 dBA Leq; however, measured hourly noise levels were approximately 2 dBA Leq to 4 dBA Leq higher during active operations (generally 9 AM to 12 PM and 1 PM to 2 PM) then transition periods (12 PM to 1 PM). Table 4-5 summarizes the hourly average noise levels measured at all measured sites in the play area. Measured noise levels were also generally consistent throughout the play area, although measurements made on the perimeter of the CCNS play area (CCNS-02, CCNS-03, and CCNS-04) were slightly higher than in the center of the play area (CCNS-01) due to the influence of the surrounding high school campus.

Figure 4-3: Ambient Noise Monitoring Locations (CCNS)



Table 4-4: Summary of Hourly Noise Levels at the CCNS Site

Day	Time	Average Noise Level (dBA L _{eq}) ^(A)	Max Noise Level (dBA L _{max}) ^(A)
11/30/22	9:00 AM to 10:00 AM	55.6	73.2
11/30/22	10:00 AM to 11:00 AM	53.9	71.9
11/30/22	11:00 AM to 12:00 PM	54.3	67.7
11/30/22	12:00 PM to 1:00 PM	52.0	75.4
11/30/22	1:00 PM to 2:00 PM	55.8	73.9

Source: MIG (See Appendix A)

(A) Values are based on noise levels at site CCNS-01. .

Day	Time	Site / Measured Average Noise Level (dBA L _{eq}) ^(A)			
		CCNS-01	CCNS-02	CCNS-03	CCNS-04
11/30/22	9:24 AM – 9:43 AM	55.7	53.6	-	-
11/30/22	9:47 AM – 9:59 AM	54.3	-	54.7	-
11/30/22	10:01 AM – 1:33 PM	54.3			55.7
11/30/22	1:37 PM to 2:00 PM	52.2	53.4		

Source: MIG (See Appendix A)
(A) Values are the average noise level for the listed time period.

4.2.2.1 Measured Noise Levels at CCNS With and Without Exterior Play

On November 30, 2022, CCNS provided nursery school services to 40 children between approximately 3 and 5 years of age. During the ambient noise monitoring, children were present inside and outside the CCNS building, with exterior play occurring throughout the day. MIG compared average and background noise levels with (131 records) and without (81 records) observed children's play at the CCNS facility (see Table 4-6). As possible, only records where other noise sources (e.g., campus noise, aircraft overflights, etc.) did not substantially contribute to the ambient noise record were included in this comparison. While average noise levels are representative of all noise sources and events during the monitoring, loud discrete events, such as a speeding car, airplane flyover, etc. increase measured average noise levels. The L₉₀ metric is generally considered to be representative of typical background noise levels not associated with discrete noise sources or events. Therefore, the measured background noise levels during periods with and without observed children's play are also presented in the table below.

Date / Condition	Number of Records	Average Noise Level (dBA L _{eq})	Background Noise Level (dBA L ₉₀)
November 30, 2022			
With Exterior Play	131	56.0	50.4
Without Exterior Play	81	49.5	44.6
Difference	--	6.5 dBA	5.8 dBA

Source: MIG (see Appendix A)

As shown in Table 4-6, both the measured average and background noise levels were approximately 6 to 7 dBA higher during periods of time when children were observed at outside play, including running, tricycling, swinging, climbing, sliding, talking, and shouting.

4.2.3 NOISE SENSITIVE RECEPTORS

Noise sensitive receptors are buildings or areas where unwanted sound or increases in sound may have an adverse effect on people or land uses. The noise sensitive receptors near the Saint Luke Lutheran Church Property include the residences that surround the site to the north (on Enderby Way), south (on The Dalles Avenue), east (on Wright Avenue) and west (on Cloverdale Court and The Dalles Avenue).

4.3 FEDERAL, STATE, AND LOCAL NOISE REGULATIONS

In general, there are no federal or state noise and vibration regulations that directly apply to the proposed Project's potential noise and vibration sources.

4.3.1 CITY OF SUNNYVALE MUNICIPAL CODE

Title 16, Buildings and Construction, Chapter 16.08, Administrative Code, of the Sunnyvale Municipal Code establishes permissible time and noise limits for construction activities. Specifically, Municipal Code Section 16.08.030 establishes:

- Construction activity shall be permitted between 7 AM and 6 PM Monday through Friday and 8 AM to 5 PM on Saturday. There shall be no construction activity on Sunday or federal holidays when city offices are closed.
- No loud environmentally disruptive noises, such as air compressors without mufflers, continuously running motors or generators, loud playing musical instruments, radios, etc. may cause a nuisance to adjacent residential neighborhoods.

Title 19, Zoning, Article 4, General Development Standards, Chapter 19.42, Operating Standards, of the Sunnyvale Municipal Code establishes noise standards for land uses in the City. Specifically, Municipal Code Section 19.42.030 sets forth”

- Operational noise shall not exceed 75 dBA at any point on the property line of the premises upon which the noise or sound is generated or produced.
- For adjacent residentially zone properties, the noise or sound level shall not exceed 60 dBA during the daytime hours and 50 dBA during the nighttime hours.

MIG notes that the City's Municipal Code Section 19.42.030 does not explicitly define the noise standard descriptor, such as the L_{eq} (average noise level), L_{10} (noise level exceed 10% of the time), or L_{max} (maximum instantaneous noise level); however, Title 19, Article 2, Definitions, Chapter 19.12, Section 19.12.160 defines the term “operational noise” to mean the “continuous or frequent noise related to the basic use of a property. Operational noise includes, but is not limited to, noise produced by: air conditioners, equipment for swimming pools or spas, industrial machinery, air compressors, or forklifts. Powered equipment or deliveries shall not be considered operational noise.” Since the Municipal Code describes the term operational noise as a continuous or frequent noise this Report applies the standard contained in Municipal Code Section 19.42.030 as an average (L_{eq}) or median (L_{50}) noise level. This application would be consistent with other recent City projects.² Additionally, the Municipal Code (Section 19.12.050 and Section 19.12.150) defines daytime as the period from 7 AM to 10 PM and nighttime as the period from 10 PM to 7 AM.

² See, for example, the City's June 2022 Draft Mitigated Negative Declaration/Initial Study for the 480/490 South Mathilda Avenue Office Project, available at: <https://www.sunnyvale.ca.gov/business-and-development/planning-and-building/ceqa-environmental-notices>.

4.3.2 CITY OF SUNNYVALE GENERAL PLAN

The Sunnyvale General Plan Noise Element contains several goals and policies related to transportation and non-transportation noise sources that are potentially applicable to the proposed Project, including:

- *Goal SN-8 Compatible Noise Environment – Maintain or achieve a compatible noise environment for all land uses in the community.*
 - Policy SN-8.1: Enforce and supplement State laws regarding interior noise levels of residential units.
 - Policy SN-8.4: Prevent significant noise impacts from new development by applying State noise guidelines and Sunnyvale Municipal Code noise regulations in the evaluation of land use issues and proposals.
 - Policy SN-8.5: Comply with “State of California Noise Guidelines for Land Use Planning” ([General Plan] Figure 6-5) for the compatibility of land uses with their noise environments, except where the City determines that there are prevailing circumstances of a unique or special nature.
 - Policy SN-8.6: Use [General Plan] Figure 6-6, “Significant Noise Impacts from New Development on Existing Land Use” to determine if proposed development results in a significant noise impact on existing development.
 - Policy SN-8.9: Consider techniques which block the path of noise and insulate people from noise.
- *Goal SN-9 Acceptable Limits for Community Noise – Maintain or achieve acceptable limits for the levels of noise generated by land use operations and single events.*³
 - Policy SN-9.1: Regulate land use operation noise.
 - Policy SN-9.3: Apply conditions to discretionary land use permits which limit hours of operation, hours of delivery, and other factors which affect noise.

The City’s General Plan (Figure 6-5) establishes 60 DNL and 75 DNL as the normally acceptable and conditionally acceptable noise compatibility limits, respectively, for residential, school, and church land uses. The City’s General Plan (Figure 6-6) also identifies the following increases in noise as a significant increase over existing noise levels:

- An increase of more than 5 dBA if the increase would not cause the noise environment to exceed the normally acceptable limit.

³ With regards to this goal, the General Plan (p. 6-36) states (emphasis added), “Noise complaints that cannot be resolved through the application of code regulations are primarily due to conditions existing prior to the adoption of the 1995 noise code revisions, *conditions that are not appropriate to regulate (children at child care centers)* or conditions that are beyond the City’s sphere of influence (transportation noise).”

- An increase of 3 dBA or more if the increase would cause the noise environment to exceed the normally acceptable limit.
- An increase of 3 dBA or more where the existing noise environment is already above the conditionally acceptable or unacceptable limits.

5 NOISE IMPACT ANALYSIS

This chapter evaluates the potential for the proposed Project to result in direct and indirect changes to the existing noise and vibration environment at and near the proposed Project area.

5.1 THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines, the proposed Project could result in potentially significant impacts related to noise and vibration if it would:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of the standards established in:
 - The City of Sunnyvale Municipal Code Section 16.08.030 (Hours of Construction – Time and Noise Limitations) or Section 19.42.030 (Noise or Sound Level); or
 - The City of Sunnyvale General Plan Noise Element Goal SN-8, Policy SN-8.6; or
- Generate excessive ground-borne vibration or ground-borne noise levels; or
- Expose people residing or working in the Project area to excessive airport-related noise levels.

5.2 NOISE IMPACT ANALYSIS METHODOLOGY

The construction and operation of the proposed Project would generate noise and vibration. This section describes the Project's noise and vibration sources and the methods used to estimate potential noise and vibration levels.

5.2.1 CONSTRUCTION NOISE AND VIBRATION

As described in Section 2.3.5, the proposed Project would generate construction noise from the following sources:

- Hand tools and construction activities such as hammering, drilling, sanding, etc.
- Minor equipment operations on the west side of the existing Mitchell Education Building. This could include small mobile equipment such as a material lift or loader (to move materials) and small stationary equipment such as an air compressor. This equipment would generate noise from engine operation, mechanical systems and components (e.g., fans, gears, propulsion of wheels or tracks), and other sources such as back-up alarms. Mobile equipment generally operates at different loads, or power outputs, and produce higher or lower noise levels depending on the operating load. Stationary equipment generally operates at a steady power output that produces a constant noise level.
- Vehicle trips, including workers, vendors, and material delivery trucks. These trips would occur on the roads that provide access to the church property, primarily The Dalles Avenue and Wright Avenue.

The construction activities associated with the Project consist of minor exterior and interior building renovation and construction activities, play equipment installation, and other minor activities. Much of the activity would be performed by hand, but the material delivery and some building renovation and construction activities could require the use of construction equipment such as a forklift or material lift, a

backhoe, a compressor etc. Table 5-1 presents the noise levels that could occur from the operation of the typical construction equipment associated with minor building renovation and construction activities.

Table 5-1: Typical Construction Equipment Noise Levels (dBA)							
Equipment	Reference Noise Level at 50 Feet (L_{max}) ^(A)	Percent Usage Factor ^(B)	Predicted Noise Levels (L_{eq}) at Distance ^(C)				
			25 Feet	35 Feet	50 Feet	75 Feet	100 Feet
Backhoe	80	0.4	82	79	76	72	70
Compressor	80	0.4	82	79	76	72	70
Delivery Truck	84	0.4	86	83	80	76	74
Generator	82	0.5	85	82	79	75	73
Man Lift	85	0.2	84	81	78	74	72

Sources: Caltrans, 2013; FHWA, 2010; and MIG (see Appendix B).
 (A) L_{max} noise levels based on manufacturer's specifications.
 (B) Usage factor refers to the amount of time the equipment produces noise over the time period.
 (C) Estimate does not account for any atmospheric or ground attenuation factors. Calculated noise levels based on Caltrans 2013: L_{eq} (hourly) = L_{max} at 50 feet – $20\log(D/50) + 10\log(UF)$, where: L_{max} = reference L_{max} from manufacturer or other source; D = distance of interest; UF = usage fraction or fraction of time period of interest equipment is in use.

Project construction equipment and activities would also be capable of generating ground-borne vibration and noise; however, the potential for ground-borne vibration and noise is typically greatest when vibratory or large equipment such as rollers, impact drivers, or bulldozers are in operation. The proposed Project would not involve large, vibration-inducing equipment operations. In addition, Project construction activities would occur at least 75 feet from any adjacent structure. For these reasons, ground-borne vibration levels were not estimated for the proposed Project.

5.2.2 OPERATIONAL NOISE

Once constructed, the proposed Project would result in the resumption and expansion of preschool services at Saint Luke's. Visitors would arrive on-site, park, and bring their children to the ACP or CCNS classrooms. The noise from these expanded services would also combine with existing noise from the SCLC. The preschool and after school services provided at Saint Luke's would generate noise from:

- Children's Play:** This noise source would consist primarily of children's speech, laughter, shouts, and sounds that come during play/from the use of play equipment (e.g., bouncing balls, swings, tricycles, etc.) during typical preschool and after school operations. The noise level produced by human speech is usually a function of background noise levels and the distance between the speaker and the listener. These and other variables control whether voice levels are normal, raised, loud, or shouting. In general, human conversation typically produces a noise level between 50 dBA to 65 dBA at a distance of three (3) feet from the speaker (Caltrans 2013, Figure 2-20; and U.S. EPA, 1977). Voice levels typically increase by 5 to 10 dBA as a speaker moves from normal to raised, and raised to loud voice levels (U.S. EPA, 1977). The above information, however, is based on normal adult conversation patterns, which are not the same as children at play.

For the purposes of this Report, potential noise levels from children's play are based on empirical measurements of play activity at the existing CCNS and SCLC facilities, plus 3 dBA to account for potential fluctuations in daily activities, differences in children's voices, etc. that may not have been captured during the specific monitoring conducted for this Report.

- **ACP/CCNS:** As shown in Table 4-4, Table 4-5, and Table 4-6, measured noise levels at the CCNS facility were up to 56 dBA L_{eq} and 73.9 dBA L_{max} . This noise level was generally observed both in the center and on the boundary of the play area during periods of time when up to 10 children were outside playing. With the addition of 3 dB to account for potential fluctuations in daily noise levels, play areas for preschool children (18 months to 5 years old) are assumed to generate an hourly average noise level of 59 dBA L_{eq} and 76.9 dBA L_{max} at 3 feet from the edge of the play area.
- **SCLC:** As shown in Table 4-1, Table 4-2, and Table 4-3, measured noise levels from SCLC children's play were up to 59 dBA L_{eq} and 73.1 dBA L_{max} . This noise level was observed at the boundary of the play area when up to 10 children were outside playing. With the addition of 3 dB to account for potential fluctuations in daily noise levels, play areas for SCLC children (approximately 5 years old to 12 years old) are assumed to generate a noise level of 62 dBA L_{eq} and 76.1 dBA L_{max} at 3 feet from the edge of the play area.
- **HVAC Equipment:** The renovated Mitchell Education Building would include individual HVAC systems for each classroom. The condensing units would be located on the north side of the building. Each unit is assumed to generate a noise level of 75 dBA at 3 feet.
- **On-site Vehicle Activity.** This noise source would consist of on-site automobile travel to and use of parking areas, which would involve automobile travel and other miscellaneous automobile noise sources such as doors closing and engine start-up. On-site automobile travel is assumed to occur at low speeds (5 to 10 mph). The total amount of hourly trips accessing ACP, CCNS, and/or SCLC is assumed to be 50 vehicles (100 trips in and out) in any one hour based on enrollment and schedule considerations. This report assumes that 80% of the vehicles access the drive aisle and northern parking area from either Wright Avenue (40% of trips) or The Dalles Avenue (40% of trips), while the remaining 20% of vehicles access the central parking lot directly via The Dalles Avenue.
- **Off-site Vehicle Travel.** This noise source would consist of off-site vehicle travel on the Dalles Avenue and Wright Avenue.

5.2.2.1 Reference Noise Levels and Operational Noise Level Estimates

The potential hourly average noise levels associated with the proposed Project's noise sources are summarized in Table 5-2. All reference noise levels are presented at a distance of three (3) feet from the source.

Table 5-2: Project Noise Source – Reference and Hourly L_{eq} Noise Levels			
Noise Source	Reference dBA^(A)	Duration^(B)	Hourly L_{eq}^(C)
Children's Play (10 children)			
ACS/CCNS	59	60 minutes	59.0
SCLC	62	60 minutes	62.0
HVAC Equipment			
ACS/CCNS	75	40 minutes	63.2
On-Site Vehicle Travel			
Low Speed Travel (5 to 10 mph)	65	30 seconds	44.2
Parking			
Low speed travel (10 mph)	65	30 seconds	44.2
Door closing	80	2 seconds	47.4
Engine start/rev	80	20 seconds	57.4
Total Combined Noise Level			58.0
Source: MIG (See Appendix C)			
(A) Reference dBA is based on a distance of 3 feet.			
(B) Duration is used to estimate the percentage of time the noise is generated per Equation 3 (out of 60 minutes in an hour).			
(C) Hourly L _{eq} estimated using Equation 3.			

The proposed Project's operational noise levels were estimated using standard theoretical equations for predicting environmental noise levels (Caltrans, 2013). For an ideal point source of sound, the energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out in a spherical pattern and travels away from the point source. Theoretically, the sound level attenuates, or decreases, by six (6) dB with each doubling of distance from the point source. The change in noise levels between two distances can be calculated according to Equation 1 as follows:

$$\text{Equation 1}$$

$$dBA2 = dBA1 + 20\log(D1/D2)$$

Where:

- dBA1 = Known noise level, such as a reference noise level
- D1 = Distance associated with dBA1
- dBA2 = Noise level at distance 2
- D2 = Distance associated with dBA2

For an ideal line source of sound, the energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out in a cylindrical pattern from the source. Theoretically, the sound level attenuates, or decreases, by three (3) dB with each doubling of distance from the line source. The change in noise levels between two distances can be calculated according to Equation 2 as follows:

$$\text{Equation 2}$$

$$dBA2 = dBA1 + 10\log(D1/D2)$$

Where:

- dBA1 = Known noise level, such as a reference noise level
- D1 = Distance associated with dBA1
- dBA2 = Noise level at distance 2
- D2 = Distance associated with dBA2

For noise sources that do not operate continuously (e.g., vehicles that travel on-site, park, and then cease to generate noise), the average, hourly noise level associated with variable (i.e., non-steady) noise source can be calculated using Equation 3 as follows:

$$\text{Equation 3}$$

$$\text{Hourly } L_{eq} = 10 * \text{Log} (P_h) * 10^{(L_p/10)}$$

Where:

- P_h = Percentage or fraction of hour the noise is generated
 L_p = The noise level generated during the partial hour (P_h)

The total combined sound pressure level from multiple, identical sources of noise at a receiver location can be calculated using Equation 4 as follows:

$$\text{Equation 4}$$

$$SPL_{Total} = SPL_1 + 10 * \text{Log} (N)$$

Where:

- SPL_1 = Sound pressure level of one source
 N = Number of identical sources to be added

Finally, the change in sound pressure levels associated with increases or decreases in the number of identical sources can be calculated using Equation 5 as follows:

$$\text{Equation 5}$$

$$\Delta SPL_{Total} = 10 * \text{Log} (N)$$

Where:

- ΔSPL = Change in sound pressure level
 N = Number of identical sources to be added or subtracted

5.3 TEMPORARY CONSTRUCTION NOISE AND VIBRATION IMPACTS

The proposed Project's minor construction activities would generally take place along the western side of the church property. As shown in Table 5-1, the typical equipment noise levels associated with minor construction activities are expected to be 79 dBA L_{eq} to 83 dBA L_{eq} at a distance of 35 feet, which is the distance between the edge of the nearest work area and the residential property line to the west. These maximum noise levels would occur for a short period time (estimated to be less than one month total). While construction activities would be short in duration, they would be audible at residences that border the church to the west and northwest.

The Sunnyvale Municipal Code does not establish numerical noise limits for construction activities; however, the Municipal Code does prohibit certain construction activities that may cause a nuisance, including the use of air compressors with mufflers), continuously running motors or generators, and loudly playing music or radios. The Municipal Code also restricts commercial construction activities to the hours of 7:00 AM to 6:00 PM, Monday through Friday, and 8 AM to 5 PM on Saturday.

To control potential construction noise levels at the Project's western and northern property lines comply with City's Municipal Code and do not otherwise result in a substantial temporary increase in noise levels, the Project is incorporating the following noise control BMPs into the Project design:

Construction Noise Control Best Management Practices. To reduce potential noise levels associated with construction of the proposed Project, the Applicant and/or its designated contractor, contractor's representatives, or other appropriate personnel shall:

- *Restrict work hours/equipment noise.* All work shall be subject to the requirements in Sunnyvale Municipal Code Section 16.08.030, Hours of Construction – Time and Noise Limitation, including deliveries, which permits construction activity between 7 AM and 6 PM Monday to Friday and 8 AM to 5 PM on Saturday. No construction shall occur on Sunday or federal holidays when city offices are closed. The Applicant and/or its contractor shall post a sign at all entrances to the construction site informing contractors, subcontractors, construction workers, etc. of this requirement. The sign shall also provide a name (or title) and phone number for an appropriate on-site and City representative to contact to submit a noise complaint.
- *Construction equipment selection, use, and noise control measures.* The following measures shall apply during construction activities:
 - Contractors shall use the smallest size equipment capable of safely completing work activities.
 - Construction staging shall occur as far away from Project property lines as possible.
 - Heavy equipment engines shall be covered, and exhaust pipes shall include a muffler in good working condition.
 - Compressors and other pneumatic tools shall include a noise suppression device on the compressed air exhaust.
 - No radios or other amplified sound devices shall be audible beyond the property line of the construction site.

The construction noise control BMP's listed above require the use of construction management and equipment controls to reduce potential noise from construction activities. These BMPs restrict work hours in accordance with the Municipal Code, require staging and stationary noise sources to be located as far from neighboring, sensitive land uses as possible, and require equipment to include standard noise attenuation features such as engine shields and mufflers. These BMPs would ensure the proposed Project construction activities comply with the City's Municipal Code and do not result in a substantial, temporary increase in the ambient noise levels that exists in the vicinity of the Project. This impact would be less than significant.

The potential for ground-borne vibration and noise is typically greatest when vibratory or large equipment such as rollers, impact drivers, or bulldozers are in operation; however, the proposed Project would not involve large, vibration-inducing equipment operations. Construction activities would not create disturbing, excessive, or offensive ground-borne vibration because equipment operations would be intermittent in duration (equipment operations would last only a few hours each day), short in duration (construction equipment is estimated to be used no more than one (1) month in total), and occur during the allowable daytime hours set forth in the City's Municipal Code (when people are less sensitive to vibration levels). The proposed Project, therefore, would not result in significant construction vibration impacts.

5.4 OPERATIONAL NOISE IMPACTS

Once constructed, the proposed Project would generate noise from children's play, HVAC equipment, and on-site vehicle travel and parking. These noise sources are described in Section 5.2.2.

5.4.1 PREDICTED NOISE LEVELS AT ADJACENT PROPERTY LINES

The proposed Project's potential noise levels were estimated using the reference and calculated hourly L_{eq} noise levels identified in Table 5-2 above, adjusted for distance (between the noise source and property line) and activity levels (e.g., maximum number of children in the play area based on enrollment, number of automobile trips per hour, etc.). Project noise levels were estimated at the Project's north and west property lines (see Figure 5-1: Modeled Noise Sources and Receptor Locations). The approximate distance between noise sources and noise receivers used to estimate potential Project noise levels is summarized in Table 5-3.

Noise Source	Distance in Feet From Noise Source to Receiver									
	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10
ACP Play Area	105	95	165	-	-	-	-	-	-	-
CCNS Play Area	55	40	135	200	-	-	-	-	-	-
Mitchell Education Building HVAC Units	-	50	90	130	130	130	130	-	-	-
SCLC Play Area 1	-	165	70	80	75	75	90	155	210	290
SCLC Play Area 2	-	-	-	240	175	130	75	75	75	105
On-site Vehicle Travel	30	30	30	30	30	30	30	30	30	30
On-site Vehicle Parking	-	-	50	10	10	10	10	80	130	220

Source: MIG, Inc. (See Appendix C)

The following discusses the key assumptions made to estimate potential Project noise levels at noise receiver locations:

- *Play Areas:* Noise from play areas was modeled from the edge of the play area, assuming the maximum number of children using the play area based on anticipated enrollment at ACP and CCNS and maximum historical enrollment at SCLC.
- *HVAC Units:* Noise from HVAC units was modeled from the north side of the Mitchell Education Building. Units were assumed to run for up to 40 minutes in any one hour, and no shielding by the SCLC building was included in the analysis.
- *On-Site Automobile Travel:* Each on-site automobile trip was assumed to travel at low speed (no more than 10 mph) along the access driveway that connects to The Dalles Avenue and Wright Avenue. It was assumed up to 40 vehicles could access the site during peak periods (drop off and pick up time), split evenly between the driveways on The Dalles Avenue (20 vehicles) and Wright Avenue (20 vehicles).
- *On-site Parking:* Up to 40 vehicles were assumed to park in the northern parking area; however, noise was estimated at individual receiver locations assuming 10 vehicles parking in the same general area (i.e., noise from parking activities farther away would not contribute to the same point on the property line as the closed 10 spaces).

Figure 5-1: Modeled Noise Sources and Receptor Locations

5.4.1.1 Compliance with Municipal Code Standards

The average hourly daytime noise levels from all Project noise sources at modeled receiver locations are summarized in Table 5-4: Hourly Project Daytime Noise Levels at Property Lines. As shown in this table, the largest contributor to potential project noise levels is anticipated to be parking activities along the northern property line; however, none of the proposed Project's noise sources would generate hourly noise levels that exceed 60 dBA L_{eq} at any adjacent residential property. In addition, the total combined noise level from all Project noise sources is estimated to be less than 58 dBA at all locations. The proposed Project, therefore, would comply with the 60 dBA L_{eq} daytime noise standard established by Municipal Code Section 19.42.030. This impact would be less than significant.

Noise Source	Noise Level at Modeled Noise Receiver (dBA L _{eq}) ^(A)									
	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10
ACP Play Area	35.1	36.0	31.2	-	-	-	-	-	-	-
CCNS Play Area	38.5	41.3	30.7	27.3	-	-	-	-	-	-
Mitchell Education Building HVAC Units	-	44.8	39.7	36.5	36.5	36.5	36.5	-	-	-
SCLC Play Area 1	-	30.2	37.7	36.5	37.1	37.1	35.5	30.7	28.1	25.3
SCLC Play Area 2	-	-	-	28.7	31.5	34.0	38.8	38.8	38.8	35.9
On-site Vehicle Travel	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2
On-site Vehicle Parking	-	-	43.6	57.6	57.6	57.6	57.6	39.5	35.3	30.7
Total Project Noise Level	43.2	47.7	47.1	57.7	57.7	57.8	57.8	44.5	43.5	42.0
Municipal Code Standard	60	60	60	60	60	60	60	60	60	60
Standard Exceeded?	No	No	No	No	No	No	No	No	No	No

Source: MIG, Inc. (See Appendix C), Sunnyvale Municipal Code Section 19.42.030.
(A) "-" indicates the source does not contribute to noise levels at this receiver due to shielding and/or distance from receiver.

5.4.1.2 Estimated Project Change in 24-Hour Noise Exposure Levels

As shown in Table 5-4, the total combined noise level from all Project noise sources, including parking activities, is estimated to be less than 58 dBA at all locations. Parking activities would not occur during all operating hours; rather, parking would generally occur during preschool drop off and pick up times, and would be staggered (i.e., not all vehicles would arrive at the exact same time as assumed in the modeling). Project noise levels outside of drop off and pick up periods would be lower, less than 48 dBA at all locations. Assuming a peak drop-off period at 7 AM, a peak pick-up period at 5 or 6 PM, and regular operations in between, the proposed Project could increase 24-hour noise levels at the site by less than 1 dBA, from 59.6 dBA DNL to 60.0 dBA DNL. This existing plus project DNL noise level would meet but would not exceed the City's normally acceptable noise limit of 60 dBA DNL for residential properties. This impact would be less than significant pursuant to General Plan policies SN-8.5 and SN-8.6.

5.4.1.3 Compliance with City General Plan Policies

The Project's consistency with the applicable policies of the City's General Plan is summarized in Table 5-5.

Table 5-5: Project Consistency with Applicable General Plan Noise Policies	
General Plan Noise Element Goal/Policy	Consistency Analysis
Goal SN-8: Compatible Noise Environment – Maintain or achieve a compatible noise environment for all land uses in the community	
Policy SN-8.1: Enforce and supplement State laws regarding interior noise levels.	Consistent. The proposed Project does not involve residential development and would not substantially change the noise environment at the Saint Luke's property. The Project involves daytime operations only. These operations would produce noise levels less than 58 dBA L_{eq} at adjacent property lines (see Table 5-4) and is estimated to result in less than a 1 dBA change in daily noise exposure levels at the adjoining property lines (see Section 5.4.1.2).
Policy SN-8.4: Prevent significant noise impacts from new development by applying State noise guidelines and Sunnyvale Municipal Code noise regulations in the evaluation of land use issues and proposals.	Consistent. As described in Section 5.4.1.1 and Section 5.4.1.2, the proposed Project would not generate hourly L_{eq} or 24-hour DNL noise levels that exceed City Municipal Code or General Plan standards.
Policy SN-8.5: Comply with "State of California Noise Guidelines for Land Use Planning" ([General Plan] Figure 6-5) for the compatibility of land uses with their noise environments, except where the City determines that there are prevailing circumstances of a unique or special nature.	Consistent. 24-hour DNL levels at the Saint Luke's Property are calculated to be 59.6 DNL under current conditions and 60.0 DNL with the proposed Project. These noise levels fall within the City's normally acceptable noise exposure limits for all land use types, including residential and public facilities such as Saint Luke's.
Policy SN-8.6: Use [General Plan] Figure 6-6, "Significant Noise Impacts from New Development on Existing Land Use" to determine if proposed development results in a significant noise impact on existing development.	Consistent. As described in Section 5.4.1.2, the 24-hour DNL levels at the Saint Luke's Property are calculated to be 59.6 DNL under current conditions and 60.0 DNL with the proposed Project. The Project, therefore, would not result in more than a 3 dBA increase in noise levels at the Saint Luke's property or otherwise cause the noise environment to exceed the City's normally acceptable limit (60 DNL) for adjacent residential land uses.

Table 5-5: Project Consistency with Applicable General Plan Noise Policies	
General Plan Noise Element Goal/Policy	Consistency Analysis
Policy SN-8.9: Consider techniques which block the path of noise and insulate people from noise.	Not applicable. As described in this Report, the Project involves daytime operations only. These operations would produce noise levels less than 58 dBA L_{eq} at adjacent property lines (see Table 5-4) and is estimated to result in less than a 1 dBA change to DNL noise exposure levels at the adjoining property lines (see Section 5.4.1.2). In addition, as described in Section 5.4.1.4, the Project will incorporate best management practices to reduce the potential for a noise-related nuisance at adjoining residential properties. Additional noise control techniques are not required for the Project.
Goal SN-9: Acceptable Limits for Community Noise – Maintain or achieve acceptable limits for the levels of noise generated by land use operations and single events	
Policy SN-9-1: Regulate land use operation noise.	Consistent. As described in Section 5.4.1.1 and Section 5.4.1.2, the proposed Project would not generate hourly L_{eq} or 24-hour DNL noise levels that exceed City Municipal Code or General Plan standards.
Policy SN-9-3: Apply conditions to discretionary land use permits which limit hours of operation, hours of delivery, and other factors which affect noise.	Not applicable. As described in this Report, the Project involves daytime operations only. These operations would produce noise levels less than 58 dBA L_{eq} at adjacent property lines (see Table 5-4) and is estimated to result in less than a 1 dBA change to DNL noise exposure levels at the adjoining property lines (see Section 5.4.1.2). In addition, as described in Section 5.4.1.4, the Project will incorporate best management practices to reduce the potential for a noise-related nuisance at adjoining residential properties. Additional noise control conditions are not required for the Project.

5.4.1.4 Other Nuisance Issues

As shown in Table 5-4, the proposed Project would, at worst-case, generate combined average hourly noise levels less than 58 dBA L_{eq} at all property line locations. The proposed Project's combined noise levels would not exceed the City's hourly 60 dBA L_{eq} standard for residential properties; however, noise from and during children's play, including yelling, shouting, balls bouncing, equipment squeaking, etc., would be audible at adjacent property lines even if standards are not exceeded. In particular, based on monitoring at CCNS and SCLS, discrete events like yelling and shouting can generate noise levels up to 77 dBA at 3 feet, which would attenuate to between 47 dBA L_{max} to 55 dBA L_{max} at modeled receiver locations. Although average noise levels would be within City limits, potential preschool and after school care play would be audible in the exterior rear yards of adjacent residential receptors.

Children's play is currently, and has historically been, a common source of noise emanating from Saint Luke's that is audible at adjacent property lines. The proposed Project would increase preschool services at Saint Luke's but would not generate substantial noise levels that would be likely to disturb adjacent land uses. Nonetheless, to reduce the potential for the Project to be audible at and potentially disturbing or bothersome to adjacent land uses, the Project has incorporated the following BMPs into its design:

Preschool/After School Noise Control Best Management Practices. To reduce potential noise levels from children's play areas, the Project shall:

- *Use soft materials for playscape surfaces.* The Project shall use soft materials (e.g., grass, wood chips, rubber mats) instead of concrete or brick in any new ACP or CCNS playscape surfaces.
- *Design CCNS play yard with potential areas of congregation on the east side of the play yard.* The Project shall design the CCNS play yard to place potential areas where children are intended to congregate (e.g., picnic tables, slides or climbing structures, ball play areas) away from the western fence as much as possible.
- *Maintain play equipment in good working order.* The Project shall maintain all play equipment in good working order. Swing sets, trampolines, tricycles, and other equipment with hinges, chains, springs, bolts, etc. should be lubricated regularly to avoid creaking, squeaking, and grinding noises.

The above measures would aid in reducing noise levels associated with children's play in the ACP and CCNS play yards that could annoy, disturb, or otherwise result in a nuisance to owners, occupants, and users of adjacent properties.

5.4.2 OFF-SITE OPERATIONAL NOISE LEVELS

Caltrans considers a doubling of total traffic volume to result in a three (3) dBA increase in traffic-related noise levels (Caltrans 2013). The proposed Project would not generate high hourly or daily traffic volumes nor result in a doubling of traffic volumes on the Dalles Avenue or Wright Avenue. The project, therefore, would not result in a substantial, permanent increase in off-site noise levels on roads used to access the site.

5.5 AIRPORT-RELATED NOISE

Saint Luke's is not located near any public or private airports. The closest airport is San Jose International Airport, approximately seven (7) miles east of Saint Luke's. The proposed Project, therefore, would not expose children or people present at Saint Luke's to excessive airport-related noise levels.

6 REPORT PREPARERS AND REFERENCES

This Report was prepared by MIG under contract to Saint Luke Lutheran Church of Sunnyvale. This Report reflects the independent, objective, professional opinion of MIG. The following individuals were involved in the preparation and review of this Report:

MIG

Chris Dugan, Director of Noise Services
William Deeman, Analyst I

2055 Junction Ave., Ste. 205
San Jose, California 95131
(650) 327-0429

6.1 REFERENCES

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APPENDIX A: Ambient Noise Monitoring Data

Appendix A

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Mitchell Education Building Renovation and Addition Project

Appendix A: Ambient Noise Monitoring Data Summary

Prepared by MIG, Inc. December 2022

Sheet 1: Ambient Noise Monitoring Data Summary (Saint Luke's)

TABLE 1: SUMMARY OF SITE LT-01 NOISE MONITORING DATA												
Date	Time	Duration	Leq	DNL	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/29/2022	5:00 PM	1 hour	54.8	54.8	48.9	71.4	59.9	57.0	56.6	55.7	53.9	53.0
11/29/2022	6:00 PM	1 hour	54.4	54.4	51.0	67.1	57.7	56.3	56.0	55.1	53.8	53.1
11/29/2022	7:00 PM	1 hour	53.4	53.4	49.8	57.3	54.8	54.3	54.2	54.0	53.4	52.6
11/29/2022	8:00 PM	1 hour	53.2	53.2	49.4	59.6	54.7	54.2	54.1	53.9	53.1	52.2
11/29/2022	9:00 PM	1 hour	55.5	55.5	49.7	74.7	60.0	58.3	57.9	56.9	54.5	53.0
11/29/2022	10:00 PM	1 hour	53.8	63.8	45.9	64.2	56.6	55.4	55.3	54.9	53.5	51.7
11/29/2022	11:00 PM	1 hour	52.4	62.4	43.0	61.2	56.0	54.8	54.6	54.0	52.0	48.9
11/30/2022	12:00 AM	1 hour	49.4	59.4	38.1	58.1	53.9	52.6	52.4	51.5	48.4	45.0
11/30/2022	1:00 AM	1 hour	48.1	58.1	34.4	60.8	52.6	51.2	51.0	50.2	47.4	43.6
11/30/2022	2:00 AM	1 hour	48.5	58.5	33.6	62.6	53.9	52.0	51.7	50.6	47.3	43.5
11/30/2022	3:00 AM	1 hour	48.5	58.5	33.3	58.2	53.5	51.9	51.6	50.7	47.4	43.7
11/30/2022	4:00 AM	1 hour	53.5	63.5	40.4	66.8	57.1	55.9	55.7	55.1	53.0	50.3
11/30/2022	5:00 AM	1 hour	56.3	66.3	46.9	62.7	58.9	58.0	57.9	57.5	56.2	54.4
11/30/2022	6:00 AM	1 hour	57.3	67.3	50.9	65.5	59.0	58.5	58.5	58.2	57.2	56.0
11/30/2022	7:00 AM	1 hour	59.3	59.3	52.4	65.7	60.8	60.4	60.3	60.0	59.2	58.2
11/30/2022	8:00 AM	1 hour	50.3	50.3	39.3	61.7	54.0	52.7	52.3	51.7	49.6	48.3
11/30/2022	9:00 AM	1 hour	48.4	48.4	37.9	71.9	56.0	52.3	51.8	50.1	46.1	43.5
11/30/2022	10:00 AM	1 hour	46.1	46.1	40.7	55.5	48.6	47.4	47.2	46.8	45.8	44.9
11/30/2022	11:00 AM	1 hour	46.1	46.1	40.4	62.1	50.4	48.1	47.9	47.3	45.3	44.1
11/30/2022	12:00 PM	1 hour	43.5	43.5	38.4	60.2	48.4	46.5	46.1	44.9	42.3	41.0
11/30/2022	1:00 PM	1 hour	48.7	48.7	39.8	65.2	54.9	52.8	52.3	50.5	46.4	44.8
11/30/2022	2:00 PM	1 hour	50.1	50.1	43.6	67.9	56.1	52.9	52.2	51.0	48.9	47.5
11/30/2022	3:00 PM	1 hour	51.6	51.6	45.3	69.6	57.1	54.3	53.8	52.5	50.5	49.3
11/30/2022	4:00 PM	1 hour	53.9	53.9	48.5	64.0	57.5	56.0	55.8	55.0	53.3	52.3
<i>Daytime (7 AM to 7 PM)</i>			52.8	-	37.9	71.9	56.6	54.8	54.5	53.7	52.2	51.1
<i>Evening (7 PM to 10 PM)</i>			54.2	-	49.4	74.7	57.3	56.1	55.8	55.2	53.7	52.6
<i>Nighttime (10 PM to 7 AM)</i>			53.2	-	33.3	66.8	56.3	55.2	55.1	54.6	52.9	50.9
<i>Nighttime (7 PM to 7 AM)</i>			53.5	-	33.3	74.7	56.6	55.5	55.3	54.7	53.1	51.4
24-hour DNL			--	59.6	-	24-hour CNEL	59.9	-	-	-	-	-

TABLE 2: SUMMARY OF ST-01 NOISE MONITORING DATA											
Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	2:47 PM	23 minutes	52.1	43.9	63.4	56.7	54.6	54.3	52.6	51.3	50.0
11/30/2022	3:19 PM	1 hour	52.6	44.1	67.2	56.8	54.2	53.9	52.9	52.1	51.1
11/30/2022	4:19 PM	20 minutes	54.2	49.3	61.1	56.4	55.5	55.4	54.6	53.8	53.1

TABLE 3: SUMMARY OF ST-02 NOISE MONITORING DATA											
Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	2:47 PM	23 minutes	50.7	44.6	62.3	55.4	53.4	53.0	51.4	49.8	48.1
11/30/2022	4:42 PM	8 minutes	53.2	49.3	67.5	60.4	55.8	54.9	52.5	51.8	50.6
11/30/2022	4:51 PM	40 minutes	52.5	48.1	64.4	55.2	54.5	54.3	53.3	52.0	50.7

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Appendix A: Ambient Noise Monitoring Data Summary

Prepared by MIG, Inc. December 2022

Sheet 1: Ambient Noise Monitoring Data Summary (Saint Luke's)

TABLE 3: SUMMARY OF ST-03 NOISE MONITORING DATA											
Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	3:19 PM	1 hour	54.8	45.7	71.0	60.5	58.0	57.6	55.2	53.6	51.8
11/30/2022	4:19 PM	20 minutes	58.6	50.1	73.1	65.9	62.6	62.1	59.3	56.1	53.1
11/30/2022	4:42 PM	8 minutes	52.8	49.6	60.5	56.4	55.3	54.8	53.4	52.2	50.8

TABLE 4: SUMMARY OF ST-04 NOISE MONITORING DATA											
Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	4:51 PM	40 minutes	52.2	47.9	64.4	55.6	54.7	54.5	52.9	51.4	50.2

TABLE 5: SUMMARY OF LT-01 NOISE MONITORING DATA (for comparison to ST sites)											
Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	2:47 PM	23 minutes	52.0	44.9	69.6	59.3	55.5	54.7	52.9	50.0	48.2
11/30/2022	3:19 PM	1 hour	52.3	50.5	62.9	55.6	54.2	54.0	53.2	51.8	50.8
11/30/2022	4:19 PM	20 minutes	54.3	50.7	85.5	58.2	56.7	56.5	55.5	53.6	52.5
11/30/2022	4:42 PM	8 minutes	52.9	50.5	63.2	56.5	54.8	54.5	53.5	52.4	51.4
11/30/2022	4:51 PM	40 minutes	53.1	49.2	64.7	56.5	55.2	55.1	54.3	52.3	51.3

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Sheet 2: Ambient Noise Monitoring Data Summary (CCNS)

Date	Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	9:00 AM	1 hour	55.6	43.2	73.2	62.5	59.6	59.1	56.1	53.5	50.2
11/30/2022	10:00 AM	1 hour	53.9	38.9	71.9	61.1	57.6	57.0	54.5	52.2	48.0
11/30/2022	11:00 AM	1 hour	54.3	39.0	67.7	64.5	56.2	55.6	53.7	51.1	47.1
11/30/2022	12:00 PM	1 hour	52.0	39.2	75.4	59.4	55.5	55.2	52.4	50.1	46.8
11/30/2022	1:00 PM	1 hour	55.8	41.5	73.9	62.8	59.8	59.4	56.2	53.7	50.4

Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	9:24 AM	20 minutes	55.7	43.9	63.4	56.7	54.6	54.3	52.6	51.3	50.0
11/30/2022	9:47 AM	12 minutes	54.3	44.1	67.2	56.8	54.2	53.9	52.9	52.1	51.1
11/30/2022	10:01 AM	212 minutes	54.3	49.3	61.1	56.4	55.5	55.4	54.6	53.8	53.1
11/30/2022	1:37 PM	23 minutes	52.2	49.3	67.5	60.4	55.8	54.9	52.5	51.8	50.6

Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	9:24 AM	20 minutes	53.6	44.2	67.7	60.2	57.1	56.6	54.3	51.9	48.8
11/30/2022	1:37 PM	23 minutes	53.4	41.5	71.9	62.7	57.8	56.7	52.8	49.9	46.4

Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	9:47 AM	12 minutes	54.7	45.1	65.1	60.9	58.5	58.0	55.4	52.9	49.8

Date	Start Time	Duration	Leq	Lmin	Lmax	LAS1.7	LAS8.3	LAS10	LAS16.7	LAS50	LAS90
11/30/2022	10:01 AM	212 minutes	55.7	38.7	79.3	64.1	60.6	59.8	55.7	51.6	47.4

Date	Time	Duration	Leq	Lmax	LAS90	Note
11/30/2022	9:04 AM	1 minute	49.7	56.1	45.1	School staff moving playground equipment
11/30/2022	9:05 AM	1 minute	50.9	56.8	46.3	School staff moving playground equipment
11/30/2022	9:06 AM	1 minute	53.8	61.0	48.1	School staff moving playground equipment
11/30/2022	9:07 AM	1 minute	60.6	66.5	52.1	School staff moving playground equipment
11/30/2022	9:24 AM	1 minute	54.6	64.0	48.7	Child activity, HS students on tennis court
11/30/2022	9:25 AM	1 minute	53.3	64.6	48.6	Child activity, HS students on tennis court
11/30/2022	9:26 AM	1 minute	51.8	57.4	49.2	Child activity, HS students on tennis court
11/30/2022	9:27 AM	1 minute	58.9	70.8	50.8	Child activity, HS students on tennis court
11/30/2022	9:29 AM	1 minute	54.4	59.4	50.8	Child activity, HS students on tennis court
11/30/2022	9:30 AM	1 minute	55.9	69.5	48.5	Child activity, HS students on tennis court
11/30/2022	9:31 AM	1 minute	53.7	58.2	51.3	Child activity, HS students on tennis court
11/30/2022	9:32 AM	1 minute	55.8	63.2	50.8	Child activity, HS students on tennis court
11/30/2022	9:33 AM	1 minute	56.5	63.1	53.3	Child activity, HS students on tennis court

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Sheet 2: Ambient Noise Monitoring Data Summary (CCNS)

11/30/2022	9:34 AM	1 minute	55.6	67.1	48.5	Child activity, HS students on tennis court
11/30/2022	9:35 AM	1 minute	55.8	66.4	49.8	Child activity, HS students on tennis court
11/30/2022	9:36 AM	1 minute	58.5	65.7	53.1	Child activity, HS students on tennis court
11/30/2022	9:37 AM	1 minute	55.7	60.4	51.6	Child activity, HS students on tennis court
11/30/2022	9:38 AM	1 minute	56.7	63.4	53.3	Child activity, HS students on tennis court
11/30/2022	9:39 AM	1 minute	52.1	59.2	50.3	Child activity, HS students on tennis court
11/30/2022	9:40 AM	1 minute	55.4	63.8	51.1	Child activity, HS students on tennis court
11/30/2022	9:41 AM	1 minute	54.1	60.4	50.7	Child activity, HS students on tennis court
11/30/2022	9:42 AM	1 minute	50.9	57.2	48.3	Child activity, HS students on tennis court
11/30/2022	9:43 AM	1 minute	54.2	61.6	49.6	Child activity, HS students on tennis court
11/30/2022	9:47 AM	1 minute	55.2	61.5	51.9	Child activity, HS students on tennis court
11/30/2022	9:48 AM	1 minute	55.1	62.0	51.1	Child activity, HS students on tennis court
11/30/2022	9:49 AM	1 minute	53.7	61.2	50.7	Child activity, HS students on tennis court
11/30/2022	9:50 AM	1 minute	52.7	59.6	48.6	Child activity, HS students on tennis court
11/30/2022	9:51 AM	1 minute	56.2	63.4	50.4	Child activity, HS students on tennis court
11/30/2022	9:52 AM	1 minute	53.2	60.0	49.5	Child activity, HS students on tennis court
11/30/2022	9:53 AM	1 minute	51.9	59.0	50.0	Child activity, HS students on tennis court
11/30/2022	9:54 AM	1 minute	51.0	58.7	48.3	Child activity, HS students on tennis court
11/30/2022	9:55 AM	1 minute	50.9	56.8	47.9	Child activity, HS students on tennis court
11/30/2022	9:56 AM	1 minute	52.0	61.4	47.2	Child activity, HS students on tennis court
11/30/2022	9:57 AM	1 minute	58.9	68.3	48.4	Child activity, HS students on tennis court
11/30/2022	9:58 AM	1 minute	52.1	56.2	49.9	Child activity, HS students on tennis court
11/30/2022	9:59 AM	1 minute	53.8	62.1	50.1	Little to no child activity, school staff noise and mu
11/30/2022	10:00 AM	1 minute	50.7	59.7	47.6	Little to no child activity, school staff noise and mu
11/30/2022	10:01 AM	1 minute	58.1	71.0	48.6	Little to no child activity, school staff noise and mu
11/30/2022	10:02 AM	1 minute	56.8	66.9	48.4	Little to no child activity, school staff noise and mu
11/30/2022	10:03 AM	1 minute	57.9	68.7	50.1	School staff noise
11/30/2022	10:04 AM	1 minute	56.1	65.8	49.7	School staff noise
11/30/2022	10:30 AM	1 minute	46.3	57.7	41.1	School staff noise, some child activity
11/30/2022	10:31 AM	1 minute	52.6	60.6	46.3	Child activity
11/30/2022	10:32 AM	1 minute	48.7	55.1	45.9	Child activity
11/30/2022	10:43 AM	1 minute	56.1	65.6	47.8	Child activity
11/30/2022	10:44 AM	1 minute	52.0	57.8	48.6	Child activity
11/30/2022	10:45 AM	1 minute	59.1	71.9	51.4	Child activity
11/30/2022	10:46 AM	1 minute	53.4	61.2	48.3	Child activity
11/30/2022	10:47 AM	1 minute	53.5	58.8	49.4	Child activity
11/30/2022	10:48 AM	1 minute	59.4	70.3	51.0	Child activity
11/30/2022	10:49 AM	1 minute	56.5	62.6	49.0	Child activity
11/30/2022	10:50 AM	1 minute	58.7	66.8	51.6	Child activity
11/30/2022	10:51 AM	1 minute	53.7	59.7	50.0	Child activity
11/30/2022	10:52 AM	1 minute	58.4	64.2	53.5	Child activity
11/30/2022	10:53 AM	1 minute	57.5	64.3	52.2	Child activity

Mitchell Education Building Renovation and Addition Project

Appendix A: Ambient Noise Monitoring Data Summary

Prepared by MIG, Inc. December 2022

Sheet 2: Ambient Noise Monitoring Data Summary (CCNS)

11/30/2022	10:54 AM	1 minute	58.0	64.7	51.9	Child activity
11/30/2022	10:55 AM	1 minute	57.1	62.9	52.5	Child activity
11/30/2022	10:56 AM	1 minute	56.0	64.6	48.9	Child activity
11/30/2022	10:57 AM	1 minute	54.8	62.3	49.2	Child activity
11/30/2022	10:58 AM	1 minute	58.7	64.1	51.6	Child activity
11/30/2022	10:59 AM	1 minute	58.7	69.0	53.7	Child activity
11/30/2022	12:47 PM	1 minute	49.7	54.7	47.6	Child activity
11/30/2022	12:48 PM	1 minute	54.9	62.3	50.4	Child activity
11/30/2022	12:49 PM	1 minute	55.3	60.7	50.4	Child activity
11/30/2022	12:50 PM	1 minute	55.1	62.1	50.4	Child activity
11/30/2022	12:51 PM	1 minute	55.4	60.1	51.6	Child activity
11/30/2022	12:52 PM	1 minute	54.6	62.0	50.7	Child activity
11/30/2022	12:53 PM	1 minute	58.1	64.0	50.6	Child activity
11/30/2022	12:54 PM	1 minute	57.6	65.6	52.0	Child activity
11/30/2022	12:55 PM	1 minute	54.1	59.5	49.7	Child activity
11/30/2022	12:56 PM	1 minute	53.6	58.9	49.5	Child activity
11/30/2022	12:57 PM	1 minute	57.4	65.7	52.3	Child activity
11/30/2022	12:58 PM	1 minute	54.6	61.6	51.1	Child activity
11/30/2022	12:59 PM	1 minute	64.8	75.4	55.9	Child activity
11/30/2022	1:00 PM	1 minute	59.0	66.7	54.1	Child activity
11/30/2022	1:01 PM	1 minute	60.5	67.4	52.5	Child activity
11/30/2022	1:02 PM	1 minute	58.2	64.8	53.0	Child activity
11/30/2022	1:03 PM	1 minute	51.6	57.0	47.6	Child activity
11/30/2022	1:04 PM	1 minute	51.9	56.5	48.0	Child activity
11/30/2022	1:05 PM	1 minute	61.6	70.7	53.2	Child activity
11/30/2022	1:06 PM	1 minute	52.2	58.3	48.3	Child activity
11/30/2022	1:07 PM	1 minute	50.2	54.8	46.9	Child activity
11/30/2022	1:08 PM	1 minute	55.4	66.2	50.1	Child activity
11/30/2022	1:09 PM	1 minute	51.8	58.5	48.1	Child activity
11/30/2022	1:10 PM	1 minute	54.8	63.7	49.7	Child activity
11/30/2022	1:11 PM	1 minute	58.5	67.0	51.2	Child activity
11/30/2022	1:12 PM	1 minute	60.2	66.6	53.0	Child activity
11/30/2022	1:13 PM	1 minute	57.6	66.9	50.5	Child activity
11/30/2022	1:14 PM	1 minute	56.5	64.1	51.4	Child activity
11/30/2022	1:15 PM	1 minute	53.7	61.8	49.9	Child activity
11/30/2022	1:16 PM	1 minute	54.9	67.0	48.6	Child activity
11/30/2022	1:17 PM	1 minute	55.9	61.8	51.6	Child activity
11/30/2022	1:18 PM	1 minute	54.4	60.8	50.4	Child activity
11/30/2022	1:19 PM	1 minute	55.5	62.4	50.9	Child activity
11/30/2022	1:20 PM	1 minute	58.5	62.5	55.3	Child activity
11/30/2022	1:21 PM	1 minute	57.1	64.3	51.2	Child activity
11/30/2022	1:22 PM	1 minute	55.3	62.1	49.8	Child activity

Mitchell Education Building Renovation and Addition Project

Appendix A: Ambient Noise Monitoring Data Summary

Prepared by MIG, Inc. December 2022

Sheet 2: Ambient Noise Monitoring Data Summary (CCNS)

11/30/2022	1:23 PM	1 minute	53.3	61.7	48.4	Child activity
11/30/2022	1:24 PM	1 minute	52.7	57.3	49.7	Child activity
11/30/2022	1:25 PM	1 minute	57.8	63.7	52.4	Child activity
11/30/2022	1:26 PM	1 minute	54.3	61.9	49.2	Child activity
11/30/2022	1:27 PM	1 minute	55.0	63.7	50.5	Child activity
11/30/2022	1:28 PM	1 minute	57.8	63.8	53.3	Child activity
11/30/2022	1:29 PM	1 minute	57.8	63.8	53.6	Child activity
11/30/2022	1:30 PM	1 minute	55.2	65.3	49.5	Child activity
11/30/2022	1:31 PM	1 minute	58.2	64.3	53.4	Child activity
11/30/2022	1:32 PM	1 minute	60.8	68.6	57.0	Child activity
11/30/2022	1:33 PM	1 minute	59.7	67.9	55.9	Child activity
11/30/2022	1:37 PM	1 minute	54.7	62.4	48.2	Child activity
11/30/2022	1:38 PM	1 minute	50.2	57.5	47.1	Child activity
11/30/2022	1:39 PM	1 minute	54.6	62.2	47.3	Child activity
11/30/2022	1:40 PM	1 minute	55.8	63.1	49.3	Child activity
11/30/2022	1:41 PM	1 minute	52.2	59.8	48.3	Child activity
11/30/2022	1:42 PM	1 minute	56.8	70.0	46.6	Child activity
11/30/2022	1:43 PM	1 minute	59.2	71.6	45.1	Child activity
11/30/2022	1:44 PM	1 minute	48.7	54.8	45.3	Child activity
11/30/2022	1:45 PM	1 minute	49.8	56.2	45.9	Child activity
11/30/2022	1:46 PM	1 minute	51.8	57.3	48.0	Child activity
11/30/2022	1:47 PM	1 minute	48.9	57.3	45.0	Child activity
11/30/2022	1:48 PM	1 minute	48.9	53.5	45.5	Child activity
11/30/2022	1:49 PM	1 minute	50.3	57.7	44.0	Child activity
11/30/2022	1:50 PM	1 minute	48.4	56.1	44.9	Child activity
11/30/2022	1:51 PM	1 minute	48.7	56.6	45.2	Child activity
11/30/2022	1:52 PM	1 minute	61.0	71.9	50.0	Child activity
11/30/2022	1:53 PM	1 minute	53.1	61.0	47.6	Child activity
11/30/2022	1:54 PM	1 minute	48.2	54.2	45.6	Child activity
11/30/2022	1:55 PM	1 minute	48.3	56.4	44.8	Child activity
11/30/2022	1:56 PM	1 minute	45.6	50.3	43.5	Child activity
11/30/2022	1:57 PM	1 minute	45.4	49.7	42.9	Child activity
11/30/2022	1:58 PM	1 minute	45.8	51.0	43.4	Child activity
11/30/2022	1:59 PM	1 minute	47.6	54.1	44.1	Child activity
Period Average/Max			56.0	75.4	50.4	

Mitchell Education Building Renovation and Addition Project

Appendix A: Ambient Noise Monitoring Data Summary

Prepared by MIG, Inc. December 2022

Sheet 2: Ambient Noise Monitoring Data Summary (CCNS)

TABLE 7: SUMMARY OF CCNS-01 NOISE MONITORING DATA WITHOUT CHILDREN'S PLAY						
Date	Time	Duration	Leq	Lmax	LAS90	Note
11/30/2022	9:01 AM	1 minute	48.2	43.7	57.4	No child activity
11/30/2022	9:02 AM	1 minute	52.5	43.2	62.4	No child activity
11/30/2022	9:03 AM	1 minute	61.0	44.1	69.5	No child activity
11/30/2022	10:05 AM	1 minute	48.8	42.1	55.9	Little to no school activity
11/30/2022	10:06 AM	1 minute	47.1	41.1	59.8	Little to no school activity
11/30/2022	10:07 AM	1 minute	45.6	41.0	52.9	Little to no school activity
11/30/2022	10:08 AM	1 minute	44.2	40.3	50.3	Little to no school activity
11/30/2022	10:09 AM	1 minute	43.4	39.9	51.1	Little to no school activity
11/30/2022	10:10 AM	1 minute	45.8	40.4	53.7	Little to no school activity
11/30/2022	10:11 AM	1 minute	51.1	44.5	57.6	Little to no school activity
11/30/2022	10:12 AM	1 minute	50.7	41.9	56.1	Little to no school activity
11/30/2022	10:13 AM	1 minute	52.7	44.2	63.1	Little to no school activity
11/30/2022	10:14 AM	1 minute	44.3	39.8	52.0	Little to no school activity
11/30/2022	10:15 AM	1 minute	49.4	41.5	56.8	Little to no school activity
11/30/2022	10:16 AM	1 minute	42.0	39.9	44.6	Little to no school activity
11/30/2022	10:17 AM	1 minute	42.3	40.1	46.5	Little to no school activity
11/30/2022	10:18 AM	1 minute	40.5	38.9	43.2	Little to no school activity
11/30/2022	10:19 AM	1 minute	41.4	39.5	44.4	Little to no school activity
11/30/2022	10:20 AM	1 minute	42.1	40.3	43.8	Little to no school activity
11/30/2022	10:21 AM	1 minute	42.9	40.1	46.4	Little to no school activity
11/30/2022	10:22 AM	1 minute	43.3	40.7	47.9	Little to no school activity
11/30/2022	10:23 AM	1 minute	45.0	41.5	48.1	Little to no school activity
11/30/2022	10:24 AM	1 minute	45.3	41.5	51.5	Little to no school activity
11/30/2022	10:25 AM	1 minute	45.9	40.8	54.0	Little to no school activity
11/30/2022	10:26 AM	1 minute	45.4	40.8	53.6	Little to no school activity
11/30/2022	10:27 AM	1 minute	42.9	39.7	49.4	Little to no school activity
11/30/2022	10:28 AM	1 minute	43.7	40.1	51.8	Little to no school activity
11/30/2022	10:29 AM	1 minute	44.2	41.0	54.8	Little to no school activity
11/30/2022	10:33 AM	1 minute	51.6	45.0	58.9	Little to no school activity
11/30/2022	10:34 AM	1 minute	51.2	43.9	60.4	Little to no school activity
11/30/2022	10:35 AM	1 minute	54.3	46.4	62.7	Little to no school activity
11/30/2022	10:36 AM	1 minute	52.5	46.1	59.6	Little to no school activity
11/30/2022	10:37 AM	1 minute	51.9	45.4	57.1	Little to no school activity
11/30/2022	10:38 AM	1 minute	52.2	46.1	57.8	Little to no school activity
11/30/2022	10:39 AM	1 minute	52.6	45.2	59.1	Little to no school activity
11/30/2022	10:40 AM	1 minute	54.3	44.7	62.4	Little to no school activity
11/30/2022	10:41 AM	1 minute	55.0	44.6	60.4	Little to no school activity
11/30/2022	10:42 AM	1 minute	58.3	49.8	66.5	Little to no school activity
11/30/2022	12:03 PM	1 minute	41.8	39.2	44.1	Little to no school activity

Mitchell Education Building Renovation and Addition Project

Appendix A: Ambient Noise Monitoring Data Summary

Prepared by MIG, Inc. December 2022

Sheet 2: Ambient Noise Monitoring Data Summary (CCNS)

11/30/2022	12:04 PM	1 minute	42.5	41.4	44.8	Little to no school activity
11/30/2022	12:05 PM	1 minute	43.3	42.0	46.6	Little to no school activity
11/30/2022	12:06 PM	1 minute	43.1	41.7	47.4	Little to no school activity
11/30/2022	12:07 PM	1 minute	43.6	42.1	45.2	Little to no school activity
11/30/2022	12:08 PM	1 minute	43.4	42.5	44.7	Little to no school activity
11/30/2022	12:09 PM	1 minute	42.9	41.7	44.1	Little to no school activity
11/30/2022	12:10 PM	1 minute	43.6	39.8	49.8	Little to no school activity
11/30/2022	12:11 PM	1 minute	52.6	43.0	63.7	Little to no school activity
11/30/2022	12:12 PM	1 minute	45.3	42.6	47.8	Little to no school activity
11/30/2022	12:13 PM	1 minute	45.7	43.7	49.5	Little to no school activity
11/30/2022	12:14 PM	1 minute	45.5	42.8	51.6	Little to no school activity
11/30/2022	12:15 PM	1 minute	45.4	41.0	55.8	Little to no school activity
11/30/2022	12:16 PM	1 minute	42.3	39.2	45.4	Little to no school activity
11/30/2022	12:17 PM	1 minute	43.3	40.7	47.9	Little to no school activity
11/30/2022	12:18 PM	1 minute	44.4	43.3	45.7	Little to no school activity
11/30/2022	12:19 PM	1 minute	45.3	44.1	51.0	Little to no school activity
11/30/2022	12:20 PM	1 minute	47.5	43.7	51.2	Little to no school activity
11/30/2022	12:21 PM	1 minute	44.5	41.5	46.1	Little to no school activity
11/30/2022	12:22 PM	1 minute	44.2	40.4	48.3	Little to no school activity
11/30/2022	12:23 PM	1 minute	49.4	44.3	61.8	Little to no school activity
11/30/2022	12:24 PM	1 minute	52.9	47.9	61.5	Little to no school activity
11/30/2022	12:25 PM	1 minute	54.5	47.4	61.0	Little to no school activity
11/30/2022	12:26 PM	1 minute	52.0	43.7	60.8	Little to no school activity
11/30/2022	12:27 PM	1 minute	43.5	41.1	46.0	Little to no school activity
11/30/2022	12:28 PM	1 minute	43.3	41.1	48.6	Little to no school activity
11/30/2022	12:29 PM	1 minute	44.2	42.0	49.2	Little to no school activity
11/30/2022	12:30 PM	1 minute	45.9	42.9	49.9	Little to no school activity
11/30/2022	12:31 PM	1 minute	44.9	41.7	52.4	Little to no school activity
11/30/2022	12:32 PM	1 minute	45.6	42.6	49.1	Little to no school activity
11/30/2022	12:33 PM	1 minute	44.5	42.4	47.8	Little to no school activity
11/30/2022	12:34 PM	1 minute	44.0	41.9	47.8	Little to no school activity
11/30/2022	12:35 PM	1 minute	48.6	44.0	52.3	Little to no school activity
11/30/2022	12:36 PM	1 minute	47.9	44.5	51.3	Little to no school activity
11/30/2022	12:37 PM	1 minute	43.6	41.4	46.2	Little to no school activity
11/30/2022	12:38 PM	1 minute	50.5	42.9	54.9	Little to no school activity
11/30/2022	12:39 PM	1 minute	44.0	42.0	49.2	Little to no school activity
11/30/2022	12:40 PM	1 minute	43.7	41.2	48.1	Little to no school activity
11/30/2022	12:41 PM	1 minute	43.2	41.2	46.5	Little to no school activity
11/30/2022	12:42 PM	1 minute	43.7	40.5	48.2	Little to no school activity
11/30/2022	12:43 PM	1 minute	47.6	43.8	51.8	Little to no school activity
11/30/2022	12:44 PM	1 minute	47.2	42.5	51.8	Little to no school activity
11/30/2022	12:45 PM	1 minute	45.4	42.1	49.8	Little to no school activity
Period Average/Max			49.5	49.8	57.3	

Summary

File Name on Meter CCNSFx.001.s
 LxTse_0003790-
 20221130 083623-
File Name on PC CCNSFx.001.ldbin
Serial Number 0003790
Model SoundExpert® LxT
Firmware Version 2.404
User
Location
Job Description
Note

Measurement

Description CCNS ST 11/30/22
Start 2022-11-30 08:36:23
Stop 2022-11-30 14:00:00
Duration 05:00:17.3
Run Time 05:00:17.3
Pause 00:00:00.0

Pre-Calibration 2022-11-30 08:34:36
Post-Calibration None
Calibration Deviation ---

Overall Settings

RMS Weight A Weighting
Peak Weight A Weighting
Detector Slow
Preamplifier PRMLxT1L
Microphone
Correction Off
Integration Method Linear
OBA Range Normal
OBA Bandwidth 1/1 and 1/3
OBA Frequency
Weighting A Weighting
OBA Max Spectrum Bin Max
Overload 122.8 dB

	A	C	Z
Under Range Peak	79.4	76.4	81.4 dB
Under Range Limit	24.3	25.5	31.7 dB
Noise Floor	15.2	16.3	22.5 dB

	First	Second	Third
Instrument Identification	MIG		

Results

LAeq 54.5 dB

LAE 97.1 dB
EA 564.218 $\mu\text{Pa}^2\text{h}$
LA_{peak} (max) 2022-11-30 09:16:36 103.9 dB
LAS_{max} 2022-11-30 11:04:49 84.4 dB
LAS_{min} 2022-11-30 10:18:35 38.9 dB
SEA -99.9 dB

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA _{peak} > 135.0 dB	0	0.0 s
LA _{peak} > 137.0 dB	0	0.0 s
LA _{peak} > 140.0 dB	0	0.0 s

Community Noise	LDay 07:00-22:00		LNight 22:00-07:00	LDay 07:00-19:00		LEvening 19:00-22:00	LNight 22:00-07:00	dB
	Ldn	22:00	07:00	Lden	19:00	19:00-22:00	07:00	
	54.6	54.6	-99.9	54.6	54.6	-99.9	-99.9	

LC_{eq} 60.9 dB
LA_{eq} 54.5 dB
LC_{eq} - LA_{eq} 6.4 dB
LA_{1eq} 60.6 dB
LA_{eq} 54.5 dB
LA_{1eq} - LA_{eq} 6.1 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	54.5		60.9			
LS(max)	84.4	2022/11/30 11:04:49				
LS(min)	38.9	2022/11/30 10:18:35				
LPeak(max)	103.9	2022/11/30 9:16:36				

Overload Count 0
Overload Duration 0.0 s
OBA Overload Count 0
OBA Overload Duration 0.0 s

Statistics

LA 1.70 62.9 dB
LA 8.30 58.5 dB
LA 10.00 57.9 dB
LA 25.00 54.2 dB
LA 50.00 49.9 dB
LA 90.00 42.3 dB

Calibration History

		Date	dB re. 1V/Pa
Preamp			
Direct	2020-01-28	06:13:43	-26.38
Direct	2020-01-27	13:00:51	-29.00
PRMLxT1L	2022-11-30	08:34:32	-29.09
PRMLxT1L	2022-11-21	13:43:04	-29.08
PRMLxT1L	2022-11-21	11:58:39	-29.11
PRMLxT1L	2022-11-21	11:58:09	-29.21
PRMLxT1L	2022-11-16	14:59:10	-29.09
PRMLxT1L	2022-11-16	12:02:07	-29.21
PRMLxT1L	2022-11-14	15:50:53	-29.09
PRMLxT1L	2022-11-14	08:53:02	-29.09
PRMLxT1L	2022-11-01	14:14:15	-28.88
PRMLxT1L	2022-10-24	13:16:14	-28.86
PRMLxT1L	2022-10-24	13:05:10	-29.00
Unknown	2019-12-01	17:09:04	-28.99

Note: Detailed calibration records are available upon request.

Summary

File Name on

Meter StLukeLT.001.s
LxT_0005064-

File Name on 20221129 170000-

PC StLukeLT.001.ldbin

Serial Number 0005064

Model SoundTrack LxT®

Firmware

Version 2.404

User

Location

Job

Description

Note

Measurement

1025 The Dalles Ave,
Sunnyvale: LT, 11/29 -

Description 12/1/22

Start 2022-11-29 17:00:00

Stop 2022-11-30 17:48:19

Duration 24:48:19.898

Run Time 24:48:19.898

Pause 00:00:00.0

Pre-

Calibration 2022-11-29 16:56:48

Post-

Calibration 2022-11-30 17:49:02

Calibration

Deviation -0.02 dB

Overall

Settings

RMS Weight A Weighting

Peak Weight A Weighting

Detector Slow

Preamplifier PRMLxT1L

Microphone

Correction Off

Integration

Method Linear

OBA Range Normal

OBA

Bandwidth 1/1 and 1/3

OBA

Frequency

Weighting A Weighting

OBA Max

Spectrum Bin Max

Overload	122.9 dB		
	A	C	Z
Under Range			
Peak	79.4	76.4	81.4 dB
Under Range			
Limit	24.4	25.5	31.7 dB
Noise Floor	15.2	16.4	22.6 dB

	First	Second	Third
Instrument Identification			

Results

LAeq	53.4 dB
LAE	102.9 dB
EA	2.171 mPa ² h
EA8	700.084 μPa ² h
EA40	3.500 mPa ² h
LApeak (max)	2022-11-30 17:45:55 116.2 dB
LASmax	2022-11-30 17:47:39 85.5 dB
LASmin	2022-11-30 03:13:58 33.3 dB
SEA	-99.9 dB

	Exceedance Counts	Duration
LAS > 60.0 dB	177	3526.5 s
LAS > 75.0 dB	5	10.1 s
LApeak > 115.0 dB	1	1.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	LDay 07:00-22:00		LNight 22:00-07:00		LDay 07:00-19:00		LEvening 19:00-22:00		LNight 22:00-07:00	
	Ldn	22:00	07:00	Lden	19:00	19:00-22:00	07:00			dB
	59.7	53.5	53.3	60.0	53.3	54.2	53.3			

LCeq	58.8 dB
LAeq	53.4 dB
LCeq - LAeq	5.4 dB
LAleq	56.7 dB
LAeq	53.4 dB
LAleq - LAeq	3.3 dB

	A	C	Z
	dB	dB	dB
	Time Stamp	Time Stamp	Time Stamp
Leq	53.4	58.8	
LS(max)	85.5	2022/11/30 17:47:39	

LS(min)	33.3	2022/11/30 3:13:58				
LPeak(max)	116.2	2022/11/30 17:45:55				

Overload

Count	0
Overload	
Duration	0.0 s
OBA Overload	
Count	0
OBA Overload	
Duration	0.0 s

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB
Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion		
Duration	8	8 h

Results

Dose	-99.94	0.00 %
Projected		
Dose	-99.94	0.00 %
TWA		
(Projected)	-99.9	6.8 dB
TWA (t)	-99.9	15.0 dB
Lep (t)	58.3	58.3 dB

Statistics

LA 1.70	60.6 dB
LA 8.30	57.0 dB
LA 10.00	56.5 dB
LA 16.70	55.0 dB
LA 50.00	51.4 dB
LA 90.00	43.2 dB

Calibration**History**

Preamp	Date	dB re. 1V/Pa
Direct	2020-01-28 05:43:54	-28.63
PRMLxT1L	2022-11-30 17:48:57	-29.15
PRMLxT1L	2022-11-29 16:56:46	-29.12
PRMLxT1L	2022-11-16 14:43:13	-29.12
PRMLxT1L	2022-11-16 12:32:55	-28.97
PRMLxT1L	2022-11-15 09:22:49	-28.98
PRMLxT1L	2022-11-13 08:51:35	-29.02

PRMLxT1L	2022-11-01 14:01:22	-28.89
PRMLxT1L	2022-10-25 15:22:53	-28.80
PRMLxT1L	2022-10-25 14:50:35	-28.73
PRMLxT1L	2022-10-25 13:12:22	-26.38
PRMLxT1L	2022-06-08 14:11:13	-28.73

Note: Detailed Calibration Records Available Upon Request

Summary

File Name on Meter CCNSVr.001.s
 LxT_0005065-
 20221130 090000-
 File Name on PC CCNSVr.001.ldbin
 Serial Number 0005065
 Model SoundTrack LxT®
 Firmware Version 2.404
 User
 Location
 Job Description
 Note

Measurement

Description CCNS ST 11/30/22
 Start 2022-11-30 09:00:00
 Stop 2022-11-30 14:00:00
 Duration 05:00:00.0
 Run Time 05:00:00.0
 Pause 00:00:00.0
 Pre-Calibration 2022-11-30 08:39:07
 Post-Calibration None
 Calibration Deviation ---

Overall Settings

RMS Weight A Weighting
 Peak Weight A Weighting
 Detector Slow
 Preamplifier PRMLxT1L
 Microphone Correction Off
 Integration Method Linear
 OBA Range Normal
 OBA Bandwidth 1/1 and 1/3
 OBA Frequency Weighting A Weighting
 OBA Max Spectrum Bin Max
 Overload 122.4 dB

	A	C	Z
Under Range Peak	78.9	75.9	80.9 dB
Under Range Limit	24.2	25.2	31.3 dB
Noise Floor	15.1	16.1	22.1 dB

Instrument Identification

	First	Second	Third
--	-------	--------	-------

Results

LAeq	55.5 dB
LAE	98.1 dB
EA	709.627 $\mu\text{Pa}^2\text{h}$
EA8	1.135 mPa^2h

EA40 5.677 mPa²h
 LA_{peak} (max) 2022-11-30 13:34:57 98.2 dB
 LAS_{max} 2022-11-30 12:26:08 79.3 dB
 LAS_{min} 2022-11-30 11:56:42 38.7 dB
 SEA -99.9 dB

Exceedance Counts Duration

LAS > 85.0 dB 0 0.0 s
 LAS > 115.0 dB 0 0.0 s
 LA_{peak} > 135.0 dB 0 0.0 s
 LA_{peak} > 137.0 dB 0 0.0 s
 LA_{peak} > 140.0 dB 0 0.0 s

		LDay	LNight		LDay	LEvening	LNight	
		07:00-	22:00-		07:00-	19:00-	22:00-	
Community Noise	Ldn	22:00	07:00	Lden	19:00	22:00	07:00	dB
	55.5	55.5	-99.9	55.5	55.5	-99.9	-99.9	

LC_{eq} 61.7 dB
 LA_{eq} 55.5 dB
 LC_{eq} - LA_{eq} 6.2 dB
 LA_{eq} 61.4 dB
 LA_{eq} 55.5 dB
 LA_{eq} - LA_{eq} 5.9 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	55.5		61.7			
LS(max)	79.3	2022/11/30 12:26:08				
LS(min)	38.7	2022/11/30 11:56:42				
LPeak(max)	98.2	2022/11/30 13:34:57				

Overload Count 0
 Overload Duration 0.0 s
 OBA Overload Count 0
 OBA Overload Duration 0.0 s

Dose Settings

Dose Name OSHA-1 OSHA-2

Exchange Rate	5	5 dB
Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results

Dose	-99.94	-99.94 %
Projected Dose	-99.94	-99.94 %
TWA (Projected)	-99.9	-99.9 dB
TWA (t)	-99.9	-99.9 dB
Lep (t)	53.5	53.5 dB

Statistics

LA 1.70	65.5 dB
LA 8.30	58.5 dB
LA 10.00	57.5 dB
LA 25.00	53.1 dB
LA 50.00	48.8 dB
LA 90.00	42.8 dB

Calibration History

Preamp	Date	dB re. 1V/Pa
Direct	2020-01-28 06:05:01	-28.49
PRMLxT1L	2022-11-30 08:38:56	-28.60
PRMLxT1L	2022-11-01 14:07:20	-28.50
PRMLxT1L	2022-10-25 15:08:07	-28.39
PRMLxT1L	2022-10-25 14:41:58	-28.56
PRMLxT1L	2022-10-25 13:10:25	-26.38
PRMLxT1L	2022-05-18 13:54:38	-28.56
PRMLxT1L	2022-05-17 10:33:16	-28.61
PRMLxT1L	2022-05-16 15:25:33	-28.67
PRMLxT1L	2022-05-16 14:05:34	-28.63
PRMLxT1L	2022-05-16 12:04:05	-28.69
PRMLxT1L	2022-05-16 08:10:38	-28.63
Unknown	2022-11-22 12:05:40	-28.57
Unknown	2022-11-21 11:46:47	-28.65
Unknown	2022-11-21 11:45:41	-28.63
Unknown	2022-11-21 11:44:13	-28.62
Unknown	2022-03-29 14:00:31	-28.57
Unknown	2022-03-29 09:47:56	-28.50
Unknown	2018-11-13 08:29:15	-28.30
Unknown	2018-11-05 14:21:01	-28.27
Unknown	2018-06-27 10:46:33	-28.02
Unknown	2018-06-27 10:46:16	-28.03

Note: Detailed calibration records available upon request.

APPENDIX B: Construction Noise Estimates

Appendix B

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Mitchell Education Building Renovation and Addition Project

Appendix B: Construction Noise Estimates

Prepared by MIG, Inc. December 2022

Sheet 1: Construction Noise Estimates

Table 1: Construction Noise Estimates

Equipment	RNL (Lmax)	Usage Factor	Distance from source and Average Noise Level (Leq)							
			25	35	50	75	100	150	200	250
Backhoe	80	0.4	82	79	76	72	70	66	64	62
Compressor	80	0.4	82	79	76	72	70	66	64	62
Delivery Truck	84	0.4	86	83	80	76	74	70	68	66
Generator	82	0.5	85	82	79	75	73	69	67	65
Man Lift	85	0.2	84	81	78	74	72	68	66	64

Notes:

(A) Reference Noise Level (RNL) based on manufacturer's specifications for Lmax at 50 feet.

(B) Usage factor refers to the amount of time the equipment produces noise over the time period.

(C) Estimate does not account for any atmospheric or ground attenuation factors. Calculated noise levels based on Caltrans 2013: $L_{eq} \text{ (hourly)} = L_{max} \text{ at 50 feet} - 20\log(D/50) + 10\log(UF)$, where: L_{max} = reference L_{max} from manufacturer or other source; D = distance of interest; UF = usage fraction or fraction of time period of interest equipment is in use

Appendix B

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APPENDIX C: Operational Noise Level Estimates

Appendix C

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Mitchell Education Building Renovation and Addition Project

Appendix C: On-Site Operational Noise Level Estimates

Prepared by MIG, Inc. December 2022

Sheet 1: dBA Reference Noise Level Information

Table 1: Reference Noise Level Information (3 Feet)

Noise Source	Reference dBA @ 3 Feet	Duration (Seconds)	Estimated Hourly Leq @ 3 Feet
<u>Children's Play</u>			
<i>ACP</i>	<i>59</i>	<i>3,600</i>	<i>59.0</i>
<i>CCNS</i>	<i>59</i>	<i>3,600</i>	<i>59.0</i>
<i>SCLC</i>	<i>62</i>	<i>3,600</i>	<i>62.0</i>
<u>HVAC Unit</u>			
<i>Operation (2 Ton)</i>	<i>75</i>	<i>2,400</i>	<i>63.2</i>
<u>On-site Automobile Trip</u>			
<i>Low speed travel (10 mph)</i>	<i>65</i>	<i>30</i>	<i>44.2</i>
<i>Door closing</i>	<i>80</i>	<i>2</i>	<i>47.4</i>
<i>Engine start/rev</i>	<i>80</i>	<i>20</i>	<i>57.4</i>
<i>Total Combined Noise Level</i>			<i>58.0</i>

Mitchell Education Building Renovation and Addition Project

Appendix C: On-Site Operational Noise Level Estimates

Prepared by MIG, Inc. December 2022

Sheet 2: Leq Noise Level Estimates

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	105	28.1	5	35.1
CCNS Play Area	3	59.0	55	33.7	3	38.5
Mitchell Bldg HVAC	3	63.2	<i>Source does not contribute to noise at this receiver.</i>			
SCLC Play Area 1	3	62.0	<i>Source does not contribute to noise at this receiver.</i>			
SCLC Play Area 2	3	62.0	<i>Source does not contribute to noise at this receiver.</i>			
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	<i>Source does not contribute to noise at this receiver.</i>			
Combined Noise Level						43.2

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	95	29.0	5	36.0
CCNS Play Area	3	59.0	40	36.5	3	41.3
Mitchell Bldg HVAC	3	63.2	50	38.8	4	44.8
SCLC Play Area 1	3	62.0	165	27.2	2	30.2
SCLC Play Area 2	3	62.0	<i>Source does not contribute to noise at this receiver.</i>			
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	<i>Source does not contribute to noise at this receiver.</i>			
Combined Noise Level						47.7

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	165	24.2	5	31.2
CCNS Play Area	3	59.0	135	25.9	3	30.7
Mitchell Bldg HVAC	3	63.2	90	33.7	4	39.7
SCLC Play Area 1	3	62.0	70	34.6	2	37.7
SCLC Play Area 2	3	62.0	<i>Source does not contribute to noise at this receiver.</i>			
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	50	33.6	10	43.6
Combined Noise Level						47.1

Mitchell Education Building Renovation and Addition Project

Appendix C: On-Site Operational Noise Level Estimates

Prepared by MIG, Inc. December 2022

Sheet 2: Leq Noise Level Estimates

Table 4: Estimated Noise Levels at Property Line R04

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
CCNS Play Area	3	59.0	200	22.5	3	27.3
Mitchell Bldg HVAC	3	63.2	130	30.5	4	36.5
SCLC Play Area 1	3	62.0	80	33.5	2	36.5
SCLC Play Area 2	3	62.0	240	23.9	3	28.7
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	10	47.6	10	57.6
Combined Noise Level						57.7

Table 5: Estimated Noise Levels at Property Line R05

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
CCNS Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
Mitchell Bldg HVAC	3	63.2	130	30.5	4	36.5
SCLC Play Area 1	3	62.0	75	34.0	2	37.1
SCLC Play Area 2	3	62.0	175	26.7	3	31.5
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	10	47.6	10	57.6
Combined Noise Level						57.7

Table 6: Estimated Noise Levels at Property Line R06

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
CCNS Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
Mitchell Bldg HVAC	3	63.2	130	30.5	4	36.5
SCLC Play Area 1	3	62.0	75	34.0	2	37.1
SCLC Play Area 2	3	62.0	130	29.3	3	34.0
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	10	47.6	10	57.6
Combined Noise Level						57.8

Mitchell Education Building Renovation and Addition Project

Appendix C: On-Site Operational Noise Level Estimates

Prepared by MIG, Inc. December 2022

Sheet 2: Leq Noise Level Estimates

Table 7: Estimated Noise Levels at Property Line R07

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
CCNS Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
Mitchell Bldg HVAC	3	63.2	130	30.5	4	36.5
SCLC Play Area 1	3	62.0	90	32.5	2	35.5
SCLC Play Area 2	3	62.0	75	34.0	3	38.8
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	10	47.6	10	57.6
Combined Noise Level						57.8

Table 8: Estimated Noise Levels at Property Line R08

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
CCNS Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
Mitchell Bldg HVAC	3	63.2	<i>Source does not contribute to noise at this receiver.</i>			
SCLC Play Area 1	3	62.0	155	27.7	2	30.7
SCLC Play Area 2	3	62.0	75	34.0	3	38.8
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	80	29.5	10	39.5
Combined Noise Level						44.5

Table 9: Estimated Noise Levels at Property Line R09

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
CCNS Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
Mitchell Bldg HVAC	3	63.2	<i>Source does not contribute to noise at this receiver.</i>			
SCLC Play Area 1	3	62.0	210	25.1	2	28.1
SCLC Play Area 2	3	62.0	75	34.0	3	38.8
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	130	25.3	10	35.3
Combined Noise Level						43.5

Mitchell Education Building Renovation and Addition Project

Appendix C: On-Site Operational Noise Level Estimates

Prepared by MIG, Inc. December 2022

Sheet 2: Leq Noise Level Estimates

Table 10: Estimated Noise Levels at Property Line R10

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
CCNS Play Area	3	59.0	<i>Source does not contribute to noise at this receiver.</i>			
Mitchell Bldg HVAC	3	63.2	<i>Source does not contribute to noise at this receiver.</i>			
SCLC Play Area 1	3	62.0	290	22.3	2	25.3
SCLC Play Area 2	3	62.0	105	31.1	3	35.9
On-Site Vehicle Travel	3	44.2	30	24.2	40	40.2
On-Site Vehicle Parking	3	58.0	220	20.7	10	30.7
Combined Noise Level						42.0

Table 11: Estimated Noise Levels at Property Line R02 (Off-peak, no vehicle travel and parking)

On-Site Noise Source	Reference Noise Data		Property Line (Single Source)		Property Line (Multiple Sources)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	No. Sources	Hourly Leq dBA
ACP Play Area	3	59.0	95	29.0	5	36.0
CCNS Play Area	3	59.0	40	36.5	3	41.3
Mitchell Bldg HVAC	3	63.2	50	38.8	4	44.8
SCLC Play Area 1	3	62.0	165	27.2	2	30.2
SCLC Play Area 2	3	62.0	<i>Source does not contribute to noise at this receiver.</i>			
On-Site Vehicle Travel	3	44.2	<i>Source does not contribute to noise at this receiver.</i>			
On-Site Vehicle Parking	3	58.0	<i>Source does not contribute to noise at this receiver.</i>			
Combined Noise Level						46.9

Mitchell Education Building Renovation and Addition Project

Appendix C: On-Site Operational Noise Level Estimates

Prepared by MIG, Inc. December 2022

Sheet 3: Estimated Change in Day-Night Noise Level (DNL)

Table 1: Estimated Change in 24-hour Noise Exposure (DNL)						
Hour	Existing Noise Level		Project Noise Level		Existing Plus Project Noise	
	dBA Leq	dBA DNL	dBA Leq	dBA DNL	dBA Leq	dBA DNL
5:00 PM	54.8	54.8	46.9	46.9	55.4	55.4
6:00 PM	54.4	54.4	57.8	57.8	59.4	59.4
7:00 PM	53.4	53.4	0	0.0	53.4	53.4
8:00 PM	53.2	53.2	0	0.0	53.2	53.2
9:00 PM	55.5	55.5	0	0.0	55.5	55.5
10:00 PM	53.8	63.8	0	0.0	53.8	63.8
11:00 PM	52.4	62.4	0	0.0	52.4	62.4
12:00 AM	49.4	59.4	0	0.0	49.4	59.4
1:00 AM	48.1	58.1	0	0.0	48.1	58.1
2:00 AM	48.5	58.5	0	0.0	48.5	58.5
3:00 AM	48.5	58.5	0	0.0	48.5	58.5
4:00 AM	53.5	63.5	0	0.0	53.5	63.5
5:00 AM	56.3	66.3	0	0.0	56.3	66.3
6:00 AM	57.3	67.3	0	0.0	57.3	67.3
7:00 AM	59.3	59.3	57.8	57.8	61.6	61.6
8:00 AM	50.3	50.3	46.9	46.9	51.9	51.9
9:00 AM	48.4	48.4	46.9	46.9	50.7	50.7
10:00 AM	46.1	46.1	46.9	46.9	49.5	49.5
11:00 AM	46.1	46.1	46.9	46.9	49.5	49.5
12:00 PM	43.5	43.5	46.9	46.9	48.5	48.5
1:00 PM	48.7	48.7	46.9	46.9	50.9	50.9
2:00 PM	50.1	50.1	46.9	46.9	51.8	51.8
3:00 PM	51.6	51.6	46.9	46.9	52.9	52.9
4:00 PM	53.9	53.9	46.9	46.9	54.7	54.7
24-HR DNL	--	59.6	--	48.5	--	59.9

Notes:

(A) Existing noise level is based on ambient noise monitoring at LT-01 (see Appendix A)

(B) Values are for the highest predicted receiver (R06 and R07 - see Sheet 2, Tables 6 and 7) during peak drop-off and pick up vehicle travel and parking activities (7 AM and 5 PM) and highest predicted receiver (R02 - see Sheet 2, Table 11) with no drop-off and pick up vehicle travel and parking activities.

Mitchell Education Building Renovation and Addition Project

Appendix C: On-Site Operational Noise Level Estimates

Prepared by MIG, Inc. December 2022

Sheet 4: Lmax Noise Level Estimates

Table 1: Estimated Noise Levels at Property Line R01				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	105	46.1
CCNS Play Area	3	77.0	55	51.7
Mitchell Bldg HVAC	3	75.0	<i>Source does not contribute to noise at this receiver.</i>	
SCLC Play Area 1	3	76.0	<i>Source does not contribute to noise at this receiver.</i>	
SCLC Play Area 2	3	76.0	<i>Source does not contribute to noise at this receiver.</i>	
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	<i>Source does not contribute to noise at this receiver.</i>	
Maximum Noise Level:				51.7

Table 2: Estimated Noise Levels at Property Line R02				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	95	47.0
CCNS Play Area	3	77.0	40	54.5
Mitchell Bldg HVAC	3	75.0	50	50.6
SCLC Play Area 1	3	76.0	165	41.2
SCLC Play Area 2	3	76.0	<i>Source does not contribute to noise at this receiver.</i>	
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	<i>Source does not contribute to noise at this receiver.</i>	
Maximum Noise Level:				54.5

Table 3: Estimated Noise Levels at Property Line R03				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	165	42.2
CCNS Play Area	3	77.0	135	43.9
Mitchell Bldg HVAC	3	75.0	90	45.5
SCLC Play Area 1	3	76.0	70	48.6
SCLC Play Area 2	3	76.0	<i>Source does not contribute to noise at this receiver.</i>	
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	50	55.6
Maximum Noise Level:				55.6

Mitchell Education Building Renovation and Addition Project

Appendix C: On-Site Operational Noise Level Estimates

Prepared by MIG, Inc. December 2022

Table 4: Estimated Noise Levels at Property Line R04				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
CCNS Play Area	3	77.0	200	40.5
Mitchell Bldg HVAC	3	75.0	130	42.3
SCLC Play Area 1	3	76.0	80	47.5
SCLC Play Area 2	3	76.0	240	37.9
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	10	69.5
Maximum Noise Level:				69.5

Table 5: Estimated Noise Levels at Property Line R05				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
CCNS Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
Mitchell Bldg HVAC	3	75.0	130	42.3
SCLC Play Area 1	3	76.0	75	48.0
SCLC Play Area 2	3	76.0	175	40.7
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	10	69.5
Maximum Noise Level:				69.5

Table 6: Estimated Noise Levels at Property Line R06				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
CCNS Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
Mitchell Bldg HVAC	3	75.0	130	42.3
SCLC Play Area 1	3	76.0	75	48.0
SCLC Play Area 2	3	76.0	130	43.3
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	10	69.5
Maximum Noise Level:				69.5

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Table 7: Estimated Noise Levels at Property Line R07				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
CCNS Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
Mitchell Bldg HVAC	3	75.0	130	42.3
SCLC Play Area 1	3	76.0	90	46.5
SCLC Play Area 2	3	76.0	75	48.0
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	10	69.5
Maximum Noise Level:				69.5

Table 8: Estimated Noise Levels at Property Line R08				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
CCNS Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
Mitchell Bldg HVAC	3	75.0	<i>Source does not contribute to noise at this receiver.</i>	
SCLC Play Area 1	3	76.0	155	41.7
SCLC Play Area 2	3	76.0	75	48.0
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	80	51.5
Maximum Noise Level:				51.5

Table 9: Estimated Noise Levels at Property Line R09				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
CCNS Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
Mitchell Bldg HVAC	3	75.0	<i>Source does not contribute to noise at this receiver.</i>	
SCLC Play Area 1	3	76.0	210	39.1
SCLC Play Area 2	3	76.0	75	48.0
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	130	47.3
Maximum Noise Level:				48.0

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Table 10: Estimated Noise Levels at Property Line R10				
On-Site Noise Source	Reference Noise Data		Property Line (Single Source)	
	Distance	Lmax dBA	Distance	Lmax dBA
ACP Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
CCNS Play Area	3	77.0	<i>Source does not contribute to noise at this receiver.</i>	
Mitchell Bldg HVAC	3	75.0	<i>Source does not contribute to noise at this receiver.</i>	
SCLC Play Area 1	3	76.0	290	36.3
SCLC Play Area 2	3	76.0	105	45.1
On-Site Vehicle Travel	3	65.0	30	45.0
On-Site Vehicle Parking	3	80.0	220	42.7
Maximum Noise Level:				45.1