



Todd Road/Standish Avenue Signalization Project

Construction Noise Assessment

prepared for

Sonoma County Department of Transportation & Public Works

La Plaza B

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1 Project Description and Impact Summary

1.1 Introduction

This study analyzes the potential noise and vibration impacts of the Todd Road/Standish Avenue Signalization Project (project) in Sonoma County, California. Rincon Consultants, Inc. (Rincon) prepared this study under contract to the Sonoma County Department of Transportation & Public Works, the lead agency for the project, to use in support of the environmental documentation being prepared pursuant to the California Environmental Quality Act (CEQA). The purpose of this study is to analyze the project's construction noise impacts related to temporary construction activity. There are no operational noise and vibration impacts associated with the project. Table 1 provides a summary of project impacts.

Table 1 Summary of Impacts

Impact Statement	Level of Significance	Applicable Recommendations
Issue 1: Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;	Less Than Significant Impact with Mitigation (Construction)	Mitigation measure NOI-1 (Construction)
Issue 2: Generation of excessive ground-borne vibration or ground-borne noise levels during construction.	Less Than Significant Impact	None Required
Issue 3: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.	No Impact	None Required

Mitigation Measures

NOI-1 Construction Noise Reduction

A Construction Management Plan (CMP) is required to be prepared consistent with Caltrans Standards Specifications and Standard Plans. The CMP shall be submitted to and approved by Sonoma County Public Works Department. The CMP would include:

- Construction sequence;
- Hours of operation;
- Traffic management plan;
- Public outreach and notification plan;
- Details on compliance with necessary permits; and
- Avoidance measures with regard to noise:
 - Commencing any particularly noisy part of the construction activity (such as masonry sawing or jack hammering) after 9 a.m.;

- Locating noise-generating equipment or processes so that their impact on neighboring premises is minimized by increasing distance between source and receiver or using intervening structures/barriers;
- Shutting or throttling equipment down whenever not in actual use;
- Ensuring that noise reduction devices such as mufflers are fitted and operating effectively;
- Ensuring that equipment is not operated if maintenance or repairs would eliminate or significantly reduce a characteristic of noise resulting from its operation that is audible at noise-affected premises;
- Where noise levels may expose residentially-zoned property to construction noise levels that exceeds 86 dBA at 50 feet, implement a temporary sound barrier and/or sound blanket that would break the line of sight between the construction equipment and the affected receiver(s); and
- Operating equipment and handling materials to minimize impact noise (such as avoiding dropping materials from height).

1.2 Project Summary

Project Location

The 2.66-acre project site, a portion of Todd Road and its intersection with Standish Avenue and Ghilotti Avenue, is located south of the City of Santa Rosa in the unincorporated central portion of Sonoma County (Figure 1). The existing intersection of Todd Road and Standish Avenue is three-legged, stop controlled intersection situated approximately 0.3-mile west of U.S. 101 and 350 feet west of Sonoma-Marin Area Rail Transit (SMART) tracks that run north-south. Todd Road is a two-lane east-west major collector that includes 150-foot long left turn lanes in each direction. Southbound Standish Avenue is a two-lane rural major collector and it is stop controlled at its intersection with Todd Road. A private property owner, Ghilotti Construction, Inc., has their driveway opposite Standish Avenue. This driveway is referred to as Ghilotti Avenue. Ghilotti Avenue is also stopped controlled at Todd Road. An aerial view of the project location is shown in Figure 2.

The project site is surrounded by a mix of land uses. Light manufacturing and commercial/industrial uses occur at the northeast corner of the intersection; farther to the north on either side of Standish Road; south of the intersection, on either side of Ghilotti Avenue; and at both east and west ends of the site. The northeast corner of the intersection contains large-lot residential properties, and additional residential properties are found to the north of Todd Road at the western end of the project area. Open fields and undeveloped land surround the residential properties, and two undeveloped areas occur to the south of Todd Road at the western end of the project site.

Project Description

The project would involve improvements to the intersection of Todd Road with Standish Avenue and Ghilotti Avenue, as well as installation of a new traffic signal. The three-legged stop would be realigned to a four-legged intersection to include Ghilotti Avenue. Ghilotti Avenue would be realigned to the west to align with Standish Avenue, resulting in a four-legged signalized intersection. Ghilotti Avenue, past the intersection is a private driveway.

Intersection Improvements and Signalization

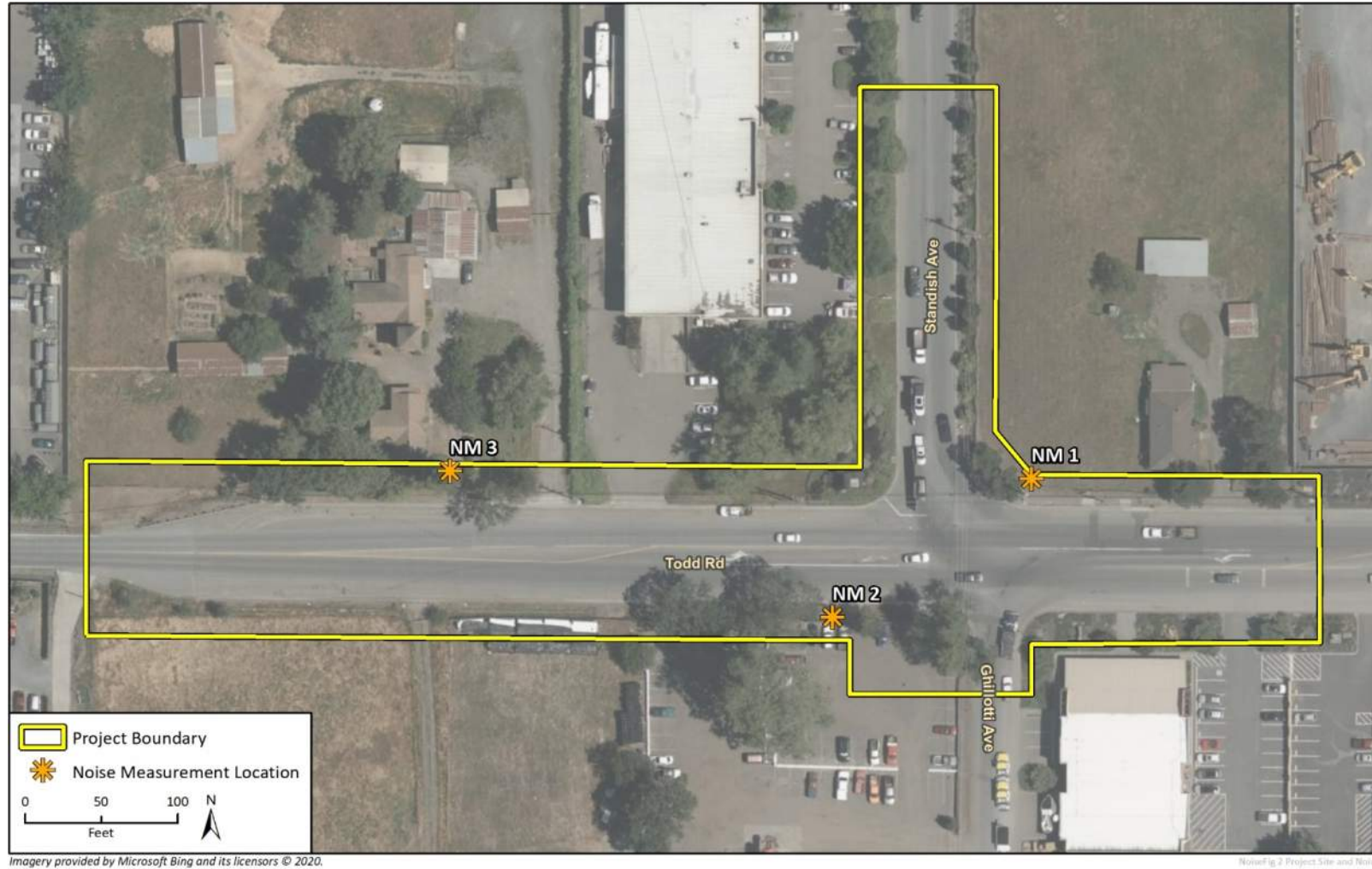
The proposed improvements would include a new traffic signal and standard curb radii improvements with standard curb ramps at each leg of the intersection and the privately developed driveway at Ghilotti Avenue. The existing sidewalk in the northeast quadrant would be upgraded to Sonoma County standards for an approximate distance of 85 feet east of the intersection along Todd Road and the utility pole would be relocated north of the sidewalk. The majority of these improvements would take place within existing Sonoma County right-of-way, with the exception of the curb connection with the Ghilotti Avenue driveway, a narrow area needed to complete the sidewalk along the south side of Todd Road, and another limited area to install the curb ramp at the northwest Todd Road and Standish Way intersection quadrant.

Construction Schedule

Construction of the project would involve roadway excavation at the intersection to install the signal power equipment, signal mast arms and new drainage inlets to connect with the existing and/or relocated storm drain lines. The depth of excavation would be approximately 10 feet. The drainage improvements would occur within the existing right-of-way and the project improvement limits. Vegetation removal would include three to four trees along the south side of Todd Road, two trees to the northeast curb return, and relocation of a commercial sign on the northwest that are located within existing right-of-way. The intersection pavement would be excavated within the project limits and new asphalt would be laid to conform to the four legs of the intersection to complete the construction process.

The project is expected to require approximately 40 to 50 working days to complete over a six-month period. Due to heavy day-time traffic, the contractor may be permitted to conduct night-time construction activities to reduce construction duration. Two-way traffic would continue with the use of the turn lane on Todd Road as a through lane. The maximum depth of excavation is ten feet to install the signal power, signal mast arms and new drainage inlets to connect with the existing and/or relocated storm drain lines.

Figure 2 Project Site Location and Noise Measurement Locations



2 Background

2.1 Overview of Sound Measurement

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (Caltrans 2013a).

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz and less sensitive to frequencies around and below 100 Hertz (Kinsler, et. al. 1999). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; dividing the energy in half would result in a 3 dB decrease (Crocker 2007).

Human perception of noise has no simple correlation with sound energy: the perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease (i.e., twice the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (half) as loud ([10.5x the sound energy] Crocker 2007).

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in level as the distance from the source increases. The manner by which noise reduces with distance depends on factors such as the type of sources (e.g., point or line, the path the sound will travel, site conditions, and obstructions). Noise levels from a point source typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance (e.g., construction, industrial machinery, ventilation units). Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013a). The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site, such as a parking lot or smooth body of water, receives no additional ground attenuation and the changes in noise levels with distance (drop-off rate) result from simply the geometric spreading of the source. An additional ground attenuation value of 1.5 dBA per doubling of distance applies to a soft site (e.g., soft dirt, grass, or scattered bushes and trees) (Caltrans 2013a). Noise levels may also be reduced by intervening structures; the amount of attenuation provided by this “shielding” depends on the size of the object and the frequencies of the noise levels. Natural terrain features such as hills and dense woods, and man-made features such as buildings and walls, can significantly alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5-dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2011). Structures can substantially reduce exposure to noise as well. The FHWA’s guidelines indicate that

modern building construction generally provides an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows.

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important factors of project noise impact. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. One of the most frequently used noise metrics is the equivalent noise level (L_{eq}); it considers both duration and sound power level. L_{eq} is defined as the single steady A-weighted level equivalent to the same amount of energy as that contained in the actual fluctuating levels over time. Typically, L_{eq} is summed over a one-hour period. L_{max} is the highest root mean squared (RMS) sound pressure level within the sampling period, and L_{min} is the lowest RMS sound pressure level within the measuring period (Crocker 2007).

Noise that occurs at night tends to be more disturbing than that occurring during the day. Community noise is usually measured using Day-Night Average Level (DNL), which is the 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours; it is also measured using Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a +5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a +10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. (Caltrans 2013a). Noise levels described by DNL and CNEL usually differ by about 1 dBA. The relationship between the peak-hour L_{eq} value and the Ldn/CNEL depends on the distribution of traffic during the day, evening, and night. Quiet suburban areas typically have CNEL noise levels in the range of 40 to 50 dBA, while areas near arterial streets are in the 50 to 60-plus CNEL range. Normal conversational levels are in the 60 to 65-dBA L_{eq} range; ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (FTA 2018).

2.2 Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of Hz. The frequency of a vibrating object describes how rapidly it oscillates. The normal frequency range of most groundborne vibration that can be felt by the human body starts from a low frequency of less than 1 Hz and goes to a high of about 200 Hz (Crocker 2007).

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings, such as from nearby construction activities, may cause windows, items on shelves, and pictures on walls to rattle. Vibration of building components can also take the form of an audible low-frequency rumbling noise, referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the vibration source (Federal Transit Administration [FTA] 2018). Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and annoying to building occupants and vibration-sensitive land uses.

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations diminish much more rapidly than low frequencies, so low frequencies tend to dominate the spectrum at large distances from the source. Discontinuities in the soil strata can also cause diffractions or channeling effects that affect

the propagation of vibration over long distances (Caltrans 2020). When a building is impacted by vibration, a ground-to-foundation coupling loss will usually reduce the overall vibration level. However, under rare circumstances, the ground-to-foundation coupling may actually amplify the vibration level due to structural resonances of the floors and walls.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared (RMS) vibration velocity. The PPV and RMS velocity are normally described in inches per second (in./sec.). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (Caltrans 2020).

2.3 Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. The following land uses are considered noise sensitive in Sonoma County: residential uses, schools, long-term care facilities (such as hospitals, nursing homes, etc.), places of public worship, and libraries (Sonoma County 2012).

Vibration sensitive receivers are similar to noise sensitive receivers, such as residences, and institutional uses, such as schools, churches, and hospitals. However, vibration sensitive receivers also include buildings where vibrations may interfere with vibration-sensitive equipment, affected by levels that may be well below those associated with human annoyance.

2.4 Project Noise Setting

The most common source of noise in the project site vicinity is vehicular traffic from Todd Road and, to a lesser extent, U.S. 101 traffic noise. Medium and heavy trucks traveling on Todd Road from U.S. 101 on and off ramps were observed during noise measurements accessing light industrial uses in the project vicinity. Commercial and industrial uses also contribute the noise setting in the project area. The nearest sensitive receivers to the project site are the single-family residences located on the northeast and southwest corners of the Todd Road and Standish Avenue intersection. Single-family residential building facades are located between 55 feet and 65 feet to the existing centerline of Todd Avenue.

To characterize ambient sound levels at and near the project site, three 15-minute sound level measurements were conducted on November 20, 2020 (Figure 2 shows the noise measurement locations). Noise Measurement (NM) 1 was conducted in the side yard area of the residence north of Todd Avenue and east of Standish Avenue adjacent to the eastern portion of proposed project construction. NM 1 represents the ambient noise level for the residential receiver located at 285 Todd Road, north of the eastern project area; NM 2 was conducted south of Todd Road adjacent to the vacant property, which measurement represents the ambient noise level for commercial receivers adjacent to the project site; and NM 3 represents the ambient noise level for the residential receiver located at 311 Todd Road, north of the western project area. Table 2 summarizes the results of the noise measurements, and Table 3 shows the recorded traffic volumes from the noise measurements adjacent to Todd Road. Detailed sound level measurement data are included in Appendix B.

Table 2 Project Vicinity Sound Level Monitoring Results

Measurement Location	Measurement Location	Sample Times	Approximate Distance to Primary Noise Source	L _{eq} (dBA)	L _{min} (dBA)	L _{max} (dBA)
NM 1	North of Todd Road – side yard of 285 Todd Road residence	11:32 – 11:47 a.m.	Approximately 50 feet to centerline of Todd Road	72.0	52.5	85.6
NM 2	South of Todd Road – front yard of vacant property	10:52 – 11:07 a.m.	Approximately 50 feet to centerline of Todd Road	72.4	48.9	92.7
NM 3	North of Todd Road – front yard of 311 Todd Road residence	11:10 – 11:25 a.m.	Approximately 50 feet to centerline of Todd Road	72.4	42.6	91.4

See Figure 2 for Noise Measurement Locations.
Detailed sound level measurement data are included in Appendix B.

Table 3 Sound Level Monitoring Traffic Counts

NM 1	Todd Road	15-minute count	157	16	17
		One-hour Equivalent	628	64	68
		Percent	83%	8%	9%
NM 2	Todd Road	15-minute count	119	11	5
		One-hour Equivalent	476	44	20
		Percent	88%	8%	4%
NM 3	Todd Road	15-minute count	95	7	1
		One-hour Equivalent	380	28	4
		Percent	92%	7%	1%

Note: Detailed sound level measurement data are included in Appendix B.

2.5 Applicable Regulatory Setting

The lead agency for the project is Sonoma County. Sonoma County’s noise regulations are provided below for informational purposes; however, Sonoma County does not provide quantitative thresholds for construction noise sources. Therefore, to provide an analysis of potential construction noise impacts from the project, Caltrans’ quantitative standards, described below, are used for the analysis.

Caltrans Standard Specifications

Caltrans requirements relative to the allowable noise emission of construction equipment will be applied for this project. Section 14-8, “Noise and Vibration,” sets construction noise thresholds to be applied at noise sensitive receivers. Project construction noise must conform to the provisions in Section 14-8.02 Noise Control, of the Standard Specifications (Caltrans 2018). That section states that the noise level from the contractor’s operations may not exceed 86 dBA at a distance of 50 feet

between the hours of 9:00 p.m. and 6:00 a.m.. For this analysis, proposed project construction noise exceeding 86 dBA L_{eq} at a distance of 50 feet during typical daylight hours would be considered a significant impact.

Sonoma County Guidelines for Preparation of Noise Analysis

The County's Guidelines for the Preparation of Noise Analysis outlines the methods and recommendations to use when preparing an acoustical analysis in Sonoma County (Sonoma County 2019). The guidelines build off the Sonoma County General Plan 2020 Noise Element and outlines the noise analysis process, criteria for requiring a noise analysis, noise analysis protocol, and noise management methodology. This analysis has been prepared in accordance with these guidelines.

The guidelines address temporary construction noise, which is not specifically included in the General Plan 2020 Noise Element. The guidelines state that temporary construction noise generally needs to be evaluated at a qualitative level, given its temporary nature; however, construction noise may be considered significant if it occurs in the early morning or evening hours and would then require a quantitative analysis. If construction activities occur during the hours of 10 p.m. to 7 a.m., then the noise standards in Table 4.13-4 (Table 4 of this report) would apply.

3 Methodology

3.1 Operational Noise and Vibration Sources

The project would not result in the generation of new vehicle trips or long-term operational noise and vibration sources. The project involves signaling an intersection and does not include widening of vehicle lanes or operation of on-site vibration sources, and therefore would not bring vehicles closer to residential properties than existing roadways or introduce new vibration sources to the project area. Therefore, no impacts from operational noise would occur and this issue is not analyzed further.

3.2 Construction Noise

Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (FHWA 2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, construction noise levels were estimated at noise sensitive receivers near the project site. RCNM provides reference noise levels for standard construction equipment, with an attenuation of 6 dBA per doubling of distance for stationary equipment.

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FHWA 2018). Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some have high-impact noise levels.

Construction activity would result in temporary noise in the project area, exposing surrounding sensitive receivers to increased noise levels. The project will involve grading, paving, striping, concrete construction and signalization. Excavation would be limited to ten feet below ground surface. Construction noise would typically be higher during the heavier periods of initial construction (i.e., grading) and would be lower during the later construction phases (i.e., paving, striping, and concrete construction). Typical heavy construction equipment during project grading could include dozers, excavators, and graders. It is assumed that diesel engines would power all construction equipment. Construction equipment would not all operate at the same time or location. In addition, construction equipment would not be in constant use during the operating day.

Based on the construction schedule for the project, there would be 26 sequences of construction for project completion. The noisiest construction activities would include the use of heavy duty construction equipment and have been analyzed. Construction proposed for the project modeled for this report include removing existing drainage facilities, signal pole foundations excavating, and repair of existing pavement. Each construction activity would use a different equipment mix and these three sequences represent the most conservative assumptions for noise levels attributable to anticipated project construction equipment based on the equipment listed. The three noisiest pieces of equipment were analyzed together for construction noise impacts due to their likelihood

of being used in conjunction at the same time and therefore a conservative scenario for the greatest noise generation during construction phases was modeled (RCNM calculations are included in Appendix C).

3.3 Groundborne Vibration

The proposed project involves reconfiguration and signalization of an existing intersection and therefore does not include vibration sources associated with operation. Thus, construction activities have the only potential to generate ground-borne vibration affecting nearby receivers, especially during grading and excavation of the project site. The greatest vibratory source during construction within the project vicinity would be a vibratory roller. Neither blasting nor pile driving would be required for construction of the proposed project. Construction vibration estimates are based on vibration levels reported by Caltrans and the FTA (Caltrans 2013b, FTA 2018). Table 5 shows typical vibration levels for various pieces of construction equipment used in the assessment of construction vibration (FTA 2018).

Table 5 Vibration Levels Measured during Construction Activities

Equipment	PPV at 25 ft. (in/sec)	
Pile Driver (impact)	Upper range	1.518
	Typical	0.644
Pile Driver (sonic)	Upper range	0.734
	Typical	0.170
Hydromill (slurry wall)	Soil	0.008
	Rock	0.017
Clam Shovel Drop (slurry wall)		0.202
Vibratory Roller		0.210
Hoe Ram		0.089
Large Bulldozer		0.089
Caisson Drilling		0.089
Loaded Trucks		0.076
Jackhammer		0.035
Small Bulldozer		0.003
Source: FTA 2018		

Vibration limits used in this analysis to determine a potential impact to local land uses from construction activities, such as blasting, pile-driving, vibratory compaction, demolition, drilling, or excavation, are based on information contained in Caltrans' *Transportation and Construction Vibration Guidance Manual* and the Federal Transit Administration and the FTA *Transit Noise and Vibration Impact Assessment Manual* (Caltrans 2013b; FTA 2018). Maximum recommended vibration limits by the American Association of State Highway and Transportation Officials (AASHTO) are identified in Table 6.

Table 6 AASHTO Maximum Vibration Levels for Preventing Damage

Type of Situation	Limiting Velocity (in./sec.)
Historic sites or other critical locations	0.1
Residential buildings, plastered walls	0.2–0.3
Residential buildings in good repair with gypsum board walls	0.4–0.5
Engineered structures, without plaster	1.0–1.5

Source: Caltrans 2013b

Based on AASHTO recommendations, limiting vibration levels to below 0.4 PPV in./sec. at residential structures would prevent structural damage regardless of building construction type. These limits are applicable regardless of the frequency of the source. However, as shown in Table 7 and Table 8 potential human annoyance associated with vibration is usually different if it is generated by a steady state or a transient vibration source.

Table 7 Human Response to Steady State Vibration

PPV (in./sec.)	Human Response
3.6 (at 2 Hz)–0.4 (at 20 Hz)	Very disturbing
0.7 (at 2 Hz)–0.17 (at 20 Hz)	Disturbing
0.10	Strongly perceptible
0.035	Distinctly perceptible
0.012	Slightly perceptible

Source: Caltrans 2013b

Table 8 Human Response to Transient Vibration

PPV (in./sec.)	Human Response
2.0	Severe
0.9	Strongly perceptible
0.24	Distinctly perceptible
0.035	Barely perceptible

Source: Caltrans 2013b

As shown in Table 7, the vibration level threshold at which steady vibration sources are considered to be distinctly perceptible is 0.035 in./sec. PPV. This is roughly equivalent to the FTA identified threshold of 78 VdB for assessing impacts to residential land uses from infrequent events. This threshold is used for assessing passing trains in the FTA Manual. However, as shown in Table 8, the vibration level threshold at which transient vibration sources (such as construction equipment) are considered to be distinctly perceptible is 0.24 in./sec. PPV. This is roughly equivalent to 94 VdB. This analysis uses the distinctly perceptible threshold for purposes of assessing vibration impacts.

Although groundborne vibration is sometimes noticeable in outdoor environments, groundborne vibration is almost never annoying to people who are outdoors; therefore, the vibration level threshold for human perception is assessed at occupied structures (FTA 2018). Therefore, vibration impacts are assessed at the structure of an affected property.

3.4 Significance Thresholds

Noise impacts would be considered significant if:

- **Issue 1:** The project would result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
 - **Temporary:** Per Section 14-8.02 Noise Control, of the Caltrans Standard Specifications, construction noise would be significant if construction operations exceed 86 dBA at a distance of 50 feet during typical daytime hours (7:00 a.m. to 7:00 p.m.).
- **Issue 2:** The project would result in the generation of excessive ground-borne vibration or ground-borne noise levels.
 - This would occur if the project would subject vibration-sensitive land uses to construction-related ground-borne vibration that exceeds the distinctly perceptible vibration annoyance potential criteria for human receivers of 0.24 in./sec. PPV, or the residential structural damage criteria of 0.4 PPV in./sec.
- **Issue 3:** For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, if the project exposes people residing or working in the project area to excessive noise levels.

4 Impact Analysis

4.1 Issue 1 – Temporary Noise Increase

Issue: Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Project construction would occur nearest to noise-sensitive uses located along Todd Road. Construction would occur adjacent to single-family residences (285 Todd Road and 311 Rodd Road) and to an industrial use (246 Ghilotti Ave). Over the course of a typical construction day, construction equipment would be located as close as 25 feet to the residential properties but would typically be located at an average distance of 55 feet away due to the nature of construction equipment operating at different locations on the project site throughout the day. Construction equipment would be located as close as 100 feet to the industrial property. Therefore, it is assumed that over the course of a typical construction day the construction equipment would operate 55 feet from the nearest residential property lines.

As described in Section 3.1, the typical construction equipment associated with the loudest intersection improvements and signalization are modeled for a conservative analysis and are shown in Table 9. Table 9 shows the combined hourly and maximum construction noise levels attributable to each construction sequence modeled, receivers analyzed, and resulting exterior and interior noise levels.

Table 9 Construction Noise Levels at Receivers

Construction Equipment	Land Use	Distance to Receiver, Feet	Approximate Noise Level, dBA			
			Exterior Spaces		Interior Spaces ¹	
			L _{eq}	L _{max}	L _{eq}	L _{max}
Remove Existing Drainage Facilities - 2 Dump Trucks, Excavator	285 Todd Ave Residential	65	77	78	52	53
	311 Todd Ave Residential	55	78	80	53	55
	246 Ghilotti Ave Commercial	100	73	75	48	50
Signal Pole Foundations Excavating – Dump Truck, Auger Drill Rig, Loader	285 Todd Ave Residential	65	77	78	52	53
	311 Todd Ave Residential	55	78	80	53	55
	246 Ghilotti Ave Commercial	100	74	78	49	53
Repair Existing Pavement – Jackhammer, Backhoe, Dump Truck	285 Todd Ave Residential	65	81	87	56	62
	311 Todd Ave Residential	55	82	88	57	63
	246 Ghilotti Ave Commercial	100	77	83	52	58

¹Assuming an exterior to interior noise reduction of 25 dBA due to typical building standards and windows closed.
 L_{eq}: one-hour equivalent noise level; L_{max}: instantaneous maximum noise level; dBA: A-weighted decibel
 See Appendix C for RCNM results.

As shown in Table 9, project construction hourly noise would range from 77 dBA L_{eq} to 82 dBA L_{eq} at the nearest residential receivers, with maximum noise levels ranging from 78 dBA L_{max} to 88 dBA L_{max}. Modeled project construction noise levels at the adjacent industrial property would range from 73 dBA L_{eq} to 77 dBA L_{eq}, with maximum noise levels ranging from 75 dBA L_{max} to 83 dBA L_{max}. Resulting hourly interior noise levels at residential receivers would range from 52 dBA L_{eq} to 57 dBA L_{eq} during to the heaviest periods of construction phases. Furthermore, as discussed in Section 2.4, ambient noise levels in the project area, and representative of residential receiver locations, is 72 dBA L_{eq} during daytime hours. The increase in existing ambient noise levels associated with construction equipment would range from 1 to 10 dBA at noise sensitive residential uses and up to 14 dBA at adjacent industrial uses.

The Caltrans Standard Specifications construction noise threshold is 86 dBA at 50 feet; as indicated in Table 9, instantaneous maximum noise levels (L_{max}) would exceed the 86 dBA threshold during the Repair Existing Pavement work at noise sensitive residential receivers adjacent to the project site. Nighttime construction work may be conducted to avoid heavy daytime traffic, as discussed in

Section 1.2. Therefore, construction noise impacts could be significant if conducted during the nighttime hours.

Mitigation Measures

Mitigation measure NOI-1 would be required to ensure that construction noise does not exceed the Caltrans Standard Specifications 86 dBA threshold, especially during sensitive nighttime hours.

NOI-1 Construction Noise Reduction

A Construction Management Plan (CMP) is required to be prepared consistent with Caltrans Standards Specifications and Standard Plans. The CMP shall be submitted to and approved by the Sonoma County Public Works Department. The CMP would include:

- Construction sequence;
- Hours of operation;
- Traffic management plan;
- Public outreach and notification plan;
- Details on compliance with necessary permits; and
- Avoidance measures with regard to noise:
 - Commencing any particularly noisy part of the construction activity (such as masonry sawing or jack hammering) after 9 a.m.;
 - Locating noise-generating equipment or processes so that their impact on neighboring premises is minimized by increasing distance between source and receiver or using intervening structures/barriers;
 - Shutting or throttling equipment down whenever not in actual use;
 - Ensuring that noise reduction devices such as mufflers are fitted and operating effectively;
 - Ensuring that equipment is not operated if maintenance or repairs would eliminate or significantly reduce a characteristic of noise resulting from its operation that is audible at noise-affected premises;
 - Where noise levels may expose residentially-zoned property to construction noise levels that exceeds 86 dBA at 50 feet, implement a temporary sound barrier and/or sound blanket that would break the line of sight between the construction equipment and the affected receiver(s); and
 - Operating equipment and handling materials to minimize impact noise (such as avoiding dropping materials from height).

Significance After mitigation

Implementation measures including the use of a sound barrier and/or sound blanket in Mitigation Measure NOI-1 would reduce noise levels by at least 5 dBA; therefore, noise levels from project construction would not exceed 86 dBA at 50 feet at a residentially-zoned property.

4.2 Issue 2 – Vibration

Issue: Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?

Construction activities known to generate excessive ground-borne vibration, such as pile driving, are not proposed as part of the project. The greatest anticipated source of vibration during general project construction activities would be from a vibratory roller, which may be used during paving activities and may be used within 25 feet of the nearest off-site residential structure. A vibratory roller would create approximately 0.210 in./sec. PPV at a distance of 25 feet (Caltrans 2013b). This would be below a distinctly perceptible impact for humans of 0.24 in./sec. PPV, and the structural damage impact to residential structures of 0.4 in./sec. PPV. Therefore, although a vibratory roller may be perceptible to nearby human receivers, temporary impacts associated with the roller (and other potential equipment) would be less than significant.

The project does not include substantial vibration sources associated with operation. Therefore, operational vibration impacts would result in no impact.

4.3 Issue 3 – Airport Noise

Issue: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The Santa Rosa Air Center is located approximately 2.7 miles northwest of the project site. The project site is not located within two miles of a public airport or private airstrip or located in an airport land use plan. Therefore, no substantial noise exposure would occur to construction workers or users of the intersection from aircraft noise, and no impacts would occur.

5 Conclusions

Construction noise would exceed the construction noise thresholds of 86 dBA at nearby residential properties, specifically during nighttime hours. Mitigation measure NOI-1 is required to reduce noise exposure at nearby sensitive receivers. With mitigation, impacts would be less than significant.

The proposed project would not generate new vehicle trips; therefore, no operational impacts would occur from an increase in traffic noise.

The project would generate groundborne vibration during construction. Groundborne vibration would not exceed the applicable vibration thresholds. Therefore, construction-related vibration impacts would be less than significant. No operational impacts would occur.

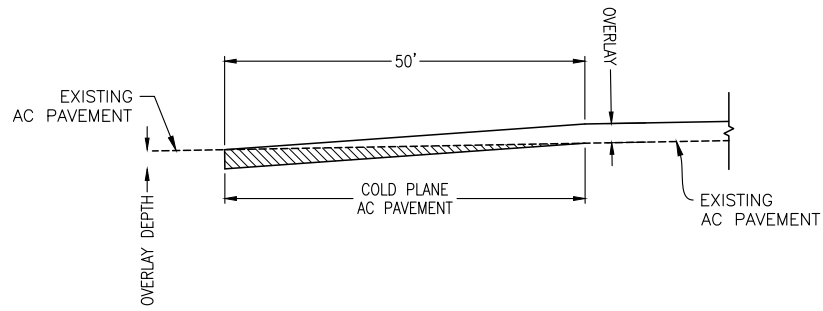
No substantial noise exposure would occur to construction workers from aircraft noise.

6 References

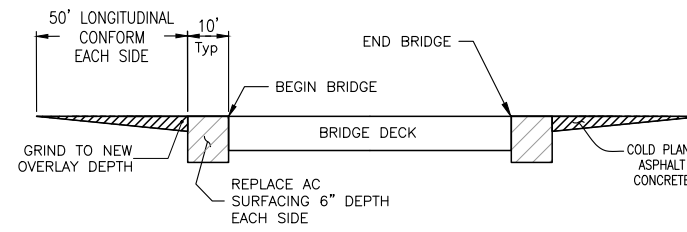
- California Department of Transportation (Caltrans). 2013a. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. (CT-HWANP-RT-20-365.01.01) April. Available at: http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf
- _____. 2013b. *Transportation and Construction Vibration Guidance Manual*. (CT-HWANP-RT-13-069.25.3) September. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf
- _____. 2018. *Standard Specifications*. Available at: <http://caltrans-opac.ca.gov/publicat.htm>
- _____. 2020. *Transportation and Construction Vibration Guidance Manual*. (CT-HWANP-RT-13-069.25.3) September. Available at: <https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf>
- Federal Highway Administration (FHWA). 2006. *FHWA Highway Construction Noise Handbook*. (FHWAHEP-06-015; DOT-VNTSC-FHWA-06-02). Available at: http://www.fhwa.dot.gov/environment/construction_noise/handbook. Accessed November 2020.
- _____. 2011. *Highway Traffic Noise Analysis and Abatement Policy and Guidance*. (FHWA-HEP-10-025). December.
- Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment*. November. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf
- Lawrence E. Kinsler and R. Frey, Austin and B. Coppens, Alan and V. Sanders, James. *Fundamentals of Acoustics*, 4th Edition. ISBN 0-471-84789-5. Wiley-VCH, December 1999.
- Los Angeles County Airport Land Use Commission. 2003. *Santa Monica Airport Influence Area*. Available at: https://planning.lacounty.gov/assets/upl/project/aluc_airport-santa-monica.pdf
- Malcolm J. Crocker (Editor). 2007. *Handbook of Noise and Vibration Control Book*, ISBN: 978-0-471-39599-7, Wiley-VCH, October.
- Sonoma County. 2012. *Sonoma County General Plan 2020, Noise Element*. October 23.

Appendix A

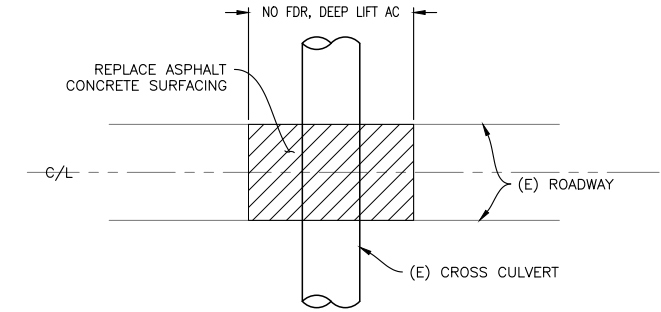
Conceptual Project Plans and List of Anticipated Construction Equipment



LONGITUDINAL CONFORM SECTION
NOT TO SCALE

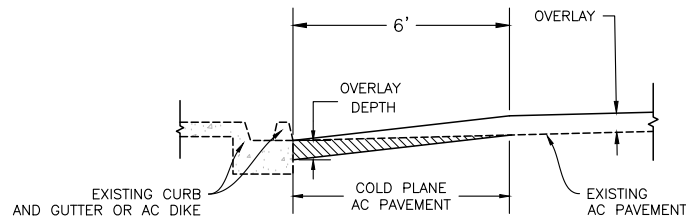


CONFORM GRINDING AT BRIDGE WITHOUT AC OVERLAY
NOT TO SCALE

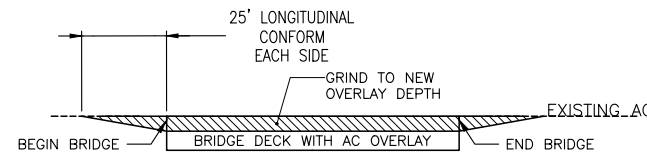


- NOTES:
- CONCRETE OR CONTROLLED DENSITY FILL TRENCH BACKFILL MATERIAL CAN REMAIN IN PLACE. CONTRACTOR TO EXCAVATE 3' Min AND 0.5' DEEP ON BOTH SIDES OF TRENCH AND REPLACE WITH FULL-DEPTH ASPHALT CONCRETE, PRIOR TO OVERLAY.
 - ALL OTHER TRENCH BACKFILL MATERIAL SHALL BE EXCAVATED TO A DEPTH OF 0.5' AND ACROSS THE ENTIRE WIDTH OF THE EXISTING TRENCH PLUS 3' Min ON BOTH SIDES. THIS AREA SHALL BE REPLACED WITH FULL-DEPTH ASPHALT CONCRETE, PRIOR TO OVERLAY.
 - USE THIS DETAIL AT CROSS CULVERTS WITH UNDER 2' EXISTING COVER, SEE QUANTITY SUMMARIES FOR LOCATIONS.

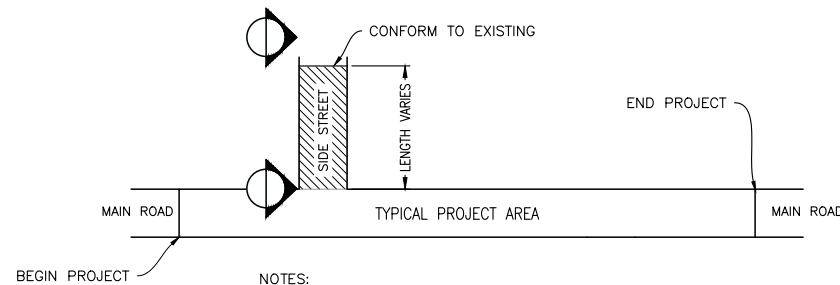
DEEP LIFT AT CROSS CULVERT
NOT TO SCALE



TRANSVERSE CONFORM SECTION
NOT TO SCALE

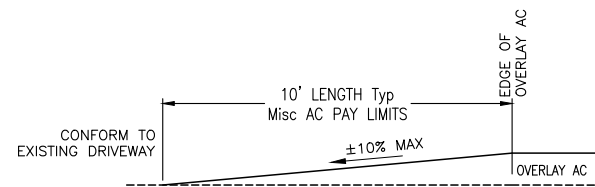


CONFORM GRINDING AT BRIDGE WITH AC OVERLAY
NOT TO SCALE



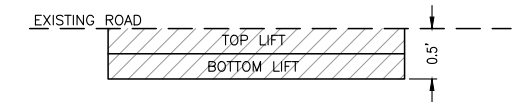
- NOTES:
- SEE SECTION A-A BELOW.

SIDE STREET CONFORM PLAN
NOT TO SCALE



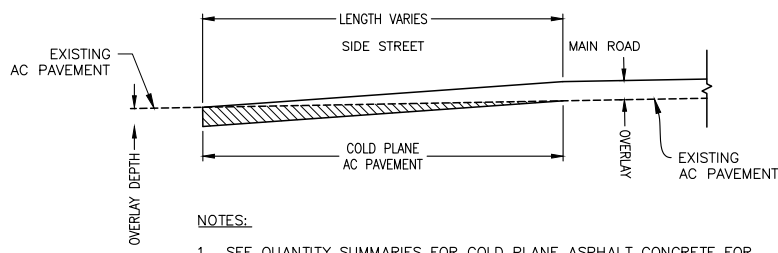
- NOTES:
- SEE Misc AC QUANTITY TABLES FOR LOCATIONS.
 - FEATHER AC TO NEAT LINE AT CONFORM.

TYPICAL DRIVEWAY CONFORM - TYPE 1
NOT TO SCALE



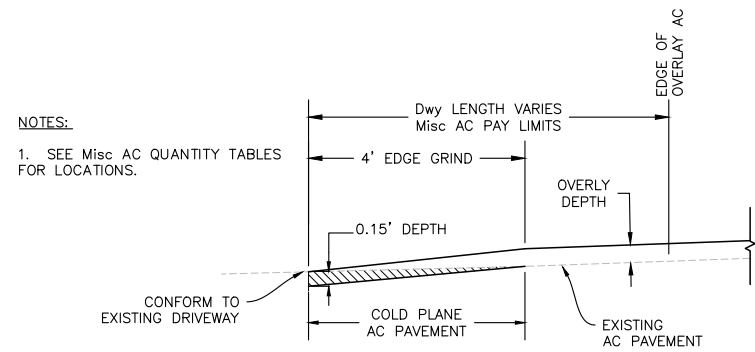
- NOTES:
- PLACE ASPHALT CONCRETE IN 2 LIFTS. TOP LIFT SHALL BE A MINIMUM 0.17" THICKNESS.
 - ASPHALT CONCRETE SHALL BE 3/4" MAX AGGREGATE GRADING.

REPLACE ASPHALT CONCRETE SURFACING SECTION - 0.50' DEPTH
NOT TO SCALE



- NOTES:
- SEE QUANTITY SUMMARIES FOR COLD PLANE ASPHALT CONCRETE FOR SIDE STREET CONFORM LOCATIONS AND LENGTHS.

SIDE STREET CONFORM SECTION A-A
NOT TO SCALE

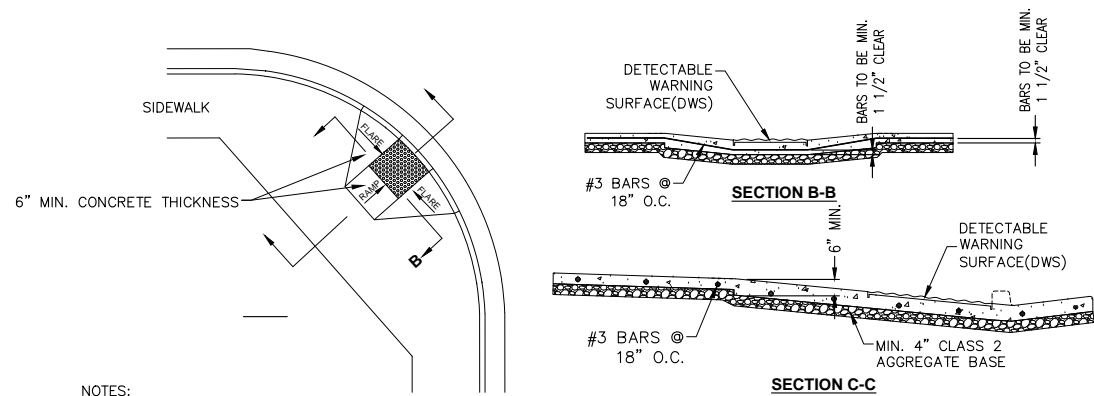


- NOTES:
- SEE Misc AC QUANTITY TABLES FOR LOCATIONS.

TYPICAL DRIVEWAY CONFORM - TYPE 2
NOT TO SCALE

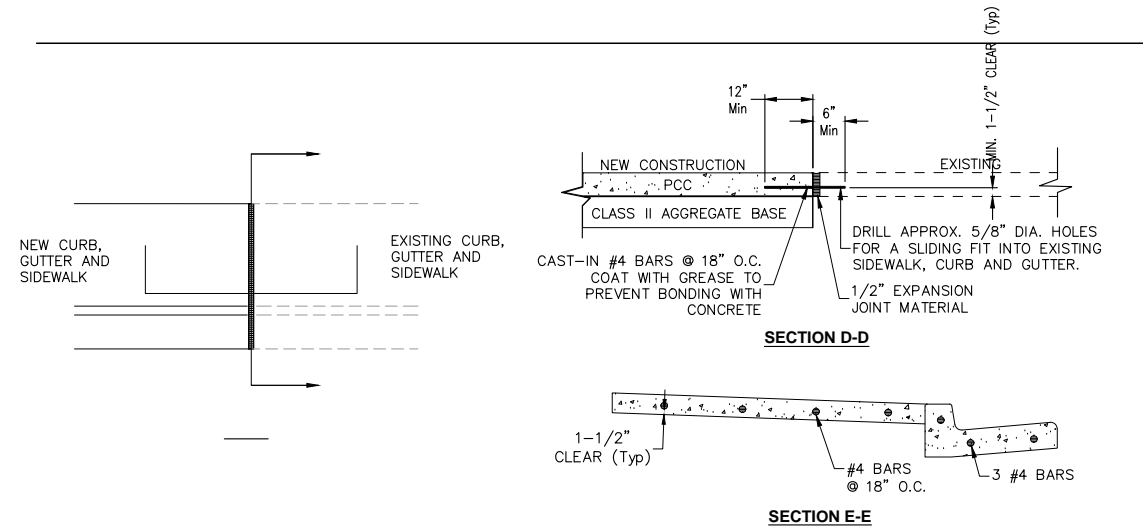
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DRAWING BY	XXX		REGISTERED CIVIL ENGINEER						CONSTRUCTION DETAILS	BUDGET NUMBER	C09999
CHECKED BY	XXX		PLANS APPROVAL DATE						FISCAL YEAR	20XX-XX	SHEET NUMBER
									TOTAL SHEETS	XX	

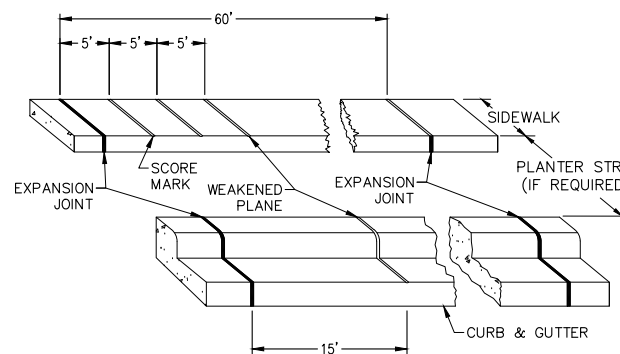


NOTES:

1. THIS DRAWING REPRESENTS TYPICAL CONCRETE, REINFORCEMENT BAR AND BEDDING CONSTRUCTION REQUIREMENTS FOR ALL TYPES OF CURB RAMPS.
2. EXCEPTIONS & SUPPLEMENTAL REQUIREMENTS TO 2018 STATE STANDARD PLANS RSP A88A.



CURB, GUTTER & SIDEWALK EXPANSION JOINT, NEW TO EXISTING



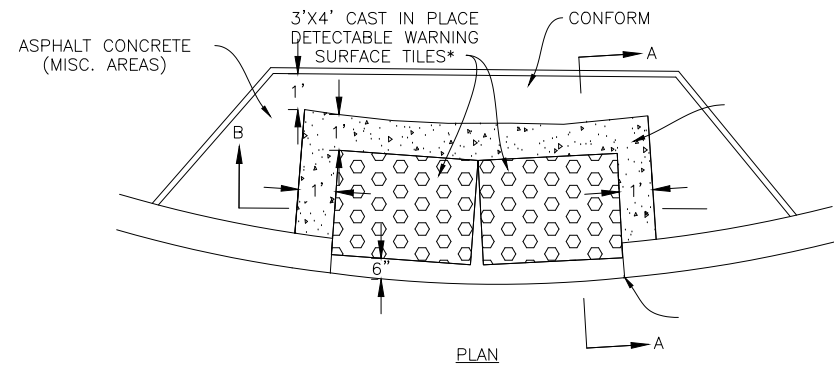
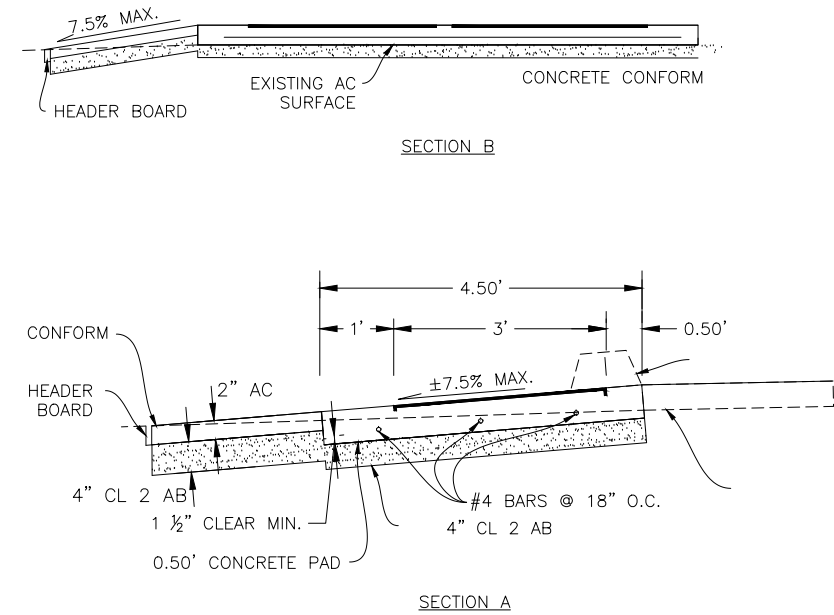
NOTES:

1. WEAKENED PLANE -1/8" WIDE x 1" DEEP IN SIDEWALKS, 1/8" WIDE x 1-1/2" DEEP IN CURB AND GUTTER.
2. SCORE MARK FOR SIDEWALKS 6' AND MORE IN WIDTH SHALL HAVE LONGITUDINAL SCORE MARK ALONG CENTER OF WALK.
3. MATERIAL FOR EXPANSION JOINT SHALL BE 1/2" THICK PREMOLDED JOINT FILLER AND SHALL EXTEND THROUGH THE FULL THICKNESS OF CONCRETE. COUNTY APPROVED MECHANICAL JOINTS MAY BE USED IN WALKS IN LIEU OF EXPANSION JOINTS.
4. EXPANSION JOINTS SHALL BE INSTALLED IN CURB AND GUTTER AT ALL CURB RETURNS, AND AT EACH SIDE OF STRUCTURES. THE EXPANSION REQUIRED AT 60' INTERVALS MAY BE REPLACED WITH WEAKENED PLANE JOINTS IF CURB AND GUTTER ARE PLACED WITH AN EXTRUSION MACHINE.
5. EXPANSION JOINTS SHALL BE PLACED IN THE SIDEWALK AT THE SAME LOCATION AS THOSE IN THE CURB AND GUTTER WHEN THE SIDEWALK IS ADJACENT TO THE CURB AND GUTTER.

WEAKENED PLANES, SCORE MARKS & EXPANSION JOINTS

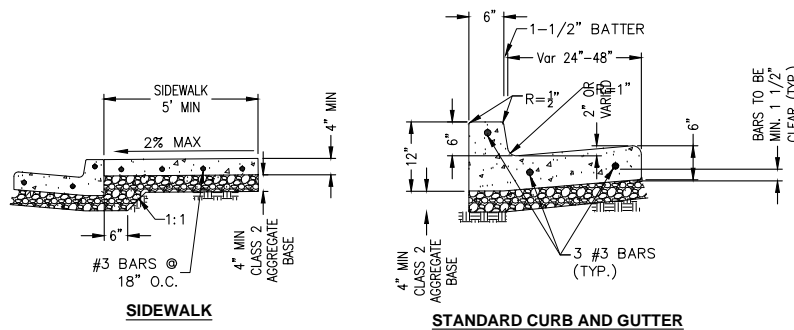
GENERAL NOTES

1. UTILITY PULL BOXES, MANHOLES, VAULTS, AND ALL OTHER UTILITY FACILITIES WITHIN THE BOUNDARIES OF THE CURB RAMP WILL BE RELOCATED OR ADJUSTED TO GRADE AS DIRECTED BY THE ENGINEER PRIOR TO, OR IN CONJUNCTION WITH, CURB RAMP CONSTRUCTION.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR USA NOTIFICATION (PH 800-642-2444). CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO COUNTY FACILITIES OR OTHER UTILITIES.
3. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AND 3' DEPTH OF THE RAMP PER STATE STANDARD PLANS. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" AND 8" FROM THE GUTTER FLOWLINE. THE DETECTABLE WARNING SURFACE SHALL CONSIST OF ROWS OF TRUNCATED DOMES ON A SQUARE PATTERN IN LINE WITH A PARALLEL ALIGNMENT TO THE DIRECTION OF TRAVEL.
4. DETECTABLE WARNING SURFACES (DWS) SHALL CONSIST OF TRUNCATED DOME TILES. THE TILES SHALL BE OF VITRIFIED POLYMER COMPOSITE CONSTRUCTION, EMBEDDED TYPE, COLOR SAFETY YELLOW, (FEDERAL COLOR 33538) MANUFACTURED BY ENGINEERED PLASTICS, INC., ARMOR-TILE TACTILE SYSTEMS, WILLIAMSVILLE, NEW YORK, OR APPROVED EQUAL.
5. THE MANUFACTURER OF TRUNCATED DOME TILES SHALL WARRANT THE DETECTABLE/TACTILE WARNING SURFACE TO BE FREE FROM DEFECTS FOR A PERIOD OF FIVE (5) YEARS FROM THE DATE OF COMPLETION. THE INSTALLATION CONTRACTOR SHALL WARRANT THE INSTALLATION TO BE FREE FROM DEFECTS FOR THE SAME PERIOD. COPIES OF THE WRITTEN WARRANTIES SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO INSTALLATION.
6. SIDEWALKS SHALL BE 4" THICK, RAMPS 6" THICK MINOR CONCRETE. NEW CONCRETE SHALL BE SECURED TO THE EXISTING CONCRETE WITH NO. 4 STEEL BARS SET AT 18" O/C. SEE DETAIL FOR CURB, GUTTER AND SIDEWALK EXPANSION JOINT NEW TO EXISTING (THIS SHEET).
7. ALL CURB, GUTTER, SIDEWALK & RAMPS SHALL HAVE NO. 3 STEEL BARS AT 18" O/C IN TWO ADJACENT PERPENDICULAR LAYERS, WITH THE LOWER LAYER OF BARS A MINIMUM 1-1/2" CLEAR OF BOTTOM.
8. CURB AND GUTTER TO BE REMOVED SHALL BE SAWCUT AT THE NEAREST SIDEWALK SCORE MARK OR EXPANSION JOINT.
9. IF LOCATED ON A CURVE, THE SIDES OF THE RAMP NEED NOT BE PARALLEL, BUT THE MINIMUM WIDTH OF THE RAMP SHALL BE 4'.
10. THE TRANSITION FROM RAMPS TO GUTTERS OR STREETS SHALL BE FLUSH.
11. CLASS 2 AGGREGATE BASE SHALL BE COMPACTED TO A RELATIVE COMPACTION OF 95% FOR ALL RAMPS, PADS, SIDEWALKS, CURBS, AND GUTTERS.
12. SPECIAL PROVISIONS REPLACE ASPHALT CONCRETE SURFACING SPEC APPLIES TO AC CONFORM BETWEEN NEW CONCRETE & EXISTING AC.



*SEE CALTRANS STANDARD PLAN RSP A88A FOR DETECTABLE WARNING SURFACE

14 ADA ASPHALT CONCRETE PAD N.T.S.



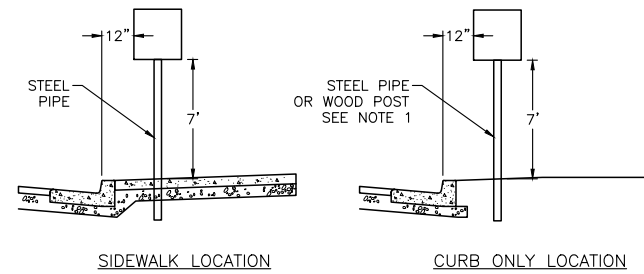
NOTES:

1. CLASS 2 AGGREGATE BASE REQUIREMENTS ALSO APPLY TO BEDDING FOR CURB RAMPS.

13 CURB, GUTTER & SIDEWALK NTS

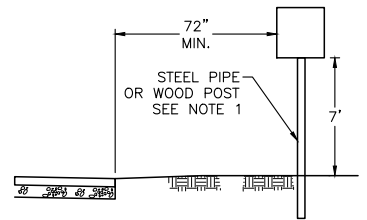
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DRAWING BY	XXX		CONSTRUCTION COMPLETED:					2021 PPP - FDR & OVERLAYS PROJECT	BUDGET NUMBER	C09999
CHECKED BY	XXX		RESIDENT ENGINEER AS BUILT DRAWINGS BY:					CONSTRUCTION DETAILS	FISCAL YEAR	20XX-XX
								SHEET NUMBER	XX	
								TOTAL SHEETS	XX	

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SIDEWALK LOCATION

CURB ONLY LOCATION

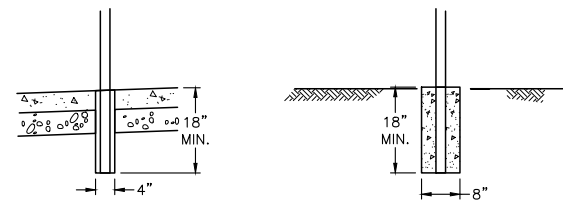


LOCATION WITH NO CURB OR SIDEWALK

NOTES:

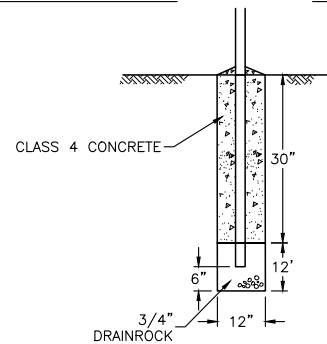
- BOTH STOP SIGN AND STREET SIGN POSTS SHALL BE 2" INSIDE DIAMETER STEEL POLES, AND SHALL BE SCHEDULE 40 GALVANIZED STEEL PIPE, CONFORMING TO ASTM 120 METAL POLES FOR STREET SIGNS SHALL BE THREADED AT ONE END AND CAPPED. WOOD POSTS SHALL CONFORM TO SECTION 56 OF CALTRANS SPECIFICATION. EXCEPT THAT REDWOOD SHALL NOT BE ALLOWED.
- DESIGN SHALL CONFORM TO THESE REQUIREMENTS UNLESS DIRECTED OTHERWISE BY THE COUNTY.
- SEE DETAIL SIGN FOUNDATION DETAILS.

SIGN LOCATION AND INSTALLATION DETAILS



METAL POLE-SIDEWALK

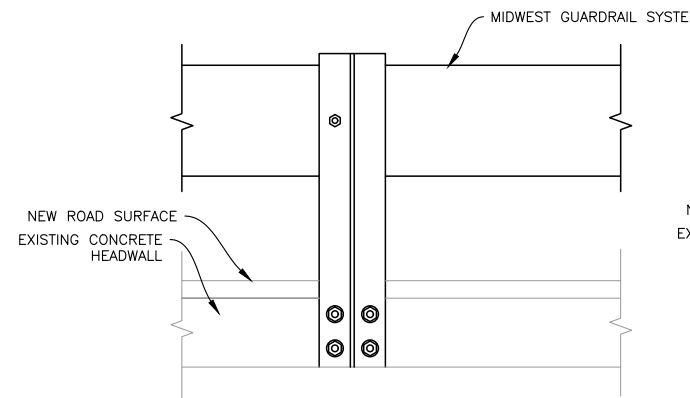
METAL POLE-NO SIDEWALK



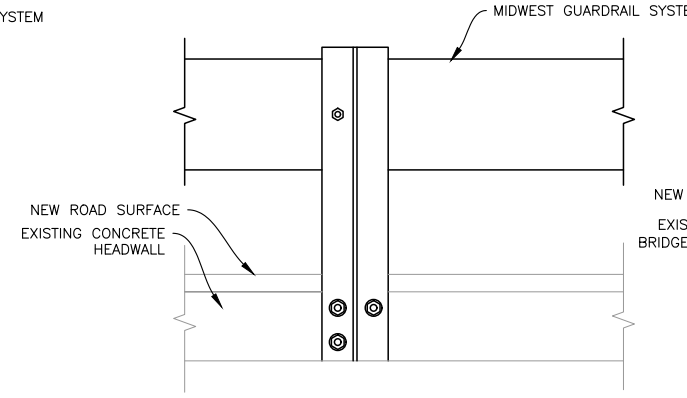
WOOD POST FOUNDATION

NOTES:

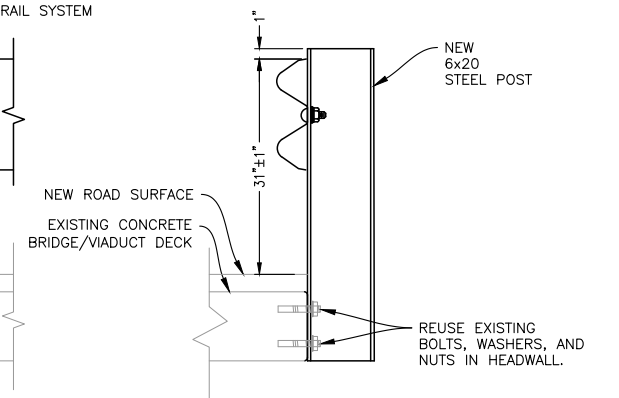
- 3/4" DRAINROCK SHOWN IN THE POST FOUNDATION DETAIL ONLY APPLIES TO WOOD POSTS.
- DESIGN SHALL CONFORM TO THESE REQUIREMENTS UNLESS DIRECTED OTHERWISE BY THE COUNTY.
- CONCRETE CONTAINING FOUR SACKS OF CEMENT PER CUBIC YARD MEETS THE CRITERION FOR CLASS 4 CONCRETE.



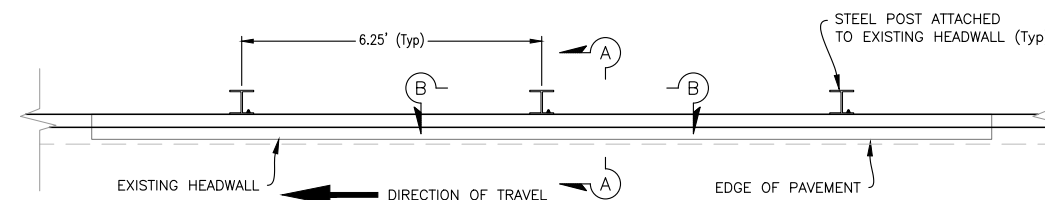
SECTION B-B: GUARD RAIL POST (4 BOLTS)
(FRONT VIEW)



SECTION B-B: GUARD RAIL POST (3 BOLT)
(FRONT VIEW)



SECTION A-A: GUARD RAIL POST
(PROFILE VIEW)



PLAN

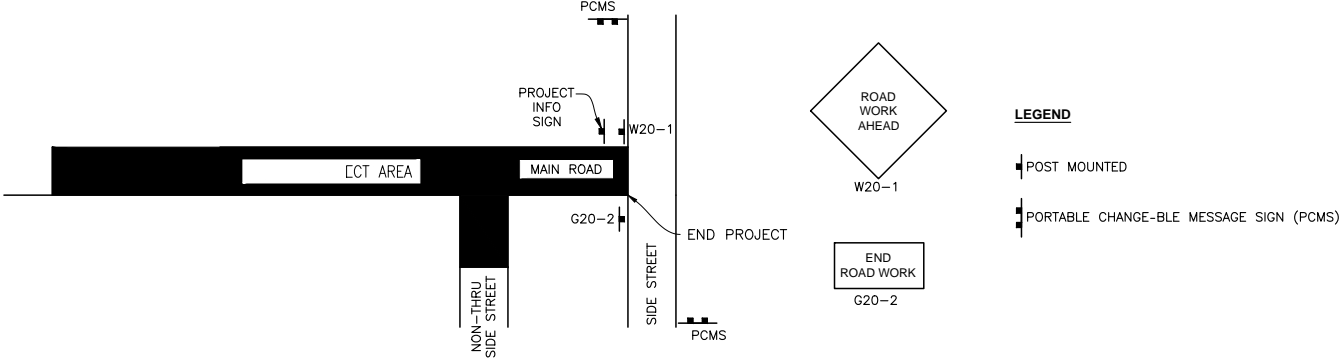
NOTES:

- EXCEPTIONS AND SUPPLEMENTAL REQUIREMENTS TO STATE Std PLAN A77L2.
- SEE QUANTITY TABLES FOR ADDITIONAL DETAILS.
- MATCH EXISTING POST LAYOUT/POST TYPE.

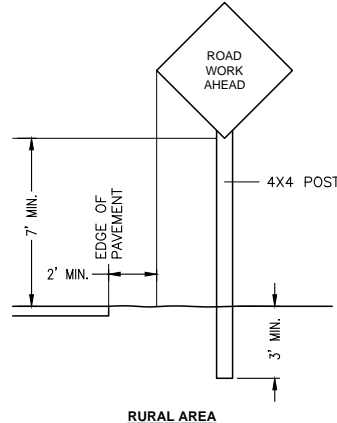
17 TYPICAL HEADWALL GUARD RAIL DETAIL
NTS

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CHECKED BY	XXX		RESIDENT ENGINEER AS BUILT DRAWINGS BY:						FISCAL YEAR	20XX-XX
							CONSTRUCTION DETAILS		SHEET NUMBER	XX
									TOTAL SHEETS	XX



TYPICAL CONSTRUCTION SIGN LOCATIONS



- CONSTRUCTION SIGNING NOTES:**
- SIGNS SHOWN ON THIS PLAN ARE TO BE STATIONARY MOUNTED UNLESS OTHERWISE NOTED.
 - SIGN LOCATIONS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. ALL SIGNS TO BE FIELD LOCATED BY ENGINEER.
 - SIGN PANELS AND POSTS FOR POST MOUNTED SIGNS TO BE FURNISHED BY THE CONTRACTOR.
 - ALL POST MOUNTED SIGNS SHOWN ON THIS PLAN ARE TO BE PLACED BEFORE ANY OF THE WORK INCLUDED IN THIS CONTRACT COMMENCES.
 - CONSTRUCTION AREA SIGNS SHALL HAVE HIGH INTENSITY RETRO-REFLECTIVE SHEETING.
 - ADDITIONAL SIGNS (POST MOUNTED AND/OR PORTABLE) MAY BE REQUIRED DURING VARIOUS STAGES OF WORK. PORTABLE SIGNS TO BE SUPPLIED BY THE CONTRACTOR.
 - PRIOR TO DIGGING, CONTRACTOR SHALL VERIFY THE EXISTENCE OF ANY CONFLICTING EXISTING UTILITIES.
 - ALL SIGNS TO BE PLACED WITHIN COUNTY R/W. CONTRACTOR TO OBTAIN PERMIT FOR ANY SIGN PLACED WITHIN NON-COUNTY R/W.

TYPICAL CONSTRUCTION SIGN PLACEMENT

**H-3. RECOMMENDED ADVANCE WARNING SIGN SPACING
CALIFORNIA MUTCD 2014 EDITION (PAGE 1136)**

ROAD TYPE	DISTANCE BETWEEN SIGNS**		
	A	B	C
URBAN - 25 MPH or LESS***	100 Ft	100 Ft	100 Ft
URBAN - MORE THAN 25 MPH TO 40 MPH***	250 Ft	250 Ft	250 Ft
URBAN - MORE THAN 40 MPH***	350 Ft	350 Ft	350 Ft
RURAL	500 Ft	500 Ft	500 Ft
EXPRESSWAY/FREEWAY	1,000 Ft	1,500 Ft	2,640 Ft

DIMENSIONS A, B, AND C ARE THE DIMENSION SHOWN IN FIGURES 6H-1 THROUGH 6H-46 (SEE 2014 C- MUTCD). THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGN. *IS THE SIGN IN A THREE-SIGN SERIES THAT IS CLOSEST TO THE TTC ZONE. THE "THIRD SIGN" IS THE SIGN FURTHEST FROM THE TTC ZONE.
 **LIMIT, OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STOPPING, OR OTHER ANTICIPATED OPERATING SPEED IN MPH.

ADVANCE WARNING SIGN SPACING



- NOTES:**
- Provided dimensions are for the 132"x78" sign panel.
 For the 96"x60" sign panel, multiply each horizontal dimension of the 132"x78" sign panel by approximately 0.728 and each vertical dimension by approximately 0.769. Adjust spacing as needed.
 For the 48"x30" sign panel, multiply each horizontal dimension of the 132"x78" sign panel by approximately 0.364 and each vertical dimension by approximately 0.385. Adjust spacing as needed.
 - Use when the project involves Senate Bill 1 funds.

C48 (CA)

ENGLISH UNITS

A	B
132	78
96	60
48	30

COLORS: LEGEND - BLACK (ARIAL BOLD ITALIC IN HEADER)
BACKGROUND - WHITE AND FLUORESCENT ORANGE
SENATE BILL 1 LOGO - CMYK COORDINATES FOR SB1 LOGO ARE AS FOLLOWS:
BROWN (C 80%, M 80%, Y 80%, K 20%), LIGHT CREAM (C 0%, M 2%, Y 7%, K 0%),
BLUE (C 75%, M 23%, Y 1%, K 0%), GREEN (C 90%, M 20%, Y 80%, 0%),
YELLOW GOLD (C 0%, M 38%, Y 85%, K 4%), RED (C 16%, M 84%, Y 65%, K 3%)
BE WORK ZONE ALERT RIBBON: PANTONE #299 BLUE AND ORANGE
SEE VECTOR GRAPHIC FILES FOR SB1 LOGO AND BE WORK ZONE ALERT GRAPHIC
ALL COLORS TO BE RETROREFLECTIVE, EXCEPT FOR BLACK

8/9/19

24 PROJECT FUNDING INFORMATION SIGN
NOT TO SCALE

"RECORD DRAWING" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION	DATE	REVISION	BY	APPROVED	<p>COUNTY OF SONOMA DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS JOHANNES J. HOEVERTSZ, P.E., DIRECTOR</p>	2021 PPP - FDR & OVERLAYS PROJECT	ROAD NUMBER	9999A
	CONSTRUCTION COMPLETED:						BUDGET NUMBER	C09999
RESIDENT ENGINEER AS BUILT DRAWINGS BY:						CONSTRUCTION DETAILS	FISCAL YEAR	20XX-XX
							SHEET NUMBER	XX
							TOTAL SHEETS	XX

TABLE 1

TAPER LENGTH CRITERIA AND CHANNELIZING DEVICE SPACING							
SPEED (mph)	MINIMUM TAPER LENGTH * FOR WIDTH OF OFFSET 12 FEET (W)				MAXIMUM CHANNELIZING DEVICE SPACING		
	TANGENT 2L	MERGING L	SHIFTING L/2	SHOULDER L/3	X	Y	Z **
					TAPER	TANGENT	CONFLICT
0	160	80	40	27	20	40	10
5	250	125	63	42	25	50	12
0	360	180	90	60	30	60	15
5	490	245	123	82	35	70	17
40	640	320	160	107	40	80	20
5	1080	540	270	180	45	90	22
0	1200	600	300	200	50	100	25
5	1320	660	330	220	50	100	25
0	1440	720	360	240	50	100	25
5	1560	780	390	260	50	100	25
0	1680	840	420	280	50	100	25
5	1800	900	450	300	50	100	25

For other offsets, use the following merging taper length formula for L:
 speed of 40 mph or less, $L = WS^2/60$
 speed of 45 mph or more, $L = WS$

where: L = Taper length in feet
 W = Width of offset in feet
 S = Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

Use the taper and tangent sections where there are no pavement markings or where there is a conflict between existing pavement markings and channelizers (CA).

TABLE 2

LONGITUDINAL BUFFER SPACE AND FLAGGER STATION SPACING				
SPEED *	Min D **	DOWNGRADE Min D ***		
		-3%	-6%	-9%
		ft	ft	ft
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	598	638	686
65	645	682	728	785
70	730	771	825	891
75	820	866	927	1003

* - Speed is posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Longitudinal buffer space or flagger station spacing

*** - Use on sustained downgrade steeper than -3 percent and longer than 1 mile.

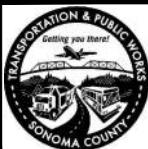
TABLE 3

ADVANCE WARNING SIGN SPACING			
ROAD TYPE	DISTANCE BETWEEN SIGNS *		
	A	B	C
	ft	ft	ft
URBAN - 25 mph OR LESS	100	100	100
URBAN - MORE THAN 25 mph TO 40 mph	250	250	250
URBAN - MORE THAN 40 mph	350	350	350
RURAL	500	500	500
EXPRESSWAY / FREEWAY	1000	1500	2640

* - The distances are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
**TRAFFIC CONTROL SYSTEM TABLES
 FOR LANE AND RAMP CLOSURES**
 NO SCALE

T9

"RECORD DRAWING" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION CONSTRUCTION COMPLETED: _____ RESIDENT ENGINEER _____ AS BUILT DRAWINGS BY: _____	DATE	REVISION	BY	APPROVED	 COUNTY OF SONOMA DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS JOHANNES J. HOEVERTSZ, P.E., DIRECTOR	2021 PPP - FDR & OVERLAYS PROJECT	ROAD NUMBER	9999A
								BUDGET NUMBER
CONSTRUCTION DETAILS						FISCAL YEAR	20XX-XX	
						SHEET NUMBER	XX	
						TOTAL SHEETS	XX	

Anticipated Construction Activity, Duration and Equipment Used

Construction Sequence of Activities	Duration (Days)	Associated Equipment
Underground Service Alert to identify utilities	1-2	None
Construction Area Signs	1	None
Fence Environmentally Sensitive Areas	1	Hand tools
Reconfigure lanes (if needed)	1	portable grinder, Paint over existing paint
Clear & Grubb	1-2	1-Backhoe, 2- 10-yard trucks
Sawcut existing pavement	1-2	Gas operated AC saw, wet vacuums
Place temporary barrier rails to delineate traffic	1	2-semi trailers, Backhoe/forklift
Remove existing drainage facilities	2	Backhoe/excavator, 2-10-yard trucks
Excavate drainage (Reinforced Concrete Pipes)	2	Backhoe/excavator
Install drainage pipes and backfill	1	Backhoe, compactor, water trailer tank
Electrical conduit and boxes	5	Small excavator/ditch witch, flatbed truck
Signal pole foundations excavate	1	Truck-mount auger, loader, 10yard-truck
Signals foundation cages and template	1	Backhoe, flatbed
Signal pole foundation concrete	1	concrete truck
Drainage boxes	5	Backhoe, concrete truck
Place and compact base	3	Backhoe, compactor, water trailer tank
Grade and form curb and gutter	4	Backhoe, flatbed truck
Place concrete curb and gutter	1-2	concrete trucks
Remove temporary rail	1	Backhoe/forklift, semi-truck
Finish roadway	2	Backhoe, 10-yard truck, compactor
Repair the existing pavement	1-2	Jackhammer, backhoe, 2-10-yard trucks, compactor
Asphalt Concrete overlay	1-2	Paver, 2-drum rollers, 3 semi-trucks, sweeper
After 21 days of curing, install poles	1-2	Truck-mount crane, flatbed
Install signals	2-3	Truck-mount crane/ bucket-truck, flatbed
Adjust manhole covers and survey monuments	3-5	Jackhammer, plate compactor, flatbed truck
Install roadway striping	1	Striping rig

Appendix B

Noise Measurement Data

Ambient Noise Survey Data Sheet

Instructions: Document noise measurement locations with a photo of the site, including the noise meter. Additionally, take notes on general and secondary noise sources, including the instantaneous noise level if possible. As a reminder, A/C weighting should be set to "A", and response time should typically be set to "slow." For additional information, please review the *Noise Measurement Protocols* in the case or on Jive.

Project Name: Todd & Ghillotti Intersection **Job Number:** 20-09882
Date: 11/20/20 **Operator Name:** Leslie Trejo

Measurement #1

Location: NM 1 - Todd & Ghillotti **Begin time:** 10:32AM **Finish time:** 10:47AM
Measurement No.: 4 **Wind (mph):** 0.2mph **Direction:** N
Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)
Calibration (dB): Start: 94.1 End: _____
Primary Noise Sources: Traffic on Todd Rd **Distance:** 50 ft from centerline
Secondary Noise Sources: _____
Notes: _____

Traffic Count: Passenger Cars: 157
 Medium Trucks (2 axles, 6 tires): ~~|||||~~ Heavy Trucks (3+ axles): ~~|||||~~

Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): _____
L_{eq}: 70.0 **SEL:** 99.5 **L_{max}:** 85.6 **L_{min}:** 52.5 **PK:** 107.6
L(05): 77.4 **L(10):** 75.5 **L(50):** 68.4 **L(90):** 58.2 **L(95):** 56.4
Response: Slow Fast Peak Impulse

Measurement #2

Location: NM2 - Todd Rd **Begin time:** 10:51AM **Finish time:** 11:05AM
Measurement No.: 5 **Wind (mph):** 0.2 **Direction:** N
Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)
Calibration (dB): Start: _____ End: _____
Primary Noise Sources: Traffic on Todd Rd **Distance:** 50 ft from centerline
Secondary Noise Sources: _____
Notes: _____

Traffic Count: Passenger Cars: 119
 Medium Trucks (2 axles, 6 tires): ~~|||||~~ Heavy Trucks (3+ axles): ~~|||~~

Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): _____
L_{eq}: 70.0 **SEL:** 99.5 **L_{max}:** 92.7 **L_{min}:** 48.9 **PK:** 112.3
L(05): 77.6 **L(10):** 75.3 **L(50):** 65.5 **L(90):** 53.4 **L(95):** 51.3
Response: Slow Fast Peak Impulse

Ambient Noise Survey Data Sheet

Instructions: Document noise measurement locations with a photo of the site, including the noise meter. Additionally, take notes on general and secondary noise sources, including the instantaneous noise level if possible. As a reminder, A/C weighting should be set to "A", and response time should typically be set to "slow." For additional information, please review the *Noise Measurement Protocols* in the case or on Jive.

Project Name: Todd & Ghilotti Intersection Job Number: 20-09882
 Date: 11/20/20 Operator Name: Leslie Trejo

Measurement #1

Location: NM 3 - West Residence Begin time: 11:10AM Finish time: 11:25AM
 Measurement No.: 6 Wind (mph): 0-2mph Direction: N
 Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)
 Calibration (dB): Start: _____ End: _____
 Primary Noise Sources: Traffic on Todd Rd Distance: 50 ft from centerline
 Secondary Noise Sources: _____
 Notes: Not sure why but eq keeps resulting in 70. Southwest residence is vacant
 Traffic Count: Passenger Cars: 95
 Medium Trucks (2 axles, 6 tires): 4/11 Heavy Trucks (3+ axles): 1
 Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): _____
 L_{eq}: 70.0 SEL: 99.5 L_{max}: 91.4 L_{min}: 42.6 PK: 110.9
 L(05): 77.1 L(10): 75.1 L(50): 63.8 L(90): 47.9 L(95): 44.7
 Response: Slow Fast Peak Impulse

Measurement #2

Location: _____ Begin time: _____ Finish time: _____
 Measurement No.: _____ Wind (mph): _____ Direction: _____
 Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)
 Calibration (dB): Start: _____ End: _____
 Primary Noise Sources: _____ Distance: _____
 Secondary Noise Sources: _____
 Notes: _____
 Traffic Count: Passenger Cars: _____
 Medium Trucks (2 axles, 6 tires): _____ Heavy Trucks (3+ axles): _____
 Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): _____
 L_{eq}: _____ SEL: _____ L_{max}: _____ L_{min}: _____ PK: _____
 L(05): _____ L(10): _____ L(50): _____ L(90): _____ L(95): _____
 Response: Slow Fast Peak Impulse

Measurement 1 - 20-09882 Todd and Standish Inte

Data Logger 2

Duration (sec) 3

Weighting A

Response SLOW

Range 40-100

L05 77.4

L10 75.5

L50 68.4

L90 58.2

L95 56.4

Lmax 85.6

Time 11/20/2020 10:34

SEL 99.5

Leq **72.0**

No.s	Date Time	Time	dB
1	11/20/2020 10:32	10:32 AM	66.3
2	11/20/2020 10:32	10:32 AM	66.4
3	11/20/2020 10:32	10:32 AM	61.2
4	11/20/2020 10:32	10:32 AM	60.1
5	11/20/2020 10:32	10:32 AM	57.9
6	11/20/2020 10:32	10:32 AM	56.4
7	11/20/2020 10:32	10:32 AM	57.4
8	11/20/2020 10:32	10:32 AM	55.7
9	11/20/2020 10:32	10:32 AM	62.3
10	11/20/2020 10:32	10:32 AM	66.3
11	11/20/2020 10:32	10:32 AM	63
12	11/20/2020 10:33	10:33 AM	64.7
13	11/20/2020 10:33	10:33 AM	66.2
14	11/20/2020 10:33	10:33 AM	61.1
15	11/20/2020 10:33	10:33 AM	58.2
16	11/20/2020 10:33	10:33 AM	57.2
17	11/20/2020 10:33	10:33 AM	58
18	11/20/2020 10:33	10:33 AM	64.1
19	11/20/2020 10:33	10:33 AM	61.6
20	11/20/2020 10:33	10:33 AM	61.8
21	11/20/2020 10:33	10:33 AM	64
22	11/20/2020 10:33	10:33 AM	68.5
23	11/20/2020 10:33	10:33 AM	69
24	11/20/2020 10:33	10:33 AM	70.6
25	11/20/2020 10:33	10:33 AM	72.6
26	11/20/2020 10:33	10:33 AM	72.4
27	11/20/2020 10:33	10:33 AM	74.6
28	11/20/2020 10:33	10:33 AM	78.6

29	11/20/2020 10:33	10:33 AM	80.7
30	11/20/2020 10:33	10:33 AM	77.7
31	11/20/2020 10:33	10:33 AM	75.3
32	11/20/2020 10:34	10:34 AM	73.8
33	11/20/2020 10:34	10:34 AM	73.5
34	11/20/2020 10:34	10:34 AM	77.3
35	11/20/2020 10:34	10:34 AM	78.7
36	11/20/2020 10:34	10:34 AM	80.7
37	11/20/2020 10:34	10:34 AM	78.7
38	11/20/2020 10:34	10:34 AM	76.7
39	11/20/2020 10:34	10:34 AM	77.3
40	11/20/2020 10:34	10:34 AM	75.5
41	11/20/2020 10:34	10:34 AM	74.4
42	11/20/2020 10:34	10:34 AM	71.3
43	11/20/2020 10:34	10:34 AM	67.4
44	11/20/2020 10:34	10:34 AM	65.6
45	11/20/2020 10:34	10:34 AM	70.7
46	11/20/2020 10:34	10:34 AM	73.3
47	11/20/2020 10:34	10:34 AM	70.3
48	11/20/2020 10:34	10:34 AM	68.2
49	11/20/2020 10:34	10:34 AM	68.5
50	11/20/2020 10:34	10:34 AM	67
51	11/20/2020 10:34	10:34 AM	76.6
52	11/20/2020 10:35	10:35 AM	75.5
53	11/20/2020 10:35	10:35 AM	68.8
54	11/20/2020 10:35	10:35 AM	67.1
55	11/20/2020 10:35	10:35 AM	67
56	11/20/2020 10:35	10:35 AM	63.8
57	11/20/2020 10:35	10:35 AM	60.6
58	11/20/2020 10:35	10:35 AM	60.5
59	11/20/2020 10:35	10:35 AM	67.7
60	11/20/2020 10:35	10:35 AM	75.5
61	11/20/2020 10:35	10:35 AM	71.7
62	11/20/2020 10:35	10:35 AM	69.7
63	11/20/2020 10:35	10:35 AM	70.5
64	11/20/2020 10:35	10:35 AM	70.3
65	11/20/2020 10:35	10:35 AM	71.3
66	11/20/2020 10:35	10:35 AM	72.3
67	11/20/2020 10:35	10:35 AM	71.9
68	11/20/2020 10:35	10:35 AM	73.6
69	11/20/2020 10:35	10:35 AM	74.9
70	11/20/2020 10:35	10:35 AM	72.2
71	11/20/2020 10:35	10:35 AM	79.5
72	11/20/2020 10:36	10:36 AM	74.9
73	11/20/2020 10:36	10:36 AM	72.3
74	11/20/2020 10:36	10:36 AM	67
75	11/20/2020 10:36	10:36 AM	70.9

76	11/20/2020 10:36	10:36 AM	83.4
77	11/20/2020 10:36	10:36 AM	77.5
78	11/20/2020 10:36	10:36 AM	70.4
79	11/20/2020 10:36	10:36 AM	73.6
80	11/20/2020 10:36	10:36 AM	74.3
81	11/20/2020 10:36	10:36 AM	76.5
82	11/20/2020 10:36	10:36 AM	74.8
83	11/20/2020 10:36	10:36 AM	76.7
84	11/20/2020 10:36	10:36 AM	75.7
85	11/20/2020 10:36	10:36 AM	71.6
86	11/20/2020 10:36	10:36 AM	68.8
87	11/20/2020 10:36	10:36 AM	73.3
88	11/20/2020 10:36	10:36 AM	72.1
89	11/20/2020 10:36	10:36 AM	68.2
90	11/20/2020 10:36	10:36 AM	66.2
91	11/20/2020 10:36	10:36 AM	62.6
92	11/20/2020 10:37	10:37 AM	59.8
93	11/20/2020 10:37	10:37 AM	59.3
94	11/20/2020 10:37	10:37 AM	61.9
95	11/20/2020 10:37	10:37 AM	66.8
96	11/20/2020 10:37	10:37 AM	66.2
97	11/20/2020 10:37	10:37 AM	61.1
98	11/20/2020 10:37	10:37 AM	62.8
99	11/20/2020 10:37	10:37 AM	73.4
100	11/20/2020 10:37	10:37 AM	70.8
101	11/20/2020 10:37	10:37 AM	71.7
102	11/20/2020 10:37	10:37 AM	69.1
103	11/20/2020 10:37	10:37 AM	76.4
104	11/20/2020 10:37	10:37 AM	73.7
105	11/20/2020 10:37	10:37 AM	70.3
106	11/20/2020 10:37	10:37 AM	71.2
107	11/20/2020 10:37	10:37 AM	71.9
108	11/20/2020 10:37	10:37 AM	76.6
109	11/20/2020 10:37	10:37 AM	70.9
110	11/20/2020 10:37	10:37 AM	68.7
111	11/20/2020 10:37	10:37 AM	70.4
112	11/20/2020 10:38	10:38 AM	78.1
113	11/20/2020 10:38	10:38 AM	80.7
114	11/20/2020 10:38	10:38 AM	76.5
115	11/20/2020 10:38	10:38 AM	71.1
116	11/20/2020 10:38	10:38 AM	69.6
117	11/20/2020 10:38	10:38 AM	69.3
118	11/20/2020 10:38	10:38 AM	66.9
119	11/20/2020 10:38	10:38 AM	67.9
120	11/20/2020 10:38	10:38 AM	68.2
121	11/20/2020 10:38	10:38 AM	64.8
122	11/20/2020 10:38	10:38 AM	62.5

123	11/20/2020 10:38	10:38 AM	60.4
124	11/20/2020 10:38	10:38 AM	58.6
125	11/20/2020 10:38	10:38 AM	61.4
126	11/20/2020 10:38	10:38 AM	69.9
127	11/20/2020 10:38	10:38 AM	70.6
128	11/20/2020 10:38	10:38 AM	63.4
129	11/20/2020 10:38	10:38 AM	58.2
130	11/20/2020 10:38	10:38 AM	55.6
131	11/20/2020 10:38	10:38 AM	58.7
132	11/20/2020 10:39	10:39 AM	60.4
133	11/20/2020 10:39	10:39 AM	68.3
134	11/20/2020 10:39	10:39 AM	63.2
135	11/20/2020 10:39	10:39 AM	57.7
136	11/20/2020 10:39	10:39 AM	59.4
137	11/20/2020 10:39	10:39 AM	66
138	11/20/2020 10:39	10:39 AM	68.6
139	11/20/2020 10:39	10:39 AM	65.4
140	11/20/2020 10:39	10:39 AM	65.6
141	11/20/2020 10:39	10:39 AM	70
142	11/20/2020 10:39	10:39 AM	64.8
143	11/20/2020 10:39	10:39 AM	67.6
144	11/20/2020 10:39	10:39 AM	73.8
145	11/20/2020 10:39	10:39 AM	71.6
146	11/20/2020 10:39	10:39 AM	71.7
147	11/20/2020 10:39	10:39 AM	73.8
148	11/20/2020 10:39	10:39 AM	72.2
149	11/20/2020 10:39	10:39 AM	67.5
150	11/20/2020 10:39	10:39 AM	66.8
151	11/20/2020 10:39	10:39 AM	71
152	11/20/2020 10:40	10:40 AM	74.6
153	11/20/2020 10:40	10:40 AM	69.4
154	11/20/2020 10:40	10:40 AM	64.5
155	11/20/2020 10:40	10:40 AM	63
156	11/20/2020 10:40	10:40 AM	62.9
157	11/20/2020 10:40	10:40 AM	69.8
158	11/20/2020 10:40	10:40 AM	69.7
159	11/20/2020 10:40	10:40 AM	66.6
160	11/20/2020 10:40	10:40 AM	63.5
161	11/20/2020 10:40	10:40 AM	64.7
162	11/20/2020 10:40	10:40 AM	68.4
163	11/20/2020 10:40	10:40 AM	63.9
164	11/20/2020 10:40	10:40 AM	59.3
165	11/20/2020 10:40	10:40 AM	59.5
166	11/20/2020 10:40	10:40 AM	65.1
167	11/20/2020 10:40	10:40 AM	74.3
168	11/20/2020 10:40	10:40 AM	70.2
169	11/20/2020 10:40	10:40 AM	67

170	11/20/2020 10:40	10:40 AM	70.6
171	11/20/2020 10:40	10:40 AM	63.3
172	11/20/2020 10:41	10:41 AM	57.9
173	11/20/2020 10:41	10:41 AM	59.2
174	11/20/2020 10:41	10:41 AM	64.8
175	11/20/2020 10:41	10:41 AM	72
176	11/20/2020 10:41	10:41 AM	68.6
177	11/20/2020 10:41	10:41 AM	65.4
178	11/20/2020 10:41	10:41 AM	59.5
179	11/20/2020 10:41	10:41 AM	58.2
180	11/20/2020 10:41	10:41 AM	59.6
181	11/20/2020 10:41	10:41 AM	69.4
182	11/20/2020 10:41	10:41 AM	69.8
183	11/20/2020 10:41	10:41 AM	61.7
184	11/20/2020 10:41	10:41 AM	63.1
185	11/20/2020 10:41	10:41 AM	63.4
186	11/20/2020 10:41	10:41 AM	58.8
187	11/20/2020 10:41	10:41 AM	57.9
188	11/20/2020 10:41	10:41 AM	60.6
189	11/20/2020 10:41	10:41 AM	66.7
190	11/20/2020 10:41	10:41 AM	71.7
191	11/20/2020 10:41	10:41 AM	68.7
192	11/20/2020 10:42	10:42 AM	70
193	11/20/2020 10:42	10:42 AM	70.7
194	11/20/2020 10:42	10:42 AM	66.6
195	11/20/2020 10:42	10:42 AM	63
196	11/20/2020 10:42	10:42 AM	66.1
197	11/20/2020 10:42	10:42 AM	66.6
198	11/20/2020 10:42	10:42 AM	59.8
199	11/20/2020 10:42	10:42 AM	55.8
200	11/20/2020 10:42	10:42 AM	54
201	11/20/2020 10:42	10:42 AM	52.6
202	11/20/2020 10:42	10:42 AM	53.1
203	11/20/2020 10:42	10:42 AM	53.1
204	11/20/2020 10:42	10:42 AM	53.7
205	11/20/2020 10:42	10:42 AM	54.7
206	11/20/2020 10:42	10:42 AM	54.7
207	11/20/2020 10:42	10:42 AM	54.3
208	11/20/2020 10:42	10:42 AM	57
209	11/20/2020 10:42	10:42 AM	56.7
210	11/20/2020 10:42	10:42 AM	58.7
211	11/20/2020 10:42	10:42 AM	56.4
212	11/20/2020 10:43	10:43 AM	58.1
213	11/20/2020 10:43	10:43 AM	57
214	11/20/2020 10:43	10:43 AM	60.1
215	11/20/2020 10:43	10:43 AM	68.4
216	11/20/2020 10:43	10:43 AM	70.4

217	11/20/2020 10:43	10:43 AM	69.6
218	11/20/2020 10:43	10:43 AM	68.2
219	11/20/2020 10:43	10:43 AM	66.8
220	11/20/2020 10:43	10:43 AM	70.5
221	11/20/2020 10:43	10:43 AM	72.2
222	11/20/2020 10:43	10:43 AM	70.8
223	11/20/2020 10:43	10:43 AM	68.7
224	11/20/2020 10:43	10:43 AM	64.5
225	11/20/2020 10:43	10:43 AM	68.7
226	11/20/2020 10:43	10:43 AM	77.7
227	11/20/2020 10:43	10:43 AM	74.9
228	11/20/2020 10:43	10:43 AM	73.4
229	11/20/2020 10:43	10:43 AM	68.4
230	11/20/2020 10:43	10:43 AM	64.1
231	11/20/2020 10:43	10:43 AM	63
232	11/20/2020 10:44	10:44 AM	64.6
233	11/20/2020 10:44	10:44 AM	62.4
234	11/20/2020 10:44	10:44 AM	59.7
235	11/20/2020 10:44	10:44 AM	59.5
236	11/20/2020 10:44	10:44 AM	64.2
237	11/20/2020 10:44	10:44 AM	68.7
238	11/20/2020 10:44	10:44 AM	64.6
239	11/20/2020 10:44	10:44 AM	60.6
240	11/20/2020 10:44	10:44 AM	60.3
241	11/20/2020 10:44	10:44 AM	66.2
242	11/20/2020 10:44	10:44 AM	70.8
243	11/20/2020 10:44	10:44 AM	66.3
244	11/20/2020 10:44	10:44 AM	68.5
245	11/20/2020 10:44	10:44 AM	75
246	11/20/2020 10:44	10:44 AM	79.6
247	11/20/2020 10:44	10:44 AM	84
248	11/20/2020 10:44	10:44 AM	80.3
249	11/20/2020 10:44	10:44 AM	71.8
250	11/20/2020 10:44	10:44 AM	63.4
251	11/20/2020 10:44	10:44 AM	63
252	11/20/2020 10:45	10:45 AM	66
253	11/20/2020 10:45	10:45 AM	67.4
254	11/20/2020 10:45	10:45 AM	73.9
255	11/20/2020 10:45	10:45 AM	73.8
256	11/20/2020 10:45	10:45 AM	75.1
257	11/20/2020 10:45	10:45 AM	72.3
258	11/20/2020 10:45	10:45 AM	72.2
259	11/20/2020 10:45	10:45 AM	70.8
260	11/20/2020 10:45	10:45 AM	70.9
261	11/20/2020 10:45	10:45 AM	67.7
262	11/20/2020 10:45	10:45 AM	64.9
263	11/20/2020 10:45	10:45 AM	70.3

264	11/20/2020 10:45	10:45 AM	74.7
265	11/20/2020 10:45	10:45 AM	71.5
266	11/20/2020 10:45	10:45 AM	75.7
267	11/20/2020 10:45	10:45 AM	73.3
268	11/20/2020 10:45	10:45 AM	71.7
269	11/20/2020 10:45	10:45 AM	73.6
270	11/20/2020 10:45	10:45 AM	70
271	11/20/2020 10:45	10:45 AM	71.5
272	11/20/2020 10:46	10:46 AM	68
273	11/20/2020 10:46	10:46 AM	68.8
274	11/20/2020 10:46	10:46 AM	65.4
275	11/20/2020 10:46	10:46 AM	62.6
276	11/20/2020 10:46	10:46 AM	59.3
277	11/20/2020 10:46	10:46 AM	59.4
278	11/20/2020 10:46	10:46 AM	62.9
279	11/20/2020 10:46	10:46 AM	67.6
280	11/20/2020 10:46	10:46 AM	77.4
281	11/20/2020 10:46	10:46 AM	74.7
282	11/20/2020 10:46	10:46 AM	72.7
283	11/20/2020 10:46	10:46 AM	66.7
284	11/20/2020 10:46	10:46 AM	71.3
285	11/20/2020 10:46	10:46 AM	73.6
286	11/20/2020 10:46	10:46 AM	74.1
287	11/20/2020 10:46	10:46 AM	71.6
288	11/20/2020 10:46	10:46 AM	69.4
289	11/20/2020 10:46	10:46 AM	66.1
290	11/20/2020 10:46	10:46 AM	77.2
291	11/20/2020 10:46	10:46 AM	81.4
292	11/20/2020 10:47	10:47 AM	80.6
293	11/20/2020 10:47	10:47 AM	74.5
294	11/20/2020 10:47	10:47 AM	69.5
295	11/20/2020 10:47	10:47 AM	67.9
296	11/20/2020 10:47	10:47 AM	73.5
297	11/20/2020 10:47	10:47 AM	73.8
298	11/20/2020 10:47	10:47 AM	69.4
299	11/20/2020 10:47	10:47 AM	68.8
300	11/20/2020 10:47	10:47 AM	68

Measurement 2 -20-09882 Todd and Standish Int

Data Logger 2

Duration (3

Weighting A

Response SLOW

Range 40-100

L05 77.6

L10 75.3

L50 65.5

L90 53.4

L95 51.3

Lmax 92.7

Time 11/20/2020 10:58

SEL 99.5

Leq **72.4**

No.s	Date Time	Time	dB
1	11/20/2020 10:52	10:52 AM	51.4
2	11/20/2020 10:52	10:52 AM	54.8
3	11/20/2020 10:52	10:52 AM	55.6
4	11/20/2020 10:52	10:52 AM	61.8
5	11/20/2020 10:52	10:52 AM	74.7
6	11/20/2020 10:52	10:52 AM	76.4
7	11/20/2020 10:52	10:52 AM	67.2
8	11/20/2020 10:52	10:52 AM	61.0
9	11/20/2020 10:52	10:52 AM	60.2
10	11/20/2020 10:52	10:52 AM	57.4
11	11/20/2020 10:52	10:52 AM	55.5
12	11/20/2020 10:52	10:52 AM	53.5
13	11/20/2020 10:52	10:52 AM	55.5
14	11/20/2020 10:52	10:52 AM	51.7
15	11/20/2020 10:52	10:52 AM	50.5
16	11/20/2020 10:52	10:52 AM	51.5
17	11/20/2020 10:52	10:52 AM	56.3
18	11/20/2020 10:53	10:53 AM	74.6
19	11/20/2020 10:53	10:53 AM	68.2
20	11/20/2020 10:53	10:53 AM	58.9
21	11/20/2020 10:53	10:53 AM	61.0
22	11/20/2020 10:53	10:53 AM	76.8
23	11/20/2020 10:53	10:53 AM	73.5
24	11/20/2020 10:53	10:53 AM	71.1
25	11/20/2020 10:53	10:53 AM	63.6
26	11/20/2020 10:53	10:53 AM	58.9
27	11/20/2020 10:53	10:53 AM	58.6
28	11/20/2020 10:53	10:53 AM	62.1

29	11/20/2020 10:53	10:53 AM	80.3
30	11/20/2020 10:53	10:53 AM	72.1
31	11/20/2020 10:53	10:53 AM	61.0
32	11/20/2020 10:53	10:53 AM	60.8
33	11/20/2020 10:53	10:53 AM	68.1
34	11/20/2020 10:53	10:53 AM	67.7
35	11/20/2020 10:53	10:53 AM	71.3
36	11/20/2020 10:53	10:53 AM	81.1
37	11/20/2020 10:53	10:53 AM	74.4
38	11/20/2020 10:54	10:54 AM	73.9
39	11/20/2020 10:54	10:54 AM	69.8
40	11/20/2020 10:54	10:54 AM	74.5
41	11/20/2020 10:54	10:54 AM	74.8
42	11/20/2020 10:54	10:54 AM	69.1
43	11/20/2020 10:54	10:54 AM	67.2
44	11/20/2020 10:54	10:54 AM	64.3
45	11/20/2020 10:54	10:54 AM	59.7
46	11/20/2020 10:54	10:54 AM	60.4
47	11/20/2020 10:54	10:54 AM	68.9
48	11/20/2020 10:54	10:54 AM	62.5
49	11/20/2020 10:54	10:54 AM	70.2
50	11/20/2020 10:54	10:54 AM	78.5
51	11/20/2020 10:54	10:54 AM	75.1
52	11/20/2020 10:54	10:54 AM	72.1
53	11/20/2020 10:54	10:54 AM	70.9
54	11/20/2020 10:54	10:54 AM	62.9
55	11/20/2020 10:54	10:54 AM	58.4
56	11/20/2020 10:54	10:54 AM	57.9
57	11/20/2020 10:54	10:54 AM	61.5
58	11/20/2020 10:55	10:55 AM	61.0
59	11/20/2020 10:55	10:55 AM	70.5
60	11/20/2020 10:55	10:55 AM	75.6
61	11/20/2020 10:55	10:55 AM	70.8
62	11/20/2020 10:55	10:55 AM	67.2
63	11/20/2020 10:55	10:55 AM	80.7
64	11/20/2020 10:55	10:55 AM	70.9
65	11/20/2020 10:55	10:55 AM	62.3
66	11/20/2020 10:55	10:55 AM	59.3
67	11/20/2020 10:55	10:55 AM	62.4
68	11/20/2020 10:55	10:55 AM	74.9
69	11/20/2020 10:55	10:55 AM	85.4
70	11/20/2020 10:55	10:55 AM	77.3
71	11/20/2020 10:55	10:55 AM	69.0
72	11/20/2020 10:55	10:55 AM	64.8
73	11/20/2020 10:55	10:55 AM	68.1
74	11/20/2020 10:55	10:55 AM	67.5
75	11/20/2020 10:55	10:55 AM	80.1

76	11/20/2020 10:55	10:55 AM	74.6
77	11/20/2020 10:55	10:55 AM	74.6
78	11/20/2020 10:56	10:56 AM	71.3
79	11/20/2020 10:56	10:56 AM	68.0
80	11/20/2020 10:56	10:56 AM	66.9
81	11/20/2020 10:56	10:56 AM	67.7
82	11/20/2020 10:56	10:56 AM	66.0
83	11/20/2020 10:56	10:56 AM	74.8
84	11/20/2020 10:56	10:56 AM	71.5
85	11/20/2020 10:56	10:56 AM	66.3
86	11/20/2020 10:56	10:56 AM	62.0
87	11/20/2020 10:56	10:56 AM	56.6
88	11/20/2020 10:56	10:56 AM	55.3
89	11/20/2020 10:56	10:56 AM	53.8
90	11/20/2020 10:56	10:56 AM	54.8
91	11/20/2020 10:56	10:56 AM	54.4
92	11/20/2020 10:56	10:56 AM	49.4
93	11/20/2020 10:56	10:56 AM	49.3
94	11/20/2020 10:56	10:56 AM	50.2
95	11/20/2020 10:56	10:56 AM	50.5
96	11/20/2020 10:56	10:56 AM	51.3
97	11/20/2020 10:56	10:56 AM	50.8
98	11/20/2020 10:57	10:57 AM	52.6
99	11/20/2020 10:57	10:57 AM	56.5
100	11/20/2020 10:57	10:57 AM	75.0
101	11/20/2020 10:57	10:57 AM	67.1
102	11/20/2020 10:57	10:57 AM	78.9
103	11/20/2020 10:57	10:57 AM	71.0
104	11/20/2020 10:57	10:57 AM	63.0
105	11/20/2020 10:57	10:57 AM	59.5
106	11/20/2020 10:57	10:57 AM	60.7
107	11/20/2020 10:57	10:57 AM	76.7
108	11/20/2020 10:57	10:57 AM	79.2
109	11/20/2020 10:57	10:57 AM	72.0
110	11/20/2020 10:57	10:57 AM	65.9
111	11/20/2020 10:57	10:57 AM	63.2
112	11/20/2020 10:57	10:57 AM	66.5
113	11/20/2020 10:57	10:57 AM	70.5
114	11/20/2020 10:57	10:57 AM	76.5
115	11/20/2020 10:57	10:57 AM	71.6
116	11/20/2020 10:57	10:57 AM	64.2
117	11/20/2020 10:57	10:57 AM	71.6
118	11/20/2020 10:58	10:58 AM	67.5
119	11/20/2020 10:58	10:58 AM	62.3
120	11/20/2020 10:58	10:58 AM	73.2
121	11/20/2020 10:58	10:58 AM	79.7
122	11/20/2020 10:58	10:58 AM	75.1

123	11/20/2020 10:58	10:58 AM	73.9
124	11/20/2020 10:58	10:58 AM	71.0
125	11/20/2020 10:58	10:58 AM	80.5
126	11/20/2020 10:58	10:58 AM	71.1
127	11/20/2020 10:58	10:58 AM	75.6
128	11/20/2020 10:58	10:58 AM	85.0
129	11/20/2020 10:58	10:58 AM	87.9
130	11/20/2020 10:58	10:58 AM	77.5
131	11/20/2020 10:58	10:58 AM	68.5
132	11/20/2020 10:58	10:58 AM	62.2
133	11/20/2020 10:58	10:58 AM	69.2
134	11/20/2020 10:58	10:58 AM	67.3
135	11/20/2020 10:58	10:58 AM	74.4
136	11/20/2020 10:58	10:58 AM	67.5
137	11/20/2020 10:58	10:58 AM	71.7
138	11/20/2020 10:59	10:59 AM	61.9
139	11/20/2020 10:59	10:59 AM	56.2
140	11/20/2020 10:59	10:59 AM	52.8
141	11/20/2020 10:59	10:59 AM	50.5
142	11/20/2020 10:59	10:59 AM	51.2
143	11/20/2020 10:59	10:59 AM	53.8
144	11/20/2020 10:59	10:59 AM	61.1
145	11/20/2020 10:59	10:59 AM	75.3
146	11/20/2020 10:59	10:59 AM	78.5
147	11/20/2020 10:59	10:59 AM	72.2
148	11/20/2020 10:59	10:59 AM	62.8
149	11/20/2020 10:59	10:59 AM	58.2
150	11/20/2020 10:59	10:59 AM	56.5
151	11/20/2020 10:59	10:59 AM	57.4
152	11/20/2020 10:59	10:59 AM	65.1
153	11/20/2020 10:59	10:59 AM	70.4
154	11/20/2020 10:59	10:59 AM	61.6
155	11/20/2020 10:59	10:59 AM	63.4
156	11/20/2020 10:59	10:59 AM	69.1
157	11/20/2020 10:59	10:59 AM	73.3
158	11/20/2020 11:00	11:00 AM	63.8
159	11/20/2020 11:00	11:00 AM	60.5
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161	11/20/2020 11:00	11:00 AM	57.3
162	11/20/2020 11:00	11:00 AM	60.4
163	11/20/2020 11:00	11:00 AM	58.0
164	11/20/2020 11:00	11:00 AM	55.6
165	11/20/2020 11:00	11:00 AM	57.7
166	11/20/2020 11:00	11:00 AM	66.8
167	11/20/2020 11:00	11:00 AM	74.7
168	11/20/2020 11:00	11:00 AM	66.0
169	11/20/2020 11:00	11:00 AM	59.0

170	11/20/2020 11:00	11:00 AM	55.4
171	11/20/2020 11:00	11:00 AM	55.5
172	11/20/2020 11:00	11:00 AM	58.5
173	11/20/2020 11:00	11:00 AM	66.2
174	11/20/2020 11:00	11:00 AM	74.3
175	11/20/2020 11:00	11:00 AM	80.6
176	11/20/2020 11:00	11:00 AM	71.5
177	11/20/2020 11:00	11:00 AM	78.7
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179	11/20/2020 11:01	11:01 AM	62.7
180	11/20/2020 11:01	11:01 AM	59.3
181	11/20/2020 11:01	11:01 AM	59.6
182	11/20/2020 11:01	11:01 AM	64.2
183	11/20/2020 11:01	11:01 AM	74.6
184	11/20/2020 11:01	11:01 AM	76.6
185	11/20/2020 11:01	11:01 AM	75.1
186	11/20/2020 11:01	11:01 AM	77.5
187	11/20/2020 11:01	11:01 AM	72.0
188	11/20/2020 11:01	11:01 AM	74.2
189	11/20/2020 11:01	11:01 AM	70.1
190	11/20/2020 11:01	11:01 AM	63.0
191	11/20/2020 11:01	11:01 AM	67.0
192	11/20/2020 11:01	11:01 AM	76.0
193	11/20/2020 11:01	11:01 AM	75.2
194	11/20/2020 11:01	11:01 AM	72.2
195	11/20/2020 11:01	11:01 AM	63.3
196	11/20/2020 11:01	11:01 AM	57.5
197	11/20/2020 11:01	11:01 AM	55.3
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201	11/20/2020 11:02	11:02 AM	65.8
202	11/20/2020 11:02	11:02 AM	57.7
203	11/20/2020 11:02	11:02 AM	54.4
204	11/20/2020 11:02	11:02 AM	52.6
205	11/20/2020 11:02	11:02 AM	52.5
206	11/20/2020 11:02	11:02 AM	60.3
207	11/20/2020 11:02	11:02 AM	60.1
208	11/20/2020 11:02	11:02 AM	70.1
209	11/20/2020 11:02	11:02 AM	69.9
210	11/20/2020 11:02	11:02 AM	69.8
211	11/20/2020 11:02	11:02 AM	67.3
212	11/20/2020 11:02	11:02 AM	60.4
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215	11/20/2020 11:02	11:02 AM	51.2
216	11/20/2020 11:02	11:02 AM	52.5

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218	11/20/2020 11:03	11:03 AM	71.6
219	11/20/2020 11:03	11:03 AM	63.6
220	11/20/2020 11:03	11:03 AM	71.1
221	11/20/2020 11:03	11:03 AM	63.7
222	11/20/2020 11:03	11:03 AM	58.0
223	11/20/2020 11:03	11:03 AM	65.5
224	11/20/2020 11:03	11:03 AM	68.5
225	11/20/2020 11:03	11:03 AM	69.1
226	11/20/2020 11:03	11:03 AM	73.7
227	11/20/2020 11:03	11:03 AM	70.2
228	11/20/2020 11:03	11:03 AM	70.4
229	11/20/2020 11:03	11:03 AM	72.0
230	11/20/2020 11:03	11:03 AM	73.0
231	11/20/2020 11:03	11:03 AM	64.8
232	11/20/2020 11:03	11:03 AM	62.1
233	11/20/2020 11:03	11:03 AM	74.9
234	11/20/2020 11:03	11:03 AM	68.1
235	11/20/2020 11:03	11:03 AM	60.9
236	11/20/2020 11:03	11:03 AM	58.6
237	11/20/2020 11:03	11:03 AM	58.0
238	11/20/2020 11:04	11:04 AM	58.4
239	11/20/2020 11:04	11:04 AM	66.4
240	11/20/2020 11:04	11:04 AM	71.4
241	11/20/2020 11:04	11:04 AM	75.2
242	11/20/2020 11:04	11:04 AM	69.9
243	11/20/2020 11:04	11:04 AM	72.7
244	11/20/2020 11:04	11:04 AM	72.8
245	11/20/2020 11:04	11:04 AM	78.4
246	11/20/2020 11:04	11:04 AM	78.3
247	11/20/2020 11:04	11:04 AM	74.7
248	11/20/2020 11:04	11:04 AM	65.5
249	11/20/2020 11:04	11:04 AM	59.4
250	11/20/2020 11:04	11:04 AM	57.2
251	11/20/2020 11:04	11:04 AM	59.6
252	11/20/2020 11:04	11:04 AM	69.1
253	11/20/2020 11:04	11:04 AM	81.1
254	11/20/2020 11:04	11:04 AM	73.5
255	11/20/2020 11:04	11:04 AM	69.2
256	11/20/2020 11:04	11:04 AM	60.7
257	11/20/2020 11:04	11:04 AM	55.4
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259	11/20/2020 11:05	11:05 AM	52.8
260	11/20/2020 11:05	11:05 AM	52.1
261	11/20/2020 11:05	11:05 AM	51.5
262	11/20/2020 11:05	11:05 AM	51.8
263	11/20/2020 11:05	11:05 AM	50.8

264	11/20/2020 11:05	11:05 AM	51.3
265	11/20/2020 11:05	11:05 AM	50.6
266	11/20/2020 11:05	11:05 AM	53.3
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274	11/20/2020 11:05	11:05 AM	70.5
275	11/20/2020 11:05	11:05 AM	62.2
276	11/20/2020 11:05	11:05 AM	67.8
277	11/20/2020 11:05	11:05 AM	71.7
278	11/20/2020 11:06	11:06 AM	66.2
279	11/20/2020 11:06	11:06 AM	58.8
280	11/20/2020 11:06	11:06 AM	71.9
281	11/20/2020 11:06	11:06 AM	65.8
282	11/20/2020 11:06	11:06 AM	56.7
283	11/20/2020 11:06	11:06 AM	52.1
284	11/20/2020 11:06	11:06 AM	51.8
285	11/20/2020 11:06	11:06 AM	56.5
286	11/20/2020 11:06	11:06 AM	66.5
287	11/20/2020 11:06	11:06 AM	77.2
288	11/20/2020 11:06	11:06 AM	68.3
289	11/20/2020 11:06	11:06 AM	61.2
290	11/20/2020 11:06	11:06 AM	67.6
291	11/20/2020 11:06	11:06 AM	66.8
292	11/20/2020 11:06	11:06 AM	63.5
293	11/20/2020 11:06	11:06 AM	70.4
294	11/20/2020 11:06	11:06 AM	62.1
295	11/20/2020 11:06	11:06 AM	57.5
296	11/20/2020 11:06	11:06 AM	55.0
297	11/20/2020 11:06	11:06 AM	56.1
298	11/20/2020 11:07	11:07 AM	58.6
299	11/20/2020 11:07	11:07 AM	79.2
300	11/20/2020 11:07	11:07 AM	73.8

asurement 3 - 20-09882 Todd and Standish In

Data Logger 2

Duration 3

Weighting A

Response SLOW

Range 40-100

L05 77.1

L10 75.1

L50 63.8

L90 47.9

L95 44.7

Lmax 91.4

Time 11/20/2020 11:10

SEL 99.5

Leq **72.4**

No.s	Date Time	Time	dB
1	11/20/2020 11:10	11:10 AM	47.4
2	11/20/2020 11:10	11:10 AM	49.7
3	11/20/2020 11:10	11:10 AM	67.7
4	11/20/2020 11:10	11:10 AM	89.4
5	11/20/2020 11:10	11:10 AM	81.2
6	11/20/2020 11:10	11:10 AM	72.1
7	11/20/2020 11:10	11:10 AM	74.5
8	11/20/2020 11:11	11:11 AM	68.3
9	11/20/2020 11:11	11:11 AM	77.9
10	11/20/2020 11:11	11:11 AM	76.8
11	11/20/2020 11:11	11:11 AM	72.1
12	11/20/2020 11:11	11:11 AM	62.9
13	11/20/2020 11:11	11:11 AM	67.0
14	11/20/2020 11:11	11:11 AM	75.4
15	11/20/2020 11:11	11:11 AM	79.2
16	11/20/2020 11:11	11:11 AM	70.8
17	11/20/2020 11:11	11:11 AM	71.7
18	11/20/2020 11:11	11:11 AM	61.5
19	11/20/2020 11:11	11:11 AM	57.3
20	11/20/2020 11:11	11:11 AM	59.8
21	11/20/2020 11:11	11:11 AM	61.1
22	11/20/2020 11:11	11:11 AM	55.8
23	11/20/2020 11:11	11:11 AM	52.5
24	11/20/2020 11:11	11:11 AM	59.6
25	11/20/2020 11:11	11:11 AM	70.0
26	11/20/2020 11:11	11:11 AM	59.3
27	11/20/2020 11:11	11:11 AM	50.6
28	11/20/2020 11:12	11:12 AM	47.4

29	11/20/2020 11:12	11:12 AM	47.9
30	11/20/2020 11:12	11:12 AM	54.3
31	11/20/2020 11:12	11:12 AM	75.3
32	11/20/2020 11:12	11:12 AM	72.0
33	11/20/2020 11:12	11:12 AM	62.5
34	11/20/2020 11:12	11:12 AM	56.5
35	11/20/2020 11:12	11:12 AM	51.7
36	11/20/2020 11:12	11:12 AM	55.4
37	11/20/2020 11:12	11:12 AM	61.1
38	11/20/2020 11:12	11:12 AM	74.4
39	11/20/2020 11:12	11:12 AM	65.7
40	11/20/2020 11:12	11:12 AM	57.5
41	11/20/2020 11:12	11:12 AM	61.2
42	11/20/2020 11:12	11:12 AM	73.0
43	11/20/2020 11:12	11:12 AM	66.8
44	11/20/2020 11:12	11:12 AM	75.6
45	11/20/2020 11:12	11:12 AM	71.3
46	11/20/2020 11:12	11:12 AM	69.0
47	11/20/2020 11:12	11:12 AM	62.2
48	11/20/2020 11:13	11:13 AM	74.2
49	11/20/2020 11:13	11:13 AM	64.1
50	11/20/2020 11:13	11:13 AM	63.4
51	11/20/2020 11:13	11:13 AM	68.6
52	11/20/2020 11:13	11:13 AM	61.5
53	11/20/2020 11:13	11:13 AM	60.3
54	11/20/2020 11:13	11:13 AM	63.0
55	11/20/2020 11:13	11:13 AM	68.1
56	11/20/2020 11:13	11:13 AM	73.3
57	11/20/2020 11:13	11:13 AM	71.0
58	11/20/2020 11:13	11:13 AM	72.3
59	11/20/2020 11:13	11:13 AM	73.6
60	11/20/2020 11:13	11:13 AM	66.5
61	11/20/2020 11:13	11:13 AM	63.1
62	11/20/2020 11:13	11:13 AM	63.9
63	11/20/2020 11:13	11:13 AM	66.0
64	11/20/2020 11:13	11:13 AM	65.6
65	11/20/2020 11:13	11:13 AM	59.7
66	11/20/2020 11:13	11:13 AM	57.4
67	11/20/2020 11:13	11:13 AM	56.7
68	11/20/2020 11:14	11:14 AM	53.9
69	11/20/2020 11:14	11:14 AM	62.9
70	11/20/2020 11:14	11:14 AM	70.0
71	11/20/2020 11:14	11:14 AM	60.4
72	11/20/2020 11:14	11:14 AM	54.3
73	11/20/2020 11:14	11:14 AM	53.7
74	11/20/2020 11:14	11:14 AM	54.1
75	11/20/2020 11:14	11:14 AM	63.1

76	11/20/2020 11:14	11:14 AM	78.7
77	11/20/2020 11:14	11:14 AM	76.5
78	11/20/2020 11:14	11:14 AM	65.2
79	11/20/2020 11:14	11:14 AM	64.4
80	11/20/2020 11:14	11:14 AM	60.9
81	11/20/2020 11:14	11:14 AM	56.1
82	11/20/2020 11:14	11:14 AM	63.0
83	11/20/2020 11:14	11:14 AM	77.3
84	11/20/2020 11:14	11:14 AM	74.6
85	11/20/2020 11:14	11:14 AM	73.7
86	11/20/2020 11:14	11:14 AM	70.7
87	11/20/2020 11:14	11:14 AM	68.0
88	11/20/2020 11:15	11:15 AM	73.1
89	11/20/2020 11:15	11:15 AM	79.3
90	11/20/2020 11:15	11:15 AM	74.8
91	11/20/2020 11:15	11:15 AM	75.9
92	11/20/2020 11:15	11:15 AM	68.9
93	11/20/2020 11:15	11:15 AM	71.0
94	11/20/2020 11:15	11:15 AM	62.5
95	11/20/2020 11:15	11:15 AM	54.9
96	11/20/2020 11:15	11:15 AM	50.8
97	11/20/2020 11:15	11:15 AM	51.5
98	11/20/2020 11:15	11:15 AM	68.8
99	11/20/2020 11:15	11:15 AM	69.1
100	11/20/2020 11:15	11:15 AM	74.0
101	11/20/2020 11:15	11:15 AM	80.4
102	11/20/2020 11:15	11:15 AM	71.6
103	11/20/2020 11:15	11:15 AM	64.2
104	11/20/2020 11:15	11:15 AM	77.4
105	11/20/2020 11:15	11:15 AM	68.0
106	11/20/2020 11:15	11:15 AM	58.2
107	11/20/2020 11:15	11:15 AM	54.1
108	11/20/2020 11:16	11:16 AM	54.5
109	11/20/2020 11:16	11:16 AM	57.0
110	11/20/2020 11:16	11:16 AM	58.3
111	11/20/2020 11:16	11:16 AM	60.3
112	11/20/2020 11:16	11:16 AM	74.6
113	11/20/2020 11:16	11:16 AM	74.4
114	11/20/2020 11:16	11:16 AM	80.0
115	11/20/2020 11:16	11:16 AM	72.3
116	11/20/2020 11:16	11:16 AM	62.1
117	11/20/2020 11:16	11:16 AM	61.7
118	11/20/2020 11:16	11:16 AM	57.2
119	11/20/2020 11:16	11:16 AM	52.7
120	11/20/2020 11:16	11:16 AM	58.1
121	11/20/2020 11:16	11:16 AM	71.7
122	11/20/2020 11:16	11:16 AM	65.9

123	11/20/2020 11:16	11:16 AM	55.1
124	11/20/2020 11:16	11:16 AM	49.5
125	11/20/2020 11:16	11:16 AM	51.7
126	11/20/2020 11:16	11:16 AM	67.3
127	11/20/2020 11:16	11:16 AM	84.6
128	11/20/2020 11:17	11:17 AM	76.5
129	11/20/2020 11:17	11:17 AM	68.2
130	11/20/2020 11:17	11:17 AM	67.1
131	11/20/2020 11:17	11:17 AM	73.2
132	11/20/2020 11:17	11:17 AM	84.9
133	11/20/2020 11:17	11:17 AM	75.0
134	11/20/2020 11:17	11:17 AM	63.9
135	11/20/2020 11:17	11:17 AM	54.7
136	11/20/2020 11:17	11:17 AM	48.8
137	11/20/2020 11:17	11:17 AM	46.0
138	11/20/2020 11:17	11:17 AM	44.3
139	11/20/2020 11:17	11:17 AM	44.1
140	11/20/2020 11:17	11:17 AM	45.6
141	11/20/2020 11:17	11:17 AM	66.1
142	11/20/2020 11:17	11:17 AM	70.5
143	11/20/2020 11:17	11:17 AM	62.4
144	11/20/2020 11:17	11:17 AM	57.0
145	11/20/2020 11:17	11:17 AM	51.4
146	11/20/2020 11:17	11:17 AM	73.4
147	11/20/2020 11:17	11:17 AM	64.3
148	11/20/2020 11:18	11:18 AM	54.4
149	11/20/2020 11:18	11:18 AM	48.5
150	11/20/2020 11:18	11:18 AM	54.3
151	11/20/2020 11:18	11:18 AM	64.6
152	11/20/2020 11:18	11:18 AM	74.6
153	11/20/2020 11:18	11:18 AM	63.6
154	11/20/2020 11:18	11:18 AM	53.0
155	11/20/2020 11:18	11:18 AM	46.9
156	11/20/2020 11:18	11:18 AM	44.6
157	11/20/2020 11:18	11:18 AM	44.4
158	11/20/2020 11:18	11:18 AM	45.8
159	11/20/2020 11:18	11:18 AM	43.6
160	11/20/2020 11:18	11:18 AM	44.6
161	11/20/2020 11:18	11:18 AM	49.5
162	11/20/2020 11:18	11:18 AM	61.9
163	11/20/2020 11:18	11:18 AM	69.8
164	11/20/2020 11:18	11:18 AM	70.0
165	11/20/2020 11:18	11:18 AM	59.6
166	11/20/2020 11:18	11:18 AM	50.0
167	11/20/2020 11:18	11:18 AM	44.3
168	11/20/2020 11:19	11:19 AM	44.4
169	11/20/2020 11:19	11:19 AM	46.3

170	11/20/2020 11:19	11:19 AM	54.0
171	11/20/2020 11:19	11:19 AM	77.7
172	11/20/2020 11:19	11:19 AM	69.8
173	11/20/2020 11:19	11:19 AM	60.2
174	11/20/2020 11:19	11:19 AM	63.1
175	11/20/2020 11:19	11:19 AM	72.2
176	11/20/2020 11:19	11:19 AM	73.7
177	11/20/2020 11:19	11:19 AM	65.1
178	11/20/2020 11:19	11:19 AM	56.1
179	11/20/2020 11:19	11:19 AM	55.7
180	11/20/2020 11:19	11:19 AM	71.8
181	11/20/2020 11:19	11:19 AM	66.3
182	11/20/2020 11:19	11:19 AM	62.5
183	11/20/2020 11:19	11:19 AM	72.7
184	11/20/2020 11:19	11:19 AM	62.6
185	11/20/2020 11:19	11:19 AM	54.2
186	11/20/2020 11:19	11:19 AM	49.8
187	11/20/2020 11:19	11:19 AM	46.6
188	11/20/2020 11:20	11:20 AM	45.1
189	11/20/2020 11:20	11:20 AM	43.2
190	11/20/2020 11:20	11:20 AM	44.1
191	11/20/2020 11:20	11:20 AM	43.7
192	11/20/2020 11:20	11:20 AM	45.0
193	11/20/2020 11:20	11:20 AM	49.4
194	11/20/2020 11:20	11:20 AM	70.5
195	11/20/2020 11:20	11:20 AM	59.9
196	11/20/2020 11:20	11:20 AM	52.1
197	11/20/2020 11:20	11:20 AM	49.6
198	11/20/2020 11:20	11:20 AM	45.6
199	11/20/2020 11:20	11:20 AM	47.9
200	11/20/2020 11:20	11:20 AM	50.3
201	11/20/2020 11:20	11:20 AM	47.4
202	11/20/2020 11:20	11:20 AM	46.6
203	11/20/2020 11:20	11:20 AM	52.4
204	11/20/2020 11:20	11:20 AM	71.1
205	11/20/2020 11:20	11:20 AM	60.8
206	11/20/2020 11:20	11:20 AM	68.1
207	11/20/2020 11:20	11:20 AM	75.5
208	11/20/2020 11:21	11:21 AM	65.9
209	11/20/2020 11:21	11:21 AM	56.2
210	11/20/2020 11:21	11:21 AM	60.7
211	11/20/2020 11:21	11:21 AM	71.2
212	11/20/2020 11:21	11:21 AM	62.2
213	11/20/2020 11:21	11:21 AM	61.4
214	11/20/2020 11:21	11:21 AM	71.8
215	11/20/2020 11:21	11:21 AM	64.8
216	11/20/2020 11:21	11:21 AM	70.7

217	11/20/2020 11:21	11:21 AM	80.2
218	11/20/2020 11:21	11:21 AM	70.7
219	11/20/2020 11:21	11:21 AM	65.9
220	11/20/2020 11:21	11:21 AM	61.6
221	11/20/2020 11:21	11:21 AM	66.3
222	11/20/2020 11:21	11:21 AM	72.1
223	11/20/2020 11:21	11:21 AM	72.9
224	11/20/2020 11:21	11:21 AM	63.5
225	11/20/2020 11:21	11:21 AM	55.5
226	11/20/2020 11:21	11:21 AM	52.6
227	11/20/2020 11:21	11:21 AM	57.0
228	11/20/2020 11:22	11:22 AM	57.6
229	11/20/2020 11:22	11:22 AM	67.8
230	11/20/2020 11:22	11:22 AM	63.6
231	11/20/2020 11:22	11:22 AM	76.8
232	11/20/2020 11:22	11:22 AM	73.7
233	11/20/2020 11:22	11:22 AM	66.6
234	11/20/2020 11:22	11:22 AM	62.3
235	11/20/2020 11:22	11:22 AM	73.5
236	11/20/2020 11:22	11:22 AM	74.6
237	11/20/2020 11:22	11:22 AM	73.4
238	11/20/2020 11:22	11:22 AM	65.1
239	11/20/2020 11:22	11:22 AM	58.0
240	11/20/2020 11:22	11:22 AM	78.5
241	11/20/2020 11:22	11:22 AM	73.9
242	11/20/2020 11:22	11:22 AM	66.8
243	11/20/2020 11:22	11:22 AM	61.1
244	11/20/2020 11:22	11:22 AM	58.6
245	11/20/2020 11:22	11:22 AM	56.6
246	11/20/2020 11:22	11:22 AM	63.8
247	11/20/2020 11:22	11:22 AM	70.0
248	11/20/2020 11:23	11:23 AM	59.7
249	11/20/2020 11:23	11:23 AM	51.5
250	11/20/2020 11:23	11:23 AM	54.6
251	11/20/2020 11:23	11:23 AM	71.5
252	11/20/2020 11:23	11:23 AM	75.9
253	11/20/2020 11:23	11:23 AM	75.0
254	11/20/2020 11:23	11:23 AM	78.3
255	11/20/2020 11:23	11:23 AM	71.2
256	11/20/2020 11:23	11:23 AM	62.5
257	11/20/2020 11:23	11:23 AM	56.0
258	11/20/2020 11:23	11:23 AM	58.2
259	11/20/2020 11:23	11:23 AM	68.8
260	11/20/2020 11:23	11:23 AM	68.7
261	11/20/2020 11:23	11:23 AM	59.3
262	11/20/2020 11:23	11:23 AM	53.8
263	11/20/2020 11:23	11:23 AM	55.6

264	11/20/2020 11:23	11:23 AM	61.5
265	11/20/2020 11:23	11:23 AM	69.2
266	11/20/2020 11:23	11:23 AM	83.1
267	11/20/2020 11:23	11:23 AM	76.4
268	11/20/2020 11:24	11:24 AM	65.6
269	11/20/2020 11:24	11:24 AM	60.4
270	11/20/2020 11:24	11:24 AM	59.0
271	11/20/2020 11:24	11:24 AM	56.7
272	11/20/2020 11:24	11:24 AM	59.4
273	11/20/2020 11:24	11:24 AM	82.3
274	11/20/2020 11:24	11:24 AM	72.1
275	11/20/2020 11:24	11:24 AM	63.0
276	11/20/2020 11:24	11:24 AM	76.1
277	11/20/2020 11:24	11:24 AM	77.9
278	11/20/2020 11:24	11:24 AM	69.0
279	11/20/2020 11:24	11:24 AM	72.0
280	11/20/2020 11:24	11:24 AM	69.1
281	11/20/2020 11:24	11:24 AM	63.0
282	11/20/2020 11:24	11:24 AM	59.0
283	11/20/2020 11:24	11:24 AM	64.3
284	11/20/2020 11:24	11:24 AM	68.7
285	11/20/2020 11:24	11:24 AM	81.4
286	11/20/2020 11:24	11:24 AM	81.1
287	11/20/2020 11:24	11:24 AM	73.4
288	11/20/2020 11:25	11:25 AM	71.8
289	11/20/2020 11:25	11:25 AM	67.8
290	11/20/2020 11:25	11:25 AM	65.8
291	11/20/2020 11:25	11:25 AM	69.8
292	11/20/2020 11:25	11:25 AM	63.2
293	11/20/2020 11:25	11:25 AM	72.3
294	11/20/2020 11:25	11:25 AM	62.0
295	11/20/2020 11:25	11:25 AM	52.4
296	11/20/2020 11:25	11:25 AM	48.3
297	11/20/2020 11:25	11:25 AM	45.5
298	11/20/2020 11:25	11:25 AM	51.0
299	11/20/2020 11:25	11:25 AM	64.0
300	11/20/2020 11:25	11:25 AM	65.8

Appendix C

Roadway Construction Noise Model (RCNM) Results and Modeled Equipment

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Repair Existing Pavement

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
285 Todd Road	Residential	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Jackhammer	Yes	20		88.9	65	0
Backhoe	No	40		77.6	65	0
Dump Truck	No	40		76.5	65	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Jackhammer	87	80	86	86	1	None
Backhoe	75	71	86	86	None	None
Dump Truck	74	70	86	86	None	None
Total	87	81	86	86	1	None

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Remove Existing Drainage Facilites

---- Receptor #2 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
311 Todd Road	Residential	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Jackhammer	Yes	20		88.9	55	0
Backhoe	No	40		77.6	55	0
Dump Truck	No	40		76.5	55	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Jackhammer	88	81	86	86	2	None
Backhoe	77	73	86	86	None	None
Dump Truck	76	72	86	86	None	None
Total	88	82	86	86	2	None

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Remove Existing Drainage Facilites

---- Receptor #3 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
246 Ghilotti Ave	Industrial	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Jackhammer	Yes	20		88.9	100	0
Backhoe	No	40		77.6	100	0
Dump Truck	No	40		76.5	100	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Jackhammer	83	76	86	86	None	None
Backhoe	72	68	86	86	None	None
Dump Truck	70	67	86	86	None	None
Total	83	77	86	86	None	None

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Signal Pole Foundations Excavate

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
285 Todd Road	Residential	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Dump Truck	No	40		76.5	65	0
Auger Drill Rig	No	20		84.4	65	0
Front End Loader	No	40		79.1	65	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Dump Truck	74	70	86	86	None	None
Auger Drill Rig	74	70	86	86	None	None
Front End Loader	78	75	86	86	None	None
Total	78	77	86	86	None	None

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Remove Existing Drainage Facilites

---- Receptor #2 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
311 Todd Road	Residential	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Dump Truck	No	40		76.5	55	0
Auger Drill Rig	No	20		84.4	55	0
Front End Loader	No	40		79.1	55	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Dump Truck	76	72	86	86	None	None
Auger Drill Rig	76	72	86	86	None	None
Front End Loader	80	76	86	86	None	None
Total	80	78	86	86	None	None

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Remove Existing Drainage Facilites

---- Receptor #3 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
246 Ghilotti Ave	Industrial	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Dump Truck	No	40		76.5	100	0
Auger Drill Rig	No	20		84.4	100	0
Front End Loader	No	40		79.1	100	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Dump Truck	70	67	86	86	None	None
Auger Drill Rig	78	71	86	86	None	None
Front End Loader	73	69	86	86	None	None
Total	78	74	86	86	None	None

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Remove Existing Drainage Facilites

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
285 Todd Road	Residential	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Dump Truck	No	40	76.5	76.5	65	0
Dump Truck	No	40	76.5	76.5	65	0
Excavator	No	40	80.7	80.7	65	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Dump Truck	74	70	86	86	None	None
Dump Truck	74	70	86	86	None	None
Excavator	78	75	86	86	None	None
Total	78	77	86	86	None	None

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Remove Existing Drainage Facilites

---- Receptor #2 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
311 Todd Road	Residential	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Dump Truck	No	40	76.5	76.5	55	0
Dump Truck	No	40	76.5	76.5	55	0
Excavator	No	40	80.7	80.7	55	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Dump Truck	76	72	86	86	None	None
Dump Truck	76	72	86	86	None	None
Excavator	80	76	86	86	None	None
Total	80	78	86	86	None	None

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2020
Case Description: Remove Existing Drainage Facilites

---- Receptor #3 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
246 Ghilotti Ave	Industrial	72	N/A	N/A

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Dump Truck	No	40	76.5	76.5	100	0
Dump Truck	No	40	76.5	76.5	100	0
Excavator	No	40	80.7	80.7	100	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)		Noise Limit Exceedance (dBA)	
	*Lmax	Leq	Day		Day	
			Lmax	Leq	Lmax	Leq
Dump Truck	70	67	86	86	None	None
Dump Truck	70	67	86	86	None	None
Excavator	75	71	86	86	None	None
Total	75	73	86	86	None	None

*Calculated Lmax is the Loudest value.