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SUBJECT: Construction Noise Evaluation for the Master Drainage Plan – Storm Drain Improvement Project (Pennsylvania Avenue and 6th Street City of Beaumont CA

The firm of Ldn Consulting is pleased to submit the following noise analysis for the proposed Master Drainage Plan (MDP) Storm Drain Improvement Project in the City of Beaumont CA. The purpose of the noise evaluation is to examine the construction noise conditions for the MDP Storm Drain Improvement construction and recommend reduction measures, if needed, for compliance with the City of Beaumont Noise standards, plans and policy goals for noise.

Project Location/Description

The Proposed Project would construct approximately 5,000 linear feet of 84-in to 102-inch RCP along 6th Street, Pennsylvania Avenue, and East 1st Street in the City to handle anticipated future flows. Manholes would be constructed for maintenance access at intervals of no more than 500 feet at the end of each line. Additional components to be installed include inlets and outlets to facilitate efficient entry and exit from the system. The RCP would feature grated openings to prevent the accumulation of debris. Some RCP demolition would occur but most of the existing structures would be protected. Approximately 13,000 cubic yards of material will be removed from the site to allow for the installation of the RCP and subgrade and approximately 5,000 cubic yards of material will be brought back to backfill and build up the structure necessary to reconstruct the roads.

The Proposed Project would include traffic control measures such as signs, barriers, and flaggers to ensure safety and maintain vehicle and pedestrian access along the right-of-way. Best management practices (BMPs) would include basins and silt fences to address soil erosion and protect water quality during construction. The affected right-of-way would be restored after installation of the RCP. The RCP would be installed at a depth no greater than 25 feet to allow for future construction and improvements in the area. Construction is anticipated to commence in the summer of 2025 and conclude in the spring of 2026.

Figure 1: Project Vicinity

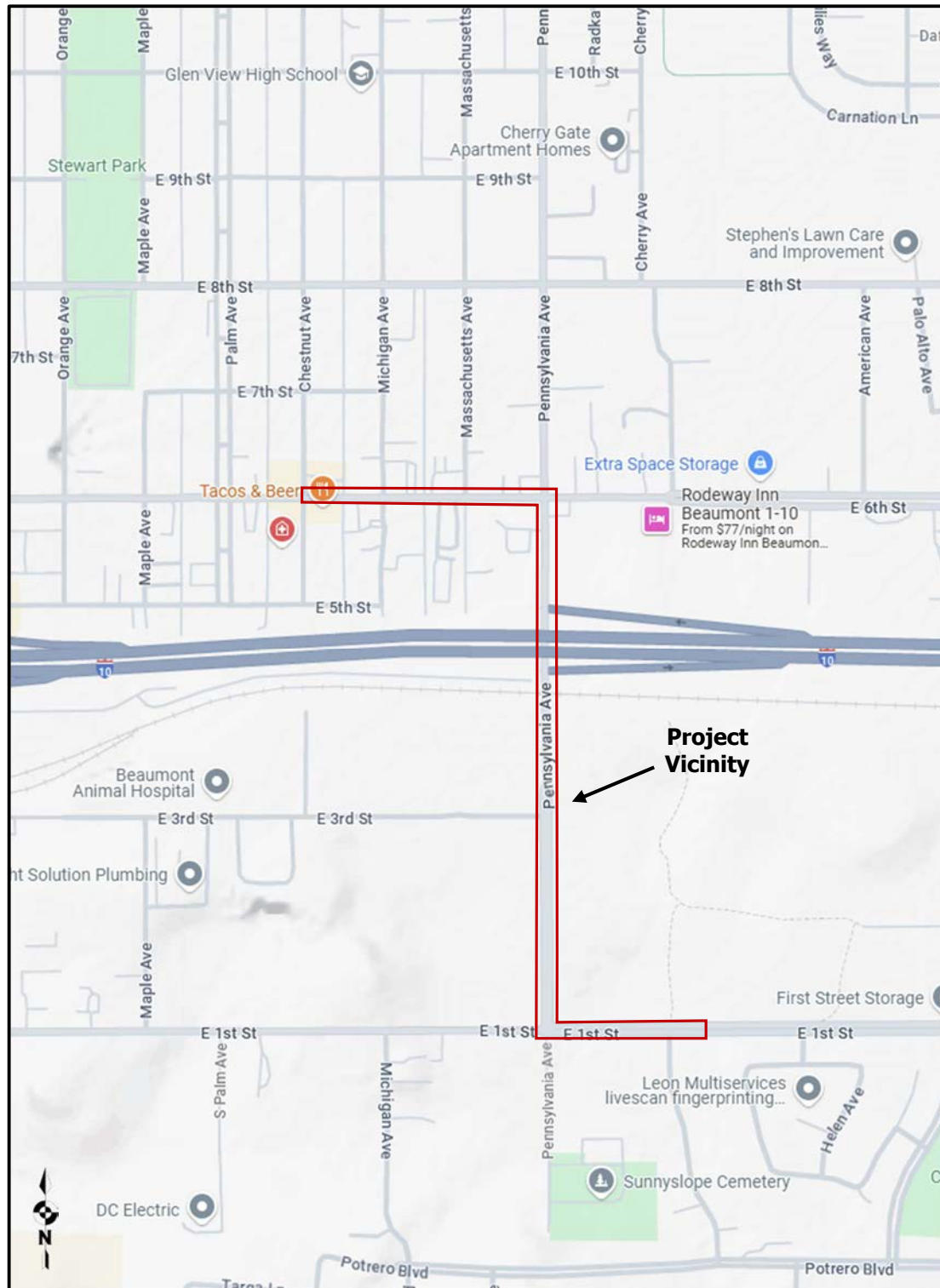
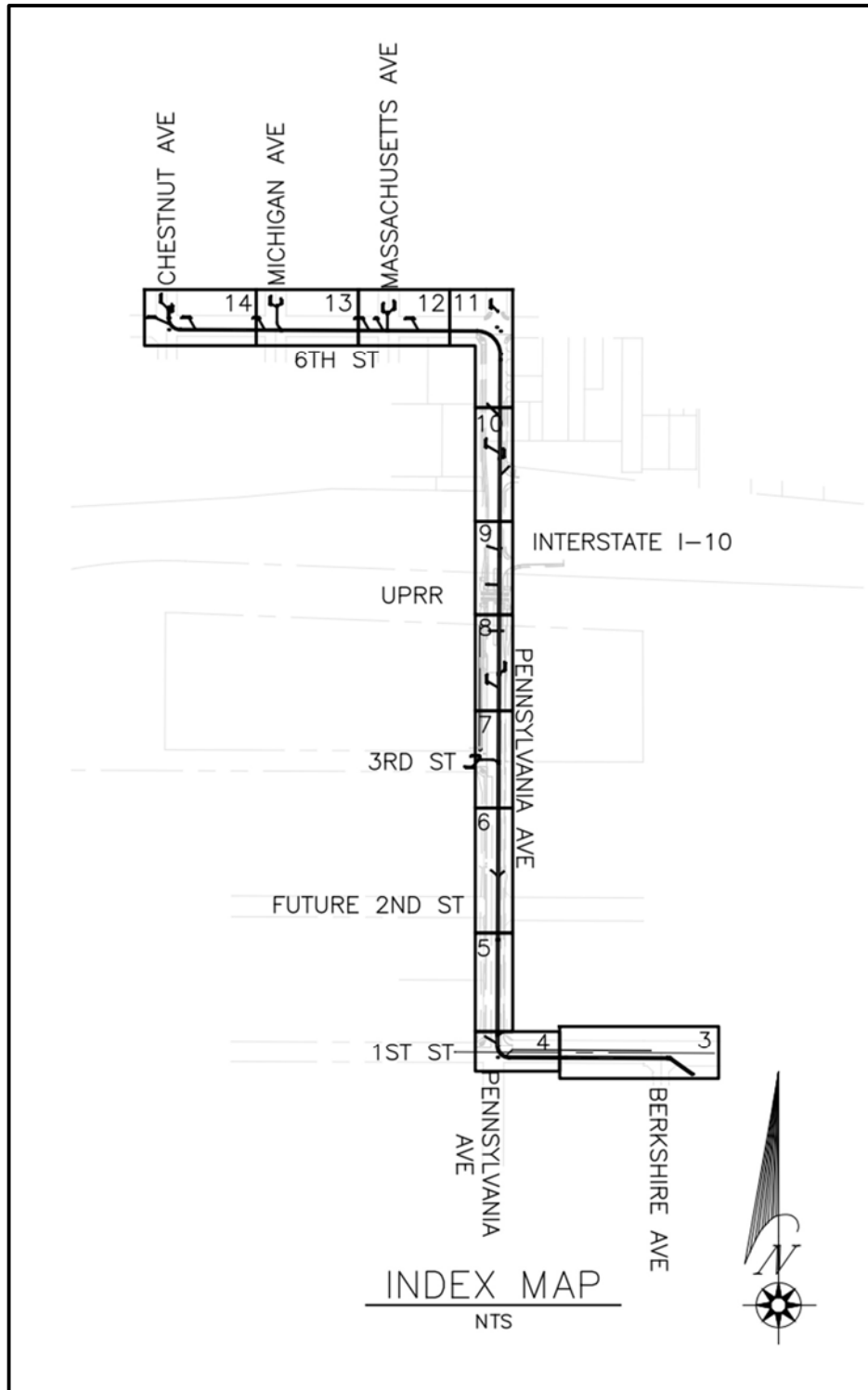


Figure 2: Proposed Project Configuration



Background

Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel (dB). The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies.

The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as Leq represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval.

Sound from a localized source (a "point" source) radiates uniformly outward as it travels away from the source. The sound level attenuates or drops-off at a rate of 6 dBA for each doubling of distance. A drop-off rate of 6 dBA per doubling of distance was used for this piece of equipment. For example, a noise level of 75 dBA measured at 50 feet from the noise source to the receptor would be reduced to 69 dBA at 100 feet from the source to the receptor and reduced to 63 dBA at 200 feet from the source.

City of Beaumont Thresholds of Significance

The Beaumont Municipal Code (MC) establishes the following provisions for noise relative to the proposed Project:

Section 9.02.110 – Special Provisions

F. Construction, Landscape. Maintenance or Repair

1. It shall be unlawful for any person to engage in or permit the generation of noise related to landscape maintenance, construction including erection, excavation, demolition, alteration or repair of any structure or improvement, at such sound levels, as measured at the property line of the nearest adjacent occupied property, as to be in excess of the sound levels permitted under this Chapter, at other times than between the hours of 7:00 a.m. and 6:00 p.m. The person engaged in such activity is hereby permitted to exceed sound levels otherwise set forth in this Chapter for the duration of the activity during the above described hours for purposes of construction. However, nothing contained herein shall permit any person to cause sound levels to at any time exceed 55 dB(A) for intervals of more than 15 minutes per hour as measured in the interior of the nearest occupied residence or school.

2. Whenever a construction site is within one-quarter of a mile of an occupied residence or residences, no construction activities shall be undertaken between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May. Exceptions to these standards shall be allowed only with the written consent of the building official.

Methodology and Assumptions

Construction noise levels were based on typical noise levels generated by construction equipment published by the FTA and the FHWA. Construction noise is assessed in dBA Leq. This unit is appropriate because Leq can be used to describe noise level from operation of each piece of equipment separately, and levels can be combined to represent the noise level from all equipment operating during a given period. Construction noise modeling was conducted using the FHWA Roadway Construction Noise Model (RCNM).

Reference noise levels are used to estimate operational noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise). Noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

The City of Beaumont does not establish quantitative construction noise standards; therefore, this analysis conservatively uses the FTA's threshold of 80 dBA (8-hour Leq) for residential uses and 90 dBA (8-hour Leq) for non-residential uses to evaluate construction noise impacts.

Construction Noise Findings

The proposed storm drain line will start at the southeast corner of 1st Street and Berkshire Avenue, within the existing graded open channel. The remainder of the storm drain would be located within the street right-of-way, beginning along 1st Street. Construction of the storm drain line would require excavation, pipeline construction, and paving.

Construction activities are only expected to be in close proximity to residential uses for the portion of the line that ties into the existing graded open channel at the southeast corner of 1st Street and Berkshire Avenue. The land uses along the portions of the line along Pennsylvania Avenue and 6th Street are primarily retail and commercial.

Noise levels along the line are linear and the equipment will be moving near the residences at an average distance of 50 feet while working within the open channel. Once within the street right-of-way, construction will be located a minimum 90 feet from the existing residences. The amount of equipment utilized would be limited due to alignment and work area constraints, therefore, it is expected that only one piece of equipment could be working in one area at any given time. Not all the equipment will operate continuously over an 8-hour period, the equipment will be utilized on an as-needed basis.

As can be seen in Table 1 below, at a distance as close as 50 feet, the anticipated worst-case noise level would be below the FTA's 80 dBA Leq 8-hour standard at the nearest residential property lines. Additionally, the equipment will be moving linearly along the length of the line, therefore, the noise levels are expected to be lower. Therefore, no construction noise impacts are anticipated and no mitigation measures are required.

Table 1: Construction Noise Levels

Construction Equipment	Quantity	Source Level @ 50-Foot (dBA)*	Duty Cycle (Percent Utilized)	8-Hour Noise Level @ Property Line (dBA)
Linear, Excavation and Export				
Off-Highway Trucks	1	75	40%	71.0
Excavators	1	77	40%	73.0
Concrete/Industrial Saws	1	83	40%	79.0
Skid Steer Loaders	1	74	40%	70.0
Linear, Set Drainage Piping Network & Sub-Grade Construction including Material Import				
Skid Steer Loaders	1	74	40%	70.0
Excavators	1	77	40%	73.0
Tractors/Loaders/Backhoes	1	75	40%	71.0
Plate Compactors	1	74	40%	70.0
Off-Highway Trucks	1	75	40%	71.0
Linear, Asphalt Paving Placement				
Off-Highway Trucks	1	75	40%	71.0
Rollers	1	77	40%	73.0
Pavers	1	79	40%	75.0
Paving Equipment	1	78	40%	74.0
*Source: DEFRA 2006 and Empirical Data				

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Conclusions

Based upon the calculations of the noise levels when construction equipment is located near the closest noise sensitive land uses, the average noise levels would not exceed the 80 dBA 8-hour standard and no impacts will occur and no mitigation measures are required.

Project construction noise levels are considered exempt if activities do not occur within the hours specified in the City of Beaumont Municipal Code, Section 9.02.030 of 6:00 p.m. and 6:00 a.m. during the months of June through September and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May unless approval is obtained from the City Building Official or City Engineer.

At the time of this analysis, no Project construction activity is planned outside of the specified hours. Therefore, no impacts are anticipated and no mitigation is required during construction of the proposed Project. Additionally, all equipment should be properly fitted with mufflers and all staging and maintenance should be conducted as far away from the existing residence as possible.

Sincerely,

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Jeremy Loudon, Principal