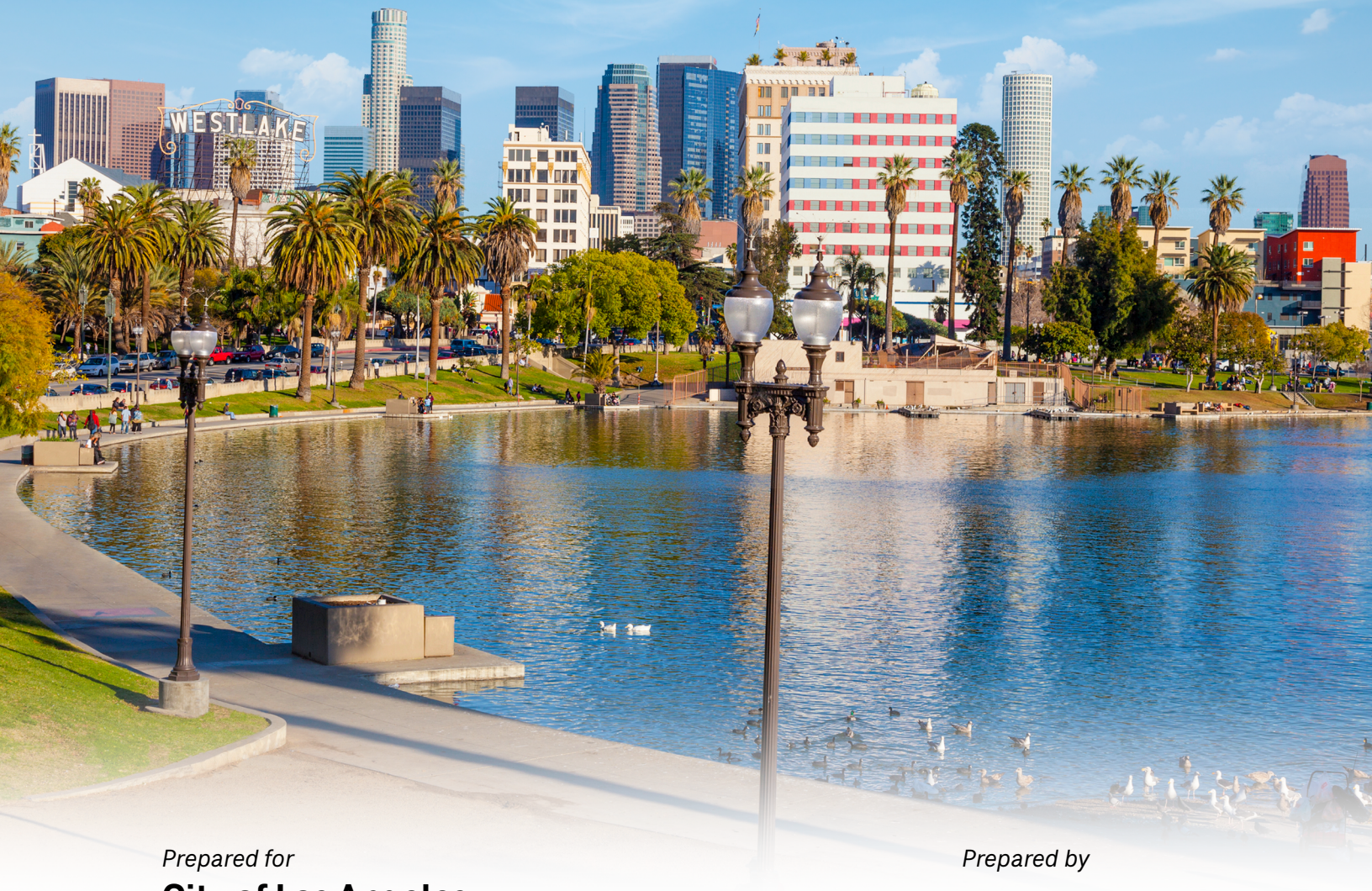
MacArthur Lake Stormwater Capture Project

# Draft Environmental Impact Report

**Appendix F** | Noise and Vibration Calculations




*Prepared for*

**City of Los Angeles**

environment LASANITATION
CITY OF LOS ANGELES
zero waste • zero wasted water

*Prepared by*

CDM Smith

State Clearinghouse No. 2022040153 | **May 2024**

# Appendix F
# Noise and Vibration Calculations

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**Construction Noise - Equipment**

**8-Hour Construction Noise Level at 50 Feet (dBA)**

**INDIVIDUAL CONTRIBUTIONS TO TOTALS**

| Construction Area | Equipment Description | RCNM Equipment Types | Usage Factor | Equipment Lmax @ 50' | Equipment Leq(h) @ 50' | Number of Equipment | Add to Single Source Level (dBA) | Total Lmax @ 50' | Total Leq(h) @ 50' | Total Lmax @ 50' | Total Leq(h) @ 50' |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lake Street *incl. installation of the diversion structure, drain-line upgrade, pretreatment unit, pump station, actuated valve and meter vaults, and installation of pipeline along Lake Street and crossing 7th Street into MacArthur Park* | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 | 6.31E+07 | 2.52E+07 |
| | Concrete Truck | Concrete Mixer Truck | 40% | 79 | 75 | 1 | 0 | 79 | 75 | 7.94E+07 | 3.18E+07 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 | 3.98E+07 | 1.59E+07 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 2 | 3 | 78 | 74 | 6.32E+07 | 2.53E+07 |
| | Asphalt Milling Machine | Pavement Scarifier | 20% | 90 | 83 | 1 | 0 | 90 | 83 | 1.00E+09 | 2.00E+08 |
| | Crane | Crane | 16% | 81 | 73 | 1 | 0 | 81 | 73 | 1.26E+08 | 2.01E+07 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 | 1.26E+08 | 5.04E+07 |
| | Paving Equipment | Roller | 20% | 80 | 73 | 1 | 0 | 80 | 73 | 1.00E+08 | 2.00E+07 |
| | | | | | | | **Lake Street Total** | **92** | **86** | | |
| Grand View Street *incl. installation of pipeline along Grand View Street and crossing 7th Street into MacArthur Park* | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 | 6.31E+07 | 2.52E+07 |
| | Concrete Truck | Concrete Mixer Truck | 40% | 79 | 75 | 1 | 0 | 79 | 75 | 7.94E+07 | 3.18E+07 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 | 3.98E+07 | 1.59E+07 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 1 | 0 | 75 | 71 | 3.16E+07 | 1.26E+07 |
| | Asphalt Milling Machine | Pavement Scarifier | 20% | 90 | 83 | 1 | 0 | 90 | 83 | 1.00E+09 | 2.00E+08 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 | 1.26E+08 | 5.04E+07 |
| | Paving Equipment | Roller | 20% | 80 | 73 | 1 | 0 | 80 | 73 | 1.00E+08 | 2.00E+07 |
| | | | | | | | **Grand View Street Total** | **92** | **86** | | |
| MacArthur Park (Pipeline) *incl. installation of pipeline along 7th Street within MacArthur Park and connection to the* wetlands area | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 | 6.31E+07 | 2.52E+07 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 | 3.98E+07 | 1.59E+07 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 1 | 0 | 75 | 71 | 3.16E+07 | 1.26E+07 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 | 1.26E+08 | 5.04E+07 |
| | | | | | | | **MacArthur Park (Pipeline) Total** | **84** | **80** | | |
| MacArthur Park (Treatment Structures) *incl. installation of pipeline along treatment structures within MacArthur Park* | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 | 6.31E+07 | 2.52E+07 |
| | Concrete Truck | Concrete Mixer Truck | 40% | 79 | 75 | 1 | 0 | 79 | 75 | 7.94E+07 | 3.18E+07 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 | 3.98E+07 | 1.59E+07 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 1 | 0 | 75 | 71 | 3.16E+07 | 1.26E+07 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 | 1.26E+08 | 5.04E+07 |
| | | | | | | | **MacArthur Park (Treatment Structures) Total** | **85** | **81** | | |
| MacArthur Park (Treatment Wetlands) *incl. installation of the wetlands* | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 | 6.31E+07 | 2.52E+07 |
| | Concrete Truck | Concrete Mixer Truck | 40% | 79 | 75 | 1 | 0 | 79 | 75 | 7.94E+07 | 3.18E+07 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 | 3.98E+07 | 1.59E+07 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 1 | 0 | 75 | 71 | 3.16E+07 | 1.26E+07 |
| | Bulldozer | Front End Loader | 40% | 79 | 75 | 1 | 0 | 79 | 75 | 7.94E+07 | 3.18E+07 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 | 1.26E+08 | 5.04E+07 |
| | | | | | | | **MacArthur Park (Treatment Wetlands) Total** | **86** | **82** | | |

**8-Hour Construction Noise Level Summary at the Receptor (dBA)**

| Noise-Sensitive Use | Distance from Loudest Construction Activity to a Receptor (ft) | 8-Hour Construction Noise Level at the Receptor (dBA) | Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | Daytime Increase Over Existing (dBA) | Significant? |
|---|---|---|---|---|---|
| The American Cement Building Apartments | 315 | 66 | 67 | 7 | Yes |
| Parkview Terrace Apartments | 265 | 68 | 68 | 8 | Yes |
| Iglesia Pentecostes Unidos Por Cristo | 335 | 65 | 67 | 7 | Yes |
| 2416-2422 W. 7th St. Residence | 310 | 66 | 67 | 7 | Yes |
| Churchill Lofts Apartments | 280 | 67 | 68 | 8 | Yes |
| MacArthur Park Visual and Performing Arts Elementary | 25 | 92 | 92 | 32 | Yes |
| LA New Times Western School/LA Onnuri Community Church | 175 | 74 | 75 | 15 | Yes |
| Grand View Street Residences | 35 | 89 | 89 | 29 | Yes |
| Cristo Salva Bilingual Church | 75 | 82 | 82 | 22 | Yes |
| La Vina En Los Angeles | 19 | 94 | 94 | 34 | Yes |
| Southeast Park Unhoused Population | 250 | 72 | 72 | 12 | Yes |
| MacArthur Park | -- | -- | -- | -- | Yes |

**Construction Noise - Equipment**

**8-Hour Construction Noise Level at the Receptor (dBA) - The American Cement Building Apartments**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 1035 | 725 | 385 | 555 | 315 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 26.3 | 23.2 | 17.7 | 20.9 | 16.0 |
| Atmospheric Attenuation (dBA) | 0.85 | 0.60 | 0.32 | 0.46 | 0.26 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 59 | 62 | 62 | 60 | 66 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 62 | 64 | 64 | 63 | 67 |
| Daytime Increase Over Existing (dBA) | 2 | 4 | 4 | 3 | 7 |
| Significant? | No | No | No | No | Yes |

**8-Hour Construction Noise Level at the Receptor (dBA) - Parkview Terrace Apartments**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 945 | 585 | 290 | 415 | 265 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 25.5 | 21.4 | 15.3 | 18.4 | 14.5 |
| Atmospheric Attenuation (dBA) | 0.78 | 0.48 | 0.24 | 0.34 | 0.22 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 60 | 64 | 65 | 63 | 68 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 63 | 65 | 66 | 65 | 68 |
| Daytime Increase Over Existing (dBA) | 3 | 5 | 6 | 5 | 8 |
| Significant? | No | Yes | Yes | No | Yes |

**8-Hour Construction Noise Level at the Receptor (dBA) - Iglesia Pentecostes Unidos Por Cristo**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 875 | 530 | 320 | 375 | 335 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 24.9 | 20.5 | 16.1 | 17.5 | 16.5 |
| Atmospheric Attenuation (dBA) | 0.72 | 0.44 | 0.26 | 0.31 | 0.28 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 60 | 65 | 64 | 64 | 65 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 63 | 66 | 65 | 65 | 67 |
| Daytime Increase Over Existing (dBA) | 3 | 6 | 5 | 5 | 7 |
| Significant? | No | Yes | Yes | Yes | Yes |

**8-Hour Construction Noise Level at the Receptor (dBA) - 2416-2422 W. 7th St. Residence**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 825 | 480 | 280 | 325 | 310 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 24.3 | 19.6 | 15.0 | 16.3 | 15.8 |
| Atmospheric Attenuation (dBA) | 0.68 | 0.40 | 0.23 | 0.27 | 0.26 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 61 | 65 | 65 | 65 | 66 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 63 | 67 | 66 | 66 | 67 |
| Daytime Increase Over Existing (dBA) | 3 | 7 | 6 | 6 | 7 |
| Significant? | No | Yes | Yes | Yes | Yes |

**Construction Noise - Equipment**

**8-Hour Construction Noise Level at the Receptor (dBA) - Churchill Lofts Apartments**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 775 | 430 | 235 | 275 | 280 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 23.8 | 18.7 | 13.4 | 14.8 | 15.0 |
| Atmospheric Attenuation (dBA) | 0.64 | 0.35 | 0.19 | 0.23 | 0.23 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 61 | 66 | 67 | 66 | 67 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 64 | 67 | 67 | 67 | 68 |
| Daytime Increase Over Existing (dBA) | 4 | 7 | 7 | 7 | 8 |
| Significant? | No | Yes | Yes | Yes | Yes |

**8-Hour Construction Noise Level at the Receptor (dBA) - MacArthur Park Visual and Performing Arts Elementary**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 375 | 25 | 95 | 100 | 245 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 17.5 | -6.0 | 5.6 | 6.0 | 13.8 |
| Atmospheric Attenuation (dBA) | 0.31 | 0.02 | 0.08 | 0.08 | 0.20 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 68 | 92 | 75 | 75 | 68 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 69 | 92 | 75 | 75 | 69 |
| Daytime Increase Over Existing (dBA) | 9 | 32 | 15 | 15 | 9 |
| Significant? | Yes | Yes | Yes | Yes | Yes |

**8-Hour Construction Noise Level at the Receptor (dBA) - LA New Times Western School/LA Onnuri Community Church**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 425 | 175 | 450 | 465 | 620 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 18.6 | 10.9 | 19.1 | 19.4 | 21.9 |
| Atmospheric Attenuation (dBA) | 0.35 | 0.14 | 0.37 | 0.38 | 0.51 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 67 | 74 | 61 | 62 | 60 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 68 | 75 | 63 | 64 | 63 |
| Daytime Increase Over Existing (dBA) | 8 | 15 | 3 | 4 | 3 |
| Significant? | Yes | Yes | No | No | No |

**8-Hour Construction Noise Level at the Receptor (dBA) - Grand View Street Residences**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 185 | 35 | 245 | 315 | 505 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 11.4 | -3.1 | 13.8 | 16.0 | 20.1 |
| Atmospheric Attenuation (dBA) | 0.15 | 0.03 | 0.20 | 0.26 | 0.42 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 74 | 89 | 66 | 65 | 62 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 75 | 89 | 67 | 66 | 64 |
| Daytime Increase Over Existing (dBA) | 15 | 29 | 7 | 6 | 4 |
| Significant? | Yes | Yes | Yes | Yes | No |

**Construction Noise - Equipment**

**8-Hour Construction Noise Level at the Receptor (dBA) - Cristo Salva Bilingual Church**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 230 | 75 | 90 | 240 | 415 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 13.3 | 3.5 | 5.1 | 13.6 | 18.4 |
| Atmospheric Attenuation (dBA) | 0.19 | 0.06 | 0.07 | 0.20 | 0.34 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 72 | 82 | 75 | 68 | 64 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 73 | 82 | 75 | 68 | 65 |
| Daytime Increase Over Existing (dBA) | 13 | 22 | 15 | 8 | 5 |
| Significant? | Yes | Yes | Yes | Yes | Yes |

**8-Hour Construction Noise Level at the Receptor (dBA) - La Vina En Los Angeles**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 19 | 385 | 240 | 585 | 755 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | -8.5 | 17.7 | 13.6 | 21.4 | 23.6 |
| Atmospheric Attenuation (dBA) | 0.02 | 0.32 | 0.20 | 0.48 | 0.62 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 94 | 67 | 66 | 59 | 58 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 94 | 68 | 67 | 63 | 62 |
| Daytime Increase Over Existing (dBA) | 34 | 8 | 7 | 3 | 2 |
| Significant? | Yes | Yes | Yes | No | No |

**8-Hour Construction Noise Level at the Receptor (dBA) - Southeast Park Unhoused Population**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 250 | 615 | 245 | 745 | 865 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 14.0 | 21.8 | 13.8 | 23.5 | 24.8 |
| Atmospheric Attenuation (dBA) | 0.21 | 0.51 | 0.20 | 0.61 | 0.71 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 72 | 63 | 66 | 57 | 57 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 72 | 65 | 67 | 62 | 62 |
| Daytime Increase Over Existing (dBA) | 12 | 5 | 7 | 2 | 2 |
| Significant? | Yes | No | Yes | No | No |

**8-Hour Construction Noise Level at the Receptor (dBA) - MacArthur Park**

| Phase Type | Lake Street | Grand View Street | MacArthur Park (Pipeline) | MacArthur Park (Treatment Structures) | MacArthur Park (Treatment Wetlands) |
|---|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 630 | 605 | 335 | 380 | 420 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 86 | 86 | 80 | 81 | 82 |
| Distance Divergence (dBA) | 22.0 | 21.7 | 16.5 | 17.6 | 18.5 |
| Atmospheric Attenuation (dBA) | 0.52 | 0.50 | 0.28 | 0.31 | 0.35 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 63 | 63 | 63 | 63 | 63 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 65 | 65 | 65 | 65 | 65 |
| Daytime Increase Over Existing (dBA) | 5 | 5 | 5 | 5 | 5 |
| Significant? | Yes | Yes | Yes | Yes | Yes |

Minimum Daytime Unmitigated Leq (Construction Noise + Existing) (dBA)

County
Los Angeles

Existing Noise Levels
Land Use Type: Urban Residential
Background Noise (dBA): 60

Significance Level
5 dBA *(daytime increase over existing noise levels)*
*Reference: Significance threshold based on L.A. CEQA Thresholds Guide criteria*
*"A project would normally have a significant impact on noise levels from construction if... construction activities lasting more than 10 days in a three month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise sensitive use..."*

## Construction Noise - Traffic

**Construction Vehicles - Equivalent Noise Levels**

| Roadway | Existing AADT | Maximum Daily Truck Hauling Trips | Maximum Daily Worker Trips | Speed (mph) | Equivalency Factor for Heavy-Duty Vehicles | Equivalent Vehicles | Total With Project | Increase Ratio |
|---|---|---|---|---|---|---|---|---|
| 6th Street at Lake Street | 26,002 | 24 | 13 | 55 | 10.4 | 263 | 26,265 | 1.01 |
| 7th Street at Parkview Street | 5,909 | 24 | 13 | 55 | 10.4 | 263 | 6,172 | 1.04 |
| 8th Street at Alvarado Street | 21,122 | 24 | 13 | 55 | 10.4 | 263 | 21,385 | 1.01 |
| Alvarado Street at 3rd Street | 33,944 | 24 | 13 | 55 | 10.4 | 263 | 34,207 | 1.01 |
| Alvarado Street at Wilshire Boulevard | 24,385 | 24 | 13 | 55 | 10.4 | 263 | 24,648 | 1.01 |
| Alvarado Street at 6th Street | 22,035 | 24 | 13 | 55 | 10.4 | 263 | 22,298 | 1.01 |
| Alvarado Street at Olympic Boulevard | 27,297 | 24 | 13 | 55 | 10.4 | 263 | 27,560 | 1.01 |
| Pico Boulevard at Alvarado Street | 18,433 | 24 | 13 | 55 | 10.4 | 263 | 18,696 | 1.01 |
| Vermont Avenue at Venice Boulevard | 25,077 | 24 | 13 | 55 | 10.4 | 263 | 25,340 | 1.01 |
| State Route 110 at 5th Street/6th Street | 516,000 | 24 | 13 | 55 | 10.4 | 263 | 516,263 | 1.00 |
| Note: | | | | | | | **Maximum** | **1.04** |
| *Impacts would be significant if traffic volume changes would result in a 5 dBA or higher increase to ambient noise* | | | | | | | **Significant?** | **No** |
| *Doubling of the noise source produces only a 3 dB increase, which is a barely perceptible change; therefore, there would be no audible change in traffic noise* | | | | | | | | |

References:

*FHWA. 2011. Highway Traffic Noise: Analysis and Abatement Guidance.*

*Navigate LA - LADOT Traffic Data*

*California Department of Transportation. Traffic Census Program 2020 AADT. Available: https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/census/aadt/2020-traffic-volumes.xlsx*

*Maximum daily truck hauling trips are for the **pump station** construction task. See Pump Station caleemod outputs (sheet pump-station-caleemod)*

## Noise Reductions from Mitigation Measures

| Mitigation Type | Reduction (dBA) |
|---|---|
| Noise barrier or other obstruction just barely breaks the line-of-sight between the noise source and the receptor | 3 |
| Noise source completely shielded by a building | 15 |
| Noise source completely enclosed or completely shielded with solid barrier located close to the source | 8 |
| Enclosure and/or barrier with some gaps | 5 |
| Noise source completely enclosed and completely shielded with a solid barrier located close to the source | 10 |
| Noise source enclosed or shielded with heavy vinyl noise curtain material | 5 |

Source

*FHWA. RCNM User's Guide Appendix A Best Practices for Calculating Estimated Shielding for Use in the RCNM*

**Atmospheric Attenuation**

| **Assumptions** | **Los Angeles** |
|---|---|
| Ambient pressure (kPa) | 101.3 |
| Temperature (F) | 68 |
| Relative humidity (%) | 90 |
| Frequency of noise source (Hz) | 500 |
| **Air Attenuation Coefficient (α, dB/km)** | 2.7 |
| **Air Attenuation Coefficient (α, dB/ft)** | 0.0008 |

$A_{air} = \alpha d$

Weather in Los Angeles County

| | | |
|---|---|---|
| Average temperature | 64.2 | °F |
| Average relative humidity | 79.23 | % |

*Reference:*

*Harris, Cyril M. 1998. Handbook of Acoustical Measurements and Noise Control. 3rd ed. - Chapter 3 Calculation of Attenuation*
*http://www.usa.com/los-angeles-county-ca-weather.htm*

**Equipment noise emissions and acoustical usage factors database**

| Equipment Description | Impact Device? | Acoustical Use Factor | Spec 721.560 Lmax @ 50ft (dBA, slow) | Actual Measured Lmax @ 50 ft (dBA, slow) |
|---|---|---|---|---|
| All Other Equipment > 5 hp | No | 50% | 85 | N/A |
| Auger Drill Rig | No | 20% | 85 | 84 |
| Backhoe | No | 40% | 80 | 78 |
| Bar Bender | No | 20% | 80 | N/A |
| Blasting | Yes | 1% | 94 | N/A |
| Boring Jack Power Unit | No | 50% | 80 | 83 |
| Chain Saw | No | 20% | 85 | 84 |
| Clam Shovel (dropping) | Yes | 20% | 93 | 87 |
| Compactor (ground) | No | 20% | 80 | 83 |
| Compressor (air) | No | 40% | 80 | 78 |
| Concrete Batch Plant | No | 15% | 83 | N/A |
| Concrete Mixer Truck | No | 40% | 85 | 79 |
| Concrete Pump Truck | No | 20% | 82 | 81 |
| Concrete Saw | No | 20% | 90 | 90 |
| Crane | No | 16% | 85 | 81 |
| Dozer | No | 40% | 85 | 82 |
| Drill Rig Truck | No | 20% | 84 | 79 |
| Drum Mixer | No | 50% | 80 | 80 |
| Dump Truck | No | 40% | 84 | 76 |
| Excavator | No | 40% | 85 | 81 |
| Flat Bed Truck | No | 40% | 84 | 74 |
| Front End Loader | No | 40% | 80 | 79 |
| Generator | No | 50% | 82 | 81 |
| Generator (<25KVA, VMS signs) | No | 50% | 70 | 73 |
| Gradall | No | 40% | 85 | 83 |
| Grader | No | 40% | 85 | N/A |
| Grapple (on backhoe) | No | 40% | 85 | 87 |
| Horizontal Boring Hydr. Jack | No | 25% | 80 | 82 |
| Hydra Break Ram | Yes | 10% | 90 | N/A |
| Impact Pile Driver | Yes | 20% | 95 | 101 |
| Jackhammer | Yes | 20% | 85 | 89 |
| Man Lift | No | 20% | 85 | 75 |
| Mounted Impact Hammer (hoe ram) | Yes | 20% | 90 | 90 |
| Pavement Scarifier | No | 20% | 85 | 90 |
| Paver | No | 50% | 85 | 77 |
| Pickup Truck | No | 40% | 55 | 75 |
| Pneumatic Tools | No | 50% | 85 | 85 |
| Pumps | No | 50% | 77 | 81 |
| Refrigerator Unit | No | 100% | 82 | 73 |
| Rivit Buster/Chipping Gun | Yes | 20% | 85 | 79 |
| Rock Drill | No | 20% | 85 | 81 |
| Roller | No | 20% | 85 | 80 |
| Sand Blasting (Single Nozzle) | No | 20% | 85 | 96 |
| Scraper | No | 40% | 85 | 84 |
| Shears (on backhoe) | No | 40% | 85 | 96 |
| Slurry Plant | No | 100% | 78 | 78 |
| Slurry Trenching Machine | No | 50% | 82 | 80 |
| Soil Mix Drill Rig | No | 50% | 80 | N/A |
| Tractor | No | 40% | 84 | N/A |
| Vacuum Excavator (vac-truck) | No | 40% | 85 | 85 |
| Vacuum Street Sweeper | No | 10% | 80 | 82 |
| Ventilation Fan | No | 100% | 85 | 79 |
| Vibrating Hopper | No | 50% | 85 | 87 |
| Vibratory Concrete Mixer | No | 20% | 80 | 80 |
| Vibratory Pile Driver | No | 20% | 95 | 101 |
| Warning Horn | No | 5% | 85 | 83 |
| Welder/Torch | No | 40% | 73 | 74 |

Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power. In case of

*FHWA. RCNM User's Guide - Table 1. CA/T equipment noise emissions and acoustical usage factors database.*

## Average Ambient Noise Levels for Various Land Uses

| Land Use Description | Average Ldn (dBA) | Daytime Leq (dBA) | Nighttime Leq (dBA) |
|---|---|---|---|
| Wilderness | 35 | 35 | 25 |
| Rural Residential | 40 | 40 | 30 |
| Quiet Suburban Residential | 50 | 50 | 40 |
| Normal Suburban Residential | 55 | 55 | 45 |
| Urban Residential | 60 | 60 | 50 |
| Noisy Urban Residential | 65 | 65 | 55 |
| Very Noisy Urban Residential | 70 | 70 | 60 |

Source:
U.S. EPA, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an A

Notes:
The LA City ZIMAS model indicates that the land-use in the immediate vicinity of the project is zoned as "P" (Park) or "C2" (Light Commercial) with minimal areas zoned "R2" (Residential). The LA City noise ordinance indicates that the presumed noise level for these areas would be 60 dBA, consistent with the USEPA urban residential daytime Leq of 60 dBA.

**Number of Equivalent Vehicles as a Function of Vehicle Type and Speed Based on TNM Reference Energy Mean Emission Levels**

| Speed (km/h [mph]) | | Equivalent Vehicles | | |
|---|---|---|---|---|
| | | 1 Heavy Truck | 1 Medium Truck | 1 Auto |
| 56 | (35) | 19.1 | 7.1 | 1 |
| 64 | (40) | 15.1 | 5.8 | 1 |
| 72 | (45) | 12.9 | 5 | 1 |
| 80 | (50) | 11.5 | 4.5 | 1 |
| 88.5 | (55) | 10.4 | 4.1 | 1 |
| 97 | (60) | 9.6 | 3.7 | 1 |
| 105 | (65) | 8.9 | 3.5 | 1 |
| 113 | (70) | 8.3 | 3.2 | 1 |

Source:
*California Department of Transportation (Caltrans). Technical Noise Supplement to the Traffic Noise Analysis Protocol. September 2013.*

# Construction Vibration Structural

**Significance Thresholds**

*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for vibration damage. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Structural Results**

| Construction Area | Southern California Surgery Center | Jimenez Arcade | La Vina En Los Angeles | 2228 7th Street Building | MacArthur Park Visual and Performing Arts Elementary | Grand View Street Residences |
|---|---|---|---|---|---|---|
| Lake Street | 0.404 | 0.551 | 0.320 | 0.006 | 0.004 | 0.010 |
| Grand View Street | 0.006 | 0.003 | 0.003 | 0.127 | 0.210 | 0.127 |
| MacArthur Park (Pipeline) | 0.014 | 0.013 | 0.003 | 0.013 | 0.012 | 0.003 |
| MacArthur Park (Treatment Structures) | 0.001 | 0.001 | 0.001 | 0.004 | 0.011 | 0.002 |
| MacArthur Park (Treatment Wetlands) | 0.001 | 0.001 | 0.001 | 0.002 | 0.003 | 0.001 |
| **Maximum** | 0.404 | 0.551 | 0.320 | **0.127** | **0.210** | **0.127** |
| Caltrans Building Category | fragile structures | fragile structures | fragile structures | fragile structures | modern industrial or commercial structures | older residential structures |
| **Threshold** | **0.10** | **0.10** | **0.10** | **0.10** | **0.50** | **0.30** |
| Significant? | yes | yes | yes | yes | no | no |

**Construction Vibration Structural**

| | | | | At Source | Southern California Surgery Center | Jimenez Arcade | La Vina En Los Angeles | 2228 7th Street Building | MacArthur Park Visual and Performing Arts Elementary | Grand View Street Residences |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | **25** | 16 | 13 | 19 | **265** | **375** | **185** |
| **Construction Area** | **Equipment Description** | **Equivalent Equipment Types** | **Number of Equipment** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** |
| Lake Street | Backhoe | Small bulldozer | 1 | 0.003 | 0.006 | 0.008 | 0.005 | <0.001 | <0.001 | <0.001 |
| *incl. installation of the diversion structure, drain-line upgrade, pretreatment unit, pump station, actuated valve and meter vaults, and installation of pipeline along Lake Street and crossing 7th Street into MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.146 | 0.199 | 0.116 | 0.002 | 0.001 | 0.004 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.146 | 0.199 | 0.116 | 0.002 | 0.001 | 0.004 |
| | Pickup Truck | n/a | 2 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | 0.067 | 0.092 | 0.053 | 0.001 | 0.001 | 0.002 |
| | Crane | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.171 | 0.234 | 0.136 | 0.003 | 0.002 | 0.004 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.404 | 0.551 | 0.320 | 0.006 | 0.004 | 0.010 |
| | | | **Lake Street Total** | **N/A** | 0.404 | 0.551 | 0.320 | **0.006** | **0.004** | **0.010** |

| | | | | At Source | Southern California Surgery Center | Jimenez Arcade | La Vina En Los Angeles | 2228 7th Street Building | MacArthur Park Visual and Performing Arts Elementary | Grand View Street Residences |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | **25** | **265** | **390** | **385** | **35** | **25** | **35** |
| Grand View Street | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | 0.002 | 0.003 | 0.002 |
| *incl. installation of pipeline along Grand View Street and crossing 7th Street into MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.001 | 0.001 | 0.046 | 0.076 | 0.046 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.001 | 0.001 | 0.046 | 0.076 | 0.046 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | 0.001 | 0.001 | 0.001 | 0.021 | 0.035 | 0.021 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.003 | 0.001 | 0.001 | 0.054 | 0.089 | 0.054 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.006 | 0.003 | 0.003 | 0.127 | 0.210 | 0.127 |
| | | | **Grand View Street Total** | **N/A** | **0.006** | **0.003** | **0.003** | **0.127** | **0.210** | **0.127** |

| | | | | At Source | Southern California Surgery Center | Jimenez Arcade | La Vina En Los Angeles | 2228 7th Street Building | MacArthur Park Visual and Performing Arts Elementary | Grand View Street Residences |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | **25** | **85** | **90** | **240** | **90** | **95** | **245** |
| MacArthur Park (Pipeline) | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of pipeline along 7th Street within MacArthur Park and connection to the wetlands* | Water Truck | Loaded Trucks | 1 | 0.076 | 0.012 | 0.011 | 0.003 | 0.011 | 0.010 | 0.002 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.014 | 0.013 | 0.003 | 0.013 | 0.012 | 0.003 |
| | | | **MacArthur Park (Pipeline) Total** | **N/A** | **0.014** | **0.013** | **0.003** | **0.013** | **0.012** | **0.003** |

## Construction Vibration Structural

| | | | | At Source | Southern California Surgery Center | Jimenez Arcade | La Vina En Los Angeles | 2228 7th Street Building | MacArthur Park Visual and Performing Arts Elementary | Grand View Street Residences |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 420 | 540 | 585 | 200 | 100 | 315 |
| MacArthur Park (Treatment Struc | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of pipeline along* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | 0.001 | 0.003 | 0.010 | 0.002 |
| *treatment structures within* | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | 0.001 | 0.003 | 0.010 | 0.002 |
| *MacArthur Park* | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.001 | 0.001 | 0.004 | 0.011 | 0.002 |
| **MacArthur Park (Treatment Structures) Total** | | | | **N/A** | **0.001** | **0.001** | **0.001** | **0.004** | **0.011** | **0.002** |

| | | | | At Source | Southern California Surgery Center | Jimenez Arcade | La Vina En Los Angeles | 2228 7th Street Building | MacArthur Park Visual and Performing Arts Elementary | Grand View Street Residences |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 570 | 685 | 755 | 380 | 245 | 505 |
| MacArthur Park (Treatment Wetl | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of the wetlands* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | <0.001 | 0.001 | 0.002 | 0.001 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | <0.001 | 0.001 | 0.002 | 0.001 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Bulldozer | Large Bulldozer | 1 | 0.089 | 0.001 | 0.001 | 0.001 | 0.002 | 0.003 | 0.001 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.001 | 0.001 | 0.002 | 0.003 | 0.001 |
| **MacArthur Park (Treatment Wetlands) Total** | | | | **N/A** | **0.001** | **0.001** | **0.001** | **0.002** | **0.003** | **0.001** |

# Construction Vibration Annoyance

**Significance Threshold**
0.04 PPV

*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for distinctly perceptible vibration. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Annoyance Results**

| Construction Area | The American Cement Building Apartments | Parkview Terrace Apartments | Iglesia Pentecostes Unidos Por Cristo | 2416-2422 W. 7th St. Residence | Churchill Lofts Apartments | MacArthur Park Visual and Performing Arts Elementary |
|---|---|---|---|---|---|---|
| Lake Street | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.004 |
| Grand View Street | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.210 |
| MacArthur Park (Pipeline) | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.012 |
| MacArthur Park (Treatment Structures) | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.011 |
| MacArthur Park (Treatment Wetlands) | 0.002 | 0.003 | 0.002 | 0.002 | 0.002 | 0.003 |
| **Maximum** | **0.002** | **0.003** | **0.002** | **0.002** | **0.003** | **0.210** |
| **Threshold** | **0.040** | **0.040** | **0.040** | **0.040** | **0.040** | **0.040** |
| Significant? | no | no | no | no | no | yes |

**Construction Vibration Annoyance**

| Construction Area | Equipment Description | Equivalent Equipment Types | Number of Equipment | At Source | The American Cement Building Apartments | Parkview Terrace Apartments | Iglesia Pentecostes Unidos Por Cristo | 2416-2422 W. 7th St. Residence | Churchill Lofts Apartments | MacArthur Park Visual and Performing Arts Elementary |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 1,035 | 945 | 875 | 825 | 775 | 375 |
| | | | | PPV (in/sec) | PPV (in/sec) | PPV (in/sec) | PPV (in/sec) | PPV (in/sec) | PPV (in/sec) | PPV (in/sec) |
| Lake Street | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of the diversion structure, drain-line upgrade, pretreatment unit, pump station, actuated valve and meter vaults, and installation of pipeline along Lake Street and crossing 7th Street into MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| | Pickup Truck | n/a | 2 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| | Crane | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 | 0.002 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.004 |
| | | | **Lake Street Total** | **N/A** | **0.001** | **0.001** | **0.001** | **0.001** | **0.001** | **0.004** |

| Construction Area | Equipment Description | Equivalent Equipment Types | Number of Equipment | At Source | The American Cement Building Apartments | Parkview Terrace Apartments | Iglesia Pentecostes Unidos Por Cristo | 2416-2422 W. 7th St. Residence | Churchill Lofts Apartments | MacArthur Park Visual and Performing Arts Elementary |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 725 | 585 | 530 | 480 | 430 | 25 |
| Grand View Street | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.003 |
| *incl. installation of pipeline along Grand View Street and crossing 7th Street into MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | <0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.076 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | <0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.076 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.035 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.089 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.210 |
| | | | **Grand View Street Total** | **N/A** | **0.001** | **0.002** | **0.002** | **0.002** | **0.003** | **0.210** |

| Construction Area | Equipment Description | Equivalent Equipment Types | Number of Equipment | At Source | The American Cement Building Apartments | Parkview Terrace Apartments | Iglesia Pentecostes Unidos Por Cristo | 2416-2422 W. 7th St. Residence | Churchill Lofts Apartments | MacArthur Park Visual and Performing Arts Elementary |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 385 | 290 | 320 | 280 | 235 | 95 |
| MacArthur Park (Pipeline) | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of pipeline along 7th Street within MacArthur Park and connection to the wetlands* | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.010 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.012 |
| | | | **MacArthur Park (Pipeline) Total** | **N/A** | **0.001** | **0.002** | **0.002** | **0.002** | **0.003** | **0.012** |

# Construction Vibration Annoyance

**Significance Threshold**
0.04 PPV
*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for distinctly perceptible vibration. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Annoyance Results**

| Construction Area | The American Cement Building Apartments | Parkview Terrace Apartments | Iglesia Pentecostes Unidos Por Cristo | 2416-2422 W. 7th St. Residence | Churchill Lofts Apartments | MacArthur Park Visual and Performing Arts Elementary |
|---|---|---|---|---|---|---|
| Lake Street | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.004 |
| Grand View Street | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.210 |
| MacArthur Park (Pipeline) | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.012 |
| MacArthur Park (Treatment Structures) | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.011 |
| MacArthur Park (Treatment Wetlands) | 0.002 | 0.003 | 0.002 | 0.002 | 0.002 | 0.003 |
| **Maximum** | **0.002** | **0.003** | **0.002** | **0.002** | **0.003** | **0.210** |
| **Threshold** | **0.040** | **0.040** | **0.040** | **0.040** | **0.040** | **0.040** |
| Significant? | no | no | no | no | no | yes |

**Construction Vibration Annoyance**

| | | | Distance (ft): | At Source<br>25 | The American Cement Building Apartments<br>555 | Parkview Terrace Apartments<br>415 | Iglesia Pentecostes Unidos Por Cristo<br>375 | 2416-2422 W. 7th St. Residence<br>325 | Churchill Lofts Apartments<br>275 | MacArthur Park Visual and Performing Arts Elementary<br>100 |
|---|---|---|---|---|---|---|---|---|---|---|
| MacArthur Park (Treatment Struc | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of pipeline along treatment structures within MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.010 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.010 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.011 |
| **MacArthur Park (Treatment Structures) Total** | | | | **N/A** | **0.001** | **0.001** | **0.002** | **0.002** | **0.002** | **0.011** |

| | | | Distance (ft): | At Source<br>25 | The American Cement Building Apartments<br>315 | Parkview Terrace Apartments<br>265 | Iglesia Pentecostes Unidos Por Cristo<br>335 | 2416-2422 W. 7th St. Residence<br>310 | Churchill Lofts Apartments<br>280 | MacArthur Park Visual and Performing Arts Elementary<br>245 |
|---|---|---|---|---|---|---|---|---|---|---|
| MacArthur Park (Treatment Wetla | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of the wetlands* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Bulldozer | Large Bulldozer | 1 | 0.089 | 0.002 | 0.003 | 0.002 | 0.002 | 0.002 | 0.003 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.002 | 0.003 | 0.002 | 0.002 | 0.002 | 0.003 |
| **MacArthur Park (Treatment Wetlands) Total** | | | | **N/A** | **0.002** | **0.003** | **0.002** | **0.002** | **0.002** | **0.003** |

# Construction Vibration Annoyance

**Significance Threshold**
0.04 PPV

*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for distinctly perceptible vibration. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Annoyance Results**

| Construction Area | LA New Times Western School/LA Onnuri Community Church | Grand View Street Residences | Cristo Salva Bilingual Church | La Vina En Los Angeles | Southeast Park Unhoused Population | MacArthur Park Visitors |
|---|---|---|---|---|---|---|
| Lake Street | 0.003 | 0.010 | 0.008 | 0.320 | 0.007 | 0.040 |
| Grand View Street | 0.011 | 0.127 | 0.040 | 0.003 | 0.002 | 0.040 |
| MacArthur Park (Pipeline) | 0.001 | 0.003 | 0.013 | 0.003 | 0.003 | 0.040 |
| MacArthur Park (Treatment Structures) | 0.001 | 0.002 | 0.003 | 0.001 | 0.001 | 0.040 |
| MacArthur Park (Treatment Wetlands) | 0.001 | 0.001 | 0.001 | 0.001 | <0.001 | 0.040 |
| **Maximum** | **0.011** | **0.127** | **0.040** | 0.320 | **0.007** | **0.040** |
| **Threshold** | **0.040** | **0.040** | **0.040** | **0.040** | **0.040** | **0.040** |
| Significant? | no | yes | yes | yes | no | yes |

**Construction Vibration Annoyance**

| Construction Area | Equipment Description | Equivalent Equipment Types | Number of Equipment | At Source | LA New Times Western School/LA Onnuri Community Church | Grand View Street Residences | Cristo Salva Bilingual Church | La Vina En Los Angeles | Southeast Park Unhoused Population | MacArthur Park Visitors |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Distance (ft):** | **25** | **425** | **185** | **230** | 19 | **250** | **75** |
| | | | | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** |
| Lake Street | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | 0.005 | <0.001 | 0.001 |
| *incl. installation of the diversion structure, drain-line upgrade, pretreatment unit, pump station, actuated valve and meter vaults, and installation of pipeline along Lake Street and crossing 7th Street into MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.004 | 0.003 | 0.116 | 0.002 | 0.015 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.004 | 0.003 | 0.116 | 0.002 | 0.015 |
| | Pickup Truck | n/a | 2 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | <0.001 | 0.002 | 0.001 | 0.053 | 0.001 | 0.007 |
| | Crane | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.004 | 0.003 | 0.136 | 0.003 | 0.017 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.003 | 0.010 | 0.008 | 0.320 | 0.007 | 0.040 |
| | | | **Lake Street Total** | **N/A** | **0.003** | **0.010** | **0.008** | 0.320 | **0.007** | **0.040** |

| Construction Area | Equipment Description | Equivalent Equipment Types | Number of Equipment | At Source | LA New Times Western School/LA Onnuri Community Church | Grand View Street Residences | Cristo Salva Bilingual Church | La Vina En Los Angeles | Southeast Park Unhoused Population | MacArthur Park Visitors |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Distance (ft):** | **25** | **175** | **35** | **75** | **385** | **615** | **75** |
| | | | | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** |
| Grand View Street | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | 0.002 | 0.001 | <0.001 | <0.001 | 0.001 |
| *incl. installation of pipeline along Grand View Street and crossing 7th Street into MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.004 | 0.046 | 0.015 | 0.001 | 0.001 | 0.015 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.004 | 0.046 | 0.015 | 0.001 | 0.001 | 0.015 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | 0.002 | 0.021 | 0.007 | 0.001 | <0.001 | 0.007 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.005 | 0.054 | 0.017 | 0.001 | 0.001 | 0.017 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.011 | 0.127 | 0.040 | 0.003 | 0.002 | 0.040 |
| | | | **Grand View Street Total** | **N/A** | **0.011** | **0.127** | **0.040** | **0.003** | **0.002** | **0.040** |

| Construction Area | Equipment Description | Equivalent Equipment Types | Number of Equipment | At Source | LA New Times Western School/LA Onnuri Community Church | Grand View Street Residences | Cristo Salva Bilingual Church | La Vina En Los Angeles | Southeast Park Unhoused Population | MacArthur Park Visitors |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Distance (ft):** | **25** | **450** | **245** | **90** | **240** | **245** | **43** |
| | | | | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** |
| MacArthur Park (Pipeline) | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| *incl. installation of pipeline along 7th Street within MacArthur Park and connection to the wetlands* | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.002 | 0.011 | 0.003 | 0.002 | 0.034 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.003 | 0.013 | 0.003 | 0.003 | 0.040 |
| | | | **MacArthur Park (Pipeline) Total** | **N/A** | **0.001** | **0.003** | **0.013** | **0.003** | **0.003** | **0.040** |

# Construction Vibration Annoyance

**Significance Threshold**
0.04 PPV

*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for distinctly perceptible vibration. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Annoyance Results**

| Construction Area | LA New Times Western School/LA Onnuri Community Church | Grand View Street Residences | Cristo Salva Bilingual Church | La Vina En Los Angeles | Southeast Park Unhoused Population | MacArthur Park Visitors |
|---|---|---|---|---|---|---|
| Lake Street | 0.003 | 0.010 | 0.008 | 0.320 | 0.007 | 0.040 |
| Grand View Street | 0.011 | 0.127 | 0.040 | 0.003 | 0.002 | 0.040 |
| MacArthur Park (Pipeline) | 0.001 | 0.003 | 0.013 | 0.003 | 0.003 | 0.040 |
| MacArthur Park (Treatment Structures) | 0.001 | 0.002 | 0.003 | 0.001 | 0.001 | 0.040 |
| MacArthur Park (Treatment Wetlands) | 0.001 | 0.001 | 0.001 | 0.001 | <0.001 | 0.040 |
| **Maximum** | **0.011** | **0.127** | **0.040** | 0.320 | **0.007** | **0.040** |
| **Threshold** | **0.040** | **0.040** | **0.040** | **0.040** | **0.040** | **0.040** |
| Significant? | no | yes | yes | yes | no | yes |

**Construction Vibration Annoyance**

| | | | Distance (ft): | At Source<br>25 | LA New Times Western School/LA Onnuri Community Church<br>465 | Grand View Street Residences<br>315 | Cristo Salva Bilingual Church<br>240 | La Vina En Los Angeles<br>585 | Southeast Park Unhoused Population<br>745 | MacArthur Park Visitors<br>43 |
|---|---|---|---|---|---|---|---|---|---|---|
| MacArthur Park (Treatment Struc | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| *incl. installation of pipeline along treatment structures within MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.002 | 0.003 | 0.001 | <0.001 | 0.034 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.002 | 0.003 | 0.001 | <0.001 | 0.034 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.002 | 0.003 | 0.001 | 0.001 | 0.040 |
| **MacArthur Park (Treatment Structures) Total** | | | | **N/A** | **0.001** | **0.002** | **0.003** | **0.001** | **0.001** | **0.040** |

| | | | Distance (ft): | At Source<br>25 | LA New Times Western School/LA Onnuri Community Church<br>620 | Grand View Street Residences<br>505 | Cristo Salva Bilingual Church<br>415 | La Vina En Los Angeles<br>755 | Southeast Park Unhoused Population<br>865 | MacArthur Park Visitors<br>43 |
|---|---|---|---|---|---|---|---|---|---|---|
| MacArthur Park (Treatment Wetla | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| *incl. installation of the wetlands* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | 0.001 | <0.001 | <0.001 | 0.034 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | 0.001 | <0.001 | <0.001 | 0.034 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Bulldozer | Large Bulldozer | 1 | 0.089 | 0.001 | 0.001 | 0.001 | 0.001 | <0.001 | 0.040 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.001 | 0.001 | 0.001 | <0.001 | 0.040 |
| **MacArthur Park (Treatment Wetlands) Total** | | | | **N/A** | **0.001** | **0.001** | **0.001** | **0.001** | **<0.001** | **0.040** |

| Equipment | PPV at 25 ft (in/sec) | Approximate Lv† at 25 ft |
|---|---|---|
| Pile Driver (impact) | 0.644 | 104 |
| Pile Driver (sonic) | 0.17 | 93 |
| Clam shovel drop (slurry wall) | 0.202 | 94 |
| Hydromill (slurry wall) - in soil | 0.008 | 66 |
| Hydromill (slurry wall) - in rock | 0.017 | 75 |
| **Vibratory Roller** | **0.21** | **94** |
| Hoe Ram | 0.089 | 87 |
| **Large Bulldozer** | **0.089** | **87** |
| Caisson Drilling | 0.089 | 87 |
| **Loaded Trucks** | **0.076** | **86** |
| **Jackhammer** | **0.035** | **79** |
| **Small bulldozer** | **0.003** | **58** |

*Source: Federal Transit Administration. 2018. Transit Noise and Vibrat*

Note:

Values for pile drivers are based on the typical vibration source levels.

† RMS velocity in decibels (VdB) re 1 micro-inch/second

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**Construction Noise - Equipment**

**8-Hour Construction Noise Level at 50 Feet (dBA)**

| Construction Area | Equipment Description | RCNM Equipment Types | Usage Factor | Equipment Lmax @ 50' | Equipment Leq(h) @ 50' | Number of Equipment | Add to Single Source Level (dBA) | Total Lmax @ 50' | Total Leq(h) @ 50' |
|---|---|---|---|---|---|---|---|---|---|
| Diversion Structure<br>*incl. installation of the diversion structure, and other supporting infrastructure. Equipment was assumed to match that of Lake Street construction element under the proposed project.* | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 |
| | Concrete Truck | Concrete Mixer Truck | 40% | 79 | 75 | 1 | 0 | 79 | 75 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 2 | 3 | 78 | 74 |
| | Asphalt Milling Machine | Pavement Scarifier | 20% | 90 | 83 | 1 | 0 | 90 | 83 |
| | Crane | Crane | 16% | 81 | 73 | 1 | 0 | 81 | 73 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 |
| | Paving Equipment | Roller | 20% | 80 | 73 | 1 | 0 | 80 | 73 |
| | | | | | | | **Diversion Structure Total** | **92** | **86** |
| Stormwater Conveyance (non Park)<br>*incl. installation of stormwater conveyance piping in the sidewalks or roadways parallel to Alvarado Street and 7th Street.* | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 |
| | Concrete Truck | Concrete Mixer Truck | 40% | 79 | 75 | 1 | 0 | 79 | 75 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 1 | 0 | 75 | 71 |
| | Asphalt Milling Machine | Pavement Scarifier | 20% | 90 | 83 | 1 | 0 | 90 | 83 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 |
| | Paving Equipment | Roller | 20% | 80 | 73 | 1 | 0 | 80 | 73 |
| | | | | | | | **Stormwater Conveyance (non Park) Total** | **92** | **86** |
| MacArthur Park (Auxiliary Treatment)<br>*incl. installation of pipeline along treatment structures within MacArthur Park* | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 |
| | Concrete Truck | Concrete Mixer Truck | 40% | 79 | 75 | 1 | 0 | 79 | 75 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 1 | 0 | 75 | 71 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 |
| | | | | | | | **MacArthur Park (Auxiliary Treatment) Total** | **85** | **81** |
| MacArthur Park (Wetlands and Arroyo)<br>*incl. installation of the wetlands* | Backhoe | Backhoe | 40% | 78 | 74 | 1 | 0 | 78 | 74 |
| | Concrete Truck | Concrete Mixer Truck | 40% | 79 | 75 | 1 | 0 | 79 | 75 |
| | Water Truck | Dump Truck | 40% | 76 | 72 | 1 | 0 | 76 | 72 |
| | Pickup Truck | Pickup Truck | 40% | 75 | 71 | 1 | 0 | 75 | 71 |
| | Bulldozer | Front End Loader | 40% | 79 | 75 | 1 | 0 | 79 | 75 |
| | Excavator | Excavator | 40% | 81 | 77 | 1 | 0 | 81 | 77 |
| | | | | | | | **MacArthur Park (Wetlands and Arroyo) Total** | **86** | **82** |

**8-Hour Construction Noise Level at the Receptor (dBA) - Distance from construction within which noise impacts would be significant**

| Phase Type | Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 630 | 605 | 380 | 420 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 85.9 | 85.5 | 81.3 | 82.2 |
| Distance Divergence (dBA) | 22.0 | 21.7 | 17.6 | 18.5 |
| Atmospheric Attenuation (dBA) | 0.52 | 0.50 | 0.31 | 0.35 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 63 | 63 | 63 | 63 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 65 | 65 | 65 | 65 |
| Daytime Increase Over Existing (dBA) | 5 | 5 | 5 | 5 |
| Significant? | Yes | Yes | Yes | Yes |

*Receptor blocked completely by building*

| Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|
| 98 | 93 | 58 | 64 |
| 85.9 | 85.5 | 81.3 | 82.2 |
| 5.8 | 5.4 | 1.3 | 2.1 |
| 0.08 | 0.08 | 0.05 | 0.05 |
| 80 | 80 | 80 | 80 |
| 80 | 80 | 80 | 80 |
| 5 | 5 | 5 | 5 |
| Yes | Yes | Yes | Yes |

**8-Hour Construction Noise Level at the Receptor (dBA) - N6 (MacArthur Park Elementary School)**

| Phase Type | Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 925 | 290 | 330 | 450 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 85.9 | 85.5 | 81.3 | 82.2 |
| Distance Divergence (dBA) | 25.3 | 15.3 | 16.4 | 19.1 |
| Atmospheric Attenuation (dBA) | 0.76 | 0.24 | 0.27 | 0.37 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 60 | 70 | 65 | 63 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 63 | 70 | 66 | 65 |
| Daytime Increase Over Existing (dBA) | 3 | 10 | 6 | 5 |
| Significant? | No | Yes | Yes | No |

**Construction Noise - Equipment**

**8-Hour Construction Noise Level at the Receptor (dBA) - N9 (Cristo Salva Bilingual Church)**

| Phase Type | Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 815 | 165 | 205 | 325 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 85.9 | 85.5 | 81.3 | 82.2 |
| Distance Divergence (dBA) | 24.2 | 10.4 | 12.3 | 16.3 |
| Atmospheric Attenuation (dBA) | 0.67 | 0.14 | 0.17 | 0.27 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 61 | 75 | 69 | 66 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 64 | 75 | 69 | 67 |
| Daytime Increase Over Existing (dBA) | 4 | 15 | 9 | 7 |
| Significant? | No | Yes | Yes | Yes |

**8-Hour Construction Noise Level at the Receptor (dBA) - N10 (La Vina en Los Angeles)**

| Phase Type | Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 785 | 200 | 265 | 282 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 85.9 | 85.5 | 81.3 | 82.2 |
| Distance Divergence (dBA) | 23.9 | 12.0 | 14.5 | 15.0 |
| Atmospheric Attenuation (dBA) | 0.65 | 0.16 | 0.22 | 0.23 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 61 | 73 | 67 | 67 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 64 | 74 | 67 | 68 |
| Daytime Increase Over Existing (dBA) | blocked by bldg | 14 | 7 | blocked by bldg |
| Significant? | No | Yes | Yes | No |

**8-Hour Construction Noise Level at the Receptor (dBA) - Multi-family residence at 622 S. Alvarado Street**

| Phase Type | Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 335 | 385 | 365 | 465 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 85.9 | 85.5 | 81.3 | 82.2 |
| Distance Divergence (dBA) | 16.5 | 17.7 | 17.3 | 19.4 |
| Atmospheric Attenuation (dBA) | 0.28 | 0.32 | 0.30 | 0.38 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 69 | 67 | 64 | 62 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 70 | 68 | 65 | 64 |
| Daytime Increase Over Existing (dBA) | 10 | 8 | 5 | 4 |
| Significant? | Yes | Yes | Yes | No |

**8-Hour Construction Noise Level at the Receptor (dBA) - MPM Apartments**

| Phase Type | Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 450 | 475 | 530 | 490 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 85.9 | 85.5 | 81.3 | 82.2 |
| Distance Divergence (dBA) | 19.1 | 19.6 | 20.5 | 19.8 |
| Atmospheric Attenuation (dBA) | 0.37 | 0.39 | 0.44 | 0.40 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 66 | 66 | 60 | 62 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 67 | 67 | 63 | 64 |
| Daytime Increase Over Existing (dBA) | blocked by bldg | 7 | 3 | 4 |
| Significant? | No | Yes | No | No |

**8-Hour Construction Noise Level at the Receptor (dBA) - Upper-story residences at 718 Alvarado Street**

| Phase Type | Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 715 | 265 | 635 | 360 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 85.9 | 85.5 | 81.3 | 82.2 |
| Distance Divergence (dBA) | 23.1 | 14.5 | 22.1 | 17.1 |
| Atmospheric Attenuation (dBA) | 0.59 | 0.22 | 0.52 | 0.30 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 62 | 71 | 59 | 65 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 64 | 71 | 62 | 66 |
| Daytime Increase Over Existing (dBA) | 4 | 11 | 2 | 6 |
| Significant? | No | Yes | No | Yes |

**Construction Noise - Equipment**

**8-Hour Construction Noise Level at the Receptor (dBA) - Northeast unhoused populations**

| Phase Type | Diversion Structure | Stormwater Conveyance (non Park) | MacArthur Park (Auxiliary Treatment) | MacArthur Park (Wetlands and Arroyo) |
|---|---|---|---|---|
| Distance from Construction Activity to a Receptor (ft) | 180 | 265 | 170 | 260 |
| 8-Hour Construction Noise Level at 50 ft (dBA) | 85.9 | 85.5 | 81.3 | 82.2 |
| Distance Divergence (dBA) | 11.1 | 14.5 | 10.6 | 14.3 |
| Atmospheric Attenuation (dBA) | 0.15 | 0.22 | 0.14 | 0.21 |
| 8-Hour Construction Noise Level at the Receptor (dBA) | 75 | 71 | 71 | 68 |
| Daytime Unmitigated Leq (Construction Noise + Existing) (dBA) | 75 | 71 | 71 | 68 |
| Daytime Increase Over Existing (dBA) | 15 | 11 | 11 | 8 |
| Significant? | Yes | Yes | Yes | Yes |

Minimum Daytime Unmitigated Leq (Construction Noise + Existing) (dBA)

County
Los Angeles

Existing Noise Levels
Land Use Type Urban Residential
Background Noise (dBA) 60

Significance Level
5 dBA *(daytime increase over existing noise levels)*
*Reference: Significance threshold based on L.A. CEQA Thresholds Guide criteria*
*"A project would normally have a significant impact on noise levels from construction if... construction activities lasting more than 10 days in a three month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise sensitive use..."*

# Construction Vibration Structural

**Significance Thresholds**

*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for vibration damage. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Construction Vibration Structural**

| | | | | At Source | Southern California Surgery Center | Building located at 658 Alvarado Street |
|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | n/a | 10 |
| **Construction Area** | **Equipment Description** | **Equivalent Equipment Types** | **Number of Equipment** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** |
| Diversion Structure<br>*incl. installation of the diversion structure, and other supporting infrastructure. Equipment was assumed to match that of Lake Street construction element under the proposed project.* | Backhoe | Small bulldozer | 1 | 0.003 | n/a | 0.012 |
| | Concrete Truck | Loaded Trucks | 1 | 0.076 | n/a | 0.300 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | n/a | 0.300 |
| | Pickup Truck | n/a | 2 | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | n/a | 0.138 |
| | Crane | n/a | 1 | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | n/a | 0.352 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | n/a | 0.830 |
| | | | **Diversion Structure Total** | **N/A** | **0.000** | **0.830** |

| | | | | At Source | Southern California Surgery Center | Building located at 658 Alvarado Street |
|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 30 | n/a |
| Stormwater Conveyance (non Park)<br>*incl. installation of stormwater conveyance piping in the sidewalks or roadways parallel to Alvarado Street and 7th Street.* | Backhoe | Small bulldozer | 1 | 0.003 | 0.002 | n/a |
| | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.058 | n/a |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.058 | n/a |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | 0.027 | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.068 | n/a |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.160 | n/a |
| | | | **incl. installation of stormwater conveyance Total** | **N/A** | **0.160** | **0.000** |

# Construction Vibration Annoyance

**Significance Threshold**
0.04 PPV
*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for distinctly perceptible vibration. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Annoyance Results**

| Construction Area | MacArthur Park Elementary School | Grand View Street Residences | La Vina En Los Angeles | Multi-family residence at 622 S. Alvarado Street | MPM Apartments | Upper-story residences at 718 Alvarado Street |
|---|---|---|---|---|---|---|
| Diversion Structure | 0.001 | 0.001 | 0.000 | 0.004 | 0.003 | 0.000 |
| Stormwater Conveyance (non Park) | 0.005 | 0.007 | 0.014 | 0.004 | 0.002 | 0.007 |
| MacArthur Park (Auxiliary Treatment) | 0.002 | 0.002 | 0.003 | 0.002 | 0.001 | 0.001 |
| MacArthur Park (Wetlands and Arroyo) | 0.001 | 0.002 | 0.003 | 0.001 | 0.001 | 0.002 |
| | | | | | | |
| **Maximum** | **0.01** | **0.01** | **0.01** | **0.00** | **0.00** | **0.01** |
| **Threshold** | **0.04** | **0.04** | **0.04** | **0.04** | **0.04** | **0.04** |
| Significant? | no | no | no | no | no | no |

**Construction Vibration Annoyance**

| | | | | At Source | MacArthur Park Elementary School | Grand View Street Residences | La Vina En Los Angeles | Multi-family residence at 622 S. Alvarado Street | MPM Apartments | Upper-story residences at 718 Alvarado Street |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 925 | 900 | >500 | 330 | 450 | >500 |
| **Construction Area** | **Equipment Description** | **Equivalent Equipment Types** | **Number of Equipment** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** |
| Diversion Structure *incl. installation of the diversion structure, and other supporting infrastructure. Equipment was assumed to match that of Lake Street construction element under the proposed project.* | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | n/a | <0.001 | <0.001 | n/a |
| | Concrete Truck | Loaded Trucks | 1 | 0.076 | <0.001 | <0.001 | n/a | 0.002 | 0.001 | n/a |
| | Water Truck | Loaded Trucks | 1 | 0.076 | <0.001 | <0.001 | n/a | 0.002 | 0.001 | n/a |
| | Pickup Truck | n/a | 2 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | <0.001 | <0.001 | n/a | 0.001 | <0.001 | n/a |
| | Crane | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | <0.001 | <0.001 | n/a | 0.002 | 0.001 | n/a |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.001 | 0.001 | n/a | 0.004 | 0.003 | n/a |
| | | | **Diversion Structure Total** | **N/A** | **0.001** | **0.001** | **0.000** | **0.004** | **0.003** | **0.000** |

| | | | | At Source | MacArthur Park Elementary School | Grand View Street Residences | La Vina En Los Angeles | Multi-family residence at 622 S. Alvarado Street | MPM Apartments | Upper-story residences at 718 Alvarado Street |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 290 | 250 | 150 | 380 | 480 | 250 |
| Stormwater Conveyance (non Par | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of stormwater conveyance piping in the sidewalks or roadways parallel to Alvarado Street and 7th Street.* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.002 | 0.005 | 0.001 | 0.001 | 0.002 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.002 | 0.005 | 0.001 | 0.001 | 0.002 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | 0.001 | 0.001 | 0.002 | 0.001 | <0.001 | 0.001 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.002 | 0.003 | 0.006 | 0.002 | 0.001 | 0.003 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.005 | 0.007 | 0.014 | 0.004 | 0.002 | 0.007 |
| | | | **Stormwater Conveyance (non Park) Total** | **N/A** | **0.005** | **0.007** | **0.014** | **0.004** | **0.002** | **0.007** |

| | | | | At Source | MacArthur Park Elementary School | Grand View Street Residences | La Vina En Los Angeles | Multi-family residence at 622 S. Alvarado Street | MPM Apartments | Upper-story residences at 718 Alvarado Street |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 330 | 300 | 260 | 350 | 510 | 500 |
| MacArthur Park (Auxiliary Treatm | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of pipeline along treatment structures within MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.002 | 0.002 | 0.003 | 0.002 | 0.001 | 0.001 |
| | | | **MacArthur Park (Auxiliary Treatment) Total** | **N/A** | **0.002** | **0.002** | **0.003** | **0.002** | **0.001** | **0.001** |

# Construction Vibration Annoyance

**Significance Threshold**
0.04 PPV
*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for distinctly perceptible vibration. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Annoyance Results**

| Construction Area | MacArthur Park Elementary School | Grand View Street Residences | La Vina En Los Angeles | Multi-family residence at 622 S. Alvarado Street | MPM Apartments | Upper-story residences at 718 Alvarado Street |
|---|---|---|---|---|---|---|
| Diversion Structure | 0.001 | 0.001 | 0.000 | 0.004 | 0.003 | 0.000 |
| Stormwater Conveyance (non Park) | 0.005 | 0.007 | 0.014 | 0.004 | 0.002 | 0.007 |
| MacArthur Park (Auxiliary Treatment) | 0.002 | 0.002 | 0.003 | 0.002 | 0.001 | 0.001 |
| MacArthur Park (Wetlands and Arroyo) | 0.001 | 0.002 | 0.003 | 0.001 | 0.001 | 0.002 |
| | | | | | | |
| **Maximum** | **0.01** | **0.01** | **0.01** | **0.00** | **0.00** | **0.01** |
| **Threshold** | **0.04** | **0.04** | **0.04** | **0.04** | **0.04** | **0.04** |
| Significant? | no | no | no | no | no | no |

**Construction Vibration Annoyance**

| | | | | At Source | MacArthur Park Elementary School | Grand View Street Residences | La Vina En Los Angeles | Multi-family residence at 622 S. Alvarado Street | MPM Apartments | Upper-story residences at 718 Alvarado Street |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Distance (ft):** | **25** | **450** | **380** | **265** | **460** | **495** | **355** |
| MacArthur Park (Wetlands and A | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| *incl. installation of the wetlands* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | Bulldozer | Large Bulldozer | 1 | 0.089 | 0.001 | 0.002 | 0.003 | 0.001 | 0.001 | 0.002 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.001 | 0.002 | 0.003 | 0.001 | 0.001 | 0.002 |
| **MacArthur Park (Wetlands and Arroyo) Total** | | | | **N/A** | **0.001** | **0.002** | **0.003** | **0.001** | **0.001** | **0.002** |

# Construction Vibration Annoyance

**Significance Threshold**

0.04 PPV

*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for distinctly perceptible vibration. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Annoyance Results**

| Construction Area | Northeast unhoused populations | MacArthur Park visitors |
|---|---|---|
| Diversion Structure | 0.014 | 0.040 |
| Stormwater Conveyance (non Park) | 0.012 | 0.040 |
| MacArthur Park (Auxiliary Treatment) | 0.005 | 0.040 |
| MacArthur Park (Wetlands and Arroyo) | 0.003 | 0.040 |
| | | |
| **Maximum** | **0.01** | **0.04** |
| **Threshold** | **0.04** | **0.04** |
| Significant? | no | yes |

**Construction Vibration Annoyance**

| | | | | At Source | Northeast unhoused populations | MacArthur Park visitors |
|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 150 | 75 |
| **Construction Area** | **Equipment Description** | **Equivalent Equipment Types** | **Number of Equipment** | **PPV (in/sec)** | **PPV (in/sec)** | **PPV (in/sec)** |
| Diversion Structure *incl. installation of the diversion structure, and other supporting infrastructure. Equipment was assumed to match that of Lake Street construction element under the proposed project.* | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | 0.001 |
| | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.005 | 0.015 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.005 | 0.015 |
| | Pickup Truck | n/a | 2 | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | 0.002 | 0.007 |
| | Crane | n/a | 1 | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.006 | 0.017 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.014 | 0.040 |
| | | | **Diversion Structure Total** | **N/A** | **0.014** | **0.040** |

| | | | | At Source | Northeast unhoused populations | MacArthur Park visitors |
|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 170 | 75 |
| Stormwater Conveyance (non Par | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | 0.001 |
| *incl. installation of stormwater conveyance piping in the sidewalks or roadways parallel to Alvarado Street and 7th Street.* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.004 | 0.015 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.004 | 0.015 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a |
| | Asphalt Milling Machine | Jackhammer | 1 | 0.035 | 0.002 | 0.007 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.005 | 0.017 |
| | Paving Equipment | Vibratory Roller | 1 | 0.210 | 0.012 | 0.040 |
| | | | **Stormwater Conveyance (non Park) Total** | **N/A** | **0.012** | **0.040** |

| | | | | At Source | Northeast unhoused populations | MacArthur Park visitors |
|---|---|---|---|---|---|---|
| | | | Distance (ft): | 25 | 160 | 43 |
| MacArthur Park (Auxiliary Treatm | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | 0.001 |
| *incl. installation of pipeline along treatment structures within MacArthur Park* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.005 | 0.034 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.005 | 0.034 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.005 | 0.040 |
| | | | **MacArthur Park (Auxiliary Treatment) Total** | **N/A** | **0.005** | **0.040** |

# Construction Vibration Annoyance

**Significance Threshold**

0.04 PPV

*References: Vibration annoyance threshold based on Caltrans Transportation and Construction Vibration Guidance Manual threshold for distinctly perceptible vibration. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*

**Summary of Vibration Annoyance Results**

| Construction Area | Northeast unhoused populations | MacArthur Park visitors |
|---|---|---|
| Diversion Structure | 0.014 | 0.040 |
| Stormwater Conveyance (non Park) | 0.012 | 0.040 |
| MacArthur Park (Auxiliary Treatment) | 0.005 | 0.040 |
| MacArthur Park (Wetlands and Arroyo) | 0.003 | 0.040 |
| | | |
| **Maximum** | **0.01** | **0.04** |
| **Threshold** | **0.04** | **0.04** |
| Significant? | no | yes |

**Construction Vibration Annoyance**

| | | | | At Source | Northeast unhoused populations | MacArthur Park visitors |
|---|---|---|---|---|---|---|
| | | | **Distance (ft):** | **25** | **260** | **43** |
| MacArthur Park (Wetlands and A | Backhoe | Small bulldozer | 1 | 0.003 | <0.001 | 0.001 |
| *incl. installation of the wetlands* | Concrete Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.034 |
| | Water Truck | Loaded Trucks | 1 | 0.076 | 0.002 | 0.034 |
| | Pickup Truck | n/a | 1 | n/a | n/a | n/a |
| | Bulldozer | Large Bulldozer | 1 | 0.089 | 0.003 | 0.040 |
| | Excavator | Large Bulldozer | 1 | 0.089 | 0.003 | 0.040 |
| | | | **MacArthur Park (Wetlands and Arroyo) Total** | **N/A** | **0.003** | **0.040** |