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# 1. Basic Project Information

## 1.1. Basic Project Information

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<th>Landscape Area (sq ft)</th>
<th>Special Landscape Area (sq ft)</th>
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### 1.3. User-Selected Emission Reduction Measures by Emissions Sector

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<th>Measure Title</th>
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<td>Transportation</td>
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<td>Waste</td>
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<td>Implement Waste Reduction Plan</td>
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* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

### 2. Emissions Summary

#### 2.1. Construction Emissions Compared Against Thresholds

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<th>Criteria Pollutants (lb/day for daily, ton/yr for annual)</th>
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<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>PM10E</th>
<th>PM10D</th>
<th>PM10T</th>
<th>PM2.5E</th>
<th>PM2.5D</th>
<th>PM2.5T</th>
<th>BCO2</th>
<th>NBCO2</th>
<th>CO2T</th>
<th>CH4</th>
<th>N2O</th>
<th>R</th>
<th>CO2e</th>
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<tbody>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<td>1.35</td>
<td>14.2</td>
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<td>1.26</td>
<td>2.53</td>
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<td>15,053</td>
<td>0.42</td>
<td>1.82</td>
<td>25.6</td>
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<td>0.52</td>
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<td>2.73</td>
<td>15,053</td>
<td>15,053</td>
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<td>1.82</td>
<td>25.6</td>
<td>15,633</td>
<td></td>
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<td>52%</td>
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<td>59%</td>
<td>7%</td>
<td>59%</td>
<td>28%</td>
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<td>1.18</td>
<td>5,816</td>
<td>5,816</td>
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<td>0.17</td>
<td>0.17</td>
<td>5,871</td>
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<tr>
<td>Mit.</td>
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<td>22.0</td>
<td>30.0</td>
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<td>0.96</td>
<td>1.22</td>
<td>2.18</td>
<td>0.88</td>
<td>0.29</td>
<td>1.18</td>
<td>5,816</td>
<td>5,816</td>
<td>0.23</td>
<td>0.17</td>
<td>0.17</td>
<td>5,871</td>
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</tbody>
</table>
### 2.2. Construction Emissions by Year, Unmitigated

| Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual) |
| Year | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|------|-----|-----|----|-----|-------|-------|-------|-------|-------|-------|------|------|------|----|-----|----|----|-----|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2023 | 3.28 | 44.6 | 29.1 | 0.11 | 1.35 | 14.2 | 15.5 | 2.53 | 3.78 | — | 15,053 | 15,053 | 0.42 | 1.82 | 25.6 | 15,633 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2023 | 1.53 | 13.0 | 16.8 | 0.03 | 0.56 | 0.83 | 1.39 | 0.52 | 0.20 | 0.72 | — | 3,695 | 3,695 | 0.14 | 0.14 | 0.13 | 3,740 |
| 2024 | 18.1 | 22.0 | 30.0 | 0.05 | 0.96 | 1.22 | 2.18 | 0.88 | 0.29 | 1.18 | — | 5,816 | 5,816 | 0.23 | 0.17 | 0.17 | 5,871 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2023 | 0.73 | 7.71 | 7.29 | 0.02 | 0.29 | 1.35 | 1.64 | 0.27 | 0.31 | 0.57 | — | 2,228 | 2,228 | 0.07 | 0.17 | 1.36 | 2,283 |
2.3. Construction Emissions by Year, Mitigated

## Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

<table>
<thead>
<tr>
<th>Year</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>PM10E</th>
<th>PM10D</th>
<th>PM10T</th>
<th>PM2.5E</th>
<th>PM2.5D</th>
<th>PM2.5T</th>
<th>BCO2</th>
<th>NBCO2</th>
<th>CO2T</th>
<th>CH4</th>
<th>N2O</th>
<th>R</th>
<th>CO2e</th>
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</thead>
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<tr>
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<td>Daily - Summer (Max)</td>
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<tr>
<td>2023</td>
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<td>21.4</td>
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<td>0.56</td>
<td>14.2</td>
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<td>2.53</td>
<td>2.73</td>
<td>—</td>
<td>15,053</td>
<td>15,053</td>
<td>0.42</td>
<td>1.82</td>
<td>25.6</td>
<td>15,633</td>
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<tr>
<td>2024</td>
<td>18.1</td>
<td>22.0</td>
<td>30.0</td>
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<td>1.18</td>
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<td>5,816</td>
<td>5,816</td>
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<td>0.17</td>
<td>5,871</td>
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2.4. Operations Emissions Compared Against Thresholds

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<tr>
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<th>ROG</th>
<th>NOx</th>
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<th>SO2</th>
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<th>PM2.5E</th>
<th>PM2.5D</th>
<th>PM2.5T</th>
<th>BCO2</th>
<th>NBCO2</th>
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<th>CH4</th>
<th>N2O</th>
<th>R</th>
<th>CO2e</th>
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<td>0.30</td>
<td>0.05</td>
<td>0.10</td>
<td>—</td>
<td>369</td>
<td>369</td>
<td>0.01</td>
<td>0.03</td>
<td>0.22</td>
<td>378</td>
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<td>2024</td>
<td>0.34</td>
<td>0.39</td>
<td>0.53</td>
<td>&lt;0.005</td>
<td>0.02</td>
<td>0.02</td>
<td>0.04</td>
<td>0.02</td>
<td>0.01</td>
<td>0.02</td>
<td>—</td>
<td>96.6</td>
<td>96.6</td>
<td>&lt;0.005</td>
<td>&lt;0.005</td>
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### 2.5. Operations Emissions by Sector, Unmitigated

#### Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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<th>NBCO2</th>
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### 2.6. Operations Emissions by Sector, Mitigated

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### 3. Construction Emissions Details

#### 3.1. Demolition (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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<th>SO2</th>
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| Waste    | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | —     | —    | —   | —   | —  | —   |
| Refrig.  | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | —     | —    | —   | —   | —  | —   |
| Total    | 3.44| 4.50| 7.31| 0.04| 0.05  | 0.91  | 0.96  | 0.05  | 0.18  | 0.23  | 68.6 | 4,919 | 4,987 | 7.19| 0.60| —  | 3,207, 3,207 |
| Average Daily | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | —     | —    | —   | —   | —  | —   |
| Mobile   | 0.70| 4.49| 7.21| 0.04| 0.05  | 0.91  | 0.96  | 0.05  | 0.18  | 0.23  | —    | 4,091 | 4,091 | 0.12| 0.46| 5.96| 4,238 |
| Area     | 3.16| 0.02| 2.58| < 0.005| < 0.005| —     | < 0.005| < 0.005| —     | < 0.005| —    | 10.6 | 10.6 | < 0.005| < 0.005| —  | 10.7 |
| Energy   | 0.00| 0.00| 0.00| 0.00| 0.00  | —     | 0.00  | 0.00  | —     | 0.00  | —    | 652  | 652  | 0.06| 0.01| —  | 656 |
| Water    | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | 53.3 | 183  | 237 | 5.49| 0.13| —  | 413 |
| Waste    | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | 15.2 | 0.00 | 15.2 | 1.52| 0.00| —  | 53.3 |
| Refrig.  | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | —    | —    | —   | —   | —  | —   |
| Total    | 3.86| 4.51| 9.79| 0.04| 0.05  | 0.91  | 0.96  | 0.05  | 0.18  | 0.23  | 68.6 | 4,937 | 5,006 | 7.19| 0.60| 3,213 | 8,579 |
| Annual   | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | —    | —    | —   | —   | —  | —   |
| Mobile   | 0.13| 0.82| 1.32| 0.01| 0.01  | 0.17  | 0.18  | 0.01  | 0.03  | 0.04  | —    | 677  | 677  | 0.02 | 0.08| 0.99| 702 |
| Area     | 0.58| < 0.005| 0.47| < 0.005| < 0.005| —     | < 0.005| < 0.005| —     | < 0.005| —    | 1.76 | 1.76 | < 0.005| < 0.005| —  | 1.76 |
| Energy   | 0.00| 0.00| 0.00| 0.00| 0.00  | —     | 0.00  | 0.00  | —     | 0.00  | —    | 108  | 108  | 0.01 | < 0.005| —  | 109 |
| Water    | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | 8.83 | 30.3 | 39.2 | 0.91| 0.02| —  | 68.4 |
| Waste    | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | 11.4 | 817  | 829  | 1.19| 0.10| 532 | 1,420 |
| Refrig.  | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | 531  | 531  | —    | —   | —   | —  | —   |
| Total    | 0.70| 0.82| 1.79| 0.01| 0.01  | 0.17  | 0.18  | 0.01  | 0.03  | 0.04  | 11.4 | 817  | 829  | 1.19| 0.10| 532 | 1,420 |
| Daily, Summer (Max) | — | — | — | — | — | — | 2.95 | 28.0 | 24.2 | 0.03 | 1.22 | — | 1.22 | 1.12 | — | 1.12 | 3,489 | 3,489 | 0.14 | 0.03 | — | 3,501 |
|---------------------|---|---|---|---|---|---|-----|-----|-----|-----|-----|---|-----|-----|---|-----|-----|-----|---|-----|
| Off-Road Equipment  | — | — | — | — | — | — | — | 11.2 | 11.2 | — | 1.69 | 1.69 | — | — | — | 3,501 |
| Demolition          | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Onsite truck        | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily       | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| Daily, Summer (Max) | 0.19 | 1.84 | 1.59 | < 0.005 | 0.08 | — | 0.08 | 0.07 | — | 0.07 | — | 229 | 229 | 0.01 | < 0.005 | — | 230 |
| Off-Road Equipment  | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Demolition          | — | — | — | — | — | — | — | 0.73 | 0.73 | — | 0.11 | 0.11 | — | — | — | — | — | — |
| Onsite truck        | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual              | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment  | 0.04 | 0.34 | 0.29 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 38.0 | 38.0 | < 0.005 | < 0.005 | — | 38.1 |
| Demolition          | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck        | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite             | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker              | 0.06 | 0.07 | 0.91 | 0.00 | 0.00 | 0.16 | 0.16 | 0.00 | 0.04 | 0.04 | — | 174 | 174 | 0.01 | 0.01 | 0.80 | 177 |
| Vendor              | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
### 3.2. Demolition (2023) - Mitigated

**Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)**

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<th>SO2</th>
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### 3.3. Grading (2023) - Unmitigated

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### 3.5. Building Construction (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)
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### 3.6. Building Construction (2023) - Mitigated

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### 3.7. Building Construction (2024) - Unmitigated

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### 3.8. Building Construction (2024) - Mitigated

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3.9. Paving (2024) - Unmitigated
Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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3.10. Paving (2024) - Mitigated

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3.10. Paving (2024) - Mitigated

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### 3.11. Architectural Coating (2024) - Unmitigated

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### Architectural Coatings (2024) - Mitigated

**Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)**

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### 3.12. Architectural Coating (2024) - Mitigated

- **Worker**
  - Onsite: 0.04
  - Offsite: —
  - Daily, Summer (Max): —
  - Daily, Winter (Max): —
- **Vendor**
  - Onsite: 0.00
  - Offsite: —
  - Daily, Summer (Max): —
  - Daily, Winter (Max): —
- **Hauling**
  - Onsite: 0.00
  - Offsite: —
  - Daily, Summer (Max): —
  - Daily, Winter (Max): —
- **Average Daily**
  - Worker: 0.04
  - Vendor: 0.00
  - Hauling: 0.00
- **Annual**
  - Worker: < 0.005
  - Vendor: 0.00
  - Hauling: 0.00

**GHGs (lb/day for daily, MT/yr for annual)**

- **Worker**
  - Onsite: 0.29
  - Offsite: —
  - Daily, Summer (Max): —
  - Daily, Winter (Max): —
- **Vendor**
  - Onsite: 0.00
  - Offsite: —
  - Daily, Summer (Max): —
  - Daily, Winter (Max): —
- **Hauling**
  - Onsite: 0.00
  - Offsite: —
  - Daily, Summer (Max): —
  - Daily, Winter (Max): —
- **Average Daily**
  - Worker: < 0.005
  - Vendor: 0.00
  - Hauling: 0.00
- **Annual**
  - Worker: < 0.005
  - Vendor: 0.00
  - Hauling: 0.00
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### 4. Operations Emissions Details

#### 4.1. Mobile Emissions by Land Use

##### 4.1.1. Unmitigated

**Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)**

| Land Use                  | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R   | CO2e |
|---------------------------|-----|-----|----|-----|-------|-------|-------|-------|-------|-------|------|------|------|-----|-----|-----|-----|------|
| Daily, Summer (Max)       |     |     |    |     |       |       |       |       |       |       |      |      |      |     |     |     |     |      |
| Worker                   | 0.04 | 0.06 | 0.62 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | 132 | 132 | 0.01 | 0.01 | 0.02 | 133 |
| Vendor                   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling                  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily            |     |     |    |     |       |       |       |       |       |       |      |      |      |     |     |     |     |      |
| Worker                   | < 0.005 | 0.01 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | 13.8 | 13.8 | < 0.005 | < 0.005 | 0.03 | 14.0 |
| Vendor                   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling                  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual                   |     |     |    |     |       |       |       |       |       |       |      |      |      |     |     |     |     |      |
| Worker                   | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | 2.29 | 2.29 | < 0.005 | < 0.005 | < 0.005 | 2.32 |
| Vendor                   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling                  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
### Parking Lot

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#### 4.1.2. Mitigated

**Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)**

| Land Use       | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|----------------|-----|-----|----|-----|-------|-------|-------|-------|-------|-------|------|-------|------|-----|----|----|----|-----|
| Daily, Winter (Max) | —   | —   | —  | —   | —     | —     | —     | —     | —     | —     | —    | —     | —    | —   | —  | —  | —  |     |

1300 Lawrence Drive Detailed Report, 4/17/2023
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**4.2. Energy**

**4.2.1. Electricity Emissions By Land Use - Unmitigated**

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)
### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)
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4.2.3. Natural Gas Emissions By Land Use - Unmitigated
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### 4.2.4. Natural Gas Emissions By Land Use - Mitigated

**Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)**

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### 4.3. Area Emissions by Source

#### 4.3.2. Unmitigated

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### 4.3.1. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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### 4.4. Water Emissions by Land Use

#### 4.4.2. Unmitigated

**Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)**

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<th>PM10D</th>
<th>PM10T</th>
<th>PM2.5E</th>
<th>PM2.5D</th>
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<th>NBCO2</th>
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- ROG: Reactive Organic Gases
- NOx: Nitrogen Oxides
- CO: Carbon Monoxide
- SO2: Sulfur Dioxide
- PM10E: Particulate Matter 10- 
volumetrically
- PM10D: Particulate Matter 10-
  diameter
- PM10T: Particulate Matter 10-
  time
- PM2.5E: Particulate Matter 2.5-
  volumetrically
- PM2.5D: Particulate Matter 2.5-
  diameter
- PM2.5T: Particulate Matter 2.5-
  time
- BCO2: Black Carbon
- NBCO2: Black Carbon
- CO2T: Carbon Dioxide
- CH4: Methane
- N2O: Nitrous Oxide
- R: Radiative Forcing
- CO2e: Carbon Dioxide Equivalent
| Unrefrigerated Warehouse-No Rail | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 53.3 | 183 | 237 | 5.49 | 0.13 | -- | 413 |
| Parking Lot | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 |
| Total | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 53.3 | 183 | 237 | 5.49 | 0.13 | -- | 413 |
| Annual | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Unrefrigerated Warehouse-No Rail | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.83 | 30.3 | 39.2 | 0.91 | 0.02 | -- | 68.4 |
| Parking Lot | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 |
| Total | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.83 | 30.3 | 39.2 | 0.91 | 0.02 | -- | 68.4 |

4.4.1. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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### 4.5. Waste Emissions by Land Use

#### 4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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| Unrefrigerated Parking Lot |     |     |    |     |       |       |       |        |        |        |      |       |      |     |     |   |      |
| Total                     |     |     |    |     |       |       |       |        |        |        |      |       |      |     |     |   |      |

<p>| Unrefrigerated Parking Lot | 61.0 | 0.00 | 61.0 | 6.09 | 0.00 | — | — | 213 |
| Total                     | 61.0 | 0.00 | 61.0 | 6.09 | 0.00 | — | — | 213 |</p>
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### 4.5.1. Mitigated

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Daily, Winter (Max) Detailed Report, 4/17/2023
4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

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4.6.2. Mitigated

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4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)
### 4.7. Offroad Emissions By Equipment Type

#### 4.7.1. Unmitigated

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4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

<table>
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<th>Equipment Type</th>
<th>ROG</th>
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<th>CH4</th>
<th>N2O</th>
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Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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<th>Equipment Type</th>
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### 4.8. Stationary Emissions By Equipment Type

#### 4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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<th>Equipment Type</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
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<th>PM10D</th>
<th>PM10T</th>
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<th>PM2.5D</th>
<th>PM2.5T</th>
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<th>CO2T</th>
<th>CH4</th>
<th>N2O</th>
<th>R</th>
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<td><strong>Daily, Summer (Max)</strong></td>
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</table>
### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

<table>
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<th>Equipment Type</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
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<th>NBCO2</th>
<th>CO2T</th>
<th>CH4</th>
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### 4.9. User Defined Emissions By Equipment Type

#### 4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>PM10E</th>
<th>PM10D</th>
<th>PM10T</th>
<th>PM2.5E</th>
<th>PM2.5D</th>
<th>PM2.5T</th>
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<th>CH4</th>
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<td>Daily, Summer (Max)</td>
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</table>
### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

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<th>Equipment Type</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>PM10E</th>
<th>PM10D</th>
<th>PM10T</th>
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### 4.10. Soil Carbon Accumulation By Vegetation Type

#### 4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)
### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

**Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)**

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### 4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

**Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)**

<table>
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<th>Species</th>
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### 4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

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<th>PM2.5D</th>
<th>PM2.5T</th>
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<th>NBCO2</th>
<th>CO2T</th>
<th>CH4</th>
<th>N2O</th>
<th>R</th>
<th>CO2e</th>
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### 4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

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<th>Land Use</th>
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<th>PM10T</th>
<th>PM2.5E</th>
<th>PM2.5D</th>
<th>PM2.5T</th>
<th>BCO2</th>
<th>NBCO2</th>
<th>CO2T</th>
<th>CH4</th>
<th>N2O</th>
<th>R</th>
<th>CO2e</th>
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### 4.10.6. Avoided and Sequestered Emissions by Species - Mitigated
## Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

<table>
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<th>Species</th>
<th>ROG</th>
<th>NOx</th>
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<th>SO2</th>
<th>PM10E</th>
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<th>PM2.5E</th>
<th>PM2.5D</th>
<th>PM2.5T</th>
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</table>

**Note:** The table provides a detailed breakdown of pollutants and GHGs for different time periods (daily, summer, winter, annual) and their avoided and removed amounts. The data is expressed in pounds per day for daily pollutants and tons per year for annual pollutants.
5. Activity Data

5.1. Construction Schedule

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<th>End Date</th>
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5.2. Off-Road Equipment

5.2.1. Unmitigated

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<tr>
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<td>Tractors/Loaders/Backhoes</td>
<td>Diesel</td>
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<td>8.00</td>
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<td>Diesel</td>
<td>Average</td>
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<td>7.00</td>
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<td>Diesel</td>
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<tr>
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<td>Fuel Type</td>
<td>Engine Tier</td>
<td>Number per Day</td>
<td>Hours Per Day</td>
<td>Horsepower</td>
<td>Load Factor</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------</td>
<td>-----------</td>
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<td>----------------</td>
<td>---------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Building Construction</td>
<td>Generator Sets</td>
<td>Diesel</td>
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<td>8.00</td>
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<td>Tractors/Loaders/Backhoes</td>
<td>Diesel</td>
<td>Average</td>
<td>3.00</td>
<td>7.00</td>
<td>84.0</td>
<td>0.37</td>
</tr>
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<td>Welders</td>
<td>Diesel</td>
<td>Average</td>
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<td>Air Compressors</td>
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<td>6.00</td>
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### 5.2.2. Mitigated

<table>
<thead>
<tr>
<th>Phase Name</th>
<th>Equipment Type</th>
<th>Fuel Type</th>
<th>Engine Tier</th>
<th>Number per Day</th>
<th>Hours Per Day</th>
<th>Horsepower</th>
<th>Load Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition</td>
<td>Concrete/Industrial Saws</td>
<td>Diesel</td>
<td>Tier 4 Final</td>
<td>3.00</td>
<td>8.00</td>
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<tr>
<td>Demolition</td>
<td>Rubber Tired Dozers</td>
<td>Diesel</td>
<td>Tier 4 Final</td>
<td>2.00</td>
<td>8.00</td>
<td>367</td>
<td>0.40</td>
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<tr>
<td>Grading</td>
<td>Graders</td>
<td>Diesel</td>
<td>Tier 4 Final</td>
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<td>367</td>
<td>0.40</td>
</tr>
<tr>
<td>Grading</td>
<td>Tractors/Loaders/Backhoes</td>
<td>Diesel</td>
<td>Tier 4 Final</td>
<td>3.00</td>
<td>8.00</td>
<td>84.0</td>
<td>0.37</td>
</tr>
<tr>
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<td>Diesel</td>
<td>Average</td>
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<td>7.00</td>
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<td>Diesel</td>
<td>Average</td>
<td>3.00</td>
<td>8.00</td>
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<tr>
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<td>8.00</td>
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5.3. Construction Vehicles

5.3.1. Unmitigated

<table>
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<th>Phase Name</th>
<th>Trip Type</th>
<th>One-Way Trips per Day</th>
<th>Miles per Trip</th>
<th>Vehicle Mix</th>
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<tbody>
<tr>
<td>Demolition</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Demolition</td>
<td>Worker</td>
<td>12.5</td>
<td>18.5</td>
<td>LDA,LDT1,LDT2</td>
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<tr>
<td>Demolition</td>
<td>Vendor</td>
<td>—</td>
<td>10.2</td>
<td>HHDT, MHDT</td>
</tr>
<tr>
<td>Demolition</td>
<td>Hauling</td>
<td>201</td>
<td>15.7</td>
<td>HHDT</td>
</tr>
<tr>
<td>Demolition</td>
<td>Onsite truck</td>
<td>—</td>
<td>—</td>
<td>HHDT</td>
</tr>
<tr>
<td>Grading</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Grading</td>
<td>Worker</td>
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<td>18.5</td>
<td>LDA,LDT1,LDT2</td>
</tr>
<tr>
<td>Grading</td>
<td>Vendor</td>
<td>—</td>
<td>10.2</td>
<td>HHDT, MHDT</td>
</tr>
<tr>
<td>Grading</td>
<td>Hauling</td>
<td>34.1</td>
<td>15.7</td>
<td>HHDT</td>
</tr>
<tr>
<td>Grading</td>
<td>Onsite truck</td>
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<td>—</td>
<td>HHDT</td>
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<tr>
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<td>—</td>
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<td>—</td>
</tr>
<tr>
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<td>Worker</td>
<td>50.5</td>
<td>18.5</td>
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<td>Vendor</td>
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<td>10.2</td>
<td>HHDT, MHDT</td>
</tr>
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<td>Hauling</td>
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<td>20.0</td>
<td>HHDT</td>
</tr>
<tr>
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<td>Onsite truck</td>
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<td>—</td>
<td>HHDT</td>
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<tr>
<td>Paving</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Phase Name</td>
<td>Trip Type</td>
<td>One-Way Trips per Day</td>
<td>Miles per Trip</td>
<td>Vehicle Mix</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------</td>
<td>-----------------------</td>
<td>----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Paving Worker</td>
<td></td>
<td>20.0</td>
<td>18.5</td>
<td>LDA,LDT1,LDT2</td>
</tr>
<tr>
<td>Paving Vendor</td>
<td></td>
<td>—</td>
<td>10.2</td>
<td>HHDT,MHDT</td>
</tr>
<tr>
<td>Paving Hauling</td>
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<td>0.00</td>
<td>20.0</td>
<td>HHDT</td>
</tr>
<tr>
<td>Paving Onsite truck</td>
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<td>—</td>
<td>—</td>
<td>HHDT</td>
</tr>
<tr>
<td>Architectural Coating Worker</td>
<td></td>
<td>10.1</td>
<td>18.5</td>
<td>LDA,LDT1,LDT2</td>
</tr>
<tr>
<td>Architectural Coating Vendor</td>
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<td>10.2</td>
<td>HHDT,MHDT</td>
</tr>
<tr>
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<td>HHDT</td>
</tr>
<tr>
<td>Architectural Coating Onsite truck</td>
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<td>—</td>
<td>—</td>
<td>HHDT</td>
</tr>
<tr>
<td>5.3.2. Mitigated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Demolition

- **Worker**
  - Miles per Trip: 18.5
  - Vehicle Mix: LDA,LDT1,LDT2

- **Vendor**
  - Miles per Trip: 10.2
  - Vehicle Mix: HHDT,MHDT

- **Hauling**
  - Miles per Trip: 15.7
  - Vehicle Mix: HHDT

- **Onsite truck**
  - Miles per Trip: —
  - Vehicle Mix: —

### Grading

- **Worker**
  - Miles per Trip: 18.5
  - Vehicle Mix: LDA,LDT1,LDT2

- **Vendor**
  - Miles per Trip: 10.2
  - Vehicle Mix: HHDT,MHDT

- **Hauling**
  - Miles per Trip: 15.7
  - Vehicle Mix: HHDT

- **Onsite truck**
  - Miles per Trip: —
  - Vehicle Mix: —

### Building Construction

- **Worker**
  - Miles per Trip: 18.5
  - Vehicle Mix: LDA,LDT1,LDT2

- **Vendor**
  - Miles per Trip: 10.2
  - Vehicle Mix: HHDT,MHDT

- **Hauling**
  - Miles per Trip: 20.0
  - Vehicle Mix: HHDT

- **Onsite truck**
  - Miles per Trip: —
  - Vehicle Mix: —
5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

<table>
<thead>
<tr>
<th>Control Strategies Applied</th>
<th>PM10 Reduction</th>
<th>PM2.5 Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water unpaved roads twice daily</td>
<td>55%</td>
<td>55%</td>
</tr>
<tr>
<td>Limit vehicle speeds on unpaved roads to 25 mph</td>
<td>44%</td>
<td>44%</td>
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</table>

5.5. Architectural Coatings

<table>
<thead>
<tr>
<th>Phase Name</th>
<th>Residential Interior Area Coated (sq ft)</th>
<th>Residential Exterior Area Coated (sq ft)</th>
<th>Non-Residential Interior Area Coated (sq ft)</th>
<th>Non-Residential Exterior Area Coated (sq ft)</th>
<th>Parking Area Coated (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural Coating</td>
<td>0.00</td>
<td>0.00</td>
<td>180,522</td>
<td>60,174</td>
<td>4,493</td>
</tr>
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</table>

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities
<table>
<thead>
<tr>
<th>Phase Name</th>
<th>Material Imported (Cubic Yards)</th>
<th>Material Exported (Cubic Yards)</th>
<th>Acres Graded (acres)</th>
<th>Material Demolished (Ton of Debris)</th>
<th>Acres Paved (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>19,250</td>
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</tr>
<tr>
<td>Grading</td>
<td>—</td>
<td>6,000</td>
<td>38.5</td>
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<td>—</td>
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<tr>
<td>Paving</td>
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<td>0.00</td>
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<td>1.72</td>
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</table>

5.6.2. Construction Earthmoving Control Strategies

<table>
<thead>
<tr>
<th>Control Strategies Applied</th>
<th>Frequency (per day)</th>
<th>PM10 Reduction</th>
<th>PM2.5 Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Exposed Area</td>
<td>2</td>
<td>61%</td>
<td>61%</td>
</tr>
<tr>
<td>Water Demolished Area</td>
<td>2</td>
<td>36%</td>
<td>36%</td>
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</tbody>
</table>

5.7. Construction Paving

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Area Paved (acres)</th>
<th>% Asphalt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>0.00</td>
<td>0%</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>1.72</td>
<td>100%</td>
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5.8. Construction Electricity Consumption and Emissions Factors

<table>
<thead>
<tr>
<th>kWh per Year and Emission Factor (lb/MWh)</th>
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<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>2023</td>
</tr>
<tr>
<td>2024</td>
</tr>
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5.9. Operational Mobile Sources

5.9.1. Unmitigated

<table>
<thead>
<tr>
<th>Land Use Type</th>
<th>Trips/Weekday</th>
<th>Trips/Saturday</th>
<th>Trips/Sunday</th>
<th>Trips/Year</th>
<th>VMT/Weekday</th>
<th>VMT/Saturday</th>
<th>VMT/Sunday</th>
<th>VMT/Year</th>
</tr>
</thead>
</table>
5.9.2. Mitigated

<table>
<thead>
<tr>
<th>Land Use Type</th>
<th>Trips/Weekday</th>
<th>Trips/Saturday</th>
<th>Trips/Sunday</th>
<th>Trips/Year</th>
<th>VMT/Weekday</th>
<th>VMT/Saturday</th>
<th>VMT/Sunday</th>
<th>VMT/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>206</td>
<td>206</td>
<td>206</td>
<td>75,115</td>
<td>2,765</td>
<td>2,765</td>
<td>2,765</td>
<td>1,009,101</td>
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<tr>
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<td>0.00</td>
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5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

<table>
<thead>
<tr>
<th>Residential Interior Area Coated (sq ft)</th>
<th>Residential Exterior Area Coated (sq ft)</th>
<th>Non-Residential Interior Area Coated (sq ft)</th>
<th>Non-Residential Exterior Area Coated (sq ft)</th>
<th>Parking Area Coated (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.00</td>
<td>180,522</td>
<td>60,174</td>
<td>4,493</td>
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</table>

5.10.3. Landscape Equipment

<table>
<thead>
<tr>
<th>Season</th>
<th>Unit</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Snow Days</td>
<td>day/yr</td>
<td>0.00</td>
</tr>
<tr>
<td>Summer Days</td>
<td>day/yr</td>
<td>180</td>
</tr>
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</table>
5.10.4. Landscape Equipment - Mitigated

<table>
<thead>
<tr>
<th>Season</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow Days</td>
<td>day/yr</td>
<td>0.00</td>
</tr>
<tr>
<td>Summer Days</td>
<td>day/yr</td>
<td>180</td>
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5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Electricity (kWh/yr)</th>
<th>CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>Natural Gas (kBTU/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>617,404</td>
<td>349</td>
<td>0.0330</td>
<td>0.0040</td>
<td>0.00</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>65,595</td>
<td>349</td>
<td>0.0330</td>
<td>0.0040</td>
<td>0.00</td>
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</tbody>
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5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Electricity (kWh/yr)</th>
<th>CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>Natural Gas (kBTU/yr)</th>
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</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>617,404</td>
<td>349</td>
<td>0.0330</td>
<td>0.0040</td>
<td>0.00</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>65,595</td>
<td>349</td>
<td>0.0330</td>
<td>0.0040</td>
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5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Indoor Water (gal/year)</th>
<th>Outdoor Water (gal/year)</th>
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</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
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<td>460,415</td>
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5.12.2. Mitigated

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<thead>
<tr>
<th>Land Use</th>
<th>Indoor Water (gal/year)</th>
<th>Outdoor Water (gal/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>27,830,475</td>
<td>460,415</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

5.13. Operational Waste Generation

5.13.1. Unmitigated

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Waste (ton/year)</th>
<th>Cogeneration (kWh/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>113.13</td>
<td>0.00</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

5.13.2. Mitigated

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Waste (ton/year)</th>
<th>Cogeneration (kWh/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>28.28</td>
<td>0.00</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

<table>
<thead>
<tr>
<th>Land Use Type</th>
<th>Equipment Type</th>
<th>Refrigerant</th>
<th>GWP</th>
<th>Quantity (kg)</th>
<th>Operations Leak Rate</th>
<th>Service Leak Rate</th>
<th>Times Serviced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>Cold storage</td>
<td>R-404A</td>
<td>3,922</td>
<td>7.50</td>
<td>7.50</td>
<td>7.50</td>
<td>25.0</td>
</tr>
</tbody>
</table>

5.14.2. Mitigated
5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Fuel Type</th>
<th>Engine Tier</th>
<th>Number per Day</th>
<th>Hours Per Day</th>
<th>Horsepower</th>
<th>Load Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrefrigerated Warehouse-No Rail</td>
<td>Cold storage</td>
<td>R-404A</td>
<td>3,922</td>
<td>7.50</td>
<td>7.50</td>
<td>7.50</td>
</tr>
</tbody>
</table>

5.15.2. Mitigated

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Fuel Type</th>
<th>Engine Tier</th>
<th>Number per Day</th>
<th>Hours Per Day</th>
<th>Horsepower</th>
<th>Load Factor</th>
</tr>
</thead>
</table>

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Fuel Type</th>
<th>Number per Day</th>
<th>Hours per Day</th>
<th>Hours per Year</th>
<th>Horsepower</th>
<th>Load Factor</th>
</tr>
</thead>
</table>

5.16.2. Process Boilers

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Fuel Type</th>
<th>Number</th>
<th>Boiler Rating (MMBtu/hr)</th>
<th>Daily Heat Input (MMBtu/day)</th>
<th>Annual Heat Input (MMBtu/yr)</th>
</tr>
</thead>
</table>

5.17. User Defined

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Fuel Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

5.18. Vegetation

5.18.1. Land Use Change
5.18.1.1. Unmitigated

<table>
<thead>
<tr>
<th>Vegetation Land Use Type</th>
<th>Vegetation Soil Type</th>
<th>Initial Acres</th>
<th>Final Acres</th>
</tr>
</thead>
</table>

5.18.1.2. Mitigated

<table>
<thead>
<tr>
<th>Vegetation Land Use Type</th>
<th>Vegetation Soil Type</th>
<th>Initial Acres</th>
<th>Final Acres</th>
</tr>
</thead>
</table>

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

<table>
<thead>
<tr>
<th>Biomass Cover Type</th>
<th>Initial Acres</th>
<th>Final Acres</th>
</tr>
</thead>
</table>

5.18.1.2. Mitigated

<table>
<thead>
<tr>
<th>Biomass Cover Type</th>
<th>Initial Acres</th>
<th>Final Acres</th>
</tr>
</thead>
</table>

5.18.2. Sequestration

5.18.2.1. Unmitigated

<table>
<thead>
<tr>
<th>Tree Type</th>
<th>Number</th>
<th>Electricity Saved (kWh/year)</th>
<th>Natural Gas Saved (btu/year)</th>
</tr>
</thead>
</table>

5.18.2.2. Mitigated

<table>
<thead>
<tr>
<th>Tree Type</th>
<th>Number</th>
<th>Electricity Saved (kWh/year)</th>
<th>Natural Gas Saved (btu/year)</th>
</tr>
</thead>
</table>

6. Climate Risk Detailed Report

6.1. Climate Risk Summary
Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

<table>
<thead>
<tr>
<th>Climate Hazard</th>
<th>Result for Project Location</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature and Extreme Heat</td>
<td>14.1</td>
<td>annual days of extreme heat</td>
</tr>
<tr>
<td>Extreme Precipitation</td>
<td>4.95</td>
<td>annual days with precipitation above 20 mm</td>
</tr>
<tr>
<td>Sea Level Rise</td>
<td>0.00</td>
<td>meters of inundation depth</td>
</tr>
<tr>
<td>Wildfire</td>
<td>29.4</td>
<td>annual hectares burned</td>
</tr>
</tbody>
</table>

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi. Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

### 6.2. Initial Climate Risk Scores

<table>
<thead>
<tr>
<th>Climate Hazard</th>
<th>Exposure Score</th>
<th>Sensitivity Score</th>
<th>Adaptive Capacity Score</th>
<th>Vulnerability Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature and Extreme Heat</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Extreme Precipitation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sea Level Rise</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Wildfire</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Flooding</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Drought</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Snowpack Reduction</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Air Quality Degradation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

### 6.3. Adjusted Climate Risk Scores

<table>
<thead>
<tr>
<th>Climate Hazard</th>
<th>Exposure Score</th>
<th>Sensitivity Score</th>
<th>Adaptive Capacity Score</th>
<th>Vulnerability Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature and Extreme Heat</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Extreme Precipitation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sea Level Rise</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Wildfire</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Flooding</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Drought</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Snowpack Reduction</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Air Quality Degradation</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

### 6.4. Climate Risk Reduction Measures

### 7. Health and Equity Details

#### 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Result for Project Census Tract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure Indicators</td>
<td>—</td>
</tr>
<tr>
<td>AQ-Ozone</td>
<td>47.4</td>
</tr>
<tr>
<td>AQ-PM</td>
<td>41.5</td>
</tr>
<tr>
<td>AQ-DPM</td>
<td>54.6</td>
</tr>
<tr>
<td>Indicator</td>
<td>Result for Project Census Tract</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Drinking Water</td>
<td>57.5</td>
</tr>
<tr>
<td>Lead Risk Housing</td>
<td>26.2</td>
</tr>
<tr>
<td>Pesticides</td>
<td>23.9</td>
</tr>
<tr>
<td>Toxic Releases</td>
<td>25.9</td>
</tr>
<tr>
<td>Traffic</td>
<td>88.0</td>
</tr>
<tr>
<td>Effect Indicators</td>
<td>—</td>
</tr>
<tr>
<td>CleanUp Sites</td>
<td>76.7</td>
</tr>
<tr>
<td>Groundwater</td>
<td>95.4</td>
</tr>
<tr>
<td>Haz Waste Facilities/Generators</td>
<td>99.0</td>
</tr>
<tr>
<td>Impaired Water Bodies</td>
<td>96.8</td>
</tr>
<tr>
<td>Solid Waste</td>
<td>0.00</td>
</tr>
<tr>
<td>Sensitive Population</td>
<td>—</td>
</tr>
<tr>
<td>Asthma</td>
<td>6.47</td>
</tr>
<tr>
<td>Cardio-vascular</td>
<td>23.6</td>
</tr>
<tr>
<td>Low Birth Weights</td>
<td>81.5</td>
</tr>
<tr>
<td>Socioeconomic Factor Indicators</td>
<td>—</td>
</tr>
<tr>
<td>Education</td>
<td>42.3</td>
</tr>
<tr>
<td>Housing</td>
<td>36.7</td>
</tr>
<tr>
<td>Linguistic</td>
<td>79.0</td>
</tr>
<tr>
<td>Poverty</td>
<td>41.7</td>
</tr>
<tr>
<td>Unemployment</td>
<td>63.4</td>
</tr>
</tbody>
</table>

### 7.2. Healthy Places Index Scores

The maximum Healthy Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Result for Project Census Tract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>—</td>
</tr>
<tr>
<td>Above Poverty</td>
<td>50.891826</td>
</tr>
<tr>
<td>Category</td>
<td>Value</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Employed</td>
<td>66.62389324</td>
</tr>
<tr>
<td>Median HI</td>
<td>80.00769922</td>
</tr>
<tr>
<td>Education</td>
<td>—</td>
</tr>
<tr>
<td>Bachelor's or higher</td>
<td>77.04350058</td>
</tr>
<tr>
<td>High school enrollment</td>
<td>100</td>
</tr>
<tr>
<td>Preschool enrollment</td>
<td>84.35775696</td>
</tr>
<tr>
<td>Transportation</td>
<td>—</td>
</tr>
<tr>
<td>Auto Access</td>
<td>24.89413576</td>
</tr>
<tr>
<td>Active commuting</td>
<td>79.73822661</td>
</tr>
<tr>
<td>Social</td>
<td>—</td>
</tr>
<tr>
<td>2-parent households</td>
<td>83.72898755</td>
</tr>
<tr>
<td>Voting</td>
<td>71.96201719</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>—</td>
</tr>
<tr>
<td>Alcohol availability</td>
<td>57.74412935</td>
</tr>
<tr>
<td>Park access</td>
<td>81.35506224</td>
</tr>
<tr>
<td>Retail density</td>
<td>49.6856153</td>
</tr>
<tr>
<td>Supermarket access</td>
<td>58.44989093</td>
</tr>
<tr>
<td>Tree canopy</td>
<td>73.65584499</td>
</tr>
<tr>
<td>Housing</td>
<td>—</td>
</tr>
<tr>
<td>Homeownership</td>
<td>29.61632234</td>
</tr>
<tr>
<td>Housing habitability</td>
<td>34.69780572</td>
</tr>
<tr>
<td>Low-inc homeowner severe housing cost burden</td>
<td>54.20248941</td>
</tr>
<tr>
<td>Low-inc renter severe housing cost burden</td>
<td>35.30091107</td>
</tr>
<tr>
<td>Uncrowded housing</td>
<td>29.84729886</td>
</tr>
<tr>
<td>Health Outcomes</td>
<td>—</td>
</tr>
<tr>
<td>Insured adults</td>
<td>32.84999358</td>
</tr>
<tr>
<td>Arthritis</td>
<td>87.4</td>
</tr>
<tr>
<td>Condition</td>
<td>Value</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Asthma ER Admissions</td>
<td>88.5</td>
</tr>
<tr>
<td>High Blood Pressure</td>
<td>63.5</td>
</tr>
<tr>
<td>Cancer (excluding skin)</td>
<td>66.1</td>
</tr>
<tr>
<td>Asthma</td>
<td>51.9</td>
</tr>
<tr>
<td>Coronary Heart Disease</td>
<td>85.5</td>
</tr>
<tr>
<td>Chronic Obstructive Pulmonary Disease</td>
<td>68.2</td>
</tr>
<tr>
<td>Diagnosed Diabetes</td>
<td>85.5</td>
</tr>
<tr>
<td>Life Expectancy at Birth</td>
<td>96.6</td>
</tr>
<tr>
<td>Cognitively Disabled</td>
<td>85.7</td>
</tr>
<tr>
<td>Physically Disabled</td>
<td>76.0</td>
</tr>
<tr>
<td>Heart Attack ER Admissions</td>
<td>65.6</td>
</tr>
<tr>
<td>Mental Health Not Good</td>
<td>52.8</td>
</tr>
<tr>
<td>Chronic Kidney Disease</td>
<td>85.5</td>
</tr>
<tr>
<td>Obesity</td>
<td>61.8</td>
</tr>
<tr>
<td>Pedestrian Injuries</td>
<td>40.0</td>
</tr>
<tr>
<td>Physical Health Not Good</td>
<td>62.9</td>
</tr>
<tr>
<td>Stroke</td>
<td>84.7</td>
</tr>
<tr>
<td>Health Risk Behaviors</td>
<td>—</td>
</tr>
<tr>
<td>Binge Drinking</td>
<td>29.5</td>
</tr>
<tr>
<td>Current Smoker</td>
<td>53.5</td>
</tr>
<tr>
<td>No Leisure Time for Physical Activity</td>
<td>56.1</td>
</tr>
<tr>
<td>Climate Change Exposures</td>
<td>—</td>
</tr>
<tr>
<td>Wildfire Risk</td>
<td>28.4</td>
</tr>
<tr>
<td>SLR Inundation Area</td>
<td>0.0</td>
</tr>
<tr>
<td>Children</td>
<td>20.9</td>
</tr>
<tr>
<td>Elderly</td>
<td>92.9</td>
</tr>
<tr>
<td>English Speaking</td>
<td>14.1</td>
</tr>
</tbody>
</table>
7.3. Overall Health & Equity Scores

<table>
<thead>
<tr>
<th>Metric</th>
<th>Result for Project Census Tract</th>
</tr>
</thead>
<tbody>
<tr>
<td>CalEnviroScreen 4.0 Score for Project Location (a)</td>
<td>61.0</td>
</tr>
<tr>
<td>Healthy Places Index Score for Project Location (b)</td>
<td>75.0</td>
</tr>
<tr>
<td>Project Located in a Designated Disadvantaged Community (Senate Bill 535)</td>
<td>No</td>
</tr>
<tr>
<td>Project Located in a Low-Income Community (Assembly Bill 1550)</td>
<td>No</td>
</tr>
<tr>
<td>Project Located in a Community Air Protection Program Community (Assembly Bill 617)</td>
<td>No</td>
</tr>
</tbody>
</table>

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Healthy Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.
8. User Changes to Default Data

<table>
<thead>
<tr>
<th>Screen</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>120,348 SF warehouse, 191-space parking lot, 35,615 SF of landscaping on 6.64 acres.</td>
</tr>
<tr>
<td>Construction: Construction Phases</td>
<td>Construction to start 7/5/2023 and take approximately 7 months to complete.</td>
</tr>
<tr>
<td>Construction: Off-Road Equipment</td>
<td>Pump and mixer added to paving, excavator removed from demo, extra saws added to demo, and scraper added to grading (per equipment list).</td>
</tr>
<tr>
<td>Construction: Trips and VMT</td>
<td>Round trip to disposal site is 31.4 miles (15.7 miles one-way) during demo and grading.</td>
</tr>
<tr>
<td>Operations: Energy Use</td>
<td>Project will be all electric and estimated to consume 10% more electricity than default of 561,276.01 kWh/year.</td>
</tr>
<tr>
<td>Operations: Vehicle Data</td>
<td>Trip generation rates updated per 11th Edition ITE for warehousing (150), 1.71 trips/TSF.</td>
</tr>
<tr>
<td>Operations: Fleet Mix</td>
<td>Vehicle mix updated per ITE vehicle mix of 35% trucks (72 trucks) and 65% cars. Truck mix = 5.83% 2-axle, 7.77% 3-axle and 21.36% 4+ axle.</td>
</tr>
</tbody>
</table>
Appendix B
Biological Review
January 6, 2023

Tom Wood | Cruzan
9171 Wilshire Blvd., Suite 500
Beverly Hills, CA 90210
tom@cruzan.co
Transmitted Via E-mail

Subject: Biological Resources Review for the property at 1300 Lawrence Drive,
Thousand Oaks. CA 91320

Dear Mr. Wood:

Introduction - This letter reports on the biological conditions present on the above property. A brief floristic survey of the site was conducted on December 26, 2022. The skies were clear, there was a light breeze with temperature at 80°F at 2:00 pm. The purpose of the survey was to determine the general biologic character of the site and to determine if any sensitive resources or resources protected or administered by regulatory agencies were present on the site. No attempt was made to thoroughly catalogue all of the species present on the property, however, easy access to the entire site insured that no species present were overlooked. The California Natural Diversity Database and the California Native Plant Society’s lists of sensitive plants were accessed for the nine quadrangle area surrounding the site. The potential for the occurrence of any species found on these lists was evaluated. An arborist report has been prepared for the project so potential impacts and required mitigation measures for trees will not be addressed here. However, all of the plants noted on the property are listed.

Site Description – The property is located in the city of Thousand Oaks in the heavily developed west San Fernando Valley. The area is characterized by light industry with many surrounding lots occupied by commercial, manufacturing, and warehouse buildings. The subject property is presently a parking lot with typical landscaping around the perimeter and on scattered islands within the lot.

Vegetation – As noted above, the property is a typical parking lot. The vegetation present is characterized by remnants of the original landscaping, supplemented by volunteers from surrounding landscaped areas and scattered ruderal (weedy) species. The following are characteristic of the nonnative species noted at the time of the survey:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>rosemary</td>
<td><em>Salvia rosmarinus</em></td>
<td>Acacia</td>
<td><em>Acacia sp.</em></td>
</tr>
<tr>
<td>Indian hawthorn</td>
<td><em>Rhaphiolepis indica</em></td>
<td>carrotwood</td>
<td><em>Cupaniopsis anacardioides</em></td>
</tr>
<tr>
<td>lantana</td>
<td><em>Lantana sp.</em></td>
<td>jacaranda</td>
<td><em>Jacaranda mimosifolia</em></td>
</tr>
<tr>
<td>firethorn</td>
<td><em>Pyracantha angustifolia</em></td>
<td>glossy privet</td>
<td><em>Ligustrum lucidum</em></td>
</tr>
<tr>
<td>Plant Name</td>
<td>Common Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agapanthus orientalis</td>
<td>lily of the Nile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lonicera periclymenum</td>
<td>honeysuckle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hedra helix</td>
<td>English ivy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asparagus (densiflorus?)</td>
<td>Asparagus fern</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eucalyptus sideroxylon</td>
<td>red-ironbark Euc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eucalyptus camaldulensis</td>
<td>blue gum</td>
<td></td>
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<tr>
<td>Cinnamomum camphora</td>
<td>camphor tree</td>
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<td></td>
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<tr>
<td>Pinus canariensis</td>
<td>Canary Island pine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pinus halepensis</td>
<td>Aleppo pine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazilian pepper</td>
<td>Schinus terebenthifolia</td>
</tr>
<tr>
<td>golden rain tree</td>
<td>Koelreuteria paniculata</td>
</tr>
<tr>
<td>Chinese elm</td>
<td>Ulmus parviflora</td>
</tr>
<tr>
<td>Mexican fan palm</td>
<td>Washingtonia robusta</td>
</tr>
<tr>
<td>late cotoneaster</td>
<td>Cotoneaster lacteus</td>
</tr>
<tr>
<td>holly oak</td>
<td>Quercus ilex</td>
</tr>
<tr>
<td>crepe myrtle</td>
<td>Lagerstroemia indica</td>
</tr>
<tr>
<td>Bermuda grass</td>
<td>Cynodon dactylon</td>
</tr>
</tbody>
</table>

Two native species were also present in the lot, each represented by just a few individual plants. These were coyote brush (*Baccharis pilularis*) and two-colored cudweed (*Pseudognaphalium biolettii*). These species are adapted to take advantage of soil disturbances and are often considered weeds in the garden but also provide resources for native wildlife.

There is a drainage to the southeast that is believed to be offsite but does convey runoff from at least part of the property. In this area there are some coast live oaks (*Quercus agrifolia*) and narrow-leaved willows (*Salix exigua*).

**Wildlife** - The cursory nature of the site survey conducted in support of a constraints analysis resulted in few wildlife observations. No reptiles or amphibians were noted at the time of the survey, but the western fence lizard may occur there. Any mammal species found in the suburban areas of southern California may utilize or traverse the site on occasion including numerous rodent species, raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), and eastern fox squirrel (*Sciurus niger*). Birds were the only wildlife directly observed during the brief survey. Birds observed include both common suburban species and migrating or winter resident species. The species seen were Allan’s hummingbird, Audubon’s warbler, American crow, common raven, northern mockingbird, lesser goldfinch, dark-eyed junco, white-throated nuthatch, and the invasive Eurasian collard dove. There were several inactive bird nests noted in the trees and shrubs onsite.

None of these species are Listed as threatened or Endangered and none are specifically protected by state or federal Endangered Species Acts. All native bird species that occur on the site are protected from nest disturbance by the federal Migratory Bird Treaty Act and the California Fish and Game Code. These regulations prohibit the disturbance of nesting birds in any manner that may cause reproductive failure. In general, this means that land clearing must be accomplished during winter months while the birds are not nesting. If clearing cannot be accomplished during the non-nesting season (Currently considered to be from September 30 through January 1 per CDFW) nesting bird surveys must be conducted, and any nests discovered must be avoided during construction. In general, nesting bird surveys are required for any construction that takes place between January 1 and September 30. Because the buffer distances recommended by CDFW (500 feet for raptors and 300 feet for all other species) extend far beyond the property limits in many cases, nest detection and avoidance
may be difficult or impossible on adjacent private properties. In these cases, appropriate nest avoidance strategies may be determined by a qualified biological monitor who is onsite if land clearance is scheduled during nesting season.

**Sensitive Biological Resources –**

There are 109 species and habitats reported in the nine-quad area surrounding the site that are protected pursuant to Federal and/or State endangered species laws, or have been designated as Species of Concern by the USFWS or Species of Special Concern by the CDFW. In addition, Section 15380(b) of the California Environmental Quality Act (CEQA) Guidelines provides a definition of rare, endangered or threatened species that are not included in any listing. Species recognized under these terms are collectively referred to as “special-status species.” For purposes of this analysis, special-status species include:

- Plant and wildlife species listed as rare, threatened or endangered under the Federal or State Endangered Species Acts;
- Species that are candidates for listing under either Federal or State law;
- Species designated by the USFWS as Proposed or Candidates for listing and/or species designated as Species of Special Concern by CDFW;
- Species protected by the Federal Migratory Bird Treaty Act (16 U.S.C. 703-711);
- Bald and golden eagles protected by the Federal Bald Eagle Protection Act (16 U.S.C. 668); and
- Species such as candidate species that may be considered rare or endangered pursuant to Section 15380(b) of the CEQA Guidelines.

**Conclusion** - The site survey revealed that the property is practically devoid of vegetation and what is present consists of nonnative landscape and common weedy species limited to the perimeter of, and islands within, the parking lot. There is no chance that any of the sensitive species reported as occurring in the surround area would reside on the property.

It is a pleasure working with you and I look forward to the opportunity to continue assisting with this project if the need arises.

Sincerely,
Biological Assessment Services

Ty M. Garrison
Principal / Biologist
Appendix C
Oak Tree Report
October 4, 2022 – Original  
April 18, 2023 – Revised

Cruzan  
Attn. Mr. Tom Wood  
9171 Wilshire Blvd., Suite #500  
Beverly Hills, Ca 90210  

Re: 1300 Lawrence Dr. LLC  
Oak Tree Letter / Report for 1300 Lawrence Dr., Thousand Oaks, Ca.

Dear Mr. Wood,  

This letter is being prepared to present the facts and findings to the City of Thousand Oaks staff.  
Per resolution No. 2010-14, Oak Tree Protection and Preservation Guidelines.

The Site  
The site is currently a flat, abandoned parking lot. It seems that the landscape could have been installed at least 12 years ago. There are parking lot planters and perimeter landscaping. According to the current Grading Plan, 90% of the site will be graded to receive the new building necessitating the removal of all vegetation except some Eucalyptus along Corporate Center Drive and the Eastern property line.

Vegetation  
Currently the property has the following trees species on site. Eucalyptus, Koelreuteria, Pinus, Lagerstroemia, and some Pistacia. There is 1 small Oak tree #134 – Quercus agrifolia, located in the landscape area above the street on Lawrence Dr. There is one Quercus ilex with 2 trunks @ 1” caliper, noted as Tree #135. There is one other Quercus agrifolia, Tree # 136 within the drainage swale on the S.E. property line on a manufactured slope. The maintenance of this parking lot is almost nonexistent.

Oak Tree #134 - Quercus agrifolia – Coast Live Oak  
This is a very healthy, small Coast Live Oak tree. The tree is approximately 20’ high and has a canopy diameter of approximately 9’. The tree is approximately 3” in diameter at D.B.H and leans to the south. This tree we would grade as a B in health and aesthetics. According to the Grading Plan, the site will be graded up to the trunk of this tree, requiring it’s removal since it falls within the Code criteria. We would recommend that as mitigation for this volunteer Oak that 2-24” box & 1- 36” box to be planted as part of the future landscape plan.
**Oak Tree #135 - Quercus ilex – Holly Oak**

This tree appears to have been severely pruned and poorly maintained. It is suckering from the base. It has 2 small trunks. There is one dominant trunk that is at least 1” caliper. There is a lot of shrubs and groundcover around the tree. I would give this non-native Oak a grade of D for health and aesthetics. This tree will be impacted by the grading of the site to accommodate the future building and possibly new landscape and irrigation. There should be no mitigation required for this removal.

**Oak Tree #136 – Quercus Agrifolia – Coast Live Oak**

There is a small volunteer Oak located on the slope of an existing drainage area. According to the Architectural Site Plan, there are proposed double retaining walls. These walls will cause the removal of this Oak. We recommend that the Landscape Plan reflect Oak Tree mitigation of 2-24” and 1-36” box Oaks to be planted.

**Mitigation**

In summary, we are requesting that we submit a Type “C” Oak Tree Permit and that the suggested mitigation be accepted as meeting the spirit of the City of Thousand Oaks ordinances. We will plant 4 – 24” box Quercus lobata standards and 2-36” box Quercus agrifolia standards as mitigation for these 2 volunteer Oaks.

Cordially,

Lee Newman
Landscape Architect, License #1314

Cc: Melanie Danneberg – Ware Malcomb
    Keith Malloy – Ware Malcomb

Encl: Oak Tree Permit Application Revision
    Site Tree Photos
    Site Legend/100 Scale Map L-1
    Summary of Field Observations Sheet
    Dripline Measurements Sheet
OAK TREE #136
QUERCUS AGRIFOLIA
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<td>REMOVE DEADWOOD</td>
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**REMARKS:**
## DRIPLINE MEASUREMENTS

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<th>E</th>
<th>SE</th>
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<tr>
<td>134</td>
<td>3</td>
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<td>6</td>
<td>6'</td>
<td>7</td>
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<td>HEIGHT TO CANOPY</td>
<td>10'</td>
<td>8</td>
<td>6'</td>
<td>6'</td>
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<td></td>
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<td></td>
</tr>
<tr>
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<td>0</td>
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<td>3'</td>
<td>18&quot;</td>
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<tr>
<td>HEIGHT TO CANOPY</td>
<td>NA</td>
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<td>THIS IS NOT A TREE, ONLY SKINNY TRUNKS &amp; LEANING</td>
<td></td>
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<tr>
<td>136</td>
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<td></td>
<td>18&quot;</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**NAME:** 1300 Lawrence Dr.

**Page:** 1
Appendix D

Cultural Assessment
CULTURAL RESOURCE ASSESSMENT REPORT FOR THE 1300 LAWRENCE DRIVE INDUSTRIAL BUILDING THOUSAND OAKS, VENTURA COUNTY, CALIFORNIA

Prepared by:
Katherine Sinsky, M.A., RPA
Rachael Irwin, B.A.

Prepared for:
Cruzan
9171 Wilshire Boulevard, Suite 500
Beverly Hills, California 90210

PaleoWest Technical Report No.: 22-610

PaleoWest, LLC
517 South Ivy Avenue
Monrovia, California 91016
(626) 408-8006

December 2, 2022

Keywords: Cultural Resources Assessment; Section 106 of the National Historic Preservation Act; California Environmental Quality Act Plus; Thousand Oaks, Ventura County
PaleoWest, LLC (PaleoWest) completed a cultural resource assessment in support of the Cruzan Industrial Building Project (Project) at 1300 Lawrence Drive in the city of Thousand Oaks, Ventura County, California. The proposed Project involves the demolition of an existing paved parking lot and the construction of an industrial and warehouse building on the approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035).

This report presents the results of the records search, Native American Heritage Commission (NAHC) outreach results, literature review, fieldwork, and analysis with recommendations. The proposed Project is subject to compliance with the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA). The City of Thousand Oaks (City) is the lead agency for CEQA and Section 106.

Results of the NWIC records search indicate that no cultural resources have been previously documented within the Area of Potential Effect (APE) or in a 0.25-mile buffer around the APE. PaleoWest contacted the NAHC on October 7, 2022, for a review of the Sacred Lands File (SLF). The NAHC responded on November 3, 2022, indicating that results were negative. PaleoWest sent letters to 11 tribal contacts identified by the NAHC to notify them of Project plans on October 17, 2022 and followed up with phone calls on November 23, 2022. As of December 2, 2022, no responses have been received.

PaleoWest archaeologist Katherine Sinsky, M.A., RPA authored this report and completed the survey of the APE on November 3, 2022. Sinsky is a Principal Investigator who meets the Secretary of the Interior’s Standards for Professional Qualifications (SOISPA) (62 Federal Register 33708-33723) in archaeology.
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INTRODUCTION

PaleoWest, LLC (PaleoWest) completed a cultural resource assessment in support of the 1300 Lawrence Drive Industrial Building Project (Project) in the city of Thousand Oaks, Ventura County, California (Figure 1). The proposed Project involves the demolition of the existing parking lots at the site and the construction of a new 120,348-square foot (ft²) industrial building. The approximately 6.64-acre Area of Potential Effects (APE) (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot.

This report documents the results of the background research and records search, Native American consultation efforts by the lead federal agency, historical consultation, and the results of the built environment field survey to identify potential historic properties within the APE. PaleoWest completed this work under contract to Cruzan.

PROJECT LOCATION AND DESCRIPTION

The APE is at 1300 Lawrence Drive in the city of Thousand Oaks (Figure 2 and Figure 3). The approximately 6.64-acre APE covers three APNs: 667-0-172-015, 667-0-172-025, and 667-0-172-035. The property is currently an underutilized parking lot bounded on the west by Lawrence Drive, on the north by Corporate Center Drive, and on the east and south by corporate and industrial buildings.

Cruzan proposes to demolish the existing parking lot and construct a 120,384 square foot (ft²) building, containing 112,384 ft² of warehouse space and 8000 ft² office space. The total lot size is 289,046 ft², 40 percent of which will be covered by the proposed building. The landscaped area is planned to cover 36,816 ft², or 12 percent of the lot. A total of 191 parking stalls and 10 bike racks are proposed for construction around the building. The APE is in an M-1 Industrial Park zoning area, which are established to provide areas for the development of planned manufacturing, technology, and life science uses.

The proposed Project is subject to compliance with CEQA and Section 106 of the NHPA. The City of Thousand Oaks (City) is the lead agency for CEQA and Section 106.
Figure 1. Project vicinity map.
Figure 2. Project location map.
Figure 3. APE map.
REGULATORY SETTING

FEDERAL

National Historic Preservation Act (NHPA)

The NHPA of 1966, as amended (54 United States Code [USC] 300101 et seq.), sets forth the responsibilities that federal agencies must meet regarding cultural resources, especially Section 106 and its implanting regulations in 36 CFR 800. Federal agencies must conduct the necessary studies and consultations to identify cultural resources that may be affected by an undertaking, evaluate cultural resources that may be affected to determine if they are eligible for the National Register of Historic Places (NRHP) (that is, whether identified resources constitute historic properties) and assess whether such historic properties would be adversely affected. Historic properties are resources that are listed on or eligible for listing on the NRHP (36 CFR 800.16[l][1]). A property may be listed in the NRHP if it meets criteria provided in the NRHP regulations (36 CFR 60.4). Typically, such properties must also be 50 years or older (36 CFR 60.4[d]).

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, or association, and meets any of the following criteria for listing on the NRHP:

A. That are associated with events that have made a significant contribution to the broad patterns of our history;

B. That are associated with the lives of persons significant in our past;

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

Section 106 defines an adverse effect as an effect that alters, directly or indirectly, the qualities that make a resource eligible for listing in the NRHP (36 CFR 800.5[a][1]). Consideration must be given to the property’s location, design, setting, materials, workmanship, feeling, and association, to the extent that these qualities contribute to the integrity and significance of the resource. Adverse effects may be direct and reasonably foreseeable or may be more remote in time or distance (36 CFR 8010.5[a][1]).

Archaeological and Historic Preservation Act (AHPA)

The AHPA was established in 1960 for the preservation of significant scientific, prehistoric, historical, and archaeological materials and data that might be lost or destroyed as a result of flooding, the construction of access roads, relocation of railroads and highways, or any other federally funded activity that is associated with the construction of a dam or reservoir. Under this law, historical and archaeological resources do not have to be eligible, or
considered eligible, in the NRHP for an impact to occur. If a project will have an adverse effect to significant historical or archaeological resources or data, the State Water Board will coordinate with the United States Environmental Protection Agency (USEPA) to initiate consultation with the relevant federal agencies.

STATE

California Environmental Quality Act (CEQA)

The proposed Project is subject to compliance with CEQA, as amended. Compliance with CEQA statutes and guidelines requires both public and private projects with financing or approval from a public agency to assess the project’s impact on cultural resources (Public Resources Code Section 21082, 21083.2 and 21084 and California Code of Regulations 10564.5). The first step in the process is to identify cultural resources that may be impacted by the Project and then determine whether the resources are “historically significant” resources.

CEQA defines historically significant resources as “resources listed or eligible for listing in the California Register of Historical Resources (CRHR)” (Public Resources Code Section 5024.1). A cultural resource may be considered historically significant if the resource is 45 years old or older, possesses integrity of location, design, setting, materials, workmanship, feeling, and association, and meets any of the following criteria for listing on the CRHR:

1. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
4. Has yielded, or may be likely to yield, information important in prehistory or history (Public Resources Code Section 5024.1).

Cultural resources are buildings, sites, humanly modified landscapes, traditional cultural properties, structures, or objects that may have historical, architectural, cultural, or scientific importance. CEQA states that if a project will have a significant impact on important cultural resources, deemed “historically significant,” then project alternatives and mitigation measures must be considered. Additionally, any proposed project that may affect historically significant cultural resources must be submitted to the State Historic Preservation Officer (SHPO) for review and comment prior to project approval by the responsible agency and prior to construction.

California Register of Historical Resources Criteria

The criteria used to establish the significance of a property for listing on the California Register of Historical Resources (CRHR) are as follows:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or

3. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values; or

4. It has yielded, or is likely to yield, information important to prehistory or history of the local area, California, or the nation.

For a property to qualify under the CRHR’s Criteria for Evaluation, it must also retain “historic integrity of those features necessary to convey its significance,” (National Park Service 1997). To determine if a property retains the physical characteristics corresponding to its historic context, the NRHP has identified seven aspects of integrity, which the CRHR closely follows.

Location is the place where the historic property was constructed or the place where the historic event occurred.

Design is the combination of elements that create the form, plan, space, structure, and style of a property.

Setting is the physical environment of a historic property.

Materials are the physical elements that were combined or deposited during a particular period and in a particular pattern or configuration to form a historic property.

Workmanship is the physical evidence of the crafts of a particular cultural or people during any given period in history or prehistory.

Feeling is the property’s expression of the aesthetic or historic sense of a particular period.

Association is the direct link between an important historic event or person and a historic property.

Because integrity is based on a property’s significance in a specific historic context, evaluations of integrity can only be completed after historic significance has been established.

California Assembly Bill 52 (AB 52)

Signed into law on September 2014, California AB 52 created a new class of resources—tribal cultural resources—for consideration under CEQA. Tribal cultural resources may include sites, features, places, cultural landscapes, sacred places, or objects with cultural value to a California Native American tribe that are listed or determined to be eligible for listing in the CRHR, included in a local register of historical resources, or a resource determined by the lead CEQA agency, in its discretion and supported by substantial evidence, to be significant and eligible for listing on the CRHR. AB 52 requires that the lead CEQA agency consult with California Native American tribes that have requested consultation for projects that may affect tribal cultural resources. The lead CEQA agency shall begin consultation with participating Native American tribes prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report. Under AB 52, a project that has potential to cause a substantial adverse change to a tribal cultural resource constitutes a significant effect on the environment unless mitigation reduces such effects to a less than significant level.
LOCAL

City of Thousand Oaks

The City of Thousand Oaks 2045 General Plan (1997) provides brief regulatory context for the proposed Project. The following policies support strategies that aim to enhance the City’s identity and preserve existing cultural resources:

- **Historic Preservation:** Historical areas, facilities and natural features must be preserved by a program of legislative controls, tax incentives, direct acquisition by public agencies and private initiative.
- **Archaeological:** The City shall preserve and protect archaeological resources for future generations and the Conejo Valley’s cultural heritage.

CULTURAL RESOURCE INVENTORY

RECORDS SEARCH RESULTS

On October 7, 2022, PaleoWest staff submitted a records search request of the California Historical Resources Information System at the South Central Coastal Information Center (SCCIC) at California State University Fullerton for the 1300 Lawrence Drive Thousand Oaks Industrial Building Project (File No. 22-0400). This records search included a review of cultural resource studies and recorded cultural resources within the APE and a 0.25-mile (mi) radius around the APE. PaleoWest also reviewed the Office of Historic Preservation (OHP) Historic Properties Directory, which includes information regarding properties listed in the NRHP, CRHR, California State Historical Landmarks, California State Points of Historical Interest, and pertinent historic building surveys. The objective of the records search was to identify pre-contact or historic period cultural resources recorded in the study area during previous cultural resource investigations.

Records search results indicate that one cultural resource study has been completed within the APE (Table 1), and 10 within the 0.25-mile buffer around the APE (Table 2). The resource study within the APE was prepared by archaeologist Robert Lopez in 1986. The report describes the results of his cultural resource investigation for a 1.60-acre area within the 6.64-acre APE and details the history of the surrounding Conejo Valley. Lopez did not find any indicators of pre-contact archaeological materials in the study.

Four cultural resources have been identified within 0.25 miles of the APE (Table 3). Site P-56-000173 is a small pre-contact artifact scatter on a knoll, recorded by C. King in 1967. Site P-56-000438 was a small lithic scatter recorded by Whitley and Ivie in 1977. The site record suggests the scatter was imminently threatened by the expansion of an adjacent airfield. Site P-56-000449 was a pre-contact habitation site including a shell midden and artifact scatter. The site record, documented in 1977 by Whitley and Ivie, indicates that the site is on a ridge near quartz crystal and chalcedony sources, and that the scatter contained a variety of shell types, chert and quartz flakes, bifaces, projectile points, and cores. The site was
approximately 500 meters (m) northwest of the APE and has since been destroyed by development of the industrial park.

Table 1. Previous Cultural Resource Investigations in APE

<table>
<thead>
<tr>
<th>Report No.</th>
<th>Author(s)</th>
<th>Year</th>
<th>Title</th>
<th>Company/Agency</th>
</tr>
</thead>
</table>

Table 2. Previous Cultural Resource Studies Investigations in 0.25-mile Study Area

<table>
<thead>
<tr>
<th>Report No.</th>
<th>Author(s)</th>
<th>Year</th>
<th>Title</th>
<th>Company/Agency</th>
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<tr>
<td>VN-00103</td>
<td>Clewlow, William C. Jr.</td>
<td>1978</td>
<td>Preliminary Archaeological Investigations on Mgm Ranch: 4-VEN-170, 4-VEN-171, 4-VEN-272, 4-VEN-437, 4-VEN-449</td>
<td>University of California, Los Angeles Archaeological Survey</td>
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<td>VN-00914</td>
<td>Whitley, David S.</td>
<td>1985</td>
<td>Archaeological Survey of Portions of the Northrop Corporation Property, Newbury Park, Ventura County, California</td>
<td>University of California, Los Angeles Archaeological Survey</td>
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<tr>
<td>VN-00934</td>
<td>W &amp; S Consultants</td>
<td>1990</td>
<td>Intensive Phase 1 Archaeological Survey and Cultural Resources Assessment of the Proposed Academy Business Park, Newbury Park Ventura County, California</td>
<td>W &amp; S Consultants</td>
</tr>
<tr>
<td>VN-01527</td>
<td>Allen, Patricia A.</td>
<td>1978</td>
<td>An Historic Study of the Property Known As the M.g.m Ranch a Planned Community by Shapell Industries Inc.</td>
<td>Conejo Valley Historical Society</td>
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<tr>
<td>VN-02810</td>
<td>Schmidt, James, Schmidt, June, and Romani, Gwen</td>
<td>2008</td>
<td>Results of Extended Phase I Investigations at Sites P56-100196 (SCE MN-1), P56-001797 (CA-Ven-1797; SCE MN-2), and P56-100197 (SCE MN-3), for the Southern California Edison Moorpark-Newbury Park 66kV New Source Line Project (WO 4605-2104;JO 6042-0468), Ventura County, California</td>
<td>Compass Rose Archaeological, Inc.</td>
</tr>
<tr>
<td>VN-02843</td>
<td>Amaglio, Alessandro</td>
<td>2005</td>
<td>Conejo Fire Mitigation, Conejo Recreation and Park District, FFEAM-1498-DR-CA, HMG# #1498-98-36</td>
<td>URS</td>
</tr>
<tr>
<td>VN-03038</td>
<td>Fulton, Phil</td>
<td>2012</td>
<td>Cultural Resource Assessment Class I Inventory Verizon Wireless Services Brush Facility City of Thousand Oaks, Ventura County, Ca</td>
<td>LSA Associates</td>
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</table>
Table 3. Previous Cultural Resources in 0.25-mile Study Area

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<tr>
<td>P-56-000173</td>
<td>–</td>
<td>Prehistoric</td>
<td>1967 (King)</td>
</tr>
<tr>
<td>P-56-000438</td>
<td>Site B</td>
<td>Prehistoric</td>
<td>1977 (Whitley and Ivie)</td>
</tr>
<tr>
<td>P-56-000449</td>
<td>Site M</td>
<td>Prehistoric</td>
<td>1977 (Whitley and Ivie)</td>
</tr>
<tr>
<td>P-56-100197</td>
<td>SCE MN-3</td>
<td>Prehistoric</td>
<td>1990 (C. E. Drover and D.M. Smith)</td>
</tr>
</tbody>
</table>

NATIVE AMERICAN HERITAGE COMISSION OUTREACH

PaleoWest contacted the NAHC on October 7, 2022, for a review of the Sacred Lands File (SLF). The objective of the SLF search was to determine if the NAHC had any knowledge of Native American cultural resources (e.g., traditional use or gathering area, place of religious or sacred activity, etc.) within the immediate vicinity of the APE. On November 3, 2022, the NAHC responded stating that the SLF search for the Project was negative and provided a contact list of local Native American groups to be contacted for additional information.

On November 18, 2022, PaleoWest sent letters notifying 11 affiliated tribal contacts of the proposed Project and results of the current assessment. Follow-up calls were made to all tribal contacts on November 23, 2022. Annette Ayala, CRM Committee Chair of the Barbareño/Ventureño Band of Mission Indians, and Chairperson Anthony Morales of the Gabrielleño/Tongva San Gabriel Band of Mission Indians indicated that their tribes are interested in engaging in consultation upon receipt of the official notification from the lead agency.

This outreach does not constitute formal Assembly Bill (AB) 52 consultation as required by CEQA. AB 52 consultation is performed between the lead government agency and California Native American tribes who have requested notification of projects in their traditional area. Attachment B provides the results of the outreach effort.

ARCHIVAL RESEARCH RESULTS

Historical documents, cultural resource studies, historical aerial photos, and local historical resources were used and examined to identify potential pre-contact and historic period and resources in the APE. The Project is in an unsectioned portion of Township 1 North, Range 19 West, on the Newbury Park, California U.S. Geological Survey (USGS 2021) 7.5-minute series quadrangle topographic map.

The APE is within an area of California’s Central Coast called the Conejo Valley and was first claimed by the Spanish explorer Juan Rodriguez Cabrillo in 1542. The region stays out of the written record until 1770, when Gaspar de Portola visited while on an expedition to establish California’s second Mission in Monterey (Lopez 1986). As the California coast became colonized and indoctrinated by the Spanish, the Conejo Valley stayed relatively free of Mission activity for a little more than a decade. The San Buenoventura Mission is the nearest mission, 22 miles west of the APE, and Mission San Fernando Rey De Espana is 27 miles west.

The region was exclusively inhabited by indigenous Chumash peoples, until around 1782 when Mission San Buenoventura was established, allowing for a more active colonization of the area.
Mission San Buenoventura missionaries converted 26 Chumash individuals from 1788 to 1809; the Franciscans in the area were known to frequently take converts from neighboring Rancherias. It was reported by Spanish travelers that several villages in the Conejo Valley were abandoned by 1792, which is notable as the Chumash people were known to have settlement patterns consisting of centralized, long-term occupations sites during this time (Lopez 1986; see also City of Thousand Oaks n.d.).

In 1803, the APE was part of a land grant given by Governor Jose Arrillaga to two Spanish soldiers, Ygnacio Rodriguez and Jose Polanco, and was partially given away as another land grant in 1852 to Spanish Army Officer Jose De La Guerra Noriega, who used the land to ranch cattle (Figure 4) (USDC 1852). The area became known as Newbury after Ebert S. Newbury established the first post office in 1875; this allowed for more immigrants to settle permanently (Figure 5 through Figure 8; Newbury 1875). In 1919, Janns Investment Company purchased 10,000 acres of land in the Conejo Valley. This company is most notable known for its land donation that led to the establishment of the University of California, Los Angeles (UCLA; Enriquez 1987).

Historical aerial photos show the APE as completely vacant and undeveloped in 1936 and remained that way until 2002, when the land was developed into a parking lot (Figure 9; NETR 2022; UCSB 1936). The area around the APE became more developed and industrialized over time, which is reflected in aerial photos starting in 1967, with large structures now visible across what is now Lawrence Drive (Figure 10).
Figure 5. 1900 USGS topographic map showing APE location within Conejo Valley, scale 1:62,500 (USGS 1900).

Figure 6. 1903 USGS topographic map showing the APE in Conejo Valley, scale 1:25,000 (USGS 1903).
Figure 7. USGS topographic map showing APE location in 1950, scale 1:24,000 (USGS 1950).

Figure 8. First post office in Newbury, California (circled), at Egbert S. Newbury’s residence, 1875 (Newbury 1875).
Figure 9. 1936 aerial photograph, APE outlined in red (UCSB 1936).

Figure 10. 1970 aerial photograph, APE outlined in red (UCSB 1970).
FIELD INVESTIGATION

FIELD METHODS

A survey of the APE was conducted to identify and record historical resources. As a means of evaluating potential impacts to such resources, PaleoWest archaeologist Katherine Sinsky conducted an intensive pedestrian survey of the APE on November 3, 2022. Transect intervals were spaced 15 meters apart and oriented east to west. All exposed ground surfaces were examined for artifacts, and digital photographs were taken for use in documentation and reporting. Photographs included general views of the APE, structures, features, and other relevant images.

The APE was examined for the presence of historical artifacts or site indicators. Historical site indicators include foundations, fence lines, ditches, standing buildings, objects or structures such as sheds; or concentrations of materials at least 45 years in age, such as domestic refuse (glass bottles, ceramics, toys, buttons, or leather shoes), or refuse from other pursuits such as agriculture (e.g., metal tanks, farm machinery parts, horseshoes) or structural materials (e.g., nails, glass window panes, corrugated metal, wood posts or planks, metal pipes and fittings, etc.).

SURVEY RESULTS

The survey covered the entire approximately 6.64-acre APE. PaleoWest surveyed 100 percent of the APE, which was open and accessible to the surveyor. The expansive site is a paved parking lot, with approximately 5 percent of the ground surface visible in landscaped areas along the edges of the APE and in curbed end islands and divisors (Figure 11). No cultural materials were identified during the survey. Photos are provided in Attachment B.

Figure 11. APE overview from western side looking east, November 3, 2022.
CONCLUSION AND RECOMMENDATIONS

Cruzan proposes to demolish the existing paved parking lot and construct an industrial building at 1300 Lawrence Drive in Thousand Oaks, Ventura County. To mitigate potential impacts to cultural and paleontological resources, PaleoWest evaluated the proposed APE for the presence of archaeological resources using data gathered during pedestrian survey, historical research, NAHC outreach, and the results of a standard records search.

Tribal contacts representing the Barbareño/Ventureño Band of Mission Indians and the Gabrieleño/Tongva San Gabriel Band of Mission Indians have requested to engage in consultation with the lead agency.

Though there is no evidence for pre-contact archaeological deposits within the APE, four Pre-contact sites have been identified in the 0.25-mi study area. This suggests the APE is within an archaeologically sensitive part of the Conejo Valley. PaleoWest recommends pre-construction training for unanticipated discovery of archaeological resources to familiarize crews with cultural resources that may be encountered. A qualified archaeologist may be retained to conduct the Worker’s Environmental Awareness Program (WEAP) training on archaeological sensitivity for construction personnel prior to the commencement of any ground disturbing activities.

If previously unidentified cultural resources are unearthed during construction activities, work should cease within 50 ft of the find and directed away from the discovery until a Secretary of the Interior-qualified archaeologist assesses the significance of the resource. The archaeologist, in consultation with the sponsor and tribes, should make the necessary plans for treatment of the find(s) if the resource is eligible for listing in the NRHP or CRHR.

The discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to date to the Pre-contact Period, the Coroner will notify the NAHC, which will determine and notify a most likely descendant (MLD). The MLD has 48 hours from being granted site access to make recommendations for the disposition of the remains. If the MLD does not make recommendations within 48 hours, the landowner shall reinter the remains in an area of the property secure from subsequent disturbance.
REFERENCES

City of Thousand Oaks


Enriquez, Sam

Lopez, Robert

National Park Service (NPS)

Nationwide Environmental Title Research (NETR) Online

Newbury, Francis

United States, District Court (USDC)
1852 “Conejo grant: [Ventura and Los Angeles counties, Calif.]: Jose de la Guerra Y Noriega, claimant: case no. 107, Southern District, 1852 – 1857. Documents pertaining to the adjudication of private land claims in California, circa 1852-1892 Collection. Bancroft Library, University of California, Berkeley.

University of California Santa Barbara (UCSB) Aerial Photography Collection


U.S. Geological Survey (USGS)
1900 Trufino Pass, California. Scale 1:62,500.

1903 Camulos, California, Scale 1:125,000.
1950  *Newbury Park, California*. Scale 1:24,000.
2021  *Newbury Park, California*. Scale 1:24,000.
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November 3, 2022

Katherine Sinsky
PaleoWest Archaeology

Via Email to: ksinkys@paleowest.com

Re: 22-0675 1300 Lawrence Drive Thousand Oaks Industrial Building Project, Ventura County

Dear Ms. Sinsky:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Cody.Campagne@nahc.ca.gov.

Sincerely,

Cody Campagne
Cultural Resources Analyst

Attachment
This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed 22-0675 1300 Lawrence Drive Thousand Oaks Industrial Building Project, Ventura County.
<table>
<thead>
<tr>
<th>Contact Name</th>
<th>Tribe</th>
<th>Date/method</th>
<th>Response</th>
<th>Date/method</th>
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</thead>
<tbody>
<tr>
<td>Annette Ayala</td>
<td>Barbareno/Ventureno Band of Mission Indians</td>
<td>Email 11/18/22</td>
<td>None</td>
<td>Call 11/23/22</td>
<td>Left voicemail; responded with voicemail, will call back Monday 11/28</td>
<td>Call 11/28/2022</td>
<td>Left voicemail</td>
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<tr>
<td>Dayna Barrios</td>
<td>Barbareno/Ventureno Band of Mission Indians</td>
<td>Email 11/18/22</td>
<td>None</td>
<td>Call 11/23/22</td>
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<td>N/A</td>
<td>N/A</td>
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<tr>
<td>Julio Quair</td>
<td>Chumash Council of Bakersfield</td>
<td>Email 11/18/22</td>
<td>None</td>
<td>Call 11/23/22</td>
<td>Number disconnected</td>
<td>N/A</td>
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<tr>
<td>Gabe Frausto</td>
<td>Coastal Band of the Chumash Nation</td>
<td>Email 11/18/22</td>
<td>None</td>
<td>Call 11/23/22</td>
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<td>Mia Lopez</td>
<td>Coastal Band of the Chumash Nation</td>
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<td>Call 11/23/22</td>
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<td>N/A</td>
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<tr>
<td>Anthony Morales</td>
<td>Gabrieleno/Tongva San Gabriel Band of Mission Indians</td>
<td>Email 11/18/22</td>
<td>None</td>
<td>Call 11/23/22</td>
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<td>Call 11/28/2022</td>
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<td>Sandonne Goad</td>
<td>Gabrieleno/Tongva Nation</td>
<td>Email 11/18/22</td>
<td>None</td>
<td>Call 11/23/22</td>
<td>Voicemail box is full</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>Charles Alvarez</td>
<td>Gabrieleno-Tongva Tribe</td>
<td>Email 11/18/22</td>
<td>Email returned as undeliverable</td>
<td>Call 11/23/22</td>
<td>Left voicemail</td>
<td>N/A</td>
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<tr>
<td>Violet Walker</td>
<td>Northern Chumash Tribal Council</td>
<td>Email 11/18/22</td>
<td>None</td>
<td>Call 11/23/22</td>
<td>Left voicemail</td>
<td>N/A</td>
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<tr>
<td>San Luis Obispo County Chumash Council</td>
<td>Mail 11/21/22</td>
<td>None</td>
<td>No phone listed</td>
<td></td>
<td>Referred to Wendy Teeter, x7516; left voicemail</td>
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<tr>
<td>Kenneth Kahn</td>
<td>Santa Ynez Band of Chumash Indians</td>
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<td>None</td>
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<td></td>
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</table>
November 18, 2022

Gabrieleno-Tongva Tribe
Charles Alvarez
23454 Vanowen Street
West Hills, CA, 91307

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Charles Alvarez,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (f²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

A search of the Sacred Land files by the Native American Heritage Commission (NAHC) has been completed and results, received November 3, 2022, were negative. The information you provide will be used to assess areas of potential adverse impact within the Project area. Any information you might provide will be confidential and not divulged to the general public.

Results of the records search indicate that no cultural resources have been identified in the Project area or vicinity. No archaeological resources were identified within the Project area as a result of the archaeological field survey completed on November 3, 2022. The Project area is entirely paved with 5% ground surface visibility in landscaped areas.

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Sincerely,

PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
Project Location

Project Vicinity Map
USGS 7.5' Quadrangle:
Newbury Park, CA (1967)
T1N R20W Sec 00
Conejo Land Grant
SBBM | UTM Zone 11 | NAD 83
Project Location Map
USGS 7.5’ Quadrangle:
Newbury Park, CA (1967)
T1N R20W Sec 00
Conejo Land Grant
SBBM | UTM Zone 11 | NAD 83
November 18, 2022

Barboreno/Ventureno Band of Mission Indians
Annette Ayala
CRM Committee Chair
188 S. Santa Rosa Street
Ventura, CA, 93001

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Annette Ayala,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (f²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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Sincerely,

PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
November 18, 2022

**Barbareno/ Ventureno Band of Mission Indians**
Dayna Barrios  
Chairperson  
188 S. Santa Rosa Street  
Ventura, CA, 93001

**RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California**

Dear Chairperson Barrios,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (ft²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute *Newbury Park, CA* topographic quadrangle. The Project area is depicted on the enclosed maps.

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Sincerely,

**PALEOWEST**

Katherine Sinsky  
Project Manager  
760.207.4242  
ksinsky@paleowest.com
November 18, 2022

Coastal Band of the Chumash Nation
Gabe Frausto
Vice Chair
P.O. Box 4464
Santa Barbara, CA, 93140

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Chairperson Frausto,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (f²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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Sincerely,

PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
November 18, 2022

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Sandonne Goad
Chairperson
106 ½ Judge John Aiso Street, #231
Los Angeles, CA, 90012

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Chairperson Goad,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (f²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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Sincerely,

PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
November 18, 2022

Santa Ynez Band of Chumash Indians
Kenneth Kahn  
Chairperson  
P.O. Box 517  
Santa Ynez, CA, 93460

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Chairperson Kahn,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (ft²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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Sincerely,

PALEOWEST

Katherine Sinsky  
Project Manager  
760.207.4242  
ksinsky@paleowest.com
November 18, 2022

Coastal Band of the Chumash Nation
Mia Lopez
Chairperson
P.O. Box 4464
Santa Barbara, CA, 93140

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Chairperson Lopez,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (f²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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Sincerely,

PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
November 18, 2022

_Gabrieleno/Tongva San Gabriel Band of Mission Indians_
Anthony Morales
Chairperson
P.O. Box 693
San Gabriel, CA, 91778

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Chairperson Morales,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (f²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
November 18, 2022

Chumash Council of Baskersfield
Julio Quair
Chairperson
729 Texas Street
Bakersfield, CA, 93307

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Chairperson Quair,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (ft²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
November 18, 2022

San Luis Obispo County Chumash Council
1030 Ritchie Road
Grover Beach, CA, 93433

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear San Luis Obispo County Chumash Council,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot (f²) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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Sincerely,

PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
November 18, 2022

Northern Chumash Tribal Council
Violet Walker
Chairperson
P.O. Box 6533
Los Osos, CA, 93412

RE: Native American Outreach for the 1300 Lawrence Drive Industrial Building Project, Thousand Oaks, Ventura County, California

Dear Chairperson Walker,

PaleoWest LLC (PaleoWest) is seeking any information you may have on Native American cultural resources in or near 1300 Lawrence Drive, in the city of Thousand Oaks, Ventura County, California. The client proposes to demolish the existing parking lot and construction of a new 120,348-square foot ($^2$) industrial building. The approximately 6.64-acre site (Assessor’s Parcel Numbers [APNs] 667-0-172-015, 667-0-172-025, and 667-0-172-035) is currently a paved parking lot. The project is depicted on the USGS 7.5-minute Newbury Park, CA topographic quadrangle. The Project area is depicted on the enclosed maps.

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Sincerely,

PALEOWEST

Katherine Sinsky
Project Manager
760.207.4242
ksinsky@paleowest.com
Figure 1. sign at northeast entrance, view southwest

Figure 2. view from northeast corner, looking southwest
Figure 3. view from northeast corner, looking west

Figure 4. view from northeast corner, looking south
Figure 5. view from center of east side, looking north

Figure 6. view from south corner, looking north
Figure 7. view from near south corner, looking north

Figure 8. view from near southwest corner, looking northeast
Figure 9. View from west edge looking east

Figure 10. View from Lawrence Drive looking at north corner of APE, looking east
Figure 11. view from Lawrence Drive looking southeast towards western entrance
Appendix E
Energy Worksheets
### Construction Transportation Energy Worksheet

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>Emissions (MT CO₂) (1)</th>
<th>Diesel-Powered</th>
<th>Gasoline-Powered</th>
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<tr>
<td>Worker</td>
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| **Total Emissions in MT CO₂**    | 427.11                   | 48.4           |
| **Total Emissions in pounds CO₂**| 941,778                   | 106,722        |
| **Total Fuel Consumption**      | 42,537 gallons           | 5,445 gallons  |

\(1\) MT CO₂ = metric tons of carbon dioxide

\(2\) 1 MT of CO₂ = 2,205 pounds of CO₂.

\(3\) Diesel fuel has a CO₂ factor of 22.14 pounds of CO₂ per 1 gallon of diesel fuel. Gasoline has a CO₂ factor of 19.6 pounds of CO₂ per 1 gallon of gasoline. Source: U.S. Energy Information Administration, Environment Carbon Dioxide Emissions Coefficients, Release date: February 2, 2016.
Operational Transportation Energy Worksheet

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Ventura
Calendar Year: 2024
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/year for CVMT and EVMT, trips/year for Trips, kWh/year for Energy Consumption, tons/year for Emissions, 1000 gallons/year for Fuel Consumption

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<th>Vehicle Category</th>
<th>Model Year</th>
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<td>Aggregate</td>
<td>18610012.86</td>
<td>784.9688819</td>
<td>23.7079626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventura</td>
<td>2024 MH</td>
<td>Aggregate</td>
<td>Aggregate</td>
<td>3641169.074</td>
<td>354.0010491</td>
<td>10.2857579</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventura</td>
<td>2024 MHDT</td>
<td>Aggregate</td>
<td>Aggregate</td>
<td>79669809.98</td>
<td>8818.356517</td>
<td>9.03454173</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventura</td>
<td>2024 OBUS</td>
<td>Aggregate</td>
<td>Aggregate</td>
<td>2188969.613</td>
<td>261.8385465</td>
<td>8.35997575</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventura</td>
<td>2024 SBUS</td>
<td>Aggregate</td>
<td>Aggregate</td>
<td>2848322.392</td>
<td>372.956806</td>
<td>7.63717475</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventura</td>
<td>2024 UBUS</td>
<td>Aggregate</td>
<td>Aggregate</td>
<td>2133022.195</td>
<td>340.5991166</td>
<td>6.20250939</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total:
Ventura | 2024 HDHT | Aggregate | Aggregate | Gasoline | 21594.0677 | 5.294266109 | 4.07876377 |
Ventura | 2024 LDA | Aggregate | Aggregate | Gasoline | 33100671.33 | 109519.9686 | 30.2325428 |
Ventura | 2024 LDT1 | Aggregate | Aggregate | Gasoline | 29184173.43 | 11708.69623 | 24.9252119 |
Ventura | 2024 LDT2 | Aggregate | Aggregate | Gasoline | 15567712.64 | 63773.86016 | 42.4108066 |
Ventura | 2024 LHD1 | Aggregate | Aggregate | Gasoline | 11958851.17 | 8793.376467 | 13.5998399 |
Ventura | 2024 LHD2 | Aggregate | Aggregate | Gasoline | 19144678.8 | 1598.211618 | 11.9788134 |
Ventura | 2024 MCY | Aggregate | Aggregate | Gasoline | 30324513.96 | 737.654205 | 41.1093894 |
Ventura | 2024 MDV | Aggregate | Aggregate | Gasoline | 10045095.4 | 50912.54535 | 19.7300986 |
Ventura | 2024 MH | Aggregate | Aggregate | Gasoline | 8973727.099 | 1813.477865 | 9.484835215 |
Ventura | 2024 MHDT | Aggregate | Aggregate | Gasoline | 11022043.42 | 2081.556087 | 5.29599802 |
Ventura | 2024 OBUS | Aggregate | Aggregate | Gasoline | 3100552.54 | 602.4627281 | 5.14646367 |
Ventura | 2024 SBUS | Aggregate | Aggregate | Gasoline | 1675927.061 | 187.5141948 | 8.93760318 |
Ventura | 2024 UBUS | Aggregate | Aggregate | Gasoline | 104690.306 | 210.4589036 | 4.97437879 |

Total:
Ventura | 2024 HDHT | Aggregate | Aggregate | Electricity | 317473.7897 | 0 |
Ventura | 2024 LDA | Aggregate | Aggregate | Electricity | 20856293.6 | 0 |
Ventura | 2024 LDT1 | Aggregate | Aggregate | Electricity | 725066.9977 | 0 |
Ventura | 2024 LDT2 | Aggregate | Aggregate | Electricity | 7953349.134 | 0 |
Ventura | 2024 LHD1 | Aggregate | Aggregate | Electricity | 751658.1198 | 0 |
Ventura | 2024 LHD2 | Aggregate | Aggregate | Electricity | 184333.1652 | 0 |
Ventura | 2024 MDV | Aggregate | Aggregate | Electricity | 865462.947 | 0 |
Ventura | 2024 MHDT | Aggregate | Aggregate | Electricity | 279782.229 | 0 |
Ventura | 2024 OBUS | Aggregate | Aggregate | Electricity | 10616.47637 | 0 |
Ventura | 2024 SBUS | Aggregate | Aggregate | Electricity | 10397.27245 | 0 |
Ventura | 2024 UBUS | Aggregate | Aggregate | Electricity | 4855.331859 | 0 |
Ventura | 2024 HDHT | Aggregate | Aggregate | Natural Gas | 3187046.658 | 514.4234879 |
Ventura | 2024 OBUS | Aggregate | Aggregate | Natural Gas | 22572.17431 | 2.40335676 |
Ventura | 2024 SBUS | Aggregate | Aggregate | Natural Gas | 86909.88336 | 20.62157589 |
Ventura | 2024 UBUS | Aggregate | Aggregate | Natural Gas | 412662.003 | 925.3583935 |
Ventura | 2024 LDT1 | Aggregate | Aggregate | Plug-in Hybrid | 10779775.24 | 1731.3637 |
Ventura | 2024 LDT2 | Aggregate | Aggregate | Plug-in Hybrid | 500831.2321 | 7.291506104 |
Ventura | 2024 MDV | Aggregate | Aggregate | Plug-in Hybrid | 14121020.22 | 215.2561206 |

Total VMT Diesel VMT Gasoline VMT
7,105,096,846 380,050,655 6,359,088,223
Average Diesel MPG* Average Gasoline MPG*
14 26
Percent of Total 5.35 89.50

* weighted by percentage of VMT for each vehicle category
Project No. W1251-06-01
December 8, 2020

Mr. Thomas Wood
Cruzan Properties – Investments, LLC
505 N. Brand Blvd., Suite 210
Glendale, CA 91203

Subject: PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED INDUSTRIAL DISTRIBUTION CENTER
LAWRENCE DRIVE & CORPORATE CENTER DRIVE
THOUSAND OAKS, CALIFORNIA
APN: 667 0172 015, 667 0172 025, 667 0172 035

Dear Mr. Wood

In accordance with your authorization of our proposal dated October 23, 2020, we have performed a geotechnical investigation for proposed industrial distribution center located at the southeast corner of the intersection of Lawrence Drive and Corporate Center Drive in the City of Thousand Oaks, California. The accompanying report presents the findings of our study and our conclusions and recommendations pertaining to the geotechnical aspects of proposed design and construction. Based on the results of our investigation, it is our opinion that the site can be developed as proposed, provided the recommendations of this report are followed and implemented during design and construction.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned.

Very truly yours,

GEOCON WEST, INC.

Joshua Kulas
Staff Engineer

Harry Derkalousdian
PE 79694

Gerald A. Kasman
CEG 2251

(EMAIL) Addressee
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1. PURPOSE AND SCOPE

This report presents the results of a preliminary geotechnical investigation for the proposed industrial distribution center located at the southeast corner of the intersection of Lawrence Drive and Corporate Center Drive in the City of Thousand Oaks, California (see Vicinity Map, Figure 1). The purpose of the investigation was to evaluate subsurface soil and geologic conditions underlying the site and, based on conditions encountered, to provide conclusions and preliminary recommendations pertaining to the geotechnical aspects of proposed design and construction.

The scope of this investigation included a site reconnaissance, field exploration, laboratory testing, engineering analysis, and the preparation of this report. The site was explored on October 21, 2020 by excavating eight 8-inch-diameter borings using a truck-mounted hollow-stem auger drilling machine. The hollow-stem auger borings were excavated to a maximum depth of 25½ feet below the existing ground surface. The approximate locations of the exploratory borings are depicted on the Site Plan (see Figure 2). A detailed discussion of the field investigation, including boring logs, is presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to determine pertinent physical and chemical soil properties. Appendix B presents a summary of the laboratory test results.

The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions. References reviewed to prepare this report are provided in the List of References section.

If project details vary significantly from those described herein, Geocon should be contacted to determine the necessity for review and possible revision of this report.

2. SITE AND PROJECT DESCRIPTION

The subject site is located at the southeast corner of the intersection of Lawrence Drive and Corporate Center Drive in the City of Thousand Oaks, California. The approximately 6.5-acre site is currently occupied by an asphalt paved parking lot with miscellaneous landscaping and paving improvements. The site is bounded by Lawrence Drive to the west, by Corporate Center Drive to the north, by a two-story industrial building to the south, and by a three-story industrial building to the east. The site is relatively level and surface water drainage at the site appears to be by sheet flow to the city streets. Vegetation on site consists of trees and shrubs that are confined to planter areas.
Based on the information provided by the Client, it is our understanding the proposed project is preliminary and the location of proposed structures and site improvements have not been determined at this time. It is assumed that proposed structures will be up to four stories high and will be constructed at or near present site grade. Plans for the proposed industrial distribution center are not available at this time. The limits of the existing improvements and adjacent structures are depicted on the Site Plan (see Figure 2).

Based on the preliminary nature of the design at this time, wall and column loads were not available. It is anticipated that column loads for the proposed structure will be up to 450 kips, and wall loads will be up to 4.5 kips per linear foot.

Once the design phase and foundation loading configuration proceeds to a more finalized plan, the recommendations within this report should be reviewed and revised, if necessary. Any changes in the design, location or elevation of any structure, as outlined in this report, should be reviewed by this office. Geocon should be contacted to determine the necessity for review and possible revision of this report.

### 3. GEOLOGIC SETTING

The site is located in the Conejo Valley, located between the Santa Monica Mountains to the south and the Conejo Hills to the north. The Conejo Valley is an alluvial-filled valley that has been uplifted as a results of regional tectonics.

Regionally, the site is within the southern portion of the Transverse Ranges geomorphic province. The Santa Monica Mountains, formed during regional uplift, trend east-west along the southern margin of the San Fernando Valley and extend to the Oxnard Plain on the west. The Transverse Ranges geomorphic province is characterized by east-west trending geologic structures such as the Simi-Santa Rosa faults, located approximately 7.2 miles south and 2.7 miles north of the site.

### 4. SOIL AND GEOLOGIC CONDITIONS

Based on published geologic maps of the area, the site is underlain by artificial fill and Pleistocene age alluvial fan deposits consisting of sand, and silt, clay and gravel (CGS, 2010; Dibblee, 1990).

#### 4.1 Artificial Fill

Artificial fill was encountered in our explorations to a maximum depth of 8 feet below existing ground surface. The artificial fill generally consists of brown to grayish brown sand with silt and silty sand which can be characterized as dry and loose to medium dense. The fill is likely the result of past grading or construction activities at the site. Deeper fill may exist between excavations and in other portions of the site that were not directly explored.
4.2 Older alluvium

The artificial fill is underlain by Pleistocene-age alluvial deposits that were observed to generally consist of grayish brown, brown and yellowish-brown interbedded poorly- to well-graded sand and silty sand with minor interbeds of silt and clay. The older alluvial soils are characterized as dry to slightly most and medium dense to very dense or stiff to hard.

5. GROUNDWATER

Groundwater was not encountered in any of our subsurface explorations to a maximum depth of 25½ feet below the existing ground surface. Groundwater is not expected to impact the proposed at-grade improvements to the site.

Recent requirements for stormwater infiltration could result in shallower seepage conditions in the immediate site vicinity. Proper surface drainage of irrigation and precipitation will be critical for future performance of the project. Recommendations for drainage are provided in the Surface Drainage section of this report (see Section 7.17).

6. GEOLOGIC HAZARDS

6.1 Surface Fault Rupture

The numerous faults in Southern California include Holocene-active, pre-Holocene, and inactive faults. The criteria for these major groups are based on criteria developed by the California Geological Survey (CGS, formerly known as CDMG) for the Alquist-Priolo Earthquake Fault Zone Program (CGS, 2018). By definition, a Holocene-active fault is one that has had surface displacement within Holocene time (about the last 11,700 years). A pre-Holocene fault has demonstrated surface displacement during Quaternary time (approximately the last 1.6 million years) but has had no known Holocene movement. Faults that have not moved in the last 1.6 million years are considered inactive.

The site is not within a state-designated Alquist-Priolo Earthquake Fault Zone (CDMG, 1999 2020a; 2020b) for surface fault rupture hazards. No Holocene-active or pre-Holocene faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low. However, the site is located in the seismically active Southern California region, and could be subjected to moderate to strong ground shaking in the event of an earthquake on one of the many active Southern California faults. The faults in the vicinity of the site are shown in Figure 3, Regional Fault Map.
The closest surface trace of an active fault to the site is the Simi-Santa Rosa Fault Zone located approximately 2.7 miles to the north (CDMG, 1999; USGS, 2006). Other nearby active faults are the Wright Road Fault, Oak Ridge Fault, the San Cayatano Fault, and the Faults of Orcutt and Timber Canyons located approximately 10 miles west, 11 miles north, 14 miles north, and 14.5 miles north of the site, respectively (USGS, 2006; Ziony and Jones, 1989). The active San Andreas Fault Zone is located approximately 40 miles northeast of the site (Ziony and Jones, 1989).

Several buried thrust faults, commonly referred to as blind thrusts, underlie the Southern California area at depth. These faults are not exposed at the ground surface and are typically identified at depths greater than 3.0 kilometers. The October 1, 1987 Mw 5.9 Whittier Narrows earthquake and the January 17, 1994 Mw 6.7 Northridge earthquake were a result of movement on the Puente Hills Blind Thrust and the Northridge Thrust, respectively. These thrust faults and others in the Los Angeles area are not exposed at the surface and do not present a potential surface fault rupture hazard at the site; however, these deep thrust faults are considered active features capable of generating future earthquakes that could result in moderate to significant ground shaking at the site.

6.2 Seismicity

As with all of Southern California, the site has experienced historic earthquakes from various regional faults. The seismicity of the region surrounding the site was formulated based on research of an electronic database of earthquake data. The epicenters of recorded earthquakes with magnitudes equal to or greater than 5.0 in the site vicinity are depicted on Figure 4, Regional Seismicity Map. A partial list of moderate to major magnitude earthquakes that have occurred in the Southern California area within the last 100 years is included in the following table.

### LIST OF HISTORIC EARTHQUAKES

<table>
<thead>
<tr>
<th>Earthquake (Oldest to Youngest)</th>
<th>Date of Earthquake</th>
<th>Magnitude</th>
<th>Distance to Epicenter (Miles)</th>
<th>Direction to Epicenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near Redlands</td>
<td>July 23, 1923</td>
<td>6.3</td>
<td>60</td>
<td>ENE</td>
</tr>
<tr>
<td>Long Beach</td>
<td>March 10, 1933</td>
<td>6.4</td>
<td>20</td>
<td>ESE</td>
</tr>
<tr>
<td>Tehachapi</td>
<td>July 21, 1952</td>
<td>7.5</td>
<td>94</td>
<td>NW</td>
</tr>
<tr>
<td>San Fernando</td>
<td>February 9, 1971</td>
<td>6.6</td>
<td>44</td>
<td>NNW</td>
</tr>
<tr>
<td>Whittier Narrows</td>
<td>October 1, 1987</td>
<td>5.9</td>
<td>22</td>
<td>NE</td>
</tr>
<tr>
<td>Sierra Madre</td>
<td>June 28, 1991</td>
<td>5.8</td>
<td>36</td>
<td>NNE</td>
</tr>
<tr>
<td>Landers</td>
<td>June 28, 1992</td>
<td>7.3</td>
<td>108</td>
<td>ENE</td>
</tr>
<tr>
<td>Big Bear</td>
<td>June 28, 1992</td>
<td>6.4</td>
<td>87</td>
<td>ENE</td>
</tr>
<tr>
<td>Northridge</td>
<td>January 17, 1994</td>
<td>6.7</td>
<td>34</td>
<td>NW</td>
</tr>
<tr>
<td>Hector Mine</td>
<td>October 16, 1999</td>
<td>7.1</td>
<td>127</td>
<td>ENE</td>
</tr>
<tr>
<td>Ridgecrest</td>
<td>July 5, 2019</td>
<td>7.1</td>
<td>142</td>
<td>NNE</td>
</tr>
</tbody>
</table>
The site could be subjected to strong ground shaking in the event of an earthquake. However, this hazard is common in Southern California and the effects of ground shaking can be mitigated if the proposed structures are designed and constructed in conformance with current building codes and engineering practices.

6.3 Seismic Design Criteria

The following table summarizes site-specific design criteria obtained from the 2019 California Building Code (CBC; Based on the 2018 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. The data was calculated using the online application Seismic Design Maps, provided by OSHPD. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2019 CBC and Table 20.3-1 of ASCE 7-16. The values presented on the following page are for the risk-targeted maximum considered earthquake (MCE\(_R\)).

### 2019 CBC SEISMIC DESIGN PARAMETERS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>2019 CBC Reference</th>
</tr>
</thead>
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<td>Site Class</td>
<td>D</td>
<td>Section 1613.2.2</td>
</tr>
<tr>
<td>MCE(_R) Ground Motion Spectral Response Acceleration – Class B (short), (S_s)</td>
<td>1.491g</td>
<td>Figure 1613.2.1(1)</td>
</tr>
<tr>
<td>MCE(_R) Ground Motion Spectral Response Acceleration – Class B (1 sec), (S_I)</td>
<td>0.542g</td>
<td>Figure 1613.2.1(2)</td>
</tr>
<tr>
<td>Site Coefficient, (F_A)</td>
<td>1.2</td>
<td>Table 1613.2.3(1)</td>
</tr>
<tr>
<td>Site Coefficient, (F_V)</td>
<td>1.7*</td>
<td>Table 1613.2.3(2)</td>
</tr>
<tr>
<td>Site Class Modified MCE(<em>R) Spectral Response Acceleration (short), (S</em>{MS})</td>
<td>1.491g</td>
<td>Section 1613.2.3 (Eqn 16-36)</td>
</tr>
<tr>
<td>Site Class Modified MCE(<em>R) Spectral Response Acceleration – (1 sec), (S</em>{MI})</td>
<td>0.953*</td>
<td>Section 1613.2.3 (Eqn 16-37)</td>
</tr>
<tr>
<td>5% Damped Design Spectral Response Acceleration (short), (S_{DS})</td>
<td>0.994g</td>
<td>Section 1613.2.4 (Eqn 16-38)</td>
</tr>
<tr>
<td>5% Damped Design Spectral Response Acceleration (1 sec), (S_{DI})</td>
<td>0.635*</td>
<td>Section 1613.2.4 (Eqn 16-39)</td>
</tr>
</tbody>
</table>

Note:

*Per Section 11.4.8 of ASCE/SEI 7-16, a ground motion hazard analysis shall be performed for projects for Site Class “E” sites with \(S_S\) greater than or equal to 1.0g and for Site Class “D” and “E” sites with \(S_I\) greater than 0.2g. Section 11.4.8 also provides exceptions which indicates that the ground motion hazard analysis may be waived provided the exceptions are followed. Using the code based values presented in the table above, in lieu of performing a ground motion hazard analysis, requires the exceptions outlined in ASCE 7-16 Section 11.4.8 be followed.
The table below presents the mapped maximum considered geometric mean (MCEG) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-16.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>ASCE 7-16 Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mapped MCEG Peak Ground Acceleration, PGA</td>
<td>0.601g</td>
<td>Figure 22-7</td>
</tr>
<tr>
<td>Site Coefficient, F_PGA</td>
<td>1.1</td>
<td>Table 11.8-1</td>
</tr>
<tr>
<td>Site Class Modified MCEG Peak Ground Acceleration, PGAM</td>
<td>0.661g</td>
<td>Section 11.8.3 (Eqn 11.8-1)</td>
</tr>
</tbody>
</table>

The Maximum Considered Earthquake Ground Motion (MCE) is the level of ground motion that has a 2 percent chance of exceedance in 50 years, with a statistical return period of 2,475 years. According to the 2019 California Building Code and ASCE 7-16, the MCE is to be utilized for the evaluation of liquefaction, lateral spreading, seismic settlements, and it is our understanding that the intent of the Building code is to maintain “Life Safety” during a MCE event. The Design Earthquake Ground Motion (DE) is the level of ground motion that has a 10 percent chance of exceedance in 50 years, with a statistical return period of 475 years.

Deaggregation of the MCE peak ground acceleration was performed using the USGS online Unified Hazard Tool, 2014 Conterminous U.S. Dynamic edition (v4.2.0). The result of the deaggregation analysis indicates that the predominant earthquake contributing to the MCE peak ground acceleration is characterized as a 6.75 magnitude event occurring at a hypocentral distance of 12.65 kilometers from the site.

Deaggregation was also performed for the Design Earthquake (DE) peak ground acceleration, and the result of the analysis indicates that the predominant earthquake contributing to the DE peak ground acceleration is characterized as a 6.69 magnitude occurring at a hypocentral distance of 17.9 kilometers from the site.

Conformance to the criteria in the above tables for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.
6.4 Liquefaction Potential

Liquefaction is a phenomenon in which loose, saturated, relatively cohesionless soil deposits lose shear strength during strong ground motions. Primary factors controlling liquefaction include intensity and duration of ground motion, gradation characteristics of the subsurface soils, in-situ stress conditions, and the depth to groundwater. Liquefaction is typified by a loss of shear strength in the liquefied layers due to rapid increases in pore water pressure generated by earthquake accelerations.

The current standard of practice, as outlined in the “Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California” and “Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California” requires liquefaction analysis to a depth of 50 feet below the lowest portion of the proposed structure. Liquefaction typically occurs in areas where the soils below the water table are composed of poorly consolidated, fine to medium-grained, primarily sandy soil. In addition to the requisite soil conditions, the ground acceleration and duration of the earthquake must also be of a sufficient level to induce liquefaction.

The State of California Seismic Hazard Zone Map for the Newbury Park Quadrangle (CDMG, 1998) indicates that the site is not located in an area designated as having a potential for liquefaction. In addition, a review of the City of Thousand Oaks General Plan (City of Thousand Oaks, 2014) indicates that the site is not located within an area identified as having a potential for liquefaction. Based on these considerations, the potential for liquefaction and associated ground deformations beneath the site is considered very low.

6.5 Slope Stability

The topography at the site is relatively level and the topography in the immediate site vicinity slopes gently to the south. The site is not located within a City of Thousand Oaks Landslide Hazard Area (City of Thousand Oaks, 2014). Additionally, the site is not within an area identified as having a potential for seismic slope instability (CDMG, 1998). There are no known landslides near the site, nor is the site in the path of any known or potential landslides. Therefore, the potential for slope stability hazards to adversely affect the proposed development is considered low.

6.6 Earthquake-Induced Flooding

Earthquake-induced flooding is inundation caused by failure of dams or other water-retaining structures due to earthquakes. The City of Thousand Oaks Safety Element (City of Thousand Oaks, 2014) indicates that the site is not located within an inundation area. Therefore, the potential for inundation at the site as a result of an earthquake-induced dam failure is considered low.
6.7 Tsunamis, Seiches, and Flooding

The site is not located within a coastal area. Therefore, tsunamis are not considered a significant hazard at the site.

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. No major water-retaining structures are located immediately up-gradient from the project site. Therefore, flooding resulting from a seismic-induced seiche is considered unlikely.

The site is within an area of minimal flooding (Zone X) as defined by the Federal Emergency Management Agency (FEMA, 2020; City of Thousand Oaks, 2014). Therefore, flooding is not anticipated to adversely impact the site.

6.8 Oil Fields & Methane Potential

Based on a review of the California Geologic Energy Management Division (CalGEM) Well Finder Website, the site is not located within an oil field and active oil or gas wells are not documented in the immediate site vicinity (CalGEM, 2020). However, due to the voluntary nature of record reporting by the oil well drilling companies, wells may be improperly located or not shown on the location map and undocumented wells could be encountered during construction. Any wells encountered during construction will need to be properly abandoned in accordance with the current requirements of the CalGEM.

Since the site is not located within the boundaries of a known oil field, the potential for the presence of methane or other volatile gases at the site is considered low. However, should it be determined that a methane study is required for the proposed development it is recommended that a qualified methane consultant be retained to perform the study and provide mitigation measures as necessary.

6.9 Subsidence

Subsidence occurs when a large portion of land is displaced vertically, usually due to the withdrawal of groundwater, oil, or natural gas. Soils that are particularly subject to subsidence include those with high silt or clay content. The site is not located within an area of known ground subsidence. No large-scale extraction of groundwater, gas, oil, or geothermal energy is occurring or planned at the site or in the general site vicinity. There appears to be little or no potential for ground subsidence due to withdrawal of fluids or gases at the site.
7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

7.1.1 It is our opinion that neither soil nor geologic conditions were encountered during the investigation that would preclude the construction of the proposed development provided the recommendations presented herein are followed and implemented during design and construction.

7.1.2 Between one and eight feet of existing artificial fill was encountered during the site investigation. The existing fill encountered is believed to be the result of past grading and construction activities at the site. Deeper fill may exist in other areas of the site that were not directly explored. Future demolition of existing improvements which occupy the site will likely disturb the upper few feet of soil. It is our opinion that the existing fill, in its present condition, is not suitable for direct support of proposed foundations or slabs. The existing fill and site soils are suitable for re-use as engineered fill provided the recommendations in the Grading section of this report are followed (see Section 7.4).

7.1.3 The results of our laboratory testing indicate that the existing upper alluvial soils are subject to excessive hydro-consolidation upon saturation. Hydro-consolidation is the tendency of a soil structure to collapse upon saturation, resulting in the overall settlement of the effected soils and any overlying soils, foundations, or improvements supported therein. The grading and foundation recommendations presented herein are intended to minimize the potential for settlement as a result of hydroconsolidation.

7.1.4 Based on these considerations, it is recommended that the upper 5 feet of existing earth materials within the building footprint areas be excavated and properly compacted for foundation and slab support. Deeper excavations, such as in the area were the existing artificial fill was encountered at a depth of 8 feet below ground surface, should be conducted as necessary to remove all existing artificial fill or soft alluvial soils at the direction of the Geotechnical Engineer (a representative of Geocon). Proposed building foundations should be underlain by a minimum of 3 feet of newly placed engineered fill. The excavation should extend laterally a minimum distance of 3 feet beyond the building footprint area, including building appurtenances, or for a distance equal to the depth of fill below the foundation, whichever is greater. The limits of existing fill and/or soft alluvial soil removal will be verified by the Geocon representative during site grading activities.

7.1.5 Additional grading should be conducted as necessary to maintain the required 3 feet of newly placed engineered fill below foundations. The grading contractor should verify all bottom of footing elevations prior to commencement of grading activities to ensure that grading is conducted deep enough to provide the required 3 feet of engineering fill below foundations.
Subsequent to the recommended grading, the proposed structures may be supported on a conventional spread foundation system deriving support in newly placed engineered fill. Recommendations for the design of a Conventional Foundation System are provided in Section 7.6.

All excavations must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon). Prior to placing any fill, the excavation bottom must be proof-rolled in the presence of the Geotechnical Engineer (a representative of Geocon) and approved in writing.

At the time of this investigation the upper site soils were above the optimum moisture content. The moisture content of the soil is likely to change between wet and dry seasons. If the soils are over optimum at the time of construction it is likely that spreading and drying will be required in order to obtain a moisture content suitable for placement and compaction.

Where new foundations are constructed immediately adjacent to existing foundations, the new foundation should be deepened to match or exceed the depth of the existing foundation to prevent a surcharge on the existing foundation. Where a proposed foundation will be deeper than an existing adjacent foundation, the proposed foundation must be designed to resist the surcharge imposed by the existing foundation. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing foundation.

Stable excavations for the recommended grading can be achieved with sloping measures where sufficient space is available. However, if excavations in close proximity to an existing adjacent structure and/or property line are required, special excavation measures may be necessary in order to maintain lateral support of existing improvements. Excavation recommendations are provided in the Temporary Excavations section of this report (Section 7.16).

Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures, which will not be tied to the proposed structure, may be supported on conventional foundations deriving support on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and compaction cannot be performed or is undesirable, foundations may derive support directly in the undisturbed alluvial soils at or below 30 inches below the existing ground surface. If the soils exposed in the excavation bottom are soft or loose, compaction of the soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved by a Geocon representative.
7.1.12 Where new paving is to be placed, it is recommended that all existing fill and soft alluvial soils be excavated and properly compacted for paving support. The client should be aware that excavation and compaction of all existing fill and soft alluvial soils in the area of new paving is not required; however, paving constructed over existing uncertified fill or unsuitable alluvial soil may experience increased settlement and/or cracking, and may therefore have a shorter design life and increased maintenance costs. As a minimum, the upper 12 inches of subgrade soil should be scarified and properly compacted for paving support. Paving recommendations are provided in Section 7.11 of this report.

7.1.13 Once the design and foundation loading configuration for the proposed structures proceeds to a more finalized plan, the recommendations within this report should be reviewed and revised, if necessary. Based on the final foundation loading configurations, the potential for settlement should be reevaluated by this office.

7.1.14 Any changes in the design, location or elevation, as outlined in this report, should be reviewed by this office. Geocon should be contacted to determine the necessity for review and possible revision of this report.

7.2 Soil and Excavation Characteristics

7.2.1 The in-situ soils can be excavated with moderate effort using conventional excavation equipment. Some caving should be anticipated in unshored excavations, especially where granular soils are encountered.

7.2.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable OSHA rules and regulations to maintain safety and maintain the stability of existing adjacent improvements.

7.2.3 All onsite excavations must be conducted in such a manner that potential surcharges from existing structures, construction equipment, and vehicle loads are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing foundation or vehicle load. Penetrations below this 1:1 projection will require special excavation measures such as sloping or shoring. Excavation recommendations are provided in the Temporary Excavations section of this report (see Section 7.16).

7.2.4 The upper 5 feet of existing site soils encountered during this investigation are considered to have a “medium” expansive potential (EI’s = 59 and 83) and are classified as “expansive” based on the 2019 California Building Code (CBC) Section 1803.5.3. Recommendations presented herein assume that the proposed foundations and slabs will derive support in these materials.
7.3 Minimum Resistivity, pH, and Water-Soluble Sulfate

7.3.1 Potential of Hydrogen (pH) and resistivity testing as well as chloride content testing were performed on representative samples of soil to generally evaluate the corrosion potential to surface utilities. The tests were performed in accordance with California Test Method Nos. 643 and 422 and indicate that the soils are considered “corrosive” to “severely corrosive” with respect to corrosion of buried ferrous metals on site. Due to the corrosive potential of the soils, it is recommended that PVC, ABS or other approved plastic piping be utilized in lieu of cast-iron when in direct contact with the site soils. The results are presented in Appendix B (Figure B24) and should be considered for design of underground structures.

7.3.2 Laboratory tests were performed on representative samples of the site materials to measure the percentage of water-soluble sulfate content. Results from the laboratory water-soluble sulfate tests are presented in Appendix B (Figure B24) and indicate that the on-site materials possess a sulfate exposure class of “S0” to concrete structures as defined by 2019 CBC Section 1904 and ACI 318-14 Table 19.3.1.1.

7.3.3 Geocon West, Inc. does not practice in the field of corrosion engineering and mitigation. If corrosion sensitive improvements are planned, it is recommended that a corrosion engineer be retained to evaluate corrosion test results and incorporate the necessary precautions to avoid premature corrosion of buried metal pipes and concrete structures in direct contact with the soils.

7.4 Grading

7.4.1 Grading is anticipated to include preparation of building pad, excavation of site soils for proposed foundations and slabs, utility trenches, and placement of backfill for utility trenches.

7.4.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer, geotechnical engineer, and, if applicable, building official in attendance. Special soil handling requirements can be discussed at that time.

7.4.3 Some caving should be anticipated in unshored excavations, especially where granular soils are encountered, and the contractor should be aware that formwork may be required to prevent caving of shallow spread foundation excavations.

7.4.4 Earthwork should be observed, and compacted fill tested by representatives of Geocon West, Inc. The existing fill and alluvial soil encountered during exploration is suitable for re-use as engineered fill, provided any encountered oversize material (greater than 6 inches) and any encountered deleterious debris are removed.
7.4.5 At the time of this investigation the upper site soils were above the optimum moisture content. The moisture content of the soil is likely to change between wet and dry seasons. If the soils are over optimum at the time of construction it is likely that spreading and drying will be required in order to obtain a moisture content suitable for placement and compaction.

7.4.6 Grading should commence with the removal of all existing vegetation and existing improvements from the area to be graded. Deleterious debris such as wood and root structures should be exported from the site and should not be mixed with the fill soils. Asphalt and concrete should not be mixed with the fill soils unless approved by the Geotechnical Engineer. All existing underground improvements planned for removal should be completely excavated and the resulting depressions properly backfilled in accordance with the procedures described herein. Once a clean excavation bottom has been established it must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.).

7.4.7 As a minimum, it is recommended that the upper 5 feet of existing earth materials within the proposed building footprint areas be excavated and properly compacted for foundation and slab support. Deeper excavations should be conducted as necessary, such as in the area where the existing artificial fill was encountered at a depth of 8 feet below ground surface, to remove all existing artificial fill or soft alluvial soils at the direction of the Geotechnical Engineer (a representative of Geocon). Proposed building foundations should be underlain by a minimum of 3 feet of newly placed engineered fill. The excavation should extend laterally a minimum distance of 3 feet beyond the building footprint area, including building appurtenances, or for a distance equal to the depth of fill below the foundation, whichever is greater. The limits of existing fill and/or soft alluvial soil removal will be verified by the Geocon representative during site grading activities.

7.4.8 Additional grading should be conducted as necessary to maintain the required 3 feet of newly placed engineered fill below foundations. The grading contractor should verify all bottom of footing elevations prior to commencement of grading activities to ensure that grading is conducted deep enough to provide the required 3 feet of engineering fill below foundations.

7.4.9 All excavations must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon). Prior to placing any fill, the excavation bottom must be proof-rolled in the presence of the Geotechnical Engineer (a representative of Geocon) and approved in writing.
7.4.10 It is anticipated that stable excavations for the recommended grading can be achieved with sloping measures. However, if excavations in close proximity to an existing adjacent structure and/or property line are required, special excavation measures may be required in order to maintain support of the existing improvements. Excavation recommendations are provided in the *Temporary Excavations* section of this report (Section 7.16).

7.4.11 All fill and backfill soils should be placed in horizontal loose layers approximately 6 to 8 inches thick, moisture conditioned to approximately two percent above optimum moisture content, and properly compacted to at least 90 percent relative compaction, as determined by ASTM Test Method D 1557 (latest edition).

7.4.12 Due to the expansive potential of the soils it is recommended that the subgrade be maintained at two percent above optimum moisture content prior to and at the time of concrete placement.

7.4.13 Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures, which will not be tied to the proposed structure, may be supported on conventional foundations deriving support on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and compaction cannot be performed or is undesirable, foundations may derive support directly in the undisturbed alluvial soils at or below a depth of 30 inches below the existing ground surface. If the soils exposed in the excavation bottom are soft or loose, compaction of the soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved by a Geocon representative.

7.4.14 Where new paving is to be placed, it is recommended that all existing fill and soft alluvial soils be excavated and properly compacted for paving support. The client should be aware that excavation and compaction of all existing fill and soft alluvial soils in the area of new paving is not required; however, paving constructed over existing uncertified fill or unsuitable alluvial soil may experience increased settlement and/or cracking, and may therefore have a shorter design life and increased maintenance costs. As a minimum, the upper 12 inches of subgrade soil should be scarified and properly compacted to a minimum of 95 percent of the laboratory maximum dry density in accordance with ASTM D 1557 (latest edition). *Preliminary Pavement Recommendations* section of this report (see Section 7.11).

7.4.15 All imported fill shall be observed, tested, and approved by Geocon West, Inc. prior to bringing soil to the site. Rocks larger than 6 inches in diameter shall not be used in the fill. If necessary, import soils used as structural fill should have an expansion index less than 50 and soil corrosivity properties that are equally or less detrimental to that of the existing onsite soils (see Figure B24). Imported soil placed in building pad areas must be placed uniformly across the pad at the direction of the Geotechnical Engineer (a representative of Geocon).
7.4.16 Utility trenches should be properly backfilled in accordance with the requirements of the Green Book (latest edition). The pipe should be bedded with clean sands (Sand Equivalent greater than 30) to a depth of at least 1 foot over the pipe, and the bedding material must be inspected and approved in writing by the Geotechnical Engineer (a representative of Geocon). The use of gravel is not acceptable unless used in conjunction with filter fabric to prevent the gravel from having direct contact with soil. The remainder of the trench backfill may be derived from onsite soil or approved import soil, compacted as necessary, until the required compaction is obtained. The use of minimum 2-sack slurry as backfill is also acceptable. Prior to placing any bedding materials or pipes, the excavation bottom must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon).

7.4.17 All trench and foundation excavation bottoms must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon), prior to placing bedding materials, fill, steel, gravel, or concrete.

7.5 Shrinkage

7.5.1 Shrinkage results when a volume of material removed at one density is compacted to a higher density. A shrinkage factor between 3 and 9 percent should be anticipated when excavating and compacting the upper five feet of existing earth materials on the site to an average relative compaction of 90 percent.

7.5.2 If import soils will be utilized in the building pad, the soils must be placed uniformly and at equal thickness at the direction of the Geotechnical Engineer (a representative of Geocon West, Inc.).

7.6 Conventional Foundation Design

7.6.1 Subsequent to the recommended grading, a conventional foundation system may be utilized for support of the proposed structure provided foundations derive support in newly placed engineered fill. As a minimum, foundations for the proposed structures should be underlain by at least three feet of newly placed engineered fill.

7.6.2 Continuous footings may be designed for an allowable bearing capacity of 2,300 pounds per square foot (psf), and should be a minimum of 12 inches in width, 30 inches in depth below the lowest adjacent grade, and 18 inches into the recommended bearing material.

7.6.3 Isolated spread foundations may be designed for an allowable bearing capacity of 2,700 psf, and should be a minimum of 24 inches in width, 30 inches in depth below the lowest adjacent grade, and 18 inches into the recommended bearing material.
7.6.4 The allowable soil bearing pressure may be increased by 50 psf and 300 psf for each additional foot of foundation width and depth, respectively, up to a maximum allowable soil bearing pressure of 4,500 psf.

7.6.5 The allowable bearing pressures may be increased by one-third for transient loads due to wind or seismic forces.

7.6.6 If depth increases are utilized for the exterior wall footings, this office should be provided a copy of the final construction plans so that the excavation recommendations presented herein could be properly reviewed and revised if necessary.

7.6.7 Continuous footings should be reinforced with four No. 4 steel reinforcing bars, two placed near the top of the footing and two near the bottom. Reinforcement for spread footings should be designed by the project structural engineer.

7.6.8 The above foundation dimensions and minimum reinforcement recommendations are based on soil conditions and building code requirements only, and are not intended to be used in lieu of those required for structural purposes.

7.6.9 Due to the expansive potential of the subgrade soils, the moisture content in the slab and foundation subgrade should be maintained at 2 percent above optimum moisture content prior to and at the time of concrete placement.

7.6.10 If depth increases are utilized for the exterior wall footings, this office should be provided a copy of the final construction plans so that the excavation recommendations presented herein could be properly reviewed and revised if necessary.

7.6.11 Foundation excavations should be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to the placement of reinforcing steel and concrete to verify that the excavations and exposed soil conditions are consistent with those anticipated. If unanticipated soil conditions are encountered, foundation modifications may be required.

7.6.12 This office should be provided a copy of the final construction plans so that the excavation recommendations presented herein could be properly reviewed and revised if necessary.
7.7 **Foundation Settlement**

7.7.1 The maximum expected static settlement for an on-grade structure supported on a conventional foundation system in the recommended bearing materials and designed with a maximum bearing pressure of 4,500 psf is estimated to be less than 1½ inches and occur below the heaviest loaded structural element. Settlement of the foundation system is expected to occur on initial application of loading. Differential settlement is not expected to exceed ¾ inch over a distance of 20 feet.

7.7.2 Once the design and foundation loading configurations for the proposed structure proceed to a more finalized plan, the estimated settlements presented in this report should be reviewed and revised, if necessary. If the final foundation loading configurations are greater than the assumed loading conditions, the potential for settlement should be reevaluated by this office.

7.8 **Miscellaneous Foundations**

7.8.1 Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures, which will not be tied to the proposed structure, may be supported on conventional foundations deriving support on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and compaction cannot be performed or is undesirable, foundations may derive support directly in the competent undisturbed alluvial soils at or below a depth of 30 inches below the existing ground surface.

7.8.2 If the soils exposed in the excavation bottom are soft, compaction of the soft soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved by a Geocon representative. Miscellaneous foundations may be designed for a bearing value of 1,500 psf, and should be a minimum of 12 inches in width, 30 inches in depth below the lowest adjacent grade and 18 inches into the recommended bearing material. The allowable bearing pressure may be increased by up to one-third for transient loads due to wind or seismic forces.

7.8.3 Foundation excavations should be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to the placement of reinforcing steel and concrete to verify that the excavations and exposed soil conditions are consistent with those anticipated.

7.9 **Lateral Design**

7.9.1 Resistance to lateral loading may be provided by friction acting at the base of foundations, slabs and by passive earth pressure. An allowable coefficient of friction of 0.28 may be used with the dead load forces in the undisturbed alluvial soils or engineered fill.
7.9.2 Passive earth pressure for the sides of foundations and slabs poured against the alluvial soils or properly compacted engineered fill may be computed as an equivalent fluid having a density of 180 pcf with a maximum earth pressure of 1,800 pcf. When combining passive and friction for lateral resistance, the passive component should be reduced by one-third.

7.10 **Concrete Slab-on-Grade**

7.10.1 Concrete slab-on-grade subject to vehicle loading should be designed in accordance with the recommendations in the *Preliminary Pavement Recommendations* section of this report (Section 7.11).

7.10.2 Subsequent to the recommended grading, concrete slab-on-grade for structure, not subject to vehicle loading, should be a minimum of 4 inches thick and minimum slab reinforcement should consist of No. 4 steel reinforcing bars placed 16 inches on center in both horizontal directions. Steel reinforcing should be positioned vertically near the slab midpoint.

7.10.3 Slab-on-grade at the ground surface that may receive moisture-sensitive floor coverings or may be used to store moisture-sensitive materials should be underlain by a vapor retarder placed directly beneath the slab. The vapor retarder and acceptable permeance should be specified by the project architect or developer based on the type of floor covering that will be installed. The vapor retarder design should be consistent with the guidelines presented in Section 9.3 of the American Concrete Institute’s (ACI) Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials (ACI 302.2R-06) and should be installed in general conformance with ASTM E 1643 (latest edition) and the manufacturer’s recommendations. A minimum thickness of 15 mils extruded polyolefin plastic is recommended; vapor retarders which contain recycled content or woven materials are not recommended. The vapor retarder should have a permeance of less than 0.01 perms demonstrated by testing before and after mandatory conditioning is recommended. The vapor retarder should be installed in direct contact with the concrete slab with proper perimeter seal. If the California Green Building Code requirements apply to this project, the vapor retarder should be underlain by 4 inches of clean aggregate. It is important that the vapor retarder be puncture resistant since it will be in direct contact with angular gravel. As an alternative to the clean aggregate suggested in the Green Building Code, it is our opinion that the concrete slab-on-grade may be underlain by a vapor retarder over 4 inches of clean sand (sand equivalent greater than 30), since the sand will serve a capillary break and will minimize the potential for punctures and damage to the vapor barrier.

7.10.4 For seismic design purposes, a coefficient of friction of 0.28 may be utilized between concrete slabs and subgrade soils without a moisture barrier, and 0.15 for slabs underlain by a moisture barrier.
7.10.5 Exterior slabs for walkways or flatwork, not subject to traffic loads, should be at least 4 inches thick and reinforced with No. 3 steel reinforcing bars placed 18 inches on center in both horizontal directions, positioned near the slab midpoint. Prior to construction of slabs, the upper 12 inches of subgrade should be moistened to approximately two percent above optimum moisture content and properly compacted to at least 95 percent relative compaction, as determined by ASTM Test Method D 1557 (latest edition). Crack control joints should be spaced at intervals not greater than 8 feet and should be constructed using saw-cuts or other methods as soon as practical following concrete placement. Crack control joints should extend a minimum depth of one-fourth the slab thickness. The project structural engineer should design construction joints as necessary.

7.10.6 The recommendations of this report are intended to reduce the potential for cracking of slabs due to settlement. However, even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade may exhibit some cracking due to minor soil movement and/or concrete shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

7.11 Preliminary Pavement Recommendations

7.11.1 Where new paving is to be placed, it is recommended that all existing fill and soft or unsuitable alluvial materials be excavated and properly recompacted for paving support. The client should be aware that excavation and compaction of all existing artificial fill and soft alluvium in the area of new paving is not required; however, paving constructed over existing unsuitable material may experience increased settlement and/or cracking, and may therefore have a shorter design life and increased maintenance costs. As a minimum, the upper 12 inches of paving subgrade should be scarified, moisture conditioned to approximately two percent above optimum moisture content, and properly compacted to at least 95 percent relative compaction, as determined by ASTM Test Method D 1557 (latest edition).

7.11.2 The following pavement sections are based on an assumed R-Value of 20. Once site grading activities are complete an R-Value should be obtained by laboratory testing to confirm the properties of the soils serving as paving subgrade, prior to placing pavement.
7.11.3 The Traffic Indices listed below are estimates. Geocon does not practice in the field of traffic engineering. The actual Traffic Index for each area should be determined by the project civil engineer. If pavement sections for Traffic Indices other than those listed below are required, Geocon should be contacted to provide additional recommendations. Pavement thicknesses were determined following procedures outlined in the *California Highway Design Manual* (Caltrans). It is anticipated that the majority of traffic will consist of automobile and large truck traffic.

### PRELIMINARY PAVEMENT DESIGN SECTIONS

<table>
<thead>
<tr>
<th>Location</th>
<th>Estimated Traffic Index (TI)</th>
<th>Asphalt Concrete (inches)</th>
<th>Class 2 Aggregate Base (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile Parking And Driveways</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Trash Truck &amp; Fire Lanes</td>
<td>7.0</td>
<td>4.0</td>
<td>12.0</td>
</tr>
</tbody>
</table>

7.11.4 Asphalt concrete should conform to Section 203-6 of the *“Standard Specifications for Public Works Construction”* (Green Book). Class 2 aggregate base materials should conform to Section 26-1.02A of the *“Standard Specifications of the State of California, Department of Transportation”* (Caltrans). The use of Crushed Miscellaneous Base in lieu of Class 2 aggregate base is acceptable. Crushed Miscellaneous Base should conform to Section 200-2.4 of the *“Standard Specifications for Public Works Construction”* (Green Book).

7.11.5 Unless specifically designed and evaluated by the project structural engineer, where exterior concrete paving will be utilized for support of vehicles, it is recommended that the concrete be a minimum of 6 inches of concrete reinforced with No. 3 steel reinforcing bars placed 18 inches on center in both horizontal directions. Concrete paving supporting vehicular traffic should be underlain by a minimum of 4 inches of aggregate base and a properly compacted subgrade. The subgrade and base material should be compacted to 95 percent relative compaction as determined by ASTM Test Method D 1557 (latest edition).

7.11.6 The performance of pavements is highly dependent upon providing positive surface drainage away from the edge of pavements. Ponding of water on or adjacent to the pavement will likely result in saturation of the subgrade materials and subsequent cracking, subsidence and pavement distress. If planters are planned adjacent to paving, it is recommended that the perimeter curb be extended at least 12 inches below the bottom of the aggregate base to minimize the introduction of water beneath the paving.
7.12 Retaining Wall Design

7.12.1 The recommendations presented below are generally applicable to the design of rigid concrete or masonry retaining walls having a maximum height of 5 feet. In the event that walls significantly higher than 5 feet are planned, Geocon should be contacted for additional recommendations.

7.12.2 Retaining wall foundations may be designed in accordance with the recommendations provided in the Conventional Foundation Design section of this report (see Section 7.6).

7.12.3 Retaining walls with a level backfill surface that are not restrained at the top should be designed utilizing a triangular distribution of pressure (active pressure). Restrained walls are those that are not allowed to rotate more than 0.001H (where H equals the height of the retaining portion of the wall in feet) at the top of the wall. Where walls are restrained from movement at the top, walls may be designed utilizing a triangular distribution of pressure (at-rest pressure). The table below presents recommended pressures to be used in retaining wall design, assuming that proper drainage will be maintained.

<table>
<thead>
<tr>
<th>HEIGHT OF RETAINING WALL (Feet)</th>
<th>ACTIVE PRESSURE EQUIVALENT FLUID PRESSURE (Pounds Per Cubic Foot)</th>
<th>AT-REST PRESSURE EQUIVALENT FLUID PRESSURE (Pounds Per Cubic Foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 5</td>
<td>30</td>
<td>66</td>
</tr>
</tbody>
</table>

7.12.4 The wall pressures provided above assume that the proposed retaining walls will support relatively undisturbed alluvial soils or engineered fill derived from onsite soil. If import soil is used to backfill proposed walls, revised earth pressures may be required to account for the geotechnical properties of the soil placed as engineered fill. This should be evaluated once the use of import soil is established. All imported fill shall be observed, tested, and approved by Geocon West, Inc. prior to bringing soil to the site.

7.12.5 The wall pressures provided above assume that the retaining wall will be properly drained preventing the buildup of hydrostatic pressure. If retaining wall drainage is not implemented, the equivalent fluid pressure to be used in design of undrained walls is 90 pcf. This value includes hydrostatic pressures plus buoyant lateral earth pressures.

7.12.6 Additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic or adjacent structures and should be designed for each condition as the project progresses.
7.12.7 It is recommended that line-load surcharges from adjacent wall footings, use horizontal pressures generated from NAV-FAC DM 7.2. The governing equations are:

For \( \frac{x}{H} \leq 0.4 \)

\[
\sigma_H(z) = \frac{0.20 \times \left( \frac{z}{H} \right)^2}{0.16 + \left( \frac{z}{H} \right)^2} \times \frac{Q_L}{H}
\]

and

For \( \frac{x}{H} > 0.4 \)

\[
\sigma_H(z) = \frac{1.28 \times \left( \frac{x}{H} \right)^2 \times \left( \frac{z}{H} \right)^2}{\left( \frac{x}{H} \right)^2 + \left( \frac{z}{H} \right)^2} \times \frac{Q_L}{H}
\]

where \( x \) is the distance from the face of the excavation or wall to the vertical line-load, \( H \) is the distance from the bottom of the footing to the bottom of excavation or wall, \( z \) is the depth at which the horizontal pressure is desired, \( Q_L \) is the vertical line-load and \( \sigma_H(z) \) is the horizontal pressure at depth \( z \).

7.12.8 It is recommended that vertical point-loads, from construction equipment outriggers or adjacent building columns use horizontal pressures generated from NAV-FAC DM 7.2. The governing equations are:

For \( \frac{x}{H} \leq 0.4 \)

\[
\sigma_H(z) = \frac{0.28 \times \left( \frac{z}{H} \right)^2}{0.16 + \left( \frac{z}{H} \right)^2} \times \frac{Q_p}{H^2}
\]

and

For \( \frac{x}{H} > 0.4 \)

\[
\sigma_H(z) = \frac{1.77 \times \left( \frac{x}{H} \right)^2 \times \left( \frac{z}{H} \right)^2}{\left( \frac{x}{H} \right)^2 + \left( \frac{z}{H} \right)^2} \times \frac{Q_p}{H^2}
\]

then

\[
\sigma_H'(z) = \sigma_H(z) \cos^2(1.1\theta)
\]

where \( x \) is the distance from the face of the excavation/wall to the vertical point-load, \( H \) is distance from the outrigger/bottom of column footing to the bottom of excavation, \( z \) is the depth at which the horizontal pressure is desired, \( Q_p \) is the vertical point-load, \( \sigma_H(z) \) is the horizontal pressure at depth \( z \), \( \theta \) is the angle between a line perpendicular to the excavation/wall and a line from the point-load to location on the excavation/wall where the surcharge is being evaluated, and \( \sigma_H(z) \) is the horizontal pressure at depth \( z \).
7.12.9 In addition to the recommended earth pressure, the upper 10 feet of the retaining wall adjacent to the street or driveway areas should be designed to resist a uniform lateral pressure of 100 psf, acting as a result of an assumed 300 psf surcharge behind the shoring due to normal street traffic. If the traffic is kept back at least 10 feet from the wall, the traffic surcharge may be neglected.

7.12.10 Seismic lateral forces will be required for any retaining walls in excess of 6 feet. Recommendations for seismic lateral forces will be provided under separate cover, if necessary.

7.13 Retaining Wall Drainage

7.13.1 Retaining walls should be provided with a drainage system extended at least two-thirds the height of the wall. At the base of the drain system, a subdrain covered with a minimum of 12 inches of gravel should be installed, and a compacted fill blanket or other seal placed at the surface (see Figure 5). The clean bottom and subdrain pipe, behind a retaining wall, should be observed by the Geotechnical Engineer (a representative of Geocon), prior to placement of gravel or compacting backfill.

7.13.2 As an alternative, a plastic drainage composite such as Miradrain or equivalent may be installed in continuous, 4-foot wide columns along the entire back face of the wall, at 8 feet on center. The top of these drainage composite columns should terminate approximately 18 inches below the ground surface, where either hardscape or a minimum of 18 inches of relatively cohesive material should be placed as a cap (see Figure 6). These vertical columns of drainage material would then be connected at the bottom of the wall to a 4-inch subdrain pipe.

7.13.3 Subdrainage pipes at the base of the retaining wall drainage system should outlet to an acceptable location via controlled drainage structures. Drainage should not be allowed to flow uncontrolled over descending slopes.

7.13.4 Moisture affecting below grade walls is one of the most common post-construction complaints. Poorly applied or omitted waterproofing can lead to efflorescence or standing water. Particular care should be taken in the design and installation of waterproofing to avoid moisture problems, or actual water seepage into the structure through any normal shrinkage cracks which may develop in the concrete walls, floor slab, foundations and/or construction joints. The design and inspection of the waterproofing is not the responsibility of the geotechnical engineer. A waterproofing consultant should be retained in order to recommend a product or method, which would provide protection to subterranean walls, floor slabs and foundations.
7.14 Elevator Pit Design

7.14.1 The elevator pit slab and retaining wall should be designed by the project structural engineer. Elevator pits may be designed in accordance with the recommendations in the *Conventional Foundation Design and Retaining Wall Design* sections of this report (see Section 7.6 and Section 7.12).

7.14.2 Additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic, or adjacent foundations and should be designed for each condition as the project progresses.

7.14.3 If retaining wall drainage is to be provided, the drainage system should be designed in accordance with the *Retaining Wall Drainage* section of this report (see Section 7.13).

7.14.4 It is suggested that the exterior walls and slab be waterproofed to prevent excessive moisture inside of the elevator pit. Waterproofing design and installation is not the responsibility of the geotechnical engineer.

7.15 Elevator Piston

7.15.1 If a plunger-type elevator piston is installed for this project, a deep drilled excavation will be required. It is important to verify that the drilled excavation is not situated immediately adjacent to a foundation or the drilled excavation could compromise the existing foundation support, especially if the drilling is performed subsequent to the foundation construction. Additionally, some of the site soils have little to no cohesion and are prone to excessive caving.

7.15.2 Casing may be required if caving is expected in the drilled excavation. The contractor should be prepared to use casing and should have it readily available at the commencement of drilling activities. Continuous observation of the drilling and installation of the elevator piston by the Geotechnical Engineer (a representative of Geocon West, Inc.) is required.

7.15.3 The annular space between the piston casing and drilled excavation wall should be filled with a minimum of 1½-sack slurry pumped from the bottom up. As an alternative, pea gravel may be utilized. The use of soil to backfill the annular space is not acceptable.

7.16 Temporary Excavations

7.16.1 Excavations up to 8 feet in height may be required during grading operations and foundation excavations. The excavations are expected to expose artificial fill and alluvial soils. Vertical excavations up to 5 feet may be attempted where not surcharged by adjacent traffic, construction equipment, or structures. Sloping measures will likely be required to provide a stable excavation.
7.16.2 Vertical excavations greater than 5 feet or where surcharged by existing structures will require sloping or shoring measures in order to provide a stable excavation. Where sufficient space is available, temporary unsurcharged embankments could be sloped back at a uniform 1:1 slope gradient or flatter up to maximum height of 12 feet. A uniform slope does not have a vertical portion.

7.16.3 If excavations in close proximity to an existing adjacent structure and/or property line are required, special excavation measures such as shoring may be necessary in order to maintain lateral support of existing improvements. Recommendations for special temporary excavation measures can be provided under separate cover, if necessary.

7.16.4 Where sloped embankments are utilized, the top of the slope should be barricaded to prevent vehicles and storage loads at the top of the slope within a horizontal distance equal to the height of the slope. If the temporary construction embankments are to be maintained during the rainy season, berms are suggested along the tops of the slopes where necessary to prevent runoff water from entering the excavation and eroding the slope faces. Geocon personnel should inspect the soils exposed in the cut slopes during excavation so that modifications of the slopes can be made if variations in the soil conditions occur. All excavations should be stabilized within 30 days of initial excavation.

7.17 Surface Drainage

7.17.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the original designed engineering properties. Proper drainage should be maintained at all times.

7.17.2 All site drainage should be collected and controlled in non-erosive drainage devices. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2019 CBC 1804.4 or other applicable standards. In addition, drainage should not be allowed to flow uncontrolled over any descending slope. Discharge from downspouts, roof drains and scuppers are not recommended onto unprotected soils within 5 feet of the building perimeter. Planters which are located adjacent to foundations should be sealed to prevent moisture intrusion into the soils providing foundation support. Landscape irrigation is not recommended within 5 feet of the building perimeter footings except when enclosed in protected planters.
7.17.3 Positive site drainage should be provided away from structures, pavement, and the tops of slopes to swales or other controlled drainage structures.

7.17.4 Landscaping planters immediately adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. Either a subdrain, which collects excess irrigation water and transmits it to drainage structures, or impervious above-grade planter boxes should be used. In addition, where landscaping is planned adjacent to the pavement, it is recommended that consideration be given to providing a cutoff wall along the edge of the pavement that extends at least 12 inches below the base material.

7.18 Plan Review

7.18.1 Grading, foundation, and shoring plans (if applicable) should be reviewed by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to finalization to verify that the plans have been prepared in substantial conformance with the recommendations of this report and to provide additional analyses or recommendations.
LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon West, Inc. should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon West, Inc.

2. This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. The findings of this report are valid as of the date of this report. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

4. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.
LIST OF REFERENCES

California Division of Mines and Geology, 2002, Seismic Hazard Zone Report for the Newbury Park 7.5 Minute Quadrangle, Ventura, California, Seismic Hazard Zone Report 055.


California Geological Survey, 2010, Geologic Compilation of Quaternary Surficial Deposits in Southern California, Los Angeles 30’X 60’ Quadrangle, A Project for the Department of Water Resources by the California Geological Survey, Compiled from existing sources by Trinda L. Bedrossian, CEG and Peter D. Roffers, CGS Special Report 217, Plate 9, Scale 1:100,000.


U.S.G.S Topographic Maps, 7.5-Minute Series, Newbury Park, CA Quadrangle, Released 1981


REFERENCE: U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES, NEWBURY PARK, CA QUADRANGLE
RETAIING WALL DRAIN DETAIL

Lawrence Drive & Corporate Center Drive
Thousand Oaks, CA

GEOCON WEST, INC.
ENVIRONMENTAL GEOTECHNICAL MATERIALS
3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504
PHONE (818) 841-8388 - FAX (818) 841-1704

DRAFTED BY: JJK CHECKED BY: HHD DEC. 2020 PROJECT NO. W1251-06-01 FIG. 5

GROUND SURFACE

PROPERLY COMPACTED BACKFILL

WATERPROOF WALL

3/4" CRUSHED ROCK

FILTER FABRIC ENVELOPE

MIRAFI 140N OR EQUIVALENT

4" DIA. PERFORATED ABS OR ADS PIPE - EXTEND TO DRAINAGE SYSTEM

NO SCALE
RETAINING WALL DRAIN DETAIL

NO SCALE

GROUND SURFACE

18"

PROPERLY COMPACTED BACKFILL

DRAINAGE PANEL (J-DRAIN 1000 OR EQUIVALENT)

WATER PROOFING BY ARCHITECT

3/4" CRUSHED ROCK
(1 CU. FT./ FT.)

FILTER FABRIC ENVELOPE
MIRAFI 140N OR EQUIVALENT
4" DIA. PERFORATED PVC PIPE
EXTENDED TO APPROVED OUTLET

RETAINING WALL

FOUNDATION

Lawrence Drive & Corporate Center Drive
Thousand Oaks, CA

DRAFTED BY: JJK CHECKED BY: HHD DEC. 2020 PROJECT NO. W1251-06-01 FIG. 6
APPENDIX A

FIELD INVESTIGATION

The site was explored on October 21, 2020 by excavating eight 8-inch-diameter borings using a truck-mounted hollow-stem auger drilling machine. The hollow-stem auger borings were excavated to a maximum depth of 25½ feet below the existing ground surface. Representative and relatively undisturbed samples were obtained by driving a 3-inch, O. D., California Modified Sampler into the “undisturbed” soil mass with blows from a 140-pound auto-hammer falling 30 inches. The California Modified Sampler was equipped with 1-inch by 2¾-inch diameter brass sampler rings to facilitate soil removal and testing. Bulk samples were also obtained.

The soil conditions encountered in the borings were visually examined, classified and logged in general accordance with the Unified Soil Classification System (USCS). The logs of the borings are presented on Figures A1 through A8. The logs depict the soil and geologic conditions encountered and the depth at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, penetration rates, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the logs were revised based on subsequent laboratory testing. The approximate locations of the borings are shown on Figure 2.
### BORING 1

**ELEV. (MSL.)**   **DATE COMPLETED**  **10/21/2020**  
**EQUIPMENT**  **HOLLOW STEM AUGER**  **BY:**  **CB**

<table>
<thead>
<tr>
<th>DEPTH IN FEET</th>
<th>SAMPLE NO.</th>
<th>LITHOLOGY</th>
<th>SOIL CLASS (USCS)</th>
<th>GROUNDWATER</th>
<th>MATERIAL DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>B1@1'</td>
<td>SM</td>
<td></td>
<td></td>
<td>ARTIFICIAL FILL</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, medium dense, slightly moist, light grayish brown, fine- to medium-grained, gravel, some clay.</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OLDER ALLUVIUM</td>
</tr>
<tr>
<td>6</td>
<td>B1@5'</td>
<td>SW</td>
<td></td>
<td></td>
<td>Silty Sand, poorly graded, very dense, dry, yellowish brown, fine- to medium-grained, pinhole porosity.</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>B1@6.5'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>B1@10'</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>B1@14.5'</td>
<td>SP-SM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>B1@24.5'</td>
<td>SP-SM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total depth of boring:** 25 feet  
**Fill to 1 foot.**  
**No groundwater encountered.**  
**Backfilled and patched.**  
*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.

**NOTE:**  THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

---

**SAMPLE SYMBOLS**
- □ ... SAMPLING UNSUCCESSFUL
- ☐ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ☒ ... DISTURBED OR BAG SAMPLE
- □ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

---

**Figure A1,**  
**Log of Boring 1, Page 1 of 1**

---

**GEOCON**
### MATERIAL DESCRIPTION

**ARTIFICIAL FILL**
- Silty Sand, poorly graded, medium dense, slightly moist, light gray with brown mottles, fine- to medium-grained, gravel, some clay.

**OLDER ALLUVIUM**
- Sand with Gravel, well-graded, very dense, slightly moist, yellowish brown, some silt.
- Sand with Silt, well-graded, very dense, slightly moist, brown with oxidation mottles, fine gravel.
- Sand, poorly graded, medium dense, slightly moist, reddish brown, fine- to medium-grained, trace gravel.
- Silty Clay, stiff, moist, gray with oxidation mottles.
- Silty Sand with Clay, medium dense, moist, fine-grained, gray with oxidation mottles.

Total depth of boring: 25.5 feet
- Fill to 8 foot.
- No groundwater encountered.
- Backfilled and patched.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.

---

**SAMPLE SYMBOLS**
- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

**NOTE:** THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.
**BOARING 3**

**MATERIAL DESCRIPTION**

<table>
<thead>
<tr>
<th>DEPTH (FEET)</th>
<th>SAMPLE NO.</th>
<th>LITHOLOGY</th>
<th>SOIL CLASS (USCS)</th>
<th>GROUNDWATER</th>
<th>MATERIAL DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>B3@2'</td>
<td></td>
<td></td>
<td></td>
<td><strong>AC: 4” BASE: 7” ARTIFICIAL FILL</strong></td>
</tr>
<tr>
<td>2</td>
<td>B3@5'</td>
<td>SM</td>
<td></td>
<td></td>
<td>Sand with Silt, poorly graded, medium dense, moist, dark brown, fine- to medium-grained, some clay, trace coarse-grained, and fine gravel.</td>
</tr>
<tr>
<td>4</td>
<td>B3@7'</td>
<td>SW</td>
<td></td>
<td></td>
<td><strong>OLDER ALLUVIUM</strong></td>
</tr>
<tr>
<td>6</td>
<td>B3@10'</td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, poorly graded, medium dense, moist, yellowish brown, fine-to medium-grained, pinhole porosity.</td>
</tr>
<tr>
<td>8</td>
<td>B3@14.5'</td>
<td>SP</td>
<td></td>
<td></td>
<td>Sand, well graded, very dense, dry, yellowish brown with oxidation mottles.</td>
</tr>
<tr>
<td>10</td>
<td>B3@20'</td>
<td>SW</td>
<td></td>
<td></td>
<td>Sand, poorly graded, medium dense, moist, reddish brown, fine-to medium-grained.</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- increased gravel, very dense</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sand, well-graded, dense, moist, yellowish brown, some silt and gravel, trace clay, pinhole porosity.</td>
</tr>
<tr>
<td>16</td>
<td>B3@24.5'</td>
<td></td>
<td></td>
<td></td>
<td>- very dense, increase in gravel content, no clay</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total depth of boring: 25 feet</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fill to 3 feet.</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No groundwater encountered.</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Backfilled and patched.</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.</td>
</tr>
</tbody>
</table>

**DEEP DENSITY (P.C.F.)**

<table>
<thead>
<tr>
<th>DEPTH (FEET)</th>
<th>PENETRATION RESISTANCE (BLOWS/FT*)</th>
<th>DRY DENSITY (P.C.F.)</th>
<th>MOISTURE CONTENT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>25</td>
<td>103.6</td>
<td>20.2</td>
</tr>
<tr>
<td>6</td>
<td>52</td>
<td>108.8</td>
<td>19.7</td>
</tr>
<tr>
<td>8</td>
<td>50</td>
<td>108.1</td>
<td>6.9</td>
</tr>
<tr>
<td>8.5</td>
<td>45</td>
<td>100.1</td>
<td>20.2</td>
</tr>
<tr>
<td>14.5</td>
<td>50</td>
<td>110.1</td>
<td>12.6</td>
</tr>
<tr>
<td>24.5</td>
<td>66</td>
<td>121.6</td>
<td>17.5</td>
</tr>
<tr>
<td>25</td>
<td>50 (6&quot;)</td>
<td>112.2</td>
<td>8.7</td>
</tr>
</tbody>
</table>

**Figure A3, Log of Boring 3, Page 1 of 1**

**NOTE:** THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.
## BORING 4

**LITHOLOGY**

<table>
<thead>
<tr>
<th>DEPTH IN FEET</th>
<th>SAMPLE NO.</th>
<th>MATERIAL DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>BULK 0-5&quot;</td>
<td><strong>ARTIFICIAL FILL</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silty Sand, poorly graded, medium dense, moist, grayish brown, clay, gravel.</td>
</tr>
<tr>
<td></td>
<td>B4@2&quot;</td>
<td>Clay with Silt, hard, moist, dark brown, some fine- to medium-grained sand.</td>
</tr>
<tr>
<td></td>
<td>B4@5&quot;</td>
<td><strong>OLDER ALLUVIUM</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silty Sand, poorly graded, very dense, moist, yellowish brown, fine- to medium-grained, pinhole porosity, some coarse-grained.</td>
</tr>
<tr>
<td></td>
<td>B4@6&quot;</td>
<td>Sand, well-graded, very dense, slightly moist, yellowish brown with oxidation mottles, fine- to medium-grained, some coarse-grained and silt.</td>
</tr>
<tr>
<td></td>
<td>B4@9.5&quot;</td>
<td>SM</td>
</tr>
<tr>
<td></td>
<td>B4@15&quot;</td>
<td>- dense, slightly moist, reddish brown</td>
</tr>
<tr>
<td></td>
<td>B4@20&quot;</td>
<td>SM</td>
</tr>
<tr>
<td></td>
<td>B4@25&quot;</td>
<td>ML</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silty Sand with Clay, poorly graded, dense, moist, yellowish brown with oxidation mottles, fine-grained, pinhole porosity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silt with Clay, stiff, moist, gray with oxidation mottles, pinhole porosity, some fine-grained sand.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total depth of boring: 25.5 feet</td>
</tr>
</tbody>
</table>

**GROUNDWATER**

- Fill to 5.5 feet.
- No groundwater encountered.
- Backfilled and patched.

**ELEV. (MSL.) — DATE COMPLETED**

- **10/21/2020**

**EQUIPMENT**

- HOLLOW STEM AUGER

**PETETRATION RESISTANCE (BLOWS/FT*)**

- 43
- 50 (5")
- 50 (5")
- 77
- 73
- 36

**DRY DENSITY (P.C.F.)**

- 109.9
- 91.6
- 105.5
- 119.9
- 105.4
- 97.2

**MOISTURE CONTENT (%)**

- 15.2
- 14.7
- 8.3
- 11.0
- 22.1
- 26.4

**SAMPLE SYMBOLS**

- .. SAMPLING UNSUCCESSFUL
- .. STANDARD PENETRATION TEST
- .. DRIVE SAMPLE (UNDISTURBED)
- .. DISTURBED OR BAG SAMPLE
- .. CHUNK SAMPLE
- .. WATER TABLE OR SEEPAGE

**NOTE:** The log of subsurface conditions shown hereon applies only at the specific boring or trench location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

---

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.*
Figure A5,
Log of Boring 5, Page 1 of 1

SAMPLING SYMBOLS
- .. SAMPLING UNSUCCESSFUL  I .. STANDARD PENETRATION TEST  ■ .. DRIVE SAMPLE (UNDISTURBED)
- .. DISTURBED OR BAG SAMPLE  N .. CHUNK SAMPLE  ¥ .. WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

AC: 3”   BASE: 8”
ARTIFICIAL FILL
Sand with Silt, well-graded, medium dense, moist, brown, some clay and fine gravel.

OLDER ALLUVIUM
Silty Sand, poorly graded, very dense, moist, yellowish brown with oxidation mottles, fine-grained, trace clay.

Silty Sand with Clay, poorly graded, dense, moist, yellowish brown with oxidation mottles, fine-grained, trace clay.

Silty Sand with Clay, poorly graded, dense, moist, yellowish brown with oxidation mottles, fine-grained, pinhole porosity, trace medium-grained.

Sand, well-graded, very dense, moist, yellowish brown with oxidation mottles, pinhole porosity, some silt.

Total depth of boring: 25 feet
Fill to 1.5 feet.
No groundwater encountered.
Backfilled and patched.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.
### BORING 6

**ELEV. (MSL.)**

**DATE COMPLETED:** 10/21/2020

**EQUIPMENT:** HOLLOW STEM AUGER

**BY:** CB

<table>
<thead>
<tr>
<th>DEPTH IN FEET</th>
<th>SAMPLE NO.</th>
<th>LITHOLOGY</th>
<th>SOIL CLASS (USCS)</th>
<th>MATERIAL DESCRIPTION</th>
<th>PENETRATION RESISTANCE (BLOWS/FT*)</th>
<th>DRY DENSITY (P.C.F.)</th>
<th>MOISTURE CONTENT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>BULK 0-5'</td>
<td></td>
<td></td>
<td>AC: 3”    BASE: 7”   ARTIFICIAL FILL Sand with Silt, poorly graded, medium dense, slightly moist, brown, clay, some fine gravel.</td>
<td>30</td>
<td>113.7</td>
<td>11.4</td>
</tr>
<tr>
<td>2</td>
<td>B6@2'</td>
<td>SM</td>
<td></td>
<td>OLDER ALLUVIUM Silty Sand, poorly graded, dense, slightly moist, yellowish brown, pinhole porosity.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>B6@5'</td>
<td>SW</td>
<td></td>
<td>Sand, well-graded, dense, slightly moist, yellowish brown with oxidation mottles with gravel, some silt.</td>
<td>75</td>
<td>111.5</td>
<td>10.3</td>
</tr>
<tr>
<td>6</td>
<td>B6@7'</td>
<td>SM</td>
<td></td>
<td>Silty Sand with Clay, poorly graded, very dense, dry, yellowish brown, fine-grained, pinhole porosity.</td>
<td>50 (6&quot;)</td>
<td>108.2</td>
<td>22.6</td>
</tr>
<tr>
<td>8</td>
<td>B6@10'</td>
<td></td>
<td></td>
<td>Sand, poorly graded, very dense, slightly moist, yellowish brown, fine-grained, pinhole porosity, trace silt and oxidation mottles.</td>
<td>87</td>
<td>106.9</td>
<td>6.5</td>
</tr>
<tr>
<td>10</td>
<td>B6@15'</td>
<td>SP</td>
<td></td>
<td>- fine- to medium-grained</td>
<td>76</td>
<td>108.0</td>
<td>18.8</td>
</tr>
<tr>
<td>12</td>
<td>B6@20'</td>
<td></td>
<td></td>
<td>- some gravel to 1”, trace clay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>B6@24.5'</td>
<td></td>
<td></td>
<td>- grades coarser</td>
<td>50 (6&quot;)</td>
<td>106.9</td>
<td>10.5</td>
</tr>
</tbody>
</table>

**Total depth of boring:** 25 feet  
Fill to 2.5 feet.  
No groundwater encountered.  
Backfilled and patched.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.

---

**Figure A6,**  
**Log of Boring 6, Page 1 of 1**

**SAMPLE SYMBOLS**

- .. SAMPLING UNSUCCESSFUL  
- .. STANDARD PENETRATION TEST  
- .. DRIVE SAMPLE (UNDISTURBED)  
- .. DISTURBED OR BAG SAMPLE  
- .. CHUNK SAMPLE  
- .. WATER TABLE OR SEEPAGE

**NOTE:** THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.
## Boring 7

### Elevation (M.S.L.) --- Date Completed: 10/21/2020

**Equipment:** Hollow Stem Auger  
**By:** CB

### Material Description

<table>
<thead>
<tr>
<th>Depth (Feet)</th>
<th>Sample No.</th>
<th>Lithology</th>
<th>Soil Class (USCS)</th>
<th>Groundwater</th>
<th>Penetration Resistance (Blows/ft*)</th>
<th>Dry Density (P.C.F.)</th>
<th>Moisture Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60</td>
<td>103.6</td>
<td>19.6</td>
</tr>
</tbody>
</table>

**ARTIFICIAL FILL**
- Sand with Silt, medium dense, moist, brown, fine- to medium-grained, clay, some coarse grained and gravel (to 1”).

**OLDER ALLUVIUM**

- **ML**
  - Silt with Clay, hard, moist, yellowish brown, pinhole porosity, some fine-grained sand.

- **SP-SM**
  - Sand with Silt, very dense, moist, yellowish brown, fine-grained, pinhole porosity.

- **SW**
  - Sand, well-graded, dense, slightly moist, yellowish brown, trace silt and fine gravel.

- **SP**
  - Sand, poorly graded, very dense, moist, reddish brown, fine- to medium-grained, trace silt.

- **ML**
  - Silt, hard, moist, yellowish brown with oxidation mottles, some sand, trace fine gravel.

- **SW**
  - Sand, well-graded, very dense, moist, yellowish brown with oxidation mottles, some silt, trace fine gravel.

- **SW**
  - Increased gravel

- Total depth of boring: 25 feet  
  - Fill to 2.5 feet.  
  - No groundwater encountered.  
  - Backfilled and patched.  
  - *Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.

---

**Figure A7, Log of Boring 7, Page 1 of 1**

**Sample Symbols:**
- .. SAMPLING UNSUCCESSFUL  
- .. STANDARD PENETRATION TEST  
- .. DRIVE SAMPLE (UNDISTURBED)  
- .. DISTURBED OR BAG SAMPLE  
- .. CHUNK SAMPLE  
- .. WATER TABLE OR SEEPAGE

**Note:** The log of subsurface conditions shown hereon applies only at the specific boring or trench location and at the date indicated.  It is not warranted to be representative of subsurface conditions at other locations and times.
# Boring 8

<table>
<thead>
<tr>
<th>Depth IN Feet</th>
<th>Sample No.</th>
<th>Lithology</th>
<th>Groundwater</th>
<th>Soil Class (USCS)</th>
<th>Equipment</th>
<th>Date Completed</th>
<th>Penetration Resistance (Blows/ft*)</th>
<th>Dry Density (P.C.F.)</th>
<th>Moisture Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>BULK</td>
<td>0-5'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>B8@2'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>B8@5'</td>
<td>CL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B8@7'</td>
<td>SP-SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>B8@10'</td>
<td>ML</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>B8@15'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>B8@20'</td>
<td>SP-SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>B8@25'</td>
<td>SW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Material Description**

- **Artificial Fill**: Sand with silt, loose, dry, brown, fine- to medium-grained, clay, some gravel, trace coarse-grained.

- **Older Alluvium**: Clay with silt, hard, moist, dark grayish brown, fine-grained, some sand.

- **Sand with Silt**: Poorly graded, very dense, dry, brown, fine- to medium-grained, some coarse-grained and silt.

- **Silt with Sand**: Stiff, moist, yellowish brown, fine-grained, trace clay and oxidation mottles.

Total depth of boring: 25.5 feet

Fill to 3 feet.

No groundwater encountered.

Backfilled and patched.

*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.

**Note:** The log of subsurface conditions shown hereon applies only at the specific boring or trench location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.
APPENDIX B
LABORATORY TESTING

Laboratory tests were performed in accordance with “American Society for Testing and Materials (ASTM)”, or other suggested procedures. Selected samples were tested for direct shear strength, expansion and consolidation characteristics, maximum dry density, corrosivity, in-place dry density and moisture content. The results of the laboratory tests are summarized in Figures B1 through B24. The in-place dry density and moisture content of the samples tested are presented on the boring logs, Appendix A.
**DIRECT SHEAR TEST RESULTS**

Consolidated Drained ASTM D-3080

**Boring No.** | B2&B4
---|---
**Sample No.** | B2&B4@0-5
**Depth (ft)** | 0-5
**Sample Type:** | Ring

**Soil Identification:**
Grayish Brown Silty Sand with Clay (SM)

**Strength Parameters**

<table>
<thead>
<tr>
<th></th>
<th>C (psf)</th>
<th>$\phi$ (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak</td>
<td>519</td>
<td>22.1</td>
</tr>
<tr>
<td>Ultimate</td>
<td>417</td>
<td>23.0</td>
</tr>
</tbody>
</table>

**Normal Stress (kip/ft²)** | 1 | 3 | 5
---|---|---|---
**Peak Shear Stress (kip/ft²)** | 0.86 | 1.66 | 2.48
**Shear Stress @ End of Test (ksf)** | 0.77 | 1.59 | 2.47
**Deformation Rate (in./min.)** | 0.05 | 0.05 | 0.05
**Initial Sample Height (in.)** | 1.0 | 1.0 | 1.0
**Ring Inside Diameter (in.)** | 2.375 | 2.375 | 2.375
**Initial Moisture Content (%)** | 12.1 | 12.1 | 12.1
**Initial Dry Density (pcf)** | 105.0 | 105.0 | 105.0
**Initial Degree of Saturation (%)** | 54.1 | 53.9 | 54.1
**Soil Height Before Shearing (in.)** | 1.2 | 1.2 | 1.2
**Final Moisture Content (%)** | 23.9 | 22.1 | 21.3

**Project No.:** W1251-06-01

Lawrence Drive & Corporate Center Drive Thousand Oaks, CA

**Checked by:** JMH

**Figure B1**

**DEC. 2020**
**DIRECT SHEAR TEST RESULTS**

Consolidated Drained ASTM D-3080

Project No.: W1251-06-01
Lawrence Drive & Corporate Center Drive
Thousand Oaks, CA

Checked by: JMH

DEC. 2020

**Soil Identification:**
Yellowish Brown Silty Sand (SM)

**Strength Parameters**

<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Sample No.</th>
<th>Depth (ft)</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3</td>
<td>B3@5</td>
<td>5</td>
<td>Ring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strength Parameters</th>
<th>C (pcf)</th>
<th>( \phi ) (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak</td>
<td>505</td>
<td>33.8</td>
</tr>
<tr>
<td>Ultimate</td>
<td>219</td>
<td>31.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Normal Stress (kip/ft²)</th>
<th>1</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Shear Stress (kip/ft²)</td>
<td>1.19</td>
<td>2.48</td>
<td>3.87</td>
</tr>
<tr>
<td>Shear Stress @ End of Test (ksf)</td>
<td>0.84</td>
<td>2.07</td>
<td>3.33</td>
</tr>
<tr>
<td>Deformation Rate (in./min.)</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Initial Sample Height (in.)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Ring Inside Diameter (in.)</td>
<td>2.375</td>
<td>2.375</td>
<td>2.375</td>
</tr>
<tr>
<td>Initial Moisture Content (%)</td>
<td>21.7</td>
<td>22.2</td>
<td>23.1</td>
</tr>
<tr>
<td>Initial Dry Density (pcf)</td>
<td>104.6</td>
<td>104.3</td>
<td>101.5</td>
</tr>
<tr>
<td>Initial Degree of Saturation (%)</td>
<td>95.9</td>
<td>97.5</td>
<td>94.5</td>
</tr>
<tr>
<td>Soil Height Before Shearing (in.)</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Final Moisture Content (%)</td>
<td>23.2</td>
<td>22.8</td>
<td>22.7</td>
</tr>
</tbody>
</table>

**Figure B2**

The graph illustrates the relationship between shear stress and normal stress, with data points indicating the results at various sample locations and depths. The table provides detailed parameters including sample identification, depth, and specific soil characteristics, along with calculated strength parameters such as peak and ultimate shear stress, initial and final moisture content, and initial degree of saturation.
Boring No. | B1
---|---
Sample No. | B1@1
Depth (ft) | 1
Sample Type: | Ring

Soil Identification:
Yellowish Brown Silty Sand (SM)

**Strength Parameters**

<table>
<thead>
<tr>
<th></th>
<th>C (psf)</th>
<th>$\phi$ (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak</td>
<td>410</td>
<td>28.4</td>
</tr>
<tr>
<td>Ultimate</td>
<td>408</td>
<td>27.7</td>
</tr>
</tbody>
</table>

**Normal Stress (kip/ft²)**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Shear Stress (kip/ft²)</td>
<td>0.94</td>
<td>2.05</td>
<td>3.11</td>
</tr>
<tr>
<td>Shear Stress @ End of Test (ksf)</td>
<td>0.92</td>
<td>2.01</td>
<td>3.02</td>
</tr>
<tr>
<td>Deformation Rate (in./min.)</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Initial Sample Height (in.)</th>
<th>1.0</th>
<th>1.0</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ring Inside Diameter (in.)</td>
<td>2.375</td>
<td>2.375</td>
<td>2.375</td>
<td></td>
</tr>
<tr>
<td>Initial Moisture Content (%)</td>
<td>13.3</td>
<td>16.6</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td>Initial Dry Density (pcf)</td>
<td>87.2</td>
<td>88.7</td>
<td>85.0</td>
<td></td>
</tr>
<tr>
<td>Initial Degree of Saturation (%)</td>
<td>38.5</td>
<td>49.7</td>
<td>42.3</td>
<td></td>
</tr>
<tr>
<td>Soil Height Before Shearing (in.)</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Final Moisture Content (%)</td>
<td>25.3</td>
<td>22.7</td>
<td>22.4</td>
<td></td>
</tr>
</tbody>
</table>

**DIRECT SHEAR TEST RESULTS**
Consolidated Drained ASTM D-3080

Checked by: JMH

Project No.: W1251-06-01
Lawrence Drive & Corporate Center Drive
Thousand Oaks, CA

DEC. 2020 Figure B3
**DIRECT SHEAR TEST RESULTS**
Consolidated Drained ASTM D-3080

<table>
<thead>
<tr>
<th>Sample Type:</th>
<th>Ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boring No.</td>
<td>B6</td>
</tr>
<tr>
<td>Sample No.</td>
<td>B6@5</td>
</tr>
<tr>
<td>Depth (ft)</td>
<td>5</td>
</tr>
</tbody>
</table>
| Soil
Identification: | Yellowish Brown Well Graded Sand (SW) |

<table>
<thead>
<tr>
<th>Strength Parameters</th>
<th>C (psf)</th>
<th>(\phi) (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak</td>
<td>601</td>
<td>32.7</td>
</tr>
<tr>
<td>Ultimate</td>
<td>415</td>
<td>31.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Normal Stress (kip/ft²)</th>
<th>1</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Shear Stress (kip/ft²)</td>
<td>1.27</td>
<td>2.48</td>
<td>3.84</td>
</tr>
<tr>
<td>Shear Stress @ End of Test (ksf)</td>
<td>1.01</td>
<td>2.29</td>
<td>3.45</td>
</tr>
<tr>
<td>Deformation Rate (in./min.)</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Initial Sample Height (in.)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Ring Inside Diameter (in.)</td>
<td>2.375</td>
<td>2.375</td>
<td>2.375</td>
</tr>
<tr>
<td>Initial Moisture Content (%)</td>
<td>13.1</td>
<td>15.1</td>
<td>11.3</td>
</tr>
<tr>
<td>Initial Dry Density (pcf)</td>
<td>110.6</td>
<td>94.7</td>
<td>103.5</td>
</tr>
<tr>
<td>Initial Degree of Saturation (%)</td>
<td>67.7</td>
<td>52.2</td>
<td>48.7</td>
</tr>
<tr>
<td>Soil Height Before Shearing (in.)</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Final Moisture Content (%)</td>
<td>17.2</td>
<td>16.6</td>
<td>18.0</td>
</tr>
</tbody>
</table>
Boring No.  | B6&B8
Sample No.  | B6&B8@0-5
Depth (ft)  | 0-5
Sample Type: | Ring

Soil Identification:
Yellowish Brown Silty Sand with Clay (SM)

Strength Parameters

<table>
<thead>
<tr>
<th></th>
<th>C (psf)</th>
<th>φ (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak</td>
<td>294</td>
<td>27.0</td>
</tr>
<tr>
<td>Ultimate</td>
<td>195</td>
<td>28.0</td>
</tr>
</tbody>
</table>

Normal Stres (kip/ft2)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>1</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Stres (kip/ft2)</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Peak Shear Stress (kip/ft²)</td>
<td>0.78</td>
<td>1.86</td>
<td>2.82</td>
</tr>
<tr>
<td>Shear Stress @ End of Test (ksf)</td>
<td>0.70</td>
<td>1.85</td>
<td>2.82</td>
</tr>
<tr>
<td>Deformation Rate (in./min.)</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Initial Sample Height (in.)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Ring Inside Diameter (in.)</td>
<td>2.375</td>
<td>2.375</td>
<td>2.375</td>
</tr>
<tr>
<td>Initial Moisture Content (%)</td>
<td>11.6</td>
<td>11.7</td>
<td>11.7</td>
</tr>
<tr>
<td>Initial Dry Density (pcf)</td>
<td>109.0</td>
<td>109.0</td>
<td>109.0</td>
</tr>
<tr>
<td>Initial Degree of Saturation (%)</td>
<td>57.5</td>
<td>58.0</td>
<td>57.7</td>
</tr>
<tr>
<td>Soil Height Before Shearing (in.)</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Final Moisture Content (%)</td>
<td>21.4</td>
<td>19.8</td>
<td>19.2</td>
</tr>
</tbody>
</table>

DIRECT SHEAR TEST RESULTS
Consolidated Drained ASTM D-3080

Checked by: JMH

Project No.: W1251-06-01
Lawrence Drive & Corporate Center Drive Thousand Oaks, CA
DEC. 2020 Figure B5
WATER ADDED AT 2.0 KSF

CONSOLIDATION TEST RESULTS

<table>
<thead>
<tr>
<th>SAMPLE ID.</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1@1</td>
<td>Yellowish Brown Silty Sand (SM)</td>
<td>94.0</td>
<td>11.4</td>
<td>20.9</td>
</tr>
</tbody>
</table>

CONSOLIDATION PRESSURE (ksf) vs. PERCENT CONSOLIDATION

Lawrence Drive &
Corporate Center Drive
Thousand Oaks, CA

Checked by: JMH

Project No.: W1251-06-01

ASTM D-2435

DEC. 2020

Figure B6
<table>
<thead>
<tr>
<th>SAMPLE ID.</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1@6.5</td>
<td>Reddish Brown Well Graded Sand (SW)</td>
<td>100.8</td>
<td>11.4</td>
<td>18.5</td>
</tr>
</tbody>
</table>
WATER ADDED AT 2.0 KSF

<table>
<thead>
<tr>
<th>SAMPLE ID.</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1@10</td>
<td>Yellowish Brown Silty Sand (SM)</td>
<td>101.3</td>
<td>16.4</td>
<td>21.3</td>
</tr>
</tbody>
</table>

CONSOLIDATION TEST RESULTS
ASTM D-2435

Checked by: JMH

Project No.: W1251-06-01
Lawrence Drive & Corporate Center Drive Thousand Oaks, CA
DEC. 2020  Figure B8
### CONSOLIDATION TEST RESULTS

**ASTM D-2435**

---

**SAMPLE ID.** | **SOIL TYPE** | **DRY DENSITY (PCF)** | **INITIAL MOISTURE (%)** | **FINAL MOISTURE (%)**
--- | --- | --- | --- | ---

B1@20 | Gray Silty Sand with Clay (SM) | 98.4 | 15.0 | 20.6

---

Check by: JMH

---

**Project No.:** W1251-06-01

Lawrence Drive & Corporate Center Drive

Thousand Oaks, CA

**Checked by:** JMH

**DEC. 2020**

**Figure B9**
WATER ADDED AT 2.0 KSF

<table>
<thead>
<tr>
<th>SAMPLE ID.</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3@5</td>
<td>Yellowish Brown Silty Sand (SM)</td>
<td>105.6</td>
<td>19.7</td>
<td>20.7</td>
</tr>
</tbody>
</table>

CONSOLIDATION TEST RESULTS
ASTM D-2435

Checked by: JMH

Project No.: W1251-06-01
Lawrence Drive & Corporate Center Drive
Thousand Oaks, CA
DEC. 2020 Figure B10
WATER ADDED AT 2.0 KSF

CONSOLIDATION TEST RESULTS

<table>
<thead>
<tr>
<th>SAMPLE ID.</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3@10</td>
<td>Reddish Brown Poorly Graded Sand (SP)</td>
<td>101.5</td>
<td>20.2</td>
<td>22.7</td>
</tr>
</tbody>
</table>

Checked by: JMH

Project No.: W1251-06-01

Lawrence Drive & Corporate Center Drive
Thousand Oaks, CA

DEC. 2020

Figure B11
SAMPLE ID. | SOIL TYPE                      | DRY DENSITY (PCF) | INITIAL MOISTURE (%) | FINAL MOISTURE (%)
----------|--------------------------------|------------------|----------------------|------------------
B3@20     | Yellowish Brown Well Graded Sand (SW) | 93.3             | 17.5                 | 21.9             

WATER ADDED AT 2.0 KSF

CONSOLIDATION TEST RESULTS
ASTM D-2435

Checked by: JMH

DEC. 2020
<table>
<thead>
<tr>
<th>SAMPLE ID.</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B4@9.5</td>
<td>Yellowish Brown Silty Sand (SM)</td>
<td>97.1</td>
<td>8.3</td>
<td>18.8</td>
</tr>
</tbody>
</table>

WATER ADDED AT 2.0 KSF

CONSOLIDATION TEST RESULTS

GEOCON

ASTM D-2435

Checked by: JMH

Project No.: W1251-06-01

Lawrence Drive & Corporate Center Drive

Thousand Oaks, CA

DEC. 2020

Figure B13
WATER ADDED AT 2.0 KSF

SAMPLE ID | SOIL TYPE | DRY DENSITY (PCF) | INITIAL MOISTURE (%) | FINAL MOISTURE (%)
---|---|---|---|---
B4@20 | Yellowish Brown Silty Sand with Clay (SM) | 101.4 | 22.1 | 24.7

CONSOLIDATION TEST RESULTS
ASTM D-2435

Checked by: JMH

Project No.: W1251-06-01
Lawrence Drive & Corporate Center Drive
Thousand Oaks, CA
DEC. 2020
Figure B14
### Consolidation Test Results

**Sample ID:** B6@5  
**Soil Type:** Yellowish Brown Well Graded Sand (SW)  
**Initial Moisture (%):** 10.3  
**Final Moisture (%):** 16.6  

**Dry Density (PCF):** 108.5

---

**Figure B15**

**Consolidation Test Results**

*ASTM D-2435*

**Checked by:** JMH  
**Project No.:** W1251-06-01  
**Lawrence Drive & Corporate Center Drive**  
**Thousand Oaks, CA**  
**DEC. 2020**  
**Figure B15**
WATER ADDED AT 2.0 KSF

CONSOLIDATION TEST RESULTS

<table>
<thead>
<tr>
<th>SAMPLE ID</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B6@10</td>
<td>Yellowish Brown Poorly Graded Sand (SP)</td>
<td>91.6</td>
<td>13.1</td>
<td>21.7</td>
</tr>
</tbody>
</table>

Consolidation Pressure (ksf)

Percent Consolidation

Consolidation Test Results

ASTM D-2435

Checked by: JMH

Project No.: W1251-06-01
Lawrence Drive & Corporate Center Drive
Thousand Oaks, CA
DEC. 2020
Figure B16
WATER ADDED AT 2.0 KSF

CONSOLIDATION TEST RESULTS

Lawrence Drive &
Corporate Center Drive
Thousand Oaks, CA

Checked by:       JMH

CONSOLIDATION TEST RESULTS
ASTM D-2435

SAMPLE ID. | SOIL TYPE                        | DRY DENSITY (PCF) | INITIAL MOISTURE (%) | FINAL MOISTURE (%) |
------------|----------------------------------|-------------------|----------------------|--------------------|
B6@20       | Yellowish Brown Poorly Graded Sand (SP) | 104.4             | 17.5                 | 20.5               |
**WATER ADDED AT 2.0 KSF**

**CONSOLIDATION TEST RESULTS**

Lawrence Drive &
Corporate Center Drive
Thousand Oaks, CA

Checked by: JMH

<table>
<thead>
<tr>
<th>SAMPLE ID.</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B8@10</td>
<td>Yellowish Brown Sand w/ Silt (SP-SM)</td>
<td>101.0</td>
<td>20.1</td>
<td>22.3</td>
</tr>
</tbody>
</table>

---

**CONSOLIDATION TEST RESULTS**

ASTM D-2435

Project No.: W1251-06-01

Lawrence Drive &
Corporate Center Drive
Thousand Oaks, CA

DECEMBER 2020

Figure B18
<table>
<thead>
<tr>
<th>SAMPLE ID.</th>
<th>SOIL TYPE</th>
<th>DRY DENSITY (PCF)</th>
<th>INITIAL MOISTURE (%)</th>
<th>FINAL MOISTURE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B8@20</td>
<td>Yellowish Brown Sand w/ Silt (SP-SM)</td>
<td>102.9</td>
<td>21.2</td>
<td>21.3</td>
</tr>
</tbody>
</table>

**Figure B19**

WATER ADDED AT 2.0 KSF

CONSOLIDATION TEST RESULTS
ASTM D-2435

Checked by: JMH

DEC. 2020
# Expansion Index Test Results

**B2&B4 @ 0-5’**

### MOLDED SPECIMEN

<table>
<thead>
<tr>
<th></th>
<th>BEFORE TEST</th>
<th>AFTER TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen Diameter</td>
<td>(in.)</td>
<td>4.0</td>
</tr>
<tr>
<td>Specimen Height</td>
<td>(in.)</td>
<td>1.0</td>
</tr>
<tr>
<td>Wt. Comp. Soil + Mold</td>
<td>(gm)</td>
<td>733.6</td>
</tr>
<tr>
<td>Wt. of Mold</td>
<td>(gm)</td>
<td>367.8</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>(Assumed)</td>
<td>2.7</td>
</tr>
<tr>
<td>Wet Wt. of Soil + Cont.</td>
<td>(gm)</td>
<td>487.5</td>
</tr>
<tr>
<td>Dry Wt. of Soil + Cont.</td>
<td>(gm)</td>
<td>451.8</td>
</tr>
<tr>
<td>Wt. of Container</td>
<td>(gm)</td>
<td>187.5</td>
</tr>
<tr>
<td>Moisture Content</td>
<td>(%)</td>
<td>13.5</td>
</tr>
<tr>
<td>Wet Density</td>
<td>(pcf)</td>
<td>110.3</td>
</tr>
<tr>
<td>Dry Density</td>
<td>(pcf)</td>
<td>97.2</td>
</tr>
<tr>
<td>Void Ratio</td>
<td></td>
<td>0.7</td>
</tr>
<tr>
<td>Total Porosity</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>Pore Volume</td>
<td>(cc)</td>
<td>87.6</td>
</tr>
<tr>
<td>Degree of Saturation</td>
<td>(%) [S&lt;sub&gt;max&lt;/sub&gt;]</td>
<td>50.1</td>
</tr>
</tbody>
</table>

### EXPANSION INDEX TEST RESULTS

- **Date:** 10/27/2020
  - **Time:** 10:00
  - **Pressure (psi):** 1.0
  - **Elapsed Time (min):** 0
  - **Dial Readings (in.):** 0.2575
- **Date:** 10/27/2020
  - **Time:** 10:10
  - **Pressure (psi):** 1.0
  - **Elapsed Time (min):** 10
  - **Dial Readings (in.):** 0.2575

- **Date:** 10/28/2020
  - **Time:** 10:00
  - **Pressure (psi):** 1.0
  - **Elapsed Time (min):** 1430
  - **Dial Readings (in.):** 0.34
- **Date:** 10/28/2020
  - **Time:** 11:00
  - **Pressure (psi):** 1.0
  - **Elapsed Time (min):** 1490
  - **Dial Readings (in.):** 0.34

**Expansion Index (EI meas) =** 82.5

**Expansion Index (Report) =** 83

<table>
<thead>
<tr>
<th>Expansion Index, EI&lt;sub&gt;50&lt;/sub&gt;</th>
<th>CBC CLASSIFICATION *</th>
<th>UBC CLASSIFICATION **</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>Non-Expansive</td>
<td>Very Low</td>
</tr>
<tr>
<td>21-50</td>
<td>Expansive</td>
<td>Low</td>
</tr>
<tr>
<td>51-90</td>
<td>Expansive</td>
<td>Medium</td>
</tr>
<tr>
<td>91-130</td>
<td>Expansive</td>
<td>High</td>
</tr>
<tr>
<td>&gt;130</td>
<td>Expansive</td>
<td>Very High</td>
</tr>
</tbody>
</table>

* Reference: 2019 California Building Code, Section 1803.5.3
** Reference: 1997 Uniform Building Code, Table 18-I-B.

**Project No.:** W1251-06-01

**Lawrence Drive & Corporate Center Drive Thousand Oaks, CA**

**EXPANSION INDEX TEST RESULTS**

ASTM D-4829

**Checked by:** JMH

**DEC. 2020**

**Figure B20**
### MOLDED SPECIMEN

<table>
<thead>
<tr>
<th>Specimen Diameter (in.)</th>
<th>BEFORE TEST</th>
<th>AFTER TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen Height (in.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wt. Comp. Soil + Mold (gm)</td>
<td>746.5</td>
<td>796.3</td>
</tr>
<tr>
<td>Wt. of Mold (gm)</td>
<td>368.1</td>
<td>368.1</td>
</tr>
<tr>
<td>Specific Gravity (Assumed)</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Wet Wt. of Soil + Cont. (gm)</td>
<td>487.5</td>
<td>796.3</td>
</tr>
<tr>
<td>Dry Wt. of Soil + Cont. (gm)</td>
<td>456.8</td>
<td>339.7</td>
</tr>
<tr>
<td>Wt. of Container (gm)</td>
<td>187.5</td>
<td>368.1</td>
</tr>
<tr>
<td>Moisture Content (%)</td>
<td>11.4</td>
<td>26.1</td>
</tr>
<tr>
<td>Wet Density (pcf)</td>
<td>114.1</td>
<td>129.0</td>
</tr>
<tr>
<td>Dry Density (pcf)</td>
<td>102.5</td>
<td>102.3</td>
</tr>
<tr>
<td>Void Ratio</td>
<td>0.6</td>
<td>0.7</td>
</tr>
<tr>
<td>Total Porosity</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Pore Volume (cc)</td>
<td>81.2</td>
<td>93.3</td>
</tr>
<tr>
<td>Degree of Saturation (%)</td>
<td>48.1</td>
<td>94.9</td>
</tr>
</tbody>
</table>

### Expansion Index Test Results

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Pressure (psi)</th>
<th>Elapsed Time (min)</th>
<th>Dial Readings (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/26/2020</td>
<td>10:00</td>
<td>1.0</td>
<td>0</td>
<td>0.2965</td>
</tr>
<tr>
<td>10/26/2020</td>
<td>10:10</td>
<td>1.0</td>
<td>10</td>
<td>0.296</td>
</tr>
<tr>
<td>10/27/2020</td>
<td>10:00</td>
<td>1.0</td>
<td>1430</td>
<td>0.3545</td>
</tr>
<tr>
<td>10/27/2020</td>
<td>11:00</td>
<td>1.0</td>
<td>1490</td>
<td>0.3545</td>
</tr>
</tbody>
</table>

**Add Distilled Water to the Specimen**

**Expansion Index (EI meas) =**

58.5

**Expansion Index (Report) =**

59

### Expansion Index, $E_{50}$

<table>
<thead>
<tr>
<th>Expansion Index, $E_{50}$</th>
<th>CBC CLASSIFICATION *</th>
<th>UBC CLASSIFICATION **</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>Non-Expansive</td>
<td>Very Low</td>
</tr>
<tr>
<td>21-50</td>
<td>Expansive</td>
<td>Low</td>
</tr>
<tr>
<td>51-90</td>
<td>Expansive</td>
<td>Medium</td>
</tr>
<tr>
<td>91-130</td>
<td>Expansive</td>
<td>High</td>
</tr>
<tr>
<td>&gt;130</td>
<td>Expansive</td>
<td>Very High</td>
</tr>
</tbody>
</table>

* Reference: 2019 California Building Code, Section 1803.5.3

** Reference: 1997 Uniform Building Code, Table 18-I-B.

---

**EXPANSION INDEX TEST RESULTS**

ASTM D-4829

Checked by: JMH

Project No.: W1251-06-01

Lawrence Drive & Corporate Center Drive Thousand Oaks, CA

DEC. 2020 Figure B21
Sample No:  

**B2&B4 @ 0-5'**  
Grayish Brown Silty Sand with Clay (SM)

<table>
<thead>
<tr>
<th>TEST NO.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wt. Compacted Soil + Mold (g)</td>
<td>6078</td>
<td>6130</td>
<td>6112</td>
<td>5960</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight of Mold (g)</td>
<td>4136</td>
<td>4136</td>
<td>4136</td>
<td>4136</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Weight of Soil (g)</td>
<td>1942</td>
<td>1994</td>
<td>1976</td>
<td>1824</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Weight of Soil + Cont. (g)</td>
<td>699.7</td>
<td>717.7</td>
<td>690.9</td>
<td>643.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Weight of Soil + Cont. (g)</td>
<td>640.9</td>
<td>646.7</td>
<td>614.8</td>
<td>599.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight of Container (g)</td>
<td>133.2</td>
<td>126.7</td>
<td>124.6</td>
<td>137.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture Content (%)</td>
<td>11.6</td>
<td>13.7</td>
<td>15.5</td>
<td>9.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Density (pcf)</td>
<td>128.5</td>
<td>131.9</td>
<td>130.7</td>
<td>120.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Density (pcf)</td>
<td>115.1</td>
<td>116.0</td>
<td>113.1</td>
<td>110.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Maximum Dry Density (pcf) | 116.5 |   |   |   |
| Bulk Specific Gravity (dry) | 2.65 |   |   |   |
| Corrected Maximum Dry Density (pcf) | 118.5 |   |   |   |

| Optimum Moisture Content (%) | 12.5 |   |   |   |
| Oversized Fraction (%) | 6.0 |   |   |   |
| Corrected Moisture Content (%) | 12.0 |   |   |   |

**Preparation Method:** A

**MODIFIED COMPACTION TEST OF SOILS**  
ASTM D-1557

Checked by: JMH  
DEC. 2020  
Figure B22
### Preparation Method:

- **A**

### MODIFIED COMPACTION TEST OF SOILS

ASTM D-1557

- **Sample No:**
- **Project No.:** W1251-06-01
- **Lawrence Drive & Corporate Center Drive**
- **Thousand Oaks, CA**
- **Checked by:** JMH
- **DATE:** DEC. 2020

#### Test No.

<table>
<thead>
<tr>
<th>Test No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wt. Compacted Soil + Mold (g)</td>
<td>6180</td>
<td>6175</td>
<td>6045</td>
<td>5927</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight of Mold (g)</td>
<td>4136</td>
<td>4136</td>
<td>4136</td>
<td>4136</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Weight of Soil (g)</td>
<td>2044</td>
<td>2039</td>
<td>1909</td>
<td>1791</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Weight of Soil + Cont. (g)</td>
<td>656.6</td>
<td>621.3</td>
<td>644.6</td>
<td>599.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Weight of Soil + Cont. (g)</td>
<td>602.9</td>
<td>561.6</td>
<td>601.4</td>
<td>566.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight of Container (g)</td>
<td>148.5</td>
<td>135.7</td>
<td>146.7</td>
<td>133.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture Content (%)</td>
<td>11.8</td>
<td>14.0</td>
<td>9.5</td>
<td>7.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Density (pcf)</td>
<td>135.2</td>
<td>134.9</td>
<td>126.3</td>
<td>118.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Density (pcf)</td>
<td>120.9</td>
<td>118.3</td>
<td>115.3</td>
<td>110.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Test Results

- **Maximum Dry Density (pcf):** 121.0
- **Optimum Moisture Content (%):** 12.0
- **Bulk Specific Gravity (dry):** 2.65
- **Oversized Fraction (%):** 7.0
- **Corrected Maximum Dry Density (pcf):** 123.5
- **Corrected Moisture Content (%):** 11.0

#### Graph

- **Dry Density (pcf) vs. Moisture Content (%)**

#### Notes

- **Figures B23**
### SUMMARY OF LABORATORY WATER SOLUBLE SULFATE TEST RESULTS
**California Test No. 417**

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Water Soluble Sulfate (% $SO_4$)</th>
<th>Sulfate Exposure*</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2&amp;B4 @ 0-5'</td>
<td>0.000</td>
<td>S0</td>
</tr>
<tr>
<td>B6&amp;B8 @ 0-5'</td>
<td>0.000</td>
<td>S0</td>
</tr>
</tbody>
</table>

### SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (pH) AND RESISTIVITY TEST RESULTS
**California Test No. 643**

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>pH</th>
<th>Resistivity (ohm centimeters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2&amp;B4 @ 0-5'</td>
<td>6.9</td>
<td>1000 (Severely Corrosive)</td>
</tr>
<tr>
<td>B6&amp;B8 @ 0-5'</td>
<td>7.5</td>
<td>1300 (Corrosive)</td>
</tr>
</tbody>
</table>

### SUMMARY OF LABORATORY CHLORIDE CONTENT TEST RESULTS
**EPA No. 325.3**

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Chloride Ion Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2&amp;B4 @ 0-5'</td>
<td>0.007</td>
</tr>
<tr>
<td>B6&amp;B8 @ 0-5'</td>
<td>0.008</td>
</tr>
</tbody>
</table>
Subject: PERCOLATION TEST RESULTS
PROPOSED INDUSTRIAL DISTRIBUTION CENTER
LAWRENCE DRIVE & CORPORATE CENTER DRIVE
THOUSAND OAKS, CALIFORNIA
APN: 667 0172 015, 667 0172 025, 667 0172 035


Dear Mr. Wood:

In accordance with your authorization of our proposal dated March 4, 2022, this letter has been prepared to present the results of the percolation testing performed at the subject site located at the southeast corner of the intersection of Lawrence Drive and Corporate Center Drive in the City of Thousand Oaks, California.

Based on information provided by the design engineer, it is our understanding that the proposed stormwater infiltration system consists of a deep drywell infiltration system that will introduce water into the soil at a depth between 15 and 50 feet below the existing ground surface.

The site was explored on March 19, 2022, by drilling one 8-inch diameter boring with a truck mounted hollow stem auger, denoted on the Site Plan as B9 (see Figure 1), to depths of 60½ feet below the existing ground. The boring logs are provided herein as Appendix A. The boring was over excavated to collect soil samples and was backfilled to the proposed invert elevation with a bentonite seal placed at the bottom of the invert. Slotted casing was set into the boring and the annular space between the casing and excavation was filled with gravel. The boring was then filled with water to pre-saturate the soils. The casing was refilled with water and percolation test readings were performed after repeated flooding of the cased excavation.
Based on the test results, the field-measured percolation rate and the design infiltration rate are provided in the following table. The Reduction Factor (Rf), to convert the field-measured percolation rate to an infiltration rate, is also shown in the table below. This value has been calculated in accordance with the Boring Percolation Test Procedure in the County of Los Angeles Department of Public Works GMED Guidelines for Design, Investigation, and Reporting Low Impact Development Stormwater Infiltration (June 2021). Calculations of the percolation rate, reduction factor, and infiltration rate are provided on Figure 2.

<table>
<thead>
<tr>
<th>Boring</th>
<th>Soil Type</th>
<th>Infiltration Depth (ft)</th>
<th>Measured Percolation Rate (in / hour)</th>
<th>Design Infiltration Rate (in / hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B9</td>
<td>Older Alluvium</td>
<td>15-50</td>
<td>0.07</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Based on the test method utilized (Boring Percolation Test), the reduction factor RFt may be taken as 1.0 in the infiltration system design. Based on the number of tests performed and consistency of the soils throughout the site, it is suggested that the reduction factor RFv be taken as 1.0. In addition, provided proper maintenance is performed to minimize long-term siltation and plugging, the reduction factor RFs may be taken as 1.0. Additional correction factors may be required and should be applied by the engineer in responsible charge of the design of the stormwater infiltration system and based on applicable guidelines.

The results of the percolation testing indicated that the infiltration rate within the alluvial soils at the location and depths listed in the table above is less than the generally accepted minimally required infiltration rate of 0.3 inches per hour. The slow infiltration rate is likely the result of the very dense soils that are present within the tested layers, which are typically not conducive to rapid infiltration. Based on these considerations, a stormwater infiltration system is not recommended for this development. It is suggested that stormwater be retained, filtered and discharged in accordance with the requirements of the local governing agency.

If you have any questions regarding this letter, or if we may be of further service, please contact the undersigned.
Should you have any questions regarding this letter, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

**GEOCON WEST, INC.**

Joe Hicks, M.S.  
PE 93183  

Neal Berliner  
GE 2576

Attachments:  
Figure 1, Site Plan  
Figure 2, Percolation Test Calculations  
Figure A1, Boring Log
### BORING PERCOLATION TEST FIELD LOG

<table>
<thead>
<tr>
<th>Date:</th>
<th>Saturday, March 19, 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boring/Test Number:</td>
<td>Boring 9 / Test 1</td>
</tr>
<tr>
<td>Project Number:</td>
<td>W1251-06-01</td>
</tr>
<tr>
<td>Project Location:</td>
<td>Corporate Center Drive</td>
</tr>
<tr>
<td>Earth Description:</td>
<td>SM</td>
</tr>
<tr>
<td>Tested By:</td>
<td>MR</td>
</tr>
<tr>
<td>Diameter of Boring:</td>
<td>8 inches</td>
</tr>
<tr>
<td>Diameter of Casing:</td>
<td>2 inches</td>
</tr>
<tr>
<td>Depth of Boring:</td>
<td>50 feet</td>
</tr>
<tr>
<td>Depth to Invert of BMP:</td>
<td>15 feet</td>
</tr>
<tr>
<td>Depth to Water Table:</td>
<td>100 feet</td>
</tr>
<tr>
<td>Diameter of BMP:</td>
<td>8 inches</td>
</tr>
<tr>
<td>Depth to Initial Water Depth (d₁):</td>
<td>177.6 inches</td>
</tr>
<tr>
<td>Start Time for Pre-Soak:</td>
<td>9:30 AM</td>
</tr>
<tr>
<td>Start Time for Standard:</td>
<td>10:30 AM</td>
</tr>
<tr>
<td>Water Remaining in Boring (Y/N):</td>
<td>Yes</td>
</tr>
<tr>
<td>Standard Time Interval Between Readings:</td>
<td>30 min</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reading Number</th>
<th>Time Start (hh:mm)</th>
<th>Time End (hh:mm)</th>
<th>Elapsed Time (min)</th>
<th>Water Drop During Standard Time Interval, Δd (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11:00 AM</td>
<td>11:30 AM</td>
<td>30</td>
<td>9.1</td>
</tr>
<tr>
<td>2</td>
<td>11:30 AM</td>
<td>12:00 PM</td>
<td>30</td>
<td>9.7</td>
</tr>
<tr>
<td>3</td>
<td>12:00 PM</td>
<td>12:30 PM</td>
<td>30</td>
<td>9.5</td>
</tr>
<tr>
<td>4</td>
<td>12:30 PM</td>
<td>1:00 PM</td>
<td>30</td>
<td>7.4</td>
</tr>
<tr>
<td>5</td>
<td>1:00 AM</td>
<td>1:30 AM</td>
<td>30</td>
<td>7.1</td>
</tr>
<tr>
<td>6</td>
<td>1:30 AM</td>
<td>2:00 AM</td>
<td>30</td>
<td>7.0 Achieved with Readings</td>
</tr>
<tr>
<td>7</td>
<td>2:00 AM</td>
<td>2:30 AM</td>
<td>30</td>
<td>7.0 Stabilized Readings</td>
</tr>
<tr>
<td>8</td>
<td>2:30 AM</td>
<td>3:00 AM</td>
<td>30</td>
<td>7.0 Stabilized Readings</td>
</tr>
</tbody>
</table>

### MEASURED PERCOLATION RATE & DESIGN INFILTRATION RATE CALCULATIONS*

* Calculations Below Based on Stabilized Readings Only

- **Boring Radius, r:** 4 inches
- **Test Section Height, h:** 422.4 inches
- **Test Section Surface Area, A = 2πrh + πr²**
  
- **Discharged Water Volume, V = πr²Δd**

\[
\text{Percolation Rate} = \frac{V}{\Delta T}
\]

<table>
<thead>
<tr>
<th>Reading</th>
<th>V (in³)</th>
<th>Percolation Rate (inches/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>350</td>
<td>0.07</td>
</tr>
<tr>
<td>7</td>
<td>350</td>
<td>0.07</td>
</tr>
<tr>
<td>8</td>
<td>350</td>
<td>0.07</td>
</tr>
</tbody>
</table>

\[
\text{Measured Percolation Rate} = 0.07 \text{ inches/hour}
\]

**Reduction Factors**

- **Boring Percolation Test, RFₚ =** 1
- **Site Variability, RFᵥ =** 1
- **Long Term Siltation, RFₛ =** 1

\[
\text{Total Reduction Factor, } RF = RFₚ + RFᵥ + RFₛ = 3
\]

**Design Infiltration Rate**

\[
\text{Design Infiltration Rate} = \frac{\text{Measured Percolation Rate}}{RF} = \frac{0.07}{3} = 0.02 \text{ inches/hour}
\]

**FIGURE 2**
### BORING 9

**ELEV. (MSL.)** - 
**DATE COMPLETED** 03/19/2022

**EQUIPMENT** HOLLOW STEM AUGER
**BY:** MR

<table>
<thead>
<tr>
<th>DEPTH IN FEET</th>
<th>SAMPLE NO.</th>
<th>LITHOLOGY</th>
<th>SOIL CLASS (USCS)</th>
<th>GROUNDWATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>AC: 4&quot;</td>
<td>BASE: 8&quot;</td>
<td>ARTIFICIAL FILL</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>ALLUVIUM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Silty Sand, poorly graded, very dense, slightly moist, yellowish brown, fine-grained, some fine gravel, trace medium-grained.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>B9@10'</td>
<td>SM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>SMO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>B9@20'</td>
<td>ML</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>B9@29'</td>
<td>ML</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### MATERIAL DESCRIPTION

AC: 4"  BASE: 8"
ARTIFICIAL FILL

ALLUVIUM
Silty Sand, poorly graded, very dense, slightly moist, yellowish brown, fine-grained, some fine gravel, trace medium-grained.

Sandy Silt, hard, slightly moist, yellowish brown, fine-grained, some oxidation.

Silt with Sand, poorly graded, hard, yellowish brown, fine-grained, trace medium-grained and fine gravel.

---

**SAMPLE SYMBOLS**
- **..** SAMPLING UNSUCCESSFUL
- **I** STANDARD PENETRATION TEST
- **D** DRIVE SAMPLE (UNDISTURBED)
- **X** DISTURBED OR BAG SAMPLE
- **N** CHUNK SAMPLE
- **V** WATER TABLE OR SEEPAGE

**NOTE:** THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.
## MATERIAL DESCRIPTION

<table>
<thead>
<tr>
<th>Depth</th>
<th>Sample No.</th>
<th>Lithology</th>
<th>Soil Class (USCS)</th>
<th>Groundwater</th>
<th>Equipment</th>
<th>Dry Density (P.C.F.)</th>
<th>Moisture Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>B9@34.5</td>
<td>ML</td>
<td>Silt, hard, slightly moist, yellowish brown, trace fine-grained sand.</td>
<td>- increase in silt</td>
<td>HOLLOW STEM AUGER</td>
<td>50 (6&quot;)</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>B9@34.5</td>
<td>ML</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>B9@39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>B9@44.5</td>
<td>SP</td>
<td>Sand, poorly graded, very dense, slightly moist, yellowish brown, fine-grained, some silt.</td>
<td>- increase in silt</td>
<td></td>
<td>50 (4&quot;)</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>B9@44.5</td>
<td></td>
<td>Silt, hard, slightly moist, brown, light oxidation mottles.</td>
<td>- increase in silt</td>
<td></td>
<td>50 (6&quot;)</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>B9@50</td>
<td>ML</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>B9@54.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure A1, Log of Boring 9, Page 2 of 3

Sample Symbols:
- ... Sampling Unsuccessful
- ... Standard Penetration Test
- ... Drive Sample (Undisturbed)
- ... Disturbed or Bag Sample
- ... Chunk Sample
- ... Water Table or Seepage

Note: The log of subsurface conditions shown hereon applies only at the specific boring or trench location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.
<table>
<thead>
<tr>
<th>DEPTH IN FEET</th>
<th>SAMPLE NO.</th>
<th>LITHOLOGY</th>
<th>SOIL CLASS (USCS)</th>
<th>GROUNDWATER</th>
<th>MATERIAL DESCRIPTION</th>
</tr>
</thead>
</table>
| 60           | 60 @ 60.5' | ML        |                   |             | Total depth of boring: 60.5 feet  
Fill to 5 feet.  
No groundwater encountered.  
Backfilled with soil cuttings and tamped.  
AC patched with cold patch.  
*Penetration resistance for 140-pound hammer falling 30 inches by auto-hammer.  
NOTE: The stratification lines presented herein represent the approximate boundary between earth types; the transitions may be gradual.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

Figure A1, Log of Boring 9, Page 3 of 3

SAMPLE SYMBOLS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>SAMPLING UNSUCCESSFUL</td>
</tr>
<tr>
<td>☑</td>
<td>STANDARD PENETRATION TEST</td>
</tr>
<tr>
<td>☐</td>
<td>DRIVE SAMPLE (UNDISTURBED)</td>
</tr>
</tbody>
</table>
Appendix D – LID and Grading Plan
THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY AND COPYRIGHT OF WARE MALCOMB AND SHALL NOT BE USED ON ANY OTHER WORK ... ON THE JOB SITE. ANY DISCREPANCY SHALL BE BROUGHT TO THE NOTICE OF WARE MALCOMB PRIOR TO THE COMMENCEMENT OF ANY WORK.
Appendix E – Soil Map
SOIL MAP

PROJECT NAME: 1300 LAWRENCE DRIVE
JOB NO.: LAX20-0077-00  DATE: 07/27/2022
DRAWN: AM  PA/PM: KM  SCALE: 1:200

CIVIL ENGINEERING & SURVEYING

915 Wilshire Blvd.
Los Angeles, CA 90017
P 310.903.4000
waremalcomb.com
Appendix F – Environmental Sensitive Area Map
Appendix G – VenturaTC Calculations
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

TIME OF CONCENTRATION

TC Program Version: 2.64.0.37

Project: Cruzan - Pre-Development Hydrology

Date: 3/3/2022 1:52:09 PM

Engineer: AM

Consultant: Ware Malcomb

------------------------------------------------------------------------

SUMMARY OF COMPUTATIONS

------------------------------------------------------------------------

Watershed Name: Pre-Development Hydrology

------------------------------------------------------------------------

<table>
<thead>
<tr>
<th>Name</th>
<th>Zone</th>
<th>Storm</th>
<th>Soil</th>
<th>Area (acres)</th>
<th>TC (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Hydrology</td>
<td>CON3</td>
<td>10</td>
<td>5.00</td>
<td>6.6 / 7</td>
<td>9.824 / 10</td>
</tr>
</tbody>
</table>

------------------------------------------------------------------------
Watershed Name: Pre-Development Hydrology

Sub-Area Name: Existing Hydrology
Tc: 9.824 Minutes

DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 9.824 min. = 10 min.

SUB AREA INPUT DATA

Sub Area Name: Existing Hydrology
Total Area (ac): 6.64
Flood Zone: 3
Rainfall Zone: CON3
Storm Frequency (years): 10
Development Type: Industrial
Soil Type: 5.00
Percent Impervious: 88

SUB AREA OUTPUT

Intensity (in/hr): 1.944
C Total: 0.877
Sum Q Segments (cfs): 11.31
Q Total (cfs): 11.31
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 589.45
Time of Concentration (min): 9.824
DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 2.4223
Flow Type: Overland
Length (ft): 72.67
Top Elevation (ft): 686.66
Bottom Elevation (ft): 682.77
Contributing Area (acres): 0.05
Percent of Sub-Area (%): 0.8
Overland Type: Mountain
Development Type: Industrial
Map Slope: 0.0535
Effective Slope: 0.0535
Q for Flow Path (cfs): 0.09
Avg Velocity (ft/s): 0.50
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 2.7866
Flow Type: Street
Length (ft): 509.82
Top Elevation (ft): 683.81
Bottom Elevation (ft): 674.82
Contributing Area (acres): 2.57
Percent of Sub-Area (%): 38.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0176
Q for Flow Path (cfs): 4.38
Q Top (cfs): 0.09
Q Bottom (cfs): 4.46
Velocity Top (ft/s): 1.10
Velocity Bottom (ft/s): 2.97
Avg Velocity (ft/s): 2.03
Wave Velocity (ft/s): 3.05

----------------------------------------

DATA FOR FLOW PATH 3

----------------------------------------

Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 1.8088
Flow Type: Street
Length (ft): 477.87
Top Elevation (ft): 680.28
Bottom Elevation (ft): 673.37
Contributing Area (acres): 1.66
Percent of Sub-Area (%): 25.0
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0145
Q for Flow Path (cfs): 2.83
Q Top (cfs): 4.46
Q Bottom (cfs): 7.29
Velocity Top (ft/s): 2.75
Velocity Bottom (ft/s): 3.12
Avg Velocity (ft/s): 2.94
Wave Velocity (ft/s): 4.40

---------------------------------------------

DATA FOR FLOW PATH 4

---------------------------------------------

Flow Path Name: A4
FLOW PATH TRAVEL TIME (min): 0.1567
Flow Type: Street
Length (ft): 71.02
Top Elevation (ft): 675.37
Bottom Elevation (ft): 671.72
Contributing Area (acres): 0.04
Percent of Sub-Area (%): 0.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0514
Q for Flow Path (cfs): 0.07
Q Top (cfs): 7.29
Q Bottom (cfs): 7.36
Velocity Top (ft/s): 5.03
Velocity Bottom (ft/s): 5.04
Avg Velocity (ft/s): 5.04
Wave Velocity (ft/s): 7.55

---------------------------------------------

DATA FOR FLOW PATH 5

---------------------------------------------

Flow Path Name: A5
FLOW PATH TRAVEL TIME (min): 1.6111
Flow Type: Street
Length (ft): 547.9
Top Elevation (ft): 683.81
Bottom Elevation (ft): 671.72
Contributing Area (acres): 1.18
Percent of Sub-Area (%): 17.8
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0221
Q for Flow Path (cfs): 2.01
Q Top (cfs): 7.36
Q Bottom (cfs): 9.37
Velocity Top (ft/s): 3.66
Velocity Bottom (ft/s): 3.89
Avg Velocity (ft/s): 3.78
Wave Velocity (ft/s): 5.67

DATA FOR FLOW PATH 6

Flow Path Name: A6
FLOW PATH TRAVEL TIME (min): 0.1033
Flow Type: Street
Length (ft): 48.7
Top Elevation (ft): 674.15
Bottom Elevation (ft): 671.8
Contributing Area (acres): 0.07
Percent of Sub-Area (%): 1.1
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0483
Q for Flow Path (cfs): 0.12
Q Top (cfs): 9.37
Q Bottom (cfs): 9.49
Velocity Top (ft/s): 5.23
Velocity Bottom (ft/s): 5.25
Avg Velocity (ft/s): 5.24
Wave Velocity (ft/s): 7.86

DATA FOR FLOW PATH 7

Flow Path Name: A7
FLOW PATH TRAVEL TIME (min): 0.8793
Flow Type: Street
Length (ft): 236.56
Top Elevation (ft): 675.81
Bottom Elevation (ft): 673.36
Contributing Area (acres): 0.85
Percent of Sub-Area (%): 12.8
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0104
Q for Flow Path (cfs): 1.45
Q Top (cfs): 9.49
Q Bottom (cfs): 10.94
Velocity Top (ft/s): 2.94
Velocity Bottom (ft/s): 3.04
Avg Velocity (ft/s): 2.99
Wave Velocity (ft/s): 4.48

DATA FOR FLOW PATH 8
Flow Path Name: A8
FLOW PATH TRAVEL TIME (min): 0.0562
Flow Type: Street
Length (ft): 39.12
Top Elevation (ft): 675.38
Bottom Elevation (ft): 670.63
Contributing Area (acres): 0.22
Percent of Sub-Area (%): 3.3
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.1214
Q for Flow Path (cfs): 0.37
Q Top (cfs): 10.94
Q Bottom (cfs): 11.31
Velocity Top (ft/s): 7.70
Velocity Bottom (ft/s): 7.77
Avg Velocity (ft/s): 7.74
Wave Velocity (ft/s): 11.61
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

TIME OF CONCENTRATION

TC Program Version: 2.64.0.37

Project: Cruzan - Pre-Development Hydrology

Date: 3/3/2022 1:52:09 PM

Engineer: AM

Consultant: Ware Malcomb

------------------------------------------------------------------------

SUMMARY OF COMPUTATIONS

------------------------------------------------------------------------

Watershed Name: Pre-Development Hydrology

------------------------------------------------------------------------

<table>
<thead>
<tr>
<th>Name</th>
<th>Zone</th>
<th>Storm</th>
<th>Soil</th>
<th>Area (acres)</th>
<th>TC (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Hydrology</td>
<td>CON3</td>
<td>25</td>
<td>5.00</td>
<td>6.6 / 7</td>
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</table>

------------------------------------------------------------------------
Watershed Name: Pre-Development Hydrology

Sub-Area Name: Existing Hydrology
Tc: 8.926 Minutes

DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 8.926 min. = 9 min.

SUB AREA INPUT DATA

Sub Area Name: Existing Hydrology
Total Area (ac): 6.64
Flood Zone: 3
Rainfall Zone: CON3
Storm Frequency (years): 25
Development Type: Industrial
Soil Type: 5.00
Percent Impervious: 88

SUB AREA OUTPUT

Intensity (in/hr): 2.460
C Total: 0.879
Sum Q Segments (cfs): 14.36
Q Total (cfs): 14.36
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 535.56
Time of Concentration (min): 8.926
DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 1.9554
Flow Type: Overland
Length (ft): 72.67
Top Elevation (ft): 686.66
Bottom Elevation (ft): 682.77
Contributing Area (acres): 0.05
Percent of Sub-Area (%): 0.8
Overland Type: Mountain
Development Type: Industrial
Map Slope: 0.0535
Effective Slope: 0.0535
Q for Flow Path (cfs): 0.11
Avg Velocity (ft/s): 0.62
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 2.6242
Flow Type: Street
Length (ft): 509.82
Top Elevation (ft): 683.81
Bottom Elevation (ft): 674.82
Contributing Area (acres): 2.57
Percent of Sub-Area (%): 38.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0176
Q for Flow Path (cfs): 5.56
Q Top (cfs): 0.11
Q Bottom (cfs): 5.67
Velocity Top (ft/s): 1.16
Velocity Bottom (ft/s): 3.15
Avg Velocity (ft/s): 2.16
Wave Velocity (ft/s): 3.24

DATA FOR FLOW PATH 3

Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 1.7034
Flow Type: Street
Length (ft): 477.87
Top Elevation (ft): 680.28
Bottom Elevation (ft): 673.37
Contributing Area (acres): 1.66
Percent of Sub-Area (%): 25.0
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0145
Q for Flow Path (cfs): 3.59
Q Top (cfs): 5.67
Q Bottom (cfs): 9.26
Velocity Top (ft/s): 2.93
Velocity Bottom (ft/s): 3.31
Avg Velocity (ft/s): 3.12
Wave Velocity (ft/s): 4.68

DATA FOR FLOW PATH 4

Flow Path Name: A4
FLOW PATH TRAVEL TIME (min): 0.1476
Flow Type: Street
Length (ft): 71.02
Top Elevation (ft): 675.37
Bottom Elevation (ft): 671.72
Contributing Area (acres): 0.04
Percent of Sub-Area (%): 0.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0514
Q for Flow Path (cfs): 0.09
Q Top (cfs): 9.26
Q Bottom (cfs): 9.35
Velocity Top (ft/s): 5.34
Velocity Bottom (ft/s): 5.35
Avg Velocity (ft/s): 5.35
Wave Velocity (ft/s): 8.02

DATA FOR FLOW PATH 5

Flow Path Name: A5
FLOW PATH TRAVEL TIME (min): 1.5172
Flow Type: Street
Length (ft): 547.9
Top Elevation (ft): 683.81
Bottom Elevation (ft): 671.72
Contributing Area (acres): 1.18
Percent of Sub-Area (%): 17.8
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0221
Q for Flow Path (cfs): 2.55
Q Top (cfs): 9.35
Q Bottom (cfs): 11.90
Velocity Top (ft/s): 3.89
Velocity Bottom (ft/s): 4.13
Avg Velocity (ft/s): 4.01
Wave Velocity (ft/s): 6.02

DATA FOR FLOW PATH 6

Flow Path Name: A6
FLOW PATH TRAVEL TIME (min): 0.0973
Flow Type: Street
Length (ft): 48.7
Top Elevation (ft): 674.15
Bottom Elevation (ft): 671.8
Contributing Area (acres): 0.07
Percent of Sub-Area (%): 1.1
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0483
Q for Flow Path (cfs): 0.15
Q Top (cfs): 11.90
Q Bottom (cfs): 12.05
Velocity Top (ft/s): 5.55
Velocity Bottom (ft/s): 5.57
Avg Velocity (ft/s): 5.56
Wave Velocity (ft/s): 8.35

------------------------------------------------------------------------
DATA FOR FLOW PATH 7
------------------------------------------------------------------------
Flow Path Name: A7
FLOW PATH TRAVEL TIME (min): 0.8281
Flow Type: Street
Length (ft): 236.56
Top Elevation (ft): 675.81
Bottom Elevation (ft): 673.36
Contributing Area (acres): 0.85
Percent of Sub-Area (%): 12.8
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0104
Q for Flow Path (cfs): 1.84
Q Top (cfs): 12.05
Q Bottom (cfs): 13.89
Velocity Top (ft/s): 3.12
Velocity Bottom (ft/s): 3.23
Avg Velocity (ft/s): 3.17
Wave Velocity (ft/s): 4.76

------------------------------------------------------------------------
DATA FOR FLOW PATH 8
Flow Path Name: A8

FLOW PATH TRAVEL TIME (min): 0.0529

Flow Type: Street

Length (ft): 39.12
Top Elevation (ft): 675.38
Bottom Elevation (ft): 670.63

Contributing Area (acres): 0.22
Percent of Sub-Area (%): 3.3

Street Width (ft): 32
Curb Height (in): 6

Map Slope: 0.1214

Q for Flow Path (cfs): 0.48
Q Top (cfs): 13.89
Q Bottom (cfs): 14.36

Velocity Top (ft/s): 8.18
Velocity Bottom (ft/s): 8.25

Avg Velocity (ft/s): 8.22
Wave Velocity (ft/s): 12.32
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

TIME OF CONCENTRATION

TC Program Version: 2.64.0.37

Project: Cruzan - Pre-Development Hydrology

Date: 3/3/2022 1:52:09 PM

Engineer: AM

Consultant: Ware Malcomb

********************************************************************************
SUMMARY OF COMPUTATIONS
********************************************************************************

Watershed Name: Pre-Development Hydrology

********************************************************************************

<table>
<thead>
<tr>
<th>Name</th>
<th>Zone</th>
<th>Storm</th>
<th>Soil</th>
<th>Area (acres)</th>
<th>TC (min)</th>
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<tbody>
<tr>
<td>Existing Hydrology</td>
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<td>50.00</td>
<td>6.6 / 7</td>
<td>7.875 / 8</td>
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********************************************************************************
Watershed Name: Pre-Development Hydrology

Sub-Area Name: Existing Hydrology

Tc: 7.875 Minutes

DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 7.875 min. = 8 min.

SUB AREA INPUT DATA

Sub Area Name: Existing Hydrology
Total Area (ac): 6.64
Flood Zone: 3
Rainfall Zone: CON3
Storm Frequency (years): 50
Development Type: Industrial
Soil Type: 5.00
Percent Impervious: 88

SUB AREA OUTPUT

Intensity (in/hr): 2.933
C Total: 0.882
Sum Q Segments (cfs): 17.18
Q Total (cfs): 17.18
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 472.52
Time of Concentration (min): 7.875
DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 1.2112
Flow Type: Overland
Length (ft): 72.67
Top Elevation (ft): 686.66
Bottom Elevation (ft): 682.77
Contributing Area (acres): 0.05
Percent of Sub-Area (%): 0.8
Overland Type: Mountain
Development Type: Industrial
Map Slope: 0.0535
Effective Slope: 0.0535
Q for Flow Path (cfs): 0.13
Avg Velocity (ft/s): 1.00
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 2.5088
Flow Type: Street
Length (ft): 509.82
Top Elevation (ft): 683.81
Bottom Elevation (ft): 674.82
Contributing Area (acres): 2.57
Percent of Sub-Area (%): 38.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0176
Q for Flow Path (cfs): 6.65
Q Top (cfs): 0.13
Q Bottom (cfs): 6.78
Velocity Top (ft/s): 1.22
Velocity Bottom (ft/s): 3.30
Avg Velocity (ft/s): 2.26
Wave Velocity (ft/s): 3.39

------------------------------------------------------------------------
DATA FOR FLOW PATH 3
------------------------------------------------------------------------
Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 1.6285
Flow Type: Street
Length (ft): 477.87
Top Elevation (ft): 680.28
Bottom Elevation (ft): 673.37
Contributing Area (acres): 1.66
Percent of Sub-Area (%): 25.0
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0145
Q for Flow Path (cfs): 4.29
Q Top (cfs): 6.78
Q Bottom (cfs): 11.07
Velocity Top (ft/s): 3.06
Velocity Bottom (ft/s): 3.46
Avg Velocity (ft/s): 3.26
Wave Velocity (ft/s): 4.89

------------------------------------------------------------------------

DATA FOR FLOW PATH 4

------------------------------------------------------------------------

Flow Path Name: A4
FLOW PATH TRAVEL TIME (min): 0.1411
Flow Type: Street
Length (ft): 71.02
Top Elevation (ft): 675.37
Bottom Elevation (ft): 671.72
Contributing Area (acres): 0.04
Percent of Sub-Area (%): 0.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0514
Q for Flow Path (cfs): 0.10
Q Top (cfs): 11.07
Q Bottom (cfs): 11.18
Velocity Top (ft/s): 5.59
Velocity Bottom (ft/s): 5.60
Avg Velocity (ft/s): 5.59
Wave Velocity (ft/s): 8.39

------------------------------------------------------------------------

DATA FOR FLOW PATH 5

------------------------------------------------------------------------

Flow Path Name: A5
FLOW PATH TRAVEL TIME (min): 1.4505
Flow Type: Street
Length (ft): 547.9
Top Elevation (ft): 683.81
Bottom Elevation (ft): 671.72
Contributing Area (acres): 1.18
Percent of Sub-Area (%): 17.8
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0221
Q for Flow Path (cfs): 3.05
Q Top (cfs): 11.18
Q Bottom (cfs): 14.23
Velocity Top (ft/s): 4.07
Velocity Bottom (ft/s): 4.32
Avg Velocity (ft/s): 4.20
Wave Velocity (ft/s): 6.30

DATA FOR FLOW PATH 6

Flow Path Name: A6
FLOW PATH TRAVEL TIME (min): 0.0930
Flow Type: Street
Length (ft): 48.7
Top Elevation (ft): 674.15
Bottom Elevation (ft): 671.8
Contributing Area (acres): 0.07
Percent of Sub-Area (%): 1.1
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0483
Q for Flow Path (cfs): 0.18
Q Top (cfs): 14.23
Q Bottom (cfs): 14.41
Velocity Top (ft/s): 5.81
Velocity Bottom (ft/s): 5.83
Avg Velocity (ft/s): 5.82
Wave Velocity (ft/s): 8.73

DATA FOR FLOW PATH 7

Flow Path Name: A7
FLOW PATH TRAVEL TIME (min): 0.7917
Flow Type: Street
Length (ft): 236.56
Top Elevation (ft): 675.81
Bottom Elevation (ft): 673.36
Contributing Area (acres): 0.85
Percent of Sub-Area (%): 12.8
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0104
Q for Flow Path (cfs): 2.20
Q Top (cfs): 14.41
Q Bottom (cfs): 16.61
Velocity Top (ft/s): 3.26
Velocity Bottom (ft/s): 3.38
Avg Velocity (ft/s): 3.32
Wave Velocity (ft/s): 4.98

DATA FOR FLOW PATH 8
Flow Path Name: A8
FLOW PATH TRAVEL TIME (min): 0.0506
Flow Type: Street
Length (ft): 39.12
Top Elevation (ft): 675.38
Bottom Elevation (ft): 670.63
Contributing Area (acres): 0.22
Percent of Sub-Area (%): 3.3
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.1214
Q for Flow Path (cfs): 0.57
Q Top (cfs): 16.61
Q Bottom (cfs): 17.18
Velocity Top (ft/s): 8.56
Velocity Bottom (ft/s): 8.63
Avg Velocity (ft/s): 8.59
Wave Velocity (ft/s): 12.89
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

TIME OF CONCENTRATION

TC Program Version: 2.64.0.37

Project: Cruzan - Post-Development Hydrology

Date: 7/28/2022 1:52:09 PM

Engineer: AM

Consultant: Ware Malcomb

------------------------------------------------------------------------

SUMMARY OF COMPUTATIONS

------------------------------------------------------------------------

Watershed Name: Post-Development Hydrology

------------------------------------------------------------------------

<table>
<thead>
<tr>
<th>Name</th>
<th>Zone</th>
<th>Storm</th>
<th>Soil</th>
<th>Area (acres)</th>
<th>TC (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Development Hydr</td>
<td>CON3</td>
<td>10</td>
<td>5.00</td>
<td>6.7 / 7</td>
<td>20.655 / 21</td>
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------------------------------------------------------------------------
Watershed Name: Post-Development Hydrology

Sub-Area Name: Post Development Hydrology

Tc: 20.655 Minutes

DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 20.655 min. = 21 min.

SUB AREA INPUT DATA

Sub Area Name: Post Development Hydrology

Total Area (ac): 6.65
Flood Zone: 3
Rainfall Zone: CON3
Storm Frequency (years): 10
Development Type: Industrial
Soil Type: 5.00
Percent Impervious: 87

SUB AREA OUTPUT

Intensity (in/hr): 1.323
C Total: 0.860
Sum Q Segments (cfs): 7.57
Q Total (cfs): 7.57
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 1,239.33
Time of Concentration (min): 20.655
DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 3.6267
Flow Type: Overland
Length (ft): 108.8
Top Elevation (ft): 686.66
Bottom Elevation (ft): 683.38
Contributing Area (acres): 0.1
Percent of Sub-Area (%): 1.5
Overland Type: Valley
Development Type: Industrial
Map Slope: 0.0301
Effective Slope: 0.0301
Q for Flow Path (cfs): 0.11
Avg Velocity (ft/s): 0.50
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 1.3113
Flow Type: Street
Length (ft): 180.44
Top Elevation (ft): 685
Bottom Elevation (ft): 680.61
Contributing Area (acres): 0.18
Percent of Sub-Area (%): 2.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0243
Q for Flow Path (cfs): 0.20
Q Top (cfs): 0.11
Q Bottom (cfs): 0.32
Velocity Top (ft/s): 1.33
Velocity Bottom (ft/s): 1.73
Avg Velocity (ft/s): 1.53
Wave Velocity (ft/s): 2.29

------------------------------------------------------------------------

DATA FOR FLOW PATH 3

------------------------------------------------------------------------

Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 1.3936
Flow Type: Street
Length (ft): 230.65
Top Elevation (ft): 684
Bottom Elevation (ft): 678.88
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 4.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0222
Q for Flow Path (cfs): 0.35
Q Top (cfs): 0.32
Q Bottom (cfs): 0.67
Velocity Top (ft/s): 1.67
Velocity Bottom (ft/s): 2.01
Avg Velocity (ft/s): 1.84
Wave Velocity (ft/s): 2.76

DATA FOR FLOW PATH 4

Flow Path Name: A4
FLOW PATH TRAVEL TIME (min): 0.7959
Flow Type: Street
Length (ft): 151.8
Top Elevation (ft): 681.92
Bottom Elevation (ft): 678.35
 Contributing Area (acres): 0.16
Percent of Sub-Area (%): 2.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0235
Q for Flow Path (cfs): 0.18
Q Top (cfs): 0.67
Q Bottom (cfs): 0.85
Velocity Top (ft/s): 2.06
Velocity Bottom (ft/s): 2.18
Avg Velocity (ft/s): 2.12
Wave Velocity (ft/s): 3.18

DATA FOR FLOW PATH 5

Flow Path Name: A5
FLOW PATH TRAVEL TIME (min): 0.7712
Flow Type: Street
Length (ft): 158.6
Top Elevation (ft): 680
Bottom Elevation (ft): 676.07
Contributing Area (acres): 0.17
Percent of Sub-Area (%): 2.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0248
Q for Flow Path (cfs): 0.19
Q Top (cfs): 0.85
Q Bottom (cfs): 1.05
Velocity Top (ft/s): 2.23
Velocity Bottom (ft/s): 2.34
Avg Velocity (ft/s): 2.29
Wave Velocity (ft/s): 3.43

------------------------------------------------------------------------
DATA FOR FLOW PATH 6
------------------------------------------------------------------------
Flow Path Name: A6
FLOW PATH TRAVEL TIME (min): 0.7064
Flow Type: Street
Length (ft): 147.01
Top Elevation (ft): 677.36
Bottom Elevation (ft): 674.02
Contributing Area (acres): 0.15
Percent of Sub-Area (%): 2.3
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0227
Q for Flow Path (cfs): 0.17
Q Top (cfs): 1.05
Q Bottom (cfs): 1.22
Velocity Top (ft/s): 2.27
Velocity Bottom (ft/s): 2.36
Avg Velocity (ft/s): 2.31
Wave Velocity (ft/s): 3.47

DATA FOR FLOW PATH 7

Flow Path Name: A7
FLOW PATH TRAVEL TIME (min): 0.3836
Flow Type: Street
Length (ft): 79.12
Top Elevation (ft): 675.01
Bottom Elevation (ft): 673.38
Contributing Area (acres): 0.08
Percent of Sub-Area (%): 1.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0206
Q for Flow Path (cfs): 0.09
Q Top (cfs): 1.22
Q Bottom (cfs): 1.31
Velocity Top (ft/s): 2.27
Velocity Bottom (ft/s): 2.31
Avg Velocity (ft/s): 2.29
Wave Velocity (ft/s): 3.44

DATA FOR FLOW PATH 8
Flow Path Name: A8
FLOW PATH TRAVEL TIME (min): 0.9326
Flow Type: Street
Length (ft): 131.46
Top Elevation (ft): 674.37
Bottom Elevation (ft): 673.48
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 4.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0068
Q for Flow Path (cfs): 0.35
Q Top (cfs): 1.31
Q Bottom (cfs): 1.66
Velocity Top (ft/s): 1.52
Velocity Bottom (ft/s): 1.61
Avg Velocity (ft/s): 1.57
Wave Velocity (ft/s): 2.35

DATA FOR FLOW PATH 9

Flow Path Name: A9
FLOW PATH TRAVEL TIME (min): 0.2833
Flow Type: Street
Length (ft): 63.04
Top Elevation (ft): 674.25
Bottom Elevation (ft): 672.95
Contributing Area (acres): 0.08
Percent of Sub-Area (%): 1.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0206
Q for Flow Path (cfs): 0.09
Q Top (cfs): 1.66
Q Bottom (cfs): 1.75
Velocity Top (ft/s): 2.46
Velocity Bottom (ft/s): 2.49
Avg Velocity (ft/s): 2.47
Wave Velocity (ft/s): 3.71

-------------------------------

DATA FOR FLOW PATH 10
-------------------------------

Flow Path Name: A10
FLOW PATH TRAVEL TIME (min): 0.7260
Flow Type: Street
Length (ft): 167.8
Top Elevation (ft): 674.19
Bottom Elevation (ft): 670.59
Contributing Area (acres): 0.21
Percent of Sub-Area (%): 3.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0215
Q for Flow Path (cfs): 0.24
Q Top (cfs): 1.75
Q Bottom (cfs): 1.99
Velocity Top (ft/s): 2.53
Velocity Bottom (ft/s): 2.61
Avg Velocity (ft/s): 2.57
Wave Velocity (ft/s): 3.85

DATA FOR FLOW PATH 11

Flow Path Name: A11
FLOW PATH TRAVEL TIME (min): 0.6774
Flow Type: Street
Length (ft): 150.92
Top Elevation (ft): 673.54
Bottom Elevation (ft): 670.82
Contributing Area (acres): 0.19
Percent of Sub-Area (%): 2.9
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0180
Q for Flow Path (cfs): 0.22
Q Top (cfs): 1.99
Q Bottom (cfs): 2.21
Velocity Top (ft/s): 2.44
Velocity Bottom (ft/s): 2.51
Avg Velocity (ft/s): 2.48
Wave Velocity (ft/s): 3.71

DATA FOR FLOW PATH 12

Flow Path Name: A12
FLOW PATH TRAVEL TIME (min): 0.5546
Flow Type: Street
Length (ft): 125.66
Top Elevation (ft): 673.56
Bottom Elevation (ft): 671.32
Contributing Area (acres): 0.13
Percent of Sub-Area (%): 2.0
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0178
Q for Flow Path (cfs): 0.15
Q Top (cfs): 2.21
Q Bottom (cfs): 2.36
Velocity Top (ft/s): 2.50
Velocity Bottom (ft/s): 2.54
Avg Velocity (ft/s): 2.52
Wave Velocity (ft/s): 3.78

DATA FOR FLOW PATH 13

Flow Path Name: A13
FLOW PATH TRAVEL TIME (min): 0.5697
Flow Type: Street
Length (ft): 135.64
Top Elevation (ft): 673.68
Bottom Elevation (ft): 671.04
Contributing Area (acres): 0.14
Percent of Sub-Area (%): 2.1
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0195
Q for Flow Path (cfs): 0.16
Q Top (cfs): 2.36
Q Bottom (cfs): 2.51
Velocity Top (ft/s): 2.62
Velocity Bottom (ft/s): 2.67
Avg Velocity (ft/s): 2.65
Wave Velocity (ft/s): 3.97

---------------------------------------------------------

DATA FOR FLOW PATH 14

---------------------------------------------------------

Flow Path Name: A14
FLOW PATH TRAVEL TIME (min): 1.1943
Flow Type: Street
Length (ft): 170.17
Top Elevation (ft): 671.32
Bottom Elevation (ft): 670.52
Contributing Area (acres): 0.27
Percent of Sub-Area (%): 4.1
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0047
Q for Flow Path (cfs): 0.31
Q Top (cfs): 2.51
Q Bottom (cfs): 2.82
Velocity Top (ft/s): 1.56
Velocity Bottom (ft/s): 1.61
Avg Velocity (ft/s): 1.58
Wave Velocity (ft/s): 2.37
DATA FOR FLOW PATH 15

Flow Path Name: A15

FLOW PATH TRAVEL TIME (min): 1.7699
Flow Type: Street
Length (ft): 349.35
Top Elevation (ft): 673.97
Bottom Elevation (ft): 670.52
Contributing Area (acres): 0.69
Percent of Sub-Area (%): 10.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0099
Q for Flow Path (cfs): 0.79
Q Top (cfs): 2.82
Q Bottom (cfs): 3.61
Velocity Top (ft/s): 2.13
Velocity Bottom (ft/s): 2.26
Avg Velocity (ft/s): 2.19
Wave Velocity (ft/s): 3.29

DATA FOR FLOW PATH 16

Flow Path Name: A16

FLOW PATH TRAVEL TIME (min): 0.9230
Flow Type: Street
Length (ft): 263.74
Top Elevation (ft): 677.97
Bottom Elevation (ft): 671.81
Contributing Area (acres): 0.39
Percent of Sub-Area (%): 5.9
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0234
Q for Flow Path (cfs): 0.44
Q Top (cfs): 3.61
Q Bottom (cfs): 4.05
Velocity Top (ft/s): 3.13
Velocity Bottom (ft/s): 3.22
Avg Velocity (ft/s): 3.17
Wave Velocity (ft/s): 4.76

DATA FOR FLOW PATH 17

Flow Path Name: A17
FLOW PATH TRAVEL TIME (min): 0.6371
Flow Type: Street
Length (ft): 195.42
Top Elevation (ft): 678.37
Bottom Elevation (ft): 673.17
Contributing Area (acres): 0.21
Percent of Sub-Area (%): 3.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0266
Q for Flow Path (cfs): 0.24
Q Top (cfs): 4.05
Q Bottom (cfs): 4.29
Velocity Top (ft/s): 3.38
Velocity Bottom (ft/s): 3.43
Avg Velocity (ft/s): 3.41
Wave Velocity (ft/s): 5.11

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DATA FOR FLOW PATH 18
-------------------------------

Flow Path Name: A18
FLOW PATH TRAVEL TIME (min): 1.0459
Flow Type: Street
Length (ft): 299.1
Top Elevation (ft): 684.27
Bottom Elevation (ft): 678.29
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 15.3
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 1.16
Q Top (cfs): 4.29
Q Bottom (cfs): 5.45
Velocity Top (ft/s): 3.08
Velocity Bottom (ft/s): 3.27
Avg Velocity (ft/s): 3.18
Wave Velocity (ft/s): 4.77

-------------------------------
Flow Path Name: A19
FLOW PATH TRAVEL TIME (min): 0.9913
Flow Type: Street
Length (ft): 298.46
Top Elevation (ft): 680.55
Bottom Elevation (ft): 674.58
Contributing Area (acres): 0.89
Percent of Sub-Area (%): 13.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 1.01
Q Top (cfs): 5.45
Q Bottom (cfs): 6.46
Velocity Top (ft/s): 3.27
Velocity Bottom (ft/s): 3.42
Avg Velocity (ft/s): 3.35
Wave Velocity (ft/s): 5.02

----------------------------------------------
DATA FOR FLOW PATH 20
----------------------------------------------
Flow Path Name: A20
FLOW PATH TRAVEL TIME (min): 0.8597
Flow Type: Street
Length (ft): 268.75
Top Elevation (ft): 678.86
Bottom Elevation (ft): 673.48
Contributing Area (acres): 0.77
Percent of Sub-Area (%): 11.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 0.88
Q Top (cfs): 6.46
Q Bottom (cfs): 7.34
Velocity Top (ft/s): 3.42
Velocity Bottom (ft/s): 3.53
Avg Velocity (ft/s): 3.47
Wave Velocity (ft/s): 5.21

DATA FOR FLOW PATH 21

Flow Path Name: A21
FLOW PATH TRAVEL TIME (min): 0.5022
Flow Type: Street
Length (ft): 180.96
Top Elevation (ft): 683.38
Bottom Elevation (ft): 678.37
Contributing Area (acres): 0.2
Percent of Sub-Area (%): 3.0
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0277
Q for Flow Path (cfs): 0.23
Q Top (cfs): 7.34
Q Bottom (cfs): 7.57
Velocity Top (ft/s): 3.99
Velocity Bottom (ft/s): 4.02
Avg Velocity (ft/s): 4.00
Wave Velocity (ft/s): 6.01
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

TIME OF CONCENTRATION

TC Program Version: 2.64.0.37

Project: Cruzan - Post-Development Hydrology

Date: 7/28/2022 1:52:09 PM

Engineer: AM

Consultant: Ware Malcomb

------------------------------------------------------------------------

SUMMARY OF COMPUTATIONS

Watershed Name: Post-Development Hydrology

------------------------------------------------------------------------

<table>
<thead>
<tr>
<th>Name</th>
<th>Zone</th>
<th>Storm</th>
<th>Soil</th>
<th>Area (acres)</th>
<th>TC (min)</th>
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<tr>
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<td>CON3</td>
<td>25</td>
<td>5.00</td>
<td>6.7 / 7</td>
<td>19.295 / 19</td>
</tr>
</tbody>
</table>

------------------------------------------------------------------------
Watershed Name: Post-Development Hydrology

Sub-Area Name: Post Development Hydrology

Tc: 19.295 Minutes

DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 19.295 min. = 19 min.

SUB AREA INPUT DATA

Sub Area Name: Post Development Hydrology
Total Area (ac): 6.65
Flood Zone: 3
Rainfall Zone: CON3
Storm Frequency (years): 25
Development Type: Industrial
Soil Type: 5.00
Percent Impervious: 87

SUB AREA OUTPUT

Intensity (in/hr): 1.680
C Total: 0.868
Sum Q Segments (cfs): 9.69
Q Total (cfs): 9.69
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 1,157.69
Time of Concentration (min): 19.295
DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 3.2939
Flow Type: Overland
Length (ft): 108.8
Top Elevation (ft): 686.66
Bottom Elevation (ft): 683.38
Contributing Area (acres): 0.1
Percent of Sub-Area (%): 1.5
Overland Type: Valley
Development Type: Industrial
Map Slope: 0.0301
Effective Slope: 0.0301
Q for Flow Path (cfs): 0.15
Avg Velocity (ft/s): 0.55
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 1.2321
Flow Type: Street
Length (ft): 180.44
Top Elevation (ft): 685
Bottom Elevation (ft): 680.61
Contributing Area (acres): 0.18
Percent of Sub-Area (%): 2.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0243
Q for Flow Path (cfs): 0.26
Q Top (cfs): 0.15
Q Bottom (cfs): 0.41
Velocity Top (ft/s): 1.42
Velocity Bottom (ft/s): 1.84
Avg Velocity (ft/s): 1.63
Wave Velocity (ft/s): 2.44

------------------------------------------------------------------------

DATA FOR FLOW PATH 3

------------------------------------------------------------------------

Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 1.3095
Flow Type: Street
Length (ft): 230.65
Top Elevation (ft): 684
Bottom Elevation (ft): 678.88
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 4.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0222
Q for Flow Path (cfs): 0.45
Q Top (cfs): 0.41
Q Bottom (cfs): 0.86
Velocity Top (ft/s): 1.77
Velocity Bottom (ft/s): 2.14
Avg Velocity (ft/s): 1.96
Wave Velocity (ft/s): 2.94

DATA FOR FLOW PATH 4

Flow Path Name: A4
FLOW PATH TRAVEL TIME (min): 0.7479
Flow Type: Street
Length (ft): 151.8
Top Elevation (ft): 681.92
Bottom Elevation (ft): 678.35
Contributing Area (acres): 0.16
Percent of Sub-Area (%): 2.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0235
Q for Flow Path (cfs): 0.23
Q Top (cfs): 0.86
Q Bottom (cfs): 1.09
Velocity Top (ft/s): 2.19
Velocity Bottom (ft/s): 2.32
Avg Velocity (ft/s): 2.26
Wave Velocity (ft/s): 3.38

DATA FOR FLOW PATH 5

Flow Path Name: A5
FLOW PATH TRAVEL TIME (min): 0.7246
Flow Type: Street
Length (ft): 158.6
Top Elevation (ft): 680
Bottom Elevation (ft): 676.07
Contributing Area (acres): 0.17
Percent of Sub-Area (%): 2.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0248
Q for Flow Path (cfs): 0.25
Q Top (cfs): 1.09
Q Bottom (cfs): 1.34
Velocity Top (ft/s): 2.37
Velocity Bottom (ft/s): 2.49
Avg Velocity (ft/s): 2.43
Wave Velocity (ft/s): 3.65

DATA FOR FLOW PATH 6

Flow Path Name: A6
FLOW PATH TRAVEL TIME (min): 0.6638
Flow Type: Street
Length (ft): 147.01
Top Elevation (ft): 677.36
Bottom Elevation (ft): 674.02
Contributing Area (acres): 0.15
Percent of Sub-Area (%): 2.3
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0227
Q for Flow Path (cfs): 0.22
Q Top (cfs): 1.34  
Q Bottom (cfs): 1.56  
Velocity Top (ft/s): 2.41  
Velocity Bottom (ft/s): 2.51  
Avg Velocity (ft/s): 2.46  
Wave Velocity (ft/s): 3.69

------------------------------------------------------------------------

DATA FOR FLOW PATH 7

------------------------------------------------------------------------

Flow Path Name: A7  
FLOW PATH TRAVEL TIME (min): 0.3605  
Flow Type: Street  
Length (ft): 79.12  
Top Elevation (ft): 675.01  
Bottom Elevation (ft): 673.38  
Contributing Area (acres): 0.08  
Percent of Sub-Area (%): 1.2  
Street Width (ft): 32  
Curb Height (in): 6  
Map Slope: 0.0206  
Q for Flow Path (cfs): 0.12  
Q Top (cfs): 1.56  
Q Bottom (cfs): 1.68  
Velocity Top (ft/s): 2.42  
Velocity Bottom (ft/s): 2.46  
Avg Velocity (ft/s): 2.44  
Wave Velocity (ft/s): 3.66

------------------------------------------------------------------------

DATA FOR FLOW PATH 8
Flow Path Name: A8
FLOW PATH TRAVEL TIME (min): 0.8763
Flow Type: Street
Length (ft): 131.46
Top Elevation (ft): 674.37
Bottom Elevation (ft): 673.48
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 4.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0068
Q for Flow Path (cfs): 0.45
Q Top (cfs): 1.68
Q Bottom (cfs): 2.13
Velocity Top (ft/s): 1.62
Velocity Bottom (ft/s): 1.72
Avg Velocity (ft/s): 1.67
Wave Velocity (ft/s): 2.50

DATA FOR FLOW PATH 9

Flow Path Name: A9
FLOW PATH TRAVEL TIME (min): 0.2662
Flow Type: Street
Length (ft): 63.04
Top Elevation (ft): 674.25
Bottom Elevation (ft): 672.95
Contributing Area (acres): 0.08
Percent of Sub-Area (%): 1.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0206
Q for Flow Path (cfs): 0.12
Q Top (cfs): 2.13
Q Bottom (cfs): 2.24
Velocity Top (ft/s): 2.61
Velocity Bottom (ft/s): 2.65
Avg Velocity (ft/s): 2.63
Wave Velocity (ft/s): 3.95

---------------------------------
DATA FOR FLOW PATH 10
---------------------------------
Flow Path Name: A10
FLOW PATH TRAVEL TIME (min): 0.6822
Flow Type: Street
Length (ft): 167.8
Top Elevation (ft): 674.19
Bottom Elevation (ft): 670.59
Contributing Area (acres): 0.21
Percent of Sub-Area (%): 3.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0215
Q for Flow Path (cfs): 0.31
Q Top (cfs): 2.24
Q Bottom (cfs): 2.55
Velocity Top (ft/s): 2.69
Velocity Bottom (ft/s): 2.78
Avg Velocity (ft/s): 2.73
Wave Velocity (ft/s): 4.10

DATA FOR FLOW PATH 11

Flow Path Name: A11
FLOW PATH TRAVEL TIME (min): 0.6365
Flow Type: Street
Length (ft): 150.92
Top Elevation (ft): 673.54
Bottom Elevation (ft): 670.82
Contributing Area (acres): 0.19
Percent of Sub-Area (%): 2.9
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0180
Q for Flow Path (cfs): 0.28
Q Top (cfs): 2.55
Q Bottom (cfs): 2.83
Velocity Top (ft/s): 2.60
Velocity Bottom (ft/s): 2.67
Avg Velocity (ft/s): 2.63
Wave Velocity (ft/s): 3.95

DATA FOR FLOW PATH 12

Flow Path Name: A12
FLOW PATH TRAVEL TIME (min): 0.5211
Flow Type: Street

Length (ft): 125.66

Top Elevation (ft): 673.56

Bottom Elevation (ft): 671.32

Contributing Area (acres): 0.13

Percent of Sub-Area (%): 2.0

Street Width (ft): 32

Curb Height (in): 6

Map Slope: 0.0178

Q for Flow Path (cfs): 0.19

Q Top (cfs): 2.83

Q Bottom (cfs): 3.02

Velocity Top (ft/s): 2.66

Velocity Bottom (ft/s): 2.70

Avg Velocity (ft/s): 2.68

Wave Velocity (ft/s): 4.02

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DATA FOR FLOW PATH 13

------------------------------------------------------------------------

Flow Path Name: A13

FLOW PATH TRAVEL TIME (min): 0.5353

Flow Type: Street

Length (ft): 135.64

Top Elevation (ft): 673.68

Bottom Elevation (ft): 671.04

Contributing Area (acres): 0.14

Percent of Sub-Area (%): 2.1

Street Width (ft): 32

Curb Height (in): 6
Map Slope: 0.0195
Q for Flow Path (cfs): 0.20
Q Top (cfs): 3.02
Q Bottom (cfs): 3.22
Velocity Top (ft/s): 2.79
Velocity Bottom (ft/s): 2.84
Avg Velocity (ft/s): 2.82
Wave Velocity (ft/s): 4.22

DATA FOR FLOW PATH 14

Flow Path Name: A14
FLOW PATH TRAVEL TIME (min): 1.1222
Flow Type: Street
Length (ft): 170.17
Top Elevation (ft): 671.32
Bottom Elevation (ft): 670.52
Contributing Area (acres): 0.27
Percent of Sub-Area (%): 4.1
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0047
Q for Flow Path (cfs): 0.39
Q Top (cfs): 3.22
Q Bottom (cfs): 3.61
Velocity Top (ft/s): 1.66
Velocity Bottom (ft/s): 1.71
Avg Velocity (ft/s): 1.68
Wave Velocity (ft/s): 2.53
DATA FOR FLOW PATH 15

Flow Path Name: A15
FLOW PATH TRAVEL TIME (min): 1.6631
Flow Type: Street
Length (ft): 349.35
Top Elevation (ft): 673.97
Bottom Elevation (ft): 670.52
Contributing Area (acres): 0.69
Percent of Sub-Area (%): 10.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0099
Q for Flow Path (cfs): 1.01
Q Top (cfs): 3.61
Q Bottom (cfs): 4.62
Velocity Top (ft/s): 2.26
Velocity Bottom (ft/s): 2.41
Avg Velocity (ft/s): 2.33
Wave Velocity (ft/s): 3.50

DATA FOR FLOW PATH 16

Flow Path Name: A16
FLOW PATH TRAVEL TIME (min): 0.8673
Flow Type: Street
Length (ft): 263.74
Top Elevation (ft): 677.97
Bottom Elevation (ft): 671.81
Contributing Area (acres): 0.39
Percent of Sub-Area (%): 5.9
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0234
Q for Flow Path (cfs): 0.57
Q Top (cfs): 4.62
Q Bottom (cfs): 5.19
Velocity Top (ft/s): 3.33
Velocity Bottom (ft/s): 3.43
Avg Velocity (ft/s): 3.38
Wave Velocity (ft/s): 5.07

DATA FOR FLOW PATH 17

Flow Path Name: A17
FLOW PATH TRAVEL TIME (min): 0.5986
Flow Type: Street
Length (ft): 195.42
Top Elevation (ft): 678.37
Bottom Elevation (ft): 673.17
Contributing Area (acres): 0.21
Percent of Sub-Area (%): 3.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0266
Q for Flow Path (cfs): 0.31
Q Top (cfs): 5.19
Q Bottom (cfs): 5.49
Velocity Top (ft/s): 3.60
Velocity Bottom (ft/s): 3.65
Avg Velocity (ft/s): 3.63
Wave Velocity (ft/s): 5.44

DATA FOR FLOW PATH 18

Flow Path Name: A18
FLOW PATH TRAVEL TIME (min): 0.9828
Flow Type: Street
Length (ft): 299.1
Top Elevation (ft): 684.27
Bottom Elevation (ft): 678.29
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 15.3
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 1.49
Q Top (cfs): 5.49
Q Bottom (cfs): 6.98
Velocity Top (ft/s): 3.28
Velocity Bottom (ft/s): 3.48
Avg Velocity (ft/s): 3.38
Wave Velocity (ft/s): 5.07

DATA FOR FLOW PATH 19
Flow Path Name: A19
FLOW PATH TRAVEL TIME (min): 0.9314
Flow Type: Street
Length (ft): 298.46
Top Elevation (ft): 680.55
Bottom Elevation (ft): 674.58
Contributing Area (acres): 0.89
Percent of Sub-Area (%): 13.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 1.30
Q Top (cfs): 6.98
Q Bottom (cfs): 8.28
Velocity Top (ft/s): 3.48
Velocity Bottom (ft/s): 3.64
Avg Velocity (ft/s): 3.56
Wave Velocity (ft/s): 5.34

DATA FOR FLOW PATH 20

Flow Path Name: A20
FLOW PATH TRAVEL TIME (min): 0.8078
Flow Type: Street
Length (ft): 268.75
Top Elevation (ft): 678.86
Bottom Elevation (ft): 673.48
Contributing Area (acres): 0.77
Percent of Sub-Area (%): 11.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 1.12
Q Top (cfs): 8.28
Q Bottom (cfs): 9.40
Velocity Top (ft/s): 3.64
Velocity Bottom (ft/s): 3.76
Avg Velocity (ft/s): 3.70
Wave Velocity (ft/s): 5.55

DATA FOR FLOW PATH 21

Flow Path Name: A21
FLOW PATH TRAVEL TIME (min): 0.4719
Flow Type: Street
Length (ft): 180.96
Top Elevation (ft): 683.38
Bottom Elevation (ft): 678.37
Contributing Area (acres): 0.2
Percent of Sub-Area (%): 3.0
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0277
Q for Flow Path (cfs): 0.29
Q Top (cfs): 9.40
Q Bottom (cfs): 9.69
Velocity Top (ft/s): 4.24
Velocity Bottom (ft/s): 4.28
Avg Velocity (ft/s): 4.26
Wave Velocity (ft/s): 6.39
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

TIME OF CONCENTRATION

TC Program Version: 2.64.0.37

Project: Cruzan - Post-Development Hydrology

Date: 7/28/2022 1:52:09 PM

Engineer: AM

Consultant: Ware Malcomb

----------------------------------
SUMMARY OF COMPUTATIONS
----------------------------------

Watershed Name: Post-Development Hydrology

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<table>
<thead>
<tr>
<th>Name</th>
<th>Zone</th>
<th>Storm</th>
<th>Soil</th>
<th>Area (acres)</th>
<th>TC (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Development Hydr</td>
<td>CON3</td>
<td>50</td>
<td>6.7 /</td>
<td>7</td>
<td>17.097 / 17</td>
</tr>
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----------------------------------
Watershed Name: Post-Development Hydrology

Sub-Area Name: Post Development Hydrology
Tc: 17.097 Minutes

DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 17.097 min. = 17 min.

SUB AREA INPUT DATA

Sub Area Name: Post Development Hydrology
Total Area (ac): 6.65
Flood Zone: 3
Rainfall Zone: CON3
Storm Frequency (years): 50
Development Type: Industrial
Soil Type: 5.00
Percent Impervious: 87

SUB AREA OUTPUT

Intensity (in/hr): 2.008
C Total: 0.871
Sum Q Segments (cfs): 11.63
Q Total (cfs): 11.63
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 1,025.79
Time of Concentration (min): 17.097
DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 1.8133
Flow Type: Overland
Length (ft): 108.8
Top Elevation (ft): 686.66
Bottom Elevation (ft): 683.38
Contributing Area (acres): 0.1
Percent of Sub-Area (%): 1.5
Overland Type: Valley
Development Type: Industrial
Map Slope: 0.0301
Effective Slope: 0.0301
Q for Flow Path (cfs): 0.17
Avg Velocity (ft/s): 1.00
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 1.1769
Flow Type: Street
Length (ft): 180.44
Top Elevation (ft): 685
Bottom Elevation (ft): 680.61
Contributing Area (acres): 0.18
Percent of Sub-Area (%): 2.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0243
Q for Flow Path (cfs): 0.31
Q Top (cfs): 0.17
Q Bottom (cfs): 0.49
Velocity Top (ft/s): 1.48
Velocity Bottom (ft/s): 1.92
Avg Velocity (ft/s): 1.70
Wave Velocity (ft/s): 2.56

DATA FOR FLOW PATH 3

Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 1.2507
Flow Type: Street
Length (ft): 230.65
Top Elevation (ft): 684
Bottom Elevation (ft): 678.88
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 4.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0222
Q for Flow Path (cfs): 0.54
Q Top (cfs): 0.49
Q Bottom (cfs): 1.03
Velocity Top (ft/s): 1.86
Velocity Bottom (ft/s): 2.24
Avg Velocity (ft/s): 2.05
Wave Velocity (ft/s): 3.07

DATA FOR FLOW PATH 4

Flow Path Name: A4
FLOW PATH TRAVEL TIME (min): 0.7144
Flow Type: Street
Length (ft): 151.8
Top Elevation (ft): 681.92
Bottom Elevation (ft): 678.35
Contributing Area (acres): 0.16
Percent of Sub-Area (%): 2.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0235
Q for Flow Path (cfs): 0.28
Q Top (cfs): 1.03
Q Bottom (cfs): 1.31
Velocity Top (ft/s): 2.29
Velocity Bottom (ft/s): 2.43
Avg Velocity (ft/s): 2.36
Wave Velocity (ft/s): 3.54

DATA FOR FLOW PATH 5

Flow Path Name: A5
FLOW PATH TRAVEL TIME (min): 0.6921
Flow Type: Street
Length (ft): 158.6
Top Elevation (ft): 680
Bottom Elevation (ft): 676.07
Contributing Area (acres): 0.17
Percent of Sub-Area (%): 2.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0248
Q for Flow Path (cfs): 0.30
Q Top (cfs): 1.31
Q Bottom (cfs): 1.61
Velocity Top (ft/s): 2.48
Velocity Bottom (ft/s): 2.61
Avg Velocity (ft/s): 2.55
Wave Velocity (ft/s): 3.82

------------------------------------------------------------------------
DATA FOR FLOW PATH 6
------------------------------------------------------------------------
Flow Path Name: A6
FLOW PATH TRAVEL TIME (min): 0.6340
Flow Type: Street
Length (ft): 147.01
Top Elevation (ft): 677.36
Bottom Elevation (ft): 674.02
Contributing Area (acres): 0.15
Percent of Sub-Area (%): 2.3
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0227
Q for Flow Path (cfs): 0.26
Q Top (cfs): 1.61
Q Bottom (cfs): 1.87
Velocity Top (ft/s): 2.53
Velocity Bottom (ft/s): 2.63
Avg Velocity (ft/s): 2.58
Wave Velocity (ft/s): 3.86

------------------------------------------------------------------------
DATA FOR FLOW PATH 7
------------------------------------------------------------------------
Flow Path Name: A7
FLOW PATH TRAVEL TIME (min): 0.3443
Flow Type: Street
Length (ft): 79.12
Top Elevation (ft): 675.01
Bottom Elevation (ft): 673.38
Contributing Area (acres): 0.08
Percent of Sub-Area (%): 1.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0206
Q for Flow Path (cfs): 0.14
Q Top (cfs): 1.87
Q Bottom (cfs): 2.01
Velocity Top (ft/s): 2.53
Velocity Bottom (ft/s): 2.58
Avg Velocity (ft/s): 2.55
Wave Velocity (ft/s): 3.83

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DATA FOR FLOW PATH 8
Flow Path Name: A8
FLOW PATH TRAVEL TIME (min): 0.8370
Flow Type: Street
Length (ft): 131.46
Top Elevation (ft): 674.37
Bottom Elevation (ft): 673.48
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 4.7
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0068
Q for Flow Path (cfs): 0.54
Q Top (cfs): 2.01
Q Bottom (cfs): 2.55
Velocity Top (ft/s): 1.69
Velocity Bottom (ft/s): 1.80
Avg Velocity (ft/s): 1.75
Wave Velocity (ft/s): 2.62

DATA FOR FLOW PATH 9

Flow Path Name: A9
FLOW PATH TRAVEL TIME (min): 0.2542
Flow Type: Street
Length (ft): 63.04
Top Elevation (ft): 674.25
Bottom Elevation (ft): 672.95
Contributing Area (acres): 0.08
Percent of Sub-Area (%): 1.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0206
Q for Flow Path (cfs): 0.14
Q Top (cfs): 2.55
Q Bottom (cfs): 2.69
Velocity Top (ft/s): 2.74
Velocity Bottom (ft/s): 2.77
Avg Velocity (ft/s): 2.76
Wave Velocity (ft/s): 4.13

DATA FOR FLOW PATH 10

Flow Path Name: A10
FLOW PATH TRAVEL TIME (min): 0.6516
Flow Type: Street
Length (ft): 167.8
Top Elevation (ft): 674.19
Bottom Elevation (ft): 670.59
Contributing Area (acres): 0.21
Percent of Sub-Area (%): 3.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0215
Q for Flow Path (cfs): 0.37
Q Top (cfs): 2.69
Q Bottom (cfs): 3.06
Velocity Top (ft/s): 2.82
Velocity Bottom (ft/s): 2.91
Avg Velocity (ft/s): 2.86
Wave Velocity (ft/s): 4.29

DATA FOR FLOW PATH 11

Flow Path Name: A11
FLOW PATH TRAVEL TIME (min): 0.6080
Flow Type: Street
Length (ft): 150.92
Top Elevation (ft): 673.54
Bottom Elevation (ft): 670.82
Contributing Area (acres): 0.19
Percent of Sub-Area (%): 2.9
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0180
Q for Flow Path (cfs): 0.33
Q Top (cfs): 3.06
Q Bottom (cfs): 3.39
Velocity Top (ft/s): 2.72
Velocity Bottom (ft/s): 2.79
Avg Velocity (ft/s): 2.76
Wave Velocity (ft/s): 4.14

DATA FOR FLOW PATH 12

Flow Path Name: A12
FLOW PATH TRAVEL TIME (min): 0.4977
Flow Type: Street
Length (ft): 125.66
Top Elevation (ft): 673.56
Bottom Elevation (ft): 671.32
Contributing Area (acres): 0.13
Percent of Sub-Area (%): 2.0
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0178
Q for Flow Path (cfs): 0.23
Q Top (cfs): 3.39
Q Bottom (cfs): 3.62
Velocity Top (ft/s): 2.78
Velocity Bottom (ft/s): 2.83
Avg Velocity (ft/s): 2.81
Wave Velocity (ft/s): 4.21

DATA FOR FLOW PATH 13

Flow Path Name: A13
FLOW PATH TRAVEL TIME (min): 0.5113
Flow Type: Street
Length (ft): 135.64
Top Elevation (ft): 673.68
Bottom Elevation (ft): 671.04
Contributing Area (acres): 0.14
Percent of Sub-Area (%): 2.1
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0195
Q for Flow Path (cfs): 0.24
Q Top (cfs): 3.62
Q Bottom (cfs): 3.87
Velocity Top (ft/s): 2.92
Velocity Bottom (ft/s): 2.97
Avg Velocity (ft/s): 2.95
Wave Velocity (ft/s): 4.42

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DATA FOR FLOW PATH 14

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Flow Path Name: A14
FLOW PATH TRAVEL TIME (min): 1.0718
Flow Type: Street
Length (ft): 170.17
Top Elevation (ft): 671.32
Bottom Elevation (ft): 670.52
Contributing Area (acres): 0.27
Percent of Sub-Area (%): 4.1
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0047
Q for Flow Path (cfs): 0.47
Q Top (cfs): 3.87
Q Bottom (cfs): 4.34
Velocity Top (ft/s): 1.74
Velocity Bottom (ft/s): 1.79
Avg Velocity (ft/s): 1.76
Wave Velocity (ft/s): 2.65
DATA FOR FLOW PATH 15

Flow Path Name: A15
FLOW PATH TRAVEL TIME (min): 1.5885
Flow Type: Street
Length (ft): 349.35
Top Elevation (ft): 673.97
Bottom Elevation (ft): 670.52
Contributing Area (acres): 0.69
Percent of Sub-Area (%): 10.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0099
Q for Flow Path (cfs): 1.21
Q Top (cfs): 4.34
Q Bottom (cfs): 5.55
Velocity Top (ft/s): 2.37
Velocity Bottom (ft/s): 2.52
Avg Velocity (ft/s): 2.44
Wave Velocity (ft/s): 3.67

DATA FOR FLOW PATH 16

Flow Path Name: A16
FLOW PATH TRAVEL TIME (min): 0.8284
Flow Type: Street
Length (ft): 263.74
Top Elevation (ft): 677.97
Bottom Elevation (ft): 671.81
Contributing Area (acres): 0.39
Percent of Sub-Area (%): 5.9
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0234
Q for Flow Path (cfs): 0.68
Q Top (cfs): 5.55
Q Bottom (cfs): 6.23
Velocity Top (ft/s): 3.49
Velocity Bottom (ft/s): 3.59
Avg Velocity (ft/s): 3.54
Wave Velocity (ft/s): 5.31

DATA FOR FLOW PATH 17

Flow Path Name: A17
FLOW PATH TRAVEL TIME (min): 0.5718
Flow Type: Street
Length (ft): 195.42
Top Elevation (ft): 678.37
Bottom Elevation (ft): 673.17
Contributing Area (acres): 0.21
Percent of Sub-Area (%): 3.2
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0266
Q for Flow Path (cfs): 0.37
Q Top (cfs): 6.23
Q Bottom (cfs): 6.59
Velocity Top (ft/s): 3.77
Velocity Bottom (ft/s): 3.83
Avg Velocity (ft/s): 3.80
Wave Velocity (ft/s): 5.70

DATA FOR FLOW PATH 18

Flow Path Name: A18
FLOW PATH TRAVEL TIME (min): 0.9387
Flow Type: Street
Length (ft): 299.1
Top Elevation (ft): 684.27
Bottom Elevation (ft): 678.29
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 15.3
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 1.78
Q Top (cfs): 6.59
Q Bottom (cfs): 8.38
Velocity Top (ft/s): 3.43
Velocity Bottom (ft/s): 3.65
Avg Velocity (ft/s): 3.54
Wave Velocity (ft/s): 5.31

DATA FOR FLOW PATH 19
Flow Path Name: A19
FLOW PATH TRAVEL TIME (min): 0.8897
Flow Type: Street
Length (ft): 298.46
Top Elevation (ft): 680.55
Bottom Elevation (ft): 674.58
Contributing Area (acres): 0.89
Percent of Sub-Area (%): 13.4
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 1.56
Q Top (cfs): 8.38
Q Bottom (cfs): 9.94
Velocity Top (ft/s): 3.65
Velocity Bottom (ft/s): 3.81
Avg Velocity (ft/s): 3.73
Wave Velocity (ft/s): 5.59

DATA FOR FLOW PATH 20

Flow Path Name: A20
FLOW PATH TRAVEL TIME (min): 0.7715
Flow Type: Street
Length (ft): 268.75
Top Elevation (ft): 678.86
Bottom Elevation (ft): 673.48
Contributing Area (acres): 0.77
Percent of Sub-Area (%): 11.6
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0200
Q for Flow Path (cfs): 1.35
Q Top (cfs): 9.94
Q Bottom (cfs): 11.28
Velocity Top (ft/s): 3.81
Velocity Bottom (ft/s): 3.93
Avg Velocity (ft/s): 3.87
Wave Velocity (ft/s): 5.81

DATA FOR FLOW PATH 21

Flow Path Name: A21
FLOW PATH TRAVEL TIME (min): 0.4507
Flow Type: Street
Length (ft): 180.96
Top Elevation (ft): 683.38
Bottom Elevation (ft): 678.37
Contributing Area (acres): 0.2
Percent of Sub-Area (%): 3.0
Street Width (ft): 32
Curb Height (in): 6
Map Slope: 0.0277
Q for Flow Path (cfs): 0.35
Q Top (cfs): 11.28
Q Bottom (cfs): 11.63
Velocity Top (ft/s): 4.44
Velocity Bottom (ft/s): 4.48
Avg Velocity (ft/s): 4.46
Wave Velocity (ft/s): 6.69
Appendix G
Paleo Assessment
December 2, 2022

Tom Wood
Cruzan
9171 Wilshire Boulevard, Suite 500
Beverly Hills, California 90210
Transmitted via email to tom@cruzan.co

RE: Paleontological Resource Assessment for the 1300 Lawrence Drive Industrial Building Report, City of Thousand Oaks, Ventura County, California

Dear Mr. Wood,

At the request of Cruzan, PaleoWest, LLC (PaleoWest) conducted a paleontological resource assessment for the 1300 Lawrence Drive Industrial Building Project (Project), in the city of Thousand Oaks, Ventura County, California. The goal of the assessment was to identify the geologic units that may be impacted by Project development, determine the paleontological sensitivity of geologic unit(s) within the Project area, assess potential for impacts from development of the Project to paleontological resources under the California Environmental Quality Act (CEQA) guidelines, and recommend mitigation measures to avoid or mitigate impacts to scientifically significant paleontological resources, as necessary. This paleontological resource assessment included a review of existing geologic maps and primary literature regarding fossiliferous geologic units within the proposed Project vicinity and region. This technical memorandum, which was written in accordance with the guidelines set forth by the Society of Vertebrate Paleontology (SVP) (2010), has been prepared to support environmental review under CEQA. It is the understanding of PaleoWest that the City of Thousand Oaks (City) will be the lead agency.

PROJECT LOCATION AND DESCRIPTION

The Project area is at 1300 Lawrence Drive in the city of Thousand Oaks (Figures 1 and 2). The approximately 6.64-acre Project area covers three Assessor’s Parcel Numbers (APNs): 667-0-172-015, 667-0-172-025, and 667-0-172-035). The property is currently an underutilized parking lot at the southern corner of Lawrence Drive and Corporate Center Drive.

Cruzan proposes to demolish the existing parking lot and construct a 120,384 square foot (ft²) building, containing 112,384 ft² of warehouse space and 8000 ft² office space. The total lot size is 289,046 ft², 40 percent of which will be covered by the proposed building. The landscape area is planned to cover 36,816 ft², or 12 percent of the lot. A total of 191 parking stalls and 10 bike racks are proposed for construction around the building. The Project area is in an M-1 Industrial Park zoning area, which are established to provide areas for the development of planned manufacturing, technology, and life science uses.
Figure 1. Project vicinity map.
Figure 2. Project location map.
REGULATORY CONTEXT

Paleontological resources (i.e., fossils) are considered nonrenewable scientific resources because once destroyed, they cannot be replaced. As such, paleontological resources are afforded protection under various federal, state, and local laws and regulations. Laws pertinent to this Project are discussed below.

STATE LAWS AND REGULATIONS

California Environmental Quality Act

CEQA requires that public agencies and private interests identify the potential environmental consequences of their projects on any object or site of significance to the scientific annals of California (Division I, California Public Resources Code [PRC] Section 5020.1 [j]). Appendix G in Section 15023 provides an Environmental Checklist of questions (Section 15023, Appendix G, Section XIV, Part A) that includes the following: “Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?”

CEQA does not define “a unique paleontological resource or site.” However, the SVP has provided guidance specifically designed to support state and Federal environmental review. The SVP broadly defines significant paleontological resources as follows (SVP, 2010:11):

“Fossils and fossiliferous deposits consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecological, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years).”

Significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, diagnostically important, or are common but have the potential to provide valuable scientific information for evaluating evolutionary patterns and processes, or which could improve our understanding of paleochronology, paleoecology, paleophylogeography, or depositional histories. New or unique specimens can provide new insights into evolutionary history; however, additional specimens of even well represented lineages can be equally important for studying evolutionary pattern and process, evolutionary rates, and paleophylogeography. Even unidentifiable material can provide useful data for dating geologic units if radiometric dating is possible. As such, common fossils (especially vertebrates) may be scientifically important, and therefore considered significant.

California Public Resources Code

Section 5097.5 of the Public Resources Code (PRC) states:

“No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a
misdemeanor. As used in this PRC section, ‘public lands’ means lands owned by, or under the jurisdiction of, the state or any city, county, district, authority, or public corporation, or any agency thereof.”

Consequently, public agencies are required to comply with PRC 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others.

LOCAL

The City of Thousand Oaks General Plan (City of Thousand Oaks, 2013), Chapter 6, establishes that multiple sedimentological deposits in the City contain paleontological resources, including Pleistocene deposits. Chapter 8, Section N, of the General Plan states the following policies:

- **CO-37**: Management of paleontological resources such as significant fossil beds, or fossils of regional significance shall emphasize resource protection and conservation unless excavation and salvage is deemed appropriate by scientific authorities.

- **CO-38**: Decisions pertaining to the disposition of paleontological resources shall be made in concert with recognized public agencies, groups or individuals having jurisdiction, expertise or interest in these matters, including but not limited to the Stagecoach Inn Museum, local natural history museums, colleges and universities.

In addition, Chapter 8, Section N, of the General Plan also establishes the following Implementation Measures:

- In areas considered to have a high likelihood of harboring paleontological resources, the City shall require the preparation of a Paleontological Resource survey as part of the environmental review process for proposed development projects.

- Support the efforts of local citizens, appointed committees or other public agencies and private institutions that are working to conserve and curate paleontological resources. Full public discussion shall be encouraged prior to any action being taken.

PALEONTOLOGICAL RESOURCE POTENTIAL

Absent specific agency guidelines, most professional paleontologists in California adhere to the guidelines set forth by SVP (2010) to determine the course of paleontological mitigation for a given project. These guidelines establish protocols for the assessment of the paleontological resource potential of underlying geologic units and outline measures to mitigate adverse impacts that could result from project development. Using baseline information gathered during a paleontological resource assessment, the paleontological resource potential of the geologic unit(s) (or members thereof) underlying a project area can be assigned to one of four categories defined by SVP (2010). Although these standards were written specifically to protect vertebrate paleontological resources, all fields of paleontology have adopted the following guidelines:

**HIGH POTENTIAL (SENSITIVITY)**

Rock units from which significant vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered have a high potential for containing significant non-
renewable fossiliferous resources. These units include but are not limited to, sedimentary formations and some volcanic formations which contain significant nonrenewable.

**LOW POTENTIAL (SENSITIVITY)**

Sedimentary rock units that are potentially fossiliferous but have not yielded fossils in the past or contain common and/or widespread invertebrate fossils of well documented and understood taphonomic, phylogenetic species and habitat ecology. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils prior to the start of construction. Generally, these units will be poorly represented by specimens in institutional collections and will not require protection or salvage operations. However, as excavation for construction gets underway it is possible that significant and unanticipated paleontological resources might be encountered and require a change of classification from Low to High Potential and, thus, require monitoring and mitigation if the resources are found to be significant.

**UNDETERMINED POTENTIAL (SENSITIVITY)**

Specific areas underlain by sedimentary rock units for which little information is available have undetermined fossiliferous potentials. Field surveys by a qualified vertebrate paleontologist to specifically determine the potentials of the rock units are required before programs of impact mitigation for such areas may be developed.

**NO POTENTIAL**

Rock units of metamorphic or igneous origin are commonly classified as having no potential for containing significant paleontological resources.

**METHODS**

To assess whether a particular area has the potential to contain significant fossil resources at the subsurface, it is necessary to review published geologic mapping to determine the geology and stratigraphy of the area. Geologic units are considered “sensitive” for paleontological resources if they are known to contain significant fossils anywhere in their extent. Therefore, a search of pertinent local and regional museum repositories for paleontological localities within and nearby the Project area is necessary to determine whether fossil localities have been previously discovered within a particular rock unit. For this Project, informal records searches were conducted of the online University of California Museum of Paleontology (UCMP) Collections and San Diego Natural History Museum (SDNHM) Collections, the online Paleobiology Database (PBDB) and FAUNMAP, and other published and unpublished geological and paleontological literature of the area.
RESOURCE CONTEXT

GEOLOGIC SETTING

The Project area is in the south-central portion of the Transverse Ranges geomorphic province, a region of northwest-trending mountain ranges and valleys, locally dominated by the Santa Monica Mountains and Simi Hills, roughly parallel to the San Andreas Fault Zone and North American Plate Boundary (Norris and Webb, 1976). Locally, the Project area is in a valley surrounded by the Conejo Volcanics, an igneous rock sequence from the Miocene Epoch (Taliaferro, 1924). The alluvial sediment accumulated in the local valleys is sourced by the igneous deposits from the surrounding Conejo Hills (Yerkes and Campbell, 1995).

SITE SPECIFIC GEOLOGY AND PALEONTOLOGY

According to Campbell et al. (2014), the Project area is entirely underlain by Old alluvium (Qoa) composed of unconsolidated to moderately indurated gravel, sand, and silt deposited on floodplains, alluvial fans, and streambeds in the middle to late Pleistocene Epoch (2.6 million years ago to 11,700 years ago). The site is currently completely developed and paved, and no undisturbed geologic deposits are visible at the ground surface.

Pleistocene deposits in Ventura County have produced remains of ground sloth, bison, mammoth, proboscid, horse, mastodon, artiodactyl, camel, duck, puffin, waterfowl, and deer mouse (Jefferson, 1991a, 1991b). The Project area is also adjacent to undivided Conejo Volcanics (Tco) in the hills to the west (Campbell et al., 2014), which may underlie the Old alluvium at depth. Unlike most igneous deposits, the Conejo Volcanics have produced paleontological resources, including foraminifera, brachiopods, bivalves, gastropods, barnacles, echinoids, worm tubes, fish scales, and wood (Kellerlynn, 2016).

LITERATURE SEARCH RESULTS

Searches of online databases and other literature produced did not produce fossil localities within three miles of the Project area (Graham and Lundelius 2010; Jefferson 1991,1991b; Miller 1971; PBDB 2022; SDNHM 2022; UCMP 2022).

FINDINGS

In accordance with the SVP (2010) sensitivity scale, the Old alluvium (Qoa) has high paleontological sensitivity because similar deposits have yielded Pleistocene vertebrate fossils in Ventura County. Due to the presence of Pleistocene deposits (Qoa) on the surface and Miocene volcanic deposits (Tco) potentially at depth, Project-related ground disturbance has the potential to impact paleontological resources throughout the Project area.
Figure 3. Geologic map of the Project area.
RECOMMENDATIONS

In general, the potential for a given project to result in negative impacts to paleontological resources is directly proportional to the amount of ground disturbance associated with the project; thus, the higher the number of ground disturbances within geological deposits with a known paleontological sensitivity, the greater the potential for negative impacts to paleontological resources. Since this Project entails excavation and grading for a new building, new ground disturbance is anticipated. The presence of Pleistocene-age sediment at the surface, and potentially fossiliferous Miocene deposits at depth, suggests that ground disturbance may result in significant impacts under CEQA to paleontological resources, such as destruction, damage, or loss of scientifically important paleontological resources. A qualified paleontologist should be retained to develop and implement the measures recommended below. These measures have been developed in accordance with SVP guidelines; if implemented, these measures will satisfy the requirements of CEQA.

WORKER’S ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

Prior to the start of the proposed Project activities, all field personnel will receive a worker’s environmental awareness training on paleontological resources. The training will provide a description of the laws and ordinances protecting fossil resources, the types of fossil resources that may be encountered in the Project area, the role of the Paleontological Monitor, outline steps to follow if a fossil discovery is made, and provide contact information for the Project Paleontologist. The training will be developed by the Project Paleontologist and can be delivered concurrently with other training including cultural, biological, safety, et cetera.

PALEONTOLOGICAL MITIGATION MONITORING

Prior to the commencement of ground disturbing activities, a professional paleontologist will be retained to prepare and implement a paleontological mitigation plan for the Project. The plan will describe the monitoring required during ground disturbing activities. Monitoring will entail the visual inspection of excavated or graded areas and trench sidewalls. If the Project Paleontologist determines full-time monitoring is no longer warranted based on the geologic conditions at depth, they may recommend that monitoring be reduced or cease entirely.

FOSSIL DISCOVERIES

If a paleontological resource is discovered, the monitor will have the authority to temporarily divert the construction equipment around the find until it is assessed for scientific significance and, if appropriate, collected. If the resource is determined to be of scientific significance, the Project Paleontologist shall complete the following:

1. **Salvage of Fossils.** If fossils are discovered, all work in the immediate vicinity should be halted to allow the Paleontological Monitor, and/or Project Paleontologist to evaluate the discovery and determine if the fossil may be considered significant. If the fossils are determined to be potentially significant, the Project Paleontologist (or Paleontological Monitor) should recover them following standard field procedures for collecting paleontological resources as outlined in paleontological mitigation plan for.
the Project. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case, the paleontologist should have the authority to temporarily direct, divert or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner.

2. **Fossil Preparation and Curation.** The paleontological mitigation plan for the Project will identify the museum that has agreed to accept fossils that may be discovered during Project related excavations. Upon completion of fieldwork, all significant fossils collected will be prepared in a properly equipped laboratory to a point ready for curation. Preparation may include the removal of excess matrix from fossil materials and stabilizing or repairing specimens. During preparation and inventory, the fossils specimens will be identified to the lowest taxonomic level practical prior to curation at an accredited museum. The fossil specimens must be delivered to the accredited museum or repository no later than 30 days after all laboratory work is completed. The cost of curation will be assessed by the repository and will be the responsibility of the client.

**FINAL PALEONTOLOGICAL MITIGATION REPORT**

Upon completion of ground disturbing activities (and curation of fossils if necessary), the Project Paleontologist should prepare a final mitigation and monitoring report outlining the results of the mitigation and monitoring program. The report should include a discussion of the location, duration and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils, and where the fossils were curated.

Thank you for contacting PaleoWest for this Project. If you have any questions, please do not hesitate to contact us.

Sincerely,

[Signature]

Benjamin Scherzer, M.S. | Senior Paleontologist
PALEOWEST
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