APPENDIX A

Incorporation of Applicable Mitigation Measures, Performance Standards, and Criteria from Prior Applicable EIRs

APPENDIX A

INCORPORATION OF FEASIBLE MITIGATION MEASURES, PERFORMANCE STANDARDS, AND CRITERIA FROM PRIOR APPLICABLE EIRS

Public Resources Code Section 21151.2 requires that a transit priority project incorporate all feasible mitigation measures, performance standards, or criteria from prior applicable EIRs. The City has complied with PRC Section 21151.2 by reviewing all of the suggested mitigation measures in Connect SoCal (2020 – 2045 Regional Transportation Plan/Sustainable Communities Strategy) and the City of Pasadena General Plan EIR for imposition on the project. The mitigation measures were not imposed if the project was found to be in substantial compliance with the mitigation measure as proposed or if the mitigation measures were found not to be relevant. If the project was not found to be in substantial compliance or the mitigation measure was found relevant, the City considered whether to use the mitigation measure or an equally effective City mitigation measure (including the mitigation measures developed for the SCEA prepared for the proposed project). The applicable mitigation measures, performance standards, or criteria from the aforementioned documents are discussed in the tables below and are included in applicable technical sections of the Environmental Checklist portion of the SCEA.

Table 1
Connect SoCal (2020 – 2045 Regional Transportation Plan/Sustainable Communities Strategy)
Applicable Mitigation Measures

Project Level Mitigation Measure	Applicability to the Project
Aesthetics	
PMM AES-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to address potential aesthetic impacts to scenic vistas, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Use a palette of colors, textures, building materials that are graffiti-resistant, and/or plant materials that complement the surrounding landscape and development. b) Use contour grading to better match surrounding terrain. Contour edges of major cut-and-fill to provide a more natural looking finished profile. c) Design new corridor landscaping to respect existing natural and man-made features and to complement the dominant landscaping of the surrounding areas. d) Replace and renew landscaping along corridors with road widenings, interchange projects, and related improvements. e) Retain or replace trees bordering highways, so that	This Mitigation Measure is not relevant to the Proposed Project as Public Resources Code Section 21099, enacted by Senate Bill 743, provides that "aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment." The project site is located in an urbanized area within the City of Pasadena. The proposed project is a 6-story plus mezzanine transit-oriented mixed-use development that includes retail, restaurants, and work/live units at the ground level and mixed-rate apartment units on levels 2-6. The project site is located less than one-quarter mile from the Metro Del Mar L Line (formerly Gold Line) station and less than one-half a mile to the Memorial Park Station. Therefore, the proposed project is located in a transit priority area as defined in Public Resources Code Section 21099. The proposed project's aesthetic impacts shall not be considered significant impacts on the environment pursuant to Public Resources Code Section 21099. Further, the Proposed Project would follow the City's guidelines regarding building design and provide a full landscape plan for approval by the City.

<table>
<tr><th>Project Level Mitigation Measure</th><th>Applicability to the Project</th></tr>
<tr><td>clear-cutting is not evident.
f) Provide new corridor landscaping that respects and provides appropriate transition to existing natural and man-made features and is complementary to the dominant landscaping or native habitats of surrounding areas.
g) Reduce the visibility of construction staging areas by fencing and screening these areas with low contrast materials consistent with the surrounding environment, and by revegetating graded slopes and exposed earth surfaces at the earliest opportunity;
h) Use see-through safety barrier designs (e.g. railings rather than walls)</td><td></td></tr>
<tr><td>PMM AES-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the State CEQA Guidelines, a Lead Agency for a project can and should consider mitigation measures to address potential aesthetic impacts that substantially degrade visual character, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency:
a) Minimize contrasts in scale and massing between the projects and surrounding natural forms and development, minimize their intrusion into important viewsheds, and use contour grading to better match surrounding terrain in accordance with county and city hillside ordinances, where applicable.
b) Design landscaping along highway corridors to add significant natural elements and visual interest to soften the hard-edged, linear transportation corridors.
c) Require development of design guidelines for projects that make elements of proposed buildings/facilities visually compatible or minimize visibility of changes in visual quality or character through use of hardscape and softscape solutions. Specific measures to be addressed include setback buffers, landscaping, color, texture, signage, and lighting criteria.
d) Design projects consistent with design guidelines of applicable general plans.
e) Require that sites are kept in a blight/nuisance-free condition. Remove blight or nuisances that compromise visual character or visual quality of project areas including graffiti abatement, trash removal, landscape management, maintenance of signage and billboards in good condition, and replace compromised native vegetation and landscape.
f) Where sound walls are proposed, require sound wall construction and design methods that account for visual impacts as follows:
— use transparent panels to preserve views where sound walls would block views from residences;
— use landscaped earth berm or a combination wall and berm to minimize the apparent sound wall height;
— construct sound walls of materials whose color and texture complements the surrounding landscape and development;</td><td>This Mitigation Measure is not relevant to the proposed project as Public Resources Code Section 21099, enacted by Senate Bill 743, provides that “aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment.”
The project site is located in an urbanized area within the City of Pasadena. The proposed project is a 6-story plus mezzanine transit-oriented mixed-use development that includes retail, restaurants, and work/live units at the ground level and mixed-rate apartment units on levels 2-6. The project site is located less than one-quarter mile from the Metro Del Mar L Line (formerly Gold Line) station and less than one-half a mile to the Memorial Park Station. Therefore, the proposed project is located in a transit priority area as defined in Public Resources Code Section 21099. The proposed project’s aesthetic impacts shall not be considered significant impacts on the environment pursuant to Public Resources Code Section 21099.</td></tr>
</table>

Project Level Mitigation Measure	Applicability to the Project
g) Design sound walls to increase visual interest, reduce apparent height, and be visually compatible with the surrounding area; and landscape the sound walls with plants that screen the sound wall, preferably with either native vegetation or landscaping that complements the dominant landscaping of surrounding areas.	
PMM AES-3: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to address potential aesthetic impacts that substantially degrade visual character, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Use lighting fixtures that are adequately shielded to a point below the light bulb and reflector and that prevent unnecessary glare onto adjacent properties. b) Restrict the operation of outdoor lighting for construction and operation activities to the hours of 7:00 a.m. to 10:00 p.m. or as otherwise required by applicable local rules or ordinances. c) Use high pressure sodium and/or cut-off fixtures instead of typical mercury-vapor fixtures for outdoor lighting. d) Use unidirectional lighting to avoid light trespass onto adjacent properties. e) Design exterior lighting to confine illumination to the project site, and/or to areas which do not include light-sensitive uses. f) Provide structural and/or vegetative screening from light-sensitive uses. g) Shield and direct all new street and pedestrian lighting away from light-sensitive off-site uses. h) Use non-reflective glass or glass treated with a non-reflective coating for all exterior windows and glass used on building surfaces. i) Architectural lighting shall be directed onto the building surfaces and have low reflectivity to minimize glare and limit light onto adjacent properties.	This Mitigation Measure is not relevant to the Proposed Project as Public Resources Code Section 21099, enacted by Senate Bill 743, provides that "aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment." The project site is located in an urbanized area within the City of Pasadena. The proposed project is a 6-story plus mezzanine transit-oriented mixed-use development that includes retail, restaurants, and work/live units at the ground level and mixed-rate apartment units on levels 2-6. The project site is located less than one-quarter mile from the Metro Del Mar L Line (formerly Gold Line) station and less than one-half a mile to the Memorial Park Station. Therefore, the proposed project is located in a transit priority area as defined in Public Resources Code Section 21099. The proposed project's aesthetic impacts shall not be considered significant impacts on the environment pursuant to Public Resources Code Section 21099.
Agriculture and Forestry	
PMM AG-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to address potential adverse effects on agricultural resources, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Require project sponsors to mitigate for loss of farmland by providing permanent protection of in-kind farmland in the form of easements, fees, or elimination of development rights/potential. b) Project relocation or corridor realignment to avoid Prime Farmland, Unique Farmland, or Farmland of Local or Statewide Importance. c) Maintain and expand agricultural land protections such as urban growth boundaries.	This Mitigation Measure is not relevant to the proposed project as no farmland or agricultural activity exists on or in the vicinity of the project site. See Section 2, Agricultural Resources, of the SCEA for further information.

Project Level Mitigation Measure	Applicability to the Project
d) Provide for mitigation fees to support a mitigation bank[1] that invests in farmer education, agricultural infrastructure, water supply, marketing, etc. that enhance the commercial viability of retained agricultural lands. e) Minimize severance and fragmentation of agricultural land by constructing underpasses and overpasses at reasonable intervals to provide property access. f) Use berms, buffer zones, setbacks, and fencing to reduce conflicts between new development and farming uses and protect the functions of farmland.	
PMM AG-2: Project level mitigation measures can and should be considered by Lead Agencies as applicable and feasible. Measures to reduce substantial adverse effects on Williamson Act contracts to the maximum extent practicable, as determined appropriate by each Lead Agency, may include the following, or other comparable measures: a) Project relocation or corridor realignment to avoid lands in Williamson Act contracts. b) Establish conservation easements consistent with the recommendations of the Department of Conservation, or 20-year Farmland Security Zone contracts (Government Code Section 51296 et seq.), 10-year Williamson Act contracts (Government Code Section 51200 et seq.), or use of other conservation tools available from the California Department of Conservation Division of Land Resource Protection.	This Mitigation Measure is not relevant to the proposed project as the project Site is not zoned for agricultural production, there is no farmland at the project site, and there are no Williamson Act Contracts in effect for the project site. See Section 2, Agricultural Resources, of the SCEA for further information.
PMM AG-3: Project level mitigation measures can and should be considered by Lead Agencies as applicable and feasible. Measures to reduce substantial adverse effects, through the conversion of Farmland to maximum extent practicable, as determined appropriate by each Lead Agency, may include the following, or other comparable measures: a) Minimize construction related impacts to agricultural and forestry resources by locating materials and stationary equipment in such a way as to prevent conflict with agriculture and forestry resources.	This Mitigation Measure is not relevant to the proposed project as the project Site is not zoned for agricultural production and there is no farmland at the project site. See Section 2, Agricultural Resources, of the SCEA for further information.
PMM AG-4: Project level mitigation measures can and should be considered by Lead Agencies as applicable and feasible. Measures to reduce substantial adverse effects, through the conversion of Farmland, to the maximum extent practicable, as determined appropriate by each Lead Agency, may include the following, or other comparable measures: a) Design proposed projects to minimize, to the greatest extent feasible, the loss of the highest valued agricultural land. b) Redesign project features to minimize fragmenting or isolating Farmland. Where a project involves acquiring land or easements, ensure that the remaining non-project area is of a size sufficient to allow economically viable farming operations. The project proponents shall be responsible for acquiring easements, making lot line adjustments, and merging affected land parcels into units suitable for continued commercial agricultural management.	This Mitigation Measure is not relevant to the proposed project as the project Site is not zoned for agricultural production and there is no farmland at the project site. See Section 2, Agricultural Resources, of the SCEA for further information.

1 The California Department of Fish and Wildlife provides a definition for conservation or mitigation banks on their website (please see https://www.wildlife.ca.gov/Conservation/Planning/Banking).

Project Level Mitigation Measure	Applicability to the Project
c) Reconnect utilities or infrastructure that serve agricultural uses if these are disturbed by project construction. If a project temporarily or permanently cuts off roadway access or removes utility lines, irrigation features, or other infrastructure, the project proponents shall be responsible for restoring access as necessary to ensure that economically viable farming operations are not interrupted.	
PMM AG-5: Project level mitigation measures can and should be considered by Lead Agencies as applicable and feasible. Measures to reduce substantial adverse effects, through the conversion of Farmland, to the maximum extent practicable, as determined appropriate by each Lead Agency, may include the following, or other comparable measures: a) Manage project operations to minimize the introduction of invasive species or weeds that may affect agricultural production on adjacent agricultural land. Where a project has the potential to introduce sensitive species or habitats or have other spill-over effects on nearby agricultural lands, the project proponents shall be responsible for acquiring easements on nearby agricultural land and/or financially compensating for indirect effects on nearby agricultural land. Easements (e.g., flowage easements) shall be required for temporary or intermittent interruption in farming activities (e.g., because of seasonal flooding or groundwater seepage). Acquisition or compensation would be required for permanent or significant loss of economically viable operations.	This Mitigation Measure is not relevant to the proposed project as the project Site is not zoned for agricultural production and there is no farmland at the project site. See Section 2, Agricultural Resources, of the SCEA for further information.
Air Quality	
PMM AQ-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to violating air quality standards. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Minimize land disturbance. b) Suspend grading and earth moving when wind gusts exceed 25 miles per hour unless the soil is wet enough to prevent dust plumes. c) Cover trucks when hauling dirt. d) Stabilize the surface of dirt piles if not removed immediately. e) Limit vehicular paths on unpaved surfaces and stabilize any temporary roads. f) Minimize unnecessary vehicular and machinery activities. g) Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway. h) Revegetate disturbed land, including vehicular paths created during construction to avoid future off-road vehicular activities. i) On Caltrans projects, Caltrans Standard Specifications 10-Dust Control, 17-Watering, and 18-Dust Palliative shall be incorporated into project	The proposed project is subject to the South Coast Air Quality Management District (SCAQMD) rules and mentioned in Section 3, Air Quality of the SCEA. Upon compliance, the project would satisfy the applicable requirements of this mitigation measure. The projects impacts to Air Quality were analyzed in Section 3, Air Quality, of the SCEA analysis and were found to be less than significant and the project would not require any mitigation measures for this impact.

Project Level Mitigation Measure	Applicability to the Project
specifications. j) Require contractors to assemble a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that could be used an aggregate of 40 or more hours for the construction project. Prepare a plan for approval by the applicable air district demonstrating achievement of the applicable percent reduction for a CARB-approved fleet. k) Ensure that all construction equipment is properly tuned and maintained. l) Minimize idling time to 5 minutes—saves fuel and reduces emissions. m) Provide an operational water truck on-site at all times. Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas. Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway. n) Utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators. o) Develop a traffic plan to minimize community impacts as a result of traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Schedule operations affecting traffic for off-peak hours. Minimize obstruction of through-traffic lanes. Provide a flag person to guide traffic properly and ensure safety at construction sites. Project sponsors should consider developing a goal for the minimization of community impacts. p) As appropriate require that portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, obtain CARB Portable Equipment Registration with the state or a local district permit. Arrange appropriate consultations with the CARB or the District to determine registration and permitting requirements prior to equipment operation at the site. q) Require projects to use Tier 4 Final equipment or better for all engines above 50 horsepower (hp). In the event that construction equipment cannot meet to Tier 4 Final engine certification, the Project representative or contractor must demonstrate through future study with written findings supported by substantial evidence that is approved by SCAG before using other technologies/strategies. Alternative applicable strategies may include, but would not be limited to, construction equipment with Tier 4 Interim or reduction in the number and/or horsepower rating of construction equipment and/or limiting the number of construction equipment operating at the same time. All equipment must be tuned and maintained in compliance with the manufacturer's recommended maintenance schedule and specifications. All maintenance records for each	

Project Level Mitigation Measure	Applicability to the Project
equipment and their contractor(s) should make available for inspection and remain on-site for a period of at least two years from completion of construction, unless the individual project can demonstrate that Tier 4 engines would not be required to mitigate emissions below significance thresholds. Project sponsors should also consider including ZE/ZNE technologies where appropriate and feasible. r) Projects located within the South Coast Air Basin should consider applying for South Coast AQMD "SOON" funds which provides funds to applicable fleets for the purchase of commercially available low-emission heavy-duty engines to achieve near-term reduction of NOx emissions from in-use off-road diesel vehicles. s) Projects located within AB 617 communities should review the applicable Community Emissions Reduction Plan (CERP) for additional mitigation that can be applied to individual projects. t) Where applicable, projects should provide information about air quality related programs to schools, including the Environmental Justice Community Partnerships (EJCP), Clean Air Ranger Education (CARE), and Why Air Quality Matters programs. u) Projects should work with local cities and counties to install adequate signage that prohibits truck idling in certain locations (e.g., near schools and sensitive receptors). v) As applicable for airport projects, the following measures should be considered: a. Considering operational improvements to reduce taxi time and auxiliary power unit usage, where feasible. Additionally, consider single engine taxing, if feasible as allowed per Federal Aviation Administration guidelines. b. Set goals to achieve a reduction in emissions from aircraft operations over the lifetime of the proposed project. **c.** Require the use of ground service equipment (GSE) that can operate on battery-power. If electric equipment cannot be obtained, require the use of alternative fuel, the cleanest gasoline equipment, or Tier 4, at a minimum. w) As applicable for port projects, the following measures should be considered: a. Develop specific timelines for transitioning to zero emission cargo handling equipment (CHE). b. Develop interim performance standards with a minimum amount of CHE replacement each year to ensure adequate progress. c. Use short side electric power for ships, which may include tugboats and other ocean-going vessels or develop incentives	

Project Level Mitigation Measure	Applicability to the Project
to gradually ramp up the usage of shore power. d. Install the appropriate infrastructure to provide shore power to operate the ships. Electrical hookups should be appropriately sized. e. Maximize participation in the Port of Los Angeles' Vessel Speed Reduction Program or the Port of Long Beach's Green Flag Initiation Program in order to reduce the speed of vessel transiting within 40 nautical miles of Point Fermin. f. Encourage the participation in the Green Ship Incentives. g. Offer incentives to encourage the use of on-dock rail. x) As applicable for rail projects, the following measures should be considered: a. Provide the highest incentives for electric locomotives and then locomotives that meet Tier 5 emission standards with a floor on the incentives for locomotives that meet Tier 4 emission standards. y) Projects that will introduce sensitive receptors within 500 feet of freeways and other sources should consider installing high efficiency of enhanced filtration units, such as Minimum Efficiency Reporting Value (MERV) 13 or better. Installation of enhanced filtration units can be verified during occupancy inspection prior to the issuance of an occupancy permit. z) Develop an ongoing monitoring, inspection, and maintenance program for the MERV filters. a. Disclose potential health impacts to prospective sensitive receptors from living in close proximity to freeways or other sources of air pollution and the reduced effectiveness of air filtration systems when windows are open or residents are outside. b. Identify the responsible implementing and enforcement agency to ensure that enhanced filtration units are installed on-site before a permit of occupancy is issued. c. Disclose the potential increase in energy costs for running the HVAC system to prospective residents. d. Provide information to residents on where MERV filters can be purchased. e. Provide recommended schedule (e.g., every year or every six months) for replacing the enhanced filtration units. f. Identify the responsible entity such as future residents themselves, Homeowner's Association, or property managers for ensuring enhanced filtration units are replaced on time.	

Project Level Mitigation Measure	Applicability to the Project
g. Identify, provide, and disclose ongoing cost-sharing strategies, if any, for replacing the enhanced filtration units. h. Set criteria for assessing progress in installing and replacing the enhanced filtration units; and i. Develop a process for evaluating the effectiveness of the enhanced filtration units. aa) Consult the SCAG Environmental Justice Toolbox for potential measures to address impacts to low-income and/or minority communities.	
Biological Resources	
PMM BIO-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to threatened and endangered species, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Require project design to avoid occupied habitat, potentially suitable habitat, and designated critical habitat, wherever practicable and feasible. b) Where avoidance is determined to be infeasible, provide conservation measures to fulfill the requirements of the applicable authorization for incidental take pursuant to Section 7 or 10(a) of the federal ESA, Section 2081 of the California ESA to support issuance of an incidental take permit, and/or as identified in local or regional plans. Conservation strategies to protect the survival and recovery of federally and state-listed endangered and local special status species may include: i. Impact minimization strategies ii. Contribution of in-lieu fees for in-kind conservation and mitigation efforts iii. Use of in-kind mitigation bank credits iv. Funding of research and recovery efforts v. Habitat restoration vi. Establishment of conservation easements vii. Permanent dedication of in-kind habitat c) Design projects to avoid desert native plants protected under the California Desert Native Plants Act, salvage and relocate desert native plants, and/or pay in lieu fees to support off-site long-term conservation strategies. d) Temporary access roads and staging areas will not be located within areas containing sensitive plants, wildlife species or native habitat wherever feasible, so as to avoid or minimize impacts to these species. e) Develop and implement a Worker Environmental Awareness Program (environmental education) to inform project workers of their responsibilities to avoid and minimize impacts on sensitive biological resources.	This Mitigation Measure is not relevant to the proposed project as the project site does not contain any critical habitat or support any species identified or designated as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. The project site is located in an urbanized area of the City and is not identified as a vegetation zone that could serve as species' habitat. No mitigation is required for this impact.

Project Level Mitigation Measure	Applicability to the Project
f) Retain a qualified botanist to document the presence or absence of special status plants before project implementation. g) Appoint a qualified biologist to monitor construction activities that may occur in or adjacent to occupied sensitive species' habitat to facilitate avoidance of resources not permitted for impact. h) Appoint a qualified biologist to monitor implementation of mitigation measures. i) Schedule construction activities to avoid sensitive times for biological resources (e.g. steelhead spawning periods during the winter and spring, nesting bird season) and to avoid the rainy season when erosion and sediment transport is increased. j) Develop an invasive species control plan associated with project construction. k) If construction occurs during breeding seasons in or adjacent to suitable habitat, include appropriate sound attenuation measures required for sensitive avian species and other best management practices appropriate for potential local sensitive wildlife. l) Conduct pre-construction surveys to delineate occupied sensitive species' habitat to facilitate avoidance. m) Where projects are determined to be within suitable habitat and may impact listed or sensitive species that have specific field survey protocols or guidelines outlined by the USFWS, CDFW, or other local agency, conduct preconstruction surveys that follow applicable protocols and guidelines and are conducted by qualified and/or certified personnel.	
PMM BIO-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to riparian habitats and other sensitive natural communities, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Consult with the USFWS and NMFS where such state-designated sensitive or riparian habitats provide potential or occupied habitat for federally listed rare, threatened, and endangered species afforded protection pursuant to the federal ESA. b) Consult with the USFS where such state-designated sensitive or riparian habitats provide potential or occupied habitat for federally listed rare, threatened, and endangered species afforded protection pursuant to the federal ESA and any additional species afforded protection by an adopted Forest Land Management Plan or Resource Management Plan for the four national forests in the six-county area: Angeles, Cleveland, Los Padres, and San Bernardino. c) Consult with the CDFW where such state-designated sensitive or riparian habitats provide potential or occupied habitat for state-listed rare, threatened, and endangered species afforded protection pursuant to the California ESA, or Fully Protected Species afforded protection pursuant to the State Fish and	This Mitigation Measure is not relevant to the proposed project as the project site does not contain any state-designated sensitive habitats, including riparian habitats that are in the jurisdiction and responsibility of U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the California Department of Fish and Wildlife; and other public agencies, and/or Lead Agencies. See Section 4, Biological Resources, of the SCEA for more information.

Project Level Mitigation Measure	Applicability to the Project
Game Code. d) Consult with the CDFW pursuant to the provisions of Section 1600 of the State Fish and Game Code as they relate to Lakes and Streambeds. e) Consult with the USFWS, USFS, CDFW, and counties and cities in the SCAG region, where state-designated sensitive or riparian habitats are occupied by birds afforded protection pursuant to the MBTA during the breeding season. f) Consult with the CDFW for state-designated sensitive or riparian habitats where furbearing mammals, afforded protection pursuant to the provisions of the State Fish and Game Code for fur-beaming mammals, are actively using the areas in conjunction with breeding activities. g) Require project design to avoid sensitive natural communities and riparian habitats, wherever practicable and feasible. h) Where avoidance is determined to be infeasible, develop sufficient conservation measures through coordination with local agencies and the regulatory agency (i.e., USFWS or CDFW) to protect sensitive natural communities and riparian habitats and develop appropriate compensatory mitigation, where required. i) Appoint a qualified wetland biologist to monitor construction activities that may occur in or adjacent to sensitive communities. j) Appoint a qualified wetland biologist to monitor implementation of mitigation measures. k) Schedule construction activities to avoid sensitive times for biological resources and to avoid the rainy season when erosion and sediment transport is increased. l) When construction activities require stream crossings, schedule work during dry conditions and use rubber-wheeled vehicles, when feasible. Have a qualified wetland scientist determine if potential project impacts require a Notification of Lake or Streambed Alteration to CDFW during the planning phase of projects. m) Consult with local agencies, jurisdictions, and landowners where such state-designated sensitive or riparian habitats are afforded protection pursuant an adopted regional conservation plan. n) Install fencing and/or mark sensitive habitat to be avoided during construction activities. o) Salvage and stockpile topsoil (the surface material from 6 to 12 inches deep) and perennial native plants, when recommended by the qualified wetland biologist, for use in restoring native vegetation to areas of temporary disturbance within the project area. Salvage of soils containing invasive species, seeds and/or rhizomes will be avoided as identified by the qualified wetland biologist. p) Revegetate with appropriate native vegetation following the completion of construction activities, as identified by the qualified wetland biologist. q) Complete habitat enhancement (e.g., through	

Project Level Mitigation Measure	Applicability to the Project
removal of non-native invasive wetland species and replacement with more ecologically valuable native species). r) Use Best Management Practices (BMPs) at construction sites to minimize erosion and sediment transport from the area. BMPs include encouraging growth of native vegetation in disturbed areas, using straw bales or other silt-catching devices, and using settling basins to minimize soil transport.	
PMM BIO-3: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to wetlands, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency. a) Require project design to avoid federally protected aquatic resources consistent with the provisions of Sections 404 and 401 of the CWA, wherever practicable and feasible. b) Where the lead agency has identified that a project, or other regionally significant project, has the potential to impact other wetlands or waters, such as those considered Waters Of the State of California under the State Wetland Definition and Procedures for Dischargers of Dredged or Fill Material to Waters of the State, not protected under Section 404 or 401 of the CWA, seek comparable coverage for these wetlands and waters in consultation with the SWRCB, applicable RWQCB, and CDFW. c) Where avoidance is determined to be infeasible, develop sufficient conservation measures to fulfill the requirements of the applicable authorization for impacts to federal and state protected aquatic resource to support issuance of a permit under Section 404 of the CWA as administered by the USACE. The use of an authorized Nationwide Permit or issuance of an individual permit requires the project applicant to demonstrate compliance with the USACE's Final Compensatory Mitigation Rule. The USACE reviews projects to ensure environmental impacts to aquatic resources are avoided or minimized as much as possible. Consistent with the administration's performance standard of "no net loss of wetlands" a USACE permit may require a project proponent to restore, establish, enhance or preserve other aquatic resources in order to replace those affected by the proposed project. This compensatory mitigation process seeks to replace the loss of existing aquatic resource functions and area. Project proponents required to complete mitigation are encouraged to use a watershed approach and watershed planning information. The new rule establishes performance standards, sets timeframes for decision making, and to the extent possible, establishes equivalent requirements and standards for the three sources of compensatory mitigation: — Permittee-responsible mitigation — Contribution of in-kind in-lieu fees	This Mitigation Measure is not relevant to the proposed project as the project site does not contain any state or federally protected wetlands. See Section 4, Biological Resources, of the SCEA for more information.

Project Level Mitigation Measure	Applicability to the Project
— Use of in-kind mitigation bank credits d) Where avoidance is determined to be infeasible and proposed projects' impacts exceed an existing Nationwide Permit (NWP) and/or California SWRCB-certified NWP, or applicable County Special Area Management Plan (SAMP), the lead agency should provide USACE and SWRCB (where applicable) an alternative analysis consistent with the Least Environmentally Damaging Practicable Alternatives in this order of priorities: — Avoidance — Impact Minimization — On-site alternatives — Off-site alternatives e) Require review of construction drawings by a certified wetland delineator as part of each project-specific environmental analysis to determine whether aquatic resources will be affected and, if necessary, perform formal wetland delineation.	
PMM BIO-4: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to wildlife movement, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Consult with the USFS where impacts to migratory wildlife corridors may occur in an area afforded protection by an adopted Forest Land Management Plan or Resource Management Plan for the four national forests in the six-County area: Angeles, Cleveland, Los Padres, and San Bernardino. b) Consult with counties, cities, and other local organizations when impacts may occur to open space areas that have been designated as important for wildlife movement related to local ordinances or conservation plans. c) Prohibit construction activities within 500 feet of occupied breeding areas for wildlife afforded protection pursuant to Title 14 § 460 of the California Code of Regulations protecting fur-bearing mammals, during the breeding season. d) Conduct a survey to identify active raptor and other migratory nongame bird nests by a qualified biologist at least two weeks before the start of construction at project sites from February 1 through August 31. e) Prohibit construction activities with 300 feet of occupied nest of birds afforded protection pursuant to the Migratory Bird Treaty Act, during the breeding season. f) Ensure that suitable nesting sites for migratory nongame native bird species protected under the Migratory Bird Treaty Act and/or trees with unoccupied raptor nests should only be removed prior to February 1, or following the nesting season. g) When feasible and practicable, proposed projects will be designed to minimize impacts to wildlife movement and habitat connectivity and preserve existing and	This Mitigation Measure is not applicable to the proposed project as the project is located in a developed urban area and does not involve the dispersal of wildlife nor would the project result in a barrier to migration or movement. The project would also comply with the Migratory Bird Treaty Act which governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests.

Project Level Mitigation Measure	Applicability to the Project
functional wildlife corridors. h) Conduct site-specific analyses of opportunities to preserve or improve habitat linkages with areas on- and off-site. i) Long linear projects with the possibility of impacting wildlife movement should analyze habitat linkages/wildlife movement corridors on a broad scale to avoid critical narrow choke points that could reduce function of recognized movement corridor. j) Require review of construction drawings and habitat connectivity mapping by a qualified biologist to determine the risk of habitat fragmentation. k) Pursue mitigation banking to preserve habitat linkages and corridors (opportunities to purchase, maintain, and/or restore offsite habitat). l) When practicable and feasible design projects to promote wildlife corridor redundancy by including multiple connections between habitat patches. m) Evaluate the potential for installation of overpasses, underpasses, and culverts to create wildlife crossings in cases where a roadway or other transportation project may interrupt the flow of species through their habitat. Retrofitting of existing infrastructure in project areas should also be considered for wildlife crossings for purposes of mitigation. n) Install wildlife fencing where appropriate to minimize the probability of wildlife injury due to direct interaction between wildlife and roads or construction. o) Where avoidance is determined to be infeasible, design sufficient conservation measures through coordination with local agencies and the regulatory agency (i.e., USFWS or CDFW) and in accordance with the respective counties and cities general plans to establish plans to mitigate for the loss of fish and wildlife movement corridors and/or wildlife nursery sites. The consideration of conservation measures may include the following measures, in addition to the measures outlined in MM-BIO-1(b), where applicable: — Wildlife movement buffer zones — Corridor realignment — Appropriately spaced breaks in center barriers — Stream rerouting — Culverts — Creation of artificial movement corridors such as freeway under- or overpasses — Other comparable measures p) Where the lead agency has identified that a RTP/SCS project, or other regionally significant project, has the potential to impact other open space or nursery site areas, seek comparable coverage for these areas in consultation with the USFWS, CDFW, NMFS, or other local jurisdictions. q) Incorporate applicable and appropriate guidance (e.g. FHWA-HEP-16-059), as well as best	

Project Level Mitigation Measure	Applicability to the Project
management practices, to benefit pollinators with a focus on native plants.	
PMM BIO-5: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce conflicts with local policies and ordinances protecting biological resources, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Consult with the appropriate local agency responsible for the administration of the policy or ordinance protecting biological resources. b) Prioritize retention of trees on-site consistent with local regulations. Provide adequate protection during the construction period for any trees that are to remain standing, as recommended by an International Society of Arboriculture (ISA) certified arborist. c) If specific project area trees are designated as “Protected Trees,” “Landmark Trees,” or “Heritage Trees,” obtain approval for encroachment or removals through the appropriate entity, and develop appropriate mitigation measures at that time, to ensure that the trees are replaced. Mitigation trees shall be locally collected native species, as directed by a qualified biologist. d) Appoint an ISA certified arborist to monitor construction activities that may occur in areas with trees are designated as “Protected Trees,” “Landmark Trees,” or “Heritage Trees,” to facilitate avoidance of resources not permitted for impact. Before the start of any clearing, excavation, construction or other work on the site, securely fence off every protected tree deemed to be potentially endangered by said site work. Keep such fences in place for duration of all such work. Clearly mark all trees to be removed. e) Establish a scheme for the removal and disposal of logs, brush, earth and other debris that will avoid injury to any protected tree. Where proposed development or other site work could encroach upon the protected perimeter of any protected tree, incorporate special measures to allow the roots to breathe and obtain water and nutrients. Minimize any excavation, cutting, filing, or compaction of the existing ground surface within the protected perimeter. Require that no change in existing ground level occur from the base of any protected tree at any time. Require that no burning or use of equipment with an open flame occur near or within the protected perimeter of any protected tree. f) Require that no storage or dumping of oil, gas, chemicals, or other substances that may be harmful to trees occur from the base of any protected trees, or any other location on the site from which such substances might enter the protected perimeter. Require that no heavy construction equipment or construction materials be operated or stored within a distance from the base of any protected trees. Require that wires, ropes, or other devices not be	The proposed project would be subject to the provisions of PMC Chapter 8.52, the City Trees and Tree Protection Ordinance and by complying therewith, would be in compliance with this Mitigation Measure. Construction activities would also be subject to the provisions of PMC Chapter 8.52, the City Trees and Tree Protection Ordinance. Compliance with these provisions would ensure that there would be no potentially significant impacts to on-site biological resources.

Project Level Mitigation Measure	Applicability to the Project
attached to any protected tree, except as needed for support of the tree. Require that no sign, other than a tag showing the botanical classification, be attached to any protected tree. g) Thoroughly spray the leaves of protected trees with water periodically during construction to prevent buildup of dust and other pollution that would inhibit leaf transpiration, as directed by the certified arborist. h) If any damage to a protected tree should occur during or as a result of work on the site, the appropriate local agency will be immediately notified of such damage. If, such tree cannot be preserved in a healthy state, as determined by the certified arborist, require replacement of any tree removed with another tree or trees on the same site deemed adequate by the local agency to compensate for the loss of the tree that is removed. Remove all debris created as a result of any tree removal work from the property within two weeks of debris creation, and such debris shall be properly disposed of in accordance with all applicable laws, ordinances, and regulations. Design projects to avoid conflicts with local policies and ordinances protecting biological resources i) Where avoidance is determined to be infeasible, sufficient conservation measures to fulfill the requirements of the applicable policy or ordinance shall be developed, such as to support issuance of a tree removal permit. The consideration of conservation measures may include: — Avoidance strategies — Contribution of in-lieu fees — Planting of replacement trees — Re-landscaping areas with native vegetation post-construction — Other comparable measures developed in consultation with local agency and certified arborist.	
PMM BIO-6: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects on HCPs and NCCPs, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Consult with the appropriate federal, state, and/or local agency responsible for the administration of HCPs or NCCPs. b) Wherever practicable and feasible, the project shall be designed to avoid lands preserved under the conditions of an HCP or NCCP. c) Where avoidance is determined to be infeasible, sufficient conservation measures to fulfill the requirements of the HCP and/or NCCP, which would include but not be limited to applicable authorization for incidental take pursuant to Section 7 or 10(a) of the federal Endangered Species Act or Section 2081 of the California ESA, shall be developed to support issuance of an incidental take permit or any other permissions required for development within the	This Mitigation Measure is not relevant to the proposed project as no habitat conservation plan or natural community conservation plans encompass the site and no locally designated natural communities occur on or adjacent to the project site. See Section 4, Biological Resources, of the SCEA for further information.

<table>
<tr><th>Project Level Mitigation Measure</th><th>Applicability to the Project</th></tr>
<tr><td>HCP/NCCP boundaries. The consideration of additional conservation measures would include the measures outlined in SMM-BIO-2, where applicable.</td><td></td></tr>
<tr><td colspan="2">Cultural Resources</td></tr>
<tr><td>PMM CULT-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the State CEQA Guidelines, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to historical resources, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency:

a) Pursuant to CEQA Guidelines Section 15064.5, conduct a record search during the project planning phase at the appropriate Information Center to determine whether the project area has been previously surveyed and whether historical resources were identified.

b) During the project planning phase, retain a qualified architectural historian, defined as an individual who meets the Secretary of the Interior's (SOI) Professional Qualification Standards (PQS) in Architectural History, to conduct historic architectural surveys if a built environment resource greater than 45 years in age may be affected by the project or if recommended by the Information Center.

c) Comply with Section 106 of the National Historic Preservation Act (NHPA) including, but not limited to, projects for which federal funding or approval is required for the individual project. This law requires federal agencies to evaluate the impact of their actions on resources included in or eligible for listing in the National Register. Federal agencies must coordinate with the State Historic Preservation Officer in evaluating impacts and developing mitigation. These mitigation measures may include, but are not limited to the following:

— Employ design measures to avoid historical resources and undertake adaptive reuse where appropriate and feasible. If resources are to be preserved, as feasible, carry out the maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction in a manner consistent with the Secretary of the Interior's Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings. If resources would be impacted, impacts should be minimized to the extent feasible.

— Where feasible, noise buffers/walls and/or visual buffers/landscaping should be constructed to preserve the contextual setting of significant built resources.

d) If a project requires the relocation, rehabilitation, or alteration of an eligible historical resource, the Secretary of the Interior's Standards for the Treatment of Historic Properties should be used to the maximum extent possible to ensure the historical significance of the resource is not impaired. The</td><td>The proposed project would not result in a substantial adverse change in the significance of the Old Pasadena Historic District or the Hotel Green/Castle Green or the building at 84 South Fair Oaks Avenue. Impacts on historical resources are less than significant and no mitigation measures are required. See Section 5, Cultural Resources, of the SCEA for further information.</td></tr>
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Project Level Mitigation Measure	Applicability to the Project
application of the standards should be overseen by an architectural historian or historic architect meeting the SOI PQS. Prior to any construction activities that may affect the historical resource, a report, meeting industry standards, should identify and specify the treatment of character-defining features and construction activities and be provided to the Lead Agency for review and approval. e) If a project would result in the demolition or significant alteration of a historical resource eligible for or listed in the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), or local register, recordation should take the form of Historic American Buildings Survey (HABS), Historic American Engineering Record (HAER), or Historic American Landscape Survey (HALS) documentation, and should be performed by an architectural historian or historian who meets the SOI PQS. Recordation should meet the SOI Standards and Guidelines for Architectural and Engineering, which defines the products acceptable for inclusion in the HABS/HAER/HALS collection at the Library of Congress. The specific scope and details of documentation should be developed at the project level in coordination with the Lead Agency. f) During the project planning phase, obtain a qualified archaeologist, defined as one who meets the SOI PQS for archaeology, to conduct a record search at the appropriate Information Center of the California Historical Resources Information System (CHRIS) to determine whether the project area has been previously surveyed and whether resources were identified. g) Contact the NAHC to request a Sacred Lands File search and a list of relevant Native American contacts who may have additional information. h) During the project planning phase, obtain a qualified archaeologist or architectural historian (depending on applicability) to conduct archaeological and/or historic architectural surveys as recommended by the qualified professional, the Lead Agency, or the Information Center. In the event the qualified professional or Information Center will make a recommendation on whether a survey is warranted based on the sensitivity of the project area for archaeological resources. Survey shall be conducted where the records indicate that no previous survey has been conducted, or if survey has not been conducted within the past 10 years. If tribal resources are identified during tribal outreach, consultation, or the record search, a Native American representative traditionally affiliated with the project area, as identified by the NAHC, shall be given the opportunity to provide a representative or monitor to assist with archaeological surveys. i) If potentially significant archaeological resources are identified through survey, and impacts to these resources cannot be avoided, a Phase II Testing and Evaluation investigation should be performed by a qualified archaeologist prior to any construction-related ground-disturbing activities to determine	

Project Level Mitigation Measure	Applicability to the Project
significance. If resources determined significant or unique through Phase II testing, and avoidance is not possible, appropriate resource-specific mitigation measures should be established by the lead agency, in consultation with consulting tribes, where appropriate, and undertaken by qualified personnel. These might include a Phase III data recovery program implemented by a qualified archaeologist and performed in accordance with the OHP's Archaeological Resource Management Reports (ARMR): Recommended Contents and Format and Guidelines for Archaeological Research Designs. Additional options can include 1) interpretative signage, or 2) educational outreach that helps inform the public of the past activities that occurred in this area. Should the project require extended Phase I testing, Phase II evaluation, or Phase III data recovery, a Native American representative traditionally affiliated with the project area, as indicated by the NAHC, shall be given the opportunity to provide a representative or monitor to assist with the archaeological assessments. The long-term disposition of archaeological materials collected from a significant resource should be determined in consultation with the affiliated tribe(s), where relevant; this could include curation with a recognized scientific or educational repository, transfer to the tribe, or respectful reinternment in an area designated by the tribe. j) In cases where the project area is developed and no natural ground surface is exposed, sensitivity for subsurface resources should be assessed based on review of literature, geology, site development history, and consultation with tribal parties. If this archaeological desktop assessment indicates that the project is located in an area sensitive for archaeological resources, as determined by the Lead Agency in consultation with a qualified archaeologist, the project should retain an archaeological monitor and, in the case of sensitivity for tribal resources, a tribal monitor, to observe ground disturbing operations, including but not limited to grading, excavation, trenching, or removal of existing features of the subject property. The archaeological monitor should be supervised by an archaeologist meeting the SOI PQS k) Conduct construction activities and excavation to avoid cultural resources (if identified). If avoidance is not feasible, further work may be needed to determine the importance of a resource. Retain a qualified archaeologist, and/or as appropriate, a qualified architectural historian who should make recommendations regarding the work necessary to assess significance. If the cultural resource is determined to be significant under state or federal guidelines, impacts to the cultural resource will need to be mitigated. l) Stop construction activities and excavation in the area where cultural resources are found until a qualified archaeologist can determine whether these resources are significant, and tribal consultation can be conducted, in the case of tribal resources. If the	

Project Level Mitigation Measure	Applicability to the Project
archaeologist determines that the discovery is significant, its long-term disposition should be determined in consultation with the affiliated tribe(s); this could include curation with a recognized scientific or educational repository, transfer to the tribe, or respectful reinternment in an area designated by the tribe.	
PMM CULT-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to human remains, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) In the event of discovery or recognition of any human remains during construction or excavation activities associated with the project, in any location other than a dedicated cemetery, cease further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the coroner of the county in which the remains are discovered has been informed and has determined that no investigation of the cause of death is required. b) If any discovered remains are of Native American origin, as determined by the county Coroner, an experienced osteologist, or another qualified professional: — Contact the County Coroner to contact the NAHC to designate a Native American Most Likely Descendant (MLD). The MLD should make a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods. This may include obtaining a qualified archaeologist or team of archaeologists to properly excavate the human remains. In some cases, it is necessary for the Lead Agency, qualified archaeologist, or developer to also reach out to the NAHC to coordinate and ensure notification in the event the Coroner is not available. — If the NAHC is unable to identify a MLD, or the MLD fails to make a recommendation within 48 hours after being notified by the commission, or the landowner or his representative rejects the recommendation of the MLD and the mediation by the NAHC fails to provide measures acceptable to the landowner, obtain a culturally affiliated Native American monitor, and an archaeologist, if recommended by the Native American monitor, and rebury the Native American human remains and any associated grave goods, with appropriate dignity, on the property and in a location that is not subject to further subsurface disturbance.	There are no known human remains on the site. The project site is not part of a formal cemetery and is not known to have been used for disposal of historic or prehistoric human remains. Thus, human remains are not expected to be encountered during construction of the proposed project. In the unlikely event that human remains are encountered during project construction, State Health and Safety Code Section 7050.5 requires the project to halt until the County Coroner has made the necessary findings as to the origin and disposition of the remains pursuant to Public Resources Code Section 5097.98. Compliance with these regulations would ensure the proposed project would satisfy applicable requirements of this mitigation measure.
Geology and Soils	

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<tr><th>Project Level Mitigation Measure</th><th>Applicability to the Project</th></tr>
<tr><td>PMM-GEO-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the State CEQA Guidelines, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to historical resources, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency:
a) Consistent with the CBC and local regulatory agencies with oversight of development associated with the Plan, ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert are conducted to ascertain soil types prior to preparation of project designs. These investigations can and should identify areas of potential failure and recommend remedial geotechnical measures to eliminate any problems.
b) Consistent with the requirements of the State Water Resources Control Board (SWRCB) for projects over one acre in size, obtain coverage under the General Construction Activity Storm Water Permit (General Construction Permit) issued by the SWRCB and prepare a stormwater pollution prevention plan (SWPPP) and submit the plan for review and approval by the Regional Water Quality Control Board (RWQCB). At a minimum, the SWPPP should include a description of construction materials, practices, and equipment storage and maintenance; a list of pollutants likely to contact stormwater; site-specific erosion and sedimentation control practices; a list of provisions to eliminate or reduce discharge of materials to stormwater; best management practices (BMPs); and an inspection and monitoring program.
c) Consistent with the requirements of the SWRCB and local regulatory agencies with oversight of development associated with the Plan, ensure that project designs provide adequate slope drainage and appropriate landscaping to minimize the occurrence of slope instability and erosion. Design features should include measures to reduce erosion caused by storm water. Road cuts should be designed to maximize the potential for revegetation.
d) Consistent with the CBC and local regulatory agencies with oversight of development associated with the Plan, ensure that, prior to preparing project designs, new and abandoned wells are identified within construction areas to ensure the stability of nearby soils.</td><td>As analyzed and concluded in Section 7, Geology and Soils, of the SCEA, the project does not have the potential for significant effects related to the exposure of people and infrastructure to the effects of earthquakes, seismic related ground-failure, liquefaction, and seismically induced landslides. The proposed project is not located adjacent to an active fault and is not in within an area subject to risk of liquefaction, landslide, or unstable or expansive soil. Further, the proposed project already complies to this Mitigation Measure as it is subject to the building construction protocols for reducing seismic hazards as provided in the Pasadena Municipal Code. Compliance would help avoid or reduce the potentially significant effects on the potential for projects to result in the exposure of people and infrastructure to the effects of earthquakes, seismic related ground-failure, liquefaction, and seismically induced landslides, that are in the jurisdiction and responsibility of public agencies, regulatory agencies, and/or Lead Agencies. The proposed project would also comply with all seismic standards provided in the California Building Code as approved as approved by the Department of Building and Safety.</td></tr>
<tr><td>PMM GEO-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the State CEQA Guidelines, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to paleontological resources. Such measures may include the following or other comparable measures identified by the Lead Agency:
a) Ensure compliance with the Paleontological Resources Preservation Act, the Federal Land Policy and Management Act, the Antiquities Act, Section 5097.5 of the Public Resources Code (PRC), adopted county and city general plans, and other federal, state and local regulations, as applicable and feasible, by adhering to and incorporating the performance</td><td>The proposed project is not known to contain paleontological resources. Therefore, the project is not expected to encounter a unique paleontological resource or unique geologic feature. As such, this mitigation measure is not applicable to the project. See Section 7, Geology and Soils, of the SCEA for further information.</td></tr>
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Project Level Mitigation Measure	Applicability to the Project
standards and practices from the 2010 Society for Vertebrate Paleontology (SVP) standard procedures for the assessment and mitigation of adverse impacts to paleontological resources. b) Obtain review by a qualified paleontologist (e.g. who meets the SVP standards for a Principal Investigator or Project Paleontologist or the Bureau of Land Management (BLM) standards for a Principal Investigator), to determine if the project has the potential to require ground disturbance of parent material with potential to contain unique paleontological or resources, or to require the substantial alteration of a unique geologic feature. The assessment should include museum records searches, a review of geologic mapping and the scientific literature, geotechnical studies (if available), and potentially a pedestrian survey, if units with paleontological potential are present at the surface. c) Avoid exposure or displacement of parent material with potential to yield unique paleontological resources. d) Where avoidance of parent material with the potential to yield unique paleontological resources is not feasible:	
PMM-GHG-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to greenhouse gas emissions, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Integrate green building measures consistent with CALGreen (California Building Code Title 24), local building codes and other applicable laws, into project design including: i. Use energy efficient materials in building design, construction, rehabilitation, and retrofit. ii. Install energy-efficient lighting, heating, and cooling systems (cogeneration); water heaters; appliances; equipment; and control systems. iii. Reduce lighting, heating, and cooling needs by taking advantage of light-colored roofs, trees for shade, and sunlight. iv. Incorporate passive environmental control systems that account for the characteristics of the natural environment. v. Use high-efficiency lighting and cooking devices. vi. Incorporate passive solar design. vii. Use high-reflectivity building materials and multiple glazing. viii. Prohibit gas-powered landscape maintenance equipment. ix. Install electric vehicle charging stations. x. Reduce wood burning stoves or fireplaces.	Impacts regarding the generation of greenhouse gas emissions were analyzed in Section 8, Greenhouse Gas Emissions, in the SCEA. The proposed project would be consistent with the Pasadena Climate Action Plan by incorporating applicable actions intended to ensure that the project contributes its fair share to the City's cumulative GHG reduction goals. The project would have a less than significant GHG impact and therefore mitigation is not required.

Project Level Mitigation Measure	Applicability to the Project
xi. Provide bike lanes accessibility and parking at residential developments. b) Reduce emissions resulting from projects through implementation of project features, project design, or other measures, such as those described in Appendix F of the State CEQA Guidelines. c) Include off-site measures to mitigate a project's emissions. d) Measures that consider incorporation of Best Available Control Technology (BACT) during design, construction and operation of projects to minimize GHG emissions, including but not limited to: i. Use energy and fuel-efficient vehicles and equipment; ii. Deployment of zero- and/or near zero emission technologies; iii. Use lighting systems that are energy efficient, such as LED technology; iv. Use the minimum feasible amount of GHG-emitting construction materials; v. Use cement blended with the maximum feasible amount of flash or other materials that reduce GHG emissions from cement production; vi. Incorporate design measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse; vii. Incorporate design measures to reduce energy consumption and increase use of renewable energy; viii. Incorporate design measures to reduce water consumption; ix. Use lighter-colored pavement where feasible; x. Recycle construction debris to maximum extent feasible; xi. Plant shade trees in or near construction projects where feasible; and xii. Solicit bids that include concepts listed above. e) Measures that encourage transit use, carpooling, bike-share and car-share programs, active transportation, and parking strategies, including, but not limited to the following: i. Promote transit-active transportation coordinated strategies; ii. Increase bicycle carrying capacity on transit and rail vehicles; iii. Improve or increase access to transit; iv. Increase access to common goods and services, such as groceries, schools, and day care; v. Incorporate affordable housing into the project;	

Project Level Mitigation Measure	Applicability to the Project
vi. Incorporate the neighborhood electric vehicle network; vii. Orient the project toward transit, bicycle and pedestrian facilities; viii. Improve pedestrian or bicycle networks, or transit service; ix. Provide traffic calming measures; x. Provide bicycle parking; xi. Limit or eliminate park supply; xii. Unbundle parking costs; xiii. Provide parking cash-out programs; xiv. Implement or provide access to commute reduction program; f) Incorporate bicycle and pedestrian facilities into project designs, maintaining these facilities, and providing amenities incentivizing their use; and planning for and building local bicycle projects that connect with the regional network; g) Improving transit access to rail and bus routes by incentives for construction of transit facilities within developments, and/or providing dedicated shuttle service to transit stations; and h) Adopting employer trip reduction measures to reduce employee trips such as vanpool and carpool programs, providing end-of-trip facilities, and telecommuting programs including but not limited to measures that: i. Provide car-sharing, bike sharing, and ride-sharing programs; ii. Provide transit passes; iii. Shift single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services; iv. Provide incentives or subsidies that increase that use of modes other than single-occupancy vehicle; v. Provide on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms; vi. Provide employee transportation coordinators at employment sites; vii. Provide a guaranteed ride home service to users of non-auto modes. i) Designate a percentage of parking spaces for ride-sharing vehicles or high-occupancy vehicles, and provide adequate passenger loading and unloading for those vehicles; j) Land use siting and design measures that reduce GHG emissions, including: i. Developing on infill and brownfields sites; ii. Building compact and mixed-use developments near transit; iii. Retaining on-site mature trees and vegetation, and planting new canopy trees;	

Project Level Mitigation Measure	Applicability to the Project
iv. Measures that increase vehicle efficiency, encourage use of zero and low emissions vehicles, or reduce the carbon content of fuels, including constructing or encouraging construction of electric vehicle charging stations or neighborhood electric vehicle networks, or charging for electric bicycles; and v. Measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse. k) Consult the SCAG Environmental Justice Toolbox for potential measures to address impacts to low-income and/or minority communities. The measures provided above are also intended to be applied in low income and minority communities as applicable and feasible.	
Hazards and Hazardous Materials	
PMM HAZ-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to the routine transport, use, or disposal of hazardous materials, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Where the construction or operation of projects involves the transport of hazardous material, provide a written plan of proposed routes of travel demonstrating use of roadways designated for the transport of such materials. b) Specify Project requirements for interim storage and disposal of hazardous materials during construction and operation. Storage and disposal strategies must be consistent with applicable federal, state, and local statutes and regulations. Specify the appropriate procedures for interim storage and disposal of hazardous materials, anticipated to be required in support of operations and maintenance activities, in conformance with applicable federal, state, and local statutes and regulations, in the business plan for projects as applicable and appropriate. c) Submit a Hazardous Materials Business/Operations Plan for review and approval by the appropriate local agency. Once approved, keep the plan on file with the Lead Agency (or other appropriate government agency) and update, as applicable. The purpose of the Hazardous Materials Business/Operations Plan is to ensure that employees are adequately trained to handle the materials and provides information to the local fire protection agency should emergency response be required. The Hazardous Materials Business/Operations Plan should include the following: — The types of hazardous materials or chemicals stored and/or used on-site, such as petroleum fuel products, lubricants, solvents, and cleaning fluids.	The project does not involve the use or storage of hazardous substances other than the small amounts of pesticides, fertilizers and cleaning agents required for normal maintenance of the structure and landscaping. The project must adhere to applicable zoning and fire regulations regarding the use and storage of any hazardous substances. Impacts were found to be less than significant as analyzed in Section 9, Hazards and Hazardous Materials, of the SCEA and mitigation is not required.

Project Level Mitigation Measure	Applicability to the Project
— The location of such hazardous materials. — An emergency response plan including employee training information. — A plan that describes the way these materials are handled, transported and disposed. d) Follow manufacturer's recommendations on use, storage, and disposal of chemical products used in construction. e) Avoid overtopping construction equipment fuel gas tanks. f) Properly contain and remove grease and oils during routine maintenance of construction equipment. g) Properly dispose of discarded containers of fuels and other chemicals. h) Prior to shipment remove the most volatile elements, including flammable natural gas liquids, as feasible. i) Identify and implement more stringent tank car safety standards. j) Improve rail transportation route analysis, and modification of routes based on that analysis. k) Use the best available inspection equipment and protocols and implement positive train control. l) Reduce train car speeds to 40 miles per hour when passing through urbanized areas of any size. m) Limit storage of crude oil tank cars in urbanized areas of any size and provide appropriate security in storage yards for all shipments. n) Notify in advance county and city emergency operations offices of all crude oil shipments, including a contact number that can provide real-time information in the event of an oil train derailment or accident. o) Report quarterly hazardous commodity flow information, including classification and characterization of materials being transported, to all first response agencies (49 Code Fed. Regs. 15.5) along the mainline rail routes used by trains carrying crude oil identified. p) Fund training and outfitting emergency response crews that includes the cost of backfilling personnel while in training. q) Undertake annual emergency responses scenario/field based training including Emergency Operations Center Training activations with local emergency response agencies.	
PMM HAZ-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce hazards related to the reasonably foreseeable upsets and accidents involving the release of hazardous materials, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Removal of the most volatile elements, including flammable natural gas liquids, prior to shipment; b) More stringent tank car safety standards;	The proposed project does not involve hazardous materials. There is no significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions. This mitigation measure is therefore not applicable to the project.

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c) Improved rail transportation route analysis, and modification of routes based on that analysis; d) Utilization of the best available inspection equipment and protocols, and implementation of positive train control; e) Reduced train car speeds to 40 miles per hour when passing through urbanized areas of any size; f) Limitations on storage of hazardous materials tank cars in urbanized areas of any size and provide appropriate security in storage yards for all shipments; g) Advance notification to county and city emergency operations offices of all crude oil and hazardous materials shipments, including a contact number that can provide real-time information in the event of an oil train derailment or accident; h) Quarterly hazardous commodity flow information, including classification and characterization of materials being transported, to all first response agencies (49 Code Fed. Regs. 15.5) along the mainline rail routes used by trains carrying hazardous materials.	
PMM HAZ-3: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to the release of hazardous materials within one-quarter mile of schools, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Where the construction and operation of projects involves the transport of hazardous materials, avoid transport of such materials within one-quarter mile of schools, when school is in session, wherever feasible. b) Where it is not feasible to avoid transport of hazardous materials, within one-quarter mile of schools on local streets, provide notifications of the anticipated schedule of transport of such materials.	The project does not involve hazardous emissions or the handling of hazardous materials, substance, or waste and is not within one-quarter mile of an existing or proposed school; the closest schools are the Waverly School and St. Andrews Elementary School, both of which are approximately one-half mile away. Therefore, the proposed project would have no hazardous material related impacts to schools. This mitigation measure is not applicable to the project.
PMM HAZ-4: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to projects that are located on a site which is included on the Cortese List, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) For any listed sites or sites that have the potential for residual hazardous materials as a result of historic land uses, complete a Phase I Environmental Site Assessment, including a review and consideration of data from all known databases of contaminated sites, during the process of planning, environmental clearance, and construction for projects. b) Where warranted due to the known presence of contaminated materials, submit to the appropriate agency responsible for hazardous materials/wastes oversight a Phase II Environmental Site Assessment report if warranted by a Phase I report for the project site. The reports should make recommendations for	Searches conducted using the California State Water Resources Control Board Geotracker and the Department of Toxic Substances Control EnviroStor did not reveal any potentially hazardous sites within 1000 feet of the project site. The site is not known or anticipated to have been contaminated with hazardous materials and no hazardous material storage facilities are known to exist onsite. This mitigation measure is not applicable.

Project Level Mitigation Measure	Applicability to the Project
remedial action, if appropriate, and be signed by a Registered Environmental Assessor, Professional Geologist, or Professional Engineer. c) Implement the recommendations provided in the Phase II Environmental Site Assessment report, where such a report was determined to be necessary for the construction or operation of the project, for remedial action. d) Submit a copy of all applicable documentation required by local, state, and federal environmental regulatory agencies, including but not limited to: permit applications, Phase I and II Environmental Site Assessments, human health and ecological risk assessments, remedial action plans, risk management plans, soil management plans, and groundwater management plans. e) Conduct soil sampling and chemical analyses of samples, consistent with the protocols established by the U.S. EPA to determine the extent of potential contamination beneath all underground storage tanks (USTs), elevator shafts, clarifiers, and subsurface hydraulic lifts when on-site demolition or construction activities would potentially affect a particular development or building. f) Consult with the appropriate local, state, and federal environmental regulatory agencies to ensure sufficient minimization of risk to human health and environmental resources, both during and after construction, posed by soil contamination, groundwater contamination, or other surface hazards including, but not limited to, underground storage tanks, fuel distribution lines, waste pits and sumps. g) Obtain and submit written evidence of approval for any remedial action if required by a local, state, or federal environmental regulatory agency. h) Cease work if soil, groundwater, or other environmental medium with suspected contamination is encountered unexpectedly during construction activities (e.g., identified by odor or visual staining, or if any underground storage tanks, abandoned drums, or other hazardous materials or wastes are encountered), in the vicinity of the suspect material. Secure the area as necessary and take all appropriate measures to protect human health and the environment, including but not limited to, notification of regulatory agencies and identification of the nature and extent of contamination. Stop work in the areas affected until the measures have been implemented consistent with the guidance of the appropriate regulatory oversight authority. i) Soil generated by construction activities should be stockpiled on-site in a secure and safe manner. All contaminated soils determined to be hazardous or non-hazardous waste must be adequately profiled (sampled) prior to acceptable reuse or disposal at an appropriate off-site facility. Complete sampling and handling and transport procedures for reuse or disposal, in accordance with applicable local, state and federal laws and policies. j) Groundwater pumped from the subsurface should be contained on-site in a secure and safe manner, prior	

Project Level Mitigation Measure	Applicability to the Project
to treatment and disposal, to ensure environmental and health issues are resolved pursuant to applicable laws and policies. Utilize engineering controls, which include impermeable barriers to prohibit groundwater and vapor intrusion into the building. k) As needed and appropriate, prior to issuance of any demolition, grading, or building permit, submit for review and approval by the Lead Agency (or other appropriate government agency) written verification that the appropriate federal, state and/or local oversight authorities, including but not limited to the Regional Water Quality Control Board (RWQCB), have granted all required clearances and confirmed that the all applicable standards, regulations, and conditions have been met for previous contamination at the site. l) Develop, train, and implement appropriate worker awareness and protective measures to assure that worker and public exposure is minimized to an acceptable level and to prevent any further environmental contamination as a result of construction. m) If asbestos-containing materials (ACM) are found to be present in building materials to be removed, submit specifications signed by a certified asbestos consultant for the removal, encapsulation, or enclosure of the identified ACM in accordance with all applicable laws and regulations, including but not necessarily limited to: California Code of Regulations, Title 8; Business and Professions Code; Division 3; California Health and Safety Code Section 25915-25919.7; and other local regulations. n) Where projects include the demolitions or modification of buildings constructed prior to 1978, complete an assessment for the potential presence or lack thereof of ACM, lead based paint, and any other building materials or stored materials classified as hazardous waste by state or federal law. o) Where the remediation of lead-based paint has been determined to be required, provide specifications to the appropriate agency, signed by a certified Lead Supervisor, Project Monitor, or Project Designer for the stabilization and/or removal of the identified lead paint in accordance with all applicable laws and regulations, including but not necessarily limited to: California Occupational Safety and Health Administration's (Cal OSHA's) Construction Lead Standard, Title 8 California Code of Regulations (CCR) Section 1532.1 and Department of Health Services (DHS) Regulation 17 CCR Sections 35001–36100, as may be amended. If other materials classified as hazardous waste by state or federal law are present, the project sponsor should submit written confirmation to the appropriate local agency that all state and federal laws and regulations should be followed when profiling, handling, treating, transporting, and/or disposing of such materials.	
PMM HAZ-5: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should	The construction and operation of the proposed project would not place any permanent or temporary physical barriers on any existing public streets. To ensure compliance with zoning,

<table>
<tr><th>Project Level Mitigation Measure</th><th>Applicability to the Project</th></tr>
<tr><td>consider mitigation measures to reduce substantial adverse effects which may impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency:
a) Continue to coordinate locally and regionally based on ongoing review and integration of projected transportation and circulation conditions.
b) Develop new methods of conveying projected and real time information to citizens using emerging electronic communication tools including social media and cellular networks;
c) Continue to evaluate lifeline routes for movement of emergency supplies and evacuation.</td><td>building and fire codes, the applicant is required to submit appropriate plans for plan review prior to the issuance of a building permit. Adherence to these requirements ensures that the project will not have a significant impact on emergency response and evacuation plans. This mitigation measure is not applicable.</td></tr>
<tr><td colspan="2">Hydrology and Water Quality</td></tr>
<tr><td>PMM HYD-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the State CEQA Guidelines, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects from violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency:
a) Complete, and have approved, a Stormwater Pollution Prevention Plan (SWPPP) prior to initiation of construction.
b) Implement Best Management Practices to reduce the peak stormwater runoff from the project site to the maximum extent practicable.
c) Comply with the Caltrans storm water discharge permit as applicable; and identify and implement Best Management Practices to manage site erosion, wash water runoff, and spill control.
d) Complete, and have approved, a Standard Urban Stormwater Management Plan, prior to occupancy of residential or commercial structures.
e) Ensure adequate capacity of the surrounding stormwater system to support stormwater runoff from new or rehabilitated structures or buildings.
f) Prior to construction within an area subject to Section 404 of the Clean Water Act, obtain all required permit approvals and certifications for construction within the vicinity of a watercourse:
g) Where feasible, restore or expand riparian areas such that there is no net loss of impervious surface as a result of the project.
h) Install structural water quality control features, such as drainage channels, detention basins, oil and grease traps, filter systems, and vegetated buffers to prevent pollution of adjacent water resources by polluted runoff where required by applicable urban storm water runoff discharge permits, on new facilities.
i) Provide operational best management practices for street cleaning, litter control, and catch basin cleaning are implemented to prevent water quality degradation in compliance with applicable storm water runoff</td><td>Though the proposed project would add typical, urban, nonpoint source pollutants to stormwater runoff, the proposed project will comply with local regulations as required by the countywide MS4 permit regarding stormwater runoff. This would ensure the proposed project complies with this Mitigation Measure and would help avoid or reduce the potential impacts on water quality or related waste discharge requirements that are within the jurisdiction and authority of the Regional Water Quality Control Boards and other regulatory agencies. See Section 10, Hydrology and Water Quality, of the SCEA for further information.</td></tr>
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Project Level Mitigation Measure	Applicability to the Project
discharge permits; and ensure treatment controls are in place as early as possible, such as during the acquisition process for rights-of-way, not just later during the facilities design and construction phase. j) Comply with applicable municipal separate storm sewer system discharge permits as well as Caltrans' storm water discharge permit including long-term sediment control and drainage of roadway runoff. k) Incorporate as appropriate treatment and control features such as detention basins, infiltration strips, and porous paving, other features to control surface runoff and facilitate groundwater recharge into the design of new transportation projects early on in the process to ensure that adequate acreage and elevation contours are provided during the right-of-way acquisition process. l) Upgrade stormwater drainage facilities to accommodate any increased runoff volumes. These upgrades may include the construction of detention basins or structures that will delay peak flows and reduce flow velocities, including expansion and restoration of wetlands and riparian buffer areas. System designs shall be completed to eliminate increases in peak flow rates from current levels. m) Encourage Low Impact Development (LID) and incorporation of natural spaces that reduce, treat, infiltrate and manage stormwater runoff flows in all new developments, where practical and feasible.	
PMM HYD-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects from violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Avoid designs that require continual dewatering where feasible. For projects requiring continual dewatering facilities, implement monitoring systems and long-term administrative procedures to ensure proper water management that prevents degrading of surface water and minimizes adverse impacts on groundwater for the life of the project, Construction designs shall comply with appropriate building codes and standard practices including the Uniform Building Code. a) Maximize, where practical and feasible, permeable surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. Minimize new impervious surfaces, including the use of in-lieu fees and off-site mitigation. b) Avoid construction and siting on groundwater recharge areas, to prevent conversion of those areas to impervious surface. c) Reduce hardscape to the extent feasible to facilitate groundwater recharge as appropriate.	Though the proposed project would add typical, urban, nonpoint source pollutants to stormwater runoff, the proposed project will comply with local regulations as required by the countywide MS4 permit regarding stormwater runoff. This would ensure the proposed project complies with this Mitigation Measure and would help avoid or reduce the potential impacts on water quality or related waste discharge requirements that are within the jurisdiction and authority of the Regional Water Quality Control Boards and other regulatory agencies. See Section 10, Hydrology and Water Quality, of the SCEA for further information.

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PMM HYD-4: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures capable of avoiding or reducing the potential impacts of locating structures that would impede or redirect flood flows, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Ensure that all roadbeds for new highway and rail facilities be elevated at least one foot above the 100-year base flood elevation. Since alluvial fan flooding is not often identified on FEMA flood maps, the risk of alluvial fan flooding should be evaluated and projects should be sited to avoid alluvial fan flooding. Delineation of floodplains and alluvial fan boundaries should attempt to account for future hydrologic changes caused by global climate change.	The proposed project would not substantially change the site's drainage patterns and would not alter a discernable drainage course resulting in flooding. The proposed project would be required to submit a drainage plan to the Building Division and the Department of Public Works for review and approval. Compliance with the City's drainage plan review and approval process would reduce the likelihood that the proposed project would lead to on-site or off-site flooding. This mitigation measure is not applicable.
Land Use and Planning	
PMM LU-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects that physically divide a community, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Facilitate good design for land use projects that build upon and improve existing circulation patterns b) Encourage implementing agencies to orient transportation projects to minimize impacts on existing communities by: — Selecting alignments within or adjacent to existing public rights of way. — Design sections above or below-grade to maintain viable vehicular, cycling, and pedestrian connections between portions of communities where existing connections are disrupted by the transportation project. — Wherever feasible incorporate direct crossings, overcrossings, or under crossings at regular intervals for multiple modes of travel (e.g., pedestrians, bicyclists, vehicles). c) Where it has been determined that it is infeasible to avoid creating a barrier in an established community, consider other measures to reduce impacts, including but not limited to: — Alignment shifts to minimize the area affected. — Reduction of the proposed right-of-way take to minimize the overall area of impact. — Provisions for bicycle, pedestrian, and vehicle access across improved roadways.	The proposed project consists of an infill development within a highly urbanized area of the City of Pasadena. The project would not physically divide an existing community. This mitigation measure is not applicable to the project.
PMM LU-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse	This mitigation measure is not applicable to the project as the proposed project would not physically divide an existing community and would not conflict with any land use plan,

Project Level Mitigation Measure	Applicability to the Project
effects that physically divide a community, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) When an inconsistency with the adopted general plan policy or land use regulation (adopted for the purpose of avoiding or mitigating an impact) is identified modify the transportation or land use project to eliminate the conflict; or, determine if the environmental, social, economic, and engineering benefits of the project warrant an amendment to the general plan or land use regulation.	policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.
Mineral Resources	
PMM MIN-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce the use of mineral resources that could be of value to the region, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Provide for the efficient use of known aggregate and mineral resources or locally important mineral resource recovery sites, by ensuring that the consumptive use of aggregate resources is minimized and that access to recoverable sources of aggregate is not precluded, as a result of construction, operation and maintenance of projects. b) Where avoidance is infeasible, minimize impacts to the efficient and effective use of recoverable sources of aggregate through measures that have been identified in county and city general plans, or other comparable measures such as: 1) Recycle and reuse building materials resulting from demolition, particularly aggregate resources, to the maximum extent practicable. 2) Identify and use building materials, particularly aggregate materials, resulting from demolition at other construction sites in the SCAG region, or within a reasonable hauling distance of the project site. 3) Design transportation network improvements in a manner (such as buffer zones or the use of screening) that does not preclude adjacent or nearby extraction of known mineral and aggregate resources following completion of the improvement and during long-term operations. 4) Avoid or reduce impacts on known aggregate and mineral resources and mineral resource recovery sites through the evaluation and selection of project sites and design features (e.g., buffers) that minimize impacts on land suitable for aggregate and mineral resource extraction by maintaining portions of MRZ-2 areas in open space or other general plan land use categories and zoning that allow for mining of mineral resources.	No active mining operations exist in the City of Pasadena. The project site is not within any of the areas designated by the City of Pasadena that may contain mineral resources. No active mining operations exist in the City of Pasadena and mining is not currently allowed within any of the City's designated land uses. This mitigation measure is not applicable.

Project Level Mitigation Measure	Applicability to the Project
Noise	
PMM NOISE-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Install temporary noise barriers during construction. b) Include permanent noise barriers and sound-attenuating features as part of the project design. Barriers could be in the form of outdoor barriers, sound walls, buildings, or earth berms to attenuate noise at adjacent sensitive uses. c) Schedule construction activities consistent with the allowable hours pursuant to applicable general plan noise element or noise ordinance d) Post procedures and phone numbers at the construction site for notifying the Lead Agency staff, local Police Department, and construction contractor (during regular construction hours and off-hours), along with permitted construction days and hours, complaint procedures, and who to notify in the event of a problem. e) Notify neighbors and occupants within 300 feet of the project construction area at least 30 days in advance of anticipated times when noise levels are expected to exceed limits established in the noise element of the general plan or noise ordinance. f) Designate an on-site construction complaint and enforcement manager for the project. g) Ensure that construction equipment are properly maintained per manufacturers' specifications and fitted with the best available noise suppression devices (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds silencers, wraps). All intake and exhaust ports on power equipment shall be muffled or shielded. h) Use hydraulically or electrically powered tools (e.g., jack hammers, pavement breakers, and rock drills) for project construction to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust should be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves should be used, if such jackets are commercially available, and this could achieve a further reduction of 5 dBA. Quieter procedures should be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures. i) Where feasible, design projects so that they are depressed below the grade of the existing noise-sensitive receptor, creating an effective barrier between the roadway and sensitive receptors. j) Where feasible, improve the acoustical insulation of	There would be no significant noise impacts associated with the proposed project, therefore this Mitigation Measure is not applicable. The proposed project is subject to the following regulatory compliance measures that avoid or reduce the significant effects of noise impacts that are in the jurisdiction and responsibility of public agencies and/or Lead Agencies: The project must comply with the City of Pasadena Noise Ordinance (Chapter 9.36 of the Pasadena Municipal Code) which establishes exterior noise standards by land use and the maximum duration of time that the noise standards may be exceeded without being considered a nuisance punishable by law. See Section 13, Noise, of the SCEA for more information

Project Level Mitigation Measure	Applicability to the Project
dwelling units where setbacks and sound barriers do not provide sufficient noise reduction. k) Using rubberized asphalt or “quiet pavement” to reduce road noise for new roadway segments, roadways in which widening or other modifications require re-pavement, or normal reconstruction of roadways where re-pavement is planned l) Projects that require pile driving or other construction noise above 90 dBA in proximity to sensitive receptors, should reduce potential pier drilling, pile driving and/or other extreme noise generating construction impacts greater than 90 dBA; a set of site-specific noise attenuation measures should be completed under the supervision of a qualified acoustical consultant. m) Use land use planning measures, such as zoning, restrictions on development, site design, and buffers to ensure that future development is compatible with adjacent transportation facilities and land uses; n) Monitor the effectiveness of noise reduction measures by taking noise measurements and installing adaptive mitigation measures to achieve the standards for ambient noise levels established by the noise element of the general plan or noise ordinance. o) Use equipment and trucks with the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds, wherever feasible) for project construction. p) Stationary noise sources can and should be located as far from adjacent sensitive receptors as possible and they should be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the Lead Agency (or other appropriate government agency) to provide equivalent noise reduction. q) Use of portable barriers in the vicinity of sensitive receptors during construction. r) Implement noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings (for instance by the use of sound blankets), and implement if such measures are feasible and would noticeably reduce noise impacts. s) Monitor the effectiveness of noise attenuation measures by taking noise measurements. t) Maximize the distance between noise-sensitive land uses and new roadway lanes, roadways, rail lines, transit centers, park-and-ride lots, and other new noise-generating facilities. u) Construct sound reducing barriers between noise sources and noise-sensitive land uses. v) Stationary noise sources can and should be located as far from adjacent sensitive receptors as possible and they should be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the Lead Agency (or other appropriate government agency) to provide equivalent noise reduction.	

Project Level Mitigation Measure	Applicability to the Project
w) Use techniques such as grade separation, buffer zones, landscaped berms, dense plantings, sound walls, reduced-noise paving materials, and traffic calming measures. x) Locate transit-related passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations away from sensitive receptors to the maximum extent feasible. y) Consult the SCAG Environmental Justice Toolbox for potential measures to address impacts to low-income and/or minority communities.	
PMM NOISE-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to vibration, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) For projects that require pile driving or other construction techniques that result in excessive vibration, such as blasting, determine the potential vibration impacts to the structural integrity of the adjacent buildings within 50 feet of pile driving locations. b) For projects that require pile driving or other construction techniques that result in excessive vibration, such as blasting, determine the threshold levels of vibration and cracking that could damage adjacent historic or other structure, and design means and construction methods to not exceed the thresholds. c) For projects where pile driving would be necessary for construction due to geological conditions, utilize quiet pile driving techniques such as predrilling the piles to the maximum feasible depth, where feasible. Predrilling pile holes will reduce the number of blows required to completely seat the pile and will concentrate the pile driving activity closer to the ground where pile driving noise can be shielded more effectively by a noise barrier/curtain. d) Restrict construction activities to permitted hours in accordance with local jurisdiction regulation. e) Properly maintain construction equipment and outfit construction equipment with the best available noise suppression devices (e.g., mufflers, silences, wraps). f) Prohibit idling of construction equipment for extended periods of time in the vicinity of sensitive receptors.	Implementation of Mitigation Measures NOI-1 and NOI-2, listed in Section 13, Noise, of the SCEA, would reduce potential vibration impacts during project construction to a less than significant level. These mitigation measures are comparable to PMM NOISE-2 of the SCAG Connect SoCal EIR.
Population and Housing	
PMM-POP-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce the displacement of existing housing, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Evaluate alternate route alignments and transportation facilities that minimize the displacement of homes and businesses. Use an	The project site does not contain any existing dwelling units. Therefore, the project would not displace existing housing and this mitigation measure is not applicable.

Project Level Mitigation Measure	Applicability to the Project
iterative design and impact analysis where impacts to homes or businesses are involved to minimize the potential of impacts on housing and displacement of people. b) Prioritize the use existing ROWs, wherever feasible. c) Develop a construction schedule that minimizes potential neighborhood deterioration from protracted waiting periods between right-of-way acquisition and construction. d) Review capacities of available urban infrastructure and augment capacities as needed to accommodate demand in locations where growth is desirable to the local lead Agency and encouraged by the SCS (primarily TPAs, where applicable). e) When General Plans and other local land use regulations are amended or updated, use the most recent growth projections and RHNA allocation plan.	
Public Services	
PMM PSP-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects of constructing new emergency response facilities, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: • Coordinate with emergency response agencies to ensure that there are adequate governmental facilities to maintain acceptable service ratios, response times or other performance objectives for emergency response services and that any required additional construction of buildings is incorporated in to the project description. • Where current levels of services at the project site are found to be inadequate, provide fair share contributions towards infrastructure improvements, as appropriate and applicable, to mitigate identified CEQA impacts. • Project sponsors can and should develop traffic control plans for individual projects. Traffic control plans should include information on lane closures and the anticipated flow of traffic during the construction period. The basic objective of each traffic control plan (TCP) is to permit the contractor to work within the public right of way efficiently and effectively while maintaining a safe, uniform flow of traffic. The construction work and the public traveling through the work zone in vehicles, bicycles or as pedestrians must be given equal consideration when developing a traffic control plan.	This mitigation measure is not applicable to the project as the proposed project would not require the construction or alteration of emergency response facilities. See Section 15, Public Services, of the SCEA for further information.
PMM PSS-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the State CEQA Guidelines, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects of constructing new or physically altered school facilities, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Where construction or expansion of school facilities is required to meet public school service ratios, require school district fees, as applicable.	This mitigation measure is addressed as the project would require fees to reduce impacts as to a less than significant impact. A fee is collected by the City's Building Official for PSUD on each residential unit constructed, as well as a fee for non-residential development. Payment of this fee mitigates any impacts on schools.

Project Level Mitigation Measure	Applicability to the Project
P**MM PSL-1:** In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects of construction of new or altered library facilities, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Where construction or expansion of library facilities is required to meet public library service ratios, require library fees, as appropriate and applicable, to mitigate identified CEQA impacts.	This mitigation measure is not applicable as the project would not cause a significant impact with regard to library services. The City as a whole is well served by its Public Information (library) System; and the project would not significantly impact library services and no new or expanded library facilities would be needed.
Recreation	
PMM REC-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects on the use of existing neighborhood and regional parks or other recreational facilities, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Prior to the issuance of permits, where projects require the construction or expansion of recreational facilities or the payment of equivalent Quimby fees, consider increasing the accessibility to natural areas and lands for outdoor recreation from the proposed project area, in coordination with local and regional open space planning and/or responsible management agencies. b) Prior to the issuance of permits, where projects require the construction or expansion of recreational facilities or the payment of equivalent Quimby fees, encourage patterns of urban development and land use which reduce costs on infrastructure and make better use of existing facilities, using strategies such as: i. Increasing the accessibility to natural areas for outdoor recreation ii. Utilizing "green" development techniques iii. Promoting water-efficient land use and development iv. Encouraging multiple uses, such as the joint use of schools v. Including trail systems and trail segments in General Plan recreation standards.	In accordance with Ordinance No. 6252, the City collects a park impact fee for each residential unit constructed and on each residential addition over 400 sq. ft. in size. These fees are used to fund land acquisition and capital improvements. The project itself would not lead to substantial physical deterioration of any recreational facilities, and would have no related significant impacts.
Transportation	
PMM-TRA-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to transportation-related impacts, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: • Transportation demand management (TDM) strategies should be incorporated into individual land use and transportation projects and plans, as part of the planning process. Local agencies should incorporate strategies identified in the Federal Highway Administration's publication: Integrating	The project would be subject to City standards for vehicle miles traveled (VMT) per capita, proximity and quality of bicycle network, proximity and quality of transit network, and pedestrian accessibility, as well as the Congestion Management Plan. Transportation impacts were concluded to be less than significant. See Section 17, Transportation, of the SCEA for further information.

Project Level Mitigation Measure	Applicability to the Project
Demand Management into the Transportation Planning Process: A Desk Reference (August 2012) into the planning process (FHWA 2012). For example, the following strategies may be included to encourage use of transit and non-motorized modes of transportation and reduce vehicle miles traveled on the region's roadways: — include TDM mitigation requirements for new developments; — incorporate supporting infrastructure for non-motorized modes, such as, bike lanes, secure bike parking, sidewalks, and crosswalks; — provide incentives to use alternative modes and reduce driving, such as, universal transit passes, road and parking pricing; — implement parking management programs, such as parking cash-out, priority parking for carpools and vanpools; — develop TDM-specific performance measures to evaluate project-specific and system-wide performance; — incorporate TDM performance measures in the decision-making process for identifying transportation investments; — implement data collection programs for TDM to determine the effectiveness of certain strategies and to measure success over time; and — set aside funding for TDM initiatives. — The increase in per capita VMT on facilities experiencing LOS F represents a significant impact compared to existing conditions. To assess whether implementation of these specific mitigation strategies would result in measurable traffic congestion reductions, implementing actions may need to be further refined within the overall parameters of the proposed Plan and matched to local conditions in any subsequent project-level environmental analysis.	
PMM TRA-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects which may substantially impair implementation of an adopted emergency response plan or emergency evacuation plan, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Prior to construction, project implementation agencies can and should ensure that all necessary local and state road and railroad encroachment permits are obtained. The project implementation agency can and should also comply with all applicable conditions of approval. As deemed necessary by the governing jurisdiction, the road	The ingress and egress for the site have been evaluated by the PasDOT and found to be adequate for emergency access or access to nearby uses. The project does not involve the elimination of a through-route, does not involve the narrowing of a roadway, and all proposed roadways, access roads and drive lanes meet the Pasadena Fire Department's access standards. The project must comply with all State and local Building, Fire and Safety Codes and plans are subject to review and approval by the Public Works and the Transportation Departments, and the Building Division and Fire Department. Therefore, there will would be no significant impacts related to inadequate emergency access.

Project Level Mitigation Measure	Applicability to the Project
encroachment permits may require the contractor to prepare a traffic control plan in accordance with professional engineering standards prior to construction. Traffic control plans can and should include the following requirements: — Identification of all roadway locations where special construction techniques (e.g., directional drilling or night construction) would be used to minimize impacts to traffic flow. — Development of circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone. — Scheduling of truck trips outside of peak morning and evening commute hours. — Limiting of lane closures during peak hours to the extent possible. — Usage of haul routes minimizing truck traffic on local roadways to the extent possible. — Inclusion of detours for bicycles and pedestrians in all areas potentially affected by project construction. — Installation of traffic control devices as specified in the California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones. — Development and implementation of access plans for highly sensitive land uses such as police and fire stations, transit stations, hospitals, and schools. The access plans would be developed with the facility owner or administrator. To minimize disruption of emergency vehicle access, affected jurisdictions can and should be asked to identify detours for emergency vehicles, which will then be posted by the contractor. Notify in advance the facility owner or operator of the timing, location, and duration of construction activities and the locations of detours and lane closures. — Storage of construction materials only in designated areas. — Coordination with local transit agencies for temporary relocation of routes or bus stops in work zones, as necessary. — Ensure the rapid repair of transportation infrastructure in the event of an emergency through cooperation among public agencies and by identifying critical infrastructure needs necessary for: a) emergency responders to enter the region, b) evacuation of affected facilities, and c) restoration of utilities.	

Project Level Mitigation Measure	Applicability to the Project
— Enhance emergency preparedness awareness among public agencies and with the public at large.	
Tribal Cultural Resources	
PMM TCR-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects on tribal cultural resources, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria; b) Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following: protecting the cultural character and integrity of the resource; protecting the traditional use of the resource; and protecting the confidentiality of the resource; c) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places; and protecting the resource.	In compliance with this mitigation measure, the Lead Agency has considered mitigation measures consistent with Section 15064.5 of the State CEQA Guidelines and, accordingly, incorporated a comparable mitigation measure. Mitigation Measure TCR-1, in Section 18, Tribal Cultural Resources, of the SCEA would reduce impacts to tribal cultural resources to a less than significant level.
Utilities and Service Systems	
PMM USSW-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce the generation of solid waste, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: Integrate green building measures with CALGreen (California Building Code Title 24) into project design, including but not limited to the following: a) Reuse and minimization of construction and demolition (C&D) debris and diversion of C&D waste from landfills to recycling facilities. b) Inclusion of a waste management plan that promotes maximum C&D diversion. c) Source reduction through (1) use of materials that are more durable and easier to repair and maintain, (2) design to generate less scrap material through dimensional planning, (3) increased recycled content, (4) use of reclaimed materials, and (5) use of structural materials in a dual role as finish material (e.g., stained concrete flooring, unfinished ceilings, etc.). d) Reuse of existing structure and shell in renovation projects. e) Development of indoor recycling program and space. f) Discourage the siting of new landfills unless all other	This Mitigation Measure is not applicable to the proposed project. Solid waste generated from construction and operation of the proposed project would be able to be sufficiently served by available landfills, and the proposed project would comply with AB 939, which requires California cities to achieve at least a 50 percent diversion rate for all solid waste, and would be subject to PMC Chapters 8.61 and 8.62 relating to waste recycling and construction waste. Further, the proposed project would be required to meet the standards of California Green Building Standards Code, and would be required to comply with design requirements for refuge storage areas (PMC Section 17.40.120).

Project Level Mitigation Measure	Applicability to the Project
waste reduction and prevention actions have been fully explored. If landfill siting or expansion is necessary, site landfills with an adequate landfill-owned, undeveloped land buffer to minimize the potential adverse impacts of the landfill in neighboring communities. g) Discourage exporting of locally generated waste outside of the SCAG region during the construction and implementation of a project. Encourage disposal within the county where the waste originates as much as possible. Promote green technologies for long-distance transport of waste (e.g., clean engines and clean locomotives or electric rail for waste-by-rail disposal systems) and consistency with SCAQMD and Connect SoCal policies can and should be required. h) Encourage waste reduction goals and practices and look for opportunities for voluntary actions to exceed the 80 percent waste diversion target. i) Encourage the development of local markets for waste prevention, reduction, and recycling practices by supporting recycled content and green procurement policies, as well as other waste prevention, reduction and recycling practices. j) Develop ordinances that promote waste prevention and recycling activities such as: requiring waste prevention and recycling efforts at all large events and venues; implementing recycled content procurement programs; and developing opportunities to divert food waste away from landfills and toward food banks and composting facilities. k) Develop and site composting, recycling, and conversion technology facilities that have minimum environmental and health impacts. l) Integrate reuse and recycling into residential industrial, institutional and commercial projects. m) Provide education and publicity about reducing waste and available recycling services. n) Implement or expand city or county-wide recycling and composting programs for residents and businesses. This could include extending the types of recycling services offered (e.g., to include food and green waste recycling) and providing public education and publicity about recycling services.	
PMM-USWW-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects on utilities and service systems, particularly for construction of wastewater facilities, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: • During the design and CEQA review of individual future projects, implementing agencies and projects sponsors shall determine whether sufficient wastewater capacity exists for the proposed projects. There CEQA determinations must ensure that the proposed development can be served by its existing or planned treatment capacity. If adequate capacity does not exist, project sponsors shall	The proposed project would be subject to a County Sanitation Districts' sewer connection fee when the project is hooked up to a sewer line. In order to cover current and future infrastructure costs for sewer facilities located in the City, the proposed project may also be subject to a Sewer Facility Fee Charge as specified under PMC 4.53, if it is determined that there is an increase in the average daily flow compared to existing conditions. Therefore, impacts on available wastewater treatment capacity of the wastewater treatment plants that serve the project site would be less than significant.

Project Level Mitigation Measure	Applicability to the Project
coordinate with the relevant service provider to ensure that adequate public services and utilities could accommodate the increased demand, and if not, infrastructure improvements for the appropriate public service or utility shall be identified in each project's CEQA documentation. The relevant public service provider or utility shall be responsible for undertaking project-level review as necessary to provide CEQA clearance for new facilities.	
PMM USWS-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to ensure sufficient water supplies, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Reduce exterior consumptive uses of water in public areas, and should promote reductions in private homes and businesses, by shifting to drought-tolerant native landscape plantings, using weather-based irrigation systems, educating other public agencies about water use, and installing related water pricing incentives. b) Promote the availability of drought-resistant landscaping options and provide information on where these can be purchased. Use of reclaimed water especially in median landscaping and hillside landscaping can and should be implemented where feasible. c) Implement water conservation best practices such as low-flow toilets, water-efficient clothes washers, water system audits, and leak detection and repair. d) For projects located in an area with existing reclaimed water conveyance infrastructure and excess reclaimed water capacity, use reclaimed water for non- potable uses, especially landscape irrigation. For projects in a location planned for future reclaimed water service, projects should install dual plumbing systems in anticipation of future use. Large developments could treat wastewater onsite to tertiary standards and use it for non-potable uses onsite.	This mitigation measure is not applicable for the proposed project. Impacts from the project on water supply are analyzed in Section 19, Utilities and Service Systems, of the SCEA. Impacts were found to be less than significant and therefore, mitigation is not required.
Wildfire	
PMM WF-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to wildfire risk, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) Launch fire prevention education for local cities and counties such that local fire agencies, homeowners, as well as commercial and industrial businesses are aware of potential sources of fire ignition and the related procedures to curb or lessen any activities that might initiate fire ignition. b) Ensure structures in high fire risk areas are built to current state and federal standards which serve to greatly increase the chances the structure will survive a wildfire and also allow for people to shelter-in-place. c) Improve road access for emergency response and evacuation so people can evacuate safely and timely	This mitigation measure is not applicable to the proposed project as impacts would be less than significant. The project site is in a low fire hazard zone. In the event a fire begins during construction or operation of the project, the nearest fire station is the City of Pasadena Fire Station No. 31, located approximately 130 feet from the project site. Being in a developed urban area, there are several fire protection facilities in the project vicinity that could respond to an emergency at the site. There would be a less than significant impact and no mitigation is required.

Project Level Mitigation Measure	Applicability to the Project
when necessary. d) Improve, and educate regarding, local emergency communications and notifications with residents and businesses. e) Enforce defensible space regulations to keep overgrown and unmanaged vegetation, accumulations of trash and other flammable material away from structures. f) Provide public education about wildfire risk and fire prevention measures, and safety procedures and practices to allow for safe evacuation and/or options to shelter-in-place	
PMM WF-2: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to wildfire risk, as applicable and feasible. Such measures may include the following or other comparable measures identified by the Lead Agency: a) New development or infrastructure activity within very high hazard severity zones or SRAs shall be required to — Submit a fire protection plan including the designation of fire watch staff; — Maintain water and other fire suppression equipment designated solely for firefighting on site for any construction and maintenance activities; — Locate construction and maintenance equipment in designated “safe areas” such that they do not discharge combustible materials; and — Designate trained fire watch staff during project construction to reduce risk of fire hazards.	This mitigation measure is not applicable to the proposed project as impacts would be less than significant. The project site is in a low fire hazard zone. In the event a fire begins during construction or operation of the project, the nearest fire station is the City of Pasadena Fire Station No. 31, located approximately 130 feet from the project site. Being in a developed urban area, there are several fire protection facilities in the project vicinity that could respond to an emergency at the site. There would be a less than significant impact and no mitigation is required.

Source: SCAG Connect SoCal (2020 – 2045 Regional Transportation Plan/ Sustainable Communities Strategy.

Table 2
2015 Pasadena General Plan EIR Applicable Mitigation Measures

Mitigation Measure	Applicability to the Project
Air Quality	
2-1. Prior to issuance of any construction permits, development project applicants shall prepare and submit to the City of Pasadena Planning Division a technical assessment evaluating potential project constructionrelated air quality impacts. The evaluation shall be prepared in conformance with South Coast Air Quality Management District (SCAQMD) methodology for assessing air quality impacts. If construction-related criteria air pollutants are determined to have the potential to exceed the SCAQMD-adopted thresholds of significance, the City of Pasadena Planning Division shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during construction activities. These identified measures shall be incorporated into all appropriate construction documents (e.g., construction management plans) submitted to the City and shall be verified by the City’s Planning Division. Mitigation measures to reduce construction-related emissions include, but are not limited to:	The proposed project is subject to the South Coast Air Quality Management District (SCAQMD) rules and regulations mentioned in Section 3, Air Quality of the SCEA. Upon compliance, the project would satisfy the applicable requirements of this mitigation measure. The projects impacts to Air Quality were analyzed in Section 3, Air Quality, of the SCEA and were found to be less than significant and the project would not require any mitigation measures for this impact.

• Requiring fugitive-dust control measures that exceed SCAQMD's Rule 403, such as: • Use of nontoxic soil stabilizers to reduce wind erosion • Applying water every four hours to active soil-disturbing activities. • Tarping and/or maintaining a minimum of 24 inches of freeboard on trucks hauling dirt, sand, soil, or other loose materials. • Using construction equipment rated by the United States Environmental Protection Agency as having Tier 3 (model year 2006 or newer) or Tier 4 (model year 2008 or newer) emission limits, applicable for engines between 50 and 750 horsepower. • Ensuring that construction equipment is properly serviced and maintained to the manufacturer's standards. • Limiting nonessential idling of construction equipment to no more than five consecutive minutes. • Using Super-Compliant VOC paints for coating of architectural surfaces whenever possible. A list of Super-Compliant architectural coating manufactures can be found on the SCAQMD's website at http://www.aqmd.gov/prdas/brochures/SuperCompliant_AIM.pdf.	
2.2. Prior to future discretionary project approval, development project applicants shall prepare and submit to the City of Pasadena Planning Division a technical assessment evaluating potential project operation phase-related air quality impacts. The evaluation shall be prepared in conformance with South Coast Air Quality Management District (SCAQMD) methodology in assessing air quality impacts. If operation-related air pollutants are determined to have the potential to exceed the SCAQMD-adopted thresholds of significance, the City of Pasadena Planning Division shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities. The identified measures shall be included as part of the Standard Conditions of Approval. Below are possible mitigation measures to reduce long-term emissions: • For site-specific development that requires refrigerated vehicles, the construction documents shall demonstrate an adequate number of electrical service connections at loading docks for plugin of the anticipated number of refrigerated trailers to reduce idling time and emissions. • Applicants for manufacturing and light industrial uses shall consider energy storage and combined heat and power in appropriate applications to optimize renewable energy generation systems and avoid peak energy use. • Site-specific developments with truck delivery and loading areas and truck parking spaces shall include signage as a reminder to limit idling of vehicles while parked for loading/unloading in accordance with California Air Resources Board Rule 2845 (13 CCR Chapter 10 § 2485). • Site-specific development shall demonstrate that an adequate number of electrical vehicle Level 2 charging stations are provided onsite. The location of the electrical outlets shall be specified on building plans, and proper installation shall be verified by the Building Division prior to issuance of a Certificate of Occupancy. • Applicant-provided appliances shall be Energy Star appliances (e.g., dishwashers, refrigerators, clothes washers, and dryers). Installation of Energy Star appliances shall be verified by the Building & Safety Division during plan check. • Applicants for future development projects along existing and planned transit routes shall coordinate with the City of Pasadena, Metro, and Foothill Transit to ensure that bus pads and shelters are incorporated, as appropriate.	The proposed project complies with this Mitigation Measure as the analysis required by this measure has been included in the analysis for the proposed project. The project's construction and operational emissions do not exceed applicable thresholds with compliance with SCAQMD regulations and implementation of project-specific mitigation. See Section 3, Air Quality, of the SCEA for further detail.

2-3. Prior to future discretionary project approval, applicants for new industrial or warehousing land uses that 1) have the potential to generate 100 or more diesel truck trips per day or have 40 or more trucks with operating diesel-powered transport refrigeration units, and 2) are within 1,000 feet of a sensitive land use (e.g., residential, schools, hospitals, or nursing homes), as measured from the property line of the project to the property line of the nearest sensitive use, shall submit a health risk assessment (HRA) to the City of Pasadena Planning Division. The HRA shall be prepared in accordance with policies and procedures of the state Office of Environmental Health Hazard Assessment and the South Coast Air Quality Management District. If the HRA shows that the incremental cancer risk and/or noncancer hazard index exceeds the respective thresholds, as established by the SCAQMD at the time a project is considered, the applicant will be required to identify and demonstrate that best available control technologies for toxics (T-BACTs), including appropriate enforcement mechanisms, are capable of reducing potential cancer and noncancer risks to an acceptable level. T-BACTs may include, but are not limited to, restricting idling onsite or electrifying warehousing docks to reduce diesel particulate matter, or requiring use of newer equipment and/or vehicles. T-BACTs identified in the HRA shall be identified as mitigation measures in the environmental document and/or incorporated into the site plan.	This Mitigation Measure is not relevant to the project because the project does not involve new industrial or warehousing land uses.
2.4. Prior to future discretionary approval, the City of Pasadena Planning Division shall evaluate new development proposals for sensitive land uses (e.g., residences, schools, and day care centers) within the City for potential incompatibilities with regard to the California Air Resources Board's Air Quality and Land Use Handbook: A Community Health Perspective (April 2005). In addition, applicants for siting or expanding sensitive land uses that are within the recommended buffer distances listed in Table 1-1 of the CARB Handbook shall submit a health risk assessment (HRA) to the City of Pasadena. The HRA shall be prepared in accordance with policies and procedures of the state Office of Environmental Health Hazard Assessment (OEHHA) and the South Coast Air Quality Management District (SCAQMD). The latest OEHHA guidelines shall be used for the analysis, including age sensitivity factors, breathing rates, and body weights appropriate for children. If the HRA shows that the incremental cancer risk and/or noncancer hazard index exceeds the respective thresholds, as established by the SCAQMD at the time a project is considered, the applicant will be required to identify and demonstrate that mitigation measures are capable of reducing potential cancer and noncancer risks to an acceptable level (i.e., below the aforementioned thresholds as established by the SCAQMD), including appropriate enforcement mechanisms. Measures to reduce risk may include but are not limited to: • Air intakes oriented away from high-volume roadways and/or truck loading zones. • Heating, ventilation, and air conditioning systems of the buildings provided with appropriately sized maximum efficiency rating value (MERV) filters. • Heating, ventilation, and air conditioning systems for units that are installed with MERV filters shall maintain positive pressure within the building's filtered ventilation system to reduce infiltration of unfiltered outdoor air Mitigation measures identified in the HRA shall be identified as mitigation measures in the environmental document and/or incorporated into the site development plan as a component of the proposed project. The air intake design and MERV filter requirements shall be noted and/or reflected on all building plans submitted to the City and shall be verified by the City's Planning Division. The intent of this mitigation measure is to reflect current CARB and SCAQMD Guidance/Standards as well as CEQA legislation and case law, and the City implementation of the measure shall adhere to current standards/law at the time such analyses are undertaken.	This Mitigation Measure is not relevant to the project's CEQA document as a result of the 2015 California Supreme Court's decision in the California Building Industry Association v. Bay Area Air Quality Management District (2015) case.
2.5. Prior to future discretionary approval, if it is determined that a project has the potential to emit nuisance odors beyond the property line, an odor	This Mitigation Measure is not relevant to the proposed project as the development of mixed-

management plan shall be prepared by the project applicant, subject to review and approval by the Planning & Community Development Director or their designee. Facilities that have the potential to generate nuisance odors include but are not limited to: • Wastewater treatment plants • Composting, green waste, or recycling facilities • Fiberglass manufacturing facilities • Painting/coating operations • Large-capacity coffee roasters • Food-processing facilities The odor management plan shall show compliance with the South Coast Air Quality Management District's Rule 402 for nuisance odors. The Odor Management Plan shall identify the best available control technologies for toxics (T-BACTs) that will be utilized to reduce potential odors to acceptable levels, including appropriate enforcement mechanisms. T-BACTs may include but are not limited to scrubbers (i.e., air pollution control devices) at the industrial facility. TBACTs identified in the odor management plan shall be identified as mitigation measures in the environmental document and/or incorporated into the site plan.	use projects involving residential and commercial and residential uses are not typically associated with odor nuisances or complaints. Further, the project would comply with SCAQMD Rule 402, which prohibits the discharge of air contaminants that would cause injury, detriment, nuisance, or annoyance to the public.
Biological Resources	
3.1. The City of Pasadena shall require applicants of future development projects that disturb undeveloped land in the San Rafael Hills and tract of land at the northwest intersection of Crestford Drive and Florecita Drive, shown on Figure 5.3-2, to prepare a biological resources survey. The survey shall be conducted by a qualified biologist and shall be a reconnaissance level field survey of the project site for the presence and quality of biological resources potentially affected by project development. These resources include, but are not limited to, special status species or their habitat, sensitive habitats such as wetlands or riparian areas, and jurisdictional waters. If sensitive or protected biological resources are absent from the project site and adjacent lands potentially affected by the project, the biologist shall submit a written report substantiating such to the City of Pasadena before issuance of a grading permit by the City, and the project may proceed without any further biological investigation. If sensitive or protected biological resources are present on the project site or may be potentially affected by the project, implementation of Mitigation Measure 3-2 shall be required.	This Mitigation Measure is not relevant to the proposed project is not located near undeveloped land in the San Rafael Hills or tract of land at the northwest intersection of Crestford Drive and Florecita Drive, shown on Figure 5.3-2 of the General Plan EIR. The project site is in an urbanized area within the City of Pasadena. The project site does not contain any critical habitat or support any species identified or designated as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. Further the project site is not located on protected wetlands that are in the jurisdiction and responsibility of the U.S. Army Corps of Engineers, public agencies and/or Lead Agencies.
3.2. A qualified biologist shall evaluate impacts to sensitive or protected biological resources from development. The impact assessment may require focused surveys that determine absence or presence and distribution of biological resources on the site. These surveys may include, but are not limited to: 1) focused special status animal surveys if suitable habitat is present; 2) appropriately timed focused special status plant surveys that will maximize detection and accurate identification of target plant species; and 3) a delineation of jurisdictional boundaries around potential wetlands, riparian habitat, and waters of the United States or State. The results of these surveys will assist in assessing actual project impacts, and with the development of project specific mitigation measures. Alternatively, the project applicant may forgo focused plant and animal surveys and assume presence of special status species in all suitable habitats on the project site. The qualified biologist shall substantiate the impact evaluation or the assumed presence of special-status species in all suitable habitats onsite in a written report submitted to the City of Pasadena before issuance of a grading permit by the City.	This Mitigation Measure is not relevant to the proposed project is not located near undeveloped land in the San Rafael Hills or tract of land at the northwest intersection of Crestford Drive and Florecita Drive, shown on Figure 5.3-2 of the General Plan EIR. The project site is located in an urbanized area of the City, and therefore the project site is not located within or adjacent to migratory fish, wildlife species, or established native resident and/or migratory wildlife corridors, and native wildlife nursery sites.
3.3. The City of Pasadena shall require applicants of development project to avoid potential impacts to sensitive or protected biological resources to the greatest extent feasible. Depending on the resources potentially present on the project site, avoidance may include: 1) establishing appropriate no-disturbance buffers around onsite or adjacent resources, and/or 2) initiating	This Mitigation Measure is not applicable to the proposed project as the project is located in a developed urban area and does not involve the dispersal of wildlife nor would the project result in a barrier to migration or movement. This

construction at a time when special status or protected animal species will not be vulnerable to project-related mortality (e.g., outside the avian nesting season or bat maternal or wintering roosting season). Consultation with relevant regulatory agencies may be required in order to establish suitable buffer areas. If the project avoids all sensitive or protected biological resources, no further action is required. If avoidance of all significant impacts to sensitive or protected biological resources is not feasible, the project shall implement Mitigation Measure 3-4.	Mitigation Measure is not relevant to the proposed project as the project site does not contain any critical habitat or support any species identified or designated as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. The project site is located in an urbanized area of the City and is not identified as a vegetation zone that could serve as species' habitat. The project would also comply with the Migratory Bird Treaty Act which governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests.
3.4. The City of Pasadena shall require applicants to design development projects to minimize potential impacts to sensitive or protected biological resources to the greatest extent feasible, in consultation with a qualified biologist and/or appropriate regulatory agency staff. Minimization measures may include 1) exclusion and/or silt fencing, 2) relocation of impacted resources, 3) construction monitoring by a qualified biologist, and 4) an informative training program conducted by a qualified biologist for construction personnel on sensitive biological resources that may be impacted by project construction. If minimization of all significant impacts to sensitive or protected biological resources is infeasible, the project shall implement Mitigation Measure 3-5.	This Mitigation Measure is not applicable to the proposed project as the project is located in a developed urban area and does not involve the dispersal of wildlife nor would the project result in a barrier to migration or movement. This Mitigation Measure is not relevant to the proposed project as the project site does not contain any critical habitat or support any species identified or designated as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. The project site is located in an urbanized area of the City and is not identified as a vegetation zone that could serve as species' habitat. The project would also comply with the Migratory Bird Treaty Act which governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests.
3.5. A qualified biologist will develop appropriate mitigations that will reduce project impacts to sensitive or protected biological resources to a less than significant level, if feasible. The type and amount of mitigation will depend on the resources impacted, the extent of the impacts, and the quality of habitats to be impacted. Mitigations may include, but are not limited to: 1) compensation for lost habitat or waters in the form of preservation or creation of in-kind habitat or waters, either onsite or offsite, protected by conservation easement; 2) purchase of appropriate credits from an approved mitigation bank servicing the Pasadena area; and 3) payment of in-lieu fees.	This Mitigation Measure is not applicable to the proposed project as the project is located in a developed urban area and does not involve the dispersal of wildlife nor would the project result in a barrier to migration or movement. This Mitigation Measure is not relevant to the proposed project as the project site does not contain any critical habitat or support any species identified or designated as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. The project site is located in an urbanized area of the City and is not identified as a vegetation zone that could serve as species' habitat. The project would also comply with the Migratory Bird Treaty Act which governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests.
3.6. Applicants of projects developed pursuant to the General Plan Update shall obtain appropriate permit authorization(s) for impacts to jurisdictional waters, wetlands, and/or riparian habitats. The types of permits potentially required for impacts to jurisdictional waters are a Clean Water Act (Section 404) permit issued by the US Army Corps of Engineers, a California Water Certificate or Waste Discharge Order issued by the Regional Water Quality Control Board, and a Stream Alteration Agreement issued by the California Department of Fish and Wildlife	This Mitigation Measure is not relevant to the proposed project as the project site is not located on protected wetlands or other jurisdictional waters that are in the jurisdiction and responsibility of the U.S. Army Corps of Engineers, the Regional Water Quality Control Board, or the California Department of Fish and Wildlife.

Cultural Resources	
4.1. If cultural resources are discovered during construction of land development projects in Pasadena that may be eligible for listing in the California Register for Historic Resources, all ground disturbing activities in the immediate vicinity of the find shall be halted until the find is evaluated by a Registered Professional Archaeologist. If testing determines that significance criteria are met, then the project shall be required to perform data recovery, professional identification, radiocarbon dates as applicable, and other special studies; and provide a comprehensive final report including site record to the City and the South Central Coastal Information Center at California State University Fullerton. No further grading shall occur in the area of the discovery until Planning Department approves the report.	The proposed project would not result in a substantial adverse change in the significance of the Old Pasadena Historic District or the Hotel Green/Castle Green or the building at 84 South Fair Oaks Avenue. Impacts on historical resources are less than significant and no mitigation measures are required. See Section 5, Cultural Resources, of the SCEA for further information.
4.2. The City shall require applicants for development permits that involve grading in areas within the paleontologically sensitive Topanga formation (see Figure 5.4-2 of the DEIR) to provide studies by a qualified paleontologist assessing the sensitivity of the project for buried paleontological resources. On properties determined to be moderately to highly sensitive for paleontological resources, such studies shall provide a detailed mitigation plan, including a monitoring program and recovery and/or in situ preservation plan, based on the recommendations of a qualified paleontologist. The mitigation plan shall include the following requirements: • A paleontologist shall be retained for the project and will be on call during grading and other significant ground-disturbing activities more than six feet below the ground surface. • Should any potentially significant fossil resources be discovered, no further grading shall occur in the area of the discovery until the Planning and Community Development Director concurs in writing that adequate provisions are in place to protect any significant resources. Work may continue outside a minimum radius of 25 feet from the discovery pending review by the Director. • Unanticipated discoveries shall be evaluated for significance by a qualified paleontologist. If evaluation determines that significance criteria are met, then the project shall be required to perform data recovery, professional identification, radiocarbon dates as applicable, and other special studies; and provide a comprehensive final report, including catalog with museum numbers.	This Mitigation Measure is not relevant to the proposed project is not located within the Topanga formation , as shown on Figure 5.4-2 of the City's General Plan EIR.
Greenhouse Gas Emissions	
5.1. Within approximately 18 months of adoption of the proposed General Plan Update, the City of Pasadena shall prepare and present to the City Council for adoption a community climate action plan/greenhouse gas reduction plan (Plan). The Plan shall identify strategies to be implemented to reduce GHG emissions associated with the City, and shall include as one alternative a program that achieves the AB 32 targets. In addition, the City shall monitor GHG emissions by updating its community-wide GHG emissions inventory every five years upon adoption of the initial Plan. Upon the next update to the Plan, the inventory, GHG reduction measures, and GHG reductions shall be forecast to year 2035 to ensure progress toward achieving the interim target that aligns with the longterm GHG reduction goals of Executive Order S-03-04. The Plan update shall take into account the reductions achievable from federal and state actions and measures as well as ongoing work by the City and the private sector. The 2035 Plan update shall be completed by January 1, 2021, with a plan to achieve GHG reductions for 2035 or 2040, provided the state has an actual plan to achieve reductions for 2035 or 2040. New reduction programs in similar sectors as the proposed Plan (building energy, transportation, waste, water, wastewater, agriculture, and others) will likely be necessary. Future targets shall be considered in alignment with state reduction targets, to the maximum extent feasible, but it is premature at this time to determine whether or not such targets can be feasibly met through the combination of federal, state, and local action given technical, logistical and financial constraints. Future updates to the Plan shall account for the horizon beyond 2035 as the state	This Mitigation Measure is not relevant to the proposed project as the development of a community action plan/greenhouse reduction plan is a City-directed measure and is under City jurisdiction. It is not applicable at the project level. Furthermore, impacts regarding the generation of greenhouse gas emissions were analyzed in Section 8, Greenhouse Gas Emissions, in the SCEA. The proposed project would be consistent with the Pasadena Climate Action Plan by incorporating applicable actions intended to ensure that the project contributes its fair share to the City's cumulative GHG reduction goals. The project would have a less than significant GHG impact and therefore mitigation is not required.

adopts actual plans to meet post-2035 targets. In all instances, the Plan and any updates shall be consistent with state and federal law	
Noise	
9.1. Prior to issuance of building and occupancy permits, applicants of industrial projects that involve vibration-intensive machinery or activities adjacent to sensitive receptors shall prepare a study to evaluate potential vibration impacts. The study shall prepared by an acoustical engineer and be submitted to the City of Pasadena Planning Division. The study shall evaluate the vibration levels associated with operation of project-related equipment and activities experienced by nearby sensitive receptors. If it is determined that vibration impacts to nearby receptors exceed the Federal Transit Administration (FTA) vibration-annoyance criterion, the study shall recommend and the applicant shall implement the identified measures with the purpose of reducing vibration impacts to a less than significant level. The City of Pasadena shall verify implementation of all identified measures.	Implementation of Mitigation Measures NOI-1 and NOI-2, listed in Section 13, Noise, of the SCEA, would reduce potential vibration impacts during project construction to a less than significant level.
9.2. Prior to issuance of building permits for the new construction of habitable area, applicants for development projects shall adhere to the appropriate Vibration Category 2 and Vibration Category 3 screening distances for light rail transit as recommended in Table 9- 2 of the Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment (FTA 2006) in evaluating vibration impacts related to trains on the Metro Gold Line. Applicants for development projects that fall within the screening distances shall prepare and submit to the City of Pasadena Planning Division a study evaluating vibration impacts to the proposed development from train operations. The study shall be prepared by an acoustical engineer who shall identify measures to reduce impacts to habitable structures to below the FTA vibration annoyance criterion. The identified measures shall be incorporated into all design plans submitted to the City of Pasadena.	This Mitigation Measure is not relevant to the proposed project since the project site would not be within the FTA screening distances for light rail transit. FTA recommended screening distance for light rail transit in relation to residential uses is 150 feet between the rail tracks and the property line. The nearest station is approximately one-quarter mile and therefore, the proposed project would be outside of the appropriate screening distances for light rail transit and would not be affected by vibration impacts from train operations.
9.3. Prior to issuance of any grading and construction permits, applicants for individual projects that involve vibration-intensive construction activities, such as pile drivers, jack hammers, and vibratory rollers, within 25 feet of sensitive receptors (e.g., residences and historic structures) shall prepare and submit to the City of Pasadena Planning Division a study to evaluate potential construction-related vibration impacts. The study shall be prepared by an acoustical engineer and shall identify measures to reduce impacts to habitable structures to below the FTA vibration annoyance criterion. If construction-related vibration is determined to be perceptible at vibration-sensitive uses, additional requirements, such as use of less-vibration-intensive equipment or construction technique, shall be implemented during construction (e.g., drilled piles, static rollers, and nonexplosive rock blasting). Identified measures shall be included on all construction and building documents and submitted for verification to the City of Pasadena Planning Division.	Implementation of Mitigation Measures NOI-1 and NOI-2, listed in Section 13, Noise, of the SCEA, would reduce potential vibration impacts during project construction to a less than significant level.
9.4. Prior to issuance of any construction permits, applicants for individual projects that involve vibration-intensive construction activities, such as pile drivers, jack hammers, bulldozers, and vibratory rollers, within 25 feet of sensitive receptors (e.g., residences) or 50 feet of historic structures, shall prepare and submit to the City of Pasadena Planning Division a study to evaluate potential construction-related vibration impacts. The vibration assessment shall be prepared by an acoustical engineer and be based on the FTA vibration-induced architectural damage criterion. If the study determines a potential exceedance of the FTA thresholds, measures shall be identified that ensure vibration levels are reduced to below the thresholds. Measures to reduce vibration levels can include use of less-vibration-intensive equipment (e.g., drilled piles and static rollers) and/or construction techniques (e.g., nonexplosive rock blasting and use of hand tools) and preparation of a preconstruction survey report to assess the condition of the affected sensitive structure. Notwithstanding the above, pile drivers shall not be allowed within 150 feet of any historic structures. Identified measures shall be included on all construction and building documents and submitted for verification to the City of Pasadena Planning Division.	Implementation of Mitigation Measures NOI-1 and NOI-2, listed in Section 13, Noise, of the SCEA, would reduce potential vibration impacts during project construction to a less than significant level.

Prior to issuance of construction permits, applicants for new development projects within 500 feet of noise-sensitive receptors shall implement the following best management practices to reduce construction noise levels: • Consider the installation of temporary sound barriers for construction activities immediately adjacent to occupied noise-sensitive structures. • Equip construction equipment with mufflers. • Restrict haul routes and construction-related traffic. • Reduce nonessential idling of construction equipment to no more than five minutes The identified best management practices shall be noted on all site plans and/or construction management plans and submitted for verification to the City of Pasadena Planning Division.	The project would comply with this measure as noise levels from construction equipment would comply to PMC Section 9.36, which restricts noise from construction equipment to 85 dBA, and limits hours of operation.
Transportation	
13.1. The City of Pasadena shall update its existing transportation impact fee program by 2020. The City shall prepare a "Nexus" Study that will serve as the basis for requiring development impact fees under AB 1600 legislation, as codified by California Code Government Section 66000 et seq. The established procedures under AB 1600 require that a "reasonable relationship" or nexus exist between the traffic improvements and facilities required to mitigate the traffic impacts of new development pursuant to the proposed project. After approval of the Nexus Study, the City shall update the transportation impact fee program to fund all citywide circulation improvements, including the pedestrian and bicycle network. The fee program shall stipulate that fees are assessed when there is new construction or when there is an increase in square footage within an existing building or the conversion of existing square footage to a more intensive use. Fees are calculated by multiplying the proposed square footage or dwelling unit by the rate identified. The fees are included with any other applicable fees payable at the time the building permit is issued. The City will use the development fees to fund construction (or to recoup fees advanced to fund construction).	This Mitigation Measure is not relevant to the proposed project as updating the City's transportation impact fee program is a City directed measure and is under City jurisdiction. It is not applicable at the project level.

Source: City of Pasadena General Plan EIR 2015.

Table 3
Central District Specific Plan EIR Applicable Mitigation Measures

Mitigation Measure	Applicability to the Project
Aesthetics	
The following mitigation measure will be applied at the individual project level to avoid potential new light and glare effects. 1. For development proposals subject to environmental review and/or design review, the City will examine potential light and glare effects associated with structures and on-site activities, and will ensure that features are incorporated into projects to avoid any adverse light and glare impacts. 2. The Zoning Code will limit the use of reflective and glare-producing building materials. 3. The Zoning Code will require that all nighttime lighting be focused down onto the site and not onto adjacent properties. 4. The City will establish a program to encourage the use of low wattage bulbs in nighttime lighting by offering an incentive that discounting the cost of energy- conserving nighttime lighting.	This Mitigation Measure is not relevant to the proposed project as Public Resources Code Section 21099, enacted by Senate Bill 743, provides that "aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment." The project site is located in an urbanized area within the City of Pasadena. The proposed project is a 6-story plus mezzanine transit-oriented mixed-use development that includes retail, restaurants, and work/live units at the ground level and mixed-rate apartment units on levels 2-6. The project site is located less than one-quarter mile from the Metro Del Mar L Line (formerly Gold Line) station and less than one-half a mile to the Memorial Park Station. Therefore, the proposed project is located in a transit priority area as defined in Public Resources Code Section 21099. The proposed

	project's aesthetic impacts shall not be considered significant impacts on the environment pursuant to Public Resources Code Section 21099.
Air Quality	
At the individual development project level, the City will apply the following mitigation measures which will work toward regional emissions reductions: The City will encourage the incorporation of energy conservation techniques (i.e. installation of energy saving devices, construction of electric vehicle charging stations, use of sunlight-filtering window coatings or double-paned windows, utilization of light-colored roofing materials as opposed to dark-colored roofing materials, and placement of shady trees next to habitable structures) in new developments.	The proposed project is subject to the South Coast Air Quality Management District (SCAQMD) rules and regulations mentioned in Section 3, Air Quality of the SCEA. Upon compliance, the project would satisfy the applicable requirements of this mitigation measure. The projects impacts to Air Quality were analyzed in Section 3, Air Quality, of the SCEA and were found to be less than significant and the project would not require any mitigation measures for this impact.
Noise	
1. If a 15-20 dBA reduction is needed, the following shall be included in development projects as directed by the Building Official: • Air conditioning or a mechanical ventilation system • Windows and sliding glass doors should be double-paned glass and mounted in low air infiltration rate frames (0.5 cfm or less, per American National Standard Institute [ANSI] specifications) • Solid core exterior doors with perimeter weather stripping and threshold seals 2. If a 20-25 dBA reduction is needed, the following shall be included in development projects as directed by the Building Official: • Same as No. 1(a) – (c) • Exterior walls consist of stucco or brick veneer. Wood siding with a 1/2" minimum thickness fiberboard underlayer may also be used • Glass in both windows and doors should not exceed 20% of the floor area in a room • Roof or attic vents facing the noise source should be baffled 3. If a 25-30 dBA reduction is needed, the following shall be included in development projects as directed by the Building Official: • Same as No. 2(a) – (d) • The interior sheetrock of exterior wall assemblies should be attached to studs by resilient channels. Staggered studs or double walls are acceptable alternatives • Window assemblies should have a laboratory-tested STC rating of 30 or greater (Windows that provide superior noise reduction capability and that are laboratory-tested are sometimes called "sound-rated" windows. In general, these windows have thicker glass and/or increased air space between panes. In contrast, standard energy conservation double-pane glazing with a 1/8" or 1/4" air space may be less effective in reducing noise from some noise sources than single pane glazing).	This proposed project is not anticipated to have a significant noise impact and therefore would not require noise mitigation for nearby receptors.

Source: City of Pasadena, 2004 Land Use and Mobility Elements, Zoning Code Revisions, and Central District Specific Plan EIR

APPENDIX B

Air Quality

1.0 INTRODUCTION

This study describes the existing air quality of the proposed mixed-use development at 86 S. Fair Oaks Avenue, and evaluates the potential air quality impacts. This report has been prepared by Impact Sciences, Inc., under contract to the City of Pasadena, in support of the environmental documentation being prepared pursuant to the California Environmental Quality Act (CEQA). This analysis considers both the temporary air quality impacts that would result from project construction and the long-term impacts associated with the operation of the project.

1.1 Project Location

The 86 S. Fair Oaks Avenue project site in the City of Pasadena is bounded by S. Fair Oaks Avenue to the west, Dayton Street to the south, Castle Green to the east, and the Green Hotel Apartments to the north. The Project site is located within the boundaries of the Old Pasadena National Register Historic District and the Hotel Green National Register listing. Major transportation facilities in the vicinity of the proposed project site include the Del Mar Metro Gold Line Station located 800 feet from the site and the Memorial Park Metro Gold Line Station located 0.4 miles from the site.

1.2 Project Description

The proposed project is a 6-story plus mezzanine transit-oriented mixed-use development that includes retail, restaurants, and work/live units at the ground level and mixed-rate apartment units on levels 2-6. Along Fair Oaks Avenue, the ground floor of the proposed building includes approximately 6,200 square feet of retail and food uses. Four work/live units, approximately 1,300 square feet each, are proposed in the ground floor along Dayton Street, facing Central Park. The proposed project contains 84 apartment units (24 studios, 37 one-bedroom flats, three (3) one-bedroom townhouses, 18 two-bedroom flats, and two (2) two-bedroom townhouses), including eight (8) on-site residences for very low-income residents. All parking for the proposed project would be located in four (4) levels of underground parking that accommodate 195 parking spaces, including replacement of existing parking spaces for the adjacent Green Hotel Apartments, which currently utilizes the surface parking located on the project site.

The proposed project would include amenity space for project residents, including a swimming pool and spa with cabana and changing rooms, gym, lounge and multiple roof decks/terraces.

The proposed project would provide 16,231 sf of open space, which would be divided between approximately 12,037 sf of hardscape and 4,194 sf of landscape (softscape). Landscaping for the proposed project would include native and adaptive species that are drought tolerant. The proposed project would include 38 new trees, including one 96" box tree, 10 - 60" box trees, 21 - 24" box trees and 6 – 36" box trees.

2.1 Air Quality Setting

South Coast Air Basin

South Coast Air Basin Characteristics

The California Air Resources Board (CARB) divides the state into air basins that share similar meteorological and topographical features. The City of Pasadena is located within the South Coast Air Basin (SCAB), which incorporates approximately 12,000 square miles consisting of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The SCAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the southwest and high mountains around the rest of its perimeters.

Temperature and Precipitation

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. It is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. This usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds. The annual average temperature varies little throughout the SCAB region, ranging from the low 60s to the high 80s, measures in degrees Fahrenheit (F°). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas.

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all annual rains fall between November and April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains.

Humidity

Although the SCAB has a semiarid climate, the air near the earth's surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the SCAB by offshore winds, the "ocean effect" is dominant. Periods of heavy fog, especially along the coast, are frequent, and low clouds, often referred to as high fog, are a characteristic climate feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the SCAB.

Wind

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is higher during the dry summer months than during the rainy winter.

Between periods of wind, air stagnation may occur in both the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During the winter and fall, surface high-pressure systems over the SCAB, combined with other meteorological conditions, can result in very strong, downslope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east affect the diffusion of pollutants by inhibiting the eastward transport of pollutants. Air quality in the SCAB generally ranges from fair to poor and is similar to air quality in most of coastal Southern California. The entire region experiences heavy concentration of air pollutants during prolonged periods of stable atmospheric conditions.

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, two similarly distinct types of temperature inversions control the vertical depth through which pollutants are mixed. These inversions are the marine/subsidence inversion and the radiation inversion. The height of the base of the inversion at any given time is known as the "mixing height." The combination of winds and inversions is a critical determinant leading to highly degraded air quality in the summer and generally good air quality in the winter in Pasadena.

Air Pollutants of Concern

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards for outdoor concentrations. The federal and state ambient air quality standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons such as children, pregnant women, and the elderly, from illness or discomfort. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter 2.5 microns or less in diameter (PM2.5), particulate matter ten microns or less in diameter (PM10), and lead (Pb). Note that

Reactive Organic Gases (ROGs), which are also known as reactive organic compounds (ROCs) or volatile organic compounds (VOCs), and Nitrogen oxide (NOx) are not classified as criteria pollutants. However, ROGs and NOx are widely emitted from land development projects and participate in photochemical reactions in the atmosphere to form O_3; therefore, NOx and ROGs are relevant to the proposed project and are of concern in the air basin and are listed below along with the criteria pollutants. Sources and health effects commonly associated with criteria pollutants are summarized in **Table 1, Criteria Pollutants Summary of Common Sources and Effects**.

Table 1
Criteria Pollutants Summary of Common Sources and Effects

Pollutant	Major Man-Made Sources	Human Health & Welfare Effects
Carbon Monoxide (CO)	An odorless, colorless gas formed when carbon in fuels is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO_2)	A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include moto vehicles, electric utilities, and other sources that burn fuel.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Contributes to global warming and nutrient overloading which deteriorates water quality. Causes brown discoloration of the atmosphere.
Ozone (O_3)	Formed by a chemical reaction between volatile organic compounds (VOC) and nitrous oxides (NOx) in the presence of sunlight. VOCs are also commonly referred to as reactive organic gases (ROGs). Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, gasoline storage and transport, solvents, paints, and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. Damages rubber, some textiles, and dyes.
Particulate Matter (PM10 & PM2.5)	Produced by power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles, and others.	Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Sulfur Dioxide (SO_2)	A colorless, nonflammable gas formed when fuel containing sulfur is burned; when gasoline is extracted from ore. Examples are petroleum refineries, cement manufacturing, metal processing facilities, locomotives, and ships.	Respiratory irritant; aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron, and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.

Source: CAPCOA, 2013.

Ambient Air Quality

Criteria Air Pollutant Monitoring Data

Ambient air quality in Pasadena can be inferred from ambient air quality measurements conducted at nearby air quality monitoring stations. Existing levels of ambient air quality and historical trends and projections in the vicinity of Pasadena are documented by measurements made by the South Coast Air Quality Management District (SCAQMD), the air pollution regulatory agency in the SCAB regions maintains air quality monitoring stations which process ambient air quality measurements.

The purpose of the monitoring station is to measure ambient concentrations of pollutants and determine whether ambient air quality meets the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS). Ozone and particulate meter (PM10 and PM2.5) are pollutants of particular concern in the SCAB. The monitoring stations located closest to the proposed project site and most representative of air quality near the project site are the Pasadena South Wilson Avenue station, located approximately 1.5 miles southeast of the project site, and the Los Angeles North Main Street station, located approximately 7.0 miles southwest of the project site. Ambient emission concentrations vary due to localized variations in emissions sources and climate and should be considered "generally" representative of ambient concentrations in Pasadena. The Pasadena South Wilson Avenue station monitors O_3, PM2.5, and NO_2, see **Table 2, Pasadena South Wilson Avenue Air Monitoring Station Ambient Pollutant Concentrations**. The Los Angles North Main Street station monitors O_3, PM2.5, PM10, and NO_2, see **Table 3, Los Angeles North Main Street Air Monitoring Station Ambient Pollutant Concentrations**.

Table 2
Pasadena South Wilson Avenue Air Monitoring Station Ambient Pollutant Concentrations

Pollutant	Standards[1]	Year 2016	2017	2018
OZONE (O_3)				
Maximum 1-hour concentration monitored (ppm)		0.126	0.139	0.112
Maximum 8-hour concentration monitored (ppm)		0.090	0.100	0.090
Number of days exceeding state 1-hour standard	0.09 ppm	12	18	8
Number of days exceeding federal/state 8-hour standard	0.070 ppm	18	36	19
NITROGEN DIOXIDE (NO_2)				
Maximum 1-hour concentration monitored (ppm)		0.0719	0.0723	0.0682
Annual average concentration monitored (ppm)		0.015	0.015	0.014
Number of days exceeding state 1-hour standard	0.18 ppm	0	0	0
FINE PARTICULATE MATTER ($PM_{2.5}$)				

Pollutant	Standards[1]	Year 2016	2017	2018
Maximum 24-hour concentration monitored (μg/m³)		29.2	22.8	32.5
Annual average concentration monitored (μg/m³)		9.5	9.6	10.2
Number of samples exceeding federal standard	35 μg/m³	0	0	0

Source: California Air Resources Board, "Air Quality Data Statistics," http://www.arb.ca.gov/adam/. 2019.
NA = not available
1 *Parts by volume per million of air (ppm), micrograms per cubic meter of air (μg/m³), or annual arithmetic mean (aam).*
2 *The 8-hour federal O_3 standard was revised from 0.075 ppm to 0.070 ppm in 2015. The statistics shown are based on the 2015 standard of 0.070 ppm.*

Table 3
Los Angeles North Main Street Air Monitoring Station Ambient Pollutant Concentrations

Pollutant	Standards[1]	Year 2016	2017	2018
OZONE (O_3)				
Maximum 1-hour concentration monitored (ppm)		0.103	0.116	0.098
Maximum 8-hour concentration monitored (ppm)		0.078	0.086	0.073
Number of days exceeding state 1-hour standard	0.09 ppm	2	6	2
Number of days exceeding federal/state 8-hour standard	0.070 ppm	4	14	4
NITROGEN DIOXIDE (NO_2)				
Maximum 1-hour concentration monitored (ppm)		0.065	0.081	0.070
Annual average concentration monitored (ppm)		0.021	0.021	0.019
Number of days exceeding state 1-hour standard	0.18 ppm	0	0	0
RESPIRABLE PARTICULATE MATTER (PM_{10})				
Maximum 24-hour concentration monitored (μg/m³)		74.6	96.2	81.2
Annual average concentration monitored (μg/m³)		25.8	25.7	30.2
Number of samples exceeding state standard	50 μg/m³	21	40	31
Number of samples exceeding federal standard	150 μg/m³	0	0	0
FINE PARTICULATE MATTER ($PM_{2.5}$)				
Maximum 24-hour concentration monitored (μg/m³)		44.3	54.9	61.4
Annual average concentration monitored (μg/m³)		11.7	12.0	12.8
Number of samples exceeding federal standard	35 μg/m³	2	6	6

Source: California Air Resources Board, "Air Quality Data Statistics," http://www.arb.ca.gov/adam/. 2019.
NA = not available
1 *Parts by volume per million of air (ppm), micrograms per cubic meter of air (μg/m³), or annual arithmetic mean (aam).*
2 *The 8-hour federal O_3 standard was revised from 0.075 ppm to 0.070 ppm in 2015. The statistics shown are based on the 2015 standard of 0.070 ppm.*

The attainment status for the SCAB region is included in **Table 4, Attainment Status of Criteria Pollutants in the South Coast Air Basin**. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. The SCAB region is designated as a nonattainment area for federal ozone, PM2.5, and lead standards and are designated as nonattainment for state ozone, PM10, and PM2.5 standards.

Table 4
Attainment Status of the South Coast Air Basin (SCAB)

Pollutant	State	Federal
Ozone (O_3)	Non-Attainment	Non-Attainment
Particulate Matter (PM10)	Non-Attainment	Attainment
Particulate Matter (PM2.5)	Non-Attainment	Non-Attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Non-Attainment (Partial)[1]

Source: SCAQMD. 2016. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin.
[1] The Los Angeles County portion of the Basin is designated as a non-attainment area for the federal lead standard on the basis of source-specific monitoring at two locations as determined by U.S. EPA using 2007-2009 data. However, all stations in the Basin, including the near-source monitoring in Los Angeles County, have remained below the lead NAAQS for the 2012 through 2015 period. The SCAQMD will request that the U.S. EPA re-designated the Los Angeles County portion of the Basin as attainment for lead.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes, such as petroleum refining and chrome-plating operations; commercial operations, such as gasoline stations and dry cleaners; and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage, or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches.

To date, CARB has designated 244 compounds as TACs. Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to a relatively few compounds.

CARB identified diesel particulate matter (DPM) as a TAC. DPM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particulates and gases produced when an engine burns diesel fuel. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM very between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine. Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. DPM poses the greatest health risk among the TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiovascular diseases.

Residential areas are considered to be sensitive receptors to air pollutions because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Children are considered more susceptible to health effects of air pollution due to their immature immune systems and developing organs (OEHHA 2007). As such, schools are also considered sensitive receptors, as children are present for extended durations and engage in regular outdoor activities. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation.

2.2 Regulatory Framework

Federal

Clean Air Act

The Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the U.S. Environmental Protection Agency (EPA) to establish NAAQS, with states retaining the option to adopt more stringent standards or to include other specific pollutants. On April 2, 2007, the Supreme Court found that carbon dioxide is an air pollutant covered by the CAA; however, no NAAQS have been established for carbon dioxide.

These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those "sensitive receptors" most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

The EPA has classified air basins (or portions thereof) as being in attainment, nonattainment, or unclassified for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designations. **Table 4** lists the federal attainment status of the SCAB for the criteria pollutants.

National Emissions Standards for Hazardous Air Pollutants Program

Under federal law, 187 substances are currently listed as hazardous air pollutants (HAPs). Major sources of specific HAPs are subject to the requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) program. The EPA is establishing regulatory schemes for specific source categories and requires implementation of the Maximum Achievable Control Technologies (MACT) for major sources of HAPs in each source category. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and is aimed at HAPs that are a problem is California. The state has formally identified 244 substances as TACs and is adopting appropriate control measures for each. Once adopted at the state level, each air district will be required to adopt a measure that is equally or more stringent.

National Ambient Air Quality Standards

The federal CAA required the U.S. EPA to establish NAAQS. The NAAQS set primary standards and secondary standards for specific air pollutants**.** Primary standards define limits for the intention of protecting public health, which include sensitive populations such as asthmatics, children, and the elderly. Secondary Standards define limits to protect public welfare to include protection against decreased visibility, damage to animals, crops, vegetation, and buildings. A summary of the federal ambient air quality standards is shown in **Table 5, National Ambient Air Quality Standards**.

Table 5
National Ambient Air Quality Standards

Pollutant		Primary/Secondary	Averaging Time	Level
Carbon Monoxide		Primary	8 hours	9 ppm
			1 hour	35 ppm
Lead		Primary and secondary	Rolling 3-month average	0.15 μg/m³
Nitrogen dioxide		Primary	1 hour	100 ppb
		Primary and secondary	Annual	0.053 ppm
Ozone		Primary and secondary	8 hours	0.070 ppm
Particulate Matter	PM2.5	Primary	Annual	12 μg/m³
		Secondary	Annual	15 μg/m³
		Primary and secondary	24 hours	35 μg/m³
	PM10	Primary and secondary	24 hours	150 μg/m³
Sulfur dioxide		Primary	1 hour	75 ppb
		Secondary	3 hours	0.5 ppm

Source:
California Air Resources Board. May 2016. Ambient Air Quality Standards. Available online at:
https://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed November 16, 2018.

State

California Clean Air Act of 1988

The California CAA of 1988 (CCAA) allows states to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. The California Air Resources Board (CARB), a part of the California Environmental Protection Agency (Cal EPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the CAAQS. The CCAA, amended in 1992, requires all air quality management districts (AQMDs) in the state to achieve and maintain the CAAQS. The CAAQS are generally stricter than national standards for the same pollutants and has also established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles, for which there are no national standards. CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB also has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts.

California Ambient Air Quality Standards

The federal CAA permits states to adopt additional or more protective air quality standards if needed. California has set standards for certain pollutants, such as particulate matter and ozone, which are more protective of public health than respective federal standards. California has also set standards for some pollutants that are not addressed by federal standards. The state standards for ambient air quality are summarized in **Table 6, California Ambient Air Quality Standards**.

Table 6
California Ambient Air Quality Standards

Pollutant		Averaging Time	Level
Carbon monoxide		8 hours	9 ppm
		1 hour	20 ppm
Lead		30-day average	1.5 μg/m^3
Nitrogen dioxide		1 hour	0.180 ppm
		Annual	0.030 ppm
Ozone		8 hours	0.070 ppm
		1 hour	0.09 ppm
Particulate matter	PM2.5	Annual	12 μg/m^3
	PM10	24 hours	50 μg/m^3
		Annual	20 μg/m^3
Sulfur dioxide		1 hour	0.25 ppm
		24 hours	0.04 ppm
Sulfates		24 hours	25 μg/m^3
Hydrogen sulfide		1 hour	0.03 ppm
Vinyl chloride		24 hours	0.01 ppm

Source:
California Air Resources Board. 2016. Ambient Air Quality Standards. May. Available online at: https://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed November 16, 2018.

California State Implementation Plan

The federal CAA (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as a SIP. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The EPA has the responsibility to review all SIPs to determine if they conform to the requirements of the CAA.

State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the EPA for approval and publication in the Federal Register. The 2016 Air Quality Management Plan (2016 AQMP) is the SIP for SCAB. The 2016 AQMP is a regional blueprint for achieving air quality standards and healthful air in the SCAB and those portions of the Salton Sea Air Basin (SSAB) that are under the SCAQMD's jurisdictions. The 2016 AQMP represents a new approach, focusing on available, proven, and cost effective alternatives to traditional strategies, while seeking to achieve multiple goals in partnerships with other entities promoting reductions in greenhouse gases and toxic risk, as well as efficiencies in energy use, transportation, and goods movement. The most effective way to reduce air pollution impacts is to reduce emissions from mobile sources. The AQMP relies on regional and multi-level partnerships of governmental agencies at the federal, state, regional, and local level. Those agencies (EPA, CARB, local governments, Southern California Association of Governments [SCAG] and the SCAQMD) are the primary agencies that implement the AQMP programs. The 2016 AQMP incorporates the latest scientific and technical information and planning assumptions, including SCAG's 2016-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts. The 2016 AQMP includes integrated strategies and measures to meet the NAAQS.

California Air Toxics "Hot Spots" Information and Assessment Act (AB 2588)

The California Air Toxics Program is supplemented by the Air Toxics "Hot Spots" program, which became law (AB 2588, Statutes of 1987) in 1987. In 1992, the AB 2588 program was amended by Senate Bill 1731 to require facilities that pose a significant health risk to the community to perform a risk reduction audit and reduce their emissions through implementation of a risk management plan. Under this program, which is required under the Air Toxics "Hot Spots" Information and Assessment Act (Section 44363 of the California Health and Safety Code), facilities are required to report their air toxics emissions, assess health risks, and notify nearby residents and workers of significant risks when present.

Typically, land development projects generate diesel emissions from construction vehicles during the construction phase, as well as some diesel emissions from small trucks during the operational phase. Diesel exhaust is mainly composed of particulate matter and gases, which contain potential cancer-causing substances. Emissions from diesel engines currently include over 40 substances that are listed by EPA as hazardous air pollutants and by CARB as TACs. On August 27, 1998, CARB identified particulate matter in diesel exhaust as a TAC, based on data linking diesel particulate emissions to increased risks of lung cancer and respiratory disease.

In March 2015, the OEHHA adopted "The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments" in accordance with the Health and Safety Code, Section 44300. The Final Guidance Manual incorporates the scientific basis from three earlier developed Technical Support Documents to assess risk from exposure to facility emissions. The 2015 OEHHA Final Guidance has key changes including greater age sensitivity in particular for children, decreased exposure durations, and higher breathing rate profiles. Because cancer risk could be up to three times greater using this new guidance, it may result in greater mitigation requirements, more agency backlog, and increased difficulty in getting air permits. Regardless of the change in calculation methodology, actual emissions and cancer risk within South Coast Air Basin has declined by more than 50 percent since 2005.

The CARB provides a computer program, the Hot Spots Analysis and Reporting Program (HARP), to assist in a coherent and consistent preparation of an HRA. HARP2, an update to HARP, was released in March 2015. HARP2 has a more refined risk characterization in HRA and CEQA documents and incorporates the 2015 OEHHA Final Guidance.

Regional

South Coast Air Quality Management District

The SCAQMD is the air pollution control district for Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The agency's primary responsibility is ensuring that the SCAB region meets attainment for the federal and state standards. The SCAQMD is responsible for preparing an air quality management plan in order to meet federal attainment status. The SCAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, and conducting public education campaigns, as well as many other activities. All projects are subject to SCAQMD rules and regulations in effect at the time of construction.

SCAQMD Rules and Regulations

The following is a list of noteworthy SCAQMD rules that are required of construction activities associated with the proposed project:

- **Rule 402 (Nuisance)** – This rule prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. This rule does not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

- **Rule 403 (Fugitive Dust) –** This rule requires fugitive dust sources to implement best available control measures for all sources, and all forms of visible particulate matter are prohibited from crossing any property line. This rule is intended to reduce PM10 emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust. PM10 suppression techniques are summarized blow.

  a) Portions of a construction site to remain inactive longer than a period of three months will be seeded and watered until grass cover is grown or otherwise stabilized.

  b) All on-site roads will be paved as soon as feasible or watered periodically or chemically stabilized.

  c) All material transported off-site will be either sufficiently watered or securely covered to prevent excessive amounts of dust.

  d) The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized at all times.

  e) Where vehicles leave a construction site and enter adjacent public streets, the streets will be swept daily or washed down at the end of the work day to remove soil tracked onto the paved surface.

- **Rule 1113 (Architectural Coatings) –** This rule requires manufacturers, distributors, and end-uses of architectural and industrial maintenance coatings to reduce ROG emissions from the use of these coatings, primarily by placing limits on the ROG content of various coating categories.

2.3 Impacts and Mitigation Measures

Thresholds of Significance

The impact analysis provided below is based on the application of the California Environmental Quality Act (CEQA) Guidelines Appendix G, which indicates that a project would have a significant impact on air quality if it would:

1) Conflict with or obstruct implementation of any applicable air quality plan.

2) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard.

3) Expose sensitive receptors to substantial pollutant concentrations.

4) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The significance criteria established by the applicable air quality management or air pollution control district (SCAQMD) may be relied upon to make the above determinations. According to the SCAQMD, an air quality impact is considered significant if the proposed project would violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. The SCAQMD has established thresholds of significance for air quality for construction and operational activities of land use development projects, shown in **Table 7 – South Coast Air Quality Management District Regional Significance Thresholds – Pounds per Day**.

Table 7
South Coast Air Quality Management District Regional Significance Thresholds – Pounds per Day

Mass Daily Thresholds [a]		
Pollutant	**Construction [b]**	**Operation [c]**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to South Coast AQMD Rule 402	
GHG	10,000 MT/yr CO_2eq for industrial facilities	
Ambient Air Quality Standards for Criteria Pollutants [d]		
NO_2 1-hour average annual arithmetic mean	South coast AQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour average annual average	10.4 μg/m³ (construction) [e] & 2.5 μg/m³ (operation) 1.0 μg/m3	

PM2.5	
24-hour average	10.4 μg/m³ (construction) [e] & 2.5 μg/m³ (operation)
SO_2	
1-hour average	0.25 ppm (state) & 0.075 ppm (federal - 99th percentile)
24-hour average	0.04 ppm (state)
Sulfate	
24-hour average	25 μg/m³ (state)
CO	South Coast AQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards:
1-hour average	20 ppm (state) and 35 ppm (federal)
8-hour average	9.0 ppm (state/federal)
Lead	
30-day Average	1.5 μg/m³ (state)
Rolling 3-month average	0.15 μg/m³ (federal)

[a] ***SOURCE:*** *South Coast AQMD CEQA Handbook (South Coast AQMD, 1993)*

[b] *Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).*

[c] *For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.*

[d] *Ambient air quality thresholds for criteria pollutants based on South Coast AQMD Rule 1303, Table A-2 unless otherwise stated.*

[e] *Ambient air quality threshold based on South Coast AQMD Rule 403.*

CO Hotspot Analysis

In addition to the daily thresholds listed above, development associated with the proposed project would also be subject to the ambient air quality standards. These are addressed through an analysis of localized CO impacts. The California 1-hour and 8-hour CO standards are:

- 1-hour = 20 parts per million
- 8-hour = 9 parts per million

The significance of localized impacts depends on whether ambient CO levels in the vicinity of the project site are above state and federal CO standards. Carbon monoxide concentrations in Pasadena no longer exceed either the CAAQS or the NAAQS criteria. Additionally, the SCAB region is designated as attainment under the 1-hour and 8-hour standards (see **Table 4**).

Localized Significance Thresholds

In addition to regional emissions and the CO hotspot analysis, the SCAQMD has developed a set of mass emissions rate look-up tables called localized significance thresholds (LSTs) that can be used to evaluate localized impacts that may result from construction and operational-period emissions. If the on-site emissions from proposed construction activities are below the emission levels found in the LST mass rate look-up tables for the project site receptor area (SRA), then emissions would not have the potential to cause a significant localized air quality impact. When quantifying mass emissions for LST analysis, only emissions that occur on site are considered. Consistent with SCAQMD LST guidance, emissions from offsite delivery hauling trucks, or employee trips are not considered in the evaluation of localized impacts.

The City of Pasadena lies within SCAQMD SRA 8 and the project site is approximately 0.74-acres. Therefore, **Table 8, Local Significance Thresholds – Pounds per Day** shows the LST screening threshold for a 1-acre project site in SRA 8 with sensitive receptors located within 25 meters of the project site.

Table 8
Local Significance Thresholds – Pounds per Day

Phase	Nitrogen Oxide (NO_x)	Carbon Monoxide (CO)	Coarse Particulate Matter (PM10)	Fine Particulate Matter (PM2.5)
Construction	69	535	4	3
Operation	69	535	1	1

Source:
SCAQMD. 2009. Appendix C Mass Rate Look Up Table. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2.

Toxic Air Contaminant Thresholds

Certain groups of people are more affected by air pollution than others. The California Air Resources Board (CARB) has identified the following persons who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The closest sensitive receptors to the site are residences located adjacent to the Project. However, due to the limited scale and the short duration of construction, the proposed Project would not expose sensitive receptors to substantial pollutant concentrations during construction. Additionally, the proposed Project would not include any operational sources of TACs, and operational emissions were estimated to be far below significance thresholds. Therefore, the proposed Project would not expose sensitive receptors to a potential health risk during operation.

Methodology

Air quality impacts were evaluated in accordance with the methodologies recommended by CARB and the SCAQMD. Where criteria air pollutant quantification was required, emissions modeled using the California Emissions Estimator Model version 2016.3.2 (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects.

Project Impacts and Mitigation Measures

Conflict with the 2016 Air Quality Management Plan

Impact 1 Implementation of the proposed project would not conflict with or obstruct implementation of the 2016 Air Quality Management Plan. Therefore, the project would cause no impact related to conflicts with the Air Quality Management Plan.

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the CCAA requires an air quality attainment plan to be prepared for areas designated as nonattainment with regard to the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

As previously mentioned, the project site is located within the SCAB, which is under the jurisdiction of the SCAQMD. The SCAQMD is required, pursuant to the federal Clean Air Act, to reduce emissions of criteria pollutants for which the SCAB is in nonattainment. In order to reduce such emissions, the SCAQMD drafted the 2016 Air Quality Management Plan (AQMP). The 2016 AQMP establishes a program of rules and regulations directed at reducing air pollutant emissions and achieving California and national air quality standards. The 2016 AQMP is a regional and multi-agency effort including the SCAQMD, CARB, SCAG, and the U.S. EPA. The plan's pollutant control strategies are based on the latest scientific and technical information and planning assumptions, including SCAG's 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts. (SCAG's latest growth forecasts were defined in consultation with local governments and with reference to local general plans.) The project is subject to the SCAQMD's AQMP.

Criteria for determining consistency with the AQMP are defined in Chapter 12, Section 12.2 and Section 12.3 of the SCAQMD's 1993 CEQA Air Quality Handbook, and include the following:

- Consistency Criterion No. 1: The proposed project will not result in an increase in the frequency or severity of an existing air quality violation, or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

- Consistency Criterion No. 2: The proposed project will not exceed the assumptions in the AQMP or increments based on the years of the project build-out phase.

The violations to which Consistency Criterion No. 1 refers are the CAAQS and the NAAQS. As evaluated under Impacts 2 and 3 below, the project would not exceed the short-term construction standards or long-term operational standards and in so doing would not violate any air quality standards (see **Table 9** and **Table 10**). Thus, no impact is expected, and the project would be consistent with first criterion.

Concerning Consistency Criterion No. 2, the 2016 AQMP contains air pollutant reduction strategies based on SCAG's latest growth forecasts, and SCAG's growth forecasts were defined in consultation with local governments and with reference to local general plans. The proposed project is consistent with the land use designation and development density prepared in the City of Pasadena's General Plan and therefore would not exceed the population or job growth projections used by the SCAMQD to develop the 2016 AQMP. Thus, no impact would occur, as the project is also consistent with the second criterion.

Short-Term Construction-Generated and Long-Term Operation-Generated Pollutant Emissions Resulting in Violation of Air Quality Standards or Contributing to Existing Violations

Impact 2	Project-generated construction and operational emissions would not exceed applicable significance thresholds and therefore would not contribute to regional nonattainment conditions. As a result, the project's short-term construction and long-term operational emissions of air pollutants are considered a less than significant impact.

Regional Construction Significance Analysis

Construction associated with the proposed project would generate short-term emissions of criteria air pollutants. The criteria pollutants of primary concern within the project area include ozone-precursor pollutants (i.e., ROG and NOx), PM10, and PM2.5. Construction-generated emissions are short term and of temporary duration, lasting only as long as construction activities occur, but would be considered a significant air quality impact if the volume of pollutants generated exceeds the SCAQMD's thresholds of significance.

Construction results in the temporary generation of emissions resulting from site grading and excavation, road paving, motor vehicle exhaust associated with construction equipment and worker trips, and the movement of construction equipment, especially on unpaved surfaces. Emissions of airborne particulate matter are largely dependent on the amount of ground disturbance associated with site preparation activities as well as weather conditions and the appropriate application of water.

The duration of construction activities associated with the proposed project is estimated to last approximately 28 months, beginning in 2022. Construction-generated emissions associated with the proposed project were calculated using the SCAQMD and CARB-approved California Emissions Estimator Model (CalEEMod) model. CalEEMod is designed to model construction and operational emissions for land use development projects. The model incorporates typical construction requirements such as construction equipment, demolition debris, and hauling trips. The CalEEMod model assumed that construction of the proposed project would include approximately 45,500 cubic yards of grading soil export and construction equipment was based on information provided by the project applicant, including the use of Tier 3 construction equipment. Predicted maximum daily construction-generated emissions for the proposed project are summarized in **Table 9, Construction-Related Criteria Pollutant and Precursor Emissions – Maximum Pounds per Day.**

During construction, the contractors are required to comply with SCAQMD Rule 402 (Nuisance) and Rule 403 (Fugitive Dust), among others, which assist in reducing short-term construction-related air pollutant emissions. Rule 402 prohibits emissions that would cause a public nuisance and Rule 403 requires fugitive dust sources to implement best available control measures for all sources, and all forms of visible particulate matter are prohibited from crossing any property line. As shown below, all criteria pollutant emissions would remain below their respective thresholds. The proposed project would be subject to Rules 402, 403, and 113, described in the Regulatory Framework subsection above. In addition, the project would utilize Tier 3 construction equipment (or better) which would reduce NOx and particulate matter.

Table 9
Construction-Related Criteria Pollutant and Precursor Emissions – Maximum Pounds per Day

Construction Year	ROG	NOx	CO	SO2	PM10	PM2.5
2022	3.3	60.1	68.7	0.2	4.6	3.3
2023	1.3	20.3	26.7	0.1	2.2	1.5
2024	15.1	21.6	28.9	0.1	2.5	1.6
Regional Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Exceed?	*No*	*No*	*No*	*No*	*No*	*No*

*Source: Impact Sciences, CalEEMod modeling, 2020. See **Appendix A.***
The emissions include measures within CalEEMod and as required by the SCAQMD through Rule 403. This includes the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; cover stock piles with tarps; water all haul roads twice daily; and limit speeds on unpaved roads to 15 miles per hours. Reductions percentages from the SCAQMD

CEQA Handbook (Tables XI-A through XI-E) were applied. Consistent with CARB fleet requirements, construction equipment was assumed to meet minimum Tier 3 standards.

Regional Operational Significance Analysis

Project-generated emissions would be associated with motor vehicle use and area sources, such as the use of natural-gas-fired appliances, landscape maintenance equipment, and architectural coatings associated with the operation of an 84-unit apartment building with 6,200 square feet of retail space and 4 work/live units. Long-term operational emissions attributable to the proposed project are summarized in **Table 10, Long-Term Operational Emissions – Maximum Pounds per Day**.

Table 10
Long-Term Operational Emissions – Maximum Pounds per Day

Source	ROG	NOx	CO	SO2	PM10	PM2.5
Area Source	24.2	1.8	49.7	0.11	6.5	6.46
Energy Use	0.03	0.24	0.10	.002	0.02	0.02
Mobile Source	1.23	5.3	15.5	0.06	5.4	1.49
Total	25.5	7.4	65.3	0.17	11.92	7.96
Regional Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Exceed?	*No*	*No*	*No*	*No*	*No*	*No*

Source: Impact Sciences, CalEEMod modeling, 2020. See ***Appendix A****.*

As shown in **Table 9** and **Table 10**, neither the project's construction nor operational emissions would exceed the SCAQMD's thresholds for any criteria air pollutants. Therefore, regional construction and operation operational emissions would not result in a significant long-term regional air quality impact.

Adverse health effects induced by criteria pollutant emissions are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, and the number and character of exposed individual [e.g., age, gender]). In particular, O_3 precursors, VOCs, and NOx affect air quality on a regional scale. Health effects related to O_3 are therefore the product of emissions generated by numerous sources throughout a region. Existing models have limited sensitivity to small changes in criteria pollutant concentrations, and, as such, translating project-generated criteria pollutants to specific health effects or additional days of nonattainment would produce meaningless results. In other words, the project's less than significant increases in regional air pollution from criteria air pollutants would not have measurable effect on the human health implications of the Basin's ambient air quality.

As noted in the Brief of Amicus Curiae by the SCAQMD (April 6, 2015) for the *Sierra Club vs. County of Fresno*, the SCAMQD acknowledged it would be extremely difficult, if not impossible to quantify health impact of criteria pollutants for various reasons including modeling limitations as well as where in the atmosphere air pollutants interact and form. Further, as noted in the Brief of Amicus Curiae by the San Joaquin Valley Air Pollution Control District (SJVAPCD) (April 13, 2015) for the *Sierra Club vs. County of Fresno*, SJVAPCD has acknowledged that currently available modeling tools are not equipped to provide a meaningful analysis of the correlation between an individual development project's air emissions and specific human health impacts.

The SCAQMD acknowledges that quantifying the health impacts from O_3 is difficult. The health impacts an individual may face from O_3 depends on the ambient levels of O_3 that an individual person breathes. However, measuring changes in ambient levels of O_3 presents a challenge. SCAQMD's Brief of Amicus Curiae states that it would take a large amount of additional emissions to cause a modeled increase in ambient O_3 levels over the entire region. The SCAQMD states that based on their own modeling in the SCAQMD's *2012 Air Quality Management Plan*, a reduction of 432 tons (864,000 pounds) per day of NOx and a reduction of 187 tons (374,000 pounds) per day of VOC would reduce O3 levels at the highest monitored site by only nine parts per billion. As such, the SCAQMD concludes that it is not currently possible to accurately quantify O_3-related health impacts caused by NOx or VOC emissions from relatively small projects (defined as projects with regional scope) due to photochemistry and regional model limitations. Thus, as the project would not exceed SCAQMD thresholds for construction and operational air emissions, the project would have a less than significant impact for air quality health impacts.

Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

Impact 3 Implementation of the project would not expose sensitive receptors to substantial air pollutant concentrations. This is considered a less than significant impact.

Localized Significance Thresholds

Localized Construction Significance Analysis

The nearest receptors to the project site are residents located adjacent to the north and east of the project site. In order to identify impacts to sensitive receptors, the SCAQMD recommends addressing Localized Significance Thresholds (LSTs) for construction.

LSTs were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAMQD provided the *Final Localized Significance Threshold Methodology* for guidance (SCAQMD 2008). The LST methodology assists lead agencies in analyzing localized impacts associated with project-specific analysis.

As detailed above, the SRA for the LST is the West San Gabriel Valley area (SRA 8) since this area includes the project site. LSTs apply to CO, NO_2, PM10, and PM2.5. The SCAMQD produced look-up tables for projects that disturb areas less than or equal to 5 acres in size. The project site is approximately 0.74-acres, therefore, the LST threshold for one acre was utilized for the construction LST analysis.

The SCAQMD's methodology clearly states that "off-site mobile emissions from the project should not be included in the emissions compared to LSTs." Therefore, for purposes of the construction LST analysis, only emissions included in the CalEEMod "on-site" emissions outputs were considered. The nearest sensitive receptors to the project site are the residents adjacent to the north and east. LST screening thresholds are provided for distances to sensitive receptors of 25, 50, 100, 200, and 500 meters. According to SCAQMD methodology, "It is possible that a project may have receptors closer than 25 meters. Projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters." Therefore, LSTs for receptors located at 25 meters were utilized in this analysis.

Table 11, Localized Significance of Construction Emissions – Maximum Pounds per Day, presents the results of the localized emissions during construction activity of the proposed project. As shown in **Table 10**, the on-site air pollutant emissions on the peak day of construction would not exceed the applicable LST. Therefore, impacts would be less than significant.

Table 11
Localized Significance of Construction Emissions – Maximum Pounds per Day

Construction Year	NOx	CO	PM10	PM2.5
2022	31.02	38.49	1.44	1.42
2023	18.48	23.20	0.95	0.95
2024	18.47	23.20	0.95	0.95
LST Screening Threshold	**69**	**535**	**4**	**3**
Exceed?	***No***	***No***	***No***	***No***

Localized Operational Significance Analysis

According to the SCAQMD LST methodology, LSTs would apply to operational phase of a proposed project only if the project includes stationary sources or attracts mobile sources that may spend long periods queuing and idling at the site (e.g., warehouse or transfer facilities). The project is proposing a mixed-use

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residential and commercial development and, therefore, does not include such land uses. Thus, due to the lack of queuing and idling emissions, no long-term localized significance threshold analysis is needed. Operational LST impacts would be less than significant in this regard.

Localized Air Quality Health Impacts

As evaluated above, the project's air emissions would not exceed the SCAQMD's LST thresholds. Therefore, the project would not cause or contribute to an exceedance of the most stringent applicable NAAQS or CAAQS for emissions of CO, NOx, PM10, or PM2.5. It should be noted that the ambient air quality standards are developed and represent levels at which the most susceptible persons are protected. In other words, the ambient air quality standards are purposely set in a stringent manner to protect children, the elderly, and those with existing respiratory problems. Thus, air quality health impacts would be less than significant in this regard.

Carbon Monoxide Hotspots

CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadways or intersections may reach unhealthful levels (i.e., adversely affecting residents, school children, hospital patients, the elderly, etc.).

The SCAB is designated as an attainment/maintenance area for the federal CO standards and an attainment area for state standards. There has been a decline in CO emissions even though vehicle miles traveled (VMT) on U.S. urban and rural roads have increased nationwide; estimated anthropogenic CO emissions have decreased 68 percent between 1990 and 2014. In 2014, mobile sources accounted for 82 percent of the nation's total anthropogenic CO emissions (EPA 2018). Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner burner fuels, and motor vehicle inspection/maintenance programs.

According to the SCAQMD CEQA Air Quality Handbook, a potential CO hotspot may occur at any location where the background CO concentration already exceeds 9.0 ppm, the CAAQS for 8-hour ozone. The SCAQMD prepared a detailed CO analysis in the *Federal Attainment Plan for Carbon Monoxide* as part of the 2003 AQMP. The 2003 AQMP is the most recent AQMP that addresses CO concentrations. The CO analysis included microscale modeling of CO at the worst-case intersections in SCAB. Of these locations, the Wilshire Boulevard and Veteran Avenue intersection in Los Angeles experienced the highest CO concentration of 4.6 ppm. At the time of analysis, the Wilshire Boulevard and Veteran Avenue intersection was the most congested intersection in Los Angeles County with an average daily traffic volume of approximately 100,000 vehicles per day. As CO impacts at the Wilshire Boulevard and Veteran Avenue intersection did not exceed the 8-hour CAAQS, it can be inferred that the intersections near the project site would not create any CO hotspots. Furthermore, as previously discussed, the site is located in SRA 8, West San Gabriel Valley. Communities within SRAs are expected to have similar climatology and ambient air pollutant concentrations. The monitoring station representative of SRA 8 is the Pasadena-South Wilson Avenue air quality monitoring station located approximately 1.5 miles southeast of the site. According to data obtained from the EPA's AirData database for CO pollutants, the highest eight-hour concentration reported for the Pasadena station in 2018 was 1.4 ppm. As such, the background CO concentration in combination with the CO concentration at worst-case scenario intersection in SCAB do not exceed 9.0 ppm and a CO hotspot would not occur. Therefore, CO hotspot impacts would be less than significant in this regard.

Diesel Particulate Matter

Construction would result in the generation of diesel particulate matter (diesel PM) emissions from the use of off-road diesel equipment required for grading and excavation, paving, and other construction activities. The amount to which the receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer.

The use of diesel-powered construction equipment would be temporary and episodic. The duration of exposure would be short and exhaust from construction equipment dissipates rapidly. Current methodology for conducting health risk assessments are associated with long term exposure periods (9, 30, and 70 years). Therefore, short-term construction activities would not generate a significant health risk.

Additionally, the project site is approximately 0.74-acres and, as a result, construction activities would occur in an area of less than 5 acres. CARB generally considers construction projects contained in a site of such size to represent less than significant health risk impacts due to limitations of the off-road diesel equipment able to operate and thus a reduced amount of generated diesel particulate matter (DPM), the reduced amount of dust-generating ground-disturbance possible compared to larger construction sites, and the reduced duration of construction activities compared to the development of larger sites. Furthermore, construction would be subject to and would comply with California regulations limiting the idling of heavy-duty construction equipment to no more than 5 minutes, which would further reduce nearby sensitive receptors' exposure to temporary and variable DPM emissions. For these reasons, DPM generated by construction activities, in and of itself, would not be expected to expose sensitive receptors to substantial amounts of air toxics and the project would have a less than significant impact.

Result in Other Emissions (Such as those Leading to Odors) Adversely Affecting a Substantial Number of People

Impact 4 The proposed project would not include sources that could create other emissions (such as those leading to odors) adversely affecting a substantial number of people. Thus, the project would cause a less than significant impact in this regard.

The SCAQMD *CEQA Air Quality Handbook* (1993) identifies certain land uses as sources of odors. These land uses include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding. The proposed project would not include any of the land uses that have been identified by the SCAQMD as odor sources.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust and architectural coatings. However, construction-related odors would be short-term in nature and cease upon project completion. In addition, the project would be required to comply with the California Code of Regulations, Title 13, sections 2449(d)(3) and 2485, which minimizes the idling time of construction equipment either by shutting it off when not in use or by reducing the time of idling to no more than five minutes. This would reduce the detectable odors from heavy-duty equipment exhaust. The project would also be required to comply with the SCAQMD Rule 1113 – Architectural Coating, which would minimize odor impacts from ROG emissions during architectural coating. Any odor impacts to existing adjacent land uses would be short-term and not substantial. As such, the project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant in this regard.

2.4 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

The cumulative setting for air quality includes Pasadena and SCAB. SCAB is designated as nonattainment area for state standards of ozone, PM2.5, and PM10. SCAB is designated as a nonattainment area for federal standards of ozone and PM2.5. SCAB is designated as being unclassified and/or attainment for all other pollutants. Cumulative growth in population and vehicle use could inhibit efforts to improve regional air quality and attain the ambient air quality standards.

Cumulative Impacts and Mitigation Measures

Result in a Cumulatively Considerable Net Increase in Nonattainment Criteria Pollutants

Impact 5 Implementation of the proposed project would not result in a cumulatively considerable net increase of criteria air pollutants for which the SCAB is designated nonattainment. This is considered a less than cumulatively considerable impact.

The SCAQMD's approach to assessing cumulative impacts is based on the 2016 AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the CAA and the CCAA. The SCAQMD neither recommends quantified analyses of cumulative construction or operational emissions, nor does it provide separate methodologies or thresholds of significance to be used to assess cumulative construction or operational impacts. Instead, the SCAQMD recommends that a project's potential contribution to cumulative impacts should be assessed using the same significance criteria as those for project-specific impacts. Therefore, individual development projects that generate construction-related or operational emissions that exceed the SCAQMD recommended daily thresholds for project-specific impacts would also cause a cumulative considerable increase in emissions for those pollutants for which the Basin is nonattainment.

As discussed in **Impact 1**, the proposed project would be consistent with the 2016 AQMP, which is intended to bring the SCAB into attainment for all criteria pollutants. Furthermore, operational and construction emissions calculated for the proposed project do not exceed the applicable SCAQMD daily significance thresholds that are designed to assist the region in attaining the applicable ambient air quality standards (see **Table 9, Construction-Related Criteria Pollutant and Precursor Emissions** and **Table 10, Long-Term Operational Emissions**).

Additionally, with respect to the proposed project's construction-related air quality emissions and cumulative basin-wide conditions, the SCAQMD has developed strategies to reduce criteria pollutant emissions outlined in the 2016 AQMP pursuant to federal CAA mandates. As such, the proposed project would comply with SCAQMD Rule 403 requirements and with adopted 2016 AQMP emissions control measures. Per SCAQMD rules and mandates, these same requirements (i.e., Rule 403 compliance and compliance with adopted AQMP emissions control measures) would also be imposed on construction projects throughout the SCAB, which would include related projects.

The proposed project would also not result in cumulative operational air quality impacts because emissions would not exceed the SCAQMD-adopted operational thresholds and the project's contribution is not a significant proportion of the cumulative total emissions. Cumulative projects would likewise be required to reduce their emissions per SCAQMD rules and mandates. The project's emissions would not considerably contribute to an exceedance of the NAAQS or CAAQS and would, therefore, comply with the goals of the 2016 AQMP. Therefore, the project's contribution to regional pollutant concentrations would not be cumulatively considerable and cumulative impacts would not be significant.

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South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	195.00	Space	0.00	78,000.00	0
Apartments Mid Rise	84.00	Dwelling Unit	0.74	84,000.00	240
Strip Mall	7.50	1000sqft	0.00	7,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	12			**Operational Year**	2024
Utility Company	Pasadena Water & Power				
CO2 Intensity (lb/MWhr)	1664.14	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2e intensity factor updated per SoCal Edison's 2018 Sustainability Report, see: https://www.edison.com/content/dam/eix/documents/sustainability/eix-2018-sustainability-report.pdf

Land Use - 4 work/live units (1,300 sf) included as a retail land use.

Construction Phase - Schedule per the Applicant's Construction Questionnaire.

Off-road Equipment - Construction equipment per the Applicant's Construction Questionnaire. Any hours changed based on Appendix D of CalEEMod Users Guide for a lot under 1 acre.

Off-road Equipment - Construction equipment per the Construction Questionnaire.

Off-road Equipment - From construction questionnaire.

Trips and VMT - haul route round trip = 26 miles

Demolition -

Grading - size of the project site

Construction Off-road Equipment Mitigation - Tier 3 equipment per the Construction Questionnaire. Soil stabilizers and ground cover reductions from SCAQMD CEQA Guidelines.

Mobile Land Use Mitigation - Project site near two Metro Gold Line stations.

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Off-road Equipment -

Energy Use -

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
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tblOffRoadEquipment	OffRoadEquipmentType		Concrete/Industrial Saws
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
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tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment

tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
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2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.6732	6.6554	6.6216	0.0154	0.1596	0.2794	0.4390	0.0424	0.2593	0.3017	0.0000	1,370.4627	1,370.4627	0.3430	0.0000	1,379.0370
2023	0.5091	4.7310	5.3396	0.0114	0.1558	0.2131	0.3688	0.0418	0.1977	0.2395	0.0000	1,005.6403	1,005.6403	0.2517	0.0000	1,011.9335
2024	0.3984	0.8000	0.9727	2.0700e-003	0.0317	0.0355	0.0671	8.4800e-003	0.0330	0.0415	0.0000	182.7857	182.7857	0.0439	0.0000	183.8832
Maximum	**0.6732**	**6.6554**	**6.6216**	**0.0154**	**0.1596**	**0.2794**	**0.4390**	**0.0424**	**0.2593**	**0.3017**	**0.0000**	**1,370.4627**	**1,370.4627**	**0.3430**	**0.0000**	**1,379.0370**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2387	4.3534	5.0035	0.0154	0.1567	0.1774	0.3340	0.0420	0.1772	0.2192	0.0000	936.3437	936.3437	0.2056	0.0000	941.4826
2023	0.1685	2.6403	3.4485	0.0114	0.1558	0.1252	0.2810	0.0418	0.1251	0.1669	0.0000	608.2794	608.2794	0.1258	0.0000	611.4236
2024	0.3400	0.4879	0.6453	2.0700e-003	0.0317	0.0238	0.0555	8.4800e-003	0.0238	0.0323	0.0000	114.0135	114.0135	0.0221	0.0000	114.5661
Maximum	**0.3400**	**4.3534**	**5.0035**	**0.0154**	**0.1567**	**0.1774**	**0.3340**	**0.0420**	**0.1772**	**0.2192**	**0.0000**	**936.3437**	**936.3437**	**0.2056**	**0.0000**	**941.4826**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	52.73	38.61	29.66	0.00	0.83	38.18	23.36	0.45	33.43	28.18	0.00	35.18	35.18	44.66	0.00	35.24

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2022	3-31-2022	1.4984	1.0806
2	4-1-2022	6-30-2022	2.2776	1.5780
3	7-1-2022	9-30-2022	2.0919	1.1989
4	10-1-2022	12-31-2022	1.4601	0.7294
5	1-1-2023	3-31-2023	1.2960	0.6948
6	4-1-2023	6-30-2023	1.3086	0.7008
7	7-1-2023	9-30-2023	1.3230	0.7085
8	10-1-2023	12-31-2023	1.3248	0.7103
9	1-1-2024	3-31-2024	1.1607	0.8020
		Highest	2.2776	1.5780

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6679	0.0318	1.4025	1.4100e-003		0.0850	0.0850		0.0850	0.0850	8.9224	18.5658	27.4882	0.0280	6.1000e-004	28.3682
Energy	5.0400e-003	0.0431	0.0186	2.7000e-004		3.4800e-003	3.4800e-003		3.4800e-003	3.4800e-003	0.0000	728.3444	728.3444	0.0128	3.3600e-003	729.6653
Mobile	0.2001	0.9555	2.5896	0.0104	0.9285	7.5900e-003	0.9361	0.2488	7.0500e-003	0.2558	0.0000	961.9549	961.9549	0.0433	0.0000	963.0366
Waste						0.0000	0.0000		0.0000	0.0000	9.4431	0.0000	9.4431	0.5581	0.0000	23.3950
Water						0.0000	0.0000		0.0000	0.0000	1.9126	91.0436	92.9562	0.1980	4.9700e-003	99.3868
Total	**0.8731**	**1.0304**	**4.0107**	**0.0121**	**0.9285**	**0.0961**	**1.0246**	**0.2488**	**0.0956**	**0.3443**	**20.2781**	**1,799.9087**	**1,820.1868**	**0.8401**	**8.9400e-003**	**1,843.8518**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6679	0.0318	1.4025	1.4100e-003		0.0850	0.0850		0.0850	0.0850	8.9224	18.5658	27.4882	0.0280	6.1000e-004	28.3682
Energy	4.7900e-003	0.0410	0.0177	2.6000e-004		3.3100e-003	3.3100e-003		3.3100e-003	3.3100e-003	0.0000	695.4182	695.4182	0.0122	3.2100e-003	696.6786
Mobile	0.1869	0.8808	2.2508	8.8200e-003	0.7779	6.4900e-003	0.7844	0.2084	6.0300e-003	0.2145	0.0000	816.2253	816.2253	0.0376	0.0000	817.1651
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	1.9126	91.0436	92.9562	0.1980	4.9700e-003	99.3868
Total	**0.8596**	**0.9536**	**3.6709**	**0.0105**	**0.7779**	**0.0948**	**0.8728**	**0.2084**	**0.0944**	**0.3028**	**10.8350**	**1,621.2529**	**1,632.0878**	**0.2758**	**8.7900e-003**	**1,641.5987**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**1.54**	**7.45**	**8.47**	**13.09**	**16.21**	**1.32**	**14.82**	**16.21**	**1.25**	**12.06**	**46.57**	**9.93**	**10.33**	**67.17**	**1.68**	**10.97**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2022	1/31/2022	5	21	
2	Grading	Grading	2/1/2022	8/1/2022	5	130	
3	Building Construction	Building Construction	6/1/2022	3/1/2024	5	458	
4	Architectural Coating	Architectural Coating	1/1/2024	3/1/2024	5	45	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.74

Acres of Paving: 0

Residential Indoor: 170,100; Residential Outdoor: 56,700; Non-Residential Indoor: 11,250; Non-Residential Outdoor: 3,750; Striped Parking Area: 4,680 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	158	0.38
Demolition	Off-Highway Trucks	1	8.00	402	0.38
Demolition	Other Construction Equipment	3	8.00	172	0.42
Demolition	Rough Terrain Forklifts	1	8.00	100	0.40
Demolition	Rubber Tired Loaders	1	8.00	203	0.36
Demolition	Signal Boards	2	8.00	6	0.82
Building Construction	Forklifts	0	6.00	89	0.20
Grading	Bore/Drill Rigs	1	8.00	221	0.50
Grading	Off-Highway Trucks	2	8.00	402	0.38

Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Other Construction Equipment	5	8.00	172	0.42
Grading	Rough Terrain Forklifts	1	8.00	100	0.40
Grading	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Rubber Tired Loaders	1	8.00	203	0.36
Grading	Signal Boards	2	8.00	6	0.82
Building Construction	Cranes	1	4.00	231	0.29
Demolition	Rubber Tired Dozers	0	1.00	247	0.40
Grading	Rubber Tired Dozers	0	1.00	247	0.40
Building Construction	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Other Construction Equipment	5	8.00	172	0.42
Building Construction	Paving Equipment	1	7.00	132	0.36
Building Construction	Rollers	1	7.00	80	0.38
Building Construction	Rough Terrain Forklifts	1	6.00	100	0.40
Building Construction	Rubber Tired Loaders	1	8.00	203	0.36
Building Construction	Signal Boards	2	8.00	6	0.82
Building Construction	Surfacing Equipment	2	8.00	263	0.30
Building Construction	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	11	28.00	0.00	12.00	14.70	6.90	13.00	LD_Mix	HDT_Mix	HHDT
Grading	16	40.00	0.00	5,688.00	14.70	6.90	13.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	96.00	23.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3400e-003	0.0000	1.3400e-003	2.0000e-004	0.0000	2.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0300	0.2784	0.2986	5.9000e-004		0.0129	0.0129		0.0120	0.0120	0.0000	51.7292	51.7292	0.0150	0.0000	52.1043
Total	**0.0300**	**0.2784**	**0.2986**	**5.9000e-004**	**1.3400e-003**	**0.0129**	**0.0142**	**2.0000e-004**	**0.0120**	**0.0122**	**0.0000**	**51.7292**	**51.7292**	**0.0150**	**0.0000**	**52.1043**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	1.1500e-003	2.5000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.3091	0.3091	2.0000e-005	0.0000	0.3097
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1500e-003	8.2000e-004	9.4700e-003	3.0000e-005	3.2300e-003	2.0000e-005	3.2500e-003	8.6000e-004	2.0000e-005	8.8000e-004	0.0000	2.7118	2.7118	7.0000e-005	0.0000	2.7135
Total	**1.1800e-003**	**1.9700e-003**	**9.7200e-003**	**3.0000e-005**	**3.3000e-003**	**2.0000e-005**	**3.3200e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**3.0209**	**3.0209**	**9.0000e-005**	**0.0000**	**3.0232**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.4000e-004	0.0000	4.4000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.1500e-003	0.1868	0.2363	5.9000e-004		9.4100e-003	9.4100e-003		9.4100e-003	9.4100e-003	0.0000	33.6916	33.6916	9.3800e-003	0.0000	33.9260
Total	**9.1500e-003**	**0.1868**	**0.2363**	**5.9000e-004**	**4.4000e-004**	**9.4100e-003**	**9.8500e-003**	**7.0000e-005**	**9.4100e-003**	**9.4800e-003**	**0.0000**	**33.6916**	**33.6916**	**9.3800e-003**	**0.0000**	**33.9260**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	1.1500e-003	2.5000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.3091	0.3091	2.0000e-005	0.0000	0.3097
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1500e-003	8.2000e-004	9.4700e-003	3.0000e-005	3.2300e-003	2.0000e-005	3.2500e-003	8.6000e-004	2.0000e-005	8.8000e-004	0.0000	2.7118	2.7118	7.0000e-005	0.0000	2.7135
Total	**1.1800e-003**	**1.9700e-003**	**9.7200e-003**	**3.0000e-005**	**3.3000e-003**	**2.0000e-005**	**3.3200e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**3.0209**	**3.0209**	**9.0000e-005**	**0.0000**	**3.0232**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.9700e-003	0.0000	2.9700e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2967	2.7434	2.9338	6.2900e-003		0.1255	0.1255		0.1164	0.1164	0.0000	549.5642	549.5642	0.1671	0.0000	553.7408
Total	**0.2967**	**2.7434**	**2.9338**	**6.2900e-003**	**2.9700e-003**	**0.1255**	**0.1285**	**4.3000e-004**	**0.1164**	**0.1168**	**0.0000**	**549.5642**	**549.5642**	**0.1671**	**0.0000**	**553.7408**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0150	0.5450	0.1198	1.4900e-003	0.0318	1.3300e-003	0.0331	8.7300e-003	1.2800e-003	0.0100	0.0000	146.5198	146.5198	0.0114	0.0000	146.8038
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0102	7.2400e-003	0.0838	2.7000e-004	0.0285	2.1000e-004	0.0287	7.5800e-003	1.9000e-004	7.7700e-003	0.0000	23.9821	23.9821	6.0000e-004	0.0000	23.9972
Total	**0.0252**	**0.5522**	**0.2036**	**1.7600e-003**	**0.0603**	**1.5400e-003**	**0.0619**	**0.0163**	**1.4700e-003**	**0.0178**	**0.0000**	**170.5019**	**170.5019**	**0.0120**	**0.0000**	**170.8010**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8000e-004	0.0000	9.8000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1011	2.0161	2.5018	6.2900e-003		0.0925	0.0925		0.0925	0.0925	0.0000	367.3389	367.3389	0.1094	0.0000	370.0742
Total	**0.1011**	**2.0161**	**2.5018**	**6.2900e-003**	**9.8000e-004**	**0.0925**	**0.0935**	**1.4000e-004**	**0.0925**	**0.0926**	**0.0000**	**367.3389**	**367.3389**	**0.1094**	**0.0000**	**370.0742**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0150	0.5450	0.1198	1.4900e-003	0.0318	1.3300e-003	0.0331	8.7300e-003	1.2800e-003	0.0100	0.0000	146.5198	146.5198	0.0114	0.0000	146.8038
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0102	7.2400e-003	0.0838	2.7000e-004	0.0285	2.1000e-004	0.0287	7.5800e-003	1.9000e-004	7.7700e-003	0.0000	23.9821	23.9821	6.0000e-004	0.0000	23.9972
Total	**0.0252**	**0.5522**	**0.2036**	**1.7600e-003**	**0.0603**	**1.5400e-003**	**0.0619**	**0.0163**	**1.4700e-003**	**0.0178**	**0.0000**	**170.5019**	**170.5019**	**0.0120**	**0.0000**	**170.8010**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2868	2.8965	2.8982	5.5700e-003		0.1386	0.1386		0.1286	0.1286	0.0000	485.5620	485.5620	0.1445	0.0000	489.1740
Total	**0.2868**	**2.8965**	**2.8982**	**5.5700e-003**		**0.1386**	**0.1386**		**0.1286**	**0.1286**	**0.0000**	**485.5620**	**485.5620**	**0.1445**	**0.0000**	**489.1740**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.7500e-003	0.1624	0.0410	4.4000e-004	0.0111	3.0000e-004	0.0114	3.2000e-003	2.9000e-004	3.4900e-003	0.0000	42.3444	42.3444	2.6600e-003	0.0000	42.4109
Worker	0.0287	0.0205	0.2367	7.5000e-004	0.0806	5.9000e-004	0.0812	0.0214	5.4000e-004	0.0219	0.0000	67.7401	67.7401	1.7100e-003	0.0000	67.7828
Total	**0.0334**	**0.1829**	**0.2776**	**1.1900e-003**	**0.0917**	**8.9000e-004**	**0.0926**	**0.0246**	**8.3000e-004**	**0.0254**	**0.0000**	**110.0845**	**110.0845**	**4.3700e-003**	**0.0000**	**110.1937**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0687	1.4134	1.7744	5.5700e-003		0.0730	0.0730		0.0730	0.0730	0.0000	251.7059	251.7059	0.0704	0.0000	253.4646
Total	**0.0687**	**1.4134**	**1.7744**	**5.5700e-003**		**0.0730**	**0.0730**		**0.0730**	**0.0730**	**0.0000**	**251.7059**	**251.7059**	**0.0704**	**0.0000**	**253.4646**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.7500e-003	0.1624	0.0410	4.4000e-004	0.0111	3.0000e-004	0.0114	3.2000e-003	2.9000e-004	3.4900e-003	0.0000	42.3444	42.3444	2.6600e-003	0.0000	42.4109
Worker	0.0287	0.0205	0.2367	7.5000e-004	0.0806	5.9000e-004	0.0812	0.0214	5.4000e-004	0.0219	0.0000	67.7401	67.7401	1.7100e-003	0.0000	67.7828
Total	**0.0334**	**0.1829**	**0.2776**	**1.1900e-003**	**0.0917**	**8.9000e-004**	**0.0926**	**0.0246**	**8.3000e-004**	**0.0254**	**0.0000**	**110.0845**	**110.0845**	**4.3700e-003**	**0.0000**	**110.1937**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4573	4.4925	4.9064	9.4600e-003		0.2119	0.2119		0.1965	0.1965	0.0000	825.0794	825.0794	0.2451	0.0000	831.2077
Total	**0.4573**	**4.4925**	**4.9064**	**9.4600e-003**		**0.2119**	**0.2119**		**0.1965**	**0.1965**	**0.0000**	**825.0794**	**825.0794**	**0.2451**	**0.0000**	**831.2077**

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.9900e-003	0.2070	0.0624	7.2000e-004	0.0188	2.4000e-004	0.0191	5.4400e-003	2.3000e-004	5.6700e-003	0.0000	69.7363	69.7363	3.9800e-003	0.0000	69.8358
Worker	0.0459	0.0315	0.3708	1.2300e-003	0.1369	9.8000e-004	0.1379	0.0364	9.0000e-004	0.0373	0.0000	110.8246	110.8246	2.6200e-003	0.0000	110.8900
Total	**0.0519**	**0.2385**	**0.4332**	**1.9500e-003**	**0.1558**	**1.2200e-003**	**0.1570**	**0.0418**	**1.1300e-003**	**0.0429**	**0.0000**	**180.5609**	**180.5609**	**6.6000e-003**	**0.0000**	**180.7258**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1167	2.4018	3.0153	9.4600e-003		0.1240	0.1240		0.1240	0.1240	0.0000	427.7185	427.7185	0.1192	0.0000	430.6978
Total	**0.1167**	**2.4018**	**3.0153**	**9.4600e-003**		**0.1240**	**0.1240**		**0.1240**	**0.1240**	**0.0000**	**427.7185**	**427.7185**	**0.1192**	**0.0000**	**430.6978**

3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.9900e-003	0.2070	0.0624	7.2000e-004	0.0188	2.4000e-004	0.0191	5.4400e-003	2.3000e-004	5.6700e-003	0.0000	69.7363	69.7363	3.9800e-003	0.0000	69.8358
Worker	0.0459	0.0315	0.3708	1.2300e-003	0.1369	9.8000e-004	0.1379	0.0364	9.0000e-004	0.0373	0.0000	110.8246	110.8246	2.6200e-003	0.0000	110.8900
Total	**0.0519**	**0.2385**	**0.4332**	**1.9500e-003**	**0.1558**	**1.2200e-003**	**0.1570**	**0.0418**	**1.1300e-003**	**0.0429**	**0.0000**	**180.5609**	**180.5609**	**6.6000e-003**	**0.0000**	**180.7258**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0759	0.7309	0.8498	1.6400e-003		0.0339	0.0339		0.0314	0.0314	0.0000	142.7959	142.7959	0.0424	0.0000	143.8560
Total	**0.0759**	**0.7309**	**0.8498**	**1.6400e-003**		**0.0339**	**0.0339**		**0.0314**	**0.0314**	**0.0000**	**142.7959**	**142.7959**	**0.0424**	**0.0000**	**143.8560**

3.4 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0100e-003	0.0357	0.0105	1.2000e-004	3.2600e-003	4.0000e-005	3.3000e-003	9.4000e-004	4.0000e-005	9.8000e-004	0.0000	12.0265	12.0265	6.8000e-004	0.0000	12.0434
Worker	7.5200e-003	4.9600e-003	0.0599	2.1000e-004	0.0237	1.7000e-004	0.0239	6.2900e-003	1.5000e-004	6.4500e-003	0.0000	18.5476	18.5476	4.1000e-004	0.0000	18.5580
Total	**8.5300e-003**	**0.0407**	**0.0703**	**3.3000e-004**	**0.0270**	**2.1000e-004**	**0.0272**	**7.2300e-003**	**1.9000e-004**	**7.4300e-003**	**0.0000**	**30.5741**	**30.5741**	**1.0900e-003**	**0.0000**	**30.6014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0202	0.4157	0.5219	1.6400e-003		0.0215	0.0215		0.0215	0.0215	0.0000	74.0238	74.0238	0.0206	0.0000	74.5389
Total	**0.0202**	**0.4157**	**0.5219**	**1.6400e-003**		**0.0215**	**0.0215**		**0.0215**	**0.0215**	**0.0000**	**74.0238**	**74.0238**	**0.0206**	**0.0000**	**74.5389**

3.4 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0100e-003	0.0357	0.0105	1.2000e-004	3.2600e-003	4.0000e-005	3.3000e-003	9.4000e-004	4.0000e-005	9.8000e-004	0.0000	12.0265	12.0265	6.8000e-004	0.0000	12.0434
Worker	7.5200e-003	4.9600e-003	0.0599	2.1000e-004	0.0237	1.7000e-004	0.0239	6.2900e-003	1.5000e-004	6.4500e-003	0.0000	18.5476	18.5476	4.1000e-004	0.0000	18.5580
Total	**8.5300e-003**	**0.0407**	**0.0703**	**3.3000e-004**	**0.0270**	**2.1000e-004**	**0.0272**	**7.2300e-003**	**1.9000e-004**	**7.4300e-003**	**0.0000**	**30.5741**	**30.5741**	**1.0900e-003**	**0.0000**	**30.6014**

3.5 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3084					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.0700e-003	0.0274	0.0407	7.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	5.7448	5.7448	3.2000e-004	0.0000	5.7529
Total	**0.3125**	**0.0274**	**0.0407**	**7.0000e-005**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**5.7448**	**5.7448**	**3.2000e-004**	**0.0000**	**5.7529**

3.5 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4900e-003	9.8000e-004	0.0118	4.0000e-005	4.6900e-003	3.0000e-005	4.7200e-003	1.2500e-003	3.0000e-005	1.2800e-003	0.0000	3.6709	3.6709	8.0000e-005	0.0000	3.6729
Total	**1.4900e-003**	**9.8000e-004**	**0.0118**	**4.0000e-005**	**4.6900e-003**	**3.0000e-005**	**4.7200e-003**	**1.2500e-003**	**3.0000e-005**	**1.2800e-003**	**0.0000**	**3.6709**	**3.6709**	**8.0000e-005**	**0.0000**	**3.6729**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3084					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3400e-003	0.0305	0.0412	7.0000e-005		2.1400e-003	2.1400e-003		2.1400e-003	2.1400e-003	0.0000	5.7448	5.7448	3.2000e-004	0.0000	5.7529
Total	**0.3098**	**0.0305**	**0.0412**	**7.0000e-005**		**2.1400e-003**	**2.1400e-003**		**2.1400e-003**	**2.1400e-003**	**0.0000**	**5.7448**	**5.7448**	**3.2000e-004**	**0.0000**	**5.7529**

3.5 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4900e-003	9.8000e-004	0.0118	4.0000e-005	4.6900e-003	3.0000e-005	4.7200e-003	1.2500e-003	3.0000e-005	1.2800e-003	0.0000	3.6709	3.6709	8.0000e-005	0.0000	3.6729
Total	**1.4900e-003**	**9.8000e-004**	**0.0118**	**4.0000e-005**	**4.6900e-003**	**3.0000e-005**	**4.7200e-003**	**1.2500e-003**	**3.0000e-005**	**1.2800e-003**	**0.0000**	**3.6709**	**3.6709**	**8.0000e-005**	**0.0000**	**3.6729**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1869	0.8808	2.2508	8.8200e-003	0.7779	6.4900e-003	0.7844	0.2084	6.0300e-003	0.2145	0.0000	816.2253	816.2253	0.0376	0.0000	817.1651
Unmitigated	0.2001	0.9555	2.5896	0.0104	0.9285	7.5900e-003	0.9361	0.2488	7.0500e-003	0.2558	0.0000	961.9549	961.9549	0.0433	0.0000	963.0366

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	558.60	536.76	492.24	1,865,765	1,563,250
Enclosed Parking with Elevator	0.00	0.00	0.00		
Strip Mall	332.40	315.30	153.23	579,075	485,184
Total	891.00	852.06	645.47	2,444,840	2,048,434

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846
Enclosed Parking with Elevator	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846
Strip Mall	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	647.9827	647.9827	0.0113	2.3400e-003	648.9612
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	678.4776	678.4776	0.0118	2.4500e-003	679.5022
NaturalGas Mitigated	4.7900e-003	0.0410	0.0177	2.6000e-004		3.3100e-003	3.3100e-003		3.3100e-003	3.3100e-003	0.0000	47.4355	47.4355	9.1000e-004	8.7000e-004	47.7173
NaturalGas Unmitigated	5.0400e-003	0.0431	0.0186	2.7000e-004		3.4800e-003	3.4800e-003		3.4800e-003	3.4800e-003	0.0000	49.8667	49.8667	9.6000e-004	9.1000e-004	50.1631

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	922167	4.9700e-003	0.0425	0.0181	2.7000e-004		3.4400e-003	3.4400e-003		3.4400e-003	3.4400e-003	0.0000	49.2104	49.2104	9.4000e-004	9.0000e-004	49.5028
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Strip Mall	12300	7.0000e-005	6.0000e-004	5.1000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6564	0.6564	1.0000e-005	1.0000e-005	0.6603
Total		**5.0400e-003**	**0.0431**	**0.0186**	**2.7000e-004**		**3.4900e-003**	**3.4900e-003**		**3.4900e-003**	**3.4900e-003**	**0.0000**	**49.8667**	**49.8667**	**9.5000e-004**	**9.1000e-004**	**50.1631**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	877581	4.7300e-003	0.0404	0.0172	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	46.8311	46.8311	9.0000e-004	8.6000e-004	47.1094
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Strip Mall	11325.4	6.0000e-005	5.6000e-004	4.7000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.6044	0.6044	1.0000e-005	1.0000e-005	0.6080
Total		**4.7900e-003**	**0.0410**	**0.0177**	**2.6000e-004**		**3.3100e-003**	**3.3100e-003**		**3.3100e-003**	**3.3100e-003**	**0.0000**	**47.4355**	**47.4355**	**9.1000e-004**	**8.7000e-004**	**47.7173**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	340505	257.0271	4.4800e-003	9.3000e-004	257.4153
Enclosed Parking with Elevator	457080	345.0228	6.0100e-003	1.2400e-003	345.5438
Strip Mall	101250	76.4277	1.3300e-003	2.8000e-004	76.5431
Total		**678.4776**	**0.0118**	**2.4500e-003**	**679.5022**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	338055	255.1779	4.4500e-003	9.2000e-004	255.5633
Enclosed Parking with Elevator	422529	318.9424	5.5600e-003	1.1500e-003	319.4240
Strip Mall	97851.5	73.8624	1.2900e-003	2.7000e-004	73.9739
Total		**647.9827**	**0.0113**	**2.3400e-003**	**648.9612**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6679	0.0318	1.4025	1.4100e-003		0.0850	0.0850		0.0850	0.0850	8.9224	18.5658	27.4882	0.0280	6.1000e-004	28.3682
Unmitigated	0.6679	0.0318	1.4025	1.4100e-003		0.0850	0.0850		0.0850	0.0850	8.9224	18.5658	27.4882	0.0280	6.1000e-004	28.3682

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0308					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3357					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.2751	0.0218	0.5340	1.3600e-003		0.0802	0.0802		0.0802	0.0802	8.9224	17.1458	26.0682	0.0266	6.1000e-004	26.9139
Landscaping	0.0263	0.0100	0.8685	5.0000e-005		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	1.4201	1.4201	1.3700e-003	0.0000	1.4543
Total	**0.6679**	**0.0318**	**1.4025**	**1.4100e-003**		**0.0850**	**0.0850**		**0.0850**	**0.0850**	**8.9224**	**18.5658**	**27.4882**	**0.0280**	**6.1000e-004**	**28.3682**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0308					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3357					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.2751	0.0218	0.5340	1.3600e-003		0.0802	0.0802		0.0802	0.0802	8.9224	17.1458	26.0682	0.0266	6.1000e-004	26.9139
Landscaping	0.0263	0.0100	0.8685	5.0000e-005		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	1.4201	1.4201	1.3700e-003	0.0000	1.4543
Total	**0.6679**	**0.0318**	**1.4025**	**1.4100e-003**		**0.0850**	**0.0850**		**0.0850**	**0.0850**	**8.9224**	**18.5658**	**27.4882**	**0.0280**	**6.1000e-004**	**28.3682**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Water Efficient Landscaping

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	92.9562	0.1980	4.9700e-003	99.3868
Unmitigated	92.9562	0.1980	4.9700e-003	99.3868

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	5.47294 / 3.45033	84.4641	0.1798	4.5100e-003	90.3023
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0.555544 / 0.340495	8.4921	0.0183	4.6000e-004	9.0846
Total		**92.9562**	**0.1980**	**4.9700e-003**	**99.3868**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	5.47294 / 3.45033	84.4641	0.1798	4.5100e-003	90.3023
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0.555544 / 0.340495	8.4921	0.0183	4.6000e-004	9.0846
Total		**92.9562**	**0.1980**	**4.9700e-003**	**99.3868**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	9.4431	0.5581	0.0000	23.3950

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	38.64	7.8436	0.4635	0.0000	19.4321
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	7.88	1.5996	0.0945	0.0000	3.9629
Total		**9.4431**	**0.5581**	**0.0000**	**23.3950**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise		0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator		0.0000	0.0000	0.0000	0.0000
Strip Mall		0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

86 Fair Oaks

South Coast Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	195.00	Space	0.00	78,000.00	0
Apartments Mid Rise	84.00	Dwelling Unit	0.74	84,000.00	240
Strip Mall	7.50	1000sqft	0.00	7,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	12			**Operational Year**	2024
Utility Company	Pasadena Water & Power				
CO2 Intensity (lb/MWhr)	1664.14	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2e intensity factor updated per SoCal Edison's 2018 Sustainability Report, see: https://www.edison.com/content/dam/eix/documents/sustainability/eix-2018-sustainability-report.pdf

Land Use - 4 work/live units (1,300 sf) included as a retail land use.

Construction Phase - Schedule per the Applicant's Construction Questionnaire.

Off-road Equipment - Construction equipment per the Applicant's Construction Questionnaire. Any hours changed based on Appendix D of CalEEMod Users Guide for a lot under 1 acre.

Off-road Equipment - Construction equipment per the Construction Questionnaire.

Off-road Equipment - From construction questionnaire.

Trips and VMT - haul route round trip = 26 miles

Demolition -

Grading - size of the project site

Construction Off-road Equipment Mitigation - Tier 3 equipment per the Construction Questionnaire. Soil stabilizers and ground cover reductions from SCAQMD CEQA Guidelines.

Mobile Land Use Mitigation - Project site near two Metro Gold Line stations.

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Off-road Equipment -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstructionPhase	NumDays	5.00	45.00
tblConstructionPhase	NumDays	100.00	458.00
tblConstructionPhase	NumDays	10.00	21.00
tblConstructionPhase	NumDays	2.00	130.00
tblConstructionPhase	PhaseEndDate	6/14/2022	3/1/2024
tblConstructionPhase	PhaseEndDate	6/7/2022	3/1/2024
tblConstructionPhase	PhaseEndDate	1/14/2022	1/31/2022
tblConstructionPhase	PhaseEndDate	1/18/2022	8/1/2022
tblConstructionPhase	PhaseStartDate	6/8/2022	1/1/2024
tblConstructionPhase	PhaseStartDate	1/19/2022	6/1/2022
tblConstructionPhase	PhaseStartDate	1/15/2022	2/1/2022
tblGrading	AcresOfGrading	0.00	0.74
tblGrading	MaterialExported	0.00	45,500.00
tblLandUse	LotAcreage	1.75	0.00
tblLandUse	LotAcreage	2.21	0.74
tblLandUse	LotAcreage	0.17	0.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Concrete/Industrial Saws
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment

tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
tblOffRoadEquipment	OffRoadEquipmentType		Concrete/Industrial Saws
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
tblOffRoadEquipment	OffRoadEquipmentType		Surfacing Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	13.00
tblTripsAndVMT	HaulingTripLength	20.00	13.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	9.1355	90.6934	90.0197	0.2130	2.2100	3.7774	5.9874	0.5884	3.5046	4.0930	0.0000	20,896.1723	20,896.1723	5.1775	0.0000	21,025.6107
2023	3.9167	36.3491	41.2768	0.0883	1.2202	1.6390	2.8592	0.3270	1.5204	1.8474	0.0000	8,580.6041	8,580.6041	2.1348	0.0000	8,633.9734
2024	17.7056	35.5099	43.4662	0.0928	1.4326	1.5759	3.0085	0.3833	1.4659	1.8491	0.0000	9,015.8447	9,015.8447	2.1513	0.0000	9,069.6268
Maximum	**17.7056**	**90.6934**	**90.0197**	**0.2130**	**2.2100**	**3.7774**	**5.9874**	**0.5884**	**3.5046**	**4.0930**	**0.0000**	**20,896.1723**	**20,896.1723**	**5.1775**	**0.0000**	**21,025.6107**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	3.2759	60.1179	68.6844	0.2130	2.1795	2.4122	4.5917	0.5840	2.4103	2.9942	0.0000	14,436.1900	14,436.1900	3.1316	0.0000	14,514.4792
2023	1.2970	20.2670	26.7301	0.0883	1.2202	0.9632	2.1835	0.3270	0.9626	1.2895	0.0000	5,211.2590	5,211.2590	1.0667	0.0000	5,237.9270
2024	15.1101	21.6394	28.9144	0.0928	1.4326	1.0597	2.4923	0.3833	1.0589	1.4421	0.0000	5,646.5910	5,646.5910	1.0833	0.0000	5,673.6725
Maximum	**15.1101**	**60.1179**	**68.6844**	**0.2130**	**2.1795**	**2.4122**	**4.5917**	**0.5840**	**2.4103**	**2.9942**	**0.0000**	**14,436.1900**	**14,436.1900**	**3.1316**	**0.0000**	**14,514.4792**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**36.01**	**37.24**	**28.86**	**0.00**	**0.63**	**36.57**	**21.83**	**0.34**	**31.72**	**26.49**	**0.00**	**34.29**	**34.29**	**44.19**	**0.00**	**34.35**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	24.2295	1.8229	49.6662	0.1094		6.4551	6.4551		6.4551	6.4551	786.8212	1,524.522 7	2,311.3439	2.3585	0.0534	2,386.221 7
Energy	0.0276	0.2361	0.1019	1.5100e-003		0.0191	0.0191		0.0191	0.0191		301.1981	301.1981	5.7700e-003	5.5200e-003	302.9880
Mobile	1.2341	5.2965	15.4900	0.0618	5.4007	0.0433	5.4440	1.4447	0.0403	1.4850		6,296.683 9	6,296.683 9	0.2743		6,303.541 8
Total	**25.4913**	**7.3555**	**65.2580**	**0.1726**	**5.4007**	**6.5175**	**11.9182**	**1.4447**	**6.5144**	**7.9591**	**786.8212**	**8,122.404 7**	**8,909.225 9**	**2.6386**	**0.0589**	**8,992.751 5**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	24.2295	1.8229	49.6662	0.1094		6.4551	6.4551		6.4551	6.4551	786.8212	1,524.522 7	2,311.3439	2.3585	0.0534	2,386.221 7
Energy	0.0263	0.2246	0.0968	1.4300e-003		0.0182	0.0182		0.0182	0.0182		286.5131	286.5131	5.4900e-003	5.2500e-003	288.2157
Mobile	1.1573	4.9027	13.3844	0.0524	4.5250	0.0371	4.5621	1.2105	0.0345	1.2449		5,343.517 2	5,343.517 2	0.2378		5,349.462 0
Total	**25.4131**	**6.9502**	**63.1475**	**0.1632**	**4.5250**	**6.5103**	**11.0354**	**1.2105**	**6.5077**	**7.7181**	**786.8212**	**7,154.553 0**	**7,941.374 2**	**2.6018**	**0.0587**	**8,023.899 4**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.31	5.51	3.23	5.47	16.21	0.11	7.41	16.21	0.10	3.03	0.00	11.92	10.86	1.40	0.46	10.77

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2022	1/31/2022	5	21	
2	Grading	Grading	2/1/2022	8/1/2022	5	130	
3	Building Construction	Building Construction	6/1/2022	3/1/2024	5	458	
4	Architectural Coating	Architectural Coating	1/1/2024	3/1/2024	5	45	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.74

Acres of Paving: 0

Residential Indoor: 170,100; Residential Outdoor: 56,700; Non-Residential Indoor: 11,250; Non-Residential Outdoor: 3,750; Striped Parking Area: 4,680 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	158	0.38
Demolition	Off-Highway Trucks	1	8.00	402	0.38
Demolition	Other Construction Equipment	3	8.00	172	0.42

Demolition	Rough Terrain Forklifts	1	8.00	100	0.40
Demolition	Rubber Tired Loaders	1	8.00	203	0.36
Demolition	Signal Boards	2	8.00	6	0.82
Building Construction	Forklifts	0	6.00	89	0.20
Grading	Bore/Drill Rigs	1	8.00	221	0.50
Grading	Off-Highway Trucks	2	8.00	402	0.38
Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Other Construction Equipment	5	8.00	172	0.42
Grading	Rough Terrain Forklifts	1	8.00	100	0.40
Grading	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Rubber Tired Loaders	1	8.00	203	0.36
Grading	Signal Boards	2	8.00	6	0.82
Building Construction	Cranes	1	4.00	231	0.29
Demolition	Rubber Tired Dozers	0	1.00	247	0.40
Grading	Rubber Tired Dozers	0	1.00	247	0.40
Building Construction	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Other Construction Equipment	5	8.00	172	0.42
Building Construction	Paving Equipment	1	7.00	132	0.36
Building Construction	Rollers	1	7.00	80	0.38
Building Construction	Rough Terrain Forklifts	1	6.00	100	0.40
Building Construction	Rubber Tired Loaders	1	8.00	203	0.36
Building Construction	Signal Boards	2	8.00	6	0.82
Building Construction	Surfacing Equipment	2	8.00	263	0.30
Building Construction	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	11	28.00	0.00	12.00	14.70	6.90	13.00	LD_Mix	HDT_Mix	HHDT
Grading	16	40.00	0.00	5,688.00	14.70	6.90	13.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	96.00	23.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1274	0.0000	0.1274	0.0193	0.0000	0.0193			0.0000			0.0000
Off-Road	2.8580	26.5180	28.4394	0.0566		1.2279	1.2279		1.1439	1.1439		5,430.6342	5,430.6342	1.5754		5,470.0184
Total	**2.8580**	**26.5180**	**28.4394**	**0.0566**	**0.1274**	**1.2279**	**1.3552**	**0.0193**	**1.1439**	**1.1632**		**5,430.6342**	**5,430.6342**	**1.5754**		**5,470.0184**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9700e-003	0.1071	0.0231	3.0000e-004	6.4900e-003	2.7000e-004	6.7600e-003	1.7800e-003	2.5000e-004	2.0300e-003		32.7936	32.7936	2.4600e-003		32.8551
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1099	0.0691	0.9722	3.0000e-003	0.3130	2.2500e-003	0.3152	0.0830	2.0700e-003	0.0851		298.8337	298.8337	7.5500e-003		299.0225
Total	**0.1129**	**0.1761**	**0.9953**	**3.3000e-003**	**0.3195**	**2.5200e-003**	**0.3220**	**0.0848**	**2.3200e-003**	**0.0871**		**331.6272**	**331.6272**	**0.0100**		**331.8776**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0422	0.0000	0.0422	6.3900e-003	0.0000	6.3900e-003			0.0000			0.0000
Off-Road	0.8718	17.7889	22.4996	0.0566		0.8960	0.8960		0.8960	0.8960	0.0000	3,537.0132	3,537.0132	0.9846		3,561.6280
Total	**0.8718**	**17.7889**	**22.4996**	**0.0566**	**0.0422**	**0.8960**	**0.9382**	**6.3900e-003**	**0.8960**	**0.9023**	**0.0000**	**3,537.0132**	**3,537.0132**	**0.9846**		**3,561.6280**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9700e-003	0.1071	0.0231	3.0000e-004	6.4900e-003	2.7000e-004	6.7600e-003	1.7800e-003	2.5000e-004	2.0300e-003		32.7936	32.7936	2.4600e-003		32.8551
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1099	0.0691	0.9722	3.0000e-003	0.3130	2.2500e-003	0.3152	0.0830	2.0700e-003	0.0851		298.8337	298.8337	7.5500e-003		299.0225
Total	**0.1129**	**0.1761**	**0.9953**	**3.3000e-003**	**0.3195**	**2.5200e-003**	**0.3220**	**0.0848**	**2.3200e-003**	**0.0871**		**331.6272**	**331.6272**	**0.0100**		**331.8776**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0456	0.0000	0.0456	6.6500e-003	0.0000	6.6500e-003			0.0000			0.0000
Off-Road	4.5649	42.2054	45.1350	0.0968		1.9306	1.9306		1.7904	1.7904		9,319.8581	9,319.8581	2.8332		9,390.6887
Total	**4.5649**	**42.2054**	**45.1350**	**0.0968**	**0.0456**	**1.9306**	**1.9762**	**6.6500e-003**	**1.7904**	**1.7970**		**9,319.8581**	**9,319.8581**	**2.8332**		**9,390.6887**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2276	8.1972	1.7713	0.0231	0.4971	0.0203	0.5174	0.1362	0.0194	0.1557		2,510.976 6	2,510.976 6	0.1886		2,515.692 1
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1571	0.0986	1.3889	4.2800e-003	0.4471	3.2100e-003	0.4503	0.1186	2.9600e-003	0.1215		426.9053	426.9053	0.0108		427.1750
Total	**0.3846**	**8.2959**	**3.1601**	**0.0274**	**0.9442**	**0.0235**	**0.9677**	**0.2548**	**0.0224**	**0.2772**		**2,937.881 9**	**2,937.881 9**	**0.1994**		**2,942.867 0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0151	0.0000	0.0151	2.2000e-003	0.0000	2.2000e-003			0.0000			0.0000
Off-Road	1.5561	31.0176	38.4897	0.0968		1.4231	1.4231		1.4231	1.4231	0.0000	6,229.574 6	6,229.574 6	1.8554		6,275.960 1
Total	**1.5561**	**31.0176**	**38.4897**	**0.0968**	**0.0151**	**1.4231**	**1.4383**	**2.2000e-003**	**1.4231**	**1.4253**	**0.0000**	**6,229.574 6**	**6,229.574 6**	**1.8554**		**6,275.960 1**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2276	8.1972	1.7713	0.0231	0.4971	0.0203	0.5174	0.1362	0.0194	0.1557		2,510.9766	2,510.9766	0.1886		2,515.6921
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1571	0.0986	1.3889	4.2800e-003	0.4471	3.2100e-003	0.4503	0.1186	2.9600e-003	0.1215		426.9053	426.9053	0.0108		427.1750
Total	**0.3846**	**8.2959**	**3.1601**	**0.0274**	**0.9442**	**0.0235**	**0.9677**	**0.2548**	**0.0224**	**0.2772**		**2,937.8819**	**2,937.8819**	**0.1994**		**2,942.8670**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7484	37.8633	37.8849	0.0728		1.8117	1.8117		1.6810	1.6810		6,996.6081	6,996.6081	2.0818		7,048.6540
Total	**3.7484**	**37.8633**	**37.8849**	**0.0728**		**1.8117**	**1.8117**		**1.6810**	**1.6810**		**6,996.6081**	**6,996.6081**	**2.0818**		**7,048.6540**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0607	2.0922	0.5064	5.7600e-003	0.1472	3.9100e-003	0.1511	0.0424	3.7400e-003	0.0461		617.2515	617.2515	0.0372		618.1811
Worker	0.3769	0.2367	3.3333	0.0103	1.0731	7.7100e-003	1.0808	0.2846	7.1000e-003	0.2917		1,024.5726	1,024.5726	0.0259		1,025.2199
Total	**0.4376**	**2.3289**	**3.8397**	**0.0160**	**1.2202**	**0.0116**	**1.2319**	**0.3270**	**0.0108**	**0.3378**		**1,641.8241**	**1,641.8241**	**0.0631**		**1,643.4010**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8975	18.4756	23.1949	0.0728		0.9539	0.9539		0.9539	0.9539	0.0000	3,626.9094	3,626.9094	1.0137		3,652.2511
Total	**0.8975**	**18.4756**	**23.1949**	**0.0728**		**0.9539**	**0.9539**		**0.9539**	**0.9539**	**0.0000**	**3,626.9094**	**3,626.9094**	**1.0137**		**3,652.2511**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0607	2.0922	0.5064	5.7600e-003	0.1472	3.9100e-003	0.1511	0.0424	3.7400e-003	0.0461		617.2515	617.2515	0.0372		618.1811
Worker	0.3769	0.2367	3.3333	0.0103	1.0731	7.7100e-003	1.0808	0.2846	7.1000e-003	0.2917		1,024.5726	1,024.5726	0.0259		1,025.2199
Total	**0.4376**	**2.3289**	**3.8397**	**0.0160**	**1.2202**	**0.0116**	**1.2319**	**0.3270**	**0.0108**	**0.3378**		**1,641.8241**	**1,641.8241**	**0.0631**		**1,643.4010**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5173	34.5577	37.7416	0.0728		1.6296	1.6296		1.5118	1.5118		6,996.1107	6,996.1107	2.0786		7,048.0743
Total	**3.5173**	**34.5577**	**37.7416**	**0.0728**		**1.6296**	**1.6296**		**1.5118**	**1.5118**		**6,996.1107**	**6,996.1107**	**2.0786**		**7,048.0743**

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0450	1.5772	0.4571	5.5800e-003	0.1472	1.8100e-003	0.1490	0.0424	1.7300e-003	0.0441		598.0839	598.0839	0.0329		598.9056
Worker	0.3544	0.2142	3.0782	9.9000e-003	1.0731	7.5100e-003	1.0806	0.2846	6.9200e-003	0.2915		986.4095	986.4095	0.0234		986.9934
Total	**0.3995**	**1.7914**	**3.5353**	**0.0155**	**1.2202**	**9.3200e-003**	**1.2296**	**0.3270**	**8.6500e-003**	**0.3356**		**1,584.4934**	**1,584.4934**	**0.0562**		**1,585.8991**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8975	18.4756	23.1949	0.0728		0.9539	0.9539		0.9539	0.9539	0.0000	3,626.7656	3,626.7656	1.0105		3,652.0279
Total	**0.8975**	**18.4756**	**23.1949**	**0.0728**		**0.9539**	**0.9539**		**0.9539**	**0.9539**	**0.0000**	**3,626.7656**	**3,626.7656**	**1.0105**		**3,652.0279**

3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0450	1.5772	0.4571	5.5800e-003	0.1472	1.8100e-003	0.1490	0.0424	1.7300e-003	0.0441		598.0839	598.0839	0.0329		598.9056
Worker	0.3544	0.2142	3.0782	9.9000e-003	1.0731	7.5100e-003	1.0806	0.2846	6.9200e-003	0.2915		986.4095	986.4095	0.0234		986.9934
Total	**0.3995**	**1.7914**	**3.5353**	**0.0155**	**1.2202**	**9.3200e-003**	**1.2296**	**0.3270**	**8.6500e-003**	**0.3356**		**1,584.493 4**	**1,584.493 4**	**0.0562**		**1,585.899 1**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3717	32.4842	37.7690	0.0728		1.5043	1.5043		1.3951	1.3951		6,995.802 2	6,995.802 2	2.0774		7,047.737 3
Total	**3.3717**	**32.4842**	**37.7690**	**0.0728**		**1.5043**	**1.5043**		**1.3951**	**1.3951**		**6,995.802 2**	**6,995.802 2**	**2.0774**		**7,047.737 3**

3.4 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0441	1.5731	0.4441	5.5500e-003	0.1472	1.7900e-003	0.1490	0.0424	1.7100e-003	0.0441		595.8910	595.8910	0.0324		596.7008
Worker	0.3354	0.1952	2.8741	9.5700e-003	1.0731	7.4100e-003	1.0805	0.2846	6.8200e-003	0.2914		953.9089	953.9089	0.0214		954.4441
Total	**0.3795**	**1.7683**	**3.3182**	**0.0151**	**1.2202**	**9.2000e-003**	**1.2294**	**0.3270**	**8.5300e-003**	**0.3355**		**1,549.7999**	**1,549.7999**	**0.0538**		**1,551.1449**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8975	18.4756	23.1949	0.0728		0.9539	0.9539		0.9539	0.9539	0.0000	3,626.5486	3,626.5486	1.0094		3,651.7830
Total	**0.8975**	**18.4756**	**23.1949**	**0.0728**		**0.9539**	**0.9539**		**0.9539**	**0.9539**	**0.0000**	**3,626.5486**	**3,626.5486**	**1.0094**		**3,651.7830**

3.4 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0441	1.5731	0.4441	5.5500e-003	0.1472	1.7900e-003	0.1490	0.0424	1.7100e-003	0.0441		595.8910	595.8910	0.0324		596.7008
Worker	0.3354	0.1952	2.8741	9.5700e-003	1.0731	7.4100e-003	1.0805	0.2846	6.8200e-003	0.2914		953.9089	953.9089	0.0214		954.4441
Total	**0.3795**	**1.7683**	**3.3182**	**0.0151**	**1.2202**	**9.2000e-003**	**1.2294**	**0.3270**	**8.5300e-003**	**0.3355**		**1,549.7999**	**1,549.7999**	**0.0538**		**1,551.1449**

3.5 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.7072					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.8443
Total	**13.8880**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.8443**

3.5 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0386	0.5688	1.8900e-003	0.2124	1.4700e-003	0.2138	0.0563	1.3500e-003	0.0577		188.7945	188.7945	4.2400e-003		188.9004
Total	**0.0664**	**0.0386**	**0.5688**	**1.8900e-003**	**0.2124**	**1.4700e-003**	**0.2138**	**0.0563**	**1.3500e-003**	**0.0577**		**188.7945**	**188.7945**	**4.2400e-003**		**188.9004**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.7072					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0159		281.8443
Total	**13.7667**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.8443**

3.5 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0386	0.5688	1.8900e-003	0.2124	1.4700e-003	0.2138	0.0563	1.3500e-003	0.0577		188.7945	188.7945	4.2400e-003		188.9004
Total	**0.0664**	**0.0386**	**0.5688**	**1.8900e-003**	**0.2124**	**1.4700e-003**	**0.2138**	**0.0563**	**1.3500e-003**	**0.0577**		**188.7945**	**188.7945**	**4.2400e-003**		**188.9004**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.1573	4.9027	13.3844	0.0524	4.5250	0.0371	4.5621	1.2105	0.0345	1.2449		5,343.5172	5,343.5172	0.2378		5,349.4620
Unmitigated	1.2341	5.2965	15.4900	0.0618	5.4007	0.0433	5.4440	1.4447	0.0403	1.4850		6,296.6839	6,296.6839	0.2743		6,303.5418

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	558.60	536.76	492.24	1,865,765	1,563,250
Enclosed Parking with Elevator	0.00	0.00	0.00		
Strip Mall	332.40	315.30	153.23	579,075	485,184
Total	891.00	852.06	645.47	2,444,840	2,048,434

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846
Enclosed Parking with Elevator	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846
Strip Mall	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0263	0.2246	0.0968	1.4300e-003		0.0182	0.0182		0.0182	0.0182		286.5131	286.5131	5.4900e-003	5.2500e-003	288.2157
NaturalGas Unmitigated	0.0276	0.2361	0.1019	1.5100e-003		0.0191	0.0191		0.0191	0.0191		301.1981	301.1981	5.7700e-003	5.5200e-003	302.9880

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	2526.49	0.0273	0.2328	0.0991	1.4900e-003		0.0188	0.0188		0.0188	0.0188		297.2336	297.2336	5.7000e-003	5.4500e-003	298.9999
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Strip Mall	33.6986	3.6000e-004	3.3000e-003	2.7800e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004		3.9645	3.9645	8.0000e-005	7.0000e-005	3.9881
Total		**0.0276**	**0.2361**	**0.1019**	**1.5100e-003**		**0.0191**	**0.0191**		**0.0191**	**0.0191**		**301.1981**	**301.1981**	**5.7800e-003**	**5.5200e-003**	**302.9880**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	2.40433	0.0259	0.2216	0.0943	1.4100e-003		0.0179	0.0179		0.0179	0.0179		282.8627	282.8627	5.4200e-003	5.1900e-003	284.5436
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Strip Mall	0.0310284	3.3000e-004	3.0400e-003	2.5600e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004		3.6504	3.6504	7.0000e-005	7.0000e-005	3.6721
Total		**0.0263**	**0.2246**	**0.0969**	**1.4300e-003**		**0.0181**	**0.0181**		**0.0181**	**0.0181**		**286.5131**	**286.5131**	**5.4900e-003**	**5.2600e-003**	**288.2157**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	24.2295	1.8229	49.6662	0.1094		6.4551	6.4551		6.4551	6.4551	786.8212	1,524.522 7	2,311.3439	2.3585	0.0534	2,386.221 7
Unmitigated	24.2295	1.8229	49.6662	0.1094		6.4551	6.4551		6.4551	6.4551	786.8212	1,524.522 7	2,311.3439	2.3585	0.0534	2,386.221 7

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1690					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8393					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	22.0110	1.7429	42.7184	0.1090		6.4166	6.4166		6.4166	6.4166	786.8212	1,512.0000	2,298.8212	2.3465	0.0534	2,373.3968
Landscaping	0.2102	0.0800	6.9478	3.7000e-004		0.0385	0.0385		0.0385	0.0385		12.5227	12.5227	0.0121		12.8249
Total	**24.2295**	**1.8229**	**49.6662**	**0.1094**		**6.4551**	**6.4551**		**6.4551**	**6.4551**	**786.8212**	**1,524.5227**	**2,311.3439**	**2.3585**	**0.0534**	**2,386.2217**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1690					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8393					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	22.0110	1.7429	42.7184	0.1090		6.4166	6.4166		6.4166	6.4166	786.8212	1,512.000 0	2,298.821 2	2.3465	0.0534	2,373.396 8
Landscaping	0.2102	0.0800	6.9478	3.7000e-004		0.0385	0.0385		0.0385	0.0385		12.5227	12.5227	0.0121		12.8249
Total	**24.2295**	**1.8229**	**49.6662**	**0.1094**		**6.4551**	**6.4551**		**6.4551**	**6.4551**	**786.8212**	**1,524.522 7**	**2,311.343 9**	**2.3585**	**0.0534**	**2,386.221 7**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Water Efficient Landscaping

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

86 Fair Oaks

South Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	195.00	Space	0.00	78,000.00	0
Apartments Mid Rise	84.00	Dwelling Unit	0.74	84,000.00	240
Strip Mall	7.50	1000sqft	0.00	7,500.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 31

Climate Zone 12 **Operational Year** 2024

Utility Company Pasadena Water & Power

CO2 Intensity (lb/MWhr) 1664.14 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2e intensity factor updated per SoCal Edison's 2018 Sustainability Report, see: https://www.edison.com/content/dam/eix/documents/sustainability/eix-2018-sustainability-report.pdf

Land Use - 4 work/live units (1,300 sf) included as a retail land use.

Construction Phase - Schedule per the Applicant's Construction Questionnaire.

Off-road Equipment - Construction equipment per the Applicant's Construction Questionnaire. Any hours changed based on Appendix D of CalEEMod Users Guide for a lot under 1 acre.

Off-road Equipment - Construction equipment per the Construction Questionnaire.

Off-road Equipment - From construction questionnaire.

Trips and VMT - haul route round trip = 26 miles

Demolition -

Grading - size of the project site

Construction Off-road Equipment Mitigation - Tier 3 equipment per the Construction Questionnaire. Soil stabilizers and ground cover reductions from SCAQMD CEQA Guidelines.

Mobile Land Use Mitigation - Project site near two Metro Gold Line stations.

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Off-road Equipment -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstructionPhase	NumDays	5.00	45.00
tblConstructionPhase	NumDays	100.00	458.00
tblConstructionPhase	NumDays	10.00	21.00
tblConstructionPhase	NumDays	2.00	130.00
tblConstructionPhase	PhaseEndDate	6/14/2022	3/1/2024
tblConstructionPhase	PhaseEndDate	6/7/2022	3/1/2024
tblConstructionPhase	PhaseEndDate	1/14/2022	1/31/2022
tblConstructionPhase	PhaseEndDate	1/18/2022	8/1/2022
tblConstructionPhase	PhaseStartDate	6/8/2022	1/1/2024
tblConstructionPhase	PhaseStartDate	1/19/2022	6/1/2022
tblConstructionPhase	PhaseStartDate	1/15/2022	2/1/2022
tblGrading	AcresOfGrading	0.00	0.74
tblGrading	MaterialExported	0.00	45,500.00
tblLandUse	LotAcreage	1.75	0.00
tblLandUse	LotAcreage	2.21	0.74
tblLandUse	LotAcreage	0.17	0.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Concrete/Industrial Saws
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment

tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
tblOffRoadEquipment	OffRoadEquipmentType		Concrete/Industrial Saws
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
tblOffRoadEquipment	OffRoadEquipmentType		Surfacing Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	13.00
tblTripsAndVMT	HaulingTripLength	20.00	13.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	9.2028	90.7466	89.7817	0.2113	2.2100	3.7780	5.9880	0.5884	3.5052	4.0936	0.0000	20,726.7430	20,726.7430	5.1869	0.0000	20,856.4149
2023	3.9574	36.3615	41.0170	0.0875	1.2202	1.6391	2.8593	0.3270	1.5205	1.8475	0.0000	8,503.2248	8,503.2248	2.1352	0.0000	8,556.6055
2024	17.7526	35.5246	43.1640	0.0919	1.4326	1.5760	3.0086	0.3833	1.4659	1.8492	0.0000	8,928.8189	8,928.8189	2.1515	0.0000	8,982.6064
Maximum	**17.7526**	**90.7466**	**89.7817**	**0.2113**	**2.2100**	**3.7780**	**5.9880**	**0.5884**	**3.5052**	**4.0936**	**0.0000**	**20,726.7430**	**20,726.7430**	**5.1869**	**0.0000**	**20,856.4149**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	3.3431	60.1711	68.4464	0.2113	2.1795	2.4128	4.5923	0.5840	2.4109	2.9948	0.0000	14,266.7608	14,266.7608	3.1409	0.0000	14,345.2833
2023	1.3376	20.2794	26.4703	0.0875	1.2202	0.9633	2.1835	0.3270	0.9626	1.2896	0.0000	5,133.8798	5,133.8798	1.0672	0.0000	5,160.5591
2024	15.1571	21.6542	28.6122	0.0919	1.4326	1.0597	2.4923	0.3833	1.0590	1.4422	0.0000	5,559.5653	5,559.5653	1.0835	0.0000	5,586.6521
Maximum	**15.1571**	**60.1711**	**68.4464**	**0.2113**	**2.1795**	**2.4128**	**4.5923**	**0.5840**	**2.4109**	**2.9948**	**0.0000**	**14,266.7608**	**14,266.7608**	**3.1409**	**0.0000**	**14,345.2833**

86 Fair Oaks - South Coast Air Basin, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	35.83	37.22	28.99	0.00	0.63	36.57	21.83	0.34	31.72	26.49	0.00	34.59	34.59	44.14	0.00	34.65

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	24.2295	1.8229	49.6662	0.1094		6.4551	6.4551		6.4551	6.4551	786.8212	1,524.5227	2,311.3439	2.3585	0.0534	2,386.2217
Energy	0.0276	0.2361	0.1019	1.5100e-003		0.0191	0.0191		0.0191	0.0191		301.1981	301.1981	5.7700e-003	5.5200e-003	302.9880
Mobile	1.1798	5.3896	14.6029	0.0586	5.4007	0.0435	5.4443	1.4447	0.0405	1.4852		5,977.1684	5,977.1684	0.2746		5,984.0333
Total	**25.4370**	**7.4486**	**64.3709**	**0.1694**	**5.4007**	**6.5177**	**11.9184**	**1.4447**	**6.5146**	**7.9593**	**786.8212**	**7,802.8892**	**8,589.7104**	**2.6389**	**0.0589**	**8,673.2430**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	24.2295	1.8229	49.6662	0.1094		6.4551	6.4551		6.4551	6.4551	786.8212	1,524.5227	2,311.3439	2.3585	0.0534	2,386.2217
Energy	0.0263	0.2246	0.0968	1.4300e-003		0.0182	0.0182		0.0182	0.0182		286.5131	286.5131	5.4900e-003	5.2500e-003	288.2157
Mobile	1.1050	4.9722	12.7188	0.0497	4.5250	0.0373	4.5623	1.2105	0.0347	1.2451		5,069.3677	5,069.3677	0.2391		5,075.3440
Total	**25.3608**	**7.0197**	**62.4818**	**0.1605**	**4.5250**	**6.5105**	**11.0356**	**1.2105**	**6.5079**	**7.7183**	**786.8212**	**6,880.4035**	**7,667.2246**	**2.6031**	**0.0587**	**7,749.7814**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.30	5.76	2.93	5.31	16.21	0.11	7.41	16.21	0.10	3.03	0.00	11.82	10.74	1.36	0.46	10.65

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2022	1/31/2022	5	21	
2	Grading	Grading	2/1/2022	8/1/2022	5	130	
3	Building Construction	Building Construction	6/1/2022	3/1/2024	5	458	
4	Architectural Coating	Architectural Coating	1/1/2024	3/1/2024	5	45	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.74

Acres of Paving: 0

Residential Indoor: 170,100; Residential Outdoor: 56,700; Non-Residential Indoor: 11,250; Non-Residential Outdoor: 3,750; Striped Parking Area: 4,680 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	158	0.38
Demolition	Off-Highway Trucks	1	8.00	402	0.38
Demolition	Other Construction Equipment	3	8.00	172	0.42

Demolition	Rough Terrain Forklifts	1	8.00	100	0.40
Demolition	Rubber Tired Loaders	1	8.00	203	0.36
Demolition	Signal Boards	2	8.00	6	0.82
Building Construction	Forklifts	0	6.00	89	0.20
Grading	Bore/Drill Rigs	1	8.00	221	0.50
Grading	Off-Highway Trucks	2	8.00	402	0.38
Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Other Construction Equipment	5	8.00	172	0.42
Grading	Rough Terrain Forklifts	1	8.00	100	0.40
Grading	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Rubber Tired Loaders	1	8.00	203	0.36
Grading	Signal Boards	2	8.00	6	0.82
Building Construction	Cranes	1	4.00	231	0.29
Demolition	Rubber Tired Dozers	0	1.00	247	0.40
Grading	Rubber Tired Dozers	0	1.00	247	0.40
Building Construction	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Other Construction Equipment	5	8.00	172	0.42
Building Construction	Paving Equipment	1	7.00	132	0.36
Building Construction	Rollers	1	7.00	80	0.38
Building Construction	Rough Terrain Forklifts	1	6.00	100	0.40
Building Construction	Rubber Tired Loaders	1	8.00	203	0.36
Building Construction	Signal Boards	2	8.00	6	0.82
Building Construction	Surfacing Equipment	2	8.00	263	0.30
Building Construction	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	11	28.00	0.00	12.00	14.70	6.90	13.00	LD_Mix	HDT_Mix	HHDT
Grading	16	40.00	0.00	5,688.00	14.70	6.90	13.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	96.00	23.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1274	0.0000	0.1274	0.0193	0.0000	0.0193			0.0000			0.0000
Off-Road	2.8580	26.5180	28.4394	0.0566		1.2279	1.2279		1.1439	1.1439		5,430.6342	5,430.6342	1.5754		5,470.0184
Total	**2.8580**	**26.5180**	**28.4394**	**0.0566**	**0.1274**	**1.2279**	**1.3552**	**0.0193**	**1.1439**	**1.1632**		**5,430.6342**	**5,430.6342**	**1.5754**		**5,470.0184**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.0800e-003	0.1074	0.0252	2.9000e-004	6.4900e-003	2.7000e-004	6.7600e-003	1.7800e-003	2.6000e-004	2.0400e-003		31.9788	31.9788	2.5800e-003		32.0434
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1215	0.0758	0.8785	2.8100e-003	0.3130	2.2500e-003	0.3152	0.0830	2.0700e-003	0.0851		280.2741	280.2741	7.0600e-003		280.4506
Total	**0.1245**	**0.1832**	**0.9037**	**3.1000e-003**	**0.3195**	**2.5200e-003**	**0.3220**	**0.0848**	**2.3300e-003**	**0.0871**		**312.2529**	**312.2529**	**9.6400e-003**		**312.4940**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0422	0.0000	0.0422	6.3900e-003	0.0000	6.3900e-003			0.0000			0.0000
Off-Road	0.8718	17.7889	22.4996	0.0566		0.8960	0.8960		0.8960	0.8960	0.0000	3,537.0132	3,537.0132	0.9846		3,561.6280
Total	**0.8718**	**17.7889**	**22.4996**	**0.0566**	**0.0422**	**0.8960**	**0.9382**	**6.3900e-003**	**0.8960**	**0.9023**	**0.0000**	**3,537.0132**	**3,537.0132**	**0.9846**		**3,561.6280**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.0800e-003	0.1074	0.0252	2.9000e-004	6.4900e-003	2.7000e-004	6.7600e-003	1.7800e-003	2.6000e-004	2.0400e-003		31.9788	31.9788	2.5800e-003		32.0434
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1215	0.0758	0.8785	2.8100e-003	0.3130	2.2500e-003	0.3152	0.0830	2.0700e-003	0.0851		280.2741	280.2741	7.0600e-003		280.4506
Total	**0.1245**	**0.1832**	**0.9037**	**3.1000e-003**	**0.3195**	**2.5200e-003**	**0.3220**	**0.0848**	**2.3300e-003**	**0.0871**		**312.2529**	**312.2529**	**9.6400e-003**		**312.4940**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0456	0.0000	0.0456	6.6500e-003	0.0000	6.6500e-003			0.0000			0.0000
Off-Road	4.5649	42.2054	45.1350	0.0968		1.9306	1.9306		1.7904	1.7904		9,319.8581	9,319.8581	2.8332		9,390.6887
Total	**4.5649**	**42.2054**	**45.1350**	**0.0968**	**0.0456**	**1.9306**	**1.9762**	**6.6500e-003**	**1.7904**	**1.7970**		**9,319.8581**	**9,319.8581**	**2.8332**		**9,390.6887**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2358	8.2240	1.9318	0.0225	0.4971	0.0208	0.5178	0.1362	0.0199	0.1561		2,448.5947	2,448.5947	0.1978		2,453.5400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1735	0.1083	1.2550	4.0200e-003	0.4471	3.2100e-003	0.4503	0.1186	2.9600e-003	0.1215		400.3915	400.3915	0.0101		400.6437
Total	**0.4093**	**8.3323**	**3.1868**	**0.0265**	**0.9442**	**0.0240**	**0.9682**	**0.2548**	**0.0228**	**0.2776**		**2,848.9862**	**2,848.9862**	**0.2079**		**2,854.1837**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0151	0.0000	0.0151	2.2000e-003	0.0000	2.2000e-003			0.0000			0.0000
Off-Road	1.5561	31.0176	38.4897	0.0968		1.4231	1.4231		1.4231	1.4231	0.0000	6,229.5746	6,229.5746	1.8554		6,275.9601
Total	**1.5561**	**31.0176**	**38.4897**	**0.0968**	**0.0151**	**1.4231**	**1.4383**	**2.2000e-003**	**1.4231**	**1.4253**	**0.0000**	**6,229.5746**	**6,229.5746**	**1.8554**		**6,275.9601**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2358	8.2240	1.9318	0.0225	0.4971	0.0208	0.5178	0.1362	0.0199	0.1561		2,448.594 7	2,448.594 7	0.1978		2,453.540 0
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1735	0.1083	1.2550	4.0200e-003	0.4471	3.2100e-003	0.4503	0.1186	2.9600e-003	0.1215		400.3915	400.3915	0.0101		400.6437
Total	**0.4093**	**8.3323**	**3.1868**	**0.0265**	**0.9442**	**0.0240**	**0.9682**	**0.2548**	**0.0228**	**0.2776**		**2,848.986 2**	**2,848.986 2**	**0.2079**		**2,854.183 7**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7484	37.8633	37.8849	0.0728		1.8117	1.8117		1.6810	1.6810		6,996.608 1	6,996.608 1	2.0818		7,048.654 0
Total	**3.7484**	**37.8633**	**37.8849**	**0.0728**		**1.8117**	**1.8117**		**1.6810**	**1.6810**		**6,996.608 1**	**6,996.608 1**	**2.0818**		**7,048.654 0**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0638	2.0857	0.5631	5.6100e-003	0.1472	4.0400e-003	0.1512	0.0424	3.8600e-003	0.0462		600.3509	600.3509	0.0397		601.3436
Worker	0.4164	0.2599	3.0119	9.6400e-003	1.0731	7.7100e-003	1.0808	0.2846	7.1000e-003	0.2917		960.9397	960.9397	0.0242		961.5450
Total	**0.4802**	**2.3457**	**3.5750**	**0.0153**	**1.2202**	**0.0118**	**1.2320**	**0.3270**	**0.0110**	**0.3379**		**1,561.2905**	**1,561.2905**	**0.0639**		**1,562.8885**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8975	18.4756	23.1949	0.0728		0.9539	0.9539		0.9539	0.9539	0.0000	3,626.9094	3,626.9094	1.0137		3,652.2511
Total	**0.8975**	**18.4756**	**23.1949**	**0.0728**		**0.9539**	**0.9539**		**0.9539**	**0.9539**	**0.0000**	**3,626.9094**	**3,626.9094**	**1.0137**		**3,652.2511**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0638	2.0857	0.5631	5.6100e-003	0.1472	4.0400e-003	0.1512	0.0424	3.8600e-003	0.0462		600.3509	600.3509	0.0397		601.3436
Worker	0.4164	0.2599	3.0119	9.6400e-003	1.0731	7.7100e-003	1.0808	0.2846	7.1000e-003	0.2917		960.9397	960.9397	0.0242		961.5450
Total	**0.4802**	**2.3457**	**3.5750**	**0.0153**	**1.2202**	**0.0118**	**1.2320**	**0.3270**	**0.0110**	**0.3379**		**1,561.290 5**	**1,561.290 5**	**0.0639**		**1,562.888 5**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5173	34.5577	37.7416	0.0728		1.6296	1.6296		1.5118	1.5118		6,996.110 7	6,996.110 7	2.0786		7,048.074 3
Total	**3.5173**	**34.5577**	**37.7416**	**0.0728**		**1.6296**	**1.6296**		**1.5118**	**1.5118**		**6,996.110 7**	**6,996.110 7**	**2.0786**		**7,048.074 3**

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0474	1.5687	0.4994	5.4300e-003	0.1472	1.9000e-003	0.1491	0.0424	1.8100e-003	0.0442		581.9693	581.9693	0.0349		582.8409
Worker	0.3927	0.2351	2.7761	9.2800e-003	1.0731	7.5100e-003	1.0806	0.2846	6.9200e-003	0.2915		925.1449	925.1449	0.0218		925.6903
Total	**0.4401**	**1.8038**	**3.2754**	**0.0147**	**1.2202**	**9.4100e-003**	**1.2296**	**0.3270**	**8.7300e-003**	**0.3357**		**1,507.1141**	**1,507.1141**	**0.0567**		**1,508.5312**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8975	18.4756	23.1949	0.0728		0.9539	0.9539		0.9539	0.9539	0.0000	3,626.7656	3,626.7656	1.0105		3,652.0279
Total	**0.8975**	**18.4756**	**23.1949**	**0.0728**		**0.9539**	**0.9539**		**0.9539**	**0.9539**	**0.0000**	**3,626.7656**	**3,626.7656**	**1.0105**		**3,652.0279**

3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0474	1.5687	0.4994	5.4300e-003	0.1472	1.9000e-003	0.1491	0.0424	1.8100e-003	0.0442		581.9693	581.9693	0.0349		582.8409
Worker	0.3927	0.2351	2.7761	9.2800e-003	1.0731	7.5100e-003	1.0806	0.2846	6.9200e-003	0.2915		925.1449	925.1449	0.0218		925.6903
Total	**0.4401**	**1.8038**	**3.2754**	**0.0147**	**1.2202**	**9.4100e-003**	**1.2296**	**0.3270**	**8.7300e-003**	**0.3357**		**1,507.1141**	**1,507.1141**	**0.0567**		**1,508.5312**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3717	32.4842	37.7690	0.0728		1.5043	1.5043		1.3951	1.3951		6,995.8022	6,995.8022	2.0774		7,047.7373
Total	**3.3717**	**32.4842**	**37.7690**	**0.0728**		**1.5043**	**1.5043**		**1.3951**	**1.3951**		**6,995.8022**	**6,995.8022**	**2.0774**		**7,047.7373**

3.4 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0463	1.5651	0.4852	5.4100e-003	0.1472	1.8700e-003	0.1490	0.0424	1.7900e-003	0.0442		579.9498	579.9498	0.0343		580.8079
Worker	0.3728	0.2142	2.5876	8.9700e-003	1.0731	7.4100e-003	1.0805	0.2846	6.8200e-003	0.2914		894.5688	894.5688	0.0200		895.0680
Total	**0.4191**	**1.7792**	**3.0728**	**0.0144**	**1.2202**	**9.2800e-003**	**1.2295**	**0.3270**	**8.6100e-003**	**0.3356**		**1,474.518 6**	**1,474.518 6**	**0.0543**		**1,475.876 0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8975	18.4756	23.1949	0.0728		0.9539	0.9539		0.9539	0.9539	0.0000	3,626.548 6	3,626.548 6	1.0094		3,651.783 0
Total	**0.8975**	**18.4756**	**23.1949**	**0.0728**		**0.9539**	**0.9539**		**0.9539**	**0.9539**	**0.0000**	**3,626.548 6**	**3,626.548 6**	**1.0094**		**3,651.783 0**

3.4 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0463	1.5651	0.4852	5.4100e-003	0.1472	1.8700e-003	0.1490	0.0424	1.7900e-003	0.0442		579.9498	579.9498	0.0343		580.8079
Worker	0.3728	0.2142	2.5876	8.9700e-003	1.0731	7.4100e-003	1.0805	0.2846	6.8200e-003	0.2914		894.5688	894.5688	0.0200		895.0680
Total	**0.4191**	**1.7792**	**3.0728**	**0.0144**	**1.2202**	**9.2800e-003**	**1.2295**	**0.3270**	**8.6100e-003**	**0.3356**		**1,474.5186**	**1,474.5186**	**0.0543**		**1,475.8760**

3.5 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.7072					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.8443
Total	**13.8880**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.8443**

3.5 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0738	0.0424	0.5121	1.7800e-003	0.2124	1.4700e-003	0.2138	0.0563	1.3500e-003	0.0577		177.0501	177.0501	3.9500e-003		177.1489
Total	**0.0738**	**0.0424**	**0.5121**	**1.7800e-003**	**0.2124**	**1.4700e-003**	**0.2138**	**0.0563**	**1.3500e-003**	**0.0577**		**177.0501**	**177.0501**	**3.9500e-003**		**177.1489**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.7072					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0159		281.8443
Total	**13.7667**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.8443**

3.5 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0738	0.0424	0.5121	1.7800e-003	0.2124	1.4700e-003	0.2138	0.0563	1.3500e-003	0.0577		177.0501	177.0501	3.9500e-003		177.1489
Total	**0.0738**	**0.0424**	**0.5121**	**1.7800e-003**	**0.2124**	**1.4700e-003**	**0.2138**	**0.0563**	**1.3500e-003**	**0.0577**		**177.0501**	**177.0501**	**3.9500e-003**		**177.1489**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.1050	4.9722	12.7188	0.0497	4.5250	0.0373	4.5623	1.2105	0.0347	1.2451		5,069.367 7	5,069.367 7	0.2391		5,075.344 0
Unmitigated	1.1798	5.3896	14.6029	0.0586	5.4007	0.0435	5.4443	1.4447	0.0405	1.4852		5,977.168 4	5,977.168 4	0.2746		5,984.033 3

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	558.60	536.76	492.24	1,865,765	1,563,250
Enclosed Parking with Elevator	0.00	0.00	0.00		
Strip Mall	332.40	315.30	153.23	579,075	485,184
Total	891.00	852.06	645.47	2,444,840	2,048,434

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846
Enclosed Parking with Elevator	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846
Strip Mall	0.553363	0.042540	0.203692	0.115607	0.014606	0.005830	0.021800	0.032323	0.002120	0.001725	0.004837	0.000711	0.000846

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0263	0.2246	0.0968	1.4300e-003		0.0182	0.0182		0.0182	0.0182		286.5131	286.5131	5.4900e-003	5.2500e-003	288.2157
NaturalGas Unmitigated	0.0276	0.2361	0.1019	1.5100e-003		0.0191	0.0191		0.0191	0.0191		301.1981	301.1981	5.7700e-003	5.5200e-003	302.9880

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	2526.49	0.0273	0.2328	0.0991	1.4900e-003		0.0188	0.0188		0.0188	0.0188		297.2336	297.2336	5.7000e-003	5.4500e-003	298.9999
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Strip Mall	33.6986	3.6000e-004	3.3000e-003	2.7800e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004		3.9645	3.9645	8.0000e-005	7.0000e-005	3.9881
Total		**0.0276**	**0.2361**	**0.1019**	**1.5100e-003**		**0.0191**	**0.0191**		**0.0191**	**0.0191**		**301.1981**	**301.1981**	**5.7800e-003**	**5.5200e-003**	**302.9880**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	2.40433	0.0259	0.2216	0.0943	1.4100e-003		0.0179	0.0179		0.0179	0.0179		282.8627	282.8627	5.4200e-003	5.1900e-003	284.5436
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Strip Mall	0.0310284	3.3000e-004	3.0400e-003	2.5600e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004		3.6504	3.6504	7.0000e-005	7.0000e-005	3.6721
Total		**0.0263**	**0.2246**	**0.0969**	**1.4300e-003**		**0.0181**	**0.0181**		**0.0181**	**0.0181**		**286.5131**	**286.5131**	**5.4900e-003**	**5.2600e-003**	**288.2157**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	24.2295	1.8229	49.6662	0.1094		6.4551	6.4551		6.4551	6.4551	786.8212	1,524.5227	2,311.3439	2.3585	0.0534	2,386.2217
Unmitigated	24.2295	1.8229	49.6662	0.1094		6.4551	6.4551		6.4551	6.4551	786.8212	1,524.5227	2,311.3439	2.3585	0.0534	2,386.2217

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1690					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8393					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	22.0110	1.7429	42.7184	0.1090		6.4166	6.4166		6.4166	6.4166	786.8212	1,512.0000	2,298.8212	2.3465	0.0534	2,373.3968
Landscaping	0.2102	0.0800	6.9478	3.7000e-004		0.0385	0.0385		0.0385	0.0385		12.5227	12.5227	0.0121		12.8249
Total	**24.2295**	**1.8229**	**49.6662**	**0.1094**		**6.4551**	**6.4551**		**6.4551**	**6.4551**	**786.8212**	**1,524.5227**	**2,311.3439**	**2.3585**	**0.0534**	**2,386.2217**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1690					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8393					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	22.0110	1.7429	42.7184	0.1090		6.4166	6.4166		6.4166	6.4166	786.8212	1,512.0000	2,298.8212	2.3465	0.0534	2,373.3968
Landscaping	0.2102	0.0800	6.9478	3.7000e-004		0.0385	0.0385		0.0385	0.0385		12.5227	12.5227	0.0121		12.8249
Total	**24.2295**	**1.8229**	**49.6662**	**0.1094**		**6.4551**	**6.4551**		**6.4551**	**6.4551**	**786.8212**	**1,524.5227**	**2,311.3439**	**2.3585**	**0.0534**	**2,386.2217**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Water Efficient Landscaping

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX C

Greenhouse Gases

8. GREENHOUSE GAS EMISSIONS. Would the project:

a. *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

☐ ☐ ☒ ☐

WHY? The project will generate Carbon Dioxide, which is the primary component of Greenhouse gases (GHG). Thus, the project will contribute to global warming as described by the Intergovernmental Panel on Climate Change. In total, the project will generate 1,667.47 metric tons of CO_2 during construction[1] and 1,641.60 metric tons per year for operations, see Air Quality Technical Memorandum.

The City of Pasadena developed the Climate Action Plan (CAP) as a qualified greenhouse gas (GHG) emissions reduction plan in accordance with CEQA Guidelines Section 15183.5. The project applicant has submitted a *Climate Action Plan Consistency Checklist Application Form* in order to demonstrate that the proposed project is consistent with the Pasadena CAP by incorporating applicable actions intended to ensure that the project contributes its fair share to the City's cumulative GHG reduction goals. Proposed sustainable development actions from the submitted CAP Consistency Checklist are listed and explained below in Tables 1 & 2. Review of the Checklist demonstrates that the proposed project would have a less than significant GHG impact.

b. *Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?*

☐ ☐ ☐ ☒

WHY? The project would not conflict with any applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions. The project is consistent with the General Plan and Zoning Code and is not a use that is a significant source of GHG emissions because it is consistent with the City's CAP, as set forth below. The project would not conflict with AB 32, SB32, or the Final 2017 Scoping Plan; therefore, there would be no impacts related to conflict with applicable plans.

City of Pasadena's Climate Action Plan
The City's CAP requires projects to meet at least 11 GHG Reduction Strategies, including six mandatory measures, one action in Energy Efficiency and Conservation, one action in the Sustainable Mobility and Land Use category, and three additional measures. The proposed project will implement 13 actions from the City's CAP, see **Table 1, CAP Action Measures**.

Table 1
CAP Action Measures

GHG Reduction Strategy	Sustainable Development Actions	Yes	N/A

[1] Construction emissions amortized over thirty years is approximately 55.57 MT CO2e/year.

Mandatory Measures			
T-1.2: Continue to improve bicycle and pedestrian safety	**Bicycle Storage:** Does the project provide bicycle storage lockers, racks, or other bicycle storage facilities for residents/employees? Check "N/A" only if the project does not include residents or employees.	X	
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	**Transportation Demand Management (TDM):** Does the project include a TDM plan? A TDM plan is required for the following projects: multifamily residential development that are 100 or more units; mixed-use developments with 50 or more residential units or 50,000 square feet or more of non-residential development; or non-residential projects which exceed 75,000 square feet. If applicable, please submit the TDM plan for review.	X	
T-4.1: Expand the availability and use of alternative fuel vehicles and fueling infrastructure	**Alternative Vehicle Fueling Wiring:** For projects with more than three parking spaces, does the project provide wiring for at least one 240V Type II electric car charger? Please include specifications on the project plans. Check "N/A' only if the project does not include more than three parking spaces.	X	
E-1.2: Encourage the use of energy conservation devices and passive design concepts that make use of the natural climate to increase energy efficiency	**Passive Design Features**: Does the project utilize passive design techniques such as awnings or overhands on the east, west, and south facing windows which block the high summer sun but allow in low winter sun? Please include specifications on the project plans.	X	
WC-1.1: Reduce potable water usage throughout Pasadena	**Irrigation Efficiency:** Will the project utilize drought tolerant landscaping and/or drip irrigation and/or weather controllers to reduce outdoor water use? Please include specifications on the project plans. Check "N/A" only if the project does not include any landscaping.	X	
WR-1.1: Continue to reduce solid waste and landfill GHG emissions	**Facilitate Recycling:** Does the project include a space for separate trash and recycling bins as well as provide information signage/handouts for residents/employees outlining materials to be recycled? Please include specifications on the project plans.	X	
Energy Efficiency and Conservation (select a minimum of one action)			
E-1.1: Increase energy efficiency requirements of new buildings to perform better than 2016 Title 24 Standards	**Zero-Net Energy (ZNE):** Does the project generate 100% of electricity required on site? ZNE calculations must be provided.		X
E-1.1: Increase energy efficiency requirements of new buildings to perform better than 2016 Title 24 Standards	**Energy Efficiency (Exceed 2016 Title 24):** Does the project exceed the 2016 Title 24 Efficiency Standards by at least 5%? Please include Title 24 energy model.	X	
E-4.1: Increase city-wide use of carbon-neutral energy by encouraging and/or supporting carbon-neutral technologies	**Renewable Energy:** Does the project generate at least 60% of the building's projected electricity needs through renewable energy? Please include specifications on the project plans.		X
Sustainable Mobility and Land Use (select a minimum of one action)			
T-1.1: Continue to expand Pasadena's bicycle and pedestrian network	**End-of-Trip Bicycle Facilities (Commercial Development):** Does the project provide at least one shower for every 50 employees? Please include these specifications on the project plans.	X	
T-1.1: Continue to expand Pasadena's bicycle and pedestrian network	**Bike Share:** Does the project include a bike share station? Please include these specifications on the project plans.		X
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	**Car Sharing:** Does the project provide/facilitate car sharing by providing a designated car share space on or within the immediate vicinity of the project site? Examples of car share options include ZipCar, PitCarz, and Getaround. Please include these specifications on the project plans.		X
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	**Park De-Coupling:** Does the project separate the cost of parking from the cost of commercial space and/or residential housing by charging for each individually? Please include these specifications on the project plans.	X	

T-4.1: Expand the availability and use of alternative fuel vehicles and fueling infrastructure	**Alternative Vehicle Fueling Infrastructure:** Does the proposed project include functioning 240V Type II electric car chargers at 3% of parking spaces (at least one charger) AND conduit to allow for future charger installation to 25% of spaces?	**X**	
T-5.1: Facilitate high density, mixed-use, transit-oriented, and infill development	**Transit Oriented Development:** Is the project located within 0.25 mile of a major transit stop as defined in the Zoning Code. Please include a map outlining the nearest transit stop.	**X**	
T-6.1: Reduce GHG emissions from heavy-duty construction equipment and vehicles	**Reduce GHG emissions from heavy-construction equipment:** Will the project utilize at least 30% alternative fueled construction equipment (by pieces of equipment) and implement an equipment idling limit of 3 minutes? Please provide idling limit plan including implementation strategies aligning with the total pieces of equipment and those utilizing alternative fuels.		**X**
Water Conservation			
WC-1.1: Reduce potable water usage throughout Pasadena	**Indoor Water Efficiency:** Will the project achieve at least a 35% reduction in indoor water use per the LEED V4 Indoor Water Use Reduction Calculator? Please attach the calculator output.		**X**
WC-2.1: Increase access to and use of non-potable water	**Rainwater Capture and Reuse:** Does the project utilize a rainwater capture and reuse system to reduce the amount of potable water consumed on site? Please include these specifications on the project plans.		**X**
WC-2.1: Increase access to and use of non-potable water	**Indoor & Outdoor Recycled Water:** Will the project be plumbed to utilize recycled water for either indoor or outdoor water use? Please include these specifications on the project plans.		**X**
WC-2.1: Increase access to and use of non-potable water	**Greywater:** Will the project be plumbed to take advantage of greywater produced on site such as a laundry to landscape system or another on-site water reuse system? Please include these specifications on project plans.		**X**
WC-3.1: Improve storm water to slow, sink, and treat water run-off, recharge groundwater, and improve water quality	**Permeable Surfaces:** Is at least 30% of the hardscape (e.g., surface parking lots, walkways, patios, etc.) permeable to allow infiltration? Please include these specifications on the project plans.		**X**
WC-3.1: Improve storm water to slow, sink, and treat water run-off, recharge groundwater, and improve water quality	**Stormwater Capture:** Is the project designed to retain stormwater resulting from the 95th percentile, 24-hour rain event as defined by the Los Angeles County 95th percentile precipitation isohyetal map? Please provide the engineered stormwater retention plan with the project plans.	**X**	
Waste Conservation			
WR-1.1: Continue to reduce solid waste and landfill GHG emissions	**Recycled Materials:** Does the project utilize building materials and furnishings with at least 50% ([re- or post-consumer) recycled content or products which are designed for reuse? At a minimum, project must show at least 10% of the material by cost meets the recycled content requirements? Please submit the plan for review.		**X**
WR-3.1: Implement a city-wide composting program to limit the amount of organic material entering landfills	**On-Site Composting:** Does the project include an area specifically designated for on-site composting? Please include these specifications on the project plans.		**X**
Urban Greening			
UG-1.1: Continue to preserve, enhance, and acquire additional green space throughout Pasadena to improve carbon sequestration, reduce the urban heat-island effect, and increase opportunities for active recreation	**Greenspace:** Does the project include at least 500 sq. ft. of public use greenspace (landscaped yards, parklets, rooftop garden, etc.)? At a minimum, 50% of the required greenspace must include softscape landscaping (e.g., trees, plants, grass, etc.).		**X**
UG-2.1: Continue to protect existing trees and plant new ones to improve and ensure viability of Pasadena's urban forest	**Trees:** Does the project result in a net gain of trees? Please include these specifications on the project plans.	**X**	

Source: *Architectural Resources Group, Central Park Apartments 86 S. Fair Oaks, Pasadena, CA. Climate Action Plan Consistency Submittal.*

The City's CAP requires the proposed project to provide supporting information describing how each selected Sustainable Development Action would be implemented in the proposed project. **Table 2, Project Implementation of the CAP Actions** details project consistency with the thirteen actions identified within Table 1. The *CAP Consistency Submittal* prepared by the Architectural Resources Group provides additional information regarding project consistency with these measures.

Table 2
Project Implementation of the CAP Actions

Sustainable Development Action	Description of Project Implementation
Mandatory Measures	
T-1.2: Bicycle Storage	The project provides bicycle storage facilities for residents and employees. A Class 1 Bicycle Facility is located within the building and is accessible to residents. A Class 2 Bicycle Facility is provided for non-residents and employees.
T-3.1: Transportation Demand Management	Since the project is a mixed-use development with 84 residential units, a Transportation Demand Management (TDM) plan is required to be prepared and implemented pursuant to Section 10.64.020 of the Pasadena Municipal Code. A TDM plan has been drafted and submitted to the City for review.
T-4.1: Alternative Vehicle Fueling Wiring	Three percent of on-site parking spaces (approximately six spaces) will accommodate 240V Type II electric car chargers for alternative vehicle fueling (AVF). Up to 25 percent of spaces (Approximately 49 spaces) will be capable of supporting such charging in the future.
E-1.2: Passive Design Features	The project utilizes a number of passive design techniques to increase energy efficiency. Residential units will have operable, dual-pane windows that provide both daylighting and ventilation. Every unit will also have its own occupiable exterior balcony; these balconies will typically be stacked to shade apartment glazing from excessive solar exposure. Additional fixed canopies and facade overhangs will further mitigate solar heat gain on the east, west, and south facades. Retail spaces will be provided with extensive storefront glazing, also shaded by canopies. Building surface materials are generally to be light-colored to reduce heat absorption. Paved site surfaces will be offset with significant planted areas; new and relocated existing site trees will provide extensive shading.
WC-1.1: Irrigation Efficiency	More than 75 percent of planting material utilized in this project is identified by Water Use Classification of Landscape Species (WUCOLS) as needing "Low" or "Very Low" amounts of irrigation water, indicating that an overwhelming majority of plants will be drought tolerant. The project will use a drip irrigation system with a weather-based irrigation controller.
WR-1.1: Facilitate Recycling	The project includes separate trash and recycling bins. The first parking level (P1) features two rooms that include space for separate trash and recycling bins. Informational signage will be displayed to clearly indicate which materials can be recycled to educate residents, employees, and visitors to the building about proper refuse disposal procedures.
Selective Actions	
E-1.1: Energy Efficiency (Exceed 2016 Title 24)	The project is projected to exceed the 2016 Title 24 Efficiency Standards by 11.3 percent. A Title 24 energy model has been prepared to demonstrate the project's energy efficiency features.
E-1.1: End-of-Trip Bicycle Facilities	Shower facilities for bicyclists will be located inside of the building, in proximity to the Class 1 Bicycle Facility that is described in the response for Sustainable Development Action T-1.2 (Bicycle Storage). Approximately 30 employees are projected based upon the commercial program. Two showers will be available for employees of the ground floor restaurant and retail tenants. The project also includes four live-work units with bathroom facilities. The project thus exceeds the one shower per 50 employees standards.
T-3.1: Parking De-Coupling	On-site parking for residential tenants at the Central Park Apartments will be de-coupled from the lease agreements to remove an incentive for single-occupancy vehicle usage. Parking spaces will be licensed or leased via separate agreements with building management, and a fee charged per parking space. Approximately 53 parking spaces will be available to tenants of the Hotel Green located next door as "joint parking". Those parking spaces will likely not be de-coupled due to existing lease agreements.
T-3.1: Transportation Demand Management	A Transportation Demand Management (TDM) plan is required by the City of Pasadena as the mixed-use project exceeds 50 dwelling units. This feature is not being added to the total number of selective actions that are associated with this project. A TDM plan has been drafted and submitted to the City for review.
T-4.1: Alternative Vehicle Fueling Infrastructure	The project includes six parking spaces with functioning 240V Type II wiring for alternative vehicle fueling (AVF), which is equivalent to 3 percent of on-site parking spaces. The project also includes an estimated 49 parking spaces with conduit to support future alternative vehicle parking (F-AVF) spaces, which is equivalent to 25 percent of on-site parking spaces.
T-5.1: Transit Oriented Development	The project site is located within a 0.25-mile radius of the Del Mar Metro Station and 0.4 miles of the Memorial Park Station, which are both identified in the Zoning Code as major transit stops.

WC-3.1 Stormwater Capture	The project is designed to retain stormwater resulting from the 95th percentile, 24-hour rain event per the Los Angeles County 95th percentile precipitation isohyetal map. Two infiltration drywells are proposed below the structure to capture and infiltrate the 95th percentile storm volume generated onsite. Roof drainage and runoff from all site areas will be collected and routed to the drywells, where it will infiltrate into the soil to promote groundwater recharge. Additional storage upstream of proposed drywells will be required for 95th percentile storm. Solids will be removed from stormwater run-off through settlement in the proposed drywell chambers.
UG-2.1: Trees	The project results in a net gain of trees. Nineteen trees are currently located on the property, and 38 trees are identified on the proposed landscape plan associated with the project, resulting in a net gain of 19 trees.

Source: *Architectural Resources Group, Central Park Apartments 86 S. Fair Oaks, Pasadena, CA. Climate Action Plan Consistency Submittal.*

Final 2017 Scoping Plan Update

CARB issued the Final 2017 Scoping Plan Update in November 2017 and establishes emissions reductions strategies necessary to meet SB 32's 2030 reduction goals. **Table 3, Project Consistency with Applicable 2017 Scoping Plan Measures** identifies the Scoping Plan policies that are applicable to the proposed project, demonstrating project consistency.

Table 3
Project Consistency with Applicable 2017 Scoping Plan Measures

Measures	Project Consistency
Implement SB 350 by 2030: • Increase the Renewables Portfolio Standard to 50 percent of retail sales by 2030 and grid reliability	**Not Applicable.** The measure is not related to development projects but intended for energy providers.
• Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030.	**Not Applicable.** This measure is directed towards policymakers, not development projects.
• Reduce GHG emissions in the electricity sector through the implementation of the above measures and other actions as modeled in the IRPs to meet GHG emissions reductions planning targets in the IRP process. Load-serving entities and publicly-owned utilities meet GHG emissions planning targets through a combination of measures as described in IRPs.	**Consistent.** The project is required to meet CALGreen building standards by including measures designed to reduce energy consumption.
Implement Mobile Source Strategy (Cleaner Technology and Fuels): • Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document "Potential VMT Reduction Strategies for Discussion."	**Consistent.** The project site is located within a 0.25-mile radius of the Del Mar Metro Station and 0.4 miles of the Memorial Park Station. Thus, this would reduce VMT traveled, promote alternatives to driving, and aim to reduce GHG emissions.
By 2019, develop pricing policies to support low-GHG transportation (e.g. low-emission vehicle zones for heavy duty, road use, parking pricing, transit discounts).	**Not Applicable.** This measure is directed towards policymakers, not development projects. However, the project is within 0.25-miles of the Del Mar Metro Station and 0.4 miles of the Memorial Park Station, which would lead to a reduction in VMT.
By 2019, develop regulations and programs to support organic waste landfill reduction goals in the SLCP and SB 1383.	**Not Applicable.** This measure is directed towards CARB, CalRecycle, CDFA, SWRCB, and local air districts. However, the statewide policy goals of 75 percent of solid waste generated be source reduce, recycled, or composted by 2020 under AB 341. Since the project would be operational after this year, the project's waste collection service would be required to be compliant with this waste reduction.

Identify and expand funding and financing mechanisms to support GHG reductions across all sectors.	**Consistent**. The project incorporates measures that will reduce GHG emissions from project energy, indoor water, and outdoor water use. Additionally, due to project proximity to the Del Mar and Memorial Park Metro stations, the project will reduce VMT and associated transportation emissions.

Source: *CARB. California's 2017 Climate Change Scoping Plan.*

SCAG's RTP/SCS

2016-2040 RTP/SCS

At the regional level, the 2016-2040 RTP/SCS defines strategies for reducing GHGs. In order to assess the project's potential to conflict with the RTP/SCS, this section analyzes the project's land use profile for consistency with those in the Sustainable Communities Strategy. Generally, projects are considered consistent with the provisions and general policies of applicable City and regional land use plans and regulations, such as SCAG's Sustainable Communities Strategy, if they are compatible with the general intent of the plan and would not preclude the attainment of their primary goals. **Table 4, Project Consistency with SCAG 2016-2040 RTP/SCS** demonstrates the project's consistency with the Actions and Strategies set forth in the 2016-2040 RTP/SCS. Therefore, the project would be consistent with the GHG reduction related actions and strategies contained in the 2016-2040 RTP/SCS.

Table 4
Project Consistency with SCAG 2016-2040 RTP/SCS

Actions and Strategies	Responsible Party	Consistency Analysis
Land Use Strategies		
Reflect the changing population and demands, including combatting gentrification and displacement, by increasing housing supply at a variety of affordability levels.	Local jurisdictions	**Consistent.** The proposed project includes the development of a mixed-use development on a site with an existing surface parking lot. The project would increase the housing supply, and would not displace any existing residents.
Focus new growth around transit.	Local Jurisdictions	**Consistent.** The project site is located within a 0.25-mile radius of the Del Mar Metro Station and 0.4 miles of the Memorial Park Station.
Plan for growth around livable corridors, including growth on the Livable Corridors network.	SCAG Local Jurisdictions	**Consistent.** The project site is located within a 0.25-mile radius of the Del Mar Metro Station and 0.4 miles of the Memorial Park Station.
Support local sustainability planning, including developing sustainable planning and design policies, sustainable zoning codes, and Climate Action Plans.	Local Jurisdictions	**Not Applicable.** While this strategy calls on local governments to adopt General Plan updates, zoning codes, and Climate Action Plans to further sustainable communities, the proposed project would not interfere with such policymaking and would be consistent with those policy objectives.
Protect natural and farm lands, including developing conservation strategies.	SCAG Local Jurisdictions	**Consistent.** The project site is currently developed with a surface parking lot; therefore, the proposed project would not be constructed on any natural or farm lands.
Transportation Strategies		
Preserve our existing transportation system.	SCAG County Transportation Commissions Local Jurisdictions	**Not Applicable.** While this strategy calls on investing in the maintenance of our existing transportation system, the proposed project would not interfere with such policymaking.
Manage congestion through programs like the Congestion Management Program, Transportation Demand	County Transportation Commissions Local Jurisdictions	**Consistent.** The proposed project will minimize congestion impacts on the region because of its proximity to public transit and the implementation of a transportation demand management (TDM) program.

Actions and Strategies	Responsible Party	Consistency Analysis
Management, and Transportation Systems Management strategies.		
Promote safety and security in the transportation system.	SCAG County Transportation Commissions Local Jurisdictions	**Not Applicable.** While this strategy aims to improve the safety of the transportation system and protect users from security threats, the proposed project would not interfere with such policymaking.
Complete our transit, passenger rail, active transportation, highways and arterials, regional express lanes, goods movement, and airport ground transportation systems.	SCAG County Transportation Commissions Local Jurisdictions	**Not Applicable.** This strategy calls for transportation planning partners to implement major capital and operational projects that are designed to address regional growth. The proposed project would not interfere with this larger goal of investing in the transportation system.
Technological Innovation and 21st Century Transportation		
Promote zero-emissions vehicles.	SCAG Local Jurisdictions	**Consistent.** While this action/strategy is not necessarily applicable on a project-specific basis, the project would include electric vehicle charging infrastructure.
Promote neighborhood electric vehicles.	SCAG Local Jurisdictions	**Consistent.** While this action/strategy is not necessarily applicable on a project-specific basis, the project would include electric vehicle charging infrastructure.
Implement shared mobility programs.	SCAG Local Jurisdictions	**Not Applicable.** While this strategy is designed to integrate new technologies for last-mile and alternative transportation programs, the proposed project would not interfere with these programs.

Source: *Southern California Association of Governments; 2016–2040 RTP/SCS, Chapter 5: The Road to Greater Mobility and Sustainable Growth; and Impact Sciences, 2019.*

Connect SoCal Plan

On May 7, 2020, SCAG's Regional Council adopted Connect SoCal (2020-2045 RTP/SCS) for federal transportation conformity purposes only. In light of the COVID-19 pandemic, the Regional Council will consider approval of Connect SoCal in its entirety and for all other purposes within 120 days from May 7, 2020.

Connect SoCal is a long-range visioning plan that builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern. It charts a path toward a more mobile, sustainable, and prosperous region by making connections between transportation networks, between planning strategies and between the people whose collaboration can improve the quality of life for Southern Californians. **Table 5, Project Consistency with SCAG Connect SoCal** demonstrates the project's consistency with the major goals set forth in Connect SoCal Plan. Therefore, the project would be consistent with the GHG reduction related actions and strategies contained in Connect SoCal.

Table 5
Project Consistency with SCAG Connect SoCal

Measures	Consistency Analysis
Encourage regional economic prosperity and global competitiveness.	**Not Applicable.** This strategy calls on encouraging regional economic prosperity and global competitiveness. The proposed project would not interfere with such policymaking.
Improve mobility, accessibility, reliability, and travel safety for people and goods.	**Consistent.** The project site is located within 0.25-mile radius of the Del Mar Metro Station and 0.4 miles of the Memorial Park Station.

Measures	Consistency Analysis
Enhance the preservation, security, and resilience of the transportation system.	**Not Applicable.** While this strategy calls on enhancing the preservation, security, and resilience of the transportation system, the proposed project would not interfere with such policymaking.
Increase person and goods movements and travel choices within the transportation system.	**Not Applicable.** This strategy calls on SCAG to increase person and goods movement and travel choices across the transportation system. The proposed project would not interfere with this goal.
Reduce greenhouse gas emissions and improve air quality.	**Consistent.** The Project would result in criteria air pollutant and GHG emissions during construction and operation. However, emissions would not exceed the SCAQMD significance thresholds and would be consistent with the City's CAP.
Support healthy and equitable communities.	**Not Applicable.** This strategy calls on supporting healthy and equitable communities. The proposed project would not interfere with this goal.
Adapt to a changing climate and support an integrated regional development pattern and transportation network.	**Consistent.** The proposed project will minimize congestion impacts on the region because of its proximity to public transit and the implementation of a transportation demand management (TDM) program.
Leverage new transportation technologies and data-driven solutions that result in more efficient travel.	**Not Applicable.** This strategy calls on SCAG to use new transportation technologies and data-driven solutions to increase travel efficiency. The proposed project would not interfere with this goal.
Encourage development of diverse housing types in areas that are supported by multiple transportation options.	**Consistent.** The proposed project would construct 84 apartment units and 4 work/live units within a 0.25-mile radius of the Del Mar Metro Station and 0.4 miles of the Memorial Park Station.
Promote conservation of natural and agricultural lands and restoration of habitats.	**Not Applicable.** This strategy calls on SCAG to promote the conservation of natural and agricultural land and the restoration of habitats. The proposed project site currently serves as a surface parking lot. Therefore, the proposed project would not interfere with this goal.

Source: *Southern California Association of Governments; Connect SoCal; and Impact Science, 2020.*

Architectural Resources Group

Central Park Apartments
86 S. Fair Oaks, Pasadena, CA

Climate Action Plan Consistency Submittal

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST SUPPORTING DOCUMENTS:

Architectural Resources Group

Central Park Apartments
86 S. Fair Oaks, Pasadena, CA

Climate Action Plan Consistency Checklist

Climate Action Plan Consistency Checklist Introduction

The Climate Action Plan Consistency Checklist (Checklist) is intended to be a tool for new development projects to demonstrate consistency with Pasadena's Climate Action Plan (CAP), which is a qualified greenhouse gas (GHG) emissions reduction plan in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15183.5. This Checklist has been developed as part of the CAP implementation and monitoring process and will support the achievement of individual CAP measures as well as Pasadena's overall GHG reduction goals. In addition, this Checklist will further Pasadena's sustainability goals and policies that encourage sustainable development and aim to conserve and reduce the consumption of resources, such as energy and water, among others.

CEQA Guidelines Section 15183.5 allows lead agencies to analyze the impacts associated with GHG emissions at a programmatic level in plan-level documents such as CAPs, so that project-level environmental documents may tier from the programmatic review. Projects that meet the requirements of this Checklist will be deemed to be consistent with Pasadena's CAP and will be found to have a less than significant contribution to cumulative GHG (i.e., the project's incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b). Projects that do not meet the requirements in this Checklist will be deemed to be inconsistent with Pasadena's CAP and must prepare a project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible.

Applicability

This Checklist is only required for discretionary projects[1] that are subject to and not exempt from CEQA. Projects that are exempt from CEQA are deemed to be consistent with Pasadena's CAP, and no further review is necessary, with the exception of the Class 32 "In-Fill Development Projects" categorical exemption (CEQA Guidelines Section 15332), for which Projects are required to demonstrate consistency with the CAP through this Checklist.

[1] In this context a project is any action that meets the definition of a "Project" in Section 15378 of the State CEQA Guidelines.

Climate Action Plan Consistency Checklist Application Form

When required, the Checklist must be included in the project submittal package. The requirements in the Checklist will be included in the project's conditions of approval. The applicant is required to provide supporting documentation on how the proposed project will implement the measures identified in the Checklist to the satisfaction of the Planning & Community Development Department.

Step 1: Complete a Master Land Use Application Form (separate attachment)

Step 2: Demonstrate consistency with the Land Use Element of the General Plan

The growth projections outlined in the 2015 General Plan Land Use Element were used in Pasadena's CAP to estimate community-wide GHG emissions over time. Therefore, new development projects must be consistent with the Land Use Element to be consistent with Pasadena's CAP. In order for City staff to determine a project's consistency with the Land Use Element, please answer the following question and provide explanation with supporting documentation for each response.

Is the proposed project consistent with the existing land use designation of the Land Use Element?

☑ Yes ☐ No

If "Yes," proceed and complete Step 3 of the Checklist.

If "No," the proposed project may not tier from this document and must prepare a comprehensive project-specific analysis of GHG emissions and incorporate the measures in this Checklist to the extent feasible.

Step 3: Demonstrate consistency with Pasadena's CAP

Proposed projects which complete one of the following three options will be deemed to be consistent with Pasadena's CAP and will be found to have a less than significant contribution to cumulative GHG emissions (i.e., the project's incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b).

Please select one of the following options:

- ☑ Option A: Sustainable Development Actions – Demonstrate that the proposed project is consistent with the Pasadena CAP by incorporating applicable actions intended to ensure that the project contributes its fair share to the City's cumulative GHG reduction goals
- ☐ Option B: GHG Efficiency - Demonstrate that the proposed project is consistent with Pasadena's per person GHG efficiency thresholds
- ☐ Option C: Net Zero GHG Emissions – Demonstrate that the proposed project would not result in a net increase in GHG emissions

Option A: Sustainable Development Actions

In order to complete this option, a proposed project must incorporate applicable Sustainable Development Actions to the satisfaction of the applicable City Departments. Incorporating these actions will ensure that the project is reducing its fair share of GHG emissions and support the achievement of Pasadena's overall GHG emissions reduction goals. For each action selected, please submit the requested documentation. If a mandatory action is not applicable to the project, please provide a description as to why that action cannot be implemented.

Mandatory Actions (all of the actions below are required)

GHG Reduction Strategy (Measure in Pasadena's CAP)	Sustainable Development Actions	Yes	N/A
		Check the appropriate box and provide explanation	
T-1.2: Continue to improve bicycle and pedestrian safety	**Bicycle Storage:** Does the project provide bicycle storage lockers, racks, or other bicycle storage facilities for residents/employees? Check "N/A" only if the project does not include residents or employees.	✓	
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	**Transportation Demand Management (TDM):** Does the project include a TDM plan? A TDM plan is required for the following projects: multifamily residential development that are 100 or more units; mixed-use developments with 50 or more residential units or 50,000 square feet or more of non-residential development; or non-residential projects which exceed 75,000 square feet. If applicable, please submit the TDM plan for review.	✓	
T-4.1: Expand the availability and use of alternative fuel vehicles and fueling infrastructure	**Alternative Vehicle Fueling Wiring:** For projects with more than three parking spaces, does the project provide wiring for at least one 240V Type II electric car charger? Please include specifications on the project plans. Check "N/A" only if the project does not include more than three parking spaces.	✓	
E-1.2: Encourage the use of energy conservation devices and passive design concepts that make use of the natural climate to increase energy efficiency	**Passive Design Features:** Does the project utilize passive design techniques such as awnings or overhangs on the east, west, and south facing windows which block the high summer sun but allow in lower winter sun? Please include specifications on the project plans.	✓	
WC-1.1: Reduce potable water usage throughout Pasadena	**Irrigation Efficiency:** Will the project utilize drought tolerant landscaping and/or drip irrigation and/or weather controllers to reduce outdoor water use? Please include specifications on the project plans. Check "N/A" only if the project does not include any landscaping.	✓	
WR-1.1: Continue to reduce solid waste and landfill GHG emissions	**Facilitate Recycling:** Does the project include a space for separate trash and recycling bins as well as provide informational signage/handouts for residents/employees outlining materials to be recycled? Please include specifications on the project plans.	✓	

Selective Actions

In addition the mandatory actions, the proposed project must implement the following:

- One additional action in the Energy Efficiency and Conservation category
- One additional action in the Sustainable Mobility and Land Use category
- Three additional actions from any category

Energy Efficiency and Conservation (select a minimum of one action)

GHG Reduction Strategy (Measure in Pasadena's CAP)	Sustainable Development Actions	Yes	No
E-1.1: Increase energy efficiency requirements of new buildings to perform better than 2016 Title 24 Standards	**Zero-Net Energy (ZNE):** Does the project generate 100% of electricity required on site? ZNE calculations must be provided.		X
E-1.1: Increase energy efficiency requirements of new buildings to perform better than 2016 Title 24 Standards	**Energy Efficiency (Exceed 2016 Title 24):** Does the project exceed the 2016 Title 24 Efficiency Standards by at least 5%? Please include Title 24 energy model.	✓	
E-4.1: Increase city-wide use of carbon-neutral energy by encouraging and/or supporting carbon-neutral technologies	**Renewable Energy:** Does the project generate at least 60% of the building's projected electricity needs through renewable energy? Please include specifications on the project plans.		X

Sustainable Mobility and Land Use (select a minimum of one action)

GHG Reduction Strategy (Measure in Pasadena's CAP)	Sustainable Development Action	Yes	No
T-1.1: Continue to expand Pasadena's bicycle and pedestrian network	**End-of-Trip Bicycle Facilities (Commercial Development):** Does the project provide at least one shower for every 50 employees? Please include these specifications on the project plans.	✓	
T-1.1: Continue to expand Pasadena's bicycle and pedestrian network	**Bike Share:** Does the project include a bike share station? Please include these specifications on the project plans.		X
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	**Car Sharing:** Does the project provide/facilitate car sharing by providing a designated car share space on or within the immediate vicinity of the project site? Examples of car share options include ZipCar, PitCarz, and Getaround. Please include these specifications on the project plans.		X
T-3.1: Decrease annual commuter miles traveled by single occupancy vehiclesT-3.1	**Parking De-Coupling:** Does the project separate the cost of parking from the cost of commercial space and/or residential housing by charging for each individually? Please include these specifications on the project plans.	✓	
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	**Transportation Demand Management (TDM):** Does the project include a TDM plan? Please submit the TDM plan for review (Note: this measure cannot be combined with the mandatory measure that requires a TDM plan for projects that meet certain size thresholds.)	*Req'd*	
T-4.1: Expand the availability and use of alternative fuel vehicles and fueling infrastructure	**Alternative Vehicle Fueling Infrastructure:** Does the proposed project include functioning 240V Type II electric car chargers at 3% of parking spaces (at least one charger) AND conduit to allow for future charger installation to 25% of spaces?	✓	
T-5.1: Facilitate high density, mixed-use, transit-oriented, and infill development	**Transit Oriented Development:** Is the project located within 0.25 mile of a major transit stop as defined in the Zoning Code. Please include a map outlining the nearest transit stop.	✓	
T-6.1: Reduce GHG emissions from heavy-duty construction equipment and vehicles	**Reduce GHG emissions from heavy-construction equipment:** Will the project utilize at least 30% alternative fueled construction equipment (by pieces of equipment) and implement an equipment idling limit of 3 minutes? Please provide idling limit plan including implementation strategies along with the total pieces of equipment and those utilizing alternative fuels.		X

Water Conservation

GHG Reduction Strategy (Measure in Pasadena's CAP)	Sustainable Development Action	Yes	No
WC-1.1: Reduce potable water use throughout Pasadena	**Indoor Water Efficiency:** Will the project achieve at least a 35% reduction in indoor water use per the LEED V4 Indoor Water Use Reduction Calculator? Please attach the calculator output.		X
WC-2.1: Increase access to and use of non-potable water	**Rainwater Capture and Reuse:** Does the project utilize a rainwater capture and reuse system to reduce the amount of potable water consumed on site? Please include these specifications on the project plans.		X
WC-2.1: Increase access to and use of non-potable water	**Indoor & Outdoor Recycled Water:** Will the project be plumbed to utilize recycled water for either indoor or outdoor water use? Please include these specifications on the project plans.		X
WC-2.1: Increase access to and use of non-potable water	**Greywater:** Will the project be plumbed to take advantage of greywater produced on site such as a laundry to landscape system or another on-site water reuse system? Please include these specifications on the project plans.		X
WC-3.1: Improve storm water to slow, sink, and treat water run-off, recharge groundwater, and improve water quality	**Permeable Surfaces:** Is at least 30% of the hardscape (e.g., surface parking lots, walkways, patios, etc.) permeable to allow infiltration? Please include these specifications on the project plans.		X
WC-3.1: Improve storm water to slow, sink, and treat water run-off, recharge groundwater, and improve water quality	**Stormwater Capture:** Is the project designed to retain stormwater resulting from the 95th percentile, 24 hour rain event as defined by the Los Angeles County 95th percentile precipitation isohyetal map? Please provide the engineered stormwater retention plan with the project plans (http://dpw.lacounty.gov/wrd/hydrologygis/)	✓	

Waste Reduction

GHG Reduction Strategy (Measure in Pasadena's CAP)	Sustainable Development Action	Yes	No
WR-1.1: Continue to reduce solid waste and landfill GHG emissions	**Recycled Materials**: Does the project utilize building materials and furnishings with at least 50% (pre- or post-consumer) recycled content or products which are designed for reuse? At a minimum, projects must show at least 10% of the material by cost meets the recycled content requirement? Please submit the plan for review.		X
WR-3.1: Implement a city-wide composting program to limit the amount of organic material entering landfills	**On-Site Composting:** Does the project include an area specifically designated for on-site composting? Please include these specifications on the project plans.		X

Urban Greening

GHG Reduction Strategy (Measure in Pasadena's CAP)	Sustainable Development Action	Yes	No
UG-1.1: Continue to preserve, enhance, and acquire additional green space throughout Pasadena to improve carbon sequestration, reduce the urban heat-island effect, and increase opportunities for active recreation	**Greenspace:** Does the project include at least 500 sq. ft. of public use greenspace (landscaped yards, parklets, rooftop garden, etc.)? At a minimum, 50% of the required greenspace must include softscape landscaping (e.g., trees, plants, grass, etc.).		X
UG-2.1: Continue to protect existing trees and plant new ones to improve and ensure viability of Pasadena's urban forest	**Trees:** Does the project result in a net gain of trees? Please include these specifications on the project plans.	✓	

Total Actions Taken

Sector	Actions Selected (#)		Actions Required
Mandatory Actions	T-1.2, T-3.1, T-4.1, E-1.2, WC-1.1, WR-1.1	*6*	6
Energy Efficiency and Conservation	E-1.1	*1*	1
Sustainable Mobility and Land Use	T-1.1, T-3.1, T-4.1. T-5.1	*4*	1
Water Conservation	WC-3.1	*1*	0
Waste Reduction			0
Urban Greening		*1*	0
Total # of Actions Selected		*13*	
Total Required	*11*		

Supporting Documentation

Use the section below to provide supporting information describing how each selected Sustainable Development Action will be implemented in the proposed project. Additional information such as model outputs, invoices, and project plans should be noted below and attached to this submittal as needed.

Sustainable Development Action	Description of Project Implementation
MANDATORY ACTIONS	
STEP 2 : Demonstrate consistency with Land Use Element of the General Plan	According to the Land Use Element of the General Plan and the corresponding Land Use Diagram, the project area is designated as *High Mixed Use, 0.0-3.0 FAR, 0-87 dwelling units per acre.* The project is consistent with this designation. By incorporating ground floor retail, work-live units, and apartment units of varying types and sizes, it complies with the overarching goal of the High Mixed Use designation, which is "to support the development of multi-story mixed use buildings with a variety of compatible commercial (retail and office) and residential uses." Its FAR (2.89) and residential density (84 dwelling units proposed; 87 dwelling units allowed via density bonus: 64 units by right + 23 additional units) are both within the parameters of this land use designation.
T-1.2 Bicycle Storage	The project provides bicycle storage facilities for residents and employees. A Class 1 Bicycle Facility is located within the building and is accessible to residents. A Class 2 Bicycle Facility is provided for non-residents and employees. Refer to the CAP Consistency Checklist Supporting Docs, p. 1 (Site Plan) and p. 12-13 (Class 1 Bicycle Facility, Class 2 Bicycle Facility) for additional information and preliminary specifications for bicycle storage.
T-3.1 Transportation Demand Management	Since the project is a mixed-use development with 84 residential units a Transportation Demand Management (TDM) plan is required. A TDM plan has been drafted and is enclosed as Appendix C of CAP Consistency Checklist Supporting Docs.
T-4.1 Alternative Vehicle Fueling Wiring	Three percent of on-site parking spaces (approximately six spaces) will accommodate 240V Type II electric car chargers for alternative vehicle fueling (AVF). Up to 25 percent of spaces (approximately 49 spaces) will be capable of supporting such charging in the future. Refer to the CAP Consistency Checklist Supporting Docs, p. 2-5 (P1, P2, P3, and P4 Level Plans) for additional information about alternative vehicle fueling infrastructure and on-site parking.

Sustainable Development Action	Description of Project Implementation
E-1.2 Passive Design Features	The project utilizes a number of passive design techniques to increase energy efficiency. Residential units will have operable, dual-pane windows that provide both daylighting and ventilation. Every unit will also have its own occupiable exterior balcony; these balconies will typically be stacked to shade apartment glazing from excessive solar exposure. Additional fixed canopies and façade overhangs will further mitigate solar heat gain on the east west and south facades. Retail spaces will be provided with extensive storefront glazing, also shaded by canopies. Building surface materials are generally to be light-colored to reduce heat absorption. Paved site surfaces will be offset with significant planted areas; new and relocated existing site trees will provide extensive shading. Refer to the CAP Consistency Checklist Supporting Docs, p. 6-7 (Passive Design Features and Exterior Elevations) for additional information about passive design features of the project.
WC-1.1 Irrigation Efficiency	More than 75 percent of planting material utilized in this project is identified by WUCOLS (Water Use Classification of Landscape Species) as needing “Low” or “Very Low” amounts of irrigation water, indicating that an overwhelming majority of plants will be drought tolerant. The project will use a drip irrigation system with a weather-based irrigation controller. Refer to the CAP Consistency Checklist Supporting Docs, p. 8-9 (Landscape Plan - Ground Floor Tree Locations, Landscape Plan - Ground Floor Planting Locations) for additional information about landscape and irrigation systems.
WR-1.1 Facilitate Recycling	The project includes separate trash and recycling bins. The first parking level (P1) features two rooms that include space for separate trash and recycling bins. Informational signage will be displayed to clearly indicate which materials can be recycled to educate residents, employees, and visitors to the building about proper refuse disposal procedures. Refer to the CAP Consistency Checklist Supporting Docs, p. 2 (P1 Level Plan) for additional information about refuse disposal and storage.
SELECTIVE ACTIONS	
E-1.1 Energy Efficiency (Exceed 2016 Title 24)	The project is projected to exceed the 2016 Title 24 Efficiency Standards by 11.3 percent. A Title 24 energy model has been prepared to demonstrate the project's energy efficiency features. Refer to the CAP Consistency Checklist Supporting Docs, Appendix B, Title 24 Building Energy Analysis Report, p. 1 for Compliance Total, Column 5, 11.3 Percent Better than Standard.
T-1.1 End-of-Trip Bicycle Facilities	Shower facilities for bicyclists will be located inside of the building, in proximity to the Class 1 Bicycle Facility that is described in the response for Sustainable Development Action T-1.2 (Bicycle Storage). Approximately 30 employees are projected based upon the commercial program. Two showers will be available for employees of the ground floor restaurant and retail tenants. The project also includes four live-work units with bathroom facilities. The project thus exceeds the one shower per 50 employees standard. Refer to the CAP Consistency Checklist Supporting Docs, p. 1 (Site Plan) for supporting calculations, locations and features of the planned end-of-trip bicycle facilities.
T-3.1 Parking De-Coupling	On-site parking for residential tenants at the Central Park Apartments will be de-coupled from the lease agreements to remove an incentive for single-occupancy vehicle usage. Parking spaces will be licensed or leased via separate agreements with building management, and a fee charged per parking space. Approximately 53 parking spaces will be available to tenants of the Hotel Green located next door as “joint parking”. Those parking spaces will likely not be de-coupled due to existing lease agreements. Refer to the CAP Consistency Checklist Supporting Docs, p. 2-5 (P1, P2, P3, and P4 Level Plans) for additional information about on-site parking.

Sustainable Development Action	Description of Project Implementation
T-3.1 Transportation Demand Management (TDM)	A Transportation Demand Management (TDM) plan is required by the City of Pasadena as the mixed-use project exceeds 50 dwelling units. This feature is not being added to the total number of selective actions that are associated with this project. A draft TDM plan is included as Appendix C of the CAP Consistency Checklist Supporting Docs.
T-4.1 Alternative Vehicle Fueling Infrastructure	The project includes an estimated six parking spaces with functioning 240V Type II wiring for alternative vehicle fueling (AVF), or 3 percent of on-site parking spaces. The project also includes an estimated 49 parking spaces with conduit to support future alternative vehicle parking (F-AVF) spaces, or 25 percent of on-site parking spaces. Refer to the CAP Consistency Checklist Supporting Docs, p. 2-5 (P1, P2, P3 and P4 Level Plans) for additional information about alternative vehicle fueling infrastructure and on-site parking.
T-5.1 Transit Oriented Development	The project site is located within a 0.25-mile radius of the Del Mar Metro Station and 0.4 miles of the Memorial Park Station, which are both identified in the Zoning Code as major transit stops. Refer to the CAP Consistency Checklist Supporting Docs, p. 11 (Transit Oriented Development Map) for a map that illustrates the distance between the project site, the Del Mar Metro Station and the Memorial Park Station.
WC-3.1 Stormwater Capture	The project is designed to retain stormwater resulting from the 95th percentile, 24 hour rain event per the Los Angeles County 95th percentile precipitation isohyetal map. Two infiltration drywells are proposed below the structure to capture and infiltrate the 95th percentile storm volume generated onsite. Roof drainage and runoff from all site areas will be collected and routed to the drywells, where it will infiltrate into the soil to promote groundwater recharge. Additional storage upstream of proposed drywells will be required for 95th percentile storm. Solids will be removed from stormwater run-off through settlement in the proposed drywell chambers. Refer to the CAP Consistency Checklist Supporting Docs, p. 14 for Stormwater Capture Documentaion (Engineered Stormwater Retention Plan, Hydrologic Analysis, Drywell Calculations, Drywell Detail) and Appendix A (Geotechnical Engineering Investigation).
UG-2.1 Trees	The project results in a net gain of trees. Nineteen trees are currently located on the property, and 38 trees are identified on the proposed landscape plan associated with the project, resulting in a net gain of 19 trees. Refer to the CAP Consistency Checklist Supporting Docs, p. 8-10 (Landscape Plan - Ground Floor Tree Locations, Landscape Plan - Ground Floor Planting Locations, Existing Tree Location Exhibit) for additional information about existing and proposed trees.

Option B: GHG Efficiency

The efficiency threshold assesses the GHG efficiency of a proposed project on a service person (residents + full time employees) basis. This method recognizes that highly efficient projects (e.g., compact and mixed-use development) with relatively high mass emissions may nevertheless meet the local and State GHG reduction goals/targets. Using the demographic projections developed for the CAP, Pasadena has developed service person efficiency thresholds for the years of 2020, 2025, 2030 and 2035 which are consistent with Pasadena's GHG emission goals included in the CAP and the State targets it is designed to achieve (AB 32, SB 32, and substantial progress towards EO S-3-05). Applicants may decide to assess their proposed project's GHG emissions relative to Pasadena's GHG efficiency thresholds in lieu of completing the Sustainable Development Actions. Applicants should utilize standard GHG modeling techniques (such as CalEEMod[2]) to estimate total GHG emissions associated with the proposed project. Models should include all construction emissions (amortized over 30 years) and operational emissions. Total annual emissions should be divided by the proposed project's service population (residents + full time employees) to determine the efficiency of the proposed project using the following equation:

Proposed Project's GHG Efficiency = Annual GHG Emissions / Service Population (Residents + Full Time Employees)

The proposed project must be able to demonstrate a GHG efficiency which is less than or equal to the threshold listed below for the projects first operational year to be considered consistent with the Pasadena CAP and State targets it is designed to achieve. Refer to Appendix B for a complete description of the methodology used to calculate the efficiency thresholds.

Project First Operational Year	Threshold
2017 – 2020	5.63 MT CO_2e/Service Person
2021 – 2025	4.56 MT CO_2e/Service Person
2026 – 2030	3.57 MT CO_2e/Service Person
2031 – 2035	2.73 MT CO_2e/Service Person

[2] The California Emissions Estimator Model® (***CalEEMod***) is a statewide land use emissions computer model designed to provide a uniform platform for assessing air quality and GHG impacts associated with construction projects. Available at: http://www.caleemod.com/

Option C: Net Zero GHG Emissions

In lieu of Option A or B, applicants can demonstrate consistency with this CAP by demonstrating their proposed project would result in no net increase of GHG emissions. A proposed project can reduce its GHG emissions through the purchasing of carbon offsets issued by Climate Action Reserve[3] or other validated carbon offset registry to a level which results in zero net GHG emissions. The following methodology must be followed to prove zero net GHG emissions.

1. The applicant must model the proposed project's annual emissions using the most recent version of CalEEMod or equivalent model accepted by SCAQMD and/or CARB for CEQA purposes. Each model must include all emissions associated with the project including land clearing, demolition, earth moving, construction activities and operational related emissions such as energy use, water use, waste generation, transportation, area sources, and vegetation change, if applicable. The total annual operational emissions over 30 years as projected by the model should then be summed and added to the construction emissions to estimate the total lifetime GHG emissions associated with the project. CalEEMod is able to estimate operation related emissions over time taking into account changes to grid mix and vehicle fleet mandated by state legislation such as Renewable Portfolio Standard (RPS) and Pavley. Applicants should use CalEEMod forecasting to show overall GHG emissions and existing conditions (if applicable) should be modeled separately using CalEEMod for operations only and then subtracted from the project total to show the net change in GHG emissions.

   Example:
   Construction Emissions (1,000 MT of CO_2e) + Sum of Annual Emissions over 30 years (90,000 MT of CO_2e) – Existing Conditions (500 MT CO_2e) = 90,500 MT of CO_2e

2. The total emissions for the project must then be offset by Climate Reserve Tonnes or CRT's through the Climate Action Reserve marketplace. In the above example, the proposed project would be required to purchase 90,500 CRT's through the carbon marketplace. Offsets cost between $12-$15 as of September 2017 but prices are subject to changes in the carbon market. The marketplace can be found here: http://www.climateactionreserve.org/how/crt-marketplace/

The full CalEEMod output and verification of the CRT's purchased must be provided to the City of Pasadena as part of the review process.

[3] The Climate Action Reserve can be considered a bank which holds credits that amount to 1 metric ton of CO_2e per Climate Reserve Tonne (CRT). These credits get their reduction value through projects which reduce GHG emissions such as renewable energy development or through carbon sequestration. Those projects can sell CRT's equal to the amount of GHG emissions reduced. Other projects, can then purchase those CRT's to offset their own emissions. For more information see the Technical Appendix B of the Climate Action Plan

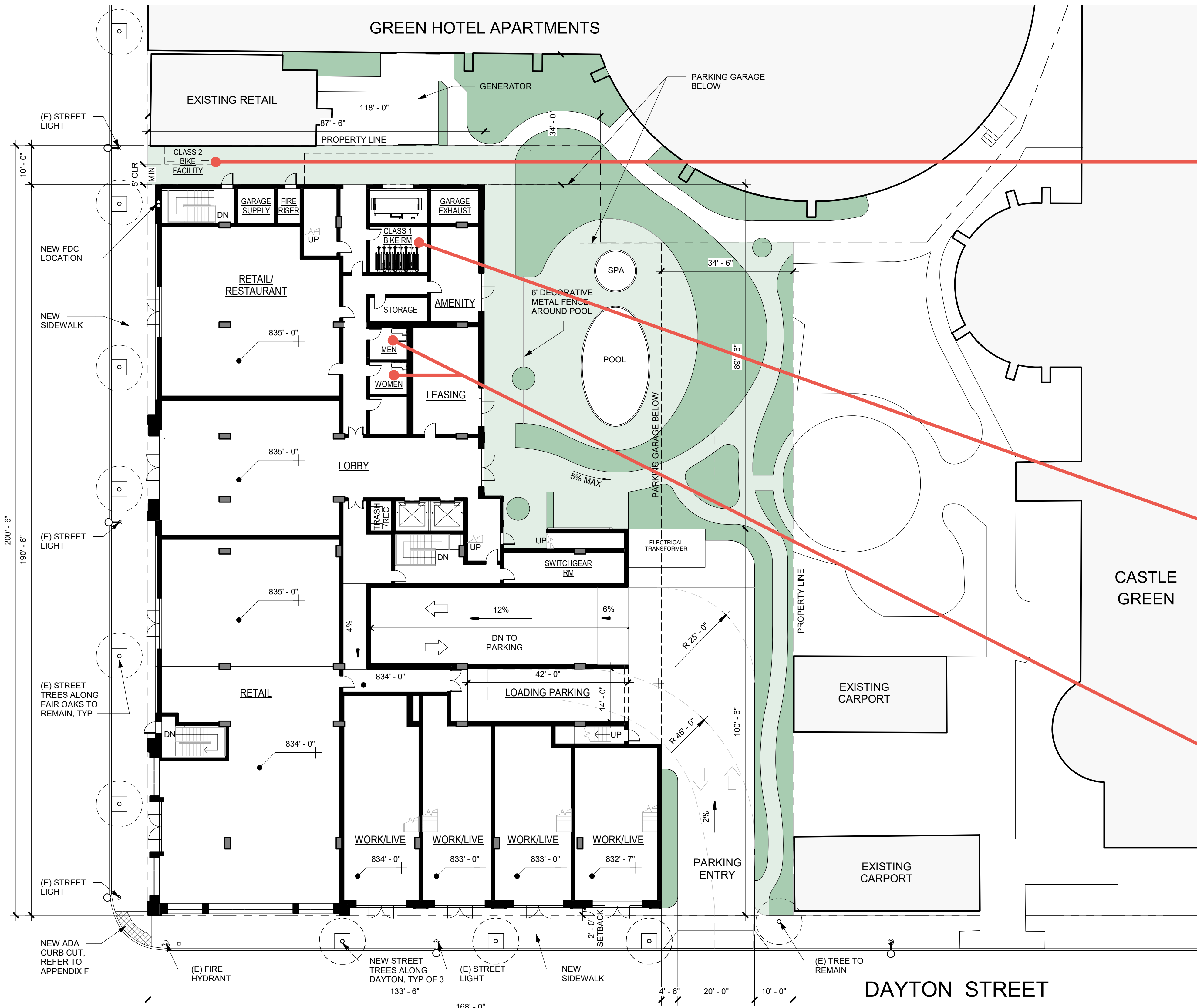
Architectural
Resources Group

Central Park Apartments
86 S. Fair Oaks, Pasadena, CA

Climate Action Plan Consistency Checklist

Supporting Documents

SITE PLAN



T - 1.2 BICYCLE STORAGE
T - 1.1 END-OF-TRIP BICYCLE FACILITIES

NON-RESIDENTIAL & EMPLOYEE BIKE PARKING

*Per Pasadena Municipal Code 17.46.320 Bicycle Parking Standards, the bicycle requirement for the non-residential portion (less than 15,000 SF) of a mixed-use project is a minimum of (4) Class 2 Bicycle Spaces.

RETAIL	4,218 SF
RESTAURANT	1,974 SF
COMMERCIAL PORTION OF WORK/LIVE	3,702 SF
TOTAL	**9,894 SF**

9,894 SF < 15,000 SF =
Minimum of (4) Class 2 Bicycle Spaces required
(4) Class 2 Bicycle Spaces provided

See p. 13 for preliminary specification.

RESIDENTIAL BIKE PARKING

*Per Pasadena Municipal Code 17.46.320 Bicycle Parking Standards, the bicycle requirement for the residential portion of a mixed-use project is a minimum of 1 space for every six dwelling units.

1 SPACE x 84 UNITS/6 UNITS = 14 =
Minimum of (14) Class 1 Bicycle Spaces required
(16) Class 1 Bicycle Spaces provided

See p. 12 for preliminary specification.

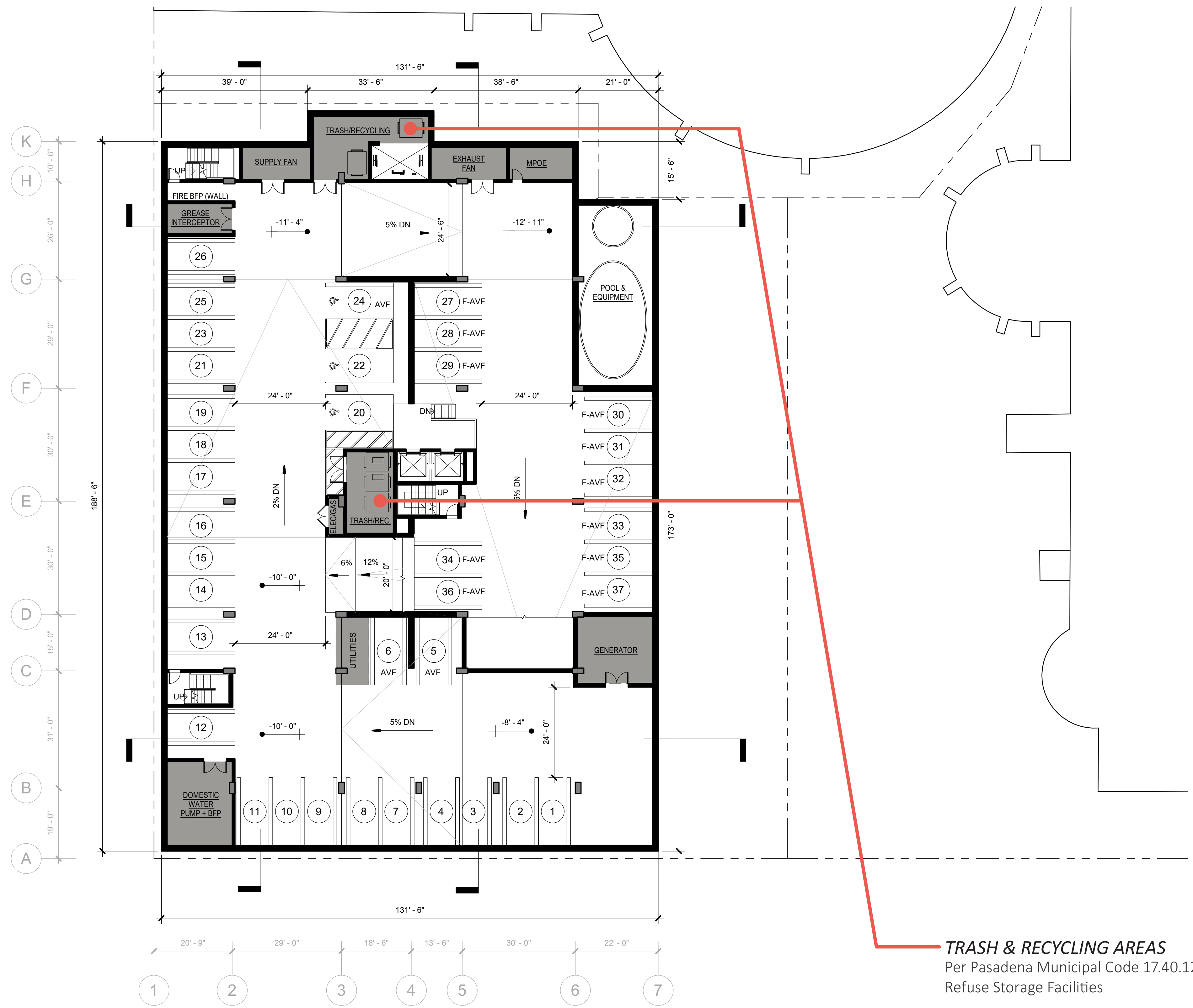
END-OF-TRIP BICYCLE FACILITIES

RETAIL (4,218 SF @ 1 employee/500 SF = 8.4)	9
RESTAURANT (1,974 SF @ 1 employee/350 SF = 5.6)	6
COMMERCIAL PORTION OF WORK/LIVE (3,702 SF @ 1 employee/250 SF = 14.8)	15
TOTAL EMPLOYEES	**30**

Minimum of (1) shower per 50 employees required
(2) Showers provided within End-of-Trip Bicycle Facilities

P1 LEVEL PLAN

T - 3.1 PARKING DE-COUPLING
T - 4.1 ALTERNATIVE VEHICLE FUELING WIRING
W - R 1.1 FACILITATE RECYCLING



TRASH & RECYCLING AREAS
Per Pasadena Municipal Code 17.40.120
Refuse Storage Facilities

OVERALL PARKING SUMMARY

Refer to page 4 of the Concept Design for complete parking tabulations.

RESIDENTIAL*	96 SPACES
GUEST	9 SPACES
WORK/LIVE*	12 SPACES
RETAIL/RESTAURANT*	25 SPACES
JOINT (GREEN HOTEL APTS)	53 SPACES
TOTAL PARKING	**195 SPACES**
STANDARD	189 SPACES
ACCESSIBLE	6 SPACES

* On-site parking for residential tenants at the Central Park Apartments will be licensed or leased via separate agreements with building management, and a fee charged per parking space.

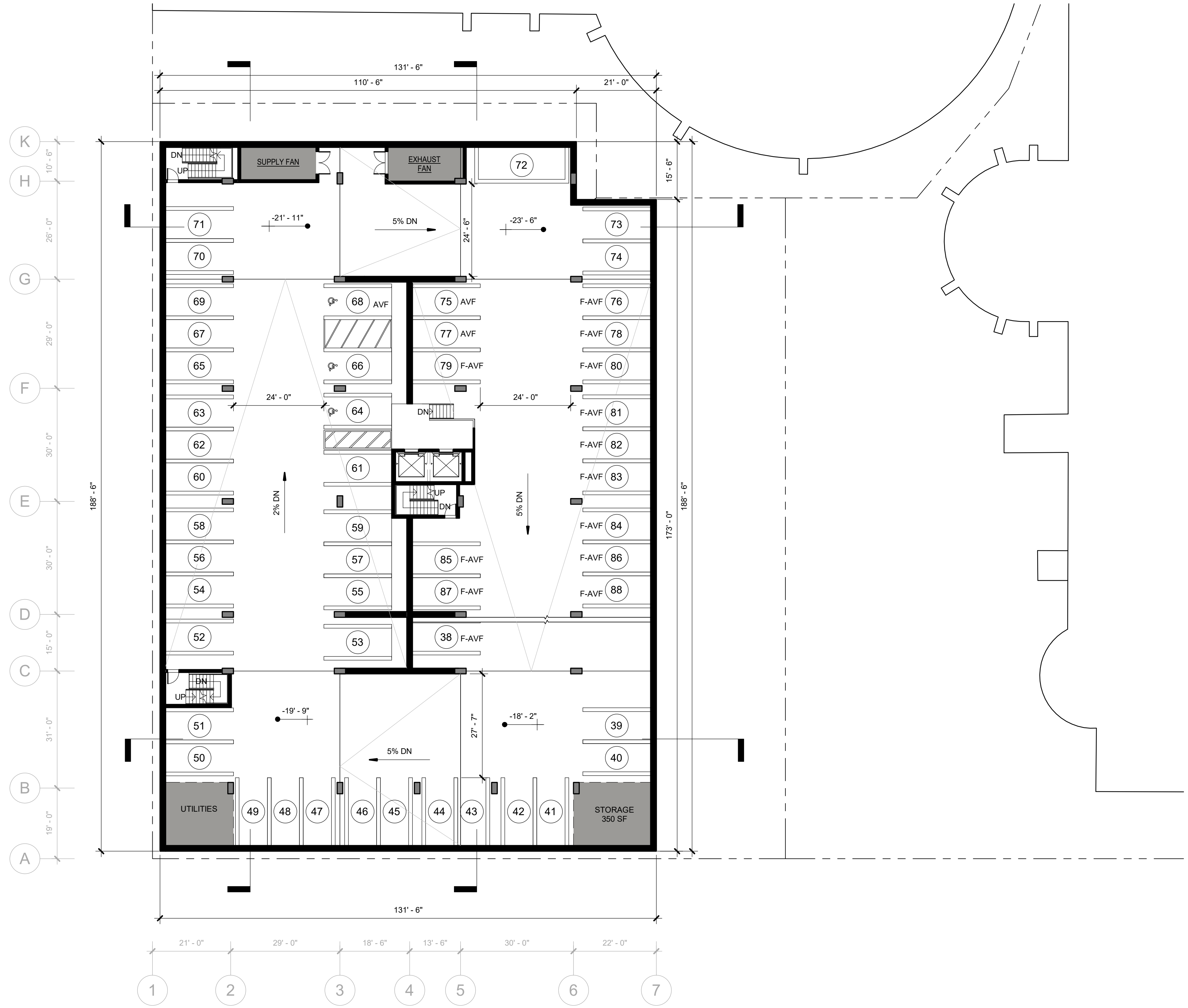
TOTAL AVF: ALTERNATIVE VEHICLE FUELING SPACES (3% of 195 SPACES = 5.85)	6 SPACES
TOTAL F-AVF: INFRASTRUCTURE FOR FUTURE CHARGER INSTALLATION (F-AVF) (25% of 195 SPACES = 48.75)	49 SPACES

P1 PARKING SUMMARY

TOTAL PARKING	**37 SPACES**
STANDARD	34 SPACES
ACCESSIBLE	3 SPACES
AVF: ALTERNATIVE VEHICLE FUELING SPACES	3 SPACES
F-AVF: INFRASTRUCTURE FOR FUTURE CHARGER INSTALLATION (F-AVF)	11 SPACES

(Locations of AVF & F-AVF spaces shown on plans are preliminary and for illustrative purposes only.)

P2 LEVEL PLAN



T - 4.1 ALTERNATIVE VEHICLE FUELING WIRING

P2 PARKING SUMMARY

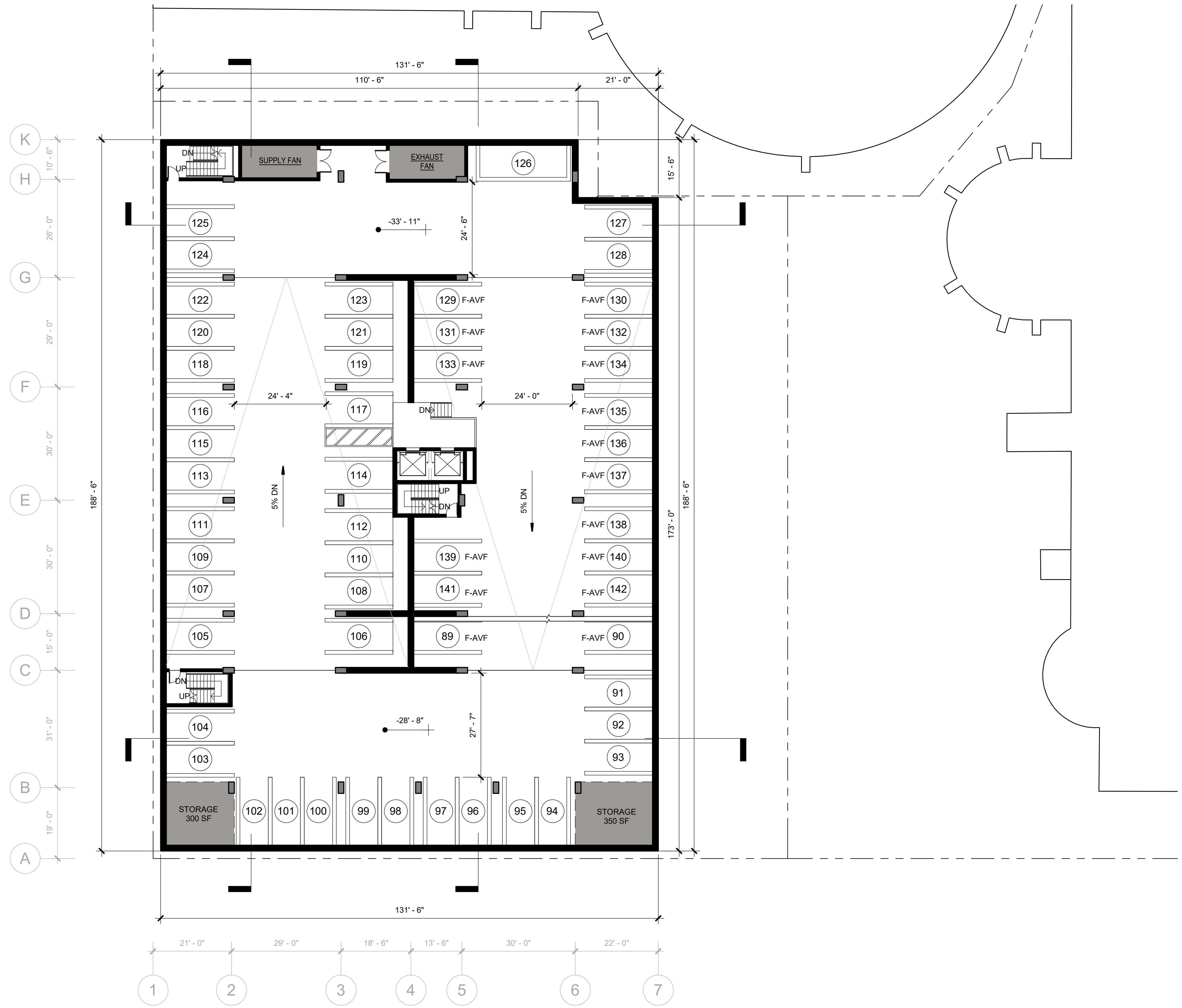
Refer to page 4 of the Concept Design for complete parking tabulations.

TOTAL PARKING	**51 SPACES**
STANDARD	48 SPACES
ACCESSIBLE	3 SPACES

AVF: ALTERNATIVE VEHICLE FUELING SPACES	3 SPACES
F-AVF: INFRASTRUCTURE FOR FUTURE CHARGER INSTALLATION	13 SPACES

(Locations of AVF & F-AVF spaces shown on plans are preliminary and for illustrative purposes only.)

P3 LEVEL PLAN



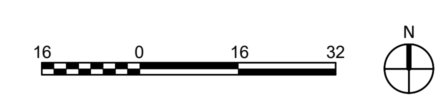
T - 4.1 ALTERNATIVE VEHICLE FUELING WIRING

P3 PARKING SUMMARY

Refer to page 4 of Concept Design for complete parking tabulations.

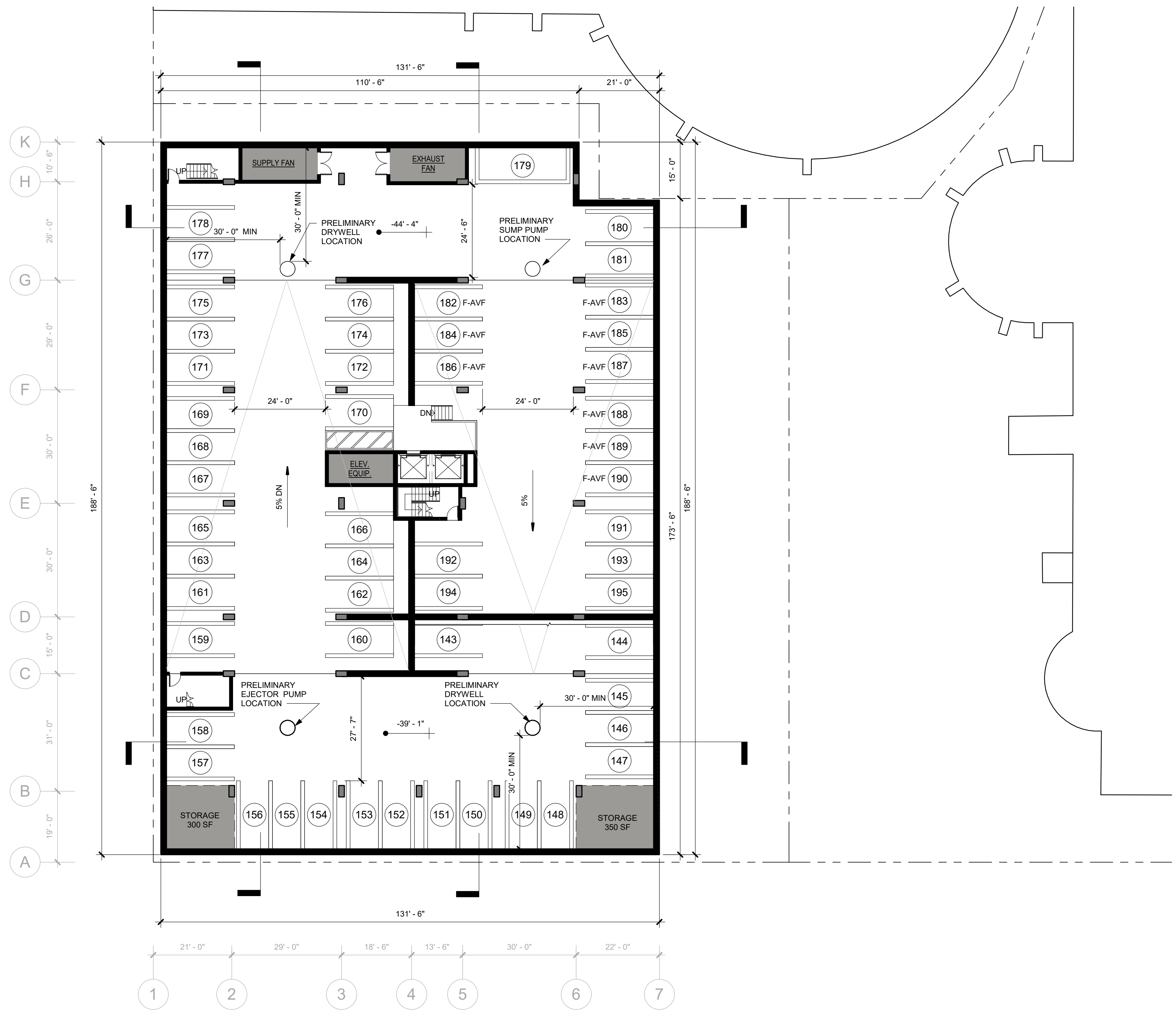
TOTAL PARKING	**54 SPACES**
STANDARD	54 SPACES
ACCESSIBLE	0 SPACES
AVF: ALTERNATIVE VEHICLE FUELING SPACES	0 SPACES
F-AVF: INFRASTRUCTURE FOR FUTURE CHARGER INSTALLATION	16 SPACES

(Locations of AVF & F-AVF spaces shown on plans are preliminary and for illustrative purposes only.)



P4 LEVEL PLAN

T - 4.1 ALTERNATIVE VEHICLE FUELING WIRING



P4 PARKING SUMMARY

Refer to page 4 of Concept design for complete parking tabulations.

TOTAL PARKING	**53 SPACES**
STANDARD	53 SPACES
ACCESSIBLE	0 SPACES

JOINT PARKING	53 SPACES
AVF: ALTERNATIVE VEHICLE FUELING SPACES	0 SPACES
F-AVF: INFRASTRUCTURE FOR FUTURE CHARGER INSTALLATION	9 SPACES

(Locations of AVF & F-AVF spaces shown on plans are preliminary and for illustrative purposes only.)

PASSIVE DESIGN FEATURES

E - 1.2 PASSIVE DESIGN FEATURES

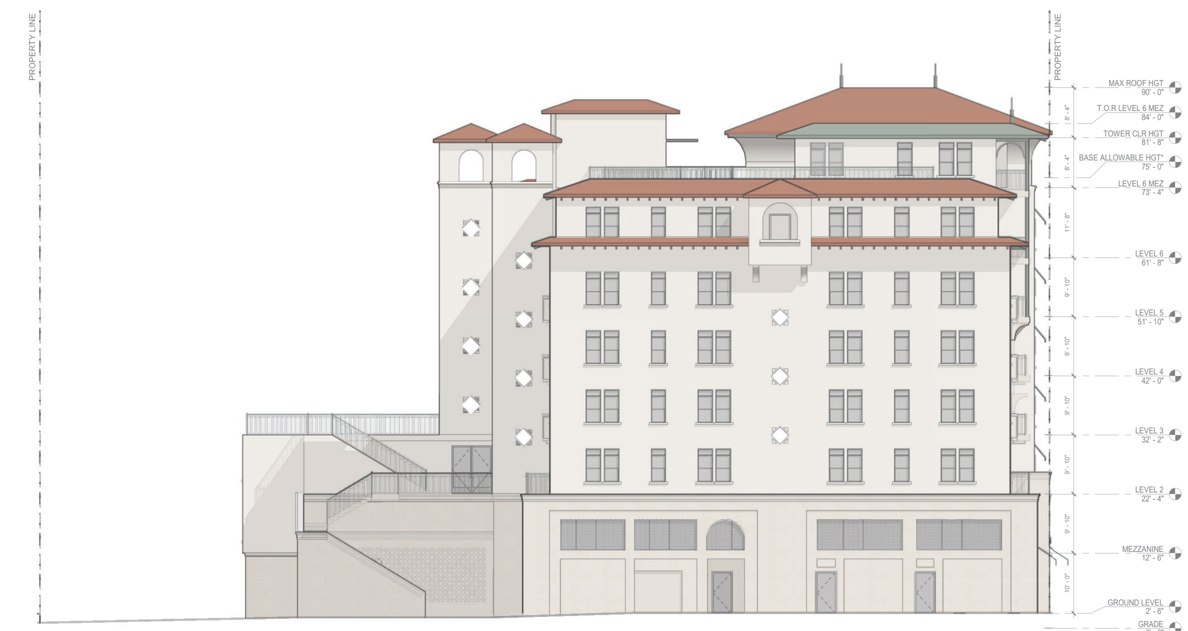
Passive design features and active systems incorporated into the project design include:

- Building configuration:
    - Building is oriented to provide all occupied rooms with daylight and a view
    - Usable exterior balconies at all apartment units
- Materials:
    - Exterior materials selected for durability and local availability
    - Interior materials selected for wear-resistance and low VOC emissions
    - Cool roofing material
- Windows:
    - Operable apartment windows
    - Dual pane glazing
    - Overhangs and fixed canopies provide solar shading at east, south and west windows
- Energy efficient building systems:
    - High-efficiency gas boilers
    - Commissioning to align system performance with design targets and energy efficiency standards
    - Water submetering and individual electric meters
- System control:
    - Each apartment and commercial unit will have its own controllable thermostat
    - Daylighting, occupancy sensors and dimmer switches will be used to optimize lighting
- Landscape:
    - Drought tolerant planting
    - Landscaped roof terraces at mezzanine, second, third, and penthouse floors
    - Low backlight/uplight/glare-rated exterior light fixtures
- Storage and collection of recyclables

EXTERIOR ELEVATIONS

E - 1.2 PASSIVE DESIGN FEATURES BY ELEVATION

SOUTH ELEVATION



NORTH ELEVATION

WEST ELEVATION

EAST ELEVATION

16 0 16 32

LANDSCAPE PLAN - GROUND FLOOR TREE LOCATIONS

WC - 1.1 IRRIGATION EFFICIENCY
UG - 2.1 TREES

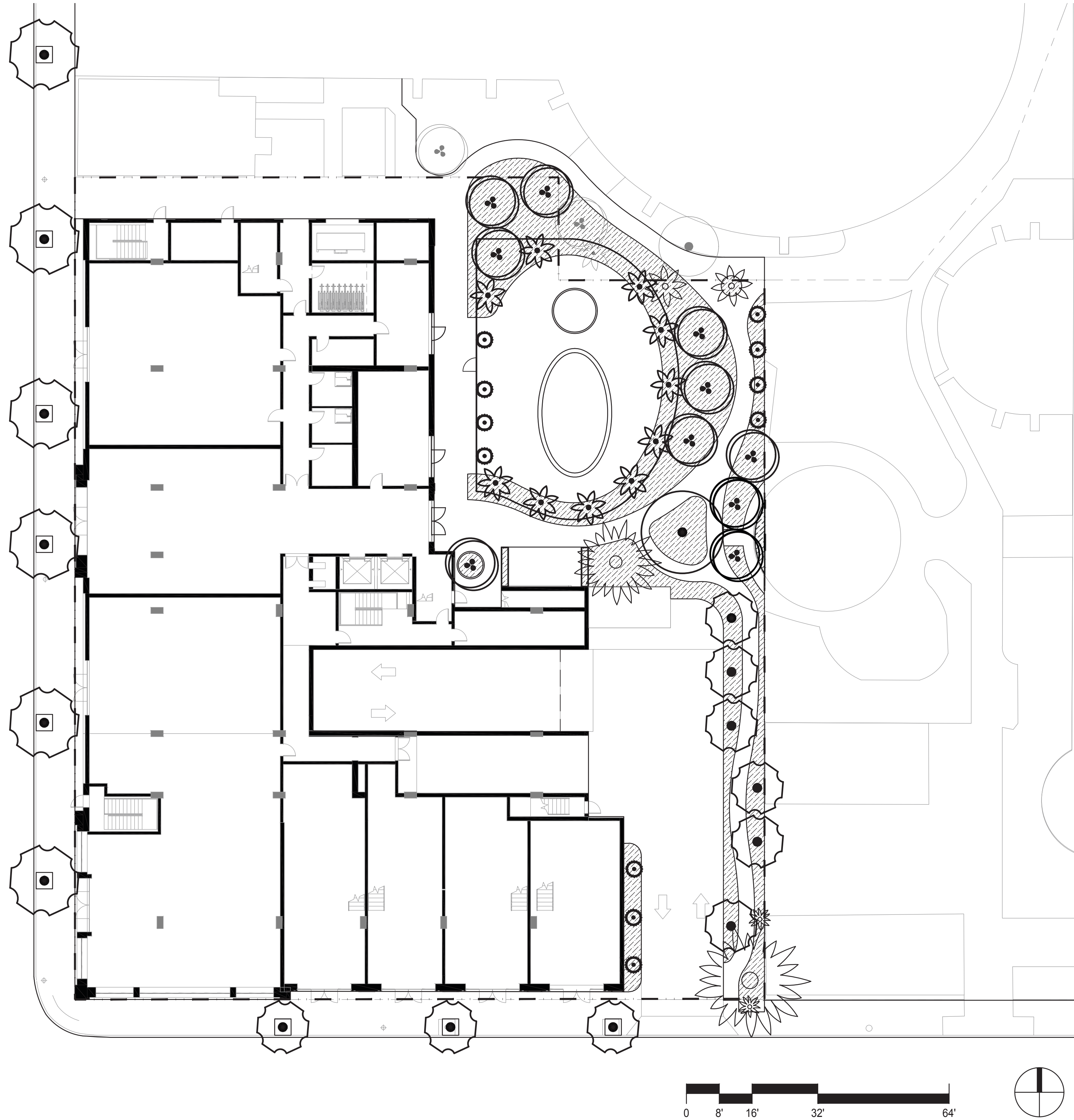
TREE LEGEND:

SYMBOL	BOTANICAL NAME "COMMON NAME"	SIZE	WUCOLS	COMMENTS
	OLEA EUROPAEA 'MAJESTIC BEAUTY' FRUITLESS OLIVE	60" BOX	LOW	MULTI-TRUNK
	ARCHONTOPHOENIX CUNNINGHAMIANA "KING PALM"	24" BOX	MODERATE	STANDARD
	UMBELLULARIA CALIFORNICA "BAY LAUREL"	24" BOX	LOW	STANDARD
	QUERCUS ENGELMANNII "ENGLEMANN OAK"	96" BOX	LOW	STANDARD
	LAGERSTROEMIA INDICA "CRAPE MYRTLE"	36" BOX	LOW	STANDARD, MATCH EXISTING STREET TREES
	PHOENIX CANARIENSIS "CANARY ISLAND DATE PALM"	–		SEE TREE REPLACEMENT CALCULATIONS
	SYAGRUS ROMANZOFFIANA "QUEEN PALM"	–		SEE TREE REPLACEMENT CALCULATIONS
	WASHINGTONIA FILIFERA "CALIFORNIA FAN PALM"	–		SEE TREE REPLACEMENT CALCULATIONS

TREE REPLACEMENT CALCULATIONS:

TREE ID	STATUS	BOTANICAL NAME "COMMON NAME"	DBH / BT HT.	REPLACEMENT TREES REQUIRED (ORD. NO. 2237, § 2, 2012.)
#38	TO BE RETAINED	PHOENIX CANARIENSIS "CANARY ISLAND DATE PALM"	20' BT	NONE
ST1	TO BE RETAINED	LAGERSTROEMIA INDICA "CRAPE MYRTLE"	3	NONE
ST2	TO BE RETAINED	LAGERSTROEMIA INDICA "CRAPE MYRTLE"	3	NONE
ST3	TO BE RETAINED	LAGERSTROEMIA INDICA "CRAPE MYRTLE"	2	NONE
ST4	TO BE RETAINED	LAGERSTROEMIA INDICA "CRAPE MYRTLE"	1	NONE
ST5	TO BE RETAINED	LAGERSTROEMIA INDICA "CRAPE MYRTLE"	1	NONE
ST6	TO BE RETAINED	LAGERSTROEMIA INDICA "CRAPE MYRTLE"	STUMP SPROUTS	NONE
ST8	TO BE RETAINED	SYAGRUS ROMANZOFFIANA "QUEEN PALM"	15' BT	NONE
ST7	TO BE TRANSPLANTED	SYAGRUS ROMANZOFFIANA "QUEEN PALM"	20' BT	NONE
#23	TO BE TRANSPLANTED	WASHINGTONIA FILIFERA "CALIFORNIA FAN PALM"	50' BT	NONE
#31	TO BE TRANSPLANTED	WASHINGTONIA FILIFERA "CALIFORNIA FAN PALM"	45' BT	NONE
#26	TO BE TRANSPLANTED	PHOENIX CANARIENSIS "CANARY ISLAND DATE PALM"	50' BT	NONE
#24	NO LONGER EXISTS*	FICUS MICROCARPA "INDIAN LAUREL FIG"	40.5"	NONE
#18	TO BE REMOVED	CINNAMOMUM CAMPHORA "CAMPHOR TREE"	31"	(4) 36" BOX TREES OR (8) 24" BOX TREES
#19	TO BE REMOVED	CINNAMOMUM CAMPHORA "CAMPHOR TREE"	16.5"	(2) 36" BOX TREES OR (4) 24" BOX TREES
#20	TO BE REMOVED	CINNAMOMUM CAMPHORA "CAMPHOR TREE"	23.5"	(4) 36" BOX TREES OR (8) 24" BOX TREES

NOTE:
*TREE #24 NO LONGER EXISTS. SEE PRIVATE TREE REMOVAL REQUEST APPLICATIONS FOR DETAILS REGARDING UPDATED TREE CONDITION.



GROUND FLOOR PROPOSED LANDSCAPE:

TREES 36" BOX OR LARGER	17
TREES 24" BOX	21
TOTAL LANDSCAPE	11,600 SF
SOFTSCAPE	3,257 SF
HARDSCAPE	8,343 SF

REPLACEMENT TREES REQUIRED:

TREES 36" BOX OR LARGER OR TREES 24" BOX	10 20

EXISTING TREES	19
PROPOSED TREES	38
NET GAIN OF TREES	**19**

LANDSCAPE PLAN - GROUND FLOOR PLANTING LOCATIONS

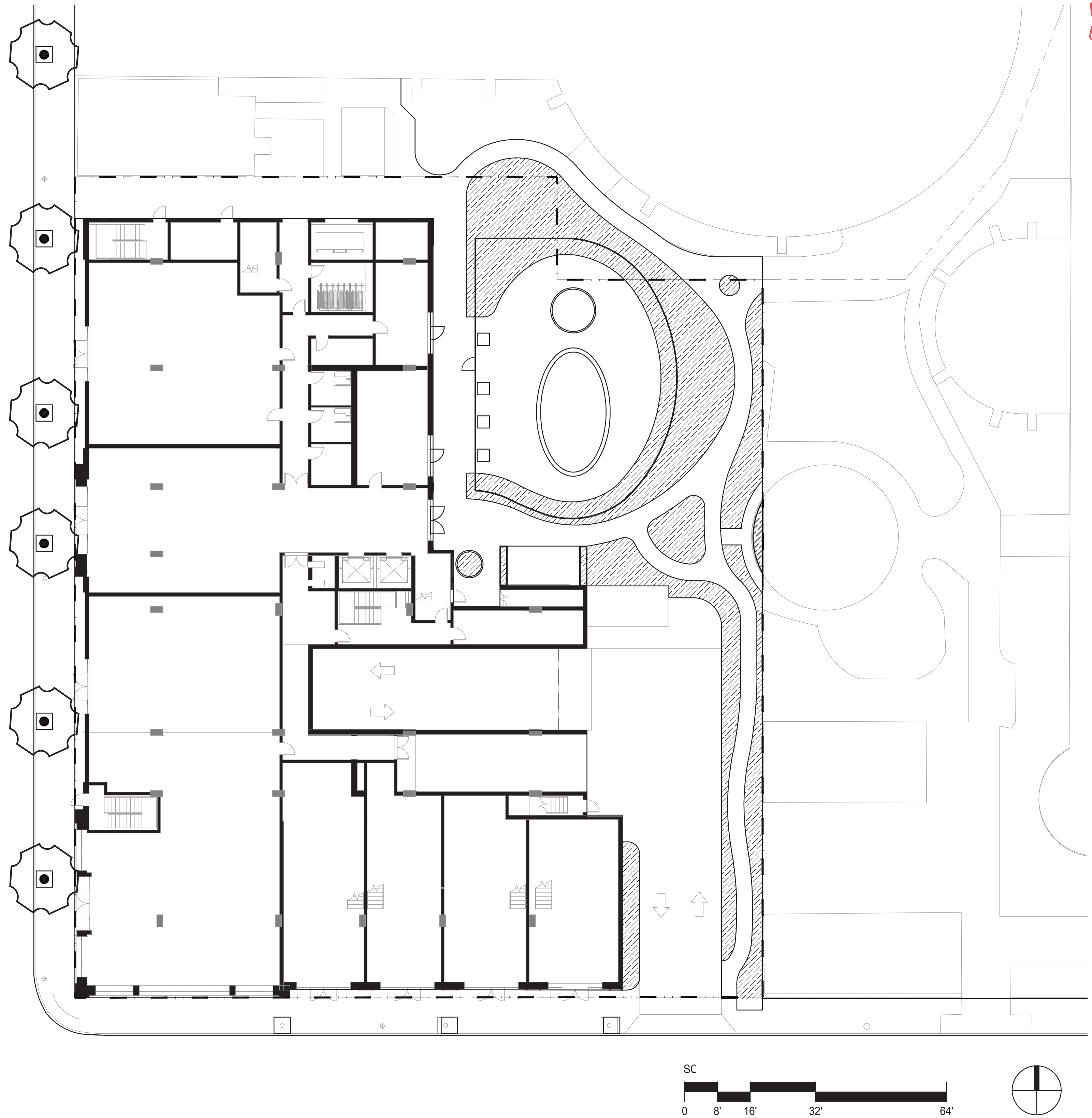
WC - 1.1 IRRIGATION EFFICIENCY
UG - 2.1 TREES

SHRUB, VINE & GROUNDCOVER LEGEND:

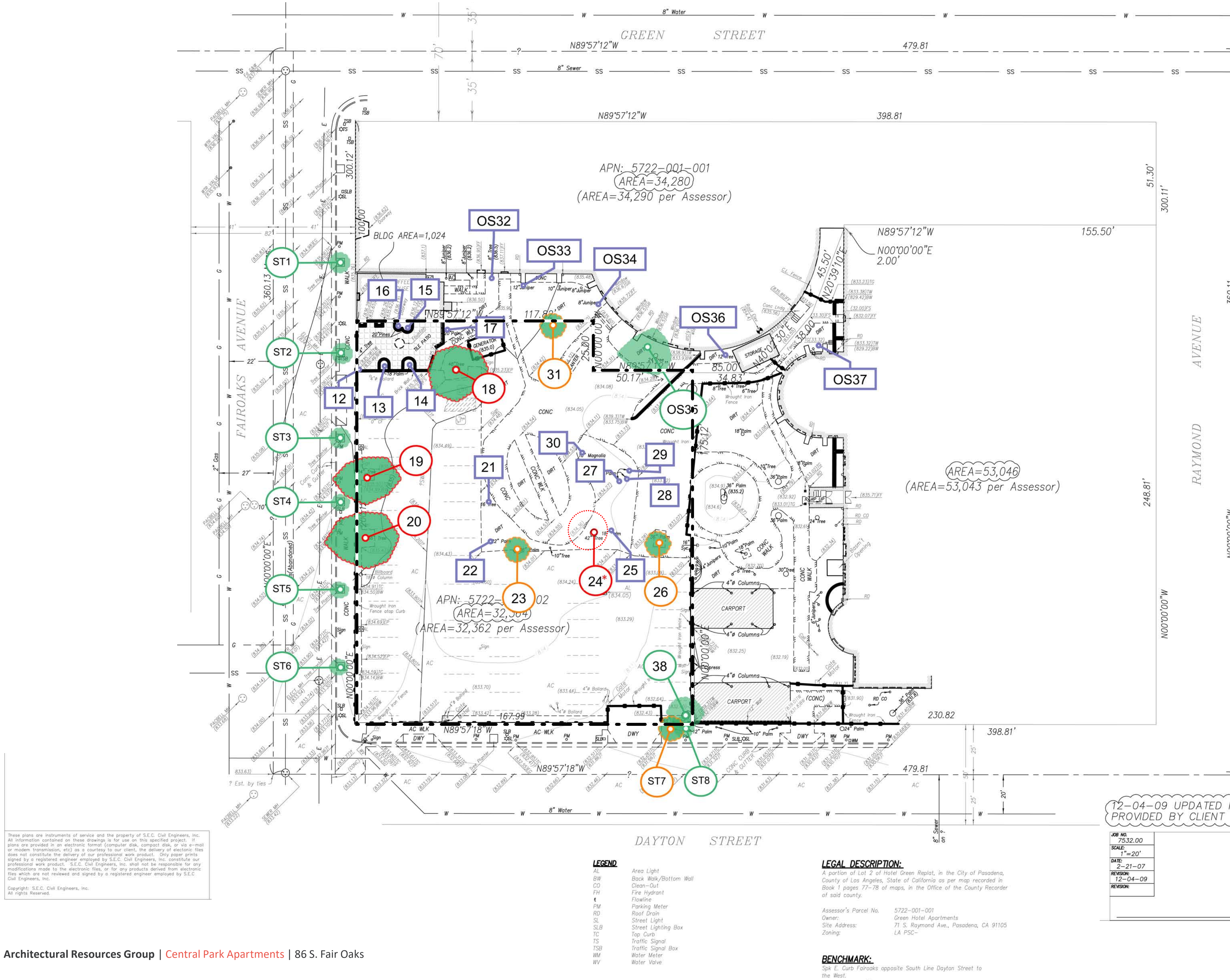
SYMBOL	BOTANICAL NAME "COMMON NAME"	SIZE	WUCOLS
	AGAVE ATTENUATA "FOXTAIL AGAVE"	15 GAL.	LOW
	ARCTOSTAPHYLOS 'SUNSET' "SUNSET MANZANITA"	5 GAL.	LOW
	ARTEMISIA 'POWIS CASTLE' "WORMWOOD"	5 GAL.	MODERATE
	CARPENTERIA CALIFORNICA "BUSH ANEMONE"	5 GAL.	LOW
	DASYLIRION LONGISSIMUM "MEXICAN GRASS TREE"	15 GAL.	VERY LOW
	DISTICTUS 'RIVERS' "ROYAL TRUMPET VINE"	5 GAL	MODERATE
	DRACENA DRACO "DRAGON TREE"	24" BOX	VERY LOW
	ARMERIA MARITIMA 'ALBA' "WHITE FLOWERED THRIFT"	1 GAL.	MODERATE
	LAVANDULA ANGUSTIFOLIA 'HIDCOTE PINK' "HIDCOTE PINK LAVENDER"	1 GAL.	LOW
	PRUNUS ILICIFOLIA SSP. 'LYONII' "CATALINA CHERRY"	15 GAL.	LOW
	ROSA X 'NOASCHNEE' "FLOWER CARPET WHITE GROUNDCOVER ROSE"	2 GAL.	MODERATE
	STRELITZIA REGINAE "BIRD OF PARADISE"	15 GAL.	MODERATE
	SALVIA CLEVELANDII 'WINNIFRED GILMAN' "BLUE SAGE"	5 GAL.	VERY LOW
	VERBENA LILACINA "DE LA MINA"	5 GAL.	LOW

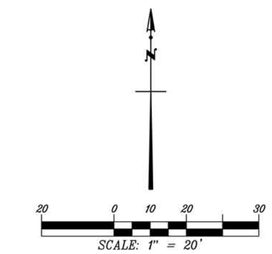
NOTE:

ALL IRRIGATION TO BE DRIP IRRIGATION WITH WEATHER BASED IRRIGATION CONTROLLER.



EXISTING TREE LOCATION EXHIBIT





TREE INVENTORY LEGEND

- City of Pasadena Protected Tree
- Protected Tree Canopy
- Inventoried Non-Protected Tree
- Protected Tree To Be Removed
- Protected/ROW Tree To Be Relocated

NOTE: INVENTORIED TREES PLOTTED OUTSIDE PROPERTY LINE BOUNDARIES ARE DESIGNATED "OS" FOR OFF-SITE AND "ST" FOR STREET TREES

* TREE # 24 NO LONGER EXISTS. SEE PRIVATE TREE REMOVAL REQUEST APPLICATION FOR DETAILS REGARDING UPDATED TREE CONDITION.

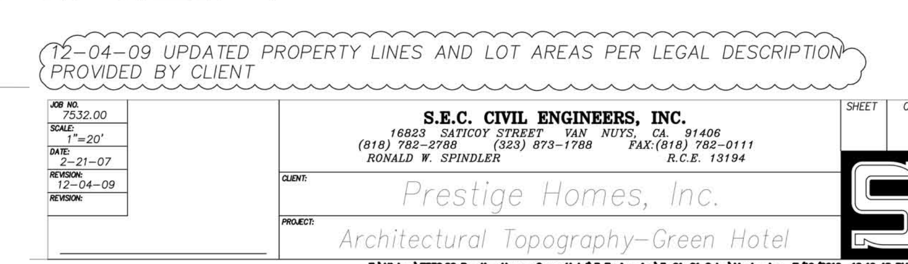
EXISTING TREES ON SITE = 19

Carlberg Associates
Horticulturists and Registered Consulting Arborists

PROTECTED TREE LOCATION EXHIBIT

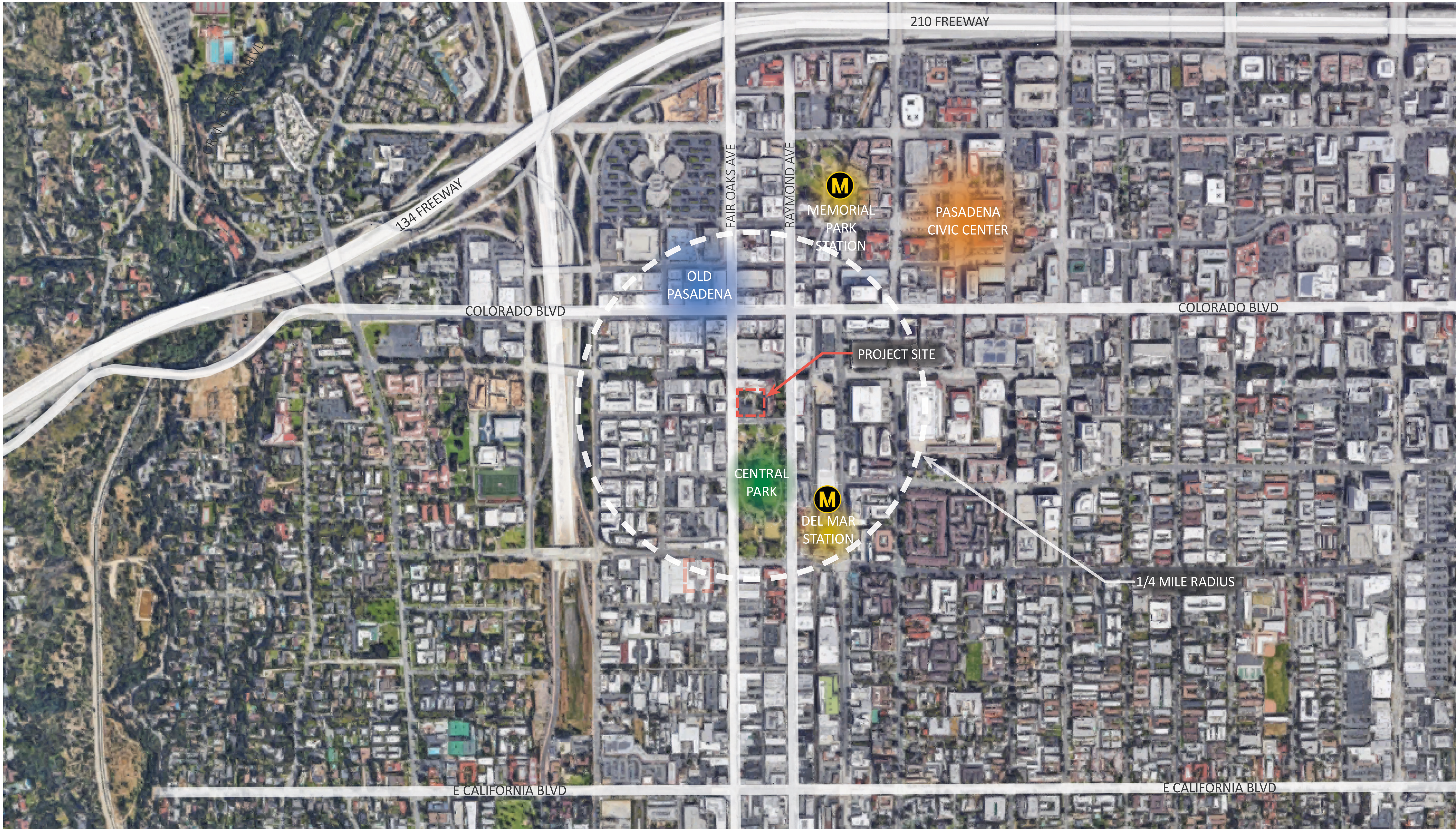
86 SOUTH FAIR OAKS AVENUE, PASADENA, CALIFORNIA
PREPARED FOR: GOLDRICH KEST

www.cycarlberg.com Revised Date: 6.07.18 By: J. Sanchez



TRANSIT ORIENTED DEVELOPMENT MAP

T - 5.1 TRANSIT ORIENTED DEVELOPMENT



CLASS 1 BICYCLE FACILITY

T - 1.2 BICYCLE STORAGE

DERO DECKER

- Sturdy red handle grips
- Lift-assist trays
- Dampers for safe lowering of trays
- Spring loaded levers hold bikes firmly in place
- U-lock compatible
- Smallest footprint
- Smooth and silent operation
- Simple installation
- Low maintenance
- Specially designed fat bike trays available
- Adjustable downward resting position to accommodate different floor clearances.

FINISH OPTIONS

Galvanized

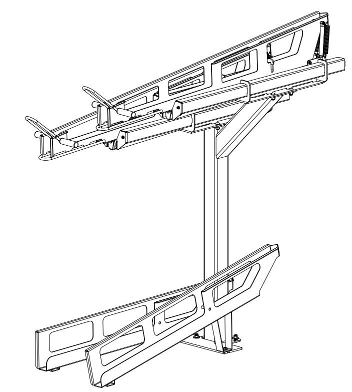
Powder Coat

White	Black	Light Gray RAL 7042	Deep Red RAL 3003	Yellow RAL 1023
CNH Bright Yellow	Orange RAL 2004	Blue RAL 5005	Sky Blue RAL 5015	Hunter Green RAL 6005
Light Green RAL 6018	Green RAL 6016	Sepia Brown RAL 8014	Bronze	Silver 9007
Dark Purple	Flat Black	Wine Red RAL 3005	Beige RAL 1001	Iron Gray 7011

www.dero.com | 1-888-337-6729

DERO DECKER
Submittal Sheet

*This is a preliminary specification and is for illutrative purposes only. Exact specification to be confirmed.



CAPACITY 4 bikes per unit. x 4 = 16 Bike Spaces

MATERIALS
Uprights: 4" 11g square tube
Upright base: 1/4" plate
Cantilevers: 11g plate
Cantilever base: 1/4" plate
Trays: 11g plate

FINISHES

☑ **Galvanized**
An after fabrication hot dipped galvanized finish is our standard option.

☐ **Powder Coat**
Our powder coat finish assures a high level of adhesion and durability by following these steps:
1. Sandblast
2. Epoxy primer electrostatically applied
3. Final thick TGIC polyester powder coat

MOUNT OPTIONS

☑ **Surface**
Each upright has one ¼" plate feet that accept 1/2" wedge anchors

SETBACKS See following page

RESIDENTIAL BIKE PARKING

*Per Pasadena Municipal Code 17.46.320 Bicycle Parking Standards, the bicycle requirement for the residential portion of a mixed-use project is a minimum of 1 space for every six dwelling units.

1 SPACE x 84 UNITS/6 UNITS = 14=
Minimum of (14) Class 1 Bicycle Spaces required
(16) Class 1 Bicycle Spaces provided

HOOP RACK

YOUR LOGO HERE

Customize the Hoop Rack and brand your bike parking

FINISH OPTIONS

Galvanized | Stainless | PVC Dip

MOUNT OPTIONS

Surface | In-Ground | Rail

Powder Coat

White	Black	Light Gray RAL 7042	Deep Red RAL 3003	Yellow RAL 1023
CNH Bright Yellow	Orange RAL 2004	Blue RAL 5005	Sky Blue RAL 5015	Hunter Green RAL 6005
Light Green RAL 6018	Green RAL 6016	Sepia Brown RAL 8014	Bronze	Silver 9007
Dark Purple	Flat Black	Wine Red RAL 3005	Beige RAL 1001	Iron Gray 7011

Thermoplastic

Black	Green	Red	Blue	Gray	Brown

Optional Lean Bar

www.dero.com | 1-888-337-6729

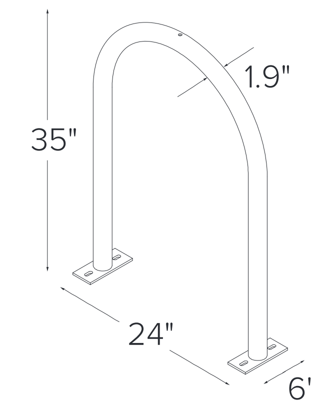
DERO A PLAYCORE Company

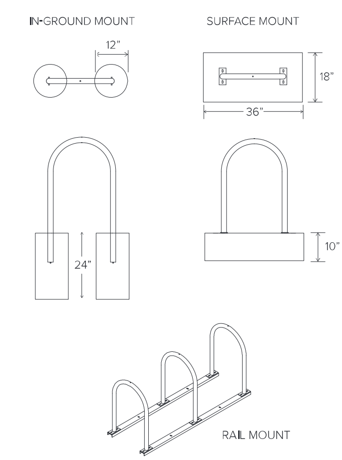
CLASS 2 BICYCLE FACILITY

T - 1.2 BICYCLE STORAGE

HOOP RACK
Submittal Sheet

*This is a preliminary specification and is for illustrative purposes only. Exact specification to be confirmed.





CAPACITY 2 Bikes x 2 = 4 Bike Spaces

MATERIALS

- ☑ **Standard**
  1.5" schedule 40 pipe (1.9" OD)
- ☐ **Lightweight**
  1.5" schedule 10 pipe (1.9" OD)

FINISHES

- ☐ **Galvanized**
  An after fabrication hot dipped galvanized finish is our standard option.
- ☑ **Powder Coat**
  Our powder coat finish assures a high level of adhesion and durability by following these steps:
  1. Sandblast
  2. Epoxy primer electrostatically applied
  3. Final thick TGIC polyester powder coat
- ☐ **Thermoplastic**
  In addition to an increased thickness (8-10mils), the thermoplastic finish covers a galvanized layer and offers superior impact resistance over powder coating.
- ☐ **PVC Dip** (plastisol)
  Other colors available by special order (minimum orders apply)
- ☐ **Stainless**
  Stainless Steel: 304 grade stainless steel material finished in either a high polished shine or a satin finish.

MOUNT OPTIONS

- ☑ **In-ground**
  In ground mount is embedded into concrete base. Specify in ground mount for this option.
- ☐ **Surface**
  Foot Mount has two 2.5"x6"x.25" feet with two anchors per foot. Specify foot mount for this option.
- ☐ **Rail**
  Rail Mounted Racks are bolted to two parallel rails which can be left freestanding or anchored to the ground. Rails are heavy duty 3"x1.4"x3/16" thick galvanized mounting rails. Specify rail mount for this option.

NON-RESIDENTIAL & EMPLOYEE BIKE PARKING

*Per Pasadena Municipal Code 17.46.320 Bicycle Parking Standards, the bicycle requirement for the non-residential portion (less than 15,000 SF) of a mixed-use project is a minimum of (4) Class 2 Bicycle Spaces.

RETAIL	4,218 SF
RESTAURANT	1,974 SF
COMMERCIAL PORTION OF WORK/LIVE	3,702 SF
TOTAL	**9,894 SF**

9,894 SF < 15,000 SF =
Minimum of (4) Class 2 Bicycle Spaces required
(4) Class 2 Bicycle Spaces provided

STORMWATER CAPTURE DOCUMENTATION

WC - 3.1 STORMWATER CAPTURE

ENGINEERED STORMWATER RETENTION PLAN - DRYWELL EXHIBIT

CENTRAL PARK APARTMENTS

Site Area: 0.74 Acres
Percent Impervious: 90.0%
95th Percentile, 24-Hour Storm: 2.0 in
95th Percentile Volume: 4,416 CF

Drywell Capacity

Torrent Resources calculated the drywell capacity as shown on the following page. Per those calculations, the drywells have a capacity to infiltrate 1,473 CF as quickly as it enters the drywell, due to the soil percolation rate and the drywell depth and diameter. The remaining 2,943 CF can be stored in the drywell rock shaft and chamber, which has a capacity of 621 CF, and a storage tank located in or under the parking level. The storage tank will require a minimum capacity of 2,322 cf (~17,500 gallon). This water will be drawn down within 96 hours as required by LA County. Because the drywell is designed to treat the 95th percentile storm, City of Pasadena Low Impact Development (LID) requirements are met and exceeded by the proposed drywell system.

Drywell A proposed approximate location below structure. All drainage on structure will be collected and routed to the drywells per Plumbing Engineer's drawings. All site drainage on grade will be collected and routed to proposed building and handoff to drywell system. Drywell A is proposed to treat half of the total site design volume.

Drywell B proposed approximate location below structure. All drainage on structure will be collected and routed to the drywells per Plumbing Engineer's drawings. All site drainage on grade will be collected and routed to proposed building and handoff to drywell system. Drywell B is proposed to treat half of the total site design volume.

kpff

700 S. Flower, Suite 2100
Los Angeles, CA 90017
O:213.418.0201
www.kpff.com

HYDROLOGIC ANALYSIS & DRYWELL CALCULATIONS

Peak Flow Hydrologic Analysis

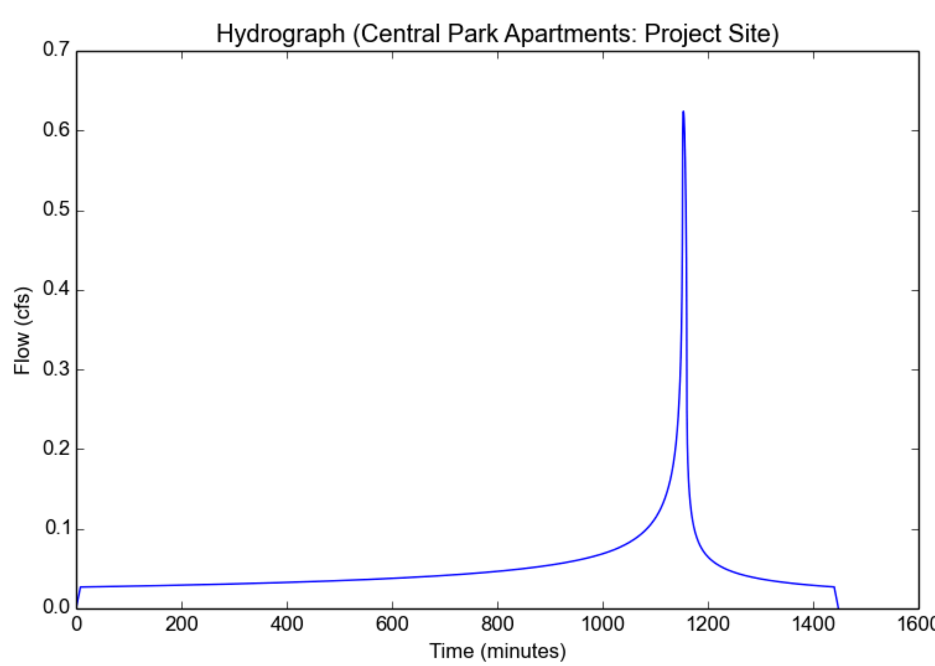
File location: P:/2017/1700925 Central Park Apartments/ENGR/STORM/LID/2018-03-18 Drywell Calcs/95th percentile Central Park Ap Site.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Central Park Apartments
Subarea ID	Project Site
Area (ac)	0.74
Flow Path Length (ft)	240.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	2.0
Percent Impervious	0.9
Soil Type	2
Design Storm Frequency	95th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	2.0
Peak Intensity (in/hr)	0.9567
Undeveloped Runoff Coefficient (Cu)	0.7155
Developed Runoff Coefficient (Cd)	0.8816
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.6241
Burned Peak Flow Rate (cfs)	0.6241
24-Hr Clear Runoff Volume (ac-ft)	0.1014
24-Hr Clear Runoff Volume (cu-ft)	4416.0298



TORRENT RESOURCES

April 2, 2019
KPFF - Los Angeles
Attn: Kevin Ellis

Re: Maxwell® Drainage System Calculations for **Central Park - Pasadena, CA**

Given:

Design Infiltration Rate	3.00 in/hr
Mitigated Volume	4,416 ft^3
Required Drawdown Time	96 hours
Min. Depth to Infiltration	20 ft
Groundwater Depth for Design	35 ft (85'-50'=35')
Rock Porosity	40 %

Design:

Actual Depth to Infiltration	20 ft
Actual Drywell Bottom Depth	25 ft

Convert Design Rate from in/hr to ft/sec.

$$3.00 \frac{in}{hr} \times \frac{1\ ft}{12\ in} \times \frac{1\ hr}{3600\ sec} = 0.000069 \frac{ft}{sec}$$

A 6 foot diameter drywell provides 18.85 SF of infiltration area per foot of depth, plus 28.27 SF at the bottom.

For a 25 foot deep drywell, infiltration occurs between 20 feet and 25 feet below grade. This provides 5 feet of infiltration depth in addition to the bottom area. Infiltration area per drywell is calculated below.

$$5\ ft \times 18.85 \frac{ft^2}{ft} + 28.27\ ft^2 = 123\ ft^2$$

Combine design rate with infiltration area to get flow (disposal) rate for each drywell.

$$0.000069 \frac{ft}{sec} \times 123\ ft^2 = 0.00851 \frac{ft^3}{sec}$$

Volume of disposal for each drywell based on various time frames are included below.

96 hrs: 0.0085 CFS x 96 hours x $\frac{3600\ sec}{1\ hr}$ = 2,941 cubic feet of retained water disposed of.

Chamber diameter = 4 feet. Drywell rock shaft diameter = 6 feet.
Volume provided in each drywell with chamber depth of 22 feet.

$$22\ ft \times 12.57\ ft^2 + 3\ ft \times 28.27\ ft^2 \times 40\ \% = 310\ ft^3$$

The MaxWell System is composed of 2 drywell(s) .
Total volume provided = 621 CF.
Total 96 hour infiltration volume = 5,881 CF.
Total infiltration flowrate = 0.01702 CFS.

Based on the total mitigated volume of 4416 CF, after subtracting the volume infiltrated as quickly as it enters the drywell of 1473 CF, the remaining volume is 2943 CF. The storage provided in the drywell system is 621 CF. Therefore 2322 CF can be stored in a separate detention system.

Bill De Jong, PE
Technical Engineer
Torrent Resources (CA), Inc.
909-915-9490

Torrent Resources (CA) Incorporated
9950 Alder Avenue
Bloomington, CA 92316
Phone 909-829-0740
CA Lic. 886759 A, C-42
An Evolution of McGuckin Drilling

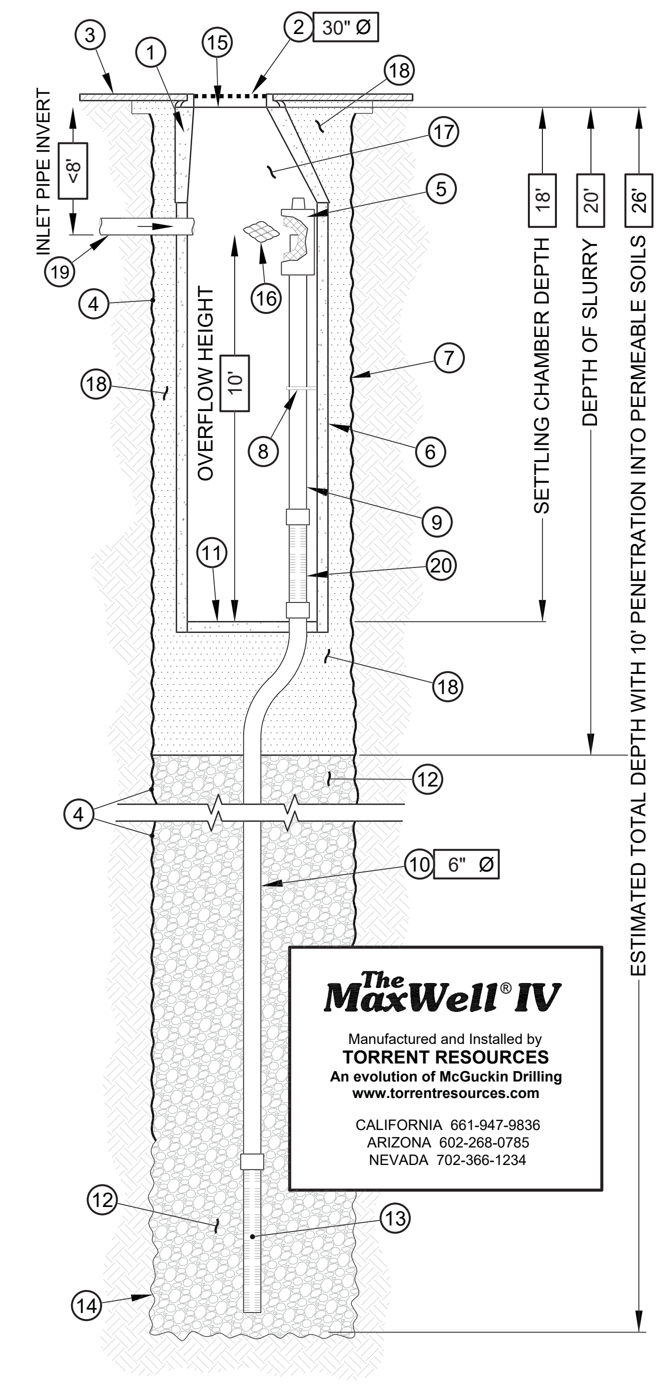
DRYWELL DETAIL

Central Park- Pasadena - 01Nov18

The MaxWell® IV Drainage System Detail And Specifications

ITEM NUMBERS

1. **MANHOLE CONE** - MODIFIED FLAT BOTTOM.
2. **CLEAN CAST IRON PRESSURIZED COVER** WITH GASKET (NEENAH R-6462-HH). BOLTED. RIM ELEVATION ±0.02' OF PLANS.
3. **GRADED BASIN OR PAVING** (BY OTHERS).
4. NON-WOVEN GEOTEXTILE SLEEVE, MIRAFITM/ 140 NL. HELD APPROX. 10 FEET OFF THE BOTTOM OF EXCAVATION.
5. **PUREFLO® DEBRIS SHIELD** - ROLLED 16 GA. STEEL X 24" LENGTH WITH VENTED ANTI-SIPHON AND INTERNAL .265" MAX. SWO FLATTENED EXPANDED STEEL SCREEN X 12" LENGTH. **FUSION BONDED EPOXY COATED**.
6. **PRE-CAST LINER** - 4000 PSI CONCRETE 48" ID. X 54" OD. **CENTER IN HOLE** AND ALIGN SECTIONS **TO MAXIMIZE BEARING SURFACE**.
7. **MIN. 6' Ø DRILLED SHAFT**.
8. **SUPPORT BRACKET** - FORMED 12 GA. STEEL. **FUSION BONDED EPOXY COATED**.
9. **OVERFLOW PIPE** - SCH. 40 PVC MATED TO DRAINAGE PIPE AT BASE SEAL.
10. **DRAINAGE PIPE** - ADS HIGHWAY GRADE WITH TRI-A COUPLER. **SUSPEND PIPE** DURING BACKFILL OPERATIONS TO PREVENT BUCKLING OR BREAKAGE. DIAMETER AS NOTED.
11. **BASE SEAL** - GEOTEXTILE OR CONCRETE SLURRY.
12. **ROCK** - WASHED, SIZED BETWEEN 3/8" AND 1-1/2" TO **BEST COMPLEMENT SOIL CONDITIONS**.
13. **FLOFAST® DRAINAGE SCREEN** - SCH. 40 PVC 0.120" SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/FT. 120" OVERALL LENGTH WITH TRI-B COUPLER.
14. **MIN. 6' Ø SHAFT** - DRILLED TO **MAINTAIN PERMEABILITY** OF DRAINAGE SOILS.
15. **FABRIC SEAL** - U.V. RESISTANT GEOTEXTILE - **TO BE REMOVED BY CUSTOMER** AT PROJECT COMPLETION.
16. **ABSORBENT** - HYDROPHOBIC PETROCHEMICAL SPONGE. MIN. 128 OZ. CAPACITY. TYPICAL, TWO PER CHAMBER.
17. **FREEBOARD DEPTH VARIES** WITH INLET PIPE ELEVATION. INCREASE SETTLING CHAMBER DEPTH AS NEEDED TO MAINTAIN ALL INLET PIPE ELEVATIONS ABOVE OVERFLOW PIPE INLET.
18. STABILIZED BACKFILL - SIX-SACK SLURRY MIX.
19. **INLET PIPE** (BY OTHERS).
20. **INTAKE SCREEN** - 6" Ø SCH. 40 PVC 0.120" MODIFIED SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/FT. 48" OVERALL LENGTH WITH TRI-C END CAP.



AZ Lic. ROC070465 A, ROC047067 B-4, ADWR 363
CA Lic. 528080, C-42, HAZ.
NV Lic. 0035350 A - NM Lic. 90504 GF04

U.S. Patent No. 4,923,330 - TM Trademark 1974, 1990, 2004

APPENDICES

Architectural
Resources Group

Central Park Apartments
86 S. Fair Oaks, Pasadena, CA

Appendix A: Geotechnical Engineering Investigation

Geotechnologies, Inc.
Consulting Geotechnical Engineers

439 Western Avenue
Glendale, California 91201-2837
818.240.9600 • Fax 818.240.9675

July, 2019
File Number 21674

Green Hotel Apartments,
a Limited Partnership
Prestige Homes, Inc.
5150 Overland Avenue
Culver City, California 90230

Attention: Tony Mouallem

Subject: Geotechnical Engineering Investigation
Proposed Mixed-Use Development
86 South Fair Oaks Avenue, Pasadena, California

Dear Mr. Mouallem:

This letter transmits the Geotechnical Engineering Investigation for the subject site prepared by Geotechnologies, Inc. This report provides geotechnical recommendations for the development of the site, including earthwork, seismic design, retaining walls, excavations, shoring and foundation design. Engineering for the proposed project should not begin until approval of the geotechnical investigation is granted by the local building official. Significant changes in the geotechnical recommendations may result due to the building department review process.

The validity of the recommendations presented herein is dependent upon review of the geotechnical aspects of the project during construction by this firm. The subsurface conditions described herein have been projected from limited subsurface exploration and laboratory testing. The exploration and testing presented in this report should in no way be construed to reflect any variations which may occur between the exploration locations or which may result from changes in subsurface conditions.

Should you have any questions please contact this office.

Respectfully submitted,
GEOTECHNOLOGIES, INC.

REGISTERED PROFESSIONAL ENGINEER
GREGORIO VARELA
No. 81201
Exp. 9/30/19
CIVIL
STATE OF CALIFORNIA

GREGORIO VARELA
R.C.E. 81201

GV:km

Distribution: (4) Addressee

Email to: [TMouallem@goldrichkest.com]
[L.MacLean@arg-la.com]

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SECTION **PAGE**

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED MIXED-USE DEVELOPMENT
86 SOUTH FAIR OAKS AVENUE
PASADENA, CALIFORNIA

INTRODUCTION

This report presents the results of the geotechnical engineering investigation performed on the subject site. The purpose of this investigation was to identify the distribution and engineering properties of the geologic materials underlying the site, and to provide geotechnical recommendations for the design of the proposed development.

This investigation included three exploratory excavations, collection of representative samples, laboratory testing, engineering analysis, review of published geologic data, review of available geotechnical engineering information and the preparation of this report. The exploratory excavation locations are shown on the enclosed Plot Plan. The results of the exploration and the laboratory testing are presented in the Appendix of this report.

PROPOSED DEVELOPMENT

Information concerning the proposed development was furnished by the client and by the office of KPFF consulting Engineers. In addition, the plans prepared by Architectural Resources Group labeled Updated Concept Design Review Submittal, were reviewed for the preparation of this report. The proposed project consists of the construction of a mixed-use structure. The proposed structure will be six stories in height, built over four subterranean parking levels. The lowest finished grade of the deepest subterranean level is expected to extend up to a depth of 54 feet below the existing grade. The enclosed Plot Plan shows the location and alignment of the proposed structure.

Column loads are estimated to be between 500 and 1,200 kips. Wall loads are estimated to be between 10 and 60 kips per lineal foot. These loads reflect the dead plus live load. Grading is anticipated to consist of excavations as deep as 58 feet for construction of the proposed subterranean levels and foundation elements.

Any changes in the design of the project or location of any structure, as outlined in this report, should be reviewed by this office. The recommendations contained in this report should not be considered valid until reviewed and modified or reaffirmed, in writing, subsequent to such review.

SITE CONDITIONS

The site is located at 86 South Fair Oaks Avenue, in the City of Pasadena, California. The site is bounded by the existing Green Hotel Apartments structure to the north, Dayton Street to the south, Fair Oaks Avenue to the west and Castle Green Apartments structure to the east. The site is shown relative to nearby topographic features in the enclosed Vicinity Map.

The project site consists of the current parking lot for the Green Hotel Apartments as well as an advertising billboard. The surface of the parking lot consists of asphalt paving, with miscellaneous concrete hardscaped areas. The existing site grade descends gently to the southeast. Based on review of the Site Survey by S.E.C. Civil Engineers, Inc., dated December 4, 2009, the topographic relief observed across the site is approximately 3 feet.

Vegetation at the site consists of mature trees and grass lawns, contained in manicured planter areas. Drainage across the site appears to be by sheetflow to Dayton Street to the south.

GEOTECHNICAL EXPLORATION

FIELD EXPLORATION

The site was explored on September 24 and 25, 2018 by drilling three exploratory excavations. The borings were drilled to depths between 50 and 80 feet below grade with the aid of a truck-mounted drilling machine using 8-inch diameter hollowstem augers. The exploration locations are shown on the Plot Plan and the geologic materials encountered are logged on Plates A-1 through A-3.

The location of exploratory excavations was determined form hardscaped features shown in the enclosed Plot Plan. Elevations of the exploratory excavations are based on elevations provided in the Site Survey by S.E.C. Civil Engineers, Inc., dated December 4, 2009. The location and elevation of the exploratory excavations should be considered accurate only to the degree implied by the method used.

Geologic Materials

Fill materials were observed in the exploratory borings to an approximate depth of three feet below the existing grade. The fill consists of silty sands, which are dark brown in color, moist, medium dense and fine grained, with occasional cobbles.

The fill is in turn underlain by native alluvial soils, consisting primarily of sands and silty sands, with occasional layers of sandy silt. The native alluvial soils are yellowish brown and dark brown in color, and are moist, medium dense to very dense, or stiff to very stiff, and fine to coarse grained, with gravel and cobbles. More detailed descriptions of the earth materials encountered may be obtained from individual logs of the subsurface excavations.

Groundwater

Groundwater was not encountered to the maximum excavated depth of 80 feet. The historically highest groundwater level was established by review of California Geological Survey Seismic Hazard Zone Report of the Pasadena Quadrangle. Review of this report indicates that the historically highest groundwater level is on the order of 85 feet below the existing site grade. A copy of this plate labeled as Historically Highest Groundwater Levels Map is attached.

Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, and other factors not evident at the time of the measurements reported herein. Fluctuations also may occur across the site. High groundwater levels can result in changed conditions.

Caving

Caving could not be directly observed during exploration due to the type of excavation equipment utilized. However, based on the experience of this firm, large diameter excavations, excavations that encounter granular, cohesionless soils will most likely experience caving.

SEISMIC EVALUATION

REGIONAL GEOLOGIC SETTING

The subject site is located in the Transverse Ranges Geomorphic Province. The Transverse Ranges are characterized by roughly east-west trending mountains and the northern and southern boundaries are formed by reverse fault scarps. The convergent deformational features of the Transverse Ranges are a result of north-south shortening due to plate tectonics. This has resulted in local folding and uplift of the mountains along with the propagation of thrust faults (including blind thrusts). The intervening valleys have been filled with sediments derived from the bordering mountains.

REGIONAL FAULTING

Based on criteria established by the California Division of Mines and Geology (CDMG) now called California Geologic Survey (CGS), faults may be categorized as active, potentially active, or inactive. Active faults are those which show evidence of surface displacement within the last 11,000 years (Holocene-age). Potentially-active faults are those that show evidence of most recent surface displacement within the last 1.6 million years (Quaternary-age). Faults showing no evidence of surface displacement within the last 1.6 million years are considered inactive for most purposes, with the exception of design of some critical structures.

Buried thrust faults are faults without a surface expression but are a significant source of seismic activity. They are typically broadly defined based on the analysis of seismic wave recordings of hundreds of small and large earthquakes in the southern California area. Due to the buried nature of these thrust faults, their existence is usually not known until they produce an earthquake. The risk for surface rupture potential of these buried thrust faults is inferred to be low (Leighton, 1990). However, the seismic risk of these buried structures in terms of recurrence and maximum potential magnitude is not well established. Therefore, the potential for surface rupture on these surface-verging splays at magnitudes higher than 6.0 cannot be precluded.

SEISMIC HAZARDS AND DESIGN CONSIDERATIONS

The primary geologic hazard at the site is moderate to strong ground motion (acceleration) caused by an earthquake on any of the local or regional faults. The potential for other earthquake-induced hazards was also evaluated including surface rupture, liquefaction, dynamic settlement, inundation and landsliding.

Surface Rupture

In 1972, the Alquist-Priolo Special Studies Zones Act (now known as the Alquist-Priolo Earthquake Fault Zoning Act) was passed into law. The Act defines “active” and “potentially active” faults utilizing the same aging criteria as that used by California Geological Survey (CGS). However, established state policy has been to zone only those faults which have direct evidence of movement within the last 11,000 years. It is this recency of fault movement that the CGS considers as a characteristic for faults that have a relatively high potential for ground rupture in the future.

CGS policy is to delineate a boundary from 200 to 500 feet wide on each side of the known fault trace based on the location precision, the complexity, or the regional significance of the fault. If a site lies within an Earthquake Fault Zone, a geologic fault rupture investigation must be performed that demonstrates that the proposed building site is not threatened by surface displacement from the fault before development permits may be issued.

Based on review of the Fault Map presented in the Technical Background Report of the 2002 City of Pasadena Safety Element of the General Plan, the subject site is not located within a “Fault Hazard Management Zone”. A copy of this map is enclosed.

Ground rupture is defined as surface displacement which occurs along the surface trace of the causative fault during an earthquake. Based on research of available literature and results of site reconnaissance, no known active or potentially active faults underlie the subject site. In addition, the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. Based on these considerations, the potential for surface ground rupture at the subject site is considered low.

Liquefaction

Liquefaction is a phenomenon in which saturated silty to cohesionless soils below the groundwater table are subject to a temporary loss of strength due to the buildup of excess pore pressure during cyclic loading conditions such as those induced by an earthquake. Liquefaction-related effects include loss of bearing strength, amplified ground oscillations, lateral spreading, and flow failures.

Review of the California Seismic Hazards Zones Map for the Pasadena Quadrangle (CDMG 1999), indicates that the subject site is not located within a "Liquefiable" area. This determination is based on groundwater records, soil type and distance to a fault capable of producing a substantial earthquake. A copy of this map has been enclosed to this report.

Groundwater was not encountered during exploration, conducted to a maximum depth of 80 feet below the existing site grade. The historically highest groundwater level for the site is reported to be on the order of 85 feet below grade. Based on the density of the soils underlying the site, and the mapped depth to the historically highest groundwater level, the soils underlying the site are not considered capable of liquefaction during the ground motion expected during the design-based earthquake.

Dynamic Dry Settlement

Seismically-induced settlement or compaction of dry or moist, cohesionless soils can be an effect related to earthquake ground motion. Such settlements are typically most damaging when the settlements are differential in nature across the length of structures.

Some seismically-induced settlement of the proposed structures should be expected as a result of strong ground-shaking, however, due to the uniform nature of the underlying geologic materials, excessive differential settlements are not expected to occur.

Tsunamis, Seiches and Flooding

Tsunamis are large ocean waves generated by sudden water displacement caused by a submarine earthquake, landslide, or volcanic eruption. The Project Site is high enough and far enough from the ocean to preclude being prone to hazards of a tsunami.

Review of the County of Los Angeles Flood and Inundation Hazards Map, Leighton (1990), indicates the Project Site does not lie within mapped inundation boundaries due to a breached upgradient reservoir.

Landsliding

The probability of seismically-induced landslides occurring on the site is considered to be low due to the general lack of elevation difference across or adjacent to the site.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the exploration, laboratory testing, and research, it is the finding of Geotechnologies, Inc. that construction of the proposed structure is considered feasible from a geotechnical engineering standpoint provided the advice and recommendations presented herein are followed and implemented during construction.

Fill materials were encountered during exploration to a depth of 3 feet below the existing site grade. It is anticipated that the existing fill will be removed during excavation of the proposed three-level subterranean garage, which is expected to extend up to an approximate depth of 54 feet below the existing site grade. The proposed structure may be supported by conventional foundations bearing in the native alluvial soils expected at the subgrade of the proposed subterranean levels.

It is anticipated that the proposed subterranean levels will extend adjacent to the property lines and existing development. Therefore the excavation for the proposed subterranean levels will require temporary shoring in order to provide a stable excavation. Shoring recommendations are provided in the "Excavations" section of this report.

The validity of the conclusions and design recommendations presented herein is dependent upon review of the geotechnical aspects of the proposed construction by this firm. The subsurface conditions described herein have been projected from excavations on the site as indicated and should in no way be construed to reflect any variations which may occur between these excavations or which may result from changes in subsurface conditions. Any changes in the design, as outlined in this report, should be reviewed by this office. The recommendations contained herein should not be considered valid until reviewed and modified or reaffirmed subsequent to such review.

2016 California Building Code Seismic Parameters

Based on information derived from the subsurface investigation, the subject site is classified as Site Class D, which corresponds to a "Stiff Soil" Profile, according to Table 20.3-1 of ASCE 7-10. This information and the site coordinates were input into the USGS U.S. Seismic Design Maps tool (Version 3.1.0) to calculate the ground motions for the site.

2016 CALIFORNIA BUILDING CODE SEISMIC PARAMETERS	
Site Class	D
Mapped Spectral Acceleration at Short Periods (S_S)	2.872g
Site Coefficient (F_a)	1.0
Maximum Considered Earthquake Spectral Response for Short Periods (S_{MS})	2.872g
Five-Percent Damped Design Spectral Response Acceleration at Short Periods (S_{DS})	1.915g
Mapped Spectral Acceleration at One-Second Period (S_1)	0.995g
Site Coefficient (F_v)	1.5
Maximum Considered Earthquake Spectral Response for One-Second Period (S_{M1})	1.492g
Five-Percent Damped Design Spectral Response Acceleration for One-Second Period (S_{D1})	0.995g

Deaggregated Seismic Source Parameters

The peak ground acceleration (PGA) and modal magnitude were obtained from the USGS Probabilistic Seismic Hazard Deaggregation program (USGS, 2008). The results are based on a 2 percent in 50 years ground motion (2,475 year return period). A shear wave velocity of 259 meters per second was utilized for Vs30. The deaggregation program indicates a PGA of 0.97g and a modal magnitude of 6.5 for the site.

EXPANSIVE SOILS

The onsite geologic materials are in the very low expansion range. The Expansion Index was found to be between 2 and 3 for bulk samples representative of the site soils. Recommended reinforcing is noted in the "Foundations" and "Slabs on Grade" sections of this report.

WATER-SOLUBLE SULFATES

The Portland cement portion of concrete is subject to attack when exposed to water-soluble sulfates. Usually the two most common sources of exposure are from soil and marine environments.

The sources of natural sulfate minerals in soils include the sulfates of calcium, magnesium, sodium, and potassium. When these minerals interact and dissolve in subsurface water, a sulfate concentration is created, which will react with exposed concrete. Over time sulfate attack will destroy improperly proportioned concrete well before the end of its intended service life.

The water-soluble sulfate content of the onsite geologic materials was tested by California Test 417. The water-soluble sulfate content was determined to be between 0.1 and 0.2 percentage by weight for the soils tested. Based on American Concrete Institute (ACI) Standard 318-08, the sulfate exposure is considered to be moderate for geologic materials with sulfate contents between 0.1 and 0.2 percent and Type II cement with a minimum strength of 4,000 psi must be utilized for concrete foundations and slabs in contact with the site soils. In addition, a water-cement ratio of 0.5 should be maintained in the poured concrete.

GRADING GUIDELINES

The following guidelines are provided for any miscellaneous compaction that may be required, such as retaining wall or trench backfill, or subgrade preparation.

Site Preparation

- A thorough search should be made for possible underground utilities and/or structures. Any existing or abandoned utilities or structures located within the footprint of the proposed grading should be removed or relocated as appropriate.

- All vegetation, existing fill, and soft or disturbed geologic materials should be removed from the areas to receive controlled fill. All existing fill materials and any disturbed geologic materials resulting from grading operations shall be completely removed and properly recompacted prior to foundation excavation.

- Any vegetation or associated root system located within the footprint of the proposed structures should be removed during grading.

- Subsequent to the indicated removals, the exposed grade shall be scarified to a depth of six inches, moistened to optimum moisture content, and recompacted in excess of the minimum required comparative density.

- The excavated areas shall be observed by the geotechnical engineer prior to placing compacted fill.

Compaction

All fill should be mechanically compacted in layers not more than 8 inches thick. The materials placed should be moisture conditions to within 3 percent of the optimum moisture content of the particular material placed. All fill shall be compacted to at least 90 percent of the maximum laboratory density for the materials used. The maximum density shall be determined by the laboratory operated by Geotechnologies, Inc. in general accordance with the most recent revision of ASTM D 1557.

Field observation and testing shall be performed by a representative of the geotechnical engineer during grading to assist the contractor in obtaining the required degree of compaction and the proper moisture content. Where compaction is less than required, additional compactive effort shall be made with adjustment of the moisture content, as necessary, until a minimum of 90 or 95 percent compaction is obtained.

Acceptable Materials

The excavated onsite materials are considered satisfactory for reuse in the controlled fills as long as any debris and/or organic matter, as well as over-sized material, is removed. Cobbles were observed during exploration. Where cobbles are encountered in the materials to be reused as controlled fill, the size of the cobbles shall be limited to a maximum of 6 inches in dimension.

Any imported materials shall be observed and tested by the representative of the geotechnical engineer prior to use in fill areas. Imported materials should contain sufficient fines so as to be relatively impermeable and result in a stable subgrade when compacted. Any required import materials should consist of geologic materials with an expansion index of less than 40. The water-soluble sulfate content of the import materials should be less than 0.1% percentage by weight.

Imported materials should be free from chemical or organic substances which could affect the proposed development. A competent professional should be retained in order to test imported materials and address environmental issues and organic substances which might affect the proposed development.

Utility Trench Backfill

Utility trenches should be backfilled with controlled fill. The utility should be bedded with clean sands at least one foot over the crown. The remainder of the backfill may be onsite soil compacted to 90 percent of the laboratory maximum density. Utility trench backfill should be tested by representatives of this firm in general accordance with the most recent revision of ASTM D 1557.

Shrinkage

Shrinkage results when a volume of soil removed at one density is compacted to a higher density. A shrinkage factor between 5 and 15 percent should be anticipated when excavating and recompacting the existing fill and underlying native geologic materials on the site to an average comparative compaction of 92 percent.

Weather Related Grading Considerations

When rain is forecast all fill that has been spread and awaits compaction shall be properly compacted prior to stopping work for the day or prior to stopping due to inclement weather. These fills, once compacted, shall have the surface sloped to drain to an area where water can be removed.

Temporary drainage devices should be installed to collect and transfer excess water to the street 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. Drainage should not be allowed to flow uncontrolled over any descending slope.

Work may start again, after a period of rainfall, once the site has been reviewed by a representative of this office. Any soils saturated by the rain shall be removed and aerated so that the moisture content will fall within three percent of the optimum moisture content.

Surface materials previously compacted before the rain shall be scarified, brought to the proper moisture content and recompacted prior to placing additional fill, if considered necessary by a representative of this firm.

Geotechnical Observations and Testing During Grading

Geotechnical observations and testing during grading are considered to be a continuation of the geotechnical investigation. It is critical that the geotechnical aspects of the project be reviewed by representatives of Geotechnologies, Inc. during the construction process. Compliance with the design concepts, specifications or recommendations during construction requires review by this firm during the course of construction. Any fill which is placed should be observed, tested, and verified if used for engineered purposes. Please advise this office at least twenty-four hours prior to any required site visit.

Proper compaction is necessary to reduce settlement of overlying improvements. Some settlement of compacted fill should be anticipated. Any utilities supported therein should be designed to accept differential settlement. Differential settlement should also be considered at the points of entry to the structure.

FOUNDATION DESIGN

Conventional

The proposed structure may be supported by conventional foundations bearing in the native alluvial soils expected at the subgrade of the proposed subterranean levels. Continuous foundations may be designed for a bearing capacity of 4,000 pounds per square foot, and should be a minimum of 12 inches in width, 18 inches in depth below the lowest adjacent grade and 18 inches into the recommended native alluvial soils.

Column foundations may be designed for a bearing capacity of 5,000 pounds per square foot, and should be a minimum of 24 inches in width, 18 inches in depth below the lowest adjacent grade and 18 inches into the recommended native alluvial soils.

The bearing capacity increase for each additional foot of width is 500 pounds per square foot. The bearing capacity increase for each additional foot of depth is 1,000 pounds per square foot. The maximum recommended bearing capacity is 8,000 pounds per square foot.

The bearing capacities indicated above are for the total of dead and frequently applied live loads, and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces.

Miscellaneous Foundations

Conventional foundations for structures such as privacy walls or trash enclosures which will not be rigidly connected to the proposed structure may bear in native alluvial soils, or in properly compacted fill materials. Continuous footings may be designed for a bearing capacity of 2,000 pounds per square foot, and should be a minimum of 12 inches in width, 18 inches in depth below the lowest adjacent grade and 18 inches into the recommended bearing material. No bearing capacity increases are recommended.

Since the recommended bearing capacity is a net value, the weight of concrete in the foundations may be taken as 50 pounds per cubic foot and the weight of the soil backfill may be neglected when determining the downward load on the foundations.

Foundation Reinforcement

All continuous foundations should be reinforced with a minimum of four #4 steel bars. Two should be placed near the top of the foundation, and two should be placed near the bottom.

Lateral Design

Resistance to lateral loading may be provided by friction acting at the base of foundations and by passive earth pressure. An allowable coefficient of friction of 0.5 may be used with the dead load forces.

Passive geologic pressure for the sides of foundations poured against undisturbed or recompacted soil may be computed as an equivalent fluid having a density of 300 pounds per cubic foot with a maximum earth pressure of 1,800 pounds per square foot.

The passive and friction components may be combined for lateral resistance without reduction. A one-third increase in the passive value may be used for short duration loading such as wind or seismic forces.

Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. The maximum settlement is expected to be 1 inch and occur below the heaviest loaded columns. Differential settlement is not expected to exceed ½-inch.

Foundation Observations

It is critical that all foundation excavations are observed by a representative of this firm to verify penetration into the recommended bearing materials. The observation should be performed prior to the placement of reinforcement. Foundations should be deepened to extend into satisfactory geologic materials, if necessary.

Foundation excavations should be cleaned of all loose soils prior to placing steel and concrete. Any required foundation backfill should be mechanically compacted, flooding is not permitted.

RETAINING WALL DESIGN

It is anticipated that the finished floor elevation of the lowest subterranean level will extend to a depth of 54 feet below the existing grade. Retaining walls may be designed as indicated below, depending on whether the walls will be restrained or cantilevered. Retaining wall foundations may be designed in accordance with the provisions of the "Foundation Design" section of this report.

Additional pressure should be added to the retaining wall design, for a surcharge condition due to vehicular traffic or adjacent structures. Based on review of the enclosed Plot Plan, it is anticipated that the proposed retaining walls will be surcharged by existing structures located to the north and east of the site. Information regarding the depth, configuration and loading of adjacent foundations will be required in order to determine the additional surcharge loading.

Vehicular traffic is expected in the vicinity of the proposed subterranean retaining walls. For traffic surcharge, the upper 10 feet of any retaining wall adjacent to streets, driveways or parking areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot traffic surcharge. If the traffic is more than 10 feet from the retaining walls, the traffic surcharge may be neglected.

Restrained Retaining Walls

Restrained subterranean retaining walls up to 35 feet in height and supporting a level back slope may be designed to resist a triangular distribution of earth pressure. It is recommended the walls be designed to resist the greater of the at-rest pressure, or the active pressure plus the seismic pressure, as discussed in the "Dynamic (Seismic) Earth Pressure" section below.

RESTRAINED BASEMENT WALLS		
	AT-REST EARTH PRESSURE	**ACTIVE EARTH PRESSURE *(To be Combined with Dynamic Seismic Earth Pressure)**
Height of Wall (Feet)	Triangular Distribution of Pressure (Pounds per Cubic Foot)	Triangular Distribution of Pressure (Pounds per Cubic Foot)*
Up to 54 feet	52	41

The lateral earth pressure recommended above for retaining walls assumes that a permanent drainage system will be installed so that external water pressure will not be developed against the walls. Also, where necessary, the retaining walls should be designed to accommodate any surcharge pressures that may be imposed by adjacent traffic and existing structures.

Dynamic (Seismic) Earth Pressure

Retaining walls exceeding 6 feet in height shall be designed to resist the additional earth pressure caused by seismic ground shaking. A triangular pressure distribution should be utilized for the additional seismic loads, with an equivalent fluid pressure of 30 pounds per cubic foot. When using the load combination equations from the building code, the seismic earth pressure should be combined with the lateral active earth pressure for analyses of restrained basement walls under seismic loading condition. The dynamic earth pressure may be omitted where the retaining wall is 6 feet in height or less.

Miscellaneous Cantilever Retaining Walls

Miscellaneous cantilever retaining walls supporting a level back slope may be designed utilizing a triangular distribution of pressure. Cantilever retaining walls may be designed for 30 pounds per cubic foot for walls retaining up to 12 feet of earth. In addition, cantilever walls greater than 6 feet in height shall be designed to resist the seismic earth pressure indicated in the previous "Dynamic (Seismic) Earth Pressure" section.

The pressure provided assumes a subdrain system will be installed behind the wall. For this equivalent fluid pressure to be valid, walls which are to be restrained at the top should be backfilled prior to the upper connection being made. Additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic or adjacent structures.

Retaining Wall Drainage

All retaining walls shall be provided with a subdrain system in order to minimize the potential for future hydrostatic pressure buildup behind the proposed retaining walls. Subdrains may consist of four-inch diameter perforated pipes, placed with perforations facing down. The pipe shall be encased in at least one-foot of gravel around the pipe. The gravel shall be wrapped in filter fabric. The gravel may consist of three-quarter inch to one inch crushed rocks.

As an alternative to the standard perforated subdrain pipe and gravel drainage system, the use of gravel pockets and weepholes is an acceptable drainage method. Weepholes shall be a minimum of 4 inches in diameter, placed at 8 feet on center along the base of the wall. Gravel pockets shall be a minimum of 1 cubic foot in dimension, and may consist of three-quarter inch to one inch crushed rocks, wrapped in filter fabric. A collector pipe shall be installed to direct collected waters to a sump

Certain types of subdrain pipe are not acceptable to the various municipal agencies, it is recommended that prior to purchasing subdrainage pipe, the type and brand is cleared with the proper municipal agencies. Subdrainage pipes should outlet to an acceptable location.

The lateral earth pressures recommended above for retaining walls assume that a permanent drainage system will be installed so that external water pressure will not be developed against the walls. If a drainage system is not provided, the walls should be designed to resist an external hydrostatic pressure due to water in addition to the lateral earth pressure. In any event, it is recommended that retaining walls be waterproofed.

Sump Pump Design

The purpose of the recommended retaining wall backdrainage system is to relieve hydrostatic pressure. Groundwater was not encountered during exploration, conducted to a maximum height of 80 feet below the existing grade. Based on the depth of the proposed development, the only water which could affect the proposed retaining walls would be irrigation water and precipitation. Additionally, the proposed site grading is such that all drainage is directed to the street and the structure has been designed with adequate non-erosive drainage devices.

Based on these considerations the retaining wall backdrainage system is not expected to experience an appreciable flow of water, and in particular, no groundwater will affect it. However, for the purposes of design, a flow of 5 gallons per minute may be assumed.

Waterproofing

Moisture effecting retaining walls is one of the most common post construction complaints. Poorly applied or omitted waterproofing can lead to efflorescence or standing water inside the building. Efflorescence is a process in which a powdery substance is produced on the surface of the concrete by the evaporation of water. The white powder usually consists of soluble salts such as gypsum, calcite, or common salt. Efflorescence is common to retaining walls and does not affect their strength or integrity.

It is recommended that retaining walls be waterproofed. Waterproofing design and inspection of its installation is not the responsibility of the geotechnical engineer. A qualified waterproofing consultant should be retained in order to recommend a product or method which would provide protection to below grade walls.

Retaining Wall Backfill

Any required backfill should be mechanically compacted in layers not more than 8 inches thick, to at least 90 percent relative compaction, obtainable by the most recent revision of ASTM D 1557 method of compaction. Flooding should not be permitted. Compaction within 5 feet, measured horizontally, behind a retaining structure should be achieved by use of light weight, hand operated compaction equipment.

Proper compaction of the backfill will be necessary to reduce settlement of overlying walks and paving. Some settlement of required backfill should be anticipated, and any utilities supported therein should be designed to accept differential settlement.

TEMPORARY EXCAVATIONS

Excavations up to a depth of 58 feet may be required for construction of the proposed subterranean levels and foundation elements. The excavations are expected to expose fill and dense native soils, which are suitable for vertical excavations up to 5 feet where not surcharged by adjacent traffic or structures. Vertical excavations exceeding 5 feet, or excavations which will be surcharged by adjacent traffic or structures should be shored.

Where sufficient space is available, temporary unsurcharged embankments could be cut at a uniform 1:1 slope gradient to a maximum depth of 20 feet, at a uniform 1½:1 (H:V) slope gradient to a maximum depth of 40 feet, and at a uniform 2:1 (H:V) slope gradient to a maximum depth of 58 feet. A uniform sloped excavation is sloped from bottom to top and does not have a vertical component.

Where sloped embankments are utilized, the tops of the slopes should be barricaded to prevent vehicles and storage loads near the top of slope within a horizontal distance equal to the depth of the excavation. If the temporary construction embankments are to be maintained during the rainy season, berms are strongly recommended along the tops of the slopes to prevent runoff water from entering the excavation and eroding the slope faces. Water should not be allowed to pond on top of the excavation nor to flow towards it.

Excavation Observations

It is critical that the soils exposed in the cut slopes are observed by a representative of Geotechnologies, Inc. during excavation so that modifications of the slopes can be made if variations in the geologic material conditions occur. Many building officials require that temporary excavations should be made during the continuous observations of the geotechnical engineer. All excavations should be stabilized within 30 days of initial excavation.

SHORING DESIGN

The following information on the design and installation of the shoring is as complete as possible at this time. It is suggested that Geotechnologies, Inc. review the final shoring plans and specifications prior to bidding or negotiating with a shoring contractor.

One method of shoring would consist of steel soldier piles, placed in drilled holes and backfilled with concrete. The soldier piles may be designed as cantilevers or laterally braced utilizing drilled tied-back anchors or raker braces.

The purpose of the proposed shoring system is to provide a temporary stable excavation, which will allow for the construction of permanent underground retaining walls. The temporary shoring walls will be built adjacent to two historic structures, Green Hotel Apartments to the north and Castle Green Apartments to the east. Based on review of the enclosed Plot Plan, it is anticipated that portions of the Green Hotel Apartments structure may be located within the influence area of the proposed subterranean excavation. The edge of the proposed subterranean excavation is expected to be located more than 80 feet away from the Castle Green Apartments, therefore the excavation is not expected to impact this structure.

The shoring system shall be designed by a qualified shoring engineer, using the geotechnical recommendations presented herein. The shoring system shall be design to accommodate the surcharge loads anticipated from the adjacent Green Hotel Apartments. In addition, a proper vertical distance shall be maintained between the proposed tiebacks and the bottom of this adjacent structure, so the installation of these tiebacks does not introduce additional stress, or pressure, on the existing structure.

Once the shoring system has been designed by a qualified shoring engineer, the geotechnical engineer of record shall review the plans to ensure that they are in conformance with the recommendations provided in the geotechnical engineering investigation. Furthermore, shoring installation must be performed during continuous inspections provided by a field technician representing the geotechnical engineer of record. This measure is intended to ensure that the recommendations provided in the geotechnical engineering investigation and shoring plans are implemented. Additionally, the inspector would notify the geotechnical engineer of record of any condition that is not consistent with the geotechnical investigation.

If the recommendations provided herein are implemented, it is the opinion of this firm that excavation of the proposed subterranean garage should not affect the existing Green Hotel Apartments structure.

Soldier Piles

Drilled cast-in-place soldier piles should be placed no closer than 2 diameters on center. The minimum diameter of the piles is 18 inches. Structural concrete should be used for the soldier piles below the excavation; lean-mix concrete may be employed above that level. As an alternative, lean-mix concrete may be used throughout the pile where the reinforcing consists of a wideflange section. The slurry must be of sufficient strength to impart the lateral bearing pressure developed by the wideflange section to the geologic materials. For design purposes, an allowable passive value for the geologic materials below the bottom plane of excavation may be assumed to be 500 pounds per square foot per foot, up to a maximum of 3,000 pounds per square foot. To develop the full lateral value, provisions should be implemented to assure firm contact between the soldier piles and the undisturbed geologic materials.

The frictional resistance between the soldier piles and retained geologic material may be used to resist the vertical component of the anchor load. The coefficient of friction may be taken as 0.5 based on uniform contact between the steel beam and lean-mix concrete and retained earth. The portion of soldier piles below the plane of excavation may also be employed to resist the downward loads. The downward capacity may be determined using a frictional resistance of 500 pounds per square foot. The minimum depth of embedment for shoring piles is 5 feet below the bottom of the footing excavation or 7 feet below the bottom of excavated plane whichever is deeper.

Caving should be expected to occur during drilling in the native granular soils underlaying the site. Where caving occurs, it will be necessary to utilize casing or polymer drilling fluid to maintain open pile shafts. If casing is used, extreme care should be employed so that the pile is not pulled apart as the casing is withdrawn. At no time should the distance between the surface of the concrete and the bottom of the casing be less than 5 feet. Large sized materials should also be anticipated during drilling (i.e. gravel, rocks and cobbles).

Lagging

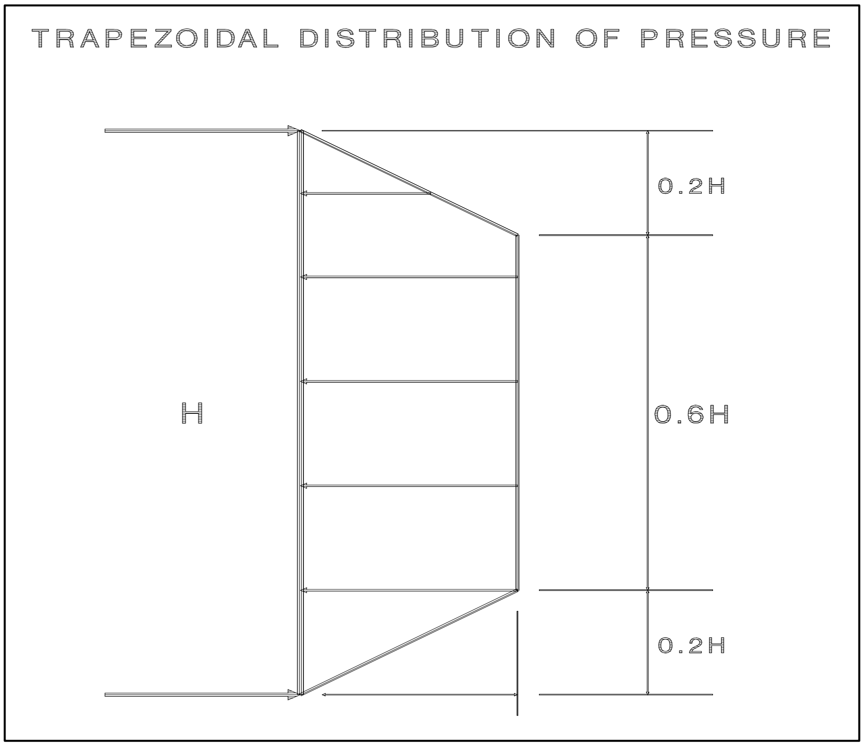
Soldier piles and anchors should be designed for the full anticipated pressures. Due to arching in the geologic materials, the pressure on the lagging will be less. It is recommended that the lagging should be designed for the full design pressure but is limited to a maximum of 400 pounds per square foot. It is recommended that a representative of this firm observe the installation of lagging to insure uniform support of the excavated embankment.

Lateral Pressures

Cantilevered shoring supporting a level backslope may be designed utilizing a triangular distribution of pressure as indicated in the following table:

HEIGHT OF SHORING “H” (feet)	EQUIVALENT FLUID PRESSURE (pounds per cubic foot)
Up to 20	28

A trapezoidal distribution of lateral earth pressure would be appropriate where shoring is to be restrained at the top by bracing or tie backs, with the trapezoidal distribution as shown in the diagram below.



Restrained shoring supporting a level backslope may be designed utilizing a trapezoidal distribution of pressure as indicated in the following table:

HEIGHT OF SHORING "H" (feet)	DESIGN SHORING FOR (Where H is the height of the wall)
Up to 20	18H
20 to 25	20H
25 to 40	22H
40 to 58	25H

Where a combination of sloped embankment and shoring is utilized, the pressure will be greater and must be determined for each combination. Additional active pressure should be applied where the shoring will be surcharged by adjacent traffic or structures.

Tied-Back Anchors

Tied-back anchors may be used to resist lateral loads. Friction anchors are recommended. For design purposes, it may be assumed that the active wedge adjacent to the shoring is defined by a plane drawn 35 degrees with the vertical through the bottom plane of the excavation. Friction anchors should extend a minimum of 20 feet beyond the potentially active wedge. Anchors should be placed at least 6 feet on center to be considered isolated.

Drilled friction anchors may be designed for a skin friction of 500 pounds per square foot. Only the frictional resistance developed beyond the active wedge would be effective in resisting lateral loads. Where belled anchors are utilized, the capacity of belled anchors may be designed by applying the skin friction over the surface area of the bonded anchor shaft. The diameter of the bell may be utilized as the diameter of the bonded anchor shaft when determining the surface area. This implies that in order for the belled anchor to fail, the entire parallel soil column must also fail.

Depending on the techniques utilized, and the experience of the contractor performing the installation, it is anticipated that a skin friction of 2,000 pounds per square foot could be utilized for post-grouted anchors. Only the frictional resistance developed beyond the active wedge would be effective in resisting lateral loads.

Anchor Installation

Tied-back anchors may be installed between 20 and 45 degrees below the horizontal. Caving of the anchor shafts should be anticipated and the following provisions should be implemented in order to minimize such caving. The anchor shafts should be filled with concrete by pumping from the tip out, and the concrete should extend from the tip of the anchor to the active wedge. In order to minimize the chances of caving, it is recommended that the portion of the anchor shaft within the active wedge be backfilled with sand before testing the anchor. This portion of the shaft should be filled tightly and flush with the face of the excavation. The sand backfill should be placed by pumping; the sand may contain a small amount of cement to facilitate pumping.

Tieback Anchor Testing

At least 10 percent of the anchors should be selected for “Quick”, 200 percent tests. It is recommended that at least three of these anchors be selected for 24-hour, 200 percent tests. It is recommended that the 24-hour tests be performed prior to installation of additional tiebacks. The purpose of the 200 percent tests is to verify the friction value assumed in design. The anchors should be tested to develop twice the assumed friction value. Where satisfactory tests are not achieved on these initial anchors, the anchor diameter and/or length should be increased until satisfactory test results are obtained.

The total deflection during the 24-hour 200 percent test should not exceed 12 inches. During the 24-hour tests, the anchor deflection should not exceed 0.75 inches measured after the 200 percent test load is applied.

For the "quick" 200 percent tests, the 200 percent test load should be maintained for 30 minutes. The total deflection of the anchor during the 200 percent quick tests should not exceed 12 inches; the deflection after the 200 percent load has been applied should not exceed 0.25 inch during the 30-minute period.

All of the remaining anchors should be tested to at least 150 percent of design load. The total deflection during the 150 percent test should not exceed 12 inches. The rate of creep under the 150 percent test load should not exceed 0.1 inch over a 15 minute period in order for the anchor to be approved for the design loading.

After a satisfactory test, each anchor should be locked-off at the design load. This should be verified by rechecking the load in the anchor. The load should be within 10 percent of the design load. Where satisfactory tests are not attained, the anchor diameter and/or length should be increased or additional anchors installed until satisfactory test results are obtained. Where post-grouted anchors are utilized, additional post-grouting may be required. The installation and testing of the anchors should be observed by a representative of the soils engineer.

Internal Bracing

Rakers may be utilized to brace the soldier piles in lieu of tieback anchors. The raker bracing could be supported laterally by temporary concrete footings (deadmen) or by the permanent interior footings. An allowable bearing pressure of 5,000 pounds per square foot may be used for the design a raker foundations. This bearing pressure is based on a raker foundation a minimum of 24 inches in width and length as well as 18 inches in depth into native alluvial soils. The base of the raker foundations should be horizontal. Care should be employed in the positioning of raker foundations so that they do not interfere with the foundations for the proposed structure.

Deflection

It is difficult to accurately predict the amount of deflection of a shored embankment. It should be realized that some deflection will occur. It is recommended that shoring deflection be limited to ½ inch at the top of the shored embankment where a structure is within a 1:1 plane projected up from the base of the excavation. A maximum deflection of 1-inch has been allowed, provided there are no structures within a 1:1 plane drawn upward from the base of the excavation. If greater deflection occurs during construction, additional bracing may be necessary to minimize settlement of adjacent buildings and utilities in adjacent street and alleys. If desired to reduce the deflection, a greater active pressure could be used in the shoring design.

Monitoring

Because of the depth of the excavation, some means of monitoring the performance of the shoring system is suggested. The monitoring should consist of periodic surveying of the lateral and vertical locations of the tops of all soldier piles and the lateral movement along the entire lengths of selected soldier piles. Also, some means of periodically checking the load on selected anchors will be necessary, where applicable.

Some movement of the shored embankments should be anticipated as a result of the relatively deep excavation. It is recommended that video and photographs of the existing buildings on the adjacent properties be made during construction to record any movements for use in the event of a dispute.

Shoring Observations

It is critical that the installation of shoring is observed by a representative of Geotechnologies, Inc. Many building officials require that shoring installation should be performed during continuous observation of a representative of the geotechnical engineer. The observations insure that the recommendations of the geotechnical report are implemented and so that modifications of the recommendations can be made if variations in the geologic material or groundwater conditions warrant. The observations will allow for a report to be prepared on the installation of shoring for the use of the local building official, where necessary.

SLABS ON GRADE

Concrete Slabs-on Grade

Concrete floor slabs should be a minimum of 5 inches in thickness. Slabs-on-grade should be cast over undisturbed native alluvial soils or properly controlled fill materials. Any geologic materials loosened or over-excavated should be wasted from the site or properly compacted to 90 percent of the maximum dry density.

Outdoor concrete flatwork should be a minimum of 4 inches in thickness. Outdoor concrete flatwork should be cast over undisturbed native alluvial soils or properly controlled fill materials. Any geologic materials loosened or over-excavated should be wasted from the site or properly compacted to 90 percent of the maximum dry density.

Design of Slabs That Receive Moisture-Sensitive Floor Coverings

Geotechnologies, Inc. does not practice in the field of moisture vapor transmission evaluation and mitigation. Therefore it is recommended that a qualified consultant be engaged to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. The qualified consultant should provide recommendations for mitigation of potential adverse impacts of moisture vapor transmission on various components of the structure.

Where dampness would be objectionable, it is recommended that the floor slabs should be waterproofed. A qualified waterproofing consultant should be retained in order to recommend a product or method which would provide protection for concrete slabs-on-grade.

All concrete slabs-on-grade should be supported on vapor retarder. The design of the slab and the installation of the vapor retarder should comply with the most recent revisions of ASTM E 1643 and ASTM E 1745. The vapor retarder should comply with ASTM E 1745 Class A requirements.

Where a vapor retarder is used, a low-slump concrete should be used to minimize possible curling of the slabs. The barrier can be covered with a layer of trimmable, compactible, granular fill, where it is thought to be beneficial. If this granular fill layer is installed, it should be a minimum of two inches in thickness. See ACI 302.2R-32, Chapter 7 for information on the placement of vapor retarders and the use of a fill layer.

Concrete Crack Control

The recommendations presented in this report are intended to reduce the potential for cracking of concrete slabs-on-grade due to settlement. However even where these recommendations have been implemented, foundations, stucco walls and concrete slabs-on-grade may display some cracking due to minor soil movement and/or concrete shrinkage. The occurrence of concrete cracking may be reduced and/or controlled by limiting the slump of the concrete used, proper concrete placement and curing, and by placement of crack control joints at reasonable intervals, in particular, where re-entrant slab corners occur.

For standard control of concrete cracking, a maximum crack control joint spacing of 15 feet should not be exceeded. Lesser spacings would provide greater crack control. Joints at curves and angle points are recommended. The crack control joints should be installed as soon as practical following concrete placement. Crack control joints should extend a minimum depth of one-fourth the slab thickness. Construction joints should be designed by a structural engineer.

Complete removal of the existing fill soils beneath outdoor flatwork such as walkways or patio areas, is not required, however, due to the rigid nature of concrete, some cracking, a shorter design life and increased maintenance costs should be anticipated. In order to provide uniform support beneath the flatwork it is recommended that a minimum of 12 inches of the exposed subgrade beneath the flatwork be scarified and recompacted to 90 percent relative compaction.

Slab Reinforcing

Concrete slabs-on-grade should be reinforced with a minimum of #3 steel bars on 18-inch centers each way. Outdoor flatwork should be reinforced with a minimum of #3 steel bars on 24-inch centers each way.

PAVEMENTS

Prior to placing paving, the existing grade should be scarified to a depth of 12 inches, moistened as required to obtain optimum moisture content, and recompacted to 90 percent of the maximum density as determined by the most recent revision of ASTM D 1557. The client should be aware that removal of all existing fill in the area of new paving is not required, however, pavement constructed in this manner will most likely have a shorter design life and increased maintenance costs. The following pavement sections are recommended:

Service	Asphalt Pavement Thickness Inches	Base Course Inches
Passenger Car Traffic	3	4
Medium Truck Traffic	4	6
Heavy Trucks	5	8

Concrete paving may also be utilized for the project. For concrete paving, the following sections are recommended:

Service	Concrete Pavement Thickness Inches	Base Course Inches
Passenger Car and Medium Truck Traffic	6	4
Heavy Trucks	7	4

Aggregate base should be compacted to a minimum of 95 percent of the most recent revision of ASTM D 1557 laboratory maximum dry density. Base materials should conform to Sections 200-2.2 or 200-2.4 of the "Standard Specifications for Public Works Construction", (Green Book), latest edition.

For standard crack control maximum expansion joint spacing of 15 feet should not be exceeded. Lesser spacings would provide greater crack control. Joints at curves and angle points are recommended. The crack control joints should be installed as soon as practical following concrete placement. Crack control joints should extend a minimum depth of one-fourth the slab thickness. Construction joints should be designed by a structural engineer. Concrete paving should be reinforced with a minimum of #3 steel bars on 24-inch centers each way.

The performance of pavement is highly dependent upon providing positive surface drainage away from the edges. Ponding of water on or adjacent to pavement can result in saturation of the subgrade materials and subsequent pavement distress. If planter islands are planned, the perimeter curb should extend a minimum of 12 inches below the bottom of the aggregate base.

SITE DRAINAGE

Proper surface drainage is critical to the future performance of the project. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Proper site drainage should be maintained at all times.

All site drainage, with the exception of any required to disposed of onsite by stormwater regulations, should be collected and transferred to the street in non-erosive drainage devices. The proposed structure should be provided with roof drainage. Discharge from downspouts, roof drains and scuppers should not be permitted on unprotected soils within five feet of the building perimeter. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope. Planters which are located within a distance equal to the depth of a retaining wall should be sealed to prevent moisture adversely affecting the wall. Planters which are located within five feet of a foundation should be sealed to prevent moisture affecting the earth materials supporting the foundation.

STORMWATER DISPOSAL

Introduction

Recently regulatory agencies have been requiring the disposal of a certain amount of stormwater generated on a site by infiltration into the site soils. Increasing the moisture content of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. This means that any overlying structure, including buildings, pavements and concrete flatwork, could sustain damage due to saturation of the subgrade soils. Structures serviced by subterranean levels could be adversely impacted by stormwater disposal by increasing the design fluid pressures on retaining walls and causing leaks in the walls. Proper site drainage is critical to the performance of any structure in the built environment.

The Proposed System

Due to the preliminary stage of the project, the type and location of any potential stormwater disposal system has not been specifically addressed for the proposed development. It is however anticipated that the infiltration system may consist of a drywell system. This firm recommends that the infiltration system is installed outside the proposed structure.

The final location and design of the proposed infiltration system shall be reviewed and approved by this office prior to construction to evaluate whether the intent of the recommendations provided by this firm are satisfied.

Percolation Testing

Percolation testing was conducted in Boring B1, following the procedure for boring percolation test provided in the Guidelines for Design, Investigation and Reporting Low Impact Development Stormwater Infiltration (GS200.2), dated June 30, 2017, presented in the Administrative Manual for the County of Los Angeles, Department of Public Works, Geotechnical and Material Engineering Division.

Borings B1 was drilled to a depth of 80 feet. At the completion of drilling, a 2-inch diameter casing was placed within the center of the borehole for the purpose of conducting percolation testing. The casing consisted of a slotted PVC pipe within the lower 30 feet of the borehole, and solid PVC pipe to the top of the borehole. A sand pack consisting of #3 Monterey Sand was poured into the annular space around the slotted portion of the casing. A 1-foot thick, hydrated bentonite seal was placed over the sand and drill cuttings were placed to the ground surface.

Prior to testing, the borehole was filled with water for the purpose of pre-soaking for 4 hours. After presoaking, the borehole was refilled with water, and the rate of drop in the water level was measured. The percolation test readings were recorded a minimum of 8 times or until a stabilized rate of drop was obtained, whichever occurred first.

The table below summarizes the results of the infiltration rate derived from the testing. This rate includes correction factors (RF_t, RF_v, and RF_s), as required by the County of Los Angeles procedure. Field readings and calculations for the percolation testing are included in the Appendix.

Boring No.	Depth of Boring Below Existing Ground Surface (ft.)	Percolation Testing Conducted Between Depths (ft.)	Infiltration Rate (in./hr.)
B1	80	50 to 80	3.12

At the completion of the percolation testing, the PVC casing was removed from the percolation testing well, and the resulting hole was backfilled with on-site soils to the ground surface. An asphalt patch was placed.

<u>Stormwater Disposal Recommendations</u>

Based on the results of the exploration, testing and research, it is the finding of this firm that the use of a drywell system for the purpose of stormwater infiltration disposal is feasible from a geotechnical standpoint. The drywell system is not expected to impact the neighboring or proposed developments, provided the advice and recommendations presented herein are implemented during design and construction.

The native site soils encountered during the geotechnical explorations conducted by this firm consist of granular sandy soils suitable for stormwater infiltration. The previous section of this report presents the anticipated infiltration rates of selected soil layers. These infiltration rates may be utilized by the civil engineer for the design of a stormwater infiltration system suitable for the project.

The potential drywell system shall be installed in the exterior of the proposed structure. It is recommended that the edge of any drywell is installed at least 30 feet away from the proposed structure, and at least 20 feet away from the existing historical structures. Stormwater infiltration should only occur in the native alluvial soils located at, or deeper, than 40 feet below the existing grade.

It is anticipated that a settling chamber will be installed in the upper 40 feet of the drywell. The seams and bottom of the settling chamber should be adequately sealed to prevent infiltration within 40 feet from the existing grade. Depending on its final location, the settling chamber of the drywell may be surcharged by adjacent foundations, in which case the chamber should be designed to withstand this additional surcharge load. The final location of the proposed drywell shall be reviewed and approved by this office prior to construction.

Stormwater infiltration must be conducted a minimum of 10 feet above the groundwater level. At the site, the historically highest groundwater level is in the order of 85 feet below grade. Therefore, it is recommended that the bottom of the drywells does not extend deeper than 75 feet below the existing grade.

Drilling for the proposed drywells will most likely encounter large sized materials (i.e. cobbles and boulders). Due to the granular nature of the site soils, caving may occur in the drilled shafts. The use of casing to maintain open shafts for installation of the drywells should be anticipated.

It is recommended that the design team, including the structural engineer, waterproofing consultant, plumbing engineer, environmental engineer and landscape architect be consulted in regards to the design and construction of filtration systems. The design and construction of stormwater infiltration systems is not the responsibility of the geotechnical engineer. However, based on the experience of this firm, it is recommended that several aspects of the use of such facilities should be considered by the design and construction team:

- All infiltration devices should be provided with overflow protection. Once the device is full of water, additional water flowing to the device should be diverted to another acceptable disposal area, or disposed offsite in an acceptable manner.

- All connections associated with stormwater infiltration systems should be sealed and water-tight. Water leaking into the subgrade soils can lead to loss of strength, piping, erosion, settlement and/or expansion of the effected earth materials.

- Excavations proposed for the installation of stormwater systems should comply with the “Temporary Excavations” sections of this geotechnical engineering investigation, as well as CalOSHA Regulations where applicable.

DESIGN REVIEW

Engineering of the proposed project should not begin until approval of the geotechnical report by the Building Official is obtained in writing. Significant changes in the geotechnical recommendations may result during the building department review process.

It is recommended that the geotechnical aspects of the project be reviewed by this firm during the design process. This review provides assistance to the design team by providing specific recommendations for particular cases, as well as review of the proposed construction to evaluate whether the intent of the recommendations presented herein are satisfied.

CONSTRUCTION MONITORING

Geotechnical observations and testing during construction are considered to be a continuation of the geotechnical investigation. It is critical that this firm review the geotechnical aspects of the project during the construction process. Compliance with the design concepts, specifications or recommendations during construction requires review by this firm during the course of construction. All foundations should be observed by a representative of this firm prior to placing concrete or steel. Any fill which is placed should be observed, tested, and verified if used for engineered purposes. Please advise Geotechnologies, Inc. at least twenty-four hours prior to any required site visit.

If conditions encountered during construction appear to differ from those disclosed herein, notify Geotechnologies, Inc. immediately so the need for modifications may be considered in a timely manner.

It is the responsibility of the contractor to ensure that all excavations and trenches are properly sloped or shored. All temporary excavations should be cut and maintained in accordance with applicable OSHA rules and regulations.

EXCAVATION CHARACTERISTICS

The exploration performed for this investigation is limited to the geotechnical excavations described. Direct exploration of the entire site would not be economically feasible. The owner, design team and contractor must understand that differing excavation and drilling conditions may be encountered based on boulders, gravel, oversize materials, groundwater and many other conditions. Fill materials, especially when they were placed without benefit of modern grading codes, regularly contain materials which could impede efficient grading and drilling. Southern California sedimentary bedrock is known to contain variable layers which reflect differences in depositional environment. Such layers may include abundant gravel, cobbles and boulders. Similarly bedrock can contain concretions. Concretions are typically lenticular and follow the bedding. They are formed by mineral deposits. Concretions can be very hard. Excavation and drilling in these areas may require full size equipment and coring capability. The contractor should be familiar with the site and the geologic materials in the vicinity.

CLOSURE AND LIMITATIONS

The purpose of this report is to aid in the design and completion of the described project. Implementation of the advice presented in this report is intended to reduce certain risks associated with construction projects. The professional opinions and geotechnical advice contained in this report are sought because of special skill in engineering and geology and were prepared in accordance with generally accepted geotechnical engineering practice. Geotechnologies, Inc. has a duty to exercise the ordinary skill and competence of members of the engineering profession. Those who hire Geotechnologies, Inc. are not justified in expecting infallibility, but can expect reasonable professional care and competence.

The recommendations of this report pertain only to the site investigated and are based upon the assumption that the geologic conditions do not deviate from those disclosed in the investigation. If any variations are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geotechnologies, Inc. should be notified so that supplemental recommendations can be prepared.

This report is issued with the understanding that it is the responsibility of the owner, or the owner's representatives, to ensure that the information and recommendations contained herein are brought to the attention of the project architect and engineer and are incorporated into the plans. The owner is also responsible to see that the contractor and subcontractors carry out the geotechnical recommendations during construction.

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 control of this firm. Therefore, this report is subject to review and should not be relied upon after a period of three years.

Geotechnical observations and testing during construction is considered to be a continuation of the geotechnical investigation. It is, therefore, most prudent to employ the consultant performing the initial investigative work to provide observation and testing services during construction. This practice enables the project to flow smoothly from the planning stages through to completion.

Should another geotechnical firm be selected to provide the testing and observation services during construction, that firm should prepare a letter indicating their assumption of the responsibilities of geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for review. The letter should acknowledge the concurrence of the new geotechnical engineer with the recommendations presented in this report.

EXCLUSIONS

Geotechnologies, Inc. does not practice in the fields of methane gas, radon gas, environmental engineering, waterproofing, dewatering organic substances or the presence of corrosive soils or wetlands which could affect the proposed development including mold and toxic mold. Nothing in this report is intended to address these issues and/or their potential effect on the proposed development. A competent professional consultant should be retained in order to address environmental issues, waterproofing, organic substances and wetlands which might affect the proposed development.

GEOTECHNICAL TESTING

Classification and Sampling

The soil is continuously logged by a representative of this firm and classified by visual examination in accordance with the Unified Soil Classification system. The field classification is verified in the laboratory, also in accordance with the Unified Soil Classification System. Laboratory classification may include visual examination, Atterberg Limit Tests and grain size distribution. The final classification is shown on the excavation logs.

Samples of the geologic materials encountered in the exploratory excavations were collected and transported to the laboratory. Undisturbed samples of soil are obtained at frequent intervals. Unless noted on the excavation logs as an SPT sample, samples acquired while utilizing a hollow-stem auger drill rig are obtained by driving a thin-walled, California Modified Sampler with successive 30-inch drops of a 140-pound hammer. The soil is retained in brass rings of 2.50 inches outside diameter and 1.00 inch in height. The central portion of the samples are stored in close fitting, waterproof containers for transportation to the laboratory. Samples noted on the excavation logs as SPT samples are obtained in general accordance with the most recent revision of ASTM D 1586. Samples are retained for 30 days after the date of the geotechnical report.

Moisture and Density Relationships

The field moisture content and dry unit weight are determined for each of the undisturbed soil samples, and the moisture content is determined for SPT samples in general accordance with the most recent revision of ASTM D 4959 or ASTM D 4643. This information is useful in providing a gross picture of the soil consistency between exploration locations and any local variations. The dry unit weight is determined in pounds per cubic foot and shown on the “Excavation Logs”, A-Plates. The field moisture content is determined as a percentage of the dry unit weight.

Direct Shear Testing

Shear tests are performed in general accordance with the most recent revision of ASTM D 3080 with a strain controlled, direct shear machine manufactured by Soil Test, Inc. or a Direct Shear Apparatus manufactured by GeoMatic, Inc. The rate of deformation is approximately 0.025 inches per minute. Each sample is sheared under varying confining pressures in order to determine the Mohr-Coulomb shear strength parameters of the cohesion intercept and the angle of internal friction. Samples are generally tested in an artificially saturated condition. Depending upon the sample location and future site conditions, samples may be tested at field moisture content. The results are plotted on the "Shear Test Diagram," B-Plates.

The most recent revision of ASTM 3080 limits the particle size to 10 percent of the diameter of the direct shear test specimen. The sheared sample is inspected by the laboratory technician running the test. The inspection is performed by splitting the sample along the sheared plane and observing the soils exposed on both sides. Where oversize particles are observed in the shear plane, the results are discarded and the test run again with a fresh sample.

Consolidation Testing

Settlement predictions of the soil's behavior under load are made on the basis of the consolidation tests in general accordance with the most recent revision of ASTM D 2435. The consolidation apparatus is designed to receive a single one-inch high ring. Loads are applied in several increments in a geometric progression, and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. Samples are generally tested at increased moisture content to determine the effects of water on the bearing soil. The normal pressure at which the water is added is noted on the drawing. Results are plotted on the "Consolidation Test," C-Plates.

Expansion Index Testing

The expansion tests performed on the remolded samples are in accordance with the Expansion Index testing procedures, as described in the most recent revision of ASTM D 4829. The soil sample is compacted into a metal ring at a saturation degree of 50 percent. The ring sample is then placed in a consolidometer, under a vertical confining pressure of 1 lbf/square inch and inundated with distilled water. The deformation of the specimen is recorded for a period of 24 hour or until the rate of deformation becomes less than 0.0002 inches/hour, whichever occurs first. The expansion index, EI, is determined by dividing the difference between final and initial height of the ring sample by the initial height, and multiplied by 1,000. Results are presented in Plate D of this report.

Laboratory Compaction Characteristics

The maximum dry unit weight and optimum moisture content of a soil are determined in general accordance with the most recent revision of ASTM D 1557. A soil at a selected moisture content is placed in five layers into a mold of given dimensions, with each layer compacted by 25 blows of a 10 pound hammer dropped from a distance of 18 inches subjecting the soil to a total compactive effort of about 56,000 pounds per cubic foot. The resulting dry unit weight is determined. The procedure is repeated for a sufficient number of moisture contents to establish a relationship between the dry unit weight and the water content of the soil. The data when plotted represent a curvilinear relationship known as the compaction curve. The values of optimum moisture content and modified maximum dry unit weight are determined from the compaction curve. Results are presented in Plate D of this report.

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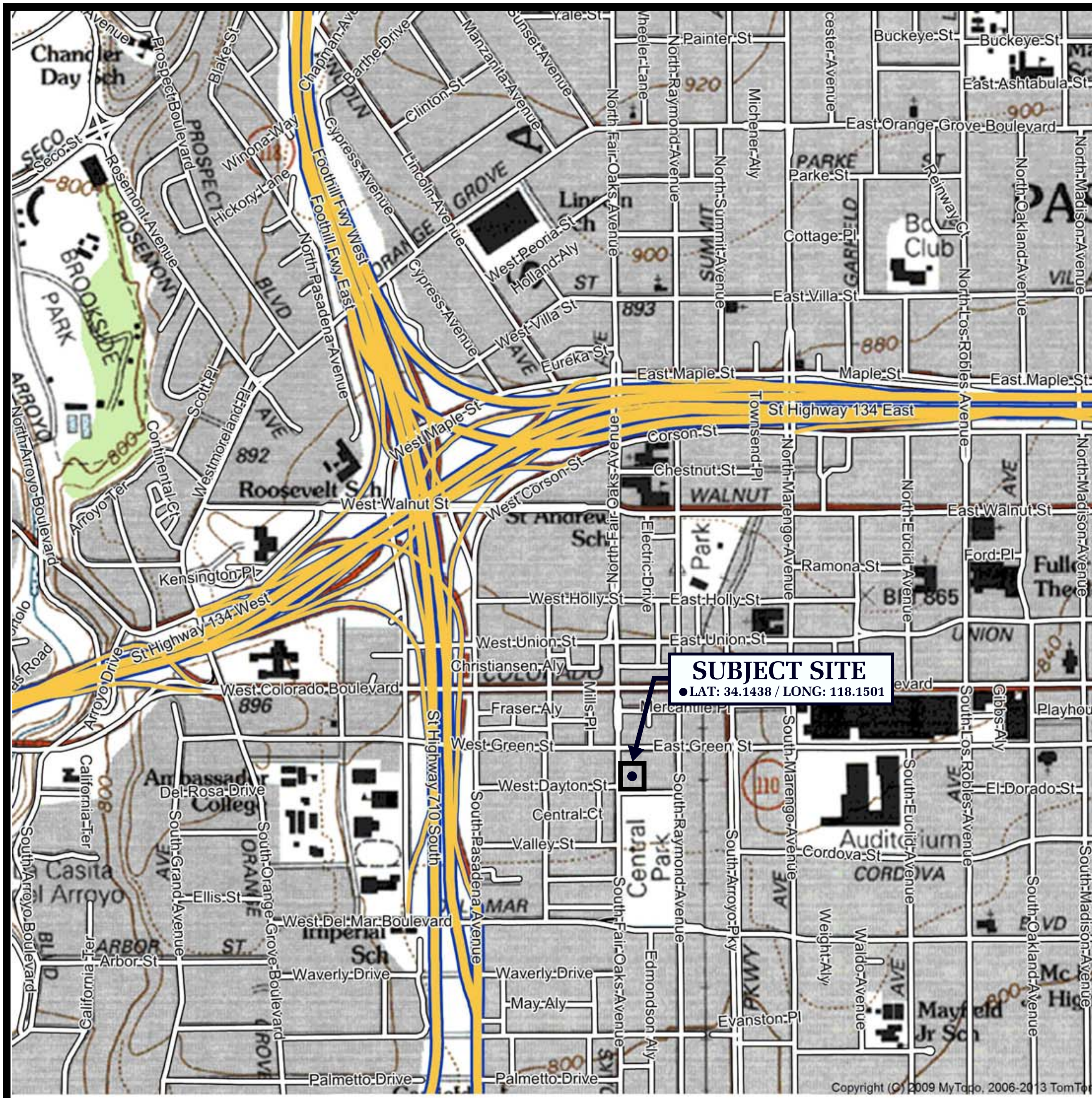

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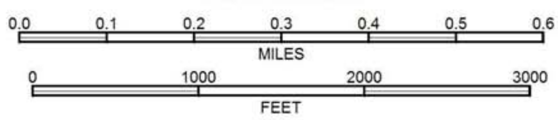


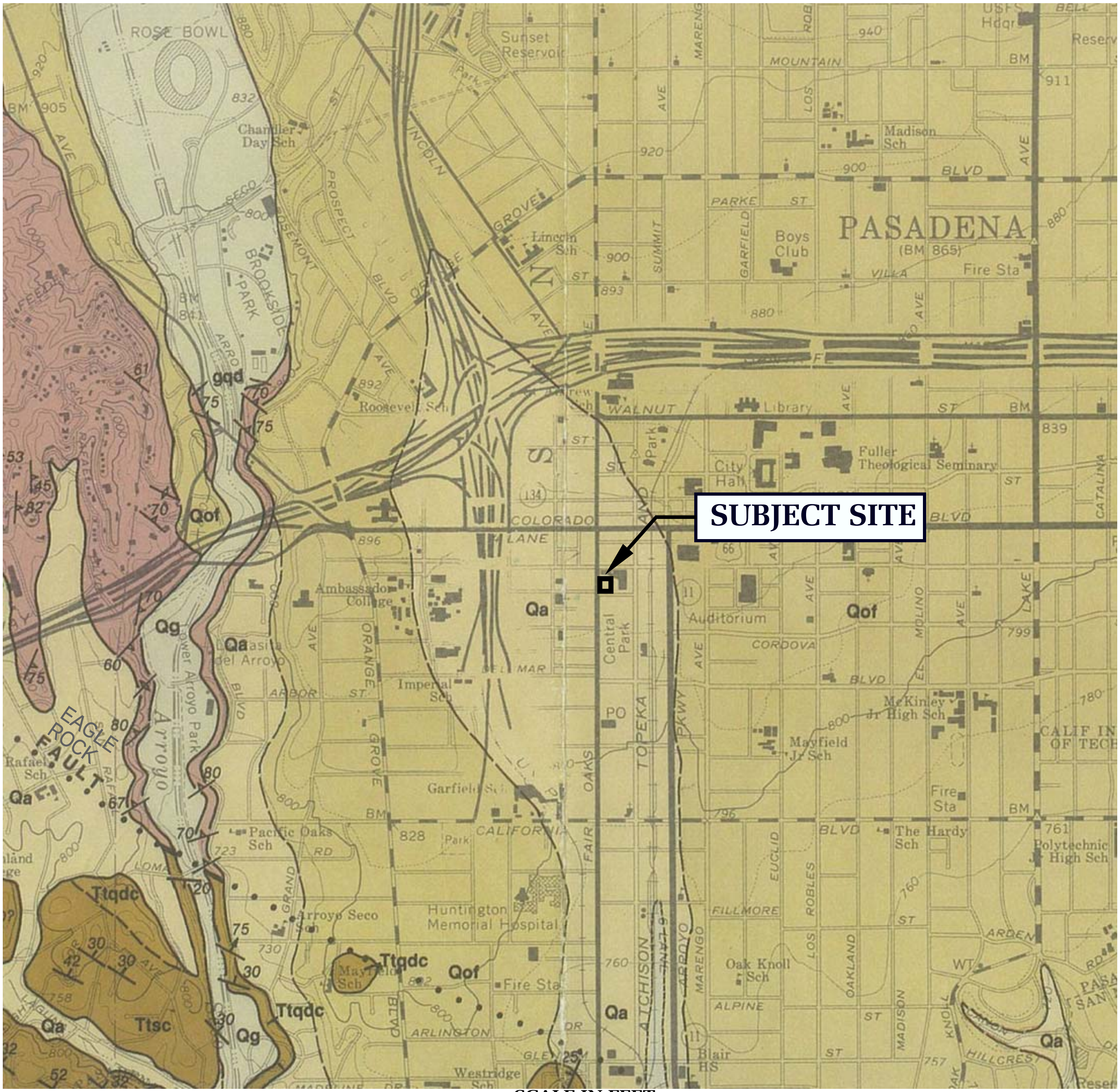
REFERENCE: U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES, PASADENA, CA QUADRANGLE

VICINITY MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

GREEN HOTEL APARTMENTS

FILE NO. 21674



SCALE IN FEET

0 2000 4000

LEGEND

Qg: Surficial Sediments -Stream channel deposits of gravel, sand and silt

Qa: Surficial Sediments - Alluvium: Unconsolidated floodplain deposits of silt, sand and gravel.

Qof: Older Surficial Sediments - Alluvial fan graveland sand derived from the San Gabriel Mountains

gqd: Quartz Diorite - Massive to gneissod

—••••? Fault - dashed where indefinite or inferred, dotted where concealed, queried where existence is doubtful

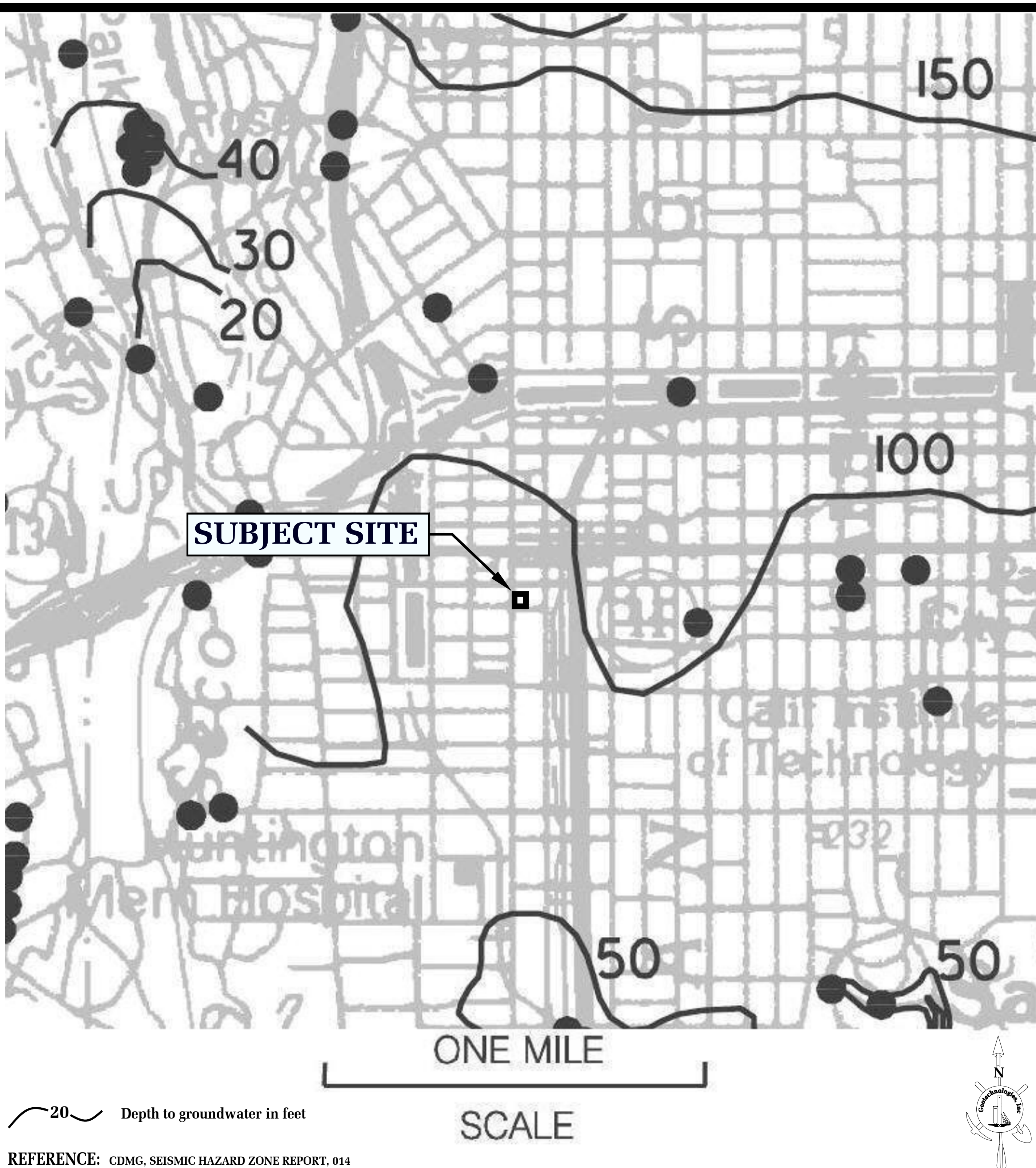
REFERENCE: DIBBLEE, T.W., (1989), GEOLOGIC MAP OF THE PASADENA QUADRANGLE, MAP #DF-23

LOCAL GEOLOGIC MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

GREEN HOTEL APARTMENTS

FILE NO. 21674



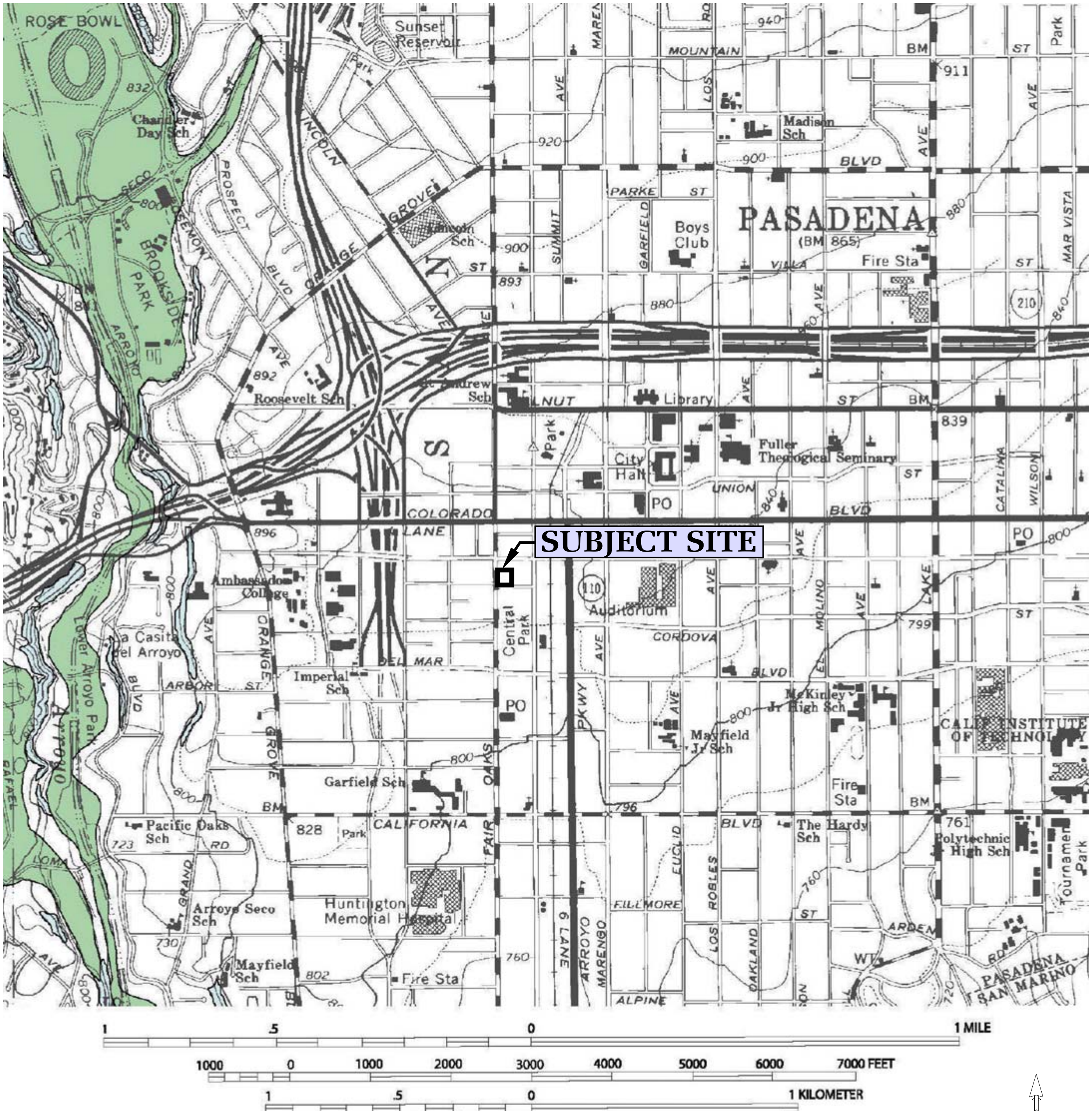
REFERENCE: CDMG, SEISMIC HAZARD ZONE REPORT, 014
PASADENA 7.5 - MINUTE QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA (1998, REVISED 2006)

HISTORICALLY HIGHEST GROUNDWATER LEVELS

Geotechnologies, Inc.
Consulting Geotechnical Engineers

GREEN HOTEL APARTMENTS

FILE NO. 21674



LIQUEFACTION AREA

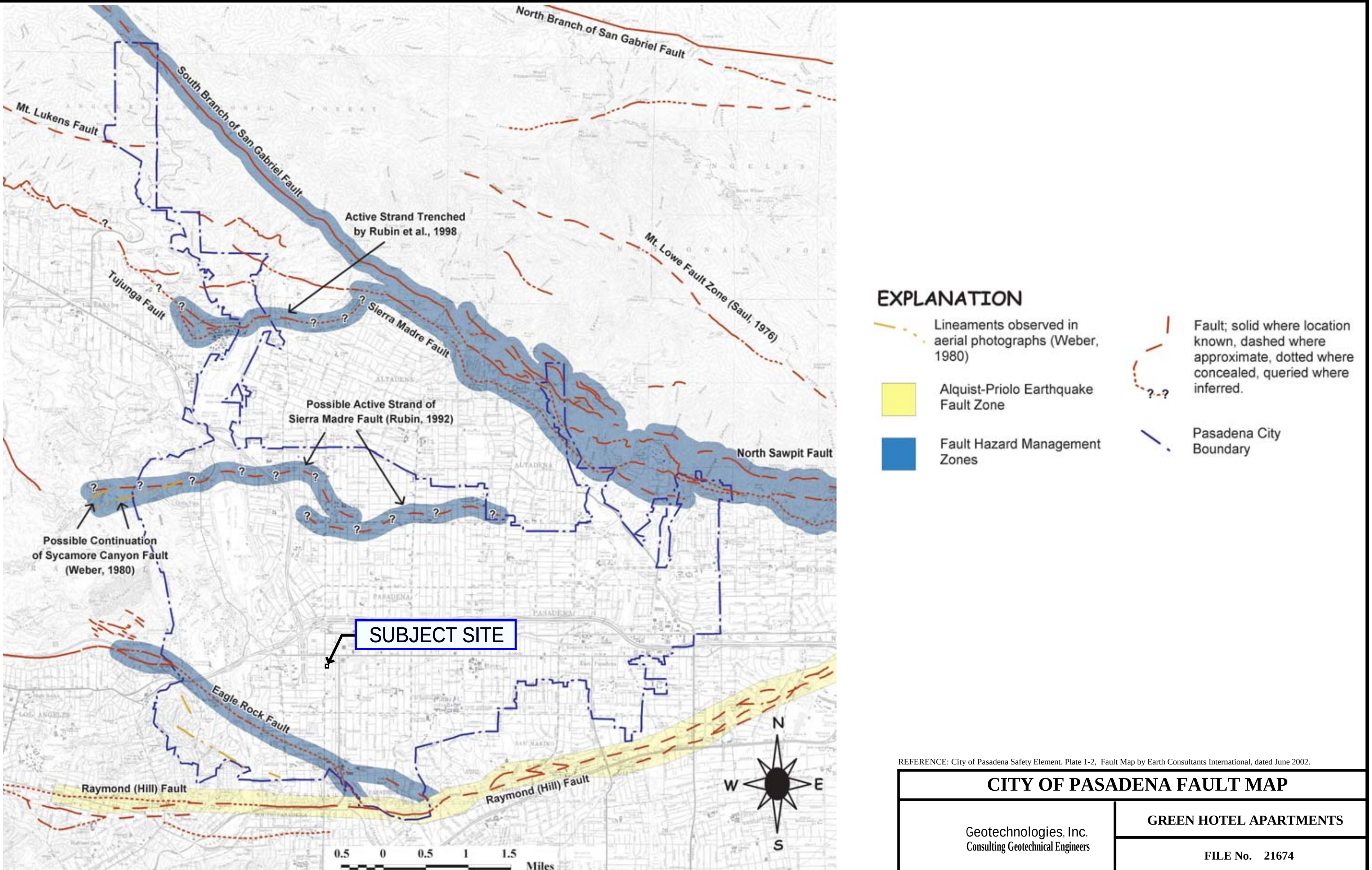
REFERENCE: SEISMIC HAZARD ZONES, PASADENA QUADRANGLE OFFICIAL MAP (CDMG, 1999)

SEISMIC HAZARD ZONE MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

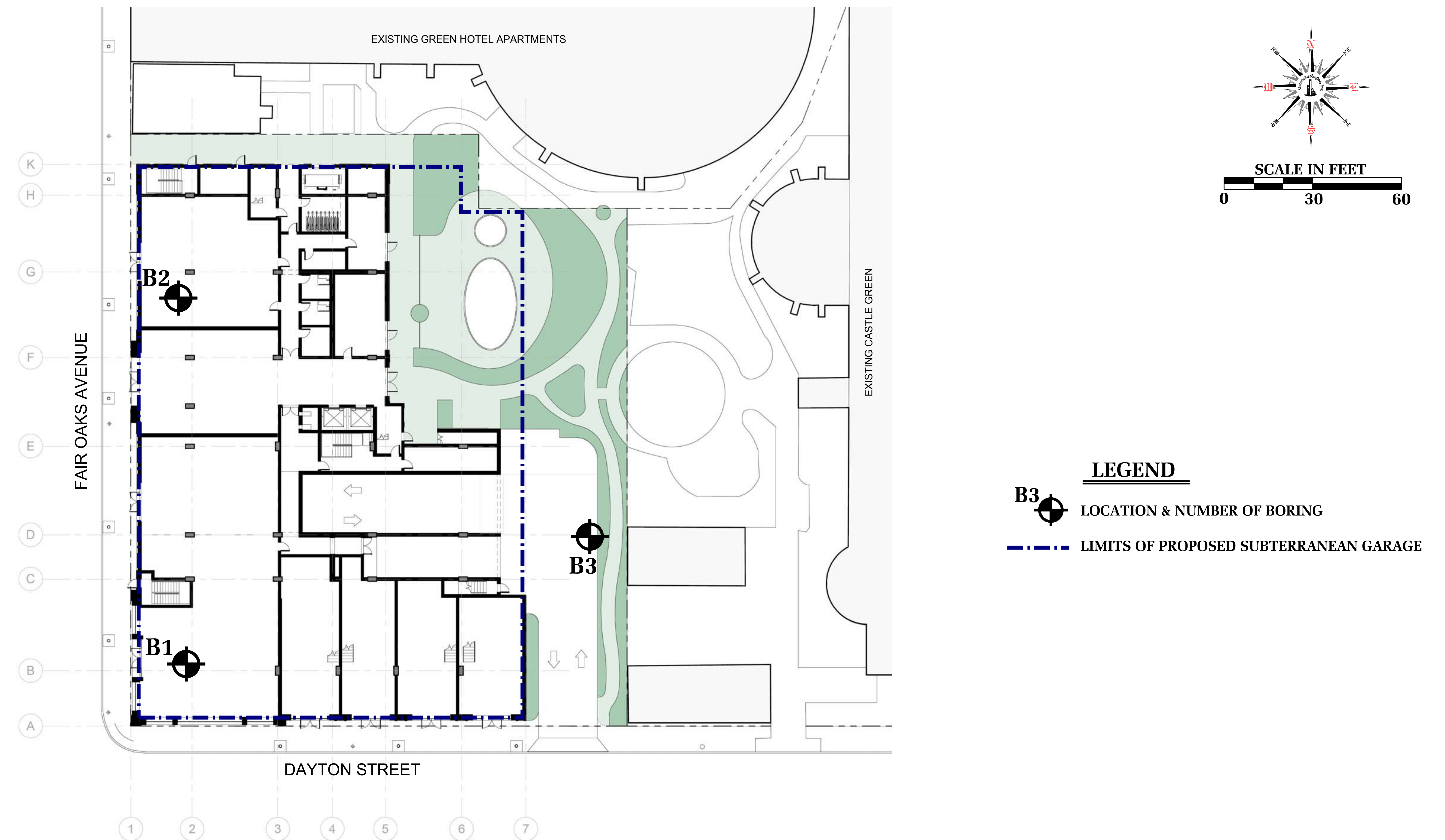
GREEN HOTEL APARTMENTS

FILE NO. 21674



REFERENCE: City of Pasadena Safety Element. Plate 1-2, Fault Map by Earth Consultants International, dated June 2002.

CITY OF PASADENA FAULT MAP	
Geotechnologies, Inc. Consulting Geotechnical Engineers	GREEN HOTEL APARTMENTS
	FILE No. 21674



Geotechnologies, Inc.
Consulting Geotechnical Engineers

PLOT PLAN

GREEN HOTEL APARTMENTS

File No.: 21674

Date: March '19

REFERENCE: GROUND FLOOR PLAN BACKGROUND BY ARCHITECTURAL RESOURCES GROUP
NOT DATED

BORING LOG NUMBER 1

Green Hotel Apartments **Date: 09/24/18** **Elevation: 834.1'***

File No. 21674 **Method: 8-inch diameter Hollow Stem Auger**

km *Reference: Site Survey by S.E.C. Civil Engineers, Inc., dated 12/4/09

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for Parking
				0 --		4-inch Asphalt over 4-inch Base
				-		
				1 --		
				-		FILL: Silty Sand, dark brown, moist, medium dense, fine grained
				2 --		
2.5	16	8.7	98.9	-		
				3 --		
				-	SM	NATIVE SOILS: Silty Sand, dark brown, moist, medium dense, fine grained
				4 --		
				-		
5	26	4.4	SPT	5 --		
				-	SP	Sand, dark and yellowish brown, moist, medium dense, fine grained
				6 --		
				-		
				7 --		
7.5	72	3.1	127.3	-		
				8 --	SW	Cobbley Sand, yellowish brown, moist, dense, fine to coarse grained
				-		
				9 --		
				-		
10	20	25.0	SPT	10 --		
				-	ML	Sandy Silt, dark and yellowish brown, moist, stiff
				11 --		
				-		
				12 --		
12.5	68	9.5	124.4	-		
				13 --	SM/SP	Silty Sand to Sand, dark and yellowish brown, moist, dense, fine to medium grained
				-		
				14 --		
				-		
15	36	4.4	SPT	15 --		
				-	SP	Sand, dark and yellowish brown, moist, medium dense, fine grained, minor gravel
				16 --		
				-		
17	45	5.8	111.3	17 --		
				-		dark brown, medium dense to dense, fine to medium grained
				18 --		
				-		
				19 --		
				-		
20	41	4.5	SPT	20 --		
				-		
				21 --		
				-		
				22 --		
22.5	79	4.2	114.1	-		
				23 --		dark and yellowish brown, very dense, minor gravel
				-		
				24 --		
				-		
25	70	4.2	SPT	25 --		
				-		

BORING LOG NUMBER 1

Green Hotel Apartments

File No. 21674

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
27.5	90	9.8	130.8	-		
				28 --	SM/SP	Silty Sand to Sand, dark and yellowish brown, moist, very dense, fine to medium grained
				-		
				29 --		
				-		
30	33	6.2	SPT	30 --		
	50/5"			-	SP/SW	Sand to Gravelly Sand, dark and yellowish brown, moist, very dense, fine to coarse grained
				31 --		
				-		
				32 --		
32.5	28	4.0	112.2	-		
	50/5"			33 --	SP	Sand, dark brown, moist, very dense, fine to medium grained
				-		
				34 --		
				-		
35	88	4.0	SPT	35 --		
				-		
				36 --		
				-		
				37 --		
37.5	100/8"	4.1	119.1	-		
				38 --	SM/SP	Silty Sand to Sand, dark and yellowish brown, moist, very dense, fine to medium grained
				-		
				39 --		
				-		
40	53	3.8	SPT	40 --		
				-	SP	Sand, dark brown, moist, dense, fine to medium grained, minor gravel
				41 --		
				-		
				42 --		
42.5	84	4.1	116.4	-		
				43 --		dark and yellowish brown, moist, very dense, fine grained
				-		
				44 --		
				-		
45	90	3.7	SPT	45 --		
				-		
				46 --		
				-		
				47 --		
47.5	100/8"	1.7	119.9	-		
				48 --		
				-		
				49 --		
				-		
50	63	3.0	SPT	50 --		
	50/5"			-		

BORING LOG NUMBER 1

Green Hotel Apartments

File No. 21674
km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				51 --		
				-		
				52 --		
52.5	100/10"	3.5	116.1	-		
				53 --		
				-		
				54 --		
				-		
55	45	4.8	SPT	55 --		
	50/2"			-	SP/SM	Sand to Silty Sand, dark and yellowish brown, moist, very dense, fine to medium grained, minor gravel
				56 --		
				-		
				57 --		
57.5	100/9"	3.0	116.1	-		
				58 --	SP	Sand, dark brown, moist, very dense, fine grained
				-		
				59 --		
				-		
60	50/6"	2.8	SPT	60 --		
				-		
				61 --		
				-		
				62 --		
62.5	100/10"	2.5	114.3	-		
				63 --		fine to medium grained, minor cobbles
				-		
				64 --		
				-		
65	50/6"	2.8	SPT	65 --		
				-		
				66 --		
				-		
				67 --		
67.5	100/9"	2.1	112.6	-		
				68 --		
				-		
				69 --		
				-		
70	45	2.6	SPT	70 --		
				-		dense
				71 --		
				-		
				72 --		
72.5	49	2.0	115.2	-		
				73 --		
				-		
				74 --		
				-		
75	49	1.8	SPT	75 --		
				-	SM/SP	Silty Sand to Sand, dark and yellowish brown, moist, dense, fine to medium grained

BORING LOG NUMBER 1

Green Hotel Apartments

File No. 21674

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				76 --		
				-		
				77 --		
77.5	83	14.5	109.5	-		
				78 --	SM/ML	Silty Sand to Sandy Silt, dark brown, moist, very dense or very stiff, fine to medium grained
				-		
				79 --		
				-		
80	48	17.8	SPT	80 --		
				-		Total Depth 80 feet
				81 --		No Water
				-		Fill to 3 feet
				82 --		
				-		
				83 --		NOTE: The stratification lines represent the approximate
				-		boundary between earth types; the transition may be gradual.
				84 --		
				-		Used 8-inch diameter Hollow-Stem Auger
				85 --		140-lb. Automatic Hammer, 30-inch drop
				-		Modified California Sampler used unless otherwise noted
				86 --		
				-		SPT=Standard Penetration Test
				87 --		
				-		
				88 --		
				-		
				89 --		
				-		
				90 --		
				-		
				91 --		
				-		
				92 --		
				-		
				93 --		
				-		
				94 --		
				-		
				95 --		
				-		
				96 --		
				-		
				97 --		
				-		
				98 --		
				-		
				99 --		
				-		
				100 --		
				-		

BORING LOG NUMBER 2

Green Hotel Apartments **Date: 09/25/18** **Elevation: 835.0'***

File No. 21674 **Method: 8-inch diameter Hollow Stem Auger**

km *Reference: Site Survey by S.E.C. Civil Engineers, Inc., dated 12/4/09

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for Parking
				0 --		2½-inch Asphalt, No Base
				-		
				1 --		FILL: Silty Sand, dark brown, moist, medium dense, fine grained, minor cobbles
				-		
				2 --		
2.5	34	2.7	127.4	-		
				3 --		
				-	SM/SP	NATIVE SOILS: Silty Sand to Sand with Cobble, dark brown, moist, medium dense, fine to medium grained
				4 --		
				-		
5	28	2.1	119.6	5 --		
				-	SP/SW	Sand to Gravelly Sand, dark and yellowish brown, moist, medium dense, fine to coarse grained
				6 --		
				-		
				7 --		
7.5	35	3.0	119.5	-		
				8 --	SW	Gravelly Sand, dark and yellowish brown, moist, medium dense, fine to coarse grained
				-		
				9 --		
				-		
10	39	2.1	96.4	10 --		
				-	SM/ML	Silty Sand to Sandy Silt, dark and yellowish brown mottling, moist, medium dense, stiff, fine grained
				11 --		
				-		
				12 --		
				-		
				13 --		
				-		
				14 --		
				-		
15	48	6.7	117.4	15 --		
				-	SM/SP	Silty Sand to Sand, dark brown, moist, dense, fine grained
				16 --		
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
20	85	4.8	127.0	20 --		
				-	SP	Sand, dark and yellowish brown, moist, very dense, fine to medium grained
				21 --		
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
25	73 50/5"	6.2	116.7	25 -- -		

BORING LOG NUMBER 2

Green Hotel Apartments

File No. 21674

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
				-		
				28 --		
				-		
				29 --		
				-		
30	88	3.0	115.2	30 --		
				-	SP/SW	Sand to Gravelly Sand, dark and yellowish brown, moist, very dense, fine to coarse grained
				31 --		
				-		
				32 --		
				-		
				33 --		
				-		
				34 --		
				-		
35	40 50/5"	3.7	117.0	35 --		
				-		
				36 --		
				-		
				37 --		
				-		
				38 --		
				-		
				39 --		
				-		
40	45 50/4"	5.5	106.3	40 --		
				-	SP	Sand, dark and yellowish brown, moist, very dense, fine to medium grained
				41 --		
				-		
				42 --		
				-		
				43 --		
				-		
				44 --		
				-		
45	45 50/5"	3.7	114.8	45 --		
				-		
				46 --		
				-		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				47 --		
				-		
				48 --		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				-		
				49 --		
				-		
50	100/9"	3.3	Disturbed	50 --		
				-		Total Depth 50 feet No Water Fill to 3 feet

BORING LOG NUMBER 3

Green Hotel Apartments | **Date: 09/25/18** | **Elevation: 833.0'***

File No. 21674 | **Method: 8-inch diameter Hollow Stem Auger**

km | *Reference: Site Survey by S.E.C. Civil Engineers, Inc., dated 12/4/09

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for Parking
				0 --		3-inch Asphalt, No Base
				-		
				1 --		FILL: Silty Sand, dark brown, moist, medium dense, fine grained, minor cobbles
				-		
				2 --		
2.5	37	4.1	115.9	-		
				3 --		
				-	SM/SW	NATIVE SOILS: Silty Sand to Cobbley Sand, dark and yellowish brown, moist, medium dense, fine to coarse grained
				4 --		
				-		
5	49	1.5	115.9	5 --		
				-	SW	Gravelly Sand, dark brown, slightly moist, medium dense to dense, fine to coarse grained
				6 --		
				-		
				7 --		
7.5	65	8.2	113.1	-		
				8 --	SP/SW	Sand to Gravelly Sand, dark and yellowish brown, moist, dense, fine to medium grained
				-		
				9 --		
				-		
10	50	24.8	99.3	10 --		
				-	ML	Sandy Silt, dark and yellowish brown mottling, moist, very stiff
				11 --		
				-		
				12 --		
				-		
				13 --		
				-		
				14 --		
				-		
15	72	9.3	125.6	15 --		
				-	SP	Sand, dark and yellowish brown, moist, very dense, fine to medium grained
				16 --		
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
20	65 50/4"	11.6	118.8	20 --		
				-		
				21 --		
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
25	90	11.6	120.6	25 --		
				-	SM/SP	Silty Sand to Sand, dark and yellowish brown, moist, very dense, fine grained

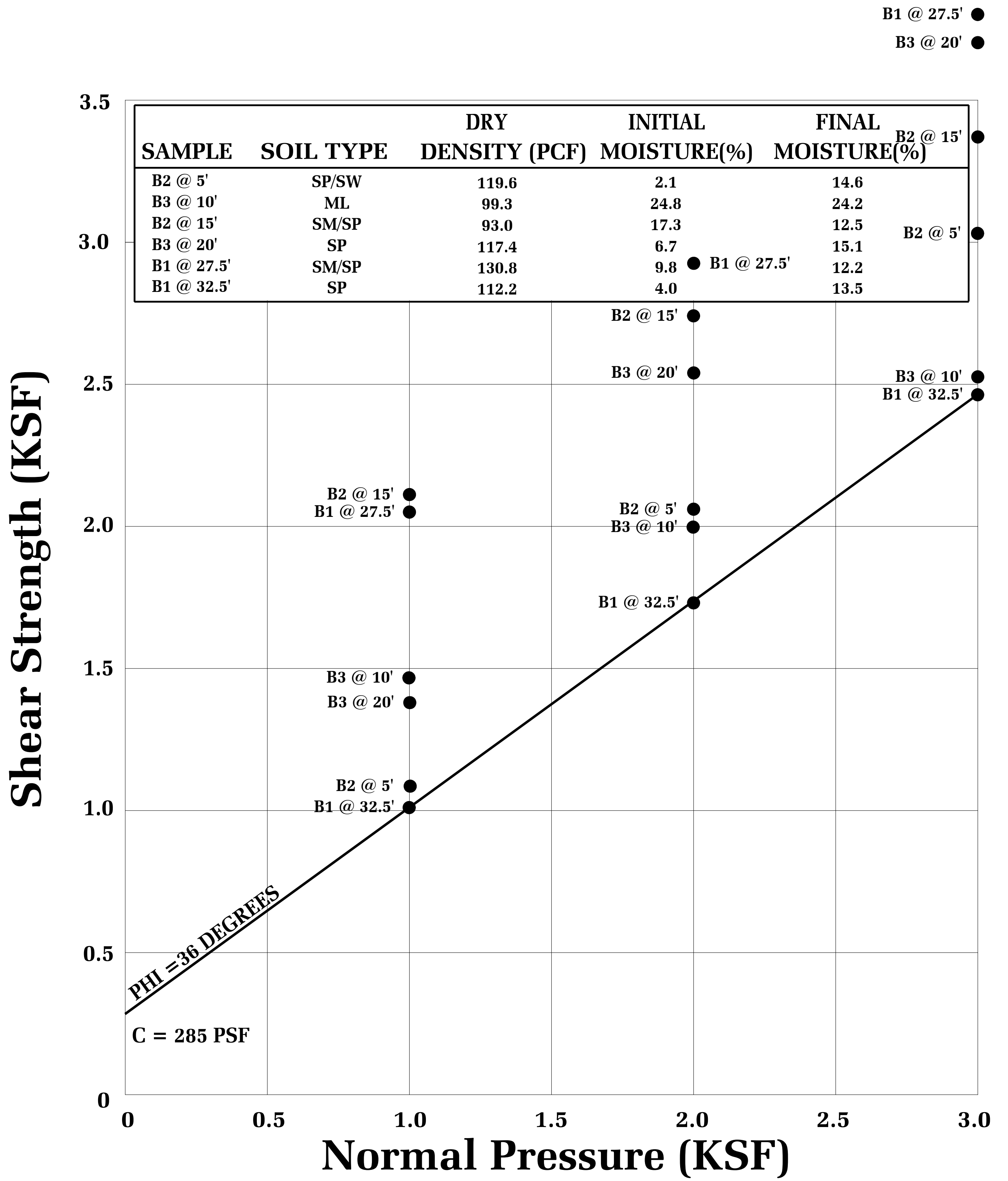
BORING LOG NUMBER 3

Green Hotel Apartments

File No. 21674

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
				-		
				28 --		
				-		
				29 --		
				-		
30	26 50/5"	6.0	115.4	30 --		
				-		
				31 --		
				-		
				32 --		
				-		
				33 --		
				-		
				34 --		
				-		
35	100/9"	2.7	112.5	35 --		
				-	SP	Sand, dark and yellowish brown, moist, very dense, fine to medium grained
				36 --		
				-		
				37 --		
				-		
				38 --		
				-		
				39 --		
				-		
40	100/10"	3.0	104.3	40 --		
				-		
				41 --		
				-		
				42 --		
				-		
				43 --		
				-		
				44 --		
				-		
45	39 50/5"	11.4	115.1	45 --		
				-	SM	Silty Sand, dark brown, moist, very dense, fine grained
				46 --		
				-		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				47 --		
				-		
				48 --		Used 8-inch diameter Hollow-Stem Auger
				-		140-lb. Automatic Hammer, 30-inch drop
				49 --		Modified California Sampler used unless otherwise noted
				-		
50	100/9"	8.8	109.9	50 --		
				-		Total Depth 50 feet No Water Fill to 3 feet



SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B2 @ 5'	SP/SW	119.6	2.1	14.6
B3 @ 10'	ML	99.3	24.8	24.2
B2 @ 15'	SM/SP	93.0	17.3	12.5
B3 @ 20'	SP	117.4	6.7	15.1
B1 @ 27.5'	SM/SP	130.8	9.8	12.2
B1 @ 32.5'	SP	112.2	4.0	13.5

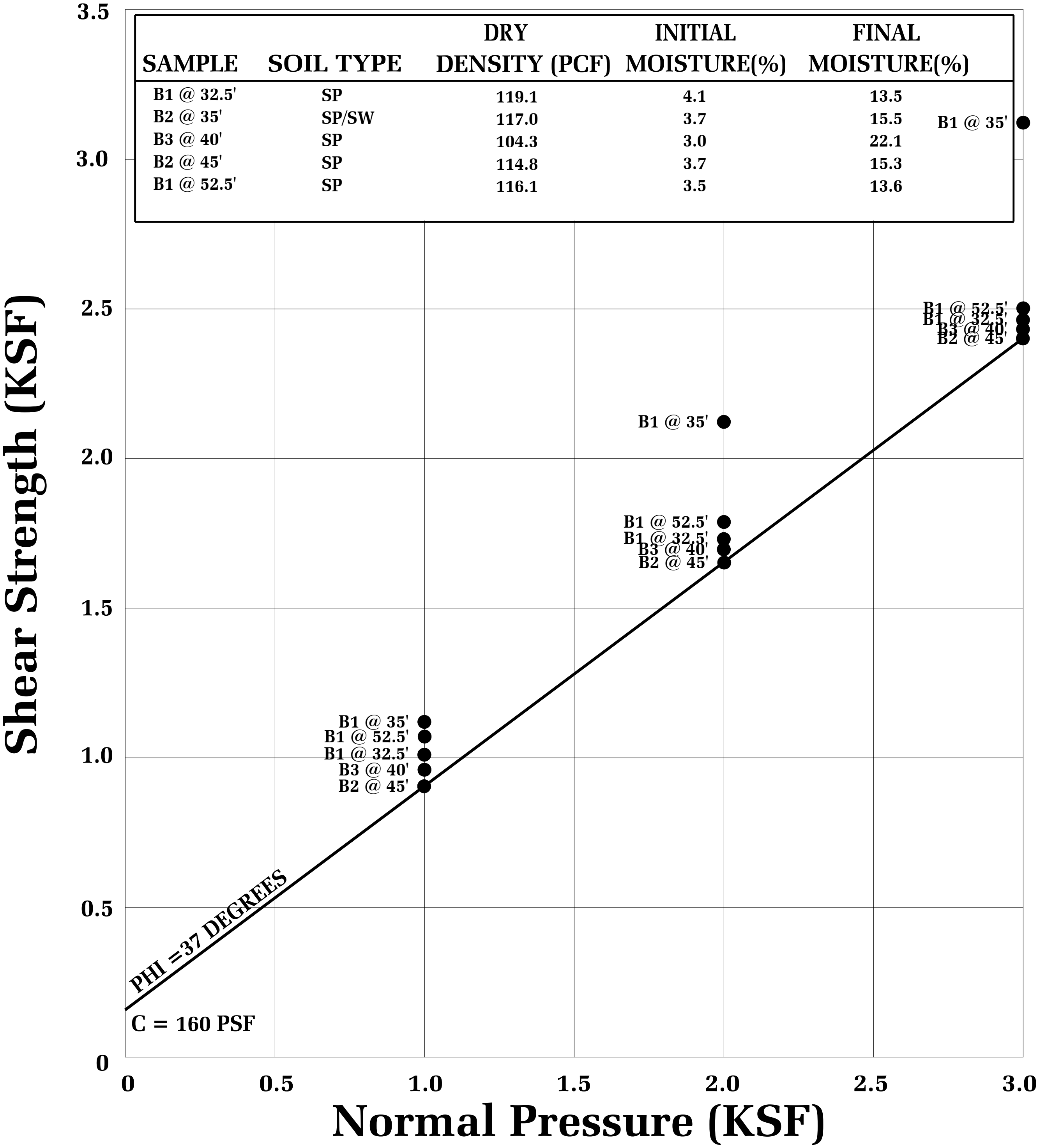
● Direct Shear, Saturated

SHEAR TEST DIAGRAM

Geotechnologies, Inc.
Consulting Geotechnical Engineers

GREEN HOTEL APARTMENTS

FILE NO. 21674 | PLATE: B-1



SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B1 @ 32.5'	SP	119.1	4.1	13.5
B2 @ 35'	SP/SW	117.0	3.7	15.5
B3 @ 40'	SP	104.3	3.0	22.1
B2 @ 45'	SP	114.8	3.7	15.3
B1 @ 52.5'	SP	116.1	3.5	13.6

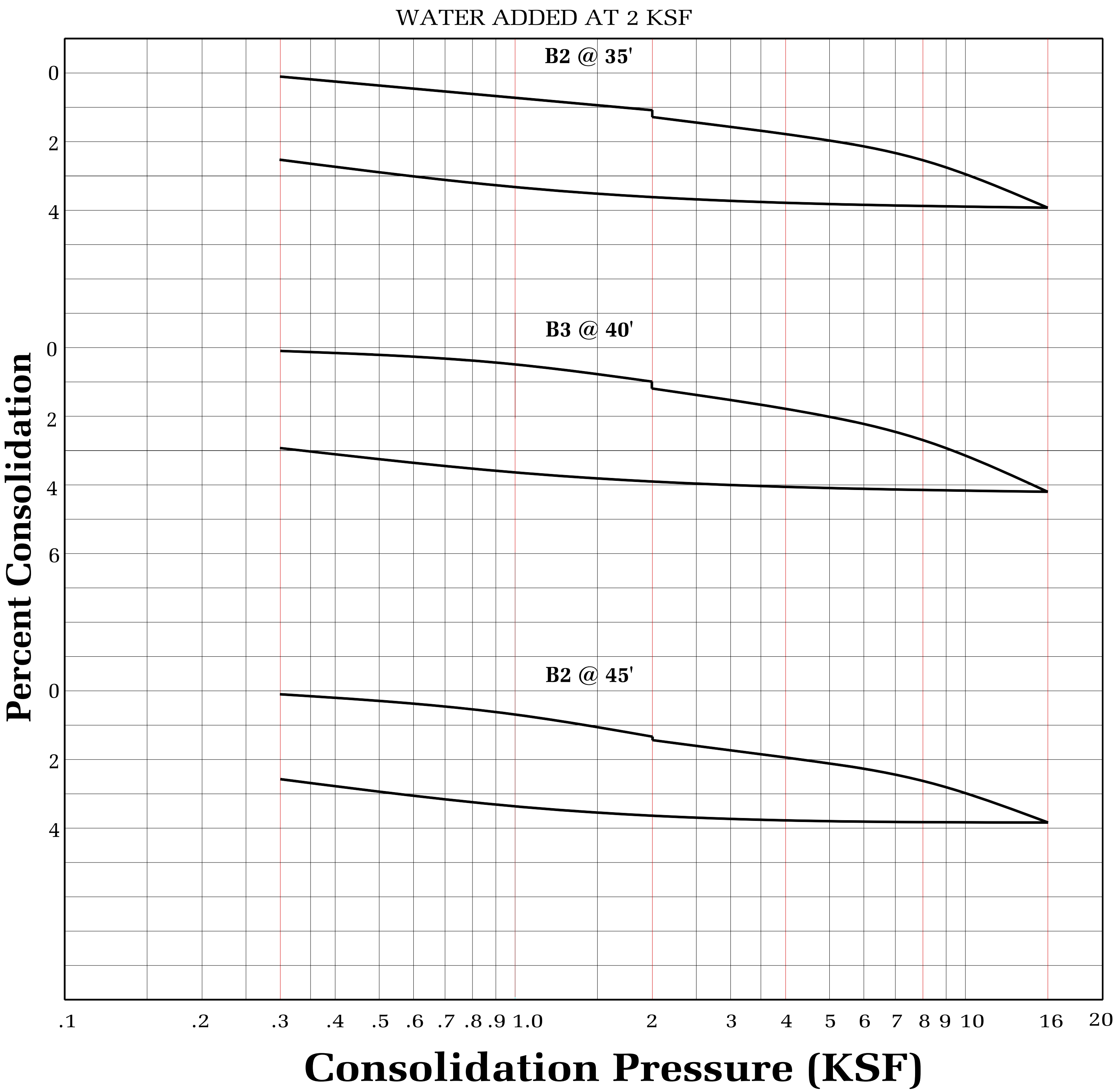
● Direct Shear, Saturated

SHEAR TEST DIAGRAM

Geotechnologies, Inc.
Consulting Geotechnical Engineers

GREEN HOTEL APARTMENTS

FILE NO. 21674 | PLATE: B-2



CONSOLIDATION TEST

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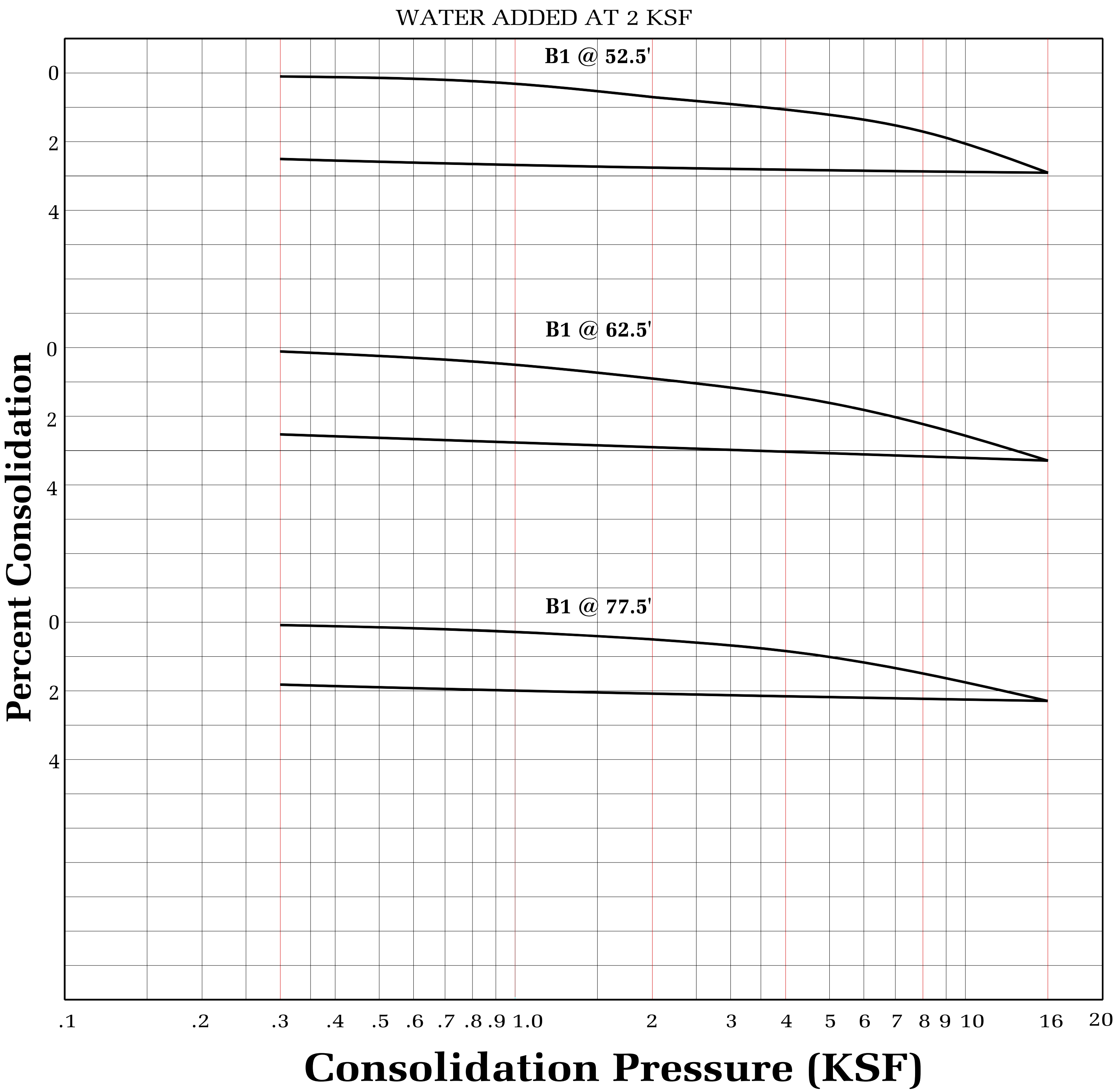
GREEN HOTEL APARTMENTS

FILE NO. 21674	**PLATE: C-1**



CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

GREEN HOTEL APARTMENTS

FILE NO. 21674	**PLATE: C-2**

ASTM D-1557

SAMPLE	B2 @ 1- 5'	B3 @ 1-5'
SOIL TYPE:	SM/SP	SM/SW
MAXIMUM DENSITY pcf.	129.3	124.4
OPTIMUM MOISTURE %	9.5	10.5

ASTM D 4829

SAMPLE	B2 @ 1- 5'	B3 @ 1-5'
SOIL TYPE:	SM/SP	SM/SW
EXPANSION INDEX UBC STANDARD 18-2	2	3
EXPANSION CHARACTER	VERY LOW	VERYLOW

SULFATE CONTENT

SAMPLE	B2 @ 1-5'	B3 @ 1-5'	B1 @ 10'	B1 @ 20'	B1 @ 30'
SULFATE CONTENT: (percentage by weight)	< 0.2 %	< 0.1 %	< 0.1 %	< 0.1 %	< 0.1 %

COMPACTION/EXPANSION/SULFATE DATA SHEET

Geotechnologies, Inc.
Consulting Geotechnical Engineers

GREEN HOTEL APARTMENTS

FILE NO. 21674

PLATE: D

Geotechnologies, Inc.

Project: Green Hotel Apartments

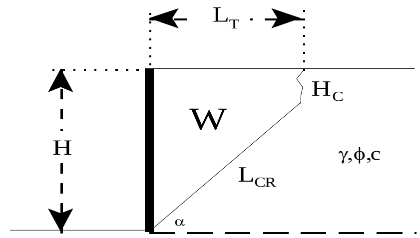
File No.: 21674

Description: Drained Cantilever Retaining Walls

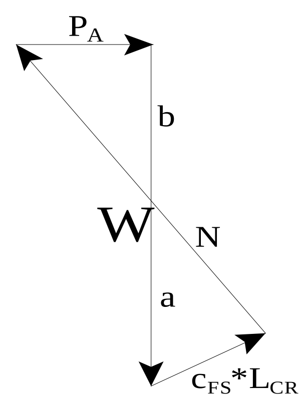
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	54.00	feet
Unit Weight of Retained Soils	(γ)	125.0	pcf
Friction Angle of Retained Soils	(ϕ)	36.0	degrees
Cohesion of Retained Soils	(c)	285.0	psf
Factor of Safety	(FS)	1.50	
Factored Parameters:	(ϕ_{FS})	25.8	degrees
	(c_{FS})	190.0	psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	7.3	1706	213225.9	72.6	50795.5	162430.4	40969.2
41	6.9	1650	206199.0	71.7	46921.6	159277.3	43144.1
42	6.6	1595	199371.3	70.8	43518.0	155853.4	45150.5
43	6.3	1542	192744.3	69.9	40509.8	152234.4	46997.0
44	6.1	1491	186314.9	69.0	37837.1	148477.8	48691.4
45	5.9	1441	180077.6	68.0	35450.6	144627.0	50240.6
46	5.7	1392	174025.5	67.1	33310.1	140715.4	51651.2
47	5.6	1345	168150.7	66.2	31382.3	136768.3	52928.8
48	5.4	1300	162444.9	65.4	29639.5	132805.5	54078.6
49	5.3	1255	156899.9	64.5	28058.2	128841.8	55105.2
50	5.2	1212	151507.5	63.7	26618.7	124888.8	56012.6
51	5.1	1170	146259.7	62.9	25304.4	120955.3	56804.4
52	5.0	1129	141148.7	62.1	24100.9	117047.8	57483.6
53	5.0	1089	136167.1	61.4	22995.8	113171.3	58052.9
54	4.9	1050	131307.8	60.7	21978.6	109329.2	58514.3
55	4.9	1013	126564.1	59.9	21040.0	105524.0	58869.6
56	4.9	975	121929.5	59.3	20172.0	101757.4	59120.2
57	4.9	939	117397.9	58.6	19367.6	98030.4	59267.0
58	4.9	904	112963.7	58.0	18620.5	94343.2	59310.5
59	4.9	869	108621.2	57.3	17925.2	90696.0	59250.9
60	4.9	835	104365.2	56.7	17276.9	87088.3	59087.9
61	4.9	802	100190.9	56.1	16671.3	83519.5	58821.1
62	4.9	769	96093.4	55.6	16104.5	79988.9	58449.2
63	5.0	737	92068.4	55.0	15573.0	76495.4	57971.1
64	5.1	705	88111.5	54.5	15073.7	73037.9	57384.8
65	5.1	674	84218.7	53.9	14603.6	69615.1	56688.2



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\,max}$ 59310.5 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

EFP 40.7 pcf

Design Wall for an Equivalent Fluid Pressure: 41 pcf

Geotechnologies, Inc.
Project: Green Hotel Apartments
File No.: 21674

Soil Weight	γ	125	pcf
Internal Friction Angle	ϕ	36	degrees
Cohesion	c	0	psf
Height of Retaining Wall	H	54	feet

Restrained Retaining Wall Design based on At Rest Earth Pressure

$\sigma'_h = K_o\sigma'_v$

$K_o = 1 - \sin\phi$	0.412	
$\sigma'_v = \gamma H$	6750.0	psf

$\sigma'_h =$	2782.4	psf	
EFP =	51.5	pcf	
$P_o =$	75126.1	lbs/ft	(based on a triangular distribution of pressure)

Design wall for an EFP of 52 pcf

Geotechnologies, Inc.
Project: Green Hotel Apartments
File No.: 21674

Seismically Induced Lateral Soil Pressure on Retaining Wall

Input:

Height of Retaining Wall:	(H)	54.0	feet
Retained Soil Unit Weight:	(γ)	125.0	pcf
Horizontal Ground Acceleration:	(k_h)	0.36	g

Seismic Increment (ΔP_{AE}):

$\Delta P_{AE} = (0.5*\gamma*H^2)*(0.75*k_h)$

$\Delta P_{AE} =$ 49207.5 lbs/ft

Force applied at 0.6H above the base of the wall
Transfer load to 2/3 of the height of the wall

$T*(2/3)*H = \Delta P_{AE}*0.6*H$

T = 44286.8 lbs/ft

$EFP = 2*T/H^2$

EFP = 30 pcf
triangular distribution of pressure

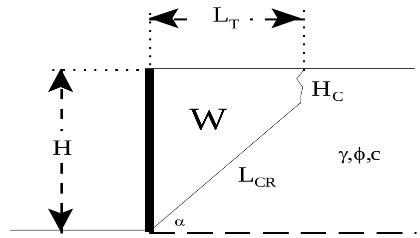
Geotechnologies, Inc.

Project: Green Hotel Apartments
File No.: 21674
Description: Temporary Shoring (up to 20 feet in height)

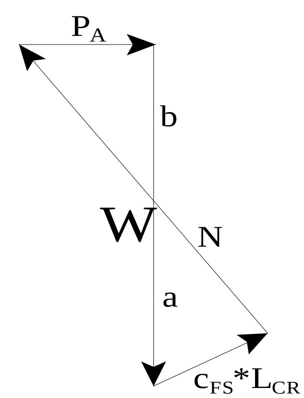
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	20.00	feet
Unit Weight of Retained Soils	(γ)	125.0	pcf
Friction Angle of Retained Soils	(ϕ)	36.0	degrees
Cohesion of Retained Soils	(c)	285.0	psf
Factor of Safety	(FS)	1.25	
Factored Parameters:	(ϕ_{FS})	30.2	degrees
	(c_{FS})	228.0	psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	12.1	152	18971.7	12.4	14268.6	4703.1	815.2
41	11.1	159	19873.3	13.5	14200.1	5673.1	1085.6
42	10.3	163	20332.5	14.4	13865.8	6466.6	1354.9
43	9.7	164	20493.0	15.1	13393.2	7099.9	1617.4
44	9.2	164	20447.4	15.6	12854.7	7592.7	1869.6
45	8.7	162	20257.1	16.0	12292.4	7964.7	2109.3
46	8.3	160	19963.9	16.2	11730.6	8233.3	2335.0
47	8.0	157	19597.1	16.4	11183.0	8414.1	2545.7
48	7.7	153	19177.4	16.6	10657.3	8520.1	2741.0
49	7.4	150	18719.9	16.6	10157.3	8562.6	2920.5
50	7.2	146	18235.4	16.7	9684.5	8551.0	3084.2
51	7.0	142	17732.1	16.7	9238.9	8493.2	3231.9
52	6.9	138	17215.9	16.6	8819.8	8396.1	3363.9
53	6.8	134	16691.3	16.6	8426.1	8265.3	3480.1
54	6.6	129	16161.8	16.5	8056.2	8105.5	3580.6
55	6.5	125	15629.7	16.4	7708.6	7921.1	3665.6
56	6.5	121	15097.1	16.3	7381.8	7715.3	3735.3
57	6.4	117	14565.2	16.2	7074.0	7491.3	3789.6
58	6.4	112	14035.2	16.1	6783.7	7251.5	3828.7
59	6.3	108	13507.8	15.9	6509.5	6998.2	3852.6
60	6.3	104	12983.4	15.8	6250.1	6733.3	3861.4
61	6.3	100	12462.4	15.6	6003.9	6458.5	3855.1
62	6.4	96	11945.0	15.4	5769.8	6175.1	3833.7
63	6.4	91	11431.1	15.3	5546.6	5884.5	3797.2
64	6.5	87	10920.8	15.1	5333.1	5587.7	3745.4
65	6.5	83	10413.9	14.9	5128.1	5285.8	3678.3



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 3861.4 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 19.3 pcf

Design Shoring for an Equivalent Fluid Pressure: 28 pcf

Geotechnologies, Inc.

Project: Green Hotel Apartments

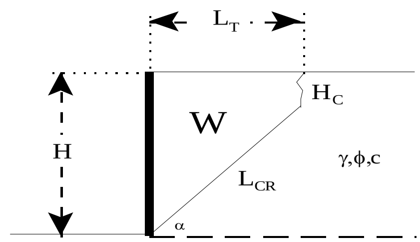
File No.: 21674

Description: Temporary Shoring (up to 25 feet in height)

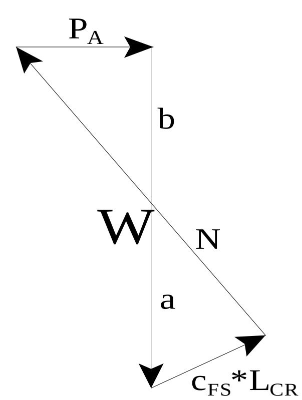
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	25.00	feet
Unit Weight of Retained Soils	(γ)	125.0	pcf
Friction Angle of Retained Soils	(ϕ)	36.0	degrees
Cohesion of Retained Soils	(c)	285.0	psf
Factor of Safety	(FS)	1.25	
Factored Parameters:	(ϕ_{FS})	30.2	degrees
	(c_{FS})	228.0	psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	12.1	286	35730.7	20.1	23246.8	12484.0	2163.8
41	11.1	288	36050.3	21.2	22193.2	13857.2	2651.8
42	10.3	288	35950.5	21.9	21048.7	14901.7	3122.2
43	9.7	285	35573.2	22.4	19899.5	15673.7	3570.6
44	9.2	280	35009.6	22.8	18788.8	16220.8	3994.2
45	8.7	275	34319.6	23.0	17737.0	16582.6	4391.6
46	8.3	268	33543.9	23.2	16752.4	16791.5	4762.1
47	8.0	262	32710.6	23.3	15836.7	16873.9	5105.3
48	7.7	255	31839.4	23.3	14988.0	16851.4	5421.2
49	7.4	248	30944.3	23.3	14202.8	16741.5	5710.2
50	7.2	240	30035.3	23.2	13476.6	16558.7	5972.4
51	7.0	233	29119.7	23.1	12804.8	16314.9	6208.3
52	6.9	226	28202.7	23.0	12182.9	16019.9	6418.3
53	6.8	218	27288.2	22.8	11606.4	15681.8	6602.8
54	6.6	211	26378.8	22.7	11071.2	15307.6	6762.1
55	6.5	204	25476.4	22.5	10573.5	14902.8	6896.6
56	6.5	197	24582.3	22.3	10110.0	14472.3	7006.6
57	6.4	190	23697.5	22.2	9677.4	14020.1	7092.3
58	6.4	183	22822.4	22.0	9272.9	13549.5	7154.0
59	6.3	176	21957.4	21.8	8893.8	13063.6	7191.7
60	6.3	169	21102.4	21.5	8537.7	12564.6	7205.6
61	6.3	162	20257.4	21.3	8202.5	12054.8	7195.6
62	6.4	155	19422.1	21.1	7886.2	11535.9	7161.9
63	6.4	149	18596.3	20.9	7586.8	11009.5	7104.2
64	6.5	142	17779.6	20.6	7302.6	10477.0	7022.6
65	6.5	136	16971.4	20.4	7032.0	9939.4	6916.6



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 7205.6 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 23.1 pcf

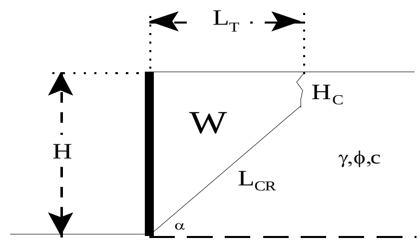
Design Shoring for an Equivalent Fluid Pressure: 32 pcf

Geotechnologies, Inc.
Project: Green Hotel Apartments
File No.: 21674
Description: Temporary Shoring (up to 40 feet in height)

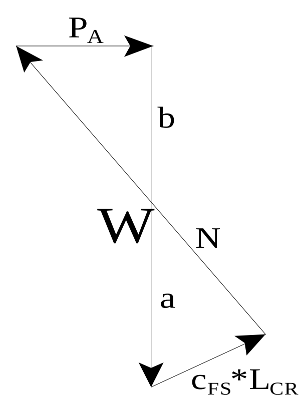
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	40.00	feet
Unit Weight of Retained Soils	(γ)	125.0	pcf
Friction Angle of Retained Soils	(ϕ)	36.0	degrees
Cohesion of Retained Soils	(c)	285.0	psf
Factor of Safety	(FS)	1.25	
Factored Parameters:	(ϕ_{FS})	30.2	degrees
	(c_{FS})	228.0	psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	12.1	867	108353.2	43.5	50181.4	58171.8	10082.9
41	11.1	849	106150.9	44.0	46172.2	59978.7	11477.8
42	10.3	829	103628.4	44.3	42597.4	61031.1	12787.2
43	9.7	807	100920.7	44.4	39418.7	61502.0	14010.6
44	9.2	785	98112.2	44.4	36591.1	61521.1	15149.1
45	8.7	762	95257.1	44.2	34070.7	61186.4	16204.3
46	8.3	739	92390.5	44.0	31817.8	60572.7	17178.5
47	8.0	716	89535.7	43.8	29797.6	59738.1	18074.0
48	7.7	694	86707.7	43.5	27980.0	58727.8	18893.2
49	7.4	671	83916.4	43.1	26339.1	57577.3	19638.4
50	7.2	649	81167.9	42.8	24853.0	56314.9	20311.7
51	7.0	628	78465.9	42.4	23502.7	54963.2	20915.2
52	6.9	606	75812.3	42.0	22272.1	53540.3	21450.8
53	6.8	586	73207.9	41.6	21147.2	52060.7	21920.0
54	6.6	565	70652.5	41.2	20116.0	50536.4	22324.4
55	6.5	545	68145.3	40.8	19168.3	48977.0	22665.2
56	6.5	525	65685.2	40.4	18294.8	47390.4	22943.5
57	6.4	506	63270.8	40.0	17487.8	45782.9	23160.1
58	6.4	487	60900.4	39.7	16740.5	44160.0	23315.8
59	6.3	469	58572.3	39.3	16046.6	42525.7	23411.0
60	6.3	450	56284.7	38.9	15400.8	40883.8	23446.0
61	6.3	432	54035.6	38.5	14798.5	39237.1	23421.0
62	6.4	415	51823.2	38.1	14235.2	37587.9	23335.9
63	6.4	397	49645.5	37.7	13707.3	35938.3	23190.3
64	6.5	380	47500.8	37.3	13211.1	34289.6	22983.8
65	6.5	363	45387.0	36.9	12743.7	32643.3	22715.9



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\,max}$ 23446.0 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 29.3 pcf

Design Shoring for an Equivalent Fluid Pressure: 35 pcf

Geotechnologies, Inc.

Project: Green Hotel Apartments

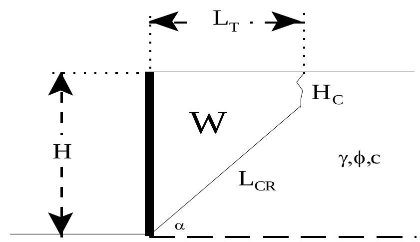
File No.: 21674

Description: Temporary Shoring (up to 58 feet in height)

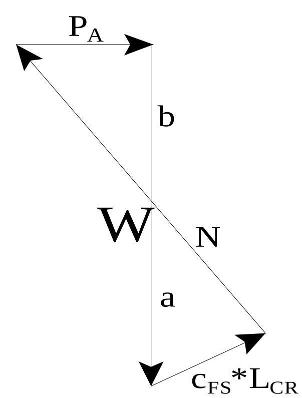
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	58.00	feet
Unit Weight of Retained Soils	(γ)	125.0	pcf
Friction Angle of Retained Soils	(ϕ)	36.0	degrees
Cohesion of Retained Soils	(c)	285.0	psf
Factor of Safety	(FS)	1.25	
Factored Parameters:	(ϕ_{FS})	30.2	degrees
	(c_{FS})	228.0	psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	12.1	1918	239744.0	71.5	82503.0	157241.1	27254.6
41	11.1	1864	232979.0	71.5	74947.0	158032.0	30241.7
42	10.3	1809	226073.5	71.2	68455.7	157617.7	33023.9
43	9.7	1753	219149.3	70.8	62841.6	156307.7	35608.0
44	9.2	1698	212279.4	70.3	57953.8	154325.6	38001.4
45	8.7	1644	205507.1	69.7	53671.1	151835.9	40211.5
46	8.3	1591	198857.7	69.1	49896.3	148961.4	42245.6
47	8.0	1539	192345.5	68.4	46550.7	145794.8	44110.8
48	7.7	1488	185977.3	67.7	43570.4	142406.9	45813.4
49	7.4	1438	179755.3	67.0	40902.8	138852.5	47359.6
50	7.2	1389	173678.7	66.3	38504.7	135174.0	48754.6
51	7.0	1342	167744.6	65.6	36340.2	131404.4	50003.5
52	6.9	1296	161949.1	64.9	34379.1	127570.0	51110.6
53	6.8	1250	156287.2	64.2	32596.2	123691.1	52079.8
54	6.6	1206	150753.8	63.5	30969.9	119783.9	52914.4
55	6.5	1163	145343.2	62.8	29481.9	115861.3	53617.4
56	6.5	1120	140049.8	62.2	28116.6	111933.2	54191.1
57	6.4	1079	134868.0	61.5	26860.4	108007.6	54637.6
58	6.4	1038	129792.3	60.9	25701.5	104090.7	54958.4
59	6.3	999	124817.2	60.3	24629.9	100187.3	55154.5
60	6.3	960	119937.5	59.7	23636.5	96301.0	55226.7
61	6.3	921	115148.2	59.1	22713.6	92434.6	55175.1
62	6.4	884	110444.1	58.5	21854.1	88590.1	54999.7
63	6.4	847	105820.7	57.9	21051.9	84768.8	54699.7
64	6.5	810	101273.3	57.3	20301.4	80971.9	54274.3
65	6.5	774	96797.4	56.8	19597.8	77199.6	53721.9



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 55226.7 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

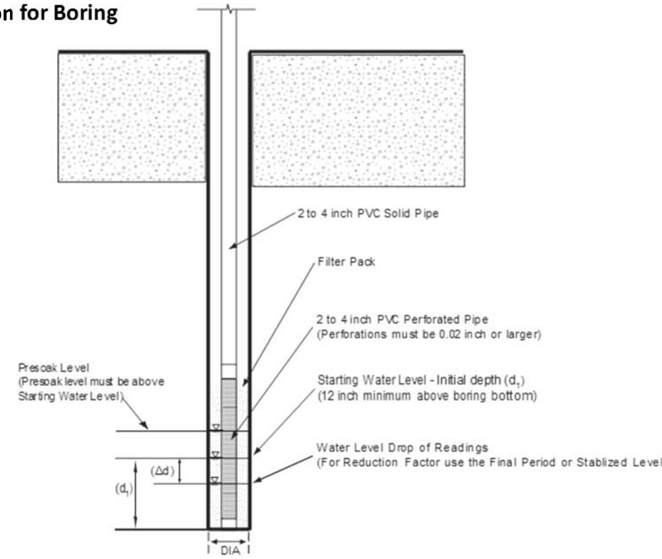
EFP 32.8 pcf

Design Shoring for an Equivalent Fluid Pressure: 40 pcf

Test Date: 24-Sep-18
File No. 21674
File Name : Green Hotel Apartments

Infiltration Rate Calculation for Boring

Testing Boring Number		1	
Boring Diameter (DIA)		8	inches
Depth of Boring		80	feet
Ground surface elevation	N.A.		feet
Length of Casing (dc)		80	feet
Top of Casing elevation	N.A.		feet
finish floor elevation	N.A.		feet
Elevation Bottom of Casing		#VALUE!	feet
Pre-soak Time		2	hours
Measured By	H.C.		



Terms

Initial water depth (d1) =dc-di
Water level drop (Δd) = di-df

Reading Number	Clock Time	Elapsed Time	Water Measurement (d_i) and (d_f)	Percolation Rate	Preadjusted Percolation Rate		Initial Water depth (d1)	Water level Drop (Δd)	Raw Percolation Rate	Percolation Rate Variation
							d1 = dc-di	Δd = di-df	Vol. H2o / Bor. Surface	
		Min	feet	ft/min	in/hour		in	in	in/hr	Percent
1	14:10		50.00				360			
	14:20	10	73.90	2.39	1720.80			286.8	6.89	
2	14:23		50.00				360			
	14:33	10	73.40	2.34	1684.80			280.8	6.65	-2.1
3	14:40		50.00				360			
	14:50	10	73.00	2.30	1656.00			276	6.47	-1.7
4	14:55		50.00				360			
	15:05	10	72.80	2.28	1641.60			273.6	6.38	-0.9
5	15:09		50.00				360			
	15:19	10	72.50	2.25	1620.00			270	6.24	-1.3
6	15:22		50.00				360			
	15:32	10	72.50	2.25	1620.00			270	6.24	0.0

Note: Calculation based on County of Los Angeles, Administrative Manual, Low Impact Development Best Management PracticeGuideline for Design, Investigation, and Reporting, dated 6/30/17.
LA County Minimum 0.3 Inches per hour

Raw Percolation Rate= 6.2 in/hr
RF_t= 2
RF_v= 1
RF_s= 1

Design Infiltration Rate = 3.12 in/hr

Architectural Resources Group

Central Park Apartments
86 S. Fair Oaks, Pasadena, CA

Appendix B: Title 24 Building Energy Analysis Report

BUILDING ENERGY ANALYSIS REPORT

PROJECT:

Central Park Apartments
86 S. Fair Oaks Avenue
Pasadena, CA 91105

Project Designer:

Architectural Resources Group
360 E. 2nd St., Suite 225
Los Angeles, CA 90012
626-583-1401

Report Prepared by:

Paul A. Breen, P.E.
Breen Engineering Inc.
1983 West 190th Street, Suite 200
Torrance, CA 90504
(310) 464-8404

Job Number:

687-18-004

Date:

July 2019

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2016 Building Energy Efficiency Standards.

This program developed by EnergySoft Software – www.energysoft.com.

TABLE OF CONTENTS

Project Name:	Central Park Apartments	NRCC-PRF-01-E	Page 1 of 42
Project Address:	86 S. Fair Oaks Avenue Pasadena 91105	Calculation Date/Time:	20:35, Wed, Jul 31, 2019
Compliance Scope:	NewEnvelopeAndMechanical	Input File Name:	Central Park Apartments.cibd16x

A. PROJECT GENERAL INFORMATION					
1.	Project Location (city)	Pasadena	**8.**	Standards Version	Compliance2016
2.	CA Zip Code	91105	**9.**	Compliance Software (version)	EnergyPro 7.2
3.	Climate Zone	9	**10.**	Weather File	BURBANK-GLENDALE_722880_CZ2010.epw
4.	Total Conditioned Floor Area in Scope	73,683 ft^2	**11.**	Building Orientation (deg)	(W) 270 deg
5.	Total Unconditioned Floor Area	19,672 ft^2	**12.**	Permitted Scope of Work	NewEnvelopeAndMechanical
6.	Total # of Stories (Habitable Above Grade)	6	13	Building Type(s)	High-Rise Residential
7.	Total # of dwelling units	88 (including live/work units)	14	Gas Type	NaturalGas

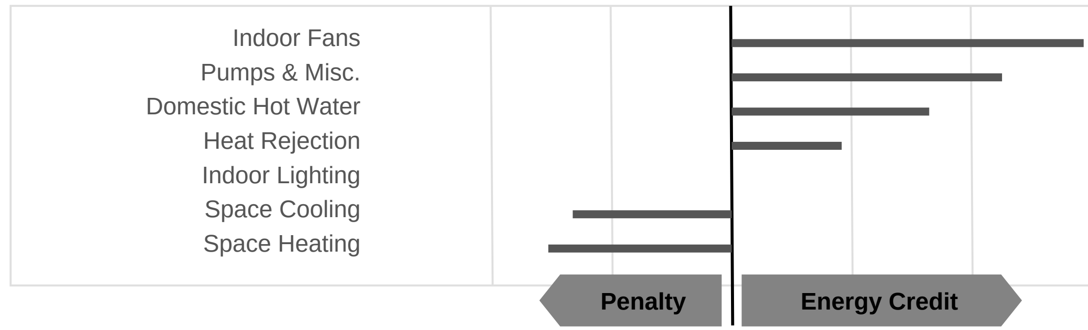
B. COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual TDV Energy Use, kBtu/ft ^{2}-yr)				**§ 140.1**
BUILDING COMPLIES				
1. Energy Component	**2. Standard Design (TDV)**	**3. Proposed Design (TDV)**	**4. Compliance Margin (TDV)**	**5. Percent Better than Standard**
Space Heating	3.95	7.66	-3.71	-93.9%
Space Cooling	38.90	42.11	-3.21	-8.3%
Indoor Fans	21.91	14.75	7.16	32.7%
Heat Rejection	2.21	--	2.21	--
Pumps & Misc.	5.49	--	5.49	--
Domestic Hot Water	17.51	13.51	4.00	22.8%
Indoor Lighting	16.13	16.13	--	0.0%
COMPLIANCE TOTAL	**106.10**	**94.16**	**11.94**	**11.3%**
Receptacle	41.41	41.41	0.0	0.0%
Process	--	--	--	--
Other Ltg	30.41	30.41	0.0	0.0%
Process Motors	--	--	--	--
TOTAL	**177.92**	**165.98**	**11.9**	**6.7%**

Project Name:	Central Park Apartments	NRCC-PRF-01-E	Page 2 of 42
Project Address:	86 S. Fair Oaks Avenue Pasadena 91105	Calculation Date/Time:	20:35, Wed, Jul 31, 2019
Compliance Scope:	NewEnvelopeAndMechanical	Input File Name:	Central Park Apartments.cibd16x

C. PRIORITY PLAN CHECK/ INSPECTION ITEMS (in order of highest to lowest TDV energy savings)

1st	Indoor Fans: Check envelope and mechanical
2nd	Pumps & Misc.: Check mechanical
3rd	Domestic Hot Water: Check mechanical
4th	Heat Rejection: Check envelope and mechanical
5th	Indoor Lighting: Check lighting
6th	Space Cooling: Check envelope and mechanical
7th	Space Heating: Check envelope and mechanical

Compliance Margin By Energy Component (from Table B column 4)



D. EXCEPTIONAL CONDITIONS

This project includes partial performance compliance scope options. The building must show compliance with all other applicable compliance scope options (performance or prescriptively) before occupying.

The aged solar reflectance and aged thermal emittance must be listed in the Cool Roof Rating Council database of certified products. For projects where initial reflectance is used, the initial reflectance must be listed, and the aged reflectance is calculated by the software program and used in the compliance model.

This project uses the Simplified Geometry Performance Modeling Approach which is not capable of modeling daylighting controls and assumes the prescriptive Secondary Daylit Control requirements are met. PRESCRIPTIVE COMPLIANCE documentation (form NRCC-LTI-02-E) for the requirements of section 140.6(d) Automatic Daylighting Controls in Secondary Daylit Zones is required.

This project includes Domestic Hot Water in the analysis. Please verify that Domestic Hot Water is included in the design for the permitted scope of work.

E. HERS VERIFICATION

This Section Does Not Apply

F. ADDITIONAL REMARKS

None Provided

G. COMPLIANCE PATH & CERTIFICATE OF COMPLIANCE SUMMARY

Identify which building components use the performance or prescriptive path for compliance. "NA"= not in project

For components that utilize the performance path, indicate the sheet number that includes mandatory notes on plans.

Building Component	Compliance Path		Compliance Forms *(required for submittal)*	Location of Mandatory Notes on Plans
Envelope	☒	Performance	NRCC-PRF-ENV-DETAILS (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-ENV-01 / 02 / 03 / 04 / 05 / 06-E	
	☐	NA		
Mechanical	☒	Performance	NRCC-PRF-MCH-DETAILS (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-MCH-01 / 02 / 03 / 04 / 05 / 06 / 07-E	
	☐	NA		
Domestic Hot Water	☒	Performance	NRCC-PRF-PLB-DETAILS (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-PLB-01-E	
	☐	NA		
Lighting (Indoor Conditioned)	☐	Performance	NRCC-PRF-LTI-DETAILS (section of the NRCC-PRF-01-E)	
	☒	Prescriptive	NRCC-LTI-01 / 02 / 03 / 04 / 05-E	
	☐	NA		
Covered Process: Commercial Kitchens	☐	Performance	S2 (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-PRC-01/ 03-E	
	☒	NA		
Covered Process: Computer Rooms	☐	Performance	S3 (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-PRC-01/ 04-E	
	☒	NA		
Covered Process: Laboratory Exhaust	☐	Performance	S4 (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-PRC-01/ 09-E	
	☒	NA		

G. COMPLIANCE PATH & CERTIFICATE OF COMPLIANCE SUMMARY

The following building components are only eligible for prescriptive compliance. Indicate which are relevant to the project.				*The following building components may have mandatory requirements per Part 6. Indicate which are relevant to the project.*			
Yes	**NA**	**Prescriptive Requirement**	**Compliance Forms**	**Yes**	**NA**	**Mandatory Requirement**	**Compliance Forms**
☒	☐	Lighting (Indoor Unconditioned) §140.6	NRCC-LTI-01 / 02 / 03 / 04 / 05-E	 ☐ ☐	 ☒ ☒	Commissioning: §120.8 Simple Systems Complex Systems	 NRCC-CXR-01 / 02 / 03 / 05-E NRCC-CXR-01 / 02 / 04 / 05-E
☐	☒	Lighting (Outdoor) §140.7	NRCC-LTO-01 / 02 / 03-E	☐	☒	Electrical: §130.5	NRCC-ELC-01-E
☐	☒	Lighting (Sign) §140.8	NRCC-LTS-01-E	☐	☒	Solar Ready: §110.10	NRCC-SRA-01 / 02-E
☒	☐	Solar Thermal Water Heating: §140.5	NRCC-STH-01-E	 ☐ ☐ ☐ ☐ ☐	 ☒ ☒ ☒ ☒ ☒	Covered Process: §120.6 Parking Garage Commercial Refrigeration Warehouse Refrigeration Compressed Air Process Boilers	NRCC-PRC-01-E NRCC-PRC-02-E NRCC-PRC-05-E NRCC-PRC-06/07/08-E NRCC-PRC-10-E NRCC-PRC-11-E

H. CERTIFICATE OF INSTALLATION, CERTIFICATE OF ACCEPTANCE & CERTIFICATE OF VERIFICATION SUMMARY (NRCI/NRCA/NRCV) – Documentation Author to indicate which Certificates must be submitted for the features to be recognized for compliance (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify). See Tables G. and H. in MCH and LTI Details Sections for Acceptance Tests and forms by equipment.		**Confirmed**	
Building Component	**Compliance Forms *(required for submittal)***	**Pass**	**Fail**
Envelope	☒ NRCI-ENV-01-E - For all buildings	☐	☐
	☒ NRCA-ENV-02-F- NFRC label verification for fenestration	☐	☐
Mechanical	☒ NRCI-MCH-01-E - For all buildings with Mechanical Systems	☐	☐
	☒ NRCA-MCH-02-A- Outdoor Air	☐	☐
	☒ NRCA-MCH-03-A – Constant Volume Single Zone HVAC	☐	☐
	☐ NRCA-MCH-04-H- Air Distribution Duct Leakage	☐	☐
	☐ NRCA-MCH-05-A- Air Economizer Controls	☐	☐
	☐ NRCA-MCH-06-A- Demand Control Ventilation	☐	☐
	☐ NRCA-MCH-07-A – Supply Fan Variable Flow Controls	☐	☐
	☐ NRCA-MCH-08-A- Valve Leakage Test	☐	☐
	☒ NRCA-MCH-09-A – Supply Water Temp Reset Controls	☐	☐
	☐ NRCA-MCH-10-A- Hydronic System Variable Flow Controls	☐	☐
	☐ NRCA-MCH-11-A – Auto Demand Shed Controls	☐	☐
	☐ NRCA-MCH-12-A- Packaged Direct Expansion Units	☐	☐
	☐ NRCA-MCH-13-A- Air Handling Units and Zone Terminal Units	☐	☐
	☐ NRCA-MCH-14-A- Distributed Energy Storage	☐	☐
	☐ NRCA-MCH-15-A – Thermal Energy Storage	☐	☐
	☐ NRCA-MCH-16-A- Supply Air Temp Reset Controls	☐	☐
	☐ NRCA-MCH-17-A – Condensate Water Temp Reset Controls	☐	☐
	☐ NRCA-MCH-18-A- Energy Management Controls Systems	☐	☐
	☐ NRCV-MCH-04-H- Duct Leakage Test	☐	☐

H. CERTIFICATE OF INSTALLATION, CERTIFICATE OF ACCEPTANCE & CERTIFICATE OF VERIFICATION SUMMARY (NRCI/NRCA/NRCV) – Documentation Author to indicate which Certificates must be submitted for the features to be recognized for compliance (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify). See Tables G. and H. in MCH and LTI Details Sections for Acceptance Tests and forms by equipment.		**Confirmed**	
Building Component	**Compliance Forms *(required for submittal)***	**Pass**	**Fail**
Plumbing	☒ NRCI-PLB-01-E - For all buildings with Plumbing Systems	☐	☐
	☐ NRCI-PLB-02-E - required on central systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCI-PLB-03-E - Single dwelling unit systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCI-PLB-21-E - HERS verified central systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCI-PLB-22-E - HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCV-PLB-21-H- HERS verified central systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCV-PLB-22-H - HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.	☐	☐
	☒ NRCI-STH-01-E - Any solar water heating	☐	☐
Indoor Lighting	☐ NRCI-LTI-01-E - For all buildings	☐	☐
	☐ NRCI-LTI-02-E - Lighting control system, or for an Energy Management Control System (EMCS)	☐	☐
	☐ NRCI-LTI-03-E - Line-voltage track lighting integral current limiter, or for a supplementary overcurrent protection panel used to energize only line-voltage track lighting	☐	☐
	☐ NRCI-LTI-04-E - Two interlocked systems serving an auditorium, a convention center, a conference room, or a theater	☐	☐
	☐ NRCI-LTI-05-E - Lighting Control Credit Power Adjustment Factor (PAF)	☐	☐
	☐ NRCI-LTI-06-E - Additional wattage installed in a video conferencing studio	☐	☐
	☐ NRCA-LTI-02-A - Occupancy sensors and automatic time switch controls.	☐	☐
	☒ NRCA-LTI-03-A - Automatic daylighting controls	☐	☐
	☐ NRCA-LTI-04-A - Demand responsive lighting controls	☐	☐
Outdoor Lighting	☐ NRCI-LTO-01-E – Outdoor Lighting	☐	☐
	☐ NRCI-LTO-02-E- EMCS Lighting Control System	☐	☐
	☐ NRCA-LTO-02-A - Outdoor Lighting Control	☐	☐
Sign Lighting	☐ NRCI-LTS-01-E – Sign Lighting	☐	☐
Electrical	☐ NRCI-ELC-01-E - Electrical Power Distribution	☐	☐
Photovoltaic	☐ NRCI-SPV-01-E Photovoltaic Systems	☐	☐

H. CERTIFICATE OF INSTALLATION, CERTIFICATE OF ACCEPTANCE & CERTIFICATE OF VERIFICATION SUMMARY (NRCI/NRCA/NRCV) – Documentation Author to indicate which Certificates must be submitted for the features to be recognized for compliance (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify). See Tables G. and H. in MCH and LTI Details Sections for Acceptance Tests and forms by equipment.		**Confirmed**	
Building Component	**Compliance Forms *(required for submittal)***	**Pass**	**Fail**
Covered Process	☐ NRCI-PRC-01-E Covered Processes	☐	☐
	☐ NRCA-PRC-01-F- Compressed Air Systems	☐	☐
	☐ NRCA-PRC-02-F- Kitchen Exhaust	☐	☐
	☐ NRCA-PRC-03-F- Garage Exhaust	☐	☐
	☐ NRCA-PRC-04-F- Refrigerated Warehouse- Evaporator Fan Motor Controls	☐	☐
	☐ NRCA-PRC-05-F- Refrigerated Warehouse- Evaporative Condenser Controls	☐	☐
	☐ NRCA-PRC-06-F- Refrigerated Warehouse- Air Cooled Condenser Controls	☐	☐
	☐ NRCA-PRC-07F- Refrigerated Warehouse- Variable Speed Compressor	☐	☐
	☐ NRCA-PRC-08-F- Electrical Resistance Underslab Heating System	☐	☐

I. ENVELOPE GENERAL INFORMATION (See NRCC-PRF-ENV-DETAILS for more information)							
1.	Total Conditioned Floor Area	73,683 ft^2	**5.**	Number of Floors Above Grade	6	**Confirmed**	
2.	Total Unconditioned Floor Area	19,672 ft^2	**6.**	Number of Floors Below Grade	0	**Pass**	**Fail**
3.	Addition Conditioned Floor Area	0 ft^2					
4.	Addition Unconditioned Floor Area	0 ft^2					

7. Opaque Surfaces & Orientation	**8. Total Gross Surface Area**	**9. Total Fenestration Area**	**10. Window to Wall Ratio**	**Pass**	**Fail**
North Wall	4,089 ft^2	797 ft^2	19.5%	☐	☐
East Wall	11,794 ft^2	4,242 ft^2	36.0%	☐	☐
South Wall	6,663 ft^2	3,386 ft^2	50.8%	☐	☐
West Wall	11,515 ft^2	4,738 ft^2	41.1%	☐	☐
Total	**34,061 ft^2**	**13,162 ft^2**	**38.6%**	☐	☐
Roof	11,150 ft^2	0 ft^2	00.0%	☐	☐

J. FENESTRATION ASSEMBLY SUMMARY							§ 110.6		Confirmed	
1.	2.	3.	4.	5.	6.	7.	8.	9.		
Fenestration Assembly Name / Tag or I.D.	Fenestration Type / Product Type / Frame Type	Certification Method[1]	Assembly Method	Area ft^2	Overall U-factor	Overall SHGC	Overall VT	Status[2]	Pass	Fail
Glass Door	VerticalFenestration GlazedDoor N/A	NFRC Rated	Manufactured	4929	0.29	0.23	0.50	N	☐	☐
Glass Window	VerticalFenestration FixedWindow N/A	NFRC Rated	Manufactured	6402	0.29	0.23	0.50	N	☐	☐
Storefront Glass Door	VerticalFenestration FixedWindow N/A	NFRC Rated	Manufactured	583	0.92	0.79	0.87	N	☐	☐
Storefront Glass Window	VerticalFenestration FixedWindow N/A	NFRC Rated	Manufactured	1248	0.92	0.79	0.87	N	☐	☐

[1] Newly installed fenestration shall have a certified NFRC Label Certificate or use the CEC default tables found in Table 110.6-A and Table 110.6-B. Center of Glass (COG) values are for the glass-only, determined by the manufacturer, and are shown for ease of verification. Site-built fenestration values are calculated per Nonresidential Appendix NA6 and are used in the analysis.

[2] Status: N - New, A – Altered, E – Existing

Taking compliance credit for fenestration shading devices? (if "Yes", see NRCC-PRF-ENV-DETAILS for more information)	No

K. OPAQUE SURFACE ASSEMBLY SUMMARY						§ 120.7/ § 140.3		Confirmed	
1.	2.	3.	4.	5.	6.	7.	8.		
Surface Name	Surface Type	Area (ft^2)	Framing Type	Cavity R-Value	Continuous R-Value	U-Factor / F-Factor / C-Factor	Status[1]	Pass	Fail
R-19 Wall (Level 2 -Pent)7	ExteriorWall	25755	Wood	19	NA	U-Factor: 0.072	N	☐	☐
R-30 Floor No Crawlspace10	ExteriorFloor	73683	NA	0	NA	U-Factor: 0.229	N	☐	☐
R-30 Roof111	Roof	11150	Wood	30	NA	U-Factor: 0.031	N	☐	☐
8 CMU Wall (Level 1-Mez617	ExteriorWall	8306	NA	0	NA	U-Factor: 0.552	N	☐	☐
R-19 Wall (Interior)654	InteriorWall	150	Wood	19	NA	U-Factor: 0.066	N	☐	☐
Slab On Grade673	UndergroundFloor	19672	NA	0	NA	F-Factor: 0.730	N	☐	☐

[1] Status: N - New, A – Altered, E – Existing

L. ROOFING PRODUCT SUMMARY							§ 140.3	Confirmed	
1.	2.	3.	4.	5.	6.	7.			
Product Type	Product Density (lb/ft^2)	Aged Solar Reflectance	Thermal Emittance	SRI	Cool Roof Credit	Roofing Product Description		Pass	Fail
R-30 Roof111	7.135	0.55	0.75	Not Provided	Yes	CRRC Prod. ID: R-30 Roof		☐	☐

M. HVAC SYSTEM SUMMARY (see NRCC-PRF-MCH-DETAILS for more information)												§ 110.1 / § 110.2	
Dry System Equipment [1] (Fan & Economizer info included below in Table N)												Confirmed	
1.	2.	3.	4.	5.	6.	7.	8.	9.		10.	11.		
Equip Name	Equip Type	System Type (Simple [2] or Complex [3])	Qty	Total Heating Output (kBtu/h)	Supp Heat Source (Y/N)	Supp Heat Output (kBtuh)	Total Cooling Output (kBtu/h)	Efficiency		Acceptance Testing Required? (Y/N) [4]	Status[5]	Pass	Fail
								Cooling	Heating				
2nd Floor Studio Units3	Exhaust ()	Simple	5	0	No	0	0	NA	NA	No	N	☐	☐
3rd Floor Studio Units28	Exhaust ()	Simple	7	0	No	0	0	NA	NA	No	N	☐	☐
4th Floor Studio Units65	Exhaust ()	Simple	5	0	No	0	0	NA	NA	No	N	☐	☐
5th Floor Studio Units86	Exhaust ()	Simple	5	0	No	0	0	NA	NA	No	N	☐	☐
6th Floor Studio Units107	Exhaust ()	Simple	5	0	No	0	0	NA	NA	No	N	☐	☐
6th Floor Studio Units119	Exhaust ()	Simple	5	0	No	0	0	NA	NA	No	N	☐	☐
2nd Floor One Bed Units156	Exhaust ()	Simple	10	0	No	0	0	NA	NA	No	N	☐	☐
3rd Floor One Bed Units207	Exhaust ()	Simple	7	0	No	0	0	NA	NA	No	N	☐	☐
4th Floor One Bed Units242	Exhaust ()	Simple	7	0	No	0	0	NA	NA	No	N	☐	☐
5th Floor One Bed Units285	Exhaust ()	Simple	7	0	No	0	0	NA	NA	No	N	☐	☐

M. HVAC SYSTEM SUMMARY (see NRCC-PRF-MCH-DETAILS for more information)												§ 110.1 / § 110.2	
Dry System Equipment [1] (Fan & Economizer info included below in Table N)												Confirmed	
1.	2.	3.	4.	5.	6.	7.	8.	9.		10.	11.		
Equip Name	Equip Type	System Type (Simple [2] or Complex [3])	Qty	Total Heating Output (kBtu/h)	Supp Heat Source (Y/N)	Supp Heat Output (kBtuh)	Total Cooling Output (kBtu/h)	Efficiency		Acceptance Testing Required? (Y/N) [4]	Status[5]	Pass	Fail
								Cooling	Heating				
6th Floor One Bed Units328	Exhaust ()	Simple	6	0	No	0	0	NA	NA	No	N	☐	☐
2nd Floor Two Bed Units359	Exhaust ()	Simple	4	0	No	0	0	NA	NA	No	N	☐	☐
3rd Floor Two Bed Units407	Exhaust ()	Simple	3	0	No	0	0	NA	NA	No	N	☐	☐
4th Floor Two Bed Units445	Exhaust ()	Simple	4	0	No	0	0	NA	NA	No	N	☐	☐
5th Floor Two Bed Units495	Exhaust ()	Simple	4	0	No	0	0	NA	NA	No	N	☐	☐
6th Floor Two Bed Units545	Exhaust ()	Simple	5	0	No	0	0	NA	NA	No	N	☐	☐
6th Floor Two Bed Units575	Exhaust ()	Simple	5	0	No	0	0	NA	NA	No	N	☐	☐
Level 1 Work/Live Units614	Exhaust ()	Simple	4	0	No	0	0	NA	NA	No	N	☐	☐
Mezzanine Level_Amenity L	SZHP (Split1Phase)	Simple	1	56	No	0	55	SEER-14.000 / EER-11.000	HSPF-8.200	Yes	N	☐	☐
Level 1 Retail Space	SZHP (Split1Phase)	Simple	4	56	No	0	55	SEER-14.000 / EER-11.000	HSPF-8.200	Yes	N	☐	☐
Level 1 Restaurant	SZHP (Split1Phase)	Simple	3	56	No	0	55	SEER-14.000 / EER-11.000	HSPF-8.200	Yes	N	☐	☐
Level 1 Lobby	SZHP (Split1Phase)	Simple	2	56	No	0	55	SEER-14.000 / EER-11.000	HSPF-8.200	Yes	N	☐	☐

M. HVAC SYSTEM SUMMARY (see NRCC-PRF-MCH-DETAILS for more information) — § 110.1 / § 110.2

Dry System Equipment [1] (Fan & Economizer info included below in Table N)

1. Equip Name	2. Equip Type	3. System Type (Simple [2] or Complex [3])	4. Qty	5. Total Heating Output (kBtu/h)	6. Supp Heat Source (Y/N)	7. Supp Heat Output (kBtuh)	8. Total Cooling Output (kBtu/h)	9. Efficiency: Cooling	9. Efficiency: Heating	10. Acceptance Testing Required? (Y/N) [4]	11. Status[5]	Confirmed: Pass	Confirmed: Fail
Level 1 Leasing Office	SZHP (Split1Phase)	Simple	1	14	No	0	12	SEER-21.100 / EER-13.000	HSPF-10.200	Yes	N	☐	☐
Level 1 Amenity Space	SZHP (Split1Phase)	Simple	1	14	No	0	12	SEER-21.100 / EER-13.000	HSPF-10.200	Yes	N	☐	☐
Mezzanine Level_Gym	SZHP (Split1Phase)	Simple	1	56	No	0	55	SEER-14.000 / EER-11.000	HSPF-8.200	Yes	N	☐	☐
Level 2 Studio Units	SZHP (Split1Phase)	Simple	5	14	No	0	12	SEER-21.100 / EER-13.000	HSPF-10.200	Yes	N	☐	☐
Level 3 Studio Units	SZHP (Split1Phase)	Simple	7	14	No	0	12	SEER-21.100 / EER-13.000	HSPF-10.200	Yes	N	☐	☐
Level 4 Studio Units	SZHP (Split1Phase)	Simple	5	14	No	0	12	SEER-21.100 / EER-13.000	HSPF-10.200	Yes	N	☐	☐
Level 5 Studio Units	SZHP (Split1Phase)	Simple	5	14	No	0	12	SEER-21.100 / EER-13.000	HSPF-10.200	Yes	N	☐	☐
Level 6 Studio Units	SZHP (Split1Phase)	Simple	5	14	No	0	12	SEER-21.100 / EER-13.000	HSPF-10.200	Yes	N	☐	☐
Level 6 T/H One Bed Units	SZHP (Split1Phase)	Simple	3	14	No	0	12	SEER-21.100 / EER-13.000	HSPF-10.200	Yes	N	☐	☐
Level 2 One Bed Units	SZHP (Split1Phase)	Simple	10	19	No	0	17	SEER-19.900 / EER-10.800	HSPF-10.200	Yes	N	☐	☐

M. HVAC SYSTEM SUMMARY (see NRCC-PRF-MCH-DETAILS for more information)												§ 110.1 / § 110.2	
Dry System Equipment [1] (Fan & Economizer info included below in Table N)												Confirmed	
1.	2.	3.	4.	5.	6.	7.	8.	9.		10.	11.		
Equip Name	Equip Type	System Type (Simple [2] or Complex [3])	Qty	Total Heating Output (kBtu/h)	Supp Heat Source (Y/N)	Supp Heat Output (kBtuh)	Total Cooling Output (kBtu/h)	Efficiency		Acceptance Testing Required? (Y/N) [4]	Status[5]	Pass	Fail
								Cooling	Heating				
Level 3 One Bed Units	SZHP (Split1Phase)	Simple	7	19	No	0	17	SEER-19.900 / EER-10.800	HSPF-10.200	Yes	N	☐	☐
Level 4 One Bed Units	SZHP (Split1Phase)	Simple	7	19	No	0	17	SEER-19.900 / EER-10.800	HSPF-10.200	Yes	N	☐	☐
Level 5 One Bed Units	SZHP (Split1Phase)	Simple	7	19	No	0	17	SEER-19.900 / EER-10.800	HSPF-10.200	Yes	N	☐	☐
Level 6 One Bed Units	SZHP (Split1Phase)	Simple	6	19	No	0	17	SEER-19.900 / EER-10.800	HSPF-10.200	Yes	N	☐	☐
Level 2 Two Bed Units	SZHP (Split1Phase)	Simple	4	26	No	0	23	SEER-19.600 / EER-11.700	HSPF-10.800	Yes	N	☐	☐
Level 3 Two Bed Units	SZHP (Split1Phase)	Simple	3	26	No	0	23	SEER-19.600 / EER-11.700	HSPF-10.800	Yes	N	☐	☐
Level 4 Two Bed Units	SZHP (Split1Phase)	Simple	4	26	No	0	23	SEER-19.600 / EER-11.700	HSPF-10.800	Yes	N	☐	☐
Level 5 Two Bed Units	SZHP (Split1Phase)	Simple	4	26	No	0	23	SEER-19.600 / EER-11.700	HSPF-10.800	Yes	N	☐	☐
Level 6 Two Bed Units	SZHP (Split1Phase)	Simple	3	26	No	0	23	SEER-19.600 / EER-11.700	HSPF-10.800	Yes	N	☐	☐
Level 6 T/H Two Bed Units	SZHP (Split1Phase)	Simple	2	32	No	0	34	SEER-15.500 / EER-11.700	HSPF-9.400	Yes	N	☐	☐

M. HVAC SYSTEM SUMMARY (see NRCC-PRF-MCH-DETAILS for more information) **§ 110.1 / § 110.2**

Dry System Equipment [1] (Fan & Economizer info included below in Table N)												Confirmed	
1.	2.	3.	4.	5.	6.	7.	8.	9.		10.	11.		
Equip Name	Equip Type	System Type (Simple [2] or Complex [3])	Qty	Total Heating Output (kBtu/h)	Supp Heat Source (Y/N)	Supp Heat Output (kBtuh)	Total Cooling Output (kBtu/h)	Efficiency		Acceptance Testing Required? (Y/N) [4]	Status[5]	Pass	Fail
								Cooling	Heating				
Level 1 + Mezzanine Work/	SZHP (Split1Phase)	Simple	4	32	No	0	34	SEER-15.500 / EER-11.700	HSPF-9.400	Yes	N	☐	☐

[1] *Dry System Equipment includes furnaces, air handling units, heat pumps, etc.*
[2] *Simple Systems must complete NRCC-CXR-03-E commissioning design review form*
[3] *Complex Systems must complete NRCC-CXR-04-E commissioning design review form*
[4] *A summary of which acceptance tests are applicable is provided in NRCC-PRF-MCH-DETAILS*
[5] *Status: N - New, A – Altered, E – Existing*

Wet System Equipment [1]								*Pumps*					Confirmed	
12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.		
Equip Name	Equip Type	Qty	Vol (gal)	Rated Capacity (kBtu/h)	Efficiency	Standby Loss	Tank Ext. R Value	Qty	GPM	HP	VSD (Y/N)	Status[2]	Pass	Fail
Raypak WH-902C1	Storage	2	356.00	900	Thrml. Eff.: 0.87	SBLF: 0.001	NA		NA		No	N	☐	☐
Raypak WH-902C1 2	Commercial Storage (TE & SBL)	2	356.00	900	Thrml. Eff.: 0.870	0.0010		NA	NA	0 (kW)	NA	N	☐	☐

[1] *Wet System Equipment includes boilers, chillers, cooling towers, water heaters, etc.*
[2] *Status: N - New, A – Altered, E – Existing*

Discrepancy between modeled and designed equipment sizing? (if "Yes", see Table F. "Additional Remarks" for an explanation)	No

N. ECONOMIZER & FAN SYSTEMS SUMMARY[1]												§ 140.4	Confirmed	
1.	2.	3.					4.					5.	Pass	Fail
Equip Name	Outside Air	Supply Fan					Return Fan					Economizer Type (if present)		
	CFM	CFM	HP	BHP	TSP (inch WC)	Control	CFM	HP	BHP	TSP (inch WC)	Control			
Mezzanine Level_Amenity L	765	1750	0.500	0.500	0.91	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
Level 1 Retail Space	211	1750	0.500	0.500	0.91	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
Level 1 Restaurant	329	1750	0.500	0.500	0.91	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
Level 1 Lobby	592	1750	0.500	0.500	0.91	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
Level 1 Leasing Office	89	450	0.066	0.066	0.47	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
Level 1 Amenity Space	394	450	0.066	0.066	0.47	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
Mezzanine Level_Gym	348	1750	0.500	0.500	0.91	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
Level 2 Studio Units	0	450	0.066	0.066	0.47	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 3 Studio Units	0	450	0.066	0.066	0.47	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 4 Studio Units	0	450	0.066	0.066	0.47	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 5 Studio Units	0	450	0.066	0.066	0.47	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 6 Studio Units	0	450	0.066	0.066	0.47	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 6 T/H One Bed Units	0	450	0.066	0.066	0.47	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 2 One Bed Units	0	560	0.066	0.066	0.37	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐

N. ECONOMIZER & FAN SYSTEMS SUMMARY[1]												§ 140.4	Confirmed	
1.	2.	3.					4.					5.		
Equip Name	Outside Air	Supply Fan					Return Fan					Economizer Type (if present)	Pass	Fail
	CFM	CFM	HP	BHP	TSP (inch WC)	Control	CFM	HP	BHP	TSP (inch WC)	Control			
Level 3 One Bed Units	0	560	0.066	0.066	0.37	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 4 One Bed Units	0	560	0.066	0.066	0.37	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 5 One Bed Units	0	560	0.066	0.066	0.37	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 6 One Bed Units	0	560	0.066	0.066	0.37	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 2 Two Bed Units	0	700	0.094	0.094	0.43	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 3 Two Bed Units	0	700	0.094	0.094	0.43	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 4 Two Bed Units	0	700	0.094	0.094	0.43	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 5 Two Bed Units	0	700	0.094	0.094	0.43	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 6 Two Bed Units	0	700	0.094	0.094	0.43	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 6 T/H Two Bed Units	0	1200	0.189	0.189	0.50	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
Level 1 + Mezzanine Work/	0	1200	0.189	0.189	0.50	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐

[1] *Mechanical ventilation calculations and exhaust fans are included in the NRCC-PRF-MCH-DETAILS section*

O. EQUIPMENT CONTROLS		§ 120.2	Confirmed	
1.	2.	3.	Pass	Fail
Equip Name	Equip Type	Controls		
2nd Floor Studio Units3	Exhaust	NA	☐	☐
3rd Floor Studio Units28	Exhaust	NA	☐	☐
4th Floor Studio Units65	Exhaust	NA	☐	☐
5th Floor Studio Units86	Exhaust	NA	☐	☐
6th Floor Studio Units107	Exhaust	NA	☐	☐
6th Floor Studio Units119	Exhaust	NA	☐	☐
2nd Floor One Bed Units156	Exhaust	NA	☐	☐
3rd Floor One Bed Units207	Exhaust	NA	☐	☐
4th Floor One Bed Units242	Exhaust	NA	☐	☐
5th Floor One Bed Units285	Exhaust	NA	☐	☐
6th Floor One Bed Units328	Exhaust	NA	☐	☐
2nd Floor Two Bed Units359	Exhaust	NA	☐	☐
3rd Floor Two Bed Units407	Exhaust	NA	☐	☐
4th Floor Two Bed Units445	Exhaust	NA	☐	☐
5th Floor Two Bed Units495	Exhaust	NA	☐	☐
6th Floor Two Bed Units545	Exhaust	NA	☐	☐
6th Floor Two Bed Units575	Exhaust	NA	☐	☐
Level 1 Work/Live Units614	Exhaust	NA	☐	☐
Mezzanine Level_Amenity L	SZHP	No DCV Controls No Economizer No Supply Air Temp. Control No Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐
Level 1 Retail Space	SZHP	No DCV Controls No Economizer No Supply Air Temp. Control No Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐

O. EQUIPMENT CONTROLS		§ 120.2	Confirmed	
1.	2.	3.	Pass	Fail
Equip Name	Equip Type	Controls		
Level 1 Restaurant	SZHP	No DCV Controls No Economizer No Supply Air Temp. Control No Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐
Level 1 Lobby	SZHP	No DCV Controls No Economizer No Supply Air Temp. Control No Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐
Level 1 Leasing Office	SZHP	No DCV Controls No Economizer No Supply Air Temp. Control No Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐
Level 1 Amenity Space	SZHP	No DCV Controls No Economizer No Supply Air Temp. Control No Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐
Mezzanine Level_Gym	SZHP	No DCV Controls No Economizer No Supply Air Temp. Control No Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐
DHW2 - SHW	Service Hot Water, Primary Only	Fixed Temperature Control, No DDC No Heat Recovery	☐	☐

P. SYSTEM DISTRIBUTION SUMMARY — § 120.4/ § 140.4(l)

		Dry System Distribution					Confirmed	
1.	2.	3.	4.	5.		6.		
				Ducts				
Equip Name	Equip Type	Duct Leakage and Sealing Required per 140.4(l)	Duct Leakage will be verified per NA1 and NA2	Insulation R-Value	Location	Status[1]	Pass	Fail
Mezzanine Level_Amenity L	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 1 Retail Space	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 1 Restaurant	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 1 Lobby	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 1 Leasing Office	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 1 Amenity Space	SZHP	No	No	8	Unconditioned	N	☐	☐
Mezzanine Level_Gym	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 2 Studio Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 3 Studio Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 4 Studio Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 5 Studio Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 6 Studio Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 6 T/H One Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 2 One Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 3 One Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 4 One Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 5 One Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 6 One Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 2 Two Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 3 Two Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 4 Two Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 5 Two Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 6 Two Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐
Level 6 T/H Two Bed Units	SZHP	No	No	8	Unconditioned	N	☐	☐

P. SYSTEM DISTRIBUTION SUMMARY — § 120.4/ § 140.4(l)

		Dry System Distribution					Confirmed	
1.	2.	3.	4.	5.		6.		
				Ducts				
Equip Name	Equip Type	Duct Leakage and Sealing Required per 140.4(l)	Duct Leakage will be verified per NA1 and NA2	Insulation R-Value	Location	Status[1]	Pass	Fail
Level 1 + Mezzanine Work/	SZHP	No	No	8	Unconditioned	N	☐	☐

[1] *Status: N - New, E – Existing*

Does the Project Include Zonal Systems? (if "Yes", see NRCC-PRF-MCH-DETAILS for system information)	Yes
Does the Project Include a Solar Hot Water System? (if "Yes", see NRCC-PRF-MCH-DETAILS for system information)	Yes
Multifamily or Hotel/ Motel Occupancy? (if "Yes", see NRCC-PRF-MCH-DETAILS for DHW system information)	Yes

Q. INDOOR CONDITIONED LIGHTING GENERAL INFO (see NRCC-PRF-LTI-DETAILS for more info)

This Section Does Not Apply

R. INDOOR CONDITIONED LIGHTING SCHEDULE (Adapted from NRCC-LTI-01-E)[1] — § 130.0

This Section Does Not Apply

[1] *If lighting power densities were used in the compliance model Building Departments will need to check prescriptive forms for Luminaire Schedule details.*

S1. COVERED PROCESS SUMMARY – ENCLOSED PARKING GARAGES — § 140.9

This Section Does Not Apply

S2. COVERED PROCESS SUMMARY – COMMERCIAL KITCHENS — § 140.9

This Section Does Not Apply

S3. COVERED PROCESS SUMMARY – COMPUTER ROOMS — § 140.9

This Section Does Not Apply

S4. COVERED PROCESS SUMMARY – LABORATORY EXHAUSTS — § 140.9

This Section Does Not Apply

T. UNMET LOAD HOURS

Thermal Zone Name	Cooling Unmet Load Hour Limit for Thermal Zone	Proposed Cooling Unmet Load Hours	Heating Unmet Load Hour Limit for Thermal Zone	Proposed Heating Unmet Load Hours
24-Lobby + Low Ceiling	150	779.5	150	256.5
25-Leasing Office	150	981.25	150	19.5
26-Amenity	150	2843	150	11

U. ENERGY USE SUMMARY

Energy Component	Standard Design Site (MWh)	Proposed Design Site (MWh)	Margin (MWh)	Standard Design Site (MBtu)	Proposed Design Site (MBtu)	Margin (MBtu)
Space Heating	0.0	33.6	--	174.4	--	--
Space Cooling	66.8	54.9	11.9	--	--	--
Indoor Fans	60.3	47.2	13.1	--	--	--
Heat Rejection	4.5	--	--	--	--	--
Pumps & Misc.	16.5	--	--	--	--	--
Domestic Hot Water	0.3	0.5	-0.2	886.9	679.1	207.8
Indoor Lighting	48.7	48.7	0.0	--	--	--
COMPLIANCE TOTAL	**197.1**	**184.9**	**12.2**	**1,061.3**	**679.1**	**--**
Receptacle	137.9	137.9	0.0	43.3	43.3	0.0
Process	--	--	--	--	--	--
Other Ltg	107.6	107.6	0.0	--	--	--
Process Motors	--	--	--	--	--	--
TOTAL	**442.6**	**430.4**	**12.2**	**1,104.6**	**722.4**	**--**

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		**§ 10-103**
I certify that this Certificate of Compliance documentation is accurate and complete.		
Documentation Author Name: Paul A. Breen, P.E.	Signature:	
Company: Breen Engineering Inc.		
Address: 1983 West 190th Street, Suite 200	Signature Date: 7/31/2019	
City/State/Zip: Torrance CA 90504	CEA Identification (If applicable): M-30533	
Phone: (310) 464-8404		

RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
1	I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, mechanical engineer, electrical engineer, or I am a licensed architect.
2	I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
3	I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

Responsible Envelope Designer Name:	**Signature:**	
Company: Architectural Resources Group		
Address: 360 E. 2nd St., Suite 225	Date Signed:	
City/State/Zip: Los Angeles CA 90012	Declaration Statement Type:	
Phone: 626-583-1401	Title:	License #:
Responsible Lighting Designer Name:	**Signature: NOT IN SCOPE**	
Company:		
Address:	Date Signed:	
City/State/Zip:	Declaration Statement Type:	
Phone:	Title:	License #:
Responsible Mechanical Designer Name: Paul A. Breen, P.E.	**Signature:**	
Company: Breen Engineering Inc.		
Address: 1983 West 190th Street, Suite 200	Date Signed: 7/31/2019	
City/State/Zip: Torrance CA 90504	Declaration Statement Type:	
Phone: (310) 464-8404	Title:	License #: M-30533

NRCC-PRF-ENV-DETAILS -SECTION START-

A. OPAQUE SURFACE ASSEMBLY DETAILS				Confirmed	
1.	2.	3.	4.	Pass	Fail
Surface Name	Surface Type	Description of Assembly Layers	Notes		
R-19 Wall (Level 2 -Pent)7	ExteriorWall	Stucco - 7/8 in. Vapor permeable felt - 1/8 in. Wood framed wall, 16in. OC, 5.5in., R-19 Gypsum Board - 5/8 in.		☐	☐
R-30 Floor No Crawlspace10	ExteriorFloor	Concrete - 140 lb/ft3 - 12 in. Carpet - 3/4 in.		☐	☐
R-30 Roof111	Roof	Clay tile - 1/2 in. Vapor permeable felt - 1/8 in. Plywood - 1/2 in. Air - Ceiling - 3/4 in. Wood framed roof, 16in. OC, 11.25in., R-30 Gypsum Board - 5/8 in.		☐	☐
8 CMU Wall (Level 1-Mez617	ExteriorWall	Concrete - Solid Grout - 105 lb/ft3 - 8 in.		☐	☐
R-19 Wall (Interior)654	InteriorWall	Gypsum Board - 5/8 in. Wood framed wall, 16in. OC, 5.5in., R-19 Gypsum Board - 5/8 in.		☐	☐
Slab On Grade673	UndergroundFloor	Slab Type = UnheatedSlabOnGrade Insulation Orientation = None Insulation R-Value = R0		☐	☐

B. OVERHANG DETAILS (Adapted from NRCC-ENV-02-E)					Confirmed	
1.	2.	3.		4.	Pass	Fail
Fenestration Tag/ID	Fenestration Orientation	Overhang Dimensions		Side fin		
		Horizontal Projection	Distance Above Window	Vertical Projection		
Balcony Door67	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door71	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door75	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door79	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐

B. OVERHANG DETAILS (Adapted from NRCC-ENV-02-E)					Confirmed	
1.	2.	3.		4.	Pass	Fail
Fenestration Tag/ID	Fenestration Orientation	Overhang Dimensions		Side fin		
		Horizontal Projection	Distance Above Window	Vertical Projection		
Balcony Door83	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window147	North	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window148	North	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window149	North	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window150	North	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window151	North	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door211	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door217	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door221	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door225	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door231	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door235	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door239	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door246	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door252	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door258	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door262	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door270	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door276	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door282	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door418	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door419	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door432	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door436	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window439	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐

B. OVERHANG DETAILS (Adapted from NRCC-ENV-02-E)					Confirmed	
1.	2.	3.		4.	Pass	Fail
Fenestration Tag/ID	Fenestration Orientation	Overhang Dimensions		Side fin		
		Horizontal Projection	Distance Above Window	Vertical Projection		
Window440	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window441	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window442	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door456	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door457	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door470	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door478	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door479	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door487	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window490	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window491	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window492	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door8	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door13	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door17	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door21	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door25	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door160	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door166	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door170	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door192	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door196	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door200	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door204	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door370	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐

B. OVERHANG DETAILS (Adapted from NRCC-ENV-02-E)					Confirmed	
1.	2.	3.		4.	Pass	Fail
Fenestration Tag/ID	Fenestration Orientation	Overhang Dimensions		Side fin		
		Horizontal Projection	Distance Above Window	Vertical Projection		
Balcony Door371	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door384	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door398	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window401	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window402	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window403	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window404	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door30	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door34	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window38	South	5.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window39	South	5.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door40	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window48	South	5.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window49	South	5.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door50	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door54	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door88	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door92	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door96	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door100	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door104	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door289	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door295	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door301	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door305	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐

B. OVERHANG DETAILS (Adapted from NRCC-ENV-02-E)					Confirmed	
1.	2.	3.		4.	Pass	Fail
Fenestration Tag/ID	Fenestration Orientation	Overhang Dimensions		Side fin		
		Horizontal Projection	Distance Above Window	Vertical Projection		
Balcony Door313	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door319	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door325	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door506	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door507	West	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door520	East	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door528	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door529	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Balcony Door537	South	1.0 ft.	2.0 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window540	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window541	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window542	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window586	East	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window587	East	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window589	East	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window608	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window609	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐
Window610	West	2.0 ft.	0.1 ft.	Left: 0 ft., Right: 0 ft.	☐	☐

C. OPAQUE DOOR SUMMARY							Confirmed	
1.	2.	3.	4.	5.	6.	7.	Pass	Fail
Opaque Door Assembly Name / Tag or I.D.	Door Type	Certification Method	Operation	Area	Overall U-factor	Status[1]		
Wood Door145	WoodGreaterThanOrEqualTo1.75inThickDoor	DefaultPerformance	Swinging	42	0.500	N	☐	☐

[1] *Status: N - New, A – Altered, E – Existing*

NRCC-PRF-MCH-DETAILS -SECTION START-

A. MECHANICAL VENTILATION AND REHEAT *(Adapted from 2016-NRCC-MCH-03-E)*																		Confirmed	
1. DESIGN AIR FLOWS								2. VENTILATION (§ 120.1)											
CONDITIONED ZONE NAME	HEATING/COOLING SYSTEM ID	DESIGN PRIMARY AIR FLOW (CFM)	DESIGN PRIMARY MINIMUM AIR FLOW (CFM)	MINIMUM PRIMARY AIR FLOW FRACTION	MAXIMUM HEATING AIR FLOW (CFM)	MAXIMUM HEATING AIR FLOW FRACTION	DDC CONTROL (Y/N)	VENT SYSTEM ID	CONDITIONED AREA (ft2)	MIN. VENT PER AREA (CFM/ft2)	DESIGN NUM. OF PEOPLE	MIN. VENT PER PERSON (CFM/person)	REQ'D VENT AIR FLOW (CFM)	DESIGN VENT AIR FLOW (CFM)	TRANSFER AIRFLOW (CFM)	DCV (Y/N)	Operable Window Interlock § 140.4(n) (Y/N)	Pass	Fail
1-2nd Floor Studio Units	Level 2 Studio Units	NA	NA	NA	NA	NA	N	2nd Floor Studio Units3	2,375	NA	10.00	19.25	193	193	NA	N	NA	☐	☐
2-3rd Floor Studio Units	Level 3 Studio Units	NA	NA	NA	NA	NA	N	3rd Floor Studio Units28	3,155	NA	14.00	18.52	259	259	NA	N	NA	☐	☐
3-4th Floor Studio Units	Level 4 Studio Units	NA	NA	NA	NA	NA	N	4th Floor Studio Units65	2,375	NA	10.00	19.25	193	193	NA	N	NA	☐	☐
4-5th Floor Studio Units	Level 5 Studio Units	NA	NA	NA	NA	NA	N	5th Floor Studio Units86	2,375	NA	10.00	19.25	193	193	NA	N	NA	☐	☐
5-6th Floor Studio Units	Level 6 Studio Units	NA	NA	NA	NA	NA	N	6th Floor Studio Units107	1,030	NA	4.00	20.45	82	82	NA	N	NA	☐	☐
6-6th Floor Studio Units	Level 6 T/H One Bed Units	NA	NA	NA	NA	NA	N	6th Floor Studio Units119	1,686	NA	6.00	21.86	131	131	NA	N	NA	☐	☐
7-2nd Floor One Bed Units	Level 2 One Bed Units	NA	NA	NA	NA	NA	N	2nd Floor One Bed Units156	6,835	NA	20.00	25.50	510	510	NA	N	NA	☐	☐

A. MECHANICAL VENTILATION AND REHEAT ***(Adapted from 2016-NRCC-MCH-03-E)***																			**Confirmed**	
1. DESIGN AIR FLOWS								2. VENTILATION (§ 120.1)												
CONDITIONED ZONE NAME	**HEATING/COOLING SYSTEM ID**	**DESIGN PRIMARY AIR FLOW (CFM)**	**DESIGN PRIMARY MINIMUM AIR FLOW (CFM)**	**MINIMUM PRIMARY AIR FLOW FRACTION**	**MAXIMUM HEATING AIR FLOW (CFM)**	**MAXIMUM HEATING AIR FLOW FRACTION**	**DDC CONTROL (Y/N)**	**VENT SYSTEM ID**	**CONDITIONED AREA (ft2)**	**MIN. VENT PER AREA (CFM/ft2)**	**DESIGN NUM. OF PEOPLE**	**MIN. VENT PER PERSON (CFM/person)**	**REQ'D VENT AIR FLOW (CFM)**	**DESIGN VENT AIR FLOW (CFM)**	**TRANSFER AIRFLOW (CFM)**	**DCV (Y/N)**	**Operable Window Interlock § 140.4(n) (Y/N)**	**Pass**	**Fail**
8-3rd Floor One Bed Units	Level 3 One Bed Units	NA	NA	NA	NA	NA	N	3rd Floor One Bed Units207	4,840	NA	14.00	25.74	360	360	NA	N	NA	☐	☐
9-4th Floor One Bed Units	Level 4 One Bed Units	NA	NA	NA	NA	NA	N	4th Floor One Bed Units242	4,840	NA	14.00	25.74	360	360	NA	N	NA	☐	☐
10-5th Floor One Bed Units	Level 5 One Bed Units	NA	NA	NA	NA	NA	N	5th Floor One Bed Units285	4,840	NA	14.00	25.74	360	360	NA	N	NA	☐	☐
11-6th Floor One Bed Units	Level 6 One Bed Units	NA	NA	NA	NA	NA	N	6th Floor One Bed Units328	3,990	NA	12.00	24.95	299	299	NA	N	NA	☐	☐
12-2nd Floor Two Bed Units	Level 2 Two Bed Units	NA	NA	NA	NA	NA	N	2nd Floor Two Bed Units359	3,140	NA	12.00	20.70	248	248	NA	N	NA	☐	☐
13-3rd Floor Two Bed Units	Level 3 Two Bed Units	NA	NA	NA	NA	NA	N	3rd Floor Two Bed Units407	2,370	NA	9.00	20.80	187	187	NA	N	NA	☐	☐
14-4th Floor Two Bed Units	Level 4 Two Bed Units	NA	NA	NA	NA	NA	N	4th Floor Two Bed Units445	3,300	NA	12.00	21.50	258	258	NA	N	NA	☐	☐
15-5th Floor Two Bed Units	Level 5 Two Bed Units	NA	NA	NA	NA	NA	N	5th Floor Two Bed Units495	3,300	NA	12.00	21.50	258	258	NA	N	NA	☐	☐

A. MECHANICAL VENTILATION AND REHEAT ***(Adapted from 2016-NRCC-MCH-03-E)***

	1. DESIGN AIR FLOWS							2. VENTILATION (§ 120.1)											Confirmed	
CONDITIONED ZONE NAME	**HEATING/COOLING SYSTEM ID**	**DESIGN PRIMARY AIR FLOW (CFM)**	**DESIGN PRIMARY MINIMUM AIR FLOW (CFM)**	**MINIMUM PRIMARY AIR FLOW FRACTION**	**MAXIMUM HEATING AIR FLOW (CFM)**	**MAXIMUM HEATING AIR FLOW FRACTION**	**DDC CONTROL (Y/N)**	**VENT SYSTEM ID**	**CONDITIONED AREA (ft2)**	**MIN. VENT PER AREA (CFM/ft2)**	**DESIGN NUM. OF PEOPLE**	**MIN. VENT PER PERSON (CFM/person)**	**REQ'D VENT AIR FLOW (CFM)**	**DESIGN VENT AIR FLOW (CFM)**	**TRANSFER AIRFLOW (CFM)**	**DCV (Y/N)**	**Operable Window Interlock § 140.4(n) (Y/N)**		Pass	Fail
16-6th Floor Two Bed Units	Level 6 Two Bed Units	NA	NA	NA	NA	NA	N	6th Floor Two Bed Units545	2,350	NA	9.00	20.67	186	186	NA	N	NA		☐	☐
17-6th Floor Two Bed Units	Level 6 T/H Two Bed Units	NA	NA	NA	NA	NA	N	6th Floor Two Bed Units575	1,850	NA	6.00	23.50	141	141	NA	N	NA		☐	☐
18-Level 1 Work/Live Units	Level 1 + Mezzanine Work/	NA	NA	NA	NA	NA	N	Level 1 Work/Live Units614	5,242	NA	8.00	44.31	355	355	NA	N	NA		☐	☐
19-Amenity Lounge	Mezzanine Level_Amenity L	1,750	NA	NA	NA	NA	N	Mezzanine Level_Amenity L	1,530	NA	51.00	15.00	765	765	NA	N	NA		☐	☐
20-Retail Space	Level 1 Retail Space	1,750	NA	NA	NA	NA	N	Level 1 Retail Space	4,218	NA	35.16	24.00	844	844	NA	N	NA		☐	☐
22-Restaurant	Level 1 Restaurant	1,750	NA	NA	NA	NA	N	Level 1 Restaurant	1,974	NA	65.80	15.00	987	987	NA	N	NA		☐	☐
23-Lobby + High Ceiling	Level 1 Lobby	1,324	NA	NA	NA	NA	N	Level 1 Lobby	1,792	NA	59.74	15.00	896	896	NA	N	NA		☐	☐
24-Lobby + Low Ceiling	Level 1 Lobby	426	NA	NA	NA	NA	N	Level 1 Lobby	577	NA	19.23	15.00	289	289	NA	N	NA		☐	☐
25-Leasing Office	Level 1 Leasing Office	450	NA	NA	NA	NA	N	Level 1 Leasing Office	590	NA	2.95	30.00	89	89	NA	N	NA		☐	☐

A. MECHANICAL VENTILATION AND REHEAT *(Adapted from 2016-NRCC-MCH-03-E)*

1. DESIGN AIR FLOWS								2. VENTILATION (§ 120.1)											Confirmed	
CONDITIONED ZONE NAME	HEATING/COOLING SYSTEM ID	DESIGN PRIMARY AIR FLOW (CFM)	DESIGN PRIMARY MINIMUM AIR FLOW (CFM)	MINIMUM PRIMARY AIR FLOW FRACTION	MAXIMUM HEATING AIR FLOW (CFM)	MAXIMUM HEATING AIR FLOW FRACTION	DDC CONTROL (Y/N)	VENT SYSTEM ID	CONDITIONED AREA (ft2)	MIN. VENT PER AREA (CFM/ft2)	DESIGN NUM. OF PEOPLE	MIN. VENT PER PERSON (CFM/person)	REQ'D VENT AIR FLOW (CFM)	DESIGN VENT AIR FLOW (CFM)	TRANSFER AIRFLOW (CFM)	DCV (Y/N)	Operable Window Interlock § 140.4(n) (Y/N)	Pass	Fail
26-Amenity	Level 1 Amenity Space	450	NA	NA	NA	NA	N	Level 1 Amenity Space	788	NA	26.27	15.00	394	394	NA	N	NA	☐	☐
27-Gym	Mezzanine Level_Gym	1,750	NA	NA	NA	NA	N	Mezzanine Level_Gym	2,321	NA	23.21	15.00	348	348	NA	N	NA	☐	☐
								TOTAL	73,683		479.36		9,185	9,185	NA			☐	☐

B. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY

1.	2.	3.	4.		5.	6.	7.			8.			§ 140.4 Confirmed	
System ID	System Type	Qty	Rated Capacity (kBtuh)		Economizer	Zone Name	Airflow (cfm)			Fan			Pass	Fail
			Heating	Cooling			Design	Min.	Min. Ratio	BHP	Cycles	ECM Motor		
Level 2 Studio Units	SZHP	5	14.00	12.00	No	1-2nd Floor Studio Units	450	NA	NA	0.066	☒	☐	☐	☐
Level 3 Studio Units	SZHP	7	14.00	12.00	No	2-3rd Floor Studio Units	450	NA	NA	0.066	☒	☐	☐	☐
Level 4 Studio Units	SZHP	5	14.00	12.00	No	3-4th Floor Studio Units	450	NA	NA	0.066	☒	☐	☐	☐
Level 5 Studio Units	SZHP	5	14.00	12.00	No	4-5th Floor Studio Units	450	NA	NA	0.066	☒	☐	☐	☐
Level 6 Studio Units	SZHP	5	14.00	12.00	No	5-6th Floor Studio Units	450	NA	NA	0.066	☒	☐	☐	☐
Level 6 T/H One Bed Units	SZHP	3	14.00	12.00	No	6-6th Floor Studio Units	450	NA	NA	0.066	☒	☐	☐	☐
Level 2 One Bed Units	SZHP	10	19.00	17.00	No	7-2nd Floor One Bed Units	560	NA	NA	0.066	☒	☐	☐	☐

B. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY														§ 140.4	
1.	2.	3.	4.		5.	6.	7.			8.				Confirmed	
System ID	System Type	Qty	Rated Capacity (kBtuh)		Economizer	Zone Name	Airflow (cfm)			Fan				Pass	Fail
			Heating	Cooling			Design	Min.	Min. Ratio	BHP	Cycles	ECM Motor			
Level 3 One Bed Units	SZHP	7	19.00	17.00	No	8-3rd Floor One Bed Units	560	NA	NA	0.066	☒	☐		☐	☐
Level 4 One Bed Units	SZHP	7	19.00	17.00	No	9-4th Floor One Bed Units	560	NA	NA	0.066	☒	☐		☐	☐
Level 5 One Bed Units	SZHP	7	19.00	17.00	No	10-5th Floor One Bed Units	560	NA	NA	0.066	☒	☐		☐	☐
Level 6 One Bed Units	SZHP	6	19.00	17.00	No	11-6th Floor One Bed Units	560	NA	NA	0.066	☒	☐		☐	☐
Level 2 Two Bed Units	SZHP	4	26.00	23.00	No	12-2nd Floor Two Bed Units	700	NA	NA	0.094	☒	☐		☐	☐
Level 3 Two Bed Units	SZHP	3	26.00	23.00	No	13-3rd Floor Two Bed Units	700	NA	NA	0.094	☒	☐		☐	☐
Level 4 Two Bed Units	SZHP	4	26.00	23.00	No	14-4th Floor Two Bed Units	700	NA	NA	0.094	☒	☐		☐	☐
Level 5 Two Bed Units	SZHP	4	26.00	23.00	No	15-5th Floor Two Bed Units	700	NA	NA	0.094	☒	☐		☐	☐
Level 6 Two Bed Units	SZHP	3	26.00	23.00	No	16-6th Floor Two Bed Units	700	NA	NA	0.094	☒	☐		☐	☐
Level 6 T/H Two Bed Units	SZHP	2	32.00	34.00	No	17-6th Floor Two Bed Units	1200	NA	NA	0.189	☒	☐		☐	☐
Level 1 + Mezzanine Work/	SZHP	4	32.00	34.00	No	18-Level 1 Work/Live Units	1200	NA	NA	0.189	☒	☐		☐	☐
19-Amenity Lounge-Trm	Uncontrolled	1	NA	NA	NA	19-Amenity Lounge	1750	NA	NA	NA	NA	☐		☐	☐
20-Retail Space-Trm	Uncontrolled	4	NA	NA	NA	20-Retail Space	1750	NA	NA	NA	NA	☐		☐	☐
22-Restaurant-Trm	Uncontrolled	3	NA	NA	NA	22-Restaurant	1750	NA	NA	NA	NA	☐		☐	☐
24-Lobby + Low Ceiling-Trm	Uncontrolled	2	NA	NA	NA	24-Lobby + Low Ceiling	426	NA	NA	NA	NA	☐		☐	☐
23-Lobby + High Ceiling-Trm	Uncontrolled	2	NA	NA	NA	23-Lobby + High Ceiling	1324	NA	NA	NA	NA	☐		☐	☐

B. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY — § 140.4

1.	2.	3.	4.		5.	6.	7.			8.			Confirmed	
System ID	System Type	Qty	Rated Capacity (kBtuh)		Economizer	Zone Name	Airflow (cfm)			Fan			Pass	Fail
			Heating	Cooling			Design	Min.	Min. Ratio	BHP	Cycles	ECM Motor		
25-Leasing Office-Trm	Uncontrolled	1	NA	NA	NA	25-Leasing Office	450	NA	NA	NA	NA	☐	☐	☐
26-Amenity-Trm	Uncontrolled	1	NA	NA	NA	26-Amenity	450	NA	NA	NA	NA	☐	☐	☐
27-Gym-Trm	Uncontrolled	1	NA	NA	NA	27-Gym	1750	NA	NA	NA	NA	☐	☐	☐

C. EXHAUST FAN SUMMARY

1.	2.	3.	4.	5.	6.	Confirmed	
System ID	Zone Name	Qty	CFM	Motor BHP	Total Static Pressure (in H20)	Pass	Fail
2nd Floor Studio Units3	1-2nd Floor Studio Units	5	60	0.023	1.47	☐	☐
3rd Floor Studio Units28	2-3rd Floor Studio Units	7	60	0.023	1.47	☐	☐
4th Floor Studio Units65	3-4th Floor Studio Units	5	60	0.023	1.47	☐	☐
5th Floor Studio Units86	4-5th Floor Studio Units	5	60	0.023	1.47	☐	☐
6th Floor Studio Units107	5-6th Floor Studio Units	5	60	0.023	1.47	☐	☐
6th Floor Studio Units119	6-6th Floor Studio Units	5	60	0.023	1.47	☐	☐
2nd Floor One Bed Units156	7-2nd Floor One Bed Units	10	60	0.023	1.47	☐	☐
3rd Floor One Bed Units207	8-3rd Floor One Bed Units	7	60	0.023	1.47	☐	☐
4th Floor One Bed Units242	9-4th Floor One Bed Units	7	60	0.023	1.47	☐	☐
5th Floor One Bed Units285	10-5th Floor One Bed Units	7	60	0.023	1.47	☐	☐
6th Floor One Bed Units328	11-6th Floor One Bed Units	6	60	0.023	1.47	☐	☐
2nd Floor Two Bed Units359	12-2nd Floor Two Bed Units	4	80	0.023	1.10	☐	☐
3rd Floor Two Bed Units407	13-3rd Floor Two Bed Units	3	80	0.023	1.10	☐	☐
4th Floor Two Bed Units445	14-4th Floor Two Bed Units	4	80	0.023	1.10	☐	☐
5th Floor Two Bed Units495	15-5th Floor Two Bed Units	4	80	0.023	1.10	☐	☐
6th Floor Two Bed Units545	16-6th Floor Two Bed Units	5	80	0.023	1.10	☐	☐
6th Floor Two Bed Units575	17-6th Floor Two Bed Units	5	80	0.023	1.10	☐	☐

C. EXHAUST FAN SUMMARY						Confirmed	
1.	2.	3.	4.	5.	6.	Pass	Fail
System ID	Zone Name	Qty	CFM	Motor BHP	Total Static Pressure (in H20)		
Level 1 Work/Live Units614	18-Level 1 Work/Live Units	4	91	0.023	0.97	☐	☐
1-2nd Floor Studio Units PropExhFan	1-2nd Floor Studio Units	5	300	NA	1.55081	☐	☐
2-3rd Floor Studio Units PropExhFan	2-3rd Floor Studio Units	7	420	NA	1.55081	☐	☐
3-4th Floor Studio Units PropExhFan	3-4th Floor Studio Units	5	300	NA	1.55081	☐	☐
4-5th Floor Studio Units PropExhFan	4-5th Floor Studio Units	5	300	NA	1.55081	☐	☐
5-6th Floor Studio Units PropExhFan	5-6th Floor Studio Units	5	300	NA	1.55081	☐	☐
6-6th Floor Studio Units PropExhFan	6-6th Floor Studio Units	3	300	NA	1.55081	☐	☐
7-2nd Floor One Bed Units PropExhFan	7-2nd Floor One Bed Units	10	600	NA	1.55081	☐	☐
8-3rd Floor One Bed Units PropExhFan	8-3rd Floor One Bed Units	7	420	NA	1.55081	☐	☐
9-4th Floor One Bed Units PropExhFan	9-4th Floor One Bed Units	7	420	NA	1.55081	☐	☐
10-5th Floor One Bed Units PropExhFan	10-5th Floor One Bed Units	7	420	NA	1.55081	☐	☐
11-6th Floor One Bed Units PropExhFan	11-6th Floor One Bed Units	6	360	NA	1.55081	☐	☐
12-2nd Floor Two Bed Units PropExhFan	12-2nd Floor Two Bed Units	4	320	NA	1.16311	☐	☐
13-3rd Floor Two Bed Units PropExhFan	13-3rd Floor Two Bed Units	3	240	NA	1.16311	☐	☐
14-4th Floor Two Bed Units PropExhFan	14-4th Floor Two Bed Units	4	320	NA	1.16311	☐	☐
15-5th Floor Two Bed Units PropExhFan	15-5th Floor Two Bed Units	4	320	NA	1.16311	☐	☐
16-6th Floor Two Bed Units PropExhFan	16-6th Floor Two Bed Units	3	400	NA	1.16311	☐	☐
17-6th Floor Two Bed Units PropExhFan	17-6th Floor Two Bed Units	2	400	NA	1.16311	☐	☐

C. EXHAUST FAN SUMMARY						Confirmed	
1.	2.	3.	4.	5.	6.	Pass	Fail
System ID	Zone Name	Qty	CFM	Motor BHP	Total Static Pressure (in H20)		
18-Level 1 Work/Live Units PropExhFan	18-Level 1 Work/Live Units	4	364	NA	1.02251	☐	☐

D. DHW EQUIPMENT SUMMARY – *(Adapted from NRCC-PLB-01)*									§ 110.3		Confirmed	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Pass	Fail
DHW Name	Heater Element Type	Tank Type	Qty	Tank Vol (gal)	Rated Input (kBtu/h)	Efficiency	Tank Insulation R-value (Int/Ext)	Standby Loss Fraction	Heat Pump Type	Tank Location or Ambient Condition		
Raypak WH-902C1	Gas	Storage	2	356.00	900	Thrml. Eff.: 0.87	NA	SBLF: 0.001	NA	NA	☐	☐
Raypak WH-902C1 2	Gas	Commercial Storage (TE & SBL)	2	356.00	900	Thrml. Eff.: 0.870	/	0.0010	NA	Unconditioned	☐	☐

E. MULTI-FAMILY CENTRAL DHW SYSTEM DETAILS									§ 110.3		Confirmed	
1.	2.	3.	4.	5.	6.	7.		8.	9.	10.	Pass	Fail
System Name	Number of Dwelling Units Served by System	System Type	Number of Water Heaters / System	Multi-Family Distribution Type	Solar Fraction (%)	Recirculating Pump		Number of Recirculation Loops	Recirculation Loop Insulation Thickness	Recirculation Loop Location		
						Eff	BHP					
MF-Raypak WH-902C1	88	Standard	2	Demand Control (Standard Design for new construction)	0.25	0.85	0.17	2	1.5	Conditioned	☐	☐

F. SOLAR HOT WATER HEATING SUMMARY (Adapted from NRCC-STH-01)										G. § RA4	
1.	2. Collector										
System Name	Manufacturer	Brand	Model #	SRRC Cert	Type	Area ft^2	Rated Eff.Curve Slope	Rated Eff.Curve Intercept	Number	Fluid	Angle from true north (degrees)	Slope from horizontal (degrees)
DHW2 - SHW												

F. SOLAR HOT WATER HEATING SUMMARY (Adapted from NRCC-STH-01)												G. § RA4
1.	2. Collector											
System Name	Manufacturer	Brand	Model #	SRRC Cert	Type	Area ft^2	Rated Eff.Curve Slope	Rated Eff.Curve Intercept	Number	Fluid	Angle from true north (degrees)	Slope from horizontal (degrees)
MF-Raypak WH-902C1												

F. SOLAR HOT WATER HEATING SUMMARY (Adapted from NRCC-STH-01)							G. § RA4	
1.	3. Software		4. Storage		5.	6	Confirmed	
System Name	Name of program used	Version	Water Heater Tank Volume (gallons)	Secondary Tank Volume (gallons)	# of Identical Dwelling Units	Solar Fraction	Pass	Fail
DHW2 - SHW			712			0.25	☐	☐
MF-Raypak WH-902C1						0.25	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)*																		§ RA4	
Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).																			
Test Description		MCH-02A	MCH-03A	MCH-04A	MCH-05A	MCH-06A	MCH-07A	MCH-08A	MCH-09A	MCH-10A	MCH-11A	MCH-12A	MCH-13A	MCH-14A	MCH-15A	MCH-16A	MCH-17A	MCH-18A	Confirmed	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	**Pass**	**Fail**
DHW2 - SHW	1	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	☐	☐
2nd Floor Studio Units3	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)* § RA4

Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

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Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	**Pass**	**Fail**
3rd Floor Studio Units28	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
4th Floor Studio Units65	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
5th Floor Studio Units86	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
6th Floor Studio Units107	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
6th Floor Studio Units119	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
2nd Floor One Bed Units156	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
3rd Floor One Bed Units207	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)* § RA4

Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		**MCH-02A**	**MCH-03A**	**MCH-04A**	**MCH-05A**	**MCH-06A**	**MCH-07A**	**MCH-08A**	**MCH-09A**	**MCH-10A**	**MCH-11A**	**MCH-12A**	**MCH-13A**	**MCH-14A**	**MCH-15A**	**MCH-16A**	**MCH-17A**	**MCH-18A**	**Confirmed**	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	**Pass**	**Fail**
4th Floor One Bed Units242	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
5th Floor One Bed Units285	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
6th Floor One Bed Units328	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
2nd Floor Two Bed Units359	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
3rd Floor Two Bed Units407	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
4th Floor Two Bed Units445	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
5th Floor Two Bed Units495	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)* § RA4

Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		**MCH-02A**	**MCH-03A**	**MCH-04A**	**MCH-05A**	**MCH-06A**	**MCH-07A**	**MCH-08A**	**MCH-09A**	**MCH-10A**	**MCH-11A**	**MCH-12A**	**MCH-13A**	**MCH-14A**	**MCH-15A**	**MCH-16A**	**MCH-17A**	**MCH-18A**	**Confirmed**	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	**Pass**	**Fail**
6th Floor Two Bed Units545	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
6th Floor Two Bed Units575	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 1 Work/Live Units614	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Mezzanine Level_Amenity L	1	X	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 1 Retail Space	4	X	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 1 Restaurant	3	X	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 1 Lobby	2	X	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 1 Leasing Office	1	X	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)* — **§ RA4**

Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		**MCH-02A**	**MCH-03A**	**MCH-04A**	**MCH-05A**	**MCH-06A**	**MCH-07A**	**MCH-08A**	**MCH-09A**	**MCH-10A**	**MCH-11A**	**MCH-12A**	**MCH-13A**	**MCH-14A**	**MCH-15A**	**MCH-16A**	**MCH-17A**	**MCH-18A**	**Confirmed**	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	**Pass**	**Fail**
Level 1 Amenity Space	1	X	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Mezzanine Level_Gym	1	X	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 2 Studio Units	5	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 3 Studio Units	7	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 4 Studio Units	5	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 5 Studio Units	5	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 6 Studio Units	5	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 6 T/H One Bed Units	3	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 2 One Bed Units	10	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)* **§ RA4**

Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		MCH-02A	MCH-03A	MCH-04A	MCH-05A	MCH-06A	MCH-07A	MCH-08A	MCH-09A	MCH-10A	MCH-11A	MCH-12A	MCH-13A	MCH-14A	MCH-15A	MCH-16A	MCH-17A	MCH-18A	Confirmed	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	**Pass**	**Fail**
Level 3 One Bed Units	7	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 4 One Bed Units	7	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 5 One Bed Units	7	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 6 One Bed Units	6	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 2 Two Bed Units	4	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 3 Two Bed Units	3	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 4 Two Bed Units	4	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 5 Two Bed Units	4	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 6 Two Bed Units	3	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
Level 6 T/H Two Bed Units	2	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)*																			**§ RA4**
Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).																			
Test Description		**MCH-02A**	**MCH-03A**	**MCH-04A**	**MCH-05A**	**MCH-06A**	**MCH-07A**	**MCH-08A**	**MCH-09A**	**MCH-10A**	**MCH-11A**	**MCH-12A**	**MCH-13A**	**MCH-14A**	**MCH-15A**	**MCH-16A**	**MCH-17A**	**MCH-18A**	**Confirmed**	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	**Pass**	**Fail**
Level 1 + Mezzanine Work/	4	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

H. EVAPORATIVE COOLER SUMMARY
This Section Does Not Apply

NRCC-PRF-LTI-DETAILS -SECTION START-

A. INDOOR CONDITIONED LIGHTING CONTROL CREDITS (Adapted from NRCC-LTI-02-E)	**§ 140.6**
This Section Does Not Apply	

B. INDOOR CONDITIONED LIGHTING MANDATORY LIGHTING CONTROLS (Adapted from NRCC-LTI-02-E)	**§ 130.1**
This Section Does Not Apply	

C. TAILORED METHOD CONDITIONED LIGHTING POWER ALLOWANCE SUMMARY AND CHECKLIST (Adapted from NRCC-LTI-04-E)	**§ 140.6**
This Section Does Not Apply	

D. GENERAL LIGHTING POWER (Adapted from NRCC-LTI-04-E)	**§ 140.6-D**
This Section Does Not Apply	

E. GENERAL LIGHTING FROM SPECIAL FUNCTION AREAS (Adapted from NRCC-LTI-04-E)	**§ 140.6(c) 3H**
This Section Does Not Apply	

F. ROOM CAVITY RATIO (Adapted from NRCC-LTI-04-E)
This Section Does Not Apply

G. ADDITIONAL "USE IT OR LOSE IT" (Adapted from NRCC-LTI-04-E)
This Section Does Not Apply

H. INDOOR & OUTDOOR LIGHTING ACCEPTANCE TESTS & FORMS (Adapted from NRCC-LTI-01-E and NRCC-LTO-01-E)	**§ 130.4**
This Section Does Not Apply	

ENVELOPE MANDATORY MEASURES: NONRESIDENTIAL — ENV-MM

Project Name	Date
Central Park Apartments	*7/31/2019*

DESCRIPTION

Building Envelope Measures:

§110.8(a):	Installed insulating material shall have been certified by the manufacturer to comply with the California Quality Standards for insulating material, Title 20 Chapter 4, Article 3.
§110.8(c):	All Insulating Materials shall be installed in compliance with the flame spread rating and smoke density requirements of Sections 2602 and 707 of Title 24, Part 2.
§110.8(g):	Heated slab floors shall be insulated according to the requirements in Table 110.8-A.
§110.7(a):	All Exterior Joints and openings in the building that are observable sources of air leakage shall be caulked, gasketed, weatherstripped or otherwise sealed.
§110.6(a):	Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft.² of window area, 0.3 cfm/ft.² of door area for residential doors, 0.3 cfm/ft.² of door area for nonresidential single doors (swinging and sliding), and 1.0 cfm/ft.² for nonresidential double doors (swinging).
§110.6(a):	Fenestration U-factor shall be rated in accordance with NFRC 100, or the applicable default U-factor.
§110.6(a) :	Fenestration SHGC shall be rated in accordance with NFRC 200, or NFRC 100 for site-built fenestration, or the applicable default SHGC.
§110.6(b):	Site Constructed Doors, Windows and Skylights shall be caulked between the unit and the building, and shall be weatherstripped (except for unframed glass doors and fire doors).
§120.7(a):	The opaque portions of the roof/ceiling that separates conditioned spaces from unconditioned spaces or ambient air shall meet the applicable U-Factor requirements as follows: **Metal Building-** The weighted average U-factor of the roof assembly shall not exceed 0.098. **Wood Framed and Others-** The weighted average U-factor of the roof assembly shall not exceed 0.075.
§120.7(b):	The opaque portions of walls that separate conditioned spaces from unconditioned spaces or ambient air shall meet the applicable U-factor as follows: **Metal Building-** The weighted average U-factor of the wall assembly shall not exceed 0.113. **Metal Framed-** The weighted average U-factor of the wall assembly shall not exceed 0.151. **Light Mass Walls-** A 6 inch or greater Hollow Core Concrete Masonry Unit shall have a U-factor not to exceed 0.440. **Heavy Mass Walls-** An 8 inch or greater Hollow Core Concrete Masonry Unit shall have a U-factor not to exceed 0.690. **Wood Framed and Others-** The weighted average U-factor of the wall assembly shall not exceed 0.110. **Spandrel Panels and Opaque Curtain Wall-** The weighted average U-factor of the spandrel panels and opaque curtain wall assembly shall not exceed 0.280. **Demising Walls-**. The opaque portions of framed demising walls shall meet the requirements of Item A or B below: A. Wood framed walls shall be insulated to meet a U-factor not greater than 0.099. B. Metal Framed walls shall be insulated to meet a U-factor not greater than 0.151.
§120.7(c):	The opaque portions of floors and soffits that separate conditioned spaces from unconditioned spaces or ambient air shall meet the applicable U-Factor requirements as follows: **Raised Mass Floors-** Shall have a minimum of 3 inches of lightweight concrete over a metal deck or the weighted average U-factor of the floor assembly shall not exceed 0.269. **Other Floors-**The weighted average U-factor of the floor assembly shall not exceed 0.071.

HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 2 Studio Units	2,375

ENGINEERING CHECKS

Number of Systems	5
Heating System	
Output per System	14,000
Total Output (Btuh)	70,000
Output (Btuh/sqft)	29.5
Cooling System	
Output per System	12,000
Total Output (Btuh)	60,000
Total Output (Tons)	5.0
Total Output (Btuh/sqft)	25.3
Total Output (sqft/Ton)	475.0
Air System	
CFM per System	450
Airflow (cfm)	2,250
Airflow (cfm/sqft)	0.95
Airflow (cfm/Ton)	450.0
Outside Air (%)	15.8 %
Outside Air (cfm/sqft)	0.15
Note: values above given at ARI conditions	

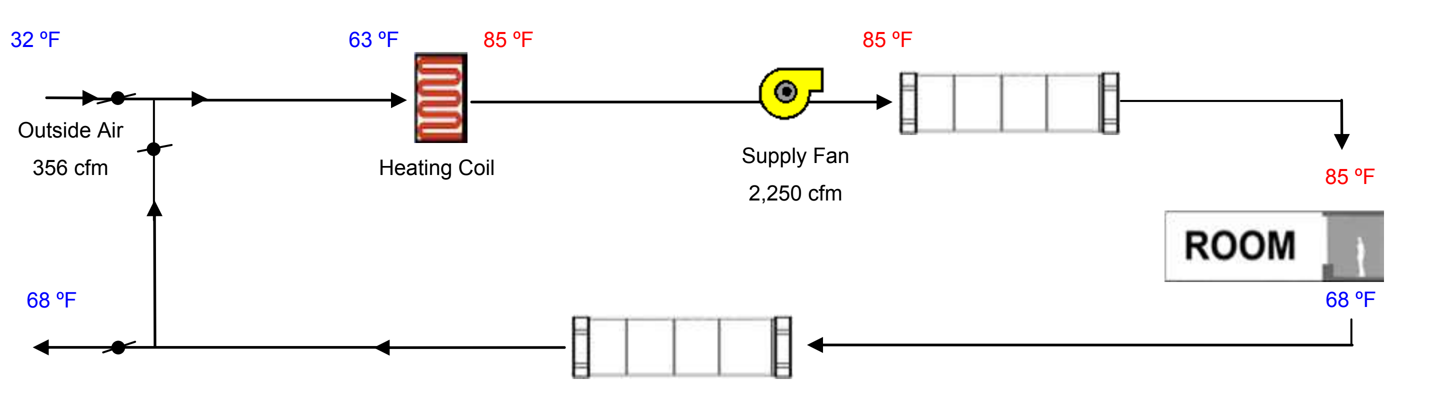
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	1,379	23,790	1,841	457	8,048
Return Vented Lighting		0			
Return Air Ducts		1,189			402
Return Fan		0			0
Ventilation	356	6,558	-988	356	13,354
Supply Fan		1,451			-1,451
Supply Air Ducts		1,189			402
TOTAL SYSTEM LOAD		34,177	852		20,756

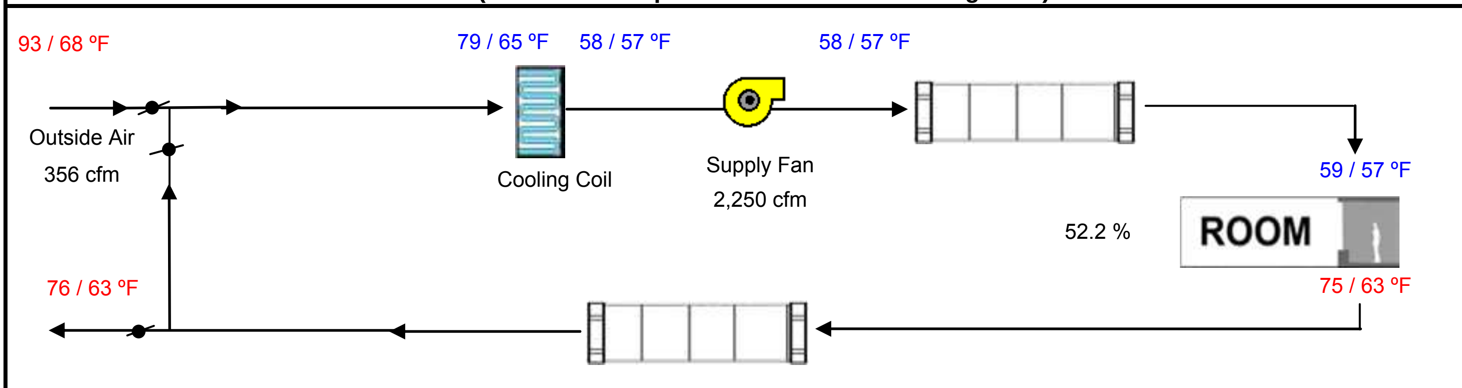
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A12NKA7/PEAD-A12AA7	47,806	10,514		51,051
Total Adjusted System Output (Adjusted for Peak Design conditions)	47,806	10,514		51,051
TIME OF SYSTEM PEAK		Jul 4 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 3 Studio Units	3,155

ENGINEERING CHECKS

Number of Systems	7
Heating System	
Output per System	14,000
Total Output (Btuh)	98,000
Output (Btuh/sqft)	31.1
Cooling System	
Output per System	12,000
Total Output (Btuh)	84,000
Total Output (Tons)	7.0
Total Output (Btuh/sqft)	26.6
Total Output (sqft/Ton)	450.7
Air System	
CFM per System	450
Airflow (cfm)	3,150
Airflow (cfm/sqft)	1.00
Airflow (cfm/Ton)	450.0
Outside Air (%)	15.0 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

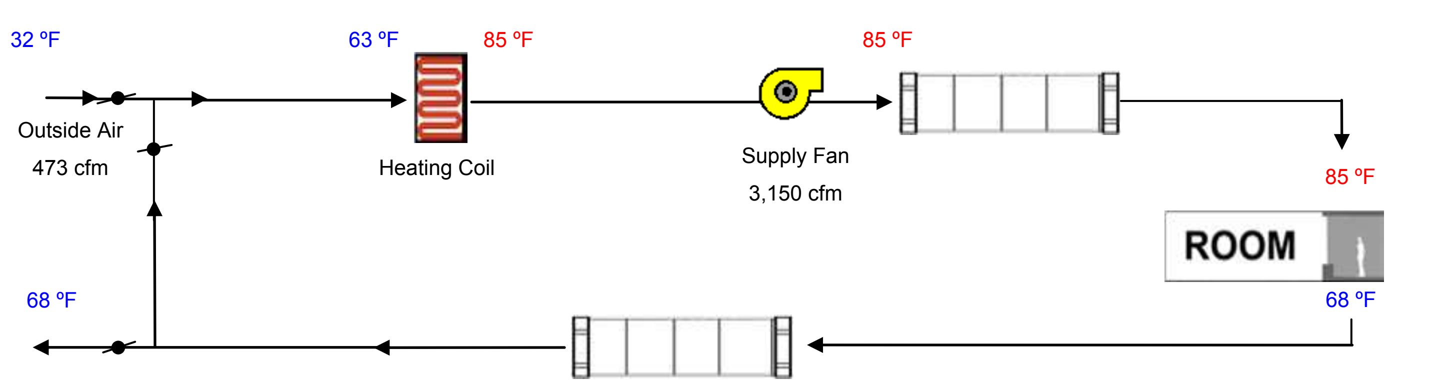
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	1,954	33,706	2,445	716	12,590
Return Vented Lighting		0			
Return Air Ducts		1,685			629
Return Fan		0			0
Ventilation	473	8,708	-1,279	473	17,730
Supply Fan		2,031			-2,031
Supply Air Ducts		1,685			629
TOTAL SYSTEM LOAD		47,816	1,166		29,548

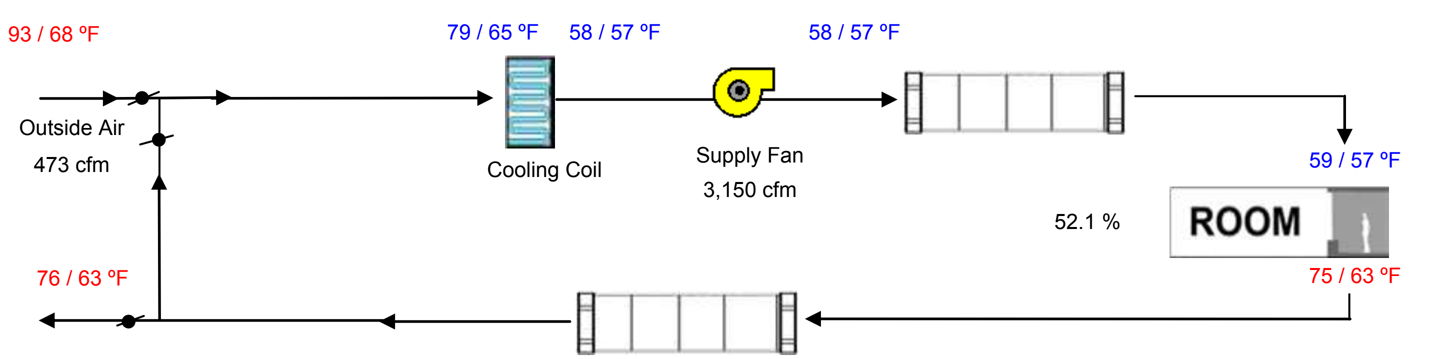
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A12NKA7/PEAD-A12AA7	66,693	14,879	71,471
Total Adjusted System Output (Adjusted for Peak Design conditions)	66,693	14,879	71,471
TIME OF SYSTEM PEAK		Aug 4 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	Floor Area
Level 4 Studio Units	2,375

ENGINEERING CHECKS

Number of Systems	5
Heating System	
Output per System	14,000
Total Output (Btuh)	70,000
Output (Btuh/sqft)	29.5
Cooling System	
Output per System	12,000
Total Output (Btuh)	60,000
Total Output (Tons)	5.0
Total Output (Btuh/sqft)	25.3
Total Output (sqft/Ton)	475.0
Air System	
CFM per System	450
Airflow (cfm)	2,250
Airflow (cfm/sqft)	0.95
Airflow (cfm/Ton)	450.0
Outside Air (%)	15.8 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

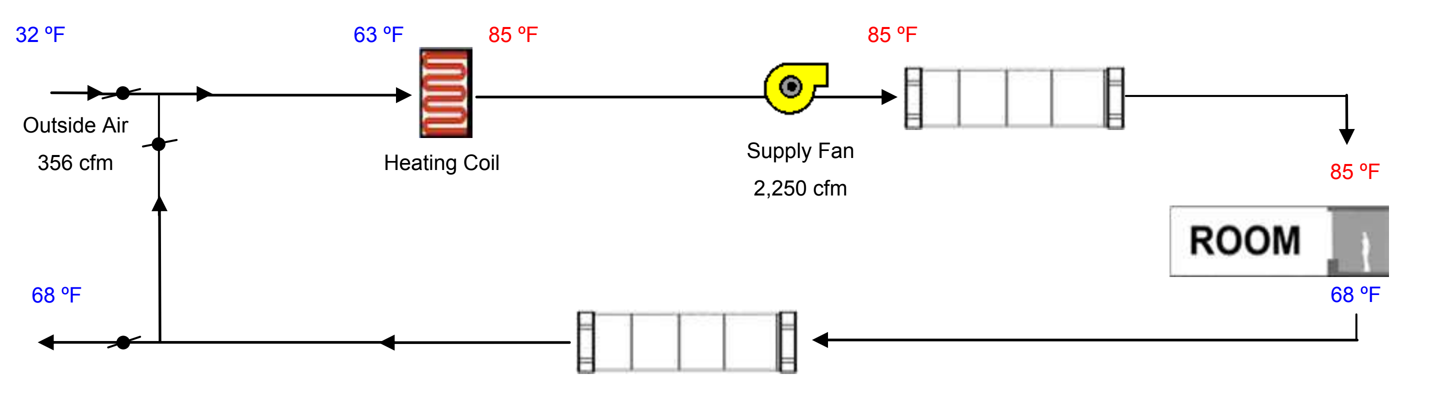
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	Sensible	Latent	CFM	Sensible
Total Room Loads	1,379	23,790	1,841	457	8,048
Return Vented Lighting		0			
Return Air Ducts		1,189			402
Return Fan		0			0
Ventilation	356	6,558	-988	356	13,354
Supply Fan		1,451			-1,451
Supply Air Ducts		1,189			402
TOTAL SYSTEM LOAD		34,177	852		20,756

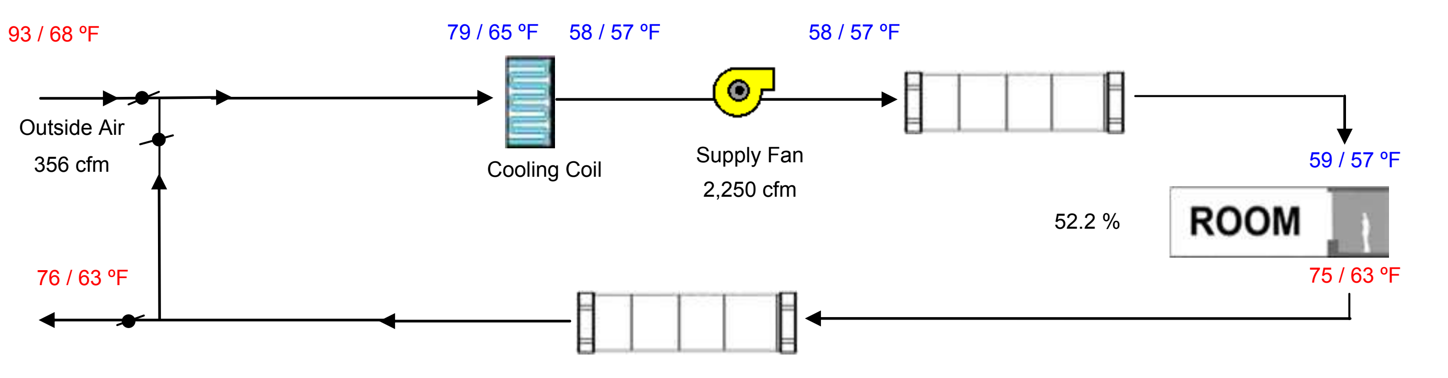
HVAC EQUIPMENT SELECTION

	Sensible	Latent		Sensible
Mitsubishi PUZ-A12NKA7/PEAD-A12AA7	47,806	10,514		51,051
Total Adjusted System Output (Adjusted for Peak Design conditions)	47,806	10,514		51,051
TIME OF SYSTEM PEAK		Jul 4 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 5 Studio Units	2,375

ENGINEERING CHECKS

Number of Systems	5
Heating System	
Output per System	14,000
Total Output (Btuh)	70,000
Output (Btuh/sqft)	29.5
Cooling System	
Output per System	12,000
Total Output (Btuh)	60,000
Total Output (Tons)	5.0
Total Output (Btuh/sqft)	25.3
Total Output (sqft/Ton)	475.0
Air System	
CFM per System	450
Airflow (cfm)	2,250
Airflow (cfm/sqft)	0.95
Airflow (cfm/Ton)	450.0
Outside Air (%)	15.8 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

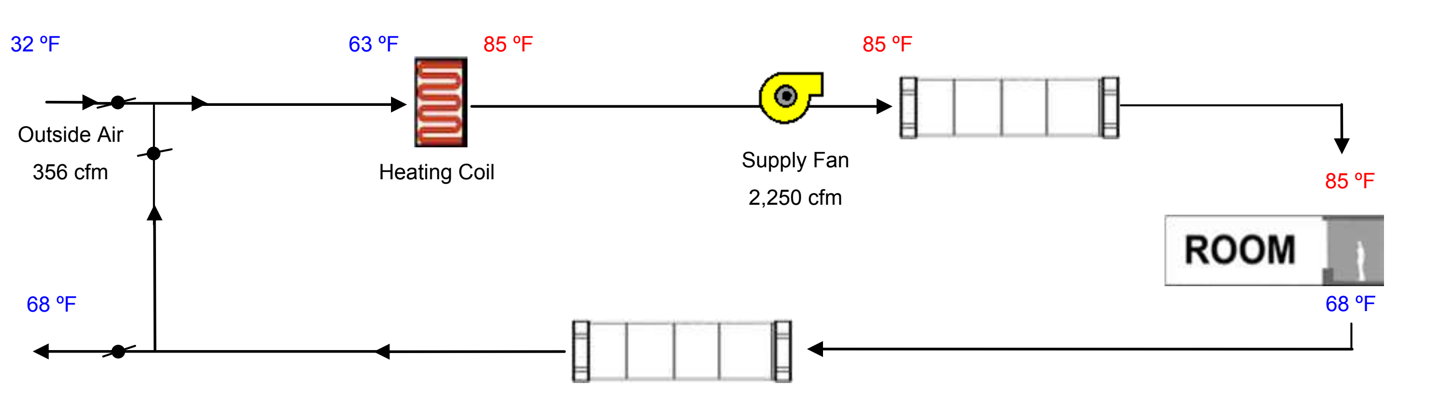
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	1,379	23,790	1,841	457	8,048
Return Vented Lighting		0			
Return Air Ducts		1,189			402
Return Fan		0			0
Ventilation	356	6,558	-988	356	13,354
Supply Fan		1,451			-1,451
Supply Air Ducts		1,189			402
TOTAL SYSTEM LOAD		34,177	852		20,756

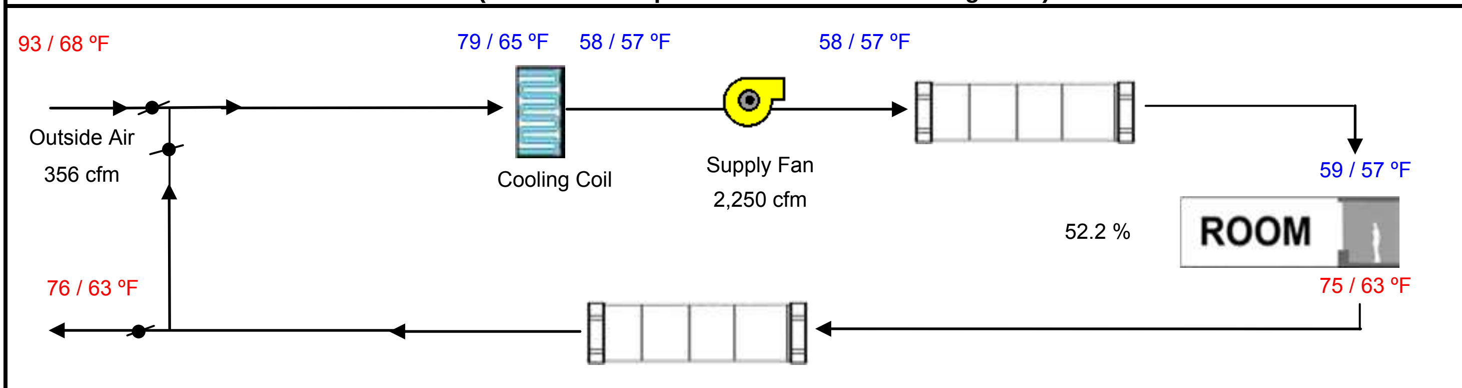
HVAC EQUIPMENT SELECTION

	Cooling Sensible	Cooling Latent	Heating Sensible
Mitsubishi PUZ-A12NKA7/PEAD-A12AA7	47,806	10,514	51,051
Total Adjusted System Output (Adjusted for Peak Design conditions)	47,806	10,514	51,051
TIME OF SYSTEM PEAK		Jul 4 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name Central Park Apartments	Date 7/31/2019
System Name Level 6 Studio Units	Floor Area 1,030

ENGINEERING CHECKS

Number of Systems	5
Heating System	
Output per System	14,000
Total Output (Btuh)	70,000
Output (Btuh/sqft)	68.0
Cooling System	
Output per System	12,000
Total Output (Btuh)	60,000
Total Output (Tons)	5.0
Total Output (Btuh/sqft)	58.3
Total Output (sqft/Ton)	206.0
Air System	
CFM per System	450
Airflow (cfm)	2,250
Airflow (cfm/sqft)	2.18
Airflow (cfm/Ton)	450.0
Outside Air (%)	13.3 %
Outside Air (cfm/sqft)	0.29

Note: values above given at ARI conditions

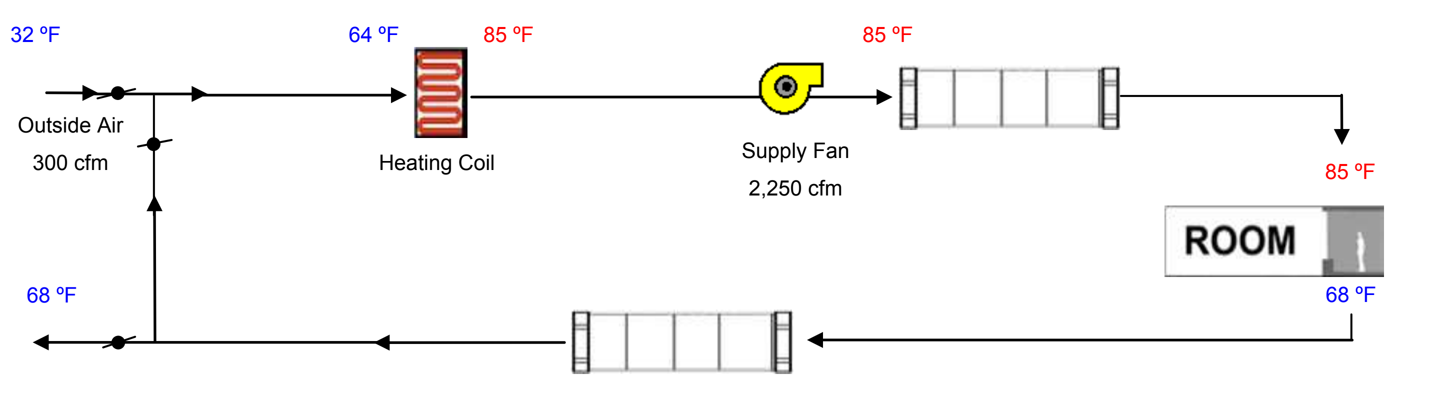
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	790	13,805	798	322	5,682
Return Vented Lighting		0			
Return Air Ducts		690			284
Return Fan		0			0
Ventilation	300	5,589	-574	300	11,261
Supply Fan		1,451			-1,451
Supply Air Ducts		690			284
TOTAL SYSTEM LOAD		22,225	224		16,061

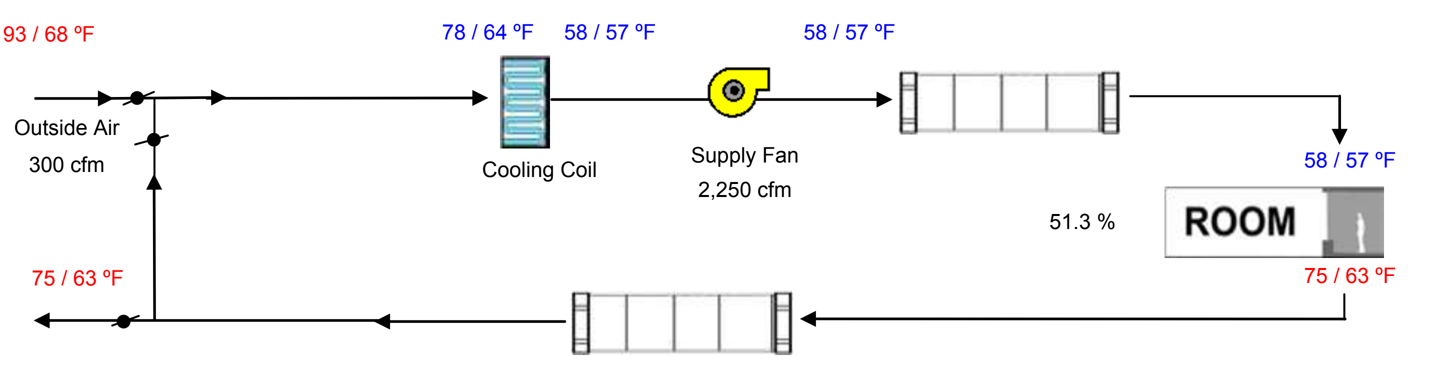
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A12NKA7/PEAD-A12AA7	47,360	10,573	51,051
Total Adjusted System Output (Adjusted for Peak Design conditions)	47,360	10,573	51,051
TIME OF SYSTEM PEAK		Jul 2 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 6 T/H One Bed Units	1,686

ENGINEERING CHECKS

Number of Systems	3
Heating System	
Output per System	14,000
Total Output (Btuh)	42,000
Output (Btuh/sqft)	24.9
Cooling System	
Output per System	12,000
Total Output (Btuh)	36,000
Total Output (Tons)	3.0
Total Output (Btuh/sqft)	21.4
Total Output (sqft/Ton)	562.0
Air System	
CFM per System	450
Airflow (cfm)	1,350
Airflow (cfm/sqft)	0.80
Airflow (cfm/Ton)	450.0
Outside Air (%)	22.2 %
Outside Air (cfm/sqft)	0.18
Note: values above given at ARI conditions	

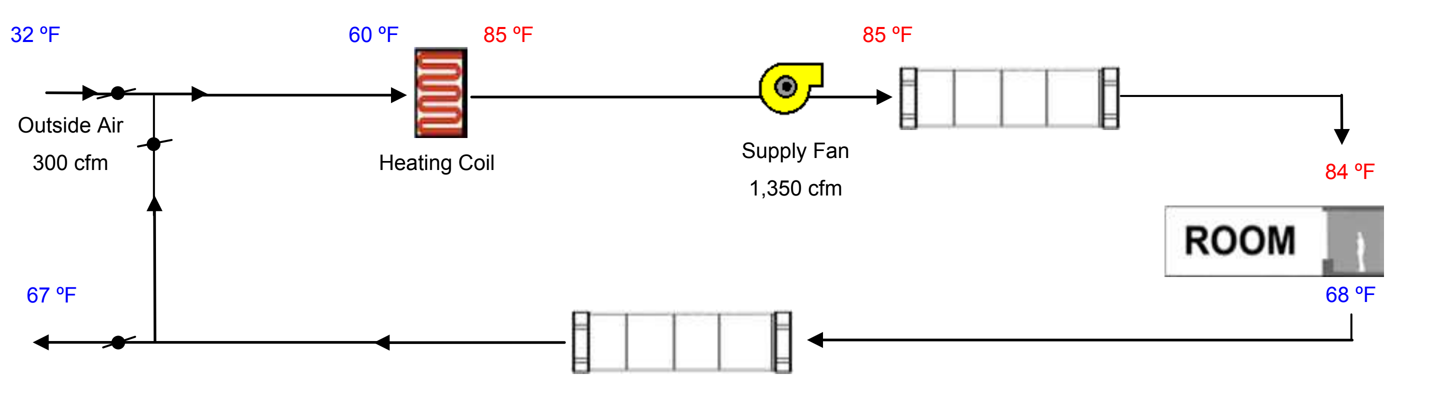
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	2,332	38,175	1,307	920	15,816
Return Vented Lighting		0			
Return Air Ducts		1,909			791
Return Fan		0			0
Ventilation	300	4,598	-898	300	11,123
Supply Fan		870			-870
Supply Air Ducts		1,909			791
TOTAL SYSTEM LOAD		47,460	409		27,650

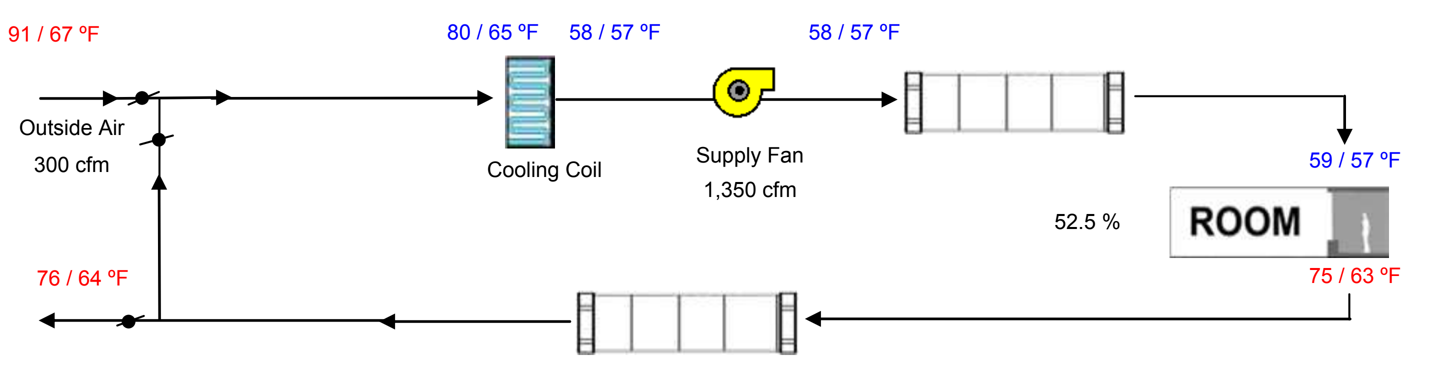
HVAC EQUIPMENT SELECTION

	Sensible	Latent		Sensible
Mitsubishi PUZ-A12NKA7/PEAD-A12AA7	29,934	5,683		30,630
Total Adjusted System Output (Adjusted for Peak Design conditions)	29,934	5,683		30,630
TIME OF SYSTEM PEAK		Jul 5 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 2 One Bed Units	6,835

ENGINEERING CHECKS

Number of Systems	10
Heating System	
Output per System	19,000
Total Output (Btuh)	190,000
Output (Btuh/sqft)	27.8
Cooling System	
Output per System	18,000
Total Output (Btuh)	180,000
Total Output (Tons)	15.0
Total Output (Btuh/sqft)	26.3
Total Output (sqft/Ton)	455.7
Air System	
CFM per System	560
Airflow (cfm)	5,600
Airflow (cfm/sqft)	0.82
Airflow (cfm/Ton)	373.3
Outside Air (%)	18.3 %
Outside Air (cfm/sqft)	0.15
Note: values above given at ARI conditions	

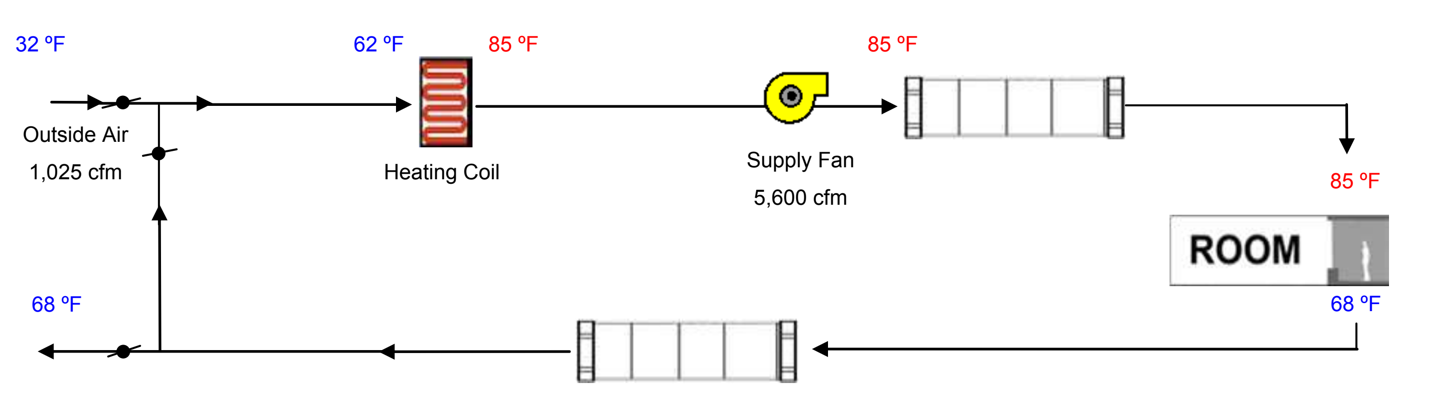
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	3,858	66,337	5,297	1,218	21,427
Return Vented Lighting		0			
Return Air Ducts		3,317			1,071
Return Fan		0			0
Ventilation	1,025	17,627	-2,996	1,025	38,418
Supply Fan		2,901			-2,901
Supply Air Ducts		3,317			1,071
TOTAL SYSTEM LOAD		93,499	2,301		59,087

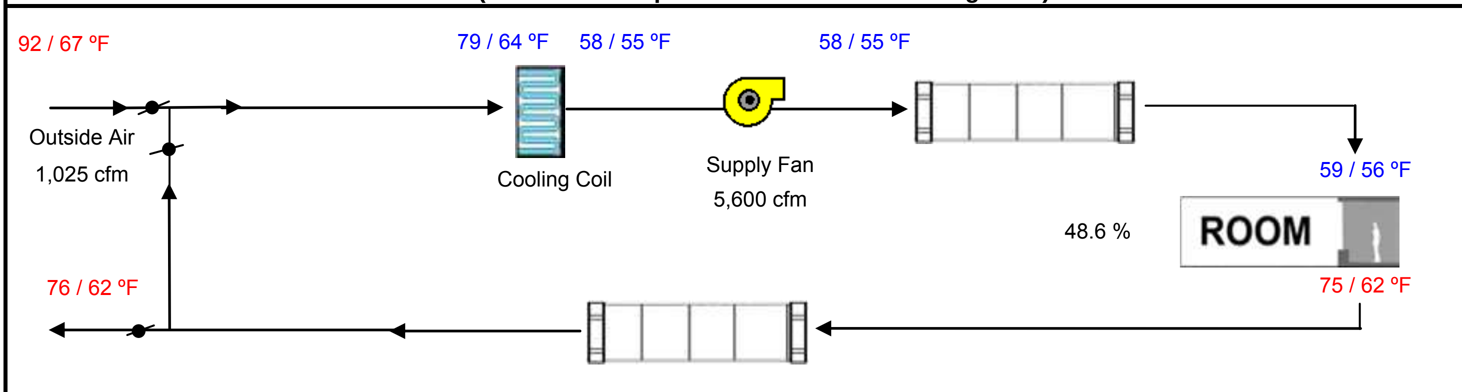
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A18NKA7/PEAD-A18AA7	156,329	16,824		138,566
Total Adjusted System Output (Adjusted for Peak Design conditions)	156,329	16,824		138,566
TIME OF SYSTEM PEAK		Sep 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 3 One Bed Units	4,840

ENGINEERING CHECKS

Number of Systems	7
Heating System	
Output per System	19,000
Total Output (Btuh)	133,000
Output (Btuh/sqft)	27.5
Cooling System	
Output per System	18,000
Total Output (Btuh)	126,000
Total Output (Tons)	10.5
Total Output (Btuh/sqft)	26.0
Total Output (sqft/Ton)	461.0
Air System	
CFM per System	560
Airflow (cfm)	3,920
Airflow (cfm/sqft)	0.81
Airflow (cfm/Ton)	373.3
Outside Air (%)	18.5 %
Outside Air (cfm/sqft)	0.15
Note: values above given at ARI conditions	

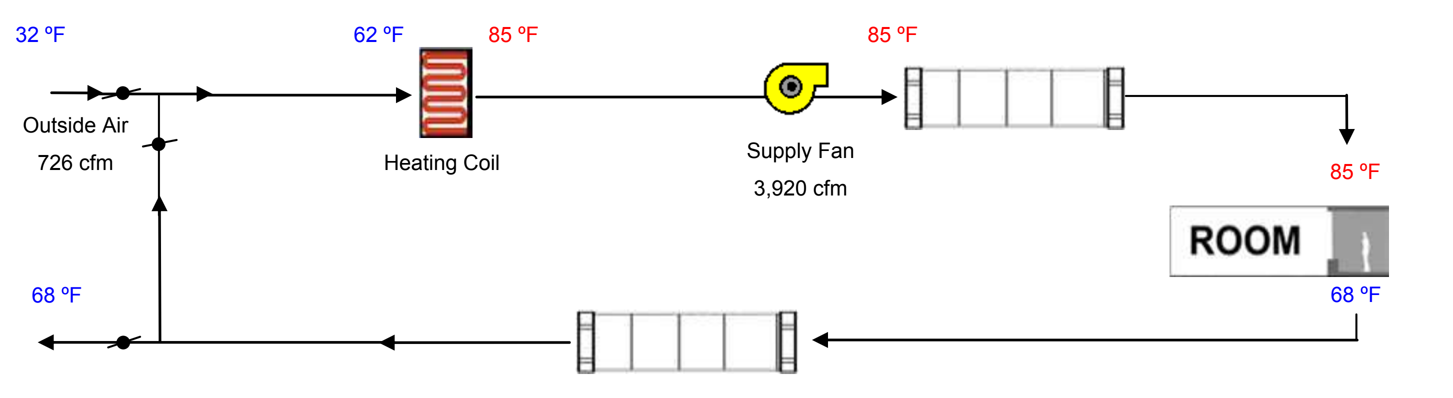
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	2,470	42,593	3,751	798	14,042
Return Vented Lighting		0			
Return Air Ducts		2,130			702
Return Fan		0			0
Ventilation	726	13,353	-2,185	726	27,213
Supply Fan		2,031			-2,031
Supply Air Ducts		2,130			702
TOTAL SYSTEM LOAD		62,237	1,566		40,629

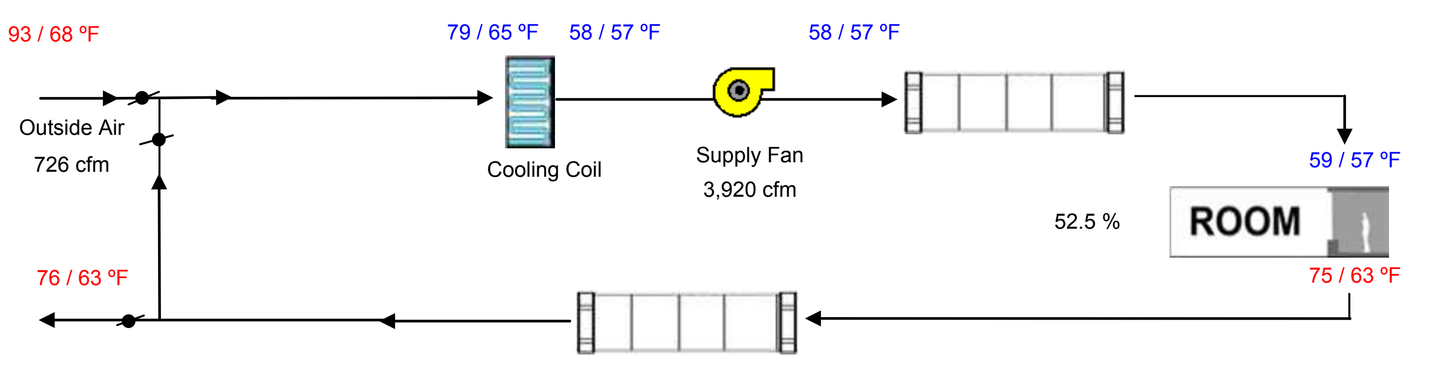
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A18NKA7/PEAD-A18AA7	104,641	18,146		96,996
Total Adjusted System Output (Adjusted for Peak Design conditions)	104,641	18,146		96,996
TIME OF SYSTEM PEAK		Jul 4 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 4 One Bed Units	4,840

ENGINEERING CHECKS

Number of Systems	7
Heating System	
Output per System	19,000
Total Output (Btuh)	133,000
Output (Btu/sqft)	27.5
Cooling System	
Output per System	18,000
Total Output (Btuh)	126,000
Total Output (Tons)	10.5
Total Output (Btuh/sqft)	26.0
Total Output (sqft/Ton)	461.0
Air System	
CFM per System	560
Airflow (cfm)	3,920
Airflow (cfm/sqft)	0.81
Airflow (cfm/Ton)	373.3
Outside Air (%)	18.5 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

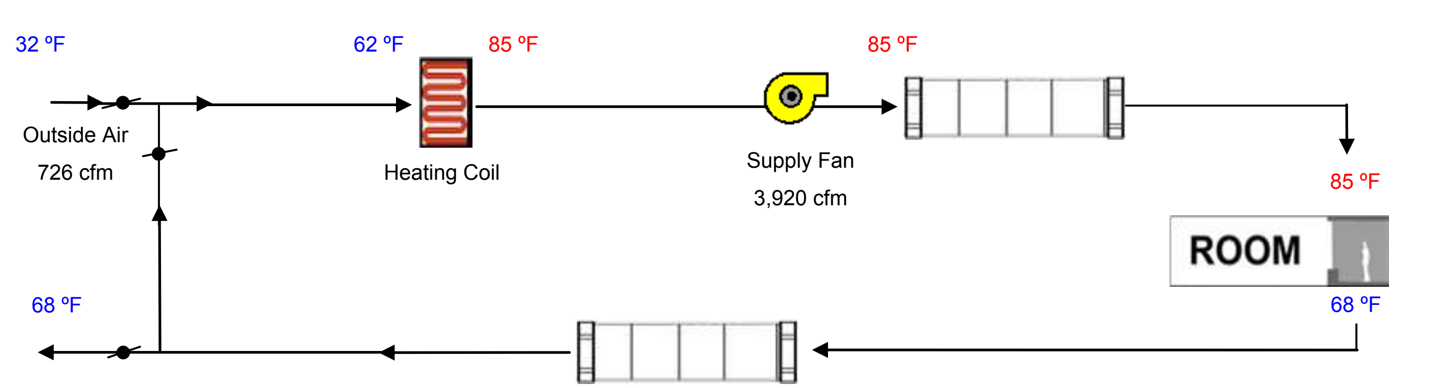
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	Sensible	Latent	CFM	Sensible
Total Room Loads	2,722	46,790	3,751	886	15,586
Return Vented Lighting		0			
Return Air Ducts		2,340			779
Return Fan		0			0
Ventilation	726	13,314	-2,185	726	27,199
Supply Fan		2,031			-2,031
Supply Air Ducts		2,340			779
TOTAL SYSTEM LOAD		66,814	1,566		42,313

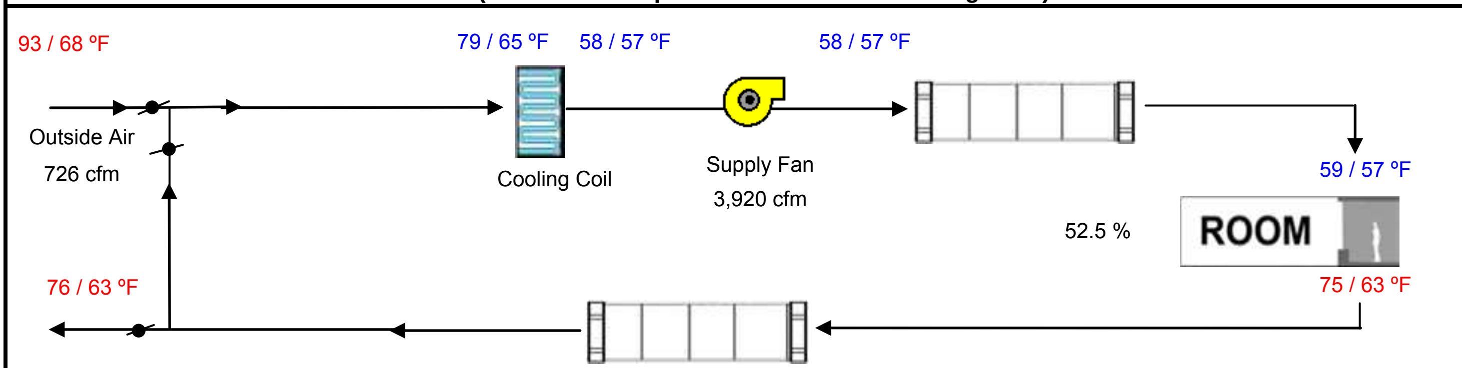
HVAC EQUIPMENT SELECTION

	Sensible	Latent		Sensible
Mitsubishi PUZ-A18NKA7/PEAD-A18AA7	104,736	18,078		96,996
Total Adjusted System Output (Adjusted for Peak Design conditions)	104,736	18,078		96,996
TIME OF SYSTEM PEAK		Jul 4 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 5 One Bed Units	4,840

ENGINEERING CHECKS

Number of Systems	7
Heating System	
Output per System	19,000
Total Output (Btuh)	133,000
Output (Btuh/sqft)	27.5
Cooling System	
Output per System	18,000
Total Output (Btuh)	126,000
Total Output (Tons)	10.5
Total Output (Btuh/sqft)	26.0
Total Output (sqft/Ton)	461.0
Air System	
CFM per System	560
Airflow (cfm)	3,920
Airflow (cfm/sqft)	0.81
Airflow (cfm/Ton)	373.3
Outside Air (%)	18.5 %
Outside Air (cfm/sqft)	0.15
Note: values above given at ARI conditions	

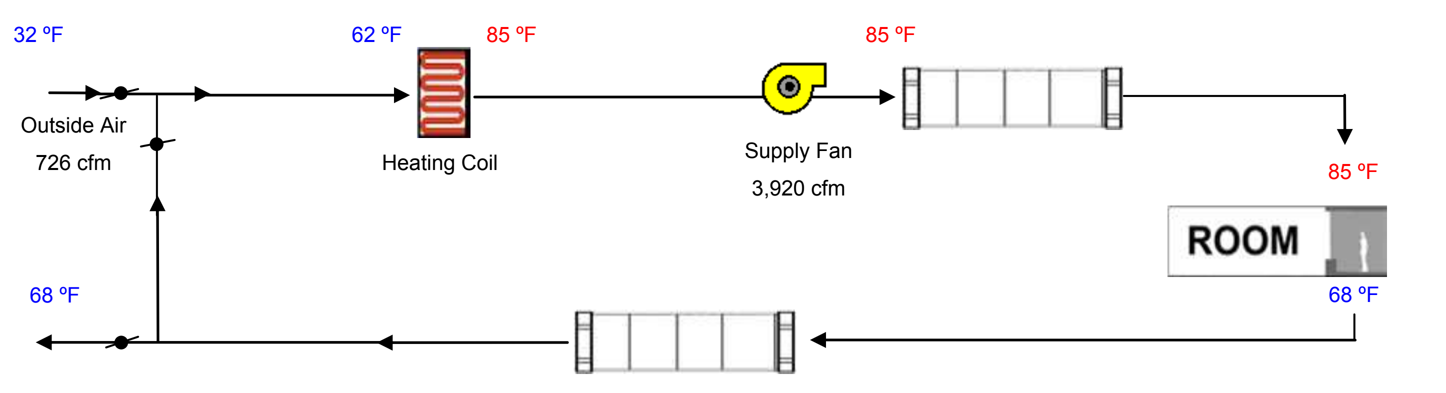
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	2,722	46,790	3,751	886	15,586
Return Vented Lighting		0			
Return Air Ducts		2,340			779
Return Fan		0			0
Ventilation	726	13,314	-2,185	726	27,199
Supply Fan		2,031			-2,031
Supply Air Ducts		2,340			779
TOTAL SYSTEM LOAD		66,814	1,566		42,313

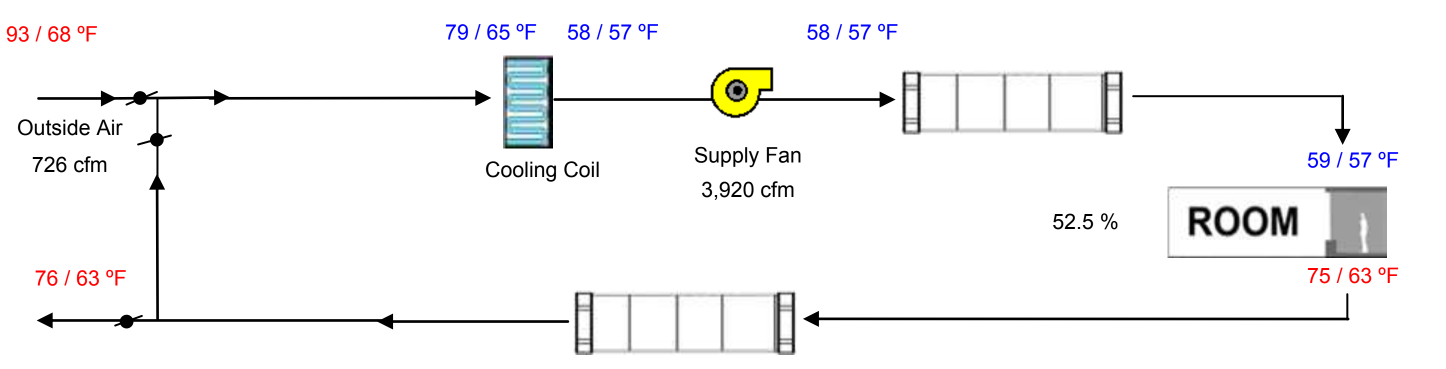
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A18NKA7/PEAD-A18AA7	104,736	18,078	96,996
Total Adjusted System Output (Adjusted for Peak Design conditions)	104,736	18,078	96,996
TIME OF SYSTEM PEAK		Jul 4 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	Floor Area
Level 6 One Bed Units	3,990

ENGINEERING CHECKS

Number of Systems	6
Heating System	
Output per System	19,000
Total Output (Btuh)	114,000
Output (Btuh/sqft)	28.6
Cooling System	
Output per System	18,000
Total Output (Btuh)	108,000
Total Output (Tons)	9.0
Total Output (Btuh/sqft)	27.1
Total Output (sqft/Ton)	443.3
Air System	
CFM per System	560
Airflow (cfm)	3,360
Airflow (cfm/sqft)	0.84
Airflow (cfm/Ton)	373.3
Outside Air (%)	17.8 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

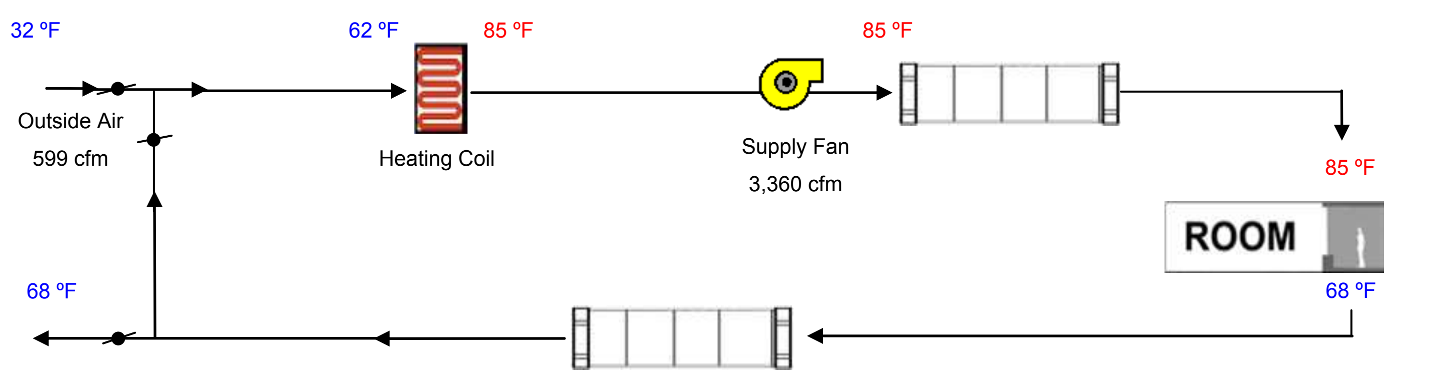
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	3,034	51,624	3,092	1,146	20,048
Return Vented Lighting		0			
Return Air Ducts		2,581			1,002
Return Fan		0			0
Ventilation	599	10,874	-1,764	599	22,363
Supply Fan		1,741			-1,741
Supply Air Ducts		2,581			1,002
TOTAL SYSTEM LOAD		69,401	1,328		42,675

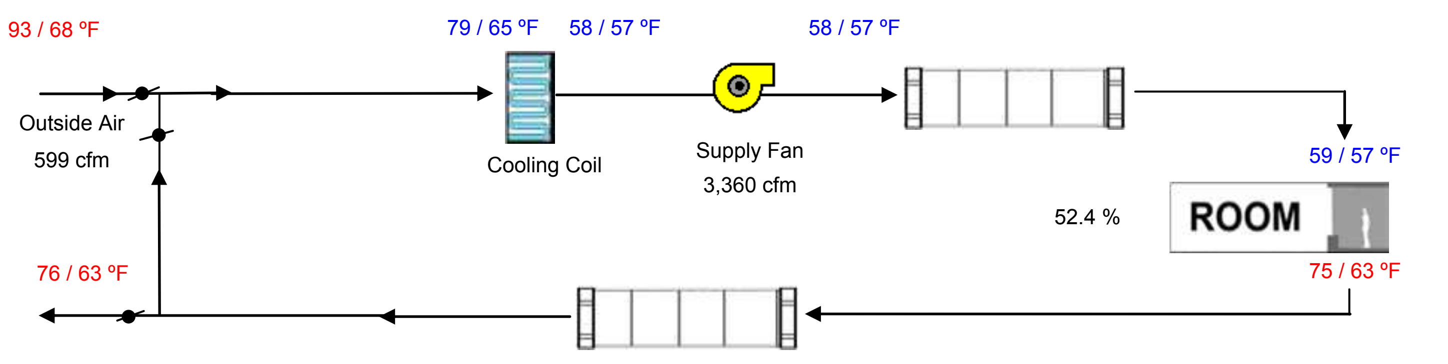
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A18NKA7/PEAD-A18AA7	89,838	15,416	83,140
Total Adjusted System Output (Adjusted for Peak Design conditions)	89,838	15,416	83,140
TIME OF SYSTEM PEAK		Jul 4 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 2 Two Bed Units	3,140

ENGINEERING CHECKS

Number of Systems	4
Heating System	
Output per System	26,000
Total Output (Btuh)	104,000
Output (Btuh/sqft)	33.1
Cooling System	
Output per System	24,000
Total Output (Btuh)	96,000
Total Output (Tons)	8.0
Total Output (Btuh/sqft)	30.6
Total Output (sqft/Ton)	392.5
Air System	
CFM per System	700
Airflow (cfm)	2,800
Airflow (cfm/sqft)	0.89
Airflow (cfm/Ton)	350.0
Outside Air (%)	16.8 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

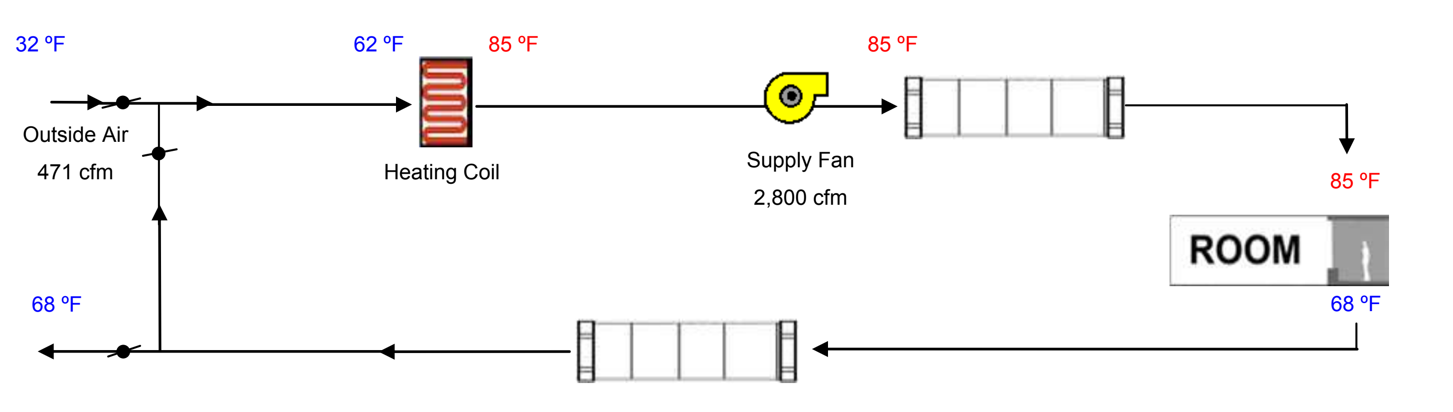
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	2,195	37,564	2,434	979	17,112
Return Vented Lighting		0			
Return Air Ducts		1,878			856
Return Fan		0			0
Ventilation	471	9,047	-1,348	471	17,595
Supply Fan		1,652			-1,652
Supply Air Ducts		1,878			856
TOTAL SYSTEM LOAD		52,019	1,086		34,767

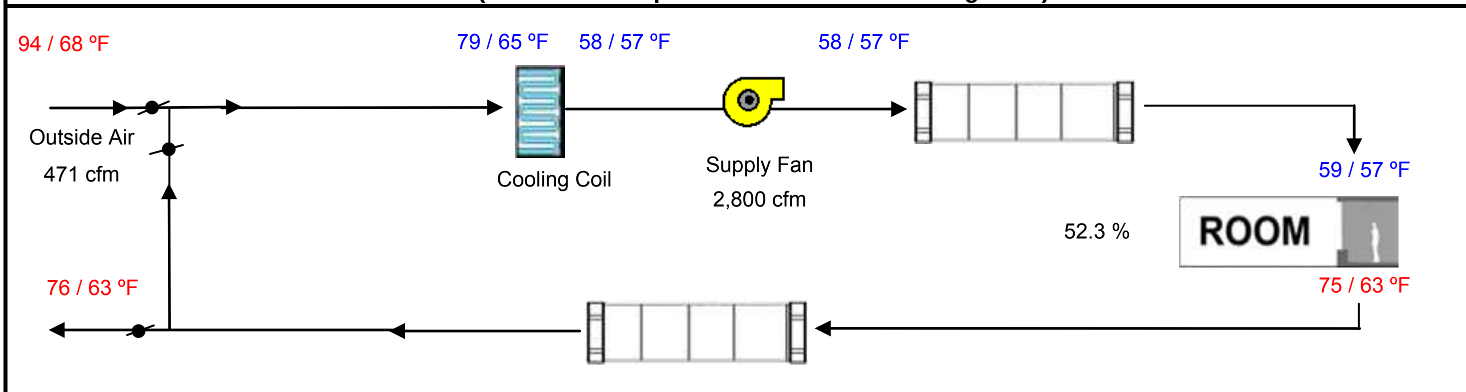
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A24NHA7/PEAD-A24AA7	73,293	19,799		75,847
Total Adjusted System Output (Adjusted for Peak Design conditions)	73,293	19,799		75,847
TIME OF SYSTEM PEAK		Jul 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 3 Two Bed Units	2,370

ENGINEERING CHECKS

Number of Systems	3
Heating System	
Output per System	26,000
Total Output (Btuh)	78,000
Output (Btuh/sqft)	32.9
Cooling System	
Output per System	24,000
Total Output (Btuh)	72,000
Total Output (Tons)	6.0
Total Output (Btuh/sqft)	30.4
Total Output (sqft/Ton)	395.0
Air System	
CFM per System	700
Airflow (cfm)	2,100
Airflow (cfm/sqft)	0.89
Airflow (cfm/Ton)	350.0
Outside Air (%)	16.9 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

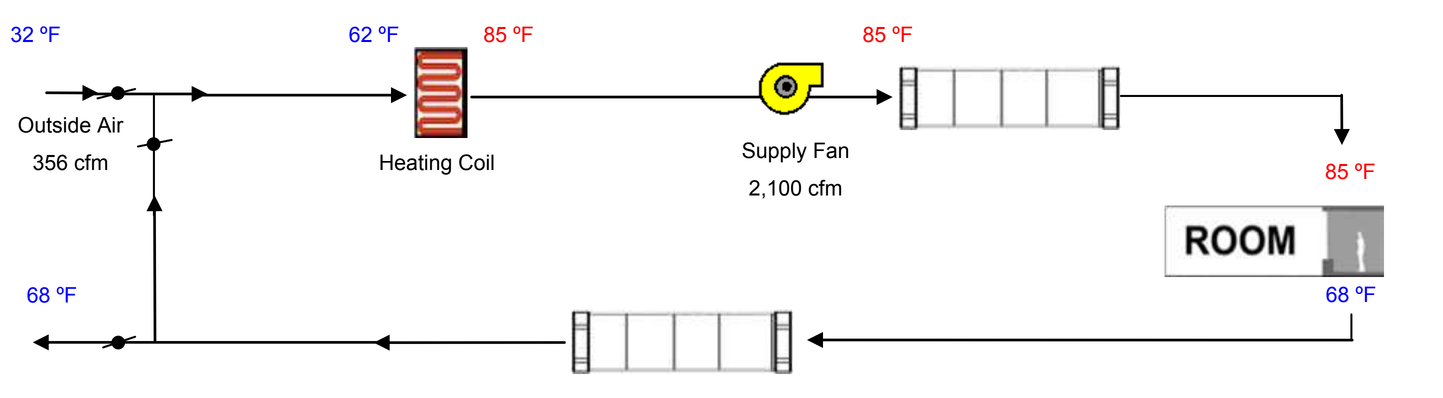
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	1,537	26,379	1,837	700	12,246
Return Vented Lighting		0			
Return Air Ducts		1,319			612
Return Fan		0			0
Ventilation	356	6,509	-1,021	356	13,286
Supply Fan		1,239			-1,239
Supply Air Ducts		1,319			612
TOTAL SYSTEM LOAD		36,764	816		25,518

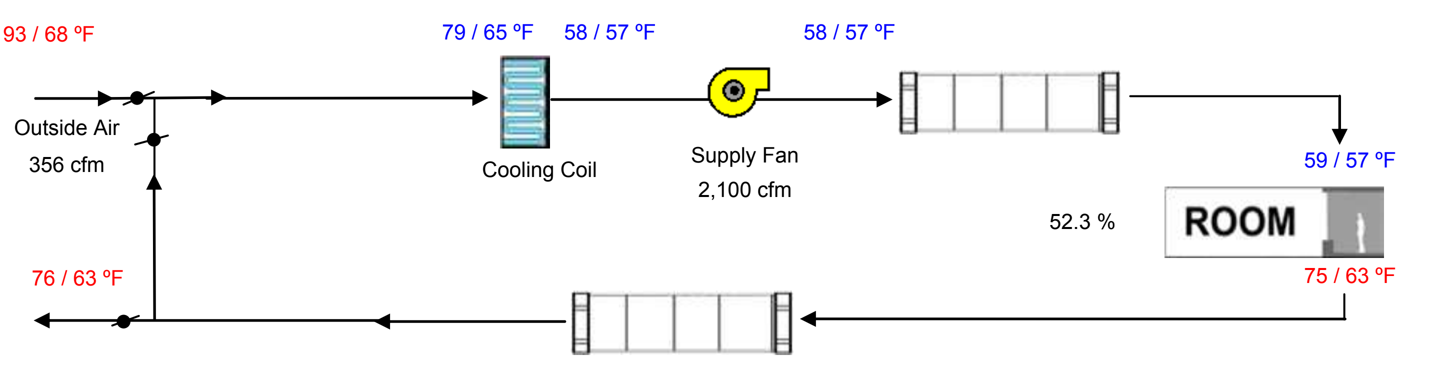
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A24NHA7/PEAD-A24AA7	54,865	15,218		56,885
Total Adjusted System Output (Adjusted for Peak Design conditions)	54,865	15,218		56,885
TIME OF SYSTEM PEAK		Jul 4 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 4 Two Bed Units	3,300

ENGINEERING CHECKS

Number of Systems	4
Heating System	
Output per System	26,000
Total Output (Btuh)	104,000
Output (Btuh/sqft)	31.5
Cooling System	
Output per System	24,000
Total Output (Btuh)	96,000
Total Output (Tons)	8.0
Total Output (Btuh/sqft)	29.1
Total Output (sqft/Ton)	412.5
Air System	
CFM per System	700
Airflow (cfm)	2,800
Airflow (cfm/sqft)	0.85
Airflow (cfm/Ton)	350.0
Outside Air (%)	17.7 %
Outside Air (cfm/sqft)	0.15
Note: values above given at ARI conditions	

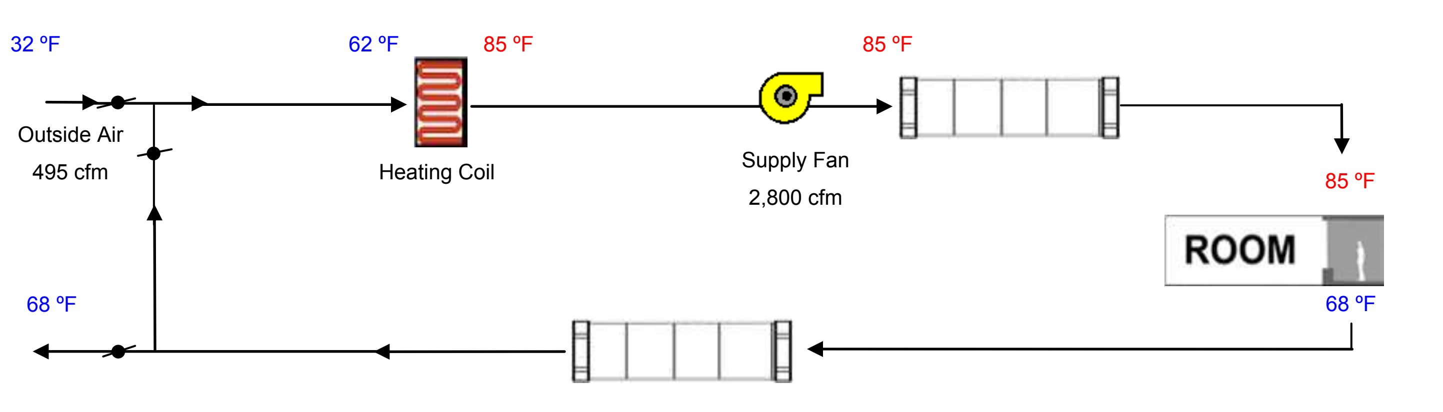
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	2,228	38,103	2,558	943	16,494
Return Vented Lighting		0			
Return Air Ducts		1,905			825
Return Fan		0			0
Ventilation	495	8,467	-1,419	495	18,498
Supply Fan		1,652			-1,652
Supply Air Ducts		1,905			825
TOTAL SYSTEM LOAD		52,032	1,138		34,989

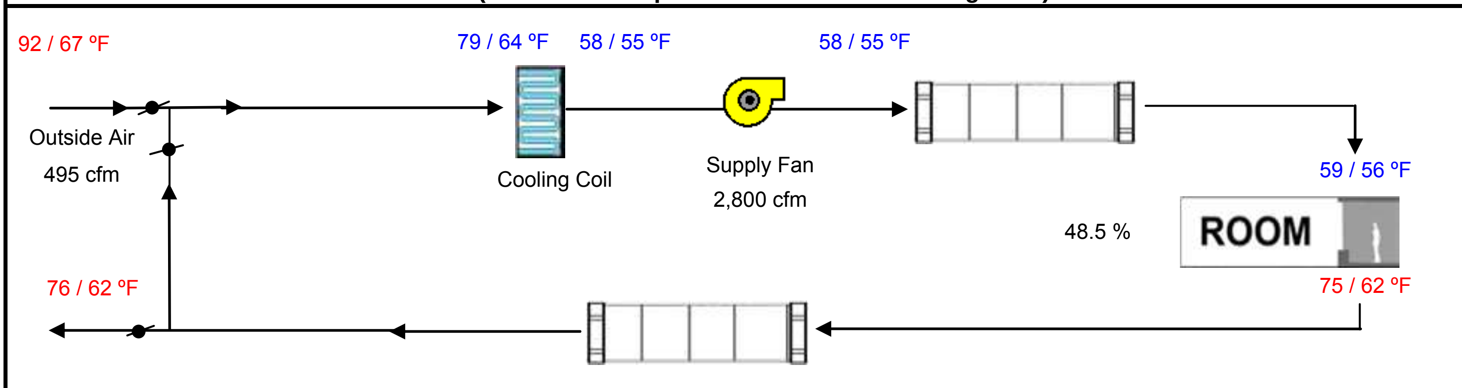
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A24NHA7/PEAD-A24AA7		76,741	15,609		75,847
Total Adjusted System Output (Adjusted for Peak Design conditions)		76,741	15,609		75,847
TIME OF SYSTEM PEAK			Sep 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 5 Two Bed Units	3,300

ENGINEERING CHECKS

Number of Systems	4
Heating System	
Output per System	26,000
Total Output (Btuh)	104,000
Output (Btuh/sqft)	31.5
Cooling System	
Output per System	24,000
Total Output (Btuh)	96,000
Total Output (Tons)	8.0
Total Output (Btuh/sqft)	29.1
Total Output (sqft/Ton)	412.5
Air System	
CFM per System	700
Airflow (cfm)	2,800
Airflow (cfm/sqft)	0.85
Airflow (cfm/Ton)	350.0
Outside Air (%)	17.7 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

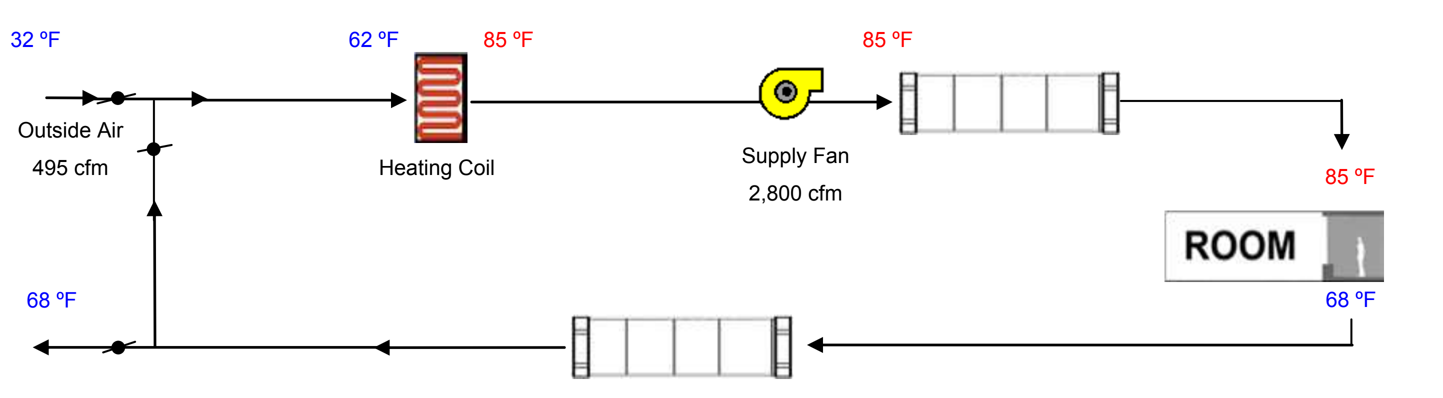
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	2,228	38,103	2,558	943	16,494
Return Vented Lighting		0			
Return Air Ducts		1,905			825
Return Fan		0			0
Ventilation	495	8,467	-1,419	495	18,498
Supply Fan		1,652			-1,652
Supply Air Ducts		1,905			825
TOTAL SYSTEM LOAD		52,032	1,138		34,989

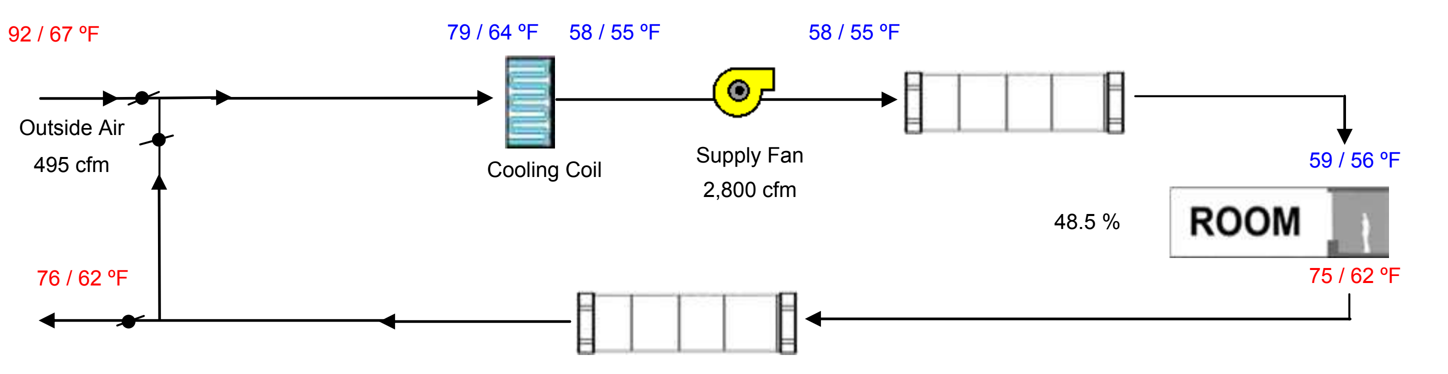
HVAC EQUIPMENT SELECTION

	Cooling Sensible	Cooling Latent		Heating Sensible
Mitsubishi PUZ-A24NHA7/PEAD-A24AA7	76,741	15,609		75,847
Total Adjusted System Output (Adjusted for Peak Design conditions)	76,741	15,609		75,847
TIME OF SYSTEM PEAK		Sep 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 6 Two Bed Units	2,350

ENGINEERING CHECKS

Number of Systems	3
Heating System	
Output per System	26,000
Total Output (Btuh)	78,000
Output (Btuh/sqft)	33.2
Cooling System	
Output per System	24,000
Total Output (Btuh)	72,000
Total Output (Tons)	6.0
Total Output (Btuh/sqft)	30.6
Total Output (sqft/Ton)	391.7
Air System	
CFM per System	700
Airflow (cfm)	2,100
Airflow (cfm/sqft)	0.89
Airflow (cfm/Ton)	350.0
Outside Air (%)	19.0 %
Outside Air (cfm/sqft)	0.17
Note: values above given at ARI conditions	

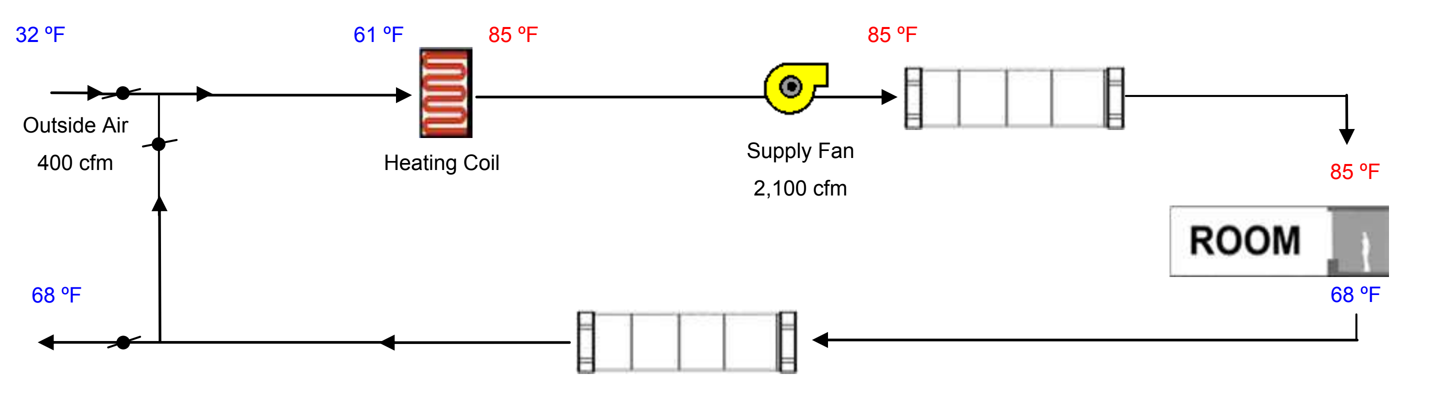
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	2,193	37,069	1,821	1,028	17,840
Return Vented Lighting		0			
Return Air Ducts		1,853			892
Return Fan		0			0
Ventilation	400	7,598	-1,135	400	14,895
Supply Fan		1,239			-1,239
Supply Air Ducts		1,853			892
TOTAL SYSTEM LOAD		49,612	686		33,281

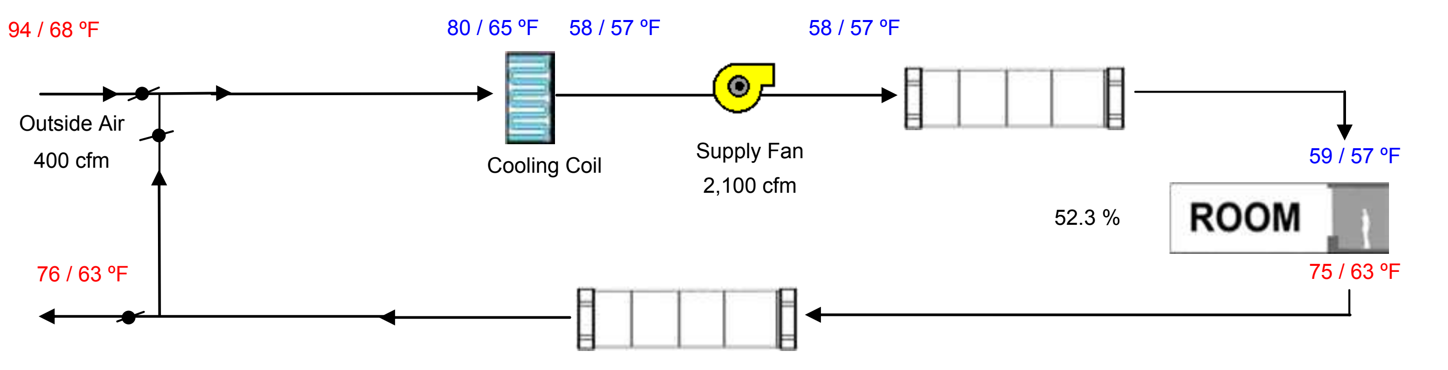
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A24NHA7/PEAD-A24AA7	55,712	14,291		56,885
Total Adjusted System Output (Adjusted for Peak Design conditions)	55,712	14,291		56,885
TIME OF SYSTEM PEAK		Aug 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 6 T/H Two Bed Units	1,850

ENGINEERING CHECKS

Number of Systems	2
Heating System	
Output per System	32,000
Total Output (Btuh)	64,000
Output (Btuh/sqft)	34.6
Cooling System	
Output per System	35,000
Total Output (Btuh)	70,000
Total Output (Tons)	5.8
Total Output (Btuh/sqft)	37.8
Total Output (sqft/Ton)	317.1
Air System	
CFM per System	1,200
Airflow (cfm)	2,400
Airflow (cfm/sqft)	1.30
Airflow (cfm/Ton)	411.4
Outside Air (%)	16.7 %
Outside Air (cfm/sqft)	0.22

Note: values above given at ARI conditions

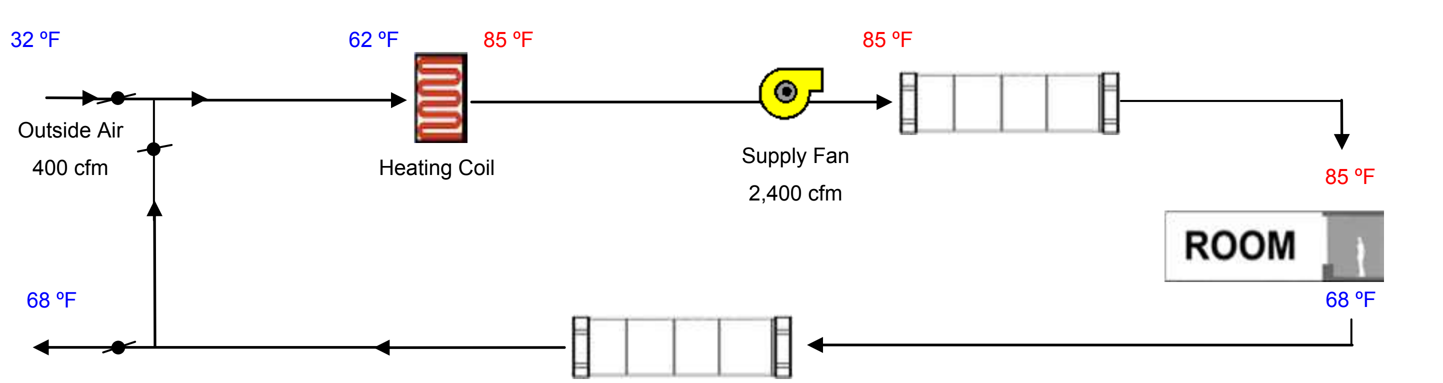
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	1,901	32,522	1,434	923	16,104
Return Vented Lighting		0			
Return Air Ducts		1,626			805
Return Fan		0			0
Ventilation	400	6,843	-915	400	14,931
Supply Fan		1,666			-1,666
Supply Air Ducts		1,626			805
TOTAL SYSTEM LOAD		44,283	519		30,980

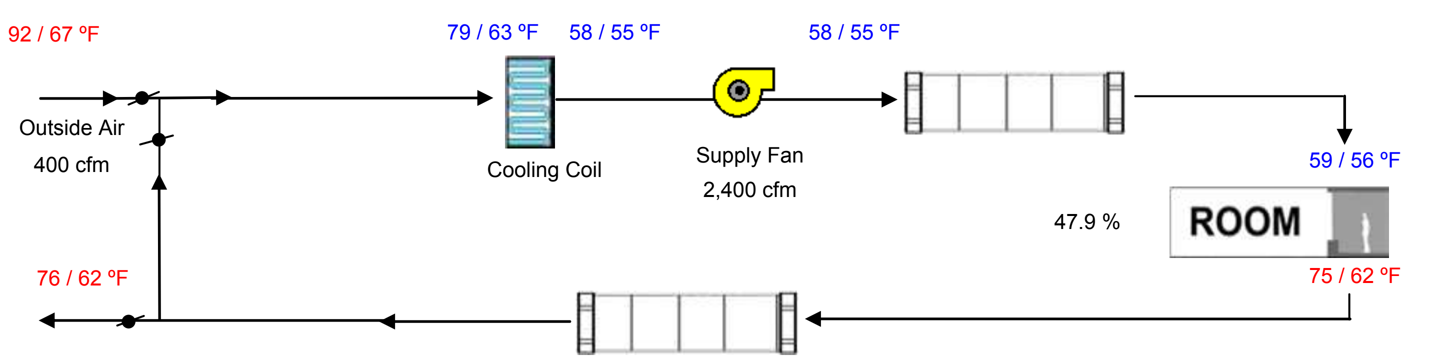
HVAC EQUIPMENT SELECTION

	Sensible	Latent	Sensible
Mitsubishi PUZ-A36NHA7/PEAD-A36AA7	59,307	7,851	46,675
Total Adjusted System Output (Adjusted for Peak Design conditions)	59,307	7,851	46,675
TIME OF SYSTEM PEAK	Sep 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 1 + Mezzanine Work/Live Units	5,242

ENGINEERING CHECKS

Number of Systems	4
Heating System	
Output per System	32,000
Total Output (Btuh)	128,000
Output (Btuh/sqft)	24.4
Cooling System	
Output per System	35,000
Total Output (Btuh)	140,000
Total Output (Tons)	11.7
Total Output (Btuh/sqft)	26.7
Total Output (sqft/Ton)	449.3
Air System	
CFM per System	1,200
Airflow (cfm)	4,800
Airflow (cfm/sqft)	0.92
Airflow (cfm/Ton)	411.4
Outside Air (%)	16.4 %
Outside Air (cfm/sqft)	0.15
Note: values above given at ARI conditions	

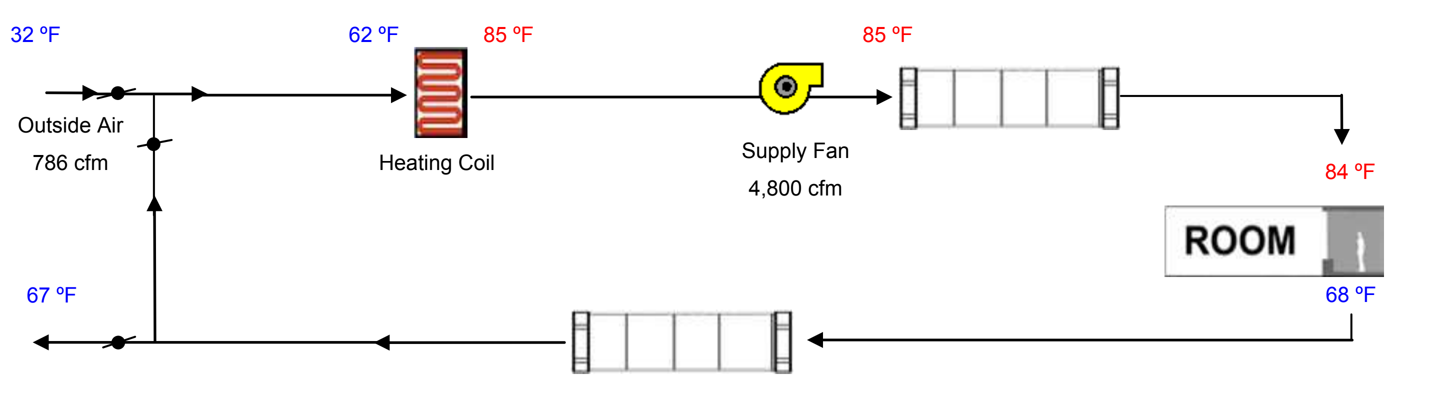
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	7,537	124,295	4,063	3,523	60,441
Return Vented Lighting		0			
Return Air Ducts		6,215			3,022
Return Fan		0			0
Ventilation	786	9,758	-2,072	786	29,120
Supply Fan		3,331			-3,331
Supply Air Ducts		6,215			3,022
TOTAL SYSTEM LOAD		149,814	1,990		92,273

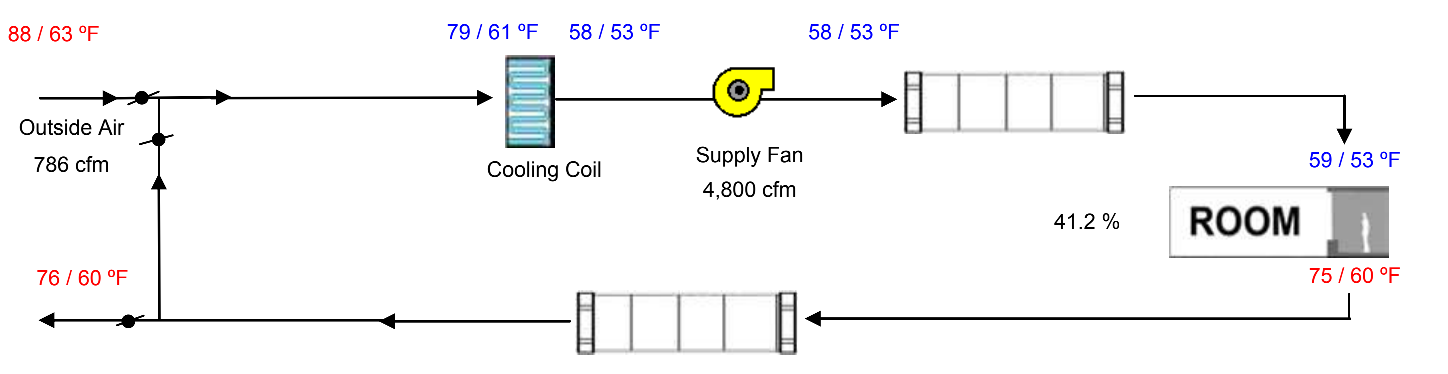
HVAC EQUIPMENT SELECTION

	Sensible	Latent		Sensible
Mitsubishi PUZ-A36NHA7/PEAD-A36AA7	128,873	3,802		93,350
Total Adjusted System Output (Adjusted for Peak Design conditions)	128,873	3,802		93,350
TIME OF SYSTEM PEAK		Oct 2 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name Central Park Apartments	Date 7/31/2019
System Name Mezzanine Level_Amenity Lounge	Floor Area 1,530

ENGINEERING CHECKS

Number of Systems	1
Heating System	
Output per System	56,000
Total Output (Btuh)	56,000
Output (Btuh/sqft)	36.6
Cooling System	
Output per System	57,000
Total Output (Btuh)	57,000
Total Output (Tons)	4.8
Total Output (Btuh/sqft)	37.3
Total Output (sqft/Ton)	322.1
Air System	
CFM per System	1,750
Airflow (cfm)	1,750
Airflow (cfm/sqft)	1.14
Airflow (cfm/Ton)	368.4
Outside Air (%)	43.7 %
Outside Air (cfm/sqft)	0.50
Note: values above given at ARI conditions	

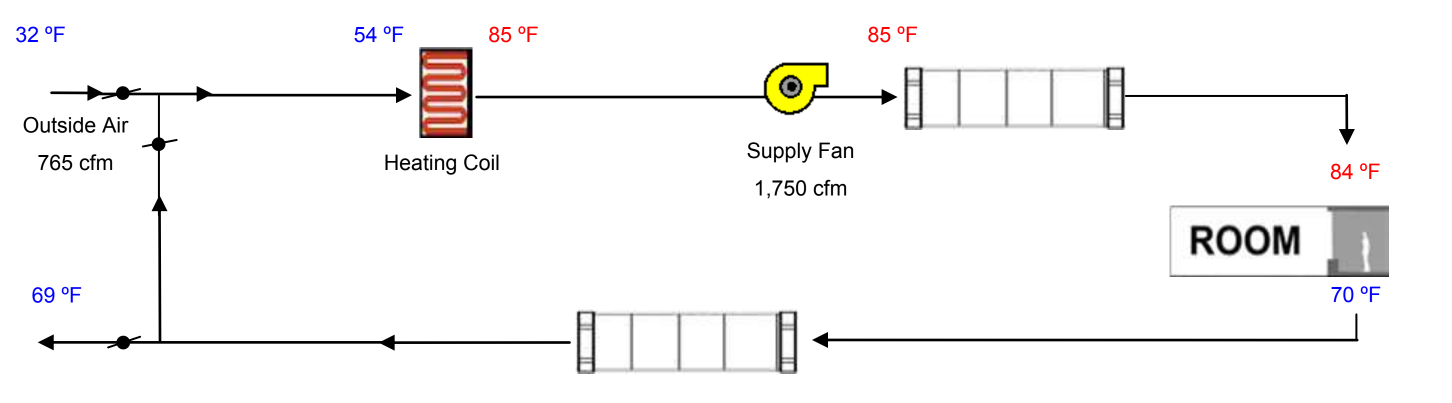
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	3,446	52,509	28,050	1,331	20,129
Return Vented Lighting		0			
Return Air Ducts		2,625			1,006
Return Fan		0			0
Ventilation	765	14,859	-14,750	765	29,973
Supply Fan		1,489			-1,489
Supply Air Ducts		2,625			1,006
TOTAL SYSTEM LOAD		74,108	13,300		50,626

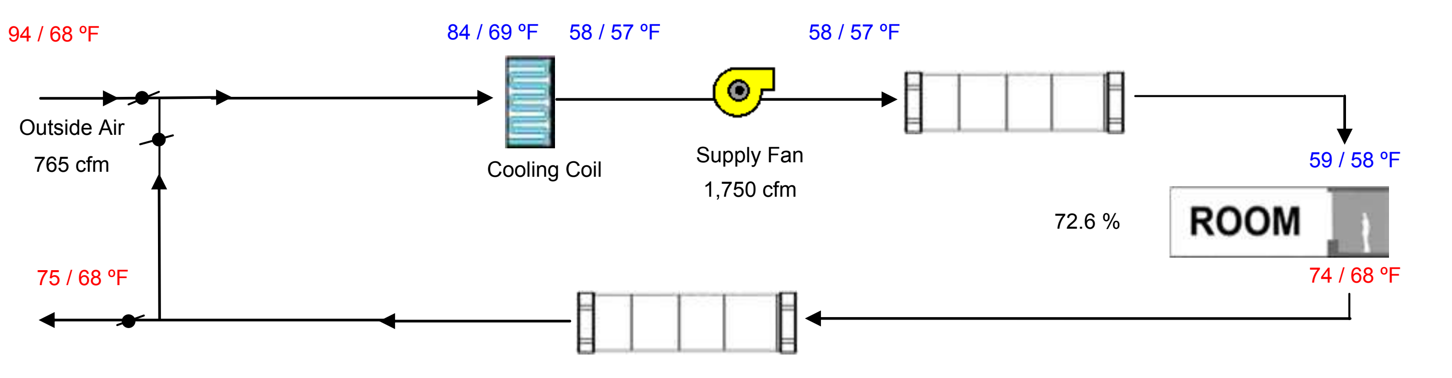
HVAC EQUIPMENT SELECTION

Carrier 25HBC560/FV4CNB006	46,309	12,765	40,841
Total Adjusted System Output (Adjusted for Peak Design conditions)	46,309	12,765	40,841
TIME OF SYSTEM PEAK		Jul 3 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments7	7/31/2019
System Name	**Floor Area**
Level 1 Retail Space	4,218

ENGINEERING CHECKS

Number of Systems	4
Heating System	
Output per System	56,000
Total Output (Btuh)	224,000
Output (Btuh/sqft)	53.1
Cooling System	
Output per System	57,000
Total Output (Btuh)	228,000
Total Output (Tons)	19.0
Total Output (Btuh/sqft)	54.1
Total Output (sqft/Ton)	222.0
Air System	
CFM per System	1,750
Airflow (cfm)	7,000
Airflow (cfm/sqft)	1.66
Airflow (cfm/Ton)	368.4
Outside Air (%)	12.1 %
Outside Air (cfm/sqft)	0.20

Note: values above given at ARI conditions

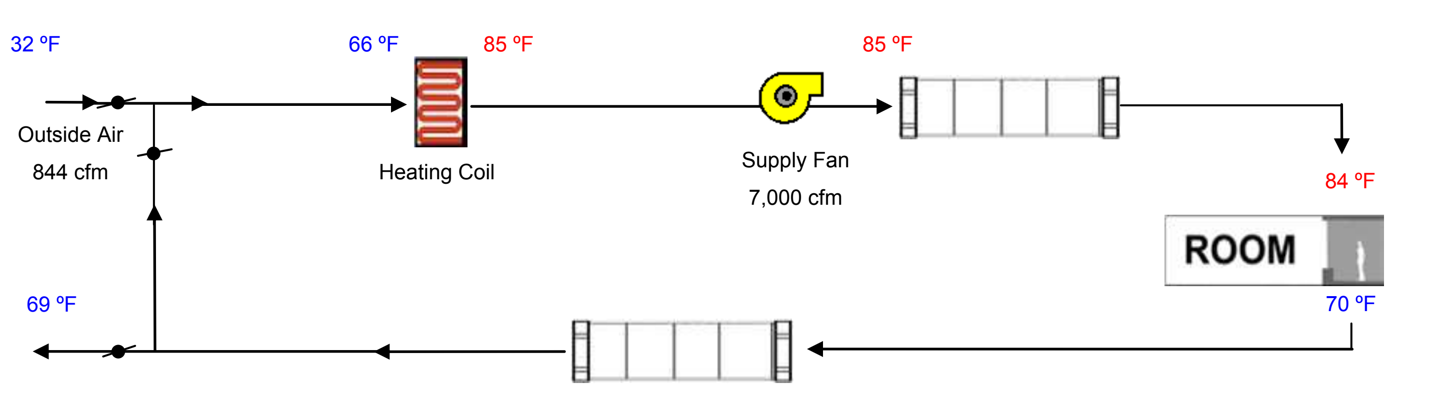
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	10,854	168,613	14,060	4,940	74,878
Return Vented Lighting		0			
Return Air Ducts		8,431			3,744
Return Fan		0			0
Ventilation	844	14,076	-4,243	844	33,087
Supply Fan		5,956			-5,956
Supply Air Ducts		8,431			3,744
TOTAL SYSTEM LOAD		205,506	9,817		109,496

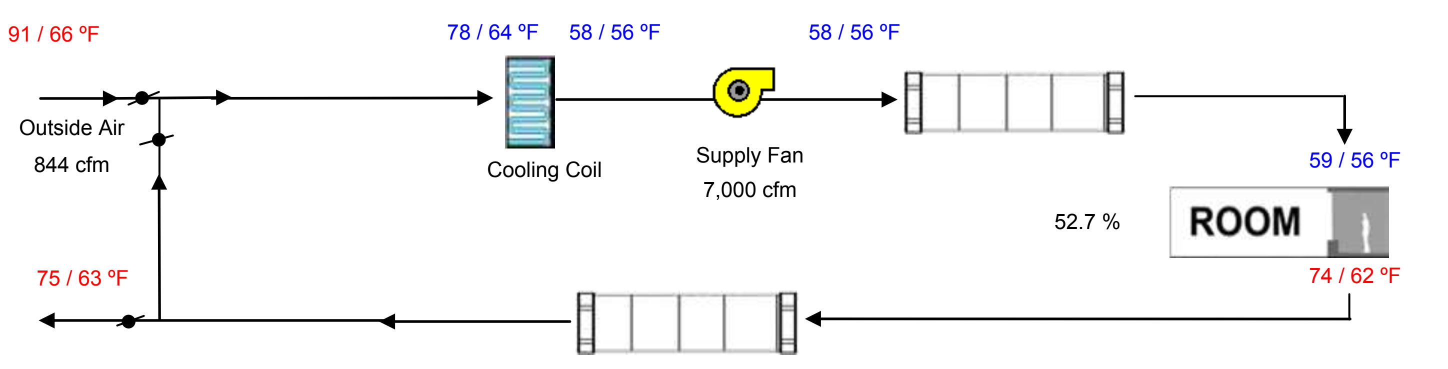
HVAC EQUIPMENT SELECTION

	Sensible	Latent		Sensible
Carrier 25HBC560/FV4CNB006	183,465	37,697		163,362
Total Adjusted System Output (Adjusted for Peak Design conditions)	183,465	37,697		163,362
TIME OF SYSTEM PEAK		Sep 4 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 1 Restaurant	1,974

ENGINEERING CHECKS

Number of Systems	3
Heating System	
Output per System	56,000
Total Output (Btuh)	168,000
Output (Btuh/sqft)	85.1
Cooling System	
Output per System	57,000
Total Output (Btuh)	171,000
Total Output (Tons)	14.3
Total Output (Btuh/sqft)	86.6
Total Output (sqft/Ton)	138.5
Air System	
CFM per System	1,750
Airflow (cfm)	5,250
Airflow (cfm/sqft)	2.66
Airflow (cfm/Ton)	368.4
Outside Air (%)	18.8 %
Outside Air (cfm/sqft)	0.50

Note: values above given at ARI conditions

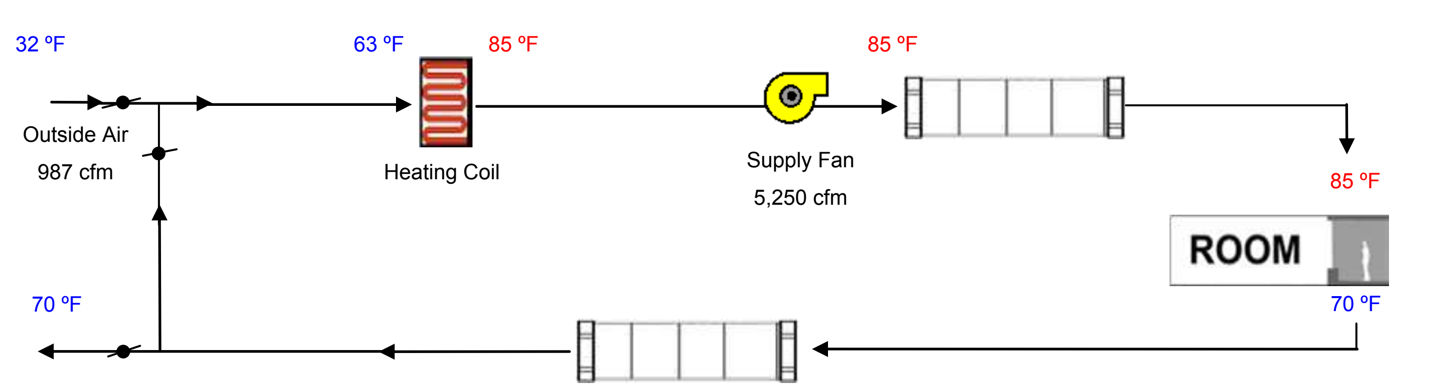
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	5,944	94,164	36,190	1,693	26,148
Return Vented Lighting		0			
Return Air Ducts		4,708			1,307
Return Fan		0			0
Ventilation	987	16,669	-10,461	987	38,993
Supply Fan		4,467			-4,467
Supply Air Ducts		4,708			1,307
TOTAL SYSTEM LOAD		124,716	25,729		63,289

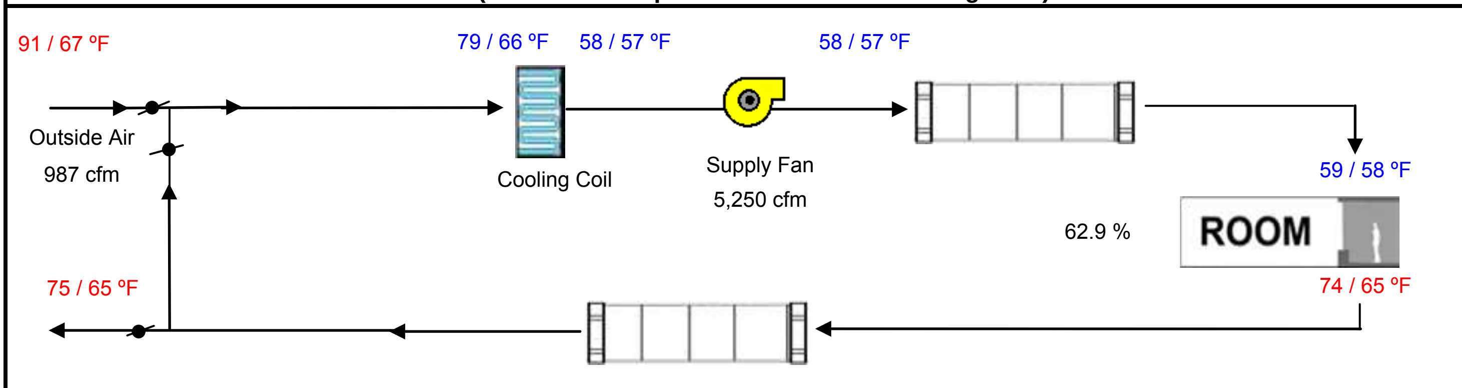
HVAC EQUIPMENT SELECTION

Carrier 25HBC560/FV4CNB006	126,123	46,880	122,522
Total Adjusted System Output (Adjusted for Peak Design conditions)	126,123	46,880	122,522
TIME OF SYSTEM PEAK		Jul 5 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 1 Lobby	2,369

ENGINEERING CHECKS

Number of Systems	2
Heating System	
Output per System	56,000
Total Output (Btuh)	112,000
Output (Btuh/sqft)	47.3
Cooling System	
Output per System	57,000
Total Output (Btuh)	114,000
Total Output (Tons)	9.5
Total Output (Btuh/sqft)	48.1
Total Output (sqft/Ton)	249.4
Air System	
CFM per System	1,750
Airflow (cfm)	3,500
Airflow (cfm/sqft)	1.48
Airflow (cfm/Ton)	368.4
Outside Air (%)	33.8 %
Outside Air (cfm/sqft)	0.50

Note: values above given at ARI conditions

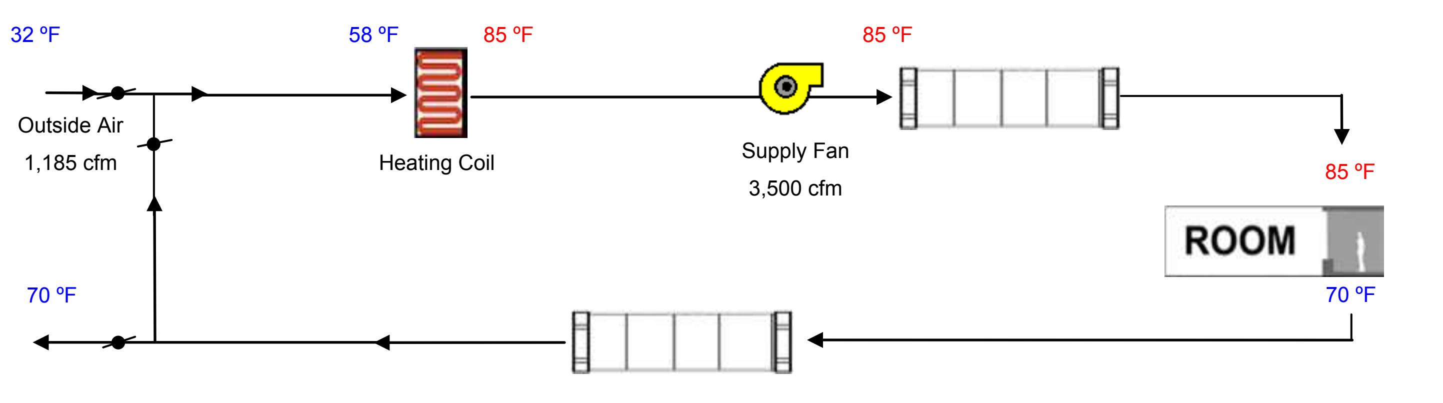
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	6,267	96,285	39,483	1,636	25,085
Return Vented Lighting		0			
Return Air Ducts		4,814			1,254
Return Fan		0			0
Ventilation	1,185	22,040	-17,358	1,185	46,666
Supply Fan		2,978			-2,978
Supply Air Ducts		4,814			1,254
TOTAL SYSTEM LOAD		130,931	22,126		71,282

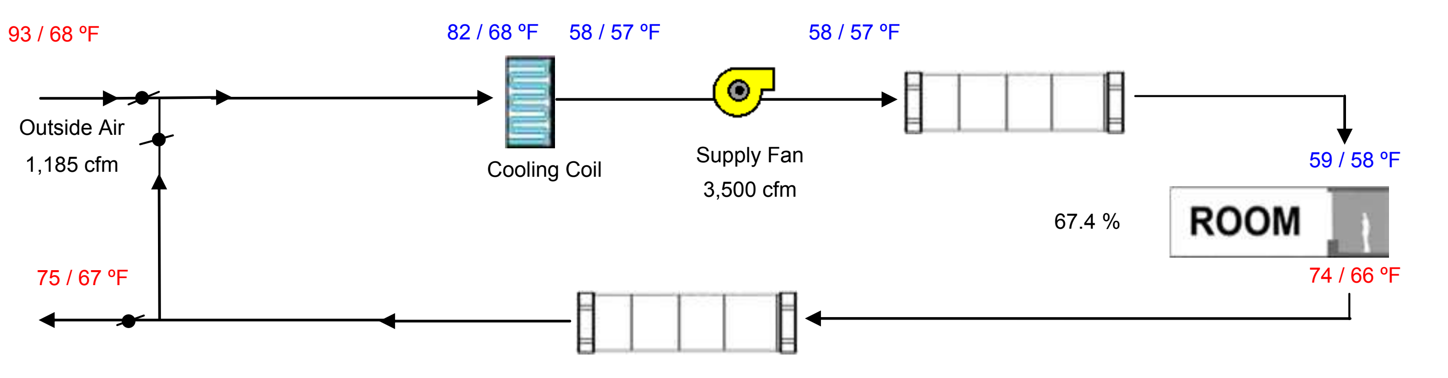
HVAC EQUIPMENT SELECTION

Carrier 25HBC560/FV4CNB006	89,462	27,282		81,681
Total Adjusted System Output (Adjusted for Peak Design conditions)	89,462	27,282		81,681
TIME OF SYSTEM PEAK		Jul 4 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 1 Leasing Office	590

ENGINEERING CHECKS

Number of Systems	1
Heating System	
Output per System	14,000
Total Output (Btuh)	14,000
Output (Btuh/sqft)	23.7
Cooling System	
Output per System	12,000
Total Output (Btuh)	12,000
Total Output (Tons)	1.0
Total Output (Btuh/sqft)	20.3
Total Output (sqft/Ton)	590.0
Air System	
CFM per System	450
Airflow (cfm)	450
Airflow (cfm/sqft)	0.76
Airflow (cfm/Ton)	450.0
Outside Air (%)	19.7 %
Outside Air (cfm/sqft)	0.15
Note: values above given at ARI conditions	

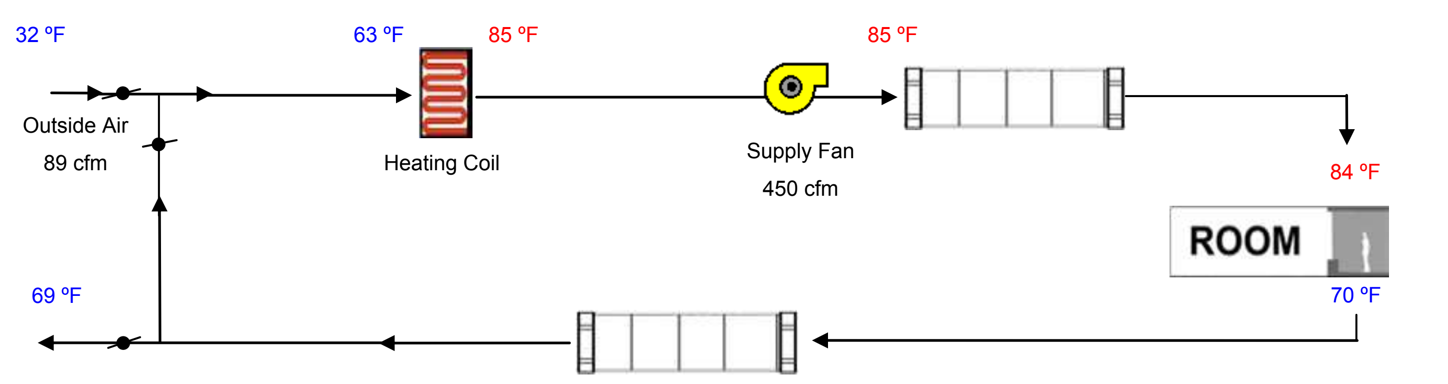
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	756	11,667	1,180	455	6,796
Return Vented Lighting		0			
Return Air Ducts		583			340
Return Fan		0			0
Ventilation	89	1,737	-507	89	3,452
Supply Fan		290			-290
Supply Air Ducts		583			340
TOTAL SYSTEM LOAD		14,861	673		10,637

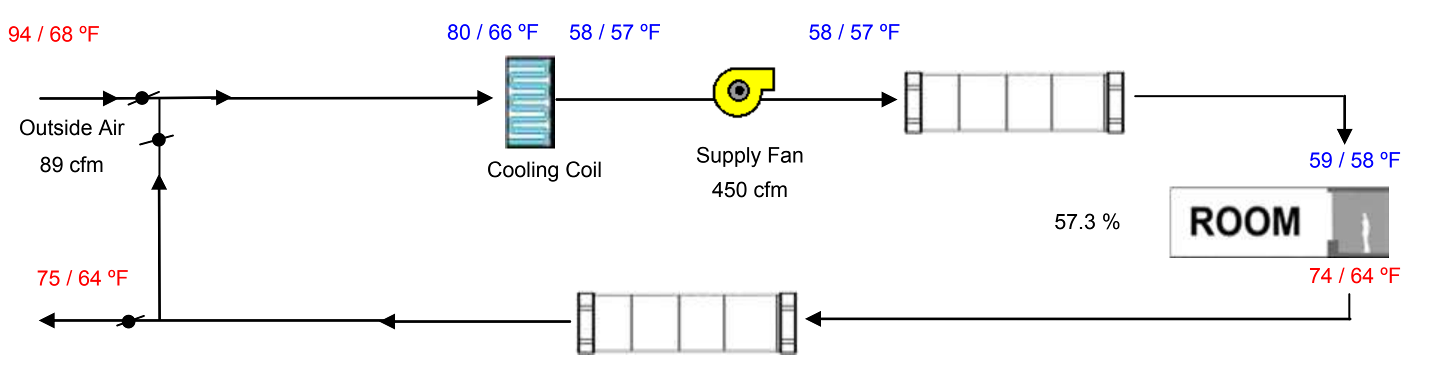
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A12NKA7/PEAD-A12AA7	9,435	2,345		10,210
Total Adjusted System Output (Adjusted for Peak Design conditions)	9,435	2,345		10,210
TIME OF SYSTEM PEAK		Jul 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Level 1 Amenity Space	788

ENGINEERING CHECKS

Number of Systems	1
Heating System	
Output per System	14,000
Total Output (Btuh)	14,000
Output (Btuh/sqft)	17.8
Cooling System	
Output per System	12,000
Total Output (Btuh)	12,000
Total Output (Tons)	1.0
Total Output (Btuh/sqft)	15.2
Total Output (sqft/Ton)	788.0
Air System	
CFM per System	450
Airflow (cfm)	450
Airflow (cfm/sqft)	0.57
Airflow (cfm/Ton)	450.0
Outside Air (%)	87.6 %
Outside Air (cfm/sqft)	0.50

Note: values above given at ARI conditions

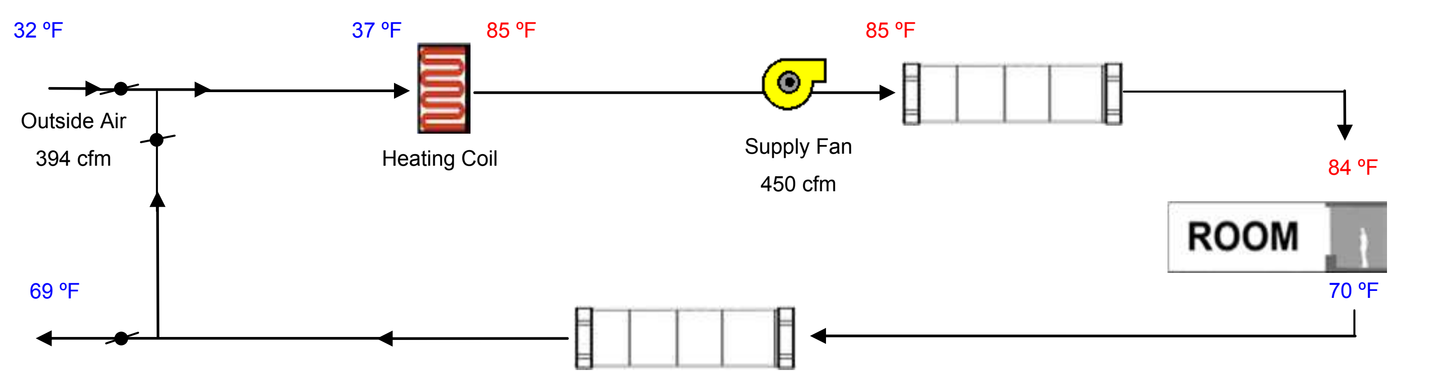
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	1,821	26,668	14,447	661	9,659
Return Vented Lighting		0			
Return Air Ducts		1,333			483
Return Fan		0			0
Ventilation	394	7,420	-13,332	394	15,241
Supply Fan		290			-290
Supply Air Ducts		1,333			483
TOTAL SYSTEM LOAD		37,045	1,115		25,575

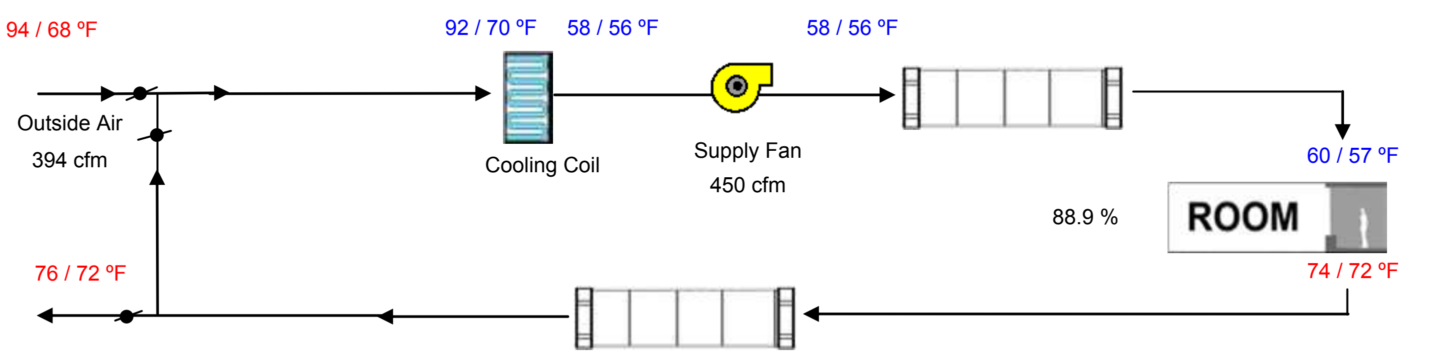
HVAC EQUIPMENT SELECTION

Mitsubishi PUZ-A12NKA7/PEAD-A12AA7	12,559	0		10,210
Total Adjusted System Output (Adjusted for Peak Design conditions)	12,559	0		10,210
TIME OF SYSTEM PEAK		Jul 3 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name	Date
Central Park Apartments	7/31/2019
System Name	**Floor Area**
Mezzanine Level_Gym	2,321

ENGINEERING CHECKS

Number of Systems	1
Heating System	
Output per System	56,000
Total Output (Btuh)	56,000
Output (Btuh/sqft)	24.1
Cooling System	
Output per System	57,000
Total Output (Btuh)	57,000
Total Output (Tons)	4.8
Total Output (Btuh/sqft)	24.6
Total Output (sqft/Ton)	488.6
Air System	
CFM per System	1,750
Airflow (cfm)	1,750
Airflow (cfm/sqft)	0.75
Airflow (cfm/Ton)	368.4
Outside Air (%)	19.9 %
Outside Air (cfm/sqft)	0.15

Note: values above given at ARI conditions

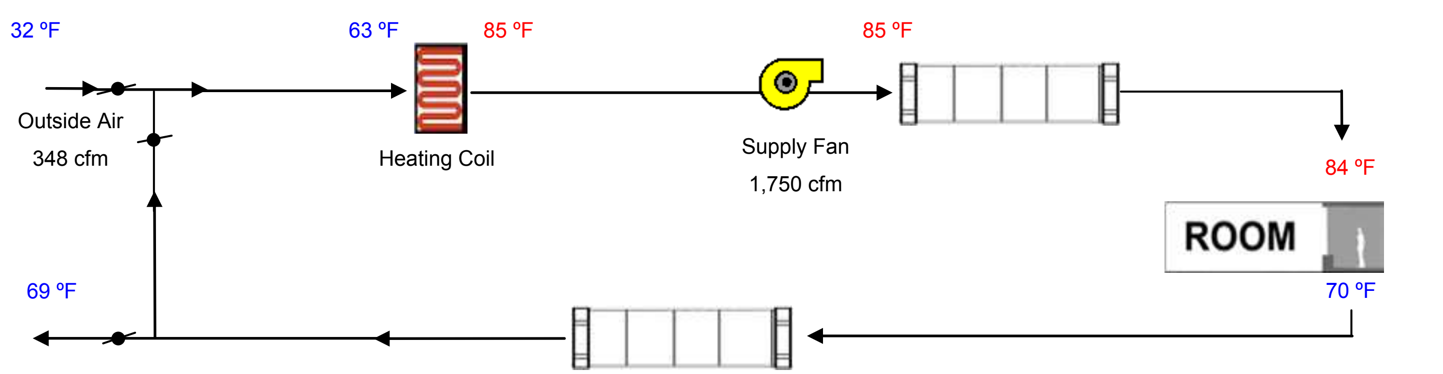
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	**Sensible**	**Latent**	**CFM**	**Sensible**
Total Room Loads	2,830	43,826	40,618	1,459	21,979
Return Vented Lighting		0			
Return Air Ducts		2,191			1,099
Return Fan		0			0
Ventilation	348	6,849	-9,963	348	13,622
Supply Fan		1,489			-1,489
Supply Air Ducts		2,191			1,099
TOTAL SYSTEM LOAD		56,547	30,654		36,310

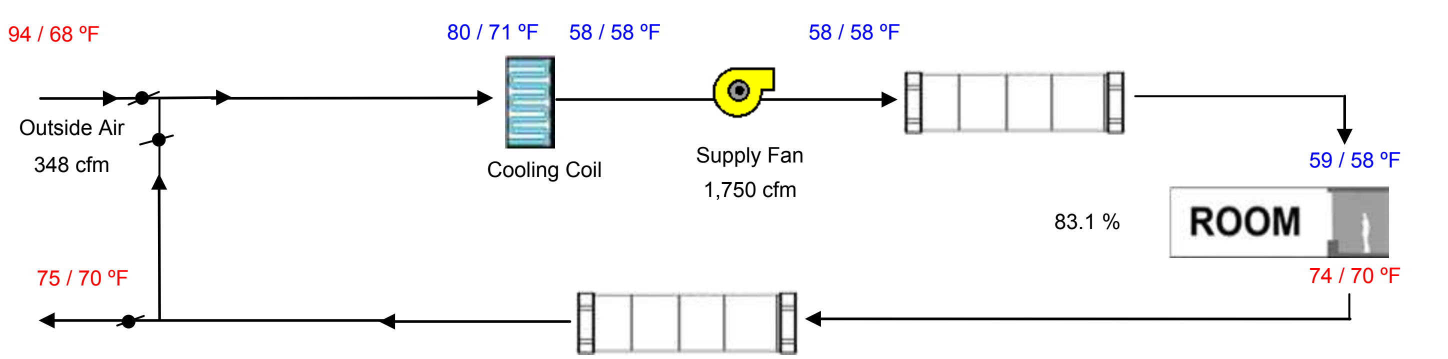
HVAC EQUIPMENT SELECTION

Carrier 25HBC560/FV4CNB006	34,959	25,994	40,841
Total Adjusted System Output (Adjusted for Peak Design conditions)	34,959	25,994	40,841
TIME OF SYSTEM PEAK		Jul 3 PM	Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



Architectural Resources Group

Central Park Apartments
86 S. Fair Oaks, Pasadena, CA

Appendix C: Draft Transportation Demand Management Plan

TRANSPORTATION DEMAND MANAGEMENT PLAN
FOR THE
CENTRAL PARK APARTMENTS
MIXED-USE DEVELOPMENT
PASADENA, CALIFORNIA

The City of Pasadena, California (City) requires large projects to meet the requirements of the City's Trip Reduction Ordinance and to prepare a project-level Transportation Demand Management (TDM) Plan to reduce the number of vehicle trips entering and leaving the project site.

PROJECT DESCRIPTION

The Central Park Apartments mixed-use project (Project) is located at 86 South Fair Oaks Avenue on the northeast corner of South Fair Oaks Avenue & East Dayton Street. The site currently contains a surface parking lot that serves the adjacent Green Hotel Apartments.

The Project includes the following land uses:

<u>Residential</u>	
Residential	84 dwelling units (DU)
Work/Live	4 DU within 5,245 square feet (sf)
<u>Commercial</u>	
Retail	4,218 sf
Restaurant	1,974 sf

The Project also includes amenities and ancillary space for the residential component, including fitness rooms, open space, and tenant leasing office space.

The Project will be contained in one building with an underground parking garage, as shown in Figure 1. The commercial space and work/live units will be located on the ground level.

A total of 195 parking spaces will be provided in the underground garage. In addition, the Project will also provide 20 bicycle spaces (16 long-term bicycle spaces and four short-term bicycle spaces).

SITE CONDITIONS AFFECTING COMMUTE TRAVEL

The Project site is located on the Fair Oaks Avenue corridor and approximately 800 feet to the northwest of the Del Mar Gold Line Station, so it is ideally located to take advantage of the adjacent shopping, restaurant, and employment opportunities and the rail service connecting the Project to the region.

PARKING REQUIREMENTS

Per the City's Municipal Code (Code), the residential component requires one parking space per unit for units under 650 sf and a minimum of 1.5 spaces per unit over 650 sf, the retail space requires three spaces per 1,000 sf, and the restaurant space requires 10 spaces per 1,000 sf. With a 25% reduction in commercial parking because the Project is a transit-oriented development, the total Code requirement for parking is 142 parking spaces.

In addition to the Code-required spaces, the Project will provide 53 replacement parking spaces in a joint parking arrangement with the Green Hotel Apartments to replace the surface parking spaces that will be displaced as part of the Project. This results in a total parking requirement of 195 parking spaces.

TDM

As previously stated, the Project will be subject to the citywide Trip Reduction Ordinance and a Project-level TDM Plan. Both programs are described below.

Trip Reduction Ordinance

The Trip Reduction Ordinance requires that projects:

1. Hire a Transportation Coordinator

   A Project employee will be designated as the Transportation Coordinator for the site and that employee will be trained/certified by the Los Angeles County Metropolitan Transportation Authority (Metro) (or equivalent). The Transportation Coordinator will be responsible for implementing, coordinating and maintaining the elements of the Trip Reduction Ordinance and the TDM Plan. The identity of the Transportation Coordinator will be given to the City prior to the issuance of the Certificate of Occupancy (COO).

2. Install and maintain a Transportation Information Center in a prominent space on-site

   The Transportation Information Center will be placed in the residential mail room so that it is accessible to all of the residents of the Project. The information center will likely be an information board that will contain the name and phone number of the Transportation Coordinator plus the following information:
   - Maps, routes and schedules for transit service to the site
   - Telephone numbers and web site information for rideshare agencies and local transit operators
   - Ridesharing promotional materials

- Bicycle routes and facility information
- Listing of available facilities for bicyclists, carpoolers, pedestrians, transit riders, and vanpoolers at the site

3. Provide a commitment by the Owner to:

   - Agree to conduct an annual Project traffic count of the Project driveway in accordance with the procedures below to verify the level of Project vehicular trips (VT).
     - The count will be conducted over a three-day consecutive weekday time period (Tuesday-Thursday) during a week with no state holidays and when Pasadena Unified School District (PUSD) schools are in session.
     - The measure of the daily Project VT will be the average of the three days of counts.
     - The vehicle count shall be taken at the Project driveway, not in the right-of-way.

   - Agree to prepare the annual traffic count in perpetuity or until the Project VT target is met for a period of five consecutive years, at which time the City would release the obligation in writing.

4. Provide Class 2 bicycle parking spaces at the rate of one space per six DU plus four spaces for non-residential uses less than 15,000 sf.

5. The project is subject to the Traffic Reduction and Transportation Improvement Fee (Ordinance No. 7076). For FY 2020, fees are $8.63 per sf for new office use, $11.46 per new retail use, and $3,662.53 per new multi-family dwelling unit. Projects shall pay the impact fees in effect at the time when the first building permit is issued.

Project-Level TDM Plan

Program Elements. The Project-level TDM Plan would acknowledge the Project VT target, which, based on information provided by the City, is 866 trips per day at full occupancy.

The Project will conduct a driveway traffic count at the Project driveway and summarize the number of vehicle trips in and out of the Project site. The count will be conducted over a three-day consecutive weekday time period (Tuesday-Thursday) during a week with no state holidays and during a week when PUSD schools are in session. The measure of the daily Project VT will be the average of the three days of counts.

The driveway traffic count will continue in perpetuity or until the fully-occupied Project meets its VT target for a period of five consecutive years, at which time the Project would be released from further counts by the City in a written staff report.

The owner shall place a deposit with the Department of Transportation prior to the issuance of the first permit for construction. This deposit is subject to a partial refund if the full deposit is not needed or additional billing in the event that the deposit amount is not sufficient to cover the cost of the review. The owner shall pay an annual TDM status report review fee in compliance with the requirements of the Trip Reduction Ordinance.

TDM Measures. The TDM Plan will include the following measures:

Tier 1 Strategies:

a. Shower and locker facilities for Project employees

   The Project will provide shower and locker facilities for Project employees, including retail and restaurant employees, to encourage walking and biking to/from the Project.

b. Unbundled parking for the residential uses

   Monthly parking fees will be separated from the monthly residential lease payments and paid separately. The parking fees could be paid on a monthly, quarterly, or annual basis. The unbundled parking will not apply to the replacement spaces provided for the Green Hotel Apartments.

c. Transportation information packet for new residents and employees

   Each new resident and employee in the Project will receive an information packet summarizing the transit and transportation alternatives available to Project tenants. The packet will emphasize the location of the Transportation Information Center and include the contact information of the Transportation Coordinator.

d. Electric vehicle (EV) charging stations

   The Project parking garage will include six spaces with EV charging stations as well as 49 spaces wired for future EV charging stations. The actual EV charging stations at each wired space will be implemented as the demand grows.

e. No overnight parking permits

   The Project will not issue any overnight parking permits to any future residents of the Project.

f. Carpool/Vanpool parking

   The Project will mark a minimum of 10% of the employee parking spaces as carpool/vanpool parking only. These spaces will be more conveniently located to the place of employment than parking spaces for single occupant vehicles and as close as possible to the employee entrances.

g. Subsidized transit passes for Project residents and employees

The Project will purchase 10 monthly (or annual) Metro EZ transit passes and offer them to residents at a 50% discount for five consecutive years from the issuance of the COO.

Alternatively and preferably, at the time of the issuance of the COO, if Metro has expanded its employee-based “whole building” transit passes to residential projects, the Project will purchase 44 annual passes and offer them to employees and residents at a 50% discount for five consecutive years from the issuance of the COO.

h. Bus stop improvements

The Project shall fund improvements at the bus stops serving the property in coordination with the City Transit Division.

Tier 2 Strategies (to be Implemented sequentially if the Tier 1 strategies do not achieve the target VT):

a. On-site Mobility Hub location/support

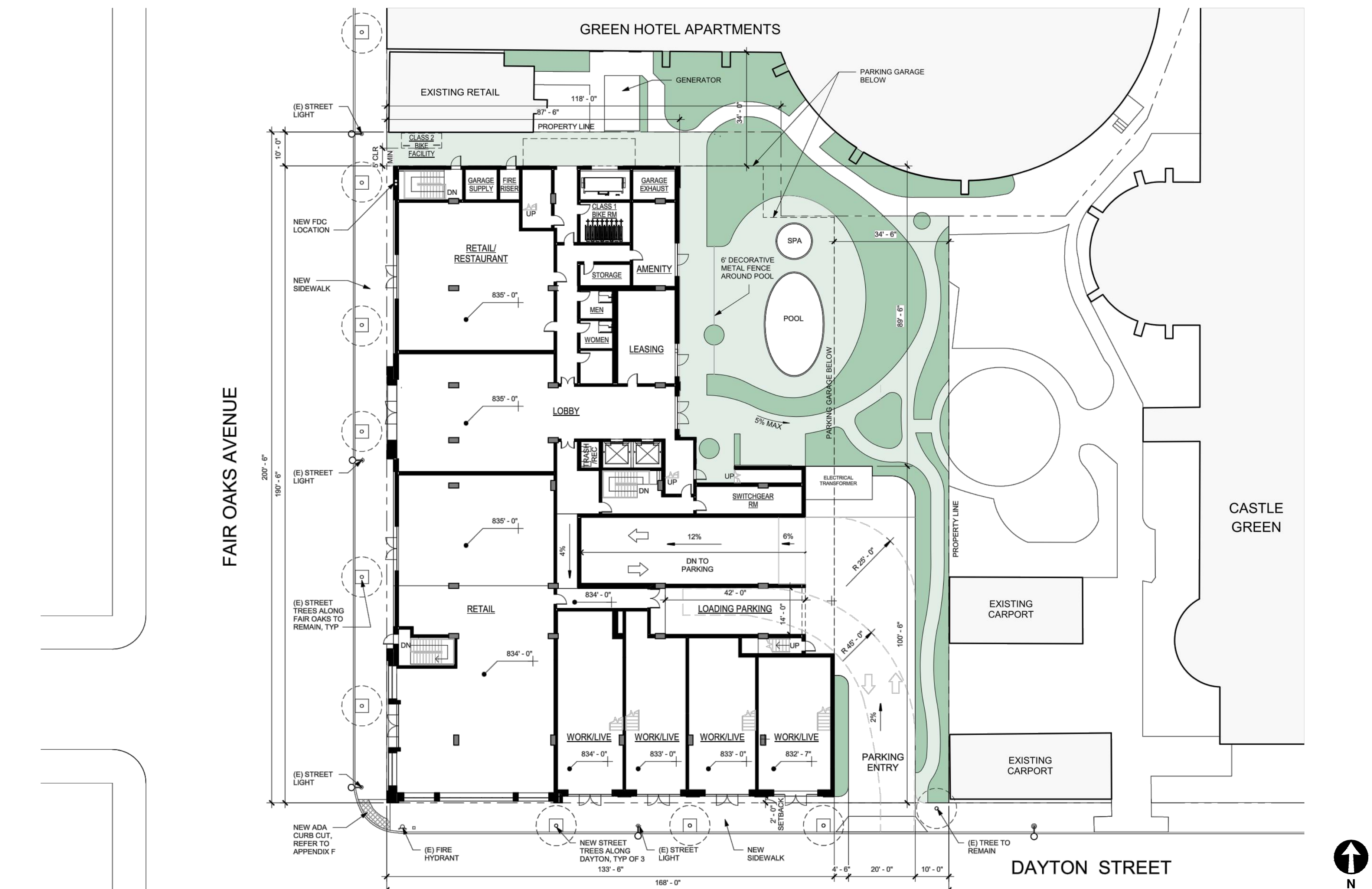
The Project will consolidate its bike share, car share, Transportation Information Center, and Transportation Coordinator into an on-site Mobility Hub in order to further promote non-auto modes of transportation. The Mobility Hub will work in concert with the City and with Metro to provide alternate transportation services to the Project and area residents and employees. The Project will be responsible for providing rent-free space for the Mobility Hub at a location and size mutually agreeable to the developer and the City or Metro.

Alternatively, given the Project’s location near the Del Mar Gold Line Station, the Project will agree to contribute $2,500 per year for a period of five years to be used for Mobility Hub improvements at the Del Mar Station.

b. Financial support for an areawide Transportation Management Organization (TMO)

Should the Project fail to meet the VT target for five consecutive years and after two years of failure of the above measures to yield sufficient results to meet the target, the Project will agree to pay $20,000 toward the initial set-up costs for an areawide TMO that serves the Project site and the surrounding area. The TMO will be run by the City or by a separate Board of Directors and a Project representative will have a seat on the Board. The Project will pay annual dues of $5,000 per year for an additional nine years beyond the initial TMO founding.

Gibson transportation consulting, inc.



Source: Architectural Resources Group, 2019.

PROJECT SITE PLAN	FIGURE 1

APPENDIX D

86 Fair Oaks Historic Resources Technical Report

CONFIDENTIAL DRAFT FOR INTERNAL REVIEW ONLY

86 South Fair Oaks Avenue
Historic Resources Technical Report
October 2020

HISTORIC RESOURCES GROUP
12 S. Fair Oaks Avenue, Suite 200, Pasadena, CA 91105-3816
Telephone 626 793 2400, Facsimile 626 793 2401
www.historicresourcesgroup.com

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PREPARED FOR

Impact Sciences
28 N. Marengo Avenue
Pasadena, California 91101

86 South Fair Oaks Avenue Historic Resources Technical Report

HISTORIC RESOURCES GROUP

A new development is proposed for an existing surface parking lot and landscaped area within in the City of Pasadena (the "Project"). The surface parking lot is located at 86 South Fair Oaks Avenue, which is within the Old Pasadena Historic District and is within the boundary of a National Register listed property (the "Project Site").

The purpose of this technical report is to determine if historical resources[1] as defined by the California Environmental Quality Act (CEQA)[2] are present on or adjacent to the Project Site and, if so, to identify potential impacts to historical resources by the proposed Project. This report is intended to inform environmental review of the proposed Project.

Under CEQA the potential impacts of a project on historical resources must be considered. The purpose of CEQA is to evaluate whether a proposed project may have a significant adverse effect on the environment and, if so, if that effect can be reduced or eliminated by pursuing an alternative course of action or through mitigation measures.

The impacts of a project on an historical resource may be considered an environmental impact. CEQA states that:

A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.[3]

Thus, an evaluation of project impacts under CEQA requires a two-part inquiry: (1) a determination of whether the project site contains or is adjacent to a historically significant resource or resources, and if so, (2) a determination of whether the proposed project will result in a "substantial adverse change" in the significance of the resource or resources. This report investigates the proposed Project Site to determine if historic resources exist either within or adjacent to its boundaries and analyzes project impacts for any adverse change in the significance of such resources.

This report contains:

[1] For the purposes of this report the term "historical" will be used in reference to CEQA. CEQA defines a historical resource as a resource listed in, or determined eligible for listing, in the California Register of Historical Resources. Otherwise, the term "historic" will be used.

[2] California PRC, Section 21084.1.

[3] Ibid.

- A review of the existing properties within, adjacent to, and in the near vicinity of the Project Site.
- A review of any previous evaluations of properties on or in the vicinity of the Project Site through historic survey or other official action.
- Analysis and evaluation of any potential historic resources.
- Review of the required consideration of historic resources under the California Environmental Quality Act (CEQA).
- Analysis of potential adverse effects of the proposed Project to historic resources and suggested mitigation measures.

This report was prepared using sources related to the Project Site's development. The following primary and secondary sources were consulted:

- Sanborn Fire Insurance maps
- Historic photographs, aerial photographs, and local histories
- National Register of Historic Places Inventory nomination forms
- Architectural and Historical Inventory, City of Pasadena
- List of Designated Historic Properties, City of Pasadena
- Archival sources from the Pasadena Museum of History
- Local History Collection, the *Pasadena Star-News* Archives, and the *Los Angeles Times* Archives.

Research, field inspection, and analysis were performed by Laura Janssen, Senior Architectural Historian; Paul Travis, Managing Principal; Christine Lazzaretto, Principal and Peyton Hall, Principal Architect; all qualified professionals who meet or exceed the Secretary of the Interior's Professional Qualification Standards.[4]

[4] Federal Register, Vol. 48, No. 190, pp. 44738-44739, September 29, 1983.

2.1 Project Location

The City of Pasadena is located approximately 10 miles northeast of the City of Los Angeles in the County of Los Angeles. Regional access to the City is provided by State Route 134 (SR 134), Interstate 210 (I-210 or Foothill Freeway), State Route 110 (SR 110), and Interstate 710 (I-710). The Project location is identified in Figure 1.

The Project site at 86 S. Fair Oaks Avenue contains 32,362 square feet bounded by S. Fair Oaks Avenue to the west, Dayton Street to the south, Castle Green to the east, and the Green Hotel Apartments to the north. The Project site is located within the boundaries of the Old Pasadena National Register Historic District and the Hotel Green National Register listing. The Project site, which currently houses a surface parking lot with landscaping, outdoor furniture for the adjacent Green Hotel Apartments and an advertising billboard, is zoned The project site is zoned CD-1 (Central District Specific Plan Sub-district 1, Old Pasadena Subdistrict) and has a General Plan Land Use designation of High Mixed Use . It is also located within 1,000 feet of the Metro Gold Line Del Mar Station, making the Project a transit-oriented development.

2.2 Project Overview

The proposed Project is a 6-story plus mezzanine transit-oriented mixed-use development that includes retail, restaurants, and work/live units at the ground level and mixed-rate apartment units on levels 2-6. Using height averaging, the building height would average 69 feet with a maximum roof height to 90 feet. Along Fair Oaks Avenue, the ground floor of the proposed building includes approximately 6,200 square feet of retail and food uses. Four work/live units, approximately 1,300 square feet each, are proposed in the ground floor along Dayton Street, facing Central Park. The proposed Project contains 84 apartment units (24 studios, 37 one-bedroom flats, three (3) one-bedroom townhouses, 18 two-bedroom flats, and two (2) two-bedroom townhouses), including eight (8) on-site residences for very low-income residents. All parking for the proposed project would be located in four (4) levels of underground parking that accommodate 195 parking spaces, including replacement of existing parking spaces for the adjacent Green Hotel Apartments, which currently utilizes the surface parking located on the project site. Access to and from the proposed Project site would be along Dayton Avenue on the southeast corner of the proposed Project site.

[5] Description of existing conditions and the proposed project as stated in the Project Environmental Impact Report. (add source, date)

The proposed Project would include amenity space for project residents, including a swimming pool and spa with cabana and changing rooms, gym, lounge and multiple roof decks/terraces.

The proposed project would provide 16,231 sf of open space, which would be divided between approximately 12,037 sf of hardscape and 4,194 sf of landscape (softscape). Landscaping for the proposed project would include native and adaptive species that are drought tolerant. The proposed project would include 38 new trees, including one 96″ box tree, 10 - 60″ box trees, 21 - 24″ box trees and 6 – 36″ box trees..

Figure 1: Project Location

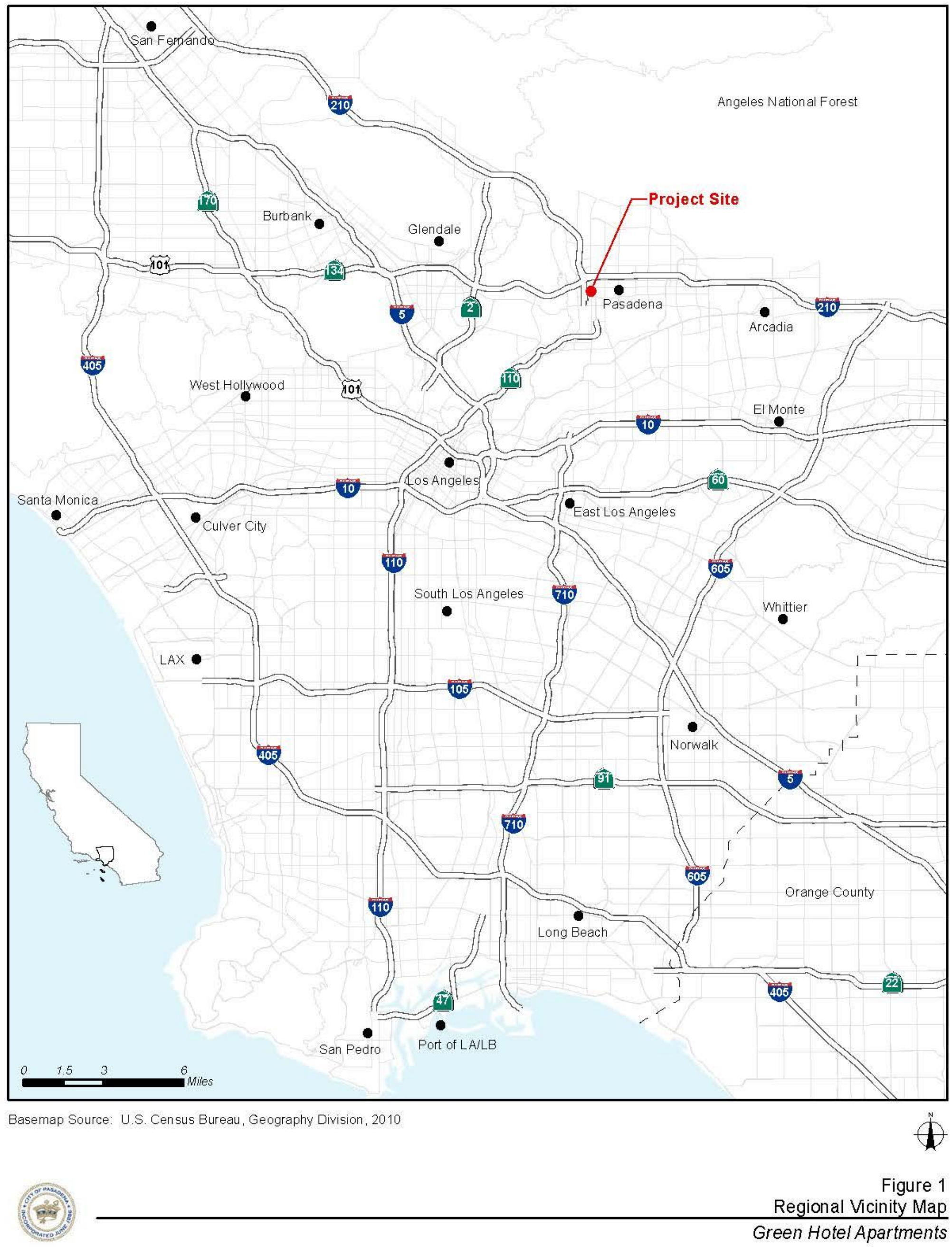
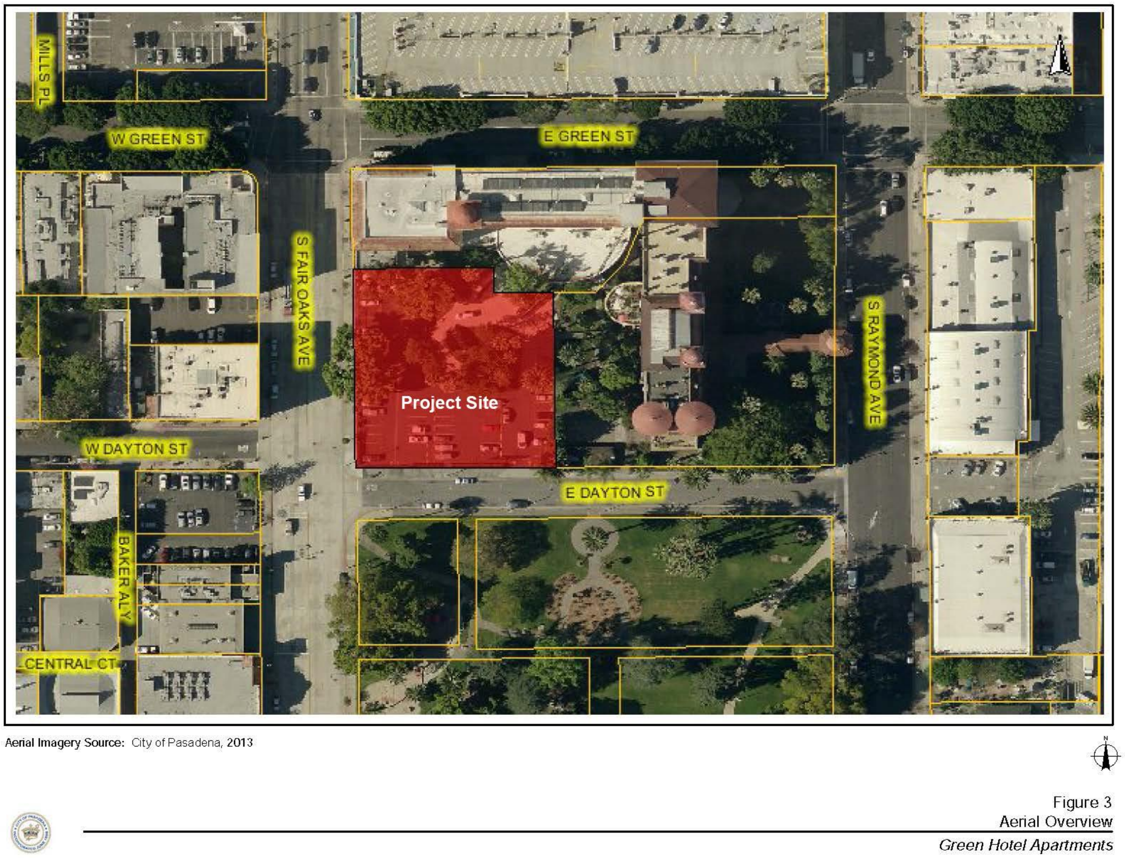


Figure 2: Project Vicinity

Figure 3: Project Site



3.1 Site Description

The project site is rectangular and approximately 32,362 square feet in area. The site is flat, and is currently utilized as a surface parking lot, which contains a billboard, and landscaped areas with twenty-seven trees. Nine of the trees onsite and all of the adjacent street trees are protected under the City Trees and Tree Protection Ordinance. The Project site is located within an urban area on one of the City's main commercial streets and is surrounded by residential, commercial, retail, and recreational land uses.

The Project site is located within the Old Pasadena Historic District which is listed in the National Register of Historic Places (1983; revised 2008). In addition, the Project site is located within the boundary of the Hotel Green/Castle Green property, which was listed individually in the National Register of Historic Places in 1982. By virtue of being listed in the National Register, both the Old Pasadena Historic District and the Hotel Green/Castle Green property are also listed in the California Register of Historical Resources. At the local level in the City of Pasadena, the Hotel Green/Castle Green was designated as a Historic Monument in 1997.[6]

The boundaries of the Hotel Green/Castle Green as defined in the original National Register registration form are: "The square block bounded by Raymond Avenue on the east, Green Street on the north, Fair Oaks [A]venue on the west and Dayton Street on the south."[7] Thus, the entire block, which includes the Project site, is listed as a historic property in the National Register and California Register.

Across Dayton Street to the south is Central Park, a 9.2-acre park which is also a contributing resource to the Old Pasadena Historic District. Across Fair Oaks Avenue to the west are three- to four-story mixed-use buildings and parking lots, and across Raymond Avenue to the east are one- and two-story commercial buildings. See a more detailed description of adjacent structures that are contributing and non-contributing to the Old Pasadena Historic District in Section 5.2 of this report.

The Los Angeles County Metropolitan Transportation Authority (Metro) Del Mar Gold Line Light Rail Station is located less than a quarter of a mile to the southeast of the Project site along Raymond Avenue just north of Del Mar Boulevard.

[6] When the Hotel Green/Castle Green was designated locally in 1997 it was as a Historic Treasure. The Pasadena Municipal Code was subsequently modified in 2005 and all Historic Treasure designations became Historic Monuments.

[7] "Hotel Green" National Register of Historic Places Inventory – Nomination Form, 1982.

The Project site is located within the Central District Specific Plan. The Specific Plan area encompasses 960 acres corresponding to the areas recognized by Pasadena residents as "downtown." Included within the boundaries of the Specific Plan area are activity centers known as Old Pasadena, the Civic Center, the Playhouse District, and South Lake Avenue. Significant uses and structures within the Central District Specific Plan include the Old Pasadena Historic District, which includes the existing historic Green Hotel Apartments and Castle Green; Pasadena Playhouse and Pasadena Playhouse Historic District; and the Pasadena Civic Center Historic District, among others.

Site photographs are included in Appendix A.

4.1 Historical Resources under CEQA

CEQA requires that environmental protection be given significant consideration in the decision-making process. Historical resources are included under environmental protection. Thus, any project or action which constitutes a substantial adverse change to a historical resource also has a significant effect on the environment pursuant to the State CEQA Guidelines.

When the California Register of Historical Resources was established in 1992, the Legislature amended CEQA to clarify which cultural resources are significant, as well as which project impacts are considered to be significantly adverse. A "substantial adverse change" means "demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired."

CEQA defines a historical resource as a resource listed in, or determined eligible for listing, in the California Register of Historical Resources. All properties on the California Register are to be considered historical under CEQA. However, because a property does not appear on the California Register does not mean it is not significant and therefore exempt from CEQA consideration. All resources determined eligible for the California Register are also to be considered under CEQA.

The courts have interpreted CEQA to create three categories of historical resources:

- *Mandatory historical resources* are resources "listed in, or determined to be eligible for listing in, the California Register of Historical Resources."
- *Presumptive historical resources* are resources "included in a local register of historical resources, as defined in subdivision (k) of Section 5020.1, or deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1" of the Public Resources Code, unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant.
- *Discretionary historical resources* are those resources that are not listed but determined to be eligible under the criteria for the California Register of Historical Resources.[8]

To simplify the first three definitions provided in the CEQA statute, an historical resource is a resource that is:

[8] *League for the Protection of Oakland's Architectural and Historic Resources vs. City of Oakland*, 52 Cal. App. 4^{th} 896, 906-7 (1997).

- Listed in the California Register of Historical Resources (California Register);
- Determined eligible for the California Register by the State Historical Resources Commission; or
- Included in a local register of historical resources.

Section 15064.5 of the CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3) supplements the statute by providing two additional definitions of historical resources, which may be simplified in the following manner. An historical resource is a resource that is:

- Identified as significant in an historical resource survey meeting the requirements of Public Resources Code 5024.1(g);
- Determined by a Lead Agency to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the Lead Agency's determination is supported by substantial evidence. Generally, this category includes resources that meet the criteria for listing on the California Register (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4852).

The fact that a resource is not listed in, or determined eligible for listing in, the California Register, not included in a local register of historical resources, or not deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1, does not preclude a lead agency from determining that the resource may be an "historical resource" for purposes of CEQA.

Properties formally determined eligible for listing in the National Register of Historic Places are automatically listed in the California Register. Properties designated by local municipalities can also be considered historical resources. A review of properties that are potentially affected by a project for historic eligibility is also required under CEQA.

4.2 Historic Designations

A property may be designated as historic by National, State, and local authorities. In order for a building to qualify for listing in the National Register or the California Register, it must meet one or more identified criteria of significance. The property must also retain sufficient architectural integrity to continue to evoke the sense of place and time with which it is historically associated.

National Register of Historic Places

The National Register of Historic Places is an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment.[9] The National Park Service administers the National Register program. Listing in the National Register assists in preservation of historic properties in several ways including: recognition that a property is of significance to the nation, the state, or the community; consideration in the planning for federal or federally assisted projects; eligibility for federal tax benefits; and qualification for Federal assistance for historic preservation, when funds are available.

To be eligible for listing and/or listed in the National Register, a resource must possess significance in American history and culture, architecture, or archaeology. Listing in the National Register is primarily honorary and does not in and of itself provide protection of an historic resource. The primary effect of listing in the National Register on private owners of historic buildings is the availability of financial and tax incentives. In addition, for projects that receive Federal funding, a clearance process must be completed in accordance with Section 106 of the National Historic Preservation Act. Furthermore, state and local regulations may apply to properties listed in the National Register.

The criteria for listing in the National Register follow established guidelines for determining the significance of properties. The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects:

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

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

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 high artistic values, 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.[10]

[9] 36CFR60, Section 60.2.
[10] 36CFR60, Section 60.3.

In addition to meeting any or all of the criteria listed above, properties nominated must also possess integrity of *location, design, setting, materials, workmanship, feeling,* and *association.*

Historic Districts

Standard preservation practice evaluates collections of buildings from similar time periods and historic contexts as historic *districts*. The National Park Service defines a historic district as "a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development."[11] A historic district derives its significance as a single unified entity.

According to the National Park Service, "a district can comprise both features that lack individual distinction and individually distinctive features that serve as focal points. It may even be considered eligible if all of the components lack individual distinction, provided that the grouping achieves significance as a whole within its historic context. In either case, the majority of the components that add to the district's historic character, even if they are individually undistinguished, must possess integrity, as must the district as a whole." Some examples of districts include business districts, college campuses, large estates, farms, industrial complexes, residential areas and rural villages.[12]

Resources that have been found to contribute to the historic identity of a district are referred to as *district contributors*. Properties located within the district boundaries that do not contribute to its significance are identified as *non-contributors*.

<u>California Register of Historical Resources</u>

The California Register is an authoritative guide in California used by State and local agencies, private groups, and citizens to identify the State's historic resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change.[13]

The criteria for eligibility for listing in the California Register are based upon National Register criteria. These criteria are:

1. 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.

[11] *National Register Bulletin 15*. How to Apply the National Register Criteria for Evaluation. Washington D.C.: National Park Service, U. S. Department of the Interior, 1997.
[12] Ibid.
[13] California PRC, Section 5023.1(a).

2. Associated with the lives of persons important to local, California or national history.

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

4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

The California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register includes the following:

- California properties formally determined eligible for (Category 2 in the State Inventory of Historical Resources), or listed in (Category 1 in the State Inventory), the National Register of Historic Places.
- State Historical Landmarks No. 770 and all consecutively numbered state historical landmarks following No. 770. For state historical landmarks preceding No. 770, the Office of Historic Preservation (OHP) shall review their eligibility for the California Register in accordance with procedures to be adopted by the State Historical Resources Commission (commission).
- Points of historical interest which have been reviewed by the OHP and recommended for listing by the commission for inclusion in the California Register in accordance with criteria adopted by the commission.[14]

Other resources which may be nominated for listing in the California Register include:

- Individual historical resources.
- Historic resources contributing to the significance of an historic district.
- Historic resources identified as significant in historic resources surveys, if the survey meets the criteria listed in subdivision (g).
- Historic resources and historic districts designated or listed as city or county landmarks or historic properties or districts pursuant to any city or county ordinance, if the criteria for designation or listing under the ordinance have been determined by the office to be consistent with California Register criteria.

[14] California PRC, Section 5023.1(d).

- Local landmarks or historic properties designated under any municipal or county ordinance.[15]

Local Designation Programs

The City of Pasadena has established an historic preservation program in order to promote "the identification, evaluation, rehabilitation, adaptive use, and restoration of historic structures." The criteria for the designation of historic monuments, landmarks, historic signs, landmark trees, or landmark districts are applied "according to applicable National Register of Historic Places Bulletins for evaluating historic properties." These criteria are excerpted below from Section 17.62.40 of the Pasadena Zoning Code.[16]

Historic Monuments

A historic monument shall include all historic resources previously designated as historic treasures… historic resources that are listed in the National Register at the State-wide or Federal level of significance (including National Historic Landmarks) and any historic resource that is significant at a regional, State, or Federal level, and is an exemplary representation of a particular type of historic resource and meets one or more of the following criteria:

a) It is associated with events that have made a significant contribution to the broad patterns of the history of the region, State, or nation.

b) It is associated with the lives of persons who are significant in the history of the region, State, or nation.

c) It is exceptional in the embodiment of the distinctive characteristics of a historic resource property type, period, architectural style, or method of construction, or that is an exceptional representation of the work of an architect, designer, engineer, or

[15] California PRC, Section 5023.1(e).
[16] City of Pasadena Online Zoning Code Title 17. http://ww2.cityofpasadena.net/zoning/

builder whose work is significant to the region, State, or nation, or that possesses high artistic values that are of regional, State-wide or national significance.

d) It has yielded, or may be likely to yield, information important in prehistory or history of the region, State, or nation.

A historic monument designation may include significant public or semi-public interior spaces and features.

Landmarks

A landmark shall include all properties previously designated a landmark… and any historic resource that is of a local level of significance and meets one or more of the criteria listed below.

A landmark may be the best representation in the City of a type of historic resource or it may be one of several historic resources in the City that have common architectural attributes that represent a particular type of historic resource. A landmark shall meet one or more of the following criteria:

a) It is associated with events that have made a significant contribution to the broad patterns of the history of the City, region, or State.

b) It is associated with the lives of persons who are significant in the history of the City, region, or State.

c) It embodies the distinctive characteristics of a type, architectural style, period, or method of construction, or represents the work of an architect, designer, engineer, or builder whose work is of significance to the City or, to the region or possesses artistic values of significance to the City or to the region.

d) It has yielded, or may be likely to yield, information important locally in prehistory or history.

Historic Signs

A historic sign shall include all signs in the sign inventory as of the date of adoption of this Zoning Code and any sign subsequently designated historically significant by the Historic Preservation Commission that possesses high artistic values. A historic sign shall meet one or more or the following criteria:

a) The sign is exemplary of technology, craftsmanship or design of the period when it was constructed, uses historic sign materials and means of illumination, and is not significantly altered from its historic period. Historic sign materials shall include metal or wood facings, or paint directly on the façade of a building. Historic means of illumination shall include incandescent light fixtures or neon tubing on the exterior of the sign. If the sign has been altered, it must be restorable to its historic function and appearance.

b) The sign is integrated with the architecture of the building.

c) A sign not meeting criteria a or b above may be considered for inclusion in the inventory if it demonstrates extraordinary aesthetic quality, creativity, or innovation.

All other regulations relating to signs shall comply with Chapter 17.48 (Signs).

Landmark Trees

A tree shall qualify to be of historic or cultural significance and of importance to the community if it meets any one of the following criteria:

1. It is one of the largest or oldest trees of the species located in the City;

2. It has historical significance due to an association with a historic event, person, site, street, or structure; or

3. It is a defining landmark or significant outstanding feature of a neighborhood.

Landmark Districts

A landmark district shall include all landmark districts previously designated… and any grouping of contiguous properties that also meet the following criteria:

a) Within its boundaries, a minimum of 60 percent of the properties qualify as contributing; and

b) The grouping represents a significant and distinguishable entity of Citywide importance and one or more of a defined historic, cultural, development and/or architectural context(s) (e.g., 1991 Citywide historic context, as amended, historic context prepared in an intensive-level survey or historic context prepared specifically for the nominated landmark district).

When considering applications to designate a landmark district, the Historic Preservation Commission shall use the National Register of Historic Places Bulletin #21: "Defining Boundaries for National Register Properties".

4.3 Central District Specific Plan

Development in central Pasadena is governed by the Central District Specific Plan which contains detailed development standards, distribution of land uses, infrastructure requirements, and implementation measures. Area Specific Plans are designed to implement the goals and policies of the City's General Plan.

The Central District Specific Plan divides the area into several sub-districts. The Project site is located within the Old Pasadena Sub-district. The objective of the Old Pasadena Sub-district is to protect the numerous historic resources in the area, and to support the long term viability of its core as a regional retail and entertainment destination through the development of nearby complementary uses, including urban housing near light rail stations and parks.[17]

4.4 Historic Significance and Integrity

Significance

The definition of historic significance used by the California Office of Historic Preservation (OHP) in its administration of the California Register is based upon the definition used by the National Park Service for the National Register:

Historic significance is defined as the importance of a property to the history, architecture, archaeology, engineering, or culture of a community, state, or the nation.[18] *It is achieved in several ways:*

- *Association with important events, activities or patterns*
- *Association with important persons*
- *Distinctive physical characteristics of design, construction, or form*
- *Potential to yield important information*

A property may be significant individually or as part of a grouping of properties.

Historic Integrity

Historic integrity is the ability of a property to convey its significance and is defined as the "authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic period."[19] The National Park Service defines seven aspects of integrity: *location, design, setting, materials, workmanship, feeling,* and *association*. These qualities are defined as follows:

- *Location* is the place where the historic property was constructed or the place where the historic event took place.

[17] Central District Specific Plan, Section 7.
[18] *National Register Bulletin 16A. How to Complete the National Register Registration Form*. Washington D.C.: National Park Service, U.S. Department of the Interior, 1997, p. 3.
[19] Ibid., p. 3.

- *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 of time and in a particular pattern or configuration to form a historic property.
- *Workmanship* is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- *Feeling* is a property's expression of the aesthetic or historic sense of a particular period of time.
- *Association* is the direct link between an important historic event or person and a historic property.[20]

[20] *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation.* Washington D.C.: National Park Service, U.S. Department of Interior, 1995.

Resources located both within and immediately outside the Project site are examined in the following analysis for the purposes of identifying potential historical resources. The context of their previous evaluations, criteria for significance and integrity issues are explored.

The Project site is located within the boundary of the Old Pasadena Historic District and on the site of one individual resource, the Hotel Green/Castle Green, as identified in the nomination form for individual listing in the National Register of Historic Places.[21]

No additional historical resources, besides those listed as contributors to the Old Pasadena Historic District, were identified in the Project site vicinity.

5.1 Site Development History

The Project site is within the boundary of the Hotel Green/Castle Green property, as identified in the nomination form for individual listing in the National Register of Historic Places.[22] The Project site occupies the southwest parcel of the block that contained the western annex of the Hotel Green. The Project site was never developed with the typical commercial blocks that were constructed in Old Pasadena at the turn of the twentieth century, and it has been surface parking and/or recreation space for much of its history.

The 1887 Sanborn map shows a one-story retail grocery store on the site facing Fair Oaks Avenue. By 1888, it was no longer on the site and the site appears vacant until 1903 when a one-story bungalow appears on the parcel facing Vineyard Street (later Dayton Street). This house was built by Colonel George G. Green (owner of the Hotel Green) for his daughter Lotta.[23]

The Hotel Green/Castle Green was originally developed as a luxury resort hotel. By the late 19th century, Pasadena had become a popular destination for well-to-do patrons escaping the severe winter weather of the mid-west and eastern seaboard; the Hotel Green/Castle Green was one of several major resort hotels constructed in the area. Located just north of The Atchison, Topeka, and Santa Fe railroad station on South

[21] The Hotel Green/Castle Green are also identified as contributors to the Old Pasadena Historic District; the District is discussed in further detail in the next section.
[22] The Hotel Green/Castle Green are also identified as contributors to the Old Pasadena Historic District; the District is discussed in further detail in the next section.
[23] "Hotel Green Bungalow" drawing archived at Pasadena Museum of History Research Library and Archives.

Raymond Avenue, the Hotel Green/Castle Green occupied a prime location in central Pasadena.

The Hotel Green/Castle Green complex was built in four phases with each phase represented by a separate building or wing. A fifth wing, intended to be constructed on the current Project site was never constructed. The first building of the Hotel Green was constructed in 1887 by developer Edward C. Webster and originally referred to as the "Hotel Webster." It was located on the east side of Raymond Avenue at the southeast corner of Raymond Avenue and Green Street. Webster overextended himself financially and was forced into insolvency before his hotel was completed. Colonel Gorge G. Green purchased the property in 1891. In 1894 he constructed an addition on the north end of the former "Hotel Webster" that continued along the remaining length of Raymond Avenue to Green Street. The hotel was re-named "Hotel Green."

The hotel was successful, and plans were soon developed for an expansion of the hotel on the west side of Raymond Avenue. The expansion of the Hotel Green onto the block west of Raymond Avenue began in the late 1890s. From accounts in the *Los Angeles Times* in 1901, it appears Colonel Green had purchased the remaining parcels of the block, including a building at the southeast corner of Fair Oaks Avenue and Green Street which was built in 1887 and was known as the Wooster Block, with plans for expansion onto the western portion.

> *"Now that Col. G.G. Green has acquired the Wooster Block and other property on Fair Oaks avenue, making him the owner of the entire frontage on that avenue from Green to Vineyard street, he will begin at once the long-contemplated additions to Hotel Green. Manager Holmes says the plan is to add another story to the Wooster Block, to be used as the main dining room of the hotel, and south of this building to erect another structure which shall be in conformity with the present west annex of the large hotel. The main entrance is to be on Green street. Parts of the lot not occupied by buildings will be laid out in parks and flower beds. It is hoped to have the work done on the opening of next season."*[24]

The expansion of the Hotel Green onto the block west of Raymond Avenue began in the late 1890s. The "West Annex" (today's Castle Green) was designed by architect Frederick Louis Roehrig and opened in January of 1899. Construction of the West Annex represented the third phase of development for the complex. The West Annex was connected to the original Hotel Green building by way of an enclosed bridge over

[24] "Hotel Green Additions," *Los Angeles Times*, May 8, 1901.

Raymond Avenue, which remained until 1929; a portion of it survives today from the east facade of the Castle Green to the Raymond Avenue sidewalk.

In the early 1900's, further expansion plans were developed to extend the hotel along Green Street to connect to the existing Wooster Block building and along Fair Oaks Avenue. The Fair Oaks Avenue façade of the planned expansion was described by the *Pasadena Evening Star* in 1902 as having ground floor shops with a long balcony above.

> *"The ground floors on South Fair Oaks avenue, with the exception of the Fair Oaks entrance, which will be in and about the center of the block, will be divided into stores and rented to persons who conduct businesses that would in their nature attract tourists and the class of persons who patronize a hotel of the character of the Green.*
>
> *For the width of sixteen feet, more or less, as the working out of the plans may determine, there will be a long balcony ranging along the tops of the portions of these stores to Vineyard street and overlooking South Fair Oaks avenue. The designs for this balcony will be exquisite, and it is intended that it shall be one of the most beautiful as well as one of the longest balconies of solid masonry in the world. Above this will rise the other five stories of the great west wing of the new hotel."*[25]

The *Pasadena Daily News* added further detail in January of 1903.

> *"For weeks Col. Green and Architect F.L.O. Roehrig have been working out plans and designs for the addition which is to cost more than a half million dollars. …*
>
> *The new building will face north on Green street and west on Fair Oaks avenue. It will be of the Moorish and Colonial style mingled. The building will be six stories high. …*
>
> *The Wooster Block so substantially built will be wholly remodeled to conform with the new structure and will be the corner section of the two mighty wings. The lower floor facing Fair Oaks avenue from Green street to Vineyard street across the whole block as owned by Col Green will be divided into store rooms fitted up with modern style for rent. These store rooms will be very deep and light.*
>
> *From Green street the guests will enter an elaborate lobby just north of the present Annex. …*

[25] "A Greater Hotel Green," *Pasadena Evening Star*, February 11, 1902.

> *The open space between the Annex and the new addition will contain a great court, where guests will promenade and while away the evenings amid a semi-tropic foliage covered with glass and brilliantly lighted. South of this the two wings open out on Central Park, of 9 ½ acres, recently acquired by Pasadena, and which is to be immediately planted in accordance with the most advanced ideas of the landscape gardener."*[26]

The proposed design would have created a U-shaped building with a landscaped central courtyard with greenhouse and connecting arcade along Dayton Street. A portion of the announced expansion was completed in 1903 with construction of the "North Annex" along Green Street, incorporating the existing Wooster Block. Construction of the North Annex represents the fourth phase of development for complex. The proposed additional wing fronting Fair Oaks Avenue, the arcade and greenhouse, all of which would have occupied the site of the currently proposed project, were never built.

It appears the southwest parcel (the Project site) was then landscaped and used for recreation by hotel guests.[27] The landscaping, which consisted of trees, shrubs and winding paths, complemented the Hotel Green Park (1894) which was on the eastern portion of the block prior to the Hotel Green expansion west of Raymond Avenue. The park became the front yard of the hotel in 1898 and is still evident today in front of the Castle Green. Central Park, just south of the hotel, was similarly designed in 1903 and became a seamless continuum of landscaping and a recreation ground for the tourists staying at the neighboring Hotel Green. The front yard of the Castle Green is now fenced with a locked gate, whereas Central Park is open to the public.

The decline of the Hotel Green led to the break-up of the hotel property beginning in 1920. The eastern portion (east side of Raymond Avenue) was sold in 1920 and became the Hotel Pasadena. The L-shaped western portion was split, and the West Annex became the Castle Green Apartments in 1924. The North Annex remained the last vestige of the Hotel Green until the early 1970s when the Hotel was converted into low-income senior apartments.

Circa 1914, a tennis court was added to the southwest parcel. The previously described bungalow was removed at some point between 1931 and 1951.[28] The 1951 Sanborn map shows the parcel as being used for auto parking. A swimming pool was added in

[26] "Greater Hotel Green," *Pasadena Daily News*, January 1, 1903.
[27] The parcel was labeled as "park" on the 1903 Sanborn Map.
[28] Sanborn maps for Pasadena. The bungalow appears on the 1903, 1910 and the 1931 maps, but not on the 1951 map.

the south gardens near the outdoor dining terrace of the Hotel Green in 1953.[29] It was infilled and paved over in the early 1970s when the Hotel was converted into low-income senior apartments. The oval shape is still present on the site and is currently covered with grass and a shuffleboard court. The 1982 National Register nomination form characterized the area created by the junction of the two buildings as having "…parking lots, garages, and other service facilities."[30]

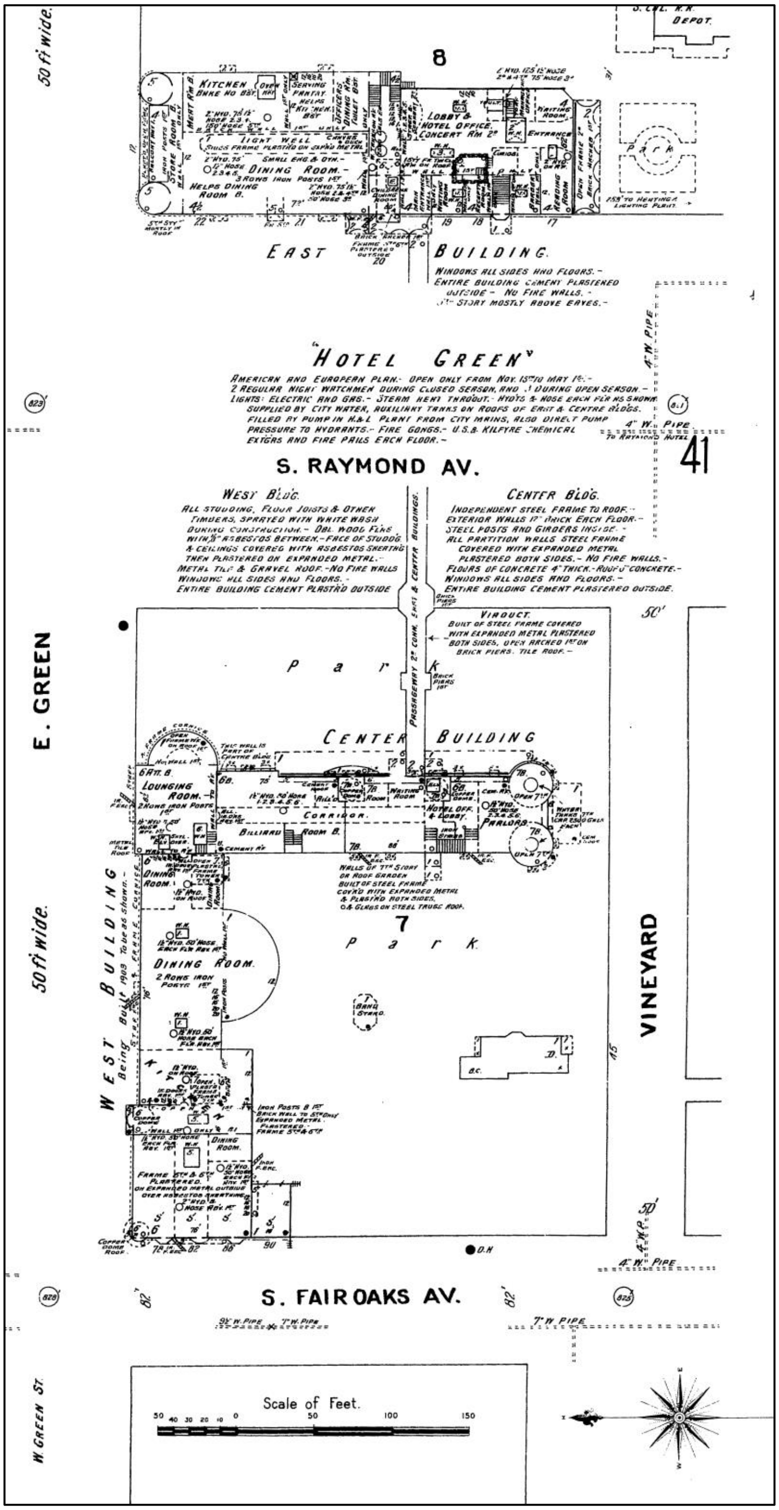
Currently, there are 27 mature trees on the Project site and it appears a few of the trees may date to the early Hotel era when it was initially landscaped as they match locations identified in a photograph from ca. 1903. (See photos below.) Additionally, according to the arborist's Tree Aging report completed by Jan C. Scow Consulting Arborists, LLC, on July 3, 2013, two trees are 100 years old or older and are conceivably remnants from the early landscape scheme. The next oldest trees identified, four from the late 1920s and early 1930s, post-date the planned landscape of the early Hotel era.[31]

The site is still in use as a surface parking lot with asphaltic concrete paving. The paving creates a U-shape in plan around a landscaped area with picnic tables, benches and a shuffleboard court marked by a hedge. This recreational area appears to have been developed in the 1950s when the pool was installed. The recreational uses associated with the period of the Hotel Green are no longer extant on the Project site.

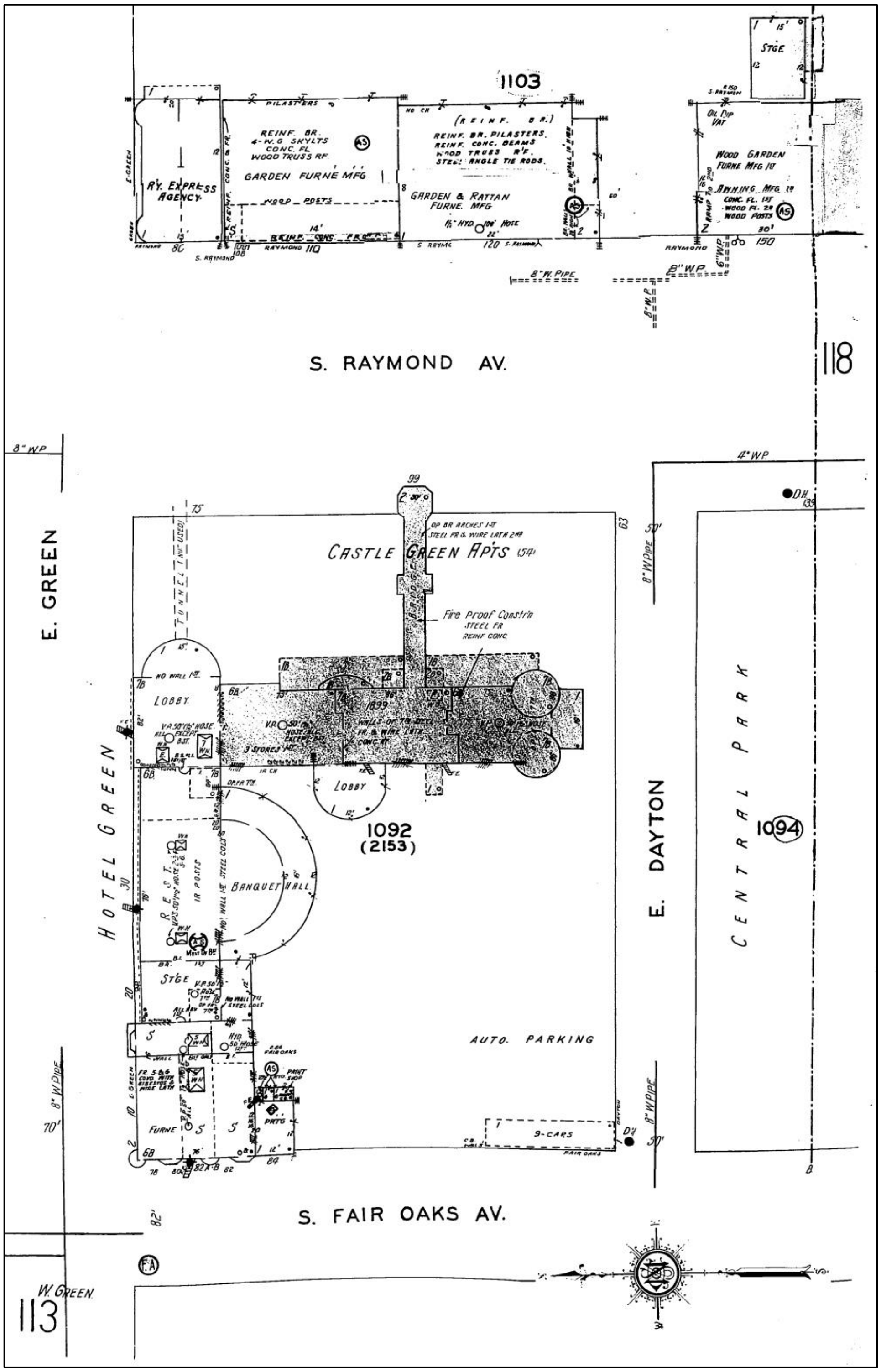
[29] William W. Ellinger III, AIA "Chronology for the Hotel Green (1887-1973), the Castle Green Apartments (1924-), the Hotel Green Apartments (1973-), and Related Events of Interest," August 1993.

[30] "Hotel Green" National Register of Historic Places Inventory – Nomination Form, 1982.

[31] "Tree Aging for 86 S. Fair Oaks," Jan C. Scow Consulting Arborists, LLC, June 3, 2013. The two trees include a Canary Island Date Palm (~1908, Tree #13) and a Camphor tree (~1913, Tree #5). See Appendix C.

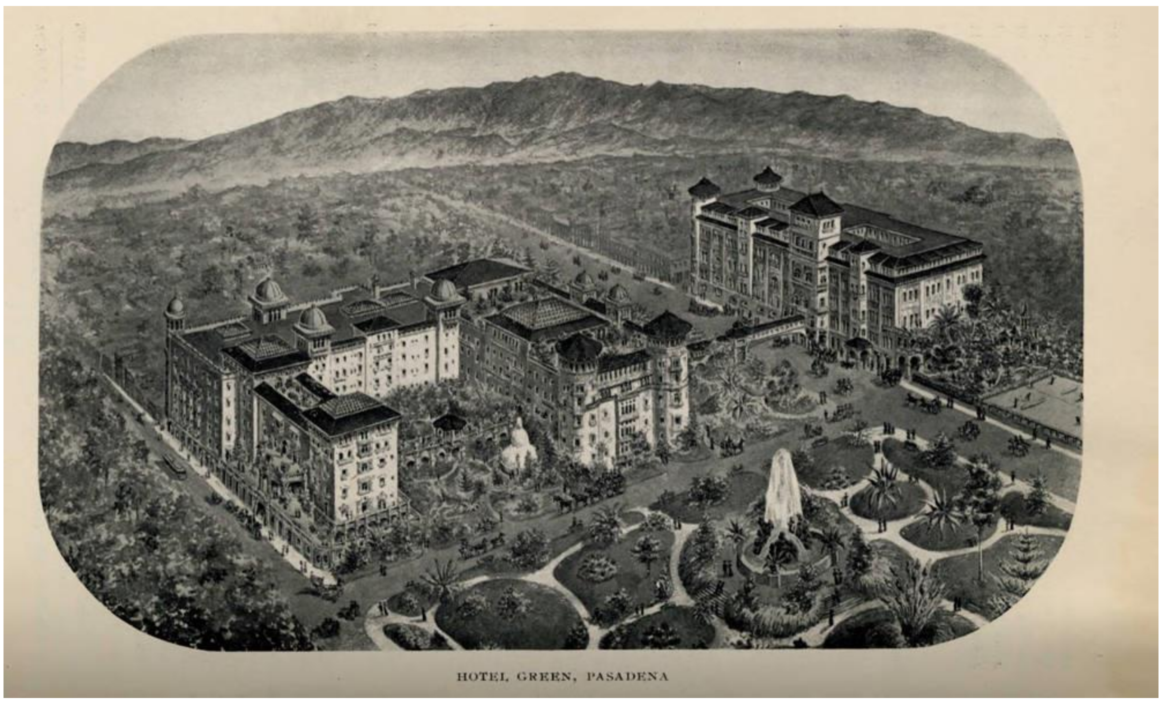


Sanborn Map showing completed expansion of Hotel Green, 1903. The southwest parcel shows the one-story bungalow and is labeled as "park".



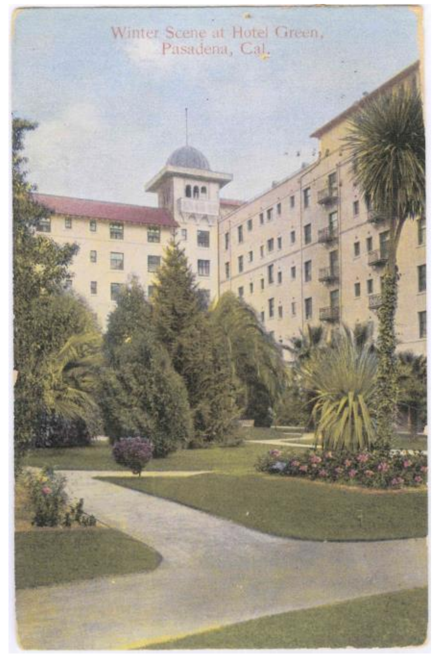
Sanborn Map showing conversion to Hotel Green/Castle Green, 1951. The bungalow has been removed from the southwest parcel and is labeled as “auto parking”.

Hotel Green rendering with planned west wing, 1903. (Pasadena Museum of History)



Hotel Green rendering with planned west wing, 1903. (Pasadena Public Library)

Hotel Green southwest parcel with bungalow and Central Park to the south, ca. 1904. (Pasadena Museum of History)



Hotel Green landscaped southwest parcel, ca. 1910. (Pasadena Museum of History)

Hotel Green southwest parcel with tennis courts, ca. 1914. (Pasadena Museum of History)

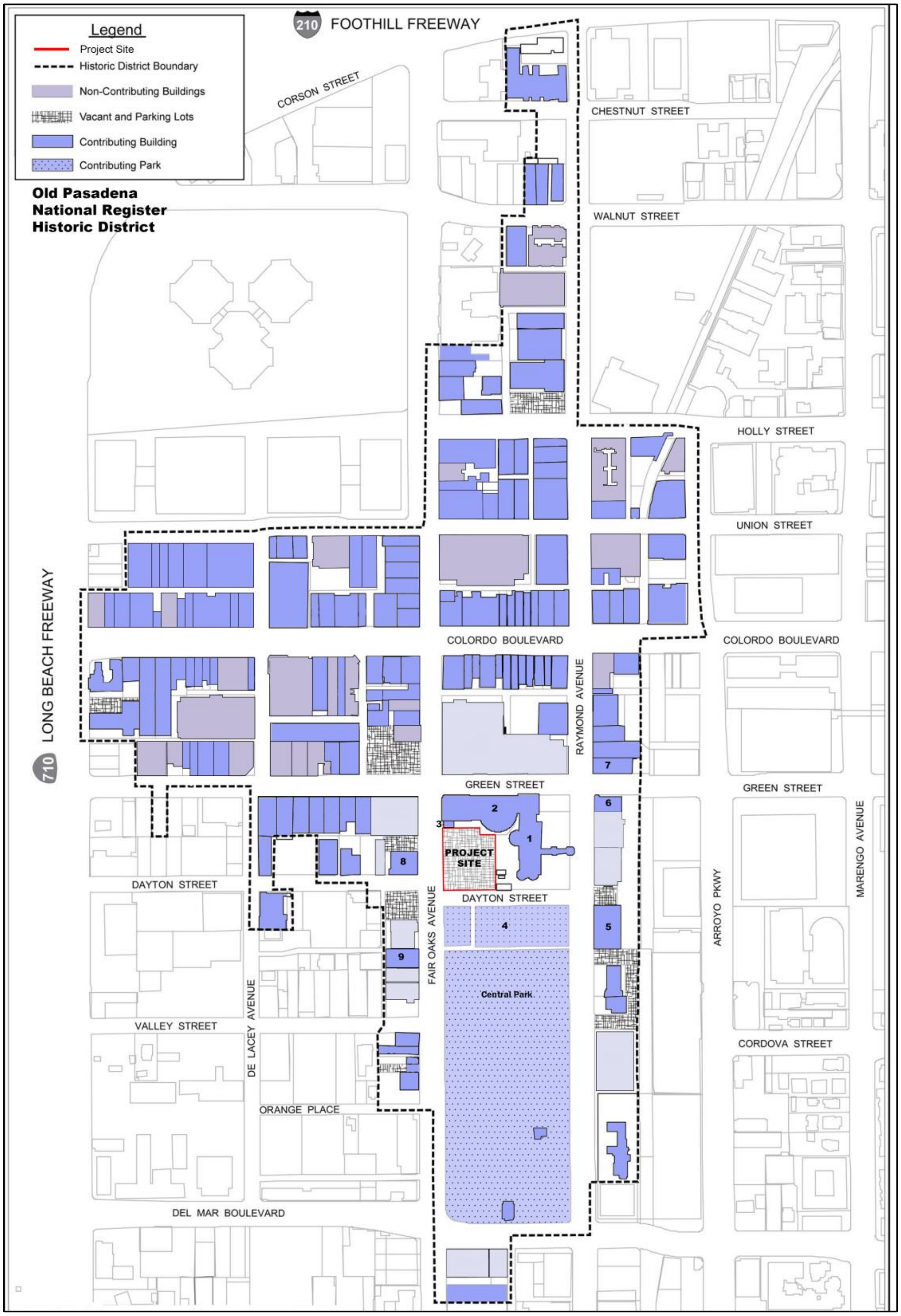
5.2 Old Pasadena National Register Historic District[32]

The Old Pasadena Historic District (the "District") was listed in the National Register of Historic Places in 1983 and amended in 2008. The nomination form for the District specifies that it is significant in local history under National Register Criteria A and C. As the historic commercial center of Pasadena, the District documents the economic development of the city and its various phases of growth between 1886 and 1936. The District also contains an important record of the evolution of architectural design in southern California as well as the work of many prominent regional architects.

The District boundaries are irregular and incorporate Fair Oaks and Raymond Avenues, the main north-south streets, and Colorado Boulevard, the main east-west street. It is generally bound on the north by Chestnut Street, on the west by Pasadena Avenue, on the south by Del Mar Boulevard and on the east by the MTA Gold Line tracks. The District contains 154 contributing and 40 noncontributing resources, which form the historic downtown of the City of Pasadena. Dating from 1886 through 1936, the buildings visually document the District's economic and social booms. Predominantly commercial in nature, the District also includes a few residential buildings, a train station, some light industrial concerns, several churches, and a park. The strong stylistic eras of Old Pasadena can be discussed using three streets within the District as examples: Fair Oaks Avenue (1880s), Raymond Avenue (1890-1915), and Colorado Boulevard (1929-30). Surrounding streets, especially Union Street and Green Street, offer small-scale buildings, which reflect their industrial and service support to businesses along the major commercial streets. Since the District was originally listed in 1983, many of the contributing buildings have been extensively rehabilitated in a manner consistent with the Secretary of the Interior's Standards. A few contributing buildings have been demolished, and several new noncontributing buildings have been constructed. Most of the new construction occurred on vacant and surface parking lots and is generally compatible with the historic architecture of the District. Overall, the District retains a high-level of integrity and continues to convey its historic significance.

Due to the changes that occurred within the District since it was first designated in 1983, it was re-evaluated in 2008. At that time, the boundaries were expanded, and individual buildings within the District were re-classified as necessary.

[32] United States Department of the Interior, National Park Service, "Old Pasadena Historic District (Additional Documentation/Boundary Change)" National Register of Historic Places Registration Form, 2008.



Old Pasadena Historic District boundary map, 2008.

The District is formally listed in the National Register and is listed in the California Register. Because it is listed in the National and California Registers, the District is considered a mandatory historical resource under CEQA.

There are several contributors to the District adjacent to the Project site. These include (building numbers below are keyed to their locations on the map on the preceding page and the close-up map in Figure 4):

1-2. 99 South Raymond Avenue,
50 East Green Street
(Hotel Green/Castle Green)

Adjacent to the Project site on the same block is the Hotel Green/Castle Green. In addition to being a contributor to the Old Pasadena Historic District, the Hotel Green/Castle Green is individually listed in the National Register along with the Project site. The nomination form for the property indicates that it is significant in local history under National Register Criteria A and C as one of the few grand nineteenth century hotel buildings in California to survive to the present day. Instrumental in the settlement of Pasadena in the 1890s and early 1900s, the hotel also fostered the social, cultural and economic development of the city. It is architecturally significant as a work of historic eclecticism, by architect Frederick L. Roehrig, popular in the late nineteenth century.

Although not directly stated in the National Register nomination, the period of significance can be established for the Hotel Green/Castle Green as beginning in 1898 when the hotel expanded across Raymond Avenue and the West Annex (Castle Green) was constructed, and ends in 1924 when the West Annex was sold and converted into cooperative apartments and renamed the Castle Green thus ending the resort era of the hotel.

The Hotel Green/Castle Green occupies the block between Fair Oaks and Raymond Avenues on the west and east and Green and Dayton Streets on the north and south, which is the same block as the Project site. The entire block is included as the boundary in the individual nomination for the Hotel Green/Castle Green.

The Castle Green, was constructed in 1898 as the West Annex and was connected to the original portion of the Hotel Green at the second story by a pedestrian bridge over Raymond Avenue. In 1903, an addition, then called the North Annex was constructed along the length of Green Street and connected to the Wooster Block, which was constructed in 1887. This portion of the building is now referred to as the Hotel Green.

The Castle Green (1898, Frederick L. Roehrig, architect) has a north-south orientation and sits approximately 100 feet from Raymond Avenue and 30 feet from Dayton Street, which provides space for a large garden along Raymond Avenue. It is a six- and seven-story building that is eclectic in design with references to Spanish Colonial Revival and Islamic architecture. The steel-framed and brick building has a dash coat cement-plaster finish. The large scale of the building is relieved by a variety of treatments to its massing, roofline, fenestration, and exterior ornamentation.

The Hotel Green (1887, C.L. Strange, architect; 1903, Frederick L. Roehrig, architect), originally the Wooster Block and the North Annex, extends along Green Street from Raymond to Fair Oaks Avenues. Although they were constructed at different times by different architects, they were joined internally and are both steel-framed structures sheathed in cement plaster.

The seven-story North Annex is covered by a low-pitched hipped roof with corbelled supporting brackets, while the six-story middle section has a shed roof carried on overhanging eaves. The window and door openings have little detailing. There is a large buttressed brick chimney on the most eastern point. The south facade has a prominent one-story semicircular projection of what was originally the hotel's dining room with square towers at both ends.

The six-story Wooster Block is distinct from the North Annex. The building's wealth of detail recalls Romanesque characteristics. It has a low-pitched shed roof with overhanging eaves, exposed rafters, and clay tiles. The street-facing elevations are articulated by numerous bays and arches.

3. <u>84 South Fair Oaks Avenue</u>

This one-story commercial brick vernacular building was constructed circa 1925. It is immediately south of the Wooster Block of the Hotel Green. The building is finished with roughly textured cement plaster. The west facade on Fair Oaks Avenue has a single storefront with vertically proportioned openings and a decorative cornice.

5.3 Resources Located in the Immediate Vicinity of the Project Site

Resources located in the immediate vicinity of the Project site include contributors to the Old Pasadena Historic District. The contributors within the immediate vicinity of the Project site are identified in this section.

Contributing resources in the immediate vicinity include:

4. Central Park

Central Park is located south of the Project site. It is a 10.73-acre site and is bounded by South Raymond Avenue on the east, Dayton Street on the north, South Fair Oaks Avenue on the west, and East Del Mar Boulevard on the south. The Castle Green and Project site are to the north and the Santa Fe Train Station is to the east. Central Park and Memorial Park (in the Civic Center National Register District) are the oldest parks in the city, the land for both parks having been purchased in 1902. Many mature trees, broad lawns, and a few small buildings connected by winding paths form the general plan of the park. The park became a recreation ground for the tourists staying at the neighboring Hotel Green.

The park was originally designed by Thomas Chisholm, but mainly reflects a redesign by Cook, Hall and Ralph Cornell in 1927. Most of the 1927 footpath configuration of intersecting circles and oval still exists, notably the large oval in the center.

5. 150 South Raymond Avenue

Constructed in 1920, this two-story industrial brick building located on the east side of Raymond Avenue across from Central Park was originally designed as a factory. The utilitarian design features large window openings stacked vertically and spaced evenly on all four sides. The arched openings have divided-light wood sash windows.

6. 80-82 South Raymond Avenue (remnant of Hotel Green)

This one-story building at the southeast corner of Raymond Avenue and Green Street is all that remains of the original portion of the Hotel Green on the east side of Raymond Avenue. Ed Webster sold his hotel to Colonel Green in 1891, who proceeded to build the annex across the street. In 1935, the original four-story hotel was demolished except for this remnant.

7. 62-70 South Raymond Avenue

Constructed in 1902, this three-story, plaster-over-brick building, located at the northeast corner of Raymond Avenue and Green Street, was originally constructed as a hotel, perhaps as a residence for employees of the Hotel Green. The widening of Green Street in 1926 caused the 20 feet of the south end of the building to be demolished. The ensuing remodeling included the South Raymond Avenue facade.

8. 103-115 South Fair Oaks Avenue (Doty Block)

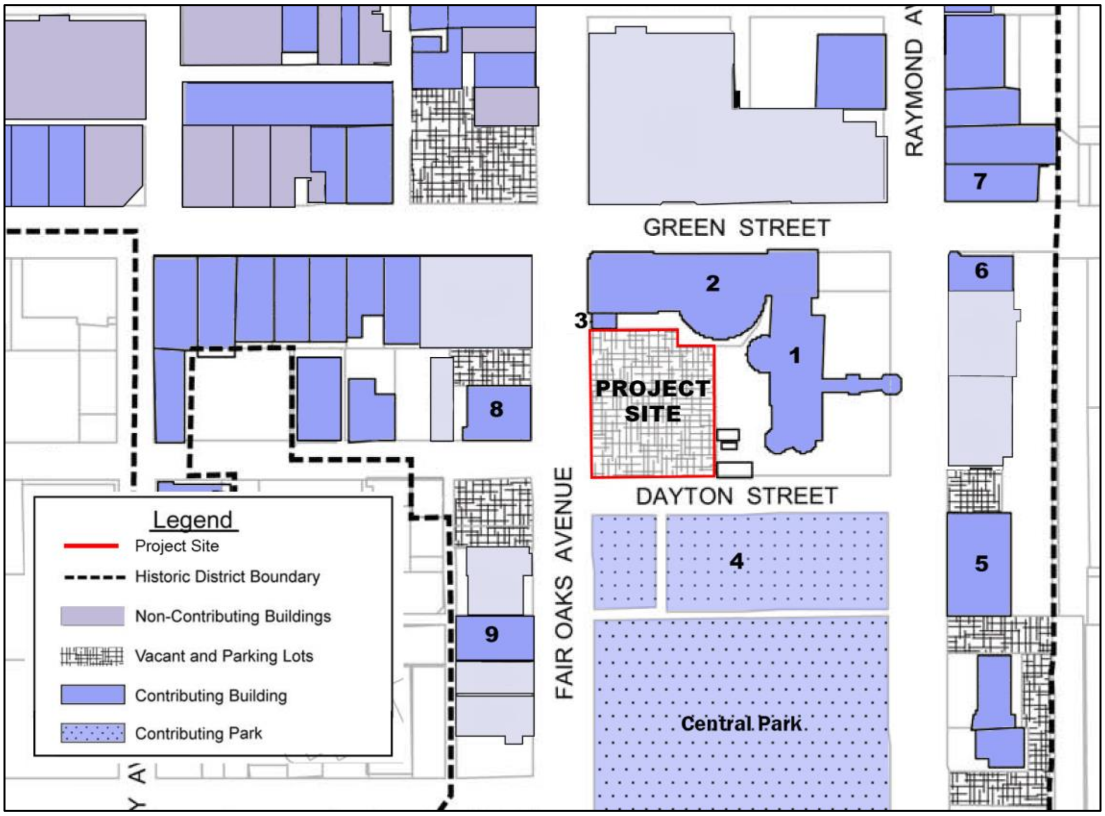
This large three-story red brick building, constructed in 1887, is located to the west of the Project site. The principal facade (along Fair Oaks Avenue) has eight bays defined by brick pilasters, accented at each story by massive blocks of grey rusticated stone tied together by narrow projecting bands of molding above the first and second stories. Built during the boom of the late 1880s for James E. Doty, the Doty Block was one of the earliest substantial brick buildings in the city. Doty's carriage business was one of the largest in the San Gabriel Valley during the 1890s. The building originally had a corner tower and projecting bays, which were removed in 1924. In 1998 the building was rehabilitated. The work included the replacement of brickwork that had been damage by abrasive cleaning and the replacement of the storefronts, except for the original cast-iron columns.

9. 155 South Fair Oaks Avenue
   (Star Saddle Livery)

Constructed in 1906 to the design of Hunt & Grey, this two-story cement plaster-over-brick building is in the Mission Revival style. This building is located on the west side of Fair Oaks Avenue across from Central Park. A three-story tower on the north side and a two-story bay with a wide garage entrance on the south dominates the building. This southern bay, a 1910 addition was built on the site of a former corral. Built for Charles N. Post, a local banker, the livery served guests of the Hotel Green who were interested in pleasure riding. Similar to many liveries, the building became an auto repair shop in the 1930s. Original architectural elements include the pitched roofs finished with red clay tile, arched window headers, divided-light wood sash casement windows, and original hayloft doors on the rear. The storefronts replaced what were originally barn-style doors. The building was rehabilitated in 1991 and again in 1999.

Historic resources located adjacent to, and within the immediate vicinity of the Project site are shown in Figure 4. Site and building photographs are included in Appendices A and B.

Figure 4: Historic Resources Adjacent to and in the Vicinity of the Project Site



1/2. **50 East Green Street/99 South Raymond Avenue (Hotel Green/Castle Green)**
3. **84 South Fair Oaks Avenue**
4. **Central Park**
5. **150 South Raymond Avenue**
6. **80-82 South Raymond Avenue (remnant of Hotel Green)**
7. **62-70 South Raymond Avenue**
8. **103-115 South Fair Oaks Avenue (Doty Block)**
9. **155 South Fair Oaks Avenue (Star Saddle Livery)**

Portion of Old Pasadena Historic District indicating Project Site and surrounding contributing resources. Numbers correspond to building descriptions in Sections 5.2 and 5.3.

6.1 Framework for Analysis

The following analysis is informed by National, State and local guidelines.

CEQA Thresholds

The CEQA Guidelines as amended in 2019 indicate that a project would have a significant impact on historical resources if it would result in a substantial adverse change in the significance of a historical resource. A substantial adverse change in the significance of a historic resource means demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired.[33]

The Guidelines go on to state that "[t]he significance of an historic resource is materially impaired when a project… [d]emolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources… local register of historic resources… or its identification in a historic resources survey."[34]

Additional Guidance

Secretary of the Interior's Standards

The *Secretary of the Interior's Standards for the Treatment of Historic Properties* (the *"Standards"*) provide guidance for reviewing proposed projects that may affect historic resources.

The intent of the *Standards* is to assist the long-term preservation of a property's significance through the preservation, rehabilitation, and maintenance of historic materials and features. The *Standards* pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and interior of the buildings. The *Standards* also encompass related landscape features and the building's site and environment, as well as attached, adjacent, or related new construction.

From a practical perspective, the *Standards* have guided agencies in carrying out their historic preservation responsibilities including State and local officials when reviewing projects that may impact historic resources. The *Standards* have also been adopted by State and local jurisdictions across the country including the City of Pasadena.

[33] *CEQA Guidelines*, section 15064.5(b)(1).
[34] *CEQA Guidelines*, section 15064.5(b)(2).

In addition, the *Standards* are a useful analytic tool for understanding and describing the potential impacts of substantial changes to historic resources. However, under California environmental law, compliance with the *Standards* does not necessarily determine whether a project would cause a substantial adverse change in the significance of an historic resource. Rather, projects that comply with the *Standards* benefit from a regulatory presumption that they would have a less than significant adverse impact on a historic resource.[35]

Specifically, Section 15064.5(b)(3) of the CEQA Guidelines states:

"Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings" (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource."

The statutory language above references the Secretary of the Interior's standards and guidelines for four distinct historic "treatments," including: (1) preservation; (2) rehabilitation; (3) restoration; and (4) reconstruction. The specific standards and guidelines associated with each of these possible treatments are provided on the National Park Service's website regarding the treatment of historic resources.[36]

For analytical purposes, a decision must be made regarding which "treatment" standards should be used to analyze a project's potential effect on historic resources.

The use of the Secretary of the Interior's "rehabilitation" standards (the Rehabilitation Standards) provide a more conservative impact analysis for this project and account for the fact that the adjacent properties will likely require some form of protection during construction activities and ongoing maintenance over the term of the construction.

Secretary of the Interior's Standards & Guidelines for Rehabilitation[37]

The National Park Service encourages maintaining the integrity of a district through the appropriate design of infill buildings at vacant sites or sites where new buildings replace non-contributing buildings. The Standards are intended as general guidance for work on

[35] *CEQA Guidelines*, section 15064(b)(3).
[36] http://www.nps.gov/hps/tps/standguide/
[37] Kay D. Weeks and Anne E. Grimmer, *The Secretary of the Interior's Standards for the Treatment of Historic Properties: with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings,* (Washington D.C.: National Park Service, U.S. Department of the Interior) 1995, pp. 63-115.

any historic building. The Guidelines for Rehabilitation expand the discussion to sites and neighborhoods.

Rehabilitation Standards #9 and #10 address related new construction. Standard 9 in part states: "New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment."[38] Standard 10 states: "New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired."[39]

As written in the Guidelines for Rehabilitation, there is a distinction, but not a fundamental difference, between the concerns for additions to historic buildings and new construction, or "infill" adjacent to historic buildings on a property or within a district. As with most matters of design and planning, the differences are defined by the scale, site, setting, and project.

Following are quotations from the National Park Service guidance that relate to the proposed Project.

"…a modern addition should be readily distinguishable from the older work; however, the new work should be harmonious with the old in scale, proportion, materials, and color."

"Plan the new addition in a manner that provides some differentiation in material, color, and detailing so that the new work does not appear to be part of the historic building. The character of the historic resource should be identifiable after the addition is constructed."[40]

National Park Service: Preservation Briefs 14

In addition to the Standards and Guidelines for Rehabilitation, the National Park Service publishes a series of briefs that includes "Preservation Briefs 14, New Exterior Additions to Historic Buildings: Preservation Concerns," as revised and republished in 2010.[41]

[38] http://www.nps.gov/hps/tps/standguide/rehab/rehab_standards.htm
[39] Ibid.
[40] Anne E. Grimmer and Kay D. Weeks, "Preservation Briefs 14, New Exterior Additions to Historic Buildings: Preservation Concerns," (Washington D.C.: National Park Service, U.S. Department of the Interior) 2010.
[41] Anne E. Grimmer and Kay D. Weeks, "Preservation Briefs 14, New Exterior Additions to Historic Buildings: Preservation Concerns," (Washington D.C.: National Park Service, U.S. Department of the Interior) 2010.

Among the concepts presented are a balance between differentiation and compatibility, and subordination of the new to the old.

Preservation Briefs 14 states:

1. There is no formula or prescription for designing a new addition that meets the Standards. A new addition to a historic building that meets the Standards can be any architectural style -- traditional, contemporary or a simplified version of the historic building. However, there must be a balance between differentiation and compatibility in order to maintain the historic character and the identity of the building being enlarged. New additions that too closely resemble the historic building or are in extreme contrast to it fall short of this balance. Inherent in all of the guidance is the concept that an addition needs to be subordinate to the historic building.

2. The intent of the Preservation Briefs is to provide guidance to owners, architects and developers on how to design a compatible new addition…. A new addition to a historic building should preserve the building's historic character. To accomplish this and meet the Secretary of the Interior's Standards for Rehabilitation, a new addition should:

   - Preserve significant historic materials, features and form;
   - Be compatible; and
   - Be differentiated from the historic building.

6.2 Potential Impacts from Demolition

The Project proposes new construction that will occupy a parcel currently used primarily as a surface parking lot. The Project proposes to demolish the existing surface parking lot, landscaped recreation area, and shuffleboard court. It also proposes to remove one billboard and 20 mature trees (11 of which are protected under the City Trees and Tree Protection Ordinance – 9 on-site and 2 in the public right-of-way).

The Project site is located within the boundary identified in the Hotel Green/Castle Green National Register nomination. The existing condition of the Project site was established after the period of significance for the Hotel Green/Castle Green (1898-1924). Because they were developed after the period of significance, the surface parking lot with landscaping, outdoor furniture, shuffleboard court and advertising billboard located on the site are not considered character-defining features of the Hotel Green/Castle Green.

The mature trees scheduled for removal, two of which date closest to the early landscape design (1903) for the Hotel Green era, are remnants of an earlier landscape design that no longer exists on the site,[42] and the context of the original landscape in which the trees were meaningful is no longer extant. Therefore, the trees are also not considered character-defining features of the Hotel Green/Castle Green. As applicable, replacement or relocation of any protected trees scheduled for removal would otherwise occur consistent with the requirements of the City's Trees and Tree Protection Ordinance.

Because the existing condition of the site no longer reflects the landscape and recreational uses associated with the Hotel's period of significance, demolition of the surface parking lot with landscaping and an advertising billboard, and removal of the mature trees will not alter the property's integrity. The historic character of the property as a whole will be retained after demolition, and the site will retain its National Register eligibility. The proposed demolition will not result in a significant direct impact to historic resources on the Project site.

The Project does not propose to demolish or alter the existing adjacent resources including the Hotel Green/Castle Green or the building at 84 South Fair Oaks Avenue or alter any existing resources in the immediate vicinity. Therefore, the proposed demolition will not result in a significant direct impact on the existing adjacent resources or the existing resources in the immediate vicinity.

6.3 Potential Impacts from New Construction

Proposed New Construction

The proposed new construction will replace an existing surface parking lot and landscaped area. New construction will be located within the Old Pasadena Historic District and immediately adjacent to District contributors Hotel Green/Castle Green and the commercial building at 84 South Fair Oaks Avenue. The proposed new construction will also be located within the boundaries of the Hotel Green/Castle Green, an individually listed historic resource. The proposed Project will be located directly north of District contributor Central Park and in the immediate vicinity of contributing buildings at 150 South Raymond Avenue, 80-82 South Raymond Avenue, 62-70 South Raymond Avenue, 103-115 South Fair Oaks Avenue, and 155 South Fair Oaks Avenue.

[42] The two trees which date to the Hotel Green era are the Canary Island Date Palm (~1908, Tree #13) and the Camphor (~1913, Tree #5). "Tree Aging for 86 S. Fair Oaks," Jan C. Scow Consulting Arborists, LLC, June 3, 2013.

The Project proposes new construction of a six-story building plus penthouse that will reach a maximum roof height of 90 feet, which is slightly shorter than the 93-foot and 6-inch maximum roof height of tallest portions of the adjacent Hotel Green/Castle Green. The new building will be situated at the far southwest portion of the parcel and will maintain grade-level open space between the existing historic buildings and the new building. Approximately 38 feet of open space will separate the south façade of the Hotel Green building and the new construction. Approximately 76 feet of open space will be maintained between the east façade of the new building and the west façade of the Castle Green building. The new building will be located approximately 13 feet from the existing one-story building at 84 South Fair Oaks Avenue.

Impacts to Surroundings of Historic Resources

The Project will not demolish or alter any historic building on the Project site or in the near vicinity of the Project site. However, because the Project will construct a six-story plus penthouse building on a parcel largely used as surface parking under current conditions, the immediate surroundings of the adjacent historic resources discussed above will be altered. For this alteration to be considered a substantial adverse change, however, it must be shown that the integrity and/or significance of the historic resources would be materially impaired by the proposed alteration.

The additional guidance provided by the National Park Service for reviewing proposed new construction that may affect an historic resource, as stated above, be it an addition to an existing building or an infill building within an historic district, strive for the same outcome: a balance between compatibility and differentiation, and the retention of integrity.

An analysis of the alteration to the immediate surroundings of each of the potentially affected historic resources follows below.

Potential Impacts to the Hotel Green/Castle Green from New Construction

The Hotel Green/Castle Green is significant as one of the few 19th century resort hotel buildings in California to survive to the present day. Instrumental in the settlement of Pasadena in the 1890s and early 1900s, the hotel also helped foster the social, cultural and economic development of the city. Designed by noted regional architect Frederick L. Roehrig, the Hotel Green/Castle Green is also architecturally significant as an outstanding example of historic eclecticism popular in the late nineteenth century.

The historic significance of the Hotel Green/Castle Green is largely conveyed by the public-facing primary facades oriented towards the adjoining public streets. The primary (east) façade of the Castle Green portion of the building faces east towards Raymond

Avenue. This façade was historically, and remains today, the primary entrance to the Castle Green. The building was set back approximately 100 feet from the street to create a landscaped park area fronting the main entrance. This garden was the only park in Pasadena at the time. Extending from the center of this façade to the curb of Raymond Avenue is the remaining section of an enclosed pedestrian bridge that once spanned the street and linked to the original Hotel Green building (no longer extant) across the street. The design articulation of east façade, the remnant pedestrian bridge and the front garden all combine to create the primary public face of the building.

The primary (north) façade of the Hotel Green portion of the building faces north along Green Street. This section was an addition to the Castle Green building at the northeast corner, spanned Green Street and adjoined the existing Wooster Block at the northwest corner. Articulated with numerous bays and arched openings at street level, the north façade is oriented to the public with street-facing shops and entrances.

Development of the Project site will be confined to the southwest parcel of the block, and therefore important street views from the north and south along Raymond Avenue and from the east along Green Street to the Hotel Green/Castle Green will remain unaltered. The building's primary east- and north-facing façades will not be obscured by the proposed Project.

The Project has the potential to block views and obscure currently available public sight lines to the secondary west façade of the Castle Green and the south façade of the Hotel Green. Both are rear, secondary facades oriented toward the interior of the block. As such, they display less of the distinctive design articulation characteristic of the primary facades which were designed to directly engage the public right-of-way. The proposed building will obscure the west façade of the Castle Green building, particularly from the west along Fair Oaks Avenue and from the southwest along Dayton Street. The west façade will remain visible when viewed northeast from the central portions of Dayton Street and Central Park, where landscaped open space will remain between the two buildings. The proposed new building will also partially block the Hotel Green's south façade from public view when viewed from the west and southwest. Both facades have historically been unobstructed.

The Project conforms to Standard 9 because maintaining the Project site as an open space is not critical to conveying the historic significance of the Hotel Green/Castle Green. Instead, it is the location, massing and architectural detailing of the Hotel Green/Castle Green buildings which convey its historic significance. After implementation of the Project, the L-shaped configuration and orientation of the Hotel Green/Castle Green will remain discernible after construction and the primary east- and west-facing facades will remain unobstructed. The Project includes grade-level open space to provide a spatial buffer between the existing buildings and the new construction so that the west façade of the Castle Green and south façade of the Hotel Green will remain discernable despite visual obstruction from the street. Although spatial relationships will be altered by the proposed new construction, the historic buildings will remain in their original locations and will not be physically altered by the new construction. The Castle Green/Hotel Green will continue to convey its historic significance after Project construction.

As noted in Section 4.4 of this report, *historic integrity* is the ability of a historic resource to convey its significance. The National Park Service defines seven aspects of integrity: *location*, *design*, *setting*, *materials*, *workmanship*, *feeling*, and *association*. The Project would not affect the integrity of *location, design, materials, or workmanship* of the Castle Green/Hotel Green. The building will remain intact in its current location and would not be materially altered by new construction to the south and west. Therefore, integrity of *feeling* would also remain unaffected because all the existing physical elements that characterize the Castle Green/Hotel Green would continue to convey the property's historic significance. Because the Castle Green/Hotel Green would retain integrity of *location, design, materials, workmanship*, and *feeling*, it would continue to reflect its historic significance as a late-19th and early 20th century resort hotel in Pasadena, therefore integrity of *association* would also remain unaffected by the Project.

The only aspect of integrity that will be affected by the Project is *setting*. The Project will alter the setting of the Castle Green/Hotel Green by constructing a new building in an area that has historically been devoid of buildings. As noted earlier, this area has been substantially altered since the period of significance and today contains a surface parking lot with landscaping, outdoor furniture and an advertising billboard. Setting features important to the historic significance of the Castle Green/Hotel Green include the configuration of street and sidewalk fronting the building's north- and east-facing façades, and the spatial relationships with buildings to the north, east and west that are also included within the District boundary. All of these will remain unchanged by the Project. The Castle Green/Hotel Green will retain integrity of *location*, *design*, *materials*, *workmanship*, *feeling*, and *association*. Integrity of *setting* will be compromised by the new construction associated with the Project but the setting features most important to conveying the historic significance of the property will remain unchanged. All but one of the seven aspects of integrity will be entirely retained after implementation of the Project (and the one aspect affected, *setting*, will be partially retained) and the Castle Green/Hotel Green will retain sufficient integrity to convey its historic significance.

The proposed new construction will also include substantial foundation work and the construction of subterranean parking. The required excavation, general construction procedures and associated vibration has the potential to de-stabilize the Castle Green/Hotel Green property. Vibration issues are examined in the Noise section of the CEQA document to address potential impacts from vibration to adjacent buildings and ensure that the historic buildings are protected. The Noise analysis determined that with mitigation to reduce potential vibration impacts associated with construction activities to a less than significant level, the Project will avoid significant impacts to the Castle Green/Hotel Green.

In summary, the integrity and significance of the Hotel Green/Castle Green will not be materially impaired by alterations to its surroundings caused by new construction associated with the Project, and it will maintain its eligibility for listing in the National Register and California Register. The proposed new construction will not result in significant impacts to the Hotel Green/Castle Green.

Alteration to the Old Pasadena Historic District

The Project site is located within the Old Pasadena Historic District. New construction will be within the District boundaries and within the vicinity of several buildings that are district contributors. In addition to the Hotel Green/Castle Green, the closest District contributor is the single-story commercial building at 84 South Fair Oaks Avenue, a small-scale commercial storefront from the mid-1920s located immediately north of the Project site. Other contributing buildings are located on the opposite side of South Fair Oaks Avenue.

The Old Pasadena Historic District is significant as the historic commercial center of Pasadena. The District documents the economic development of the city and its various phases of growth between 1886 and 1936. The District is composed of a variety of property types and architectural styles that are largely commercial in nature. Characteristic of pre-World War II commercial areas, the District is scaled to the pedestrian. Contributing properties to the District are oriented toward the street with architectural articulation largely confined to street-facing façades. The side- and rear-facing facades were constructed with minimal articulation in reaction to and in anticipation of the construction of neighboring buildings. The District's historic significance is experienced primarily from the street either by pedestrians or passing vehicles. The significance of the District contributors in the immediate vicinity is largely conveyed by their street-facing facades along Fair Oaks and Raymond Avenues These facades will not be obscured by the new construction.

The Old Pasadena Historic District is characterized by a diverse collection of buildings of varying heights and densities, with heights ranging from one story up to eight stories. The majority of buildings are built to the sidewalk with little or no setback. The proposed new construction will maintain the prevailing setback and will have a similar street orientation to the contributing buildings in the District, including ground-floor retail. At six stories plus penthouse, the proposed new building will be taller than many of the nearby contributing buildings, including the one-story commercial brick vernacular building at 84 South Fair Oaks Avenue immediately north of the Project site, and the three-story red brick building (Doty Block) located across the street at 103-115 South Fair Oaks Avenue. This contrast in scale, however, is in keeping with the overall character of the District which contains contributing buildings ranging from one to seven stories in height.

Central Park, a contributor to the Old Pasadena Historic District, is significant as one of Pasadena's oldest parks. Many mature trees, broad lawns, and a few small buildings connected by winding paths form the general plan of the park. The park became a recreation ground for the tourists staying at the neighboring Hotel Green.

As noted earlier in this report, when the planned Fair Oaks Avenue wing of the Hotel Green was not built, the southwest parcel was landscaped to complement Central Park. By 1951, the parcel was no longer used strictly for recreation and partially became a surface parking lot. A pool was added to the site in 1953 to service the Hotel Green and removed in the early 1970s when the building became low-income residential apartments. Even though two remnant trees remain on the parcel from the period of the hotel, the historic landscape is no longer discernible, and the Project parcel no longer conveys its past use as a designed landscaped area or its visual association with Central Park. Additionally, the Project will not significantly impact views or obscure public sight lines of Central Park.

Overall, the proposed new construction is compatible with the overall character of the Old Pasadena Historic District, and the integrity of the District will not be materially impaired by alterations to its setting caused by the Project. The proposed new construction will not diminish the ability of any District contributor, including the adjacent building at 84 South Fair Oaks Avenue, to convey its significance as a contributor to the District. All contributors' primary facades will remain intact and fully visible from the street.

The Project will include substantial foundation work and the construction of subterranean parking. The required excavation, general construction procedures and associated vibration has the potential to de-stabilize nearby contributing buildings including the 84 South Fair Oaks property. Vibration issues are examined in the Noise sections of the CEQA document to address potential impacts from vibration to adjacent buildings. The Noise analysis determined that with mitigation to reduce potential vibration impacts associated with construction activities to a less than significant level, the Project will avoid significant impacts to adjacent historic buildings.

Although the Project will construct a new building within the Old Pasadena Historic District boundaries, all but one of the seven aspects of integrity would be unaffected by the Project. The Project would not affect the integrity of *location, design, materials, or workmanship* for the District or any of its component contributing buildings. All contributing buildings would remain intact in their current locations and would not be materially altered by new construction associated with the Project. Therefore, integrity of *feeling* would also remain unaffected because all the existing physical elements that characterize the District and contributing buildings would remain and continue to convey their historic significance. Because all the important physical characteristics of the District will remain, they would continue to reflect their important associations with the commercial development of Pasadena during the late 19th- and early 20th centuries, therefore integrity of *association* would also remain unaffected by the Project. The only aspect of integrity that could possibly be affected by the Project is *setting*.

Setting features important to the Old Pasadena Historic District include the configuration of streets and sidewalks fronting District buildings, the pattern of tightly spaced buildings defining a central business district, and the public circulation space delineated by uniform building street walls. Adding a new building of compatible size and scale that maintains the prevailing building and set-back pattern characteristic of the District will not adversely alter the setting of the District such that its listing on the National Register would be threatened.

Despite the construction of a new building within the Old Pasadena Historic District boundaries and on land currently developed with surface parking and landscaping, the District will continue to convey its historic significance after implementation of the Project. .

<u>Compatibility</u>

As stated previously, Section 15064.5(b)(3) of the CEQA Guidelines states:

"Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings" (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource."

These Standards and additional guidance provided by the National Park Service for reviewing proposed new construction that may affect an historic resource, as stated above, be it an addition to an existing building or an infill building within an historic district, strive for the same outcome: a balance between compatibility and differentiation, and the retention of integrity.

Standard 9 in part states: "The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment."[43]

The proposed new construction will be differentiated from adjacent historic resources. It will be a contemporary design with balanced symmetrical proportions and will recall historic features that complement the eclectic design of the Hotel Green/Castle Green. The Project is compatible with the adjacent historic resources and the historic character of the District in terms of materials, features, size, scale and proportion. The new building is rectangular in plan and has massing similar to the Hotel Green/Castle Green. It also recalls traditional historic architectural design details including an emphasized base level, tower feature, arched windows, similarly proportioned fenestration, punched windows, cement plaster finishes, and a low-pitched roof with supporting brackets. The new building will also maintain the prevailing setback of the adjacent and nearby District contributors, continuing the street wall that defines and contains the immediate blocks of Fair Oaks Avenue.

The Project conforms to Standard 9 because it will be differentiated from the historic resources adjacent to the site and will be compatible with the size, scale, proportion, and massing to protect the integrity of the site and its surroundings.

Standard 10 states: "New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired."[44]

The Project will not be an addition to the adjacent historic resources. It will be a new building separate and apart from the existing buildings. As such, if the new construction is removed in the future the form and integrity of the adjacent historic resources, and the historic district, will be preserved. The Project conforms to Standard 10.

In summary, the design of the proposed new construction will be differentiated from the immediately surrounding buildings, will be compatible in size, scale and massing, and

[43] http://www.nps.gov/hps/tps/standguide/rehab/rehab_standards.htm
[44] Ibid.

will be a new building separate and apart from the adjacent existing buildings. The new construction will not result in a substantial adverse impact on the site or on existing adjacent resources and is consistent with the Secretary of the Interior's Standards.

6.4 Analytical Summary using CEQA Thresholds

Analysis of potential impacts to historical resources reveals that the Project will alter the setting and surroundings of historical resources but that the alteration will not substantially reduce the integrity or significance of those resources.

As noted above, the CEQA Guidelines as amended in 2019 indicate that a project would have a significant impact on historical resources if it would result in a substantial adverse change in the significance of a historical resource. A substantial adverse change in the significance of a historic resource means *demolition*, *destruction*, *relocation*, or *alteration* of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired.[45]

The following discussion reiterates the findings of the above analysis using the definition of "substantial adverse change" as provided in the CEQA Guidelines.

1. Would the Project involve the demolition or destruction of a significant resource?

The Project would not demolish a significant historical resource. The Project site is considered an historical resource because it is within the boundary identified in the Hotel Green/Castle Green National Register nomination and within the boundary of the Old Pasadena Historic District. The Project would replace the existing surface parking lot on the Project site. This area, originally a landscaped park space, has been substantially altered since the Hotel Green/Castle Green period of significance and is not considered a character-defining feature of the historic resource. Therefore, there are no historical resources on the Project site that would be demolished as part of the proposed Project.

As noted in Section 5 of this report, the Project site is situated in a National Register Historic District and adjacent to two contributing resources to the District. These are the Hotel Green/Castle Green at 99 South Raymond Avenue and 50 East Green Street, and the building at 84 South Fair Oaks Avenue. These buildings are located on the same block as the Project site. The Project does not propose or anticipate demolition of these buildings.

The Project will include excavation, general construction procedures and associated vibration which has the potential to de-stabilize adjacent historic buildings. Settlement

[45] *CEQA Guidelines*, section 15064.5(b)(1).

and vibration issues are examined in the Geotechnical and Noise/Vibration sections of the CEQA document to address potential impacts from settlement and vibration and ensure protection of adjacent buildings.

Therefore, the Project does not involve demolition or destruction of a significant resource.

2. Would the Project involve relocation that does not maintain the integrity of a significant resource?

The Project would not relocate any significant historical resource on or in the vicinity of the Project site. The Project will not relocate any part of Hotel Green/Castle Green at 99 South Raymond Avenue and 50 East Green Street, or the building at 84 South Fair Oaks Avenue. Therefore, the Project does not include the relocation of any adjacent buildings.

3. Would the Project involve alteration which does not maintain the integrity of a significant resource?

The Project site is within the boundary of the National Register listed Hotel Green/Castle Green. As such, the Project site is located within a historical resource. The Project site was originally a landscaped park space and has been substantially altered since its original construction. The Project would alter the historic resource by the addition of this new six-story plus penthouse building which will change the setting of the Hotel Green/Castle Green buildings.

Maintaining the Project site as an open space, however, is not critical to conveying the historic significance of the Hotel Green/Castle Green. The L-shaped configuration and orientation of the historic buildings will remain discernible after construction and the primary east- and west-facing facades will remain unobstructed. In addition, the Project does not propose conversion, rehabilitation, or alteration of identified historical buildings adjacent to the Project site, including the building at 84 South Fair Oaks Avenue.

In addition, the Project will not physically alter any contributing building to the Old Pasadena Historic District. The proposed new construction will not diminish the ability of any District contributor, including the building the Castle Green/Hotel Green and the commercial building at 84 South Fair Oaks Avenue, to convey its significance as a contributor to the District. All contributors' primary facades will remain intact and fully visible from the street. The Project does not involve alteration that does not maintain the integrity of a significant historic resource.

4. Would the Project involve construction that reduces the integrity or significance of important resources on the site or in the vicinity?

The Project does not propose the demolition, destruction, relocation or alteration of any historical building either on the Project site or in the vicinity of the Project site. As discussed above, the Project would not physically alter the Hotel Green/Castle Green buildings or the building at 84 South Fair Oaks Avenue.

The Project will, however, alter the immediate surroundings of historical resources both on the Project site and in the vicinity by constructing a new building. As stated previously, the Project will infill an open space that is historically associated with a historical resource, although the character-defining features of the open space are no longer extant. The Project will also partially obscure secondary facades of a historical resource that were previously open to public view. These impacts, however, will not substantially reduce the integrity or significance of important resources on the site or in the vicinity. As stated previously, the Project conforms to Standard 9 and 10 of the Secretary of the Interior's Standards for Rehabilitation.

The Project would not affect the integrity of *location, design, materials*, or *workmanship* of the Castle Green/Hotel Green. The building will remain intact in its current location and would not be materially altered by new construction. Therefore, integrity of *feeling* would also remain unaffected because all the existing physical elements that characterize the Castle Green/Hotel Green would continue to convey the property's historic significance. Because the Castle Green/Hotel Green would retain integrity of *location, design, materials, workmanship*, and *feeling*, it would continue to reflect its historic significance as a late-19th and early 20th century resort hotel in Pasadena, therefore integrity of *association* would also remain unaffected by the Project. Integrity of *setting* will be compromised by the new construction on an area historically used as open space but the setting features most important to conveying the historic significance of the property will remain unchanged. All but one of the seven aspects of integrity will be entirely retained after implementation of the Project (and the one aspect affected, *setting*, will be partially retained) and the Castle Green/Hotel Green will retain sufficient integrity to convey its historic significance.

Similarly, the Project would not affect the integrity of *location, design, materials*, or *workmanship* for the Old Pasadena Historic District. All contributing buildings would remain intact in their current locations and would not be materially altered by new construction associated with the Project. Therefore, integrity of *feeling* would also remain unaffected because all the physical elements that characterize the District would remain and continue to convey their historic significance. Contributors to the District would also continue to reflect their important associations with the commercial development of Pasadena during the late 19th- and early 20th centuries, leaving integrity of *association* unaffected by the Project. Integrity of *setting* for the District would also remain intact because important setting features, including the configuration of streets and sidewalks, the pattern of tightly spaced buildings, and the public circulation space will remain unchanged by the Project.

6.5 Summary of Potential Impacts on Historical Resources

Analysis of the potential impacts to historical resources has found that the Project will not result in significant adverse impacts on the identified historical resources located within and adjacent to the Project site. The Project will not result in a substantial adverse change in the significance of the Old Pasadena Historic District, the Hotel Green/Castle Green, or the Old Pasadena Historic District.

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Weeks, Kay D. and Anne E. Grimmer. *The Secretary of the Interior's Standards for the Treatment of Historic Properties: with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings*. Washington D.C.: National Park Service, U.S. Department of the Interior, 1995.

Views of the Project Site.

86 South Fair Oaks Avenue (Project Site); looking east

86 South Fair Oaks Avenue (Project Site); looking north

86 South Fair Oaks Avenue (Project Site); looking northeast

86 South Fair Oaks Avenue (Project Site); looking northeast

86 South Fair Oaks Avenue (Project Site); looking northeast

86 South Fair Oaks Avenue (Project Site); looking west

86 South Fair Oaks Avenue (Project Site); looking southwest

86 South Fair Oaks Avenue (Project Site); looking west

86 South Fair Oaks Avenue (Project Site); looking north

Street View from Fair Oaks Avenue; looking north

Street View from Fair Oaks Avenue; looking south

Street View from Dayton Street; looking east

Street View from Dayton Street; looking west

Street View from Central Park; looking north

Street View from Raymond Avenue; looking north

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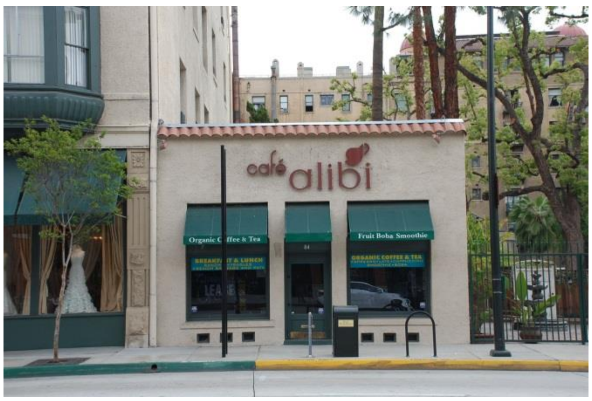
1. 99 South Raymond Avenue (Castle Green)

2. 50 East Green Street (Green Hotel)



3. 84 South Fair Oaks Avenue

4. Central Park

5. 150 South Raymond Avenue

6. 80-82 South Raymond Avenue

7. 62-70 South Raymond Avenue

8. 103-115 South Fair Oaks Avenue (Doty Block)

Jan C. Scow Consulting Arborists, LLC
Disease and Pest Diagnosis, Hazard Evaluation, Restorative Pruning Advice, Value Assessment

3887 Woodcliff Rd.
Sherman Oaks, CA 91403
(818) 789-9127

Date: 6/3/13 rev 6/7/13
To: Kristopher Forsythe
From: Jan Scow
Subject: Tree aging: 86 S. Fair Oaks

DRAFT

Tree #	Species	Status[1]	Cohort	Est. Age	~ Year	Range (years)	Reliability
1	Camphor	Protected specimen	C	70	1943	65-75 (10)	2b
2	Camphor	Protected specimen	C	70	1943	65-75 (10)	2b
3	Canary Island pine	Protected mature	E	50	1963	47-53 (6)	2a
4	Canary Island pine	Protected mature	E	50	1963	47-53 (6)	2a
5	Camphor	Protected specimen	A	100	1913	90-110 (20)	2b
6	California fan palm	Protected specimen	C	80	1933	75-85 (10)	1
7	Camphor	Protected specimen	E	45	1968	40-50 (10)	2b
9	Magnolia	Non-protected	E	40	1963	35-45 (10)	2b
10	Elm	Non-protected	E	40	1963	35-45 (10)	2b
11	California fan palm	Protected specimen	C	80	1933	75-85 (10)	1
12	Indian laurel fig	Protected specimen	D	65	1948	58-72 (14)	2b
13	Canary Isl date palm	Protected specimen	A	105	1908	100-110 (10)	1
14	Canary Isl date palm	Protected mature	F	20	1993	17-23 (6)	3
22	Queen palm	Protected street tree	F	11	2002	9-13 (4)	3
Tree #	Species	Status[2]	Cohort	age	~ Year	Range (years)	Reliability
23	Queen palm	Protected street tree	F	11	2002	9-13 (4)	3
28	Mexican fan palm	Non-protected	C	75	1938	70-80 (10)	1
29	Mexican fan palm	Non-protected	C	75	1938	70-80 (10)	1
30	Mexican fan palm	Non-protected	C	75	1938	70-80 (10)	1
31	Mexican fan palm	Non-protected	C	75	1938	70-80 (10)	1
35	X Mexican fan palm	Protected mature	B	85	1928	75-95 (10)	4
36	X Mexican fan palm	Protected mature	E	45	1968	40-50 (10)	4
37	Mexican fan palm	Non-protected	B	85	1928	80-90 (10)	1
38	Mexican fan palm	Non-protected	D	65	1948	61-68 (7)	1

[1] As per sheet A1.16 "Protected Tree & Non-Protected Tree Mitigation Analysis
[2] As per sheet A1.16 "Protected Tree & Non-Protected Tree Mitigation Analysis

Age classes (years)
A = 100+
B = 80-89
C = 70-79
D = 60-69
E = 40-59
F = < 20

Reliability	
1	plus or minus 5%
2a	plus or minus 5%
2b	plus or minus 10%
3	plus or minus 3 years
4	plus or minus 10%

Reliability
1 Believed to be very reliable, based on palm growth rates. Within plus or minus 5%.
2a Believed to be very reliable, based on ring count vs. trunk diameter of same species from previous locations. Within plus or minus 5%.
2b Believed to be reliable, based on known approximate growth rates of woody trees. Within plus or minus 10%.
3 Believed to be reliable, based on palm growth rates, but some variables make dating less certain, including uncertain growth rates and very rapid growth rates of young palms. Within plus or minus 2-3 years.
4 Believed to be fairly reliable, based on palm growth rates, but some variables make dating less certain, including uncertainty about growth rates for hybridized Washingtonia palms. Within plus or minus 10%.

APPENDIX E

Noise

1.0 INTRODUCTION

This study describes the existing noise and vibration environment of the proposed mixed-use development at 86 S. Fair Oaks Avenue, and evaluates potential noise and vibration impacts of the proposed project. This report has been prepared by Impact Sciences, Inc., under contract to the City of Pasadena, in support of the environmental documentation being prepared pursuant to the California Environmental Quality Act (CEQA). This analysis considers both the temporary noise impacts that would result from project construction and the long-term impacts associated with the operation of the project.

1.1 Project Description

The project site at 86 S. Fair Oaks Avenue contains 32,362 square feet bounded by S. Fair Oaks Avenue to the west, Dayton Street to the south, Castle Green historic event center to the east, and the Green Hotel Apartments to the north. The Project site is located within the boundaries of the Old Pasadena National Register Historic District and the Hotel Green National Register listing.

The proposed project is a 6-story plus mezzanine transit-oriented mixed-use development that includes retail, restaurant, and work/live units at the ground level and mixed-rate units on levels 2-6. Along Fair Oaks Avenue, the ground floor of the proposed building includes approximately 6,200 square feet of retail and food uses. Four work/live units, approximately 1,300 square feet each, are proposed in the ground floor along Dayton Street, facing Central Park. The proposed project contains 84 apartment units of varying types and sizes, including eight on-site residences for very low-income residents. All parking for the Project is located on 4 levels of underground parking that accommodate 195 parking spaces, including replacement of existing parking spaces for the Green Hotel Apartments, which currently utilizes the surface parking located on the project site. Access to and from the project site would be along Dayton Avenue on the southeast corner of the proposed project site. To enhance the relationship with the nearby network of rail and bus transit and reflect the principles of transit-oriented development, the project also incorporates bicycle parking. The project also includes common landscaped features at the ground floor and upper level terraces.

2.0 ENVIRONMENTAL SETTING

2.1 Fundamentals of Noise and Vibration

Noise

Noise is usually defined as unwanted sound that is an undesirable byproduct of society's normal day-to-day activities. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, and/or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). The human ear does not respond uniformly to sounds at all frequencies. For example, the human ear is less sensitive to low and high frequencies than medium frequencies, which more closely correspond with human speech. In response to the sensitivity of the human ear to different frequencies, the A-weighted noise level (or scale), which corresponds better with people's subjective judgment of sound levels, has been developed. This A-weighted sound level, referenced in units of dB(A), is measured on a logarithmic scale such that a doubling of sound energy results in a 3 dB(A) increase in noise level. Typically, changes in a community noise level of less than 3 dB(A) are not noticed by the human ear.[1] Changes from 3 to 5 dB(A) may be noticed by some individuals who are sensitive to changes in noise. A greater than 5 dB(A) increase is readily noticeable, while the human ear perceives a 10 dB(A) increase in sound level to be a doubling of sound.

On the A-weighted scale, the range of human hearing extends from approximately 3 to 140 dB(A). **Table 1, A-Weighted Decibel Scale**, provides examples of A-weighted noise levels from common sources. Noise sources occur in two forms: (1) point sources, such as stationary equipment or individual motor vehicles; and (2) line sources, such as a roadway with a large number of point sources (motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6 dB(A) for each doubling of distance from the source to the receptor at acoustically "hard" sites and 7.5 dB(A) at acoustically "soft" sites.[2] For example, if a noise source produces a noise level of 89 dB(A) at a reference distance of 50 feet, the noise level would be 83 dB(A) at a distance of 100 feet from the noise source, 77 dB(A) at a distance of 200 feet, and so on. Noise generated by a mobile source will decrease by approximately 3 dB(A) over hard surfaces and 4.5 dB(A) over soft surfaces for each doubling of distance.

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1 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.

2 Federal Highway Administration, *Highway Noise Fundamentals*, (1980) 97. Examples of "hard" or reflective sites include asphalt, concrete, and hard and sparsely vegetated soils. Examples of acoustically "soft" or absorptive sites include soft, sand, plowed farmland, grass, crops, heavy ground cover, etc.

Table 1
A-Weighted Decibel Scale

Typical A-Weighted Sound Levels	Sound Level (dB(A), Leq)
Threshold of Pain	140
Jet Takeoff at 100 Meters	125
Jackhammer at 15 Meters	95
Heavy Diesel Truck at 15 Meters	85
Conversation at 1 Meter	60
Soft Whisper at 2 Meters	35

Source: United States Occupational Safety & Health Administration, Noise and Hearing Conservation Technical Manual, 1999.

Sound levels also can be attenuated by man-made or natural barriers (e.g., sound walls, berms, ridges), as well as elevational differences. Noise is most audible when traveling by direct line-of-sight, an interrupted visual path between the noise source and noise receptor. Barriers, such as walls or buildings that break the line-of-sight between the source and the receiver, can greatly reduce noise levels from the source since sound can only reach the receiver by diffraction. Sound barriers can reduce sound levels by up to 20 dB(A) or more. However, if a barrier is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Solid walls and berms may reduce noise levels by 5 to 10 dB(A) depending on their height and distance relative to the noise source and the noise receptor.[3] Sound levels may also be attenuated 3 dB(A) by a first row of houses and 1.5 dB(A) for each additional row of houses.[4] The minimum noise attenuation provided by typical structures in California is provided in **Table 2, Building Noise Reduction Factors**.

Table 2
Building Noise Reduction Factors

Building Type	Window Condition	Noise Reduction Due to Exterior of the Structure (dB(A))
All	Open	10
Light Frame	Ordinary Sash (closed)	20
	Storm Windows	25
Masonry	Single Glazed	25

3 Federal Highway Administration, *Highway Noise Mitigation*, (1980) 18.

4 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.

	Double Glazed	35

Source: Federal Highway Administration, Highway Traffic Noise: Analysis and Abatement Guidance. December 2011.

Sound Rating Scales

Various rating scales approximate the human subjective assessment to the "loudness" or "noisiness" of a sound. Noise metrics have been developed to account for additional parameters, such as duration and cumulative effect of multiple events. Noise metrics are categorized as single event metrics and cumulative metrics, as summarized below.

In order to simplify the measurement and computation of sound loudness levels, frequency weighted networks have obtained wide acceptance. The A-weighted scale, discussed above, has become the most prominent of these scales and is widely used in community noise analysis. Its advantages are that it has shown good correlation with community response and is easily measured. The metrics used in this analysis are all based upon the dB(A) scale.

Equivalent Noise Level

Equivalent Noise Level (Leq) is the sound level corresponding to a steady-state A-weighted sound level containing the same total energy as several single event noise exposure level events during a given sample period. Leq is the "acoustic energy" average noise level during the period of the sample. It is based on the observation that the potential for noise annoyance is dependent on the total acoustical energy content of the noise. The equivalent noise level is expressed in units of dB(A). Leq can be measured for any period, but is typically measured for 15 minutes, 1 hour, or 24 hours. Leq for a 1-hour period is used by the Federal Highway Administration (FHWA) for assessing highway noise impacts. Leq for 1 hour is referred to as the Hourly Noise Level (HNL) in the California Airport Noise Regulations and is used to develop Community Noise Equivalent Level values for aircraft operations. Construction noise levels and ambient noise measurements in this section use the Leq scale.

Community Noise Equivalent Level

Community Noise Equivalent Level (CNEL) is a 24-hour, time-weighted energy average noise level based on the A-weighted decibel. It is a measure of the overall noise experienced during an entire day. The term "time-weighted" refers to the penalties attached to noise events occurring during certain sensitive periods. In the CNEL scale, 5 dB are added to measured noise levels occurring between the hours of 7:00 p.m. and 10:00 p.m. For measured noise levels occurring between the hours of 10:00 p.m. and 7:00 a.m., 10 dB are added. These decibel adjustments are an attempt to account for the higher sensitivity to noise in the evening and nighttime hours and the expected lower ambient noise levels during these periods. Existing and projected future traffic noise levels in this section use the CNEL scale.

Day-Night Average Noise Level

The day-night average sound level (Ldn) is another average noise level over a 24-hour period. Noise levels occurring between the hours of 10:00 p.m. and 7:00 a.m. are increased by 10 decibels (dB). This noise is weighted to take into account the decrease in community background noise of 10 dB(A) during this period. Noise levels measured using the Ldn scale are typically similar to CNEL measurements.

Adverse Effects of Noise Exposure

Noise is known to have several adverse effects on humans, which has led to laws and standards being set to protect public health and safety, and to ensure compatibility between land uses and activities. Adverse effects of noise on people include hearing loss, communication interference, sleep interference, physiological responses, and annoyance. Each of these potential noise impacts on people is briefly discussed in the following narrative.

Hearing Loss

Hearing loss is generally not a community noise concern, even near a major airport or a major freeway. The potential for noise-induced hearing loss is more commonly associated with occupational noise exposures in heavy industry, very noisy work environments with long-term exposure, or certain very loud recreational activities (e.g., target shooting and motorcycle or car racing). The Occupational Safety and Health Administration (OSHA) identifies a noise exposure limit of 90 dB(A) for 8 hours per day to protect from hearing loss (higher limits are allowed for shorter duration exposures). Noise levels in neighborhoods, even in very noisy neighborhoods, are not sufficiently loud enough to cause hearing loss.

Communication Interference

Communication interference is one of the primary concerns in environmental noise. Communication interference includes speech disturbance and intrusion with activities such as watching television. Noise can also interfere with communications such as within school classrooms. Normal conversational speech is in the range of 60 to 65 dB(A) and any noise in this range or louder may interfere with speech.

Sleep Interference

Noise can make it difficult to fall asleep, create momentary disturbances of natural sleep patterns by causing shifts from deep to lighter stages, and cause awakening. Noise may even cause awakening that a person may or may not be able to recall.

Physiological Responses

Physiological responses are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, and other physical changes. Studies to determine whether exposure to high noise levels can adversely affect human health have concluded that, while a relationship between noise and health effects seems plausible, there is no empirical evidence of the relationship.

Annoyance

Annoyance is an individual characteristic and can vary widely from person to person. Noise that one person considers tolerable can be unbearable to another of equal hearing capability. The level of annoyance depends both on the characteristics of the noise (including loudness, frequency, time, and duration), and how much activity interference (such as speech interference and sleep interference) results from the noise. However, the level of annoyance is also a function of the attitude of the receiver. Personal sensitivity to noise varies widely. It has been estimated that 2% to 10% of the population is highly susceptible to annoyance from any noise not of their own making, while approximately 20% are unaffected by noise.[5] Attitudes may also be affected by the relationship between the person affected and the source of noise, and whether attempts have been made to abate the noise.

Vibration

Vibration consists of waves transmitted through solid material. Groundborne vibration propagates from a source through the ground to adjacent buildings by surface waves. Vibration may comprise a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating and is measured in hertz (Hz). Most environmental vibrations consist of a composite, or "spectrum" of many frequencies, and are generally classified as broadband or random vibrations. The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than one Hz to a high of about 200 Hz. Vibration is often measured in terms of the peak particle velocity (PPV) in inches per second (in/sec) when considering impacts on buildings or other structures, as PPV represents the maximum instantaneous peak of vibration that can stress buildings.

5 Wayne County Airport Authority. *Background information on noise & its measurement, 2009*

Because it is a representation of acute vibration, PPV is often used to measure the temporary impacts of short-term construction activities that could instantaneously damage built structures. Vibration is often also measured by the Root Mean Squared (RMS) because it best correlates with human perception and response. Specifically, RMS represents "smoothed" vibration levels over an extended period of time and is often used to gauge the long-term chronic impact of a project's operation on the adjacent environment. RMS amplitude is the average of a signal's squared amplitude. It is most commonly measured in decibel notation (VdB).

Vibration energy attenuates as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. High frequency vibrations reduce much more rapidly than low frequencies, so that in the far-field from a source, the low frequencies tend to dominate. Soil properties also affect the propagation of vibration. When groundborne vibration interacts with a building, there is usually a ground-to-foundation coupling loss (i.e., the foundation of the structure does not move in sync with the ground vibration), but the vibration can also be amplified by the structural resonances of the walls and floors. Vibration in buildings is typically perceived as rattling of windows or items on shelves, or the motion of building surfaces. At high levels, vibration can result in damage to structures.

Manmade groundborne vibration is generally limited to areas within a few hundred feet of certain types of construction activities, especially pile driving. Road vehicles rarely create enough groundborne vibration to be perceptible to humans unless the road surface is poorly maintained and there are potholes or bumps. If traffic induces perceptible vibration in buildings, such as window rattling or shaking of small loose items (typically caused by heavy trucks in passing), then it is most likely an effect of low-frequency airborne noise or ground characteristics. Human annoyance by vibration is related to the number and duration of events. The more events or the greater the duration, the more annoying it will be to humans.

2.2 Noise Sensitive Receptors

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as natural parks and recreation areas, historic sites, and cemeteries are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses. Noise-sensitive receptors surrounding the project site include the Castle Green residences and events center to the east, the Green Hotel Apartments to the north and Central Park to the south.

2.3 Existing Conditions

A noise monitoring survey was completed to establish existing noise levels in the City of Pasadena at locations near the project site. Existing noise levels were calculated for four locations in proximity to the project site. **Figure 1, Noise Monitoring Locations** maps these locations relative to the project site**.** Based on the results of the ambient noise measurements, it was determined that transportation related noise sources are the primary contributor to the noise environment in each of the monitoring locations. The existing average daily noise levels for these locations are presented in **Table 3, Ambient Sound-Level Readings**.

Table 3
Ambient Sound-Level Readings

Noise Measurement Location #	Date/Time	dBA Leq
Location #1	12/10/2019; 1:23 p.m.	67.9
Location #2	12/10/2019; 1:43 p.m.	68.0
Location #3	12/10/2019; 2:13 p.m.	55.8
Location #4	12/10/2019; 2:31 p.m.	57.3

The only sources of groundborne vibration in the project site vicinity are heavy-duty vehicles (e.g., refuse trucks, delivery trucks, and school buses) traveling on local roadways. Trucks and buses typically generate groundborne vibration velocity levels of around 63 VdB, and these levels could reach 72 VdB where trucks and buses pass over bumps in the road (Caltrans 2013). In terms of PPV levels, a heavy-duty vehicle traveling at a distance of 50 feet can result in a vibration level of approximately 0.001 inch per second.

Figure 1- Noise Monitoring Locations

3.0 REGULATORY FRAMEWORK

3.1 State Regulations

Title 24, California Code of Regulations

The California Noise Insulation Standards of 1988 (California Code of Regulations Title 24, Section 3501 et seq.) require that interior noise levels from the exterior sources not exceed 45 dBA Ldn/community noise equivalent level (CNEL)6 in any habitable room of a multi-residential use facility (e.g., hotels, motels, dormitories, long-term care facilities, and apartment houses and other dwellings, except detached single-family dwellings) with doors and windows closed. Where exterior noise levels exceed 60 dBA CNEL/Ldn, an acoustical analysis is required to show that the building construction achieves an interior noise level of 45 dBA CNEL/Ldn or less.

3.2 Local Plans and Policies

City of Pasadena General Plan

The City of Pasadena General Plan contains policies and programs to achieve and maintain noise levels compatible with various types of land uses. The Noise Element provides policy-level direction for the City to limit people's exposure to noise. The following policies are found in the Noise Element of the Pasadena General Plan:

Objective 2	**The City will work to reduce the effects of traffic-generated noise from major roadways on residential and other sensitive land uses.**
Policy 2a	The City will encourage noise-compatible land uses along major roadways.
Policy 2b	The City will encourage site planning and traffic control measures that minimize the effects of traffic noise in residential zones.
Policy 2c	The City will encourage the use of alternative transportation modes as stipulated in the Mobility Element (walking, bicycling, transit use, electric vehicles) to minimize traffic noise in the City.

6 Measurements are based on Ldn or CNEL.

Policy 2d	The City will work with local and regional transit agencies and businesses to provide transportation services that reduce traffic and associated noise as stipulated in the Mobility Element.
Policy 2e	The City will work to reduce the effects of traffic-related noise in residential neighborhoods, including but not limited to neighborhoods adjacent to South Orange Grove Boulevard, Saint John Avenue, Pasadena Avenue, California Boulevard, and other busy streets passing thorough residential neighborhoods.
Objective 3	**The City will minimize noise from the Los Angeles to Pasadena Metro Line on residential and other sensitive land uses.**
Policy 3a	The City will encourage noise-compatible land uses and mitigation measures near the Los Angeles to Pasadena Metro Line rail system.
Policy 3b	After commencing operations and regularly thereafter, the City will work with the Los Angeles to Pasadena Metro Blue Line Construction Authority and/or the Los Angeles County Metropolitan Transportation Authority (LACMTA) to install noise attenuation features if the Gold Line (formerly known as the Blue Line) adversely affects existing adjacent residential or other noise-sensitive uses.
Objective 6	**The City will minimize noise spillovers from commercial and industrial operations into adjacent residential neighborhoods and other sensitive uses, while maximizing the Land Use Element's objectives to encourage mixed-use development in the Central District and other Specific Plan areas as well as to promote economic vitality.**
Policy 6a	The City will encourage automobile and truck access to industrial and commercial properties abutting residential zones to be located at the maximum practical distance from residential zones.
Policy 6b	The City will limit the use of motorized landscaping equipment, parking lot sweepers, and other high-noise equipment on commercial properties if their activity will result in noise that adversely affects residential zones.
Policy 6c	The City will encourage limitations on the hours of truck deliveries to industrial and commercial properties abutting residential zones unless there is no feasible

alternative or there are substantial transportation benefits for scheduling deliveries at another hour.

Objective 7 **The City will minimize the effects of nuisance noise on sensitive land uses as defined in Table 4 to the degree feasible.**

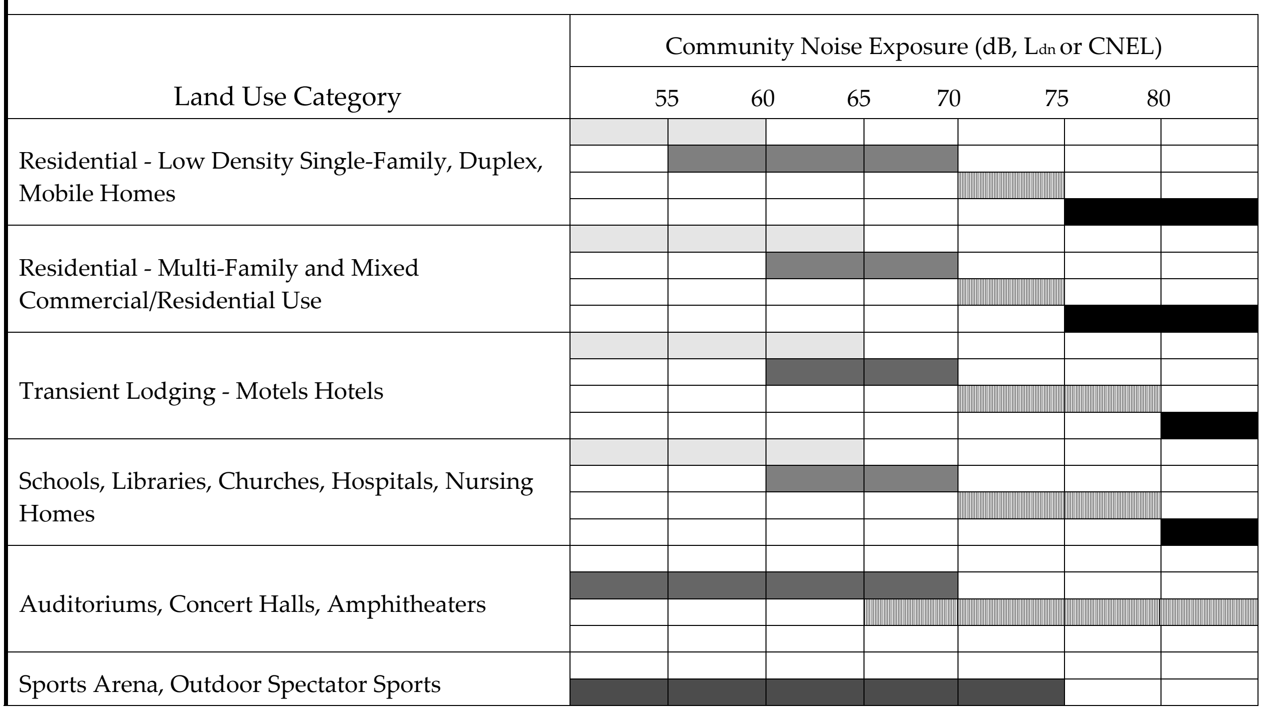
Policy 7a Whenever possible, City-sponsored events that generate noise will be scheduled during hours when effects would be minimal.

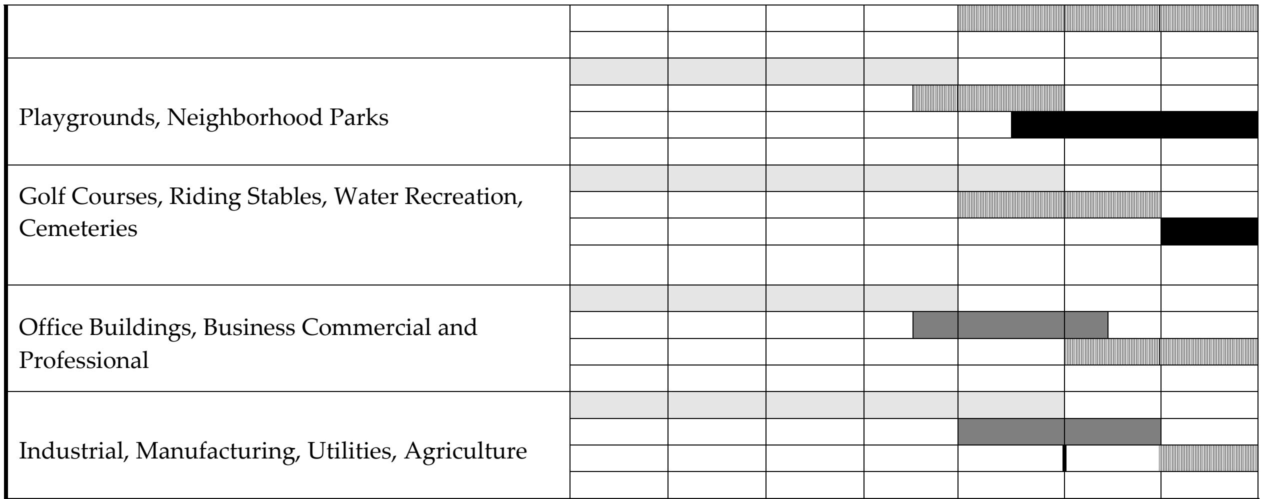
Policy 7b The City will encourage limitations on construction activities adjacent to sensitive noise receptors as defined in Table 4.

Policy 7c The City will encourage construction and landscaping activities that employ techniques to minimize noise.

Policy 7d The City will enforce noise level restrictions contained in the City of Pasadena Noise Regulations (Chapter 9.36 of the Municipal Code), except during federal, State, or local emergencies (such as power generators required for energy emergencies).

Table 4
Land Use Compatibility for Community Noise Environments





Clearly Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Normally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice.

Conditionally Acceptable - If new construction or development proceeds, an analysis of the noise reduction requirements should be made and needed noise insulation features included in the design.

Normally Unacceptable - New construction or development should generally not be undertaken, unless it can be demonstrated that an interior level of 45 dBA can be achieved.

**Please note that these guidelines are general and may not apply to specific sites.*
Source: California General Plan Guidelines, 1998, as modified by the City of Pasadena General Plan Noise Element, 2002.

City of Pasadena Municipal Code

The City has jurisdiction over noise regulation, as stated in the City's Municipal Code, Title 9, Chapter 36 Noise Restrictions (Noise Ordinance). The Noise Ordinance is intended to enforce the City's policy to prohibit "unnecessary, excessive, and annoying noises from all sources." The Noise Ordinance generally limits the generation of noise that exceeds the actual measured existing ambient noise level by 5 dB(A) at neighboring properties, with adjustments made for steady audible tones, repeated impulsive noise, and noise occurring for limited periods. Section 9.36.060 sets interior noise level standards for multifamily residential development at 60 dB(A) during daytime hours (7:00 AM to 10:00 PM) and 50 dB(A) during nighttime hours (10:00 PM to 7:00 AM).

The City's noise ordinance includes specific provisions regarding construction noise. Section 9.36.070 of the Municipal Code prohibits the operation of construction equipment and construction activity except from 7:00 AM to 7:00 PM Monday through Friday, and from 8:00 AM to 5:00 PM on Saturday in or within 500 feet of a residential district. Operation of construction equipment is prohibited on Sunday and on defined holidays. Section 9.36.080 of the Municipal Code prohibits the operation of powered construction equipment that generates a noise level of 85 dB(A) when measured at 100 feet.

4.0 NOISE ANALYSIS

4.1 Thresholds of Significance

The impacts of the proposed project related to noise would be considered significant if they would exceed any of the following Standards of Significance, in accordance with Appendix G of the *California Environmental Quality Act (CEQA) Guidelines*:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project site in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundborne vibration or groundborne noise levels;
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

4.1 Methodology

Noise levels associated with project-related construction activities were calculated using the FHWA Roadway Construction Noise Model (RCNM) and combined with existing ambient noise level readings to determine new ambient noise levels with construction activities. The applicant provided a list of construction equipment assumptions that is used for RCNM inputs. Noise levels were compared to the City's noise ordinance which includes provisions regarding construction noise levels, which prohibits a noise level of 85 dB(A) when measured at 100 feet.

For operational noise impacts, the City's noise ordinance generally limits the generation of noise that exceeds the actual measured existing ambient noise level by 5 dB(A) at neighboring properties. Therefore, increases in 5dB(A) above measured ambient noise levels are considered significant, unless mitigated.

Traffic noise in the project area was estimated using peak-hour traffic obtained from the City of Pasadena Department of Transportation. As it would take a doubling of traffic volumes to increase noise levels by 3 dB(A), traffic noise was compared to the existing A.M. and P.M. peak hour volumes to determine if there would be a doubling of traffic volumes and result in an increase in noise levels beyond 3 dB(A).

Construction vibration damage criteria are assessed based on structural category (e.g. reinforced-concrete, steel, or timber). FTA guidelines consider 0.12 inch/sec PPV to be the significant impact level for buildings extremely susceptible to vibration damage, such as the Green Hotel Apartments or Castle Green. Structures or buildings constructed of reinforced concrete, steel, or timber have a vibration damage criterion of 0.5 inch/sec PPV pursuant to FTA guidelines.[7] The FTA Guidelines include a table showing the vibration damage criteria based on structural category and is presented below in **Table 5.**

Table 5 Construction Vibration Damage Criteria

Building/Structural Category	PPV, in/sec
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual. September 2018.

4.3 Impact Analysis

Construction Impacts

Temporary On-Site Construction Activity Noise

Construction, grading, and other noise-generating activities would occur weekdays between 7:00 a.m. and 7:00 p.m., and Saturdays between 8 a.m. and 5 p.m. in accordance with section 9.36.070 the Pasadena Municipal Code. Construction is not anticipated to occur on Sundays or holidays. Construction activities would vary over several phases of development and would include large off-road equipment such as tractors, loaders, and smaller equipment such as saws, hammers, and pneumatic tools.

As noted above, section 9.36.080 of the Pasadena Municipal Code requires that construction equipment noise not exceed 85 dB(A) at 100 feet. As such, construction noise impacts will be less than significant.

Temporary Off-Site Construction Activity Noise

Construction haul trucks would generate noise off-site during site preparation and construction. This would include removal of materials from the project site, including the export of cut-and-fill materials, removal of asphalt, base materials, and demolished materials. While this vehicle activity would increase ambient noise levels along the haul route, ambient noise levels would not be expected to significantly

7 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual. September* 2018.

increase ambient noise levels by 3 dB(A) or greater at any noise sensitive land use. Studies have shown that a 3 dB(A) increase in sound level pressure is barely detectable by the human ear. A 3 dB(A) increase in roadway noise levels requires an approximate doubling of roadway traffic volume, assuming that travel speeds and fleet mix remain constant.[8] The City of Pasadena's Transportation Data Management System shows that the street segment south of the intersection of Fair Oaks Avenue and Green Street has a traffic volume of approximately 1,354 vehicles during the A.M. peak hour, and 1,400 vehicles during the P.M. peak hour.[9] The grading period would have approximately 5,688 hauling trips (including trips to and from the site) over a 130 day period, averaging about 44 trips per day. Assuming that these hauling trips would take place during an 8-hour work day period., an average of approximately 6 hauling trips per hour would occur. Though the addition of haul trucks would alter the fleet mix of the anticipated haul route, their addition to local roadways would account for 0.44 percent of the A.M. peak hour traffic volume and 0.43 percent of the P.M. peak hour traffic volume. Since it would take a doubling of roadway traffic volume to increase noise levels by 3 dB(A), the addition of haul trucks from the project would not increase traffic to levels capable of producing 3 dB(A) ambient noise increases and there would be no perceptible increase in noise due to the addition of haul trucks. However, trucks accessing the project site, while not significantly increasing ambient traffic noise levels, have the potential to instantaneously increase noise levels as each truck passes nearby sensitive receptors (e.g., an empty truck hitting a pothole, or the application of air brakes near sensitive land uses, etc.). These temporary instantaneous noise level increases may reach a maximum range of approximately 76 to 88 dB(A) at 50 feet from the source.[10,11] At a reference distance of 100 feet, a noise level of 88 dB(A) at 50 feet would drop to approximately 82 dB(A). This would not exceed the requirements specified in Pasadena Municipal Code section 9.36.080. As a result, temporary haul truck construction noise impacts on ambient noise levels would be considered less than significant.

Temporary Construction Activity Vibration

The Federal Transit Administration provides ground-borne vibration impact criteria with respect to building damage during construction activities. Peak particle velocity (PPV), expressed in inches per second, is used to measure building vibration damage. Construction vibration damage criteria are assessed based on structural category (e.g. reinforced-concrete, steel, or timber). FTA guidelines consider 0.12 inch/sec PPV to be the significant impact level for buildings extremely susceptible to vibration damage.

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8 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Protocol.* September 2013.

9 City of Pasadena, *Transportation Data Management System.* Available at: https://pasadena.ms2soft.com/tcds/tsearch.asp?loc=Pasadena&mod=

10 Federal Highway Administration, Highway Construction Noise Handbook, 2006.

11 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual. September* 2018.

Structures or buildings constructed of reinforced concrete, steel, or timber have a vibration damage criterion of 0.5 inch/sec PPV pursuant to FTA guidelines.[12]

Groundborne vibration generated by construction activities associated with the proposed project would affect both on- and off-site sensitive uses located in close proximity to the project site. As shown in **Table 6, Vibration Source Levels for Construction Equipment**, vibration velocities could range from 0.003 to 0.644 inch/sec PPV at 25 feet from the source activity, with corresponding vibration levels (VdB) ranging from 58 VdB to 87 VdB at 25 feet from the source activity, depending on the type of construction equipment in use. It should be noted that pile driving and equivalent methods are prohibited by the Municipal Code.

Table 6
Vibration Source Levels for Construction Equipment

	Approximate PPV (in/sec)					Approximate RMS (VdB)				
Equipment	**25 Feet**	**50 Feet**	**60 Feet**	**75 Feet**	**100 Feet**	**25 Feet**	**50 Feet**	**60 Feet**	**75 Feet**	**100 Feet**
Large Bulldozer	0.089	0.031	0.024	0.017	0.011	87	78	76	73	69
Caisson Drilling	0.089	0.031	0.024	0.017	0.011	87	78	76	73	69
Loaded Trucks	0.076	0.027	0.020	0.015	0.010	86	77	75	72	68
Jackhammer	0.035	0.012	0.009	0.007	0.004	79	70	68	65	61
Small Bulldozer	0.003	0.001	0.0008	0.0006	0.0004	58	49	47	44	40

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2018.

The sensitive receptors in **Figure 1** identify receptors that are sensitive to noise impacts. However, vibrational impacts can potentially damage buildings that are near the construction site. As such, **Table 7, Vibration Levels at Off-Site Sensitive Uses from Project Construction - Unmitigated**, shows the vibration velocity and levels that would occur at these nearby buildings and structures during construction at the project site. For clarity, the receptors in **Table 7** are listed as "Vibration Receptors." The receptors identified to be assessed for vibration impacts are the Green Hotel Apartments (Vibration Receptor #1) located to the north of the project site, the Castle Green (Vibration Receptor #2) located east of the project, a three-story red brick building located at 103-115 South Fair Oaks Avenue (Vibration Receptor #3) located west of the project, and a restaurant building located at 84 South Fair Oaks Avenue (Vibration Receptor #4). Based on the FTA guidance presented in Table 5, a vibration level of 0.12 PPV in/sec is used in this analysis as the threshold to determine potential significant vibration impacts to the existing Green Hotel Apartments, Castle Green, and restaurant building located at 84 South Fair Oaks Avenue.

12 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual. September* 2018.

Table 7
Vibration Levels at Off-Site Sensitive Uses from Project Construction - Unmitigated

Sensitive Uses Off-Site	Distance to Project Site (ft.)	Receptor Significance Threshold PPV (in./sec)	Estimated PPV (in/sec) [a]
Vibration Receptor #1 (Green Hotel Apartments)	20	0.12	0.124
Vibration Receptor #2 (Castle Green) [c]	40	0.12	0.044
Vibration Receptor #3 (103-115 South Fair Oaks Avenue)	80	0.5	0.016
Vibration Receptor #4 (84 South Fair Oaks Avenue)	15	0.12	0.191

The vibration velocities predicted to occur at Vibration Receptor #1 (Green Hotel Apartments), excluding one-story portions, located 20 feet to the north of the nearest project site boundary would be 0.124 in/sec PPV. This exceeds the FTA 0.12 in/sec PPV threshold. Vibration Receptor #2 (Castle Green) is approximately 40 feet from the project site; at this distance, vibration impacts are anticipated to be 0.044 in/sec PPV and would not exceed the FTA threshold. Vibration Receptor #3, at a distance of 80 feet, is estimated to have vibration levels of 0.016 in/sec PPV and would not exceed FTA thresholds either. Vibration Receptor #4 is estimated to have vibration levels of 0.191 in/sec PPV and would also exceed the FTA threshold of 0.12 in/sec PPV. **Mitigation Measures Noise-1 and Noise-2** would reduce potential vibration impacts to associated with construction activities to a less than significant level.

Mitigation Measures

MM Noise-1: Consult with Structural Engineer and Project Historical Architect

Prior to approval of grading plans and/or prior to issuance of demolition, grading and building permits, and to the satisfaction of the City of Pasadena, the applicant shall retain a Professional Structural Engineer with experience in structural vibration analysis and monitoring for historic buildings and a Project Historical Architect as a team to perform the following tasks:

- Review the project plans for demolition and construction;
- Survey the project site and the existing Green Hotel Apartments and restaurant building at 84 South Fair Oaks Avenue, including geological testing, if required; and
- Prepare and submit a report to the Director of Planning and Community Development to include, but not be limited to, the following:

— Description of existing conditions at the existing Green Hotel Apartments and restaurant building at 84 South Fair Oaks Avenue;

— Vibration level limits based on building conditions, soil conditions, and planned demolition and construction methods to ensure vibration levels would be below 0.12 ppv in/sec, the potential for damage to the existing Green Hotel Apartments and restaurant building at 84 South Fair Oaks Avenue;

— Specific measures to be taken during construction to ensure the specified vibration level limits are not exceeded; and

— A monitoring plan to be implemented during demolition and construction that includes post-construction and post-demolition surveys of the existing Green Hotel Apartments and restaurant building at 84 South Fair Oaks Avenue.

— Examples of measures that may be specified for implementation during demolition or construction include, but are not limited to

- Prohibition of certain types of impact equipment;
- Requirement for lighter tracked or wheeled equipment;
- Specifying demolition by non-impact methods, such as sawing concrete;
- Phasing operations to avoid simultaneous vibration sources; and
- Installation of vibration measuring devices to guide decision making for subsequent activities.

MM Noise-2: Post Construction Survey and Documentation

To the satisfaction of the City of Pasadena, at the conclusion of vibration-causing activities, in the unanticipated event of discovery of vibration-caused damage, the Structural Engineer and the Project Historical Architect shall document any damage to the existing Green Hotel Apartments and/or restaurant building located at 84 South Fair Oaks Avenue caused by construction of the project and shall recommend necessary repairs. The project applicant shall be responsible for any repairs associated with vibration-caused damage as a result of construction of the project. Any such repairs shall be undertaken and completed as required to conform to the Secretary of the Interior's Standards for the Treatment of Historic

Properties (36 Code of Federal Regulations 68), and shall apply the California Historical Building Code (California Code of Regulations, Title 24, Part 8) and other applicable codes.

Significance after Mitigation: Implementation of the above measures would reduce the construction related vibration impacts to a less than significant level.

Residual Impacts

Impacts would be less than significant.

Operation Impacts

Permanent Operational Traffic Noise

As discussed above, a 3 dB(A) increase in roadway noise levels requires an approximate doubling of roadway traffic volume, assuming that travel speeds and fleet mix remain constant. Furthermore, a 3 dB(A) noise level increase is the minimum noise level increase required for a human to perceive a change in ambient noise.

Trip generation estimates for the project were obtained from the traffic impact analysis prepared for the proposed project.[13] Trip generation information for the proposed project was added to peak hour traffic volumes to determine whether traffic increased enough to result in an audible noise level increase. The traffic study determined that the proposed project would add approximately 52 A.M. peak hour trips and 73 P.M. peak hour trips. The City of Pasadena's Transportation Data Management System shows that Dayton Street between Fair Oaks Avenue and Raymond Avenue has a traffic volume of approximately 70 vehicles during the A.M. peak hour, and 118 vehicles during the P.M. peak hour.[14] As noted above, it would take a doubling of roadway traffic volumes to increase noise levels by 3 dB(A). The project's addition of approximately 52 A.M. peak hour trips and 73 P.M. peak hour trips would not increase in traffic volumes enough to cause a significant audible increase in traffic noise.

Permanent Operational Stationary Noise

The Pasadena Municipal Code requires that noise generated by mechanical equipment not exceed 5 dB(A) above ambient noise levels at adjacent property lines.

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13 City of Pasadena Department of Transportation, *Transportation Impact Analysis Outside of CEQA Evaluation; 86 South Fair Oaks Avenue*. May 3, 2019.

14 City of Pasadena, *Transportation Data Management System.* Available at: https://pasadena.ms2soft.com/tcds/tsearch.asp?loc=Pasadena&mod=

During project operation, the project would include stationary noises from sources associated with building operations, such as heating, ventilation, and air conditioning (HVAC) systems, as well as vehicle parking. Large ground-level heating, ventilation, and air conditioning (HVAC) systems typically generate noise levels between 50 and 65 dB(A) at 50 feet. Rooftop mounted equipment typically produces noise levels of up to approximately 56 dB(A) at 50 feet. The proposed project is anticipated to utilize rooftop mounted HVAC equipment. HVAC equipment would be located on the roof approximately 50 feet away from receptors at the nearest property line and therefore noise from the HVAC system would cause a maximum noise level of 56.0 dB(A) Leq and a new ambient noise level of approximately 58.9 dB(A) when combined with existing ambient noise. This would result in a maximum noise level increase of approximately 3.1 dB(A) Leq. This is below the Pasadena Municipal Code threshold of a 5 dB(A) increase in ambient noise levels, and would not cause any nearby sensitive land use to exceed the normally acceptable level of noise identified in **Table 4**. Therefore, on-site HVAC noise would result in a less than significant impact.

Parking noise typically generates noise levels of approximately 60 dB(A) at 50 feet. Parking from the project would occur in subterranean parking. However, as cars enter the subterranean parking from within the project site, noise generated from parking related impacts may occur at nearby receptors. Ambient noise level readings from **Table 3** show noise levels at Receptor #3 (Central Park) to be at 55.8 dB(A). At approximately 60 feet from the subterranean parking entrance, there would be an increase of approximately 4.5 dB(A) when vehicles enter the parking levels of the project and receptors are exposed to parking noise. This is below the Pasadena Municipal Code recommended threshold of a 5 dB(A) increase in ambient noise levels and would not cause any nearby sensitive land use to exceed the normally acceptable level of noise identified in **Table 4**. Therefore, parking noise would result in a less than significant impact.

Permanent Operational Aircraft Noise

The project site is not in the vicinity of a private airstrip or airport land use plan. Likewise, the project site is not located within an airport land use plan or within two miles of a public airport or public use airport. As such, the project would not expose people residing or working in the project area to excessive airport-related noise levels. No impact would occur from the proposed project and no further analysis is required.

Residual Impacts

Impacts would be less than significant

REFERENCES

California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.

City of Pasadena Department of Transportation, *Transportation Impact Analysis Outside of CEQA Evaluation; 86 South Fair Oaks Avenue*. May 3, 2019.

City of Pasadena, *Transportation Data Management System.* Available at: https://pasadena.ms2soft.com/tcds/tsearch.asp?loc=Pasadena&mod=

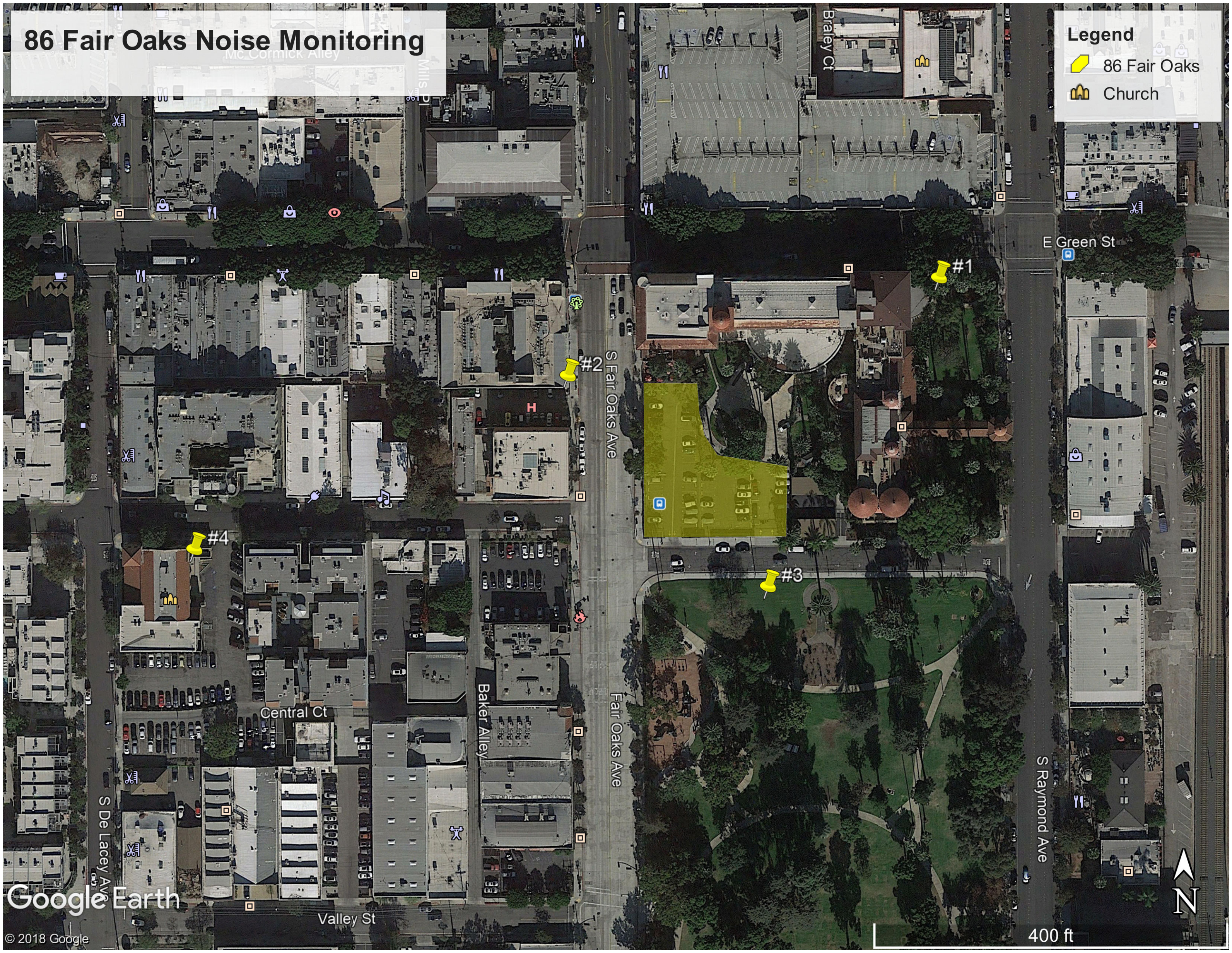
Federal Highway Administration, *Highway Noise Mitigation*, (1980) 18.

Federal Highway Administration, *Highway Noise Fundamentals*, (1980) 97.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual. September* 2018

Wayne County Airport Authority. *Background information on noise & its measurement, 2009*

Noise Monitoring Location Map



SOURCE: Google Earth, 2018

FIGURE 1

IMPACT SCIENCES

Noise Monitoring Location Map

1136.004•06/2020

Noise Monitoring Data

Summary

File Name on Meter	LxT_Data.058
File Name on PC	SLM_0005667_LxT_Data_058.00.ldbin
Serial Number	0005667
Model	SoundTrack LxT®
Firmware Version	2.302
User	ISI, Inc.
Location	86 Fair Oaks
Job Description	
Note	

Measurement

Description	
Start	2019-12-10 13:23:19
Stop	2019-12-10 13:38:19
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	2019-04-25 10:16:43
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
OBA Range	Normal			
OBA Bandwidth	1/1 and 1/3			
OBA Freq. Weighting	A Weighting			
OBA Max Spectrum	Bin Max			
Overload	144.4 dB			
	A	**C**	**Z**	
Under Range Peak	100.7	97.7	**102.7**	dB
Under Range Limit	**49.7**	47.7	55.7	dB
Noise Floor	36.6	37.2	44.8	dB

Results

LAeq	67.9 dB	
LAE	97.5 dB	
EA	620.265 µPa^{2}h	
EA8	19.848 mPa^{2}h	
EA40	99.242 mPa^{2}h	
LZpeak (max)	2019-12-10 13:37:31	107.9 dB
LASmax	2019-12-10 13:37:32	83.0 dB
LASmin	2019-12-10 13:33:19	55.7 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LCeq	78.8 dB	
LAeq	67.9 dB	
LCeq - LAeq	10.9 dB	
LAIeq	69.7 dB	
LAeq	67.9 dB	
LAIeq - LAeq	1.8 dB	

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	67.9		78.8			
Ls(max)	83.0	2019/12/10 13:37:32				
Ls(min)	55.7	2019/12/10 13:33:19				
LPeak(max)					107.9	2019/12/10 13:37:31

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Dose Settings

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

Results

Dose	-99.9	0.00 %
Projected Dose	-99.9	0.11 %
TWA (Projected)	-99.9	40.9 dB
TWA (t)	-99.9	15.9 dB
Lep (t)	52.9	52.9 dB

Statistics

LAS5.00	73.6 dB
LAS10.00	71.4 dB
LAS33.30	65.4 dB
LAS50.00	63.4 dB
LAS66.60	62.0 dB
LAS90.00	58.9 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160
PRMLxT1	2019-04-25 10:16:43	-50.8	63.1	61.3	51.2	56.0	57.1	58.9	53.6	54.2	58.7	50.0	51.2	55.9	44.2	58.6	52.4
PRMLxT1	2019-01-12 12:02:16	-50.7	36.0	38.9	46.6	48.4	43.8	43.5	44.2	51.8	40.1	38.6	41.9	38.2	45.9	53.6	46.0
PRMLxT1	2018-11-01 09:59:25	-50.5	60.6	57.6	44.5	43.2	52.3	51.3	51.9	61.9	55.5	53.4	47.6	41.6	45.8	51.6	48.3
PRMLxT1	2018-11-01 09:58:54	-50.5	71.0	70.8	55.4	46.1	54.8	46.5	53.2	58.0	55.9	50.9	45.0	43.3	45.3	50.1	50.5
PRMLxT1	2018-07-12 08:32:20	-49.8	41.3	59.9	52.6	47.8	49.3	59.8	55.3	52.0	45.0	51.6	49.1	46.5	50.0	56.0	48.6
PRMLxT1	2018-07-11 12:06:07	-49.9	26.3	38.3	46.3	36.2	46.4	59.6	42.8	50.9	56.4	57.2	51.1	55.9	48.7	63.4	33.9
PRMLxT1	2018-07-11 11:29:38	-49.0	16.7	13.9	19.6	17.7	13.2	12.2	17.8	7.3	8.0	6.4	8.6	6.1	4.0	7.8	4.8

200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
37.9	51.0	48.4	43.7	35.1	29.3	25.8	93.9	32.0	29.0	40.0	29.9	40.4	32.6	34.1	35.2	36.3	37.3	38.3	39.4	41.1
44.2	45.2	46.4	45.5	37.8	33.9	27.2	93.9	30.9	28.3	39.7	30.2	40.4	32.2	33.6	34.6	35.7	37.1	38.4	39.5	41.0
53.7	47.9	42.7	44.9	38.5	31.1	27.0	94.0	31.7	28.2	40.1	30.5	40.7	32.8	33.3	35.0	36.0	36.8	38.3	39.3	40.9
51.8	47.6	44.2	43.4	38.1	30.1	27.0	93.4	30.0	27.3	39.9	29.3	39.9	32.4	32.9	33.5	34.9	36.5	37.4	38.7	40.4
48.0	43.2	48.4	48.6	47.2	36.2	34.7	114.0	49.1	28.8	64.9	29.7	58.0	31.5	34.6	35.1	35.8	36.8	38.1	39.0	40.5
43.5	46.5	43.1	47.3	37.8	34.0	28.9	113.1	48.1	26.8	62.6	29.5	54.4	30.6	30.7	31.8	32.5	31.1	31.2	29.7	29.3
8.8	7.5	6.4	7.0	6.8	7.6	10.2	10.5	10.2	12.9	13.3	14.7	13.4	14.8	16.8	17.4	17.6	19.6	20.9	21.8	22.7

Summary

File Name on Meter	LxT_Data.059
File Name on PC	SLM_0005667_LxT_Data_059.00.ldbin
Serial Number	0005667
Model	SoundTrack LxT®
Firmware Version	2.302
User	ISI, Inc.
Location	86 Fair Oaks
Job Description	
Note	

Measurement

Description	
Start	2019-12-10 13:43:07
Stop	2019-12-10 13:58:07
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	2019-04-25 10:16:43
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	144.4 dB

	A	C	Z	
Under Range Peak	100.7	97.7	**102.7**	dB
Under Range Limit	**49.7**	47.7	55.7	dB
Noise Floor	36.6	37.2	44.8	dB

Results

LAeq	68.0 dB	
LAE	97.5 dB	
EA	629.830 µPa²h	
EA8	20.155 mPa²h	
EA40	100.773 mPa²h	
LZpeak (max)	2019-12-10 13:43:42	104.4 dB
LASmax	2019-12-10 13:43:43	81.6 dB
LASmin	2019-12-10 13:52:19	50.9 dB
SEA	-99.9 dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	76.1 dB
LAeq	68.0 dB
LCeq - LAeq	8.1 dB
LAIeq	69.7 dB
LAeq	68.0 dB
LAIeq - LAeq	1.8 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	68.0		76.1			
Ls(max)	81.6	2019/12/10 13:43:43				
Ls(min)	50.9	2019/12/10 13:52:19				
LPeak(max)					104.4	2019/12/10 13:43:42

# Overloads	0
Overload Duration	0.0 s

# OBA Overloads	0	
OBA Overload Duration	0.0 s	

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

Results		
Dose	-99.9	0.00 %
Projected Dose	-99.9	0.06 %
TWA (Projected)	-99.9	36.8 dB
TWA (t)	-99.9	11.8 dB
Lep (t)	52.9	52.9 dB

Statistics	
LAS5.00	73.1 dB
LAS10.00	71.5 dB
LAS33.30	67.7 dB
LAS50.00	65.1 dB
LAS66.60	62.5 dB
LAS90.00	55.9 dB

Summary

File Name on Meter	LxT_Data.060
File Name on PC	SLM_0005667_LxT_Data_060.00.ldbin
Serial Number	0005667
Model	SoundTrack LxT®
Firmware Version	2.302
User	ISI, Inc.
Location	86 Fair Oaks
Job Description	
Note	

Measurement

Description	
Start	2019-12-10 14:13:08
Stop	2019-12-10 14:28:08
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	2019-04-25 10:16:43
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting				
Peak Weight	Z Weighting				
Detector	Slow				
Preamp	PRMLxT1				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Normal				
OBA Bandwidth	1/1 and 1/3				
OBA Freq. Weighting	A Weighting				
OBA Max Spectrum	Bin Max				
Overload	144.4	dB			
	A		**C**	**Z**	
Under Range Peak	100.7		97.7	**102.7**	dB
Under Range Limit	**49.7**		47.7	55.7	dB
Noise Floor	36.6		37.2	44.8	dB

Results

LAeq	55.8	dB		
LAE	85.4	dB		
EA	38.358	µPa²h		
EA8	1.227	mPa²h		
EA40	6.137	mPa²h		
LZpeak (max)	2019-12-10 14:22:23		93.9	dB
LASmax	2019-12-10 14:22:50		68.5	dB
LASmin	2019-12-10 14:15:16		49.5	dB
SEA	-99.9	dB		

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	70.6	dB
LAeq	55.8	dB
LCeq - LAeq	14.7	dB
LAIeq	58.4	dB
LAeq	55.8	dB
LAIeq - LAeq	2.5	dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	55.8		70.6			
Ls(max)	68.5	2019/12/10 14:22:50				
Ls(min)	49.5	2019/12/10 14:15:16				
LPeak(max)					93.9	2019/12/10 14:22:23

# Overloads	0
Overload Duration	0.0 s

# OBA Overloads	0		
OBA Overload Duration	0.0	s	

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

Results			
Dose	-99.9	-99.9	%
Projected Dose	-99.9	-99.9	%
TWA (Projected)	-99.9	-99.9	dB
TWA (t)	-99.9	-99.9	dB
Lep (t)	40.8	40.8	dB

Statistics		
LAS5.00	59.9	dB
LAS10.00	58.2	dB
LAS33.30	55.8	dB
LAS50.00	54.8	dB
LAS66.60	53.4	dB
LAS90.00	51.4	dB

Summary			
File Name on Meter	LxT_Data.061		
File Name on PC	SLM_0005667_LxT_Data_061.00.ldbin		
Serial Number	0005667		
Model	SoundTrack LxT®		
Firmware Version	2.302		
User	ISI, Inc.		
Location	86 Fair Oaks		
Job Description			
Note			

Measurement	
Description	
Start	2019-12-10 14:31:52
Stop	2019-12-10 14:46:52
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	2019-04-25 10:16:43
Post Calibration	None
Calibration Deviation	---

Overall Settings				
RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
OBA Range	Normal			
OBA Bandwidth	1/1 and 1/3			
OBA Freq. Weighting	A Weighting			
OBA Max Spectrum	Bin Max			
Overload	144.4 dB			
	A	**C**	**Z**	
Under Range Peak	100.7	97.7	**102.7**	dB
Under Range Limit	**49.7**	47.7	55.7	dB
Noise Floor	36.6	37.2	44.8	dB

Results			
LAeq	57.3 dB		
LAE	86.8 dB		
EA	53.521 µPa²h		
EA8	1.713 mPa²h		
EA40	8.563 mPa²h		
LZpeak (max)	2019-12-10 14:43:30	101.8	dB
LASmax	2019-12-10 14:39:02	75.2	dB
LASmin	2019-12-10 14:36:32	47.0	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LCeq	68.6 dB		
LAeq	57.3 dB		
LCeq - LAeq	11.3 dB		
LAIeq	60.0 dB		
LAeq	57.3 dB		
LAIeq - LAeq	2.7 dB		

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	57.3		68.6			
Ls(max)	75.2	2019/12/10 14:39:02				
Ls(min)	47.0	2019/12/10 14:36:32				
LPeak(max)					101.8	2019/12/10 14:43:30

# Overloads	0
Overload Duration	0.0 s

# OBA Overloads	0		
OBA Overload Duration	0.0		s

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

Results			
Dose	-99.9	-99.9	%
Projected Dose	-99.9	-99.9	%
TWA (Projected)	-99.9	-99.9	dB
TWA (t)	-99.9	-99.9	dB
Lep (t)	42.2	42.2	dB

Statistics		
LAS5.00	62.8	dB
LAS10.00	60.4	dB
LAS33.30	54.4	dB
LAS50.00	52.6	dB
LAS66.60	51.0	dB
LAS90.00	48.6	dB

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/18/2020
Case Description: 86 Fair Oaks Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Location #1	Residential	67.9	67.9	67.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	280	0
Excavator	No	40		80.7	280	0
Dump Truck	No	40		76.5	280	0
Front End Loader	No	40		79.1	280	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		65.7	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		65.7	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck		61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader		64.1	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	65.7	66.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Location #2	Residential	68	68	68

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	85	0
Excavator	No	40		80.7	85	0
Dump Truck	No	40		76.5	85	0
Front End Loader	No	40		79.1	85	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		76.1	72.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		76.1	72.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck		71.8	67.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader		74.5	70.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	76.1	77	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Location #3	Residential	55.8	55.8	55.8

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	60	0
Excavator	No	40		80.7	60	0
Dump Truck	No	40		76.5	60	0
Front End Loader	No	40		79.1	60	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck		74.9	70.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader		77.5	73.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	79.1	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Location #4	Residential	57.3	57.3	57.3

			Equipment Spec	Actual	Receptor	Estimated

Description		Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Excavator		No	40		80.7	500	0
Excavator		No	40		80.7	500	0
Dump Truck		No	40		76.5	500	0
Front End Loader		No	40		79.1	500	0

		Results														
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)						
				Day		Evening		Night		Day		Evening		Night		
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Excavator		60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Excavator		60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dump Truck		56.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Front End Loader		59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Total	60.7	61.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Reference Receptor	Residential	55	55	55

Description		Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator		No	40		80.7	100	0
Excavator		No	40		80.7	100	0
Dump Truck		No	40		76.5	100	0
Front End Loader		No	40		79.1	100	0

		Results													
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck		70.4	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader		73.1	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	74.7	75.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

86 Fair Oaks Construction Noise - Unmitigated

Reference Noise Distance	100
Reference Noise Level	75.6

Sensitive Receptor	Distance (feet)	Attenuation Factors	Maximum Construction Noise Level (RCNM)	Existing Ambient (dBA, Leq)	New Ambient (dBA, Leq)	Increase
Location #1	280		66.7	67.9	70.3	2.4
Location #2	85		77.0	68	77.5	9.5
Location #3	60		80.0	55.8	80.1	24.3
Location #4	500		61.6	57.3	63.0	5.7

APPENDIX F

Transportation

MEMORANDUM

PASADENA
DEPARTMENT OF TRANSPORTATION

MOVING PEOPLE TO PLACES,
CONNECTIVITY

DATE: **June 11, 2019**

TO: **Talyn Mirzakhanian**
Zoning Administrator, Planning and Development Department

FROM: **Mike Bagheri** MB
Principal Engineer, Complete Streets

RE: **Transportation Impact Analysis – Condition Letter (CEQA)**
CASE: **86 S Fair Oaks Ave**

The City of Pasadena Department of Transportation conducted a transportation impact analysis to review potential traffic impacts related to the construction of 87 apartment units, 4 work-live units, 4,218 sf retail, and 1,974 sf restaurant on an existing surface parking lot.

The project is not expected to exceed any of the CEQA thresholds outlined in DOT's Transportation Impact Analysis Guidelines.

This study and conditions have been prepared based on the project scope provided to DOT. An update of the traffic study and its findings might be required if a significant change is made to the project scope, or if additional analysis is requested by the decision makers.

Conditions may be required as a result of the findings from the outside-of-CEQA analysis.

If you have any questions, please feel free to contact me at extension 7208.

CC: Laura Cornejo, Director of Transportation
Valerie Gibson, Transit Manager, DOT
Jon Hamblen, Parking Manager, DOT
Kevin Johnson, Senior Planner, Planning Department
Yannie Wu, Principal Engineer, Public Works
Bob Sulistio, Associate Engineer, Public Works

MXB:clv

Transportation Impact Analysis CEQA Evaluation

Transportation Impact Analysis

CEQA Evaluation

Category 2

Project Address:	**86 South Fair Oaks Avenue**
Project Summary:	**Mixed-use development with 87 apartment units, 4 work-live units, 4,218 sf retail, and 1,974 sf restaurant on an existing surface parking lot.**
Applicant:	**Architectural Resources Group, Inc. 8 Mills Place, Suite 300 Pasadena, CA 91105**
Attention:	**Kevin Johnson, Senior Planner Planning Department City of Pasadena**

May 3, 2019

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I. Study Objective

This report analyzed the impact the development will have on the City transportation system by estimating incremental changes in vehicle miles traveled (VMT) per capita, vehicle trips per capita (VT), service population proximity access to transit and bike facilities, and pedestrian accessibility score.

II. Project Description

The City of Pasadena Department of Transportation conducted an analysis to review the construction of a mixed-use development with 87 apartment units, 4 work-live units, 4,218 sf retail, and 1,974 sf restaurant on an existing surface parking lot.

Vehicular site access will be provided via one driveway along Dayton Street.

Figure 1 depicts the project's site plan.

III. Existing Transportation Network

Street System Classifications

Colorado Boulevard is classified as a **City Connector**. The speed limit varies from 25 mph in the business district to 30 to 35 mph outside the business district.

Green Street is a one-way eastbound **City Connector** from Pasadena Avenue to Hill Avenue with a speed limit of 30 mph. Parking is permitted along both sides of the street.

Fair Oaks Avenue is a **City Connector** bordering the project to the west. The posted speed limit in the vicinity of the project is 35 mph. Land use along Fair Oaks Avenue is primarily commercial. Fair Oaks Avenue shall be evaluated from an urban-commercial street context.

Raymond Avenue is a **Neighborhood Connector** east of the project. The Metro Gold Line Del Mar Station is located just south of the development and is accessible from Raymond Avenue.

Dayton Street is an **Access Road** bordering the project to the south. The roadway is a narrow, undivided, two-lane roadway with parking allowed on both sides of the street. The Fair Oaks Avenue at Dayton Street intersection is unsignalized. Pasadena Central Park is located directly south of the proposed development.

Figure 2 depicts the project within the context of the City of Pasadena's adopted Street Types map.

Figure 1. Project Site Plan

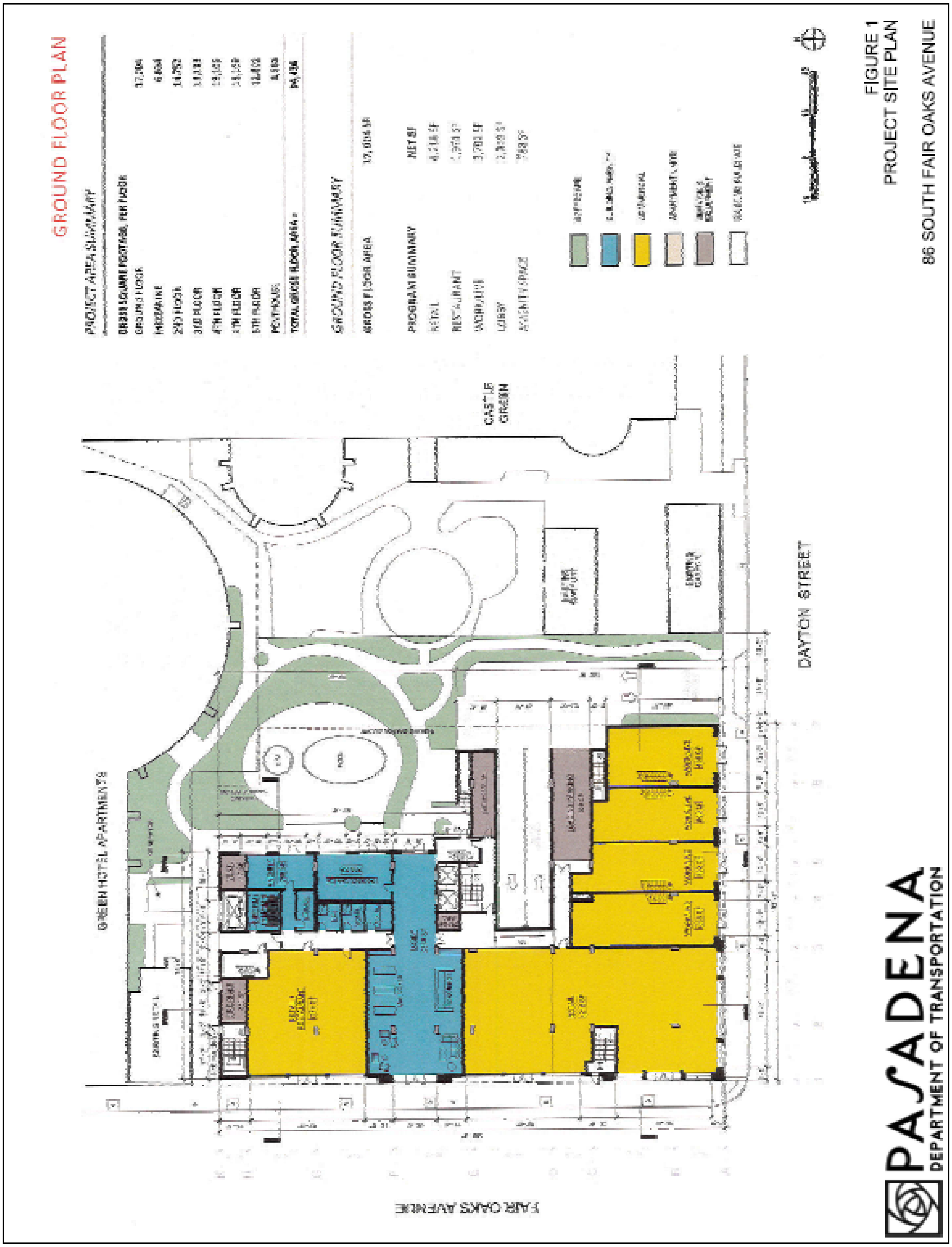
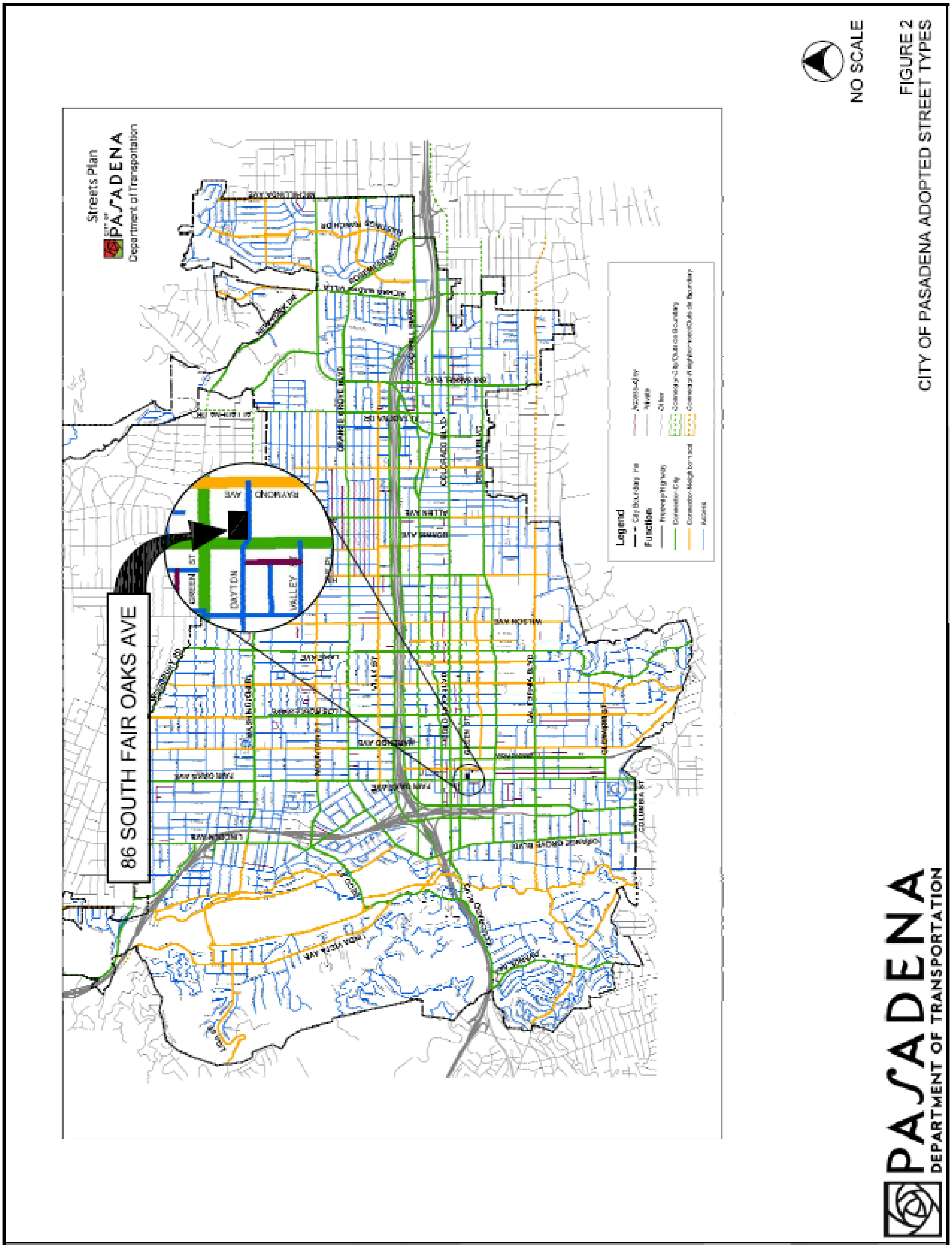


Figure 2. Street Classification Map



Existing Transit Service

Public transit service within the project study area is currently provided by LA Metro (Metro), Foothill Transit (FT), and Pasadena Transit (PT). The locations of public transit stops near the project are summarized as follows:

ID	Location	Route
1	Southwest corner of Fair Oaks Ave at Green St	Metro 260, 686, 687
2	Northeast corner of Fair Oaks Ave at Dayton St	Metro 260
3	Northeast corner of Fair Oaks Ave at Del Mar Blvd	Metro 260, 762
4	Southwest corner of Fair Oaks Ave at Del Mar Blvd	PT 20, 51;Metro 260, 686, 687, 762
5	West side of Raymond Ave b/t Dayton St/Del Mar Blvd	PT 20, 51, 52;Metro 177, 256, 501, 686, 687; Metro Gold Line
6	Southwest corner of Raymond Ave at Green St	FT 187
7	Southwest corner of Raymond Ave at Green St	PT 20, 51
8	Southeast corner of Raymond Ave at Green St	PT 20, 51, 52; Metro 177, 256, 686, 687

IV. Transportation Impact Analysis Methodology

With the City of Pasadena General Plan, the City's guiding principles cumulatively represent the community's vision for the future:

- Growth will be targeted to serve community needs and enhance quality of life.
- New construction that could affect the integrity of historic resources will be compatible with, and differentiated from, the existing historic resource.
- Economic vitality will be promoted to provide jobs, services, revenues, and opportunities.
- Pasadena will be a socially, economically, and environmentally sustainable community.
- Pasadena will be a city where people can circulate without cars.
- Pasadena will be promoted as a cultural, scientific, corporate, entertainment, and educational center for the region.
- Community participation will be a permanent part of achieving a greater city.
- Pasadena is committed to public education and a diverse educational system responsive to the broad needs of the community.

Understanding the goals and objectives of the General Plan, the Pasadena Department of Transportation sets forth goals and policies to improve overall transportation in Pasadena and create “a community where people can circulate without cars.” Inherent in this vision statement is to accommodate different modes of transportation including vehicle, pedestrian, bicycle, and transit. The analysis is based on City Transportation Impact Analysis Guidelines. This report will assess accessibility of these different modes of travel and the project’s transportation impacts using the City’s adopted transportation performance measures.

Analysis Purpose

Pasadena reviews several types and sizes of projects that could be subject to environmental review under the California Environmental Quality Act (CEQA). Transportation impact analyses are an integral part of the environmental review process that is required for all proposed projects not categorically exempt under CEQA.

Analysis Threshold Criteria - Transportation Performance Measures

The Pasadena Department of Transportation adopted a set of performance measures and CEQA caps that are closely aligned with the Mobility Element objectives and policies. Pasadena Department of Transportation’s mobility performance measures assess the quality of walking, biking, transit, and vehicular travel in the City. A combination of vehicular and multimodal performance measures are employed to evaluate system performance in reviewing new development projects. They are:

- Vehicle Miles Traveled per Capita
- Vehicle Trips per Capita
- Proximity and Quality of the Bicycle and Transit Network
- Pedestrian Accessibility

These performance measures align with the sustainability goals of the General Plan by evaluating the “efficiency” of projects by analyzing the per capita length and number of trips associated with changes in land use. With the expanded emphasis on sustainability and a continued focus on livability, the proposed performance measures will assist in determining how to balance travel modes as well as understand the mobility needs of the community.

Definitions

VMT Per Capita

The Vehicle Miles Traveled (VMT) per Capita measure sums the miles traveled for trips within the City of Pasadena Travel Demand Model (that is based on the SCAG regional model). The VMT total considers 100% of the mileage of trips that begin and end inside Pasadena and 50% of the distance travelled for trips with one end outside of Pasadena. The City’s VMT is then divided by the City’s total service population, defined as the population plus the number of jobs.

Although VMT itself will likely increase with the addition of new residents, the City can reduce VMT on a per-capita basis with land use policies that help Pasadena residents meet their daily needs within a short distance from home, reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than auto.

<u>VT Per Capita</u>
Vehicle Trips (VT) per Capita is a measure of motor vehicle trips associated with the City. The measure sums the trips with origins and destination within the City of Pasadena, as generated by the 2013 trip-based citywide Travel Demand Model. The regional VT is calculated by adding the VT associated with trips generated and attracted within City of Pasadena boundaries, and 50% of the VT associated with trips that either begin or end in the City, but have one trip end outside of the City. The City's VT is then divided by the City's total service population, defined as the population plus the number of jobs.

As with VMT, VT itself will likely increase with the addition of new residents, but the City can reduce VT on a per-capita basis with land use policies that help Pasadena residents meet their daily needs within a short distance of home, reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than auto.

<u>Proximity and Quality of Bicycle Network</u>
The Proximity and Quality of Bicycle Network provides a measure of the percent of the City's service population (population + jobs) within a quarter mile of Levels 1 & 2 bicycle facility types. The facility types are aggregated into three hierarchy levels, obtained from the City's Bicycle Transportation Plan categories as shown in the following table:

Table 1. Bicycle Facilities Hierarchy

LEVEL	DESCRIPTION	FACILITIES INCLUDED
1	Advanced Facilities	Bike Paths (P1) Multipurpose Paths (PP) Cycle Tracks/Protected Bike Lanes
2	Dedicated Facilities	Buffered Bike Lanes Bike Lanes (2, P2) Bike Boulevards (BB)
3	Basic Facilities	Bike Routes (3, P3) Enhanced Bike Routes (E3, PE3) Emphasized Bikeways (PEB)

For each bike facility level, a quarter-mile network distance buffer is calculated and the total service population (population + jobs) within the buffer are added.

The City can improve measures of Bike Facility Access by improving and expanding existing bike facilities and by encouraging residential and commercial development in areas with high-quality bike facilities.

Proximity and Quality of Transit Network
The Proximity and Quality of Transit Network provides a measure of the percent of the City's service population (population + jobs) within a quarter mile of transit facility types, as defined in the following table:

Table 2. Description of Transit Facilities

TRANSIT FACILITIES HIERARCHY	
LEVEL	FACILITIES INCLUDED
1	Includes all Gold Line stops as well as corridors with transit service, whether it be a single route or multiple routes combined, with headways of five minutes or less during the peak periods.
2	Includes corridors with transit headways of between six and 15 minutes in peak periods.
3	Includes corridors with transit headways of 16 minutes or more at peak periods.

For each facility level, a quarter-mile network distance buffer is calculated and the total service population (population + jobs) within the buffer are added.

The City can improve the measures of Transit Proximity and Quality by reducing headways on existing transit routes, by expanding transit routes to cover new areas, and by encouraging residential and commercial development to occur in areas with an already high-quality transit service.

Pedestrian Accessibility
Proximity and Quality of Pedestrian Environment score provides a measure of the average walkability in the TAZ surrounding Pasadena residents, based on a Pedestrian Accessibility metric. The Pedestrian proximity metric is a simple count of the number of land use types accessible to a Pasadena resident or employee in a given TAZ within a 5-minute walk. The ten categories of land uses are:

- Retail
- Personal Services
- Restaurant
- Entertainment
- Office (including private sector and government offices)
- Medical (including medical office and hospital uses)
- Culture (including churches, religious and other cultural uses)
- Park and Open Space
- School (including elementary and high schools)
- College

The following table summarizes the City's Metrics for determining CEQA Caps:

Table 3. City of Pasadena CEQA Caps

METRIC	DESCRIPTION	IMPACT THRESHOLD
1. VMT Per Capita	Vehicle Miles Traveled (VMT) in the City of Pasadena per service population (population + jobs).	CEQA Threshold: An increase over existing Citywide VMT per Capita of **22.6**.
2. VT Per Capita	Vehicle Trips (VT) in the City of Pasadena per service population (population + jobs).	CEQA Threshold: An increase over existing Citywide VT per Capita of **2.8**.
3. Proximity and Quality of Bicycle Network	Percent of service population (population + jobs) within a quarter mile of bicycle facility types	CEQA Threshold: Any decrease in existing citywide **31.7%** of service population (population + jobs) within a quarter mile of Level 1 & 2 bike facilities.
4. Proximity and Quality of Transit Network	Percent of service population (population + jobs) located within a quarter mile of transit facility types.	CEQA Threshold: Any decrease in existing citywide **66.6%** of service population (population + jobs) within a quarter mile of Level 1 & 2 transit facilities.
5. Pedestrian Accessibility	The Pedestrian Accessibility Score uses the mix of destinations, and a network-based walk shed to evaluate walkability	CEQA Threshold: Any decrease in the Citywide Pedestrian Accessibility Score of **3.88**.

V. Project's Transportation Impact Analysis

The analysis is based on City's Transportation Impact Analysis Guidelines. The City's calibrated travel demand forecasting model (TDF) built on SCAG's regional model was used to analyze project's impacts. The City's TDF model uses TransCAD software to simulate traffic levels and travel patterns into, out of, and within the City. The program consists of input files that summarize the City's land uses, street network, travel characteristics, and other key factors. Using this data, the model performs a series of calculations to determine the amount of trips generated, the beginning and ending location of each trip, and the route taken by the trip. To be deemed accurate for project transportation impact on the transportation system, a model must be calibrated to a year in which actual land use data and traffic volumes are available and well documented. The Pasadena TDF has been calibrated to 2013 base year conditions using actual traffic counts, Census data, and land use data compiled by City staff with land uses' associated population and job increase estimates.

Projects' proposed land uses that are consistent with the General Plan and complimentary to the surrounding land uses are expected to reduce the trip length associated with adjacent land uses; and/or increase the service population access to pedestrian, bike, and transit facilities if the project is within a quarter mile of those facilities.

The following table summarizes the following analyses of the proposed project's impacts on the transportation system using the calibrated TDF model. The results are based on the project's vehicular and non-vehicular trip making characteristics, trip length, and its interaction with other surrounding/citywide land uses, and the City's transportation network.

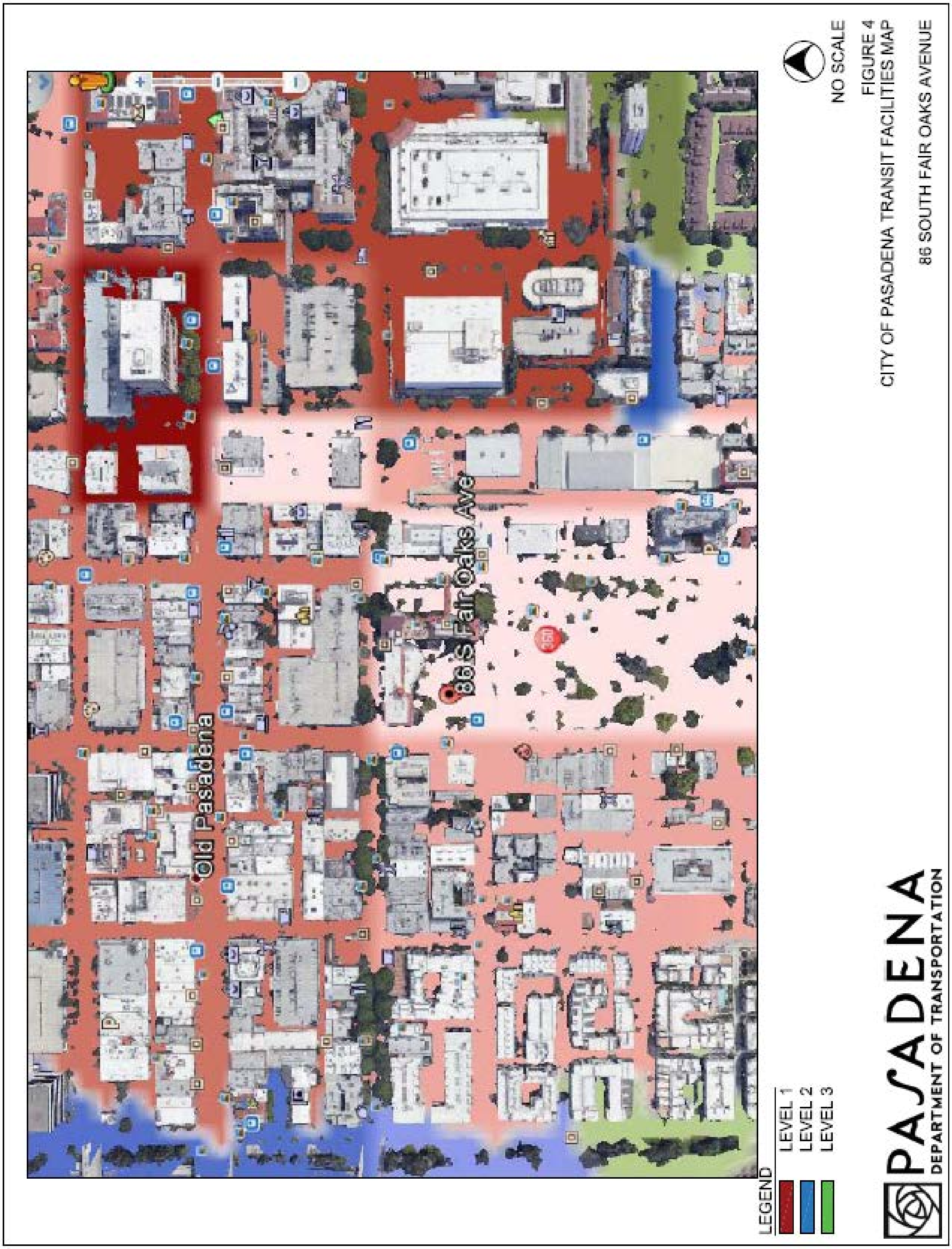
Table 4. Transportation Performance Metrics Summary

Transportation Performance Metrics	Significant Impact Cap (existing)	Incremental change (existing + project)	Significant Impact?
VMT per Capita	>22.6	16.2	No
VT per Capita	>2.8	2.8	No
Proximity and Quality of Bicycle Network	<31.7%	31.7	No
Proximity and Quality of Transit Network	<66.6%	66.7	No
Pedestrian Accessibility	<3.88	3.88	No

The TDF model calculation results determined that the project does not exceed any adopted CEQA thresholds of significance.

Figure 3. Bike Facility Map

Figure 4. Transit Facility Map



VI. Congestion Management Plan

<u>CMP Traffic Impact Analysis</u>

The 2010 Congestion Management Program (CMP) for Los Angeles County requires local jurisdictions to consider the regional transportation impacts that may result from major development projects through the local land use approval process. The geographic area examined in the traffic study must include the following, at minimum:

- All CMP arterial monitoring intersections where the proposed project will add 50 or more trips during either the AM or PM weekday peak hours of adjacent street traffic
- If CMP arterial segments are being analyzed rather than intersections, the study area must include all segments where the proposed project will add 50 or more peak hour trips.
- Mainline freeway monitoring locations where the project will add 150 or more peak hour trips
- Caltrans must also be consulted through the Notice of Preparation (NOP) process to identify other specific locations to be analyzed on the state highway system.

The trip generation rates and volumes for the proposed project is summarized:

Trip Generation Rates (proposed)

						AM Peak Hour			PM Peak Hour		
Proposed Use	Land Use Code	Amount	Units	Measure	Daily	In	Out	Total	In	Out	Total
Multi-Family Mid-Rise Apartment	221	87	DU	1	5.44	0.09	0.27	0.36	0.27	0.17	0.44
Work-Live*	San Diego	5,236	SF	1000	40.00	0.72	0.48	1.20	1.80	1.80	3.60
Retail	San Diego	4,218	SF	1000	40.00	0.72	0.48	1.20	1.80	1.80	3.60
High-Turnover (Sit-Down) Restaurant	932	1,974	SF	1000	112.18	5.47	4.47	9.94	6.06	3.71	9.77

Volumes

			AM Peak Hour			PM Peak Hour		
Proposed Use		Daily	In	Out	Total	In	Out	Total
Multi-Family Mid-Rise Apartment		473	8	23	31	23	15	38
Work-Live*		105	2	1	3	5	5	9
Retail		169	3	2	5	8	8	15
High-Turnover (Sit-Down) Restaurant		221	11	9	20	12	7	19
Total Project Trips		968	24	35	59	48	35	82
Internal Trip Capture	0%	0	0	0	0	0	0	0
Transit Trips (Residential)	5%	24	0	1	2	1	1	2
Pass-By Trips (Restaurant + Retail)	20%	78	3	2	5	4	3	7
Net Project Vehicle Trips		866	21	32	52	43	31	73
Net total (proposed minus existing trips)		***866***	***21***	***32***	***52***	***43***	***31***	***73***

* Work-live units uses retail with 50% walk in reductions.

The trip generation calculations estimated that the project would generate 866 daily trips, 52 AM and 73 PM peak hour project trips.

The arterial monitoring station locations in Pasadena are:
- Arroyo Parkway at California Boulevard (CMP ID 119)

- Pasadena Avenue/ St John Avenue at California Boulevard (CMP ID 120)
- Rosemead Boulevard at Foothill Boulevard (CMP ID 121)

The mainline freeway monitoring locations in Pasadena are:
- 110 Freeway at Pasadena Avenue (CMP Station 1050)
- 134 Freeway west of San Rafael Avenue (CMP Station 1056)
- 210 Freeway west of Routes 134 and 710 (CMP Station 1060)
- 210 Freeway at Rosemead Boulevard (CMP Station 1061)

This project does not add 50 or more peak hour trips onto the arterial monitoring station locations during either the AM or PM weekday peak hours of adjacent street traffic. Furthermore, this project will not add 150 or more peak hour trips onto the mainline freeway monitoring locations during the peak hours. No further CMP traffic analysis is required.

<u>CMP Transit Impact Analysis</u>

CMP transit analysis requirements require:

- Summary of existing transit service in the study area
- Project trip generation estimates
- Project transit trip estimates
- Project components including facilities and programs to encourage public transit use
- Analysis of transit impacts and mitigations, if any.

The CMP transit trip estimates are summarized as follows:

86 South Fair Oaks Avenue			
CMP Transit Impact Analysis - Transit Trip Calculation			
	Daily	AM Peak Hour	PM Peak Hour
Total project vehicle trips w/o trip credit	968	59	82
Total person trips	1,355	83	115
% CMP transit factor [1]	15%	15%	15%
Total Transit Trips	203	12	17
* Based on the 2010 Congestion Management Program for Los Angeles County Appendix D.8.4			
[1] Primarily commercial within 1/4 mile of a CMP transit center (Gold Line Del Mar Station)			

An increase in transit trip ridership of 203 daily transit trips, 12 AM peak hour transit trips, and 17 PM peak hour transit trips are estimated. With 11 transit lines plus the Gold Line, the following table shows that there should be adequate transit capacity to serve the project:

86 South Fair Oaks Avenue											
CMP Transit Impact Analysis											
Service Route		Seats Per Car[1]	Service Frequency		Seat Capacity per Route		Available % Seat Capacity[2,3]		Available Seat Capacity	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
PT	20	18	6	4	108	72	0.05	0.05	5	4
PT	51	18	3	3	54	54	0.05	0.05	3	3
PT	52	18	3	3	54	54	0.05	0.05	3	3
FT	187	40	4	6	160	240	0.05	0.05	8	12
Metro	177	40	2	2	80	80	0.05	0.05	4	4
Metro	256	40	2	2	80	80	0.05	0.05	4	4
Metro	260	40	6	8	240	320	0.05	0.05	12	16
Metro	501	40	10	10	400	400	0.05	0.05	20	20
Metro	686	40	2	2	80	80	0.05	0.05	4	4
Metro	687	40	2	2	80	80	0.05	0.05	4	4
Metro	762	40	5	4	200	160	0.05	0.05	10	8
Metro	Gold Line	72	16	16	1,152	1,152	0.01	0.01	12	12
Totals		446	61	62	2,688	2,772	Total Available Seat Capacity		70	72
							Project transit trips		12	17
							Surplus (Deficit)		57	54

[1]Assumed based on standard bus specifications.

[2] Seat capacity assumed to be 5% during peak hour.

[3]Approximate seat capacity for a 2-car train at 36 seats per car. Number of cars per train vary between 2-3 cars. Assumed 1% available seating capacity during peak hours at the Del Mar Station Station.

VII. Conclusion

The City of Pasadena Department of Transportation conducted an analysis to review the construction of a mixed-use development with 87 apartment units, 4 work-live units, 4,218 sf retail, and 1,974 sf restaurant on an existing surface parking lot.

The Travel Demand Forecasting Model calculation results for this project determined that the project does not cause a significant impact to any of the metrics as outlined in the City's Traffic Transportation Impact Analysis Current Practice and Guidelines.

VIII. Appendices

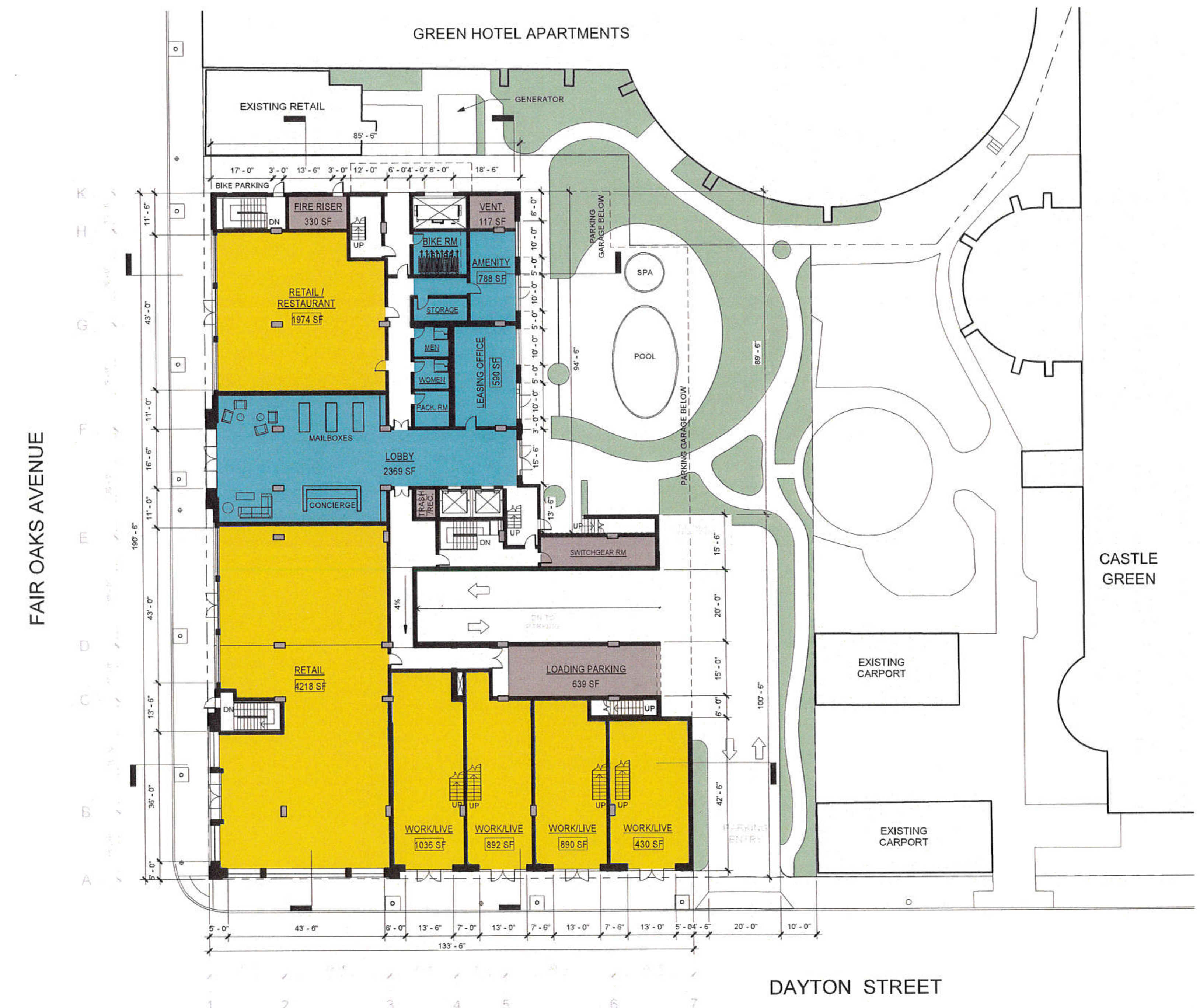
Memorandum of Understanding
City's Travel Demand Forecasting Model Output/Results

Appendix:
Memorandum of Understanding

86 South Fair Oaks
Project Data

Total Gross Floor Area	94,426 SF
Program Summary	
Dwelling Units	87 units
Work/Live (4 units)	5,236 SF
Retail	4,218 SF
Restaurant	1,974 SF
Lobby	2,369 SF
Amenity Space	4,639 SF
Dwelling Units	87 units (excludes 4 Work/Live units)
Studios	29
1 Bedroom under 650 SF	34
1 bedroom over 650 SF	4
2 bedroom	18
2 bedroom townhouse	2
Parking Summary	198 spaces within 4 subterranean levels, includes 7 ADA spaces
Residential spaces	99
Guest	9
Work/Live	12
Retail	10
Restaurant	15
Joint (Green Hotel Replacement)	53
Bicycle Parking	
Residential	15 – Class 1
Non-Residential	4 – Class 2

GROUND FLOOR PLAN



PROJECT AREA SUMMARY

GROSS SQUARE FOOTAGE, PER FLOOR	
GROUND FLOOR	17,004
MEZZANINE	6,834
2ND FLOOR	14,752
3RD FLOOR	13,133
4TH FLOOR	13,109
5TH FLOOR	13,109
6TH FLOOR	12,802
PENTHOUSE	3,683
TOTAL GROSS FLOOR AREA =	**94,426**

GROUND FLOOR SUMMARY

GROSS FLOOR AREA	17, 004 SF

PROGRAM SUMMARY	NET SF
RETAIL	4,218 SF
RESTAURANT	1,974 SF
WORK/LIVE	3,702 SF
LOBBY	2,369 SF
AMENITY SPACE	788 SF

- SOFTSCAPE
- BUILDING AMENITY
- COMMERCIAL
- APARTMENT UNITS
- SERVICE & EQUIPMENT
- EXISTING BUILDINGS

Appendix:
City’s Travel Demand Forecasting Model Output/Results

86 South Fair Oaks Avenue

VMT/Cap and VT/Cap Summary

Daily Trips	Internal	External
Internal	351,155	336,010
External	336,010	491,145

Pop	136,116
Emp	111,367
Ext. Factor	50%

FINAL REDUCED DAILY VMT BY SPEED BIN					EMFAC INPUT
Speed	Internal	External	Regional	Total	
5	109	0	1,740	1,850	0%
10	673	135	14,356	15,165	0%
15	4,135	1,353	45,870	51,358	1%
20	16,456	4,470	75,182	96,108	2%
25	98,066	12,630	150,194	260,890	5%
30	489,110	61,376	275,101	825,587	15%
35	822,415	139,323	320,207	1,281,946	23%
40	202,071	55,894	225,464	483,429	9%
45	136,021	104,933	169,393	410,347	7%
50	112,508	2,075	211,736	326,319	6%
55	95,581	7,973	229,296	332,851	6%
60	119,991	15,079	238,105	373,175	7%
65	323,603	20,896	181,045	525,544	9%
70	3,633	0	529,037	532,671	11%
75	0	0	77,279	77,279	
80	0	0	0	0	
85	0	0	0	0	
SUM	**2,424,374**	**426,138**	**2,744,006**	**5,594,519**	**100%**

TOTAL RAW DAILY SUMMARY					
Metric	Internal	External	Regional	Total	Capita
VMT	2,424,374	852,275	5,488,013	8,764,663	35.4
VT	351,155	672,020	-	1,023,175	4.1
Length	6.9	1.3	-	8.6	-

REDUCED DAILY SUMMARY					
Metric	Internal	External	Regional	Total	Capita
VMT	2,424,374	426,138	2,744,006	5,594,519	22.6
VT	351,155	336,010	-	687,165	2.8
Length	6.9	1.3	-	8.1	-

FINAL DAILY SCENARIO SUMMARY					
Pop	Emp	VMT	VT	VMT/Cap	VT/Cap
136,116	111,367	5,594,519	687,165	22.6	2.8

2013 EXISTING SUMMARY					
Pop	Emp	VMT	VT	VMT/Cap	VT/Cap
135,938	111,348	5,591,328	686,619	22.6	2.8

INCREMENTAL SCENARIO RESULTS					
Pop	Emp	VMT	VT	VMT/Cap	VT/Cap
177	19	3,190	546	16.2	2.8
				PASS	PASS

86 South Fair Oaks Avenue

Proximity and Quality Metric Summary

Proximity and Quality of Bicycle Network

Existing

Facility Type	Service Population	Service Population Adjustment	Final Service Population	Percent of Service Population
Level 2	78,415	0	78,415	31.7%
Level 3	123,670	0	123,670	50.0%
No Facility	45,202	0	45,202	18.3%
Exist City Total	247,286	0	247,286	100.0%

Existing + Project

Facility Type	Service Population	Service Population Adjustment	Final Service Population	Percent of Service Population
Level 2	78,415	0	78,415	31.7%
Level 3	123,670	196.8065789	123,867	50.1%
No Facility	45,202	0	45,202	18.3%
Exist City Total	247,286	196.8065789	247,483	100.0%

Proximity and Quality Metric Summary - Bicycle

Network	Service Population Adjustment	Significant Impact Threshold	Service Population %	Impact?
Bike	196.8065789	< 31.7%	31.7%	No

Proximity and Quality of Transit Network

Existing

Facility Type	Service Population	Service Population Adjustment	Final Service Population	Percent of Service Population
Level 1	90,600	0	90,600	36.6%
Level 2	74,298	0	74,298	30.0%
Level 3	50,495	0	50,495	20.4%
No Facility	31,893	0	31,893	12.9%
Exist City Total	247,286	0	247,286	100.0%

Existing + Project

Facility Type	Service Population	Service Population Adjustment	Final Service Population	Percent of Service Population
Level 1	90,600	196.8065789	90,797	36.7%
Level 2	74,298	0	74,298	30.0%
Level 3	50,495	0	50,495	20.4%
No Facility	31,893	0	31,893	12.9%
Exist City Total	247,286	196.8065789	247,483	100.0%

Proximity and Quality Metric Summary - Transit

Network	Service Population Adjustment	Significant Impact Threshold	Service Population %	Impact?
Transit	196.8065789	< 66.6%	66.7%	No

86 South Fair Oaks Avenue

Pedestrian Accessibility Calculation Summary

				Weighted Average:	3.882616451
PasadenaDTATAZ	Land Use Types	Population_In_TAZ	Employment_In_TAZ	Service_Population	Land Use Types
78	7	458.1239175	90.04855263	548.1724701	7

Transportation Impact Analysis

Outside of CEQA Analysis

Project Address:	**86 South Fair Oaks Avenue**
Project Summary:	**Mixed-use development with 87 apartment units, 4 work-live units, 4,218 sf retail, and 1,974 sf restaurant on an existing surface parking lot.**
Applicant:	**Architectural Resources Group, Inc.** **8 Mills Place, Suite 300** **Pasadena, CA 91105**
Attention:	**Kevin Johnson, Senior Planner** **Planning Department**

May 3, 2019

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I. Study Objective

The Department of Transportation at its discretion may analyze performance metrics outside of CEQA for projects below community-wide significance caps of 50 units and/or 50,000 square feet of development. The analysis will assess the changes to intersection Levels of Service (LOS) and "Access and Connector-Neighborhood" Street Type segments adjacent to the project. The findings may result in imposing project approval conditions to better manage project trips and protect neighborhoods from the proposed development's vehicular trips, if applicable.

II. Project Description

The City of Pasadena Department of Transportation conducted an analysis to review the construction of a mixed-use development with 87 apartment units, 4 work-live units, 4,218 sf retail, and 1,974 sf restaurant on an existing surface parking lot.

Vehicular site access will be provided via one driveway along Dayton Street.

Figure 1 depicts the project's site plan.

III. Existing Transportation Network

<u>Street System Classifications</u>

Colorado Boulevard is classified as a **City Connector**. The speed limit varies from 25 mph in the business district to 30 to 35 mph outside the business district.

Green Street is a one-way eastbound **City Connector** from Pasadena Avenue to Hill Avenue with a speed limit of 30 mph. Parking is permitted along both sides of the street.

Fair Oaks Avenue is a **City Connector** bordering the project to the west. The posted speed limit in the vicinity of the project is 35 mph. Land use along Fair Oaks Avenue is primarily commercial. Fair Oaks Avenue will be evaluated from an urban-commercial street context.

Raymond Avenue is a **Neighborhood Connector** east of the project. The Metro Gold Line Del Mar Station is located just south of the development and is accessible from Raymond Avenue.

Dayton Street is an **Access Road** bordering the project to the south. The roadway is a narrow, undivided, two-lane roadway with parking allowed on both sides of the street. The Fair Oaks Avenue at Dayton Street intersection is unsignalized. Pasadena Central Park is located directly south of the proposed development.

Figure 2 depicts the project in the City of Pasadena's Adopted Streets Plan map. Street segment analyses are limited to "access" and "neighborhood connector" street types within a residential context.

Figure 1. Project Site Plan

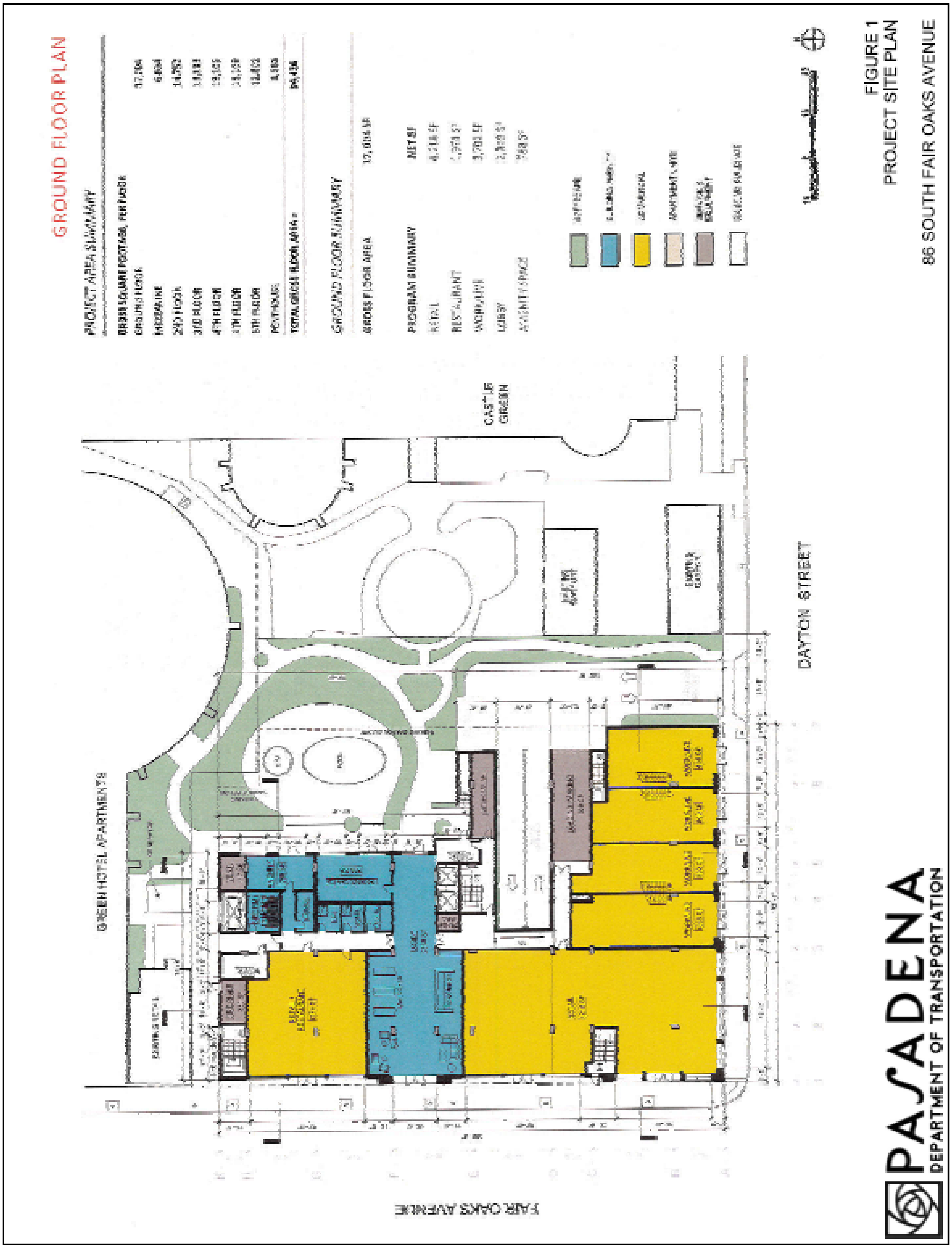
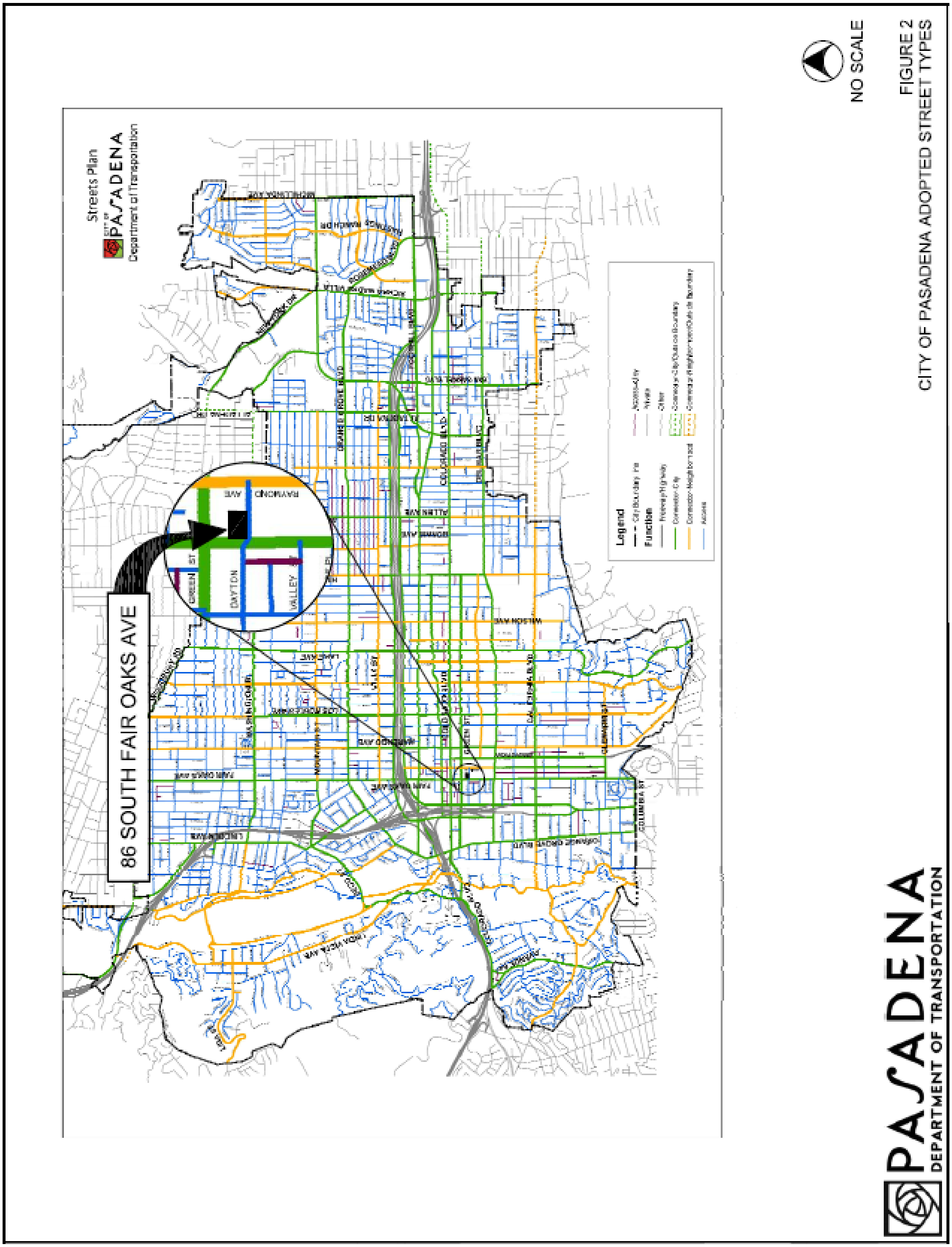


Figure 2. Streets Plan Map



The analysis considered potential traffic changes along the following street segments and intersections:

Street Segments:
- Raymond Avenue between Green Street and Dayton Street
- Raymond Avenue between Dayton Street and Del Mar Avenue
- Dayton Street between Fair Oaks Avenue and Raymond Avenue

Intersections:
- Fair Oaks Avenue and Green Street
- Fair Oaks Avenue and Del Mar Boulevard
- Raymond Avenue and Green Street
- Raymond Avenue and Del Mar Boulevard

Existing Transit Service

Public transit service within the project study area is currently provided by LA Metro (Metro), Foothill Transit (FT), and Pasadena Transit (PT). The locations of public transit stops near the project are summarized as follows:

ID	Location	Route
1	Southwest corner of Fair Oaks Ave at Green St	Metro 260, 686, 687
2	Northeast corner of Fair Oaks Ave at Dayton St	Metro 260
3	Northeast corner of Fair Oaks Ave at Del Mar Blvd	Metro 260, 762
4	Southwest corner of Fair Oaks Ave at Del Mar Blvd	PT 20, 51;Metro 260, 686, 687, 762
5	West side of Raymond Ave b/t Dayton St/Del Mar Blvd	PT 20, 51, 52;Metro 177, 256, 501, 686, 687; Metro Gold Line
6	Southwest corner of Raymond Ave at Green St	FT 187
7	Southwest corner of Raymond Ave at Green St	PT 20, 51
8	Southeast corner of Raymond Ave at Green St	PT 20, 51, 52; Metro 177, 256, 686, 687

IV. Transportation Analysis Methodology

With the City of Pasadena General Plan, the City's guiding principles cumulatively represent the community's vision for the future:

- Growth will be targeted to serve community needs and enhance quality of life.
- New construction that could affect the integrity of historic resources will be compatible with, and differentiated from, the existing historic resource.
- Economic vitality will be promoted to provide jobs, services, revenues, and opportunities.
- Pasadena will be a socially, economically, and environmentally sustainable community.
- Pasadena will be a city where people can circulate without cars.
- Pasadena will be promoted as a cultural, scientific, corporate, entertainment, and educational center for the region.
- Community participation will be a permanent part of achieving a greater city.
- Pasadena is committed to public education and a diverse educational system responsive to the broad needs of the community.

Understanding the goals and objectives of the General Plan, the Pasadena Department of Transportation sets forth goals and policies to improve overall transportation in Pasadena and create "a community where people can circulate without cars." Inherent in this vision statement is to accommodate different modes of transportation including vehicle, pedestrian, bicycle, and transit. The analysis is based on City Transportation Impact Analysis Guidelines. This report will assess accessibility of these different modes of travel and the project's transportation impacts using the City's adopted transportation performance measures.

<u>Analysis Criteria - Transportation Performance Measures</u>

The Department's defined criteria and categories when determining the level of transportation impact of projects fall under three categories based on project size and community-wide significance.

- Exempt projects have 10 residential units or less, are 10,000 sf or less, or generate less than 300 daily trips if less than 10,000 sf.
- Category 1 Projects considered below community-wide significance are between 11-49 residential units, or 10,001 to 49,999 sf.
- Category 2 Projects classified as having community-wide significance have 50 or more residential units, or are 50,000 sf or more.

Pasadena Department of Transportation's mobility performance measures assess the quality of walking, biking, transit, and vehicular travel in the City. A combination of vehicular and multimodal performance measures are employed to evaluate system performance in reviewing new development impacts.

The following table summarizes the City's Metrics Cap Outside of CEQA for projects below "communitywide significance:"

Table 1. City of Pasadena Metrics Cap

METRIC	DESCRIPTION	CAP*
1. Street Segment Analysis	The street segment analysis assesses traffic intrusion on local streets in residential neighborhoods	Increases of 10-15% above existing on streets with more than 1500 ADT would trigger conditions of approval to reduce project vehicular trips
2. Auto Level of Service	Level of Service (LOS) as defined by the Transportation Research Board's *Highway Capacity Manual (HCM) 2010*.	A decrease beyond LOS D Citywide or LOS E within Transit Oriented Districts (TODs) would trigger conditions of approval to reduce project vehicular trips
3. PEQI	Pedestrian Environmental Quality Index	Below average conditions
4. BEQI	Bicycle Environmental Quality Index	Below average conditions

*The adopted caps are not intended to be the absolute limits, but rather limits/ranges when exceeded may require additional project approval conditions.

Caps for Determining Project Street Segment Changes

Caps for evaluating changes in vehicular volumes on street segments were developed to measure the potential changes of net new trips from projects that intensify an existing land use, change site access, or alter existing traffic patterns. The caps are designed to capture a project's anticipated level of changes measured in terms of net new trips over existing conditions.

Specific caps have been established to determine whether there would be any potential project changes along neighborhood street segments by project traffic. A conservative approach is taken when calculating the traffic growth by basing the calculation on the increase relative to existing traffic volumes as follows:

$$\text{Percentage of Increase} = {}^{\text{net new project trips}}/_{\text{existing daily traffic}}$$

The daily traffic growth caps for determining the level of street segment transportation changes are summarized as follows:

Table 2. Street Segment Caps

Existing ADT	Project-Related Vehicular Increase in ADT
0 to 1,500 average daily trips	150 trips or more
1,501 to 3,499 average daily trips	10 percent or more of final project ADT
3,500 or more	8 percent or more of final project ADT

If project-related net trips exceed the caps in the table above, conditions of approval would require the project applicant to implement measures to discourage neighborhood intrusion by project related traffic. If the project traffic increases fall below the street segment caps, additional analyses are not required.

Caps for Determining Intersection Changes

Proposed development projects that meet or exceed the caps will be evaluated using the Highway Capacity Manual (HCM) Level of Service (LOS) analysis criteria at study intersections. This methodology determines an intersection's level of service by calculating delay. LOS descriptions are summarized in Table 3.

Table 3. LOS Capacity Criteria

HIGHWAY CAPACITY LEVEL OF SERVICE CRITERIA		
LOS	DESCRIPTION	DELAY (s)
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0

E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor (vehicle) progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0
Source: 2010 *Highway Capacity Manual.*		

Intersection LOS analysis using HCM criteria will be conducted for peak hour conditions. LOS caps are summarized in the following table:

Table 4: Intersection Level of Service Caps.

Study Intersections	Existing + Project LOS Cap
Citywide	D
Transit Oriented District (TOD)	E

Where the evaluated intersections exceed the LOS caps, conditions of approval will be recommended consistent with the City's guiding principles to encourage walking, biking, and transit to and from the project site to reduce project-related vehicular trips.

Pedestrian and Bicycle Environmental Quality Index Discussion

The Pedestrian Environmental Quality Index (PEQI) and Bicycle Environmental Quality Index (BEQI) is a quantitative, observational instrument used to describe and summarize the street and intersection environmental factors known to affect people's travel behaviors. The PEQI and BEQI were developed by the San Francisco Department of Public Health as a tool to assess pedestrian and bicycle safety and needs as well as to gain attention and demand for non-vehicle travel planning. The PEQI and BEQI consists of factors associated with pedestrian and bicycle environmental quality and safety, classified into five categories; Intersection Safety, Traffic, Street Design, Land Use and Perceived Safety.

Data is primarily collected through an observational survey. Indicator scores for each indicator category are based on a survey of national experts, including City, transportation planners and consultants regarding the importance of each indicator to pedestrian and bicycle environmental quality. The scores reflect the degree to which environmental factors supportive of walking, biking, and safety have been incorporated into street segment and intersection design. The PEQI and BEQI analysis result in a score for street segments and intersections on a scale ranging between 0-100 as outlined below.

Score	Description
20 and below	Poor quality, pedestrian/bicycle conditions absent
21-40	Low quality, minimal pedestrian/bicycle conditions
41-60	Average quality, pedestrian/bicycle conditions present but room for improvement
61-80	High quality, some important pedestrian/bicycle conditions present
81-100	Highest quality, many important pedestrian/bicycle conditions present

V. Transportation Analysis

Project Trip Generation

The industry standard procedure to determine the number of daily and peak hour trips a project would generate is based on published trip generation estimates from the ITE Trip Generation manual and is summarized in the following table:

Trip Generation Rates (proposed)

						AM Peak Hour			PM Peak Hour		
Proposed Use	Land Use Code	Amount	Units	Measure	Daily	In	Out	Total	In	Out	Total
Multi-Family Mid-Rise Apartment	221	87	DU	1	5.44	0.09	0.27	0.36	0.27	0.17	0.44
Work-Live*	San Diego	5,236	SF	1000	40.00	0.72	0.48	1.20	1.80	1.80	3.60
Retail	San Diego	4,218	SF	1000	40.00	0.72	0.48	1.20	1.80	1.80	3.60
High-Turnover (Sit-Down) Restaurant	932	1,974	SF	1000	112.18	5.47	4.47	9.94	6.06	3.71	9.77

Volumes

Proposed Use		Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Multi-Family Mid-Rise Apartment		473	8	23	31	23	15	38
Work-Live*		105	2	1	3	5	5	9
Retail		169	3	2	5	8	8	15
High-Turnover (Sit-Down) Restaurant		221	11	9	20	12	7	19
Total Project Trips		968	24	35	59	48	35	82
Internal Trip Capture	0%	0	0	0	0	0	0	0
Transit Trips (Residential)	5%	24	0	1	2	1	1	2
Pass-By Trips (Restaurant + Retail)	20%	78	3	2	5	4	3	7
Net Project Vehicle Trips		866	21	32	52	43	31	73
Net total (proposed minus existing trips)		***866***	***21***	***32***	***52***	***43***	***31***	***73***

* Work-live units uses retail with 50% walk in reductions.

In summary, it is estimated that the project would generate 866 daily trips, 52 AM and 73 PM peak hour project trips.

Street Segment Analysis

Figure 3 describes the project trip distribution and project traffic intersection volumes on the street network. The calculated increase in average daily traffic along access or neighborhood connector street types is summarized in Table 5.

Table 5. Street Segment Volume Summary

Street Segment	Daily Volume	Project Volume	Vehicular Increase in ADT	Exceeds Cap?
Raymond Avenue between Green Street and Dayton Street	7,745	217	2.8%	No
Raymond Avenue between Dayton Street and Del Mar Avenue	8,106	130	1.6%	No
Dayton Street between Fair Oaks Avenue and Raymond Avenue	1,049	866	82.6%	Yes

Intersection Level of Service (LOS) Analysis

Figure 4 indicates that the project is in the City's Transit Oriented District. Therefore, the Existing + Project LOS cap for intersections is "LOS E". The calculated LOS results are summarized in Table 6.

Table 6. Signalized Intersection LOS Summary

Intersection	Peak Hour	Existing		Existing w/Project		Exceeds LOS Cap?
		Delay	LOS	Delay	LOS	Yes/No
Fair Oaks Avenue at Green Street	AM	16.3	B	16.4	B	No
	PM	18.3	B	18.6	B	No
Fair Oaks Avenue at Del Mar Boulevard	AM	45.5	D	46.0	D	No
	PM	31.5	C	31.8	C	No
Raymond Avenue at Green Street	AM	10.9	B	10.9	B	No
	PM	16.0	B	15.9	B	No
Raymond Avenue at Del Mar Boulevard	AM	18.2	B	18.3	B	No
	PM	21.1	C	21.2	C	No

Figure 3 Project Trip Distribution and Project Traffic Volumes

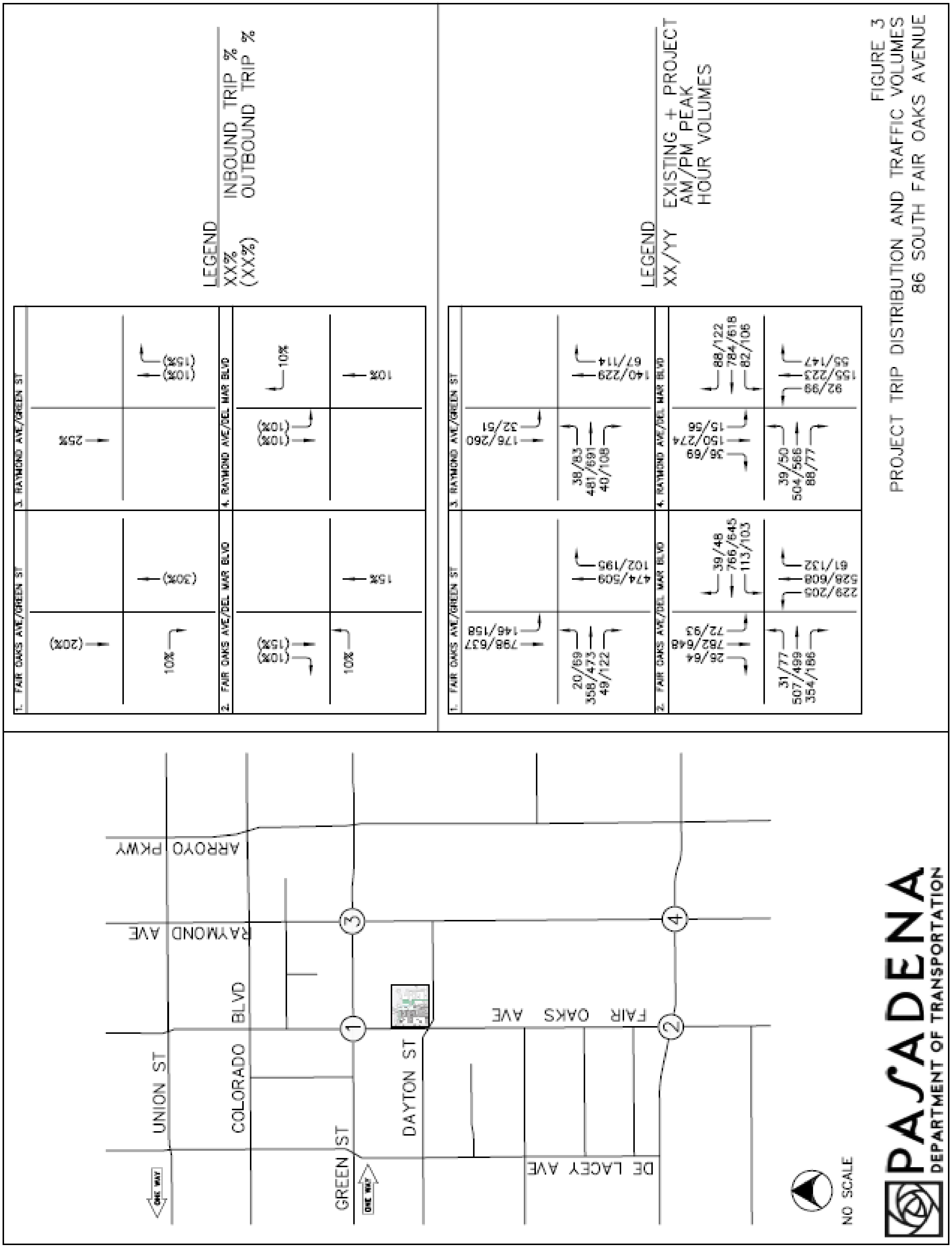
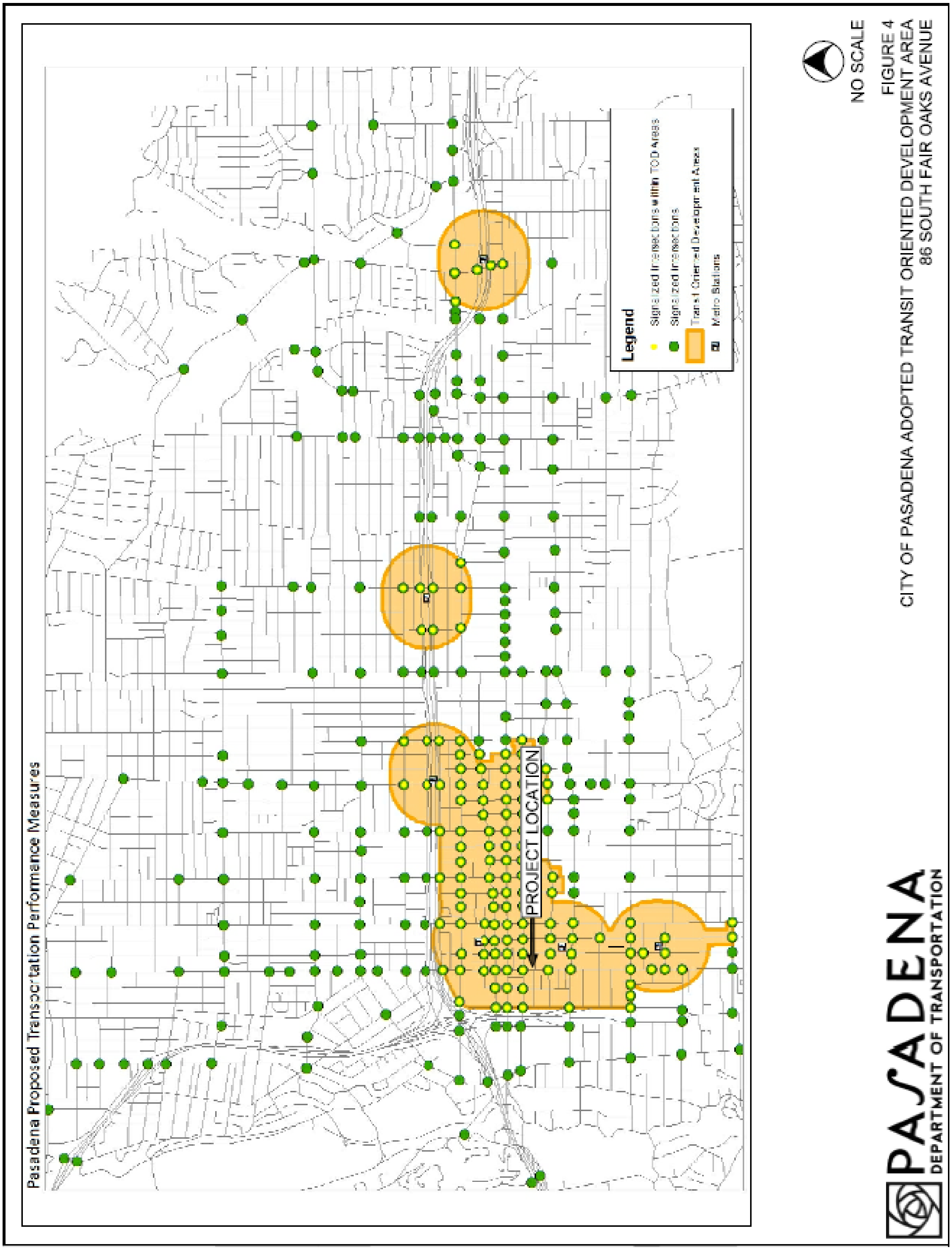


Figure 4. City of Pasadena Adopted Transit Oriented Development Area



PEQI/BEQI Analysis

An observational survey was conducted along Dayton Street between Fair Oaks Avenue and Raymond Avenue to document existing pedestrian and bicycle quality conditions. Vehicle traffic features (i.e., number of lanes, vehicle speed, etc.) as well as street quality features (i.e., sidewalk widths and impediments, driveway cuts, land use characteristics, etc.) were collected on both sides of the street.

Environmental quality of non-vehicular modes must be improved when the assessment of project study segments reveal less than average conditions. According to the PEQI and BEQI indicator and indicator category scores, the following observational scores are:

Table 7. PEQI/BEQI Summary

Segment	PEQI Score	BEQI Score
Dayton Street between Fair Oaks Avenue and Raymond Avenue - Northside - Southside	 70 - High 78 - High	 45 - Average 50 - Average

PEQI and BEQI calculations are found in the appendix of this report.

VI. Conclusion

The City of Pasadena Department of Transportation conducted an analysis to review the construction of a mixed-use development with 87 apartment units, 4 work-live units, 4,218 sf retail, and 1,974 sf restaurant on an existing surface parking lot. Vehicular site access will be provided via one driveway along Dayton Street.

Dayton Street between Fair Oaks Avenue and Raymond Avenue exceeded the adopted segment impact caps. Conditions to reduce project vehicular trips are required.

No intersections exceed the adopted caps.

The calculated PEQI and BEQI scores determined that existing pedestrian conditions are, at minimum, average along Dayton Street.

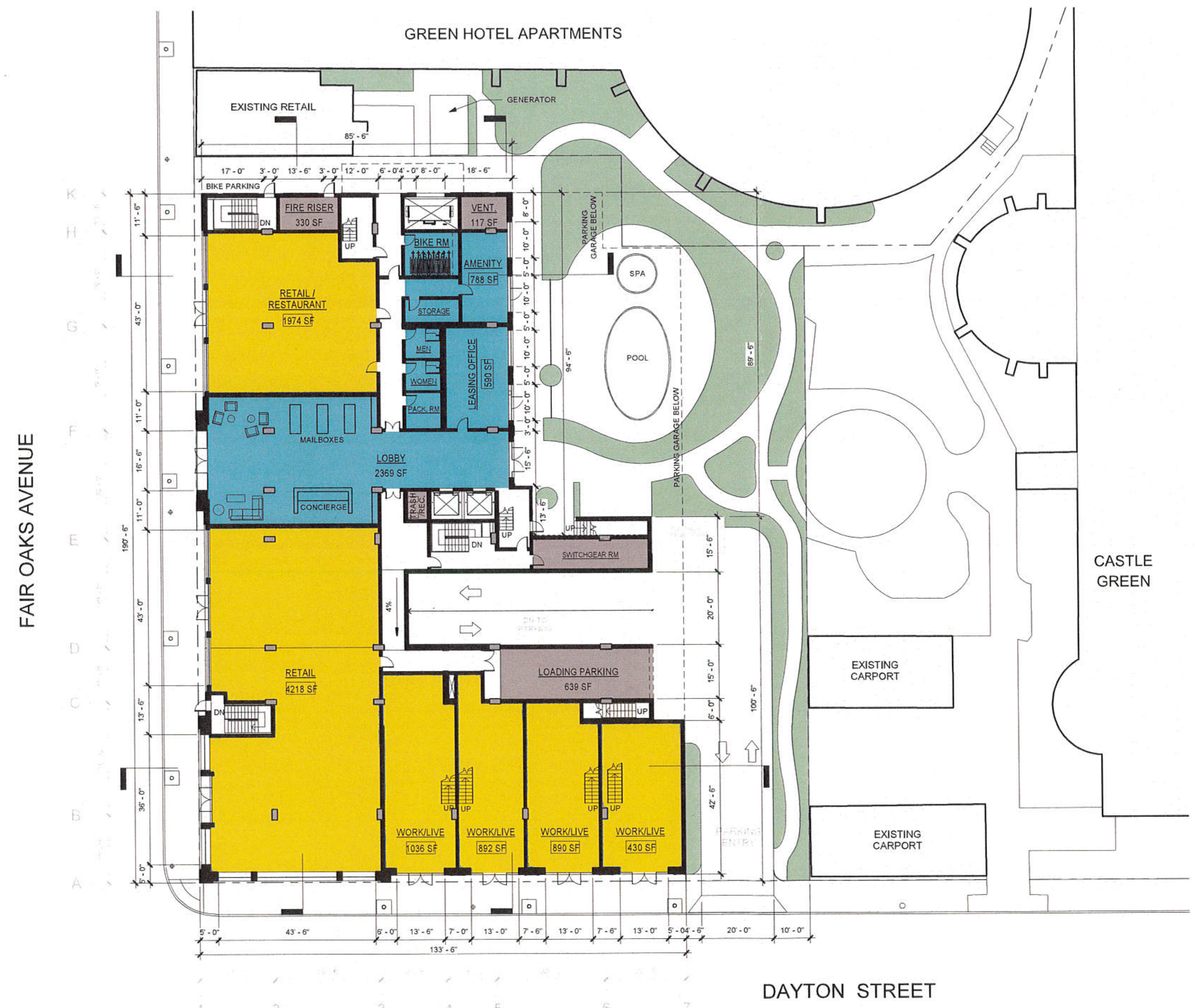
VII. Appendices

Memorandum of Understanding
Traffic Volumes
HCM Analysis
PEQI Calculation Sheet
BEQI Calculation Sheet

Appendix:
Memorandum of Understanding

86 South Fair Oaks
Project Data

Total Gross Floor Area	94,426 SF
Program Summary	
Dwelling Units	87 units
Work/Live (4 units)	5,236 SF
Retail	4,218 SF
Restaurant	1,974 SF
Lobby	2,369 SF
Amenity Space	4,639 SF
Dwelling Units	87 units (excludes 4 Work/Live units)
Studios	29
1 Bedroom under 650 SF	34
1 bedroom over 650 SF	4
2 bedroom	18
2 bedroom townhouse	2
Parking Summary	198 spaces within 4 subterranean levels, includes 7 ADA spaces
Residential spaces	99
Guest	9
Work/Live	12
Retail	10
Restaurant	15
Joint (Green Hotel Replacement)	53
Bicycle Parking	
Residential	15 – Class 1
Non-Residential	4 – Class 2



GROUND FLOOR PLAN

PROJECT AREA SUMMARY

GROSS SQUARE FOOTAGE, PER FLOOR	
GROUND FLOOR	17,004
MEZZANINE	6,834
2ND FLOOR	14,752
3RD FLOOR	13,133
4TH FLOOR	13,109
5TH FLOOR	13,109
6TH FLOOR	12,802
PENTHOUSE	3,683
TOTAL GROSS FLOOR AREA =	**94,426**

GROUND FLOOR SUMMARY

GROSS FLOOR AREA **17, 004 SF**

PROGRAM SUMMARY	NET SF
RETAIL	4,218 SF
RESTAURANT	1,974 SF
WORK/LIVE	3,702 SF
LOBBY	2,369 SF
AMENITY SPACE	788 SF

Appendix:
Traffic Volumes

Thursday, September 13, 2018 Location: Pasadena PROJECT: SC1900

ADT2455 Raymond between Green and Dayton. **Prepared by AimTD tel. 714 253 7888**

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
0:00	13		6					12:00	69		74				
0:15	9		11					12:15	81		59				
0:30	11		7					12:30	69		72				
0:45	0	33	5	29			62	12:45	69	288	60	265			553
1:00	8		10					13:00	72		74				
1:15	5		7					13:15	71		66				
1:30	3		12					13:30	66		61				
1:45	3	19	9	38			57	13:45	72	281	70	271			552
2:00	3		3					14:00	67		73				
2:15	2		5					14:15	65		50				
2:30	2		6					14:30	94		67				
2:45	0	7	3	17			24	14:45	45	271	64	254			525
3:00	0		3					15:00	59		68				
3:15	0		0					15:15	72		61				
3:30	2		0					15:30	64		65				
3:45	0	2	0	3			5	15:45	61	256	50	244			500
4:00	0		2					16:00	79		52				
4:15	2		2					16:15	69		64				
4:30	3		0					16:30	83		84				
4:45	2	7	5	9			16	16:45	57	288	60	260			548
5:00	2		4					17:00	80		101				
5:15	2		8					17:15	90		75				
5:30	2		3					17:30	77		97				
5:45	8	14	12	27			41	17:45	78	325	82	355			680
6:00	7		15					18:00	91		88				
6:15	8		12					18:15	59		63				
6:30	16		17					18:30	68		74				
6:45	19	50	26	70			120	18:45	82	300	86	311			611
7:00	24		30					19:00	69		63				
7:15	24		37					19:15	56		58				
7:30	39		51					19:30	58		52				
7:45	57	144	67	185			329	19:45	51	234	50	223			457
8:00	49		56					20:00	42		51				
8:15	47		43					20:15	41		45				
8:30	44		46					20:30	38		51				
8:45	50	190	54	199			389	20:45	32	153	41	188			341
9:00	48		66					21:00	37		45				
9:15	56		44					21:15	25		38				
9:30	54		48					21:30	22		41				
9:45	56	214	47	205			419	21:45	22	106	46	170			276
10:00	71		47					22:00	41		40				
10:15	57		49					22:15	28		40				
10:30	69		50					22:30	15		31				
10:45	60	257	47	193			450	22:45	18	102	25	136			238
11:00	54		41					23:00	16		19				
11:15	61		44					23:15	13		14				
11:30	50		58					23:30	7		17				
11:45	73	238	62	205			443	23:45	9	45	14	64			109
Total Vol.		1175		1180			**2355**			2649		2741			**5390**

Daily Totals

NB	SB	EB	WB	**Combined**
3824	3921			**7745**

	AM			PM		
	NB	SB		NB	SB	
Split %	49.9%	50.1%	**30.4%**	49.1%	50.9%	**69.6%**
Peak Hour	11:45	11:45	**11:45**	17:15	17:00	**17:00**
Volume	292	267	**559**	336	355	**680**
P.H.F.	0.90	0.90	**0.98**	0.90	0.88	**0.94**

Thursday, September 13, 2018 Location: Pasadena PROJECT: SC1900

ADT2217 Raymond between Dayton and Del Mar .нема South. **Prepared by AimTD tel. 714 253 7888**

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
0:00	13		10					12:00	77		70				
0:15	11		9					12:15	84		68				
0:30	10		7					12:30	71		62				
0:45	0	34	5	31			65	12:45	74	306	69	269			575
1:00	8		6					13:00	85		75				
1:15	3		6					13:15	64		63				
1:30	3		12					13:30	92		65				
1:45	4	18	6	30			48	13:45	66	307	76	279			586
2:00	3		4					14:00	67		58				
2:15	2		5					14:15	72		68				
2:30	2		7					14:30	97		59				
2:45	0	7	2	18			25	14:45	48	284	73	258			542
3:00	0		2					15:00	61		65				
3:15	0		0					15:15	83		61				
3:30	2		0					15:30	74		74				
3:45	0	2	1	3			5	15:45	55	273	66	266			539
4:00	0		1					16:00	85		69				
4:15	2		2					16:15	77		71				
4:30	3		1					16:30	84		88				
4:45	2	7	4	8			15	16:45	65	311	75	303			614
5:00	3		5					17:00	91		78				
5:15	0		7					17:15	107		86				
5:30	3		5					17:30	85		79				
5:45	11	17	11	28			45	17:45	85	368	94	337			705
6:00	9		13					18:00	104		84				
6:15	8		12					18:15	63		69				
6:30	17		17					18:30	76		70				
6:45	18	52	27	69			121	18:45	83	326	83	306			632
7:00	40		34					19:00	76		66				
7:15	29		38					19:15	62		69				
7:30	42		46					19:30	62		55				
7:45	64	175	57	175			350	19:45	52	252	57	247			499
8:00	61		51					20:00	41		48				
8:15	54		44					20:15	47		50				
8:30	52		39					20:30	48		45				
8:45	50	217	44	178			395	20:45	31	167	39	182			349
9:00	54		52					21:00	39		43				
9:15	61		45					21:15	25		47				
9:30	54		42					21:30	27		40				
9:45	61	230	47	186			416	21:45	19	110	51	181			291
10:00	71		46					22:00	43		38				
10:15	59		51					22:15	27		46				
10:30	73		46					22:30	16		33				
10:45	62	265	52	195			460	22:45	18	104	28	145			249
11:00	59		44					23:00	17		17				
11:15	61		42					23:15	14		20				
11:30	65		59					23:30	7		16				
11:45	74	259	57	202			461	23:45	13	51	15	68			119
Total Vol.		1283		1123			**2406**			2859		2841			**5700**

Daily Totals

NB	SB	EB	WB	**Combined**
4142	3964			**8106**

	AM			**PM**		
Split %	53.3%	46.7%	**29.7%**	50.2%	49.8%	**70.3%**
Peak Hour	11:45	11:45	**11:45**	17:15	17:15	**17:15**
Volume	306	257	**563**	381	343	**724**
P.H.F.	0.91	0.92	**0.93**	0.85	0.91	**0.94**

Wednesday, September 19, 2018 Location: Pasadena PROJECT:

ADT2454 Dayton between Fair and Raymond. **Prepared by AimTD tel. 714 253 7888**

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
0:30			0		0			12:00			10		6		
0:15			2		2			12:15			11		6		
0:30			2		0			12:30			8		0		
0:45			3	7	0	2	9	12:45			12	41	4	16	57
1:00			0		0			13:00			9		5		
1:15			3		0			13:15			14		6		
1:30			0		0			13:30			15		8		
1:45			2	5	2	2	7	13:45			16	54	5	24	78
2:00			2		0			14:00			14		8		
2:15			0		0			14:15			6		9		
2:30			2		0			14:30			15		4		
2:45			0	4	0	0	4	14:45			22	57	3	24	81
3:00			0		0			15:00			16		5		
3:15			0		0			15:15			11		5		
3:30			0		0			15:30			14		2		
3:45			0	0	0	0		15:45			13	54	5	17	71
4:00			0		0			16:00			11		8		
4:15			0		0			16:15			19		6		
4:30			0		0			16:30			13		3		
4:45			0	0	0	0		16:45			20	63	13	30	93
5:00			0		0			17:00			19		5		
5:15			0		0			17:15			22		9		
5:30			0		2			17:30			24		5		
5:45			0	0	0	2	2	17:45			15	80	9	28	108
6:00			2		0			18:00			21		13		
6:15			0		0			18:15			19		9		
6:30			0		2			18:30			12		5		
6:45			2	4	3	5	9	18:45			10	62	5	32	94
7:00			4		7			19:00			16		8		
7:15			3		2			19:15			9		7		
7:30			4		3			19:30			9		5		
7:45			12	23	4	16	39	19:45			7	41	6	26	67
8:00			12		5			20:00			10		4		
8:15			3		6			20:15			9		2		
8:30			10		0			20:30			3		3		
8:45			16	41	6	17	58	20:45			7	29	4	13	42
9:00			7		10			21:00			4		0		
9:15			13		7			21:15			8		0		
9:30			7		4			21:30			3		2		
9:45			10	37	4	25	62	21:45			8	23	4	6	29
10:00			16		3			22:00			8		3		
10:15			4		7			22:15			0		0		
10:30			12		3			22:30			4		0		
10:45			6	38	8	21	59	22:45			3	15	0	3	18
11:00			10		4			23:00			2		0		
11:15			12		3			23:15			3		0		
11:30			6		6			23:30			2		0		
11:45			12	40	2	15	55	23:45			0	7	0	0	7
Total Vol.				199		105	**304**					526		219	**745**

Daily Totals

NB	SB	EB	WB	**Combined**
		725	324	**1049**

	AM					PM		
Split %			65.5%	34.5%	**29.0%**	70.6%	29.4%	**71.0%**
Peak Hour	0:30	0:30	8:30	8:45	**8:45**	16:45	17:15	**17:15**
Volume			46	27	**70**	85	36	**118**
P.H.F.			0.72	0.68	**0.80**	0.89	0.69	**0.87**

T218

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Sep 13, 18

LOCATION: Pasadena
NORTH & SOUTH: Fair Oaks
EAST & WEST: Green

PROJECT #: SC1900
LOCATION #: 1058
CONTROL: SIGNAL

NOTES:

AM PM MD OTHER OTHER

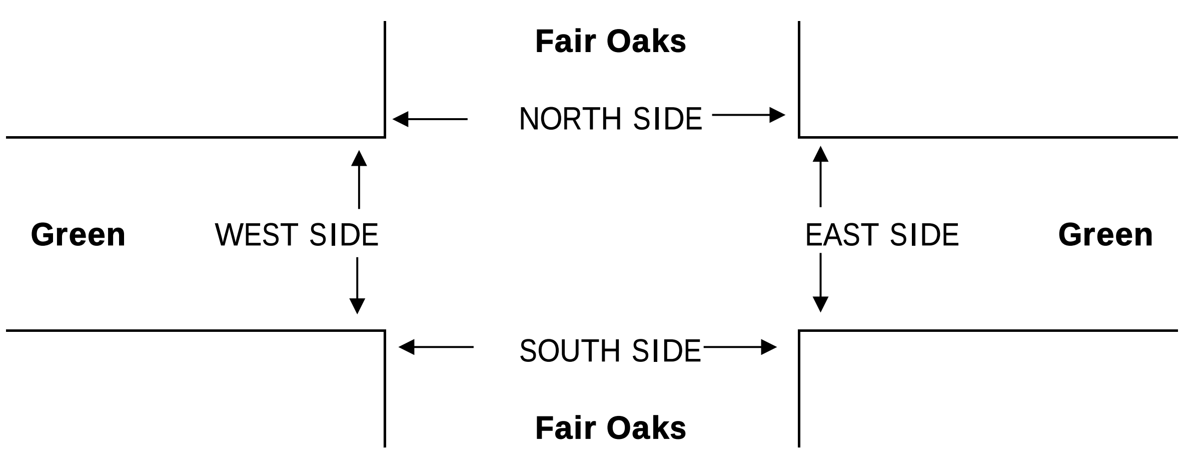
▲ N ◄ W E ► S ▼

☐ Add U-Turns to Left Turns

	NORTHBOUND Fair Oaks			SOUTHBOUND Fair Oaks			EASTBOUND Green			WESTBOUND Green			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	X	2	0	1	2	X	0.5	2	0.5	X	X	X	
AM 7:00 AM	0	56	9	12	114	0	7	37	16	0	0	0	251
7:15 AM	0	85	22	24	122	0	3	44	15	0	0	0	315
7:30 AM	0	97	26	28	174	0	1	73	11	0	0	0	410
7:45 AM	0	118	28	44	198	0	5	104	7	0	0	0	504
8:00 AM	0	109	31	44	209	0	1	84	15	0	0	0	493
8:15 AM	0	97	16	25	199	0	4	87	16	0	0	0	444
8:30 AM	0	140	27	33	188	0	10	83	9	0	0	0	490
8:45 AM	0	108	18	47	180	0	11	83	14	0	0	0	461
VOLUMES	0	810	177	257	1,384	0	42	595	103	0	0	0	3,368
APPROACH %	0%	82%	18%	16%	84%	0%	6%	80%	14%	0%	0%	0%	
APP/DEPART	987	/	852	1,641	/	1,487	740	/	1,029	0	/	0	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	0	464	102	146	794	0	20	358	47	0	0	0	1,931
APPROACH %	0%	82%	18%	16%	84%	0%	5%	84%	11%	0%	0%	0%	
PEAK HR FACTOR		0.847			0.929			0.916			0.000		0.958
APP/DEPART	566	/	484	940	/	841	425	/	606	0	/	0	0
PM 4:00 PM	0	125	46	35	148	0	16	100	20	0	0	0	490
4:15 PM	0	132	40	31	154	0	7	101	26	0	0	0	491
4:30 PM	0	126	42	39	163	0	16	104	25	0	0	0	515
4:45 PM	0	132	42	44	160	0	11	97	35	0	0	0	521
5:00 PM	0	131	39	37	151	0	19	101	22	0	0	0	500
5:15 PM	0	133	52	29	172	0	18	130	31	0	0	0	565
5:30 PM	0	103	51	52	154	0	13	116	32	0	0	0	521
5:45 PM	0	133	53	40	151	0	19	126	33	0	0	0	555
VOLUMES	0	1,015	365	307	1,253	0	119	875	224	0	0	0	4,158
APPROACH %	0%	74%	26%	20%	80%	0%	10%	72%	18%	0%	0%	0%	
APP/DEPART	1,380	/	1,134	1,560	/	1,477	1,218	/	1,547	0	/	0	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	0	500	195	158	628	0	69	473	118	0	0	0	2,141
APPROACH %	0%	72%	28%	20%	80%	0%	10%	72%	18%	0%	0%	0%	
PEAK HR FACTOR		0.934			0.954			0.922			0.000		0.947
APP/DEPART	695	/	569	786	/	746	660	/	826	0	/	0	0

U-TURNS

	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	0	0	0
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	0	0	0	0	0



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	5	3	10	6	24	5	3	9	6	23	0	0	1	0	1
7:15 AM	4	7	5	11	27	4	7	5	11	27	0	0	0	0	0
7:30 AM	7	4	7	6	24	6	3	7	5	21	1	1	0	1	3
7:45 AM	20	6	10	14	50	20	6	7	12	45	0	0	3	2	5
8:00 AM	6	9	4	15	34	6	9	4	15	34	0	0	0	0	0
8:15 AM	9	4	3	7	23	8	4	3	7	22	1	0	0	0	1
8:30 AM	33	10	15	10	68	30	8	13	10	61	3	2	2	0	7
8:45 AM	16	17	15	8	56	15	12	15	7	49	1	5	0	1	7
TOTAL	100	60	69	77	306	94	52	63	73	282	6	8	6	4	24
AM BEGIN PEAK HR			7:45 AM			64	27	27	44	162					
PM 4:00 PM	27	10	6	41	84	27	9	5	41	82	0	1	1	0	2
4:15 PM	52	7	17	33	109	49	5	13	27	94	3	2	4	6	15
4:30 PM	45	19	14	41	119	45	14	12	40	111	0	5	2	1	8
4:45 PM	39	34	17	41	131	37	29	15	39	120	2	5	2	2	11
5:00 PM	30	19	23	33	105	29	18	23	33	103	1	1	0	0	2
5:15 PM	42	25	17	34	118	42	23	17	33	115	0	2	0	1	3
5:30 PM	59	24	26	31	140	59	21	25	31	136	0	3	1	0	4
5:45 PM	45	26	29	35	135	44	26	27	35	132	1	0	2	0	3
TOTAL	339	164	149	289	941	332	145	137	279	893	7	19	12	10	48
PM BEGIN PEAK HR			5:00 PM			174	88	92	132	486					

T218

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Pasadena	PROJECT #:	SC1900
Thu, Sep 13, 18	NORTH & SOUTH:	Fair Oaks	LOCATION #:	183
	EAST & WEST:	Del Mar	CONTROL:	SIGNAL

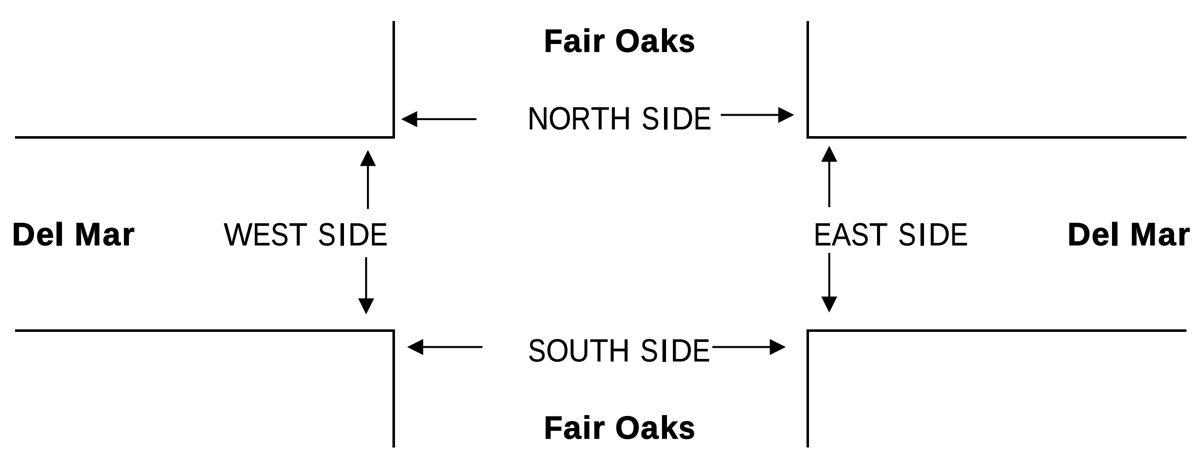
NOTES:

AM PM MD OTHER OTHER

▲ N ◄ W E ► S ▼

☑ Add U-Turns to Left Turns

		NORTHBOUND (Fair Oaks)			SOUTHBOUND (Fair Oaks)			EASTBOUND (Del Mar)			WESTBOUND (Del Mar)				U-TURNS				
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
	LANES:	1	2	0	1	2	0	1	2	0	1	2	0		0	0	0	0	
AM	7:00 AM	44	69	8	13	122	5	1	67	50	15	102	7	503	0	0	0	0	0
	7:15 AM	65	102	9	10	120	4	2	75	48	26	149	9	619	0	0	0	0	0
	7:30 AM	72	128	20	14	165	5	10	113	68	12	164	11	782	0	0	0	0	0
	7:45 AM	58	144	19	13	190	8	7	150	83	24	216	8	920	0	0	0	0	0
	8:00 AM	58	128	11	24	189	2	12	108	75	23	194	9	833	0	0	0	0	0
	8:15 AM	65	103	10	18	204	4	3	122	102	42	206	8	887	0	0	0	0	0
	8:30 AM	48	150	21	17	194	9	7	127	94	24	150	14	855	0	0	0	0	0
	8:45 AM	46	123	17	19	168	6	5	120	125	29	131	16	805	0	0	0	0	0
	VOLUMES	456	947	115	128	1,352	43	47	882	645	195	1,312	82	6,204	0	0	0	0	0
	APPROACH %	30%	62%	8%	8%	89%	3%	3%	56%	41%	12%	83%	5%						
	APP/DEPART	1,518	/	1,076	1,523	/	2,192	1,574	/	1,125	1,589	/	1,811	0					
	BEGIN PEAK HR		7:45 AM																
	VOLUMES	229	525	61	72	777	23	29	507	354	113	766	39	3,495					
	APPROACH %	28%	64%	7%	8%	89%	3%	3%	57%	40%	12%	83%	4%						
	PEAK HR FACTOR		0.922			0.965			0.927			0.896		0.950					
	APP/DEPART	815	/	593	872	/	1,244	890	/	640	918	/	1,018	0					
PM	4:00 PM	48	137	33	27	139	8	12	96	43	29	158	13	743	0	0	0	0	0
	4:15 PM	38	150	26	26	149	15	19	103	48	37	144	8	763	0	0	0	0	0
	4:30 PM	57	142	39	27	155	6	14	105	44	23	141	19	772	0	0	0	0	0
	4:45 PM	50	157	39	18	181	11	12	111	42	21	145	8	795	0	0	0	0	0
	5:00 PM	51	141	36	25	148	8	28	112	53	22	141	15	780	0	0	0	0	0
	5:15 PM	49	165	28	24	178	17	12	106	48	22	151	11	811	0	0	1	0	1
	5:30 PM	58	126	35	23	157	25	13	132	47	31	175	14	836	0	0	0	0	0
	5:45 PM	47	170	33	21	160	11	20	149	38	28	178	8	863	0	0	0	0	0
	VOLUMES	398	1,188	269	191	1,267	101	130	914	363	213	1,233	96	6,363	0	0	1	0	1
	APPROACH %	21%	64%	15%	12%	81%	6%	9%	65%	26%	14%	80%	6%						
	APP/DEPART	1,855	/	1,413	1,559	/	1,843	1,407	/	1,374	1,542	/	1,733	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	205	602	132	93	643	61	73	499	186	103	645	48	3,290					
	APPROACH %	22%	64%	14%	12%	81%	8%	10%	66%	25%	13%	81%	6%						
	PEAK HR FACTOR		0.939			0.910			0.915			0.905		0.953					
	APP/DEPART	939	/	722	797	/	932	758	/	724	796	/	912	0					



		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	7	6	3	5	21	7	5	2	4	18	0	1	1	1	3
	7:15 AM	6	3	1	7	17	6	2	1	7	16	0	1	0	0	1
	7:30 AM	13	6	6	7	32	11	6	6	6	29	2	0	0	1	3
	7:45 AM	8	2	6	6	22	8	1	4	6	19	0	1	2	0	3
	8:00 AM	5	3	5	4	17	5	2	5	3	15	0	1	0	1	2
	8:15 AM	8	10	8	6	32	8	9	8	6	31	0	1	0	0	1
	8:30 AM	5	11	8	10	34	5	9	8	8	30	0	2	0	2	4
	8:45 AM	9	8	2	4	23	8	6	2	4	20	1	2	0	0	3
	TOTAL	61	49	39	49	198	58	40	36	44	178	3	9	3	5	20
	AM BEGIN PEAK HR			7:45 AM			26	21	25	23	95					
PM	4:00 PM	9	16	11	14	50	8	16	10	13	47	1	0	1	1	3
	4:15 PM	5	14	8	11	38	5	14	8	10	37	0	0	0	1	1
	4:30 PM	4	9	4	6	23	4	8	4	6	22	0	1	0	0	1
	4:45 PM	9	7	10	8	34	9	6	9	7	31	0	1	1	1	3
	5:00 PM	7	9	14	14	44	5	8	13	11	37	2	1	1	3	7
	5:15 PM	9	8	4	8	29	7	8	4	8	27	2	0	0	0	2
	5:30 PM	0	11	6	8	25	0	7	3	8	18	0	4	3	0	7
	5:45 PM	6	13	10	9	38	4	11	9	6	30	2	2	1	3	8
	TOTAL	49	87	67	78	281	42	78	60	69	249	7	9	7	9	32
	PM BEGIN PEAK HR			5:00 PM			16	34	29	33	112					

T218

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Pasadena	PROJECT #:	SC1900
Thu, Sep 13, 18	NORTH & SOUTH:	Raymond	LOCATION #:	1059
	EAST & WEST:	Green	CONTROL:	SIGNAL

NOTES:

AM
PM
MD
OTHER
OTHER

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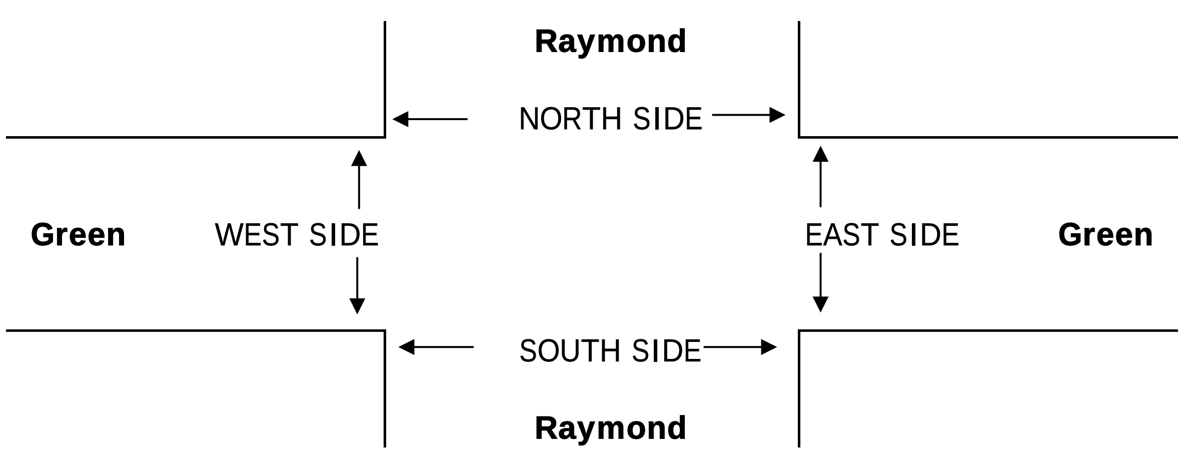
☑ Add U-Turns to Left Turns

	NORTHBOUND Raymond			SOUTHBOUND Raymond			EASTBOUND Green			WESTBOUND Green			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	X	2	0	0	2	X	0.5	2	0.5	X	X	X	
AM 7:00 AM	0	15	6	4	21	0	3	55	4	0	0	0	108
7:15 AM	0	15	11	3	32	0	5	59	4	0	0	0	129
7:30 AM	0	28	7	7	39	0	8	98	8	0	0	0	195
7:45 AM	0	42	13	12	54	0	5	141	12	0	0	0	279
8:00 AM	0	31	20	8	43	0	13	129	15	0	0	0	259
8:15 AM	0	34	10	4	35	0	14	105	7	0	0	0	209
8:30 AM	0	30	19	8	39	0	6	106	6	0	0	0	214
8:45 AM	0	32	12	7	46	0	4	112	14	0	0	0	227
VOLUMES	0	227	98	53	309	0	58	805	70	0	0	0	1,620
APPROACH %	0%	70%	30%	15%	85%	0%	6%	86%	8%	0%	0%	0%	
APP/DEPART	325	/	285	362	/	379	933	/	956	0	/	0	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	0	137	62	32	171	0	38	481	40	0	0	0	961
APPROACH %	0%	69%	31%	16%	84%	0%	7%	86%	7%	0%	0%	0%	
PEAK HR FACTOR		0.905			0.769			0.884			0.000		0.861
APP/DEPART	199	/	175	203	/	211	559	/	575	0	/	0	0
PM 4:00 PM	0	49	23	13	35	0	17	140	17	0	0	0	294
4:15 PM	0	48	22	7	51	0	21	146	11	0	0	0	306
4:30 PM	0	55	30	8	65	0	15	159	23	0	0	0	355
4:45 PM	0	39	19	10	44	0	14	174	17	0	0	0	317
5:00 PM	0	52	29	11	63	0	19	155	34	0	0	0	363
5:15 PM	0	62	20	17	54	0	19	170	25	0	0	0	367
5:30 PM	0	54	27	9	74	0	25	169	22	0	0	0	380
5:45 PM	0	58	33	14	58	0	20	197	27	0	0	0	407
VOLUMES	0	417	203	89	444	0	150	1,310	176	0	0	0	2,789
APPROACH %	0%	67%	33%	17%	83%	0%	9%	80%	11%	0%	0%	0%	
APP/DEPART	620	/	569	533	/	620	1,636	/	1,600	0	/	0	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	0	226	109	51	249	0	83	691	108	0	0	0	1,517
APPROACH %	0%	67%	33%	17%	83%	0%	9%	78%	12%	0%	0%	0%	
PEAK HR FACTOR		0.920			0.904			0.904			0.000		0.932
APP/DEPART	335	/	310	300	/	357	882	/	850	0	/	0	0

U-TURNS

	NB	SB	EB	WB	TTL
	0	0	0	0	
AM 7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	0	0	0
PM 4:00 PM	0	0	0	0	0
4:15 PM	0	1	0	0	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1
VOLUMES	0	2	0	0	2



PEDESTRIAN + BIKE CROSSINGS

	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
AM 7:00 AM	5	0	9	4	18
7:15 AM	7	6	6	5	24
7:30 AM	7	8	15	9	39
7:45 AM	13	8	9	12	42
8:00 AM	15	12	14	2	43
8:15 AM	19	3	10	5	37
8:30 AM	23	13	14	7	57
8:45 AM	22	10	24	6	62
TOTAL	111	60	101	50	322
AM BEGIN PEAK HR	7:45 AM				
PM 4:00 PM	42	19	20	10	91
4:15 PM	41	23	21	24	109
4:30 PM	32	9	17	15	73
4:45 PM	35	9	10	19	73
5:00 PM	37	24	14	16	91
5:15 PM	26	28	24	17	95
5:30 PM	41	33	29	22	125
5:45 PM	36	22	29	11	98
TOTAL	290	167	164	134	755
PM BEGIN PEAK HR	5:00 PM				

PEDESTRIAN CROSSINGS

	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
AM 7:00 AM	5	0	8	2	15
7:15 AM	7	6	5	4	22
7:30 AM	7	7	15	7	36
7:45 AM	11	8	8	11	38
8:00 AM	15	11	14	1	41
8:15 AM	18	3	10	5	36
8:30 AM	22	9	11	7	49
8:45 AM	21	7	21	5	54
TOTAL	106	51	92	42	291
AM BEGIN PEAK HR	66	31	43	24	164
PM 4:00 PM	41	18	20	10	89
4:15 PM	40	21	20	21	102
4:30 PM	31	5	16	13	65
4:45 PM	34	5	9	16	64
5:00 PM	35	23	13	15	86
5:15 PM	26	27	24	16	93
5:30 PM	41	30	27	22	120
5:45 PM	35	22	28	10	95
TOTAL	283	151	157	123	714
PM BEGIN PEAK HR	137	102	92	63	394

BICYCLE CROSSINGS

	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	1	2	3
7:15 AM	0	0	1	1	2
7:30 AM	0	1	0	2	3
7:45 AM	2	0	1	1	4
8:00 AM	0	1	0	1	2
8:15 AM	1	0	0	0	1
8:30 AM	1	4	3	0	8
8:45 AM	1	3	3	1	8
TOTAL	5	9	9	8	31
AM BEGIN PEAK HR					
PM 4:00 PM	1	1	0	0	2
4:15 PM	1	2	1	3	7
4:30 PM	1	4	1	2	8
4:45 PM	1	4	1	3	9
5:00 PM	2	1	1	1	5
5:15 PM	0	1	0	1	2
5:30 PM	0	3	2	0	5
5:45 PM	1	0	1	1	3
TOTAL	7	16	7	11	41
PM BEGIN PEAK HR					

INTERSECTION TURNING MOVEMENT COUNTS

T218

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Pasadena	PROJECT #:	SC1900
Thu, Sep 13, 18	NORTH & SOUTH:	Raymond	LOCATION #:	294
	EAST & WEST:	Del Mar	CONTROL:	SIGNAL

NOTES:

AM PM MD OTHER OTHER

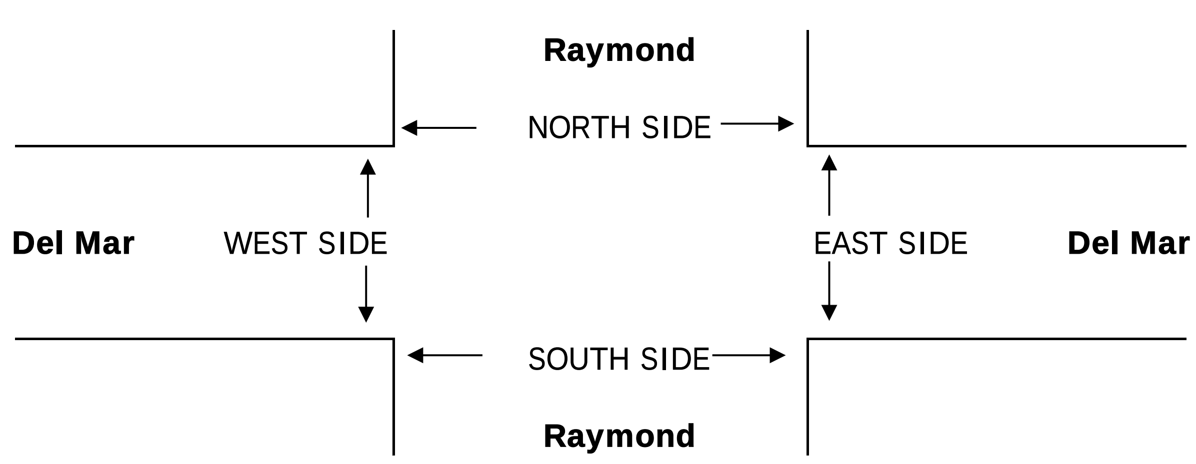
▲ N ◄ W E ► S ▼

☑ Add U-Turns to Left Turns

	NORTHBOUND Raymond			SOUTHBOUND Raymond			EASTBOUND Del Mar			WESTBOUND Del Mar			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	1	
AM 7:00 AM	10	10	7	4	21	6	6	62	19	14	105	16	280
7:15 AM	8	24	4	1	23	6	12	73	8	10	173	12	354
7:30 AM	18	20	1	4	38	14	11	117	16	22	188	15	464
7:45 AM	17	32	9	2	52	9	6	163	19	18	226	34	587
8:00 AM	24	45	14	6	43	7	10	108	24	18	190	16	505
8:15 AM	25	37	18	3	20	9	10	109	24	22	214	18	509
8:30 AM	26	39	14	1	32	11	13	124	21	24	154	18	477
8:45 AM	26	34	11	4	38	10	6	109	34	21	133	18	444
VOLUMES	154	241	78	25	267	72	74	865	165	149	1,383	147	3,620
APPROACH %	33%	51%	16%	7%	73%	20%	7%	78%	15%	9%	82%	9%	
APP/DEPART	473	/	462	364	/	581	1,104	/	968	1,679	/	1,609	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	92	153	55	12	147	36	39	504	88	82	784	86	2,078
APPROACH %	31%	51%	18%	6%	75%	18%	6%	80%	14%	9%	82%	9%	
PEAK HR FACTOR		0.904			0.774			0.839			0.856		0.885
APP/DEPART	300	/	278	195	/	317	631	/	571	952	/	912	0
PM 4:00 PM	12	53	24	13	28	16	9	146	18	21	202	22	564
4:15 PM	14	51	22	10	37	17	15	126	9	24	164	19	508
4:30 PM	16	48	28	10	65	13	16	141	12	18	170	22	559
4:45 PM	13	35	31	12	37	15	13	156	7	17	151	17	504
5:00 PM	15	49	38	9	75	24	16	123	16	29	151	29	574
5:15 PM	26	58	36	13	61	11	10	142	17	27	139	36	576
5:30 PM	26	63	41	14	78	14	13	140	18	26	158	20	611
5:45 PM	32	49	32	17	57	20	11	161	26	24	170	33	632
VOLUMES	154	406	252	98	438	130	103	1,135	123	186	1,305	198	4,528
APPROACH %	19%	50%	31%	15%	66%	20%	8%	83%	9%	11%	77%	12%	
APP/DEPART	812	/	707	666	/	747	1,361	/	1,485	1,689	/	1,589	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	99	219	147	53	271	69	50	566	77	106	618	118	2,393
APPROACH %	21%	47%	32%	13%	69%	18%	7%	82%	11%	13%	73%	14%	
PEAK HR FACTOR		0.894			0.910			0.875			0.927		0.947
APP/DEPART	465	/	387	393	/	454	693	/	766	842	/	786	0

U-TURNS

	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	0	0	0
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	0	0	0	0	0



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	13	3	10	4	30	12	3	9	4	28	1	0	1	0	2
7:15 AM	6	2	11	5	24	6	2	10	5	23	0	0	1	0	1
7:30 AM	14	3	11	5	33	13	3	11	5	32	1	0	0	0	1
7:45 AM	6	4	14	7	31	6	3	13	4	26	0	1	1	3	5
8:00 AM	6	4	10	6	26	6	4	10	6	26	0	0	0	0	0
8:15 AM	7	9	23	8	47	7	7	23	6	43	0	2	0	2	4
8:30 AM	7	8	19	4	38	6	4	19	3	32	1	4	0	1	6
8:45 AM	10	11	20	10	51	7	9	19	10	45	3	2	1	0	6
TOTAL	69	44	118	49	280	63	35	114	43	255	6	9	4	6	25
AM BEGIN PEAK HR			7:45 AM			25	18	65	19	127					
PM 4:00 PM	14	9	13	19	55	10	6	12	15	43	4	3	1	4	12
4:15 PM	9	11	10	3	33	9	11	10	2	32	0	0	0	1	1
4:30 PM	6	8	10	12	36	6	8	10	11	35	0	0	0	1	1
4:45 PM	15	5	15	5	40	14	5	14	2	35	1	0	1	3	5
5:00 PM	13	8	14	7	42	10	7	14	7	38	3	1	0	0	4
5:15 PM	12	11	26	10	59	12	10	26	8	56	0	1	0	2	3
5:30 PM	12	3	27	7	49	11	3	27	7	48	1	0	0	0	1
5:45 PM	6	16	16	7	45	4	15	15	7	41	2	1	1	0	4
TOTAL	87	71	131	70	359	76	65	128	59	328	11	6	3	11	31
PM BEGIN PEAK HR			5:00 PM			37	35	82	29	183					

Appendix:
HCM Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.91						0.95		1.00	0.95	
Frt		0.98						0.97		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		4989						3443		1770	3539	
Flt Permitted		1.00						1.00		0.21	1.00	
Satd. Flow (perm)		4989						3443		386	3539	
Volume (vph)	20	358	47	0	0	0	0	464	102	146	794	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	389	51	0	0	0	0	504	111	159	863	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	26	0	0	0	0
Lane Group Flow (vph)	0	439	0	0	0	0	0	589	0	159	863	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm									pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Actuated Green, G (s)		13.8						20.1		56.0	56.0	
Effective Green, g (s)		14.7						21.4		57.3	57.3	
Actuated g/C Ratio		0.18						0.27		0.72	0.72	
Clearance Time (s)		4.9						5.3		3.2	5.3	
Vehicle Extension (s)		4.8						4.8		2.5	4.8	
Lane Grp Cap (vph)		917						921		828	2535	
v/s Ratio Prot								c0.17		0.08	c0.24	
v/s Ratio Perm		0.09								0.06		
v/c Ratio		0.48						0.64		0.19	0.34	
Uniform Delay, d1		29.2						25.9		4.8	4.3	
Progression Factor		1.00						1.00		1.05	0.30	
Incremental Delay, d2		0.8						3.4		0.5	0.3	
Delay (s)		30.0						29.3		5.6	1.6	
Level of Service		C						C		A	A	
Approach Delay (s)		30.0			0.0			29.3			2.2	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↱		↰	↑↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.96		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3260		1805	3570		1805	3516		1805	3582	
Flt Permitted	0.20	1.00		0.13	1.00		0.13	1.00		0.31	1.00	
Satd. Flow (perm)	374	3260		241	3570		251	3516		590	3582	
Volume (vph)	29	507	354	113	766	39	229	525	61	72	777	23
Peak-hour factor, PHF	0.78	0.81	0.78	0.70	0.92	0.79	0.80	0.95	0.80	0.77	0.92	0.70
Adj. Flow (vph)	37	626	454	161	833	49	286	553	76	94	845	33
RTOR Reduction (vph)	0	140	0	0	4	0	0	12	0	0	3	0
Lane Group Flow (vph)	37	940	0	161	878	0	286	617	0	94	875	0
Confl. Peds. (#/hr)			67			37			45			42
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	33.0	27.6		41.4	32.8		37.5	29.7		33.9	27.9	
Effective Green, g (s)	32.1	27.5		41.3	32.7		38.5	31.5		34.9	29.7	
Actuated g/C Ratio	0.36	0.31		0.46	0.36		0.43	0.35		0.39	0.33	
Clearance Time (s)	3.2	3.9		3.2	3.9		3.2	5.8		3.2	5.8	
Vehicle Extension (s)	2.5	4.0		2.5	4.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	207	996		281	1297		228	1231		299	1182	
v/s Ratio Prot	0.01	c0.29		c0.06	0.25		c0.10	0.18		0.02	0.24	
v/s Ratio Perm	0.05			0.20			c0.44			0.10		
v/c Ratio	0.18	0.94		0.57	0.68		1.25	0.50		0.31	0.74	
Uniform Delay, d1	19.7	30.5		19.4	24.2		21.0	23.1		18.1	26.7	
Progression Factor	1.00	1.00		1.89	1.44		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	17.9		2.2	2.7		145.2	1.5		0.4	4.2	
Delay (s)	20.0	48.4		38.8	37.4		166.1	24.5		18.6	30.9	
Level of Service	B	D		D	D		F	C		B	C	
Approach Delay (s)		47.4			37.6			68.8			29.7	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM Average Control Delay	45.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						0.95			0.95	
Frt		0.99						0.95			1.00	
Flt Protected		1.00						1.00			0.99	
Satd. Flow (prot)		5014						3375			3511	
Flt Permitted		1.00						1.00			0.90	
Satd. Flow (perm)		5014						3375			3170	
Volume (vph)	38	481	40	0	0	0	0	137	62	32	171	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	523	43	0	0	0	0	149	67	35	186	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	38	0	0	0	0
Lane Group Flow (vph)	0	593	0	0	0	0	0	178	0	0	221	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm									Perm		
Protected Phases		2						4			4	
Permitted Phases	2									4		
Actuated Green, G (s)		26.4						26.4			26.4	
Effective Green, g (s)		26.0						26.0			26.0	
Actuated g/C Ratio		0.43						0.43			0.43	
Clearance Time (s)		3.6						3.6			3.6	
Lane Grp Cap (vph)		2173						1463			1374	
v/s Ratio Prot								0.05				
v/s Ratio Perm		0.12									c0.07	
v/c Ratio		0.27						0.12			0.16	
Uniform Delay, d1		10.9						10.2			10.4	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.3						0.2			0.3	
Delay (s)		11.2						10.3			10.6	
Level of Service		B						B			B	
Approach Delay (s)		11.2			0.0			10.3			10.6	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3529		1805	3610	1615	1805	3466		1805	3504	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.48	1.00		0.61	1.00	
Satd. Flow (perm)	1805	3529		1805	3610	1615	915	3466		1160	3504	
Volume (vph)	39	504	88	82	784	86	92	153	55	12	147	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	548	96	89	852	93	100	166	60	13	160	39
RTOR Reduction (vph)	0	12	0	0	0	46	0	42	0	0	26	0
Lane Group Flow (vph)	42	632	0	89	852	47	100	184	0	13	173	0
Turn Type	Prot			Prot		Perm	pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8			4		
Actuated Green, G (s)	4.9	40.3		8.2	43.6	43.6	25.3	19.7		15.2	13.9	
Effective Green, g (s)	5.6	41.9		8.9	45.2	45.2	27.2	21.6		17.4	15.8	
Actuated g/C Ratio	0.06	0.47		0.10	0.50	0.50	0.30	0.24		0.19	0.18	
Clearance Time (s)	4.7	5.6		4.7	5.6	5.6	4.3	5.9		4.3	5.9	
Vehicle Extension (s)	2.5	4.8		2.5	4.8	4.8	2.5	4.8		2.5	4.8	
Lane Grp Cap (vph)	112	1643		178	1813	811	350	832		236	615	
v/s Ratio Prot	0.02	0.18		c0.05	c0.24		c0.02	0.05		0.00	0.05	
v/s Ratio Perm						0.03	c0.06			0.01		
v/c Ratio	0.38	0.38		0.50	0.47	0.06	0.29	0.22		0.06	0.28	
Uniform Delay, d1	40.5	15.7		38.4	14.6	11.5	23.3	27.5		29.5	32.2	
Progression Factor	1.47	0.50		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3		1.6	0.9	0.1	0.3	0.3		0.1	0.5	
Delay (s)	60.4	8.1		40.0	15.5	11.6	23.7	27.7		29.6	32.7	
Level of Service	E	A		D	B	B	C	C		C	C	
Approach Delay (s)		11.3			17.2			26.5			32.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.91						0.95		1.00	0.95	
Frt		0.97						0.96		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		4923						3390		1770	3539	
Flt Permitted		0.99						1.00		0.16	1.00	
Satd. Flow (perm)		4923						3390		299	3539	
Volume (vph)	69	473	118	0	0	0	0	500	195	158	628	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	514	128	0	0	0	0	543	212	172	683	0
RTOR Reduction (vph)	0	49	0	0	0	0	0	58	0	0	0	0
Lane Group Flow (vph)	0	668	0	0	0	0	0	697	0	172	683	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm									pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Actuated Green, G (s)		18.3						22.9		51.5	51.5	
Effective Green, g (s)		19.2						24.2		52.8	52.8	
Actuated g/C Ratio		0.24						0.30		0.66	0.66	
Clearance Time (s)		4.9						5.3		3.2	5.3	
Vehicle Extension (s)		4.8						4.8		2.5	4.8	
Lane Grp Cap (vph)		1182						1025		650	2336	
v/s Ratio Prot								c0.21		0.08	c0.19	
v/s Ratio Perm		0.14								0.09		
v/c Ratio		0.57						0.68		0.26	0.29	
Uniform Delay, d1		26.7						24.5		7.2	5.7	
Progression Factor		1.00						1.00		0.42	0.19	
Incremental Delay, d2		1.0						3.6		0.8	0.3	
Delay (s)		27.7						28.1		3.9	1.3	
Level of Service		C						C		A	A	
Approach Delay (s)		27.7			0.0			28.1			1.9	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3404		1805	3556		1805	3466		1805	3541	
Flt Permitted	0.22	1.00		0.13	1.00		0.19	1.00		0.19	1.00	
Satd. Flow (perm)	421	3404		253	3556		363	3466		362	3541	
Volume (vph)	73	499	186	103	645	48	205	602	132	93	643	61
Peak-hour factor, PHF	0.78	0.81	0.78	0.70	0.92	0.79	0.80	0.95	0.80	0.77	0.92	0.70
Adj. Flow (vph)	94	616	238	147	701	61	256	634	165	121	699	87
RTOR Reduction (vph)	0	43	0	0	7	0	0	26	0	0	11	0
Lane Group Flow (vph)	94	811	0	147	755	0	256	773	0	121	775	0
Confl. Peds. (#/hr)			41			23			27			10
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	35.1	27.6		40.1	30.1		36.6	28.8		36.0	28.5	
Effective Green, g (s)	34.2	27.5		39.2	30.0		37.6	30.6		37.0	30.3	
Actuated g/C Ratio	0.38	0.31		0.44	0.33		0.42	0.34		0.41	0.34	
Clearance Time (s)	3.2	3.9		3.2	3.9		3.2	5.8		3.2	5.8	
Vehicle Extension (s)	2.5	4.0		2.5	4.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	263	1040		269	1185		264	1178		256	1192	
v/s Ratio Prot	0.03	c0.24		c0.06	0.21		c0.08	0.22		0.04	0.22	
v/s Ratio Perm	0.11			0.18			c0.33			0.16		
v/c Ratio	0.36	0.78		0.55	0.64		0.97	0.66		0.47	0.65	
Uniform Delay, d1	19.0	28.5		18.2	25.4		22.4	25.2		18.0	25.4	
Progression Factor	1.00	1.00		1.00	1.00		1.15	1.09		1.00	1.00	
Incremental Delay, d2	0.6	5.8		1.8	2.6		39.5	2.2		1.0	2.8	
Delay (s)	19.6	34.3		20.0	28.0		65.1	29.7		19.0	28.1	
Level of Service	B	C		C	C		E	C		B	C	
Approach Delay (s)		32.8			26.7			38.3			26.9	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						0.95			0.95	
Frt		0.98						0.95			1.00	
Flt Protected		1.00						1.00			0.99	
Satd. Flow (prot)		4969						3367			3510	
Flt Permitted		1.00						1.00			0.85	
Satd. Flow (perm)		4969						3367			2992	
Volume (vph)	83	691	108	0	0	0	0	226	109	51	249	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	751	117	0	0	0	0	246	118	55	271	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	65	0	0	0	0
Lane Group Flow (vph)	0	935	0	0	0	0	0	299	0	0	326	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm									Perm		
Protected Phases		2						4			4	
Permitted Phases	2									4		
Actuated Green, G (s)		36.4						36.4			36.4	
Effective Green, g (s)		36.0						36.0			36.0	
Actuated g/C Ratio		0.45						0.45			0.45	
Clearance Time (s)		3.6						3.6			3.6	
Lane Grp Cap (vph)		2236						1515			1346	
v/s Ratio Prot								0.09				
v/s Ratio Perm		0.19									c0.11	
v/c Ratio		0.42						0.20			0.24	
Uniform Delay, d1		14.9						13.3			13.6	
Progression Factor		1.44						1.00			0.06	
Incremental Delay, d2		0.5						0.3			0.4	
Delay (s)		22.0						13.6			1.2	
Level of Service		C						B			A	
Approach Delay (s)		22.0			0.0			13.6			1.2	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3545		1805	3610	1615	1805	3392		1805	3500	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.41	1.00		0.43	1.00	
Satd. Flow (perm)	1805	3545		1805	3610	1615	783	3392		819	3500	
Volume (vph)	50	566	77	106	618	118	99	219	147	53	271	69
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	615	84	115	672	128	108	238	160	58	295	75
RTOR Reduction (vph)	0	12	0	0	0	70	0	121	0	0	31	0
Lane Group Flow (vph)	54	687	0	115	672	58	108	277	0	58	339	0
Turn Type	Prot			Prot		Perm	pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8			4		
Actuated Green, G (s)	4.8	31.6		7.8	34.6	34.6	21.0	17.5		19.2	16.6	
Effective Green, g (s)	5.5	33.2		8.5	36.2	36.2	23.2	19.4		21.4	18.5	
Actuated g/C Ratio	0.07	0.42		0.11	0.45	0.45	0.29	0.24		0.27	0.23	
Clearance Time (s)	4.7	5.6		4.7	5.6	5.6	4.3	5.9		4.3	5.9	
Vehicle Extension (s)	2.5	4.8		2.5	4.8	4.8	2.5	4.8		2.5	4.8	
Lane Grp Cap (vph)	124	1471		192	1634	731	276	823		255	809	
v/s Ratio Prot	0.03	c0.19		c0.06	c0.19		c0.02	0.08		0.01	c0.10	
v/s Ratio Perm						0.04	0.10			0.05		
v/c Ratio	0.44	0.47		0.60	0.41	0.08	0.39	0.34		0.23	0.42	
Uniform Delay, d1	35.8	17.0		34.1	14.7	12.4	21.6	25.0		22.2	26.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	1.1		4.2	0.8	0.2	0.7	0.5		0.3	0.7	
Delay (s)	37.5	18.1		38.3	15.5	12.6	22.2	25.5		22.6	26.9	
Level of Service	D	B		D	B	B	C	C		C	C	
Approach Delay (s)		19.4			18.0			24.8			26.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.91						0.95		1.00	0.95	
Frt		0.98						0.97		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		4986						3445		1770	3539	
Flt Permitted		1.00						1.00		0.20	1.00	
Satd. Flow (perm)		4986						3445		375	3539	
Volume (vph)	20	358	49	0	0	0	0	474	102	146	798	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	389	53	0	0	0	0	515	111	159	867	0
RTOR Reduction (vph)	0	24	0	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	0	440	0	0	0	0	0	601	0	159	867	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm									pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Actuated Green, G (s)		13.8						20.2		56.0	56.0	
Effective Green, g (s)		14.7						21.5		57.3	57.3	
Actuated g/C Ratio		0.18						0.27		0.72	0.72	
Clearance Time (s)		4.9						5.3		3.2	5.3	
Vehicle Extension (s)		4.8						4.8		2.5	4.8	
Lane Grp Cap (vph)		916						926		823	2535	
v/s Ratio Prot								c0.17		0.08	c0.24	
v/s Ratio Perm		0.09								0.06		
v/c Ratio		0.48						0.65		0.19	0.34	
Uniform Delay, d1		29.2						25.9		4.9	4.3	
Progression Factor		1.00						1.00		1.13	0.30	
Incremental Delay, d2		0.8						3.5		0.5	0.3	
Delay (s)		30.0						29.4		6.0	1.6	
Level of Service		C						C		A	A	
Approach Delay (s)		30.0			0.0			29.4			2.3	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.96		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3260		1805	3570		1805	3517		1805	3579	
Flt Permitted	0.20	1.00		0.13	1.00		0.13	1.00		0.31	1.00	
Satd. Flow (perm)	374	3260		241	3570		243	3517		586	3579	
Volume (vph)	31	507	354	113	766	39	229	528	61	72	782	26
Peak-hour factor, PHF	0.78	0.81	0.78	0.70	0.92	0.79	0.80	0.95	0.80	0.77	0.92	0.70
Adj. Flow (vph)	40	626	454	161	833	49	286	556	76	94	850	37
RTOR Reduction (vph)	0	140	0	0	4	0	0	12	0	0	3	0
Lane Group Flow (vph)	40	940	0	161	878	0	286	620	0	94	884	0
Confl. Peds. (#/hr)			67			37			45			42
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	33.0	27.6		41.4	32.8		37.5	29.7		33.9	27.9	
Effective Green, g (s)	32.1	27.5		41.3	32.7		38.5	31.5		34.9	29.7	
Actuated g/C Ratio	0.36	0.31		0.46	0.36		0.43	0.35		0.39	0.33	
Clearance Time (s)	3.2	3.9		3.2	3.9		3.2	5.8		3.2	5.8	
Vehicle Extension (s)	2.5	4.0		2.5	4.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	207	996		281	1297		225	1231		298	1181	
v/s Ratio Prot	0.01	c0.29		c0.06	0.25		c0.10	0.18		0.02	0.25	
v/s Ratio Perm	0.06			0.20			c0.44			0.10		
v/c Ratio	0.19	0.94		0.57	0.68		1.27	0.50		0.32	0.75	
Uniform Delay, d1	19.7	30.5		19.4	24.2		20.8	23.1		18.1	26.8	
Progression Factor	1.00	1.00		1.89	1.44		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	17.9		2.2	2.7		152.1	1.5		0.4	4.4	
Delay (s)	20.1	48.4		38.7	37.5		172.9	24.6		18.6	31.2	
Level of Service	C	D		D	D		F	C		B	C	
Approach Delay (s)		47.4			37.7			70.8			30.0	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM Average Control Delay	46.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						0.95			0.95	
Frt		0.99						0.95			1.00	
Flt Protected		1.00						1.00			0.99	
Satd. Flow (prot)		5014						3367			3512	
Flt Permitted		1.00						1.00			0.90	
Satd. Flow (perm)		5014						3367			3170	
Volume (vph)	38	481	40	0	0	0	0	140	67	32	176	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	523	43	0	0	0	0	152	73	35	191	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	41	0	0	0	0
Lane Group Flow (vph)	0	593	0	0	0	0	0	184	0	0	226	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm									Perm		
Protected Phases		2						4			4	
Permitted Phases	2									4		
Actuated Green, G (s)		26.4						26.4			26.4	
Effective Green, g (s)		26.0						26.0			26.0	
Actuated g/C Ratio		0.43						0.43			0.43	
Clearance Time (s)		3.6						3.6			3.6	
Lane Grp Cap (vph)		2173						1459			1374	
v/s Ratio Prot								0.05				
v/s Ratio Perm		0.12									c0.07	
v/c Ratio		0.27						0.13			0.16	
Uniform Delay, d1		10.9						10.2			10.4	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.3						0.2			0.3	
Delay (s)		11.2						10.4			10.6	
Level of Service		B						B			B	
Approach Delay (s)		11.2			0.0			10.4			10.6	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3529		1805	3610	1615	1805	3468		1805	3505	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.48	1.00		0.61	1.00	
Satd. Flow (perm)	1805	3529		1805	3610	1615	910	3468		1158	3505	
Volume (vph)	39	504	88	82	784	88	92	155	55	15	150	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	548	96	89	852	96	100	168	60	16	163	39
RTOR Reduction (vph)	0	12	0	0	0	48	0	42	0	0	26	0
Lane Group Flow (vph)	42	632	0	89	852	48	100	186	0	16	176	0
Turn Type	Prot			Prot		Perm	pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8			4		
Actuated Green, G (s)	4.9	40.2		8.2	43.5	43.5	25.4	19.8		15.3	14.0	
Effective Green, g (s)	5.6	41.8		8.9	45.1	45.1	27.3	21.7		17.5	15.9	
Actuated g/C Ratio	0.06	0.46		0.10	0.50	0.50	0.30	0.24		0.19	0.18	
Clearance Time (s)	4.7	5.6		4.7	5.6	5.6	4.3	5.9		4.3	5.9	
Vehicle Extension (s)	2.5	4.8		2.5	4.8	4.8	2.5	4.8		2.5	4.8	
Lane Grp Cap (vph)	112	1639		178	1809	809	350	836		237	619	
v/s Ratio Prot	0.02	0.18		c0.05	c0.24		c0.02	0.05		0.00	0.05	
v/s Ratio Perm						0.03	c0.06			0.01		
v/c Ratio	0.38	0.39		0.50	0.47	0.06	0.29	0.22		0.07	0.28	
Uniform Delay, d1	40.5	15.7		38.4	14.7	11.5	23.3	27.4		29.5	32.1	
Progression Factor	1.47	0.50		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3		1.6	0.9	0.1	0.3	0.3		0.1	0.5	
Delay (s)	60.1	8.2		40.0	15.5	11.7	23.6	27.7		29.6	32.6	
Level of Service	E	A		D	B	B	C	C		C	C	
Approach Delay (s)		11.4			17.3			26.4			32.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.91						0.95		1.00	0.95	
Frt		0.97						0.96		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		4919						3392		1770	3539	
Flt Permitted		0.99						1.00		0.16	1.00	
Satd. Flow (perm)		4919						3392		296	3539	
Volume (vph)	69	473	122	0	0	0	0	509	195	158	637	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	514	133	0	0	0	0	553	212	172	692	0
RTOR Reduction (vph)	0	52	0	0	0	0	0	56	0	0	0	0
Lane Group Flow (vph)	0	670	0	0	0	0	0	710	0	172	692	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm									pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Actuated Green, G (s)		18.3						23.2		51.5	51.5	
Effective Green, g (s)		19.2						24.5		52.8	52.8	
Actuated g/C Ratio		0.24						0.31		0.66	0.66	
Clearance Time (s)		4.9						5.3		3.2	5.3	
Vehicle Extension (s)		4.8						4.8		2.5	4.8	
Lane Grp Cap (vph)		1181						1039		643	2336	
v/s Ratio Prot								c0.21		0.08	c0.20	
v/s Ratio Perm		0.14								0.10		
v/c Ratio		0.57						0.68		0.27	0.30	
Uniform Delay, d1		26.7						24.3		7.3	5.7	
Progression Factor		1.00						1.00		0.76	0.23	
Incremental Delay, d2		1.0						3.6		0.9	0.3	
Delay (s)		27.7						28.0		6.4	1.6	
Level of Service		C						C		A	A	
Approach Delay (s)		27.7			0.0			28.0			2.6	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3404		1805	3556		1805	3467		1805	3539	
Flt Permitted	0.22	1.00		0.13	1.00		0.19	1.00		0.19	1.00	
Satd. Flow (perm)	419	3404		254	3556		355	3467		357	3539	
Volume (vph)	77	499	186	103	645	48	205	608	132	93	648	64
Peak-hour factor, PHF	0.78	0.81	0.78	0.70	0.92	0.79	0.80	0.95	0.80	0.77	0.92	0.70
Adj. Flow (vph)	99	616	238	147	701	61	256	640	165	121	704	91
RTOR Reduction (vph)	0	43	0	0	7	0	0	26	0	0	11	0
Lane Group Flow (vph)	99	811	0	147	755	0	256	779	0	121	784	0
Confl. Peds. (#/hr)			41			23			27			10
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	35.0	27.5		40.0	30.0		36.7	28.9		36.1	28.6	
Effective Green, g (s)	34.1	27.4		39.1	29.9		37.7	30.7		37.1	30.4	
Actuated g/C Ratio	0.38	0.30		0.43	0.33		0.42	0.34		0.41	0.34	
Clearance Time (s)	3.2	3.9		3.2	3.9		3.2	5.8		3.2	5.8	
Vehicle Extension (s)	2.5	4.0		2.5	4.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	262	1036		269	1181		261	1183		255	1195	
v/s Ratio Prot	0.03	c0.24		c0.06	0.21		c0.08	0.22		0.04	0.22	
v/s Ratio Perm	0.11			0.18			c0.33			0.16		
v/c Ratio	0.38	0.78		0.55	0.64		0.98	0.66		0.47	0.66	
Uniform Delay, d1	19.1	28.6		18.3	25.5		22.4	25.2		18.0	25.4	
Progression Factor	1.00	1.00		1.00	1.00		1.15	1.09		1.00	1.00	
Incremental Delay, d2	0.7	5.9		1.8	2.7		43.1	2.2		1.0	2.8	
Delay (s)	19.8	34.5		20.1	28.1		68.8	29.7		19.0	28.2	
Level of Service	B	C		C	C		E	C		B	C	
Approach Delay (s)		33.0			26.8			39.1			27.0	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						0.95			0.95	
Frt		0.98						0.95			1.00	
Flt Protected		1.00						1.00			0.99	
Satd. Flow (prot)		4969						3363			3511	
Flt Permitted		1.00						1.00			0.85	
Satd. Flow (perm)		4969						3363			2996	
Volume (vph)	83	691	108	0	0	0	0	229	114	51	260	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	751	117	0	0	0	0	249	124	55	283	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	66	0	0	0	0
Lane Group Flow (vph)	0	935	0	0	0	0	0	307	0	0	338	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm									Perm		
Protected Phases		2						4			4	
Permitted Phases	2									4		
Actuated Green, G (s)		36.4						36.4			36.4	
Effective Green, g (s)		36.0						36.0			36.0	
Actuated g/C Ratio		0.45						0.45			0.45	
Clearance Time (s)		3.6						3.6			3.6	
Lane Grp Cap (vph)		2236						1513			1348	
v/s Ratio Prot								0.09				
v/s Ratio Perm		0.19									c0.11	
v/c Ratio		0.42						0.20			0.25	
Uniform Delay, d1		14.9						13.3			13.6	
Progression Factor		1.44						1.00			0.06	
Incremental Delay, d2		0.5						0.3			0.4	
Delay (s)		22.0						13.6			1.2	
Level of Service		C						B			A	
Approach Delay (s)		22.0			0.0			13.6			1.2	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↑↱		↰	↑↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3545		1805	3610	1615	1805	3394		1805	3501	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.42	1.00		0.39	1.00	
Satd. Flow (perm)	1805	3545		1805	3610	1615	804	3394		746	3501	
Volume (vph)	50	566	77	106	618	122	99	223	147	56	274	69
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	615	84	115	672	133	108	242	160	61	298	75
RTOR Reduction (vph)	0	12	0	0	0	72	0	124	0	0	31	0
Lane Group Flow (vph)	54	688	0	115	672	61	108	278	0	61	342	0
Turn Type	Prot			Prot		Perm	pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8			4		
Actuated Green, G (s)	4.7	32.4		7.6	35.3	35.3	19.5	16.0		19.5	16.0	
Effective Green, g (s)	5.4	34.0		8.3	36.9	36.9	21.7	17.9		21.7	17.9	
Actuated g/C Ratio	0.07	0.42		0.10	0.46	0.46	0.27	0.22		0.27	0.22	
Clearance Time (s)	4.7	5.6		4.7	5.6	5.6	4.3	5.9		4.3	5.9	
Vehicle Extension (s)	2.5	4.8		2.5	4.8	4.8	2.5	4.8		2.5	4.8	
Lane Grp Cap (vph)	122	1507		187	1665	745	266	759		253	783	
v/s Ratio Prot	0.03	c0.19		c0.06	c0.19		c0.02	0.08		0.01	c0.10	
v/s Ratio Perm						0.04	0.09			0.05		
v/c Ratio	0.44	0.46		0.61	0.40	0.08	0.41	0.37		0.24	0.44	
Uniform Delay, d1	35.9	16.4		34.3	14.3	12.1	22.7	26.3		22.1	26.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.0		5.0	0.7	0.2	0.7	0.6		0.4	0.8	
Delay (s)	37.7	17.4		39.4	15.0	12.3	23.4	26.8		22.5	27.5	
Level of Service	D	B		D	B	B	C	C		C	C	
Approach Delay (s)		18.9			17.7			26.1			26.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix:
PEQI Calculation Sheet

City of Pasadena
Department of Transportation
Pedestrian Environmental Quality Index
Calculation Summary
-- Segment --

Segment: Dayton Street
Limits: Between Fair Oaks Ave and Raymond Ave

Indicator Category		Score Weight	Indicator Response	Eastbound (South side) Surveyed Response Category Score	Indicator Response	Westbound (North side) Surveyed Response Category Score
Traffic						
	Number of Lanes	0.64	1	13	1	13
	Posted Speed Limit	0.64	25 mph or none posted	4	25 mph or none posted	4
	Traffic Volume[1]	0.64	1,000-6,000 V/D	11	1,000-6,000 V/D	11
	Street Traffic Calming Features (TCFs)	0.64	None	0	None	0
				28		**28**
Street design						
	Width of Sidewalk	1.35	8-12 ft	20	8-12 ft	20
	Width of Throughway	1.35	4-6 ft	13	4-6 ft	13
	Large SW Obstructions	1.35	None	22	None	22
	Sidewalk Impediments	1.35	None	24	None	24
	Trees	1.35	Sporadic	7	Sporadic	7
	Driveway Cuts	1.35	None	15	1 to 5	7
	Presence of Buffer	1.35	Parallel parking	11	Parallel parking	11
	Planters/Gardens	1.35	Yes	4	Yes	4
	Public Seating	1.35	No	0	No	0
				116		**108**
Land Use						
	Public Art/ Historic Sites	0.15	Yes	4	Yes	4
	Retail Use/Public Places	0.15	3 or more	11	None	0
				15		**4**
Perceived Safety						
	Lighting	0.34	Continuous	17	Continuous	17
	Illegal Graffiti	0.34	No	2	No	2
	Litter	0.34	No	11	No	11
	Empty Spaces	0.34	No	4	No	4
				34		**34**
Domain Summary		Score Weight		Category Score		Category Score
	Traffic	0.64	Traffic	28	Traffic	28
	Street Design	1.35	Street Design	116	Street Design	108
	Land Use	0.15	Land Use	15	Land Use	4
	Safety	0.34	Safety	34	Safety	34
		2.48		193		174
				PEQI Score **78** Eastbound (South side)		PEQI Score **70** Westbound (North side)

[1] Traffic volumes are based on segment volumes, not directional traffic volumes.

Appendix:
BEQI Calculation Sheet

City of Pasadena
Department of Transportation
Bicycle Environmental Quality Index
Calculation Summary

Segment: Dayton Street
Limits: Between Fair Oaks Ave and Raymond Ave

	Indicator Category	Score Weight	Indicator Response	Eastbound (South side) Surveyed Response Category Score	Indicator Response	Westbound (North side) Surveyed Response Category Score
Street design						
	Presence of a Marked Area for Bicycle Traffic	2.05	None	4	None	4
	Width of Bike Lane	2.05	None	0	None	0
	Bicycle Lane Markings	2.05	None	4	None	4
	Connectivity of Bicycle Lanes	2.05	No	13	No	13
	Pavement Type/Condition	2.05	Smooth Surface	40	Smooth Surface	40
	Street Slope	2.05	< 5%	27	< 5%	27
	Driveway Cuts	2.05	None	27	Few (Less than Five)	16
	Presence of Trees	2.05	Sporadically Lined	22	Sporadically Lined	22
				137		**126**
Vehicle Traffic						
	Posted Speed Limit	1.39	25	29	25	29
	Traffic Volume - Avg # of Vehicles Per Day	1.39	1,000 - 5,000	19	1,000 - 5,000	19
	Percentage of Heavy Vehicles	1.39	Less than 5%	36	Less than 5%	36
	Parallel Parking Adjacent to Bicycle Lane/Route	1.39	Time-restricted Parallel Parking (TPP) < 7 ft	19	Time-restricted Parallel Parking (TPP) < 7 ft	19
	Traffic Calming Features Streets	1.39	0 TCF	11	0 TCF	11
	Number of Lanes	1.39	1	36	1	36
				150		**150**
Safety/Other						
	Presence of Bicycle Lane Signs	0.42	No	15	No	15
	Bicycle/Pedestrian Scale Lighting	0.42	Yes - Public	36	Yes - Public	36
				51		**51**
Land Use						
	Bicycle Parking	0.66	No	12	No	12
	Retail Use	0.66	3 or More	22	0	14
	Line of Site	0.66	Clear Line of Sight	36	Clear Line of Sight	36
				70		**62**

Domain Summary		Score Weight	Min Score	Category Score	Min Score	Category Score
	Street design	2.05	62	137	62	126
	Vehicle Traffic	1.39	59	150	59	150
	Safety/Other	0.42	30	51	30	51
	Land Use	0.66	33	70	33	62
		4.52	184	408	184	389

BEQI Score [1] **50** Eastbound (South side)

BEQI Score [1] **45** Westbound (North side)

[1] BEQI calculation did not consider intersection indicators.