ZINNER consultants

To: City of Los Angeles Department of City Planning
CC: Jim Suhr

From: John Zinner, Greg Collins

Date: July 8, 2020

Subject: CEQA SCPE Energy and Water Efficiency Compliance for 905 Beacon

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The purpose of this memo is to describe how 905 Beacon, proposed by DHA Investment Co., LLC, will meet the Sustainable Communities Project CEQA Exemption (SCPE) criteria regarding energy and water efficiency (Public Resources Code Section 21155.1(a)(8)). 905 Beacon is a 7-story mixed-use project, of which 5 are habitable, with 145 residential units and 2,400 SF of commercial space.

The Subsection (a) (8) requirement:

> The buildings in the transit priority project are 15 percent more energy efficient than required by Chapter 6 of Title 24 of the California Code of Regulations and the buildings and landscaping are designed to achieve 25 percent less water usage than the average household use in the region.

The energy and water efficiency compliance strategies are separately described below. Each of the three sites complies with both requirements, as follows:

- Energy Use: **15.7%** less than allowed by Title 24, Part 6 2019
- Water Use: **63.3%** below the MWD baseline

ENERGY EFFICIENCY

Regulatory Framework

Subsection (a) (8) requires that a project be 15 percent more energy efficient than required by Title 24, Part 6, the California Energy Code (*note:* it's officially *Part* 6 of the California Code of Regulations, not *Chapter* 6 as it's titled in the CEQA language).

Title 24 is updated, typically every three years. Title 24 2019 has been approved and took effect January 1, 2017. Projects will need to comply under the Title 24 version in effect when filing a building permit application.

Title 24, Part 6 provides two compliance paths:

1. The *Prescriptive Path*, under which projects must implement a specified list of strategies.

2. The *Performance Path*, under which projects use California Energy Commission-approved energy modeling software to demonstrate that projects meet the required level of energy performance (typically stated in kBTUs/square foot/year). Under the Performance Path, project teams can utilize any energy efficiency strategy as long as the required energy performance level is met.

To enable the Building Official to readily confirm compliance with the Subsection (a) (8) requirement of 15 percent more efficient than Title 24, Part 6, the project must use the Performance Path.

Energy Modeling Process

Preliminary whole building energy modeling was conducted to determine the anticipated Title 24 energy code performance. The following sections provide greater detail into the energy modeling process, the necessary design measures, and the resulting performance.

The preliminary energy modeling was done using one of the software tools approved by the California Energy Commission for Title 24 compliance. Because a full compliance model requires a level of detail and design complexity not yet available for this project, we utilized the software in non-compliance mode to generate proposed and Title 24 baseline models to compare energy performance of the current design concepts.

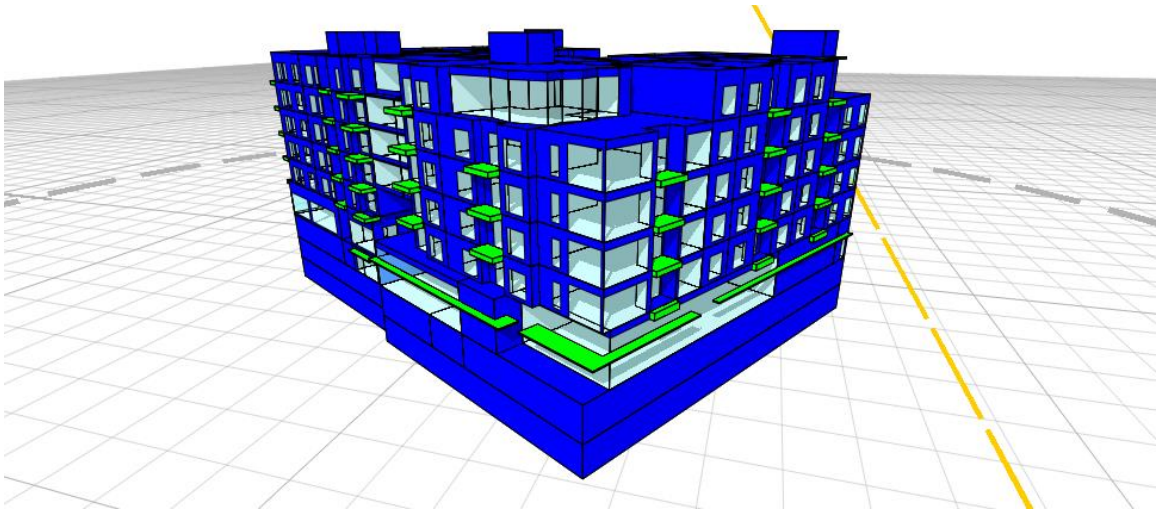

Figure 1. Renderings of the preliminary energy models from IES Virtual Environment

Energy Efficiency Measures

The energy efficiency measures used in the design and analysis of the project are summarized in this section. The measures are organized into categories (building envelope, lighting, HVAC, domestic water heating and renewables). To see more detailed inputs for the proposed and Title 24 baseline models, refer to Appendix A.

Building Envelope

1. **Exterior walls with R-21 batt insulation:** This high density insulation provides a greater R-value than that of typically used insulation products which improves insulation and, hence, reduces heating and cooling energy use.
2. **Wood-framed roofs with R-38 batt insulation:** The thickness of the proposed insulation also increases the R-value, reducing heating and cooling energy use.
3. **High-reflectance roofing rated by the Cool Roof Rating Council:** A "cool roof" reflects additional solar heat, which reduces cooling energy in cooling-dominated climates like Southern California.
4. **Overhanging balconies for solar shading:** Projecting balconies provide shading for windows that keep solar heat out, which reduces cooling energy use. Another benefit is reduced glare, which makes the space more comfortable.
5. **High-performance windows with dual-paned low-emissivity glazing:** Dual-paned windows provide additional insulation over single-paned windows, while high performance, low-emissivity coatings help to let in mostly visible light while blocking other light that brings in heat without adding another purpose. These combined effects reduce cooling energy during the summer and heating during the winter.

Lighting

1. **Optimized façade to capitalize on natural daylight first:** Optimizing the façade is a means of balancing the amount of windows. Windows let in natural daylight, which allows electric lights to be turned off, but they also bring in additional heating and cooling when compared to an insulated wall. The result is a building that provides ample daylighting while not being excessive, decreasing overall lighting, heating and cooling energy use.

2. **High-efficacy, LED lamp types for common areas:** High-efficacy LED fixtures provide more lumens (light output) per watt (electric input) than other lamps like fluorescent or incandescent.
3. **Daylighting controls for all indoor, nonresidential spaces:** Also known as "daylight harvesting," these controls sense the amount of natural daylight entering a space to automatically dim the electric lights, saving energy while maintaining light levels.
4. **Occupancy controls with dimming for most common area lighting:** Occupancy controls sense when spaces are vacant for a period of time and automatically turn off lights, saving energy as compared to leaving them on.

HVAC System

1. **High-efficiency 19 SEER split system heat pumps for heating, ventilating and air-conditioning (HVAC):** Split system heat pumps have one outdoor unit connected to one indoor fan coil unit (FCU). Seasonal energy efficiency ratio (SEER) represents the "average" efficiency of HVAC equipment. By increasing this value over typical code-minimum efficiencies, the equipment provides the same amount of heating and cooling while using less electricity to operate it. Providing individual systems for each apartment allows the system to be powered from the tenant's electric meter, which tends to encourage more responsible use and lower energy consumption.

Domestic Water Heating

1. **Centralized hot water system:** Centralized water heating systems are larger and use more efficient equipment than individual heating within the units (condensing water heaters are around 95% efficient). They have recirculation controls to keep water in the lines hot, which reduces waste. They also make it easier to integrate into renewable energy systems like solar hot water.
2. **High-efficiency water fixtures:** Using more efficient fixtures inherently uses less hot water, which reduces energy used for water heating (while also saving potable water). This is not considered in the energy model, but it certainly an added sustainability measure.

Renewables

1. **Solar hot water:** Roof-mounted solar collectors capture the sun's renewable energy and use it to pre-heat domestic hot water. This reduces the amount of gas consumption at the water heater(s) and, hence, saves energy and emissions.

Energy Model Results

Energy modeling resulted in a preliminary design that anticipates using **15.7% less energy than the Title 24-2019** energy code requirements. Refer to the table and figure below to see additional details about the result by each energy end-use at this stage.

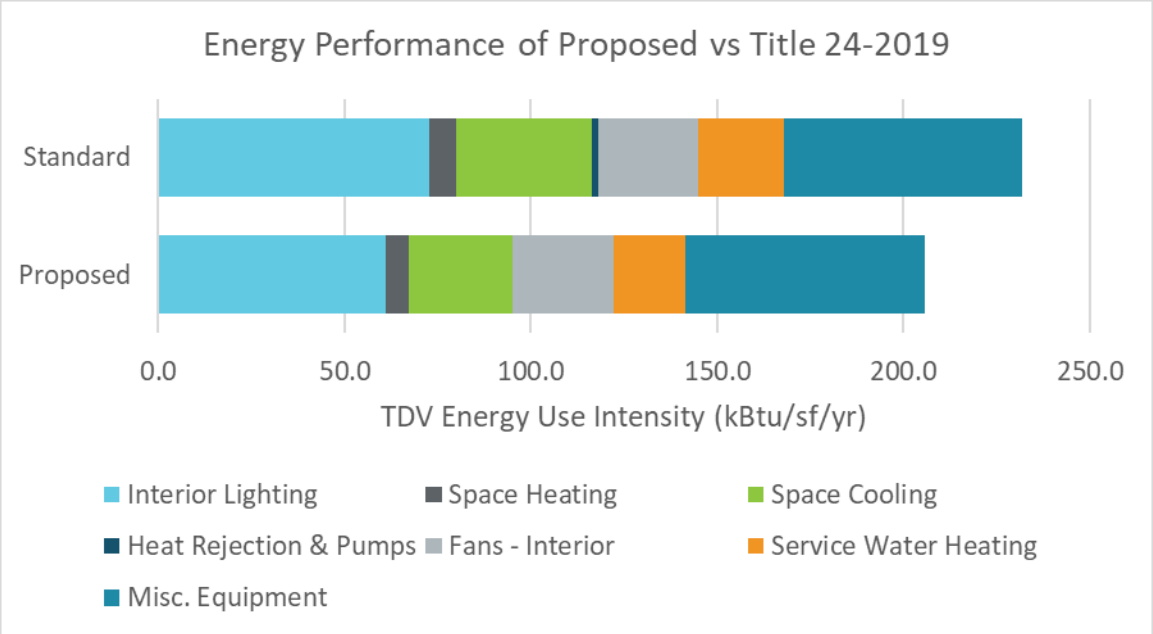

Figure 2. Energy Performance of Proposed Design Compared with the Title 24-2019 Baseline

Table 1. Energy Use Intensity (EUI) for Each Model by End-Use (kBtu/sf/yr)

Energy End-Use	Notes	Proposed	Standard	Margin
Interior Lighting	1	61.2	72.8	11.6
Space Heating	2	6.1	7.0	0.8
Space Cooling	2	27.8	36.6	8.8
Heat Rejection & Pumps	2	0.0	1.6	1.6
Fans - Interior	2	27.1	27.0	-0.1
Service Water Heating	3	19.2	22.8	3.6
Misc. Equipment	4	64.1	64.1	0.0
Compliance Total	5	**141.4**	**167.8**	**26.3**
Savings	6		**15.7%**	

Notes:
1. Corresponds to "lighting" energy category in EEMs section.
2. Corresponds to "building envelope" and "HVAC system" energy categories.
3. Corresponds to "domestic water heating" energy category.
4. Does not correspond with any EEMs as it is unregulated "process" energy.
5. Compliance total excludes misc equipment loads in alignment with Standards.
6. Percent savings determined by dividing total margin by total baseline energy.

WATER EFFICIENCY

Regulatory Framework

The Subsection (a) (8) water efficiency requirement is that each project must achieve a 25 percent water use reduction from the *regional average household water use*.

For residential and mixed-use, residential/commercial buildings, the baseline is the average regional water use in Gallons Per Capita Per Day of 131 gallons as stated in the Metropolitan Water District *Water Tomorrow Annual Report to the California State Legislature, Covering Fiscal Year 2018/19* (p. 29). It is available at: http://www.mwdh2o.com/PDF_In_The_Community/3.1_1.2_Regional_Progress_Report.pdf.

This is multiplied by 2.42, the assumed residential occupancy, based on the most recent census data and utilized for environmental analysis for by the City of Los Angeles all multi-family residential units, to determine the average daily water use per residential unit.

The projected water use for the building assumes the maximum fixture flow rates allowed under the City of Los Angeles Green Building Code for residential and nonresidential uses. Other elements are calculated using accepted industry practice. The fixture flow rates are as follows:

1. **Showerheads:** 1.8 gpm (gallons per minute)
2. **Lavatory faucets:** 1.2 gpm (residential), 0.4 gpm (nonresidential)
3. **Kitchen faucets:** 1.5 gpm
4. **Tank water closets (toilets):** 1.28 gpf (gallon per flush)
5. **Urinals:** 0.125 gpf
6. **Clothes washers:**, Energy Star certified, 3.2 WF (water factor)
7. **Dishwashers:** Energy Star certified, 4 GPC (gallons per cycle)

Projected Savings

The *Water Use Analysis* for the project, which is included in Appendix B, calculates both the baseline and projected water use and then the percentage savings. The projected water usage of the commercial space is included in the total water use per unit per day total. The projected water use is based on compliance with the City of Los Angeles Green Building Code, which includes water efficiency measures designed to reduce water use. These water efficiency measures would sufficiently reduce water use to meet the 25% threshold; no additional water reduction measures would be necessary.

The water use reduction is from 317.1 (baseline per unit) to 116.5 gpd (projected per unit). **The projected water use savings is 63.3%.**

APPENDIX A: ENERGY MODEL INPUTS

This section provides information on the detailed information that was specified in the energy models. The tables include:

- **Characteristics of Fenestration** – Describes the window framing and glazing properties used for the proposed design as well as for the Title 24-2019 Standard building model.
- **Characteristics of Opaque Constructions** – Describes the roof, wall and floor construction types for the proposed design as well as for the Title 24-2019 Standard building model.
- **Characteristics of HVAC and DHW Systems** – Describes the heating, ventilation and air-conditioning (HVAC) and domestic hot water (DHW) systems in the proposed design model as well as for the Title 24-2019 Standard building model.

Each table lists both the characteristics of the proposed design and that of the Title 24 Standard building so that they can be compared against one another. For example, the proposed roof has a better U-factor than the Title 24 model, which means the proposed roof will provide more insulating value and, hence, lower heat loss in the winter and heat gain in the summer.

Table 2. Characteristics of HVAC and DHW Systems

System Type	Proposed Design	Title 24-2019 (High-rise Residential)
HVAC System (Residential Units)		
Type	High efficiency air-cooled split system heat pumps	System 1 - Single zone AC (constant volume, cycling)
Efficiency	Cooling: 19.0 SEER Heating: 10.0 HSPF	Cooling: per T24-2019, Table 110.2-B by auto-sized capacity Heating: 80% furnace
Fan Power	0.22 W/cfm	0.35 W/cfm per T24
HVAC System (Nonres Spaces)		
Type	High efficiency packaged single-zone heat pumps with VAV fans	System 5 - Packaged VAV system
Efficiency	Cooling/heating: per T24-2019, Table 110.2-B by auto-sized capacity	Cooling: per T24-2019, Table 110.2-B by auto-sized capacity Heating: boiler plant with 80% efficiency
Fan Power	~0.5 W/cfm	~1.0 W/cfm per T24
DHW System		
Type	Centralized condensing natural gas boilers w/ recirculation	Centralized natural gas boilers w/ recirculation.
Efficiency	95%	80%
Solar Fraction	20%	20%

Table 3. Characteristics of Opaque Constructions

Building Component	Proposed Design	Title 24-2019 High-rise Residential | CZ 09
Roof		
Description	Wood framed rafter roof w/ R-38 batt insulation; CRRC-certified cool roofing	Insulation entirely above deck; R-34.93 continuous insulation
U-Factor	0.028	0.028
Aged Solar Reflectance	0.70	0.63
Thermal Emittance	0.75	0.85
Solar Reflectance Index (SRI)	82	-
Exterior Wall - Levels 1-2		
Description	2x6 Metal-framed, 16" o.c. w/ R-21 batt insulation in cavity + R-5 continuous insulation	Steel-framed wall; R-11 batt + R-10 continuous insulation
U-Factor	0.094	0.069
Exterior Wall - Levels 3+		
Description	2x6 Wood-framed, 16" o.c. w/ R-21 batt insulation in cavity	Steel-framed wall; R-11 batt + R-10 continuous insulation
U-Factor	0.069	0.069
Below-grade Wall		
Description	12" concrete wall; uninsulated	Below-grade mass wall
C-Factor	C-1.14	C-1.14
Exterior Raised Floor		
Description	Wood framed floor w/ R-19 batt insulation between framing	Metal-framed / Other
U-Factor	0.037	0.039
Exterior Floor Over Garage		
Description	Concrete slab; uninsulated	Metal-framed / Other type; R-10.91 continuous insulation
U-Factor	0.269	0.071
Slab-on-Grade Floor		
Description	Concrete (mass) floor; uninsulated	Slab floor
F-Factor	F-0.730	F-0.730

Table 4. Characteristics of Fenestration

Building Component	Proposed Design	Title 24-2019 High-rise Residential | CZ 09
Windows - Residential		
Glazing Description	Double paned, low-e	Fixed Window
Framing Description	NFRC-rated framing system	-
Assembly U-Factor	0.36	0.36
SHGC	0.25	0.25
Windows - Storefront (Nonresidential)		
Glazing Description	Double paned, low-e	Curtainwall/Storefront (Nonres)
Framing Description	NFRC-rated framing system	-
Assembly U-Factor	0.41	0.41
SHGC	0.26	0.26

APPENDIX B. WATER CALCULATION INPUTS

905 Beacon

Water Use Analysis

Fixture Type	Flow Rate[1] (gpm or gpf)		Duration (min or # flush)		Daily Uses		Occupants	=	Gallons Per Day
Residential Water Use									
Showerheads residential	1.8	x	8	x	1	x	351	=	5,054.4
Lavatory faucets residential	1.2	x	0.25	x	5	x	351	=	526.5
Kitchen faucets	1.5	x	4	x	1	x	351	=	2,106.0
Tank water closets (M)	1.28	x	1	x	5	x	176	=	1,126.4
Tank water closets (F)	1.28	x	1	x	5	x	176	=	1,126.4
Clotheswashers (gal/person-day)[2]	15.1						351	=	5,300.1
Dishwashers (gal/person-day)[3]	0.7						351	=	245.7
Nonresidential Water Use									
Lavatory faucets nonresidential	0.5	x	0.25	x	3	x	58	=	21.8
Water closets - nonresidential (F)	1.28	x	1	x	3	x	58	=	222.7
Water closets - nonresidential (M)	1.28	x	1	x	1	x	29	=	37.1
Urinals	0.125	x	1	x	2	x	29	=	7.3
Restaurant kitchen(s)[4]									625.2
Common showerhead for cyclists[5]	1.8	x	8	x	1	x	2	=	28.8
Potable Water Irrigation (daily)[6]								=	375.0
Pool Loss[7]								=	81.8
Total Daily Baseline Water Use (BWU) in Gallons Per Day								=	**16,885.1**
Average Water Use per Household per Day = 16,885.1 gpd/145 units								=	**116.5**

Current Water Use per Multi-Family Household (MWD 2018/19 Water Tomorrow Annual Report Gallons Per Capita Per Day of 131 x census estimate of 2.42 occupants per multi-family residential unit)	**317.1**
Water Use per Unit per Day (inc. appliances and landscape)	**116.5**
Percent Reduction from MWD Baseline	**63.3**

Assumptions

145 residential units x 2.42 occupants/unit (per City of LA) = 351 occupants

- Nonresidential occupants per Table A, Chapter 4, California Plumbing Code occupant load factor of 1 person/ 200 SF retail & office & 1 person/30 SF restaurant. Commercial = 2,400 sf; 1,600 sf (2/3 total) = 54 occupants; 800 retail (1/3 total) = 4 occcupants

  54 restaurant occupants
+ 4 retail occupants
  58 nonresidential occupants

1. Flow rates are the maximum allowed under City of Los Angeles Green Building Code (Form GRN 17).

2. Clothes Washer in each unit (baseline per Homes v4, 15.1 gal per person per day, WF=9.5). High efficiency

3. Dishwashers assumed in each unit (baseline per Homes v4, 0.7 gal per person per day, 6.5 GPC). High efficiency dishwashers can be 4 GPC, therefore 61% of baseline, or 0.43 gal per person per day.

4. Restaurant kitchen water use based on 1) assume kitchen = 50% of restaurant space, and 2) US EPA Savings Calculator for ENERGY STAR Certified Commercial Kitchen Equipment. Sample calculated result for 2,935 sf kitchen = 418,586 gpy/365 days = 1,146.8 gpd

5. 3% nonresidential occupants

6. Landscaping potable water use calculated using LEED v4 Outdoor Water Use Reduction Calculator v02. Assumes efficient Irrigation system and drought tolerant plants. Estimated landscape area is 4,300 SF.

7. Pool/spa surface total 657 SF. Avg 0.25 inch/0.021 ft loss per day, or 81.8 gallons to be made up per day.