



SAN FRANCISCO PLANNING DEPARTMENT

MEMO

DATE: July 2014
TO: Planning Department Staff, Shadow Analysis Consultants
FROM: Rachel Schuett, Kevin Guy, SF Planning Department
RE: Shadow Analysis Procedures and Scope Requirements

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In the City and County of San Francisco, there are two circumstances which could trigger the need for a shadow analysis:

- (1) If the proposed project would be over 40 feet tall, and could potentially cast new shadow on a property under the jurisdiction of the Recreation and Park Department, per *San Francisco Planning Code Section 295*; and/or
- (2) If the proposed project is subject to review under the California Environmental Quality Act (CEQA) and would potentially cast new shadow on a park or open space such that the use or enjoyment of that park or open space could be adversely affected.

This memorandum documents the Planning Department's standard procedures for conducting a shadow analysis both for the purposes of CEQA review and for the purposes of *Section 295* review. A complete Shadow Analysis has three main components: (1) Shadow Diagrams, (2) Shadow Calculations, and (3) a Technical Memorandum. In some cases, survey information may also be required.

A shadow analysis should be completed in five sequential steps:

- Step 1. Preliminary Shadow Fan
- Step 2. Project Initiation
- Step 3. Shadow Diagrams
- Step 4. Shadow Calculations
- Step 5. Technical Memorandum

Each of these steps is described, in detail, below.

Step 1. Preliminary Shadow Fan

The Planning Department typically prepares a preliminary shadow fan as part of the Preliminary Project Assessment (PPA) process for projects which exceed 40 feet in height. If the preliminary shadow fan indicates that the proposed project has the potential to cast new shadow on a park or open space which is protected by Section 295 of the *Planning Code*, a shadow analysis will be required for the purposes of Section 295 review.

Typically, this information is included in the PPA Letter. For projects not subject to the PPA process, and/or if the project is over 40 feet in height and has potential to cast new shadow on a park or open space that is not protected by Section 295 of the *Planning Code*, or if the project is less than 40 feet in height and could cast new shadow on any park or open space a shadow analysis may also be required for the purposes of CEQA review. This would be determined on a case-by-case basis as part of the scoping process for the environmental review. A preliminary shadow fan would be prepared by Planning Department staff at that time.

Step 2. Project Initiation

If the preliminary shadow fan indicates that there is potential for the proposed project to cast new shadow on a park or open space, and the Planning Department requests the preparation of a shadow analysis by a qualified consultant, the project sponsor should initiate the analysis by (1) filing a Shadow Analysis Application, (2) retaining the services of a qualified consultant, and (3) providing a scope of work for the shadow analysis.

- (1) Shadow Analysis Application. Filing a shadow analysis application initiates the process of shadow analysis review. The Shadow Analysis Application Packet can be found here: <http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=8442>. The fee is currently \$525.00, payable to the San Francisco Planning Department. Once the Shadow Analysis Application is received, a technical specialist will be assigned.
- (2) Qualified Consultant. The project sponsor should retain the services of a qualified shadow consultant. Currently, the Planning Department does not maintain a list of qualified consultants for the purposes of Shadow Analysis preparation. Thus, consultant selection should be based on the consultant's demonstrated capacity to prepare a Shadow Analysis as outlined in Steps 3 – 5, below.
- (3) Scope of Work. Once a technical specialist is assigned, the consultant should prepare and submit a scope of work for the Shadow Analysis. The scope of the Shadow Analysis should be based on the preliminary shadow fan, and Steps 3 – 5, below. Once the technical specialist has approved the scope of work the Shadow Analysis may be initiated.

Step 3. Shadow Diagrams

The preliminary shadow fan prepared by the Planning Department indicates whether or not there is any possibility that a project may cast new shadow on a park or open space. However, the shadow fan does not take into consideration intervening shadow that is cast by existing buildings and/or permanent infrastructure (such as elevated roadways, on- and off-ramps, etc.). Further, the preliminary shadow fan is typically based on full build out of the zoning envelope including; complete lot coverage and maximum height plus a penthouse allowance (typically 16 feet). Therefore, shadow diagrams should be prepared for the building as defined in the project description for environmental review, which should be determined in consultation with the Planning Department.

Please note: shadow cast by vegetation should not be included as part of existing or net new shadow.

Diagrams of shadows cast by the proposed project should be provided for the following four days of the year:

- Winter Solstice (December 21) - midday sun is lowest and shadows are at their longest.
- Summer Solstice (June 21) - midday sun is at its highest and shadows are at their shortest.
- Spring/Fall Equinox (March 21/September 21) - shadows are midway through a period of lengthening.
- The "worst case" shadow day – the day on which the net new shadow is largest/longest duration.

On the days the graphical depictions are required, the shadows should be shown on an hourly basis, from one hour after sunrise (Sunrise + 1 hour) to one hour before sunset (Sunset - 1 hour) and at the top of each hour in between.

Example: On June 21, the sun rises at 5:48 a.m. and sets at 8:35 p.m. Therefore shadow graphics should be included at the following times:

- A.M.: 6:48, 7:00, 8:00, 9:00, 10:00, 11:00
- P.M.: 12:00, 1:00, 2:00, 3:00, 4:00, 5:00, 6:00, 7:00, 7:35

All shadow diagrams should clearly indicate the outline of the project site and any parks or open spaces that may be affected including a generalized layout of park features such as seating areas, landscaped areas, playgrounds, recreational courts, and walking paths. The shadow diagrams should clearly indicate the shadow outline from the proposed project and should graphically distinguish between existing shadows versus net new shadow being cast by the project.

Shadow diagrams should also include the following, at a minimum:

- A north arrow
- A legend
- A figure number
- The project name (Ex. 555 Lyon Street)
- The date and time depicted (Ex. June 21 Sunset – 1 hr. or June 21 6:00 p.m.)

Shadow diagrams should be submitted as one file in .pdf format with a technical memorandum described in Step 5, below.

Step 4. Shadow Calculations

In order to obtain the information needed for a determination under Section 295, a detailed quantitative study of the new shadow cast upon an open space or park under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission is required. The quantitative study must include spreadsheets and/or tables that indicate the amount of existing shadow and net new shadow, measured in square foot hours (sfh), in 15 minute increments throughout the day during the hours regulated by Section 295 " on each day where the proposed project would result in net new shadow on the park.

The hours regulated by Section 295 occur between one hour after sunrise through one hour prior to sunset. Each 15 minute entry should expressly indicate the date, the time of sunrise, and the time of sunset. It is important to indicate the corresponding amount of existing shadow on the subject open space or park, as this amount is key in determining the relative effect of any new shadow.

In order to inform the CEQA analysis, the Planning Department may also require a detailed quantitative analysis for non-Section 295 properties, or in cases where Section 295 does not apply due to the project's height, or based on some other circumstance. This will be determined on a case-by-case basis.

These spreadsheets and tables should be summarized in the Technical Memorandum, as described in Step 5 below, and appended, in their entirety, to the report.

Step 5. Technical Memorandum

The shadow diagrams, shadow calculations, and any other supporting materials should be accompanied by a technical memorandum which includes (at a minimum) the following information:

- **Project Description.** Include the location of the project site (neighborhood, address, Assessor's Block/Lot, nearby landmarks), general topography, and project boundaries. Describe existing building(s) and land use(s) on and around the project site, including building height(s). Include proximity to parks, open spaces, and community gardens. Describe the proposed project including demolition and new construction. Describe the physical characteristics of the proposed building(s) as well as the proposed use(s). Include and refer to building elevations.
- **Modeling Assumptions.** The shadow graphics and calculations should be accompanied by clear documentation of the assumptions for the modeling including:
 - The height assumed for each of the buildings (or building envelopes).
Please note: Please contact the Planning Department for specific direction in how to model intervening shadow cast from buildings between the proposed project site and the affected park or open space.
 - The allowance for penthouses and parapets (which should be determined in consultation with Planning Department staff).
Please note: the Planning Department typically requires that final building designs be modeled rather than building envelopes, or hypothetical building forms based on existing or proposed zoning. However, building envelopes may be substituted in some circumstances as directed by Planning Department staff.
 - Building sections and elevations (for the proposed project).
 - If the project site is steep and/or has varied topography the documentation should identify where the height of the envelope of the building was measured from.
- **Potentially Affected Properties.** Potentially affected properties including: parks, publicly-accessible open spaces, and community gardens identified in the graphical depictions should be listed and described. The description of these properties should include the physical features and uses of the affected property, including but not limited to: topography, vegetation, structures, activities, and programming. Each identified use should be characterized as 'active' or 'passive.' Aerial photographs should be included, along with other supporting photos or graphics. The programming for each property should be verified with the overseeing entity, such as the Port of San Francisco, the Recreation and Parks Department, etc. Any planned improvements should also be noted.
- **Shadow Methodology and Results.** Describe how the analysis was conducted, what assumptions were made? Describe the "solar year", the "solar day" and define any other terms, as needed. Refer to shadow diagrams and describe results.
- **Quantitative Analysis (for properties subject to Section 295, and as required by the Planning Department).** The Technical Memorandum should include a narrative summary of the quantitative shadow effects that would result from the project, and discuss how these effects relate to the quantitative criteria set forth in the "Proposition K – Implementation Memo" as jointly adopted by the Planning and Recreation and Park Commissions in 1989.

The quantitative analysis discussion should (1) Identify the theoretical annual available sunlight (T.A.A.S.) for any/all affected Section 295 protected properties (and/or other properties identified by the Planning Department), calculated in square-foot-hours (sfh) by multiplying the area of the park by 3,721.4 (the number of hours in the year subject to Section 295), (2) Identify the amount of existing shadow on the park or open space (in sfh), (3) Identify the amount of net new shadow cast on the park or open space by the proposed project (in sfh), and (4) Where applicable for Section 295 properties, identify the park's 'shadow budget'. Compare (1) to (2) and (3), and (4) if applicable.

Summary tables and graphics should be included.

It should be noted that accurate park or open space boundaries are germane to an accurate calculation of the theoretical annual available sunlight hours (T.A.A.S.). It is advised that the shadow consultant verify park boundaries and area with Planning Department staff prior to initiating the calculation. Similarly, the assumptions for calculating the existing shadow load should also be verified with Planning Department staff prior to initiating the calculation.

- Shadow Characterization. The Technical Memorandum should include a narrative, qualitative summary of the effects of net new shadow on each park or open space on which new shadow would be cast. This narrative summary should be based on the following shadow characteristics:
 - Size
 - Times of year
 - Times/duration within a given day
 - Location of new shadow in relation to park features
 - Relationship of new shadow to surveyed¹ usage patterns in the park

The narrative description should clearly characterize the net new shadow that would occur over the course of the year.

Example: “the proposed project would cast net new shadow on Jackson Playground and Tennis Courts between March 3 and October 14, with the largest area of shadow being cast on July 27. . .”

Then go on to characterize the times of day during which the shadow would occur, and identify what is occurring in that area of the park or open space at that time.

- Cumulative Shadow Analysis. In the event that the proposed project would cast net new shadow on a park or open space that would also be affected by other proposed projects, the Planning Department may require a cumulative shadow analysis in addition to the 'existing plus project' analysis that is described above. The cumulative scenario should be developed in cooperation with Planning Department staff. The cumulative analysis requirement could potentially include all of the information required for the 'existing plus project' analysis, but would be determined on a case-by-case basis in consultation with Planning Department staff.

¹ Note: the scope and approach for a use survey should be vetted in advance with Planning Department staff.

- Proposed Project-Related Public Good. Under Section 295 of the Planning Code decision-makers may weigh the amount and duration of shadow cast by the proposed project against the public good or public benefits associated with the proposed project. This section should identify (1) the public interest in terms of a needed use, (2) building design and urban form, (3) impact fees, and (4) other public benefits.

The Technical Memorandum should include summary tables and graphics to inform decision makers of the potential effects of net new shadow. The Technical Memorandum should only document facts and observations related to the amount and duration of shadow and the use of the park or open space and should not include a conclusion as to whether or not an impact(s) would occur.

Work Plan

The scope of work identified in Steps 2 – 5 is a complete scope of work meeting the requirements of a shadow analysis for the purposes of a Section 295 determination and/or in support of an impact determination under CEQA, where net new shadow on a park or open space would be associated with a proposed project.

In some cases the Planning Department may wish to review the shadow diagrams, shadow calculations, and the descriptions of the use(s) of the affected properties, in advance of making further recommendations on the shadow analysis scope. Therefore, the graphics and descriptions may be requested in advance of the preparation of the full Technical Memorandum.

For example, the Planning Department may make a recommendation for the scope of a park survey(s) after reviewing the shadow diagrams, shadow calculations, and the descriptions of the use(s) of the affected properties. Therefore, the work plan for the shadow analysis should be developed in consultation with Planning Department staff.

Fees

The current application fee for a shadow analysis (K Case) is \$ 525.00 (adjusted annually). Please note, any time spent by Planning Department staff over and above the initial application fee will be billed on a time and materials basis. Recreation and Park Department staff will also bill time spent on the shadow analysis; including, but not limited to; providing information about park properties, review of the shadow analysis, preparation of the staff report, presentation to the Capital Committee and/or Recreation and Park Commission.

Recreation and Park Commission and Planning Commission Hearings

Projects which require a shadow analysis for the purpose of Section 295 compliance and which result in net new shadow on a park or open space under the jurisdiction of the Recreation and Park Department also require a hearing before the Recreation and Park Commission and the Planning Commission.

Recreation and Park Commission Hearings consist of two steps:

- (1) Capital Committee Hearing (meets 1st Wednesday of each month)
- (2) Recreation and Park Commission Hearing (meets 3rd Thursday of each month)

At the second hearing, the Recreation and Park Commission issues a recommendation, and the proposed project may then be heard by the Planning Commission.

The environmental review document should be final (not certified) prior to the Capital Committee Hearing. This means that a Categorical Exemption, or Community Plan Exemption, or Mitigated Negative Declaration should be signed, for an EIR the Responses to Comments and changes to the DEIR should be finalized. Recreation and Park Department staff should be consulted on how far in advance of the Capital Committee Hearing the environmental review document should be finalized.

The shadow analysis should be finalized at least three weeks prior to the Capital Committee Hearing for inclusion in the staff report. Recreation and Park Department staff typically review one or two drafts of the shadow analysis prior to finalizing the document. Recreation and Park staff should be consulted as early in the process as possible.

It should be noted that in some cases, a joint hearing before the Planning Commission and the Recreation and Park Commission is required. If a joint hearing is required, you will be notified by Planning Staff. Joint hearings are scheduled on a case-by-case basis through the respective Commission Secretaries.

Please do not hesitate to contact Rachel Schuett at Rachel.Schuett@sfgov.org or (415) 575.9030 or Kevin Guy at Kevin.Guy@sfgov.org or (415) 558.6163 with any questions, or if you need further clarification.