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September 9, 2008 6147-02

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Subject: ***Shadow Study of St. John Fisher Church Project***

Dear Shelly:

Dudek has completed the shadow study for the proposed St. John Fisher project. The project includes a proposed 870-seat sanctuary on an existing church campus on the corner of Crest Road and Crenshaw Boulevard in Rancho Palos Verdes, California (Figures 1 and 2). The proposed steeple on the sanctuary would be 60 feet tall, with a 14-foot-tall cross on top, for a total maximum height of 74 feet. A landscape plan would include pine and pepper trees to buffer the proposed sanctuary. This study evaluates shading effects of the existing and proposed church facilities, with an emphasis on off-site shading effects. The results of our analysis are summarized in this report.

Background – Shading Effects

Within developed settings, buildings commonly cast shadows on adjacent and nearby properties. Shading can have positive consequences, such as cooling effects during warm weather, and negative consequences, such as the loss of natural light for solar energy purposes or loss of warming influences during cool weather.

Shading from structures is a function of the location and dimensions of structures, the presentation of the ground surface to the sun relative to the earth's axis, and the sun's position in the sky relative to the ground. The sun's position in the sky changes as the seasons progress from summer to winter in both the northern and southern hemisphere. These factors influence the length and position of shadows. During any season, the sun is in its most nearly vertical position relative to the ground surface, at approximately 12 noon. This is when shadows are the shortest. On June 21 (summer solstice), the sun is the highest in the sky and shadows are the shortest. As winter approaches, the sun's angle relative to the earth's horizon changes and shadow lengths become longer. On December 21 (winter solstice), the sun is lowest in the sky, and shadows are greatest. During the spring and fall equinox, the sun rises exactly in the east and the sun is directly above the equator.

A shadow analysis was conducted in order to assess the shadow effect of the project on adjacent areas. The focus of this analysis was determining the effects of shadows cast at different times of the year by the project on off-site land uses. Figures 3 through 5 illustrate the shadows cast from the proposed

sanctuary, as well as from existing church structures. Figures 6 through 8 show the shadows cast from the proposed sanctuary, proposed trees near the corner of Crenshaw Boulevard and Crest Road, existing church buildings, and existing trees. The results of this analysis are summarized below.

Vernal and Autumnal Equinox (March 20-21 and September 22-23)

During the spring and fall equinox, shadow lengths are mid-way between summer and winter solstice. The spring and fall equinox have shadows of equal length during all times of the day, therefore, only one set of figures are shown to reflect both the spring and fall equinox predicted shadow lengths at 9:00 am and 3:00 pm (see Figures 3 and 6). On this day at 9:00 am, the shadows would extend northwesterly. Similar to the existing church structure to the immediate south of the proposed sanctuary, the sanctuary would shade the northwest corner of the project site, as well as a small portion of northbound Crenshaw Boulevard. As shown in Figure 6, project landscaping would shade most of northbound Crenshaw Boulevard and would partially shade portions of southbound Crenshaw Boulevard adjacent to the sanctuary. Similar to the existing trees along the northern portion of the church campus, proposed project landscaping would partially shade portions of westbound Crest Road north of the project site. At 3:00 pm, the project shadows would be cast northeasterly. Shadows would be confined to the project site. After 3:00 pm the shadows would continue in a northeasterly direction. No surrounding structures or residential yards would be shaded during the vernal or autumnal equinoxes.

Summer Solstice (June 21-22)

As shadows are shortest on this day, the impact would be the most minimal of any day of the year. Figures 4 and 7, Summer Solstice Shadows, depict predicted shadow lengths at 9:00 am and 3:00 pm. At 9:00 am, the shadows would extend westerly and the sanctuary would produce a relatively small shadow that is confined to the church campus and does not extend into Crenshaw Boulevard. As shown in Figure 7, the sanctuary and project landscaping would partially shade the northbound lanes of Crenshaw Boulevard adjacent to the project site. After 9:00 am, the shadows would begin to move easterly. At 3:00 pm the shadows would continue to extend easterly and would remain confined to the church campus. After 3:00 pm, the shadows would continue to move easterly. No offsite structures or residential yards would be shaded during the summer solstice.

Winter Solstice (December 21-22)

The sun's angle is at its lowest during winter solstice, therefore the shadows are longest, and potential shadow impacts are greatest. Therefore, this time period represents the worst-case shading scenario. Figures 5 and 8, Winter Solstice Shadows, depict predicted shadow lengths at 9:00 am and 3:00 pm. As shown in Figure 5, at 9:00 am, shadows from one existing structure and the proposed sanctuary would cast in a northwesterly direction upon portions of Crenshaw Boulevard and Crest Road. No shadows are cast onto adjacent residential properties as a result of proposed structures.

When existing and project landscaping is included, as shown in Figure 8, shadows would cover additional portions of Crenshaw Boulevard and Crest Road. Also, four backyards in the residential neighborhood

north of the project site would be completely or partially shaded due to shadows cast by existing and proposed landscaping. It is noted that the majority of these shadows result from existing church campus landscaping, and shading resulting from proposed landscaping would cover the intersection and the southwest portion of one residential backyard on the corner of Crenshaw Boulevard and Crest Road.

At 3:00 pm, the project would cast shadows in a northeasterly direction, and shadows resulting from existing and proposed structures would be confined to the church campus, as shown in Figure 5. Existing and proposed landscaping would shade a portion of Crest Road along the north side of the church campus, with the greatest extent of shading resulting from the existing campus trees (Figure 8). No residential structures or yards would be shaded. The shading impacts of the project would occur for a short period of time throughout the day due to the sun's motion in the sky.

Summary

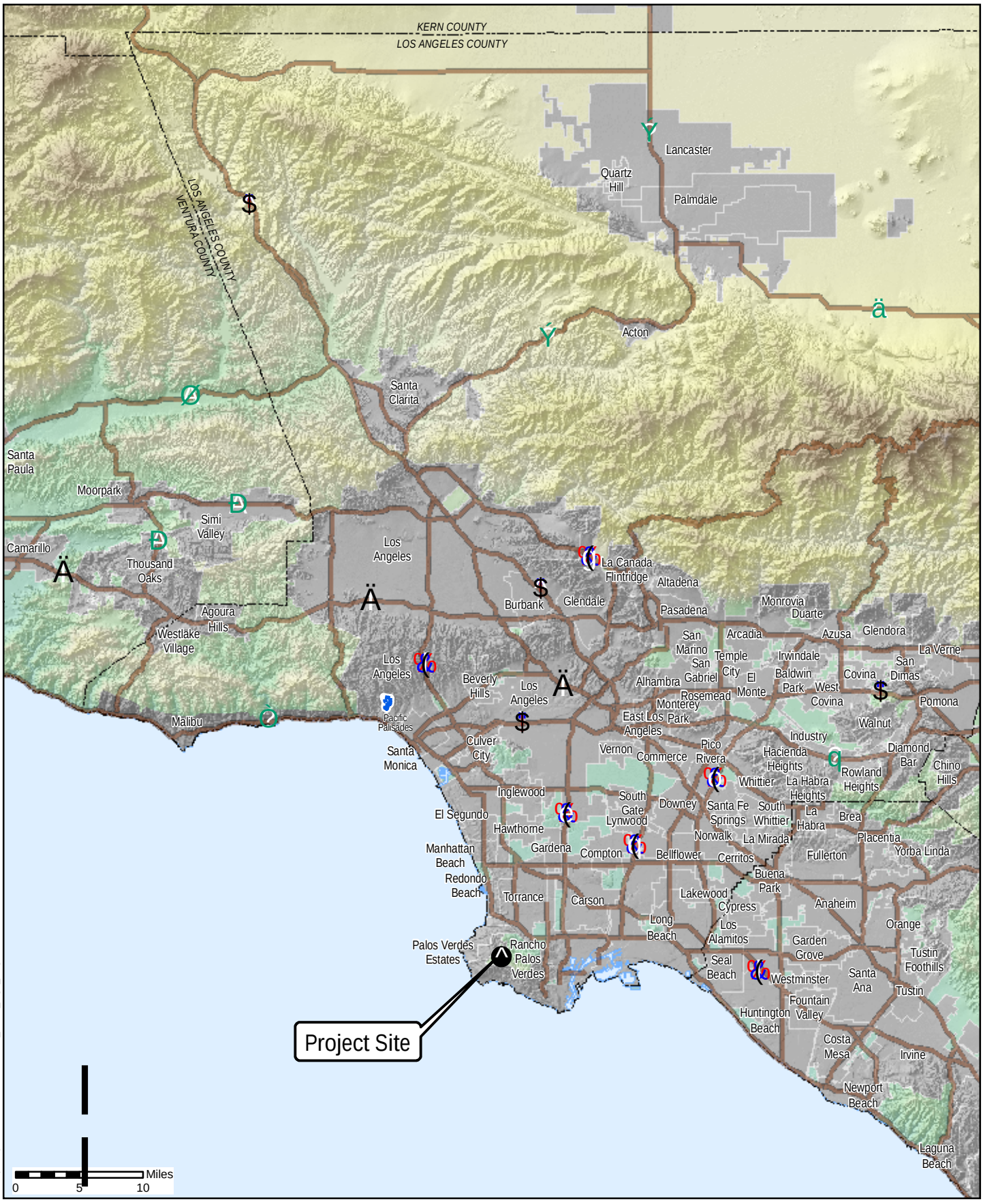
Overall, offsite shading impacts would be greatest during the winter solstice, and would predominantly result in shading to adjacent roadways. Under existing conditions, and not as a result of proposed landscaping or structures, shading of four residential yards to the north of Crest Road would result during the morning hours during the winter months. The proposed sanctuary would result in shading to the Crest Road/Crenshaw Boulevard intersection roadways only. Proposed landscaping would result in shading to a portion of one residential backyard on the northeast corner of Crest Road/Crenshaw Boulevard.

Should you have any questions regarding the above information, please do not hesitate to contact me at 760.479.4228 or sshamlou@dudek.com.

Respectfully submitted,

Shawn Shamlou, AICP
Environmental Project Manager

Enc: Figure 1 – Regional Location
Figure 2 – Project Vicinity
Figures 3 through 8 – Shadow Study graphics



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St. John Fisher Church - Shadow Study

Regional Map

FIGURE 1

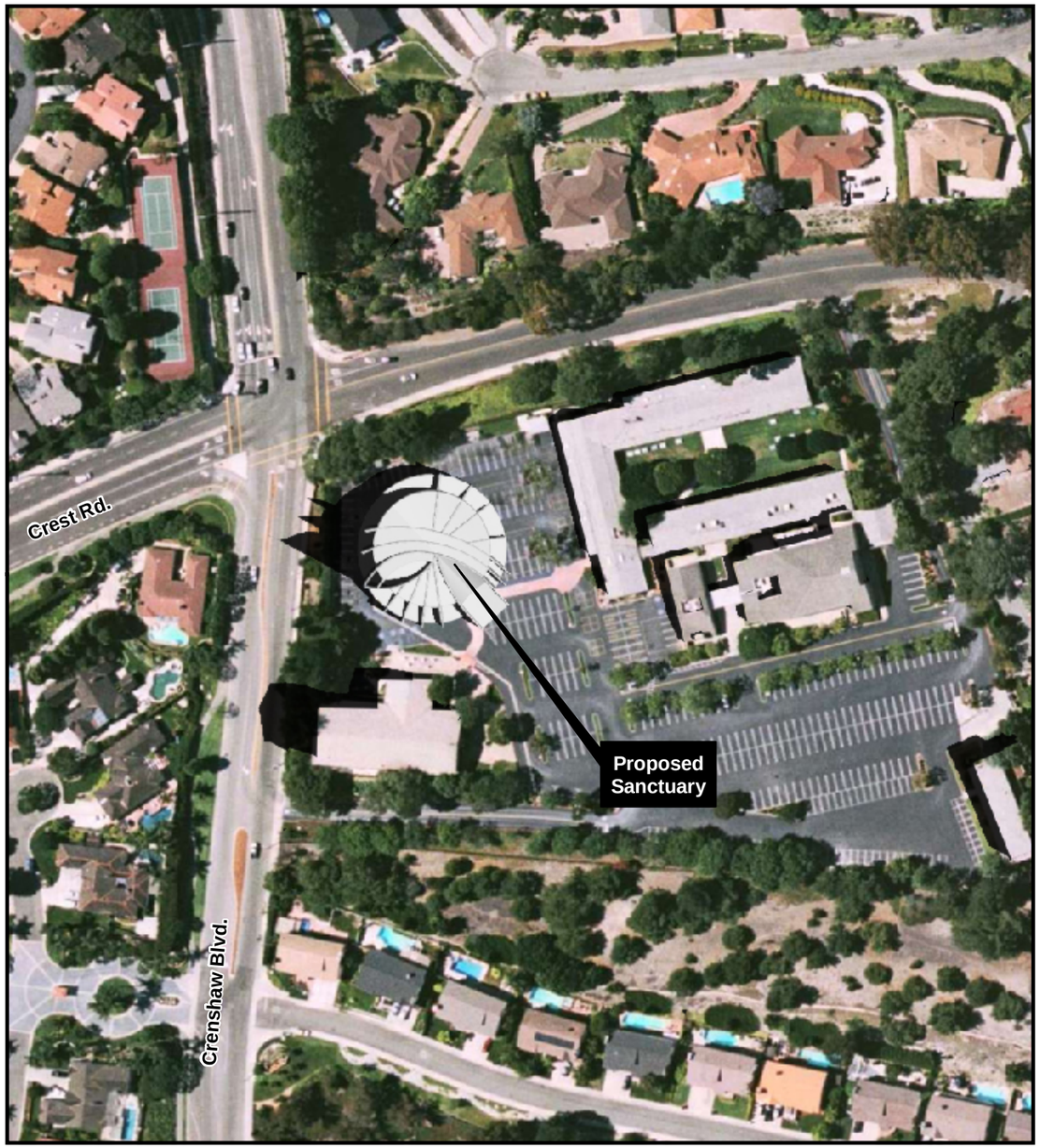


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St. John Fisher Church - Shadow Study
Project Vicinity

FIGURE
2



9am

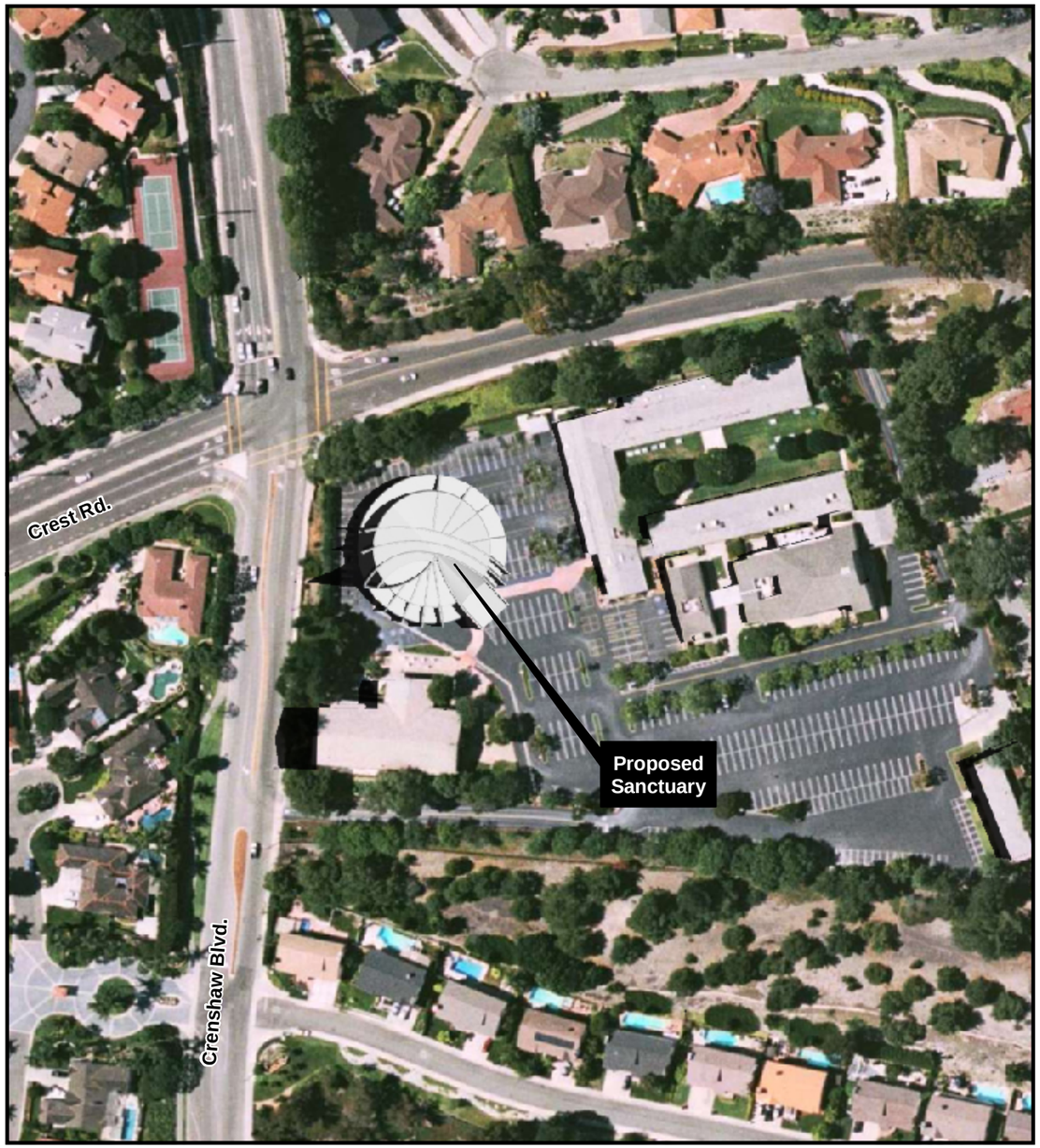


3pm

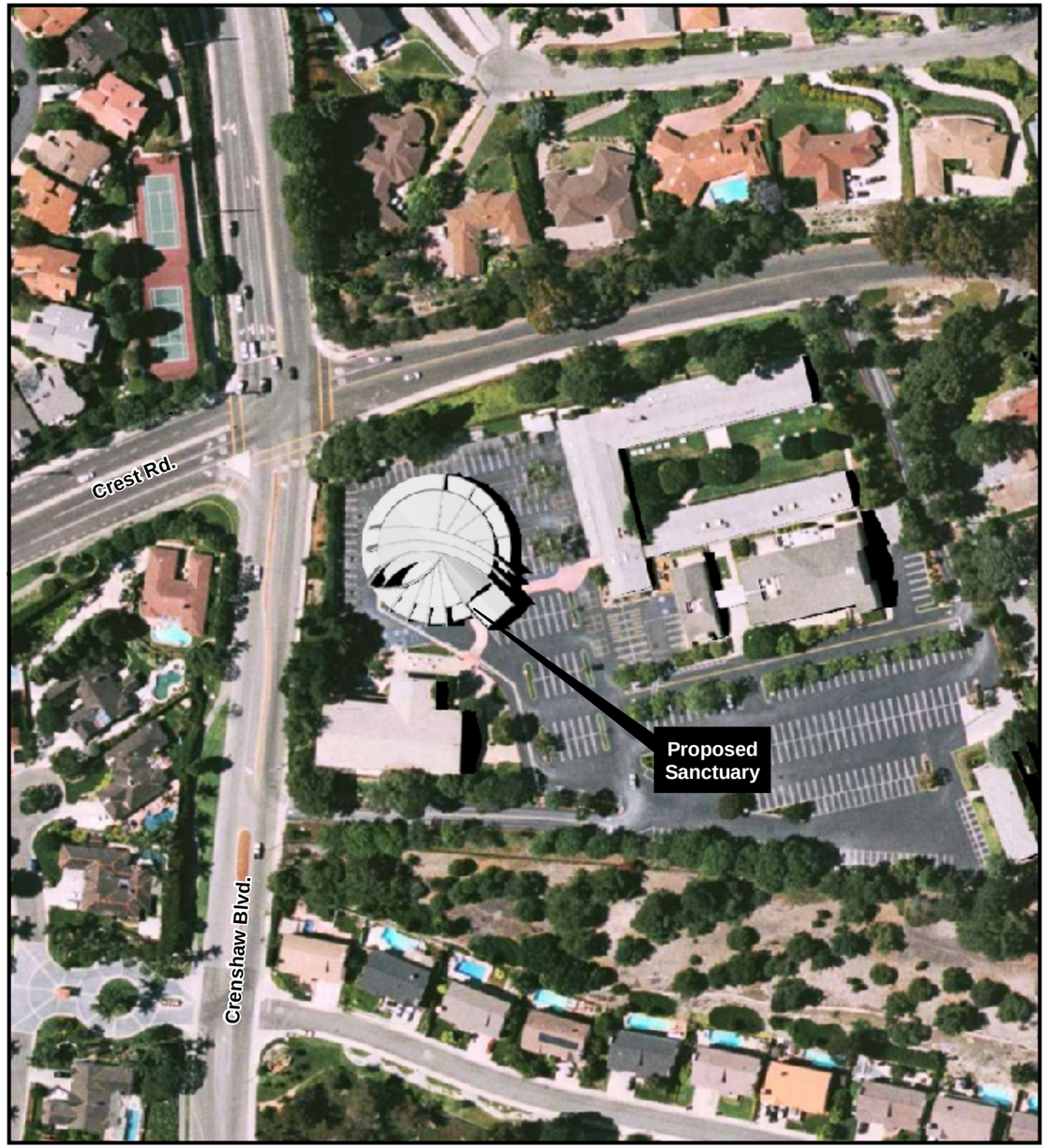
St. John Fisher Church - Shadow Study

Spring and Fall Equinox Shadows - Buildings Only

FIGURE 3



9am



3pm

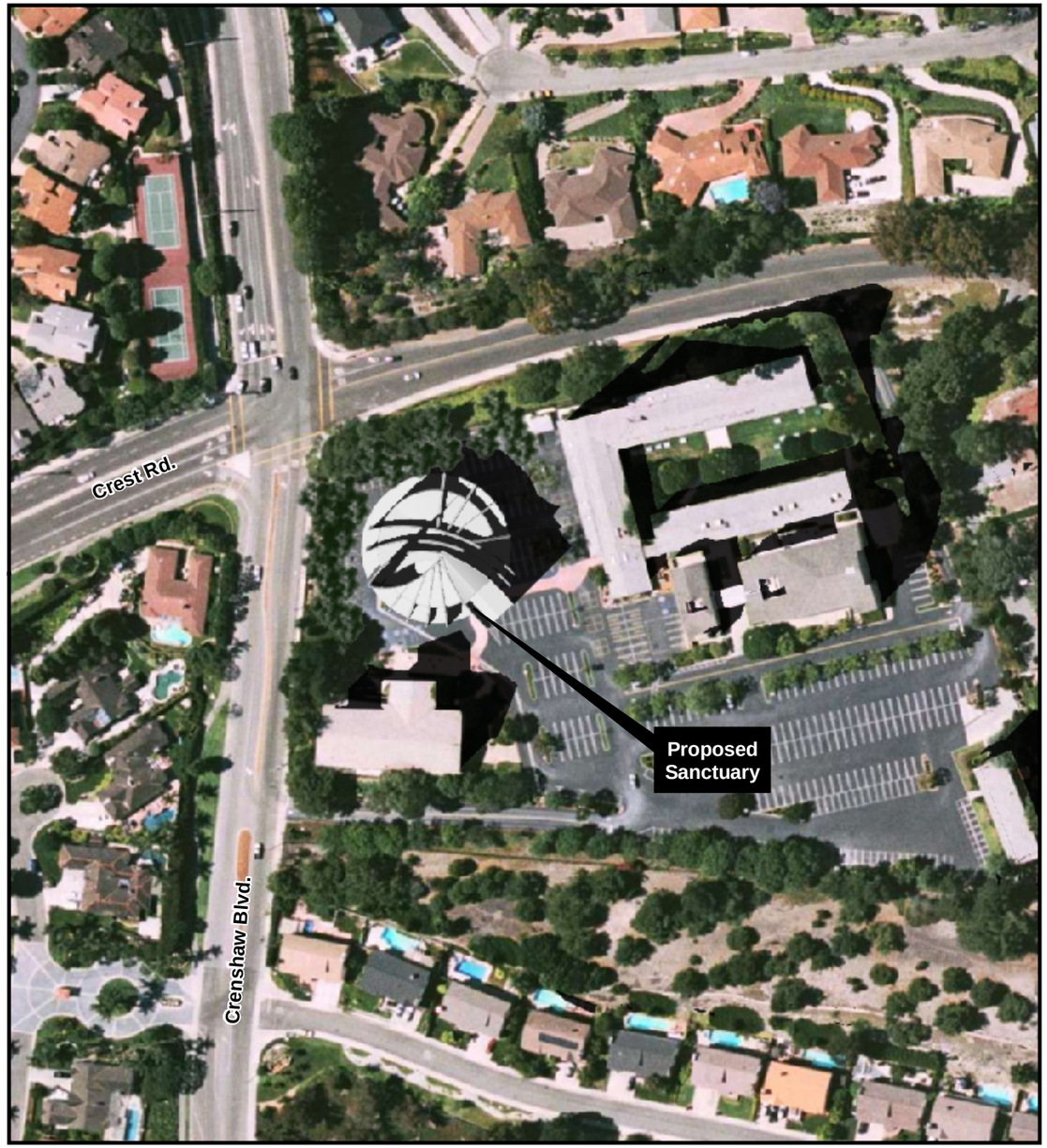
St. John Fisher Church - Shadow Study

Summer Solstice Shadows - Buildings Only

FIGURE 4



9am



3pm

St. John Fisher Church - Shadow Study

Winter Solstice Shadows - Buildings Only

FIGURE 5



9am



3pm

St. John Fisher Church - Shadow Study

Spring and Fall Equinox Shadows - Buildings and Landscaping

FIGURE 6



9am



3pm

St. John Fisher Church - Shadow Study

Summer Solstice Shadows - Buildings and Landscaping

FIGURE 7



9am



3pm

St. John Fisher Church - Shadow Study

Winter Solstice Shadows - Buildings and Landscaping

FIGURE 8