15. Pre-Programming Analysis

Overview
BOMA calculations indicated a total gross square footage of 602,519 with a total usable area of 517,097 square feet for the 450 N Street building. The total number of occupants on floors 2 through 24 with a corridor around the building core is 2218 occupants. The total number of occupants on floors 2 through 24 without a corridor around the building core is 2389.

A. Scope of Work:
Following is the scope of work requested by the State and identified as Task 14b:

1. Contractor shall prepare BOMA floor area calculations for the entire building by floor based on as-built drawings provided by the State.

2. The Contractor shall prepare a pre-programming assessment report that analyzes the reasonable capacity of the building (specifically how many people could potentially be accommodated in the building, based upon gross square foot and net square foot calculations).
   - The State shall provide the Contractor with the percentage of hard wall offices vs. open office space for analysis.

3. The Contractor shall prepare typical layouts based upon ratios provided by the State to test up to 4 typical floors in order to determine square footage required per person.

4. The Contractor shall analyze systems and support capacity, including elevators, toilet rooms, exit capacity, and stairs. A preliminary report will be submitted for the State review and comment. The State comments shall be incorporated into the final report.

B. Information Provided by the State:
The following numbers refer to the numbered Scope of Services listed above.

1. The State determined that they did not have accurate tenant improvement drawings and asked Stantec to proceed with their study based on the drawings documented as Capitol Square by Dreyfuss & Blackford, dated June 24, 1991. They deemed these drawings relatively accurate enough for this study.

2. Stantec was provided a report titled State Board of Equalization Office Optimization Study, prepared by Dreyfuss on Blackford on August 8, 1997.

3. The State requested that the four typical layouts be prepared for floors: Ground, 2nd, 3rd, and 24th.

   a. The State requested that Stantec actually prepare two typical floor layouts for each floor, one with a central corridor and one without a central corridor in order to understand potential occupancy based on either scenario.

b. The State determined that the percentage of hard walls to work stations should be 20/80 (this differs from the current tenant configuration). A standard supervisor office space should be figured at 120 SF, general office space workstations at 64 SF; with a circulation factor of 40%. The standard work station size is to be 8x8 (64 SF) which seeks the maximum occupancy available for the building (note that this number may ultimately be limited by the number of restrooms and exiting restrictions for the building, etc.).

c. The percentage of support space to be assumed per floor is 40%.

d. The State determined that the study should be based on in-board offices, in keeping with general LEED guidelines.

e. The State determined that workstation openings should attempt to not open onto main circulation ways on the floor, but rather to open onto secondary or tertiary circulation ways. This configuration is usually less efficient but considered more private and tends to provide higher workplace satisfaction.

f. The State determined that the first floor should not be considered an "office floor" and that Stantec should not plan typical office space into this floor. It was determined that this floor would remain as support spaces such as child care, mail rooms, and reception, etc. These spaces exit to the perimeter and should not contribute to the overall potential building occupancy.

g. The State determined that workstations would be planned as not 'touching' the perimeter glazing in order to plan in keeping with general LEED guidelines. Note: Should the State or another tenant eventually plan with workstations up against the exterior glazing, the total occupant counts could increase.

C. Analysis of Systems

The existing building systems were analyzed to see if they could support the total projected occupant load of 2389 distributed throughout floors 2 through 25 (a total of 21 occupied floors—floors 12 and 25 are not included in the count as they are mechanical and penthouse spaces, respectively). The building systems that were analyzed include stairs, elevators, restrooms, HVAC, and electrical.

Stairs

The maximum number of programmed occupants is 122 on floors 14 through 24. Sixty-one people would exit at each stairway. The current door clear width is 32 inches and the stairs are 51 inches wide. These existing widths are adequate to support the required exit loads (see Exhibit A).

Elevators

The existing elevators that serve the office tower do not meet the minimal performance guidelines for a Class A office building with a projected occupant load of 2389. Neither

the low-rise or high-rise elevator banks meet a minimum 30 second time interval or attain a 14% handling capacity.

Restrooms
The maximum number of programmed occupants is 122 on floors 14 through 24. Therefore, the restrooms should accommodate 61 men and 61 women. The current number of plumbing fixtures is sufficient for the women's restroom. The men's restroom requires 4 toilets, but only 3 are currently provided (see Exhibit B). The number of urinals and lavatories is sufficient.

HVAC
According to information provided by DGS, the current number of building occupants is estimated to be between 1852 and 2126. This corresponds to an additional 263 total occupants or 12.5 occupants per floor. This increase in occupant load will not affect the current capacity of the cooling system as the chillers are at 80% capacity at current peak loads. The cooling required for an additional 263 occupants is approximately 0.5 tons per floor.

Electrical
By reviewing the SMUD peak electrical demands, it appears that the building has enough capacity to support the programmed 2389 occupants. Additional dedicated outlets should be provided for large printers and GFCI receptacles should be provided in wet locations (see the Electrical section of this report for more information).

D. Summary

1. Building Gross Measured Area: + 602,519 square feet

2. Projected Occupancy count of building (not including first floor) with a central corridor: *2218 Occupants.*

3. Projected Occupancy count of building (not including first floor) without a central corridor: *2389 Occupants.*

BOE Infrastructure Study
Pre-Programming Analysis
Exit Load Capacity
Based on 2007 California Building Code

Exhibit A

TYPICAL FLOOR	USABLE AREA (sq.ft.)	BUILDING AREA (sq.ft.)	OCCUPANT LOAD FACTOR	NUMBER OF OCCUPANTS PER CODE	NUMBER OF OCCUPANTS PROGRAMMED	PROGRAMMED EGRESS WIDTH--DOORS	PROGRAMMED EGRESS WIDTH--STAIRS
2	20,603	21,082	100	211	107	8.03	10.7
3	22,530	23,009	100	230	114	8.55	11.4
4	22,408	22,887	100	229	114	8.55	11.4
11	21,949	22,428	100	224	114	8.55	11.4
14	22,523	23,002	100	230	122	9.15	12.2
16	22,582	23,061	100	231	122	9.15	12.2
24	15,719	16,198	100	162	79	5.93	7.9

EXISTING DOOR CLEARANCE: 32 inches
EXISTING STAIR WIDTH: 51 inches
EXIT WIDTH--- DOORS: 9.15 < 32 COMPLIES
EXIT WIDTH--- STAIRS: 12.2 < 51 COMPLIES

BOE Infrastructure Study
Pre-Programming Analysis
Restroom Capacity
Based on 2007 California Plumbing Code

Exhibit B

REQUIRED NUMBER OF PLUMBING FIXTURES						
	TOILETS		LAVS			
	MEN	WOMEN	MEN	WOMEN	URINALS	
OFFICE BUILDINGS--- FOR EMPLOYEE USE (122 total occupants)	4	5	2	2	2	2007 CPC Table 4-1

EXISTING NUMBER OF PLUMBING FIXTURES					
	TOILETS		LAVS		
	MEN	WOMEN	MEN	WOMEN	URINALS
OFFICE AREAS (FLOORS 2-24)	3	5	3	3	2

MENS RESTROOM DOES NOT COMPLY WITH NUMBER OF TOILETS
WOMENS RESTROOM COMPLIES