July 17, 2007 JN 60100326

Mr. Faizi Pourhasseini
Project Manager
Department if General Services
Real Estate Services Division
Professional Services Branch
7070 3rd Street, 4th Floor
West Sacramento, CA 95605

Subject: Fairview State Hospital Surplus Property Utility Analysis Study

Dear Mr. Pourhasseini,

In accordance with your request, RBF Consulting has completed a study for the water demand, sewer capacity, and available storm drain facilities for the proposed development of the surplus property on the site of the Fairview State Hospital. We have been in close contact with the City of Costa Mesa, Costa Mesa Sanitary District, Mesa Consolidated Water District, City of Costa Mesa Fire Department, and Robert Sterling from the State of California regarding the development of this site.

The Fairview State Hospital parcel is approximately 112 acres located at 2501 Harbor Boulevard within the City of Costa Mesa. Fairview State Hospital is a long-term care facility that is licensed to treat 1200 patients. When the facility is operating at full capacity, 4000 employees are required. The typical number of patients that the hospital has treated, in the last several years, has been 600-800 patients. This typical number of patients requires 1500 employees. Fairview State Hospital is a self-contained facility with its own commercial operations, medical facilities, recreation facilities, schools, and housing on site.

For this study, several assumptions have been made. It has been assumed that of the 112-acre parcel the following land uses have been assigned:

Hospital/ Commercial/ Medical Facilities:	85.8 acres (76.7%)
Open Space/ Park Facilities:	12.2 acres (10.9%)
Surplus Property / Proposed project area:	14 acres (12.5%)
Total Parcel:	**112 acres (100%)**

Exhibit 1 shows the land uses of the 112-acre hospital parcel.

As discussed with Mr. Robert Sterling, of the State of California, the surplus property is expected to be developed into approximately 130 to 175 units of affordable housing. This new affordable housing site will require sanitary sewer, domestic water, and storm drain facilities. All of the previously mentioned utility purveyors were contacted by RBF Consulting about this proposed development and options were

discussed regarding the available capacity of the existing facilities and the various options if there was not capacity available within existing facilities.

Domestic Water Service Facilities

Currently, the 112-acre Fairview Hospital parcel maintains water service through two connection points within Harbor Boulevard from Fair Drive and Merrimac Way. The two connection points are serviced by the Mesa Consolidated Water District main line system. The existing system is a private looped system. The 8" connections are fed from the 12" A.C. main line within Harbor Boulevard. The existing system serves the hospital site through a series of private 10" mainline pipes. This private loop system was constructed by the State of California during the 1980s.

RBF Consulting contacted Mark Pelka, Senior Civil Engineer with the Mesa Consolidated Water District, about the proposed affordable housing development. According to Mr. Pelka, Mesa Consolidated Water District does have the capacity to service the proposed affordable housing development. The Mesa Consolidated Water District would require a minimum 6" P.V.C pipe system be constructed for the new development.

According to Mr. Pelka, the type of housing development would greatly impact the design requirements of a proposed water system. If the new development were to be constructed as single-family homes, condominiums, or other housing facilities that are owned by individuals, then each unit would be required to have its own Mesa Consolidated Water District water meter. These meters would need to be located on a public water system. This would require that a public water main be located on the Fairview Hospital site and the appropriate easements be dedicated. If the housing development is to be apartments or other housing that is owned by the Fairview State Hospital and rented to occupants, then the proposed affordable housing development could be monitored off the existing meters and tie into the existing private water system.

For future reference and contact about the availability of water service for the proposed affordable housing development, please contact:

Mr. Mark Pelka, P.E.
Senior Civil Engineer
Mesa Consolidated Water District
1965 Placentia Ave.
Costa Mesa, CA 92628
Phone: 949-631-1291
Email: markp@mesawater.org

RBF Consulting also contacted Mr. David Hollister, with the City of Costa Mesa Fire Department, to determine the type of fire protection the proposed affordable housing development would need for approval. According to Mr. Hollister, if this project is similar to the recently constructed housing development north of Fair Drive, there should be no problem providing adequate fire protection for the site. Mr. Hollister requested that, at the time of final design, construction documents be sent to the City of Costa Mesa Fire Department for review. The City of Costa Mesa Fire Department

would then determine the type of fire protection that would be required for the new development.

For future reference and contact about the fire protection for the proposed affordable housing development, please contact:

Mr. David Hollister
City of Costa Mesa Fire Department
2803 Royal Palm Drive
Costa Mesa, CA
Phone: 714-327-7403

It is reasonable to assume that the existing private water system can support the proposed affordable housing development. Water pressure testing should be conducted to confirm the existing system could support the proposed development. The as-built plans, provided by Robert Sterling, do not identify the type of pipe used in the private water system. The type of pipe would need to be determined and depending on the type of pipe used, special care may need to be taken when joining existing lines. Exhibit 2 shows the possible location of the water connections and pressure testing points for the proposed affordable housing development.

Storm Drain Facilities

RBF Consulting received as-built storm drain plans from Mr. Robert Sterling that depict an existing storm drain system on the site of the Fairview Hospital. These storm drain plans show inlet locations and pipe sizes but do not give any information on the slope or capacity of the existing pipes. The as-built plans show that adjacent to the proposed affordable housing development there is an existing 12-inch storm drain pipe. The entire existing on-site storm drain system drains into a 36-inch storm drain pipe that is reduced to a 24-inch pipe before outleting into an existing open channel.

The onsite storm drain system appears to have been designed for nuisance flows and would be overwhelmed during a storm. For the analysis of this existing storm drain system, two major assumptions have been made. It was assumed that the slope of the existing storm drain is 0.40%. This assumption was made based on the examination of slopes in the sewer plans and the general topography of the site. It was also assumed that during a storm the developed flows of the site are 3.2 cfs/acre. This flow assumption was determined by reviewing similar projects in the vicinity.

By making the above assumptions it can be determined that the existing 12-inch storm drain pipe would only be able to accept 2 cfs. Due to the development of the proposed 14-acre affordable housing site, the 25-year storm flows are expected to be 45 cfs. It was also determined that the existing 36-inch pipe at the most downstream end of the system would only be able to accept 38 cfs from the entire site, based on the pipe size and assumed slope. The developed 25-year storm flows that would contribute storm water to this pipe are expected to be 275 cfs.

Due to the discrepancies of developed storm flows and existing pipe sizes, the City of Costa Mesa's Master Plan of Drainage was referenced to determine if the existing

City of Costa Mesa storm drain system could accept flows from the development of the proposed 14-acre affordable housing site.

Mr. Ve Tran, civil engineer for the City of Costa Mesa Engineering Department, was contacted regarding current storm drain facilities for the Fairview Hospital and capacity of the existing system to accept runoff from the proposed developed site.

The following information was obtained from the City of Costa Mesa's Master Plan of Drainage: According to the City of Costa Mesa's Master Plan of Drainage, Fairview Hospital does not have any existing storm drain facilities on site. Currently, storm water runoff surface flows into Harbor Blvd. and then north. There are no existing storm drain facilities within Harbor Boulevard. None of the existing runoff from the hospital site enters the City of Costa Mesa storm drain system. According to the City of Costa Mesa Master Plan of Drainage, the proposed affordable housing site (14 acres) currently produces storm flows of 17.7 cfs and 23.8 cfs during 10 and 25-year storms, respectively. The only existing storm drain facilities near the Fairview Hospital site are south of the hospital grounds within the Costa Mesa Golf Course. The existing facilities include a 72" pipe constructed in 1958 and a 96" pipe constructed in 1986. According to the Master Plan of Drainage, these existing storm drain facilities are undersized by 4.0' (72" pipe) and 0.5' (96" pipe).

The City of Costa Mesa requires that storm drain facilities be designed to accept runoff from 25-year storms. Due to the development of the proposed 14-acre site, the 25-year storm flows are expected to 45 cfs. This flow is based on the assumption that, within the City of Costa Mesa, developed flows are typically 3.2 cfs/acre. This flow assumption was determined by reviewing similar projects within the City of Costa Mesa and was deemed reasonable by Mr. Tran.

Due to the increase in drainage with the development of the site, RBF Consulting's recommendation is to design the project to release existing flows ($Q25_{exist.}$ = 24 cfs) into Harbor Blvd. as surface flow and to include a detention basin. This detention basin will hold the additional flows produced by developing the site and then release these flows into the existing storm drain system after the storm flow peak has passed. The additional flow produced by developing the site will be approximately 21 cfs ($Q25_{dev} - Q25_{exist}$ = 45cfs - 23.8 cfs) By designing the storm drain system with a detention basin to detain the additional flows, the existing system will not be over taxed by the development of the 14 acre site.

The location of the detention basin would need to be determined before the final design of the project. The possible locations of the detention basin include on the proposed 14-acre affordable housing site or within the Costa Mesa Golf Course. Designing the basin within the project site will decrease the number of units that could be constructed. Designing the basin within the Costa Mesa Golf Course may increase the size of basin required since, according the City of Costa Mesa, the Costa Mesa Golf Course has existing storm water runoff issues.

Regardless of the location of the proposed detention basin, the construction of the storm drain system would require an easement(s) to the City of Costa Mesa over the Costa Mesa Golf Course. This easement would be used for the general maintenance of the new system. If the proposed basin were constructed as a water feature on the golf course, the City would also need an easement to maintain the detention basin.

This proposed development and design was discussed with Mr. Tran. For future reference and contact about the availability of storm drain facilities for the proposed affordable housing development, please contact:

Mr. Ve Tran, P.E., P.L.S.
Assistant Civil Engineer
Department of Public Services
City of Costa Mesa, California
77 Fair Drive
Costa Mesa, CA
Phone: 714-754-5275
Email: vtran@ci.costa-mesa.ca.us

Sanitary Sewer Facilities

Currently, the Fairview Hospital parcel discharges wastewater through an 18" sanitary sewer main located on the Fairview Hospital site. According to the Fairview State Hospital Sanitary Sewer System plans, provided by Mr. Robert Sterling, the hospital site has an extensive sewer system within the hospital grounds. The Fairview Hospital facilities department maintains the onsite sewer system. As the sewer system leaves the hospital site it becomes a pubic facility and continues in Harbor Boulevard. The Costa Mesa Sanitary District maintains the sewer system within Harbor Boulevard. The sewer system, once in Harbor Boulevard, heads north to Baker Street, at a slope of 0.0026.

By examining the as-built plans provided to RBF Consulting, there are two possible locations for the proposed affordable housing development to join into the existing onsite sewer system. The possible join locations are located north and west of the proposed affordable housing development site. In order to determine if the onsite sewer system has the capacity for the proposed affordable housing development, a flow monitoring study and a sewer analysis should be completed.

The flow monitoring study should be conducted at several manholes. The manholes that should be monitored are as follows: MH# 31, MH# 26, MH# 23, MH# 22, MH# 19, and the unidentified manhole between the activity center and the auditorium. These are the locations, as shown on the as-built plans, where the onsite sewer system changes pipe size.

In order to complete a sewer analysis on the existing onsite sewer system, several assumptions have been made. It is assumed that the proposed affordable housing development will be constructed at what is considered medium density (130 to 175 housing units) and that the as-built plans show accurate invert elevations and lengths. When the hospital is operating at full capacity, the 1200 patients and 4000 employees are equivalent to 84 acres of medium density development. The sewer analysis must be completed under the assumption that the Fairview Hospital is operating at the full capacity at which they are licensed to treat. Under this assumption, the proposed affordable housing development will contribute 0.09 million gallons per day (mgd) to the onsite sewer system. Several stretches of the onsite sewer system were analyzed to determine if the existing system has the capacity to accept sewage runoff from the proposed affordable housing

development. The Costa Mesa Sanitary District flow rate of 6430 gallons per day per acre for medium density was used in the analysis. Assuming the results of a flow monitoring study show the same results, the onsite sewer system appears to have the capacity to accept additional sewage flow from the proposed affordable housing development.

In order to analyze the offsite sewer system, RBF Consulting contacted Robin Hamers, Manager/District Engineer for the Costa Mesa Sanitary District regarding the proposed affordable housing development. According to the Costa Mesa Sanitary District Sewer Master Plan, the sewer system, flowing at 3.46 million gallons per day (mgd), is at full capacity.

The Costa Mesa Sanitary District Sewer Master Plan identifies sewage flows expected in existing the sewer system. Each of the facilities or parcels serviced by the Costa Mesa Sanitary District have been assigned an allowable flow based on the type of development on the parcel. These expected sewage flows might be greater than actual flows due to assumption that the parcels contributing have been constructed to the maximum density allowed. According to Mr. Hamers, parcels within the City of Costa Mesa are rarely constructed to the maximum density allowed.

Due to this possible discrepancy in flows, the Costa Mesa Sanitary District completed a visual flow monitoring study on the sewer main that would service the proposed affordable housing development. The results of the visual flow monitoring study show that the existing sewer main lines are flowing approximately half full during a dry weather peak. An analysis of the Sewer Master Plan was also completed to compare actual flows to expected flows within the sewer system. The Sewer Master Plan analysis, based on current land uses, shows that the dry weather peak flow that would be experienced by the sewer main, within Harbor Boulevard, is 3.18 mgd. Table 1 compares the Sewer Master Plan flows and the actual sewage flows based on flow monitoring and actual land uses.

TABLE 1: Harbor Boulevard Sewage Flows

Sewer Master Plan Flows (based on maximum density construction)	3.46 mgd
Visual Flow Monitoring Results (at peak flow)	½ full
Actual Sewage Flows (based on current and expected land uses)	3.18 mgd

Based on the information obtained from Mr. Hamers, the Costa Mesa Sanitary District does have the capacity to support the proposed affordable housing development. Exhibit 4 shows the possible location of the sewer connections for the proposed affordable housing development.

For future reference and contact about the availability of sewer service for the proposed affordable housing development, please contact:

Mr. Robin Hamers, P.E.

Manager/ District Engineer
Costa Mesa Sanitary District
628 W. 19th Street
Costa Mesa, CA 92627
Phone: 949-631-1731

All of the above mentioned reference items (Exhibits 1,2,3, and 4) have been included for your use. Please feel free to contact me is you have any questions. I can be reached by phone at (916) 928-1113.

Sincerely,

Erik Johnson P.E.

Senior Associate Land Development

REGISTERED PROFESSIONAL ENGINEER
ERIK T. JOHNSON
No. 63882
Exp. 9-30-08
CIVIL
STATE OF CALIFORNIA

600 0 600 1200 1800

SCALE: 1"=600'

EXHIBIT 1
FAIRVIEW DEVELOPMENT CENTER

H:\PDATA\60100326\IMAGES\EXHIBITS\FAIRVIEW DEVELOPMENT CENTER.DWG KLD 5/23/07 12:16 pm

600 0 600 1200 1800

SCALE: 1"=600'

EXHIBIT 2
FAIRVIEW DEVELOPMENT CENTER
PROPOSED DOMESTIC WATER

H:\PDATA\60100326\IMAGES\EXHIBITS\DW-FAIRVIEW DEVELOPMENT CENTER.DWG MTRUJILLO 7/17/07 10:53 am

600 0 600 1200 1800

SCALE: 1"=600'

EXHIBIT 3
FAIRVIEW DEVELOPMENT CENTER
PROPOSED STORM DRAIN

H:\PDATA\60100326\IMAGES\EXHIBITS\SD-FAIRVIEW DEVELOPMENT CENTER.DWG KLO 5/23/07 12:12 pm

600 0 600 1200 1800

SCALE: 1"=600'

EXHIBIT 4
FAIRVIEW DEVELOPMENT CENTER
PROPOSED SANITARY SEWER

H:\PDATA\60100326\IMAGES\EXHIBITS\SS-FAIRVIEW DEVELOPMENT CENTER.DWG MTRUJILLO 7/17/07 10:54 am