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**Memorandum**

To: Ken Schwartz  
Scott Schilt

Date: January 21, 2003

Project No.: 0815700

From: Colleen Collins

Re: Symmes Hospital Reuse Alternatives  
Infrastructure Assessment

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This memorandum summarizes the findings of a preliminary infrastructure assessment of the Symmes Hospital site, including a review of existing utility infrastructure services for the site and an assessment of the utilities in relation to three proposed alternatives. The three alternatives reviewed include various combinations of residential, commercial and medical uses. The assessment also includes the realignment and expansion of the existing Hospital Road. The following areas have been outlined:

- Water Supply
- Sanitary Sewer
- Storm Drain
- Gas Service
- Electric Service
- Telephone
- Hospital Road Realignment

**SUMMARY OF FINDINGS**

- The proposed redevelopment in each of the alternatives for the site will require upgrades of the existing water lines. The existing 6-inch line connecting to Summer Street should be replaced with an 8-inch line, the existing 8-inch line from Woodside lane should be replaced with a new 8-inch line, and the existing 8-inch line connecting to Brattle Street should be replaced with a new 8-inch line.
- Water demands for the three alternatives indicate a higher water usage than the former hospital use, however preliminary assessment indicates that the new lines should provide sufficient service.

- There is sufficient capacity in the existing sanitary sewer pipes to handle flows generated in all three alternatives.
- Proposed redevelopment of the site will require a new storm drain system to mitigate stormwater runoff prior to the drainage system that ultimately discharges to Mill Brook.
- When a final redevelopment program is in place, the existing 2-inch gas line should be evaluated by Keyspan for adequacy.
- Proposed redevelopment of the site should include new underground electric and telephone duct banks connected to Summer Street.

## **ALTERNATIVES**

### *Alternative 1: Mixed Income Housing*

Alternative 1 presents mostly residential uses with some medical office and a Wellness Center. The “Summer Street” area of this alternative remains as open space. The proposed building program for this alternative includes 25 luxury units, 84 units of market rate housing, 32 units of affordable housing and a Wellness Center (50,000 square feet of recreational/therapeutic uses and 40,000 square feet of medical uses).

### *Alternative 2: Commercial/Medical Development*

Alternative 2 contains residential uses, some commercial office space and a Wellness Center. The “Summer Street” area of this alternative, similarly to Alternative A, remains as open space. The proposed building program for this alternative includes 30 luxury units, 34 units of market rate housing, 22 units of affordable housing, 140,000 square feet of Class A office/research and development/medical office space and a Wellness Center (50,000 square feet of recreational/therapeutic uses and 40,000 square feet of medical uses).

### *Alternative 3: Infrastructure Reuse*

Alternative 3 contains residential uses and a Wellness Center on “The Ridge”. The area closest to Summer Street will contain residential housing units. “The Top” area of this alternative is envisioned to be a community park and some residential units. The proposed building program for this alternative includes 25 luxury units, 65 units of market rate housing, 20 units of affordable housing, 76 units of retirement/assisted living housing and a Wellness Center (50,000 square feet of recreational/therapeutic uses and 40,000 square feet of medical uses).

## **INFRASTRUCTURE ASSESSMENT**

Utility analysis is based on plans and information received from the Town of Arlington and from Sodexo Marriott, as well as anecdotal information. The following information was reviewed:

- *Symmes Topographical Survey of Existing Site* prepared by Shepley Bulfinch Richardson and Abbott, dated July 12, 1982
- *New Sewer & Related Work Nurse’s Home to Summer Street* prepared by Kendall, Taylor & Co., Inc., dated July 31, 1974

- *Utilities Underground Plan* prepared by Shooshanian Engineering Associates, dated July 12, 1982, revised January 10, 1983
- *Topographic Plan of Land Belonging to Symmes Hospital* prepared by Norwood Engineering Co., Inc., dated May 14, 1990
- *Sewer Plan & Profile of Hospital Road* prepared by James M. Keane, Town Engineer, dated December 17, 1930
- *Plan & Profile of Storm Drain in Hospital Road* prepared by James M. Keane, Town Engineer, dated March 10, 1938
- *Board of Survey Plan & Profile of Hospital Road* prepared by James M. Keane, Town Engineer, dated June 1947
- Town Plans showing water, sanitary sewer and storm drain locations (Plate XII)

There is a potential for funding by the Town, as part of their existing infrastructure programs, for the upgrades to the existing sanitary and water service, based on conversations with Theresa DeBenedictis, Acting Director of Public Works. Ms. DeBenedictis indicated that the cost of the upgrades would determine the portion that the town can provide. The Town has an estimated annual budget for upgrades to the town-owned utility system.

### **Water Supply**

Existing water service is provided by the municipal system and is a closed loop system. The Massachusetts Water Resources Authority (MWRA) provides water service in Arlington. There is a 6-inch water line that was installed in 1910 that runs from Summer Street up the abandoned Hospital Road<sup>1</sup> through the parking lot adjacent to the Nurse's building, and continues on to the main hospital buildings. There is also an 8-inch line that runs from Woodside Lane and appears to have been installed in 1963. There is an existing 8-inch line that runs from Brattle Street to the north wing of the hospital. There is a 1,000 gallons-per-minute (GPM) fire pump located in the north wing of the hospital building, which was added on in the early 1980s.

According to Ron Santosuosso, the former Town Engineer, there have been no water main breaks on the site. Fred Lamburn, Facilities Manager at the site, does not believe there have been issues with the water service. However, the integrity of the pipes should be investigated to determine if they are tuberculated, given their age.

The proposed redevelopment of the site will require new piping to be installed to meet current standards. An 8-inch water line is proposed as part of the redevelopment of the site. The layout of the water line will be the same in all three alternatives. The pipe should begin at the existing water line in Summer Street, near the intersection with Grove Street, and run up the hill and along the upper portion of the driveway. This pipe replaces the existing 6-inch line. There should also be a new 8-inch line installed from Woodside Lane, which replaces the existing line. The existing line that runs from Brattle Street should also be replaced, maintaining the existing utility easement. The water system will create a loop around the site.

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<sup>1</sup> The abandoned Hospital Road ran adjacent to the east end of the property frontage on Summer Street, traversed the site running west, and then traversed back east in the area of the existing lower parking lot to reach the top of the hill in the same alignment as the current Hospital Road.

Estimated water demand for the three alternatives is as follows:

- Alternative 1: 112,118 gpd
- Alternative 2: 109,230 gpd
- Alternative 3: 116,353 gpd

Water usage is calculated based on sanitary sewer generation. A ten percent increase over the sanitary generation was assumed to allow for irrigation of the site. Water usage calculated for the Hospital as it operated prior to 1999 is approximately 86,970 gpd. A comparison of the estimated water demand for each of the three alternatives and the historic water demand, based on the existing hospital, indicates that the three alternatives generate a higher water usage than the existing use, however preliminary analysis indicates that the new lines should be sufficient.

No hydrant flow data is available in the vicinity of the site; therefore, the adequacy of the system to provide fire protection service to the proposed uses cannot be determined at this time.

### **Sanitary Sewer**

The existing sanitary sewer from the site connects to the municipal system in Summer Street, at the intersection of Grove Street. The 12-inch line runs down the abandoned hospital road, which has since become overgrown. There is a possibility that roots and brush in the area may have penetrated the pipes. Plans dated May 14, 1990 show slopes for the existing sewer line to be as steep as 25 percent in some areas. Existing capacity of the pipes is approximately 5.8 million gallons per day. Sanitary sewer generation is based on the Department of Environmental Protection *Technical Design Guidance for Review of Sewer Connection/Extension Permit Applications* and 314 CMR 7.00. A peaking factor of 2.5 was applied to the sewer generation to determine the flow through the system at the peak time in the day. Estimated peak sewer generation for the three alternatives is as follows:

- Alternative 1: 101,925 gpd
- Alternative 2: 99,300 gpd
- Alternative 3: 105,775 gpd

There is sufficient capacity in the existing sanitary sewer pipes to handle flows generated in all three alternatives. There is no invert information available for the existing lines that run along Summer Street, so the capacity of this line has not been determined. See Attachment A for sewer generation calculations.

### **Storm Drain**

Under existing conditions the upper parking area of the hospital drains to Woodside Lane. The main parking area, the parking area associated with the Nurse's Building and Hospital Road drain to Summer Street. Both storm drain lines eventually discharge to Mill Brook via a 12-foot by 4-foot reinforced concrete culvert.

Proposed redevelopment of the site will require a new storm drain system on the site and may require underground stormwater detention tanks. These detention facilities would serve to mitigate the stormwater runoff prior to discharge to Mill Brook. A hydrologic analysis of the receiving system is necessary to determine if detaining the water is beneficial or if it will cause adverse impacts by delaying the peak at which runoff enters Mill Brook.

Innovative alternatives have been discussed to recharge or reuse storm water on the site, but the existing conditions of the site do not lend toward recharge due to a shallow depth to bedrock. Other alternatives may prove too cost prohibitive.

### **Gas Service**

Keyspan provides gas service to the site. A 2-inch high-pressure gas service runs up the abandoned Hospital Road from the gas line in Summer Street. When a development program has been finalized for the site, gas lines should be evaluated by Keyspan for adequacy. The path the gas line takes has not been maintained; there may be issues with roots affecting the pipe. Proposed redevelopment will require new gas lines to the buildings. If new lines are required from the street, the gas company will install them, but the Town or the developer will be responsible for the excavation of the trenches.

### **Electric Service**

Electric service to the site is provided by Nstar via overhead wires. According to the *Property Condition & Engineering Assessment of Symmes Hospital* prepared by TWB Associates, dated September 28, 2001, electrical service to the main building is rated at 4,000 amps at 120/208 volts, 3 phase, 4 wire; the Nurse's Building is supplied by overhead wires rated at 400 amps, 120/208 volts, 3 phase, 4 wire. The report states that the electrical service is adequate for the current uses of the building. Conversations with Alan McClellan, Director of the Department of Planning and Community Development, indicate that there are no significant power outages on the site. Fred Lamburn, Facilities Manager at the site now, indicated that the lights flicker once in awhile but they don't experience many power outages. He believes they have used the emergency generator two or three times in the past two years. Arlington as a community has experienced power outages during past summer months.

Nstar has prepared a report titled *Arlington Reliability Enhancement*, dated August 12, 2002, which outlines the proposed upgrading of the entire Arlington electric service distribution lines. Future plans include converting existing 4 kV circuits to 13.8kV, and installing new 13.8kV distribution circuits. Complete upgrade in the Town should be finished by April 2004. The upgrades do not include individual properties. Upgrade of the Symmes Site should be coordinated with Nstar.

Proposed redevelopment of the site will include new underground electric and telephone duct banks running from Summer Street at the end of the existing driveway to the top of the site. These duct banks will supply power to all of the buildings. The electric company will lay the necessary pipe, but the Town or the developer will be responsible for excavation of the trenches.

### **Telephone**

Telephone service in the area is provided by Verizon. Proposed redevelopment will require the installation of new telephone lines.

### **Hospital Road Realignment**

The primary access to the site is Hospital Road, which intersects Summer Street. The close location of Hospital Road to the Summer Street/Brattle Street/Hemlock Street intersection creates several access problems for the site. The potential blockage of Hospital Road by the Summer Street westbound queue from the signal at Summer Street/Brattle Street/Hemlock Street intersection makes turning left to and from the site difficult. Furthermore, signalization of the Hospital Road/Summer Street intersection, if deemed adequate, would be difficult given the close proximity to the other intersection.

Alternative 2 includes a proposed realignment of Hospital Road to improve access to the site. The centerline of the realigned road would align with the centerline of Summer Street Place, located between Brattle Street and Grove Street. The road would wind around and join the existing roadway just below the existing helipad. From there it would follow the path of the existing centerline. However, the roadway should be widened to 26 feet from the existing width of 24 feet. The width of the road was increased to allow buses to traverse the road safely.

It is important to note that the proposed alignment of the road is preliminary and has not been engineered. Further engineering design is required to determine if it is feasible, given the steep slopes surrounding the site.

### **RECOMMENDATIONS**

The observations above are based on preliminary analysis and are representative of existing conditions only. In order to fully understand possible issues in relation to viable reuse options we recommend that the following information be gathered:

- Geotechnical information (borings, etc.)
- Hydrant flow data
- Additional information on area wide storm drainage/flooding
- Pipe materials and sizes for water, storm drain and sanitary sewer.

### **CONCLUSIONS**

The site is currently serviced with sufficient utility capacity to provide for a 150-bed hospital and residential living space for approximately 25 nursing students. The demand generated by the three proposed alternatives exceeds the existing demand and will require upgrades to meet current standards. Further investigation is required when a definitive program has been established.