

F. CIVIL ENGINEERING DESIGN NARRATIVE

Overview

Present plans for the Mary Lowell Center call for using a combination of properties in the vicinity of 5th and Washington Streets in downtown Seward. The facility now includes a building of about 40,000 sf located on the west side of the intersection of 5th Avenue and Washington Street, with parking for about 40 vehicles located across 5th Avenue about ½ block north of the building. The parking area will also include a remote heating plant for the building with hot water piping routed across 5th Avenue. As now planned, the buildings will have space for about 100 permanent users and 35 seasonal users, and will have a capacity to handle over 700 visitors at any one time.

Both sites will require the following site utilities:

- water supply for both domestic and fire protection use that meets applicable flow and quality requirements,
- conveyance of sanitary wastewater to appropriate treatment and disposal,
- removal of storm water from the site, meeting applicable flow and quality requirements, and
- electrical power, telephone, and cable television.

The approximate size requirements for each of these services are:

- Building – 3” potable water, 6” fire protection, 4” sanitary sewer, 3-phase power, roof drainage to storm drain, telephone and cable requirements to be determined.
- Parking area/heating plant – 1” potable water, no fire protection, 3” sanitary sewer, storm water treatment for parking area, telephone.

Existing Utility System Capacity and Requirements

Most of the utilities are provided by the City of Seward, with the exception of telephone and cable television service which are provided by private companies. The city uses Municipality of Anchorage standard details and specifications for design and construction of utilities, including services, with the exception that minimum cover requirements are 8-ft for water systems and 6-ft for sewer systems. The following information is based on review of existing city records and discussions with city and state staff.

Water service - The city water system consists of a 12” cast iron pipe along 4th Avenue and a 6” asbestos cement pipe along 5th Street, with a pipe of unknown size connecting the two along Washington Street. The 12” CI pipe was installed after the earthquake in 1965, and the 6” AC pipe was installed in the early 1950’s. Although the city reports no

recent problems with either pipe, both pipes are aging and especially the 6" AC may be approaching the end of its economic life. The city has no current plans for major pipe replacements in the area, although they did replace the 4" gate valve serving the building site (currently Legends Restaurant) last summer. City staff estimate the available pressure in this area at about 60 to 70 psi.

The water pipe along Washington has been identified as either a 6" AC or 4" wood stave pipe on city utility drawings, but no excavations have been done to verify its size, material or condition. Since this pipe is located under the new building, it will be necessary to de-commission it before building construction. If it is taken out of service, the city has requested that the pipe be disconnected at its connections to the mains on 4th and 5th Avenues, and the mains be repaired with pipe sections or full-circle repair clamps to replace the existing tees. The existing details at each main are unknown.

The Seward Fire Department indicates that, during a fire call, they will approach the building from both the east and west sides, and would like to have relatively short access to the main water service entry and alarm panel. With the depth of the water system in Seward, most large diameter service entries are in basements with a nearby stair to street. The present building design allows for this along 5th Avenue near Building Grid 8-F. No basement is available at the Washington Street side of the building.

Sanitary Wastewater - The city has sewer mains in the alleys between 4th and 5th and between 5th and 6th Avenues. The sewers drain down to Railroad Avenue. The sewer crossing the Washington Street right-of-way does not appear to be within the area being vacated for the new building, so the city should be able to access and maintain the sewer without any special easements.

Based on the present building design, a 4" sewer service is required based on fixture units, although a 6" service may be desirable with possible visitor load peaks. Sewer requirements are relatively at the parking lot/boiler building site. In any case, the existing sewers in both alleys appear to be of sufficient capacity to accommodate the new facilities.

Storm Drainage - The proposed facility will have significant areas of impervious surface, and will increase storm water runoff somewhat from that which occurs now. Also, the increased vehicle parking areas will result in more contaminants entering the storm water, and some form of treatment will be necessary where the drain system leaves that site.

Earlier planning documents included consideration of on-site retention of storm water to reduce effects on downstream watercourses, but because the city or MLC storm drainage is discharged directly to Resurrection Bay, there appears to be no need for on-site retention.

Because the area of each site is well below one acre, it appears that State of Alaska Department of Environmental Conservation regulations are applicable to handling storm water. At the building site, all storm water will be from either roof or pedestrian areas, which the ADEC considers to be suitable for discharge without treatment. At the parking

lot/boiler building site, runoff is susceptible to contamination and treatment will be required in accordance with 18AAC72.600. In order to receive a “letter of non-objection” from ADEC, the proposed system must show the ability to remove total suspended solids exceeding 20 microns in size from storm water runoff during storms less than a 2-year, 6-hour event. ADEC has indicated a preference, when feasible, for passive treatment such as drainage swales over mechanical systems.

Presently, the city storm drain system in the area consists of catch basins located at three corners of the 5th Avenue/Washington Street intersection. Most of 5th Avenue and Washington Street drain into these three catch basins. Runoff from properties in the area generally drain to the street gutters or alleys. Storm drains appear to range from 12” to 24” in size and the city reports no problems with the capacity of the system.

It appears that the building site, which consists of mostly roof drainage with some entry plaza area drainage, can be connected to the existing storm drain system without adversely affecting the system. The increased runoff from the parking area could present problems if discharged directly to the street or alley, as now occurs.

Electrical Power - Power is provided by the city of Seward. Two primary circuits are available on overhead poles along the alley between 4th and 5th Avenues, down to Washington Street. The primary power is three-phase, 12,470-volt, Y-configuration, and should be adequate for the anticipated building loads. The building will probably require a pad-mounted transformer in the alley, which could encroach upon the narrow alley unless additional space is obtained either within the new building site from the property across the alley. (*For details of the project electrical needs, see Section D. Electrical Narrative.*)

Telephone, Cable Television – TelAlaska provides phone service and GCI provides cable television service. It appears that data communications can be provided either by TelAlaska’s DSL service or GCI’s cable service. Both companies share poles with the city electrical system. (*For details of the project electrical needs, see Section D. Electrical Narrative.*)

Design Narrative

The proposed utility systems are shown on Drawing C-01. These systems assume that the existing streets in the area will remain approximately as they exist today, with a few exceptions. The eastern half of Washington Street is, of course, vacated for the new building. This may change the use of both Washington and the alley that crosses Washington. For purposes of schematic design, it is assumed that no changes will be made to alignment of either, but it is assumed that the alley will be re-graded and paved the length of the new building to provide better service access to the building as well as better flow of service vehicles from northerly portions of the alley to either Washington or Railway.

Water service – Two options are considered for the water service.

Option 1, the less costly option, would be to install a new 6" service near the existing the 4" service on 5th Avenue, entering the proposed building in the basement mechanical room. The major disadvantage of this option is that it relies on the older, pre-earthquake water main on 5th Avenue. The existing water main on Washington would still have to be re-moved and the mains on 4th and 5th Avenues repaired at the connections.

Option 2, would replace the existing main on Washington with a new 6" main under the proposed building, and tee off this main on the west side of the building to the mechanical room in the basement. The major disadvantage to this plan would be the installation of the water main under the building and the potential for building disruption if the pipe ever requires excavation and repair. Valving the pipe at each building wall would allow abandonment of the pipe in such an event, but water service would then rely on the 6" main in 5th Avenue.

Since the city has requested the removal of the existing water main on Washington all the way to the existing mains on 4th and 5th, the additional cost of installing a new main in this section is probably not a major incremental cost in the total project budget. Given this factor, and the additional security that connecting to both existing mains on 4th and 5th would provide, it is recommended that the Option 2 be implemented as shown on Drawing C-01.

Sewer Service – The sewer connection appears relatively straightforward, making use of the nearby sewer main in the alley between 4th and 5th Avenues. The main is 7 to 9 feet deep and the alley is only 20 feet wide, so trench shoring will be required.

Storm Drainage – Siting the building across Washington Street presents some problems. The existing street drainage on Washington flows westerly to the catch basins at the NW and SW corners of 5th and Washington, and will therefore be blocked by the new building. At least one and probably two new catch basins will be needed on Washington along the west side of the building. Based on information provided by the city public works staff, it appears that the existing storm drain manhole on 4th Street may be deep enough to receive drainage from the new catch basins at the west wall of the new building. A new storm drain along Washington Street to this location will require replacement of much of the pavement along Washington. Because no storm drain system exists on Railway Avenue, the only option to a new storm drain back along Washington would be a new storm drain under the building to the existing catch basin location at the SW corner of Washington and 5th. For purposes of schematic design, the new storm drain is shown to 4th Avenue, but should final survey information differ from preliminary data or changes occur in plans for Washington Street, a storm drain under the building could be considered in final design.

The storm drain system at the parking lot/boiler building site on 5th Avenue will require some form of treatment before discharge of runoff. A swale is proposed on the south side of the site with discharge to a new storm drain in the alley between 5th and 6th Avenues. If porous soils are encountered at the swale site, most of the runoff during normal rainfall

events may infiltrate resulting in little or no discharge. It is possible that mitigated runoff from major rainfall events could be discharged to the street or alley as now occurs. Without more subsurface soils information, it is not possible to estimate infiltration and flow mitigation, so the new storm drain will be included in schematic design plans.

Electrical Power, Telephone, Cable Television – All of these will be installed in underground conduit from overhead systems in the alley at each site. A pad-mounted transformer will be required at the building site on Washington Street.

Paving – It is assumed that the following pavement work will be required:

- Pave the alley between 4th and 5th from north side of building site to Railway
- Remove and re-pave trench section on Washington for new water main and new storm drain.
- Remove and re-pave trench sections on 4th Avenue for the new water main crossing.
- Remove and re-pave trench sections on 5th Avenue for the new water main, heating water crossing of street, and new water service for boiler building.
- Remove and re-pave trench section across Railway Avenue for the new storm drain crossing.

Alternatives to Address the Percentage of Available Budget

There appear to be few if any elements of the civil utility systems that can be modified to significantly address the project budget. Most of the utility systems connections are required regardless of the building alternatives.

Some relatively minor changes could be made if the size of the proposed building is significantly reduced, including:

- The fire protection service could be reduced from 6",
- The potable water service could be reduced from 3",
- The sewer service could be reduced from 4",
- The electrical power service may be reduced sufficiently to allow use of a pole-mounted transformer on the city system.

If the parking lot proposed on 5th Avenue is reduced or eliminated, the drainage swale and storm drain could be reduced in size or eliminated.

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