



CENTERLINE

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DESIGN MEMORANDUM

TO: Growth Management
FROM: Lawrence M. Kostaneski, PE
DATE: May 12, 2006

RE: 05-106 Village at Founders Park: Preliminary Plans Submittal

CC: Founders Park, LLC

Message: Please reference attached information.

Founders Park is the previous Federal Beef Packing Plant site. (W ½ NW ¼ SE ¼ 35-2N-7E) The site is planned for mixed use professional offices / residential. A grading project effectively raised the site above the Rapid Creek 100 yr BFE between ~ 423,450 (Section Z) and 424,190 (Section AA). Ref map panel 465420 0004F February 16, 1996. See also Floodplain Development Permit.

Water: See included routing schematic.

After preliminary submittals and continued discussion, Growth Management has concluded that a 10" CL 150 PVC water main is the minimum needed to serve the proposed project. The analysis relied on a CETEC preliminary design report and construction plans for the Omaha Street project. The following assumptions were used.

1. A PVC main was modeled that connects to an existing 10" PVC on the west side of I-190, follows the proposed infrastructure corridors westerly and connects to the existing system in W. Chicago / 12th Streets. Three scenarios were examined. J-4 is the project footprint high point.
 - a) A new 12" main loops through Founders, crosses Rapid Creek and connects to the 12" installed at the intersection of 12th St and Omaha St. J-4 is ~4,000 gpm @ ~20 psi. This is an alternate requested by the city.
 - b) The new 12" loops through Founders and connects to the existing 8" in W. Chicago St. J-4 is ~ 3,725 gpm @ ~ 20 psi.
 - c) **A new 10" is used in scenario b. J-4 is ~ 3,300 gpm @ ~ 20 psi.**
2. 2000 gpm is supplied from the water treatment plant via the existing 30" main. (J18 WTP)
3. Current programming at J2 is for 6 stories, Type 1A or 1B construction, ~ 60,000 SF total. 2003 IFC, Table B105.1 identifies 2,750 gpm @ 20 psi for this construction.
4. All valves in the existing system are open, except the zone separation valves.
5. I-190, 8th St., 5th St. and East Blvd nodes use simultaneous 500 gpm demands.
6. Both 3406 reservoirs are operational. The "full" elevation was set at 3400 MSL.
7. Performance of any node is dependent on the actual system characteristics at the time of demand.

The summary reports identify the demand and residual pressure at the nodes shown. All demand nodes exceed 20 psi in the scenario used.

After evaluating the alternatives, the least disruptive construction routing of the east segment connects to the existing 10" west of W. Blvd. North, proceeds north to Philadelphia Street then splits into two legs. The first leg crosses Philadelphia and connects to the existing 6" on the north side. The second leg continues along the south side of Philadelphia, crossing north at the approximate location of a proposed intersection with a realigned Philadelphia Street.

The north side of Philadelphia is congested with fences, sidewalks, etc. There is also little room for a new main given the location of the existing 6". Since this area will likely be re-developed in the next 5 years, it is economically prudent to wait until then, eliminating the need for service disruptions, difficult construction and unnecessary costs.

Sewer:

The existing system in W. Chicago St is a mix of line sizes. Founders will extend a 10" PVC main north in the newly created major utility and drainage easement (formerly West St.) at varying slopes. The minimum is 0.50%. A 10" PVC (.012), 0.8 full at 0.5% slope carries ~ 680 gpm. Modeling the existing system is beyond the scope of this submittal. It's assumed the existing system will handle the increase.

Service area basins were drawn from the Morningside Drainage Basin Design Plan, specifically Sub basins B, C and D, for a total of ~ 145 acres. The combined service area is on a very rugged east flank of the "hogback, north of Rapid Creek, east of I-190.

Using an optimistic 1 du / ac is 145 du. $145 \times 4 \times 100 \text{ gpcd} \sim 40 \text{ gpm}$. Peak at 3x is 120 gpm. Assuming a concentration of multi-family dwellings might raise the number to 400 du, and multi family population is more on the order of 2.5 persons: $400 \times 2.5 \times 100 \text{ gpcd} \sim 70 \text{ gpm}$. Peak at 3x ~ 210 gpm. Assuming 20% commercial type use produces $30 \text{ ac} \times 5 \text{ gpm} \sim 150 \text{ gpm}$. A total of 360 gpm with peak factor is well within the capacity of the proposed system.

Storm Drainage: See included basin boundary map and routing schematic.

The Morningside Drainage Basin Design Plan, April 1998, specifically identifies Sub-Basin B as the contributing area to the project footprint. The Design Plan did not identify any specific conveyance elements for this sub-basin. Assumptions used:

1. A 100 yr storm was used for sizing the inlets and culverts at the project discharge points. However, the 100 yr storm is largely irrelevant in this instance since the Rapid Creek 100 yr BFE will influence any discharge along this reach.
2. The project geometry creates 3 distinct contributing areas within Sub Basin B. 40 % is routed to the vacated West Street drainage easement. 30 % is routed to W. Chicago St within the project footprint. 30% is routed to Rapid Creek through the south parking lots.
3. The culverts @ 1+75 +/- W. Chicago are influenced by tailwater created by the various Rapid Creek flood stages. Tailwater elevation 3234 has been included as a discharge parameter for the culvert performance. This is the approximate 50 yr Rapid Creek stage.
4. Hydrograph 1 routes the entire north 40% of the sub-basin to the culverts @ 1+75. The culverts at 12+35 were ignored for routing purposes - a conservative approach.

Please call with questions. Thanks.

