Gray & Osborne, Inc.
CONSULTING ENGINEERS

MEMORANDUM

TO:	BRIAN JOHNSON, WATER SYSTEM SPECIALIST
FROM:	KERRI SIDEBOTTOM, P.E.
DATE:	JANUARY 28, 2022
SUBJECT:	204 4TH STREET FIRE FLOW AVAILABILITY CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON G&O #21415.09

Per your request, I have analyzed the available fire flow at one existing hydrant located on West Meeker Street at 4th Street SW and one potential hydrant on West Pioneer, west of 4th Street SW, in the central part of the City's water service area. The setup of the hydraulic model and the assumptions used to determine the static pressure and available fire flow are noted below:

- The available fire flows and pressures are measured at Nodes J-2069 and J2132, corresponding to existing Hydrants SW005 and a proposed hydrant, respectively, as shown on the attached Figure 1.

- Water system demands are based on projected 2038 demands and reservoirs are depleted of fire suppression and equalizing storage as established in the 2019 Water System Plan (WSP) approved by the Department of Health (DOH). The City's water model was updated in 2021 to reflect additional system improvements since the WSP was developed.

- All pump stations are idle and the Salmon Springs source is operating at 1,100 gpm.

The hydrants are located Zone 1, which is supplied by Maplewood Springs and the 15th Avenue SE Reservoirs. For the analysis of Hydrant SW005, the system was modeled as is with no new piping proposed, or with the existing 4-inch pipe on West Meeker Street between 4th Street SW and 5th Street SW upsized to 8 inches. The proposed hydrant is modeled on the existing 10-inch main along West Pioneer with the rest of the system as is.

The available pressure under 2038 peak hour demands at the hydrant is included in Table 1.

TABLE 1

Peak Hour Pressure

Node	Hydrant	Elevation (ft)	Peak Hour Pressure (psi)
J-2069	SW005	40	54
J2132	Proposed	39	54

Available fire flow was modeled at one existing hydrant, Hydrant SW005 (Node J-2069), which is located on an existing 4- and 8-inch main along West Meeker street, north of the site. This node was analyzed with the system as is and with the 4-inch main along West Meeker Street from 4th Street SW to 5th Street SW upsized to 8 inches. Fire flow was also modeled at a proposed hydrant (J2132) located on an existing 10-inch main along West Pioneer, south of the site, with the rest of the system piping as is. The results of this modeling are included in Table 2. The modeled fire flow is available at either hydrant individually, but not both simultaneously.

TABLE 2

Modeled Fire Flow Availability

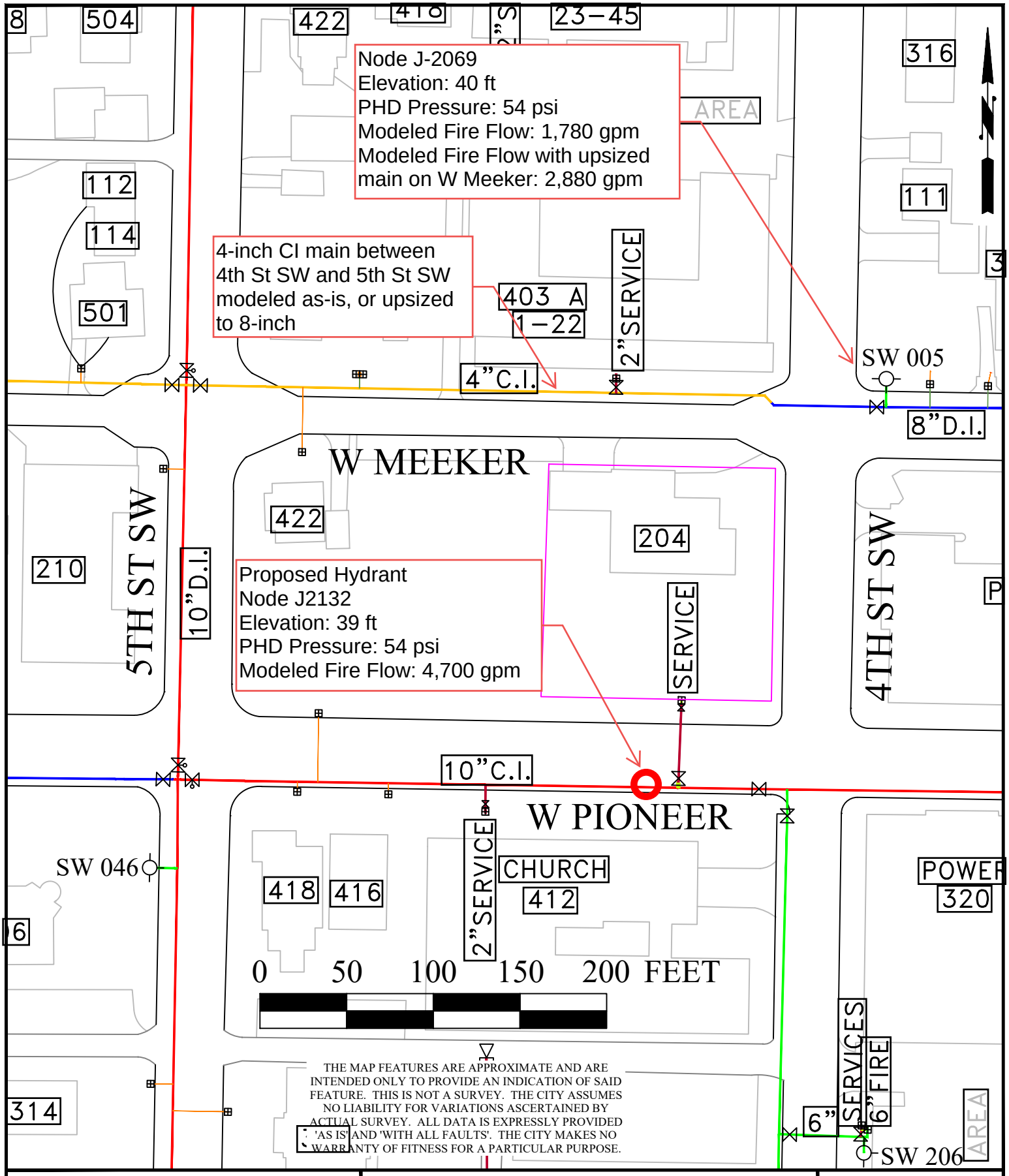
Node	Hydrant	Available Fire Flow (gpm)	Residual Pressure at Available Fire Flow (psi)	Minimum System Pressure at Available Fire Flow (psi)
J-2069	SW005	1,780 (1)	37	30
J-2069 with upsized main on West Meeker	SW005 with upsized main on West Meeker	2,880 (1)(2)	35	30
J2132	Proposed	4,700 (1)	34	29

(1) Limited by maximum system-wide velocity of 10 fps.
(2) Modeled with existing 4-inch main on West Meeker between 4th Street SW and 5th Street SW upsized to 8 inches.

Fire flow to Hydrant SW005 is limited by the 10 fps maximum velocity through the pipe along West Meeker Street, while fire flow to the proposed hydrant is limited by velocity through the 10-inch main on West Pioneer.

The DOH and City standards for water distribution systems are to meet the peak hourly demand of the system while providing a minimum pressure of 30 psi system-wide. Under peak daily demand with a fire flow, the system is designed to maintain a minimum pressure of 20 psi system-wide. Although the peak hourly demand pressure may currently be higher than these standards, the developer must recognize that the City may not provide pressure higher than 30 psi in the future. The flows and pressures determined in this memo are based on the approximate hydrant elevation at ground level. The developer may design their sprinkler system for whatever pressure they wish; however, they must recognize and be responsible for conditions when the pressure may be less than currently exists.

KS/hh
Encl.



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CITY OF PUYALLUP
PUBLIC WORKS
WATER DIVISION

HYDRAULIC MODEL FOR 204 4TH ST SW

SCALE AS SHOWN

01/26/2022

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