PRHM20231549

Gray & Osborne, Inc.
CONSULTING ENGINEERS

MEMORANDUM

TO: BRIAN JOHNSON, WATER SYSTEM SPECIALIST
FROM: KERRI SIDEBOTTOM, P.E.
DATE: NOVEMBER 13, 2023
SUBJECT: 111 – 201 WEST MAIN FIRE FLOW AVAILABILITY
CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON
G&O #21415.17

Per your request, I have analyzed the available fire flow at two existing hydrants located at 111 and 201 West Main, 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 as follows.

- The available fire flows and pressures are measured at Nodes J2228 and J2230, corresponding to existing hydrants NW290 and SW209, respectively, as shown in 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 in Zone 1, which is supplied by Maplewood Springs and the 15th Avenue SE Reservoirs. The system was modeled as-is, with no new piping proposed at this time.

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

TABLE 1

Peak Hour Pressure

Node	Hydrant	Elevation, feet	Peak Hour Pressure, psi
J2228	NW290	44	51
J2230	SW209	45	51

Available fire flow was measured at two existing hydrants: Hydrant NW290 (Node J2228) and Hydrant SW209 (Node J2230). The first hydrant is located on an existing 6-inch fire main dead-end within the property, while the other is located on an existing 8-inch main in the street. The results of this modeling are included in Table 2. The modeled fire flow is available at any hydrant individually, but not simultaneously.

TABLE 2

Modeled Fire Flow Availability

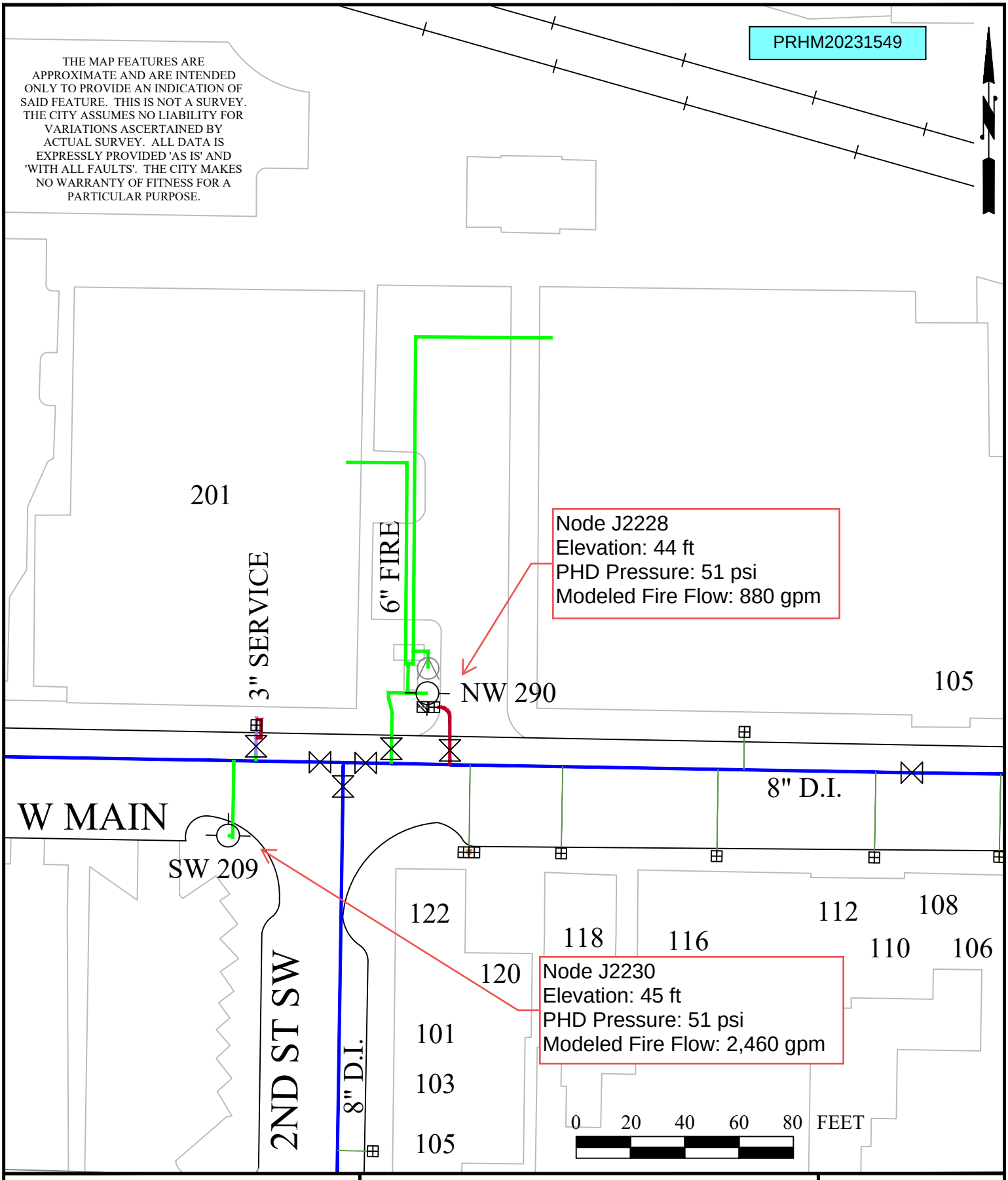
Node	Hydrant	Available Fire Flow, gpm	Residual Pressure at Available Fire Flow, psi	Minimum System Pressure at Available Fire Flow, psi
J2228	NW290	880(1)	42	30
J2230	SW209	2,460(1)	38	30

(1) Limited by maximum system-wide velocity of 10 fps.

Fire flow to both of the hydrants is limited by the 10-fps maximum velocity through the existing 6-inch fire main and the 8-inch pipe on West Main. The dead-end fire main supplying Node J2228 is only 6 inches in diameter and cannot supply more than 880 gpm without exceeding the 10-fps velocity limit. However, Node J2230 is located on an 8-inch diameter main that provides water from two directions, and as such, can sustain a higher flow under the velocity and pressure constraints.

The Department of Health 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/sr



CITY OF PUYALLUP
PUBLIC WORKS
WATER DIVISION

HYDRAULIC MODEL FOR 111 - 201 W MAIN

SCALE AS SHOWN

11/08/2023

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