Fire Flow Calculation Requirements for Mixed Construction Type Buildings and/or Mixed Hazard Classification

2022 CFC section 507.3
Effective Date: January 1, 2023

Calculations per SFM interpretation 11-015.
Fire Flow Requirements with Mixed Construction and Mixed Hazard
(SJ Muni Code 17.12 Part 13 Table B105.1(3))

Fire Flow Calculations for mixed construction type buildings and/or mixed hazard classification require the following information and calculations to be submitted with the initial plan sets to the Building Division. The summary of the calculations shall be listed on the plan.

Info Required on Submittal Package:

NAME OF PERSON/FIRM NAME & PHONE #:
NAME OF PROJECT:
PLANNING NO.:
DESCRIPTION:
LOCATION:
ADDRESS:
- Building Size (sf):
- Construction Types:
- Hazard Classifications:
- Occupancy Group:
- Number of Stories (above grade):

Example of calculation submittal:

Example Building: Type VA residential building over Type IA podium structure. 20% of the Type IA podium is utilized for light-hazard commercial space and 80% is utilized as a parking garage.

Building Size and Construction Type:
Type IA Building: 383,815 gross square feet
Type VA building: 443, 333 gross square feet
Total building area 307,052 square feet (Type IA – Garage) + 76,763 square feet (Type IA – LH commercial) + 443,333 square feet (Type VA – Residential and common use) = 827,148 square feet

Hazard Classification: OH (ordinary hazard) and LH (light hazard)

Occupancy Group: R-2 over S-2/B occupancy groups.

Number of Stories: Four stories over three story podium

Percentage of building IA (Garage-OH) = 307,052/827,148 × 100 = **37.1%**; **IA (Commercial-LH)** = 76,763/827,148 × 100 = **9.3%**; percent **VA (Residential-LH)** = 443,333/827,148 × 100 = **53.6%**

Fire flow per construction type is Type **IA (OH)** at 827,148 square feet = **6,000** gpm (25% reduction allowed By SJFD for OH) = **4,500** gpm; Type **IA (LH)** at 827,148 square feet = **6,000** gpm (50% reduction allowed By SJFD for LH) = **3,000** gpm; Type **VA** at 827,148 square feet = **8,000** gpm (50% reduction allowed By SJFD for LH) = **4,000** gpm

Therefore 0.371 (**4,500** gpm) + 0.093 (**3,000** gpm) + 0.536 (**4,000** gpm) = **1,670** + **279** + **2,144** = **4,093** gpm = Approximately **4,250** gpm (Round up based on SJFD fire flow policy) is the required Fire Flow for this project.

However:
The Fire Flow Duration, Hydrant Locations and Distribution are to be based on the full Fire Flow required per Table B105.1(3) from SJ Muni Code 17.12 Part 13.

Therefore 0.371 (**6,000** gpm) + 0.093 (**6,000** gpm) + 0.536 (**8,000** gpm) = **7,072** = Approximately **7,250** gpm (Round up based on non-sprinklered fire flow value)

Based upon 7,250 gpm Fire Flow (based on non-sprinklered fire flow value) from Table B105.1(3) from SJ Muni Code 17.12 Part 13, there needs to be a minimum of 8 hydrants with an average spacing of 200 ft for the duration of 4 hours. The frontage distance based on the 7,250 gpm flow requirement is 120 feet. Although only 4,250 gpm is being required, each (any) hydrant shall be capable of delivering at least 1,000 gpm at 20 psi on its own.

See SJFD Fire Flow and Hydrant Chart for reference.

Alternative fire flow calculations may be acceptable. However, these calculations must be evaluated and approved by the SJFD.