California State Fire Marshal
CODE INTERPRETATION

Date Issued	12/19/11	Interpretation	11-015
Topic	Fire Flow Requirements with Mixed Construction		
Code Section(s)	CFC 2010, Appendix B, BB		
Requested by	Thomas McKinnon, President Aegis Fire Systems, Inc. a subsidiary of AFPG 500 Boulder Court, Suite A Pleasanton, CA 94566 925-417-5550		

1. **In buildings of mixed Type I and Type V construction types; is it the intent of the code to require the fire flow for the respective construction types be added together to establish the minimum required fire flow for the site?**

Typically no, buildings with two types of construction may be calculated for each type of construction used within the effective area of the building. The values are then multiplied by their individual percentage of the total area and then added together. The Fire Flow without reductions pertinent to the entire building is the sum of these values. For examples of how to calculate fire flow for buildings with mixed construction types, the 2009 IFC Code and Commentary for Appendix B, Section B105 (published by the ICC) provides an explanation of the intent and examples. The following excerpts from the commentary have been reviewed and accepted by the OSFM and provide an acceptable means of compliance.

"Table B105.1 states the fire-flow and duration requirements based on the fire area, as defined by the definition in this appendix and Section B103, and the construction types defined in the IBC. As the construction type becomes more combustible, the fire-flow requirements will increase. Likewise, as the area of the building increases, the fire-flow requirements increase. The last column also specifies a minimum duration of fire flow. The duration of fire flow varies from a Minimum of 2 hours to 4 hours. Flow duration may be an issue that each jurisdiction may need to consider when assessing the capabilities of the department, the hazards presented and the realistic availability of water supply.

Applying this table, for example, a 50,000-square-foot (4546 m_2) Type IV building would require a fire flow of 4,000 gpm (15 140 L/min) with a duration of 4 hours. If the building was sprinklered and the full 75-percent reduction was allowed, the required fire flow

would be 1,500 gpm (5678 L/min) [75-percent reduction would result in 1,000 gpm (3785 L/min), which is lower than the minimum of 1,500 gpm) (5678 L/min)].

This table does not address use and occupancy classifications. A Type IA construction building housing a Group A occupancy would be treated the same as a Type IA construction building housing a Group H or Group F occupancy. Again, this table was formed based on the approaches presented by the ISO Guidelines which focus on construction types. It should be noted that Group R occupancies are specifically allowed a 25-percent reduction. This reflects the reduction allowed by the ISO Guidelines for residential occupancies.

A common question asked when applying this table is how to deal with a building that incorporates multiple construction types. Such scenarios would be better addressed through a percentage approach. For example, in a building that has two construction types, Types IA and VA, having areas of 25,000 square feet (2323 m$_2$) and 10,000 square feet (929 m$_2$), respectively, the fire flow would be calculated as follows:

Total building area
25,000 square feet (Type IA) + 10,000 square feet
(Type VA) = 35,000 square feet (3252 m$_2$)

Fire flow per construction type
Type IA at 35,000 square feet = 2,000 gpm (7370 L/min)
Type VA at 35,000 square feet = 3,250 gpm (12 112 L/min)

Percentage of building
IA = 25,000/35,000 × 100 = 71.4 percent
VA = 10,000/35,000 × 100 = 28.6 percent

Therefore
0.714 (2,000 gpm) + 0.286 (3,250 gpm) = 2,357.5
= Approximately 2,350 gpm (8894 L/min)"

2. **If a structure fully conforms to CBC Section 509.2 would it be required to combine the fire flows for a structure containing a Type IA Private Parking Garage to a Type VA Residential Apartment Building built above the garage structure?**

No (see above) this scenario is addressed in the answer above.