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This article tells about a new form of framing for use in high-rise building applications. It was designed in the mid 1990’s by a construction consortium looking for a more cost-effective way to build in areas vulnerable to earthquakes. They came up with the precast hybrid moment-resistant frame, or PHMRF. At the time this article was written this method had been used in three building either complete or nearing completion. One of these buildings will be a thirty-nine-story apartment building, the world tallest concrete building in an area at high risk of earthquakes.

This method is one of the first to safely use lateral concrete members in a zone four seismic region. This is made possible because of the special joints used between the concrete beams and the columns. The beams and columns are fitted together with mild steel bars that are slipped into PVC ducts placed inside the beams and columns. Post tension cables are then ran through hollows in the beams, holding the building plumb. These cables are designed to pull the building back into place after an earthquake. The joints are bonded together with a special fibrous grout that allows the joint to flex without causing damage. This method of building also saves money when compared to building with steel. Floor heights can be smaller, which means less materials are used on the interior walls and less skin material is needed on the outside eventually saving millions of dollars on large projects. The precast concrete can also be used without the need for additional exterior skin. PHMRF uses framing members cast in a factory instead of on site. This controlled environment allows for better structural quality and more uniformity colors can also be added when the concrete is going to be the finish of the building.

These projects do take a large amount of highly detailed planning to get right. PHMRF is considered to be one of the most challenging ways to build. Despite the intricacies involved in this form of building it is still very cost-effective means of constructing a large building in an earthquake prone area. This factor means PHMRF will probably be seen a lot more in the future.