

# Understanding Moment Frame Construction

## What It Is, Why It Matters, and Why This Building is Extraordinary

*160 West 900 South* was built with a steel moment frame — the structural system that is the engineering gold standard for serious commercial buildings, and almost never used at this scale. This exhibit explains what that means in plain language and why it matters for anyone considering this property.

### Part One: What Is a Moment Frame?

Every building needs a structural skeleton — a system of beams, columns, and connections that holds it up and keeps it stable when forces act on it. Those forces come from gravity (the weight of the building and everything in it), and from lateral forces like wind and earthquakes.

Most commercial buildings use one of three structural systems to handle these forces. Understanding the difference between them is the key to understanding why a moment frame is exceptional.

	Moment Frame	Braced Frame	Shear Wall
Seismic Performance	Exceptional	Good	Moderate
Open Floor Plans	Fully unobstructed	Limited by diagonal braces	Severely limited
Design Freedom	Maximum	Moderate	Low
Large Windows Anywhere	Yes	Restricted by braces	Not possible
Future Interior Changes	Completely free	Braces are fixed	Walls are structural
Relative Cost to Build	Premium	Economical	Moderate
Used at 160 W 900 S	Yes	No	No

#### 1. Braced Frame — The Standard Choice

In a braced frame, diagonal steel members are added between vertical columns to resist sideways forces. Think of X-shaped crossbars inside a rectangular box. It works — but those diagonal braces must stay in fixed locations forever. They cannot be moved or removed without rebuilding part of the structure. They also restrict where windows can go and how interior spaces can be laid out.



## 2. Shear Wall — The Most Restrictive

A shear wall uses solid concrete or heavily reinforced panels to resist lateral forces. These walls are literally load-bearing structure — they cannot be modified, relocated, or removed. Buildings with shear walls have fixed, permanent layouts for their entire life.

## 3. Moment Frame — The Premium Solution

A moment frame is fundamentally different. Instead of adding diagonal braces or solid walls, the structural strength is engineered directly into the connections between beams and columns. These joints are welded and designed to be completely rigid — they resist rotation and transfer forces through the frame itself, without any additional members crossing the open space inside.

The result is a building where the structural system is invisible. There are no diagonal braces interrupting the floor plan. No walls that cannot be touched. The interior is completely free.

### A Useful Analogy

*Think of a braced frame like a bicycle wheel with spokes — the spokes (diagonal braces) are what keep it rigid. Strong, but you cannot remove a spoke without compromising the whole wheel. A moment frame is more like a solid cast wheel — the strength is built into how the pieces connect, not in additional cross-members filling the space. You get the same performance with complete freedom inside.*

## Part Two: The Benefits

### 1. Seismic Safety That Protects People and the Building

Salt Lake City sits adjacent to the Wasatch Fault — one of the most seismically active fault systems in the United States. The U.S. Geological Survey has identified a major earthquake along this fault as a significant and credible regional risk. In this context, structural system selection is not an abstract engineering choice. It is a life-safety and investment-protection decision.

Moment frames are engineered specifically to perform in earthquakes. Rather than resisting seismic forces by being rigid and brittle, a moment frame absorbs and dissipates seismic energy through controlled, ductile behavior. The frame is designed to flex without fracturing — the same principle that makes a green branch bend where a dry one snaps.

- Seismic forces are distributed evenly across the entire frame rather than concentrating stress at a single point.
- The ductile welded connections absorb significant energy before sustaining structural damage.
- Post-earthquake, a moment frame building is far more likely to be repairable — and far less likely to face condemnation — than a building with a more brittle structural system.

### 2. Complete Interior Freedom — Today and for Every Future Owner

Because structural strength lives in the frame, connections rather than interior walls or diagonal braces, every square foot of interior space at 160 West 900 South is architecturally free. There are no load-



bearing interior walls. No diagonal steel members that cannot be moved. No structural constraints on where partitions, openings, or layouts are placed.

- Interior walls can be moved, added, or removed without structural engineering review.
- Fully open floor plates are achievable on both levels.
- Large window openings are possible in any location on the exterior.
- Future tenant improvements are dramatically simpler and less expensive than in a braced-frame building.

### 3. Architecture Without Compromise

Moment frames are the preferred structural system for architecturally serious buildings because they allow the design to be fully realized without structural constraints. The glass curtainwall, the clean sightlines, the unobstructed floor plates, and the expansive windows at 160 West 900 South are not just aesthetic choices — they are made possible by the structural system beneath them. In a braced frame building, the windows and open spaces you see here would have required compromise. Here, none was made.

### 4. Durability Built for Generations

Steel moment frames are engineered for the long term. Properly designed and maintained, they carry service lives measured in generations. The welded connections that define a moment frame do not experience the wear and fatigue that pinned connections in braced frames can develop over time. This building was completed in 2019. A buyer is acquiring a structure that is, in engineering terms, essentially new.

## Part Three: Why This Is Extraordinary at This Scale

Understanding the benefits of a moment frame is one thing. Understanding why it is remarkable that a building of 8,127 square feet has one requires a bit more context.

### 1. The Economics of the Decision

Moment frame construction costs significantly more than braced frame construction. The premium comes from several compounding factors:

- Engineering complexity: Every connection joint requires specialized structural engineering and detailed calculation.
- Fabrication precision: Moment frame connections are welded to exacting tolerances and must be rigorously inspected — this demands skilled labor and strict quality control.
- Material: The steel sections used are typically heavier and more robust than those in braced frames.
- Construction time: Erecting a moment frame takes longer, adding to overall project cost.

As a result, developers building speculative commercial space almost universally choose braced frames. They are faster, cheaper, and adequate for code compliance. Moment frames are reserved for buildings where the owner has either a specific performance requirement, a strong design vision, or the commitment to build the absolute best — regardless of cost.



## 2. The Scale Factor

For large institutional buildings — corporate headquarters, major civic structures, high-rise towers — moment frame construction is common because the building's size and value justify the investment. The cost premium, spread across hundreds of thousands of square feet, becomes manageable per square foot.

At 8,127 square feet, the math works differently. The engineering, fabrication, and construction costs do not scale down because the building is small. Those costs are largely fixed. The owner of 160 West 900 South made the deliberate decision to absorb them on a building of this scale — a decision that is nearly without precedent in this market.

The result is a small commercial building with the structural DNA of an institutional trophy asset. That is precisely what makes it one of a kind.

## Part Four: Future Options This Structure Provides

The moment frame structure of this building has direct implications for what a future owner can do with the property — both in terms of use and long-term investment strategy.

### 1. Unrestricted Reconfiguration at Any Time

Any future occupant — whether the immediate buyer or a subsequent tenant — can reconfigure the interior of this building without structural constraint. In a braced-frame or shear-wall building, significant reconfiguration often requires engineering review and, in some cases, is simply not possible without major structural work. Here, that question does not arise.

### 2. Compatibility With the Full Range of MU-5 Permitted Uses

The MU-5 zoning permits an extraordinary range of uses — medical clinic, hospitality, residential, gallery, restaurant, professional office, and many others. Each of these uses has different interior layout requirements. The moment frame structure means none of these uses is constrained by the building's skeleton. Whatever the future use, the interior adapts. A rigid shear-wall or braced-frame structure could make certain conversions impractical. This one does not.

### 3. Seismic Resilience as Long-Term Asset Protection

In a major seismic event along the Wasatch Fault, the difference between a building that sustains minor damage and one that requires demolition is often the structural system. This building was built to survive. That resilience is not just a safety feature — it is an investment thesis. The structural quality of 160 West 900 South reduces the risk profile of the asset in a way that no amount of cosmetic renovation can replicate in a lesser building.



## In Summary: What the Structural System Actually Means for a Buyer

- A structural system reserved almost exclusively for large institutional buildings — deployed here at 8,127 square feet.
- Exceptional seismic performance in one of the most seismically active metro areas in the western United States.
- Complete interior freedom — no structural constraints on layout, now or in the future, for any owner.
- The architectural prerequisite for the glass, the openings, and the design integrity that define this building.
- A structural asset with a service life measured in generations, completed in 2019 — essentially new.
- The single largest cost driver that separates this building from every other small commercial property in Utah — and the reason it cannot be replicated at this acquisition cost.

