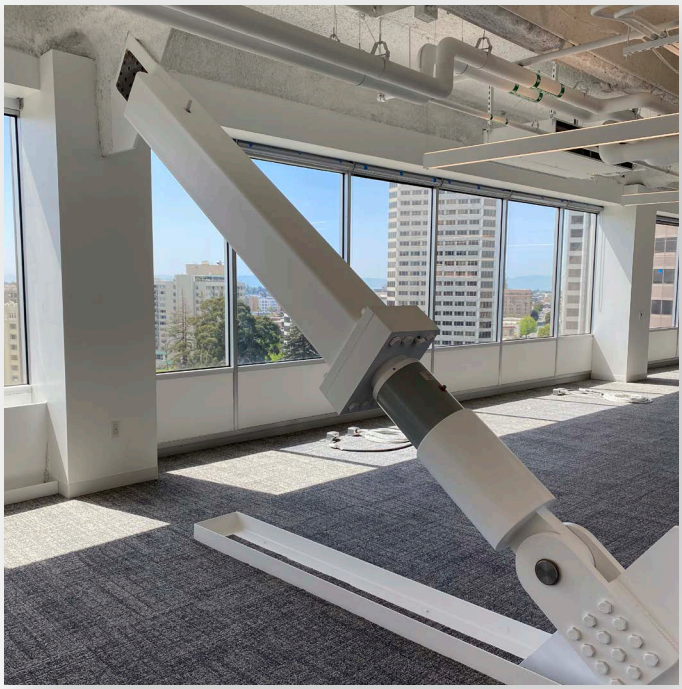
taylor devices inc.

# TAYLOR DAMPED MOMENT FRAME™

## DAMPER DESIGN *SIMPLIFIED*

- Approval Through ICC-ES Process
- 30% Reduction In Steel
- ≥ 25% Reduction In Base Shear
- No Peer Review Required
- No Time-History Analysis
- Shortened Design Time



## The New Taylor-ed Solution

Our new Taylor Damped Moment Frame™ (TDMF™) procedure simplifies the design process, eliminating the need for nonlinear time-history analysis and peer review. The prescriptive method decouples special steel moment frame design from the damper frame, allowing for easier analytical models, less guess work on damper properties, and smoothing coordination with Taylor Devices.

ICC ES

This procedure has approval* by ICC-ES through the rigorous AC494 procedure, including validation with over 80 archetype structures using the FEMA P-695 methodology.

** expected approval by February 2023*

Phone: (716) 694-0800 | 90 Taylor Drive, North Tonawanda, NY 14120 | www.taylordevices.com

## SYSTEM REQUIREMENTS

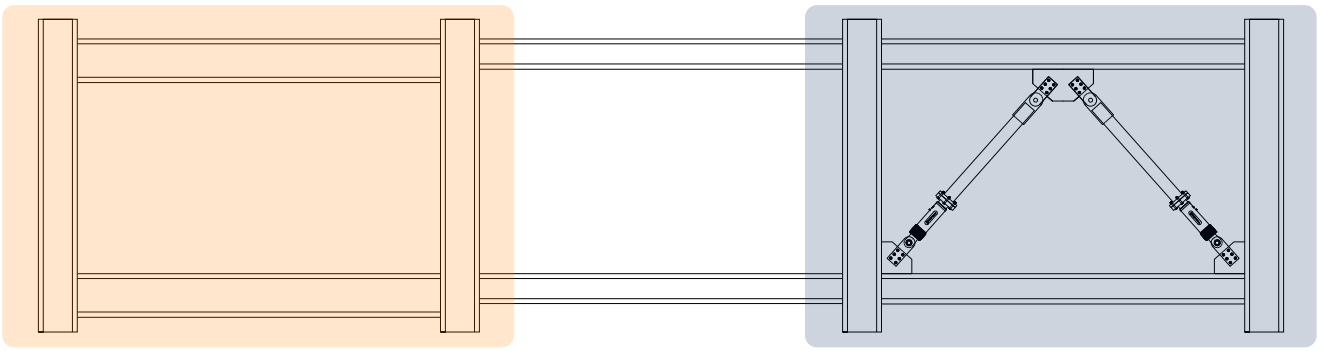
- At least 2 dampers in each principal direction at each floor
- Rigid diaphragm
- < 300’
- No extreme torsional irregularity

## PROCEDURE VALIDATION PROCESS

- ICC-ES: AC494 – Qualification of Building Seismic Performance of Alt. Seismic Force-Resisting Systems
- Following FEMA P-695 methodology
- 80+ archetype structures designed by Englekirk Structural Engineers including SidePlate frames
- Analysis conducted by HB Risk and Jim Harris of J.R. Harris & Co.
- Peer reviewed by content experts
- Invested over 4,000 hours to develop and validate the procedure

### SPECIAL STEEL MOMENT FRAME

### DAMPED FRAME

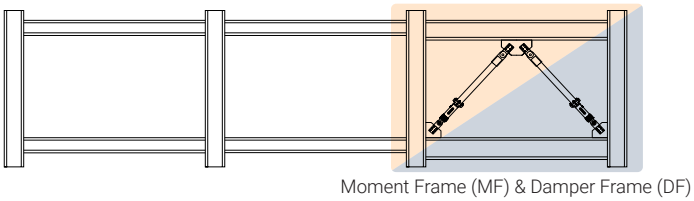


- Designed using Modal Response Spectrum Analysis
- Scale MRSA base shear to 75% of ELF base shear
- R = 8
- $C_d$ = 4.5 (instead of 5.5)
- Ω = 3
- Computer model does not include damper elements

- Damper behavior: $F = CV^{\alpha}$
- α (damper exponent) = 0.4
- C (damper constant) determined through prescriptive approach
- Damper frame designed with overstrength on damper force
- Provides 25% effective damping at DBE level

Type II

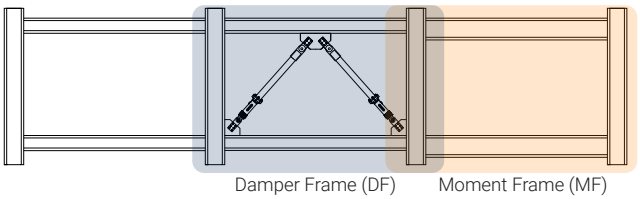
Shared Elements



Moment Frame (MF) & Damper Frame (DF)

Type III

Partial Shared Elements



Damper Frame (DF) Moment Frame (MF)

### COMBINED LOAD EFFECTS

$$E_h = max(Q_{MD}, Q_{TD}, Q_{MD} \pm 0.7\,Q_{TD})$$

$Q_{MD}$ = load effects from max. displacement stage

$Q_{TD}$ = load effect from Taylor damper