Masonry Case Studies

STAIR AND ELEVATOR TOWER DESIGN

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LEARNING OBJECTIVES

Develop understanding of the following:

• Lateral Load Resisting Systems
• Masonry Performance for Stair and Elevator Tower Design
• Masonry Advantages in Multi-Story Construction

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California State University (1994)

Photo Credit: USGS
MEANS OF EGRESS OVERVIEW

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NATIONAL FIRM. STRONG LOCAL CONNECTIONS.
MEANS OF EGRESS OVERVIEW

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LATERAL LOAD RESISTING SYSTEMS
LATERAL LOAD RESISTING SYSTEMS

Frame Systems

Braced Frames

Moment Frames

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LATERAL LOAD RESISTING SYSTEMS

Shear Wall Systems

Masonry/Concrete

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Wood/CFMF

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LATERAL LOAD RESISTING SYSTEMS

Photo Credit: NEHRP
LATERAL LOAD RESISTING SYSTEMS

Figure 6-7 – Partial-depth collector.

Photo Credit: NEHRP
MASSONERY PERFORMANCE
STAIR AND ELEVATOR DESIGN
MASSONRY PERFORMANCE

Photo Credit: Stevens

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Photo Credit: Bergmann
MASONRY PERFORMANCE

0.1" Horizontal Deflection Per Floor = H/1400

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MASSONRY PERFORMANCE

0.08” Horizontal Deflection

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MASONRY PERFORMANCE

0.02" Horizontal Deflection

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MASSONRY ADVANTAGES
STAIR AND ELEVATOR DESIGN
MASONRY ADVANTAGES

Speed of Construction

Photo Credit: Bergmann

Photo Credit: Bergmann
MASONRY ADVANTAGES

Speed of Construction

**STAIR HANGER**

SCALE: 3/4" = 1'-0"

NOTES
1. MAXIMUM HANGER LOAD SHALL NOT EXCEED 1000 LB
2. SPACING SHALL BE DETERMINED BY ENGINEER OF RECORD

Photo Credit: Bergmann

Photo Credit: Bergmann
MASONRY ADVANTAGES

Speed of Construction

DIAPHRAGM EDGE NAILING TO LEDGER BOARD PER PLAN
1 3/4"X11 7/8" LVL LEDGER BOARD

SIMPSON STRONG-TIE
1/2" DIA X 6" LG TITEN
HD ANCHOR @ 2'-0" OC

FLOORING PER ARCH
SUBFLOOR PER PLAN
FLOOR JOIST PER PLAN

TO WALL PER PLAN
TOBB PER PLAN

CEILING PER ARCH
1 3/4"X11 7/8" LVL BLOCKING @ 4'-0" OC

REINF CMU WALL PER PLAN

REINF CMU WALL PER PLAN
FLOORING PER ARCH
SUBFLOOR PER PLAN
FLOOR JOIST PER PLAN
CEILING PER ARCH

TO WALL PER PLAN
TOBB PER PLAN

DIAPHRAGM EDGE NAILING TO BLOCKING PER PLAN
SIMPSON STRONG-TIE
1/2" DIA X 6" LG TITEN
HD ANCHOR @ 0'-8" OC

2X BLOCKING BETWEEN JOISTS

SIMPSON STRONG-TIE
HU2.1/8 HANGER W/ 14-TTN25234H FACE FASTENERS & 6-10d X 1 1/2" JOIST FASTENERS

NOTES
1. WEB STIFFENER REQUIRED AT BEARING FOR I-JOISTS
2. JOIST HANGER BASED ON 2" JOIST WIDTH AND 11 7/8" JOIST DEPTH

SECTION 7
SCALE: 3/4" = 1'-0"

Photo Credit: Bergmann

SECTION 8
SCALE: 3/4" = 1'-0"
MAASONRY ADVANTAGES

Construction Safety and Bracing

Photo Credit: Bergmann

Photo Credit: Bergmann
MASTONRY ADVANTAGES

Structural Performance

Photo Credit: Bergmann

Photo Credit: Bergmann

SCALE: 3/4" = 1'-0"
MASONRY ADVANTAGES

Structural Flexibility

2 - #5 BARS AT 64" ON CENTER
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