Heifer International Center
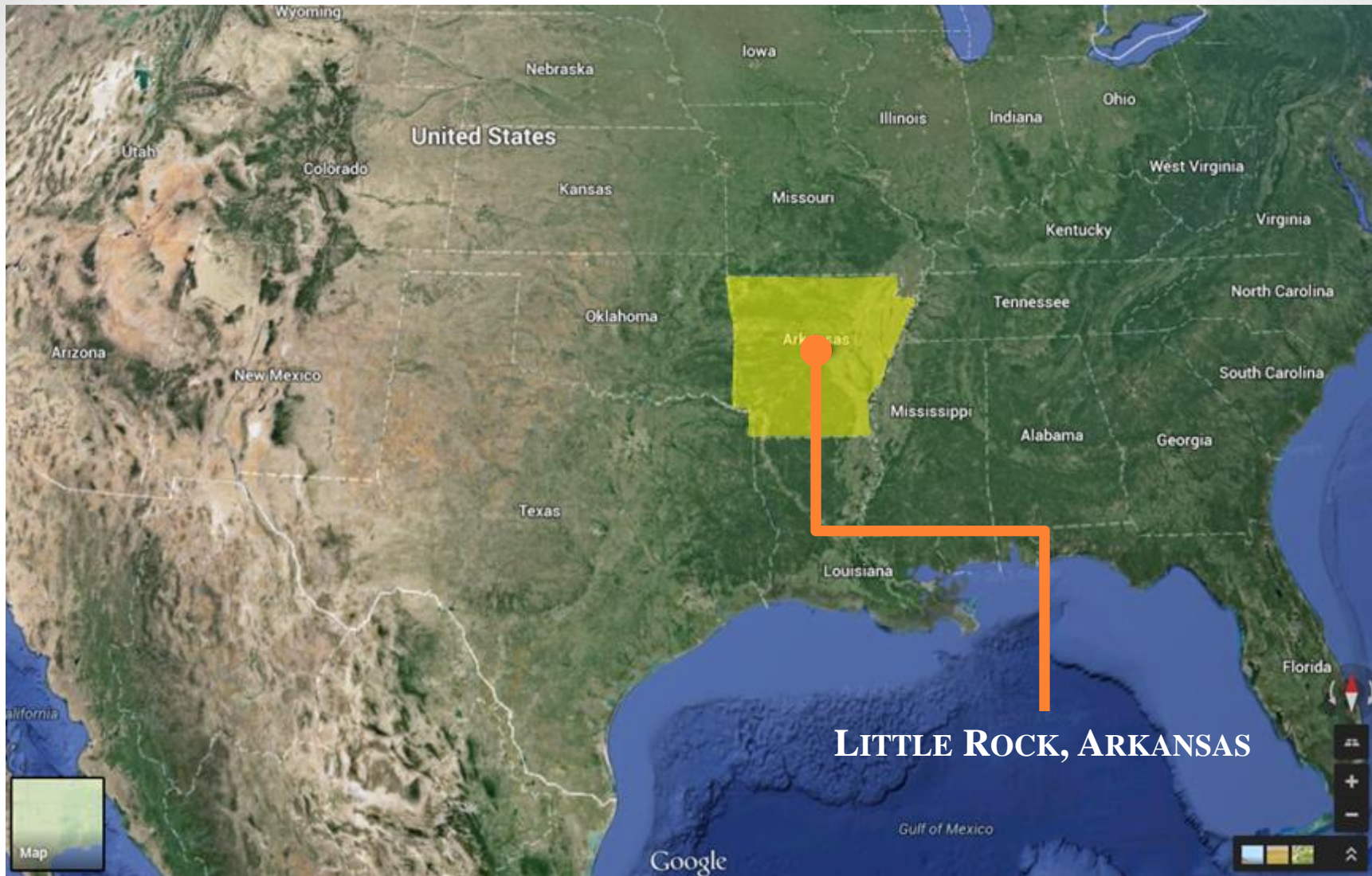
Little Rock, Arkansas

Technical Report IV

Sikandar Porter-Gill

Advisor: Dr. Thomas Boothby

LITTLE ROCK, ARKANSAS

SITE AND LOCATION

DOWNTOWN LITTLE ROCK

WILLIAM J CLINTON PRESIDENTIAL
LIBRARY & MUSEUM

HEIFER INTERNATIONAL CENTER

LITTLE ROCK, ARKANSAS

Image Courtesy: Heifer International and Meredith Parks

HEIFER INTERNATIONAL CENTER

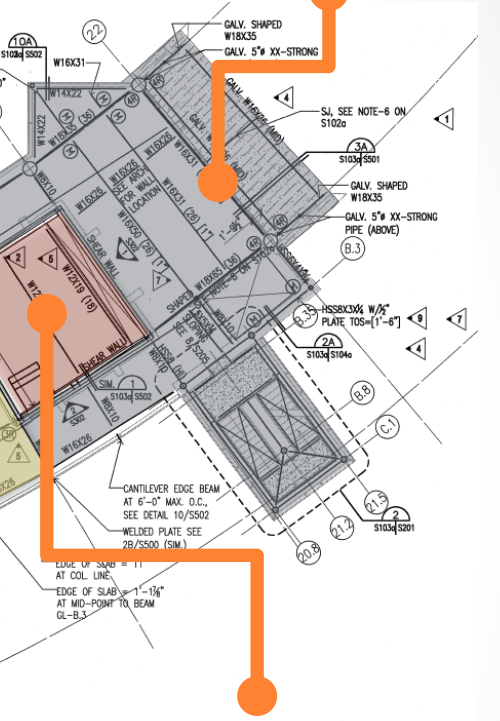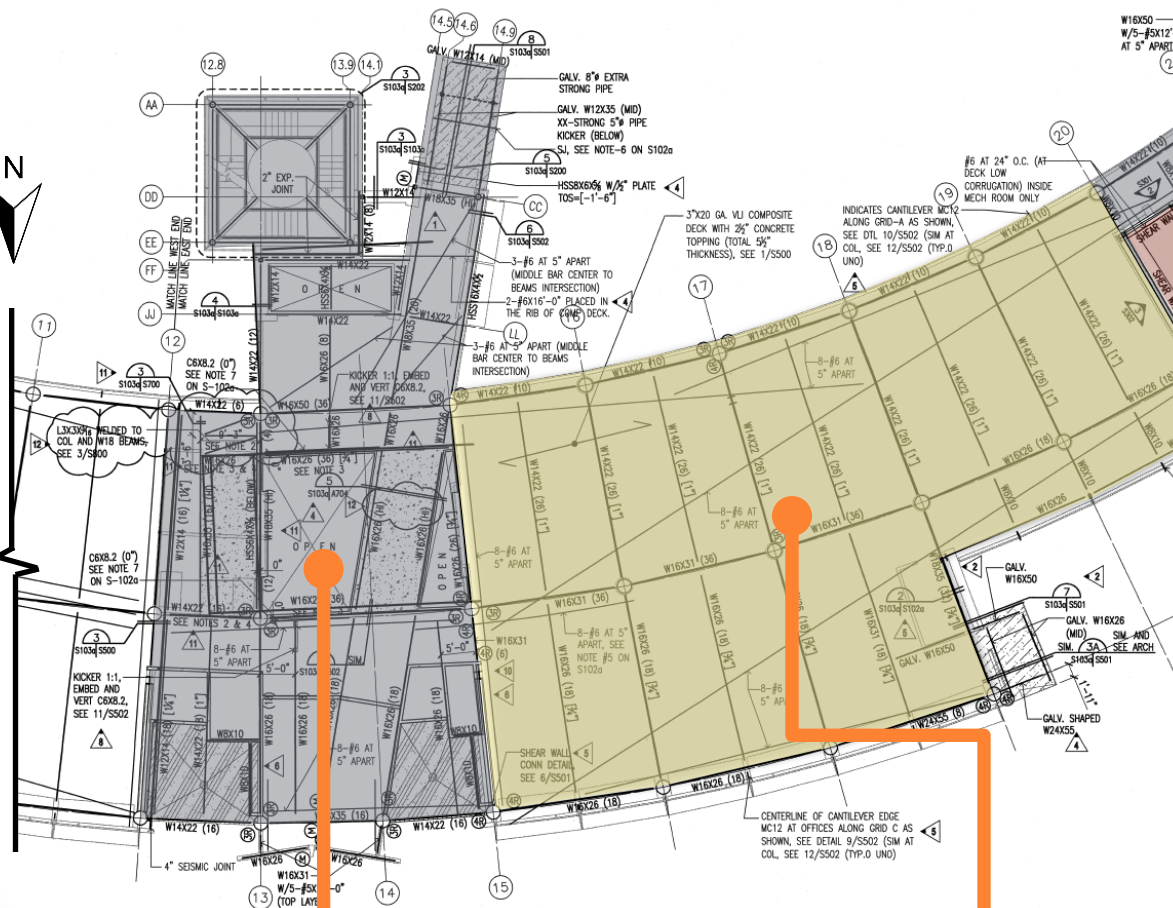|	
Height	65'-0"
Stories	4
Square Footage	98,000 GSF
Construction Dates	February 2004 – January 2006
Approximate Cost	$18 million
Project Delivery	Construction Management at Risk
USGBC Rating	LEED Platinum

PASS ON THE GIFT

HEIFER®
INTERNATIONAL

POLK STANLEY WILCOX
ARCHITECTS

CROMWELL

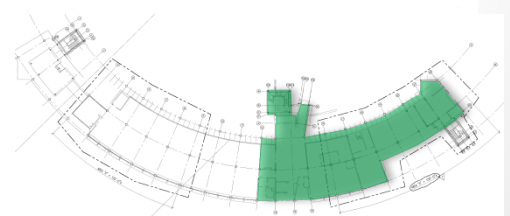# TYPICAL FLOOR PLAN

64'-0"
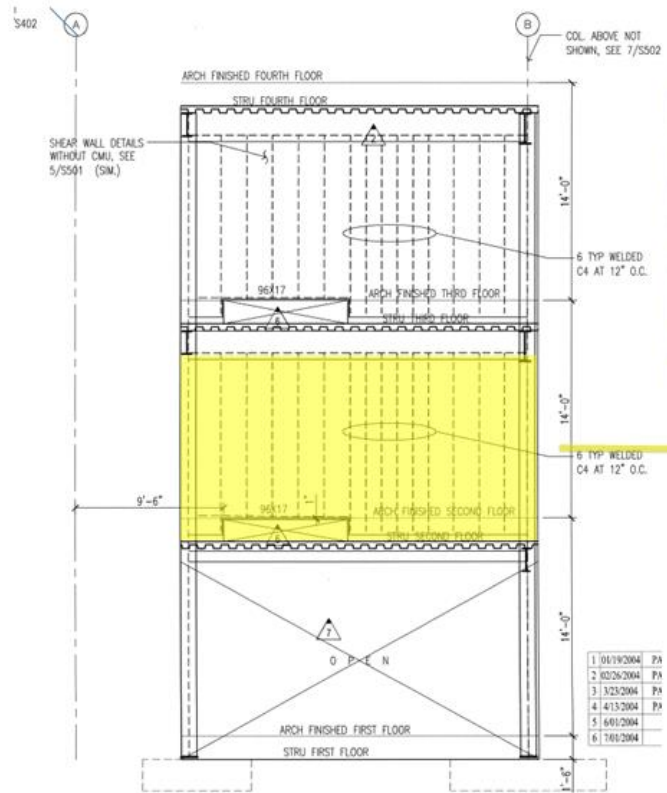
N

491'-0"
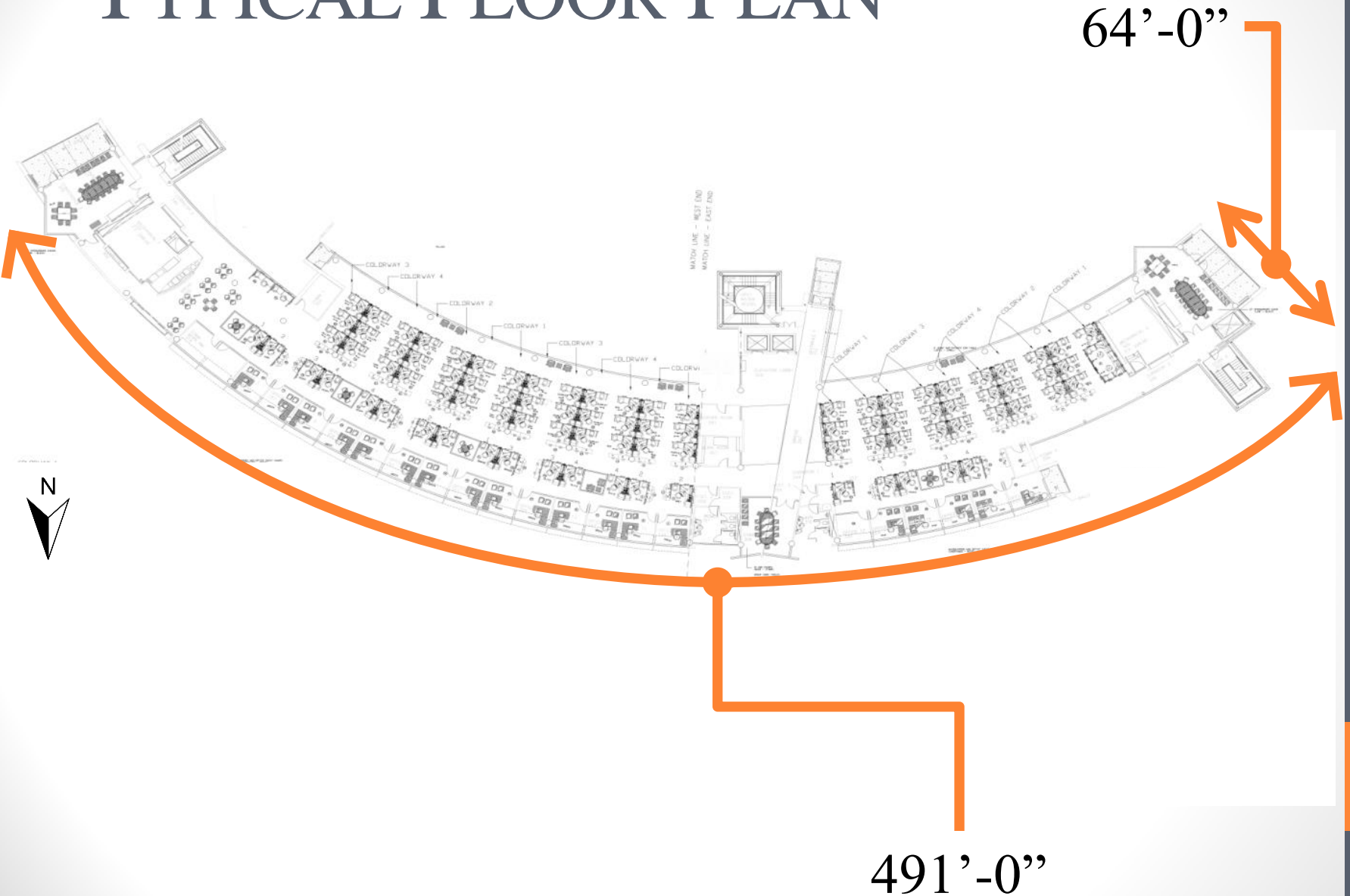
TYPICAL FLOOR PLAN

PUBLIC AREAS

MECHANICAL SPACE

PUBLIC AREAS

OFFICES

LATERAL FORCE RESISTING SYSTEM

- Composite Lateral System
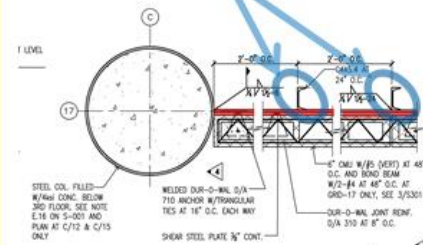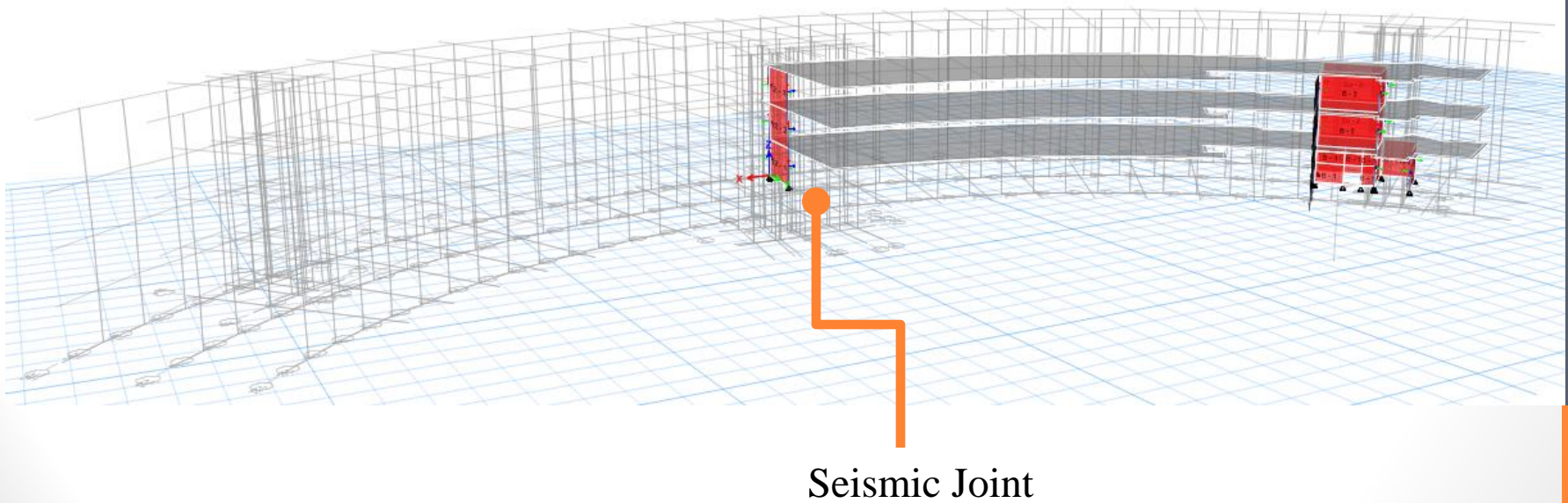 - Steel Plate Shear Wall
  - CMU Masonry Wall
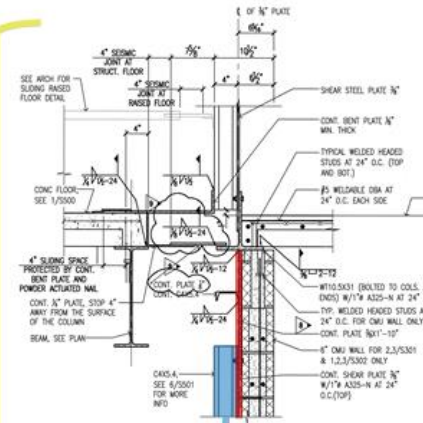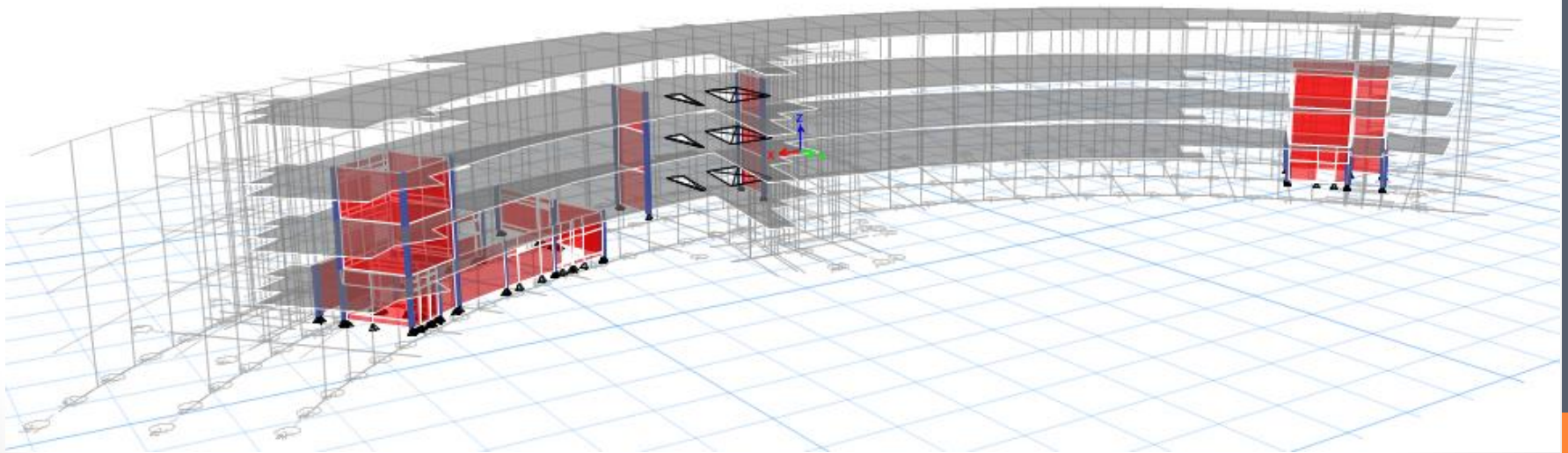
ETABS Model

- Lateral Force Resisting System
  - Steel Plate Shear Wall

ETABS MODEL

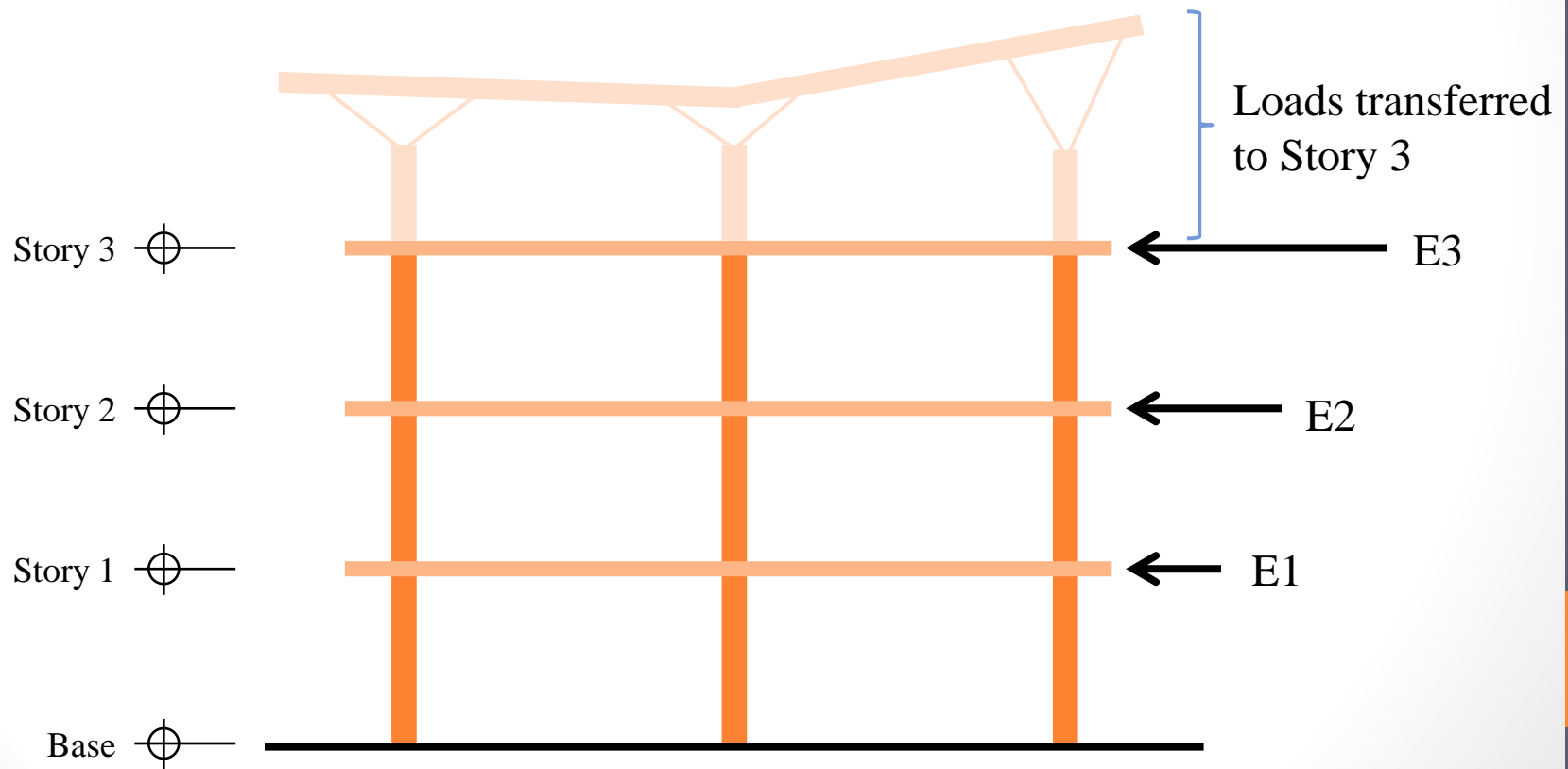- Lateral Force Resisting System
  - Steel Plate Shear Wall

Seismic Joint

ETABS MODEL

- Lateral Force Resisting System
  - Steel Plate Shear Wall
    - Converted to equivalent concrete shear wall

Steel Plate Shear Walls

Columns

Rigid Diaphragm

Pinned Restraint
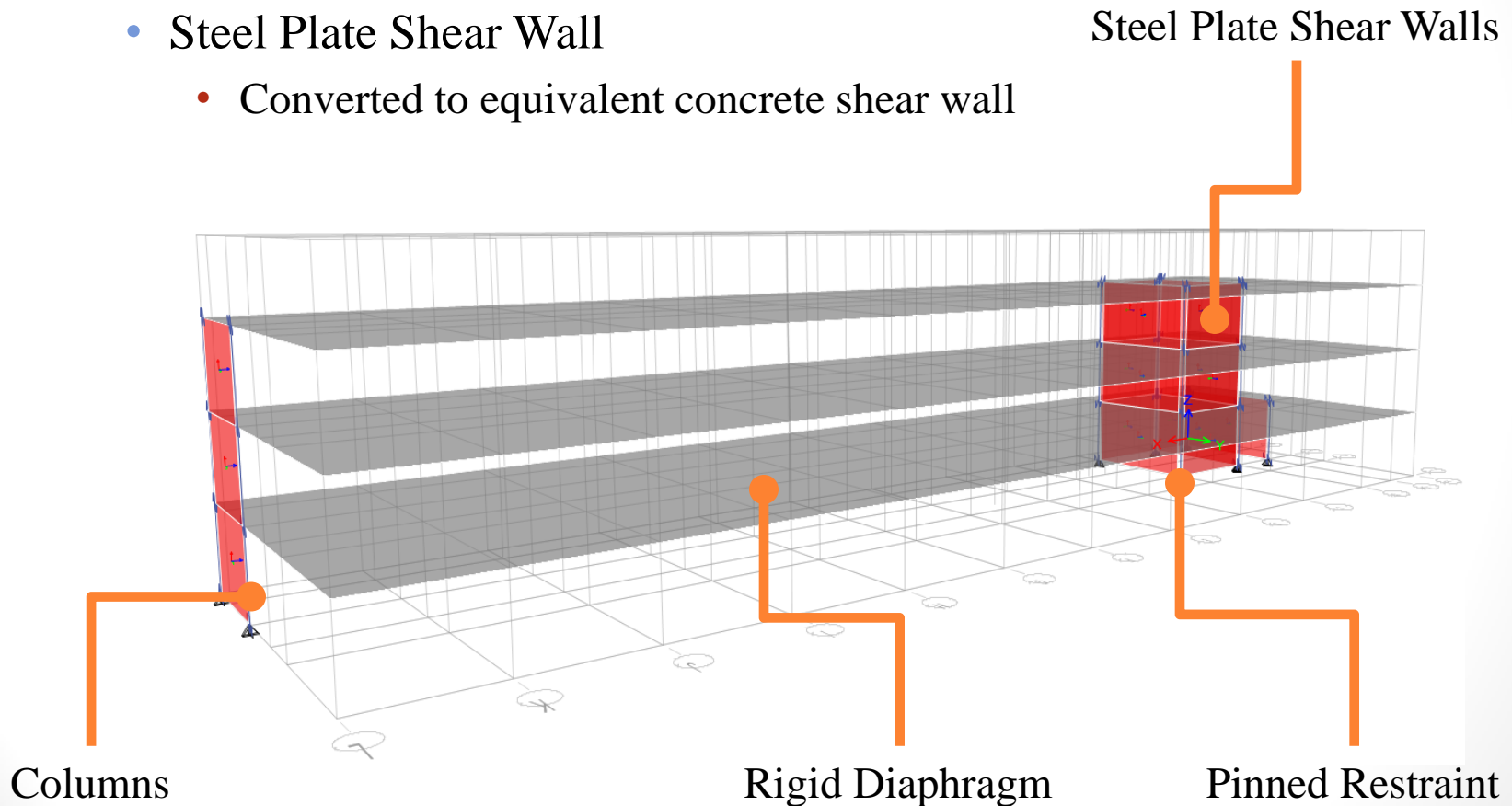
SEISMIC LOADING

- Reduction of loading

Loads transferred to Story 3

Story 3 — E3

Story 2 — E2

Story 1 — E1

Base
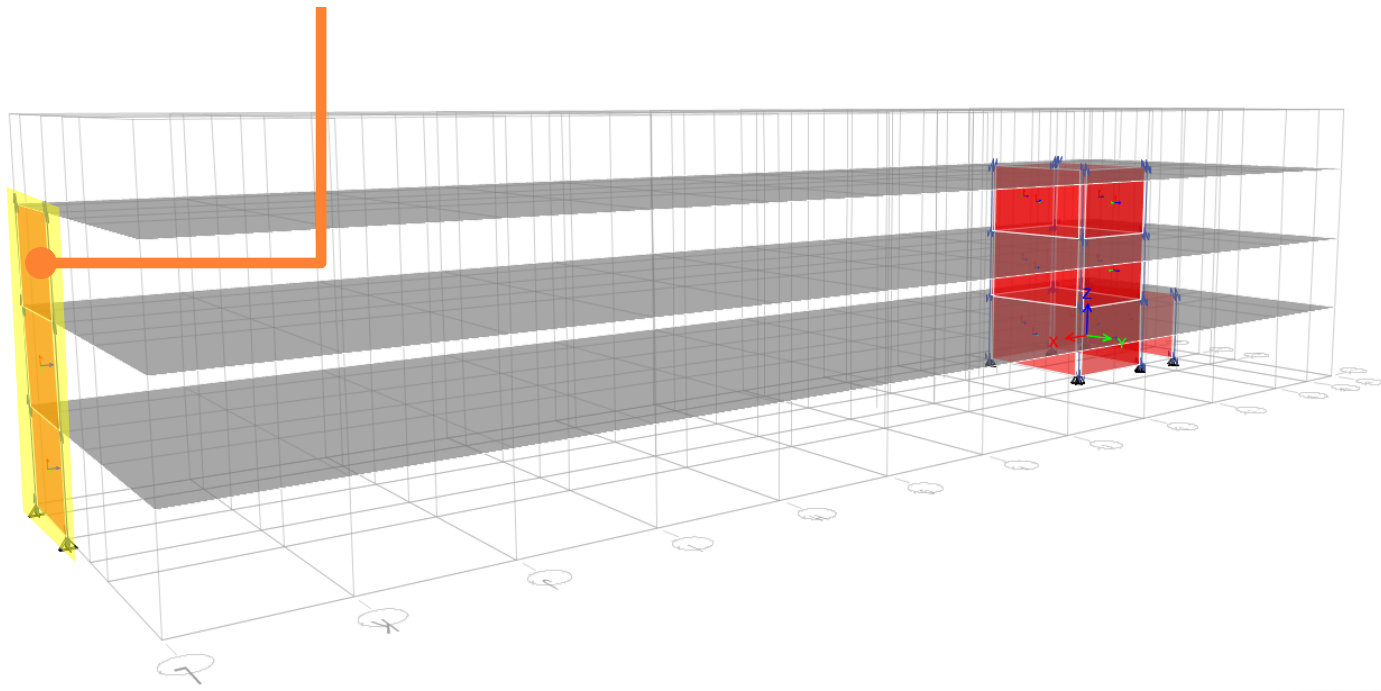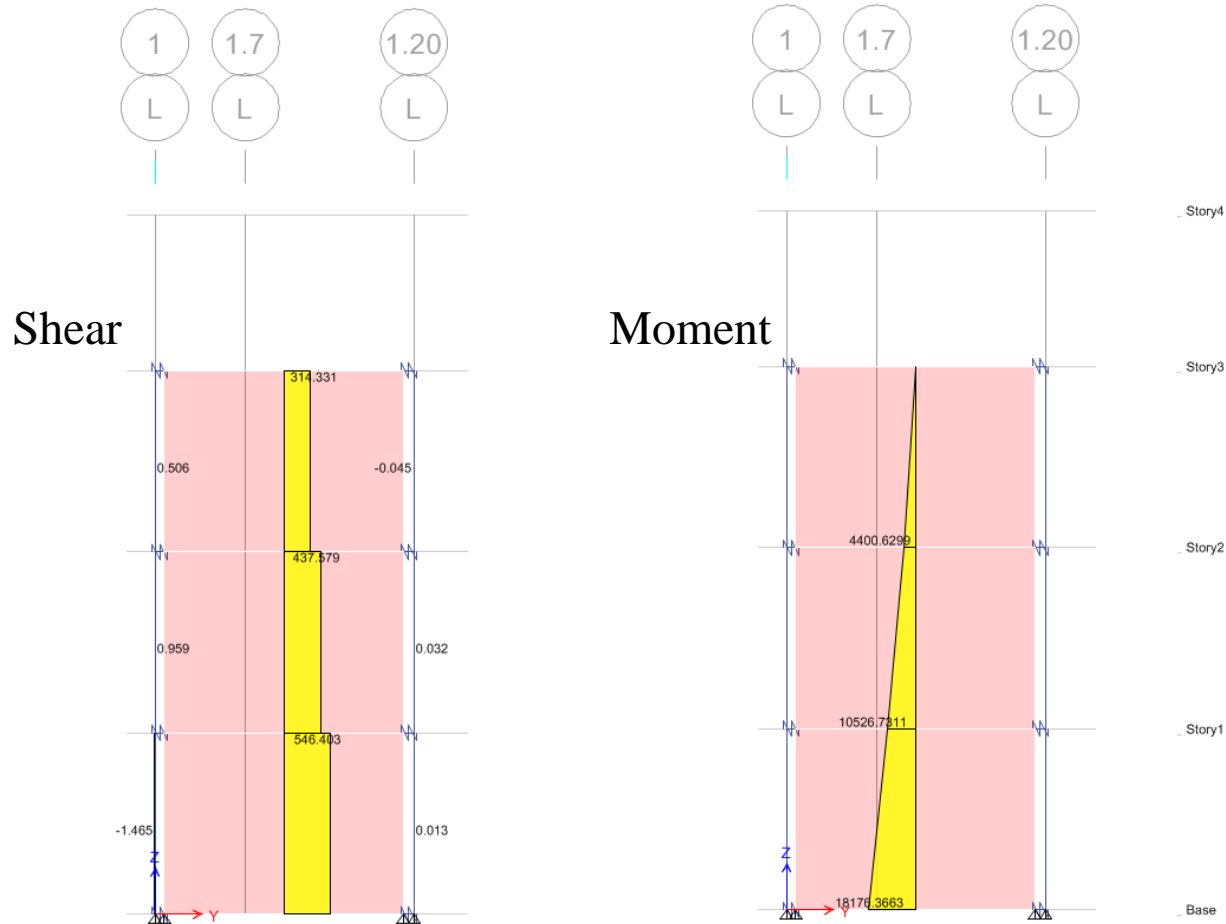
CRITICAL LFRS ELEMENT

- Seismic | Y-Direction Loading

SW-13 @ Column Line 12
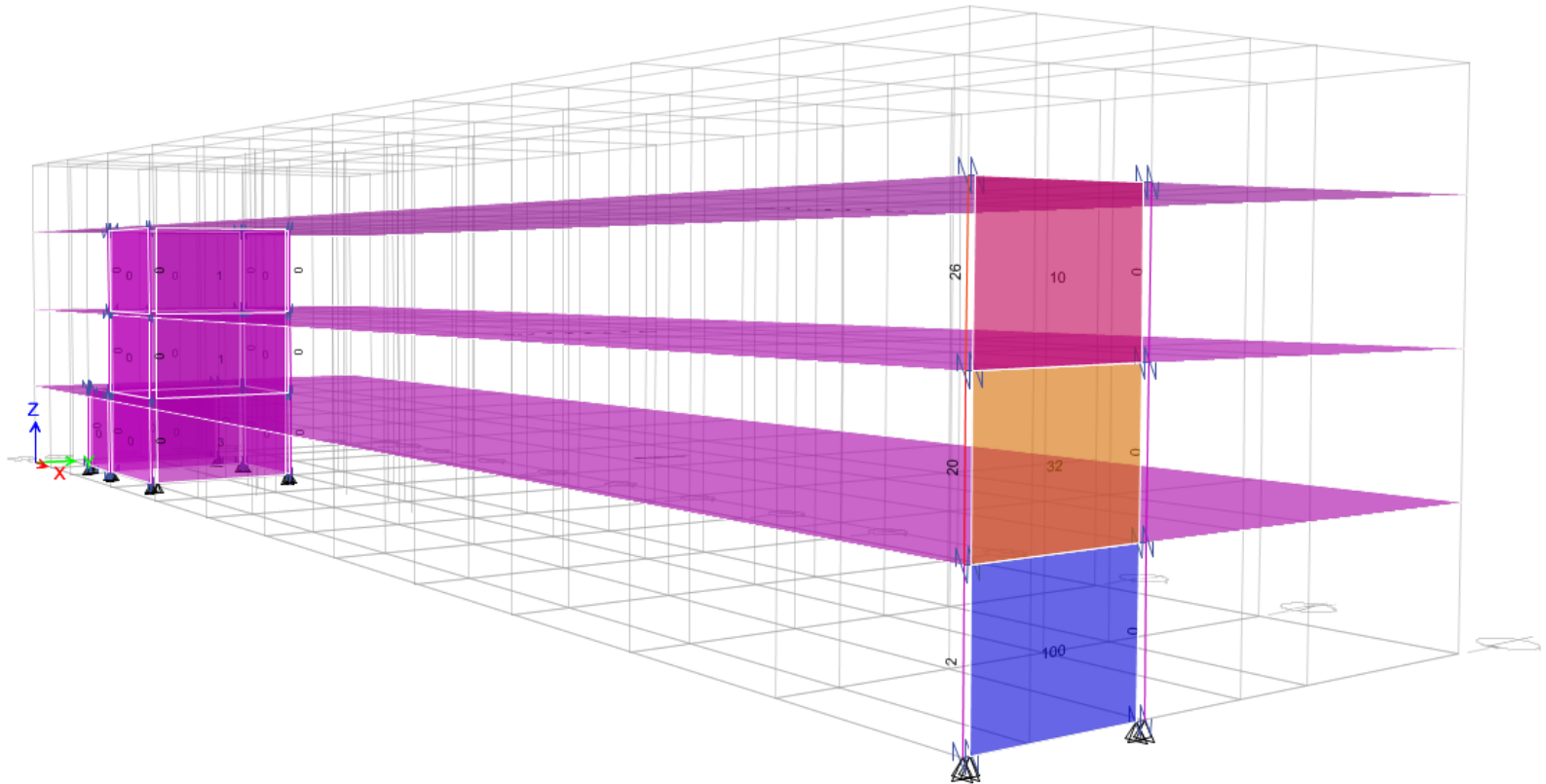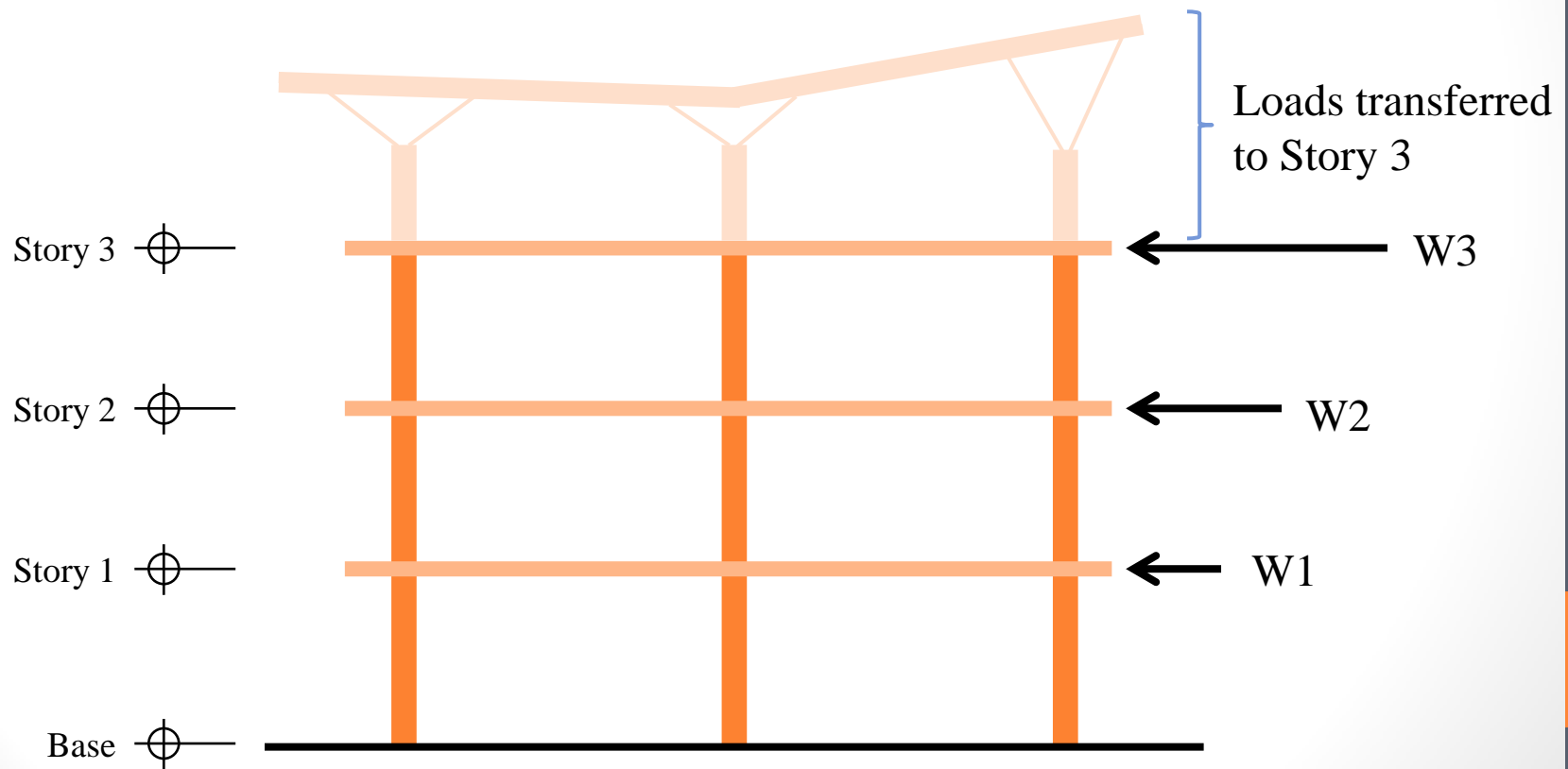
CRITICAL LFRS ELEMENT

- Seismic | Y-Direction Loading

SW-13 @ Column Line 12

ENERGY/VIRTUAL WORK DIAGRAM
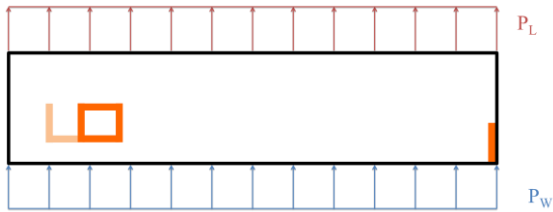
- Seismic | Y-Direction Loading

WIND LOADING

Loads transferred to Story 3

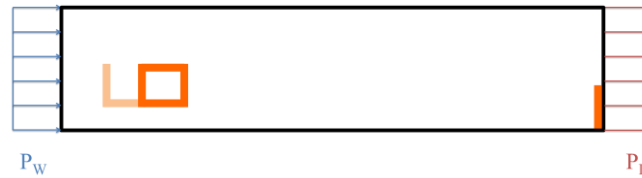Story 3 ← W3

Story 2 ← W2

Story 1 ← W1
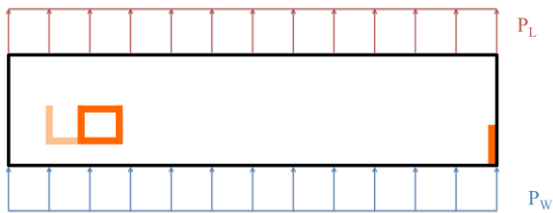
Base

WIND LOADING

Case 1
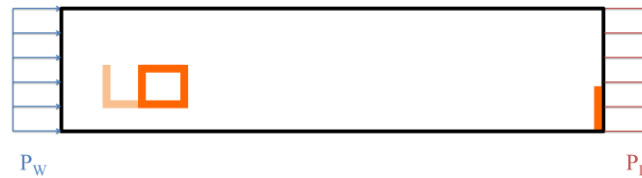
North-South, Y-Direction Loading

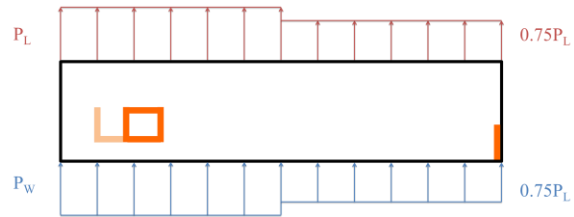East-West, X-Direction Loading

Case 3
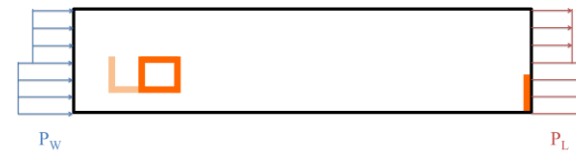
North-South, Y-Direction Loading

East-West, X-Direction Loading
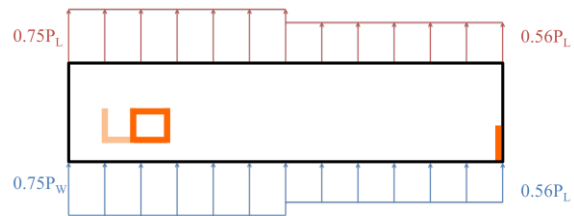
WIND LOADING

Case 2
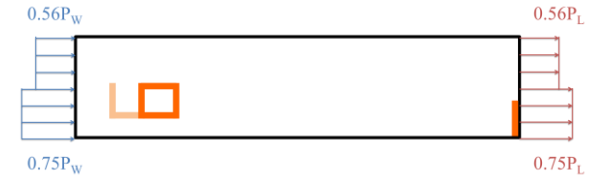

North-South, Y-Direction Loading

East-West, X-Direction Loading
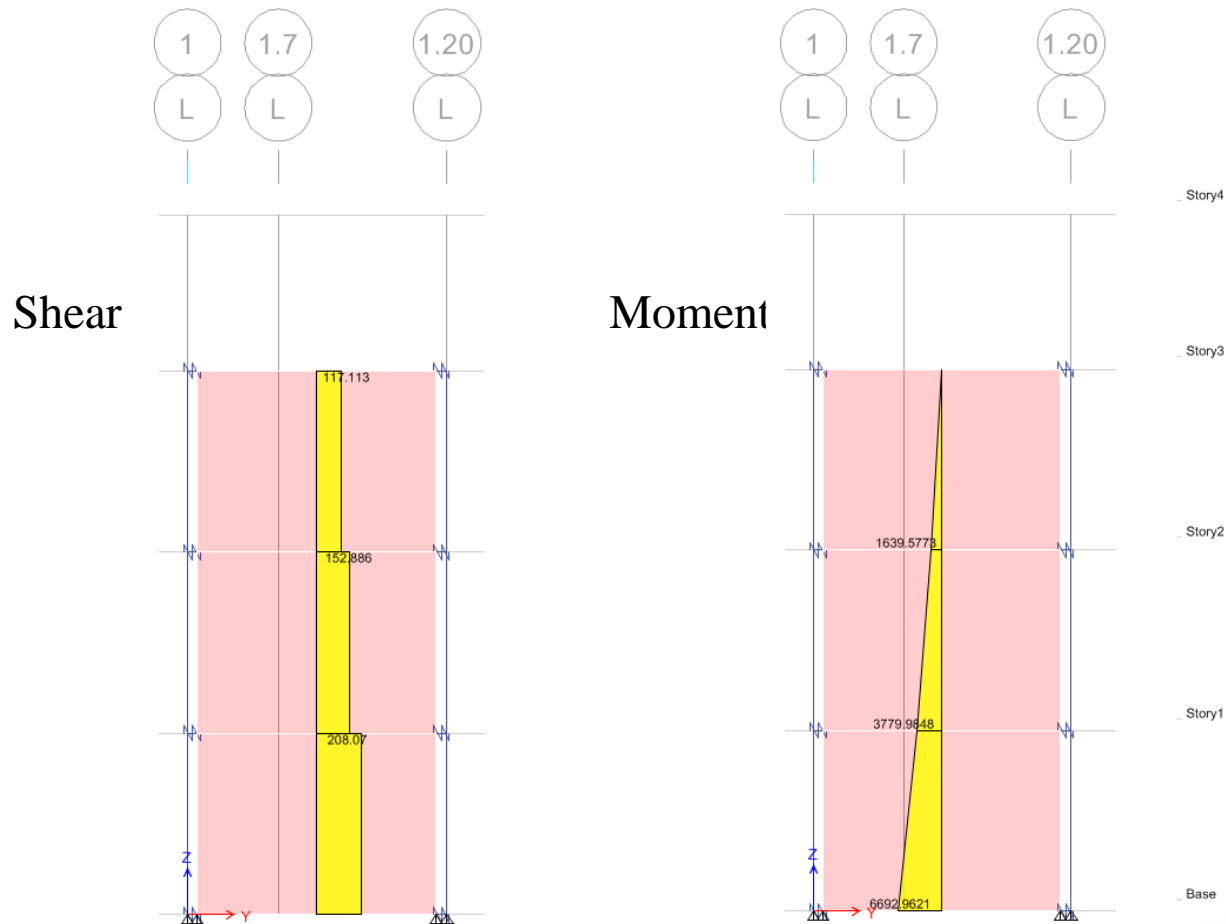
Case 4

North-South, Y-Direction Loading

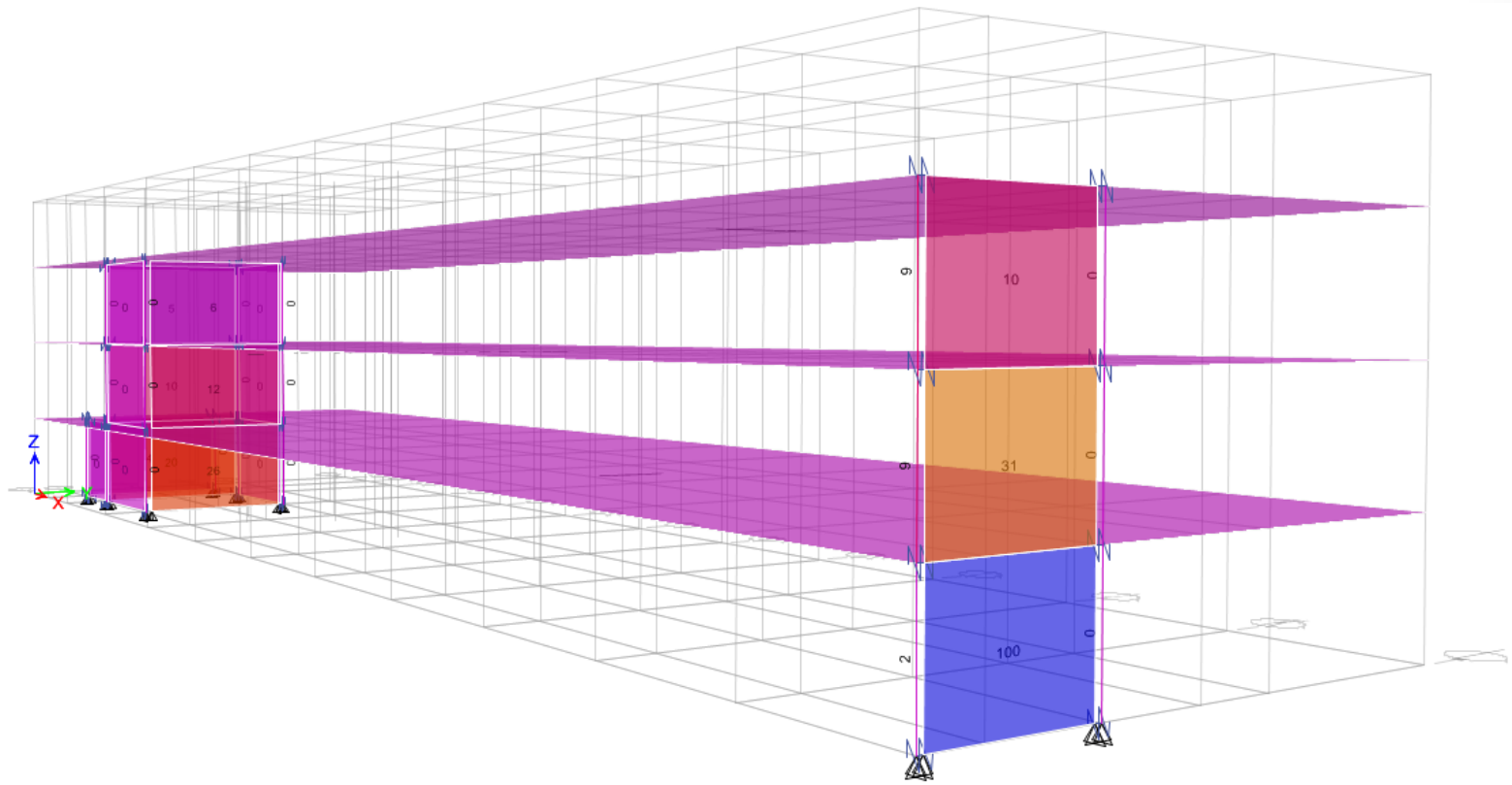East-West, Y-Direction Loading

CRITICAL LFRS ELEMENT

- Wind | Y-Direction Loading

Shear · Moment

SW-13 @ Column Line 12
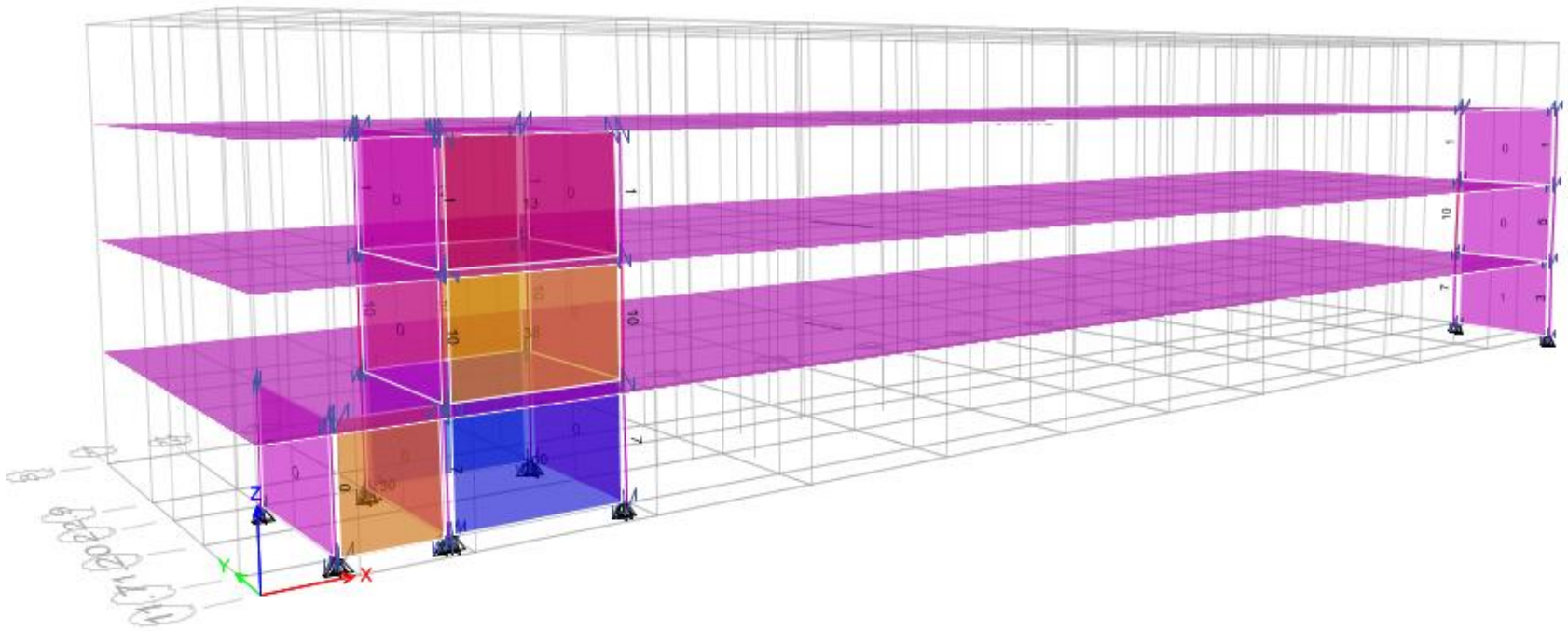
ENERGY/VIRTUAL WORK DIAGRAM

- Wind | Y-Direction Loading

ENERGY/VIRTUAL WORK DIAGRAM
[ALTERNATIVE VIEW]

- Seismic | X-Direction Loading

Note: This is not a controlling load case for the LFRS

ADEQUACY OF LFRS

- **SEISMIC STORY DRIFT**
  Pass!

- **WIND BUILDING DRIFT**
  Pass!

- **SHEAR CAPACITY**
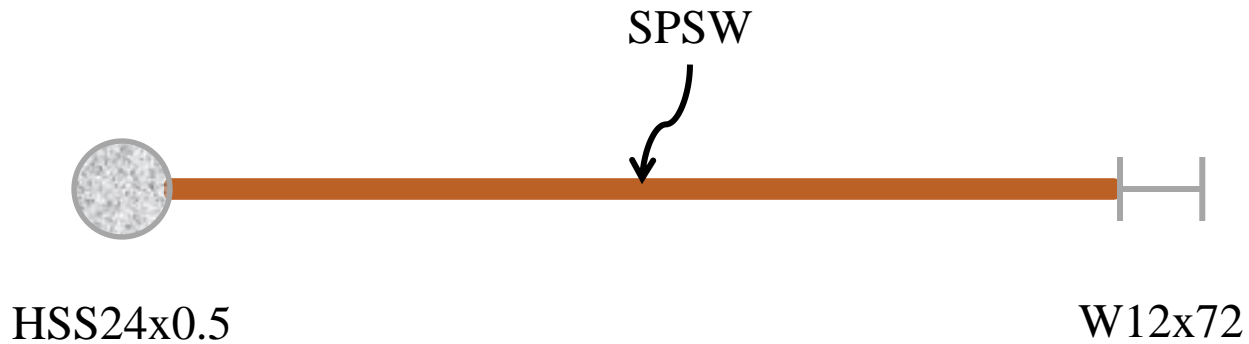 *Pass!*

LATERAL FORCE RESISTING SYSTEM ADEQUATE

THANK YOU

ADEQUACY OF LFRS

- **SHEAR CAPACITY**
  - $\varphi V_n = \varphi 0.42 F_y t_w L_{cf} \sin(2\alpha)$

SPSW

HSS24x0.5

W12x72

ADEQUACY OF LFRS

- **DEFLECTION CHECK**
  - Joint deflections of SPSW LFRS were measured using ETABS
  - Each value passed

Joint 19

Joint 28