



**QUANTUM** | CONSULTING ENGINEERS

Full-Sized legible color report is required to be provided by the Permittee on site for all Inspections



PRCTI20250117

**City of Puyallup  
Building  
REVIEWED  
FOR  
COMPLIANCE**

BSnowden

02/21/2025

12:41:07 PM



**1015 BUILDING RISK CATEGORY IV  
VOLUNTARY SEISMIC UPGRADE**

1015 39th AVENUE SE  
PUYALLUP, WA 98374

QUANTUM JOB NUMBER: 19305.04

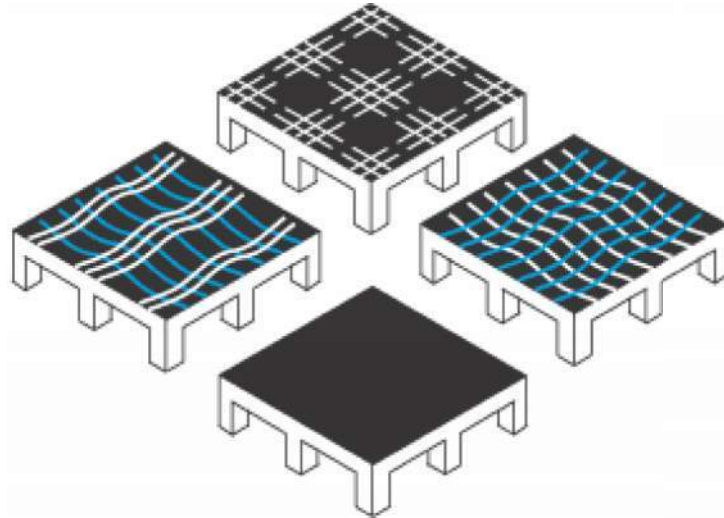
# FOUNDATION

## RAM CONCEPT FOUNDATION ANALYSIS

# South Hill 1015 Building Foundations

Quantum Consulting Engineers

By: TVM



\_Current - Braced Frame Grade Beams.cpt

12/9/2024

Project Number 19305.04

RAM Concept © 2023 Bentley Systems, Inc.  
RAM Concept™ is a trademark of Bentley Systems

23.0.1

# Table of Contents

|                                                            |     |
|------------------------------------------------------------|-----|
| Units .....                                                | 4   |
| Signs .....                                                | 5   |
| Materials .....                                            | 6   |
| Loadings .....                                             | 8   |
| Load Combinations .....                                    | 10  |
| Drawing Import: Standard Plan .....                        | 17  |
| Mesh Input: Standard Plan .....                            | 20  |
| Dead Load: All Loads Plan .....                            | 23  |
| Dead Load (transfer): All Loads Plan .....                 | 26  |
| Live Load Unreducible (transfer): All Loads Plan .....     | 29  |
| Live Load Roof (transfer): All Loads Plan .....            | 32  |
| Seismic(EQ_ASCE716_-0.3X_-E_-Y_-E_F): All Loads Plan ..... | 35  |
| Seismic(EQ_ASCE716_-0.3X_-E_Y_-E_F): All Loads Plan .....  | 38  |
| Seismic(EQ_ASCE716_0.3X_-E_-Y_-E_F): All Loads Plan .....  | 41  |
| Seismic(EQ_ASCE716_0.3X_-E_Y_-E_F): All Loads Plan .....   | 44  |
| Seismic(EQ_ASCE716_-X_-E_-0.3Y_-E_F): All Loads Plan ..... | 47  |
| Seismic(EQ_ASCE716_-X_-E_0.3Y_-E_F): All Loads Plan .....  | 50  |
| Seismic(EQ_ASCE716_X_-E_-0.3Y_-E_F): All Loads Plan .....  | 53  |
| Seismic(EQ_ASCE716_X_-E_0.3Y_-E_F): All Loads Plan .....   | 56  |
| Seismic(EQ_ASCE716_-0.3X_-E_-Y_+E_F): All Loads Plan ..... | 59  |
| Seismic(EQ_ASCE716_-0.3X_-E_Y_+E_F): All Loads Plan .....  | 62  |
| Seismic(EQ_ASCE716_0.3X_-E_-Y_+E_F): All Loads Plan .....  | 65  |
| Seismic(EQ_ASCE716_0.3X_-E_Y_+E_F): All Loads Plan .....   | 68  |
| Seismic(EQ_ASCE716_-X_-E_-0.3Y_+E_F): All Loads Plan ..... | 71  |
| Seismic(EQ_ASCE716_-X_-E_0.3Y_+E_F): All Loads Plan .....  | 74  |
| Seismic(EQ_ASCE716_X_-E_-0.3Y_+E_F): All Loads Plan .....  | 77  |
| Seismic(EQ_ASCE716_X_-E_0.3Y_+E_F): All Loads Plan .....   | 80  |
| Seismic(EQ_ASCE716_-0.3X_+E_-Y_-E_F): All Loads Plan ..... | 83  |
| Seismic(EQ_ASCE716_-0.3X_+E_Y_-E_F): All Loads Plan .....  | 86  |
| Seismic(EQ_ASCE716_0.3X_+E_-Y_-E_F): All Loads Plan .....  | 89  |
| Seismic(EQ_ASCE716_0.3X_+E_Y_-E_F): All Loads Plan .....   | 92  |
| Seismic(EQ_ASCE716_-X_+E_-0.3Y_-E_F): All Loads Plan ..... | 95  |
| Seismic(EQ_ASCE716_-X_+E_0.3Y_-E_F): All Loads Plan .....  | 98  |
| Seismic(EQ_ASCE716_X_+E_-0.3Y_-E_F): All Loads Plan .....  | 101 |
| Seismic(EQ_ASCE716_X_+E_0.3Y_-E_F): All Loads Plan .....   | 104 |
| Seismic(EQ_ASCE716_-0.3X_+E_-Y_+E_F): All Loads Plan ..... | 107 |
| Seismic(EQ_ASCE716_-0.3X_+E_Y_+E_F): All Loads Plan .....  | 110 |
| Seismic(EQ_ASCE716_0.3X_+E_-Y_+E_F): All Loads Plan .....  | 113 |
| Seismic(EQ_ASCE716_0.3X_+E_Y_+E_F): All Loads Plan .....   | 116 |
| Seismic(EQ_ASCE716_-X_+E_-0.3Y_+E_F): All Loads Plan ..... | 119 |
| Seismic(EQ_ASCE716_-X_+E_0.3Y_+E_F): All Loads Plan .....  | 122 |
| Seismic(EQ_ASCE716_X_+E_-0.3Y_+E_F): All Loads Plan .....  | 125 |
| Seismic(EQ_ASCE716_X_+E_0.3Y_+E_F): All Loads Plan .....   | 128 |
| Seismic(EQ_ASCE716_Y_-E_F): All Loads Plan .....           | 131 |
| Seismic(EQ_ASCE716_Y_+E_F): All Loads Plan .....           | 134 |
| Seismic(EQ_ASCE716_X_-E_F): All Loads Plan .....           | 137 |
| Seismic(EQ_ASCE716_X_+E_F): All Loads Plan .....           | 140 |
| Design Strip: Latitude Design Spans Plan .....             | 143 |

# Table of Contents (2)

|                                                            |     |
|------------------------------------------------------------|-----|
| Design Strip: Longitude Design Spans Plan .....            | 146 |
| Strength Design: Latitude Status Plan .....                | 149 |
| Strength Design: Latitude Top Reinforcement Plan .....     | 152 |
| Strength Design: Latitude Bottom Reinforcement Plan .....  | 155 |
| Strength Design: Latitude Shear Reinforcement Plan .....   | 158 |
| Strength Design: Longitude Status Plan .....               | 161 |
| Strength Design: Longitude Reinforcement Plan .....        | 164 |
| Strength Design: Longitude Top Reinforcement Plan .....    | 167 |
| Strength Design: Longitude Bottom Reinforcement Plan ..... | 170 |
| Strength Design: Longitude Shear Reinforcement Plan .....  | 173 |
| Soil Bearing Design: Max Soil Bearing Pressure Plan .....  | 176 |
| Soil Bearing Design: Min Soil Bearing Pressure Plan .....  | 179 |
| Calc Log .....                                             | 182 |

# Units

## Geometry Unit:

Plan Dimensions: feet  
Angles: degrees

Slab Thickness: inches  
Elevations: inches

Support Dimensions: inches  
Support Height: feet

## Loading and Reaction Unit

Point Force: Kips  
- Report As Zero: 0 Kips  
Point Moment: kip-ft  
- Report As Zero: 0 kip-ft

Line Force: kips/ft  
- Report As Zero: 0 kips/ft  
Line Moment: Kips  
- Report As Zero: 0 Kips

Area Force: psf  
- Report As Zero: 0 psf  
Area Moment: #/foot  
- Report As Zero: 0 #/foot

## Spring and Stiffness Unit:

Point Force Spring: kips/in  
Point Moment Spring: k-ft/°

Line Force Spring: ksi  
Line Moment Spring: k/°

Area Force Spring: pci  
Area Moment Spring: k/ft°

## Slab Analysis Unit:

Force: Kips  
- Report As Zero: 0 Kips  
Force Per Width: kips/ft  
- Report As Zero: 0 kips/ft

Moment: kip-ft  
- Report As Zero: 0 kip-ft  
Moment Per Width: Kips  
- Report As Zero: 0 Kips

Concrete Stress: psi  
- Report As Zero: 0 psi  
Deflection: inches  
- Report As Zero: 0 inches

## Materials Unit:

Concrete Volume: yd<sup>3</sup>  
Tendon Force: Kips  
Reinforcing Stress: ksi

Reinforcing Area: in<sup>2</sup>  
Tendon Force Per Width: kips/ft  
PT Weight: pounds

Reinforcement Weight: tons  
Tendon Profile: inches  
Cover: inches

## Miscellaneous Unit:

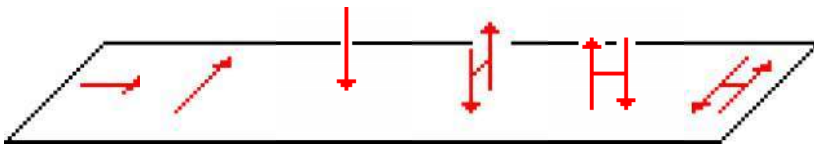
Floor Area: ft<sup>2</sup>  
Tendon Angles (for friction): radians

Density: pcf  
Temperature Change: °F

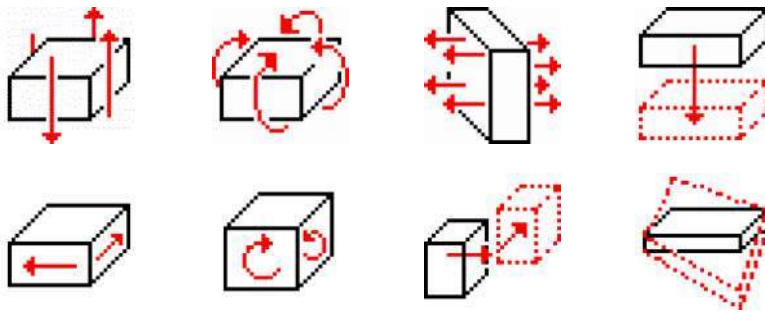
Elongations: inches

# Signs

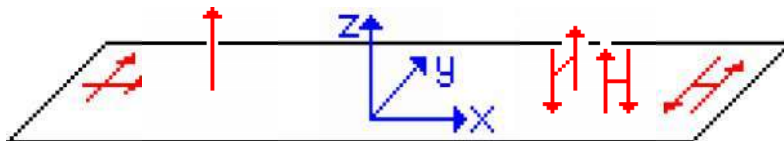
## Positive Loads



## Positive Analysis



## Positive Reactions



# Materials

## Concrete Mix

| Mix Name | Density (pcf) | Density For Loads (pcf) | $f_{ci}$ (psi) | $f_c$ (psi) | $f_{cui}$ (psi) | $f_{cu}$ (psi) | Poissons Ratio | Thermal Exp. Coeff | $E_c$ Calc | User $E_{ci}$ (psi) | User $E_c$ (psi) |
|----------|---------------|-------------------------|----------------|-------------|-----------------|----------------|----------------|--------------------|------------|---------------------|------------------|
| 3000 psi | 150           | 150                     | 3000           | 3000        | 3725            | 3725           | 0.2            | 5.556e-6           | Code       | 2500000             | 3000000          |
| 4000 psi | 150           | 150                     | 3000           | 4000        | 3725            | 4975           | 0.2            | 5.556e-6           | Code       | 2500000             | 3000000          |
| 5000 psi | 150           | 150                     | 3000           | 5000        | 3725            | 6399           | 0.2            | 5.556e-6           | Code       | 2500000             | 3000000          |
| 6000 psi | 150           | 150                     | 3000           | 6000        | 3725            | 7450           | 0.2            | 5.556e-6           | Code       | 2500000             | 3000000          |

## PT Systems

| System Name           | Strand             | Duct                    | Anchor            | $f_{se}$ (ksi) | Long-Term Losses (ksi) | Min Radius (feet) |
|-----------------------|--------------------|-------------------------|-------------------|----------------|------------------------|-------------------|
| 1/2" Unbonded         | 1/2" 7-Wire Strand | 1/2" Unbonded Sheathing | Monostrand Anchor | 175            | 22                     | 6                 |
| 0.6" Unbonded         | 0.6" 7-Wire Strand | 0.6" Unbonded Sheathing | Monostrand Anchor | 175            | 22                     | 8                 |
| 1/2" Bonded Flat Duct | 1/2" 7-Wire Strand | 1/2" Bonded Flat Duct   | Flat Duct Anchor  | 175            | 22                     | 6                 |
| 0.6" Bonded Flat Duct | 0.6" 7-Wire Strand | 0.6" Bonded Flat Duct   | Flat Duct Anchor  | 175            | 22                     | 8                 |

## Strand Materials

| Strand Name        | $A_{ps}$ (in <sup>2</sup> ) | $E_{ps}$ (ksi) | $f_{py}$ (ksi) | $f_{pu}$ (ksi) |
|--------------------|-----------------------------|----------------|----------------|----------------|
| 1/2" 7-Wire Strand | 0.153                       | 28000          | 243            | 270            |
| 0.6" 7-Wire Strand | 0.217                       | 28000          | 243            | 270            |

## Duct Systems

| Duct Name               | Type     | Shape | Material           | Duct Height (inches) | Duct Width (inches) | Max Strands Per Duct | Wobble Friction (1/feet) | Angular Friction (1/radians) |
|-------------------------|----------|-------|--------------------|----------------------|---------------------|----------------------|--------------------------|------------------------------|
| 1/2" Unbonded Sheathing | unbonded | Round | Tightly Sheathed   | 0.5                  | 0.5                 | 1                    | 0.0014                   | 0.07                         |
| 0.6" Unbonded Sheathing | unbonded | Round | Tightly Sheathed   | 0.6                  | 0.6                 | 1                    | 0.0014                   | 0.07                         |
| 1/2" Bonded Flat Duct   | bonded   | Flat  | Corrugated Plastic | 1                    | 3                   | 5                    | 0.0002                   | 0.14                         |
| 0.6" Bonded Flat Duct   | bonded   | Flat  | Corrugated Plastic | 1                    | 3                   | 4                    | 0.0002                   | 0.14                         |

## Anchor Systems

| Anchor Name       | Type             | Jacking Stress (ksi) | Anchor Friction | Seating Distance (inches) |
|-------------------|------------------|----------------------|-----------------|---------------------------|
| Monostrand Anchor | Monostrand       | 216                  | 0               | 0.25                      |
| Flat Duct Anchor  | Flat Multi-Plane | 216                  | 0.02            | 0.25                      |

## Materials (2)

### Reinforcing Bars

| <i>Bar Name</i> | <i>As (in<sup>2</sup>)</i> | <i>Es (ksi)</i> | <i>Fy (ksi)</i> | <i>Coating</i> | <i>Straight Ld/Db</i> | <i>90 Hook Ld/Db</i> | <i>180 Hook Ld/Db</i> |
|-----------------|----------------------------|-----------------|-----------------|----------------|-----------------------|----------------------|-----------------------|
| #3              | 0.11                       | 29000           | 60              | None           | Code                  | Code                 | Code                  |
| #4              | 0.2                        | 29000           | 60              | None           | Code                  | Code                 | Code                  |
| #5              | 0.31                       | 29000           | 60              | None           | Code                  | Code                 | Code                  |
| #6              | 0.44                       | 29000           | 60              | None           | Code                  | Code                 | Code                  |
| #7              | 0.6                        | 29000           | 60              | None           | Code                  | Code                 | Code                  |
| #8              | 0.79                       | 29000           | 60              | None           | Code                  | Code                 | Code                  |
| #9              | 1                          | 29000           | 60              | None           | Code                  | Code                 | Code                  |
| #10             | 1.27                       | 29000           | 60              | None           | Code                  | Code                 | Code                  |
| #11             | 1.56                       | 29000           | 60              | None           | Code                  | Code                 | Code                  |

### SSR Systems

| <i>SSR System Name</i> | <i>Stud Area (in<sup>2</sup>)</i> | <i>Head Area (in<sup>2</sup>)</i> | <i>Min Clear Head Spacing (inches)</i> | <i>Specified Stud Spacing (inches)</i> | <i>Fy (ksi)</i> | <i>Stud Spacing Rounding Increment (inches)</i> | <i>Min Studs Per Rail</i> | <i>System Type</i> |
|------------------------|-----------------------------------|-----------------------------------|----------------------------------------|----------------------------------------|-----------------|-------------------------------------------------|---------------------------|--------------------|
| 3/8" SSR               | 0.11                              | 1.11                              | 0.5                                    | None                                   | 50              | 0.25                                            | 2                         | Rail               |
| 1/2" SSR               | 0.196                             | 1.96                              | 0.5                                    | None                                   | 50              | 0.25                                            | 2                         | Rail               |
| 5/8" SSR               | 0.307                             | 3.07                              | 0.5                                    | None                                   | 50              | 0.25                                            | 2                         | Rail               |
| 3/4" SSR               | 0.442                             | 4.42                              | 0.5                                    | None                                   | 50              | 0.25                                            | 2                         | Rail               |

# Loadings

| <i>Loading Name</i>                  | <i>Type</i>                    | <i>Analysis</i> | <i>On-Pattern Factor</i> | <i>Off-Pattern Factor</i> |
|--------------------------------------|--------------------------------|-----------------|--------------------------|---------------------------|
| Self-Dead Loading                    | Self-Weight                    | Normal          | 1                        | 1                         |
| Balance Loading                      | Balance                        | Normal          | 1                        | 1                         |
| Balanced Load (transfer)             | Balance (transfer)             | Normal          | 1                        | 1                         |
| Hyperstatic Loading                  | Hyperstatic                    | Hyperstatic     | 1                        | 1                         |
| Construction Dead Load               | Stressing Dead                 | Normal          | 1                        | 1                         |
| Dead Load                            | Dead                           | Normal          | 1                        | 1                         |
| Dead Load (transfer)                 | Dead (transfer)                | Normal          | 1                        | 1                         |
| Live Load Reducible                  | Live (Reducible)               | Normal          | 1                        | 0                         |
| Live Load Reducible (transfer)       | Live (Reducible) (transfer)    | Normal          | 1                        | 0                         |
| Live Load Unreducible                | Live (Unreducible)             | Normal          | 1                        | 0                         |
| Partition Load                       | Live (Unreducible)             | Normal          | 1                        | 0                         |
| Live Load Unreducible (transfer)     | Live (Unreducible) (transfer)  | Normal          | 1                        | 0                         |
| Live Load Storage                    | Live (Storage)                 | Normal          | 1                        | 0                         |
| Live Load Storage (transfer)         | Live (Storage) (transfer)      | Normal          | 1                        | 0                         |
| Live Load Roof                       | Live (Roof)                    | Normal          | 1                        | 0                         |
| Live Load Roof (transfer)            | Live (Roof) (transfer)         | Normal          | 1                        | 0                         |
| Seismic(EQ_ASCE716_X_+E_F)           | Ultimate Seismic 1 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_-E_F)           | Ultimate Seismic 2 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_Y_+E_F)           | Ultimate Seismic 3 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_Y_-E_F)           | Ultimate Seismic 4 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_+E_0.3Y_+E_F)   | Ultimate Seismic 5 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_+E_-0.3Y_+E_F)  | Ultimate Seismic 6 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-X_+E_0.3Y_+E_F)  | Ultimate Seismic 7 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-X_+E_-0.3Y_+E_F) | Ultimate Seismic 8 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_0.3X_+E_Y_+E_F)   | Ultimate Seismic 9 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_0.3X_+E_-Y_+E_F)  | Ultimate Seismic 10 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-0.3X_+E_Y_+E_F)  | Ultimate Seismic 11 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-0.3X_+E_-Y_+E_F) | Ultimate Seismic 12 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_+E_0.3Y_-E_F)   | Ultimate Seismic 13 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_+E_-0.3Y_-E_F)  | Ultimate Seismic 14 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-X_+E_0.3Y_-E_F)  | Ultimate Seismic 15 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-X_+E_-0.3Y_-E_F) | Ultimate Seismic 16 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_0.3X_+E_Y_-E_F)   | Ultimate Seismic 17 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_0.3X_+E_-Y_-E_F)  | Ultimate Seismic 18 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-0.3X_+E_Y_-E_F)  | Ultimate Seismic 19 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_-E_0.3Y_+E_F)   | Service Seismic 20 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-0.3X_+E_-Y_-E_F) | Service Seismic 21 (transfer)  | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_-E_-0.3Y_+E_F)  | Ultimate Seismic 22 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-X_-E_0.3Y_+E_F)  | Ultimate Seismic 23 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-X_-E_-0.3Y_+E_F) | Ultimate Seismic 24 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_0.3X_-E_Y_+E_F)   | Ultimate Seismic 25 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_0.3X_-E_-Y_+E_F)  | Ultimate Seismic 26 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-0.3X_-E_Y_+E_F)  | Ultimate Seismic 27 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-0.3X_-E_-Y_+E_F) | Ultimate Seismic 28 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_-E_0.3Y_-E_F)   | Ultimate Seismic 29 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_X_-E_-0.3Y_-E_F)  | Ultimate Seismic 30 (transfer) | Normal          | 1                        | 1                         |
| Seismic(EQ_ASCE716_-X_-E_0.3Y_-E_F)  | Ultimate Seismic 31 (transfer) | Normal          | 1                        | 1                         |

## Loadings (2)

|                                      |                                |        |   |   |
|--------------------------------------|--------------------------------|--------|---|---|
| Seismic(EQ_ASCE716_-X_-E_-0.3Y_-E_F) | Ultimate Seismic 32 (transfer) | Normal | 1 | 1 |
| Seismic(EQ_ASCE716_0.3X_-E_Y_-E_F)   | Ultimate Seismic 33 (transfer) | Normal | 1 | 1 |
| Seismic(EQ_ASCE716_0.3X_-E_-Y_-E_F)  | Ultimate Seismic 34 (transfer) | Normal | 1 | 1 |
| Seismic(EQ_ASCE716_-0.3X_-E_Y_-E_F)  | Ultimate Seismic 35 (transfer) | Normal | 1 | 1 |
| Seismic(EQ_ASCE716_-0.3X_-E_-Y_-E_F) | Ultimate Seismic 36 (transfer) | Normal | 1 | 1 |

# Load Combinations

## Service LC: D

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i>           | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading        | 1                      |
| Balance Loading          | 1                      |
| Dead Load                | 1                      |
| Dead Load (transfer)     | 1                      |
| Balanced Load (transfer) | 1                      |

## Service LC: D + L

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1                      |
| Balance Loading                  | 1                      |
| Dead Load                        | 1                      |
| Dead Load (transfer)             | 1                      |
| Live Load Reducible              | 1                      |
| Live Load Reducible (transfer)   | 1                      |
| Live Load Unreducible            | 1                      |
| Live Load Unreducible (transfer) | 1                      |
| Live Load Storage                | 1                      |
| Live Load Storage (transfer)     | 1                      |
| Balanced Load (transfer)         | 1                      |
| Partition Load                   | 1                      |

## Service LC: D +0.75( L + S)

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1                      |
| Balance Loading                  | 1                      |
| Dead Load                        | 1                      |
| Dead Load (transfer)             | 1                      |
| Live Load Reducible              | 0.75                   |
| Live Load Reducible (transfer)   | 0.75                   |
| Live Load Unreducible            | 0.75                   |
| Live Load Unreducible (transfer) | 0.75                   |
| Live Load Storage                | 0.75                   |
| Live Load Storage (transfer)     | 0.75                   |
| Live Load Roof                   | 0.75                   |
| Live Load Roof (transfer)        | 0.75                   |
| Balanced Load (transfer)         | 1                      |
| Partition Load                   | 1                      |

# Load Combinations (2)

## Service Seismic LC: 1.14D + 0.7E

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: 0.7

| <i>Loading</i>       | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading    | 1.14                   |
| Dead Load            | 1.14                   |
| Dead Load (transfer) | 1.14                   |

## Service Seismic LC: 1.14D - 0.7E

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: -0.7

| <i>Loading</i>       | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading    | 1.14                   |
| Dead Load            | 1.14                   |
| Dead Load (transfer) | 1.14                   |

## Service Seismic LC: 1.11D + 0.75(L + S) + 0.525E

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: 0.525

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1.11                   |
| Dead Load                        | 1.11                   |
| Dead Load (transfer)             | 1.11                   |
| Live Load Reducible              | 0.75                   |
| Live Load Reducible (transfer)   | 0.75                   |
| Live Load Unreducible            | 0.75                   |
| Live Load Unreducible (transfer) | 0.75                   |
| Live Load Storage                | 0.75                   |
| Live Load Storage (transfer)     | 0.75                   |
| Live Load Roof                   | 0.75                   |
| Live Load Roof (transfer)        | 0.75                   |

# Load Combinations (3)

## Service Seismic LC: $1.11D + 0.75(L + S) + 0.525E$

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: -0.525

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1.11                   |
| Dead Load                        | 1.11                   |
| Dead Load (transfer)             | 1.11                   |
| Live Load Reducible              | 0.75                   |
| Live Load Reducible (transfer)   | 0.75                   |
| Live Load Unreducible            | 0.75                   |
| Live Load Unreducible (transfer) | 0.75                   |
| Live Load Storage                | 0.75                   |
| Live Load Storage (transfer)     | 0.75                   |
| Live Load Roof                   | 0.75                   |
| Live Load Roof (transfer)        | 0.75                   |

## Service Seismic LC: $0.6D + 0.7E$

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: 0.7

| <i>Loading</i>       | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading    | 0.8                    |
| Dead Load            | 0.8                    |
| Dead Load (transfer) | 0.6                    |

## Service Seismic LC: $0.6D - 0.7E$

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: -0.7

| <i>Loading</i>       | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading    | 0.8                    |
| Dead Load            | 0.8                    |
| Dead Load (transfer) | 0.6                    |

# Load Combinations (4)

## Sustained Service LC

Active Design Criteria: Sustained Service Design

Analysis: Zero-Tension

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1                      |
| Balance Loading                  | 1                      |
| Dead Load                        | 1                      |
| Dead Load (transfer)             | 1                      |
| Live Load Reducible              | 0.5                    |
| Live Load Reducible (transfer)   | 0.5                    |
| Live Load Unreducible            | 0.5                    |
| Live Load Unreducible (transfer) | 0.5                    |
| Live Load Storage                | 1                      |
| Live Load Storage (transfer)     | 1                      |
| Live Load Roof                   | 0.5                    |
| Live Load Roof (transfer)        | 0.5                    |
| Balanced Load (transfer)         | 1                      |
| Partition Load                   | 0.5                    |

## Factored LC: 1.4D

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i>       | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading    | 1.4                    |
| Hyperstatic Loading  | 1                      |
| Dead Load            | 1.4                    |
| Dead Load (transfer) | 1.4                    |

## Factored LC: 1.2D + 1.6L + 0.5S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1.2                    |
| Hyperstatic Loading              | 1                      |
| Dead Load                        | 1.2                    |
| Dead Load (transfer)             | 1.2                    |
| Live Load Reducible              | 1.6                    |
| Live Load Reducible (transfer)   | 1.6                    |
| Live Load Unreducible            | 1.6                    |
| Live Load Unreducible (transfer) | 1.6                    |
| Live Load Storage                | 1.6                    |
| Live Load Storage (transfer)     | 1.6                    |
| Live Load Roof                   | 0.5                    |
| Live Load Roof (transfer)        | 0.5                    |
| Partition Load                   | 1.6                    |

# Load Combinations (5)

## Factored LC: 1.2D + 0.5L + 1.6S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1.2                    |
| Hyperstatic Loading              | 1                      |
| Dead Load                        | 1.2                    |
| Dead Load (transfer)             | 1.2                    |
| Live Load Reducible              | 0.5                    |
| Live Load Reducible (transfer)   | 0.5                    |
| Live Load Unreducible            | 0.5                    |
| Live Load Unreducible (transfer) | 0.5                    |
| Live Load Storage                | 0.5                    |
| Live Load Storage (transfer)     | 0.5                    |
| Live Load Roof                   | 1.6                    |
| Live Load Roof (transfer)        | 1.6                    |
| Partition Load                   | 0.5                    |

## Factored Seismic LC: 1.4D + 0.5L + 0.2S + E

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: 1

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1.4                    |
| Hyperstatic Loading              | 1                      |
| Dead Load                        | 1.4                    |
| Dead Load (transfer)             | 1.4                    |
| Live Load Reducible              | 0.5                    |
| Live Load Reducible (transfer)   | 0.5                    |
| Live Load Unreducible            | 0.5                    |
| Live Load Unreducible (transfer) | 0.5                    |
| Live Load Storage                | 0.5                    |
| Live Load Storage (transfer)     | 0.5                    |
| Live Load Roof                   | 0.2                    |
| Live Load Roof (transfer)        | 0.2                    |
| Partition Load                   | 1                      |

# Load Combinations (6)

## Factored Seismic LC: $1.4D + 0.5L + 0.2S - E$

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: -1

| <i>Loading</i>                   | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading                | 1.4                    |
| Hyperstatic Loading              | 1                      |
| Dead Load                        | 1.4                    |
| Dead Load (transfer)             | 1.4                    |
| Live Load Reducible              | 0.5                    |
| Live Load Reducible (transfer)   | 0.5                    |
| Live Load Unreducible            | 0.5                    |
| Live Load Unreducible (transfer) | 0.5                    |
| Live Load Storage                | 0.5                    |
| Live Load Storage (transfer)     | 0.5                    |
| Live Load Roof                   | 0.2                    |
| Live Load Roof (transfer)        | 0.2                    |
| Partition Load                   | 1                      |

## Factored Seismic LC: $0.7D + E$

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: 1

| <i>Loading</i>       | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading    | 0.7                    |
| Hyperstatic Loading  | 1                      |
| Dead Load            | 0.7                    |
| Dead Load (transfer) | 0.7                    |

## Factored Seismic LC: $0.7D - E$

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate      Standard Factor: -1

| <i>Loading</i>       | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading    | 0.7                    |
| Hyperstatic Loading  | 1                      |
| Dead Load            | 0.7                    |
| Dead Load (transfer) | 0.7                    |

# Load Combinations (7)

## Service LC: D + S

Active Design Criteria: <none>

Analysis: Zero-Tension

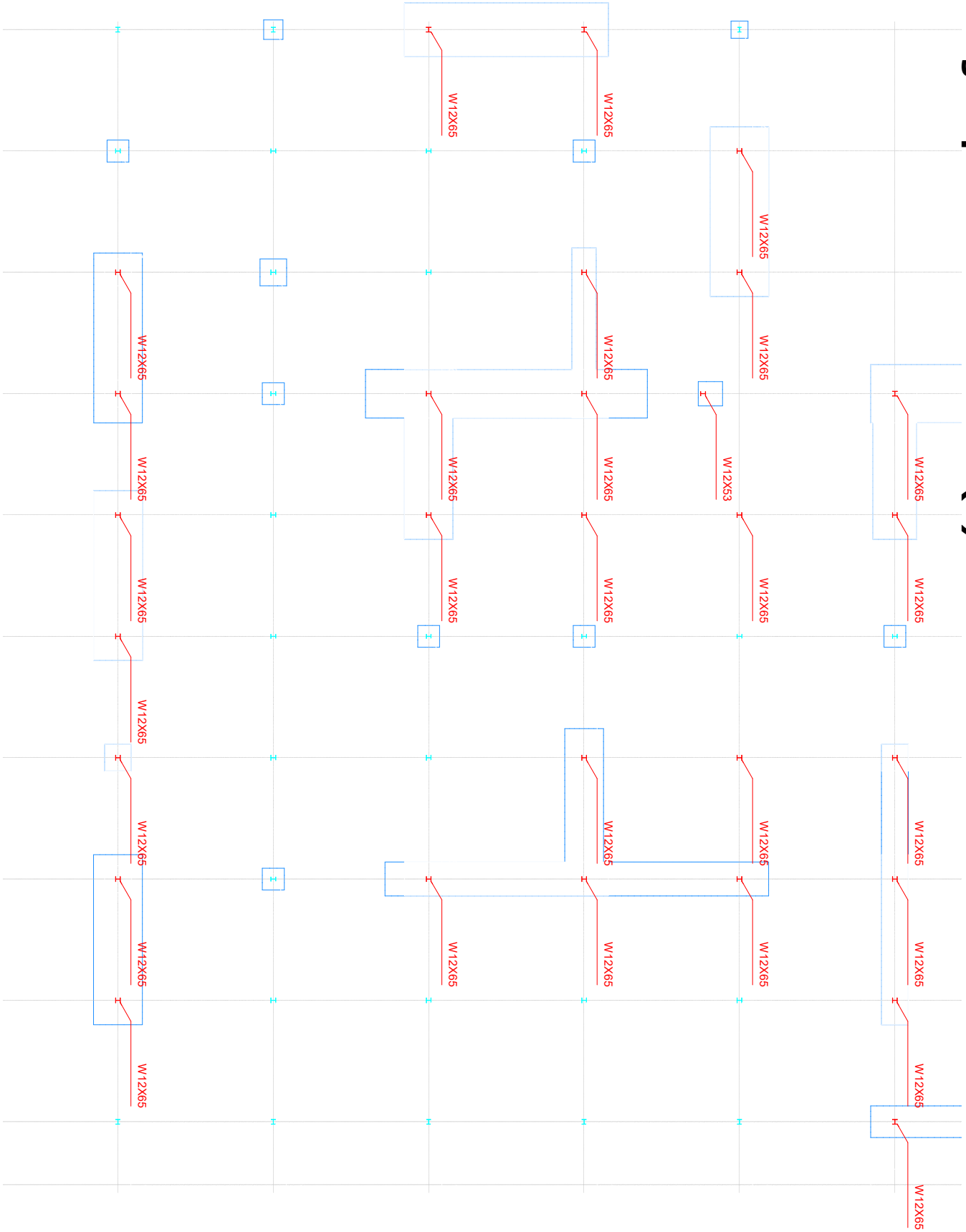
| <i>Loading</i>            | <i>Standard Factor</i> |
|---------------------------|------------------------|
| Self-Dead Loading         | 1                      |
| Balance Loading           | 1                      |
| Dead Load                 | 1                      |
| Dead Load (transfer)      | 1                      |
| Live Load Roof            | 1                      |
| Live Load Roof (transfer) | 1                      |

# Drawing Import: Standard Plan

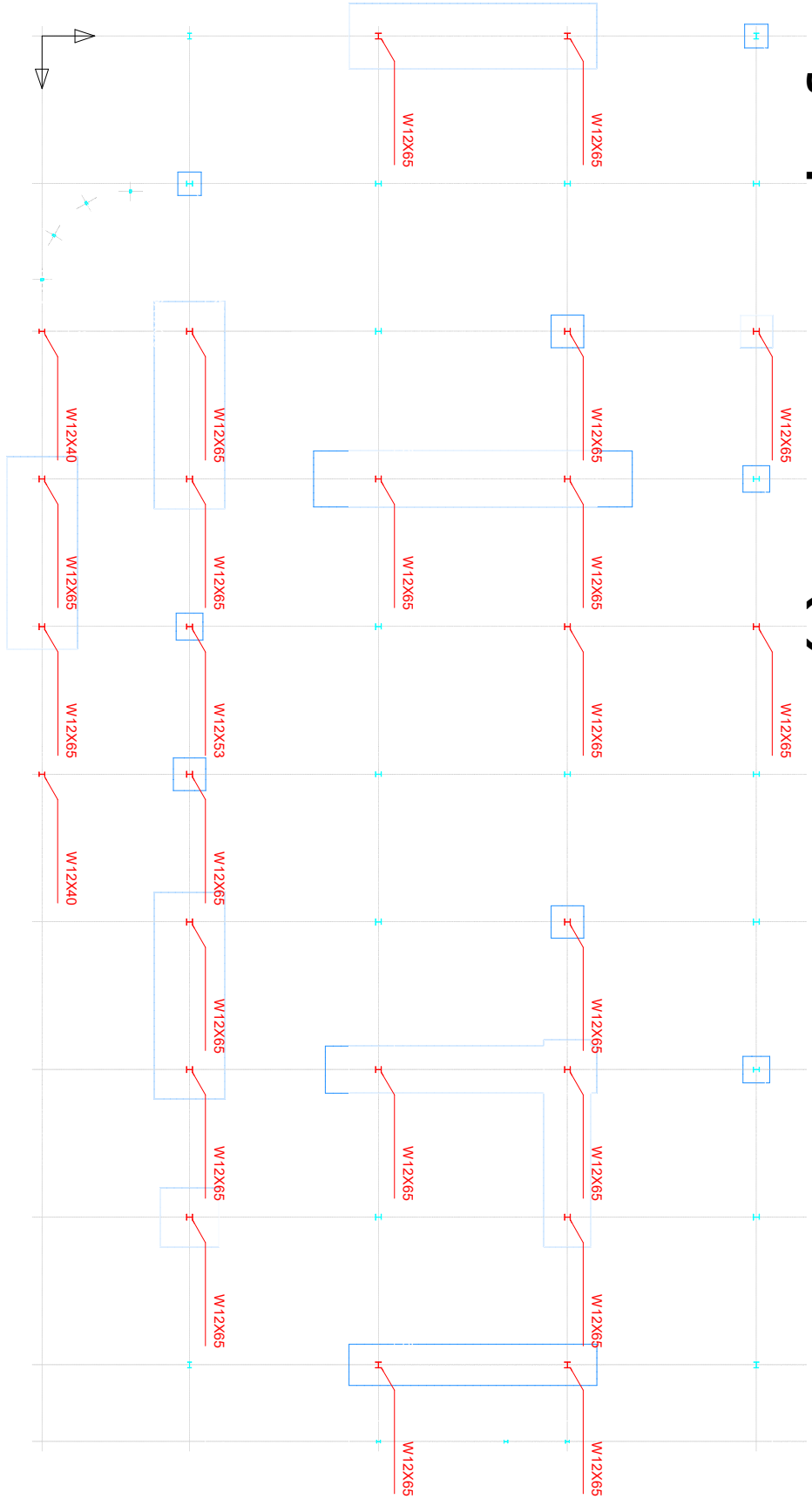
South Hill 1015 Building Foundations - \_Current - Braced Frame Grade Beams.cpt - 12/9/2024

Drawing Input: User Lines; User Notes; User Dimensions; SGR; SGR.1; SGRD; SCO; SPROD; SWL; SCOLD; SPRO; ID; SFIG; MSG; SM;  
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements;  
 SCS = 1; SCS0

# Drawing Import: Standard Plan (2)

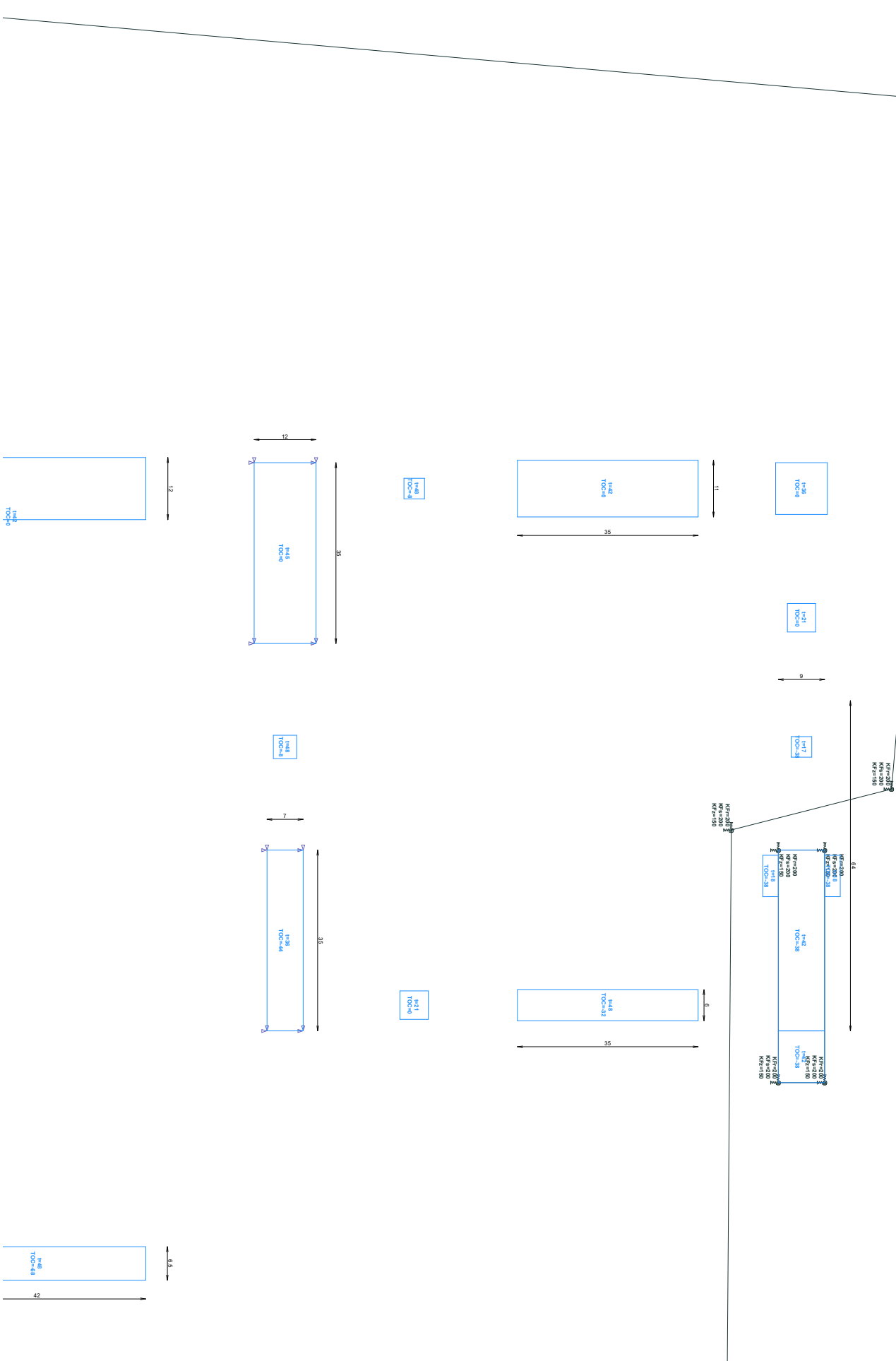


# Drawing Import: Standard Plan (3)

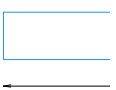
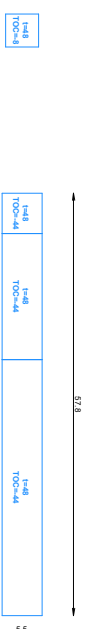


Mesh Input: Standard Plan

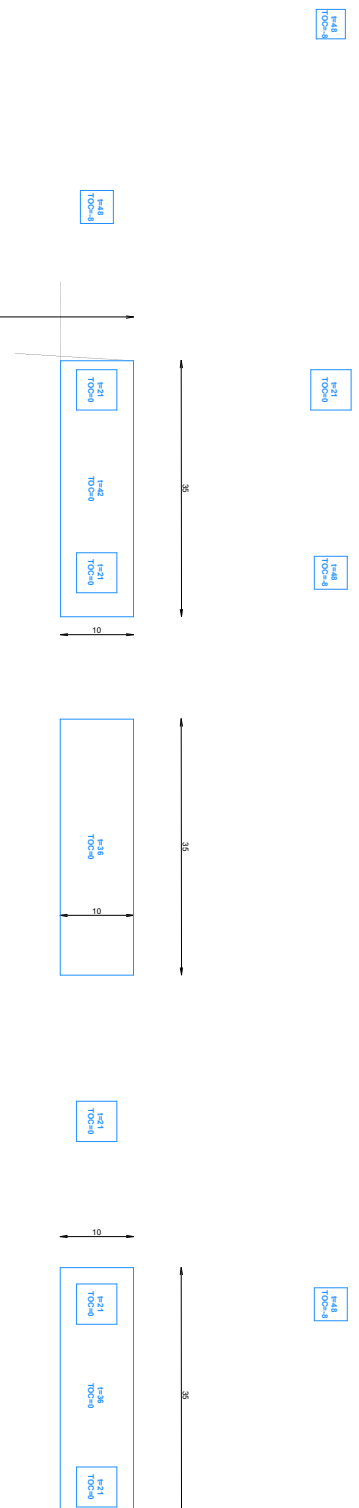
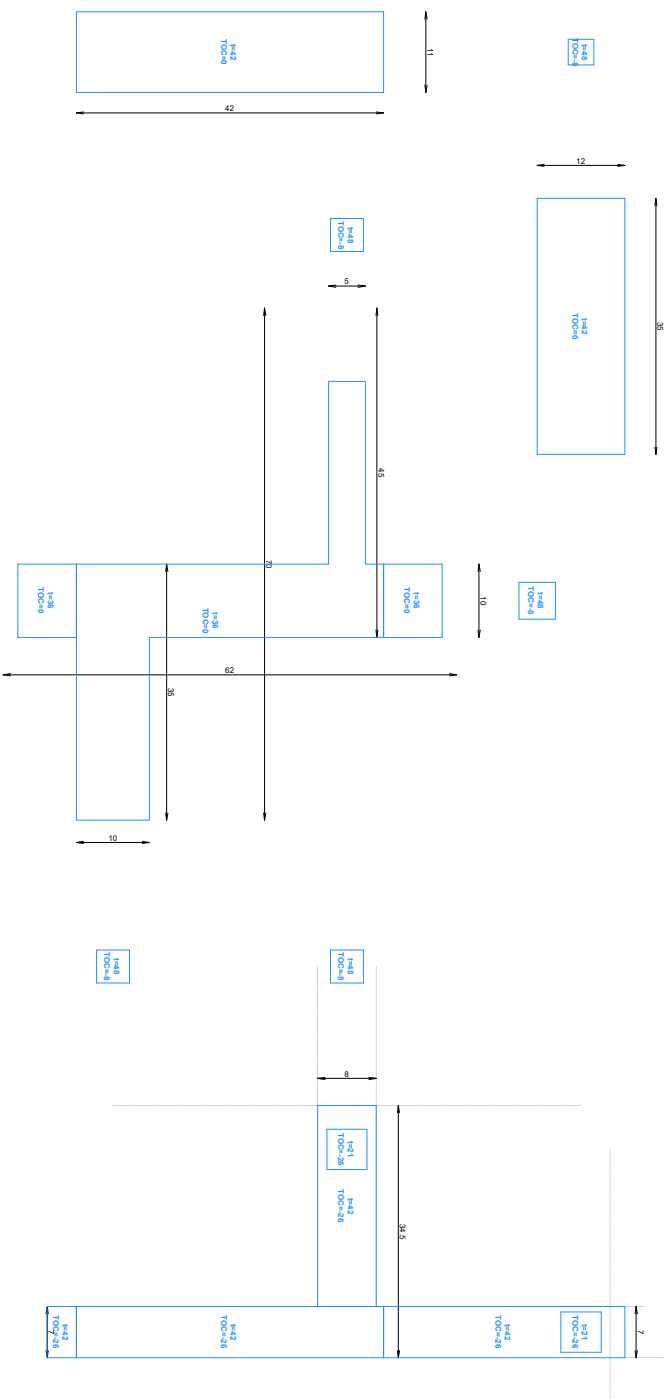
Mesh Input: Beam Properties: Slab Area, Slab Area Thickness, Slab Area, Equations, Slab Openings, Slab Opening Perimeter, Point Supports, Line Supports, Line Support Icons, Walls Above, Walls Below, Columns Above, Columns Below, Point Springs, Point Spring Icons, Line Springs, Line Spring Icons, Area Springs, Area Spring Icons, Area Spring Values, User Notes, User Lines, User Dimensions, Dead Load (Gravity), Point Load Icons, Point Load Values, Scale = 1:215



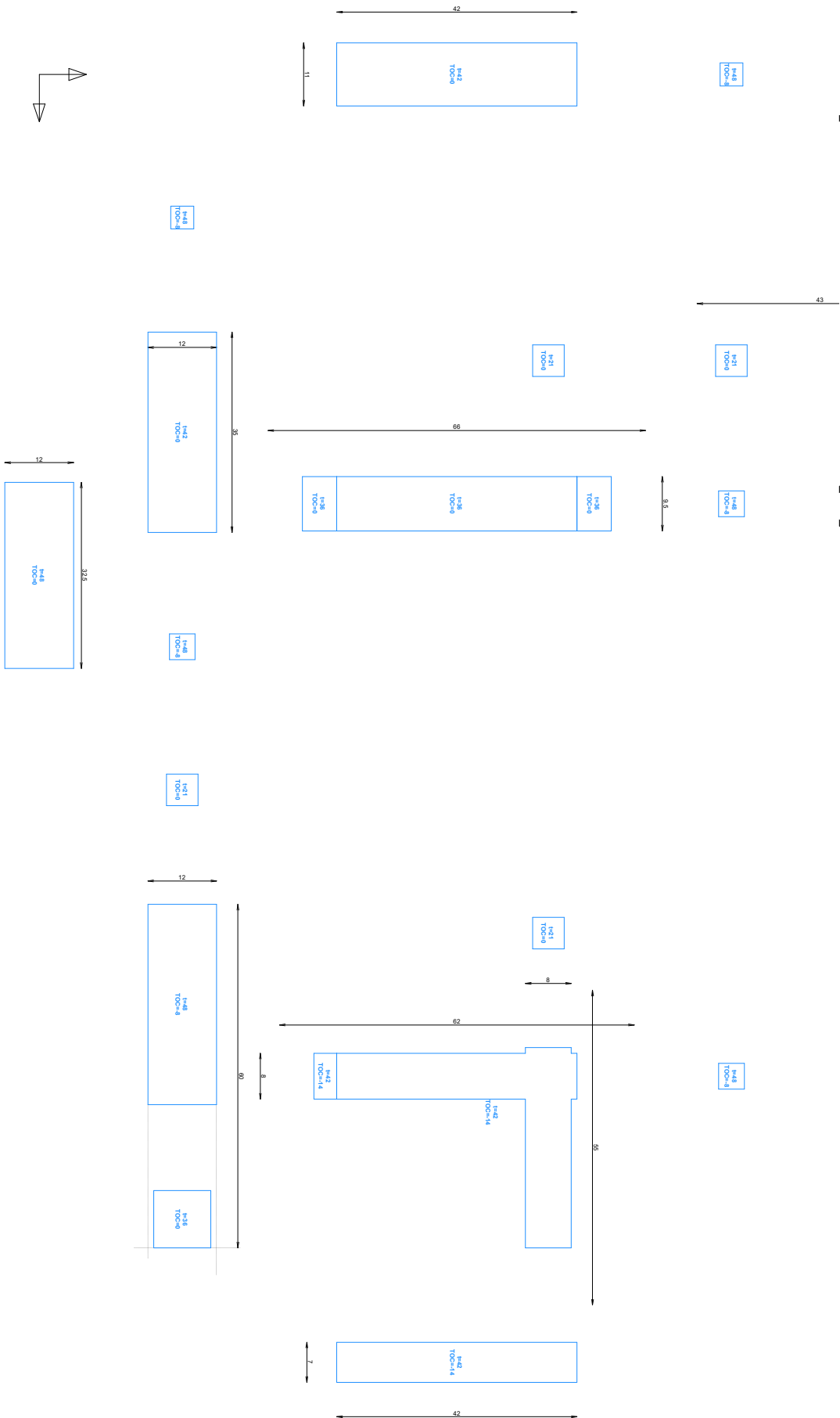
## Mesh Input: Standard Plan (2)



South Hill 1015 Building Foundations - \_Current - Braced Frame Grade Beams.cpt - 12/9/2024

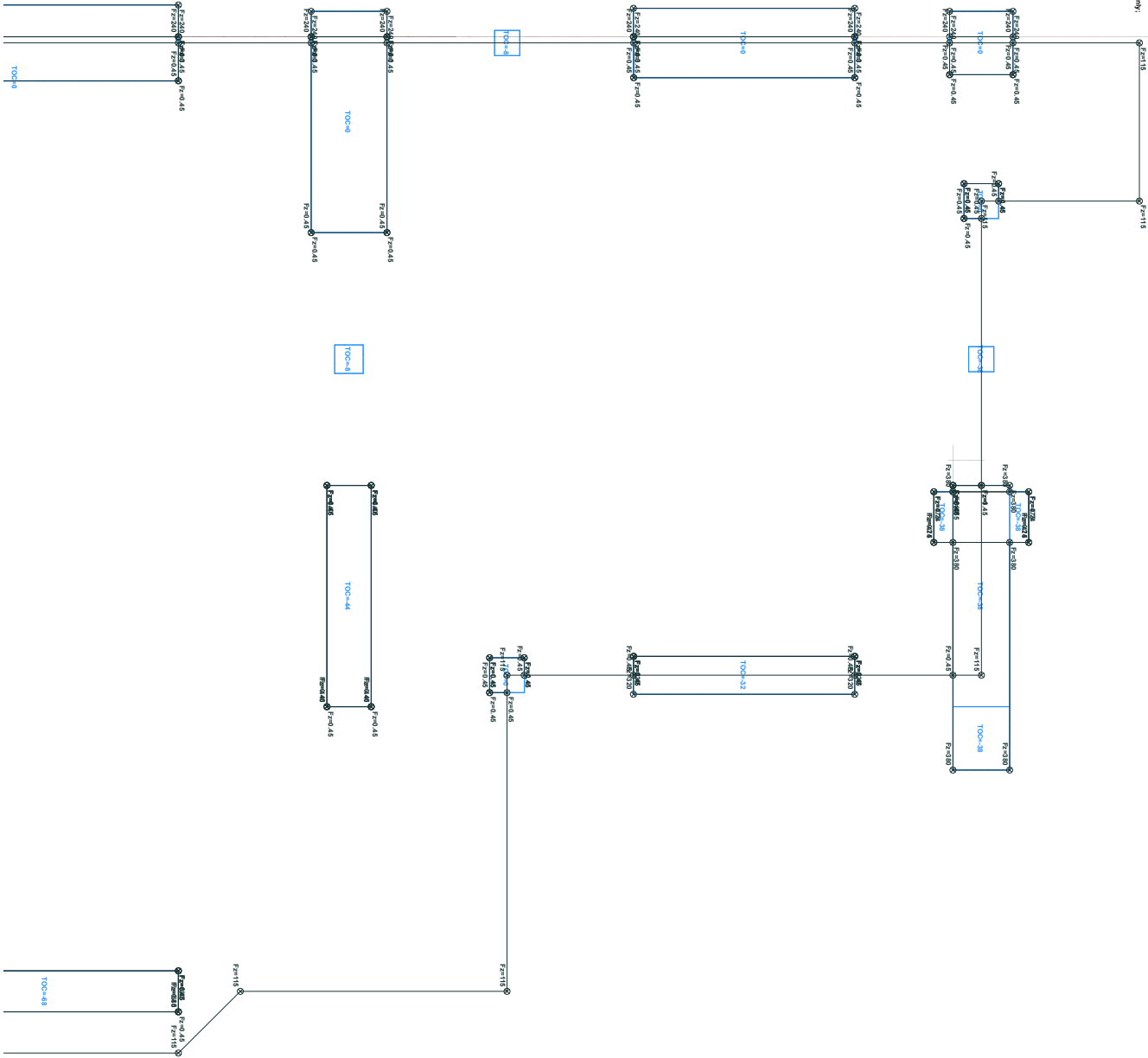


# Mesh Input: Standard Plan (3)

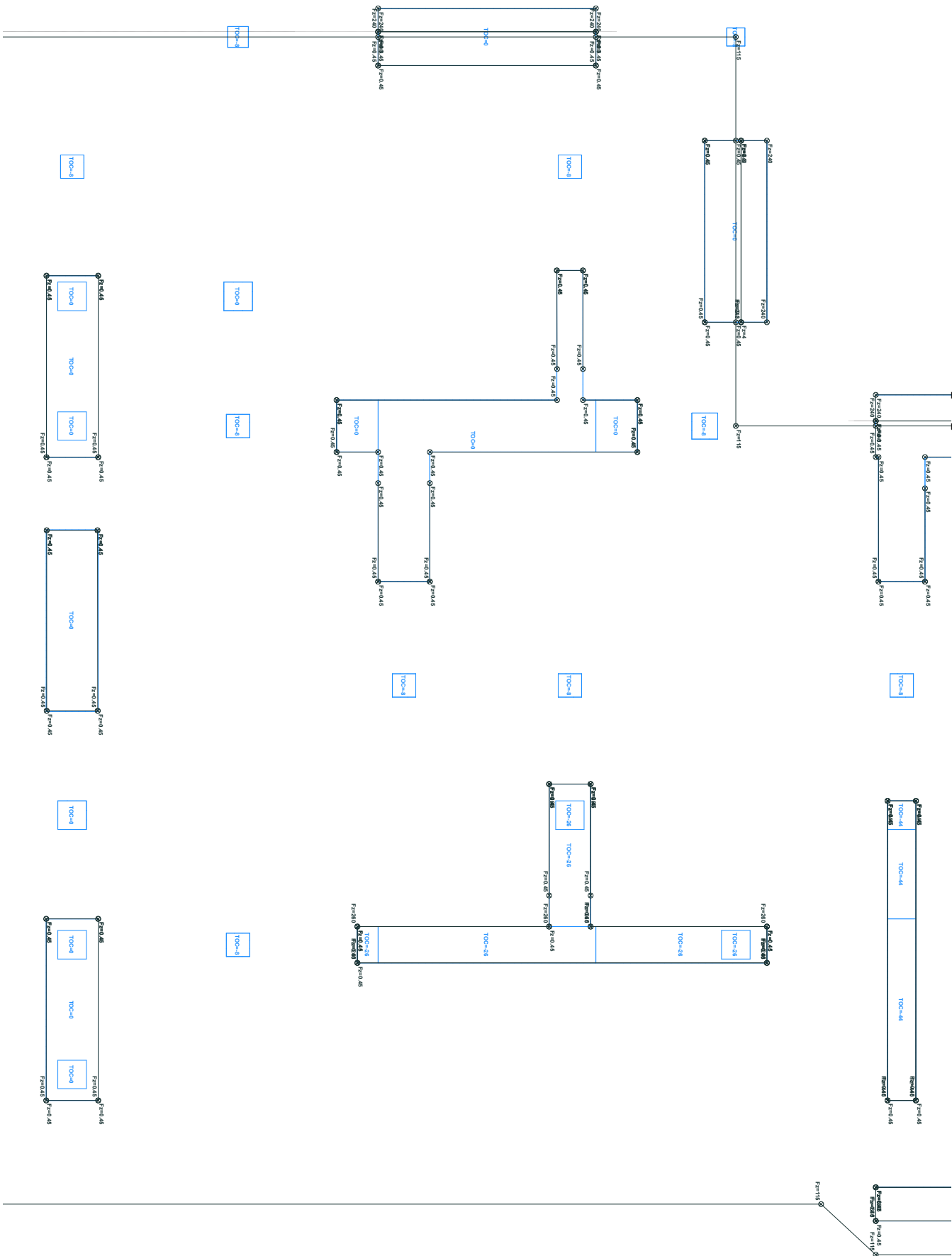


# Dead Load: All Loads Plan

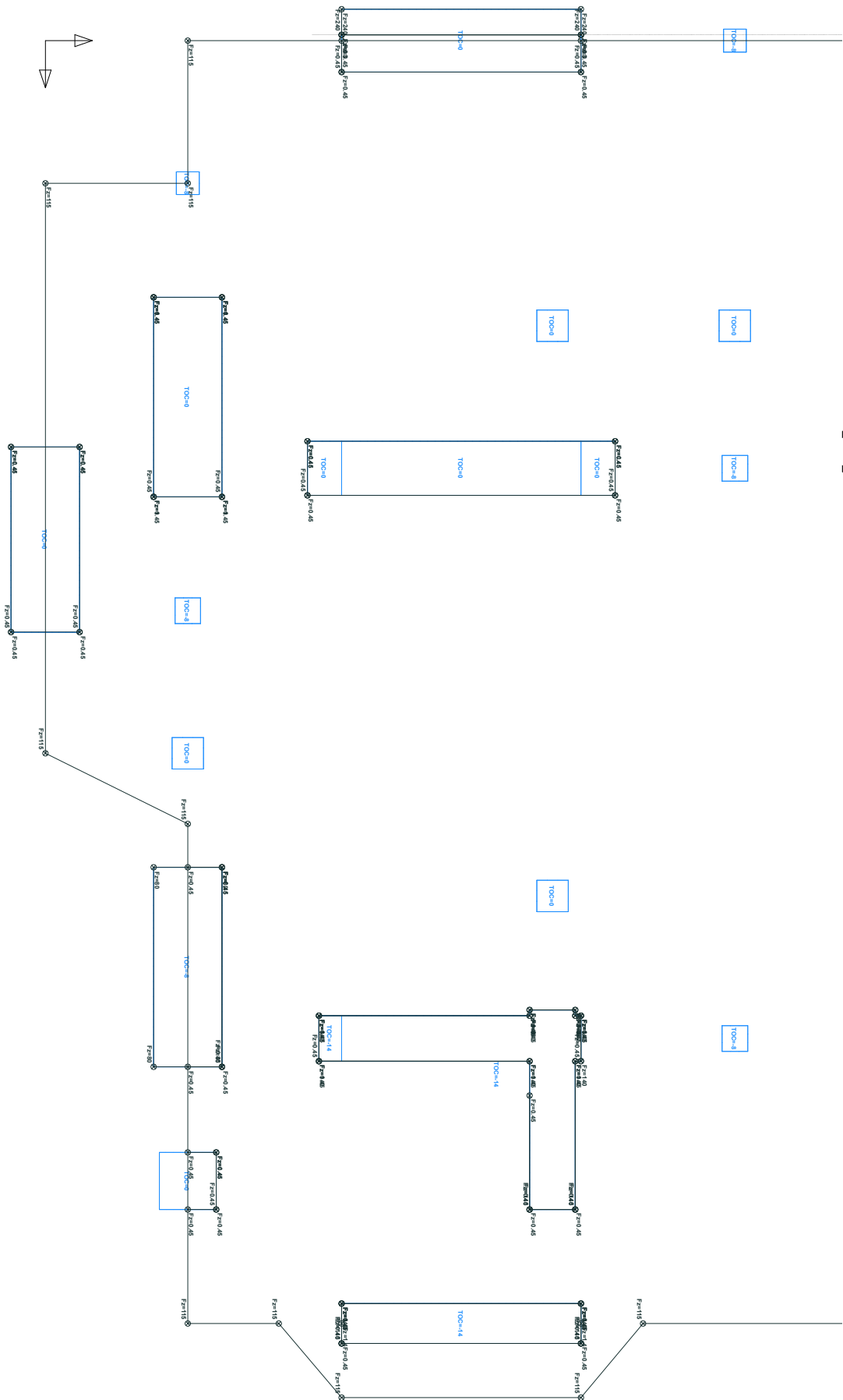
Dead Load: Point Loads, Point Load Icons; Dead Load Values, Line Loads; Area Load Icons; Area Load Values; User Notes; User Links; User Dimensions;  
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;  
Scale = 1/215



# Dead Load: All Loads Plan (2)

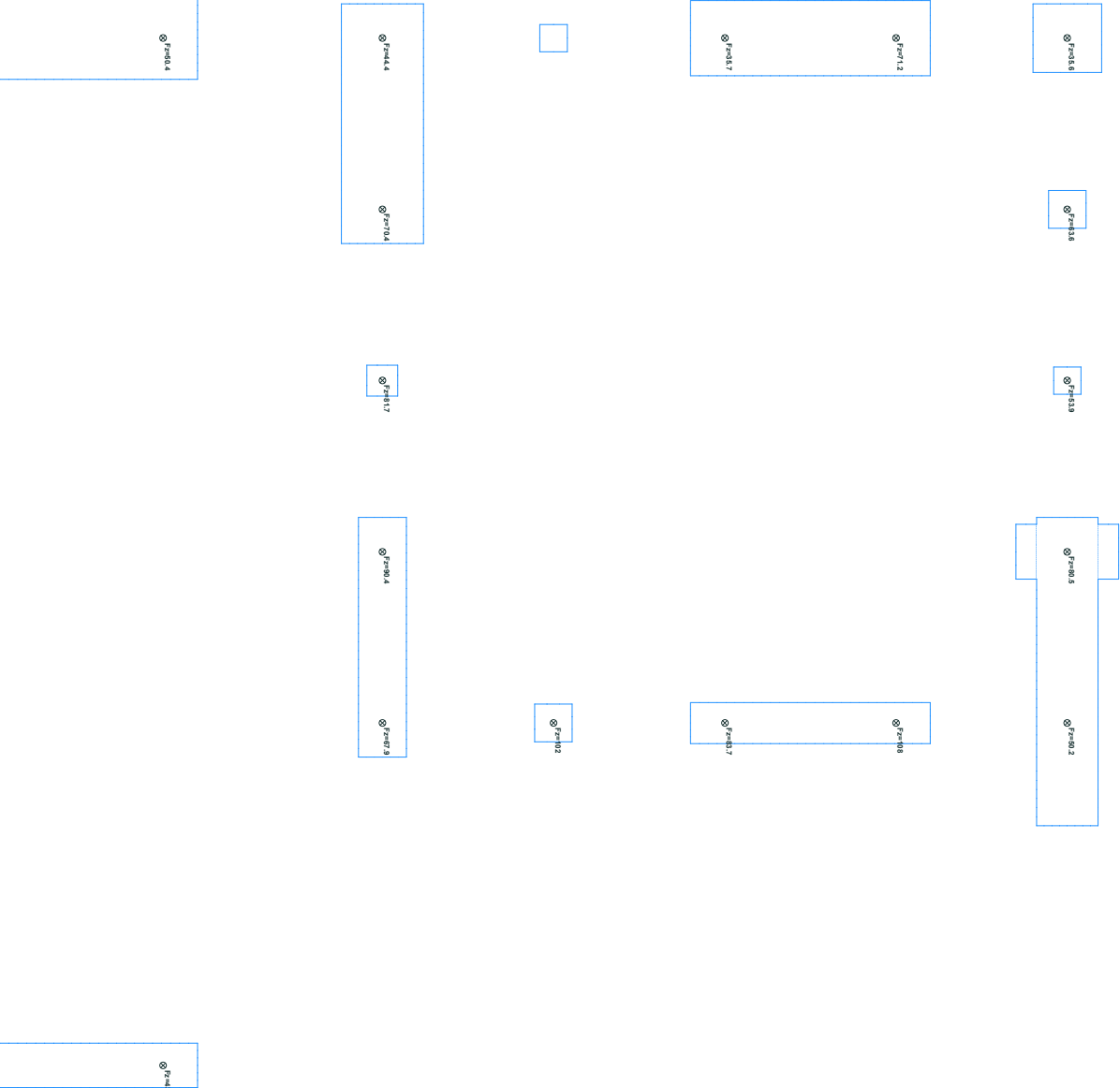


# Dead Load: All Loads Plan (3)

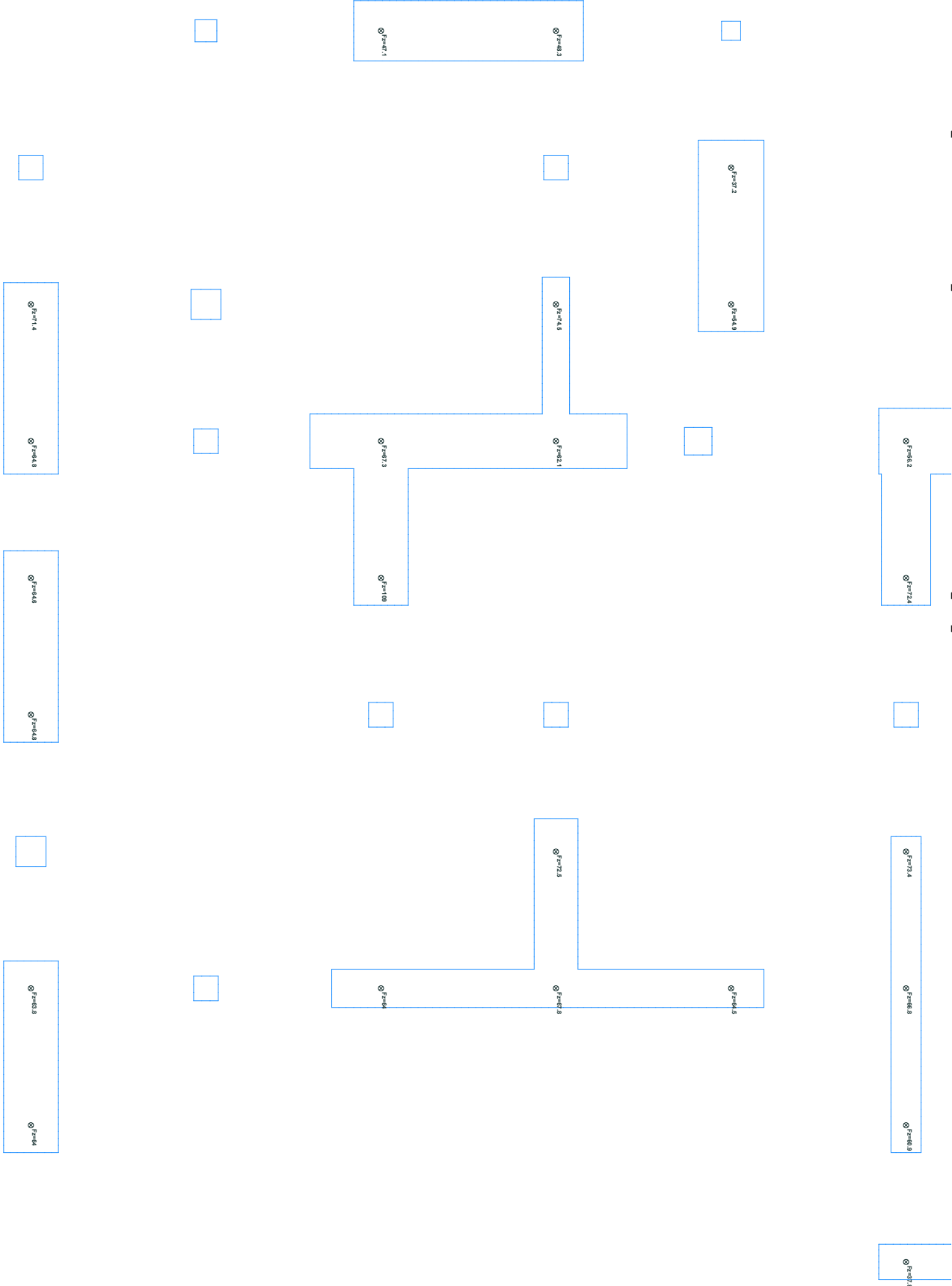


# Dead Load (transfer): All Loads Plan

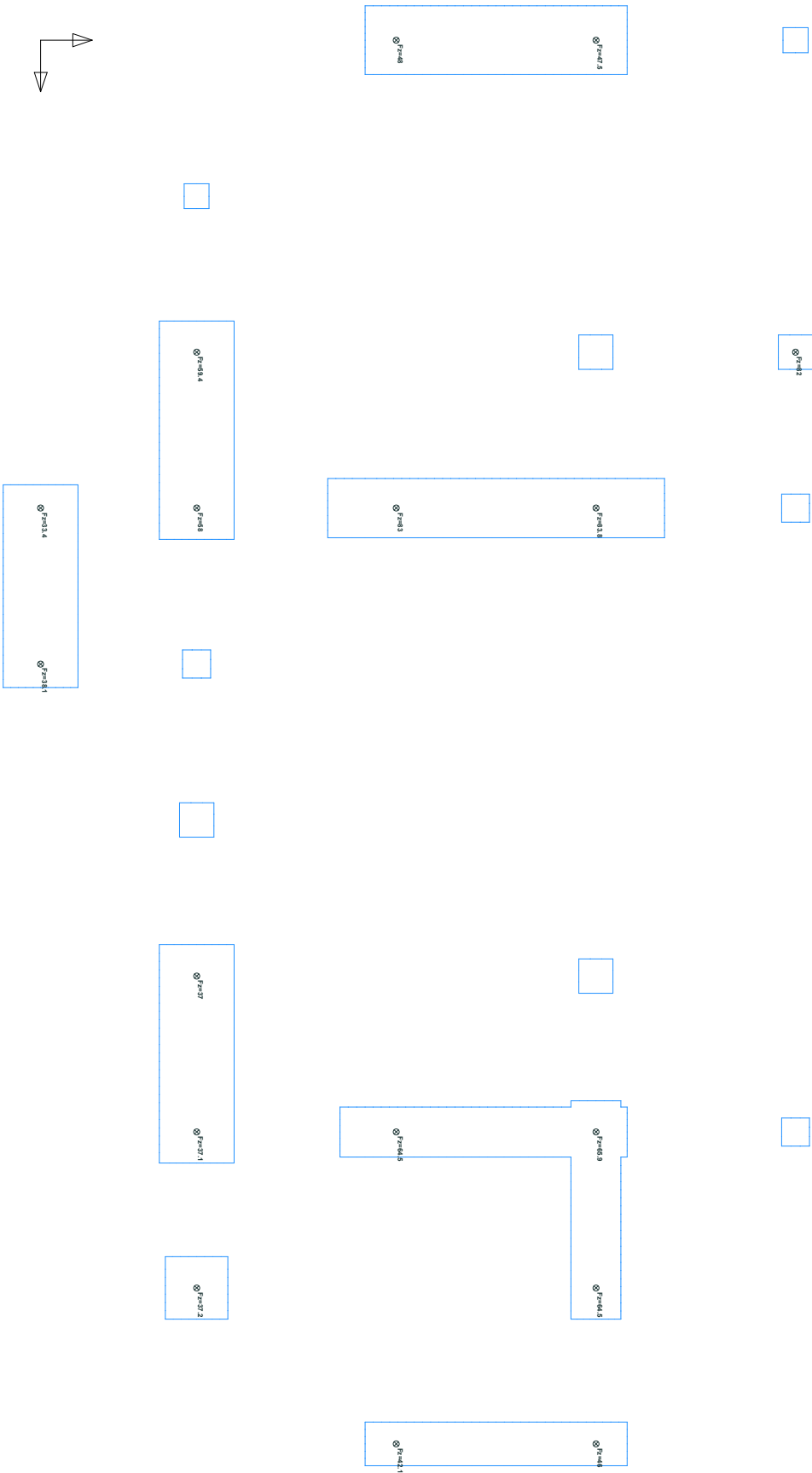
Dead Load (transfer): Point Loads, Point Load Cores, Point Load Values; Line Loads, Line Load Cores, Line Load Values; Area Loads, Area Load Values; Use the Notes, Use Lines, Use Dimensions;  
Scale = 1/32



Dead Load (transfer): All Loads Plan (2)

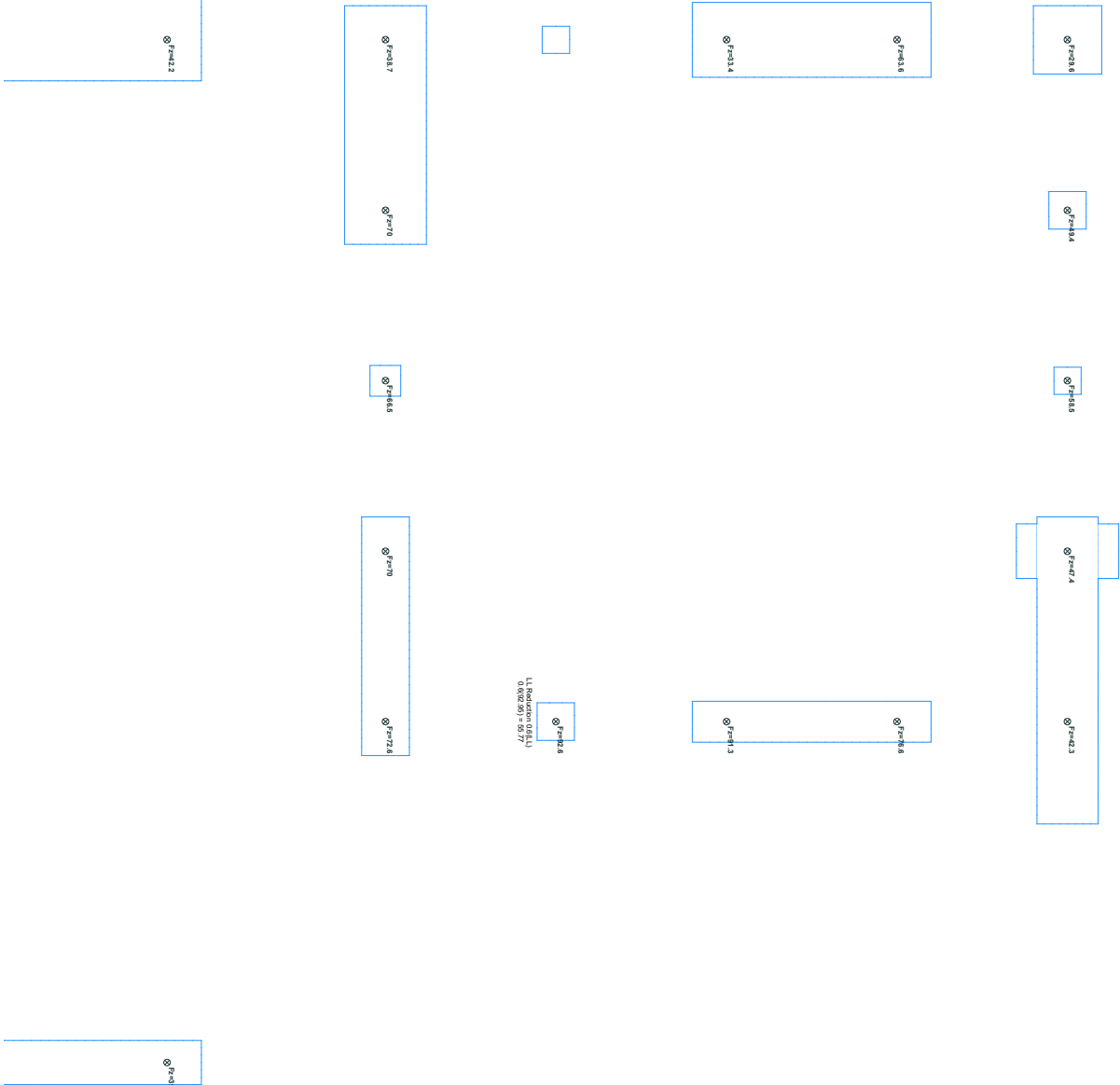


Dead Load (transfer): All Loads Plan (3)

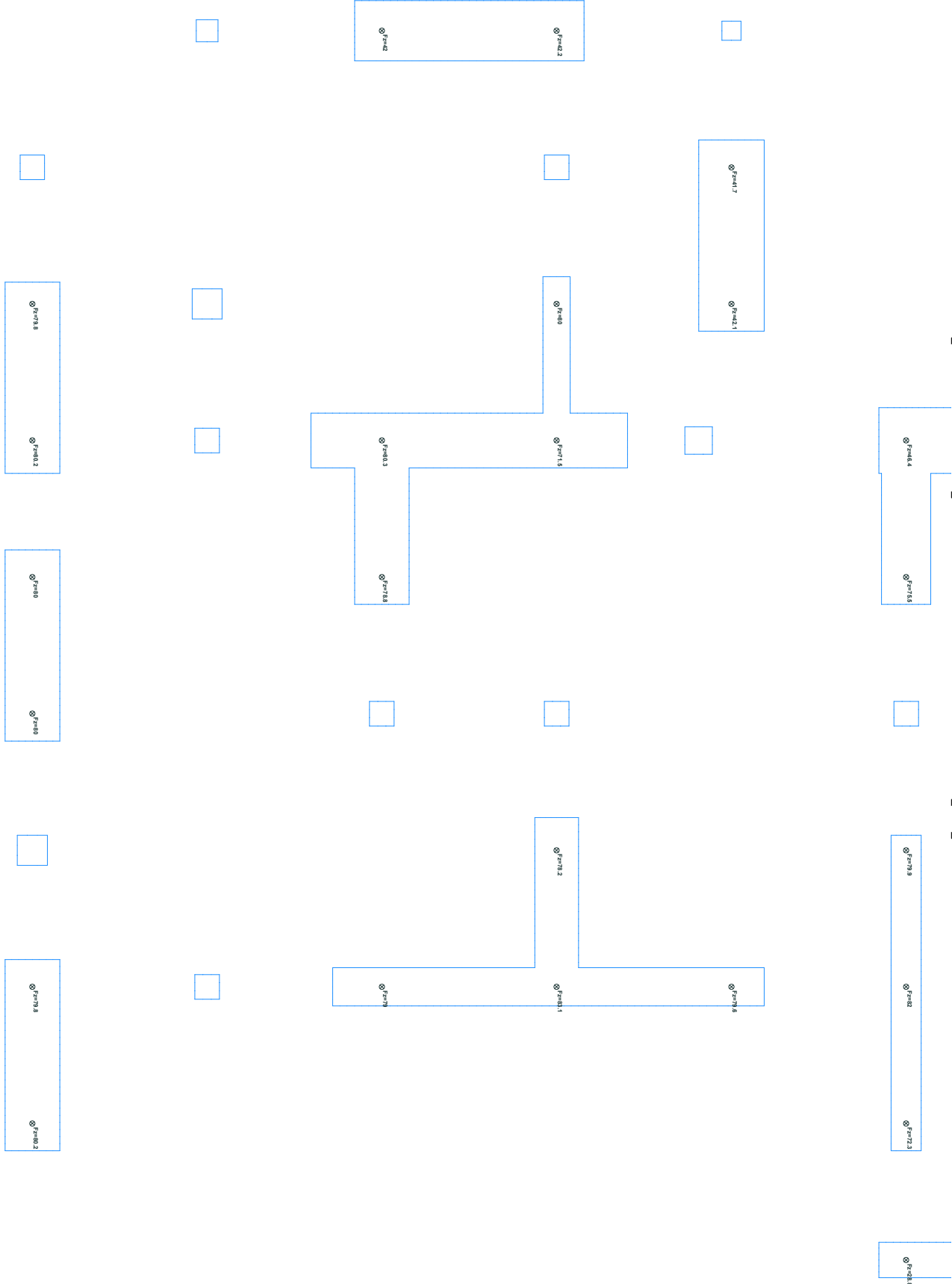


# Live Load Unreducible (transfer): All Loads Plan

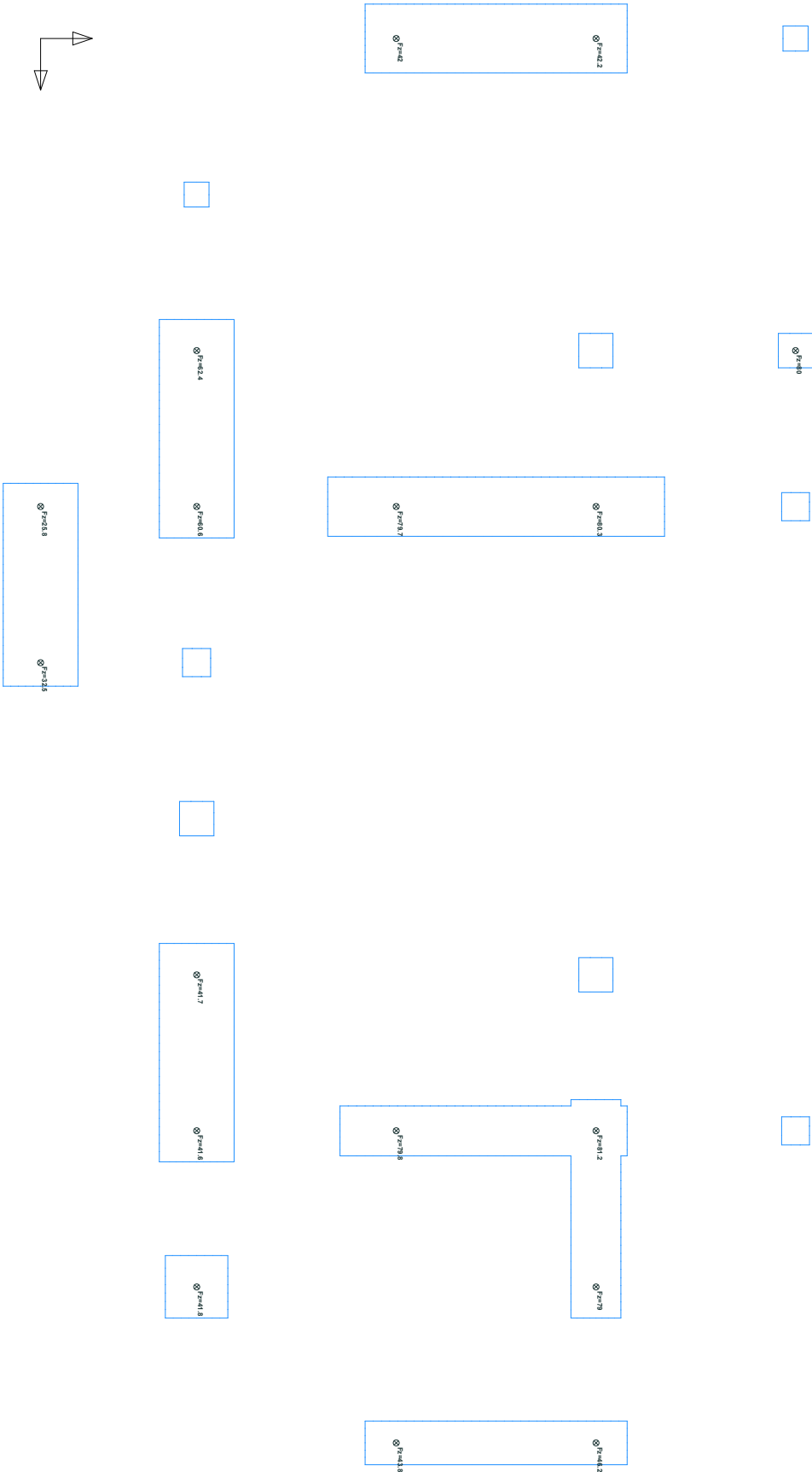
Live Load Unreducible Transfer: User Lines: User Notes: User Dimensions: Point Loads: Point Load Values: Line Loads: Line Load Tors: Area Loads: Area Load Tors: Area Load Values:  
Scale = 1/315  
Show Elements Below: Wall Elements Above: Wall Element Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:



Live Load Unreducible (transfer): All Loads Plan (2)

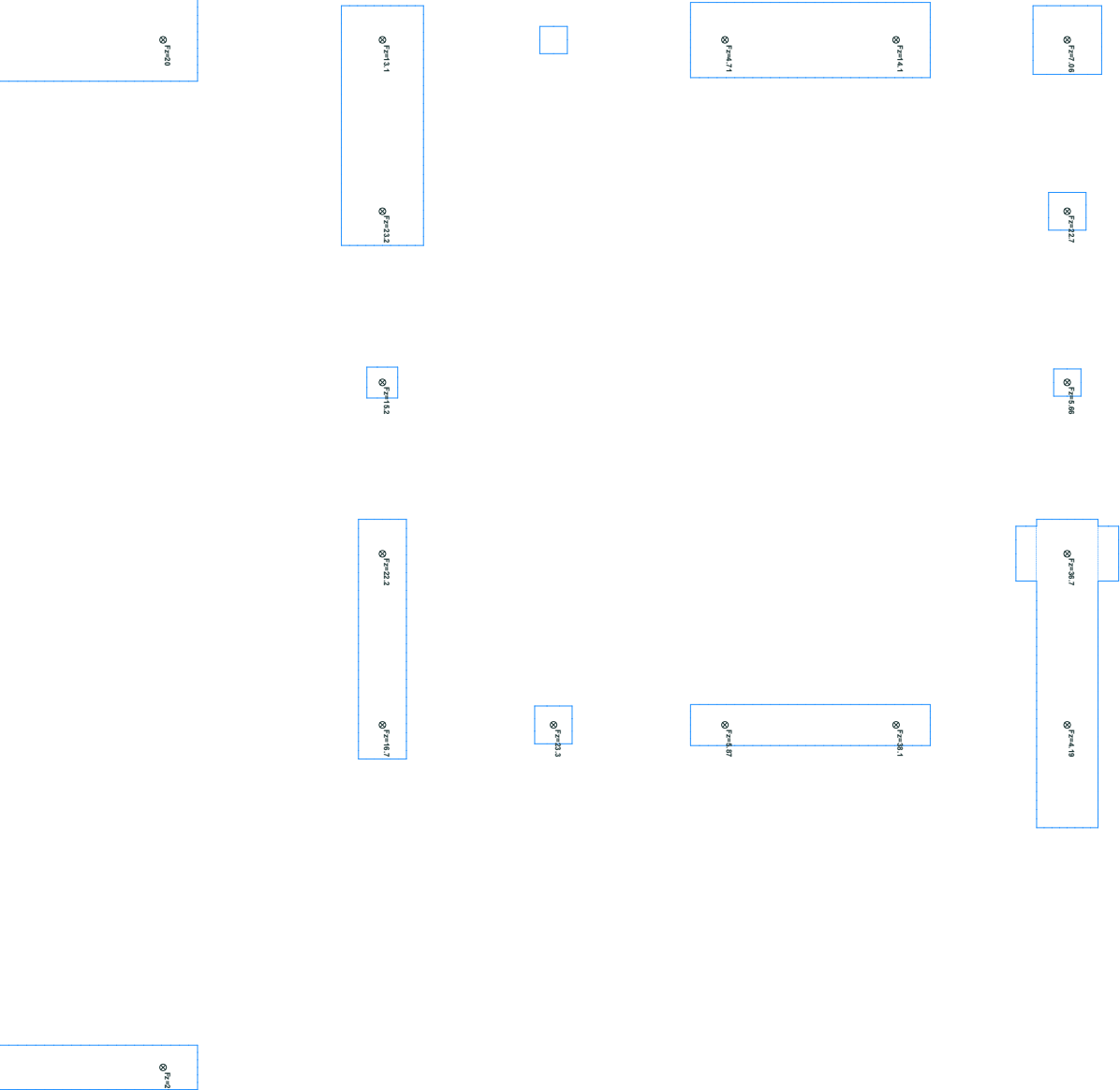


Live Load Unreducible (transfer): All Loads Plan (3)

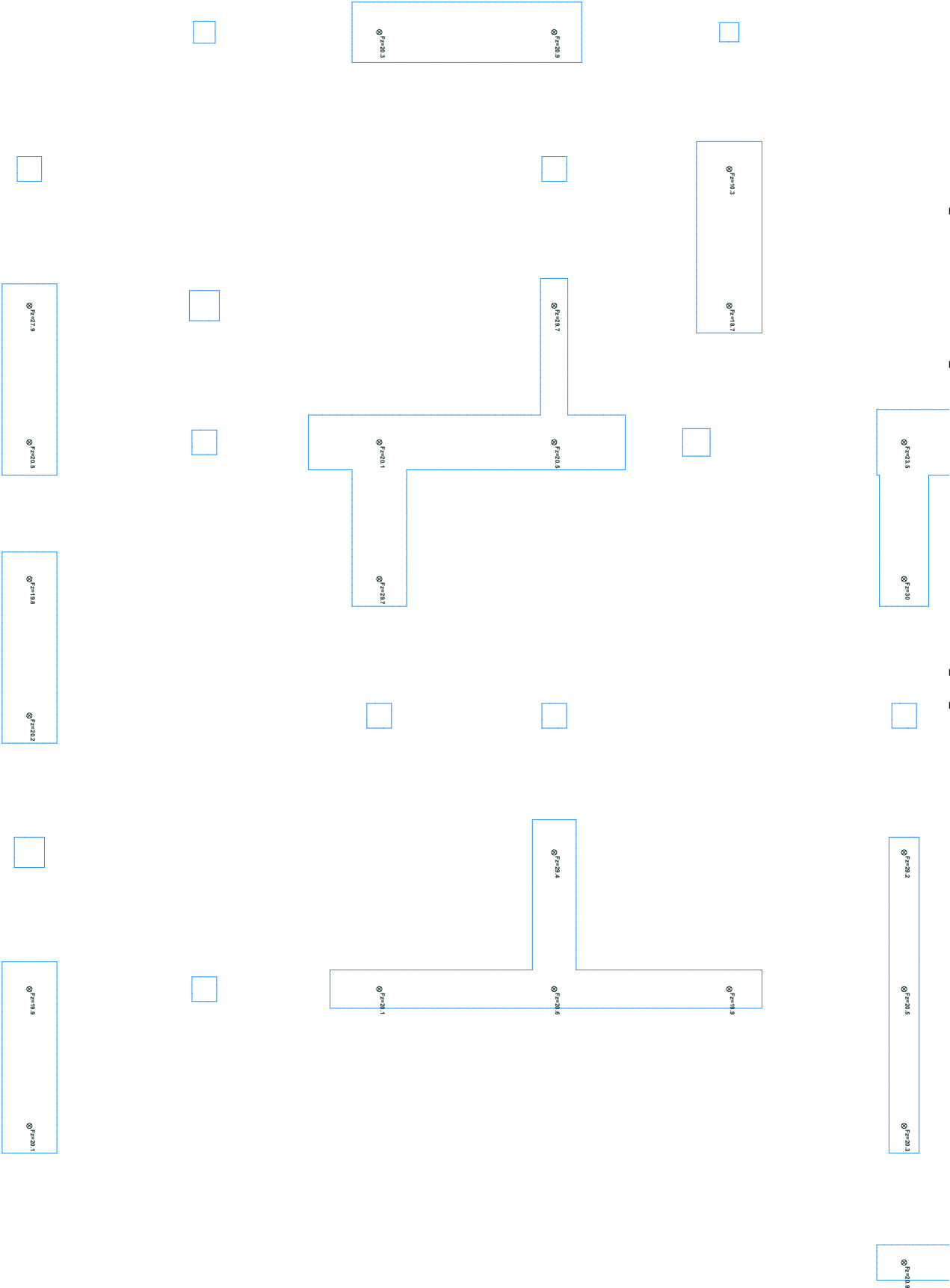


Live Load Roof (transfer): All Loads Plan

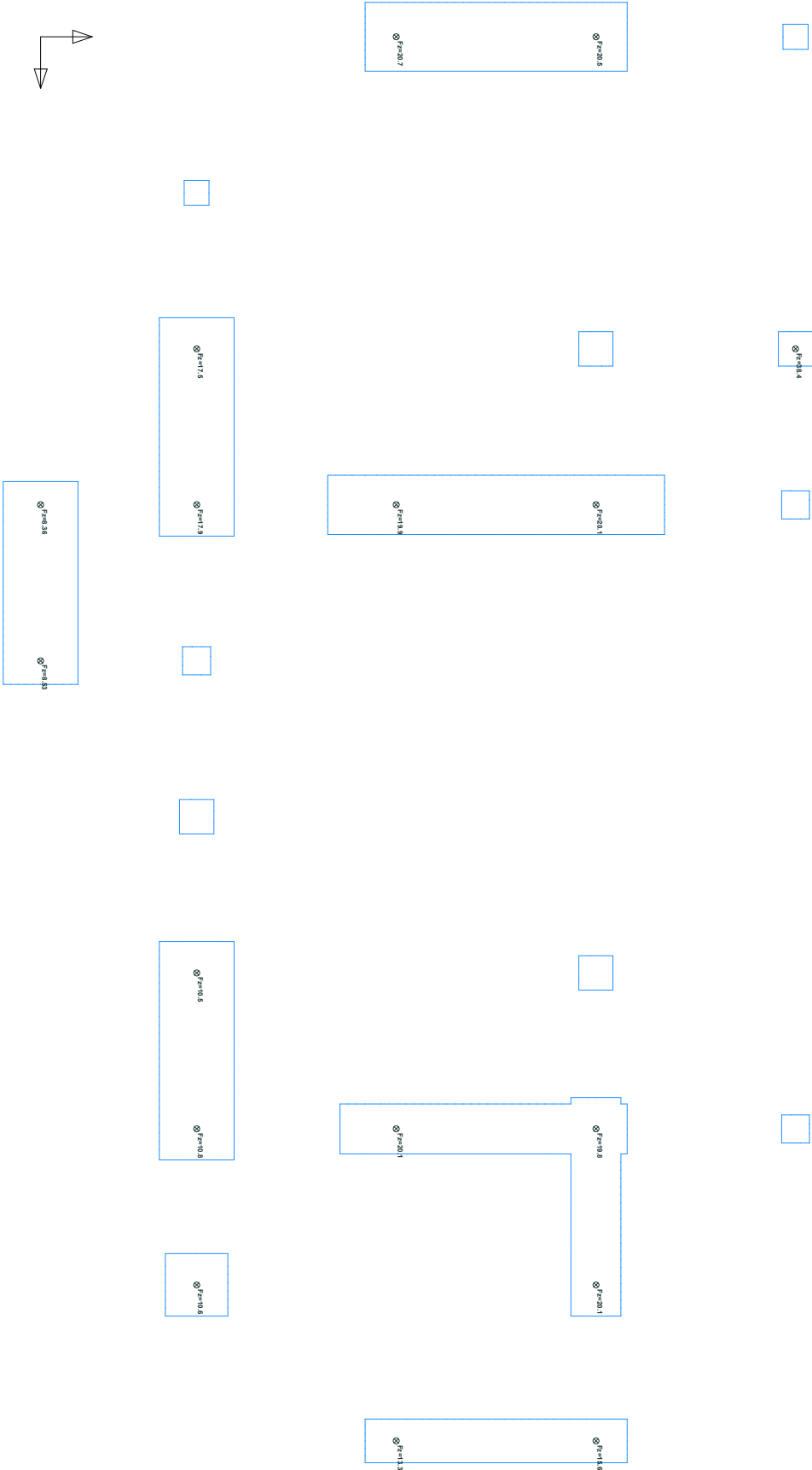
Live Load Roof (transfer): User Lines: User Notes: User Dimensions: Point Load: Point Load Values: Line Loads: Line Load Icons: Line Load Values: Area Loads: Area Load Icons: Area Load Values:  
Scale = 1/315

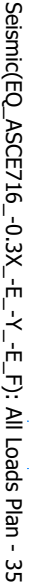


Live Load Roof (transfer): All Loads Plan (2)

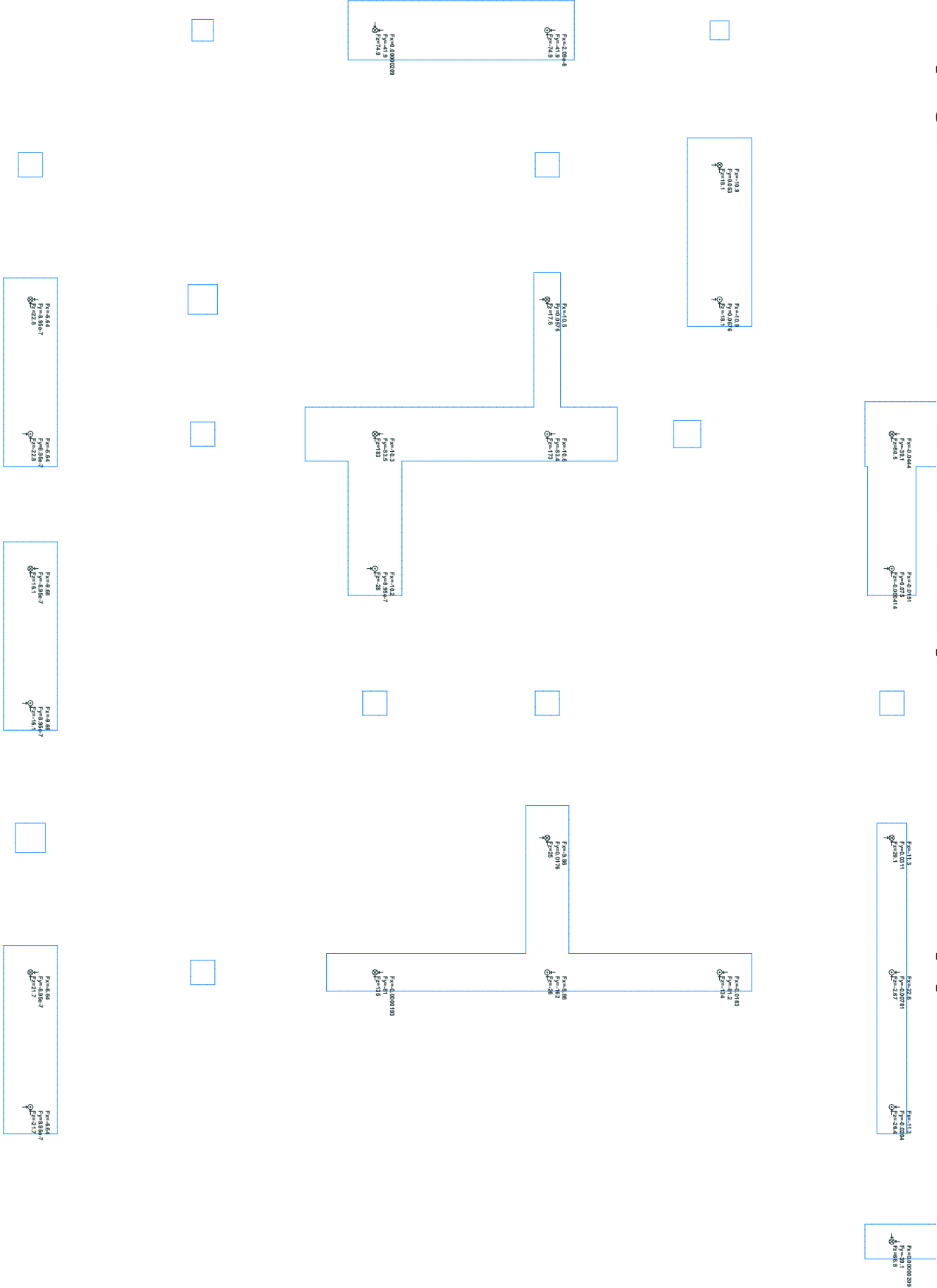


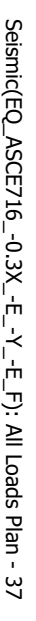
# Live Load Roof (transfer): All Loads Plan (3)





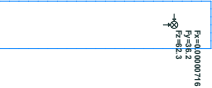
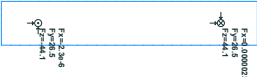
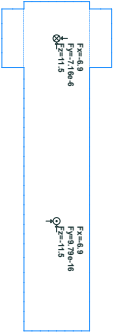
Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_-E\_F): All Loads Plan (2)

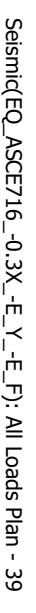




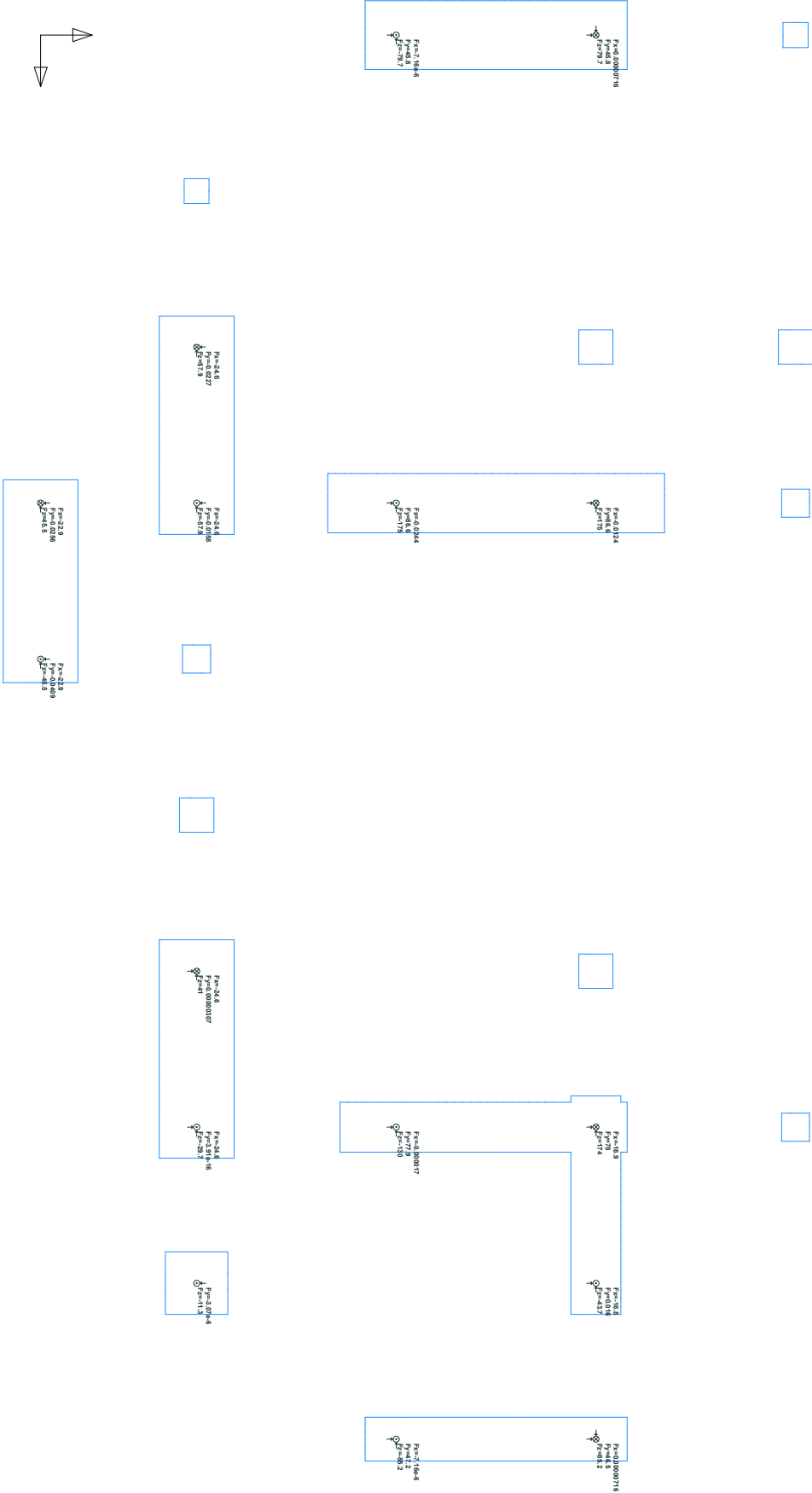
Seismic(EQ\_ASCE716\_-0.3X\_-E\_Y\_-E\_F): All Loads Plan

Seismic EQ ASCE716, 0.3X, E, Y, E, F, Use Load, Unit Notes, Unit Dimensions; Point Loads; Point Load Value; Line Loads; Line Load Value; Line Load Units; Area Loads; Area Load Value; Area Load Units; Area Load Values; Scale = 1/315



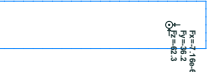
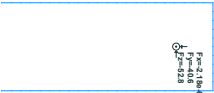
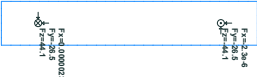
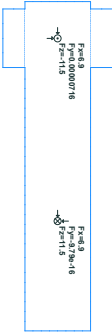


Seismic(EQ\_ASCE716\_-0.3X\_-E\_Y\_-E\_F): All Loads Plan (3)

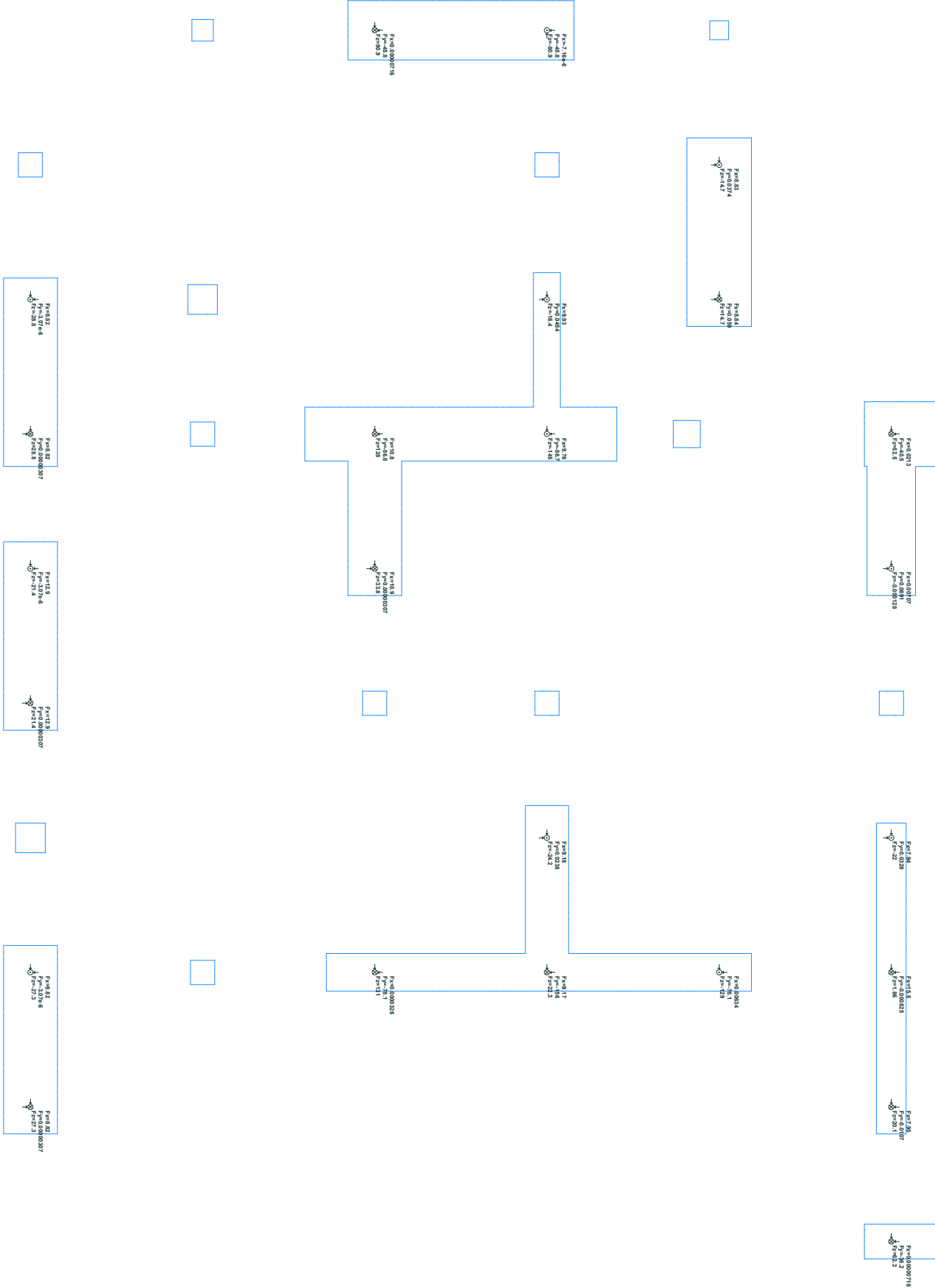


Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_-E\_F): All Loads Plan

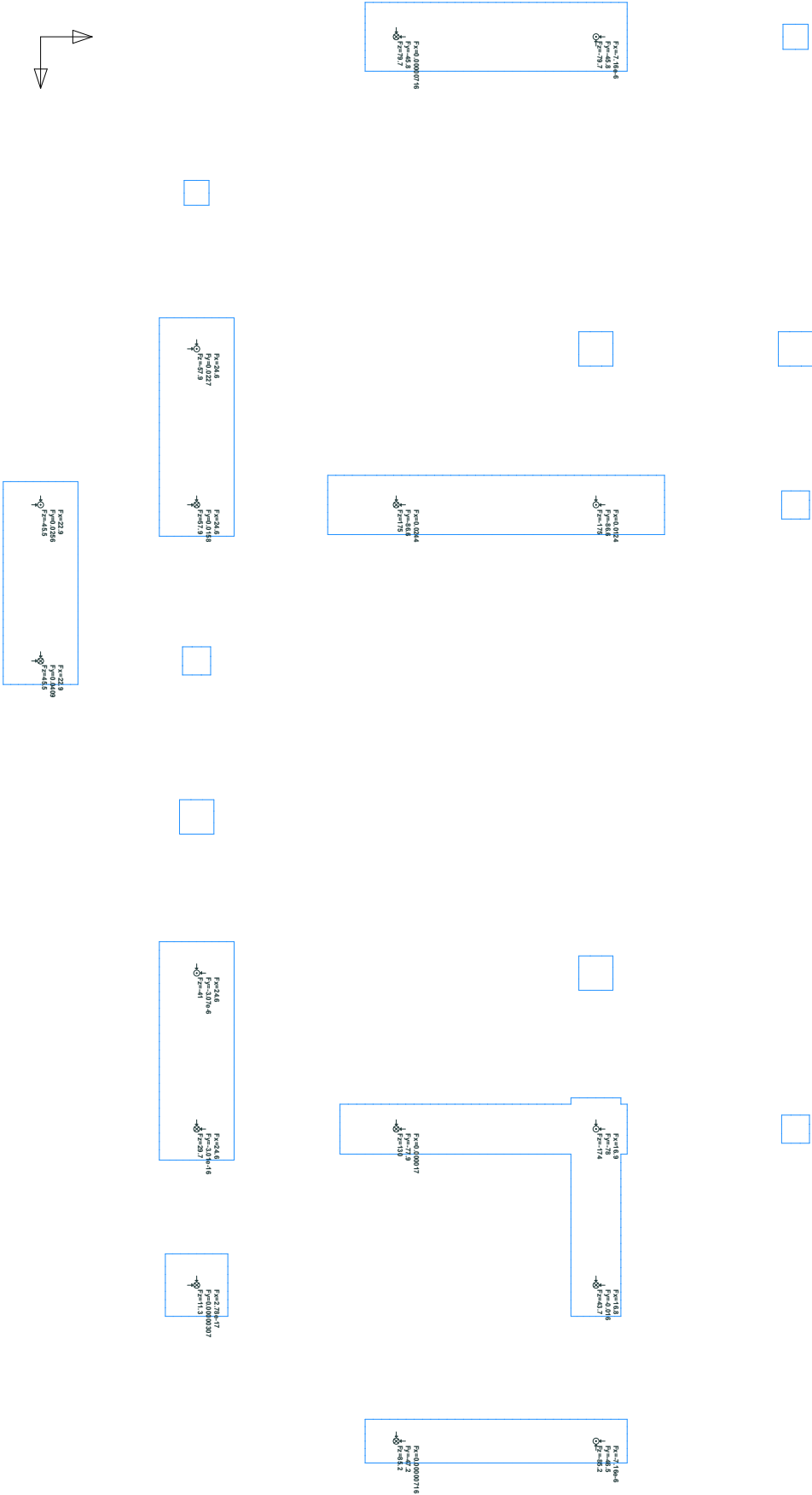
Seismic EQ ASCE716\_0.3X\_-E\_-Y\_-E\_F: Use Loads: Uplift Nodes; Uplift Dimensions; Point Loads; Point Load Corners; Point Load Values; Line Loads; Line Load Corners; Line Load Values; Area Loads; Area Load Corners; Area Load Values;  
Scale = 1/315



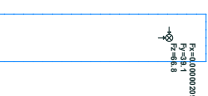
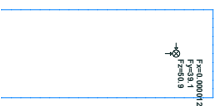
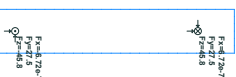
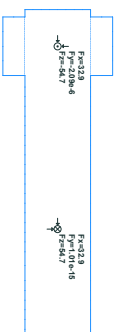
Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_-E\_F): All Loads Plan (2)



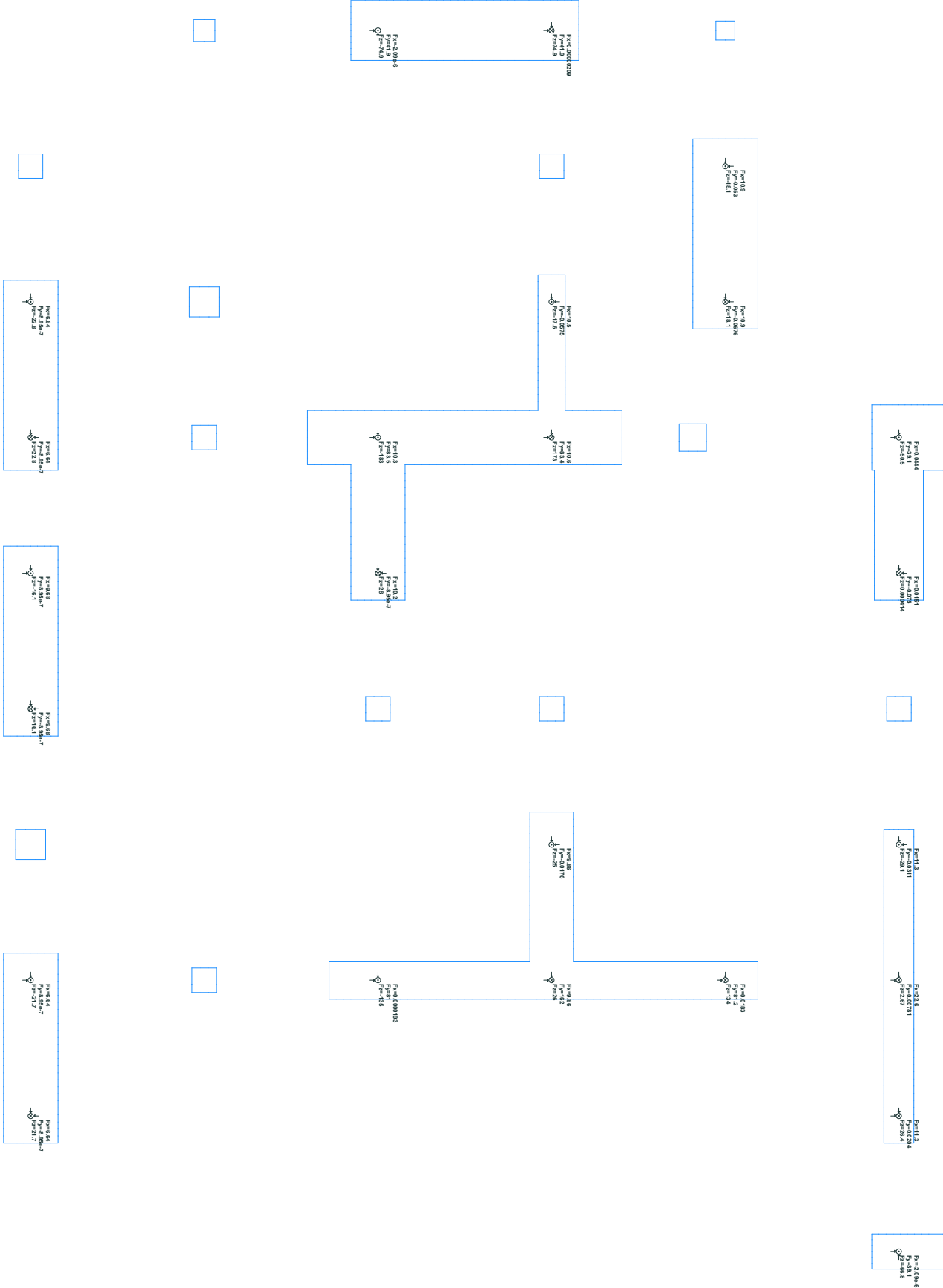
Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_-E\_F): All Loads Plan (3)



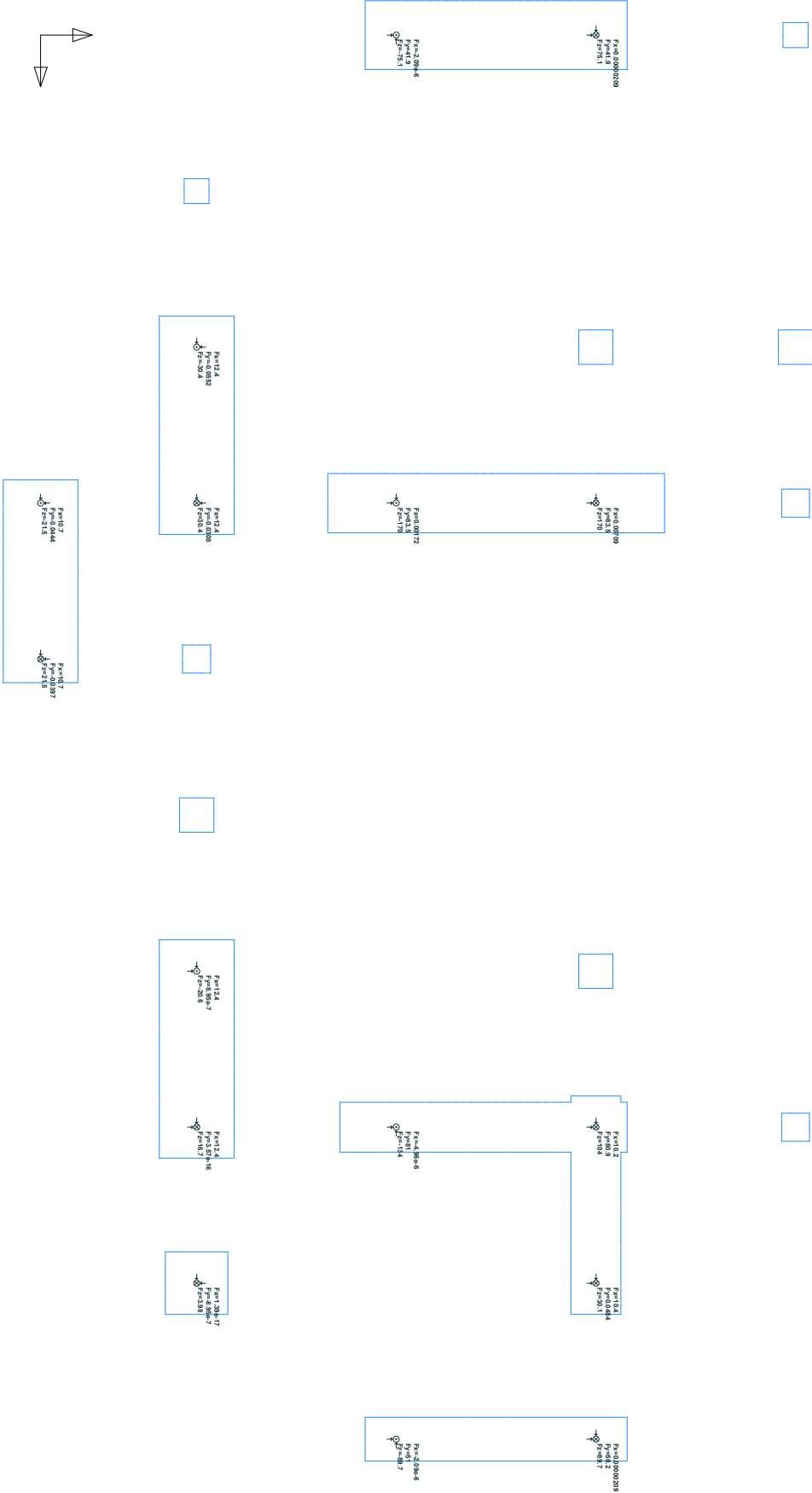
**Beam Data:** EQ, ASCE7-05, 0.9x<sub>E</sub>, E<sub>y</sub>=E<sub>x</sub>/year Load; User Notes: /User Dimensions: Point Loads; Point Load Icons: Point Load Values; Line Loads; Line Load Icons: Line Load Values; Area Loads; Area Load Icons: Area Load Values  
**Element Data:** Non Elements Below; Non Elements Above; Non Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;  
 Scale = 1:315



Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_-E\_F): All Loads Plan (2)

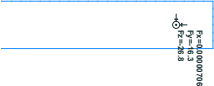
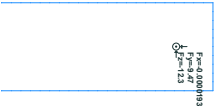
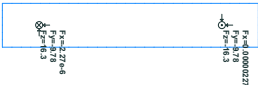
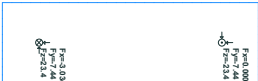
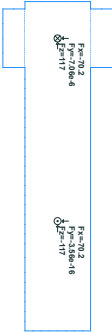


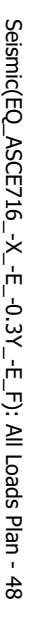
Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_-E\_F): All Loads Plan (3)



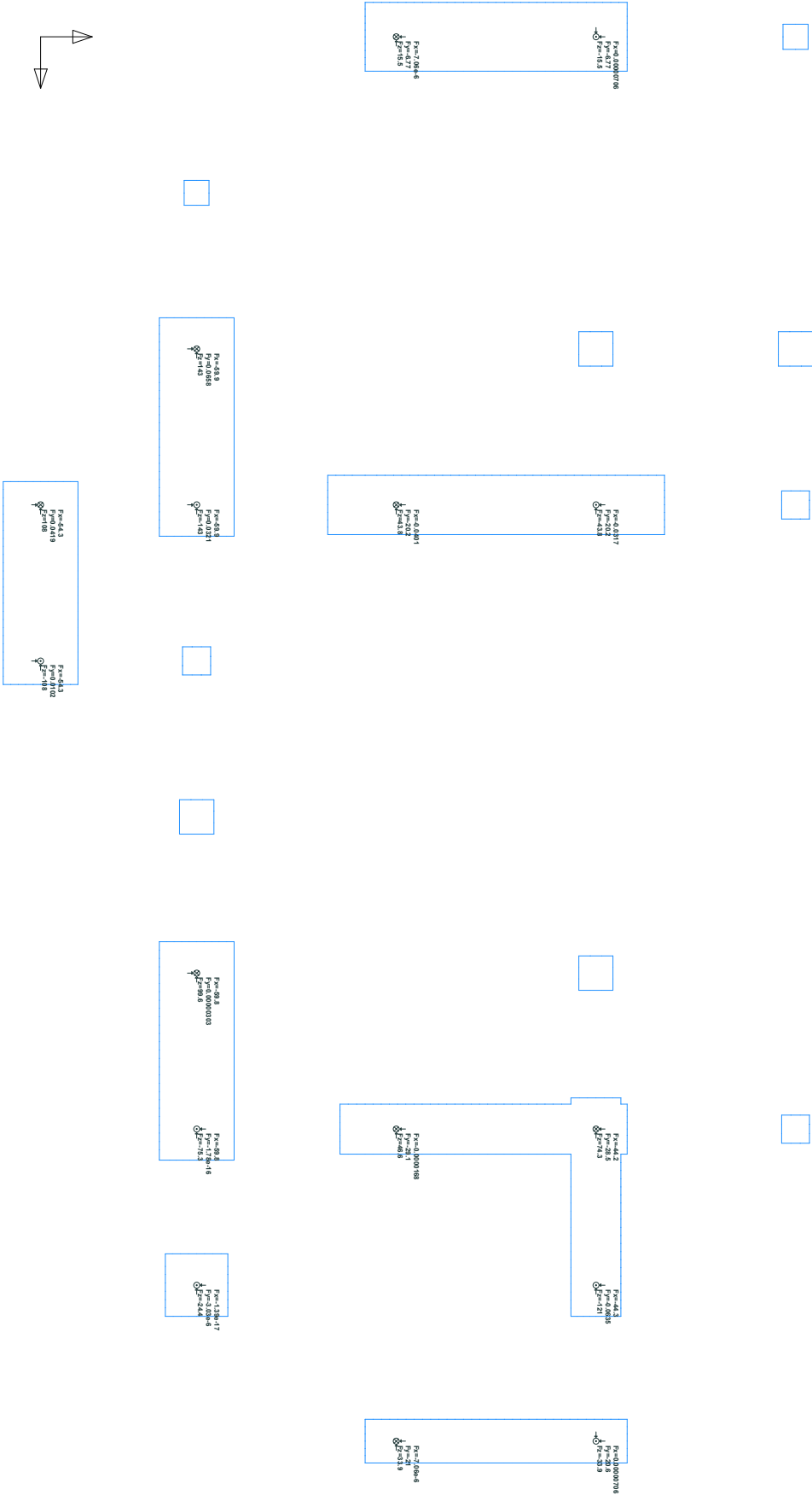
# Seismic(EQ\_ASCE716\_-X\_-E\_-0.3Y\_-E\_F): All Loads Plan

Seismic(EQ\_ASCE716\_-X\_-0.3Y\_-E\_F) User Load, User Moment, Point Load, Point Load from, Point Load Value, Line Load, Line Load from, Line Load Value, Area Load, Area Load from, Area Load Value;  
Scale = 1/315



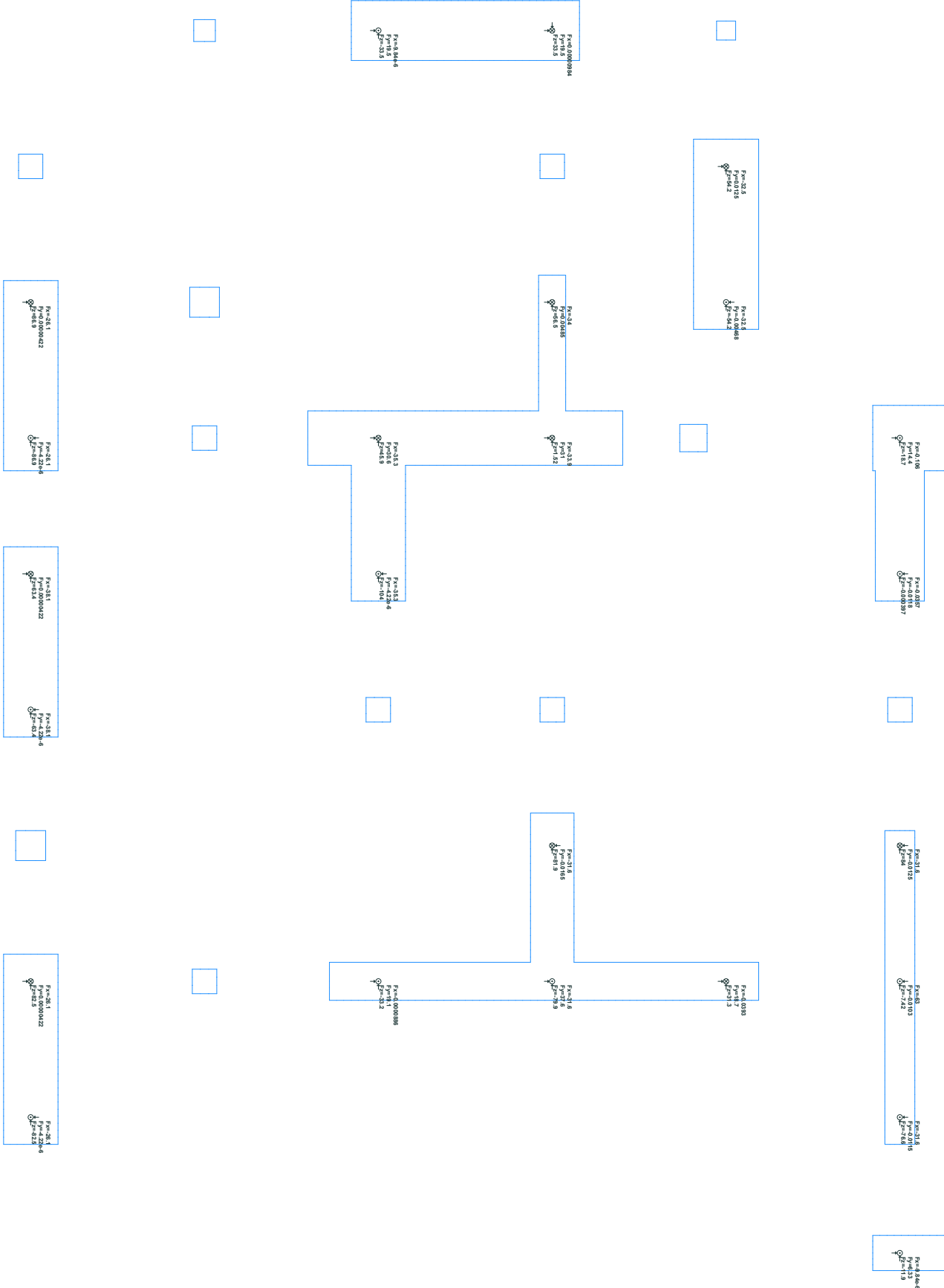


Seismic(EQ\_ASCE716\_-X\_-E\_-0.3Y\_-E\_F): All Loads Plan (3)

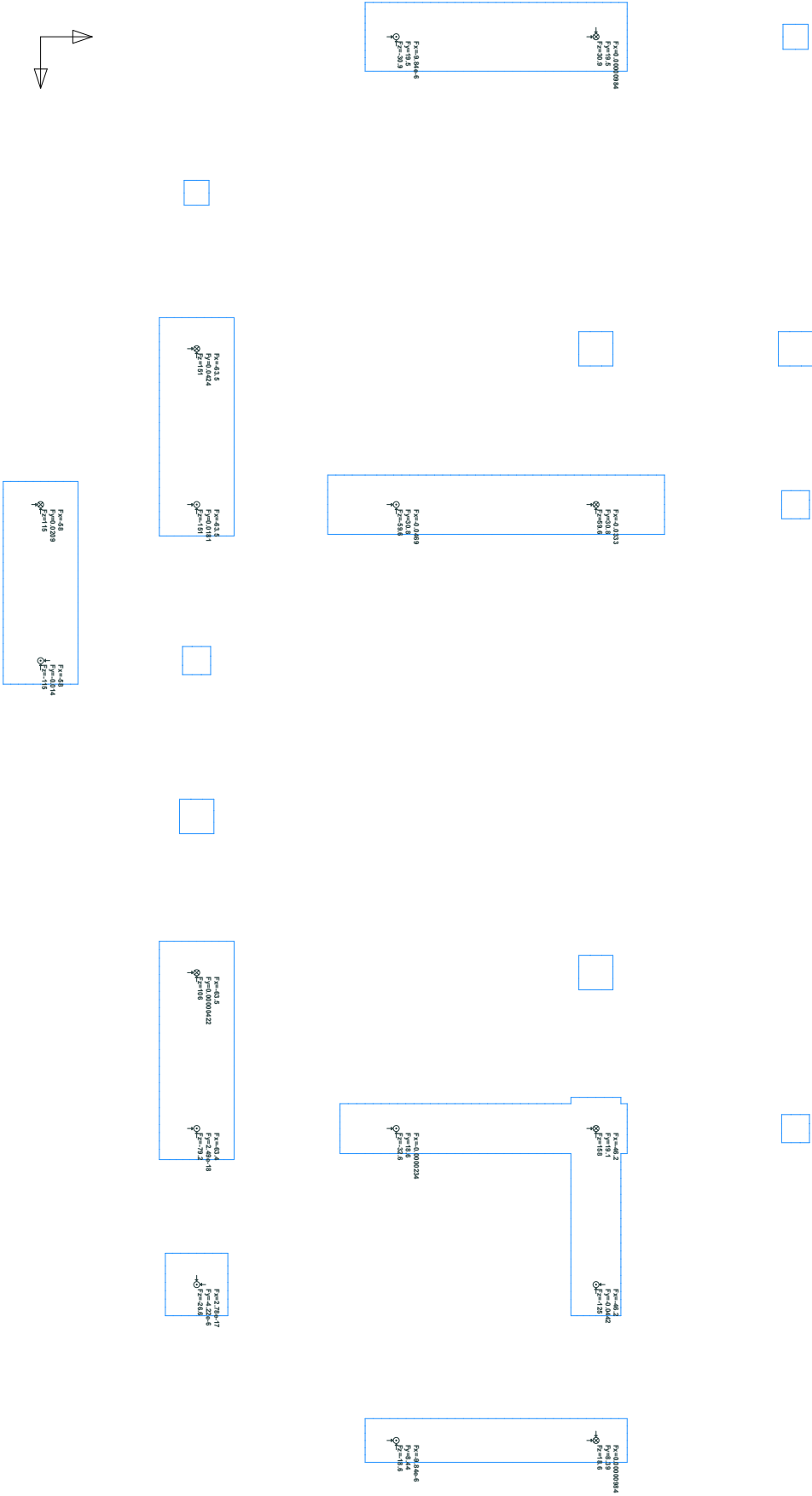




Seismic(EQ\_ASCE716\_-X\_-E\_0.3Y\_-E\_F): All Loads Plan (2)

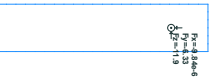
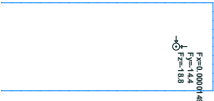
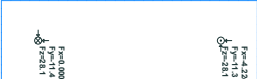
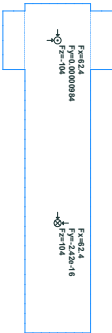


Seismic(EQ\_ASCET16\_-X\_-E\_0.3Y\_-E\_F): All Loads Plan (3)

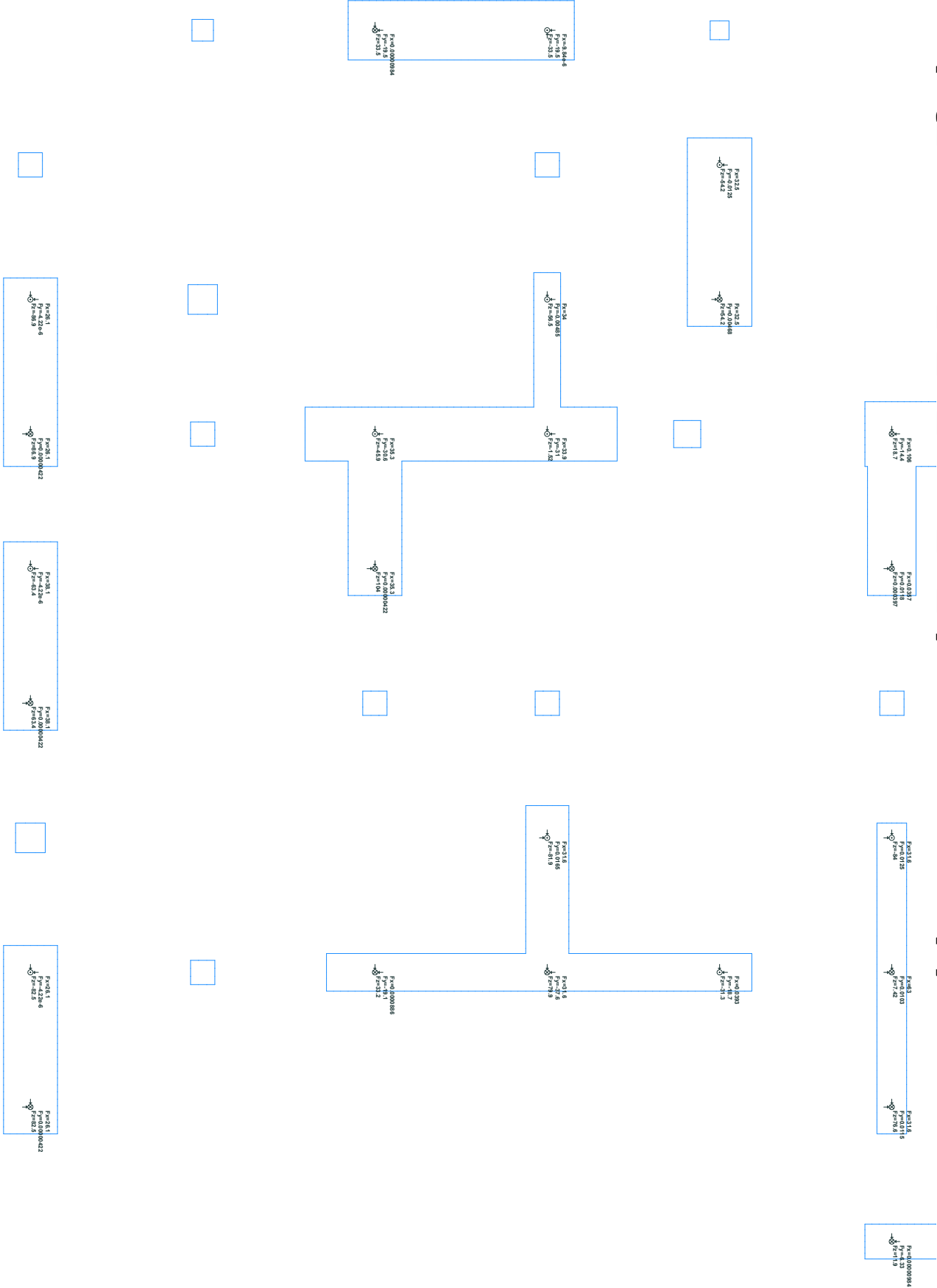


Seismic(EQ\_ASCET716\_X\_-E\_-0.3Y\_-E\_F): All Loads Plan

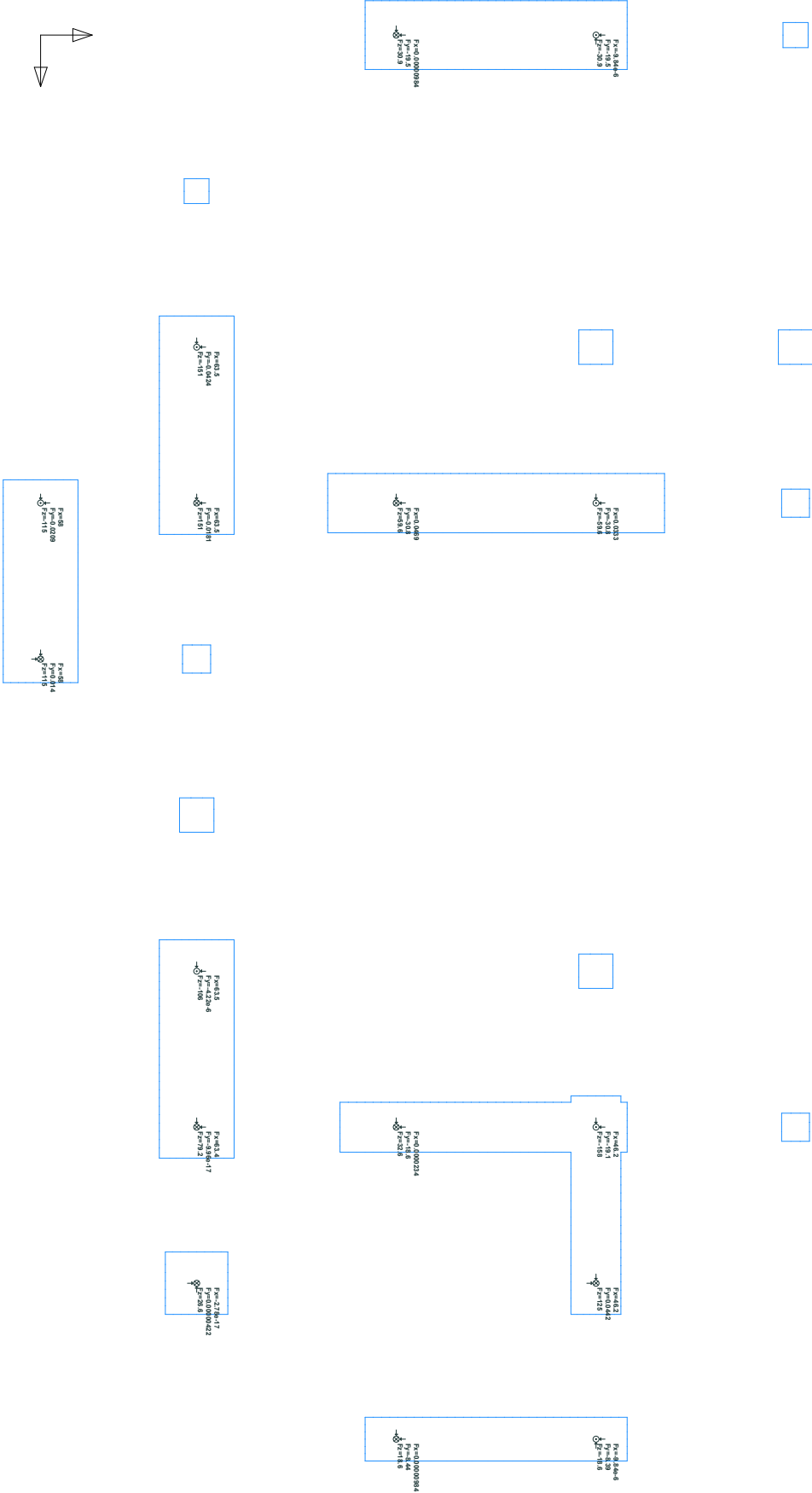
Seismic EQ\_ASCET716\_X\_-E\_-0.3Y\_-E\_F: Use Loads: Uplift Nodes; Uplift Dimensions; Point Loads; Point Load Corners; Line Loads; Line Load Corners; Line Load Values; Area Loads; Area Load Corners; Area Load Values; Scale = 1/315



Seismic(EQ\_ASCE716\_X\_-E\_-0.3Y\_-E\_F): All Loads Plan (2)

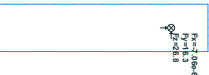
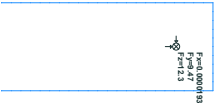
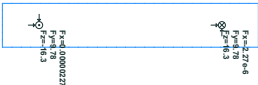
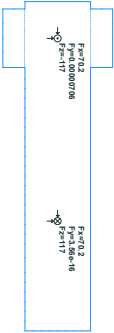


Seismic(EQ\_ASCET716\_X\_-E\_-0.3Y\_-E\_F): All Loads Plan (3)

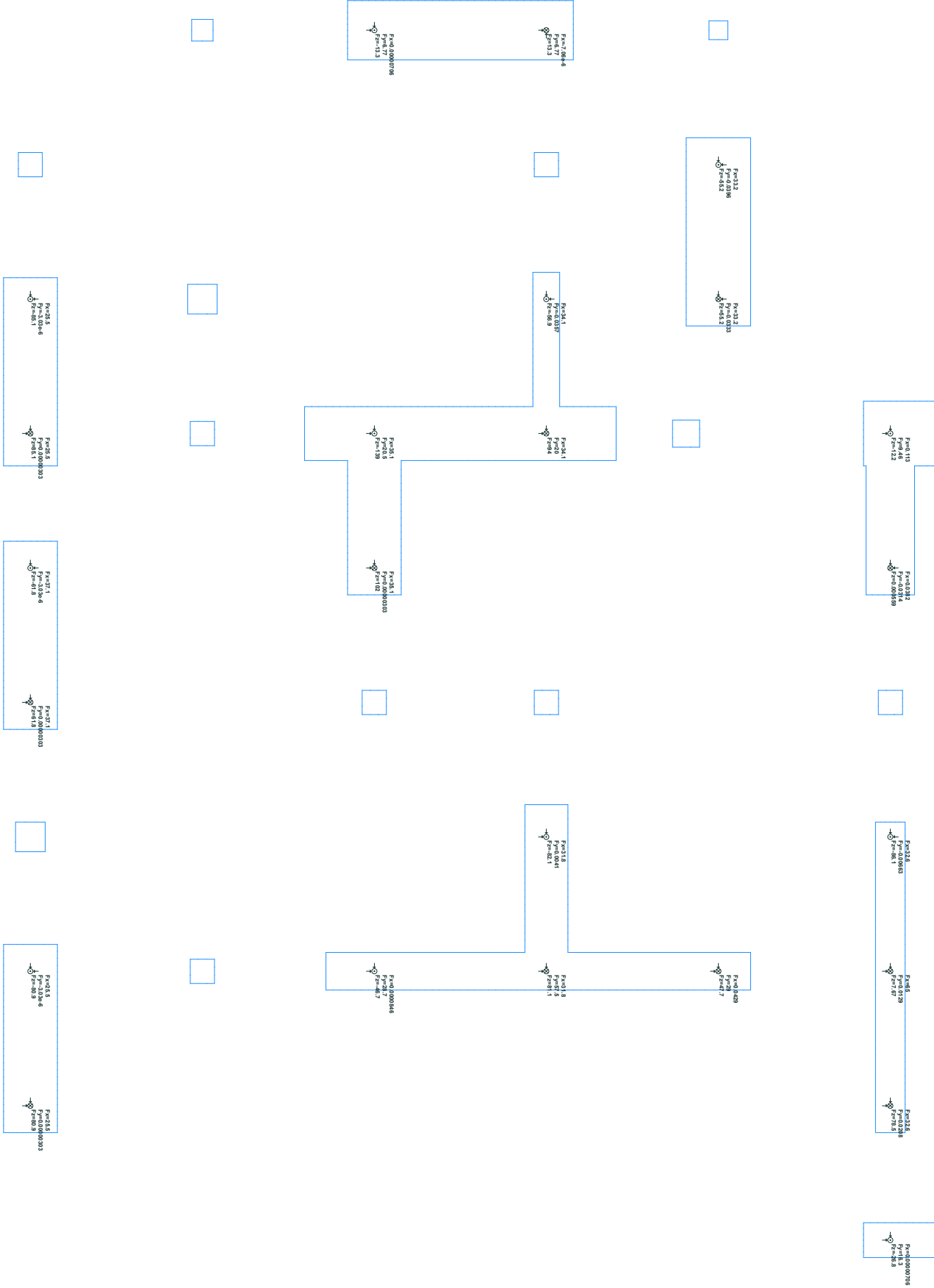


# Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_-E\_F): All Loads Plan

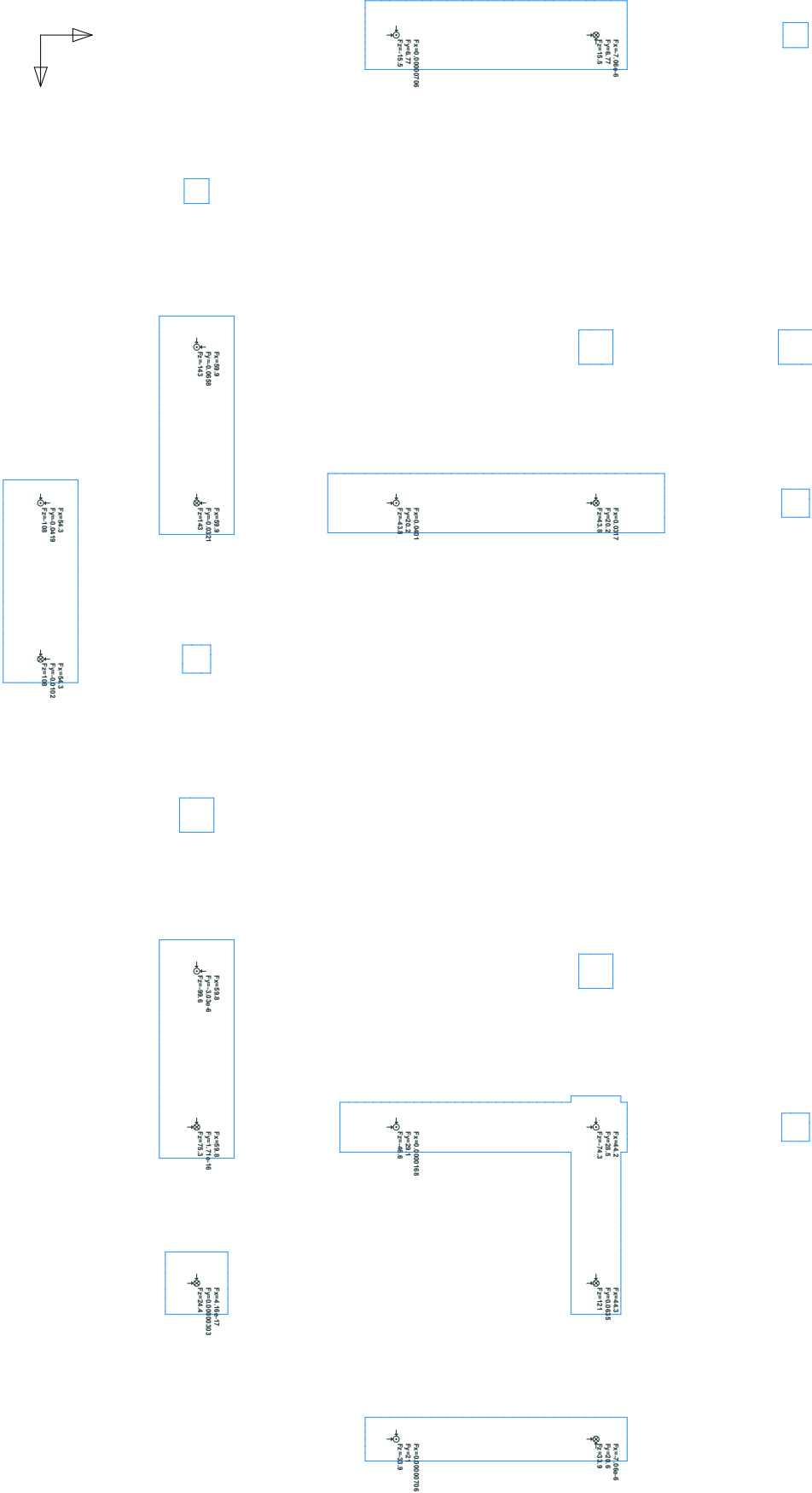
Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_-E\_F) User Lines: User Notes: User Dimensions: Point Load Icons: Point Load Values: Line Load Icons: Line Load Values: Area Load Icons: Area Load Values:   
 Scale = 1/315



Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_-E\_F): All Loads Plan (2)

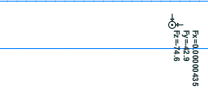
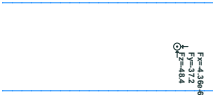
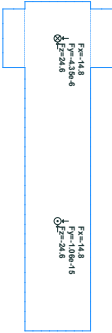


Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_-E\_F): All Loads Plan (3)

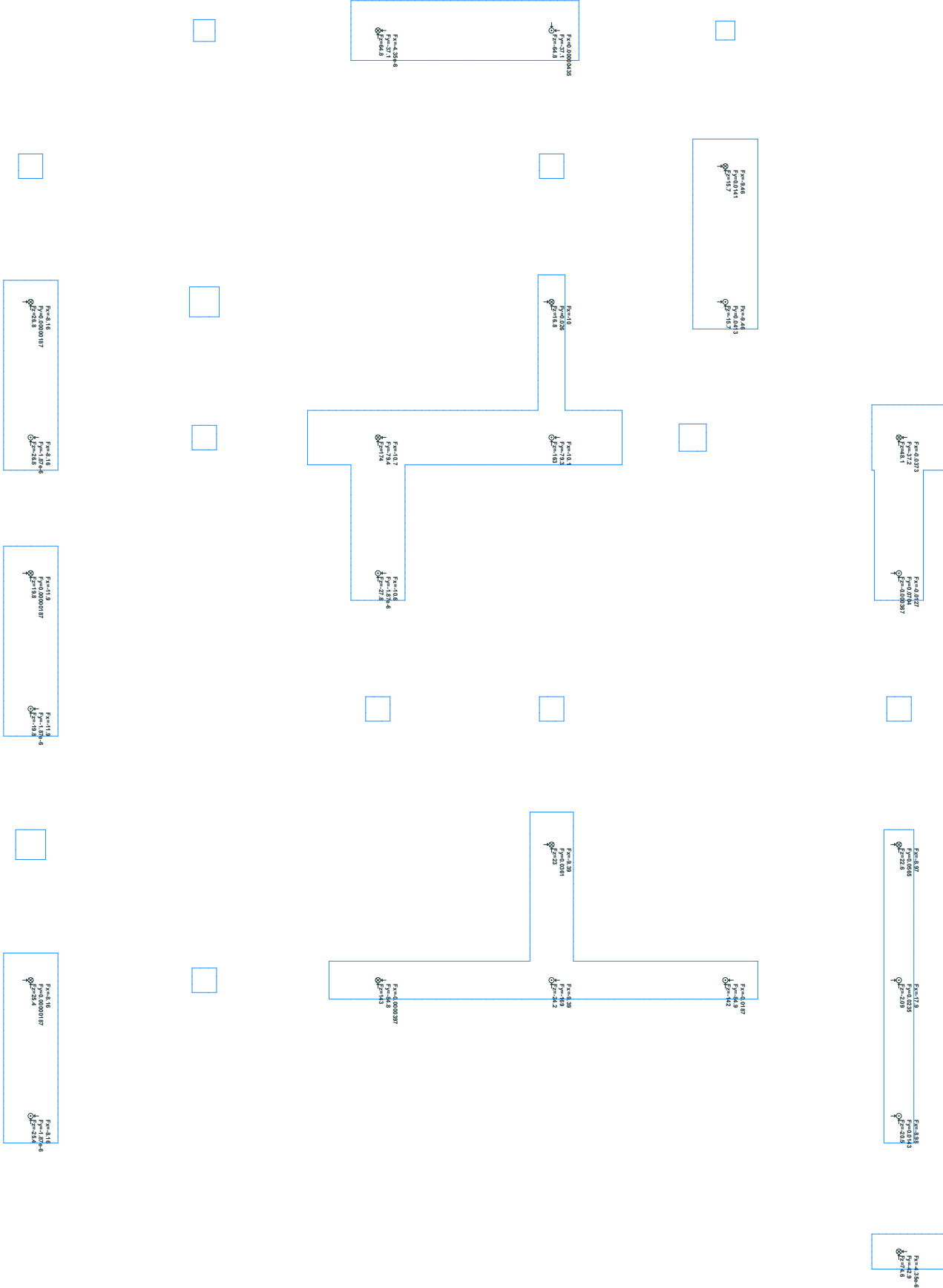


Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_+E\_F): All Loads Plan

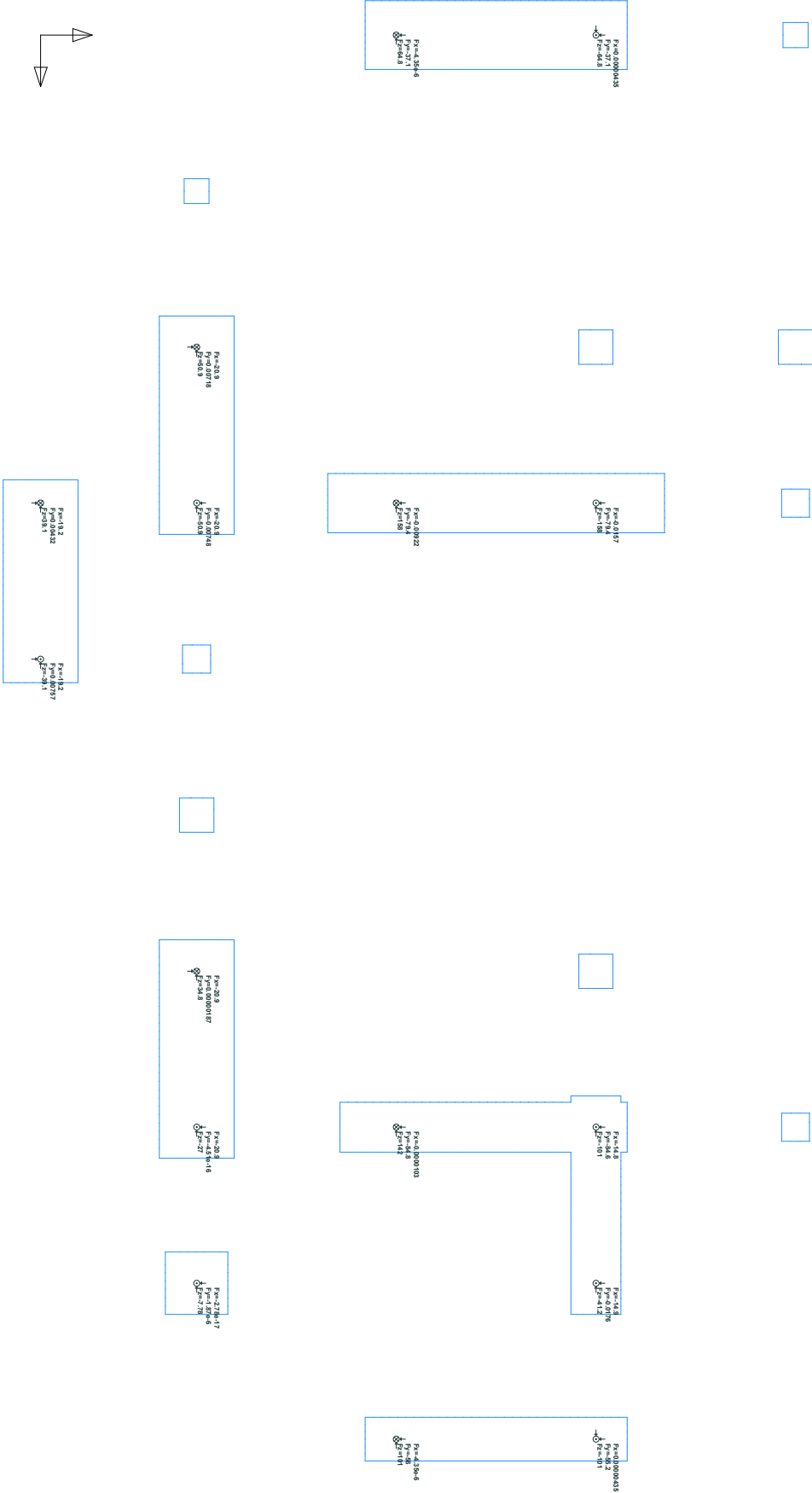
Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_+E\_F) User Notes: User Dimensions, Point Loads, Point Load Icons, Line Load Icons, Line Load Values, Area Load Icons, Area Load Values;  
Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_+E\_F) Elements Below: Wall Elements Above, Wall Elements Below, Column Elements Above, Column Elements Below, Slab Elements, Slab Element Outline Only;  
Scale = 1/315

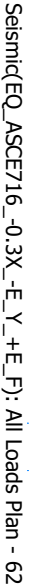


Seismic(EQ\_ASCET716\_-0.3X\_-E\_-Y\_+E\_F): All Loads Plan (2)

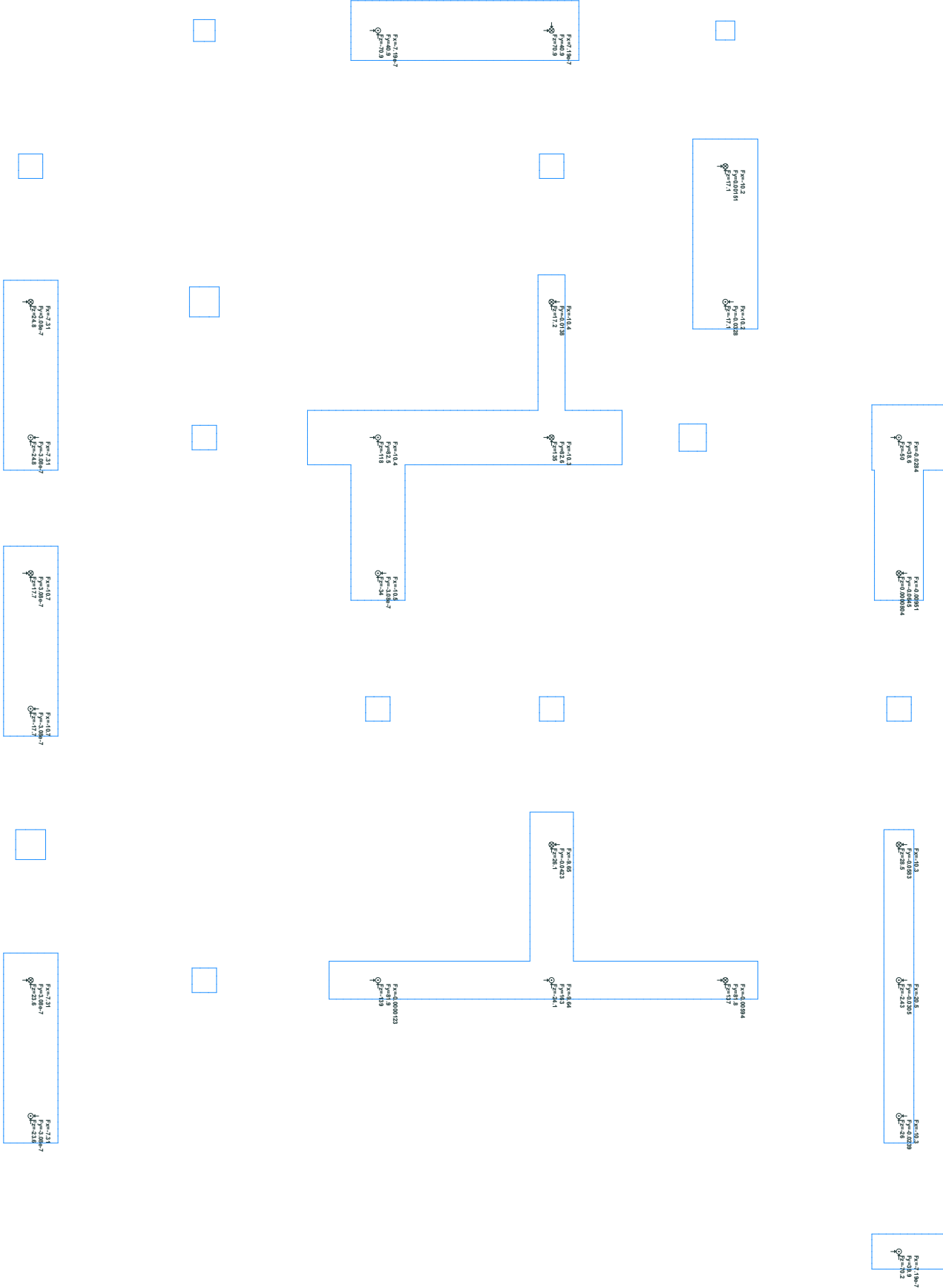


Seismic(EQ\_ASCET716\_-0.3X\_-E\_-Y\_+E\_F): All Loads Plan (3)

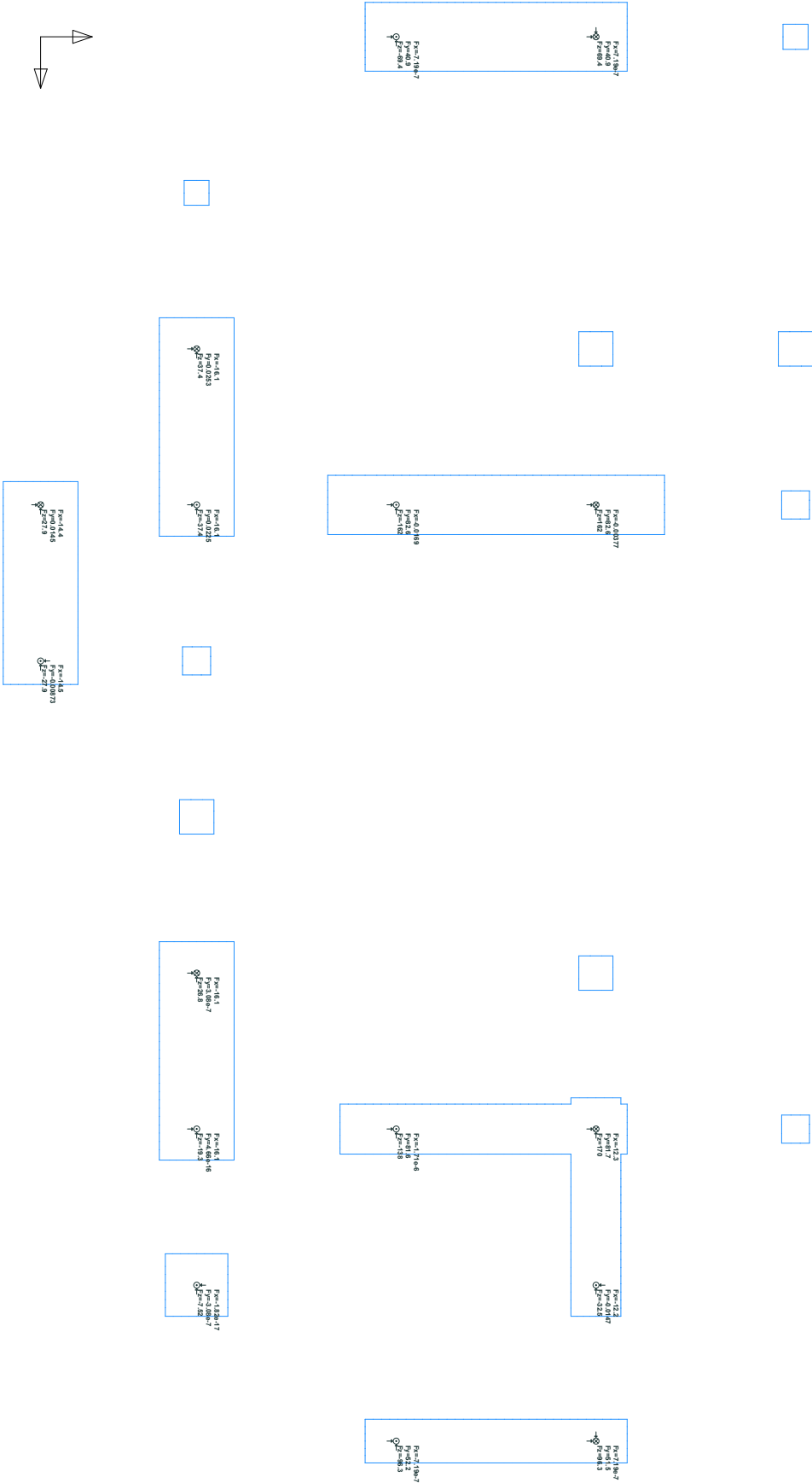




Seismic(EQ\_ASCE716\_-0.3X\_-E\_Y\_+E\_F): All Loads Plan (2)

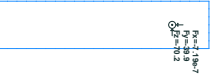
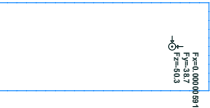
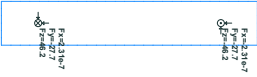
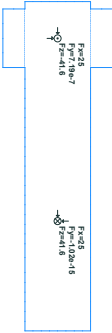


Seismic(EQ\_ASCE716\_-0.3X\_-E\_Y\_+E\_F): All Loads Plan (3)

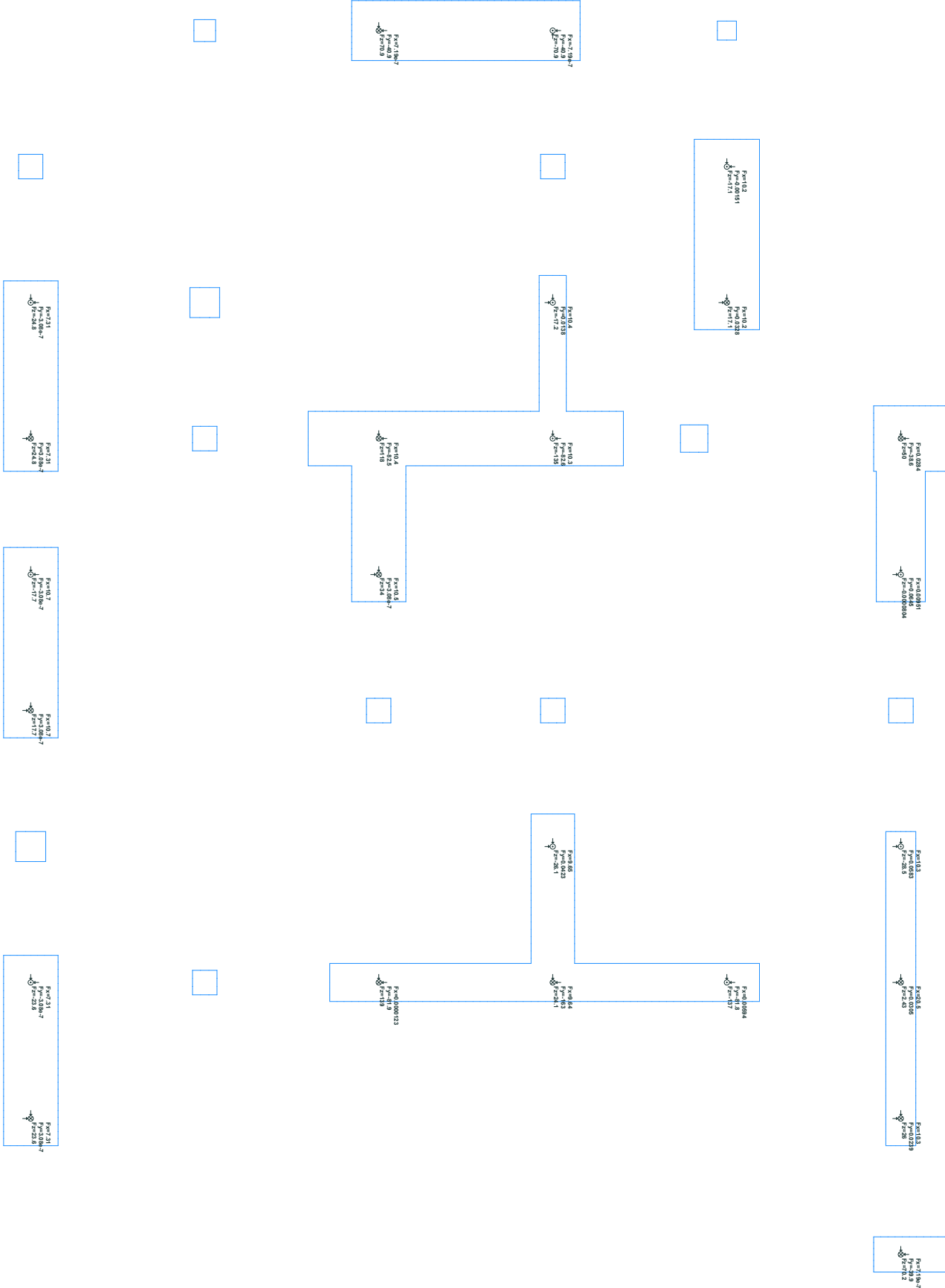


Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_+E\_F): All Loads Plan

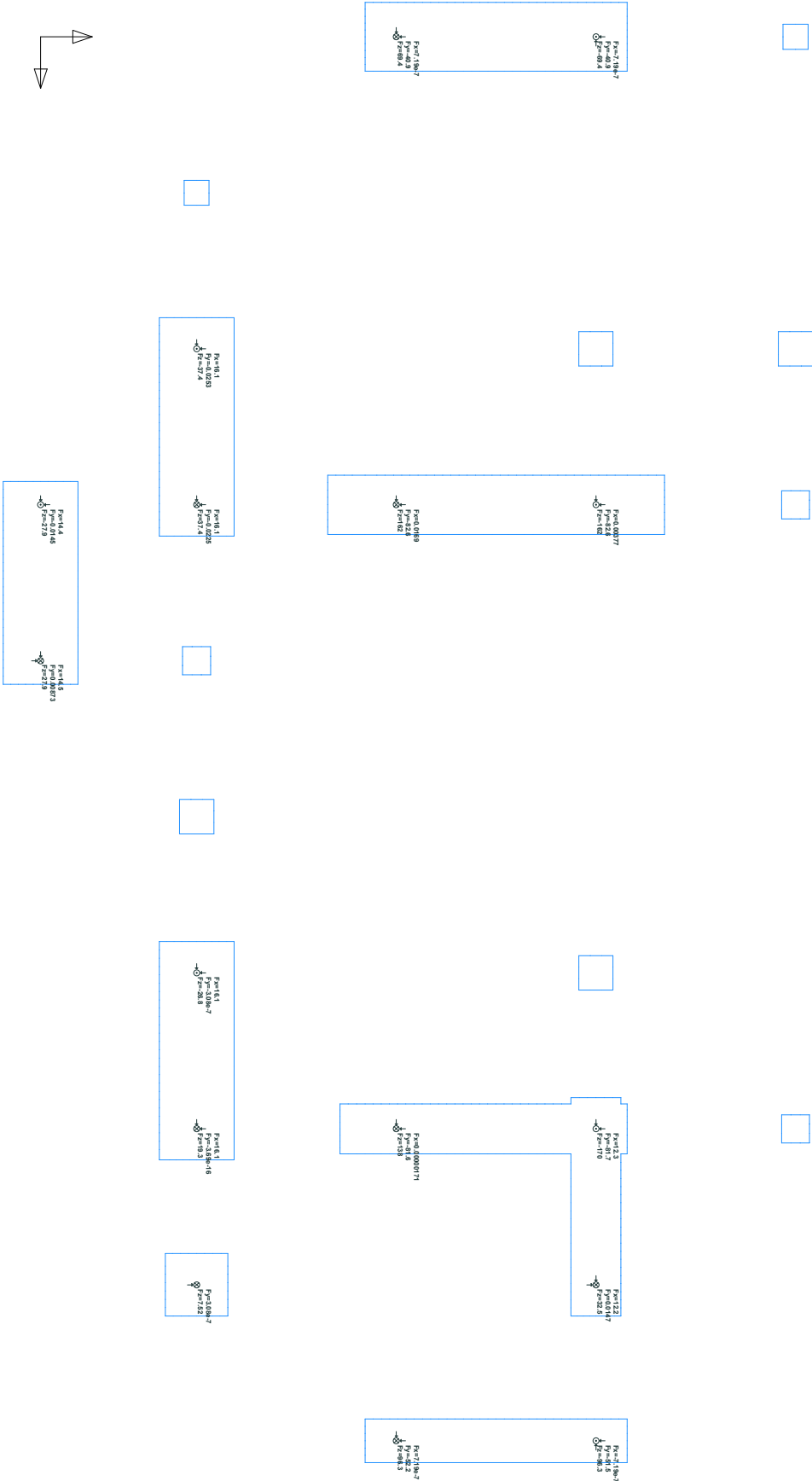
See: EQ\_ASCE716\_0.3X\_-E\_-Y\_F User Load; User Moment; User Dimension; Point Load; Line Load; Line Load from; Line Load Values; Line Load; Line Load from; Line Load Values; Area Load; Area Load from; Area Load Values; Scale = 1:15



Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_+E\_F): All Loads Plan (2)

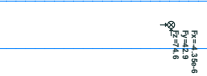
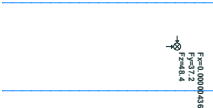
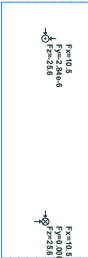
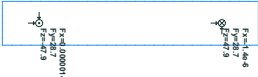
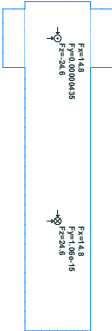


Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_+E\_F): All Loads Plan (3)

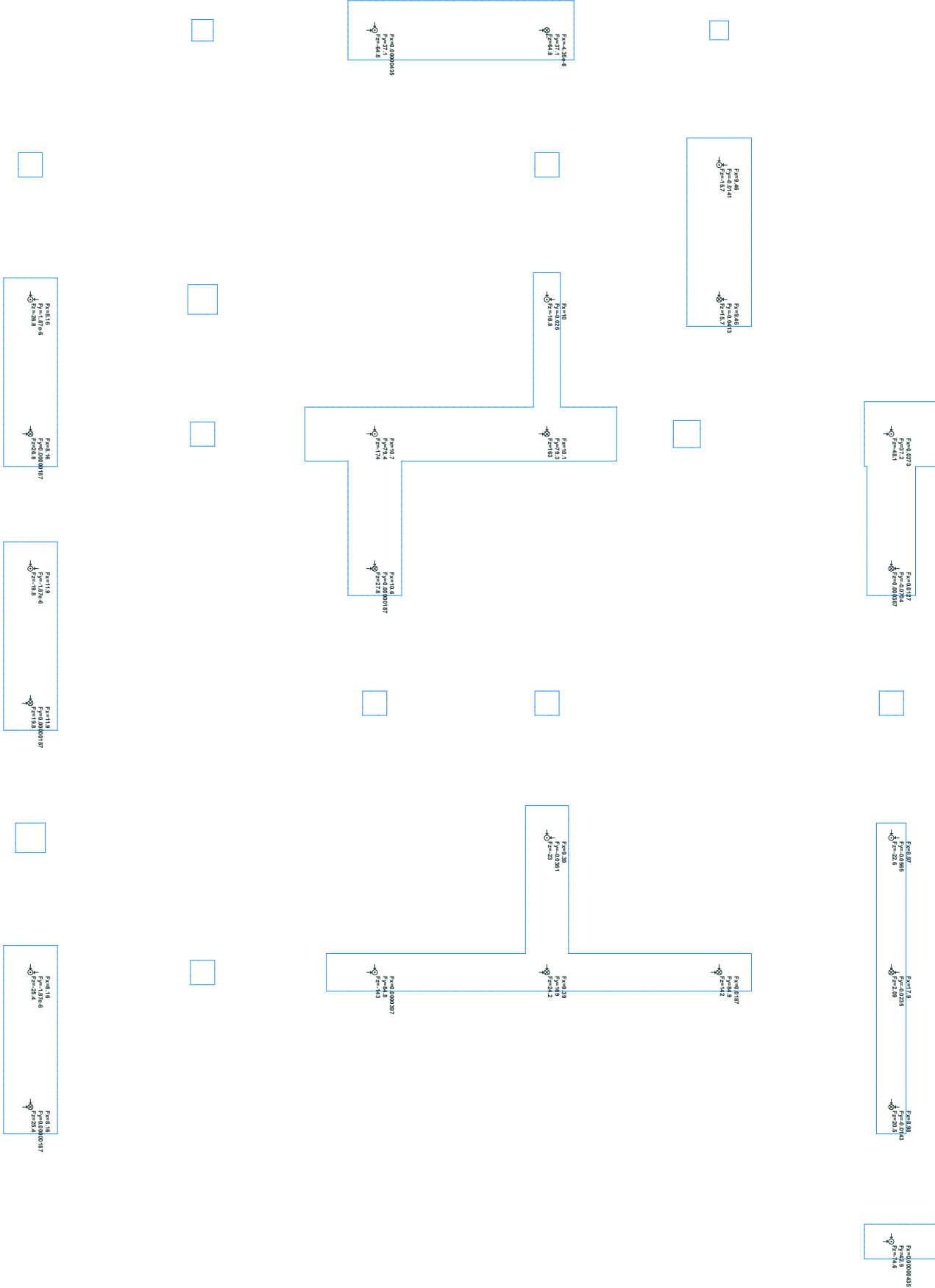


Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_+E\_F): All Loads Plan

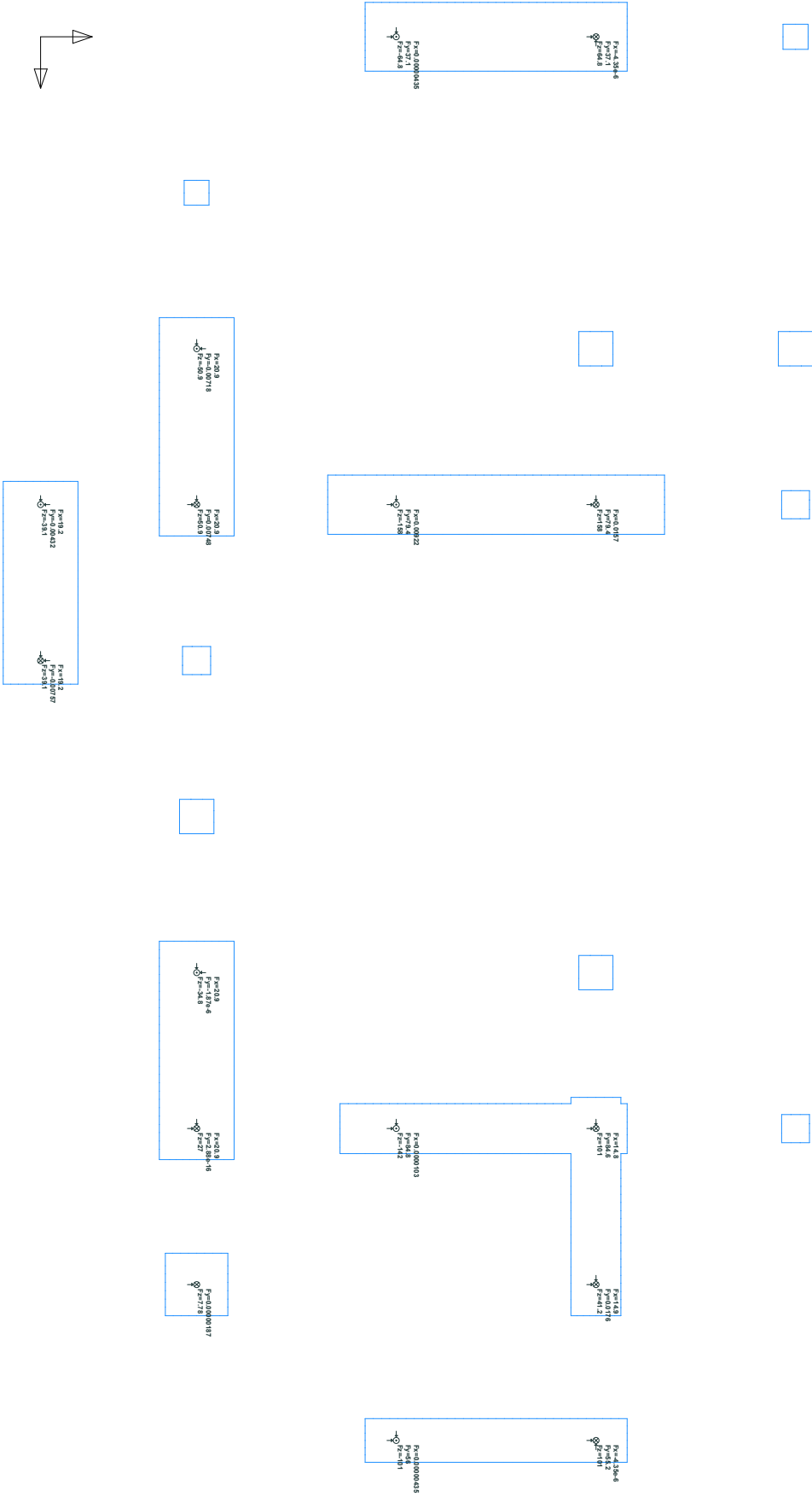
Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_+E\_F) Use Lines, Use Mass, Use Dimensions, Point Loads, Point Load Comp, Point Load Values, Line Loads, Line Load Comp, Line Load Values, Area Loads, Area Load Values.  
Scale = 1/315



Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_+E\_F): All Loads Plan (2)

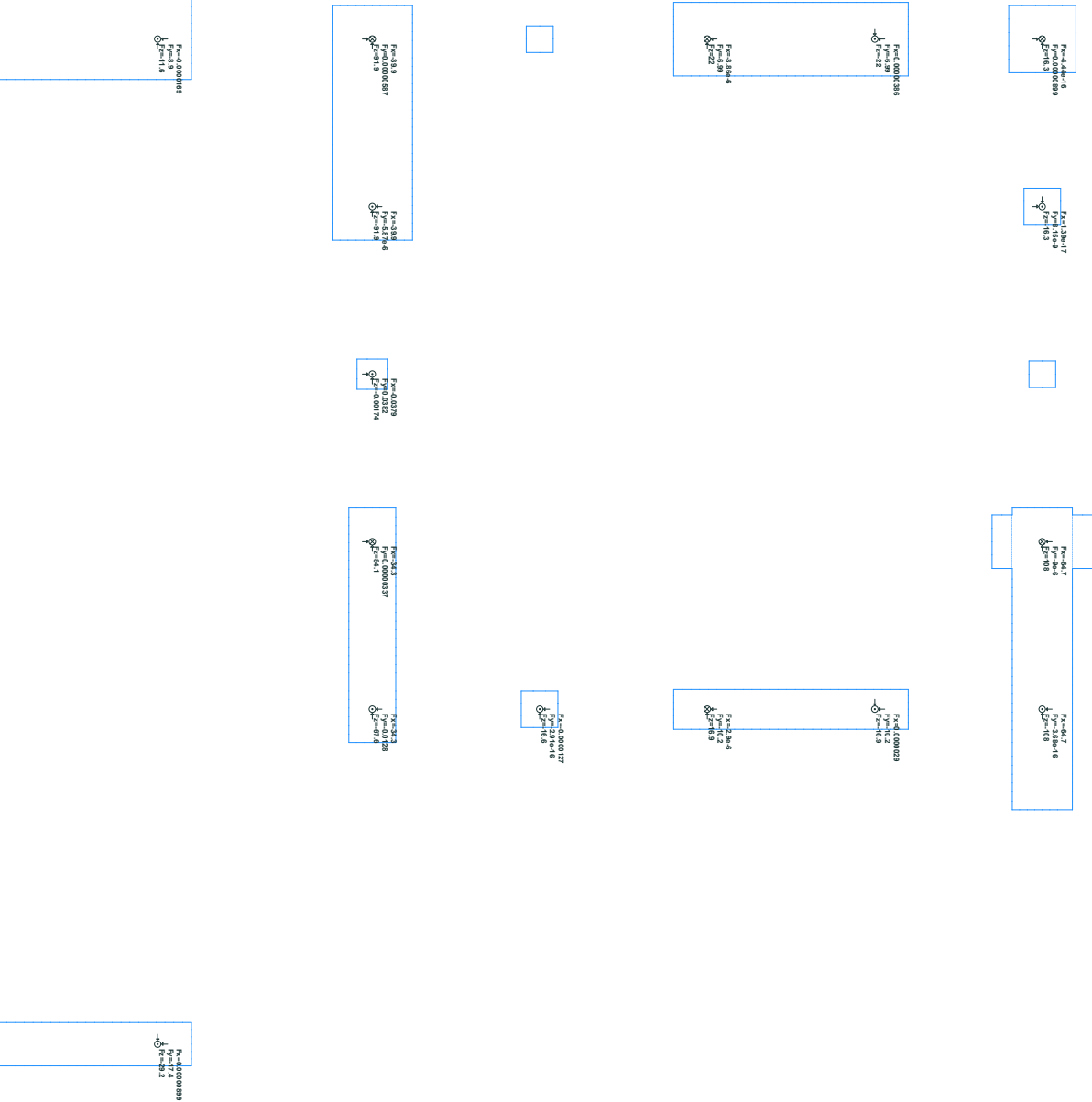


Seismic(EQ\_ASCET16\_0.3X\_-E\_Y\_+E\_F): All Loads Plan (3)

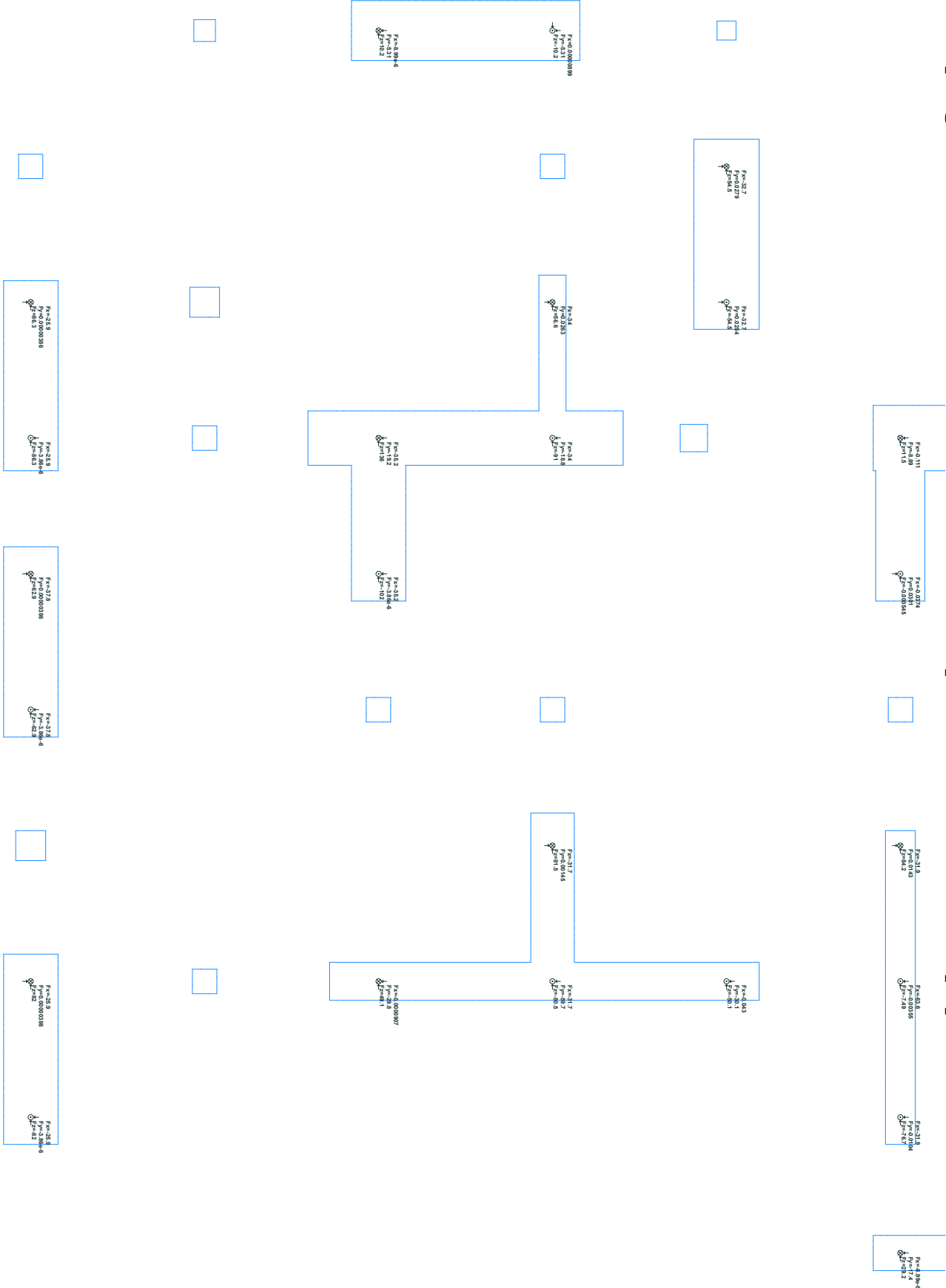


Seismic(EQ\_ASCE716\_-X\_-E\_-0.3Y\_+E\_F): All Loads Plan

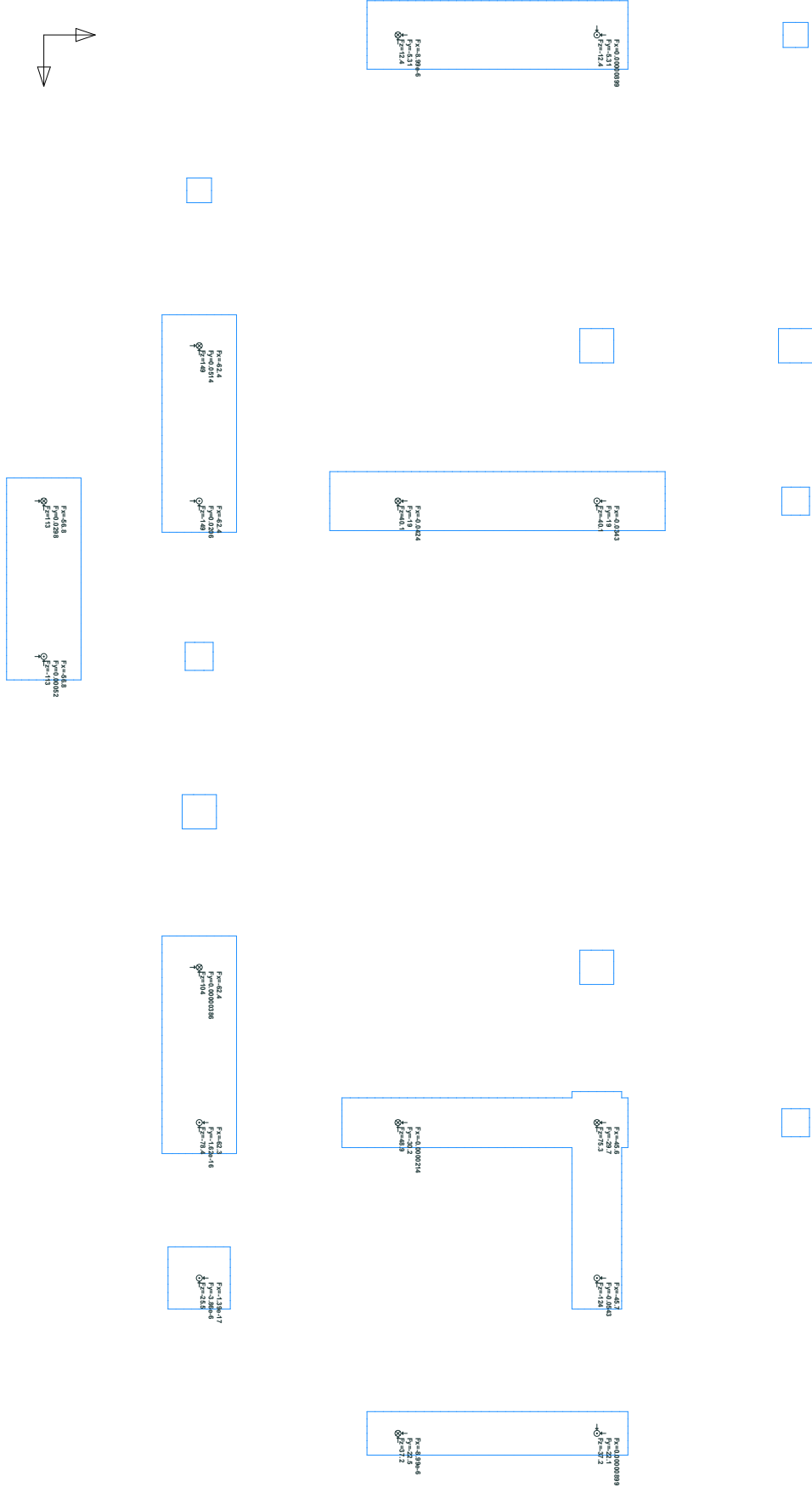
Seismic(EQ\_ASCE716\_-X\_-E\_-0.3Y\_-E\_F) User Units: User Notes: User Dimensions: Point Loads: Point Load Icons: Line Load Icons: Line Load Values: Area Loads: Area Load Icons: Area Load Values:  
Scale = 1/315

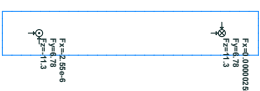
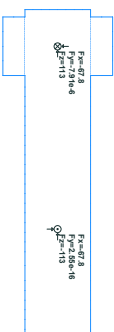


Seismic(EQ\_ASCET716\_-X\_-E\_-0.3Y\_+E\_F): All Loads Plan (2)

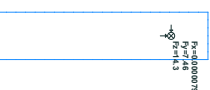


Seismic(EQ\_ASCET716\_-X\_-E\_-0.3Y\_+E\_F): All Loads Plan (3)

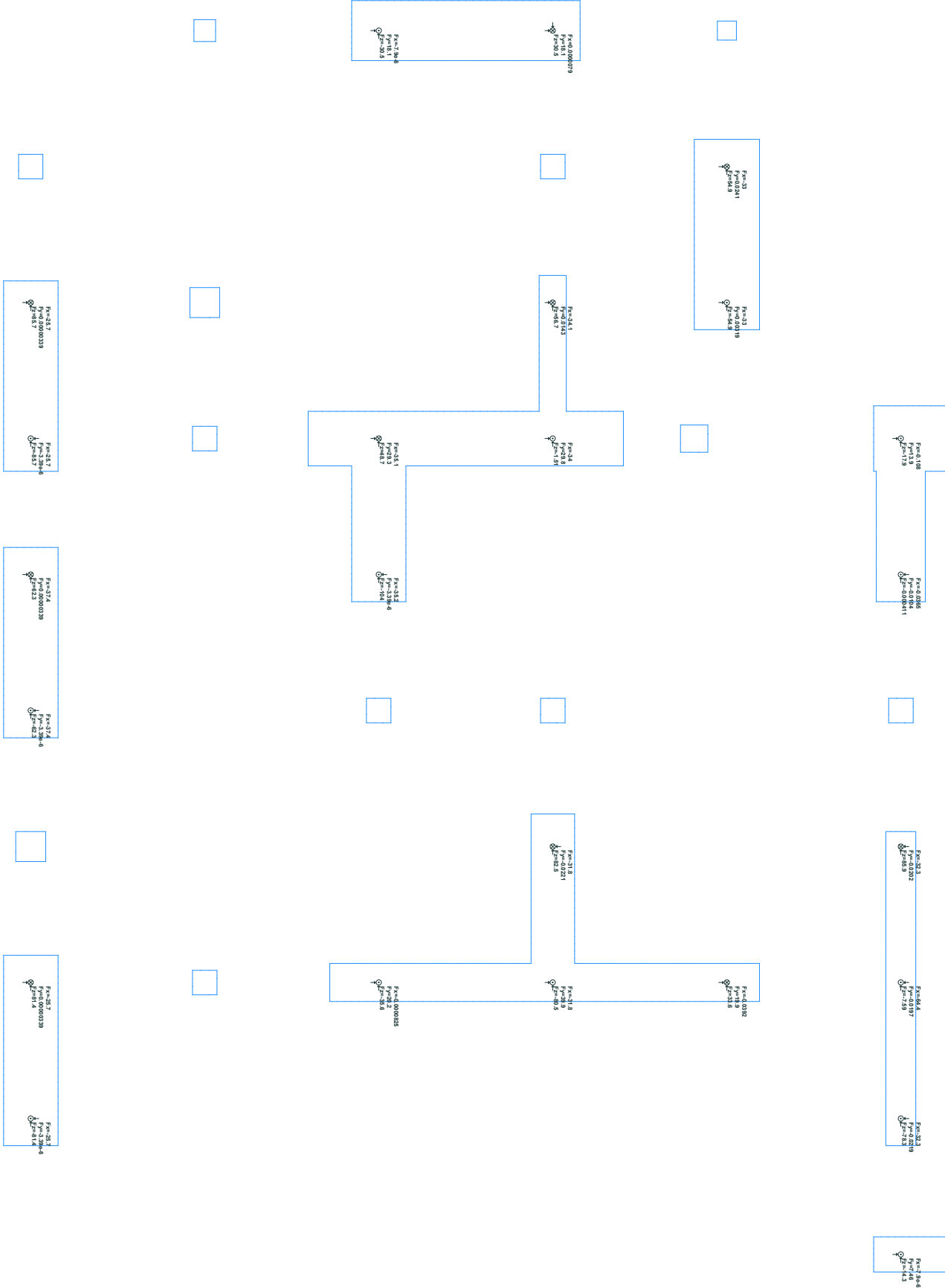




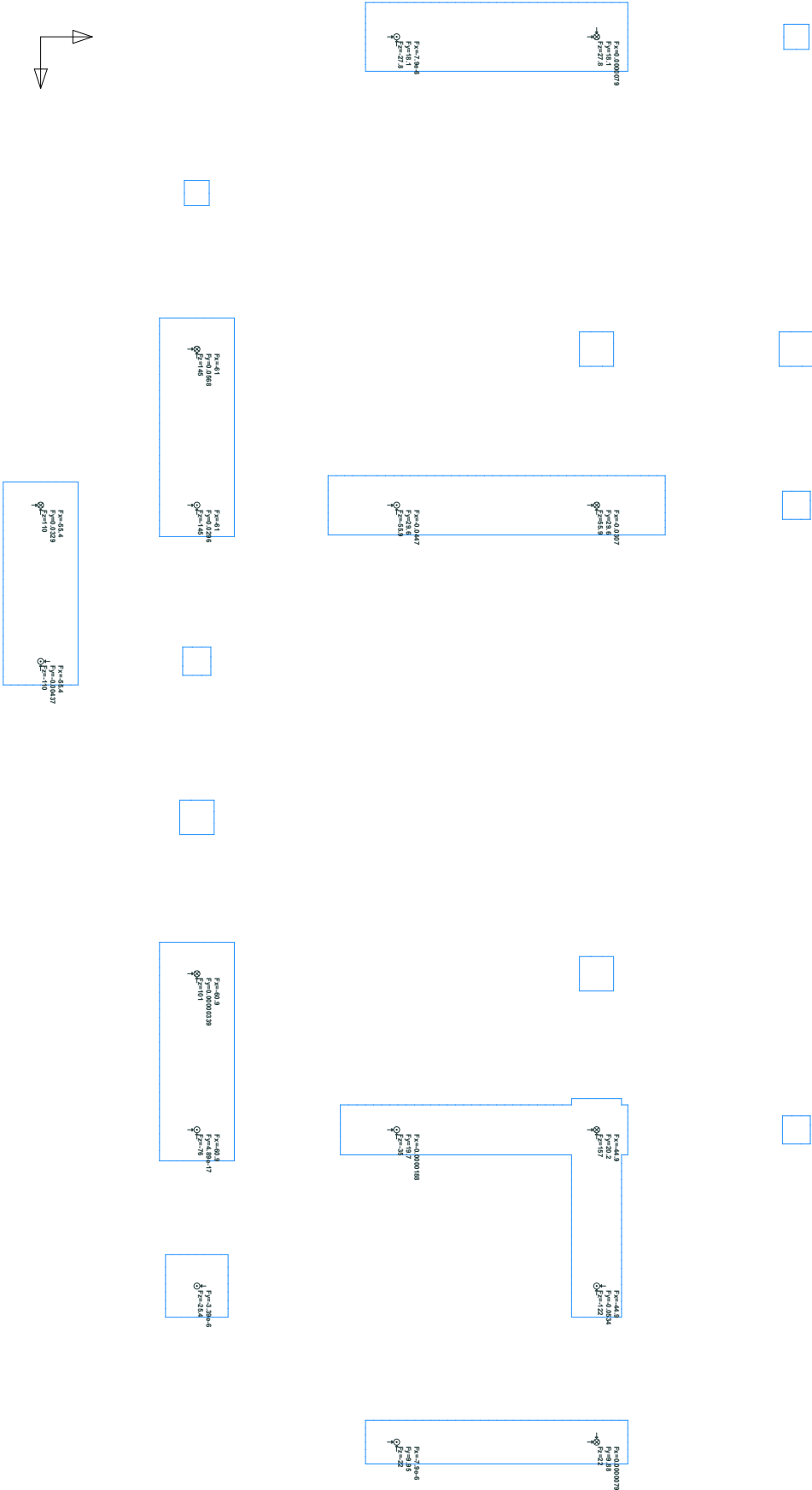
|                                                           |                                              |
|-----------------------------------------------------------|----------------------------------------------|
| $F_x = -35.1$<br>$F_y = 9.49 \cdot 10^{-7}$<br>$F_z = 84$ | $F_x = 35.2$<br>$F_y = 0.02$<br>$F_z = 90.6$ |
|-----------------------------------------------------------|----------------------------------------------|



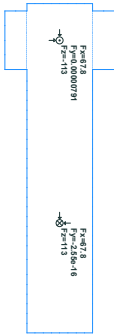
Seismic(EQ\_ASCE716\_-X\_-E\_0.3Y\_+E\_F): All Loads Plan (2)



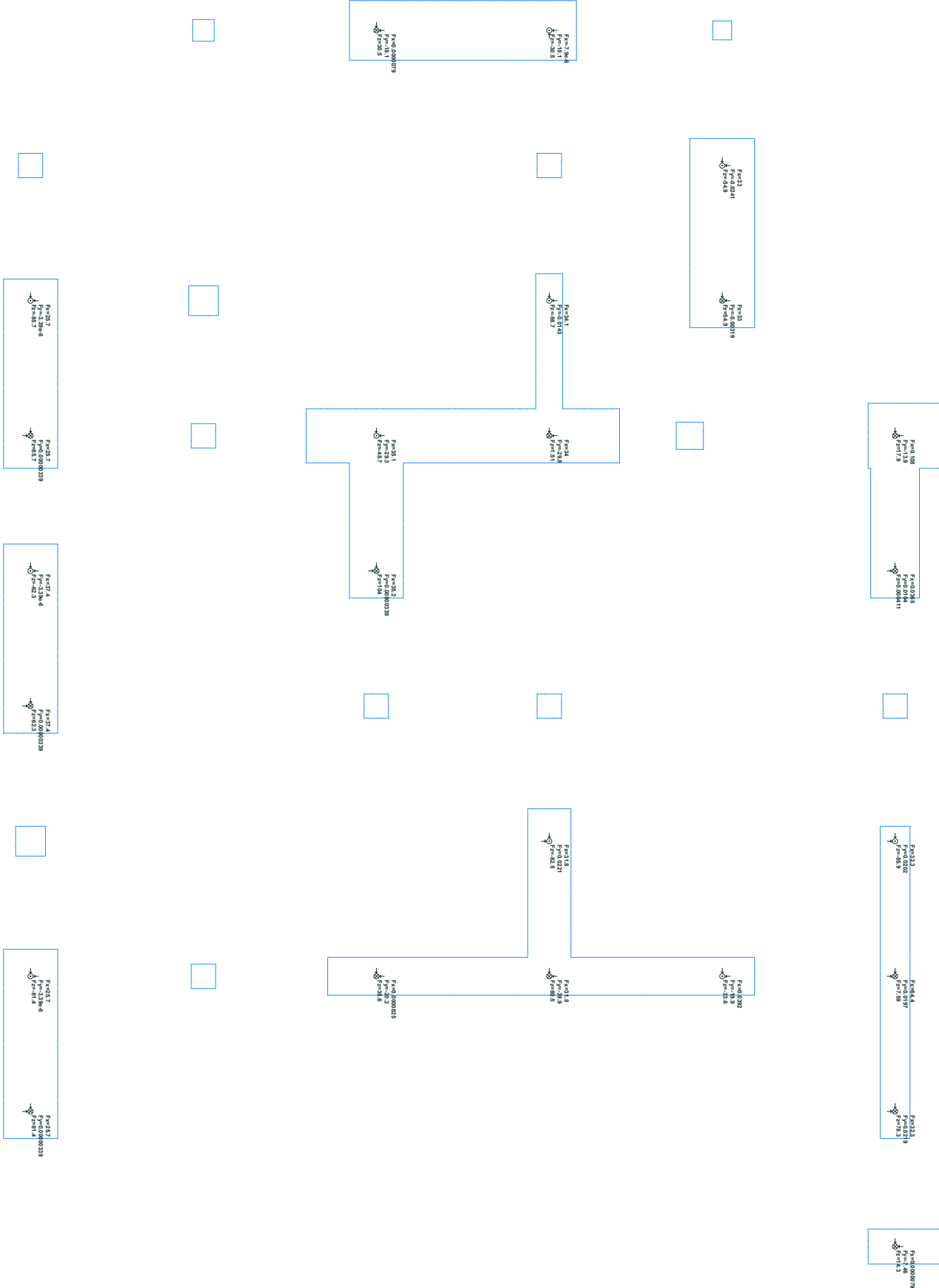
Seismic(EQ\_ASCE716\_-X\_-E\_0.3Y\_+E\_F): All Loads Plan (3)



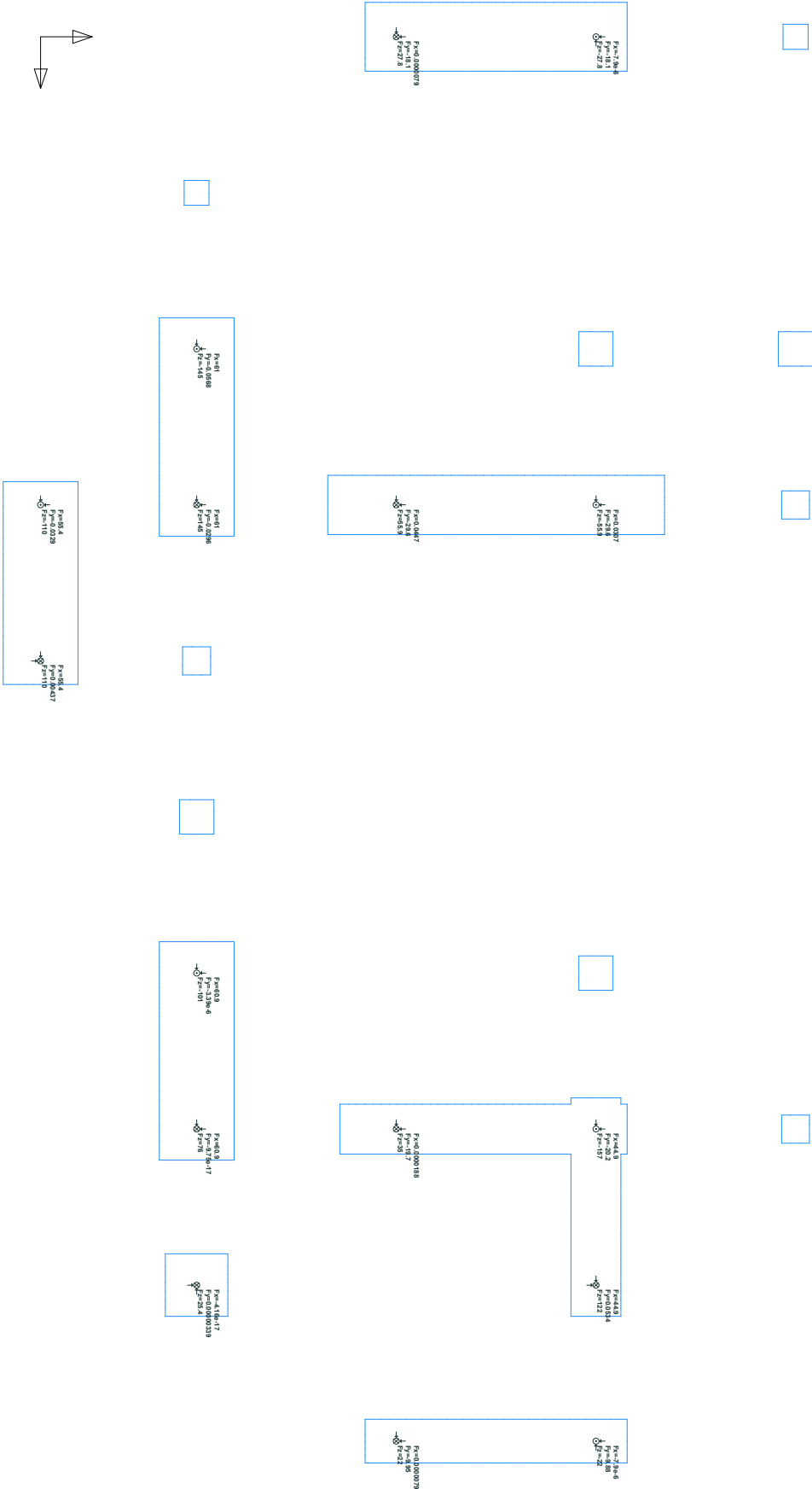
Beam type:  $\text{EQ\_ASSET7E}$ ,  $X\_E\_2Y\_1$ ,  $E\_1$  User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values  
 Element type:  $\text{Beam}$ ,  $\text{Beam}$  Elements Above;  $\text{Wall}$  Elements Below;  $\text{Wall}$  Elements Above;  $\text{Wall}$  Element Outline Only; Column Elements Above;  $\text{Slab}$  Elements;  $\text{Slab}$  Element Outline Only;  
 Scale = 1:315



Seismic(EQ\_ASCE716\_X\_-E\_-0.3Y\_+E\_F): All Loads Plan (2)

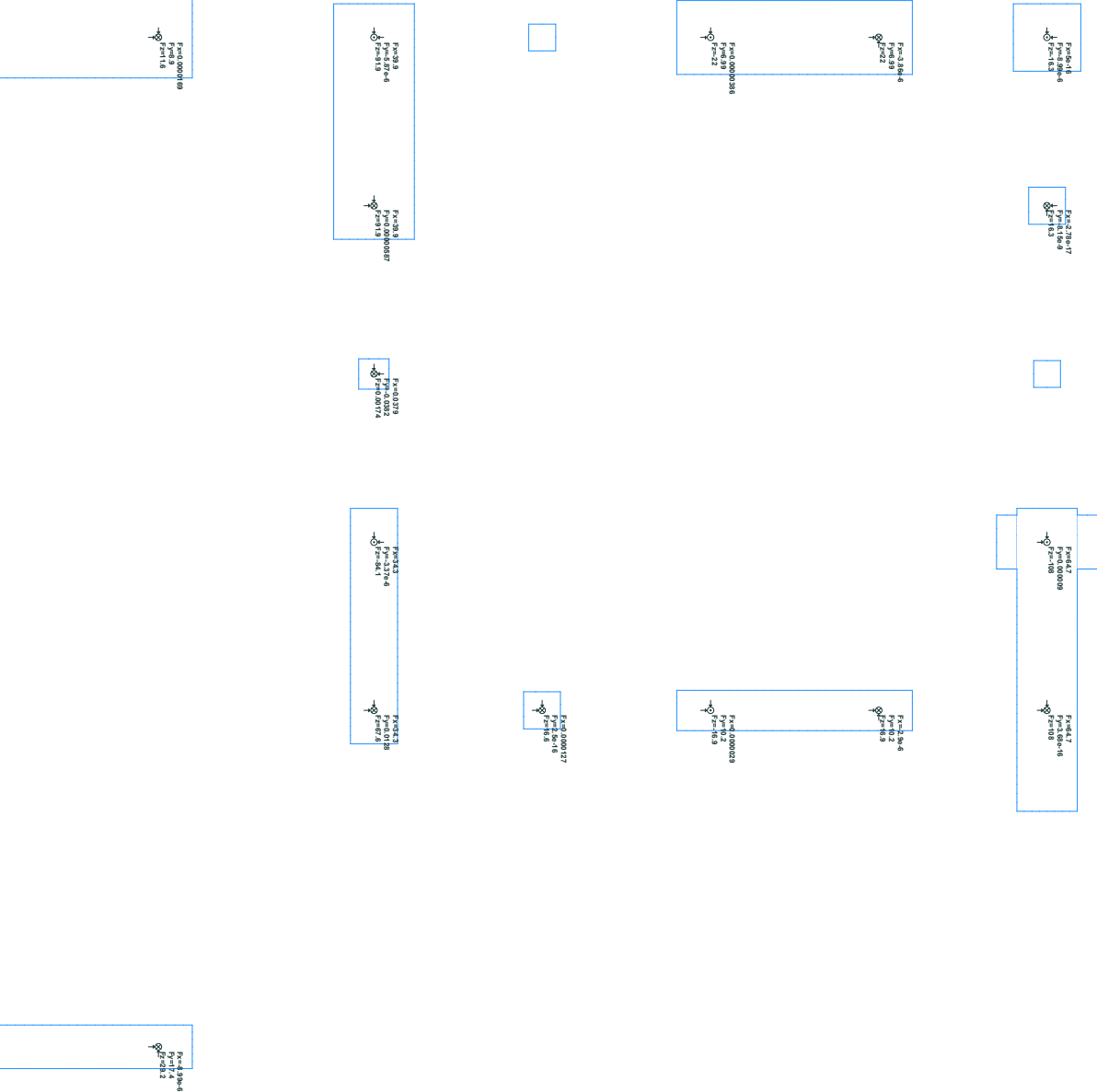


Seismic(EQ\_ASCE716\_X\_-E\_-0.3Y\_+E\_F): All Loads Plan (3)

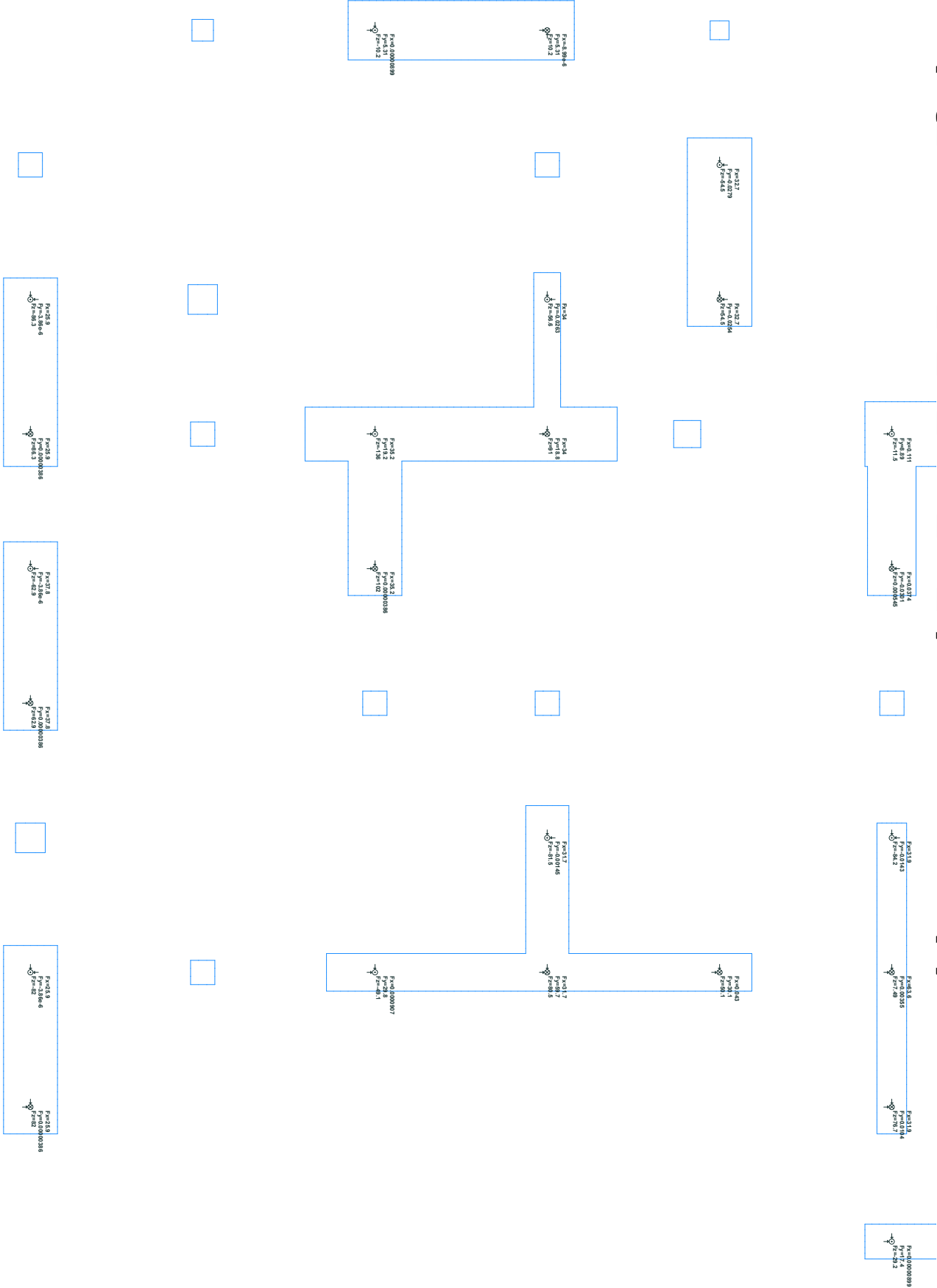


# Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_+E\_F): All Loads Plan

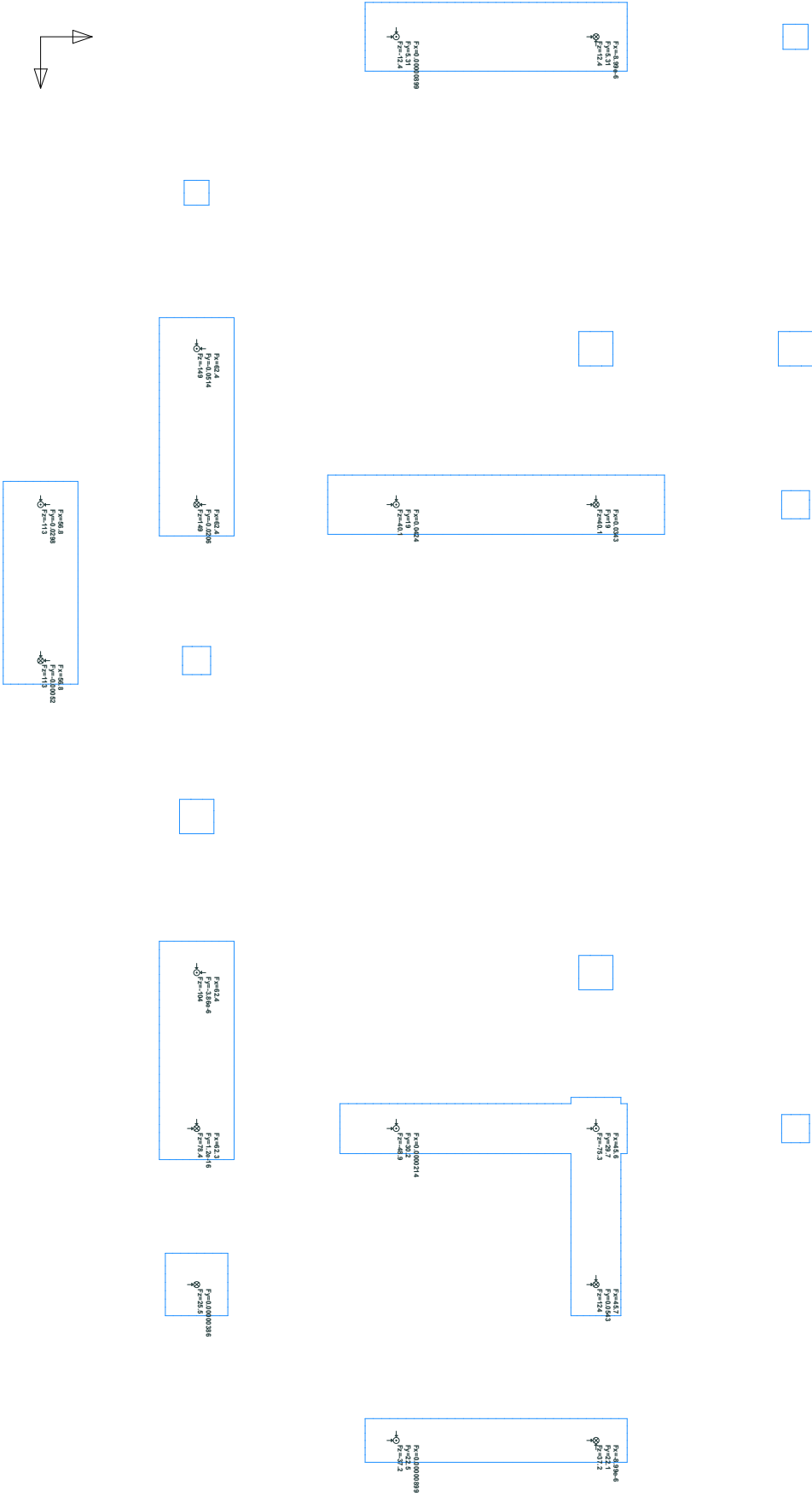
Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_+E\_F) Use Cases: Use Cases: Use Dimensions: Point Loads: Point Load Long: Line Load: Line Load Long: Line Load Vents: Area Loads: Area Load Long: Area Load Vents: Scale = 1/315



Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_+E\_F): All Loads Plan (2)

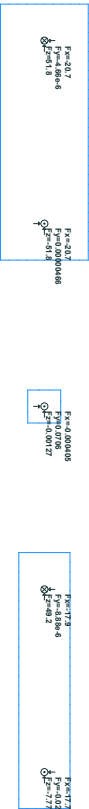
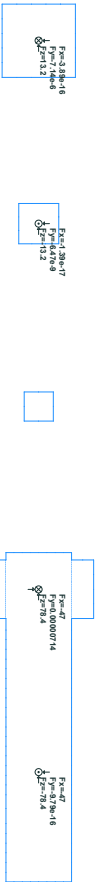


Seismic(EQ\_ASC716\_X\_-E\_0.3Y\_+E\_F): All Loads Plan (3)

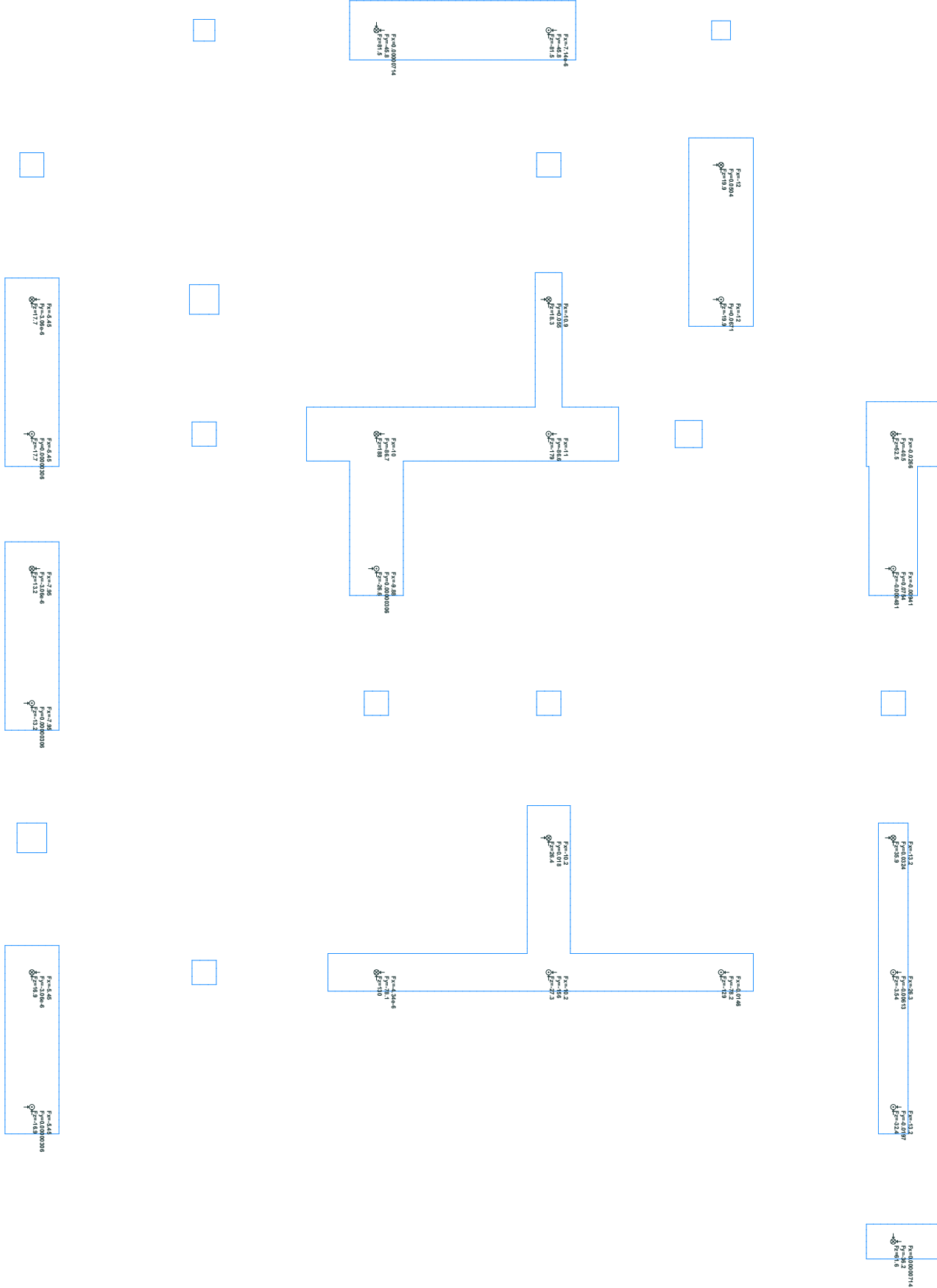


Seismic(EQ\_ASCET716\_-0.3X\_+E\_-Y\_-E\_F): All Loads Plan

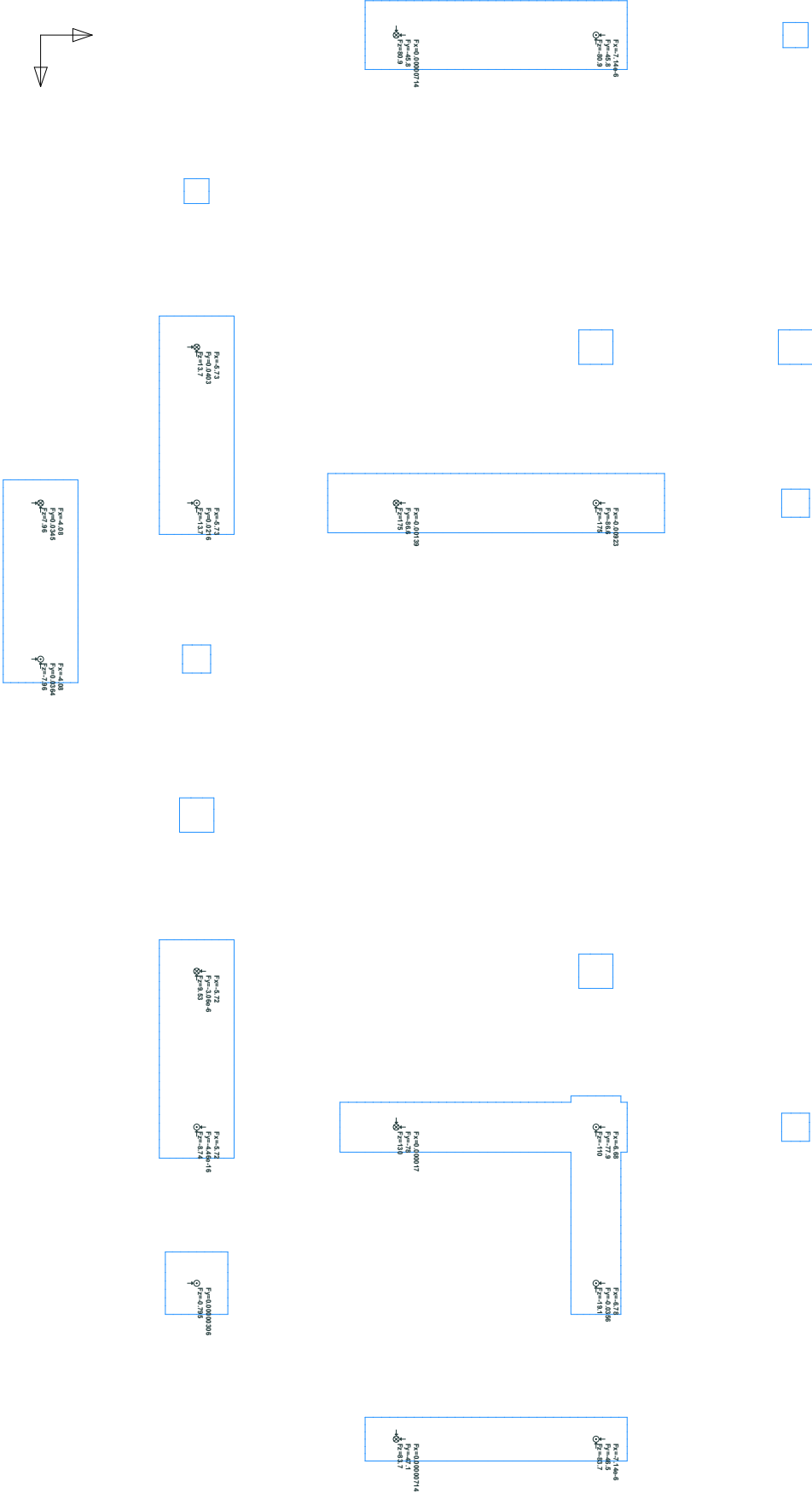
Seismic(EQ\_ASCET716\_-0.3X\_+E\_-Y\_-E\_F) User Notes: User Dimensions, Point Loads, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values.  
Scale = 1/315



Seismic(EQ\_ASCET716\_-0.3X\_+E\_-Y\_-E\_F): All Loads Plan (2)

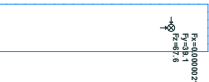
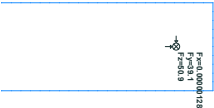
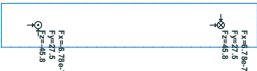
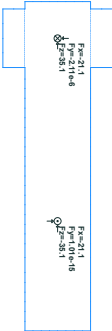


Seismic(EQ\_ASCET16\_-0.3X\_+E\_-Y\_-E\_F): All Loads Plan (3)

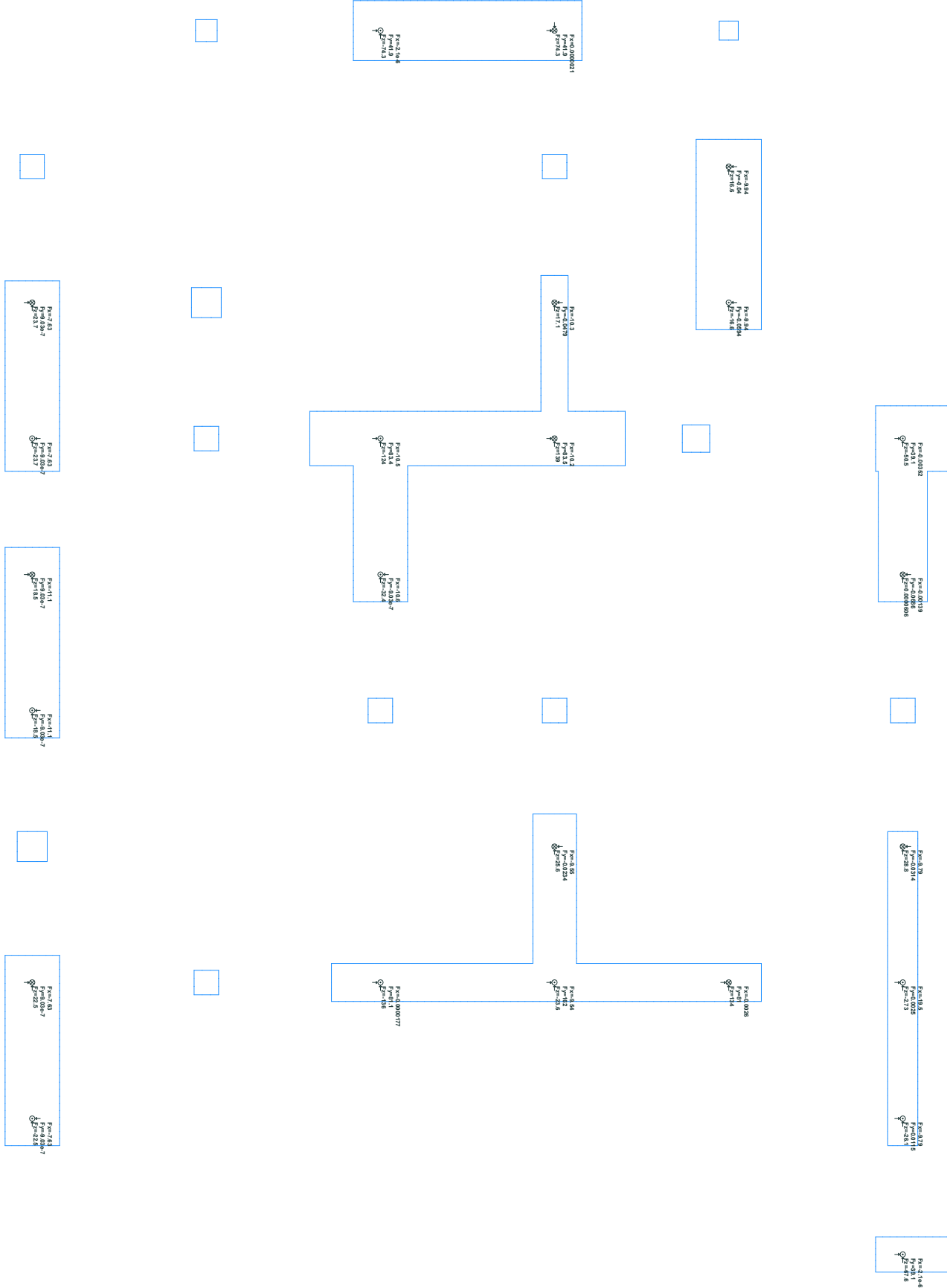


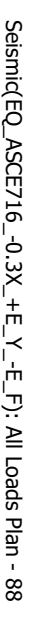
# Seismic(EQ\_ASCE716\_-0.3X\_+E\_Y\_-E\_F): All Loads Plan

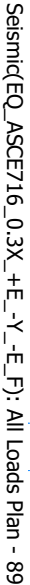
Seismic(EQ\_ASCE716\_-0.3X\_+E\_Y\_-E\_F) User Loads: User Dimensions: Point Load Icons: Point Load Values: Line Loads: Line Load Icons: Line Load Values: Area Loads: Area Load Icons: Area Load Values: Scale = 1:315



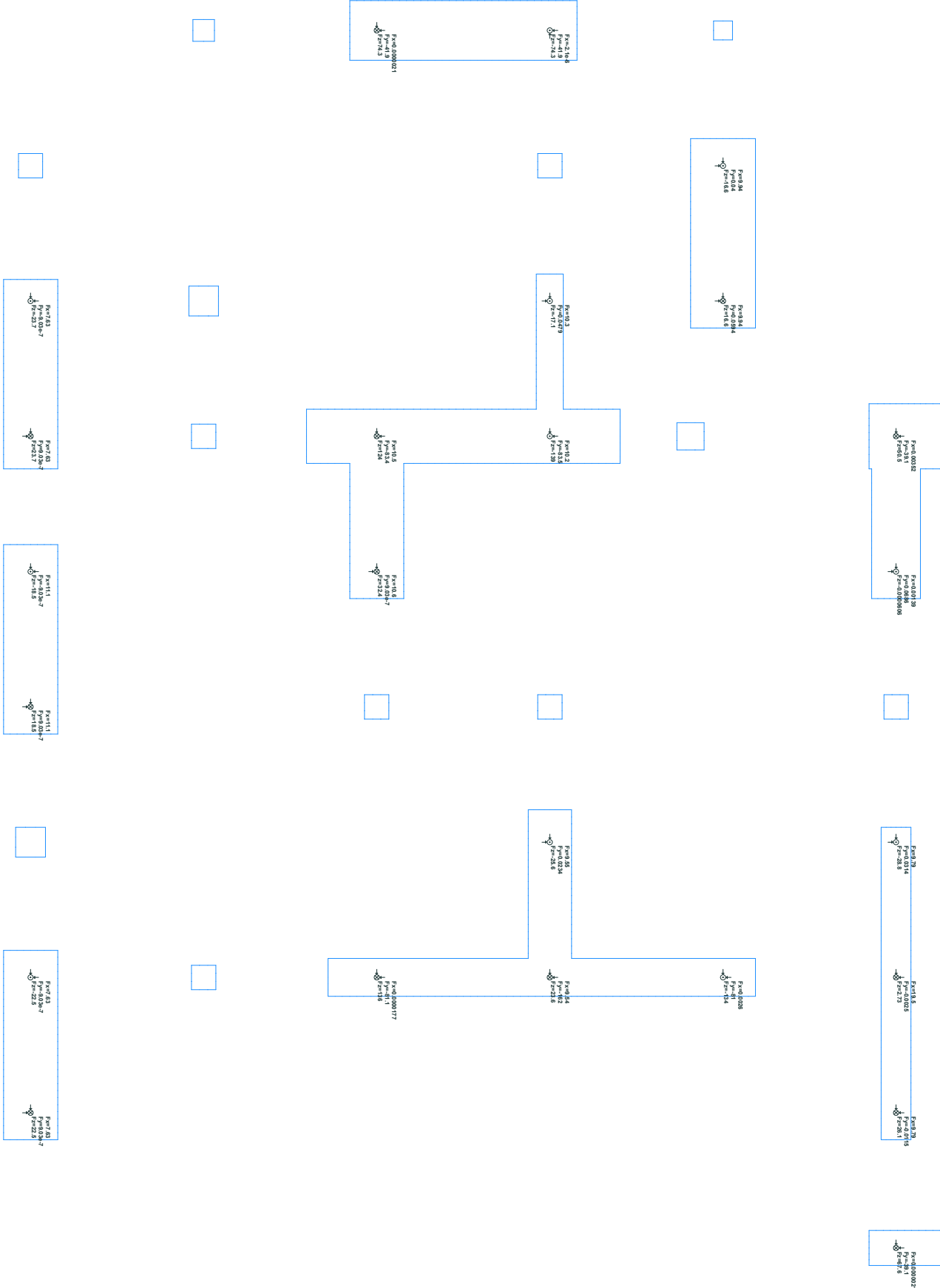
Seismic(EQ\_ASCE716\_-0.3X\_+E\_Y\_-E\_F): All Loads Plan (2)



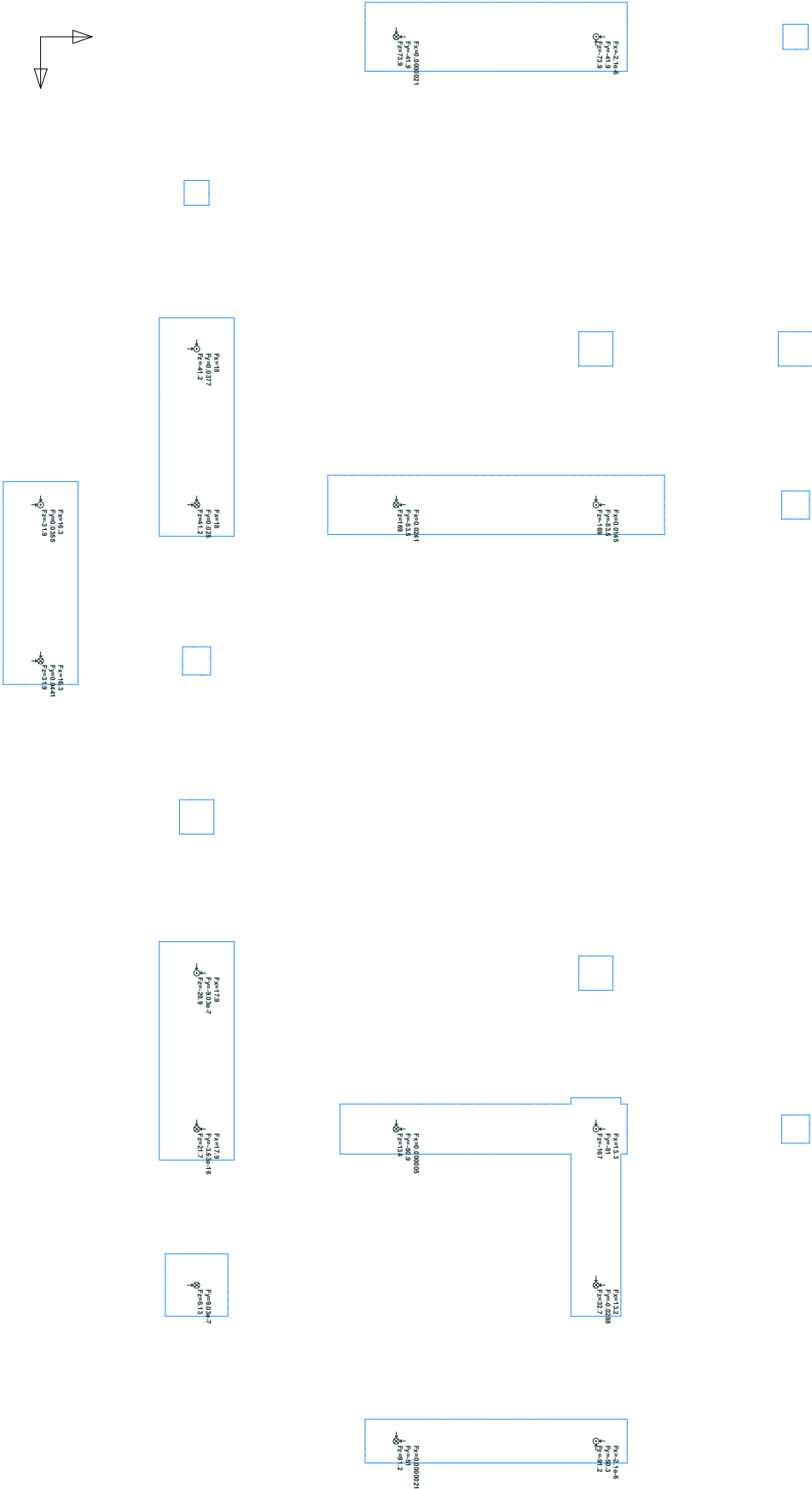




Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_-E\_F): All Loads Plan (2)

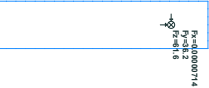
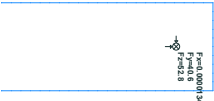
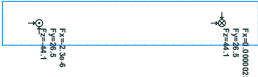
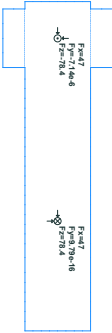


Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_-E\_F): All Loads Plan (3)

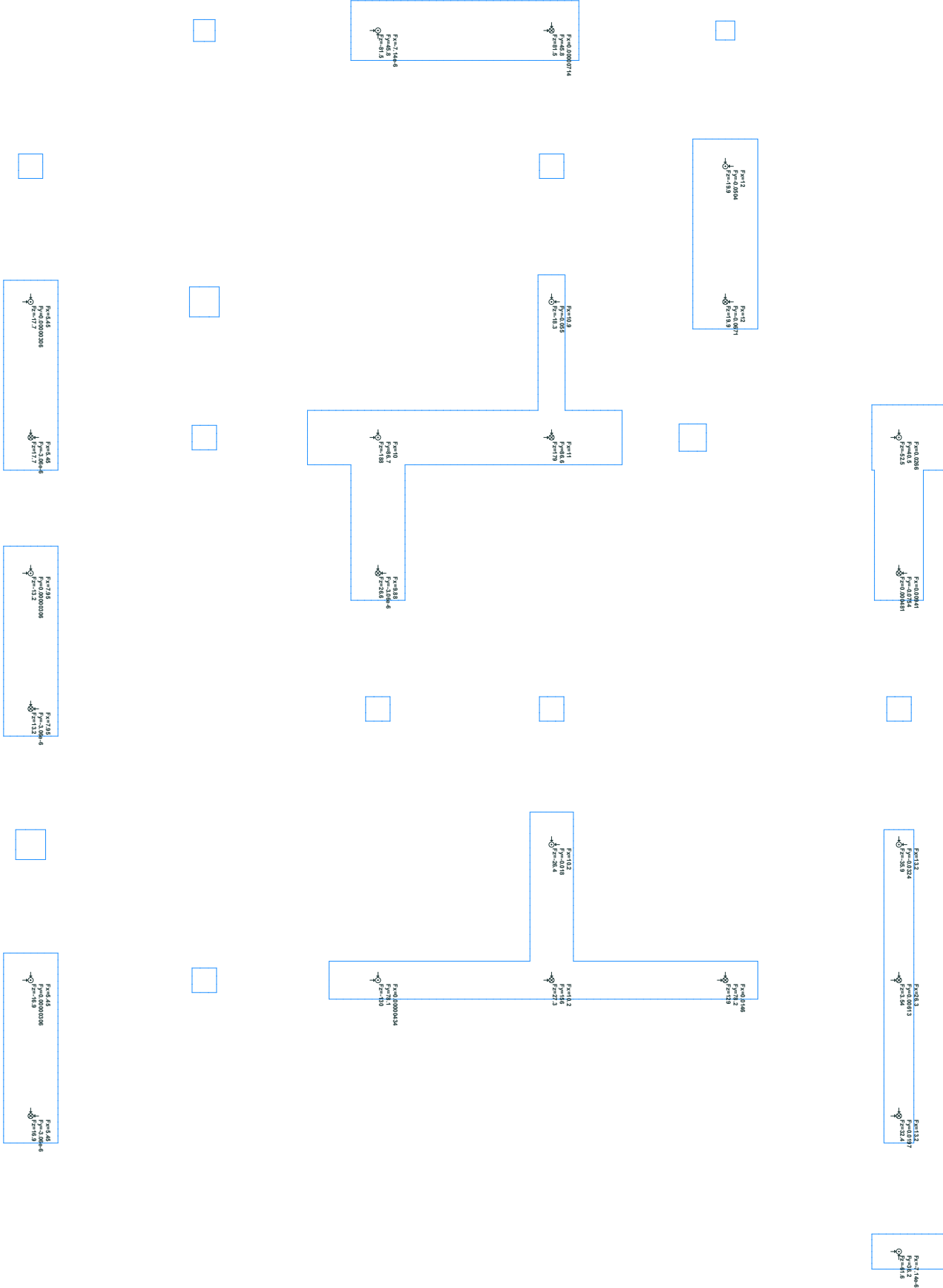


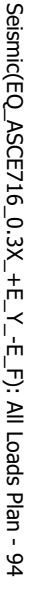
# Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_-E\_F): All Loads Plan

Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_-E\_F) Use Lines, Use Mass, Use Dimensions, Point Loads, Point Load Comp, Point Load Values, Line Loads, Line Load Comp, Line Load Values, Area Loads, Area Load Comp, Area Load Values.  
Scale = 1/315



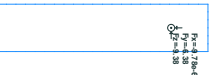
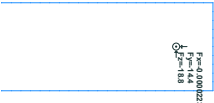
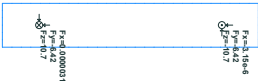
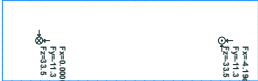
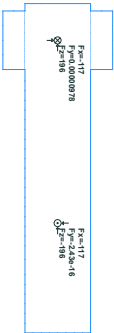
Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_-E\_F): All Loads Plan (2)



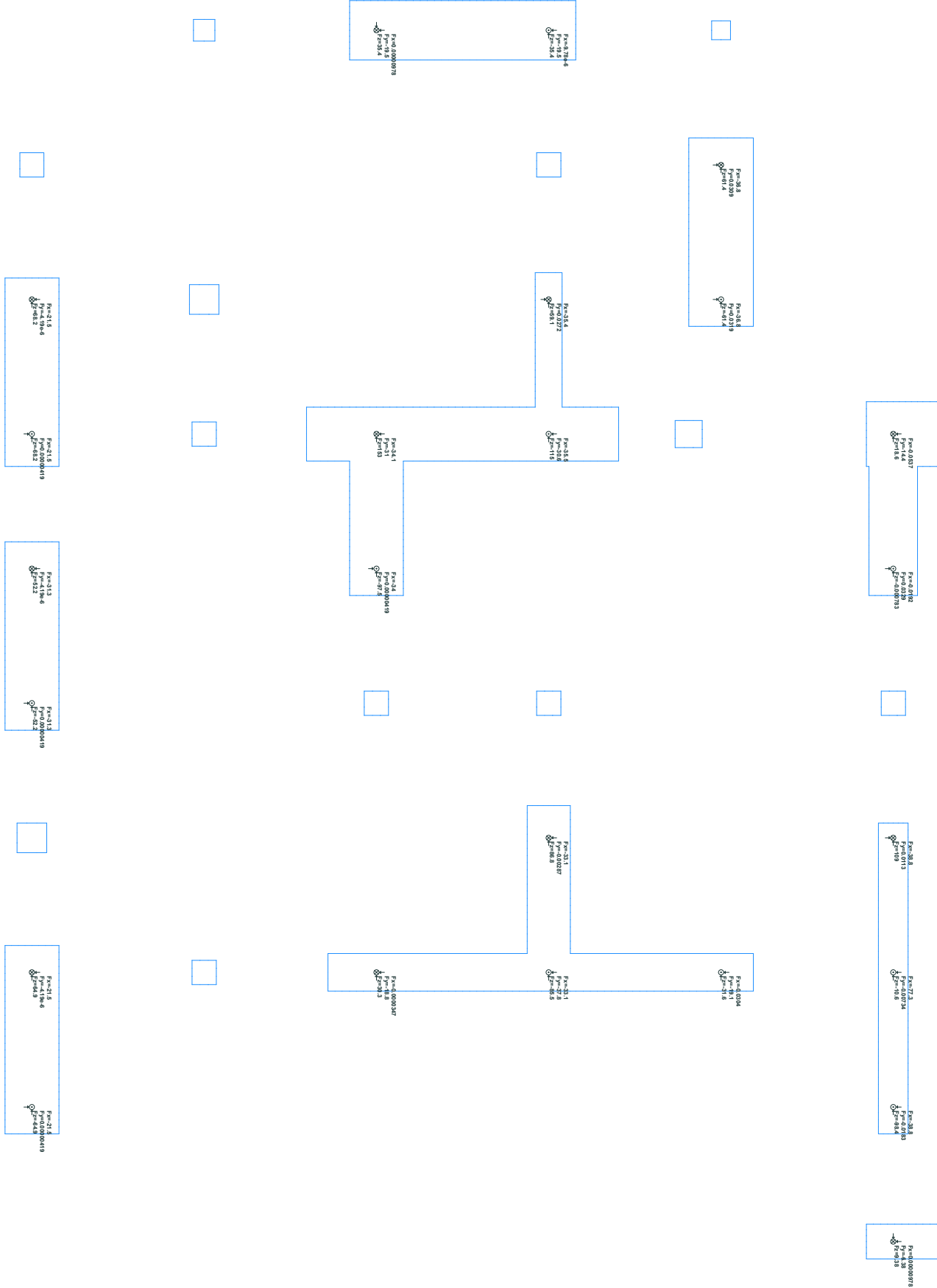


# Seismic(EQ\_ASCET716\_-X\_+E\_-0.3Y\_-E\_F): All Loads Plan

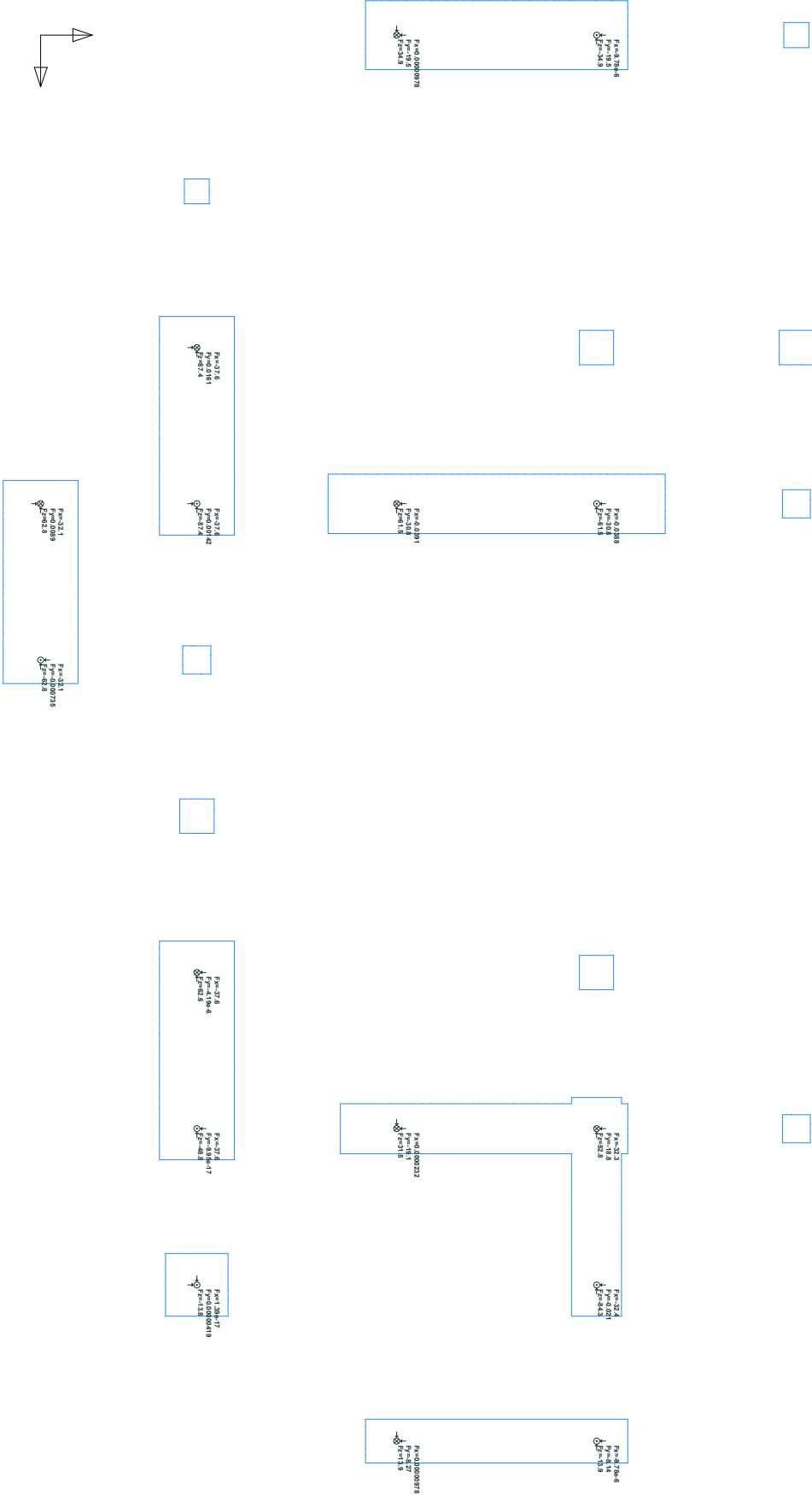
Seismic(EQ\_ASCET716\_-X\_+E\_-0.3Y\_-E\_F) User Notes: User Dimensions: Point Loads: Line Loads: Line Load from: Area Load from: Area Load Value:  
Seismic(EQ\_ASCET716\_-X\_+E\_-0.3Y\_-E\_F) Elements Below: Wall Elements Above: Wall Element: Column Elements Above: Slab Elements: Slab Element: Column Only:  
Scale = 1/315



Seismic(EQ\_ASCET716\_-X\_+E\_-0.3Y\_-E\_F): All Loads Plan (2)

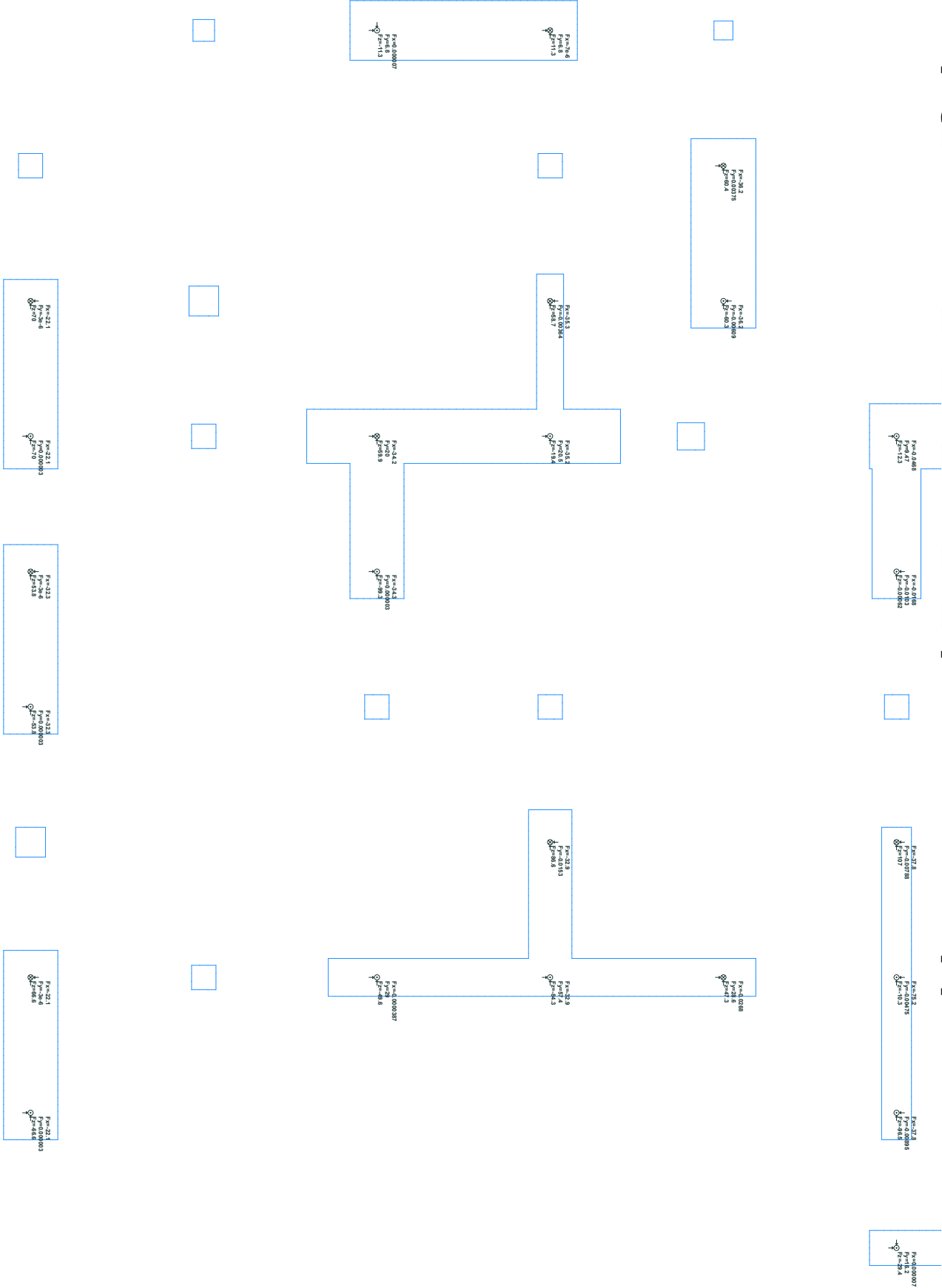


Seismic(EQ\_ASCET716\_-X\_+E\_-0.3Y\_-E\_F): All Loads Plan (3)

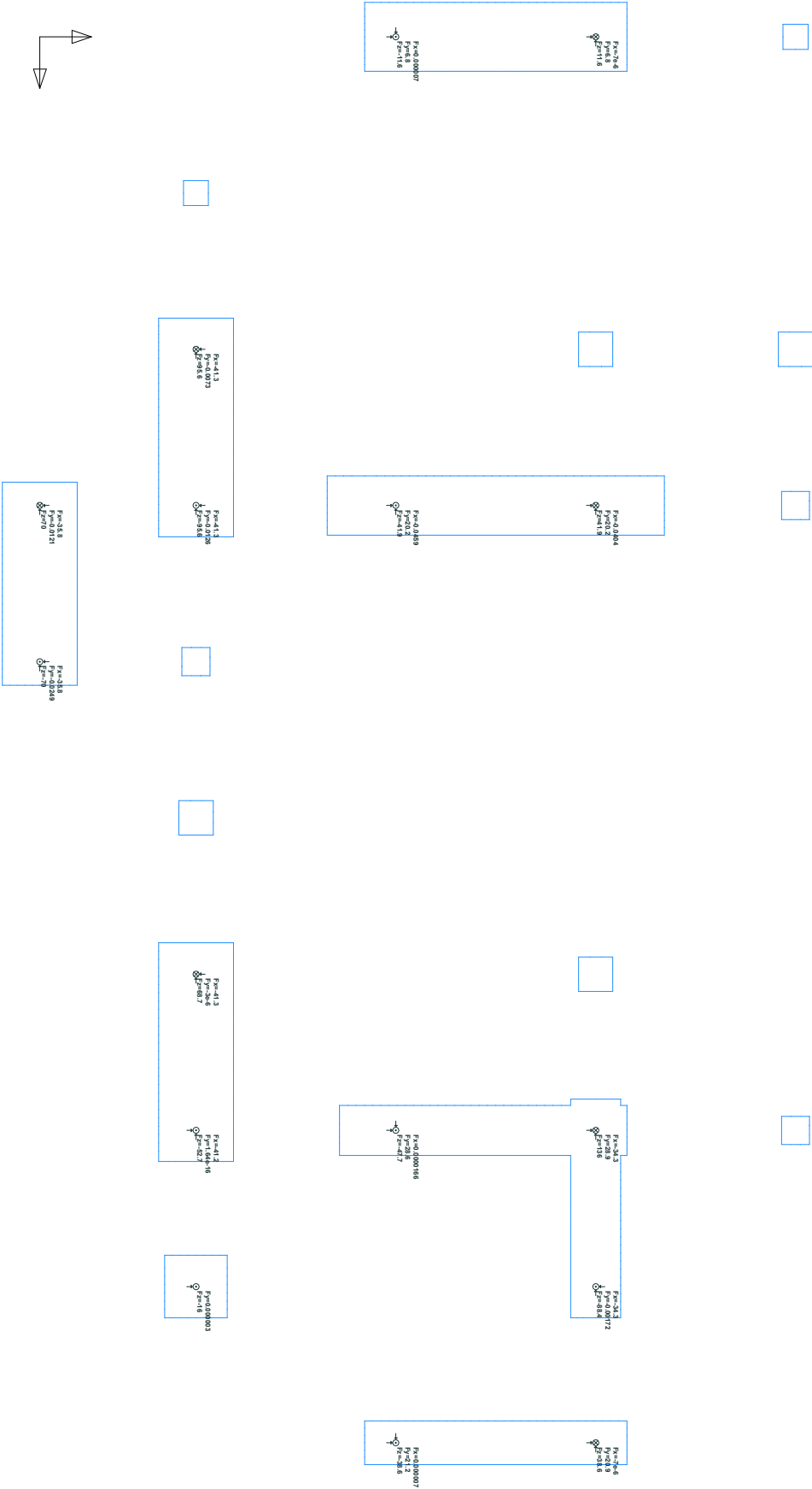


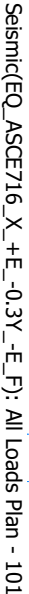


Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_-E\_F): All Loads Plan (2)

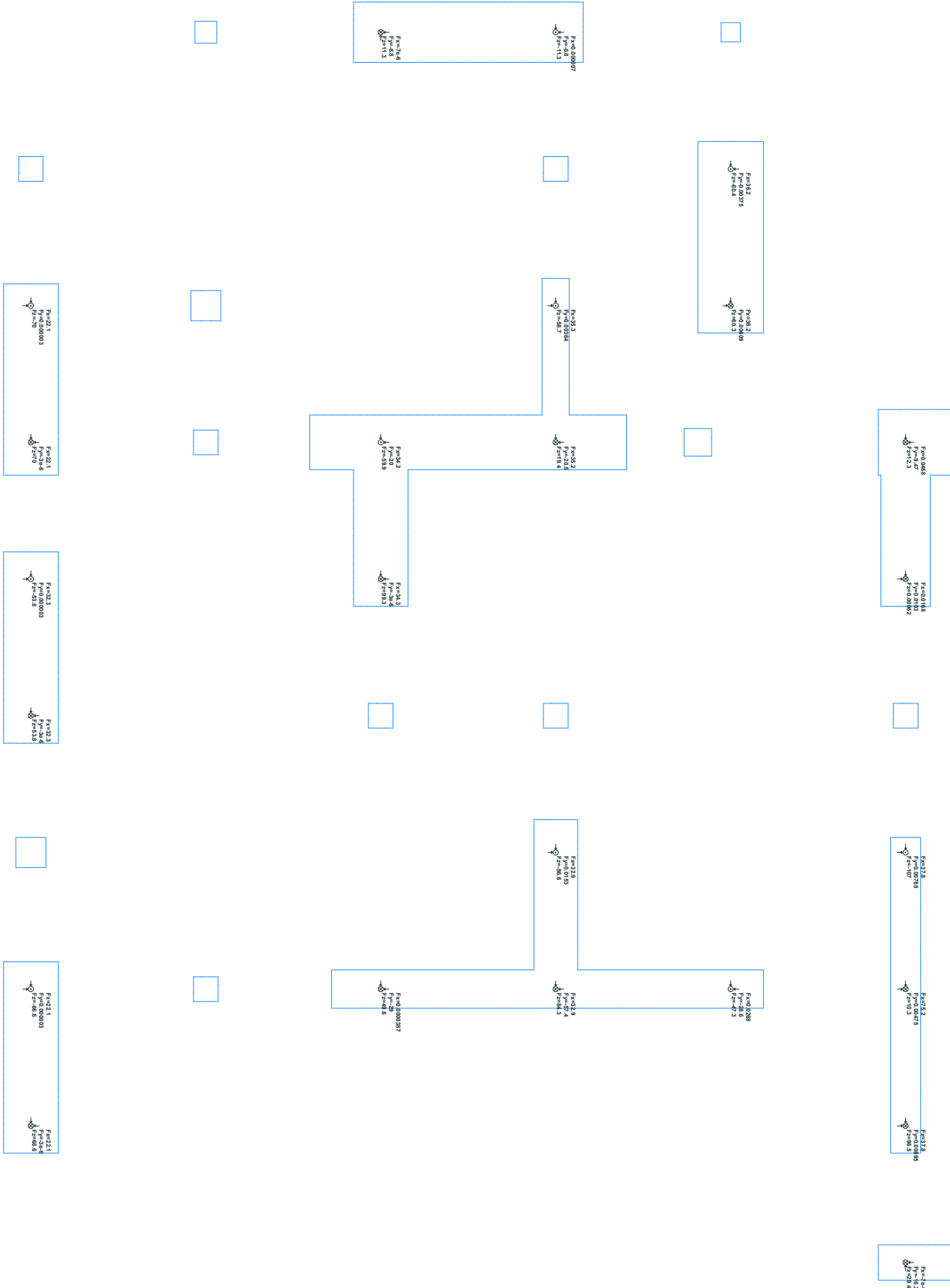


Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_-E\_F): All Loads Plan (3)

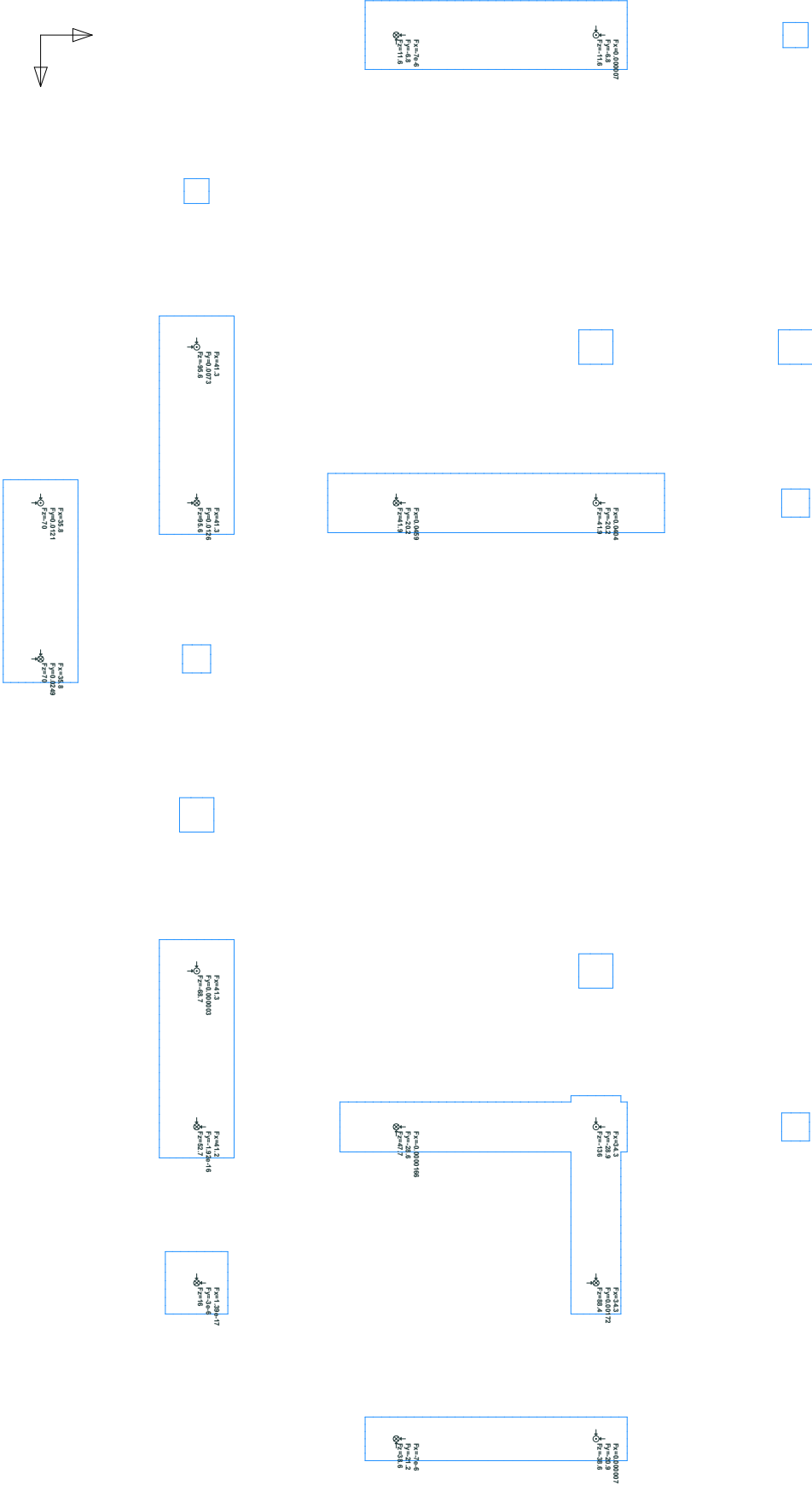




Seismic(EQ\_ASCE716\_X\_+E\_-0.3Y\_-E\_F): All Loads Plan (2)

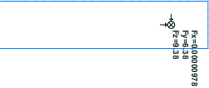
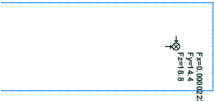
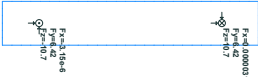
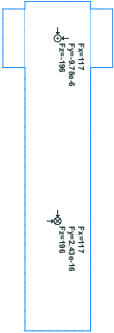


Seismic(EQ\_ASCE716\_X\_+E\_-0.3Y\_-E\_F): All Loads Plan (3)



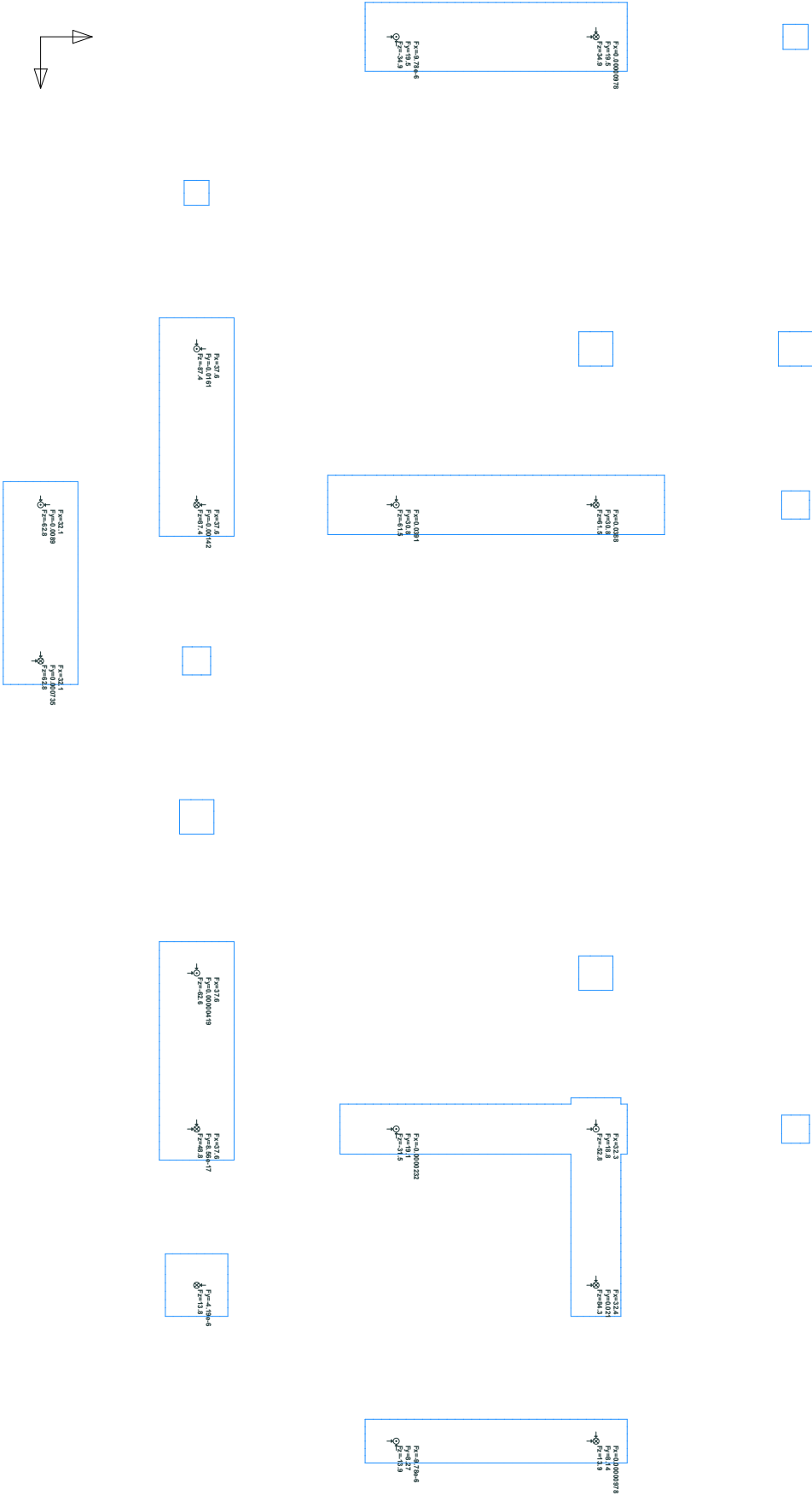
# Seismic(EQ\_ASCET716\_X\_+E\_0.3Y\_-E\_F): All Loads Plan

Seismic(EQ\_ASCET716\_X\_+E\_0.3Y\_-E\_F) Use Lines, Use Mass, Use Dimensions, Point Loads, Point Load Long, Point Load Vises, Area Loads, Area Load Long, Area Load Vises.  
Scale = 1:315



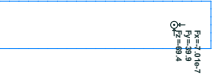
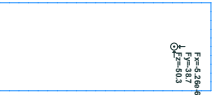
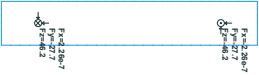
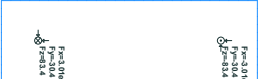
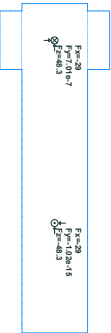


Seismic(EQ\_ASCET716\_X\_+E\_0.3Y\_-E\_F): All Loads Plan (3)

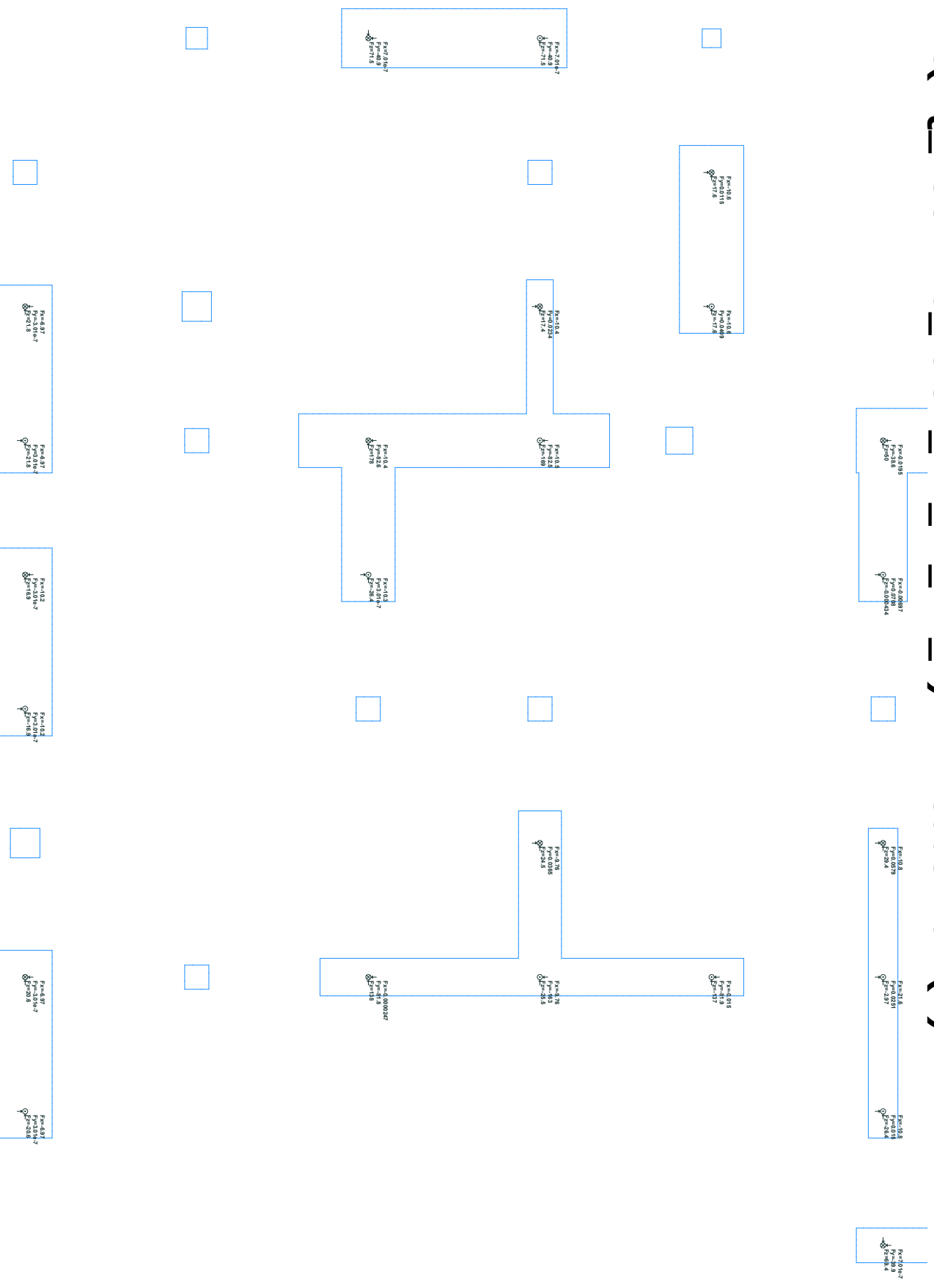


# Seismic(EQ\_ASCE716\_-0.3X\_+E\_-Y\_+E\_F): All Loads Plan

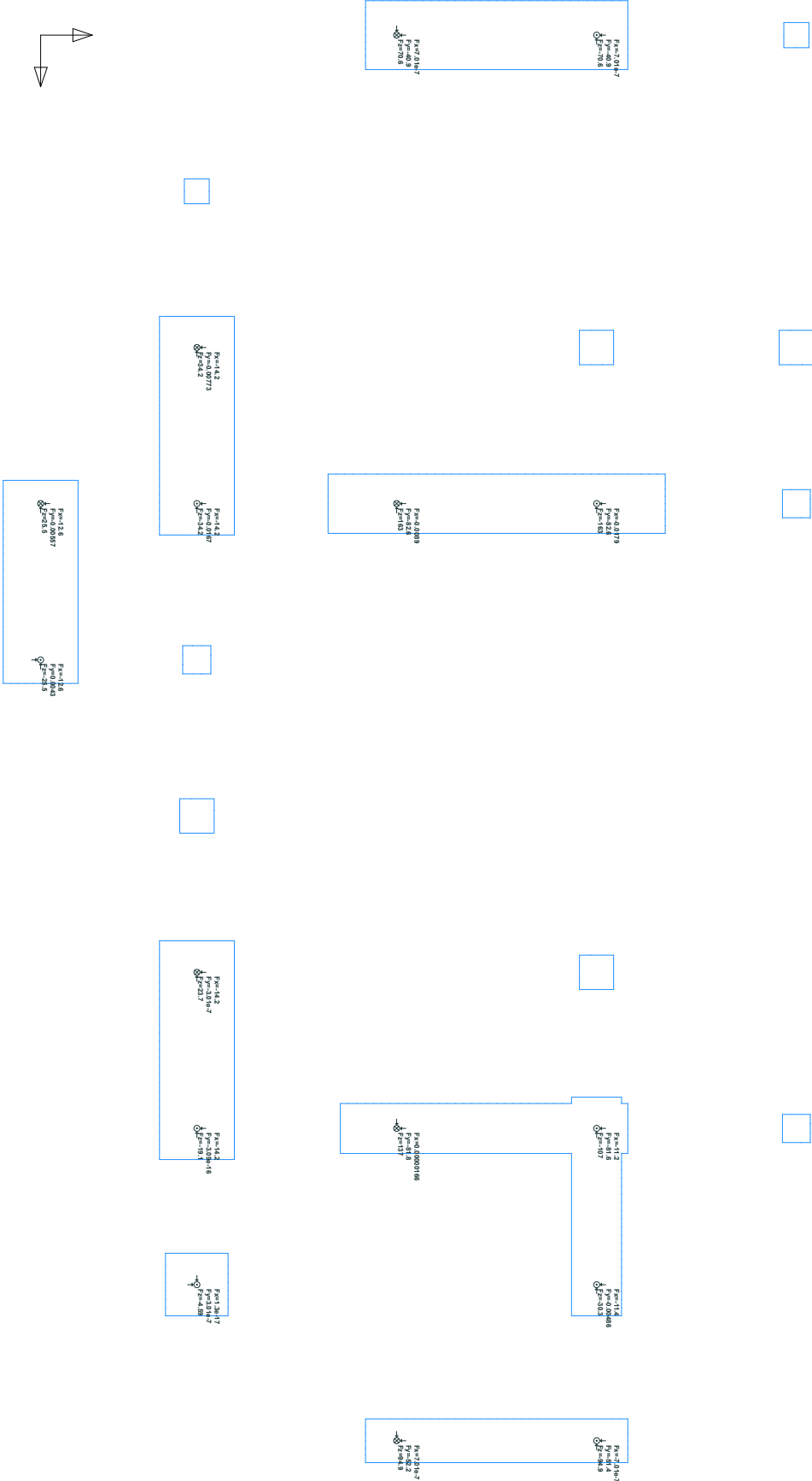
Seismic(EQ\_ASCE716\_-0.3X\_+E\_-Y\_+E\_F) User Dimensions: Point Loads: Point Load Values: Line Load From: Line Load Values: Area Loads: Area Load From: Area Load Values:  
Scale = 1:315

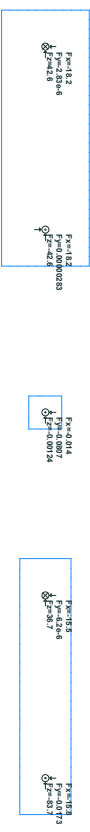


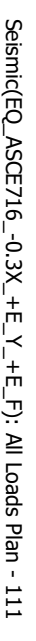
**Seismic(EQ\_ASC716\_-0.3X\_+E\_-Y\_+E\_F): All Loads Plan (2)**

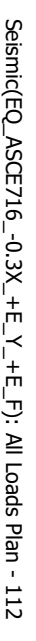


Seismic(EQ\_ASCE716\_-0.3X\_+E\_-Y\_+E\_F): All Loads Plan (3)



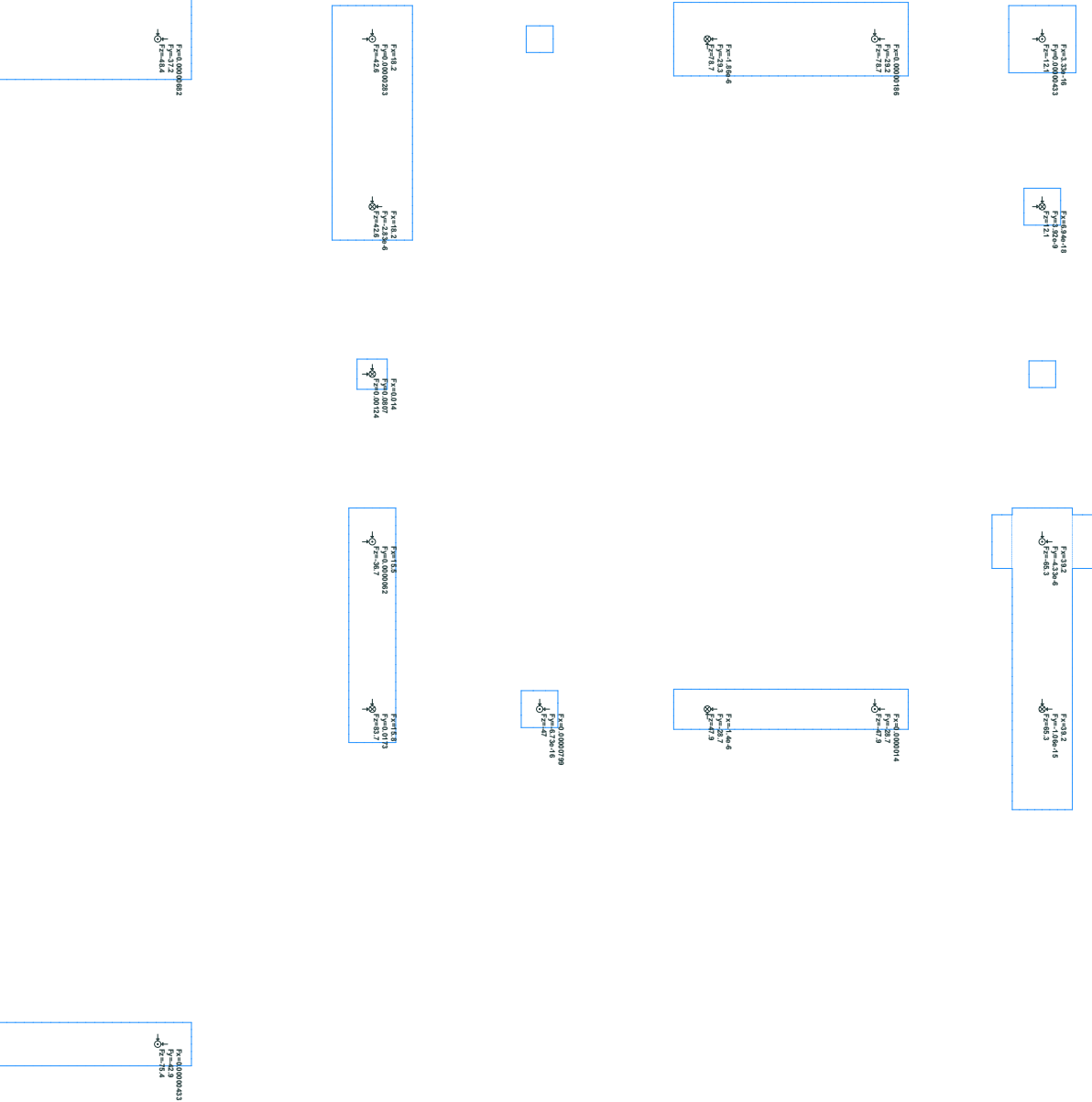




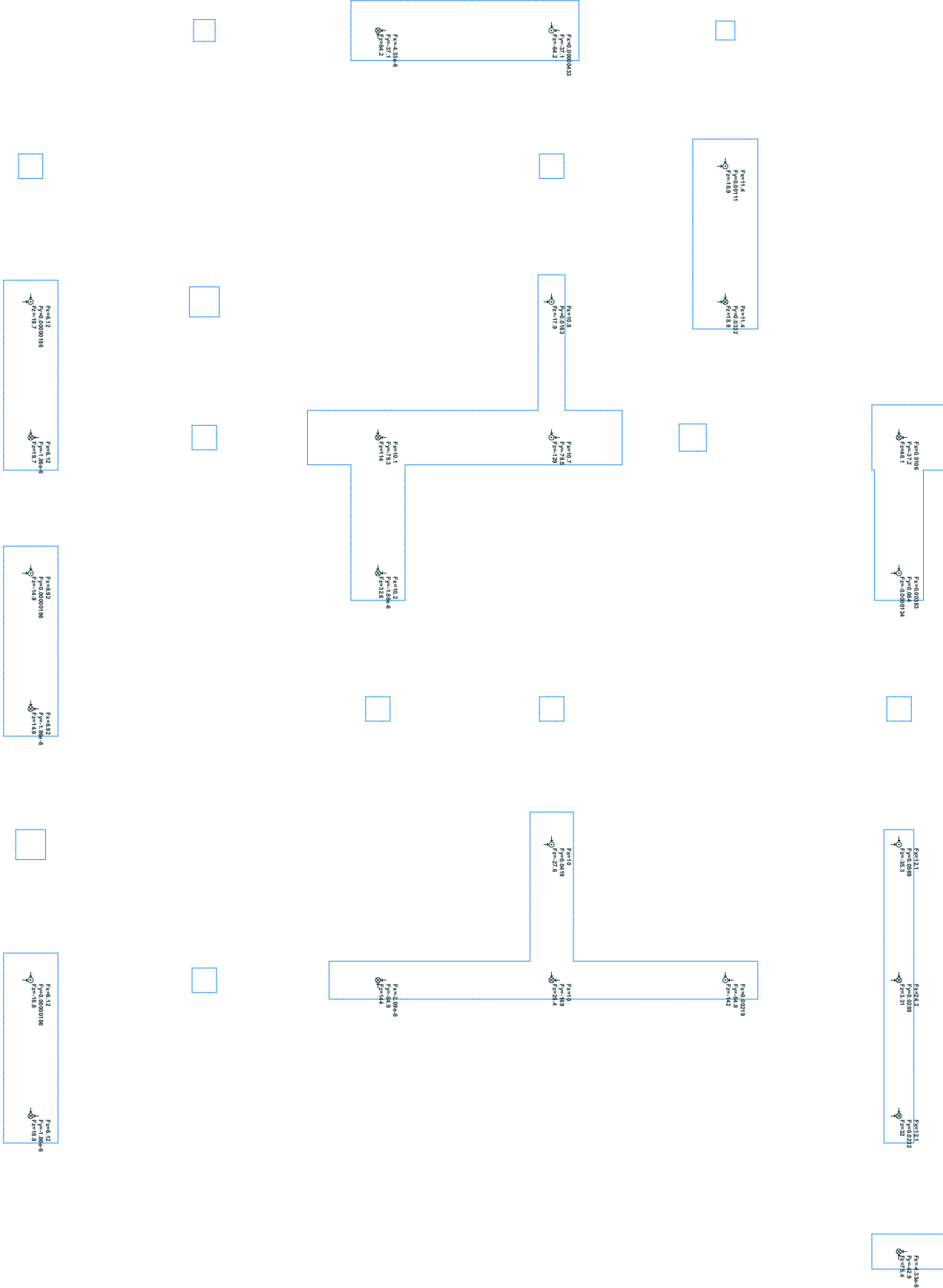


Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_+E\_F): All Loads Plan

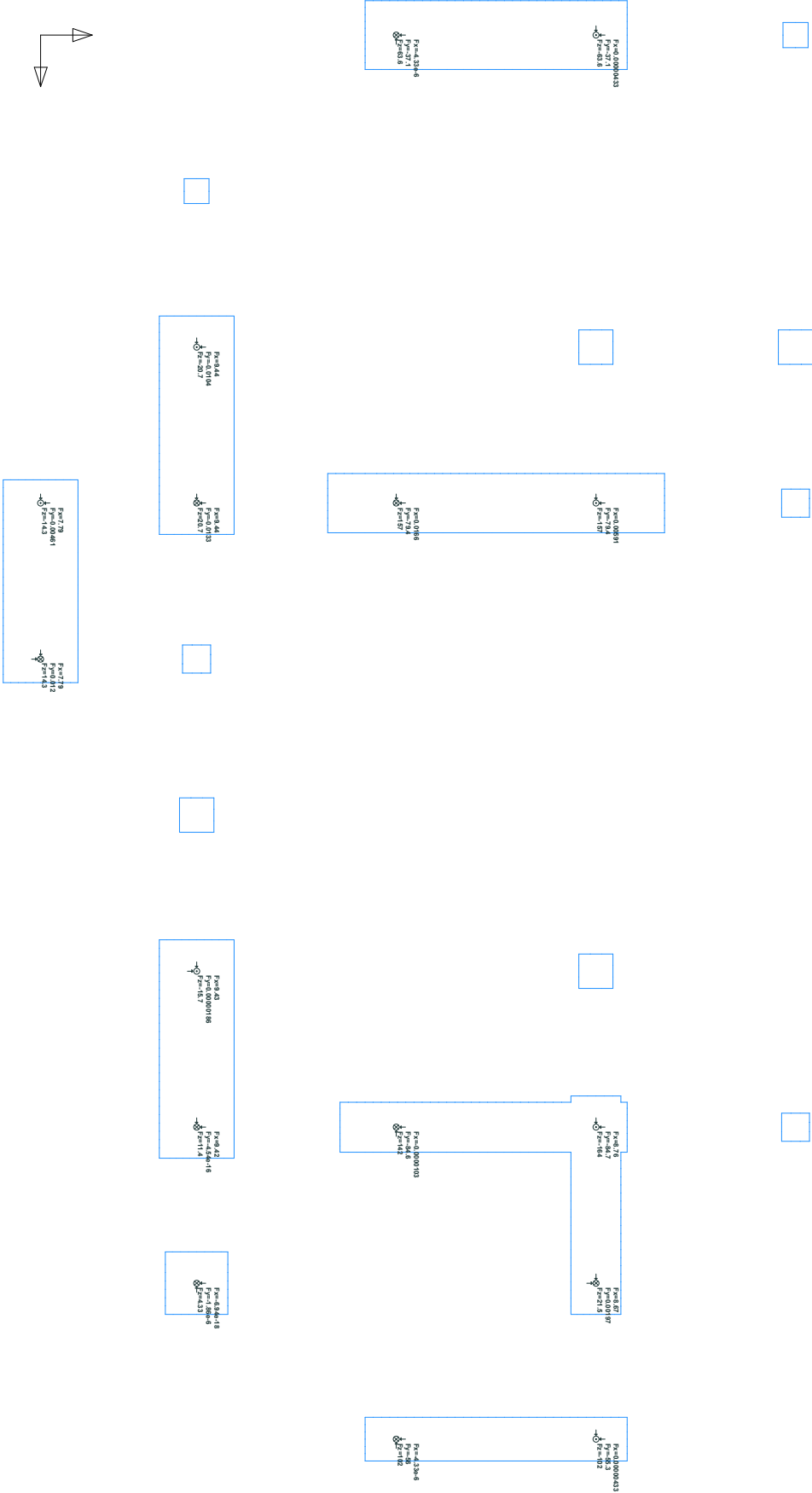
Seismic EQ ASCE716\_0.3X\_+E\_-Y\_+E\_F: User Defined; Point Load; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;  
Scale = 1:315  
Elements Below: Wall Elements Above: Wall Element Outline Only; Column Elements Above: 200 Elements; 200 Element Outline Only;



Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_+E\_F): All Loads Plan (2)

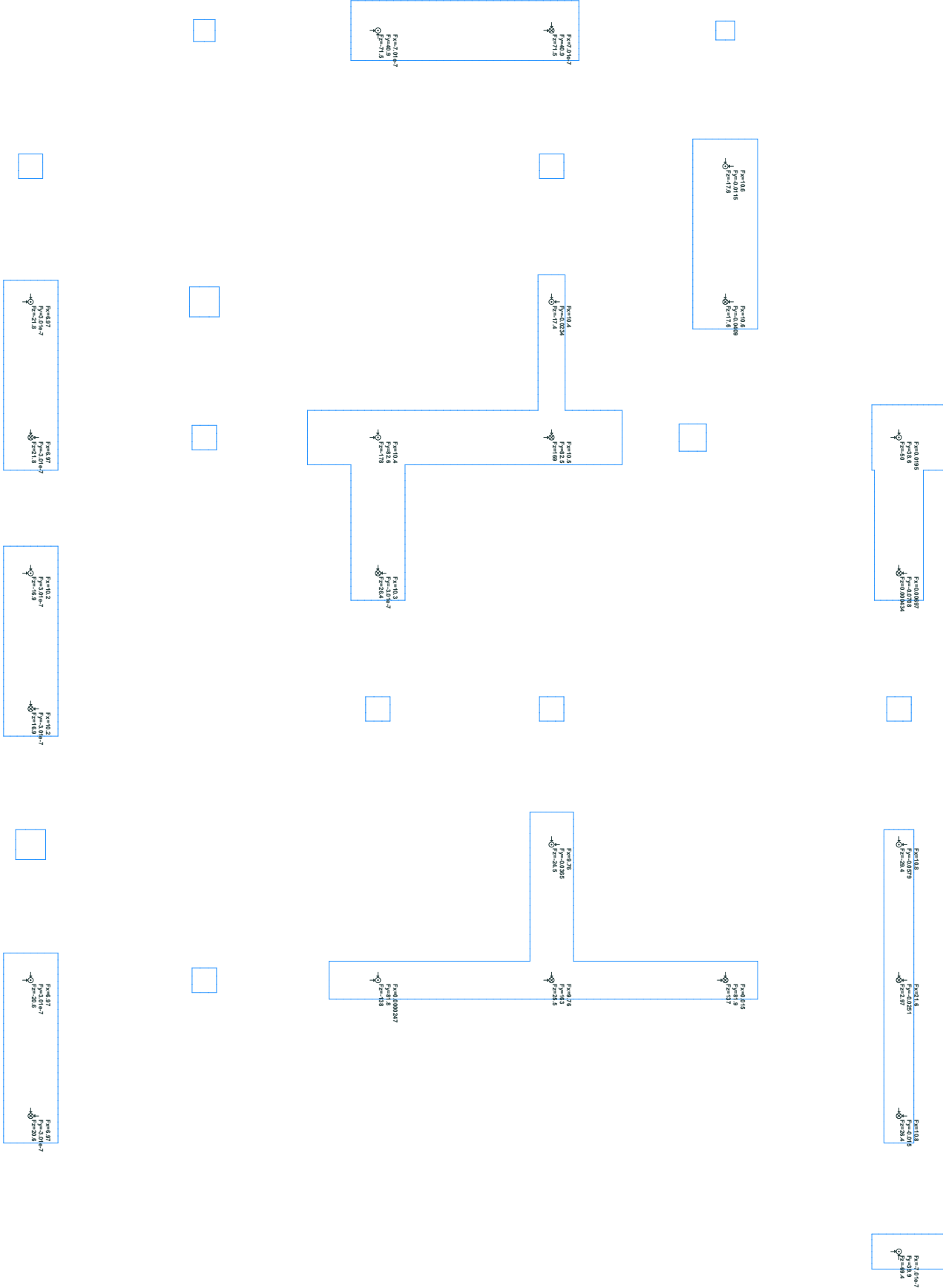


Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_+E\_F): All Loads Plan (3)

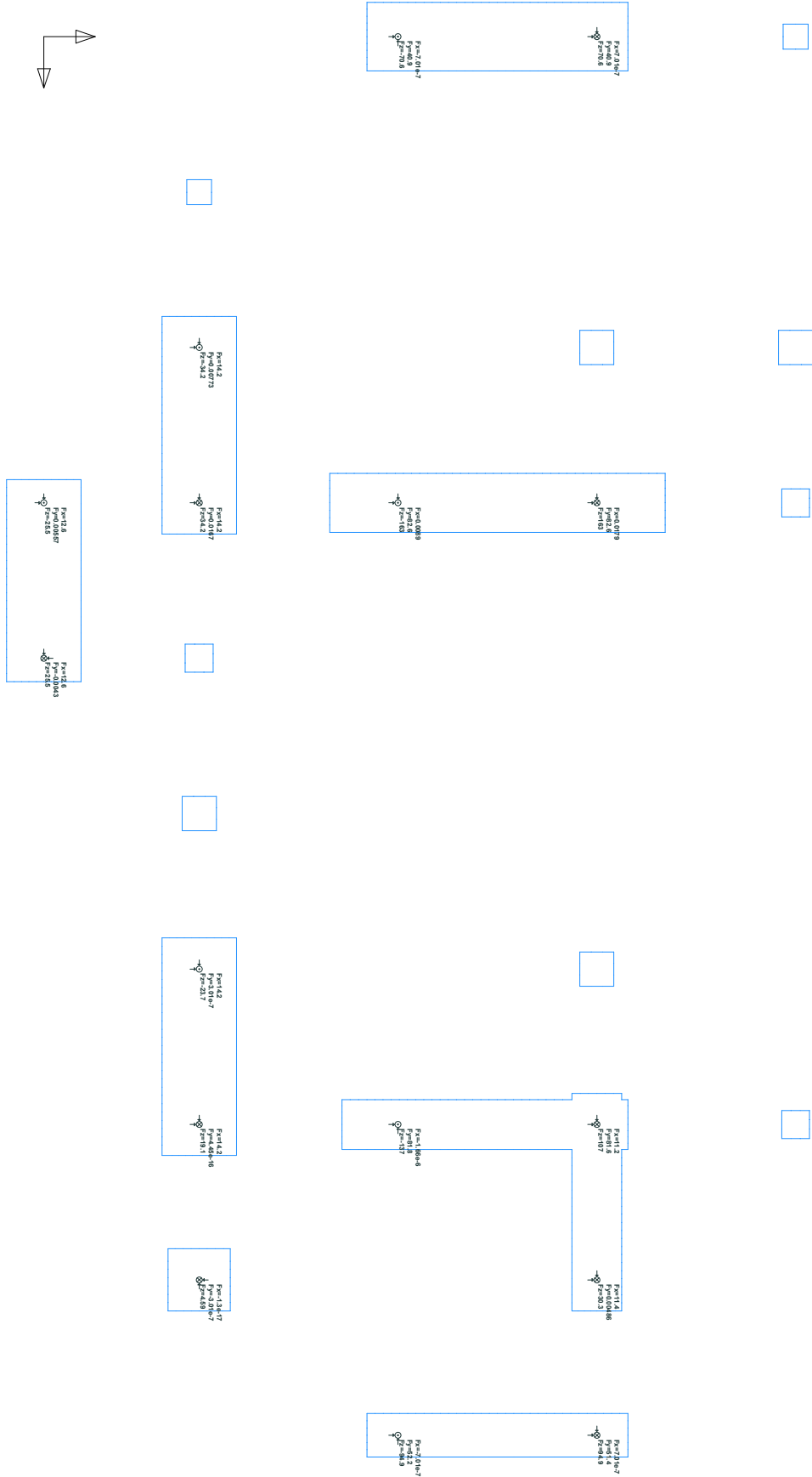




Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_+E\_F): All Loads Plan (2)

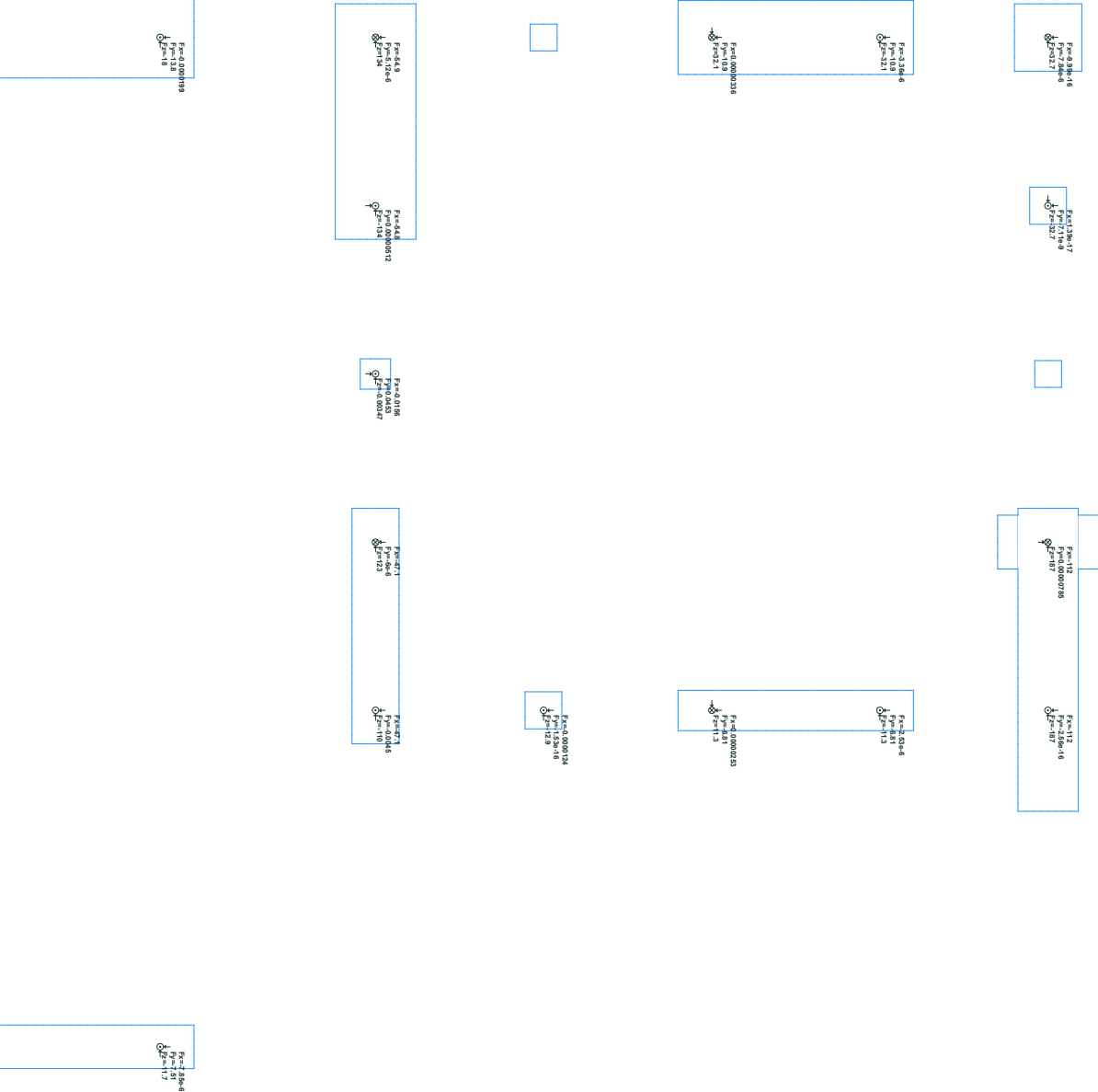


Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_+E\_F): All Loads Plan (3)

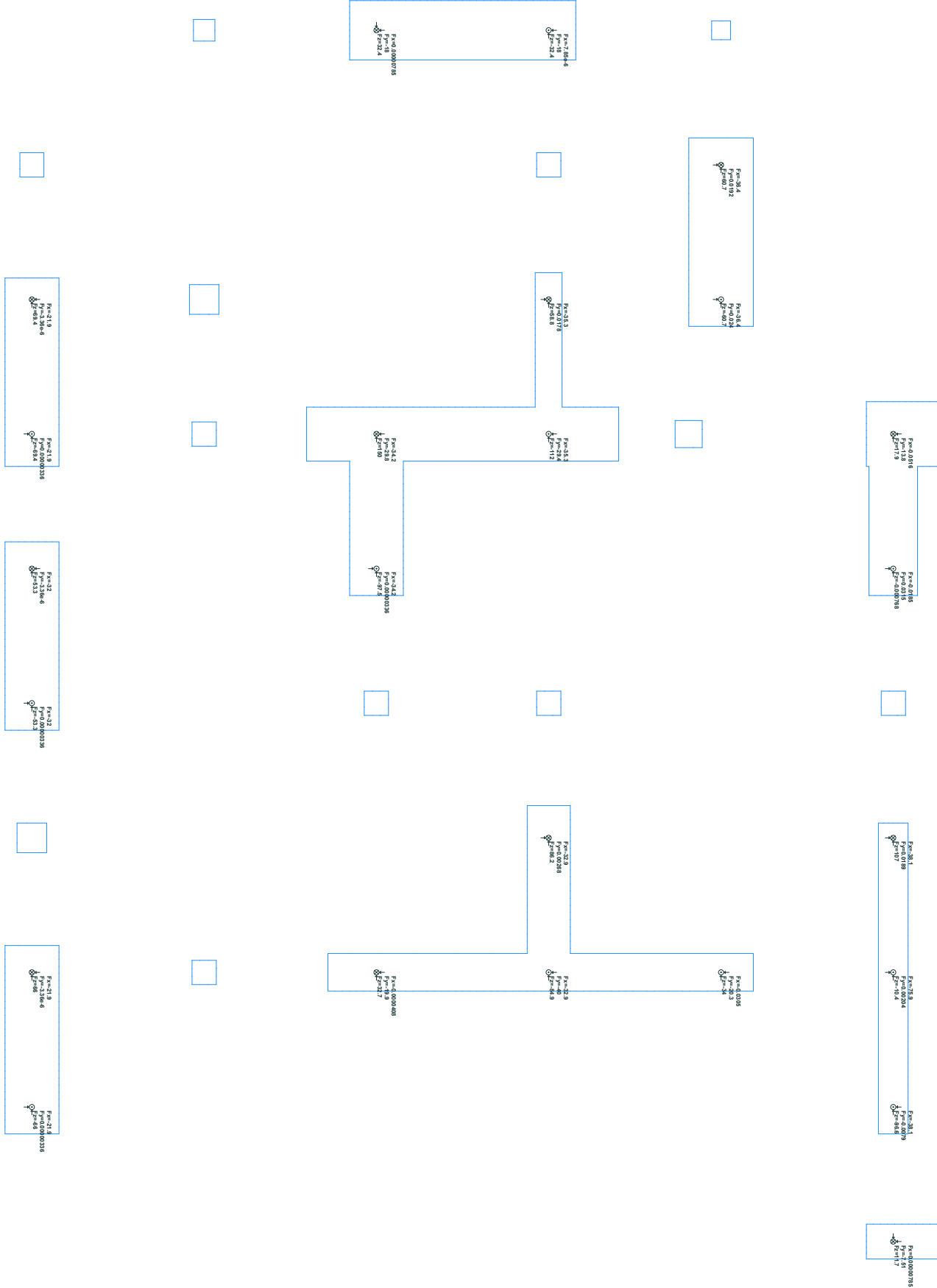


Seismic(EQ\_ASCE716\_-X\_+E\_-0.3Y\_+E\_F): All Loads Plan

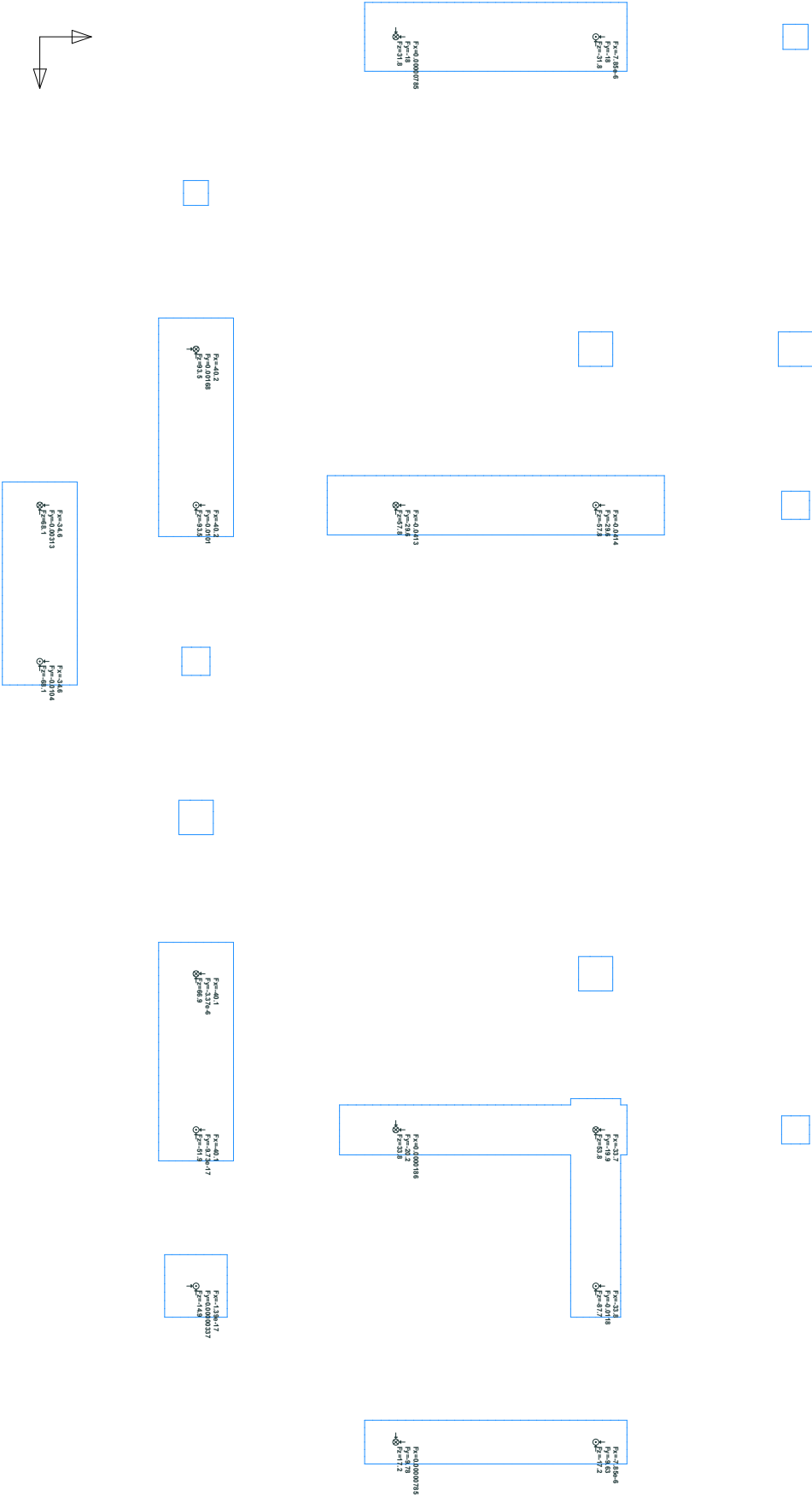
Seismic(EQ\_ASCE716\_-X\_-0.3Y\_+E\_F) User Labels: User Dimensions: Point Loads: Point Load Values: Line Load from: Line Load Values: Area Loads: Area Load from: Area Load Values: Scale = 1/315



Seismic(EQ\_ASCE716\_-X\_+E\_-0.3Y\_+E\_F): All Loads Plan (2)

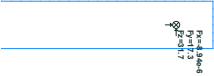
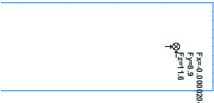
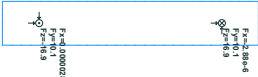
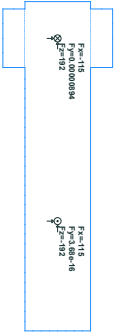


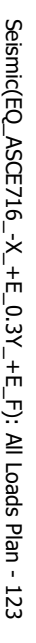
Seismic(EQ\_ASCE716\_-X\_+E\_-0.3Y\_+E\_F): All Loads Plan (3)



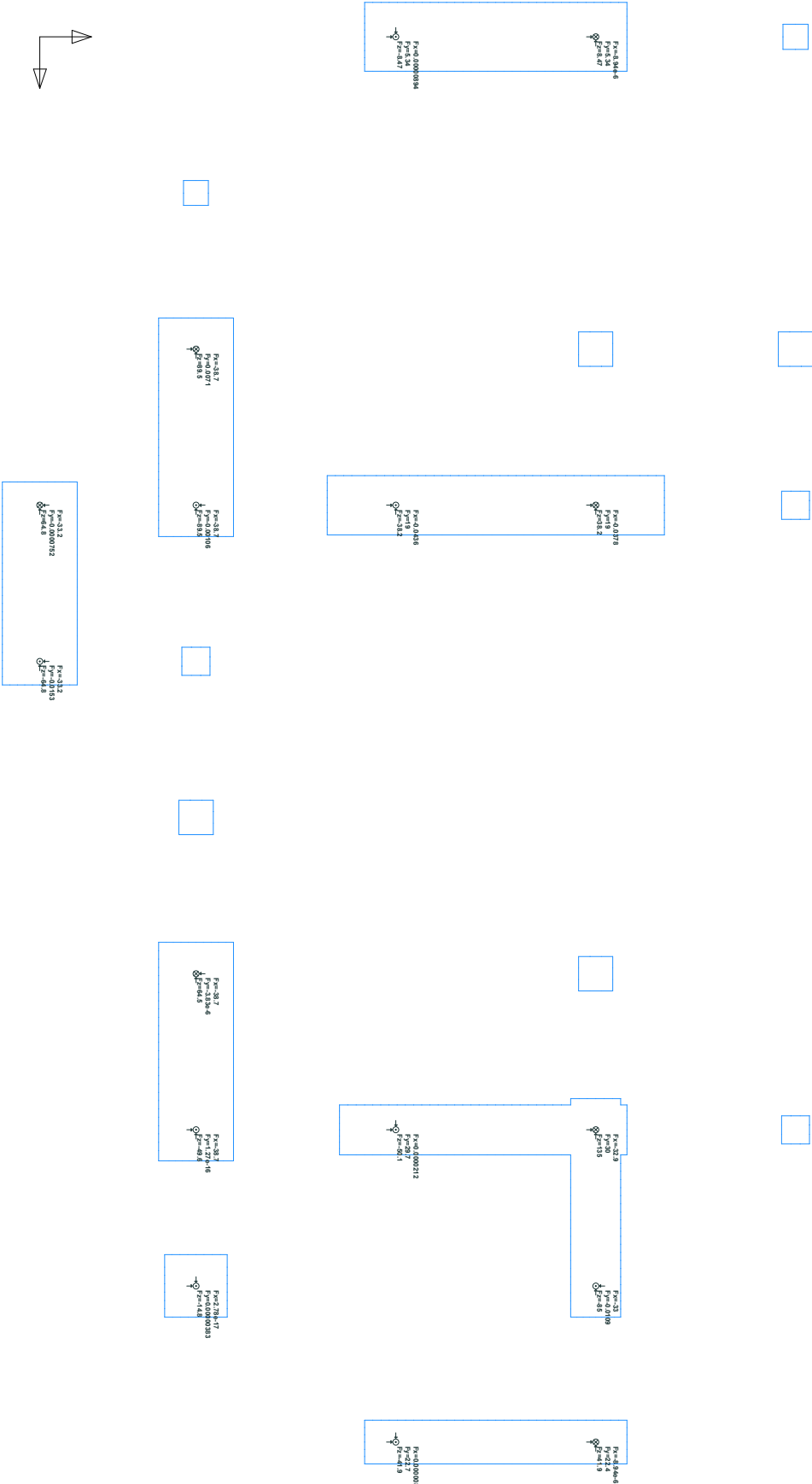
Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_+E\_F): All Loads Plan

Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_+E\_F) User Labels: User Labels; User Dimensions; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values; Scale = 1:315



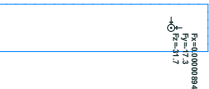
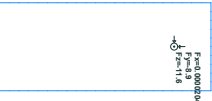
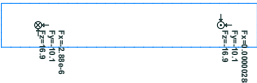
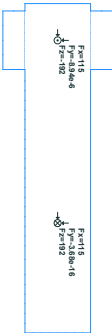


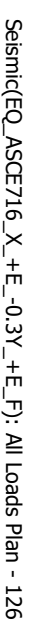
Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_+E\_F): All Loads Plan (3)

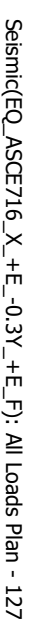


# Seismic(EQ\_ASCE716\_X\_+E\_-0.3Y\_+E\_F): All Loads Plan

Seismic(EQ\_ASCE716\_X\_+E\_-0.3Y\_+E\_F) User Inputs: User Inputs: User Direction: Point Load Values: Line Loads: Line Load Icons: Line Load Values: Area Loads: Area Load Icons: Area Load Values: Scale = 1/315

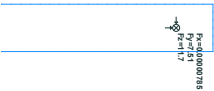
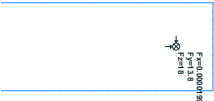
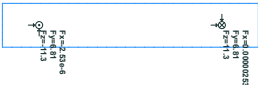
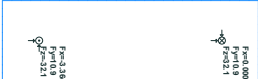
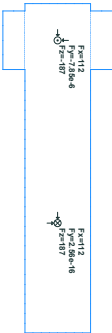




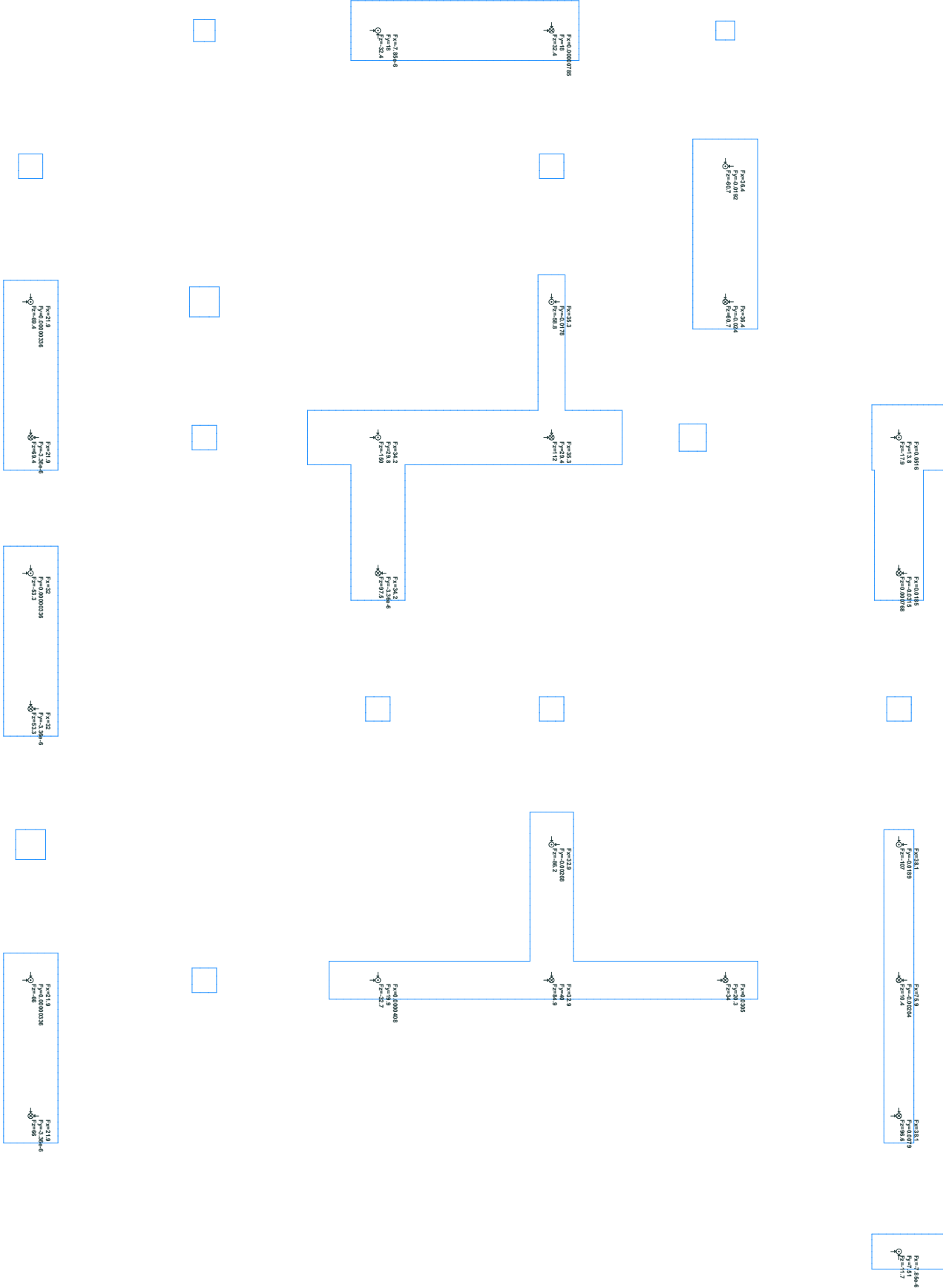


Seismic(EQ\_ASCE716\_X\_+E\_0.3Y\_+E\_F): All Loads Plan

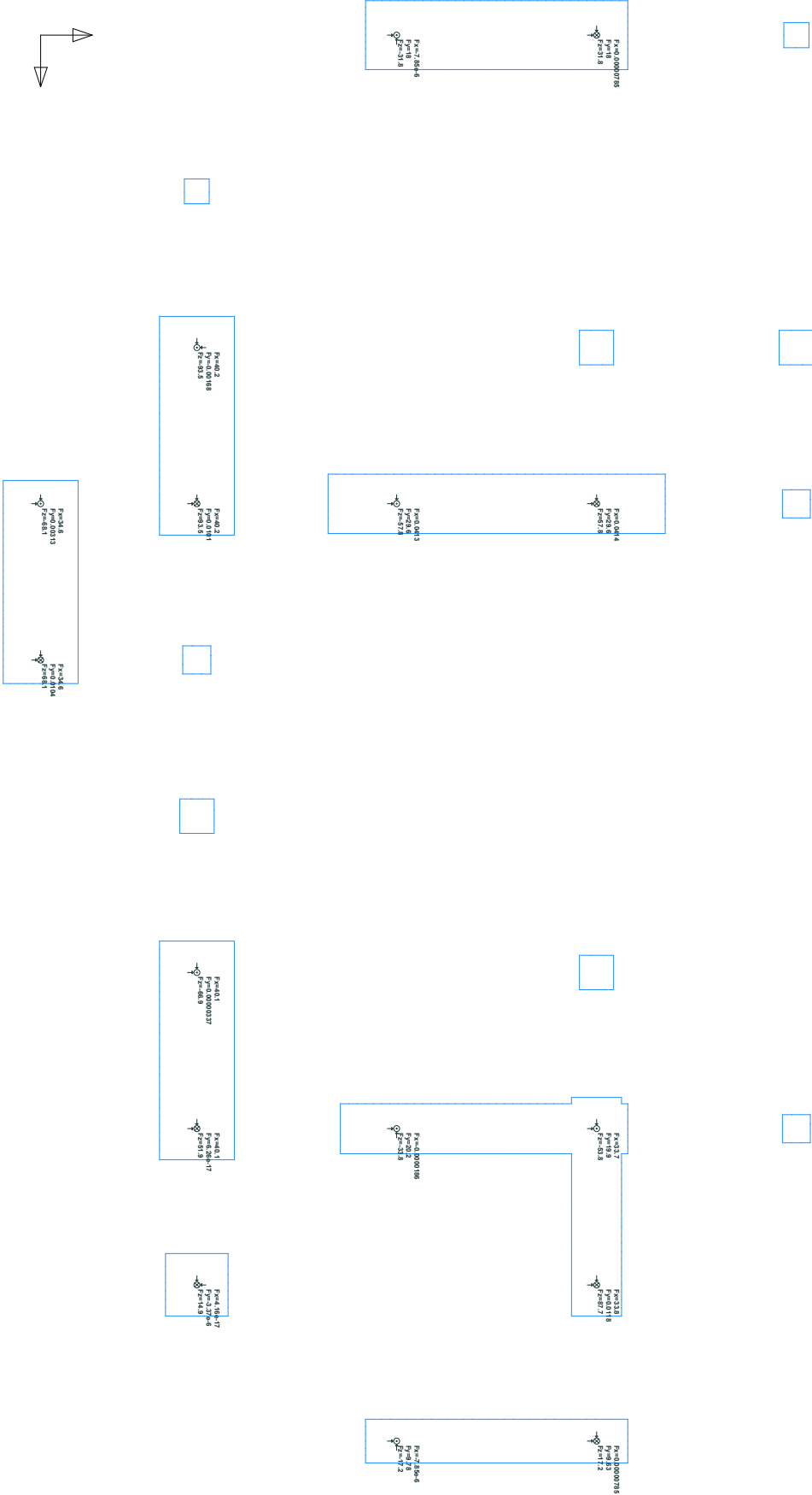
Seismic(EQ\_ASCE716\_X\_+E\_0.3Y\_+E\_F): User Units: User Members: Point Load Icons: Point Load Values: Line Load Icons: Line Load Values: Area Load Icons: Area Load Values: Scale = 1:315



Seismic(EQ\_ASCE716\_X\_+E\_0.3Y\_+E\_F): All Loads Plan (2)

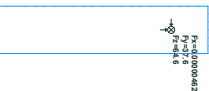
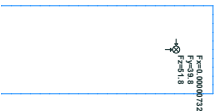
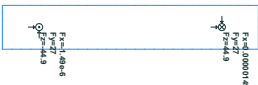
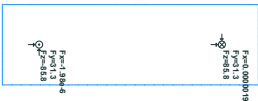
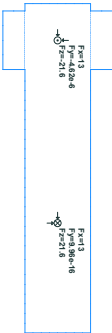


Seismic(EQ\_ASCF716\_X\_+E\_0.3Y\_+E\_F): All Loads Plan (3)

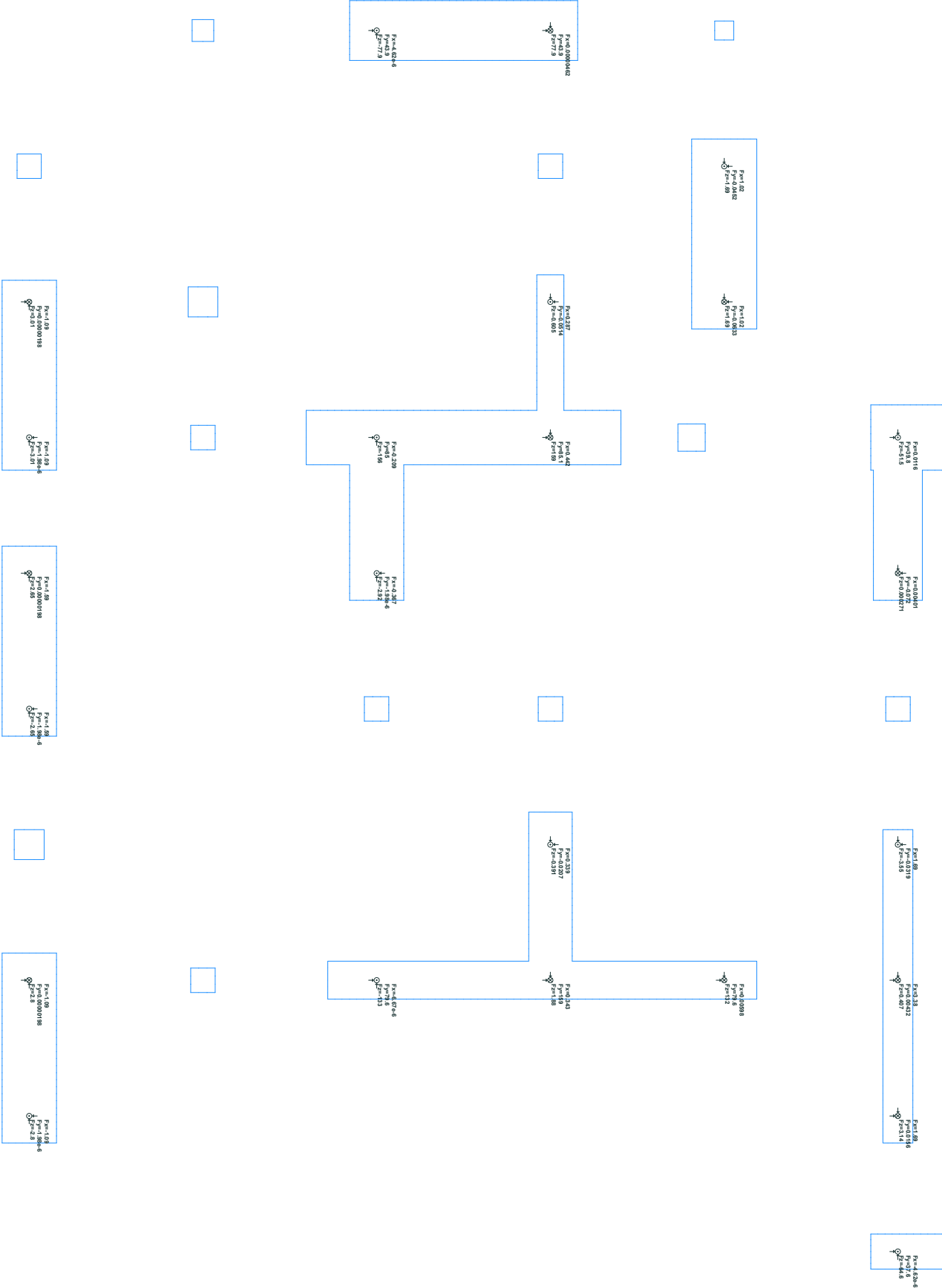


# Seismic(EQ\_ASCET716\_Y\_-E\_F): All Loads Plan

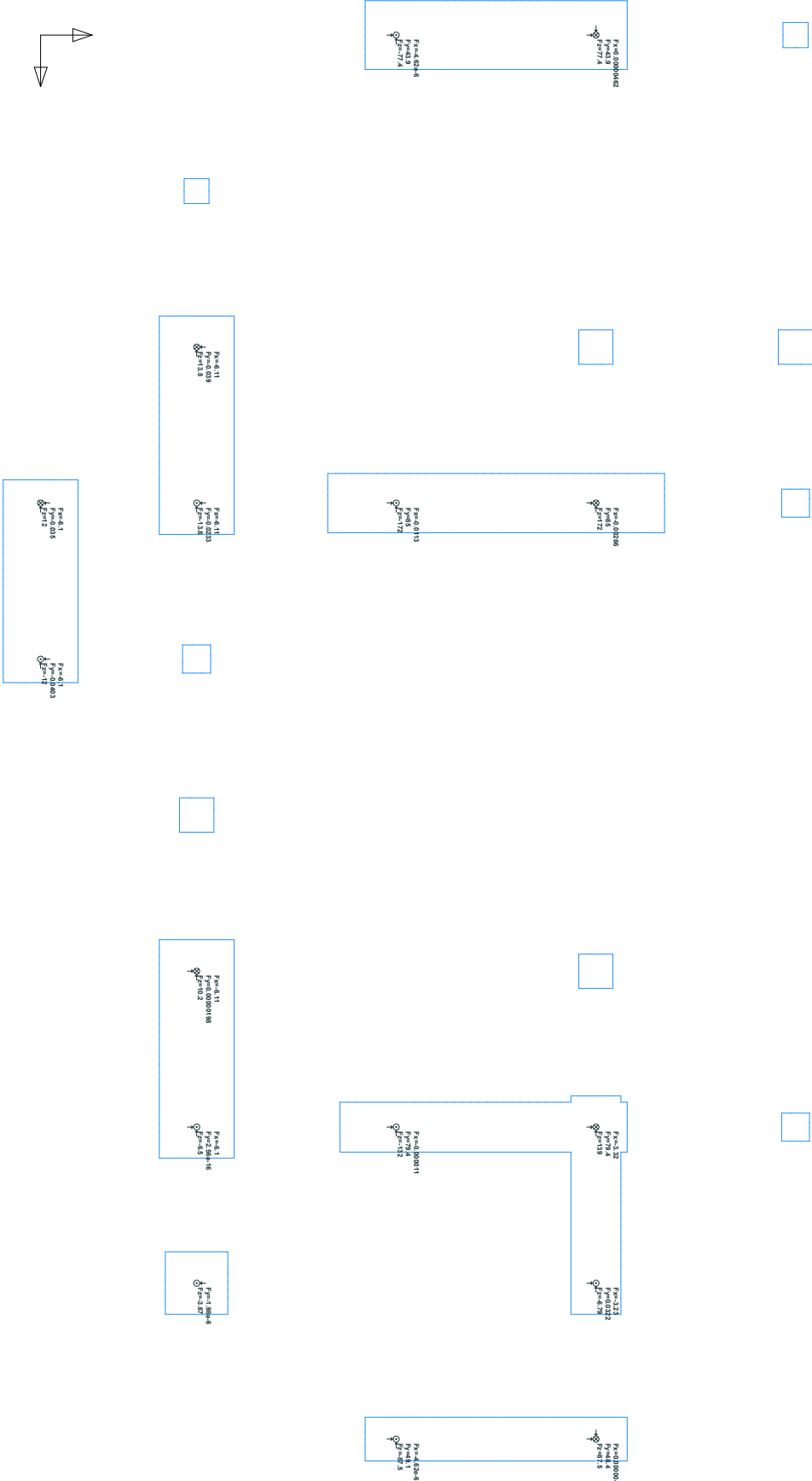
Seismic(EQ\_ASCET716\_Y\_-E\_F) User Name: User Name; User Dimensions: Point Load; Point Load Icon; Point Load Values; Line Load Icon; Line Load Values; Area Load Icon; Area Load Values; Scale = 1:315



Seismic(EQ\_ASCET16\_Y\_-E\_F): All Loads Plan (2)

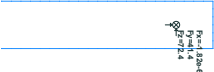
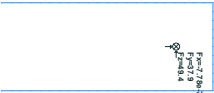
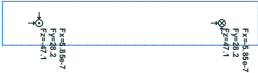
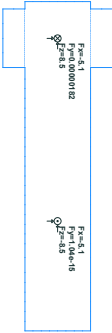


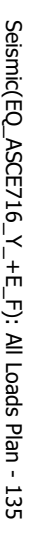
Seismic(EQ\_ASCET16\_Y\_-E\_F): All Loads Plan (3)



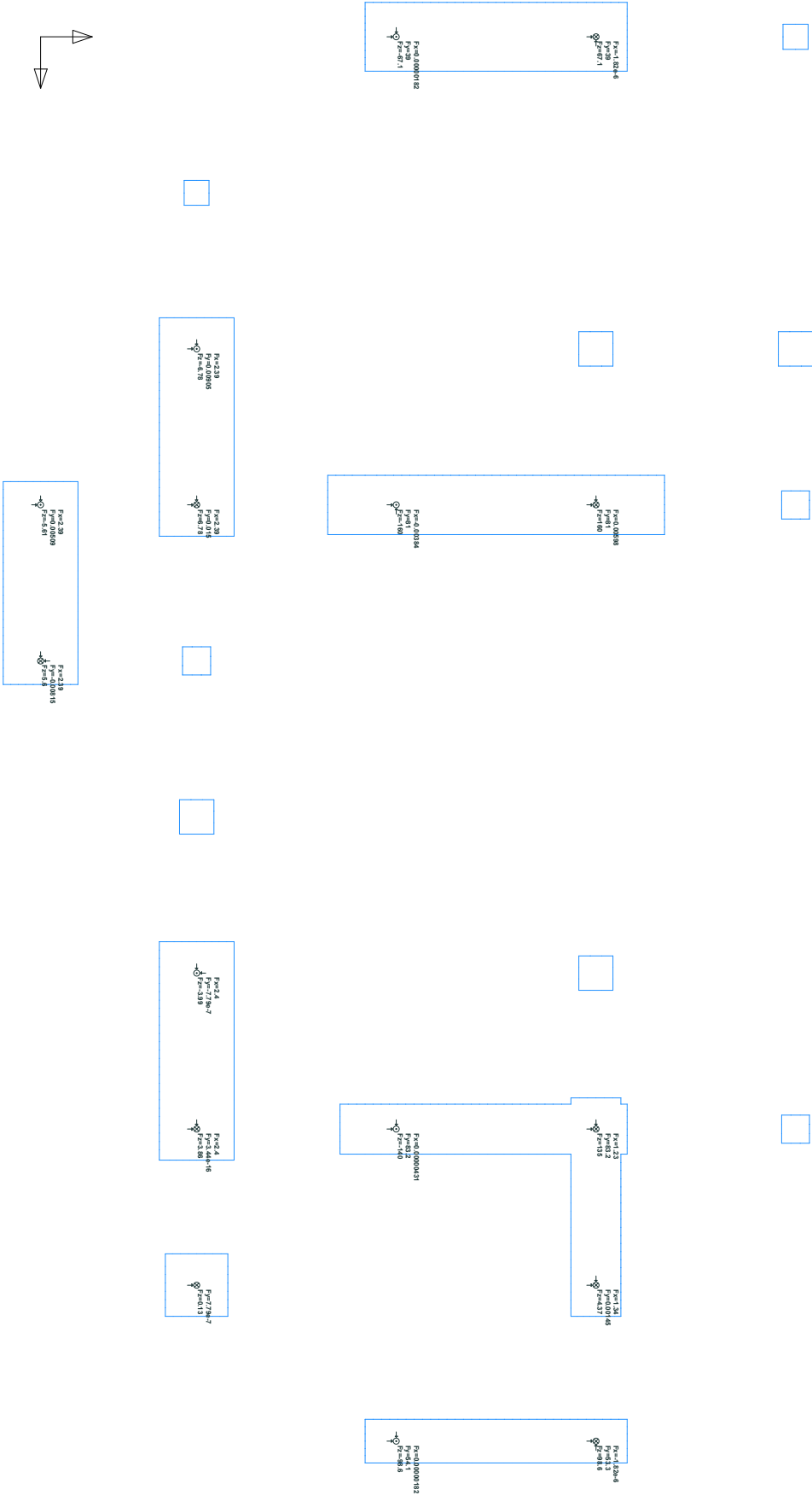
# Seismic(EQ\_ASCE716\_Y\_+E\_F): All Loads Plan

Seismic(EQ\_ASCE716\_Y\_+E\_F) User Notes: User Notes: User Dimensions: Point Loads: Point Load Icons: Point Load Values: Area Loads: Area Load Icons: Area Load Values: Area Load Values: Scale = 1:315



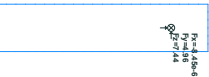
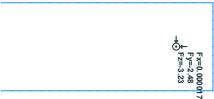
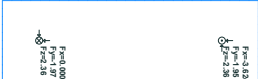
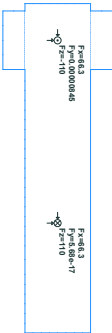


Seismic(EQ\_ASCE716\_Y\_+E\_F): All Loads Plan (3)

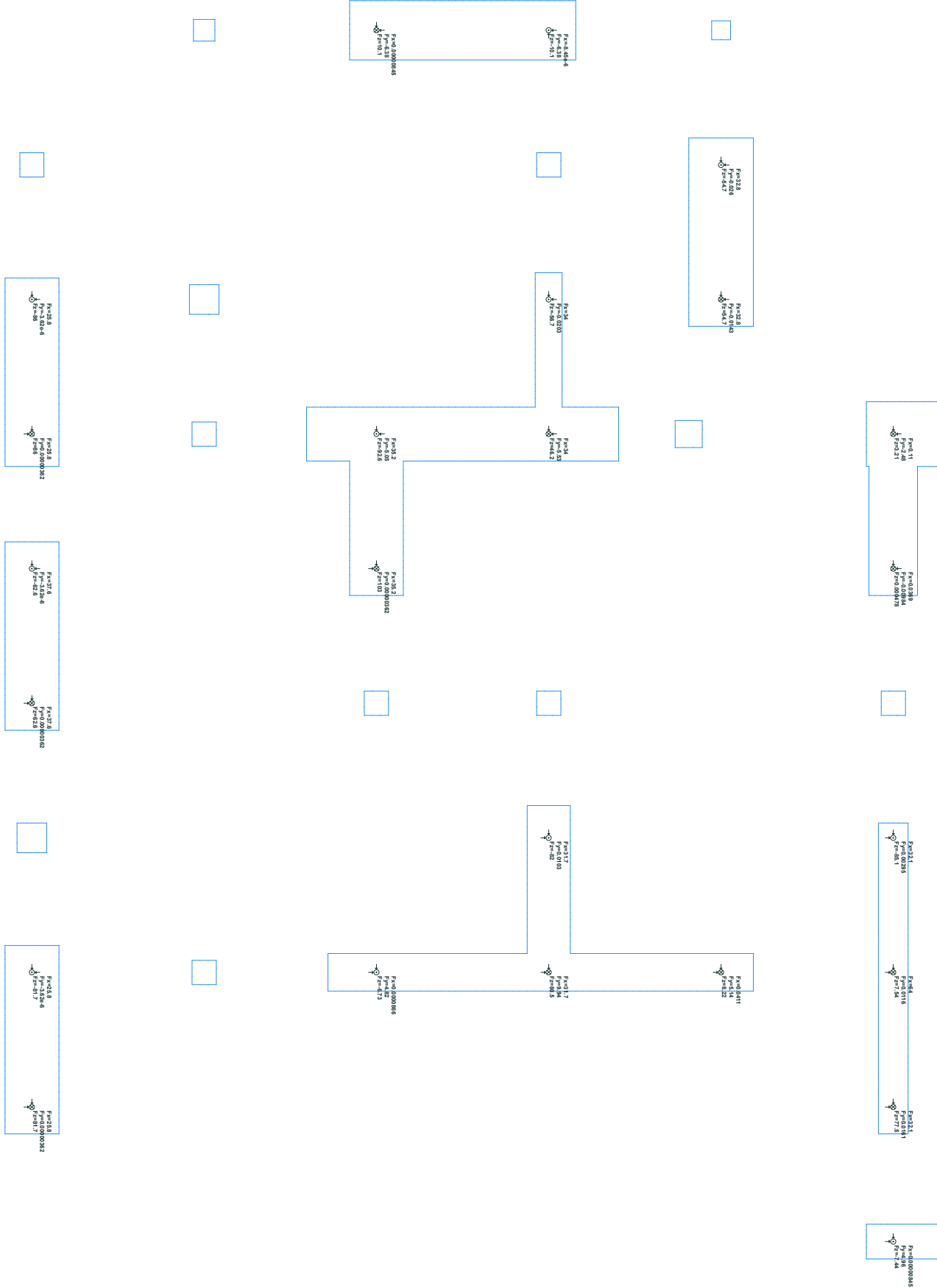


Seismic(EQ\_ASCET716\_X\_-E\_F): All Loads Plan

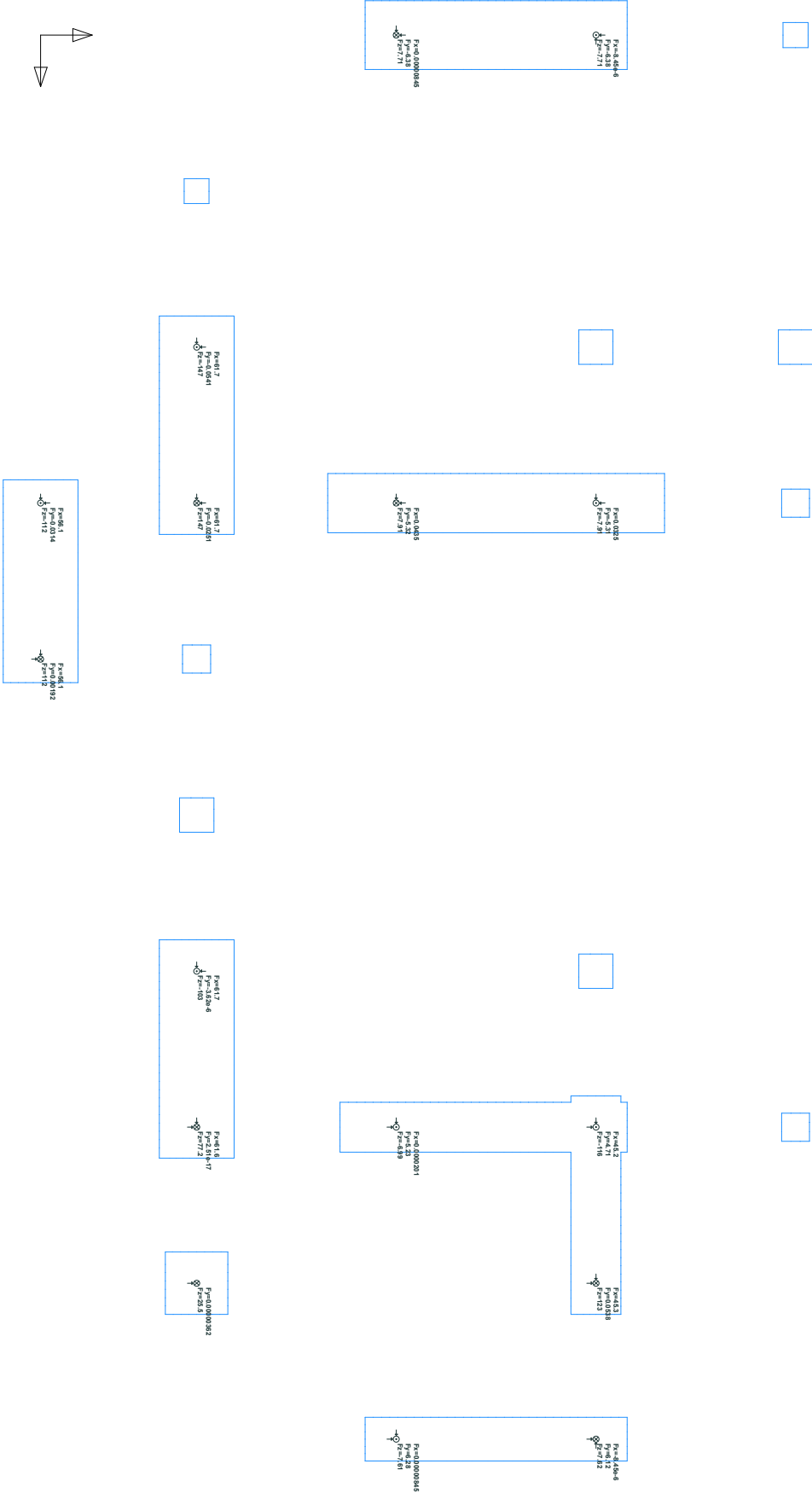
Seismic(EQ\_ASCET716\_X\_-E\_F) User Name: User Name; User Dimensions: Point Load; Point Load Icon; Point Load Values; Line Load Icon; Line Load Values; Area Load Icon; Area Load Values;  
Scale = 1:315  
Elements below Wall Elements Above Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;

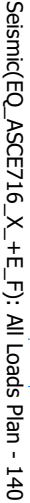


Seismic(EQ\_ASCET716\_X\_-E\_F): All Loads Plan (2)

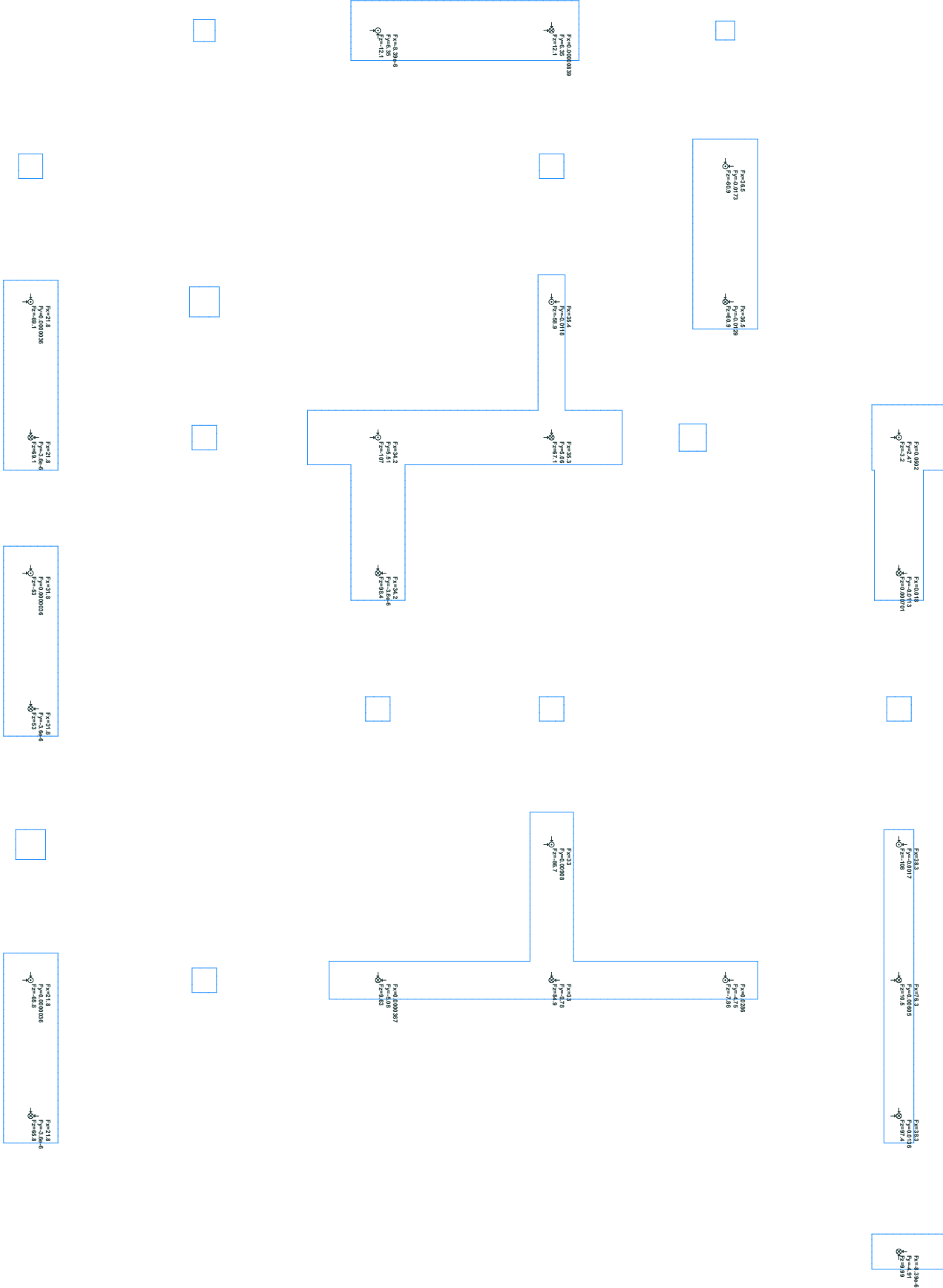


Seismic(EQ\_ASCET716\_X\_-E\_F): All Loads Plan (3)

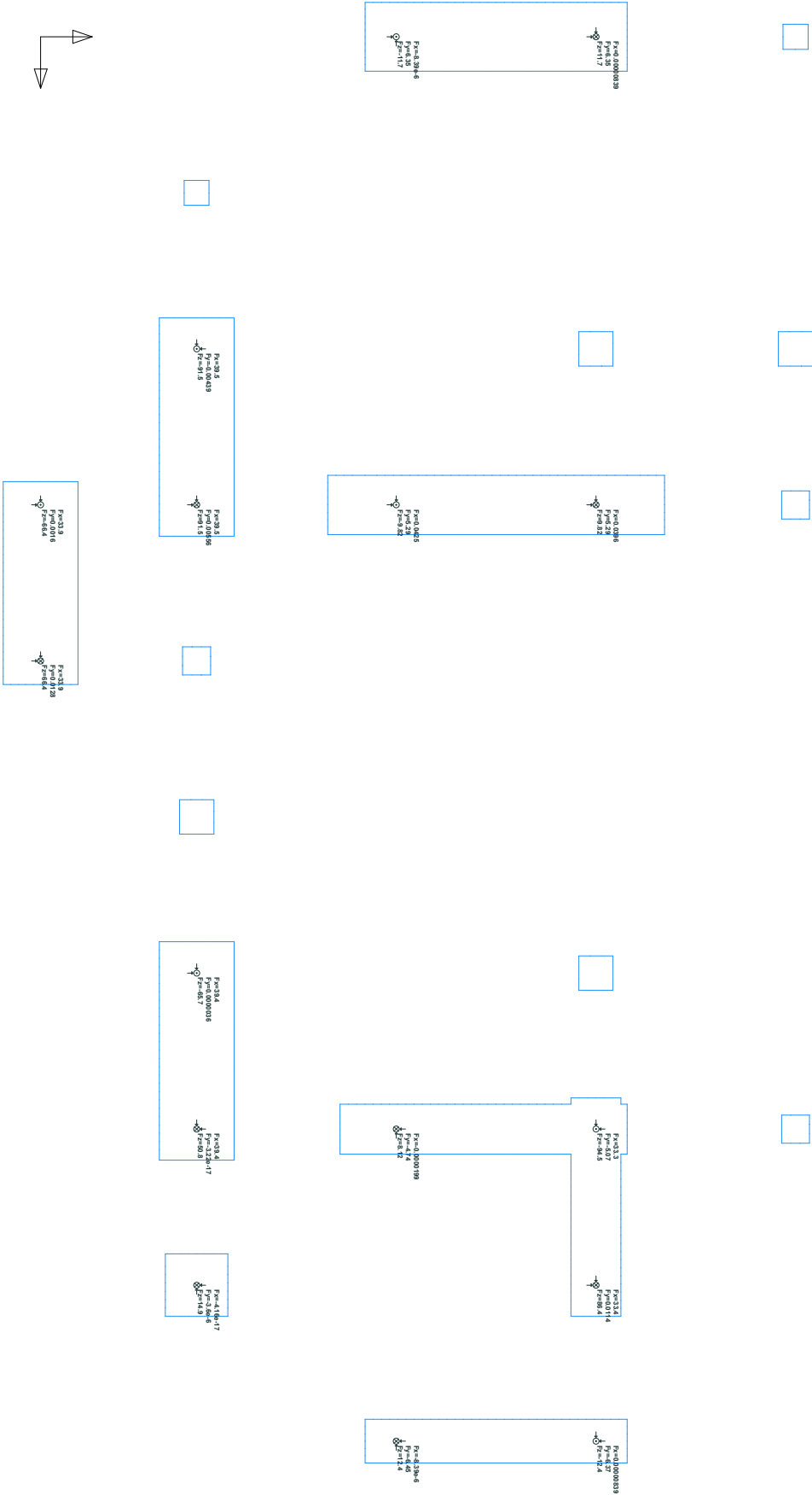




Seismic(EQ\_ASCE716\_X\_+E\_F): All Loads Plan (2)

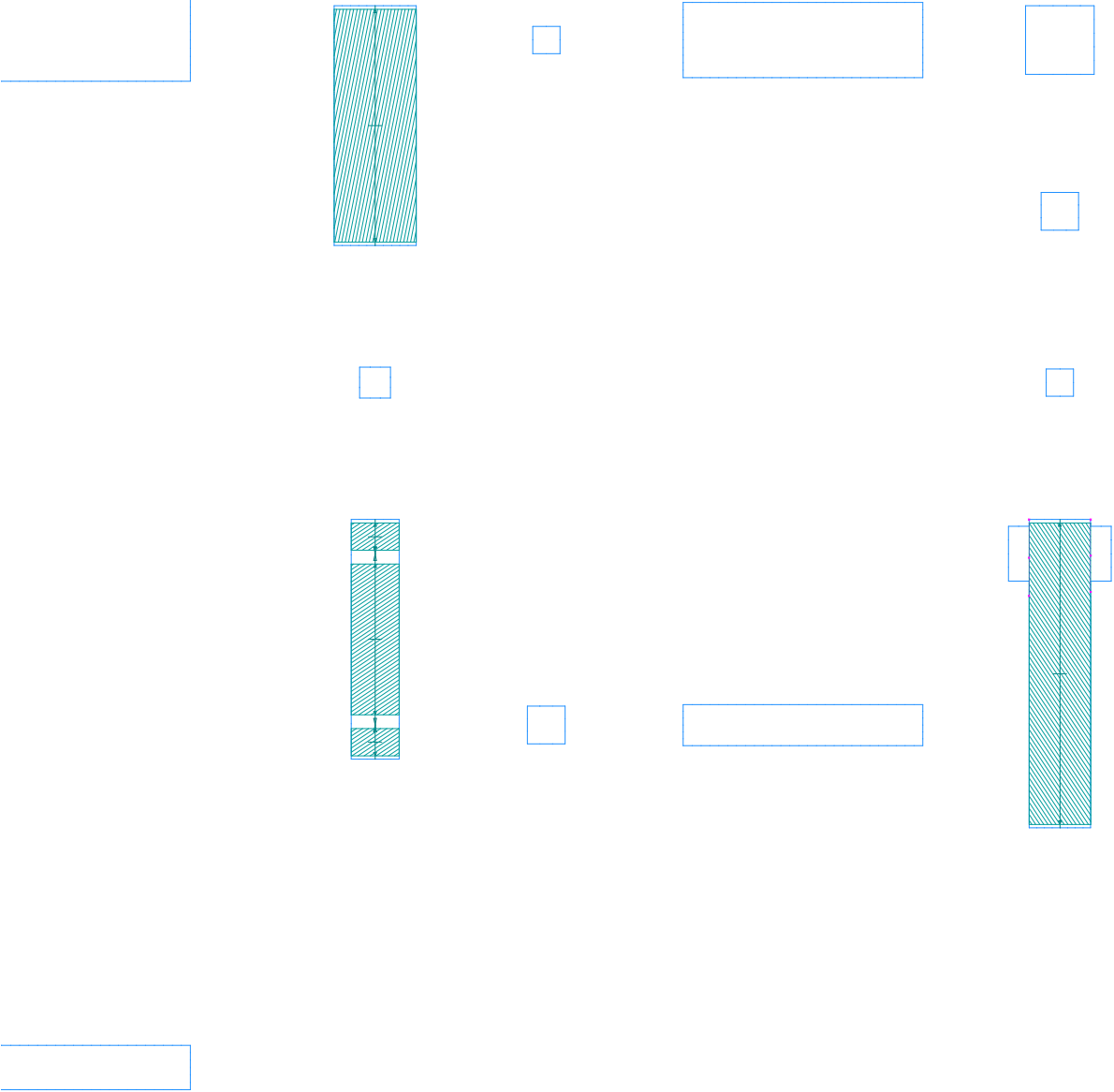


Seismic(EQ\_ASCE716\_X\_+E\_F): All Loads Plan (3)

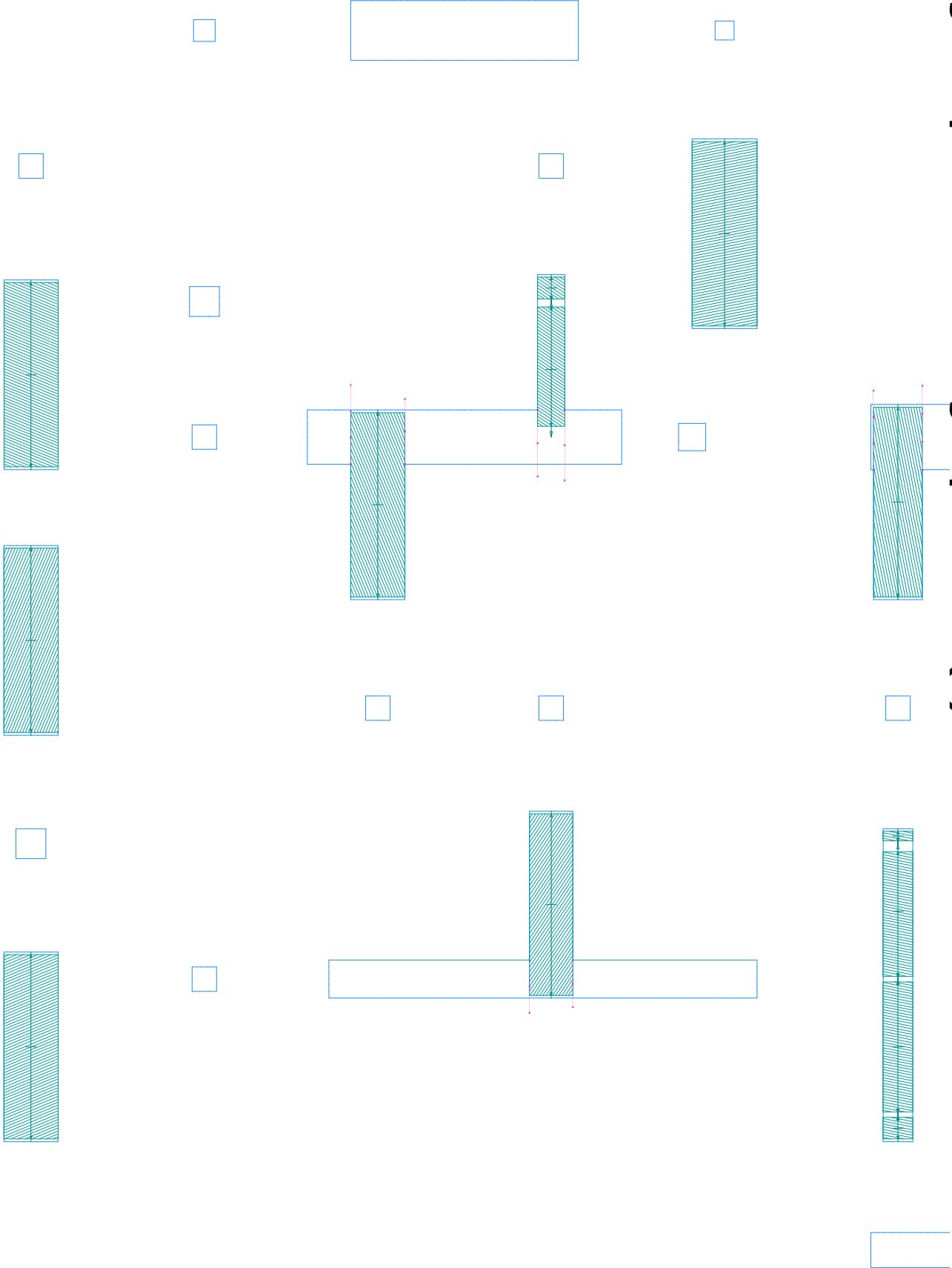


# Design Strip: Latitude Design Spans Plan

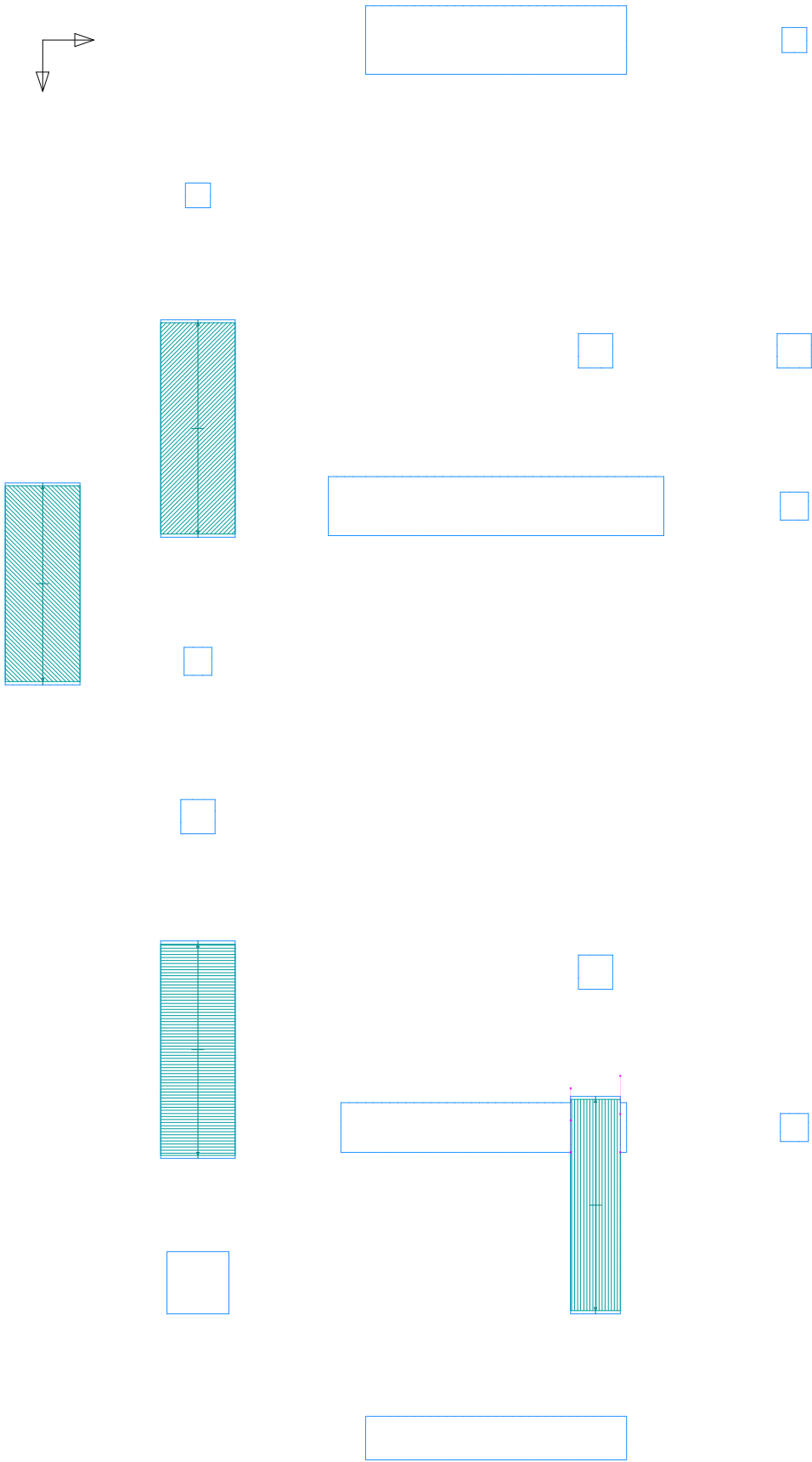
Design Strip: Latitude Span Boundaries: Latitude S8s; Latitude D8s; Latitude S8s; S8s; Hatching; Latitude Definition Checks; User Notes; User Lines; User Dimensions:  
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;  
Scale = 1/315



Design Strip: Latitude Design Spans Plan (2)

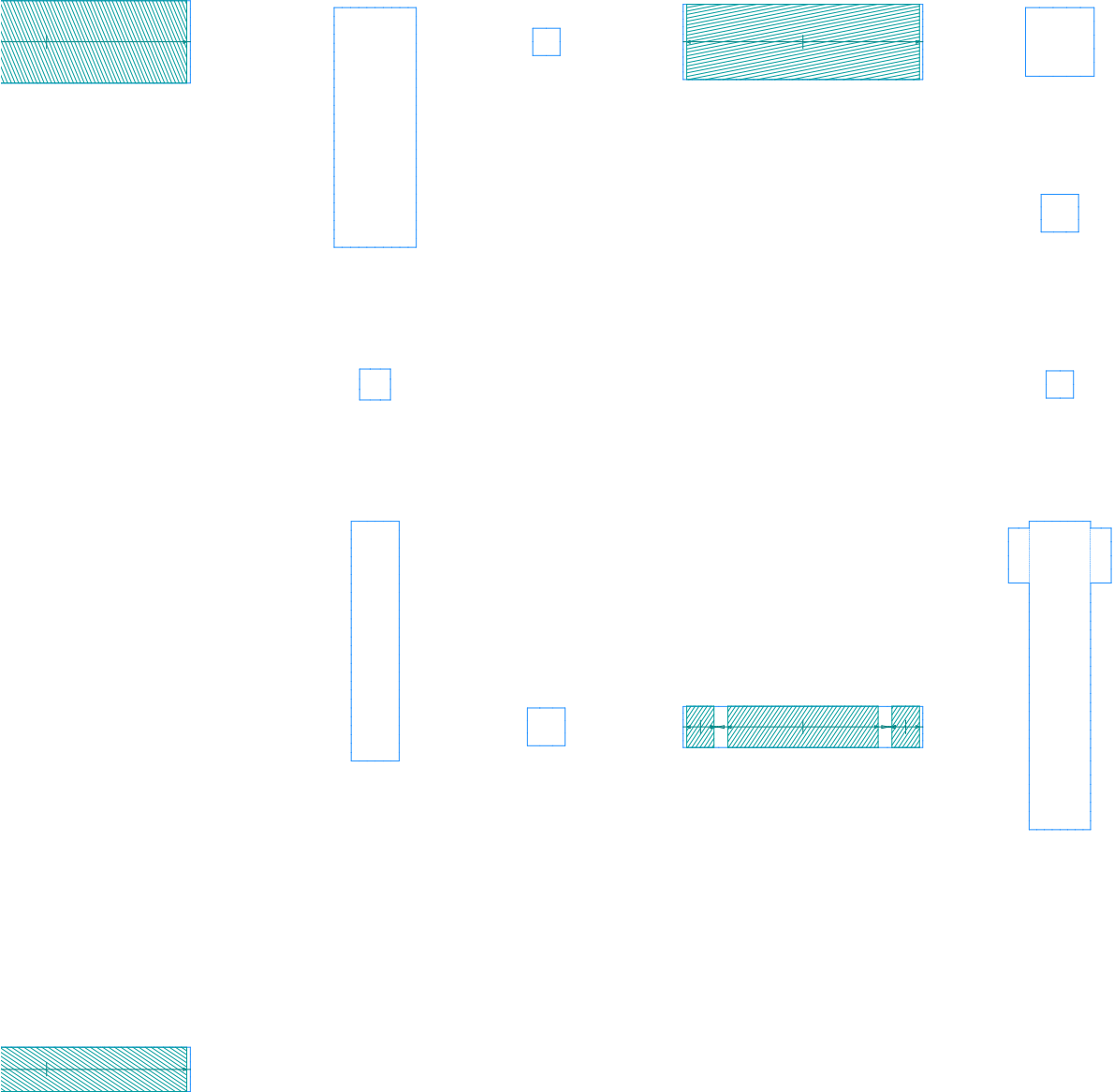


**Design Strip: Latitude Design Spans Plan (3)**

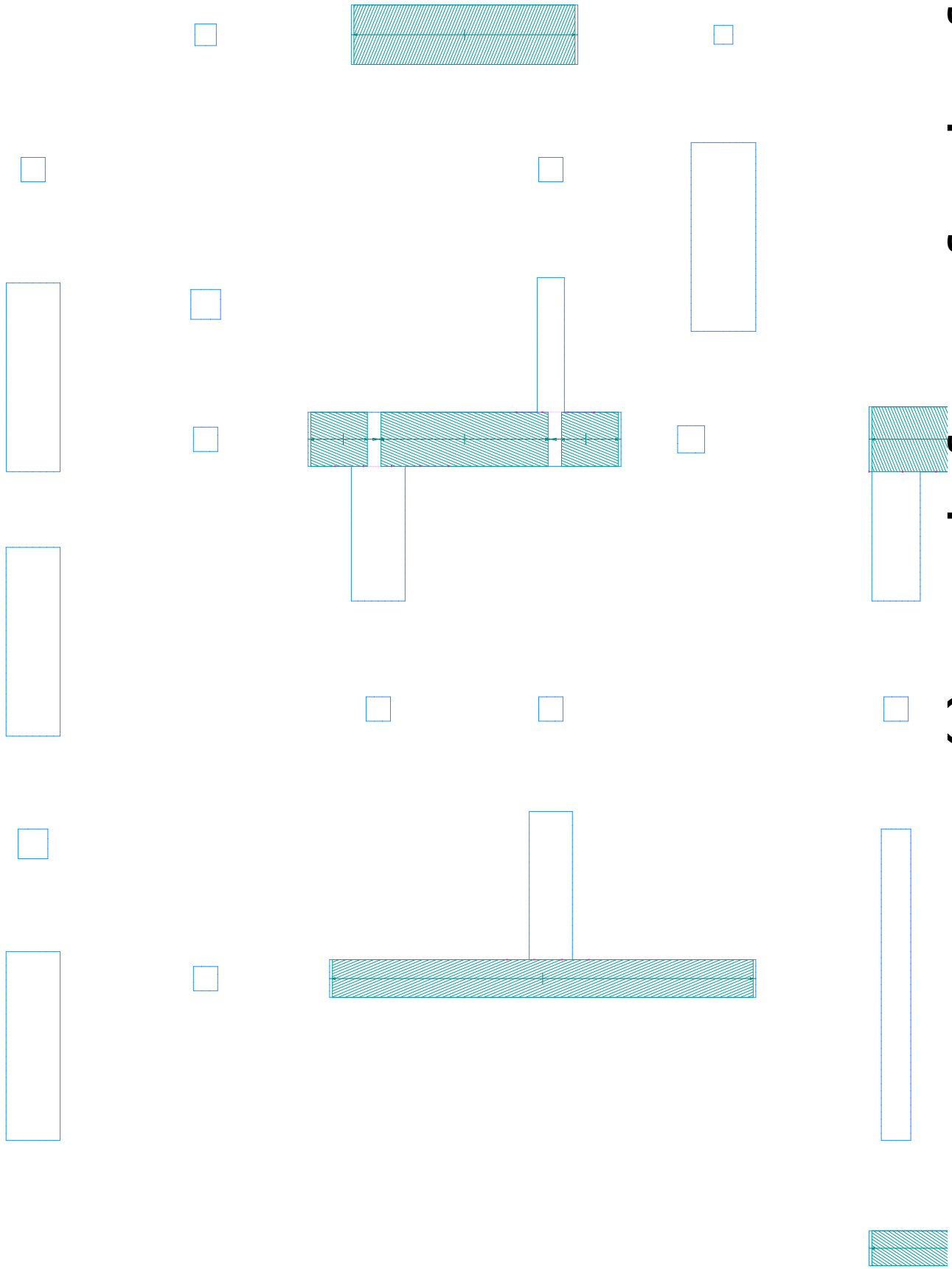


# Design Strip: Longitude Design Spans Plan

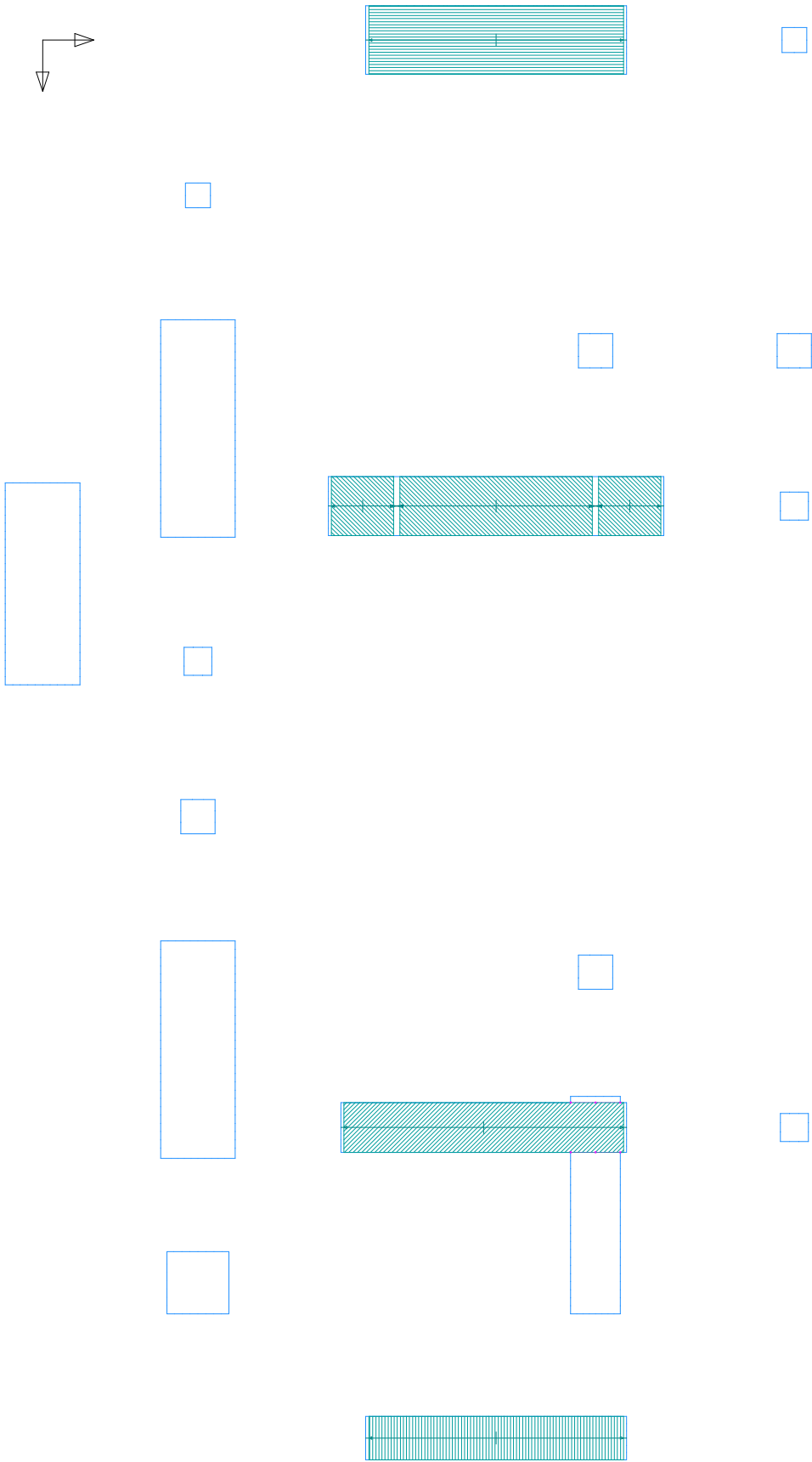
Design Strip: Longitude Span Boundaries: Longitudinal SSS, Longitudinal DBS; Longitudinal Strip Boundaries: Longitudinal SSSS, SSS Hatching, Longitudinal Definition Checks; User Notes; User Lines; User Dimensions;  
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;  
Scale = 1/315



# Design Strip: Longitude Design Spans Plan (2)



# Design Strip: Longitude Design Spans Plan (3)

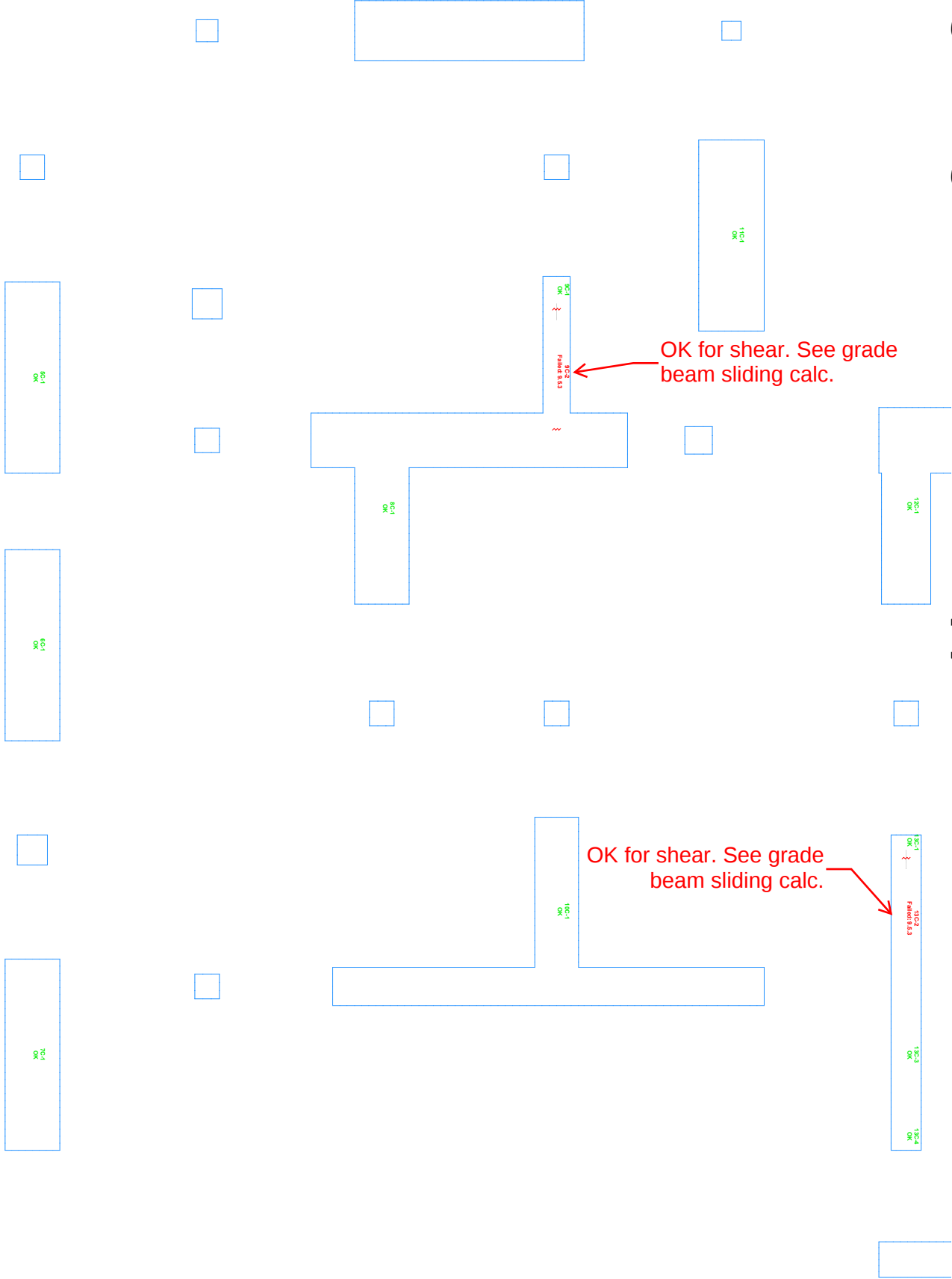


# Strength Design: Latitude Status Plan

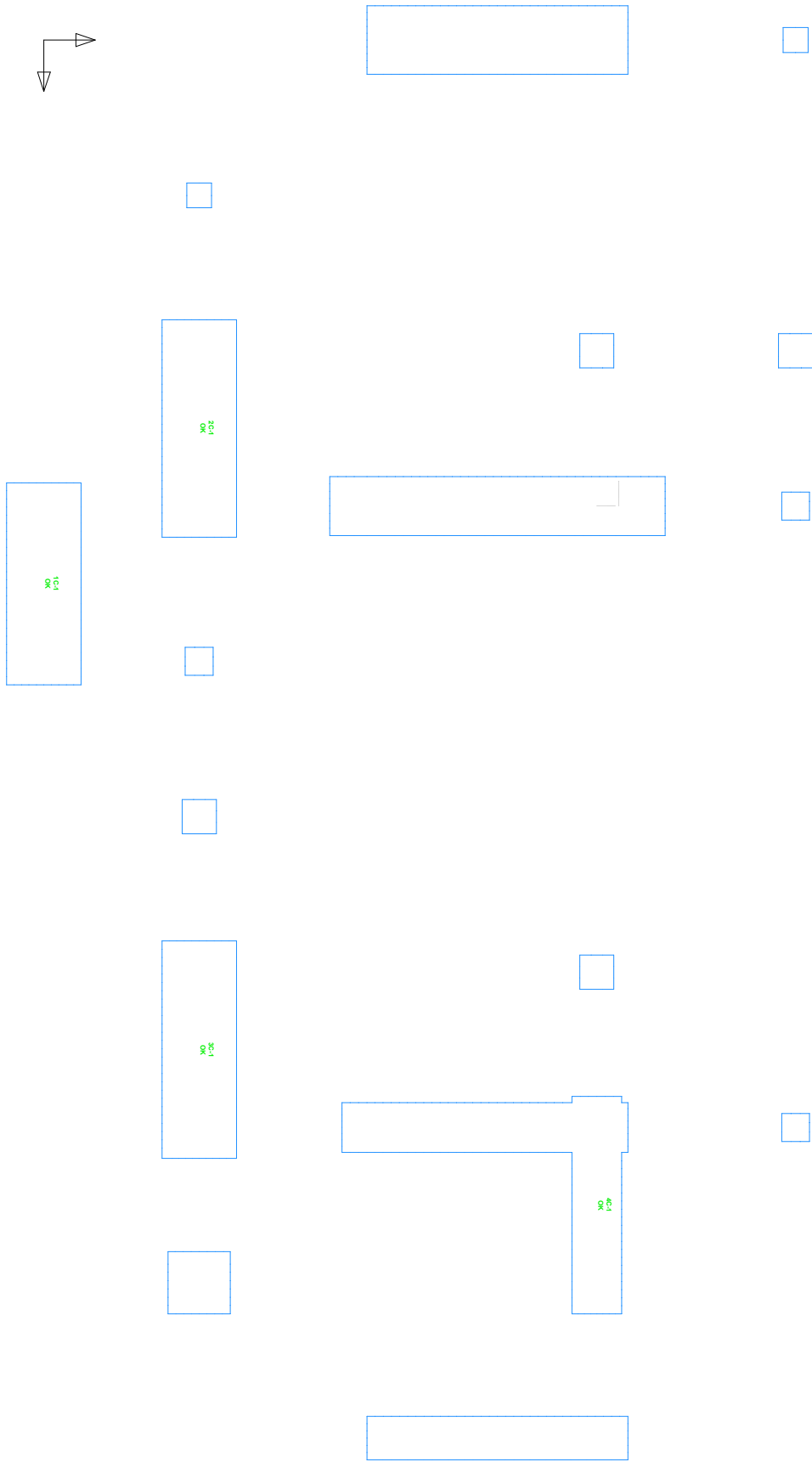
Strength Design User Lines; User Notes; User Dimensions; Span Design Number; Span Design Status; DS Design Numbers; DS Design Status; Element Wall Elements Below; Wall Element Outline Only; Column Elements Below; Column Elements Above; Sub Elements; Sub Element Outline Only; Scale = 1:315

South Hill 1015 Building Foundations - \_Current - Braced Frame Grade Beams.cpt - 12/9/2024

# Strength Design: Latitude Status Plan (2)

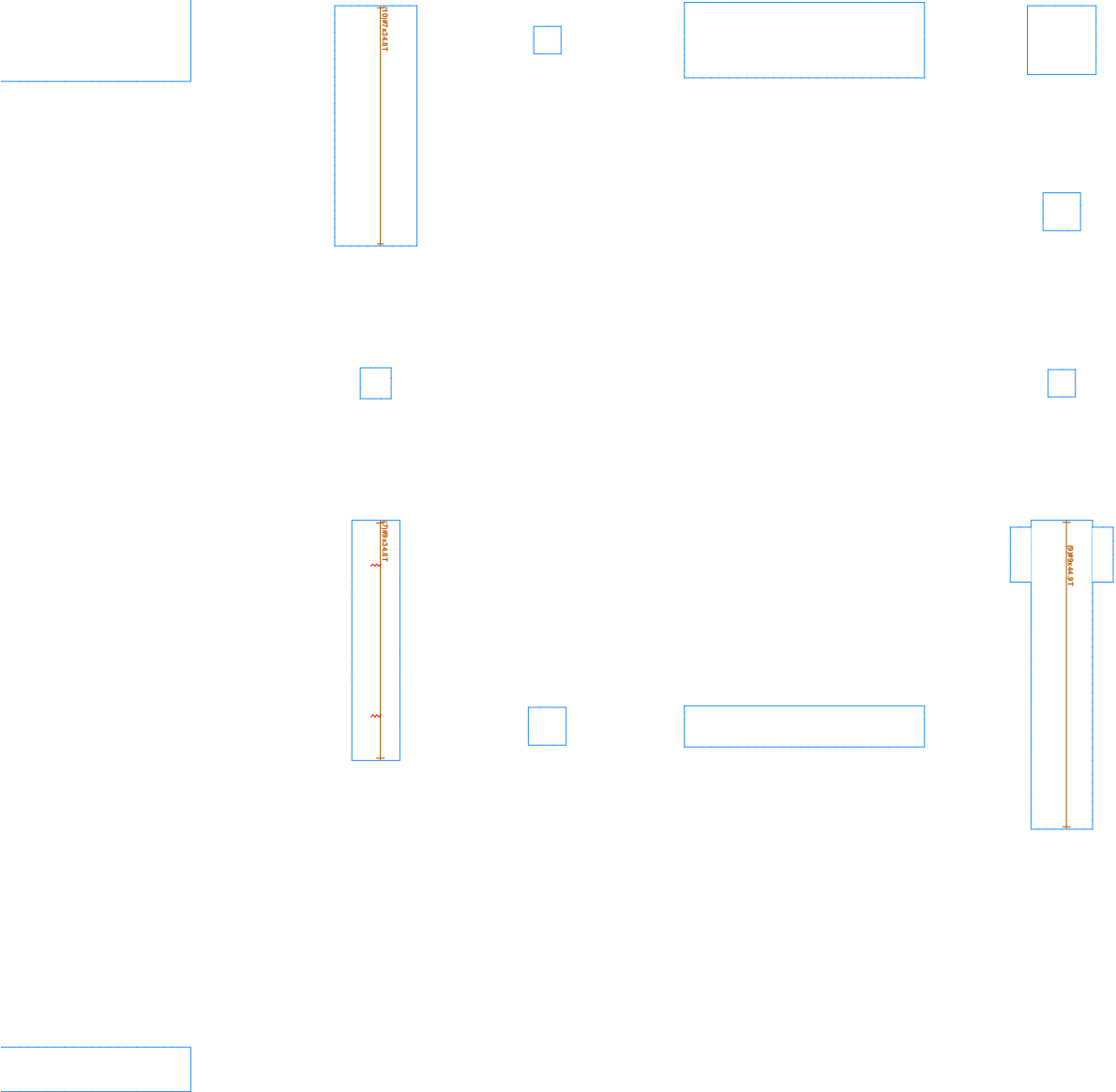


Strength Design: Latitude Status Plan (3)

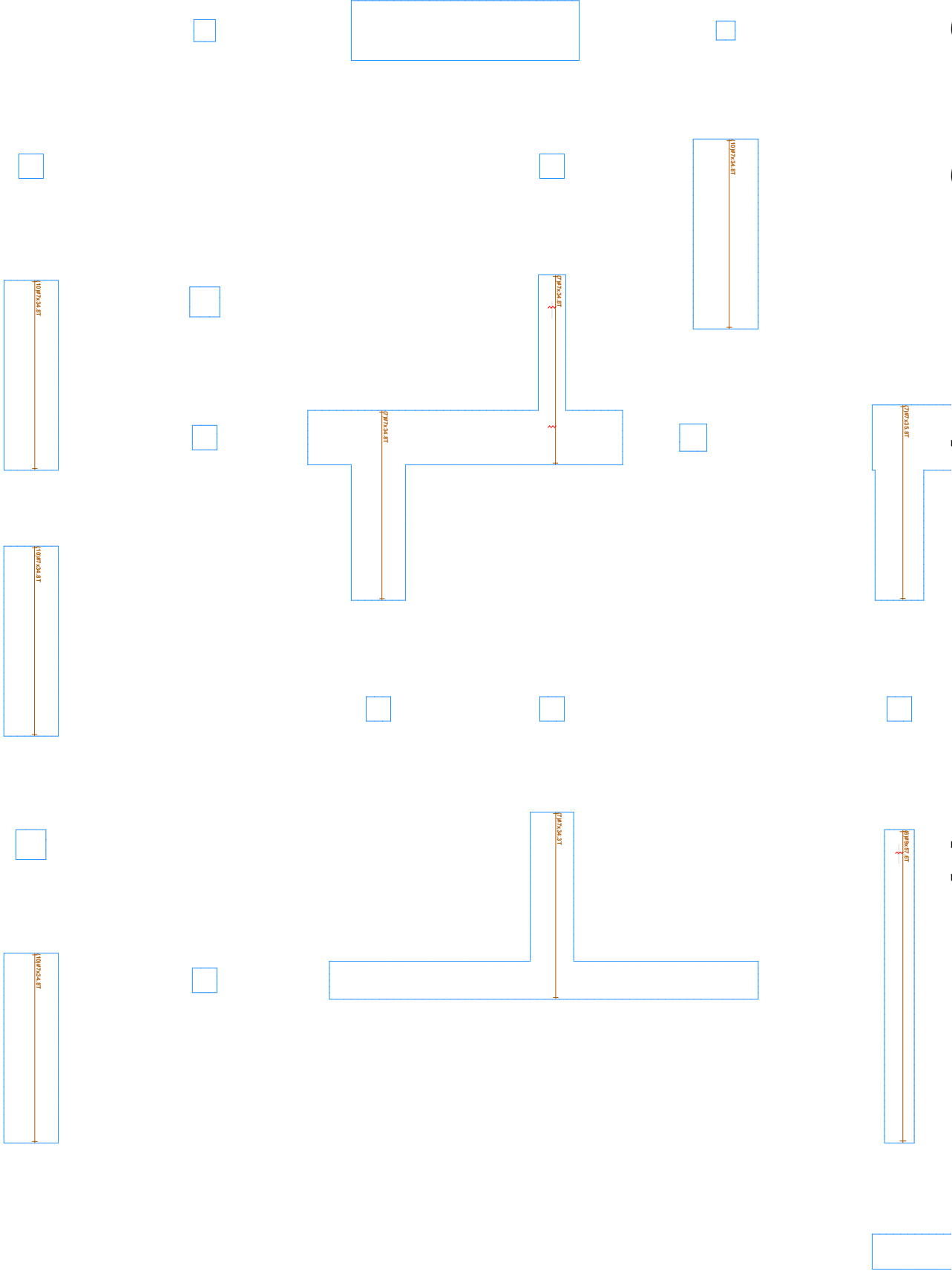


# Strength Design: Latitude Top Reinforcement Plan

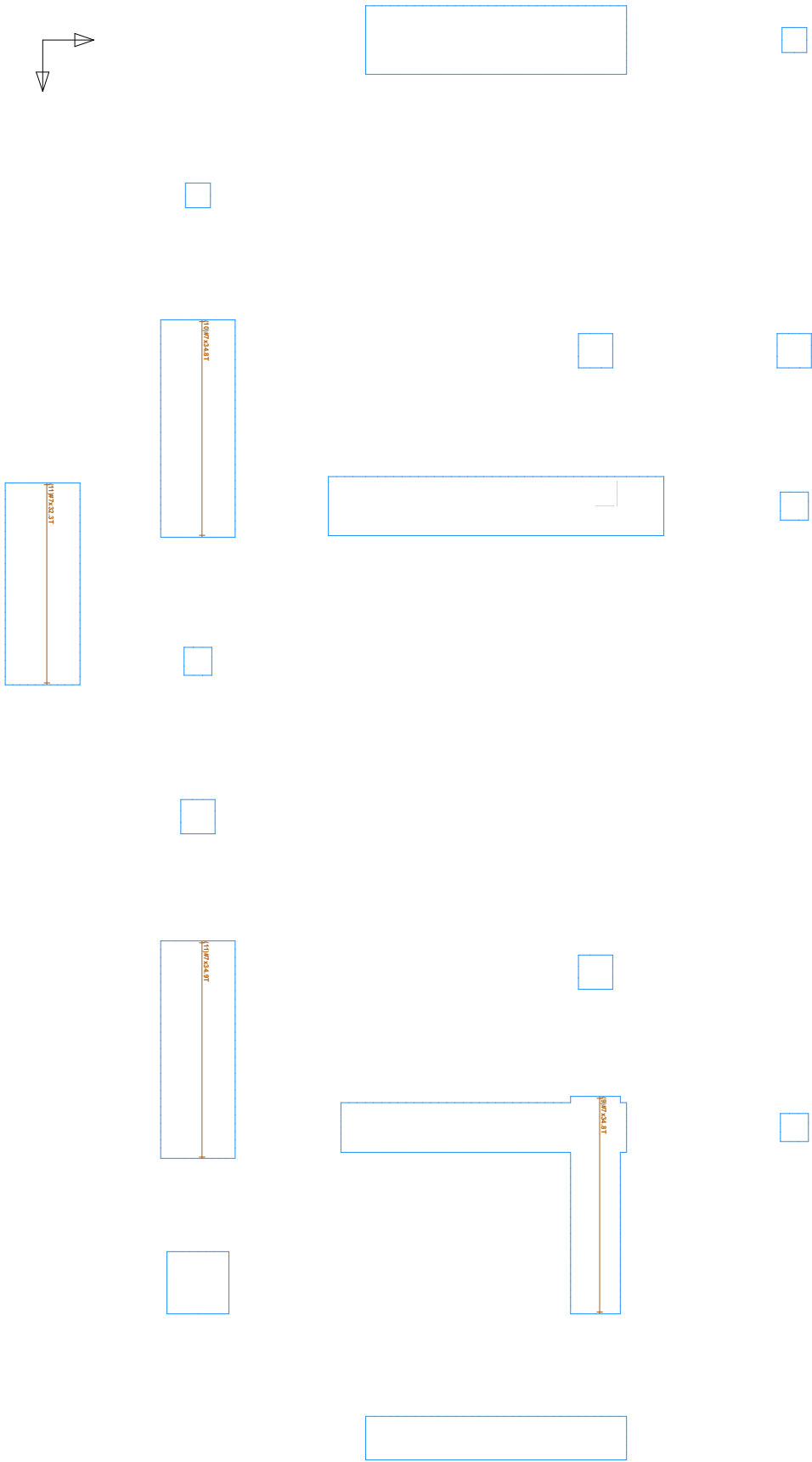
Strength Design: User Links, User Nodes, User Dimensions: Latitude Span Design: Span Design: Top Bars: Span Design: Bar Descriptions: Latitude DS Design: DS Design: Top Bars: Reinforcement: Top Face Concentrated Reinf.: Both Face Concentrated Reinf.: Auto Face Concentrated Reinf.: Concentrated Reinf. Descriptions: Top Face Distributed Reinf.: Both Face Distributed Reinf.: Auto Face Distributed Reinf.: Distributed Reinf. Descriptions: Latitude User Concentrated Reinf.: Latitude User Distributed Reinf.: Scale = 1/315



# Strength Design: Latitude Top Reinforcement Plan (2)

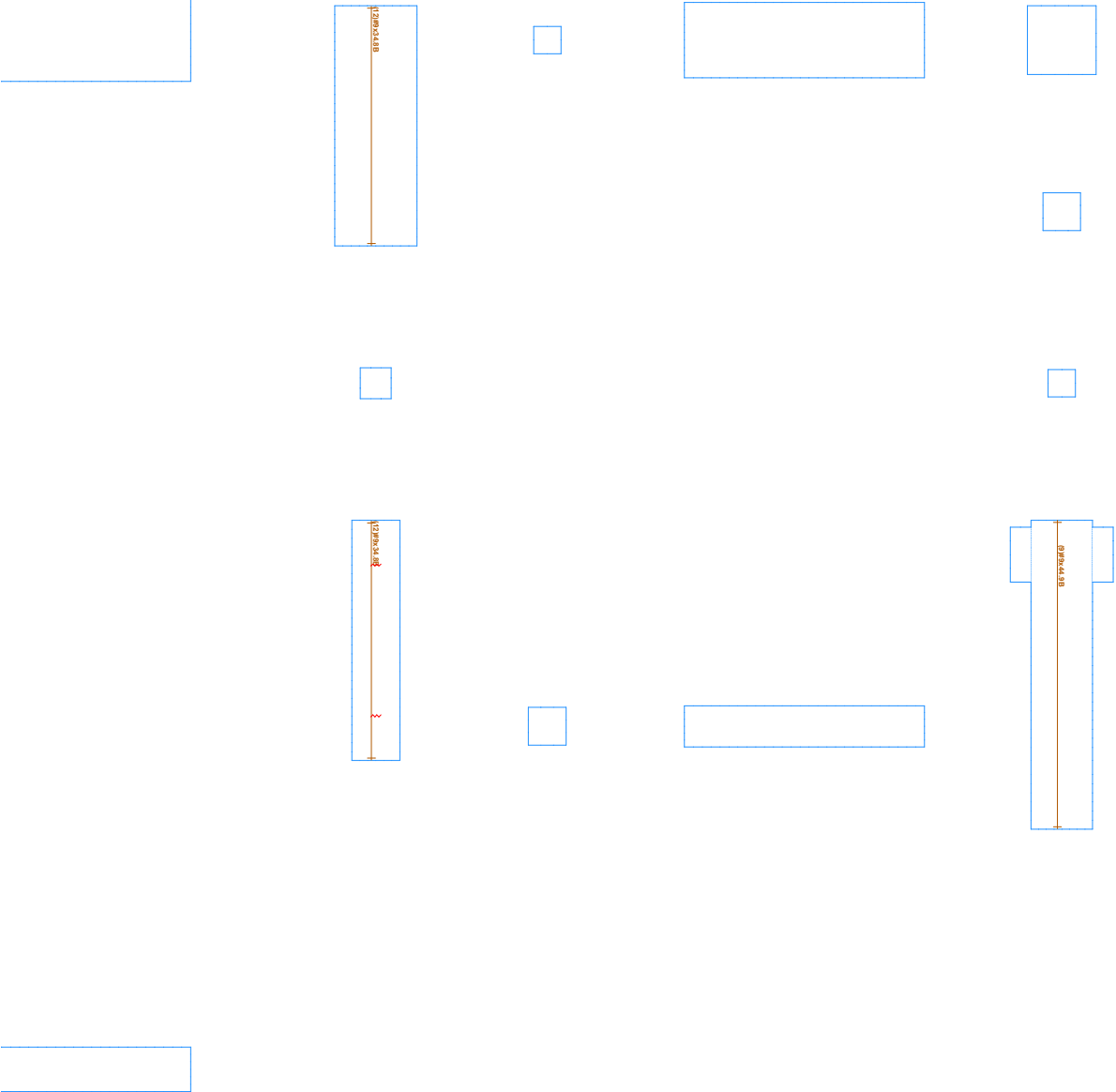


**Strength Design: Latitude Top Reinforcement Plan (3)**

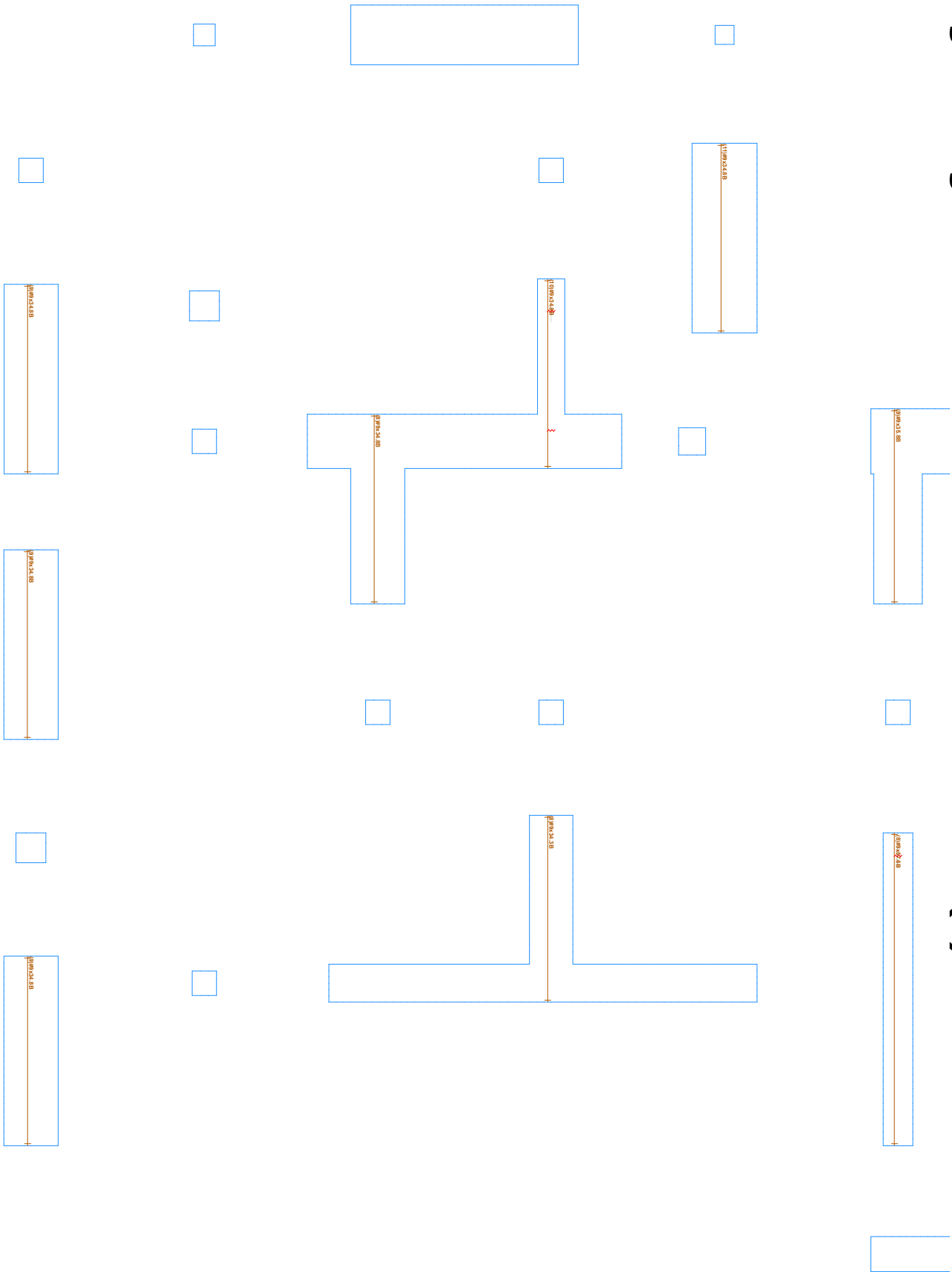


Strength Design: Latitude Bottom Reinforcement Plan

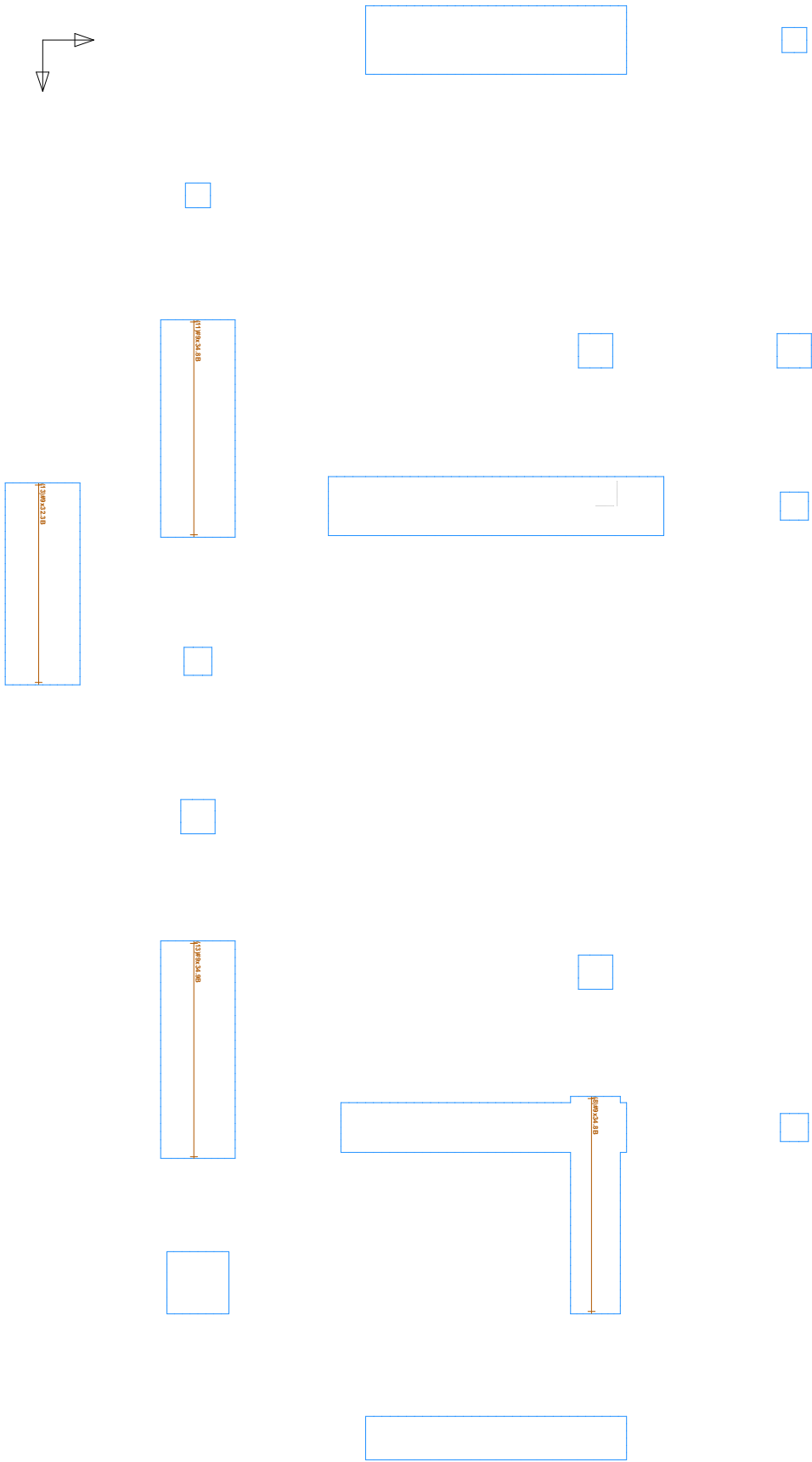
Strength Design: User Name: User Name, User Description: Latitude Span Design: Span Design Bar Description: Latitude DB Design: DB Design Bottom Bar: Reinforcement: Bottom Face Concentrated Reinf.: Both Face Concentrated Reinf.: Auto Face Concentrated Reinf.: Concentrated Reinf. Description: Bottom Face Distributed Reinf.: Both Face Distributed Reinf.: Auto Face Distributed Reinf.: Distributed Reinf. Description: Latitude User Concentrated Reinf.: Latitude User Distributed Reinf.: Scale = 1/315



Strength Design: Latitude Bottom Reinforcement Plan (2)



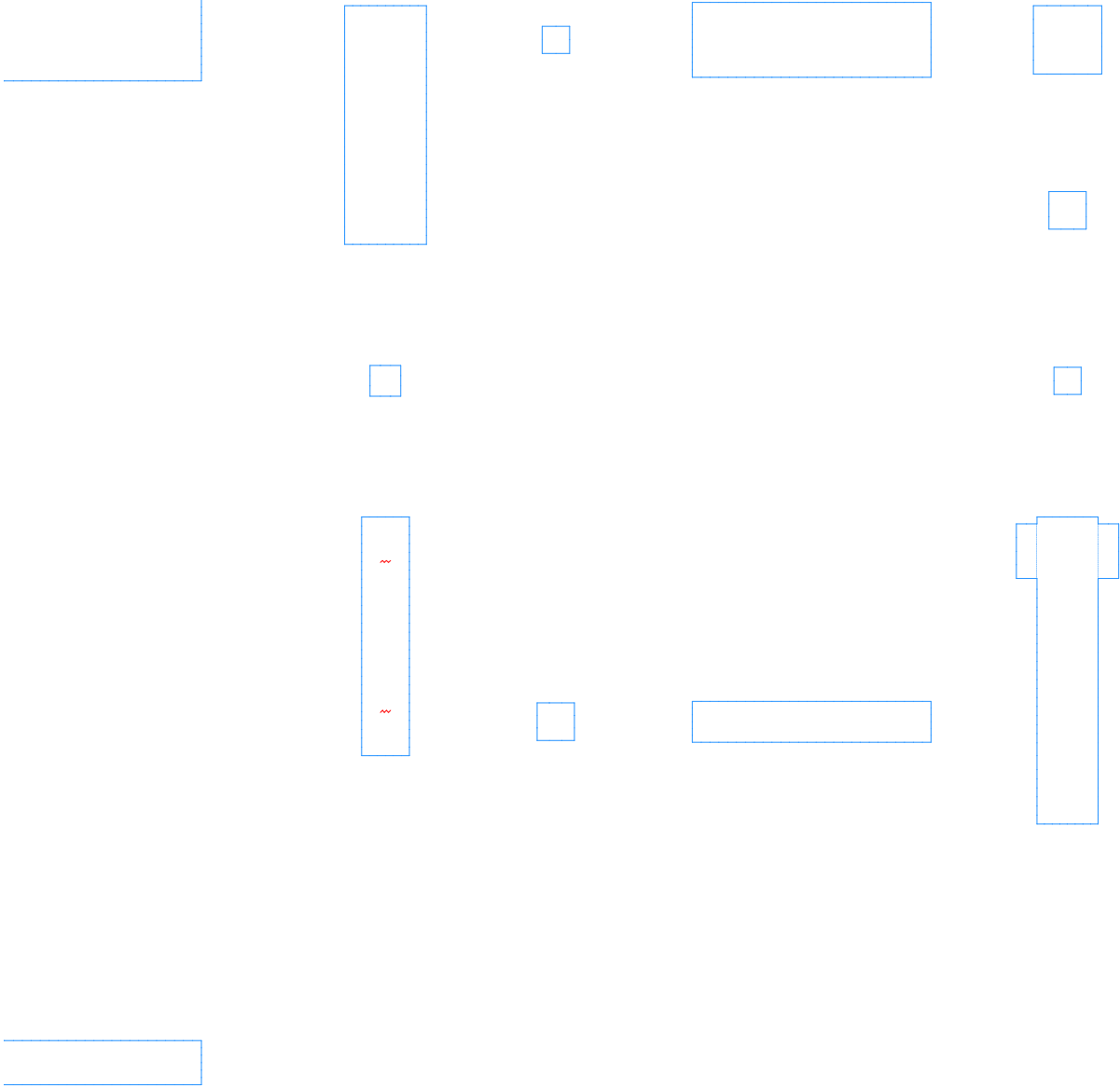
**Strength Design: Latitude Bottom Reinforcement Plan (3)**



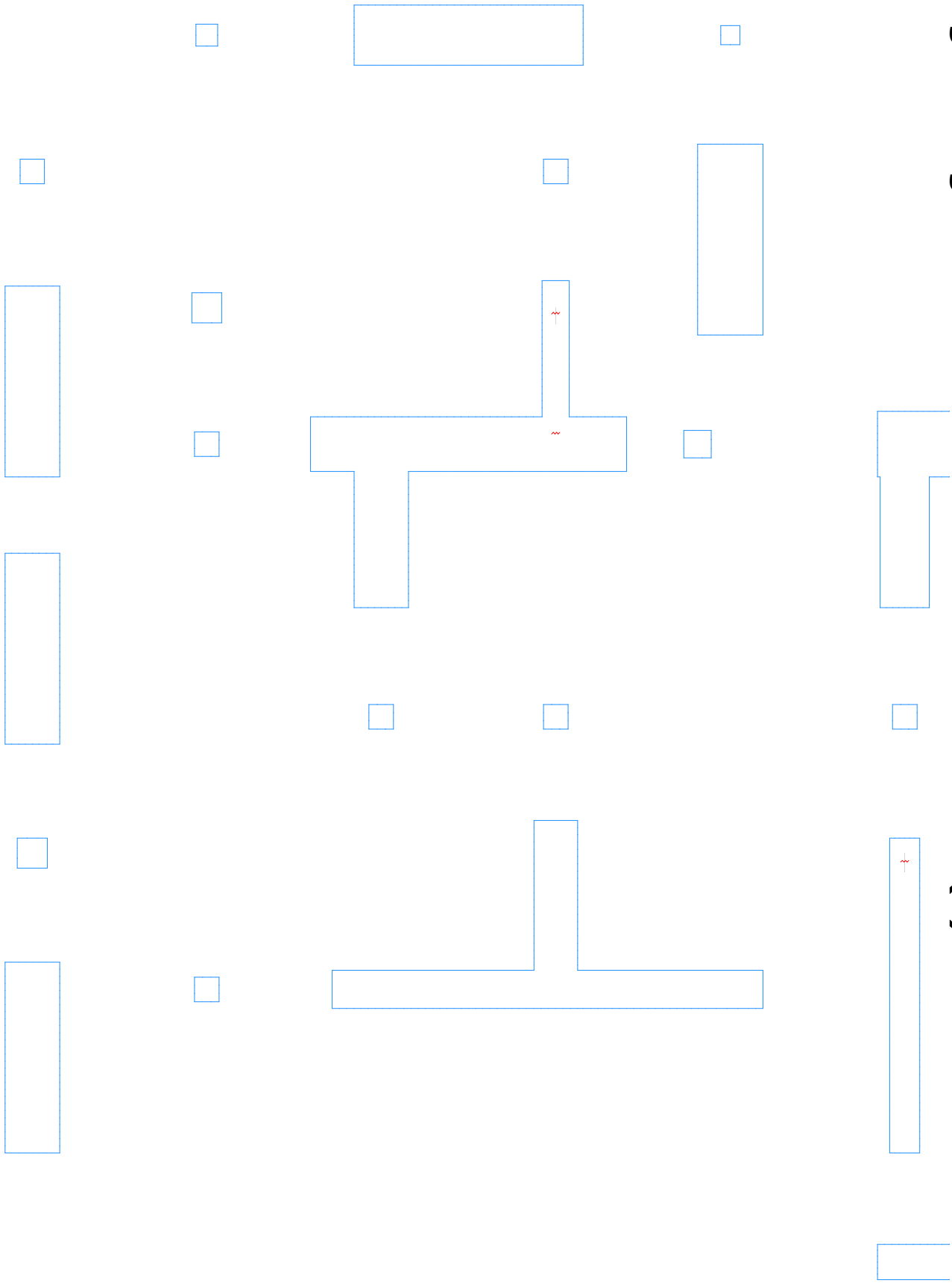
Strength Design: Latitude Shear Reinforcement Plan

Strength Design: User Links, User Notes, User Dimensions; Latitude Span Design: Span Design Shear Bars, Span Design Bar Descriptions; Latitude DS Design: DS Design Numbers, DS Design Shear Bars; DS Design Elements Show: Wall Elements Above, Wall Element Outline Only, Column Elements Show, Column Elements Above, DS Elements, DS Element Outline Only.

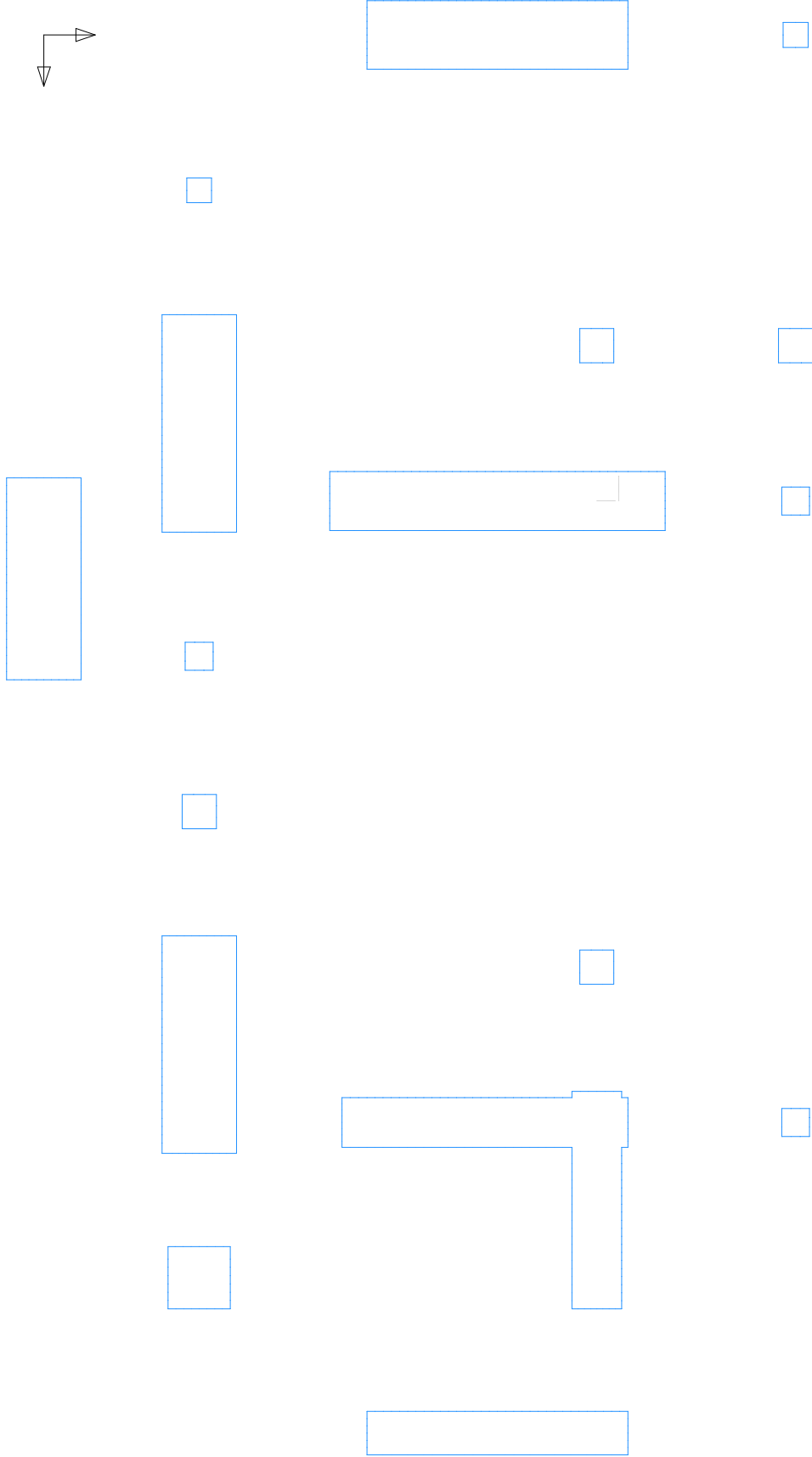
Scale = 1/32



**Strength Design: Latitude Shear Reinforcement Plan (2)**

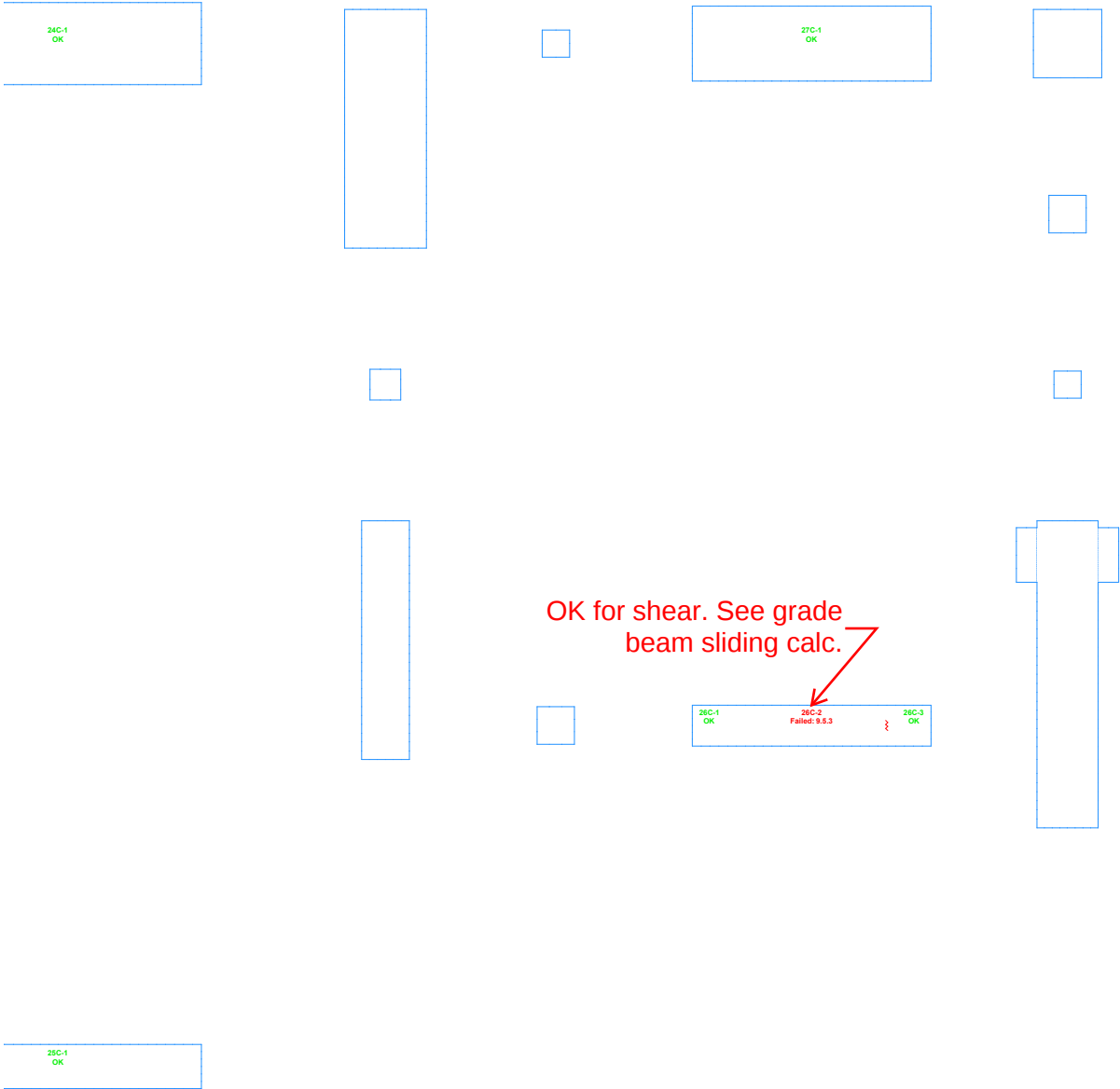


**Strength Design: Latitude Shear Reinforcement Plan (3)**

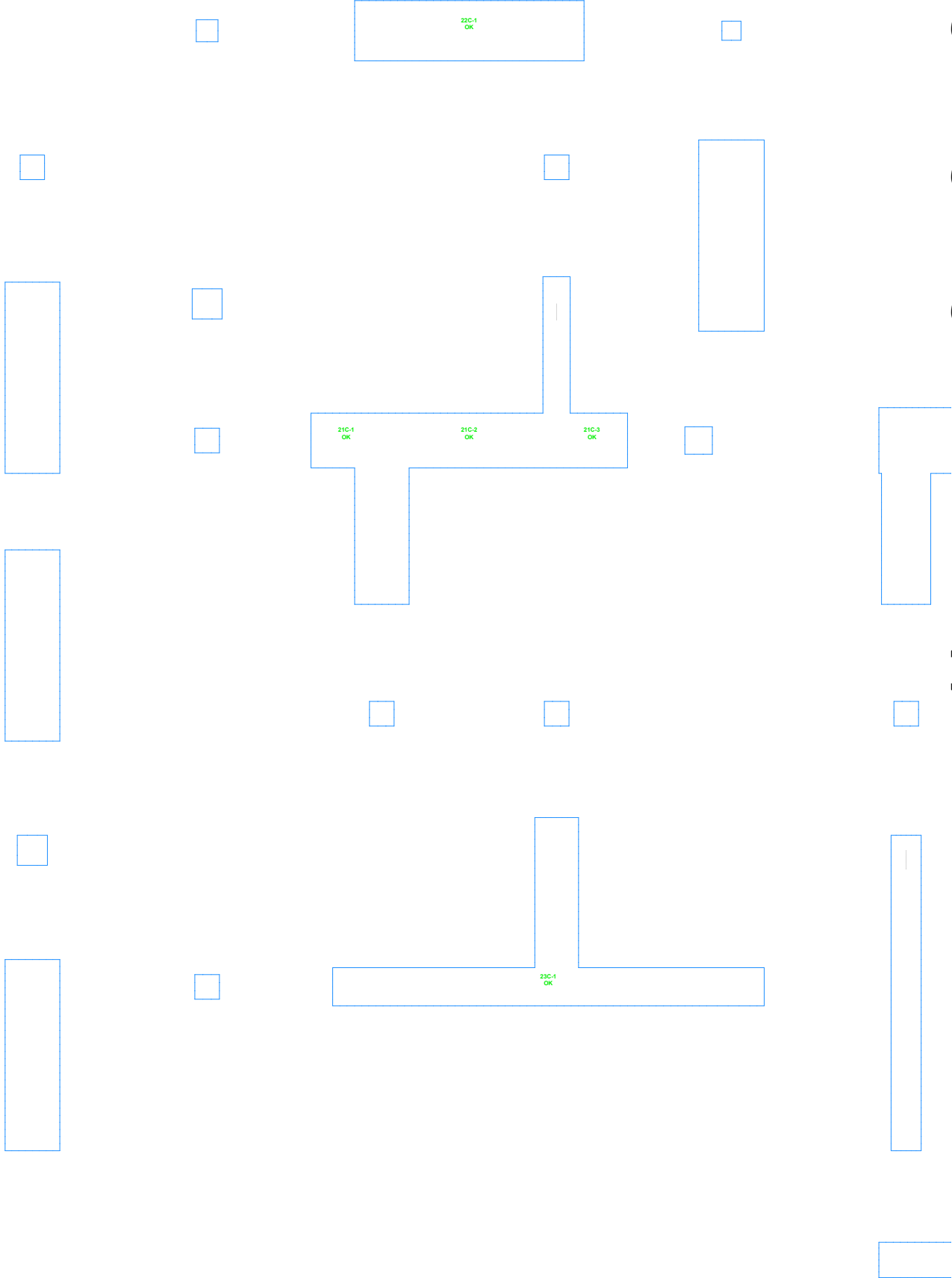


# Strength Design: Longitude Status Plan

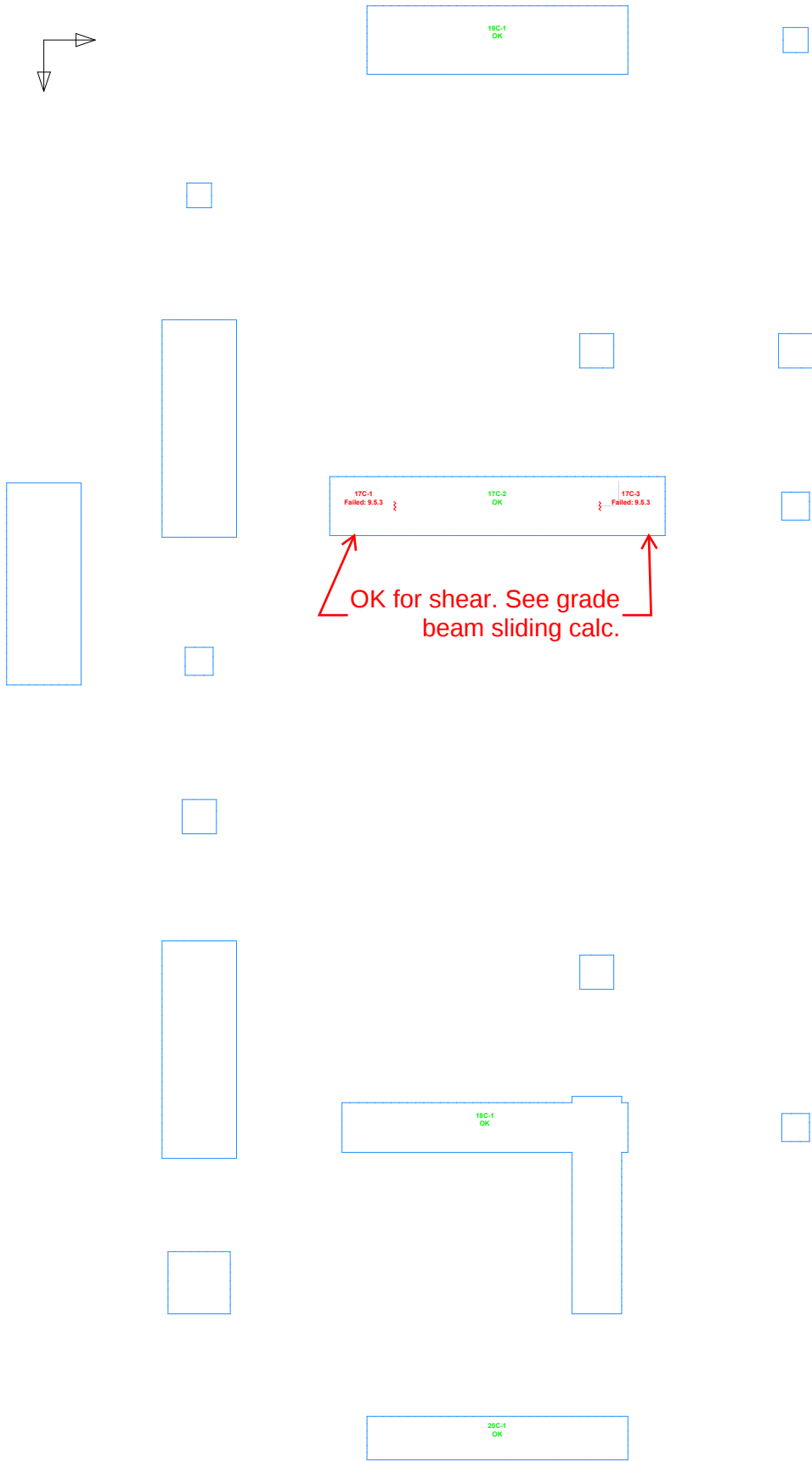
Strength Design: Use Link, Use Node, Use Dimension, Longitud Span Design, Span Design Number, Span Design Status, Longitud DS Design, DS Design Number, DS Design Status, Scale = 1/315



Strength Design: Longitude Status Plan (2)

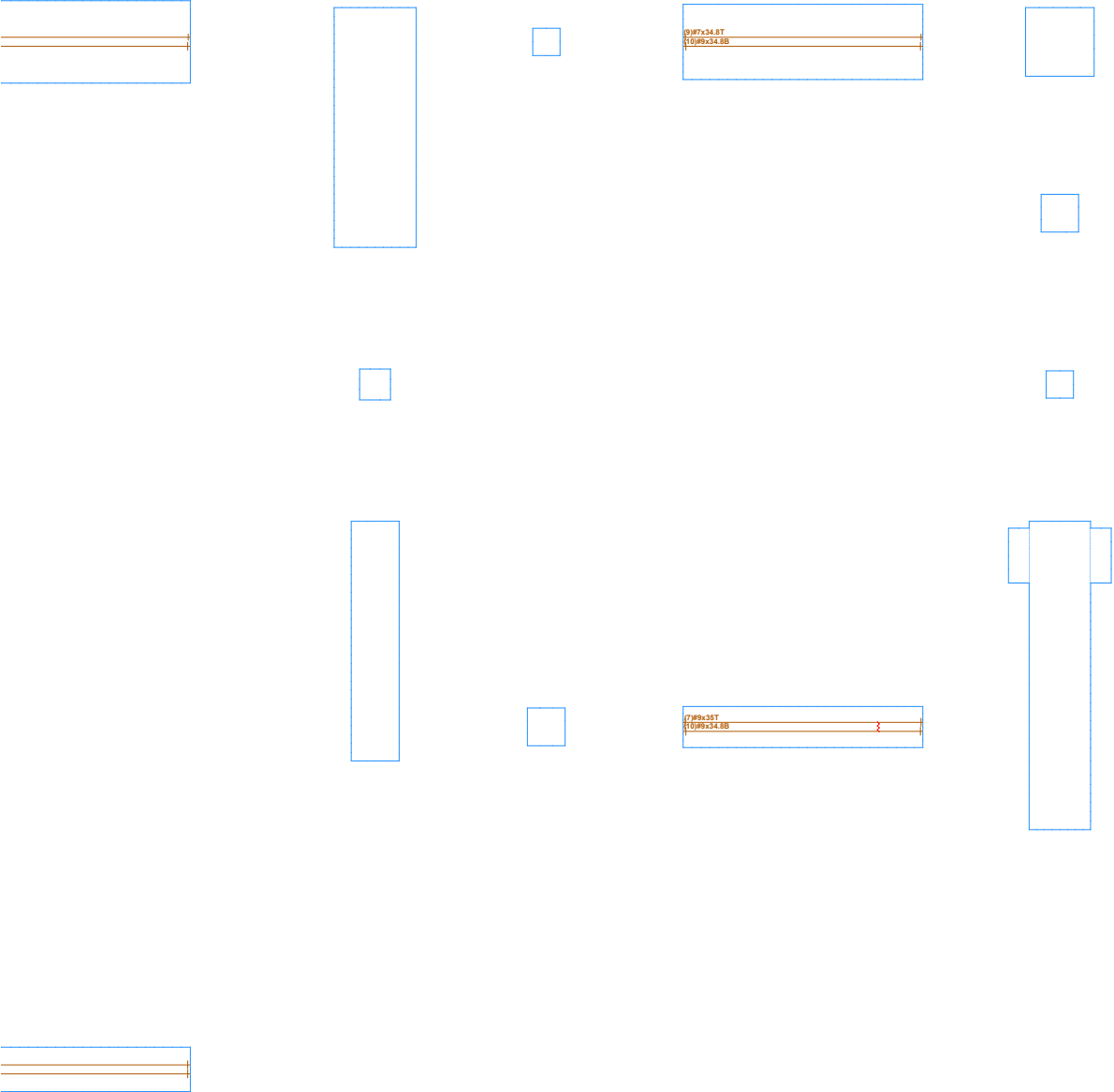


Strength Design: Longitude Status Plan (3)

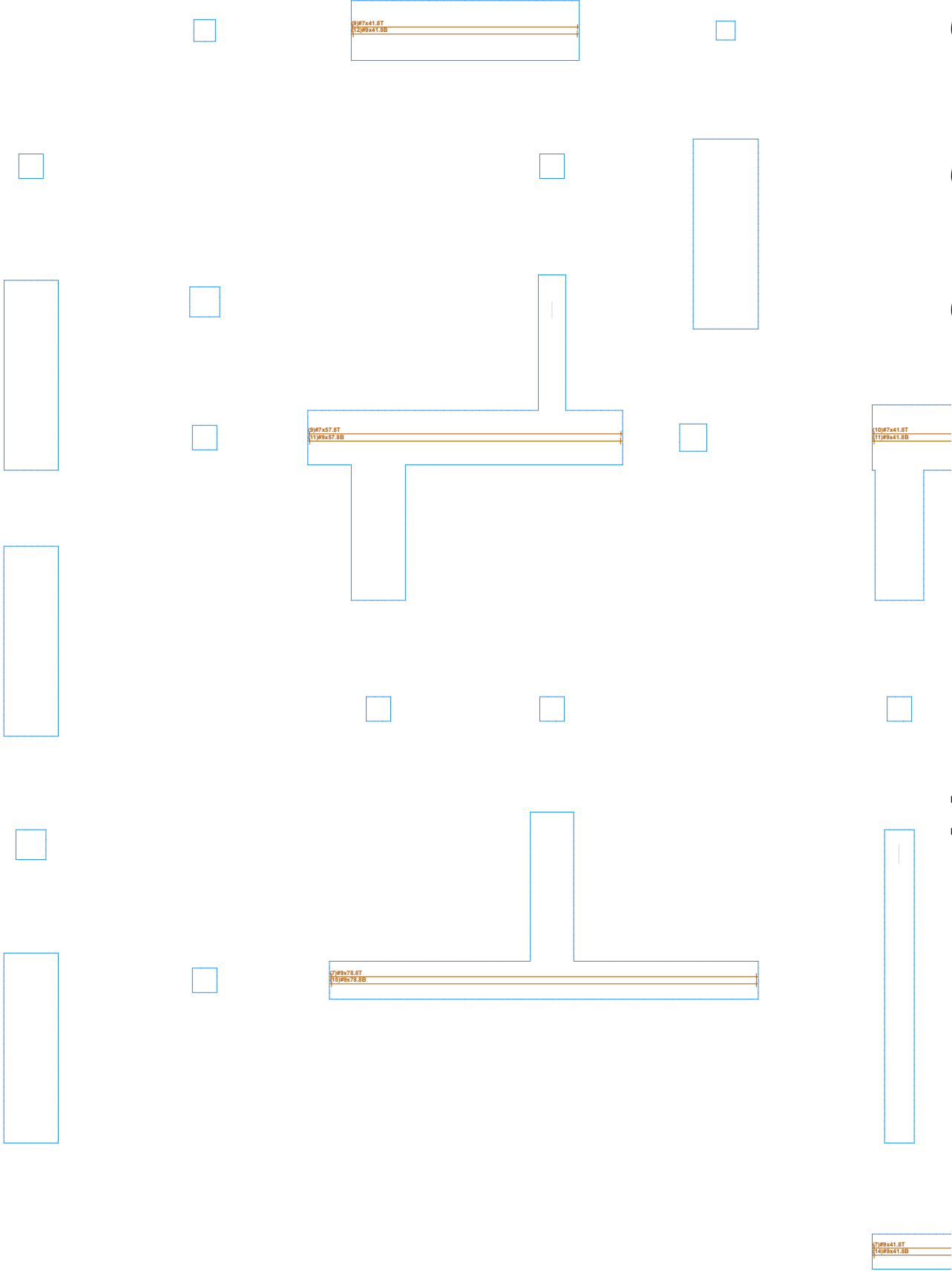


# Strength Design: Longitude Reinforcement Plan

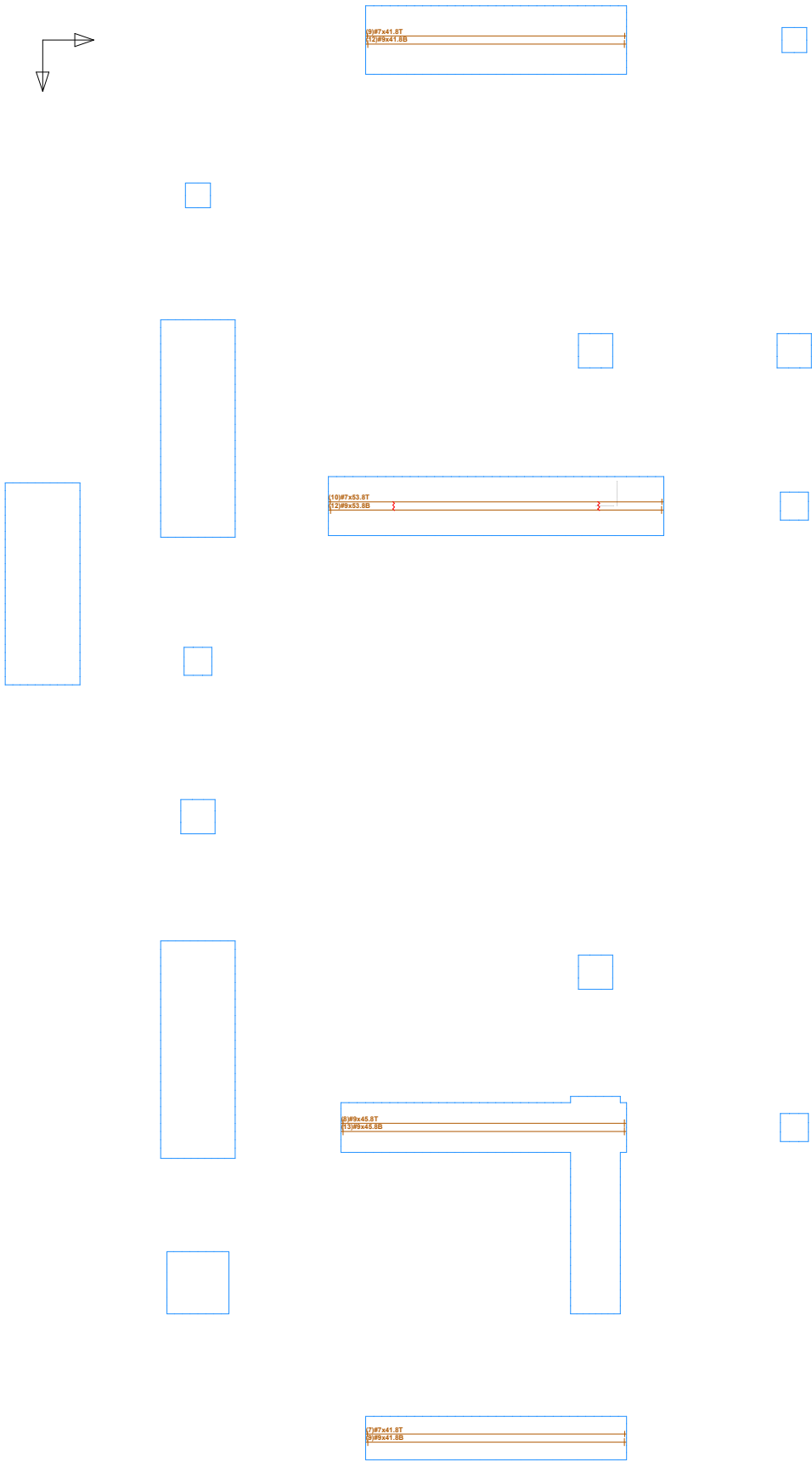
Strength Design: User Links, User Nodes, User Dimensions; Longitude Span Design: Span Design Top Bars, Span Design Section Bars, Span Design Shear Bars, Span Design Bar Descriptions, Longitude OS Design OS Design Top Bars, OS Design Bottom Bars, OS Design Shear Bars; Reinforcement: Top Face Concentrated Reinf, Bottom Face Concentrated Reinf, Both Face Concentrated Reinf, Auto Face Concentrated Reinf; Concentrated Reinf Descriptions: Top Face Distributed Reinf, Bottom Face Distributed Reinf, Both Face Distributed Reinf, Auto Face Distributed Reinf; Distributed Reinf Descriptions: Longitude User Concentrated Reinf; Longitude User Distributed Reinf; Scale = 1:215



Strength Design: Longitude Reinforcement Plan (2)

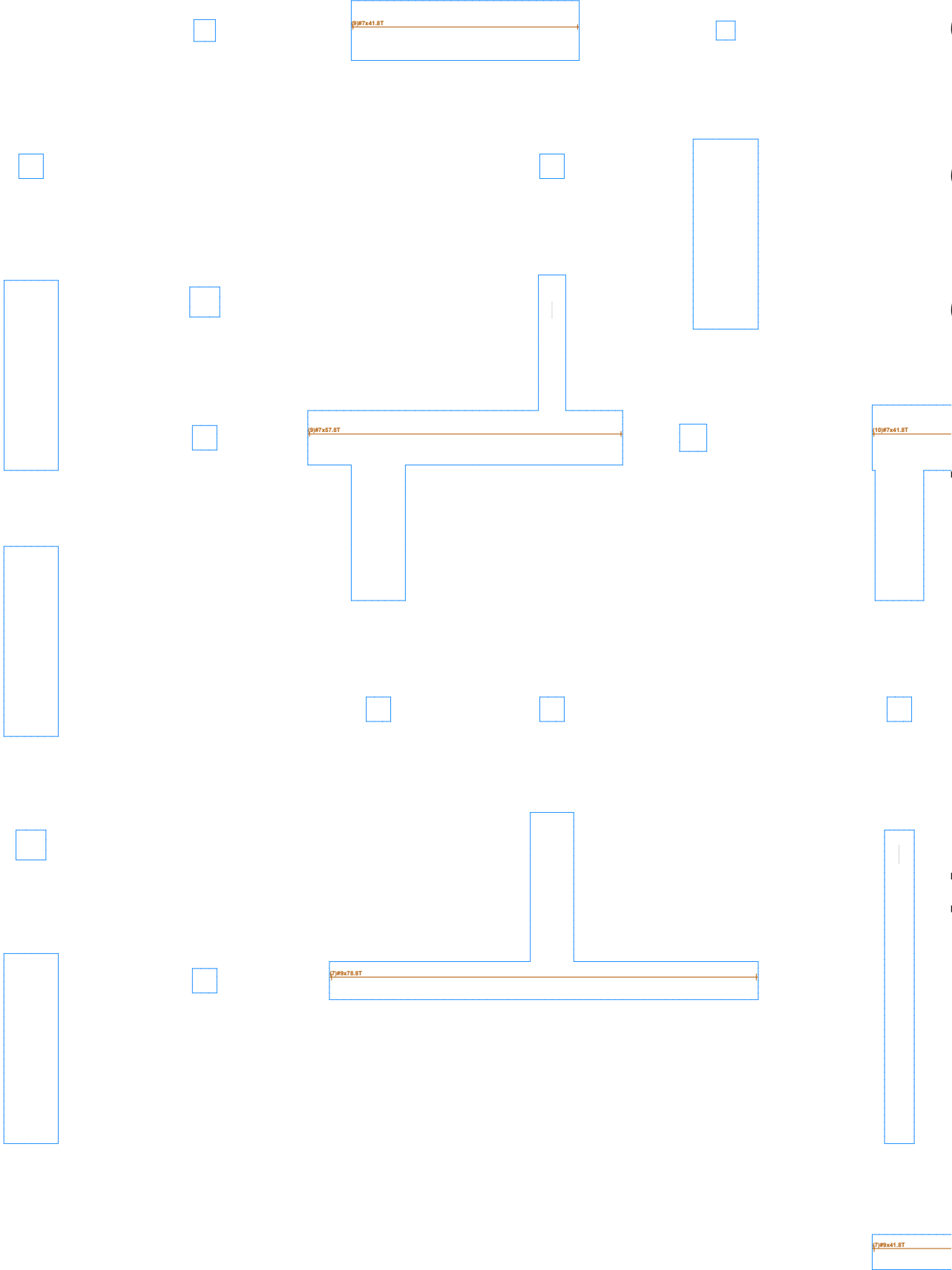


Strength Design: Longitude Reinforcement Plan (3)

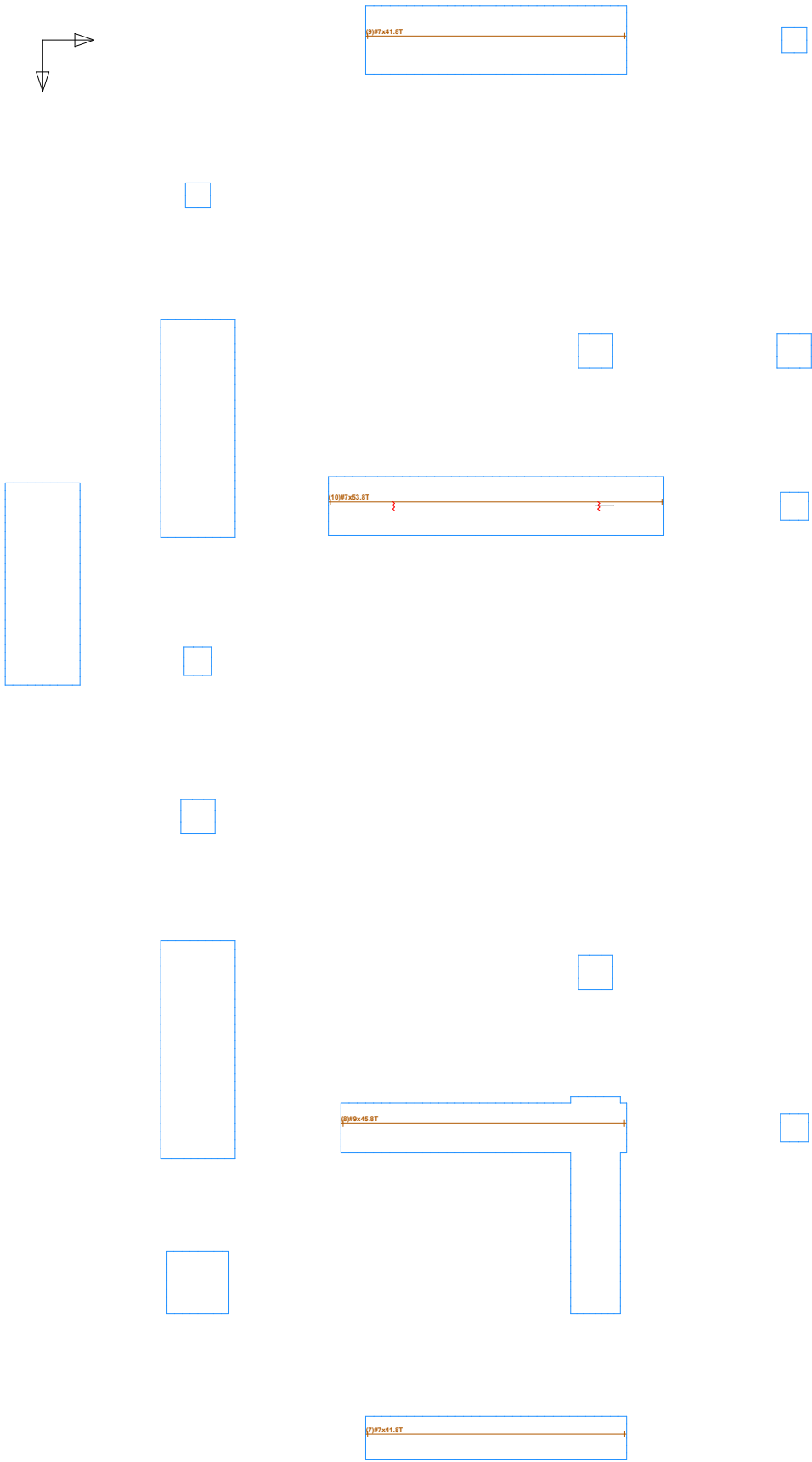




Strength Design: Longitude Top Reinforcement Plan (2)

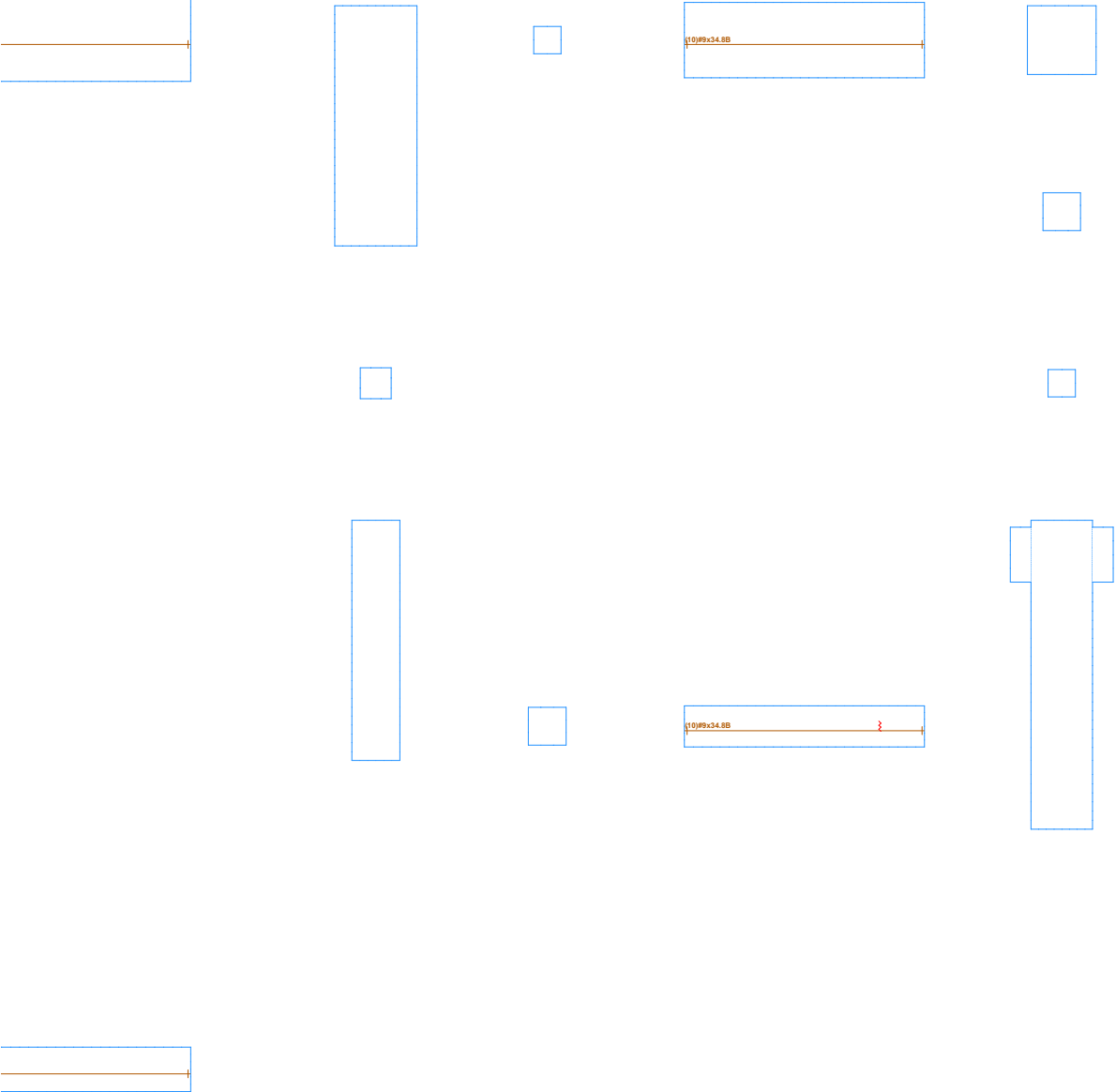


# Strength Design: Longitude Top Reinforcement Plan (3)

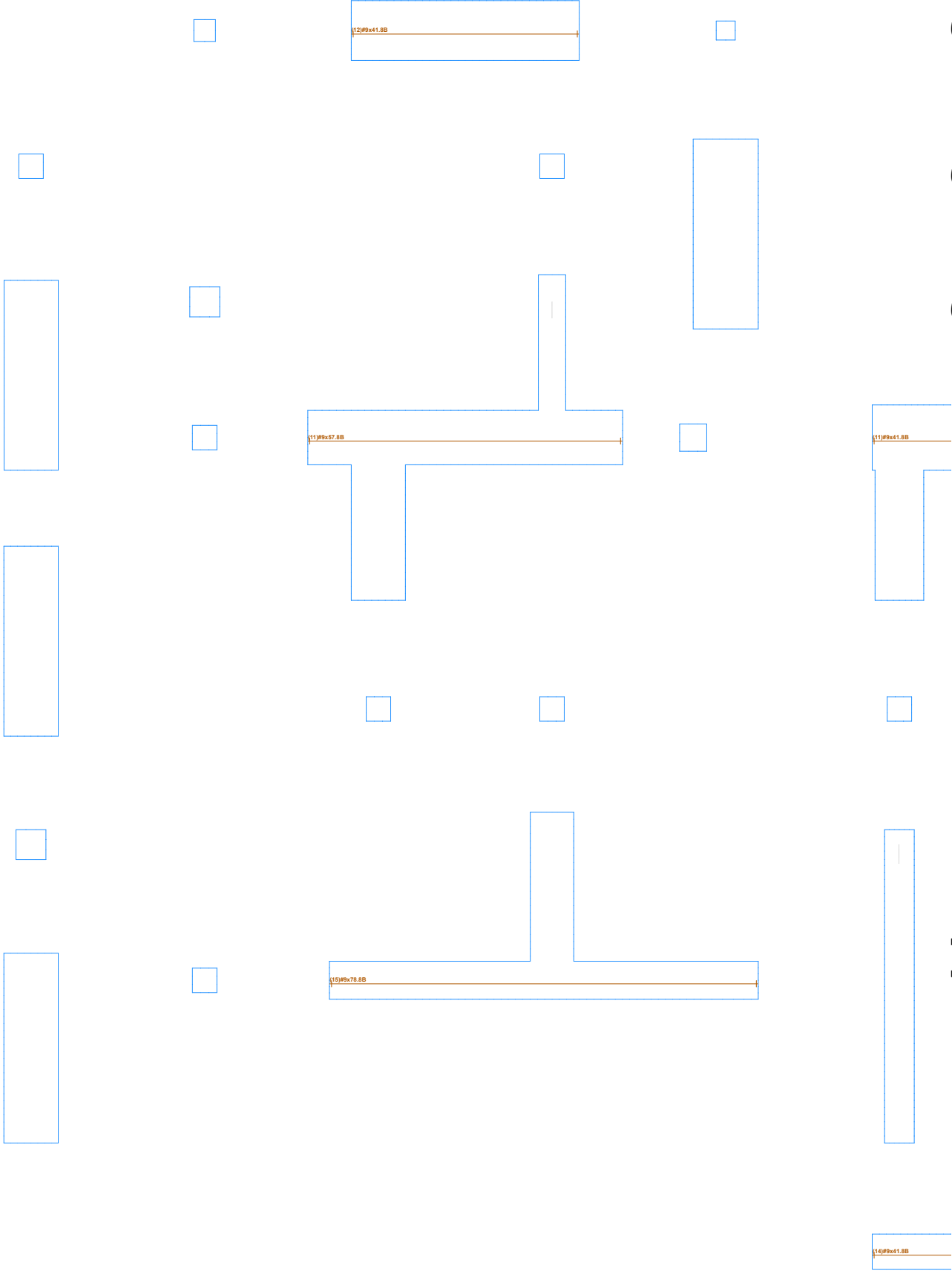


# Strength Design: Longitude Bottom Reinforcement Plan

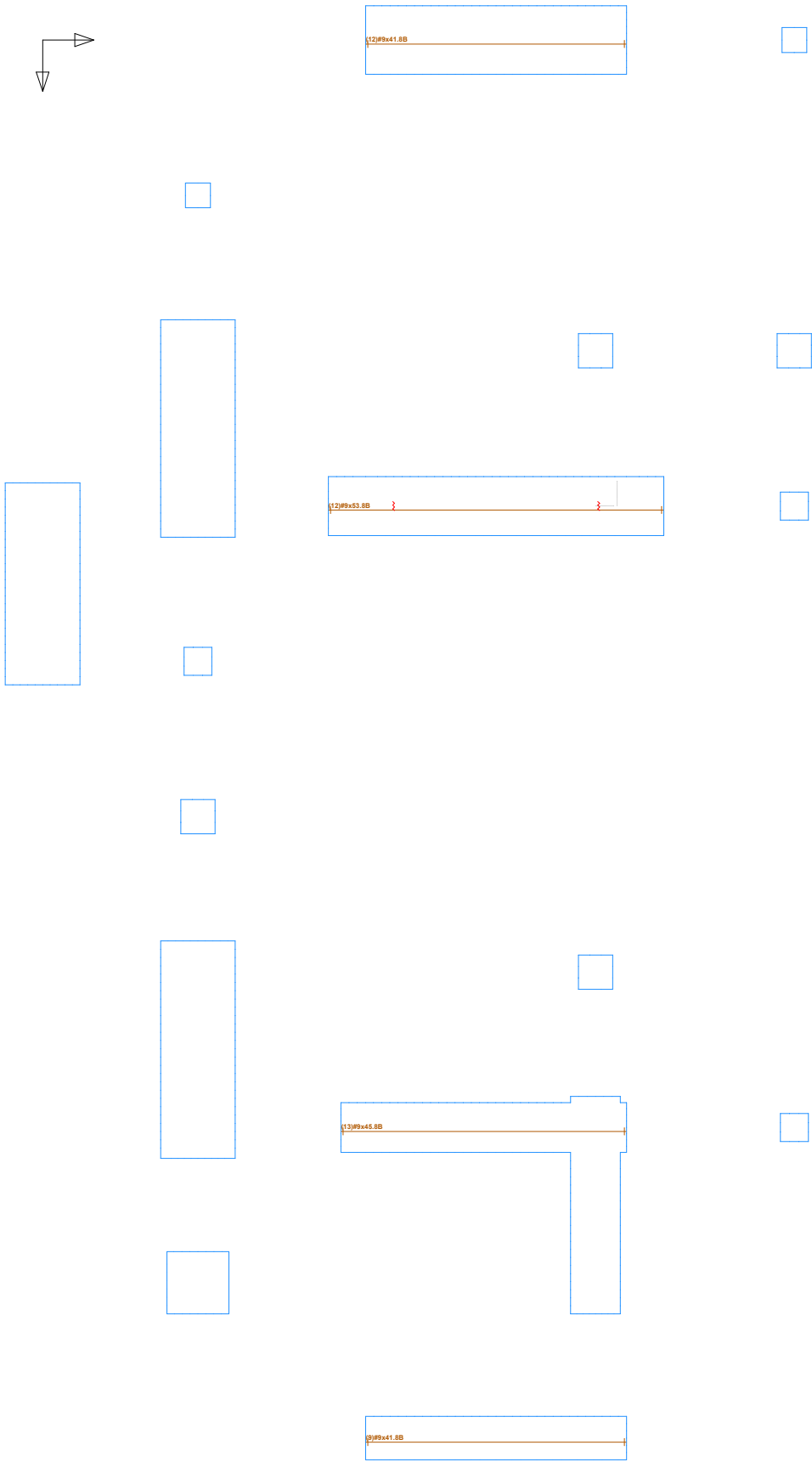
Strength Design: User Name, User Notes, User Dimensions, Longitude Span Design, Span Design Bottom Bar, Span Design Bar Description, Longitude DS Design, DS Design Bottom Bar, Reinforcement Bottom Face Concentrated Reinf, Both Face Concentrated Reinf, Auto Face Concentrated Reinf, Concentrated Reinf Description, Bottom Face Distributed Reinf, Both Face Distributed Reinf, Auto Face Distributed Reinf, Distributed Reinf Description, Longitude User Concentrated Reinf, Longitude User Distributed Reinf, Scale = 1/315



# Strength Design: Longitude Bottom Reinforcement Plan (2)

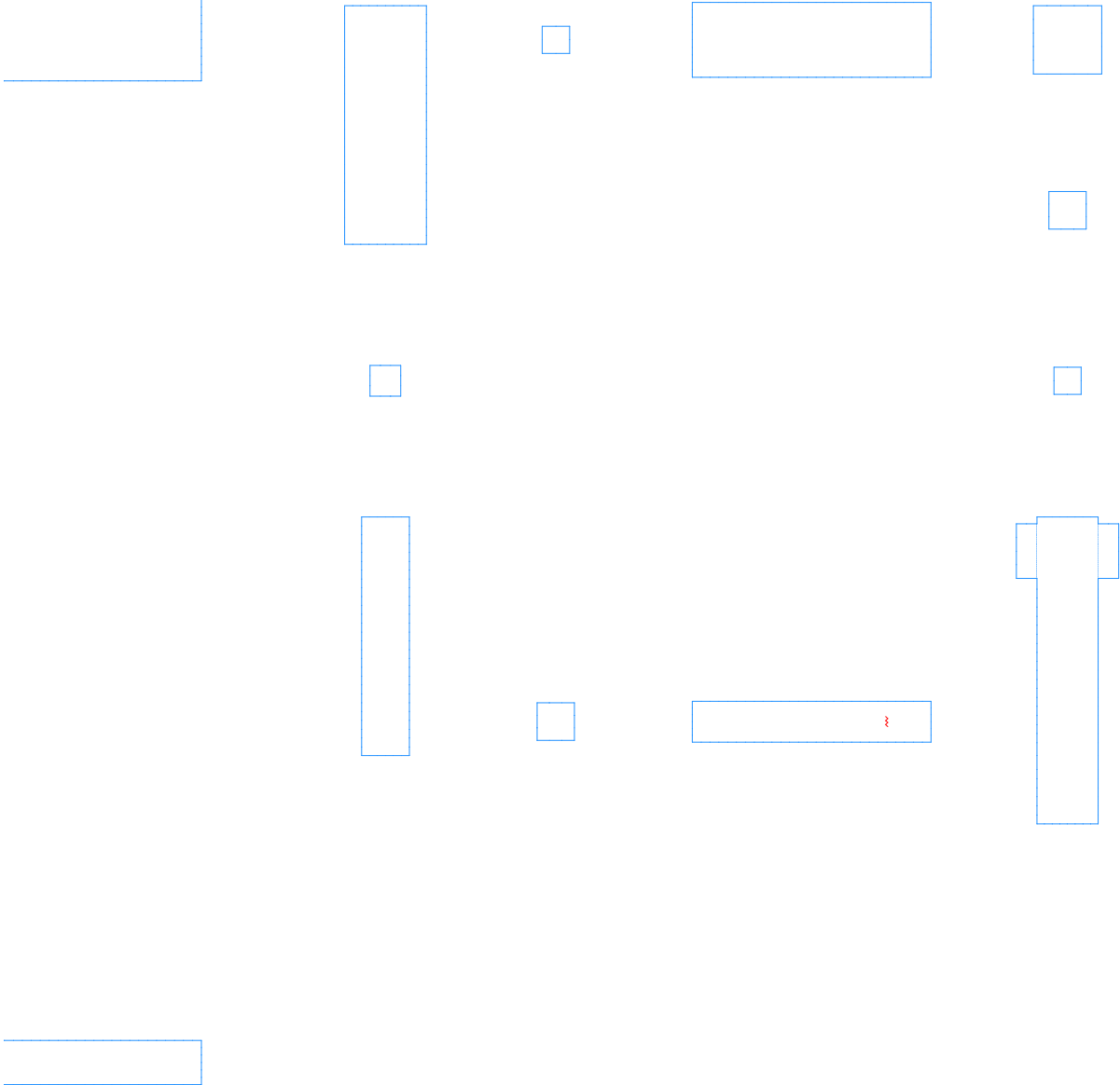


**Strength Design: Longitude Bottom Reinforcement Plan (3)**

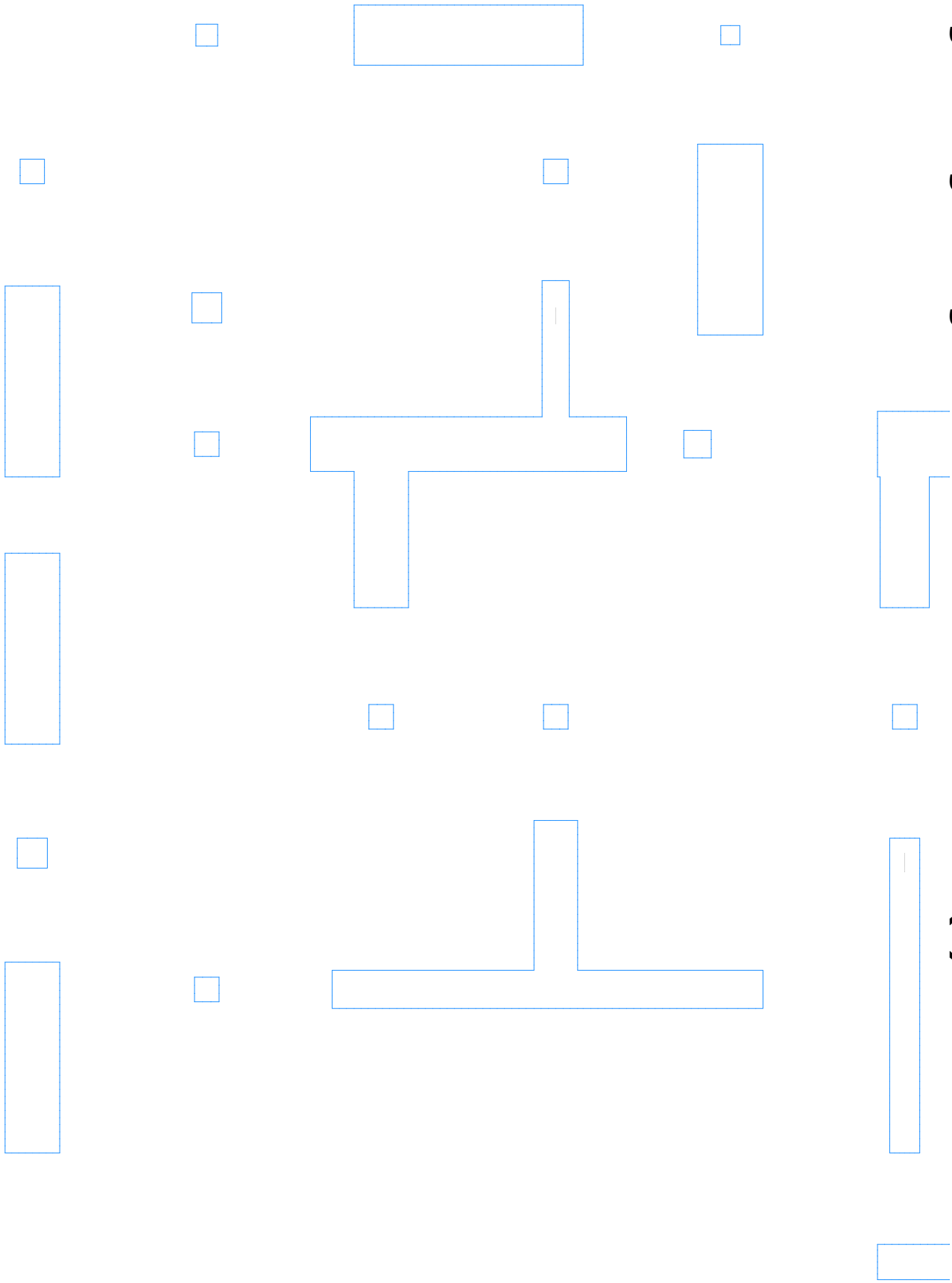


# Strength Design: Longitude Shear Reinforcement Plan

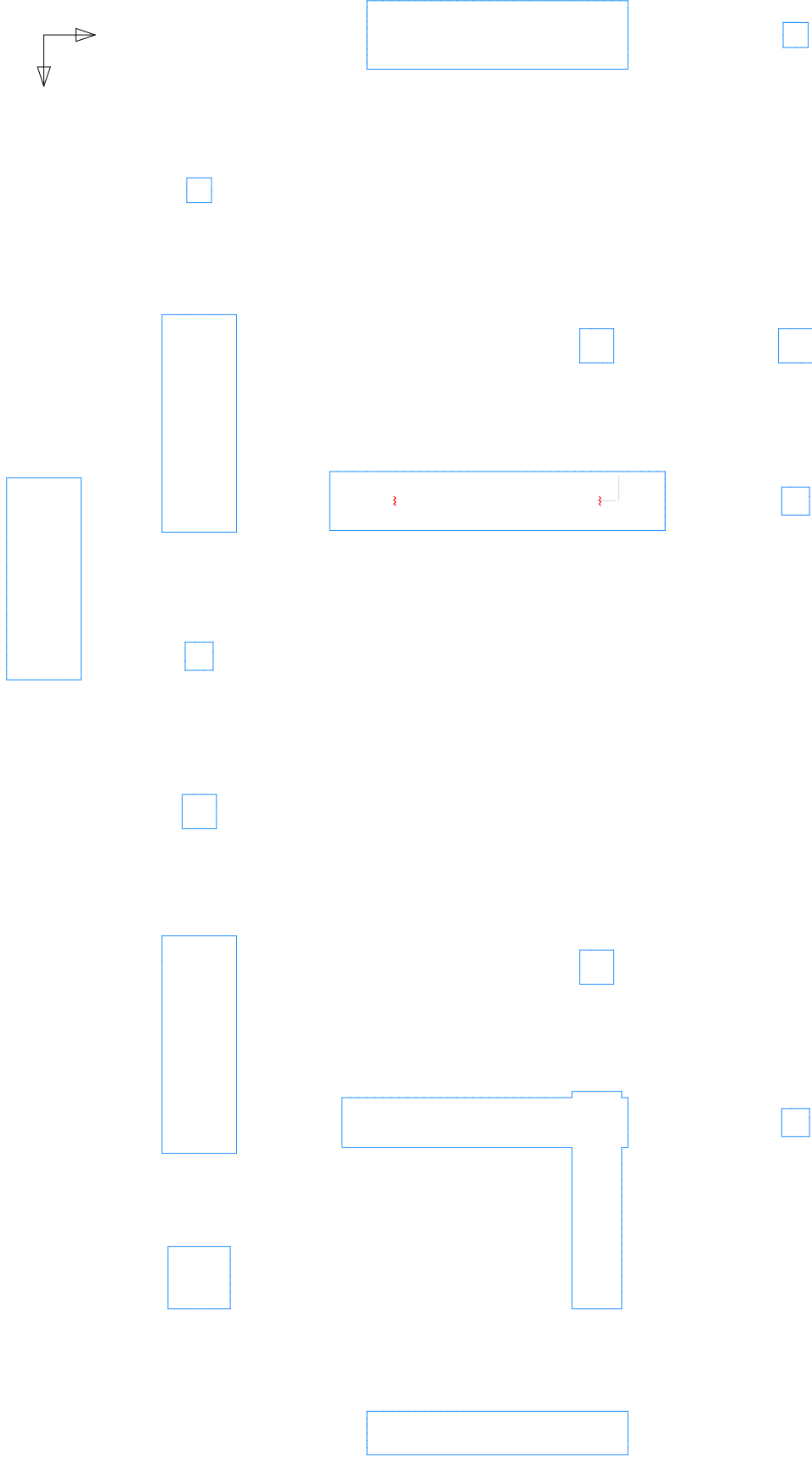
Strength Design: User Links, User Notes, User Dimensions; Longitude Span Design: Span Design Shear Bars; Span Design Bar Direction: Longitude DS Design: DS Design Shear Bars; Scale = 1/315



**Strength Design: Longitude Shear Reinforcement Plan (2)**

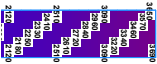
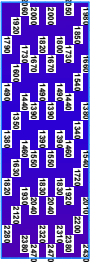
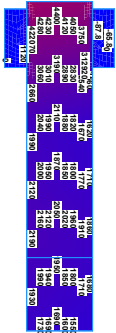


**Strength Design: Longitude Shear Reinforcement Plan (3)**

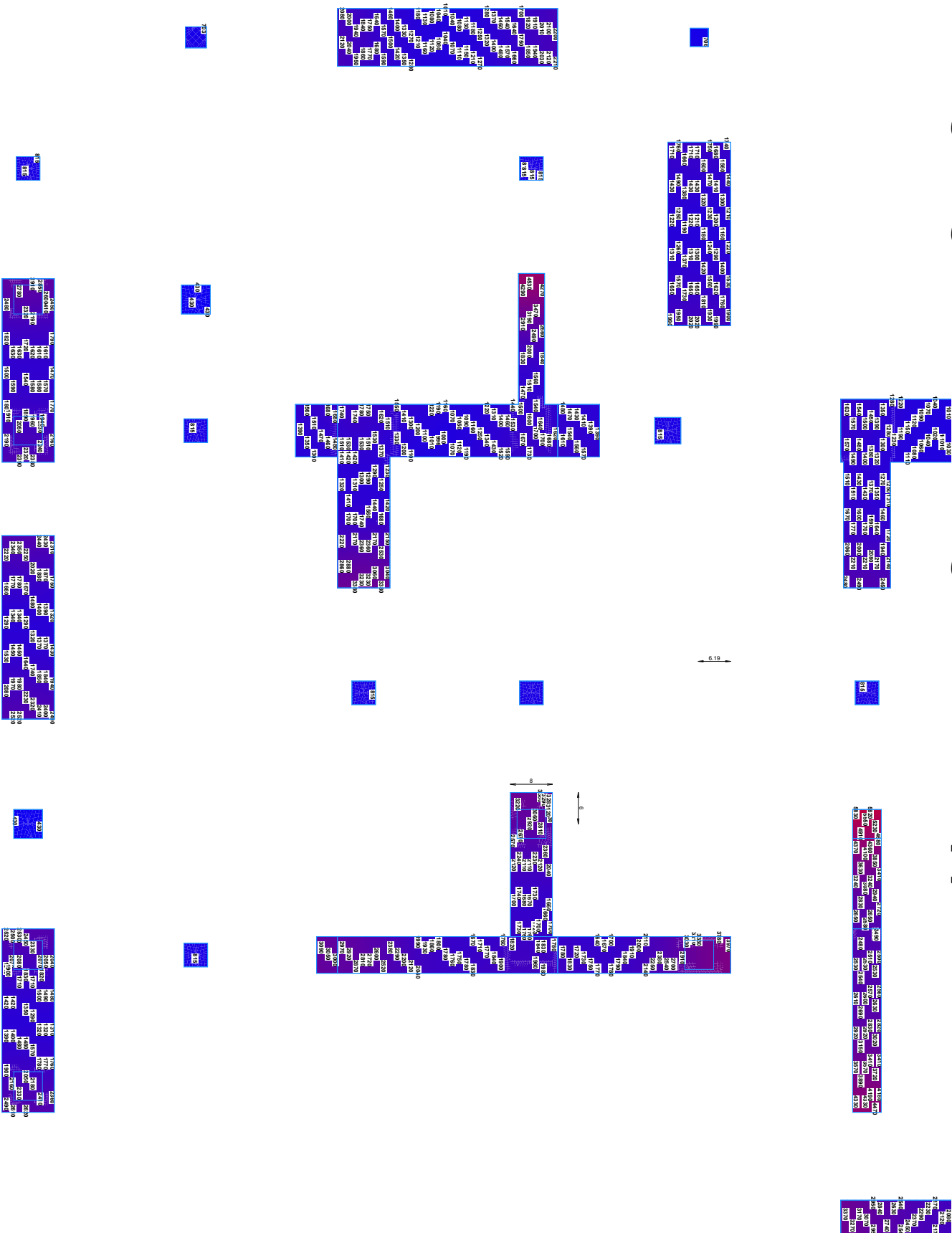


# Soil Bearing Design: Max Soil Bearing Pressure Plan

Soil Bearing Design: Latitude Span Design; Longitude Span Design; Latitude DS Design; PC Design; User Notes; User Dimensions;  
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;  
Soil Bearing Design - Area Spring Vertical Reactions Per Maximum Value

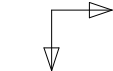
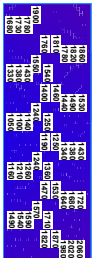
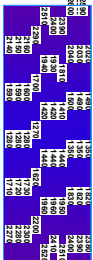
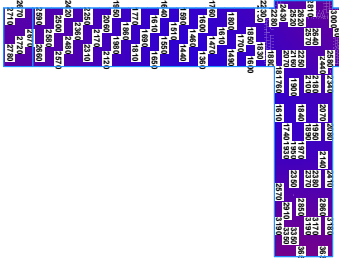
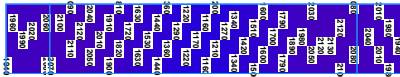
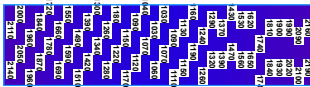


# Soil Bearing Design: Max Soil Bearing Pressure Plan (2)



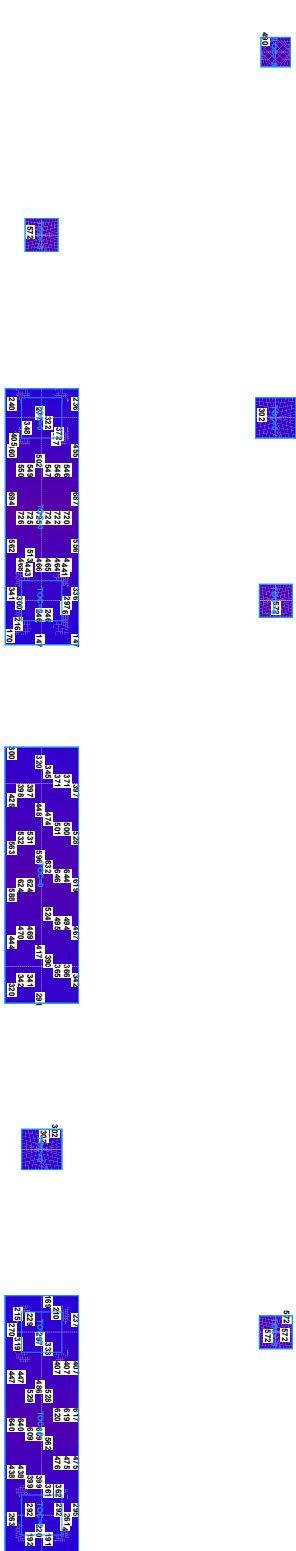
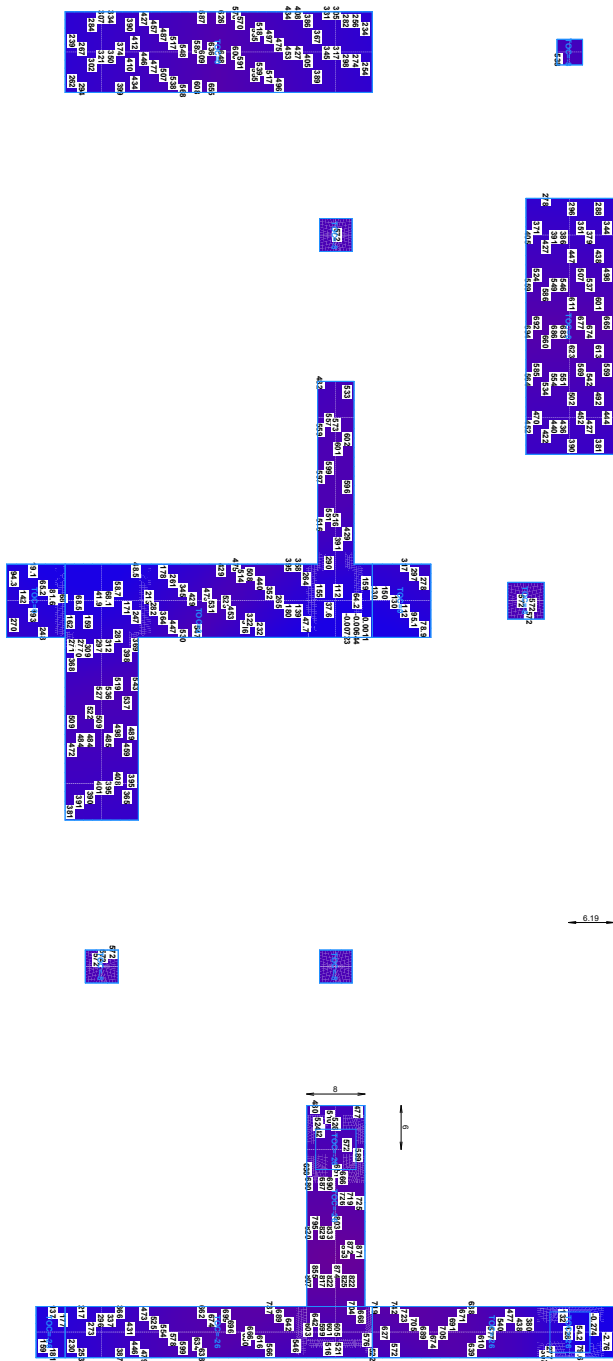
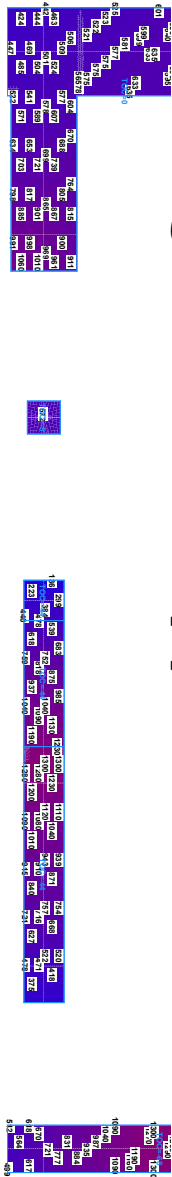
Align1 need to go deeper to get to bearing soils

# Soil Bearing Design: Max Soil Bearing Pressure Plan (3)



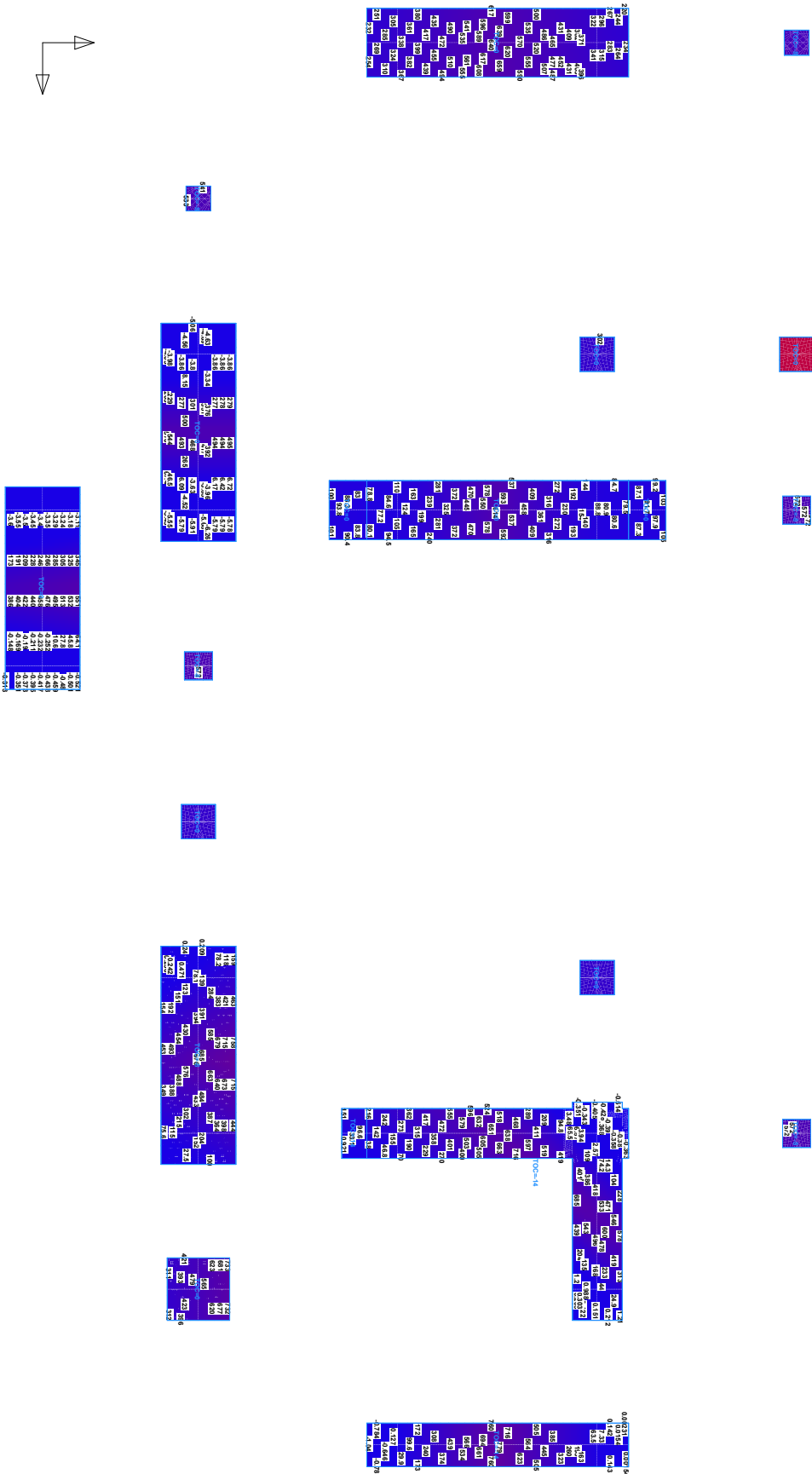


# Soil Bearing Design: Min Soil Bearing Pressure Plan (2)



Margin need to go deeper to get to bearing soils

# Soil Bearing Design: Min Soil Bearing Pressure Plan (3)



# Calc Log

Calculating Through Detailing (Everything Out-of-Date)(Considering Previous Warnings)

Active Calculation Options:

The structure is not automatically stabilized in the X and Y directions.  
 Supports above slab NOT included in self-dead loading.  
 Tendon vertical component NOT considered in punch check reactions.  
 Perform check only. No reinforcement to be designed.  
 6 zero-tension iterations are used to eliminate tension in area springs.  
 Creep Factor of 3.35 used in ECR calculations.  
 Shrinkage strain of 0.0004 used in ECR calculations.  
 ACI 318-19 is used in design.  
 Live load reduction not used

Stiffness matrix is already up to date.  
 Self-dead load creation is already up to date.  
 Generated tendons are already up to date.  
 Balance load creation is already up to date.  
 User reinforcement detailing is already up to date.  
 Concrete cross section calcs are already up to date.  
 Tendon cross section calcs are already up to date.  
 Reinforcing bar cross section calcs are already up to date.  
 Live load reduction calcs are already up to date.  
 Self-Dead Loading is already up to date.  
 Balance Loading is already up to date.  
 Balanced Load (transfer) is already up to date.  
 Construction Dead Load is already up to date.  
 Dead Load is already up to date.  
 Dead Load (transfer) is already up to date.  
 Live Load Reducible is already up to date.  
 Live Load Reducible (transfer) is already up to date.  
 Live Load Unreducible is already up to date.  
 Partition Load is already up to date.  
 Live Load Unreducible (transfer) is already up to date.  
 Live Load Storage is already up to date.  
 Live Load Storage (transfer) is already up to date.  
 Live Load Roof is already up to date.  
 Live Load Roof (transfer) is already up to date.

Solving for Seismic(EQ\_ASCE716\_X\_+E\_F).

Solving for Seismic(EQ\_ASCE716\_X\_+E\_F) - Pattern: Full Pattern.

Total Loads: (1310,-0.0158,-0.0248) Kips  
 Total Reactions: (-1310,0.0158,0.0248) Kips  
 Load-Reaction Tolerance: (2.11e-10,-1.82e-12,-7.33e-10) Kips

Solving for Seismic(EQ\_ASCE716\_X\_-E\_F).

Solving for Seismic(EQ\_ASCE716\_X\_-E\_F) - Pattern: Full Pattern.

Total Loads: (1310,-0.146,0.0116) Kips  
 Total Reactions: (-1310,0.146,-0.0116) Kips  
 Load-Reaction Tolerance: (-1.19e-11,-2.06e-11,-8.77e-10) Kips

Solving for Seismic(EQ\_ASCE716\_Y\_+E\_F).

Solving for Seismic(EQ\_ASCE716\_Y\_+E\_F) - Pattern: Full Pattern.

Total Loads: (-0.0604,1360,-0.322) Kips  
 Total Reactions: (0.0604,-1360,0.322) Kips  
 Load-Reaction Tolerance: (-8.15e-11,3.33e-10,-5.62e-10) Kips

Solving for Seismic(EQ\_ASCE716\_Y\_-E\_F).

Solving for Seismic(EQ\_ASCE716\_Y\_-E\_F) - Pattern: Full Pattern.

Total Loads: (0.0925,1360,-0.348) Kips  
 Total Reactions: (-0.0925,-1360,0.348) Kips  
 Load-Reaction Tolerance: (-1.2e-12,3.42e-10,-5.35e-10) Kips

Solving for Seismic(EQ\_ASCE716\_X\_+E\_0.3Y\_+E\_F).

Solving for Seismic(EQ\_ASCE716\_X\_+E\_0.3Y\_+E\_F) - Pattern: Full Pattern.

Total Loads: (1310,408,-0.121) Kips  
 Total Reactions: (-1310,-408,0.121) Kips  
 Load-Reaction Tolerance: (1.68e-10,9.81e-11,-9.01e-10) Kips

Solving for Seismic(EQ\_ASCE716\_X\_+E\_-0.3Y\_+E\_F).

Solving for Seismic(EQ\_ASCE716\_X\_+E\_-0.3Y\_+E\_F) - Pattern: Full Pattern.

Total Loads: (1310,-408,0.0717) Kips  
 Total Reactions: (-1310,408,-0.0717) Kips  
 Load-Reaction Tolerance: (2.4e-10,-1.03e-10,-5.64e-10) Kips

Solving for Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_+E\_F).

## Calc Log (2)

Solving for Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (-1310,408,-0.0717) Kips  
 Total Reactions: (1310,-408,0.0717) Kips  
 Load-Reaction Tolerance: (-2.24e-10,9.97e-11,5.65e-10) Kips

Solving for Seismic(EQ\_ASCE716\_-X\_+E\_-0.3Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-X\_+E\_-0.3Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (-1310,-408,0.121) Kips  
 Total Reactions: (1310,408,-0.121) Kips  
 Load-Reaction Tolerance: (-1.76e-10,-9.7e-11,9.01e-10) Kips

Solving for Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (392,1360,-0.329) Kips  
 Total Reactions: (-392,-1360,0.329) Kips  
 Load-Reaction Tolerance: (-1.97e-11,3.2e-10,-7.8e-10) Kips

Solving for Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (392,-1360,0.314) Kips  
 Total Reactions: (-392,1360,-0.314) Kips  
 Load-Reaction Tolerance: (1.38e-10,-3.25e-10,3.4e-10) Kips

Solving for Seismic(EQ\_ASCE716\_-0.3X\_+E\_Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_+E\_Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (-392,1360,-0.314) Kips  
 Total Reactions: (392,-1360,0.314) Kips  
 Load-Reaction Tolerance: (-1.38e-10,3.25e-10,-3.4e-10) Kips

Solving for Seismic(EQ\_ASCE716\_-0.3X\_+E\_-Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_+E\_-Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (-392,-1360,0.329) Kips  
 Total Reactions: (392,1360,-0.329) Kips  
 Load-Reaction Tolerance: (1.89e-11,-3.24e-10,7.83e-10) Kips

Solving for Seismic(EQ\_ASCE716\_X\_+E\_0.3Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_X\_+E\_0.3Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (1310,408,-0.129) Kips  
 Total Reactions: (-1310,-408,0.129) Kips  
 Load-Reaction Tolerance: (2.06e-10,1.01e-10,-8.92e-10) Kips

Solving for Seismic(EQ\_ASCE716\_X\_+E\_-0.3Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_X\_+E\_-0.3Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (1310,-408,0.0795) Kips  
 Total Reactions: (-1310,408,-0.0795) Kips  
 Load-Reaction Tolerance: (1.96e-10,-1.08e-10,-5.74e-10) Kips

Solving for Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-X\_+E\_0.3Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (-1310,408,-0.0795) Kips  
 Total Reactions: (1310,-408,0.0795) Kips  
 Load-Reaction Tolerance: (-1.87e-10,1.03e-10,5.73e-10) Kips

Solving for Seismic(EQ\_ASCE716\_-X\_+E\_-0.3Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-X\_+E\_-0.3Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (-1310,-408,0.129) Kips  
 Total Reactions: (1310,408,-0.129) Kips  
 Load-Reaction Tolerance: (-1.98e-10,-9.96e-11,8.93e-10) Kips

Solving for Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_+E\_Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (392,1360,-0.355) Kips  
 Total Reactions: (-392,-1360,0.355) Kips  
 Load-Reaction Tolerance: (6.33e-11,3.4e-10,-7.55e-10) Kips

Solving for Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_+E\_-Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (392,-1360,0.34) Kips  
 Total Reactions: (-392,1360,-0.34) Kips  
 Load-Reaction Tolerance: (6.38e-11,-3.31e-10,3.13e-10) Kips

Solving for Seismic(EQ\_ASCE716\_-0.3X\_+E\_Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_+E\_Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (-392,1360,-0.34) Kips  
 Total Reactions: (392,-1360,0.34) Kips  
 Load-Reaction Tolerance: (-6.38e-11,3.31e-10,-3.13e-10) Kips

Solving for Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_+E\_F) - Pattern: Full Pattern.

# Calc Log (3)

Total Loads: (1310,408,-0.0848) Kips  
 Total Reactions: (-1310,-408,0.0848) Kips  
 Load-Reaction Tolerance: (-3.79e-11,7.71e-11,-1.05e-9) Kips  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_+E\_-Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_+E\_-Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (-392,-1360,0.355) Kips  
 Total Reactions: (392,1360,-0.355) Kips  
 Load-Reaction Tolerance: (-5.95e-11,-3.44e-10,7.52e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_X\_-E\_-0.3Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_X\_-E\_-0.3Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (1310,-408,0.108) Kips  
 Total Reactions: (-1310,408,-0.108) Kips  
 Load-Reaction Tolerance: (1.57e-11,-1.21e-10,-7.11e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_-X\_-E\_0.3Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-X\_-E\_0.3Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (-1310,408,-0.108) Kips  
 Total Reactions: (1310,-408,0.108) Kips  
 Load-Reaction Tolerance: (-5.65e-12,1.2e-10,7.11e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_-X\_-E\_-0.3Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-X\_-E\_-0.3Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (-1310,-408,0.0848) Kips  
 Total Reactions: (1310,408,-0.0848) Kips  
 Load-Reaction Tolerance: (6.39e-11,-7.67e-11,1.05e-9) Kips  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (392,1360,-0.318) Kips  
 Total Reactions: (-392,-1360,0.318) Kips  
 Load-Reaction Tolerance: (-8.57e-11,3.22e-10,-8.22e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (392,-1360,0.325) Kips  
 Total Reactions: (-392,1360,-0.325) Kips  
 Load-Reaction Tolerance: (8.2e-11,-3.37e-10,2.97e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_-E\_Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_-E\_Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (-392,1360,-0.325) Kips  
 Total Reactions: (392,-1360,0.325) Kips  
 Load-Reaction Tolerance: (-8.2e-11,3.37e-10,-2.97e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_+E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_+E\_F) - Pattern: Full Pattern.  
 Total Loads: (-392,-1360,0.318) Kips  
 Total Reactions: (392,1360,-0.318) Kips  
 Load-Reaction Tolerance: (8.25e-11,-3.31e-10,8.25e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_X\_-E\_0.3Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (1310,408,-0.0927) Kips  
 Total Reactions: (-1310,-408,0.0927) Kips  
 Load-Reaction Tolerance: (-2.07e-11,7.73e-11,-1.04e-9) Kips  
 Solving for Seismic(EQ\_ASCE716\_X\_-E\_-0.3Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_X\_-E\_-0.3Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (1310,-408,0.116) Kips  
 Total Reactions: (-1310,408,-0.116) Kips  
 Load-Reaction Tolerance: (-2.03e-11,-1.23e-10,-7.18e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_-X\_-E\_0.3Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-X\_-E\_0.3Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (-1310,408,-0.116) Kips  
 Total Reactions: (1310,-408,0.116) Kips  
 Load-Reaction Tolerance: (2.11e-11,1.23e-10,7.18e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_-X\_-E\_-0.3Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-X\_-E\_-0.3Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (-1310,-408,0.0927) Kips  
 Total Reactions: (1310,408,-0.0927) Kips  
 Load-Reaction Tolerance: (2.28e-11,-7.78e-11,1.04e-9) Kips  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_-E\_Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (392,1360,-0.344) Kips

# Calc Log (4)

Total Reactions: (-392,-1360,0.344) Kips  
 Load-Reaction Tolerance: (-5.13e-12,3.35e-10,-7.99e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_0.3X\_-E\_-Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (392,-1360,0.351) Kips  
 Total Reactions: (-392,1360,-0.351) Kips  
 Load-Reaction Tolerance: (-2.15e-12,-3.34e-10,2.67e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (-392,1360,-0.351) Kips  
 Total Reactions: (392,-1360,0.351) Kips  
 Load-Reaction Tolerance: (2.15e-12,3.34e-10,-2.67e-10) Kips  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_-E\_F).  
 Solving for Seismic(EQ\_ASCE716\_-0.3X\_-E\_-Y\_-E\_F) - Pattern: Full Pattern.  
 Total Loads: (-392,-1360,0.344) Kips  
 Total Reactions: (392,1360,-0.344) Kips  
 Load-Reaction Tolerance: (1.2e-12,-3.36e-10,7.94e-10) Kips  
 Calculating Precompression in Cross Sections  
 Solving for Hyperstatic Loading.  
 Solving for Service LC: D.  
 Solving for Service LC: D + L.  
 Solving for Service LC: D + 0.75( L + S).  
 Solving for Service Seismic LC: 1.14D + 0.7E.  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.028, 0.974, 1.025, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.008, 0.9918, 1.008, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9831, 1.017, 0.9828, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.069, 0.9431, 1.052, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1, 0.9999, 1, 1, 1  
 Solving for Service Seismic LC: 1.14D - 0.7E.  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.008, 0.9918, 1.008, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.048, 0.9582, 1.039, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1, 0.9999, 1, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.069, 0.9431, 1.052, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9831, 1.017, 0.9828, 1, 1  
 Solving for Service Seismic LC: 1.11D + 0.75(L + S) + 0.525E.  
 Solving for Service Seismic LC: 1.11D + 0.75(L + S) + 0.525E.  
 Solving for Service Seismic LC: 0.6D + 0.7E.  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.205, 0.892, 1.067, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.058, 1.014, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.314, 0.9198, 0.9938, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.7555, 1.333, 0.6193, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.175, 0.9002, 1.063, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.244, 0.8929, 1.05, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.269, 0.8919, 1.039, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9879, 0.9914, 1.003, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.198, 0.9025, 1.01, 1, 1  
 Performing zero-tension iterations.

# Calc Log (5)

Accelerator Factors: 1, 1.429, 0.9464, 0.9973, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.357, 0.9501, 1, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.018, 1.015, 0.9386, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.278, 0.8997, 1.032, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.239, 0.8982, 1.048, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.147, 0.9024, 1.071, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.176, 0.8963, 1.065, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.172, 0.9012, 1.069, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.495, 0.9763, 0.9866, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9956, 0.9929, 1.004, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.026, 1.002, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.032, 1.002, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.068, 1.018, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.389, 0.9193, 1.016, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.488, 0.9782, 0.9914, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.183, 0.9128, 1.067, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.246, 0.915, 1.042, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.036, 1.004, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.062, 1.015, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.073, 1.018, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.03, 1.003, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.121, 0.9169, 1.067, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.015, 0.9885, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9863, 1.011, 0.9884, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.094, 0.928, 1.062, 1, 1  
 Solving for Service Seismic LC: 0.6D - 0.7E.  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.04, 0.9554, 1.055, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.049, 1.01, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.195, 0.8855, 1.077, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.229, 0.8957, 1.052, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9879, 0.9914, 1.003, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.269, 0.8919, 1.039, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.244, 0.8929, 1.05, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.175, 0.9002, 1.063, 1, 1

# Calc Log (6)

Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.018, 1.015, 0.9386, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.357, 0.9501, 1, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.429, 0.9464, 0.9973, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.198, 0.9025, 1.01, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.176, 0.8963, 1.065, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.147, 0.9024, 1.071, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.239, 0.8982, 1.048, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.278, 0.8997, 1.032, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.177, 0.897, 1.07, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9956, 0.9929, 1.004, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.495, 0.9763, 0.9866, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.032, 1.002, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.026, 1.002, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.073, 1.019, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.246, 0.915, 1.042, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.183, 0.9128, 1.067, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.488, 0.9782, 0.9914, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.389, 0.9193, 1.016, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.03, 1.003, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.073, 1.018, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.062, 1.015, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.036, 1.004, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.094, 0.928, 1.062, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9863, 1.011, 0.9884, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.015, 0.9885, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.121, 0.9169, 1.067, 1, 1  
 Solving for Sustained Service LC.  
 Solving for Factored LC: 1.4D.  
 Solving for Factored LC: 1.2D + 1.6L + 0.5S.  
 Solving for Factored LC: 1.2D + 0.5L + 1.6S.  
 Solving for Factored Seismic LC: 1.4D + 0.5L + 0.2S + E.  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.14, 0.9092, 1.07, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.112, 0.9221, 1.064, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.013, 0.9877, 1.012, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.05, 0.9565, 1.041, 1, 1  
 Performing zero-tension iterations.

# Calc Log (7)

Accelerator Factors: 1, 1.084, 0.9357, 1.057, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.198, 0.8961, 1.06, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.071, 0.9423, 1.052, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9867, 1.013, 0.9866, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.06571, 1.333, 0.03703, 1, 1  
 Solving for Factored Seismic LC: 1.4D + 0.5L + 0.2S - E.  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.025, 0.9771, 1.022, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.013, 0.9877, 1.012, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.112, 0.9221, 1.064, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.168, 0.9029, 1.062, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.9867, 1.013, 0.9866, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.071, 0.9423, 1.052, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.198, 0.8961, 1.06, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.084, 0.9357, 1.057, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 0.06571, 1.333, 0.03703, 1, 1  
 Solving for Factored Seismic LC: 0.7D + E.  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.132, 1.053, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.229, 1.116, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.2, 1.099, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.183, 1.09, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.13, 1.05, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.149, 1.057, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.195, 1.098, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.159, 1.078, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.201, 1.098, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.23, 1.113, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.22, 1.111, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.203, 1.102, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.15, 1.063, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.132, 1.049, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.175, 1.081, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.182, 1.094, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.193, 1.096, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.22, 1.108, 1, 1  
 Performing zero-tension iterations.

# Calc Log (8)

Accelerator Factors: 1, 1.5, 1.206, 1.102, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.233, 1.115, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.233, 1.117, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.24, 1.123, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.206, 1.102, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.227, 1.111, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.209, 1.104, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.211, 1.107, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.218, 1.11, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.244, 1.122, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.245, 1.125, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.228, 1.115, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.2, 1.097, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.214, 1.106, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.192, 1.097, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.203, 1.104, 1, 1  
 Solving for Factored Seismic LC: 0.7D - E.  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.181, 1.09, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.238, 1.121, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.195, 1.093, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.187, 1.089, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.159, 1.078, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.195, 1.098, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.149, 1.057, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.13, 1.05, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.203, 1.102, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.22, 1.111, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.23, 1.113, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.201, 1.098, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.182, 1.094, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.175, 1.081, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.132, 1.049, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.15, 1.063, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.193, 1.099, 1, 1

# Calc Log (9)

Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.206, 1.102, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.22, 1.108, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.233, 1.117, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.233, 1.115, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.233, 1.12, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.211, 1.107, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.209, 1.104, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.227, 1.111, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.206, 1.102, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.228, 1.115, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.245, 1.125, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.244, 1.122, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.218, 1.11, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.203, 1.104, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.192, 1.097, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.214, 1.106, 1, 1  
 Performing zero-tension iterations.  
 Accelerator Factors: 1, 1.5, 1.2, 1.097, 1, 1  
 Solving for Service LC: D + S.  
 Calculating Strength Design envelopes.  
 Calculating Code Minimum Design envelopes.  
 Calculating Ductility Design envelopes.  
 Initial Service Design envelopes are already up to date.  
 Calculating Service Design envelopes.  
 Calculating Soil Bearing Design envelopes.  
 Calculating Sustained Service Design envelopes.  
 Calculating User Minimum Design envelopes.  
 Calculating Strength Design - Pass 0  
 Calculating Code Minimum Design - Pass 0  
 Calculating Ductility Design - Pass 0  
 Calculating Service Design - Pass 0  
 Calculating Soil Bearing Design - Pass 0  
 Calculating Sustained Service Design - Pass 0  
 Calculating User Minimum Design - Pass 0  
 Calculating Strength Design - Pass 1  
 Calculating Code Minimum Design - Pass 1  
 Calculating Ductility Design - Pass 1  
 Calculating Service Design - Pass 1  
 Calculating Soil Bearing Design - Pass 1  
 Calculating Sustained Service Design - Pass 1  
 Calculating User Minimum Design - Pass 1  
 Calculating Strength Design - Pass 2  
 Calculating Code Minimum Design - Pass 2  
 Calculating Ductility Design - Pass 2  
 Calculating Service Design - Pass 2  
 Calculating Soil Bearing Design - Pass 2  
 Calculating Sustained Service Design - Pass 2  
 Calculating User Minimum Design - Pass 2  
 Calculating Strength Design - Final Design Check  
 Calculating Code Minimum Design - Final Design Check

## Calc Log (10)

Calculating Ductility Design - Final Design Check

Calculating Service Design - Final Design Check

Calculating Soil Bearing Design - Final Design Check

Calculating Sustained Service Design - Final Design Check

Calculating User Minimum Design - Final Design Check

Laying Out Program Reinforcement

Optimizing Program Reinforcement Layout

Converting SSR Designs

Converting Program Transverse Bar Designs

Detailing User Transverse Reinforcement

Detailing Program Reinforcement

Estimating Costs

Deflection Checks are already up to date.

This analysis has been completed successfully, check above for any warnings or errors.



**QUANTUM** | CONSULTING ENGINEERS

**1015 BUILDING RISK CATEGORY IV  
VOLUNTARY SEISMIC UPGRADE**

1015 39th AVENUE SE  
PUYALLUP, WA 98374

QUANTUM JOB NUMBER: 19305.04

# FOUNDATION

## GRADE BEAM SLIDING AND SHEAR ANALYSIS

**Braced Frame Grade Beam Sliding Analysis**

|                         |         |                  |        |
|-------------------------|---------|------------------|--------|
| Soil Weight =           | 120 psf | Slab Thickness   | 6 in   |
| Passive Soil Pressure = | 300 pcf | Typ. T/FTG Elev: | -10 in |
| Sliding Coeff. =        | 0.4     | Slab Cantilever  | 6 ft   |
| Sds =                   | 1.006   |                  |        |
| Frame Shear (k)         |         |                  |        |

| Frame ID  | Grid Location | ULT (RAM) |       |       |       | Column DL's (k) |       |      | Ftg Size |            |             | SOG         |           |             |
|-----------|---------------|-----------|-------|-------|-------|-----------------|-------|------|----------|------------|-------------|-------------|-----------|-------------|
|           |               | Col 1     | Col 2 | Col 3 | Total | ASD             | 1     | 2    | 3        | Width (ft) | Length (ft) | Height (ft) | PLINTH HT | Thick. (in) |
| 1 2/D-E   | 2 2/G-H       | 117.5     | 117.5 |       | 234.9 | 164.4           | 80.5  | 50.2 |          | 9          | 49          | 3.5         | 3.167     | 6           |
|           | 3 6/D-E       | 56.6      | 56.5  |       | 113.1 | 79.2            | 44.4  | 70.4 |          | 12         | 35          | 3.75        | 0         | 6           |
|           | 4 6/G-H       | 48.6      | 48.5  |       | 97.1  | 68.0            | 90.4  | 67.9 |          | 7          | 35          | 3           | 1.67      | 6           |
|           | 5 8/D-E       |           |       |       |       |                 |       |      |          |            |             |             |           |             |
|           | 6 8/G-J       | 38.8      | 77.3  | 38.8  | 154.9 | 108.4           | 73.4  | 66.8 | 60.9     | 5.5        | 57.75       | 4           | 3.67      | 6           |
| 7 9/B-C   | 36.8          | 36.8      |       | 73.7  | 51.6  | 37.2            | 54.9  |      | 12       | 35         | 3.5         | 0           | 6         |             |
| 8 10/C-D  | 35.4          | 35.5      |       | 70.9  | 49.6  | 74.5            | 62.1  |      | 8        | 35         | 3           | 0           | 6         |             |
| 9 10/G-H  | 33.1          | 33.1      |       | 66.1  | 46.3  | 72.5            | 67.8  |      | 8        | 35         | 3.5         | 2.167       | 6         |             |
| 10 11/D-E | 35.3          | 35.3      |       | 70.6  | 49.4  | 67.3            | 109.3 |      | 10       | 35         | 3           | 0           | 6         |             |
| 11 13/C-D | 26.1          | 26.1      |       | 52.2  | 36.6  | 71.4            | 64.9  |      | 10       | 35         | 3.5         |             | 6         |             |
| 12 13/E-F | 38.1          | 38.1      |       | 76.1  | 53.3  | 64.6            | 64.8  |      | 10       | 35         | 3           | 0           | 6         |             |
| 13 13/H-J | 26.1          | 26.1      |       | 52.2  | 36.6  | 63.8            | 64.0  |      | 10       | 35         | 3           | 0           | 6         |             |
| 14 15/H-J | 46.2          | 46.3      |       | 92.5  | 64.7  | 65.9            | 64.5  |      | 8        | 35         | 3.5         | 1.167       | 6         |             |
| 15 17/C-D | 63.5          | 63.5      |       | 127.1 | 89.0  | 59.4            | 58.0  |      | 12       | 35         | 3.5         | 0           | 6         |             |
| 16 17/F-H | 127.0         | 63.4      | 0.0   | 190.4 | 133.3 | 37.0            | 37.1  | 37.2 | 12       | 60         | 4           | 2           | 6         |             |
| 17 18/C-D | 115.9         | 58.0      |       | 173.9 | 121.7 | 33.4            | 38.1  |      | 12       | 32.5       | 4           | 0           | 6         |             |

|                                                                                   |  |                                   |  |               |                  |
|-----------------------------------------------------------------------------------|--|-----------------------------------|--|---------------|------------------|
|  |  | Project: South Hill 1015 Building |  | Date: 12/9/24 | Job No: 19305.04 |
| Client: Benaryoa                                                                  |  | By: TVM                           |  | Sheet: 1      |                  |

**Braced Frame Grade Beam Sliding Analysis**

| Frame ID | Grid Location | Self-Wts (k) | Sliding Resistance |       | Passive P (k) | Total |             | Uc |  |
|----------|---------------|--------------|--------------------|-------|---------------|-------|-------------|----|--|
|          |               |              | Col DL (k)         | V (k) |               |       |             |    |  |
| 1        | 2/D-E         | 0.0          | 0                  | 0.0   | 0.0           | 0.0   | 0.0         |    |  |
| 2        | 2/G-H         | 405.7        | 130.7              | 184.3 | 46.5          | 230.8 | <b>0.71</b> | OK |  |
| 3        | 6/D-E         | 242.6        | 114.73             | 122.8 | 25.3          | 148.1 | <b>0.53</b> | OK |  |
| 4        | 6/G-H         | 163.0        | 158.28             | 110.4 | 20.0          | 130.4 | <b>0.52</b> | OK |  |
| 5        | 8/D-E         |              |                    |       |               |       |             |    |  |
| 6        | 8/G-J         | 335.2        | 201.08             | 184.3 | 37.4          | 221.7 | <b>0.49</b> | OK |  |
| 7        | 9/B-C         | 226.8        | 92.11              | 109.6 | 22.1          | 131.6 | <b>0.39</b> | OK |  |
| 8        | 10/C-D        | 130.2        | 136.52             | 91.7  | 10.8          | 102.5 | <b>0.48</b> | OK |  |
| 9        | 10/G-H        | 224.0        | 140.26             | 125.2 | 32.9          | 158.1 | <b>0.29</b> | OK |  |
| 10       | 11/D-E        | 162.8        | 176.65             | 116.6 | 13.5          | 130.1 | <b>0.38</b> | OK |  |
| 11       | 13/C-D        | 189.0        | 136.24             | 111.8 | 18.4          | 130.1 | <b>0.28</b> | OK |  |
| 12       | 13/E-F        | 162.8        | 129.38             | 100.4 | 13.5          | 113.9 | <b>0.47</b> | OK |  |
| 13       | 13/H-J        | 162.8        | 127.8              | 99.9  | 13.5          | 113.4 | <b>0.32</b> | OK |  |
| 14       | 15/H-J        | 190.4        | 130.35             | 110.2 | 24.5          | 134.7 | <b>0.48</b> | OK |  |
| 15       | 17/C-D        | 226.8        | 117.42             | 118.3 | 22.1          | 140.3 | <b>0.63</b> | OK |  |
| 16       | 17/F-H        | 615.6        | 111.25             | 249.8 | 57.6          | 307.4 | <b>0.43</b> | OK |  |
| 17       | 18/C-D        | 239.9        | 71.5               | 107.0 | 28.8          | 135.8 | <b>0.90</b> | OK |  |

|                                                                                   |                                          |  |                      |                         |
|-----------------------------------------------------------------------------------|------------------------------------------|--|----------------------|-------------------------|
|  | Project: <b>South Hill 1015 Building</b> |  | Date: <b>12/9/24</b> | Job No: <b>19305.04</b> |
|                                                                                   | Client: <b>Benayoa</b>                   |  | By: <b>TVM</b>       | Sheet: <b>2</b>         |
|                                                                                   |                                          |  |                      |                         |

**Braced Frame Grade Beam Overturning Capacity for Base Plate Tension Anchorage**

| Overturning Resistance                |  |  |  |  |  |  |  |  |  | Moment Arms |  |           |         |      | G.B. |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
|---------------------------------------|--|--|--|--|--|--|--|--|--|-------------|--|-----------|---------|------|------|----------------|--|-------|--|-------|--|--------------------|--|-----|--|------|--|------|--|------|--|--------|--|-----|--|
| Multiply Dead Load by (1.2 + 0.2 Sds) |  |  |  |  |  |  |  |  |  | 1.4012      |  |           | Columns |      |      | Soil Res. Mom. |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| Grade                                 |  |  |  |  |  |  |  |  |  | Beam        |  | Soil Area |         | Slab |      | Col 1          |  | Col 2 |  | Col 3 |  | & Slab Mom. Couple |  |     |  |      |  |      |  |      |  |        |  |     |  |
| Column DL's (k)                       |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| Frame ID                              |  |  |  |  |  |  |  |  |  | Grid        |  | Location  |         | 1    |      | 2              |  | 3     |  | (k)   |  | (sqft)             |  | (k) |  | (ft) |  | (ft) |  | (ft) |  | (k-ft) |  | (k) |  |
| 1 2/D-E                               |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 2 2/G-H                               |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 3 6/D-E                               |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 4 6/G-H                               |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 5 8/D-E                               |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 6 8/G-I                               |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 7 9/B-C                               |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 8 10/C-D                              |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 9 10/G-H                              |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 10 11/D-E                             |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 11 13/C-D                             |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 12 13/E-F                             |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 13 13/H-I                             |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 14 15/H-I                             |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 15 17/C-D                             |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 16 17/F-H                             |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |
| 17 18/C-D                             |  |  |  |  |  |  |  |  |  |             |  |           |         |      |      |                |  |       |  |       |  |                    |  |     |  |      |  |      |  |      |  |        |  |     |  |

**Braced Frame Grade Beam Sliding Analysis**

|                         |         |                  |                  |
|-------------------------|---------|------------------|------------------|
| Soil Weight =           | 120 psf | Slab Thickness   | 6 in             |
| Passive Soil Pressure = | 300 pcf | Includes 1.5 FOS | Typ. T/FTG Elev: |
| Sliding Coeff. =        | 0.4     | Includes 1.5 FOS | -10 in           |
| Sds =                   | 1.006   | Slab Cantilever  | 6 ft             |

| Frame ID | Grid Location | ULT (RAM) |       |       |       | Column DL's (k) |      |       | Ftg Size |            |             | SOG         |           |             |
|----------|---------------|-----------|-------|-------|-------|-----------------|------|-------|----------|------------|-------------|-------------|-----------|-------------|
|          |               | Col 1     | Col 2 | Col 3 | Total | ASD             | 1    | 2     | 3        | Width (ft) | Length (ft) | Height (ft) | PLINTH HT | Thick. (in) |
| 18       | D/3-4         | 31.9      | 31.9  |       | 63.8  | 44.7            | 35.7 | 71.2  |          | 11         | 35          | 3.5         | 0         | 6           |
| 19       | H/3-4         | 28.7      | 28.7  |       | 57.5  | 40.2            | 83.7 | 108.5 |          | 6          | 35          | 4           | 2.67      | 6           |
| 20       | H/5-6         | 0.0       | 0.0   |       | 0.0   | 0.0             |      |       |          |            |             |             |           | 6           |
| 21       | D/7-8         | 40.6      | 40.6  |       | 81.1  | 56.8            | 56.2 | 50.4  |          | 12         | 42          | 3.5         | 0         | 6           |
| 22       | K/7-8         | 42.9      | 42.9  |       | 85.8  | 60.0            | 37.8 | 43.9  |          | 6.5        | 42          | 4           | 5.67      | 6           |
| 23       | H/9-11        | 84.9      | 169.0 | 84.9  | 338.8 | 237.1           | 64.0 | 67.8  | 64.5     | 7          | 80          | 3.5         | 2.167     | 6           |
| 24       | A/10-11       | 45.8      | 45.8  |       | 91.5  | 64.1            | 47.1 | 48.3  |          | 11         | 42          | 3.5         | 0         | 6           |
| 25       | D/10-11       | 86.7      | 86.7  |       | 173.4 | 121.4           | 67.3 | 62.1  |          | 10         | 58          | 3           |           | 6           |
| 26       | A/15-16       | 45.8      | 45.8  |       | 91.5  | 64.1            | 48.0 | 47.5  |          | 11         | 42          | 3.5         | 0         | 6           |
| 27       | D/15-16       | 86.6      | 86.6  |       | 173.3 | 121.3           | 83.0 | 83.8  |          | 9.5        | 54          | 3           | 0         | 6           |
| 28       | H/15-16       | 84.8      | 84.7  |       | 169.4 | 118.6           | 64.5 | 65.9  |          | 8          | 46          | 3.5         | 1.167     | 6           |
| 29       | K/15-16       | 56.0      | 55.3  |       | 111.3 | 77.9            | 42.1 | 46.0  |          | 7          | 42          | 3.5         | 1.167     | 6           |

**Braced Frame Grade Beam Sliding Analysis**

| Frame ID | Grid Location | Self-Wts (k) | Sliding Resistance |       | Passive P (k) | Total | Uc   |    |
|----------|---------------|--------------|--------------------|-------|---------------|-------|------|----|
|          |               |              | Col DL (k)         | V (k) |               |       |      |    |
| 18       | D/3-4         | 207.9        | 106.83             | 108.2 | 20.2          | 128.4 | 0.35 | OK |
| 19       | H/3-4         | 196.4        | 192.17             | 133.5 | 33.6          | 167.2 | 0.24 | OK |
| 20       | H/5-6         | 0.0          | 0                  | 0.0   | 0.0           | 0.0   |      |    |
| 21       | D/7-8         | 272.2        | 106.67             | 130.2 | 22.1          | 152.2 | 0.37 | OK |
| 22       | K/7-8         | 353.6        | 81.69              | 149.6 | 59.8          | 209.4 | 0.29 | OK |
| 23       | H/9-11        | 448.0        | 196.3              | 221.4 | 28.8          | 250.2 | 0.95 | OK |
| 24       | A/10-11       | 249.5        | 95.45              | 118.5 | 20.2          | 138.8 | 0.46 | OK |
| 25       | D/10-11       | 269.7        | 129.4              | 137.2 | 13.5          | 150.7 | 0.81 | OK |
| 26       | A/15-16       | 249.5        | 95.45              | 118.5 | 20.2          | 138.8 | 0.46 | OK |
| 27       | D/15-16       | 238.5        | 166.76             | 139.3 | 12.8          | 152.1 | 0.80 | OK |
| 28       | H/15-16       | 250.3        | 130.39             | 130.8 | 24.5          | 155.3 | 0.76 | OK |
| 29       | K/15-16       | 199.9        | 88.06              | 99.0  | 21.4          | 120.4 | 0.65 | OK |

|                                                                                   |                                          |  |                      |                         |
|-----------------------------------------------------------------------------------|------------------------------------------|--|----------------------|-------------------------|
|  | Project: <b>South Hill 1015 Building</b> |  | Date: <b>12/9/24</b> | Job No: <b>19305.04</b> |
|                                                                                   | Client: <b>Benayoa</b>                   |  | By: <b>TVM</b>       | Sheet: <b>5</b>         |
|                                                                                   |                                          |  |                      |                         |

**Braced Frame Grade Beam Overturning Capacity for Base Plate Tension Anchorage**

| Frame ID | Grid Location | Overturning Resistance                |       |            |           | Moment Arms |       |       |         |       |       |           | G.B.        |       |       |
|----------|---------------|---------------------------------------|-------|------------|-----------|-------------|-------|-------|---------|-------|-------|-----------|-------------|-------|-------|
|          |               | Multiply Dead Load by (1.2 + 0.2 Sds) |       |            |           | 1.4012      |       |       | Columns |       |       | Soil Res. | Mom. Couple |       |       |
|          |               | Column DL's (k)                       |       | Grade Beam | Soil Area | Soil        | Slab  | Space | No. Col | Col 1 | Col 2 |           |             | Col 3 |       |
|          |               | 1                                     | 2     | 3          | (k)       | (sqft)      | (k)   | (k)   | (ft)    | (ft)  | (ft)  | (ft)      | (k-ft)      | (k)   |       |
| 18       | D/3-4         | 50.0                                  | 99.7  |            | 283.2     | 385.0       | 21.6  | 81.1  | 25      | 2     | 5     | 30        | 17.5        | 9994  | 399.8 |
| 19       | H/3-4         | 117.3                                 | 152.0 |            | 176.6     | 268.3       | 135.5 | 63.5  | 25      | 2     | 5     | 30        | 17.5        | 11718 | 468.7 |
| 20       | H/5-6         |                                       |       |            |           |             |       |       |         |       |       |           |             |       |       |
| 21       | D/7-8         | 78.8                                  | 70.7  |            | 370.8     | 504.0       | 28.2  | 97.2  | 32      | 2     | 5     | 37        | 21          | 13429 | 419.7 |
| 22       | K/7-8         | 53.0                                  | 61.5  |            | 229.5     | 426.6       | 430.6 | 74.9  | 32      | 2     | 5     | 37        | 21          | 17975 | 561.7 |
| 23       | H/9-11        | 89.6                                  | 95.0  | 90.4       | 412.0     | 656.6       | 276.1 | 131.1 | 32      | 3     | 8     | 40        | 40          | 43792 | 684.3 |
| 24       | A/10-11       | 66.0                                  | 67.7  |            | 339.9     | 462.0       | 25.9  | 93.2  | 32      | 2     | 5     | 37        | 21          | 12472 | 389.8 |
| 25       | D/10-11       | 94.4                                  | 87.0  |            | 365.7     | 580.0       | 32.5  | 115.5 | 32      | 2     | 13    | 45        | 29          | 20038 | 626.2 |
| 26       | A/15-16       | 67.2                                  | 66.5  |            | 339.9     | 462.0       | 25.9  | 93.2  | 32      | 2     | 5     | 37        | 21          | 12435 | 388.6 |
| 27       | D/15-16       | 116.3                                 | 117.4 |            | 323.5     | 513.0       | 28.8  | 106.4 | 32      | 2     | 11    | 43        | 27          | 18710 | 584.7 |
| 28       | H/15-16       | 90.4                                  | 92.3  |            | 270.7     | 400.2       | 101.0 | 87.0  | 32      | 2     | 7     | 39        | 23          | 14783 | 462.0 |
| 29       | K/15-16       | 59.0                                  | 64.4  |            | 216.3     | 323.3       | 81.6  | 77.0  | 32      | 2     | 5     | 37        | 21          | 10549 | 329.6 |

|                                          |  |                      |                         |
|------------------------------------------|--|----------------------|-------------------------|
| Project: <b>South Hill 1015 Building</b> |  | Date: <b>12/9/24</b> | Job No: <b>19305.04</b> |
| Client: <b>Benanyoa</b>                  |  | By: <b>TVM</b>       | Sheet: <b>6</b>         |



**Check Grade Beam Shear Capacity**

Concept shear capacity varies, should be consistent (no net tension in grade beam)

Concrete Strength    **3000** psi  
 $\phi$  =    **0.75**

Ftg Size

From RAM Concept

| Frame ID | Grid Location (ft) | Width (ft)                                    | Height (ft) | d (in) | $\rho_w$ | $V_n$ | $\phi V_n$ (k) | $V_u$ (k) | $U_c$ | Notes                                                            |
|----------|--------------------|-----------------------------------------------|-------------|--------|----------|-------|----------------|-----------|-------|------------------------------------------------------------------|
| 1        |                    |                                               |             |        |          |       |                |           |       |                                                                  |
| 2        | 2/G-H              | 9                                             | 3.5         | 38.5   | 0.0029   | 227.7 | 170.8          | 161       | 0.94  | OK                                                               |
| 3        | 6/D-E              | 12                                            | 3.75        | 41.5   | 0.0019   | 321.6 | 241.2          | 101       | 0.42  | OK                                                               |
| 4        | 6/G-H              | 7                                             | 3           | 32.5   | 0.0040   | 149.5 | 112.1          | 107       | 0.95  | OK                                                               |
| 5        | 8/D-E              |                                               |             |        |          |       |                |           |       |                                                                  |
| 6        | 8/G-J              | 5.5                                           | 4           | 44.5   | 0.0032   | 160.9 | 120.6          | 140       | 1.16  | NG                                                               |
| 8        | G-H                | Add shear reinforcing in expanded grade beam. |             |        |          |       |                |           |       | Check at distance "d" $V_u = 115 \text{ k} < 120.6 \text{ k}$ OK |
| 8        | H-J                | 5.5                                           | 4           | 44.5   | 0.0032   | 160.9 | 120.6          | 105       | 0.87  | OK                                                               |
| 7        | 9/B-C              | 12                                            | 3.5         | 38.5   | 0.0018   | 296.5 | 222.4          | 71.3      | 0.32  | OK                                                               |
| 8        | 10/C-D             | 8                                             | 3           | 32.5   | 0.0014   | 154.6 | 116.0          | 96.9      | 0.84  | OK                                                               |
| 9        | 10/G-H             | 8                                             | 3.5         | 38.5   | 0.0012   | 174.0 | 130.5          | 110       | 0.84  | OK                                                               |
| 10       | 11/D-E             | 10                                            | 3           | 32.5   | 0.0019   | 209.9 | 157.4          | 118       | 0.75  | OK                                                               |
| 11       | 13/C-D             | 10                                            | 3.5         | 38.5   | 0.0018   | 245.6 | 184.2          | 124       | 0.67  | OK                                                               |
| 12       | 13/E-F             | 10                                            | 3           | 32.5   | 0.0021   | 213.6 | 160.2          | 103       | 0.64  | OK                                                               |
| 13       | 13/H-J             | 10                                            | 3           | 32.5   | 0.0021   | 213.6 | 160.2          | 102       | 0.64  | OK                                                               |
| 14       | 15/H-J             | 8                                             | 3.5         | 38.5   | 0.0020   | 202.4 | 151.8          | 105       | 0.69  | OK                                                               |
| 15       | 17/C-D             | 12                                            | 3.5         | 38.5   | 0.0018   | 296.5 | 222.4          | 88.8      | 0.40  | OK                                                               |
| 16       | 17/F-H             | 12                                            | 4           | 44.5   | 0.0019   | 346.6 | 259.9          | 70.5      | 0.27  | OK                                                               |
| 17       | 18/C-D             | 12                                            | 4           | 44.5   | 0.0019   | 346.6 | 259.9          | 50.2      | 0.19  | OK                                                               |

|                                                                                   |                                          |  |                      |                         |
|-----------------------------------------------------------------------------------|------------------------------------------|--|----------------------|-------------------------|
|  | Project: <b>South Hill 1015 Building</b> |  | Date: <b>12/9/24</b> | Job No: <b>19305.04</b> |
|                                                                                   | Client: <b>Benanyoa</b>                  |  | By: <b>TVM</b>       | Sheet: <b>1</b>         |
|                                                                                   |                                          |  |                      |                         |

**Check Grade Beam Shear Capacity**

Concept shear capacity varies, should be consistent (no net tension in grade beam)

Concrete Strength    3000 psi  
 $\phi$  =    0.75

Ftg Size

From RAM Concept

| Frame ID | Grid Location (ft) | Width (ft) | Height (ft) | d (in) | $\rho_w$ | $V_n$ | $\phi V_n$ (k) | $V_u$ (k) | $U_c$ | Notes |
|----------|--------------------|------------|-------------|--------|----------|-------|----------------|-----------|-------|-------|
| 18       | D/3-4              | 11         | 3.5         | 38.5   | 0.0018   | 271.1 | 203.3          | 90.7      | 0.45  | OK    |
| 19       | H/3-4              | 6          | 4           | 44.5   | 0.0029   | 175.5 | 150.0          | 40        | 0.27  | OK    |
| 20       | H/5-6              |            |             |        |          |       |                |           |       |       |
| 21       | D/7-8              | 12         | 3.5         | 38.5   | 0.0018   | 296.5 | 222.4          | 66.3      | 0.30  | OK    |
| 22       | K/7-8              | 6.5        | 4           | 44.5   | 0.0037   | 190.1 | 142.6          | 64.6      | 0.45  | OK    |
| 23       | H/9-11             | 7          | 3.5         | 38.5   | 0.0043   | 177.1 | 132.9          | 118       | 0.89  | OK    |
| 24       | A/10-11            | 11         | 3.5         | 38.5   | 0.0022   | 278.4 | 208.8          | 66.7      | 0.32  | OK    |
| 25       | D/10-11            | 10         | 3           | 32.5   | 0.0025   | 213.6 | 160.2          | 161       | 1.00  | OK    |
| 26       | A/15-16            | 11         | 3.5         | 38.5   | 0.0022   | 278.4 | 208.8          | 67        | 0.32  | OK    |
| 27       | D/15-16            | 9.5        | 3           | 32.5   | 0.0029   | 202.9 | 152.2          | 160       | 1.05  | NG    |
| 28       | H/15-16            | 8          | 3.5         | 38.5   | 0.0032   | 202.4 | 151.8          | 138       | 0.91  | OK    |
| 29       | K/15-16            | 7          | 3.5         | 38.5   | 0.0026   | 177.1 | 132.9          | 68.5      | 0.52  | OK    |

Check at distance "d"  $V_u = 109$  k < 152 k OK

|                                   |  |  |  |               |                  |
|-----------------------------------|--|--|--|---------------|------------------|
| Project: South Hill 1015 Building |  |  |  | Date: 12/9/24 | Job No: 19305.04 |
| Client: Benaryoa                  |  |  |  | By: TVM       | Sheet: 2         |