

Designing and Engineering for High Rise and Modular Buildings

by

Michael Hough



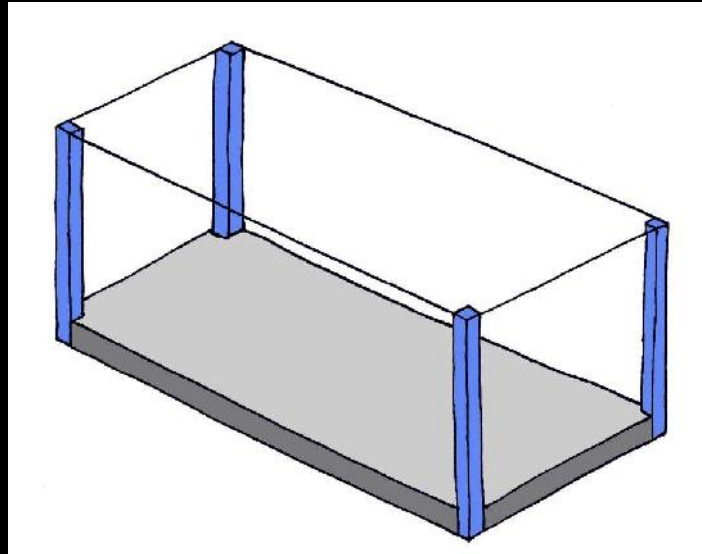
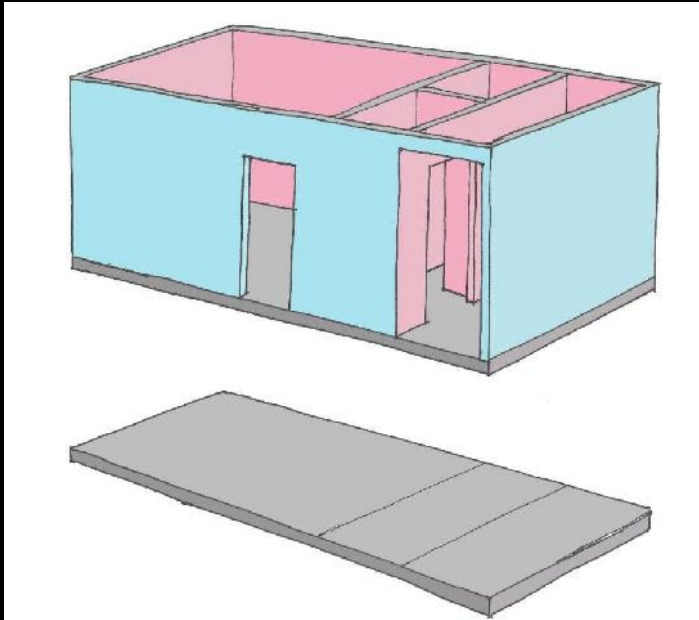


MODULAR

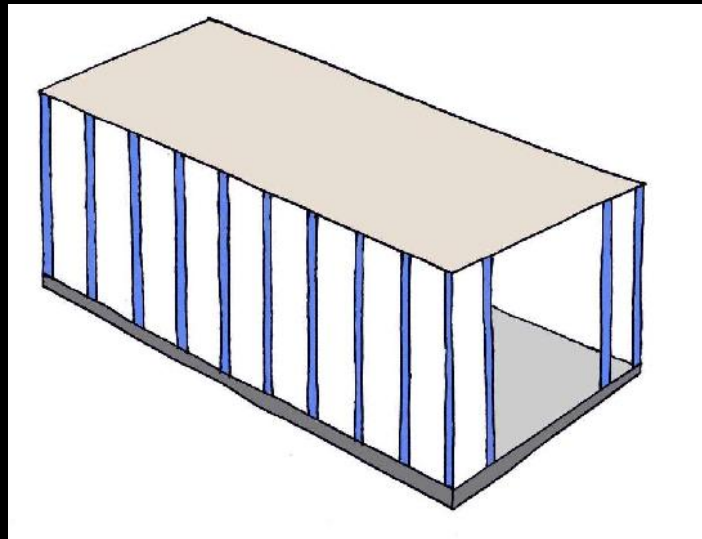
CONSTRUCTION



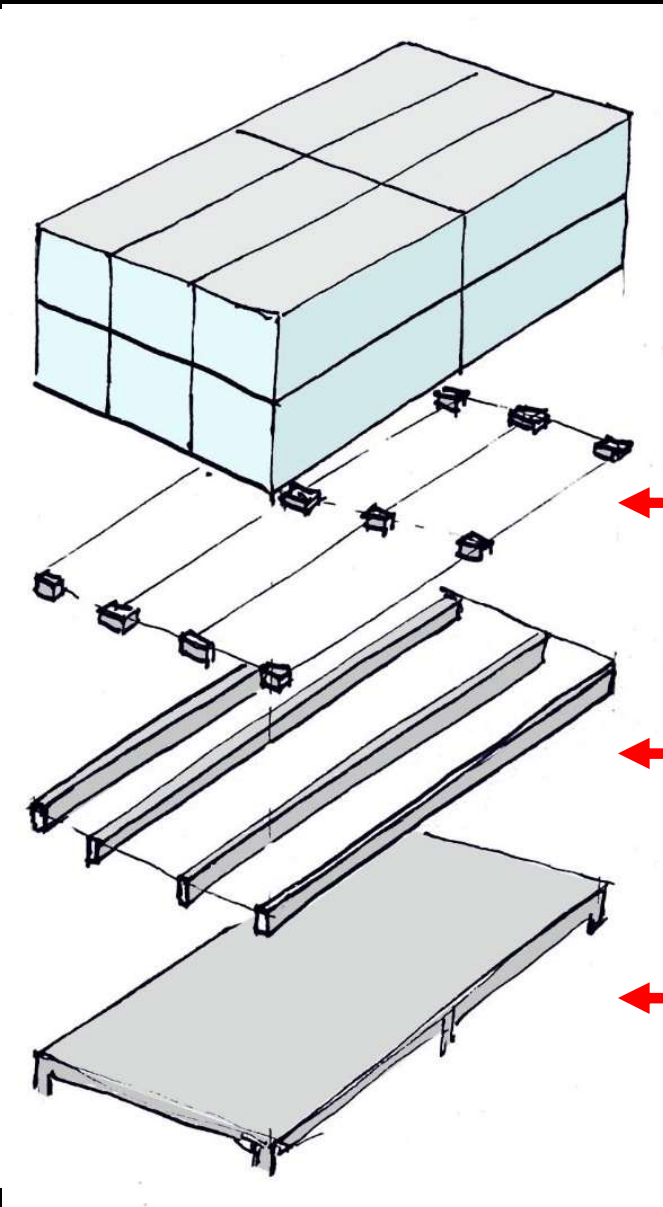
Types of Modules



**Corner
Supported**



**Wall
Supported**



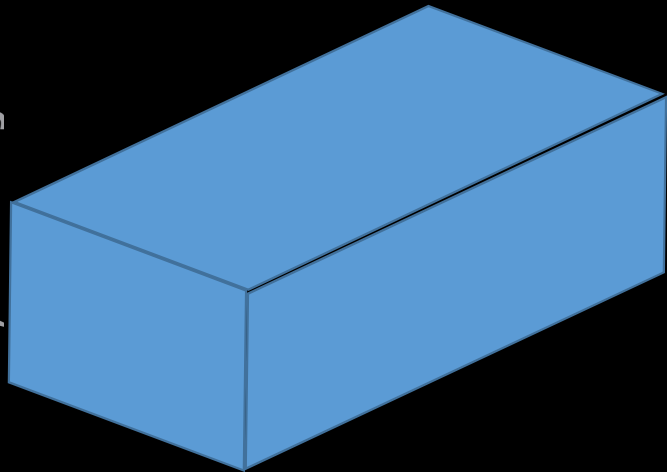
PRINCIPLES OF SUPPORT

Point Support To Module
Load Bearing Columns

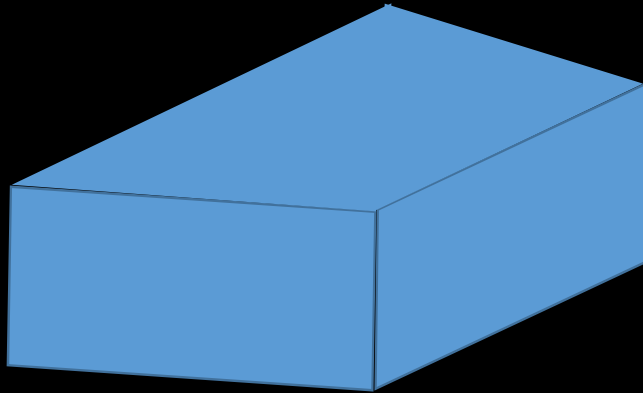
Linear Support to Wall
Elements

Slab Support To Wall or
Column Elements

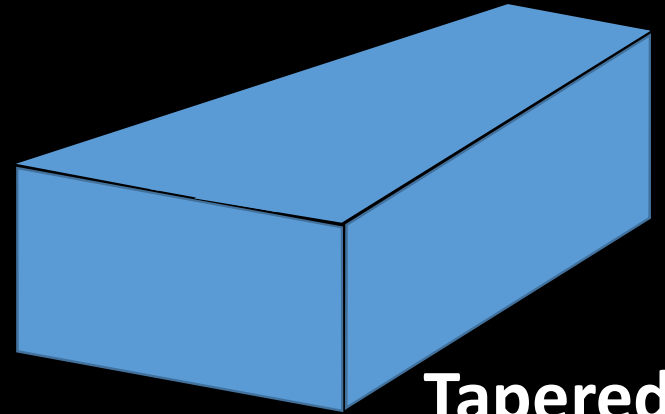
COMMON SHAPES



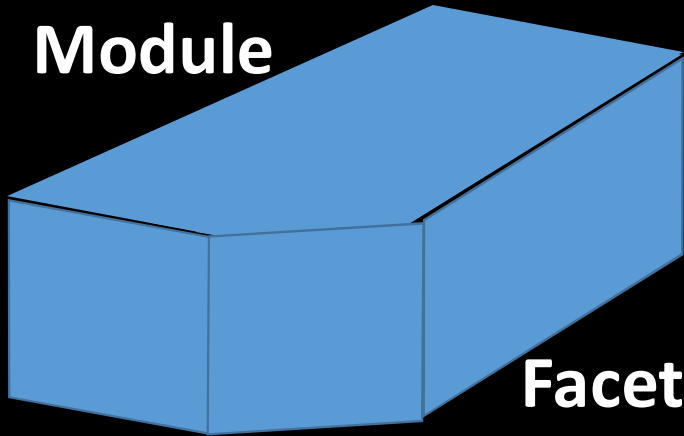
**Rectangular
Module**



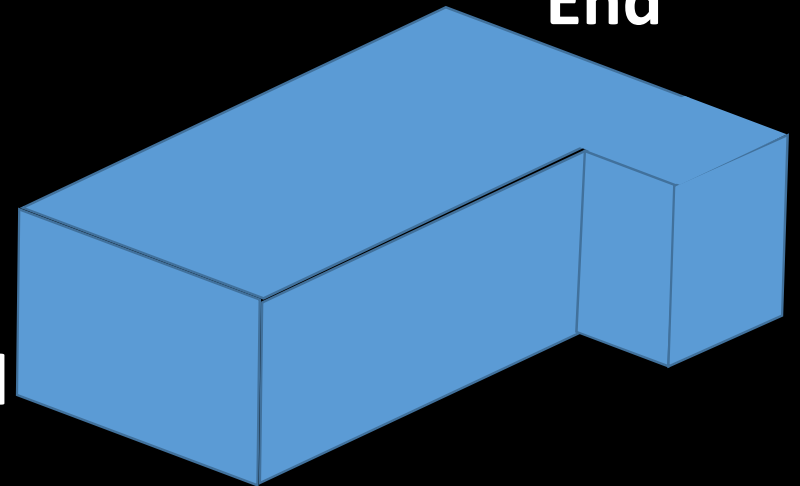
**Sloped
End**



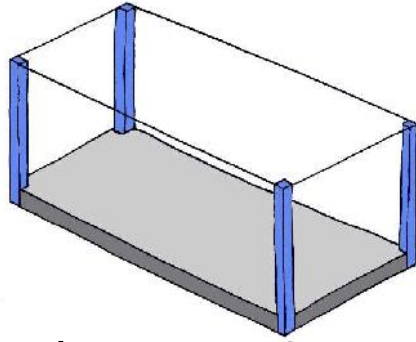
**Tapered
End**



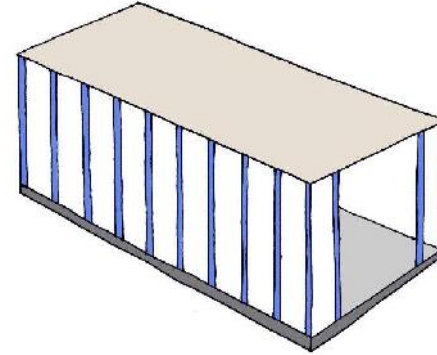
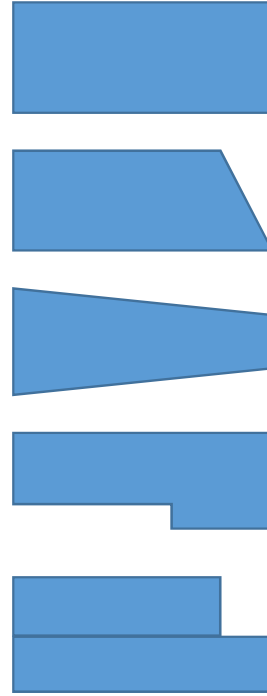
**Faceted
Module**



**Stepped
Module**



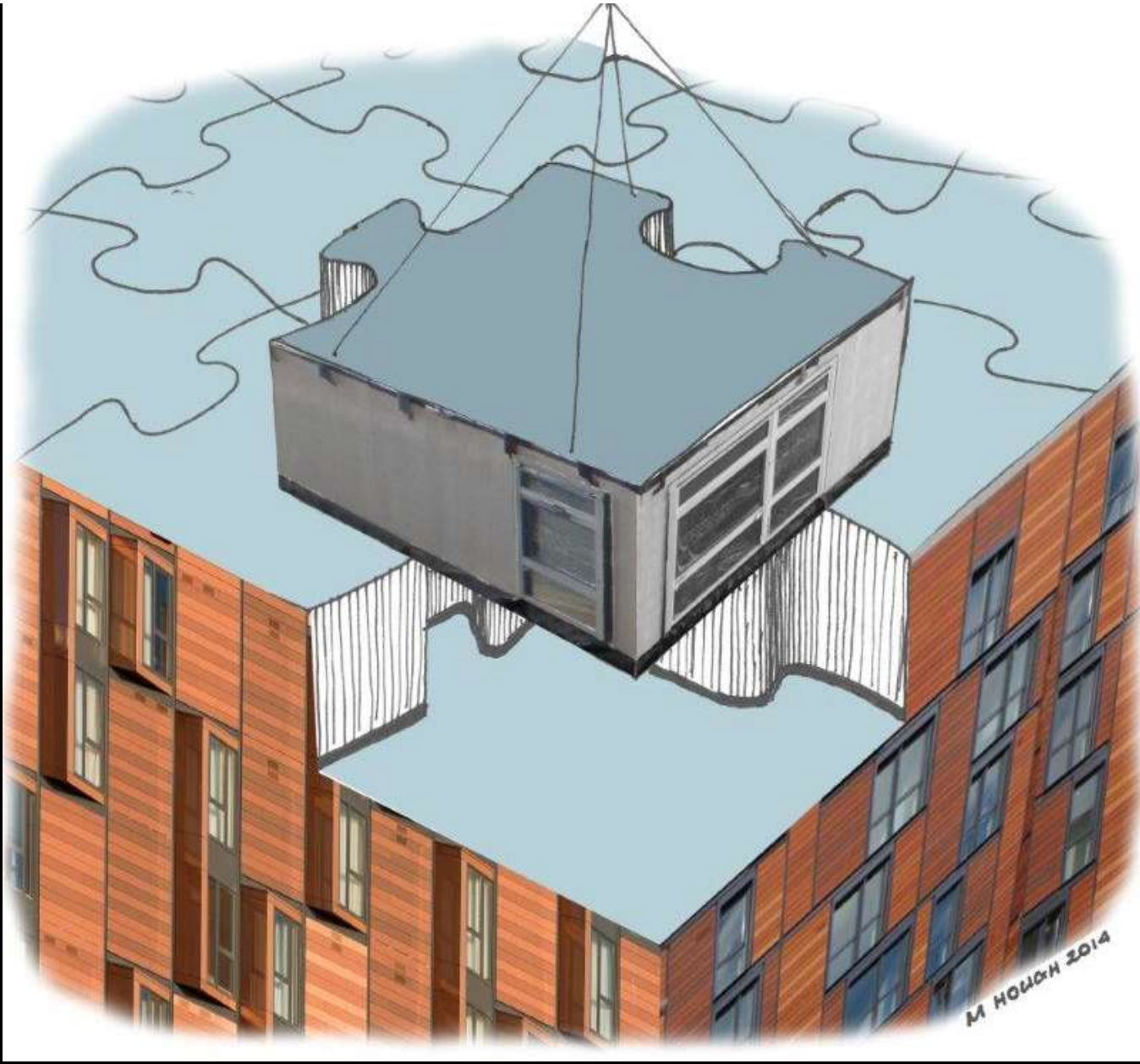
✓	Unlikely	✓
Less Likely	✓	
Possible		✓

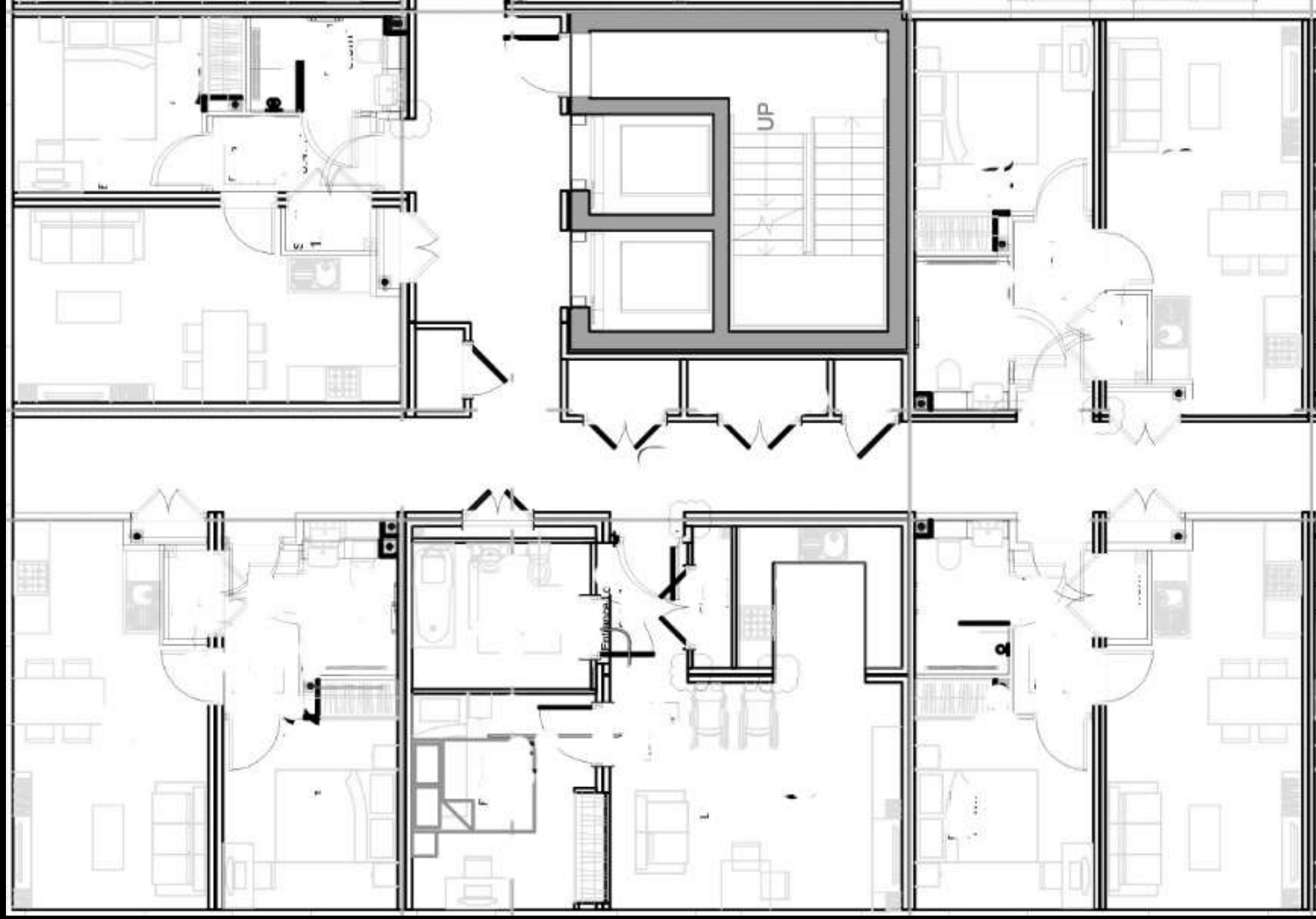


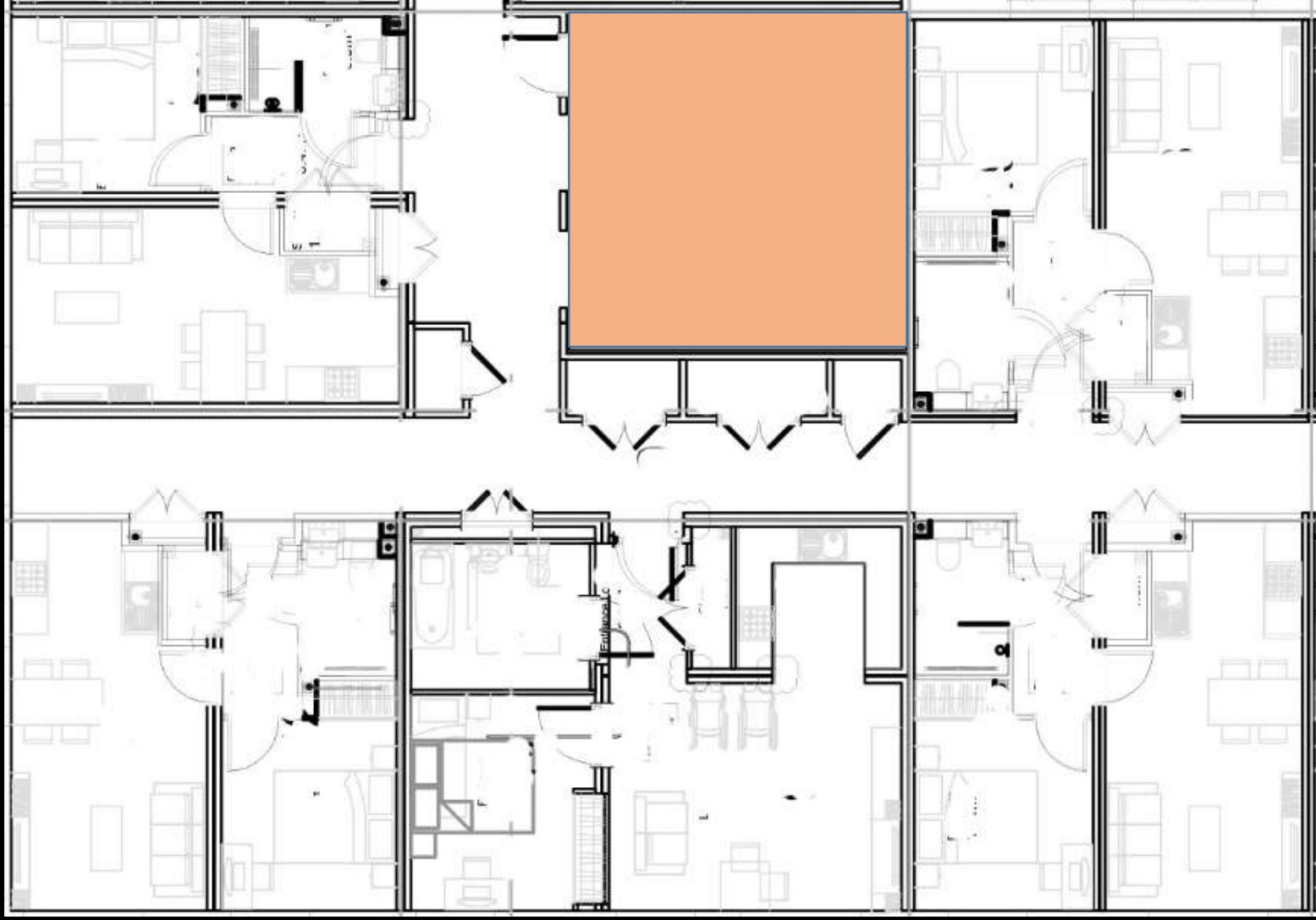
COMPATIBILITY OF TYPE AND SHAPE

✓	Rectangular Module
✓	Sloped Module
✓	Tapered Module
✓	Stepped Module
✓	Setback Module

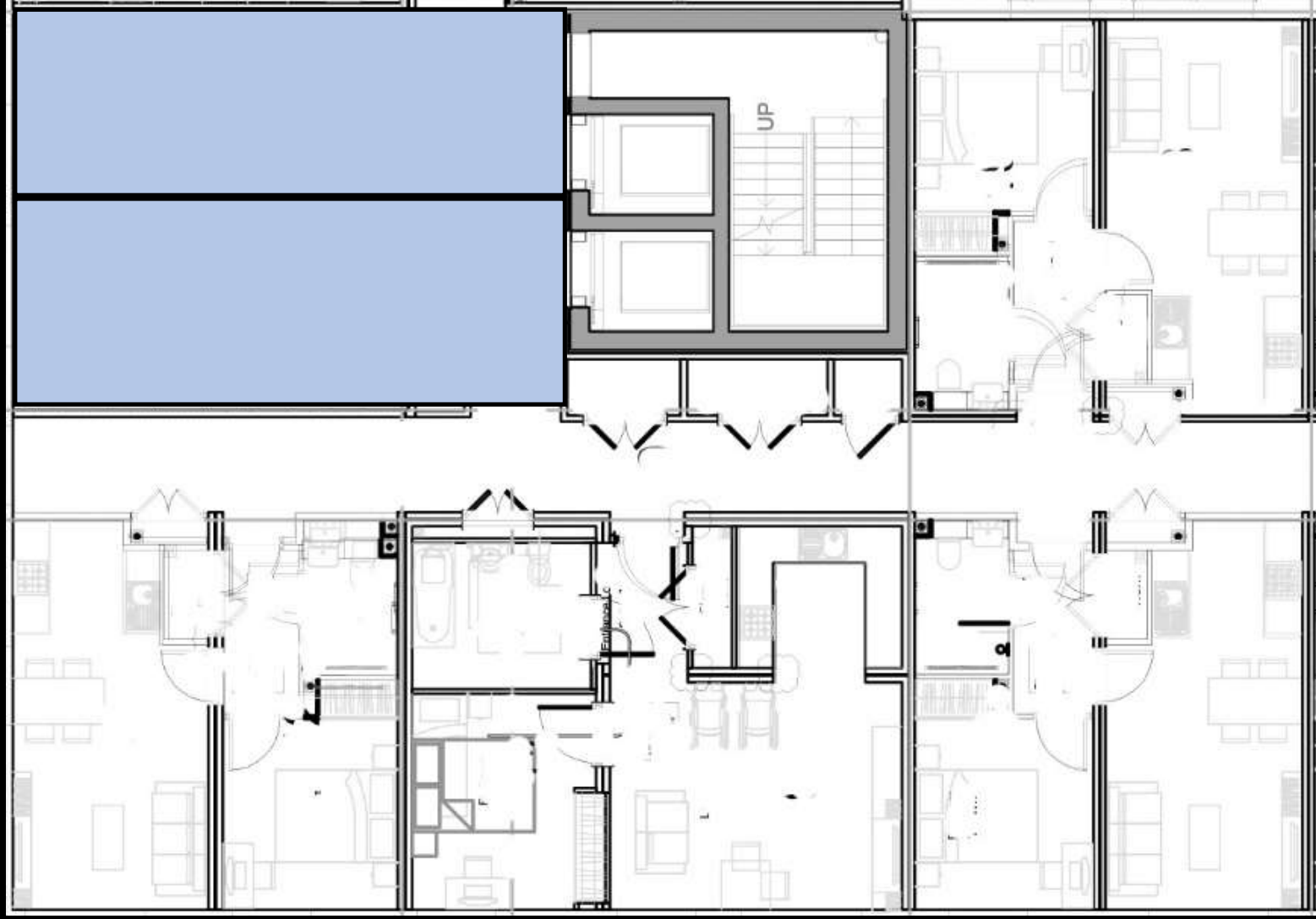






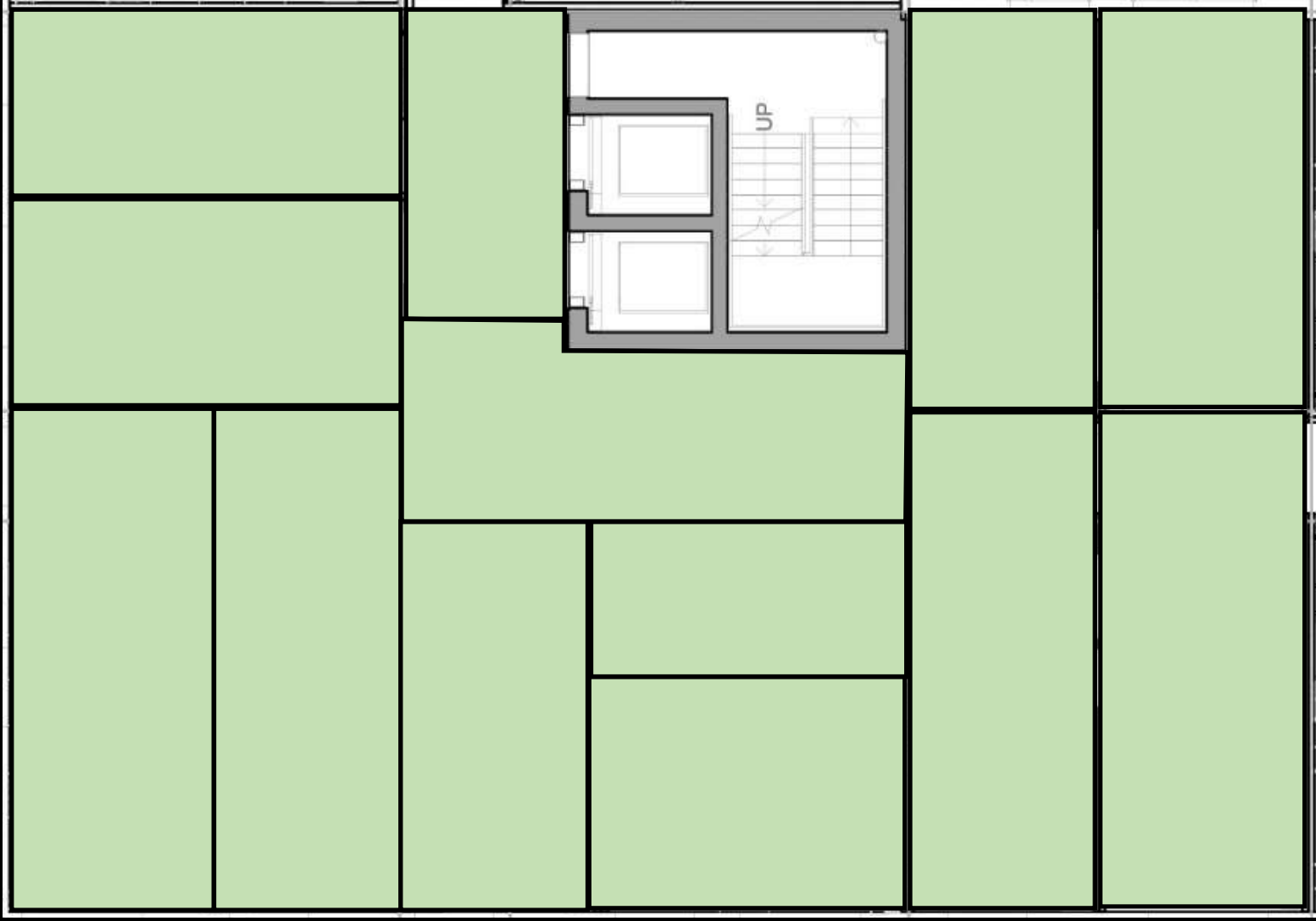




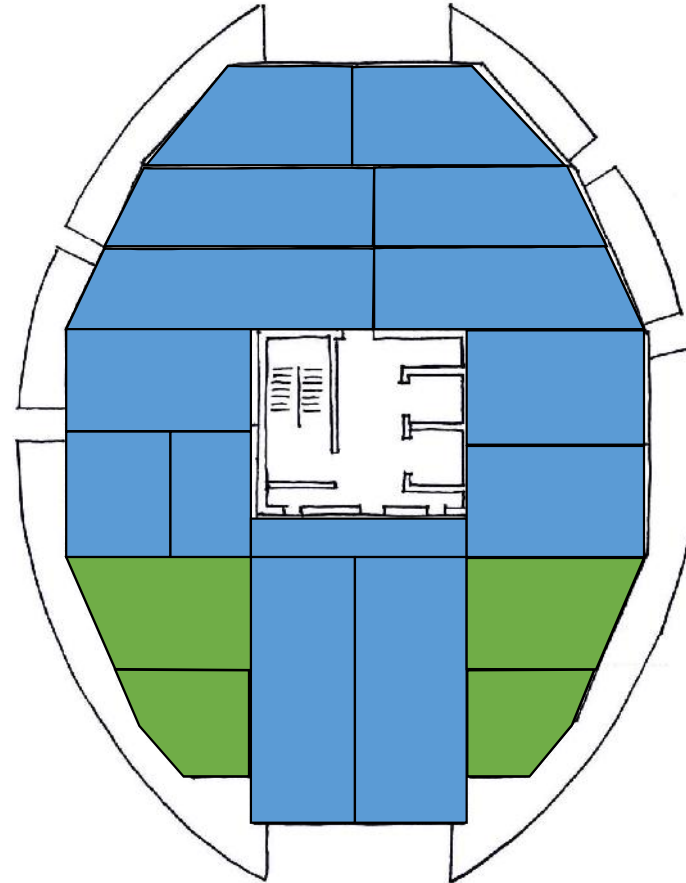
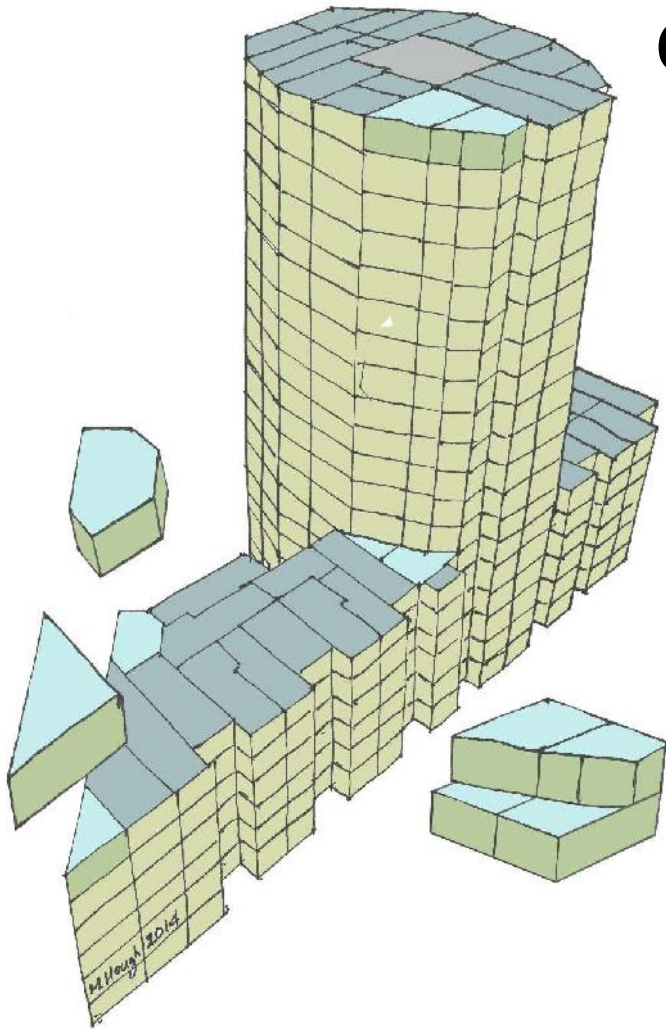


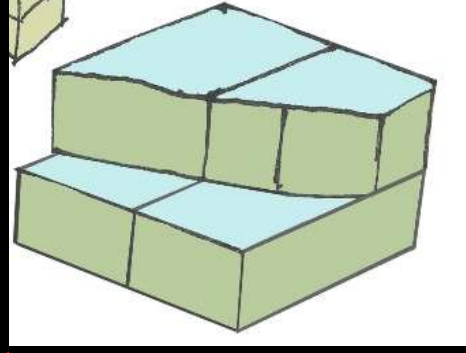
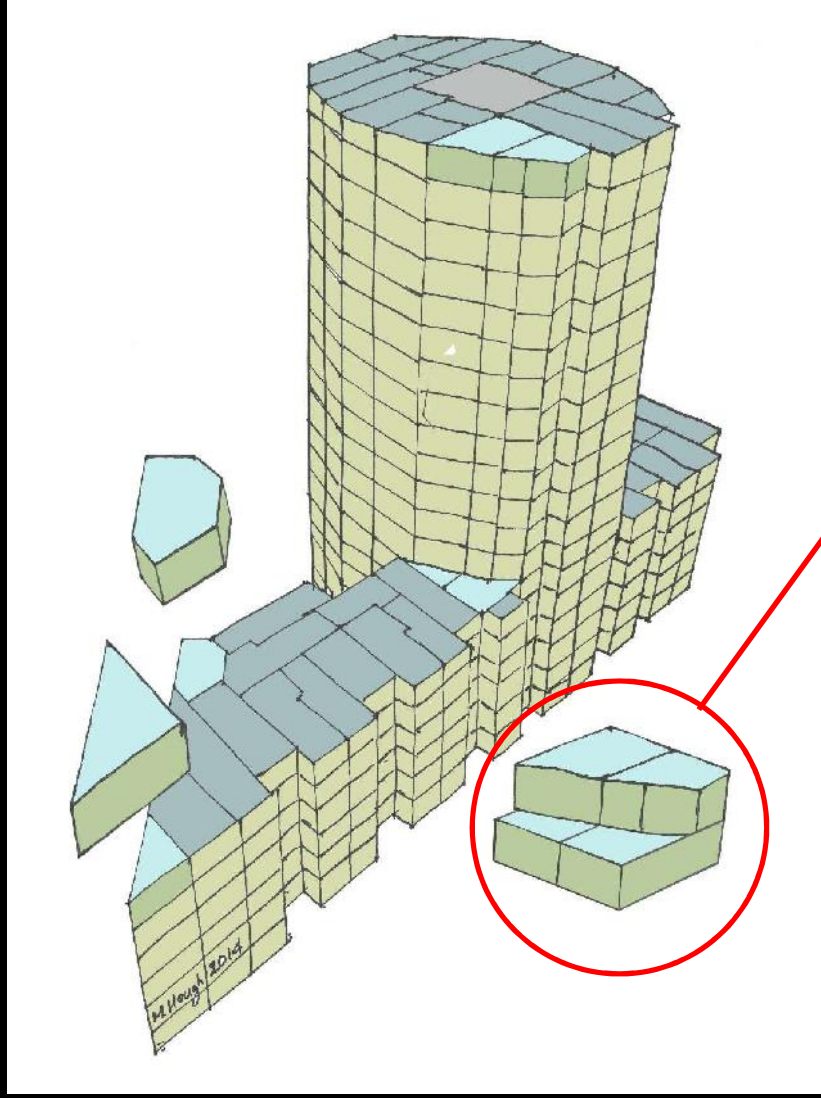






CHANGING MODULE SHAPES

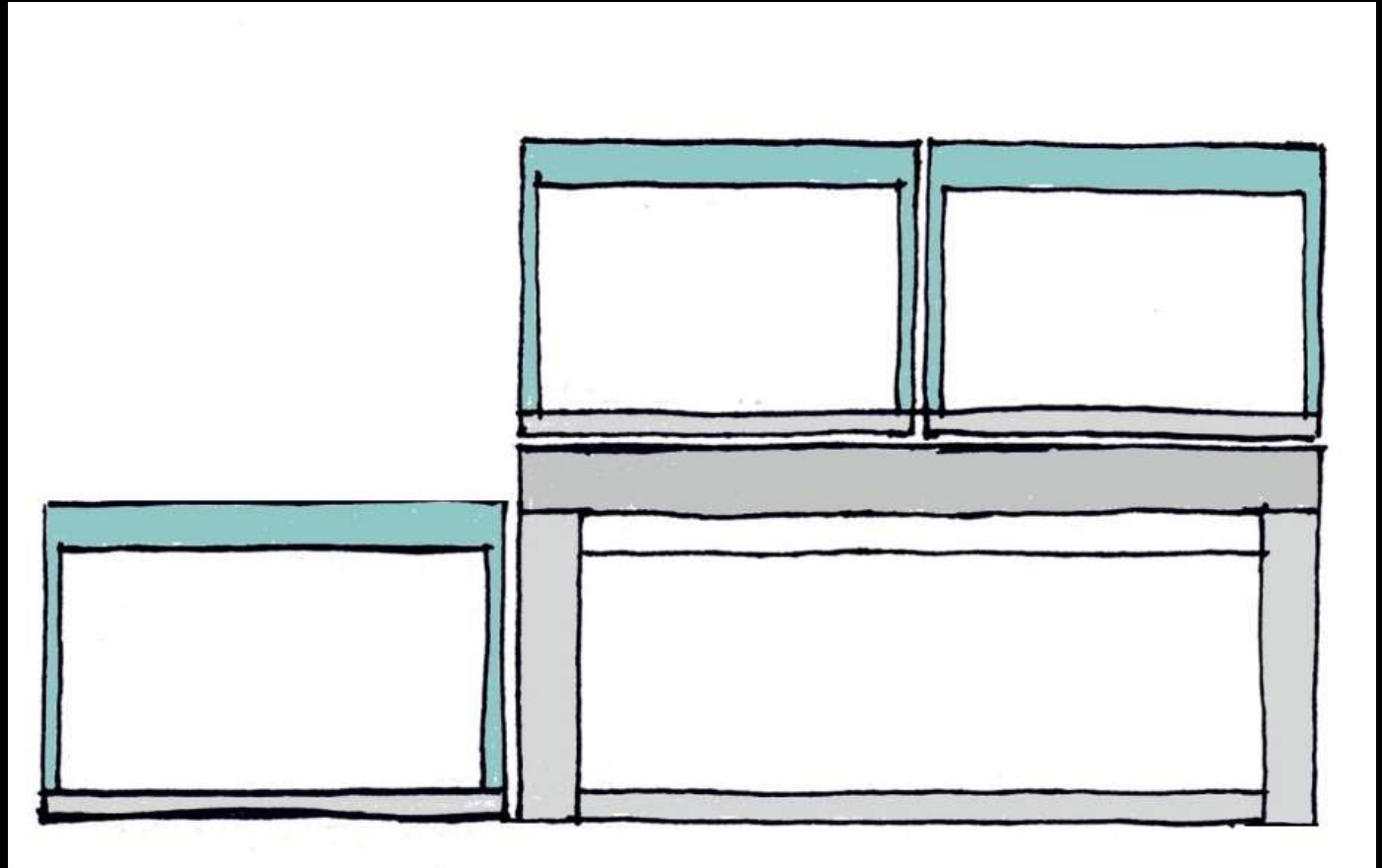






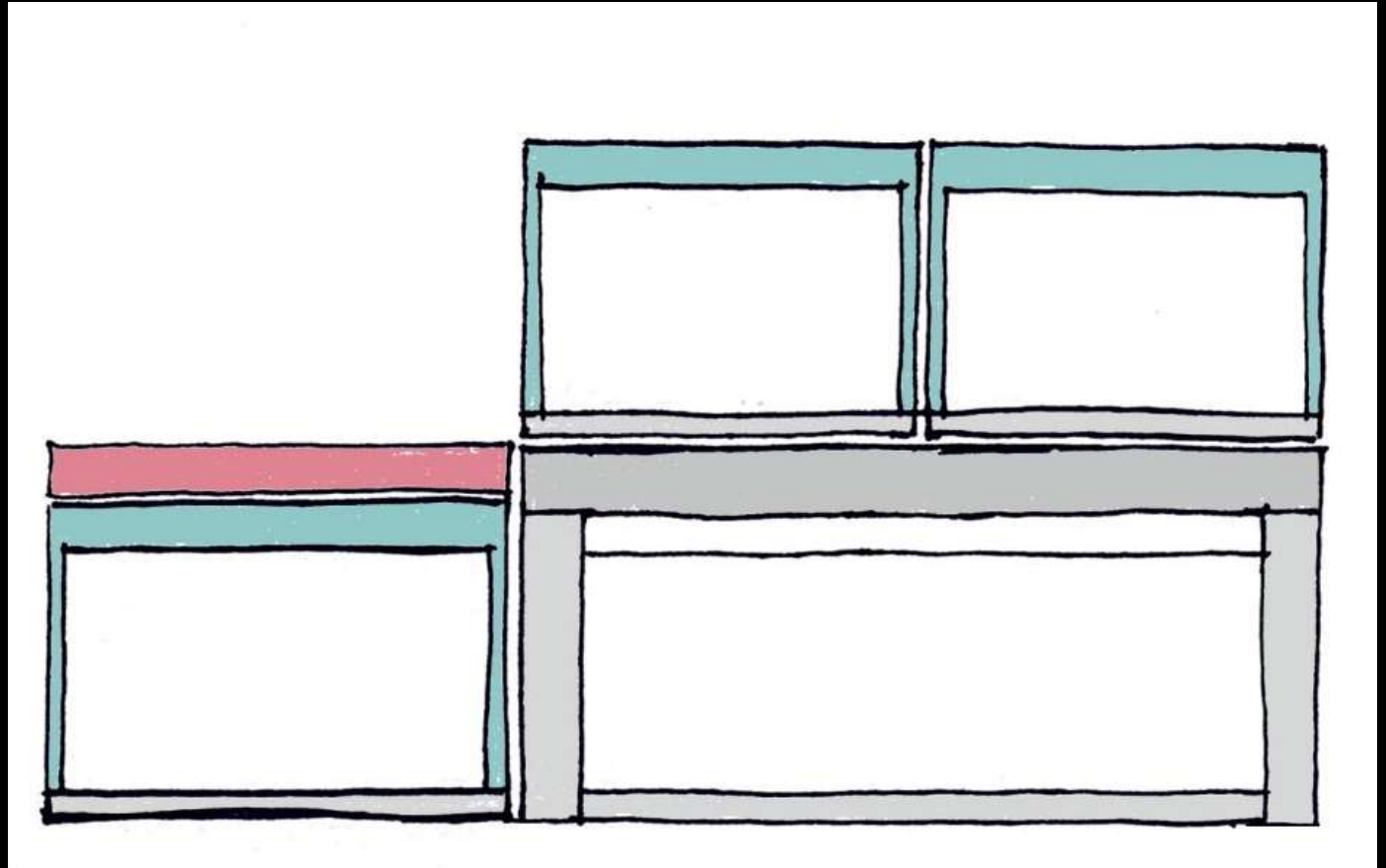
Infill Frame To Level Modules And Traditional Structure

**MODULE
BESIDE →
TRADITIONAL**



Infill Frame To Level Modules And Traditional Structure

INFILL →
MODULE
BESIDE →
TRADITIONAL



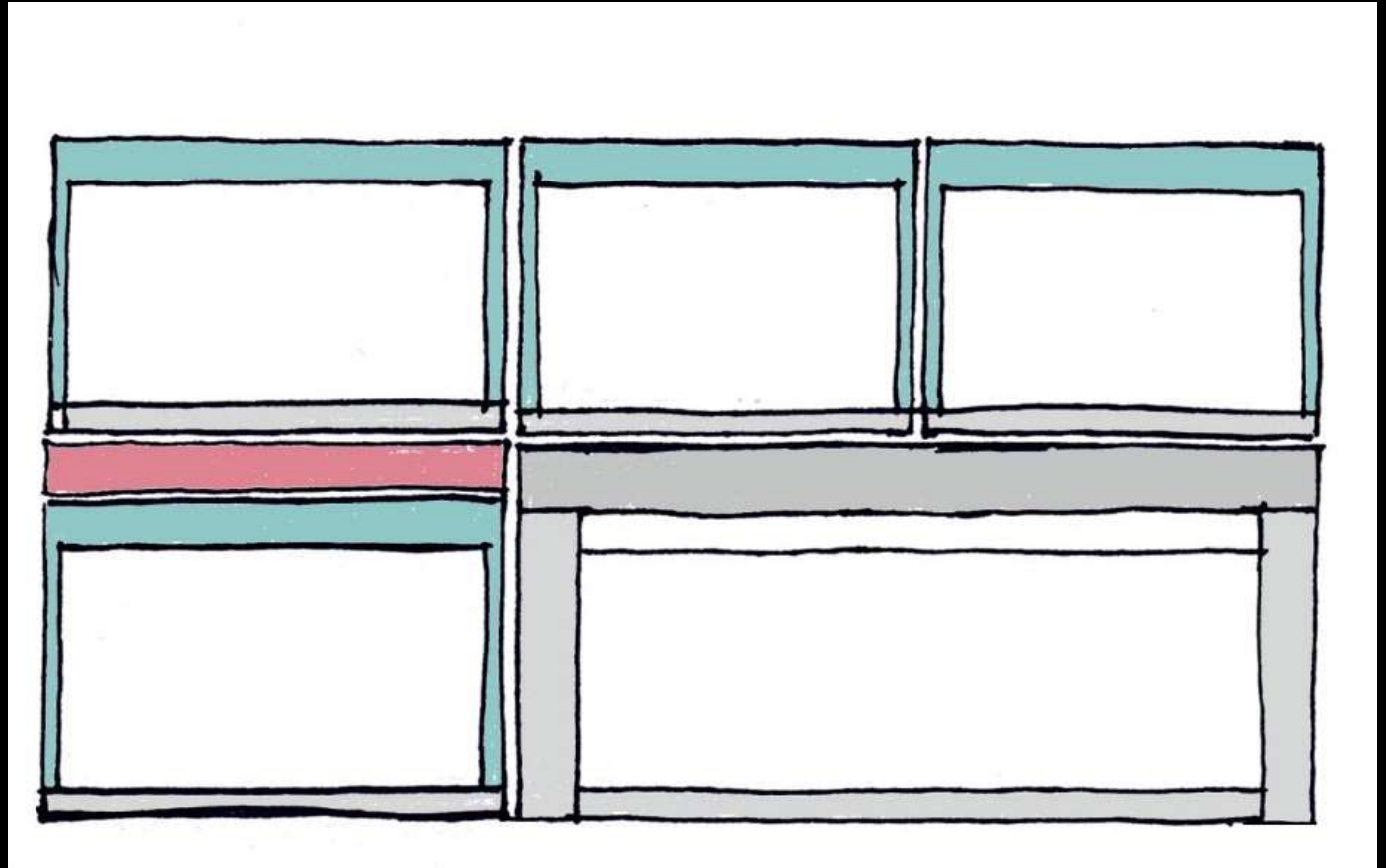
Infill Frame To Level Modules And Traditional Structure

**UPPER
MODULE** →

INFILL →
MODULE

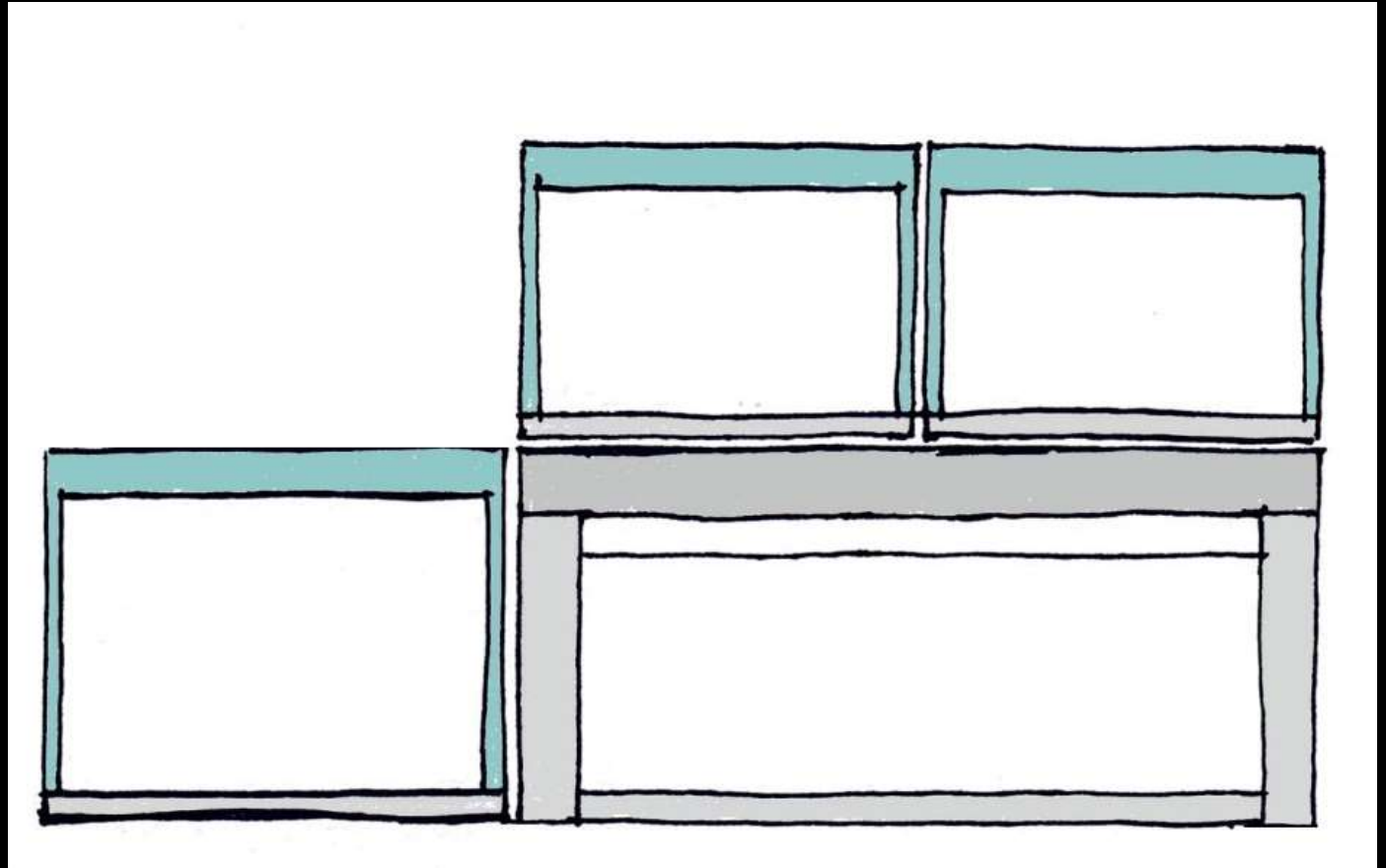
BESIDE →

TRADITIONAL



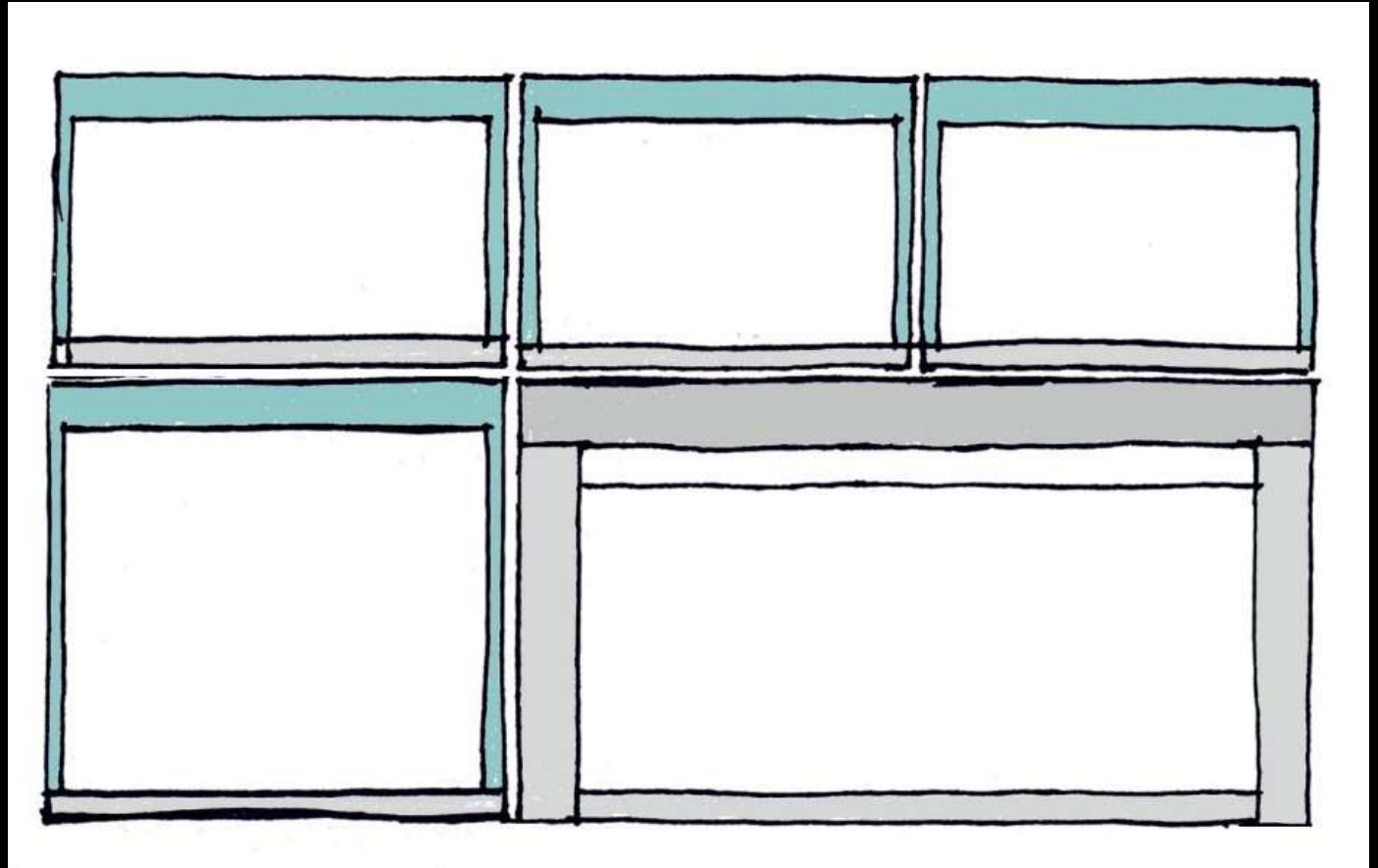
Infill Frame To Level Modules And Traditional Structure

**TALL
MODULE**

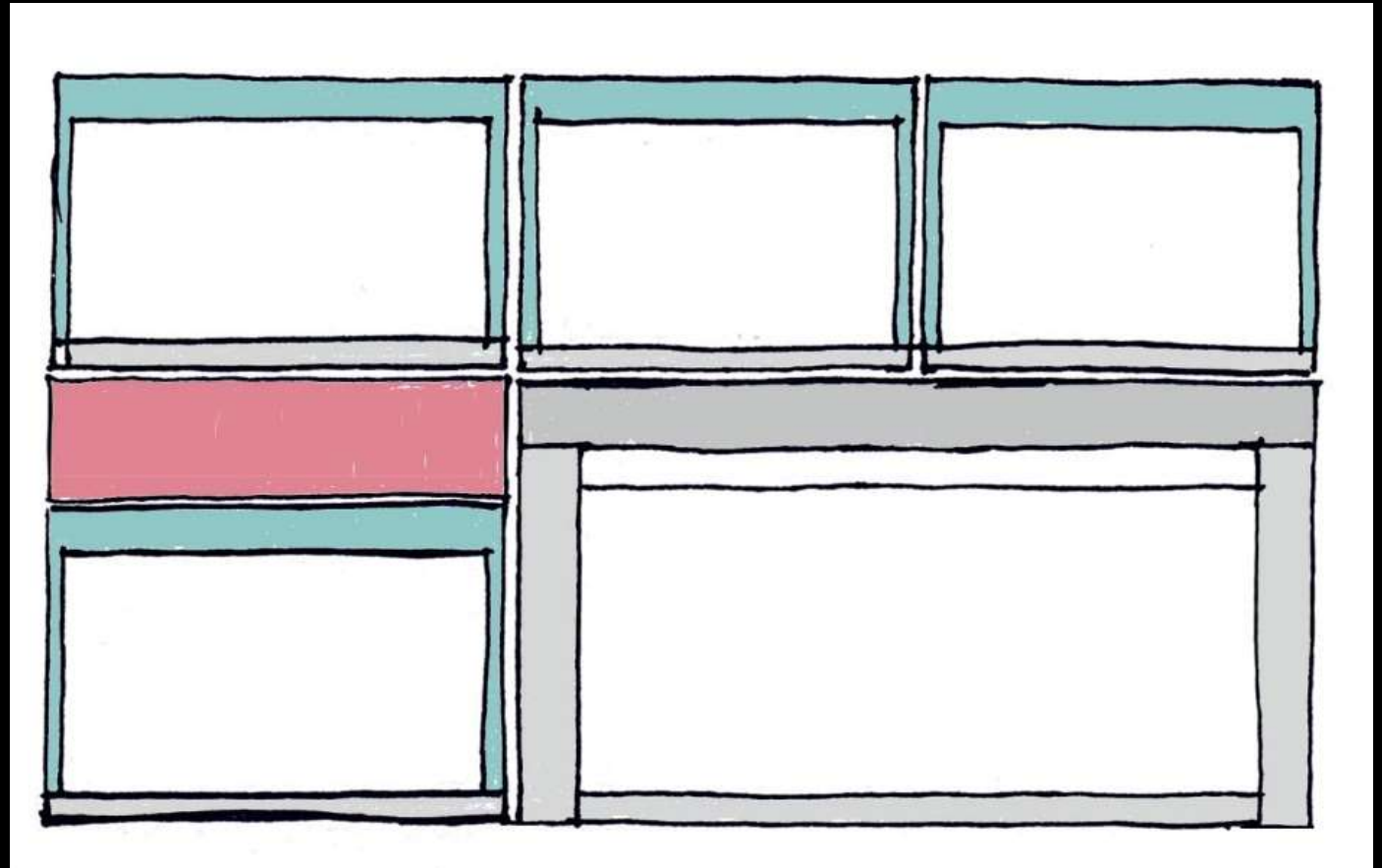
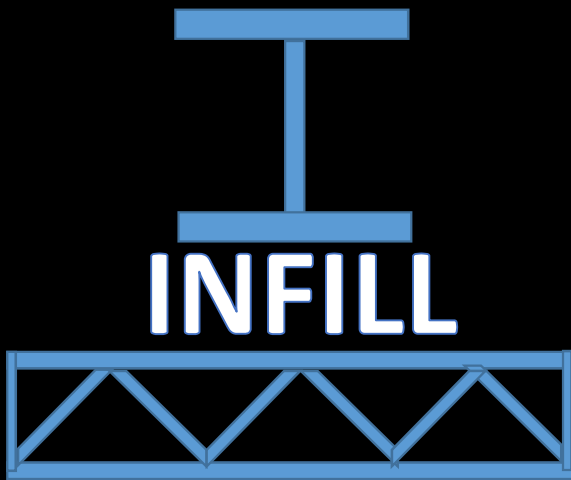


Infill Frame To Level Modules And Traditional Structure

**VERY
TALL
MODULE**

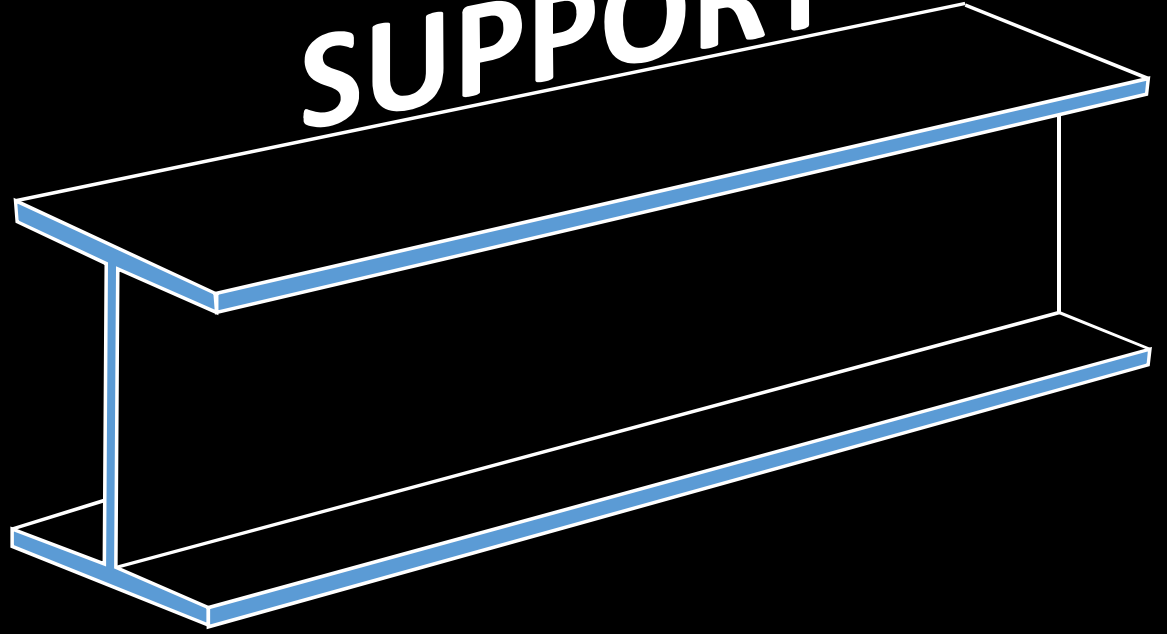


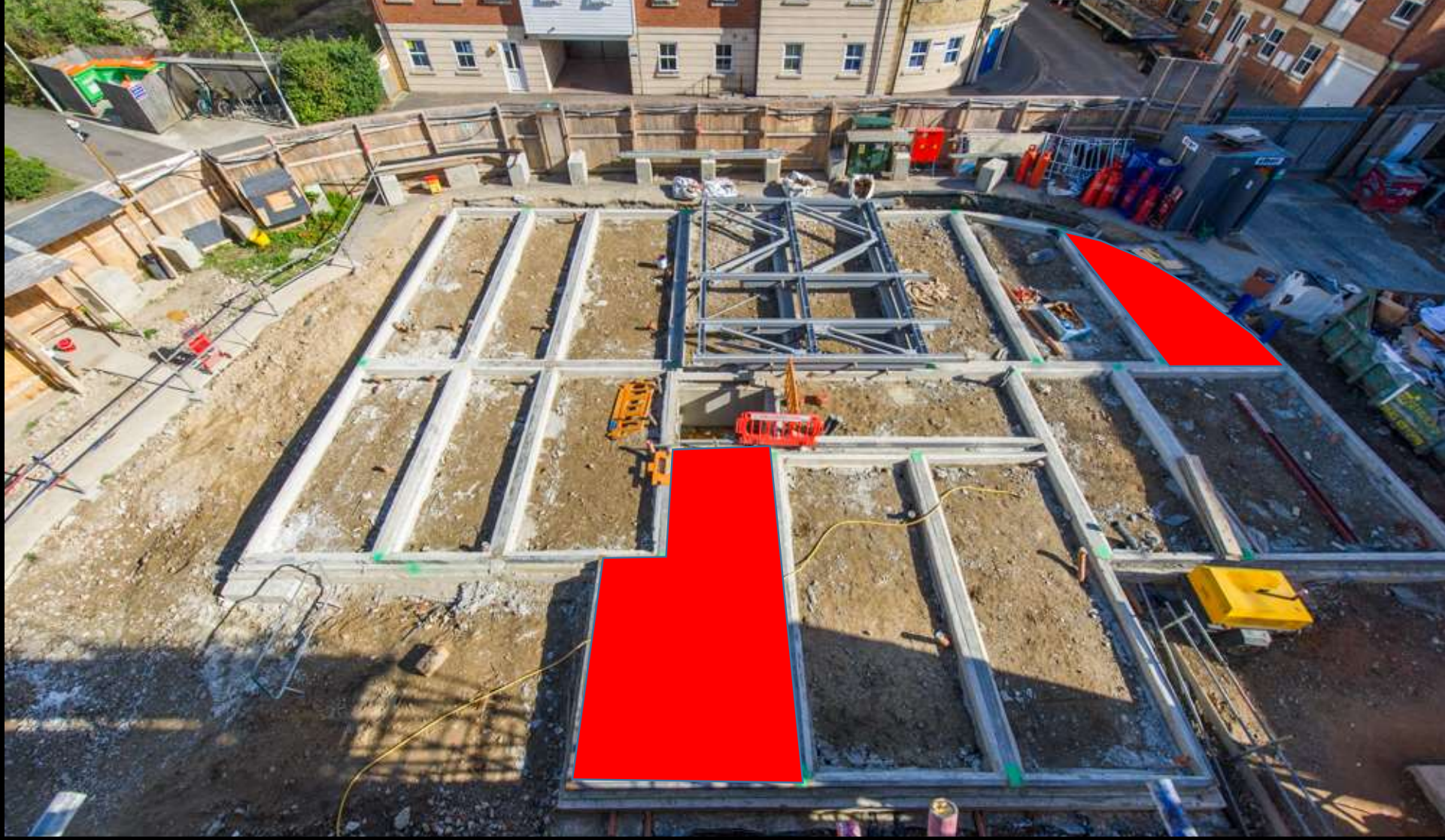
Infill Frame To Level Modules And Traditional Structure





MODULAR SUPPORT





CONCRETE TRANSFER STRUCTURE

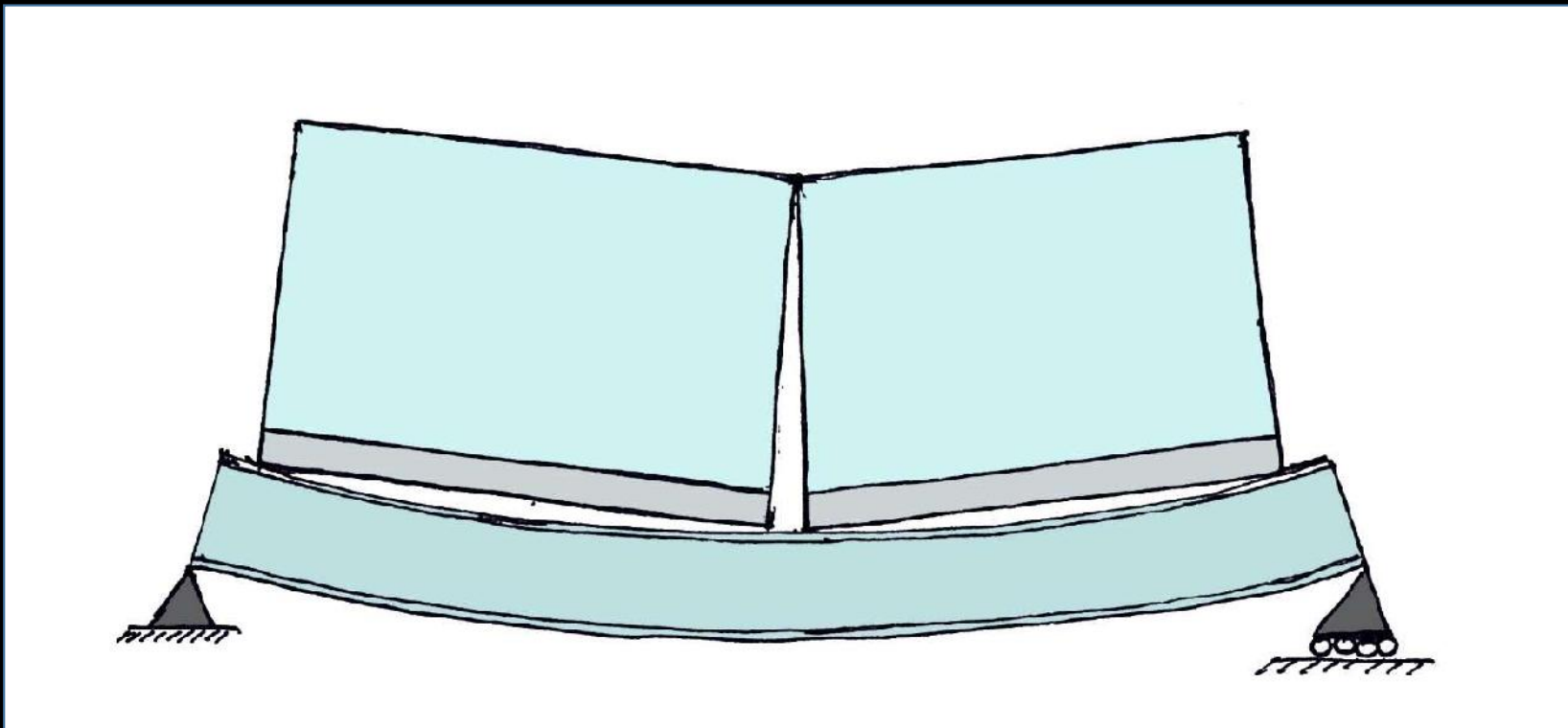


STEEL TRANSFER DECK

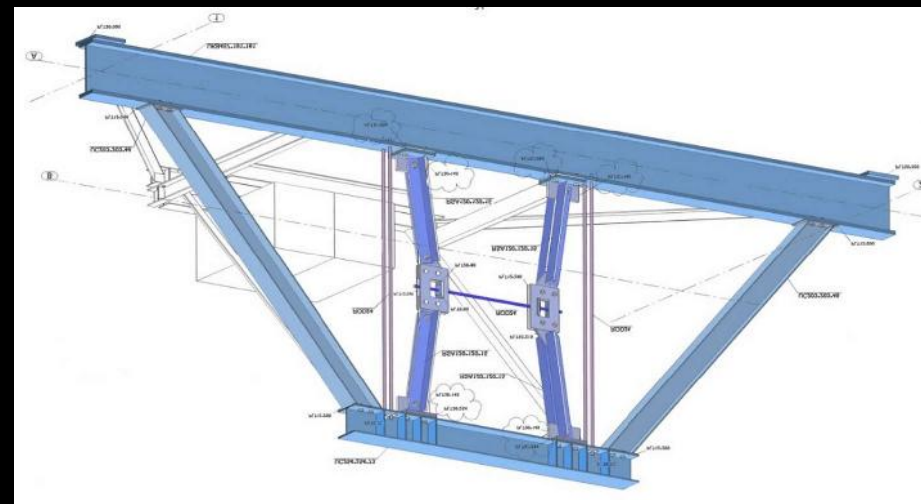




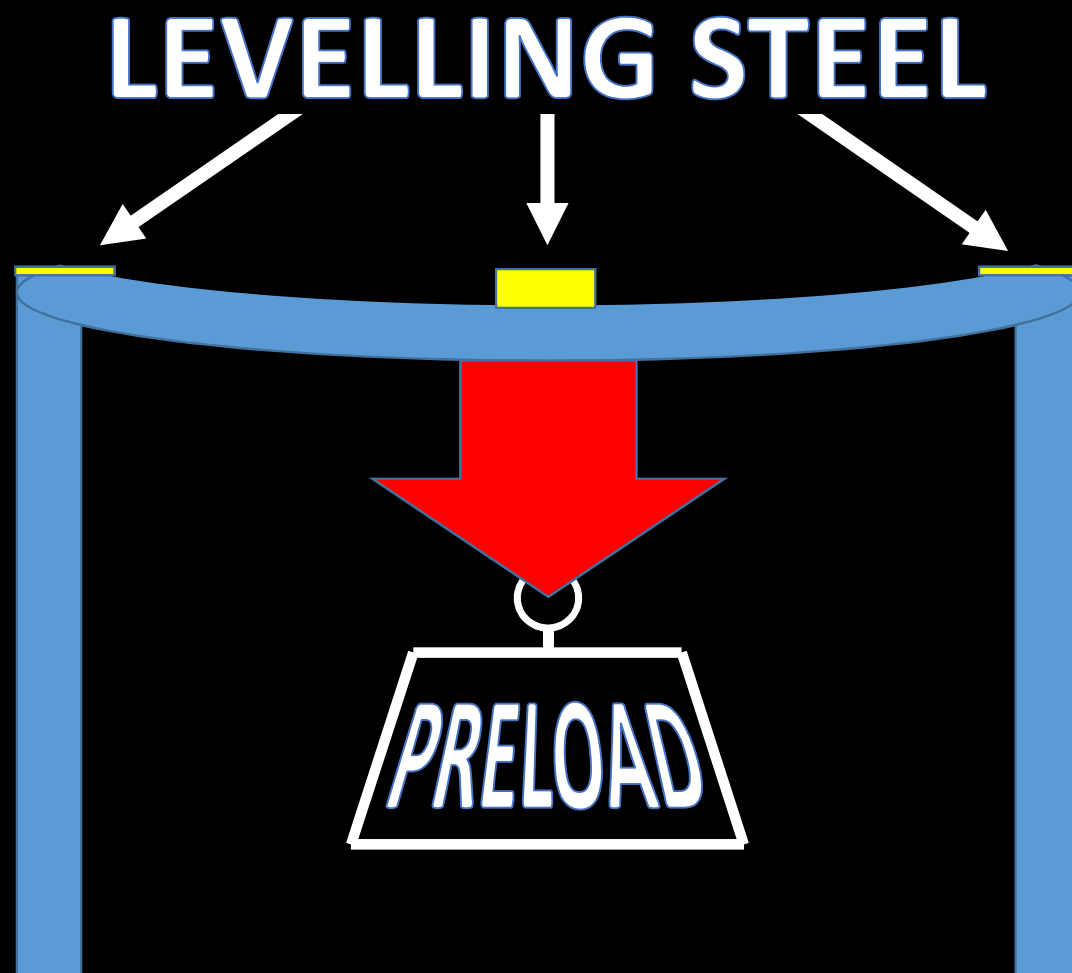


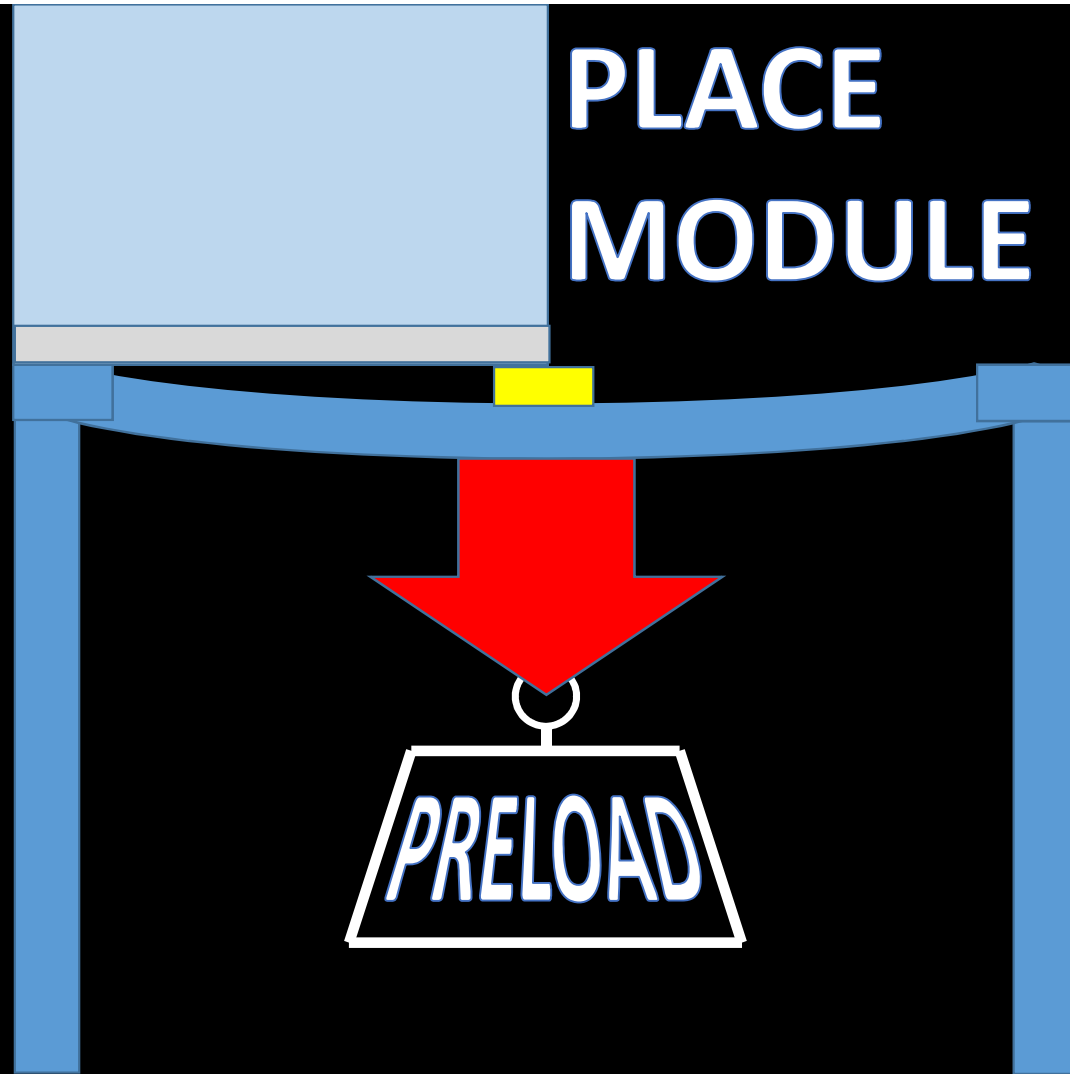


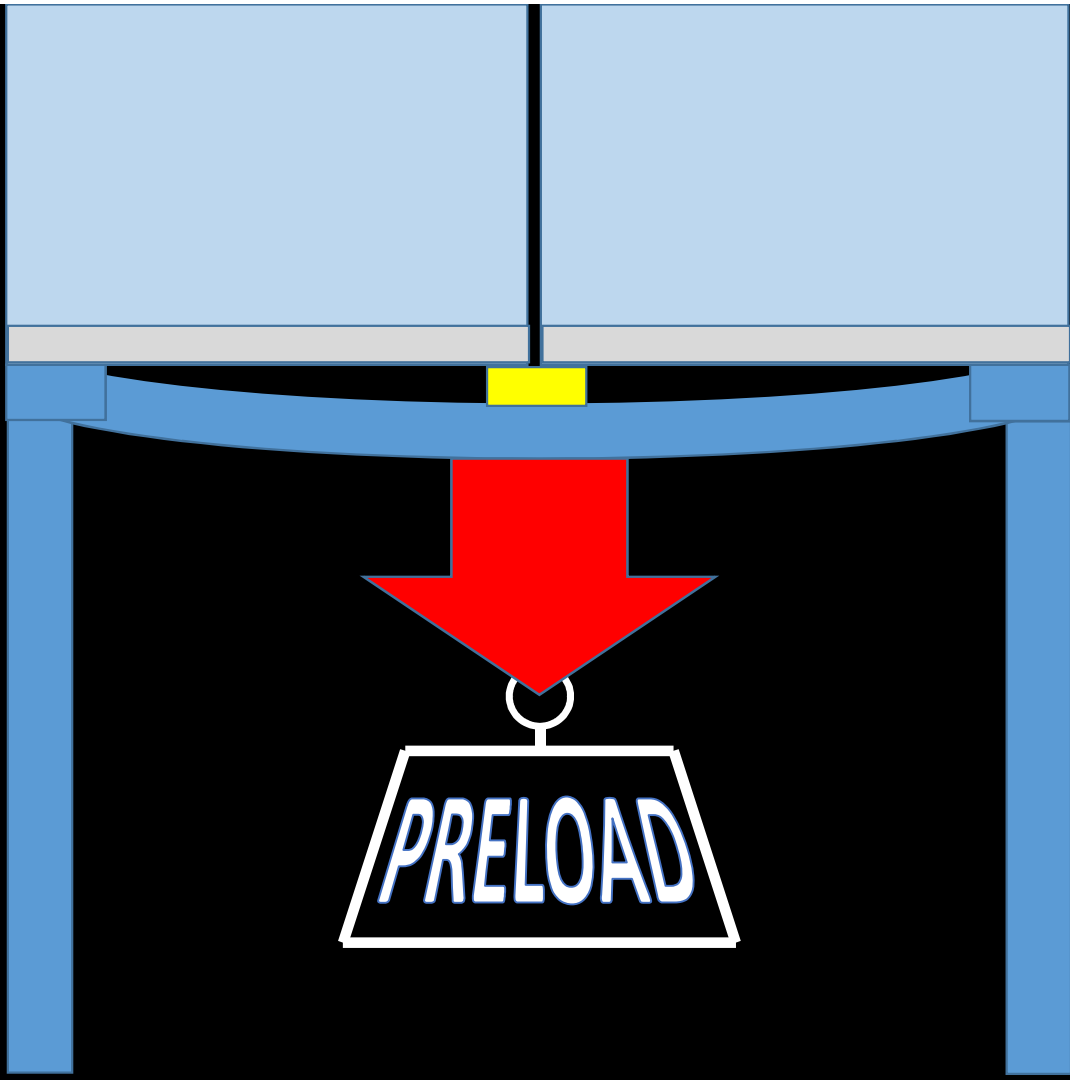
FINISHES & → FORCES ←

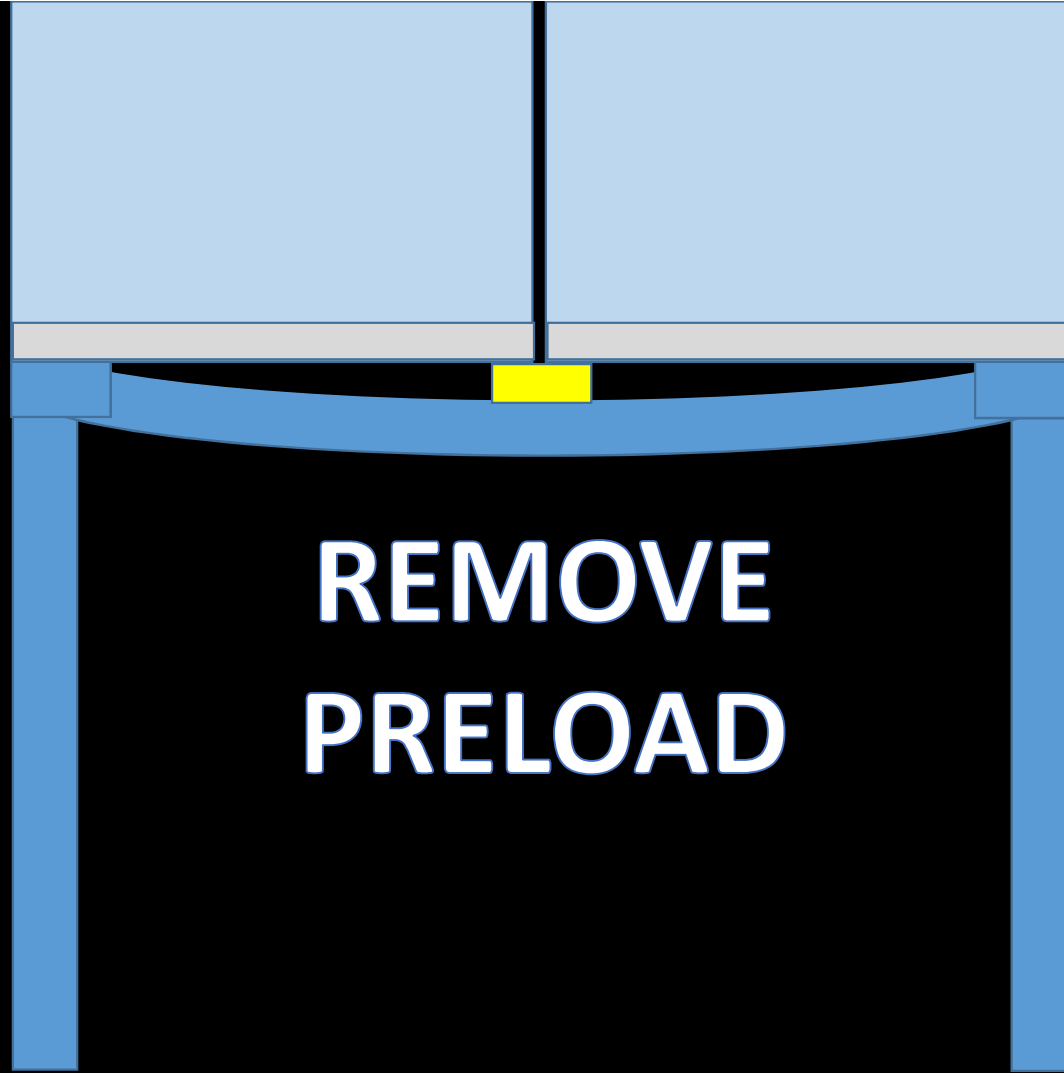


PRELOAD FRAME

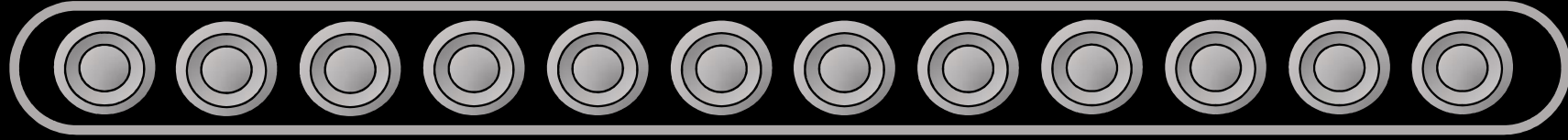


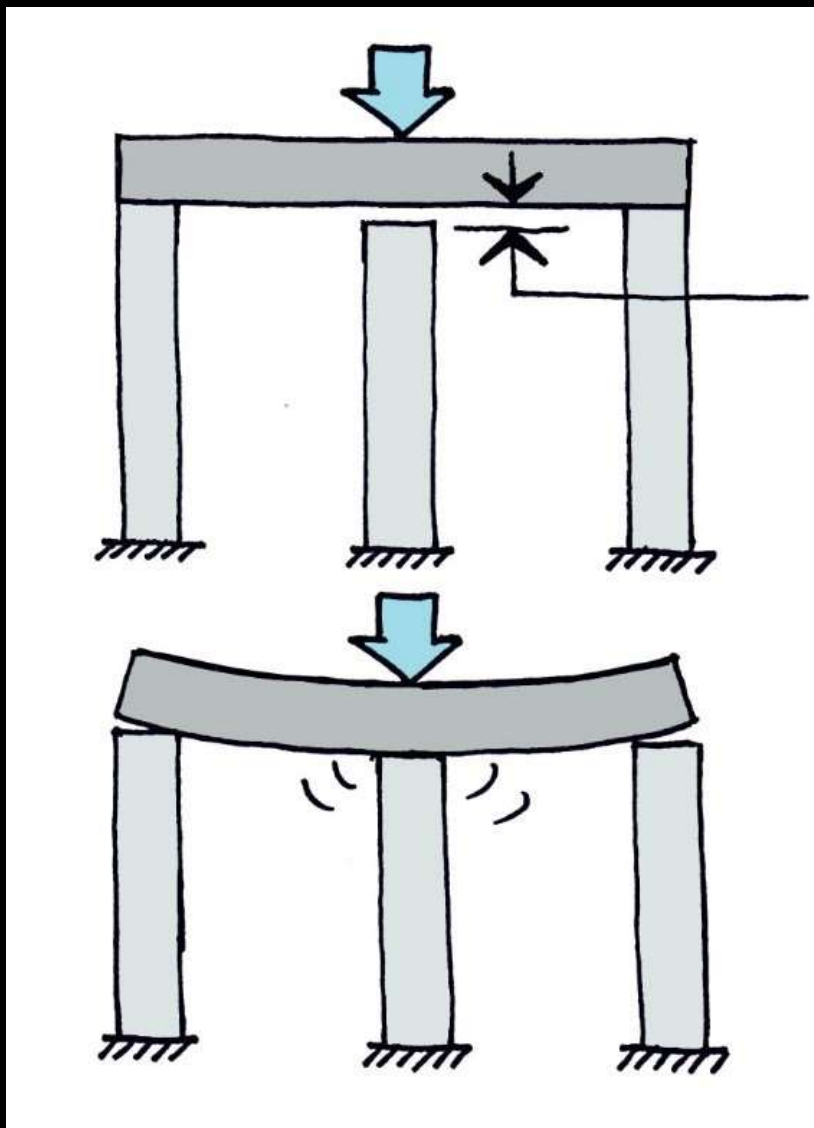




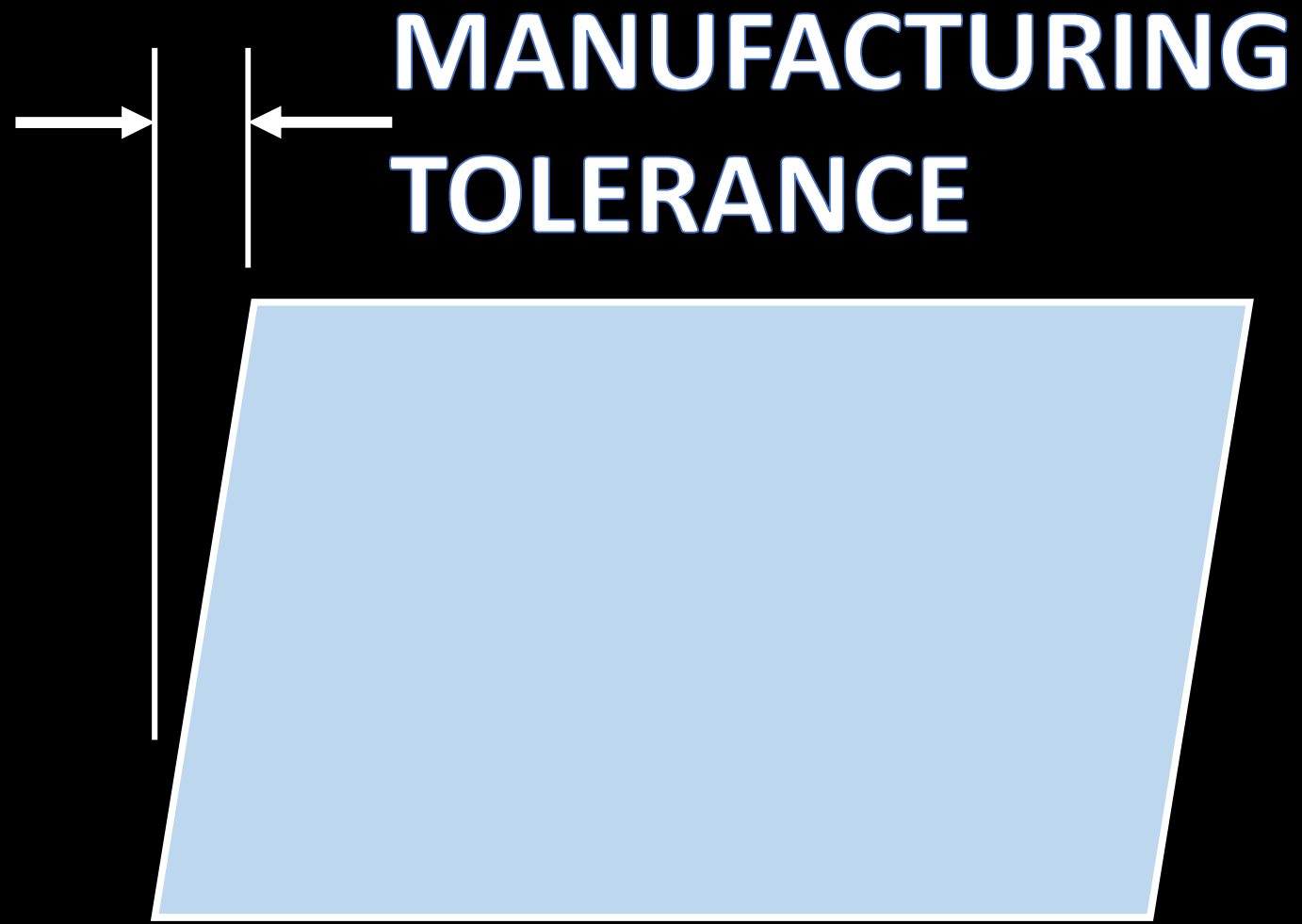


MANUFACTURING

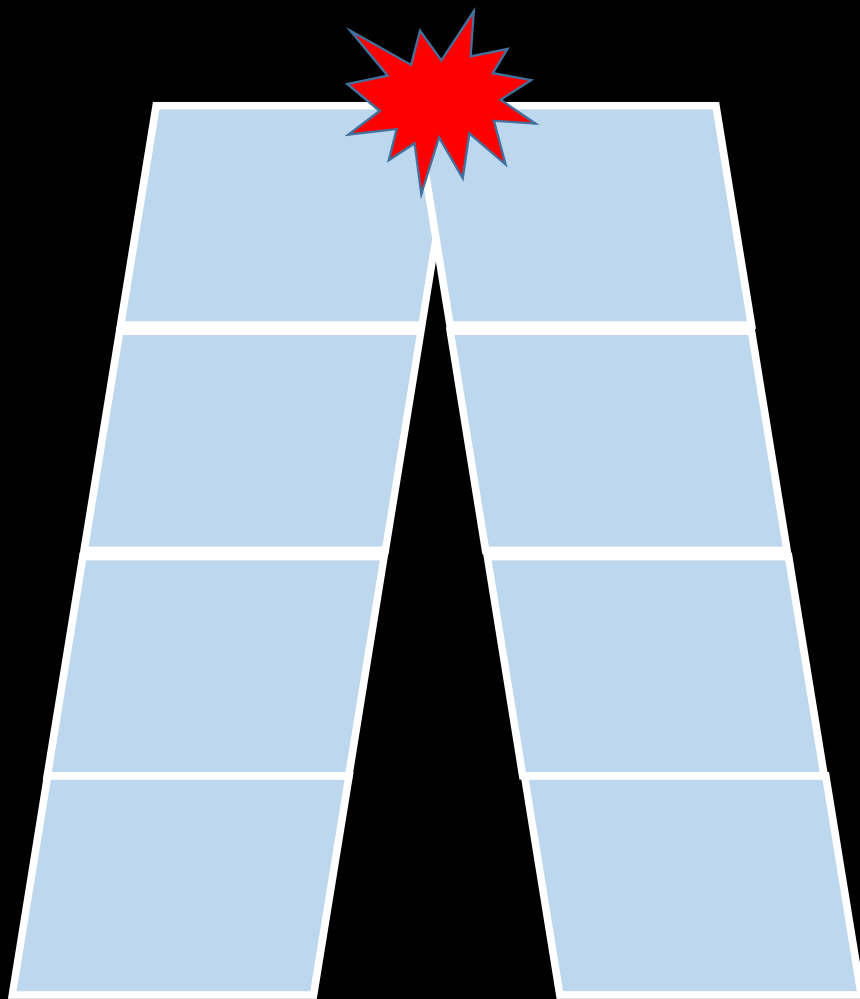




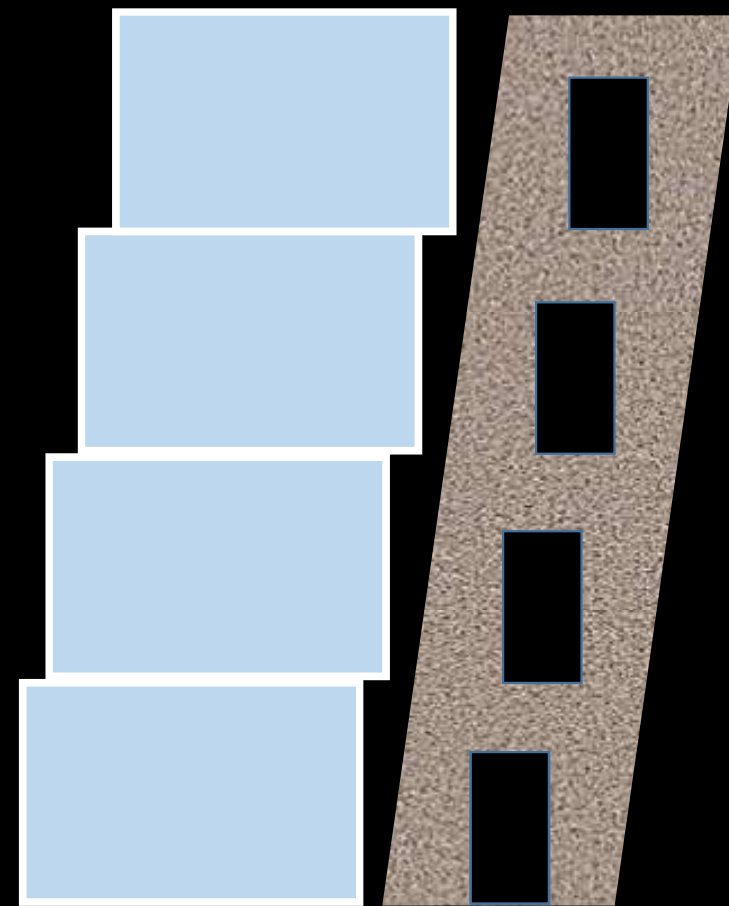
**Possible
Manufacturing
Inaccuracy**

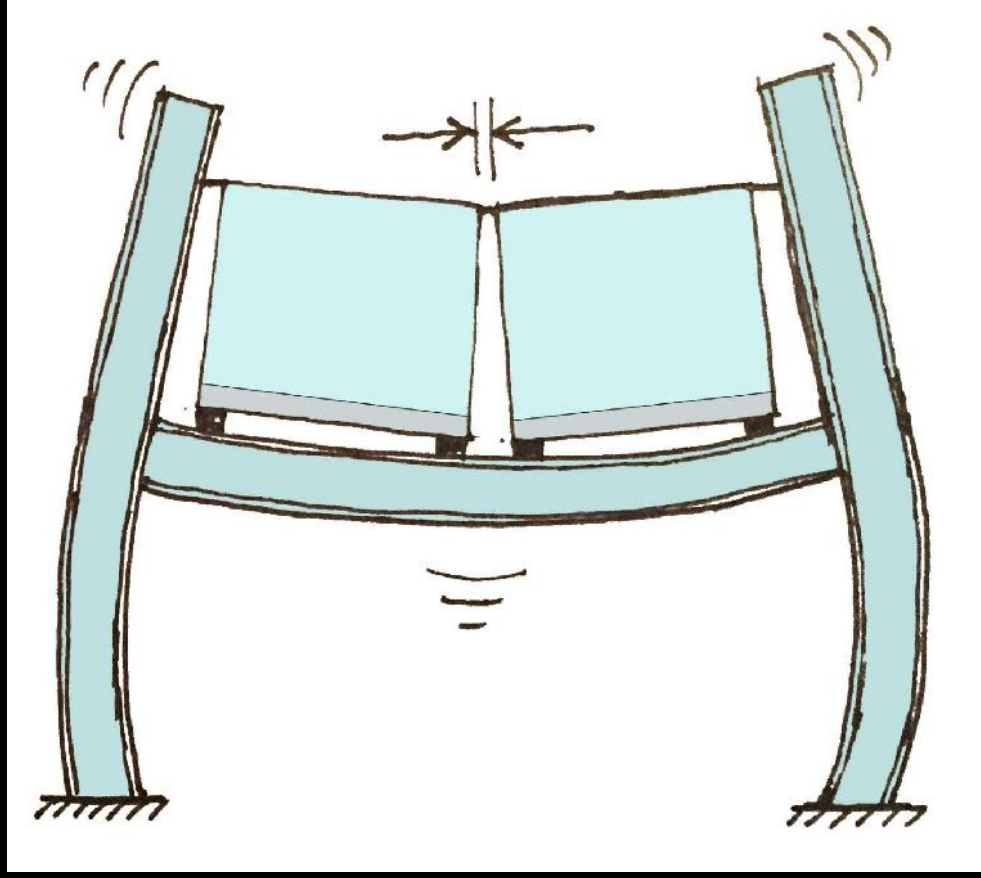
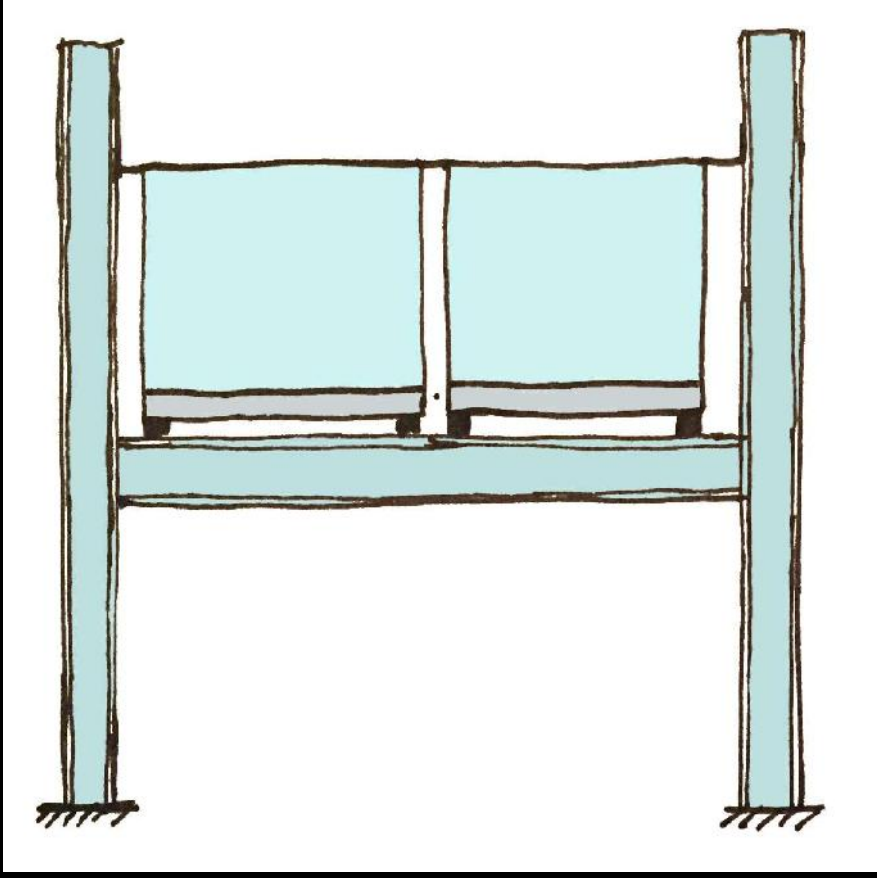


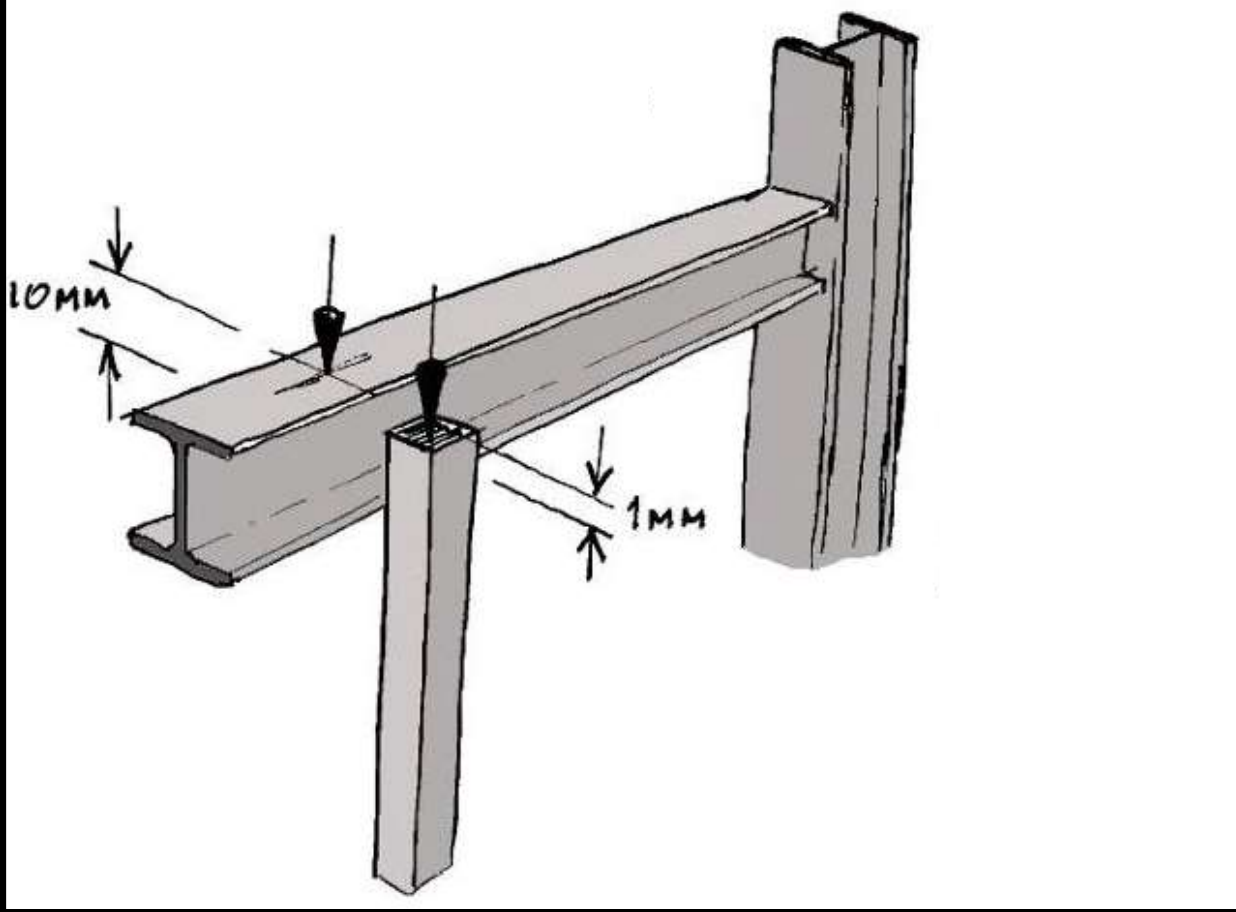
MANUFACTURING

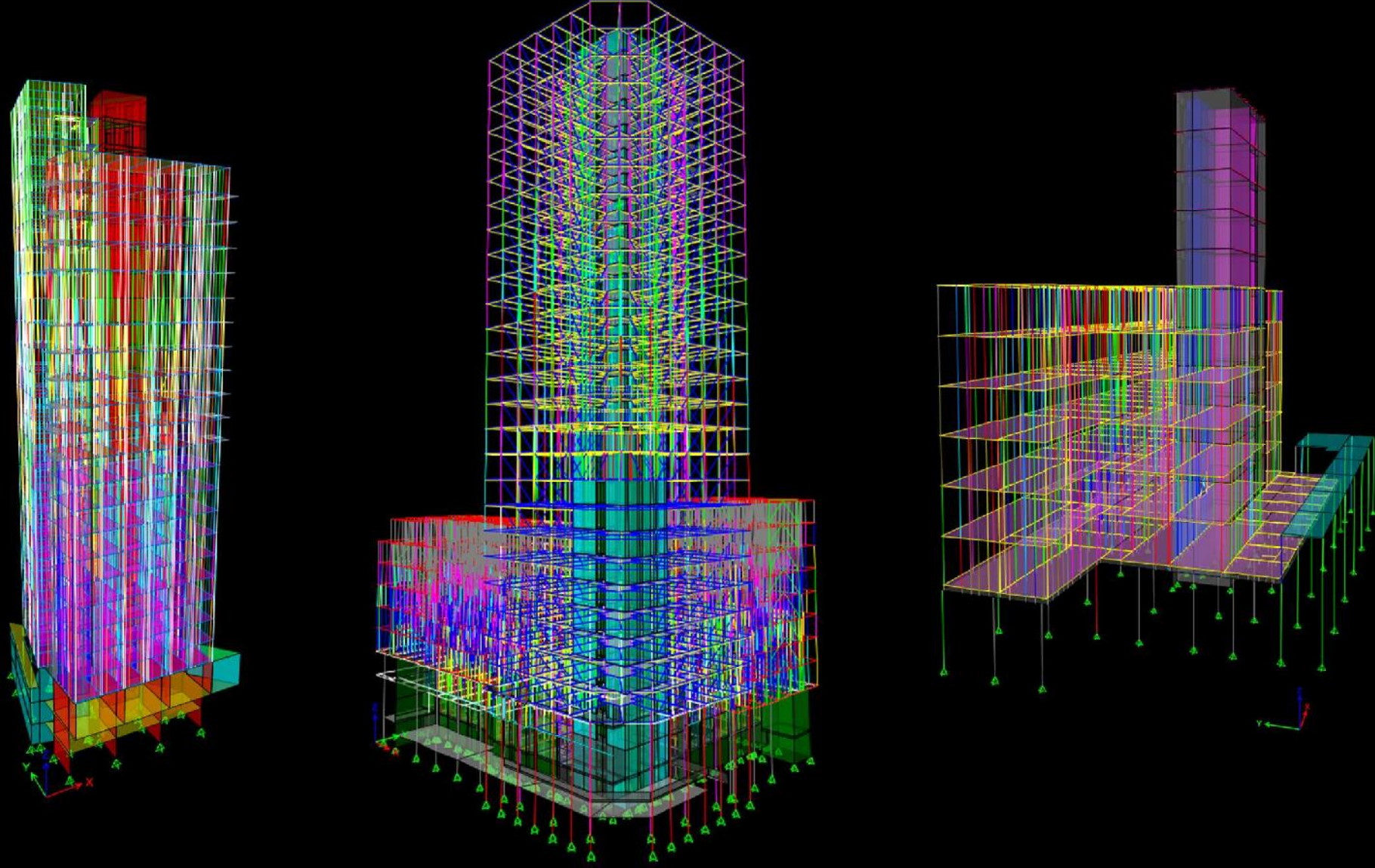


PLACING

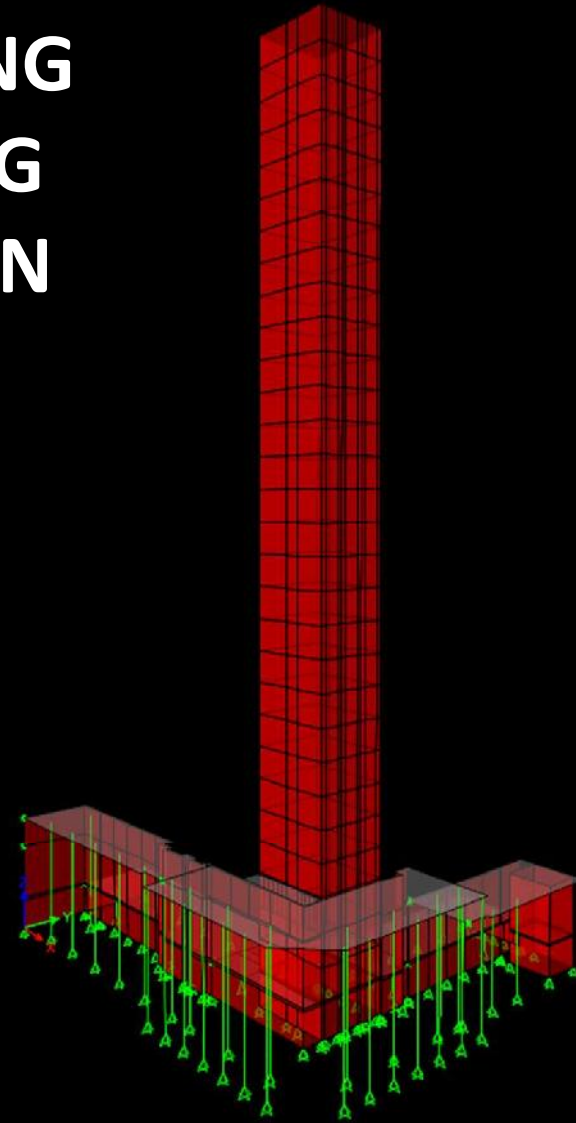
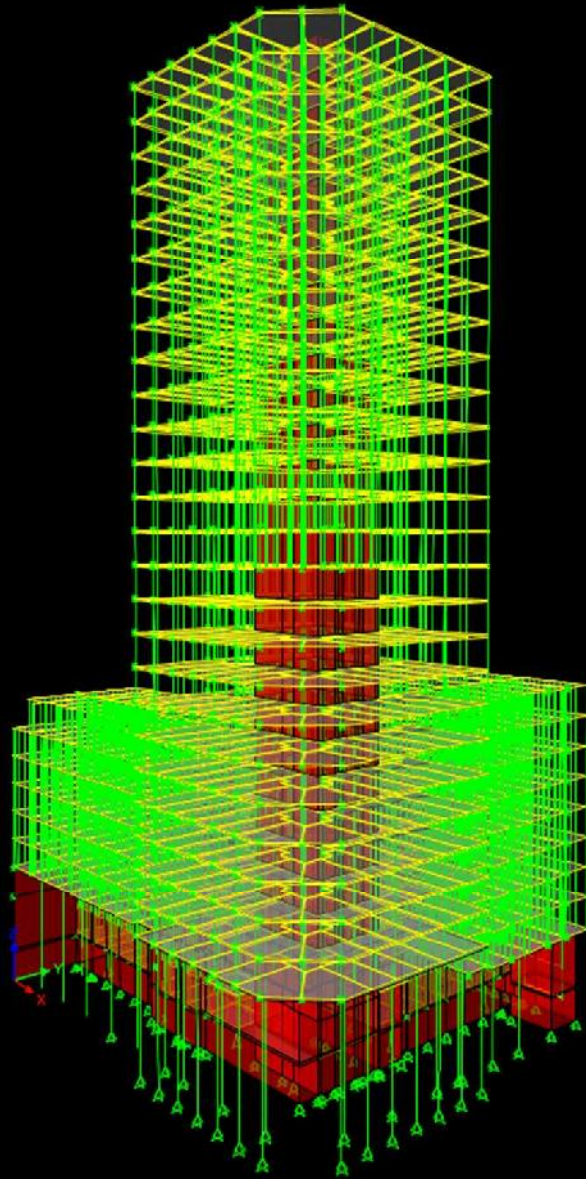


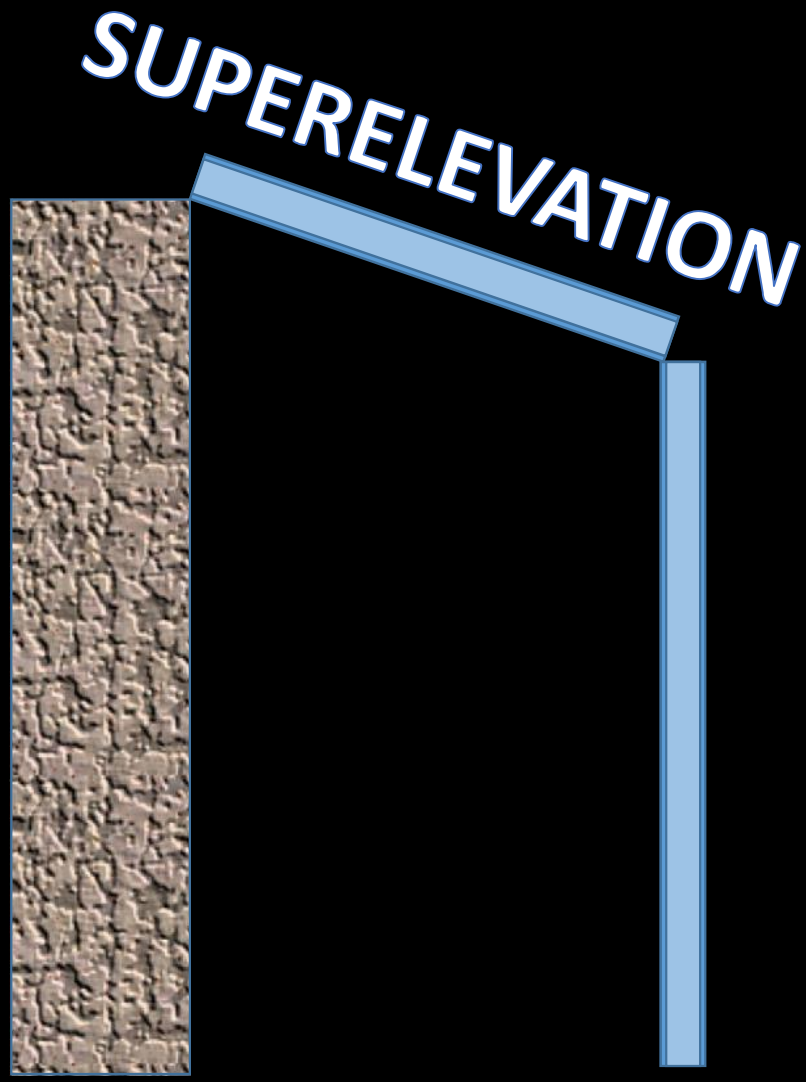




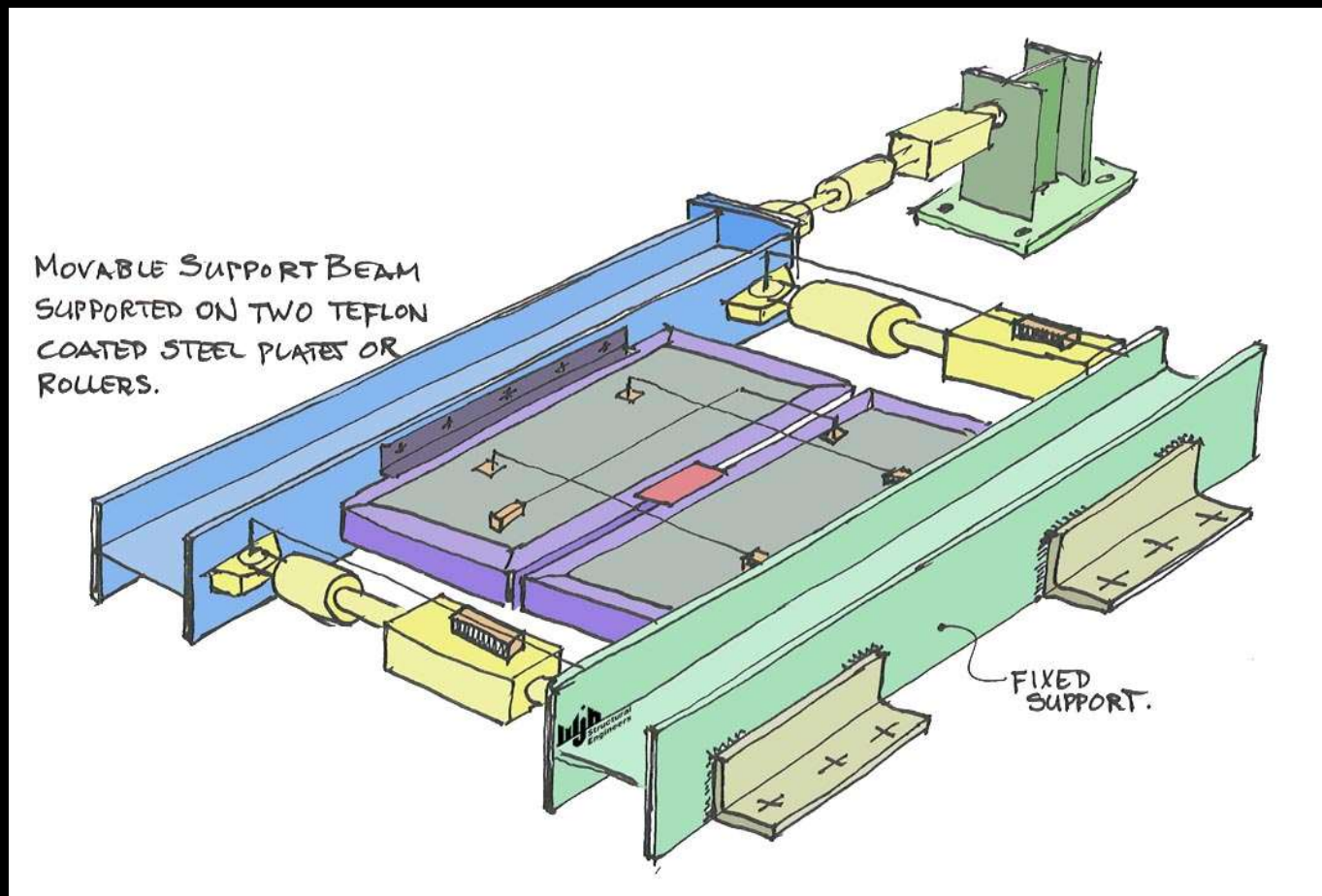


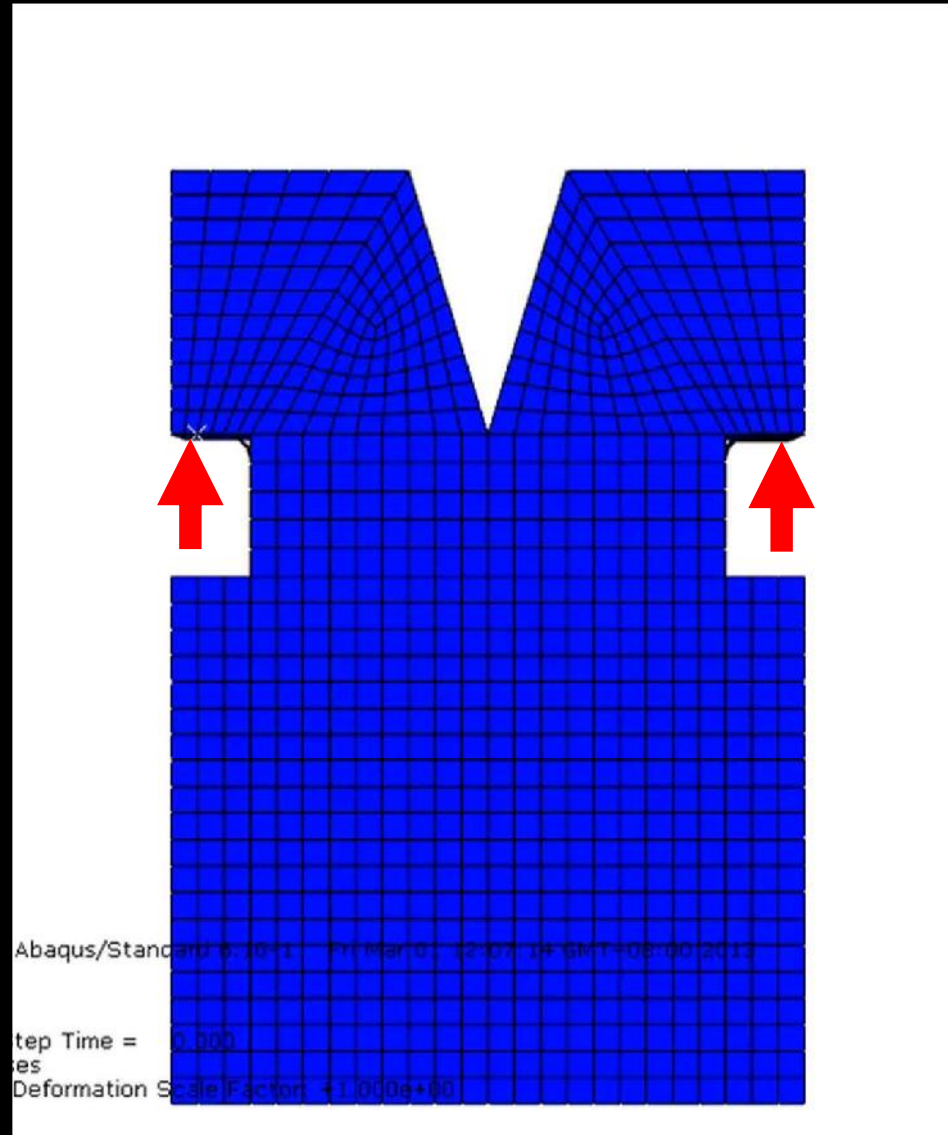
ENGINEERING MODELLING AND DESIGN

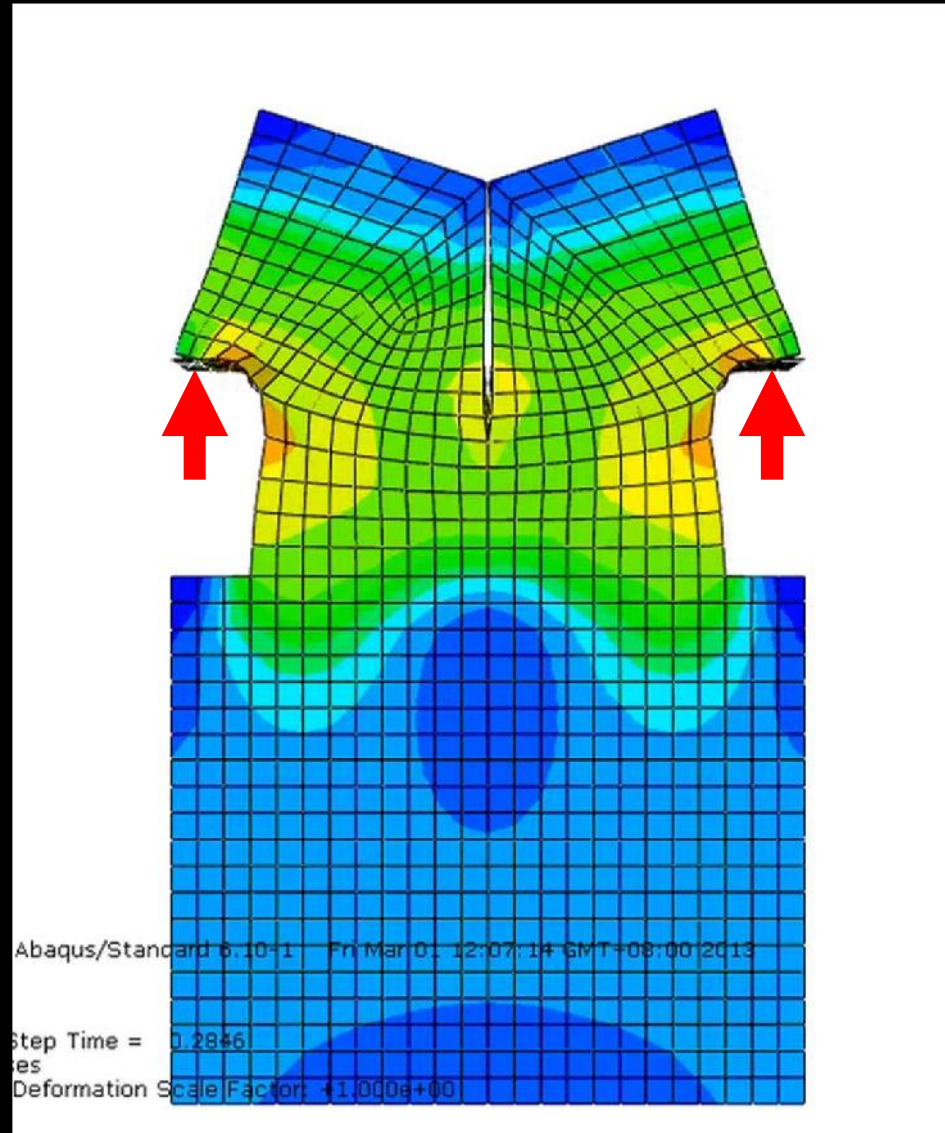












STABILITY

STEEL BRACED FRAMES



STEEL BRACED FRAMES



Concrete Core





REPETITION
IS GOOD
WHEN IT
DOES NOT
MAKE
YOUR
BUILDING
LOOK
MODULAR

CLADDING







CLADDING

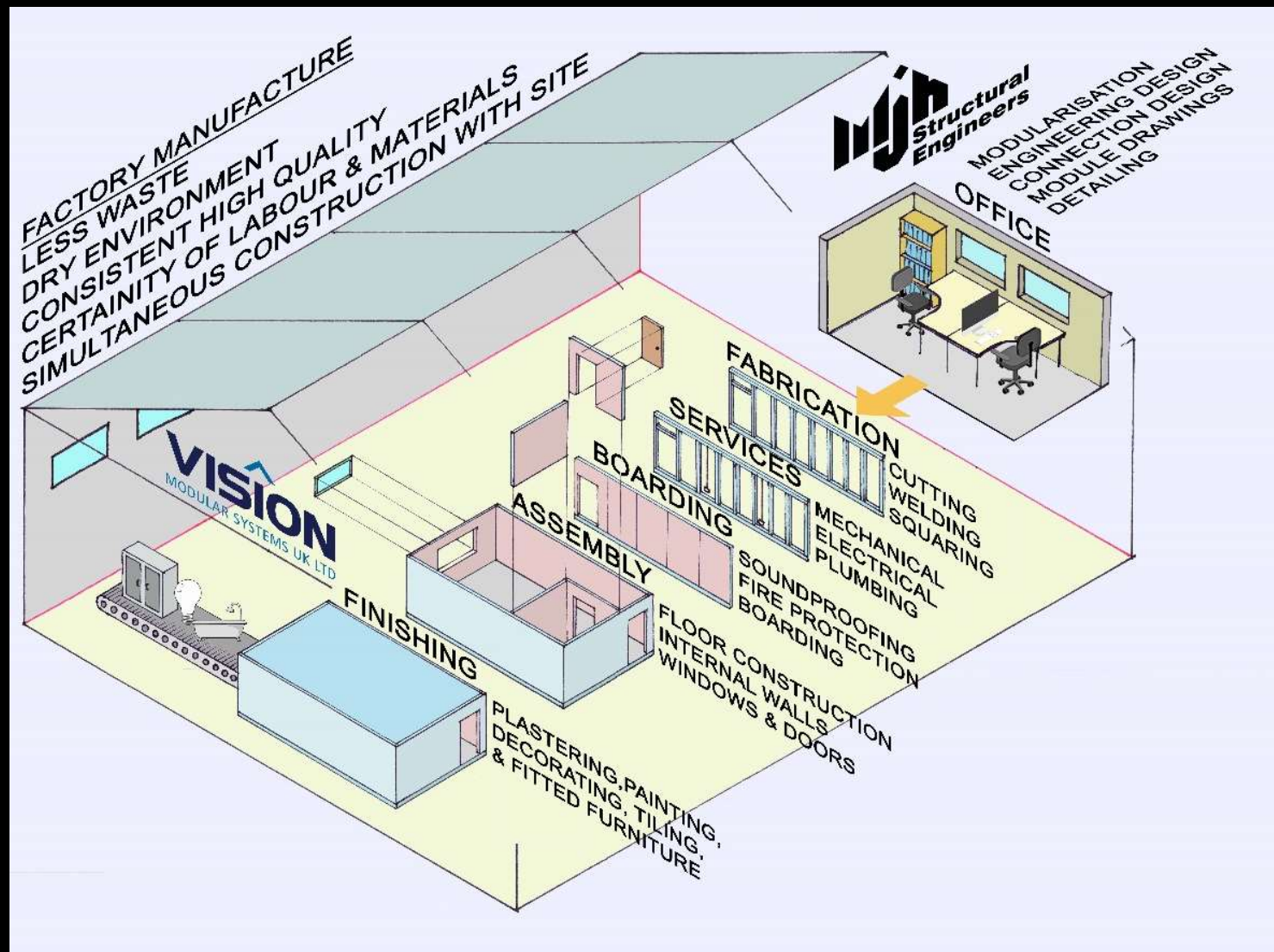


CONSTRUCTION PROCESS

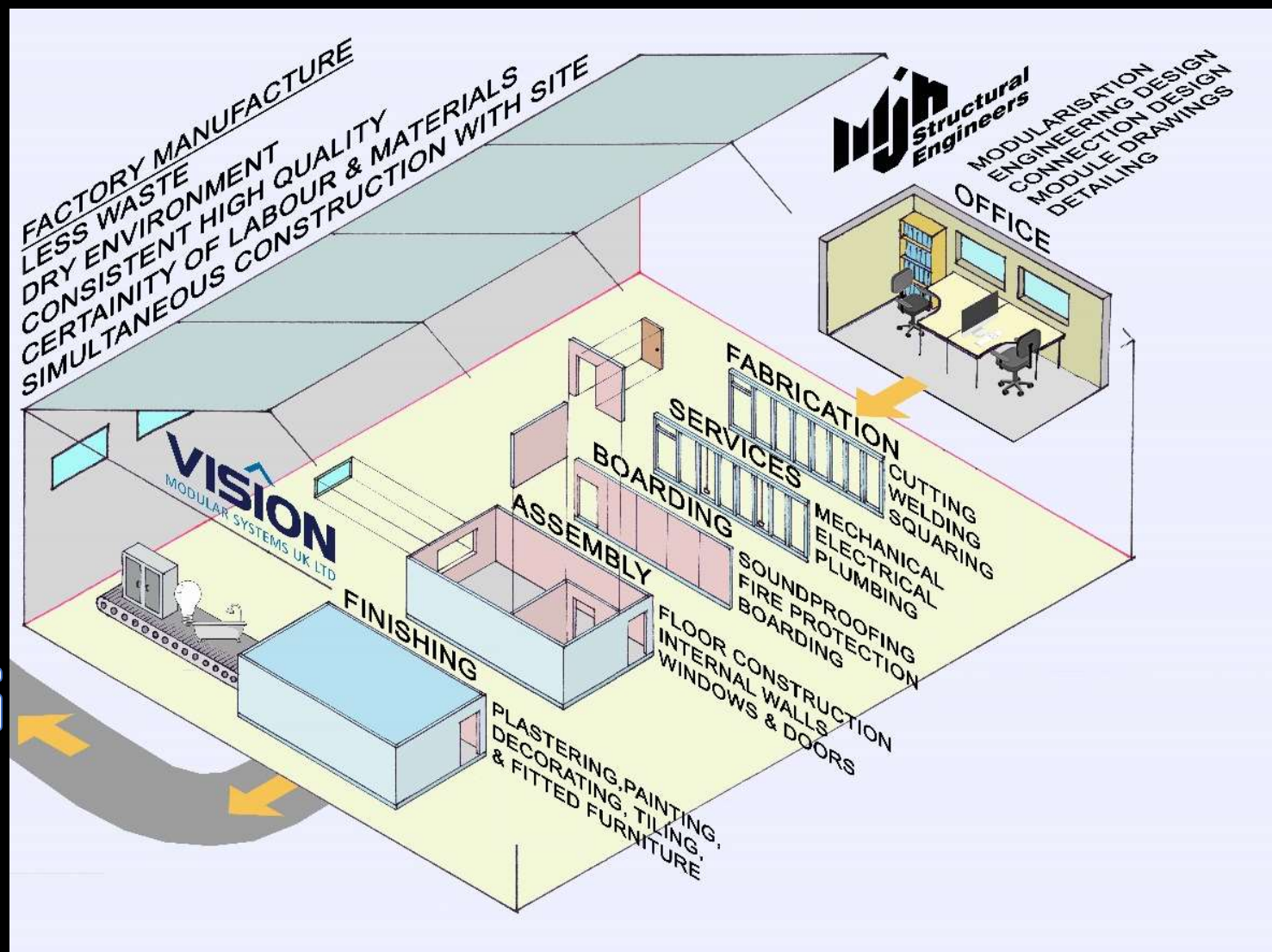
DESIGN OFFICE



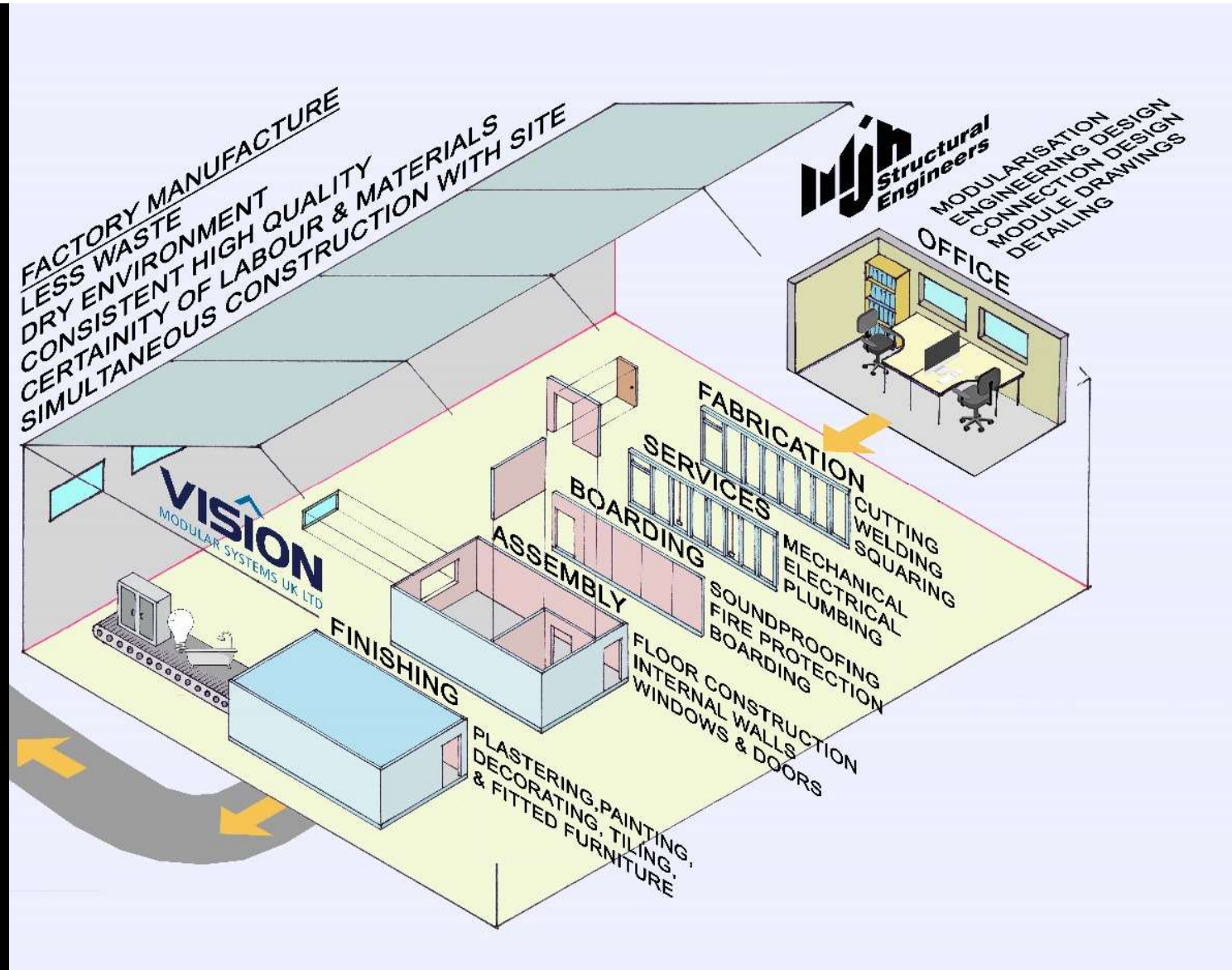
FACTORY



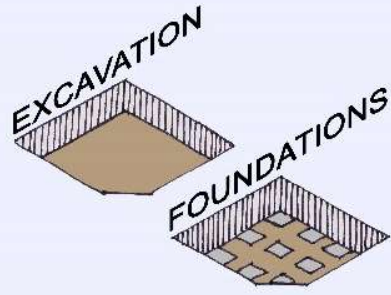
FINISHING



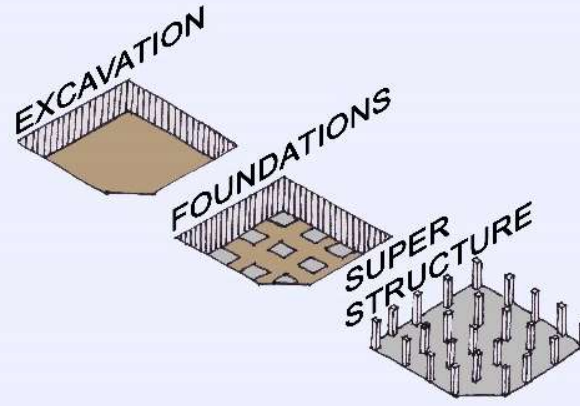
SITE



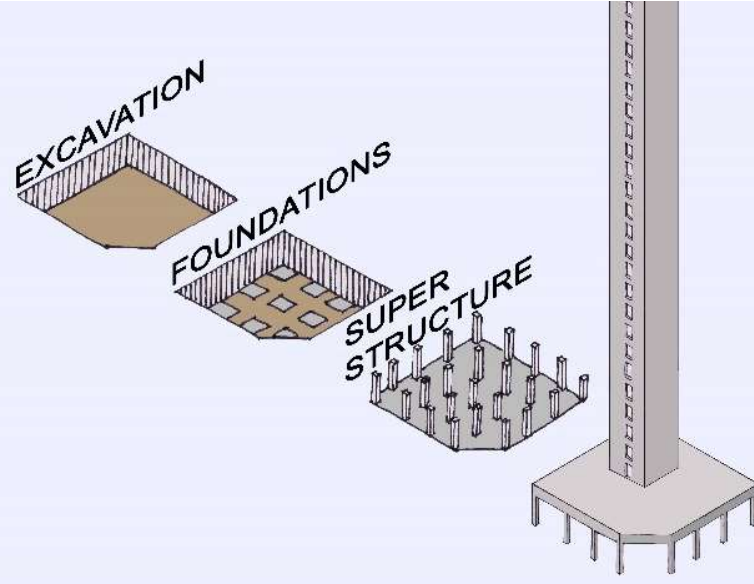
FOUNDATIONS



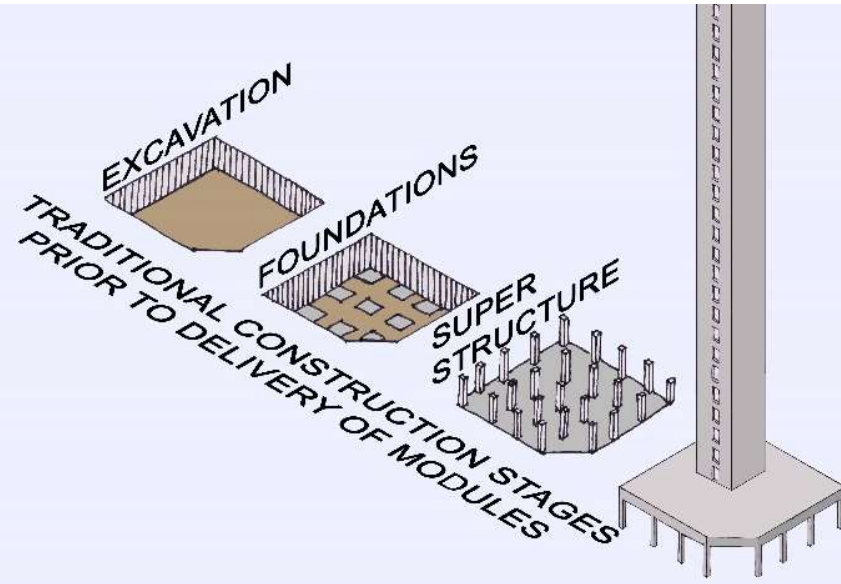
SUPER STRUCTURE



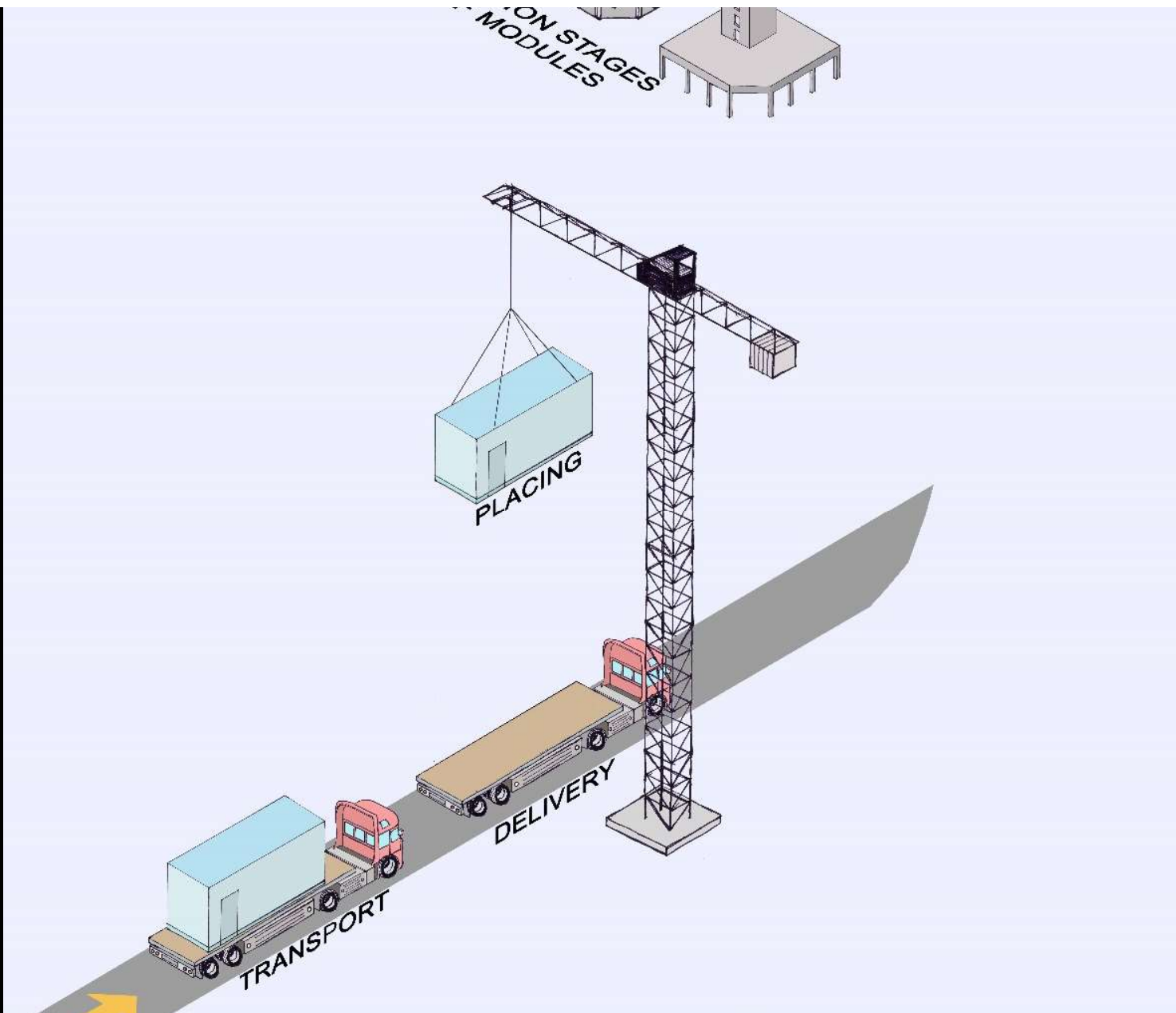
CORE



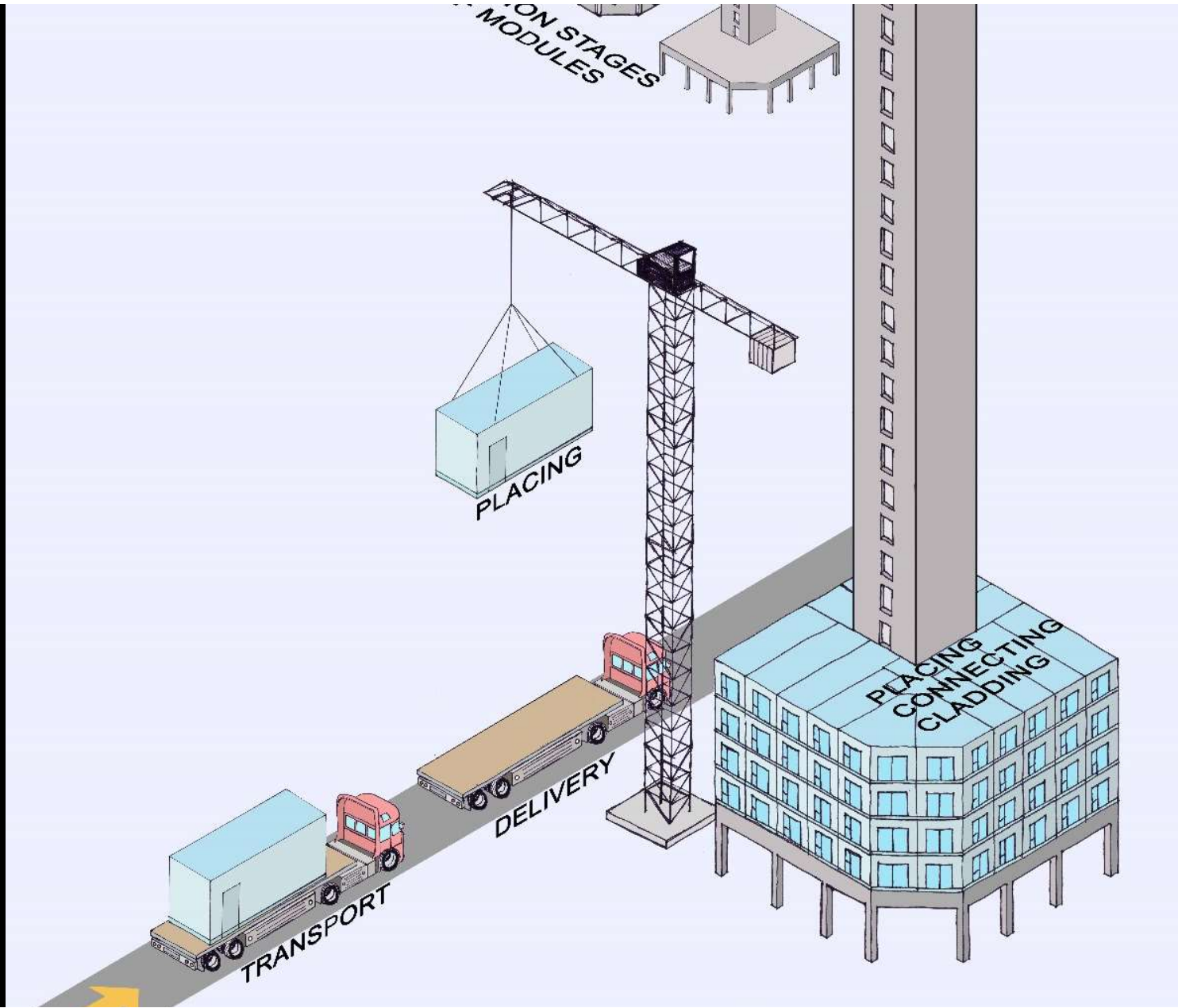
TRANSPORT

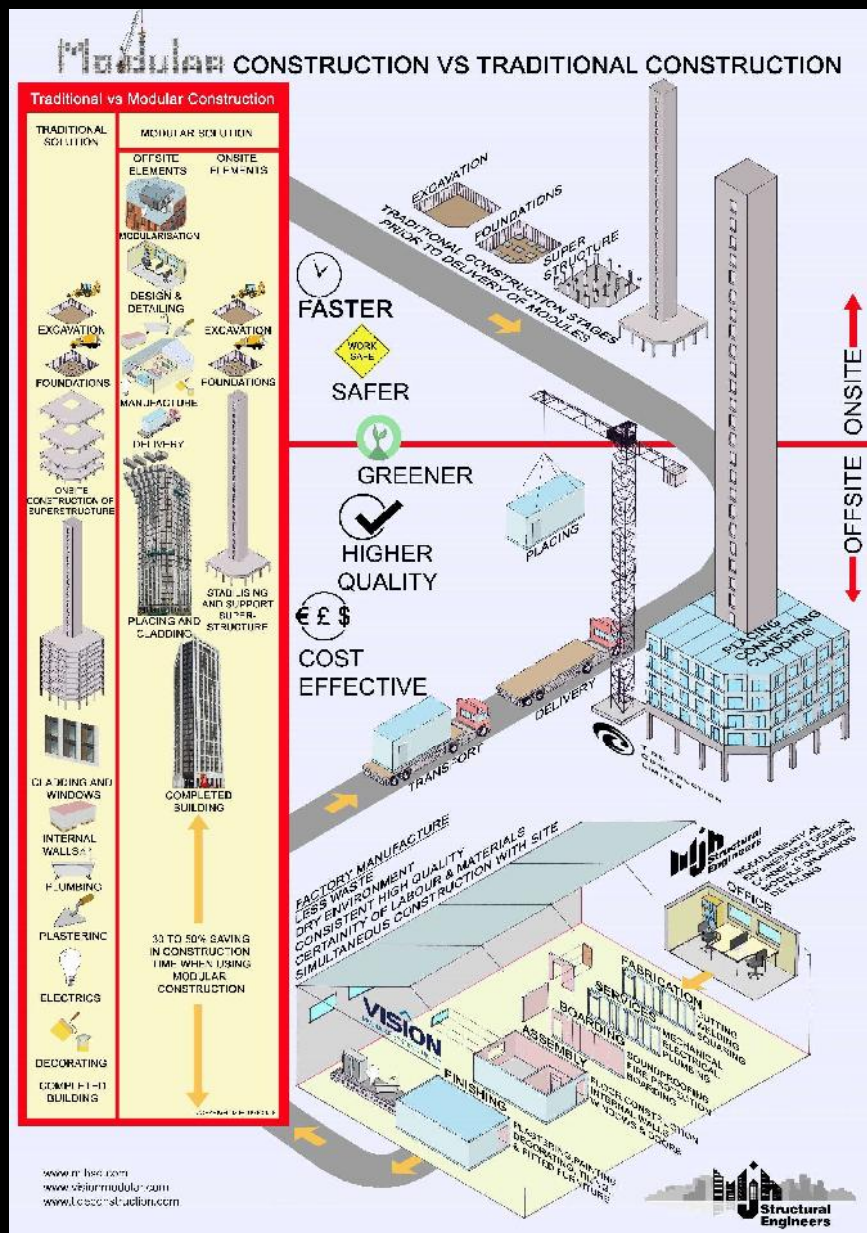


DELIVERY

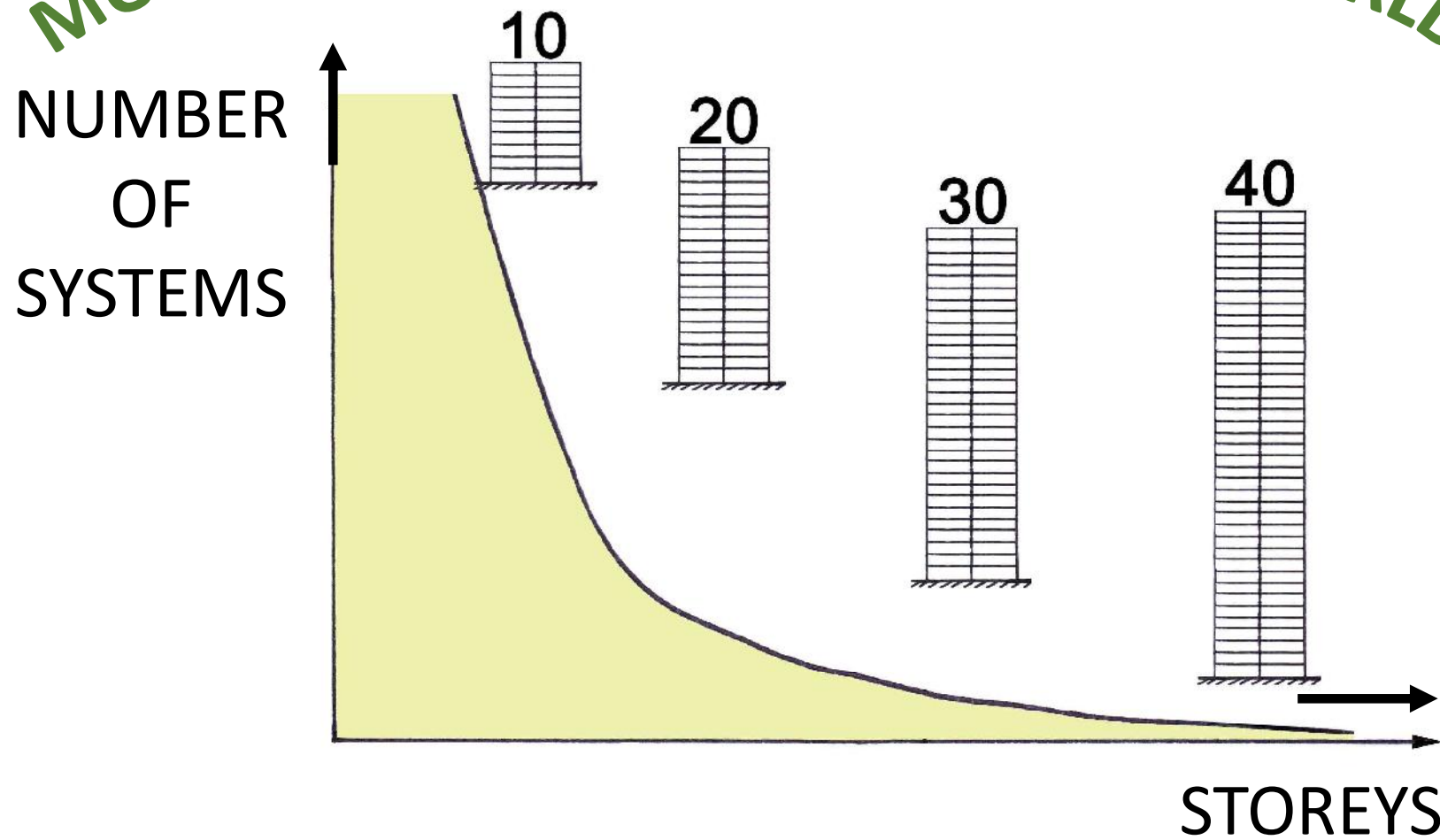


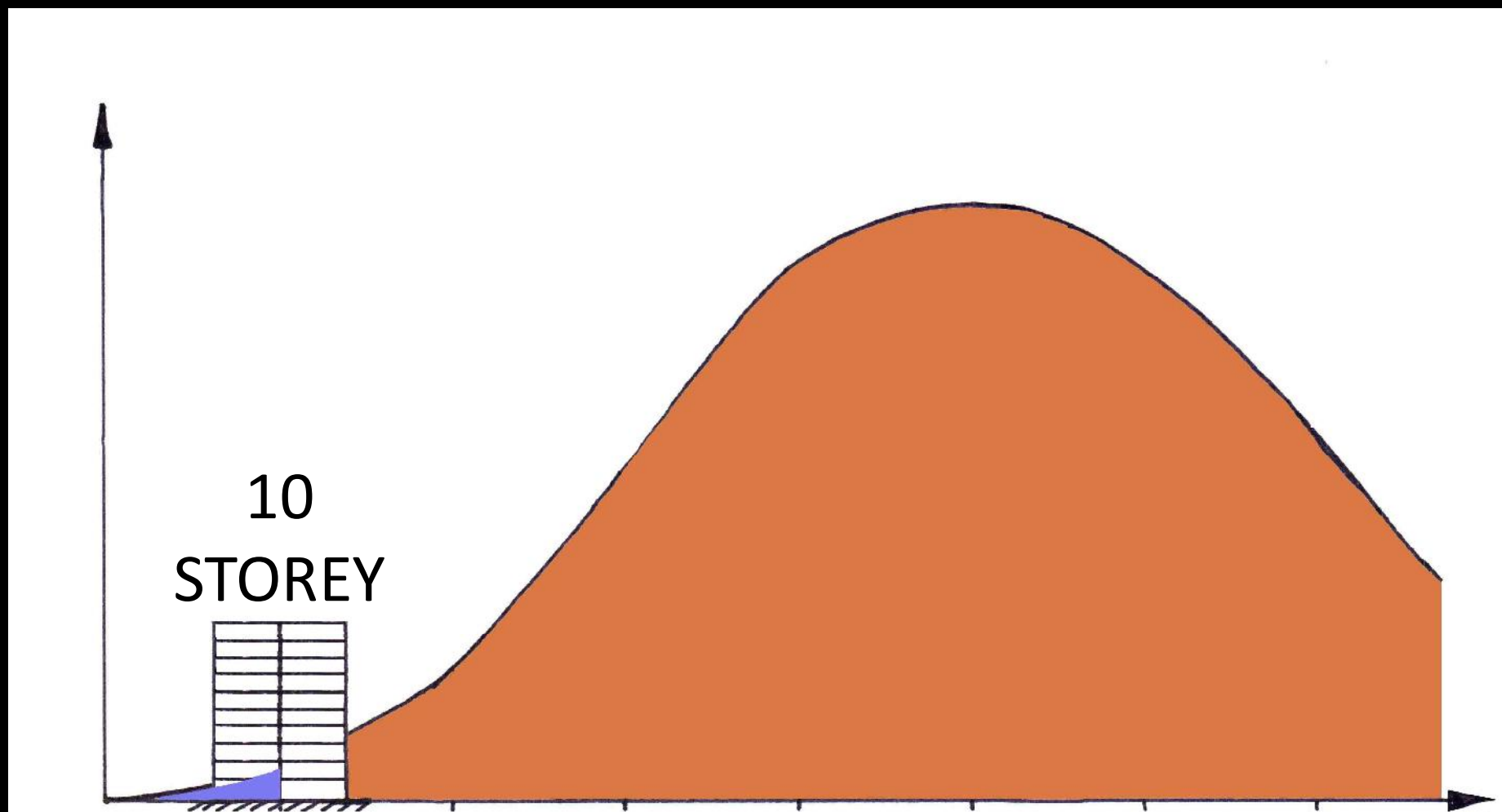
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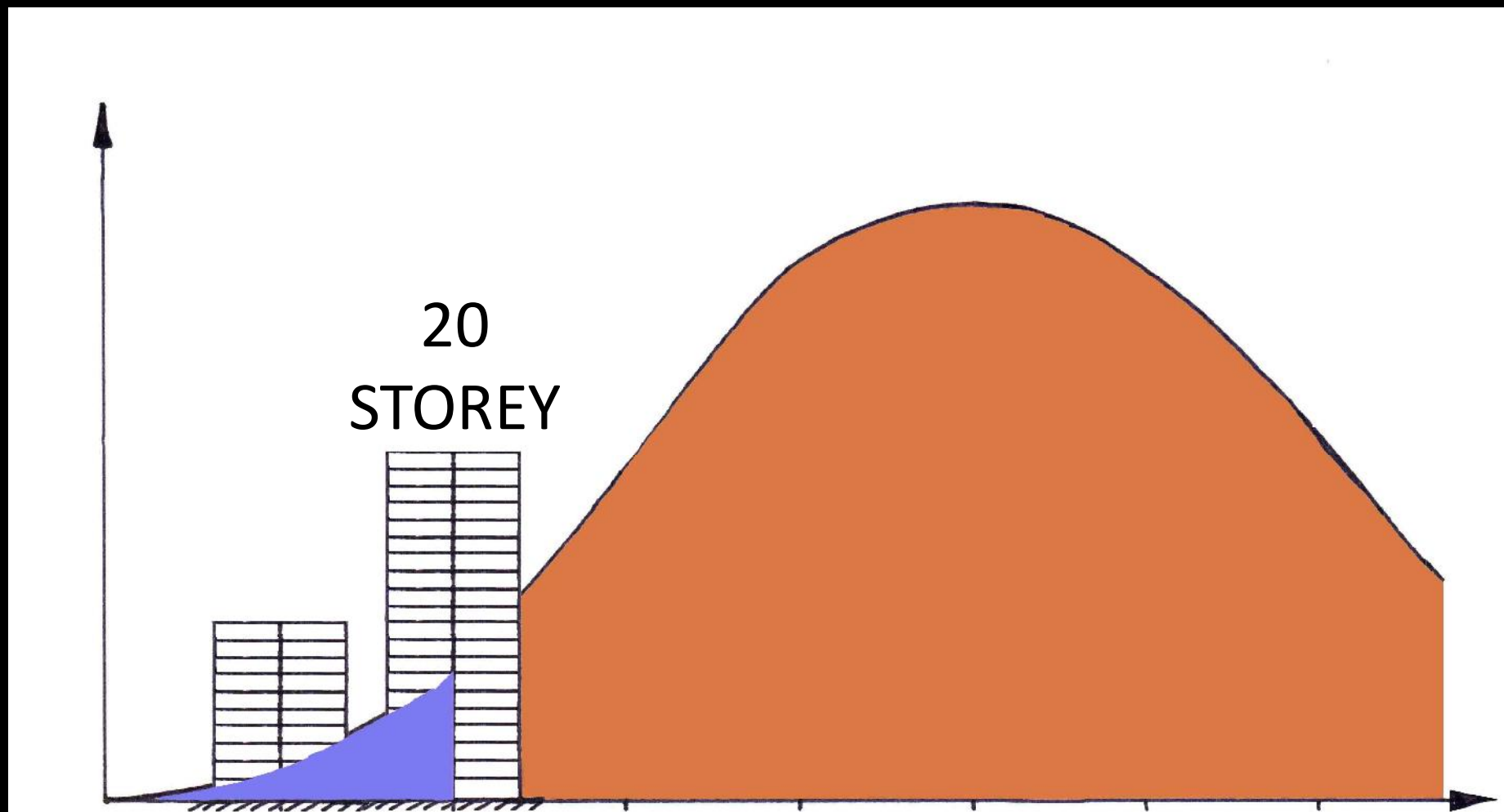


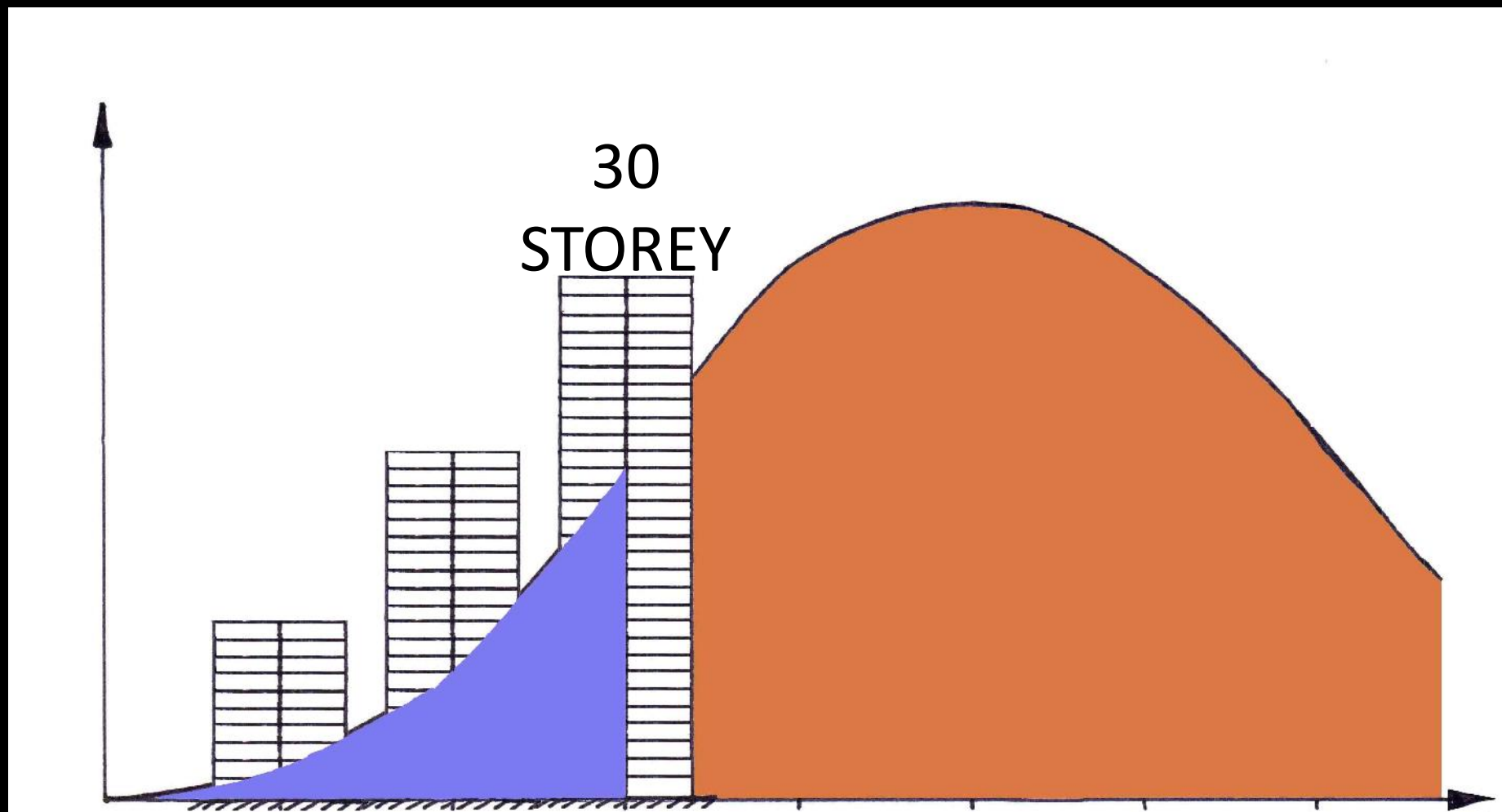


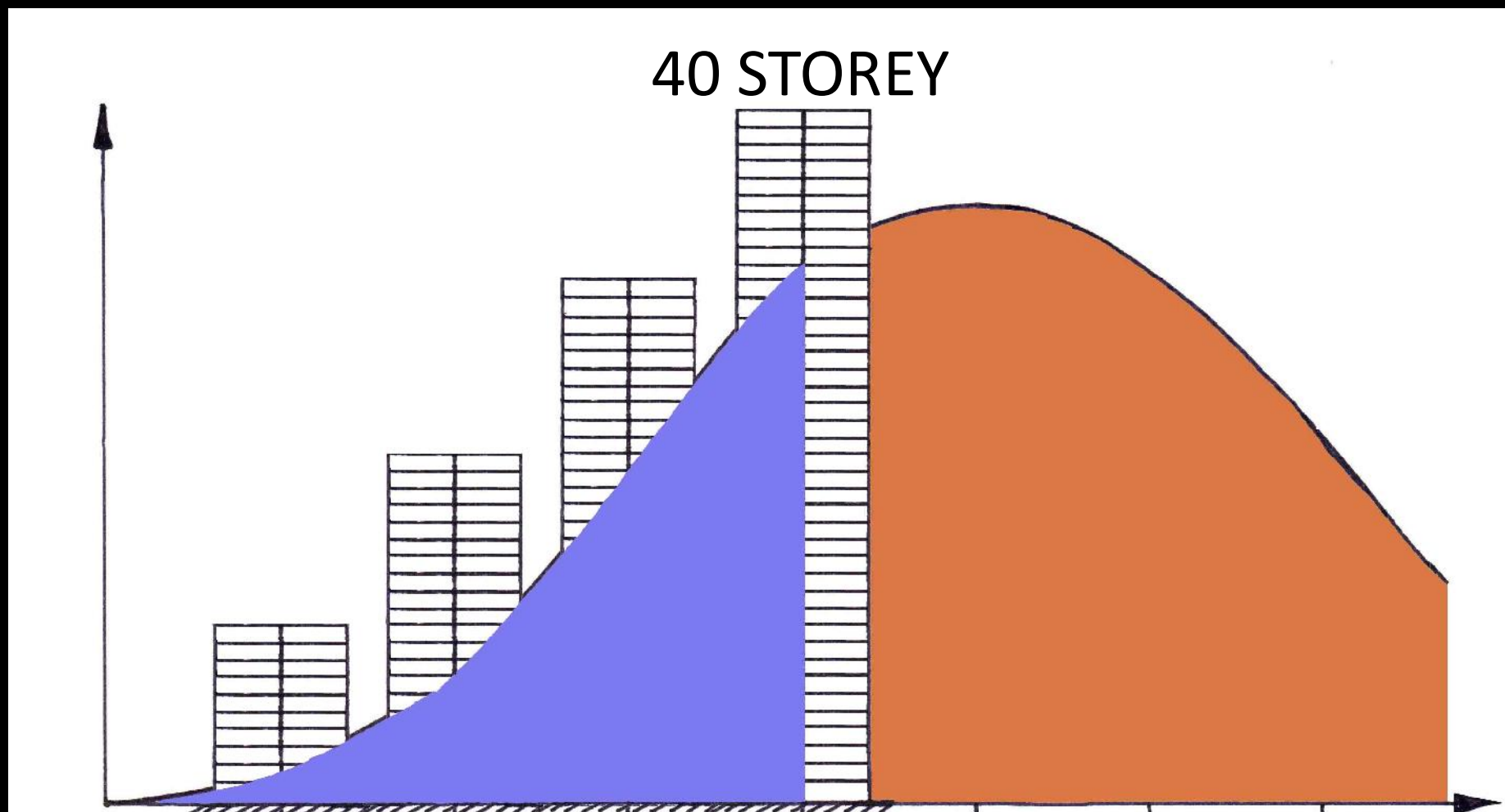
MODULAR SYSTEMS AROUND THE WORLD

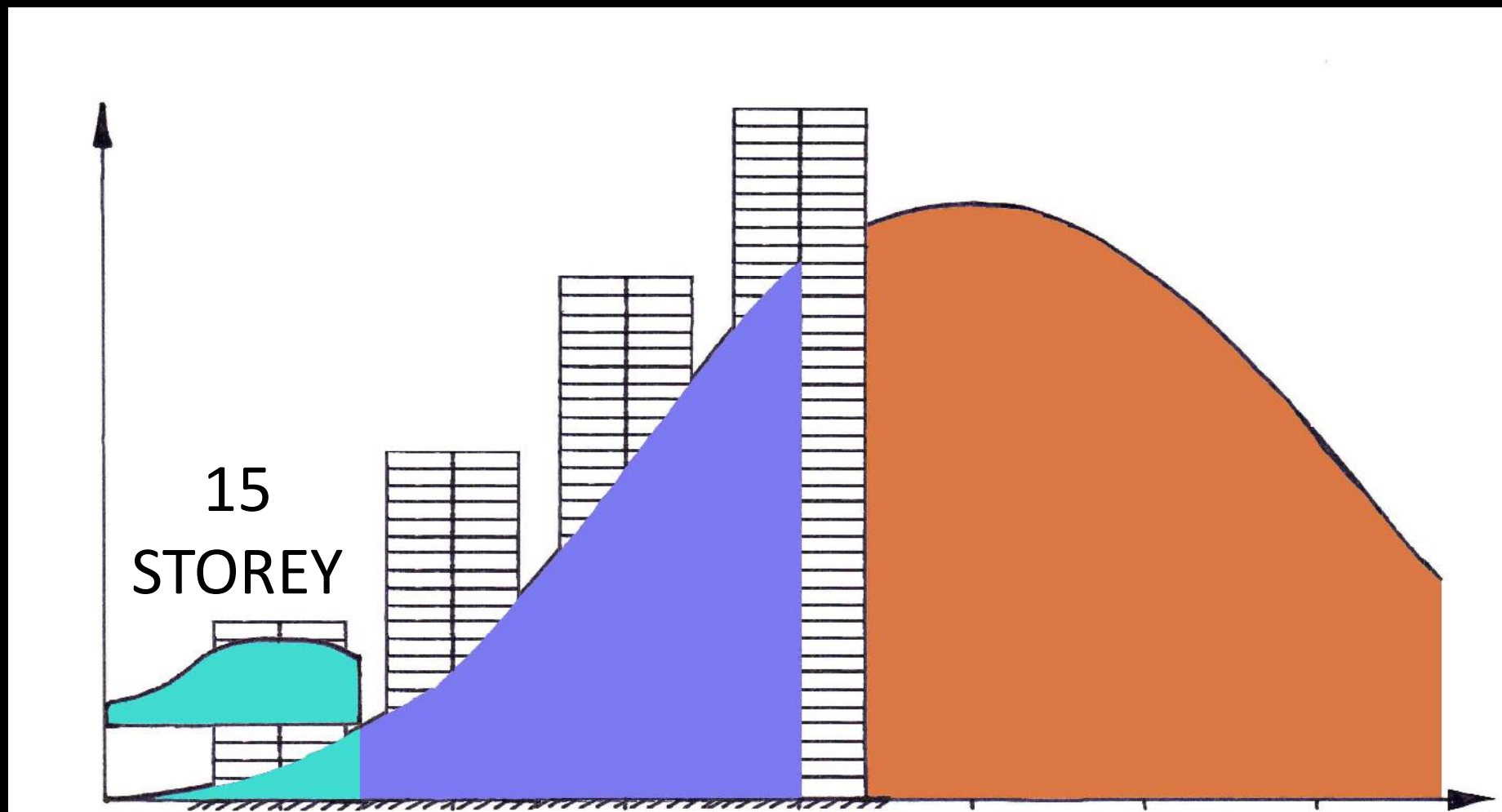


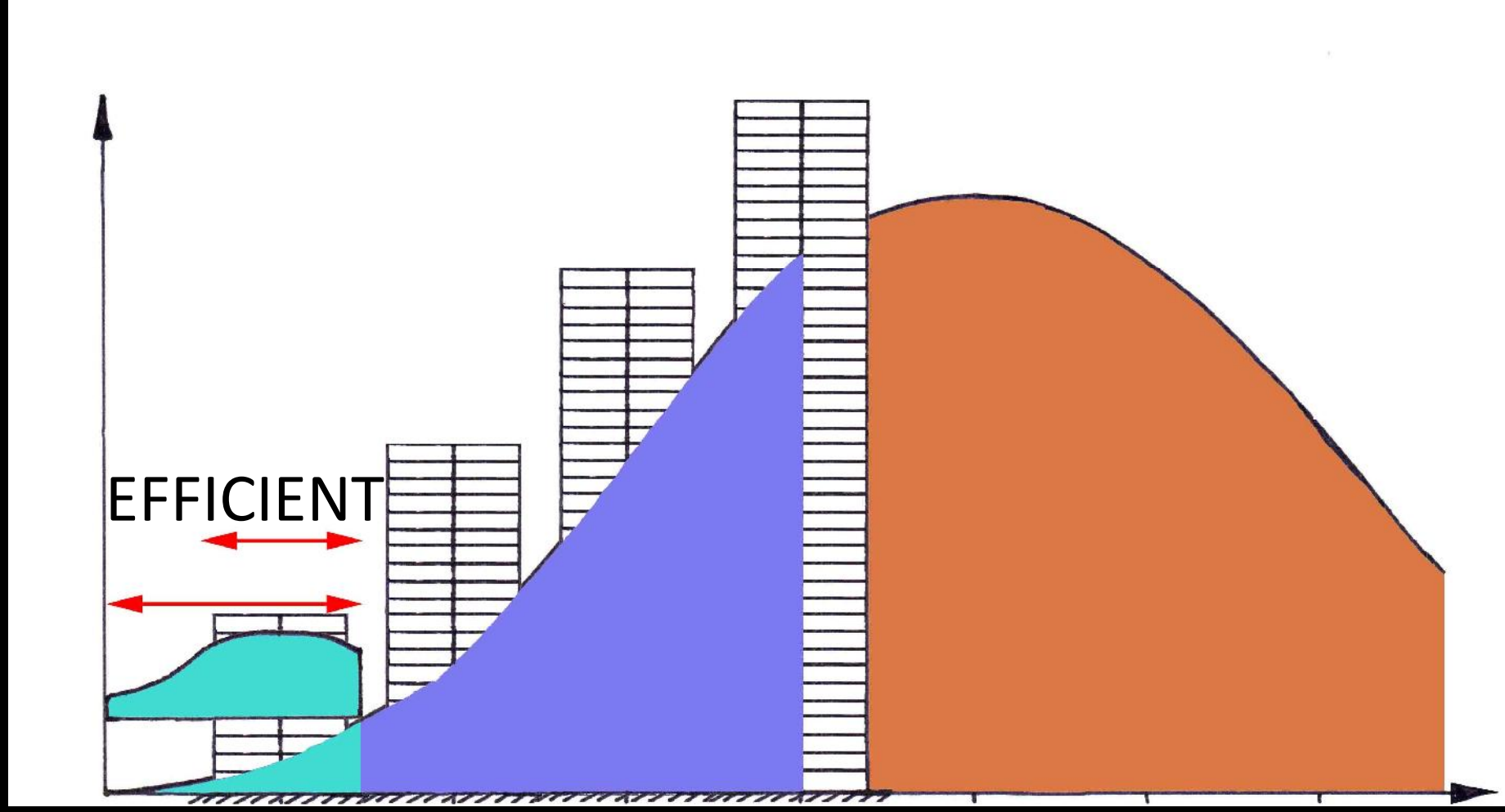


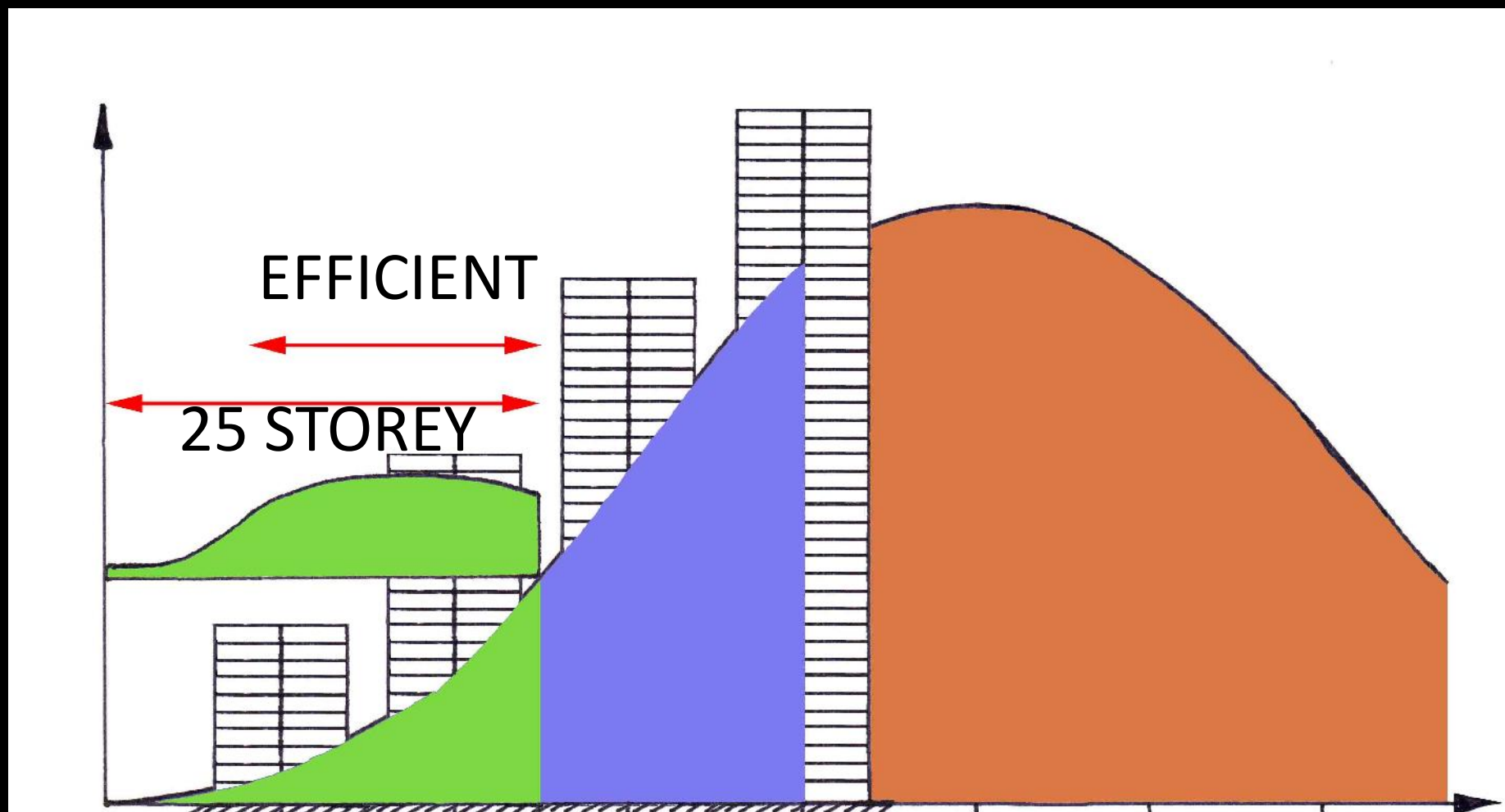


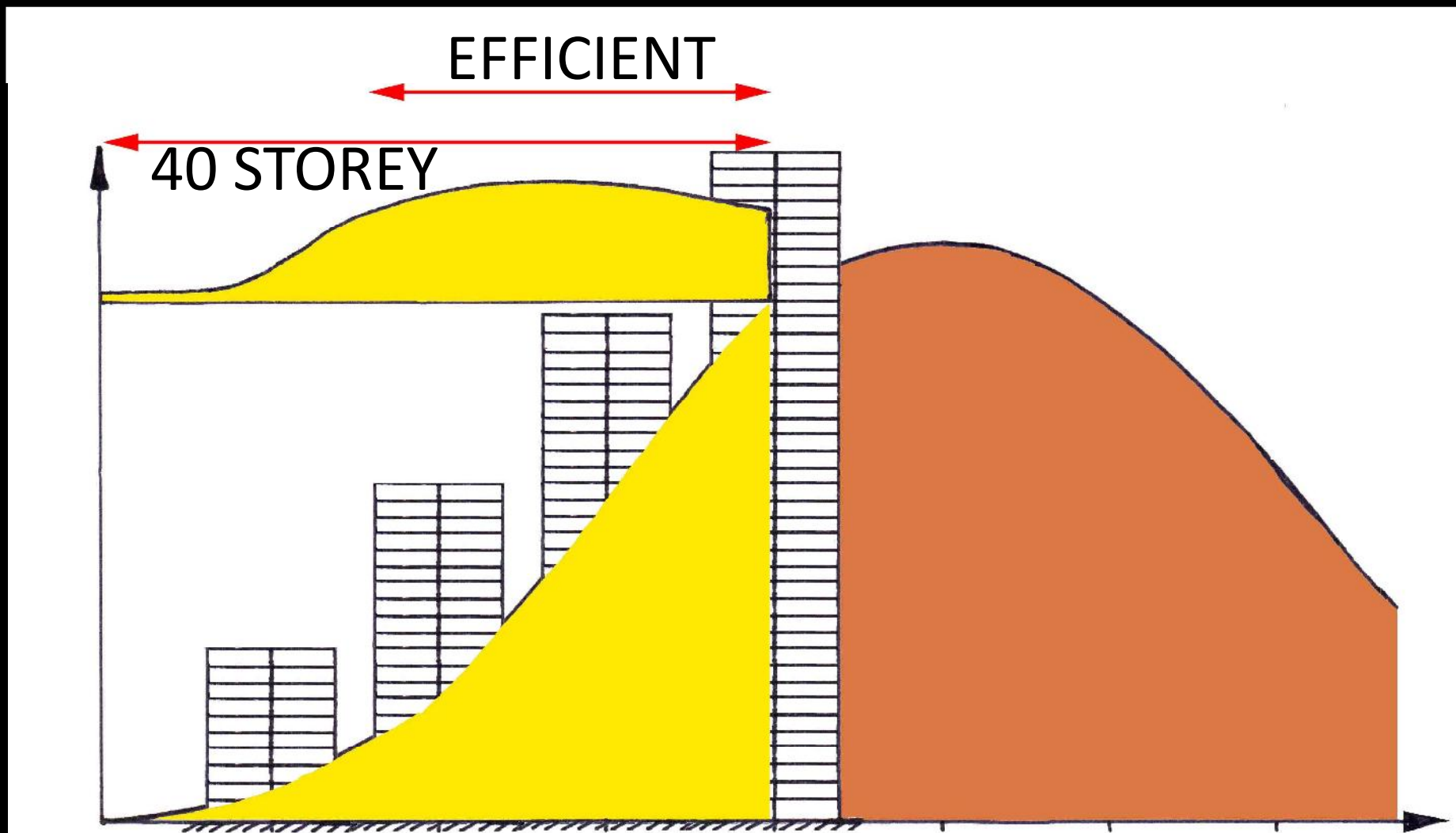






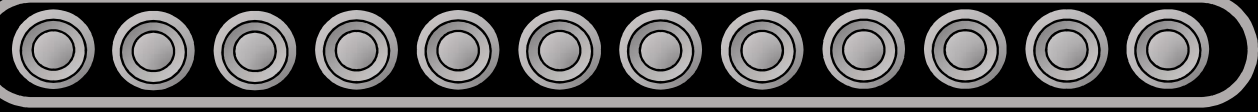




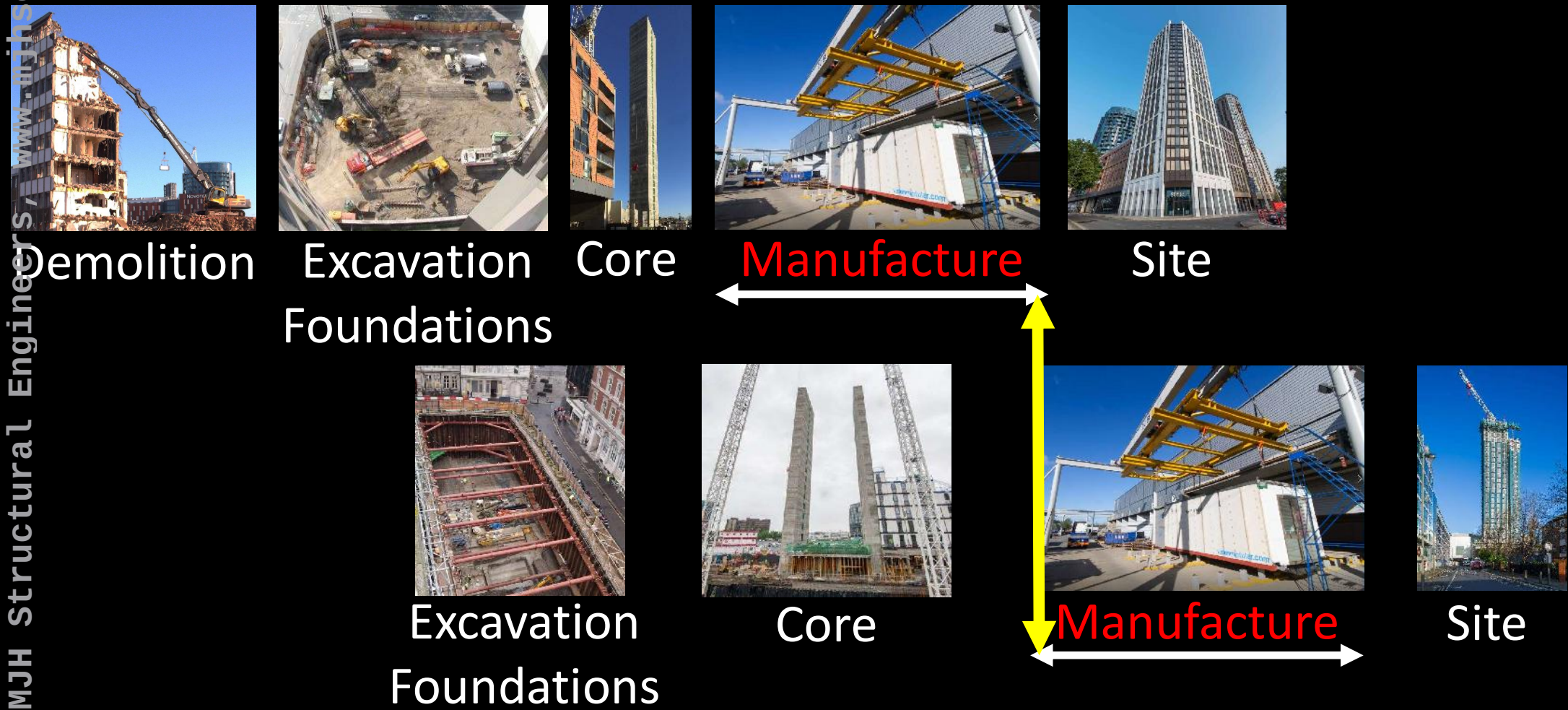


A TALLER MODULAR SYSTEM MEANS

- **INCREASING TIME TO MARKET**
- **INCREASING STRUCTURAL LOADS**
- **INCREASING TRANSFER DEPTHS**
- **INCREASING MANUFACTURING ACCURACY**
- **INCREASING SITE TOLERANCES**
- **POSSIBLY DECREASING LAYOUT FLEXIBILITY**



CONTINUITY OF MANUFACTURE



PROJECTS

WOLVERHAMPTON



Homes	657
Modular Stories	25
Modules	805
Modular Build Time	26 weeks
Modular Area m2	15704
m ² /week	604
Engineers	BMCE
Architect	OEA
Modular Provider	VISION MODULAR

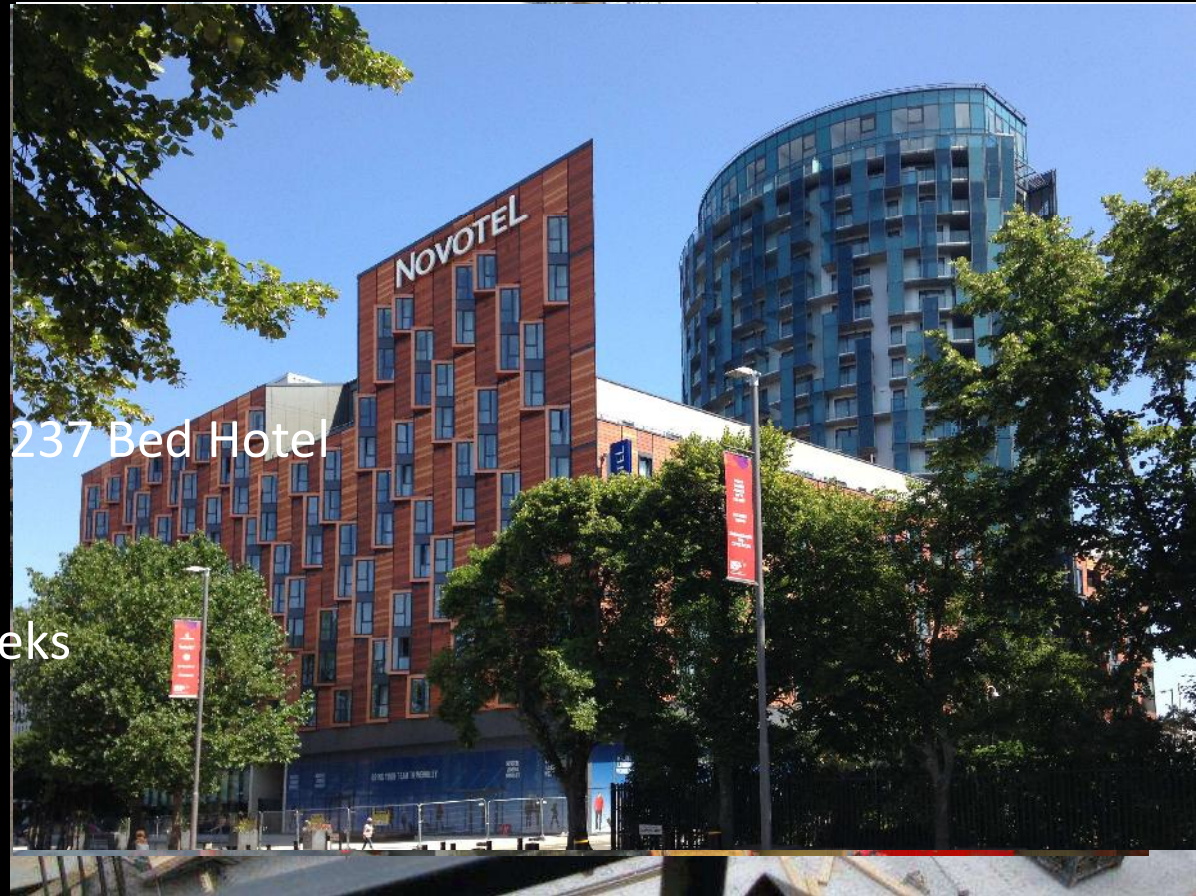




OLYMPIC WAY



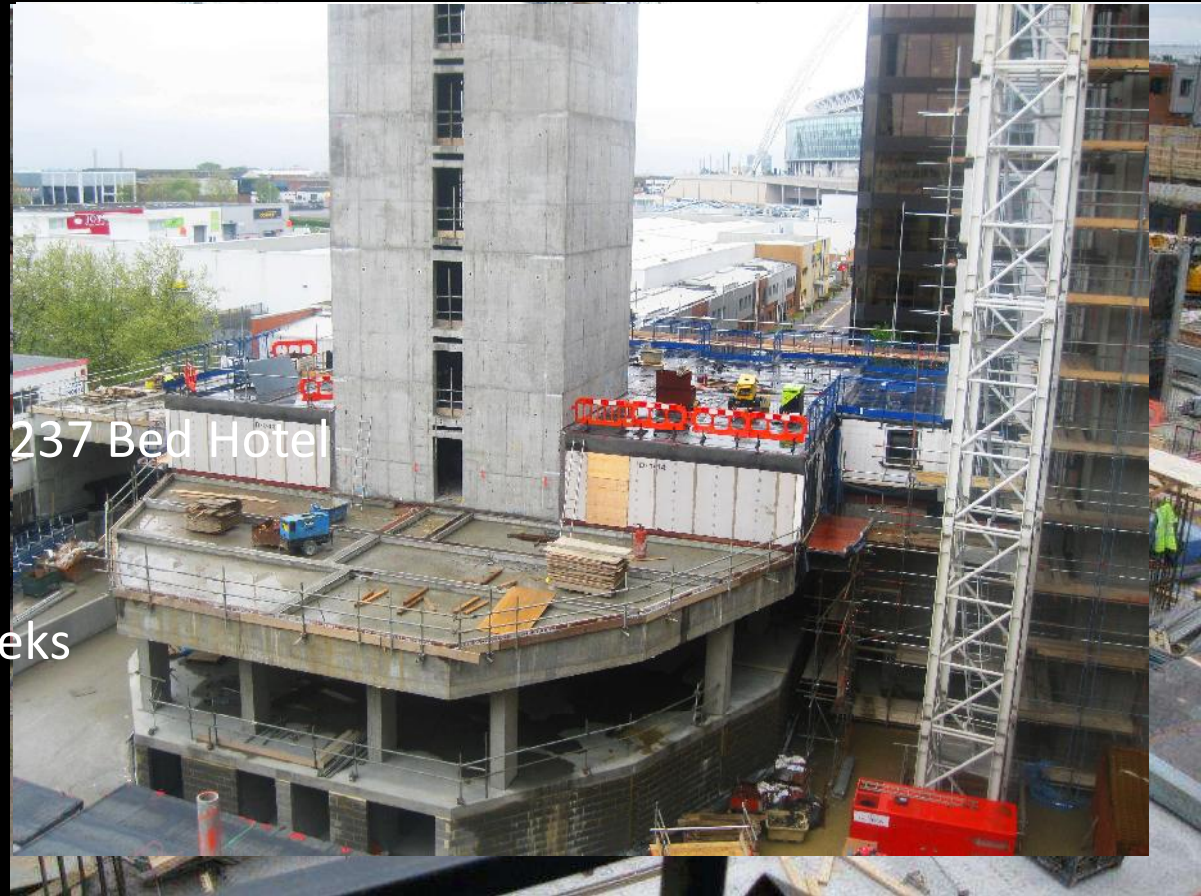
Homes	158 & 237 Bed Hotel
Modular Stories	19
Modules	831
Modular Build Time	26 weeks
Modular Area m ²	20721
m ² /week	800
Engineers	BMCE
Architect	HTA
Modular Provider	VISION MODULAR



OLYMPIC WAY



Homes	158 & 237 Bed Hotel
Modular Stories	19
Modules	831
Modular Build Time	26 weeks
Modular Area m ²	20721
m ² /week	800
Engineers	BMCE
Architect	HTA
Modular Provider	VISION MODULAR



OLYMPIC WAY



Homes	158 & 237 Bed Hotel
Modular Stories	19
Modules	831
Modular Build Time	26 weeks
Modular Area m ²	20721
m ² /week	800
Engineers	BMCE
Architect	HTA
Modular Provider	VISION MODULAR



OLYMPIC WAY



Homes	158 & 237 Bed Hotel
Modular Stories	19
Modules	831
Modular Build Time	26 weeks
Modular Area m ²	20721
m ² /week	800
Engineers	BMCE
Architect	HTA
Modular Provider	VISION MODULAR



FELDA HOUSE



Student Homes	450
Modular Stories	18
Modules	529
Modular Build Time	12 weeks
Modular Area m ²	10548
m ² /week	879
Engineers	MJH
Architect	HTA
Modular Provider	VISION MODULAR



DEXION



Student Homes	802
Modular Stories	18
Modules	896
Modular Build Time	26 weeks
Modular Area m ²	16573
m ² /week	637
Engineers	BMCE
Architect	HTA
Modular Provider	VISION MODULAR



CHAPTER LEWISHAM



Student Homes	611
Modular Stories	11
Modules	636
Modular Build Time	14 weeks
Modular Area m ²	13157
m ² /week	940
Engineers	MJH
Architect	WW&P
Modular Provider	VISION MODULAR



MAPLETON CRESCENT



Homes	86
Modular Stories	24
Modules	243
Modular Build Time	13 weeks
Modular Area m ²	5500
m ² /week	423
Engineers	MJH
Architect	MW
Modular Provider	VISION MODULAR



APEX HOUSE



Homes	580
Modular Stories	28
Modules	679
Modular Build Time	17
Modular Area m2	13600
m2/week	800
Engineers	MJH
Architect	HTA
Modular Provider	VISION MODULAR



INTERIOR

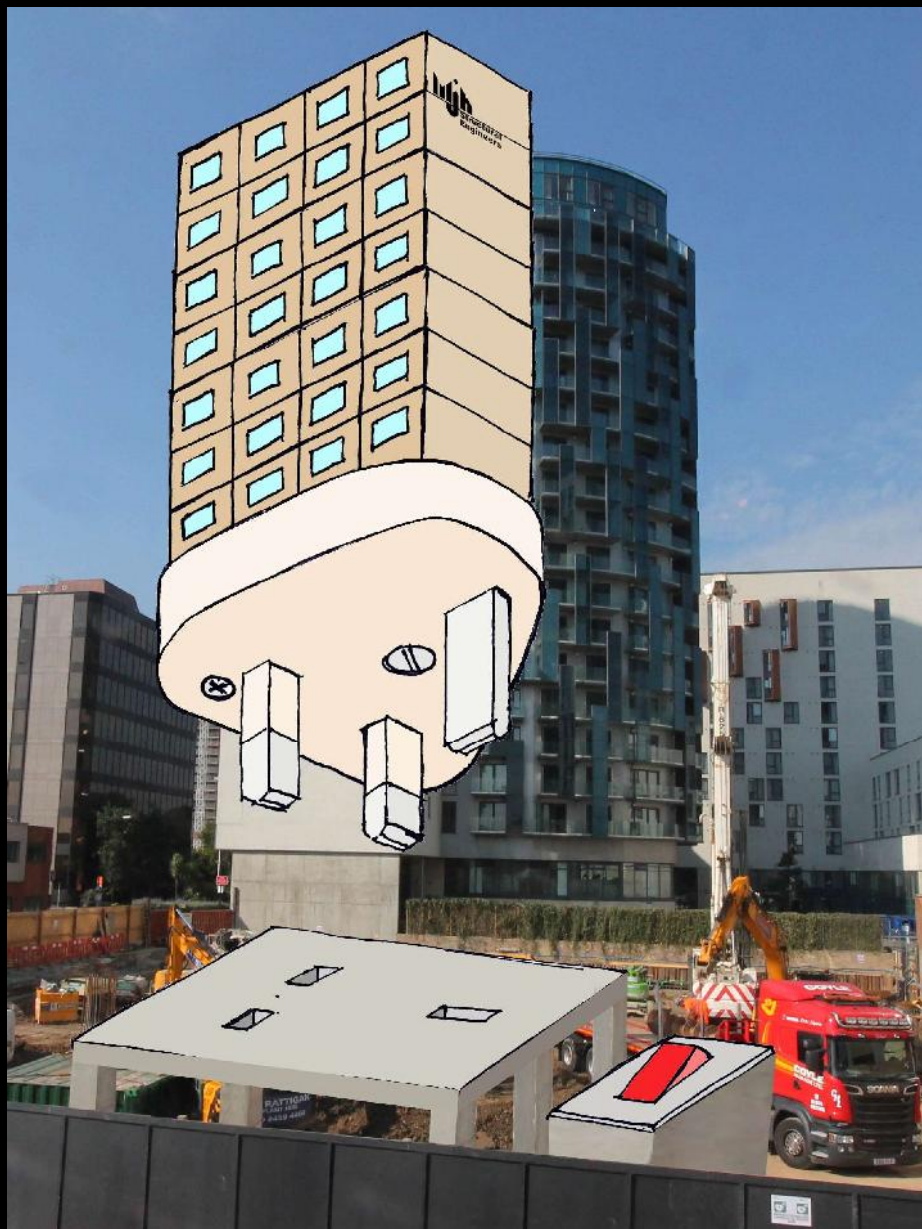






MCH Structural Engineers, www.mchse.com



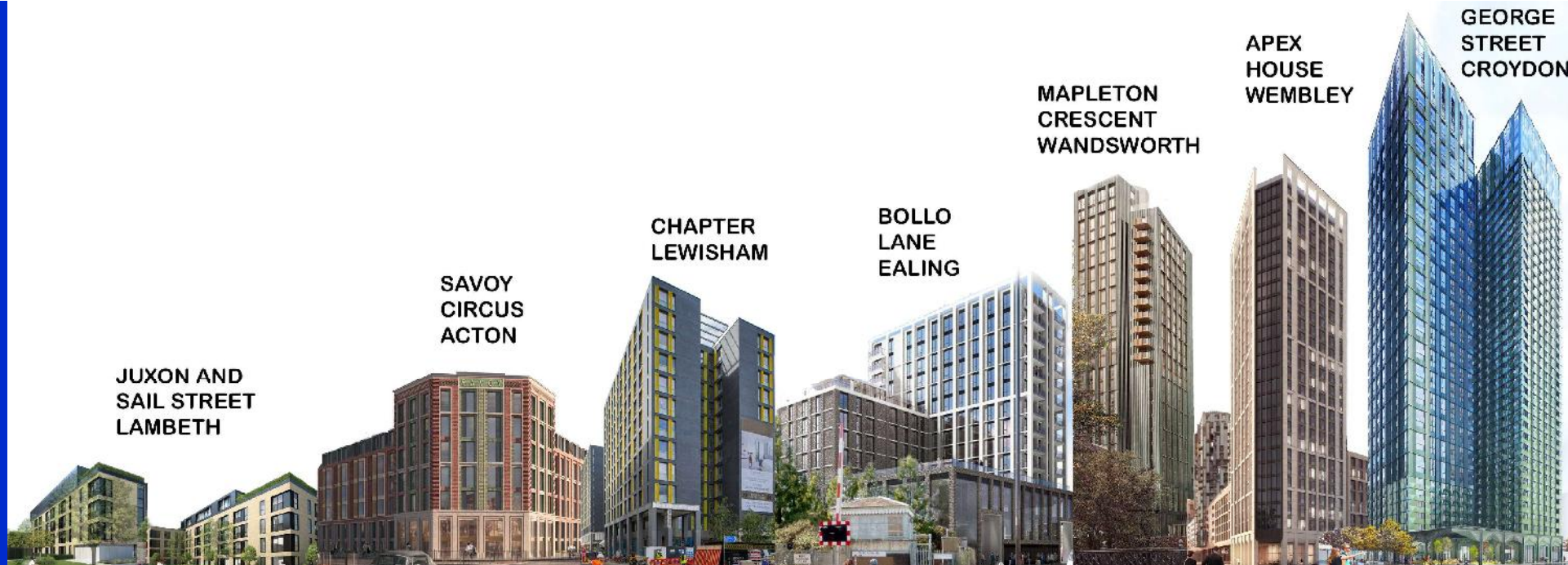


DELIVER

PLUG IN

SWITCH ON

?



MJH Structural Engineers

Specialists in Offsite and Modular Construction

Email: Info@mjhse.com
Twitter: [@MJHEngineer](https://twitter.com/MJHEngineer)
Phone: 00353 1 400 3659

