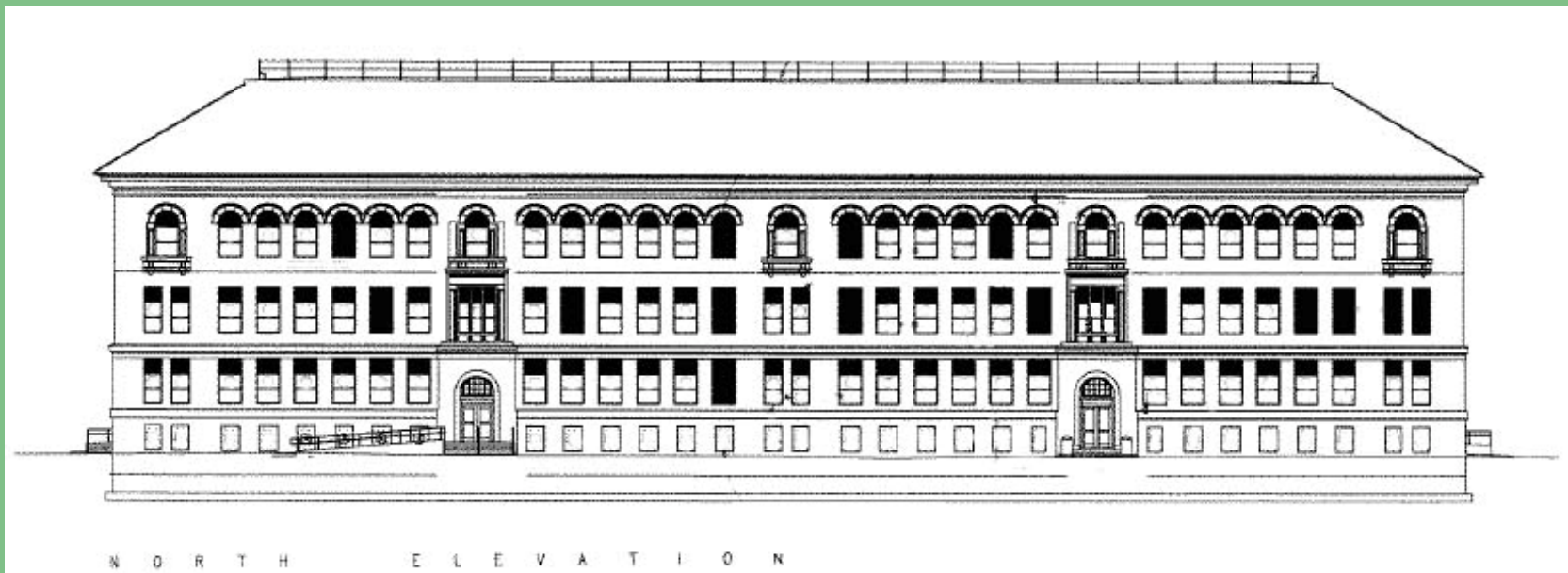


KEILLER BUILDING

Laboratory Building
University of Texas -- Medical Branch
Galveston, Texas



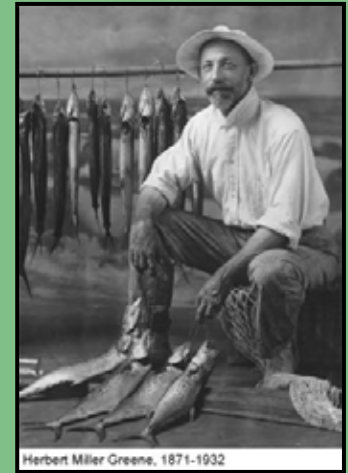
Team "That's What She Said"

Paul Gregg -- Ann Frankovich -- Julie Krebs -- Leslie Leffke -- Adam Panter

Background

- History

- Constructed in 1925 as the Laboratory Building for the University of Texas Medical Branch – Galveston, TX¹
- Architect –
 - Herbert Miller Greene, Univ. of Texas campus
 - architect, 1922-1932
- Mediterranean-influenced Beaux-Arts style
- Expanded in 1932, renovated in 1995, currently undergoing structural alterations.²



Herbert Miller Greene, 1871-1932

3



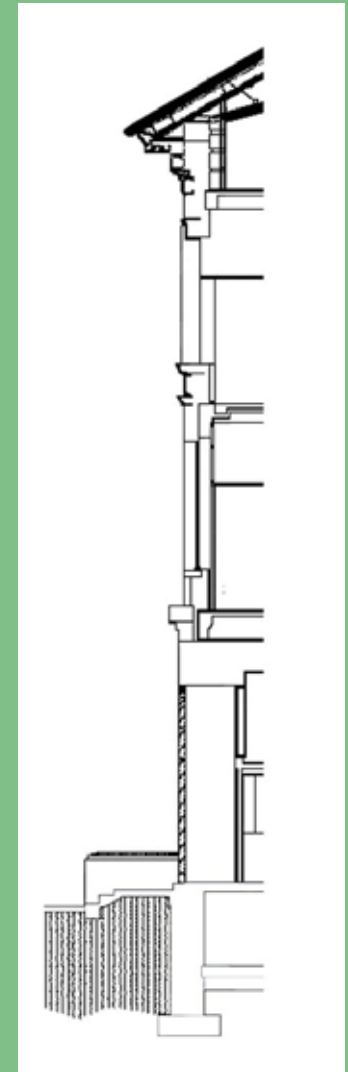
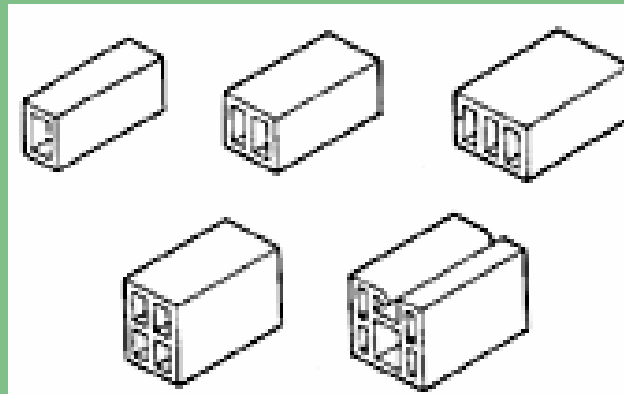
4



Construction

- Massing

- Primary system is load bearing masonry consisting of 1' clay tile masonry units with limestone and brick veneer (non load-bearing)
- No expansion joints
- Renovation/new construction uses more cast-in-place reinforced concrete, but the overall building system is still primarily load bearing clay masonry.



Construction

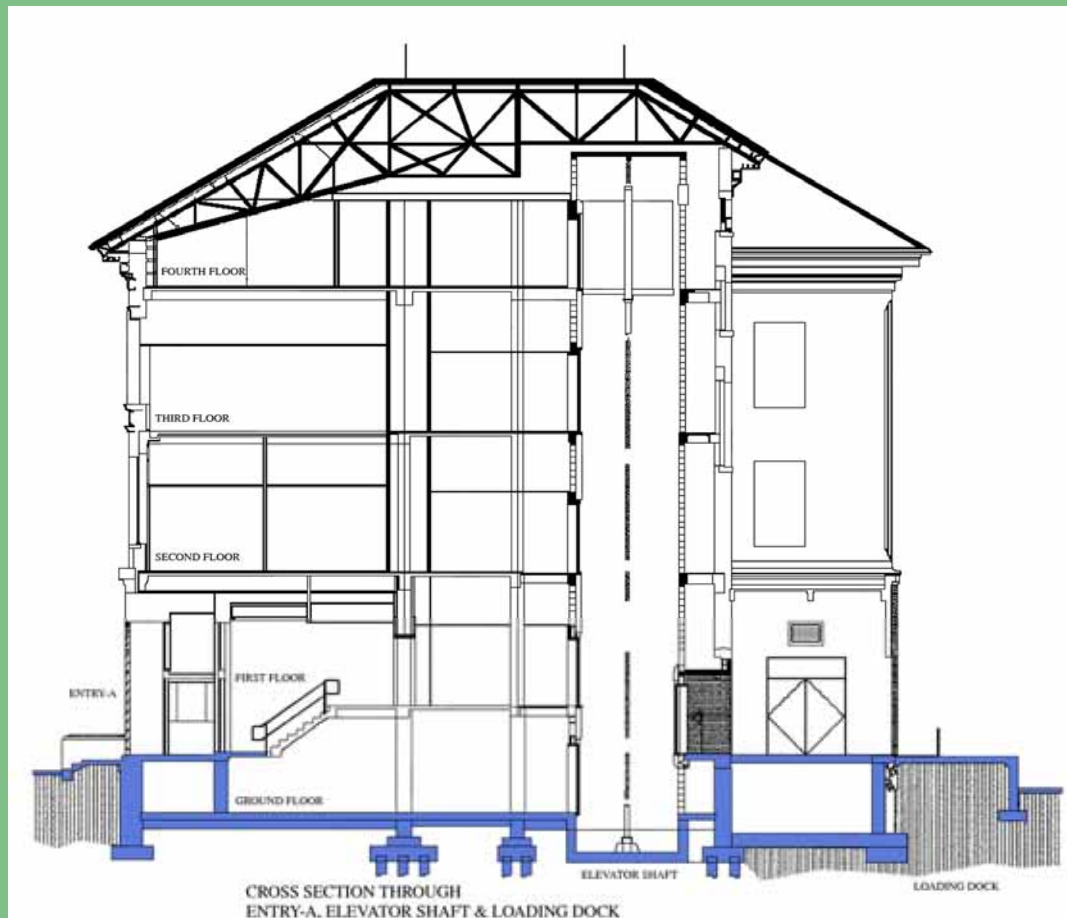
- Soil conditions

- Deep Sandy Eolian Sands of Holocene age.₅
- Cohesionless
- Building should be built upon piers or piles in order to create stability.



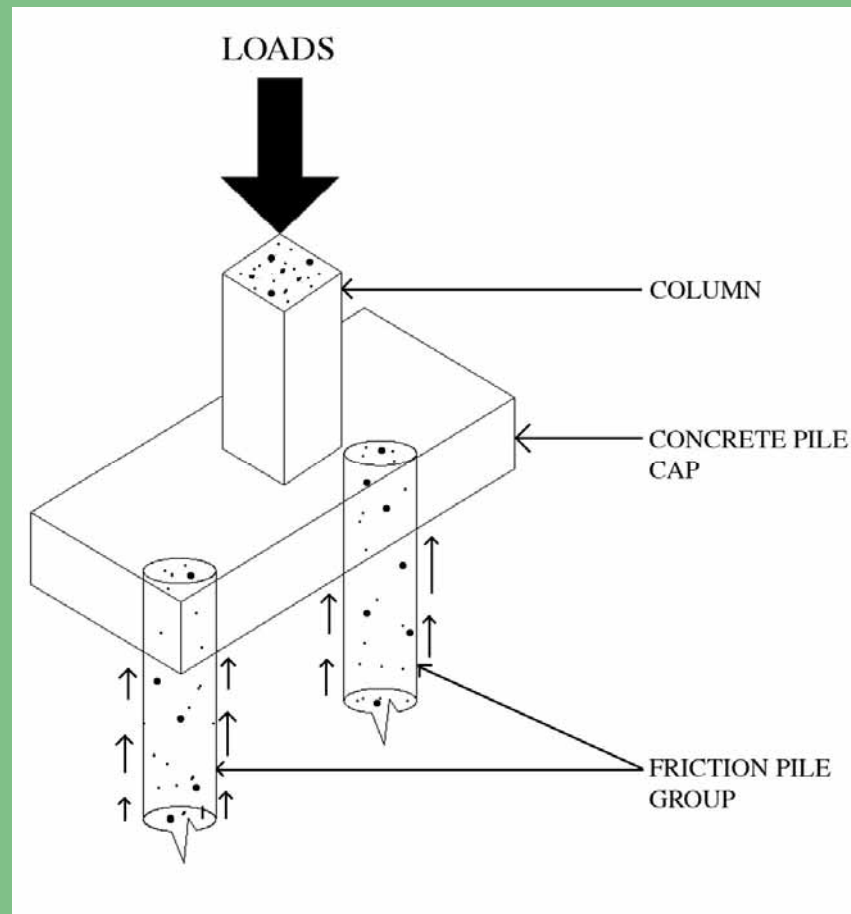
Construction

- Foundation



Construction

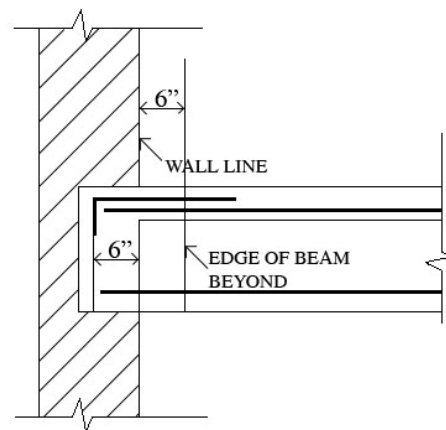
- Foundation



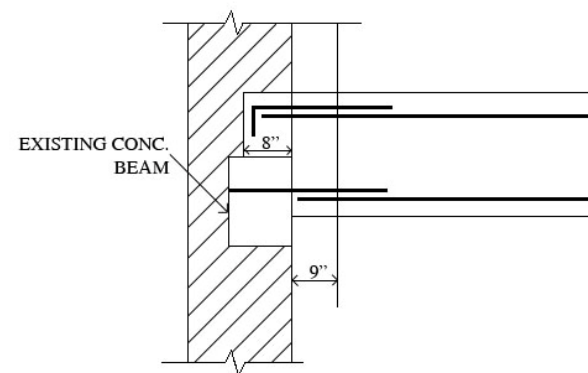
Construction

- Flooring

- Floor slabs are a one-way concrete joist system in most areas. Slabs are 5" thick, joists are 1' deep and spaced 3' on center
- Some of the longer slab areas have tertiary members to reinforce the system. Visually the slabs become a two way system, but the bay proportions exceed the maximum aspect ratio, making them one-way.



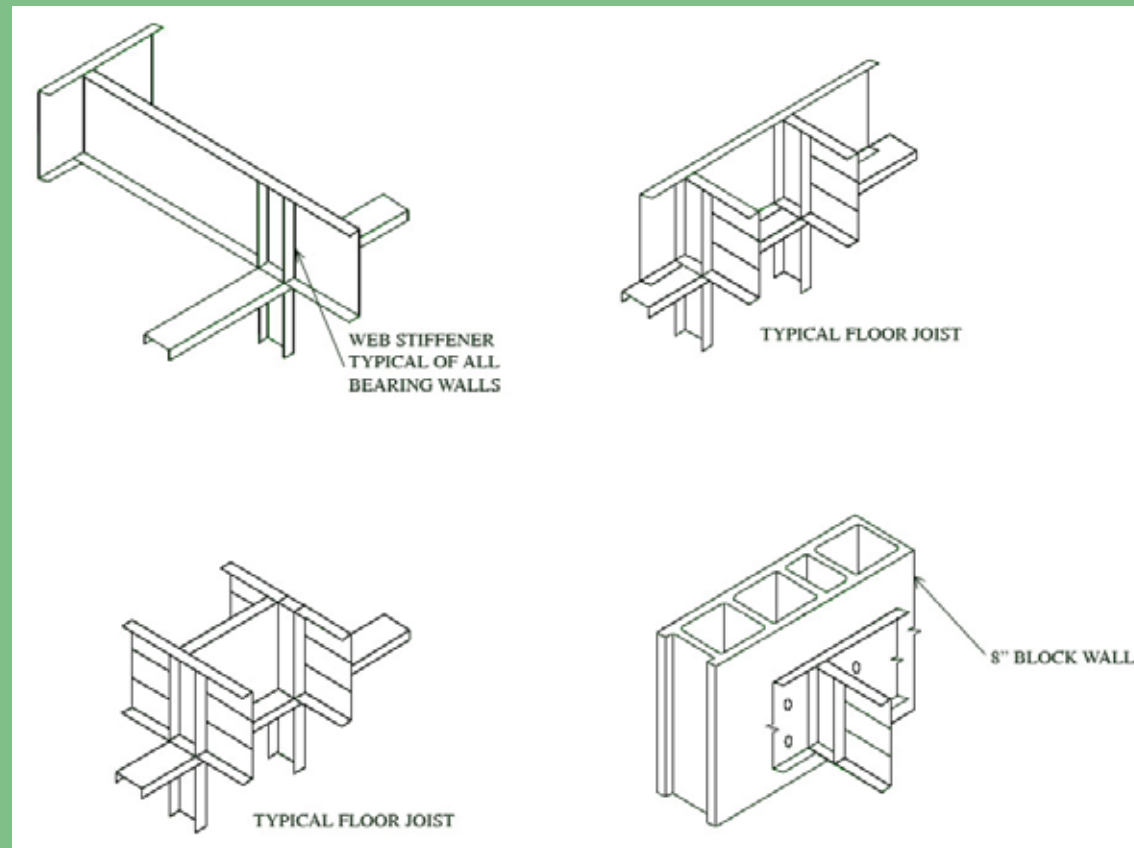
NORTH WALL



SOUTH WALL

Construction

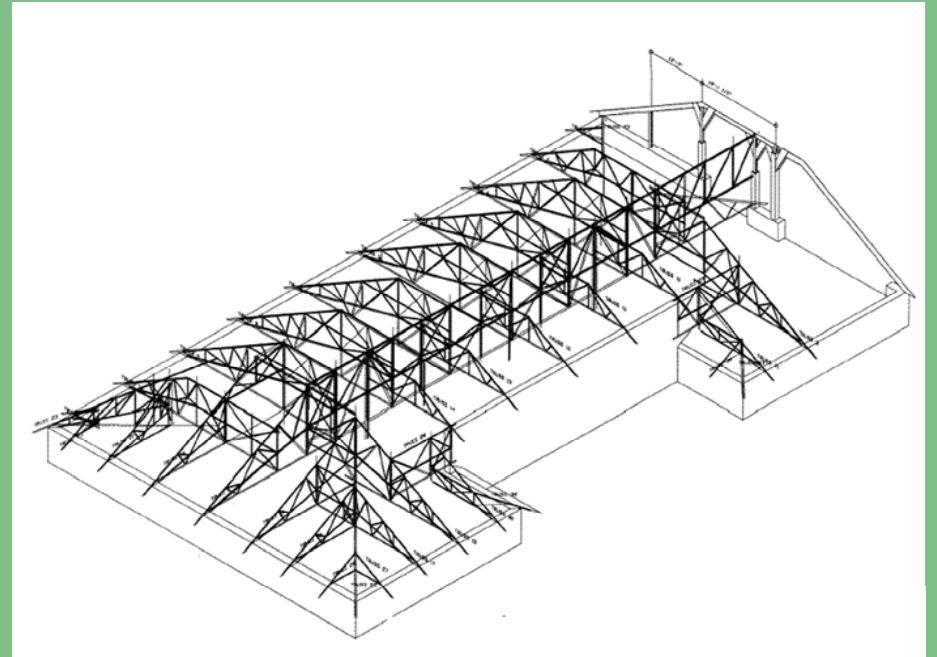
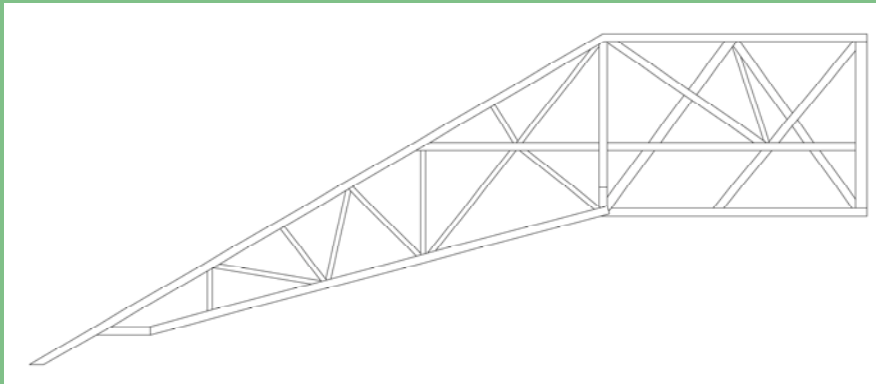
- Flooring (cont.)



Construction

- Roof system

- Roof trusses are formed of welded steel members.
- Composed of two steel angles with a gusset plate connections.
- Rigid joints.
- Truss welded to plate cast in masonry wall.



Construction

- Columns







- All interior columns composed of reinforced concrete.

CONCRETE COLUMN SCHEDULE					
MARK	SIZE	VERT. STEEL	TIES	DOWELS	DETAILS
C4	20 x 20	8, #7	#3 @ 14	8, #7 x 4'-0"	S818
C5	14 x 14	4, #7	#3 @ 14	4, #7 x 4'-0"	S818
C6	14 x 14	4, #7	#3 @ 14	4, #7 x 4'-0"	S818
C7	14 x 14	4, #7	#3 @ 14	4, #7 x 4'-0"	S818
C8	14 x 14	4, #7	#3 @ 14	4, #7 x 4'-0"	S818
C9	20 x 20	8, #7	#3 @ 14	8, #7 x 4'-0"	S818
C10	20 x 20	8, #7	#3 @ 14	8, #7 x 4'-0"	S818
C11	20 x 20	8, #7	#3 @ 14	8, #7 x 4'-0"	S818

NOTE: COLUMNS EXTEND BETWEEN 3RD AND 4TH FLOORS

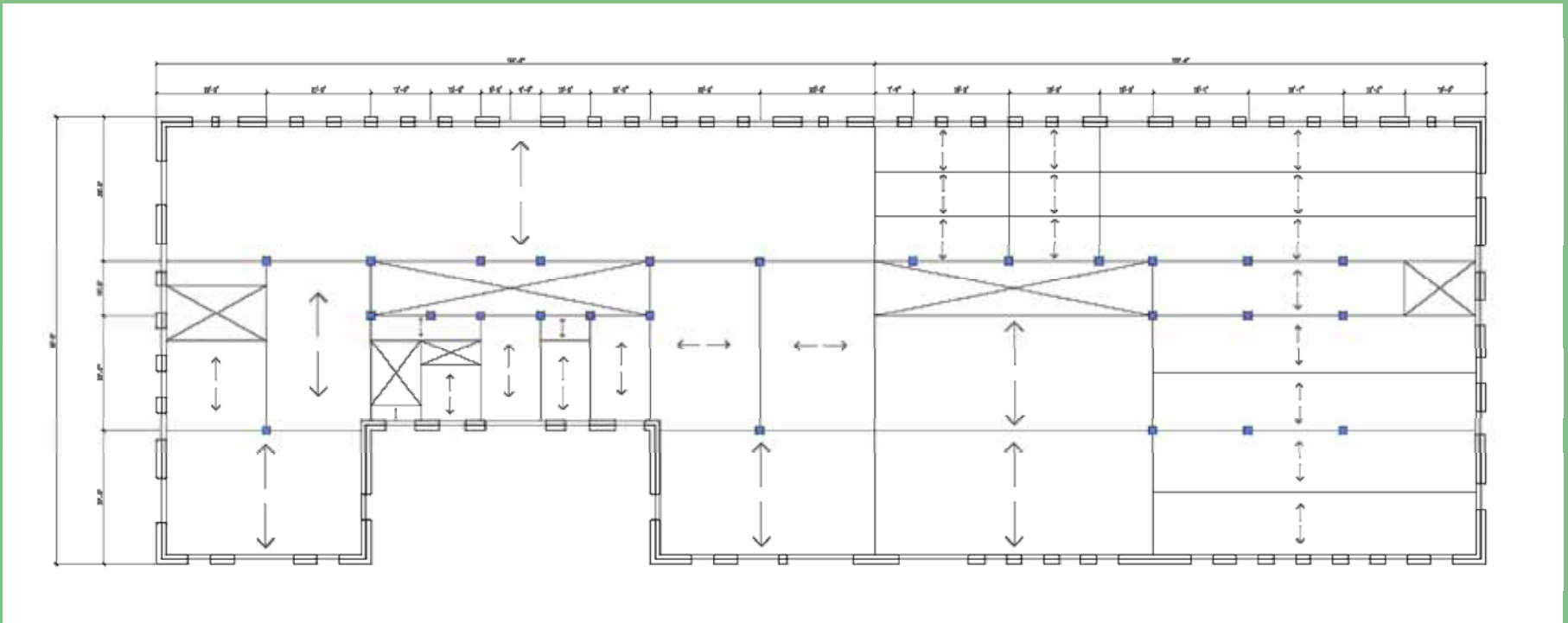
Construction

- Supports

Buckled shape of column shown by dashed line	(a)	(b)	(c)	(d)	(e)	(f)
						
Theoretical K value	0.5	0.7	1.0	1.0	2.0	2.0
Recommended design values when ideal conditions are approximated	0.65	0.80	1.0	1.2	2.10	2.0

Construction

- Load Tracing



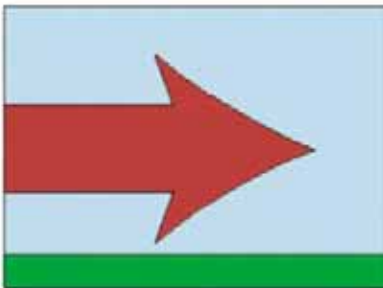
- Can you say plan irregularity??

Construction

- Loads

THE TWO-MINUTE ENGINEER

FORCES

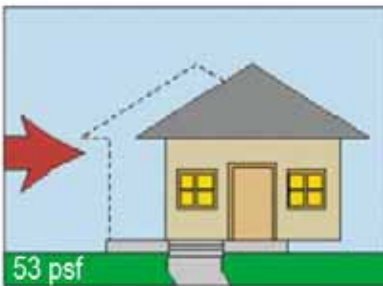


Lateral load: Forces applied parallel to level ground surface. (wind, seismic, backfill, etc.)

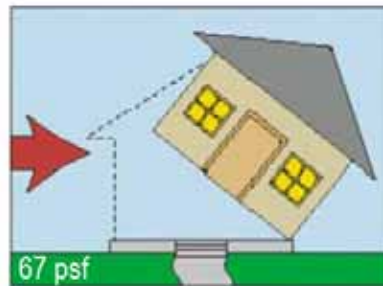


Uplift: Forces applied perpendicular to level ground surface, in an upward direction. (wind uplift and vertical seismic forces)

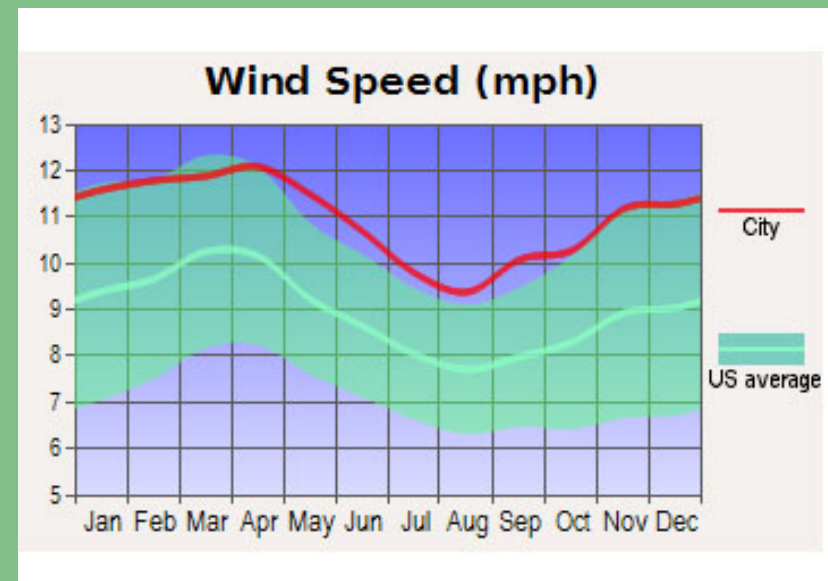
REACTION



Base shear: The reaction at the base of a wall or structure due to an applied lateral load - "Sliding Force"

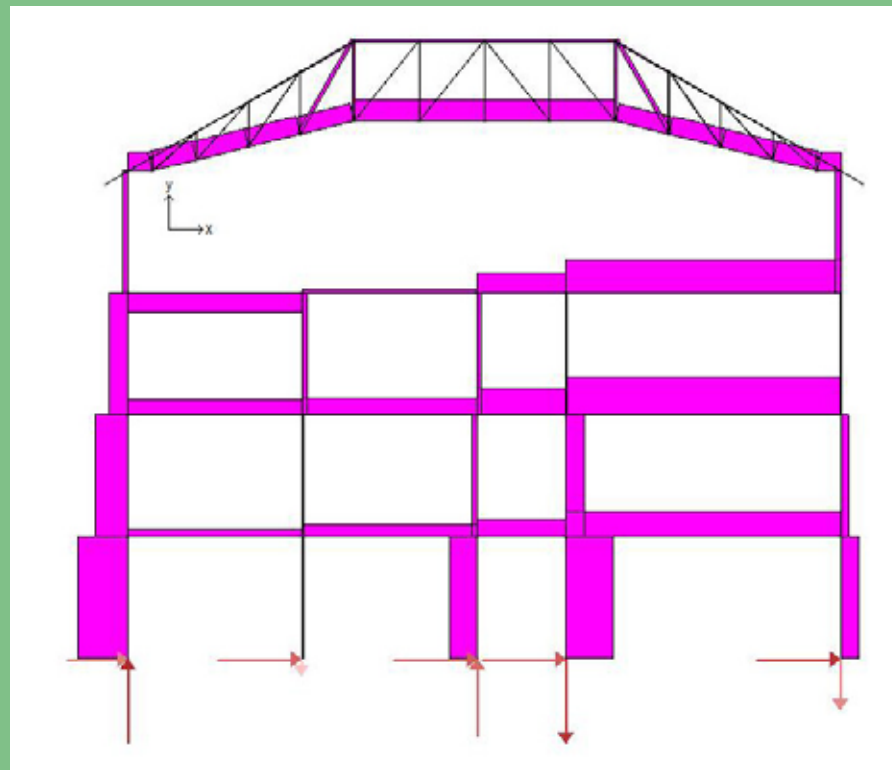


Overturning: What happens when a lateral force acts on a wall or structure and it can't slide - "Tip Over Force."



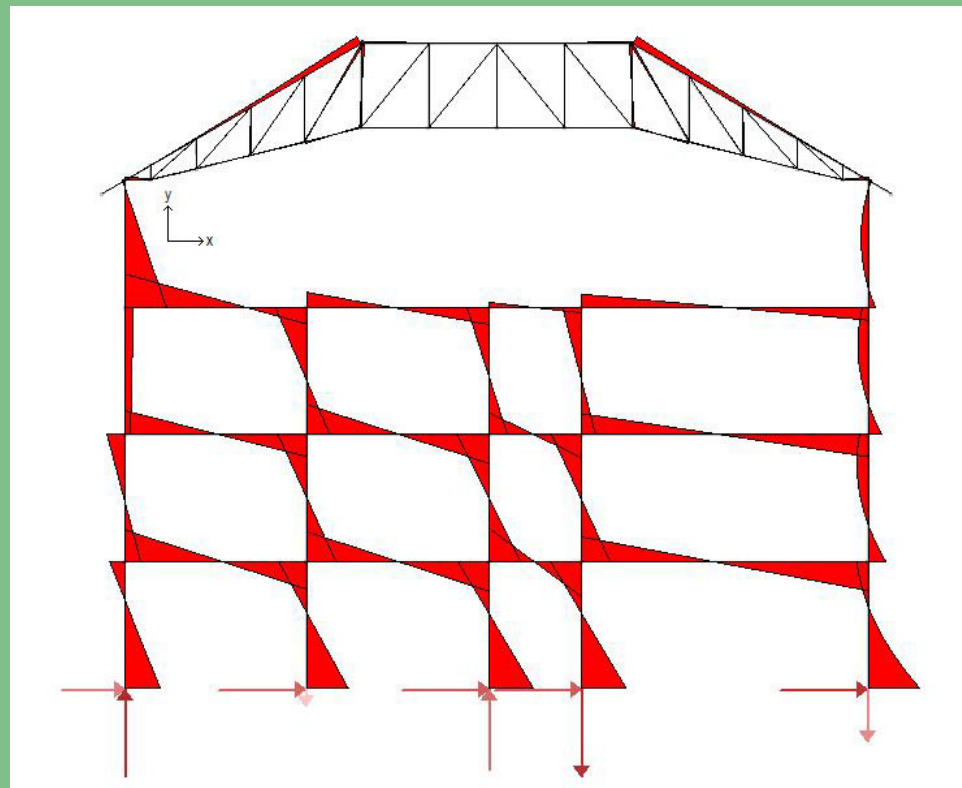
Construction

- Loads
 - Force Diagram



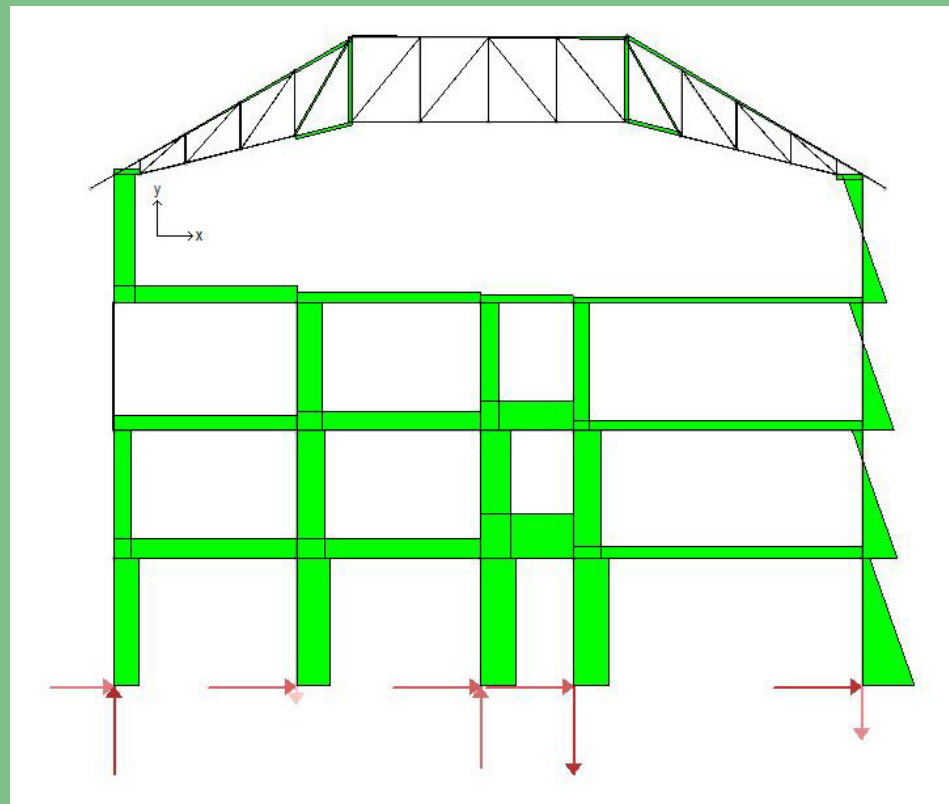
Construction

- Loads
 - Moment Diagram



Construction

- Loads
 - Shear Diagram



Construction

- Loads

- Load Resisting Factors
 - The building functions as shear walls connected by a rigid diaphragm
 - Resists the overturning moment, resists torsion due to building length
 - Basically, the building functions as a monolithic structure.

Sources

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