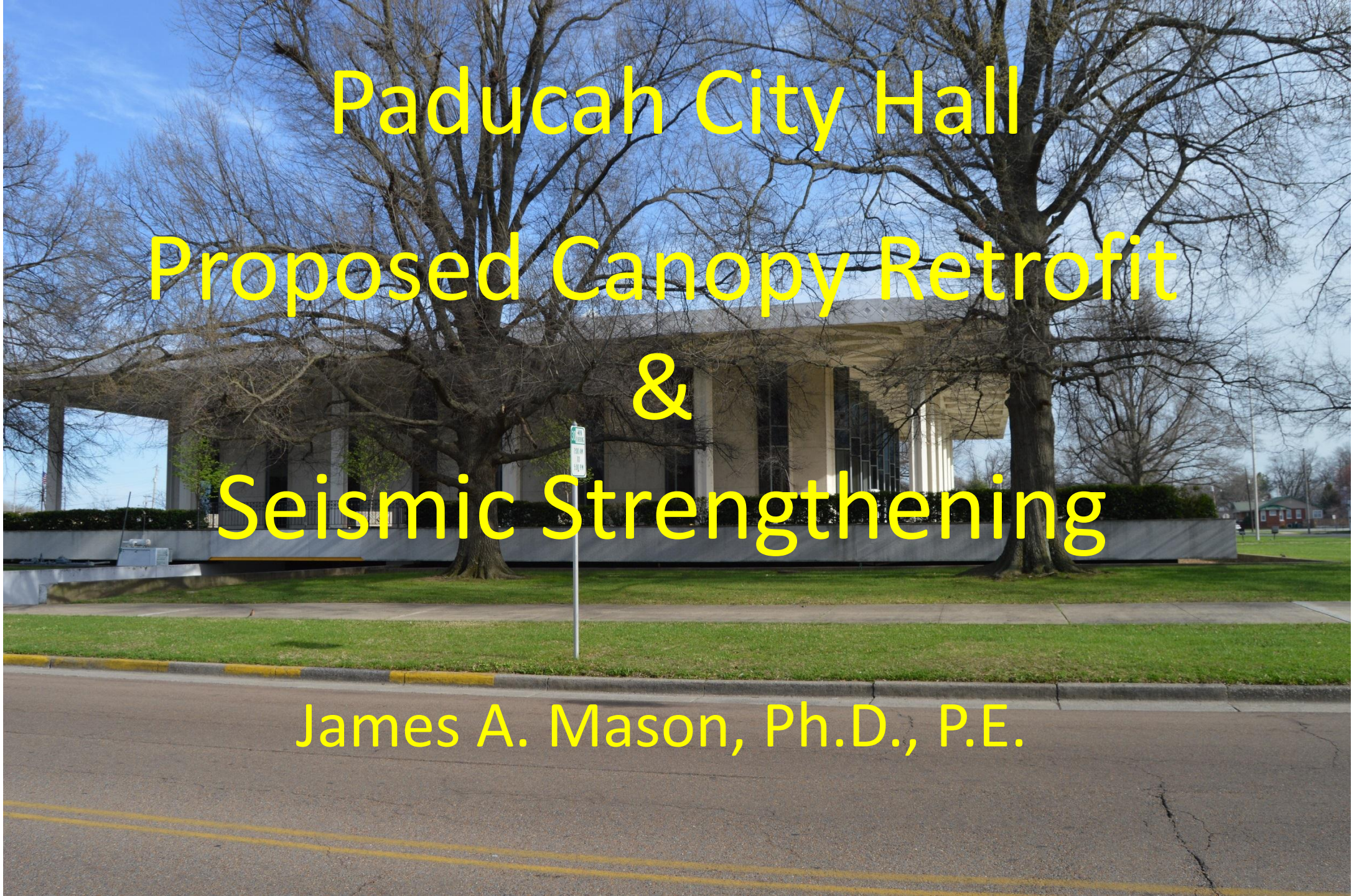
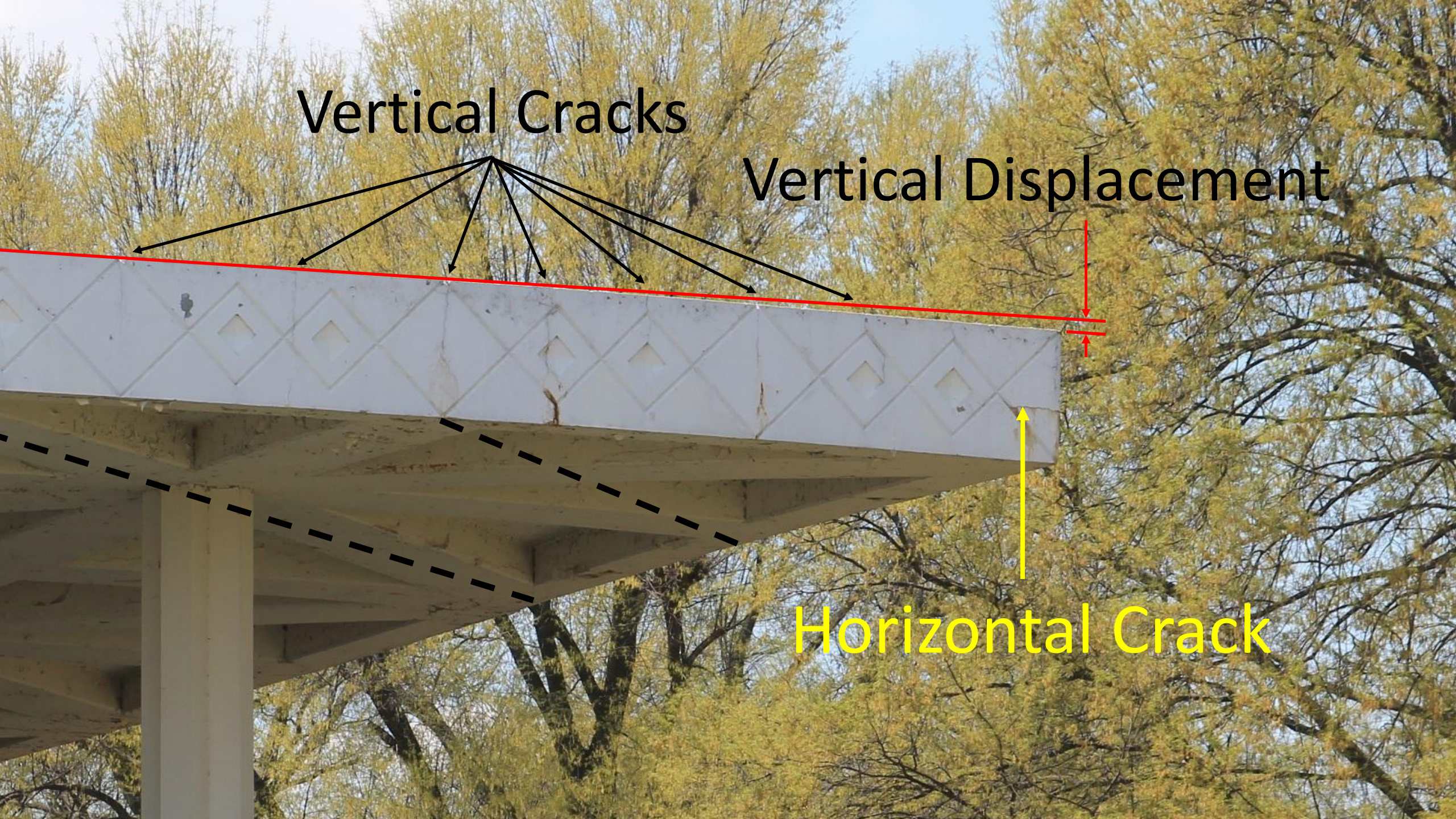
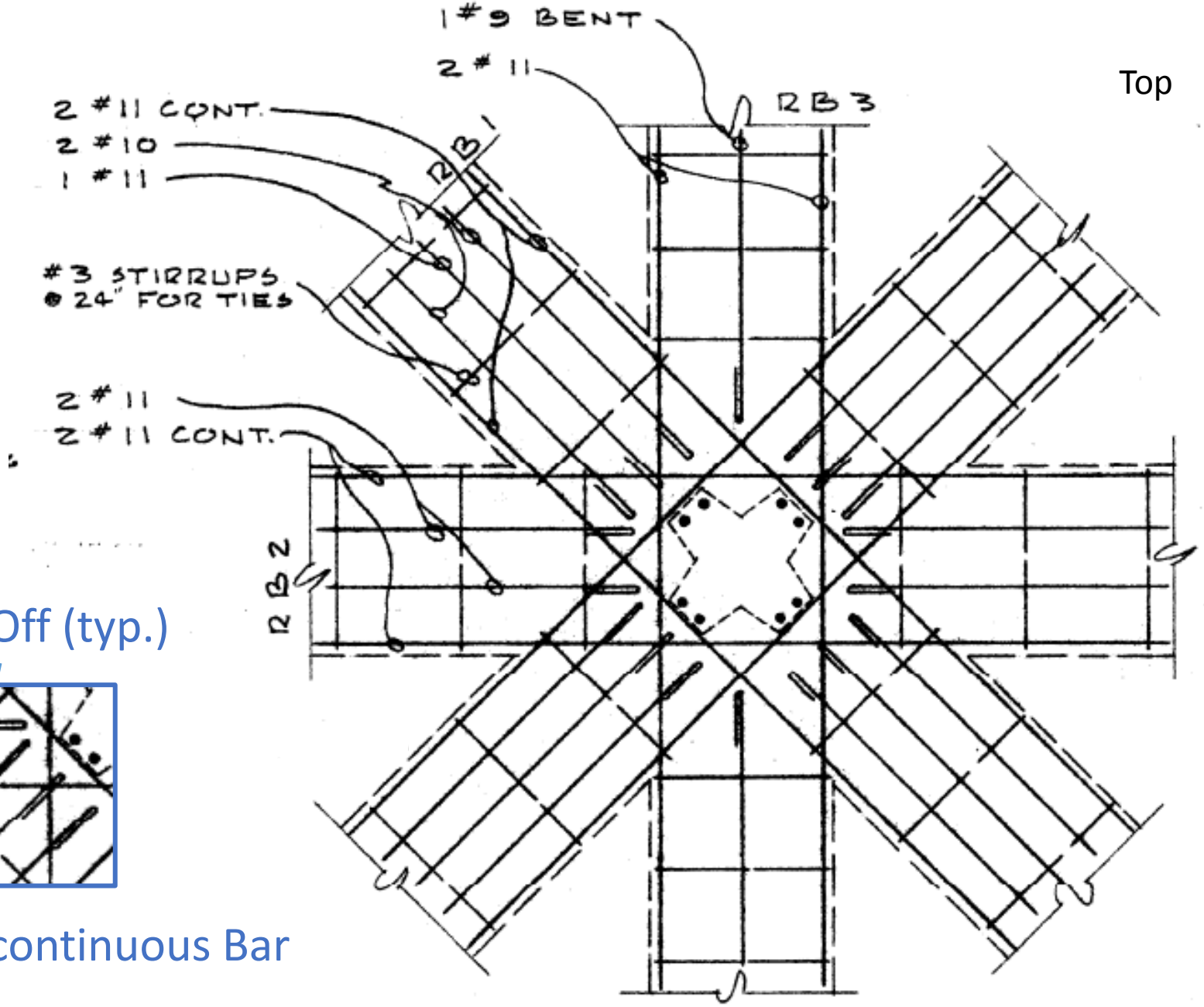


Paducah City Hall

Proposed Canopy Retrofit & Seismic Strengthening

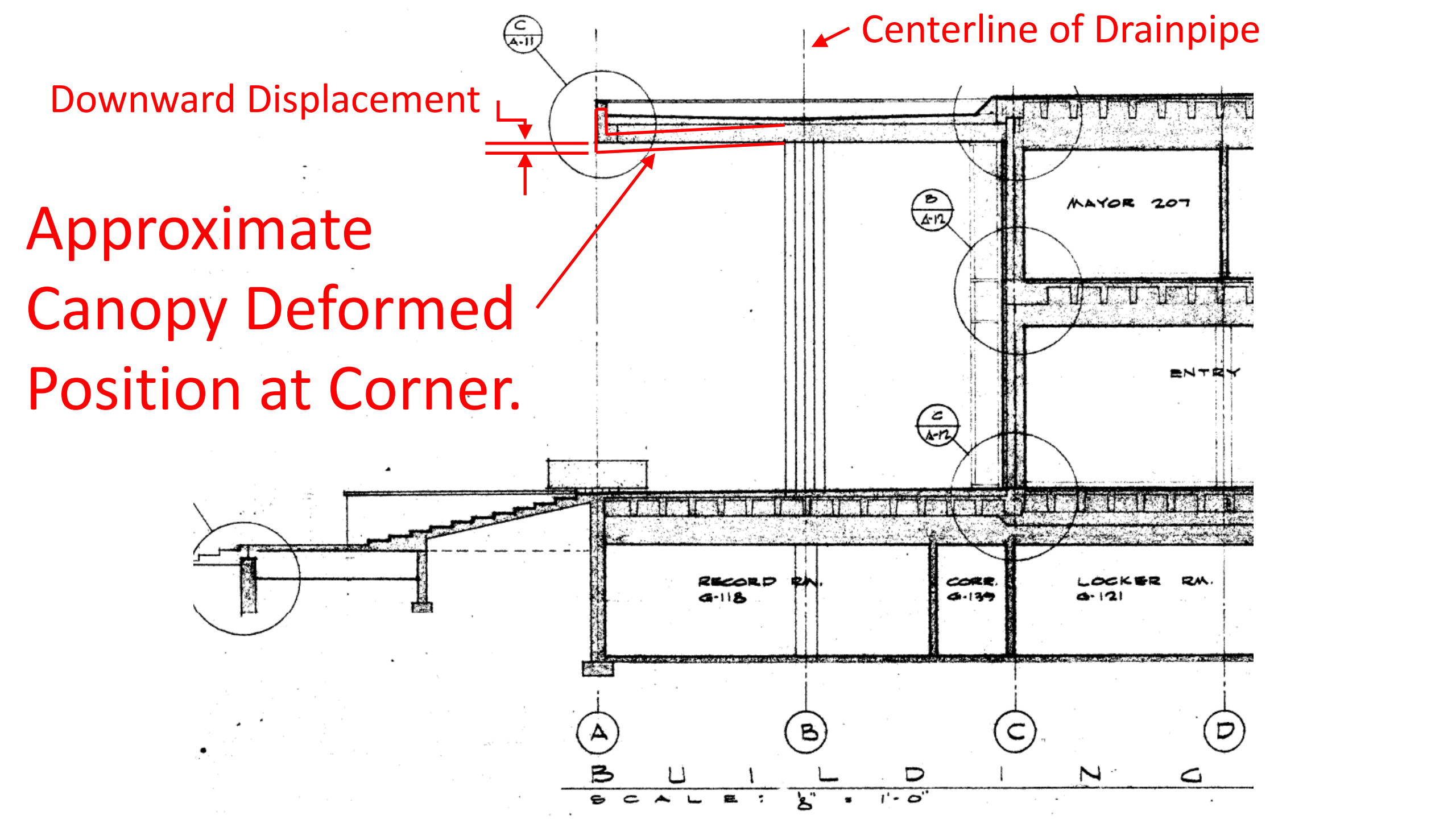
James A. Mason, Ph.D., P.E.

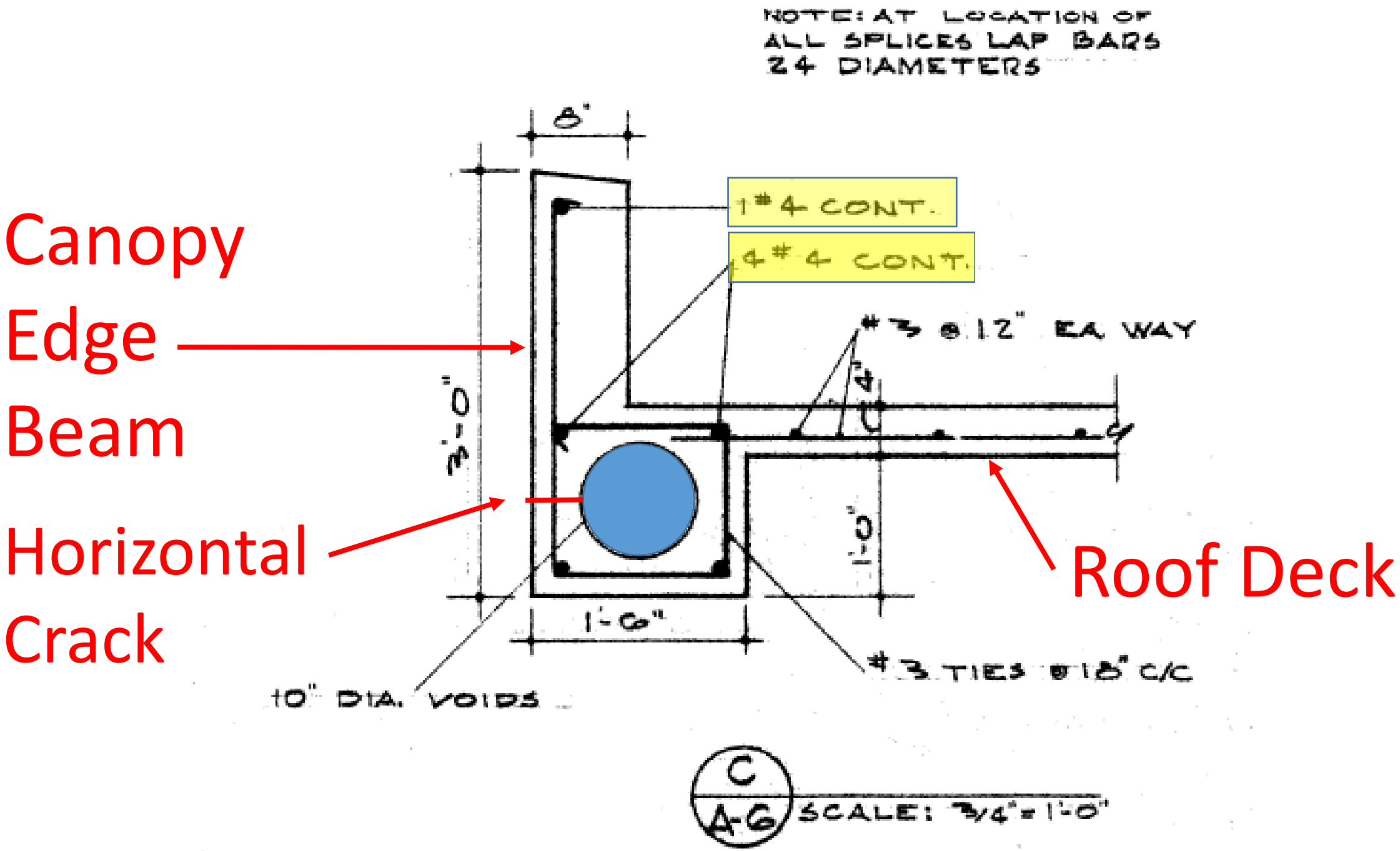

Vertical Cracks
Vertical Displacement
Horizontal Crack



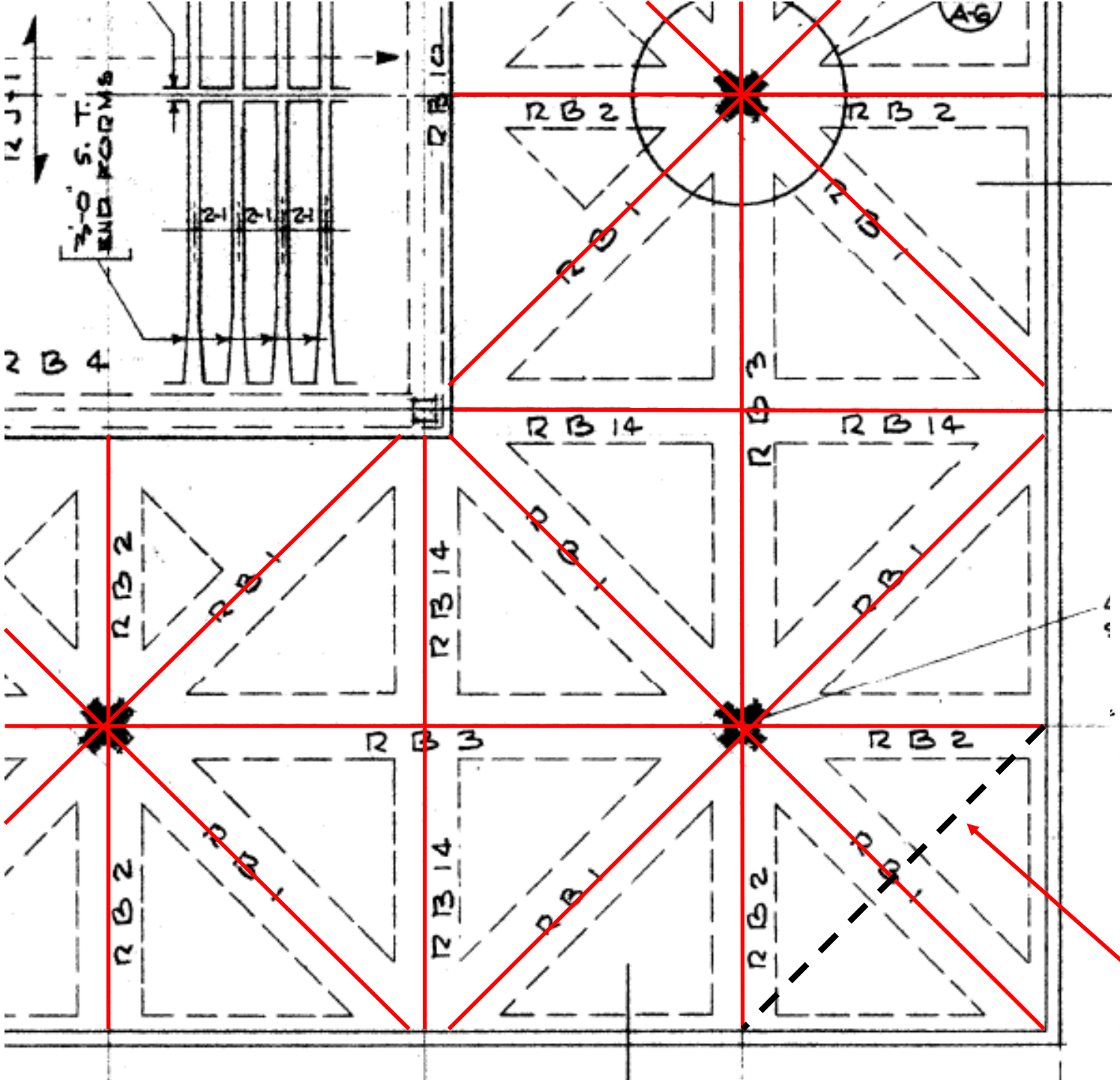
Bar Cut-Off (typ.)

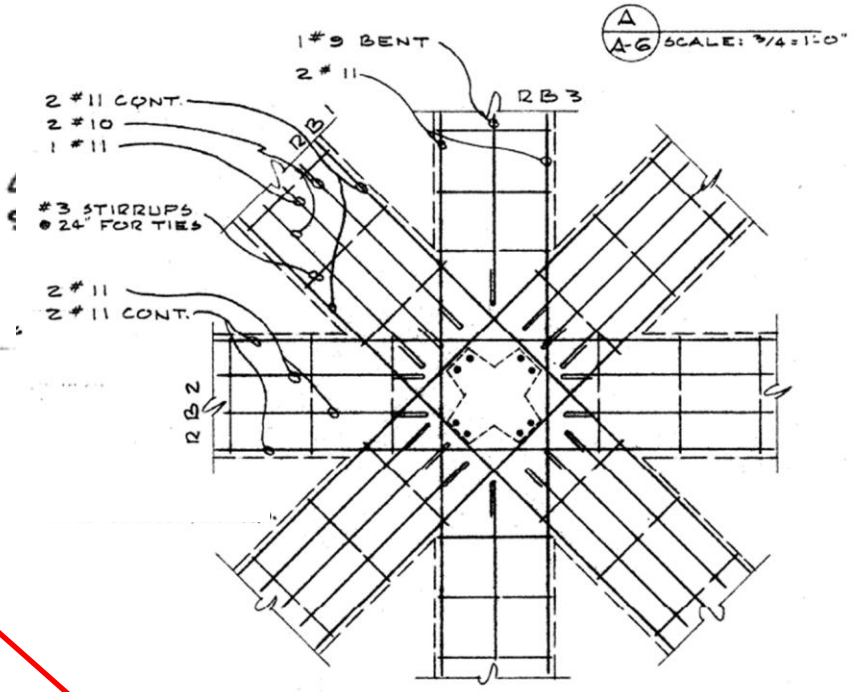
Detail of Discontinuous Bar


Centerline of Drainpipe
Downward Displacement
Approximate Canopy Deformed Position at Corner.
C A-11
B A-12
C A-12
MAYOR 207
ENTRY
RECORD RM. G-118
CORR. G-139
LOCKER RM. G-121
A
B
C
D
BUILDING
SCALE: 1/8" = 1'-0"


NOTE: AT LOCATION OF ALL SPLICES LAP BARS 24 DIAMETERS
8"
1 #4 CONT.
4 #4 CONT.
#3 @ 12" EA WAY
3'-0"
1'-0"
1'-6"
#3 TIES @ 18" C/C
10" DIA. VOIDS
C
A-6
SCALE: 3/4" = 1'-0"
Canopy Edge Beam
Horizontal Crack
Roof Deck

Strengthening. General Layout Pattern.

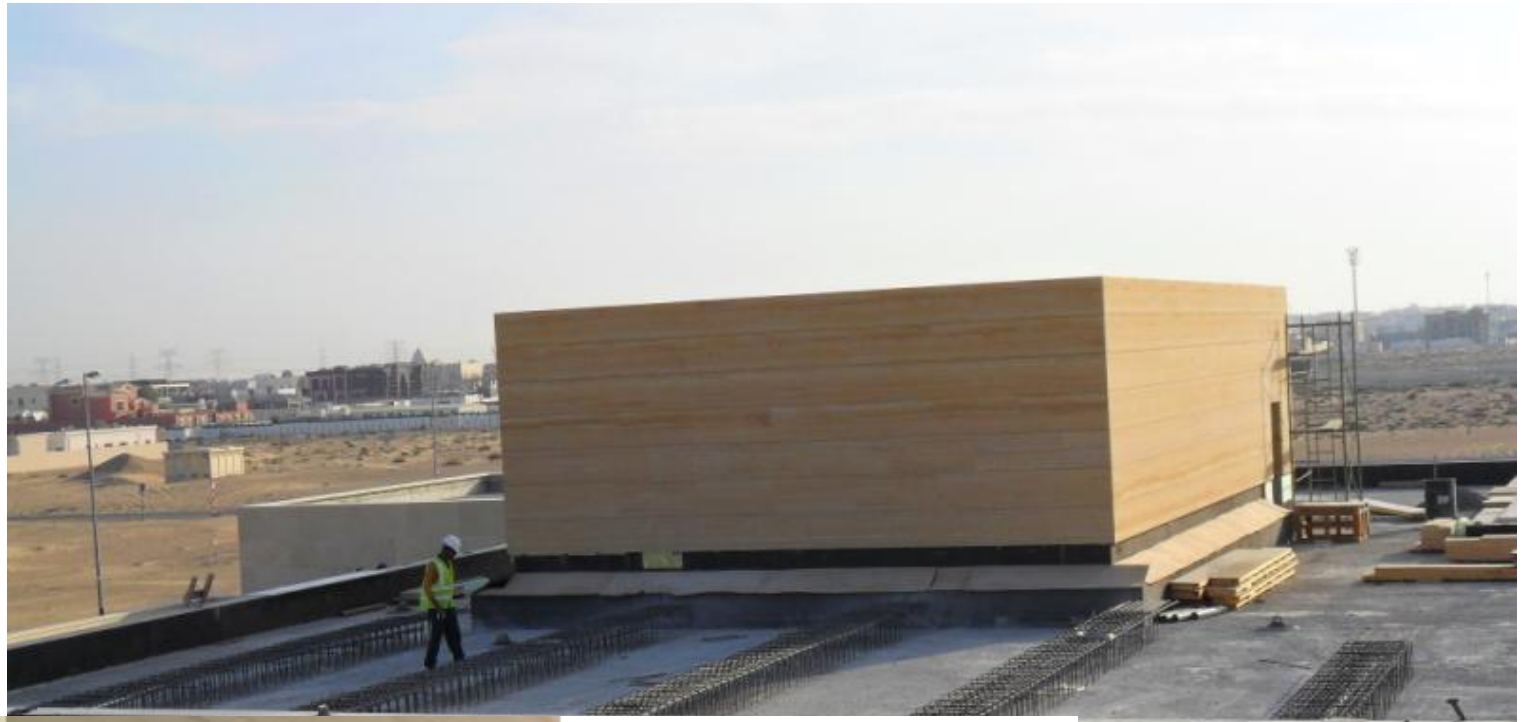


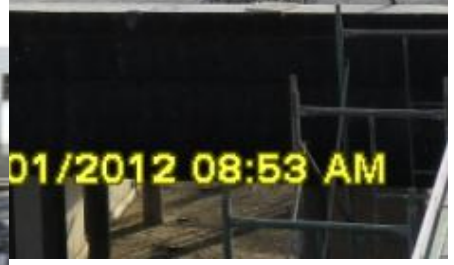


Line of Rotation

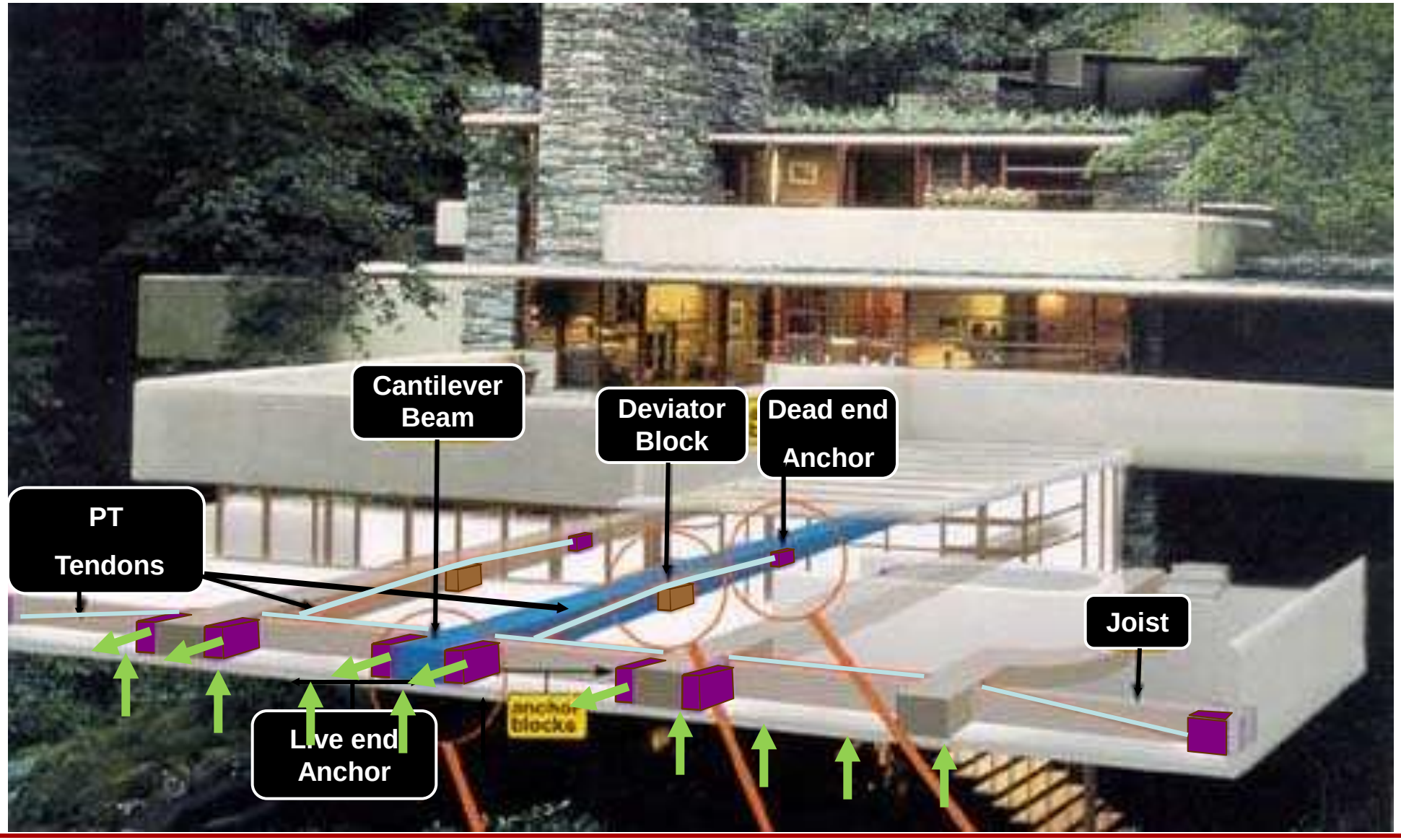
Up stand PT beams:
Block B

- Slab Thickness = 450 mm
- Cantilever Length = 5.8 m
- Existing Deflection = 60 mm



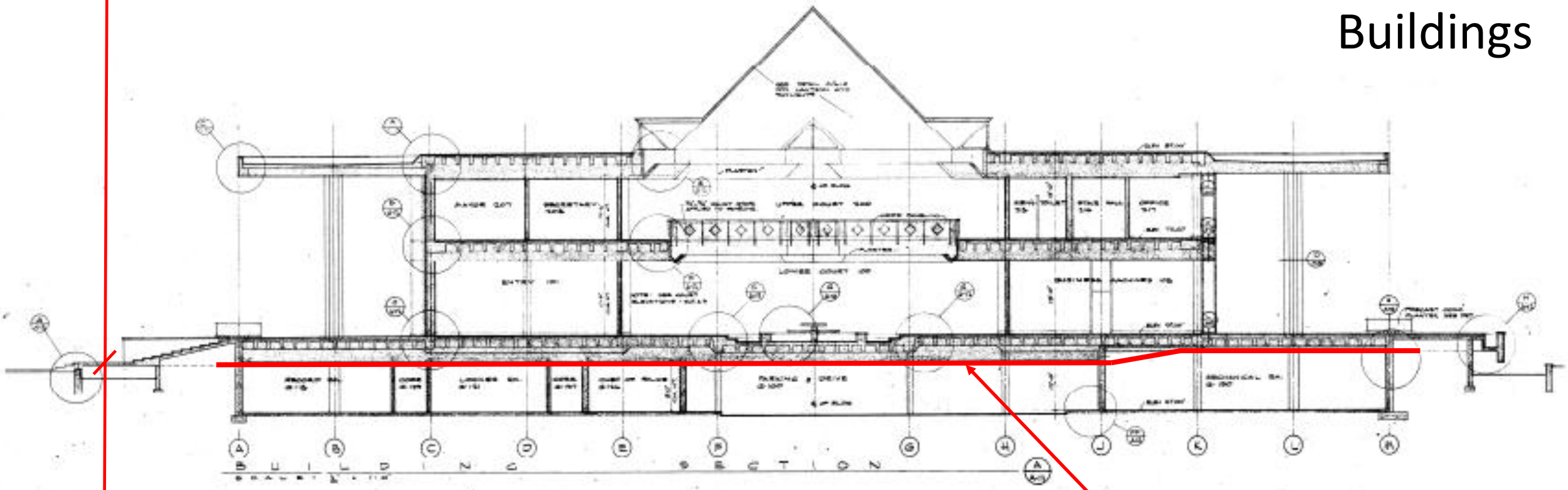


Case Study: Fallingwater External Post-Tensioning



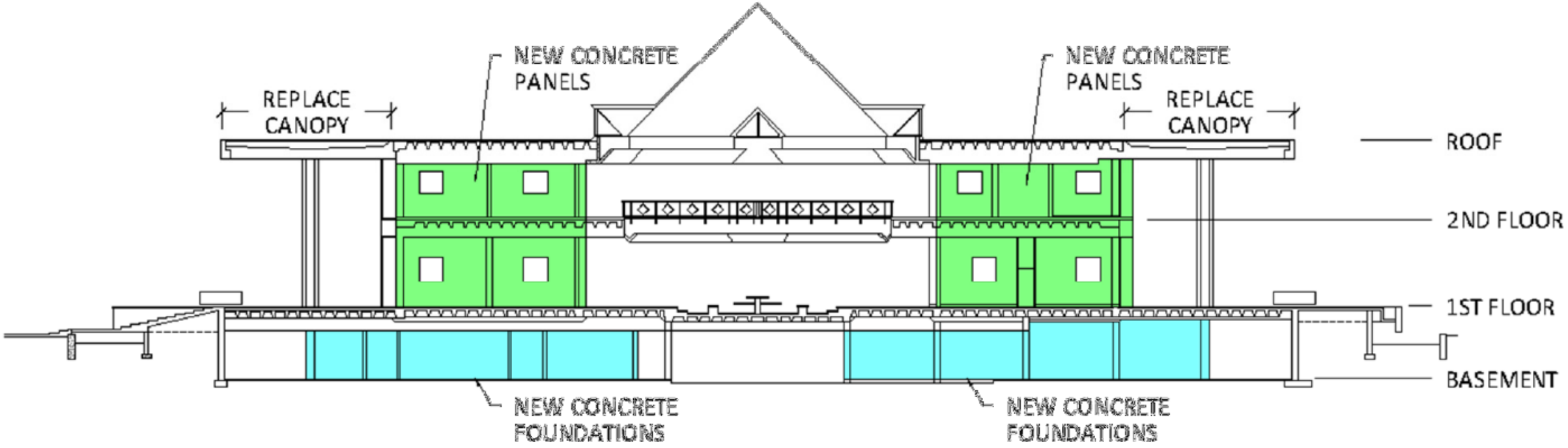
Base Isolated Structure

FEMA 356. Seismic Rehabilitation of Buildings



Earthquake Resistant Strengthened Basement

Line of Decoupling



STRENGTHENING OPTION SECTION

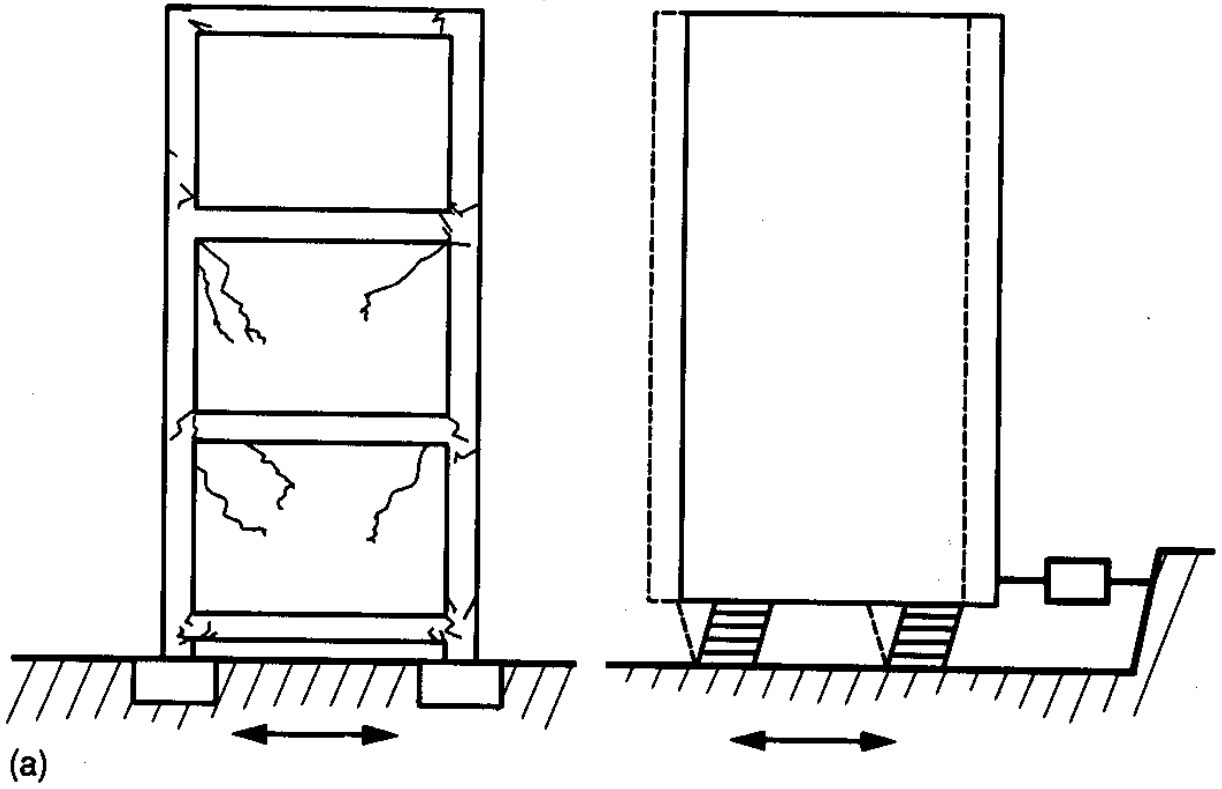
BFW Seismic Strengthening & Canopy Replacement

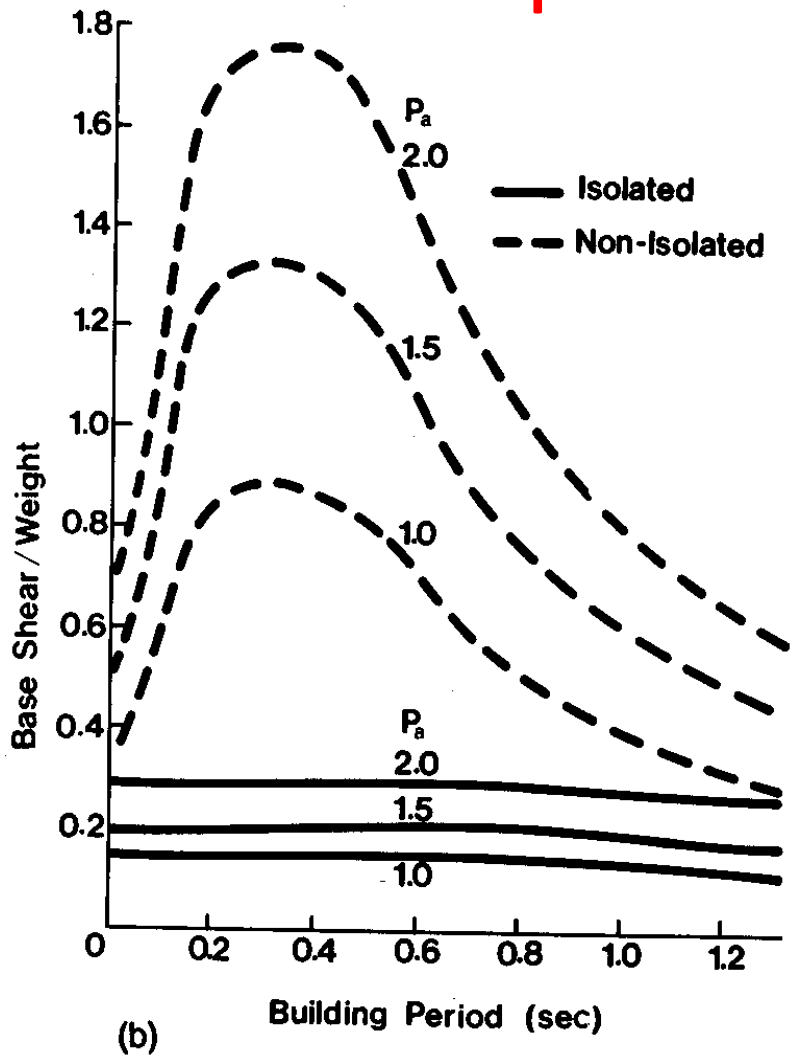
Emergency Command Center

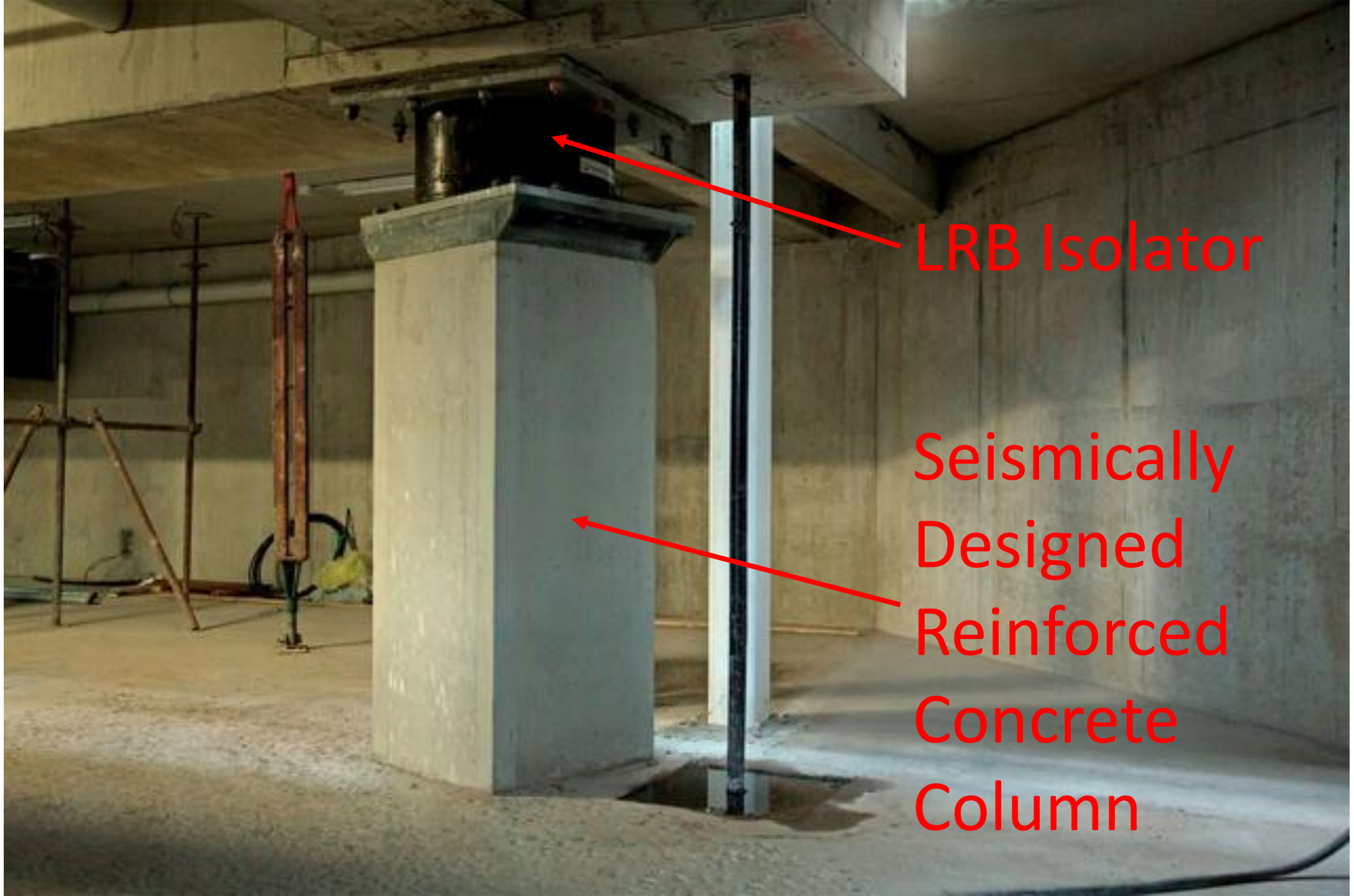
Building and Content Damage

Operational Post-Natural Disaster

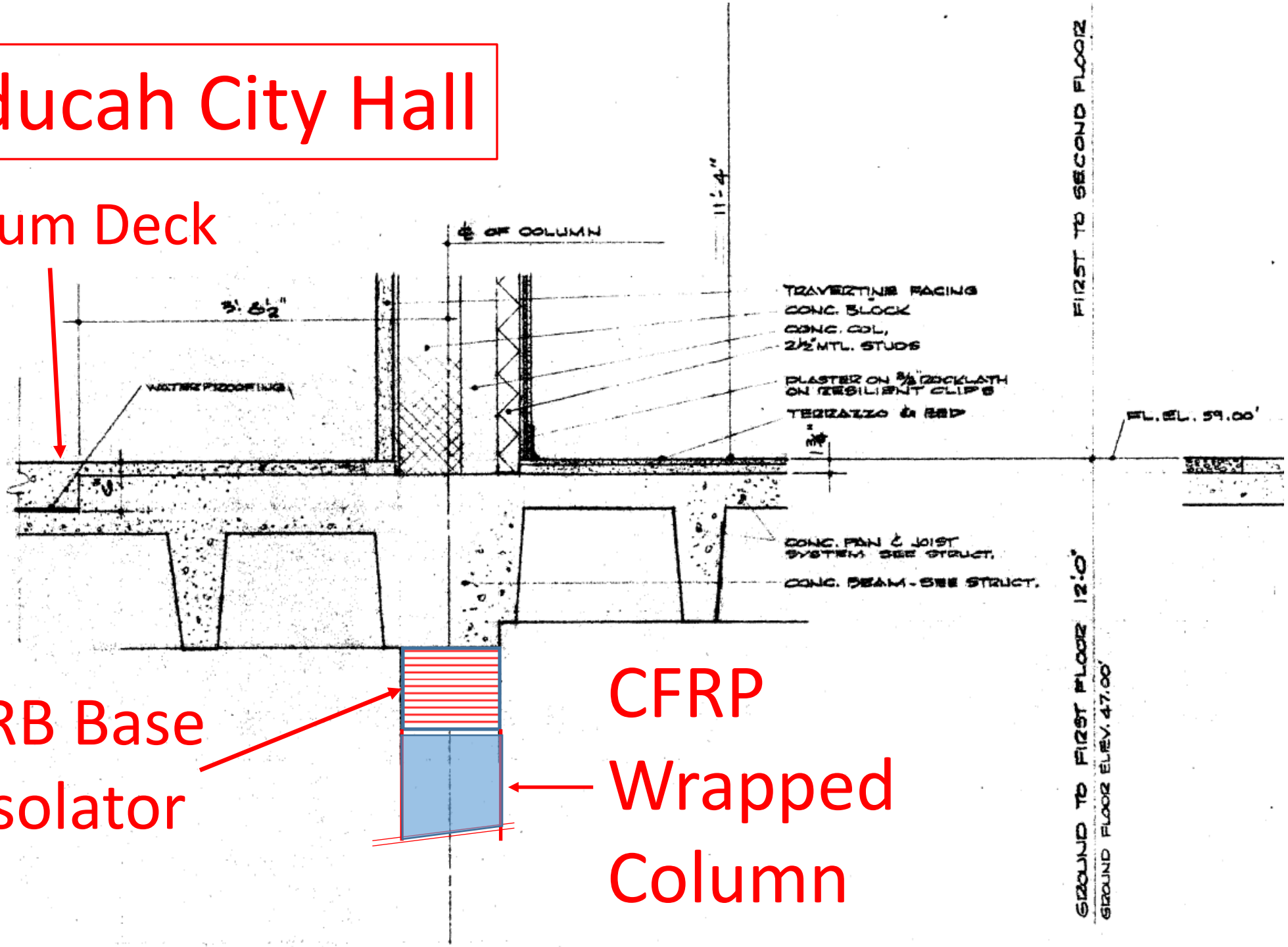
Base Isolation Option






LRB Isolator
Seismically Designed Reinforced Concrete Column

Paducah City Hall



Preliminary Cost Estimate

Canopy Strengthening				
4 - Beams at each location X 22 Locations				
Beam #	Length (ft)			
1	20		50 lf total X 22 locations = 1200 lf of beam enlargement	
2	10		Beam enlargement = 8" deep x 3.5 ft wide = 2800 cf of enlargement	
3	10		Say (@$200/cf)	$560,000
4	10			
sum =	50		Jacking + Shoring	$500,000
			Patching spalls	$40,000
			Subtotal =	**$1,100,000**
Does not include any roof work, i.e., roof removal and reconstruction, drainpipe work, paint removal and repainting, etc.				

Base Isolation					
Columns - 64 locations @ $15.7k each, incl. shoring + jacking					
			Say		$1,000,000
Columns - FRP Wrap @ $50/sf					
Type	Width	Height	Surface Area	Number	Cost
	(ft)	(ft)	(sf)		
12"x12"	1	10	40	44	$88,000
18"x18"	1.5	10	60	20	$60,000
Perimeter Wall @ $1250/lf			600 lf	Say	$750,000
Tie-backs	Number	Cost/each			
plus	48	$6,500			$312,000
Edge beam					
			Subtotal =		**$2,210,000**
			Total =		**$3,310,000**

Does NOT include:

- Moving existing equipment,
- Removal of wall partitions (jail area)
- HVAC work or equipment
- Podium Deck work

Baseline Cost Comparison

BFW		ALT.
$2.3M	CANOPY	$1.1M
$1.8M	SEISMIC UPGRADE	$2.2M
$4.1M	TOTAL	$3.3M
Note: BFW canopy estimate includes new roof + downspouts		
BFW seismic upgrades includes seal + paint new conc. walls		
	plus construction of new interior walls where needed.	

CANOPY / SEISMIC UPGRADE COMPARISON

	PROPOSAL COMPARISON	
BFW		ALT.
N	OPERATIONAL DURING CONSTRUCTION	Y
Q	GENERAL SAFETY DURING CONSTRUCTION	Y
Q	PODIUM DECK. SURVIVAL DURING CONSTRUCTION	Y
N	EXISTING LANDSCAPING	Y
Q	PERFORMANCE OF CANOPY DURING HIGH WINDS	Y
Y	BUILDING INTERIOR EXPOSED DURING CONSTRUCTION	N
Y	COST	Y
N	FUNDING FLEXIBILITY	Y
	Y : Yes. N : No. Q : Questionable.	

The New From
The Old . . . .
Through The Haze Of Time Comes
A Magnificent Paducah City Hall
The Old From
The New . . . .
New City Hall—A Shrine To Democracy
Many Hands
Were Busy In
Long Struggle
By Don Walker
Sun-Democrat Staff Writer
Sun-Democrat
Section D—16 Pages
Paducah, Ky.
February 26, 1965

JFK Center for Performing Arts.
Washington, D.C

North Carolina
Legislative Building (1960)