AMERICAN EAGLE OUTFITTERS Quantum II Corporate Headquarters

Michael Sandretto Spring – 2007 Structural Option

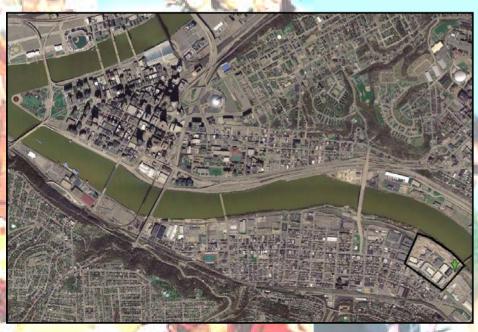
Presentation Outline

Building Description & Background

- Problem Statement & Proposed Solution
- Depth Study
 - Cross Braced Lateral System
- Breadth Study
 - Cost Analysis & Scheduling
 - Alternative Floor System
- Conclusions

Location & History The Old South Side Works

- One of many steel manufacturing facilities that made the region an industrial power.
- 2 ½ miles outside the city on the south shore of the Monongahela River.





Location & History The New South Side Works

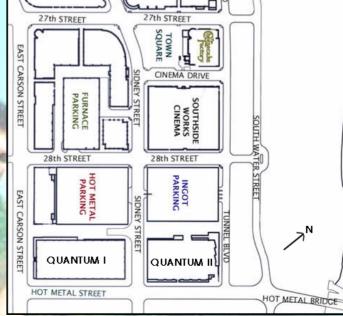
Opened in 2002

34 acre, multi-million dollar commercial development



Includes: retail, dining, offices, cinema, parking,
 & apartments.





Quantum II

6 story 186,000 square foot office.
Purchased by American Eagle Outfitters
Currently in tenant fit-out.
\$22.4 million



Project Team

- **Developer: Soffer Development**
- **Owner: American Eagle Outfitters**
- Base Building Architect: Davis Gardner Gannon Pope
- **Base Building Engineer: Watson Engineers**
- Fit-out Architect: The Design Alliance
- Fit-out Engineer: Atlantic Engineering Services
 - **Fit-out MEP: Tower Engineering**

Building Systems

- Mechanical
 CAV System
 18000 CFM Roof Top Unit
 7200 CFM Roof Top Unit
- Lighting / Electrical
 480/277V, 3 Phase, 4 Wire Primary System
 208/120V, 3 Phase, 4 Wire Secondary System



Gravity System

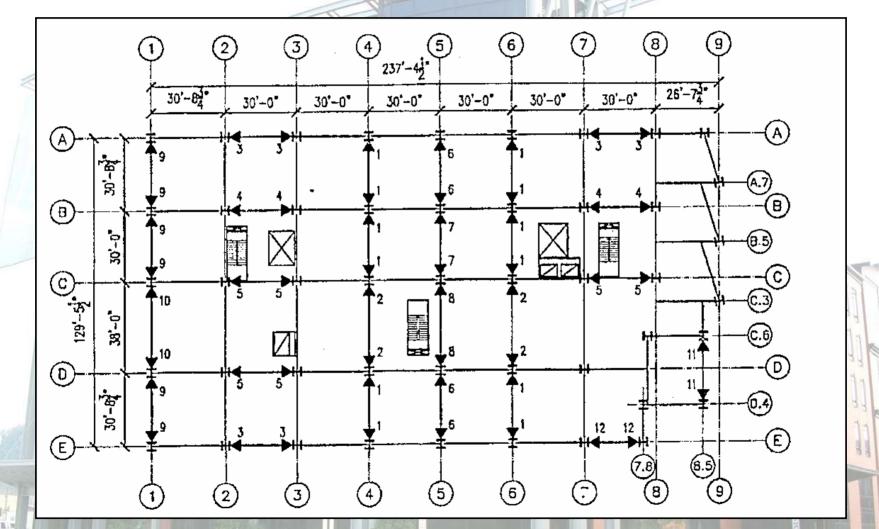
- Composite floor deck: 3" 4 ksi concrete over 3" 20 gauge metal deck
- ¾" diameter 4 ½" long shear studs
- 50 ksi steel members
- 3 rows of 30'x30' bays
- 1 row of 38'x30' bays

Gravity System

(7)	W24x62 (2)	(7)	(7)	N24x62 (2)	(7)	(7)	V24x62 (2)	(7)	(7)	N24x62 (2)	(7)	(7)	N24x62 (2)	(7)	(7)	W24x62 (2)	(7)	(7)	V24x62 (2)	(7) H (9)	(7)_(3)
W18x35 (18)	W18x35 (18)	W18X35 (18)	W18x35 (18)	W18X35 (18)	W18X35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	W18x35 (18)	(10)	V16x31 (2) (3)
(0)		(0)	10		(0)			(0)			(0) I			(0) I			(0) H			(8) (16)	W18x35 (16) (2)
									-			164								(c) (c)	18×35
W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	W18x35 (18	×81 (13)	V16x31 (2) (4)(
		.						1								N24x84				x35	W18x35 (17)
																				(12) 12) 12) 12) 12) 12) 12) 12)	
W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (3-	W21x44 (34	W21x44 (3-	W21x44 (3-	(11)(7) (5)	(12) (12) (12) (13) (13) (13) (14) (15) (15) (15) (15) (15) (15) (15) (15
,	W24x62			V24x62		V	V24x62			V24x62			V24x62			N24x62		W2	24x62	(12) (12) 5 (26)	W12x16 (26) W12x14 (18)
(10)	(2)	(10)	(10)	(2)	(10)	(10)	(2)	(10)	(10)	(2)	(10)	(10)	(2)	(10)	(10)	(2)	(10)	(10)	(7)	W21)	12x16
V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18×35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	V18x35 (18)	(18)	-	26 -
		5			5			5			5			5			5		5	V8X10	
	W18x35 (18) (01) W18x35 (18) (6) W18x35 (18) (18) (2)	(81) 95X81W (81) 95X81W (9) (2) (81) 95X81W (2) (10) (45) 45X12W (10) (45) (45) (45) (45) (45) (45) (45) (45	W18x35 (18) (01) W18x35 (18) (01) W18x35 (18) (01) (01) (01) (01) W18x35 (18) (01) (01) (01) (01) W18x35 (18) (01) (01) (01) (01) W18x35 (18) (01) (02) (02) (01) W18x35 (18) (01) (02) (01) (01) W18x35 (18) (01) (01) (01) (01) W18x35 (18) (01) (01) (01) (01)	W18x35 (18) (0) W18x35 (18) (0) W18x35 (18) (0) W18x35 (18) (0) W18x35 (18) (0) (10) (10) W18x35 (18) (0) (18) (18) W18x35 (18) (0) (10) (10) W18x35 (18) (10) (10) (10) W18x35 (18) (10) (10) (11) W18x35 (18) (10) (11) (11) W18x35 (18) (11) (11) (11) W18x35 (18) (11) (11) (11)	(10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10)	(10) (13) (118x35 (18) (13) (13) (13) (14) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) (11) <td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td> <td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td> <td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td> <td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td> <td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td> <td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td> <td>(1) (2) (1) (2) (3) (2) (4) (4) (5) (5) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (</td> <td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td> <td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td> <td>(1) (2) (3) (2) (4) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (5) (5) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6)<td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td><td>W18x35 (18) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) <th< td=""><td>W18x35 (18) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) <th(2)< th=""> (2) <th(2)< th=""> <th(2< td=""><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>(a) (b) (c) (</td></th(2<></th(2)<></th(2)<></td></th<></td></td>	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	(1) (2) (1) (2) (3) (2) (4) (4) (5) (5) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7) ($ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	(1) (2) (3) (2) (4) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (4) (5) (5) (5) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6) <td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td> <td>W18x35 (18) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) <th< td=""><td>W18x35 (18) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) <th(2)< th=""> (2) <th(2)< th=""> <th(2< td=""><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>(a) (b) (c) (</td></th(2<></th(2)<></th(2)<></td></th<></td>	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	W18x35 (18) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) <th< td=""><td>W18x35 (18) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) <th(2)< th=""> (2) <th(2)< th=""> <th(2< td=""><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>(a) (b) (c) (</td></th(2<></th(2)<></th(2)<></td></th<>	W18x35 (18) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) <th(2)< th=""> (2) <th(2)< th=""> <th(2< td=""><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>(a) (b) (c) (</td></th(2<></th(2)<></th(2)<>	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	(a) (b) (c) (

2 2 20

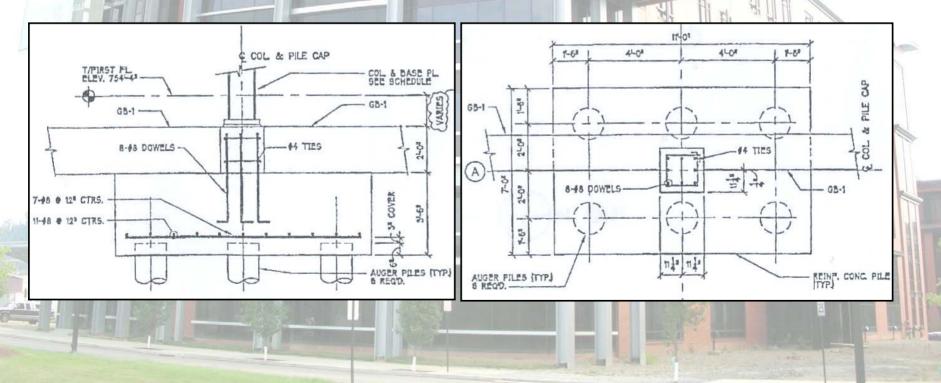
Lateral System



Moment framing plan

Foundation

- 45' concrete piles
- 3 ksi concrete with 60 ksi reinforcing steel
- Grade beams surround building perimeter

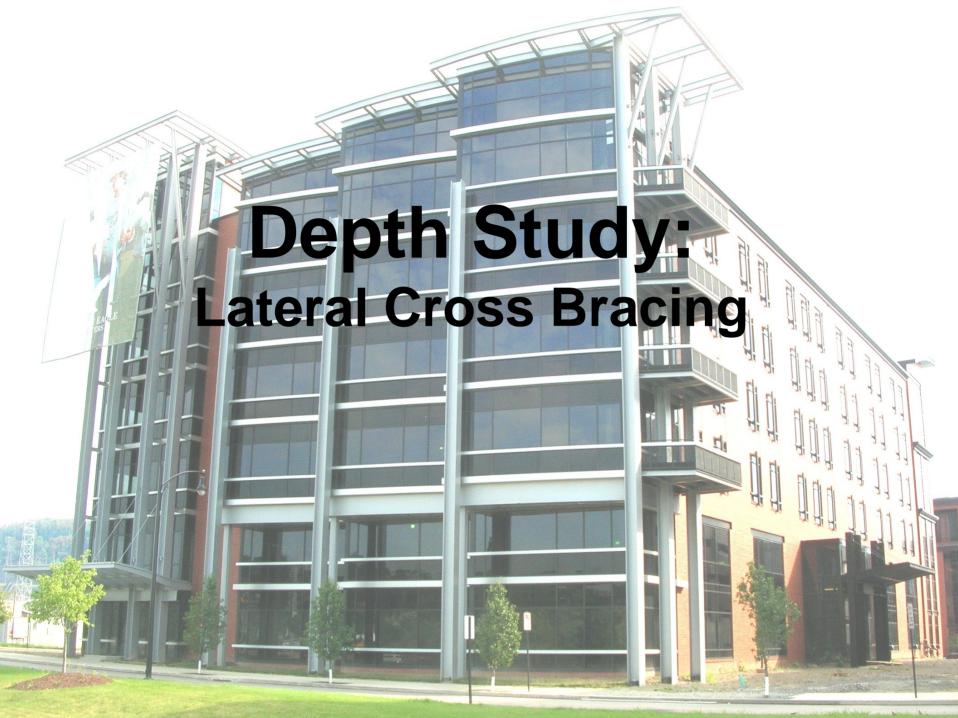


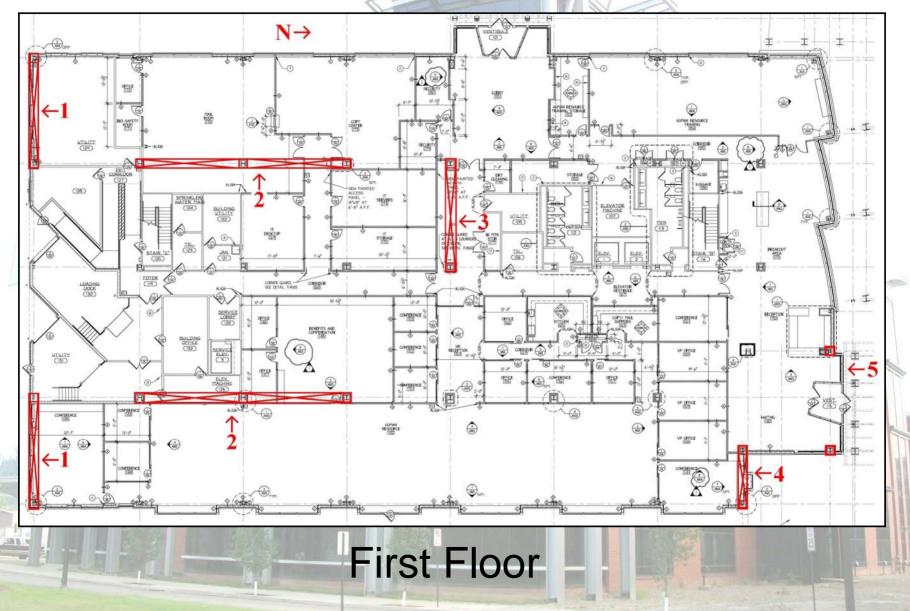
Problem Statement

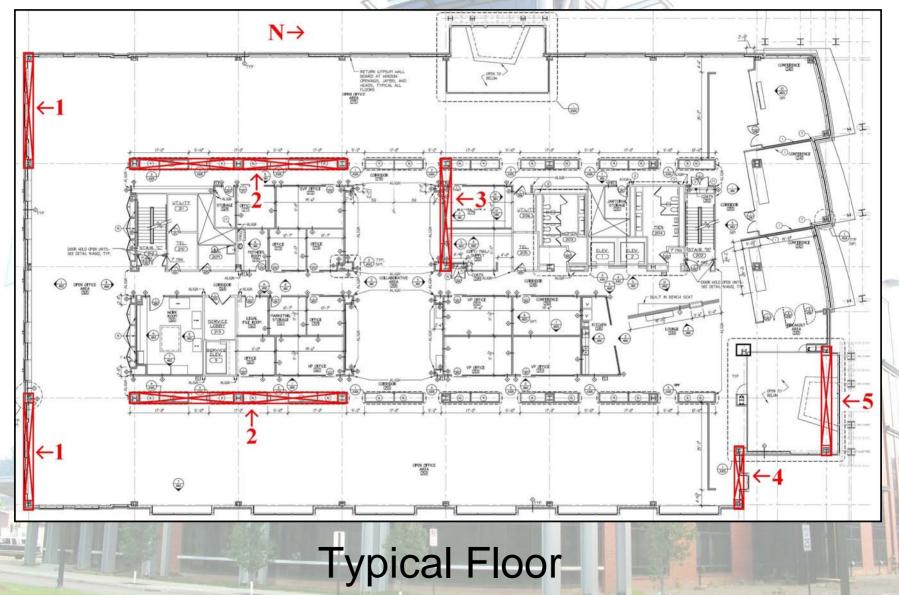
- Designed for maximum fit-out adaptability
- Lateral system unobtrusive to floor plan
- Required extensive moment frame system

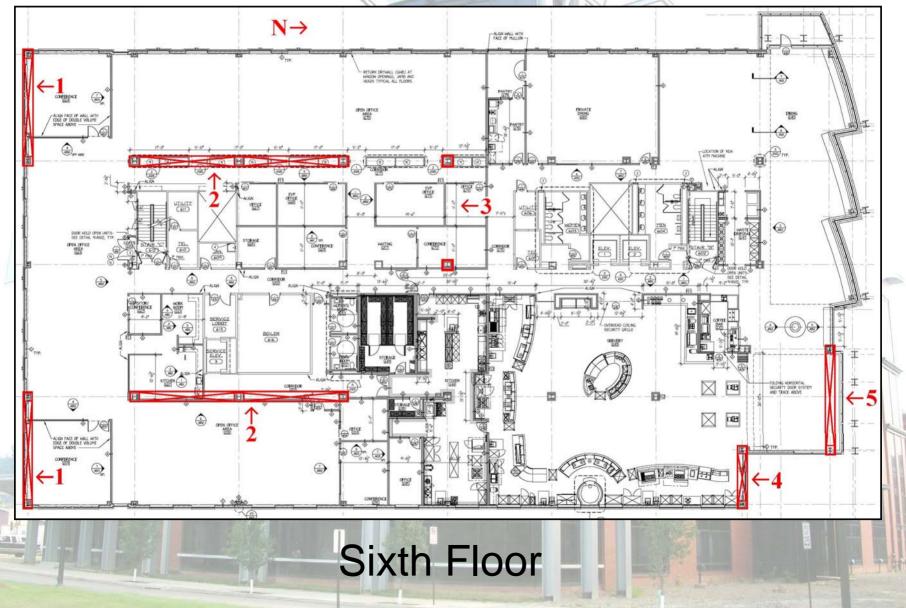
Proposed Solution

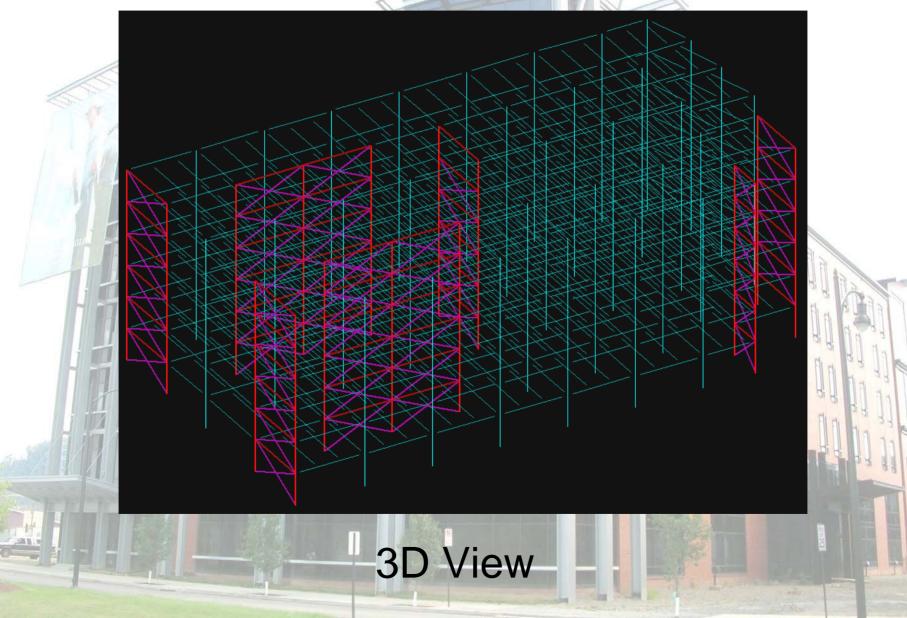
- Replace existing lateral system
- Employ diagonal steel cross bracing
- Utilize final architectural plans to retro-fit structure with cross bracing without obstructing floor plan
- Design assisted by RAM Steel











Loads: Gravity

Dead Loads

- Typical Floor Slab 57 psf
 Roof
- Roof Slab
 57 psf
 All Floors
- Exterior Curtin Wall 20 psf
- MEP 10 psf
- Miscellaneous

10 psf 5 psf Stairs

Balconies
Flat Roof Snow

Live Loads

30 psf

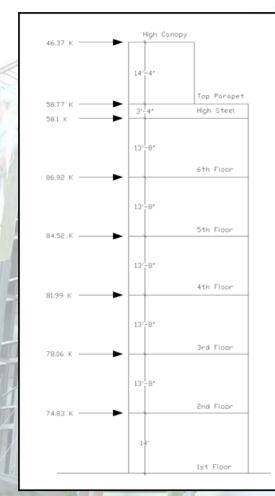
100 psf

100 psf

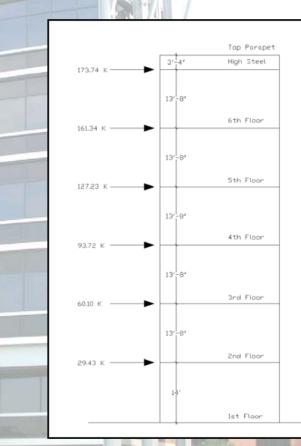
100 psf

21 psf

Loads: Lateral



Wind Force Diagram



Seismic Force Diagram



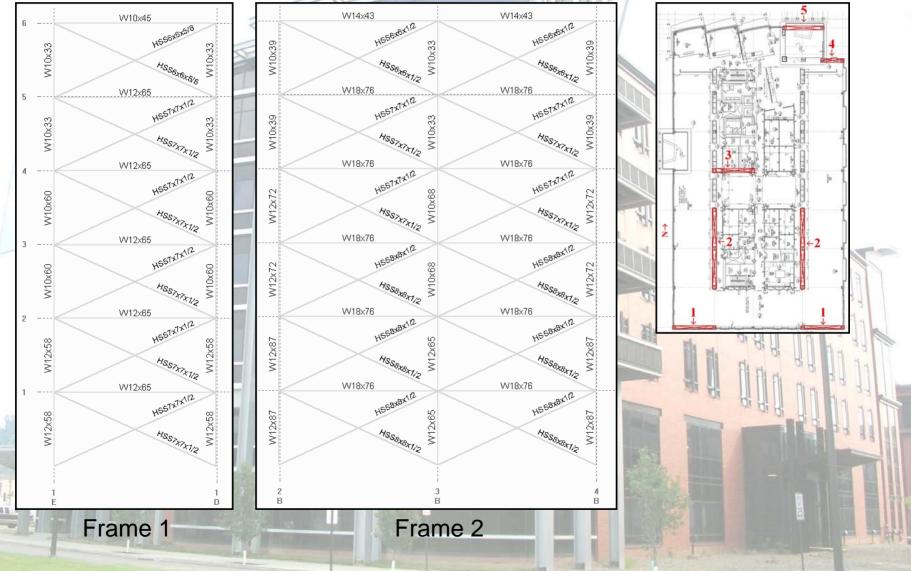
	A-)	N16x31	-	v	V16x31		V	V16x31	-	1	N16x31	1.00	- 1	W16x31	-		W16x31		1	N16x31) T	W12x1	4 -	
		(13)	(2)	(13)	(10)	(2)	(10)	(10)	(2)	(10)	(10)	(2)	(10)	(10)	(2)	(10)	(10)	(2)	(10)	(10)	(2)	(10) - ((14) (7) (2) F	
		W14x22 (18)	W14x22 (18)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	(8) (9)	01W 010X12	$(3)(7)^{+}$										
6	B		N18x40		,			,				N18x40	-	-	N18x40	-	-	W18x40			N18x40	i i	(12)	(15) (8NN	
	U	(17)	(2)	(17)	1		ĺ	1			(13)	(2)	(13)	(13)	(2)	(13)	(13)	(2)	(13)	(13)	(2)	(13)	×14	N10x12 (15)	
	W12x16 (28)	W14x22 (14)	W14x22 (14)	W14x22 (14)	W12x19 (30)	W12x19 (30)	W12x19 (30)	W12X19 (30)	W12×19 (30)	W12x19 (30)	W12×19 (30)	W12x19 (30)		W12x19 (30)	W18x35 (28) ~ (28)	72X314 (16) (11 72X14 (16) (11 73) 01 91 91 73	$\frac{\times 31}{(3)(9)}$								
	C		W18x40			V18x40			V18x40			N18x40	Ser 1	1000	N18x40			W18x40			N18x40		×14	x12	
		(26)	(2)	(26)	(21)	(2)	(21)	(21)	(2)	(21)	(21)	(2)	(21)	(21)	(2)	(21)	(21)	(2)	(21)	(21)	(2)	(20) (8)	W12	161	
	W16x26 (20)	W16x26 (36)	W16x26 (36)	W16x26 (34)	W16x26 (34)	W16x26 (34)	W16x26 (34)	W16x26 (34)	W16x26 (34)	W16x26 (34)	W16x26 (34)	W16x26 (32)	1) (1) (1) (1) (1) (2) (2) (6)	V16:0 (5)	(13)										
	D		W21x44		. 1							W18x40		_	N18x40			W18x40	-	w	18x35	×44 (6 (26)		
	U	(12)	(2)	(12)	1		- 1	1			(22)	(2)	(22)	(22)	(2)	(22)	(22)	(2)	(22)	(11)	(7) (W21x44 11) (1 W12x16 (26)	W12x16		
		W14x22 (18)	W14x22 (18)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)	W14x22 (16)			/16x26	(5)										
	E	3	W16x31	1		V16x31			V16x31			W16x31			N16x31	110		W16x31	110		4x22 =	Ax-			
L	Q	(13)	(2)	(13) 2	(10)	(2)	(10) 3	(10)	(2)	(10) 4	(10)	(2)	(10) E	(10)	(2)	(10) 8	5 (10)	(2)	(10) 7	(10)	(7) (3	\$7.9)8)	(8.5/) 9	1

Lateral

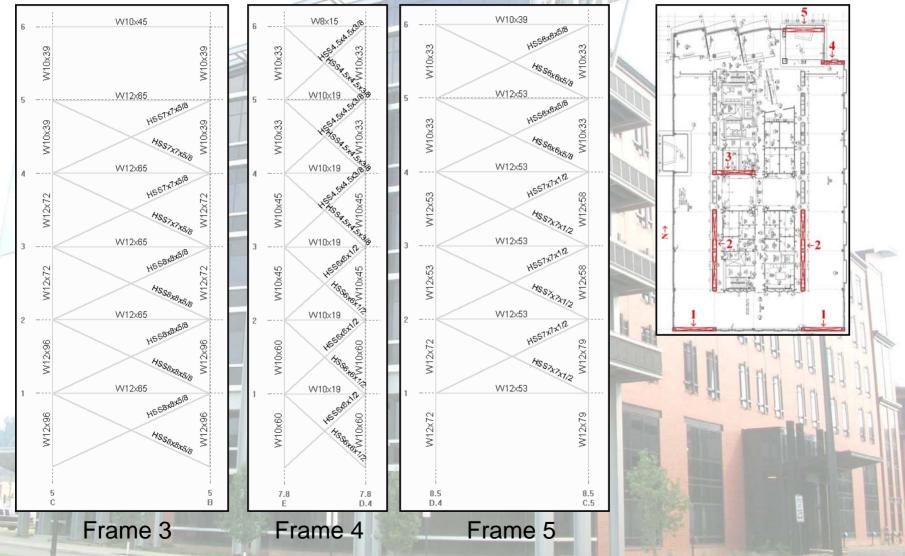
- Square HSS shapes used in bracing
- Sized to withstand wind & seismic
- Drift kept within $\Delta = L/400$

-2.52"











Breadth: Cost Analysis & Scheduling Alternative Floor

Breadth: Cost Analysis

Cost data taken from RS Means

Exist	ting Syste	em
Typical Floo	r (x5) \$	351,851
Roof	\$	298,701
Columns	\$	360,112
A starter	Total \$	2,418,068

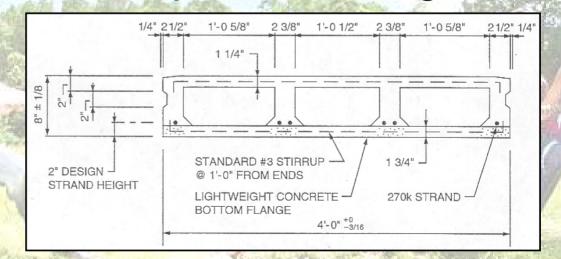
Redesigned System Typical Floor (x5) 265,690 S 207,827 Roof \$ Columns 238,602 \$ 168,848 Bracing \$ Total 1,943,727 \$

Breadth: Construction Schedule

10.000		1 at 1		Pater of Contract	a mark the set	and the second	1	1 S						
ID	Task Name	Duration		Month 1					onth 2			Mont		
1	1st Floor Col.	1 day	Week -1	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
2	1st Floor Bracing	1 day												
3	2nd Floor Beam	5 days		*										
4	2nd Floor Deck	10 days												
5	2nd Floor Studs	3 days												
6	2nd Floor Slab	2 days												
7	2st Floor Col.	1 day			Ť.									
8	2nd Floor Bracing	1 day												
9	3rd Floor Beam	5 days												
10	3rd Floor Deck	10 days												
11	3rd Floor Studs	3 days					h							
12	3rd Floor Slab	2 days					_							
13	3rd Floor Col.	1 day				Ť.								
14	3rd Floor Bracing	1 day					T h							
15	4th Floor Beam	5 days					_ *							
16	4th Floor Deck	10 days						1						
17	4th Floor Studs	3 days												
18	4th Floor Slab	2 days												
	4th Floor Col.	1 day						Ĕ.						
20	4th Floor Bracing	1 day						Ľ.						
21	5th Floor Beam	5 days												
22	5th Floor Deck	10 days												
23		3 days												
24	5th Floor Slab	2 days							\perp					
25		1 day							Ĭ.					
26	-	1 day							Ď-	7				
27		5 days												
		10 days												
		3 days												
30		2 days									\downarrow			
31		1 day									ĨĻ.			
32	6Th Floor Bracing	1 day									Ĕ,			
33	Roof Beam	6 days									*			
		10 days										-		
		2 days												
36	Roof Slab	2 days												

Breadth: Alternative Floor

8" Hollow Core Concrete Planks
Longer span capability – reduces beams
Self weight = 57 psf – minimal impact on slab weight & seismic loads
Unable to utilize composite framing



Breadth: Alternative Floor

W21x44	W24x55	W21x44	W21x44
W21x44 X55	W24x55	W21x44	W21x44 W21x55
W21x44	- H W24x55	W21x44	W21x44

Hollow Core PI	ank	System
Steel	\$	33,844
Slab	\$	36,826
Total	\$	70,670

	Redesigned	Syst	em
Steel		\$	21,862
Slab		\$	13,452
	Total	\$	35,314

Conclusions

