



American Concrete Institute®
Advancing concrete knowledge

The Art of Concrete, Part 3


ACI Spring 2012 Convention
March 18 – 21, Dallas, TX

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WEB SESSIONS

Jeff Wagner, Vice President of Operations, McCarthy, Dallas, TX. A seven-year McCarthy veteran and a 24-year veteran in the construction industry, Wagner has played an integral role in the successful completion of major projects including the award-winning AT&T Performing Arts Center Dee & Charles Wylie Theatre and the \$128-million W Dallas Victory Hotel & Residences, including the Dallas “hot spot” inside the W Hotel, the Ghostbar. Wagner also had the opportunity to work with a team on a \$25-million facility at Iowa State University, his alma mater, to house the engineering college’s teaching and research facility. Currently, Wagner is working on the \$60-million KDC Park Tower in downtown Dallas and the Dallas City Performance Hall, a 124,000-square-foot multi-phase theatre facility.

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“Behind the Aluminum Skin of the Wylie Theatre



Jeff Wagner
Senior Project Manager
Chris Arpaia
Project Superintendent
Special thanks to a legend: Beau Johnson

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Dee & Charles Wylie Theatre




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Theatre Equipment


- Four Possible Seating/Stage Configurations (600 Capacity)
- Three 3-level Seating Towers
 - Towers “Fly” Into the Ceiling Above for Storage
- Catwalk Structure Above
- Fly Tower for Curtains and Proscenium Wall
- Nine Performance Seating Lifts Including the Orchestra Pit Lift
- \$1Million Sound/Video System



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Stacked Vertical Theatre



- Architects vision to create a tall Theatre with stacked floors to balance the size of the huge opera house next door.

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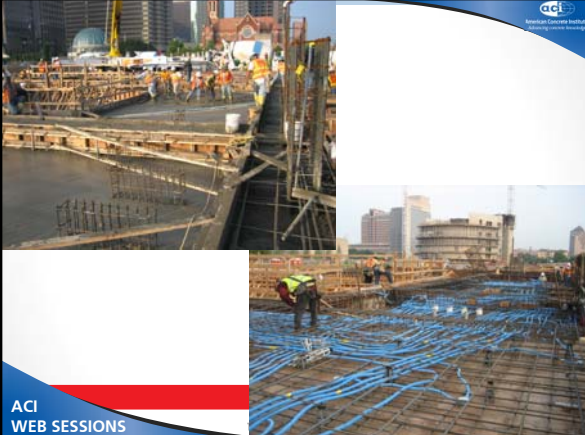
Subgrade work

- Shotcrete and tie backs for soil retention.
- Columns and one sided gang walls on drilled piers in excavation.
- Blue Carlon Flex conduit used for extensive conduit runs in Audience chamber sub floor.
- Large beams in AC subfloor create Theatre vomitory.

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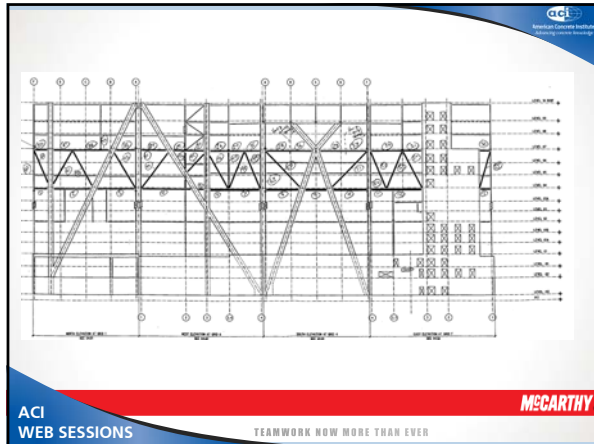


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Shear Wall and Columns

- Two columns per side and one side a shear wall that rise 135 feet above grade.
- Shoring towers and decks provide support for 15-20 foot lifts on columns.
- Shear wall for elevators use Jump gangs.

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On the way up

- Imbeds that weigh up to 6500 pounds.
- 18 #11 bars in columns/ nelson studs/ stirrups/ How does it fit?
- Bottom pumping columns for quality of finish.

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This slide contains the text 'On the way up' and a bulleted list of three items. The ACI logo is in the top right corner, and the text 'ACI WEB SESSIONS', 'TEAMWORK NOW MORE THAN EVER', and 'MCCARTHY' is at the bottom.

Immediate Challenges

- Column forming and temporary shoring
- Embed placement and welding of embeds to each other
- Construction joint locations and rebar coordination
- Exposed Concrete columns must be linear when we are done



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Column Placement

Columns are pumped from the bottom with 3/8" aggregate mix due to rebar and embed congestion



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How's it Going to Stay up?

- Ellis shores carry battered column's dead load inside formwork.
- Exterior elevator steel framework modified to be wind bracing for shear wall.
- Knitting the entire thing together with some of the permanent steel

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Column post shores to prevent deflection after placement



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Developing the Erection plan

- Structural Engineer MK
- Support Engineer TY LIN
- Rebar Installer Great Western
- Forming sub Skyline
- Erector Bosworth Steel
- Architects/ Engineers/ Contractors build the plan over 15 plus meetings.

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McCARTHY Wylly Theatre Erection Procedure Updated: 5-14-08

1. Erection Add-Modifications to the structure

a. Temporary Steel Columns

- The temporary steel columns bear on the level 1 slab at each of the four corners and the slab cannot support the loads from the columns. We propose to transfer the load to the adjacent foundation walls by using wide flange beams at 45° at the corners of level 1 to transfer loads to the foundation walls (Designed by TY Lin). MCA has confirmed the walls will accept the loads. Wide flanges will be expansion bolted to the deck.
- The deck will require shores near A/1 down to level -2 due to absence of a foundation wall at this location.

b. Shear Wall Wind Braces

- The shear wall must be wind braced with no more than two single floor elevations spanning on-braced. Bracing will involve installing the elevator shaft steel framework and incorporating removable 4" pipe bracing (Designed by TY Lin). Class B shims will be used to fit the diagonals in place.

c. Concrete column wind bracing

- Column wind braces will be installed at approx. elevation 10' sloped to interior at approximately 70° (Designed by TY Lin).
- Attachment anchor bolts will be cast in the level 1 deck for each column.

d. Grid 1 concrete column vertical dead load brace (Designed by TY Lin)

- The grid 1 column brace will be attached at approx. 10' elevation.
- Anchor bolts will be required on the level 1 deck.
- Shoring will be required from the level 1 deck down to the level -2 deck due to no foundation wall at this location.

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McCARTHY Wylly Theatre Erection Procedure Updated: 5-14-08

e. Temporary column at A/2

- Foundation revisions interior of the building require us to excavate and place a footing from the top of rock elevation to the top of the slab at level -3 with anchor bolts (per TY Lin's design)
- Foundation revisions exterior of the building require us to drill one 24" pier offset 4' from gridline A on gridline 2
- Temporary column at A/2 will be designed by TY Lin and is preliminary two 24" pipe piles with a wide flange member at the top connecting to the embed plate at approximately 68'

2. Pour concrete columns past the connecting points for the steel trusses at level 7

- Refer to the attached construction joint plan for the following steps regarding the concrete columns.
- Shoring towers will be erected with horizontal work platforms below each column construction joint to support column formwork.
- Columns will be shored within each pour via adjustable shores incorporated within the forms.
- Refer to attached belt truss sequence drawing for steel piece number designations.

a. Form, pour, strip, and re-shore all columns Lilt 1

b. Erect the shoring towers at level 1 and build work platforms for lilt #2

c. Install temporary wind load column bracing at all concrete columns

d. Form, pour, strip, and re-shore all columns Lilt 2

e. Install grid 1 temporary dead load brace (preferably occurs with step b)

f. Form, pour, strip, and re-shore all columns Lilt 3

g. Form, pour, strip and re-shore all columns Lilt 4

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McCARTHY Wylly Theatre Erection Procedure Updated: 5-14-08

- Re-shore not required at grid 4
- Erect WAW belt truss member 12011A at grid 4

b. Form, pour, strip, and re-shore all columns Lilt 5

- Re-shore not required at grid 4
- Erect WAW belt truss member 42021A at grid 4

L. Install temporary corner brace at A/2

J. Form, pour, strip, and re-shore all columns Lilt 6

- Re-shore not required at grid 4
- Erect WAW belt truss member 42024A at grid 4

k. Form, pour, strip, and re-shore grid 4 columns, grid A columns, and grid 1 column lilt 7

- Re-shore not required at grid 4

l. Form, pour, strip, and re-shore grid A W2 column lilt 8 and grid 1 N2 vertically lilt 8

m. Erect the grid A/1 temporary column followed by WAW belt truss members 33005A, 33009B, 34023A, and 34011B prior to stripping shoring at the A/1 corner in order to minimize deflections of the grid 1 and grid A battered columns (if these can be installed earlier during column pours this will move up)

n. Remove all temporary shoring and formwork.

o. Temporary wind and dead load braces will remain in place

3. Pour the shear wall from level 1 through to level 7 simultaneously with the column pours.

- The concrete shear wall will be braced using 4" diameter diagonal pipe braces added to the steel elevator shaft framework (Designed by TY Lin).

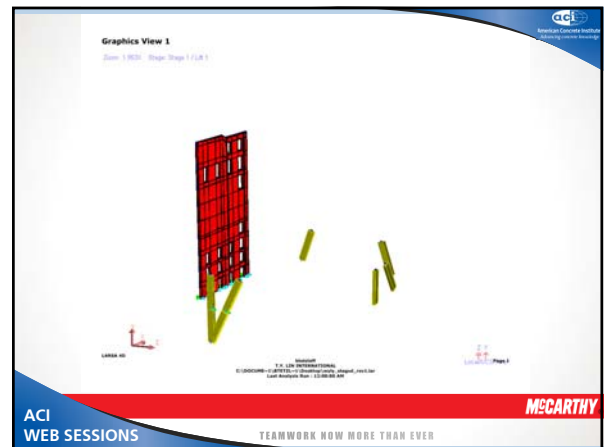
a. Form, pour, strip and brace shear wall to level 1a

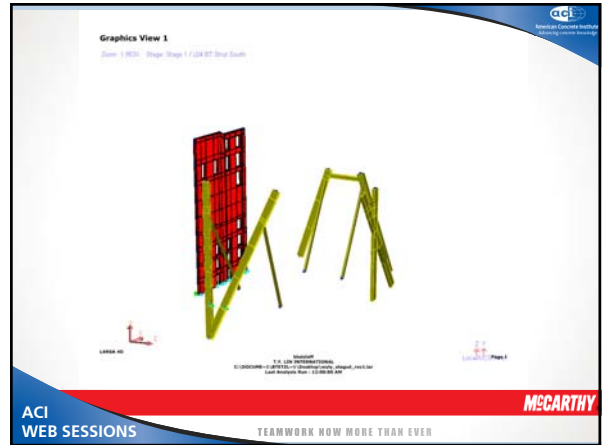
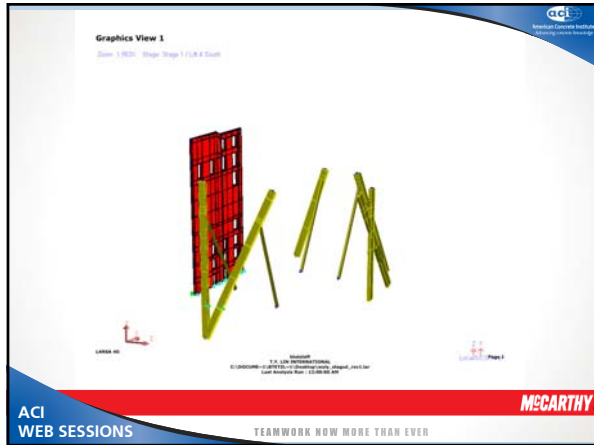
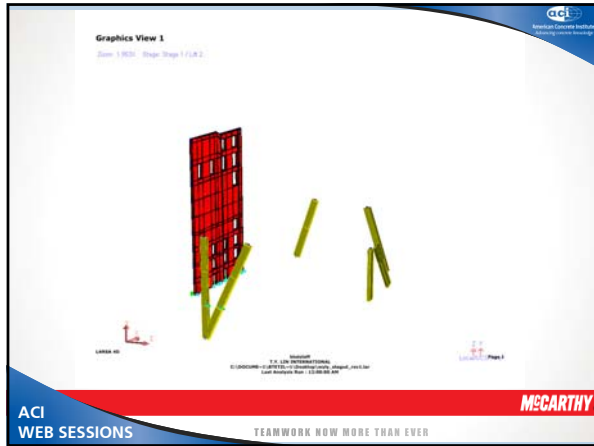
b. Form, pour, strip, and brace shear wall to level 1b

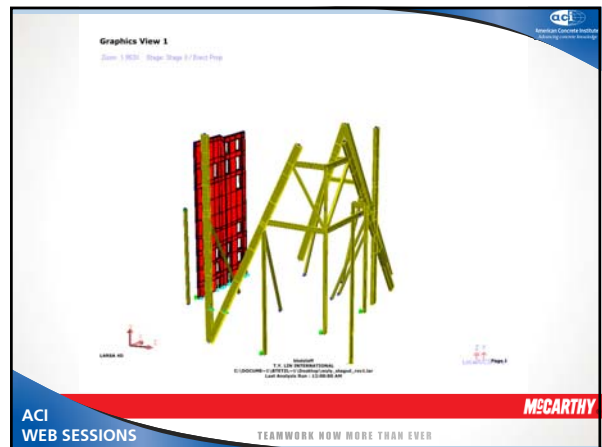
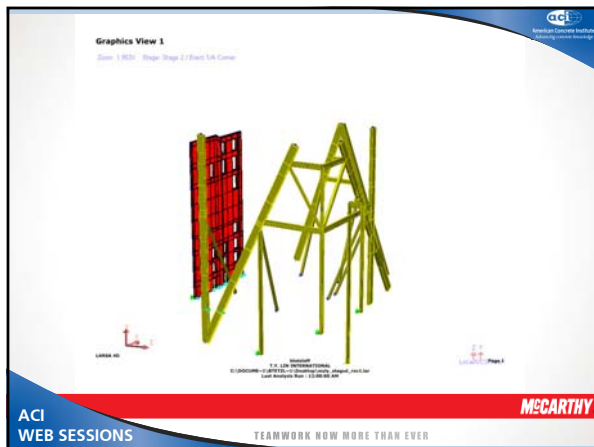
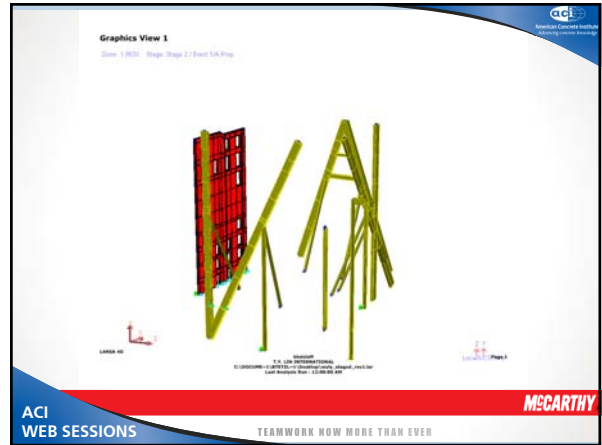
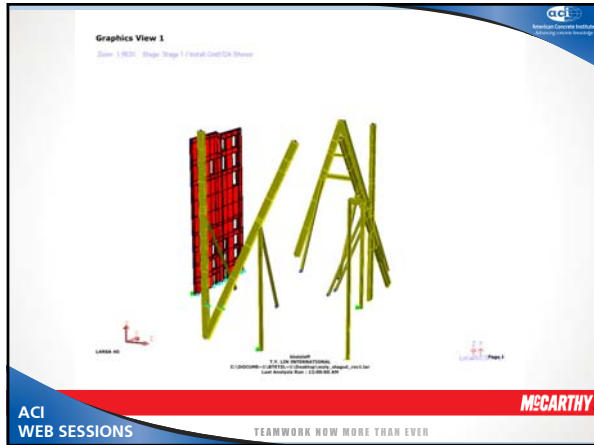
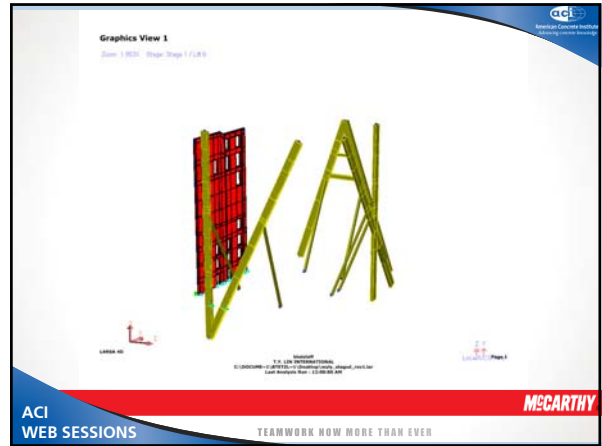
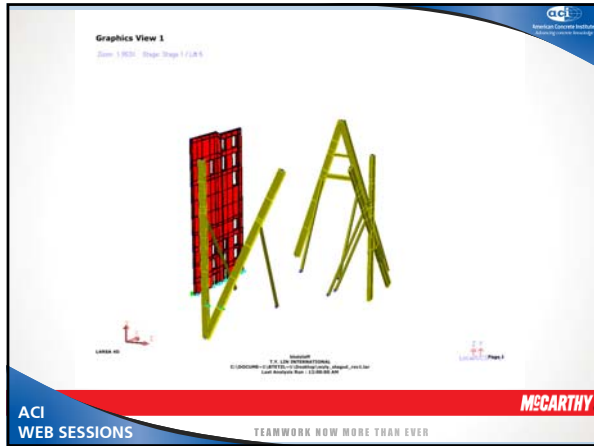
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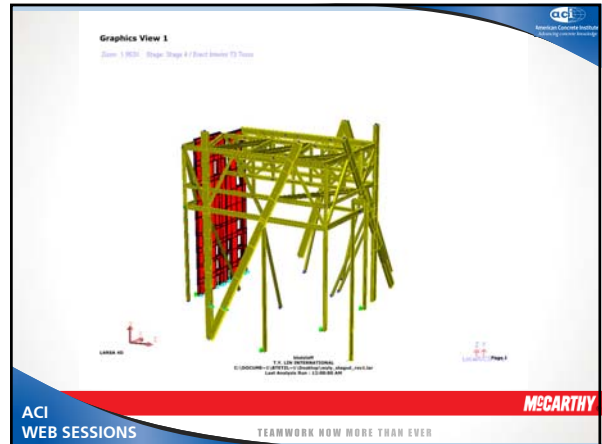
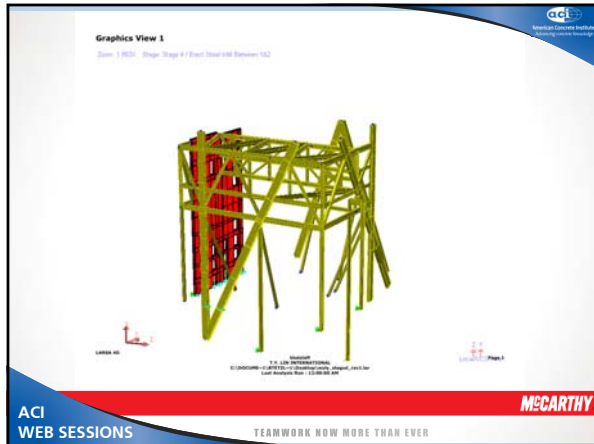
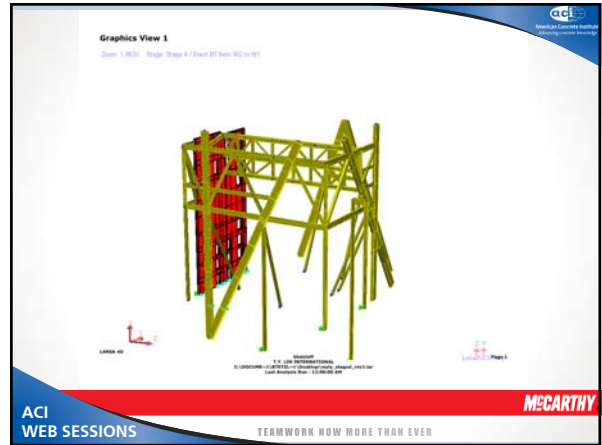
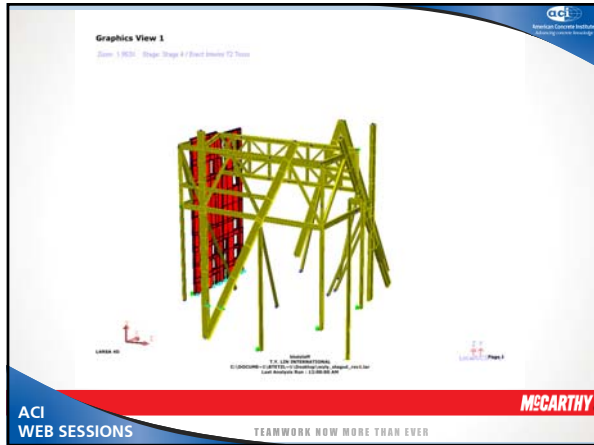
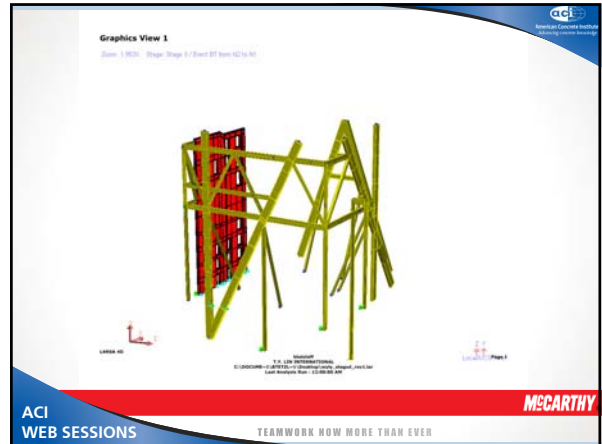
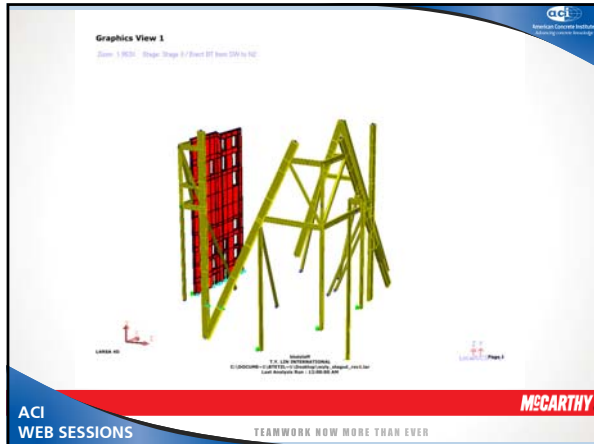
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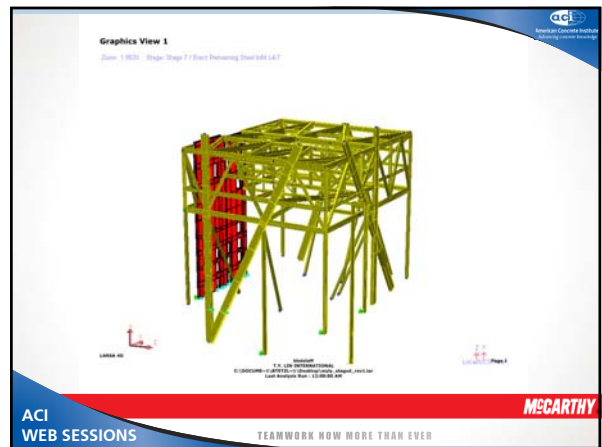
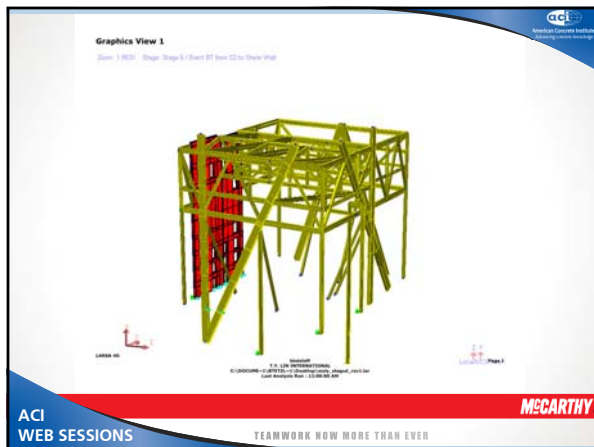
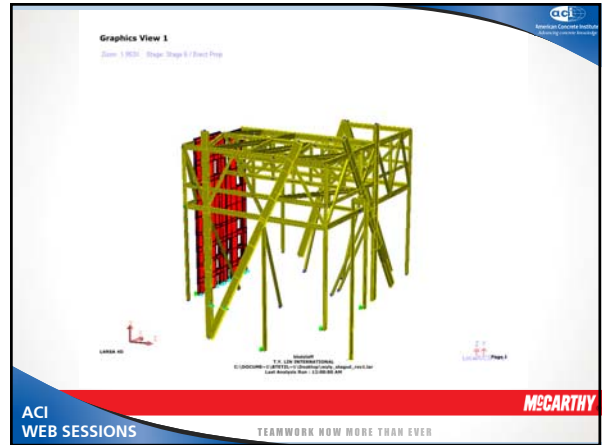
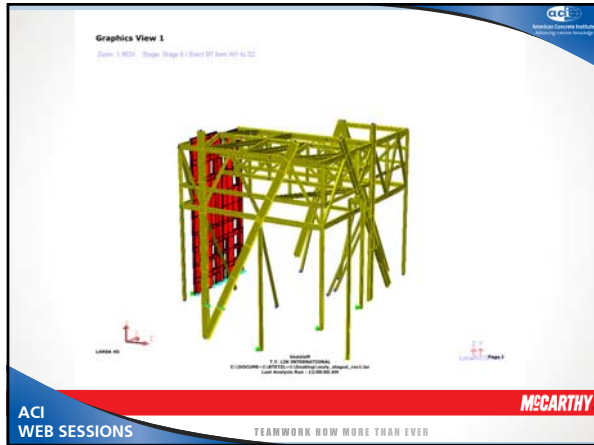
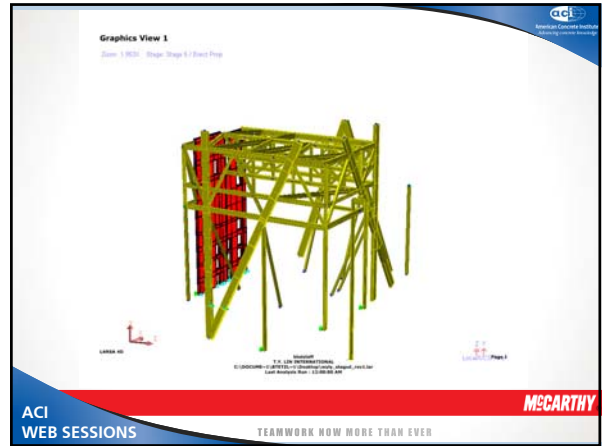
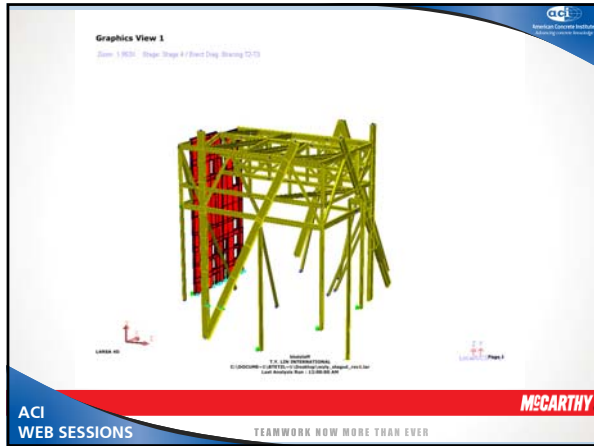
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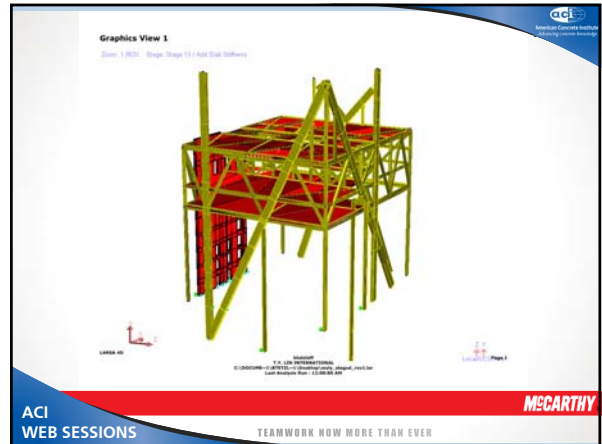
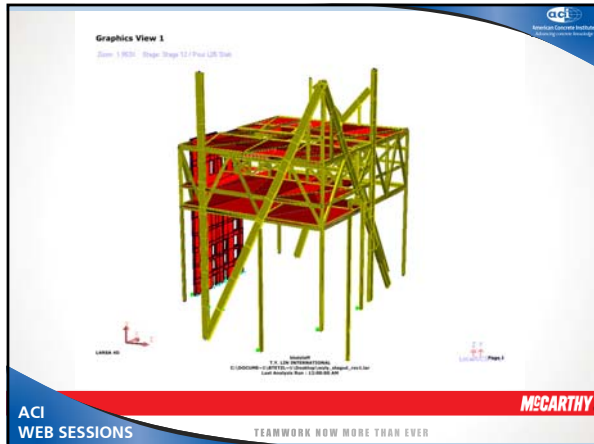
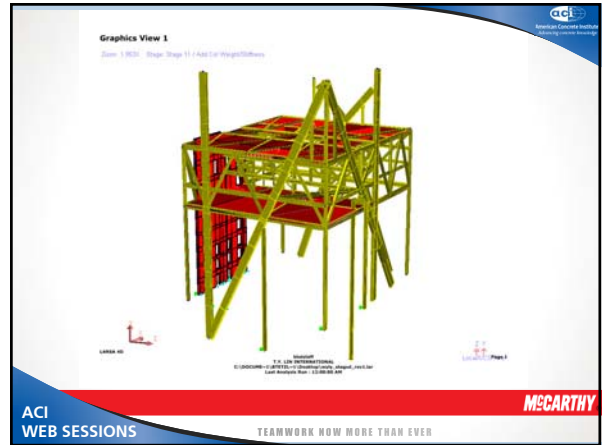
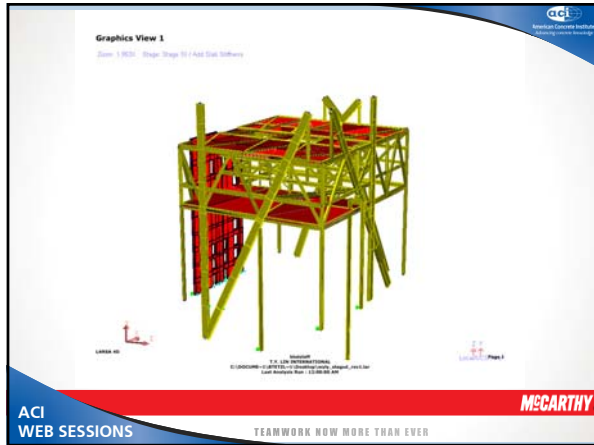
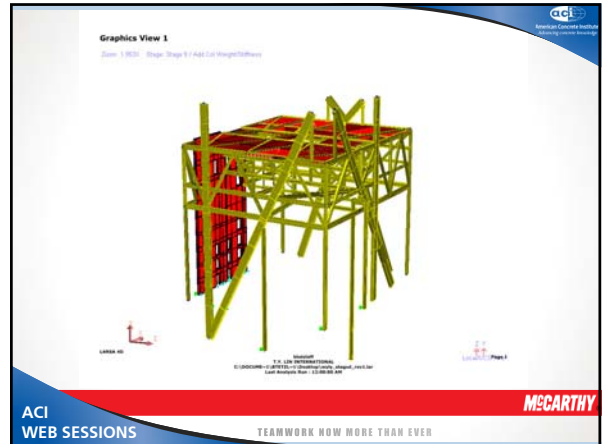
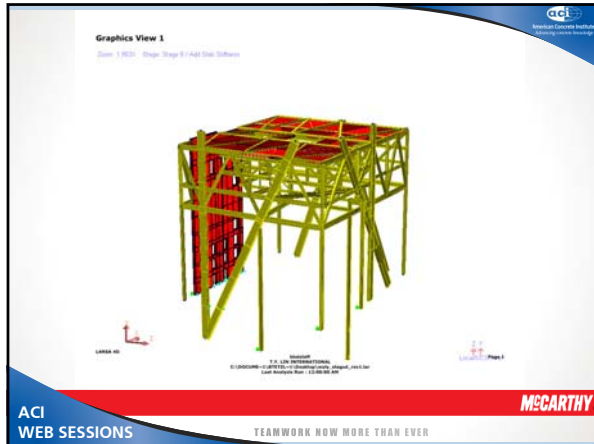


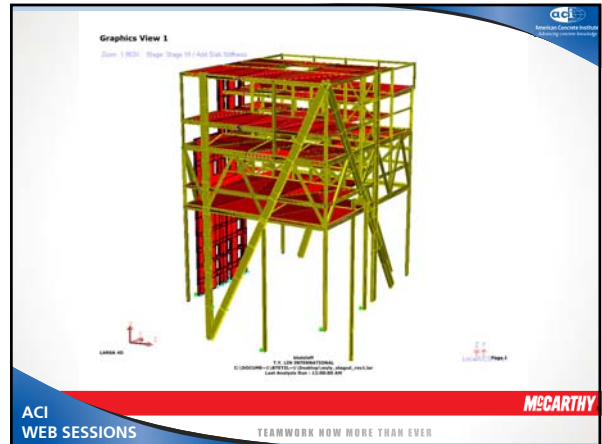
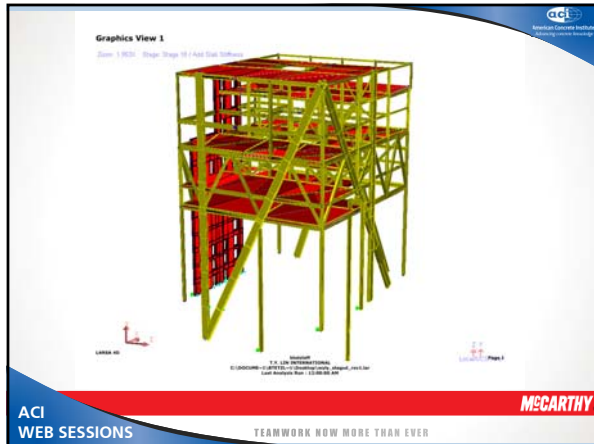
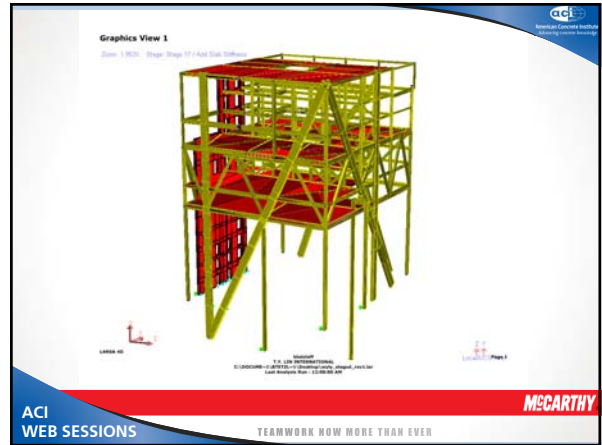
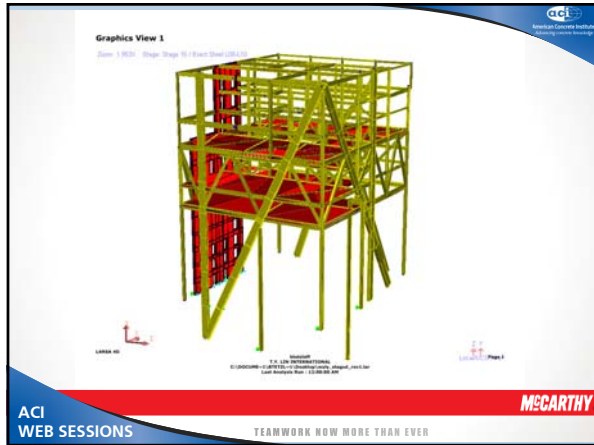
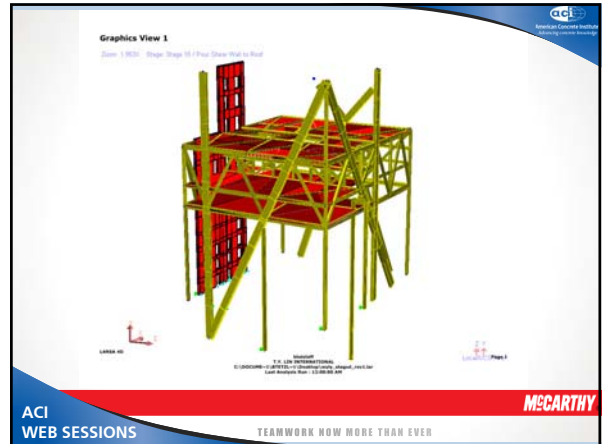
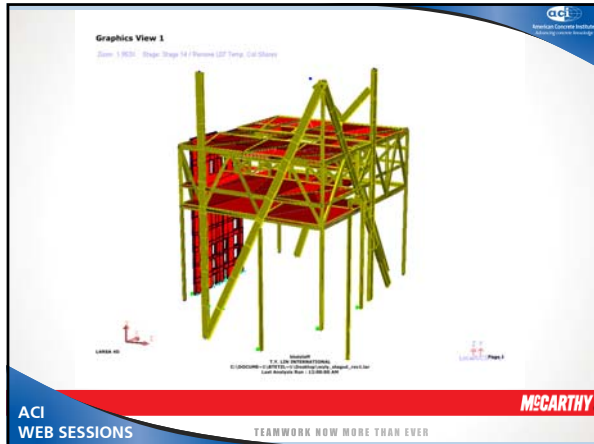


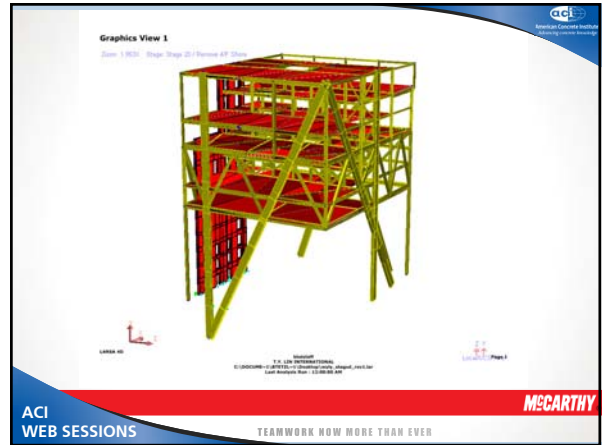
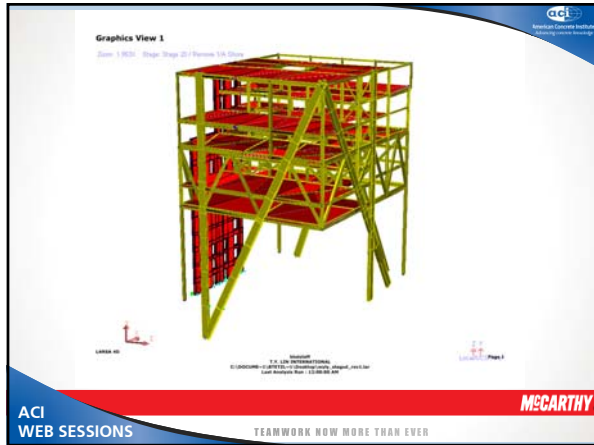
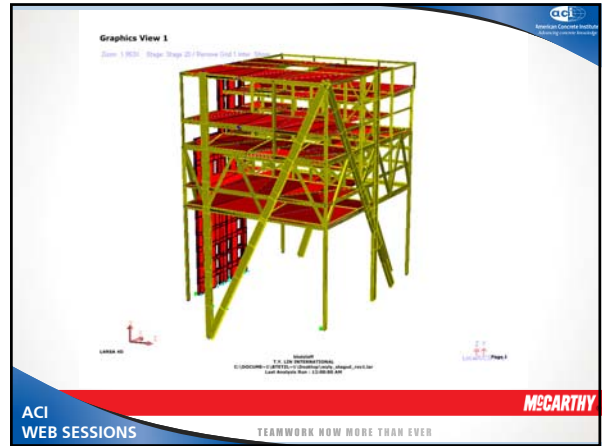
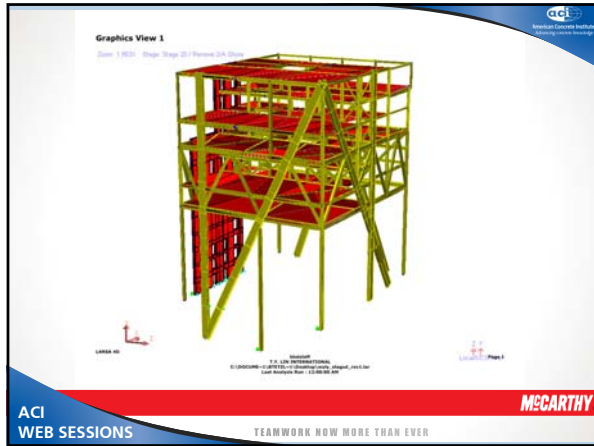














Temporary Supports

- Corners have temporary columns.
- Temporary supports at the battered columns.
- Temporary supports for wind bracing at the battered columns.

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Placing the Decks

- Floor seven goes first
- Followed by levels 4, 5, and 6.
- While 4, 5, and 6 are being poured, we start pouring shear walls and columns again above level 7.

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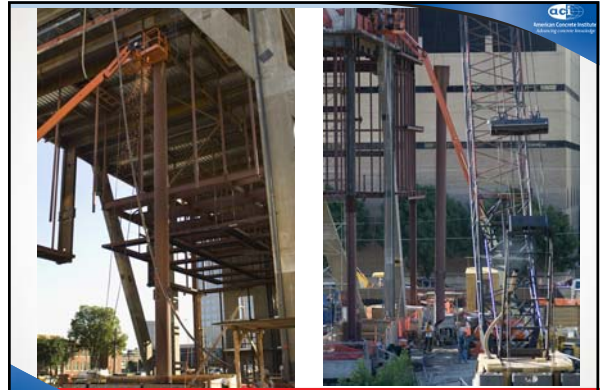
Removing Temporary Steel

- Wind braces
- Battered column braces
- Corner braces
- Engineer calculates $5/8$ " deflection and we measure.... $5/8$ ".

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