



## **DYNAMIC LOADING ON NON-BUILDING STRUCTURES IN RISA**

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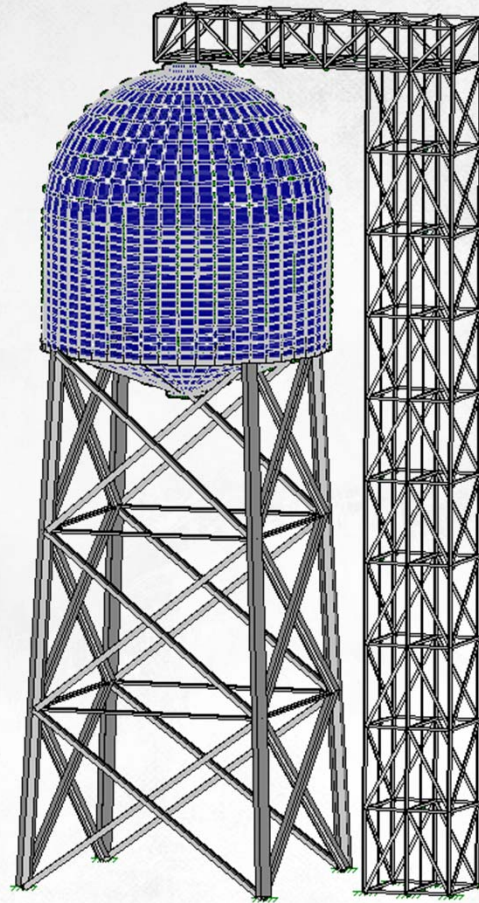
# NON-BUILDING STRUCTURES IN RISA



RISA-3D

Today's Webinar Objectives

- Dynamic Analysis
- Seismic Loading
- Moving Loads



Let's Start with the Model!

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# NON-BUILDING STRUCTURES IN RISA

## Chapter 15 Seismic Design Requirements for Non-Building Structures

- Elevated tanks, vessels, bins or hoppers (AISC7 15.5.5)
- Trussed Towers (AISC7 15.6.2)

$$C_s = \frac{S_{DS}}{(R/I_e)} \quad (12.8-2)$$

$$S_{D1}=0.238 \quad S_{DS}=0.423 \quad S_1=.167$$

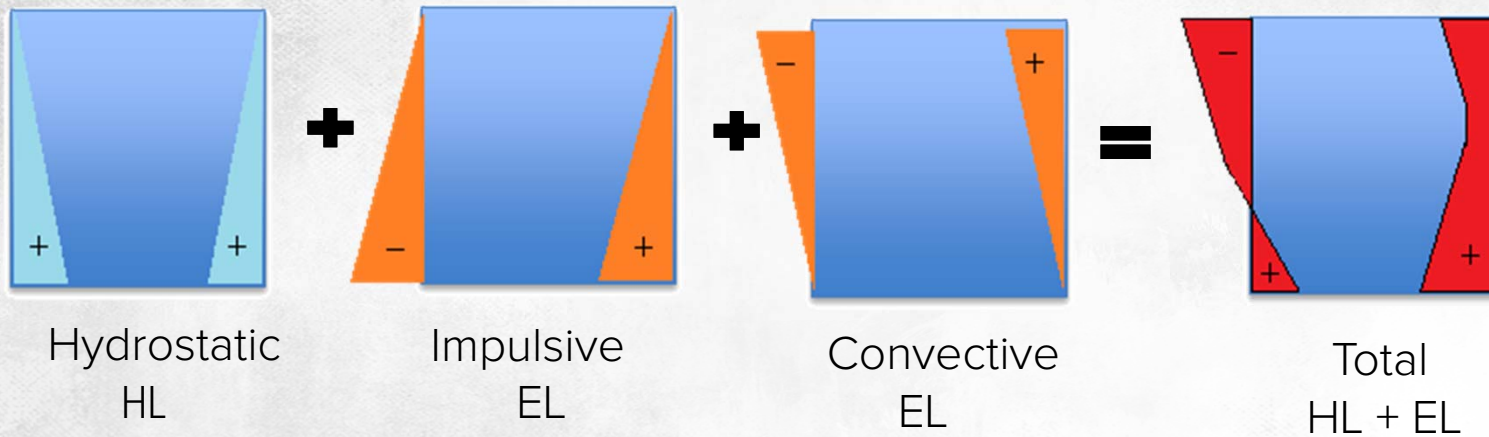
$$I_e=1.25 \quad \text{Category III}$$

$$C_s = 0.163 \text{ Tank}$$

$$C_s = 0.176 \text{ Tower}$$

# NON-BUILDING STRUCTURES IN RISA

Dynamic Sloshing (ACI 350.3-06)



# NON-BUILDING STRUCTURES IN RISA

Types of Loads:

➤ Dead Loads

➤ Sloshing Loads

$$HL \times 0.14S_{DS} + ELX \times 0.7$$

➤ Seismic Loads (RSA)

$$Ev (DL \times S_{DS})$$

$$SX \times \text{Scaling Factor}$$

$$\frac{I}{R} \times \frac{\text{ELF Base Shear (157k)}}{\text{RSA Base Shear (150k)}} = 0.402$$

Basic Load Cases										
	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distrib...	Area(M...	Surfac...
1	Hydrostatic Pressure	HL								720
2	Dead Load	DL		-1						
3	Live Load	LL								
4	Fluid Weight	HL								238
5	Wind X	WLX							1	1488
6	Wind Z	WLZ							1	1488
7	Torsion	WLY						48		
8	Ice Weight	IL						36		1488
9	Ice Wind X	WLXP1						36		1488
10	Ice Wind Z	WLZP1						36		1488
11		None								
12	Surface Area Unit	None								960
13	Water Dyn Wt	None								960
14		None								
15	ELF X-Direction	None	-163					36		2448
16		None								
17	Impulsive	ELX								958
18	Convective	ELX								720
19		None								



# NON-BUILDING STRUCTURES IN RISA

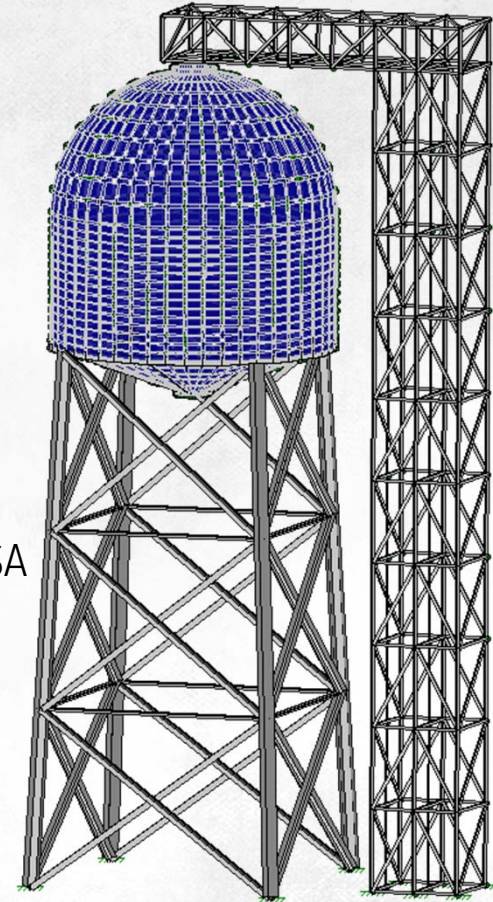


RISA-3D

Upcoming Webinars:

Part 2 of 3: Wind Loading on Non-Building Structures in RISA  
2/10/2016

Part 3 of 3: Dynamic Loading on Non-Building Structures in RISA  
3/2/2016



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# QUESTIONS?

Please let us know if you have questions

- We will answer questions for the next 5 minutes
- Once the webinar is closed, we will post all Q&A's at [risa.com](https://www.risa.com)
- For further information, contact us at [info@risa.com](mailto:info@risa.com)