



Summer Engineering Seminar (SES)

Civil Engineering Session

Intro and Bridge Design

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Civil Engineering?



Civil Engineers design & build structures to support the progress of human civilization!



Civil Engineering Sub-disciplines?



First thing to do after wake-up

Use the Toilet!

Environmental Engineering

Other Environmental Engineering work



Dump Areas



Environmental Assessment



Waste Water Treatment Plant

Civil Engineering Sub-disciplines?



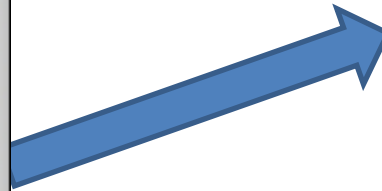
SECOND thing to do after wake-up

Take a shower (water!)

Water Resources Engineering



Water Resources (Lakes, Rivers,)



Water Demand

(Houses, factories,)

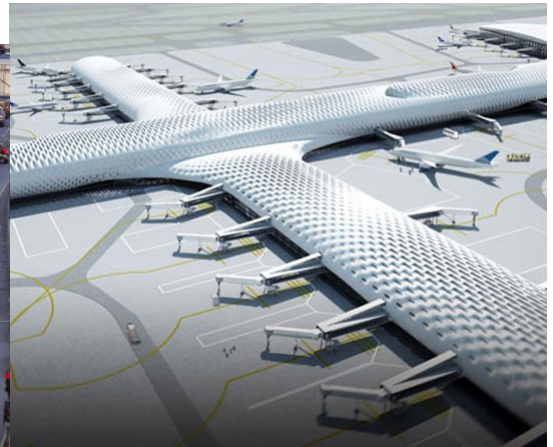
Civil Engineering Sub-disciplines?



How do you go to School?

Transportation (car, bus, train, ...)

Transportation Engineering



Civil Engineering Sub-disciplines?

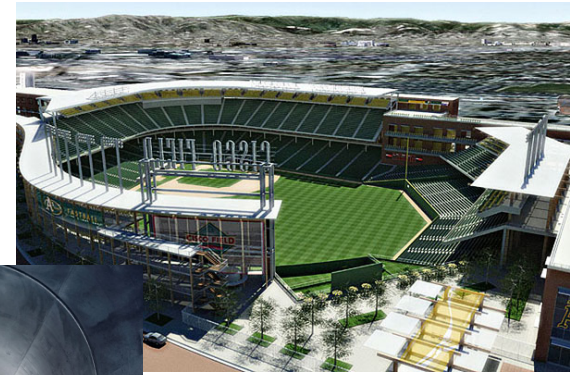


Where do we live, study, and work?

Buildings (homes, offices,)

Structural Engineering

Other structures: bridges,
tunnels, tanks, stadiums



Civil Engineering Sub-disciplines?



What is wrong with this tower?

Soil Stabilization!

Geotechnical Engineering



Beaver Dam!



Earth Dam

Civil Engineering Sub-disciplines?



Who construct all these structures?

Contractors!

Construction Engineering



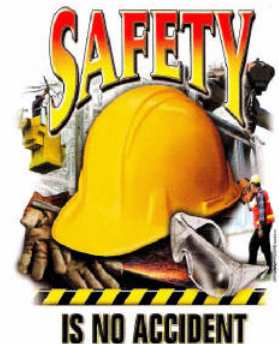
Time



Cost



Crews



Civil Engineering Sub-disciplines?



Environmental Engineering

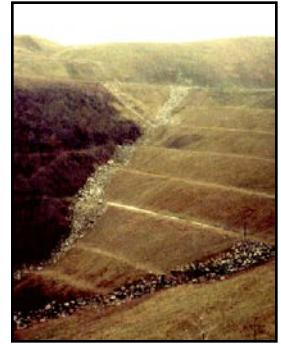
Structural Engineering

Geotechnical Engineering

Water Resources Engineering

Transportation Engineering

Construction Engineering



West Point Bridge Design Exercise

First Who does not know bridges!



Golden Gate Bridge



First Who does not know bridges!



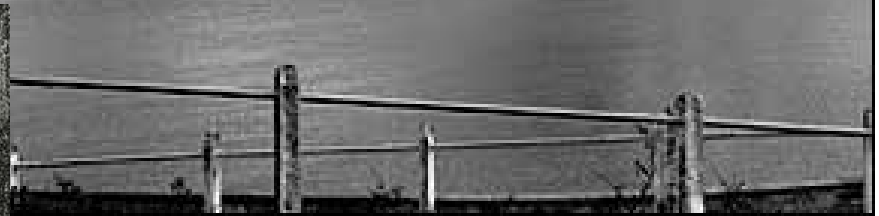
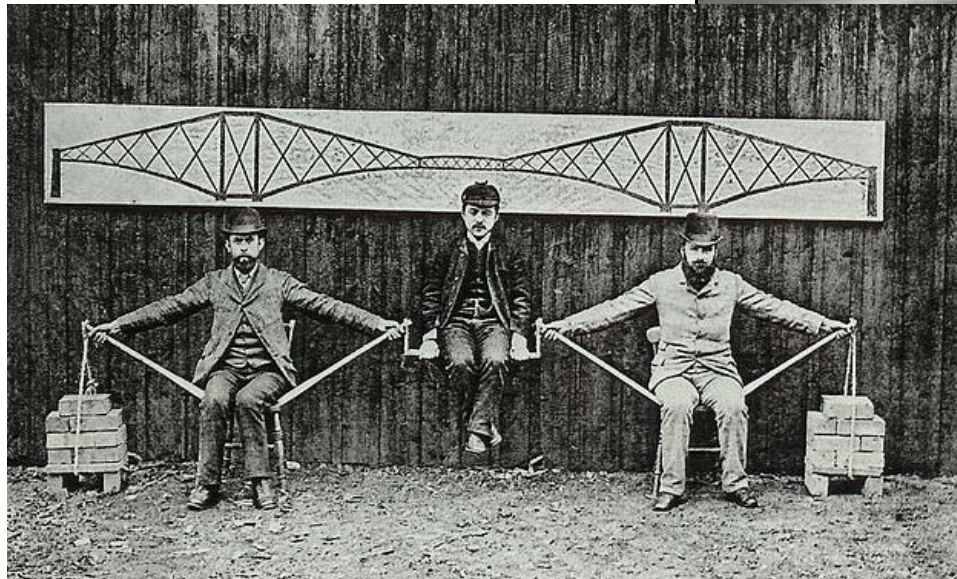
London Tower Bridge



First Who does not know bridges!



Firth of Forth Bridge



First Who does not know bridges!



Brooklyn Bridge



First Who does not know bridges!



Hangzhou Bay Bridge



First Who does not know bridges!



Navajo Bridge, Arizona



Smaller bridges are also lovely and beautiful

They usually follow typical designs!



Cheyenne River Bridge, South Dakota

Truss Bridge Typical Configurations



Pratt



Parker



K-Truss



Howe



Camelback



Warren



Fink



Double Intersection Pratt



Warren (with Verticals)



Bowstring



Baltimore



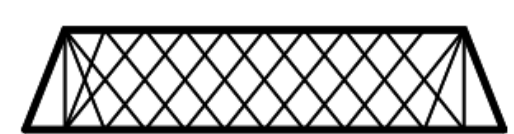
Double Intersection Warren



Waddell "A" Truss



Pennsylvania

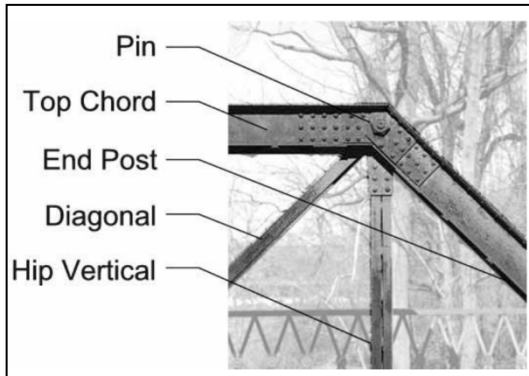


Lattice

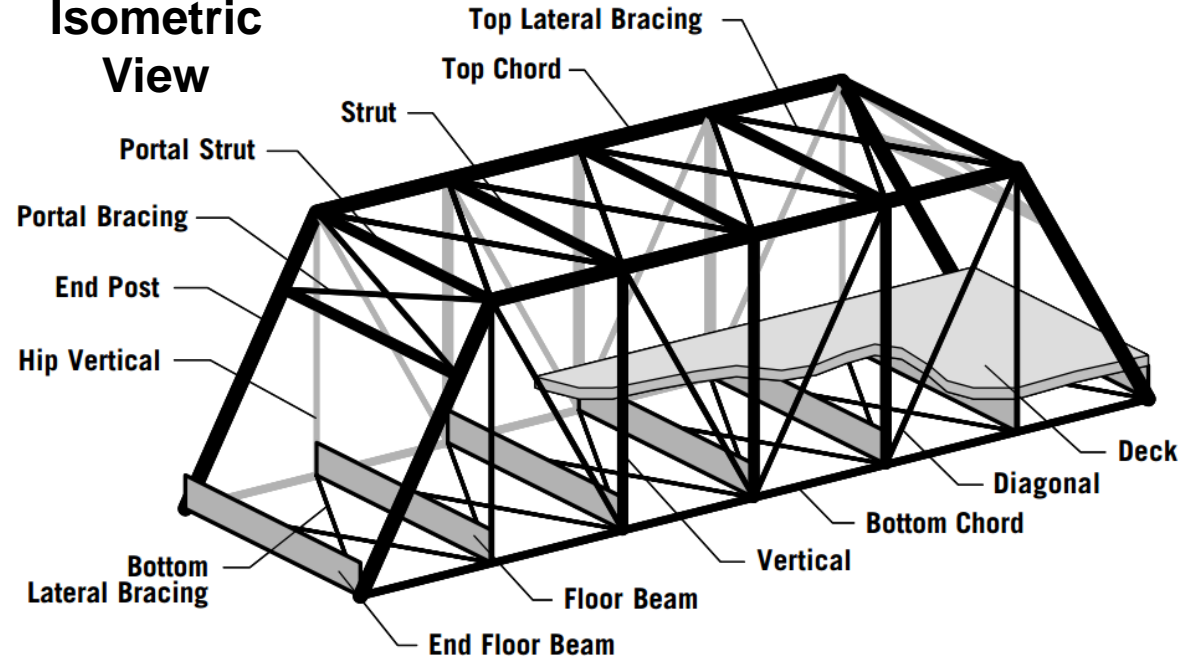
Bridge Components



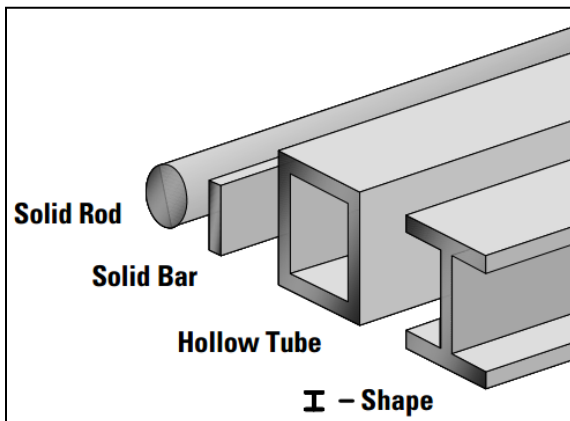
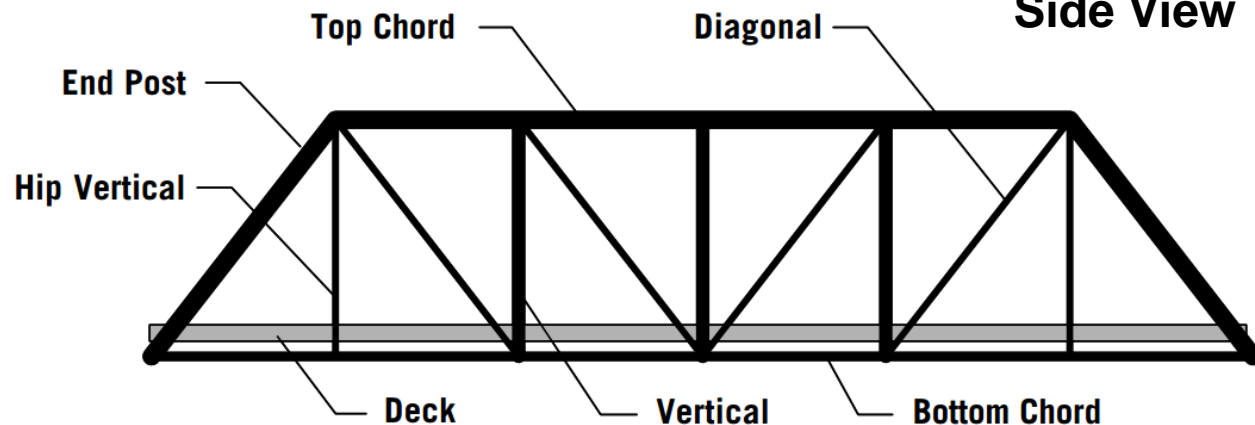
Trusses are made of Pinned Connections



Isometric View



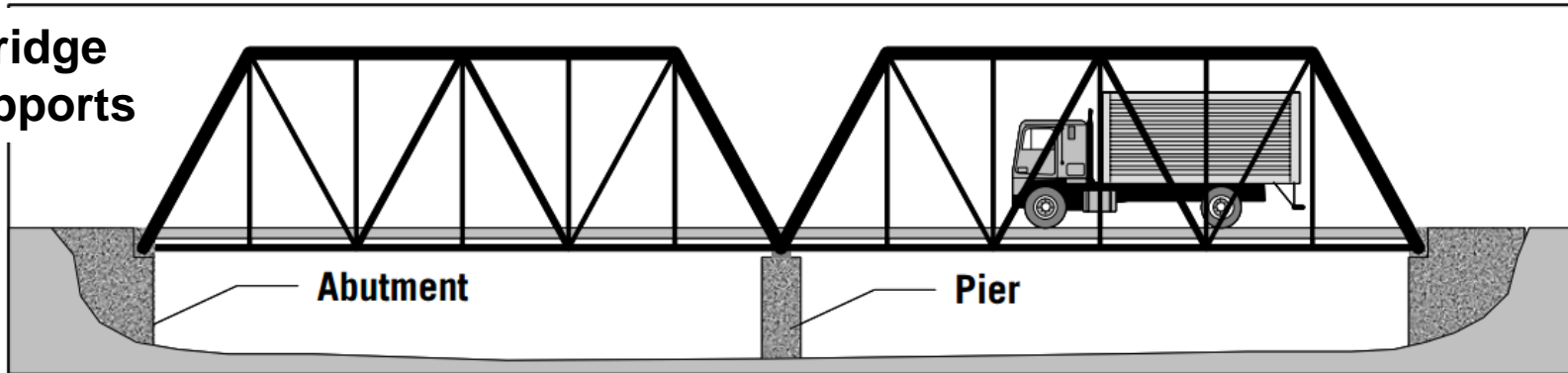
Side View



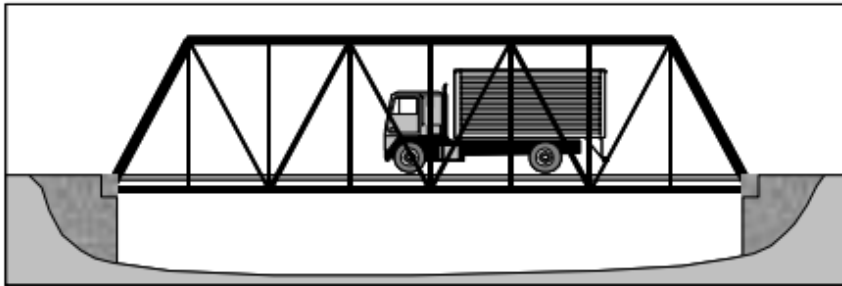
Type of Steel Truss Members

Bridge Typical Designs

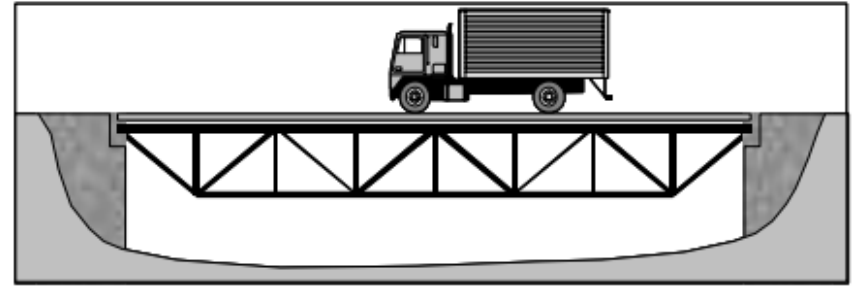
Bridge
Supports



Types of Truss Bridges

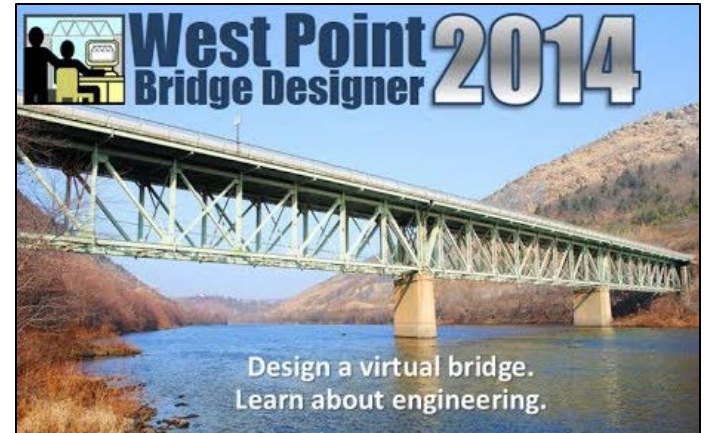


Through truss.



Deck truss.

West Point Bridge Designer



Design a 40-meter single-span truss bridge to carry a two-lane highway across a river using West Point Bridge Designer (WPBD) 2015 edition.

Best Bridge Design is the **LEAST-COST!**

Groups Formation

Time to form groups of 2 students each!

Who played with WP Bridge Designer before????

Pick your teammate or ask the instructor to pick for you.

DESIGN TIME

Please move to the Engineering Computing Center

After the allocated design time, save your file in the following format: "G??.FunnyName".

For example, group G4 that picked "Tussiers" would save their design file as: "G04.Tussiers". Save your file in the SES folder in the network shared drive Y.

RESULTS SHARING & CONCLUSION

Follow Your Heart & Passion!

Best wishes for your future career!

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