West Point Bridge Designer Tutorial

West Point Bridge Designer will introduce you to engineering through an authentic, hands-on design experience. This software provides you with the tools to model, test, and optimize a steel highway bridge, based on realistic specifications, constraints, and performance criteria.

Part 1 – Getting Started

1. Open West Point Bridge Designer
   Start > All Programs > West Point Bridge Designer > WPBD2007.exe

2. If the Design Tip of the Day dialog box appears, uncheck the box next to Show Tips at Startup and click on Close.

3. The Welcome dialog box will appear. Check the circle next to Create a New Design and click on OK.
4. You will now see the **Design Project Setup Wizard**. **1 Read the Design Requirement.** Read the design requirement and click on **Next**.

![Design Project Setup Wizard](image)

5. **Design Project Wizard 2 Enter Local Contest Information.** Check the **No** circle for **Are you participating in a local bridge design contest?** Click on **Next**.

![Design Project Setup Wizard](image)
6. **Design Project Wizard 3 Select the Deck Elevation and Support Configuration.**
   Select the following:
   - 24 meters
   - Standard Abutments
   - No Pier (One Span)
   - No Cable Anchorages
   Click on **Next**.

7. **Design Project Wizard 4 Select the Deck Material and Truck Loading.**
   Select the following:
   - High Strength Concrete
   - Standard 180 kN Truck
   Click on **Next**.
8. **Design Project Wizard 5 Select a Standard Truss Template (Optional).**
   Select none and click on Next.

9. **Design Project Wizard 6 Fill in the Title Block (Optional).**
   Enter your name under Designed By and click on Next.
10. **Design Project Wizard 7 Design the Steel Truss.**
Read the steps to design the truss and click on **Finish**.
Part 2 – Designing Your Bridge

A structural model is a mathematical idealization of a real structure. The model is a tool to help us predict how the real structure will behave when it is loaded.

You begin the structural model by drawing joints – the points at which truss members are connected together. There are 12 joints created automatically that represent the connecting points between the concrete bridge deck and the steel structure. These 12 joints are shown as circles.

1. **Draw the first joint.**
   Move the mouse cursor (indicated by two perpendicular red lines to X4, Y6. Use the ruler along the left side (Y) and bottom (X) of the screen to help you. Click the left mouse button to draw the joint.

   ![Diagram](image)

   Note: If you make a mistake and draw a joint in the wrong spot, click on the **erase a joint or member** icon on the **Design Tools** toolbar and then click on the joint you want to erase. To go back to drawing joints, click on the **Draw a Joint** icon on the **Design Tools** toolbar.
2. **Draw the rest of the joints.**
   Draw joints at the following locations as shown: X16, Y6   X28, Y6   X40, Y6

3. **Draw the steel structural members.**
   Click on the **Draw a Member** icon on the **Design Tools** toolbar. Click on a joint to start and drag the cursor and release it at the second joint to draw the member. Draw the steel structural members as shown:
Part 3 – Testing the Design

1. Click on the load test your current design icon.

2. The Load Test dialog box will appear. The bridge is unstable. Spend some time looking thru the examples. Close the Load Test dialog box.

   Back to the drawing board!

Part 4 – Your Mission

1. Change the design so it works. You will need to use the eraser on the Design Tools toolbar.
2. Optimize the design to build the lowest costing bridge that works. The cost is shown at the top of the screen.

   Note: You can experiment with different materials and member sizes by changing their values at the top of the screen. Use the select joint or member icon on the Design Tools toolbar. Hold down the CTRL key on the keyboard to pick multiple members at once.

Remember to keep the following specifications if you decide to start a new file:
- 24 meters
- Standard Abutments
- No Pier (One Span)
- No Cable Anchorages
- High Strength Concrete
- Standard 180 kN Truck
- No Truss Template