

# 1 Connections Tutorial 1 – Bolt Connection for Diagonal Brace (US)

## 1.1 Software Version and Standard

This tutorial was completed using WoodWorks® US 2019, and NDS 2018.

## 1.2 Introduction

Click [here](#) to download the Connections file (.con) created from going through this tutorial.

## 1.3 Connection Type

1. Click the **New** button on the toolbar.
2. Select the connection type **Lapped Shear, Wood-to-wood** with a **Skew, two side members** configuration.
3. Click on **OK**.

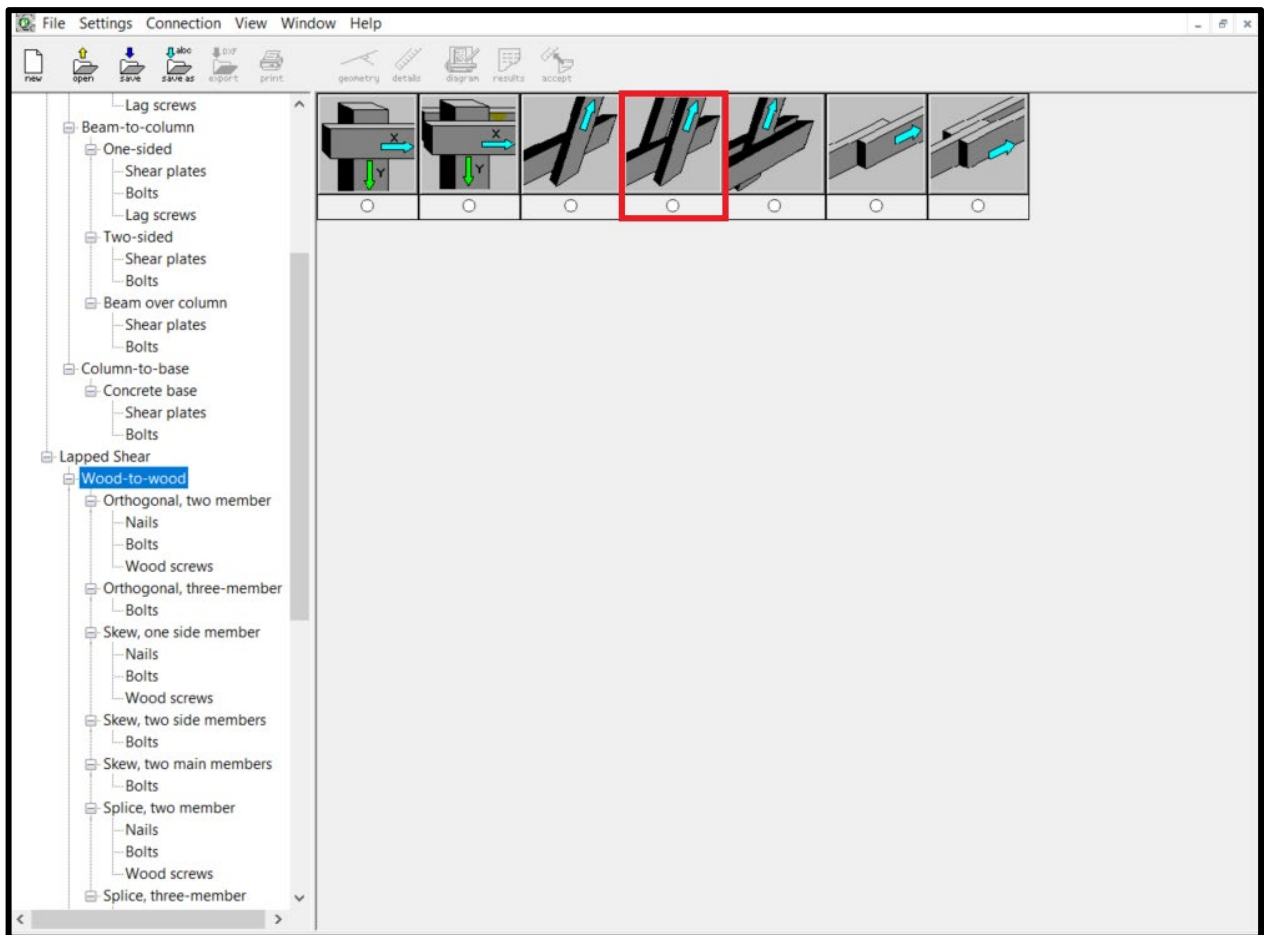


Figure 1: Connections Tutorial 1 – Selecting Connection Type

## 1.4 Connection Details

### 1.4.1 Main Member

1. Specify **Material** to **Glulam-Unbalanced**.
2. Specify **Species** as **West Species**.
3. Specify **Grade** as **24F-V4 DF**.
4. Specify **Thickness** as **3-1/8 (in.)**.
5. Specify **Width** as **9 (in.)**.
6. Specify the **End Type** as **Extended**.

The image shows a software interface for defining a main member. It has two tabs: 'Main' and 'Side'. The 'Main' tab is active. The interface is divided into several sections:

- Left Column:** Name (Main), Material (Glulam-Unbalan.), Species (West Species), Grade (24F-V4 DF), Thickness (3-1/8 in.), Width (9 in.), Ply (dropdown), End Type (extended), Offset (0.0 in.).
- Right Column (Moisture Content):** In-Service (Dry), Fabrication (Dry).
- Right Column (Temperature):** Temperature (deg. F) (T < 100F).
- Right Column (Fire Retardant):** Fire treatment factor ([not active]).
- Right Column (Loads):** Force (0), Duration (dropdown), Force (0), Duration (dropdown).

A 'Run Design' button is located at the bottom center of the form.

Figure 2: Connections Tutorial 1 – Main Member Details

### 1.4.2 Side Members

1. Specify **Material** to **Lumber-soft**.
2. Specify **Species** as **Hem-fir**.
3. Specify **Grade** as **No.1**.
4. Specify **Thickness** as **2 (in.)**.
5. Specify **Width** as **6 (in.)**.
6. Specify **Offset** as **0.0 (in.)**.
7. Specify a **Slope** of **45** degrees.
8. Input a **Force** of **1355 (lbs)**.
9. Specify a Load **Duration** of **Permanent**.

The screenshot shows a software interface for configuring a side member. The 'Side' tab is active, displaying various input fields and dropdown menus. The 'Main' section includes fields for Name, Material, Species, Grade, Thickness, Width, Ply, End Type, Offset, and Slope. The 'Moisture Content' section includes In-Service and Fabrication dropdowns. The 'Temperature (deg. F)' section includes a dropdown menu. The 'Fire Retardant' section includes a Fire treatment factor dropdown. The 'Loads (lbs)' section includes Force and Duration dropdowns, and a second set of Force and Duration dropdowns.

Figure 3: Connections Tutorial 1 – Side Member Details

## 1.5 Review and Accept Design Results

Once a load has been input, *Connections* will automatically complete the design, and a drawing of the connection will automatically generate on the **Details** screen. At this point, it is possible to review the **Diagram**, **Results** and **Accept** the design. For this example, one 3/4-inch bolt was found to be adequate in resisting the specified load. Both the **Diagram** and **Results** can quickly be printed using the **Print** icon.

Click [here](#) to download a PDF of the design results.

Click [here](#) to download a PDF of the diagram.

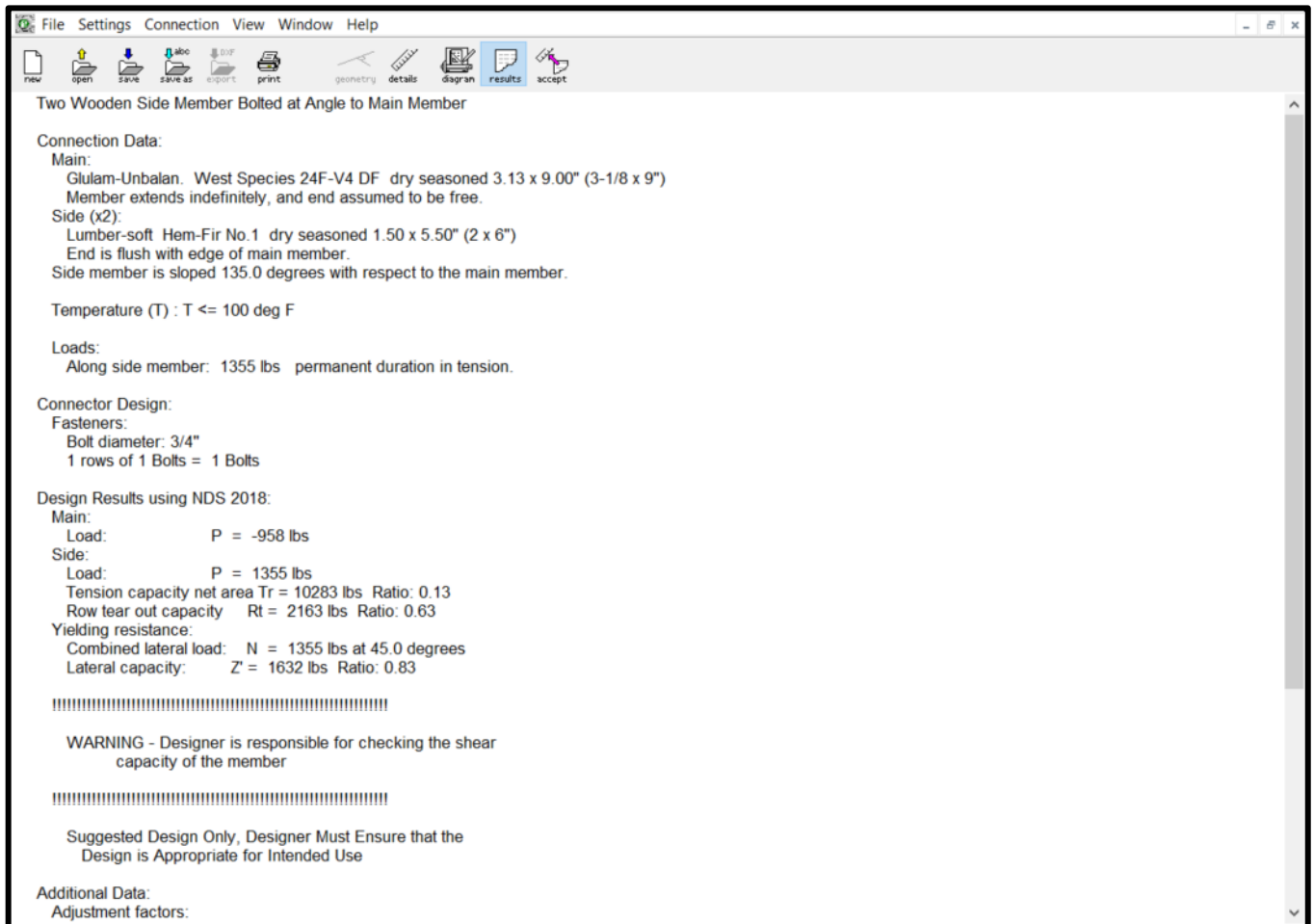


Figure 4: *Connections Tutorial 1 – Review Results*