Are You Counting Your Teeth Correctly?

By Glenn Traylor

On occasion, we are required to utilize a detailed tooth count to qualify a connection on a metal plate connected wood truss. Fortunately, we have several tools that can assist us. My June article, "Which is Better: Plate Placement Method or Tooth Count Method?", includes a point-by-point comparison of two of these tools, showing how neither is the perfect solution for all situations. In addition, we should include two more items on this list of tools for counting teeth:

1. Plate Placement Method (PPM) – Critical plate inspection template
   a. This is generated by the plate manufacturer's software
   b. Software settings allow any or all plates to be generated
2. Digital QC tools
   a. Available to SBCA members at no charge for the software
   b. Utilizes electronic devices with camera and wireless connection to connect to your system database
3. Tooth Count Method (TCM)
   a. This is generated by the plate manufacturer's software
   b. A compilation of connectors, with 4, 6, or 8 per page that can printed to accompany the job
4. A combination of PPM and TCM.

Except for TCM, these tools consider the conditions and requirements that must be followed. It is built into the software. Sometimes, it's up to an old-fashioned tooth count to make the determination, but there are several rules that need to be understood. Based on a recent inspection challenge conducted at BCMC 2022 in Columbus, it was observed that many in the industry may not be aware of this particular rule that is dictated in part by the American Wood Council's National Design Specification® (NDS®) for Wood Construction.

Let us look at a typical example. In this analysis, we are not going to consider defects in the plated area.

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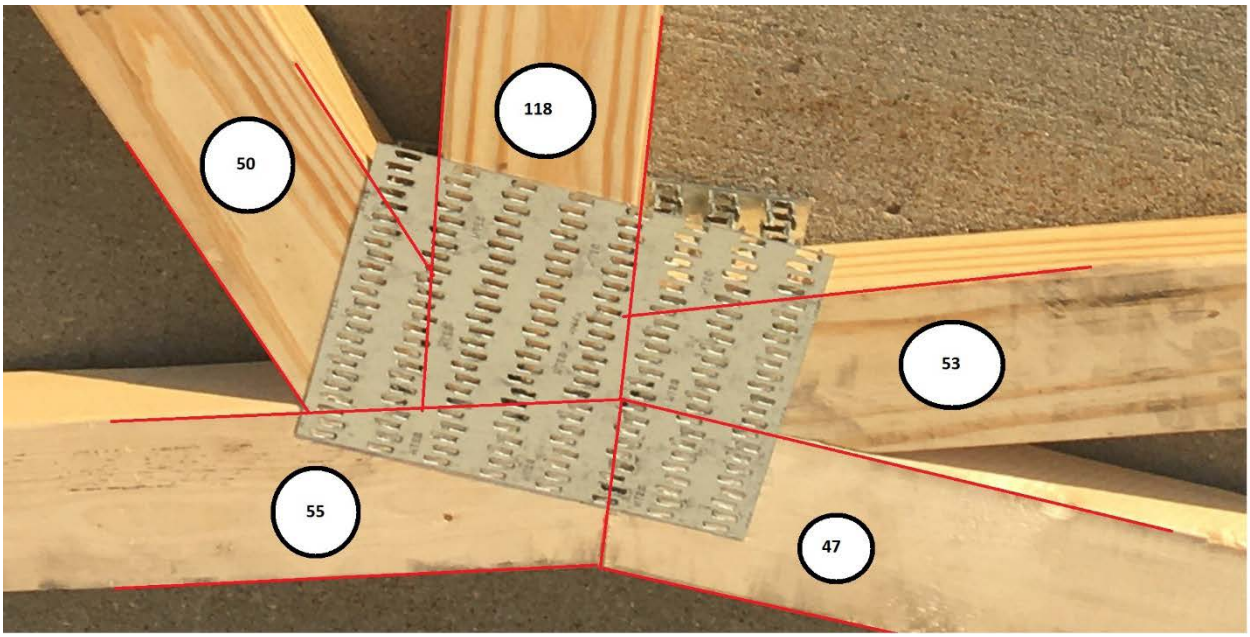
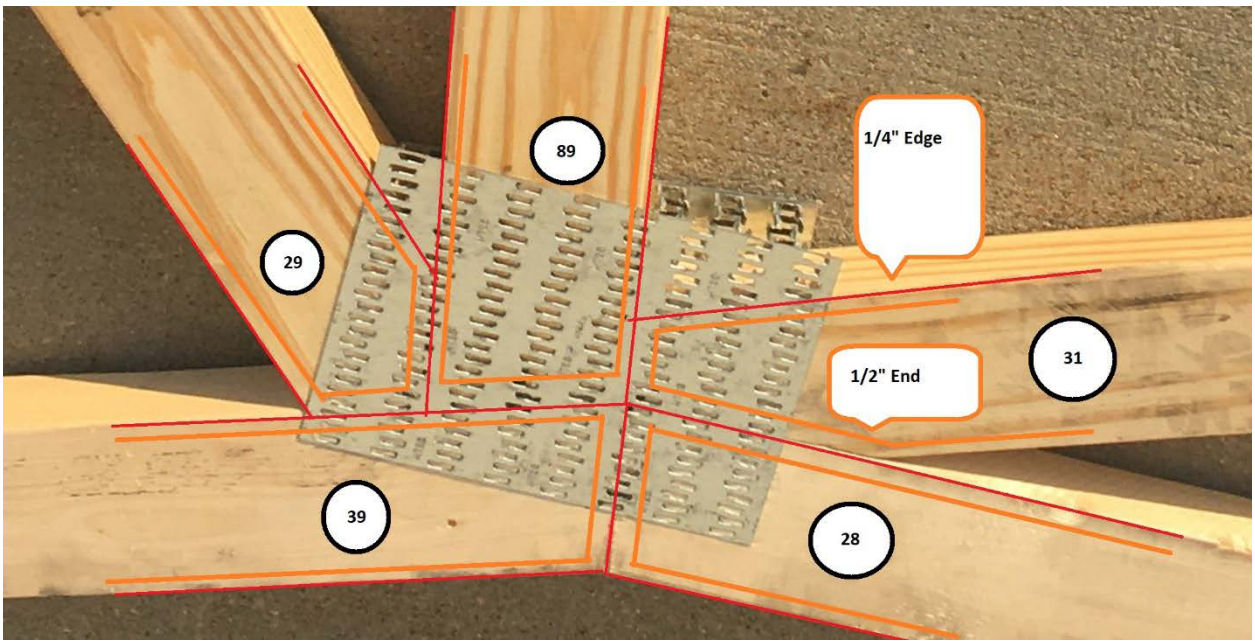


In the first photo, a particular joint is illustrated. Teeth are counted for each member considering all teeth in the web member. This is a simple process – but that does not automatically make it a correct process.



As we apply the ***NDS***® rule reflected in ***ANSI/TPI 1–2014***, 3.7.7.2.2 Ineffective Teeth – End and Edge Distances, the second photo shows the *actual effective* teeth. The ***NDS***® rule dictates that lumber within ½" of the end of the member and lumber within ¼" of the edge of the lumber (the margins shown with the orange lines) cannot be counted as effective.

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Thus, the table demonstrates the difference between simply counting ALL teeth versus counting *effective* teeth. When the teeth located in the ½" end distance and the ¼" edge distance are eliminated from the count, the reduction can be striking. The percentages will differ from case to case, but in this example the result varies from roughly 60% to 70%.

Member	# Teeth in Member	# Excluding Edge and End	Comparision
BC 1	55	39	71%
BC 2	47	28	60%
W 1	50	29	58%
W 2	118	87	74%
W 3	53	31	58%

When it comes down to which teeth *to count when you're counting*, TCM is the most precise method. With TCM, you can verify the effective tooth holding with your own eyes. As long as you take into account the edge and end distance considerations, TCM will prevail over PPM in this challenge.

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