G.1 Scope

The purpose of this appendix is to establish minimum allowances to be used with the TPIC-2007 design procedures to account for material defects and variances in workmanship. It is the responsibility of the manufacturer to adjust these allowances for trusses that cannot be manufactured within the limits described in this appendix.

G.2 Truss Shop Drawing

The truss shop drawings are the drawings provided to the plant personnel for the fabrication of each truss. They include enlarged joint details, tooth count requirements, cutting list, truss layout and/or jig location details.

G.3 Materials

G.3.1 Lumber

G.3.1.1 The lumber shall meet the criteria as described in TPIC Section 2.1 and be the size, species and grade (or better) specified on the Truss Shop Drawings.

G.3.1.2 Splits in any wood member caused by the manufacturing process shall not exceed those permitted in the grade and species of lumber used.

G.3.2 Metal Connector Plates

G.3.2.1 Metal connector plates shall meet the criteria as described in TPIC Section 2.2 and be of the gauge, type, manufacturer, width and length as specified on the Truss Shop Drawing.

G.4 Plating

Section 5.1 in the TPIC design procedures describes the conditions for which the design criterion for truss plates is based. To allow for minimum manufacturing and material variances the plate design criteria shall be adjusted to allow for plate misplacement and ineffective teeth. This section provides the procedure to adjust the design criteria to match that which is generally achievable in the manufacturing process.

G.4.1 Tooth Effectiveness

G.4.1.1 Effective Teeth

Effective teeth are teeth fully embedded normal to the surface of the lumber and into quality wood of the member.

G.4.1.2 Ineffective Teeth

Ineffective teeth are teeth that are improperly embedded and cannot resist loading. Examples include teeth located over wane, knot holes, loose or decayed knots, pitch pockets, unsound wood, holes and joint gaps or teeth that have been flattened before or during the pressing, or that have a tooth embedment gap of 1.6 mm (1/16") or greater. Teeth located within the 13 mm (½") end and 6 mm (¼") edge distances of the lumber are considered to be ineffective when the design is based upon the net area method.

G.4.1.3 Partially Effective Teeth

Teeth not completely embedded and can resist loading may be considered to be partially effective.

When a metal connector plate is installed in the connection area of lumber which contains tooth holes from a previously installed plate and where the wood is otherwise undamaged, metal connector plate teeth shall be considered 50% effective.

G.4.1.4 Minimum Effective Teeth

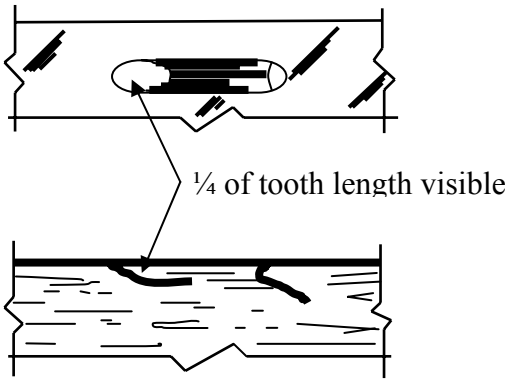
The truss designer shall provide a minimum 10% reserve capacity in grip for each member to allow for ineffective teeth. This requirement may be met by limiting the grip JSI to 0.90 in each member. The required number of effective teeth in each member shown on truss shop drawings or in lists shall be calculated according to TPIC Section 5.1. This means that in the manufacturing process, the average number of effective teeth for both sides of the join in any member shall never be less than the required number of teeth specified on the shop drawing. When averaging the effective teeth on both sides no one side shall have less than 85% of the specified effective teeth required.

Joint Stress Index: The Joint Stress Index (JSI) is the ratio of the calculated force in a member to the lateral resistance of the teeth in that member. Example: If a member has a design force of 4.0 kN (900 lbs) in it and the teeth of the connector plate has a lateral resistance of 4.45 kN (1000 lbs), the JSI = 0.90.

G.4.1.5 Tooth Flattening

After pressing, teeth are considered flattened and ineffective if ¼ or greater of the tooth is visible within the tooth slot. A tooth shall also be considered flattened if the surface of the wood has raised (i.e., wood lifted up beyond its normal surface plane) within the tooth-slot opening of the metal connector plate.

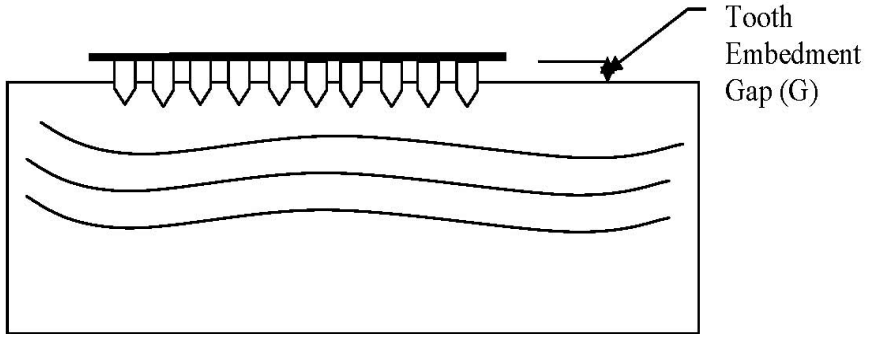
Sketch Showing Flattened Teeth



Both teeth are considered ineffective within a tooth slot.

G.4.1.6 Tooth Embedment Gap

After pressing, all teeth of each connector plate shall be completely embedded in each wood member. Teeth with an embedment gap of less than 0.8 mm (1/32") shall be considered effective. Teeth with a gap equal to or greater than 1.6 mm (1/16") shall be considered ineffective. Teeth with a gap between 0.8 mm (1/32") and 1.6 mm (1/16") shall be considered to be 60% effective.



Tooth Effectiveness Table – Embedment Gap

Tooth Embedment Gap (G)	Tooth Effectiveness
0 mm < G < 0.8 mm (0" < G < 1/32")	100%
0.8 mm ≤ G < 1.6 mm (1/32" ≤ G < 1/16")	60%
G ≥ 1.6 mm (G ≥ 1/16")	0%

G.4.2 Plate Placement Tolerances

During the truss manufacturing process, plates shall be positioned according to the Truss Shop Drawing and should be placed within the 6 mm (¼") plate placement translation tolerance and within the plus and minus five degree (±5°) plate rotation tolerance. In no case shall the positioning decrease the number of effective teeth in any member to less than the minimum number required for that member.

G.4.2.1 Translation

The truss designer shall use a minimum plate placement translation tolerance of 6 mm (¼") parallel and perpendicular to the plate axis. The designer shall select a plate size and placement for each joint that resists the lateral forces in each member. The plate shall then be shifted by 6 mm (¼") up, down, left, right, up and to the left, up and to the right, down and to the left, and down and to the right, and shall be checked to verify that a JSI of 0.90 is not exceeded in any member.

G.4.2.2 Rotation

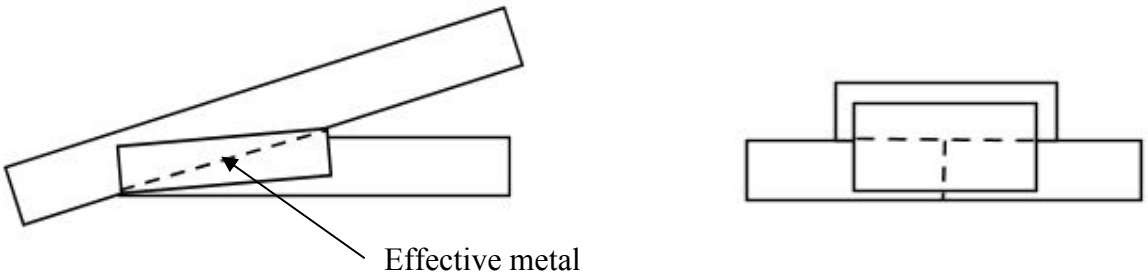
The truss designer shall also use a minimum plate placement rotation tolerance of plus and minus five degrees (5°) about the centre of the connector plate. The designer shall select a plate size and placement for each joint that resists the lateral forces in each member. The plate shall then be rotated 5° clockwise and checked to verify that a JSI of 0.90 is not exceeded in any member. The plate shall then be rotated 5° counterclockwise from its original position and checked to verify that a JSI of 0.90 is not exceeded in any member. If the plate does not resist the force in any member, the plate size is increased and checked again for the two rotated (+ 5° and -5°) positions.

Note: In both the shifting and rotational checks these misplacements are limited to the outer boundaries of the truss. Translation and Rotation checks are done independent of each other.

G.4.2.3 Metal Effectiveness

The truss designer shall ensure the sum of the length or width of metal across each side of a joint shall adequately resist the shear or tension forces at the joint. This check also applies to each shifted location and rotated location using the appropriate shear and breaking values for these locations and actual length or width of metal across the joint.

All supplemental blocking such as wedges and splice blocks must be installed as per the Truss Shop Drawing.

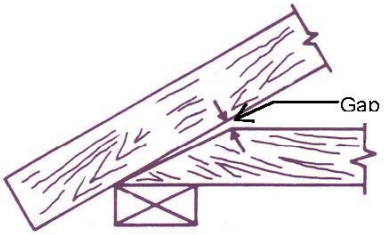


G.5 Truss Assembly

G.5.1 Member to Member Gaps

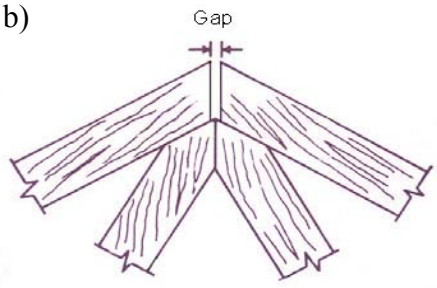
Members at each joint should have wood to wood bearing at each interface. Gaps in joints after pressing shall not exceed 1.6 mm (1/16 inch) for compression splices including pitch breaks and 3 mm (1/8 inch) for all other joints.

a)



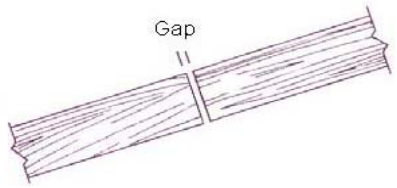
Gap between Top and Bottom Chords in heel joints shall not exceed 3 mm (1/8”)

b)



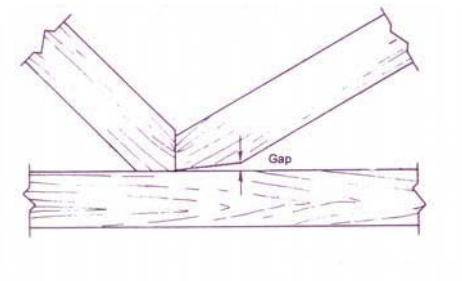
Gap between Top Chords in a Peak joint shall not exceed 1.6 mm (1/16”)

c)



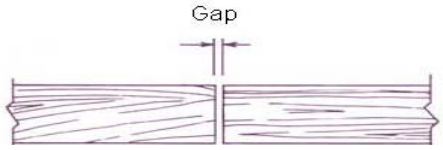
Gaps in Compression Splices shall not exceed 1.6 mm (1/16")

d)



Gaps in interior webs shall not exceed 3 mm (1/8")

e)



Gaps in Tension Splices shall not exceed 3 mm (1/8")

G.5.2 Overall Truss Dimensions

The dimensions of a completed truss if different from those as specified on the Truss Shop Drawing shall not exceed the differences shown in the following table:

Truss Dimensions	Maximum Difference between specified and measured dimensions
Length ≤ 9144 mm (30 feet)	6 mm (1/4")
Length > 9144 mm (30 feet)	13 mm (1/2")
Overall Height ≤ 1200 mm (4 feet)	3 mm (1/8")
Overall Height > 1200 mm (4 feet)	6 mm (1/4")
Left Heel/Stub Height	3 mm (1/8")
Right Heel/Stub Height	3 mm (1/8")
Left Overhang	3 mm (1/8")
Right Overhang	3 mm (1/8")