

# "Triangle 29"

**le logiciel du charpentier**

[www.triangle29.com](http://www.triangle29.com)

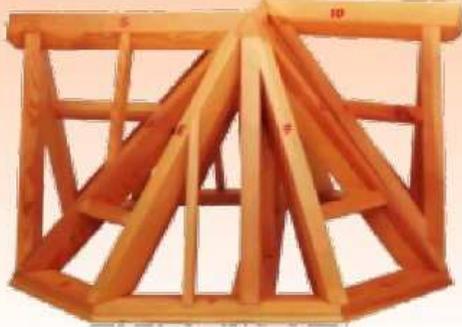


## Manuel d'utilisation



Triangle 29 – Pierrick Le Floc'h – 29360 Clohars Carnoët – France

*Etude du trait de charpente*



## "TRIANGLE 29"

Logiciel pour les charpentiers

En 1 **minute** "top chrono" les principales coupes sont trouvées ; imprimez, c'est fini !

*Un outil d'aide au taillage*

téléchargeable sur le site : [www.triangle29.com](http://www.triangle29.com)



*Une application pour les miroitiers*

- Instantaneous calculation primal cuts
- on either side of the main beam
- By simply entering 3 values
- The slope of the two sides and the angle in plan

Pierrick Le Floc'h

Site : [www.triangle29.com](http://www.triangle29.com)

Email : [triangle29@wanadoo.fr](mailto:triangle29@wanadoo.fr)

Supply the dashboard,  
data entry: The Left side slope in degrees or %  
Right side of the slope in degrees or %  
The angle of the plan view in degrees



Left side slope of 30.00 °

Right side slope of 40.00 °

The angle of the plan view to 120.00 °

Once the slope and angle of the plan view shown you click the "Enter" key on your keyboard

# Sheet sections

- Grabbing these three values allows software to find the main
- sections either side of the main beam and I provide a sheet cutting.

## COUPES EN DEGRES ET POURCENTAGES

Angle des Versants  
**77.75 °** G et D    **42.25 °**  
 Vu en plan  
**120.00 °**

| VERSANT G                         |                        |
|-----------------------------------|------------------------|
| Pente du versant G en degrés      | <b>30.00 °</b>         |
| <b>Coefficient multiplicateur</b> |                        |
| rampant = base x 1.155            | rampant = haut x 2.000 |
| hauteur = base x 0.577            | hauteur = ramp x 0.500 |
| base = rampant x 0.866            | base = hauteur x 1.732 |

|                                   |
|-----------------------------------|
| rampant arêtier = base x 1.148    |
| rampant arêtier = hauteur x 2.035 |
| hauteur arêtier = base x 0.564    |
| hauteur arêtier = rampant x 0.491 |
| base arêtier = rampant x 0.871    |
| base arêtier = hauteur x 1.773    |

| VERSANT D                         |                        |
|-----------------------------------|------------------------|
| Pente du versant D en degrés      | <b>40.00 °</b>         |
| <b>Coefficient multiplicateur</b> |                        |
| rampant = base x 1.306            | rampant = haut x 1.556 |
| hauteur = base x 0.839            | hauteur = ramp x 0.643 |
| base = rampant x 0.766            | base = hauteur x 1.192 |

| Arbalétrier Versant G |                                   |        |                |
|-----------------------|-----------------------------------|--------|----------------|
|                       | Degrés                            | P/cent | Degrés         |
| G1                    | <b>30.00 °</b> Niveau arbalétrier | 173 %  | <b>60.00 °</b> |
| G2                    | <b>60.00 °</b> Aplomb arbalétrier | 58 %   | <b>30.00 °</b> |

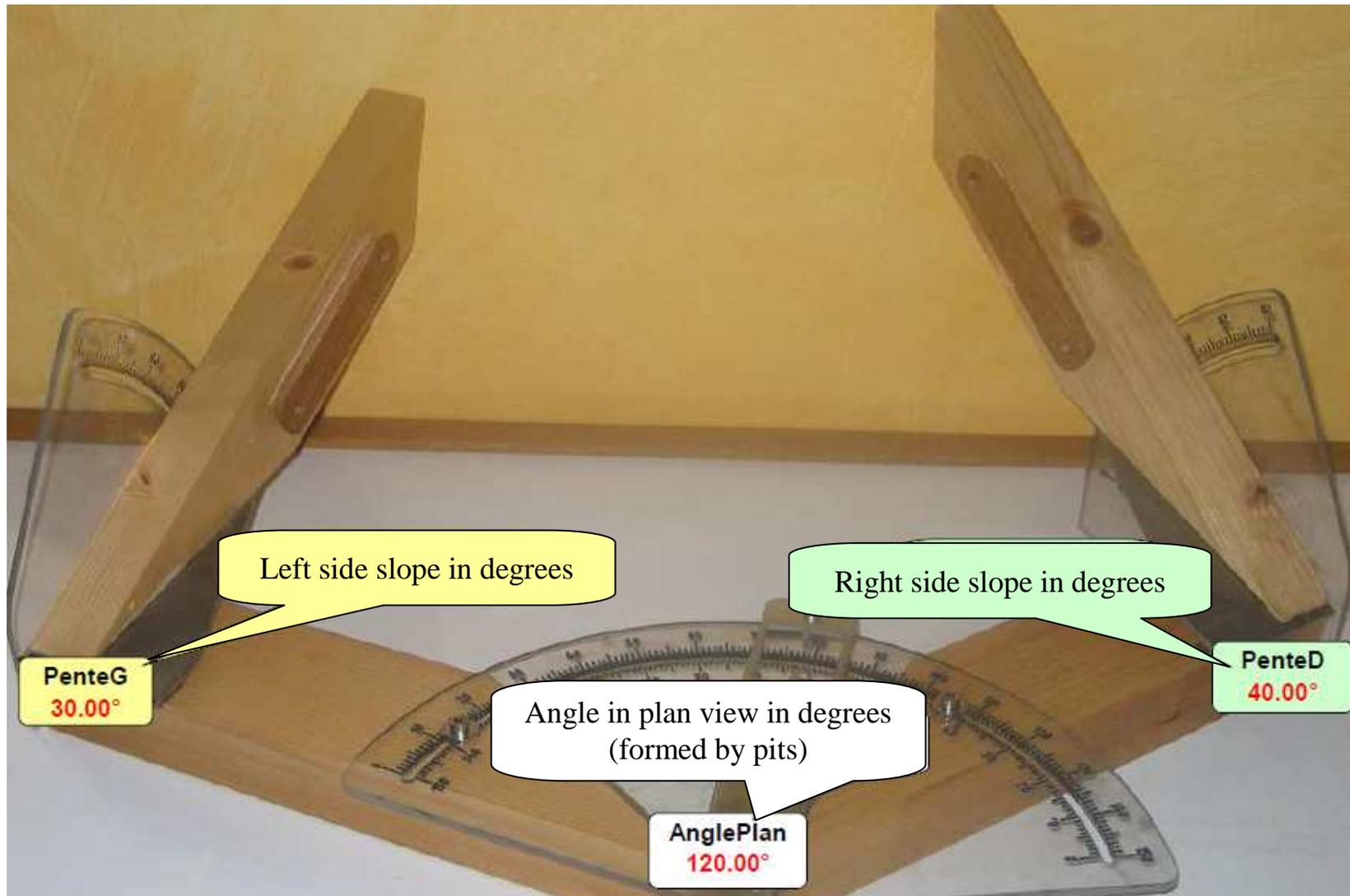
| Arbalétrier Versant D |                                   |        |                |
|-----------------------|-----------------------------------|--------|----------------|
|                       | Degrés                            | P/cent | Degrés         |
| D1                    | <b>40.00 °</b> Niveau arbalétrier | 119 %  | <b>50.00 °</b> |
| D2                    | <b>50.00 °</b> Aplomb arbalétrier | 84 %   | <b>40.00 °</b> |

| Arêtier vu du côté G |                                       |                 |                |
|----------------------|---------------------------------------|-----------------|----------------|
|                      | Degrés                                | P/cent          | Degrés         |
| G3                   | <b>29.43 °</b> Niveau arêtier         | 177 %           | <b>60.57 °</b> |
| G4                   | <b>60.57 °</b> Aplomb arêtier         | 56 %            | <b>29.43 °</b> |
| G5                   | <b>77.75 °</b> Arêtier/sablière       | 22 %            | <b>12.25 °</b> |
| G6                   | <b>83.91 °</b> Déclardement           | 11 %            | <b>6.09 °</b>  |
| G7                   | 62.6 mm Axe déclardement              | ht déclardement | 6.8 mm         |
| G8                   | <b>88.86 °</b> Tracé panne surarêtier | 2 %             | <b>1.14 °</b>  |

| Arêtier vu du côté D |                                       |                 |                |
|----------------------|---------------------------------------|-----------------|----------------|
|                      | Degrés                                | P/cent          | Degrés         |
| D3                   | <b>29.43 °</b> Niveau arêtier         | 177 %           | <b>60.57 °</b> |
| D4                   | <b>60.57 °</b> Aplomb arêtier         | 56 %            | <b>29.43 °</b> |
| D5                   | <b>42.25 °</b> Arêtier/sablière       | 110 %           | <b>47.75 °</b> |
| D6                   | <b>61.59 °</b> Déclardement           | 54 %            | <b>28.41 °</b> |
| D7                   | 12.4 mm Axe déclardement              | ht déclardement | 6.8 mm         |
| D8                   | <b>68.14 °</b> Tracé panne surarêtier | 40 %            | <b>21.86 °</b> |

## Step 1: Set the model

I propose a demonstration from a detachable model.



## Adjustment of the model

- I will adjust the position of the hip by referring to the line of G5
- "Road cuts."

In our example the axis of the hip is **77.75 °** Pit left, see online G5 the "road cuts."

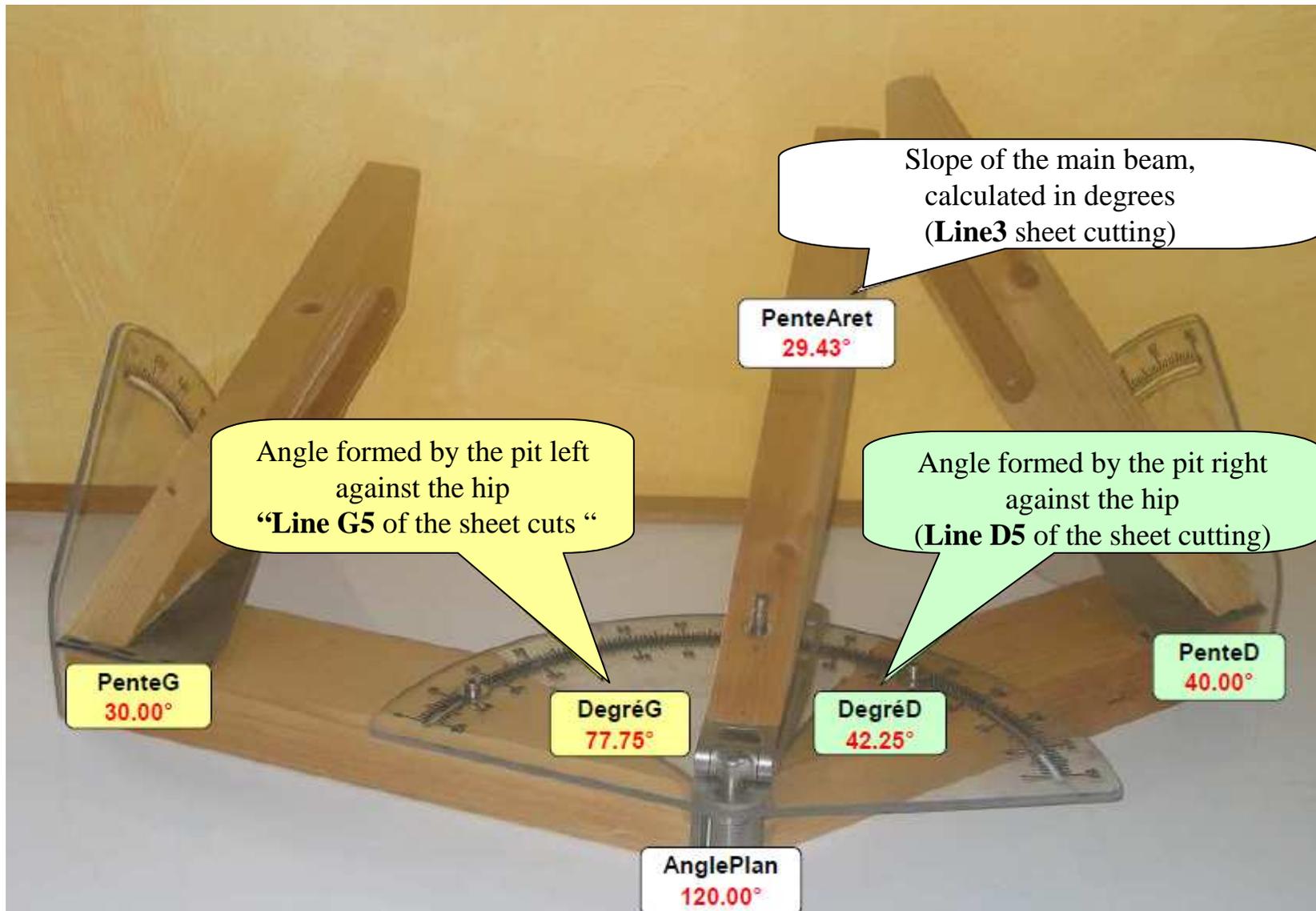
### Arêtier vu du côté G

|    | Degrés  |                         | P/cent          | Degrés  |
|----|---------|-------------------------|-----------------|---------|
| G3 | 29.43 ° | Niveau arêtier          | 177 %           | 60.57 ° |
| G4 | 60.57 ° | Aplomb arêtier          | 56 %            | 29.43 ° |
| G5 | 77.75 ° | Arêtier/sablière        | 22 %            | 12.25 ° |
| G6 | 83.91 ° | Déclardement            | 11 %            | 6.09 °  |
| G7 | 62.6 mm | Axe déclardement        | ht déclardement | 6.8 mm  |
| G8 | 88.86 ° | Tracé panne sur arêtier | 2 %             | 1.14 °  |



Adjusting the slope of the hip referring to the G3 line of "sheet cuts "in our example **29.43 °**

## Step 2: Setting the hip with Info sheet sections



## Tracing faults

- G9 on the line can be read plumb cut down the left,
- Ie  $83.80^\circ$  or an angle of 11%

| Pannes à dévers du versant G |               |                           |        |               |
|------------------------------|---------------|---------------------------|--------|---------------|
|                              | Degrés        |                           | P/cent | Degrés        |
| G9                           | $83.80^\circ$ | Coupe aplomb pannes       | 11 %   | $6.20^\circ$  |
| G10                          | $79.35^\circ$ | Coupe d'alignement pannes | 19 %   | $10.65^\circ$ |
| G11                          | $79.41^\circ$ | Scie, aplomb sur la table | 19 %   | $10.59^\circ$ |
| G12                          | $83.91^\circ$ | Scie, dessus sur la table | 11 %   | $6.09^\circ$  |



I set my bevel with the rule provided for this purpose, namely an offset 11 mm on a ruler 100 mm.

I do the same operation for cutting the line alignment see G10,  $79.35^\circ$  or an angle of 19% on the rule the offset is 19 mm

## Tracing Troubleshooting (continued)

- Now the left is drawn down, I have to cut. To do this, we must
- find the angle of cut. On the "road cut" I propose two scenarios:
- the first, the fault lies flat on the table, namely the cutting level on the table.
- See the line G11,  $79.41^\circ$  You'll probably be forced to refer to
- complement of the angle shown on the right of the table, ie  $10.59^\circ$  because
- Most saws indicate  $0^\circ$  to an angle of  $90.00^\circ$

| Pannes à dévers du versant G |               |                           |        |               |
|------------------------------|---------------|---------------------------|--------|---------------|
|                              | Degrés        |                           | P/cent | Degrés        |
| G9                           | $83.80^\circ$ | Coupe aplomb pannes       | 11 %   | $6.20^\circ$  |
| G10                          | $79.65^\circ$ | Coupe d'alignement pannes | 19 %   | $10.65^\circ$ |
| G11                          | $79.41^\circ$ | Scie, aplomb sur la table | 19 %   | $10.59^\circ$ |
| G12                          | $83.91^\circ$ | Scie, dessus sur la table | 11 %   | $6.09^\circ$  |



The second solution, cutting alignment is on the table, it can be used when the cutting angle is too acute. This angle is the angle of the saw cutting roofing panels.

## Search angle of the saw with the cutting level on the table (D11 Line)

| Pannes à dévers du versant D |         |                           |        |         |
|------------------------------|---------|---------------------------|--------|---------|
|                              | Degrés  |                           | P/cent | Degrés  |
| D9:                          | 54.71 ° | Coupe aplomb pannes       | 71 %   | 35.29 ° |
| D10:                         | 49.86 ° | Coupe d'alignement pannes | 84 %   | 40.14 ° |
| D11:                         | 55.46 ° | Scie, aplomb sur la table | 69 %   | 34.54 ° |
| D12:                         | 61.58 ° | Scie, dessus sur la table | %      | 26.41 ° |

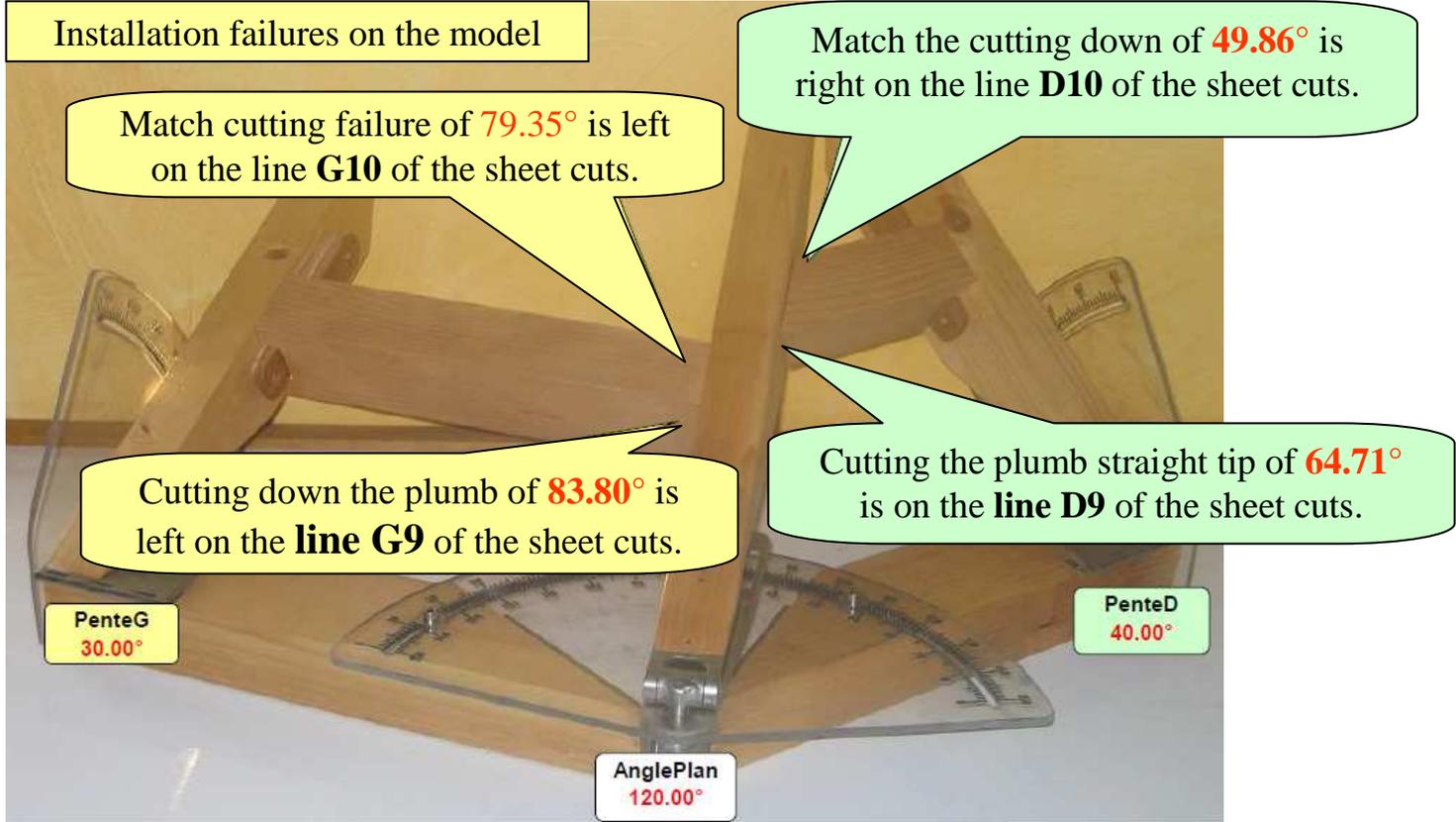
54.71 ° plumb cut line D19

49.86 ° cut alignment line D10

Angle of the saw with the cut on the table  
Aplomb 55.46 ° line D11

Angle of the saw, with the top of the table (line D12)

To address some saws that are calibrated to zero for an angle of 90 °, you will be forced to refer to the additional angles on the right column.



| Arêtier vu du côté G |         |                         |                 |         |
|----------------------|---------|-------------------------|-----------------|---------|
|                      | Degrés  |                         | P/cent          | Degrés  |
| G3                   | 29.43 ° | Niveau arêtier          | 177 %           | 60.57 ° |
| G4                   | 60.57 ° | Aplomb arêtier          | 56 %            | 29.43 ° |
| G5                   | 77.75 ° | Arêtier/sablière        | 22 %            | 12.25 ° |
| G6                   | 83.91 ° | Déclardement            | 11 %            | 6.09 °  |
| G7                   | 62.6 mm | Axe déclardement        | ht déclardement | 6.8 mm  |
| G8                   | 88.86 ° | Tracé panne sur arêtier | 2 %             | 1.14 °  |

| Arêtier vu du côté D |         |                         |                 |         |
|----------------------|---------|-------------------------|-----------------|---------|
|                      | Degrés  |                         | P/cent          | Degrés  |
| D3                   | 29.43 ° | Niveau arêtier          | 177 %           | 60.57 ° |
| D4                   | 60.57 ° | Aplomb arêtier          | 56 %            | 29.43 ° |
| D5                   | 42.25 ° | Arêtier/sablière        | 110 %           | 47.75 ° |
| D6                   | 61.59 ° | Déclardement            | 54 %            | 28.41 ° |
| D7                   | 12.4 mm | Axe déclardement        | ht déclardement | 6.8 mm  |
| D8                   | 68.14 ° | Tracé panne sur arêtier | 40 %            | 21.86 ° |

| Pannes à dévers du versant G |         |                           |        |         |
|------------------------------|---------|---------------------------|--------|---------|
|                              | Degrés  |                           | P/cent | Degrés  |
| G9                           | 83.80 ° | Coupe aplomb pannes       | 11 %   | 6.20 °  |
| G10                          | 79.35 ° | Coupe d'alignement pannes | 19 %   | 10.65 ° |
| G11                          | 79.41 ° | Scie, aplomb sur la table | 19 %   | 10.59 ° |
| G12                          | 83.91 ° | Scie, dessus sur la table | 11 %   | 6.09 °  |

| Pannes à dévers du versant D |         |                           |        |         |
|------------------------------|---------|---------------------------|--------|---------|
|                              | Degrés  |                           | P/cent | Degrés  |
| D9                           | 54.71 ° | Coupe aplomb pannes       | 71 %   | 35.29 ° |
| D10                          | 49.86 ° | Coupe d'alignement pannes | 84 %   | 40.14 ° |
| D11                          | 55.46 ° | Scie, aplomb sur la table | 69 %   | 34.54 ° |
| D12                          | 61.59 ° | Scie, dessus sur la table | 54 %   | 28.41 ° |

# Other methods relating to the main beam

On the "road cut" you will find other cuts related to the hip.

## Arêtier vu du côté G

|    | Degrés  |                         | P/cent         | Degrés  |
|----|---------|-------------------------|----------------|---------|
| G3 | 29.43 ° | Niveau arêtier          | 177 %          | 60.57 ° |
| G4 | 60.57 ° | Aplomb arêtier          | 56 %           | 29.43 ° |
| G5 | 77.75 ° | Arêtier/sablière        | 22 %           | 12.25 ° |
| G6 | 83.91 ° | Délardement             | 11 %           | 6.09 °  |
| G7 | 62.6 mm | Axe délardement         | ht délardement | 6.8 mm  |
| G8 | 88.86 ° | Tracé panne sur arêtier | 2 %            | 1.14 °  |

Line 8 is the angle of the fault trace on the hip.



## Empannons du versant G

|     | Degrés  |                                  | P/cent | Degrés  |
|-----|---------|----------------------------------|--------|---------|
| G13 | 10.65 ° | Coupe d'alignement des empannons | 532 %  | 79.35 ° |
| G14 | 12.25 ° | Scie, aplomb sur la table        | 461 %  | 77.75 ° |
| G15 | 83.91 ° | Scie, dessus sur la table        | 11 %   | 6.09 °  |

Lines 13, 14, 15, indicate the alignment of cuts Jack rafter, left and right, as well as the cutting angles.

## Coupes de tête du versant G

|     | Degrés  |  | P/cent | Degrés  |
|-----|---------|--|--------|---------|
| G16 | 10.71 ° | Déjoutement contre arbalétrier G           | 529 %  | 79.29 ° |
| G17 | 12.25 ° | Scie, aplomb sur la table, C/arba G        | 461 %  | 77.75 ° |
| G18 | 84.01 ° | Scie, dessus sur la table, C/arba G        | 10 %   | 5.99 °  |
| G19 | 76.00 ° | Engueulement, perpendiculaire arba G       | 25 %   | 14.00 ° |
| G20 | 77.75 ° | Scie, aplomb sur la table, perpendi arba G | 22 %   | 12.25 ° |
| G21 | 61.30 ° | Scie, dessus sur la table, perpendi arba G | 55 %   | 28.70 ° |

Lines 16, 17, 18, indicate the angle of the rafters déjoutements against left and right angles and cuts. Lines 19, 20, 21 indicate the angle of engueulements perpendicular to the left and right sides, and the angles of cuts.

## multipliers

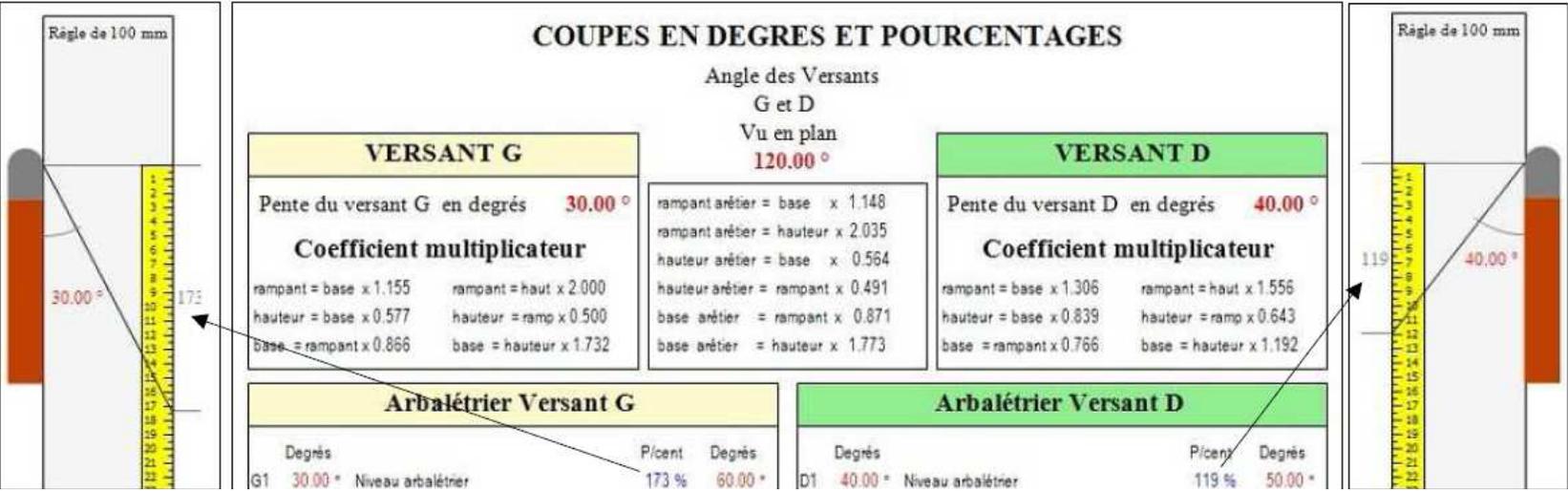
- At the beginning of the table, I said multipliers that allow
- find a stranger from a reference value. This is for the slopes
- left and right, as well as the hip.

### COUPES EN DEGRES ET POURCENTAGES

|   |  |   |
|---|--|---|
| Angle des Versants<br><b>77.75° G et D    42.25°</b>  |  |   |
| Vu en plan<br><b>120.00°</b>  |  |   |
| <b>VERSANT G</b>  |  | <b>VERSANT D</b>  |
| Pente du versant G en degrés <b>30.00°</b><br><br><b>Coefficient multiplicateur</b><br>rampant = base x 1.155      rampant = haut x 2.000<br>hauteur = base x 0.577      hauteur = ramp x 0.500<br>base = rampant x 0.866      base = hauteur x 1.732 | rampant arêtier = base x 1.148<br>rampant arêtier = hauteur x 2.035<br>hauteur arêtier = base x 0.564<br>hauteur arêtier = rampant x 0.491<br>base arêtier = rampant x 0.871<br>base arêtier = hauteur x 1.773 | Pente du versant D en degrés <b>40.00°</b><br><br><b>Coefficient multiplicateur</b><br>rampant = base x 1.306      rampant = haut x 1.556<br>hauteur = base x 0.839      hauteur = ramp x 0.643<br>base = rampant x 0.766      base = hauteur x 1.192 |

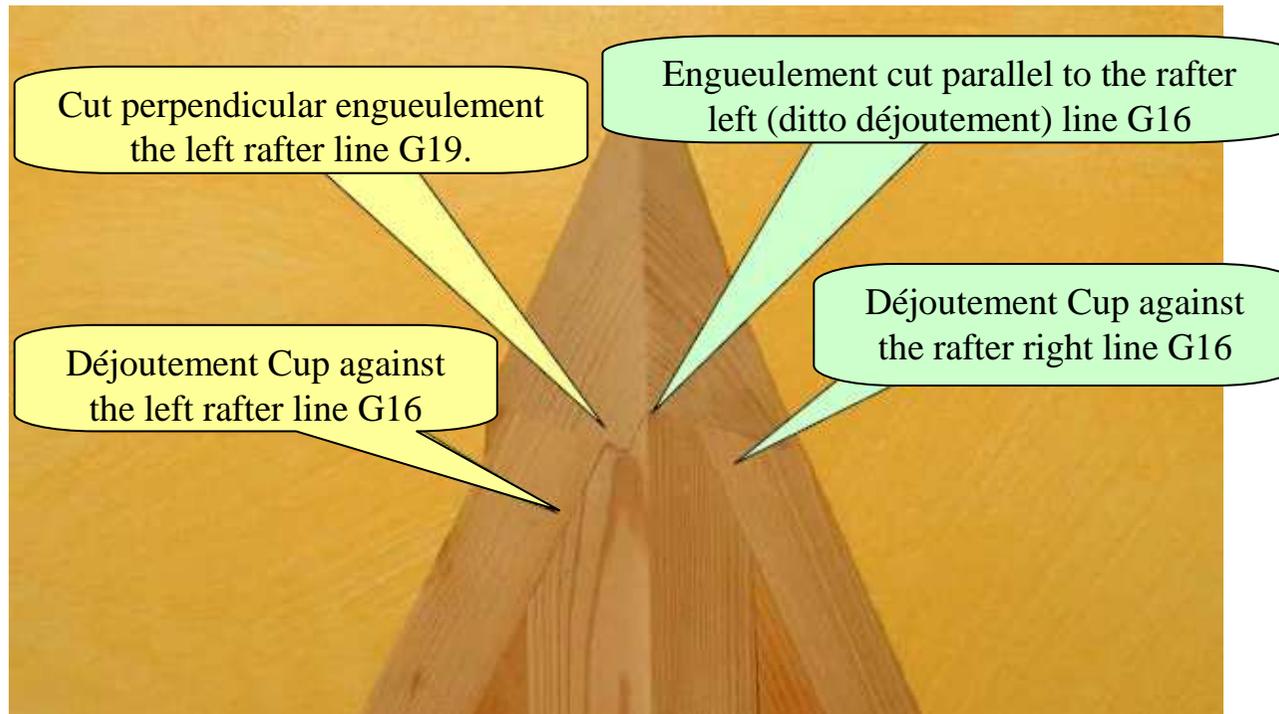
To see all ratings elevation you plan, it suffices to refer to the first line of the tables "Multiplier". Namely, the crawling = base x coefficient (base dimensions being taken up).

# Rule how it works!



To draw an angle without protractor, I thought to convert degrees to percentages, which adjusts the grasshopper with a graduated rule 100 mm. In the example at an angle of **30.00 °** it should be an offset of 173 mm on the ruler, and **40.00 °** the offset is 119 mm.

# Enguelements and Déjoutements



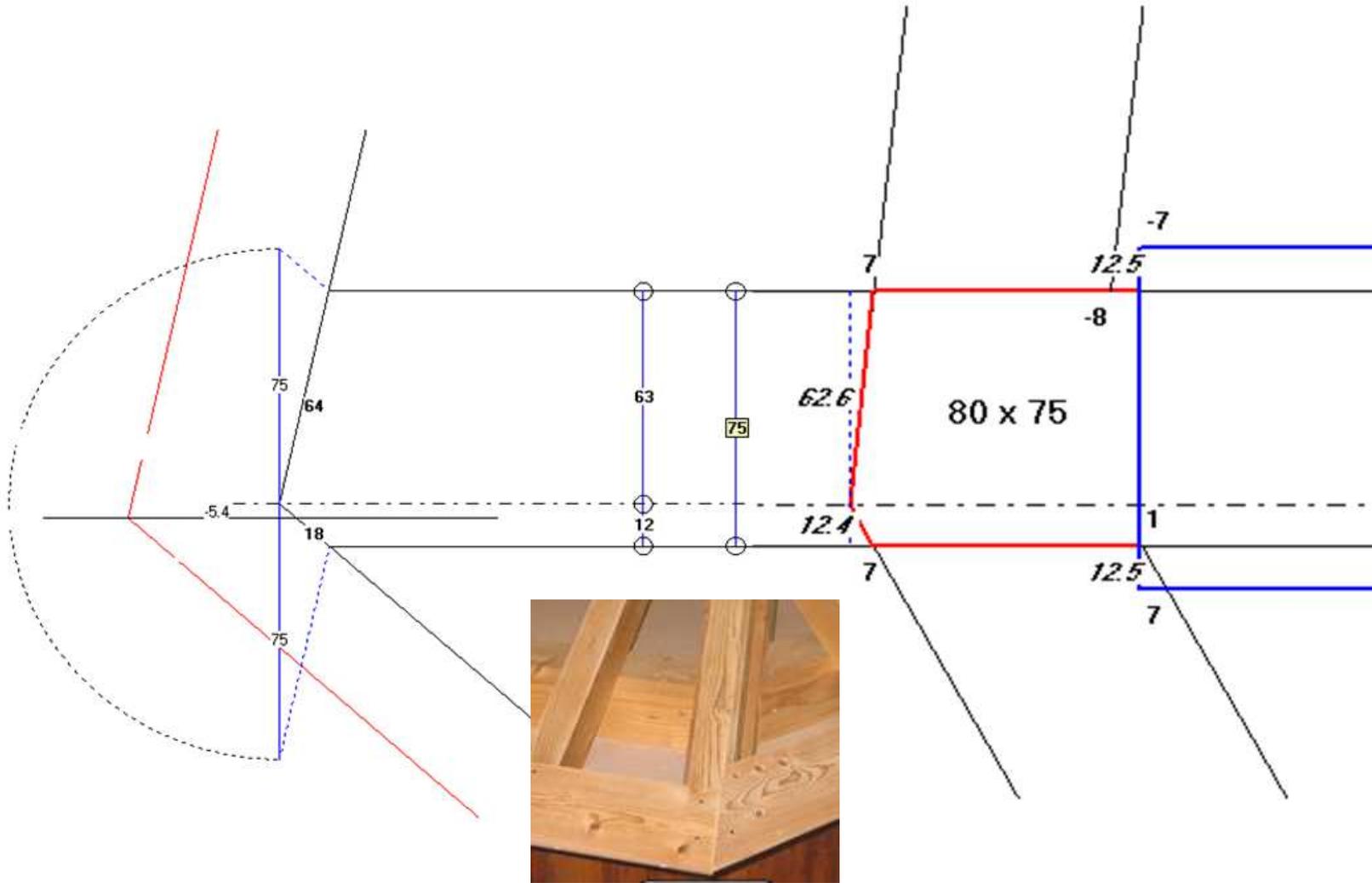
To trace and enguelements déjoutements the hip, take the dimensions the plan view and multiply by the coefficient (first row of the table center).

## COUPES EN DEGRES ET POURCENTAGES

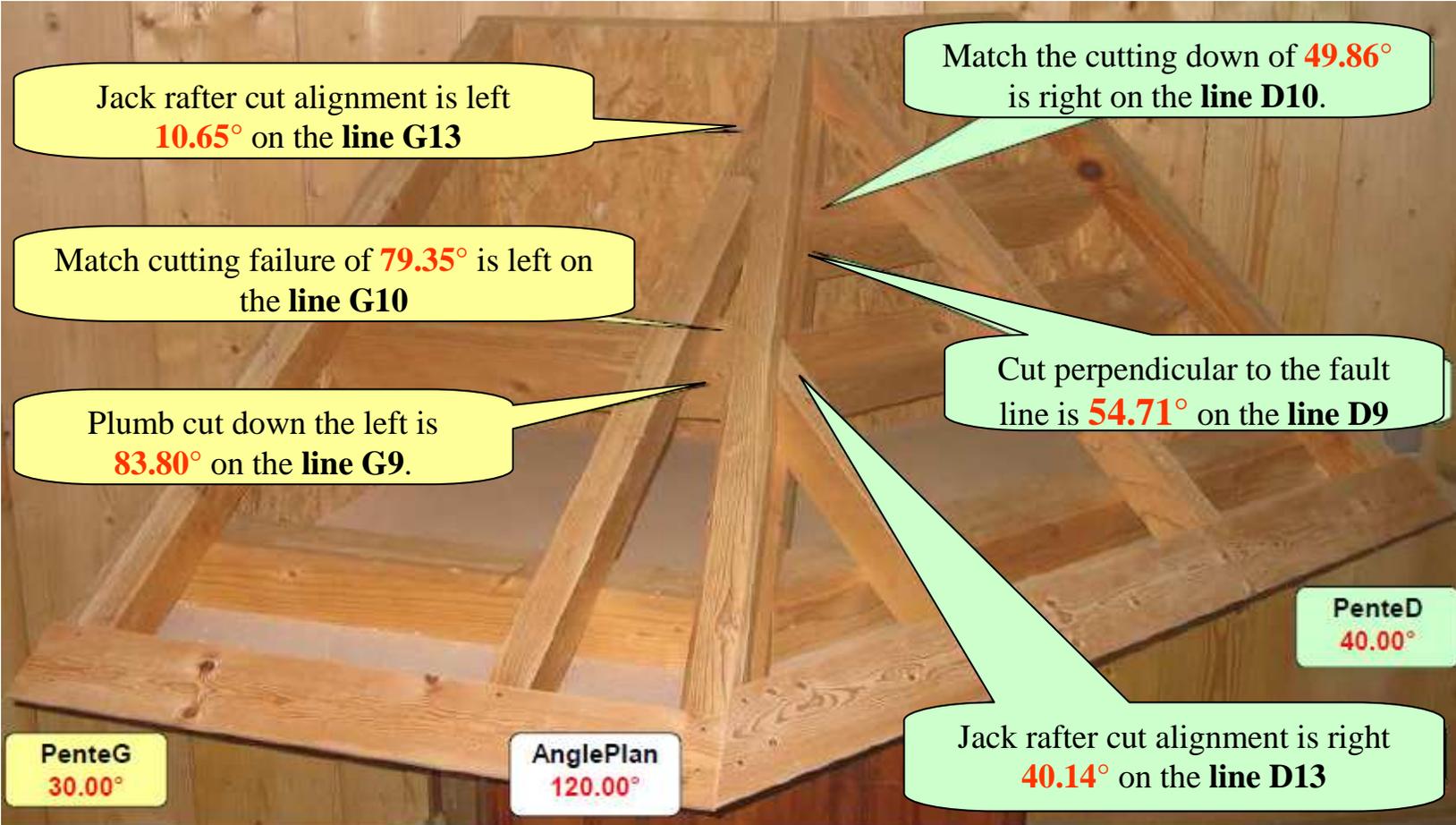
Angle des Versants  
 77.75° G et D 42.25°  
 Vu en plan  
 120.00°

| VERSANT G                           |                                   | VERSANT D                           |                        |
|-------------------------------------|-----------------------------------|-------------------------------------|------------------------|
| Pente du versant G en degrés 30.00° |                                   | Pente du versant D en degrés 40.00° |                        |
| <b>Coefficient multiplicateur</b>   |                                   | <b>Coefficient multiplicateur</b>   |                        |
| rampant = base x 1.155              | rampant = haut x 2.000            | rampant = base x 1.306              | rampant = haut x 1.556 |
| hauteur = base x 0.577              | hauteur = ramp x 0.500            | hauteur = base x 0.839              | hauteur = ramp x 0.643 |
| base = rampant x 0.866              | base = hauteur x 1.732            | base = rampant x 0.766              | base = hauteur x 1.192 |
| rampant arêtier = base x 1.148      | rampant arêtier = hauteur x 2.035 |                                     |                        |
| hauteur arêtier = base x 0.564      | hauteur arêtier = rampant x 0.491 |                                     |                        |
| base arêtier = rampant x 0.871      | base arêtier = hauteur x 1.773    |                                     |                        |

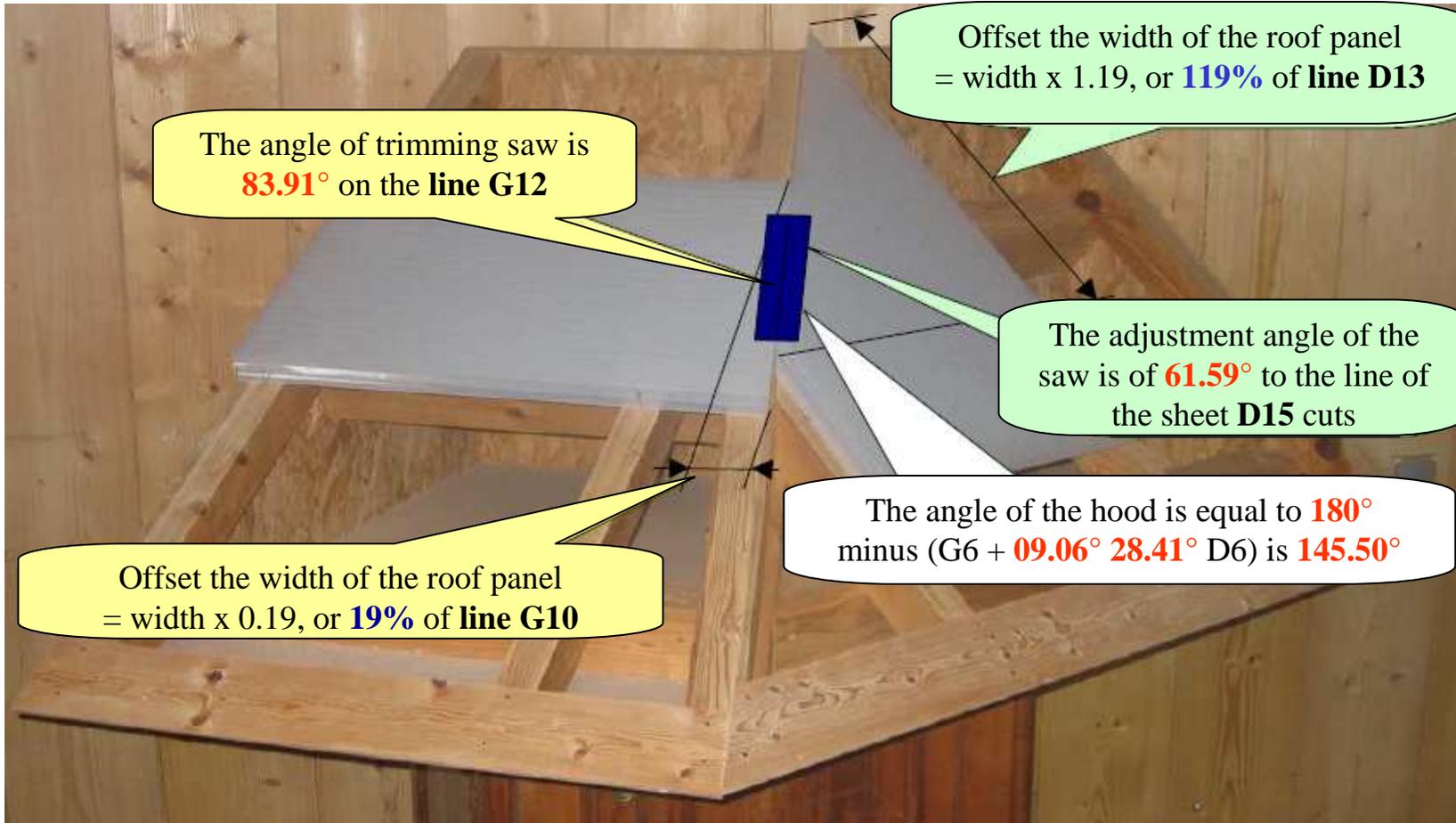
Developed in the end view



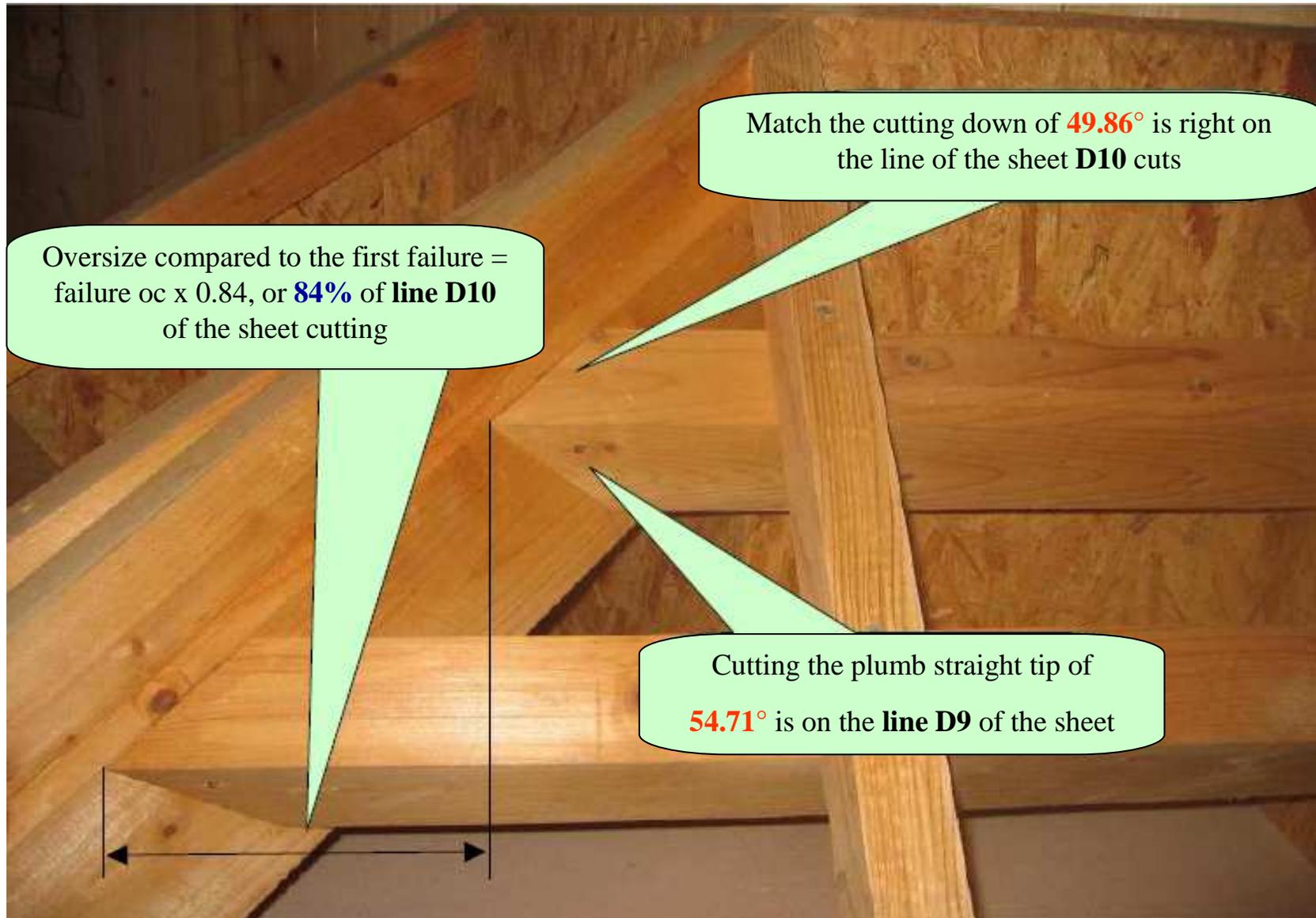
model



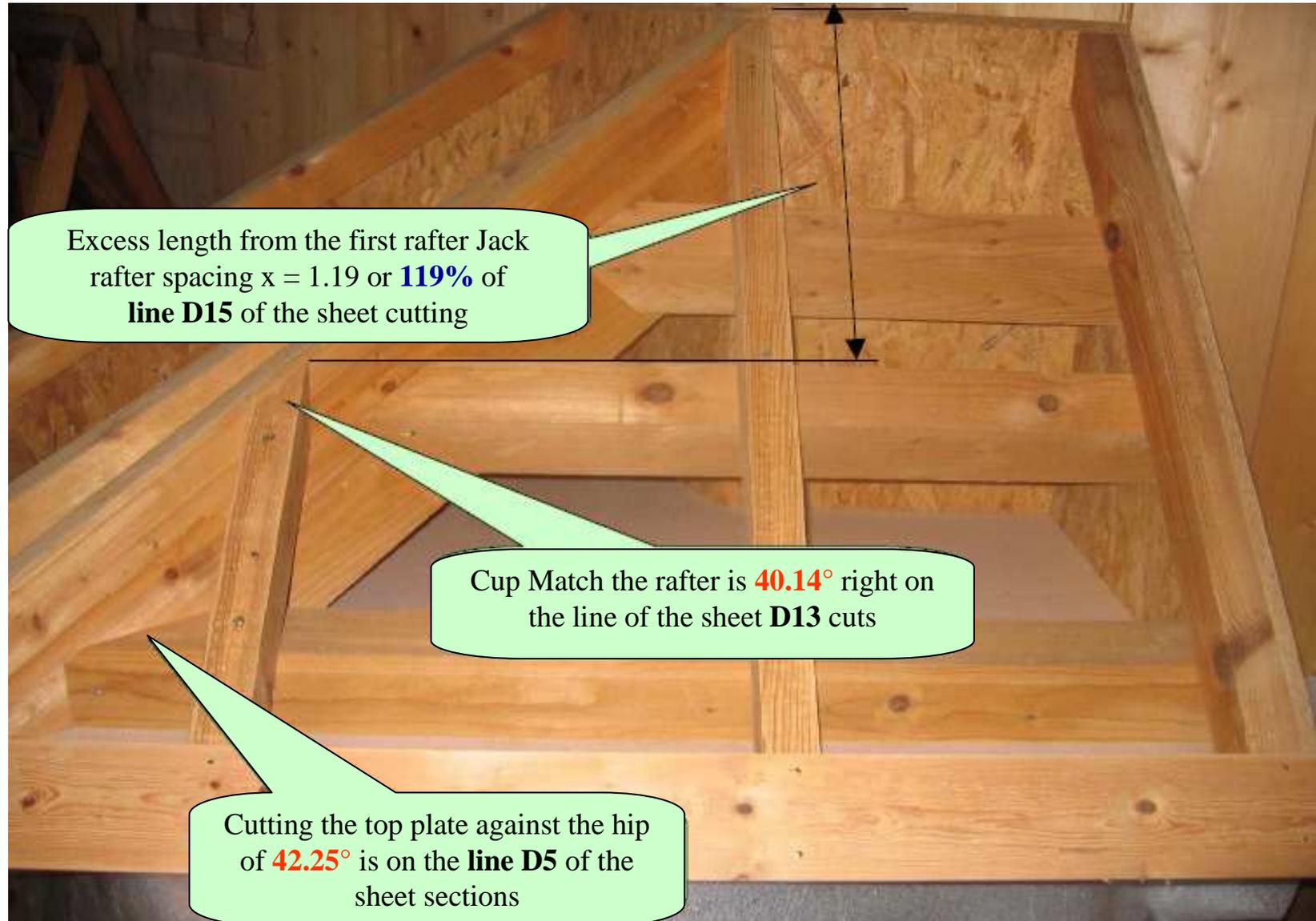
# model



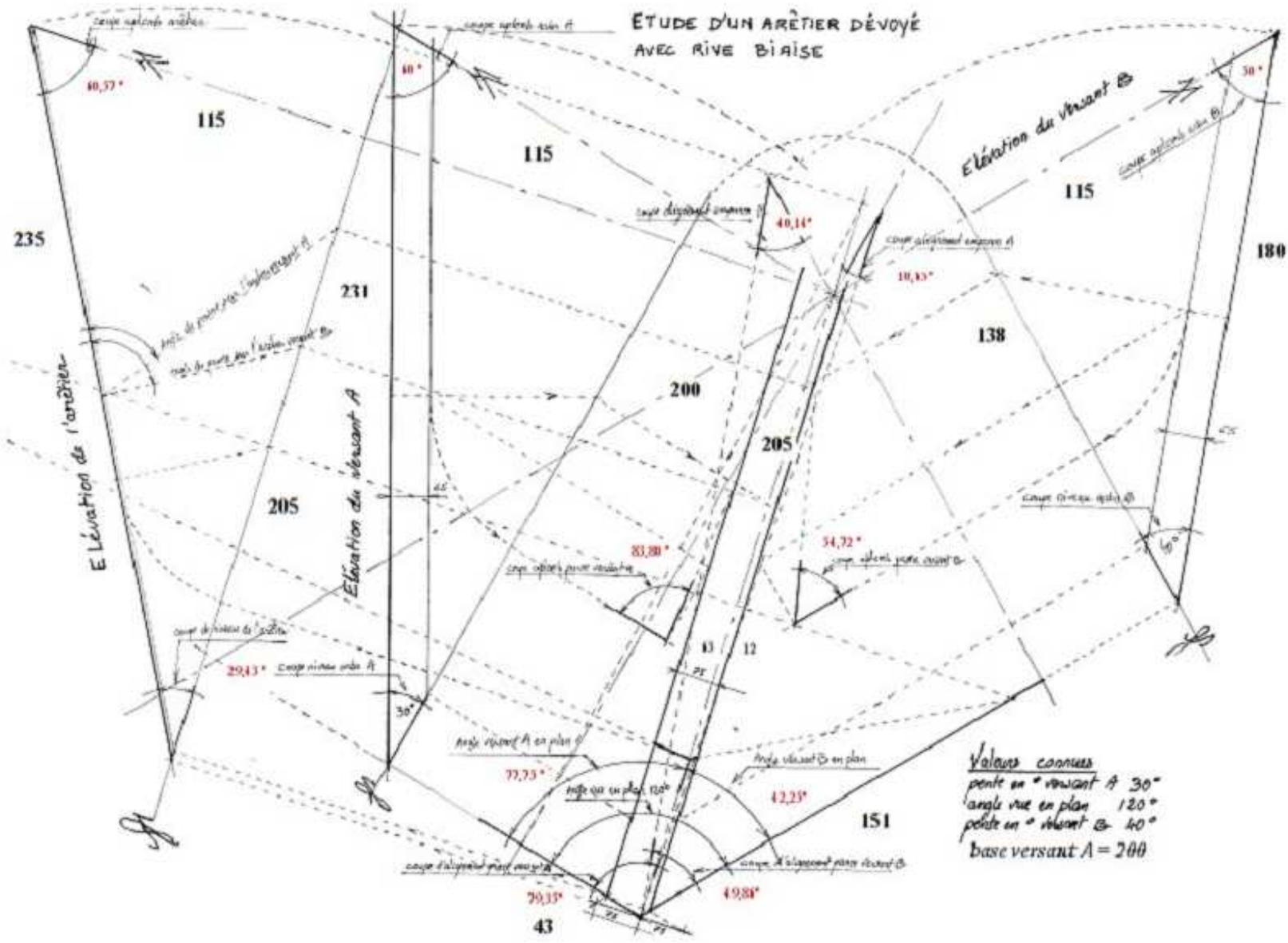
## Cup failures and overlengths



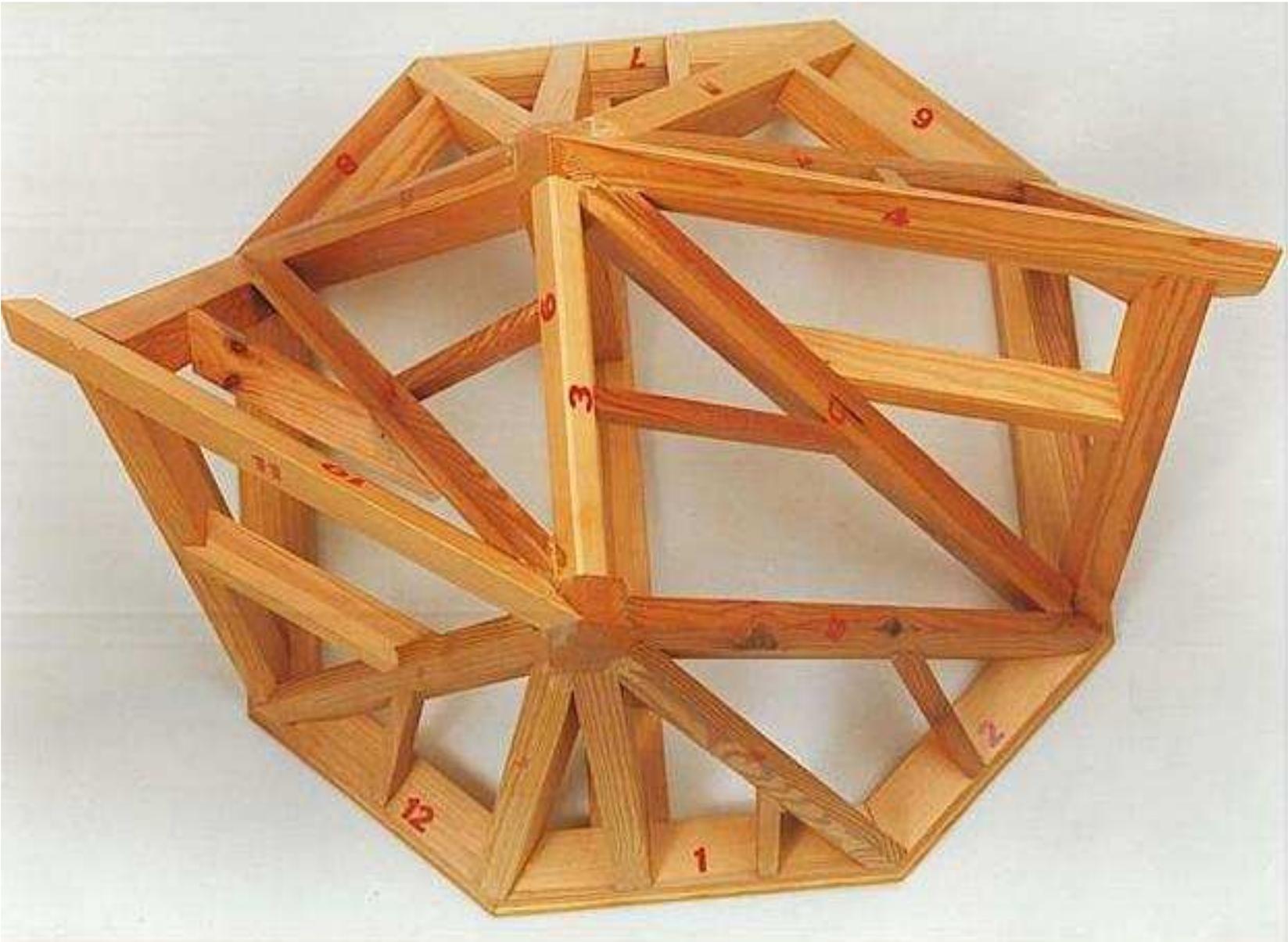
## Jack rafter and cut overlength



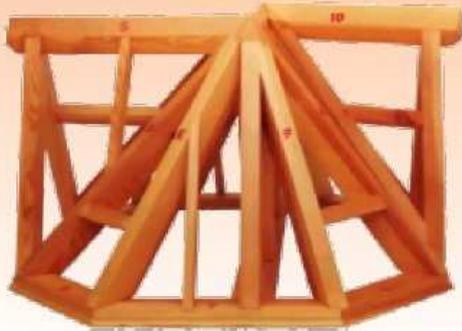
# Related structural



Model produced with Triangle29



*Etude du trait de charpente*



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Logiciel pour les charpentiers

En **1 minute** "top chrono" les principales coupes sont trouvées ; imprimez, c'est fini !

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téléchargeable sur le site : [www.triangle29.com](http://www.triangle29.com)



*Une application pour les miroitiers*

Contact: Pierrick LE FLOC'H

Site: [www.triangle29.com](http://www.triangle29.com)

Email: [triangle29@wanadoo.fr](mailto:triangle29@wanadoo.fr)