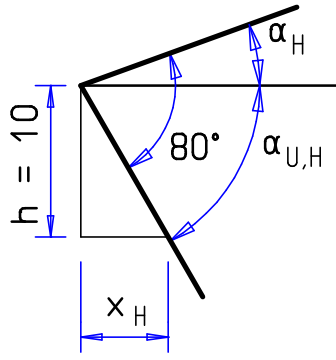
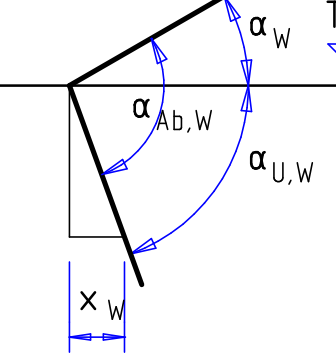


Geg.: Dachneigung Hauptdach $\alpha_H = 20^\circ$; Grundmaß Hauptdach $g_H = 6,50m$;
 Dachneigung Walmdach $\alpha_W = 30^\circ$; Grundmaß Walmdach $g_W = 4,098m$;
 Gratwinkel $\alpha_G = 17,113^\circ$; Gratgrundwinkel $\gamma_H = 57,772^\circ$; $\gamma_W = 32,228^\circ$;
 Sparren 12/18; Saumabschnitt Hauptdach 10° zurück (80°).
 Ges.: Die angepassten Abschnittswinkel für die Walmdachsparren und den
 Gratsparren.

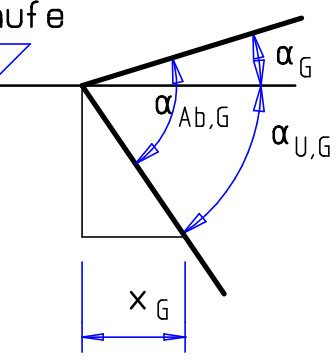
HD - Profil
 $\alpha_{Ab,H} = 80^\circ$



WD - Profil



Grat - Profil



$h = 10cm$ frei angenommen

$\alpha_{U,H} = 80^\circ - 20^\circ = 60^\circ$

$x_H = \frac{10}{\tan 60^\circ} = 5,77cm$

$x_W = 5,77 \times \tan 32,228^\circ = 3,64cm$

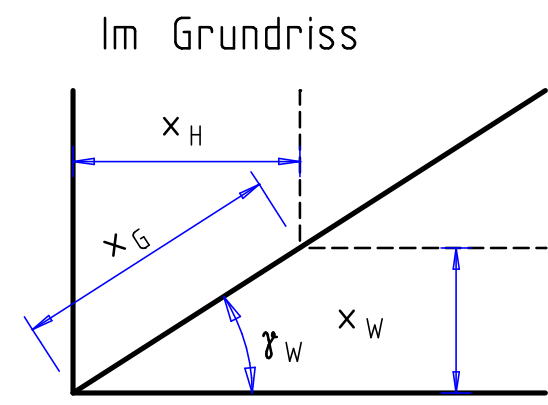
$\alpha_{U,W} = \tan^{-1} \frac{10}{3,64} = 70,00^\circ$

$\alpha_{Ab,W} = 30 + 70 = 100^\circ$

$x_G = \frac{5,77}{\sin 57,772^\circ} = 6,82cm$

$\alpha_{U,G} = \tan^{-1} \frac{10}{6,82} = 55,686^\circ$

$\alpha_{Ab,G} = 17,113 + 55,686 = 72,799^\circ$



$\alpha_{Ab,x} = \tan^{-1} \left(\frac{\tan \alpha_{AbuH} \cdot \tan \alpha_x}{\tan \alpha_H} \right) + \alpha_x$

Geg.: Dachneigung Hauptdach $\alpha_H = 22^\circ$; Grundmaß Hauptdach $g_H = 4,30m$;
 Dachneigung Walmdach $\alpha_W = 38^\circ$; Gratsparren 16/24.
 Ges.: Walmdachgrundmaß g_W ; der Gratsparrenwinkel α_G ; die Gratsparrenlänge,
 die Gratgrundwinkel γ_H und γ_W und die Abgratungshöhe ah_H und ah_W .

Normalprofil Hauptdach $h_F = \tan 22^\circ \cdot 430 = 173,7cm$

Normalprofil Walmdach $g_W = \frac{173,7}{\tan 38^\circ} = 222,4cm$

Gratprofil

$\gamma_H = \tan^{-1} \frac{430}{222,4} = 62,66^\circ$

$\gamma_W = \tan^{-1} \frac{222,4}{430} = 27,34^\circ$

$g_G = \frac{430}{\sin 62,66^\circ} = 484,1cm$

$\alpha_G = \tan^{-1} \frac{173,7}{484,1} = 19,74^\circ$

$l_G = \frac{484,1}{\cos 19,74^\circ} = 514,3cm$

$V_H = \frac{8}{\tan 62,66^\circ} = 4,1cm$

$ah_H = \sin 19,74^\circ \cdot 4,1 = 1,4cm$

$V_W = \frac{8}{\tan 27,34^\circ} = 15,5cm$

$ah_W = \sin 19,74^\circ \cdot 15,5 = 5,2cm$

Geg.: Grundmaß Hauptdach $g_H = 4,80m$; Grundmaß Walmdach $g_W = 3,60m$;
 Gratwinkel $\alpha_G = 25^\circ$; Gratsparren 16/20.
 Ges.: Alle Grundmaße, Neigungswinkel und Abgratungshöhen.

Gratprofil

$\gamma_H = \tan^{-1} \frac{480}{360} = 53,13^\circ$

$\gamma_W = \tan^{-1} \frac{360}{480} = 36,87^\circ$

$g_G = \frac{480}{\sin 62,66^\circ} = 600,0cm$

$h_F = \tan 25^\circ \cdot 600 = 279,8cm$ $l_G = \frac{600}{\cos 25^\circ} = 662,0cm$

$V_H = \frac{8}{\tan 53,13^\circ} = 6,0cm$

$ah_H = \sin 25^\circ \cdot 6,0 = 2,5cm$

$V_W = \frac{8}{\tan 36,87^\circ} = 10,7cm$

$ah_W = \sin 25^\circ \cdot 10,7 = 4,5cm$

Hauptdach $\alpha_H = \tan^{-1} \frac{279,8}{480} = 30,24^\circ$

Walmdach $\alpha_W = \tan^{-1} \frac{279,8}{360} = 37,85^\circ$

Geg.: Dachneigung Walmdach $\alpha_W = 28,5^\circ$; Grundmaß Hauptdach $g_H = 6,45m$;
 Grundmaß Walmdach $g_W = 3,80m$; Grundmaß Pfette $g_{Pf,H} = 95cm$;
 Sparren 10/18; Gratsparren 14/20.
 Ges.: Alle Grundmaße, Neigungswinkel, Abgratungshöhen, Senkelmaße, Verstickmaß
 und Höhenlage der Hauptdachpfette

Walmdachprofil

$h_F = \tan 28,5^\circ \cdot 380 = 206,3cm$ $l_{Sp,W} = \frac{380}{\cos 28,5^\circ} = 432,4cm$

Hauptdachprofil

$\alpha_H = \tan^{-1} \frac{206,3}{645} = 17,74^\circ$

$l_{Sp,H} = \frac{645}{\cos 17,74^\circ} = 677,2cm$

$t = \frac{18}{6} = 3,0cm$

$l_{S1H} = \frac{95}{\cos 17,74^\circ} = 99,7cm$

$0 = 18 - 3,0 = 15,0cm$

$0_{V,H} = \frac{15,0}{\cos 17,74^\circ} = 15,7cm$

$H_{Pf1,H} = 95 \cdot \tan 17,74^\circ - 15,7 = 14,6cm$

Gratprofil

$\gamma_H = \tan^{-1} \frac{645}{380} = 59,50^\circ$

$\gamma_W = \tan^{-1} \frac{380}{645} = 30,50^\circ$

$g_G = \frac{645}{\sin 59,50^\circ} = 748,6cm$

$\alpha_G = \tan^{-1} \frac{206,3}{748,6} = 15,41^\circ$

$l_G = \frac{206,3}{\sin 15,41^\circ} = 776,5cm$

$g_{1HG} = \frac{95}{\sin 59,50^\circ} = 110,3cm$

$l_{S1HG} = \frac{110,3}{\cos 15,41^\circ} = 114,4cm$

$V_H = \frac{7}{\tan 59,50^\circ} = 4,1cm$

$ah_H = \sin 15,41^\circ \cdot 4,1 = 1,1cm$

$V_W = \frac{7}{\tan 30,50^\circ} = 11,9cm$

$ah_W = \sin 15,41^\circ \cdot 11,9 = 3,2cm$

Geg.: Dachneigung Hauptdach $\alpha_H = 24^\circ$; Grundmaß Hauptdach $g_H = 6,80m$;
 Dachneigung Walmdach $\alpha_W = 32^\circ$; Grundmaß Fußpfetten $g_{Pf,H,W} = 90cm$;
 Sparren 10/14; Gratsparren 14/16.
 Ges.: Alle Grundmaße, Neigungswinkel, Abgratungshöhen, Senkelmaße, Verstickmaß
 und Höhenlage der Fußpfetten.

Hauptdachprofil

$h_F = \tan 24^\circ \cdot 680 = 302,76cm$ $l_{Sp,H} = \frac{680}{\cos 24^\circ} = 744,4cm$

$t = \frac{14}{6} = 2,33 \Rightarrow 2,5cm$ $l_{S1H} = \frac{90}{\cos 24^\circ} = 98,5cm$

$0 = 14 - 2,5 = 11,5cm$

$0_{V,H} = \frac{11,5}{\cos 24^\circ} = 12,6cm$

$H_{Pf,H} = 90 \cdot \tan 24^\circ - 12,6 = 27,5cm$

Walmdachprofil

$g_W = \frac{302,76}{\tan 32^\circ} = 484,5cm$ $l_{Sp,W} = \frac{302,76}{\sin 32^\circ} = 571,3cm$

$0_{V,W} = \frac{11,5}{\cos 32^\circ} = 13,6cm$ $l_{S1W} = \frac{90}{\cos 32^\circ} = 106,1cm$

$H_{Pf,W} = 90 \cdot \tan 32^\circ - 13,6 = 42,7cm$

Gratprofil

$\gamma_H = \tan^{-1} \frac{680}{484,5} = 54,530^\circ$ $\gamma_W = \tan^{-1} \frac{484,5}{680} = 35,470^\circ$

$g_G = \frac{680}{\sin 54,53^\circ} = 835,0cm$ $\alpha_G = \tan^{-1} \frac{302,76}{835,0} = 19,931^\circ$

$l_G = \frac{302,76}{\sin 19,931^\circ} = 888,2cm$

$g_{S1HG} = \frac{90}{\sin 54,53^\circ} = 110,5cm$

$l_{S1HG} = \frac{110,5}{\cos 19,931^\circ} = 117,5cm$

$g_{S1WG} = \frac{90}{\sin 35,47^\circ} = 155,1cm$

$l_{S1WG} = \frac{155,1}{\cos 19,931^\circ} = 165,0cm$

$V_H = \frac{7}{\tan 54,53^\circ} = 5,0cm$ $ah_H = \sin 19,931^\circ \cdot 5,0 = 1,7cm$

$V_W = \frac{7}{\tan 35,47^\circ} = 9,8cm$ $ah_W = \sin 19,931^\circ \cdot 9,8 = 3,3cm$

Geg.: Firsthöhe $h_F = 2,25m$; Grundmaß Hauptdach $g_H = 5,10m$;
 Dachneigung Walmdach $\alpha_W = 30^\circ$; Grundmaß Pfette $g_{Pf,W} = 2,40m$;
 Sparren 10/16; Gratsparren 12/18. Sparrenabstand max. 80cm.
 Ges.: Alle Grundmaße, Neigungswinkel, Abgratungshöhen, Senkelmaße, Verstickmaß
 und Höhenlage der Walmdachpfette, gleichmäßige Schifferteilung Walmdach
 und die erste Schifferlänge und das dazugehörige Verstickmaß.

Hauptdachprofil

$\alpha_H = \tan^{-1} \frac{225}{510} = 23,806^\circ$ $l_{Sp,H} = \frac{510}{\cos 23,806^\circ} = 557,4cm$

Walmdachprofil

$g_W = \frac{225}{\tan 30^\circ} = 389,7cm$ $l_{Sp,W} = \frac{225}{\sin 30^\circ} = 450,0cm$

$t = \frac{16}{6} = 2,67 \Rightarrow 2,5cm$

$0 = 16 - 2,5 = 13,5cm$

$0_{V,W} = \frac{13,5}{\cos 30^\circ} = 14,4cm$

$H_{Pf,W} = 240 \cdot \tan 30^\circ - 14,4 = 124,2cm$

Gratprofil

$\gamma_H = \tan^{-1} \frac{510}{389,7} = 52,615^\circ$ $\gamma_W = \tan^{-1} \frac{389,7}{510} = 37,385^\circ$

$g_G = \frac{510}{\sin 52,615^\circ} = 641,9cm$ $\alpha_G = \tan^{-1} \frac{225}{641,9} = 19,318^\circ$

$l_G = \frac{225}{\sin 19,318^\circ} = 680,1cm$

$V_H = \frac{6}{\tan 52,615^\circ} = 4,58cm$ $ah_H = \sin 19,318^\circ \cdot 4,58 = 1,5cm$

$V_W = \frac{6}{\tan 37,385^\circ} = 7,85cm$ $ah_W = \sin 19,318^\circ \cdot 7,85 = 2,6cm$

$g_{S1WG} = \frac{240}{\sin 37,385^\circ} = 395,3cm$ $l_{S1WG} = \frac{395,3}{\cos 19,318^\circ} = 418,9cm$

Schiffer Walmdach $x_{S,W} = \frac{6}{\sin 37,385^\circ} = 9,9cm$

$l_H = (510 - 9,9) \cdot 2 + 10 = 990,2cm$ $n = \frac{990,2}{80} = 12,4 \Rightarrow 13$

$e_{Sch,W} = \frac{990,2}{13} = 76,17cm$ $g_{Sch,W} = 76,17 \cdot \tan 37,385^\circ = 58,2cm$

$l_{Sch,W} = \frac{58,2}{\cos 30^\circ} = 67,2cm$ $V_{Sch,W} = 10 \cdot \tan 37,385^\circ = 7,6cm$

Geg.: Firsthöhe $h_F = 2,50m$; Grundmaß Hauptdach $g_H = 6,35m$;
 Grundmaß Walmdach $g_W = 4,60m$; Grundmaß Fußpfetten $g_{1,H,W} = 85cm$;
 Grundmaß Mittelpfette Hauptdach $g_{2,H} = 4,50m$; Sparren 10/16;
 Gratsparren 16/18.
 Ges.: Alle Grundmaße, Neigungswinkel, Abgratungshöhen, Senkelmaße, Verstickmaß
 und Höhenlagen der Pfetten, Grundmaß der angepassten Walmdachmittelpfette.

Normalprofil Hauptdach

$\alpha_H = \tan^{-1} \frac{250}{635} = 21,490^\circ$ $l_{Sp,H} = \frac{635}{\cos 21,49^\circ} = 682,4cm$

$t = \frac{16}{6} = 2,67 \Rightarrow 2,5cm$ $l_{S1H} = \frac{85}{\cos 21,49^\circ} = 91,4cm$

$0 = 16 - 2,5 = 13,5cm$

$0_{V,H} = \frac{13,5}{\cos 21,49^\circ} = 14,5cm$ $l_{S2H} = \frac{450}{\cos 21,49^\circ} = 483,6cm$

$H_{Pf1,H} = 85 \cdot \tan 21,49^\circ - 14,5 = 18,96cm$

$H_{Pf2,H} = 450 \cdot \tan 21,49^\circ - 14,5 = 162,7cm$

Normalprofil Walmdach

$\alpha_W = \tan^{-1} \frac{250}{460} = 28,523^\circ$ $l_{Sp,W} = \frac{460}{\cos 28,523^\circ} = 523,5cm$

$0_{V,W} = \frac{13,5}{\cos 28,523^\circ} = 15,4cm$ $l_{S1W} = \frac{85}{\cos 28,523^\circ} = 96,7cm$

$H_{Pf1,W} = 85 \cdot \tan 28,523^\circ - 15,4 = 30,8cm$

$g_{Pf2,W} = \frac{162,7 + 15,4}{\tan 28,523^\circ} = 327,7cm$ $l_{S2W} = \frac{327,7}{\cos 28,523^\circ} = 373,0cm$

Gratprofil

$\gamma_H = \tan^{-1} \frac{635}{460} = 54,08^\circ$ $\gamma_W = \tan^{-1} \frac{460}{635} = 35,92^\circ$

$g_G = \frac{635}{\sin 54,08^\circ} = 784,1cm$ $l_G = \frac{250}{\sin 17,684^\circ} = 823,0cm$

$\alpha_G = \tan^{-1} \frac{250}{784,1} = 17,684^\circ$

$V_H = \frac{8}{\tan 54,08^\circ} = 5,8cm$ $ah_H = \sin 17,684^\circ \cdot 5,8 = 1,8cm$

$V_W = \frac{8}{\tan 35,92^\circ} = 11,04cm$ $ah_W = \sin 17,684^\circ \cdot 11,0 = 3,4cm$

$l_{S1H} = 110,2cm$ $l_{S2H} = 583,2cm$ $l_{S1W} = 152,0cm$ $l_{S2W} = 586,4cm$