Roofing (Algorithm)

Properties of Gable Roofing:

    I.   Rafters and Purlins (Wood, Tubular Steel or C-Purlins)

   II.   G.I Roof and Its Accessories

  III.   Roof Accessories (Tinswork)

I.   Rafters and Purlins

1. The user will choose one kind of material for rafters and purlins by clicking the circle besides the choices (such as wood, tubular, or c-purlins),

A. Rafters and Purlins (Wood)

1. If the user chose the wood as a material for rafters and purlins, he needs to input the Length of Rafter, Length of Purlins, Spacing for Rafter, and Spacing of Purlins.

Properties of Gable Roofing

| Rafter and Purlins ▼ | | Unit | m ▼ |

● Wood ○ Tubular Steel ○ C-Purlins

Dimension:

Length of Rafter [   ]
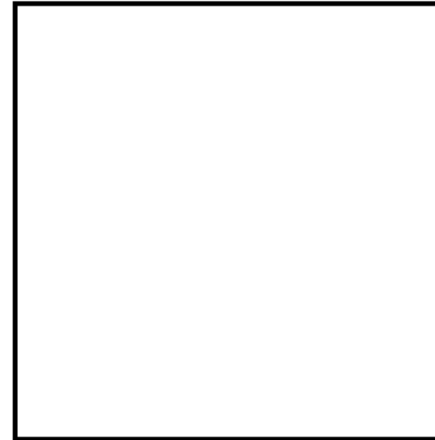
Length of Purlins [   ]

Spacing of Rafter [▼]
▶ 0.8 m
▶ Customize

Spacing of Purlins [▼]
▶ 0.6 m
▶ Customize

Example:

Structural Member	Name
Roofing (Gable) ▼	[ ]

Properties of Gable Roofing

| Rafter and Purlins ▼ | | Unit | m ▼ |

● Wood ○ Tubular Steel ○ C-Purlins

Dimension:

Length of Rafter [5. 22 m]

Length of Purlins [12.0 m]

Spacing of Rafter [0.8 m ▼]

Spacing of Purlins [0.6 m ▼]

Formula:

Pcs. of Rafters = $\frac{Length\ of\ Purlins}{Spacing\ of\ Rafter}$ + 1 *note: round- up the answer if not whole no.*

Total Pcs. of Rafters = (Pcs. of Rafters) x (2)

Pcs. of Purlins = $\frac{Length\ of\ Rafters}{Spacing\ of\ Purlins}$ + 1 *note: round- up the answer if not whole no.*

Total Pcs. of Purlins = (Pcs. of Purlins) x (2)

Length of Rafters into Ft. = (Length of Rafters (meter)) x (3.28) *note: round- up the answer if not whole no.*

Length of Purlins into Ft. = (Length of Purlins (meter)) x (3.28) *note: round- up the answer if not whole no.*

Rafters' Board Ft. = (Total Pcs. of Rafters) x ($\frac{(2)x(6)x(Length\ of\ Rafters\ into\ ft.)}{12}$)

note: round- up the answer if not whole no.

Purlins' Board Ft. = (Total Pcs. of Purlins) x ($\frac{(2)x(2)x(Length\ of\ Purlins\ into\ ft.)}{12}$)

note: round- up the answer if not whole no.

Total Board ft. = Rafters' Board Ft. + Purlins' Board Ft.

Procedure in Computing the Rafters and Purlins (Wood):

1. Solve for Pcs. of Rafters

    Pcs. of Rafters = $\frac{Length\ of\ Purlins}{Spacing\ of\ Rafter}$ + 1

    Pcs. of Rafters = $\frac{12\ m}{0.8\ m}$ + 1

    Pcs. of Rafters = 16 pcs

2. Solve for Total Pcs. of Rafters

    Total Pcs. of Rafters = (Pcs. of Rafters) x (2)

    Total Pcs. of Rafters = (16) x (2)

    Total Pcs. of Rafters = 32 pcs

3. Solve for Length of Rafters into Ft.

    Length of Rafters into Ft. = (Length of Rafters (meter)) x (3.28)

    Length of Rafters into Ft. = (5.22) x (3.28)

Length of Rafters into Ft. = 17.1216 (round- up)

Length of Rafters into Ft. = 18 ft.

4. Solve for Pcs. of Purlins

Pcs. of Purlins = $\frac{Length\ of\ Rafters}{Spacing\ of\ Purlins}$ + 1

Pcs. of Purlins = $\frac{5.22}{0.6}$ + 1

Pcs. of Purlins = $\frac{5.22\ m}{0.6\ m}$ + 1

Pcs. of Purlins = 9.7 (round- up)

Pcs. of Purlins = 10 pcs.

5. Solve for Total Pcs. of Purlins

Total Pcs. of Purlins = (Pcs. of Purlins) x (2)

Total Pcs. of Purlins = (10) x (2)

Total Pcs. of Purlins = 20 pcs.

6. Solve for Length of Purlins into Ft.

Length of Purlins into Ft. = (Length of Purlins (meter)) x (3.28)

Length of Purlins into Ft. = (12) x (3.28)

Length of Purlins into Ft. =39.36 (round- up)

Length of Purlins into Ft. = 40 ft.

7. Solve for Rafters' Board Ft.

Rafters' Board Ft. = (Total Pcs. of Rafters) x $(\frac{(2)x(6)x(Length\ of\ Rafters\ into\ ft.)}{12})$

Rafters' Board Ft. = (32) x $(\frac{(2)x(6)x(18)}{12})$

Rafters' Board Ft. = 576 bd ft.

8. Solve for Purlins' Board Ft.

Purlins' Board Ft. = (Total Pcs. of Purlins) x $(\frac{(2)x(2)x(Length\ of\ Purlins\ into\ ft.)}{12})$

Purlins' Board Ft. = (20) x $(\frac{(2)x(2)x(40)}{12})$

Purlins' Board Ft. = 266.67 (round- up)

Purlins' Board Ft. = 267 bd. ft

9. Solve for the Total Board ft.

Total Board ft. = Rafters' Board Ft. + Purlins' Board Ft.

Total Board ft. = 576 + 267

Total Board ft. = 843 bd ft.

B. Tubular Steel

1. If the user chose the tubular steel as a material for rafters and purlins, he needs to input the Length of Rafter (Side Wall), Length of Rafter, Length of Purlins, Spacing of Rafter, Spacing of Purlins, Commercial Length of Tubular Steel (Rafter) and Commercial Length of Tubular Steel (Purlins).

Example:

Properties of Gable Roofing

| Rafter and Purlins ▼ | | Unit | m ▼ |

◯ Wood ● Tubular Steel ◯ C-Purlins

Dimension:

Length of Rafter (Side Wall)	10 m
Length of Rafter	5. 22 m
Length of Purlins	12.0 m
Spacing of Rafter	1.0 m ▼
Spacing of Purlins	0.6 m ▼
Commercial Length of Tubular Steel (Rafter)	50 mm x 100mm x 1.5 mm ▼
Commercial Length of tubular Steel (Purlins)	50mm x 50mm x 1.2mm ▼

Formula:

Pcs. of Rafters = $\frac{Length\ of\ Rafter\ (Side\ Wall)}{Spacing\ of\ Rafter}$ + 1 *note: round- up the answer if not whole no.*

Total Pcs. of Rafters = (Pcs. of Rafters) x (2)

Total Length of Rafters = (Total Pcs. of Rafters) x (Length of Rafter)

Pcs. of 6m Commercial Length of Rafters = $\frac{Total\ Length\ of\ Rafters}{6}$ *note: round- up the answer if not whole no.*

Pcs. of Purlins = $\frac{Length\ of\ Rafter}{Spacing\ of\ Purlins}$ + 1 *note: round- up the answer if not whole no.*

Total Pcs. of Purlins = (Pcs. of Purlins) x (2)

Total Length of Purlins = (Total Pcs. of Purlins) x (Length of Purlins)

Pcs. of 6m Commercial Length of Purlins = $\frac{Total\ Length\ of\ Purlins}{6}$ *note: round- up the answer if not whole no.*

Procedure in Computing the Rafters and Purlins (Tubular Steel):

1. Solve for Pcs. of Rafters

   Pcs. of Rafters = $\frac{Length\ of\ Rafter\ (Side\ Wall)}{Spacing\ of\ Rafter} + 1$

   Pcs. of Rafters = $\frac{10\ m}{1.0\ m} + 1$

   Pcs. of Rafters = 11 pcs

2. Solve for Total Pcs. of Rafters

   Total Pcs. of Rafters = (Pcs. of Rafters) x (2)

   Total Pcs. of Rafters = (11) x (2)

   Total Pcs. of Rafters = 22 pcs

3. Solve for Total Length of Rafters

   Total Length of Rafters = (Total Pcs. of Rafters) x (Length of Rafter)

   Total Length of Rafters = (22) x (5.22)

   Total Length of Rafters = 114.84

4. Solve for Pcs. of 6m Commercial Length of Rafters

   Pcs. of 6m Commercial Length of Rafters = $\frac{Total\ Length\ of\ Rafters}{6}$

   Pcs. of 6m Commercial Length of Rafters = $\frac{114.84}{6}$

   Pcs. of 6m Commercial Length of Rafters = 19.14 (round- up)

   Pcs. of 6m Commercial Length of Rafters = 20 pcs- *50mm x 100mm x 1.5 mm*

   Note: the "50mm x 100mm x 1.5 mm" is what the user chose in commercial length of rafters

5. Solve for Pcs. of Purlins

   Pcs. of Purlins = $\frac{Length\ of\ Rafters}{Spacing\ of\ Purlins} + 1$

   Pcs. of Purlins = $\frac{5.22}{0.6} + 1$

   Pcs. of Purlins = $\frac{5.22\ m}{0.6\ m} + 1$

   Pcs. of Purlins = 9.7 (round- up)

Pcs. of Purlins = 10 pcs.

6. Solve for Total Pcs. of Purlins

Total Pcs. of Purlins = (Pcs. of Purlins) x (2)

Total Pcs. of Purlins = (10) x (2)

Total Pcs. of Purlins = 20 pcs.

7. Solve for Total Length of Purlins

Total Length of Purlins = (Total Pcs. of Purlins) x (Length of Purlins)

Total Length of Purlins = (20) x (12)

Total Length of Purlins = 240

8. Solve for Pcs. of 6m Commercial Length of Purlins

Pcs. of 6m Commercial Length of Purlins = $\frac{Total\ Length\ of\ Purlins}{6}$

Pcs. of 6m Commercial Length of Purlins = $\frac{240}{6}$

Pcs. of 6m Commercial Length of Purlins = $40\ pcs -$ **50mm x 50mm x 1.2 mm**

Note: the "50mm x 50mm x 1.2 mm" is what the user chose in commercial length of purlins

C. C- Purlins

⭕ Wood ⭕ Tubular Steel ⬤ C-Purlins

1. If the user chose the C- Purlins as a material for rafters and purlins, he needs to input the Length of Rafter (Side Wall), Length of Rafter, Length of Purlins, Spacing of Rafter, Spacing of Purlins, Commercial Length of C- Purlins (Rafter) and Commercial Length of C- Purlins (Purlins).

Example:

Properties of Gable Roofing

| Rafter and Purlins ▼ | | Unit | m ▼ |

○ Wood ○ Tubular Steel ● C-Purlins

Dimension:

Length of Rafter (Side Wall)	10 m
Length of Rafter	5.22 m
Length of Purlins	12 m
Spacing of Rafter	1.0 m ▼
Spacing of Purlins	0.6 m ▼

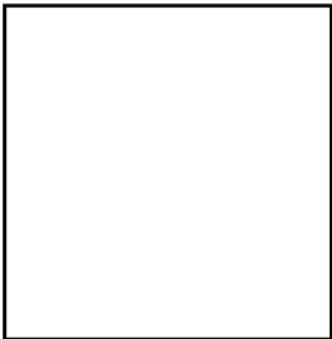| Commercial Length of Cee Purlins (Rafter) | 50mm x 150 mm x 1.5 mm ▼ |
| Commercial Length of Cee Purlins (Purlins) | 50mm x 75 mm x 1.2 mm ▼ |

Formula:

Pcs. of Rafters = $\dfrac{Length\ of\ Rafter\ (Side\ Wall)}{Spacing\ of\ Rafter} + 1$ *note: round- up the answer if not whole no.*

Total Pcs. of Rafters = (Pcs. of Rafters) x (2)

Total Length of Rafters = (Total Pcs. of Rafters) x (Length of Rafter)

Pcs. of 6m Commercial Length of Rafters = $\frac{Total\ Length\ of\ Rafters}{6}$ *note: round- up the answer if not whole no.*

Pcs. of Purlins = $\frac{Length\ of\ Rafter}{Spacing\ of\ Purlins} + 1$ *note: round- up the answer if not whole no.*

Total Pcs. of Purlins = (Pcs. of Purlins) x (2)

Total Length of Purlins = (Total Pcs. of Purlins) x (Length of Purlins)

Pcs. of 6m Commercial Length of Purlins = $\frac{Total\ Length\ of\ Purlins}{6}$ *note: round- up the answer if not whole no.*

Procedure in Computing the Rafters and Purlins (C- Purlins):

Note: the algorithm of tubular steel and c-purlins have the same procedure in computing the rafters and purlins.

1. Solve for Pcs. of Rafters

   Pcs. of Rafters = $\frac{Length\ of\ Rafter\ (Side\ Wall)}{Spacing\ of\ Rafter} + 1$

   Pcs. of Rafters = $\frac{10\ m}{1.0\ m} + 1$

   Pcs. of Rafters = 11 pcs

2. Solve for Total Pcs. of Rafters

   Total Pcs. of Rafters = (Pcs. of Rafters) x (2)

   Total Pcs. of Rafters = (11) x (2)

   Total Pcs. of Rafters = 22 pcs

3. Solve for Total Length of Rafters

   Total Length of Rafters = (Total Pcs. of Rafters) x (Length of Rafter)

   Total Length of Rafters = (22) x (5.22)

   Total Length of Rafters = 114.84

4. Solve for Pcs. of 6m Commercial Length of Rafters

   Pcs. of 6m Commercial Length of Rafters = $\frac{Total\ Length\ of\ Rafters}{6}$

   Pcs. of 6m Commercial Length of Rafters = $\frac{114.84}{6}$

   Pcs. of 6m Commercial Length of Rafters = 19.14 (round- up)

   Pcs. of 6m Commercial Length of Rafters = 20 pcs- *50mm x 150mm x 1.5 mm*

   Note: the "50mm x 150mm x 1.5 mm" is what the user chose in commercial length of rafters

5. Solve for Pcs. of Purlins

Pcs. of Purlins = $\frac{Length\ of\ Rafters}{Spacing\ of\ Purlins} + 1$

Pcs. of Purlins = $\frac{5.22}{0.6} + 1$

Pcs. of Purlins = $\frac{5.22\ m}{0.6\ m} + 1$

Pcs. of Purlins = 9.7 (round- up)

Pcs. of Purlins = 10 pcs.

6. Solve for Total Pcs. of Purlins

Total Pcs. of Purlins = (Pcs. of Purlins) x (2)

Total Pcs. of Purlins = (10) x (2)

Total Pcs. of Purlins = 20 pcs.

7. Solve for Total Length of Purlins

Total Length of Purlins = (Total Pcs. of Purlins) x (Length of Purlins)

Total Length of Purlins = (20) x (12)

Total Length of Purlins = 240

8. Solve for Pcs. of 6m Commercial Length of Purlins

Pcs. of 6m Commercial Length of Purlins = $\frac{Total\ Length of\ Purlins}{6}$

Pcs. of 6m Commercial Length of Purlins = $\frac{240}{6}$

Pcs. of 6m Commercial Length of Purlins = $40\ pcs -$ **50mm x 75mm x 1.2 mm**

Note: the "50mm x 75mm x 1.2 mm" is what the user chose in commercial length of purlins

II.   G.I. Roof and Its Accessories

1. The user needs to input the Length of purlins (along the Gutter Line), Effective Covering, Height of Roof Sheet (if more than 1, click the plus beside the box to add more height of roof sheet).

Properties of Gable Roofing

G.I Roof and Its Accesories ▽   Unit [m] ▽

Dimension:

Length of Purlins   [   ]
(Along the Gutter Line)

Effective Covering   [   ] ▼
(Side Lapping)

▶ 0.7 m
▶ 0.6 m

Height of Roof   [   ] ⊕
Sheet

2. The user needs to choose what materials is needed for the gable roof they are estimating, by clicking the circle besides the provided materials. The material choices for the user are: Corrugated G.I Sheet, G.I Rivets, G.I Washers, Lead Washers, Umbrella Nails and Plain G.I Strap. *Note: if the user also choses plain G.I strap, he needs to choose the size of purlins of it. *

Materials:

O Corrugated G.I Sheet
O G.I Roof Nails
O G.I Rivets
O G.I Washers
O Lead Washers
O Umbrella Nails
● Plain G.I. Strap

Size of Purlins   [   ] ▼
(Inches)

▶ 2" x 3"
▶ 2" x 4"
▶ 2" x 5"
▶ 2" x 6"

Example:

Properties of Gable Roofing

G.I Roof and Its Accesories ▽   Unit [m] ▽

Dimension:

Length of Purlins   [12.90 m]
(Along the Gutter Line)

Effective Covering   [0.60 m] ▼
(Side Lapping)

Height of Roof   [3.00 m]
Sheet

                           [2.10 m] ⊕

Materials:

● Corrugated G.I Sheet
● G.I Roof Nails
○ G.I Rivets
○ G.I Washers
● Lead Washers
○ Umbrella Nails
● Plain G.I. Strap

Size of Purlins   [2" x 3"] ▼
(Inches)

Formula:

Pcs. of Corrugated G.I. Sheets = $\frac{Length\ of\ Purlins}{Effective\ Covering}$ *note: round- up the answer if not whole no.*

Total Pcs. of Corrugated G.I. Sheets = (Pcs. of Corrugated G.I. Sheets) x (2)

$$\text{Pcs. of Plain G.I. Sheets} = \frac{\begin{aligned}&(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 1) \, X \, (\textit{Number of G.I Rivets According to the Height of Roof Sheet } 1) + \\ &(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 2) \, X \, (\textit{Number of G.I Rivets According to the Height of Roof Sheet } 2) + \ldots\ldots \\ &(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } n) \, X \, (\textit{Number of G.I Rivets According to the Height of Roof Sheet } n)\end{aligned}}{\begin{array}{c}\text{Number of Strap in One Plain Sheet}\\ \text{According to the Size of Purlins}\\ \text{Inches}\end{array}}$$

$$\text{Kg. of G.I. Roof Nails} = \frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 1) \, X \, (\textit{Number of G.I Nails According to the Height of Roof Sheet } 1)}{120} +$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 2) \, X \, (\textit{Number of G.I Nails According to the Height of Roof Sheet } 2)}{120} + \ldots\ldots\ldots$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } n) \, X \, (\textit{Number of G.I Nails According to the Height of Roof Sheet } n)}{120}$$

$$\text{Kg. of G.I. Rivets} = \frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 1) \, X \, (\textit{Number of G.I Rivets According to the Height of Roof Sheet } 1)}{180} +$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 2) \, X \, (\textit{Number of G.I Rivets According to the Height of Roof Sheet } 2)}{180} + \ldots\ldots\ldots$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } n) \, X \, (\textit{Number of G.I Rivets According to the Height of Roof Sheet } n)}{180}$$

$$\text{Kg. of G.I. Washers} = \frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 1) \, X \, (\textit{Number of G.I Washer According to the Height of Roof Sheet } 1)}{126} +$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 2) \, X \, (\textit{Number of G.I Washers According to the Height of Roof Sheet } 2)}{126} + \ldots\ldots\ldots$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } n) \, X \, (\textit{Number of G.I Washers According to the Height of Roof Sheet } n)}{126}$$

$$\text{Kg. of Lead Washers} = \frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 1) \, X \, (\textit{Number of Lead Washers According to the Height of Roof Sheet } 1)}{75} +$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 2) \, X \, (\textit{Number of Lead Washers According to the Height of Roof Sheet } 2)}{75} + \ldots\ldots\ldots$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } n) \, X \, (\textit{Number of Lead Washers According to the Height of Roof Sheet } n)}{75}$$

$$\text{Kg. of Umbrella Nails} = \frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 1) \, X \, (\textit{Number of Umbrella Nails According to the Height of Roof Sheet } 1)}{120} +$$

$$\frac{(\text{Total Pieces of Corrugated G.I. Sheet for } \textit{Height of Roof Sheet } 2) \, X \, (\textit{Number of Umbrella Nails According to the Height of Roof Sheet } 2)}{120} + \ldots\ldots\ldots$$

Note: the number or pieces of nails, rivets, lead washers and umbrella nails are depending on the height of roof sheet. And the pieces of G.I Washer per sheet are twice the pcs of rivets. See the table below.

Height of Roof Sheet	Number of G.I. Nails, Rivets, Lead Washer, and Umbrella Nails per Sheet	Number of G.I. Washer per Sheet
1.50 m	14 pcs	28 pcs
1.80 m	14 pcs	28 pcs
2.10 m	18 pcs	36 pcs
2.40 m	18 pcs	36 pcs
2.70 m	22 pcs	44 pcs
3.00 m	22 pcs	44 pcs
3.60 m	26 pcs	52 pcs

Note: the number per kg of materials of G.I. roof nails, G.I. rivets, G.I. washers, Lead Washers and Umbrella Nails are shown below.

TABLE 6-3 QUANTITY OF ROOF ACCESSORIES IN KILOGRAMS

Materials	Number per Kilogram
G.I. Roof Nails	120
G.I. Rivets	180
G.I. Washers	126
Lead Washers	75
Umbrella Nails	120

Note: the number of straps in one plain G.I. sheet are shown below

TABLE 6-4 SIZE AND QUANTITY OF STRAPS IN ONE PLAIN G.I. SHEET

Size of Purlins Inches	Size of G.I. Strap in Inches	Number of Strap in One Plain Sheet
2" x 3"	1" x 9"	384
2" x 4"	1" x 10"	342

Example:

Properties of Gable Roofing

| G.I Roof and Its Accesories ▽ |

Unit | m ▽ |

Dimension:

Length of Purlins
(Along the Gutter Line)

| 12.90 m |

Effective Covering
(Side Lapping)

| 0.60 m ▼ |

Height of Roof
Sheet

| 3.00 m |

| 2.10 m | ⊕

Materials:

● Corrugated G.I Sheet
● G.I Roof Nails
○ G.I Rivets
○ G.I Washers
● Lead Washers
○ Umbrella Nails
● Plain G.I. Strap

Size of Purlins
(Inches)

| 2" x 3" ▼ |

Procedure in Computing G.I. Roof and Its Accessories:

Note: G.I. Nails, Rivets, G.I. Washer, Lead Washer, and Umbrella Nails has the same process of solving. With the aid of the formula and table above.

1. Solve for Corrugated G.I Sheet

Pcs. of Corrugated G.I. Sheets = $\frac{Length\ of\ Purlins}{Effective\ Covering}$

Pcs. of Corrugated G.I. Sheets = $\frac{12.90}{0.60}$

Pcs. of Corrugated G.I. Sheets = 21.5 (round- up)

Pcs. of Corrugated G.I. Sheets = 22 pcs

2. Solve for Total Pcs. of Corrugated G.I. Sheets with corresponding height of roof sheets

Total Pcs. of Corrugated G.I. Sheets = (Pcs. of Corrugated G.I. Sheets) x (2)

Total Pcs. of Corrugated G.I. Sheets = (22) x (2)

Total Pcs. of Corrugated G.I. Sheets = 44 pcs. – 0.8m x 3.00m

Total Pcs. of Corrugated G.I. Sheets = 44 pcs. – 0.8m x 2.10m

Note: 0.8m is the standard width of corrugated G.I sheet.

3. Solve for the Kg of G.I. Roof Nails

Kg. of G.I. Roof Nails = $\frac{(Total\ Pieces\ of\ Corrugated\ G.I.Sheet\ for\ Height\ of\ Roof\ Sheet\ 1)\ X\ (Number\ of\ G.I\ Nails\ According\ to\ the\ Height\ of\ Roof\ Sheet\ 1)}{120}$ +

$\frac{(Total\ Pieces\ of\ Corrugated\ G.I.Sheet\ for\ Height\ of\ Roof\ Sheet\ 2)\ X\ (Number\ of\ G.I\ Nails\ According\ to\ the\ Height\ of\ Roof\ Sheet\ 2)}{120}$ + ...

$\frac{(Total\ Pieces\ of\ Corrugated\ G.I.Sheet\ for\ Height\ of\ Roof\ Sheet\ n)\ X\ (Number\ of\ G.I\ Nails\ According\ to\ the\ Height\ of\ Roof\ Sheet\ n)}{120}$

Kg. of G.I. Roof Nails = $\frac{(44)\ x\ (22)}{120}$ + $\frac{(44)\ x\ (18)}{120}$

Kg. of G.I. Roof Nails = 14. 67 kg (round- up)

Kg. of G.I. Roof Nails = 15 kg

4. Solve for the Kg of Lead Washers

$$\text{Kg. of Lead Washers} = \frac{(\text{Total Pieces of Corrugated G. I. Sheet for } Height\ of\ Roof\ Sheet\ 1)\ X\ (\text{Number}_{\text{of Lead Washers}}\ According\ to\ the\ Height\ of\ Roof\ Sheet\ 1)}{75} +$$

$$\frac{(\text{Total Pieces of Corrugated G. I. Sheet for } Height\ of\ Roof\ Sheet\ 2)\ X\ (\text{Number}_{\text{of Lead Washers}}\ According\ to\ the\ Height\ of\ Roof\ Sheet\ 2)}{75} + \ldots\ldots\ldots$$

$$\frac{(\text{Total Pieces of Corrugated G. I. Sheet for } Height\ of\ Roof\ Sheet\ n)\ X\ (\text{Number}_{\text{of Lead Washers}}\ According\ to\ the\ Height\ of\ Roof\ Sheet\ n)}{75}$$

Kg. of Lead Washers = $\frac{(44)\ x\ (22)}{75} + \frac{(44)\ x\ (18)}{75}$

Kg. of Lead Washers = 23.47 kg (round- up)

Kg. of Lead Washers = 24 kg

5. Solve for the Pcs. of Plain Sheet for the Strap

$$\text{Pcs. of Plain G.I. Sheets} = \frac{\begin{array}{l}(\text{Total Pieces of Corrugated G. I. Sheet for } Height\ of\ Roof\ Sheet\ 1)\ X\ (\text{Number of G. I Rivets } According\ to\ the\ Height\ of\ Roof\ Sheet\ 1) + \\ (\text{Total Pieces of Corrugated G. I. Sheet for } Height\ of\ Roof\ Sheet\ 2)\ X\ (\text{Number of G. I Rivets } According\ to\ the\ Height\ of\ Roof\ Sheet\ 2) + \ldots\ldots \\ (\text{Total Pieces of Corrugated G. I. Sheet for } Height\ of\ Roof\ Sheet\ n)\ X\ (\text{Number of G. I Rivets } According\ to\ the\ Height\ of\ Roof\ Sheet\ n)\end{array}}{\begin{array}{c}\text{Number of Strap in One Plain Sheet} \\ \text{According to the Size of Purlins} \\ \text{Inches}\end{array}}$$

Pcs. of Plain G.I. Sheets = $\frac{((44)\ x\ (22)) + ((44)x(18))}{384}$

Pcs. of Plain G.I. Sheets = 4.58 pcs (round- up)

Pcs. of Plain G.I. Sheets = 5 pcs

III.   Roof Accessories (Tinswork)

1. The user will choose what kind of material he wants by clicking the circle besides the choices. If it is circle has a highlight of black it means that was the roof accessories that was included in estimating by the system.
2. The user is also required to input the dimension for the Total Length, Effective Width and Total Width of the Roof Accessories (tinswork) that he chose.

Properties of Gable Roofing

| Roof Accesories (Tinswork) | ▼ |

Unit [m ▼]

Dimension:

○ Gutter
  Total Length [   ]
  Effective Length [2.35 m ▼]
  Total Width [   ]

○ Flashing
  Total Length [   ]
  Effective Length [2.30 m ▼]
  Total Width [   ]

○ Ridge Roll
  Total Length [   ]
  Effective Length [2.20 m ▼]
  Total Width [   ]

○ Valley Roll
  Total Length [   ]
  Effective Length [2.30 m ▼]
  Total Width [   ]

○ Hipped Roll
  Total Length [   ]
  Effective Length [2.20 m ▼]
  Total Width [   ]

Example:

Properties of Gable Roofing

| Roof Accesories (Tinswork) | ▼ |

Unit [m ▼]

Dimension:

● Gutter
  Total Length [20 m]
  Effective Length [2.35 m ▼]
  Total Width [0.45 m]

● Flashing
  Total Length [18 m]
  Effective Length [2.30 m ▼]
  Total Width [0.45 m]

● Ridge Roll
  Total Length [10 m]

Formula:

Pcs. of Gutter = $\dfrac{Total\ Length\ of\ Gutter}{Effective\ Length\ of\ Gutter}$ *note: round- up the answer if not whole no.*

Pcs. Derived from One G.I. Sheet for Gutter= $\dfrac{0.90}{Total\ Width\ of\ Gutter}$

Pcs. of Plain G.I Sheet for Gutter = $\dfrac{Pcs.\ of\ Gutter}{Pcs.\ Derived\ from\ One\ G.I.\ Sheet\ for\ Gutter}$ *note: round- up the answer if not whole no.*

Pcs. of Flashing = $\dfrac{Total\ Length\ of\ Flashing}{Effective\ Length\ of\ Flashing}$ *note: round- up the answer if not whole no.*

Pcs. Derived from One G.I. Sheet for Flashing = $\dfrac{0.90}{Total\ Width\ of\ Flashing}$

Pcs. of Plain G.I Sheet for Flashing = $\dfrac{Pcs.\ of\ Flashing}{Pcs.\ Derived\ from\ One\ G.I.\ Sheet\ for\ Flashing}$ *note: round- up the answer if not whole no.*

Pcs. of Ridge Roll = $\dfrac{Total\ Length\ of\ Ridge\ Roll}{Effective\ Length\ of\ Ridge\ Roll}$ *note: round- up the answer if not whole no.*

Pcs. Derived from One G.I. Sheet for Ridge Roll = $\dfrac{0.90}{Total\ Width\ of\ Ridge\ Roll}$

Pcs. of Plain G.I Sheet for Ridge Roll = $\dfrac{Pcs.\ of\ Flashing}{Pcs.\ Derived\ from\ One\ G.I.\ Sheet\ for\ Ridge\ Roll}$ *note: round- up the answer if not whole no.*

Pcs. of Valley Roll = $\dfrac{Total\ Length\ of\ Valley\ Roll}{Effective\ Length\ of\ Valley\ Roll}$ *note: round- up the answer if not whole no.*

Pcs. Derived from One G.I. Sheet for Valley Roll = $\dfrac{0.90}{Total\ Width\ of\ Valley\ Roll}$

Pcs. of Plain G.I Sheet for Valley Roll = $\dfrac{Pcs.\ of\ Flashing}{Pcs.\ Derived\ from\ One\ G.I.\ Sheet\ for\ Valley\ Roll}$ *note: round- up the answer if not whole no.*

Pcs. of Hipped Roll = $\dfrac{Total\ Length\ of\ Hipped\ Roll}{Effective\ Length\ of\ Hipped\ Roll}$ *note: round- up the answer if not whole no.*

Pcs. Derived from One G.I. Sheet for Hipped Roll = $\dfrac{0.90}{Total\ Width\ of\ HippedRoll}$

Pcs. of Plain G.I Sheet for Hipped Roll = $\dfrac{Pcs.\ of\ Flashing}{Pcs.\ Derived\ from\ One\ G.I.\ Sheet\ for\ Hipped\ Roll}$ *note: round- up the answer if not whole no.*

Total Pieces of Plain G.I Sheet for the Tinswork = (Pcs. of Plain G.I Sheet for Gutter) + (Pcs. of   Plain G.I Sheet for Flashing) + (Pcs. of Plain G.I Sheet for Ridge Roll) + (Pcs. of Plain G.I Sheet for Valley Roll) + (Pcs. of Plain G.I Sheet for Hipped Roll)

Procedure in Computing Roof Accessories (Tinswork):

Note: The process of solving for Gutter, Flashing, Ridge Roll, Valley Roll and Hipped Roll has the same process.

1. Solve for the pcs of Plain G.I Sheet for Gutter.

    Pcs. of Gutter = $\frac{Total\ Length\ of\ Gutter}{Effective\ Length\ of\ Gutter}$

    Pcs. of Gutter = $\frac{20}{2.35}$

    Pcs. of Gutter = 8.51 (round- up)

    Pcs. of Gutter = 9 pcs

    Pcs. Derived from One G.I. Sheet for Gutter= $\frac{0.90}{Total\ Width\ of\ Gutter}$

    Pcs. Derived from One G.I. Sheet for Gutter= $\frac{0.90}{0.45}$

    Pcs. Derived from One G.I. Sheet for Gutter= 2 pcs

    Pcs. of Plain G.I Sheet for Gutter = $\frac{Pcs.\ of\ Gutter}{Pcs.\ Derived\ from\ One\ G.I.\ Sheet\ for\ Gutter}$

    Pcs. of Plain G.I Sheet for Gutter = $\frac{9}{2}$

    Pcs. of Plain G.I Sheet for Gutter = 4.5 (round-up)

    Pcs. of Plain G.I Sheet for Gutter = 5 pcs

2. Solve for the pcs of Plain G.I Sheet for Flashing.

    Pcs. of Flashing = $\frac{Total\ Length\ of\ Flashing}{Effective\ Length\ of\ Flashing}$

    Pcs. of Flashing = $\frac{18}{2.30}$

    Pcs. of Flashing = 7.8 (round- up)

    Pcs. of Flashing = 8 pcs

    Pcs. Derived from One G.I. Sheet for Flashing = $\frac{0.90}{Total\ Width\ of\ Flashing}$

    Pcs. Derived from One G.I. Sheet for Flashing = $\frac{0.90}{0.45}$

Pcs. Derived from One G.I. Sheet for Flashing = 2 pcs

Pcs. of Plain G.I Sheet for Flashing = $\frac{Pcs.\,of\,Flashing}{Pcs.\,Derived\,from\,One\,G.I.\,Sheet\,for\,Flashing}$

Pcs. of Plain G.I Sheet for Flashing = $\frac{8}{2}$

Pcs. of Plain G.I Sheet for Flashing = 4 pcs

3. Solve for the Pcs. of Plain G.I Sheet for Ridge Roll

Pcs. of Ridge Roll = $\frac{Total\,Length\,of\,Ridge\,Roll}{Effective\,Length\,of\,Ridge\,Roll}$

Pcs. of Ridge Roll = $\frac{10}{2.20}$

Pcs. of Ridge Roll = 4.5 pcs (round-up)

Pcs. of Ridge Roll = 5 pcs

Pcs. Derived from One G.I. Sheet for Ridge Roll = $\frac{0.90}{Total\,Width\,of\,Ridge\,Roll}$

Pcs. Derived from One G.I. Sheet for Ridge Roll = $\frac{0.90}{0.45}$

Pcs. Derived from One G.I. Sheet for Ridge Roll = 2 pcs

Pcs. of Plain G.I Sheet for Ridge Roll = $\frac{Pcs.\,of\,Flashing}{Pcs.\,Derived\,from\,One\,G.I.\,Sheet\,for\,Ridge\,Roll}$

Pcs. of Plain G.I Sheet for Ridge Roll = $\frac{5}{2}$

Pcs. of Plain G.I Sheet for Ridge Roll = 2.5 pcs (round-up)

Pcs. of Plain G.I Sheet for Ridge Roll = 3 pcs

4. Solve for the Total Pcs. of Plain G.I. Sheet by getting the Sum of it all.
Total Pieces of Plain G.I Sheet for the Tinswork = (Pcs. of Plain G.I Sheet for Gutter) + (Pcs. of   Plain G.I Sheet for Flashing) + (Pcs. of Plain G.I Sheet for Ridge Roll) + (Pcs. of Plain G.I Sheet for Valley Roll) + (Pcs. of Plain G.I Sheet for Hipped Roll)
Total Pieces of Plain G.I Sheet for the Tinswork = (5) + (4) + (3)
Total Pieces of Plain G.I Sheet for the Tinswork = 12 pcs