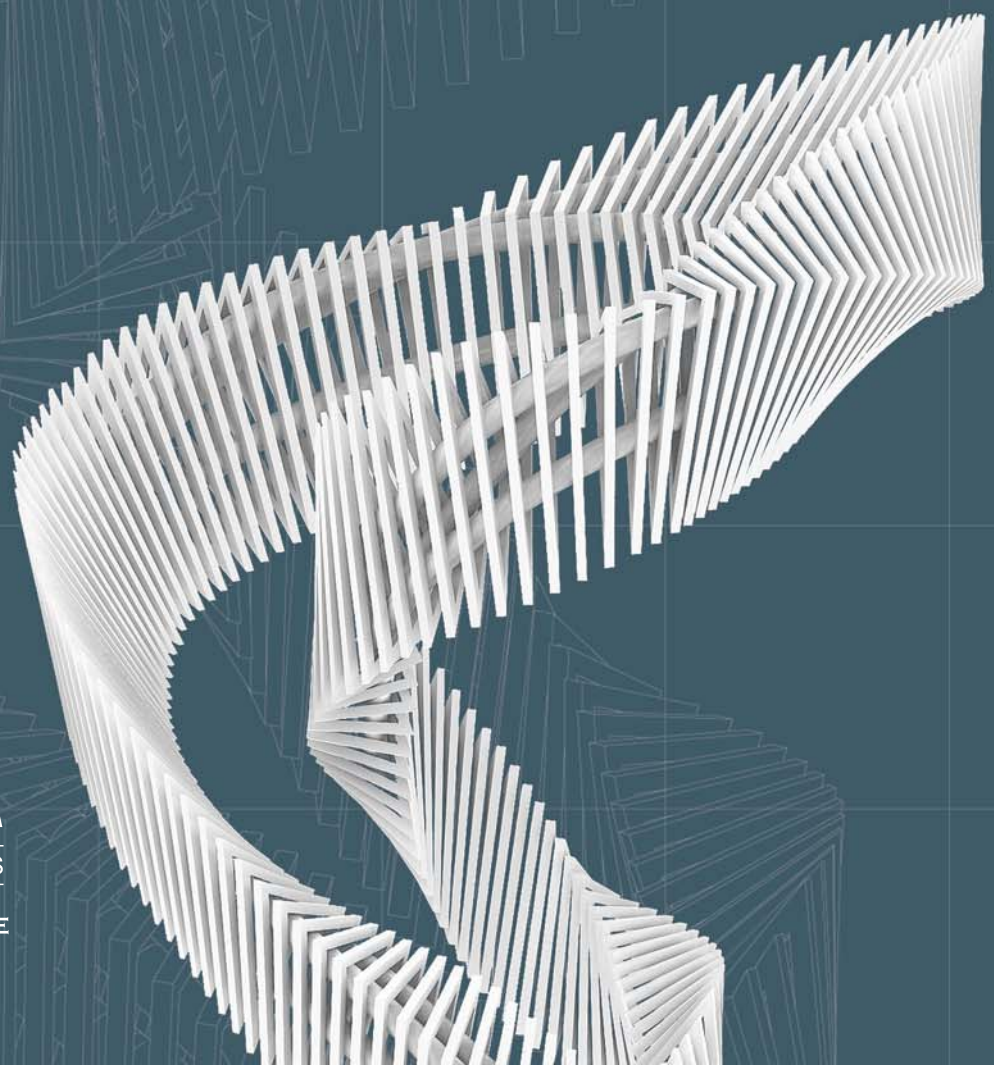
TATA

TATA STEEL

Designers' Manual

Version - II



TATA STRUCTURA

STEEL HOLLOW SECTIONS

THE SHAPE OF THINGS TO COME

Dear Designer,

Welcome to the world of structural tubes - Tata Structura, from Tata Steel !

This new-age structural material from Tata Steel opens up a world of possibilities for designers.

Tata Structura is manufactured at Tata Steel's state-of-the-art tube production facility in Jamshedpur and offers a host of technical and commercial advantages over conventional sections.

The excellent distribution of material around the axis of Tata Structura steel hollow sections, ensures remarkable strength with decisive advantages in application. High torsional rigidity and compressive strength ensures greater efficiency, while higher strength to weight ratio guarantees extra savings in steel. The smooth, uniform profile minimises dust accumulation and facilitates easy, on-site fabrication.

Overall, Tata Structura ensures significant enhancement in aesthetics and visual appeal and is being increasingly used in iconic structures countrywide.

In this **Version-II** of the designers' manual, we have refined the designs with higher grade of steel YST 310 to ensure further saving in weight. We have also added design examples of Portal Frames and built up purlins in flat slopes.

We hope you will find this manual a useful reference guide to aid you in the designing of contemporary structures.

Yours sincerely,

Kulvin Suri
Chief (Marketing & Sales)
Tubes SBU, Tata Steel Limited
October 2011

Contents

1 General Notes & Design Data 1

2 Trusses

a) 6m Span; Roof Slope 1 in 3 2-3

6m Span; Roof Slope 1 in 4 4-5

b) 7.5m Span; Roof Slope 1 in 3 6-7

7.5m Span; Roof Slope 1 in 4 8-9

c) 10m Span; Roof Slope 1 in 3 10-11

10m Span; Roof Slope 1 in 4 12-13

d) 12m Span; Roof Slope 1 in 3 14-15

12m Span; Roof Slope 1 in 4 16-17

e) 15m Span; Roof Slope 1 in 3 18-19

15m Span; Roof Slope 1 in 4 20-21

f) 18m Span; Roof Slope 1 in 3 22-23

18m Span; Roof Slope 1 in 4 24-25

g) 20m Span; Roof Slope 1 in 3 26-27

20m Span; Roof Slope 1 in 4 28-29

h) 22m Span; Roof Slope 1 in 3 30-31

22m Span; Roof Slope 1 in 4 32-33

i) 25m Span; Roof Slope 1 in 3 34-35

25m Span; Roof Slope 1 in 4 36-37

j) 28m Span; Roof Slope 1 in 3 38-39

28m Span; Roof Slope 1 in 4 40-41

k) 30m Span; Roof Slope 1 in 3 42-43

30m Span; Roof Slope 1 in 4 44-45

l) 32m Span; Roof Slope 1 in 3 46-47

32m Span; Roof Slope 1 in 4 48-49

m) 35m Span; Roof Slope 1 in 3 50-51

35m Span; Roof Slope 1 in 4 52-53

n) 40m Span; Roof Slope 1 in 3 54-55

40m Span; Roof Slope 1 in 4 56-57

3 Lean to Trusses

a) 5m Span; Roof Slope 1 in 3 58-59

5m Span; Roof Slope 1 in 4 60-61

b) 9m Span; Roof Slope 1 in 3 62-63

9m Span; Roof Slope 1 in 4 64-65

4 Portals

a) 5m Span; Roof Slope 1 in 3 66-69

5m Span; Roof Slope 1 in 4 70-73

b) 7.5m Span; Roof Slope 1 in 3 74-77

7.5m Span; Roof Slope 1 in 4 78-81

c) 10m Span; Roof Slope 1 in 3 82-83

10m Span; Roof Slope 1 in 4 84-85

d) 15m Span; Roof Slope 1 in 10 86-91

e) 20m Span; Roof Slope 1 in 10 92-97

5 Design table of Purlin, Girt, Eave Beam, Tie Runner 98

6 Purlin table for Single Section 98

7 Purlin table for Built-up Section 99

8 Typical Details

a) Truss Support 100

b) Alternate Detail of Pinned support for Truss 101

c) Purlin, Purlin-prop, Tie-Runner and Hanger 102

d) Shop & Field Splices 103

e) Portal Frame 104-106

f) 12m Span Truss 107

g) Lean to Truss 108

h) North Light Truss 109

9 Designer Example 110-145

10 Additional Data

a) Corrosion Resistant Properties 146

b) Safe Loads in “KN” for Single RHS 147-149

c) Safe Loads in “KN” for Single SHS 150-152

d) Safe Load Capacities of "TATA" Single SHS 153

e) Safe Load Capacities of "TATA" Single RHS 154

11 General Technical Specifications and Tolerances 155

12 Section Properties

a) Properties of Tata Structura (SHS) 156

b) Properties of Tata Structura (RHS) 157

c) Properties of Tata Structura (CHS) 158

General Notes

Roof Trusses, Purlins, Side Girts etc. for industrial sheds are designed with cold finished RHS/SHS manufactured by Tata Steel Tubes SBU.

Pitched roof trusses for rectangular clad buildings of 14 different spans, lean-to-trusses of 2 different spans and portal frames of 5 different spans for six wind zones, (as mapped by Bureau of Indian Standards) and each span having two different slopes i.e.1 in 3, 1 in 4 for trusses and 1 in10 slope for portal frames above 15 m span have been considered to cover various practical combinations of roof systems and existing manufacturing practices in the country.

Truss configurations for different spans have been arrived at after trial and error, considering overall economy in terms of savings in weight and ease of manufacturing. However, other configurations may also be tried.

Trusses have been analysed assuming rigid member to member connections except at ridge and hanger joints. The designs have been prepared for simply supported conditions and reaction values have been tabulated accordingly.

Trusses have been analysed for Dead Load, Superimposed Load, Wind Load and combinations thereof according to IS: 875-87. Only nodal loads have been considered for the purlins to be located strictly at node points, based on the maximum allowable span of G.I sheeting. For other roofing material allowing longer spans, suitable changes in truss configurations should be tried.

For Wind Load combinations, allowable stresses have been increased by 33.33% as per provision of IS:806.

Effective length of each member has been assumed to be 0.85 times the node to node distance. In case of compression loading, member has been designed against buckling in and out of plane of truss.

Maximum slenderness ratio for compression member has been restricted to 180. Maximum deflection of mid span node of truss has been restricted to "span/325".

As RHS/SHS are still considered non-conventional sections, typical fabrication detailing for different spans have been incorporated, so that practising structural engineers may find it helpful as a ready reference.

Design Data

Design Code : IS:806, use of hollow section for general construction in Steel Material : IS: 4923

Grade : YST 310

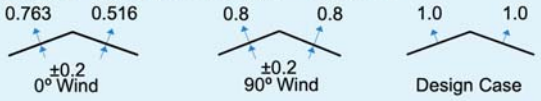
Design Loading :

1. Dead Load
   - i) G.I sheeting & fastener = 0.60KN/m^2
   - II) Purlins = As per Purlin Table
   - iii) Truss, tie member etc = Actual RHS/SHS wt+ 5% of truss weight due to gusset plate etc.
2. Imposed Load per m2 plan area (for truss design):
   Ref. IS : 875,87, part 2 CL 4.5.1 & table 2
   Roof slope 1in 3 = 0.667x(0.75-8.435x0.02)
   = 0.3875KN/m^2 hence 0.4KN/m^2
   Roof slope 1in 4 = 0.667x(0.75-4.036x0.02)
   = 0.446 KN/m^2
3. Wind Load :
   Refer IS : B75-1987, Part 3

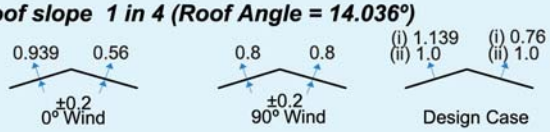
Wind Zone	Zone I	Zone II	Zone III	Zone IV	Zone V	Zone VI
Wind Speed	33m/s	39m/s	44m/s	47m/s	50m/s	55m/s
Design Wind Pressure in N/m^2	653.4	912.6	1161.6	1325.4	1500.0	1815.0

Pressure Coefficients:

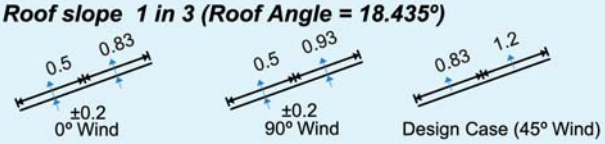
Roof slope 1 in 3 (Roof Angle = 18.435°)



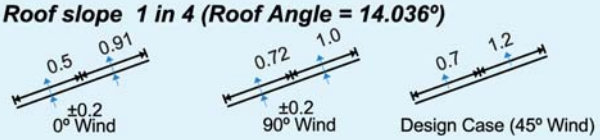
Roof slope 1 in 4 (Roof Angle = 14.036°)



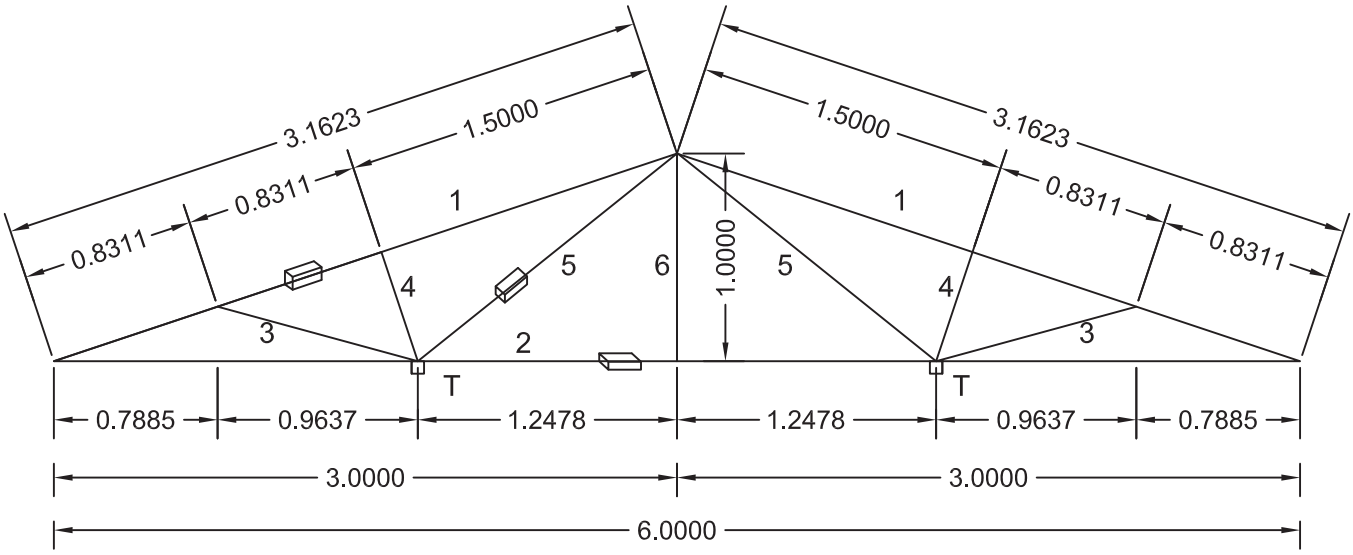
Roof slope 1 in 3 (Roof Angle = 18.435°)



Roof slope 1 in 4 (Roof Angle = 14.036°)



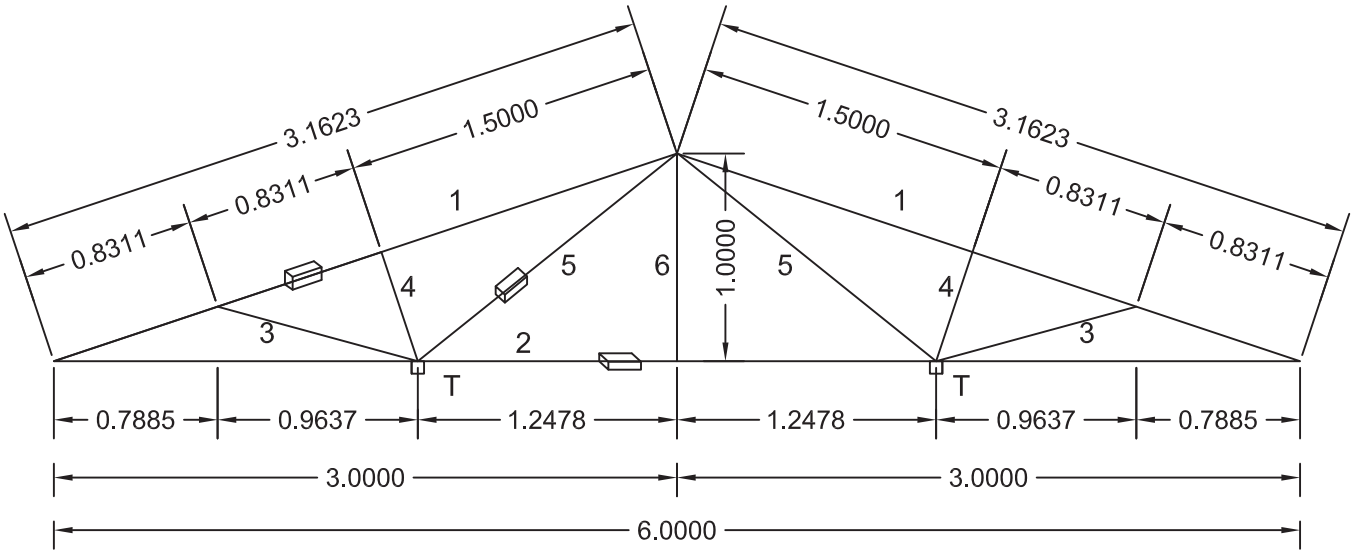
Span : 6m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	32X32X2.6	14.29	32X32X2.6	14.29	32X32X2.6	14.29	32X32X2.6	14.29	32X32X2.6	14.29	32X32X2.6	14.29	KG
2	50X25X2.6	16.26	60X40X2.9	24.72	60X40X2.9	24.72	60X40X2.9	24.72	60X40X2.9	24.72	60X40X2.9	24.72	KG
3	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	KG
4	25X25X2.6	1.87	25X25X2.6	1.87	25X25X2.6	1.87	25X25X2.6	1.87	25X25X2.6	1.87	25X25X2.6	1.87	KG
5	50X25X2.6	8.67	50X25X2.6	8.67	50X25X2.6	8.67	50X25X2.6	8.67	50X25X2.6	8.67	50X25X2.6	8.67	KG
6	25X25X2.6	1.69	25X25X2.6	1.69	25X25X2.6	1.69	25X25X2.6	1.69	25X25X2.6	1.69	25X25X2.6	1.69	KG
	TOTAL	**46.16**	**TOTAL**	**54.62**	**TOTAL**	**54.62**	**TOTAL**	**54.62**	**TOTAL**	**54.62**	**TOTAL**	**54.62**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		2113		2156		2156		2156		2156		2156	N
LL		5693		5693		5693		5693		5693		5693	N
WL0+PRE	732	-7942	1022	-11094	1230	-14120	1483	-16105	1679	-18233	2031	-22061	N
		-6961		-9725		-12377		-14117		-15983		-19338	N
WL 90+PRE		-8817		-12316		-15675		-17879		-20242		-24491	N

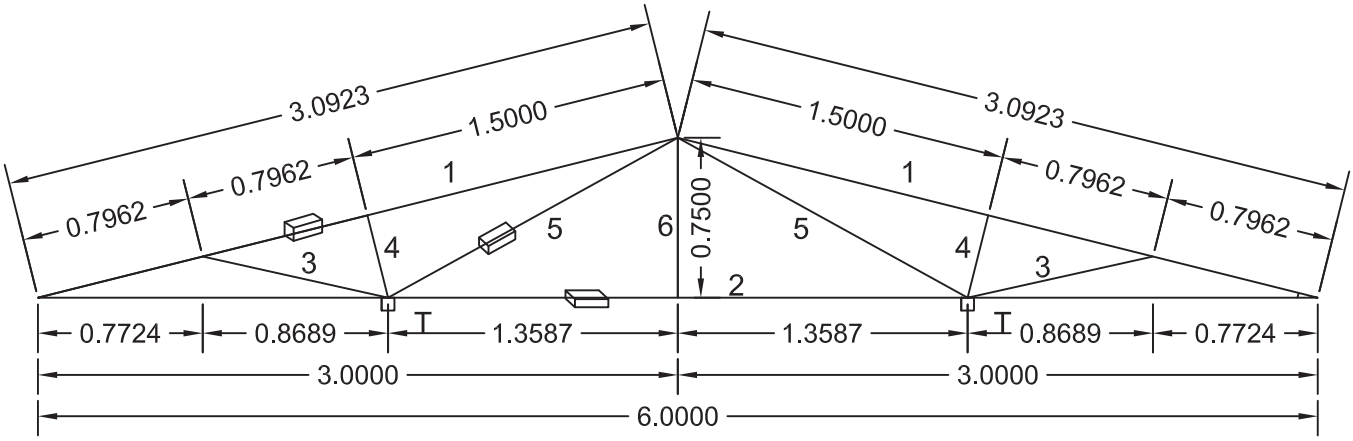
Span : 6m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	32X32X2.6	14.29	32X32X2.6	14.29	32X32X2.6	14.29	32X32X2.6	14.29	32X32X2.6	14.29	38X38X2.6	17.39	KG
2	50X25X3.2	19.44	60X40X2.9	24.72	60X40X2.9	24.72	60X40X2.9	24.72	60X40X2.9	24.72	80X40X3.2	33.00	KG
3	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	KG
4	25X25X2.6	1.87	25X25X2.6	1.87	25X25X2.6	1.87	25X25X2.6	1.87	25X25X2.6	1.87	25X25X2.6	1.87	KG
5	50X25X2.6	8.67	50X25X2.6	8.67	50X25X2.6	8.67	50X25X2.6	8.67	50X25X2.6	8.67	50X25X2.6	8.67	KG
6	25X25X2.6	1.69	25X25X2.6	1.69	25X25X2.6	1.69	25X25X2.6	1.69	25X25X2.6	1.69	25X25X2.6	1.69	KG
	TOTAL	**49.34**	**TOTAL**	**54.62**	**TOTAL**	**54.62**	**TOTAL**	**54.62**	**TOTAL**	**54.62**	**TOTAL**	**66.00**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		2838		2874		2874		2874		2874		2952	N
LL		7588		7588		7588		7588		7588		7588	N
WL0+PRE	975	-10586	1362	-14787	1733	-18821	1978	-21481	2238	-24308	2709	-29422	N
		-9279		-12962		-16498		-18830		-21308		-25791	N
WL 90+PRE		-11751		-16416		-20894		-23848		-26986		-32664	N

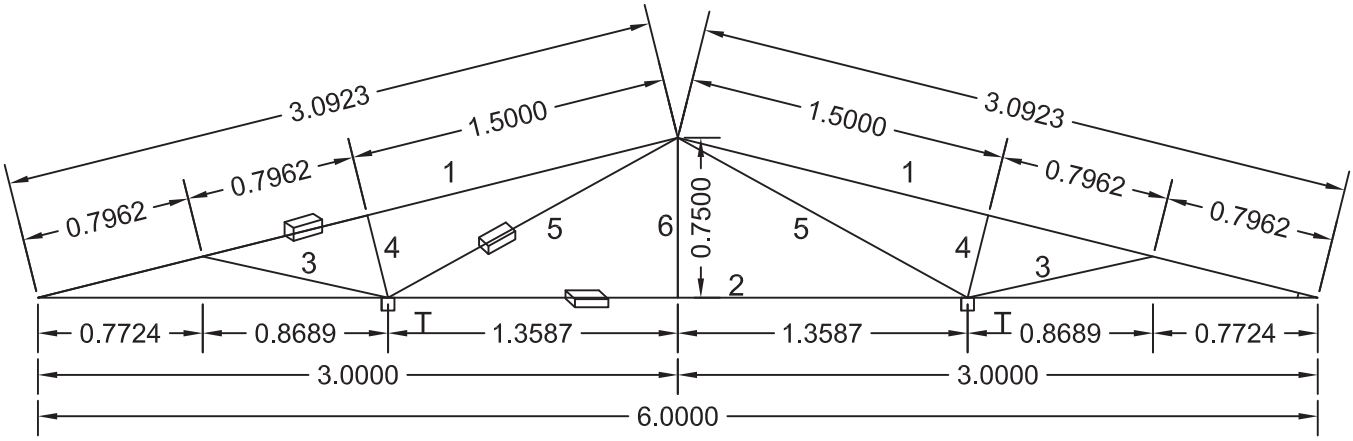
Span : 6m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	32X32X3.2	16.64	32X32X3.2	16.64	32X32X3.2	16.64	32X32X3.2	16.64	32X32X3.2	16.64	32X32X3.2	16.64	KG
2	50X25X2.6	16.26	60X40X2.9	24.72	60X40X2.9	24.72	60X40X2.9	24.72	60X40X2.9	24.72	80X40X3.2	33.00	KG
3	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	KG
4	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	KG
5	50X25X2.6	8.41	50X25X2.6	8.41	50X25X2.6	8.41	50X25X2.6	8.41	50X25X2.6	8.41	50X25X3.2	10.06	KG
6	25X25X2.6	1.27	25X25X2.6	1.27	25X25X2.6	1.27	25X25X2.6	1.27	25X25X2.6	1.27	25X25X2.6	1.27	KG
	TOTAL	**46.93**	**TOTAL**	**55.39**	**TOTAL**	**55.39**	**TOTAL**	**55.39**	**TOTAL**	**55.39**	**TOTAL**	**65.31**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		2654		2698		2698		2698		2698		2749	N
LL		6228		6228		6228		6228		6228		6228	N
WL0+PRE	847	-9181	1182	-12825	1505	-16323	1716	-18618	1943	-21078	2351	-25503	N
		-7566		-10570		-13453		-15344		-17372		-21019	N
WL 90+PRE		-8846		-12357		-15727		-17938		-20309		-24572	N

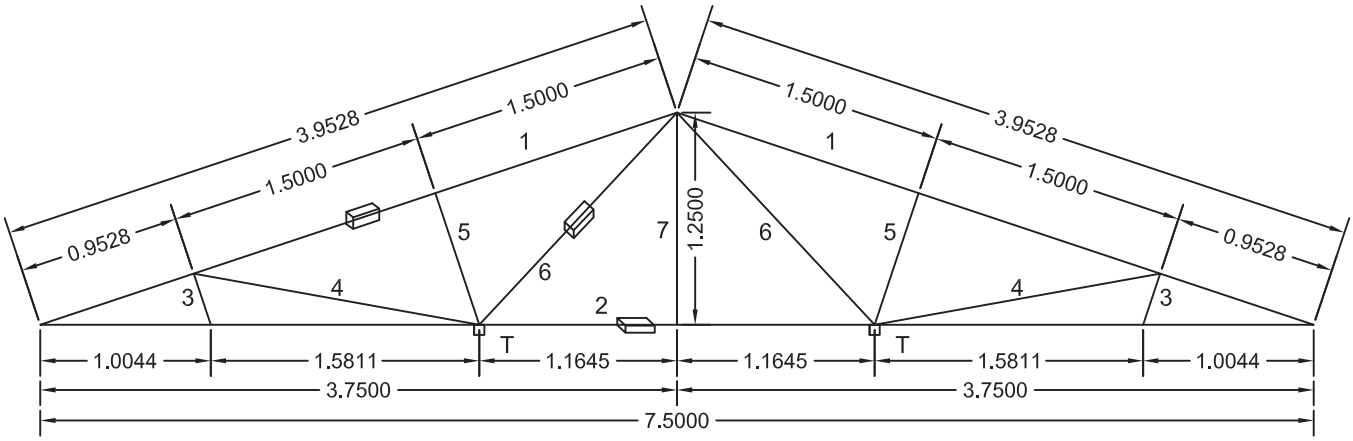
Span : 6m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	38X38X2.6	17.01	38X38X2.6	17.01	38X38X2.6	17.01	38X38X2.6	17.01	50X50X3.6	30.80	60X60X3.2	34.02	KG
2	60X40X2.9	24.72	60X40X2.9	24.72	60X40X2.9	24.72	80X40X3.2	33.00	80X40X3.2	33.00	80X40X3.2	33.00	KG
3	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	KG
4	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	KG
5	50X25X2.6	8.41	50X25X2.6	8.41	50X25X2.6	8.41	50X25X2.6	8.41	50X25X2.6	8.41	60X40X2.9	12.79	KG
6	25X25X2.6	1.27	25X25X2.6	1.27	25X25X2.6	1.27	25X25X2.6	1.27	25X25X2.6	1.27	25X25X2.6	1.27	KG
	TOTAL	**55.76**	**TOTAL**	**55.76**	**TOTAL**	**55.76**	**TOTAL**	**64.04**	**TOTAL**	**77.83**	**TOTAL**	**85.42**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		3599		3599		3599		3656		8608		8727	N
LL		8301		8301		8301		8301		19055		23059	N
WL0+PRE	1128	-12238	1576	-17094	2006	-21757	2288	-24823	2589	-28091	3133	-33994	N
		-10086		-14088		-17932		-20459		-23151		-28017	N
WL 90+PRE		-11791		-16470		-20963		-23917		-27066		-27066	N

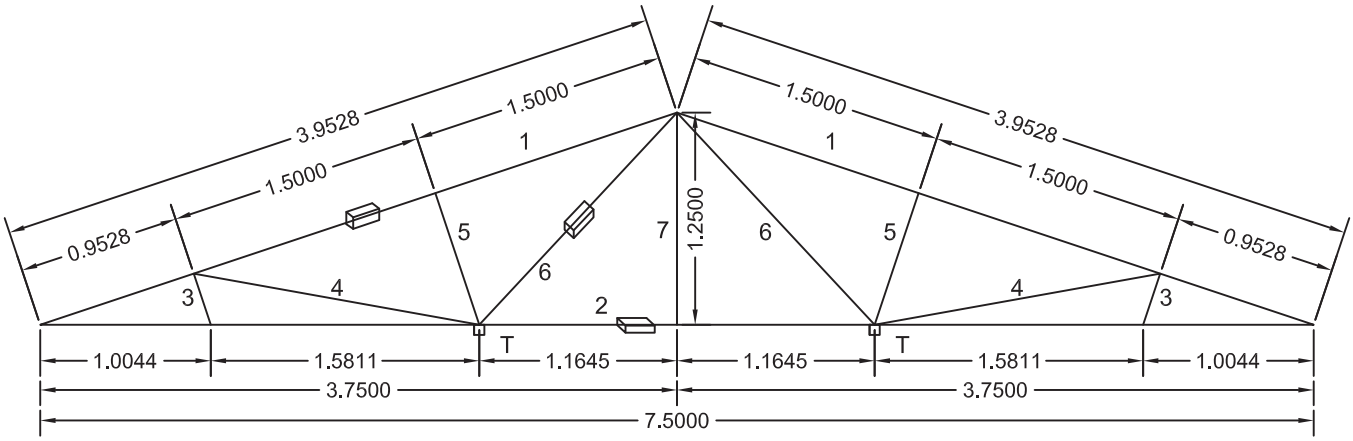
Span : 7.5m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	32X32X2.6	17.88	32X32X2.6	17.88	32X32X2.6	17.88	32X32X2.6	17.88	32X32X2.6	17.88	38X38X2.6	21.75	KG
2	50X25X2.6	20.33	66X33X2.6	27.68	66X33X2.9	30.53	66X33X2.9	30.53	66X33X2.9	30.53	80X40X2.6	34.13	KG
3	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	KG
4	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	KG
5	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	KG
6	50X25X2.6	9.27	50X25X2.6	9.27	50X25X2.6	9.27	50X25X2.6	9.27	50X25X2.6	9.27	50X25X2.6	9.27	KG
7	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	KG
	TOTAL	**59.21**	**TOTAL**	**66.56**	**TOTAL**	**69.41**	**TOTAL**	**69.41**	**TOTAL**	**69.41**	**TOTAL**	**76.88**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		2949		2986		3001		3001		3001		3039	N
LL		7117		7117		7117		7117		7117		7117	N
WL0+PRE	925	-9932	1291	-13875	1643	-17659	1875	-20152	2122	-22803	2567	-27599	N
		-8707		-12163		-15481		-17666		-19991		-24196	N
WL 90+PRE		-11026		-15404		-19605		-22372		-25316		-30642	N

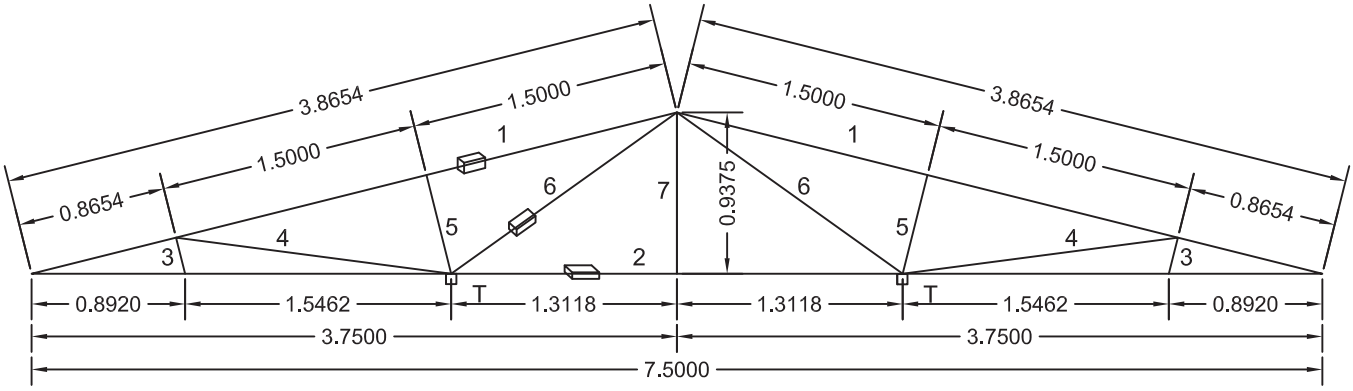
Span : 7.5m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	38X38X2.6	21.75	38X38X2.6	21.75	38X38X2.6	21.75	38X38X2.6	21.75	38X38X2.6	21.75	38X38X3.2	26.02	KG
2	50X25X3.2	24.30	66X33X2.6	27.68	66X33X2.9	30.53	66X33X3.6	36.98	66X33X3.6	36.98	80X40X3.2	41.25	KG
3	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	KG
4	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	KG
5	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	KG
6	50X25X2.6	9.27	50X25X2.6	9.27	50X25X2.6	9.27	50X25X2.6	9.27	50X25X2.6	9.27	60X40X2.9	14.09	KG
7	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	KG
	TOTAL	**67.06**	**TOTAL**	**70.43**	**TOTAL**	**73.28**	**TOTAL**	**79.73**	**TOTAL**	**79.73**	**TOTAL**	**93.10**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		3987		4010		4030		4074		4074		4165	N
LL		9493		9493		9493		9493		9493		9493	N
WL0+PRE	1232	-13249	1723	-18513	2192	-23558	2500	-26875	2830	-30410	3424	-36807	N
		-11615		-16229		-20652		-23559		-26659		-32267	N
WL 90+PRE		-14708		-20553		-26154		-29837		-33762		-40863	N

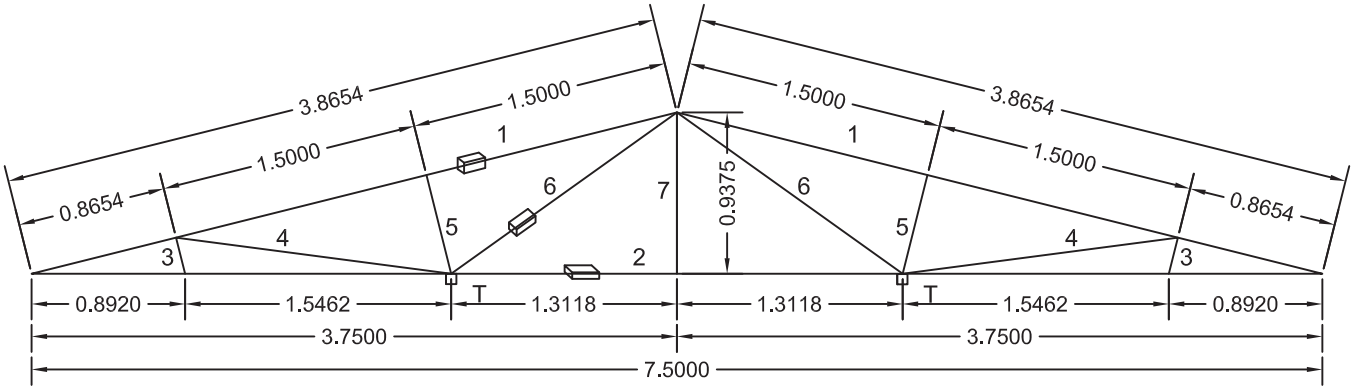
Span : 7.5m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	38X38X2.6	21.26	38X38X2.6	21.26	38X38X2.6	21.26	38X38X2.6	21.26	38X38X2.6	21.26	40X40X3.2	26.98	KG
2	66X33X2.6	27.68	66X33X2.6	27.68	80X40X2.6	34.13	80X40X2.6	34.13	80X40X2.6	34.13	80X40X4	50.33	KG
3	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	KG
4	25X25X2.6	5.45	25X25X2.6	5.45	25X25X2.6	5.45	25X25X2.6	5.45	25X25X2.6	5.45	25X25X2.6	5.45	KG
5	25X25X2.6	2.00	25X25X2.6	2.00	25X25X2.6	2.00	25X25X2.6	2.00	25X25X2.6	2.00	25X25X2.6	2.00	KG
6	50X25X2.6	8.74	50X25X2.6	8.74	50X25X2.6	8.74	50X25X2.6	8.74	50X25X2.6	8.74	50X25X3.2	10.45	KG
7	25X25X2.6	1.58	25X25X2.6	1.58	25X25X2.6	1.58	25X25X2.6	1.58	25X25X2.6	1.58	25X25X2.6	1.58	KG
	TOTAL	**67.44**	**TOTAL**	**67.44**	**TOTAL**	**73.89**	**TOTAL**	**73.89**	**TOTAL**	**73.89**	**TOTAL**	**97.52**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		2967		2967		3000		3000		3000		3120	N
LL		7765		7765		7765		7765		7765		7765	N
WL0+PRE	1043	-11446	1456	-15989	1853	-20351	2115	-23224	2393	-26279	2895	-31796	N
		-9490		-13259		-16874		-19256		-21789		-26365	N
WL 90+PRE		-11029		-15407		-19607		-22376		-25321		-30636	N

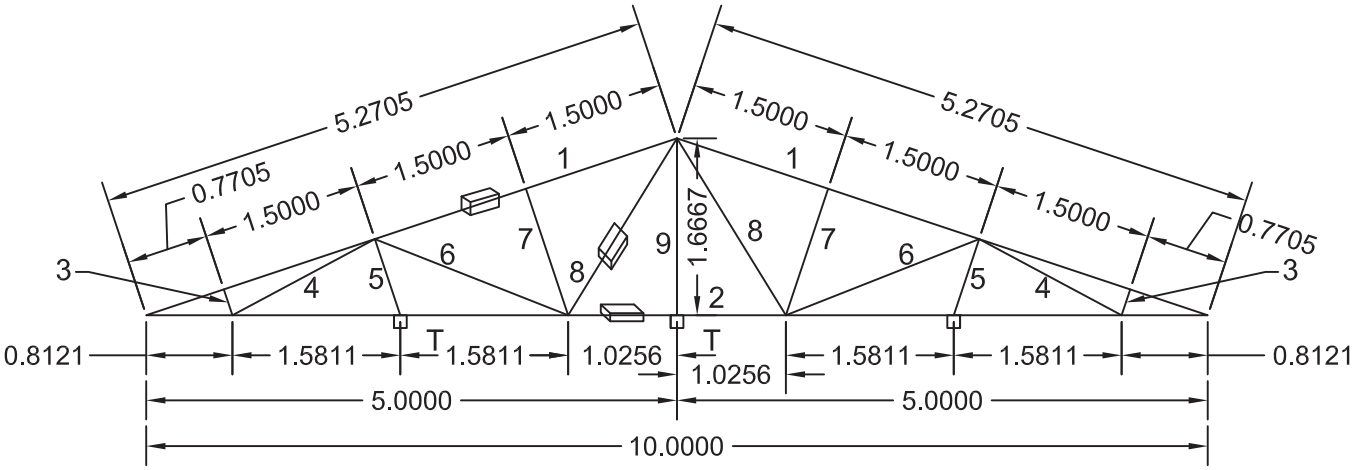
Span : 7.5m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	40X40X2.6	22.57	40X40X2.6	22.57	40X40X2.6	22.57	38X38X3.2	25.43	50X50X2.6	28.91	50X50X3.6	38.50	KG
2	60X40X2.9	30.90	60X40X2.9	30.90	80X40X3.2	41.25	80X40X3.2	41.25	80X40X4	50.33	80X40X4.8	58.88	KG
3	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	KG
4	32X32X2.6	7.29	32X32X2.6	7.29	32X32X2.6	7.29	32X32X2.6	7.29	32X32X2.6	7.29	32X32X2.6	7.29	KG
5	25X25X2.6	2.00	25X25X2.6	2.00	25X25X2.6	2.00	25X25X2.6	2.00	25X25X2.6	2.00	25X25X2.6	2.00	KG
6	50X25X2.6	8.74	50X25X2.6	8.74	50X25X2.6	8.74	50X25X3.2	10.45	60X40X2.9	13.29	60X40X2.9	13.29	KG
7	25X25X2.6	1.58	25X25X2.6	1.58	25X25X2.6	1.58	25X25X2.6	1.58	25X25X2.6	1.58	25X25X2.6	1.58	KG
	TOTAL	**73.82**	**TOTAL**	**73.82**	**TOTAL**	**84.17**	**TOTAL**	**88.74**	**TOTAL**	**104.13**	**TOTAL**	**122.26**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		4001		4001		4072		4103		4209		4334	N
LL		10358		10358		10358		10358		10358		10358	N
WL0+PRE	1391	-15269	1942	-21323	2472	-27150	2820	-30972	3192	-35058	3862	-42418	N
		-12660		-17681		-22512		-25681		-29070		-35172	N
WL 90+PRE		-14711		-20546		-26159		-29842		-33779		-40869	N

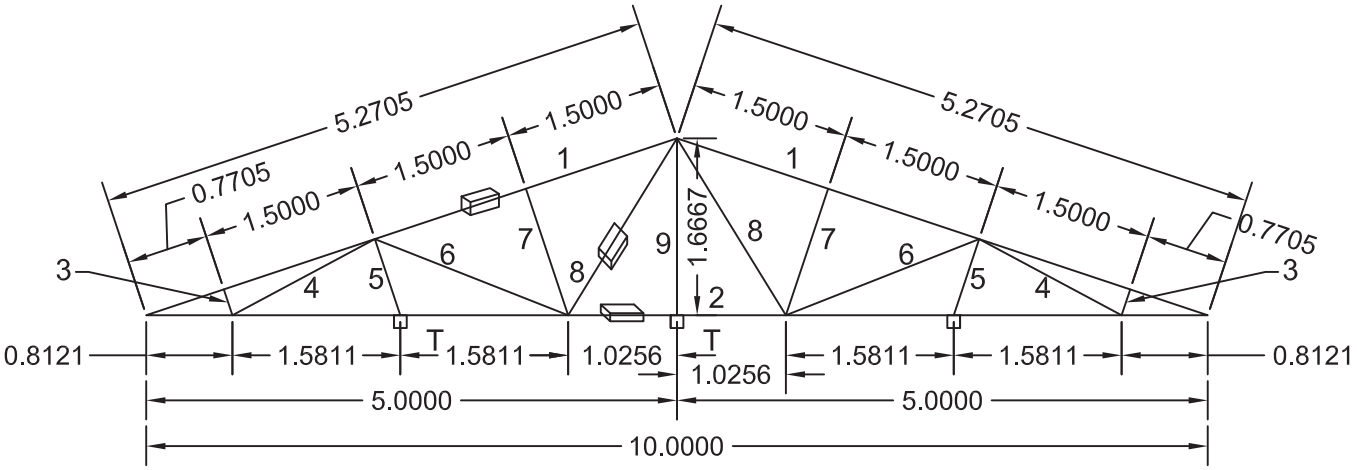
Span : 10m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	38X38X3.2	34.68	38X38X3.2	34.68	38X38X3.2	34.68	38X38X3.2	34.68	38X38X3.2	34.68	40X40X3.2	36.79	KG
2	66X33X2.6	36.90	66X33X2.6	36.90	66X33X2.6	36.90	66X33X3.6	49.30	66X33X3.6	49.30	80X40X3.2	55.00	KG
3	25X25X2.6	0.87	25X25X2.6	0.87	25X25X2.6	0.87	25X25X2.6	0.87	25X25X2.6	0.87	25X25X2.6	0.87	KG
4	25X25X2.6	5.14	25X25X2.6	5.14	25X25X2.6	5.14	25X25X2.6	5.14	25X25X2.6	5.14	32X32X2.6	6.88	KG
5	25X25X2.6	2.56	25X25X2.6	2.56	25X25X2.6	2.56	25X25X2.6	2.56	25X25X2.6	2.56	25X25X2.6	2.56	KG
6	32X32X2.6	8.85	32X32X2.6	8.85	32X32X2.6	8.85	32X32X2.6	8.85	32X32X2.6	8.85	32X32X2.6	8.85	KG
7	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	KG
8	50X25X2.6	10.61	50X25X2.6	10.61	50X25X2.6	10.61	50X25X2.6	10.61	50X25X3.2	12.68	66X33X2.6	14.44	KG
9	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	KG
	TOTAL	**106.67**	**TOTAL**	**106.67**	**TOTAL**	**106.67**	**TOTAL**	**119.07**	**TOTAL**	**121.14**	**TOTAL**	**132.44**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		3998		3998		3998		4062		4073		4131	N
LL		9488		9488		9488		9488		9488		9488	N
WL0+PRE	1230	-13243	1717	-18499	2186	-23545	2494	-26869	2822	-30405	3415	-36800	N
		-11609		-16219		-20642		-23557		-26657		-32264	N
WL 90+PRE		-14704		-20541		-26142		-29833		-33759		-40860	N

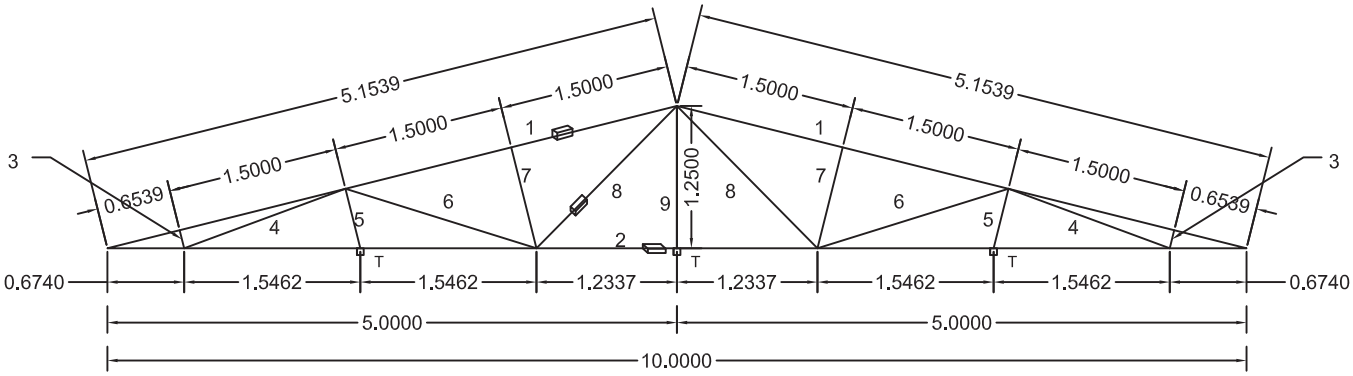
Span : 10m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X2.6	39.42	50X50X2.6	39.42	50X50X2.6	39.42	50X50X2.6	39.42	50X50X2.6	39.42	50X50X3.6	52.49	KG
2	66X33X2.6	36.90	66X33X2.6	36.90	66X33X3.6	49.30	80X40X3.2	55.00	80X40X3.2	55.00	80X40X4	67.10	KG
3	25X25X2.6	0.87	25X25X2.6	0.87	25X25X2.6	0.87	25X25X2.6	0.87	25X25X2.6	0.87	25X25X2.6	0.87	KG
4	25X25X2.6	5.14	25X25X2.6	5.14	25X25X2.6	5.14	32X32X2.6	6.88	32X32X2.6	6.88	32X32X2.6	6.88	KG
5	25X25X2.6	2.56	25X25X2.6	2.56	25X25X2.6	2.56	25X25X2.6	2.56	25X25X2.6	2.56	25X25X2.6	2.56	KG
6	32X32X2.6	8.85	32X32X2.6	8.85	32X32X2.6	8.85	32X32X2.6	8.85	32X32X2.6	8.85	32X32X2.6	8.85	KG
7	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	KG
8	50X25X2.6	10.61	50X25X2.6	10.61	50X25X3.2	12.68	66X33X2.6	14.44	66X33X2.6	14.44	66X33X2.6	14.44	KG
9	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	KG
	TOTAL	**111.41**	**TOTAL**	**111.41**	**TOTAL**	**125.88**	**TOTAL**	**135.08**	**TOTAL**	**135.08**	**TOTAL**	**160.25**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		5366		5366		5465		5528		5528		5701	N
LL		12656		12656		12656		12656		12656		12656	N
WL0+PRE	1640	-17666	2291	-24684	2916	-31411	3326	-35834	3764	-40548	4555	-49076	N
		-15488		-21640		-27539		-31417		-35550		-43026	N
WL 90+PRE		-19614		-27407		-34876		-39787		-45021		-54490	N

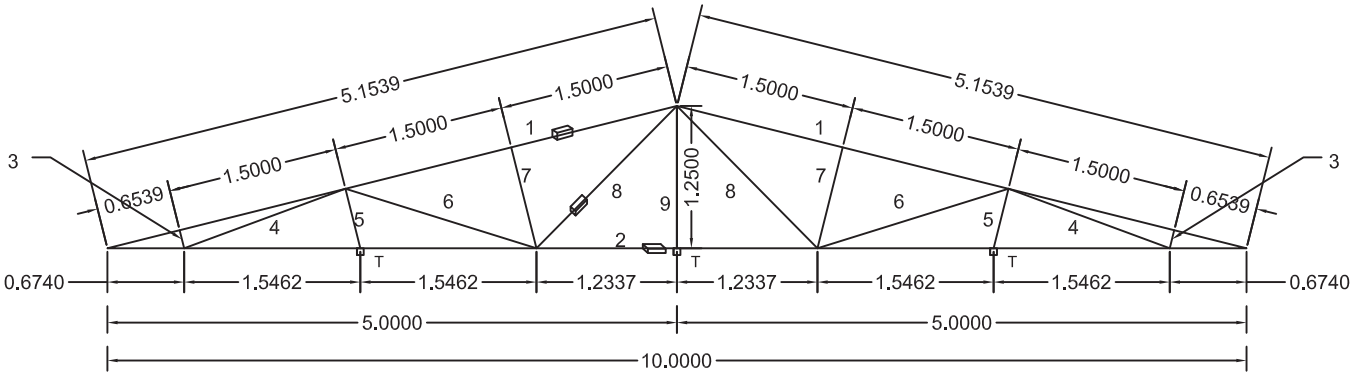
Span : 10m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	40X40X4.0	43.29	40X40X4.0	43.29	40X40X4.0	43.29	40X40X4.0	43.29	40X40X4.0	43.29	50X50X3.6	51.33	KG
2	66X33X2.6	36.90	66X33X2.9	40.70	80X40X3.2	55.00	80X40X3.2	55.00	80X40X3.2	55.00	96X48X3.2	67.10	KG
3	25X25X2.6	1.10	25X25X2.6	1.10	25X25X2.6	1.10	25X25X2.6	1.10	25X25X2.6	1.10	25X25X2.6	1.10	KG
4	25X25X2.6	5.10	25X25X2.6	5.10	25X25X3.2	5.98	32X32X2.6	6.82	32X32X2.6	6.82	32X32X2.6	6.82	KG
5	25X25X2.6	1.82	25X25X2.6	1.82	25X25X2.6	1.82	25X25X2.6	1.82	25X25X2.6	1.82	25X25X2.6	1.82	KG
6	25X25X3.2	6.95	32X32X2.6	7.94	32X32X2.6	7.94	32X32X2.6	7.94	32X32X2.6	7.94	32X32X2.6	7.94	KG
7	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	KG
8	50X25X2.6	9.52	50X25X2.6	9.52	50X25X2.6	9.52	50X25X3.2	11.38	66X33X2.6	12.96	66X33X2.6	12.96	KG
9	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	KG
	TOTAL	**109.89**	**TOTAL**	**114.68**	**TOTAL**	**129.85**	**TOTAL**	**132.56**	**TOTAL**	**134.14**	**TOTAL**	**154.28**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		3980		4005		4083		4097		4105		4208	N
LL		10350		10350		10350		10350		10350		10350	N
WL0+PRE	1389	-15258	1940	-21314	2467	-27127	2816	-30958	3187	-35031	3856	-42386	N
		-12452		-17395		-22138		-25265		-28589		-34590	N
WL 90+PRE		-14700		-20535		-26136		-29827		-33752		-40837	N

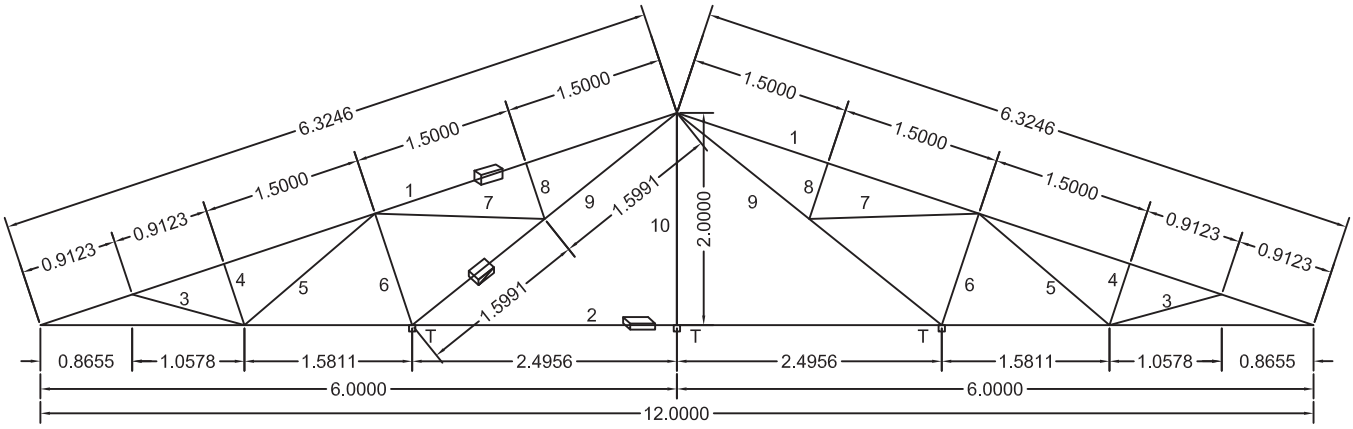
Span : 10m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X3.6	51.33	50X50X3.6	51.33	50X50X3.6	51.33	50X50X3.6	51.33	60X60X3.2	56.69	60X60X4.0	69.17	KG
2	66X33X2.6	36.90	80X40X3.2	55.00	80X40X3.2	55.00	80X40X4	67.10	80X40X4.8	78.50	96X48X4	82.20	KG
3	25X25X2.6	1.10	25X25X2.6	1.10	25X25X2.6	1.10	25X25X2.6	1.10	25X25X2.6	1.10	25X25X2.6	1.10	KG
4	25X25X2.6	5.10	25X25X3.2	5.98	32X32X2.6	6.82	32X32X2.6	6.82	32X32X2.6	6.82	38X38X2.6	8.30	KG
5	25X25X2.6	1.82	25X25X2.6	1.82	25X25X2.6	1.82	25X25X2.6	1.82	25X25X2.6	1.82	25X25X2.6	1.82	KG
6	32X32X2.6	7.94	32X32X2.6	7.94	32X32X2.6	7.94	32X32X2.6	7.94	32X32X2.6	7.94	32X32X2.6	7.94	KG
7	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	KG
8	50X25X2.6	9.52	50X25X2.6	9.52	66X33X2.6	12.96	66X33X2.6	12.96	66X33X2.6	12.96	66X33X2.6	12.96	KG
9	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	KG
	TOTAL	**118.92**	**TOTAL**	**137.89**	**TOTAL**	**142.18**	**TOTAL**	**154.28**	**TOTAL**	**171.04**	**TOTAL**	**188.69**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		5371		5502		5531		5614		5729		5849	N
LL		13807		13807		13807		13807		13807		13807	N
WL0+PRE	1852	-20354	2586	-28425	3293	-36191	3756	-41287	4252	-46734	5144	-56544	N
		-16611		-23198		-29536		-33695		-38140		-46146	N
WL 90+PRE		-19610		-27387		-34869		-39779		-45027		-54479	N

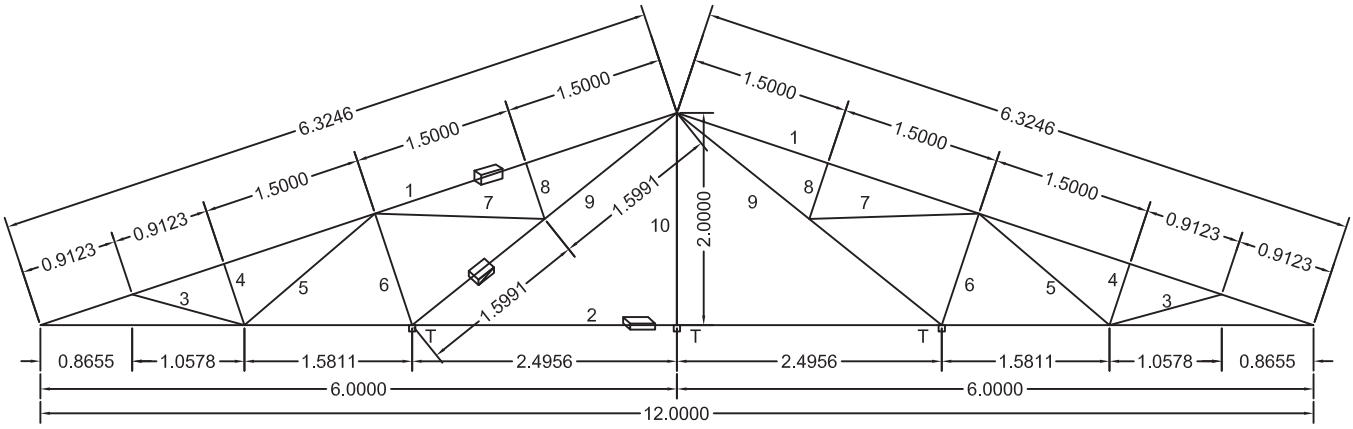
Span : 12m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	40X40X3.2	44.15	40X40X3.2	44.15	40X40X3.2	44.15	40X40X3.2	44.15	40X40X3.2	44.15	50X50X2.9	52.12	KG
2	66X33X2.6	44.28	80X40X3.2	66.00	80X40X3.2	66.00	80X40X4	80.52	80X40X4.8	94.20	96X48X4	98.64	KG
3	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	KG
4	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	KG
5	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	32X32X2.6	7.32	32X32X2.6	7.32	KG
6	25X25X2.6	3.7518	25X25X2.6	3.7518	25X25X2.6	3.7518	25X25X2.6	3.7518	25X25X2.6	3.7518	25X25X2.6	3.7518	KG
7	25X25X2.6	5.41	25X25X2.6	5.41	25X25X2.6	5.41	25X25X2.6	5.41	32X32X2.6	7.23	32X32X2.6	7.23	KG
8	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	KG
9	50X25X2.6	17.34	66X33X2.6	23.62	66X33X2.6	23.62	66X33X2.6	23.62	66X33X2.6	23.62	66X33X3.6	31.55	KG
10	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	KG
	TOTAL	**131.43**	**TOTAL**	**159.42**	**TOTAL**	**159.42**	**TOTAL**	**173.94**	**TOTAL**	**191.29**	**TOTAL**	**211.64**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		4859		5003		5003		5077		5167		5270	N
LL		11376		11376		11376		11376		11376		11376	N
WL0+PRE	1472	-15878	2057	-22181	2618	-28231	2986	-32200	3380	-36455	4090	-44108	N
		-13924		-19452		-24757		-28237		-31969		-38680	N
WL90+PRE		-17633		-24632		-31350		-35758		-40484		-48982	N

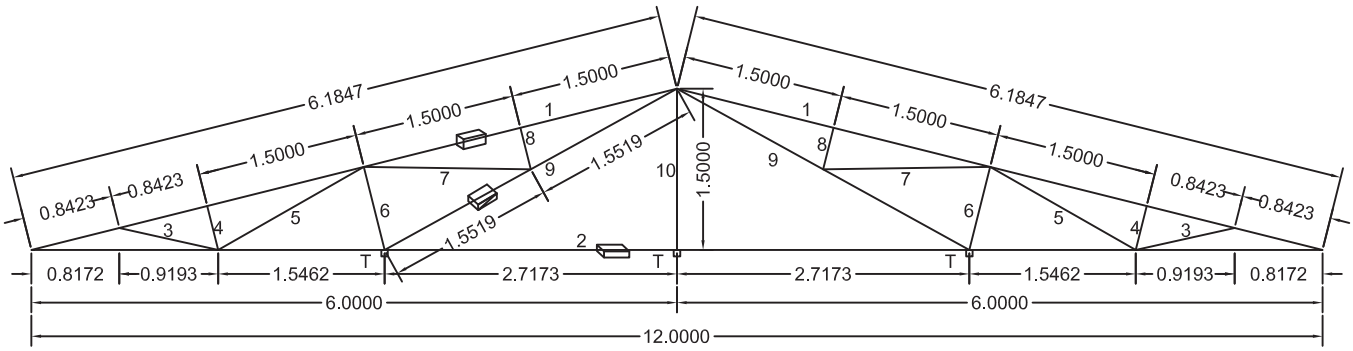
Span : 12m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X3.6	63.00	50X50X3.6	63.00	50X50X3.6	63.00	50X50X3.6	63.00	50X50X3.6	63.00	60X60X3.2	69.58	KG
2	66X33X3.6	59.16	80X40X3.2	66.00	96X48X3.2	80.52	96X48X3.2	80.52	96X48X4	98.64	96X48X4.8	115.92	KG
3	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	KG
4	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	KG
5	25X25X2.6	5.48	25X25X2.6	5.48	32X32X2.6	7.32	32X32X2.6	7.32	32X32X2.6	7.32	32X32X2.6	7.32	KG
6	25X25X2.6	3.75	25X25X2.6	3.75	25X25X2.6	3.75	25X25X2.6	3.75	25X25X2.6	3.75	25X25X2.6	3.75	KG
7	25X25X2.6	5.41	25X25X2.6	5.41	32X32X2.6	7.23	32X32X2.6	7.23	32X32X2.6	7.23	32X32X2.6	7.23	KG
8	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	KG
9	66X33X2.6	23.62	66X33X2.6	23.62	66X33X2.6	23.62	66X33X3.6	31.55	66X33X3.6	31.55	80X40X3.2	35.20	KG
10	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	KG
	TOTAL	**171.43**	**TOTAL**	**178.27**	**TOTAL**	**196.46**	**TOTAL**	**204.40**	**TOTAL**	**222.52**	**TOTAL**	**250.03**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		6750.0		6798.00		6921		6976		7100.0		7289.0	N
LL		15165.0		15165.00		15165		15165		15165.0		15165.0	N
WL0+PRE	1963.0	-21165.0	2741.0	-29564.00	3489.0	-37630	3981.0	-42933	4505.0	-48586.0	5451.0	-58795.0	N
		-18561.0		-25925.00		-32999		-37650		-42607.0		-51559.0	N
WL90+PRE		-23504.0		-32831.00		-41788		-47677		-53954		-65292.0	N

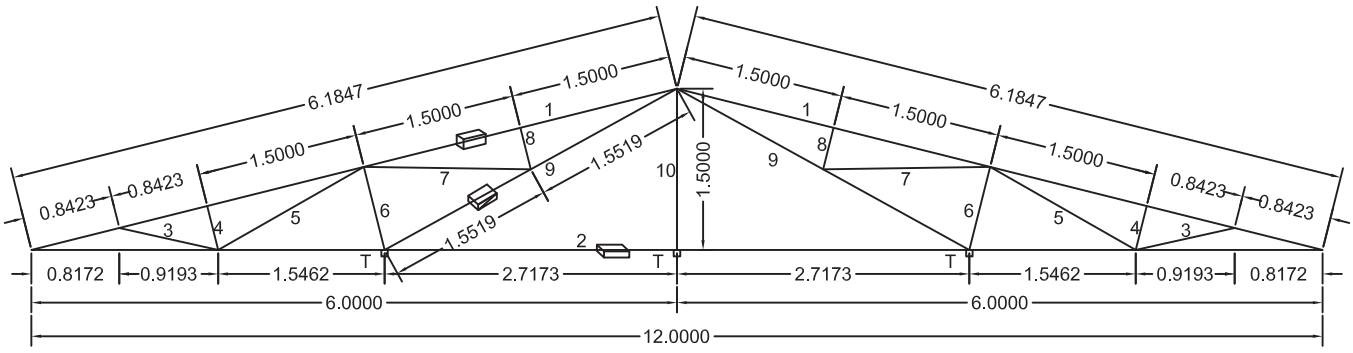
Span : 12m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X2.6	46.26	50X50X2.6	46.26	50X50X2.6	46.26	50X50X2.9	50.96	50X50X3.6	61.60	60X60X4	83.00	KG
2	66X33X3.6	59.16	80X40X3.2	66.00	96X48X3.2	80.52	96X48X3.2	80.52	96X48X4	98.64	122X61X3.6	116.04	KG
3	25X25X2.6	3.18	25X25X2.6	3.18	25X25X2.6	3.18	25X25X2.6	3.18	25X25X2.6	3.18	25X25X2.6	3.18	KG
4	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	KG
5	25X25X2.6	5.27	25X25X2.6	5.27	32X32X2.6	7.04	32X32X2.6	7.04	32X32X2.6	7.04	32X32X2.6	7.04	KG
6	25X25X2.6	2.69	25X25X2.6	2.69	25X25X2.6	2.69	25X25X2.6	2.69	25X25X2.6	2.69	25X25X2.6	2.69	KG
7	25X25X2.6	5.25	25X25X2.6	5.25	32X32X2.6	7.01	32X32X2.6	7.01	32X32X2.6	7.01	32X32X2.6	7.01	KG
8	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	KG
9	66X33X2.6	22.91	66X33X2.6	22.91	66X33X3.6	30.60	66X33X3.6	30.60	80X40X3.2	34.14	80X40X3.2	34.14	KG
10	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	KG
	TOTAL	**150.02**	**TOTAL**	**156.86**	**TOTAL**	**182.62**	**TOTAL**	**187.32**	**TOTAL**	**219.62**	**TOTAL**	**258.42**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		4916		4951		5083		5107		5274		5473	N
LL		12411		12411		12411		12411		12411		12411	N
WL0+PRE	1666	-18295	2326	-25558	2961	-32528	3377	-37102	3823	-42005	4626	-50823	N
		-15172		-21195		-26975		-30768		-34834		-42147	N
WL90+PRE		-17630		-24630		-31347		-35754		-40478		-48977	N

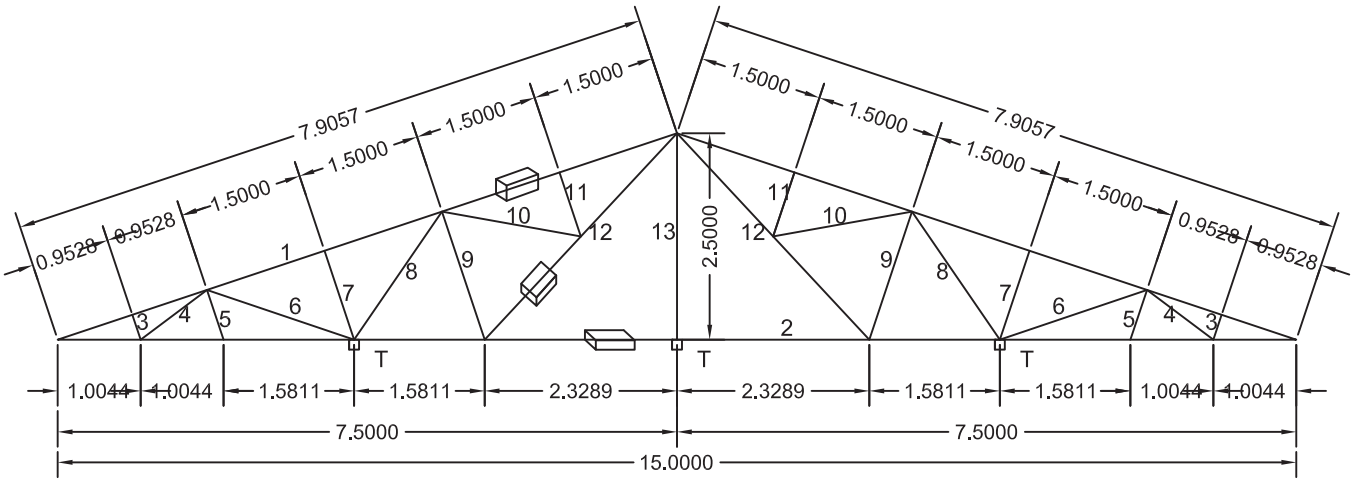
Span : 12m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X3.6	61.60	50X50X3.6	61.60	50X50X3.6	61.60	60X60X3.2	68.03	72X72X3.2	83.00	72X72X4	101.68	KG
2	80X40X3.2	66.00	96X48X3.2	80.52	96X48X4	98.64	96X48X4.8	116.04	122X61X3.6	116.04	122X61X4.5	142.56	KG
3	25X25X2.6	3.18	25X25X2.6	3.18	25X25X2.6	3.18	25X25X2.6	3.18	25X25X2.6	3.18	25X25X2.6	3.18	KG
4	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	KG
5	25X25X2.6	5.27	32X32X2.6	7.04	32X32X2.6	7.04	32X32X2.6	7.04	32X32X2.6	7.04	38X38X2.6	8.57	KG
6	25X25X2.6	2.69	25X25X2.6	2.69	25X25X2.6	2.69	25X25X2.6	2.69	25X25X2.6	2.69	25X25X2.6	2.69	KG
7	25X25X2.6	5.25	32X32X2.6	7.01	32X32X2.6	7.01	32X32X2.6	7.01	32X32X2.6	7.01	38X38X2.6	8.54	KG
8	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	25X25X2.6	1.35	KG
9	66X33X2.6	22.91	66X33X2.9	25.27	80X40X3.2	34.14	80X40X3.2	34.14	80X40X3.2	34.14	80X40X4	41.65	KG
10	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	KG
	TOTAL	**172.20**	**TOTAL**	**192.62**	**TOTAL**	**219.62**	**TOTAL**	**243.45**	**TOTAL**	**258.42**	**TOTAL**	**314.17**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		6706		6845		7030		7192		7295		7678	N
LL		16543		16543		16543		16543		16543		16543	N
WL0+PRE	2220	-24387	3101	-34065	3947	-43358	4503	-49468	5095	-55982	6166	-67745	N
		-20223		-28250		-35957		-41024		-46425		-56181	N
WL90+PRE		-23501		-32828		-41784		-47672		-53948		-65254	N

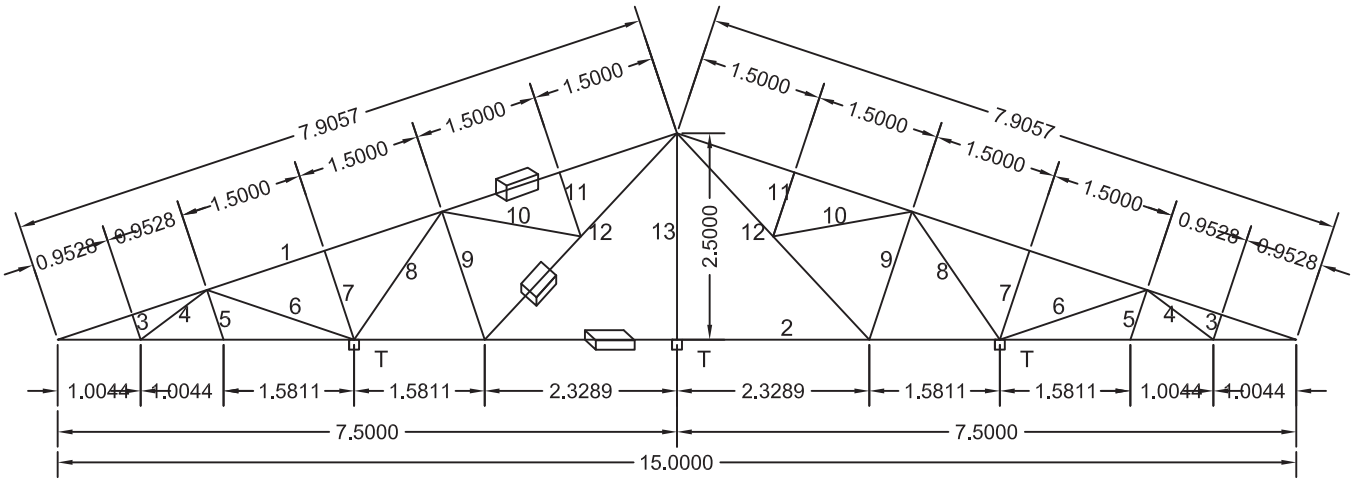
Span : 15m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	40X40X4	66.44	40X40X4	66.44	40X40X4	66.44	40X40X4	66.44	60X60X2.6	71.98	60X60X3.2	87.01	KG
2	66X33X3.6	73.95	80X40X3.2	82.50	96X48X3.2	100.65	96X48X3.2	100.65	96X48X4	123.30	122X61X3.6	145.05	KG
3	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	KG
4	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	KG
5	25X25X2.6	2.16	25X25X2.6	2.16	25X25X2.6	2.16	25X25X2.6	2.16	25X25X2.6	2.16	25X25X2.6	2.16	KG
6	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	KG
7	25X25X2.6	3.84	25X25X2.6	3.84	25X25X2.6	3.84	25X25X2.6	3.84	25X25X2.6	3.84	25X25X2.6	3.84	KG
8	25X25X2.6	6.35	25X25X2.6	6.35	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	KG
9	25X25X2.6	5.54	25X25X2.6	5.54	25X25X2.6	5.54	25X25X2.6	5.54	25X25X2.6	5.54	32X32X2.6	7.41	KG
10	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	32X32X2.6	7.73	KG
11	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	KG
12	50X25X2.6	18.54	66X33X2.6	25.24	66X33X2.6	25.24	66X33X2.6	25.24	66X33X2.9	27.84	66X33X3.6	33.72	KG
13	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	KG
	TOTAL	**200.43**	**TOTAL**	**215.68**	**TOTAL**	**235.97**	**TOTAL**	**235.97**	**TOTAL**	**266.76**	**TOTAL**	**313.24**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		6093		6171		6275		6275		6434		6673	N
LL		14222		14222		14222		14222		14222		14222	N
WL0+PRE	1840	-19848	-2571	-27728	3272	-35290	3732	-40252	4225	-45571	5111	-55138	N
		-17403		-24311		-30942		-35292		-39956		-48344	N
WL90+PRE		-22040		-30789		-39186		-44695		-50602		-61225	N

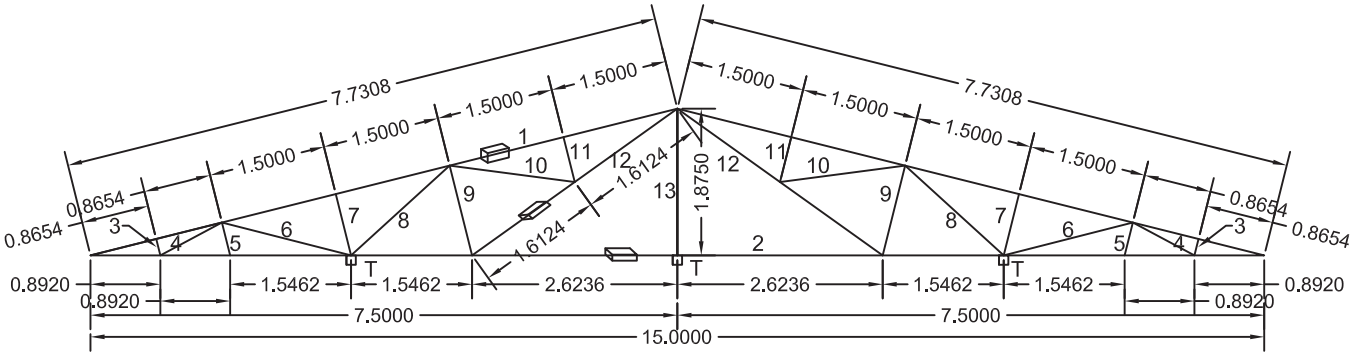
Span : 15m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X2.6	71.98	60X60X2.6	71.98	60X60X2.6	71.98	60X60X3.2	87.01	60X60X4	106.15	60X60X4.8	124.19	KG
2	80X40X3.2	82.50	96X48X3.2	100.65	96X48X4	123.30	96X48X4.8	144.90	122X61X3.6	145.05	122X61X3.6	145.05	KG
3	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	25X25X2.6	1.07	KG
4	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	KG
5	25X25X2.6	2.16	25X25X2.6	2.16	25X25X2.6	2.16	25X25X2.6	2.16	25X25X2.6	2.16	25X25X2.6	2.16	KG
6	32X32X2.6	8.52	32X32X2.6	8.52	32X32X2.6	8.52	32X32X2.6	8.52	32X32X2.6	8.52	32X32X2.6	8.52	KG
7	25X25X2.6	3.84	25X25X2.6	3.84	25X25X2.6	3.84	25X25X2.6	5.13	25X25X2.6	3.84	25X25X2.6	3.84	KG
8	25X25X2.6	6.35	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	32X32X3.2	10.11	38X38X2.6	10.34	KG
9	32X32X2.6	7.41	32X32X2.6	7.41	32X32X2.6	7.41	32X32X2.6	7.41	32X32X2.6	7.41	32X32X2.6	7.41	KG
10	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	32X32X2.6	7.73	32X32X2.6	7.73	KG
11	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	KG
12	50X25X3.2	22.16	66X33X2.6	25.24	66X33X2.9	27.84	66X33X3.6	33.72	80X40X3.2	37.62	80X40X3.2	37.62	KG
13	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	KG
	TOTAL	**222.16**	**TOTAL**	**245.53**	**TOTAL**	**270.78**	**TOTAL**	**314.58**	**TOTAL**	**340.05**	**TOTAL**	**358.31**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		8271		8430		8604		8896		9079		9205	N
LL		18958		18958		18958		18958		18958		18958	N
WL0+PRE	2453	-26458	3427	-36957	4361	-47040	4976	-53669	5631	-60735	6814	-73497	N
		-23198		-32403		-41244		-47056		-53251		-64441	N
WL90+PRE		-29379		-41037		-52233		-59594		-67440		-81611	N

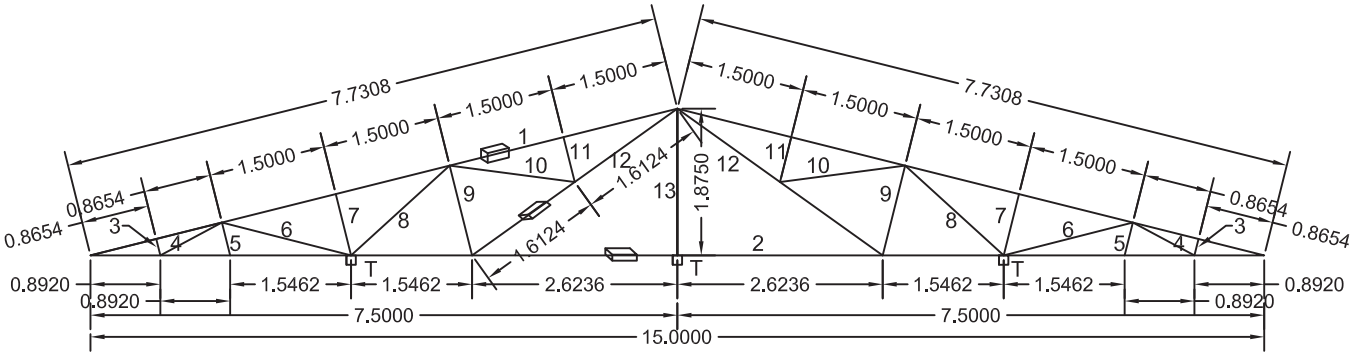
Span : 15m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X3.6	77.00	50X50X3.6	77.00	50X50X3.6	77.00	50X50X3.6	77.00	60X60X4	103.75	72X72X4	127.10	KG
2	80X40X3.2	82.50	80X40X4.8	117.75	96X48X4	123.30	96X48X4.8	144.90	122X61X3.6	145.05	122X61X3.6	145.05	KG
3	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	KG
4	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	KG
5	25X25X2.6	1.46	25X25X2.6	1.46	25X25X2.6	1.46	25X25X2.6	1.46	25X25X2.6	1.46	25X25X2.6	1.46	KG
6	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	KG
7	25X25X2.6	2.73	25X25X2.6	2.73	25X25X2.6	2.73	25X25X2.6	2.73	25X25X2.6	2.73	25X25X2.6	2.73	KG
8	25X25X2.6	5.76	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	38X38X3.2	11.21	KG
9	25X25X2.6	4.00	25X25X2.6	4.00	25X25X2.6	4.00	25X25X2.6	4.00	25X25X2.6	4.00	25X25X2.6	4.00	KG
10	25X25X2.6	5.45	25X25X2.6	5.45	25X25X2.6	5.45	25X25X2.6	5.45	32X32X2.6	7.29	32X32X2.6	7.29	KG
11	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	KG
12	66X33X2.6	23.80	66X33X2.6	23.80	66X33X2.9	26.25	66X33X3.6	31.80	80X40X2.6	29.34	80X40X3.2	35.47	KG
13	25X25X2.6	3.17	25X25X2.6	3.17	25X25X2.6	3.17	25X25X2.6	3.17	25X25X2.6	3.17	25X25X2.6	3.17	KG
	TOTAL	**218.05**	**TOTAL**	**255.24**	**TOTAL**	**263.24**	**TOTAL**	**290.39**	**TOTAL**	**316.67**	**TOTAL**	**349.66**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		6147		6338		6379		6519		6654		6824	N
LL		15543		15543		15543		15543		15543		15543	N
WL0+PRE	2087	-22916	2915	-32013	-3709	-40745	4231	-46474	4790	-52615	5795	-63660	N
		-18998		-26539		-33778		-38527		-43618		-52775	N
WL90+PRE		-22079		-30845		-39257		-44777		-50694		-61336	N

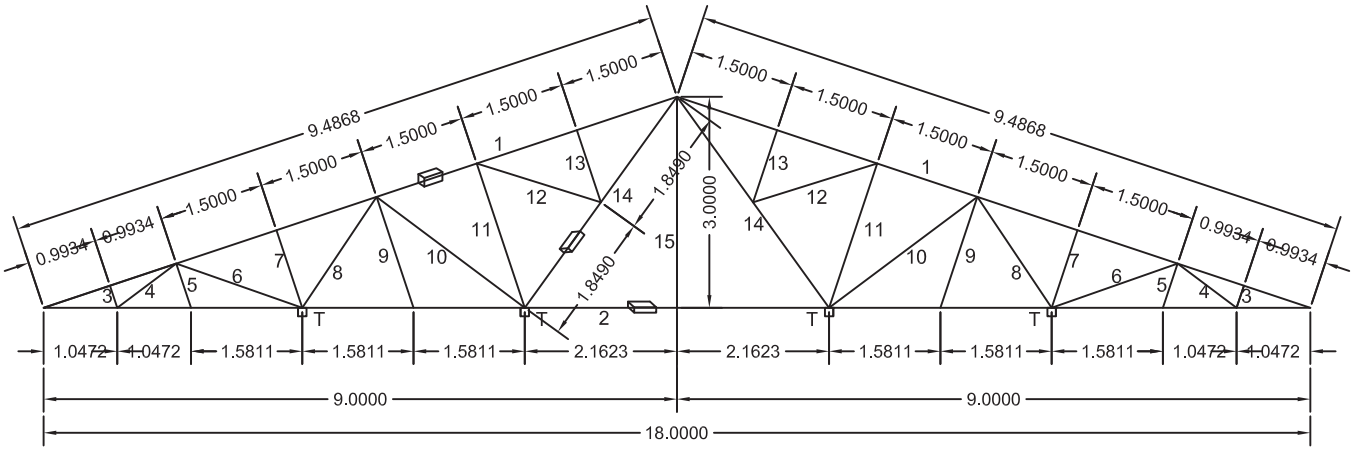
Span : 15m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X3.2	85.04	60X60X3.2	85.04	60X60X4	103.75	60X60X4	103.75	72X72X4	127.10	72X72X4.8	149.36	KG
2	80X40X4	100.65	96X48X4	123.30	122X61X3.6	145.05	122X61X3.6	145.05	122X61X4.5	178.20	122X61X4.5	178.20	KG
3	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	KG
4	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	25X25X2.6	3.01	KG
5	25X25X2.6	1.46	25X25X2.6	1.46	25X25X2.6	1.46	25X25X2.6	1.46	25X25X2.6	1.46	25X25X2.6	1.46	KG
6	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	32X32X2.6	7.70	KG
7	25X25X2.6	2.73	25X25X2.6	2.73	25X25X2.6	2.73	25X25X2.6	2.73	25X25X2.6	2.73	25X25X2.6	2.73	KG
8	25X25X2.6	5.76	32X32X2.6	7.70	32X32X2.6	7.70	38X38X2.6	9.37	38X38X2.6	9.37	38X38X2.6	9.37	KG
9	25X25X2.6	4.00	25X25X2.6	4.00	25X25X2.6	4.00	25X25X2.6	4.00	25X25X2.6	4.00	25X25X2.6	4.00	KG
10	25X25X2.6	5.45	25X25X2.6	5.45	32X32X2.6	7.29	32X32X2.6	7.29	32X32X2.6	7.29	32X32X2.6	7.29	KG
11	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	25X25X2.6	0.73	KG
12	66X33X2.6	23.80	66X33X2.9	26.25	80X40X3.2	35.47	80X40X3.2	35.47	80X40X3.2	35.47	80X40X4	43.28	KG
13	25X25X2.6	3.17	25X25X2.6	3.17	25X25X2.6	3.17	25X25X2.6	3.17	25X25X2.6	3.17	25X25X2.6	3.17	KG
	TOTAL	**244.24**	**TOTAL**	**271.28**	**TOTAL**	**322.80**	**TOTAL**	**324.47**	**TOTAL**	**380.97**	**TOTAL**	**411.04**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		8373		8558		8912		8923		9311		9518	N
LL		20718		20718		20718		20718		20718		20718	N
WL0+PRE	2781	-30547	3885	-42670	4944	-54311	5610	-61964	6384	-70123	7725	-84857	N
		-25324		-35373		-45024		-51369		-58131		-70348	N
WL90+PRE		-29432		-41112		-52328		-59702		-67562		-81758	N

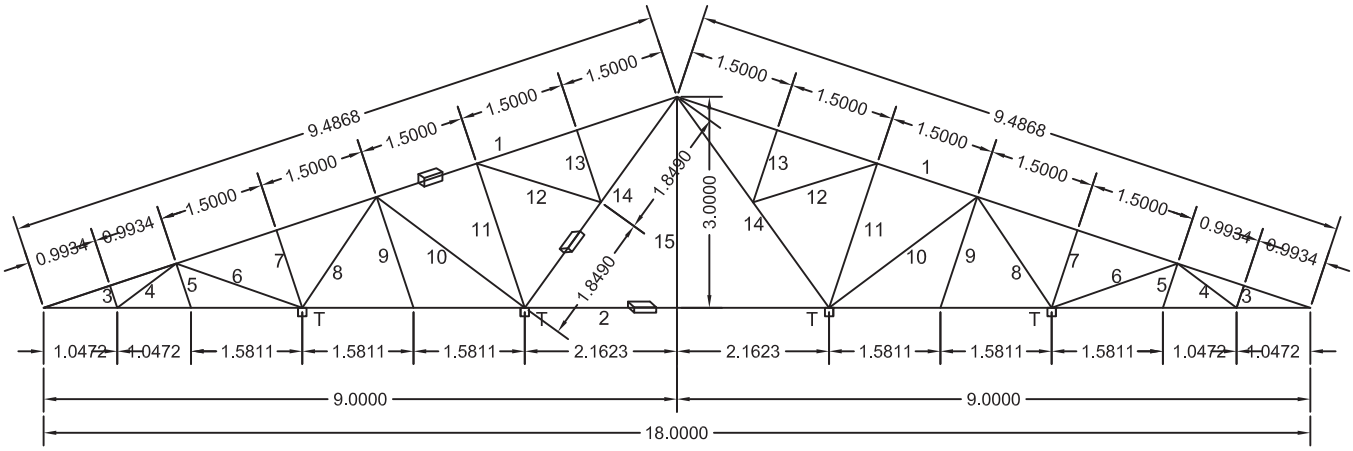
Span : 18m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X2.9	78.20	50X50X2.9	78.20	50X50X2.9	78.20	60x60x2.6	86.36	60x60x3.2	104.39	72X72X3.2	127.36	KG
2	80X40X3.2	99.00	80X40X4.8	141.30	96X48X4	147.96	96X48X4	147.96	96X48X4.8	173.88	122X61X3.6	174.06	KG
3	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	KG
4	25X25X2.6	3.54	25X25X2.6	3.54	25X25X2.6	3.54	25X25X2.6	3.54	25X25X2.6	3.54	25X25X2.6	3.54	KG
5	25X25X2.6	2.25	25X25X2.6	2.25	25X25X2.6	2.25	25X25X2.6	2.25	25X25X2.6	2.25	25X25X2.6	2.25	KG
6	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32x32x2.6	8.59	32X32X2.6	8.59	KG
7	25X25X2.6	3.94	25X25X2.6	3.94	25X25X2.6	3.94	25X25X2.6	3.94	25X25X2.6	3.94	25X25X2.6	3.94	KG
8	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	KG
9	25X25X2.6	5.63	25X25X2.6	5.63	25X25X2.6	5.63	25X25X2.6	5.63	25X25X2.6	5.63	25X25X2.6	5.63	KG
10	38X38X2.6	14.49	38X38X2.6	14.49	38x38x2.6	14.49	38x38x2.6	14.49	38x38x2.6	14.49	38x38x2.6	14.49	KG
11	32X32X2.6	9.79	32X32X2.6	9.79	32X32X2.6	9.79	32X32X2.6	9.79	32X32X2.6	9.79	32X32X2.6	9.79	KG
12	25X25X2.6	6.25	25X25X2.6	6.25	25X25X2.6	6.25	25X25X2.6	6.25	25X25X2.6	6.25	25X25X2.6	6.25	KG
13	25X25X2.6	3.67	25X25X2.6	3.67	25X25X2.6	3.67	25X25X2.6	3.67	25X25X2.6	3.67	25X25X2.6	3.67	KG
14	66X33X2.6	27.29	66X33X2.6	27.29	66X33X2.6	27.29	66X33X2.9	30.10	66X33X3.6	36.46	80x40x3.2	40.68	KG
15	25X25X2.6	5.07	25X25X2.6	5.07	25X25X2.6	5.07	25X25X2.6	5.07	25X25X2.6	5.07	25X25X2.6	5.07	KG
	TOTAL	**277.40**	**TOTAL**	**319.70**	**TOTAL**	**326.36**	**TOTAL**	**337.34**	**TOTAL**	**387.65**	**TOTAL**	**415.01**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		7370		7588		7622		7679		7938		8078	N
LL		17100		17100		17100		17100		17100		17100	N
WL0+PRE	2212	-23872	3089	-33349	3932	-42443	4484	-48411	5077	-54809	6124	-66315	N
		-20924		-29231		-37203		-42434		-48042		-58127	N
WL90+PRE		-26503		-37024		-47121		-53747		-60849		-73623	N

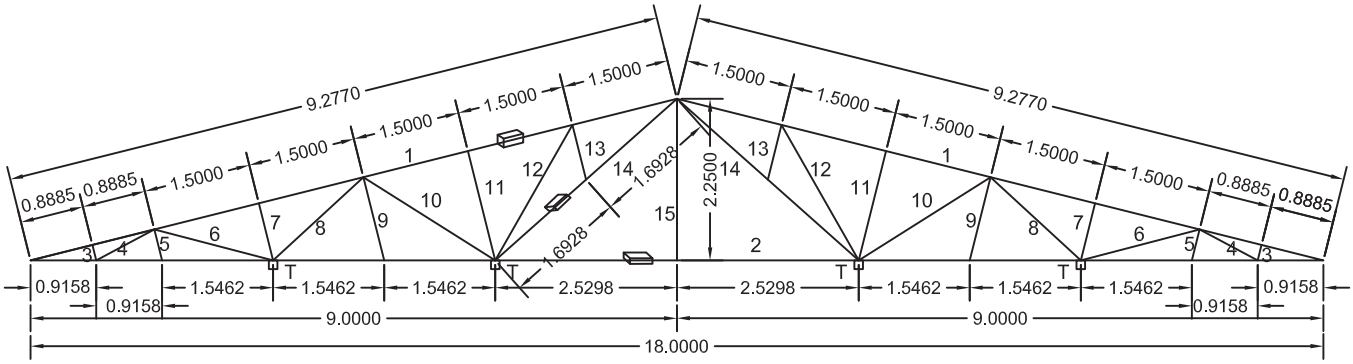
Span : 18m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X2.6	86.36	60X60X2.6	86.36	60X60X3.2	104.39	72X72X3.2	127.36	60X60X4.8	148.99	80X80X4	175.00	KG
2	80X40X4	120.78	122X61X3.6	174.06	122X61X3.6	174.06	122X61X3.6	174.06	122X61X3.6	174.06	122X61X4.5	213.84	KG
3	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	KG
4	25X25X2.6	3.54	25X25X2.6	3.54	25X25X2.6	3.54	25X25X2.6	3.54	25X25X2.6	3.54	25X25X2.6	3.54	KG
5	25X25X2.6	2.25	25X25X2.6	2.25	25X25X2.6	2.25	25X25X2.6	2.25	25X25X2.6	2.25	25X25X2.6	2.25	KG
6	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	KG
7	25X25X2.6	3.94	25X25X2.6	3.94	25X25X2.6	3.94	25X25X2.6	3.94	25X25X2.6	3.94	25X25X2.6	3.94	KG
8	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	32X32X2.6	8.59	38X38X2.6	10.45	38X38X2.6	10.45	KG
9	25X25X2.6	5.63	25X25X2.6	5.63	25X25X2.6	5.63	25X25X2.6	5.63	25X25X2.6	5.63	25X25X2.6	5.63	KG
10	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	KG
11	32X32X2.6	9.79	32X32X2.6	9.79	32X32X2.6	9.79	32X32X2.6	9.79	32X32X2.6	9.79	32X32X2.6	9.79	KG
12	25X25X2.6	6.25	25X25X2.6	6.25	25X25X2.6	6.25	25X25X2.6	6.25	38X38X2.6	10.18	38X38X2.6	10.18	KG
13	25X25X2.6	3.67	25X25X2.6	3.67	25X25X2.6	3.67	25X25X2.6	3.67	25X25X2.6	3.67	25X25X2.6	3.67	KG
14	66X33X2.6	27.29	66X33X2.6	27.29	66X33X3.6	36.46	80X40X3.2	40.68	80X40X3.2	40.68	80X40X3.2	40.68	KG
15	25X25X2.6	5.07	25X25X2.6	5.07	25X25X2.6	5.07	25X25X2.6	5.07	25X25X2.6	5.07	25X25X2.6	5.07	KG
	TOTAL	**307.35**	**TOTAL**	**360.63**	**TOTAL**	**387.83**	**TOTAL**	**415.01**	**TOTAL**	**442.43**	**TOTAL**	**508.21**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		10030		10396		10582		10768		10958		11409	N
LL		22795		22795		22795		22795		22795		22795	N
WL0+PRE	2948	-31821	4117	-44449	5241	-56575	5977	-64524	6768	-73070	8188	-88395	N
		-27892		-38961		-49590		-56558		-64048		-77481	N
WL90+PRE		-35328		-49347		-62810		-71635		-81123		-98137	N

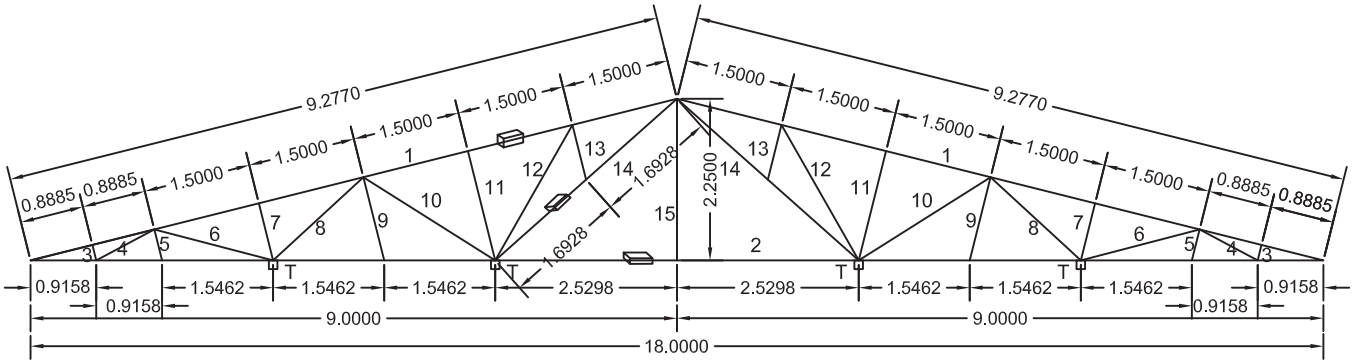
Span : 18m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X3.2	102.05	60X60X3.2	102.05	60X60X3.2	102.05	72x72x3.2	124.50	60X60X4.8	145.65	80x80x4	171.07	KG
2	80X40X4	120.78	122X61X3.6	174.06	122X61X3.6	174.06	122X61X3.6	174.06	122X61X3.6	174.06	122X61X4.5	213.84	KG
3	25X25X2.6	0.75	25x25x2.6	0.75	25x25x2.6	0.75	25x25x2.6	0.75	25x25x2.6	0.75	25x25x2.6	0.75	KG
4	25X25X2.6	3.10	25x25x2.6	3.10	25x25x2.6	3.10	25x25x2.6	3.10	25x25x2.6	3.10	25x25x2.6	3.10	KG
5	25X25X2.6	1.50	25x25x2.6	1.50	25x25x2.6	1.50	25x25x2.6	1.50	25x25x2.6	1.50	25x25x2.6	1.50	KG
6	32X32X2.6	7.73	32x32x2.6	7.73	32x32x2.6	7.73	32x32x2.6	7.73	32x32x2.6	7.73	32x32x2.6	7.73	KG
7	25X25X2.6	2.77	25x25x2.6	2.77	25x25x2.6	2.77	25x25x2.6	2.77	25x25x2.6	2.77	25x25x2.6	2.77	KG
8	25X25X2.6	5.78	32x32x2.6	7.73	32x32x2.6	7.73	32x32x2.6	7.73	32x32x2.6	7.73	38x38x2.6	9.40	KG
9	25X25X2.6	4.04	25x25x2.6	4.04	25x25x2.6	4.04	25x25x2.6	4.04	25x25x2.6	4.04	25x25x2.6	4.04	KG
10	32X32X2.6	9.81	32x32x2.6	9.81	32x32x2.6	9.81	32x32x2.6	9.81	32x32x2.6	9.81	32x32x2.6	9.81	KG
11	25X25X2.6	5.30	25x25x2.6	5.30	25x25x2.6	5.30	25x25x2.6	5.30	25x25x2.6	5.30	25x25x2.6	5.30	KG
12	32X32X2.6	9.81	32x32x2.6	9.81	32x32x2.6	9.81	32x32x2.6	9.81	32x32x2.6	9.81	32x32x2.6	9.81	KG
13	25X25X2.6	0.64	25x25x2.6	0.64	25x25x2.6	0.64	25x25x2.6	0.64	25x25x2.6	0.64	25x25x2.6	0.64	KG
14	66X33X2.6	24.99	66X33X2.6	24.99	66X33X3.6	33.38	66X33X3.6	33.38	80x40x3.2	37.24	80x40x3.2	37.24	KG
15	25X25X2.6	3.80	25x25x2.6	3.80	25x25x2.6	3.80	25x25x2.6	3.80	25x25x2.6	3.80	25x25x2.6	3.80	KG
	TOTAL	**302.84**	**TOTAL**	**358.07**	**TOTAL**	**366.47**	**TOTAL**	**388.92**	**TOTAL**	**413.93**	**TOTAL**	**480.80**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		7454		7738		7782		7896		8027		8371	N
LL		18636		18636		18636		18636		18636		18636	N
WL0+PRE	2501	-27472	3493	-38378	4446	-48844	5071	-55712	5741	-63074	6946	-76315	N
		-22778		-31821		-40450		-46194		-52299		-63278	N
WL90+PRE		-26469		-36978		-47062		-53680		-60773		-73531	N

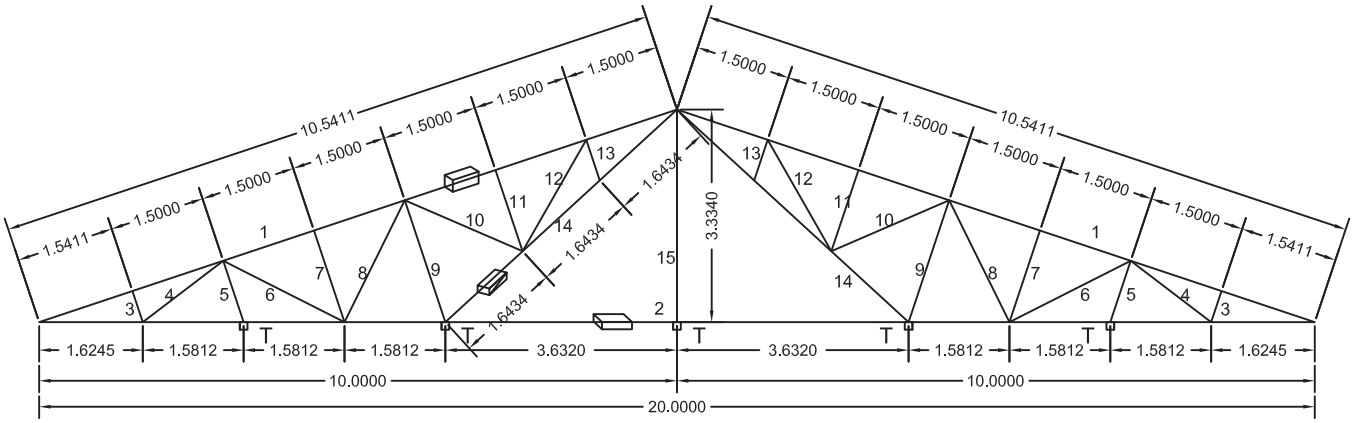
Span : 18m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4	124.50	60X60X4	124.50	72X72X4	152.51	72X72X4	152.51	80X80X4	171.07	91X91X4.5	220.42	KG
2	122X61X3.6	174.06	122X61X3.6	174.06	122X61X3.6	174.06	122X61X4.5	213.84	122X61X5.4	252.18	145X82X4.8	286.56	KG
3	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	KG
4	25X25X2.6	3.10	25X25X2.6	3.10	25X25X2.6	3.10	25X25X2.6	3.10	25X25X2.6	3.10	25X25X2.6	3.10	KG
5	25X25X2.6	1.50	25X25X2.6	1.50	25X25X2.6	1.50	25X25X2.6	1.50	25X25X2.6	1.50	25X25X2.6	1.50	KG
6	38X38X2.6	9.40	38X38X2.6	9.40	38X38X2.6	9.40	38X38X2.6	9.40	38X38X2.6	9.40	38X38X2.6	9.40	KG
7	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	25X25X2.6	2.77	KG
8	25X25X2.6	5.78	32X32X2.6	7.73	32X32X2.6	7.73	32X32X3.2	9.19	38X38X2.6	9.40	38X38X2.6	9.40	KG
9	25X25X2.6	4.04	25X25X2.6	4.04	25X25X2.6	4.04	25X25X2.6	4.04	25X25X2.6	4.04	25X25X2.6	4.04	KG
10	38X38X2.6	11.94	38X38X2.6	11.94	38X38X2.6	11.94	38X38X2.6	11.94	38X38X2.6	11.94	38X38X2.6	11.94	KG
11	25X25X2.6	5.30	25X25X2.6	5.30	25X25X2.6	5.30	25X25X2.6	5.30	25X25X2.6	5.30	25X25X2.6	5.30	KG
12	38X38X2.6	11.94	38X38X2.6	11.94	38X38X2.6	11.94	38X38X2.6	11.94	38X38X2.6	11.94	38X38X2.6	11.94	KG
13	25X25X2.6	0.64	25X25X2.6	0.64	25X25X2.6	0.64	25X25X2.6	0.64	25X25X2.6	0.64	25X25X2.6	0.64	KG
14	66X33X2.6	24.99	66X33X3.6	33.38	80X40X3.2	37.24	80X40X3.2	37.24	80X40X3.2	37.24	122X61X3.6	65.48	KG
15	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	KG
	TOTAL	**384.50**	**TOTAL**	**394.85**	**TOTAL**	**426.72**	**TOTAL**	**467.97**	**TOTAL**	**525.07**	**TOTAL**	**637.04**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		10497		10568		10786		11070		11462		12231	N
LL		24841		24841		24841		24841		24841		24841	N
WL0+PRE	3333	-36619	4656	-51152	5956	-65107	6758	-74255	7653	-84089	9258	-101726	N
		-30364		-42413		-53984		-61569		-69724		-84347	N
WL90+PRE		-35284		-49286		-62732		-71546		-81022		-98015	N

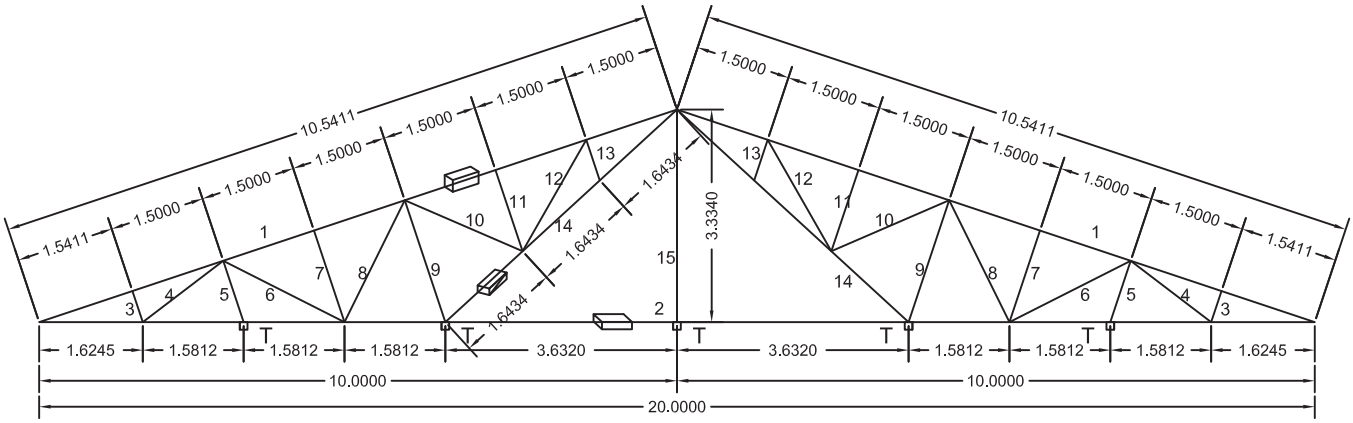
Span : 20m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X2.6	95.96	60X60X2.6	95.96	60X60X2.6	95.96	60X60X3.2	116.00	60X60X4.0	141.51	80X80X3.2	158.39	KG
2	96X48X3.2	134.20	96X48X3.2	134.20	96X48X4	164.40	122X61X3.6	193.40	122X61X3.6	193.40	122X61X3.6	193.40	KG
3	25X25X2.6	1.74	25X25X2.6	1.74	25X25X2.6	1.74	25X25X2.6	1.74	25X25X2.6	1.74	25X25X2.6	1.74	KG
4	25X25X2.6	5.37	25X25X2.6	5.37	25X25X2.6	5.37	32X32X2.6	7.19	32X32X2.6	7.19	32X32X2.6	7.19	KG
5	25X25X2.6	3.41	25X25X2.6	3.41	25X25X2.6	3.41	25X25X2.6	3.41	25X25X2.6	3.41	25X25X2.6	3.41	KG
6	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	KG
7	25X25X2.6	5.12	25X25X2.6	5.12	25X25X2.6	5.12	25X25X2.6	5.12	25X25X2.6	5.12	25X25X2.6	5.12	KG
8	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	38X38X2.6	11.77	38X38X2.6	11.77	38X38X2.6	11.77	KG
9	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	KG
10	32X32X2.6	9.15	32X32X2.6	9.15	32X32X2.6	9.15	32X32X2.6	9.15	32X32X2.6	9.15	32X32X3.2	10.89	KG
11	25X25X2.6	4.56	25X25X2.6	4.56	25X25X2.6	4.56	25X25X2.6	4.56	25X25X2.6	4.56	25X25X2.6	4.56	KG
12	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	KG
13	25X25X2.6	2.28	25X25X2.6	2.28	25X25X2.6	2.28	25X25X2.6	2.28	25X25X2.6	2.28	25X25X2.6	2.28	KG
14	80X40X2.6	44.91	80X40X3.2	54.29	80X40X4	66.23	96X48X3.2	66.23	96X48X3.2	66.23	96X48X4	81.13	KG
15	25X25X2.6	5.64	25X25X2.6	5.64	25X25X2.6	5.64	25X25X2.6	5.64	25X25X2.6	5.64	25X25X2.6	5.64	KG
	TOTAL	**349.96**	**TOTAL**	**359.34**	**TOTAL**	**401.48**	**TOTAL**	**454.43**	**TOTAL**	**479.95**	**TOTAL**	**513.46**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		6632		6681		6898		7171		7302		7474	N
LL		18975		18975		18975		18975		18975		18975	N
WL0+PRE	2455	-26478	3438	-37007	4359	-47072	4969	-53709	5627	-60779	6802	-73549	N
		-23213		-32426		-41269		-47082		-53287		-64485	N
WL90+PRE		-29400		-41064		-52271		-59647		-67498		-81671	N

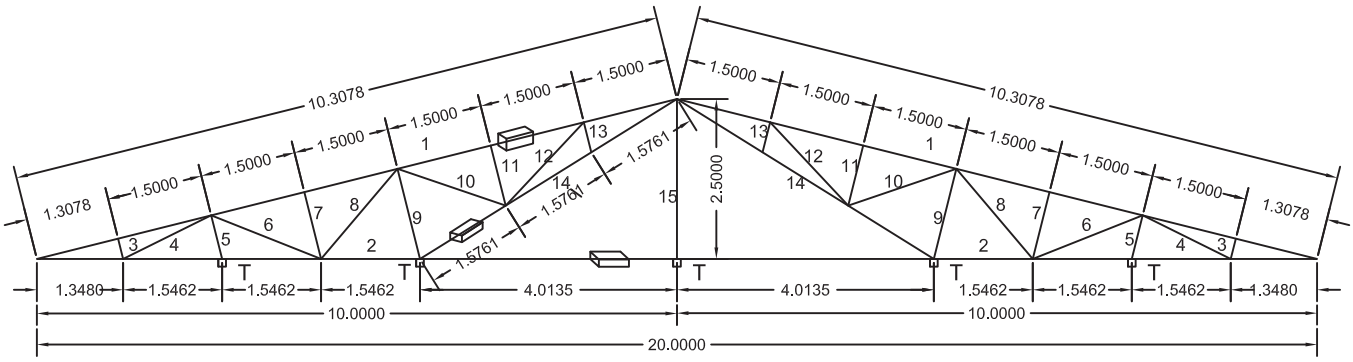
Span : 20m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4	141.51	60X60X4	141.51	60X60X4	141.51	60X60X4	141.51	60X60X4.8	165.56	80X80X4	194.45	KG
2	96X48X3.2	134.20	96X48X4	164.40	122X61X3.6	193.40	122X61X3.6	193.40	122X61X3.6	193.40	122X61X4.5	237.60	KG
3	25X25X2.6	1.74	25X25X2.6	1.74	25X25X2.6	1.74	25X25X2.6	1.74	25X25X2.6	1.74	25X25X2.6	1.74	KG
4	25X25X2.6	5.37	25X25X2.6	5.37	32X32X2.6	7.19	32X32X2.6	7.19	32X32X2.6	7.19	32X32X2.6	7.19	KG
5	25X25X2.6	3.41	25X25X2.6	3.41	25X25X2.6	3.41	25X25X2.6	3.41	25X25X2.6	3.41	25X25X2.6	3.41	KG
6	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	32X32X2.6	9.67	KG
7	25X25X2.6	5.12	25X25X2.6	5.12	25X25X2.6	5.12	25X25X2.6	5.12	25X25X2.6	5.12	25X25X2.6	5.12	KG
8	32X32X2.6	9.67	32X32X2.6	9.67	38X38X2.6	11.77	38X38X2.6	11.77	38X38X2.6	11.77	40X40X2.6	12.50	KG
9	38X38X2.6	11.11	38X38X2.6	11.11	38X38X2.6	11.11	38X38X2.6	11.11	38X38X2.6	11.11	38X38X2.6	11.11	KG
10	32X32X2.6	9.15	32X32X2.6	9.15	32X32X2.6	9.15	32X32X2.6	9.15	32X32X2.6	9.15	38X38X2.6	11.14	KG
11	25X25X2.6	4.56	25X25X2.6	4.56	25X25X2.6	4.56	25X25X2.6	4.56	25X25X2.6	4.56	25X25X2.6	4.56	KG
12	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	KG
13	25X25X2.6	2.28	25X25X2.6	2.28	25X25X2.6	2.28	25X25X2.6	2.28	25X25X2.6	2.28	25X25X2.6	2.28	KG
14	80X40X2.6	44.91	80X40X4	66.23	96X48X3.2	66.23	96X48X4	81.13	96X48X4	81.13	122X61X3.6	95.44	KG
15	25X25X2.6	5.64	25X25X2.6	5.64	25X25X2.6	5.64	25X25X2.6	5.64	25X25X2.6	5.64	25X25X2.6	5.64	KG
	TOTAL	**397.50**	**TOTAL**	**449.02**	**TOTAL**	**481.93**	**TOTAL**	**496.83**	**TOTAL**	**520.87**	**TOTAL**	**610.99**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		11294		11385		11611		11713		11879		12498	N
LL		25311		25311		25311		25311		25312		25311	N
WL0+PRE	3273	-35322	4574	-49354	5820	-62806	6640	-71649	7514	-81076	9095	-98126	N
		-30966		-43269		-55062		-62814		-71078		-86028	N
WL90+PRE		-39219		-54801		-69736		-79557		-90022		-108956	N

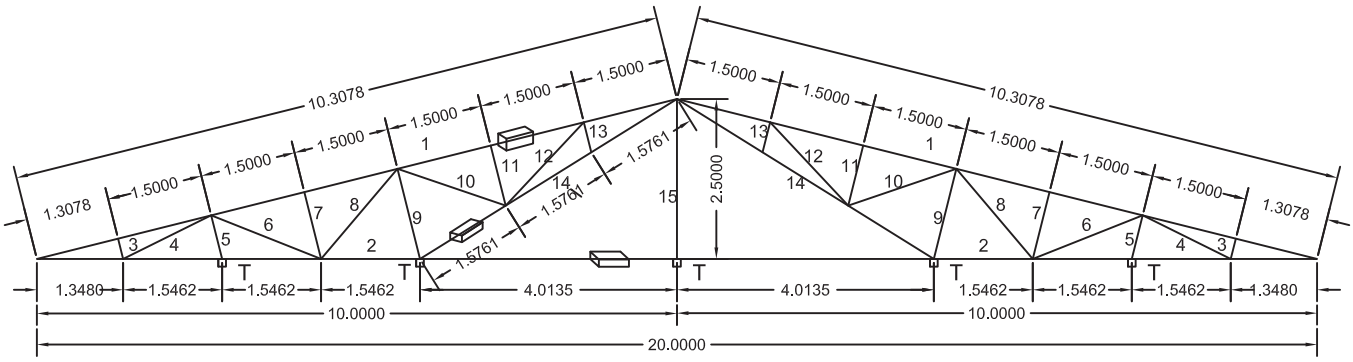
Span : 20m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4	138.36	60X60X4	138.36	60X60X4	138.36	60X60X4	138.36	60X60X4.8	161.87	72X72X4.8	199.19	KG
2	96X48X4	164.40	122X61X3.6	193.40	122X61X3.6	193.40	122X61X4.5	237.60	122X61X5.4	280.20	145X82X4.8	318.40	KG
3	25X25X2.6	1.11	25X25X2.6	1.11	25X25X2.6	1.11	25X25X2.6	1.11	25X25X2.6	1.11	25X25X2.6	1.11	KG
4	25X25X2.6	5.21	25X25X2.6	5.21	32X32X2.6	6.96	32X32X2.6	6.96	32X32X2.6	6.96	32X32X2.6	6.96	KG
5	25X25X2.6	2.38	25X25X2.6	2.38	25X25X2.6	2.38	25X25X2.6	2.38	25X25X2.6	2.38	25X25X2.6	2.38	KG
6	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	KG
7	25X25X2.6	3.63	25X25X2.6	3.63	25X25X2.6	3.63	25X25X2.6	3.63	25X25X2.6	3.63	25X25X2.6	3.63	KG
8	25X25X2.6	6.25	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	38X38X2.6	10.18	38X38X2.6	10.18	KG
9	32X32X2.6	6.60	32X32X2.6	6.60	32X32X2.6	6.60	32X32X2.6	6.60	32X32X2.6	6.60	32X32X2.6	6.60	KG
10	25X25X2.6	6.05	32X32X2.6	8.09	32X32X2.6	8.09	32X32X2.6	8.09	32X32X2.6	8.09	32X32X3.2	9.63	KG
11	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	KG
12	25X25X2.6	6.83	25X25X2.6	6.83	25X25X2.6	6.83	25X25X2.6	6.83	25X25X2.6	6.83	25X25X2.6	6.83	KG
13	25X25X2.6	1.64	25X25X2.6	1.64	25X25X2.6	1.64	25X25X2.6	1.64	25X25X2.6	1.64	25X25X2.6	1.64	KG
14	80X40X2.6	43.04	96X48X3.2	63.48	96X48X3.2	63.48	96X48X4	77.76	122X61X3.6	91.48	122X61X3.6	91.48	KG
15	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	KG
	TOTAL	**401.36**	**TOTAL**	**454.94**	**TOTAL**	**456.70**	**TOTAL**	**515.18**	**TOTAL**	**596.82**	**TOTAL**	**673.88**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		6832		7107		7116		7426		7839		8235	N
LL		20705		20704		20704		20704		20704		20704	N
WL0+PRE	2775	-30519	3883	-42616	4950	-54250	5636	-61898	6386	-70054	7718	-84758	N
		-25307		-35336		-44978		-51325		-58088		-70275	N
WL90+PRE		-30746		-41436		-52279		-59653		-67516		-81696	N

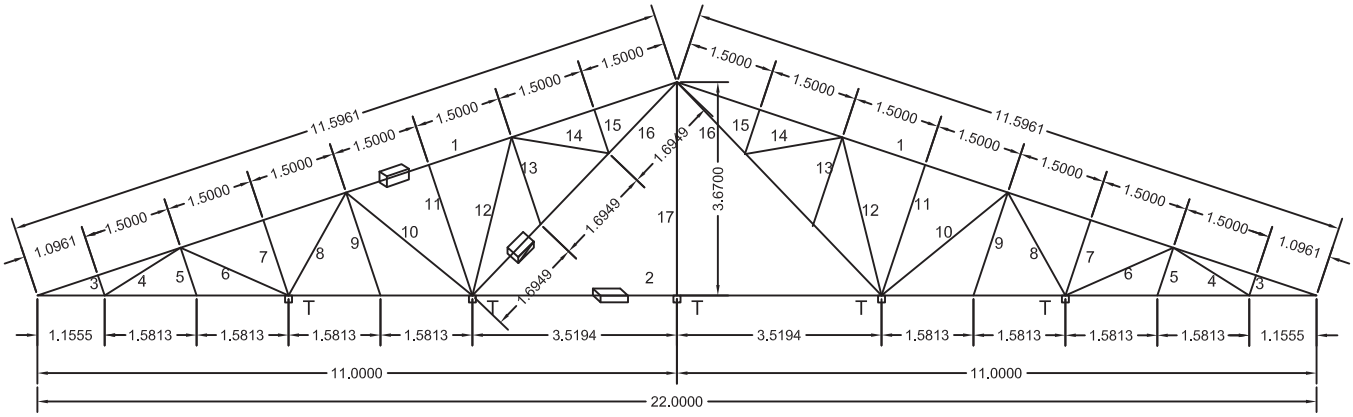
Span : 20m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	72X72X4	169.50	72X72X4	169.50	72X72X4	169.50	80X80X4	190.12	80X80X4.8	224.14	91X91X5.4	288.89	KG
2	122X61X3.6	193.40	122X61X3.6	193.40	122X61X4.5	237.60	122X61X5.4	280.20	145X82X4.8	318.40	145X82X4.8	318.40	KG
3	25X25X2.6	1.11	25X25X2.6	1.11	25X25X2.6	1.11	25X25X2.6	1.11	25X25X2.6	1.11	25X25X2.6	1.11	KG
4	25X25X2.6	5.21	32X32X2.6	6.96	32X32X2.6	6.96	32X32X2.6	6.96	38X38X2.6	8.47	38X38X2.6	8.47	KG
5	25X25X2.6	2.38	25X25X2.6	2.38	25X25X2.6	2.38	25X25X2.6	2.38	25X25X2.6	2.38	25X25X2.6	2.38	KG
6	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	32X32X2.6	8.36	KG
7	25X25X2.6	3.63	25X25X2.6	3.63	25X25X2.6	3.63	25X25X2.6	3.63	25X25X2.6	3.63	25X25X2.6	3.63	KG
8	32X32X2.6	8.36	32X32X2.6	8.36	38X38X2.6	10.18	38X38X2.6	10.18	38X38X2.6	10.18	38X38X3.2	12.17	KG
9	32X32X2.6	6.60	32X32X2.6	6.60	32X32X2.6	6.60	32X32X2.6	6.60	32X32X2.6	6.60	32X32X2.6	6.60	KG
10	25X25X2.6	6.05	32X32X2.6	8.09	32X32X2.6	8.09	32X32X2.6	8.09	38X38X2.6	9.85	38X38X2.6	9.85	KG
11	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	KG
12	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	32X32X2.6	9.13	KG
13	25X25X2.6	1.64	25X25X2.6	1.64	25X25X2.6	1.64	25X25X2.6	1.64	25X25X2.6	1.64	25X25X2.6	1.64	KG
14	80X40X4	63.48	96X48X3.2	63.48	96X48X4.8	91.38	122X61X3.6	91.48	122X61X3.6	91.48	122X61X4.5	112.38	KG
15	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	25X25X2.6	4.23	KG
	TOTAL	**486.34**	**TOTAL**	**490.14**	**TOTAL**	**564.06**	**TOTAL**	**627.37**	**TOTAL**	**702.86**	**TOTAL**	**790.51**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		11551		11576		12085		12520		13039		13641	N
LL		27619		27619		27619		27619		27620		27619	N
WL0+PRE	3701	-40712	5169	-56856	6583	-72390	7509	-82583	8499	-93480	10284	-113102	N
		-33759		-47145		-60026		-68478		-77512		-93785	N
WL90+PRE		-41015		-57279		-72929		-83199		-94175		-113944	N

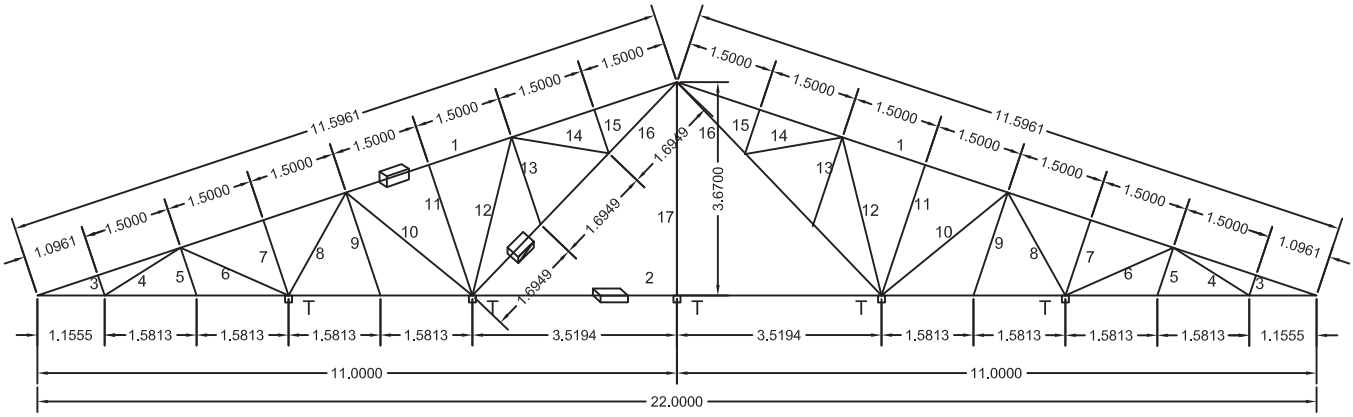
Span : 22m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X3.2	128.72	60X60X3.2	128.72	60X60X3.2	128.72	60X60X4	155.62	60X60X4	155.62	60X60X4.8	182.06	KG
2	96X48X3.2	147.62	96X48X4	180.84	122X61X3.6	212.74	122X61X3.6	212.74	122X61X4.5	261.36	122X61X5.4	308.22	KG
3	25X25X2.6	1.24	25X25X2.6	1.24	25X25X2.6	1.24	25X25X2.6	1.24	25X25X2.6	1.24	25X25X2.6	1.24	KG
4	25X25X2.6	5.22	25X25X2.6	5.22	25X25X2.6	5.22	25X25X2.6	5.22	32X32X2.6	6.98	32X32X2.6	6.98	KG
5	25X25X2.6	2.93	25X25X2.6	2.93	25X25X2.6	2.93	25X25X2.6	2.93	25X25X2.6	2.93	25X25X2.6	2.93	KG
6	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	KG
7	25X25X2.6	4.62	25X25X2.6	4.62	25X25X2.6	4.62	25X25X2.6	4.62	25X25X2.6	4.62	25X25X2.6	4.62	KG
8	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	38X38X2.6	11.16	KG
9	25X25X2.6	6.31	25X25X2.6	6.31	25X25X2.6	6.31	25X25X2.6	6.31	25X25X2.6	6.31	25X25X2.6	6.31	KG
10	38X38X2.6	15.41	38X38X2.6	15.41	38X38X2.6	15.41	38X38X2.6	15.41	38X38X2.6	15.41	38X38X2.6	15.41	KG
11	32X32X2.6	10.70	32X32X2.6	10.70	32X32X2.6	10.70	32X32X2.6	10.70	32X32X2.6	10.70	32X32X2.6	10.70	KG
12	38X38X2.6	15.42	38X38X2.6	15.42	38X38X2.6	15.42	38X38X2.6	15.42	38X38X2.6	15.42	38X38X2.6	15.42	KG
13	25X25X2.6	5.34	25X25X2.6	5.34	25X25X2.6	5.34	25X25X2.6	5.34	25X25X2.6	5.34	25X25X2.6	5.34	KG
14	25X25X2.6	5.73	25X25X2.6	5.73	25X25X2.6	5.73	25X25X2.6	5.73	25X25X2.6	5.73	32X32X2.6	7.66	KG
15	25X25X2.6	2.67	25X25X2.6	2.67	25X25X2.6	2.67	25X25X2.6	2.67	25X25X2.6	2.67	25X25X2.6	2.67	KG
16	80X40X2.6	46.27	80X40X3.2	55.94	96X48X3.2	68.24	96X48X3.2	68.24	96X48X3.2	68.24	96X48X4	83.60	KG
17	25X25X2.6	6.20	25X25X2.6	6.20	25X25X2.6	6.20	25X25X2.6	6.20	25X25X2.6	6.20	25X25X2.6	6.20	KG
	TOTAL	**422.73**	**TOTAL**	**465.61**	**TOTAL**	**509.81**	**TOTAL**	**536.72**	**TOTAL**	**587.10**	**TOTAL**	**679.67**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		7557		7777		8005		8150		8410		8887	N
LL		20874		20874		20874		20874		20874		20874	N
WLO+PRE	2708	-29132	3779	-40688	4792	-51790	5463	-59088	6192	-66870	7486	-80931	N
		-25540		-35671		-45401		-51795		-58623		-70946	N
WL9O+PRE		-32346		-45180		-57510		-65627		-74262		-89855	N

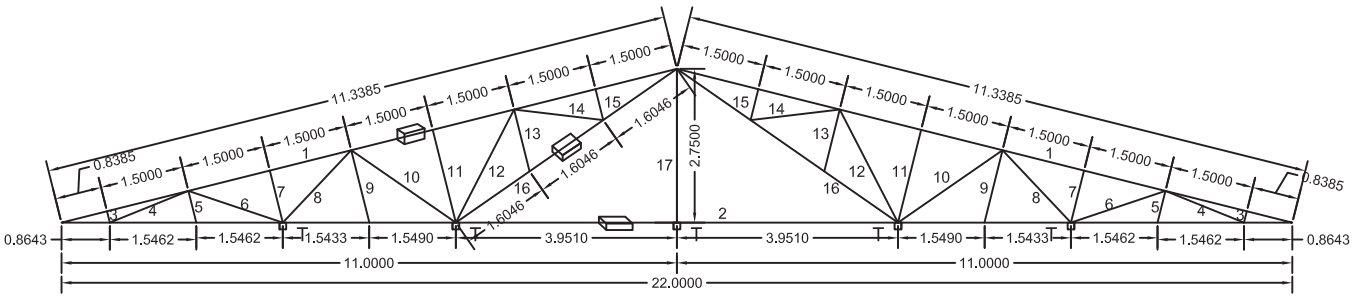
Span : 22m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4	155.62	60X60X4	155.62	60X60X4	155.62	60X60X4.8	182.06	80X80X4	213.83	80X80X4.8	252.10	KG
2	96X48X4	180.84	122X61X3.6	212.74	122X61X4.5	261.36	122X61X5.4	308.22	122X61X5.4	308.22	145X82X4.8	350.24	KG
3	25X25X2.6	1.24	25X25X2.6	1.24	25X25X2.6	1.24	25X25X2.6	1.24	25X25X2.6	1.24	25X25X2.6	1.24	KG
4	25X25X2.6	5.22	25X25X2.6	5.22	25X25X2.6	5.22	32X32X2.6	6.98	32X32X2.6	6.98	32X32X2.6	6.98	KG
5	25X25X2.6	2.93	25X25X2.6	2.93	25X25X2.6	2.93	25X25X2.6	2.93	25X25X2.6	2.93	25X25X2.6	2.93	KG
6	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	KG
7	25X25X2.6	4.62	25X25X2.6	4.62	25X25X2.6	4.62	25X25X2.6	4.62	25X25X2.6	4.62	25X25X2.6	4.62	KG
8	32X32X2.6	9.17	32X32X2.6	9.17	32X32X2.6	9.17	38X38X2.6	11.16	38X38X2.6	11.16	38X38X2.6	11.16	KG
9	25X25X2.6	6.31	25X25X2.6	6.31	25X25X2.6	6.31	25X25X2.6	6.31	25X25X2.6	6.31	25X25X2.6	6.31	KG
10	38X38X2.6	15.41	38X38X2.6	15.41	38X38X3.2	18.44	38X38X3.2	18.44	40X40X2.6	16.37	40X40X2.6	16.37	KG
11	32X32X2.6	10.70	32X32X2.6	10.70	32X32X2.6	10.70	32X32X2.6	10.70	32X32X2.6	10.70	32X32X2.6	10.70	KG
12	38X38X2.6	15.42	38X38X2.6	15.42	38X38X2.6	15.42	38X38X2.6	15.42	38X38X2.6	15.42	38X38X2.6	15.42	KG
13	25X25X2.6	5.34	25X25X2.6	5.34	25X25X2.6	5.34	25X25X2.6	5.34	25X25X2.6	5.34	25X25X2.6	5.34	KG
14	25X25X2.6	5.73	25X25X2.6	5.73	25X25X2.6	5.73	25X25X2.6	5.73	32X32X2.6	7.66	32X32X2.6	7.66	KG
15	25X25X2.6	2.67	25X25X2.6	2.67	25X25X2.6	2.67	25X25X2.6	2.67	25X25X2.6	2.67	25X25X2.6	2.67	KG
16	80X40X2.6	46.27	80X40X4	68.24	96X48X3.2	68.24	96X48X4	83.60	96X48X4.8	98.34	122X61X3.6	98.34	KG
17	25X25X2.6	6.20	25X25X2.6	6.20	25X25X2.6	6.20	25X25X2.6	6.20	25X25X2.6	6.20	25X25X2.6	6.20	KG
	TOTAL	**482.85**	**TOTAL**	**536.72**	**TOTAL**	**588.36**	**TOTAL**	**680.77**	**TOTAL**	**727.15**	**TOTAL**	**807.43**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		11765		12042		12308		12785		13023		13436	N
LL		27833		27833		27833		27833		27833		27833	N
WLO+PRE	3612	-38862	5026	-54115	6393	-69088	7288	-78823	8260	-89204	9986	-107962	N
		-34070		-47443		-60564		-69095		-78203		-94642	N
WL9O+PRE		-43150		-60270		-76718		-87546		-99066		-119866	N

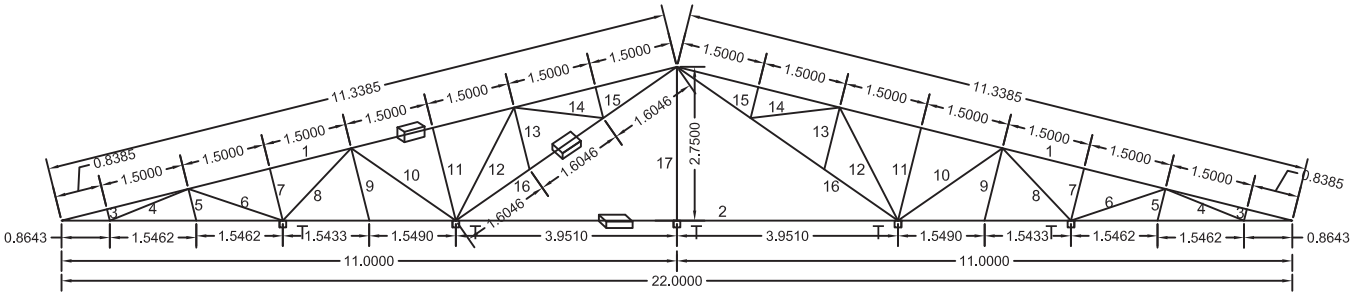
Span : 22m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4.8	178.01	60X60X4.8	178.01	60X60X4.8	178.01	60X60X4.8	178.01	80X80X4	209.08	80X80X4.8	246.50	KG
2	96X48X3.2	147.62	122X61X3.6	212.74	122X61X4.5	261.36	122X61X4.5	261.36	122X61X5.4	308.22	145X82X4.8	350.24	KG
3	25X25X2.6	0.71	25X25X2.6	0.71	25X25X2.6	0.71	25X25X2.6	0.71	25X25X2.6	0.71	25X25X2.6	0.71	KG
4	25X25X2.6	5.12	25X25X2.6	5.12	32X32X2.6	6.85	32X32X2.6	6.85	32X32X2.6	6.85	32X32X2.6	6.85	KG
5	25X25X2.6	1.98	25X25X2.6	1.98	25X25X2.6	1.98	25X25X2.6	1.98	25X25X2.6	1.98	25X25X2.6	1.98	KG
6	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	KG
7	25X25X2.6	3.24	25X25X2.6	3.24	25X25X2.6	3.24	25X25X2.6	3.24	25X25X2.6	3.24	25X25X2.6	3.24	KG
8	25X25X2.6	6.02	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	38X38X2.6	9.79	38X38X2.6	9.79	KG
9	25X25X2.6	4.51	25X25X2.6	4.51	25X25X2.6	4.51	25X25X2.6	4.51	25X25X2.6	4.51	25X25X2.6	4.51	KG
10	38X38X2.6	12.51	38X38X2.6	12.51	38X38X2.6	12.51	38X38X2.6	12.51	38X38X2.6	12.51	38X38X2.6	12.51	KG
11	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	KG
12	32X32X2.6	10.28	32X32X2.6	10.28	32X32X2.6	10.28	32X32X2.6	10.28	32X32X2.6	10.28	32X32X2.6	10.28	KG
13	25X25X2.6	3.85	25X25X2.6	3.85	25X25X2.6	3.85	25X25X2.6	3.85	25X25X2.6	3.85	25X25X2.6	3.85	KG
14	25X25X2.6	5.42	25X25X2.6	5.42	25X25X2.6	5.42	25X25X2.6	5.42	32X32X2.6	7.25	32X32X2.6	7.25	KG
15	25X25X2.6	1.93	25X25X2.6	1.93	25X25X2.6	1.93	25X25X2.6	1.93	25X25X2.6	1.93	25X25X2.6	1.93	KG
16	80X40X2.6	43.81	80X40X4	64.60	96X48X3.2	64.60	96X48X4	79.14	96X48X4.8	93.10	122X61X3.6	93.10	KG
17	25X25X2.6	4.65	25X25X2.6	4.65	25X25X2.6	4.65	25X25X2.6	4.65	25X25X2.6	4.65	25X25X2.6	4.65	KG
	TOTAL	**443.48**	**TOTAL**	**531.43**	**TOTAL**	**581.78**	**TOTAL**	**596.31**	**TOTAL**	**691.78**	**TOTAL**	**771.21**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		9173		9627		9886		9961		10452		10861	N
LL		22768		22768		22768		22768		22768		22768	N
WLO+PRE	3054	-33565	4272	-46864	5443	-59662	6199	-68074	7022	-77041	8490	-93213	N
		-27831		-38862		-49469		-56448		-63884		-77290	N
WL9O+PRE		-32338		-45082		-57494		-65606		-74098		-89848	N

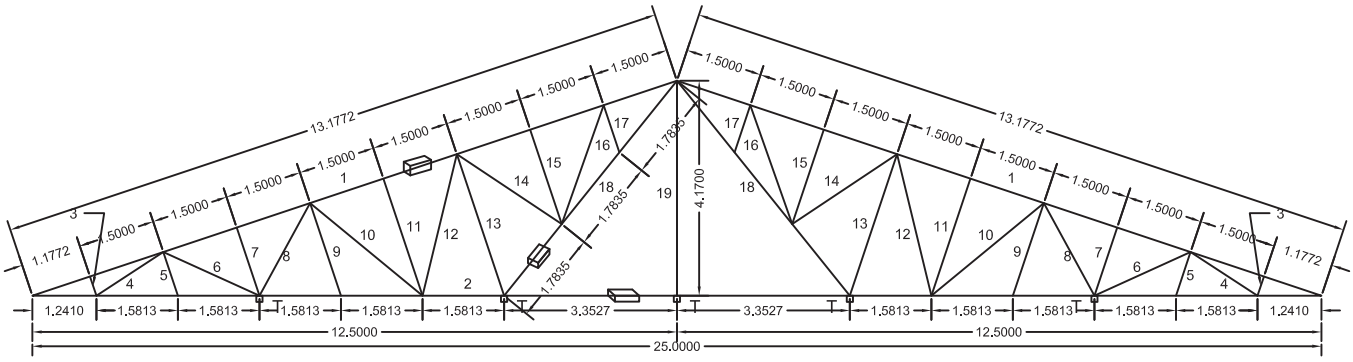
Span : 22m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	72X72X4	186.40	72X72X4	186.40	80X80X4	209.08	80X80X4.8	246.50	91X91X4.5	269.40	91X91X5.4	317.70	KG
2	122X61X3.6	212.74	122X61X4.5	261.36	122X61X5.4	308.22	145X82X4.8	350.24	145X82X4.8	350.24	172X92X4.8	411.62	KG
3	25X25X2.6	0.71	25X25X2.6	0.71	25X25X2.6	0.71	25X25X2.6	0.71	25X25X2.6	0.71	25X25X2.6	0.71	KG
4	25X25X2.6	5.12	32X32X2.6	6.85	32X32X2.6	6.85	32X32X2.6	6.85	32X32X2.6	6.85	38X38X2.6	8.33	KG
5	25X25X2.6	1.98	25X25X2.6	1.98	25X25X2.6	1.98	25X25X2.6	1.98	25X25X2.6	1.98	25X25X2.6	1.98	KG
6	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	32X32X2.6	8.05	KG
7	25X25X2.6	3.24	25X25X2.6	3.24	25X25X2.6	3.24	25X25X2.6	3.24	25X25X2.6	3.24	25X25X2.6	3.24	KG
8	32X32X2.6	8.05	32X32X2.6	8.05	38X38X2.6	9.79	38X38X2.6	9.79	38X38X2.6	9.79	40X40X2.6	10.40	KG
9	25X25X2.6	4.51	25X25X2.6	4.51	25X25X2.6	4.51	25X25X2.6	4.51	25X25X2.6	4.51	25X25X2.6	4.51	KG
10	38X38X2.6	12.51	38X38X2.6	12.51	38X38X2.6	12.51	38X38X2.6	12.51	38X38X2.6	12.51	38X38X2.6	12.51	KG
11	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	25X25X2.6	5.78	KG
12	32X32X2.6	10.28	32X32X2.6	10.28	32X32X2.6	10.28	32X32X2.6	10.28	32X32X2.6	10.28	32X32X2.6	10.28	KG
13	25X25X2.6	3.85	25X25X2.6	3.85	25X25X2.6	3.85	25X25X2.6	3.85	25X25X2.6	3.85	25X25X2.6	3.85	KG
14	25X25X2.6	5.42	25X25X2.6	5.42	32X32X2.6	10.28	32X32X2.6	7.25	32X32X2.6	7.25	32X32X2.6	7.25	KG
15	25X25X2.6	1.93	25X25X2.6	1.93	25X25X2.6	1.93	25X25X2.6	1.93	25X25X2.6	1.93	25X25X2.6	1.93	KG
16	80X40X4	64.60	96X48X3.2	64.60	122X61X3.6	93.10	122X61X3.6	93.10	122X61X3.6	93.10	122X61X4.5	114.38	KG
17	25X25X2.6	4.65	25X25X2.6	4.65	25X25X2.6	4.65	25X25X2.6	4.65	25X25X2.6	4.65	25X25X2.6	4.65	KG
	TOTAL	**539.82**	**TOTAL**	**590.17**	**TOTAL**	**694.80**	**TOTAL**	**771.21**	**TOTAL**	**794.12**	**TOTAL**	**927.17**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		11963		12222		12746		13154		13273		14010	N
LL		30361		30361		30361		30361		30361		30361	N
WLO+PRE	4974	-44776	5699	-62516	7261	-79589	8269	-90811	9367	-102772	11326	-124347	N
		-37126		-51842		-65991		-75302		-85222		-103104	N
WL9O+PRE		-43139		-60139		-76697		-87518		-98846		-119857	N

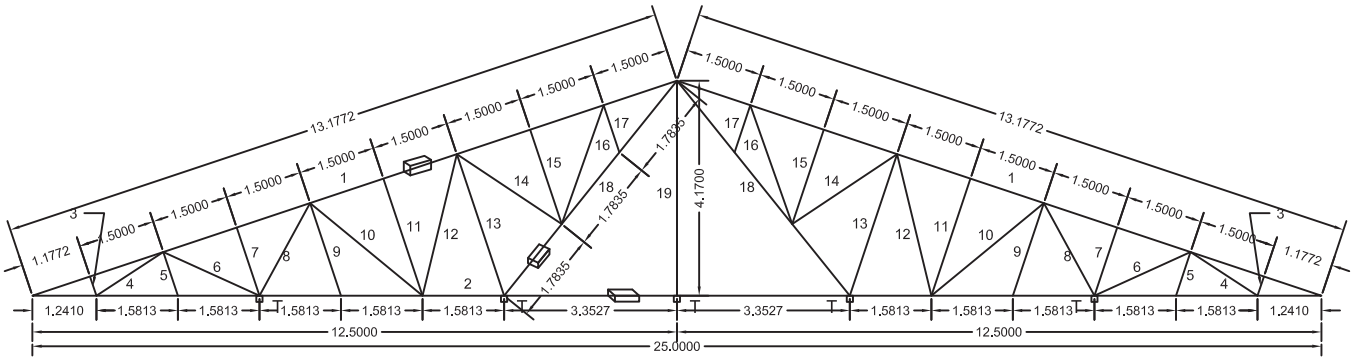
Span : 25m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X3.2	144.98	60X60X3.2	144.98	60X60X3.2	144.98	60X60X4.0	176.88	60X60X4.8	206.93	80X80X4.0	243.04	KG
2	96X48X3.2	167.75	96X48X4.8	241.50	122X61X3.6	241.75	122X61X4.5	297.00	122X61X5.4	350.25	145X82X4.8	398.00	KG
3	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	KG
4	25X25X2.6	5.26	25X25X2.6	5.26	25X25X2.6	5.26	25X25X2.6	5.26	32X32X2.6	7.03	32X32X2.6	7.03	KG
5	25X25X2.6	3.03	25X25X2.6	3.03	25X25X2.6	3.03	25X25X2.6	3.03	25X25X2.6	3.03	25X25X2.6	3.03	KG
6	32X32X2.6	9.24	32X32X2.6	9.24	32X32X2.6	9.24	32X32X2.6	9.24	32x32x2.6	9.24	32X32X2.6	9.24	KG
7	25X25X2.6	4.71	25X25X2.6	4.71	25X25X2.6	4.71	25X25X2.6	4.71	25X25X2.6	4.71	25X25X2.6	4.71	KG
8	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X3.2	11.03	38x38x2.6	11.28	KG
9	25X25X2.6	6.41	25X25X2.6	6.41	25X25X2.6	6.41	25X25X2.6	6.41	25X25X2.6	6.41	25X25X2.6	6.41	KG
10	38X38X2.6	15.57	38X38X2.6	15.57	38x38x2.6	15.57	38x38x2.6	15.57	38x38x2.6	15.57	38x38x2.6	15.57	KG
11	32X32X2.6	10.83	32X32X2.6	10.83	32X32X2.6	10.83	32X32X2.6	10.83	32X32X2.6	10.83	32X32X2.6	10.83	KG
12	38X38X2.6	15.57	38X38X2.6	15.57	40X40X2.6	16.53	40X40X3.2	19.75	50X50X2.6	21.17	50X50X2.6	21.17	KG
13	40X40X3.2	20.21	40X40X3.2	20.21	40X40X3.2	20.21	40X40X3.2	20.21	40X40X3.2	20.21	40X40X3.2	20.21	KG
14	32X32X2.6	11.05	32X32X2.6	11.05	32X32X2.6	11.05	38x38x2.6	13.45	38x38x2.6	13.45	38x38x2.6	13.45	KG
15	32X32X2.6	8.72	32X32X2.6	8.72	32X32X2.6	8.72	32X32X2.6	8.72	32X32X2.6	8.72	32X32X2.6	8.72	KG
16	32X32X2.6	11.04	32X32X2.6	11.04	32X32X2.6	11.04	32X32X2.6	11.04	32X32X2.6	11.04	32X32X2.6	11.04	KG
17	25X25X2.6	3.26	25X25X2.6	3.26	25X25X2.6	3.26	25X25X2.6	3.26	25X25X2.6	3.26	25X25X2.6	3.26	KG
18	80X40X2.6	48.73	80X40X3.2	58.91	96X48X3.2	71.86	96X48X3.2	71.86	96X48X4	88.04	122X61X3.6	103.57	KG
19	25X25X2.6	7.05	25X25X2.6	7.05	25X25X2.6	7.05	25X25X2.6	7.05	25X25X2.6	7.05	25X25X2.6	7.05	KG
	TOTAL	**503.98**	**TOTAL**	**587.90**	**TOTAL**	**602.07**	**TOTAL**	**694.84**	**TOTAL**	**799.26**	**TOTAL**	**898.90**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		8672		9106		9178		9656		10194		10706	N
LL		23720		23719		23721		23721		23721		23721	N
WL0+PRE	3069	-33114	4297	-46245	5449	-58867	6209	-67119	7039	-75999	8505	-91977	N
		-29029		-40544		-51602		-58836		-66617		-81129	N
WL90+PRE		-36764		-51351		-65366		-74547		-84389		-102107	N

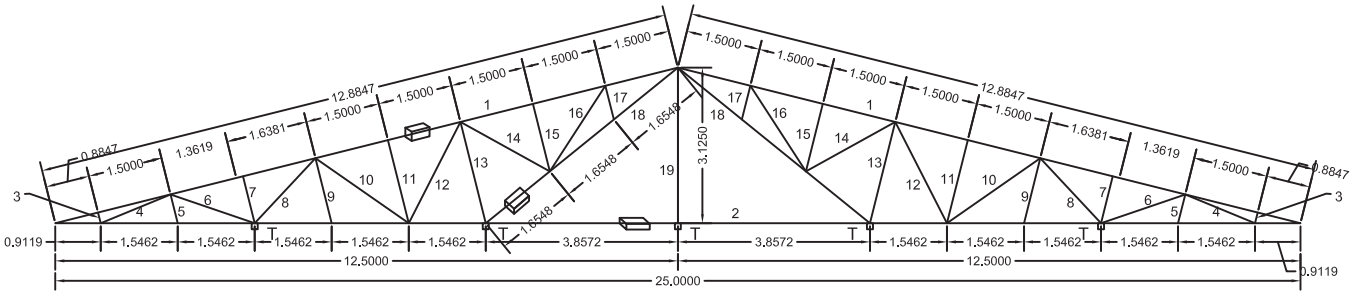
Span : 25m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4.0	176.88	60X60X4.0	176.88	72X72X4	216.68	72X72X4.0	216.68	72X72X4.8	254.64	91X91X4.5	313.16	KG
2	96X48X4	205.50	122X61X3.6	241.75	122X61X4.5	297.00	145X82X4.8	398.00	145X82X4.8	398.00	145X82X5.4	443.50	KG
3	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	KG
4	25X25X2.6	5.26	25X25X2.6	5.26	32X32X2.6	7.03	32X32X2.6	7.03	32X32X2.6	7.03	32X32X2.6	7.03	KG
5	25X25X2.6	3.03	25X25X2.6	3.03	25X25X2.6	3.03	25X25X2.6	3.03	25X25X2.6	3.03	25X25X2.6	3.03	KG
6	32X32X2.6	9.24	32X32X2.6	9.24	32X32X2.6	9.24	32X32X2.6	9.24	32X32X2.6	9.24	32X32X2.6	9.24	KG
7	25X25X2.6	4.71	25X25X2.6	4.71	25X25X2.6	4.71	25X25X2.6	4.71	25X25X2.6	4.71	25X25X2.6	4.71	KG
8	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	38X38X2.6	11.28	38X38X2.6	11.28	38X38X2.6	11.28	KG
9	25X25X2.6	6.41	25X25X2.6	6.41	25X25X2.6	6.41	25X25X2.6	6.41	25X25X2.6	6.41	25X25X2.6	6.41	KG
10	38X38X2.6	15.57	38X38X2.6	15.57	38X38X2.6	15.57	38X38X2.6	15.57	38X38X2.6	15.57	38X38X2.6	15.57	KG
11	32X32X2.6	10.83	32X32X2.6	10.83	32X32X2.6	10.83	32X32X2.6	10.83	32X32X2.6	10.83	32X32X2.6	10.83	KG
12	38X38X2.6	15.57	40X40X3.2	19.75	50X50X2.6	21.17	50X50X2.6	21.17	50X50X2.6	21.17	50X50X2.9	23.32	KG
13	40X40X3.2	20.21	50X50X2.6	21.65	50X50X2.6	21.65	50X50X2.6	21.65	50X50X2.6	21.65	50X50X2.6	21.65	KG
14	32X32X2.6	11.05	32X32X2.6	11.05	32X32X2.6	11.05	38X38X2.6	13.45	38X38X2.6	13.45	38X38X2.6	13.45	KG
15	32X32X2.6	8.72	32X32X2.6	8.72	32X32X2.6	8.72	32X32X2.6	8.72	32X32X2.6	8.72	32X32X2.6	8.72	KG
16	32X32X2.6	11.04	32X32X2.6	11.04	32X32X2.6	11.04	32X32X2.6	11.04	32X32X2.6	11.04	32X32X2.6	11.04	KG
17	25X25X2.6	3.26	25X25X2.6	3.26	25X25X2.6	3.26	25X25X2.6	3.26	25X25X2.6	3.26	25X25X2.6	3.26	KG
18	80X40X2.6	48.73	96X48X3.2	71.86	96X48X4	88.04	96X48X4	88.04	122X61X3.6	103.57	122X61X3.6	103.57	KG
19	25X25X2.6	7.05	25X25X2.6	7.05	25X25X2.6	7.05	25X25X2.6	7.05	25X25X2.6	7.05	25X25X2.6	7.05	KG
	TOTAL	**573.62**	**TOTAL**	**638.64**	**TOTAL**	**753.06**	**TOTAL**	**858.46**	**TOTAL**	**911.95**	**TOTAL**	**1018.12**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		13401		13736		14325		14867		15143		15690	N
LL		31629		31629		31629		31629		31629		31629	N
WL0+PRE	4092	-44174	5732	-61692	7267	-78528	8282	-89535	9389	-101369	11344	-122698	N
		-38725		-54084		-68836		-78486		-88867		-108225	N
WL90+PRE		-49044		-68500		-87197		-99445		-112574		-136211	N

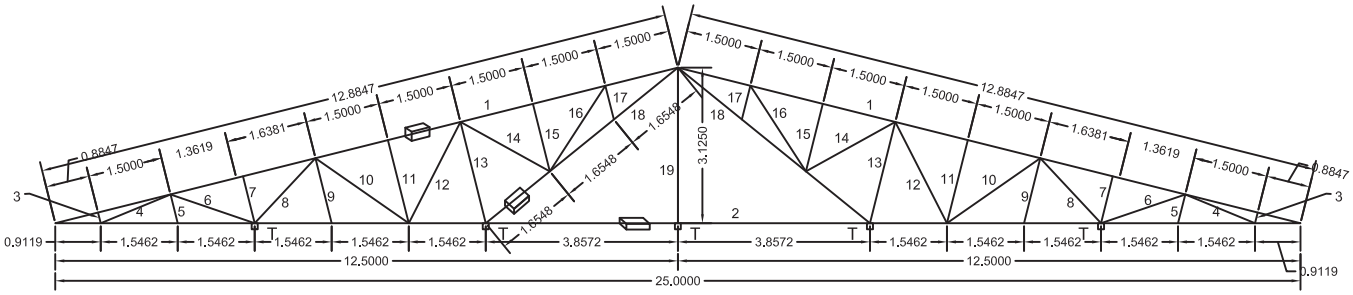
Span : 25m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4.8	202.29	60X60X4.8	202.29	72X72X4	211.83	80X80X4	237.60	72X72X4.8	248.94	91X91X4.5	306.15	KG
2	96X48X4	205.50	122X61X3.6	241.75	122X61X4.5	297.00	122X61X5.4	350.25	145X82X4.8	398.00	145X82X5.4	443.50	KG
3	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	KG
4	25X25X2.6	5.12	25X25X2.6	5.12	32X32X2.6	6.85	32X32X2.6	6.85	32X32X2.6	6.85	32X32X2.6	6.85	KG
5	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	KG
6	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	KG
7	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	KG
8	25X25X2.6	6.04	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	38X38X2.6	9.83	38X38X2.6	9.83	KG
9	25X25X2.6	4.55	25X25X2.6	4.55	25X25X2.6	4.55	25X25X2.6	4.55	25X25X2.6	4.55	25X25X2.6	4.55	KG
10	38X38X2.6	12.56	38X38X2.6	12.56	38X38X2.6	12.56	38X38X2.6	12.56	38X38X2.6	12.56	38X38X2.6	12.56	KG
11	25X25X2.6	5.82	25X25X2.6	5.82	25X25X2.6	5.82	25X25X2.6	5.82	25X25X2.6	5.82	25X25X2.6	5.82	KG
12	32X32X2.6	10.32	38X38X2.6	12.56	38X38X2.6	12.56	40X40X2.6	13.33	40X40X3.2	15.94	50X50X2.6	17.08	KG
13	38X38X2.6	11.52	38X38X2.6	11.52	38X38X2.6	11.52	38X38X2.6	11.52	38X38X2.6	11.52	38X38X2.6	11.52	KG
14	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	38X38X2.6	11.28	KG
15	25X25X2.6	4.72	25X25X2.6	4.72	25X25X2.6	4.72	25X25X2.6	4.72	25X25X2.6	4.72	25X25X2.6	4.72	KG
16	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	KG
17	25X25X2.6	2.36	25X25X2.6	2.36	25X25X2.6	2.36	25X25X2.6	2.36	25X25X2.6	2.36	25X25X2.6	2.36	KG
18	80X40X2.6	45.18	96X48X3.2	66.62	96X48X3.2	66.62	96X48X4	81.61	96X48X4.8	95.91	122X61X3.6	96.01	KG
19	25X25X2.6	5.28	25X25X2.6	5.28	25X25X2.6	5.28	25X25X2.6	5.28	25X25X2.6	5.28	25X25X2.6	5.28	KG
	TOTAL	**553.92**	**TOTAL**	**615.89**	**TOTAL**	**682.41**	**TOTAL**	**777.19**	**TOTAL**	**854.93**	**TOTAL**	**960.89**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		10610		10929		11271		11759		12160		12705	N
LL		25873		25873		25873		25873		25873		25873	N
WL0+PRE	3470	-38143	4854	-53257	6184	-67798	7044	-77357	7979	-87546	9647	-105925	N
		-31627		-44162		-56215		-64143		-72596		-87839	N
WL90+PRE		-36747		-51343		-65336		-74552		-84379		-102100	N

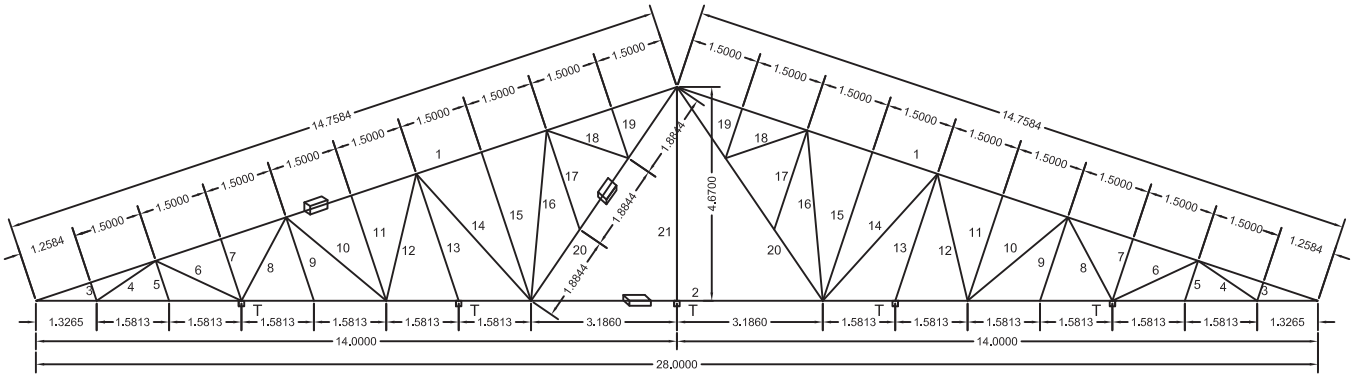
Span : 25m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	80X80X4.0	237.60	80X80X4	237.60	72X72X4.8	248.94	91X91X4.5	306.15	91X91X5.4	361.04	113X113X4.8	410.26	KG
2	122X61X3.6	241.75	122X61X4.5	297.00	145X82X4.8	398.00	145X82X4.8	398.00	145X85X5.4	443.00	172X92X5.4	522.00	KG
3	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	KG
4	25X25X2.6	5.12	32X32X2.6	6.85	32X32X2.6	6.85	32X32X2.6	6.85	32X32X2.6	6.85	38X38X2.6	8.34	KG
5	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	KG
6	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	32X32X2.6	8.08	KG
7	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	25X25X2.6	3.28	KG
8	32X32X2.6	8.08	32X32X2.6	8.08	38X38X2.6	9.83	38X38X2.6	9.83	38X38X2.6	9.83	40X40X2.6	10.44	KG
9	25X25X2.6	4.55	25X25X2.6	4.55	25X25X2.6	4.55	25X25X2.6	4.55	25X25X2.6	4.55	25X25X2.6	4.55	KG
10	38X38X2.6	12.56	38X38X2.6	12.56	38X38X2.6	12.56	38X38X2.6	12.56	38X38X2.6	12.56	38X38X2.6	12.56	KG
11	25X25X2.6	5.82	25X25X2.6	5.82	25X25X2.6	5.82	25X25X2.6	5.82	25X25X2.6	5.82	25X25X2.6	5.82	KG
12	38X38X2.6	12.56	38X38X2.6	12.56	50X50X2.6	17.08	50X50X2.6	17.08	50X50X2.6	17.08	50X50X2.6	17.08	KG
13	40X40X2.6	12.24	38X38X2.6	11.53	38X38X2.6	11.53	38X38X2.6	11.53	38X38X2.6	11.53	38X38X2.6	11.53	KG
14	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	38X38X2.6	11.28	38X38X2.6	11.28	KG
15	25X25X2.6	4.72	25X25X2.6	4.72	25X25X2.6	4.72	25X25X2.6	4.72	25X25X2.6	4.72	25X25X2.6	4.72	KG
16	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	32X32X2.6	9.27	KG
17	25X25X2.6	2.36	25X25X2.6	2.36	25X25X2.6	2.36	25X25X2.6	2.36	25X25X2.6	2.36	25X25X2.6	2.36	KG
18	96X48X3.2	66.62	96X48X3.2	66.62	122X61X3.6	96.01	122X61X3.6	96.01	122X61X3.6	96.01	122X61X4.5	117.95	KG
19	25X25X2.6	5.28	25X25X2.6	5.28	25X25X2.6	5.28	25X25X2.6	5.28	25X25X2.6	5.28	25X25X2.6	5.28	KG
	TOTAL	**651.92**	**TOTAL**	**708.18**	**TOTAL**	**856.18**	**TOTAL**	**913.39**	**TOTAL**	**1015.29**	**TOTAL**	**1167.55**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		13699		13990		14751		15046		15572		16347	N
LL		34499		34499		34499		34499		34499		34499	N
WL0+PRE	4622	-50861	6475	-71046	8250	-90442	9397	-103194	10644	-116787	12869	-141304	N
		-42172		-58912		-74992		-85567		-96843		-117165	N
WL90+PRE		-48998		-68491		-87159		-103439		-112561		-136202	N

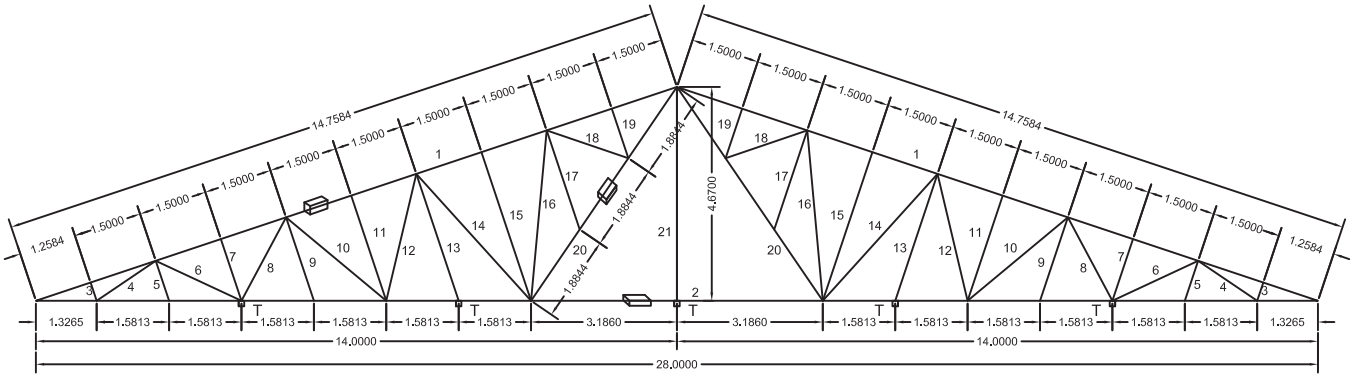
Span : 28m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4.0	198.08	60X60X4.0	198.08	60X60X4.0	198.08	60X60X4.8	231.73	60X60X4.8	231.73	80X80X4.8	320.88	KG
2	96X48X4	230.16	122X61X3.6	270.76	122X61X4.5	332.64	122X61X5.4	392.28	122X61X5.4	392.28	145X82X4.8	445.76	KG
3	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	KG
4	25X25X2.6	5.26	25X25X2.6	5.26	25X25X2.6	5.26	25X25X2.6	5.26	32X32X2.6	7.04	32X32X2.6	7.04	KG
5	25X25X2.6	3.11	25X25X2.6	3.11	25X25X2.6	3.11	25X25X2.6	3.11	25X25X2.6	3.11	25X25X2.6	3.11	KG
6	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	KG
7	25X25X2.6	4.82	25X25X2.6	4.82	25X25X2.6	4.82	25X25X2.6	4.82	25X25X2.6	4.82	25X25X2.6	4.82	KG
8	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	38X38X2.6	11.39	38X38X2.6	11.39	KG
9	25X25X2.6	6.51	25X25X2.6	6.51	25X25X2.6	6.51	25X25X2.6	6.51	25X25X2.6	6.51	25X25X2.6	6.51	KG
10	38X38X2.6	15.68	38X38X2.6	15.68	38X38X2.6	15.68	38X38X2.6	15.68	38X38X2.6	15.68	38X38X2.6	15.68	KG
11	32X32X2.6	10.96	32X32X2.6	10.96	32X32X2.6	10.96	32X32X2.6	10.96	32X32X2.6	10.96	32X32X2.6	10.96	KG
12	38X38X2.6	15.68	38X38X2.6	15.68	40X40X2.6	16.64	40X40X3.2	19.89	50X50X2.6	21.32	50X50X2.6	21.32	KG
13	25X25X2.6	9.87	25X25X2.6	9.87	25X25X2.6	9.87	25X25X2.6	9.87	25X25X2.6	9.87	25X25X2.6	9.87	KG
14	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	KG
15	50X50X2.6	25.62	50X50X2.6	25.62	50X50X2.6	25.62	50X50X2.6	25.62	50X50X2.6	25.62	50X50X2.6	25.62	KG
16	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	KG
17	25X25X2.6	7.72	25X25X2.6	7.72	25X25X2.6	7.72	32X32X2.6	10.33	32X32X2.6	10.33	32X32X2.6	10.33	KG
18	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	KG
19	25X25X2.6	3.87	25X25X2.6	3.87	25X25X2.6	3.87	25X25X2.6	3.87	25X25X2.6	3.87	25X25X2.6	3.87	KG
20	80X40X2.6	51.46	96X48X3.2	75.89	96X48X3.2	75.89	96X48X4	92.97	96X48X4	92.97	122X61X3.6	109.37	KG
21	32X32X2.6	10.55	32X32X2.6	10.55	32X32X2.6	10.55	32X32X2.6	10.55	32X32X2.6	10.55	32X32X2.6	10.55	KG
	TOTAL	**681.80**	**TOTAL**	**746.83**	**TOTAL**	**809.68**	**TOTAL**	**925.90**	**TOTAL**	**931.13**	**TOTAL**	**1090.16**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		11310		11538		11781		12220		13507		12862	N
LL		26567		26567		26567		26567		26567		26567	N
WL0+PRE	3442	-37077	4812	-51783	6099	-65914	6958	-75203	7881	-85108	9525	-102988	N
		-32505		-45399		-57782		-65919		-74612		-90290	N
WL90+PRE		-41169		-57384		-73193		-83524		-94516		-114359	N

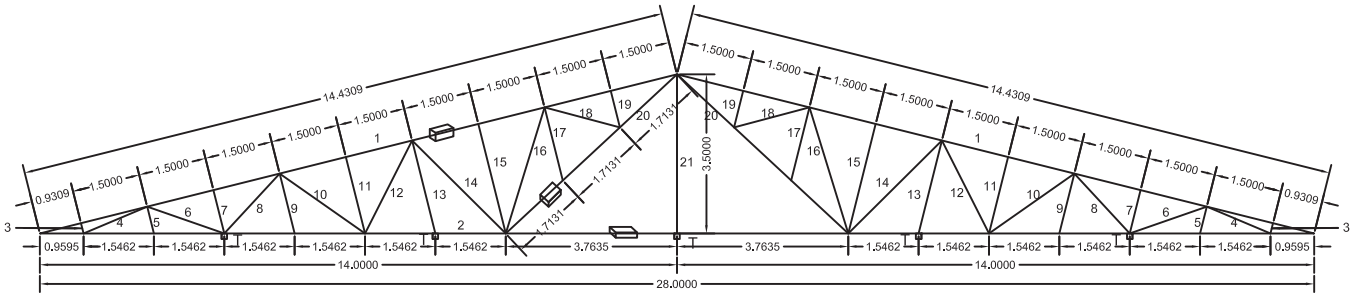
Span : 28m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	72X72X4.0	242.65	72X72X4.0	242.65	72X72X4.0	242.65	80X80X4.0	272.17	80X80X4.8	320.88	91X91X5.4	413.58	KG
2	96X48X4.8	270.48	122X61X4.5	332.64	122X61X5.4	392.28	145X82X4.8	445.76	145X82X4.8	445.76	172X92X4.8	523.88	KG
3	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	25X25X2.6	1.42	KG
4	25X25X2.6	5.26	32X32X2.6	7.04	32X32X2.6	7.04	32X32X2.6	7.04	32X32X2.6	7.04	32X32X2.6	7.04	KG
5	25X25X2.6	3.11	25X25X2.6	3.11	25X25X2.6	3.11	25X25X2.6	3.11	25X25X2.6	3.11	25X25X2.6	3.11	KG
6	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	32X32X2.6	9.36	KG
7	25X25X2.6	4.82	25X25X2.6	4.82	25X25X2.6	4.82	25X25X2.6	4.82	25X25X2.6	4.82	25X25X2.6	4.82	KG
8	32X32X2.6	9.36	32X32X2.6	9.36	38X38X2.6	11.39	38X38X2.6	11.39	38X38X2.6	11.39	40X40X2.6	12.09	KG
9	25X25X2.6	6.51	25X25X2.6	6.51	25X25X2.6	6.51	25X25X2.6	6.51	25X25X2.6	6.51	25X25X2.6	6.51	KG
10	40X40X2.6	16.64	40X40X2.6	16.64	40X40X2.6	16.64	40X40X3.2	19.89	50X50X2.6	21.32	40X40X2.6	16.64	KG
11	32X32X2.6	10.96	32X32X2.6	10.96	32X32X2.6	10.96	32X32X2.6	10.96	32X32X2.6	10.96	32X32X2.6	10.96	KG
12	38X38X2.6	15.68	40X40X2.6	16.64	50X50X2.6	21.32	50X50X2.6	21.32	50X50X2.6	21.32	50X50X2.9	23.48	KG
13	25X25X2.6	9.87	25X25X2.6	9.87	25X25X2.6	9.87	25X25X2.6	9.87	25X25X2.6	9.87	25X25X2.6	9.87	KG
14	50X50X2.6	27.98	50X50X2.6	27.98	50X50X3.6	37.25	50X50X3.6	37.25	50X50X3.6	37.25	50X50X2.9	30.82	KG
15	50X50X2.6	25.62	50X50X2.6	25.62	50X50X2.6	25.62	50X50X2.6	25.62	50X50X2.6	25.62	50X50X2.6	25.62	KG
16	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	50X50X2.6	27.98	KG
17	25X25X2.6	7.72	25X25X2.6	7.72	25X25X2.6	7.72	32X32X2.6	10.33	32X32X2.6	10.33	32X32X2.6	10.33	KG
18	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	32X32X2.6	8.52	32X32X2.6	8.52	KG
19	25X25X2.6	3.87	25X25X2.6	3.87	25X25X2.6	3.87	25X25X2.6	3.87	25X25X2.6	3.87	25X25X2.6	3.87	KG
20	80X40X3.2	62.21	96X48X3.2	75.89	96X48X4	92.97	96X48X4.8	109.37	122X61X3.6	109.37	122X61X3.6	109.37	KG
21	32X32X2.6	10.55	32X32X2.6	10.55	32X32X2.6	10.55	32X32X2.6	10.55	32X32X2.6	10.55	32X32X2.6	10.55	KG
	TOTAL	**778.41**	**TOTAL**	**857.00**	**TOTAL**	**949.69**	**TOTAL**	**1054.95**	**TOTAL**	**1107.23**	**TOTAL**	**1269.80**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		15663		16028		16505		17047		17333		18153	N
LL		35902		35902		35902		35902		35902		35902	N
WL0+PRE	4592	-49461	6417	-60978	8136	-87930	9281	-100320	10514	-113534	12706	-137387	N
		-43363		-60563		-77081		-87936		-99532		-120445	N
WL90+PRE		-54919		-76551		-97639		-111421		-126084		-152556	N

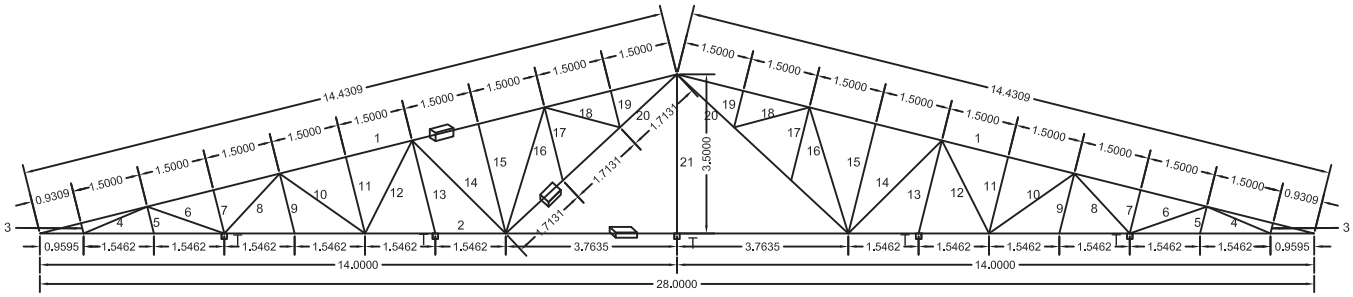
Span : 28m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	72X72X4.0	237.24	72X72X4.0	237.24	72X72X4.0	237.24	91X91X3.6	279.09	91X91X4.5	342.88	91X91X5.4	404.35	KG
2	122X61X3.6	270.76	122X61X4.5	332.64	122X61X5.4	392.28	145X82X4.8	445.76	145X82X4.8	445.76	145X82X5.4	496.72	KG
3	25X25X2.6	0.79	25X25X2.6	0.79	25X25X2.6	0.79	25X25X2.6	0.79	25X25X2.6	0.79	25X25X2.6	0.79	KG
4	25X25X2.6	5.23	25X25X2.6	5.23	32X32X2.6	6.99	32X32X2.6	6.99	32X32X2.6	6.99	32X32X2.6	6.99	KG
5	25X25X2.6	2.05	25X25X2.6	2.05	25X25X2.6	2.05	25X25X2.6	2.05	25X25X2.6	2.05	25X25X2.6	2.05	KG
6	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	KG
7	25X25X2.6	3.32	25X25X2.6	3.32	25X25X2.6	3.32	25X25X2.6	3.32	25X25X2.6	3.32	25X25X2.6	3.32	KG
8	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	38X38X2.6	9.86	38X38X2.6	9.86	KG
9	25X25X2.6	4.59	25X25X2.6	4.59	25X25X2.6	4.59	25X25X2.6	4.59	25X25X2.6	4.59	25X25X2.6	4.59	KG
10	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	KG
11	25X25X2.6	5.86	25X25X2.6	5.86	25X25X2.6	5.86	25X25X2.6	5.86	25X25X2.6	5.86	25X25X2.6	5.86	KG
12	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	40X40X3.2	16.00	40X40X3.2	16.00	50X50X2.9	18.88	KG
13	25X25X2.6	7.12	25X25X2.6	7.12	25X25X2.6	7.12	25X25X2.6	7.12	25X25X2.6	7.12	25X25X2.6	7.12	KG
14	40X40X3.2	20.25	40X40X3.2	20.25	40X40X3.2	20.25	40X40X3.2	20.25	40X40X3.2	20.25	40X40X3.2	20.25	KG
15	32X32X2.6	11.22	32X32X2.6	11.22	32X32X2.6	11.22	32X32X2.6	11.22	32X32X2.6	11.22	32X32X2.6	11.22	KG
16	38X38X2.6	15.95	38X38X2.6	15.95	38X38X2.6	15.95	38X38X2.6	15.95	38X38X2.6	15.95	38X38X2.6	15.95	KG
17	32X32X2.6	7.48	32X32X2.6	7.48	32X32X2.6	7.48	32X32X2.6	7.48	32X32X2.6	7.48	32X32X2.6	7.48	KG
18	25X25X2.6	5.79	25X25X2.6	5.79	25X25X2.6	5.79	25X25X2.6	5.79	25X25X2.6	5.79	32X32X2.6	7.74	KG
19	25X25X2.6	2.80	25X25X2.6	2.80	25X25X2.6	2.80	25X25X2.6	2.80	25X25X2.6	2.80	25X25X2.6	2.80	KG
20	80X40X4.8	80.69	80X40X4.8	80.69	96X48X3.2	68.97	96X48X4	84.49	96X48X4.8	99.29	122X61X3.6	99.40	KG
21	25X25X2.6	5.92	25X25X2.6	5.92	25X25X2.6	5.92	25X25X2.6	5.92	25X25X2.6	5.92	25X25X2.6	5.92	KG
	TOTAL	**728.48**	**TOTAL**	**790.36**	**TOTAL**	**840.04**	**TOTAL**	**954.29**	**TOTAL**	**1034.63**	**TOTAL**	**1152.01**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		12376		12695		12950		13538		13953		14642	N
LL		28978		28978		28978		28978		28978		28978	N
WL0+PRE	5184	-56988	5436	-59649	6937	-75934	7888	-86638	8936	-98051	10805	-118635	N
		-47253		-49461		-62960		-71843		-81308		-98369	N
WL90+PRE		-54905		-57504		-73176		-83499		-94505		-114352	N

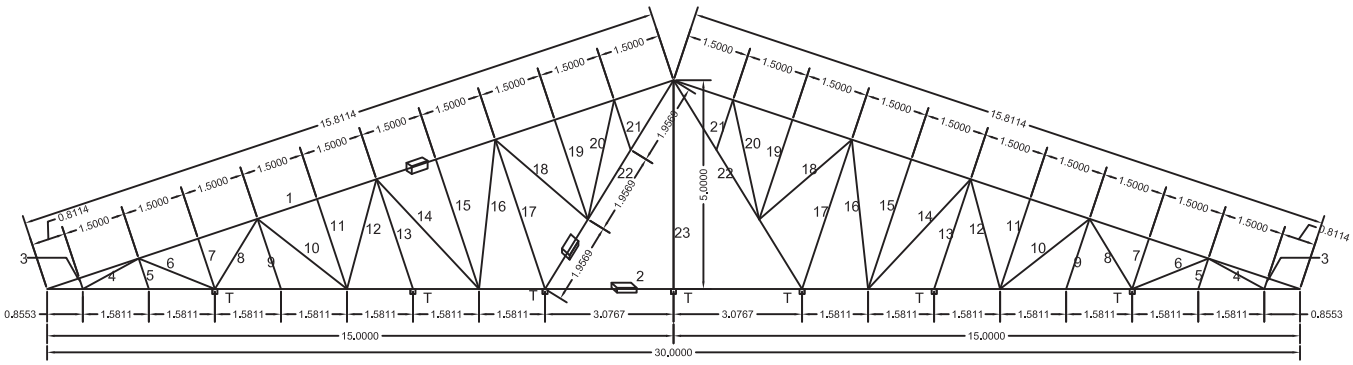
Span : 28m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	91X91X4.5	342.88	91X91X4.5	342.88	91X91X4.5	342.88	91X91X5.4	404.35	100X100X5	415.90	113X113X5.4	512.01	KG
2	122X61X3.6	270.76	122X61X5.4	392.28	145X82X4.8	445.76	145X82X5.4	496.72	172X92X4.8	523.88	200X100X5	623.28	KG
3	25X25X2.6	0.79	25X25X2.6	0.79	25X25X2.6	0.79	25X25X2.6	0.79	25X25X2.6	0.79	25X25X2.6	0.79	KG
4	25X25X2.6	5.23	32X32X2.6	6.99	32X32X2.6	6.99	32X32X2.6	6.99	32X32X2.6	6.99	40X40X3.2	10.79	KG
5	25X25X2.6	2.05	25X25X2.6	2.05	25X25X2.6	2.05	25X25X2.6	2.05	25X25X2.6	2.05	25X25X2.6	2.05	KG
6	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	32X32X2.6	8.11	KG
7	25X25X2.6	3.32	25X25X2.6	3.32	25X25X2.6	3.32	25X25X2.6	3.32	25X25X2.6	3.32	25X25X2.6	3.32	KG
8	32X32X2.6	8.11	32X32X2.6	8.11	38X38X2.6	9.86	38X38X2.6	9.86	38X38X2.6	9.86	40X40X3.2	12.52	KG
9	25X25X2.6	4.59	25X25X2.6	4.59	25X25X2.6	4.59	25X25X2.6	4.59	25X25X2.6	4.59	25X25X2.6	4.59	KG
10	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	38X38X2.6	12.60	KG
11	25X25X2.6	5.86	25X25X2.6	5.86	25X25X2.6	5.86	25X25X2.6	5.86	25X25X2.6	5.86	25X25X2.6	5.86	KG
12	38X38X2.6	12.60	38X38X2.6	12.60	40X40X3.2	16.00	50x50x2.6	17.14	50x50x2.6	17.14	50x50x2.6	17.14	KG
13	25X25X2.6	7.12	25X25X2.6	7.12	25X25X2.6	7.12	25X25X2.6	7.12	25X25X2.6	7.12	25X25X2.6	7.12	KG
14	50x50x2.6	21.70	50x50x2.6	21.70	50x50x2.6	21.70	50x50x2.6	21.70	50x50x2.6	21.70	50x50x2.6	21.70	KG
15	32X32X2.6	11.22	32X32X2.6	11.22	32X32X2.6	11.22	32X32X2.6	11.22	32X32X2.6	11.22	32X32X2.6	11.22	KG
16	38X38X2.6	15.95	38X38X2.6	15.95	38X38X2.6	15.95	38X38X2.6	15.95	38X38X2.6	15.95	38X38X2.6	15.95	KG
17	32X32X2.6	7.48	32X32X2.6	7.48	32X32X2.6	7.48	32X32X2.6	7.48	38X38X2.6	9.10	32X32X2.6	7.48	KG
18	25X25X2.6	5.79	25X25X2.6	5.79	25X25X2.6	5.79	32X32X2.6	7.74	38X38X2.6	9.42	38X38X2.6	9.42	KG
19	25X25X2.6	2.80	25X25X2.6	2.80	25X25X2.6	2.80	25X25X2.6	2.80	25X25X2.6	2.80	25X25X2.6	2.80	KG
20	80X40X4	68.97	96x48x4	84.49	96X48X4.8	99.40	122X61X3.6	99.40	122X61X3.6	99.40	122X61X4.5	122.11	KG
21	25X25X2.6	5.92	25X25X2.6	5.92	25X25X2.6	5.92	25X25X2.6	5.92	25X25X2.6	5.92	25X25X2.6	5.92	KG
	TOTAL	**823.85**	**TOTAL**	**962.65**	**TOTAL**	**1036.18**	**TOTAL**	**1151.72**	**TOTAL**	**1193.72**	**TOTAL**	**1416.78**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		15745		16460		16838		17518		17708		18798	N
LL		38638		38638		38638		38638		38637		38638	N
WL0+PRE	5184	-56988	7252	-79572	9240	-101296	10523	-115576	11921	-130801	14414	-158260	N
		-47253		-65982		-83989		-95838		-108464		-131224	N
WL90+PRE		-54905		-76710		-97617		-111388		-126069		-152546	N

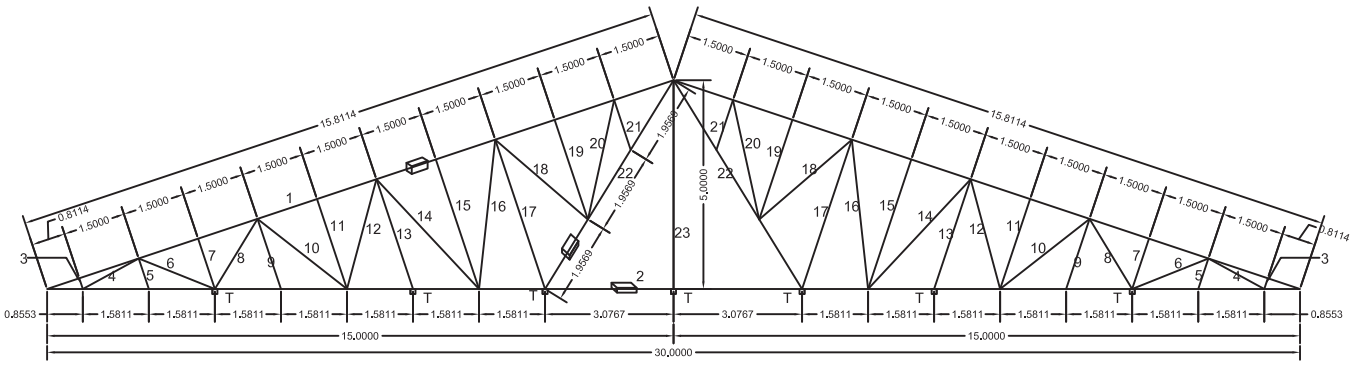
Span : 30m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4.8	247.57	60X60X4.8	247.57	60X60X4.8	247.57	60X60X4.8	247.57	80X80X4.0	290.77	80X80X4.8	342.81	KG
2	96X48X4.0	246.60	122X61X3.6	290.10	122X61X3.6	290.10	122X61X4.5	356.40	122X61X5.4	421.20	145X82X4.8	477.60	KG
3	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	KG
4	25X25X2.6	5.15	25X25X2.6	5.15	25X25X2.6	5.15	25X25X2.6	5.15	25X25X2.6	5.15	32X32X2.6	6.89	KG
5	25X25X2.6	2.60	25X25X2.6	2.60	25X25X2.6	2.60	25X25X2.6	2.60	25X25X2.6	2.60	25X25X2.6	2.60	KG
6	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	KG
7	25X25X2.6	4.29	25X25X2.6	4.29	25X25X2.6	4.29	25X25X2.6	4.29	25X25X2.6	4.29	25X25X2.6	4.29	KG
8	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	38X38X2.6	10.81	KG
9	25X25X2.6	5.98	25X25X2.6	5.98	25X25X2.6	5.98	25X25X2.6	5.98	25X25X2.6	5.98	25X25X2.6	5.98	KG
10	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	KG
11	32X32X2.6	10.26	32X32X2.6	10.26	32X32X2.6	10.26	32X32X2.6	10.26	32X32X2.6	10.26	32X32X2.6	10.26	KG
12	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	40X40X2.6	15.89	40X40X3.2	18.99	50X50X2.6	20.35	KG
13	25X25X2.6	9.36	25X25X2.6	9.36	25X25X2.6	9.36	25X25X2.6	9.36	25X25X2.6	9.36	25X25X2.6	9.36	KG
14	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	KG
15	50X50X2.6	24.46	50X50X2.6	24.46	50X50X2.6	24.46	50X50X2.6	24.46	50X50X2.6	24.46	50X50X2.6	24.46	KG
16	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	50X50X3.6	35.84	60X60X2.6	32.74	60X60X2.6	32.74	KG
17	50X50X2.9	31.07	50X50X2.9	31.07	50X50X3.6	37.55	50X50X3.6	37.55	60X60X2.6	34.31	60X60X2.6	34.31	KG
18	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	KG
19	38X38X2.6	13.82	38X38X2.6	13.82	38X38X2.6	13.82	38X38X2.6	13.82	38X38X2.6	13.82	38X38X2.6	13.82	KG
20	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	KG
21	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	KG
22	96X48X3.2	78.79	96X48X3.2	78.79	96X48X3.2	78.79	96X48X4	96.52	96X48X4	96.52	122X61X3.6	113.54	KG
23	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	KG
	TOTAL	**830.1641**	**TOTAL**	**873.66**	**TOTAL**	**880.15**	**TOTAL**	**974.03**	**TOTAL**	**1078.80**	**TOTAL**	**1209.29**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		13727		13951		13985		14469		15004		15680	N
LL		24862		28463		24862		24862		24862		24862	N
WLO+PRE	3690	-39722	5154	-55478	6057	-70658	7452	-80569	8444	-91199	10204	-110337	N
		-34825		-48638		-63297		-70622		-80685		-96732	N
WL9O+PRE		-44105		-61603		-78415		-89483		-101258		-122518	N

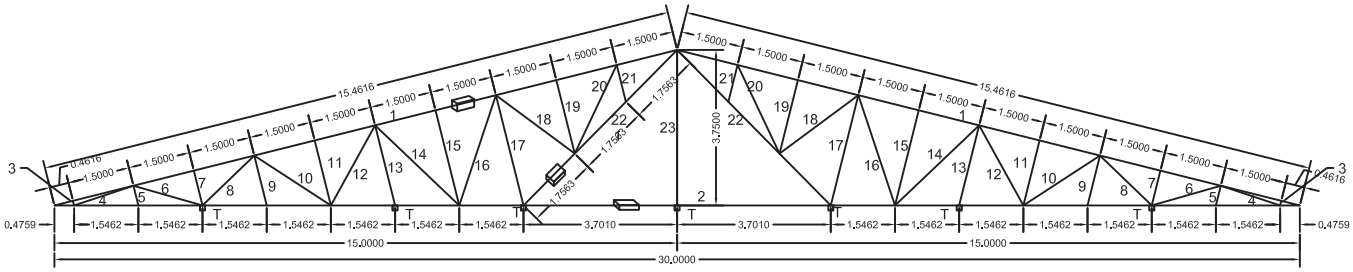
Span : 30m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	72X72X4.0	259.24	72X72X4.0	259.24	80X80X4.0	290.77	80X80X4.8	342.81	91X91X4.5	374.66	100X100X5.0	454.45	KG
2	96x48x4.8	289.80	122X61X4.5	356.40	122X61X5.4	421.20	145X82X4.8	477.60	145X82X4.8	477.60	172X92X4.8	561.30	KG
3	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	KG
4	25X25X2.6	5.15	25X25X2.6	5.15	25X25X2.6	5.15	32X32X2.6	6.89	32X32X2.6	6.89	32X32X2.6	6.89	KG
5	25X25X2.6	2.60	25X25X2.6	2.60	25X25X2.6	2.60	25X25X2.6	2.60	25X25X2.6	2.60	25X25X2.6	2.60	KG
6	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	KG
7	25X25X2.6	4.29	25X25X2.6	4.29	25X25X2.6	4.29	25X25X2.6	4.29	25X25X2.6	4.29	25X25X2.6	4.29	KG
8	32X32X2.6	8.88	32X32X2.6	8.88	32X32X2.6	8.88	38X38X2.6	10.81	38X38X2.6	10.81	38X38X2.6	10.81	KG
9	25X25X2.6	5.98	25X25X2.6	5.98	25X25X2.6	5.98	25X25X2.6	5.98	25X25X2.6	5.98	25X25X2.6	5.98	KG
10	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	38X38X2.6	14.97	KG
11	32X32X2.6	10.26	32X32X2.6	10.26	32X32X2.6	10.26	32X32X2.6	10.26	32X32X2.6	10.26	32X32X2.6	10.26	KG
12	38X38X2.6	14.97	38X38X2.6	14.97	40X40X3.2	18.99	50X50X2.6	20.35	50X50X2.6	20.35	50X50X2.6	20.35	KG
13	25X25X2.6	9.36	25X25X2.6	9.36	25X25X2.6	9.36	25X25X2.6	9.36	25X25X2.6	9.36	25X25X2.6	9.36	KG
14	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	50X50X2.6	26.91	KG
15	50X50X2.6	24.46	50X50X2.6	24.46	50X50X2.6	24.46	50X50X2.6	24.46	50X50X2.6	24.46	50X50X2.6	24.46	KG
16	50X50X2.6	26.91	50X50X2.6	26.91	60X60X2.6	32.74	60X60X2.6	32.74	60X60X2.6	32.74	60X60X3.2	39.58	KG
17	60X60X2.6	34.31	60X60X2.6	34.31	60X60X2.6	34.31	60X60X2.6	34.31	60X60X2.6	34.31	60X60X2.6	34.31	KG
18	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	40X40X2.6	17.09	KG
19	38X38X2.6	13.82	38X38X2.6	13.82	38X38X2.6	13.82	38X38X2.6	13.82	38X38X2.6	13.82	38X38X2.6	13.82	KG
20	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	38X38X2.6	16.10	KG
21	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	KG
22	96X48X3.2	78.79	96X48X3.2	78.79	96X48X4	96.52	122X61X3.6	113.54	122X61X3.6	113.54	122X61X3.6	113.54	KG
23	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	KG
	TOTAL	**888.28**	**TOTAL**	**954.88**	**TOTAL**	**1078.80**	**TOTAL**	**1209.29**	**TOTAL**	**1241.14**	**TOTAL**	**1412.46**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		17174		17517		18152		18829		18994		19876	N
LL		37950		37950		37950		37950		37950		37951	N
WL 0+PRE	4922	-52989	6876	-74008	8080	-94259	9940	-107479	11265	-121660	13612	-147190	N
		-46455		-64883		-84438		-94209		-107633		-129039	N
WL90+PRE		-58835		-82178		-104607		-119369		-137869		-163439	N

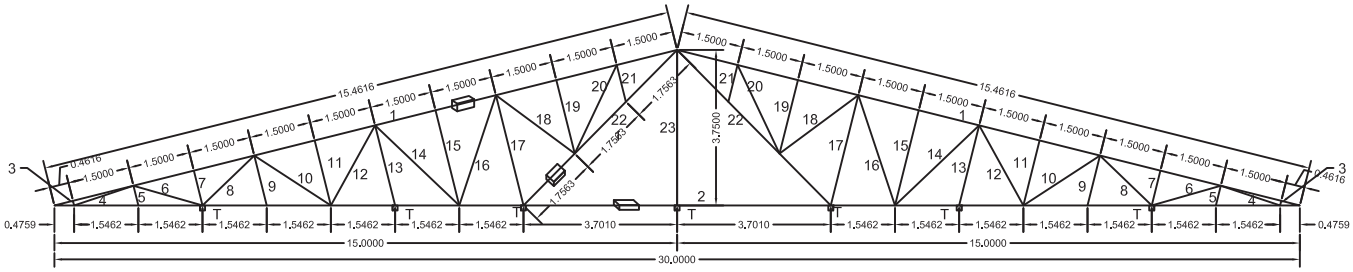
Span : 30m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	80X80X4.0	285.17	80X80X4.0	285.17	80X80X4.0	285.1746	80X80X4.8	336.21	91X91X4.5	367.45	100X100X5	445.70	KG
2	96X48X4.8	289.80	122X61X4.5	356.40	122X61X5.4	420.3	145X82X4.8	477.60	145X82X4.8	477.60	172x92x4.8	561.30	KG
3	25X25X2.6	0.39	25X25X2.6	0.39	25X25X2.6	0.390052	25X25X2.6	0.39	25X25X2.6	0.39	25X25X2.6	0.39	KG
4	25X25X2.6	5.07	25X25X2.6	5.07	32X32X2.6	6.78	32X32X2.6	6.78	32X32X2.6	6.78	32X32X2.6	6.78	KG
5	32X32X2.6	2.22	32X32X2.6	2.22	32X32X2.6	2.22	32X32X2.6	2.22	32X32X2.6	2.22	32X32X2.6	2.22	KG
6	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	KG
7	25X25X2.6	2.94	25X25X2.6	2.94	25X25X2.6	2.94	25X25X2.6	2.94	25X25X2.6	2.94	25X25X2.6	2.94	KG
8	25X25X2.6	5.86	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	38X38X2.6	9.54	KG
9	32X32X2.6	5.63	32X32X2.6	5.63	32X32X2.6	5.63	32X32X2.6	5.63	32X32X2.6	5.63	32X32X2.6	5.63	KG
10	32X32X2.6	9.97	32X32X2.6	9.97	38X38X2.6	12.13	38X38X2.6	12.13	38X38X2.6	12.13	38X38X2.6	12.13	KG
11	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	KG
12	32X32X2.6	9.97	38X38X2.6	12.13	38X38X2.6	12.13	38X38X2.6	12.13	40X40X2.6	12.88	50X50X2.6	16.49	KG
13	32X32X2.6	9.02	32X32X2.6	9.02	32X32X2.6	9.02	32X32X2.6	9.02	32X32X2.6	9.02	32X32X2.6	9.02	KG
14	40X40X2.6	16.38	40X40X2.6	16.38	40X40X2.6	16.38	50X50X2.6	20.98	40X40X3.2	19.58	50X50X2.6	20.98	KG
15	40X40X2.6	13.84	40X40X2.6	13.84	40X40X2.6	13.84	40X40X2.6	13.84	40X40X2.6	13.84	40X40X2.6	13.84	KG
16	38X38X2.6	15.43	50X50X2.6	20.98	50X50X2.6	20.98	50X50X2.6	20.98	50X50X2.6	20.98	60X60X2.6	25.53	KG
17	50X50X2.6	20.53	50X50X2.6	20.53	50X50X2.6	20.53	50X50X2.6	20.53	50X50X2.6	20.53	50X50X2.6	20.53	KG
18	32X32X2.6	10.71	32X32X2.6	10.71	32X32X2.6	10.71	32X32X2.6	10.71	32X32X2.6	10.71	38X38X2.6	13.04	KG
19	25X25X2.6	6.19	25X25X2.6	6.19	25X25X2.6	6.19	25X25X2.6	6.19	25X25X2.6	6.19	25X25X2.6	6.19	KG
20	32X32X2.6	10.69	32X32X2.6	10.69	32X32X2.6	10.69	32X32X2.6	10.69	32X32X2.6	10.69	32X32X2.6	10.69	KG
21	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	KG
22	80X40X3.2	57.97	80X40X4.8	82.74	96X48X4	86.64	96X48X4	86.64	96X48X4.8	101.82	122X61X3.6	101.92	KG
23	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	KG
	TOTAL	**800.52**	**TOTAL**	**901.58**	**TOTAL**	**973.25**	**TOTAL**	**1086.18**	**TOTAL**	**1131.95**	**TOTAL**	**1307.59**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		13474		13995		14363		14944		15180		16084	N
LL		31049		31049		31049		31049		31049		31049	N
WLO+PRE	4164	-48205	5824	-63909	7422	-81359	8453	-92829	9575	-105055	11576	-127110	N
		-37952		-52995		-67458		-76975		-87117		-105395	N
WL9O+PRE		-44098		-61611		-78534		-89463		-101255		-122520	N

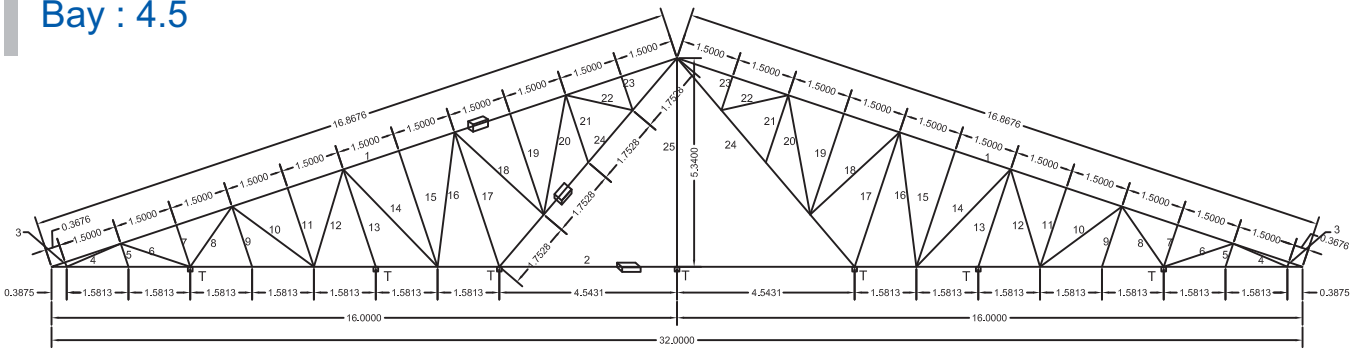
Span : 30m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	91X91X4.5	367.45	91X91X4.5	367.45	91X91X4.5	367.45	91X91X5.4	433.33	113X113X4.8	492.41	132X132X5.4	645.82	KG
2	122X61X3.6	290.10	122X61X5.4	420.30	145X82X4.8	477.60	145X82X5.4	532.20	172X92X4.8	561.30	200X100X5	667.80	KG
3	25X25X2.6	0.39	25X25X2.6	0.39	25X25X2.6	0.39	25X25X2.6	0.39	25X25X2.6	0.39	25X25X2.6	0.39	KG
4	25X25X2.6	5.07	32X32X2.6	6.78	32X32X2.6	6.78	32X32X2.6	6.78	32X32X2.6	6.78	38X38X2.6	8.25	KG
5	32X32X2.6	2.22	32X32X2.6	2.22	32X32X2.6	2.22	32X32X2.6	2.22	32X32X2.6	2.22	32X32X2.6	2.22	KG
6	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	KG
7	25X25X2.6	2.94	25X25X2.6	2.94	25X25X2.6	2.94	25X25X2.6	2.94	25X25X2.6	2.94	25X25X2.6	2.94	KG
8	32X32X2.6	7.84	32X32X2.6	7.84	32X32X2.6	7.84	38X38X2.6	9.54	38X38X2.6	9.54	38X38X2.6	9.54	KG
9	32X32X2.6	5.63	32X32X2.6	5.63	32X32X2.6	5.63	32X32X2.6	5.63	32X32X2.6	5.63	32X32X2.6	5.63	KG
10	38X38X2.6	12.13	38X38X2.6	12.13	38X38X2.6	12.13	38X38X2.6	12.13	38X38X2.6	12.13	38X38X2.6	12.13	KG
11	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	25X25X2.6	5.48	KG
12	32X32X2.6	9.97	38X38X2.6	12.13	40X40X2.6	12.88	50X50X2.6	16.49	50X50X2.6	16.49	50X50X2.6	16.49	KG
13	32X32X2.6	9.02	32X32X2.6	9.02	32X32X2.6	9.02	32X32X2.6	9.02	32X32X2.6	9.02	32X32X2.6	9.02	KG
14	50X50X2.6	20.98	50X50X2.6	20.98	50X50X2.6	20.98	50X50X2.6	20.98	50X50X2.6	20.98	50X50X2.6	20.98	KG
15	40X40X2.6	13.84	40X40X2.6	13.84	40X40X2.6	13.84	40X40X2.6	13.84	40X40X2.6	13.84	40X40X2.6	13.84	KG
16	40X40X2.6	16.38	50X50X2.6	20.98	50X50X2.6	20.98	60X60X2.6	25.53	60X60X2.6	25.53	60X60X2.6	25.53	KG
17	50X50X2.6	20.53	50X50X2.6	20.53	50X50X2.6	20.53	50X50X2.6	20.53	50X50X2.6	20.53	50X50X2.6	20.53	KG
18	32X32X2.6	10.71	32X32X2.6	10.71	32X32X2.6	10.71	38X38X2.6	13.04	38X38X2.6	13.04	38X38X2.6	13.04	KG
19	25X25X2.6	6.19	25X25X2.6	6.19	25X25X2.6	6.19	25X25X2.6	6.19	25X25X2.6	6.19	25X25X2.6	6.19	KG
20	32X32X2.6	10.69	32X32X2.6	10.69	32X32X2.6	10.69	32X32X2.6	10.69	32X32X2.6	10.69	32X32X2.6	10.69	KG
21	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	KG
22	80X40X4	70.72	96X48X4	86.64	122X61X3.6	101.92	122X61X3.6	101.92	122X61X3.6	101.92	122X61X4.5	125.22	KG
23	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	KG
	TOTAL	**905.54**	**TOTAL**	**1060.12**	**TOTAL**	**1133.46**	**TOTAL**	**1266.12**	**TOTAL**	**1354.30**	**TOTAL**	**1638.97**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		17132		17928		18305		19080		19442		20908	N
LL		41397		41397		41397		41397		41397		41397	N
WL 0+PRE	5554	-64306	7769	-85255	9901	-108532	11276	-123835	12773	-140144	15442	-169565	N
		-50628		-70695		-89990		-102684		-116213		-140598	N
WL 90+PRE		-58827		-82190		-104764		-119343		-135074		-163442	N

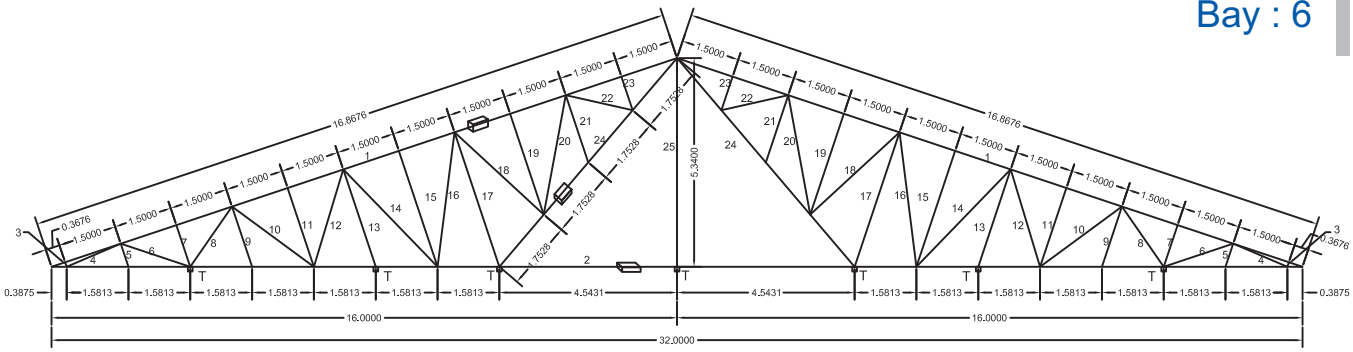
Span : 32m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	60X60X4.8	264.82	60X60X4.8	264.82	60X60X4.8	264.82	72X72X4.0	277.30	72X72X4.8	325.88	91X91X4.5	400.77	KG
2	122X61X3.6	309.44	122X61X3.6	309.44	122X61X4.5	380.16	145X82X4.8	509.44	145X82X4.8	509.44	145X82X4.8	509.44	KG
3	25X25X2.6	0.41	25X25X2.6	0.41	25X25X2.6	0.41	25X25X2.6	0.41	25X25X2.6	0.41	25X25X2.6	0.41	KG
4	50X50X2.6	11.26	50X50X2.6	11.26	50X50X2.6	11.26	50X50X2.6	11.26	50X50X2.6	11.26	50X50X2.6	11.26	KG
5	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	KG
6	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	25X25X2.6	6.34	KG
7	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	KG
8	25X25X2.6	6.34	25X25X2.6	6.34	32X32X2.6	8.47	32X32X2.6	8.47	32X32X2.6	8.47	32X32X2.6	8.47	KG
9	25X25X2.6	5.49	25X25X2.6	5.49	25X25X2.6	5.49	25X25X2.6	5.49	25X25X2.6	5.49	25X25X2.6	5.49	KG
10	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	KG
11	32X32X2.6	9.61	32X32X2.6	9.61	32X32X2.6	9.61	32X32X2.6	9.61	32X32X2.6	9.61	32X32X2.6	9.61	KG
12	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	40X40X2.6	15.19	50X50X2.6	19.46	KG
13	25X25X2.6	8.88	25X25X2.6	8.88	25X25X2.6	8.88	25X25X2.6	8.88	25X25X2.6	8.88	25X25X2.6	8.88	KG
14	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	KG
15	40X40X2.6	18.26	40X40X2.6	18.26	40X40X2.6	18.26	40X40X2.6	18.26	40X40X2.6	18.26	40X40X2.6	18.26	KG
16	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.9	28.57	60X60X2.6	31.55	KG
17	60X60X2.6	33.01	60X60X2.6	33.01	60X60X2.6	33.01	60X60X2.6	33.01	60X60X2.6	33.01	60X60X2.6	33.01	KG
18	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	50X50X2.6	23.24	KG
19	38X38X2.6	14.96	38X38X2.6	14.96	38X38X2.6	14.96	38X38X2.6	14.96	38X38X2.6	14.96	38X38X2.6	14.96	KG
20	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	KG
21	25X25X2.6	6.13	25X25X2.6	6.13	25X25X2.6	6.13	25X25X2.6	6.13	25X25X2.6	6.13	25X25X2.6	6.13	KG
22	25X25X2.6	5.93	25X25X2.6	5.93	25X25X2.6	5.93	25X25X2.6	5.93	25X25X2.6	5.93	25X25X2.6	5.93	KG
23	25X25X2.6	3.07	25X25X2.6	3.07	25X25X2.6	3.07	25X25X2.6	3.07	25X25X2.6	3.07	25X25X2.6	3.07	KG
24	122X61X3.6	135.59	122X61X3.6	135.59	122X61X3.6	135.59	122X61X3.6	135.59	122X61X3.6	135.59	122X61X4.5	166.58	KG
25	32X32X2.6	12.07	32X32X2.6	12.07	32X32X2.6	12.07	32X32X2.6	12.07	32X32X2.6	12.07	32X32X2.6	12.07	KG
	TOTAL	**974.26**	**TOTAL**	**974.26**	**TOTAL**	**1047.12**	**TOTAL**	**1188.88**	**TOTAL**	**1240.98**	**TOTAL**	**1359.20**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		15239		15239		15614		16340		16608		17516	N
LL		30361		30361		30361		30361		30361		30361	N
WLO+PRE	3934	-42376	5495	-59199	6994	-75344	7982	-85980	9033	-97295	10933	-117762	N
		-37151		-51900		-66056		-75380		-85299		-103244	N
WL9O+PRE		-47052		-65731		-83659		-95469		-108032		-130758	N

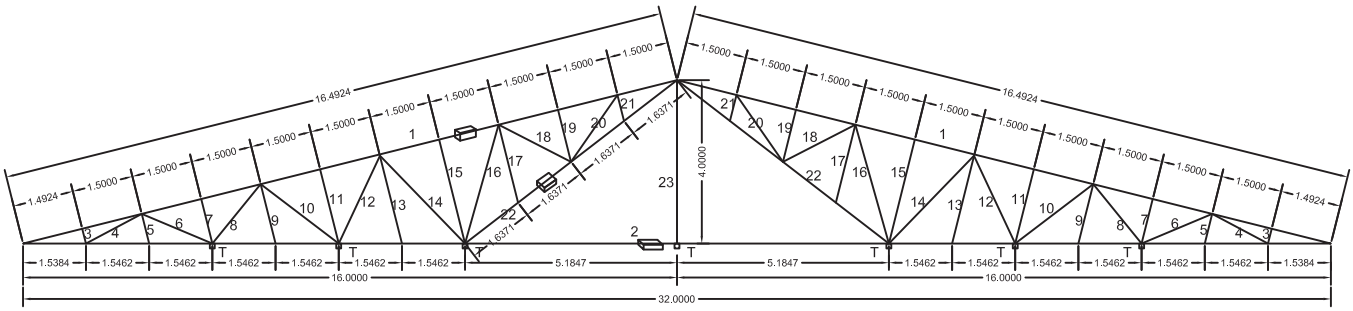
Span : 32m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	80X80X4	311.04	80X80X4	311.04	80X80X4	311.04	80X80X4.8	366.70	91X91X5.4	472.63	113X113X4.8	537.06	KG
2	122X61X3.6	309.44	122X61X4.5	380.16	145X82X4.8	509.44	145X82X4.8	509.44	145X82X4.8	509.44	172X92X4.8	598.72	KG
3	25X25X2.6	0.41	25X25X2.6	0.41	25X25X2.6	0.41	25X25X2.6	0.41	25X25X2.6	0.41	25X25X2.6	0.41	KG
4	50X50X2.6	11.26	50X50X2.6	11.26	50X50X2.6	11.26	50X50X2.6	11.26	50X50X2.6	11.26	50X50X2.6	11.26	KG
5	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	KG
6	32X32X2.6	8.47	32X32X2.6	8.47	32X32X2.6	8.47	32X32X2.6	8.47	32X32X2.6	8.47	32X32X2.6	8.47	KG
7	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	KG
8	25X25X2.6	6.34	32X32X2.6	8.47	32X32X2.6	8.47	32X32X2.6	8.47	38X38X2.6	10.31	38X38X2.6	10.31	KG
9	25X25X2.6	5.49	25X25X2.6	5.49	25X25X2.6	5.49	25X25X2.6	5.49	25X25X2.6	5.49	25X25X2.6	5.49	KG
10	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	38X38X2.6	14.31	KG
11	32X32X2.6	9.61	32X32X2.6	9.61	32X32X2.6	9.61	32X32X2.6	9.61	32X32X2.6	9.61	32X32X2.6	9.61	KG
12	38X38X2.6	14.31	38X38X2.6	14.31	40X40X2.6	15.19	50X50X2.6	19.46	50X50X2.6	19.46	50X50X2.6	19.46	KG
13	25X25X2.6	8.88	25X25X2.6	8.88	25X25X2.6	8.88	25X25X2.6	8.88	25X25X2.6	8.88	25X25X2.6	8.88	KG
14	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	50X50X2.6	25.94	KG
15	40X40X2.6	18.26	40X40X2.6	18.26	40X40X2.6	18.26	40X40X2.6	18.26	40X40X2.6	18.26	40X40X2.6	18.26	KG
16	50X50X2.6	25.94	50X50X2.6	25.94	60X60X2.6	31.55	60X60X2.6	31.55	60X60X2.6	31.55	60X60X3.2	38.14	KG
17	60X60X2.6	33.01	60X60X2.6	33.01	60X60X2.6	33.01	60X60X2.6	33.01	60X60X2.6	33.01	60X60X2.6	33.01	KG
18	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	50X50X2.6	23.24	50X50X2.6	23.24	KG
19	38X38X2.6	14.96	38X38X2.6	14.96	38X38X2.6	14.96	38X38X2.6	14.96	38X38X2.6	14.96	38X38X2.6	14.96	KG
20	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	40X40X2.6	18.14	KG
21	25X25X2.6	6.13	25X25X2.6	6.13	25X25X2.6	6.13	25X25X2.6	6.13	25X25X2.6	6.13	25X25X2.6	6.13	KG
22	25X25X2.6	5.93	25X25X2.6	5.93	25X25X2.6	5.93	25X25X2.6	5.93	32X32X2.6	7.92	32X32X2.6	7.92	KG
23	25X25X2.6	3.07	25X25X2.6	3.07	25X25X2.6	3.07	25X25X2.6	3.07	25X25X2.6	3.07	25X25X2.6	3.07	KG
24	96X48X4.0	115.26	122X61X3.6	135.59	122X61X3.6	135.59	122X61X4.5	166.58	122X61X5.4	196.45	145X82X4.8	223.23	KG
25	32X32X2.6	12.07	32X32X2.6	12.07	32X32X2.6	12.07	32X32X2.6	12.07	32X32X2.6	12.07	32X32X2.6	12.07	KG
	TOTAL	**1002.28**	**TOTAL**	**1095.47**	**TOTAL**	**1231.25**	**TOTAL**	**1322.17**	**TOTAL**	**1466.89**	**TOTAL**	**1653.98**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		20520		21159		22089		22712		23703		25086	N
LL		40501.58		40501.58		40502		40502		40502		40502	N
WLO+PRE	5247.96	-56529	7332.98	-78988	9331	-100515	10645	-114668	12046	-129754	14579	-157044	N
		-49560.1		-69250.3		-88123		-100532		-113758		-137683	N
WL9O+PRE		-62767.4		-87704.9		-111607		-127323		-144073		-174375	N

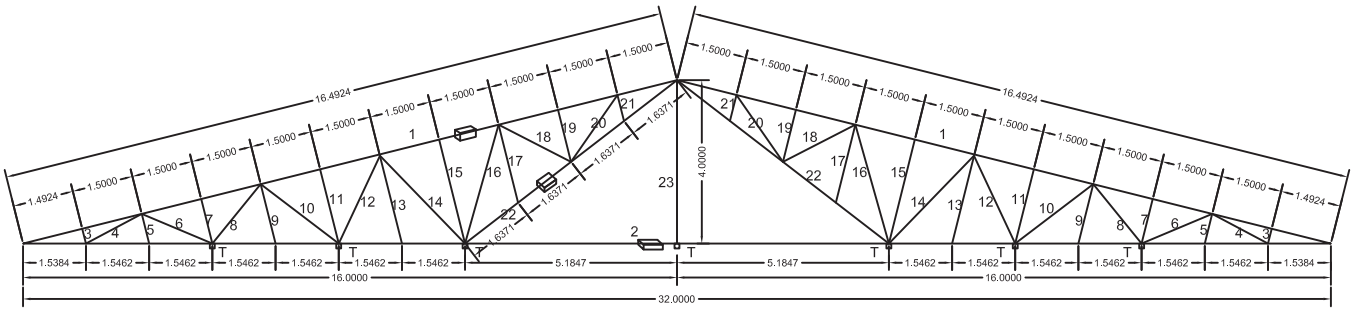
Span : 32m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	80X80X4	304.12	80X80X4	304.12	80X80X4	304.12	91X91X4.5	391.86	91X91X5.4	462.12	113X113X4.8	525.12	KG
2	122X61X3.6	309.44	145X82X4.8	509.44	145X82X4.8	509.44	145X82X4.8	509.44	145X82X5.4	567.68	172X92X4.8	598.72	KG
3	25X25X2.6	1.25	25X25X2.6	1.25	25X25X2.6	1.25	25X25X2.6	1.25	25X25X2.6	1.25	25X25X2.6	1.25	KG
4	25X25X2.6	5.22	25X25X2.6	5.22	32X32X2.6	6.99	32X32X2.6	6.99	32X32X2.6	6.99	32X32X2.6	6.99	KG
5	25X25X2.6	2.53	25X25X2.6	2.53	25X25X2.6	2.53	25X25X2.6	2.53	25X25X2.6	2.53	25X25X2.6	2.53	KG
6	40X40X2.6	10.94	40X40X2.6	10.94	40X40X2.6	10.94	40X40X2.6	10.94	40X40X2.6	10.94	40X40X2.6	10.94	KG
7	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	KG
8	32X32X2.6	8.47	32X32X2.6	8.47	32X32X2.6	8.47	38X38X2.6	8.47	38X38X2.6	10.31	40X40X2.6	10.94	KG
9	25X25X2.6	5.06	25X25X2.6	5.06	25X25X2.6	5.06	25X25X2.6	5.06	25X25X2.6	5.06	25X25X2.6	5.06	KG
10	50X50X2.6	17.95	50X50X2.6	17.95	50X50X2.6	17.95	50X50X2.6	17.95	50X50X2.6	17.95	50X50X2.6	17.95	KG
11	25X25X2.6	6.33	25X25X2.6	6.33	25X25X2.6	6.33	25X25X2.6	6.33	25X25X2.6	6.33	25X25X2.6	6.33	KG
12	32X32X2.6	10.73	38X38X2.6	13.05	40X40X2.6	13.86	50X50X2.6	17.75	50X50X2.6	17.75	50X50X2.6	17.75	KG
13	25X25X2.6	7.60	25X25X2.6	7.60	25X25X2.6	7.60	25X25X2.6	7.60	25X25X2.6	7.60	25X25X2.6	7.60	KG
14	50X50X2.6	22.38	50X50X2.6	22.38	50X50X2.6	22.38	50X50X2.6	22.38	50X50X2.6	22.38	50X50X2.6	22.38	KG
15	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	KG
16	40X40X2.6	17.65	40X40X2.6	17.65	40X40X2.6	17.65	40X40X2.6	17.65	40X40X2.6	17.65	40X40X2.6	17.65	KG
17	25X25X2.6	6.65	25X25X2.6	6.65	25X25X2.6	6.65	25X25X2.6	6.65	25X25X2.6	6.65	25X25X2.6	6.65	KG
18	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	KG
19	25X25X2.6	4.43	25X25X2.6	4.43	25X25X2.6	4.43	25X25X2.6	4.43	25X25X2.6	4.43	25X25X2.6	4.43	KG
20	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	KG
21	25X25X2.6	2.22	25X25X2.6	2.22	25X25X2.6	2.22	25X25X2.6	2.22	25X25X2.6	2.22	25X25X2.6	2.22	KG
22	96X48X4	107.66	122X61X3.6	126.65	122X61X3.6	126.65	122X61X4.5	155.59	122X61X5.4	183.49	145X82X4.8	208.50	KG
23	25X25X2.6	6.76	25X25X2.6	6.76	25X25X2.6	6.76	25X25X2.6	6.76	25X25X2.6	6.76	25X25X2.6	6.76	KG
	TOTAL	**893.63**	**TOTAL**	**1114.95**	**TOTAL**	**1117.51**	**TOTAL**	**1238.09**	**TOTAL**	**1396.32**	**TOTAL**	**1516.02**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		14001		15138		15151		15780		16680		17273	N
LL		33132		33132		33132		33132		33132		33132	N
WLO+PRE	4444	-48845	6208	-68236	7901	-86846	9017	-99106	10203	-112147	12350	-135740	N
		-40497		-56575		-72004		-82169		-92982		-112542	N
WL9O+PRE		-47058		-65740		-83669		-95481		-108045		-130774	N

Span : 32m
Roof Slope : 1 in 4
Bay : 6



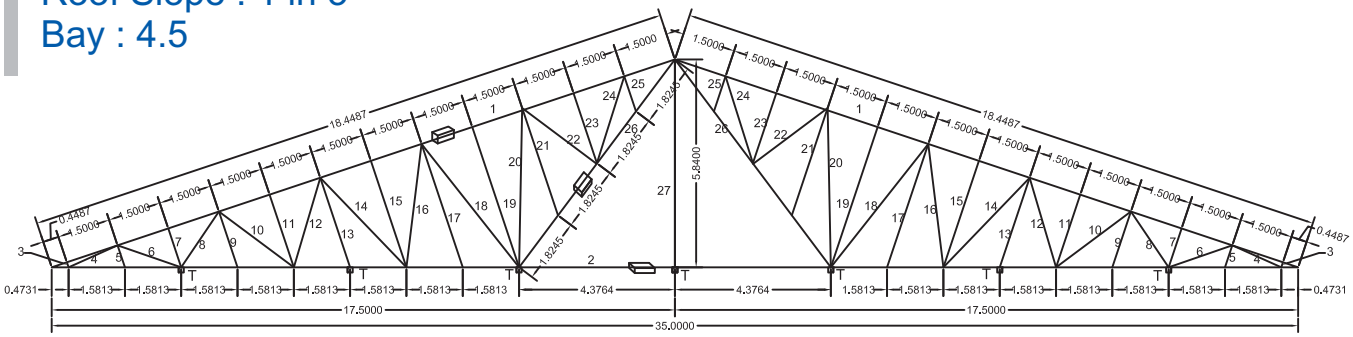
SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	91X91X4.5	391.86	91X91X4.5	391.86	91X91X5.4	462.12	91X91X5.4	462.12	113X113X4.8	525.12	132X132X5.4	688.73	KG
2	122X61X5.4	448.32	145X82X4.8	509.44	145X82X5.4	567.68	172X92X4.8	598.72	172X92X5.4	668.16	200X100X6	844.80	KG
3	25X25X2.6	1.25	25X25X2.6	1.25	25X25X2.6	1.25	25X25X2.6	1.25	25X25X2.6	1.25	25X25X2.6	1.25	KG
4	25X25X2.6	5.22	32X32X2.6	6.99	32X32X2.6	6.99	32X32X2.6	6.99	32X32X2.6	6.99	38X38X2.6	8.50	KG
5	25X25X2.6	2.53	25X25X2.6	2.53	25X25X2.6	2.53	25X25X2.6	2.53	25X25X2.6	2.53	25X25X2.6	2.53	KG
6	40X40X2.6	10.94	40X40X2.6	10.94	40X40X2.6	10.94	40X40X2.6	10.94	40X40X2.6	10.94	40X40X2.6	10.94	KG
7	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	25X25X2.6	3.80	KG
8	32X32X2.6	8.47	32X32X2.6	8.47	38X38X2.6	10.31	38X38X2.6	10.31	38X38X2.6	10.31	50X50X2.6	14.02	KG
9	25X25X2.6	5.06	25X25X2.6	5.06	25X25X2.6	5.06	25X25X2.6	5.06	25X25X2.6	5.06	25X25X2.6	5.06	KG
10	50X50X2.6	17.95	50X50X2.6	17.95	50X50X2.6	17.95	50X50X2.6	17.95	50X50X2.6	17.95	50X50X2.6	17.95	KG
11	25X25X2.6	6.33	25X25X2.6	6.33	25X25X2.6	6.33	25X25X2.6	6.33	25X25X2.6	6.33	25X25X2.6	6.33	KG
12	38X38X2.6	13.05	40X40X2.6	13.86	50X50X2.6	17.75	50X50X2.6	17.75	50X50X2.6	17.75	60X60X2.6	21.60	KG
13	25X25X2.6	7.60	25X25X2.6	7.60	25X25X2.6	7.60	25X25X2.6	7.60	25X25X2.6	7.60	25X25X2.6	7.60	KG
14	50X50X2.6	22.38	50X50X2.6	22.38	50X50X2.6	22.38	50X50X2.6	22.38	50X50X2.6	22.38	50X50X2.6	22.38	KG
15	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	KG
16	40X40X2.6	17.65	40X40X2.6	17.65	40X40X2.6	17.65	40X40X2.6	17.65	40X40X2.6	17.65	40X40X2.6	17.65	KG
17	25X25X2.6	6.65	25X25X2.6	6.65	25X25X2.6	6.65	25X25X2.6	6.65	25X25X2.6	6.65	25X25X2.6	6.65	KG
18	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	38X38X2.6	10.96	38X38X2.6	10.96	KG
19	25X25X2.6	4.43	25X25X2.6	4.43	25X25X2.6	4.43	25X25X2.6	4.43	25X25X2.6	4.43	25X25X2.6	4.43	KG
20	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	32X32X2.6	9.01	KG
21	25X25X2.6	2.22	25X25X2.6	2.22	25X25X2.6	2.22	25X25X2.6	2.22	25X25X2.6	2.22	25X25X2.6	2.22	KG
22	122X61X3.6	126.65	122X61X3.6	126.65	122X61X5.4	183.49	145X82X4.8	208.50	145X82X4.8	208.50	145X82X4.8	208.50	KG
23	25X25X2.6	6.76	25X25X2.6	6.76	25X25X2.6	6.76	25X25X2.6	6.76	25X25X2.6	6.76	25X25X2.6	6.76	KG
	TOTAL	**1141.57**	**TOTAL**	**1205.25**	**TOTAL**	**1396.32**	**TOTAL**	**1452.38**	**TOTAL**	**1586.77**	**TOTAL**	**1936.09**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		20377		20813		22251		22607		23556		25819	N
LL		44198		44198		44198		44198		44198		44198	N
WLO+PRE	5928	-65159	8284	-91047	10541	-115859	12025	-132174	13608	-149563	16469	-181019	N
		-54023		-75487		-96060		-109586		-124003		-150083	N
WL9O+PRE		-62775		-87716		-111622		-127339		-144092		-174397	N

Span : 35m

Roof Slope : 1 in 3

Bay : 4.5

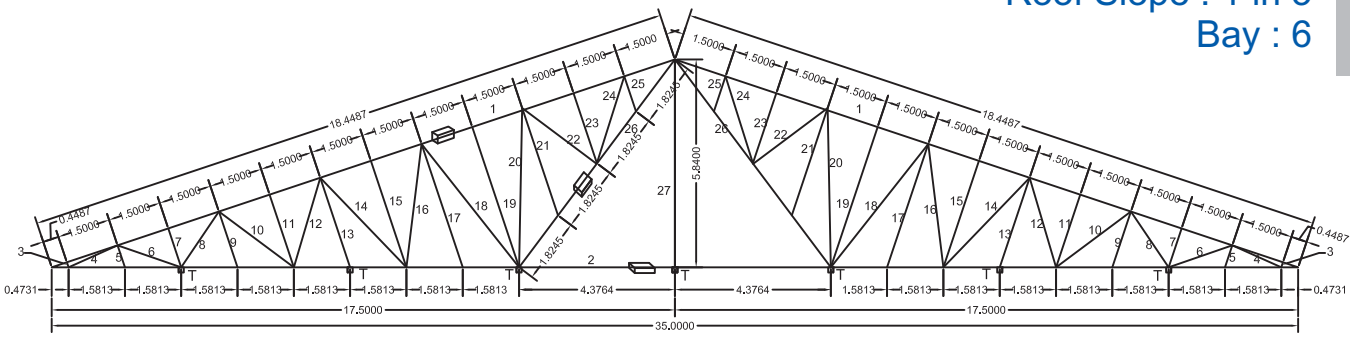


SUPPORT CONDITION : ONE PINNED OTHER ROLLER

T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	72X72X4	303.30	72X72X4	303.30	72X72X4	303.30	80X80X4	340.20	80X80X4.8	401.08	91X91X5.4	516.94	KG
2	122X61X3.6	338.45	122X61X3.6	338.45	122X61X4.5	415.80	145X82X4.8	557.20	145X82X4.8	557.20	145X82X4.8	557.20	KG
3	25X25X2.6	0.51	25X25X2.6	0.51	25X25X2.6	0.51	25X25X2.6	0.51	25X25X2.6	0.51	25X25X2.6	0.51	KG
4	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	38X38X2.6	8.29	KG
5	25X25X2.6	2.20	25X25X2.6	2.20	25X25X2.6	2.20	25X25X2.6	2.20	25X25X2.6	2.20	25X25X2.6	2.20	KG
6	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	KG
7	25X25X2.6	3.89	25X25X2.6	3.89	25X25X2.6	3.89	25X25X2.6	3.89	25X25X2.6	3.89	25X25X2.6	3.89	KG
8	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	KG
9	25X25X2.6	5.58	25X25X2.6	5.58	25X25X2.6	5.58	25X25X2.6	5.58	25X25X2.6	5.58	25X25X2.6	5.58	KG
10	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	KG
11	32X32X2.6	7.27	32X32X2.6	9.73	32X32X2.6	9.73	32X32X2.6	9.73	32X32X2.6	9.73	32X32X2.6	9.73	KG
12	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	40X40X2.6	15.32	50X50X2.6	14.43	KG
13	25X25X2.6	8.97	25X25X2.6	8.97	25X25X2.6	8.97	25X25X2.6	8.97	25X25X2.6	8.97	25X25X2.6	8.97	KG
14	50X50X2.6	26.12	50X50X2.6	26.12	50X50X2.6	26.12	50X50X2.6	26.12	50X50X2.6	26.12	50X50X2.6	26.12	KG
15	40X40X2.6	18.41	40X40X2.6	18.41	40X40X2.6	18.41	40X40X2.6	18.41	40X40X2.6	18.41	40X40X2.6	18.41	KG
16	50X50X2.6	26.12	50X50X2.6	26.12	50X50X2.6	26.12	50X50X2.6	26.12	60X60X2.6	31.78	60X60X2.6	31.78	KG
17	25X25X2.6	12.35	25X25X2.6	12.35	25X25X2.6	12.35	25X25X2.6	12.35	25X25X2.6	12.35	25X25X2.6	12.35	KG
18	60X60X2.6	40.19	60X60X2.6	40.19	60X60X2.6	40.19	60X60X2.6	40.19	60X60X2.6	40.19	60X60X2.6	40.19	KG
19	60X60X2.6	37.81	60X60X2.6	37.81	60X60X2.6	37.81	60X60X2.6	37.81	60X60X2.6	37.81	60X60X2.6	37.81	KG
20	60X60X2.6	40.73	60X60X2.6	40.73	60X60X2.6	40.73	60X60X2.6	40.73	60X60X2.6	40.73	60X60X2.6	40.73	KG
21	25X25X2.6	10.53	25X25X2.6	10.53	25X25X2.6	10.53	25X25X2.6	10.53	25X25X2.6	10.53	25X25X2.6	10.53	KG
22	38X38X2.6	14.54	38X38X2.6	14.54	38X38X2.6	14.54	38X38X2.6	14.54	38X38X2.6	14.54	38X38X2.6	14.54	KG
23	32X32X2.6	9.46	32X32X2.6	9.46	32X32X2.6	9.46	32X32X2.6	9.46	32X32X2.6	9.46	32X32X2.6	9.46	KG
24	38X38X2.6	14.25	38X38X2.6	14.25	38X38X2.6	14.25	38X38X2.6	14.25	38X38X2.6	14.25	38X38X2.6	14.25	KG
25	25X25X2.6	3.51	25X25X2.6	3.51	25X25X2.6	3.51	25X25X2.6	3.51	25X25X2.6	3.51	25X25X2.6	3.51	KG
26	122X61X3.6	141.14	122X61X3.6	141.14	122X61X3.6	141.14	122X61X3.6	141.14	122X61X4.5	173.40	122X61X5.4	204.49	KG
27	38X38X2.6	16.06	38X38X2.6	16.06	38X38X2.6	16.06	38X38X2.6	16.06	38X38X2.6	16.06	38X38X2.6	16.06	KG
	TOTAL	**1132.41**	**TOTAL**	**1134.86**	**TOTAL**	**1212.21**	**TOTAL**	**1390.51**	**TOTAL**	**1490.20**	**TOTAL**	**1639.45**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		16884		16884		17282		18198		18711		19504	N
LL		33208		33208		33208		33208		33208		33208	N
WL0+PRE	4284	-46129	5985	-64442	7617	-82017	8692	-93595	9836	-105911	11905	-128191	N
		-40470		-56537		-71957		-82115		-92920		-112467	N
WL90+PRE		-51236		-71577		-91098		-103958		-117638		-142385	N

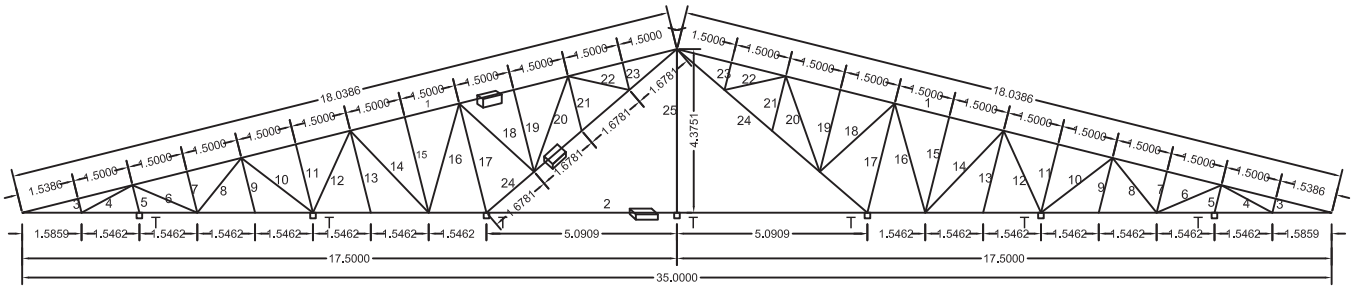
Span : 35m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	80X80X4.8	401.08	80X80X4.8	401.08	80X80X4.8	401.081	91X91X4.5	438.35	91X91X5.4	516.94	100X100X6	626.53	KG
2	122X61X3.6	338.45	122X61X4.5	415.80	145X48X4.8	557.200	145X48X4.8	557.20	145X82X5.4	620.90	172X92X4.8	654.85	KG
3	25X25X2.6	0.51	25X25X2.6	0.51	25X25X2.6	0.505	25X25X2.6	0.51	25X25X2.6	0.51	25X25X2.6	0.51	KG
4	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.095	25X25X2.6	5.10	32X32X2.6	6.81	32X32X2.6	6.81	KG
5	25X25X2.6	2.20	25X25X2.6	2.20	25X25X2.6	2.197	25X25X2.6	2.20	25X25X2.6	2.20	25X25X2.6	2.20	KG
6	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.543	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.54	KG
7	25X25X2.6	3.89	25X25X2.6	3.89	25X25X2.6	3.887	25X25X2.6	3.89	25X25X2.6	3.89	25X25X2.6	3.89	KG
8	32X32X2.6	8.54	32X32X2.6	8.54	32X32X2.6	8.543	32X32X2.6	8.54	38X38X2.6	10.40	38X38X2.6	10.40	KG
9	25X25X2.6	5.58	25X25X2.6	5.58	25X25X2.6	5.577	25X25X2.6	5.58	25X25X2.6	5.58	25X25X2.6	5.58	KG
10	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.427	38X38X2.6	14.43	38X38X2.6	14.43	38X38X2.6	14.43	KG
11	32X32X2.6	9.73	32X32X2.6	9.73	32X32X2.6	9.727	32X32X2.6	9.73	32X32X2.6	9.73	32X32X2.6	9.73	KG
12	38X38X2.6	14.43	38X38X2.6	14.43	40X40X2.6	15.318	50X50X2.6	19.62	50X50X2.6	19.62	50X50X2.6	19.62	KG
13	25X25X2.6	8.97	25X25X2.6	8.97	25X25X2.6	8.965	25X25X2.6	8.97	25X25X2.6	8.97	25X25X2.6	8.97	KG
14	50X50X2.6	26.12	50X50X2.6	26.12	50X50X2.6	26.120	50X50X2.6	26.12	50X50X2.6	26.12	50X50X2.6	26.12	KG
15	40X40X2.6	18.41	40X40X2.6	18.41	40X40X2.6	18.414	40X40X2.6	18.41	40X40X2.6	18.41	40X40X2.6	18.41	KG
16	50X50X2.6	26.12	50X50X2.6	26.12	60X60X2.6	31.777	60X60X2.6	31.78	60X60X2.6	31.78	60X60X3.2	38.41	KG
17	25X25X2.6	12.35	25X25X2.6	12.35	25X25X2.6	12.349	25X25X2.6	12.35	25X25X2.6	12.35	25X25X2.6	12.35	KG
18	60X60X2.6	40.19	60X60X2.6	40.19	60X60X2.6	40.195	60X60X2.6	40.19	60X60X3.2	48.59	60X60X3.2	48.59	KG
19	60X60X2.6	37.81	60X60X2.6	37.81	60X60X2.6	37.806	60X60X2.6	37.81	60X60X2.6	37.81	60X60X2.6	37.81	KG
20	60X60X2.6	40.73	60X60X2.6	40.73	60X60X2.6	40.727	60X60X2.6	40.73	60X60X2.6	40.73	60X60X2.6	40.73	KG
21	25X25X2.6	10.53	25X25X2.6	10.53	25X25X2.6	10.530	25X25X2.6	10.53	25X25X2.6	10.53	25X25X2.6	10.53	KG
22	38X38X2.6	14.54	38X38X2.6	14.54	38X38X2.6	14.537	38X38X2.6	14.54	38X38X2.6	14.54	38X38X2.6	14.54	KG
23	32X32X2.6	9.46	32X32X2.6	9.46	32X32X2.6	9.456	32X32X2.6	9.46	32X32X2.6	9.46	32X32X2.6	9.46	KG
24	38X38X2.6	14.25	38X38X2.6	14.25	38X38X2.6	14.253	38X38X2.6	14.25	38X38X2.6	14.25	38X38X2.6	14.25	KG
25	25X25X2.6	3.51	25X25X2.6	3.51	25X25X2.6	3.510	25X25X2.6	3.51	25X25X2.6	3.51	25X25X2.6	3.51	KG
26	122X61X3.6	141.14	122X61X3.6	141.14	122X61X4.5	173.400	122X61X4.5	173.40	122X61X5.4	204.49	145X82X4.8	232.37	KG
27	38X38X2.6	16.06	38X38X2.6	16.06	38X38X2.6	16.060	38X38X2.6	16.06	38X38X2.6	16.06	38X38X2.6	16.06	KG
	TOTAL	**1232.64**	**TOTAL**	**1309.99**	**TOTAL**	**1490.20**	**TOTAL**	**1531.77**	**TOTAL**	**1717.11**	**TOTAL**	**1895.16**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		23194		23725		24960		25245		26656		27844	N
LL		44299		44299		44299		44299		44299		44299	N
WL0+PRE	5715	-61535	7985	-85984	10162	-109417	11593	-124824	13118	-141246	15877	-170952	N
		-53988		-75437		-95996		-109513		-123921		-149984	N
WL90+PRE		-68349		-95504		-121532		-138645		-156885		189881	N

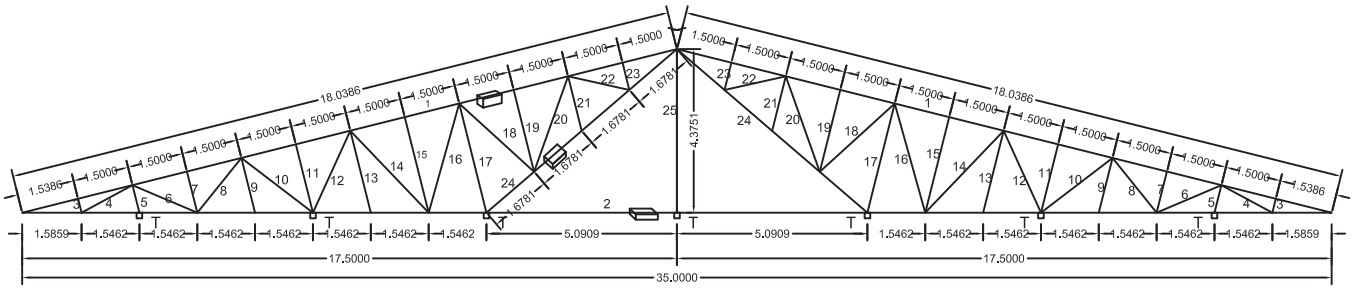
Span : 35m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	80X80X4.8	392.16	80X80X4.8	392.16	80X80X4.8	392.16	91X91X4.5	428.59	91X91X5.4	505.44	100X100X6	612.59	KG
2	122X61X4.5	415.80	145X82X4.8	557.20	145X82X4.8	557.20	145X82X5.4	620.90	172X92X4.8	654.85	172X92X5.4	730.80	KG
3	25X25X2.6	1.30	25X25X2.6	1.30	25X25X2.6	1.30	25X25X2.6	1.30	25X25X2.6	1.30	25X25X2.6	1.30	KG
4	25X25X2.6	5.23	25X25X2.6	5.23	32X32X2.6	5.23	32X32X2.6	7.00	32X32X2.6	7.00	32X32X2.6	7.00	KG
5	25X25X2.6	2.57	25X25X2.6	2.57	25X25X2.6	2.57	25X25X2.6	2.57	25X25X2.6	2.57	25X25X2.6	2.57	KG
6	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	KG
7	25X25X2.6	3.83	25X25X2.6	3.83	25X25X2.6	3.83	25X25X2.6	3.83	25X25X2.6	3.83	25X25X2.6	3.83	KG
8	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	38X38X2.6	10.35	38X38X2.6	10.35	38X38X2.6	10.35	KG
9	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	KG
10	38X38X2.6	13.25	38X38X2.6	13.25	38X38X2.6	13.25	38X38X2.6	13.25	38X38X2.6	13.25	38X38X2.6	13.25	KG
11	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	KG
12	32X32X2.6	10.89	38X38X2.6	13.25	40X40X2.6	13.25	50X50X2.6	18.02	50X50X2.6	18.02	50X50X2.6	18.02	KG
13	25X25X2.6	7.64	25X25X2.6	7.64	25X25X2.6	7.64	25X25X2.6	7.64	25X25X2.6	7.64	25X25X2.6	7.64	KG
14	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	KG
15	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	KG
16	40X40X2.6	17.70	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	60X60X2.6	27.59	60X60X2.6	27.59	KG
17	50X50X2.6	22.51	50X50X2.6	22.51	50X50X2.6	22.51	50X50X2.6	22.51	50X50X2.6	22.51	50X50X2.6	22.51	KG
18	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	50X50X2.6	20.27	KG
19	32X32X2.6	10.20	32X32X2.6	10.20	32X32X2.6	10.20	32X32X2.6	10.20	32X32X2.6	10.20	32X32X2.6	10.20	KG
20	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	KG
21	25X25X2.6	5.09	25X25X2.6	5.09	25X25X2.6	5.09	25X25X2.6	5.09	25X25X2.6	5.09	25X25X2.6	5.09	KG
22	25X25X2.6	5.67	25X25X2.6	5.67	25X25X2.6	5.67	25X25X2.6	5.67	25X25X2.6	5.67	32X32X2.6	7.58	KG
23	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	KG
24	96X48X4	110.35	122X61X3.6	129.82	122X61X3.6	129.82	122X61X4.5	159.49	122X61X5.4	188.08	145X82X4.8	213.73	KG
25	32X32X2.6	9.89	32X32X2.6	9.89	32X32X2.6	9.89	32X32X2.6	9.89	32X32X2.6	9.89	32X32X2.6	9.89	KG
	TOTAL	**1132.07**	**TOTAL**	**1300.27**	**TOTAL**	**1300.27**	**TOTAL**	**1438.46**	**TOTAL**	**1582.76**	**TOTAL**	**1798.78**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		16315		17178		17191		17995		18712		19844	N
LL		36221		36221		36221		36221		36221		36221	N
WL0+PRE	4848	-53273	6773	-74422	8620	-94719	9837	-108091	11131	-122315	13473	-148045	N
		-44191		-61735		-78572		-89664		-101463		-122807	N
WL90+PRE		-51336		-71716		-91275		-104161		-117867		-142663	N

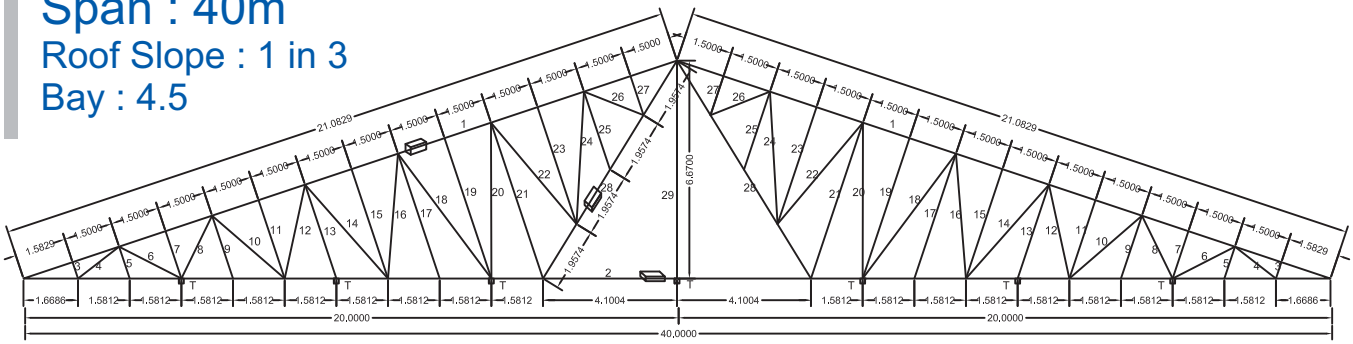
Span : 35m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	91X91X5.4	505.44	91X91X5.4	505.44	91X91X5.4	505.44	113X113X4.8	574.35	113X113X5.4	640.01	150X150X5	803.07	KG
2	122X61X5.4	490.35	145X82X4.8	557.20	172X92X4.8	654.85	172X92X5.4	730.80	200X100X5	779.10	200X100X6	924.00	KG
3	25X25X2.6	1.30	25X25X2.6	1.30	25X25X2.6	1.30	25X25X2.6	1.30	25X25X2.6	1.30	25X25X2.6	1.30	KG
4	25X25X2.6	5.23	32X32X2.6	7.00	32X32X2.6	7.00	32X32X2.6	7.00	32X32X2.6	7.00	38X38X2.6	8.52	KG
5	25X25X2.6	2.57	25X25X2.6	2.57	25X25X2.6	2.57	25X25X2.6	2.57	25X25X2.6	2.57	25X25X2.6	2.57	KG
6	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	32X32X2.6	8.50	KG
7	25X25X2.6	3.83	25X25X2.6	3.83	25X25X2.6	3.83	25X25X2.6	3.83	25X25X2.6	3.83	25X25X2.6	3.83	KG
8	32X32X2.6	8.50	32X32X2.6	8.50	38X38X2.6	10.35	38X38X2.6	10.35	38X38X2.6	10.35	50X50X2.6	14.07	KG
9	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	25X25X2.6	5.10	KG
10	40X40X2.6	14.07	40X40X2.6	14.07	40X40X2.6	14.07	40X40X2.6	14.07	40X40X2.6	14.07	40X40X2.6	14.07	KG
11	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	25X25X2.6	6.37	KG
12	38X38X2.6	13.25	40X40X2.6	14.07	50X50X2.6	18.02	50X50X2.6	18.02	50X50X2.6	18.02	60X60X2.6	21.92	KG
13	25X25X2.6	7.64	25X25X2.6	7.64	25X25X2.6	7.64	25X25X2.6	7.64	25X25X2.6	7.64	25X25X2.6	7.64	KG
14	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	50X50X2.6	22.68	KG
15	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	38X38X2.6	14.49	KG
16	50X50X2.6	22.68	50X50X2.6	22.68	60X60X2.6	27.59	60X60X2.6	27.59	60X60X2.6	27.59	60X60X3.2	33.35	KG
17	60X60X2.6	27.39	60X60X2.6	27.39	60X60X2.6	27.39	60X60X2.6	27.39	60X60X2.6	27.39	60X60X2.6	27.39	KG
18	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	40X40X2.6	15.83	50X50X2.6	20.27	50X50X2.6	20.27	KG
19	32X32X2.6	10.20	32X32X2.6	10.20	32X32X2.6	10.20	32X32X2.6	10.20	32X32X2.6	10.20	32X32X2.6	10.20	KG
20	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	38X38X2.6	14.91	KG
21	25X25X2.6	5.09	25X25X2.6	5.09	25X25X2.6	5.09	25X25X2.6	5.09	25X25X2.6	5.09	25X25X2.6	5.09	KG
22	25X25X2.6	5.67	25X25X2.6	5.67	25X25X2.6	5.67	32X32X2.6	7.58	32X32X2.6	7.58	32X32X2.6	7.58	KG
23	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	KG
24	122X61X3.6	129.82	122X61X3.6	129.82	122X61X5.4	188.08	145X82X4.8	213.73	145X82X4.8	213.73	145X82X4.8	213.73	KG
25	32X32X2.6	9.89	32X32X2.6	9.89	32X32X2.6	9.89	32X32X2.6	9.89	32X32X2.6	9.89	32X32X2.6	9.89	KG
	TOTAL	**1352.40**	**TOTAL**	**1421.83**	**TOTAL**	**1588.45**	**TOTAL**	**1761.78**	**TOTAL**	**1880.19**	**TOTAL**	**2203.06**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		23273		23748		25001		26063		26890		29102	N
LL		48319		48319		48319		48319		48319		48319	N
WL0+PRE	6467	-71066	9037	-99301	11499	-126363	13119	-144156	14845	-163122	17967	-197429	N
		-58951		-82372		-104821		-119581		-135313		-163772	N
WL90+PRE		-68482		-95690		-121769		-138915		-157191		-190251	N

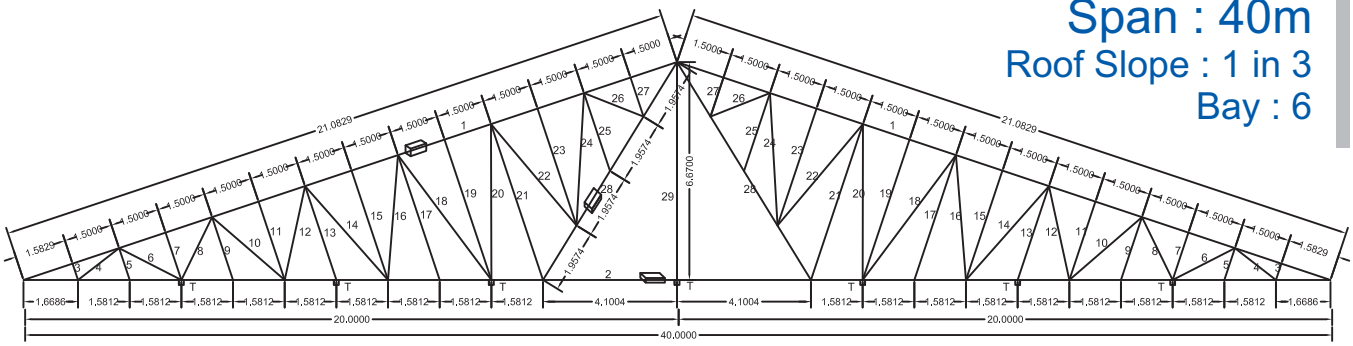
Span : 40m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	80X80X4	388.7705	80X80X4	388.77	80X80X4	388.77	91X91X3.6	407.75	91X91X4.5	500.93	91X91X5.4	590.75	KG
2	122X61X3.6	386.80	122X61X4.5	475.20	145X82X4.8	636.80	145X82X4.8	636.80	145X82X5.4	709.60	172X92X4.8	748.40	KG
3	25X25X2.6	1.78	25X25X2.6	1.78	25X25X2.6	1.78	25X25X2.6	1.78	25X25X2.6	1.78	25X25X2.6	1.78	KG
4	25X25X2.6	5.37	25X25X2.6	5.37	25X25X2.6	5.37	25X25X2.6	5.37	25X25X3.2	6.30	32X32X2.6	7.19	KG
5	25X25X2.6	3.47	25X25X2.6	3.47	25X25X2.6	3.47	25X25X2.6	3.47	25X25X2.6	3.47	25X25X2.6	3.47	KG
6	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	KG
7	25X25X2.6	5.17	25X25X2.6	5.17	25X25X2.6	5.17	25X25X2.6	5.17	25X25X2.6	5.17	25X25X2.6	5.17	KG
8	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	38X38X2.6	11.78	38X38X2.6	11.78	KG
9	25X25X2.6	6.86	25X25X2.6	6.86	25X25X2.6	6.86	25X25X2.6	6.86	25X25X2.6	6.86	25X25X2.6	6.86	KG
10	38X38X2.6	16.17	38X38X2.6	16.17	38X38X2.6	16.17	38X38X2.6	16.17	38X38X2.6	16.17	38X38X2.6	16.17	KG
11	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	KG
12	38X38X2.6	16.17	38X38X2.6	16.17	40X40X2.6	17.17	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	KG
13	25X25X2.6	10.24	25X25X2.6	10.24	25X25X2.6	10.24	25X25X2.6	10.24	25X25X2.6	10.24	25X25X2.6	10.24	KG
14	50X50X2.6	28.69	50X50X2.6	28.69	50X50X2.6	28.69	50X50X2.6	28.69	50X50X2.6	28.69	50X50X2.6	28.69	KG
15	50X50X2.6	26.40	50X50X2.6	26.40	50X50X2.6	26.40	50X50X2.6	26.40	50X50X2.6	26.40	50X50X2.6	26.40	KG
16	50X50X2.6	28.69	50X50X2.6	28.69	50X50X2.9	31.60	60X60X2.6	34.90	60X60X2.6	34.90	60X60X3.2	42.19	KG
17	25X25X2.6	13.62	25X25X2.6	13.62	25X25X2.6	13.62	25X25X2.6	13.62	25X25X2.6	13.62	25X25X2.6	13.62	KG
18	60X60X2.6	43.43	60X60X2.6	43.43	60X60X2.6	43.43	60X60X2.6	43.43	60X60X2.6	43.43	60X60X2.6	43.43	KG
19	60X60X2.6	41.22	60X60X2.6	41.22	60X60X2.6	41.22	60X60X2.6	41.22	60X60X2.6	41.22	60X60X2.6	41.22	KG
20	60X60X2.6	43.43	60X60X2.6	43.43	60X60X3.2	52.49	72X72X3.2	64.04	72X72X3.2	64.04	72X72X3.2	64.04	KG
21	72X72X3.2	67.50	72X72X3.2	67.50	72X72X3.2	67.50	72X72X3.2	67.50	72X72X3.2	67.50	72X72X3.2	67.50	KG
22	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	KG
23	50X50X2.6	28.22	50X50X2.6	28.22	50X50X2.6	28.22	50X50X2.6	28.22	50X50X2.6	28.22	50X50X2.6	28.22	KG
24	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	KG
25	25X25X2.6	8.50	25X25X2.6	8.50	25X25X2.6	8.50	25X25X2.6	8.50	25X25X2.6	8.50	25X25X2.6	8.50	KG
26	32X32X2.6	8.93	32X32X2.6	8.93	32X32X2.6	8.93	32X32X2.6	8.93	32X32X2.6	8.93	32X32X2.6	8.93	KG
27	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	KG
28	122X61X3.6	151.43	122X61X3.6	151.42	122X61X3.6	151.42	122X61X4.5	186.03	122X61X4.5	186.03	145X82X4.8	249.29	KG
29	38X38X2.6	18.34	38X38X2.6	18.34	38X38X2.6	18.34	38X38X2.6	18.34	38X38X2.6	18.34	38X38X2.6	18.34	KG
	TOTAL	**1460.61**	**TOTAL**	**1549.00**	**TOTAL**	**1723.58**	**TOTAL**	**1796.83**	**TOTAL**	**1965.84**	**TOTAL**	**2165.89**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		19743		20199		21097		21473		22466		23469	N
LL		37950		37950		37950		37950		37950		37950	N
WL0+PRE	4919	-52967	6870	-73978	8746	-94175	9981	-107469	11294	-121611	13665	-147141	N
		-46453		-64881		-82594		-94254		-106657		-129048	N
WL9O+PRE		-58808		-82138		-104561		-119321		-135023		-163369	N

Span : 40m
Roof Slope : 1 in 3
Bay : 6



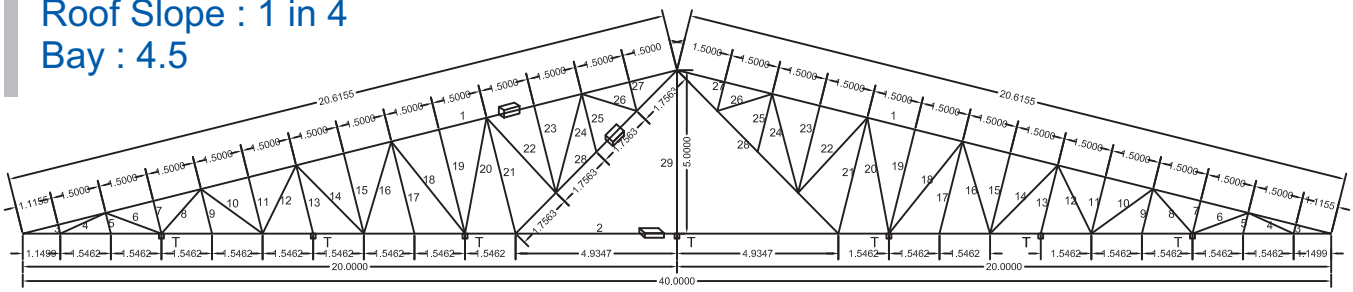
SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	91X91X4.5	500.93	91X91X4.5	500.93	91X91X4.5	500.93	91X91X5.4	590.75	113X113X4.8	671.28	132X132X4.8	788.93	KG
2	122X61X3.6	386.80	145X82X4.8	636.80	145X82X5.4	709.60	172X92X4.8	748.40	172X92X5.4	835.20	200X100X5	890.40	KG
3	25X25X2.6	1.78	25X25X2.6	1.78	25X25X2.6	1.78	25X25X2.6	1.78	25X25X2.6	1.78	25X25X2.6	1.78	KG
4	25X25X2.6	5.37	25X25X2.6	5.37	32X32X2.6	7.19	32X32X2.6	7.19	32X32X2.6	7.19	32X32X2.6	7.19	KG
5	25X25X2.6	3.47	25X25X2.6	3.47	25X25X2.6	3.47	25X25X2.6	3.47	25X25X2.6	3.47	25X25X2.6	3.47	KG
6	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	32X32X2.6	9.68	KG
7	25X25X2.6	5.17	25X25X2.6	5.17	25X25X2.6	5.17	25X25X2.6	5.17	25X25X2.6	5.17	25X25X2.6	5.17	KG
8	32X32X2.6	9.68	32X32X2.6	9.68	38X38X2.6	11.78	38X38X2.6	11.78	38X38X2.6	11.78	40X40X2.6	11.78	KG
9	25X25X2.6	6.86	25X25X2.6	6.86	25X25X2.6	6.86	25X25X2.6	6.86	25X25X2.6	6.86	25X25X2.6	6.86	KG
10	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	KG
11	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	KG
12	38X38X2.6	16.17	40X40X2.6	17.17	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	60X60X2.6	31.99	KG
13	25X25X2.6	10.24	25X25X2.6	10.24	25X25X2.6	10.24	25X25X2.6	10.24	25X25X2.6	10.24	25X25X2.6	10.24	KG
14	60X60X2.6	34.90	60X60X2.6	34.90	60X60X2.6	34.90	60X60X2.6	34.90	60X60X2.6	34.90	60X60X2.6	34.90	KG
15	50X50X2.6	26.40	50X50X2.6	26.40	50X50X2.6	26.40	50X50X2.6	26.40	50X50X2.6	26.40	50X50X2.6	26.40	KG
16	50X50X2.6	28.69	60X60X2.6	34.90	60X60X2.6	34.90	60X60X2.6	34.90	60X60X3.2	42.19	72X72X3.2	51.47	KG
17	25X25X2.6	13.62	25X25X2.6	13.62	25X25X2.6	13.62	25X25X2.6	13.62	25X25X2.6	13.62	25X25X2.6	13.62	KG
18	72X72X3.2	64.04	72X72X3.2	64.04	72X72X3.2	64.04	72X72X3.2	64.04	72X72X3.2	64.04	72X72X3.2	64.04	KG
19	60X60X2.6	41.22	60X60X2.6	41.22	60X60X2.6	41.22	60X60X2.6	41.22	60X60X2.6	41.22	60X60X2.6	41.22	KG
20	60X60X2.6	43.43	60X60X3.2	52.49	72X72X3.2	64.04	72X72X3.2	64.04	72X72X3.2	64.04	80X80X3.2	71.68	KG
21	72X72X3.2	67.50	72X72X3.2	67.50	72X72X3.2	67.50	80X80X3.2	75.55	80X80X3.2	75.55	80X80X3.2	75.55	KG
22	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	KG
23	50X50X2.6	28.22	50X50X2.6	28.22	50X50X2.6	28.22	50X50X2.6	28.22	50X50X2.6	28.22	50X50X2.6	28.22	KG
24	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	60X60X2.6	36.95	KG
25	25X25X2.6	8.50	25X25X2.6	8.50	25X25X2.6	8.50	25X25X2.6	8.50	25X25X2.6	8.50	25X25X2.6	8.50	KG
26	32X32X2.6	8.93	32X32X2.6	8.93	32X32X2.6	8.93	32X32X2.6	8.93	32X32X2.6	8.93	32X32X2.6	8.93	KG
27	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	25X25X2.6	4.25	KG
28	122X61X3.6	151.42	122X61X3.6	151.42	122X61X4.5	186.03	122X61X5.4	219.38	145X82X4.8	249.29	145X82X4.8	249.29	KG
29	38X38X2.6	18.34	38X38X2.6	18.34	38X38X2.6	18.34	38X38X2.6	18.34	38X38X2.6	18.34	38X38X2.6	18.34	KG
	TOTAL	**1605.41**	**TOTAL**	**1871.69**	**TOTAL**	**1999.38**	**TOTAL**	**2169.40**	**TOTAL**	**2373.93**	**TOTAL**	**2573.69**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	N
DL		27331		29160		30199		31331		32592		32951	N
LL		50625		50625		50625		50625		50625		50625	N
WL0+PRE	6561	-70658	9169	-98729	11668	-125636	13311	-143328	15062	-162184	18229	-196295	N
		61969		-86589		-110188		-125702		-142241		-172156	N
WL9O+PRE		-78449		-109619		-139493		-159135		-180070		-217942	N

Span : 40m

Roof Slope : 1 in 4

Bay : 4.5

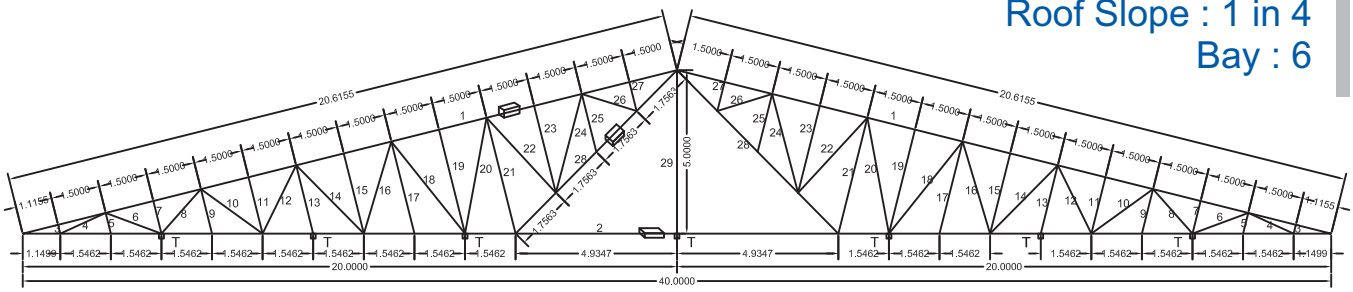


SUPPORT CONDITION : ONE PINNED OTHER ROLLER

T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	91X91X4.5	489.82	91X91X4.5	489.82	91X91X4.5	489.82	91X91X5.4	577.65	113X113X4.8	656.40	132X132X4.8	771.43	KG
2	122X61X4.5	475.20	145X82X4.8	636.80	145X82X5.4	709.60	172X92X4.8	748.40	172X92X5.4	835.20	200X100X5	890.40	KG
3	25X25X2.6	0.94	25X25X2.6	0.94	25X25X2.6	0.94	25X25X2.6	0.94	25X25X2.6	0.94	25X25X2.6	0.94	KG
4	40X40X2.6	8.91	40X40X2.6	8.91	40X40X2.6	8.91	40X40X2.6	8.91	40X40X2.6	8.91	40X40X2.6	8.91	KG
5	25X25X2.6	2.21	25X25X2.6	2.21	25X25X2.6	2.21	25X25X2.6	2.21	25X25X2.6	2.21	25X25X2.6	2.21	KG
6	38X38X2.6	10.00	38X38X2.6	10.00	38X38X2.6	10.00	38X38X2.6	10.00	38X38X2.6	10.00	38X38X2.6	10.00	KG
7	25X25X2.6	3.48	25X25X2.6	3.48	25X25X2.6	3.48	25X25X2.6	3.48	25X25X2.6	3.48	25X25X2.6	3.48	KG
8	25X25X2.6	4.46	32X32X2.6	7.25	32X32X2.6	7.25	32X32X2.6	7.25	38X38X2.6	7.25	38X38X2.6	7.25	KG
9	25X25X2.6	4.75	25X25X2.6	4.75	25X25X2.6	4.75	25X25X2.6	4.75	25X25X2.6	4.75	25X25X2.6	4.75	KG
10	38X38X2.6	12.80	38X38X2.6	12.80	38X38X2.6	12.80	38X38X2.6	12.80	38X38X2.6	12.80	38X38X2.6	12.80	KG
11	25X25X2.6	6.01	25X25X2.6	6.01	25X25X2.6	6.01	25X25X2.6	6.01	25X25X2.6	6.01	25X25X2.6	6.01	KG
12	32X32X2.6	10.52	38X38X2.6	12.80	38X38X2.6	12.80	40X40X2.6	13.59	50X50X2.6	17.41	50X50X2.6	17.41	KG
13	32X32X2.6	9.74	32X32X2.6	9.74	32X32X2.6	9.74	32X32X2.6	9.74	32X32X2.6	9.74	32X32X2.6	9.74	KG
14	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	KG
15	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	KG
16	38X38X2.6	16.17	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	60X60X2.6	26.76	60X60X2.6	26.76	KG
17	38X38X2.6	15.97	38X38X2.6	15.97	38X38X2.6	15.97	38X38X2.6	15.97	38X38X2.6	15.97	38X38X2.6	15.97	KG
18	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	KG
19	50X50X2.6	24.53	50X50X2.6	24.53	50X50X2.6	24.53	50X50X2.6	24.53	50X50X2.6	24.53	50X50X2.6	24.53	KG
20	50X50X2.6	26.97	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	60X60X3.2	39.66	72X72X3.2	48.39	KG
21	60X60X2.6	33.25	60X60X2.6	33.25	60X60X2.6	33.25	60X60X2.6	33.25	60X60X2.6	33.25	60X60X2.6	33.25	KG
22	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	50X50X2.6	23.37	KG
23	38X38X2.6	15.07	38X38X2.6	15.07	38X38X2.6	15.07	38X38X2.6	15.07	38X38X2.6	15.07	38X38X2.6	15.07	KG
24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	KG
25	25X25X2.6	6.18	25X25X2.6	6.18	25X25X2.6	6.18	25X25X2.6	6.18	25X25X2.6	6.18	25X25X2.6	6.18	KG
26	25X25X2.6	5.97	25X25X2.6	5.97	25X25X2.6	5.97	25X25X2.6	5.97	25X25X2.6	5.97	32X32X2.6	7.98	KG
27	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	KG
28	122X61X3.6	135.86	122X61X3.6	135.86	122X61X4.5	166.91	122X61X4.5	166.91	122X61X5.4	196.84	145X82X4.8	223.68	KG
29	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	KG
	TOTAL	**1438.40**	**TOTAL**	**1616.74**	**TOTAL**	**1720.59**	**TOTAL**	**1848.00**	**TOTAL**	**2058.91**	**TOTAL**	**2271.84**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		19494		20405		21061		21688		22673		23779	N
LL		41396		41396		41396		41396		41396		41396	N
WLO+PRE	5754	-61000	8039	-85217	10230	-108459	11675	-123769	13211	-140056	15985	-169459	N
		-50628		-70727		-90016		-102723		-116240		-140644	N
WL9O+PRE		-58796		-82139		-104539		-119298		-134996		-163336	N

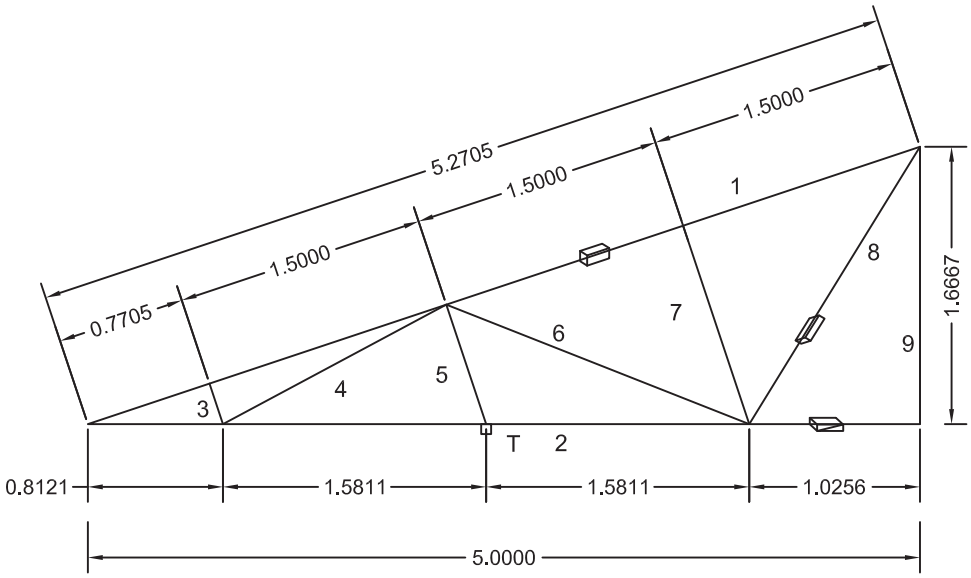
Span : 40m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	113X113X4.8	656.40	113X113X4.8	656.40	113X113X4.8	656.40	113X113X5.4	731.44	132X132X5.4	860.90	150X150X6	1088.50	KG
2	145X82X4.8	636.80	145X82X4.8	636.80	172X92X4.8	748.40	200X100X5	890.40	200X100X6	1056.00	240X120X6	1282.00	KG
3	25X25X2.6	0.94	25X25X2.6	0.94	25X25X2.6	0.94	25X25X2.6	0.94	25X25X2.6	0.94	25X25X2.6	0.94	KG
4	40X40X2.6	8.91	40X40X2.6	8.91	40X40X2.6	8.91	40X40X2.6	8.91	40X40X2.6	8.91	40X40X2.6	8.91	KG
5	25X25X2.6	2.21	25X25X2.6	2.21	25X25X2.6	2.21	25X25X2.6	2.21	25X25X2.6	2.21	25X25X2.6	2.21	KG
6	38X38X2.6	10.00	38X38X2.6	10.00	38X38X2.6	10.00	38X38X2.6	10.00	38X38X2.6	10.00	38X38X2.6	10.00	KG
7	25X25X2.6	3.48	25X25X2.6	3.48	25X25X2.6	3.48	25X25X2.6	3.48	25X25X2.6	3.48	25X25X2.6	3.48	KG
8	32X32X2.6	5.96	32X32X2.6	5.96	38X38X2.6	7.25	38X38X2.6	7.25	38X38X2.6	7.25	40X40X2.6	7.70	KG
9	25X25X2.6	4.75	25X25X2.6	4.75	25X25X2.6	4.75	25X25X2.6	4.75	25X25X2.6	4.75	25X25X2.6	4.75	KG
10	38X38X2.6	12.80	38X38X2.6	12.80	38X38X2.6	12.80	38X38X2.6	12.80	40X40X2.6	13.59	40X40X2.6	13.59	KG
11	25X25X2.6	6.01	25X25X2.6	6.01	25X25X2.6	6.01	25X25X2.6	6.01	25X25X2.6	6.01	25X25X2.6	6.01	KG
12	38X38X2.6	12.80	38X38X2.6	12.80	50X50X2.6	17.41	50X50X2.6	17.41	50X50X2.6	17.41	50X50X2.6	17.41	KG
13	32X32X2.6	9.74	32X32X2.6	9.74	32X32X2.6	9.74	32X32X2.6	9.74	32X32X2.6	9.74	32X32X2.6	9.74	KG
14	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	50X50X2.6	21.99	KG
15	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	38X38X2.6	13.91	KG
16	40X40X2.6	17.17	50X50X2.6	21.99	60X60X2.6	26.76	60X60X2.6	26.76	60X60X2.6	26.76	60X60X3.2	32.35	KG
17	38X38X2.6	15.97	38X38X2.6	15.97	38X38X2.6	15.97	38X38X2.6	15.97	38X38X2.6	15.97	38X38X2.6	15.97	KG
18	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	60X60X2.6	32.81	KG
19	50X50X2.6	24.53	50X50X2.6	24.53	50X50X2.6	24.53	50X50X2.6	24.53	50X50X2.6	24.53	50X50X2.6	24.53	KG
20	50X50X2.6	26.97	60X60X2.6	32.81	60X60X3.2	39.66	72X72X3.2	48.39	72X72X3.2	48.39	72X72X3.2	48.39	KG
21	72X72X3.2	49.04	72X72X3.2	49.04	72X72X3.2	49.04	72X72X3.2	49.04	72X72X3.2	49.04	72X72X3.2	49.04	KG
22	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	50X50X2.6	23.37	50X50X2.6	23.37	50X50X2.6	23.37	KG
23	38X38X2.6	15.07	38X38X2.6	15.07	38X38X2.6	15.07	38X38X2.6	15.07	38X38X2.6	15.07	38X38X2.6	15.07	KG
24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	40X40X2.6	18.24	KG
25	25X25X2.6	6.18	25X25X2.6	6.18	25X25X2.6	6.18	25X25X2.6	6.18	25X25X2.6	6.18	25X25X2.6	6.18	KG
26	25X25X2.6	5.97	25X25X2.6	5.97	25X25X2.6	5.97	32X32X2.6	7.98	32X32X2.6	7.98	32X32X2.6	7.98	KG
27	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	25X25X2.6	3.09	KG
28	122X61X3.6	135.86	122X61X4.5	166.91	122X61X5.4	196.84	145X82X4.8	223.68	145X82X4.8	223.68	145X82X5.4	249.25	KG
29	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	32X32X2.6	11.30	KG
	TOTAL	**1787.14**	**TOTAL**	**1828.86**	**TOTAL**	**1987.90**	**TOTAL**	**2247.63**	**TOTAL**	**2543.49**	**TOTAL**	**3028.69**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	N
DL		28395		28682		29901		31555		33580		36965	N
LL		55220		55220		55220		55221		55220		55220	N
WL0+PRE	7675	-81375	10719	-113643	13648	-144694	15570	-165067	17625	-186844	21325	-226068	N
		-67537		-94319		-120088		-136999		-155073		-187626	N
WL9O+PRE		-78433		-109537		-139464		-159103		-180092		-217898	N

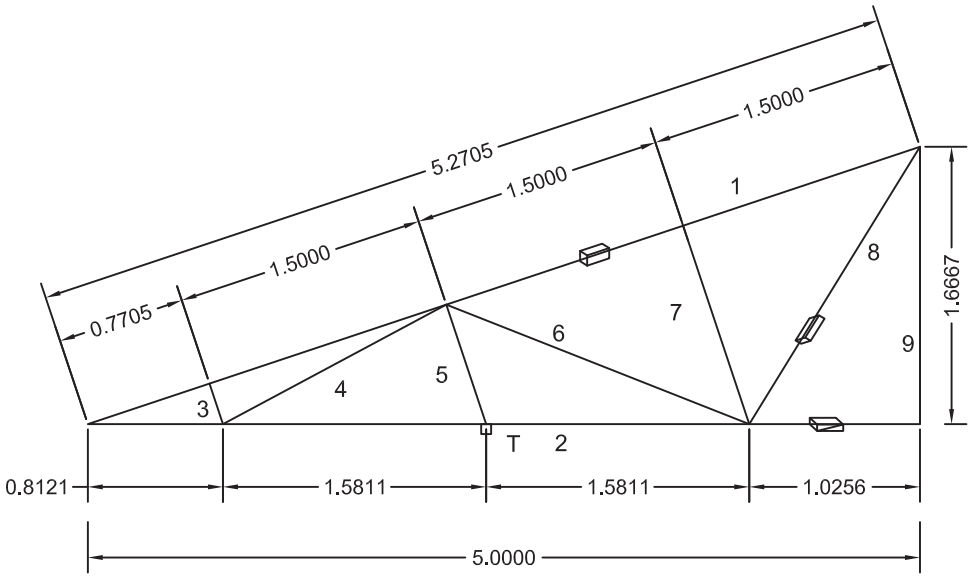
Span : 5m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	32X32X2.6	11.91	32X32X2.6	11.91	32X32X2.6	11.91	32X32X2.6	11.91	32X32X2.6	11.91	32X32X2.6	11.91	KG
2	50X25X2.6	13.55	50X25X2.6	13.55	50X25X2.6	13.55	50X25X3.2	16.20	66X33X2.6	18.45	66X33X2.6	18.45	KG
3	25X25X2.6	0.43	25X25X2.6	0.43	25X25X2.6	0.43	25X25X3.2	0.51	25X25X3.2	0.51	25X25X3.2	0.51	KG
4	32X32X2.6	3.44	32X32X2.6	3.44	32X32X2.6	3.44	32X32X2.6	3.44	32X32X2.6	3.44	32X32X2.6	3.44	KG
5	25X25X2.6	1.28	25X25X2.6	1.28	25X25X2.6	1.28	25X25X2.6	1.28	25X25X2.6	1.28	25X25X2.6	1.28	KG
6	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	KG
7	25X25X2.6	2.12	25X25X2.6	2.12	25X25X2.6	2.12	25X25X2.6	2.12	25X25X2.6	2.12	25X25X2.6	2.12	KG
8	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	32X32X3.2	5.26	38X38X2.6	5.38	KG
9	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	KG
	TOTAL	**44.40**	**TOTAL**	**44.40**	**TOTAL**	**44.40**	**TOTAL**	**47.12**	**TOTAL**	**50.22**	**TOTAL**	**50.33**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		2007		2007		2007		2020		2039		2041	N
LL		4744		4744		4744		4744		4744		4744	N
WL+PRE	5883	-9803	8219	-13696	10460	-17431	11937	-19891	13508	-22509	16342	-27233	N
DL		2125		2125		2125		2140		2152		2152	N
LL		4745		4744		4744		4744		4744		4744	N
WL+PRE		-7843		-10957		-13945		-15913		-18007		-21786	N

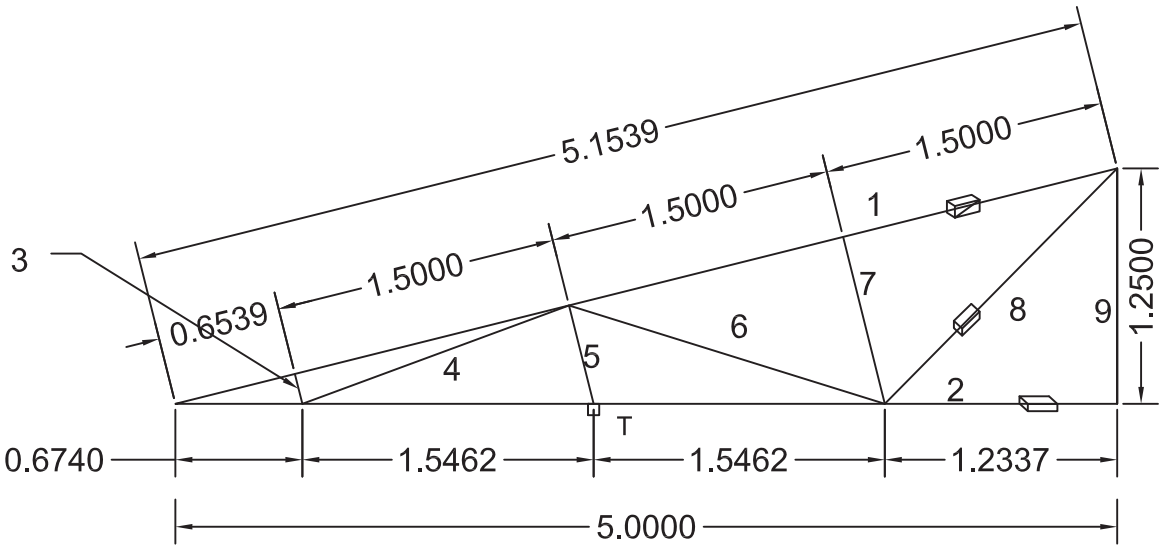
Span : 5m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	32X32X2.6	11.91	32X32X2.6	11.91	32X32X2.6	11.91	32X32X2.6	11.91	32X32X2.6	11.91	32X32X2.6	11.91	KG
2	50X25X2.6	13.55	50X25X2.6	13.55	66X33X2.6	18.45	66X33X2.6	18.45	66X33X2.6	18.45	66X33X2.9	20.35	KG
3	25X25X2.6	0.43	25X25X2.6	0.43	25X25X2.6	0.43	25X25X2.6	0.43	25X25X2.6	0.43	25X25X2.6	0.43	KG
4	32X32X2.6	3.44	32X32X2.6	3.44	32X32X2.6	3.44	32X32X2.6	3.44	32X32X2.6	3.44	32X32X2.6	3.44	KG
5	25X25X2.6	1.28	25X25X2.6	1.28	25X25X2.6	1.28	25X25X2.6	1.28	25X25X2.6	1.28	25X25X2.6	1.28	KG
6	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	32X32X2.6	4.42	KG
7	25X25X2.6	2.12	25X25X2.6	2.12	25X25X2.6	2.12	25X25X2.6	2.12	25X25X2.6	2.12	25X25X2.6	2.12	KG
8	32X32X2.6	4.42	32X32X2.6	4.42	32X32X3.2	5.26	38X38X2.6	5.38	38X38X2.6	5.38	40X40X2.6	5.71	KG
9	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	25X25X2.6	2.82	KG
	TOTAL	**44.40**	**TOTAL**	**44.40**	**TOTAL**	**50.14**	**TOTAL**	**50.26**	**TOTAL**	**50.26**	**TOTAL**	**52.49**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		2677		2677		2720		2722		2722		2739	N
LL		6327		6327		6327		6327		6327		6327	N
WL+PRE	7848	-13078	10966	-18274	13955	-23254	15920	-26528	18013	-30017	21803	-36332	N
DL		2836		2836		2871		2871		2871		2885	N
LL		6329		6329		6329		6329		6329		6329	N
WL+PRE		-10463		-14619		-18602		-21222		-24015		-29065	N

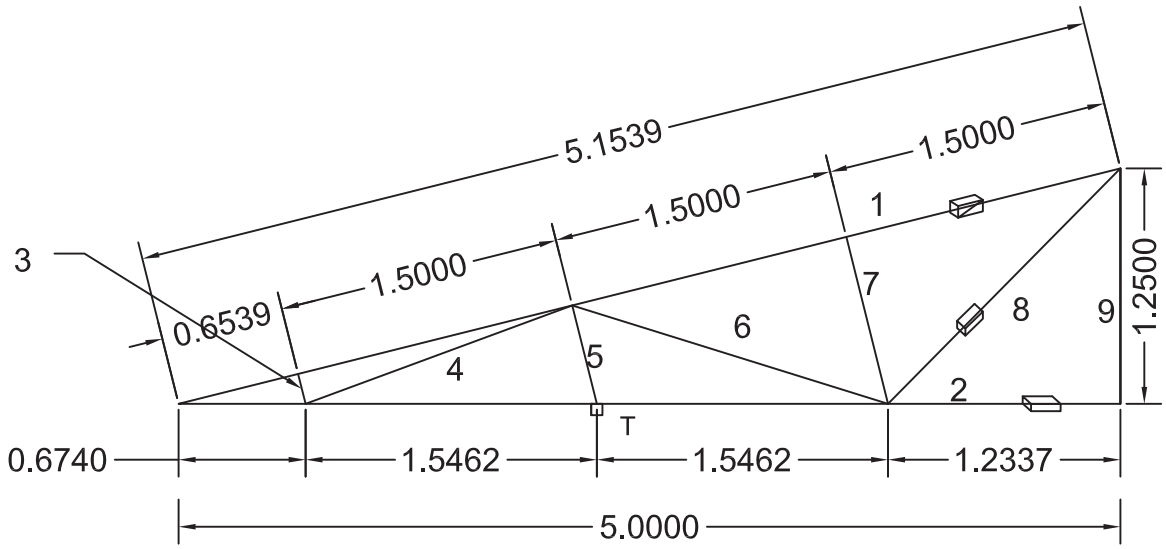
Span : 5m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	32X32X3.2	13.86	32X32X3.2	13.86	32X32X3.2	13.86	32X32X3.2	13.86	32X32X3.2	13.86	32X32X3.2	13.86	KG
2	50X25X2.6	13.55	50X25X2.6	13.55	66X33X2.6	18.45	66X33X2.6	18.45	66X33X2.6	18.45	66X33X2.9	20.35	KG
3	25X25X2.6	0.28	25X25X2.6	0.28	25X25X2.6	0.28	25X25X2.6	0.28	25X25X2.6	0.28	25X25X2.6	0.28	KG
4	25X25X3.2	2.99	25X25X3.2	2.99	32X32X2.6	3.41	32X32X2.6	3.41	32X32X2.6	3.41	32X32X2.6	3.41	KG
5	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	KG
6	25X25X3.2	3.48	25X25X3.2	3.48	32X32X2.6	3.97	32X32X2.6	3.97	32X32X2.6	3.97	32X32X2.6	3.97	KG
7	25X25X2.6	1.54	25X25X2.6	1.54	25X25X2.6	1.54	25X25X2.6	1.54	25X25X2.6	1.54	25X25X2.6	1.54	KG
8	25X25X3.2	3.48	32X32X2.6	3.97	32X32X2.6	3.97	32X32X2.6	3.97	32X32X3.2	4.72	38X38X2.6	4.83	KG
9	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	KG
	TOTAL	**42.20**	**TOTAL**	**42.69**	**TOTAL**	**48.51**	**TOTAL**	**48.51**	**TOTAL**	**49.26**	**TOTAL**	**51.27**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		645		649		678		678		685		696	N
LL		5175		5175		5175		5175		5175		5175	N
WL+PRE	4412	-9374	6163	-13096	7844	-16666	8952	-19019	10129	-21523	12261	-26050	N
DL		2128		2128		2158		2158		2159		2169	N
LL		5175		5175		5175		5175		5175		5175	N
WL+PRE		-8271		-11554		-14707		-16783		-18991		-22985	N

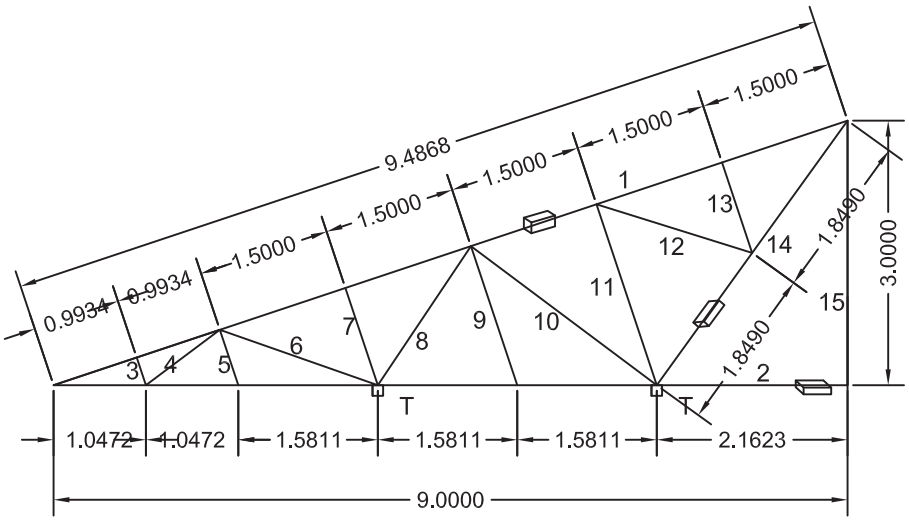
Span : 5m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	38X38X2.6	14.17	38X38X2.6	14.17	38X38X2.6	14.17	38X38X2.6	14.17	38X38X2.6	14.17	50X50X2.6	19.28	KG
2	50X25X2.6	13.55	66X33X2.6	18.45	66X33X2.6	18.45	66X33X2.6	18.45	80X40X2.6	22.75	80X40X3.2	27.50	KG
3	25X25X2.6	0.28	25X25X2.6	0.28	25X25X2.6	0.28	25X25X2.6	0.28	25X25X2.6	0.28	25X25X2.6	0.28	KG
4	32X32X2.6	3.41	32X32X2.6	3.41	32X32X2.6	3.41	32X32X2.6	3.41	32X32X2.6	3.41	38X38X2.6	4.15	KG
5	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	25X25X2.6	0.91	KG
6	32X32X2.6	3.97	32X32X2.6	3.97	32X32X2.6	3.97	32X32X2.6	3.97	32X32X2.6	3.97	38X38X2.6	4.83	KG
7	25X25X2.6	1.54	25X25X2.6	1.54	25X25X2.6	1.54	25X25X2.6	1.54	25X25X2.6	1.54	25X25X2.6	1.54	KG
8	32X32X2.6	3.97	32X32X2.6	3.97	38X38X2.6	4.83	38X38X2.6	4.83	38X38X2.6	4.83	40X40X2.6	5.13	KG
9	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	25X25X2.6	2.11	KG
	TOTAL	**43.91**	**TOTAL**	**48.81**	**TOTAL**	**49.68**	**TOTAL**	**49.68**	**TOTAL**	**53.98**	**TOTAL**	**65.73**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		873		907		917		917		947		1027	N
LL		6903		6903		6903		6903		6903		6903	N
WL+PRE	5885	-12505	8224	-17473	10466	-22235	11939	-25366	13510	-28703	16351	-34740	N
DL		2848		2881		2883		2883		2913		2993	N
LL		6905		6905		6905		6905		6905		6905	N
WL+PRE		-11034		-15418		-19620		-22383		-25326		-30654	N

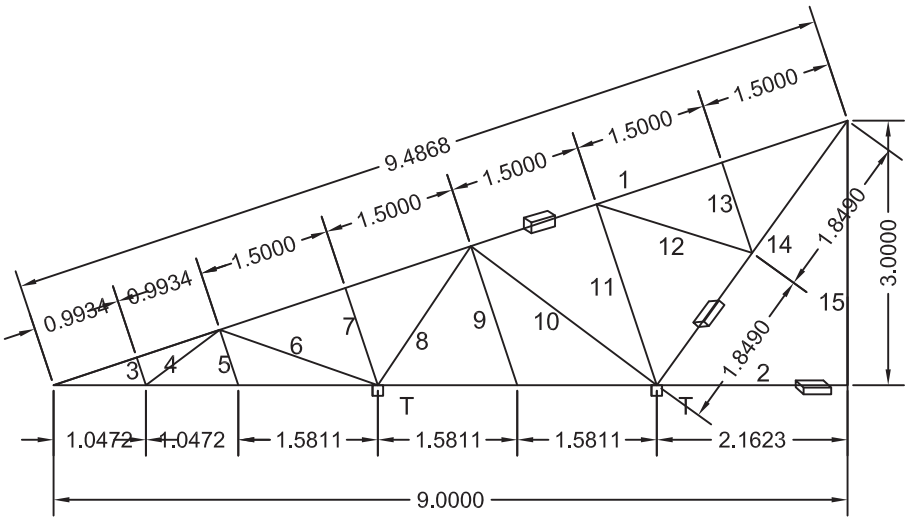
Span : 9m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	38X38X2.6	26.10	38X38X2.6	26.10	38X38X2.6	26.10	38X38X2.6	26.10	38X38X2.6	26.10	38X38X2.6	26.10	KG
2	66X33X2.6	33.21	66X33X3.6	44.37	80X40X2.6	40.95	80X40X3.2	49.50	96X48X3.2	60.39	96X48X3.2	60.39	KG
3	25X25X2.6	0.56	25X25X2.6	0.56	25X25X2.6	0.56	25X25X2.6	0.56	25X25X2.6	0.56	25X25X2.6	0.56	KG
4	25X25X2.6	1.77	25X25X2.6	1.77	25X25X2.6	1.77	25X25X2.6	1.77	25X25X2.6	1.77	25X25X2.6	1.77	KG
5	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	KG
6	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	KG
7	25X25X2.6	1.96	25X25X2.6	1.96	25X25X2.6	1.96	25X25X2.6	1.96	25X25X2.6	1.96	25X25X2.6	1.96	KG
8	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	38X38X2.6	5.22	38X38X2.6	5.22	KG
9	25X25X2.6	2.81	25X25X2.6	2.81	25X25X2.6	2.81	25X25X2.6	2.81	25X25X2.6	2.81	25X25X2.6	2.81	KG
10	38X38X2.6	7.24	38X38X2.6	7.24	38X38X2.6	7.24	38X38X2.6	7.24	38X38X2.6	7.24	38X38X2.6	7.24	KG
11	32X32X2.6	4.89	32X32X2.6	4.89	32X32X2.6	4.89	32X32X2.6	4.89	32X32X2.6	4.89	32X32X2.6	4.89	KG
12	25X25X2.6	3.12	25X25X2.6	3.12	25X25X2.6	3.12	25X25X2.6	3.12	25X25X2.6	3.12	32X32X2.6	4.18	KG
13	25X25X2.6	1.83	25X25X2.6	1.83	25X25X2.6	1.83	25X25X2.6	1.83	25X25X2.6	1.83	25X25X2.6	1.83	KG
14	66X33X2.6	13.65	66X33X2.6	13.65	66X33X3.6	18.24	66X33X3.6	18.24	80X40X2.6	16.83	80X40X3.2	20.34	KG
15	40X40X2.6	8.76	40X40X2.6	8.76	40X40X2.6	8.76	40X40X2.6	8.76	40X40X2.6	8.76	40X40X2.6	8.76	KG
	TOTAL	**115.59**	**TOTAL**	**126.75**	**TOTAL**	**127.92**	**TOTAL**	**136.47**	**TOTAL**	**146.88**	**TOTAL**	**151.45**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		3672		3729		3753		3797		3840		3886	N
LL		8539		8539		8539		8539		8539		8539	N
WL+PRE	10586	-17646	14788	-24650	18821	-31374	21467	-35803	24304	-40514	29406	-49020	N
DL		3646		3743		3731		3775		3829		3850	N
LL		8539		8538		8538		8538		8538		8538	N
WL+PRE		-14117		-19721		-25100		-28629		-32412		-39216	N

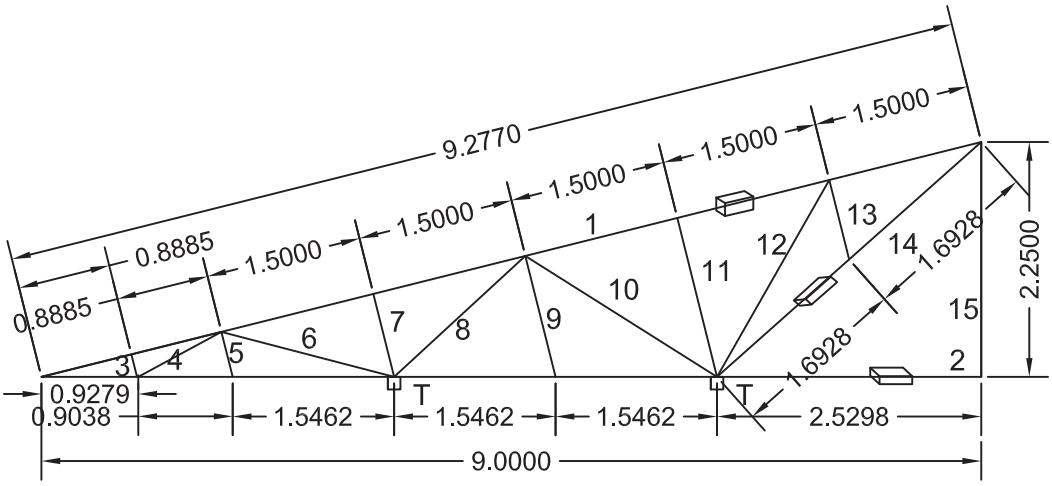
Span : 9m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	38X38X2.6	26.10	38X38X2.6	26.10	38X38X2.6	26.10	38X38X3.2	31.22	40X40X3.2	33.12	50X50X3.6	47.26	KG
2	66X33X2.9	36.63	80X40X2.6	40.95	96X48X3.2	60.39	96X48X3.2	60.39	96X48X3.2	60.39	96X48X4	73.98	KG
3	25X25X2.6	0.56	25X25X2.6	0.56	25X25X2.6	0.56	25X25X2.6	0.56	25X25X2.6	0.56	25X25X2.6	0.56	KG
4	25X25X2.6	1.77	25X25X2.6	1.77	25X25X2.6	1.77	25X25X2.6	1.77	25X25X2.6	1.77	25X25X2.6	1.77	KG
5	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	25X25X2.6	1.12	KG
6	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	KG
7	25X25X2.6	1.96	25X25X2.6	1.96	25X25X2.6	1.96	25X25X2.6	1.96	25X25X2.6	1.96	25X25X2.6	1.96	KG
8	32X32X2.6	4.29	32X32X2.6	4.29	32X32X2.6	4.29	38X38X2.6	5.22	38X38X2.6	5.22	38X38X2.6	5.22	KG
9	25X25X2.6	2.81	25X25X2.6	2.81	25X25X2.6	2.81	25X25X2.6	2.81	25X25X2.6	2.81	25X25X2.6	2.81	KG
10	38X38X2.6	7.24	38X38X2.6	7.24	38X38X2.6	7.24	38X38X2.6	7.24	38X38X2.6	7.24	38X38X2.6	7.24	KG
11	32X32X2.6	4.89	32X32X2.6	4.89	32X32X2.6	4.89	32X32X2.6	4.89	32X32X2.6	4.89	32X32X2.6	4.89	KG
12	25X25X2.6	3.12	25X25X2.6	3.12	25X25X2.6	3.12	32X32X2.6	4.18	32X32X2.6	4.18	32X32X2.6	4.18	KG
13	25X25X2.6	1.83	25X25X2.6	1.83	25X25X2.6	1.83	25X25X2.6	1.83	25X25X2.6	1.83	25X25X2.6	1.83	KG
14	66X33X2.6	13.65	66X33X3.6	18.24	80X40X2.6	16.83	80X40X3.2	20.34	80X40X3.2	20.34	80X40X4	24.82	KG
15	40X40X3.2	10.47	40X40X3.2	10.47	50X50X2.6	11.22	50X50X2.6	11.22	50X50X2.6	11.22	50X50X2.6	11.22	KG
	TOTAL	**120.72**	**TOTAL**	**129.63**	**TOTAL**	**148.41**	**TOTAL**	**159.04**	**TOTAL**	**160.93**	**TOTAL**	**193.14**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		4941		5026		5152		5247		5260		5505	N
LL		11382		11382		11382		11382		11382		11382	N
WL+PRE	14110	-23521	19710	-32856	25087	-41820	28622	-47714	32401	-54013	39197	-65342	N
DL		4936		4973		5104		5153		5167		5365	N
LL		11382		11382		11382		11381		11382		11382	N
WL+PRE		-18818		-26285		-33457		-38171		-43211		-52274	N

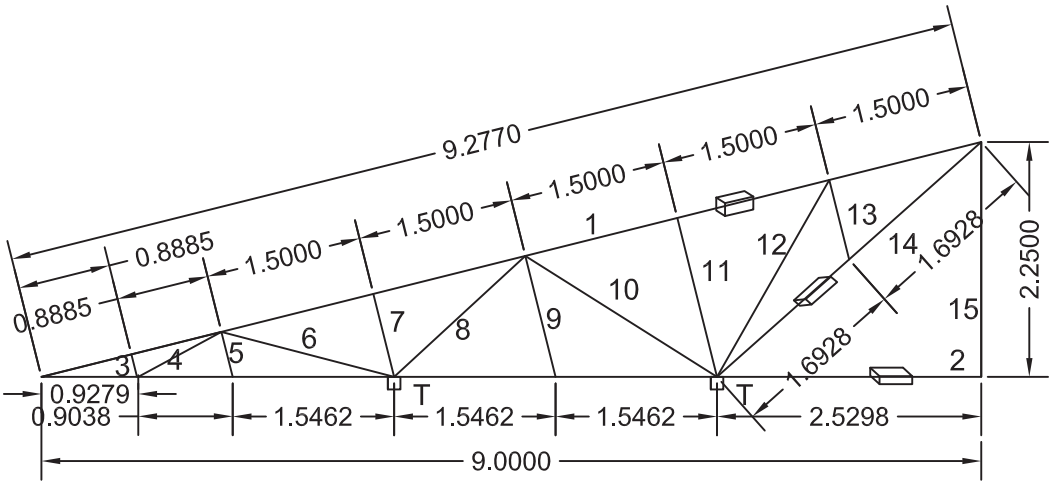
Span : 9m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	38X38X2.6	25.51	50X50X2.6	34.70	50X50X2.6	34.70	50X50X2.6	34.70	50X50X2.6	34.70	50X50X3.6	46.20	KG
2	66X33X2.9	36.63	80X40X2.6	40.95	96X48X3.2	60.39	96X48X3.2	60.39	96X48X3.2	60.39	96X48X4	73.98	KG
3	25X25X2.6	0.37	25X25X2.6	0.37	25X25X2.6	0.37	25X25X2.6	0.37	25X25X2.6	0.37	25X25X2.6	0.37	KG
4	25X25X2.6	1.55	25X25X2.6	1.55	25X25X2.6	1.55	25X25X2.6	1.55	25X25X2.6	1.55	32X32X2.6	2.07	KG
5	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	KG
6	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	KG
7	25X25X2.6	1.38	25X25X2.6	1.38	25X25X2.6	1.38	25X25X2.6	1.38	25X25X2.6	1.38	25X25X2.6	1.38	KG
8	25X25X2.6	2.89	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	38X38X2.6	4.70	38X38X2.6	4.70	KG
9	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	KG
10	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	KG
11	25X25X2.6	2.65	25X25X2.6	2.65	25X25X2.6	2.65	25X25X2.6	2.65	25X25X2.6	2.65	25X25X2.6	2.65	KG
12	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	KG
13	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	KG
14	66X33X2.6	12.49	66X33X2.6	12.49	80X40X2.6	15.40	80X40X2.6	15.40	80X40X2.6	15.40	80X40X3.2	18.62	KG
15	38X38X2.6	6.19	38X38X2.6	6.19	38X38X2.6	6.19	38X38X2.6	6.19	38X38X2.6	6.19	38X38X2.6	6.19	KG
	TOTAL	**107.44**	**TOTAL**	**121.92**	**TOTAL**	**144.27**	**TOTAL**	**144.27**	**TOTAL**	**145.11**	**TOTAL**	**173.94**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		3322		3395		3521		3521		3525		3683	N
LL		9314		9314		9315		9315		9315		9315	N
WL+PRE	7444	-16872	11098	-23572	14125	-29999	16111	-34219	18240	-38741	22069	-46872	N
DL		3671		3745		3849		3849		3854		3987	N
LL		9317		9316		9316		9316		9316		9316	N
WL+PRE		-14893		-20805		-26479		-30202		-34193		-41371	N

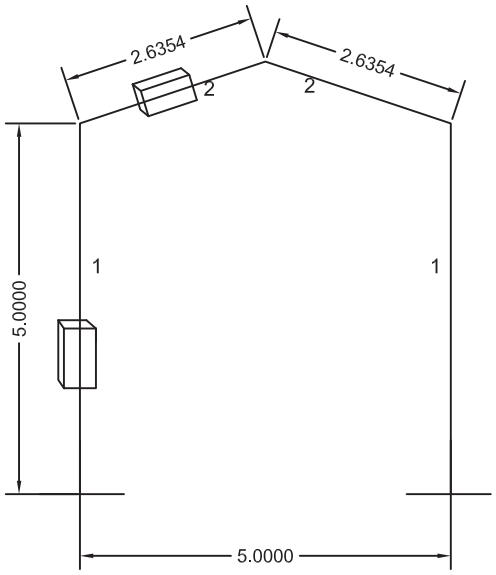
Span : 9m
Roof Slope : 1 in 4
Bay : 6



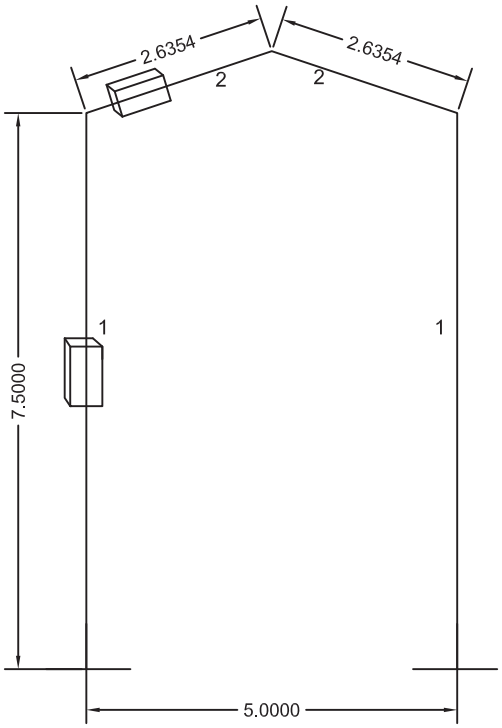
SUPPORT CONDITION : ONE PINNED OTHER ROLLER
T : TIE RUNNER

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X2.6	34.70	50X50X2.6	34.70	50X50X2.6	34.70	50X50X3.6	46.20	50X50X3.6	46.20	60X60X4	62.25	KG
2	80X40X2.6	40.95	96X48X3.2	60.39	96X48X3.2	60.39	96X48X4	73.98	96X48X4	73.98	122X61X3.6	87.03	KG
3	25X25X2.6	0.37	25X25X2.6	0.12	25X25X2.6	0.12	25X25X2.6	0.12	25X25X2.6	0.12	25X25X2.6	0.12	KG
4	25X25X2.6	1.55	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	25X25X2.6	2.54	KG
5	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	25X25X2.6	0.75	KG
6	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	32X32X2.6	3.86	KG
7	25X25X2.6	1.38	25X25X2.6	1.38	25X25X2.6	1.38	25X25X2.6	1.38	25X25X2.6	1.38	25X25X2.6	1.38	KG
8	32X32X2.6	3.86	32X32X2.6	3.86	38X38X2.6	4.70	38X38X2.6	4.70	38X38X2.6	4.70	38X38X2.6	4.70	KG
9	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	25X25X2.6	2.02	KG
10	38X38X2.6	5.97	38X38X2.6	5.97	38X38X2.6	5.97	38X38X2.6	5.97	38X38X2.6	5.97	38X38X2.6	5.97	KG
11	25X25X2.6	2.65	25X25X2.6	2.65	25X25X2.6	2.65	25X25X2.6	2.65	25X25X2.6	2.65	25X25X2.6	2.65	KG
12	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	32X32X2.6	4.91	KG
13	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	25X25X2.6	1.33	KG
14	66X33X2.6	12.49	66X33X3.6	16.69	80X40X2.6	15.40	80X40X3.2	18.62	96X48X3.2	22.72	96X48X4	27.83	KG
15	38X38X2.6	6.19	38X38X2.6	6.19	38X38X2.6	6.19	38X38X2.6	6.19	38X38X2.6	6.19	38X38X2.6	6.19	KG
	TOTAL	**122.98**	**TOTAL**	**147.35**	**TOTAL**	**146.90**	**TOTAL**	**175.21**	**TOTAL**	**179.31**	**TOTAL**	**213.52**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		4535		4717		4707		4918		4966		5232	N
LL		12417		12417		12417		12417		12417		12416	N
WL+PRE	10590	-22492	14792	-31418	18828	-39989	21481	-45625	24309	-51632	29417	-62481	N
DL		4998		5139		5143		5322		5329		5546	N
LL		12420		12420		12420		12420		12420		12420	N
WL+PRE		-19852		-27730		-35295		-40268		-45570		-55146	N

Span : 5m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : FIXED AT BOTTOM



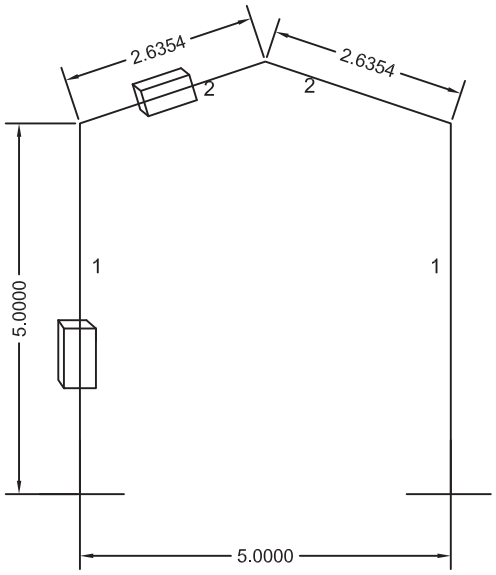
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
	MEM NO	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**		**MEM NO**	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**	
HT 5M	1	145X82X4.8	15.92	10	159.20		1	145X82X5.4	17.74	10	177.40	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X3.6	9.67	5.154	49.84	
				TOTAL	**209.04**					**TOTAL**	**227.24**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	638.68	4224.98	-1243	-638.68	4224.98	1242.98	655.63	4321.43	-1290.27	-655.63	4321.4	1290.27
LL	948.99	4752	-1847.8	-948.99	4752	1847.8	974	4752	-1917.87	-974	4752	1917.87
WL0	-3933.08	-6289.76	9756.49	-1352.6	-3157.8	4941.53	-5398.15	-8621.05	13432.8	-1567.74	-4571.8	6242.51
WL90	-56.1	-5888.8	341.17	56.1	-5888.8	-341.17	-96.08	-8224.69	535.58	96.08	-8224.7	-535.58
SUCT	-141.27	1473.09	180.79	141.27	1473.09	-180.79	-196.27	2057.05	245.39	196.27	2057.1	-245.39
PRESSURE	141.27	-1473.09	-180.79	-141.27	-1473.1	180.79	196.27	-2057.05	-245.39	-196.27	-2057.1	245.39
HT 7.5 M	1	180X180X5	26.97	15	404.55		1	220X220X6	39.59	15	593.85	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X4.5	11.88	5.156	61.25	
				TOTAL	**454.39**					**TOTAL**	**655.10**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	474.47	5491.45	-1401.6	-474.47	5491.45	1401.57	524.31	6526.13	-1664.93	-524.31	6526.1	1664.93
LL	704.89	4752	-2083.5	-704.89	4752	2083.52	763.93	4752	-2428.59	-763.93	4752	2428.59
WL0	-7937.36	-7982.86	29223.1	-3792.3	-2188.9	18778.1	-11301.82	-9615.85	44482	-5421.58	-3577	29103.4
WL90	2238.99	-5888.8	-4652.5	-2239	-5888.8	4652.51	3131.56	-8224.69	-6366.35	-3131.56	-8225	6366.35
SUCT	-1017.02	1473.59	2217.72	1017	1473.6	-2217.72	-1436.86	2057.05	3126.25	1436.86	2057.1	-3126.3
PRESSURE	1017.02	-1473.59	-2217.7	-1017	-1473.6	2217.72	1436.86	-2057.05	-3126.25	-1436.86	-2057	3126.25
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

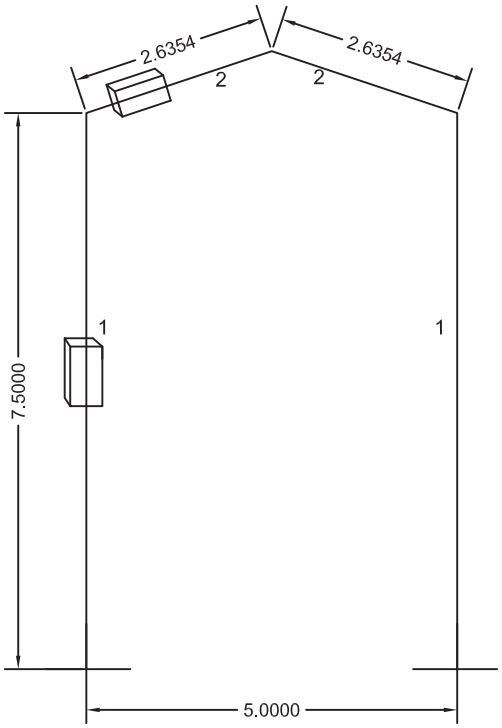
	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	172X91X5.4	20.88	10	208.80		1	200X100X5	22.26	10	222.6	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X4.5	11.88	5.154	61.23	
				TOTAL	**258.64**					**TOTAL**	**283.83**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	705.98	4479.91	-1454.5	-705.98	4479.91	1454.53	733.4	4614.44	-1533.46	-733.4	4614.4	1533.46
LL	1048.97	4752	-2162.9	-1049	4752	2162.88	1068.51	4752	-2236.43	-1068.51	4752	2236.43
WL0	-7025.54	-10674.12	18322.9	-1844.7	-6116.9	8227.24	-8062.42	-12085.53	21307.7	-2060.28	-7075	9469.21
WL90	-199.47	-10469.08	972.69	199.47	-10469	-972.69	-254.07	-11948.01	1219.15	254.07	-11948	-1219.2
SUCT	-241.36	2617.63	268.08	241.36	2617.63	-268.08	-272.19	2988.03	288.09	272.19	2988	-288.09
PRESSURE	241.36	-2617.63	-268.08	-241.36	-2617.6	268.08	272.75	-2986.53	-289.3	-272.75	-2987	289.3
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	220X220X6	39.59	15	593.85	
	2	145X82X4.8	15.92	5.154	82.05		2	145X82X4.8	15.92	5.154	82.05	
				TOTAL	**760.65**					**TOTAL**	**675.90**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	521.73	7071.38	-1591.9	-521.73	7071.38	1591.9	495.44	6635.74	-1450.78	-495.44	6635.7	1450.78
LL	733.92	4752	-2242.1	-733.92	4752	2242.09	696.78	4752	-2042.28	-696.78	4752	2042.28
WL0	-18244.39	-13384.32	70015.2	-9582.8	-1590.4	48366.7	-16218.85	-15460.97	59878.6	-8069.36	-3700	39526.8
WL90	5743.45	-10467.58	-12291	-5743.5	-10468	12291.4	4538.2	-11946.01	-9448.56	-4538.2	-11946	9448.56
SUCT	-1820.95	2618.13	3967.88	1821	2618.13	-3967.88	-2061.61	2986.53	4495.62	2061.61	2986.5	-4495.6
PRESSURE	1820.95	-2618.13	-3967.9	-1821	-2618.1	3967.88	2061.61	-2986.53	-4495.62	-2061.61	-2987	4495.62
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	200X100X5	22.26	10	222.60		1	240X120X5	26.97	10	269.70	
	2	122X61X5.4	14.01	5.154	72.21		2	148X82X4.8	15.92	5.154	82.05	
				TOTAL	**294.81**					**TOTAL**	**351.75**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	732.28	4672.23	-1505.9	-732.28	4672.23	1505.9	712.39	4874.12	-1464.33	-712.39	4874.1	1464.33
LL	1047.16	4752	-2155.8	-1047.2	4752	2155.75	1049.53	4752	-2163.69	-1049.53	4752	2163.69
WL0	-9067.94	-13792.73	23626.4	-2384.5	-7894.9	10621.1	-10980.66	-16664.55	28673.1	-2879.19	-9574	12893.3
WL90	-257.12	-13520.79	1250.27	257.12	-13521	-1250.27	-312.99	-16359.83	1519.91	312.99	-16360	-1519.9
SUCT	-311.25	3381.2	346.09	311.25	3381.2	-346.09	-376.76	4092.67	418.67	376.76	4092.7	-418.67
PRESSURE	311.25	-3381.2	-346.09	-311.25	-3381.2	346.09	376.76	-4092.67	-418.67	-376.76	-4093	418.67
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	250X250X6	45.24	15	678.60	
	2	145X82X4.8	15.92	5.154	82.05		2	172X92X4.8	18.71	5.154	96.43	
				TOTAL	**760.65**					**TOTAL**	**775.03**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	521.73	7072.38	-1591.9	-521.73	7072.38	1591.9	499.82	7148.08	-1449.26	-499.82	7148.1	1449.26
LL	733.92	4752	-2242.1	-733.92	4752	2242.09	686.58	4752	-1992.8	-686.58	4752	1992.8
WL0	-18482.33	-16506.34	70834.3	-9002.9	-5178.3	46605.8	-22170.5	-21477.26	81057.9	-11089.4	-4761	53544.6
WL90	5148.9	-13520.79	-10600	-5148.9	-13521	10600.4	6206.68	-16359.83	-12950.7	-6206.68	-16360	12950.7
SUCT	-2349.8	3381.2	5119.93	2349.8	3381.2	-5119.93	-2812.29	4092.67	6131.02	2812.29	4092.7	-6131
PRESSURE	2349.8	-3381.2	-5119.9	-2349.8	-3381.2	5119.93	2812.29	-4092.67	-6131.02	-2812.29	-4093	6131.02
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 5m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : FIXED AT BOTTOM



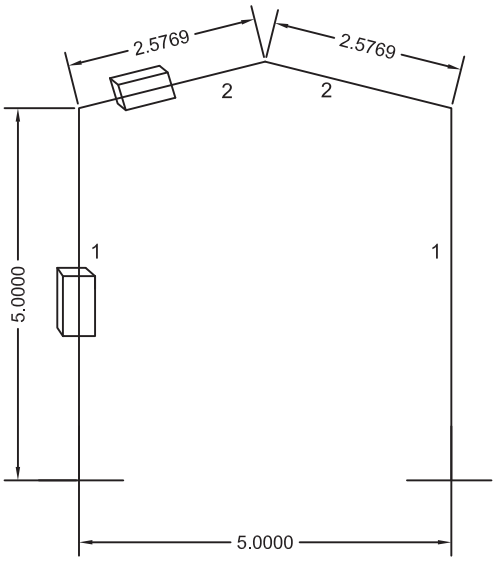
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
	MEM NO	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**		**MEM NO**	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**	
HT 5M	1	200X100X4	18.01	10	180.10		1	200X100X4	18.01	10	180.10	
	2	122X61X3.6	9.67	5.273	50.991		2	122X61X5.4	14.01	5.273	73.87	
				TOTAL	**231.09**					**TOTAL**	**253.97**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	936	5382.2	-1954.3	-936	5382.2	1954.3	949.4	5940.98	-1912.92	-949.4	5940.98	1912.92
LL	1421.7	6336	-2970.37	-1421.7	6336	2954.4	1810.01	8452.22	-3650.37	-1810.01	8452.22	3650.37
WL0	-5360.3	-8044.7	14181	-1379.33	-4808.4	6332.2	-7295.28	-11320.01	18643.86	-1997.23	-6279.2	8505.3
WL90	-165.84	-7854.45	794.64	165.84	-7854.45	-794.64	-174.11	-10971.74	879.81	174.11	-10972	-879.81
SUCT	-264.44	1719.1	375.7	264.4	1719.1	-375.73	-257.2	2744.1	302.85	257.2	2744.1	-302.9
PRESSURE	173.5	-1964.6	-178.7	-173.52	-1964.6	178.73	257.2	-2744.1	-302.85	-257.2	-2744.1	302.9
HT 7.5 M	1	260X180X6	39.59	15	593.85		1	220X220X6	39.59	15	593.85	
	2	122X61X4.5	11.88	5.273	62.64		2	145X82X4.8	15.92	5.273	83.95	
				TOTAL	**656.49**					**TOTAL**	**677.80**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	705.4	7567.4	-2328.26	-705.43	7567.35	2328.26	660.92	8852.1	-1935.3	-660.9	8852.08	1935.3
LL	1055.6	6336.0	-3487.57	-1055.63	6336	3487.57	1239.34	8452.2	-3632.5	-1239.3	8452.22	3632.53
WL0	-13380.9	-9624.6	48392.55	-5995.05	-3944.42	30084.9	-14898.61	-14200.8	54998.21	-7410.4	-3398.39	36298.43
WL90	4673.8	-7855.7	-8791.56	-4673.8	-7855.66	8791.56	4170.76	-10971.7	-8684.2	-4170.76	-10971.7	8684.21
SUCT	-2050.8	1965.8	4109.1	2050.76	1965.8	-4109.13	-1893.11	2744.1	4128.0	1893.11	2744.1	-4128.0
PRESSURE	2050.76	-1965.8	-4109.13	-2050.76	-1965.77	4109.13	1893.11	-2744.1	-4128.0	-1893.11	-2744.1	4128.0
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

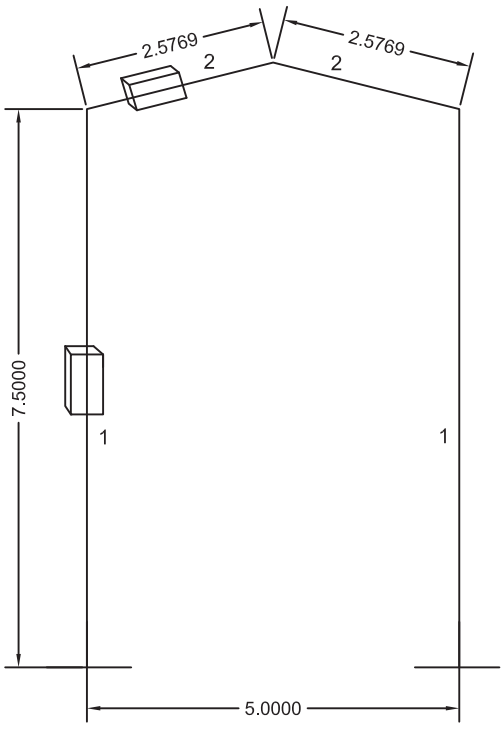
	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	200X100X6	26.4	10	264.00		1	200X100X6	26.4	10	264.00	
	2	122X61X5.4	14.01	5.154	72.21		2	122X61X5.4	14.01	5.154	72.21	
				TOTAL	**336.21**					**TOTAL**	**336.21**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	820.57	6516.97	-1728.14	-820.57	6516.97	1728.14	998.85	6516.97	-2092.04	-998.85	6516.97	2092.04
LL	1428.48	6339.17	-2995.46	-1428.48	6339.17	2995.46	1428.48	6339.17	-2995.46	-1428.48	6339.17	2995.46
WL0	-9429.8	-14115.59	24958.84	-2403.03	-8283.62	11077.49	-10762.23	-16107.99	28485.73	-2741.46	-9452.73	12641.22
WL90	-298.75	-13965.76	1437.12	298.75	-13965.8	-1437.12	-342.98	-15938.65	1644.07	342.98	-15938.7	-1644.07
SUCT	-317.59	3491.92	334.07	317.59	3491.92	-334.07	-362.53	3986.03	381.29	362.53	3986.03	-381.29
PRESSURE	317.59	-3491.92	-334.07	-317.59	-3491.92	334.07	363.28	-3984.03	-382.91	-363.28	-3984.03	382.91
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	250X250X6	45.24	15	678.60	
	2	172X92X4.8	18.71	5.154	96.43		2	172X92X4.8	18.71	5.154	96.43	
				TOTAL	**775.03**					**TOTAL**	**775.03**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	665.15	9552.33	-1921.55	-665.15	9552.33	1921.55	665.15	9552.33	-1921.55	-665.15	9552.33	1921.55
LL	910.16	6339.17	-2631.96	-910.16	6339.17	2631.96	910.16	6339.17	-2631.96	-910.16	6339.17	2631.96
WL0	-24143.3	-19654.76	88037.38	-12978.2	-321.48	60883.72	-21574.46	-21051.79	78552.2	-10826	-4508.94	51920.31
WL90	7585.53	-13963.76	-16309.5	-7585.53	-13963.8	16309.49	6041.65	-15935.98	-12616.5	-6041.65	-15936	12616.46
SUCT	-2398.72	3492.59	5229.18	2398.72	3492.59	-5229.18	-2738.54	3984.03	5970.26	2738.54	3984.03	-5970.26
PRESSURE	2442.3	-3306.5	-5358.26	-2442.3	-3306.5	5358.26	2738.54	-3984.03	-5970.26	-2738.54	-3984.03	5970.26
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	240X120X5	26.4	10	264.00		1	240X120X5	26.4	10	264.00	
	2	145X82X4.8	15.92	5.154	82.05		2	145X82X4.8	15.92	5.154	82.05	
				TOTAL	**346.05**					**TOTAL**	**346.05**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	995.22	6625.47	-2049.21	-995.22	6625.47	2049.21	995.22	6625.47	-2049.21	-995.22	6625.47	2049.21
LL	1400.07	6339.17	-2886.36	-1400.07	6339.17	2886.36	1400.07	6339.17	-2886.36	-1400.07	6339.17	2886.36
WL0	-12104.5	-18373.37	31606.64	-3173.11	-10557.9	14210.14	-14648.2	-22230.52	38249.98	-3840.84	-12771.8	17199.7
WL90	-345.37 -	18036.73	1676.25	345.37	-18036.7	-1676.25	-417.53	-21824.01	2027.56	417.53	-21824	-2027.56
SUCT	-415.33	4510.52	461.62	415.33	4510.52	-461.62	-502.59	5459.62	558.51	502.59	5459.62	-558.51
PRESSURE	415.33	-4510.52	-461.62	-415.33	-4510.52	461.62	502.59	-5459.62	-558.51	-502.59	-5459.62	558.51
HT 7.5 M	1	250X250X8	59.5	15	892.50		1	250X250X8	59.5	15	892.50	
	2	172X92X4.8	18.71	5.154	96.43		2	200X100X5	22.26	5.154	114.73	
				TOTAL	**988.93**					**TOTAL**	**1007.23**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	688.49	11021.45	-2034.84	-688.49	11021.45	2034.84	666.56	11133.53	-1902.38	-666.56	11133.53	1902.38
LL	942.22	6339.17	-2788.07	-942.22	6339.17	2788.07	889.18	6339.17	-2540.27	-889.18	6339.17	2540.27
WL0	-24532.7	-22987.82	91477.22	-12132.7	-5939.5	60346.14	-29456.65	-29452.79	105666.1	-14912	-5549.52	69883.16
WL90	6860.19	-18036.73	-14256.3	-6860.19	-18036.7	14256.33	8250.68	-21824.01	-17278	-8250.68	-21824	17278
SUCT	-3117.01	4510.52	6798.68	3117.01	4510.52	-6798.68	-3727.32	5459.62	8124.31	3727.32	5459.62	-8124.31
PRESSURE	3117.01	-4510.52	-6798.68	-3117.01	-4510.52	6798.68	3727.32	-5459.62	-8124.31	-3727.32	-5459.62	8124.31
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 5m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : FIXED AT BOTTOM



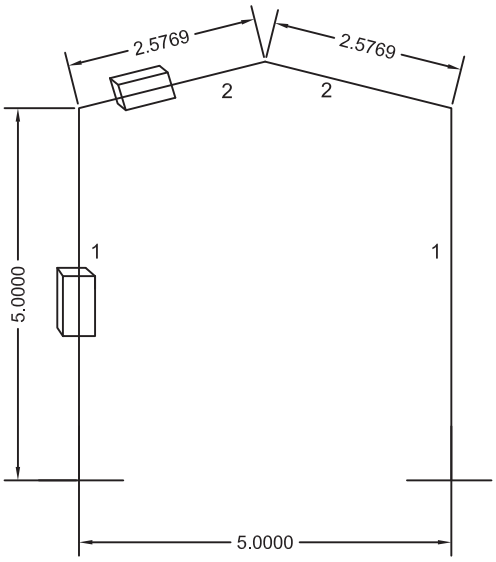
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
	MEM NO	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**		**MEM NO**	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**	
HT 5M	1	145X82X4.8	15.92	10	159.20		1	145X82X5.4	17.74	10	177.40	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X3.6	9.67	5.154	49.84	
				TOTAL	**209.04**					**TOTAL**	**227.24**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	635	4218.9	-1196.3	-634.9	4218.9	1196.3	651.8	4342.79	-1239.32	-651.8	4342.79	1239.32
LL	1054.6	5302.5	-1987.7	-1054.6	5302.5	1187.7	1082.67	5302.5	-2059.45	-1082.67	5302.5	2059.45
WL0	-4050.4	-7460.93	9783.9	-1120.37	-3820.51	4435.7	-4827.8	-8762.77	11803.85	-1284.03	-4571.9	5283.92
WL90	-162.98	-5957.8	508.8	162.98	-5957.8	-508.8	-211.62	-7042.11	656.49	211.62	-7042.1	-656.49
SUCT	-104.4	1490.3	115.3	104.4	1490.3	-115.3	-121.09	1761.57	127.65	121.09	1761.57	-127.65
PRESSURE	104.4	1490.3	-115.3	-104.4	-1490.3	115.3	121.09	-1761.57	-127.65	-121.09	-1761.6	127.65
HT 7.5 M	1	180X180X6	32.05	15	480.75		1	180X180X6	32.05	15	480.75	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X4.5	11.88	5.156	61.25	
				TOTAL	**530.59**					**TOTAL**	**542.00**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	478.72	5877.79	-1382.16	-478.72	5877.79	1382.16	477.3	5936.55	-1357.23	-477.3	5936.55	1357.23
LL	795.05	5302.5	-2296.72	-795.05	5302.5	2296.72	777.45	5302.5	-2212.01	-777.45	5302.5	2212.01
WL0	-8082.4	-8559.63	30096.92	-3781.85	-2721.81	19341.9	-9521.6	-10343.81	34872.45	-4501.94	-2990.85	22432.59
WL90	2121.27	-5957.79	-4299.24	-2121.27	-5957.79	4299.24	2505.32	-7042.11	-5106.19	-2505.32	-7042.11	5106.19
SUCT	-976.17	1490.83	2087.11	976.17	1490.8	-2087.11	-1149.73	1762.16	2461.08	1149.73	1762.16	-2461.08
PRESSURE	976.17	-1490.83	-2087.11	-976.17	-1490.83	2087.11	1149.73	-1762.16	-2461.08	-1149.73	-1762.16	2461.08
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

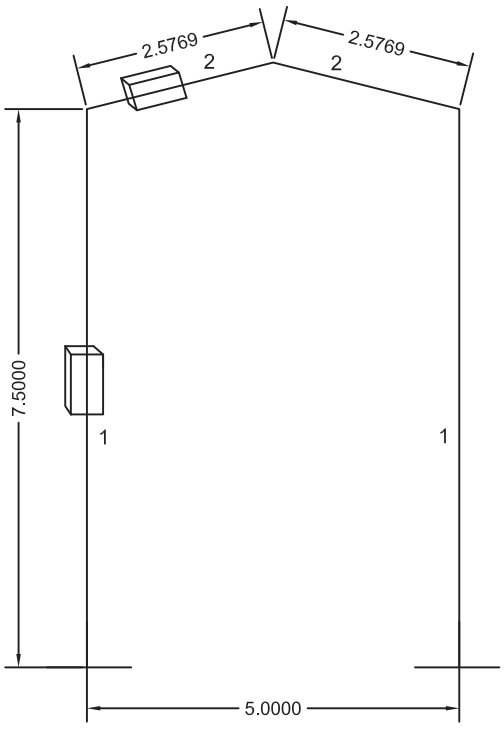
	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	145X82X5.4	17.74	10	177.40		1	172X92X4.8	18.71	10	187.10	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X3.6	9.67	5.154	49.84	
				TOTAL	**227.24**					**TOTAL**	**236.94**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	651.8	4342.79	-1239.32	-651.8	4342.79	1239.32	690.64	4385.94	-1350.97	-690.64	4385.94	1350.97
LL	1082.67	5302.5	-2059.45	-1082.67	5302.5	2059.45	1147.28	5302.5	-2245.49	-1147.28	5302.5	2245.49
WL0	-5448.63	-9889.62	13321.77	-1449.15	-5159.82	5963.41	-5930.39	-10379.8	14995.71	-1437.92	-5696.25	6527.28
WL90	-238.84	-7947.69	740.91	238.84	-7947.69	-740.91	-310.62	-8489.85	974.34	310.62	-8489.85	-974.34
SUCT	-136.67	1988.1	144.06	136.67	1988.1	-144.06	-138.43	2123.72	122.43	138.43	2123.72	-122.43
PRESSURE	136.67	-1988.1	-144.06	-136.67	-1988.1	144.06	138.43	-2123.72	-122.43	-138.43	-2123.72	122.43
HT 7.5 M	1	220X220X6	39.59	15	593.85		1	220X220X6	39.59	15	593.85	
	2	122X61X5.4	14.01	5.154	72.21		2	122X61X5.4	14.01	5.154	72.21	
				TOTAL	**666.06**					**TOTAL**	**666.06**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	515.26	6575.2	-1532.21	-515.26	6575.2	1532.21	515.26	6575.2	-1532.21	-515.26	6575.2	1532.21
LL	824.26	5302.5	-2453.45	-824.26	5302.5	2453.45	824.26	5302.5	-2453.45	-824.26	5302.5	2453.45
WL0	-10838.5	-10991.1	41488.17	-4988.43	-4058.34	26600.42	-11577.83	-11740.87	44318.32	-5328.72	-4335.18	28415
WL90	2827.29	-7947.69	-5654.02	-2827.29	-7947.69	5654.02	3020.16	-8489.85	-6039.71	-3020.16	-8489.85	6039.71
SUCT	-1307.36	1988.77	2784.39	1307.36	1988.77	-2784.39	-1396.54	2124.43	2974.33	1396.54	2124.43	-2974.33
PRESSURE	1307.36	-1988.77	-2784.39	-1307.36	-1988.77	2784.39	1396.54	-2124.43	-2974.33	-1396.54	-2124.43	2974.33
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	172X92X4.8	18.71	10	187.10		1	172X92X4.8	18.71	10	187.10	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X4.5	11.88	5.154	61.23	
				TOTAL	**236.94**					**TOTAL**	**248.33**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	690.64	4385.94	-1350.97	-690.64	4385.94	1350.97	685.94	4444.56	-1322.03	-685.94	4444.56	1322.03
LL	1147.28	5302.5	-2245.49	-1147.28	5302.5	2245.49	1117.64	5302.5	-2155.35	-1117.64	5302.5	2155.35
WL0	-6309.1	-11042.65	15953.33	-1529.75	-6060.01	6944.11	-6878.77	-12245.34	17113.96	-1740.86	-6560.81	7550.17
WL90	-330.46	-9032.01	1036.56	330.46	-9032.01	-1036.56	-333.04	-9931.64	1034.68	333.04	-9931.64	-1034.68
SUCT	-147.27	2259.34	130.25	147.27	2259.34	-130.25	-166.23	2484.38	161.69	166.23	2484.38	-161.69
PRESSURE	147.27	-2259.34	-130.25	-147.27	-2259.34	130.25	166.23	-2484.38	-161.69	-166.23	-2484.38	161.69
HT 7.5 M	1	220X220X6	39.59	15	593.85		1	220X220X6	39.59	15	593.85	
	2	122X61X5.4	14.01	5.154	72.21		2	145X82X4.8	15.92	5.154	82.05	
				TOTAL	**666.06**					**TOTAL**	**675.90**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	515.26	6575.2	-1532.21	-515.26	6575.2	1532.21	489.89	6625.84	-1385.29	-489.89	6625.84	1385.29
LL	824.26	5302.5	-2453.45	-824.26	5302.5	2453.45	770.99	5302.5	-2181.78	-770.99	5302.5	2181.78
WL0	-12317.2	-12490.64	47148.48	-5669.01	-4612.03	30229.57	-13411.62	-14689.95	48855.16	-6366.07	-4116.21	31454.07
WL90	3213.02	-9032.01	-6425.41	-3213.02	-9032.01	6425.41	3531.95	-9931.64	-7211.55	-3531.95	-9931.64	7211.55
SUCT	-1485.73	2260.1	3164.26	1485.73	2260.1	-3164.26	-1619.21	2485.21	3466.86	1619.21	2485.21	-3466.86
PRESSURE	1485.73	-2260.1	-3164.26	-1485.73	-2260.1	3164.26	1619.21	-2485.21	-3466.86	-1619.21	-2485.21	3466.86
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 5m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : FIXED AT BOTTOM



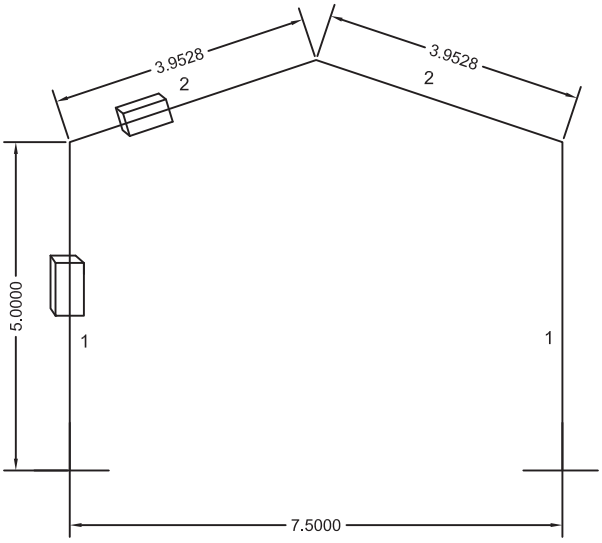
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	145X82X5.4	17.74	10.00	177.40		1	172x92x5.4	20.88	10.00	208.80	
	2	122X61X4.5	14.01	5.15	72.21		2	122X61X4.5	14.01	5.15	72.21	
				TOTAL	**249.61**					**TOTAL**	**281.01**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	860	5872	-1618	-860	5872	1617	929	6086	-1805	-929	6086	1805
LL	1400	7073	-2636	-1400	7073	2635	1514	7073	-2944	-1514	7073	2944
WL0	-5396	-9963	13009	-1502	-5087	5911	-7725	-13619	19401	-1907	-7398	8492
WL90	-214	-7948	669	213	-7947	-668	-391	-11099	1223	392	-11099	-1223
SUCT	-140	1989	-155	139	1988	-155	-183	2776	169	183	2776	-169
PRESSURE	140	-1989	-155	-139	-1988	155	183	-2776	-169	-183	-2776	169
HT 7.5 M	1	220X220X6	39.59	15.00	593.85		1	220X220X6	39.59	15.00	593.85	
	2	122X61X4.5	9.67	5.15	49.84		2	122X61X4.8	14.01	5.16	72.24	
				TOTAL	**643.69**					**TOTAL**	**666.09**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	687	8695	-2076	-686	8695	2076	654	8838	-1847	-654	8838	1847
LL	1118	7073	-3387	-1118	7073	3386	1028	7073	-2910	-1029	7073	2910
WL0	-10866	-10800	42106	-4961	-4248	26932	-14988	-16417	54599	-7114	-4600	35152
WL90	2823	-7947	-5604	-2824	-7948	5604	3947	-11099	-8059	-3947	-11099	8059
SUCT	-1309	1988	2782	1309	1988	-2782	-1809	2777	3874	1809	2777	-3874
PRESSURE	1309	-1988	-2782	-1309	-1988	2782	1809	-2777	-3874	-1809	-2777	3874
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

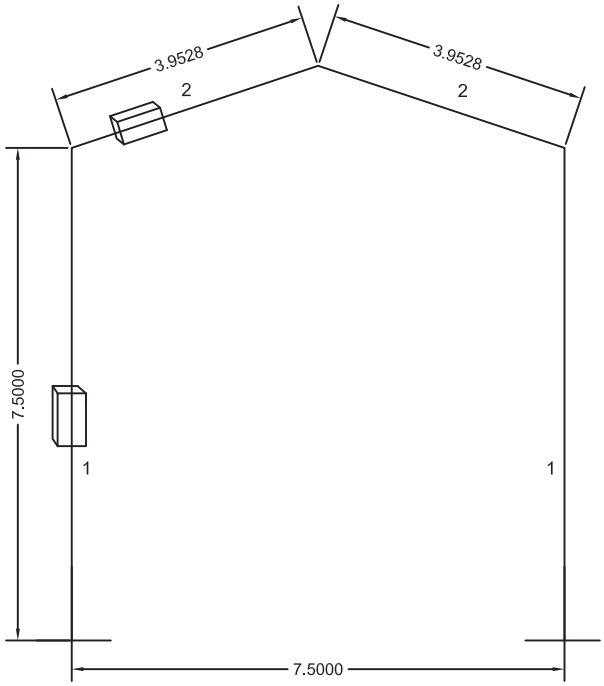
	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	150X150X5	22.26	10.00	222.60		1	150X150X5	22.26	10.00	222.60	
	2	145X82X4.8	18.71	5.15	96.43		2	145X82X4.8	18.71	5.15	96.43	
				TOTAL	**319.03**					**TOTAL**	**319.03**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	844	6283	-1563	-844	6283	1564	844	6283	-1563	-844	6283	1563
LL	1328	7073	-2462	-1327	7073	2462	1327	7073	-2462	-1327	7073	2462
WL0	-9435	-17890	22324	-2830	-8868	10436	-10762	-20410	25468	-3239	-10117	11906
WL90	-307	-14131	996	307	-14131	-996	-350	-16121	1136	350	-16121	-1136
SUCT	-256	3535	304	256	3536	-304	-292	4032	347	292	4032	-347
PRESSURE	256	-3535	-304	-256	-3536	304	292	-4032	-347	-292	-4032	347
HT 7.5 M	1	220X220X8	51.96	15.00	779.40		1	220X220X8	51.96	15.00	779.40	
	2	145X82X5.4	17.74	5.15	91.43		2	172X92X4.8	18.71	5.15	96.43	
				TOTAL	**870.83**					**TOTAL**	**875.83**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	675	10199	-1921	-675	10199	1921	645	10229	-1789	-645	10229	1789
LL	1040	7073	-2966	-1040	7073	2966	988	7073	-2744	-988	7073	2743
WL0	-19118	-20670	70235	-9024	-6088	45195	-21639	-24659	76785	-10465	-5869	49512
WL90	5029	-14131	-10244	-5029	-14131	10244	5713	-16121	-11743	-5713	-16121	11743
SUCT	-2308	3536	4941	2308	3536	-4941	-2607	4034	5588	2607	4034	-5588
PRESSURE	2308	-3536	-4941	-2308	-3536	4941	2607	-4034	-5588	-2607	-4034	5588
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	150X150X6	26.40	10.00	264.00		1	200X100X5	22.26	10.00	222.60	
	2	122X61X4.8	18.71	5.15	96.43		2	145X82X4.8	15.92	5.15	82.05	
				TOTAL	**360.43**					**TOTAL**	**304.65**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	869	6567	-1624	-691	4386	1351	907	6283	-1716	-907	6283	1716
LL	1368	7073	-2558	-1147	5303	2245	1428	7073	-2703	-1428	7073	2703
WL0	-12295	-22969	29392	-1530	-6060	6944	-9051	-16526	22026	-2447	-8563	9930
WL90	-449	-18242	1419	330	-9032	-1037	-636	-22079	1974	636	-22079	-1974
SUCT	-325	4563	374	147	2259	-130	-383	5523	414	383	5523	-414
PRESSURE	325	-4563	-374	-147	-2259	130	383	-5523	-414	-383	-5523	414
HT 7.5 M	1	220X220X8	51.96	15.00	779.40		1	220X220X10	63.92	15.00	958.80	
	2	200X100X5	22.26	5.15	114.73		2	200X100X6	26.40	5.15	136.07	
				TOTAL	**894.13**					**TOTAL**	**1094.87**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	619	10339	-1681	-619	10339	1681	642	11717	-1747	-642	11717	1747
LL	923	7073	-2513	-923	7073	2513	928	7073	-2530	-928	7073	2530
WL0	-24236	-29078	83134	-12091	-5464	53899	-29359	-35101	100930	-14610	-6707	65394
WL90	6406	-18242	-13228	-6405	-18242	13229	7759	-22079	-16021	-7759	-22079	16021
SUCT	-2902	4564	6216	2902	4564	-6216	-3518	5525	7535	3518	5525	-7535
PRESSURE	2902	-4564	-6216	-2902	-4564	6216	3518	-5525	-7535	-3518	-5525	7535
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 7.5m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : FIXED AT BOTTOM



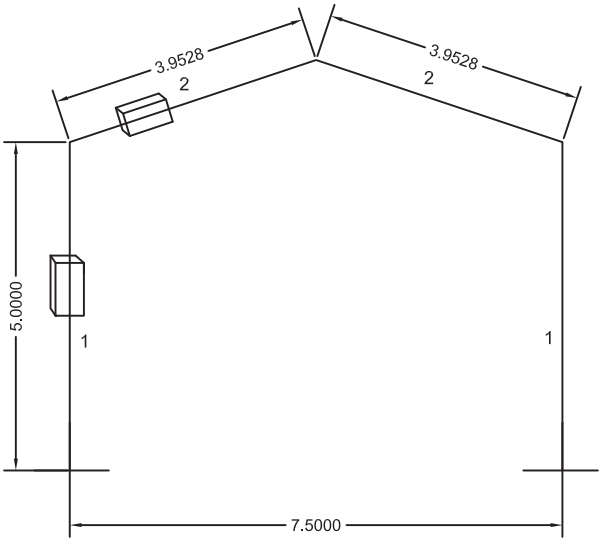
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	200X100X4	18.01	10	180.10		1	200X100X4	18.01	10	180.10	
	2	145X82X4.8	15.92	7.906	125.86		2	145X82X4.8	15.92	7.906	125.86	
				TOTAL	**305.96**					**TOTAL**	**305.96**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1534	6169	-3190	-1534	6175	3190	1534	6169	-3191	-1534	6174	3190
LL	2176	7111	-4525	-2176	7120	4525	2176	7111	-4525	-2176	7121	4525
WL0	-4786	-8149	11429	62	-5584	1723	-6685	-11386	15966	87	-7800	2406
WL90	-1165	-8566	2675	1165	-8579	-2675	-1628	11967	3737	1628	-11984	-3737
SUCT	112	2142	-344	-112	2145	344	158	2994	-481	-158	2998	481
PRESSURE	-112	-2142	344	112	-2145	-344	-158	-2994	481	158	-2998	-481
HT 7.5 M	1	240X120X6	32.05	15	480.75		1	180X180X8	41.91	15	628.65	
	2	145X82X4.8	15.92	7.906	125.86		2	145X82X4.8	15.92	7.906	125.86	
				TOTAL	**606.61**					**TOTAL**	**754.51**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1114	7713	-3479	-1114	7718	3479	1091	8474	-3346	-1091	8478	3347
LL	1579	7111	-4936	-1579	7120	4936	1546	7111	-4749	-1546	7120	4748
WL0	-8683	-9026	31760	-3028	-4707	16321	-12077	-12754	43552	-4284	-6431	22532
WL90	1526	-8566	-2495	-1526	-8579	2494	2148	2148	-3607	-2149	-11984	3606
SUCT	-866	2142	1787	866	2145	-1787	-1210	-1210	2506	1210	2997	-2506
PRESSURE	866	-2142	-1787	-866	-2145	1787	1210	1210	-2506	-1210	-2997	2506
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

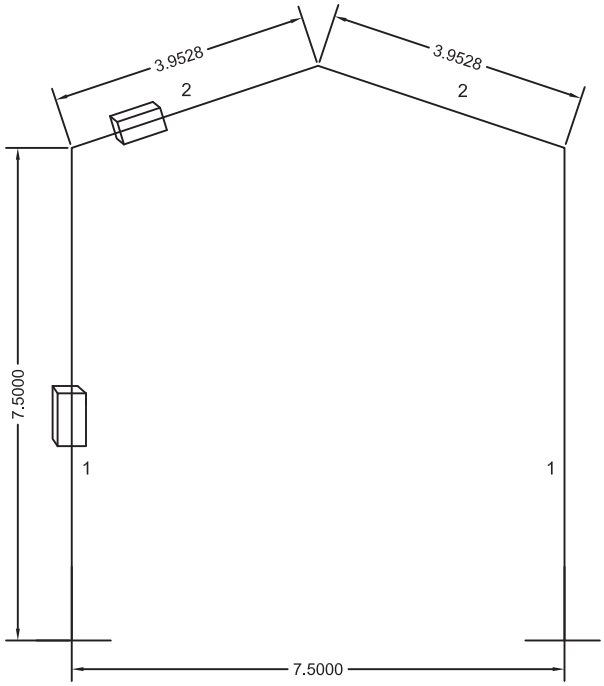
	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	200X100X4	18.01	10	180.10		1	150X150X5	22.26	10	222.60	
	2	145X82X4.8	15.92	7.906	125.86		2	145X82X4.8	15.92	7.906	125.86	
				TOTAL	**305.96**					**TOTAL**	**348.46**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1533	6169	-3190	-1533	6174	3190	1488	6387	-3039	-1488	6392	3039
LL	2175	7111	-4525	-2175	7120	4525	2109	7111	-4311	-2109	7120	4311
WL0	-8508	-14491	20321	109	-9928	3062	-9574	-16598	22509	-5.43	-11254	3638
WL90	-2070	-15231	4756	2070	-15252	-4757	-2267	-17372	5109	2267	-17396	-5109
SUCT	200	3809	-613	-200	3814	613	211	4345	-638	-211	4351	638
PRESSURE	-200	-3809	613	200	-3814	-613	-211	-4345	638	211	-4351	-638
HT 7.5 M	1	220X220X6	39.59	15	593.85		1	220X220X6	39.59	15	593.85	
	2	145X82X4.8	15.92	7.906	125.86		2	145X82X5.4	17.74	7.906	140.25	
				TOTAL	**719.71**					**TOTAL**	**734.10**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1150	8294	-3700	-1150	8299	3700	1148	8392	-3619	-1148	8397	3619
LL	1631	7111	-5250	-1631	7120	5250	1595	7111	-5029	-1595	7120	5029
WL0	-15539	-15775	58070	-5282	-8643	29472	-17644	-18205	64982	-6105	-9647	33286
WL90	2679	-15231	-4160	-2679	-15253	4159	3084	-17372	-4966	-3084	-17396	4966
SUCT	-1541	3809	3151	1541	3814	-3151	-1758	4345	3616	1758	4351	-3616
PRESSURE	1541	-3809	-3151	-1541	-3814	3151	1758	-4345	-3616	-1758	-4351	3616
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	150X150X5	22.26	10	222.60		1	150X150X6	26.4	10	264.00	
	2	145X82X4.8	15.92	7.906	125.86		2	145X82X5.4	17.74	7.906	140.25	
				TOTAL	**348.46**					**TOTAL**	**404.25**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1488	6387	-3039	-1488	6392	3039	1518	6697	-3102	-1518	6702	3102
LL	2109	7111	-4311	-2109	7120	4311	2109	7111	-4309	-2109	7120	4310
WL0	-10838	-18791	25484	-6.15	-12741	4118	-13112	-22737	30825	-9.07	-15415	4984
WL90	-2565	-19669	5783	2565	-19695	-5784	-3103	-23797	6994	3103	-23830	-6994
SUCT	239	4919	-722	-239	4926	723	289	5952	-873	-289	5960	874
PRESSURE	-239	-4919	722	239	-4926	-723	-289	-5952	873	289	-5960	-874
HT 7.5 M	1	220X220X8	51.96	15	779.40		1	220X220X8	51.96	15	779.40	
	2	172X92X4.8	18.71	7.906	147.92		2	200X100X5	22.26	7.906	175.99	
				TOTAL	**927.32**					**TOTAL**	**955.39**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1134	9379	-3514	-1134	9384	3514	1098	9505	-3261	-1097	9510	3261
LL	1564	7111	-4848	-1564	7120	4848	1474	7111	-4382	-1474	7120	4383
WL0	-19895	-20827	72332	-6992	-10706	37306	-23777	-25951	83297	-8755	-12200	43703
WL90	3518	-19668	-5833	-3518	-19696	5832	4329	-23797	-7611	-4329	-23830	7610
SUCT	-1990	4919	4115	1990	4926	-4115	-2398	5952	5004	2398	5960	-5004
PRESSURE	1990	-4919	-4115	1990	-4926	4115	2398	-5952	-5004	-2398	-5960	5004
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 7.5m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : FIXED AT BOTTOM



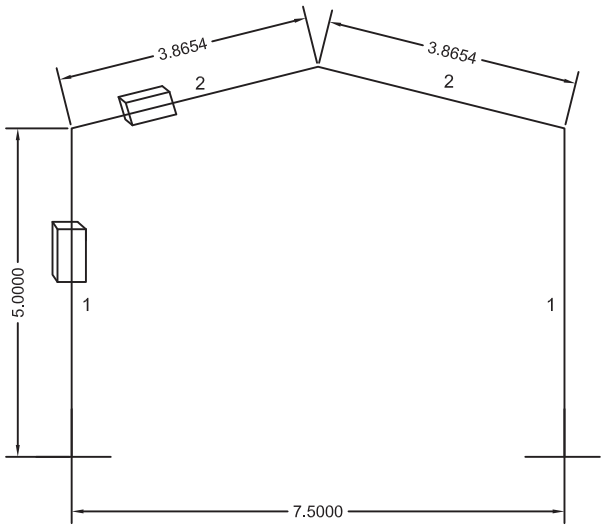
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
	MEM NO	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**		**MEM NO**	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**	
HT 5M	1	200X100X6	26.4	10	264.00		1	200X100X6	26.4	10	264.00	
	2	145X82X5.4	17.74	7.906	140.25		2	145X82X5.4	17.74	7.906	140.25	
				TOTAL	**404.25**					**TOTAL**	**404.25**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2150.26	8934.68	-4564.83	-2150.26	8941.71	4565.14	1504.08	6197.41	-3284.89	-1504.08	6197.41	3284.89
LL	2986.46	9486.99	-6343.43	-2986.46	9498.5	6343.85	2082.11	6337	-4554.98	-2082.11	6337	4554.98
WL0	-6465.6	-10825.02	15706.05	164.62	-7495.87	2190.32	-8837.85	-11234.94	23014.03	-1020.77	-8038.53	6656.13
WL90	-1614.95	-11427.63	3792.53	1614.95	-11443.52	-3793.12	-1056.08	-10975.24	2994.02	1056.08	-10975.2	-2994.02
SUCT	162.02	2858.21	-503.63	-162.02	2862.18	503.77	-78.26	2745.46	-112.24	78.26	2745.46	112.24
PRESSURE	-162.02	-2858.21	503.63	162.02	-2862.18	-503.77	78.26	-2745.46	112.24	-78.26	-2745.46	-112.24
HT 7.5 M	1	220X140X8	41.91	15	628.65		1	260X180X6	39.59	15	593.85	
	2	145X82X5.4	17.74	7.906	140.25		2	145X82X4.8	18.71	7.906	147.92	
				TOTAL	**768.90**					**TOTAL**	**741.77**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1535	11434	-4846	-1535	11441	4846	1129	8407	-3492	-1129	8413	3492
LL	2133	9487	-6734	-2133	9498	6734	1563	7112	-4836	-1563	7120	4836
WL0	-11611	-11966	42806	-4011	-6355	21901	-16139	-16908	58629	-5678	-8678	30261
WL90	2027	-11428	-3258	-2027	-11444	3257	2856	-15959	-4743	-2856	-15981	4742
SUCT	-1157	2858	2379	1157	2862	-2379	-1615	3992	3340	1615	3997	-3340
PRESSURE	1157	-2858	-2379	-1157	-2862	2379	1615	-3992	-3340	-1615	-3997	3340
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

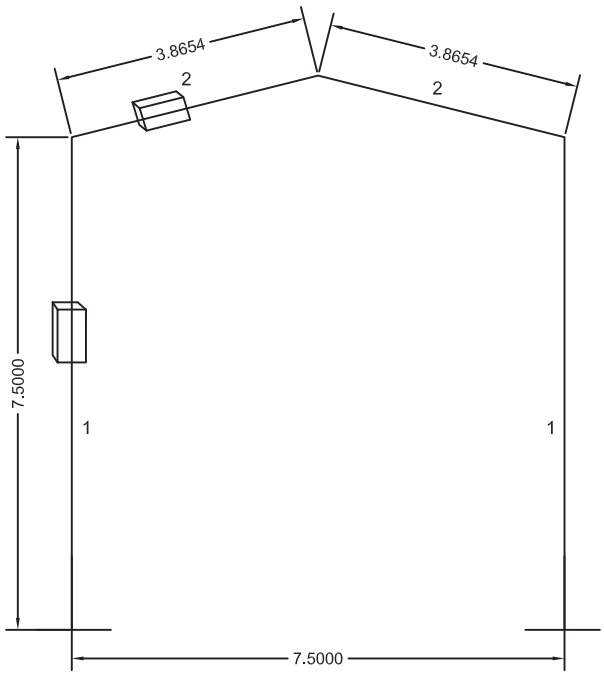
	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	200X100X6	26.4	10	264.00		1	240X120X5	26.97	10	269.70	
	2	172X92X4.8	18.71	7.906	147.92		2	145X82X5.4	17.74	7.906	140.25	
				TOTAL	**411.92**					**TOTAL**	**409.95**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1524.39	6712.96	-3114.3	-1524.39	6718.24	3114.48	1727.34	6727.11	-3902.6	-1727.34	6732.36	3902.89
LL	2110.21	7111.67	-4312.91	-2110.21	7120.33	4313.15	2399.44	7111.69	-5425	-2399.44	7120.31	5425.41
WL0	-11198.6	-19411.45	26336.23	-5.26	-13165.14	4260.35	-13525.8	-21713.31	34421.75	744.3	-15450.4	3719.01
WL90	-2649.67	-20319.57	5968.05	2649.67	-20347.88	-5968.87	-3593.15	-23180.84	9029.85	3593.15	-23213	-9031.4
SUCT	246.96	5082.2	-744.14	-246.96	5089.28	744.34	389.36	5797.84	-1287.72	-389.36	5805.88	1288.1
PRESSURE	-246.96	-5082.2	744.14	246.96	-5089.28	-744.34	-389.36	-5797.84	1287.72	389.36	-5805.88	-1288.1
HT 7.5 M	1	220X220X8	51.96	15	779.40		1	250X250X6	45.24	15	678.60	
	2	172X92X4.8	18.71	7.906	147.92		2	172X92X5.4	20.88	7.906	165.08	
				TOTAL	**927.32**					**TOTAL**	**843.68**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1130	9361	-3500	-1130	9366	3501	1163	8955	-3616	-1163	8961	3616
LL	1565	7112	-4848	-1565	7120	4849	1573	7112	-4893	-1573	7120	4894
WL0	-20554	-21515	74725	-7224	-11061	38542	-23473	-24469	85656	-8216	-12695	44133
WL90	3635	-20320	-6028	-3635	-20348	6027	4139	-23181	-6811	-4139	-23213	6810
SUCT	-2056	5082	4252	2056	5089	-4252	-2346	5798	4843	2346	5806	-4843
PRESSURE	2056	-5082	-4252	-2056	-5089	4252	2346	-5798	-4843	-2346	-5806	4843
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	240X120X6	32.05	10	320.50		1	240X120X6	32.05	10	320.50	
	2	172X92X4.8	18.71	7.906	147.92		2	172X92X5.4	20.88	7.906	165.08	
				TOTAL	**468.42**					**TOTAL**	**485.58**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1659.06	7003.34	-3596.33	-1659.06	7008.61	3596.58	1672.39	7115.57	-3578.45	-1672.39	7120.84	3578.69
LL	2296.96	7111.69	-4982.13	-2296.96	7120.31	4982.48	2262.07	7111.68	-4842.95	-2262.07	7120.32	4843.28
WL0	-15010.3	-24740.93	37079.9	547.33	-17311.98	4795.89	-18044.2	-30018.08	44131.71	539.33	-20879.4	5999.14
WL90	-3832.27	-26230.46	9196.69	3832.27	-26266.9	-9198.19	-4545.25	-31747.25	10756.43	4545.25	-31791.4	-10758.2
SUCT	395.02	6560.6	-1250.72	-395.02	6569.71	1251.09	460.63	7940.42	-1440.45	-460.63	7951.45	1440.88
PRESSURE	-395.02	-6560.6	1250.72	395.02	-6569.71	-1251.09	-460.63	-7940.42	1440.45	460.63	-7951.45	-1440.88
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	250X250X8	59.5	15	892.50	
	2	200X100X5	22.26	7.906	175.99		2	240X120X5	26.97	7.906	213.22	
				TOTAL	**854.59**					**TOTAL**	**1105.72**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1120	8987	-3370	-1120	8993	3370	1111	10277	-3255	-1111	10283	3256
LL	1505	7112	-4530	-1505	7120	4530	1436	7112	-4211	-1436	7120	4211
WL0	-26321	-28318	93378	-9537	-13735	48760	-31548	-34995	109003	-11853	-15902	57617
WL90	4749	-26230	-8209	-4749	-26267	8208	5810	-31747	-10401	-5810	-31791	10400
SUCT	-2648	6561	5512	2648	6570	-5512	-3190	7940	6676	3190	7951	-6676
PRESSURE	2648	-6561	-5512	-2648	-6570	5512	3190	-7940	-6676	-3190	-7951	6676
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 7.5m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : FIXED AT BOTTOM



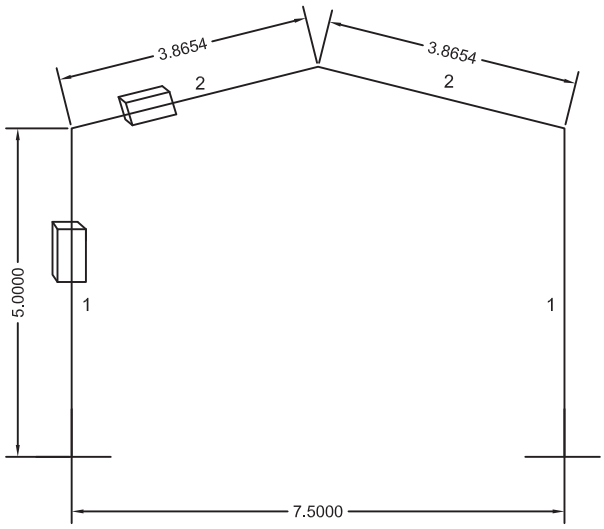
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	200X100X4	18.01	10	180.10		1	200X100X4	18.01	10	180.10	
	2	145X82X4.8	15.92	7.74	123.22		2	145X82X4.8	15.92	7.74	123.22	
				TOTAL	**303.32**					**TOTAL**	**303.32**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1586	6130	-3171	-1586	6126	3171	1585	6130	-3171	-1585	6130	3171
LL	2506	7771	-5021	-2506	7777	5021	2506	7770	-5021	-2506	7770	5021
WL0	-5174	-9323	11888	500	-6168	838	-7228	-13024	16606	699	-8617	1172
WL90	-1458	-8454	3162	1457	-8454	-3162	-2036	-11810	4417	2036	-11810	-4417
SUCT	201	2115	-505	-201	2115	505	281	2955	-705	-281	2955	705
PRESSURE	-201	-2115	505	201	2115	-505	-281	-2955	705	281	-2955	-705
HT 7.5 M	1	240X120X6	32.05	15	480.75		1	260X180-X6	39.59	15	593.85	
	2	145X82X4.8	15.92	7.74	123.22		2	145X82X4.8	15.92	7.74	123.22	
				TOTAL	**603.97**					**TOTAL**	**717.07**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1140	7675	-3414	-1140	7671	3417	1213	8256	-3848	-1213	8251	3852
LL	1802	7771	-5407	-1802	7777	5406	1919	7771	-6099	-1919	7777	6099
WL0	-8912	-10220	31962	-2749	-5272	15423	-12632	-13858	47230	-3659	-7783	22105
WL90	1267	-8454	-1768	-1267	-8462	1768	1689	-11810	-1878	-1689	-11821	1879
SUCT	-781	2116	1525	781	2118	-1525	-1083	2956	2033	1083	2958	-2034
PRESSURE	781	-2116	-1525	-781	-2118	1525	1083	-2956	-2033	-1083	-2958	2034
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

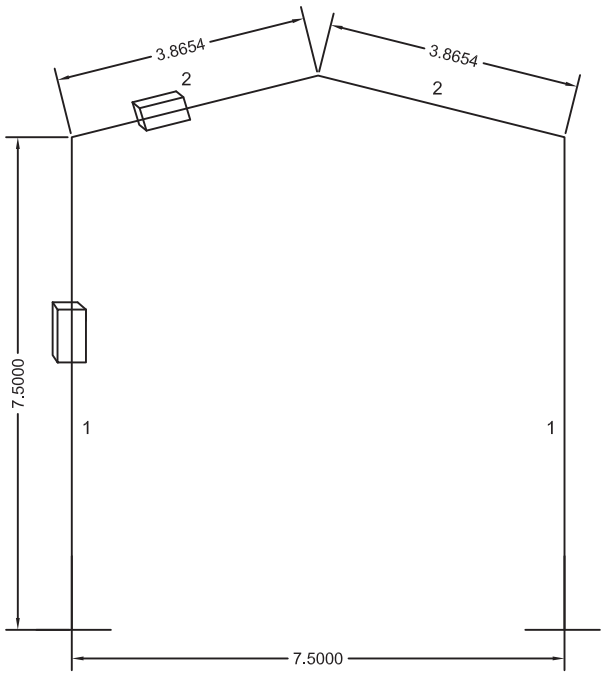
	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	240X120X4	21.78	10	217.80		1	240X120X4	21.78	10	217.80	
	2	145X82X4.8	15.92	7.74	123.22		2	145X82X4.8	15.92	7.74	123.22	
				TOTAL	**341.02**					**TOTAL**	**341.02**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1718	6325	-3645	-1718	6325	3645	1718	6325	-3645	-1718	6325	3645
LL	2718	7770	-5778	-2718	7770	5778	2718	7770	-5778	-2718	7770	5778
WL0	-3696	-15322	5623	5325	-12221	-133348	-4216	-17477	6413	6074	-13939	-15224
WL90	-2879	-15031	6679	2879	-15045	-6679	-3285	-17144	7618	3285	-17144	-7618
SUCT	417	3761	-1125	-417	3761	1125	475	4290	-1283	-475	4290	1283
PRESSURE	-417	-3761	1125	417	-3761	-1125	-475	-4290	1283	475	-4290	-1283
HT 7.5 M	1	260X180X6	39.59	15	593.85		1	260X180X6	39.59	15	593.85	
	2	145X82X5.4	17.74	7.74	137.31		2	145X82X5.4	17.74	7.74	137.31	
				TOTAL	**731.16**					**TOTAL**	**731.16**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1221	8352	-3824	-1221	8347	3827	1177	8802	-3551	-1177	8798	3554
LL	1894	7771	-5941	-1894	7777	5941	1819	7771	-5497	-1819	7777	5497
WL0	-16029	-17742	59431	-4705	-9802	28035	-18113	-20619	65410	-5536	-10798	31486
WL90	2173	-15031	-2565	-2173	-15045	2566	2556	-17145	-3483	-2556	-17160	3484
SUCT	-1381	3762	2617	1381	3765	-2618	-1584	4291	3077	1584	4295	-3078
PRESSURE	1381	-3762	-2617	-1381	-3765	2618	1584	-4291	-3077	-1584	-4295	3078
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	240X120X4	21.78	10	217.80		1	240X120X5	26.97	10	269.70	
	2	145X82X4.8	15.92	7.74	123.22		2	172X92X4.8	18.71	7.74	144.82	
				TOTAL	**341.02**					**TOTAL**	**414.52**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1718	6324	-3645	-1718	6325	3645	1673.21	6701.44	-3410.8	-1673.21	6697.03	3413.34
LL	2718	7770	-5778	-2718	7770	5778	2586.39	7770.82	-5280.74	-2586.39	7777.18	5280.47
WL0	-4776	-19795	7264	6880	-15788	-17243	-5444.34	-23809.1	8052.44	7989.23	-19226.6	-19132.8
WL90	-3719	-19419	8628	3719	-19419	-8628	-4213.53	-23485.43	9332.95	4213.53	-23506.7	-9332.06
SUCT	538	4860	-1454	-538	4860	1454	591.85	5877.5	-1518.29	-591.85	5878	1518.06
PRESSURE	-538	-4860	1454	538	-4860	-1454	-591.85	-5877.5	1518.29	591.85	-5878	-1518.06
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	250X250X6	45.24	15	678.60	
	2	172X92X5.4	20.88	7.74	161.61		2	240X120X4	21.78	7.74	168.58	
				TOTAL	**840.21**					**TOTAL**	**847.18**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1187	8912	-3541	-1187	8907	3544	1079	8924	-3052	-1079	8920	3054
LL	1794	7771	-5361	-1794	7777	5361	1626	7771	-4605	-1626	7777	4605
WL0	-20449	-23509	73171	-6337	-12075	35416	-24172	-29577	81861	-8223	-13459	40874
WL90	2920	-19419	-4122	-2920	-19437	4123	3705	-23485	-6058	-3705	-23507	6058
SUCT	-1796	4860	3511	1796	4864	-3511	-2171	5878	4366	2171	5883	-4366
PRESSURE	1796	-4860	-3511	-1796	-4864	3511	2171	-5878	-4366	-2171	-5883	4366
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 7.5m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : FIXED AT BOTTOM



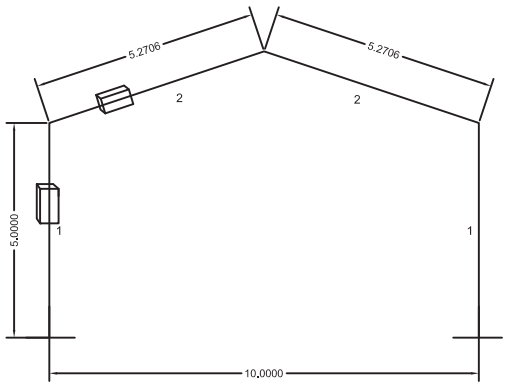
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
	MEM NO	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**		**MEM NO**	**SECTION**	**UNIT WT**	**LENGTH**	**TOTAL**	
HT 5M	1	240X120X4	21.78	10	217.80		1	240X120X4	21.78	10	217.80	
	2	172X92X4.8	18.71	7.74	144.82		2	172X92X4.8	18.71	7.74	144.82	
				TOTAL	**362.62**					**TOTAL**	**362.62**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2166.79	8584.05	-4334.29	-2166.79	8578.26	4337.28	1624.28	6434.82	-3249.1	-1624.28	6430.48	3251.34
LL	3348.98	10366.28	-6708.55	-3348.98	10374.75	6708.24	2510.48	7770.83	-5028.9	-2510.48	7777.17	5028.66
WL0	-6907.25	-12433.24	15880.57	672.25	-8232.54	1126.28	-9646.33	-17363.67	22178.03	938.83	-11497.2	1572.91
WL90	-1946.72	-11277.75	4220.94	1946.72	-11288	-4220.57	-2718.69	-15749.96	5894.76	2718.69	-15764.2	-5894.24
SUCT	268.59	2822.39	-673.7	-268.59	2824.94	673.61	375.11	3941.61	-940.86	-375.11	3945.18	940.73
PRESSURE	-268.59	-2822.39	673.7	268.59	-2824.94	-673.61	-375.11	-3941.61	940.86	375.11	-3945.18	-940.73
HT 7.5 M	1	260X180X6	39.59	15	593.85		1	260X180X6	39.59	15	593.85	
	2	172X92X4.8	18.71	7.74	144.82		2	172X92X4.8	18.71	7.74	144.82	
				TOTAL	**738.67**					**TOTAL**	**738.67**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1539	11161	-4572	-1539	11155	4575	1154	8367	-3427	-1154	8362	3430
LL	2379	10366	-7076	-2379	10375	7076	1783	7771	-5304	-1783	7777	5304
WL0	-11859	-13695	42255	-3697	-6970	20488	-16562	-19126	59012	-5163	-9734	28612
WL90	1703	-11278	-2439	-1703	-11288	2440	2378	-15750	-3407	-2378	-15764	3407
SUCT	-1043	2822	2046	1043	2825	-2046	-1457	3942	2858	1457	3945	-2858
PRESSURE	1043	-2822	-2046	-1043	-2825	2046	1457	-3942	-2858	-1457	-3945	2858
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

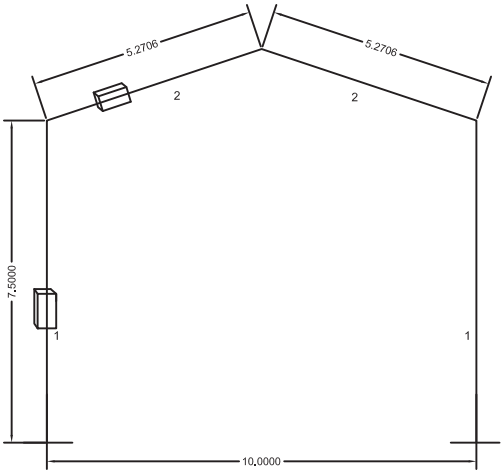
	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	240X120X4	21.78	10	217.80		1	240X120X4	21.78	10	217.80	
	2	172X92X4.8	18.71	7.74	144.82		2	172X92X4.8	18.71	7.74	144.82	
				TOTAL	**362.62**					**TOTAL**	**362.62**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1624.28	6434.82	-3249.1	-1624.28	6430.48	3251.34	1624.28	6434.82	-3249.1	-1624.28	6430.48	3251.34
LL	2510.48	7770.83	-5028.9	-2510.48	7777.17	5028.66	2510.48	7770.83	-5028.9	-2510.48	7777.17	5028.66
WL0	-12281.9	-22107.68	28237.41	1195.33	-14638.4	2002.65	-14011.3	-25220.66	32213.51	1363.64	-16699.6	2284.64
WL90	-3461.48	-20053.09	7505.3	3461.48	-20071.3	-7504.63	-3948.89	-22876.75	8562.12	3948.89	-22897.5	-8561.36
SUCT	477.59	5018.52	-1197.91	-477.59	5023.06	1197.75	544.84	5725.17	-1366.59	-544.84	5730.36	1366.4
PRESSURE	-477.59	-5018.52	1197.91	477.59	-5023.06	-1197.75	-544.84	-5725.17	1366.59	544.84	-5730.36	-1366.4
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	250X250X6	45.24	15	678.60	
	2	172X92X5.4	20.88	7.74	161.61		2	200X100X5	22.26	7.74	172.29	
				TOTAL	**840.21**					**TOTAL**	**850.89**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1187	8912	-3541	-1187	8907	3544	1145	8943	-3320	-1145	8939	3323
LL	1794	7771	-5361	-1794	7777	5361	1719	7771	-4994	-1719	7777	4993
WL0	-21117	-24276	75560	-6544	-12470	36573	-23853	-28227	83119	-7703	-13693	40809
WL90	3015	-20053	-4257	-3015	-20071	4258	3523	-22877	-5400	-3523	-22897	5400
SUCT	-1854	5019	3625	1854	5023	-3626	-2119	5725	4208	2119	5730	-4208
PRESSURE	1854	-5019	-3625	-1854	-5023	3626	2119	-5725	-4208	-2119	-5730	4208
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	240X120X5	26.97	10	269.70		1	240X120X6	32.05	10	320.50	
	2	172X92X4.8	18.71	7.74	144.82		2	200X100X5	22.26	7.74	172.29	
				TOTAL	**414.52**					**TOTAL**	**492.79**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1673.21	6701.44	-3410.8	-1673.21	6697.03	3413.34	1656.49	7103.56	-3297.5	-1656.49	7099.25	3299.66
LL	2586.39	7770.82	-5280.74	-2586.39	7777.18	5280.47	2488.34	7770.83	-4960.32	-2488.34	7777.17	4960.09
WL0	-16090.6	-28442.22	37567.67	1779.06	-18993	2192.46	-19105.2	-34573.26	43746.32	1783.64	-22838.6	3258.11
WL90	-4644.28	-25886.39	10287.07	4644.28	-25909.9	-10286.1	-5343.37	-31330.84	11516.54	5343.37	-31359.2	-11515.5
SUCT	652.36	6478.37	-1673.5	-652.36	6484.25	1673.26	732.64	7840.91	-1825.53	-732.64	7848.01	1825.28
PRESSURE	-652.36	-6478.37	1673.5	652.36	-6484.25	-1673.26	-732.64	-7840.91	1825.53	732.64	-7848.01	-1825.28
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	250X250X8	59.5	15	892.50	
	2	240X120X5	26.97	7.74	208.75		2	240X120X5	26.97	7.74	208.75	
				TOTAL	**887.35**					**TOTAL**	**1101.25**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1085	9130	-3036	-1085	9126	3038	1133	10229	-3216	-1133	10225	3218
LL	1571	7771	-4400	-1571	7777	4400	1641	7771	-4661	-1641	7777	4661
WL0	-26431	-32929	88261	-9276	-14507	44562	-32313	-39346	109866	-10904	-18066	54704
WL90	4131	-25886	-6923	-4131	-25910	6923	4927	-31331	-7994	-4927	-31359	7995
SUCT	-2387	6478	4817	2387	6484	-4818	-2898	7841	5820	2898	7848	-5820
PRESSURE	2387	-6478	-4817	-2387	-6484	4818	2898	-7841	-5820	-2898	-7848	5820
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 10m
Roof Slope : 1 in 3
Bay : 4.5



SUPPORT CONDITION : FIXED AT BOTTOM



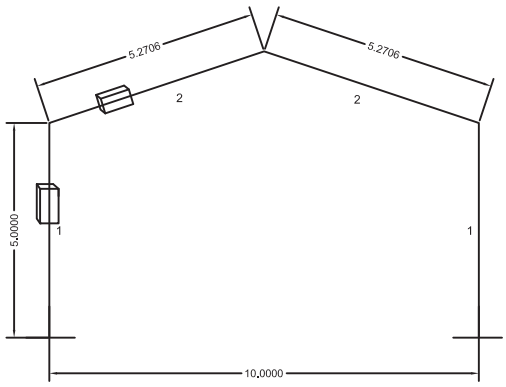
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	180X180X5	26.97	15	404.55		1	220X220X6	39.59	15	593.85	
	2	172X92X4.8	18.71	10.56	197.58		2	172X92X5.4	20.88	10.56	220.49	
				TOTAL	**602.13**					**TOTAL**	**814.34**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1866	9178	-5671	-1866	9178	5595	2132	10274	-6836	-2132	10274	6836
LL	2633	9498	-7910	-2633	9498	7784	2918	9498	-9366	-2918	9498	9366
WL0	-9519	-11246	31824	-1987	-6788	11202	-13718	-15354	48484	-2356	-9886	15480
WL90	349	-11354	838	-349	-11354	-663	254	-15955	2486	-254	-15955	-2486
SUCT	-563	2923	926	563	2923	-1581	-755	4084	1075	755	4084	-1075
PRESSURE	563	-2923	-926	-563	-2923	1581	755	-4084	-1075	-755	-4084	1075
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

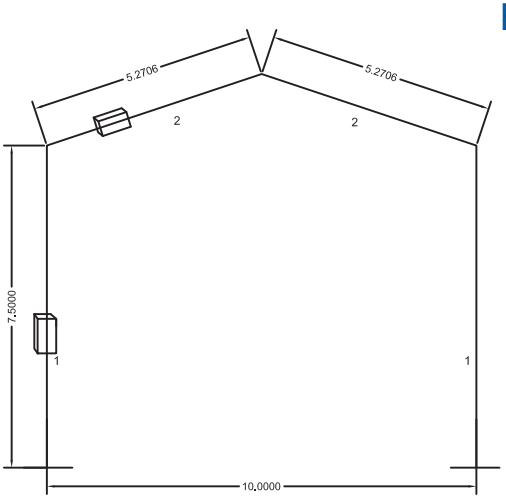
	WIND 44						WIND 47					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	220X220X6	39.59	15	593.85		1	220X220X6	39.59	15	593.85	
	2	172X92X5.4	20.88	10.56	220.49		2	240X120X4	21.78	10.56	230.00	
				TOTAL	**814.34**					**TOTAL**	**823.85**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2131	10274	-6836	-2131	10284	6836	1928	10292	-5781	-1928	10300	5781
LL	2918	9497	-9366	-2918	9497	9366	2632	9497	-7896	-2632	9497	7896
WL0	-17459	-19541	61707	-2999	-12582	19703	-19299	-22872	64513	-4037	-13768	22516
WL90	324	-20306	3165	-324	-20338	-3165	713	-23161	1664	-713	-23199	-1664
SUCT	-961	5197	1368	961	5197	-1368	-1144	5928	1888	1144	5928	-1888
PRESSURE	961	-5197	-1368	-961	-5197	1368	1144	-5928	-1888	-1144	-5928	-1888
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	250X250X6	45.24	15	678.60		1	250X250X6	45.24	15	678.60	
	2	200X100X5	22.25	10.56	234.96		2	240X120X5	26.97	10.56	284.80	
				TOTAL	**913.56**					**TOTAL**	**963.40**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2170	10754	-7029	-2170	10761	7029	2070	11008	-6301	-2070	11008	6301
LL	2952	9497	-9570	-2953	9497	9570	2713	9497	-8269	-2713	9497	8269
WL0	-22625	-25148	80571	-3794	-16335	25433	-26685	-31114	90497	-5280	-19076	30875
WL90	371	-26222	4391	-371	-26264	-4391	849	-31727	2922	-849	-31727	-2922
SUCT	-1234	6712	1713	1234	6712	-1713	-1551	8121	2486	1551	8121	-2486
PRESSURE	1234	-6712	-1713	-1234	-6712	1713	1551	-8121	-2486	-1551	-8121	2486
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 10m
Roof Slope : 1 in 3
Bay : 6



SUPPORT CONDITION : FIXED AT BOTTOM



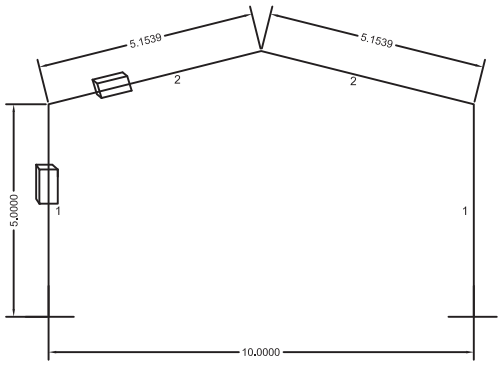
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	180X180X6	32.05	15	480.75		1	220X220X6	39.59	15	593.85	
	2	200X100X5	22.26	10.56	235.07		2	240X120X5	26.97	10.56	284.80	
				TOTAL	715.82					TOTAL	878.65	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2467.1	12989.41	-7280.51	-2467.1	13000.07	7280.25	1937.07	10573.02	-5731.6	-1937.07	10581.01	5731.4
LL	3355.22	12669.6	-9905.47	-3355.22	12687.07	9904.92	2540.25	9497.45	-7519.76	-2540.25	9510.55	7519.34
WL0	-12525.2	-15169.6	41162.27	-2824.75	-8932.4	14839.82	-17543.6	-21147.3	57856.38	-3893.38	-12512.4	20731.46
WL90	552.19	-15235.6	725.31	-552.19	-15259.7	-724.56	747.74	-21277.3	1107.81	-747.74	-21310.9	-1106.72
SUCT	-761.33	3899.9	1294.07	761.33	3905.98	-1294.23	-1061.16	5446.42	1795.71	1061.16	5454.9	-1795.94
PRESSURE	761.33	-3899.9	-1294.07	-761.33	-3905.98	1294.23	1061.16	-5446.42	-1795.71	-1061.16	-5454.9	1795.94
UNIT	N	N	NM	N	N	NM	N	N	NM	N	N	NM

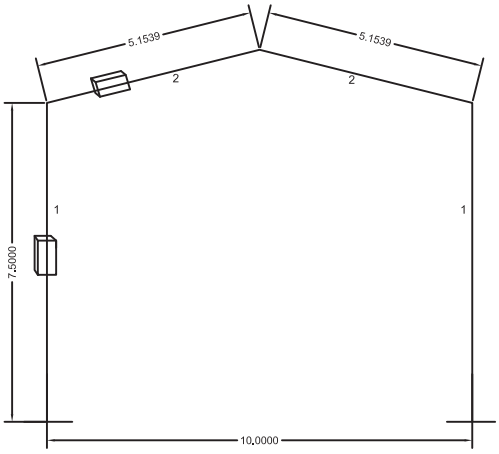
	WIND 44						WIND 47					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	220X220X6	39.59	15	593.85		1	250X250X6	45.24	15	678.60	
	2	240X120X5	26.97	10.56	284.80		2	240X120X5	26.97	10.56	284.80	
				TOTAL	878.65					TOTAL	963.40	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1937.07	10573.02	-5731.6	-1937.07	10581.01	5731.4	2069.19	11008.58	-6301.25	-2069.19	11016.58	6300.98
LL	2540.25	9497.45	-7519.76	-2540.25	9510.55	7519.34	2713.76	9497.44	-8269.12	-2713.76	9510.56	8268.55
WL0	-22336.8	-26925	73663.62	-4957.12	-15930.9	26395.62	-25993.03	-30308.6	88151.6	-5144.12	-18581.9	30074.87
WL90	952.04	-27090.6	1410.48	-952.04	-27133.4	-1409.1	827.03	-30905.1	2847.12	-827.03	-30954.1	-2845.02
SUCT	-1351.09	6934.46	2286.33	1351.09	6945.26	-2286.62	-1511.43	7910.89	2422.52	1511.43	7923.23	-2422.95
PRESSURE	1351.09	-6934.46	-2286.33	-1351.09	-6945.26	2286.62	1511.43	-7910.89	-2422.52	-1511.43	-7923.23	2422.95
UNIT	N	N	NM	N	N	NM	N	N	NM	N	N	NM

	WIND 50						WIND 55					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	250X250X6	45.24	15	678.60		1	250X250X8	59.5	15	892.50	
	2	240X120X5	26.97	10.56	284.80		2	240X120X6	32.05	10.56	338.45	
				TOTAL	963.40					TOTAL	1230.95	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2069.19	11008.58	-6301.25	-2069.19	11016.58	6300.98	2180.58	12382.23	-6698.01	-2180.58	12390.24	6697.72
LL	2713.76	9497.44	-8269.12	-2713.76	9510.56	8268.55	2753.81	9497.43	-8464.47	-2753.81	9510.57	8463.87
WL0	-29412.7	-34295.9	99748.77	-5820.88	-21026.6	34031.5	-35757.11	-41363.5	122181.6	-6886.74	-25594.4	41190.44
WL90	935.83	-34971	3221.69	-935.83	-35026.4	-3219.31	1047.69	-42326.1	4356.61	-1047.69	-42393.1	-4353.55
SUCT	-1710.27	8951.64	2741.23	1710.27	8965.61	-2741.72	-2059.09	10834.35	3244.34	2059.09	10851.26	-3244.97
PRESSURE	1710.27	-8951.64	-2741.23	-1710.27	-8965.61	2741.72	2059.09	-10834.4	-3244.34	-2059.09	-10851.3	3244.97
UNIT	N	N	NM	N	N	NM	N	N	NM	N	N	NM

Span : 10m
Roof Slope : 1 in 4
Bay : 4.5



SUPPORT CONDITION : FIXED AT BOTTOM



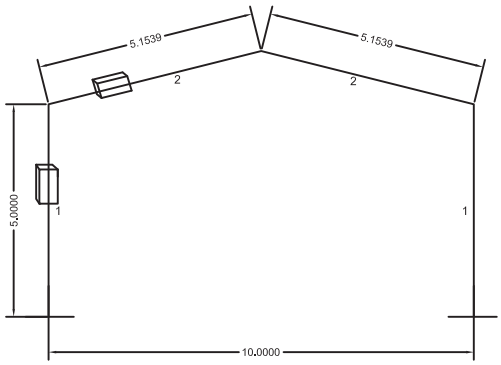
SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	180X180X6	32.05	15	480.75		1	220X220X6	39.59	15	593.85	
	2	172X92X5.4	20.88	10.308	215.23		2	200X100X5	22.26	10.308	229.46	
				TOTAL	**695.98**					**TOTAL**	**823.31**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1933.04	9617.91	-5628.18	-1933.04	9727.11	5625.55	2041.26	10240.59	-6079.57	-2041.26	10349.91	6076.33
LL	2960.48	10486.16	-8625.05	-2960.48	10685.83	8618.36	3107.28	10486.01	-9261.71	-3107.28	10685.99	9253.46
WL0	-11788.4	-14651.03	41805.25	-3494.7	-6820.52	19352.63	-16691.9	-20160.7	60852.07	-4658.59	-9835.05	27653.31
WL90	14.89	-11567.5	1701.56	-14.89	-11808.9	-1693.7	-106.05	-16159.5	2985.13	106.05	-16497.2	-2971.59
SUCT	-462.24	2946.88	643.31	462.24	3007.75	-644.86	-626.1	4116.73	788.24	626.1	4201.87	-790.91
PRESSURE	462.24	-2946.88	-643.31	-462.24	-3007.75	644.86	626.1	-4116.73	-788.24	-626.1	-4201.87	790.91
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

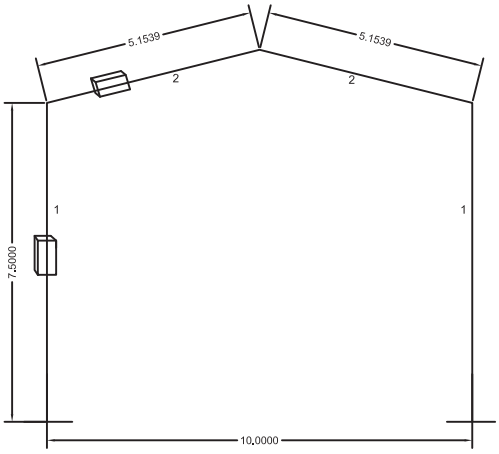
	WIND 44						WIND 47					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	250X250X6	45.24	15	678.60		1	250X250X6	45.24	15	678.60	
	2	240X120X5	26.97	10.308	278.01		2	240X120X5	26.97	10.308	278.01	
				TOTAL	**956.61**					**TOTAL**	**956.61**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2059.36	10925.62	-6044.35	-2059.36	11034.87	6041.46	2059.36	10925.62	-6044.35	-2059.36	11034.87	6041.46
LL	3024.35	10486.1	-8883.2	-3024.35	10685.9	8875.85	3024.35	10486.1	-8883.2	-3024.35	10685.9	8875.85
WL0	-21083.6	-25876.22	75666.35	-6089.7	-12300.2	34805.44	-24048.1	-29514.6	86305.61	-6945.96	-14029.7	39699.34
WL90	-40.41	-20566.88	3321.57	40.41	-20996.3	-3306.22	-46.09	-23458.7	3788.61	46.09	-23948.5	-3771.1
SUCT	-812.24	5239.52	1093.15	812.24	5347.8	-1096.18	-926.45	5976.23	1246.86	926.45	6099.74	-1250.31
PRESSURE	812.24	-5239.52	-1093.15	-812.24	-5347.8	1096.18	926.45	-5976.23	-1246.86	-926.45	-6099.74	1250.31
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	250X250X6	45.24	15	678.60		1	250X250X10	73.34	15	1100.10	
	2	240X120X5	26.97	10.308	278.01		2	240X120X8	41.91	10.308	432.01	
				TOTAL	**956.61**					**TOTAL**	**1532.11**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2059.36	10925.62	-6044.35	-2059.36	11034.87	6041.46	2305.09	13882.45	-6788.21	-2305.09	13991.72	6785.23
LL	3024.35	10486.1	-8883.2	-3024.35	10685.9	8875.85	3045.29	10486.08	-8975.87	-3045.29	10685.92	8968.3
WL0	-27237.9	-33429.52	97753.44	-7867.29	-15890.6	44965.18	-33005.3	-40346.5	118907.1	-9451.09	-19301.4	54529.77
WL90	-52.2	-26570.37	4291.14	52.2	-27125.1	-4271.31	-99.53	-32134.2	5367.09	99.53	-32805.3	-5342.39
SUCT	-1049.33	6768.94	1412.24	1049.33	6908.83	-1416.16	-1263.36	8186.36	1675.65	1263.36	8355.58	-1680.53
PRESSURE	1049.33	-6768.94	-1412.24	-1049.33	-6908.83	1416.16	1263.36	-8186.36	-1675.65	-1263.36	-8355.58	1680.53
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 10m
Roof Slope : 1 in 4
Bay : 6



SUPPORT CONDITION : FIXED AT BOTTOM



SUPPORT CONDITION : FIXED AT BOTTOM

	WIND 33						WIND 39					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	220X220X6	39.59	15	593.85		1	250X250X6	45.24	15	678.60	
	2	200X100X6	26.4	10.308	272.13		2	200X100X6	26.4	10.308	272.13	
				TOTAL	**865.98**					**TOTAL**	**950.73**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2745.1	13953.24	-8074.61	-2745.1	14098.99	8070.72	2179.97	10895.18	-6636.65	-2179.97	11004.61	6632.91
LL	4048.76	13988.44	-11918.1	-4048.76	14255	11908.19	3215.66	10485.88	-9798.99	-3215.66	10686.12	9789.47
WL0	-15834.6	-19399.17	56921.12	-4553.02	-9243.88	26116.54	-22475.01	-26547	83851.62	-5997.33	-13454.5	37564.15
WL90	-40.73	-15430.93	2547.34	40.73	-15753.1	-2535.69	-272.88	-21549.6	4699.92	272.88	-22000.5	-4679.09
SUCT	-607.48	3931.11	808.73	607.48	4012.36	-811.03	-812.81	5489.91	912.18	812.81	5603.56	-916.29
PRESSURE	607.48	-3931.11	-808.73	-607.48	-4012.36	811.03	812.81	-5489.91	-912.18	-812.81	-5603.56	916.29
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

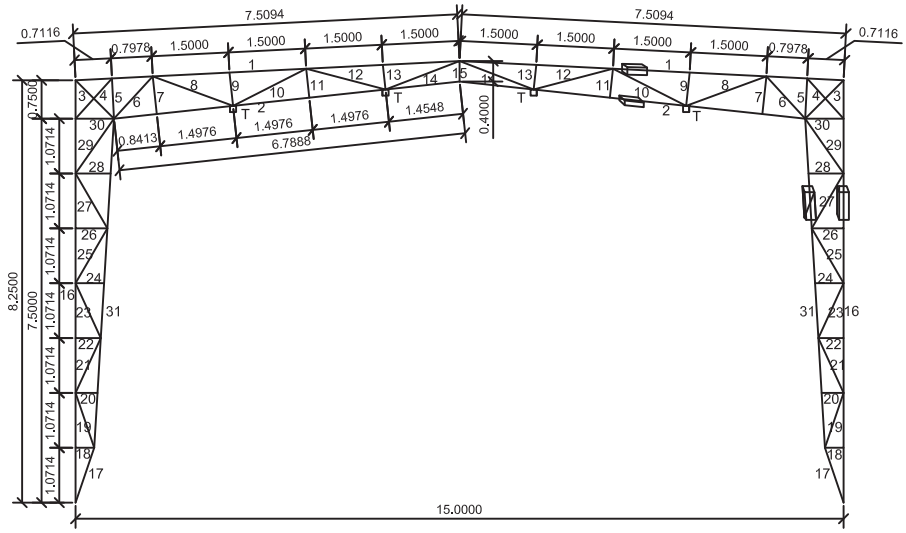
	WIND 44						WIND 47					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	220X220X8	51.96	15	779.40		1	250X250X8	59.5	15	892.50	
	2	240X120X6	32.05	10.308	330.37		2	240X120X6	32.05	10.308	330.37	
				TOTAL	**1109.77**					**TOTAL**	**1222.87**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2031.42	11712.48	-5849.17	-2031.42	11821.62	5846.84	2169.28	12293.16	-6414.17	-2169.28	12402.45	6411.09
LL	2874.01	10486.24	-8280.53	-2874.01	10685.76	8274.59	3069.36	10486.05	-9083.08	-3069.36	10685.95	9075.23
WL0	-27734	-34999.94	97055.31	-8517.42	-15930.6	45534.16	-32220.51	-39200.9	116622.4	-9135.46	-18901.1	53318.73
WL90	162.36	-27438.33	3475.84	-162.36	-28010.4	-3459.33	-137.39	-31301.3	5426.59	137.39	-31955.1	-5401.65
SUCT	-1115.82	6990.03	1626.11	1115.82	7134.34	-1629.36	-1224.3	7974.17	1595.99	1224.3	8139.04	-1600.92
PRESSURE	1115.82	-6990.03	-1626.11	-1115.82	-7134.34	1629.36	1224.3	-7974.17	-1595.99	-1224.3	-8139.04	1600.92
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
HT 7.5M	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
	1	250X250X8	59.5	15	892.50		1	250X250X10	73.34	15	1100.10	
	2	260X180X6	39.59	10.308	408.09		2	260X180X6	39.59	10.308	408.09	
				TOTAL	**1300.59**					**TOTAL**	**1508.19**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2112.24	12692.33	-6053.42	-2112.24	12801.45	6051.21	2185.7	13759.44	-6334.5	-2185.7	13868.62	6331.93
LL	2834.49	10486.27	-8128.61	-2834.49	10685.73	8122.98	2933.19	10486.18	-8507.18	-2933.19	10685.82	8500.67
WL0	-35665.9	-45309.21	124146.2	-11130.8	-20436.7	58641.65	-43573.88	-54401.3	153931	-13065.1	-25172.3	71674.28
WL90	283.63	-35420.08	4173.96	-283.63	-36158.3	-4153.77	125.47	-42869.2	5964.13	-125.47	-43763.5	-5935.82
SUCT	-1451.42	9023.41	2153.39	1451.42	9209.65	-2157.38	-1725.37	10921.14	2452.55	1725.37	11146.7	-2458.15
PRESSURE	1451.42	-9023.41	-2153.39	-1451.42	-9209.65	2157.38	1725.37	-10921.1	-2452.55	-1725.37	-11146.7	2458.15
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 15m

Roof Slope : 1 in 10

Bay : 4.5



SUPPORT CONDITION : FIXED AT BOTTOM
T : TIE RUNNER

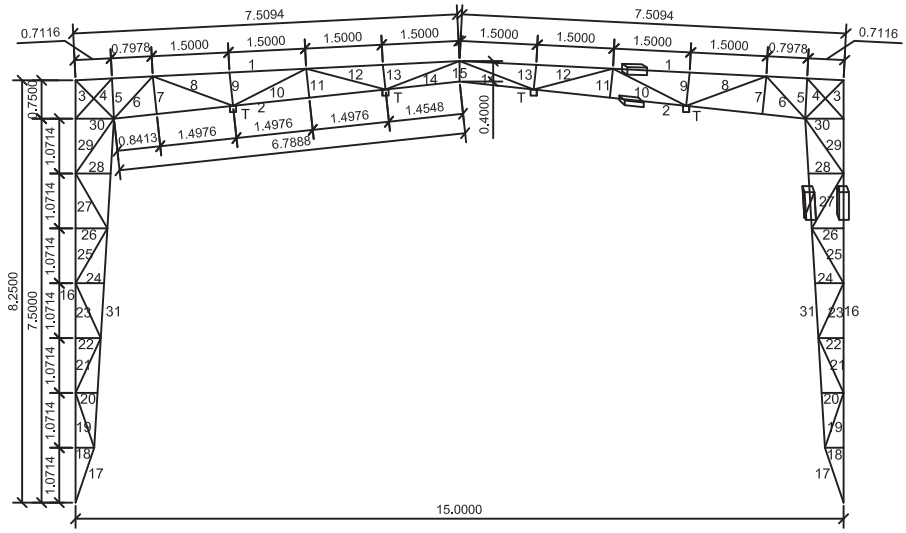
	SPEED 33 M/S			SPEED 39 M/S			SPEED 44 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	60X60X2.6	68.34	KG	60X60X2.6	68.34	KG	60X60X3.2	82.60	KG
2	80X40X2.6	61.78	KG	80X40X2.6	61.78	KG	80X40X4	91.11	KG
3	40X40X3.2	7.40	KG	50X50X2.9	8.73	KG	50X50X3.6	10.55	KG
4	40X40X3.2	7.40	KG	50X50X2.9	8.73	KG	50X50X3.6	10.55	KG
5	60X60X2.6	7.16	KG	80X80X3.2	11.81	KG	80X80X4	14.50	KG
6	40X40X3.2	7.82	KG	50X50X2.9	9.23	KG	50X50X3.6	11.16	KG
7	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG
8	40X40X3.2	11.66	KG	50X50X2.9	13.76	KG	50X50X3.6	16.63	KG
9	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG
10	40X40X3.2	11.18	KG	50X50X2.9	13.20	KG	50X50X3.6	15.96	KG
11	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG
12	40X40X3.2	11.18	KG	50X50X2.9	13.20	KG	50X50X3.6	15.96	KG
13	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG
14	40X40X3.2	10.82	KG	50X50X2.9	12.77	KG	50X50X3.6	15.43	KG
15	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
16	60X60X2.6	75.08	KG	80X80X3.2	123.92	KG	80X80X4	152.13	KG
17	60X60X2.6	10.30	KG	80X80X3.2	17.00	KG	80X80X4	20.86	KG
18	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG
19	40X40X2.6	6.61	KG	40X40X2.6	6.61	KG	50X50X2.6	8.46	KG
20	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG
21	40X40X2.6	6.89	KG	40X40X2.6	6.89	KG	50X50X2.6	8.82	KG
22	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG
23	40X40X2.6	7.41	KG	40X40X2.6	7.41	KG	50X50X2.6	9.50	KG
24	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG
25	40X40X2.6	7.23	KG	40X40X2.6	7.23	KG	50X50X2.6	9.26	KG
26	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG
27	40X40X2.6	7.23	KG	40X40X2.6	7.23	KG	50X50X2.6	9.26	KG
28	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
29	40X40X2.6	7.64	KG	40X40X2.6	7.64	KG	50X50X2.6	9.78	KG
30	80X40X2.6	6.83	KG	80X40X2.6	6.83	KG	80X40X4	10.07	KG
31	60X60X2.6	58.60	KG	80X80X3.2	96.73	KG	80X80X4	118.75	KG
	TOTAL	**421.14**	**KG**	**TOTAL**	**531.64**	**KG**	**TOTAL**	**663.97**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	1706	6663	-246	1865	7230	-391	1970	7910	-394
LL	5263	16875	-871	5674	16875	-1418	5636	16875	-1380
WLO	-13084	-23517	4833	-18957	-32401	11124	-24037	-41284	13716
	-407	-11515	2596	110	-16539	6041	50	-21002	7424
WL90	-4085	-19530	513	-6178	-27283	1167	-7846	-34724	1459
SUCTION	566	4390	-29	862	6133	-66	1103	7805	-87
PRESSURE	-566	-4390	29	-862	-6133	66	-1103	-7805	87
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	SPEED 47 M/S			SPEED 50 M/S			SPEED 55 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	72X72X3.2	100.78	KG	72X72X3.2	100.78	KG	72X72X4	123.46	KG
2	96X48X3.2	91.11	KG	96X48X3.2	91.11	KG	96X48X4	111.61	KG
3	50X50X3.6	10.55	KG	60X60X3.2	11.65	KG	72X72X3.2	14.22	KG
4	50X50X3.6	10.55	KG	60X60X3.2	11.65	KG	72X72X3.2	14.22	KG
5	91X91X4.5	18.69	KG	100X100X5	22.67	KG	113X113X5.4	27.91	KG
6	50X50X3.6	11.16	KG	60X60X3.2	12.33	KG	60X60X3.2	12.33	KG
7	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG
8	50X50X3.6	16.63	KG	60X60X3.2	18.37	KG	60X60X3.2	18.37	KG
9	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG
10	50X50X3.6	15.96	KG	60X60X3.2	17.62	KG	60X60X3.2	17.62	KG
11	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG
12	50X50X3.6	15.96	KG	60X60X3.2	17.62	KG	60X60X3.2	17.62	KG
13	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG
14	50X50X3.6	15.43	KG	60X60X3.2	17.04	KG	60X60X3.2	17.04	KG
15	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
16	91X91X4.5	196.02	KG	100X100X5	237.77	KG	113X113X5.4	292.71	KG
17	91X91X4.5	26.88	KG	100X100X5	32.61	KG	113X113X5.4	40.15	KG
18	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG
19	50X50X2.6	8.46	KG	50X50X2.6	8.46	KG	50X50X2.9	9.32	KG
20	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG
21	50X50X2.6	8.82	KG	50X50X2.6	8.82	KG	50X50X2.9	9.72	KG
22	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG
23	50X50X2.6	9.50	KG	50X50X2.6	9.50	KG	50X50X2.9	10.46	KG
24	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG
25	50X50X2.6	9.26	KG	50X50X2.6	9.26	KG	50X50X2.9	10.21	KG
26	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG
27	50X50X2.6	9.26	KG	50X50X2.6	9.26	KG	50X50X2.9	10.21	KG
28	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
29	50X50X2.6	9.78	KG	50X50X2.6	9.78	KG	50X50X2.9	10.78	KG
30	96X48X3.2	10.07	KG	96X48X3.2	10.07	KG	96X48X4	12.33	KG
31	91X91X4.5	153.01	KG	100X100X5	185.60	KG	113X113X5.4	228.49	KG
	TOTAL	**770.50**	**KG**	**TOTAL**	**864.59**	**KG**	**TOTAL**	**1031.37**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2046	8456	-461	2112	8939	-497	2233	9796	-586
LL	5738	16875	-1645	5857	16875	-1827	5925	16875	-2146
WLO	-27680	-46726	19076	-31662	-52562	24697	-38542	-63157	34328
	320	-24319	10481	687	-27871	13855	1064	-34162	18907
WL90	-9055	-39607	1930	-10471	-44841	2383	-12809	-54254	3367
SUCTION	1260	8903	-98	1459	10079	-106	1783	12195	-144
PRESSURE	-1260	-8903	98	-1459	-10079	106	-1783	-12195	144
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 15m

Roof Slope : 1 in 10

Bay : 6



SUPPORT CONDITION : FIXED AT BOTTOM
T : TIE RUNNER

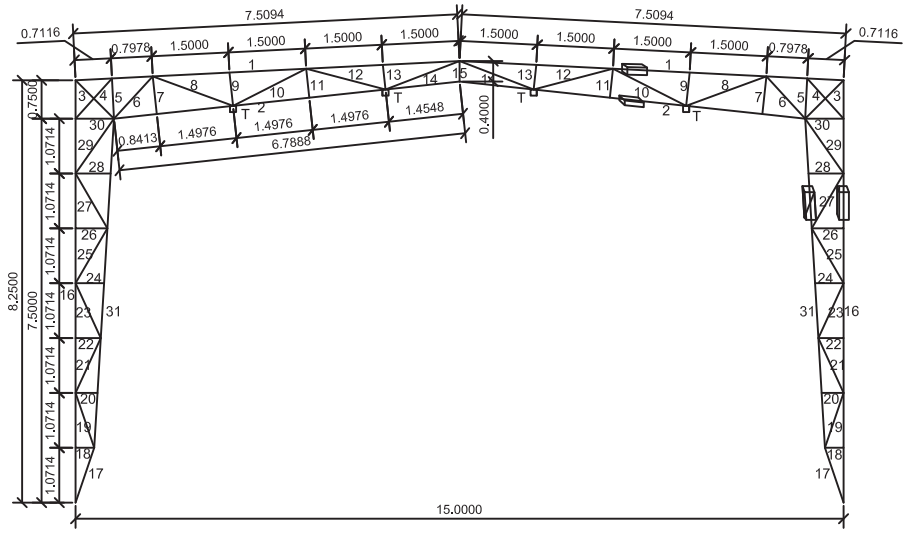
	SPEED 33 M/S			SPEED 39 M/S			SPEED 44 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	60X60X3.2	82.60	KG	60X60X3.2	82.60	KG	80X80X3.2	112.79	KG
2	80X40X2.6	61.78	KG	80X40X4	91.11	KG	96X48X3.2	91.11	KG
3	50X50X2.6	7.93	KG	50X50X2.9	8.73	KG	60X60X2.6	9.64	KG
4	50X50X2.6	7.93	KG	50X50X2.9	8.73	KG	60X60X2.6	9.64	KG
5	72X72X3.2	10.55	KG	100X100X4	18.45	KG	100X100X5	22.67	KG
6	50X50X2.6	8.38	KG	50X50X2.9	9.23	KG	60X60X2.6	10.20	KG
7	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG
8	50X50X2.6	12.49	KG	50X50X2.9	13.76	KG	60X60X2.6	15.20	KG
9	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG
10	50X50X2.6	11.98	KG	50X50X2.9	13.20	KG	60X60X2.6	14.58	KG
11	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG
12	50X50X2.6	11.98	KG	50X50X2.9	13.20	KG	60X60X2.6	14.58	KG
13	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG
14	50X50X2.6	11.59	KG	50X50X2.9	12.77	KG	60X60X2.6	14.10	KG
15	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
16	72X72X3.2	110.72	KG	100X100X4	193.55	KG	100X100X5	237.77	KG
17	72X72X3.2	15.18	KG	100X100X4	26.54	KG	100X100X5	32.61	KG
18	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG
19	40X40X2.6	6.61	KG	40X40X3.2	7.90	KG	50X50X2.6	8.46	KG
20	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG
21	40X40X2.6	6.89	KG	40X40X3.2	8.23	KG	50X50X2.6	8.82	KG
22	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG
23	40X40X2.6	7.41	KG	40X40X3.2	8.86	KG	50X50X2.6	9.50	KG
24	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG
25	40X40X2.6	7.23	KG	40X40X3.2	8.64	KG	50X50X2.6	9.26	KG
26	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG
27	40X40X2.6	7.23	KG	40X40X3.2	8.64	KG	50X50X2.6	9.26	KG
28	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
29	40X40X2.6	7.64	KG	40X40X3.2	9.13	KG	50X50X2.6	9.78	KG
30	80X40X2.6	6.83	KG	80X40X4	10.07	KG	96X48X3.2	10.07	KG
31	72X72X3.2	86.42	KG	100X100X4	151.08	KG	100X100X5	185.60	KG
	TOTAL	**511.99**	**KG**	**TOTAL**	**727.04**	**KG**	**TOTAL**	**858.24**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2475	9556	-477	2741	11028	-778	2836	11925	-732
LL	7341	22512	-1565	7791	22512	-2585	7760	22512	-2443
WLO	-17841	-31125	8821	-25645	-42643	20320	-32612	-54299	25544
	-155	-15608	4794	511	-22622	11061	612	-28797	14322
WL90	-5682	-26053	908	-8513	-36384	2140	-10701	-46325	2469
SUCTION	784	5856	-47	1195	8179	-126	1482	10413	-111
PRESSURE	-784	-5856	47	-1195	-8179	126	-1482	-10413	111
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	SPEED 47 M/S			SPEED 50 M/S			SPEED 55 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	72X72X4	123.46	KG	80X80X4	138.48	KG	80X80X4	138.48	KG
2	96X48X4	111.61	KG	122X61X3.6	131.30	KG	122X61X3.6	131.30	KG
3	60X60X3.2	11.65	KG	72X72X3.2	14.22	KG	72X72X3.2	14.22	KG
4	60X60X3.2	11.65	KG	72X72X3.2	14.22	KG	72X72X3.2	14.22	KG
5	113X113X4.8	25.04	KG	113X113X5.4	27.91	KG	113X113X5.4	27.91	KG
6	60X60X3.2	12.33	KG	60X60X3.2	12.33	KG	60X60X3.2	12.33	KG
7	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG
8	60X60X3.2	18.37	KG	60X60X3.2	18.37	KG	60X60X3.2	18.37	KG
9	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG
10	60X60X3.2	17.62	KG	60X60X3.2	17.62	KG	60X60X3.2	17.62	KG
11	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG
12	60X60X3.2	17.62	KG	60X60X3.2	17.62	KG	60X60X3.2	17.62	KG
13	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG
14	60X60X3.2	17.04	KG	60X60X3.2	17.04	KG	60X60X3.2	17.04	KG
15	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
16	113X113X4.8	262.68	KG	113X113X5.4	292.71	KG	113X113X5.4	292.71	KG
17	113X113X4.8	36.03	KG	113X113X5.4	40.15	KG	113X113X5.4	40.15	KG
18	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG
19	50X50X2.6	8.46	KG	50X50X2.9	9.32	KG	50X50X2.9	9.32	KG
20	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG
21	50X50X2.6	8.82	KG	50X50X2.9	9.72	KG	50X50X2.9	9.72	KG
22	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG
23	50X50X2.6	9.50	KG	50X50X2.9	10.46	KG	50X50X2.9	10.46	KG
24	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG
25	50X50X2.6	9.26	KG	50X50X2.9	10.21	KG	50X50X2.9	10.21	KG
26	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG
27	50X50X2.6	9.26	KG	50X50X2.9	10.21	KG	50X50X2.9	10.21	KG
28	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
29	50X50X2.6	9.78	KG	50X50X2.9	10.78	KG	50X50X2.9	10.78	KG
30	96X48X4	12.33	KG	122X61X3.6	14.51	KG	122X61X3.6	14.51	KG
31	113X113X4.8	205.05	KG	113X113X5.4	228.49	KG	113X113X5.4	228.49	KG
	TOTAL	**960.19**	**KG**	**TOTAL**	**1068.25**	**KG**	**TOTAL**	**1068.25**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	2971	12622	-868	3077	13364	-859	3077	13364	-859
LL	7794	22512	-2828	7801	22512	-2782	7801	22512	-2782
WLO	-37293	-61577	32940	-42205	-69747	36625	-30654	-50659	26602
	787	-33220	18064	896	-37521	20058	651	-27253	14569
WL90	-12263	-52848	3201	-13923	-59801	3563	-16852	-72378	4313
SUCTION	1697	11879	-122	1935	13442	-135	2342	16269	-164
PRESSURE	-1697	-11879	122	-1935	-13442	135	-2342	-16269	164
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 15m

Roof Slope : 1 in 10

Bay : 7.5



SUPPORT CONDITION : FIXED AT BOTTOM
T : TIE RUNNER

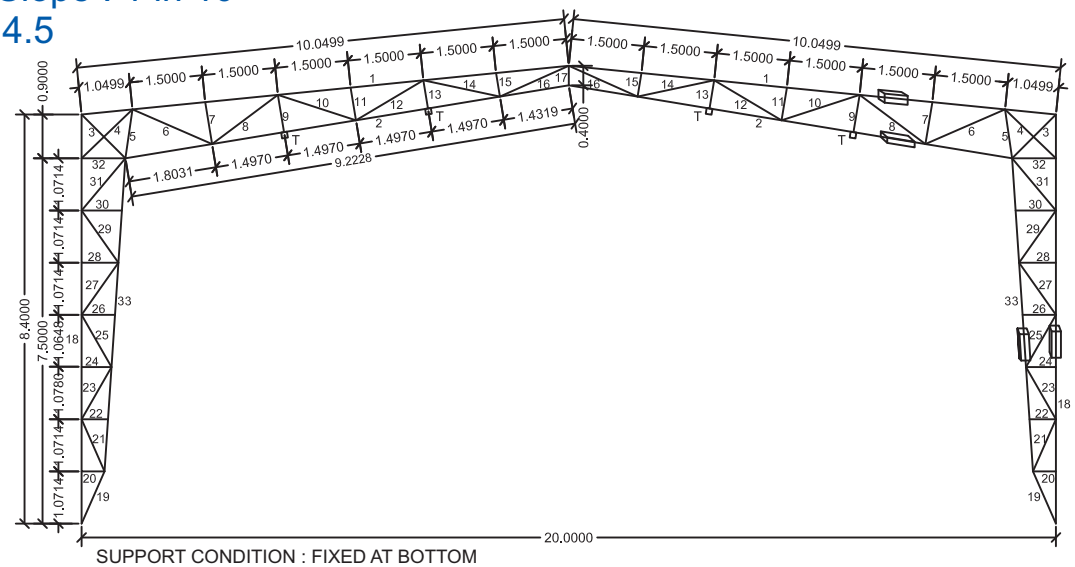
	SPEED 33 M/S			SPEED 39 M/S			SPEED 44 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	60X60X4	100.78	KG	60X60X4	100.78	KG	72X72X4	123.46	KG
2	96X48X3.2	91.11	KG	96X48X3.2	91.11	KG	96X48X4	111.61	KG
3	50X50X2.6	7.93	KG	60X60X2.6	9.64	KG	60X60X4	14.22	KG
4	50X50X2.6	7.93	KG	60X60X2.6	9.64	KG	60X60X4	14.22	KG
5	60X60X4.8	12.35	KG	91X91X5.4	22.04	KG	113X113X5.4	27.91	KG
6	50X50X2.6	8.38	KG	60X60X2.6	10.20	KG	60X60X4	15.04	KG
7	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG
8	50X50X2.6	12.49	KG	60X60X2.6	15.20	KG	60X60X4	22.41	KG
9	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG
10	50X50X2.6	11.98	KG	60X60X2.6	14.58	KG	60X60X4	21.50	KG
11	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG
12	50X50X2.6	11.98	KG	60X60X2.6	14.58	KG	60X60X4	21.50	KG
13	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG
14	50X50X2.6	11.59	KG	60X60X2.6	14.10	KG	60X60X4	20.79	KG
15	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
16	60X60X4.8	129.53	KG	91X91X5.4	231.17	KG	113X113X5.4	292.71	KG
17	60X60X4.8	17.76	KG	91X91X5.4	31.70	KG	113X113X5.4	40.15	KG
18	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG
19	40X40X2.6	6.61	KG	60X60X2.6	10.30	KG	50X50X2.9	9.32	KG
20	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG
21	40X40X2.6	6.89	KG	60X60X2.6	10.73	KG	50X50X2.9	9.72	KG
22	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG
23	40X40X2.6	7.41	KG	60X60X2.6	11.55	KG	50X50X2.9	10.46	KG
24	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG
25	40X40X2.6	7.23	KG	60X60X2.6	11.27	KG	50X50X2.9	10.21	KG
26	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG
27	40X40X2.6	7.23	KG	60X60X2.6	11.27	KG	50X50X2.9	10.21	KG
28	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
29	40X40X2.6	7.64	KG	60X60X2.6	11.90	KG	50X50X2.9	10.78	KG
30	96X48X3.2	10.07	KG	96X48X3.2	10.07	KG	96X48X4	12.33	KG
31	60X60X4.8	101.11	KG	91X91X5.4	180.45	KG	113X113X5.4	228.49	KG
	TOTAL	**600.60**	**KG**	**TOTAL**	**844.87**	**KG**	**TOTAL**	**1049.63**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	3106.47	12650.7	-352.3	3465.39	14741.4	-776.72	3767.25	16496.2	-984.39
LL	8917.64	28148.3	-1238.6	9728.4	28148.3	-2853.5	9838.7	28148.3	-3536
WLO	-21988.26	-39257	7577.75	-32026.99	-53526	22902.12	-41022.74	-67380.6	36399.18
	-514.41	-19177	4358.67	620.39	-28029	12716.29	1049.47	-36419.3	20117.78
WL90	-6925.55	-32576	685.62	-10592.79	-45466	2382.98	-13578.65	-57867.4	3510.48
SUCTION	960.52	7322.52	-23.64	1481.69	10219.9	-148.78	1884.59	13007.6	-136.1
PRESSURE	-960.52	-7322.5	23.64	-1481.69	-10220	148.78	-1884.59	-13007.6	136.1
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	SPEED 47 M/S			SPEED 50 M/S			SPEED 55 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	72X72X4.8	145.08	KG	80X80X4.8	163.26	KG	91X91X5.4	210.42	KG
2	122X61X3.6	131.30	KG	122X61X3.6	131.30	KG	122X61X4.5	161.31	KG
3	60X60X4	14.22	KG	60X60X4.8	16.63	KG	80X80X4	19.54	KG
4	60X60X4	14.22	KG	60X60X4.8	16.63	KG	80X80X4	19.54	KG
5	132X132X5.4	32.84	KG	150X150X5	35.01	KG	150X150X6	41.53	KG
6	60X60X4	15.04	KG	60X60X4.8	17.59	KG	80X80X4	20.66	KG
7	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG	32X32X2.6	3.34	KG
8	60X60X4	22.41	KG	60X60X4.8	26.22	KG	80X80X4	30.79	KG
9	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG	32X32X2.6	2.96	KG
10	60X60X4	21.50	KG	60X60X4.8	25.15	KG	80X80X4	29.54	KG
11	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG	32X32X2.6	2.57	KG
12	60X60X4	21.50	KG	60X60X4.8	25.15	KG	80X80X4	29.54	KG
13	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG	32X32X2.6	2.18	KG
14	60X60X4	20.79	KG	60X60X4.8	24.33	KG	80X80X4	28.57	KG
15	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
16	132X132X5.4	344.52	KG	150X150X5	367.29	KG	150X150X6	435.60	KG
17	132X132X5.4	47.25	KG	150X150X5	50.37	KG	150X150X6	59.74	KG
18	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG	25X25X2.6	1.23	KG
19	50X50X2.9	9.32	KG	50X50X3.6	11.27	KG	60X60X3.2	12.45	KG
20	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG	25X25X2.6	1.45	KG
21	50X50X2.9	9.72	KG	50X50X3.6	11.75	KG	60X60X3.2	12.97	KG
22	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG	25X25X2.6	1.67	KG
23	50X50X2.9	10.46	KG	50X50X3.6	12.64	KG	60X60X3.2	13.96	KG
24	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG	25X25X2.6	1.88	KG
25	50X50X2.9	10.21	KG	50X50X3.6	12.34	KG	60X60X3.2	13.62	KG
26	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG	25X25X2.6	2.10	KG
27	50X50X2.9	10.21	KG	50X50X3.6	12.34	KG	60X60X3.2	13.62	KG
28	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
29	50X50X2.9	10.78	KG	50X50X3.6	13.03	KG	60X60X3.2	14.39	KG
30	122X61X3.6	14.51	KG	122X61X3.6	14.51	KG	122X61X4.5	17.82	KG
31	132X132X5.4	268.93	KG	150X150X5	286.71	KG	150X150X6	340.03	KG
	TOTAL	**1197.41**	**KG**	**TOTAL**	**1296.13**	**KG**	**TOTAL**	**1548.26**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	3932.02	17761.3	-1082.12	4125.27	18609.9	-1562.98	4435	20769	-1542
LL	9877.22	28148.3	-3897.37	10075	28148.3	-5280.77	9978	28149	-5020
WLO	-46922.87	-76412	46099.22	-53669.81	-85556.1	62957.11	-64641	-103713	74028
	1310.44	-42031	25505.13	2053.97	-48476.3	31765.02	2179	-58486	27942
WL90	-15511	-66031	4283.1	-17824.92	-74721.8	6991.67	-21299	-90424	7807
SUCTION	2141.74	14842.6	-119.02	2442.63	16796.1	-352.48	2904	20326	-312
PRESSURE	-2141.74	-14843	119.02	-2442.63	-16796.1	352.48	-2904	-20326	312
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 20m

Roof Slope : 1 in 10

Bay : 4.5



SUPPORT CONDITION : FIXED AT BOTTOM
T : TIE RUNNER

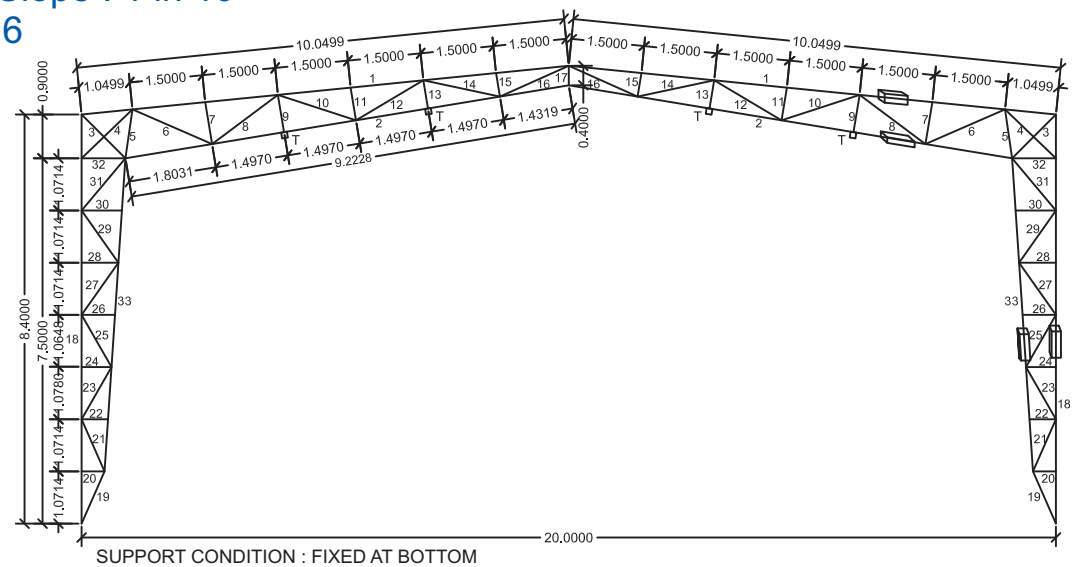
	SPEED 33 M/S			SPEED 39 M/S			SPEED 44 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	72X72X3.2	134.86	KG	72X72X3.2	134.86	KG	80X80X3.2	150.94	KG
2	122X61X3.6	178.35	KG	122X61X3.6	178.35	KG	122X61X3.6	178.35	KG
3	50X50X2.6	9.52	KG	60X60X2.6	11.58	KG	60X60X3.2	14.00	KG
4	50X50X2.6	10.84	KG	60X60X2.6	13.19	KG	60X60X3.2	15.94	KG
5	72X72X3.2	13.62	KG	72X72X3.2	13.62	KG	72X72X4	16.69	KG
6	50X50X2.6	13.33	KG	50X50X2.6	13.33	KG	60X60X2.6	16.22	KG
7	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG
8	50X50X2.6	13.01	KG	50X50X2.6	13.01	KG	60X60X2.6	15.82	KG
9	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG
10	50X50X2.6	12.35	KG	50X50X2.6	12.35	KG	60X60X2.6	15.02	KG
11	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG
12	50X50X2.6	12.35	KG	50X50X2.6	12.35	KG	60X60X2.6	15.02	KG
13	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG
14	50X50X2.6	11.82	KG	50X50X2.6	11.82	KG	60X60X2.6	14.38	KG
15	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG
16	50X50X2.6	12.54	KG	50X50X2.6	12.54	KG	60X60X2.6	15.25	KG
17	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
18	72X72X3.2	112.73	KG	72X72X3.2	112.73	KG	72X72X4	138.10	KG
19	72X72X3.2	15.70	KG	72X72X3.2	15.70	KG	72X72X4	19.23	KG
20	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG
21	38X38X2.6	6.43	KG	40X40X2.6	6.83	KG	50X50X2.6	8.74	KG
22	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG
23	38X38X2.6	6.78	KG	40X40X2.6	7.20	KG	50X50X2.6	9.22	KG
24	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
25	38X38X2.6	6.78	KG	40X40X2.6	7.20	KG	50X50X2.6	9.22	KG
26	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
27	38X38X2.6	7.32	KG	40X40X2.6	7.77	KG	50X50X2.6	9.96	KG
28	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG
29	38X38X2.6	7.21	KG	40X40X2.6	7.66	KG	50X50X2.6	9.81	KG
30	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG
31	38X38X2.6	7.63	KG	40X40X2.6	8.10	KG	50X50X2.6	10.37	KG
32	122X61X3.6	17.41	KG	122X61X3.6	17.41	KG	122X61X3.6	17.41	KG
33	72X72X3.2	86.47	KG	72X72X3.2	86.47	KG	72X72X4	105.92	KG
	TOTAL	**727.50**	**KG**	**TOTAL**	**734.51**	**KG**	**TOTAL**	**836.08**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	3462	9936	-521	3483	9972	-527	3617	10494	-540
LL	9692	23626	-1607	9744	23626	-1628	9872	23626	-1651
WLO	-17759	-29964	5451	-24886	-41865	7596	-31930	-53277	9762
	4141	-18500	1685	5862	-25839	2272	7717	-32892	2905
WL90	-8800	-27342	1283	-12372	-38197	1823	-15946	-48614	2367
SUCTION	1564	6146	-191	2202	8586	-273	2837	10928	-359
PRESSURE	-1564	-6146	191	-2202	-8586	273	-2837	-10928	359
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	SPEED 47 M/S			SPEED 50 M/S			SPEED 55 M/S		
MEM NO	**SECTION**	**TOTAL**	**UNIT**	**SECTION**	**TOTAL**	**UNIT**	**SECTION**	**TOTAL**	**UNIT**
1	72X72X4	165.21	KG	91X91X3.6	194.35	KG	91X91X4.5	238.76	KG
2	122X61X3.6	178.35	KG	122X61X3.6	178.35	KG	122X61X4.5	219.11	KG
3	60X60X3.2	14.00	KG	72X72X3.2	17.08	KG	72X72X3.2	17.08	KG
4	60X60X3.2	15.94	KG	72X72X3.2	19.45	KG	72X72X3.2	19.45	KG
5	100X100X4	23.81	KG	100X100X5	29.25	KG	113X113X4.8	32.32	KG
6	60X60X2.6	16.22	KG	60X60X2.6	16.22	KG	72X72X3.2	23.91	KG
7	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG
8	60X60X2.6	15.82	KG	60X60X2.6	15.82	KG	72X72X3.2	23.34	KG
9	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG
10	60X60X2.6	15.02	KG	60X60X2.6	15.02	KG	72X72X3.2	22.16	KG
11	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG
12	60X60X2.6	15.02	KG	60X60X2.6	15.02	KG	72X72X3.2	22.16	KG
13	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG
14	60X60X2.6	14.38	KG	60X60X2.6	14.38	KG	72X72X3.2	21.20	KG
15	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG
16	60X60X2.6	15.25	KG	60X60X2.6	15.25	KG	72X72X3.2	22.49	KG
17	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
18	100X100X4	197.06	KG	100X100X5	242.09	KG	113X113X4.8	267.46	KG
19	100X100X4	27.45	KG	100X100X5	33.72	KG	113X113X4.8	37.25	KG
20	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG
21	50X50X2.6	8.74	KG	50X50X2.6	8.74	KG	60X60X2.6	10.64	KG
22	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG
23	50X50X2.6	9.22	KG	50X50X2.6	9.22	KG	60X60X2.6	11.22	KG
24	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
25	50X50X2.6	9.22	KG	50X50X2.6	9.22	KG	60X60X2.6	11.22	KG
26	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
27	50X50X2.6	9.96	KG	50X50X2.6	9.96	KG	60X60X2.6	12.11	KG
28	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG
29	50X50X2.6	9.81	KG	50X50X2.6	9.81	KG	60X60X2.6	11.93	KG
30	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG
31	50X50X2.6	10.37	KG	50X50X2.6	10.37	KG	60X60X2.6	12.62	KG
32	122X61X3.6	17.41	KG	122X61X3.6	17.41	KG	122X61X4.5	21.38	KG
33	100X100X4	151.15	KG	100X100X5	185.69	KG	113X113X4.8	205.15	KG
	TOTAL	**969.89**	**KG**	**TOTAL**	**1096.89**	**KG**	**TOTAL**	**1293.43**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	3811	11182	-943	3921	11834	-883	4225	12840	-1193
LL	10277	23625	-2913	10343	23625	-2752	10282	23625	-3403
WLO	-37353	-60225	19558	-42464	-68177	21807	-51210	-82217	31203
	9735	-38060	5762	11197	-43097	6995	13379	-52416	9081
WL90	-18899	-55450	4747	-21495	-62777	4996	-25798	-75956	7530
SUCTION	3356	12464	-718	3811	14111	-738	4649	17128	-1277
PRESSURE	-3356	-12464	718	-3811	-14111	738	-4649	-17128	1277
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 20m

Roof Slope : 1 in 10

Bay : 6



SUPPORT CONDITION : FIXED AT BOTTOM
T : TIE RUNNER

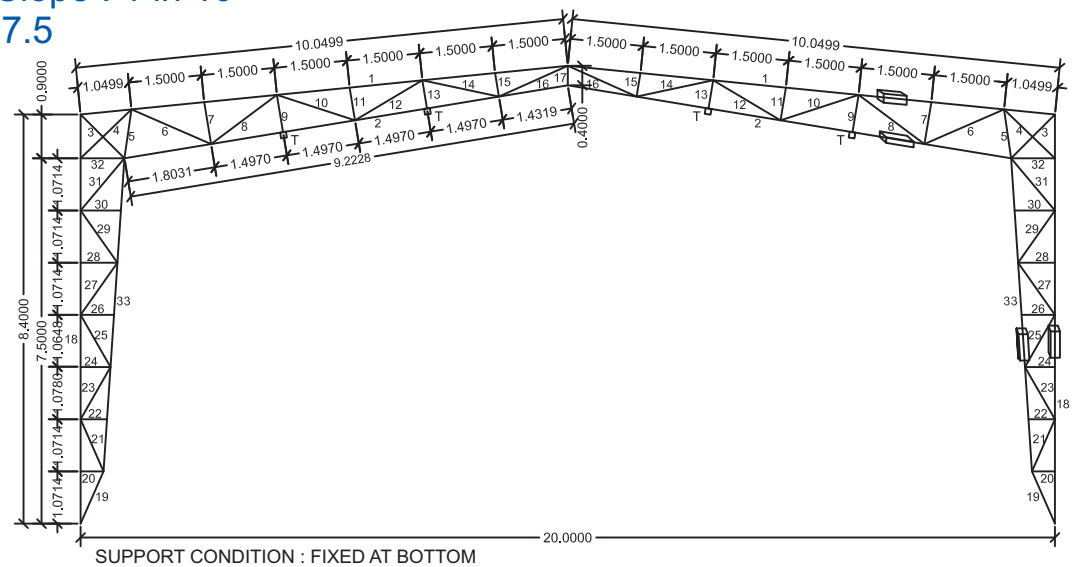
	SPEED 33 M/S			SPEED 39 M/S			SPEED 44 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	80X80X3.2	150.94	KG	80X80X3.2	150.94	KG	91X91X3.6	194.35	KG
2	122X61X3.6	178.35	KG	122X61X3.6	178.35	KG	122X61X3.6	178.35	KG
3	60X60X2.6	11.58	KG	60X60X3.2	14.00	KG	72X72X3.2	17.08	KG
4	60X60X2.6	13.19	KG	60X60X3.2	15.94	KG	72X72X3.2	19.45	KG
5	72X72X4	16.69	KG	80X80X4.0	18.72	KG	100X100X5	29.25	KG
6	50X50X2.9	14.68	KG	60X60X2.6	16.22	KG	60X60X2.6	16.22	KG
7	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG
8	50X50X2.9	14.33	KG	60X60X2.6	15.82	KG	60X60X2.6	15.82	KG
9	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG
10	50X50X2.9	13.60	KG	60X60X2.6	15.02	KG	60X60X2.6	15.02	KG
11	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG
12	50X50X2.9	13.60	KG	60X60X2.6	15.02	KG	60X60X2.6	15.02	KG
13	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG
14	50X50X2.9	13.02	KG	60X60X2.6	14.38	KG	60X60X2.6	14.38	KG
15	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG
16	50X50X2.9	13.81	KG	60X60X2.6	15.25	KG	60X60X2.6	15.25	KG
17	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
18	72X72X4	138.10	KG	80X80X4.0	154.90	KG	100X100X5	242.09	KG
19	72X72X4	19.23	KG	80X80X4.0	21.57	KG	100X100X5	33.72	KG
20	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG
21	38X38X2.6	6.43	KG	50X50X2.6	8.74	KG	50X50X2.6	8.74	KG
22	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG
23	38X38X2.6	6.78	KG	50X50X2.6	9.22	KG	50X50X2.6	9.22	KG
24	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
25	38X38X2.6	6.78	KG	50X50X2.6	9.22	KG	50X50X2.6	9.22	KG
26	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
27	38X38X2.6	7.32	KG	50X50X2.6	9.96	KG	50X50X2.6	9.96	KG
28	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG
29	38X38X2.6	7.21	KG	50X50X2.6	9.81	KG	50X50X2.6	9.81	KG
30	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG
31	38X38X2.6	7.63	KG	50X50X2.6	10.37	KG	50X50X2.6	10.37	KG
32	122X61X3.6	17.41	KG	122X61X3.6	17.41	KG	122X61X3.6	17.41	KG
33	72X72X4	105.92	KG	80X80X4.0	118.81	KG	100X100X5	185.69	KG
	TOTAL	**807.07**	**KG**	**TOTAL**	**870.14**	**KG**	**TOTAL**	**1096.89**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	4766	13802	-660	4903	14234	-870	5230	15787	-1178
LL	13099	31516	-2039	13368	31516	-2674	13798	31516	-3672
WLO	-23881	-39974	7133	-33768	-55682	12414	-43869	-70433	22529
	5715	-24677	2340	8398	-34606	3694	11567	-44523	7227
WL90	-11886	-36474	1607	-16961	-50938	3011	-22207	-64855	5161
SUCTION	2112	8199	-235	3018	11450	-457	3938	14578	-762
PRESSURE	-2112	-8199	235	-3018	-11450	457	-3938	-14578	762
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	SPEED 47 M/S			SPEED 50 M/S			SPEED 55 M/S		
MEM NO	**SECTION**	**TOTAL**	**UNIT**	**SECTION**	**TOTAL**	**UNIT**	**SECTION**	**TOTAL**	**UNIT**
1	91X91X4.5	238.76	KG	100X100X5	289.61	KG	100X100X5	289.61	KG
2	122X61X4.5	219.11	KG	122X61X4.5	219.11	KG	145X82X4.8	293.63	KG
3	72X72X3.2	17.08	KG	72X72X3.2	17.08	KG	80X80X4	23.47	KG
4	72X72X3.2	19.45	KG	72X72X3.2	19.45	KG	80X80X4	26.72	KG
5	100X100X5	29.25	KG	113X113X4.8	32.32	KG	150X150X5	45.19	KG
6	72X72X3.2	23.91	KG	72X72X3.2	23.91	KG	72X72X3.2	23.91	KG
7	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG
8	72X72X3.2	23.34	KG	72X72X3.2	23.34	KG	72X72X3.2	23.34	KG
9	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG
10	72X72X3.2	22.16	KG	72X72X3.2	22.16	KG	72X72X3.2	22.16	KG
11	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG
12	72X72X3.2	22.16	KG	72X72X3.2	22.16	KG	72X72X3.2	22.16	KG
13	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG
14	72X72X3.2	21.20	KG	72X72X3.2	21.20	KG	72X72X3.2	21.20	KG
15	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG
16	72X72X3.2	22.49	KG	72X72X3.2	22.49	KG	72X72X3.2	22.49	KG
17	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
18	100X100X5	242.09	KG	113X113X4.8	267.46	KG	150X150X5	373.97	KG
19	100X100X5	33.72	KG	113X113X4.8	37.25	KG	150X150X5	52.09	KG
20	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG
21	60X60X2.6	10.64	KG	60X60X2.6	10.64	KG	60X60X3.2	12.86	KG
22	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG
23	60X60X2.6	11.22	KG	60X60X2.6	11.22	KG	60X60X3.2	13.56	KG
24	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
25	60X60X2.6	11.22	KG	60X60X2.6	11.22	KG	60X60X3.2	13.56	KG
26	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
27	60X60X2.6	12.11	KG	60X60X2.6	12.11	KG	60X60X3.2	14.64	KG
28	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG
29	60X60X2.6	11.93	KG	60X60X2.6	11.93	KG	60X60X3.2	14.42	KG
30	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG
31	60X60X2.6	12.62	KG	60X60X2.6	12.62	KG	60X60X3.2	15.26	KG
32	122X61X4.5	21.38	KG	122X61X4.5	21.38	KG	145X82X4.8	28.66	KG
33	100X100X5	185.69	KG	113X113X4.8	205.15	KG	150X150X5	286.84	KG
	TOTAL	**1242.00**	**KG**	**TOTAL**	**1344.27**	**KG**	**TOTAL**	**1670.20**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	5545	16777	-1299	5732	17477	-1608	6300	19712	-2527
LL	13508	31516	-3684	13565	31516	-4450	14199	31517	-6844
WLO	-49404	-80424	24995	-56080	-90665	33745	-69821	-108693	58953
	12553	-50720	7494	14382	-57731	9799	19352	-70916	14589
WL90	-24757	-73987	5943	-28020	-83721	8079	-35660	-101330	15287
SUCTION	4379	16631	-884	4935	18819	-1192	6314	22778	-2320
PRESSURE	-4379	-16631	884	-4935	-18819	1192	-6314	-22778	2320
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Span : 20m

Roof Slope : 1 in 10

Bay : 7.5



SUPPORT CONDITION : FIXED AT BOTTOM
T : TIE RUNNER

	SPEED 33 M/S			SPEED 39 M/S			SPEED 44 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	91X91X3.6	194.35	KG	91X91X4.5	238.76	KG	91X91X4.5	238.76	KG
2	122X61X4.5	219.11	KG	122X61X4.5	219.11	KG	122X61X4.5	219.11	KG
3	60X60X3.2	14.00	KG	60X60X4	17.08	KG	60X60X4.8	19.99	KG
4	60X60X3.2	15.94	KG	60X60X4	19.45	KG	60X60X4.8	22.75	KG
5	72X72X4.8	19.61	KG	91X91X5.4	28.44	KG	100X100X6	34.47	KG
6	60X60X3.2	19.60	KG	60X60X3.2	19.60	KG	60X60X4	23.91	KG
7	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG
8	60X60X3.2	19.13	KG	60X60X3.2	19.13	KG	60X60X4	23.34	KG
9	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG
10	60X60X3.2	18.16	KG	60X60X3.2	18.16	KG	60X60X4	22.16	KG
11	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG
12	60X60X3.2	18.16	KG	60X60X3.2	18.16	KG	60X60X4	22.16	KG
13	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG
14	60X60X3.2	17.38	KG	60X60X3.2	17.38	KG	60X60X4	21.20	KG
15	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG
16	60X60X3.2	18.44	KG	60X60X3.2	18.44	KG	60X60X4	22.49	KG
17	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
18	72X72X4.8	162.29	KG	91X91X5.4	235.37	KG	100X100X6	285.26	KG
19	72X72X4.8	22.60	KG	91X91X5.4	32.78	KG	100X100X6	39.73	KG
20	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG
21	40X40X3.2	8.16	KG	50X50X2.9	9.63	KG	50X50X3.6	11.64	KG
22	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG
23	40X40X3.2	8.61	KG	50X50X2.9	10.16	KG	50X50X3.6	12.28	KG
24	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
25	40X40X3.2	8.61	KG	50X50X2.9	10.16	KG	50X50X3.6	12.28	KG
26	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
27	40X40X3.2	9.29	KG	50X50X2.9	10.97	KG	50X50X3.6	13.26	KG
28	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG
29	40X40X3.2	9.15	KG	50X50X2.9	10.80	KG	50X50X3.6	13.06	KG
30	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG
31	40X40X3.2	9.68	KG	50X50X2.9	11.43	KG	50X50X3.6	13.81	KG
32	122X61X4.5	21.38	KG	122X61X4.5	21.38	KG	122X61X4.5	21.38	KG
33	72X72X4.8	124.48	KG	91X91X5.4	180.53	KG	100X100X6	218.80	KG
	TOTAL	**988.59**	**KG**	**TOTAL**	**1197.40**	**KG**	**TOTAL**	**1342.32**	**KG**
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	6358	18811	-858	6801	20601	-1327	7068	21839	-1590
LL	16214	39407	-2482	16814	39407	-3840	17150	39407	-4600
WLO	-29682	-50005	8625	-42375	-69373	18432	-54600	-88026	27702
	6967	-30833	2790	10672	-43451	5850	14249	-55572	8587
WL90	-14694	-45606	1957	-21216	-63652	4226	-27563	-81014	6510
SUCTION	2607	10252	-286	3756	14308	-620	4884	18211	-973
PRESSURE	-2607	-10252	286	-3756	-14308	620	-4884	-18211	973
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	SPEED 47 M/S			SPEED 50 M/S			SPEED 55 M/S		
MEM NO	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT	SECTION	TOTAL	UNIT
1	91X91X5.4	281.57	KG	100X100X6	341.26	KG	132X132X5.4	419.65	KG
2	122X61X5.4	258.40	KG	122X61X5.4	258.40	KG	145X82X5.4	327.20	KG
3	72X72X4.8	24.59	KG	72X72X4.8	24.59	KG	80X80X4.8	27.68	KG
4	72X72X4.8	27.99	KG	72X72X4.8	27.99	KG	80X80X4.8	31.50	KG
5	113X113X5.4	36.01	KG	150X150X5	45.19	KG	150X150X6	53.59	KG
6	60X60X4	23.91	KG	60X60X4.8	27.98	KG	72X72X4	29.30	KG
7	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG	32X32X2.6	3.94	KG
8	60X60X4	23.34	KG	60X60X4.8	27.30	KG	72X72X4	28.59	KG
9	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG	32X32X2.6	3.55	KG
10	60X60X4	22.16	KG	60X60X4.8	25.92	KG	72X72X4	27.14	KG
11	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG	32X32X2.6	3.11	KG
12	60X60X4	22.16	KG	60X60X4.8	25.92	KG	72X72X4	27.14	KG
13	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG	32X32X2.6	2.68	KG
14	60X60X4	21.20	KG	60X60X4.8	24.81	KG	72X72X4	25.98	KG
15	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG	32X32X2.6	2.25	KG
16	60X60X4	22.49	KG	60X60X4.8	26.31	KG	72X72X4	27.55	KG
17	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG	32X32X2.6	0.90	KG
18	113X113X5.4	298.03	KG	150X150X5	373.97	KG	150X150X6	443.52	KG
19	113X113X5.4	41.51	KG	150X150X5	52.09	KG	150X150X6	61.78	KG
20	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG	25X25X2.6	1.59	KG
21	60X60X3.2	12.86	KG	60X60X3.2	12.86	KG	60X60X4	15.69	KG
22	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG	25X25X2.6	1.83	KG
23	60X60X3.2	13.56	KG	60X60X3.2	13.56	KG	60X60X4	16.55	KG
24	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
25	60X60X3.2	13.56	KG	60X60X3.2	13.56	KG	60X60X4	16.55	KG
26	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG	25X25X2.6	2.32	KG
27	60X60X3.2	14.64	KG	60X60X3.2	14.64	KG	60X60X4	17.86	KG
28	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG	25X25X2.6	3.17	KG
29	60X60X3.2	14.42	KG	60X60X3.2	14.42	KG	60X60X4	17.59	KG
30	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG	25X25X2.6	2.80	KG
31	60X60X3.2	15.26	KG	60X60X3.2	15.26	KG	60X60X4	18.61	KG
32	122X61X5.4	25.22	KG	122X61X5.4	25.22	KG	145X82X5.4	31.93	KG
33	113X113X5.4	228.60	KG	150X150X5	286.84	KG	150X150X6	340.19	KG
		1471.96	KG		1708.56	KG		2036.04	KG
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	7443	22949	-2081	7973	24975	-3185	8688	27905	-3396
LL	17224	39407	-5703	17623	39408	-8442	17536	39408	-8340
WLO	-162619	-100140	37267	-71786	-112235	60372	-86589	-135908	71817
	16437	-63718	10252	19683	-73190	15103	23538	-88481	17740
WL90	-31564	-92443	9253	-36363	-104611	15432	-43831	-126594	18522
SUCTION	5589	20780	-1392	6405	23515	-2311	7727	28456	-2789
PRESSURE	-5589	-20780	1392	-6405	-23515	2311	-7727	-28456	2789
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

DESIGN TABLE OF PURLIN, GIRT, EAVE BEAM, TIE RUNNER

RECOMMENDED RHS/SHS FOR GIRT

TRUSS SPACING(m)	WIND SPEED 33 m/s	WIND SPEED 39 m/s	WIND SPEED 44 m/s	WIND SPEED 47 m/s	WIND SPEED 50 m/s	WIND SPEED 55 m/s	REMARK
3.0	RHS 66X33X2.6 (@ 3.69 Kg/m)	RHS 66X33X2.6 (@ 3.69 Kg/m)	RHS 66X33X2.6 (@ 3.69 Kg/m)	RHS 66X33X2.9 (@ 4.07 Kg/m)	RHS 66X33X2.9 (@ 4.07 Kg/m)	RHS 80X40X2.6 (@ 4.55 Kg/m)	C.G.I. SIDE GIRT SHEETING GIRT SPACING = 1.7 m
4.5	RHS 66X33X3.6 (@ 4.93 Kg/m)	RHS 80X40X3.2 (@ 5.5 Kg/m)	RHS 80X40X4.0 (@ 6.71 Kg/m)	RHS 80X40X4.8 (@ 7.85 Kg/m)	RHS 96X48X3.2 (@ 6.71 Kg/m)	RHS 96X48X4.0 (@ 8.22 Kg/m)	
6.0	RHS 80X40X4.8 (@ 7.85 Kg/m)	RHS 96X48X4.0 (@ 8.22 Kg/m)	RHS122X61X3.6 (@ 9.67 Kg/m)	RHS122X61X3.6 (@ 9.67 Kg/m)	RHS122X61X3.6 (@ 9.67 Kg/m)	RHS122X61X5.4 (@ 14.01 Kg/m)	
7.5	RHS 96X48X4.8 (@ 9.66 Kg/m)	RHS122X61X3.6 (@ 9.67 Kg/m)	RHS122X61X4.5 (@ 11.88 Kg/m)	RHS122X61X5.4 (@ 14.01 Kg/m)	RHS 145X82X4.8 (@ 15.92 Kg/m)	RHS 145X82X4.8 (@ 15.92 Kg/m)	
9.0	RHS122X61X4.5 (@ 11.88 Kg/m)	RHS122X61X5.4 (@ 14.01 Kg/m)	RHS 145X82X4.8 (@ 15.92 Kg/m)	RHS 145X82X4.8 (@ 15.92 Kg/m)	RHS 145X82X5.4 (@ 17.74 Kg/m)	RHS 172X92X4.8 (@ 18.71 Kg/m)	

RECOMMENDED RHS/SHS FOR EAVES BEAM & TIE RUNNER

TRUSS SPACING(m)	3.0	4.5	6.0	7.5	9.0
EAVES BEAM	RHS 66X33X2.6 (@3.69 Kg/m)	RHS 96X48X3.2 (@6.71 Kg/m)	RHS 122X61X3.6 (@9.67 Kg/m)	RHS 145X82X4.8 (@15.92 Kg/m)	RHS 172X92X5.4 (@17.74 Kg/m)
TIE RUNNER	SHS 25 X25X2.6 (@1.69 Kg/m)	SHS38 X38 X2.6 (@2.75 Kg/m)	SHS 50X50X2.6 (@3.74 Kg/m)	SHS 72X72X3.2 (@6.71 Kg/m)	SHS 72X72X3.2 (@6.71 Kg/m)

NOTE :

1) SIZES ARE ABOVE ARE DETERMONED BY MAXIMUM ALLOWABLE SLENDERNESS RATIO 250 FOR EAVES BEAM AND 350 FOR TIE RUNNER.

2) ABOVE SECTION GENERALLY SATISFY OTHER DESIGN REQUIREMENT, STILL IT IS ADVISABLE TO CHECK FOR THE COMPRESSION DUE TO BRACING FORCE AS THE CASE MAY BE.

PURLIN TABLE FOR SINGLE SECTION

SPAN	SPEED 33	SPEED 39	SPEED 44	SPEED 47	SPEED 50	SPEED 55
			SLOPE 1 IN 3			
3 M	RHS 66X33X2.6	RHS 66X33X2.6	RHS 66X33X2.6	RHS 66X33X2.6	RHS 66X33X2.6	RHS 80X40X2.6
4.5 M	RHS 96X48X3.2	RSH 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2
6 M	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6
7.5 M	RHS 122X61X5.4	RHS 122X61X5.4	RHS 122X61X5.4	RHS 122X61X5.4	RHS 122X61X5.4	RHS 122X61X5.4
			SLOPE 1 IN 4			
3 M	RHS 66X33X2.6	RHS 66X33X2.6	RHS 80X40X2.6	RHS 80X40X2.6	RHS 80X40X2.6	RHS 80X40X2.6
4.5 M	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2
6 M	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6
7.5 M	RHS 145x82x4.8	RHS 145x82x4.8	RHS 145x82x4.8	RHS 145x82x4.8	RHS 145x82x4.8	RHS 145x82x4.8
			SLOPE 1 IN 10			
3 M	RHS 66X33X2.6	RHS 66X33X2.6	RHS 66X33X2.6	RHS 66X33X2.6	RHS 66X33X2.6	RHS 80X40X2.6
4.5 M	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2	RHS 96X48X3.2
6 M	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6	RHS 122X61X3.6
7.5 M	RHS 145x82x4.8	RHS 145x82x4.8	RHS 145x82x4.8	RHS 145x82x4.8	RHS 145x82x4.8	RHS 145x82x4.8

DESIGN CONSIDERATIONS

GRADE OF STEEL FOR PURLINS = YST-310
MOMENT = WL^2/10
DEFLECTION = 0.5X5XWL^4/(384XEXI)
PERMISSIBLE DEFLECTION = L/200

DELECTION CONSIDERED = ONLY DOWNWARD DEFLECTION CONSIDERED FOR DEFLECTION CRITERION(DL+LL)
PURLIN SPACING = 1500 MM
SHEETING = CGI

PURLIN TABLE FOR BUILTUP SECTION

SLOPE 1 IN 3

SPAN	SPEED 33			SPEED 39			SPEED 44		
	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE
7.5M	RHS 66X33X2.9	RHS 50x25x2.6	400	RHS 66X33X2.9	RHS 50x25x2.6	400	RHS 66X33X2.9	RHS 50x25x2.6	400
9.0M	RHS 96X48X3.2	RHS 50x25x2.6	300	RHS 96X48X3.2	RHS 50x25x2.6	300	RHS 96X48X3.2	RHS 50x25x2.6	300
10.5M	RHS 122X61X3.6	RHS 50x25x2.6	325	RHS 122X61X3.6	RHS 50x25x2.6	325	RHS 122X61X3.6	RHS 50x25x2.6	325
12M	RHS 122X61X3.6	RHS 66X33X2.6	400	RHS 122X61X3.6	RHS 66X33X2.6	400	RHS 122X61X3.6	RHS 66X33X2.6	400
SPAN	SPEED 47			SPEED 50			SPEED 55		
	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE
7.5M	RHS 66X33X2.9	RHS 50x25x2.6	400	RHS 66X33X2.9	RHS 50x25x2.6	400	RHS 66X33X2.9	RHS 50x25x2.6	400
9.0M	RHS 96X48X3.2	RHS 50x25x2.6	300	RHS 96X48X3.2	RHS 50x25x2.6	300	RHS 96X48X3.2	RHS 50x25x2.6	300
10.5M	RHS 122X61X3.6	RHS 50x25x2.6	325	RHS 122X61X3.6	RHS 50x25x2.6	325	RHS 122X61X3.6	RHS 50x25x2.6	325
12M	RHS 122X61X3.6	RHS 66X33X2.6	400	RHS 122X61X3.6	RHS 66X33X2.6	400	RHS 122X61X3.6	RHS 66X33X2.6	400

SLOPE 1 IN 4

SPAN	SPEED 33			SPEED 39			SPEED 44		
	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE
7.5M	RHS 66X33X2.9	RHS 50x25x2.6	325	RHS 66X33X2.9	RHS 50x25x2.6	325	RHS 66X33X2.9	RHS 50x25x2.6	325
9.0M	RHS 96X48X3.2	RHS 50x25x2.6	300	RHS 96X48X3.2	RHS 50x25x2.6	300	RHS 96X48X3.2	RHS 50x25x2.6	300
10.5M	RHS 122X61X3.6	RHS 50x25x2.6	325	RHS 122X61X3.6	RHS 50x25x2.6	325	RHS 122X61X3.6	RHS 50x25x2.6	325
12M	RHS 122X61X3.6	RHS 66X33X2.6	400	RHS 122X61X3.6	RHS 66X33X2.6	400	RHS 122X61X3.6	RHS 66X33X2.6	400
SPAN	SPEED 47			SPEED 50			SPEED 55		
	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE
7.5M	RHS 66X33X2.9	RHS 50x25x2.6	325	RHS 66X33X2.9	RHS 50x25x2.6	325	RHS 66X33X2.9	RHS 50x25x2.6	325
9.0M	RHS 96X48X3.2	RHS 50x25x2.6	300	RHS 96X48X3.2	RHS 50x25x2.6	300	RHS 96X48X3.2	RHS 50x25x2.6	300
10.5M	RHS 122X61X3.6	RHS 50x25x2.6	325	RHS 122X61X3.6	RHS 50x25x2.6	325	RHS 122X61X3.6	RHS 50x25x2.6	325
12M	RHS 122X61X3.6	RHS 66X33X2.6	400	RHS 122X61X3.6	RHS 66X33X2.6	400	RHS 122X61X3.6	RHS 66X33X2.6	400

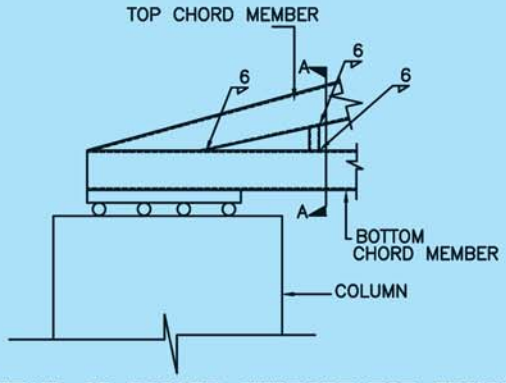
SLOPE 1 IN 10

SPAN	SPEED 33			SPEED 39			SPEED 44		
	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE
7.5M	RHS 66X33X2.6	RHS 50x25x2.6	300	RHS 66X33X2.6	RHS 50x25x2.6	300	RHS 66X33X2.6	RHS 50x25x2.6	300
9.0M	RHS 66X33X2.6	RHS 50x25x2.6	300	RHS 66X33X2.6	RHS 50x25x2.6	300	RHS 66X33X2.6	RHS 50x25x2.6	300
10.5M	RHS 96X48X3.2	RHS 50x25x2.6	325	RHS 96X48X3.2	RHS 50x25x2.6	325	RHS 96X48X3.2	RHS 50x25x2.6	325
12M	RHS 96X48X4	RHS 50x25x2.6	450	RHS 96X48X4	RHS 50x25x2.6	450	RHS 96X48X4	RHS 50x25x2.6	450
SPAN	SPEED 47			SPEED 50			SPEED 55		
	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE	TOP MEMBER	BOT MEMBER	C/C DISTANCE
7.5M	RHS 66X33X2.6	RHS 50x25x2.6	300	RHS 66X33X2.6	RHS 50x25x2.6	300	RHS 66X33X2.6	RHS 50x25x2.6	300
9.0M	RHS 66X33X2.6	RHS 50x25x2.6	300	RHS 66X33X2.6	RHS 50x25x2.6	300	RHS 66X33X2.6	RHS 50x25x2.6	300
10.5M	RHS 96X48X3.2	RHS 50x25x2.6	325	RHS 96X48X3.2	RHS 50x25x2.6	325	RHS 96X48X3.2	RHS 50x25x2.6	325
12M	RHS 96X48X4	RHS 50x25x2.6	450	RHS 96X48X4	RHS 50x25x2.6	450	RHS 96X48X4	RHS 50x25x2.6	450

DESIGN CONSIDERATIONS

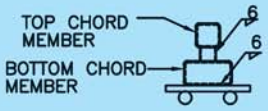
GRADE OF STEEL FOR PURLINS = YST-310
MOMENT = WL^2/10
DEFLECTION = 0.5X5XWL^4/(384XEXI)
PERMISSIBLE DEFLECTION = L/200
PURLIN SPACING = 1500 MM
SHEETING = CGI

Typical Details of Truss Support

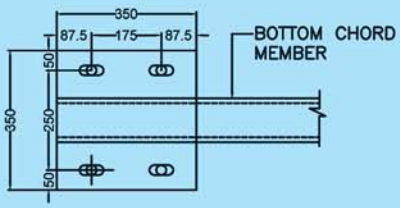


DETAIL OF ROLLER SUPPORT FOR TRUSS

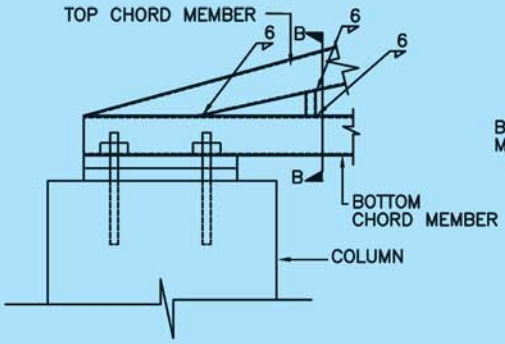
(FOR IDEALIZED ROLLER CONDITION THIS DETAIL CAN BE FOLLOWED)



SECTION A–A

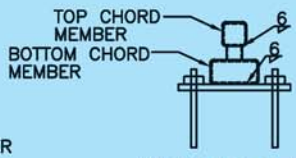


DETAIL OF BASE PLATE

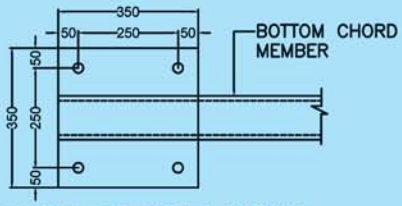


DETAIL OF PINNED SUPPORT FOR TRUSS

(FOR IDEALIZED PINNED CONDITION THIS DETAIL CAN BE FOLLOWED)



SECTION B–B



DETAIL OF BASE PLATE

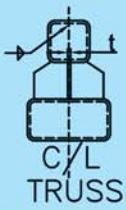
SLOTTED HOLES AT ONE END OF TRUSS AND CIRCULAR HOLES AT OTHER ENDS.

TRUSS SPAN (m)	BOLT DIA. GRADE B CLASS 4.6	HOLE DIA. (D)	SIZE OF BASE PLATE		
			B	L	T
UPTO 9.0m	20	23	200	200	10
9.0m TO 12.0m	20	23	220	220	10
15.0m TO 18.0m	20	23	250	250	12
20.0m TO 24.0m	20	23	300	300	12
28.0m TO 40.0m	25	28	350	350	16

Notes :

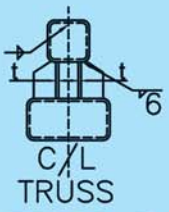
1) All base plate sizes and bolt dia shall be designed for actual forces
2) All bolts are of grade (B) class 4.6.
3) Open ends of all members shall be sealed.

Alternate Detail of Pinned support for Truss



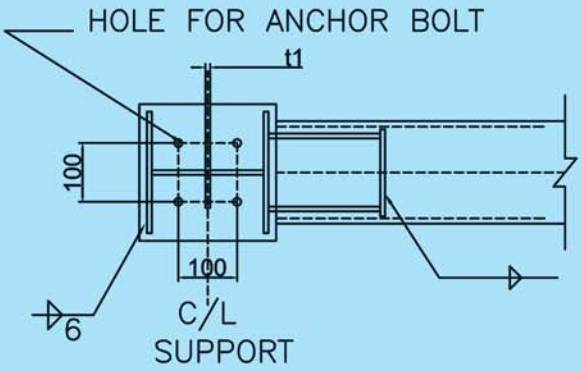
SECTION A–A

(TRUSS SPAN UPTO 12M)

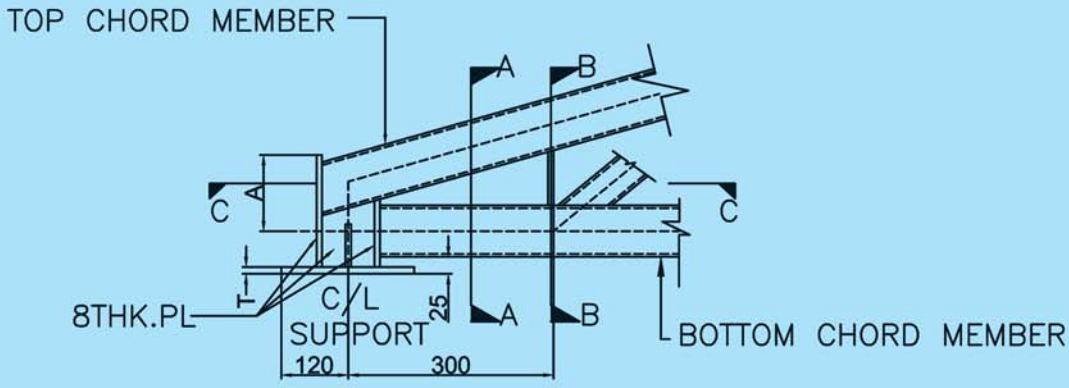


SECTION B–B

(TRUSS SPAN FROM 12 TO 40M)

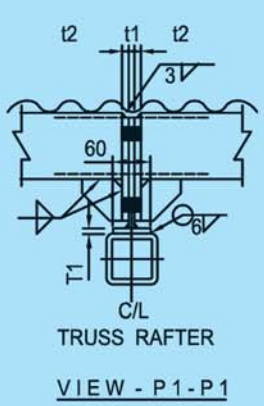


SECTION C–C

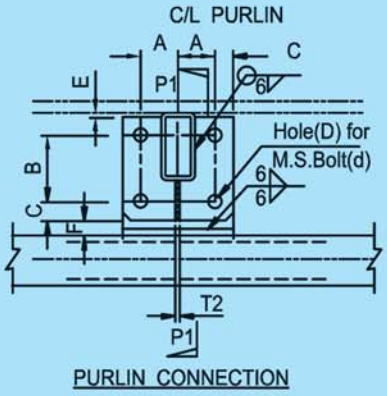


TRUSS SPAN (m)	BOLT DIA. GRADE B CLASS 4.6	HOLE DIA. (D)	DIMENSIONS			
			A	t	t1	T
UPTO 9.0m	20	23	75	6	-	8
9.0m TO 12.0m	20	23	75	8	6	8
15.0m TO 18.0m	20	23	75	6	6	10
20.0m TO 24.0m	20	23	100	8	6	12
28.0m TO 40.0m	25	28	150	8	8	16

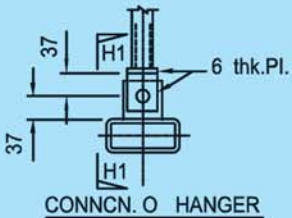
Typical Details of Purlin, Purlin-prop, Tie-Runner and Hanger



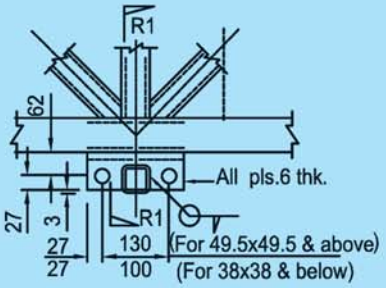
VIEW - P1-P1



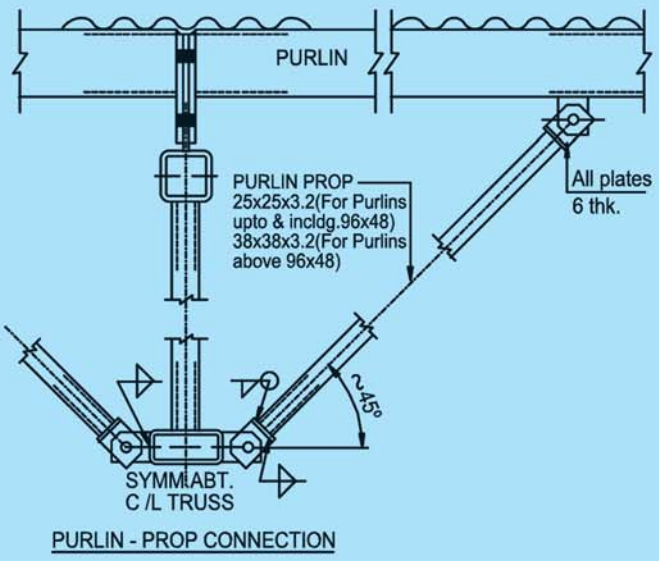
PURLIN CONNECTION



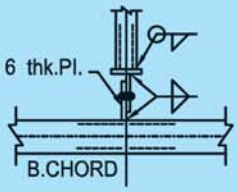
CONNCN. O HANGER
WITH B. CHORD



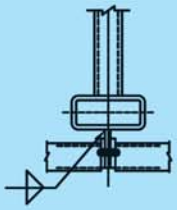
TIE-RUNNER CONNECTION
WITH BOTTOM CHORD



PURLIN - PROP CONNECTION



VIEW - H1-H1



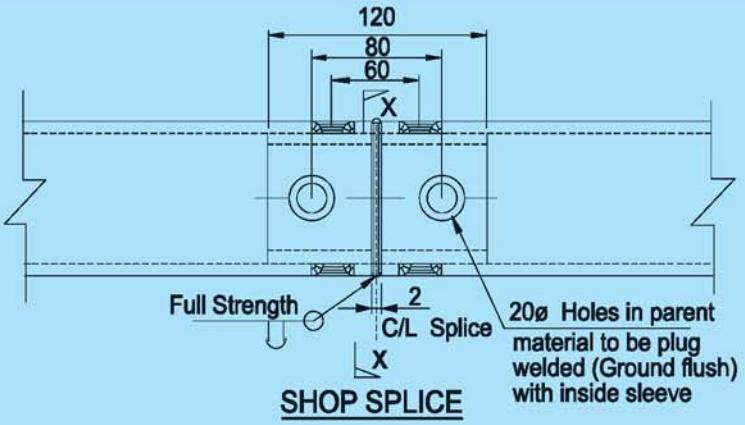
VIEW - R1-R1

Purlin Size	Plate thickness				Dimension					Bolt Dia(d) Grade(B) Class 4.6	Hole Dia(D)
	T1	T2	t1	t2	A	B	C	E	F	d	D
RHS 66x33x2.9/3.6	-	-	8	8	50	60	27	3	15	16	18
RHS 96x48x3.2/4.0	-	-	8	10	60	80	33	3	15	20	22
RHS 122x61x3.6/4.5/5.4	-	6	8	10	67	150	33	4	15	20	22
RHS 145x82x4.8/5.4	10	8	10	12	82	160	40	5	25	25	27
RHS 172x92x4.8/5.4	12	8	10	12	87	220	40	5	27	25	27

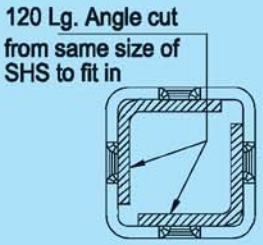
Notes :

1) The details are based on the worst design loading for the group and may be improved upon based on actual loading.
2) Side Runner connection shall be similar Unless Otherwise required.
3) Unless Otherwise Noted:
   a) All dimensions are in Millimetre.
   b) All welds are 4 thk. fillet.
   c) All bolts are of grade (B) class 4.6.
4) Open ends of all members shall be sealed.

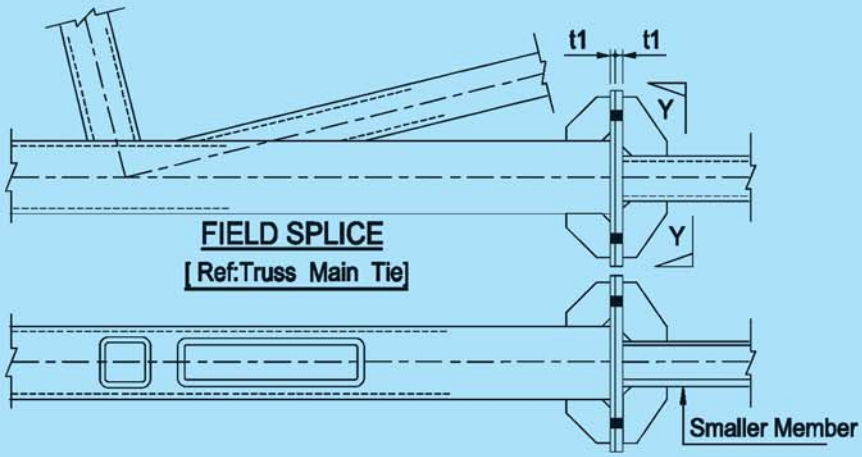
Typical Details of Shop & Field Splices



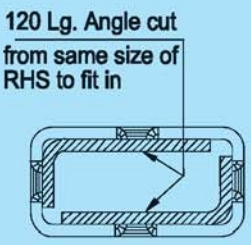
SHOP SPLICE



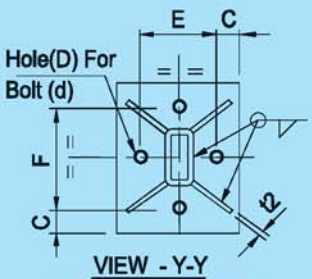
VIEW - X-X (For SHS)



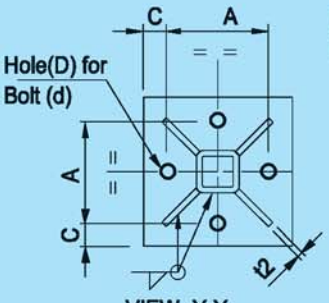
FIELD SPLICE [Ref:Truss Main Tie]



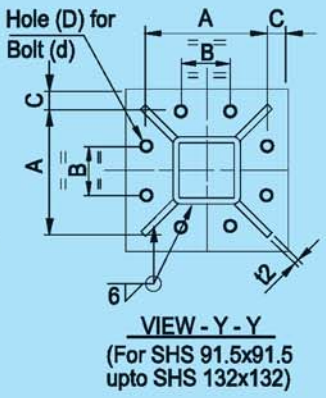
VIEW - X-X (For RHS)



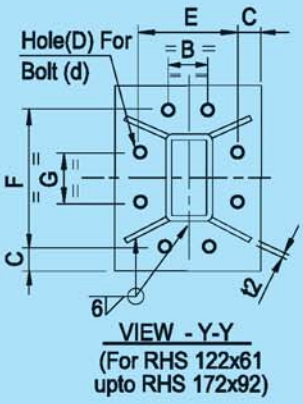
VIEW - Y-Y (For RHS upto 96x48)



VIEW -Y-Y (For SHS upto 72x72)



VIEW - Y - Y (For SHS 91.5x91.5 upto SHS 132x132)



VIEW - Y-Y (For RHS 122x61 upto RHS 172x92)

Size of Smaller Member	Plate Thickness		Bolt Grade (B) Class 4.6			Dimension (To be checked against other side member)					
	t1	t2	Dia(D)	Hole Dia(D)	Nos.	A	B	C	E	F	G
SHS 38x38x4/RHS 50x25x3.2	8	6	16	18	4	100	-	27	90	110	-
SHS 49.5x49.5x4.5/RHS 66x33x4.5	8	6	20	22	4	120	-	33	110	140	-
SHS 72x72x4.8/RHS 96x48x4.8	10	6	25	27	4	150	-	40	130	180	-
SHS 91.5x91.5x4.5/RHS 122x61x4.5	16	8	20	22	8	170	55	33	140	200	70
SHS 91.5x91.5x5.4 upto 132x132x5.4/ RHS 122x61x5.4 upto 172x92x5.4	20	8	25	27	8	220	70	40	180	260	90

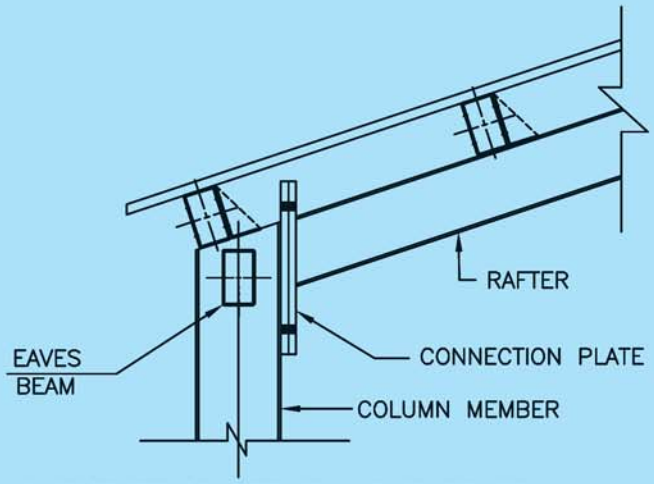
Notes :

1) The details are based on the worst design loading for the group and may be improved upon based on actual loading.

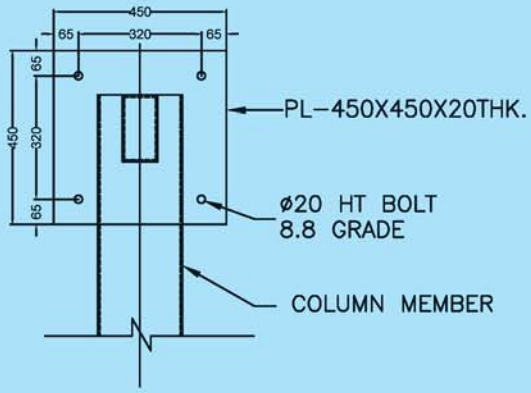
2) Unless Otherwise Noted:
   a) All dimensions are in Millimetre.
   b) All welds are 4 thk. fillet

3) Open ends of all members shall be sealed.

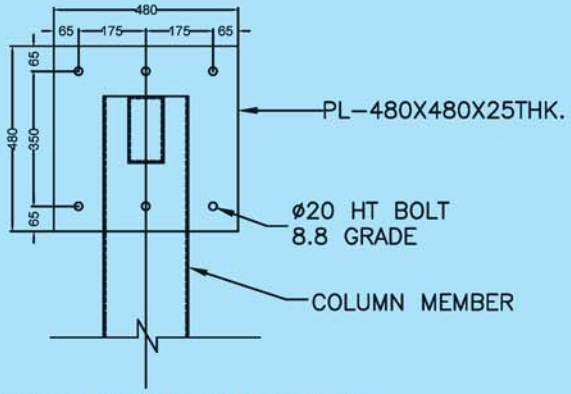
Typical Details of Portal Frame



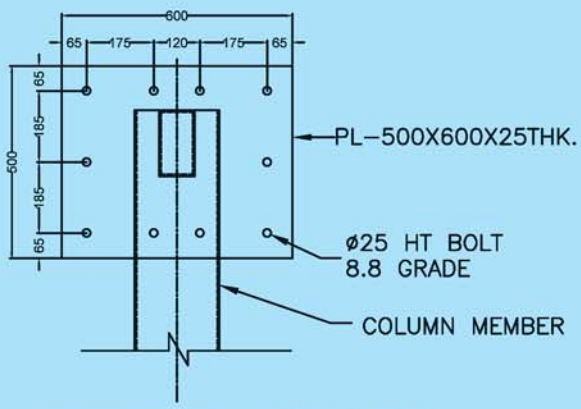
CONNECTION DETAIL AT HAUNCH FOR PORTAL



CONNECTION PLATE FOR 5M SPAN PORTAL

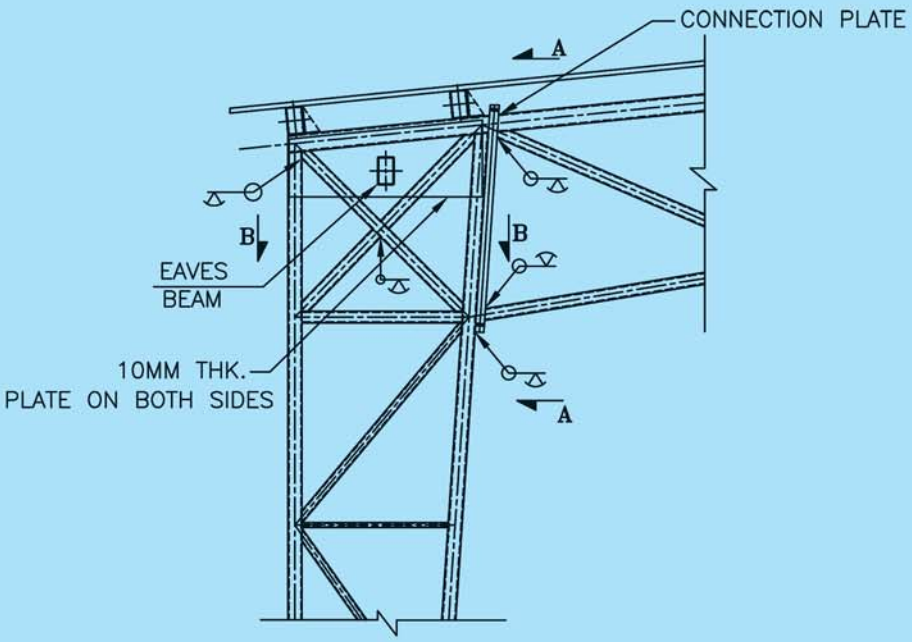


CONNECTION PLATE FOR 7.5M SPAN PORTAL

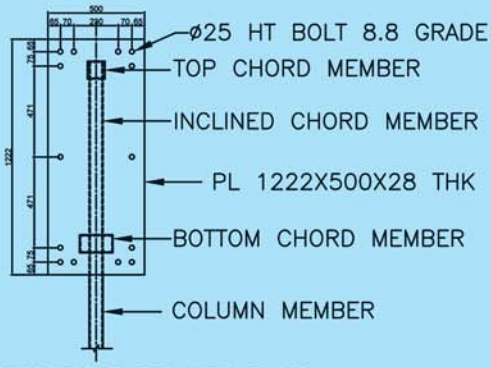


CONNECTION PLATE FOR 10M SPAN PORTAL

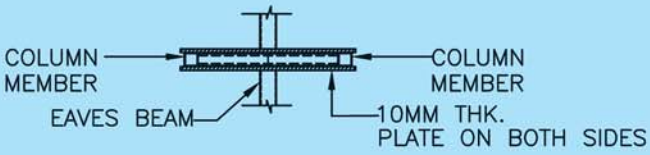
Typical Details of Portal Frame



CONNECTION DETAIL AT HAUNCH
FOR LATTICE PORTAL SPAN 15 TO 20M

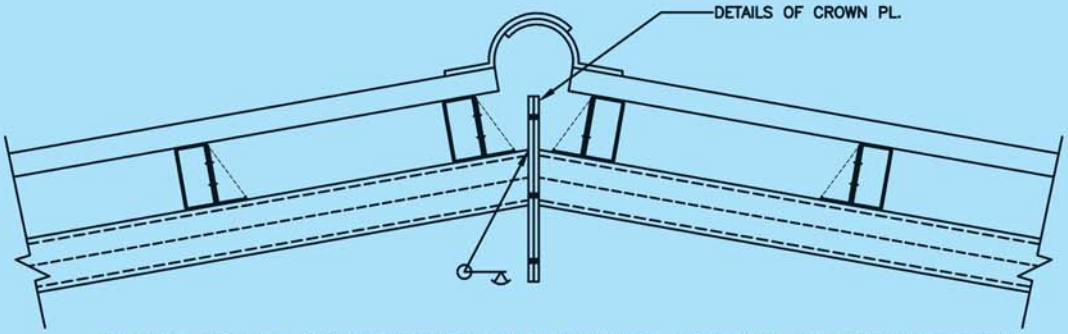


CONNECTION PLATE FOR
15 TO 20M SPAN PORTAL

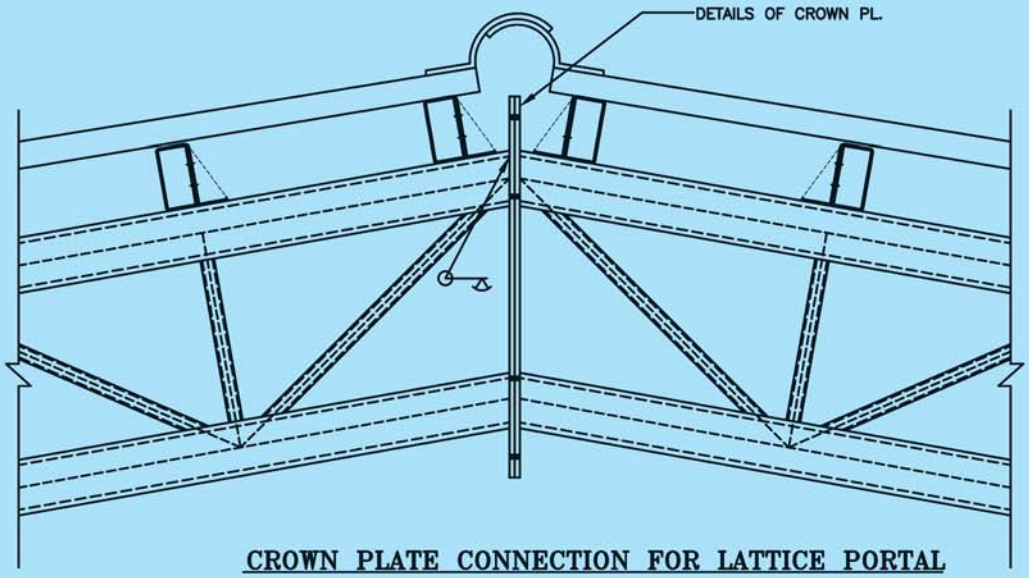


SECTION B–B

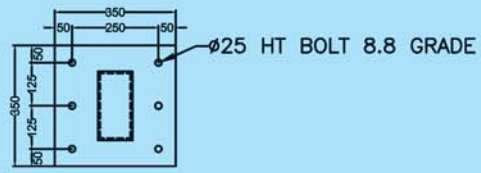
Typical Details of Portal Frame



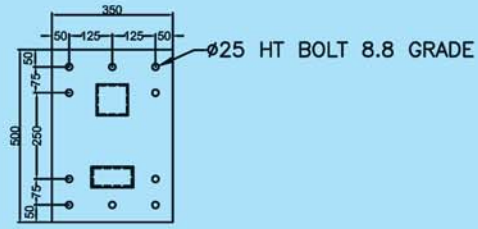
CROWN PLATE CONNECTION FOR SINGLE PORTAL FRAME MEMBER



CROWN PLATE CONNECTION FOR LATTICE PORTAL

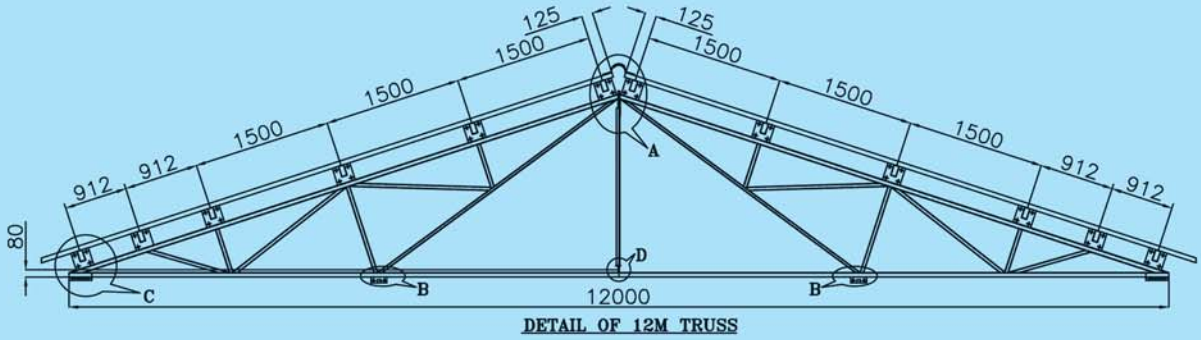


DETAILS OF CROWN PL.
UP TO 10M SPAN

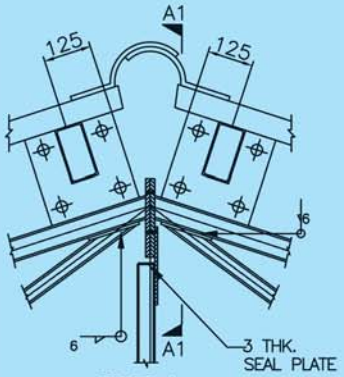


DETAILS OF CROWN PL.
FROM 15 TO 20M SPAN

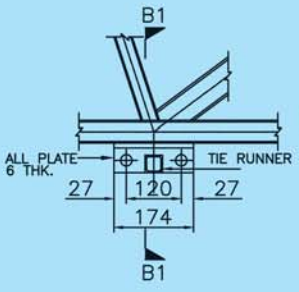
Typical Details of 12m Span Truss



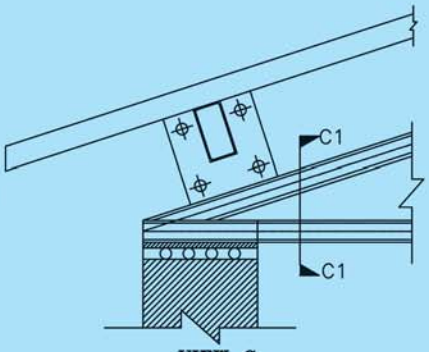
DETAIL OF 12M TRUSS



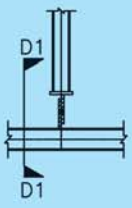
VIEW A
(SCALE:-1:10)



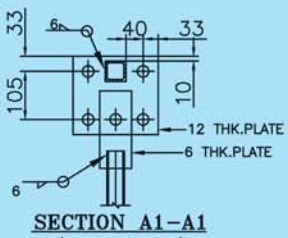
VIEW B
(SCALE:-1:10)



VIEW C
(SCALE:-1:10)

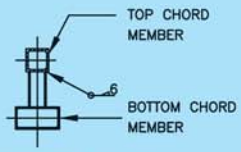


VIEW D
(SCALE:-1:10)

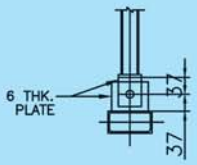


SECTION A1-A1
(SCALE:-1:10)

SECTION B1-B1
(SCALE:-1:10)

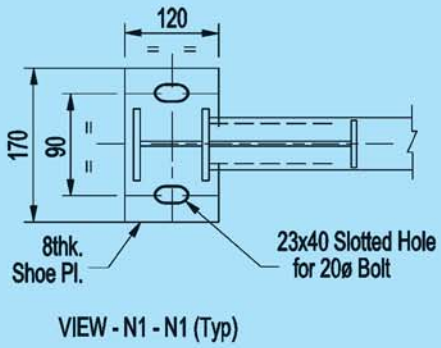


SECTION C1-C1
(SCALE:-1:10)

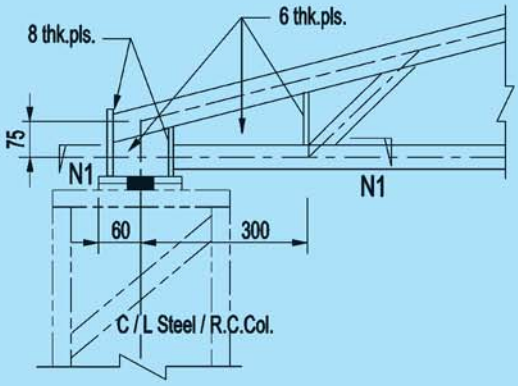


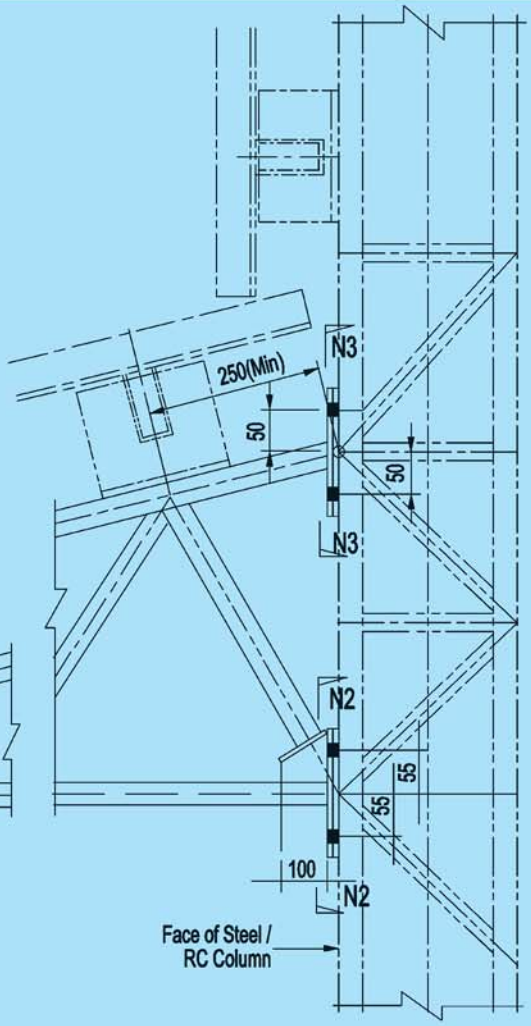
SECTION D1-D1
(SCALE:-1:10)

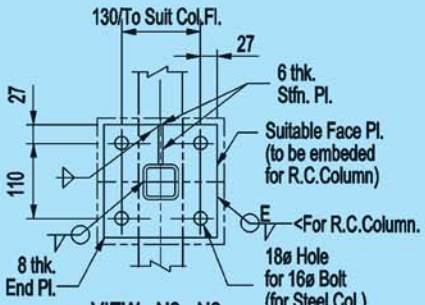
Typical Details of Lean to Truss



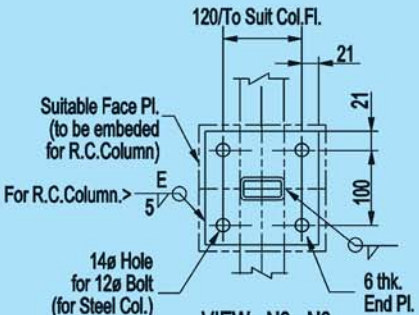
VIEW - N1 - N1 (Typ)







VIEW - N2 - N2
(AS DRAWN & NOTED)



VIEW - N3 - N3
(AS DRAWN & NOTED)

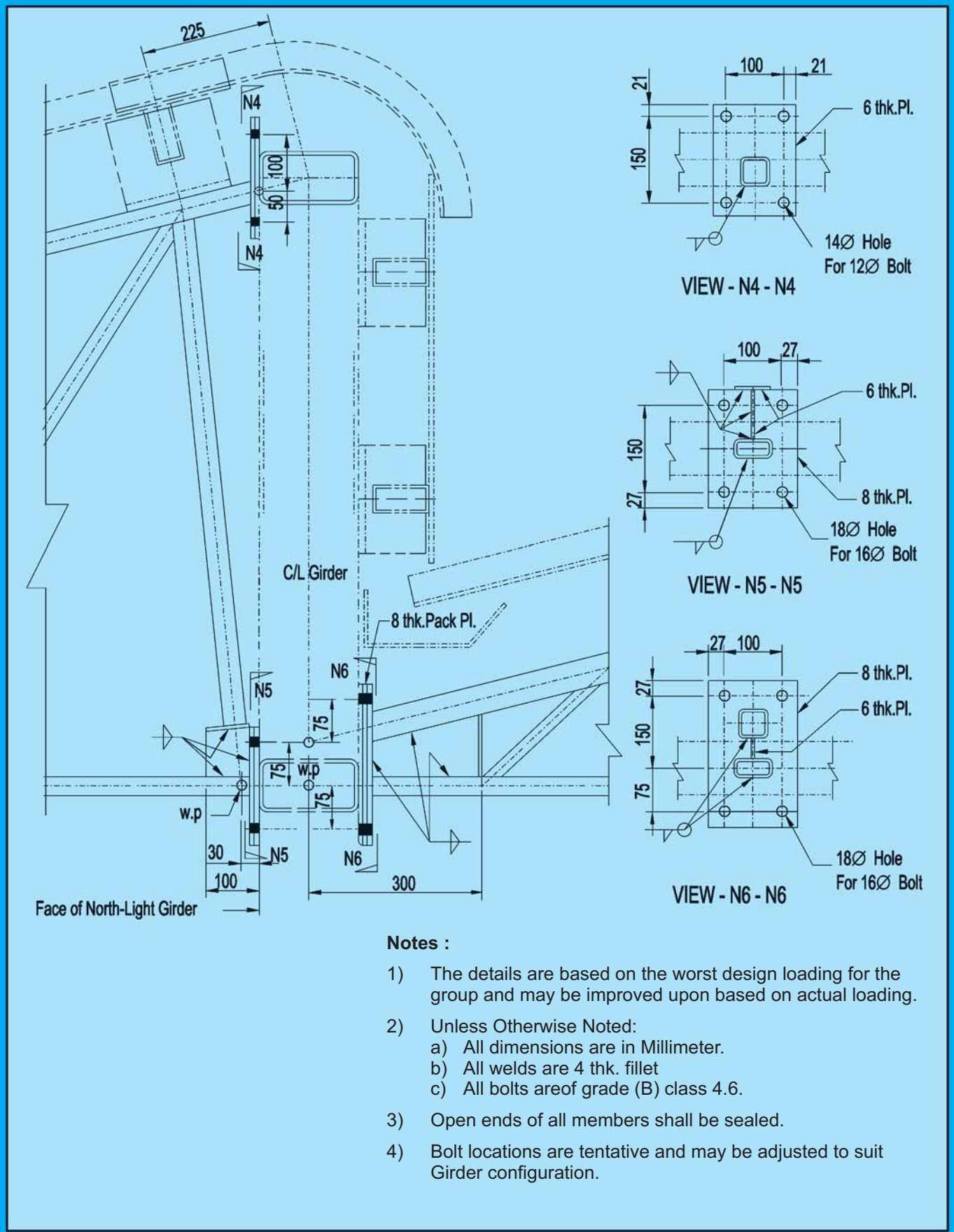
Notes :

1) The details are based on the worst design loading for the group and may be improved upon based on actual loading.

2) Unless Otherwise Noted:
   a) All dimensions are in Millimeter.
   b) All welds are 4 thk. fillet
   c) All bolts areof grade (B) class 4.6.

3) Open ends of all members shall be sealed.

Typical Details of North Light Truss



Notes :

1) The details are based on the worst design loading for the group and may be improved upon based on actual loading.

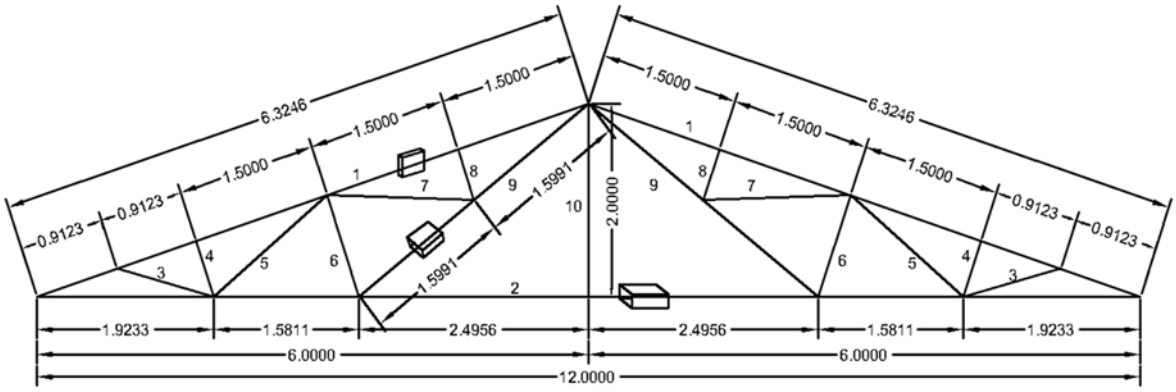
2) Unless Otherwise Noted:
   a) All dimensions are in Millimeter.
   b) All welds are 4 thk. fillet
   c) All bolts areof grade (B) class 4.6.

3) Open ends of all members shall be sealed.

4) Bolt locations are tentative and may be adjusted to suit Girder configuration.

Trusses

DESIGN OF TRUSS FOR 12 METER SPAN AS PER IS 800-1984



SUPPORT CONDITION: ONE PINNED OTHER ROLLER
T: TIE RUNNER

SPAN OF TRUSS	=	12 M
BAY SPACING	=	6.0 M
WIND SPEED	=	33MPERS
SLOPE OF ROOF	=	1 IN 3
THETA	=	18.44 DEGREE
MATERIAL FOR CONSTRUCTION	=	SHS/RHS OF TATA STRUCTURA YST-310

DEAD LOAD *(REF. IS: 875 PART 1) 1987*

S/W OF SHEETING	=	60 N/SQMT		
S/W OF PURLIN	=	58.86 N/MT		
*NODAL LOAD	=	60X1.5X6.0+100X6.0	=	1140N
*NODAL LOAD	=	60 X (1.5+0.9123) / 2 X6.0+100X6.0		
	=	1035 N		
*NODAL LOAD	=	60 X 0.9123 X 6.0+100X6.0	=	682 N
*NODAL LOAD	=	60 X 0.9123/2 X 6.0+100X6.0	=	518 N

LIVE LOAD *(REF. IS: 875 PART 2) 1987*

LIVE LOAD	=	750 N/SQMT		
AS THE ROOF SLOPE IS GREATER THAN 10^0				
LIVE LOAD	=	750-(20X8.44)		
	=	581.2 N/SQMT		
581.2X2/3	=	388 N/SQMT *(WHILE DESIGN OF TRUSS L.L. CAN BE TAKEN AS 2/3 (CL. 4.5.1 IS: 875 PART I)*		
MINIMUM LL	=	400 N/SQMT *(TABLE 2, IS: 875 PART II)*		
*NODAL LOAD	=	400X1.5X6.0	=	3600 N
*NODAL LOAD	=	400 X (1.5+0.9123) / 2 X 6.0	=	2895 N
*NODAL LOAD	=	400 X 0.9123 X6.0	=	2190 N
*NODAL LOAD	=	400 X 0.9123 / 2 X6.0	=	1095 N

WIND LOAD *(REF. IS 875: PART 3 1987)*

BASIC WIND FORCE CALCULATION

BASIC WIND SPEED (V_b)		=	33 M/S
DESIGN WIND SPEED (V_z)		=	K_1 X K_2 X K_3 X V_b
DESIGNED WIND PRESSURE (Pz)		=	0.6 X $(V_z)^2$
K_1 *(PROBABILTY FACTOR)*	*ASSUMED AS*	=	1.0
K_2 *(TERRAIN HEIGHT FACTOR)*	*ASSUMED AS*	=	1.0
K_3 *(TOPOGRAPHY FACTOR)*	*ASSUMED AS*	=	1.0
DESIGNED WIND SPEED (Vz)		=	1 X 1 X 1 X 33 = 33 M/S
DESIGNED WIND PRESSURE (Pz)		=	0.6 X 33^2
		=	**653.4 N/SQM**

A) WIND 0+ PRESSURES

EXTERNAL PRESSURE COEFFICIENT (CPe) (REF .IS 875: PART 3 1987 TABLE. No – 5)

BUILDING HEIGHT RATIO	=	½ < h/w <3/2
ON WINDWARD SIDE	=	0.77
ON LEEWARD SIDE	=	-0.52

INTERNAL PRESSURE COEFFICIENT (CPi) *(REF .IS 875: PART 3 1987)*

(ASSUMING NORMAL PERMEABILITY)

CPi	=	±0.2
TOTAL PRESSURE COEFFICIENT	=	CPe + CPi

NODAL LOAD ON WINDWARD SIDE

*NODAL LOAD	=	0.97X653.4X6.0X1.5
	=	5705 N FX=1805 N FY=5413 N
*NODAL LOAD	=	0.97X 653.4X 6.0X (1.5+0.9123)/2
	=	4587 N FX=1451 FY=4352 N
*NODAL LOAD	=	0.97X653.4X6.0X0.9123
	=	3470 N FX=1098 N FY=3292 N
*NODAL LOAD	=	0.97X653.4X6.0X0.9123/2
	=	1735 N FX=549 N FY=1646 N

NODAL LOAD ON LEEWARD SIDE

*NODAL LOAD	=	0.72X653.4X6.0X1.5
	=	4236 N FX=1340 N FY=4019 N
*NODAL LOAD	=	0.72X 653.4X 6.0X (1.5+0.9123)/2
	=	3405 N FX=1078 N FY=2331 N
*NODAL LOAD	=	0.72X653.4X6.0X0.9123
	=	2576 N FX=815 N FY=2444 N
*NODAL LOAD	=	0.72X653.4X6.0X0.9123/2
	=	1288 N FX=408 N FY=1222 N

B) WIND 90+ PRESSURE

CPe ON WINDWARD SIDE	=	-0.8
CPe ON LEEWARD SIDE	=	-0.8
CPi	=	±0.2
TOTAL PRESSURE COEFFICIENT	=	CPe + CPi

NODAL LOAD ON WIND WARD/ LEEWARD SIDE

*NODAL LOAD	=	1X653.4X6.0X1.5
	=	5881 N FX=1861 N FY=5580 N
*NODAL LOAD	=	1X653.4X 6.0X (1.5+0.9123)/2
	=	4729 N FX=1496 N FY=4487 N
*NODAL LOAD	=	1X653.4X6.0X0.9123
	=	3577 N FX=1132 N FY=3394 N
*NODAL LOAD	=	1X653.4X6.0X0.9123/2
	=	1789 N FX=566 N FY=1697 N

LOAD COMBINATIONS

FOLLOWING LOAD COMBINATIONS ARE CONSIDERED FOR DESIGN OF TRUSSES

1) DL + LL

2) (DL + WL) X 0.75

AS PER IS 800: 1984 CLAUSE 3.9.2 FOR DESIGN OF TRUSS MEMBER, THE SRESSES ARE INCREASED BY 33% WHEN WIND IS CONSIDERED.

SUPPORT CONDITION

WHILE DESIGN OF TRUSS, ONE SUPOORT ASSUMED AS A PINNED AND OTHER ROLLER, SAME SHALL BE ENSURED AT THE SITE.

STAAD OUTPUT FILE

STAAD.Pro
Version 2007 Build 04
Proprietary Program of Research Engineers, Intl.
Date = AUG 5, 2011
Time = 17:30:57

USER ID: acdc

1. STAAD TRUSS
   INPUT FILE: 12M SPAN BAY 6 SLOPE 1 IN 3 33.STD
2. START JOB INFORMATION
3. ENGINEER DATE 23-JAN-11
4. END JOB INFORMATION
5. INPUT WIDTH 79
6. UNIT METER NEWTON
7. JOINT COORDINATES
8. 1 0 0 0; 2 6 0 0; 3 6 2 0; 4 4.57697 1.52566 0; 5 3.15395 1.05132 0
9. 6 1.73093 0.576975 0; 9 3.5044 0 0; 10 1.92325 0 0; 11 4.7522 1 0; 12 12 0 0
10. 13 7.42303 1.52566 0; 14 8.84605 1.05132 0; 15 10.2691 0.576975 0
11. 18 8.4956 0 0; 19 10.0767 0 0; 20 7.2478 1 0; 21 0.865465 0.288487 0
12. 22 11.1346 0.288487 0
13. MEMBER INCIDENCES
14. 1 1 10; 2 3 2; 3 3 4; 4 4 5; 5 5 6; 6 6 21; 9 9 2; 10 10 9; 12 6 10; 13 5 9
15. 14 9 11; 15 11 3; 16 4 11; 18 10 5; 19 5 11; 20 12 19; 21 3 13; 22 13 14
16. 23 14 15; 24 15 22; 27 18 2; 28 19 18; 30 15 19; 31 14 18; 32 18 20; 33 20 3
17. 34 13 20; 36 19 14; 37 14 20; 38 21 1; 39 10 21; 40 22 12; 41 19 22
18. DEFINE MATERIAL START
19. ISOTROPIC STEEL
20. E 2.05E+011
21. POISSON 0.3
22. DENSITY 77008.5
23. ALPHA 1.2E-005
24. DAMP 0.03
25. END DEFINE MATERIAL
26. MEMBER PROPERTY INDIAN
27. 2 12 13 16 18 19 30 31 34 36 37 39 41 TABLE ST TUB25252.6
28. 1 9 10 20 27 28 TABLE ST TUB66333.6
29. 14 15 32 33 TABLE ST TUB66332.6
30. 3 TO 6 21 TO 24 38 40 TABLE ST TUB50503.6
31. CONSTANTS
32. BETA 90 MEMB 1 9 10 14 15 20 27 28 32 33
33. MATERIAL STEEL ALL
34. SUPPORTS
35. 1 PINNED
36. 12 FIXED BUT FX FZ MX MY MZ
37. LOAD 1 LOADTYPE DEAD TITLE DL
38. SELFWEIGHT Y -1.05
39. * S/W OF SHEETING 60 N/SQMT
40. * S/W OF PURLIN=58.86 N/MT
41. *NODAL LOAD=60X1.5X4.5+100X4.5=855 N
42. JOINT LOAD
43. 3 TO 5 13 14 FY -855
44. *NODAL LOAD=60X(1.5+0.91)/2X4.5+100X4.5=776 N
45. 6 15 FY -776
46. *NODAL LOAD=60X0.91X4.5+100X4.5=696 N
47. 21 22 FY -696
48. *NODAL LOAD=60X0.91/2X4.5+100X4.5=573 N
49. 1 12 FY -573

```
LOAD 2 LOADTYPE LIVE TITLE LL
*750-20X8.44=581.2N/SQMT
*581.2X2/3=388
*LL=400 N/SQMT
JOINT LOAD
*NODAL LOAD =400X1.5X4.5=2700 N
3 TO 5 13 14 FY -2700
*NODAL LOAD =400X(1.5+0.91)/2X4.5=2169 N
6 15 FY -2169
*NODAL LOAD =400X0.91X4.5=1638 N
21 22 FY -1638
*NODAL LOAD =400X0.91/2X4.5=819 N
1 12 FY -819
LOAD 3 LOADTYPE WIND TITLE WIND0+PRE
*WIND SPEED 33M/S
*WIND PRE=.6X33^2=653.4 N/SQMT
*CPE ON WND WARD SIDE =0.77
*CPE ON LEWARD SIDE = -0.52
*CPE PRESSURE=-0.2
JOINT LOAD
*NODAL LOAD ON WIND WARD =0.97X653.4X4.5X1.5=4279 N FX=1354 N FY=4059 N
4 5 FX -1354 FY 4059
*NODAL LOAD ON WIND WARD =0.97X653.4X4.5X(1.5+0.91)/2=3437 N FX=1087 N FY=3261
6 FX -1087 FY 3261
*NODAL LOAD ON WIND WARD =0.97X653.4X4.5X0.91=2596 N FX=821 N FY=2463 N
21 FX -821 FY 2463
*NODAL LOAD ON WIND WARD =0.97X653.4X4.5X0.91/2=1298 N FX=410 N FY=1231 N
1 FX -410 FY 1231
*NODAL LOAD ON LEE WARD SIDE =.72X653.4X4.5X1.5=3176 N FX=1004 N FY=3013 N
13 14 FX 1004 FY 3013
*NODAL LOAD ON LEE WARD SIDE =.72X653.4X4.5X(1.5+0.91)/2=2552 N FX=807 N FY=242
15 FX 807 FY 2422
*NODAL LOAD ON LEE WARD SIDE =.72X653.4X4.5X0.91=1927 N FX=609 N FY=1829 N
22 FX 609 FY 1829
*NODAL LOAD ON LEE WARD SIDE =.72X653.4X4.5X0.91/2=964 N FX=305 N FY=915 N
12 FX 305 FY 915
3 FX -175 FY 3536
LOAD 4 LOADTYPE WIND TITLE WIND90+PRE
*CPE ON WND WARD SIDE =0.8
*CPE ON LEWARD SIDE = -0.8
JOINT LOAD
*NODAL LOAD ON WIND WARD LEEWARD SIDE =1X653.4X4.5X1.5=4410 N FX=1395 N FY=418
4 5 FX -1395 FY 4184
13 14 FX 1395 FY 4184
*NODAL LOAD ON WIND WARD LEEWARD SIDE =1X653.4X4.5X(1.5+0.91)/2=3544 N FX=1120
6 FX -1120 FY 3363
15 FX 1120 FY 3363
*NODAL LOAD ON WIND WARD LEEWARD SIDE =1X653.4X4.5X0.91=2676 N FX=846 N FY=253
21 FX -846 FY 2539
22 FX 846 FY 2539
*NODAL LOAD ON WIND WARD LEEWARD SIDE =1X653.4X4.5X0.91/2=1338 N FX=423 N FY=1
1 FX -423 FY 1270
12 FX 423 FY 1270
3 FY 4184
LOAD 21
REPEAT LOAD
1 1.333
LOAD 22
REPEAT LOAD
2 1.333
```

110. LOAD 23
111. REPEAT LOAD
112. 3 1.333
113. LOAD 24
114. REPEAT LOAD
115. 4 1.333
116. LOAD COMB 5 COMBINATION LOAD CASE 5
117. 21 1.0 22 1.0
118. LOAD COMB 6 COMBINATION LOAD CASE 6
119. 21 0.75 23 0.75
120. LOAD COMB 7 COMBINATION LOAD CASE 7
121. 21 0.75 24 0.75
122. PERFORM ANALYSIS

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 18/ 33/ 2

SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

ORIGINAL/FINAL BAND-WIDTH	=	16/ 4/ 10 DOF
TOTAL PRIMARY LOAD CASES	=	8, TOTAL DEGREES OF FREEDOM = 33
SIZE OF STIFFNESS MATRIX	=	1 DOUBLE KILO-WORDS
REQRD/AVAIL. DISK SPACE	=	12.1/ 111196.4 MB

123. LOAD LIST 21 TO 24
124. PRINT SUPPORT REACTION

SUPPORT REACTIONS - UNIT NEWT METE STRUCTURE TYPE = TRUSS

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	21	0.00	6749.98	0.00	0.00	0.00	0.00
	22	0.00	15164.19	0.00	0.00	0.00	0.00
	23	1962.18	-21164.67	0.00	0.00	0.00	0.00
	24	0.00	-23503.43	0.00	0.00	0.00	0.00
12	21	0.00	6749.99	0.00	0.00	0.00	0.00
	22	0.00	15164.23	0.00	0.00	0.00	0.00
	23	0.00	-18560.06	0.00	0.00	0.00	0.00
	24	0.00	-23503.49	0.00	0.00	0.00	0.00

********** **END OF LATEST ANALYSIS RESULT** **********

125. LOAD LIST 5 TO 7
126. UNIT MMS NEWTON
127. PARAMETER 1
128. CODE INDIAN
129. KY 0.85 ALL
130. KZ 0.85 ALL
131. FYLD 310 ALL
132. LZ 3200 MEMB 14 15 32 33
133. LZ 3500 MEMB 1 10 20 28
134. LZ 2500 MEMB 9 27
135. CHECK CODE ALL

STAAD.Pro CODE CHECKING - (IS-800)

ALL UNITS ARE - NEWT MMS (UNLESS OTHERWISE NOTED)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
1 ST	TUB66333.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.970	7
		35398.23 C	0.00	0.00	0.00
2 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	TENSION	0.005	5
		214.96 T	0.00	0.00	0.00
3 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.631	5
		52170.41 C	0.00	0.00	1500.00
4 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.649	5
		53703.45 C	0.00	0.00	1499.99
5 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.681	5
		56332.17 C	0.00	0.00	1500.00
6 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.542	5
		57595.48 C	0.00	0.00	912.28
9 ST	TUB66333.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.652	7
		16506.84 C	0.00	0.00	0.00
10 ST	TUB66333.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.743	7
		27118.47 C	0.00	0.00	0.00
12 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.121	5
		3815.95 C	0.00	0.00	608.18
13 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.570	5
		10006.71 C	0.00	0.00	1108.19
14 ST	TUB66332.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.327	7
		10702.59 C	0.00	0.00	0.00
15 ST	TUB66332.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.479	7
		15661.02 C	0.00	0.00	0.00
16 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.139	5
		4604.89 C	0.00	0.00	554.10
18 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.544	7
		5269.10 C	0.00	0.00	0.00
19 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.504	7
		4984.80 C	0.00	0.00	0.00
20 ST	TUB66333.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.970	7
		35395.62 C	0.00	0.00	0.00

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
21 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.631	5
		52170.30 C	0.00	0.00	1500.00
22 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.649	5
		53703.34 C	0.00	0.00	1499.99
23 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.681	5
		56330.50 C	0.00	0.00	1500.03
24 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.542	5
		57594.29 C	0.00	0.00	912.31
27 ST	TUB66333.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.652	7
		16506.84 C	0.00	0.00	0.00
28 ST	TUB66333.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.743	7
		27118.38 C	0.00	0.00	0.00
30 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.121	5
		3816.29 C	0.00	0.00	608.21
31 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.570	5
		10006.62 C	0.00	0.00	1108.19
32 ST	TUB66332.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.327	7
		10702.50 C	0.00	0.00	0.00
33 ST	TUB66332.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.479	7
		15660.94 C	0.00	0.00	0.00
34 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.139	5
		4604.90 C	0.00	0.00	554.10
36 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.544	7
		5268.08 C	0.00	0.00	0.00
37 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.504	7
		4984.80 C	0.00	0.00	0.00
38 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.595	5
		63137.25 C	0.00	0.00	912.28
39 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.306	5
		5452.78 C	0.00	0.00	0.00
40 ST	TUB50503.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.595	5
		63133.16 C	0.00	0.00	912.22
41 ST	TUB25252.6	(INDIAN SECTIONS)			
		PASS	COMPRESSION	0.306	5
		5449.18 C	0.00	0.00	0.00

********** END OF TABULATED RESULT OF DESIGN **********

136. *SELECT OPTIMIZED
137. PARAMETER 2
138. CODE INDIAN
139. UNIT METER KG
140. STEEL TAKE OFF ALL

STEEL TAKE-OFF

PROFILE	LENGTH(METE)	WEIGHT(KG)
ST TUB66333.6	12.00	59.033
ST TUB25252.6	15.17	25.667
ST TUB50503.6	12.65	62.919
ST TUB66332.6	6.40	23.549

	TOTAL =	**171.168**

********** END OF DATA FROM INTERNAL STORAGE **********

141. FINISH

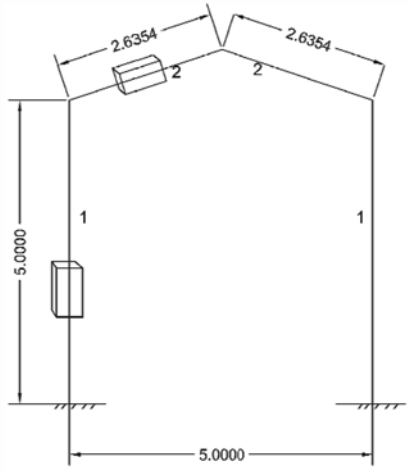
********** END OF THE STAAD.Pro RUN **********

MEMBER TABLE 12 M SPAN SLOPE 1 IN 3 BAY 6.0

	SPEED 33		SPEED 39		SPEED 44		SPEED 47		SPEED 50		SPEED 55		
MEM NO	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	SECTION	TOTAL	UNIT
1	50X50X3.6	63.00	50X50X3.6	63.00	50X50X3.6	63.00	50X50X3.6	63.00	50X50X3.6	63.00	60X60X3.2	69.58	KG
2	66X33X3.6	59.16	80X40X3.2	66.00	96X48X3.2	80.52	96X48X3.2	80.52	96X48X4	98.64	96X48X4.8	115.92	KG
3	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	25X25X2.6	3.71	KG
4	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	25X25X2.6	2.06	KG
5	25X25X2.6	5.48	25X25X2.6	5.48	32X32X2.6	7.32	32X32X2.6	7.32	32X32X2.6	7.32	32X32X2.6	7.32	KG
6	25X25X2.6	3.75	25X25X2.6	3.75	25X25X2.6	3.75	25X25X2.6	3.75	25X25X2.6	3.75	25X25X2.6	3.75	KG
7	25X25X2.6	5.41	25X25X2.6	5.41	32X32X2.6	7.23	32X32X2.6	7.23	32X32X2.6	7.23	32X32X2.6	7.23	KG
8	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	25X25X2.6	1.88	KG
9	66X33X2.6	23.62	66X33X2.6	23.62	66X33X2.6	23.62	66X33X3.6	31.55	66X33X3.6	31.55	80X40X3.2	35.20	KG
10	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	25X25X2.6	3.38	KG
	TOTAL	**171.43**	**TOTAL**	**178.27**	**TOTAL**	**196.46**	**TOTAL**	**204.40**	**TOTAL**	**222.52**	**TOTAL**	**250.03**	**KG**
REACTION	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	FX	FY	
DL		6750.0		6798.00		6921		6976		7100.0		7289.0	N
LL		15165.0		15165.00		15165		15165		15165.0		15165.0	N
WL0+PRE	1963.0	-21165.0	2741.0	-29564.00	3489.0	-37630	3981.0	-42933	4505.0	-48586.0	5451.0	-58795.0	N
		-18561.0		-25925.00		-32999		-37650		-42607.0		-51559.0	N
WL90+PRE		-23504.0		-32831.00		-41788		-47677		-53954		-65292.0	N

Portals

DESIGN OF PORTAL FOR 5 M SPAN AS PER IS 800-1984



DIMENSIONS OF SHED	=	5 X 25 SQ.MT
SPAN	=	5 M
HT OF SHED	=	5 M
BAY SPACING	=	4.5 M
WIND SPEED	=	33 MPERS
SLOPE	=	1 IN 3
THETA	=	18.44 DEGREE
TYPE OF SHEETING	=	A.C SHEETS
MATERIAL FOR CONSTRUCTION	=	SHS/RHS OF TATA STRUCTURA YST-310 GRADE

FOLLOWING LOADS ARE CONSIDERED WHILE DESIGN OF PORTALS

DEAD LOAD *(AS PER IS-875 PART I)*

S/W OF SHEETING	=	170 N/SQMT
S/W OF PURLIN	=	100 N/MT
NODAL LOAD	=	170X1.32X4.5+100X4.5=1460

LIVE LOAD *(AS PER IS-875 PART II)*

750-20X8.44	=	581.2 N/SQMT
581.2X2/3	=	388 N/SQMT (WHILE DESIGNING OF TRUSSES LL CAN BE TAKEN AS 2/3, (CL4.5.1 IS-875 PART I)
MINIMUM LL	=	400 N/SQMT (TABLE 2 IS-875, PART II)
NODAL LOAD	=	400X1.32X4.5= 2376 N

WIND LOAD *(AS PER IS-875 PART III)*

BASIC WIND FORCE CALCULATION

WIND SPEED (V_b)		=	33 m/s
DESIGN WIND SPEED (V_z)		=	K_1 X K_2 X K_3 X V_b
DESIGN WIND PRESSURE (Pz)		=	$0.6XVz^2$
K1 (PROBABILITY FACTOR)	*ASSUMED AS*	=	1
K2 (TERRAIN HEIGHT FACTOR)	*ASSUMED AS*	=	1
K3 (TOPOGRAPHY FACTOR)	*ASSUMED AS*	=	1
DESIGN WIND SPEED (Vz)		=	1X1X1X33 = 33 m/s
DESIGN WIND PRESSURE (Pz)		=	$0.6X33^2$
		=	**653.4 N/SQMT**

A) WIND 0

EXTERNAL PRESSURE COEFFICIENT (CPE) *(REF .IS 875: PART 3 1987 TABLE. No – 5)*

h/W	=	5/5 = 1
L/W	=	25/5 = 5
Cpe ON WIND WARD SIDE	=	-0.763
Cpe ON LEEWARD SIDE	=	-0.52
LOADING ON WINDWARD SIDE	=	653.4X0.763X1.32X4.5=2962 N/M
LOADING ON LEEWARD SIDE	=	653.4X0.52X1.32X4.5=2019 N/M
WIND LOAD ON CLADDING	=	HT OF CLADDING 3.0 M FROM BOTTOM
Cpe ON WINDWARD SIDE	=	-0.7
Cpe ON LEEWARD SIDE	=	-0.3
LOADING ON WINDWARD SIDE	=	653.4X0.7X4.5=2059 N/M
LOADING ON LEEWARD SIDE	=	653.4X0.3X4.5=883 N/M

B) WIND 90

Cpe ON WINDWARD SIDE	=	-0.8
Cpe ON LEEWARD SIDE	=	-0.8
LOAD ON WIND WARD & LEEWARD SIDE	=	0.8X653.4X1.32X4.5=3105 N/M
WIND LOAD ON CLADDING	=	HT OF CLADDING 3.0 M FROM BOTTOM
Cpe ON WIND WINDWARD SIDE	=	-0.5
Cpe ON LEEWARD SIDE	=	-0.5
LOADING ON WINDWARD & LEEWARD SIDE	=	653.4X0.5X4.5=1470 N/M

C) SUCTION

Cpi ON WINDWARD & LEEWARD SIDE	=	-0.2
LOAD ON WINDWARD & LEEWARD SIDE	=	0.2X653.4X1.32X4.5=776 N/M
WIND LOAD ON CLADDING	=	HT OF CLADDING 3.0 M FROM BOTTOM
Cpi ON WIND WINDWARD SIDE	=	-0.2
Cpi ON LEEWARD SIDE	=	-0.2
LOADING ON WINDWARD & LEEWARD	=	653.4X0.2X4.5=588 N/M

D) PRESSURE

Cpi ON WIND WARD & LEEWARD SIDE	=	0.2
LOAD ON WINDWARD & LEEWARD SIDE	=	0.2X653.4X1.32X4.5=776 N/M
WIND LOAD ON CLADDING	=	HT OF CLADDING 3.0 M FROM BOTTOM
Cpi ON WINDWARD SIDE	=	0.2
Cpi ON LEEWARD SIDE	=	0.2
LOADING ON WINDWARD & LEEWARD SIDE	=	653.4X0.2X4.5=588 N/M

LOAD COMBINATIONS

FOLLOWING LOAD COMBINATIONS ARE CONSIDERED FOR DESIGN OF TRUSSES

A) DL+LL
B) DL X 0.75 + WL0 X 0.75 + SUCTION X 0.75
C) DL X 0.75 + WL0 X 0.75 + PRESSURE X 0.75
D) DL X 0.75 + WL90 X 0.75 + SUCTION X 0.75
E) DL X 0.75 + WL90 X 0.75 + PRESSURE X 0.75

FOR DESIGN OF PORTAL MEMBERS, THE STRESSES ARE INCREASED BY 33% WHEN WIND IS CONSIDERED. SO COMBINATION IS APPLIED WITH FACTOR OF 0.75 (AS PER IS-800 CL 3.9.2)

SUPPORTS CONDITIONS:

WHILE DESIGN OF PORTALS, SUPPRTS ARE CONSIDERED AS FIXED AND SAME SHALL BE ENSURED AT SITE.

STAAD OUTPUT FILE

STAAD.Pro
Version 2007 Build 04
Proprietary Program of Research Engineers, Intl.
Date= OCT 17, 2011
Time= 16:24:54

USER ID: acdc

```
1.    STAAD SPACE
      INPUT FILE: PORTAL 5M HT5 4.5 33 1 IN 3.STD
2.    START JOB INFORMATION
3.    ENGINEER DATE 21-JUL-10
4.    JOB COMMENT PORTAL SPAN 5 M
5.    JOB COMMENT BAY 4.5M
6.    JOB COMMENT WIND SPEED 33M/S
7.    JOB COMMENT SLOPE 1 IN 3
8.    JOB COMMENT THETA 18.44
9.    END JOB INFORMATION
10.   INPUT WIDTH 79
11.   UNIT METER NEWTON
12.   JOINT COORDINATES
13.   1 0 0 0; 2 5 0 0; 3 0 5 0; 4 5 5 0; 5 2.5 5.84 0
14.   MEMBER INCIDENCES
15.   1 1 3; 2 2 4; 3 3 5; 4 5 4
16.   DEFINE MATERIAL START
17.   ISOTROPIC STEEL
18.   E 2.05E+011
19.   POISSON 0.3
20.   DENSITY 77008.5
21.   ALPHA 1.2E-005
22.   DAMP 0.03
23.   END DEFINE MATERIAL
24.   MEMBER PROPERTY INDIAN
25.   1 2 TABLE ST TUB145824.8
26.   3 4 TABLE ST TUB122613.6
27.   CONSTANTS
28.   MATERIAL STEEL ALL
29.   SUPPORTS
30.   1 2 FIXED
31.   LOAD 1 LOADTYPE DEAD TITLE DL
32.   * S/W OF SHEETING 170 N/SQMT
33.   * S/W OF PURLIN=100 N/MT
34.   *NODAL LOAD=170X1.32X4.5+100X4.5=1460 N
35.   SELFWEIGHT Y -1.05 LIST 1 TO 4
36.   MEMBER LOAD
37.   3 4 CON GY -1460
38.   JOINT LOAD
39.   3 4 FY -955
40.   5 FY -1460
41.   LOAD 2 LOADTYPE LIVE TITLE LL
42.   *750-20X8.44=581.2N/SQMT
43.   *581.2X2/3=388
44.   *LL=400 N/SQMT
45.   *NODAL LOAD =400X1.32X4.5=2376 N
46.   MEMBER LOAD
47.   3 4 CON GY -2376
48.   JOINT LOAD
49.   5 FY -2376
50.   3 4 FY -1188
51.   LOAD 3 LOADTYPE WIND TITLE WIND 0
52.   *WIND SPEED 33 M/S
53.   *WIND PRE = .6X33^2=653.4
54.   *CPE ON WIND WARD SIDE=-0.763
55.   *CPE ON LEEWARD SIDE=-0.52
56.   *LOAD ON WINDWARD SIDE=653.4X0.763X1.32X4.5=2962 N
```

```
*LOAD ON LEEWARD SIDE =653.4X0.52X1.32X4.5=2019 N
MEMBER LOAD
3 CON Y 2962
4 CON Y 2019
JOINT LOAD
3 5 FX -469 FY 1405
4 5 FX 320 FY 958
*CPE FOR CLADDING
*ON WIND WARD =-0.7 ON LEEWARD -0.3
*LOAD ON CLADDING ON WINDWARD SIDE
*.7X653.4X4.5=2059
*0.3X653.4X4.5=883
MEMBER LOAD
1 UNI GX 2059 3 5
2 UNI GX 883 3 5
LOAD 4 LOADTYPE WIND TITLE WIND 90
*CPE ON WIND WARD AND LEEWARD SIDE=-0.8
*LOAD =.8X653.4X1.32X4.5=3105
MEMBER LOAD
3 4 CON Y 3105
JOINT LOAD
3 FX -492 FY 1473
4 FX 492 FY 1473
5 FY 2945
*CPE FOR CLADDING
*ON WIND WARD =-0.5 ON LEEWARD -0.5
*LOAD=0.5X653.4*4.5=1470
MEMBER LOAD
1 UNI GX -1470 3 5
2 UNI GX 1470 3 5
LOAD 5 LOADTYPE WIND TITLE SUCTION
*CPE =0.2
*LOAD=.2X653.4X1.32X4.5=776
MEMBER LOAD
3 4 CON Y -776
JOINT LOAD
3 FX 123 FY -369
4 FX -123 FY -369
5 FY -737
*CPE =0.2
*LOAD=.2X653.4X4.5=588
MEMBER LOAD
1 UNI GX 588 3 5
2 UNI GX -588 3 5
LOAD 6 LOADTYPE WIND TITLE PRE
MEMBER LOAD
3 4 CON Y 776
JOINT LOAD
3 FX -123 FY 369
4 FX 123 FY 369
5 FY 737
*CPE =0.2
*LOAD=.2X653.4X4.5=588
MEMBER LOAD
1 UNI GX -588 3 5
2 UNI GX 588 3 5
LOAD COMB 7 COMBINATION LOAD CASE 7
1 1.0 2 1.0
LOAD COMB 8 COMBINATION LOAD CASE 8
1 0.75 3 0.75 5 0.75
LOAD COMB 9 COMBINATION LOAD CASE 9
1 0.75 3 0.75 6 0.75
LOAD COMB 10 COMBINATION LOAD CASE 10
1 0.75 4 0.75 5 0.75
LOAD COMB 11 COMBINATION LOAD CASE 11
1 0.75 4 0.75 6 0.75
PERFORM ANALYSIS
```

PROBLEM STATISTICS

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 5/ 4/ 2

SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

ORIGINAL/FINAL BAND-WIDTH = 2/ 2/ 18 DOF
TOTAL PRIMARY LOAD CASES = 6, TOTAL DEGREES OF FREEDOM = 18
SIZE OF STIFFNESS MATRIX = 1 DOUBLE KILO-WORDS
REQRD/AVAIL. DISK SPACE = 12.0/ 107609.8 MB

124. LOAD LIST 1 TO 6
125. PRINT SUPPORT REACTION ALL

SUPPORT REACTIONS -UNIT NEWT METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	1	638.68	4224.98	0.00	0.00	0.00	-1242.98
	2	948.99	4752.00	0.00	0.00	0.00	-1847.80
	3	-3933.08	-6289.76	0.00	0.00	0.00	9756.49
	4	-56.10	-5888.80	0.00	0.00	0.00	341.17
	5	-141.27	1473.09	0.00	0.00	0.00	180.79
	6	141.2	-1473.09	0.00	0.00	0.00	-180.79
2	1	-638.68	4224.98	0.00	0.00	0.00	1242.98
	2	-948.99	4752.00	0.00	0.00	0.00	1847.80
	3	-1352.57	-3157.84	0.00	0.00	0.00	4941.53
	4	56.10	-5888.80	0.00	0.00	0.00	-341.17
	5	141.27	1473.09	0.00	0.00	0.00	-180.79
	6	-141.27	-1473.09	0.00	0.00	0.00	180.79

********** END OF LATEST ANALYSIS RESULT **********

126. LOAD LIST 7 TO 11
127. UNIT MMS NEWTON
128. PARAMETER 1
129. CODE INDIAN
130. BEAM 1 ALL
131. FYLD 310 ALL
132. LY 1320 MEMB 3 4
133. UNL 1320 MEMB 3 4
134. CHECK CODE ALL

STAAD.Pro CODE CHECKING - (IS-800)

ALL UNITS ARE - NEWT MMS (UNLESS OTHERWISE NOTED)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
1 ST	TUB145824.8		(INDIAN SECTIONS)		
		PASS	7.1.2 BEND C	0.843	8
		443.77 T	0.00	6520732.00	0.00
2 ST	TUB145824.8		(INDIAN SECTIONS)		
		PASS	IS-7.1.1(A)	0.712	7
		8159.08 C	0.00	-4847574.50	5000.00
3 ST	TUB122613.6		(INDIAN SECTIONS)		
		PASS	IS-7.1.1(A)	0.704	7
		3421.12 C	0.00	4847574.50	0.00
4 ST	TUB122613.6		(INDIAN SECTIONS)		
		PASS	IS-7.1.1(A)	0.704	7
		3421.12 C	0.00	4847574.50	2637.35

********** END OF TABULATED RESULT OF DESIGN **********

135. PARAMETER 3
136. CODE INDIAN
137. UNIT METER KG
138. STEEL TAKE OFF ALL

STEEL TAKE-OFF

PROFILE	LENGTH(METE)	WEIGHT(KG)
ST TUB145824.8	10.00	158.862
ST TUB122613.6	5.27	50.905

	TOTAL =	**209.766**

********** END OF DATA FROM INTERNAL STORAGE **********

139. FINISH

********** END OF THE STAAD.Pro RUN **********

MEMBER TABLE FOR 5M SPAN SLOPE 1 IN 3 BAY 4.5

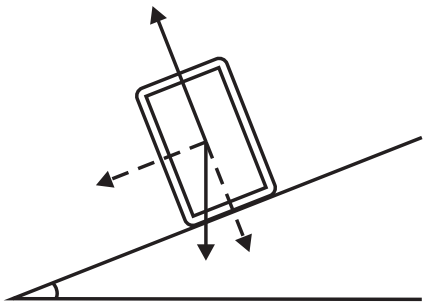
	WIND 33						WIND 39					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	145X82X4.8	15.92	10	159.20		1	145X82X5.4	17.74	10	177.40	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X3.6	9.67	5.154	49.84	
				TOTAL	**209.04**					**TOTAL**	**227.24**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	638.68	4224.98	-1243	-638.68	4224.98	1242.98	655.63	4321.43	-1290.27	-655.63	4321.4	1290.27
LL	948.99	4752	-1847.8	-948.99	4752	1847.8	974	4752	-1917.87	-974	4752	1917.87
WL0	-3933.08	-6289.76	9756.49	-1352.6	-3157.8	4941.53	-5398.15	-8621.05	13432.8	-1567.74	-4571.8	6242.51
WL90	-56.1	-5888.8	341.17	56.1	-5888.8	-341.17	-96.08	-8224.69	535.58	96.08	-8224.7	-535.58
SUCT	-141.27	1473.09	180.79	141.27	1473.09	-180.79	-196.27	2057.05	245.39	196.27	2057.1	-245.39
PRESSURE	141.27	-1473.09	-180.79	-141.27	-1473.1	180.79	196.27	-2057.05	-245.39	-196.27	-2057.1	245.39
HT 7.5 M	1	180X180X5	26.97	15	404.55		1	220X220X6	39.59	15	593.85	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X4.5	11.88	5.156	61.25	
				TOTAL	**454.39**					**TOTAL**	**655.10**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	474.47	5491.45	-1401.6	-474.47	5491.45	1401.57	524.31	6526.13	-1664.93	-524.31	6526.1	1664.93
LL	704.89	4752	-2083.5	-704.89	4752	2083.52	763.93	4752	-2428.59	-763.93	4752	2428.59
WL0	-7937.36	-7982.86	29223.1	-3792.3	-2188.9	18778.1	-11301.82	-9615.85	44482	-5421.58	-3577	29103.4
WL90	2238.99	-5888.8	-4652.5	-2239	-5888.8	4652.51	3131.56	-8224.69	-6366.35	-3131.56	-8225	6366.35
SUCT	-1017.02	1473.59	2217.72	1017	1473.6	-2217.72	-1436.86	2057.05	3126.25	1436.86	2057.1	-3126.3
PRESSURE	1017.02	-1473.59	-2217.7	-1017	-1473.6	2217.72	1436.86	-2057.05	-3126.25	-1436.86	-2057	3126.25
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 44						WIND 47					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	172X91X5.4	20.88	10	208.80		1	200X100X5	22.26	10	222.6	
	2	122X61X3.6	9.67	5.154	49.84		2	122X61X4.5	11.88	5.154	61.23	
				TOTAL	**258.64**					**TOTAL**	**283.83**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	705.98	4479.91	-1454.5	-705.98	4479.91	1454.53	733.4	4614.44	-1533.46	-733.4	4614.4	1533.46
LL	1048.97	4752	-2162.9	-1049	4752	2162.88	1068.51	4752	-2236.43	-1068.51	4752	2236.43
WL0	-7025.54	-10674.12	18322.9	-1844.7	-6116.9	8227.24	-8062.42	-12085.53	21307.7	-2060.28	-7075	9469.21
WL90	-199.47	-10469.08	972.69	199.47	-10469	-972.69	-254.07	-11948.01	1219.15	254.07	-11948	-1219.2
SUCT	-241.36	2617.63	268.08	241.36	2617.63	-268.08	-272.19	2988.03	288.09	272.19	2988	-288.09
PRESSURE	241.36	-2617.63	-268.08	-241.36	-2617.6	268.08	272.75	-2986.53	-289.3	-272.75	-2987	289.3
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	220X220X6	39.59	15	593.85	
	2	145X82X4.8	15.92	5.154	82.05		2	145X82X4.8	15.92	5.154	82.05	
				TOTAL	**760.65**					**TOTAL**	**675.90**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	521.73	7071.38	-1591.9	-521.73	7071.38	1591.9	495.44	6635.74	-1450.78	-495.44	6635.7	1450.78
LL	733.92	4752	-2242.1	-733.92	4752	2242.09	696.78	4752	-2042.28	-696.78	4752	2042.28
WL0	-18244.39	-13384.32	70015.2	-9582.8	-1590.4	48366.7	-16218.85	-15460.97	59878.6	-8069.36	-3700	39526.8
WL90	5743.45	-10467.58	-12291	-5743.5	-10468	12291.4	4538.2	-11946.01	-9448.56	-4538.2	-11946	9448.56
SUCT	-1820.95	2618.13	3967.88	1821	2618.13	-3967.88	-2061.61	2986.53	4495.62	2061.61	2986.5	-4495.6
PRESSURE	1820.95	-2618.13	-3967.9	-1821	-2618.1	3967.88	2061.61	-2986.53	-4495.62	-2061.61	-2987	4495.62
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

	WIND 50						WIND 55					
	MEM NO	SECTION	UNIT WT	LENGTH	TOTAL		MEM NO	SECTION	UNIT WT	LENGTH	TOTAL	
HT 5M	1	200X100X5	22.26	10	222.60		1	240X120X5	26.97	10	269.70	
	2	122X61X5.4	14.01	5.154	72.21		2	148X82X4.8	15.92	5.154	82.05	
				TOTAL	**294.81**					**TOTAL**	**351.75**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	732.28	4672.23	-1505.9	-732.28	4672.23	1505.9	712.39	4874.12	-1464.33	-712.39	4874.1	1464.33
LL	1047.16	4752	-2155.8	-1047.2	4752	2155.75	1049.53	4752	-2163.69	-1049.53	4752	2163.69
WL0	-9067.94	-13792.73	23626.4	-2384.5	-7894.9	10621.1	-10980.66	-16664.55	28673.1	-2879.19	-9574	12893.3
WL90	-257.12	-13520.79	1250.27	257.12	-13521	-1250.27	-312.99	-16359.83	1519.91	312.99	-16360	-1519.9
SUCT	-311.25	3381.2	346.09	311.25	3381.2	-346.09	-376.76	4092.67	418.67	376.76	4092.7	-418.67
PRESSURE	311.25	-3381.2	-346.09	-311.25	-3381.2	346.09	376.76	-4092.67	-418.67	-376.76	-4093	418.67
HT 7.5 M	1	250X250X6	45.24	15	678.60		1	250X250X6	45.24	15	678.60	
	2	145X82X4.8	15.92	5.154	82.05		2	172X92X4.8	18.71	5.154	96.43	
				TOTAL	**760.65**					**TOTAL**	**775.03**	
REACTION	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ	FX	FY	MZ
DL	521.73	7072.38	-1591.9	-521.73	7072.38	1591.9	499.82	7148.08	-1449.26	-499.82	7148.1	1449.26
LL	733.92	4752	-2242.1	-733.92	4752	2242.09	686.58	4752	-1992.8	-686.58	4752	1992.8
WL0	-18482.33	-16506.34	70834.3	-9002.9	-5178.3	46605.8	-22170.5	-21477.26	81057.9	-11089.4	-4761	53544.6
WL90	5148.9	-13520.79	-10600	-5148.9	-13521	10600.4	6206.68	-16359.83	-12950.7	-6206.68	-16360	12950.7
SUCT	-2349.8	3381.2	5119.93	2349.8	3381.2	-5119.93	-2812.29	4092.67	6131.02	2812.29	4092.7	-6131
PRESSURE	2349.8	-3381.2	-5119.9	-2349.8	-3381.2	5119.93	2812.29	-4092.67	-6131.02	-2812.29	-4093	6131.02
UNIT	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**	**N**	**N**	**NM**

Purlin

DESIGN OF PURLIN FOR 310 GRADE STEEL



BASIC WIND SPEED (Vb) = 33 M/S

FACTORS K1 *PROBABILITY FACTOR* = 1

K2 *TERRAIN HEIGHT FACTOR* = 1

K3 *TOPOGRAPHY FACTOR* = 1

For calculating ext. pressure co-eff. Ref. Table 16,is 875-(Part-III)-1987

Height,H = 10.5 M

Length,L = 4.5 M

Width,W = 20 M L/W = 0.225

H/L = 2.333 = 2.5 H/W = 0.525

DESIGNED WIND SPEED (Vz) = K1XK2XK3X WIND SPEED = 33 M/S

DESIGNED WIND PRESSURE (Pz) = 0.6 X Vz^2

= 653.4 KG/SQMT

SPACING OF PURLIN = 1.5 M

BAY SPACING = 6 M

SLOPE OF ROOF = 1 IN 3

THETA = 18.44

COS 18.44 = 0.95

SIN 18.44 = 0.32

LOAD CALCULATION

DEAD LOAD

WT OF SHEETING = 60 N/SQMT

WT OF SHEETING ON PURLIN = 90 N/M

SELF WEIGHT OF PURLIN = 96.75 N/M

TOTAL DEAD LOAD ON PURLIN = 186.75 N/M

LIVE LOAD

= 750-20X8.44

= 581.11 N/SQMT

TOTAL LIVE LOAD ON PURLIN = 871.67 N/M

WIND LOAD

WIND CPE EXTERNAL = -0.77 WIND WARD SIDE

= -0.52 LEEWARD SIDE

PRESSURE CPE INTERNAL = -0.2

TOTAL CPE = -0.97

TOTAL WIND LOAD ON PURLIN = 950.697 N/M

MOMENT = W X L^2/10

MOMENT	DL	LL	WL	TOTAL DL+LL	TOTAL DL-WL	MAX
	NMM	NMM	NMM	NMM	NMM	NMM
MXX	637786.43	2976983.1	3422509	3614769.493	2784722.768	3614769
MYY	212595.48	992327.69	0	1204923.164	212595.4775	1204923

Z_{XX} REQ = 17.667 CM^3

Z_{YY} REQ = 5.889 CM^3

PROVIDE	SECTION		122	61	3.6		RATIO	L/C
	AX	WT	IXX	IYY	ZXX	ZYY	0.69	DL+LL
	12.32	96.75	232.61	78.83	38.13	25.84	0.40	DL-WL

CHECK FOR DEFLECTION

DEFLECTIION		=	$0.5x5wxl^4/(384xEI)$	DEFLECTION CHECK
ACTUAL DEFLECTIION	DL+LL	=	19.20 MM	OK
ACTUAL DEFLECTIION	DL+WL	=	13.86 MM	OK
PERMISSIBLE	*L/200*	=	*30.00 MM*	

FOR DL+LL	FCBX	=	M_{XX}/Z_{XX}	94.80	*ACTUAL*
	FCBY	=	M_{YY}/Z_{YY}	46.62	*ACTUAL*
FOR DL-WL	FCBX	=	M_{XX}/Z_{XX}	73.03	*ACTUAL*
	FCBY	=	M_{YY}/Z_{YY}	8.23	*ACTUAL*

FOR DL+LL $\dfrac{\text{FCBX ACTUAL}}{\text{FCBX PERMISSIBLE}} + \dfrac{\text{FCBY ACTUAL}}{\text{FCBY PERMISSIBLE}} = \dfrac{94.80}{205} + \dfrac{46.62}{205} = 0.69$

LESS THAN 1 OK

FOR DL+WL $\dfrac{\text{FCBX ACTUAL}}{\text{FCBX PERMISSIBLE}} + \dfrac{\text{FCBY ACTUAL}}{\text{FCBY PERMISSIBLE}} = \dfrac{73.03}{205} + \dfrac{8.23}{205} = 0.40$

LESS THAN 1.33 OK

Purlin

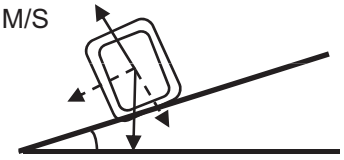
DESIGN OF BUILT-UP PURLIN FOR 310 GRADE STEEL

BASIC WIND SPEED = 55 M/S

FACTORS K1 PROBABILITY FACTOR = 1

K2 TERRAIN HEIGHT FACTOR = 1

K3 TOPOGRAPHY FACTOR = 1



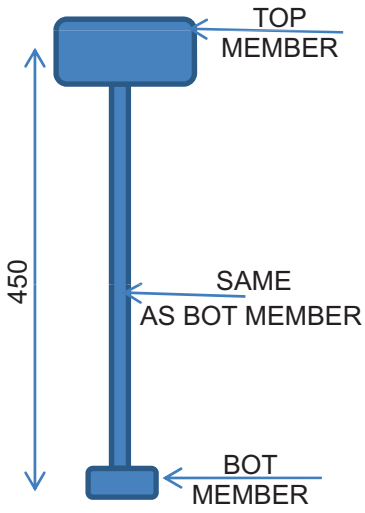
For calculating ext. pressure co-eff. Ref. Table 16,is 875-(Part-III)-1987

Height, H = 10.5 M

Length, L = 45 M

Width,W = 20 M L/W = 2.25

H/L = 0.23333 = 0.25 H/W = 0.525



BUILT-UP MEMBER

WIND PRESSURE = K1 X K2 X K3 X 0.6 X WIND SPEED^2

= 1815 KG/SQMT

SPACING OF PURLIN = 1.5 M

BAY SPACING = 12 M

SLOPE OF ROOF = 1 IN 10

THETA = 5.713

COS 5.71349 = 0.995

SIN 5.71349 = 0.100

LOAD CALCULATION

DEAD LOAD

WT OF SHEETING = 60 N/SQMT

WT OF SHEETING ON PURLIN = 90 N/M

SELF WEIGHT OF PURLIN = 120.24 N/M

TOTAL DEAD LOAD ON PURLIN = 210.24 N/M

LIVE LOAD

LOAD = 750 N/SQMT

TOTAL LIVE LOAD ON PURLIN = 1125 N/M

WIND LOAD

WIND CPe EXTERNAL = -0.77 WIND WARD SIDE

= -0.52 LEEWARD SIDE

PRESSURE CPi INTERNAL = -0.2

TOTAL CPE = -0.97

TOTAL WIND LOAD ON PURLIN = 2640.825 N/M

MOMENT = WxL^2/10

MOMENT	DL	LL	WL	TOTAL DL+LL	TOTAL DL-WL	MAX	UNIT
MXX	3012384.036	16119602.48	38027880	19131986.52	35015495.96	35015495.96	NMM
MYY	301238.4036	1611960.248	0	1913198.652	301238.4036	1913198.652	NMM

ZXX REQ = 171.141231 CM^3

ZYY REQ = 9.35092205 CM^3

				DEFLECTION CHECK
DEFLECTION		=	0.5x5wxl^4/ (384 x EI)	
DEFLECTION	DL+LL	=	16.99 MM	OK
	DL+WL	=	30.93 MM	OK
PERMISSIBLE	L/200	=	60.00 MM	

FOR DL+LL	FCBX=	MXX/ZXX PROVIDED	126.55	ACTUAL
	FCBY=	MYY/ZYY PROVIDED	71.91	ACTUAL
FOR DL-WL	FCBX=	MXX/ZXX PROVIDED	231.61	ACTUAL
	FCBY=	MYY/ZYY PROVIDED	11.32	ACTUAL

FOR DL+LL $\frac{\text{FCBX ACTUAL}}{\text{FCBX PERMISSIBLE}} + \frac{\text{FCBY ACTUAL}}{\text{FCBY PERMISSIBLE}} = \frac{126.54654}{204.60} + \frac{71.9104}{204.60} = 0.97$

LESS THAN 1 OK

FOR DL+WL $\frac{\text{FCBX ACTUAL}}{\text{FCBX PERMISSIBLE}} + \frac{\text{FCBY ACTUAL}}{\text{FCBY PERMISSIBLE}} = \frac{231.60636}{204.60} + \frac{11.3225}{204.60} = 1.19$

LESS THAN 1.33 OK

	SECTION		96	48	4	
TOP MEMBER	AX	WT	IXX	IYY	ZXX	ZYY
	10.47	82.18	117.54	39.32	24.49	16.38

	SECTION		50	25	2.6	
BOTTOM MEMBER	AX	WT	IXX	IYY	ZXX	ZYY
	3.46	27.13	10.16	3.36	4.06	2.69

PROPERTIES OF BUILT UP SECTION

C/C OF TOP & BOT MEMBER	=	450	MM
AX TOTAL	=	13.92	CM^2
SELF WEIGHT	=	120.24	N/MT
CG FROM CEN OF TOP MEMB	=	11.16819	CM
CG FROM CEN OF BOT MEMB	=	33.83181	CM
IXX OF BUILT UP SECTION	=	5303.857	CM^4
IYY OF BUILT UP SECTION	=	127.71	CM^4
ZXX OF BUILT UP FROM TOP	=	390.9038	CM^3
ZXX OF BUILT UP FROM BOT	=	151.1854	CM^3
ZYY OF BUILT UP SECTION	=	26.60532	CM^3

DESIGN OF GIRT

LOAD CALCULATION

SPAN OF GIRT	=	6.0	m		
MAX. SPACING OF GIRT	=	1.7	m		
C.G.I. SHEETING WEIGHT	=	60	N/m^2		
WT. ON GIRT.	=	102	N/m		
GIRT SELF WEIGHT	=	100	N/m	……..	(assumed)
TOTAL LOAD	=	202	N/m		

VERTICAL BENDING MOMENT

$$Myy = \frac{wl^2}{10} = \frac{202 \times 6^2}{10}$$

$$= 727.2 \text{ Nm}$$

HORIZONTAL BENDING MOMENT DUE TO WIND

$$\frac{h}{w} = \frac{10.5}{12} = 0.875 \quad \text{Cpe} = 0.7$$

$$\frac{L}{w} = \frac{45}{12} = 3.75 \quad \text{Cpi} = 0.2$$

PRESSURE COEFFICIENT = CP = Cpe +Cpi

CP = 0.7+0.2 = 0.9

WIND SPEED (Vb) = 33 m/s

DESIGN WIND SPEED (Vz) = 1X1X1X33 = 33 m/s

DESIGN WIND PRESSURE = $0.6 \times Vz^2$

= $0.6X33^2$ = 653.4 m/s

WIND LOAD ON WINDWORD WALL

= 0.9X653.4X1.7

= 999.70

HORIZONTAL BENDING MOMENT

$$Mxx = \frac{wl^2}{10} = \frac{999.7 \times 6^2}{10}$$

$$= 3598.9272 \text{ Nm}$$

REQUIRED SECTIONAL MODULUS

$$Z \text{ req} = \frac{M}{0.66fy} = \frac{3598.93}{0.66X310}$$

$$= 17.59006452$$

TRY RHS 80 X 40 X 4.8 @ 10.01 KG/m

$$fbc = \frac{359892.72}{18.3} + \frac{72720}{12.02} = 257.16 \text{ Mpa}$$

$$fbc < 204.6 X1.33 = 272.118 \text{ Mpa}$$

HENCE OK

DESIGN WITH CONVENSIONAL SECTION

REFER BIS, Sp38, 1987 RECOMMENDED SECTION

ISMC 125@12.7 KG/m WITH ONE 12 φ SAG ROD @ 0.9 KG/m AT CENTER

TOTAL WEIGHT (INCLUDING SAG ROD) = 619.2 X 12.7 +225 = **8088.8 Kg**

DESIGN OF COLUMN

THE COLUMN IS DESIGN AS PER PROPPED CANTILEVER FIXED AT BASE

CALCULATION OF LOADS

a) DEAD LOAD

WT. OF C.G.I. SIDE WALL	=	60 X 10.5X6	=	3780	N
WT. OF GIRT (8 NO's)	=	100 X6X 8	=	4800	N
SELF WT. OF COLUMN	=	650X10.5	=	6825	N ….(assumed)@650 Kg/m
		TOTAL	=	15405	N
REACTION FROM ROOF TRUSS DUE					
TO DEAD LOAD			=	6750	N
TOTAL DEAD LOAD ON COLUMN			=	22155	N

b) LIVE LOAD

REACTION FROM ROOF TRUSS DUE			
TO LIVE LOAD	=	15165	N
MAX. COMPRESSIVE FORCE ON COLUMN CAP	=	(6750 + 15165)	
(D.L. +L.L.)	=	21915	N
MAX. COMPRESSIVE FORCE ON COLUMN BASE	=	(22155 + 15165)	
(D.L. +L.L.)	=	37320	N

c) WIND LOAD

REACTION FROM ROOF

1 . REACTION DUE WIND PERPENDICULAR TO RIDGE (0^0 WIND)

HORIZONTAL FORCE = 1963 N VERTICAL UPLIFT = 21165 N

2 . REACTION DUE TO WIND PARELLEL TO RIDGE (90^0 WIND)

VERTICAL UPLIFT = 23504 N

MAX. UPLIFT AT COLUMN CAP	=	(23504 -6750)	=	16754	N
MAX. UPLIFT AT COLUMN BASE	=	(16754 -15405)	=	1349	N

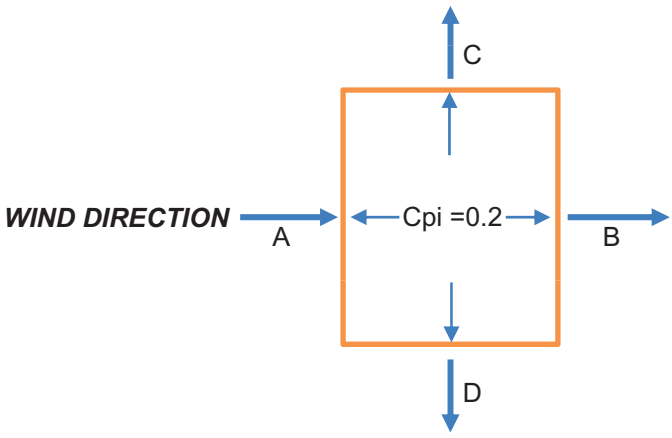
WIND FORCE REFER IS 875 PART 3

h/w =0.875 l/w = 3.75

WIND PERPENDICULAR TO RIDGE (REF. FIG.)

a) PRESSURE

REFERING IS 875 PART 3 1987
TABLE NO. 4



Cpe at A	=	0.7
Cpe at B	=	0.3
Cpe at C	=	0.7
Cpe at D	=	0.7
Cpi	=	0.2

PRESSURE COEFFICIENT

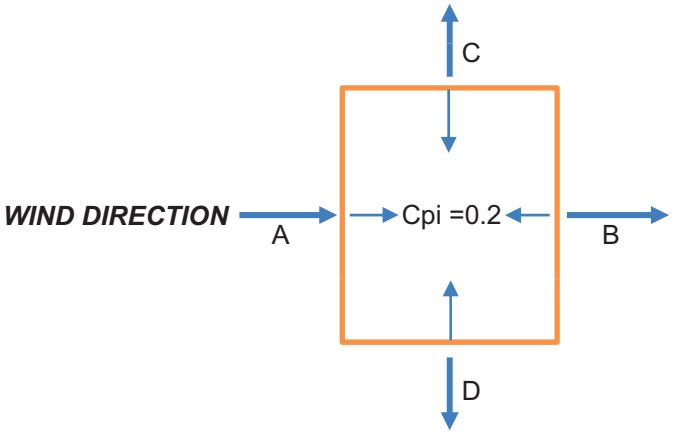
CP AT FACE A = (0.7 - 0.2) = 0.5
CP AT FACE B = (0.3 + 0.2) = 0.5
CP AT FACE C = (0.7 + 0.2) = 0.9
CP AT FACE D = (0.7 + 0.2) = 0.9

} CP = Cpe + Cpi

b) SUCTION

PRESSURE COEFFICIENT

CP AT FACE A = (0.7 + 0.2) = 0.9
CP AT FACE B = (0.3 - 0.2) = 0.1
CP AT FACE C = (0.7 - 0.2) = 0.5
CP AT FACE D = (0.7 - 0.2) = 0.5



WIND LOAD ON COLUMN

a) PRESSURE

= 0.5 X 653.4X 6.0 = 1960.2 N/m ..... ON FACE A & B

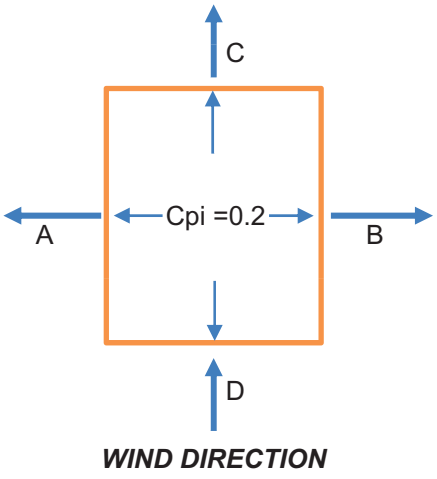
b) SUCTION

= 0.9 X 653.4X 6.0 = 3529 N/m ..... ON FACE A
= 0.1 X 653.4X 6.0 = 393 N/m ..... ON FACE B

WIND PARELLEL TO RIDGE (REF. FIG.)

a) PRESSURE

REFERING IS 875 PART 3 1987
TABLE NO. 4

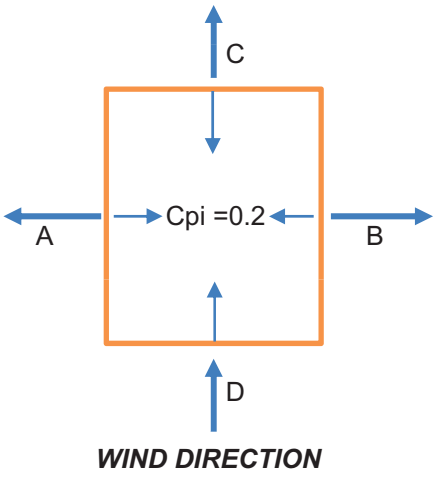


Cpe at A = 0.5
Cpe at B = 0.5
Cpe at C = 0.7
Cpe at D = 0.1
Cpi = 0.2

PRESSURE COEFFICIENT

CP AT FACE A = (0.5 + 0.2) = 0.7
CP AT FACE B = (0.5 + 0.2) = 0.7
CP AT FACE C = (0.7 + 0.2) = 0.9
CP AT FACE D = (0.1 - 0.2) = -0.1

b) SUCTION



PRESSURE COEFFICIENT

CP AT FACE A = (0.5 - 0.2) = 0.3
CP AT FACE B = (0.5 - 0.2) = 0.3
CP AT FACE C = (0.7 - 0.2) = 0.5
CP AT FACE D = (0.1 + 0.2) = 0.3

WIND LOAD ON COLUMN

a) PRESSURE

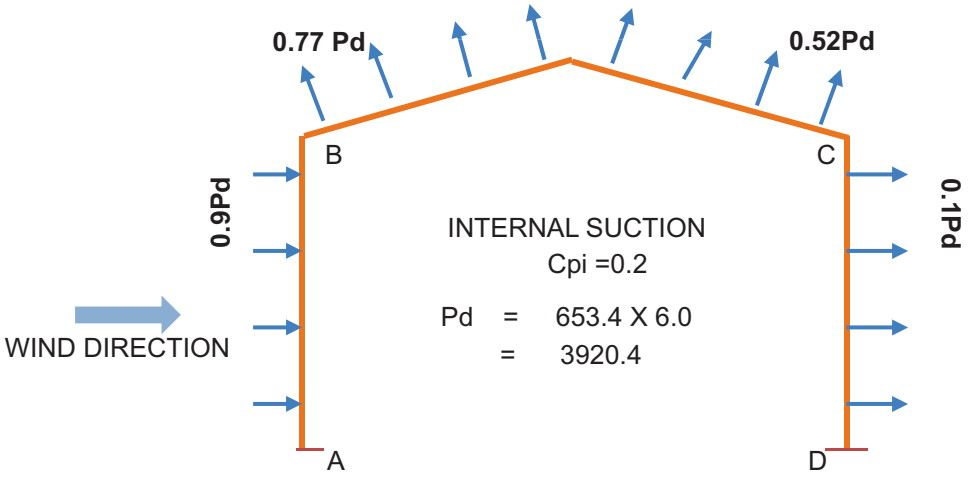
= 0.9 X 653.4X 6.0 = 3529 N/m ..... ON FACE C
= 0.1 X 653.4X 6.0 = 393 N/m ..... ON FACE D

b) SUCTION

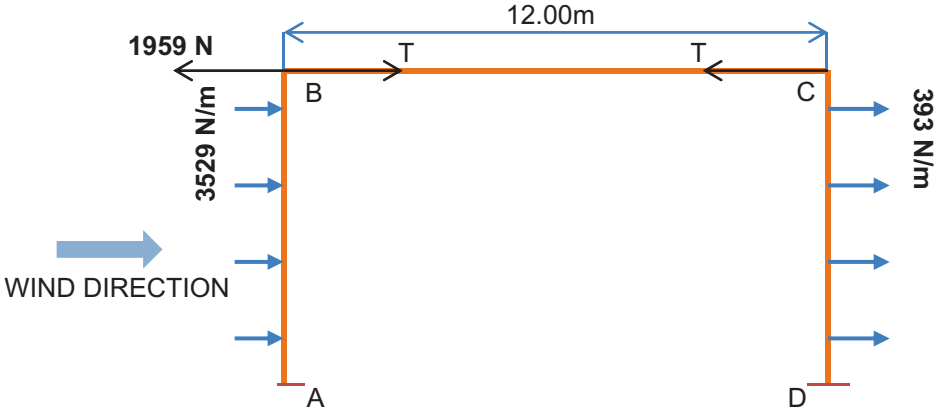
= 0.5 X 653.4X 6.0 = 1961 N/m ..... ON FACE C
= 0.3 X 653.4X 6.0 = 1177 N/m ..... ON FACE D

MOMENT AT BASE

WORST WIND CASE FOR MAX. MOMENT AT THE BASE IS AS SHOWN



TO DETERMINE FORCE IN THE TIE , CONSIDER THE FRAME GIVEN BELOW



NET HORIZONTAL FORCE AT TIE LEVEL DUE TO WIND ON ROOF

= (0.77-0.52)X sin 18.43 0 X 6.32 X 3921.4

= 1959 N

DEFLECTION OF COLUMN AB

$$= \frac{3529 \times 10.5^4}{8EI} + \frac{T \times 10.5^3}{3EI} - \frac{1959 \times 10.5^3}{3EI}$$

DEFLECTION OF COLUMN CD

$$= \frac{393 \times 10.5^4}{8EI} - \frac{T \times 10.5^3}{3EI}$$

EQUIATING DEFLECTION OF AB AND CD

$$\frac{3529 \times 10.5^4}{8EI} + \frac{T \times 10.5^3}{3EI} - \frac{T \times 10.5^3}{3EI} = \frac{393 \times 10.5^4}{8EI} - \frac{T \times 10.5^3}{3EI}$$

T = -5195 N (COMPRESSION)

MOMENT AT BASE OF AB = (3529 X 10.5^2 /2) +(1959 X 10.5) -(5195X 10.5)

= 160.5575 X 10^3 Nm

SHEAR FORCE AT BASE AB = (3529 X 10.5 -1959-5195

= 29901 N

MOMENT AT BASE OF CD = (393 X 10.5^2 /2) +(5195X 10.5)

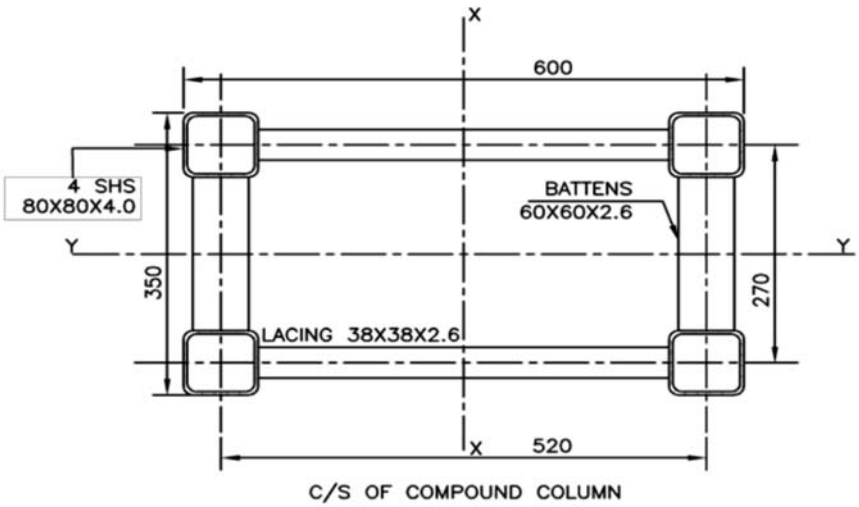
= 76.211 X 10^3 Nm

SHEAR FORCE AT BASE CD = (393 X 10.5 +5195)

= 9322 N

DESIGN FORCES ON COLUMN

DESIGN FORCES / LOCATION	TENSION KN	COMPRESSION KN	SHEAR KN	MOMENT Knm
COLUMN CAP	16.754	21.915	1.968	-
COLUMN BASE	1.349	37.32	29.901	160.55



C/S OF COMPOUND COLUMN

COMPOUND COLUMN PROPERTIES

$A = 4 \times 11.75 = 47\ cm^2$

$I_{XX} = 4 \times (111.04 + 47 \times (52/2)^2) = 127532.16$

$I_{XX} = 4 \times (111.04 + 47 \times (27/2)^2) = 9009.91$

$R_{XX} = 52.09\ cm$ ..... $R = \sqrt{I / A}$

$R_{YY} = 13.85\ cm$

$\lambda = 1.5 \times 1050 / 52.09 = 30.236$

$\lambda = 0.85 \times 1050 / 13.85 = 64.44$

DESIGN OF COLUMN SECTION

1. ALLOWABLE AXIAL COMPRESSIVE STRESS
   (σac permissible) = 136.34 Mpa (REF. IS800:1984 TABLE 5.1)
2. COMPRESSIVE FORCE = 37320 N
3. TENSILE FORCE = 1349 N
4. SHEAR FORCE = 29901 N
5. BENDING MOMENT = 160550 Nm

COMPRESSIVE FORCE PER LEG $= \frac{37320}{4} = 9330$ N

COMPRESSIVE FORCE PER LEG DUE TO BENDING MOMENT $= \frac{160550}{2 \times 0.52} = 154375$ N

TOTAL COMPRESSIVE FORCE = 9330+154375 = 163705 N

HENCE MAX. COMPRESSIVE FORCE PER LEG (σac actual) $= \frac{163705}{1175} = 139.3234$ Mpa

$1.33 \times 136.34 > 139.3234$

$> (\sigma$ac actual) **HENCE SAFE**

CHECK FOR SIMULTANEOUS ACTION OF BENDING MOMENT AND AXIAL TENSION

MAX. TENSILE FORCE PER LEG DUE TO UPLIFT $= \frac{1349}{4} = 337.25$ Mpa

COMPRESSIVE FORCE PER LEG DUE TO BENDING MOMENT $= \frac{160550}{2 \times 0.52} = 154375$ N

TOTAL COMPRESSIVE FORCE = 337.25+154375 = 154712.3 N

HENCE MAX. COMPRESSIVE FORCE PER LEG (σat actual) $= \frac{154712.25}{1175} = 131.67$ Mpa

$1.33 \times 186 > 131.67$

(σat permissible) > (σat actual) **HENCE SAFE**

CHECK FOR MAXIMUM DEFLECTION AT EAVES LEVEL

DEFLECTION AT TOP $= \frac{0.393 \times 1050^4}{8 \times 2.1 \times 10^6 \times 32142.84} - \frac{5.195 \times 1050^3}{3 \times 2.1 \times 10^6 \times 32142.84}$

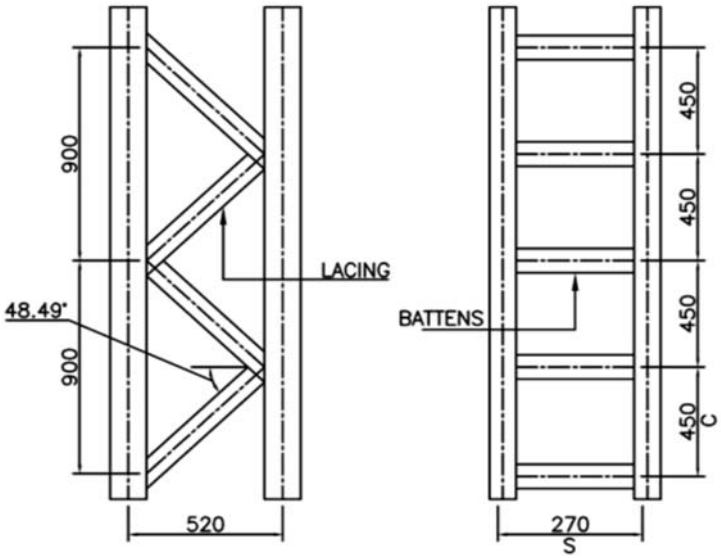
$= 0.915\ cm$

ALLOWABLE DEFLECTION = SPAN /325

$= 1050/325 = 3.231\ cm$

ALLOWABLE DEFLECTION > ACTUAL DEFLECTION HENCE OK

DESIGN OF COLUMN LACING PARELLEL TO MINOR AXIS (Y-Y AXIS)



ELEVATION (FIG.A) **SIDE VIEW FIG.(B)**

USING SINGLE LACING MAKING AN AN ANGLE OF 48.490 WITH THW AXIS OF COLUMN
THE SPACING BETWEEN THE CONNECTION IS 900 mm (REF. FIG: A)

L/r RATIO FOR THE MAIN MEMBER

= 0.85 X90 /3.07 = 24.919 < 50

< 0.7 X 59 .35

HENCE OK *MIN. RATIO FOR COMPOUND COLUMN=59.35*

TRANSVERSE SHEAR FORCE = 2.5 % AXIAL FORCE + CALCULATED SHEAR FORCE

= 0.025 X37320 + 29901 = 30834 N

FORCE IN EACH LACING MEMBER = 30834/ (2 X cos (90 -48.49)

= 20587.841

TRY SHS 38X38X2.6 @ 2.75 kg /m

AREA = 3.51 cm^2

Ixx=Iyy = 7.14 cm^4

Rxx=Ryy = 1.43 cm

Leff = 0.7 X 450 /cos48 49 = 47.53 cm

$$\frac{\text{Leff}}{\text{Rmin}} = \frac{47.53}{1.43} = 33.238$$

ALLOWABLE COMPRESSIVE STRESS = 174.78 Mpa (REF. IS800:1984 TABLE 5.1)

MAX. COMPRESSIVE FORCE = $\frac{20587.841}{351}$ = 58.655 Mpa

< **ALLOWABLE COMPRESSIVE STRESS (174.78 Mpa)**

HENCE OK

DESIGN OF COLUMN BATTENING PARELLEL TO MAJOR AXIS (X-X AXIS)

TRANSVERSE SHEAR FORCE (V) = 2.5% OF (DIRECT AXIAL LOAD /2 + 2X AXIAL LOAD PER LEG DUE TO BENDING MOMENT)

= 0.025 X (37320/2 + 2 X (154375)

= 8185.3 N

SHEAR FORCE ON EACH BATTEN MEMBER

= V. C ./ S = 8185.3 X 450 / 270

= 13642.083 N

BENDING MOMENT ON EACH BATTEN MEMBER

= V.C / 2 = 8185.3 X 0.45 /2

= 1841.681 N

TRY SHS 60X60X2.6 @ 4.55 kg /m

AREA = 5.8 cm^2

Zxx=Zyy = 10.44 cm^3

MAXIMUM AVERAGE SHEAR STRESS = $\frac{13642.083 \times 2}{580}$

= 47.042 Mpa

< 140 MPa(PERMISSIBLE SHEAR STRESS)

HENCE OK

MAXIMUM BENDING STRESS = $\frac{1841.681 \times 10^3}{10440}$

= 176.406 Mpa

< 205 MPa(PERMISSIBLE SHEAR STRESS)

HENCE OK

TOTAL WEIGHT OF EACH BUILT UP COLUMN MEMBER

1 WEIGHT OF MAIN MEMBER = 4 X 9.22 X 10.5 = 387.24 Kg

2 WEIGHT OF LACING AND BATTENS

= (2X24X0.668+2X2X0.52)X2.75+(2X24X.23X4.55)

= 144.128 Kg

DESIGN WITH CONVENSIONAL SECTIONS

REF. BIS SP38: 1987

DESIGN SECTION FOR COLUMN : ISMB550 @ 86.9 Kg/m

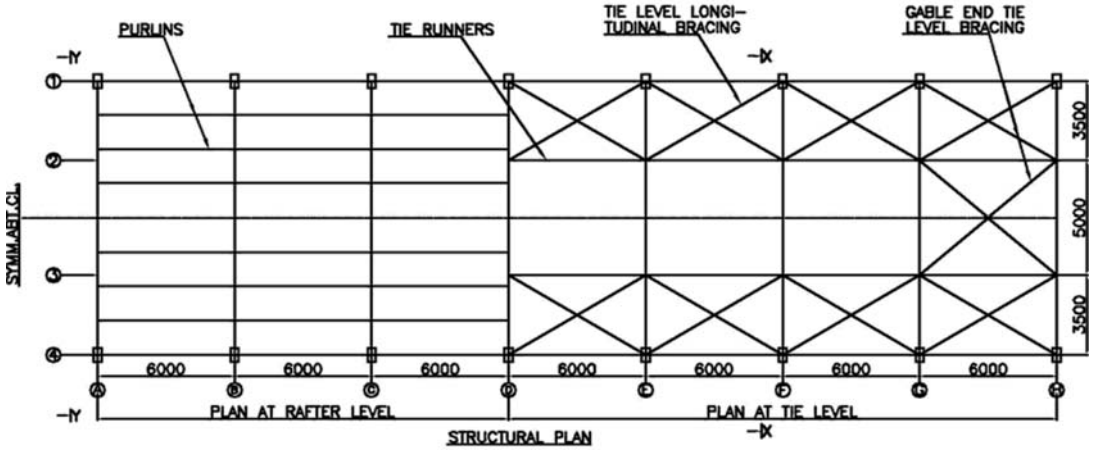
NOTE : CONSIDERING WIND LOAD AS PER IS 875:1987 AS CALCULATED ABOVE THAT REQUIRED CONVENSIONAL SECTION SHOULD BE ISMB550 @ 103.7 Kg/m TO MAKE ADEQUATE TO TAKE CARE OF INCREASED DESIGNED LOAD.

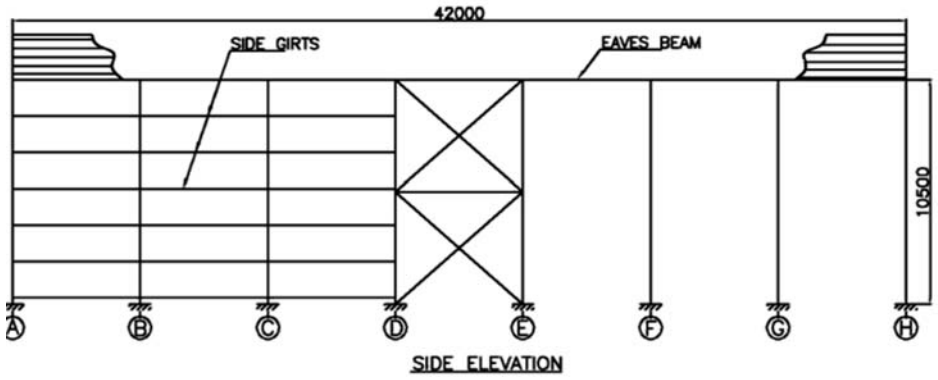
TOTAL WEIGHT WEIGHT OF ONE COLUMN = 103.7 X 10.5 = 1088.85 Kg

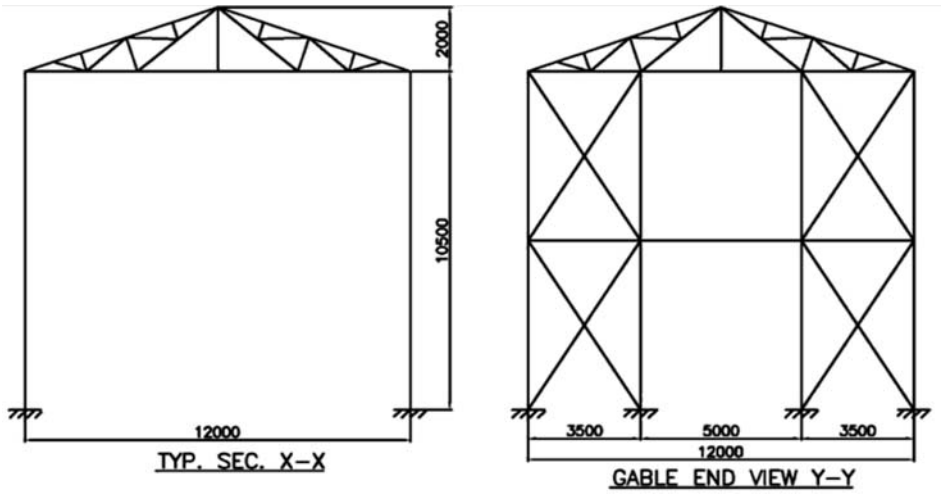
DESIGN OF BRACING

COLUMN HAVE BEEN DESIGNED AS A TIED CANTILEVERED TO RESIST WIND FORCE NORMAL TO THE RIDGE CONSEQUENTLY THE TIE BRACING IN THE L-DIRECTION IS DESIGNED NOMINALLY TO MINIMIZE THE DIFFERNCIAL DEFLECTION OF VARIOUS FRAMES AND TO PROVIDE MORE RIGIDITY.

THE BRACING AT THE LEVEL AT TWO END BAY IS DESIGNED TO TRANSFER WIND LOAD ON THE BUILDING DUE TO WIND PARELLEL TO RIDGE.







STRUCTURAL LAYOUT OF THE SHED

DESIGN OF TIE LEVE BRACING

LENGTH OF BRACING MEMBER = $\sqrt{(6^2 + 3.5^2)}$ = 6.946 m

SINCE THESE ARE TENSION MEMBER (L/r) = 350

$$R_{xx} \text{ REQ.} = \frac{694.6}{350} = 1.985$$

$$R_{yy} \text{ REQ.} = \frac{694.6}{2X\ 350} = 0.992$$

PROVIDE RHS 66X33X2.6 @ 3.69 Kg/m

Rxx = 2.31 cm

Ryy = 1.34 cm

TOTAL WEIGHT WITH RHS = 4 X 5 X 6.946 X 3.69 = 512.61 Kg

DESIGN WITH CONVENSIONAL BRACING

REF . BIS SP38 : 1987

RECOMMENDED SECTION ISA 65X65X6 @ 5.8Kg/m

(R_{xx} =R_{yy} =1.98 cm, Ruu =2.5 cm, Rvv= 1.26 cm)

TOTAL WEIGHT = 4 X 5 X 6.946 X 5.8 = 805.74 Kg

DESIGN OF TIE RUNNERS

TIE RUNER IS DESIGN ON THE BASIS OF l/r RATIO

LENGTH OF TIE RUNNER = 6 m

$$R_{min} = \frac{600}{350} = 1.714$$

PROVIDES SHS 50X50X2.6 @ 3.74 Kg/m

R_{min} = 1.92 cm

TOTAL WEIGHT WITH SHS = 3X42 X 3.74 = 471.24 Kg

DESIGN WITH CONVENSIONAL BRACING

REF . BIS SP38 : 1987

RECOMMENDED SECTION ISA 90X90X6 @ 8.2Kg/m

(R_{xx} =R_{yy} =1.75 cm)

TOTAL WEIGHT = 3 X 42X 8.2 = 1033.2 Kg

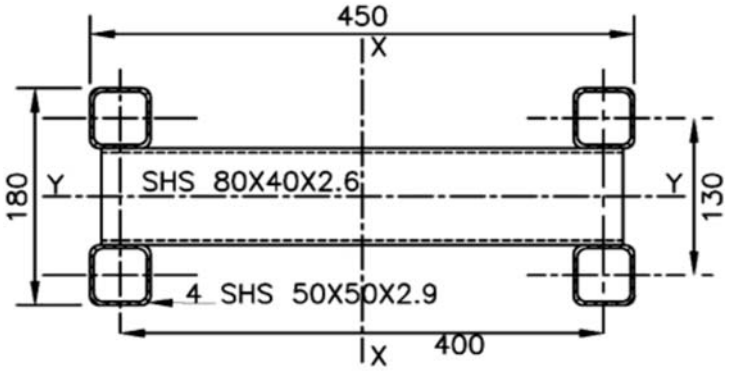
DESIGN OF GABLE WIND COLUMN

WIND LOAD

HIEGHT OF THE COLUMN	=	10.5 m
WIND FORCE ON COLUMN	=	0.9X 653.4 X (3.5+2.5)/2
	=	1765 N/m
BENDING MOMENT M_{max}	=	1765 X 10.5^2 /8
	=	24323.91 Nm
SHEAR FORCE AT BASE	=	5/8 X 1765 X 10.5
	=	11582.8 N

DEAD LOAD

SELF WEIGHT @500 N/m	=	500 X10.5 =1050 N
WEIGHT OF SIDE GIRT @100N/m	=	(3.5 X 7/2 +5 X 4/2) X100
	=	2225 N
WEIGHT OF C.G.I. SHEETING	=	(3.5 X10.5/2 +5 X 10.5/2) X60
	=	2677.5 N
TOTAL	=	5952.5 N



GABLE END COLUMN C/S

A = 4X5.25 = 21 cm^2

I_{xx} = $4(18.99+21(40/2)^2)$

= 33675.96 cm^4

I_{yy} = $4(18.99+21(18/2)^2)$

= 3624.96 cm^4

R_{xx} = $\sqrt{Ixx/A}$

= 40.045 cm

R_{xx} = $\sqrt{Iyy/A}$

= 13.14 cm

λ = Ixx/ Rxx = 26.2211

λ = Iyy/ Ryy = 79.909

ALLOWABLE AXIAL COMPRESSIVE STRESS

(σ ac permissible) = 179.578 Mpa (REF. IS800:1984 TABLE 5.1)

COMPRESSIVE FORCE PER LEG DUE TO D.L. = $\frac{5952.5}{4}$ = 1488.125 Mpa

COMPRESSIVE FORCE PER LEG DUE TO MOMENT

= $\frac{24323.91}{2 \text{ X } 0.4}$ = 30404.88281 Mpa

TOTAL COMPRESSIVE FORCE PER LEG = 1488.125+30404.88 = 31893.00781 Mpa

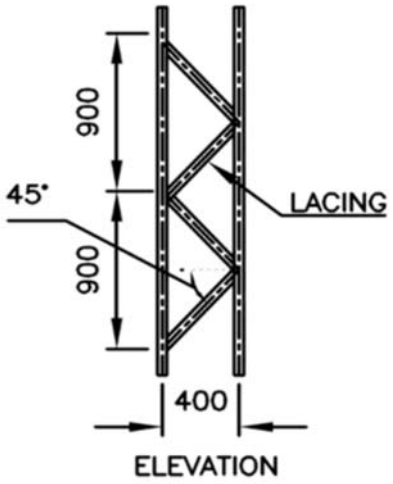
MAX. COMPRESSIVE STRESS PER LEG DUE TO DEAD LOAD & BENDING MOMENT

= $\frac{31893.01}{525}$ = 60.75 Mpa

1.33 X 179.578 > 60.749

(σ ac permissible) > (σ ac actual) **HENCE SAFE**

DESIGN OF COMPOUND COLUMN LACING



CONSIDER SINGLE LACING MEMBER AT 45^0 WITH THE VERTICAL AS SHOWN

UNSUPPORTED LENGTH = 900 mm

LENGTH OF LACING MEMBER = 450 / cos 45 = 637

MAX. SHEAR FORCE

= 2.5% OF AXIAL LOAD + CALCULATED SHEAR

= 0.025 X 5952.5 +11582.5

= 11731.62 N

MAX. AXIAL LOAD ON LACING MEMBER $= \frac{11731.62}{\cos 45} =$ 16591.01 N

TRY 80X40X2.6 @4.55 KG/m

Rxx	=	2.84 cm	A =	5.8 cm^2
Ryy	=	1.65 cm		
L_{eff}	=	0.7 X 637	=	446
L_{eff}/R_{yy}	=	44.6/1.65	=	27.03

ALLOWABLE AXIAL COMPRESSIVE STRESS

(σac permissible) = 179.485 Mpa (REF. IS800:1984 TABLE 5.1)

MAX. COMPRESSIVE FORCE $= \frac{16591}{580} =$ 28.605 Mpa

< ALLOWABLE COMPRESSIVE STRESS (179.485Mpa)

HENCE OK

DESIGN OF BRACING FOR WIND PERPENDICULAR TO RIDGE

WIND DRAG ON ROOF AND WALL

(REFER CLUASE 6.3.1 OF IS:875 (PART 3) :1987)

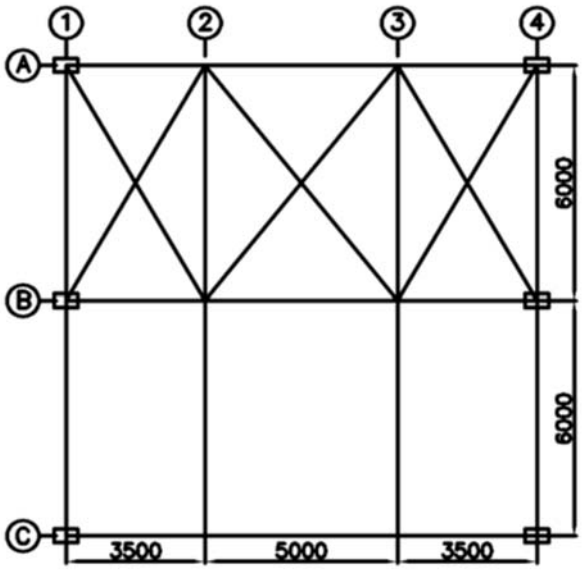
d = 42.0 m , h = 10.5 m , b = 12m)

d/h = 4

AS d/h = 4 WIND DRAG ON WALL AND ROOF SHOULD NOT BE CONSIDERD

TIE LEVEL BRACING AT GABLE END

WINDWORD SIDE BRACING *(REFER FIG. BELOW)*



TIE LEVEL PLAN

WIND FORCE AT NODE (2) & (3)

REACTION FROM GABLE END COLUMN

$$= \frac{(3.5 + 5) \times 653.4 \times 0.9}{2} = 2500 \text{ N}$$

WIND FORCE AT NODE (1) & (4)

ASSUMING EXTRA PROJECTION 250 mm Leff =3.5+0.23 = 3.73 m

REACTION FROM GABLE END COLUMN

$$= \frac{3.73 \times 653.4 \times 0.9}{2} = 1097 \text{ N}$$

$$\text{LENGTH OF BRACING MEMBER} = \sqrt{(6^2 + 3.5^2)} = 6.946 \text{ m}$$

$$\text{MAXIMUM TENSION IN BRACING} = \frac{2500 \times 6.946}{6} = 2895 \text{ N}$$

$$\text{NET EFFECTIVE AREA REQUIRED} = \frac{2895}{205 \times 1.33 \times 100} = 0.106 \text{ cm}^2$$

$$\text{LENGTH OF BRACING MEMBER} = \sqrt{(6^2 + 5^2)} = 7.81 \text{ m}$$

$$\text{NET EFFECTIVE AREA REQUIRED} = \frac{1097}{205 \times 1.33 \times 100} = 0.04 \text{ cm}^2$$

SINCE THESE ARE TENSION MEMBER (L/r) = 350

R_{xx} REQ. = $\frac{781}{350}$ = 2.231

R_{yy} REQ. = $\frac{781}{2X\ 350}$ = 1.116

PROVIDE RHS 66X33X2.6 @ 3.69 Kg/m

Rxx = 2.31 cm

Ryy = 1.34 cm

TOTAL WEIGHT WITH RHS = 2 X (4 X 6.946 +2 X 7.81) X 3.69 = 320.32 Kg

DESIGN WITH CONVENSIONAL BRACING SECTION

REF . BIS SP38 : 1987

RECOMMENDED SECTION ISA 70X70X6 @ 6.3Kg/m

TOTAL WEIGHT = 2 X (4 X 6.946 +2 X 7.81) X 6.3 = 547 Kg

RAFTER BRACING

RAFTER BRACING IS PROVIDED IN THE END PAIR OF TRUSSES TO TAKE CARE OF ERRECTION LOAD . EXTREME TWO SETS PURLIN ARE TO BE CONNECTED WITH BRACING MEMBER.

LENGTH OF BRACING MEMBER = $\sqrt{(6^2+ 6.32^2)}$ = 8.714 m

SINCE THESE ARE TENSION MEMBER (L/r) = 350

R_{xx} REQ. = $\frac{871.4}{350}$ = 2.490

R_{yy} REQ. = $\frac{871.4}{2X\ 350}$ = 1.245

PROVIDE RHS 80X40X2.6 @ 4.55 Kg/m

Rxx = 2.31 cm

Ryy = 1.34 cm

TOTAL WEIGHT WITH RHS = (2(4 X 8.714 X 4.55) = 317.19Kg

DESIGN WITH CONVENSIONAL BRACING SECTION

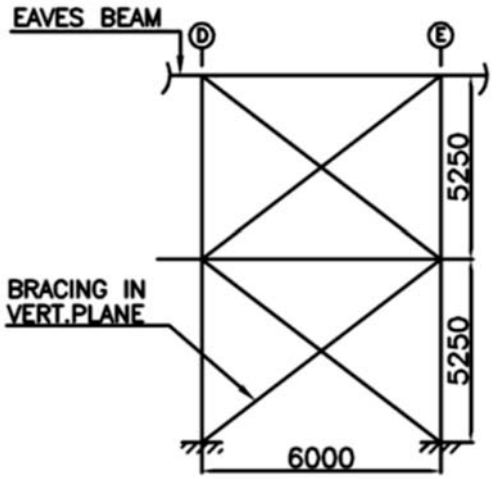
REF . BIS SP38 : 1987

RECOMMENDED SECTION ISA 80X80X6 @ 7.3Kg/m

TOTAL WEIGHT = (2(4 X 8.714 X 7.3) = 509 Kg

WIND BRACING IN BAY (D) - (E)

(REFER FIG. BELOW)



DESIGN OF EAVES BEAM AND VERTICAL BRACING

EAVES BEAM

FORCE FROM TIE LEVEL BRACING = 2500 + 1097 = 3597 N

$$R_{min} = \frac{600}{250} = 2.4 \text{ cm}$$

TRY SECTION 72 X72X 3.2 @ 6.71 Kg/m

A = 8.54 cm^2, Rmin = 2.79 cm

$$\text{MAXIMUM AXIAL STRESS} = \frac{3597}{854} = 4.21 \text{ Mpa}$$

$$L/R = \frac{600}{2.79} = 215.054$$

ALLOWABLE COMPRESSIVE STRESS = 24.75 Mpa REF. IS800:1984 TABLE 5.1)

> MAXIMUM AXIAL STRESS

HENCE OK

TOTAL WEIGHT WITH SHS = (2 X 42 X 6.71) 563.64 Kg

DESIGN WITH CONVENSIONAL BRACING SECTION

REF . BIS SP38 : 1987

RECOMMENDED SECTION ISMB250 @ 37.3Kg/m

TOTAL WEIGHT = (2 X 42 X 37.3) 3133.2 Kg

BRACING IN VERTICAL PLANE BETWEEN (D) & (E) COLUMN

LENGTH OF BRACING MEMBER = $\sqrt{(6^2 + 5.25^2)}$ = 7.97m

SINCE THESE ARE TENSION MEMBER (L/r) = 350

$$R_{xx} \text{ REQ.} = \frac{797}{350} = 2.277$$

$$R_{yy} \text{ REQ.} = \frac{797}{2X\ 350} = 1.139$$

$$\text{MAXIMUM TENSION IN BRACING} = \frac{3597\ X7.97}{6} = 4778N$$

PROVIDE RHS 80X40X2.6 @ 4.55 Kg/m

Rxx = 2.84 cm A = 5.8 cm^2

Ryy = 1.65 cm

$$\text{MAX. TENSILE STRESS} = \frac{4778}{580} = 8.24 \text{ Mpa}$$

< 1.33 X 205 Mpa

HENCE OK

TOTAL WEIGHT WITH RHS = (2(4 X 7.97 X 4.55) = 290Kg

DESIGN WITH CONVENSIONAL BRACING SECTION

REF . BIS SP38 : 1987

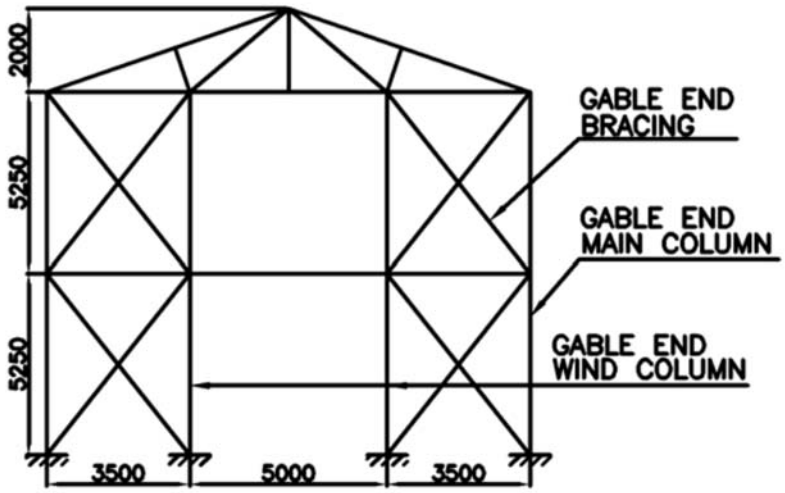
RECOMMENDED SECTION ISA70X70X6 @ 6.3Kg/m

TOTAL WEIGHT = (2(4 X 7.97 X 6.3) = 401.69Kg

THE FOUNDATION OF THESE COLUMNS TO BE CHECKED FOR ADDITIONAL AXIAL FORCE TUE TO BRACING FORCE

DESIGN OF GABLE END BRACING

SINCE COLUMN ARE DESIGNED AS PROPPED CANTILEVERE TO RESIST WIND FORCE, THE GABLE END BRACING AS SHOWN BELOW ARE DESIGNED NOMINALLY FOR OVERALL STIFFNESS OF THE STRUCTURE.



GABLE END VIEW

LENGTH OF BRACING MEMBER = $\sqrt{(3.5^2 + 5.25^2)}$ = 6.31 m

SINCE THESE ARE TENSION MEMBER (L/r) = 350

$$R_{xx} \text{ REQ.} = \frac{631}{350} = 1.803$$

$$R_{yy} \text{ REQ.} = \frac{631}{2 \times 350} = 0.901$$

PROVIDE RHS 66X33X2.6 @ 3.69 Kg/m

Rxx = 2.31 cm A = 4.7 cm^2

Ryy = 1.34 cm

TOTAL WEIGHT WITH RHS = 2(8 X 6.31 X 3.69) = 372.54 Kg

DESIGN WITH CONVENSIONAL BRACING SECTION

REF . BIS SP38 : 1987

RECOMMENDED SECTION ISA55X55X6 @ 4.9Kg/m

TOTAL WEIGHT = 2(8 X 6.31 X 4.9) = 495 Kg

NOTE :

DETAIL DESIGN OF DIFFERENT CONNECTION LIKE COLUMN BASE PLATE, ROOF TRUSS GUSSET PLATE, SUPPORT ETC. ARE NOT WORKED OUT HERE TO LIMIT THE SIZE OF THIS HANDBOOK WHICH MAY BE DONE FOLLOWING ANY STANDARD PROCEDURE BASED ON CORRESPONDING REACTION VALUE. HOWEVER FOR CALCULATION OF TOTAL WEIGHT, CONNECTING PLATE WEIGHTS HAVE BEEN CONSIDERED AS PER BIS PROVISION FOR CONVENTIONAL DESIGN & AS PER PRACTICAL EXPERIENCE FOR RHS / SHS DESIGN.

Corrosion Resistant Properties

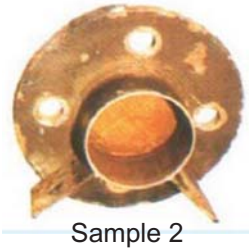
1. Internal corrosion cannot occur in sealed closed structural as water is excluded and oxygen unreplenished. Only external surface needs protection.
2. RHS/SHS have a smooth continuous profile with non re-entrant corners which do not trap dirt and water. RHS/SHS do not require stripe coating as they have no edges and sharp corners.

INTERNAL CORROSION – A case study

Sample 1

Two of the original 'Tubewrights' erected in 1954 at Stamford Bridge, Chelsea, were replaced in 1975, taken down and the used sections were cut and despatched to the Corby Works of British Steel for examination.

Sample No 1. Of the 139.7mm o.d. CHS was cut lengthwise to expose the internal surfaces for examination. Little evidence of internal corrosion was found other than a discolouration of the surface caused by the oxygen and moisture in the entrapped air; much of the original mill scale was still visible. A light rust in the centre of the sample developed after the tube was cut open for examination.



Sample 2

Sample No 2. Of the 139.7mm o.d. CHS incorporating an intermediate flanged joint was examined and the condition of the internal flange face, which had been enclosed and thus hermatically sealed by welding to the CHS, was still comparatively bright with the marking-off lines clearly visible.

The above report is from British Steel Publication No. TD 347/10E/91 titled – CORROSION THE CASE for STRUCTURAL HOLLOW SECTIONS.

The following historical examples demonstrate that corrosion will not occur on internal surface of sealed hollow sections.

Certain of the examination referred to have also indicated that, even when weld seams are not perfectly sealed or small holes have been made in the section, traces of superficial rust only can be detected in the immediate neighbourhood of the appropriate welds or holes.

Application	Location	Comment	Period of service of sample (years)	Examination
Trolley bus poles	Pittsburg USA	At least 22,000 such poles were installed. Some 18,000 still in service today	40-50	Thicknesses of section walls still within original manufacturing tolerance
Lighting Column	Daylon, Ohio, USA	No corrosion damage visible on any column in the series	59	Internal surfaces still bore original mill scale, No pitting of steel
Davits of ocean liner SS Aquitania		Application subject to aggressive marine environment. Two davits donated for research when ship scrapped	37	No internal corrosion
Roof trusses at pickling plant	Hiltrup, Westphalia	Extremely aggressive industrial environment	9	No internal corrosion. Original mill scale visible
	Italy	Tubular lattices available	25-30	No internal corrosion detected

The above table is reprinted from CIDECT publication 'The Hollow Section' No.6, 1982, and refers to case studies that demonstrate the non-occurrence of Internal Corrosion.

Conclusion: Hollow Sections that are sealed by the combination of end details and structural quality welding do not corrode internally.

SAFE LOADS IN “KN” FOR SINGLE RHS STRUT DIFFERENT L/Rmin RATIOS

MATERIAL TATA STRUCTURA GRADE YST-310, IS-4923

SHS SIZE	AREA	Ryy	Leff 2m	SAFE	Leff 3m	SAFE	Leff 4m	SAFE	Leff 5m	SAFE	Leff 6m	SAFE	Leff 7m	SAFE	Leff 8m	SAFE
			Ryy	LOAD	Ryy	LOAD	Ryy	LOAD	Ryy	LOAD	Ryy	LOAD	Ryy	LOAD	Ryy	LOAD
50X25X2	174	10.10	198.02	4.98												
50X25X2.6	346	9.90	202.02	9.55												
50X25X3.2	413	9.60	208.33	10.88												
50X25X4	495	9.20	217.39	11.77												
60X40X2.6	476	15.90	125.79	29.96	188.68	14.94										
60X40X2.9	525	15.80	126.58	32.76	189.87	16.29										
60X40X3.6	635	15.50	129.03	38.53	193.55	19.01										
60X40X4.5	767	15.10	132.45	44.70	198.68	21.78										
66X33X2.6	470	13.40	149.25	22.30	223.88	10.63										
66X33X2.9	519	13.30	150.38	24.30	225.56	11.65										
66X33X3.6	628	12.90	155.04	27.93	232.56	13.49										
66X33X4.5	758	12.50	160.00	31.84	240.00	15.16										
80X40X2.6	580	16.50	121.21	38.37	181.82	19.40										
80X40X3.2	701	16.20	123.46	45.27	185.19	22.74										
80X40X4	855	15.90	125.79	53.82	188.68	26.84										
80X40X4.8	1001	15.50	129.03	60.74	193.55	29.97										
96X48X3.2	854	19.70	101.52	73.00	152.28	39.16	203.05	23.39								
96X48X4	1047	19.40	103.09	87.85	154.64	46.78	206.19	28.02								
96X48X4.8	1231	19.00	105.26	100.62	157.89	53.00	210.53	31.81								
122X61X3.6	1232	25.30	79.05	140.97	118.58	84.30	158.10	52.91	197.63	35.37	237.15	25.34				
122X61X4.5	1514	24.90	80.32	170.40	120.48	100.93	160.64	63.20	200.80	42.15	240.96	29.99				
122X61X5.4	1785	24.50	81.63	197.63	122.45	116.54	163.27	72.64	204.08	48.52	244.90	33.95				
145X82X4.8	2028	33.60	59.52	291.36	89.29	202.80	119.05	137.81	148.81	96.76	178.57	70.11	208.33	53.40	238.10	41.33

SAFE LOADS IN “KN” FOR SINGLE RHS STRUT DIFFERENT L/Rmin RATIOS

MATERIAL TATA STRUCTURA GRADE YST-310, IS-4923

SHS SIZE	AREA	Ryy	Leff 2m Ryy	SAFE LOAD	Leff 3m Ryy	SAFE LOAD	Leff 4m Ryy	SAFE LOAD	Leff 5m Ryy	SAFE LOAD	Leff 6m Ryy	SAFE LOAD
145X82X5.4	2260	33.30	60.06	322.98	90.09	223.50	120.12	151.23	150.15	106.05	180.18	76.72
172X92X4.8	2383	38.20	52.36	366.27	78.53	274.52	104.71	196.09	130.89	141.50	157.07	103.58
172X92X5.4	2659	37.90	52.77	407.15	79.16	303.83	105.54	216.60	131.93	155.95	158.31	113.92
200X100X4	2295	42.30	47.28	367.80	70.92	290.59	94.56	214.64	118.20	157.89	141.84	119.10
200X100X5	2836	41.90	47.73	452.97	71.60	356.21	95.47	262.16	119.33	191.91	143.20	144.87
200X100X6	3363	41.40	48.31	534.81	72.46	418.04	96.62	306.23	120.77	223.50	144.93	168.30
200X100X8	4379	40.50	49.38	690.75	74.07	533.75	98.77	387.46	123.46	282.80	148.15	210.68
220X140X4	2775	58.40	34.25	483.34	51.37	430.35	68.49	361.47	85.62	291.76	102.74	233.82
220X140X5	3436	58.00	34.48	597.75	51.72	531.16	68.97	445.14	86.21	358.41	103.45	287.08
220X140X6	4083	57.50	34.78	709.20	52.17	628.60	69.57	525.29	86.96	421.61	104.35	337.47
220X140X8	5339	56.60	35.34	924.70	53.00	815.77	70.67	678.02	88.34	540.97	106.01	432.42
240X120X4	2775	51.10	39.14	471.13	58.71	401.84	78.28	320.74	97.85	248.59	117.42	193.09
240X120X5	3436	50.70	39.45	582.39	59.17	495.33	78.90	393.96	98.62	304.62	118.34	235.90
240X120X6	4083	50.20	39.84	690.61	59.76	585.24	79.68	463.33	99.60	357.17	119.52	275.51
240X120X8	5339	49.30	40.57	898.65	60.85	756.65	81.14	594.82	101.42	456.91	121.70	351.35
260X180X6	5043	74.00	27.03	905.15	40.54	849.00	54.05	763.13	67.57	663.90	81.08	562.23
260X180X8	6619	73.10	27.36	1186.92	41.04	1110.35	54.72	995.45	68.40	863.12	82.08	728.68
260X180X10	8143	72.20	27.70	1458.82	41.55	1361.01	55.40	1216.87	69.25	1051.44	83.10	884.79
260X180X12	9614	71.30	28.05	1720.66	42.08	1600.82	56.10	1427.28	70.13	1228.77	84.15	1030.50
300X150X6	5163	63.50	31.50	912.06	47.24	827.67	62.99	715.14	78.74	593.18	94.49	483.33
300X150X8	6779	62.60	31.95	1194.77	47.92	1081.20	63.90	929.76	79.87	767.33	95.85	623.56
300X150X10	8343	61.70	32.41	1466.92	48.62	1323.64	64.83	1132.61	81.04	930.64	97.24	753.43
300X150X12	9854	60.80	32.89	1728.34	49.34	1554.86	65.79	1323.55	82.24	1082.64	98.68	872.86
300X200X6	5763	82.90	24.13	1042.74	36.19	993.72	48.25	916.89	60.31	821.40	72.38	717.12
300X200X8	7579	82.00	24.39	1370.32	36.59	1304.14	48.78	1200.99	60.98	1072.71	73.17	934.07
300X200X10	9343	81.10	24.66	1688.00	36.99	1604.27	49.32	1474.45	61.65	1312.89	73.98	1140.09
300X200X12	11054	80.20	24.94	1995.59	37.41	1893.93	49.88	1737.13	62.34	1541.85	74.81	1335.11

SAFE LOADS IN “KN” FOR SINGLE RHS STRUT DIFFERENT L/Rmin RATIOS

MATERIAL TATA STRUCTURA GRADE YST-310, IS-4923

SHS SIZE	AREA	Ryy	Leff 7m Ryy	SAFE LOAD	Leff 8m Ryy	SAFE LOAD	Leff 9m Ryy	SAFE LOAD	Leff 10m Ryy	SAFE LOAD	Leff 12m Ryy	SAFE LOAD
145X82X5.4	2260	33.30	210.21	58.62	240.24	45.09						
172X92X4.8	2383	38.20	183.25	78.70	209.42	62.23	235.60	49.76				
172X92X5.4	2659	37.90	184.70	86.66	211.08	68.27	237.47	54.53				
200X100X4	2295	42.30	165.48	91.36	189.13	71.75	212.77	57.77	236.41	47.55		
200X100X5	2836	41.90	167.06	111.10	190.93	87.12	214.80	69.65	238.66	57.48		
200X100X6	3363	41.40	169.08	129.03	193.24	100.99	217.39	79.98	241.55	66.22		
200X100X8	4379	40.50	172.84	161.43	197.53	125.86	222.22	99.74	246.91	68.12		
220X140X4	2775	58.40	119.86	186.31	136.99	152.93	154.11	124.72	171.23	104.08	205.48	74.66
220X140X5	3436	58.00	120.69	228.55	137.93	187.08	155.17	152.61	172.41	127.25	206.90	91.47
220X140X6	4083	57.50	121.74	268.59	139.13	218.88	156.52	178.59	173.91	148.76	208.70	107.22
220X140X8	5339	56.60	123.67	343.98	141.34	278.67	159.01	226.88	176.68	188.62	212.01	135.59
240X120X4	2775	51.10	136.99	152.93	156.56	121.33	176.13	98.65	195.69	81.28	234.83	58.37
240X120X5	3436	50.70	138.07	186.76	157.79	148.11	177.51	120.24	197.24	99.05	236.69	71.00
240X120X6	4083	50.20	139.44	217.99	159.36	172.79	179.28	139.99	199.20	115.30	239.04	82.44
240X120X8	5339	49.30	141.99	276.60	162.27	219.39	182.56	177.43	202.84	146.46	243.41	103.14
260X180X6	5043	74.00	94.59	471.45	108.11	397.85	121.62	332.16	135.14	284.45	162.16	207.44
260X180X8	6619	73.10	95.76	609.54	109.44	513.38	123.12	429.02	136.80	365.64	164.16	266.99
260X180X10	8143	72.20	96.95	738.22	110.80	620.47	124.65	519.05	138.50	440.11	166.20	321.80
260X180X12	9614	71.30	98.18	857.45	112.20	719.11	126.23	602.23	140.25	508.09	168.30	371.86
300X150X6	5163	63.50	110.24	396.33	125.98	324.29	141.73	268.27	157.48	223.35	188.98	161.64
300X150X8	6779	62.60	111.82	509.64	127.80	417.20	143.77	343.95	159.74	285.58	191.69	206.71
300X150X10	8343	61.70	113.45	613.61	129.66	502.57	145.87	412.81	162.07	343.48	194.49	247.40
300X150X12	9854	60.80	115.13	708.19	131.58	580.35	148.03	474.81	164.47	396.23	197.37	283.69
300X200X6	5763	82.90	84.44	615.40	96.50	525.57	108.56	452.02	120.63	383.59	144.75	289.01
300X200X8	7579	82.00	85.37	799.49	97.56	681.56	109.76	585.43	121.95	497.44	146.34	372.85
300X20010	9343	81.10	86.31	973.18	98.64	828.05	110.97	710.31	123.30	604.37	147.97	450.53
300X200X12	11054	80.20	87.28	1136.41	99.75	965.01	112.22	826.62	124.69	704.34	149.63	522.02

NOTE: 1) SAFE LOADS CALCULATED FOR L/RYY UPTO 250.
2) SAFE LOADS ARE CALCULATED CONSIDERING UNSUPPORTED ABOUT MINOR AXIS

SAFE LOADS IN “KN” FOR SINGLE SHS STRUT DIFFERENT L/Rmin RATIOS

MATERIAL TATA STRUCTURA GRADE YST-310, IS-4923

SHS SIZE	AREA	Ryy	Leff 2m	SAFE	Leff 3m	SAFE	Leff 4m	SAFE	Leff 5m	SAFE	Leff 6m	SAFE	Leff 7m	SAFE
			Ryy	LOAD	Ryy	LOAD	Ryy	LOAD	Ryy	LOAD	Ryy	LOAD	Ryy	LOAD
25X25X2	174	9.20	217.39	4.40										
25X25X2.6	216	8.90	224.72	4.87										
25X25X3.2	253	8.60	232.56	5.44										
32X32X2	230	12.10	165.29	9.17	247.93									
32X32X2.6	288	11.80	169.49	11.00	254.24									
32X32X3.2	342	11.50	173.91	12.46	260.87									
38X38X2.6	351	14.30	139.86	18.64	209.79	9.14								
38X38X3.2	419	14.00	142.86	21.49	214.29	10.36								
38X38X4	503	13.60	147.06	24.53	220.59	11.54								
40X40X2.6	372	15.10	132.45	21.68	198.68	10.56								
40X40X3.2	445	14.80	135.14	25.10	202.70	12.22								
40X40X4	535	14.40	138.89	28.77	208.33	14.09								
50X50X2.6	476	19.20	104.17	39.43	156.25	20.88	208.33	12.53						
50X50X2.9	525	19.00	105.26	42.91	157.89	22.60	210.53	13.57						
50X50X3.6	635	18.70	106.95	50.83	160.43	26.56	213.90	15.77						
50X50X4.5	767	18.20	109.89	59.14	164.84	30.73	219.78	17.69						
60X60X2.6	580	23.30	85.84	60.80	128.76	35.31	171.67	21.65	214.59	15.15				
60X60X3.2	701	23.00	86.96	72.39	130.43	41.85	173.91	25.54	217.39	16.67				
60X60X4	855	22.60	88.50	86.45	132.74	49.66	176.99	30.10	221.24	19.56				
60X60X4.8	1001	22.20	90.09	98.99	135.14	56.46	180.18	33.98	225.23	22.50				
72X72X3.2	854	27.90	71.68	107.15	107.53	67.87	143.37	43.54	179.21	29.31	215.05	20.91		
72X72X4	1047	27.50	72.73	129.73	109.09	81.57	145.45	52.06	181.82	35.03	218.18	24.65		
72X72X4.8	1231	27.10	73.80	150.55	110.70	93.92	147.60	59.63	184.50	40.19	221.40	28.14		
80X80X3.2	957	31.10	64.31	130.67	96.46	87.32	128.62	58.35	160.77	39.90	192.93	28.83	225.08	21.52
80X80X4	1175	30.70	65.15	158.95	97.72	105.44	130.29	70.26	162.87	48.00	195.44	34.51	228.01	26.08
80X80X4.8	1385	30.40	65.79	186.03	98.68	122.68	131.58	81.57	164.47	55.69	197.37	39.87	230.26	30.40

SAFE LOADS IN “KN” FOR SINGLE SHS STRUT DIFFERENT L/Rmin RATIOS

MATERIAL TATA STRUCTURA GRADE YST-310, IS-4923

SHS SIZE	AREA	Ryy	Leff 2m Ryy	SAFE LOAD	Leff 3m Ryy	SAFE LOAD	Leff 4m Ryy	SAFE LOAD	Leff 5m Ryy	SAFE LOAD	Leff 6m Ryy	SAFE LOAD
91.5X91.5X3.6	1232	35.60	56.18	182.77	84.27	131.85	112.36	91.96	140.45	64.96	168.54	47.54
91.5X91.5X4.5	1514	35.20	56.82	223.25	85.23	160.00	113.64	111.07	142.05	78.38	170.45	57.26
91.5X91.5X5.4	1785	34.80	57.47	261.57	86.21	186.19	114.94	128.62	143.68	90.67	172.41	66.11
100X100X4	1495	38.90	51.41	231.76	77.12	175.39	102.83	125.84	128.53	91.23	154.24	67.09
100X100X5	1836	38.40	52.08	282.90	78.13	212.63	104.17	152.08	130.21	109.89	156.25	80.55
100X100X6	2163	37.90	52.77	331.20	79.16	247.16	105.54	176.20	131.93	126.86	158.31	92.67
113.5X113.5X4.8	2028	44.00	45.45	329.46	68.18	265.11	90.91	198.56	113.64	148.78	136.36	112.65
113.5X113.5X5.4	2260	43.80	45.66	366.58	68.49	294.39	91.32	220.15	114.16	164.63	136.99	124.55
132X132X4.8	2383	51.60	38.76	405.39	58.14	346.98	77.52	278.15	96.90	216.19	116.28	168.53
132X132X5.4	2659	51.30	38.99	451.80	58.48	385.90	77.97	308.55	97.47	239.42	116.96	186.24
150X150X4	2295	59.30	33.73	400.81	50.59	358.42	67.45	302.53	84.32	245.46	101.18	196.96
150X150X5	2836	58.90	33.96	494.71	50.93	441.54	67.91	371.89	84.89	301.05	101.87	241.44
150X150X6	3363	58.40	34.25	585.76	51.37	521.54	68.49	438.07	85.62	353.58	102.74	283.37
150X150X8	4379	57.40	34.84	760.37	52.26	673.62	69.69	562.57	87.11	451.25	104.53	361.14
180X180X4	2775	71.60	27.93	496.82	41.90	462.65	55.87	412.89	69.83	355.90	83.80	298.82
180X180X5	3436	71.10	28.13	614.82	42.19	571.64	56.26	509.34	70.32	438.14	84.39	367.16
180X180X6	4083	70.60	28.33	730.19	42.49	677.81	56.66	602.98	70.82	517.59	84.99	432.88
180X180X8	5339	69.70	28.69	953.83	43.04	882.80	57.39	782.99	71.74	669.49	86.08	557.84
220X220X6	5043	87.00	22.99	915.33	34.48	877.31	45.98	749.55	57.47	739.00	68.97	653.33
220X220X8	6619	86.00	23.26	1200.50	34.88	1149.09	46.51	978.84	58.14	963.76	69.77	849.54
220X220X10	8143	85.00	23.53	1475.80	35.29	1410.66	47.06	1197.98	58.82	1177.86	70.59	1035.12
220X220X12	9614	84.10	23.78	1741.19	35.67	1662.22	47.56	1407.61	59.45	1382.16	71.34	1211.22
250X250X6	5763	99.20	20.16	1054.16	30.24	1024.56	40.32	971.72	50.40	901.54	60.48	819.93
250X250X8	7579	98.20	20.37	1385.57	30.55	1345.31	40.73	1274.18	50.92	1180.18	61.10	1071.29
250X250X10	9343	97.30	20.55	1707.18	30.83	1656.05	41.11	1566.52	51.39	1448.70	61.66	1312.72
250X250X12	11054	96.30	20.77	2018.63	31.15	1956.14	41.54	1847.74	51.92	1705.75	62.31	1542.50

SAFE LOADS IN “KN” FOR SINGLE SHS STRUT DIFFERENT L/Rmin RATIOS

MATERIAL TATA STRUCTURA GRADE YST-310, IS-4923

SHS SIZE	AREA	Ryy	Leff 7m Ryy	SAFE LOAD	Leff 8m Ryy	SAFE LOAD	Leff 9m Ryy	SAFE LOAD	Leff 10m Ryy	SAFE LOAD	Leff 12m Ryy	SAFE LOAD
91.5X91.5X3.6	1232	35.60	196.63	35.74	224.72	27.75						
91.5X91.5X4.5	1514	35.20	198.86	42.91	227.27	33.72						
91.5X91.5X5.4	1785	34.80	201.15	49.57	229.89	39.29						
100X100X4	1495	38.90	179.95	50.86	205.66	40.17	231.36	32.48				
100X100X5	1836	38.40	182.29	61.16	208.33	48.35	234.38	38.79				
100X100X6	2163	37.90	184.70	70.49	211.08	55.54	237.47	44.36				
113.5X113.5X4.8	2028	44.00	159.09	86.10	181.82	67.85	204.55	54.94	227.27	45.17		
113.5X113.5X5.4	2260	43.80	159.82	95.13	182.65	75.04	205.48	60.80	228.31	50.10		
132X132X4.8	2383	51.60	135.66	133.54	155.04	106.00	174.42	86.34	193.80	71.16	232.56	51.21
132X132X5.4	2659	51.30	136.45	147.53	155.95	117.07	175.44	95.26	194.93	78.49	233.92	56.41
150X150X4	2295	59.30	118.04	158.25	134.91	129.82	151.77	105.83	168.63	88.46	202.36	63.18
150X150X5	2836	58.90	118.85	193.29	135.82	158.60	152.80	129.32	169.78	108.02	203.74	77.29
150X150X6	3363	58.40	119.86	225.78	136.99	185.33	154.11	151.15	171.23	126.14	205.48	90.48
150X150X8	4379	57.40	121.95	287.41	139.37	234.01	156.79	190.94	174.22	159.02	209.06	114.68
180X180X4	2775	71.60	97.77	248.87	111.73	208.87	125.70	174.86	139.66	147.73	167.60	108.12
180X180X5	3436	71.10	98.45	305.31	112.52	255.92	126.58	214.38	140.65	180.77	168.78	132.25
180X180X6	4083	70.60	99.15	359.38	113.31	300.86	127.48	252.19	141.64	212.37	169.97	155.20
180X180X8	5339	69.70	100.43	462.20	114.78	385.60	129.12	323.61	143.47	271.84	172.17	198.26
220X220X6	5043	87.00	80.46	566.61	91.95	487.43	103.45	421.35	114.94	363.39	137.93	274.58
220X220X8	6619	86.00	81.40	735.02	93.02	631.27	104.65	545.07	116.28	468.10	139.53	352.96
220X220X10	8143	85.00	82.35	893.34	94.12	765.92	105.88	660.54	117.65	564.74	141.18	425.83
220X220X12	9614	84.10	83.23	1042.85	95.12	892.66	107.02	768.97	118.91	654.66	142.69	494.04
250X250X6	5763	99.20	70.56	732.78	80.65	646.01	90.73	565.52	100.81	496.73	120.97	382.22
250X250X8	7579	98.20	71.28	955.53	81.47	840.87	91.65	735.32	101.83	645.48	122.20	496.12
250X250X10	9343	97.30	71.94	1168.68	82.22	1026.72	92.50	896.96	102.77	786.91	123.33	604.20
250X250X12	11054	96.30	72.69	1370.32	83.07	1201.53	93.46	1048.48	103.84	919.23	124.61	704.94

NOTE: 1) SAFE LOADS CALCULATED FOR L/RYY UPTO 250.
2) SAFE LOADS ARE CALCULATED CONSIDERING UNSUPPORTED ABOUT MINOR AXIS

SAFE LOAD CAPACITIES OF "TATA" SINGLE SHS

MATERIAL: IS : 4923, GRADE : 310

SECTION	AREA (mm^2)	TENSION			ELASTIC MODULUS		BENDING MOMENTS		DIRECT SHEAR	
		Allow. Tension Ft (KN)	Allow. Length Lx (m)	Allow. Length Ly (m)	Zxx	Zyy	Allow.@ X-X axis Mxx (Knm)	Allow.@ Y-Y axis Myy (Knm)	Allow.@ X-X axis Fx (KN)	Allow.@ Y-Y axis Fy (KN)
SHS 25X25X3.2	253	47.06	3.01	3.01	1.51	1.51	0.31	0.31	15.69	15.69
SHS 38X38X3.2	419	77.93	4.90	4.90	4.30	4.30	0.88	0.88	25.98	25.98
SHS 38X38X4.0	503	93.56	4.76	4.76	4.87	4.87	1.00	1.00	31.19	31.19
SHS 49.5X49.5X2.9	525	97.65	6.58	6.58	7.60	7.60	1.56	1.56	32.55	32.55
SHS 49X49X3.6	635	118.11	6.47	6.47	8.86	8.86	1.82	1.82	39.37	39.37
SHS 49X49X4.5	767	142.66	6.30	6.30	10.20	10.20	2.09	2.09	47.55	47.55
SHS 72X72X3.2	854	158.84	9.67	9.67	18.42	18.42	3.78	3.78	52.95	52.95
SHS 72X72X4.0	1047	194.74	9.62	9.62	21.95	21.95	4.50	4.50	64.91	64.91
SHS 72X72X4.8	1231	228.97	9.48	9.48	25.09	25.09	5.14	5.14	76.32	76.32
SHS 91.5X91.5X3.6	1232	229.15	12.46	12.46	34.21	34.21	7.01	7.01	76.38	76.38
SHS 91.5X91.5X4.5	1514	281.60	12.32	12.32	41.00	41.00	8.41	8.41	93.87	93.87
SHS 91.5X91.5X5.4	1785	332.01	12.18	12.18	47.14	47.14	9.66	9.66	110.67	110.67
SHS 113.5X113.5X4.8	2028	377.21	15.40	15.40	69.30	69.30	14.21	14.21	125.74	125.74
SHS 113.5X113.5X5.4	2260	420.36	15.33	15.33	76.23	76.23	15.63	15.63	140.12	140.12
SHS 132X132X4.8	2383	443.24	18.06	18.06	96.12	96.12	19.70	19.70	147.75	147.75
SHS 132X132X5.4	2660	494.76	17.95	17.95	106.08	106.08	21.75	21.75	164.92	164.92
SHS 150X150X4.0	2295	426.87	20.76	20.76	107.71	107.71	22.08	22.08	142.29	142.29
SHS 150X150X5.0	2836	527.50	20.62	20.62	130.95	130.95	26.84	26.84	175.83	175.83
SHS 150X150X6.0	3363	625.52	20.44	20.44	152.79	152.79	31.32	31.32	208.51	208.51
SHS 150X150X8.0	4379	814.49	20.09	20.09	192.40	192.40	39.44	39.44	271.50	271.50
SHS 180X180X4.0	2775	516.15	25.06	25.06	157.97	157.97	32.38	32.38	172.05	172.05
SHS 180X180X5.0	3436	639.10	24.89	24.89	192.99	192.99	39.56	39.56	213.03	213.03
SHS 180X180X6.0	4083	759.44	24.71	24.71	226.28	226.28	46.39	46.39	253.15	253.15
SHS 180X180X8.0	5339	993.05	24.40	24.40	287.86	287.86	59.01	59.01	331.02	331.02
SHS 220X220X6.0	5043	938.00	30.45	30.45	346.67	346.67	71.07	71.07	312.67	312.67
SHS 220X220X8.0	6619	1231.13	30.10	30.10	445.00	445.00	91.23	91.23	410.38	410.38
SHS 220X220X10	8143	1514.60	29.75	29.75	535.20	535.20	109.72	109.72	504.87	504.87
SHS 220X220X12	9614	1788.20	29.44	29.44	617.55	617.55	126.60	126.60	596.07	596.07
SHS 250X250X6.0	5763	1071.92	34.72	34.72	453.76	453.76	93.02	93.02	357.31	357.31
SHS 250X250X8.0	7579	1409.69	34.37	34.37	585.25	585.25	119.98	119.98	469.90	469.90
SHS 250X250X10	9343	1737.80	34.06	34.06	707.38	707.38	145.01	145.01	579.27	579.27
SHS 250X250X12	11054	2056.04	33.71	33.71	802.38	802.38	164.49	164.49	685.35	685.35

SAFE LOAD CAPACITIES OF "TATA" SINGLE RHS

MATERIAL: IS : 4923, GRADE : 310

SECTION	AREA (mm^2)	TENSION			ELASTIC MODULUS		BENDING MOMENTS		DIRECT SHEAR	
		Allow. Tension Ft (KN)	Allow. Length Lx (m)	Allow. Length Ly (m)	Zxx	Zyy	Allow.@ X-X axis Mxx (Knm)	Allow.@ Y-Y axis Myy (Knm)	Allow.@ X-X axis Fx (KN)	Allow.@ Y-Y axis Fy (KN)
RHS 50X25X3.2	413	76.82	5.88	3.36	4.65	3.04	0.95	0.62	25.61	51.21
RHS 66X33X2.9	519	96.53	8.01	4.65	8.28	5.53	1.70	1.13	32.18	64.36
RHS 66X33X3.6	628	116.81	7.87	4.51	9.66	6.37	1.98	1.31	38.94	77.87
RHS 66X33X4.5	758	140.99	7.70	4.37	11.10	7.23	2.28	1.48	47.00	93.99
RHS 96X48X3.2	854	158.84	11.90	6.89	20.54	13.87	4.21	2.84	52.95	105.90
RHS 96X48X4.0	1047	194.74	11.72	6.79	24.49	16.38	5.02	3.36	64.91	129.83
RHS 96X48X4.8	1231	228.97	11.55	6.65	27.99	18.56	5.74	3.80	76.32	152.64
RHS 122X61X3.6	1232	229.15	15.19	8.85	38.13	25.84	7.82	5.30	76.38	152.77
RHS 122X61X4.5	1514	281.60	15.01	8.71	45.73	30.75	9.37	6.30	93.87	187.74
RHS 122X61X5.4	1785	332.01	14.84	8.57	52.60	35.09	10.78	7.19	110.67	221.34
RHS 145X82X4.8	2028	377.21	18.30	11.76	76.57	55.73	15.70	11.42	125.74	251.47
RHS 145X82X5.4	2260	420.36	18.20	11.65	84.26	61.12	17.27	12.53	140.12	280.24
RHS 172X92X4.8	2383	443.24	21.70	13.37	106.64	75.41	21.86	15.46	147.75	295.49
RHS 172X92X5.4	2659	494.57	21.59	13.26	117.73	82.99	24.13	17.01	164.86	329.72
RHS 200X100X4.0	2295	426.87	25.31	14.23	119.97	82.16	24.59	16.84	142.29	284.58
RHS 200X100X5.0	2836	527.50	25.10	14.67	145.93	99.39	29.92	20.37	175.83	351.66
RHS 200X100X6.0	3363	625.52	24.92	14.49	170.33	115.38	34.92	23.65	208.51	417.01
RHS 200X100X8.0	4379	814.49	24.50	14.18	214.62	143.84	44.00	29.49	271.50	543.00
RHS 220X140X4.0	2775	516.15	28.91	20.44	172.06	135.38	35.27	27.75	172.05	344.10
RHS 220X140X5.0	3436	639.10	28.74	20.30	210.31	165.40	43.11	33.91	213.03	426.06
RHS 220X140X6.0	4083	759.44	28.53	20.13	246.47	193.10	50.53	39.59	253.15	506.29
RHS 220X140X8.0	5339	993.05	28.18	19.81	314.21	344.61	64.41	70.65	331.02	662.04
RHS 240X120X4.0	2775	516.15	30.52	17.89	175.89	120.89	36.06	24.78	172.05	344.10
RHS 240X120X5.0	3436	639.10	30.35	17.75	214.97	147.08	44.07	30.15	213.03	426.06
RHS 240X120X6.0	4083	759.44	30.14	17.57	252.16	171.74	51.69	35.21	253.15	506.29
RHS 240X120X8.0	5339	993.05	29.72	17.26	320.99	216.66	65.80	44.42	331.02	662.04
RHS 260X180X6.0	5043	938.00	34.34	25.90	373.53	307.05	76.57	62.95	312.67	625.33
RHS 260X180X8.0	6619	1231.13	33.99	25.59	479.90	393.12	98.38	80.59	410.38	820.76
RHS 260X180X10	8143	1514.60	33.60	25.27	577.65	471.58	118.42	96.67	504.87	1009.73
RHS 260X180X12	9614	1788.20	33.25	24.96	667.11	542.77	136.76	111.27	596.07	1192.14
RHS 300X150X6.0	5163	960.32	37.98	22.23	404.90	277.28	83.00	56.84	320.11	640.21
RHS 300X150X8.0	6779	1260.89	37.56	21.91	520.53	353.88	106.71	72.55	420.30	840.60
RHS 300X150X10	8343	1551.80	37.17	21.60	626.93	423.16	128.52	86.75	517.27	1034.53
RHS 300X150X12	9854	1832.84	36.75	21.28	724.41	485.47	148.50	99.52	610.95	1221.90
RHS 300X200X6.0	5763	1071.92	39.59	29.02	491.35	396.22	100.73	81.23	357.31	714.61
RHS 300X200X8.0	7579	1409.69	39.20	28.70	634.24	509.70	130.02	104.49	469.90	939.80
RHS 300X200X10	9343	1737.80	38.85	28.39	767.15	614.43	157.27	125.96	579.27	1158.53
RHS 300X200X12	11054	2056.04	38.47	28.07	890.39	710.43	182.53	145.64	685.35	1370.70

General Technical Specifications and Tolerances

PERMISSIBLE AXIAL COMPRESSIVE STRESS (Yst 310 Grade)																											
1/r	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	300	350
Ac	186	183	178	169	157	143	128	113	99	87	77	67	60	53	47	42	38	34	31	28	26	23	22	20	18	13	10

OTHER ALLOWABLE STRESS VALUES (IN Mpa)							
Steel Grade	Minimum Yield Stress	Minimum UTS	Axial Stress in Tension	Bending Stress in Ten. or Compn.	Shear Stress	Bearing Stress	Equivalant Stress
Yst 310	310	450	186	205	140	232	279

Section Type	Grade	Mechanical Properties				Dimensional Tolerance					
		YST	UTS	% of Elongation		Outside dimension	Thickness	Squareness	Corner radius	Weight	
		Mpa	Mpa	<25.4 mm	<25.4 mm					Individual lengths	On lot of 10 MT
RHS/SHS IS: 4923	YST 210	210	330	12	20	+/-1% with a minimum of +/-0.50 mm	+/-10%	90 deg. +/-2 deg.	31 max	10% -8%	+/-7.5%
	YST 240	240	410	10	15						
	YST 310	310	450	8	10						
CHS IS: 1161	YST 210	210	330	12	20	OD upto and Incl 48.3 +0.4/-0.8 mm; Over 48.3 mm +/-1.0%	+ no limit -10%	NA	NA	L +10%, -8%	L +/-5%
	YST 240	240	410	12	17					M & H +/-10%	M & H +/-7.5%
	YST 310	310	450	12	14						

Length	6.0 m ± 0.05 m Customized length ranging from 6 m may be supplied.
Straightness	Minimum 1: 200th of any length measured along the centre line (mill straightened condition) unless otherwise specifically arranged.
Twist Tolerance	Maximum 2 mm ± 0.5 mm / m length – measured relative vertical shift of any adjacent corner of the section, measured by keeping one side on flat surface.
End Finish	Plain ended – Mechanically sheared, mill – cut finish without further machining.
Surface Finish	Black without any surface treatment of oiling or varnishing.
Raw Material	Sulphur content: 0.05% max, phosphorus content: 0.05% max, equivalent carbon percentage well within specified weldability limits with matching physical properties. For corrosion resistant steel in Cu-bearing variety, refer to the WRS section of this brochure.
Weldability	Tata Structura Steel Hollow Section are weldable with standard M. S. Electrodes without any pre-heating.
Packing	Bundled by sealing metal strap, and each bundle is labelled for size, measurement, Lot no. etc. Approximate weight of each bundle is 1.5 Mt (+/-500 kg).
Identification	Marking of **"TATA STRUCTURA"** emblem on surface punched/stenciled/sticker pasted on all Steel Hollow Sections. Standard BIS mark is also put on the sections.
NOTE	Tata Structura Hollow Sections in customized size, grade, length, surface finish and end finish may be delivered as per agreed supply conditions.

Properties of Tata Structura (Square Hollow Sections)

YST 310 Grade

B MM	D MM	T MM	Area Cm ^ 2	Weight Kg / Mtr	Ixx Cm ^ 4	Iyy Cm ^ 4	Rxx Cm	Ryy Cm	Zxx Cm ^ 3	Zyy Cm ^ 3	J Cm ^ 4	B Cm ^ 3	Outer Surface Area Sq. Mtr / Mtr.
25	25	2.00	1.74	1.36	1.48	1.48	0.92	0.92	1.19	1.19	2.49	1.76	0.090
25	25	2.60	2.16	1.69	1.72	1.72	0.89	0.89	1.38	1.38	2.92	2.02	0.087
25	25	3.20	2.53	1.98	1.89	1.89	0.86	0.86	1.51	1.51	3.16	2.16	0.084
30	30	2.00	2.14	1.68	2.72	2.72	1.13	1.13	1.81	1.81	4.53	2.70	0.110
30	30	2.60	2.68	2.10	3.23	3.23	1.10	1.10	2.15	2.15	5.45	3.18	0.107
30	30	3.20	3.17	2.49	3.62	3.62	1.07	1.07	2.41	2.41	6.13	3.52	0.104
38	38	2.00	2.78	2.18	5.88	5.88	1.46	1.46	3.10	3.10	9.63	4.63	0.142
38	38	2.60	3.51	2.75	7.14	7.14	1.43	1.43	3.76	3.76	11.88	5.59	0.139
38	38	3.20	4.19	3.29	8.18	8.18	1.40	1.40	4.30	4.30	13.77	6.37	0.136
38	38	4.00	5.03	3.95	9.26	9.26	1.36	1.36	4.87	4.87	15.67	7.12	0.131
40	40	2.60	3.72	2.92	8.45	8.45	1.51	1.51	4.22	4.22	14.03	6.29	0.147
40	40	2.90	4.09	3.21	9.11	9.11	1.49	1.49	4.56	4.56	15.23	6.78	0.145
40	40	3.20	4.45	3.49	9.72	9.72	1.48	1.48	4.86	4.86	16.34	7.21	0.144
40	40	4.00	5.35	4.20	11.07	11.07	1.44	1.44	5.54	5.54	18.75	8.12	0.139
50	50	2.60	4.76	3.73	17.47	17.47	1.92	1.92	6.99	6.99	28.58	10.44	0.187
50	50	2.90	5.25	4.12	18.98	18.98	1.90	1.90	7.59	7.59	31.28	11.33	0.185
50	50	3.60	6.35	4.98	22.15	22.15	1.87	1.87	8.86	8.86	37.00	13.17	0.181
50	50	4.50	7.67	6.02	25.50	25.50	1.82	1.82	10.20	10.20	43.07	15.05	0.177
60	60	2.60	5.80	4.55	31.33	31.33	2.33	2.33	10.44	10.44	50.68	15.63	0.227
60	60	2.90	6.41	5.03	34.21	34.21	2.31	2.31	11.40	11.40	55.70	17.05	0.225
60	60	3.20	7.01	5.50	36.94	36.94	2.30	2.30	12.31	12.31	60.54	18.39	0.224
60	60	4.00	8.55	6.71	43.55	43.55	2.26	2.26	14.52	14.52	72.41	21.62	0.219
60	60	4.80	10.01	7.85	49.22	49.22	2.22	2.22	16.41	16.41	82.70	24.32	0.215
72	72	3.20	8.54	6.71	66.32	66.32	2.79	2.79	18.42	18.42	107.44	27.56	0.272
72	72	4.00	10.47	8.22	79.03	79.03	2.75	2.75	21.95	21.95	129.85	32.78	0.267
72	72	4.80	12.31	9.66	90.31	90.31	2.71	2.71	25.09	25.09	150.14	37.36	0.263
80	80	3.20	9.57	7.51	92.71	92.71	3.11	3.11	23.18	23.18	149.24	34.69	0.304
80	80	4.00	11.75	9.22	111.04	111.04	3.07	3.07	27.76	27.76	181.21	41.49	0.299
80	80	4.80	13.85	10.87	127.58	127.58	3.04	3.04	31.89	31.89	210.68	47.58	0.295
91.5	91.5	3.60	12.32	9.67	156.49	156.49	3.56	3.56	34.21	34.21	251.66	51.20	0.347
91.5	91.5	4.50	15.14	11.88	187.57	187.57	3.52	3.52	41.00	41.00	305.78	61.29	0.343
91.5	91.5	5.40	17.85	14.01	215.68	215.68	3.48	3.48	47.14	47.14	355.78	70.34	0.338
100	100	4.00	14.95	11.73	226.35	226.35	3.89	3.89	45.27	45.27	364.36	67.75	0.379
100	100	5.00	18.36	14.41	271.10	271.10	3.84	3.84	54.22	54.22	442.42	81.04	0.374
100	100	6.00	21.63	16.98	311.47	311.47	3.79	3.79	62.29	62.29	514.36	92.93	0.369
113.5	113.5	4.80	20.28	15.92	393.30	393.30	4.40	4.40	69.30	69.30	635.19	103.70	0.429
113.5	113.5	5.40	22.60	17.74	432.58	432.58	4.38	4.38	76.23	76.23	703.72	113.98	0.426
132	132	4.80	23.83	18.71	634.39	634.39	5.16	5.16	96.12	96.12	1015.65	143.91	0.503
132	132	5.40	26.60	20.88	700.11	700.11	5.13	5.13	106.08	106.08	1128.44	158.75	0.500
150	150	4.00	22.95	18.01	807.82	807.82	5.93	5.93	107.71	107.71	1273.42	161.39	0.579
150	150	5.00	28.36	22.26	982.12	982.12	5.89	5.89	130.95	130.95	1565.02	196.11	0.574
150	150	6.00	33.63	26.40	1145.91	1145.91	5.84	5.84	152.79	152.79	1844.55	228.67	0.569
150	150	7.00	38.78	30.44	1299.44	1299.44	5.79	5.79	173.26	173.26	2111.34	259.09	0.564
150	150	8.00	43.79	34.38	1443.00	1443.00	5.74	5.74	192.40	192.40	2364.69	287.41	0.559
180	180	4.00	27.75	21.78	1421.74	1421.74	7.16	7.16	157.97	157.97	2224.25	236.76	0.699
180	180	5.00	34.36	26.97	1736.87	1736.87	7.11	7.11	192.99	192.99	2743.01	289.14	0.694
180	180	6.00	40.83	32.05	2036.52	2036.52	7.06	7.06	226.28	226.28	3245.22	338.88	0.689
180	180	7.00	47.18	37.04	2321.04	2321.04	7.01	7.01	257.89	257.89	3730.05	386.03	0.684
180	180	8.00	53.39	41.91	2590.73	2590.73	6.97	6.97	287.86	287.86	4196.69	430.60	0.679
220	220	6.00	50.43	39.59	3813.36	3813.36	8.70	8.70	346.67	346.67	6017.34	519.41	0.849
220	220	8.00	66.19	51.96	4894.99	4894.99	8.60	8.60	445.00	445.00	7836.83	666.26	0.839
220	220	10.00	81.43	63.92	5887.19	5887.19	8.50	8.50	535.20	535.20	9549.82	800.48	0.829
220	220	12.00	96.14	75.47	6793.08	6793.08	8.41	8.41	617.55	617.55	11148.33	922.30	0.818
250	250	6.00	57.63	45.24	5672.00	5672.00	9.92	9.92	453.76	453.76	8900.86	680.00	0.969
250	250	8.00	75.79	59.50	7315.65	7315.65	9.82	9.82	585.25	585.25	11633.03	876.58	0.959
250	250	10.00	93.43	73.34	8841.86	8841.86	9.73	9.73	707.35	707.35	14232.65	1058.67	0.949
250	250	12.00	110.54	86.77	10254.21	10254.21	9.63	9.63	820.34	820.34	16690.61	1226.51	0.938

Properties of Tata Structura (Rectangular Hollow Sections)

YST 310 Grade

D MM	B MM	T MM	Area Cm ^ 2	Weight Kg / Mtr	Ixx Cm ^ 4	Iyy Cm ^ 4	Rxx Cm	Ryy Cm	Zxx Cm ^ 3	Zyy Cm ^ 3	J Cm ^ 4	B Cm ^ 3	Outer Surface Area Sq. Mtr / Mtr.
50	25	2.00	2.74	2.15	8.38	2.81	1.75	1.01	3.35	2.25	7.06	3.87	0.140
50	25	2.60	3.46	2.71	10.16	3.36	1.71	0.99	4.06	2.69	8.59	4.63	0.137
50	25	3.20	4.13	3.24	11.63	3.80	1.68	0.96	4.65	3.04	9.80	5.20	0.134
50	25	4.00	4.95	3.88	13.13	4.23	1.63	0.92	5.25	3.38	10.86	5.70	0.129
60	40	2.60	4.76	3.73	22.76	12.09	2.19	1.59	7.59	6.05	26.06	9.93	0.187
60	40	2.90	5.25	4.12	24.74	13.11	2.17	1.58	8.25	6.56	28.48	10.76	0.185
60	40	3.60	6.35	4.98	28.90	15.23	2.13	1.55	9.63	7.62	33.56	12.47	0.181
60	40	4.50	7.67	6.02	33.31	17.44	2.08	1.51	11.10	8.72	38.84	14.18	0.177
66	33	2.60	4.70	3.69	25.15	8.43	2.31	1.34	7.62	5.11	21.18	8.81	0.185
66	33	2.90	5.19	4.07	27.33	9.12	2.29	1.33	8.28	5.53	23.07	9.53	0.183
66	33	3.60	6.28	4.93	31.87	10.52	2.25	1.29	9.66	6.37	26.94	10.95	0.179
66	33	4.50	7.58	5.95	36.64	11.93	2.20	1.25	11.10	7.23	30.77	12.33	0.175
80	40	2.60	5.80	4.55	46.58	15.74	2.84	1.65	11.65	7.87	39.03	13.57	0.227
80	40	2.90	6.41	5.03	50.87	17.11	2.82	1.63	12.72	8.56	42.75	14.76	0.225
80	40	3.20	7.01	5.50	54.94	18.41	2.80	1.62	13.74	9.21	46.28	15.87	0.224
80	40	4.00	8.55	6.71	64.79	21.49	2.75	1.59	16.20	10.74	54.77	18.49	0.219
80	40	4.80	10.01	7.85	73.22	24.03	2.71	1.55	18.30	12.02	61.81	20.60	0.215
96	48	3.20	8.54	6.71	98.61	33.28	3.40	1.97	20.54	13.87	82.68	23.91	0.272
96	48	4.00	10.47	8.22	117.54	39.32	3.35	1.94	24.49	16.38	99.11	28.24	0.267
96	48	4.80	12.31	9.66	134.35	44.55	3.30	1.90	27.99	18.56	113.57	31.95	0.263
120	60	3.20	10.85	8.51	199.88	67.95	4.29	2.50	33.31	22.65	166.52	39.03	0.344
120	60	3.60	12.11	9.51	220.75	74.77	4.27	2.48	36.79	24.92	184.53	42.97	0.341
120	60	4.50	14.87	11.67	264.52	88.88	4.22	2.44	44.09	29.63	222.48	51.08	0.337
120	60	5.40	17.52	13.76	304.00	101.33	4.17	2.40	50.67	33.78	256.68	58.20	0.332
145	82	4.80	20.28	15.92	555.16	228.50	5.23	3.36	76.57	55.73	532.20	94.26	0.429
145	82	5.40	22.60	17.74	610.85	250.59	5.20	3.33	84.26	61.12	588.16	103.38	0.426
172	92	4.80	23.83	18.71	917.13	346.91	6.20	3.82	106.64	75.41	823.66	128.66	0.503
172	92	5.40	26.60	20.88	1012.47	381.74	6.17	3.79	117.73	82.99	912.88	141.61	0.500
200	100	4.00	22.95	18.01	1199.71	410.78	7.23	4.23	119.97	82.16	991.44	141.46	0.579
200	100	5.00	28.36	22.26	1459.25	496.94	7.17	4.19	145.93	99.39	1213.39	171.26	0.574
200	100	6.00	33.63	26.40	1703.31	576.91	7.12	4.14	170.33	115.38	1423.83	198.92	0.569
200	100	8.00	43.79	34.38	2146.21	719.19	7.00	4.05	214.62	143.84	1807.96	247.98	0.559
220	140	4.00	27.75	21.78	1892.55	947.64	8.26	5.84	172.05	135.38	1999.95	223.99	0.699
220	140	5.00	34.36	26.97	2313.36	1155.23	8.21	5.80	210.31	165.03	2462.98	273.20	0.694
220	140	6.00	40.83	32.05	2713.97	1351.66	8.15	5.75	246.72	193.09	2909.70	319.79	0.689
220	140	8.00	53.39	41.91	3456.10	1712.17	8.05	5.66	314.19	244.60	3751.18	405.24	0.679
240	120	4.00	27.75	21.78	2110.72	725.35	8.72	5.11	175.89	120.89	1736.35	208.03	0.699
240	120	5.00	34.36	26.97	2579.67	882.47	8.67	5.07	214.97	147.08	2134.16	253.29	0.694
240	120	6.00	40.83	32.05	3025.91	1030.45	8.61	5.02	252.16	171.74	2516.08	295.94	0.689
240	120	8.00	53.39	41.91	3851.84	1299.95	8.49	4.93	320.99	216.66	3229.53	373.58	0.679
260	180	6.00	50.43	39.59	4855.87	2763.43	9.81	7.40	373.53	307.05	5602.92	500.28	0.849
260	180	8.00	66.19	51.96	6238.69	3538.10	9.71	7.31	479.90	393.12	7285.62	640.83	0.839
260	180	10.00	81.43	63.92	7509.51	4244.26	9.60	7.22	577.65	471.58	8863.14	768.79	0.829
260	180	12.00	96.14	75.47	8671.80	4884.69	9.50	7.13	667.06	542.74	10327.90	884.42	0.818
300	150	6.00	51.63	40.53	6073.51	2079.57	10.85	6.35	404.90	277.28	5019.15	477.44	0.869
300	150	8.00	67.79	53.22	7807.95	2654.12	10.73	6.26	520.53	353.88	6504.50	609.92	0.859
300	150	10.00	83.43	65.49	9403.90	3173.71	10.62	6.17	626.93	423.16	7884.60	729.65	0.849
300	150	12.00	98.54	77.35	10865.21	3640.89	10.50	6.08	724.35	485.45	9152.78	836.93	0.838
300	200	6.00	57.63	45.24	7370.23	3962.19	11.31	8.29	491.35	396.22	8167.28	650.09	0.969
300	200	8.00	75.79	59.50	9513.66	5097.04	11.20	8.20	634.24	509.70	10656.78	836.79	0.959
300	200	10.00	93.43	73.34	11507.24	6144.30	11.10	8.11	767.15	614.43	13015.51	1009.05	0.949
300	200	12.00	110.54	86.77	13354.97	7107.11	10.99	8.02	890.33	710.71	15234.93	1167.16	0.938

Properties of Tata Structura (Circular Hollow Sections)

YST 310 Grade

NB MM	OD MM	Thk MM	Weight Kg / Mtr.	Area Cm ^2	Outer Surface Area Cm^2 / Mtr	Moment of Inertia Cm ^ 4	Section Modulus Cm ^ 3	Radius of Gyration Cm
15	21.3	2.00	0.952	1.21	669	0.57	0.54	0.69
		2.60	1.199	1.53		0.68	0.64	0.67
		3.20	1.428	1.82		0.77	0.72	0.65
20	26.9	2.30	1.395	1.78	845	1.36	1.01	0.87
		2.60	1.558	1.98		1.48	1.10	0.86
		3.20	1.870	2.38		1.70	1.27	0.85
25	33.7	2.60	1.994	2.54	1059	3.09	1.84	1.10
		3.20	2.407	3.07		3.60	2.14	1.08
		4.00	2.930	3.73		4.19	2.49	1.06
32	42.4	2.60	2.552	3.25	1332	6.46	3.05	1.41
		3.20	3.094	3.94		7.62	3.59	1.39
		4.00	3.788	4.83		8.99	4.24	1.36
40	48.3	2.90	3.247	4.14	1517	10.70	4.43	1.61
		3.20	3.559	4.53		11.59	4.80	1.60
		4.00	4.370	5.57		13.77	5.70	1.57
50	60.3	2.90	4.105	5.23	1894	21.59	7.16	2.03
		3.60	5.034	6.41		25.87	8.58	2.01
		4.50	6.193	7.89		30.90	10.25	1.98
65	76.1	3.20	5.753	7.33	2391	48.78	12.82	2.58
		3.60	6.437	8.20		54.01	14.19	2.57
		4.50	7.946	10.12		65.12	17.11	2.54
80	88.9	3.20	6.763	8.62	2793	79.21	17.82	3.03
		4.00	8.375	10.67		96.34	21.67	3.00
		4.80	9.955	12.68		112.49	25.31	2.98
100	114.3	3.60	9.828	12.52	3591	191.98	33.59	3.92
		4.50	12.185	15.52		234.32	41.00	3.89
		5.40	14.502	18.47		274.54	48.04	3.85
125	139.7	4.50	15.004	19.11	4389	437.20	62.59	4.78
		4.80	15.969	20.34		463.33	66.33	4.77
		5.40	17.885	22.78		514.50	73.66	4.75
150	165.1	4.50	17.823	22.70	5187	732.57	88.74	5.68
		6.00	23.542	29.99		950.25	115.11	5.63
		8.00	30.995	39.48		1221.25	147.94	5.56
		10.00	38.250	48.73		1471.29	178.23	5.49
200	219.1	5.00	26.400	33.63	6883	1928.04	176.00	7.57
		6.00	31.532	40.17		2281.95	208.30	7.54
		8.00	41.648	53.06		2959.63	270.16	7.47
		10.00	51.567	65.69		3598.44	328.47	7.40
		12.00	61.289	78.07		4199.88	383.38	7.33
250	273	6.00	39.508	50.33	8577	4487.08	328.72	9.44
		8.00	52.282	66.60		5851.71	428.70	9.37
		10.00	64.860	82.62		7154.09	524.11	9.31
		12.00	77.240	98.39		8396.14	615.10	9.24
300	323.9	6.30	49.345	62.86	10176	7928.90	489.59	11.23
		8.00	62.325	79.39		9910.08	611.92	11.17
		10.00	77.412	98.61		12158.34	750.75	11.10
		12.00	92.303	117.58		14319.56	884.20	11.04
350	355.6	8.00	68.579	87.36	11172	13201.37	742.48	12.29
		10.00	85.230	108.57		16223.50	912.46	12.22
		12.00	101.684	129.53		19139.47	1076.46	12.16

Pipe Supporting Structure,
Tata Steel, Jamshedpur

Proper care has been taken to ensure that all data and information herein is factual and that numerical values are accurate.

To the best of our knowledge, all information contained in the manual is accurate at the time of publication. However, Tata Steel does not assume any responsibility for error in or interpretation of information in this manual or in its use.

Commonwealth Games Village, Delhi

TATA STEEL

Tata Steel Limited (Tubes SBU)
43, Jawaharlal Nehru Road, Kolkata - 700 071
Tel : +91 33 2224 8160, 2224 8636, Fax: +91 33 2288 6996
E-mail:tatastructura@tatasteel.com, Web: www.tatastructura.com
Call our toll free Helpline : **1800 345 8282**

October 2011