

Calculation Sheet
for

Double Side Support of Wall 300 mm Thickness
Basement Floor
Steel Waller System

KALAM VILLA

PLOT NO. 631-6364 AT FAIRWAY, DUBAI HILLS, DUBAI

CONTRACTOR: **CITY NIGHT CONTRACTING L.L.C.**

CONSULTANT: **WHITE SPACE**

CLIENT: -

DRAWING REFERENCE: **DBC/B/2021/2679**

DESARCH
SCAFFOLDING

Date: 29-FEBRUARY-2021

Regulations and Standards

- 1 – BS 5975: 1996, Formwork for Concrete
- 2 – BS: Formwork Guide to Good Practice 1995
- 3 – Plywood 18mm – Reference for Formwork Guide to Good Practice 1995 Page (38)
- 4 – BS 5975:2008 Code of Practice for Temporary Works Procedures & the permissible Stress Design
- 5 – SAP 2000: Structural Analysis Program.
- 6 – BS 5950-2000: Code of Design Steel in SAP 2000
- 7 – CIRIA REPORT CIRIA R108



1 – Index of Calculation Sheet

1. Index of Calculation Sheet	Page 03
2. Formwork Elements Design Data	
a. Cladding Plywood 18mm	Page 05
b. Sec. H20 Beam	Page 05
c. Main Decking is Steel Waller.	Page 05
d. TIES: (TIE ROD DVD ϕ 16mm)	Page 06
e. TURNBUCKLE	Page 06
3. Design of Formwork Elements	
a. Sheeting Plywood 18mm	Page 08 – 09
b. Secondary H20 Beam	Page 10
c. Main Decking is Steel Waller.	Page 11 – 12
d. TIES: (TIE ROD DVD ϕ 16mm)	Page 12
e. TURNBUCKLE	Page 13
4. Used Tables and Formulas	Page 14
5. Material Manufacturer Data & Tests	Page 16
6. Attached Drawing	Page 28 – 29

2 – Formwork Elements Design Data

1. Sheeting Plywood 18m:

*Where values assumed are based on the **18mm. Thickness COFI – Form SP Plus or Equivalent** stated in the (formwork – A Guide to Good Practice)

Appendix A table D-S

For 1.00m Wide

$$A = 100 \times (1.8) = 180 \text{ Cm}^2$$

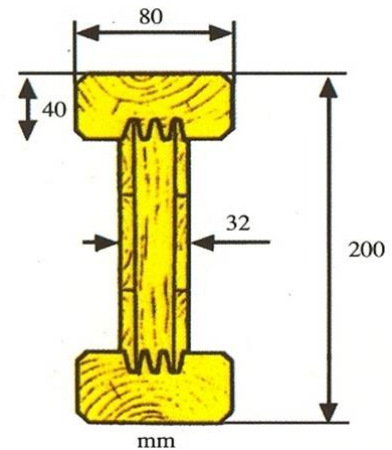
$$E I = 0.321 \text{ T.m}^2 / \text{m} \quad (\text{Attached Table page no.16})$$

$$M \text{ Resistance} = 0.060 \text{ T.M} \quad (\text{Attached Table page no.16})$$

$$Q \text{ Capacity} = 0.862 \text{ T} \quad (\text{Attached Table page no.16})$$

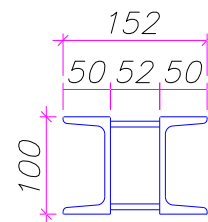
2. Secondary is H20 Beam:

- Allowable Bending Moment = 0.5 T.M
- Allowable Shear Force = 1.10 T
- Moment Of Inertia I = 4642 Cm⁴
- Modulus of Elasticity E = 100 T/Cm²

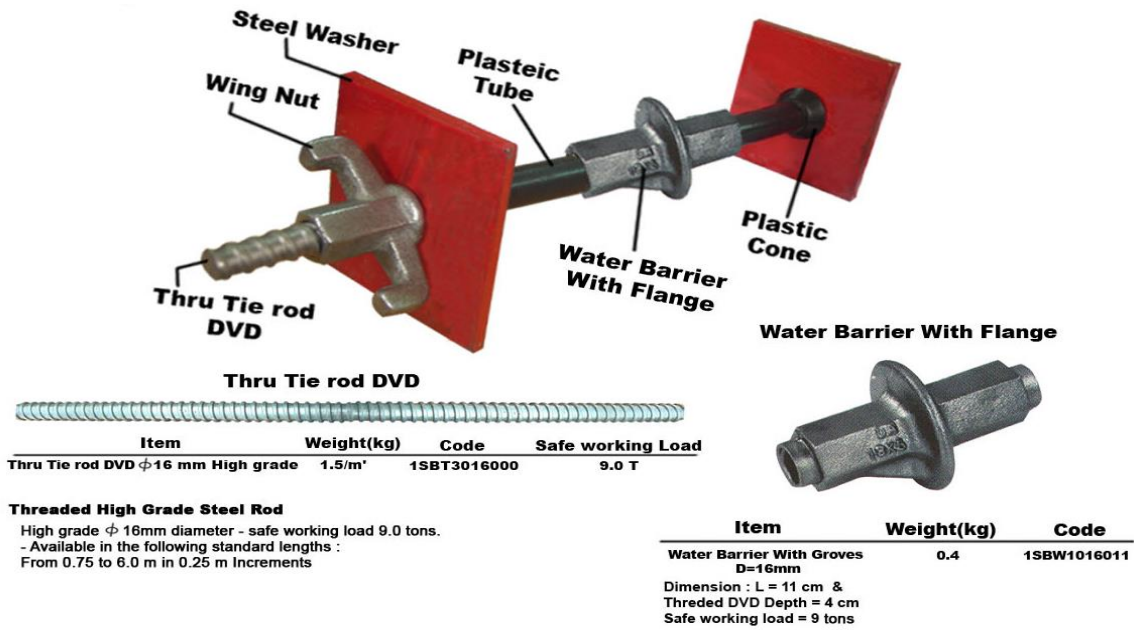


3. Main Decking is Steel Waller:

- Allowable Bending Moment = 1.14 T.M
- Allowable Shear Force = 10 T
- I (Moment of Inertia) = 412 Cm⁴
- E (Modules of Elasticity) = 2100 T/Cm²



4. TIES: (TIE ROD DVD ϕ 16mm):



❖ Tie Rods is subjected to only Axial force from concrete pressure

Allowable tensile force = 9.0 t

5. TURN BUCKLE (TUBE = 2.0"x 2.50mm):

- $A = 4.716 \text{ cm}^2$
- $I = 19.668 \text{ cm}^4$
- $Z = 6.528 \text{ cm}^3$
- $i = 2.040 \text{ cm}$

3– Design of Formwork Elements

*Design Loads

From CIRIA REPORT 108:

$$P_{\max} = D \times (C_1 \times \sqrt{R} + C_2 \times K \times \sqrt{H - C_1 \times \sqrt{R}}) \text{ or } DH \text{ t/m}^2 \text{ whichever is smaller.}$$

Where	C1	coefficient dependent on the size and shape of formwork
	C2	coefficient dependent on the constituent materials of the concrete
	D	weight density of concrete, t/m ³
	H	vertical form height, m
	h	vertical pour height, m
	K	temperature coefficient taken as $[36 / (T+16)]^2$
	R	the rate at which the concrete rises vertically up the form. m/h
	T	concrete temperature at placing, °C

$$\text{Max. Conc. Height} = H_{\text{SIDE}} = 3.500 \text{ m}$$

$$\text{Assumed Max. Rate of pour (R)} = 1.00 \text{ m/hr}$$

$$\text{Concrete temperature (T)} = 32.0 \text{ }^\circ\text{C}$$

$$K = [36 / (T+16)]^2 = 0.563$$

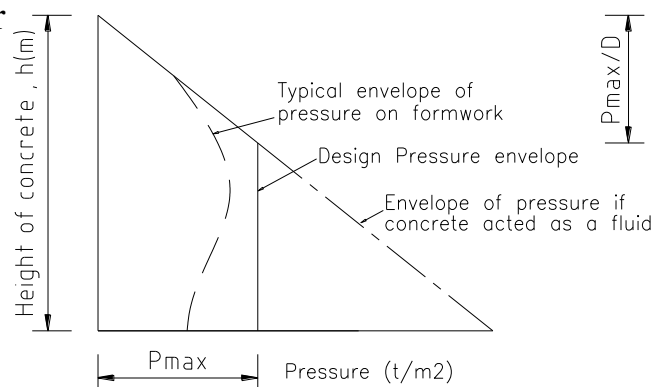
$$C1 \text{ (walls)} = 1.00$$

$$C2 = 0.45$$

$$D = 2.50 \text{ t/m}^3$$

$$P_{\max} = 2.5 \times (1.0 \times \sqrt{1.00} + 0.45 \times 0.563 \times 3.925 \sqrt{3.925 - 1.0 \times \sqrt{1.00}}) \text{ t/m}^2$$

$$P_{\max} = 3.60 \text{ t/m}^2$$



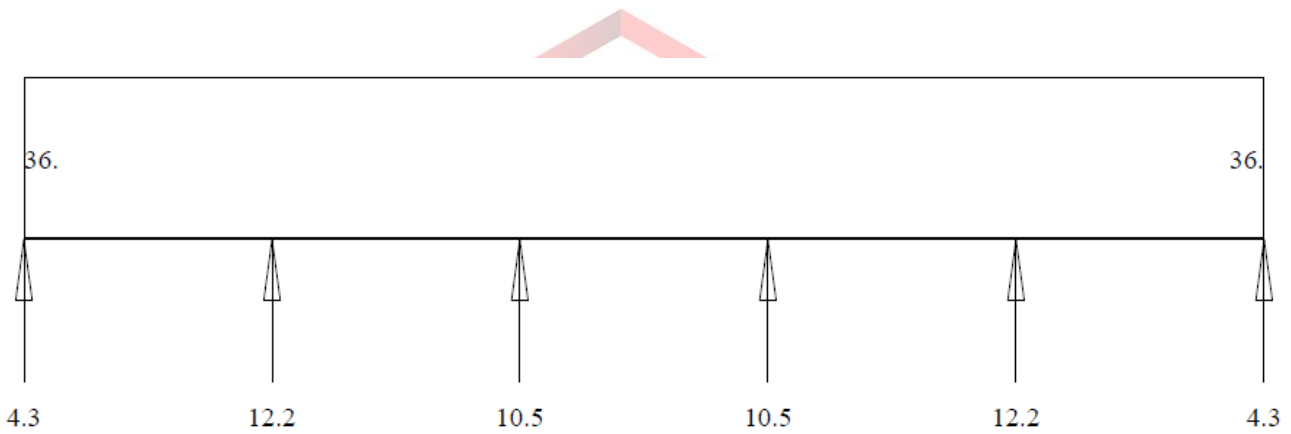
Sheeting Plywood 18mm:

The assumed plywood is 18mm thickness COFI – FORM plus or equivalent with the width of the bearers acting as secondary supporting the plywood is 80mm B width of H20 beam.

For a Strip 1m

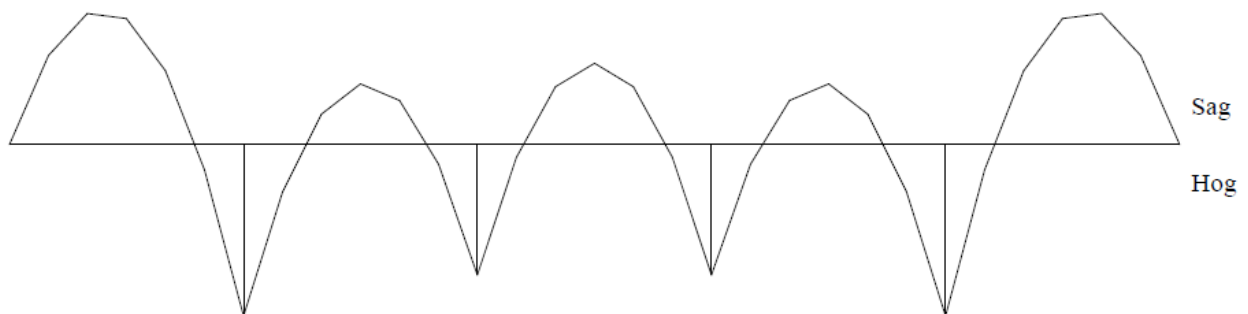
Assumed Spacing Between Sec. Beams = 30 Cm.

Noted that the width of the secondary beam is 8 cm



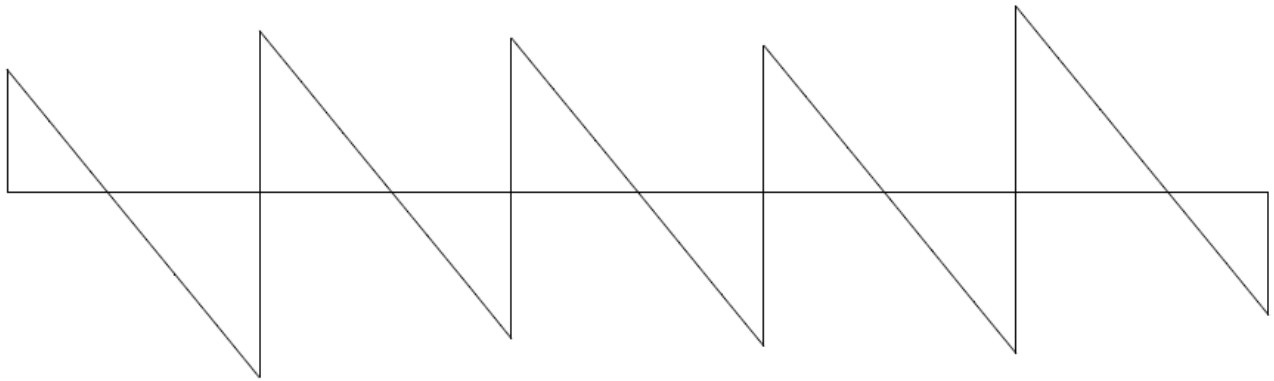
• Check for Moment:

BENDING MOMENT DISTRIBUTION - Max. Sag 0.3 kN.m - Max. Hog 0.3 kN.m



$$M = Wl^2/10$$

$$= 3.60 \times (0.30)^2/10 = 0.0324 \text{ T.M.} < 0.06 \text{ T.M.} \quad \text{Safe}$$

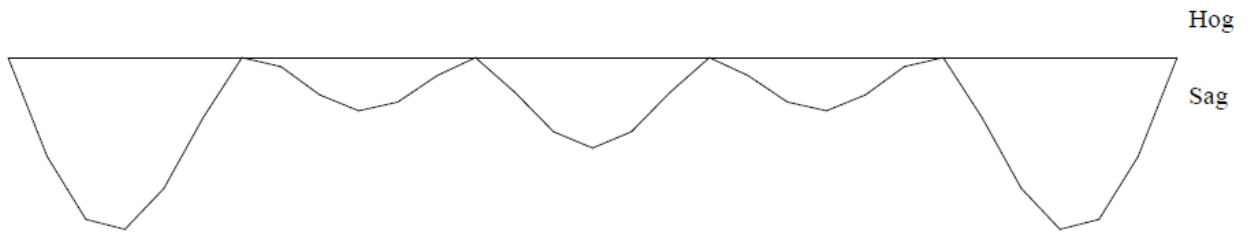


$$Q = 0.525 W (L-B)$$

$$= 0.525 \times 3.60 \times (0.30-0.08) = 0.416 T < 0.862 T \quad \text{Safe}$$

• Check for Deflection:

DEFLECTION DISTRIBUTION - Max. Sag 0.4 mm



$$D = 0.0068 Wl^4/EI$$

$$= 0.0068 \times 3.60 \times (0.30)^4 / 0.321$$

$$= 0.61 \text{ mm} < L/270$$

$$= 300/270$$

$$= 1.11 \text{ mm.} \quad \text{Safe}$$

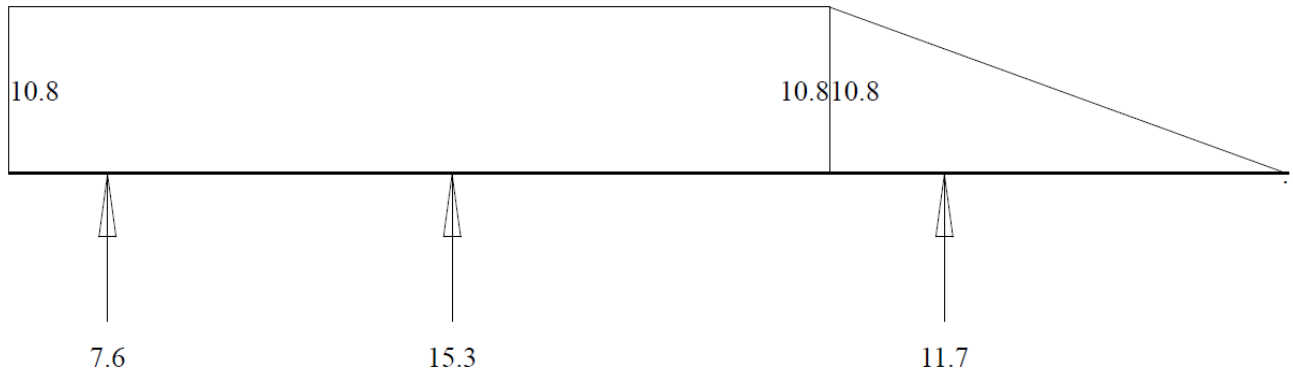
*****Plywood will not work as cantilever**

Secondary is H20 Beam:

Spacing Between Secondary Beams = 30 Cm

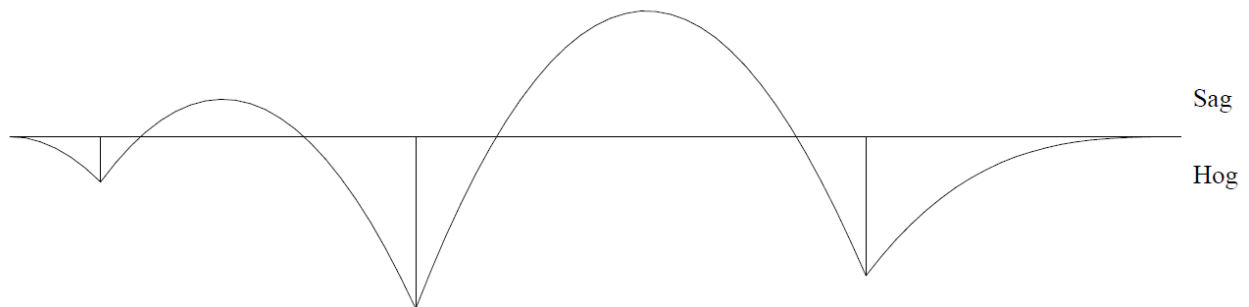
Span = as per steel waller spacing

$$W = 3.60 \times 0.30 = 1.08 \text{ T/M}$$



• Check for Moment:

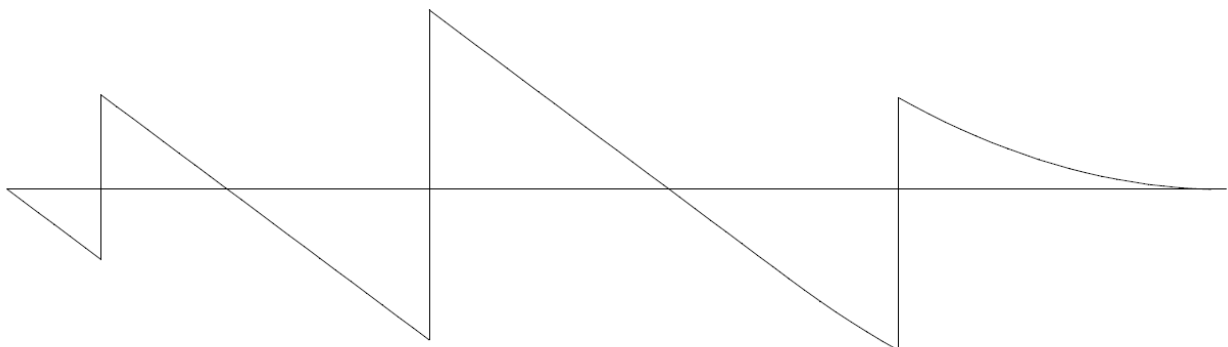
BENDING MOMENT DISTRIBUTION - Max. Sag 1.3 kN.m - Max. Hog 1.8 kN.m



$$M = 0.18 \text{ T.M.} < 0.5 \text{ T.M.} \quad \text{Safe}$$

• Check for Shear:

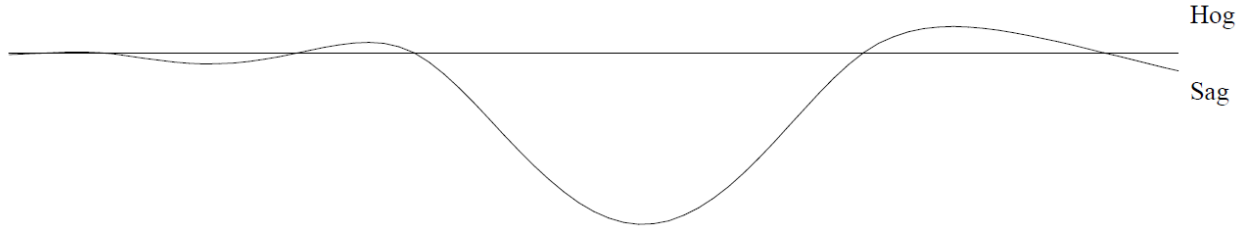
SHEAR FORCE DISTRIBUTION - Max. 8.3 kN



$$Q = 0.83 \text{ T} < 1.10 \text{ T} \quad \text{Safe}$$

• Check for Deflection:

DEFLECTION DISTRIBUTION - Max. Sag 0.5 mm - Max. Hog 0.1 mm



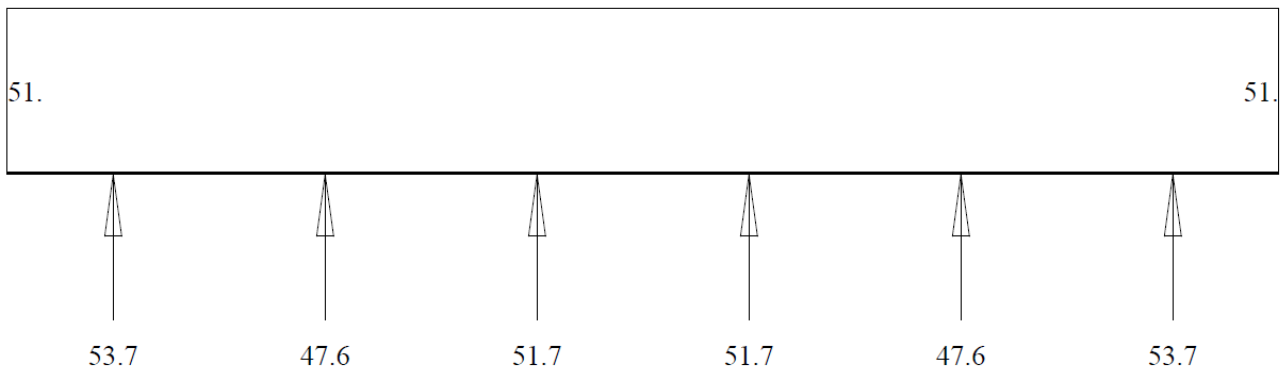
$$D = 0.50 \text{ mm} < L/270 = 1500/270 = 5.55 \text{ mm.} \quad \text{Safe}$$

Main Decking is Steel Waller:

Critical steel waller = the second steel waller

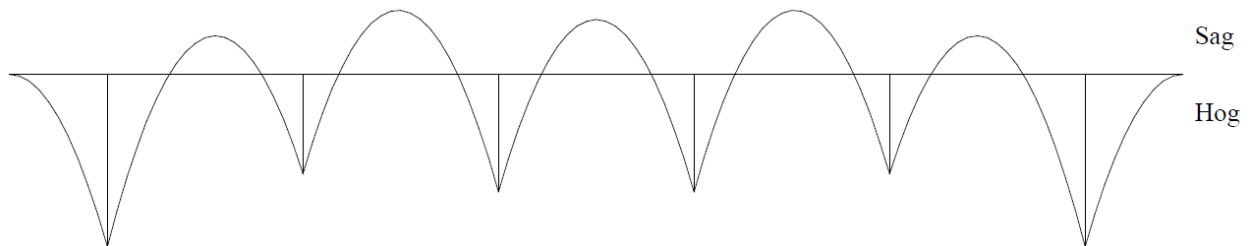
$$W = \text{Max. Reaction on secondary} / \text{secondary spacing} \\ = 1.53 / 0.30 = 5.10 \text{ T/M}$$

$$L_{\text{Main}} = \text{spacing between tie rod} = 1.00 \text{ M}$$



• Check for Moment:

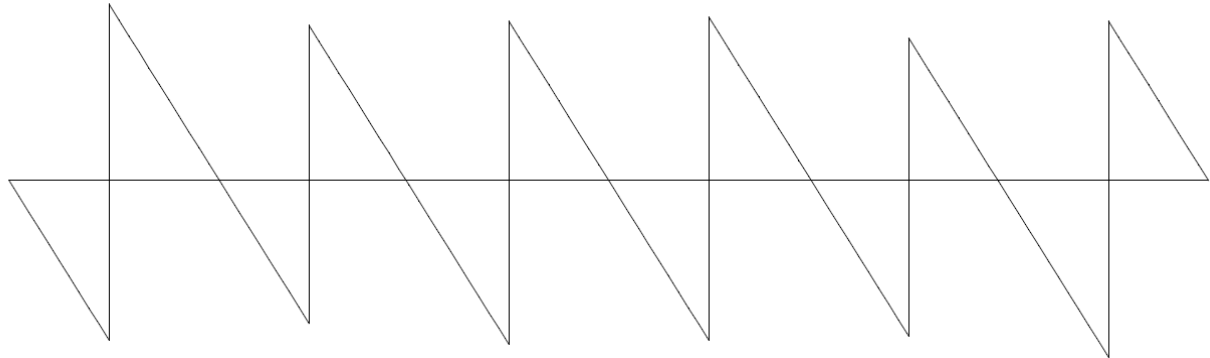
BENDING MOMENT DISTRIBUTION - Max. Sag 2.4 kN.m - Max. Hog 6.4 kN.m



$$M = 0.64 \text{ T.M.} < 1.14 \text{ T.M.} \quad \text{Safe}$$

• Check for Shear:

SHEAR FORCE DISTRIBUTION - Max. 28.2 kN



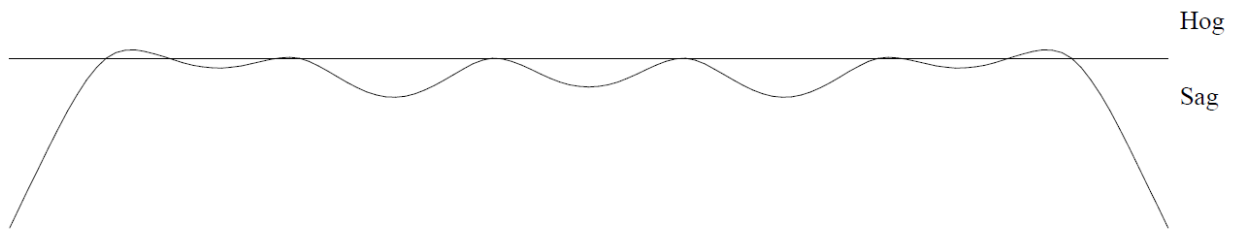
$Q = 2.82 T < 10 T$

Safe

• Check for Deflection:



DEFLECTION DISTRIBUTION - Max. Sag 0.8 mm - Max. Hog 0.0 mm



$D = 0.80 \text{ mm} < L/270 = 1000/270 = 3.70 \text{ mm.}$

Safe

TIES: (TIE ROD DVD ϕ 16mm):

• Load on Tie Rod:

$P = \text{Max. Reaction on Main}$
 $= 5.37 T < 9.0 T$ **Safe**

TURN BUCKLE (TUBE = 2.0" x 2.50mm):

For using turn buckle every 60 cm linear

HZ Load = 2.5% Dead Load BS5975 (attached page no. 22)

$$H = 2.5 \times (3.925 \times 1.40 \times 0.60) / 100 = 0.082 \text{ t}$$

For using 2 turn buckle one on angle 6 and the other on angle 59

The critical one on angle 59

$$F = 0.082 / 2 / \cos 59 = 0.08 \text{ t}$$

$$L = 3.118 \text{ m}$$

$$\lambda = \frac{L}{i} = (311.8 / 2.04) = 152.8 > 100$$

$$F_{\text{all}} = 7500 / \lambda^2 = 0.32 \text{ t/cm}^2$$

$$F_{\text{act}} = \frac{P}{A}$$

$$= 0.08 / 4.71$$

$$= 0.017 \text{ t/cm}^2 < 0.32 \text{ t/cm}^2 \quad \text{Safe}$$



4 – Used Tables and Formulas

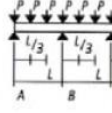
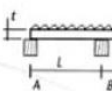
Appendix D. Structural properties of sheet materials.

Table D – 5. Working structural properties of sheet materials from trade associations and suppliers: general and SOFFIT formwork.

PERMISSIBLE STRESSES	Source	Plywoods (Note 2)									Expanded Metal		
		Finnish 18 mm			Canadian US 17.5 mm			US 17.5mm			English		
		UPM-Kymmene data tables (Note 2)			CANPLY			APA – The Engineered Wood Association			Expamet Building Products		
General and SOFFITS	Direction of face grain relative to span (Note 1)	WISA-Form birch through	Mirror Construction birch and spruce	Spruce through	COPI-FORM SP Plus 175mm	Mixed softwood species 175mm	Douglas Fir G15 19mm	American Group 1 Exterior	American Hardwood or Group 1 Exterior	American Group 1 Exterior	Hy-Rib Designers Guide December 2004		
		13-ply film faced	11-ply film faced	7-ply overlaid	7-ply overlaid	7-ply overlaid	7-ply sanded	7-ply overlaid	7-ply overlaid	7-ply overlaid	Grade 2411	Grade 2611	Grade 2811
Bending stiffness B (kNm ² /m)	Parallel Perpendicular	3.16 2.34	2.30 2.10	2.56 1.21	3.21 1.70	3.00 1.59	2.95 ns	2.74 1.15	2.63 1.61	3.35 1.41	3.94 n/a	2.53 n/a	2.00 n/a
Moment of resistance Z (kNm/m)	Parallel Perpendicular	0.903 0.766	0.708 0.568	0.458 0.292	0.600 0.439	0.577 0.423	0.515 ns	0.526 0.231	0.643 0.323	0.484 0.297	0.431	0.287	0.244
Shear load (Note 4) qA (kN/m) (Note 5)	Parallel Perpendicular	14.89 13.05	9.53 13.05	5.41 4.57	8.62 7.06	6.62 5.39	6.58 ns	9.28 8.19	8.46 8.46	8.46 8.46	9.97	7.45	5.44
Thickness (mm)		176	176	176	1723	170	185	1723	170	167	0.75	0.50	0.40
Estimated weight (kg/m ²)		12.0	10.2	8.1	11.50	8.7	10.9	11.5	10.0	10.7	6.34	4.23	3.89
Trade names		WISA-Form Birch	WISA-Form Beto	WISA-Form MDO WISA-Form Slab	Richmond Ultraform Westam Crown 44	Richmond Coastform	CanFly G15	Pouform 107	Olympic Classic	Olympic B-Mate	Hy-Rib 2411	Hy-Rib 2611	Hy-Rib 2811

Notes to Table D – 5:

- Direction of face grain relative to span indicates the disposition of the plywood face grain relative to the supporting structure and not relative to its orientation on the panel. See Figure 39.
- The working properties for plywoods were submitted by the trade associations for Service Class 3 condition for wet end use, where none stated marked 'ns'.
- The working properties for Expanded Metal were submitted by the source.
- The shear load for plywood includes the 1.5 allowance for the parabolic distribution of the shear stress, see Section 3.3.2.4 Shear.
- The shear load includes a modification factor of 1.1 for plywood, see Section 3.3.2.4 Shear.

Case condition	Moment (kNm)	Reaction (kN)	Shear force (kN)	Deflections	
				Distance from A	Value (m)
57 	$M_A = M_E = -0.281 PL$ $M_C = M_D = -0.211 PL$ $M_B = M_D = 0.240 PL$ $M_{AB} = M_{BC} = 0.10 PL$ $M_{CD} = 0.122 PL$	$R_A = R_E = 1.719 P$ $R_B = R_D = 3.351 P$ $R_C = R_D = 2.930 P$	$S_{AB} = S_{DE} = 0.72 P$ $S_{BC} = S_{CD} = 1.28 P$ $S_{AC} = S_{BD} = 1.07 P$ $S_{CB} = S_{DC} = 0.93 P$ $S_{CD} = S_{DC} = 1.00 P$	0.442 L 1.073 L 1.533 L 2.50 L -	$\delta_{AB} = 0.0183 \frac{PL^4}{EI}$ $\delta_{BC} = -0.000602 \frac{PL^4}{EI}$ $\delta_{CD} = 0.00484 \frac{PL^4}{EI}$ $\delta_{DE} = 0.00918 \frac{PL^4}{EI}$ range = $0.0185 \frac{PL^4}{EI}$
58 Formwork use only: face contact material continuous over four or more supports with $L < 610$ mm and width of support B wider than $2t$ 	$M_A = -0.095 wL^2$ $M_{AB} = 0.085 wL^2$	$R_A = 0.5 wL$ $R_B = 1.0 wL$	$S_{AB} = S_{BC} = S_{CD}$ $= 0.525 w(L - B - t)$	-	Approximate $\delta_{AB} = 0.0066 \frac{wL^4}{EI}$ range = $0.00497 \frac{wL^4}{EI}$

Appendix B.3 Typical loading cases

horizontal forces on the opposing formwork surfaces may be resisted within the formwork system by tying opposite faces together. Where the opposite faces are not adequately tied together, the lateral forces will be transferred either to the falsework or through the soffit formwork acting as a plate, see 19.3.2.4. It is important that individual formwork panels forming the soffit are also adequately restrained against separation by horizontal forces.

Where the soffit is not level, the concept is more complex and is discussed in Annex H.

19.2.7 Water and wave forces

Where falsework is subjected to water and wave forces, these should be evaluated as outlined in 17.5.2.

19.2.8 Dynamic and impact forces

The effects of dynamic and impact forces on falsework should be evaluated and allowed for in the design. The magnitude of such forces is given in Clause 4. Where possible, such impact forces should be minimized or avoided (see 17.4). It is always preferable to prevent accidental impacts from occurring rather than to strengthen the falsework to resist them.

The dynamic effects from concrete pumping should also be considered [see 17.4.3.4e)].

19.2.9 Notional lateral forces to be considered

19.2.9.1 Minimum stability

To ensure the lateral stability of general falsework structures, including beam grillages, they should be designed to be able to resist, at each phase of construction, the applied vertical loads (W) and a horizontal disturbing force F_H which is the greater of:

- 2.5% of the applied vertical loads (i.e. 2.5% W) considered as acting at the points of contact between the vertical loads and the supporting falsework; or
- the forces that can result from erection tolerances (normally taken as 1% of the applied vertical load (i.e. 1% W), refer to 19.2.4) plus the sum of other imposed loads, including wind, out of vertical by design, concrete pressures, water and waves as described in 19.2.7, dynamic and impact forces as described in 19.2.8, and the forces generated by the permanent works as described in 19.2.10.

NOTE The term F_H is used in the text and figures which follow. The term R_H is used to denote the reaction that resists F_H .

19.2.9.2 Node point stability

Within falsework structures the effective lengths of members, as struts, may be reduced by introducing points of restraint within the length of the strut. A point of restraint will normally be achieved where there is lacing or bracing in two directions to that point, usually called a node point. Each level of lacing and associated diagonal bracing should be capable of resisting a notional force, denoted by N_H ,

5 – Material Manufacturer Data and Tests

MR. BLAZG

JIANGSU LANDISI WOOD CO., LTD

GUANHU TOWN, PIZHOU CITY, JIANGSU PROVINCE, CHINA

TEL: +86-516-86919099, FAX: +86-51682869999.

PACKING LIST

DATE: MAY 1, 2018

INVOICE NO.: LDSC180401/2

THE CREDIT NUMBER: 4001IML201800739

TO: CICON BUILDING MATERIALS.

P.O.BOX 660, ABU DHABI, U.A.E.

FROM LIANYUNGANG PORT, CHINA

TO JEBEL ALI PORT, U.A.E.

DESCRIPTION OF GOODS	QUANTITY	CRATES	SHEETS	G.W	N.W
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BOTH SIDES PRINTED IN GOLD "INDONESIA" BRAND, FILM FACED PLYWOOD, COMBI CORE, WBP PHENOLIC GLUE, IMPORTED BROWN DYNEA FILM, GLOSSY SURFACE, ALL EDGES SEALES AND PAINTED WITH DARK BROWN COLOUR WATER PROOF PAINT.

SIZE: 4' X 8' X18 MM (13-PLY)

525.19CBM	280CRATES	9800SHEETS	285000KGS	280000KGS
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PRICE AS PER SALE CONTRACT NO. DUB/0121/18 DATED 21ST MARCH 2018 OF TRANSCONTINENTAL INDENTING CO. (LLC), DUBAI.

SHIPPING MARKS: ON FOUR SIDES OF THE CRATE HAVE BEEN MARKED AS FOLLOWS:

"INDONESIA" FILM FACED PLYWOOD, WBP PHENOLIC GLUE SIZE: 18MM X 1220MMX 2440MM (13) PLY CICON/ABU DHABI INDONESIA

TOTAL: 525.19CBM	280CRATES	9800SHEETS	285000KGS	280000KGS
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PACKING: EXPORT STANDARD IN STRONG SEAWORTHY WOODEN CRATES, CRATES COVERED WITH THICK PLYWOOD AND POLYTHENE HAVING 5 PLY TIGHTLY TIED WITH 7 IRON BOUND STRIPS, 35 SHEETS PER WOODEN CRATE.

NUMBER OF SHEETS IN EACH CRATE: 35 SHEETS

TOTAL NUMBER OF SHEETS: 9800SHEETS

TOTAL NUMBER OF CRATES: 280CRATES

WE CERTIFY THAT FOREST STEWARD CHIP CERTIFICATE NUMBER HAS BEEN CLEARLY MENTIONED ON EACH AND EVERY CRATE.

WE CERTIFY THAT THE WORD "INDONESIA" TO APPEAR ON TWO SIDES OF THE EACH AND EVERY SHEET.

江苏兰蒂斯木业有限公司
JIANGSU LANDISI WOOD CO., LTD.

兰 蒂 斯 木 业

BUREAU VERITAS
Certification

CERTIFICATE
Number: EV-CCC-097420

Issued: April 20th, 2018
Valid until: April 20th, 2023

Bureau Veritas Certification certifies that the company

JIANGSU LANDISI WOOD CO., LTD
has implemented a FSC product group control system according to the Forest Stewardship Council certification system, in the following location:

JIANGSU LANDISI WOOD CO., LTD
GUANHU TOWN, WIZHOU CITY, JIANGSU PROVINCE, CHINA
221400--WIZHOU--CHINA

for its activities concerning:

Manufacturing and sales of plywood certified FSC 100%

as stated in its product's special label FSC 100% (Group 1)

This company has been assessed and found to conform to the requirements of the

FSC Chain of Custody standard, Ref.: ISO-COC-14-01-21

This certificate is valid for a 5 years period

April 20th, 2018
F. JOLY DE BRESKON
Bureau Veritas Certification

THE CREDIT NUMBER: 40011ML201800739

The validity of this certificate shall be verified on-line by us.
This certificate just does not constitute evidence that a particular product supplied by the certificate holder is FSC-certified or FSC Controlled Wood Products, unless printed or sold by the certificate holder and only by controlled channels or in a place of the certificate holder. FSC Chain of Custody is liable for the product and the certificate holder.

FSC official #CC-COC-079 - Great Wall Jiangsu Co., Ltd.
Managerial office: Bureau Veritas Wood & Paper Control Center
in full of the products or services the new holder of the scope of the certificate must be notified by e-mail to Bureau Veritas Certification.
This is before receiving the product change notice. Certificates of copies or reproduction and the website URL will be printed or printed by Bureau Veritas Control.
Warranty: not in force for liability claims.
This certificate is based on ISO 14001 and ISO 9001:2008.

FSC

JIANGSU LANDISI WOOD CO., LTD

GUANHU TOWN, PIZHOU CITY, JIANGSU PROVINCE, CHINA

TEL: +86-516-86919099, FAX: +86-51682869999.

TECHNICAL DATA SHEET

DATE: MAY 1, 2018

INVOICE NO.: LDSC180401/2

THE CREDIT NUMBER: 4001HML201800739

PRODUCT NAME: BOTH SIDES PRINTED IN GOLD "INDONESIA" BRAND, FILM FACED PLYWOOD, COMBI CORE, WBP PHENOLIC GLUE, IMPORTED BROWN DYNEA FILM, GLOSSY SURFACE, ALL EDGES SEALS AND PAINTED WITH DARK BROWN COLOUR WATER PROOF PAINT.

Technical Specifications					
Characteristics		Unit of Measure	Test Method	Value	Result
Moisture Content		%	En 322	10	Approved
Density		Kg/m3	En 323	600	Approved
Longitudinal Module of Elasticity		Mpa	En 310	6100	Approved
Lateral Module of Elasticity		Mpa		4800	Approved
Longitudinal Bending Strength(N/mm)		Mpa	En 310	55.01	Approved
Lateral Bending Strength(N/mm)		Mpa		43.01	Approved
Bonding	Bonding quality	Mpa	En 314	Max:1.72 Min:0.85	Approved
Data sheet of WBP (Phenolic) GLUE					
Test item	Test result		starndard		
Appearance	Red Tansparent liquid		Red Tansparent liquid		
Solid content %	35.9%		30.8%~40.6%		
Viscosity cp	72		60~100		
Solid time sec	1050 s		900s~1200s		
PH	11.2		10~12		
Hydromete	1.076		1.018~1.198		

JIANGSU LANDISI WOOD CO., LTD.

GUANHU TOWN, PIZHOU CITY, JIANGSU PROVINCE, CHINA

TEL: +86-516-86919099, FAX: +86-51682869999.

MILL TEST CERTIFICATE

PRODUCT NAME: BOTH SIDES PRINTED IN GOLD "INDONESIA" BRAND, FILM FACED PLYWOOD		CONTRACT: CICON BUILDING MATERIALS.		
TESTED DATE	MAY 1, 2018	ITEM	THICKNESS	COLOR
ORDER	CICON BUILDING MATERIALS.	FACE	1.10	W
STANDARD TEST	GB/T 17656-2008	CORE	1.71	B
DIMENSION	18.0mmX4'X8'	CORE	1.66	W
GLUE TYPE	WBP GLUE	CORE	1.70	B
WOOD KIND	COMBI	CORE	1.75	W
MOIST CONTENT	10.0%	CORE	1.70	B
NUMBER OF SAMPLE	1	CORE	1.75	W
SAMPLE TEST	1	CORE	1.66	W
		CORE	1.75	B
		BACK	1.17	W
ITEM	UNIT	VALUE OF TEST	JUDGEMENT	
DENSITY	KG/M3	600	PASSED ✓	
BONDING QUALITY	Mpa	0.85-1.72	PASSED ✓	
	%	90%samples>=0.70Mpa	PASSED ✓	
MODULES OF ELASTRICTY	Longitudinal	Mpa	6100	PASSED ✓
	Lateral		4800	PASSED ✓
BEND STRESS	Longitudinal	Mpa	55.01	PASSED ✓
	Lateral		43.01	PASSED ✓
REMARK: HOT PRESS: 930' TEMPERATURE : 135℃ PRESS GAUCE: 10 kg/cm3 DATE: MAY 1, 2018 INVOICE NO.: LDSC180401/2 THE CREDIT NUMBER: 40011ML201800739 SHIPPING MARKS: ON FOUR SIDES OF THE CRATE HAVE BEEN MARKED AS FOLLOWS: " INDONESIA" FILM FACED PLYWOOD, WBP PHENOLIC GLUE SIZE: 18MM X 1220MMX 2440MM (13) PLY CICON/ABU DHABI INDONESIA THE VESSEL NAME: CAPE KORTIA 007W JIANGSU LANDISI WOOD CO., LTD. VERY TRULY YOURS JIANGSU LANDISI WOOD CO., LTD				

602/180401-2



中华人民共和国出入境检验检疫
ENTRY-EXIT INSPECTION AND QUARANTINE
OF THE PEOPLE'S REPUBLIC OF CHINA

正本
ORIGINAL

共1页, 第1页 Page 1 of 1

植物检疫证书
PHYTOSANITARY CERTIFICATE

编号 No.: 218000001623449001

发货人名称及地址 Name and Address of Consignor	JIANGSU LANDISI WOOD CO., LTD GUANHU TOWN, PEIZHOU CITY, JIANGSU PROVINCE, CHINA TEL: +86-516-86912999, FAX: +86-51681869999		
收货人名称及地址 Name and Address of Consignee	CICON BUILDING MATERIALS, P.O. BOX 660, ABU DHABI, U.A.E.		
品名 Name of Produce	FILM FACED PLYWOOD	植物学名 Botanical Name of Plants	***
报检数量 Quantity Declared	**525.19CBM	标记及号码 Mark & No.	SEE REMARKS 1.
包装种类及数量 Number and Type of Packages	**280CRATES		
产地 Place of Origin	XUZHOU, CHINA		
到达口岸 Port of Destination	JEBEL ALI, U.A.E.		
运输工具 Means of Conveyance	BY VESSEL	检验日期 Date of Inspection	08 May, 2018

兹证明上述植物、植物产品或其他检疫物已经按照规定程序进行检查和/或检验，被认为不带有输入国或地区规定的检疫性有害生物，并且基本不带有其他的有害生物，因而符合输入国或地区现行的植物检疫要求。
This is to certify that the plants, plant products or other regulated articles described above have been inspected and/or tested according to appropriate procedures and are considered to be free from quarantine pests specified by the importing country/ region, and practically free from other injurious pests; and that they are considered to conform with the current phytosanitary requirements of the importing country/region.

杀虫和/或灭菌处理 DISINFESTATION AND/OR DISINFECTION TREATMENT

日期 Date	***	药剂及浓度 Chemical and Concentration	***
处理方法 Treatment	***	持续时间及温度 Duration and Temperature	***

附加声明 ADDITIONAL DECLARATION

REMARKS: 1. ON FOUR SIDES OF THE CRATE HAVE BEEN MARKED AS FOLLOWS:
INDONESIA
FILM FACED PLYWOOD,
CREDIT NUMBER: 4001IML201800739
WBP PHENOLIC GLUE
SIZE: 18MM X 1220MM
X 2440MM (13) PLY
CICON/ABU DHABI
INDONESIA



签证地点 Place of Issue XUZHOU, CHINA 签证日期 Date of Issue 08 May, 2018

授权签字人 Authorized Officer WU SHEN 签名 Signature 吴申

中华人民共和国出入境检验检疫机关及其官员或代表不承担签发本证书的任何法律责任。(No financial liability with respect to this certificate shall attach to the entry-exit inspection and quarantine authorities of the P. R. of China or to any of its officers or representatives.)
[e-S-1(2000, 1.1)]



AA4300120



RIVET PIN & SPRING CLIP



إحدى شركات استثمار رأس المال العربي والأجنبي



Technical Report

RIVET PIN 17MM

* Allowable Double Shear force for RIVET PIN 17MM is **8.0 ton**

Approved:

Head Of Technical Sector

Eng. Mostafa Sabry

Head Office & Factories : Widy Houf - Helwan - Cairo Tel. 02/236 90 616 - 236 90 739
Tel: 36 95 700 (10 Lines) Fax: 236 95 260
Alexandria: 27 Dr Mahmoud Dawid St. - Customs Building - Smouha Telfax 03/ 42 00 489
Port Saïd: El Freepor Building Tel: 066/ 32 32 642

الإدارة والمصانع: وادي حوف حلوان
تليفون: ٢٣٦٩٥٧٠٠ (١٠ خطوط) فاكس: ٢٣٦٩٥٢٦٠
الإسكندرية: ٢٧ شارع د محمود داود - عمارة الجمارك - سموحة ت. وفاكس: ٠٣/٤٢٠٠٤٨٩
بورسعيد: عمارة الفريبور تليفون: ٠٦٦/٣٢٣٢٥٤٢

Internet: www.acrowmisa.com E-mail: info@acrowmisa.com E-mail: sales@acrowmisa.com E-mail: Design@acrowmisa.com

Housing and Building National Research Center
Building Materials Research & Quality Control Institute



Shear Test Results on Rivet Pin & Spring Clip

Client: Acrow Misr

Delivery No. : 1140

Project : ———

Delivery Date: 12/5/2009

Specimen Code: MTL\ST\2009\264

Additional information : ———

Specimen No.	Ultimate load (kN)	Factor of safety	Working load (kN)
1	108.5	1.5	72.33
2	111.0	1.5	74.00
3	113.0	1.5	75.33

Specimen Shape:



Before testing

Page 1 of 2

87 El-Tahreer St. Dokki Giza P.O. Box 1770
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www.hbrc.edu.eg

شارع التحرير - الدقي ص.ب. ١٧٧٠٠

تليفون: (٠٢) ٣٣٥٦٧٢٢ - (٠٢) ٣٣٥٦٨٥٣ فاكس: ٣٣٥١٥٦٤

Housing and Building National Research Center
Building Materials Research & Quality Control Institute



Failure of specimen no. 1



Failure of specimen no. 2



Failure of specimen no. 3

Notes :

- The above information is according to the client's letter .
- The factor of safety is given by the client.
- The above results are valid only for the Samples delivered by the client .



Prepared by
Eng. Ahada Diaa
Eng. Raghad Osama

Supervisor
Dr. H. Karmouy

Head of Institute
Sayed
12/5
Prof. Dr. Sayed Abd-El Baky

Page 2 of 2

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٨٧ شارع التحرير - القلي - ص.ب.: ١٧٧٠
تليفون: ٣٣٥٦٧٢٢ (٠٢) - ٣٣٥٦٨٥٣ (٠٢) فاكس: ٣٣٥١٥٦٤

TIE ROD



إحدى شركات إستثمار رأس المال العربي والأجنبي



Metallic Scaffolding - Formwork
Steel Structure, Storage & Shelving Systems



للشركات والسقالات المعدنية
منشآت معدنية - أنظمة تجهيزات المخازن

Design Department Technical Report

According to the attached test report of:

Tie Rod DVD Imported

D=15mm

It is recommended that:

Allowable tensile force (T) = 9.0ton

Approved:

Eng.

M. Sabry

Head Office & Factories : Wady Houf - Helwan - Cairo Tel.:02/236 90 616 - 236 90 739
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الإدارة والمصانع: وادي حوف حلوان
تلفون: ٢٣٦٩٥٧٠٠ (١٠ خطوط) فاكس: ٢٣٦٩٥٢٦٠
الإسكندرية: ٢٧ شارع د محمود داود - عمارة الجمارك - سموحة ت. وفاكس: ٠٢/٤٢٠٠٤٨٩
بورسعيد: عمارة الفريبور تلفون: ٠٦٦/٣٢٣٢٥٤٢

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Housing & Building National Research Center

Building Materials Research & Quality Control Institute.



مركز بحوث مواد البناء ومراقبة الجودة



المركز القومي لبحوث الإسكان والبناء

Tensile Test Results of "Tie Rod" Samples

Client: ACROWMISK
Project: -----
Code No. : MTLAST\2008\103

Delivery Date: 13/5/2008
Delivery No. : 789
Additional Info: Tie Rod Samples
صليب ترسميون لوسين ديهيداج هندى

PROPERTY	Sample NO.		
	1	2	3
Nominal Size (mm)	16	16	16
Nominal Area (mm ²)	201.06	201.06	201.06
Sample Length (mm)	350.22	349.16	350.63
Sample Mass (gm)	524	524	525
Mass per meter run (Kg/m)	1.496	1.501	1.497
Initial Gauge Length (mm)	160	160	160
Final Gauge Length (mm)	161.48	166.64	163.87
Ultimate Load (KN)	149.20	147.60	147.50
Tensile Strength (N/mm ²)	742.06	734.11	733.61
Elongation %	---	4.15	---

NOTES:

- Tests were carried out as per ESS76/2001 Specification.
- Tested samples didn't show any yield
- Fracture occurred in the gauge length for specimen 2 only.
- The above results are valid only on the samples delivered.
- The above information is according to the client's letter.

Prepared by
Eng. Fatma Al Zahrae

Supervisor
Dr. Hamed



Head of Institute
Dr. Hamed Bahnsawy
14/5/2008

Prof. Dr. Hamed Hamed Bahnsawy

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٨٧ شارع التحرير-القطي ص.ب. ١٧٧٠٠
تليفون: ٣٣٥٦٧٢٢ (٠٢) - ٣٣٥٦٨٥٣ (٠٢) فاكس: ٣٣٥١٥٦٤

Steel Wailer (Solider) [10 UPN]

PROPERTIES OF SECTION

Painted Blue

Area of Section = 27.00 cm^2

Space between flange = 52 mm

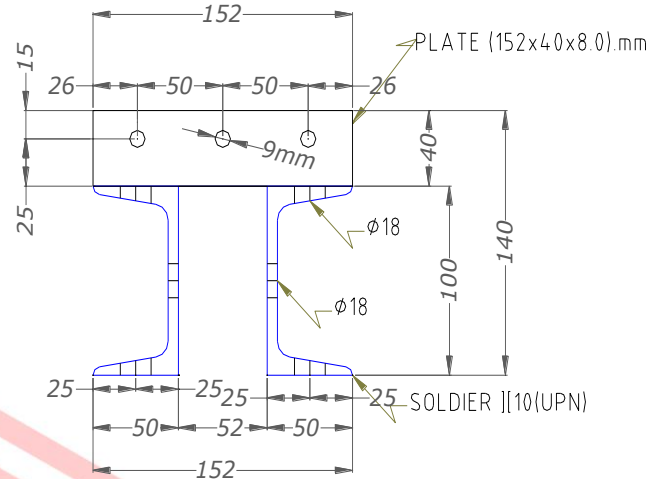
Moment of inertia (I_y) = 412.0 cm^4

Section Modulus (Z_y) = 82.4 cm^3

Allowable Stress = $1.4t / \text{cm}^2$

Permissible Bending Moment = Allowable Stress x (Z_y) = 11.50 KN.m

Weight/m = 10.60 kg/m (for one Channel)



Designation	Depth	Width	Thickness Web	Thickness Flange	Sectional Area	Weight	Moment of Inertia - Ix	Moment of Inertia - Iy	Section of Modulus - Wx	Section of Modulus - Wy
	mm	mm	mm	mm	cm**2	kg/m	cm**4	cm**4	cm**3	cm**3
UPN 50 x 25	50	25	5	6	4.92	3.86	16.8	2.5	6.7	1.48
UPN 50 x 38	50	38	5	7	7.12	5.59	26.4	9.1	10.6	3.75
UPN 60 x 30	60	30	6	6	6.46	5.07	31.6	4.5	10.5	2.16
UPN 65 x 42	65	42	5.5	7.5	9.03	7.09	57.5	14.1	17.7	5.07
UPN 80 x 45	80	45	6	8	11	8.64	106	19.4	26.5	6.36
UPN 100 x 50	100	50	6	8.5	13.5	10.6	206	29.2	41.2	8.40
UPN 120 x 55	120	55	7	9	17	13.4	364	43.2	60.7	11.1
UPN 140 x 60	140	60	7	10	20.4	16	605	62.7	86.4	14.8
UPN 160 x 65	160	65	7.5	10.5	24	18.8	925	85.3	116	18.3
UPN 180 x 70	180	70	8	11	28	22	1350	114	150	22.4
UPN 200 x 75	200	75	8.5	11.5	32.2	25.3	1910	148	191	27
UPN 220 x 80	220	80	9	12.5	37.4	29.4	2690	197	245	33.6
UPN 240 x 85	240	85	9.5	13	42.3	33.2	3600	248	300	39.6
UPN 260 x 90	260	90	10	14	48.3	37.9	4820	317	371	47.7
UPN 280 x 95	280	95	10	15	53.3	41.8	6280	399	448	57.2
UPN 300 x 100	300	100	10	16	58.8	43.2	8030	495	535	67.8
UPN 350 x 100	350	100	14	16	77.3	60.6	12840	570	734	75.0

RAWL® Throughbolt

CONCRETE

BOLT FIXINGS

The **Rawl R-HPT Throughbolt** is a high performance Throughbolt designed to function reliably in both non-cracked and cracked concrete and is ideal for safety critical applications.

- Economical, quick to install.
- Tested in accordance with level 1 of the pending European Technical Guidelines (ETAG).
- Enhanced load performance.
- Suitable for all applications in concrete.

Features

Cold forming for increased tensile strength, good surface finish and reduced friction

Increased external grip for improved load capacity in cracked concrete



• Rolled thread form to ensure good thread fit and reliable setting

• Special design of stainless steel expander provides an enhanced performance in cracked and non-cracked concrete

R-HPT

Product Data (R-SPT & R-HPT)

THROUGHBOLTS	BOX 100	BOX 50	BOX 25	BOX 10
Standard Performance Throughbolt (zinc-plated)	56-102	56-128	56-152	56-164
	56-104	56-129	56-153	56-166
	56-108	56-132	56-154	56-168
	56-112	56-136	56-156	56-172
	56-114	56-138	56-158	-
	56-116	56-139	56-159	-
	56-120	56-140	56-160	-
	56-124	56-144	-	-
	56-126	56-148	-	-
	-	56-150	-	-
Standard Performance Throughbolt (stainless steel 316)	56-604	56-628	56-651	56-664
	56-610	56-636	56-652	56-666
	56-616	56-638	56-656	56-672
	56-620	56-640	56-658	-
	56-624	56-648	56-659	-
	-	56-650	56-660	-
Standard Performance Throughbolt (Hot Dip Galvanised)	56-814	56-828	56-853	56-864
	56-816	56-832	56-852	56-872
	56-820	56-836	56-856	-
	56-824	56-840	56-859	-
	56-826	56-844	56-860	-
	56-829	56-848	-	-
-	56-850	-	-	
High Performance Throughbolt	56-314	56-328	56-350	56-364
	56-316	56-330	56-352	56-366
	56-320	56-332	56-354	-
	56-324	56-336	56-356	-
	56-326	56-338	56-360	-
	-	56-340	56-362	-
	-	56-342	-	-
	-	56-344	-	-
	-	-	-	-
	-	56-346	-	-

Standard Performance Throughbolts (R-SPT) Design Data

SIZE	STANDARD EMBEDMENT DEPTH SAFE WORKING LOAD IN CONCRETE 30N/mm ² (kN)		REDUCED EMBEDMENT DEPTH SAFE WORKING LOAD IN CONCRETE 30N/mm ² (kN)	
	Tension	Shear	Tension	Shear
M6	2.3	2.0	1.8	1.5
M8	3.8	4.4	2.3	2.9
M10	5.8	6.6	3.1	4.5
M12	9.0	10.5	5.2	6.5
M16	14.2	16.3	7.1	12.8
M20	17.5	24.0	13.4	20.5
M24	19.1	28.8	17.8	28.8

For Performance Data Characteristics for M16 90 SPT please contact Technical Advisory Service.

High Performance Throughbolts (R-HPT) Design Data

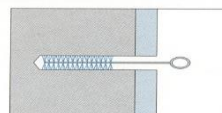
SIZE	STANDARD EMBEDMENT DEPTH SAFE WORKING LOAD IN CONCRETE 30N/mm ² (kN)	
	Tension	Shear
M8	4.0	4.4
M10	6.5	6.6
M12	10.6	10.5
M16	16.1	16.3
M20	23.2	24.0

Installation

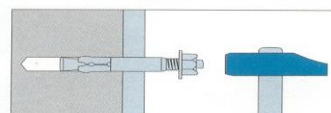
Technical Advisory Service Tel 0141 638 7961



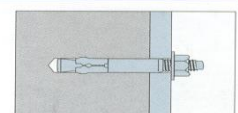
Drill hole of required depth and diameter through clearance hole in fixture into concrete.



Remove debris.



With nut and washer assembled, tap Throughbolt through fixture into hole until fixing depth is reached.



Tighten nut to recommended torque.

8