CIDB MALAYSIA

TECHNICAL OPINION

SUBMITTED TO CIDB MALAYSIA | MAY 2012

TECHNICAL OPINION REPORT

PRODUCT
High – Re Formply

APPLICANT
Progressive Base Sdn. Bhd.

CIDB MALAYSIA

CONSTRUCTION INDUSTRY DEVELOPMENT BOARD
7th Floor, CIDB Headquarters,
Grand Seasons Avenue,
No. 72, Jalan Pahang, 53000 Kuala Lumpur

CREAM
Construction Research Institute of Malaysia

CONSTRUCTION RESEARCH INSTITUTE OF MALAYSIA
Makmal Kerja Raya Maysia (MKRM),
IBS Centre, 1st Floor, Block E, Lot 8,
Jalan Chan Sow Lin, 55200 Kuala Lumpur

FOREWORD

Construction Industry Development Board (CIDB Malaysia) is a statutory body enacted under the Act 520 in 1994 (revised 2010). Its mission is to develop Malaysian Construction Industry towards global competitiveness. To support that mission, a number of functions were formulated and one of them is to encourage the improvement of construction techniques and materials. Under that function, CIDB is to carry out assessment and appraisal of innovations of any kind of product and technology related to construction and to publish its finding, in the form of Technical Opinion.

This Technical Opinion will provide a reference to the relevant/interested parties in the construction industry. CIDB assess innovation based on application and evaluation by its Technical Opinion. Applicants may use it as a supporting document for regulatory and approving authorities, architects, engineers and others in dealing with the new products and technologies.

This Technical Opinion was prepared on behalf of CIDB by The Technical Expert Panels on construction products, construction material and technology in Construction Industry. The Technical Expert Panels was set-up by CIDB and its members were drawn from experts that represent relevant sector in the construction industry.

This Technical Opinion has been modelled based on international recommended practice.

CIDB Technical Expert Panel Committee for High – Re Formply

Technical Expert Panel

Ir. Dr. Zuhairi Abd. Hamid	(Chairman)	Construction Research Institute of Malaysia. (CREAM)
Dr. Mohamad Omar Mohamad Khaidzir	(Technical Expert Panel)	Forest Research Institute of Malaysia. (FRIM)
Associate Prof. Dr. Zaidon Ashaari	(Technical Expert Panel)	Universiti Putra Malaysia (UPM)
Ir. Mohd Azhari Mohd Salleh	(Technical Expert Panel)	Jabatan Kerja Raya (JKR)

Secretariat

Ahmad Hazim bin Abdul Rahim	CREAM
Mohd Termidzi Mohd Ghani	CREAM
Nurulhuda binti Mat Kilau	CREAM
Syed Hazni bin Abd Gani	CREAM
Suhaila binti Abdul Halim	CREAM

GENERAL PROVISIONS

The purpose of this report is to assist respective parties, concerned applicants, granting approval authority and users to decide upon the technical suitability which includes product specifications and applications. This report shall not be considered as an approval.

Special note should be taken of the provisions and limitations set out and the period of validity of the Technical Opinion.

A Technical Opinion is initially given a term of validity of three (3) years from the date of issue in the expectation that, after that period, the subject will no longer be an innovation. The report can be reviewed within the first twelve (12) months. The limitation on the validity of the opinions should not be interpreted as implying a similarly limited life expectancy of the products or system described in the Technical Opinion. However, if experience shows poor overall standard of quality or performance, the Technical Opinion will be withdrawn.

The legitimacy and validity of the Technical Opinion can be verified at office of CIDB Head Office.

CIDB, the Technical Expert Panels shall accept no responsibility for the quality and performance of the products.

Disclaimer

While every effort is made to ensure accuracy of the information presented in this report, neither the Technical Expert Panels nor its Secretariats or CREAM can accept responsibility for any loss or damage incurred in connection with the use of the contents.

Definition

Technical Opinion Programme:	A programme that was initiated by CIDB with the aim to evaluate products, materials, components or system with regard to, but not limited to IBS. It normally covers wide range of innovative products to be used in local construction industry
Technical Expert Panel:	Individuals selected based on their expertise in civil and structural engineering, timber engineering, forest products research and development as well as their experiences in construction industry.
High-Re Formply:	A product manufactured from hardwood veneer and using advanced veneering technology. The base panel surface is laminated with a Phenolic Film and the edges of the panel are coated with a water resistant sealant to prevent absorption of water.
Phenolic Film:	Type of Phenolic Film can either be of smooth or wire mesh texture. The colour is dark brown with density spread of 125 gsm / 125 gsm (both faces) or 220 gsm / 220 gsm (both faces)

Abbreviation

CIDB	Construction Industrial Development Board
CREAM	Construction Research Institute of Malaysia
FRIM	Forest Research Institute Malaysia
UPM	Universiti Putra Malaysia
JKR	Jabatan Kerja Raya
PBSB	Progressive Base Sdn. Bhd.
MOR	Modulus of Rupture
MOE	Modulus of Elasticity
EN	European Nation
BS EN	British Standard of the European Nation
IBS	Industrialised Building System
cm	centimetre
cps	centipoise
gsm	gram per square metre
kg	kilogram
m	metre
max	maximum
min	minimum
mm	millimetre
MPa	Mega Pascal
N	Newton

CONTENT ***PAGE***

1.0 IDENTIFICATION

1.1 Title of Product

High – Re Formply

1.2 Country of Origin

Malaysia

1.3 Date of Evaluation

19th December 2011, 18th January 2012, 23rd February 2012, 10th April 2012

1.4 Purpose

The application of this product is used as phenolic-coated plywood for concrete formwork in IBS system.

1.5 Applicant & Address

Progressive Base Sdn. Bhd.	Contact:	
No 6, Jalan TUDM,	Telephone	: 03 – 7847 6227
Kampung Baru Subang,	Fax	: 03 –7847 6373
40150 Shah Alam, Selangor.	Website	: www.high-re.com

1.6 Manufacturer & Address

Menawan Wood Sdn. Bhd.	Contact:	
Lot 515, Jalan Datuk Edward	Telephone	: 085 – 656 699
Jeli, Piasau Industrial Estate,	Fax	: 085 – 650 999
98000 Miri, Sarawak.		

1.7 Holding Company & Address

Wason Resources Sdn. Bhd.	Contact:	
No. 6, Jalan TUDM,	Telephone	: 03-7847 6368
Kampung Baru Subang,	Fax	: 03-7847 6373
40150 Shah Alam, Selangor.	Website	:http://www.wasonmalaysia.com/

Note: This Technical Opinion report is issued based on application and documents provided by Progressive Base Sdn. Bhd. and only valid for the product specification rendered during submission. It is the responsibility of the applicant to notify CIDB of any change in the product specification and supplier mentioned in this report.

2.0 DESCRIPTION

2.1 General Description of Product

High-Re Formply is manufactured from hardwood veneer using advanced veneering technology. The base panel surface is laminated with a Phenolic Film and the edges of the panel are coated with a water resistant sealant to prevent absorption of water.

2.2 Element of Product

I. Species

Medium / light hardwood

II. Product Dimension

a) Average density: 680 ± 20 kg/m^3
b) Panel size: 1220 mm x 2440 mm (± 1.0 mm per linear metre of edge)
c) Thickness: 18.0 mm (± 0.5 mm)

III. Phenolic Film

a) Type : Smooth or wire mesh
b) Colour : Dark brown
c) Film spread : 125 gsm/125 gsm (both faces) or 220 gsm/220 gsm (both faces)

2.3 Usage Application

High-Re Formply is used as plywood formwork for IBS system in the construction of structural elements such as:

- Shear Wall/ Wall
- Column
- Beam
- Slab

High-Re Formply is claimed to be used in combination with other IBS system formwork providers such as Peri System to form a stronger system formwork panels.

2.4 Product Advantages

a) High quality concrete finishes which precludes the need for additional work or finishing touches at site.
b) Exceptionally high re-used rate through easy-to-follow procedures.
c) Saving in labour and material arising from repeated usage. (Approximately 20 – 30 cycles. Refer testimonials letter from clients in Appendix A)
d) Saving the cost of crane operation and workforce due to lightweight of plywood.

2.5 Usage Limitation

High-Re Formply can be used repeatedly up to 20 to 30 times as claimed by end users in their testimonials (Appendix A).

2.6 Procedure of Proper Preventive Maintenance (Appendix B).

a. Application of release agent before the first casting job
b. Cleaning and reapplying of release agent for subsequent uses
c. Treating of all cut edges with water–sealing paint (ideally, minimum of 2 or 3 layers)
d. Storage and stacking above ground and under cover against direct sunlight and rain so as to maintain strength and prevent warping.

3.0 BASIS OF APPRAISAL

3.1 Check on Document Received from Progressive Base Sdn. Bhd.

The following documents were received to support the appraisal of the products.

i. Test report on the material and product testing (Appendix C and Appendix D).
ii. Testimonial letters from end users (Appendix A).
iii. EC Certificate of Factory Production Control (Appendix E).

3.2 Technical Visit

Date	**:**	**23rd February 2012**
Project Name	**:**	**Platinum Park Phase 3 Project (Naza Tower)**
Project Address:		**Lot 267 and Lot 270, Jalan Stonor,**
		50450 Kuala Lumpur, Malaysia
Contractor	**:**	**IJM Construction Sdn. Bhd.**

One technical visit to Naza Tower construction site was conducted on 23rd February 2012. The team consisted of nine (9) persons including the Technical Expert Panels and the Secretariat. The purpose of the visit was to determine the actual condition of High-Re Formply applied in building construction.

The technical visit team was accompanied by Mr Hwang Thean Ming, sales representative from PBSB and Mr Fong Kok Foo, Senior Construction Manager from IJM Construction Sdn. Bhd..

According to Mr Fong (personal communication on 23rd February 2012), the product has been used repeatedly up to thirteen (13) storeys for lift core structure, walls, columns and beams for Tabung Haji Tower and Naza Tower. The photographs taken during the site visit are shown in Appendix F.

4.0 MATERIAL: STANDARDS, SPECIFICATIONS AND TESTS.

4.1 Material Standard and Specification

i.	Wood species	:	Medium light hardwood
ii.	Density	:	680 ± 20 kg/m^3
iii.	Panel size	:	1220 mm x 2440 mm (± 1.0 mm per linear metre of edge)
iv.	Thickness	:	18.0 mm (± 0.5 mm)
v.	No. of plies	:	11
vi.	Moisture content	:	11%
vii.	Bonding/Adhesive	:	WBP (Water-Boiled Proof) / Phenol formaldehyde
viii.	Phenolic Film	:	Type – smooth or wire mesh
		:	Colour – dark brown
		:	Density – 125 gsm/125 gsm & 220 gsm/220 gsm
ix.	Glueline Shear strength:		Approximately 1.5 Mpa

4.2 Type of Tests

4.2.1 The following tests have been conducted for the applicant at the Forest Research Institute of Malaysia (FRIM) in accordance with acceptable international standards. The tests include:

a) Modulus of Elasticity (N/mm^2 or MPa)
b) Bending strength (N/mm^2 or MPa)
c) Shear strength - Glueline (N/mm^2 or MPa)
d) Wood failure (%)

4.2.2 The following tests have been conducted for the applicant at Menawan Wood Resources Sdn. Bhd. according to in-house specifications. The tests include:

1. *Test on Plywood*

a) Bonding (N/mm^2 or MPa)
b) Moisture Content (%)
c) Soaking (%)
d) Density (kg/m^3)

2. *Test on Phenolic Resin*

a) Specific Gravity
b) Viscosity (cps)
c) pH

d) Temperature (^{o}C)

e) Gelation Time (minute)

f) Solid Content (%)

4.3 Additional Test Required

The supplier is to notify CIDB on any additional test required (if any) by fabricator or client.

4.4 Check on Test Report Provided by Progressive Base Sdn. Bhd.

4.4.1. Test on Plywood

The following tests were conducted by Forest Research Institute of Malaysia (FRIM) on 14th December 2011. The sample tested was 18 mm, 13 plies plywood (High-Re Formply) supplied by the applicant.

i. Table 4.1 : Plywood Bending Parallel to the Face Grain

Type of test	Standard Used	Average	Standard Deviation	Minimum	Maximum	Unit
Modulus of Rupture (MOR)	EN 310: 1993	77.0	3.80	71.4	82.6	MPa
Modulus of Elasticity (MOE)	EN 310: 1993	9927	171.4	9711	10155	MPa

ii. Table 4.2: Plywood Bending Perpendicular to the Face Grain

Type of test	Standard Used	Average	Standard Deviation	Minimum	Maximum	Unit
Modulus of Rupture (MOR)	EN 310: 1993	77.6	4.91	70.2	84.8	MPa
Modulus of Elasticity (MOE)	EN 310: 1993	8251	219	7840	8516	MPa

iii. Table 4.3: Shear Strength – Glueline

Type of test	Standard Used	Average	Standard Deviation	Minimum	Maximum	Unit
Shear Strength - Glueline	BS EN 314-1: 2004	1.0	0.4	0.5	1.5	MPa
Wood Failure	BS EN 314-1: 2004	47	29	20	100	%

The details of the test results are listed in Appendix C

4.4.2. Test on Plywood

The following tests were conducted by Menawan Wood Sdn. Bhd.. The sample tested was 18 mm, 13 plies plywood (High-Re Formply)

i. Table 4.4: Bonding Test, Moisture Content, Soaking Test and Density

Type of test	Specification (CE Marking Standard)	Average	Minimum	Maximum	Unit
Bonding Test	1	1.513	1.432	1.637	N/mm^2
Moisture content	14 (max)	7.8	7.6	8.7	%
Soaking Test	-	100	100	100	%
Density	400	663	649	671	kg/m^3

4.4.3. Test on Phenolic Resin

The following tests were conducted by Menawan Wood Sdn. Bhd. on 31 January 2012.

ii. Table 4.5: Testing of Phenolic Resin

Type of testing	Specification (In-house Standard)	Results Achieved	Unit
Specific Gravity	1.185 – 1.220	1.200	-
Viscosity	75 – 110	90	cps
pH	12.0 – 13.5	12.0	-
Temperature	30	30	^oC
Gelation Time	60 minute	52 minute	minute
Solid Content	41 – 47	43.17	%

The details of the test results are listed in Appendix D

5.0 DESIGN / MANUFACTURING

5.1 Design of High – Re Formply

Not applicable for this product

5.2 Manufacturing Process

The manufacturing flow chart of the product is shown in Appendix G

5.3 QA/ QC Plan

Internal quality check on finished product is claimed to be conducted by Menawan Wood Sdn. Bhd. The Quality Check of Finished Product is shown in Appendix H

6.0 COMPLIANCE TO INTERNATIONAL STANDARDS.

6.1 Standard for Material Tests.

A series of tests and methods were performed for the manufacturer and applicant in accordance with European standards (EN). The standards are listed in Table 6.1:

Table 6.1: European standards test for plywood

Type of tests	Standard	Agency that performed the test or method
Sampling method	**EN 326 – 1** Wood-based panels – Sampling, cutting and inspection. (Part 1: Sampling and cutting of test pieces and expression of test results)	Methods followed by FRIM for specimens supplied by applicant
Modulus of Elasticity (MOE)	**BS EN 310 : 1993** Wood-based panels. Determination of modulus of elasticity in bending and of bending strength	Methods followed by FRIM for specimens supplied by applicant
Modulus of Rupture (MOR)	**BS EN 310 : 1993** Wood-based panels. Determination of modulus of elasticity in bending and of bending strength	
Shear strength - Glueline	**BS EN 314-1 : 2004** Plywood. Bonding Quality. Test Methods.	
Wood failure	**BS EN 314-1 : 2004** Plywood. Bonding Quality. Test Methods.	
Bonding Test	**EN 314** Plywood – Bonding Class 3	Methods followed by Menawan Wood Sdn. Bhd
Density	**EN 323 : 1993** Wood-based panels. Determination of density.	

Type of tests	Standard	Agency that performed the test or method
Moisture content	**EN 322 : 1993** Wood-based panels. Determination of moisture content.	Methods followed by Menawan Wood Sdn. Bhd
Structural plywood in external conditions	**EN 636 – 3 S** Plywood specifications	Certificate issued by BM TRADA for specimens supplied by Menawan Wood Sdn. Bhd (Appendix E)
Structural plywood in internal humid conditions	**EN 636 – 2 S** Plywood specifications	
Structural plywood in internal dry conditions	**EN 636 – 1 S** Plywood specifications	

7.0 VALIDITY OF OPINION

7.1. Condition

The Technical Opinion Report given herein is based on the experiences of the Technical Expert Panels. The recommendations are based on and limited to the available information provided by applicant including visual inspection on the utilisation of the product on site, and test reports from accredited laboratories.

The recommendations are also based on and limited to the available information provided by applicant and during interview between the Technical Expert Panel and representatives from the applicant on 18th January 2012 and also on site interview during the visual inspection of the product at the construction site on the 23rd February 2012. In addition, the information was also made available through test reports provided by accredited laboratories.

7.2. Recommendations from Technical Expert Panels

A few additional recommendations have been raised by Technical Expert Panels. The recommendations are as follows:

a) Product catalogue recommendations:
   i. The term 'Average Ultimate Value' must be added for Modulus of Elasticity (MOE) and Modulus of Rupture (MOR) value for correct engineer's future reference.

ii. The term ‘glueline’ must be added to the sentence ‘shear strength’ to clarify the type of shear strength tested for plywood.

iii. The term ‘Film Spread’ must be added to the word Density for Phenolic Film i.e. Density (Film Spread) : 125 gsm / 125 gsm and 220 gsm / 220 gsm.

iv. The applicant should prepare a complete handling, application and maintenance guide booklet for users to follow so as to maximise the panel’s structural integrity. This guide should lay out the need to protect the panels against direct and prolonged rain and sunshine, the application of special release agent to ease dismantling of formwork from hardened concrete and the method to repair small damages to panels such as tearing of vinyl overlay during dismantling process.

v. The reusability claim of the product (or any amount, depending on work contractor) should be substantiated with a log book or document of support for future promotional brochure.

vi. Test report does not include test results for Panel Shear and Rolling Shear where these values are important for engineering design calculation. The shear values provided in the test report are only for glueline shear strength.

7.3. Withdrawal

Non-compliance to any International Standard related to this product will lead to withdrawal of this Technical Opinion.

7.4. Term of Validity

The recommendation is valid for three (3) years from the issuance of this Technical Opinion Report subject to the validity of the existing Test Certificates. This report is valid from May 2012 to April 2015.

8.0 APPROVED OPINION ABSTRACT

The Technical Expert Panels concludes that High-Re Formply is an advanced panel product as compared to normal plywood panel for formwork fabrication intended for reinforced concrete moulding. Even though it was claimed that the product can be reused up to 20 – 30 times, the claim is yet to be realistically proven since it cannot be ascertained with just a single short site visit.

However, based on visual judgement of the finished structural elements, such as walls, columns and beams, it was evident that the final concrete surface was smooth and would only need minimal finishing to look presentable

The product is used with other formwork system such as DOKA or PERI for horizontal under support of the panels. It is also suitable to be used for "automatic climbing" type of formwork system due to its immediate reusability.

Based on the majority of testimonials given by end users, it is advised that the reusability count of the product should be limited up to 30 times.

Ir. Dr. Zuhairi Abd. Hamid
Chairman
Technical Expert Panel

Dr. Mohamad Omar Mohamad Khaidzir
Technical Expert Panel

Associate Prof. Dr. Zaidon Ashaari
Technical Expert Panel

Ir. Mohd Azhari Mohd Salleh
Technical Expert Panel

9.0 REFERENCES

Internet

1 www.high-re.com (12 December 2011)

2 http://www.wasonmalaysia.com/ (15 January 2012)

3 http://www.bsigroup.com/ (23 January 2012)

4 http://www.bmtrada.com/ (5 February 2012)

5 PBSB. (2011 a). Testimonial Letter from IJM Construction Sdn. Bhd.

6 PBSB. (2011 b). Testimonial Letter from Putra Perdana Construction Sdn. Bhd.

7 PBSB. (2011 c). Testimonial Letter from CWC Construction Sdn. Bhd.

8 PBSB. (2011 d). Testimonial Letter from Jurustra Bumibina Sdn. Bhd.

9 PBSB. (2011 e). Diagram of Production Process

10 PBSB. (2011 f). Quality Control Plan of Finished Product

11 PBSB. (2011 g). High-Re Formply Catalogue

12 PBSB. (2011 h). EC Certificate from BM TRADA

13 PBSB. (2011 i). Film Face Plywood Test Report from Menawan Wood Sdn. Bhd.

14 PBSB. (2011 j). Plywood Test Report from Forest Research Institute of Malaysia.

15 PBSB. (2011 k). Resin Test Report from Menawan Wood Sdn. Bhd.

APPENDIX A

TESTIMONIALS LETTER

1) IJM Construction Sdn Bhd
2) Putra Perdana Construction Sdn Bhd
3) CWC Construction Sdn Bhd
4) Jurustra Bumibina Sdn Bhd

07 July 2011

IJM CONSTRUCTION SDN BHD
(195650-H)

Wisma IJM, Jalan Yong Shook Lin
46050 Petaling Jaya
Selangor Darul Ehsan, Malaysia
Tel: 603-79858288
Fax: 603-79529858
E-mail: ijm@ijm.com
http://www.ijm.com

TO WHOM IT MAY CONCERN

CADANGAN PEMBANGUNAN SATU BLOK PERDAGANGAN BERCAMPUR 42 TINGKAT TERDIRI DARI HOTEL 17 TINGKAT (361 BILIK), APARTMENT SERVIS 4 TINGKAT (38 UNITS) DAN RUANG PEJABAT (13 TINGKAT) TERMASUK TINGKAT MEZANIN, 1 TINGKAT "LOWER GROUND" DAN 2 TINKAT TEMPAT LETAK KERETA BAWAH TANAH DI ATAS LOT 70, 71 & 89, JALAN PINANG, SEKSYEN 58 DALAM BANDARAYA KUALA LUMPUR
(GRAND HYATT HOTEL, KUALA LUMPUR)
-HI RE FORMPLY

This is to certify that the above Project had used HI RE FORMPLY with the following System Formwork :-

a) Column Form _ PERI System Formwork
b) Table Form – PERI System Formwork
c) Lift Core Wall Form – Aluma System Formwork

We hereby wish to confirm that HI RE FORMPLY have lasted 30 to 40 times uses and we are very satisfied with the performance, compared to using normal plywood with conventional timber which requires lots of replacement, and incurred downtime, additional labour and created excessive rubbish to be cleared.

2149 699 1

Your faithfully
IJM CONSTRUCTION SDN BHD

BEH LAI SENG
Sr Project Manager

LSY/ciw

PUTRA PERDANA CONSTRUCTION Sdn Bhd

(A Subsidiary of PUTRAJAYA PERDANA BERHAD) (158402-A)

Date: 13 DEC 2010

PROJECT : Platinum Park-Phase 1, Jalan Stonor, KL.
CONTRACTOR: Putra Perdana Const. Sdn. Bhd.
PRODUCT: HI RE FORMPLY

To Whom It May Concern

We hereby wish to confirm that for this job, we have used HI RE FORMPLY with the following System Formwork below:-

a) Table Form - PERI System Formwork

We hereby wish to confirm that HI RE FORMPLY have lasted more than 20 to 30 times and we are very satisfied with
HI RE FORMPLY instead of using the normal plywood with conventional timber which requires a lot of replacement which
will cost downtime, additional labour and alot of rubbish to be cleared.

Best Regards

Putra Perdana Const Sdn. Bhd.

PERDANA CONSTRUCTION Sdn Bhd * PUTRAJAYA
Felda Tower Platinum Park

Project Manager: Mr. Thong Fook Fun

Head Office:
2nd & 3rd Floor, No. 5,
Jalan P16, Precinct 16, 62150 Putrajaya.
Tel: (03) 8886-8888 (Hunting Line) Fax: (03) 8886-8886
Email: info@p-perdana.com

CWC CONSTRUCTION SDN BHD (Co.No. 741184-H)
C16-17, Block C, Taman Serdang Perdana, 43300 Seri Kembangan, Selangor Darul Ehsan, Malaysia.
Tel: 03-8943 1292 Fax: 03-8943 1292

Date: 08 July 2011

PROJECT : BANGUNAN KEMENTERIAN PERUMAHAN DAN KERAJAAN TEMPATAN, PUTRAJAYA (4G10)

CONTRACTOR: CWC CONSTRUCTION SDN BHD

PRODUCT: HI-RE FORMPLY

To Whom It May Concern:

We hereby wish to confirm that for this job we have used HI RE FORMPLY with the following System Formwork below:-

a) Column Form : Doka System Formwork

b) Table Form : Doka System Formwork

c) Lift Core Wall Form: Doka Climbing Formwork

We hereby wish to confirm that HI RE FORMPLY have lasted around 20-30 cycle times and we are very satisfied with HI RE FORMPLY.

Best Regards,

CWC Construction Sdn Bhd

Project Manager: Mr. Chu Voon Biau

JURUSTRA BUMIBINA SDN BHD (572817-H)

Date: 05th JUL 2011

PROJECT : LOT G, KL SENTRAL.
CONTRACTOR: JURUSTRA BUMIBINA SDN. BHD.
PRODUCT: HI RE FORMPLY

To Whom It May Concern

We hereby wish to confirm that for this job, we have used HI RE FORMPLY with the following System Formwork below:-

a) Column Form - PERI System Formwork
b) Table Form - PERI System Formwork
c) Lift Core Wall Form - PERI System Formwork

We hereby wish to confirm that HI RE FORMPLY have lasted more than 30 to 40 times and we are very satisfied with
HI RE FORMPLY instead of using the normal plywood with conventional timber which requires a lot of replacement which
will cost downtime, additional labour and alot of rubbish to be cleared.

Best Regards,

JURUSTRA BUMIBINA SDN. BHD.

Director: Mr. Wong Chin Fung

Lot 22A, Batu 5, Jalan Ampang, 68000 Ampang, Selangor.
T 03-4251 1819, 03-4251 1820 F + 603-4251 1823
E bumibina@hotmail.com / bumibina22a@gmail.com

APPENDIX B

PRODUCT CATALOGUE

&

PICTURES OF PRODUCT

HIGH-RE FORMPLY

- The Obvious Choice for System Formwork

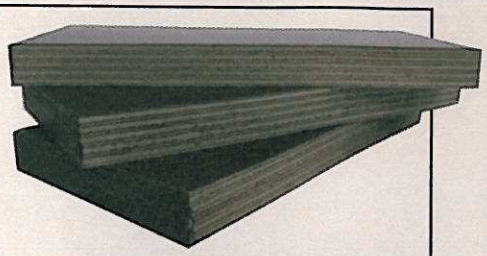
Strong, Durable, Economical, Environmental

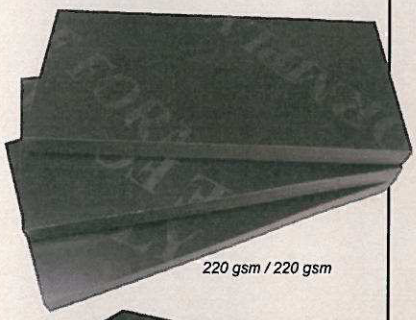
HIGH-RE FORMPLY is manufactured from selected hardwood veneers and using advanced veneering technology, High-Re Formply gives a higher strength to load impact, is stable and sturdy, durable and economical besides being environmentally-friendly as it can be re-used dozens of times with good site practice. The base panel surface is laminated with a Phenolic Film and the edges of the panel are coated with a water resistant sealant to prevent absorption of water.

Technical Information

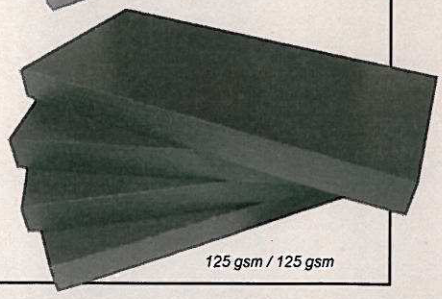
Specie	: Medium Light Hardwood.		
Density	: 680 ± 20 kg/m3 (EN 323 : 1993)		
Panel Size	: 1220mm x 2440mm (± 1.0mm per linear metre of edge)		
Thickness	: 18.0mm (± 0.5mm)		
No of Plies	: 11 Plies		
Moisture content	: 11% (EN 322 : 1993)		
Bonding / Adhesive	: WBP (Water-boil proof) / Phenolic Formaldehyde		
Standard	: EN 314 Plywood - Bonding Class 3		
Phenolic Film	: Type	:	Smooth or Wiremesh
	Colour	:	Dark Brown
	Density	:	125 gsm / 125 gsm and 220 gsm / 220 gsm
MOE (EN 310 : 1993)	: Approx 6,000 Mpa (Bending paralled to face grain)		
	: Approx 7,400 Mpa (Bending perpendicular to face grain)		
MOR (EN 310 : 1993)	: Approx 54.45 Mpa (Bending paralled to face grain)		
	: Approx 64.00 Mpa (Bending perpendicular to face grain)		
Shear strength	: Approx 1.5 Mpa		

(Quotation available upon request for other thicknesses and for heavier gsm on the film, Anti-skid or Wire-meshed on 1 side.)





220 gsm / 220 gsm



125 gsm / 125 gsm

Technical information of the product is for general guidance only and therefore does not form any legal contract, to the best of our knowledge, all information are correct at the time of printing.

For more details, please contact:

Progressive Base Sdn Bhd (673887 - H)

No. 6, Jalan TUDM, Kampung Baru Subang, 40150 Shah Alam, Selangor Darul Ehsan, Malaysia.

Tel: +603-7847 6227 / 6230 /6273 / 6275 / 6368 (Hunting) Fax: +603-7847 6373 Email: progressivebase@gmail.com

Technical Information

Wood species	:	medium light hardwood
Density	:	680 +/- 20 kg/m3 (EN 323 : 1993)
Panel size	:	1220 mm x 2440 mm (+/- 1.0 mm per linear metre of edge)
Thickness	:	18.0 mm (+/- 0.5 mm)
No. of Plies	:	11
Moisture content	:	11% (EN 322 : 1993)
Bonding/Adhesive	:	WBP (Water-Boiled Proof)/ Phenolic Formaldehyde
Standard	:	EN 314 Plywood – Bonding Class 3
Phenolic Film	:	Type – smooth or wire mesh
		Colour – Dark brown
		Density - 125 gsm/125gsm & 200 gsm/220 gsm
MOE (EN 310 : 1993)	:	Approx. 6,000 Mpa (bending parallel to face grain)
		Approx. 7,400 Mpa (bending perpendicular to face grain)
MOR (EN 310 : 1993)	:	Approx. 5445 Mpa (bending parallel to face grain)
		Approx. 64.00 Mpa (bending perpendicular to face grain)
Shear strength	:	Approx. 1.5 Mpa

Note : *(a) Above technical information is for general guidance only and, to the best of our knowledge, is correct at the time of printing.*

(b) Other thicknesses, heavier gsm on film, anti-skid or wire-meshed on one side, available upon request.

For more information, please contact:

Progressive Base Sdn Bhd
Tel: +(6)03- 7847 6227 / 6230 / 6273 / 6275 /6368 (Hunting) Fax: +(6)03-7847 6373
Email: progressivebase@gmail.com

B&I

HIGH-RE FORMPLY
for Quality Formwork

Using proven and advanced veneering technology, HIGH-RE FORMPLY panel moulds are constructed from multiple plies of medium light hardwood for casting/formwork., i.e., for walls, columns and tables/slabs. Whatever the application, HIGH-RE FORMPLY is characterised by features of:

- solidity and strength, with high load-bearing and load-impact capabilities;
- stability and sturdiness in structure and
- durability, in its capability for repeated usage.

Water absorption or ingress is prevented by laminating the surface of the base panel with a phenolic film under high pressure and coating of the panel edges with water-resistant sealant.

In building construction formwork, all of the above translates into real cost-benefit advantages accruing from HIGH-RE FORMPLY, i.e.,

- ➤ **high quality concrete finishes** which precludes the need for additional work or finishing touches at site;
- ➤ exceptionally **high re-use rate** through practice of easy-to-follow procedures of proper preventive maintenance, viz.,

  - application of release agents BEFORE the first casting job:
  - cleaning and oiling for subsequent uses;
  - treating of all cut edges with water-sealing paint (ideally, minimum of 2 or 3 layers)
  - storage/stacking above ground and under cover against direct sunlight and rain so as to maintain strength and prevent warping.
  - **savings** in labour and materials arising from repeated usage.

APPENDIX B : PICTURES OF PRODUCT (HIGH RE FORMPLY)

Picture 1

Picture 2

Picture 3

Picture 4

Picture 5

Picture 6

Picture 7

Picture 8

Picture 9

Picture 10

Picture 11

Picture 12

Picture 13

Picture 14

Picture 15

Picture 16

Picture 17

Picture 18

APPENDIX C

TEST REPORT

from Forest Research Institute of Malaysia (FRIM)

1. **Plywood Bending Parallel to the Face Grain.**
2. **Plywood Bending Perpendicular to the Face Grain.**
3. **Shear Strength**

INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA
Forest Research Institute Malaysia (FRIM)
52109 Kepong, Selangor Darul Ehsan
Tel : 603-6279 7000 Fax : 603-6273 1314
Website : www.frim.gov.my

Rujukan kami: FRIM 394/490/5/4 Klt. 11 (70) Tarikh: 14 Disember 2011
Rujukan tuan:

PROGRESSIVE BASE SDN. BHD.
No. 6, Jalan TUDM
Kampung Baru Subang
40150 Shah Alam, Selangor Darul Ehsan

Tuan,

LAPORAN UJIAN

Merujuk kepada perkara di atas dan email dari Syarikat Wason Resources Sdn. Bhd. bertarikh 5 Disember 2011 serta satu (1) set sampel *HIGH-RE FORM PLYWOOD (18 mm)* yang diterima pada tarikh yang sama. Bersama-sama ini disertakan laporan ujian terhadap sampel tersebut yang telah diuji untuk ujian *bending strength* mengikut Piawaian British *(British Standard)*.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(.....)
DR. RAHIM BIN SUDIN
B/p Ketua Pengarah
FRIM

Makmal Ujian Komposit Kayu
Bahagian Keluaran Hutan
Inst. Penyelidikan Perhutanan Malaysia
52109 Kepong, Selangor Darul Ehsan
(Tel: 03-62797310, Fax: 03-62804620)

INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA
Forest Research Institute Malaysia (FRIM)
52109 Kepong, Selangor Darul Ehsan
Tel : 603-6279 7000 Fax : 603-6278 [illegible]
Website : www.frim.gov.my

Our reference: FR M 394/490/5/4 Klt. 11 (70) Date: December 14, 2011
Your reference:

TEST REPORT

Job No.: 149/11	
This report consists of 2 pages	Page 1 of 2
This report is neither a certificate of quality nor an approval certificate. This report only covers samples supplied by the customer to be tested at FRIM. Wood Composite Testing Laboratory is not responsible in the selection of samples for testing. This report or any part of it cannot be published or used for any other purposes except with the permission from FRIM.	

CUSTOMER

Name and Address	PROGRESSIVE BASE SDN. BHD. No. 6, Jalan TUDM Kampung Baru Subang 40150 Shah Alam, Selangor Darul Ehsan

SAMPLE DESCRIPTION

WCTL Series No.	3691211
Manufacturer:	MENAWAN WOOD SDN. BHD.
Date received:	3 August 2011
Sampling:	EN 326-1
Standard used:	BS EN 310:1993
Production date:	09/05/2011
Batch No.:	10652011
Ref:	PBSB/MW/042011
Product:	18mm High-Re Formplywood

The remaining of samples will be disposed after testing has been carried out.

Prepared by

Rozaida Latip
Assistant Research Officer

Approved by

Dr. Rahim Sudin
Director of Forest Products Division

Makmal Ujian Komposit Kayu
Bahagian Keluaran Hutan
Inst. Penyelidikan Perhutanan Malaysia
52109 Kepong, Selangor Darul Ehsan
(Tel: 03-62797310, Fax: 03-62804620)

INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA
Forest Research Institute Malaysia (FRIM)
52109 Kepong, Selangor Darul Ehsan
Tel : 603-6279 7000 Fax : 603-6273 1314
Website : www.frim.gov.my

Our reference: FRIM 394/490/5/4 Klt. 11 (70) Date: December 14, 2011
Your reference:

TEST REPORT

Job No.: 149/11	
This report consists of 2pages	Page 2 of 2
This report is neither a certificate of quality nor an approval certificate. This report only covers samples supplied by the customer to be tested at FRIM. Wood Composite Testing Laboratory is not responsible in the selection of samples for testing. This report or any part of it cannot be published or used for any other purposes except with the permission from FRIM.	

TEST RESULTS

Bending parallel to the face grain

Product: 18mm High-Re Formplywood	MOR (MPa)	MOE (MPa)
1	73.3	9711
2	82.6	9840
3	78.4	10155
4	71.4	9975
5	76.9	9995
6	79.1	9735
7	74.2	10151
8	80.2	9856
Average	**77.0**	**9927**
Std. Deviation	**3.80**	**171.4**
Minimum	**71.4**	**9711**
Maximum	**82.6**	**10155**

Bending perpendicular to the face grain

Product: 18mm High-Re Formplywood	MOR (MPa)	MOE (MPa)
1	84.8	8447
2	79.6	7840
3	80.6	8209
4	81.0	8220
5	73.2	8516
6	73.3	8325
7	70.2	8069
8	77.9	8379
Average	**77.6**	**8251**
Std. Deviation	**4.91**	**219**
Minimum	**70.2**	**7840**
Maximum	**84.8**	**8516**

Prepared by

Rozaida Latip
Assistant Research Officer

Approved by

Dr. Rahim Sudin
Director of Forest Products Division

Makmal Ujian Komposit Kayu
Bahagian Keluaran Hutan
Inst. Penyelidikan Perhutanan Malaysia
52109 Kepong, Selangor Darul Ehsan
(Tel: 03-62797310, Fax: 03-62804620)

INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA
Forest Research Institute Malaysia (FRIM)
52109 Kepong, Selangor Darul Ehsan
Tel: 603-6279 7000 Fax: 603-6273 1314
http://www.frim.gov.my
MS ISO 9001 : 2000 CERTIFIED

Our reference: FRIM 394/490/5/4 Klt. 10 (38)
Your reference:

Date: August 23, 2011

TEST REPORT

Job No.: 104/11	
This report consists of 6 pages	Page 6 of 6
This report is neither a certificate of quality nor an approval certificate. This report only covers samples supplied by the customer to be tested at FRIM. Wood Composite Testing Laboratory is not responsible in the selection of samples for testing. This report or any part of it cannot be published or used for any other purposes except with the permission from FRIM.	

TEST RESULTS

Table 3: Shear strength value for Plywood tested according BS EN314-1:2004 (Pre-treatments 5.1.3)

Product: 18mm High-Re Formply (13 plies)

Sample	Shear strength (MPa)	Wood Failure (%)
1	1.3	80
2	1.1	80
3	0.7	20
4	1.4	100
5	0.7	20
6	1.3	60
7	1.2	40
8	1.5	40
9	0.5	20
10	0.7	20
11	0.5	40
Average	**1.0**	**47**
Std. Deviation	**0.4**	**29**
Minimum	**0.5**	**20**
Maximum	**1.5**	**100**

Prepared by

Rozaida Latip
Assistant Research Officer

Approved by

Dr. Rahim Sudin
Head of Biocomposites and Wood Protection Program

Makmal Ujian Komposit Kayu
Bahagian Keluaran Hutan
Inst. Penyelidikan Perhutanan Malaysia
52109 Kepong, Selangor Darul Ehsan
(Tel: 03-62797310, Fax: 03-62804620)

APPENDIX D

TEST REPORT

from Menawan Wood Sdn. Bhd.

1. **Bonding Test, Moisture Content, Soaking Test and Density**

2. **Testing of Phenolic Resin**

MENAWAN WOOD SDN. BHD.

(No. Syarikat: 673696-X)
Lot 515, Jalan Datuk Edward Jeli, Piasau Industrial Estate,
98000 Miri, Sarawak, Malaysia.
Tel: 6-085-656699 Fax: 6-085-650999

FILM FACE PLYWOOD - HI RE FORMPLY

SUMMARY LABORATORY TEST REPORT

PRODUCT SPECIFICATION			THICKNESS OF VENEER			CE MARKING STANDARD		
Type of Plywood	:	Film Face	Total Ply	:	13	Moisture Content Test	:	Max 14%
Production Date	:	18-6-2011	Face	:	1.5	Bonding Test	:	1 N/MM^2
Size	:	18mm	S/C	:	1.5 x 6	Bending Test	:	F 20, E 20
Glue Type	:	22-6-2011	L/C	:	1.5 x 5	Density	:	400 KG/M^3
Testing Date	:		Back	:	1.5	**JAS STANDARD**		
						Soaking Test	:	Area Delaminasi Max 25mm

Type of Test	NaOH TEST	CEMENT TEST	BENDING TEST	BONDING TEST	MOISTURE CONTENT TEST	SOAKING TEST	DENSITY TEST
No. of Panel	-	-	(N/MM^2)	(N/MM^2)	(%)	(%)	(KG/M^3)
1	3	Film In Good Condition	F20, E40	1.480	11.79	100	537.221
2	3	Film In Good Condition	F20, E40	1.461	11.42	100	493.657
3	3	Film In Good Condition	F20, E40	1.432	10.41	100	509.561
4	3	Film In Good Condition	F20, E40	1.555	10.73	100	495.248
5	3	Film In Good Condition	F20, E40	1.637	11.35	100	533.127
MAX	3	-	-	1.637	11.79	100	537.221
MIN	3	-	-	1.432	10.41	100	493.657
AVERAGE	-	-	-	1.513	11.14	100	513.7628
JUDGEMENT	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Explanation For Bending Test

1. Modulus of Elasticity (E)

The modulus of elasticity E_m (in N/mm^2)

Formula: $E_m = \dfrac{l_3(F_2 - F_1)}{4\,bt^3\,(a_2 - a_1)}$

2. Bending Strength (F)

Formula: $f_m = \dfrac{3\,F_{max} l 1}{2\,bt_2}$

Remarks:

PLEASE REFER TO ATTACHMENT FOR REFERENCE.

MENAWAN WOOD SDN. BHD
KAPIT-SARAWAK-EAST MALAYSIA
Company No : 673696-X

STEP BY STEP TO EXCELLENCE

DATE : 1-2-2012 SECTION : Laboratory SHIFT : A	**RESIN TEST REPORT**	PAGE : of

TYPE OF RESIN	: Phenol	TEST NUMBER	:
DATE RECEIVED	: 31-1-2012	SUB CONTRACTOR	:
TEST DATE	: 31-1-2012	NETT WEIGHT	:

1. SAMPLE TEST RESULT

NO	TYPE OF TEST	PASSING STANDARD	TESTING RESULT	JUDGEMENT
1	SPECIFIC GRAVITY	1.185 ~ 1.220	1.200	Passed
2	VISCOSITY	75 ~ 110 cps	95 cps	Passed
3	pH	12.0 ~ 13.5	12.0	Passed
4	TEMPERATURE	30°C	30°C	Passed
5	GELATION TIME	1 jam	53 minit	Passed
6	SOLID CONTENT	41 - 47%	43.17%	Passed
7	FREE FORMALIN	-	-	

TEST STATUS : **A. (PASSED) / ACCEPTED**
B. FAILED / REJECTED

2. RETESTING RECORD

NO	TYPE OF TEST	TESTING RESULT	JUDGEMENT
1	SPECIFIC GRAVITY		
2	VISCOSITY		
3	pH		
4	TEMPERATURE		
5	GELATION TIME		
6	SOLID CONTENT		
7	FREE FORMALIN		

RETESTING RESULT : **A. PASSED / ACCEPTED**
B. FAILED / REJECTED

REMARK : _____

Prepared By;
QC Laboratory

Acknowledged By;
QC Supervisor

Approved By:
QC Superintendent

APPENDIX E

EC CERTIFICATE

from BM TRADA Certification

BM TRADA CERTIFICATION

CE

EC Certificate of Factory Production Control

1224-CPD-0182

In compliance with the Directive 89/106/EEC of the Council of European Communities of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to the construction products (Construction Products Directive - CPD), amended by the Directive 93/68/EEC of the Council of European Communities of 22 July 1993, it has been stated that the construction product

Phenol-Formaldehyde Bonded Structural Plywood

for the intended use as

Structural plywood in external conditions (EN 636-3 S) complying with EN 636
Structural plywood in internal humid conditions (EN 636-2 S) complying with EN 636
Structural plywood in internal dry conditions (EN 636-1 S) complying with EN 636
All with formaldehyde class E1

produced by the manufacturer

Menawan Wood Sdn Bhd (Co No. 673696-X)

Head Office
Lot 515, Jalan Datuk Edward Jeli
Piasau Industry Estate
98000 Miri, Sarawak
Malaysia

Factory
LPF 0018
Sungai Seping
Kapit Sarawak
Malaysia

is submitted by the manufacturer to the initial type-testing of the product and a factory production control and that the approved body **BM TRADA Certification Ltd** has performed the initial inspection of the factory and of the factory production control and performs the continuous surveillance, assessment and approval of the factory production control.

This certificate attests that all provisions concerning the attestation of factory production control described in Annex ZA of the standard

EN 13986:2004

were applied.

Particular conditions applicable to the use of the product are given in additional information available from the manufacturer or their agent.

03 August 2009	03 August 2011	02 August 2012
Date of Initial Registration	**Date of Last Issue**	**Date of Expiry**

Signed on behalf of BM TRADA Certification Ltd

Product Certification Manager

Position

Issued by: BM TRADA Certification Ltd., Stocking Lane, Hughenden Valley, High Wycombe, Bucks, HP14 4ND, UK
For verification of this certificate please visit www.bmtrada.com

APPENDIX F

SITE VISIT PHOTOS

Date : 23rd February 2012

Project Name : Platinum Park Phase 3

Contractor : IJM Construction Sdn. Bhd.

APPENDIX F: SITE VISIT PICTURE

Picture 1:
Platinum Park Phase 3 (Naza Tower) construction site.

Picture 2:
High-Re FormPly used in conjunction with other formwork system i.e: PERI Formwork.

Picture 3:
High-Re FormPly is used in building lift core for Tabung Haji Tower.

Picture 4:
Final concrete surface using High-Re FormPly indicates smooth surface with minimal finishing required.

Picture 5:
Plywood residual is clearly seen from the final concrete surface that used normal quality plywood as compared to High-Re FormPly in Picture 4.

Picture 6:
Group photo taken with Mr Hwang from Progressive Base Sdn Bhd.

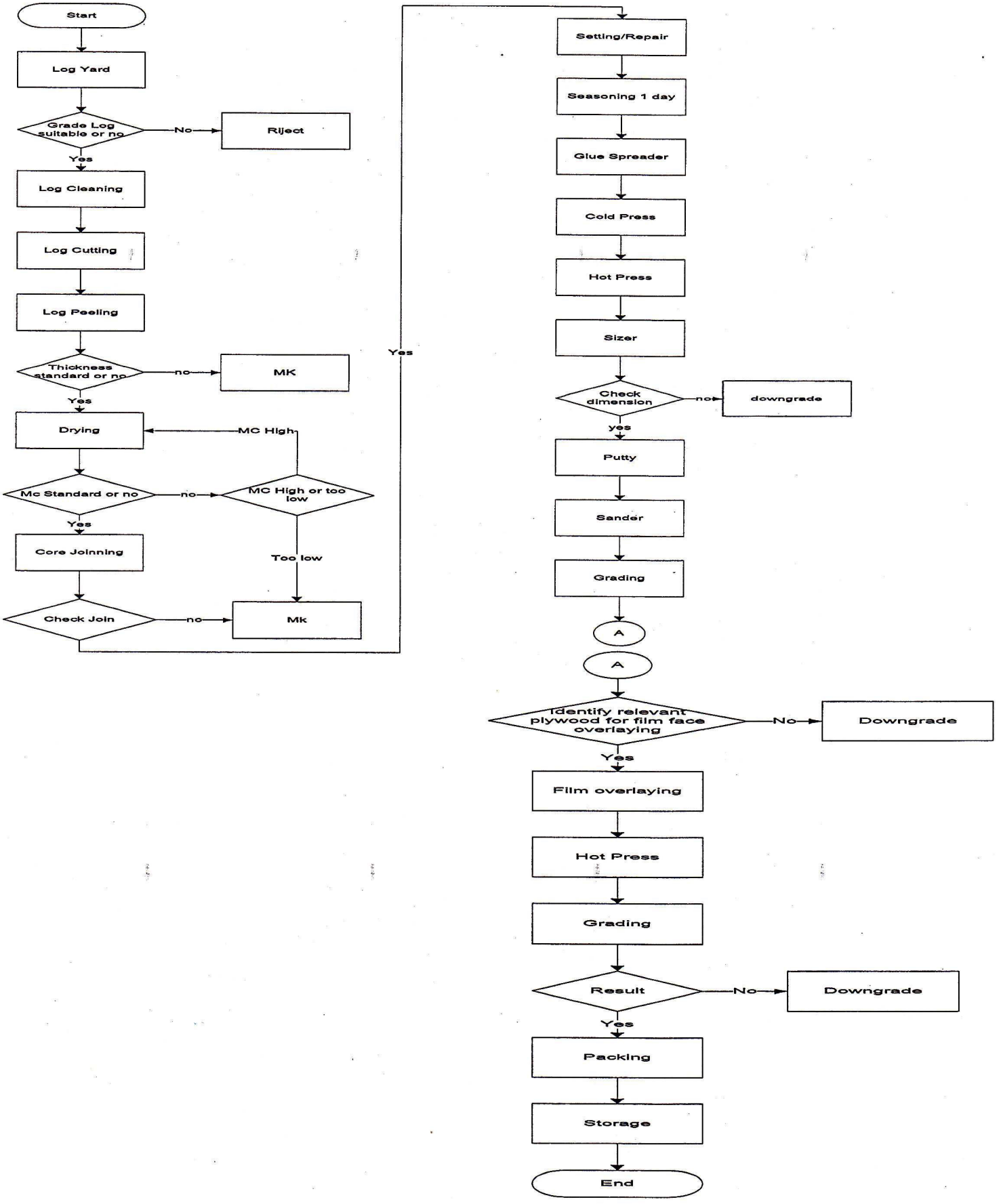
APPENDIX G

DIAGRAM OF PRODUCTION PROCESS

MENAWAN WOOD SDN. BHD.

(No. Syarikat: 673696-X)
Lot 515, Jalan Datuk Edward Jeli, Piasau Industrial Estate,
98000 Miri, Sarawak, Malaysia.
Tel: 6-085-656699 Fax: 6-085-650999

DIAGRAM OF PRODUCTION PROCESS



APPENDIX H

QUALITY CHECK ON FINISHED PRODUCT

MENAWAN WOOD SDN. BHD.

(No. Syarikat: 673696-X)
Lot 515, Jalan Datuk Edward Jeli, Piasau Industrial Estate,
98000 Miri, Sarawak, Malaysia.
Tel: 6-085-656699 Fax: 6-085-650999

Incoming Raw Material

~ Film Face

When the raw material (Film Face) arrive to factory, first will check the expire date of manufacturing and keep it at cool place with temperature room 20-21 °C

~ Resin Phenol

Test : Solid Content
: pH
: Specific Gravity
: Poise
: Gel Time

Supplier of raw material

~ Film face
- Dongwha
- Store Enso

~ Phenol
- Shin Yang Chemical Sdn. Bhd.

(f). Now at Menawan Wood Sdn. Bhd. got the JAS, CARB and Ce Marking Certificate.

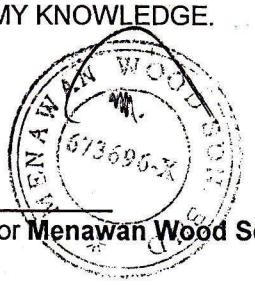
(g). 1- Hadi Purnomo (Superintendent QC)
2 - Suwito (Superintendent QC)

Quality Check On Finish Product

- Film face plywood will be graded according to the product specification or standard.
- The grading staff will separate the film face plywood according to the respective grades.
- After grading process, QC staff will choose at least 2 bundle the film face plywood to re-grade again and the quantity of regrade were depend to the volume production.
- Every defect on film face plywood will record at the form where create by QC Dept and calculate the quality of the that day production.

DECLARATION

THIS IS TO CERTIFY THAT THE INFORMATION/STATEMENT GIVEN IN THIS FORM ARE CORRECT TO MY KNOWLEDGE.



for **Menawan Wood Sdn Bhd**

APPENDIX I

WASON (MALAYSIA)
COMPANY PROFILE

WASON GROUP OF COMPANIES

Wason group of companies comprises three companies mainly:-

1) **Wason (Malaysia) Sdn. Bhd** - Holding Company
Incorporated: 5th December 1988

2) **Wason Resources Sdn. Bhd**. - Trading Company
Incorporated: 11th November 1986

3) **Shinemakers Sdn. Bhd**. - Property Investment Company
Incorporated: 15th September 1994

4) **Progressive Base Sdn. Bhd.** - Trading Company
Incorporated: 02nd December 2004

Company Details:-

Address of the companies: - No: 6, Jalan TUDM, Kampung Baru Subang
40150 Shah Alam, Selangor Darul Eshan.
Tel: 603-7847 6227/6230/6273/6368 (Hunting)
Fax: 603-7847 6373
E-mail: info@wasonmalaysia.com

Bankers: - OCBC Bank - Damansara Utama Branch
Alliance Bank – Subang Jaya Branch

Director & Shareholders: - Chua Choy Guan - Managing Director
Ong Meng Lim - Director
Ooi Pitt Lock - Executive Director

GROUP BUSINESS ACTIVITIES:-

1) Wason (Malaysia) Sdn. Bhd. is the group Holding Company and is involved in providing management services to the member of the group.

2) Wason Resources Sdn. Bhd. is a Trading Company of Plywood, Medium Density Fibre Board, Particleboard, Timber Products and Building Materials.

   The company is a member of the Persatuan Pekilang Panel Malaysia (The Malaysian Panel-Products Manufacturers Association) and holds an export licence from Lembaga Perindustrian Kayu Malaysia under Registration No: T/E-3119/06/2009 (PSU).

   Wason Resources Sdn. Bhd. have been exporting our panel products to Australia, New Zealand, Middle East, China and other Asean countries for the past 20 years.

   Wason Resources Sdn. Bhd. also imports Plywood from Finland and East European countries, and Timber from East Europe, Canada and Australia.

   In the local market area, we are stockist for the whole range of panel boards and timber products. We sell to wholesalers and distributors and direct to the furniture manufacturers and contractors.

   Wason Resources Sdn. Bhd. representing a European Group selling the above for construction, oil and gas industries.

   Our principal is from Czech Republic and this Scaffold Board is accepted and widely used in Europe and the Middle East.

   We attached our sales organization chart and job references for significant projects.

3) Shinemakers Sdn. Bhd. is a Property Investment Company holding industrial warehouses for the purpose of collecting rents. At present the company and its associates hold 8 industrial warehouses and offices.

4) Progressive Base Sdn. Bhd. is a Trading Company of Plywood, Medium Density Fibre Board, Particleboard, Timber Products and Building Materials.

   Progressive Base Sdn. Bhd. is a Sole Agent for High-Re Formply which is widely use in construction sites. High-Re Formply is a very strong, stable durable with high reuses and is the obvious economical choice for system formwork such as Column Form, Wall Form, Climbing Wall Form and Table Form and also OSB Panel for usage : Interior Design, Crating / Packing, Shingle Roofing, Flooring (Base), Bracing, Furniture (Sofa), Shelving in Warehouses.