

# SGS

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 1 of 19

CUSTOMER NAME: TIANJIN WELLMADE SCAFFOLD CO., LTD.  
ADDRESS: NO.1 GUANGYUAN ROAD, TANGGUANTUN INDUSTRIAL&LOGISTIC ZONE, JINGHAI, TIANJIN, China

Sample Name : RINGLOCK SCAFFOLDING  
Product Specification : OD48.3\*3.2mm  
Manufacturer : Tianjin Wellmade Scaffold Co., Ltd.

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

\*\*\*\*\*  
Test Required : Please see the next page(s)  
Test Method : Please see the next page(s)  
SGS Ref. No. : TJIN1709013096ML  
Date of Receipt : Sep. 25, 2017  
Testing Start Date : Sep. 25, 2017  
Testing End Date : Oct. 27, 2017  
Test result(s) : For further details, please refer to the following page(s)  
(Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

Signed for  
SGS-CSTC Standards Technical  
Services ( Shanghai ) Co., Ltd.

Joyce Li

Joyce Li  
Authorized signatory



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.cn/term-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.cn/term-and-conditions/Term-and-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.  
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8387 4443, or email: CN.Stockcheck@sgs.com  
No.35, Block 1155, East Kang Qian Road, Pudong District, Shanghai, China. 201219 1(86-21) 61196300 1(86-21) 61191853/68183826 www.sgsgroup.com.cn  
中国·上海·浦东康桥东路1155弄69号 邮编:201219 1(86-21) 61196300 1(86-21) 61191853/68183826 e sgs.china@sgs.com

Member of the SGS Group (SGS SA)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 2 of 19

### Summary of Result(s):

| No. | Test Item                                  | Test Method                                                 | Result     | Conclusion |
|-----|--------------------------------------------|-------------------------------------------------------------|------------|------------|
| 1   | Requirements for structural design-Actions | EN 12810-1:2003 clause 8.1<br>&EN 12811-1:2003 Clause 6.2.9 | See Result | Pass       |
| 2   | Deflections                                | EN 12810-1:2003 clause 8.7<br>&EN 12811-1:2003 Clause 6.3   | See Result | Pass       |
| 3   | Ultimate load test                         | Offered by client                                           | See Result | /          |

Note: Pass : Meet the requirements;  
Fail : Does not meet the requirements;  
/ : Not Apply to the judgment



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/terms-and-conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of this test report & certificate, please contact us at telephone (86-755) 8119 1443, or email: [CN.Docscheck@sgs.com](mailto:CN.Docscheck@sgs.com)  
 No.81, Road 1158, East Kang Qiao Road, Pudong District, Shanghai, China 201219    t:(86-21)81196300    f:(86-21)81191853/708182620    [www.sgs.com.cn](http://www.sgs.com.cn)  
 中国·上海·浦东康桥路1158号 邮编:201219    t:(86-21)81196300    f:(86-21)81191853/708182620    [www.sgs.com.cn](http://www.sgs.com.cn)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 3 of 19

### I. Requirements for structural design-actions

Test method:

EN 12810-1:2003 clause 8.1 & EN 12811-1:2003 Clause 6.2.9

### 1. Sample information

Table 1 The weight of designed bay,  $G_d$  <sup>Note</sup>

| Scaffold components          | Unit Mass (kg) | Number of components<br>in design bay<br>(38.53m design height) | The weight of design<br>bay, $G_d$ (kg) |
|------------------------------|----------------|-----------------------------------------------------------------|-----------------------------------------|
| 1.0m Standard with spigot    | 5.29           | 148                                                             | 3566                                    |
| 1.0m Standard without spigot | 4.44           | 4                                                               |                                         |
| 1.83 Ledger                  | 7.08           | 308                                                             |                                         |
| 0.24m Base Collar            | 1.43           | 4                                                               |                                         |
| 1.83×3.0m Brace              | 12.18          | 39                                                              |                                         |
| 0.227×1.83m Steel Plank      | 12.20          | 6                                                               |                                         |
| Hollow Base Jacks            | 3.72           | 4                                                               |                                         |
| U-Head(Hollow)               | 4.08           | 4                                                               |                                         |

Note:  $G_d$ =for one bay, the self-weight of the assembled scaffold at its maximum design height including all components, such as steel plank, scaffolding standard, base collar and so on.



SGS China Inspection & Testing Services  
Selling Service Certificate of Inspection & Testing Services

Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Sale and printed over-leaf, available on request. It is possible at any time to agree alternative Terms and Conditions. Also, for electronic documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/terms-and-conditions/terms-and-conditions-english>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any isolated link document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from examining all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone (+86-21) 5443 1443, or email: [CN.Discuss@sgs.com](mailto:CN.Discuss@sgs.com)

SGS, Blvd 1190, East Kang Qiao Road, Pudong District, Shanghai, China, 201219 | (86-21) 51190300 | (86-21) 51191803 / 08183020 | [www.sgs.com.cn](http://www.sgs.com.cn)  
中国·上海·浦东康桥东路1159弄819号 邮编: 201219 | (86-21) 51190300 | (86-21) 51191803 / 08183020 | [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 4 of 19

Table 2 The weight of test bay,  $G_T$

| Scaffold components          | Design unit Mass (kg) | Number of components in test bay (6.53m test height) | The weight of test bay, $G_T$ (kg) |
|------------------------------|-----------------------|------------------------------------------------------|------------------------------------|
| 1.0m Standard with spigot    | 5.61                  | 20                                                   | 709                                |
| 1.0m Standard without spigot | 4.74                  | 4                                                    |                                    |
| 1.83m Ledger                 | 7.53                  | 52                                                   |                                    |
| 0.24m Base Collar            | 1.50                  | 4                                                    |                                    |
| 1.83x3.0m Brace              | 13.10                 | 6                                                    |                                    |
| 0.227x1.83m Steel Plank      | 12.10                 | 6                                                    |                                    |
| Hollow Base Jacks            | 3.58                  | 4                                                    |                                    |
| U-Head(Hollow)               | 3.73                  | 4                                                    |                                    |

Note:  $G_T$  for one bay, the weight of the assembled scaffold as erected to the height for the test, including all the components.

Table 3 Service loads on working areas

EN 12811-1:2003 stipulates that the service uniformly distributed load applied to a working area for a load class 4 shall be 3.0kN/m<sup>2</sup>.

| Load class on working area                         | Class 4           |
|----------------------------------------------------|-------------------|
| The number of working area in design bay           | One working areas |
| Uniformly distributed load $q_1$ kN/m <sup>2</sup> | 3.0               |

### 2. Scaffold configuration in test:

The maximum working area design height of scaffold system was 37.03m according to client's instruction while the scaffold assembly installed in test was one bay wide (1.83m) and one bay long (1.83m), the height of scaffold was 6m apart from adjustable leg. The maximum extension height of the adjustable leg was 450mm.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.cn/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.cn/Terms-and-Conditions-Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction clauses defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone (86-755) 8337 1443, or email: [CN.Check@sgs.com](mailto:CN.Check@sgs.com)

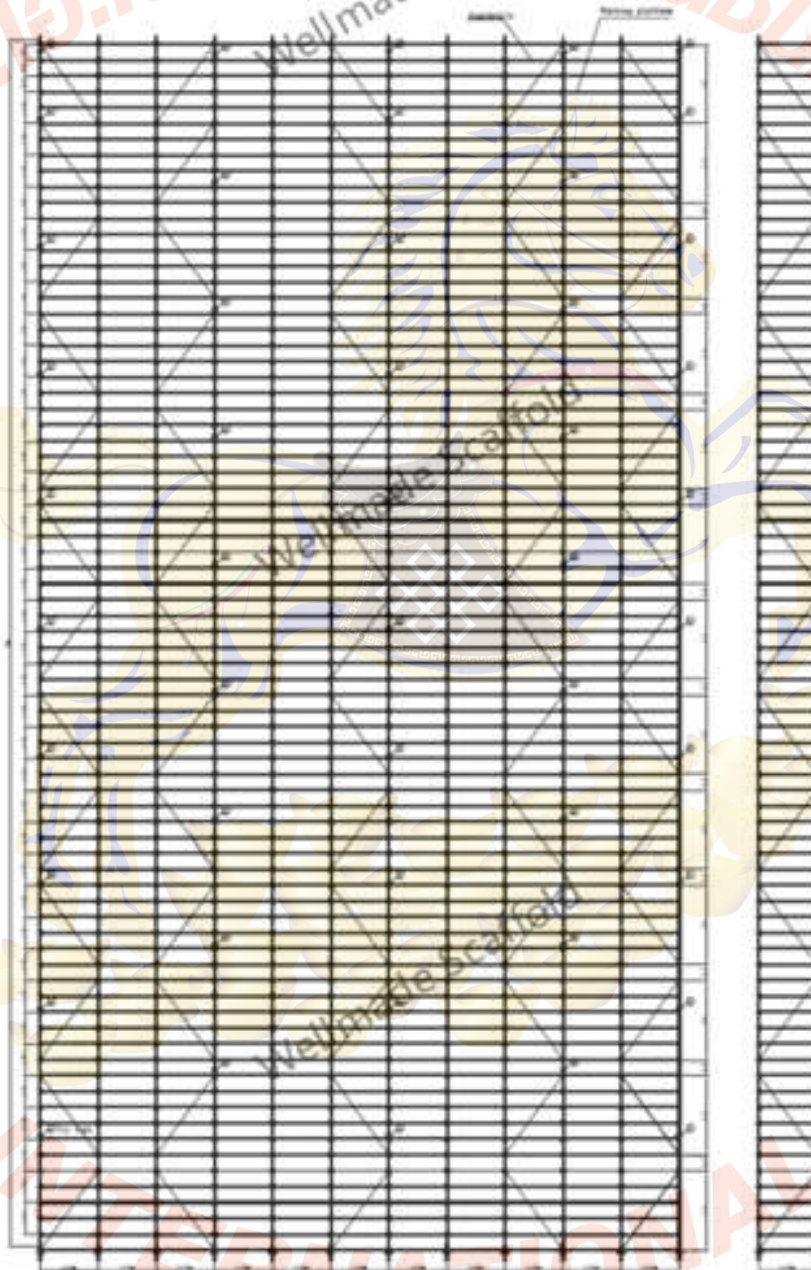
No. 98, Block 1158, East Yang Qiao Road, Pudong District, Shanghai, China 201219    1 (86-21) 81190000    1 (86-21) 81191853/168183620    [www.sgs.com.cn](http://www.sgs.com.cn)  
 中国·上海·浦东康桥东路1158弄69号 邮编 201219    1 (86-21) 81190000    1 (86-21) 81191853/168183620    [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 5 of 19



Scaffold configuration



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at [www.sgs.com.cn/terms-and-conditions.aspx](http://www.sgs.com.cn/terms-and-conditions.aspx) and, for electronic format documents, subject to Terms and Conditions for Electronic Documents, available on request or accessible at [www.sgs.com.cn/terms-and-conditions.aspx](http://www.sgs.com.cn/terms-and-conditions.aspx). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not constitute parties to a transaction from assuming all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of the test report & certificate, please contact us at telephone: 86 (0)21 5455 1445, or email: CN.Despatch@sgs.com  
 No. 88, Road 1188, East Yang Qiao Road, Pudong District, Shanghai, China, 201319 1 (86-21) 51196300 1 (86-21) 51191853/08183820 1 (86-21) 51191853/08183820  
 中国·上海·浦东杨桥东路1153弄88号 邮编: 201319 1 (86-21) 51196300 1 (86-21) 51191853/08183820 1 (86-21) 51191853/08183820

## TEST REPORT

No. : SHIN1709031460CM

Date : Dec. 05, 2017

Page: 6 of 19

### 3. Load calculation:

#### 1) Self-weight of the scaffold:

A vertical load was applied simulating the action of self-weight of the scaffold assembly at the maximum design height in one bay on the standards. The load was distributed on the four standards through load beams.

$$F_s = G_s - G_1 = 3566 - 709 = 2857 \text{ kgf}$$

#### 2) Uniformly distributed service load appropriate to the class of the working scaffold specified in Table 3, column 2, acting on the working area of the most unfavourable decked level.

Specification of the steel plank: 1830mm (Length) × 227mm (Width)

Number of steel plank in three working platforms: 6pcs

$$F_u = q_1 \times L \times W = 3.0 \times 1.83 \times 0.227 \times 6 \times 1000 / 9.8 = 763 \text{ kgf}$$

#### 3) Horizontal working load specified in 6.2.3.

Horizontal working load:

$$F_{dh1} = F_u \times 2.5\% = 186.9 \text{ N};$$

$$F_{dh2} = 300 \text{ N};$$

$F_{dh} = 300 \text{ N}$  (For each bay considered the notional horizontal load shall be not less than 2.5% of the total of the uniformly distributed load,  $q_1$ , specified in Table 3, on that bay, or 0.3kN, which is greater.)

$$F_h = H_s \times F_{dh} / H_0 = 37.03 \times 300 / 6.53 = 1701 \text{ N} = 173.6 \text{ kgf}$$

### 4. Test procedure:

Apply the load combinations to the scaffold assembly, check the scaffold whether it be capable of resisting the worst combinations of loads to which it is likely to be subjected. The horizontal load shall be applied parallel and perpendicular to the bay separately.

### 5. Acceptance criteria:

All system configurations shall resist the combination of loads without any visual deformation.



Unless otherwise agreed, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from ensuring all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention To check the authenticity of testing / inspection report & certificate, please contact us at telephone (+86-21) 8327 5443, or email: [CN.Questions@sgs.com](mailto:CN.Questions@sgs.com)

(Shanghai Branch) East Kang Road, Pudong District, Shanghai, China, 201219 t(+86-21) 81190300 f(+86-21) 81191853/18183020 www.sgs.com.cn  
中国·上海·浦东康桥东路1159弄69号 邮编:201219 t(+86-21) 81190300 f(+86-21) 81191853/18183020 e.sgs.china@sgs.com

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 7 of 19

### 6. Test results:

#### 1) Horizontal working load parallel to the bay

| Test Item                                | Test height | Value of Load                      |          | Test result                                                                                    | Conclusion |
|------------------------------------------|-------------|------------------------------------|----------|------------------------------------------------------------------------------------------------|------------|
| Load combinations<br>(Service condition) | 6.53m       | Self-weight                        | 2857kgf  | The scaffold was capable of resisting the combination of loads without any visual deformation. | Pass       |
|                                          |             | Uniformly distributed service load | 763kgf   |                                                                                                |            |
|                                          |             | Horizontal working load            | 173.6kgf |                                                                                                |            |

#### 2) Horizontal working load perpendicular to the bay

| Test Item                                | Test height | Value of Load                      |          | Test result                                                                                    | Conclusion |
|------------------------------------------|-------------|------------------------------------|----------|------------------------------------------------------------------------------------------------|------------|
| Load combinations<br>(Service condition) | 6.53m       | Self-weight                        | 2857kgf  | The scaffold was capable of resisting the combination of loads without any visual deformation. | Pass       |
|                                          |             | Uniformly distributed service load | 763kgf   |                                                                                                |            |
|                                          |             | Horizontal working load            | 173.6kgf |                                                                                                |            |



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.cn/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.cn/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-21) 5387 5443, or email: CN.Despatch@sgs.com

No.88, West 1150, East Yang Gas Road, Pudong District, Shanghai, China 201204 (86-21) 51191830 (86-21) 51191831/08183020 www.sgs.com.cn  
中国·上海·浦东康桥东路1150弄88号 邮编: 201204 (86-21) 51191830 (86-21) 51191831/08183020 e: sgs.china@sgs.com

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 8 of 19

Test photos:



Test assembly



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/terms-and-conditions/terms-and-conditions.aspx>. Attention is drawn to the limitation of liability, jurisdiction and arbitration clauses defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is strictly prohibited and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated, the results shown in this test report apply only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the reliability of testing / inspection report & certificate, please contact us at Tel: +86 (0) 21 5387 1463, or email: [CN.Shanghai@sgs.com](mailto:CN.Shanghai@sgs.com)

No. 99, Block 1199, East Kang Qiao Road, Putong District, Shanghai, China: 201219 Tel: +86 (21) 61196300 Fax: +86 (21) 61191853/68182620 [www.sgs.com.cn](http://www.sgs.com.cn)  
中国·上海·浦东康桥东路1159弄69号 邮编: 201219 Tel: +86 (21) 61196300 Fax: +86 (21) 61191853/68182620 e: [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 9 of 19



Load frame



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/terms-and-conditions/terms-e-document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from ensuring all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-21) 5307 1443, or email: [CN.Docscheck@sgs.com](mailto:CN.Docscheck@sgs.com)

No.88, Road 1198, East Kang Qiao Road, Pudong District, Shanghai, China, 201319 t:(86-21) 61190300 f:(86-21) 61191853/68183820 [www.sgsgroup.com.cn](http://www.sgsgroup.com.cn)  
中国·上海·浦东康桥东路1159弄68号 邮编:201319 t:(86-21) 61190300 f:(86-21) 61191853/68183820 e: [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 10 of 19

### II. Deflection

Test method:

EN 12810-1:2003 clause 8.7 & EN 12811-1:2003 Clause 6.3

#### 1. Side protection

Test result:

| Test Item                         | Test location          | Value of Load | Test result | Requirement                                                                       | Conclusion |
|-----------------------------------|------------------------|---------------|-------------|-----------------------------------------------------------------------------------|------------|
| Deflection of the side protection | Principal guardrail    | 0.3 KN        | 1.15mm      | The principal guardrail shall not have an elastic deflection greater than 35mm    | Pass       |
|                                   | Intermediate guardrail |               | 2.11mm      | The intermediate guardrail shall not have an elastic deflection greater than 35mm | Pass       |



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and each sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection certificates, please contact us at telephone (86-755) 8307 1443, or email: [CN-Check@sgs.com](mailto:CN-Check@sgs.com)

No. 85, Road 1155, East Kang Qiao Road, Pudong District, Shanghai, China 201315  
 中国·上海·浦东康桥东路1155号55楼5505室

Tel: (86-21) 81190300 / (86-21) 81191853 / (86-21) 81190300  
 Fax: (86-21) 81190300 / (86-21) 81191853 / (86-21) 81190300

[www.sgs.com.cn](http://www.sgs.com.cn)  
[sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 11 of 19

### 2. Plank

Sample Specification: 1830mm×227mm×63mm×2.00mm (Length × Width × height × Wall thickness)

Test results:

Load class: 4

| Test item                               | Test span | Value of Load    | Test result                                                                                                                                  | Requirement                                                                                                                                                    | Conclusion |
|-----------------------------------------|-----------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Concentrated load on area 500mm × 500mm | 1.83m     | 1.50KN<br>Note 1 | The platform unit was capable of supporting the concentrated load on area 500mm × 227mm and the deflection at the center of span was 3.60mm. | The platform unit shall be capable of supporting the concentrated load on area 500mm × 227mm and the deflection at the center of span shall not exceed 18.3mm. | Pass       |
| Concentrated load on area 200mm × 200mm |           | 1.00KN           | The platform unit was capable of supporting the concentrated load on area 200mm × 200mm and the deflection at the center of span was 2.47mm. | The platform unit shall be capable of supporting the concentrated load on area 200mm × 200mm and the deflection at the center of span shall not exceed 18.3mm. | Pass       |

Note:

1. When a platform unit is less than 500mm wide, the load is reduced for this unit in proportion to its width, except that in no case the loading shall be reduced to less than 1.5 KN.
2. When subjected to the concentrated loads specified in table 3, columns 3 and 4 the elastic deflection of any platform unit shall not exceed 1/100 of its span.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/terms-and-conditions/terms-and-conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of the Client's instructions, if any. The Client's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all the rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this table refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone (86-755) 8387 1443, or email: [CN.Despatch@sgs.com](mailto:CN.Despatch@sgs.com)

No.88, Block 1152, East Fang Qiao Road, Pudong District, Shanghai, China 201219 (86-21) 81190300 (86-21) 81191853/68183820 [www.sgs.com.cn](http://www.sgs.com.cn)

中国·上海·浦东康桥东路1152弄63号 邮编:201219 (86-21) 81190300 (86-21) 81191853/68183820 [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 12 of 19

Table 3 — Service loads on working areas (see also 6.2.2)

| Load class | Uniformly distributed load<br>$q_1$<br>kN/m <sup>2</sup> | Concentrated load on area<br>500 mm x 500 mm<br>$F_1$<br>kN | Concentrated load on area<br>200 mm x 200 mm<br>$F_2$<br>kN | Partial area load          |                                           |
|------------|----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|----------------------------|-------------------------------------------|
|            |                                                          |                                                             |                                                             | $q_2$<br>kN/m <sup>2</sup> | Partial area factor<br>$a_p$ <sup>1</sup> |
| 1          | 0,75 <sup>2</sup>                                        | 1,50                                                        | 1,00                                                        | ---                        | ---                                       |
| 2          | 1,50                                                     | 1,50                                                        | 1,00                                                        | ---                        | ---                                       |
| 3          | 2,00                                                     | 1,50                                                        | 1,00                                                        | ---                        | ---                                       |
| 4          | 3,00                                                     | 3,00                                                        | 1,00                                                        | 5,00                       | 0,4                                       |
| 5          | 4,50                                                     | 3,00                                                        | 1,00                                                        | 7,50                       | 0,4                                       |
| 6          | 6,00                                                     | 3,00                                                        | 1,00                                                        | 10,00                      | 0,5                                       |

<sup>1</sup> See 6.2.2.4

<sup>2</sup> See 6.2.2.1

Sample photos:



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/terms-and-conditions/terms-and-conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone (86-21) 5337 1443, or email: [CN.SGScheck@sgs.com](mailto:CN.SGScheck@sgs.com)

No. 88, Block 11M, East Kang Qiao Road, Pudong District, Shanghai, China: 201219 | (86-21) 51196300 | (86-21) 51191853/58183620 | [www.sgs.com.cn](http://www.sgs.com.cn)

中国·上海·浦东康桥东路1159弄69号 邮编: 201219 | (86-21) 51196300 | (86-21) 51191853/58183620 | [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

Member of the SGS Group (SGS SA)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 13 of 19

### III. Ultimate load test

#### 1. 1.0m Standard

Test method: Offered by client

Test procedure:

The scaffold assembly installed in test was one bay wide (1.83m) and one bay long (1.83m), by 3×1.0m standards high. Apply a compression load progressively to the top of one standard till failure occurs, record the maximum load and failure mode. See the following picture for details.



Test assembly



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/terms-and-conditions/terms-and-conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8327 1431, or email: [CN.Detect@sgs.com](mailto:CN.Detect@sgs.com)

No. 88, Road 1188, East Kang Qian Road, Pudong District, Shanghai, P.R. China 201219 1(86-21) 61196300 1(86-21) 61191853/98182620 [www.sgs.com.cn](http://www.sgs.com.cn)

中国·上海·浦东康桥东路1158号 邮编 201219 1(86-21) 61196300 1(86-21) 61191853/98182620 [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 14 of 19

### Test results:

| Test item                           | Test height | Failure load (kN) | Failure mode                                 |
|-------------------------------------|-------------|-------------------|----------------------------------------------|
| Ultimate load test of 1.0m standard | 3.0m        | 217.33            | The sample was bending in the first standard |

### Test photos:



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at [www.sgs.com/terms-and-conditions.aspx](http://www.sgs.com/terms-and-conditions.aspx) and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/terms-and-conditions/Terms-Electronic.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of the document is advised that information contained herein reflects the Company's findings at the time of its intervention only and where the terms of Client's instructions, if any, the Company's sole responsibility is to its Client and this document does not extend to any liability to a transaction from exercise of their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without the written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8387 1443, or email: [CN.Docscheck@sgs.com](mailto:CN.Docscheck@sgs.com)

No.85, Weib 1190, East Yang Gao Road, Pudong District, Shanghai, China. 201219 t:(86-21) 81196300 f:(86-21) 81191953/88183820 www.sgs.com.cn  
中国·上海·浦东新区杨高东路1153弄69号 邮编:201219 t:(86-21) 81196300 f:(86-21) 81191953/88183820 e: [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 15 of 19



After test



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/terms-and-conditions/terms-and-conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not constitute parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone (+86-755) 8327 5443, or email: [CN.SGScheck@sgs.com](mailto:CN.SGScheck@sgs.com)

No. 88, Block 1193, East Kang Gas Road, Pudong District, Shanghai, China: 201219 1 (86-21) 81190300 1 (86-21) 81191853/18183820 [www.sgs.com.cn](http://www.sgs.com.cn)  
中国·上海·浦东新区东康路1153弄69号 邮编: 201219 1 (86-21) 81190300 1 (86-21) 81191853/18183820 e: [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 16 of 19

1.83m Ledger

Test method: Offered by client

Test procedure:

Fix the sample on the platform of universal testing machine as per client's requirement, apply a compression load progressively to the middle of ledger via a 100 × 100mm block till failure occurs, record the maximum load and failure mode. See the following picture for details.



Test assembly

Test results:

| Test item                          | Failure load (kN) | Failure mode                                   |
|------------------------------------|-------------------|------------------------------------------------|
| Ultimate load test of 1.83m ledger | 14.04             | The sample was bending in the middle of ledger |



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.cn/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.cn/Terms-and-Conditions/Terms-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to the Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing machine report & certificate, please contact us at telephone: (86-21) 5307 5443, or email: [CN.Deschere@sgs.com](mailto:CN.Deschere@sgs.com)

No. 88, Block 1193, East Kang Qian Road, Pudong District, Shanghai, China, 201219 | (86-21) 51190300 | (86-21) 51191853/08183820 | [www.sgs.com.cn](http://www.sgs.com.cn)

中国·上海·浦东康桥南路1193号 邮编: 201219 | (86-21) 51190300 | (86-21) 51191853/08183820 | [www.sgs.com.cn](http://www.sgs.com.cn)

## TEST REPORT

No. : SHIN170903146CCM

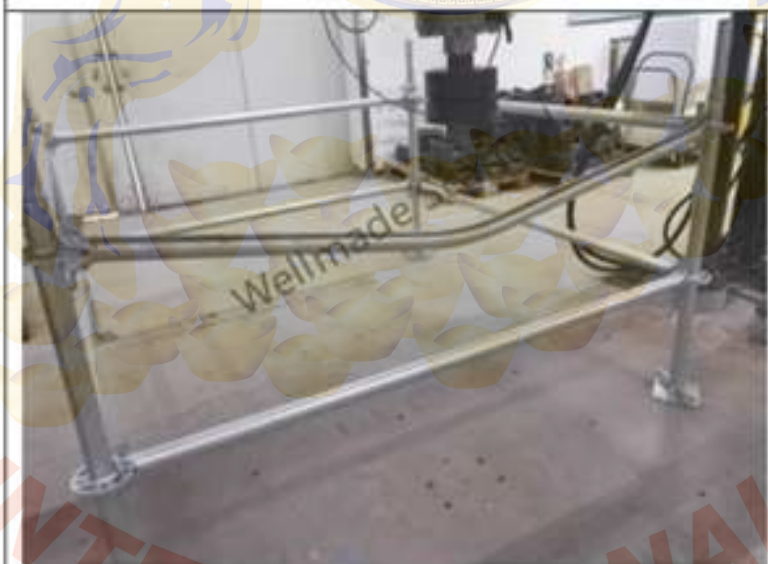
Date : Dec. 05, 2017

Page: 17 of 19

Test photos:



1.83m Ledger



After test



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service, which are available on request or on our website at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction clauses defined therein. Any holder of this document is advised that information included herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, and the Company's sole responsibility is to its Client and this document does not constitute parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone (+86-21) 6327 1443, or email: [Chk.Docs@sgs.com](mailto:Chk.Docs@sgs.com)

No. 38, Road 1181, East Kang Qiao Road, Pudong District, Shanghai, China: 201319 1 (86-21) 61196300 1 (86-21) 61191853/58182820 [www.sgsgroup.com.cn](http://www.sgsgroup.com.cn)  
中国·上海·浦东康桥东路1158弄69号 邮编: 201319 1 (86-21) 61196300 1 (86-21) 61191853/58182820 [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

## TEST REPORT

No. : SHIN170903146CCM

Date : Dec. 05, 2017

Page: 18 of 19

### 3. Steel plank

Sample Specification: 1830mm×227mm×63mm×2.00mm (Length × Width × height × Wall thickness)

Test method: Offered by client

Test procedure:

Fix the sample on the platform of universal testing machine as per client's requirement, apply a compression load progressively to the middle of ledger via a 200mm×200mm block till failure occurs, record the maximum load and failure mode. See the following picture for details.



Test assembly

### Test results:

| Test item                         | Failure load (kN) | Failure mode                                  |
|-----------------------------------|-------------------|-----------------------------------------------|
| Ultimate load test of steel plank | 9.16              | The sample was bending in the middle of plank |



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/terms-and-conditions/terms-and-conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing inspection report & certificate, please contact us at telephone: (86-21) 5887 1443, or email: CN.SGS@sgs.com  
 No. 88, Block 115B, East Kang Qiao Road, Pudong District, Shanghai, China, 201219 t:(86-21) 51190000 f:(86-21) 51191863/58183820 www.sgsgroup.com.cn  
 中国·上海·浦东康桥东路1159弄69号 邮编: 201219 t:(86-21) 51190000 f:(86-21) 51191863/58183820 e: sgs.china@sgs.com

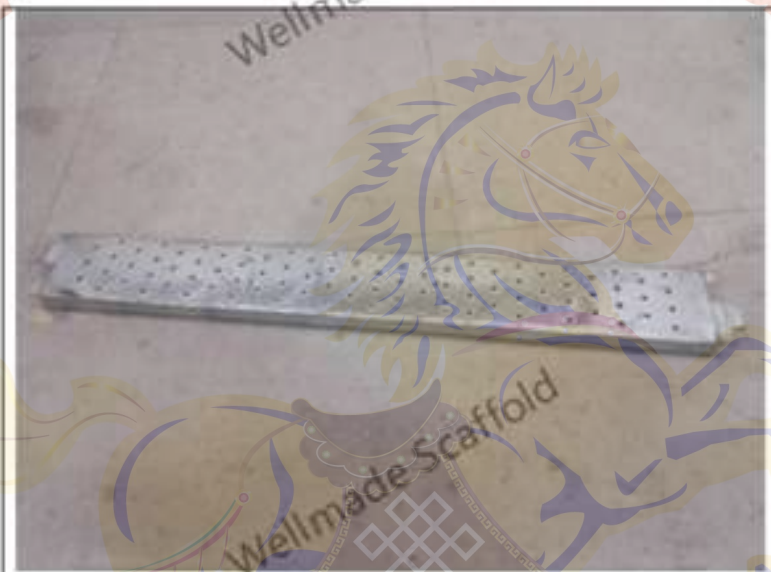
## TEST REPORT

No. : SHIN170903146CCM

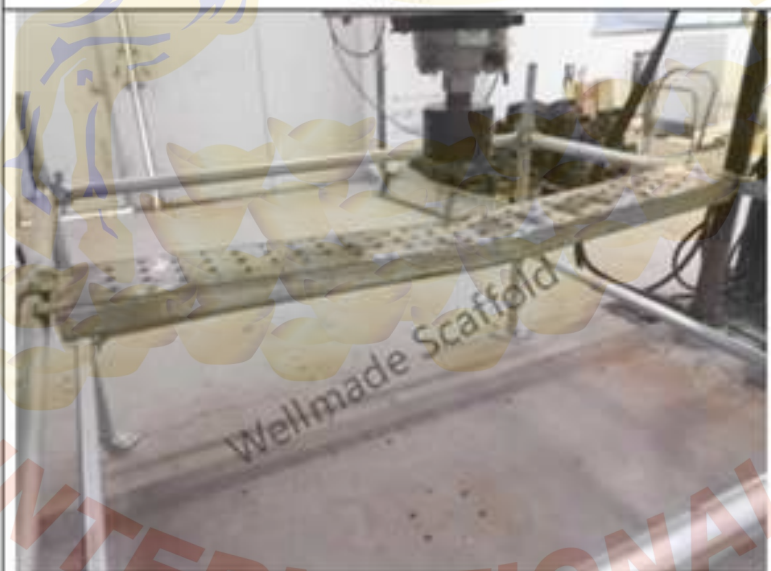
Date : Dec. 05, 2017

Page: 19 of 19

Test photos:



Plank



After test

\*\*\*\*\* End of report \*\*\*\*\*



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/terms-and-conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/terms-and-conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of this report, please contact us at telephone (+86-21) 5443 5443, or email: [CN.Doecheck@sgs.com](mailto:CN.Doecheck@sgs.com)

No.88, Block T158, East Kang Ge Road, Pudong District, Shanghai, China. 201219 1 (86-21) 61190300 1 (86-21) 61191853/168163620 [www.sgs.com](http://www.sgs.com)

中国·上海·浦东康桥东路1158弄68号 邮编: 201219 1 (86-21) 61190300 1 (86-21) 61191853/168163620 [www.sgs.com](http://www.sgs.com)