

## Test Report

for

### KETE Window Wall System 100A & Sliding Door System 100B

for AS/NZS 4284:2008

(SLS pressure = +/-1.8 kPa)

(ULS pressure = +/-2.8 kPa)



KETE Window Wall System 100A

KETE Sliding Door System 100B

RESEARCH ENGINEERING DEVELOPMENT  
FACADE CONSULTANTS LIMITED

31 JANUARY 2018

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## 1. Introduction

This report describes the test conducted for the **KETE Window Wall System 100A & Sliding Door System 100B** designed by **Guangdong Kete Facadetech Co., Ltd.** The test has been conducted by using the actual samples and simulated conditions in a test chamber against the following specifications in order to ensure the safety and serviceability of the system.

- 1-1.1 Preliminary Test-Open and close Operable Awning Sash and Sliding Door Test (AS/NZS 4420.1-2016 Clause 2)
- 1-1.2 Preliminary Test-Static Pressure Test (AS/NZS 4284:2008 Clause 8.2.2)
- 1-1.3 Preliminary Test-Water Penetration Test - Static (AS/NZS 4284:2008 Clause 8.2.3)
- 1-1.4 Preliminary Test-Water Penetration Test - Cyclic (AS/NZS 4284:2008 Clause 8.2.3)
- 1-2 Structural Test at Serviceability Limit State (AS/NZS 4284:2008 Clause 8.3)
- 1-3 Open and close Operable Awning Sash and Sliding Door Test (AS/NZS 4420.1-2016 Clause 2)
- 1-4 Operating Force Test (AS/NZS 4420.1-2016 Clause 4)
- 1-5 Air Infiltration Test (AS/NZS 4284:2008 Clause 8.4)
- 1-6 Water Penetration Test - Static (AS/NZS 4284:2008 Clause 8.5)
- 1-7 Water Penetration Test - Cyclic (AS/NZS 4284:2008 Clause 8.6)
- 1-8 Proof Test at Ultimate Limit State (AS/NZS 4284:2008 Clause 8.8)
- 1-9 Extra Proof Test at Ultimate Limit State (AS/NZS 4284:2008 Clause 8.8) (ULS pressure =+/-3.1 kPa)

**2. Witness on the Test**

Mr. Michael Yan of

**BG &E Façades Pty Ltd**

Mr. John Zhuo and  
Mr. Kim Dong of

**Guangdong Kete Facadetech Co., Ltd.**

**3. Test Information**

Location of Testing Laboratory:

No.111, Jiaoxin Road, Lanhe Town, Nansha District,  
Guangzhou, China

Test Engineer

Ms. Ivy Zou and  
Dr. Joe Cheung of  
**Research Engineering Development  
Facade Consultants Limited (HOKLAS No. 91)**

System Owner:

**Guangdong Kete Facadetech Co., Ltd.**

System Designers:

**Guangdong Kete Facadetech Co., Ltd.  
BG &E Façades Pty Ltd**

Date of Test:

11<sup>th</sup> & 12<sup>th</sup> January 2018

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#### 4. Details of the Test Specimen

##### 4.1 General Description

The specimen is constructed in accordance with the actual size section using the identical material to the material designed by **Guangdong Kete Facadeteck Co., Ltd.** and to be used in the future projects. The construction method and fixing of the specimen is also the same as the method used in actual installation of the systems on future project sites.

##### 4.2 Testing Sample

KETE Window Wall System 100A is a window wall system including an awning window and fixed panels.

The dimension of the specimen: 2.10 m width x 2.7 m height.

KETE Sliding Door System 100B is a sliding door system.

The dimension of the specimen: 2.05 m width x 2.7 m height.

##### 4.3 As-built PMU Testing Drawing (Enclosed)

M-01, M-02, M-03, M-04, M-05, M-06, M-07, M-08, DY-03, JD-15, JD-16, JD-17, JD-18, JD-19, JD-20, JD-21, JD-22, JD-23, JD-24, JD-25, JD-26, JD-27, JD-201

##### 4.4 Glass

8mm Toughened Glass (Heat Soaked) + 12A + 8mm Toughened Glass (Heat Soaked)

##### 4.5 Sealant

GUIBAO 998 for weather sealant

##### 4.6 Equipment

The externally mounted chamber is equipped with a manometer, air and water flowmeter, water pump and air-blowers. The deformation of specimen shall be detected by electronic transducers.

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**5. Test Specification and Sequence****5.1.1 Preliminary Test- Open and close Operable Awning Sash and Sliding Door Test (AS/NZS 4420.1-2016 Clause 2)****Procedure**

Unlock, open, close and lock the operable awning sash and sliding sash for 5 cycles. Inspect the operating mechanism of the awing and the sliding door sash for any defects.

**Requirement**

No damage should be observed after the test.

**5.1.2 Preliminary Test-Static Pressure Test (AS/NZS 4284:2008 Clause 8.2.2)****Procedure**

Preload the specimen to + / -1.8 kPa (positive and negative SLS design wind pressure) for 10 seconds respectively.

**Requirement**

No separation, plastic deformations or deleterious should be observed.

**5.1.3 Preliminary Test-Water Penetration Test - Static (AS/NZS 4284:2008 Clause 8.2.3)****Procedure**

- (a) Without disturbing the seal between the specimen and the test chamber, adjust all ventilators, included in the test specimen so that their operation conforms to the specification requirements, and adjust all hardware for maximum tightness without interfering with their operations.
- (b) Adjust the water spray to the specified rate of 0.05L/ m<sup>2</sup>. sec
- (c) At the start of the test, the water spray operates for 5 minutes with zero pressure.
- (d) Apply the air pressure difference of **540 Pa** promptly and maintain a pressure along with the specified rate of water spray for 15 minutes.
- (e) Remove the air pressure difference and stop the water spray.
- (f) Observation of the internal surface of the specimen shall be carried out during the water spray operation and for 5 minutes after the water spray has stopped and there is zero pressure differential on the specimen.

**Requirement**

No water leakage should be observed.

**5.1.4 Preliminary Test-Water Penetration Test – Cyclic (AS/NZS 4284:2008 Clause 8.2.3) Procedure**

- (a) The test shall be performed upon completion of the static water test. Should the cyclic water test not commence within 30 min of the static water test then before the start of the test, the water spray operates for 5 minutes with zero pressure.
- (b) Adjust the water spray to the specified rate of 0.05L/ m<sup>2</sup>. sec.
- (c) Apply a cyclic positive air pressure for a duration of 5.0 minutes. The applied pressure shall be varied between the specified limits with a cycle time of 3 s to 5 s.
- (d) Record the cyclic pressure by the pressure gauge data logger.
- | <u>Pressure</u>            | <u>Duration</u> |
|----------------------------|-----------------|
| <b>270 - 540 - 270 Pa</b>  | 5 min.          |
| 0.00 Pa                    | 2 min.          |
| <b>360 - 720 - 360 Pa</b>  | 5 min.          |
| 0.00 Pa                    | 2 min.          |
| <b>540 - 1080 - 540 Pa</b> | 5 min.          |
- (e) Remove the air pressure difference and stop the water spray.
- (f) Observation of the internal surface of the specimen shall be carried out during the water spray operation and for 5 minutes after the water spray has stopped and there is zero pressure differential on the specimen.

**Requirement**

No water leakage should be observed.

## 5.2 Structural Test at Serviceability Limit State (AS/NZS 4284:2008 Clause 8.3)

### Procedure

Positive / negative pressure up to 100% of the SLS Wind Pressure is applied as follows:

#### Take-up

<u>Pressure (kPa)</u>	<u>Duration</u>	<u>Observation</u>
1.80 (100%)	2 min.	take readings (Initial take-up period)
0.0	2 min.	take readings then set zero (Zero stage Z1)

#### Mode 1

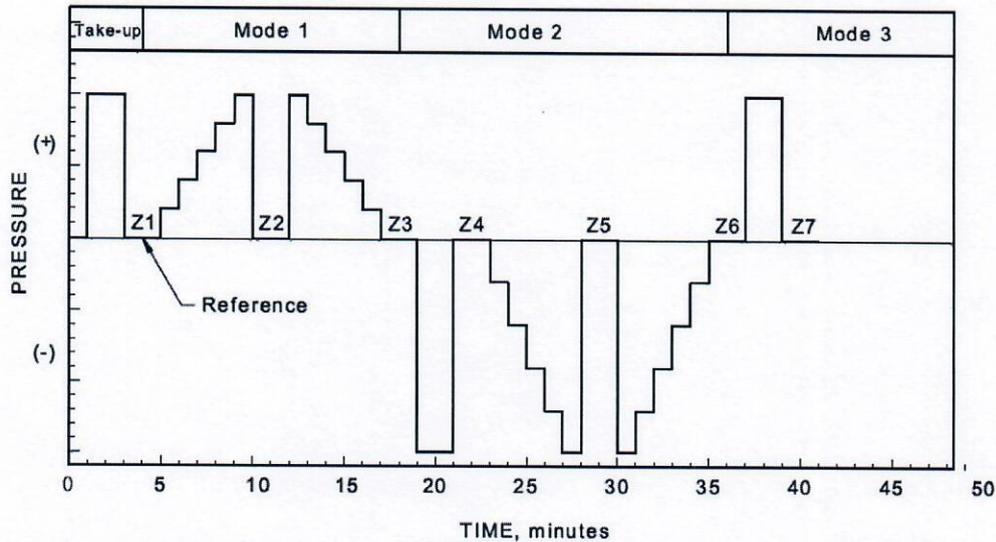
<u>Pressure (kPa)</u>	<u>Duration</u>	<u>Observation</u>
0.36(20%)	1 min.	take readings
0.72 (40%)	1 min.	take readings
1.08 (60%)	1 min.	take readings
1.44 (80%)	1 min.	take readings
1.80 (100%)	1 min.	take readings
0.0	2 min.	take readings (Zero stage Z2)
1.80 (100%)	1 min.	take readings
1.44 (80%)	1 min.	take readings
1.08 (60%)	1 min.	take readings
0.72 (40%)	1 min.	take readings
0.36 (20%)	1 min.	take readings
0.0	2 min.	take readings (Zero stage Z3)

#### Mode 2

<u>Pressure (kPa)</u>	<u>Duration</u>	<u>Observation</u>
-1.80 (100%)	2 min.	take readings (take-up period)
0.0	2 min.	take readings (Zero Stage Z4)
-0.36 (20%)	1 min.	take readings
-0.72 (40%)	1 min.	take readings
-1.08 (60%)	1 min.	take readings
-1.44 (80%)	1 min.	take readings
-1.80(100%)	1 min.	take readings
0.0	2 min.	take readings (Zero stage Z5)
-1.80 (100%)	1 min.	take readings
-1.44 (80%)	1 min.	take readings
-1.08 (60%)	1 min.	take readings
-0.72 (40%)	1 min.	take readings
-0.36 (20%)	1 min.	take readings
0.0	2 min.	take readings (Zero stage Z6)

#### Mode 3

<u>Pressure (kPa)</u>	<u>Duration</u>	<u>Observation</u>
1.80 (100%)	2 min.	take readings
0.0	2 min.	take readings (Zero stage Z7)



NOTE: The displacements used for deflection/span ratios are based on zero deflections at the reference stages Z1 and Z4. The reducing pressure steps from Z2 to Z3 and from Z5 to Z6 are optional.

### Requirement

The performance of the specimen is evaluated against the following criteria.

- (i) The glass should not break.
- (ii) The deflection of the framing members of the specimen should not exceed span/250, during the positive and negative pressure tests.
- (iii) The glass panel deflection should not exceed span/60.
- (iv) Maximum successive member displacement should not exceed 3mm.
- (v) Maximum slippage should not exceed 3mm.
- (vi) Maximum displacement (Framing member) should not exceed 20 mm.

### 5.3 Open and close Operable Awning Sash and Sliding Door Test (AS/NZS 4420.1-2016 Clause 2)

#### Procedure

Unlock, open, close and lock the operable awning sash and sliding door sash for 5 cycles. Inspect the operating mechanism of the awning sash and sliding door for any defects.

#### Requirement

No damage should be observed after the test.

### 5.4 Operating Force Test (AS/NZS 4420.1-2016 Clause 4)

#### Procedure

Closed, but unlocked the awning window and the sliding door, apply an operating force without shock in the direction of the awning sash and sliding door operation.

#### Requirement

The test force shall be not greater than the value given in the table below.

Product and movement type	Initiate (N)	Maintain (N)
Sliding door	180	110
Awning Window	160	80

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**5.5 Air Infiltration Test – Static (AS/NZS 4284:2008 Clause 8.4)****Procedure**

- (a) Without disturbing the seal between the specimen and the test chamber, adjust all ventilators, included in the test specimen so that their operation conforms to the specification requirements, and adjust all hardware for maximum tightness without interfering with their operations.
- (b) Adjust the air flow through the test chamber to provide the specified test pressure difference across the test specimen. When the test conditions are stabilized, record the air flow through the flowmeter and the test pressure difference.
- (c) Eliminate extraneous chamber leakage, or, if this is impractical, measure the amount of such leakage with the specimen sealed, at the air pressure differences to be exerted during the air leakage tests. The metering equipment for the measurement of air leakage may be used for measuring the extraneous leakage, or it may be necessary to provide additional air metering equipment for this purpose.

Air infiltration is to be checked under pressure of  $\pm 150$  Pa (AS/NZS 4284:2008 requirement) and  $\pm 300$  Pa (BG & E Façades Pty Ltd specification requirement)

**Requirement**

Air infiltration rate should not exceed:

1.6 L/sec/m<sup>2</sup>@ $\pm 150$  Pa (AS/NZS 4284:2008 requirement)

1.0 L/sec/m<sup>2</sup>@ $\pm 300$  Pa (BG & E Façades Pty Ltd specification requirement)

**5.6 Water Penetration Test - Static (AS/NZS 4284:2008 Clause 8.5)****Procedure**

- (a) Without disturbing the seal between the specimen and the test chamber, adjust all ventilators, included in the test specimen so that their operation conforms to the specification requirements, and adjust all hardware for maximum tightness without interfering with their operations.
- (b) Adjust the water spray to the specified rate of 0.05L/ m<sup>2</sup>. sec
- (c) At the start of the test, the water spray operates for 5 minutes with zero pressure.
- (d) Apply the air pressure difference of **540 Pa** promptly and maintain a pressure along with the specified rate of water spray for 15 minutes.
- (e) Remove the air pressure difference and stop the water spray.
- (f) Observation of the internal surface of the specimen shall be carried out during the water spray operation and for 5 minutes after the water spray has stopped and there is zero pressure differential on the specimen.

**Requirement**

No water leakage should be observed.

**5.7 Water Penetration Test – Cyclic (AS/NZS 4284:2008 Clause 8.6)****Procedure**

- (a) The test shall be performed upon completion of the static water test. Should the cyclic water test not commence within 30 min of the static water test then before the start of the test, the water spray operates for 5 minutes with zero pressure.
- (b) Adjust the water spray to the specified rate of 0.05L/ m<sup>2</sup>. sec.
- (c) Apply a cyclic positive air pressure for a duration of 5.0 minutes. The applied pressure shall be varied between the specified limits with a cycle time of 3 s to 5 s.
- (d) Record the cyclic pressure by the pressure gauge data logger.

<u>Pressure</u>	<u>Duration</u>
<b>270 - 540 - 270 Pa</b>	5 min.
0.00 Pa	2 min.
<b>360 - 720 - 360 Pa</b>	5 min.
0.00 Pa	2 min.
<b>540 - 1080 - 540 Pa</b>	5 min.

Remove the air pressure difference and stop the water spray.

- (e) Observation of the internal surface of the specimen shall be carried out during the water spray operation and for 5 minutes after the water spray has stopped and there is zero pressure differential on the specimen.

**Requirement**

No water leakage should be observed.

**5.8 Structural Test at Ultimate Limit State (AS/NZS 4284:2008 Clause 8.8)****Procedure**

Positive / negative pressure up to Ultimate Limit State is applied and held for 10 seconds.

**Positive**

<u>Pressure (Pa)</u>	<u>Duration</u>
0 to 2800	50s-60s
2800	10s

**Negative**

<u>Pressure (Pa)</u>	<u>Duration</u>
0 to -2800	50s-60s
-2800	10s

The sample shall be inspected at the end of each of the positive and negative pressure stages. Record all incidences of non-linear deflection and/or collapse.

**Requirement**

There shall be no collapse of the test sample. Collapse shall mean any one or any combination of the following:

- (a) Dislodgment of any framing member, façade panels or any part thereof.
- (b) Failure of any fixings that connect the façade to the building structure, such that the test sample is unstable.
- (c) Failure of any stop, locking device, fastener or support which would allow an opening light to come open.

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- (d) Repeated breakage of glass resulting in loss of chamber pressure. Glass may only be replaced once before the sample is deemed to have collapsed.
  - (e) Repeated cracking of glass which does not result in loss of chamber pressure. Glass may only be replaced twice before the sample is deemed to have collapsed.
  - (f) Any permanent distortion of a panel shall be noted and documented in the test report.

### 5.9 Extra Structural Test at Ultimate Limit State (AS/NZS 4284:2008 Clause 8.8) Procedure

Positive / negative pressure up to Ultimate Limit State is applied and held for 10 seconds.

#### Positive

<u>Pressure (Pa)</u>	<u>Duration</u>
0 to 3100	50s-60s
3100	10s

#### Negative

<u>Pressure (Pa)</u>	<u>Duration</u>
0 to -3100	50s-60s
-3100	10s

The sample shall be inspected at the end of each of the positive and negative pressure stages. Record all incidences of non-linear deflection and/or collapse.

#### Requirement

Requested by the client, for information only.

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**6. Test Procedure and Observations**

**11<sup>th</sup> January 2018**

**6.1.1 Preliminary Test- Open and close Operable Awning Sash and Sliding Door Test Procedure**

The testing procedures described in section 5.1.1 were followed.

**Observation**

No damage was observed.

**6.1.2 Preliminary Test-Static Pressure Test (AS/NZS 4284:2008 Clause 8.2.2) Procedure**

The testing procedures described in section 5.1.2 were followed.

**Observation**

No separation, plastic deformations or deleterious was observed.

**6.1.3 Preliminary Test-Water Penetration Test - Static (AS/NZS 4284:2008 Clause 8.2.3) Procedure**

The testing procedures described in section 5.1.3 were followed.

**Observation**

No water leakage was observed.

**6.1.4 Preliminary Test-Water Penetration Test - Cyclic (AS/NZS 4284:2008 Clause 8.2.3) Procedure**

The testing procedures described in section 5.1.4 were followed.

**Observation**

No water leakage was observed.

12<sup>th</sup> January 2018

## 6.2 Structural Test at Serviceability Limit State (AS/NZS 4284 Clause 8.3) Procedure

The testing procedures described in section 5.2 were followed.

### Observation for positive pressure up to 1.80 kPa

(For Locations of transducers, please refer to Figure 1)

Pressure in kPa	Displacement in mm									
	Locations of Transducers									
	Mullion Span = 2585 mm			Mullion Span = 1450 mm			Mullion Span = 2540 mm			
	1	2	3	7	8	9	10	11	12	
<b>Take-up</b>										
At Pressure = <b>1.80</b>	4.03	11.08	2.37	10.78	8.88	2.80	2.94	9.93	5.33	
At Pressure = <b>0.00</b>	0.18	0.28	0.18	0.26	0.29	0.20	0.32	0.56	0.56	
<i>Zero reference</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Z1
<b>Mode 1</b>										
At Pressure = <b>0.36</b>	0.44	2.04	0.61	1.97	1.66	0.65	0.32	1.86	0.90	
At Pressure = <b>0.72</b>	1.58	4.43	1.06	4.31	3.46	1.15	0.86	3.89	1.94	
At Pressure = <b>1.08</b>	2.60	6.76	1.50	6.59	5.24	1.66	1.48	5.88	2.92	
At Pressure = <b>1.44</b>	3.34	8.95	1.90	8.71	7.04	2.16	2.07	7.70	3.81	
At Pressure = <b>1.80</b>	3.92	10.99	2.24	10.70	8.68	2.60	2.62	9.50	4.80	
Relative Disp. (mm)	--	7.910	--	--	2.030	--	--	5.790	--	
Permitted Relative Displ. #	--	10.340	--	--	5.800	--	--	10.160	--	
At Pressure = <b>0.00</b>	0.06	0.20	0.06	0.19	0.18	0.10	0.06	0.11	0.11	Z2
Relative Disp. (mm)	--	0.140	--	--	0.035	--	--	0.025	--	
At Pressure = <b>1.80</b>	3.94	11.03	2.28	10.74	8.74	2.66	2.68	9.66	4.86	
Relative Disp. (mm)	--	7.920	--	--	2.040	--	--	5.890	--	
Permitted Relative Displ. #	--	10.340	--	--	5.800	--	--	10.160	--	
At Pressure = <b>1.44</b>	3.65	9.28	2.08	9.04	7.45	2.38	2.34	8.30	4.36	
At Pressure = <b>1.08</b>	3.08	7.37	1.77	7.16	5.95	2.02	1.88	6.70	3.62	
At Pressure = <b>0.72</b>	2.18	5.16	1.40	4.99	4.20	1.58	1.34	4.78	2.72	
At Pressure = <b>0.36</b>	1.08	2.78	0.86	2.66	2.32	0.99	0.76	2.71	1.67	
At Pressure = <b>0.00</b>	0.08	0.28	0.10	0.26	0.26	0.15	0.08	0.20	0.16	Z3
Relative Disp. (mm)	--	0.190	--	--	0.055	--	--	0.080	--	

# note -The Deflection of Framing Member should not exceed span/250

#### Detailed Calculation for Relative Deflections at Design Wind Load (1.80 kPa)

Relative Deflection of Mullion at Locations 1, 2 and 3

$$\begin{aligned}
 &= 11.03 - (3.94 + 2.28)/2 \\
 &= 7.920 \text{ mm} < \text{Span} / 250 = 2585.0 / 250 = 10.340 \text{ mm} \\
 &= \text{span} / 326 = 10.340 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

Relative Deflection of Mullion at Locations 7, 8 and 9

$$\begin{aligned}
 &= 8.74 - (10.74 + 2.66)/2 \\
 &= 2.040 \text{ mm} < \text{Span} / 250 = 1450.0 / 250 = 5.800 \text{ mm} \\
 &= \text{span} / 711 = 5.800 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

Relative Deflection of Mullion at Locations 10, 11 and 12

$$\begin{aligned}
 &= 9.66 - (2.68 + 4.86)/2 \\
 &= 5.890 \text{ mm} < \text{Span} / 250 = 2540.0 / 250 = 10.160 \text{ mm} \\
 &= \text{span} / 431 = 10.160 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

### Observation for negative pressure up to -1.80 kPa

(For Locations of transducers, please refer to Figure 1)

Pressure in kPa	Displacement in mm									
	Locations of Transducers									
	Mullion Span = 2585 mm			Mullion Span = 1450 mm			Mullion Span = 2540 mm			
	1	2	3	7	8	9	10	11	12	
<b>Mode 2</b>										
At Pressure = -1.80	2.07	11.04	4.18	10.30	9.49	4.40	1.98	8.78	4.56	
At Pressure = 0.00	0.36	0.44	0.36	0.36	0.54	0.48	0.49	0.92	1.10	Z4
Relative Disp. (mm)	--	0.080	--	--	0.120	--	--	0.125	--	
At Pressure = -0.36	0.52	2.24	0.97	2.08	1.92	1.08	0.74	2.68	1.65	
At Pressure = -0.72	0.86	4.39	1.76	4.08	3.76	1.88	1.08	4.36	2.48	
At Pressure = -1.08	1.24	6.58	2.56	6.13	5.62	2.73	1.38	5.88	3.22	
At Pressure = -1.44	1.66	8.82	3.37	8.24	7.56	3.60	1.66	7.36	3.89	
At Pressure = -1.80	2.07	11.07	4.18	10.32	9.50	4.32	1.95	8.82	4.58	
Relative Disp. (mm)	--	7.945	--	--	2.180	--	--	5.555	--	
Permitted Relative Displ. #	--	10.340	--	--	5.800	--	--	10.160	--	
At Pressure = 0.00	0.42	0.54	0.44	0.46	0.52	0.72	0.52	1.08	1.18	Z5
Relative Disp. (mm)	--	0.110	--	--	-0.070	--	--	0.230	--	
At Pressure = -1.80	2.07	11.12	4.20	10.35	9.52	4.72	1.96	8.84	4.60	
Relative Disp. (mm)	--	7.985	--	--	1.985	--	--	5.560	--	
Permitted Relative Displ. #	--	10.340	--	--	5.800	--	--	10.160	--	
At Pressure = -1.44	1.98	9.16	3.55	8.52	7.86	4.31	1.78	7.62	4.15	
At Pressure = -1.08	1.66	7.04	2.82	6.54	6.08	3.54	1.52	6.23	3.61	
At Pressure = -0.72	1.28	4.88	2.08	4.51	4.28	2.74	1.24	4.74	2.99	
At Pressure = -0.36	0.88	2.76	1.30	2.50	2.53	1.94	0.94	3.12	2.23	
At Pressure = 0.00	0.46	0.62	0.50	0.53	0.60	1.11	0.52	1.12	1.24	Z6
Relative Disp. (mm)	--	0.140	--	--	-0.220	--	--	0.240	--	
<b>Mode 3</b>										
At Pressure = 1.80	3.94	11.02	2.26	10.74	8.70	2.04	2.72	9.89	4.78	
Relative Disp. (mm)	--	7.920	--	--	2.310	--	--	6.140	--	
At Pressure = 0.00	-0.05	0.04	-0.06	0.05	0.04	-0.62	0.02	-0.14	-0.20	Z7
Relative Disp. (mm)	--	0.095	--	--	0.325	--	--	-0.050	--	

# note - The Deflection of Framing Member should not exceed span/250

#### Detailed Calculation for Relative Deflections at Design Wind Load (-1.80 kPa)

Relative Deflection of Mullion at Locations 1, 2 and 3

$$\begin{aligned}
 &= 11.12 - (2.07 + 4.20)/2 \\
 &= 7.985 \text{ mm} < \text{Span} / 250 = 2585.0 / 250 = 10.340 \text{ mm} \\
 &= \text{span} / 324 = 10.340 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

Relative Deflection of Mullion at Locations 7, 8 and 9

$$\begin{aligned}
 &= 9.50 - (10.32 + 4.32)/2 \\
 &= 2.180 \text{ mm} < \text{Span} / 250 = 1450.0 / 250 = 5.800 \text{ mm} \\
 &= \text{span} / 665 = 5.800 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

Relative Deflection of Mullion at Locations 10, 11 and 12

$$\begin{aligned}
 &= 8.84 - (1.96 + 4.60)/2 \\
 &= 5.560 \text{ mm} < \text{Span} / 250 = 2540.0 / 250 = 10.160 \text{ mm} \\
 &= \text{span} / 457 = 10.160 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

### Observation for positive pressure up to 1.80 kPa

(For Locations of transducers, please refer to Figure 1)

Pressure in kPa	Displacement in mm								
	Locations of Transducers								
	Transom Span = 927 mm			Transom Span = 835 mm			Glass Panel Span = 905 mm		
	4	5	6	13	14	15	16	17	18
<b>Take-up</b>									
At Pressure = <b>1.80</b>	2.66	7.09	10.80	1.55	2.62	3.62	11.38	9.97	4.18
At Pressure = <b>0.00</b>	0.22	0.18	0.23	0.58	0.47	0.41	0.31	0.24	0.16
<i>Zero reference</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Mode 1</b>									
At Pressure = <b>0.36</b>	0.30	1.22	1.96	0.10	0.28	0.56	2.12	1.84	0.66
At Pressure = <b>0.72</b>	0.72	2.70	4.32	0.26	0.74	1.24	4.54	3.92	1.52
At Pressure = <b>1.08</b>	1.22	4.19	6.62	0.47	1.18	1.94	6.91	6.00	2.42
At Pressure = <b>1.44</b>	1.80	5.64	8.74	0.72	1.64	2.58	9.16	7.98	3.28
At Pressure = <b>1.80</b>	2.50	7.04	10.74	0.96	2.12	3.20	11.26	9.85	4.08
Relative Disp. (mm)	--	0.420	--	--	0.040	--	--	2.180	--
Permitted Relative Displ. #	--	3.708	--	--	3.340	--	--	15.083	--
At Pressure = <b>0.00</b>	0.16	0.14	0.18	0.04	0.02	0.02	0.19	0.11	0.09
Relative Disp. (mm)	--	-0.030	--	--	-0.010	--	--	-0.030	--
At Pressure = <b>1.80</b>	2.52	7.06	10.75	1.04	2.19	3.27	11.30	9.88	4.10
Relative Disp. (mm)	--	0.425	--	--	0.035	--	--	2.180	--
Permitted Relative Displ. #	--	3.708	--	--	3.340	--	--	15.083	--
At Pressure = <b>1.44</b>	2.10	5.94	9.01	0.98	2.02	2.96	9.46	8.18	3.48
At Pressure = <b>1.08</b>	1.56	4.64	7.12	0.84	1.70	2.46	7.50	6.41	2.74
At Pressure = <b>0.72</b>	1.06	3.20	4.96	0.67	1.32	1.85	5.26	4.41	1.87
At Pressure = <b>0.36</b>	0.62	1.69	2.61	0.46	0.86	1.13	2.83	2.31	1.00
At Pressure = <b>0.00</b>	0.21	0.18	0.25	0.08	0.09	0.06	0.26	0.14	0.14
Relative Disp. (mm)	--	-0.050	--	--	0.020	--	--	-0.060	--

# note -The Deflection of Framing Member should not exceed span/250  
 -The Deflection of Glass Panel should not exceed span/60

#### Detailed Calculation for Relative Deflections at Design Wind Load (1.80 kPa)

Relative Deflection of Transom at Locations 4, 5 and 6

$$\begin{aligned}
 &= 7.06 - (2.52 + 10.75)/2 \\
 &= 0.425 \text{ mm} < \text{Span} / 250 = 927.0 / 250 = 3.708 \text{ mm} \\
 &= \text{span} / 2181 = 3.708 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

Relative Deflection of Transom at Locations 13, 14 and 15

$$\begin{aligned}
 &= 2.12 - (0.96 + 3.20)/2 \\
 &= 0.040 \text{ mm} < \text{Span} / 250 = 835.0 / 250 = 3.340 \text{ mm} \\
 &= \text{span} / 20875 = 3.340 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

Relative Deflection of Glass Panel at Locations 16, 17 and 18

$$\begin{aligned}
 &= 9.85 - (11.26 + 4.08)/2 \\
 &= 2.180 \text{ mm} < \text{Span} / 60 = 905.0 / 60 = 15.083 \text{ mm} \\
 &= \text{span} / 415 = 15.083 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

### Observation for negative pressure up to -1.80 kPa

(For Locations of transducers, please refer to Figure 1)

Pressure in kPa	Displacement in mm								
	Locations of Transducers								
	Transom			Transom			Glass Panel		
	Span = 927 mm			Span = 835 mm			Span = 905 mm		
	4	5	6	13	14	15	16	17	18
<b>Mode 2</b>									
At Pressure = -1.80	2.10	6.52	10.26	2.10	2.98	3.44	11.40	10.22	4.47
At Pressure = 0.00	0.32	0.26	0.32	0.73	0.74	0.72	0.52	0.46	0.32
Relative Disp. (mm)	--	-0.060	--	--	0.015	--	--	0.040	--
At Pressure = -0.36	0.54	1.28	2.08	0.93	1.24	1.69	2.36	2.20	0.94
At Pressure = -0.72	0.88	2.57	4.08	1.24	1.78	2.43	4.56	4.14	1.72
At Pressure = -1.08	1.28	3.87	6.13	1.55	2.22	2.81	6.80	6.18	2.63
At Pressure = -1.44	1.72	5.20	8.18	1.87	2.64	3.18	9.14	8.30	3.58
At Pressure = -1.80	2.14	6.52	10.28	2.19	3.06	3.54	11.42	10.32	4.50
Relative Disp. (mm)	--	0.310	--	--	0.195	--	--	2.360	--
Permitted Relative Displ. #	--	3.708	--	--	3.340	--	--	15.083	--
At Pressure = 0.00	0.40	0.34	0.44	0.82	0.80	0.80	0.56	0.61	0.40
Relative Disp. (mm)	--	-0.080	--	--	-0.010	--	--	0.130	--
At Pressure = -1.80	2.14	6.54	10.30	2.26	3.10	3.58	11.43	10.32	4.51
Relative Disp. (mm)	--	0.320	--	--	0.180	--	--	2.350	--
Permitted Relative Displ. #	--	3.708	--	--	3.340	--	--	15.083	--
At Pressure = -1.44	1.88	5.40	8.48	2.14	2.88	3.38	9.46	8.57	3.82
At Pressure = -1.08	1.56	4.16	6.50	1.97	2.60	3.11	7.29	6.62	2.98
At Pressure = -0.72	1.23	2.91	4.47	1.72	2.25	2.78	5.06	4.58	2.06
At Pressure = -0.36	0.89	1.67	2.47	1.34	1.76	2.30	2.88	2.62	1.25
At Pressure = 0.00	0.45	0.36	0.49	0.88	0.85	0.84	0.64	0.68	0.43
Relative Disp. (mm)	--	-0.110	--	--	-0.010	--	--	0.145	--
<b>Mode 3</b>									
At Pressure = 1.80	2.49	7.07	10.72	1.18	2.29	3.38	11.26	9.74	4.10
Relative Disp. (mm)	--	0.465	--	--	0.010	--	--	2.060	--
At Pressure = 0.00	-0.02	0.00	0.08	-0.15	-0.06	-0.06	0.02	-0.16	-0.04
Relative Disp. (mm)	--	-0.030	--	--	0.045	--	--	-0.150	--

# note -The Deflection of Framing Member should not exceed span/250

-The Deflection of Glass Panel should not exceed span/60

#### Detailed Calculation for Relative Deflections at Design Wind Load (-1.80 kPa)

Relative Deflection of Transom at Locations 4, 5 and 6

$$\begin{aligned}
 &= 6.54 - (2.14 + 10.30)/2 \\
 &= 0.320 \text{ mm} < \text{Span} / 250 = 927.0 / 250 = 3.708 \text{ mm} \\
 &= \text{span} / 2897 = 3.708 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

Relative Deflection of Transom at Locations 13, 14 and 15

$$\begin{aligned}
 &= 3.06 - (2.19 + 3.54)/2 \\
 &= 0.195 \text{ mm} < \text{Span} / 250 = 835.0 / 250 = 3.340 \text{ mm} \\
 &= \text{span} / 4282 = 3.340 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

Relative Deflection of Glass Panel at Locations 16, 17 and 18

$$\begin{aligned}
 &= 10.32 - (11.42 + 4.50)/2 \\
 &= 2.360 \text{ mm} < \text{Span} / 60 = 905.0 / 60 = 15.083 \text{ mm} \\
 &= \text{span} / 383 = 15.083 \text{ mm} \quad \text{O.K.}
 \end{aligned}$$

**6.3 Open and close Operable Awning Sash and Sliding Door Test (AS/NZS 4420.1-2016 Clause 2)**

**Procedure**

The testing procedures described in section 5.3 were followed.

**Observation**

No damage was observed.

**6.4 Operating Force Test (AS/NZS 4420.1-2016 Clause 4)**

**Procedure**

The testing procedures described in section 5.4 were followed.

**Observation**

Product and movement type			Test Force(N)			
			1	2	3	Mean
100A Awning Sash	Open	Initiate	38.80	38.20	37.60	38.20 < 160
		Maintain	26.33	26.07	26.60	26.33 < 80
	Close	Initiate	26.60	24.00	27.20	25.93 < 160
		Maintain	22.55	17.50	15.53	18.53 < 80
100B Sliding Door	Open	Initiate	95.00	91.80	91.20	92.67 < 180
		Maintain	77.72	66.69	79.27	74.56 < 110
	Close	Initiate	86.40	73.40	72.60	77.47 < 180
		Maintain	34.70	38.84	40.87	38.14 < 110

**6.5 Air Infiltration Test (AS/NZS 4284:2008 Clause 8.4)**

**Procedure**

The testing procedures described in section 5.5 were followed.

**Observation of Window Wall System 100A**

Specimen area =  $2.1 \times 2.7 = 5.67 \text{ m}^2$

The airflow rates measured during the test were as follows:

Test Pressure (Pa)	+75	+150	+300	-75	-150	-300
a) Air Flow Rate (m <sup>3</sup> /hr) of Chamber	16.95	23.46	33.40	16.51	23.62	34.13
b) Air Flow Rate (m <sup>3</sup> /hr) of Chamber and Specimen	17.12	23.62	33.44	17.47	24.50	36.12
c) Air Flow Rate (m <sup>3</sup> /hr) of Specimen = b) - a)	0.17	0.16	0.04	0.96	0.88	1.99

Allowable Flow Rate for Specimen at +150Pa

$$= 5.67 \text{ m}^2 \times 1.6 \text{ L/sec/m}^2$$

$$= 9.072 \text{ L/sec}$$

$$= 32.65 \text{ m}^3/\text{hr} > 0.16 \text{ m}^3/\text{hr} \quad \text{O.K.}$$

Allowable Flow Rate for Specimen at -150Pa

$$= 5.67 \text{ m}^2 \times 1.6 \text{ L/sec/m}^2$$

$$= 9.072 \text{ L/sec}$$

$$= 32.65 \text{ m}^3/\text{hr} > 0.88 \text{ m}^3/\text{hr} \quad \text{O.K.}$$

The rate of air leakage of the specimen was within allowable values.  
(AS/NZS 4284:2008 Table D1)

Allowable Flow Rate for **Specimen** at +300Pa  
=  $5.67 \text{ m}^2 \times 1.0 \text{ L/sec/m}^2$   
= 5.67 L/sec  
=  $23.81 \text{ m}^3/\text{hr} > 0.04\text{m}^3/\text{hr}$       **O.K.**

Allowable Flow Rate for **Specimen** at -300Pa  
=  $6.615 \text{ m}^2 \times 1.0 \text{ L/sec/m}^2$   
= 6.615 L/sec  
=  $23.81 \text{ m}^3/\text{hr} > 1.99\text{m}^3/\text{hr}$       **O.K.**

The rate of air leakage of the specimen was within allowable values.  
(BG & E Façades Pty Ltd specification requirement)

#### Observation of Sliding Door System 100B

Specimen area =  $2.05 \times 2.7 = 5.535 \text{ m}^2$

The airflow rates measured during the test were as follows:

Test Pressure (Pa)	+75	+150	+300	-75	-150	-300
a) Air Flow Rate (m <sup>3</sup> /hr) of Chamber	1.377	5.023	9.155	4.456	8.075	12.970
b) Air Flow Rate (m <sup>3</sup> /hr) of Chamber and Specimen	6.400	6.967	9.311	17.620	33.660	60.190
c) Air Flow Rate (m <sup>3</sup> /hr) of Specimen = b) - a)	5.023	1.944	0.156	13.164	25.585	47.220

Allowable Flow Rate for **Specimen** at +150Pa  
=  $5.535 \text{ m}^2 \times 1.6 \text{ L/sec/m}^2$   
= 8.856 L/sec  
=  $31.88 \text{ m}^3/\text{hr} > 1.944\text{m}^3/\text{hr}$       **O.K.**

Allowable Flow Rate for **Specimen** at -150Pa  
=  $5.535 \text{ m}^2 \times 1.6 \text{ L/sec/m}^2$   
= 8.856 L/sec  
=  $31.88 \text{ m}^3/\text{hr} > 25.585\text{m}^3/\text{hr}$       **O.K.**

The rate of air leakage of the specimen was within allowable values.  
(AS/NZS 4284:2008 Table D1)

---

**6.6 Water Penetration Test - Static (AS/NZS 4284:2008 Clause 8.5)**

**Procedure**

The testing procedures described in section 5.6 were followed.

**Observation**

No water leakage was observed.

**6.7 Water Penetration Test - Cyclic (AS/NZS 4284:2008 Clause 8.6)**

**Procedure**

The testing procedures described in section 5.7 were followed.

**Observation**

No water leakage was observed.

**6.8 Structural Test at Ultimate Limit State (AS/NZS 4284:2008 Clause 8.8)**

**Procedure**

The testing procedures described in section 5.8 were followed.

**Observation**

No collapse was observed under the specified pressure.  
The maximum pressures attained were +2.8 kPa/ -2.8 kPa.  
(As per AS/NZS 4284:2008 test requirement)

**6.9 Extra Structural Test at Ultimate Limit State (AS/NZS 4284:2008 Clause 8.8)**

**Procedure**

The testing procedures described in section 5.9 were followed.

**Observation**

No collapse was observed under the specified pressure.  
The maximum pressures attained were +3.1 kPa/ -3.1 kPa.

## 7. Summary of Test Results

### 11<sup>th</sup> January 2018

Test	Results
1.1.1) Preliminary Test- Open and close Operable Awning Sash and Sliding Door Test (AS/NZS 4420.1-2016 Clause 2)	No damage was observed. Please refer to Clause 6.1.1 for details.
1.1.2) Preliminary Test- Static Pressure Test (AS/NZS 4284:2008 Clause 8.2.2)	No separation, plastic deformations or deleterious was observed. Please refer to Clause 6.1.2 for details.
1.1.3) Preliminary Test- Water Penetration Test - Static (AS/NZS 4284:2008 Clause 8.2.3)	No water leakage was observed. Please refer to Clause 6.1.3 for details.
1.1.4) Preliminary Test- Water Penetration Test - Cyclic (AS/NZS 4284:2008 Clause 8.2.3)	No water leakage was observed. Please refer to Clause 6.1.4 for details.

### 12<sup>th</sup> January 2018

Test results to AS/NZS 4284:2008:

Test	Results
2) Structural Test at Serviceability Limit State (AS/NZS 4284:2008 Clause 8.3)	During the structural test at Serviceability Limit State, the deflections of the framing members as well as glass panel were within the allowable deflection limits. Maximum successive member displacement did not exceed 3 mm. (SLS pressure = +/-1.8 kPa) Please refer to Clause 6.2 for details.
3) Open and close Operable Awning Sash and Sliding Door Test (AS/NZS 4420.1-2016 Clause 2)	No damage was observed. Please refer to Clause 6.3 for details.
4) Operating Force Test (AS/NZS 4420.1-2016 Clause 4)	The test force was within allowable value. Please refer to Clause 6.4 for details.
5) Air Infiltration Test (AS/NZS 4284:2008 Clause 8.4)	The rate of air leakage of the specimen at +/-150Pa was less than 1.6 L/sec/m <sup>2</sup> . Please refer to Clause 6.5 for details.
6) Water Penetration Test - Static (AS/NZS 4284:2008 Clause 8.5)	No water leakage was observed. Please refer to Clause 6.6 for details.
7) Water Penetration Test - Cyclic (AS/NZS 4284:2008 Clause 8.6)	No water leakage was observed. Please refer to Clause 6.7 for details.
8) Structural Test at Ultimate Limit State (AS/NZS 4284:2008 Clause 8.8)	No collapse was observed under the specified pressure. (ULS pressure = +/-2.8 kPa) Please refer to Clause 6.8 for details.

**12<sup>th</sup> January 2018**

Test results to the extra items requested by the client:

Test	Results
9) Extra Air Infiltration Test (AS/NZS 4284:2008 Clause 8.4)	The rate of air leakage of the Window Wall System 100A at +/-300Pa were less than 1.0 L/sec/m <sup>2</sup> . (BG &E Façades Pty Ltd specification requirement) Please refer to Clause 6.5 for details.
10) Extra Structural Test at Ultimate Limit State (AS/NZS 4284:2008 Clause 8.8)	No collapse was observed under the specified pressure. (ULS pressure = +/-3.1 kPa) Please refer to Clause 6.9 for details.

I certify the above test results are the true record for the performance test of the **KETE Window Wall System 100A & Sliding Door 100B** designed by **Guangdong Kete Facadetech Co., Ltd. and BG &E Façades Pty Ltd.**

For and on the behalf of  
Research Engineering Development  
Façade Consultants Limited

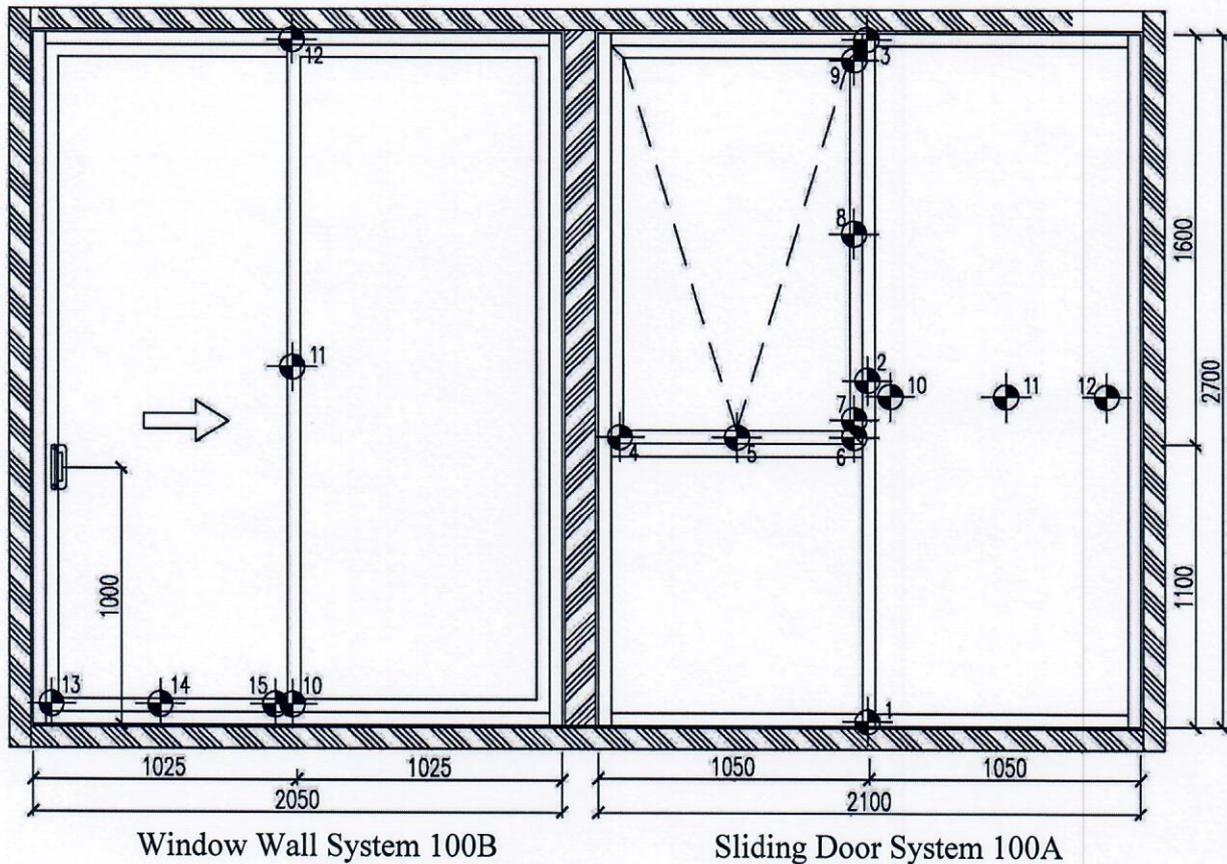


Dr. ZHANG Zhuoran  
Authorized Signature

## Appendices

Figure 1 - Location of displacement transducers

Photo 1 - Photograph of the PMU Test Mock-up



Mullion: 1-2-3, 7-8-9, 10-11-12  
Transom: 4-5-6, 13-14-15  
Glass Panel: 16-17-18

Figure 1: Locations of Displacement Transducers (Outdoor View)



KETE Window Wall System 100A

KETE Sliding Door System 100B

Photo 1: Mock-up of the Window Wall System 100A & Sliding Door System 100B

**- End of Report -**

**As-built PMU Test drawings from client**

**KETE WINDOW WALL AND  
SLIDING DOOR  
100A/B SYSTEM  
PMU DRAWINGS**

2017.12.11





DIE SCHEDULE

CODE E13076	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13125	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13077	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1
DESCRIPTION SUBHEAD			AREA (mm <sup>2</sup> ) 583.86	DESCRIPTION CAPPING			AREA (mm <sup>2</sup> ) 110.74	DESCRIPTION SUBSILL			AREA (mm <sup>2</sup> ) 726.87	DESCRIPTION SUBSILL			AREA (mm <sup>2</sup> ) 634.4
CODE E13086	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13081	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13082	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13083	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1
DESCRIPTION MALE MULLION			AREA (mm <sup>2</sup> ) 538.47	DESCRIPTION FEMALE MULLION			AREA (mm <sup>2</sup> ) 493.8	DESCRIPTION MALE MULLION			AREA (mm <sup>2</sup> ) 756.54	DESCRIPTION FEMALE MULLION			AREA (mm <sup>2</sup> ) 663.99
CODE E13084	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13089	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13078	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13079	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1
DESCRIPTION TRANSOM			AREA (mm <sup>2</sup> ) 782.36	DESCRIPTION TARANSOM CAPPING			AREA (mm <sup>2</sup> ) 273.65	DESCRIPTION TRANSOM			AREA (mm <sup>2</sup> ) 1122.73	DESCRIPTION TRANSOM			AREA (mm <sup>2</sup> ) 849.67

设计变更

日期	变更内容

备注:  
Notes

1. 图上所有尺寸以标注为准, 勿以度量。
2. 图上所有尺寸单位均为mm, 除非另有标注。
3. 图上所有加 \* 尺寸表示待定尺寸。

建筑设计  
Architect

业主  
Owner

工程监理  
Supervisor

总承包  
Contractor

广东科腾幕墙有限公司



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工程名称 **KETE WINDOW WALL  
AND SLIDING DOOR 150A/B/C  
&100A/B/C SYSTEM**

工程编号  
Project No.

图名 **MATERIAL LIST-150A&150B  
&150C&100A&100B&100C**

设计  
Design **KAI**

审核  
Check **KIM**

批准  
Approve **JOHN**

日期  
Scale **2017. 12. 11**

图纸编号  
Drawing No. **M-01**

修改序号 

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**R O**  
Revision No.

DIE SCHEDULE

CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH	
C29418	6063-T5	POWDERCOAT		E13087	6063-T5	POWDERCOAT		E13088	6063-T5	POWDERCOAT		C29422	6063-T5	POWDERCOAT	
DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE
AWNING SASH FRAME		234.83	1:1	CAPPING		63.26	1:1	ANTI-ROTATION CLIP		47	1:1	AWNING SASH		526.31	1:1
CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH	
C29412	6063-T5	POWDERCOAT		C29411	6063-T5	POWDERCOAT		D33500	6063-T5	POWDERCOAT		D33501	6063-T5	POWDERCOAT	
DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE
AWNING SASH		411.29	1:1	GLAZING BEAD		74.85	1:1	CAPPING		69.12	1:1	TRANSOM HEAD TRACK		778.87	1:1
CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH		CODE	MATERIAL	FINISH	
D33502	6063-T5	POWDERCOAT		D33505	6063-T5	POWDERCOAT		D33517	6063-T5	POWDERCOAT		D33507	6063-T5	POWDERCOAT	
DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE	DESCRIPTION		AREA (mm <sup>2</sup> )	SCALE
TRANSOM SILL TRACK		644.88	1:1	RAIL		479.58	1:1	HOOKED STILE		855.35	1:1	HOOKED STILE		371.72	1:1

设计变更

日期	变更内容

备注:  
Notes

1. 图上所有尺寸以标注为准, 勿以度量。
2. 图上所有尺寸单位均为mm, 除非另有标注。
3. 图上所有加 \* 尺寸表示待定尺寸。

建筑设计  
Architect

业主  
Owner

工程监理  
Supervisor

总承包  
Contractor

广东科腾幕墙有限公司



**Guangdong KETE  
Facadeteck CO., LTD**

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MAIL: fsfyzv@163.com

MAIL: fsfyzv@163.com

Http: //www.gdkete.cn

工程名称 **KETE WINDOW WALL  
AND SLIDING DOOR 150A/B/C  
&100A/B/C SYSTEM**

工程编号  
Project No.

图名 **MATERIAL LIST-150A&150B  
Drawing Name &150C&100A&100B&100C**

设计 **KAI**  
Design

审核 **KIM**  
Check

批准 **JOHN**  
Approve

日期 **2017. 12. 11**  
Scale

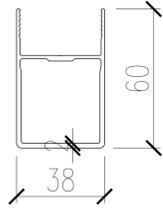
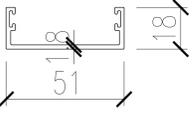
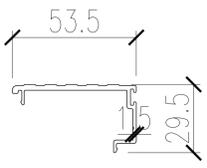
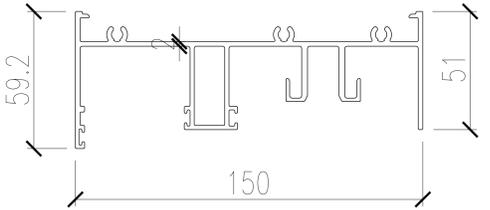
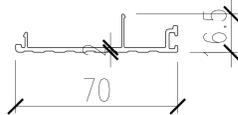
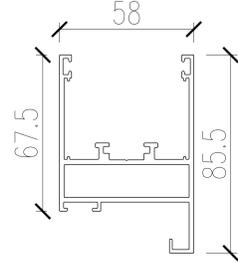
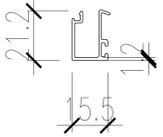
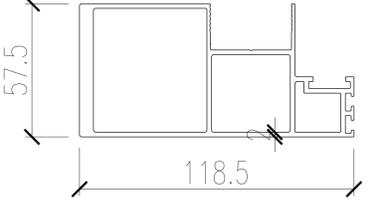
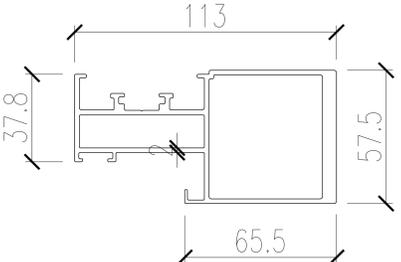
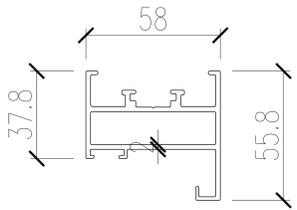
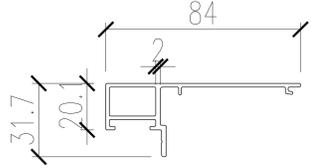
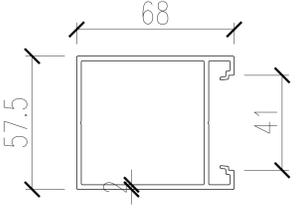
图纸编号 **M-02**  
Drawing No.

修改序号 

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**R O**  
Revision No.

DIE SCHEDULE

															
CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE
D33506	6063-T5	POWDERCOAT	1:1	E13101	6063-T5	POWDERCOAT	1:1	D33509	6063-T5	POWDERCOAT	1:1	D33511	6063-T5	POWDERCOAT	1:1
DESCRIPTION STILE				DESCRIPTION SNAP-IN ADAPTOR				DESCRIPTION CAPPING				DESCRIPTION TRANSOM HEAD TRACK			
AREA (mm <sup>2</sup> ) 339.48				AREA (mm <sup>2</sup> ) 168.32				AREA (mm <sup>2</sup> ) 186.16				AREA (mm <sup>2</sup> ) 964.17			
															
CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE
D33480	6063-T5	POWDERCOAT	1:1	D33515	6063-T5	POWDERCOAT	1:1	D33499	6063-T5	POWDERCOAT	1:1	D33497	6063-T5	POWDERCOAT	1:1
DESCRIPTION CAPPING				DESCRIPTION RAIL				DESCRIPTION GLAZING BEAD				DESCRIPTION HOOKED STILE			
AREA (mm <sup>2</sup> ) 172.81				AREA (mm <sup>2</sup> ) 635.89				AREA (mm <sup>2</sup> ) 79.08				AREA (mm <sup>2</sup> ) -			
															
CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE	CODE	MATERIAL	FINISH	SCALE
D33477	6063-T5	POWDERCOAT	1:1	D33467	6063-T5	POWDERCOAT	1:1	D33510	6063-T5	POWDERCOAT	1:1	D33487	6063-T5	POWDERCOAT	1:1
DESCRIPTION HOOKED STILE				DESCRIPTION HOOKED STILE				DESCRIPTION CAPPING				DESCRIPTION STILE			
AREA (mm <sup>2</sup> ) 1048.22				AREA (mm <sup>2</sup> ) 503.45				AREA (mm <sup>2</sup> ) 274.52				AREA (mm <sup>2</sup> ) 524.86			

设计变更

日期	变更内容

备注:  
Notes

1. 图上所有尺寸以标注为准, 勿以度量。
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建筑设计  
Architect

业主  
Owner

工程监理  
Supervisor

总承包  
Contractor

广东科腾幕墙有限公司



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MAIL: fsfyzv@163.com

工程名称 KETE WINDOW WALL  
Project Name AND SLIDING DOOR 150A/B/C  
&100A/B/C SYSTEM

工程编号  
Project No.

图名 MATERIAL LIST-150A&150B  
Drawing Name &150C&100A&100B&100C

设计 KAI  
Design

审核 KIM  
Check

批准 JOHN  
Approve

日期 2017. 12. 11  
Scale

图纸编号 M-03  
Drawing No.

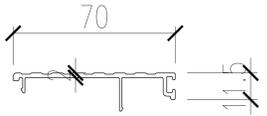
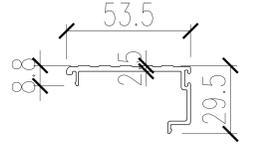
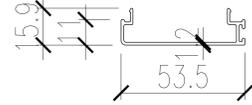
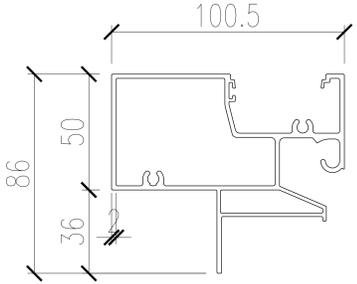
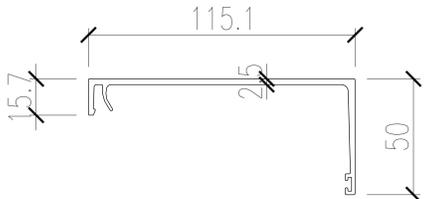
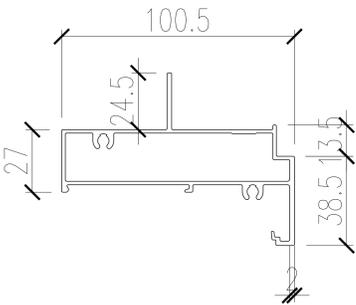
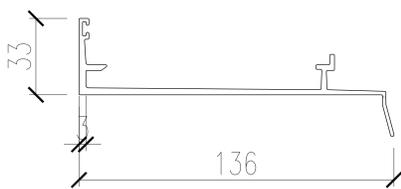
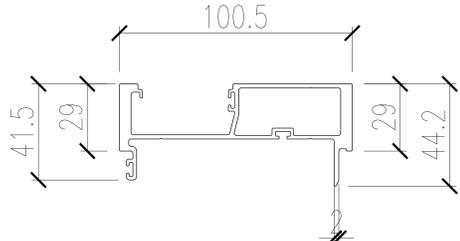
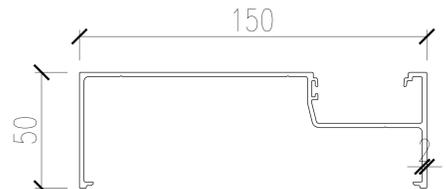
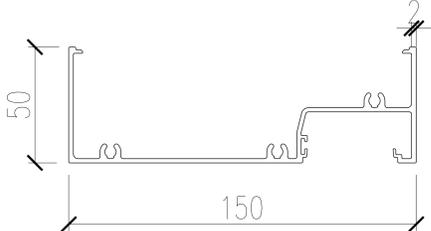
修改序号 

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 R O  
Revision No.



DIE SCHEDULE

															
CODE D33480	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE D33509	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE D33459	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13154	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1
DESCRIPTION CAPPING				DESCRIPTION CAPPING				DESCRIPTION CAPPING				DESCRIPTION TRANSOM			
AREA (mm <sup>2</sup> ) 172.81				AREA (mm <sup>2</sup> ) 186.16				AREA (mm <sup>2</sup> ) 116.48				AREA (mm <sup>2</sup> ) 862.31			
															
CODE E13148	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13153	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13147	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1
DESCRIPTION SUBHEAD				DESCRIPTION TRANSOM				DESCRIPTION SUBSILL				DESCRIPTION SUBSILL			
AREA (mm <sup>2</sup> ) 460.11				AREA (mm <sup>2</sup> ) 576.40				AREA (mm <sup>2</sup> ) 598.1				AREA (mm <sup>2</sup> ) 505.6			
															
CODE E13149	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13080	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13085	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1				
DESCRIPTION MALE MULLION				DESCRIPTION MULLION				DESCRIPTION TRANSOM							
AREA (mm <sup>2</sup> ) 671.69				AREA (mm <sup>2</sup> ) 544.23				AREA (mm <sup>2</sup> ) 635.61							

设计变更	
日期	变更内容
备注: Notes	
1. 图上所有尺寸以标注为准, 勿以度量。 2. 图上所有尺寸单位均为mm, 除非另有标注。 3. 图上所有加 * 尺寸表示待定尺寸。	
建筑设计 Architect	
业主 Owner	
工程监理 Supervisor	
总承包 Contractor	
广东科腾幕墙有限公司	
	
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MAIL: fsfyzv@163.com      MAIL: fsfyzv@163.com	
Http: //www.gdkete.cn	
工程名称 Project Name	KETE WINDOW WALL AND SLIDING DOOR 150A/B/C &100A/B/C SYSTEM
工程编号 Project No.	
图名 Drawing Name	MATERIAL LIST-150A&150B &150C&100A&100B&100C
设计 Design	KAI
审核 Check	KIM
批准 Approve	JOHN
日期 Scale	2017. 12. 11
图纸编号 Drawing No.	M-05
修改序号 Revision No.	

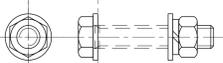
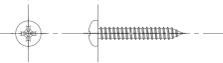
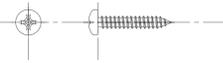
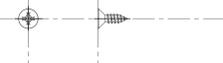
DIE SCHEDULE

CODE E13358	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13357	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13360	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13363	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1
DESCRIPTION AWNING SASH FRAME			AREA (mm <sup>2</sup> ) 146.3	DESCRIPTION GLAZING BEAD			AREA (mm <sup>2</sup> ) 67.5	DESCRIPTION TRANSOM			AREA (mm <sup>2</sup> ) 522.8	DESCRIPTION TRANSOM			AREA (mm <sup>2</sup> ) 741.2
CODE E13359	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13361	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13362	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1	CODE E13365	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1
DESCRIPTION TRANSOM			AREA (mm <sup>2</sup> ) 506.3	DESCRIPTION MALE MULLION			AREA (mm <sup>2</sup> ) 717.8	DESCRIPTION FEMALE MULLION			AREA (mm <sup>2</sup> ) 640.6	DESCRIPTION AWNING SASH			AREA (mm <sup>2</sup> ) 385.9
CODE E13364	MATERIAL 6063-T5	FINISH POWDERCOAT	SCALE 1:1												
DESCRIPTION AWNING SASH			AREA (mm <sup>2</sup> ) 505												

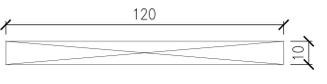
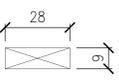
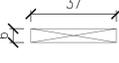
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日期	变更内容
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建筑设计 Architect	
业主 Owner	
工程监理 Supervisor	
总承包 Contractor	
广东科腾幕墙有限公司  Guangdong KETE Facadeteck CO., LTD TEL: +86-757-81800209 FAX: +86-757-81800199 MAIL: fsfyzv@163.com      MAIL: fsfyzv@163.com Http: //www.gdkete.cn	
工程名称 Project Name	KETE WINDOW WALL AND SLIDING DOOR 150A/B/C &100A/B/C SYSTEM
工程编号 Project No.	
图名 Drawing Name	MATERIAL LIST-150A&150B &150C&100A&100B&100C
设计 Design	KAI
审核 Check	KIM
批准 Approve	JOHN
日期 Scale	2017. 12. 11
图纸编号 Drawing No.	M-06
修改序号 Revision No.	

# MATERIAL LIST

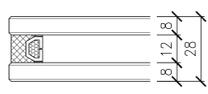
## FASTENERS SCHEDULE

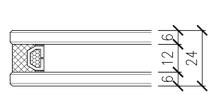
LEGEND NO.	FASTENER COMPONENT	DESCRIPTION
F01		M10X40mm PAN HEAD SCREW 304 STAINLESS STEEL GR. A2-50 @≤ 600mm
F02		st5.5X38 PAN-HEAD SELF DRILLING SCREW 304 STAINLESS STEEL GR. A2-50
F03		st4.2x45 COUNTERSUNK HEAD SELF DRILLING SCREW 304 STAINLESS STEEL GR. A2-50 @≤ 300mm
F04		st4.2x32 COUNTERSUNK HEAD SELF DRILLING SCREW 304 STAINLESS STEEL GR. A2-50
F05		st5.5x32 PAN-HEAD SELF DRILLING SCREW 304 STAINLESS STEEL GR. A2-50
F06		st4.2x13 COUNTERSUNK HEAD SELF DRILLING SCREW 304 STAINLESS STEEL GR. A2-50
F07		st4.2x13 PAN-HEAD SELF DRILLING SCREW 304 STAINLESS STEEL GR. A2-50

## MISC BLOCK

LEGEND NO.	PROFILE	DESCRIPTION
MB01		∅12mm COMPRESSED CLOSED CELL BACKING ROD MATERIAL:POLYETHELENE BY INSTALLER ON SITE
MB02		WEATHER SEAL (CONTINUOUS) GUIBAO 998
MB03		120mmx10mm , L=100mm SILICONE SETTING BLOCK HARDNESS SHORE A :85±5 COLOR BLACK
MB04		28mmx9mm , L=100mm SILICONE SETTING BLOCK HARDNESS SHORE A :85±5 COLOR BLACK
MB05		STRUCTURAL SEALANT (CONTINUOUS) GUIBAO 992
MB06		6x37mm SINGLE SIDED GLAZING TAPE ADD BLACK AND HARD
MB07		∅12 HOLE COVER EPDM COLOR BLACK

## GLASS

LEGEND NO.	PROFILE	DESCRIPTION
GL01		8mm TOUGHENED HEAT SOAKED +12AIR( SEALANT) + 8mm TOUGHENED HEAT SOAKED

LEGEND NO.	PROFILE	DESCRIPTION
GL02		6mm TOUGHENED HEAT SOAKED +12AIR( STRUCTURAL SEALANT) + 6mm TOUGHENED HEAT SOAKED

## 设计变更

日期	变更内容

备注:  
Notes

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- 图上所有尺寸单位均为mm, 除非另有标注。
- 图上所有加 \* 尺寸表示待定尺寸。

建筑设计  
Architect

业主  
Owner

工程监理  
Supervisor

总承包  
Contractor

广东科腾幕墙有限公司



**Guangdong KETE  
Facadeteck CO., LTD**

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FAX: +86-757-81800199

MAIL: fsfyzv@163.com  
Http: //www.gdkete.cn

MAIL: fsfyzv@163.com

工程名称 KETE WINDOW WALL  
Project Name AND SLIDING DOOR 150A/B/C  
&100A/B/C SYSTEM

工程编号  
Project No.

图名 MATERIAL LIST-150A&150B  
Drawing Name &150C&100A&100B&100C

设计 KAI  
Design

审核 KIM  
Check

批准 JOHN  
Approve

日期 2017. 12. 11  
Scale

图纸编号 M-07  
Drawing No.

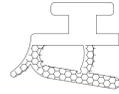
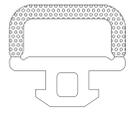
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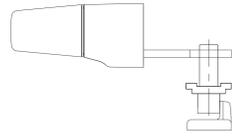
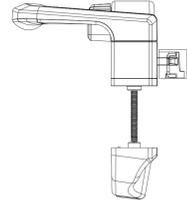
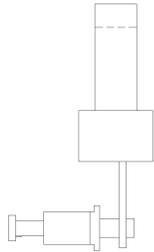
 R 0  
Revision No.

## MATERIAL LIST

### Rubber strip

LEGEND NO.	FASTENER COMPONENT	DESCRIPTION
GK01		COLOR:BLACK MATERIAL:EPDM complex rubber HARDNESS SHORE A :65±5A 45±5A
GK02		COLOR:BLACK MATERIAL:EPDM rubber HARDNESS SHORE A :65±5A
GK03		COLOR:BLACK MATERIAL:EPDM rubber HARDNESS SHORE A :65±5A
GK04		COLOR:BLACK MATERIAL:EPDM rubber HARDNESS SHORE A :75±5A
GK05		COLOR:BLACK MATERIAL:EPDM complex rubber HARDNESS SHORE A :65±5A 45±5A
GK06		COLOR:BLACK MATERIAL:SILICONE HARDNESS SHORE A :65±5A
GK07		COLOR:BLACK MATERIAL:EPDM rubber HARDNESS SHORE A :65±5A

### MISC BLOCK

LEGEND NO.	PROFILE	DESCRIPTION
HF01		WINDOW HANDLE KINLONG CODE: CZS320 COLOR BLACK WITHOUT KEY
HF02		SILING DOOR HANDLE KINLONG CODE:Y2LSGS32A COLOR BLACK WITHOUT KEY
HF03		FRICITION STAY KINLONG CODE: SC320 304 STAINLESS STEEL
HF04		SILING DOOR ROLLER KINLONG CODE:MLF18 304 STAINLESS STEEL
HF05		SILING DOOR HANDLE ARCHITECTURE SCIENCE AND TECHNOLOGY CODE:psk-0751/US952-1 COLOR BLACK WITHOUT KEY

### 设计变更

日期	变更内容

备注:  
Notes

- 图上所有尺寸以标注为准, 勿以度量。
- 图上所有尺寸单位均为mm, 除非另有标注。
- 图上所有加 \* 尺寸表示待定尺寸。

建筑设计  
Architect

业主  
Owner

工程监理  
Supervisor

总承包  
Contractor

广东科腾幕墙有限公司



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Facadeteck CO., LTD**

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工程名称 KETE WINDOW WALL  
Project Name AND SLIDING DOOR 150A/B/C  
&100A/B/C SYSTEM

工程编号  
Project No.

图名 MATERIAL LIST-150A&150B  
Drawing Name &150C&100A&100B&100C

设计 KAI  
Design

审核 KIM  
Check

批准 JOHN  
Approve

日期 2017. 12. 11  
Scale

图纸编号 M-08  
Drawing No.

修改序号 

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 R O  
Revision No.

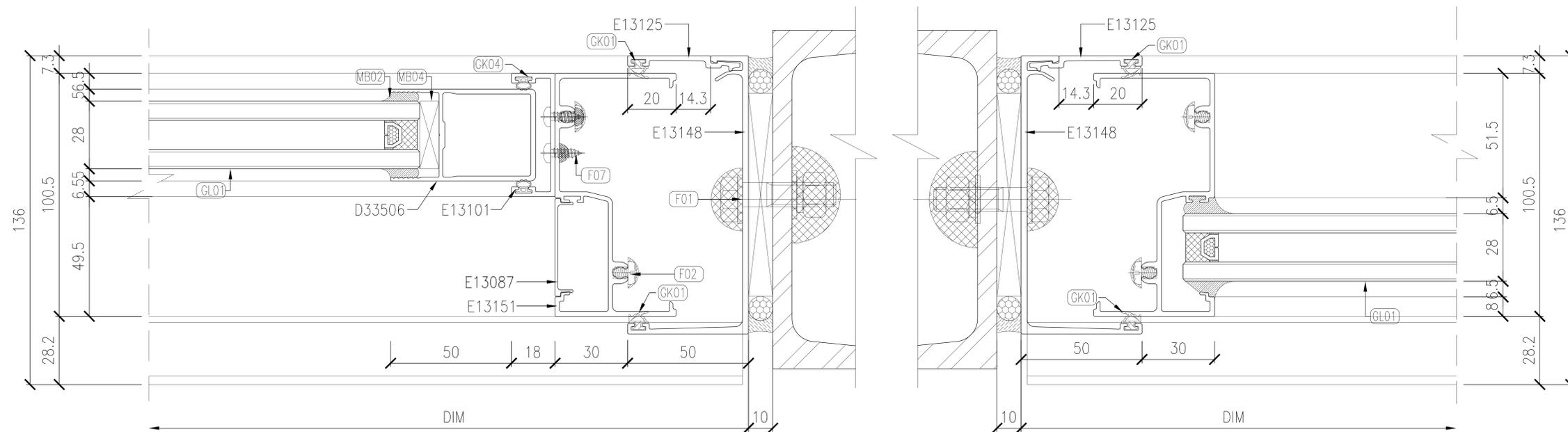












OUTSIDE

①

设计变更

日期	变更内容

备注:  
Notes

1. 图上所有尺寸以标注为准, 勿以度量。
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Architect

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工程名称 KETE WINDOW WALL  
Project Name AND SLIDING DOOR 100A/B  
SYSTEM

工程编号  
Project No.

图名 DETAIL-100A&100B  
Drawing Name

设计 KAI  
Design

审核 KIM  
Check

批准 JOHN  
Approve

日期 2017. 12. 11  
Scale

图纸编号 JD-20  
Drawing No.

修改序号 

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 R O  
Revision No.





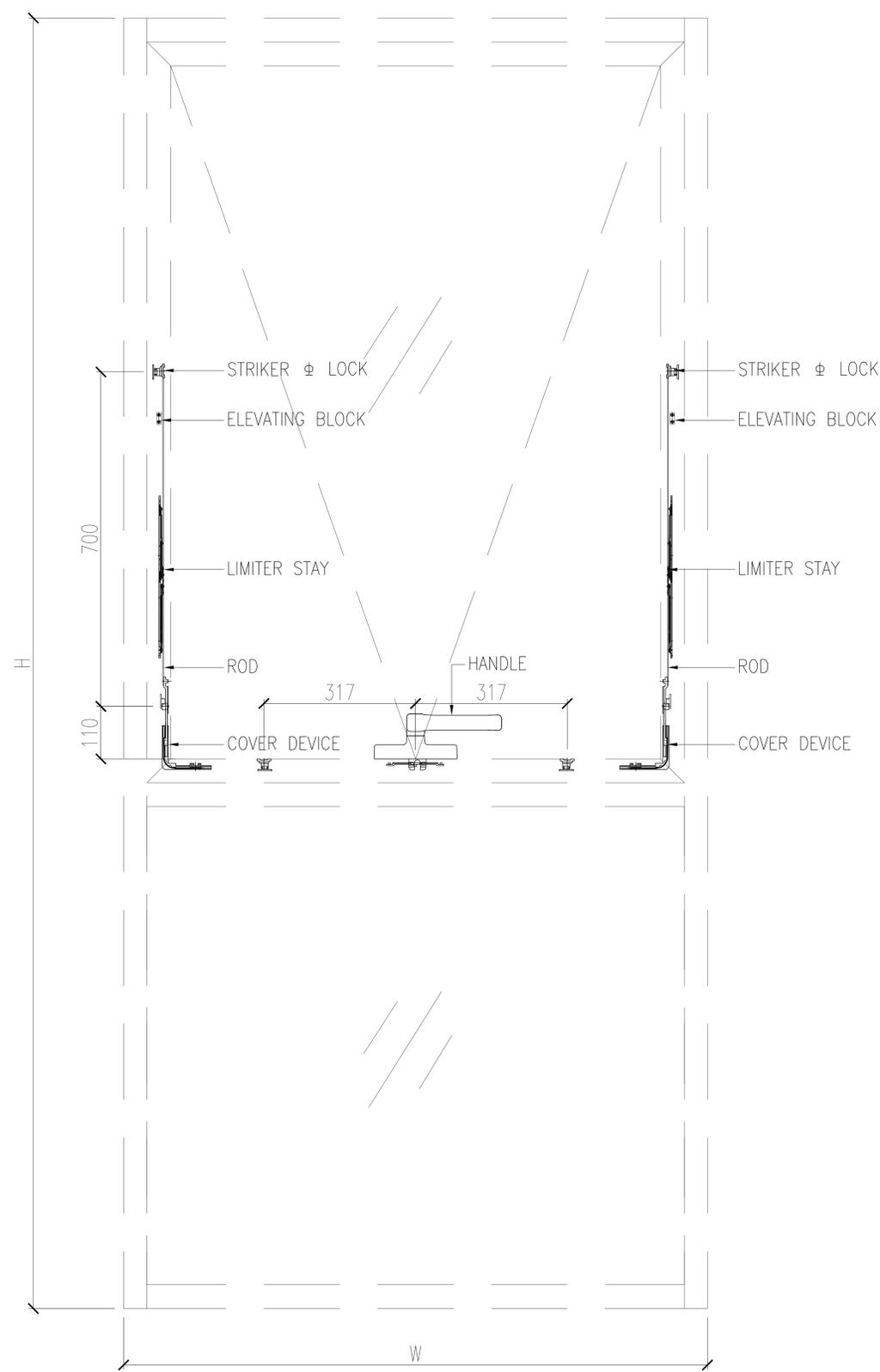




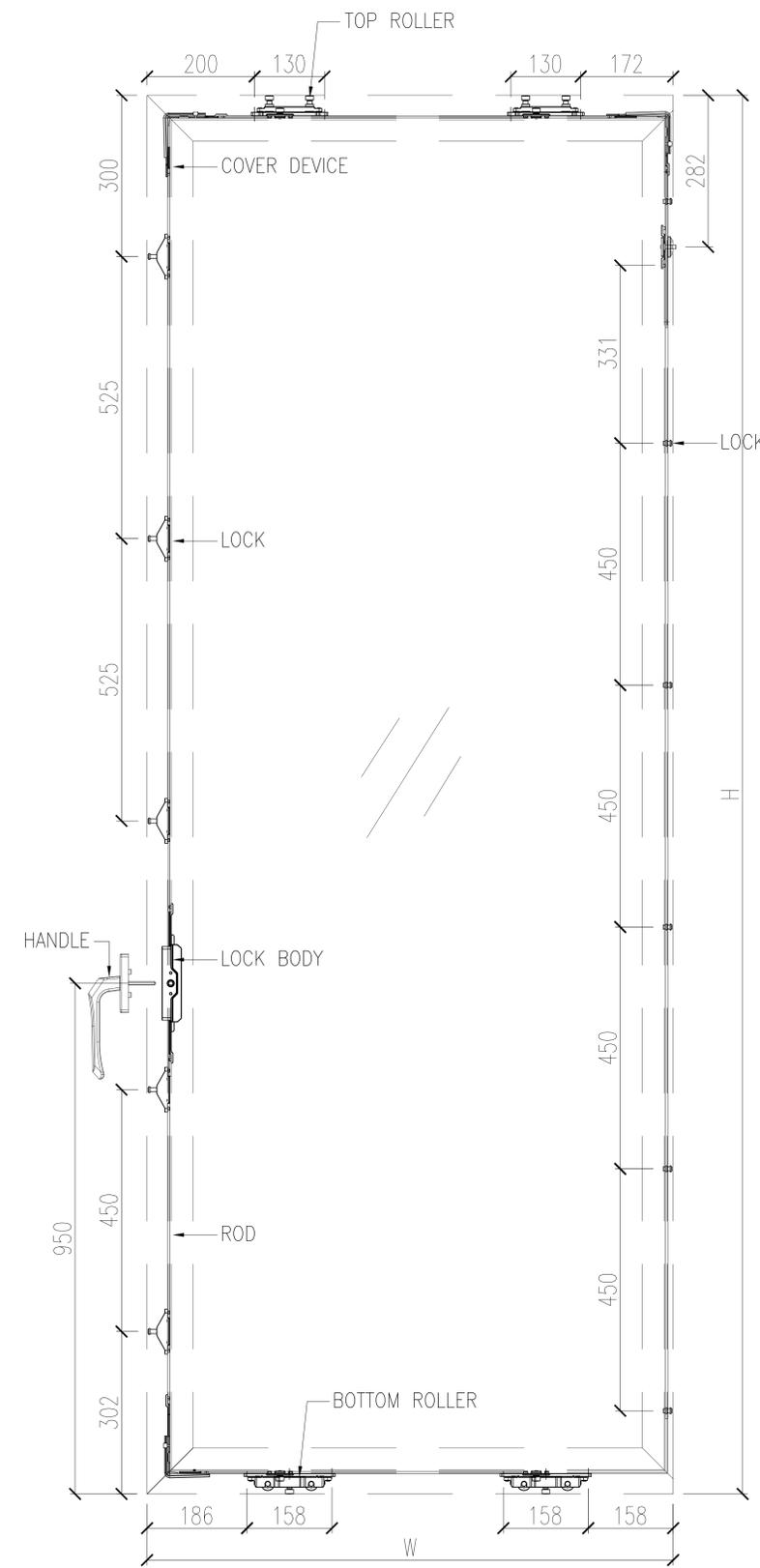








IRONMONGERY DISTRIBUTION DIAGRAM OF  
TOP HUNG WINDOW  
FOR 100A,150A,100C SYSTEM



IRONMONGERY DISTRIBUTION DIAGRAM OF  
SLIDING DOOR SASH IN 150B SYSTEM

设计变更

日期	变更内容

备注:  
Notes

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工程名称 KETE WINDOW WALL  
Project Name AND SLIDING DOOR 150A/B/C  
&100A/B/C SYSTEM

工程编号  
Project No.

图名 DETAIL-150A&150B  
Drawing Name &150C&100A&100B&100C

设计 KAI  
Design

审核 KIM  
Check

批准 JOHN  
Approve

日期 2017. 12. 11  
Scale

图纸编号 JD-201  
Drawing No.

修改序号 

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 R O  
Revision No.