



工程指示 / 要求簡箋(E.I.)

工程指示編號：EI / 7340 / 24

修改版次： -

工程編號： J - 858

工程名稱：將軍澳日出康城 LP 11

工程項目：幕牆 試水機械人 2 部 (SquareDog Robotics) 地盆試大水用

收件人：Maggie

發件人：Ant Yeung

日期：19/02/2024

附上：

請採購 2 部試水機械人，送地盆供試大水用。(SquareDog Robotics)

2023.06.30 T1 BD 現場已經試用。其後 2023.07.03 NOW TV 已拍攝。

附上

Midi's Concern + 附件一 21 頁 catalog + 附件二 Risk Assessment  
驗 OP 後試水- 預 7 月中來儀器

請在 2024.07.15 前完成上列要求。

分發東莞各部門：

- |                                 |                              |   |   |  |   |                                |                              |
|---------------------------------|------------------------------|---|---|--|---|--------------------------------|------------------------------|
| <input type="checkbox"/> 生產技術總監 | <input type="checkbox"/> 連附件 | <input checked="" type="checkbox"/> 技術部   | <input checked="" type="checkbox"/> 連附件 | <input type="checkbox"/> 生產部             | <input type="checkbox"/> 連附件            | <input type="checkbox"/> 機械設計部 | <input type="checkbox"/> 連附件 |
| <input type="checkbox"/> 採購部    | <input type="checkbox"/> 連附件 | <input checked="" type="checkbox"/> 生產統籌部 | <input checked="" type="checkbox"/> 連附件 | <input checked="" type="checkbox"/> 小羅&清 | <input checked="" type="checkbox"/> 連附件 |                                |                              |
| <input type="checkbox"/> 質檢部    | <input type="checkbox"/> 連附件 | <input type="checkbox"/> 會計部              | <input type="checkbox"/> 連附件            | <input type="checkbox"/> 報關組             | <input type="checkbox"/> 連附件            | <input type="checkbox"/> 其他    | <input type="checkbox"/> 連附件 |

分發香港各部門：

- |   |   |                               |                              |                              |                              |   |           |   |
|---|---|-------------------------------|------------------------------|------------------------------|------------------------------|---|-----------|---|
| <input type="checkbox"/> 行政部            | <input type="checkbox"/> 連附件            | <input type="checkbox"/> 會計部  | <input type="checkbox"/> 連附件 | <input type="checkbox"/> 統籌部 | <input type="checkbox"/> 連附件 | <input checked="" type="checkbox"/> 工程部地盤科文 | <u>積哥</u> | <input checked="" type="checkbox"/> 連附件 |
| <input checked="" type="checkbox"/> 採購部 | <input checked="" type="checkbox"/> 連附件 | <input type="checkbox"/> QS 部 | <input type="checkbox"/> 連附件 | <input type="checkbox"/> 維修部 | <input type="checkbox"/> 連附件 | <input type="checkbox"/> 其他                 | _____     | <input type="checkbox"/> 連附件            |

傳遞編號：

發件人簽署：

HK / 24

項目經理簽署：





**SQUAREDOG ROBOTICS LIMITED**

Workshop A & B, 5/F, Hop Hing Industrial Building,  
 704 Castle Peak Road, KOWLOON  
 HK  
 +852 36130688  
 accounting@squaredogrobotics.com  
 www.squaredogrobotics.com

A/C RECEIVED

24 JAN 2024

# Sales Invoice

**BILL TO**

Midi Aluminium Fabricator  
 Limited  
 Unit 5, 5/F,  
 Sunray Industrial Centre,  
 610 Cha Kwo Ling Road,  
 Kowloon.  
 Attn.: Mr. Marco K.M. Tam  
 Tel: (852) 9218 8611

**SHIP TO**

To be advised

**SALES INVOICE NO.** S20240003**DATE** 17/01/2024**DUE DATE** 16/02/2024**TERMS** Net 30**SALES PERSON**

Angela Yuen

**OUR QUOTATION NO.**

QU2023HK-0103AY

PRODUCT / SERVICE	QTY	RATE	AMOUNT
<b>Prepayment</b>	2		
SQD-Sky Inspector			
~ SQD-Sky Inspector - Main body			
~ Control remote			
~ Wireless video transmitter + Waterproof camera set x 4			
~ End tool - Inspector tool for water leaking test (AAMA 501 standard)			
~ 6mm (7X19) steel wire, 150m x 2			
~ 4mm (7x19) steel wire, 150m (RHRL and LHRL) x 2			
~ 380V, 16A, 5 pins socket with 100m electrical wire			
~ Rope grip accessories x 4			
~ User documents (User manual, Operation manual and Product certificate)			
~ 3 days operation training			



Deposit: \$896,000 x 30%

Beneficiary : SQUAREDOG ROBOTICS LIMITED  
 Bank : Bank of China (Hong Kong) Limited  
 Account number :  
 012-802-2-002512-1 (HKD)  
 012-802-2-002513-4 (Foreign Currency)  
 Swift code : BKCHHKHHXXX

**BALANCE DUE**



## Quotation

### SquareDog Robotics Limited

Address: Workshop A&B, 5/F, Hop Hing Industrial Building, 704 Castle Peak Road, Kowloon, Hong Kong  
Tel : (852) 3613 0688  
From : Angela Yuen  
E-mail : [angela.yuen@squaredogrobotics.com](mailto:angela.yuen@squaredogrobotics.com)

Quotation no. :	
QU2023HK-0103AY	
Date :	7/11/2023
Valid Date :	6/11/2024
Currency :	HKD

Customer

### MIDI ALUMINIUM FABRICATOR LIMITED

Address: Unit 5, 5/F Sunray Industrial Centre,  
610 Cha Kwo Ling Road, Kowloon.  
Attn : Marco K. M. Tam  
Tel : +852 9218 8611  
E-mail : [midi@midiltd.com.hk](mailto:midi@midiltd.com.hk)

Item #	Product #	Product Description	QTY	Unit Price	Sub-Total
1	SKY-I	<b>SQD-Sky Inspector</b> SQD-Sky Inspector - Main Body Control Remote Wireless video transmitter + Waterproof Camera set x 4 End tool- Inspector tool for water leaking test (AAMA 501 standard) 6mm (7 x 19) steel wire, 150m x 2 4mm (7 x 19) steel wire, 150m (RHRL and LHRL) x 2 380V, 16A, 5 pins socket with 100m electrical wire Rope grip accessories x 4 User documents (User manual, Operation manual, and Product certificate) 3 Days Operation Training	2	\$	\$
				<b>Total :</b>	<b>\$</b>

### Terms and Condition

Payment : COD  
Delivery : 6 Weeks after receive deposit  
Warranty : 1 years

*Dr Angela Yuen*

SquareDog Robotics Limited

Date : 7/11/2023

MIDI ALUMINIUM FABRICATOR LIMITED

Date :  
(With Company Stamp)



29 November 2023

**By Email**  
[midi@midiltd.com.hk](mailto:midi@midiltd.com.hk)

MIDI Aluminium Fabricator Limited  
Unit 6-8, 1st Floor, Sunray Industrial Centre,  
610 Cha Kwo Ling Road,  
Kowloon

Attention: Mr LAW Ho Yin  
Copy to: Mr TAM Kim Man

Dear Mr LAW Ho Yin,

**Notification of Approval [Application Number: 17675]**

On behalf of the Construction Industry Council ("**CIC**"), we are pleased to inform you that your captioned application to the Construction Innovation and Technology Fund ("**CITF**") has been approved by the Vetting Sub-Committee of the CITF.

Unless otherwise defined, the terms used herein shall have the same meanings defined in the terms and conditions constituting part of the CITF agreement between the CIC and you ("**Terms and Conditions**").

This Notification of Approval is subject to the following terms and conditions:

1. The ceiling amount of the Funding shall be:

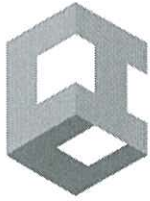
	Type	Product Name	Code	Vendor Name	Quotation Reference No.	Quantity	Fund Ceiling (HK\$)
(a)	ACT	SQD-Sky Inspector	N/A	SquareDog Robotics Limited	QU2023HK-0103AY	2	

2. Pursuant to clause 8.1 of the Terms and Conditions, the Agreement between the CIC and you governing the Funding shall comprise the following documents:

- (a) the Application Framework;
- (b) the Application Form (together with the Declaration) submitted by you



- on 9 November 2023 including all amendments, supplement or clarification made to the application in writing;
- (c) the Terms and Conditions;
  - (d) Important Notes for Technology Adoption; and
  - (e) this Notification of Approval.
3. You will receive the Funding by way of reimbursement. Actual reimbursement will be made in accordance with the Agreement and will be subject to adjustments within the aforesaid ceiling amount based on your actual expenditure in relation to the Approved Project in item 2 (b) above.
4. This approval is granted by CITF to encourage wider adoption of innovative construction methods and new technologies in the construction industry, which is based on the information provided by the applicant and the equipment manufacturer, and should not be construed as an endorsement or guarantee of the equipment's quality, durability, or fitness for any particular purpose. The approval is valid only under the specified conditions and for the intended use of the equipment, and any modification or misuse of the equipment may lead to revocation of the approval. Applicants and Users are responsible for ensuring that the equipment is installed, operated, and maintained in accordance with the manufacturer's instructions and all applicable safety and regulatory requirements. CITF reserves the right to inspect the equipment and/or the manufacturer at any time and to modify or revoke the approval if there are any safety concerns or regulatory non-compliance issues.
5. Users are required to observe the followings when adopting the technology:
- (a) The users shall strictly follow the manufacturer's instructions;
  - (b) The users shall strictly comply with the relevant statutory requirements especially those in relation to safety;
  - (c) The users shall provide sufficient and effective means of protection to the vicinity of the work areas to protect the public and passers-by; and



CONSTRUCTION  
INDUSTRY COUNCIL  
建造業議會

Our ref 本會檔號: VSC/CITF/FA/2311040  
Your ref 來函檔號:

- (d) The users shall NOT use the robot for purpose and working conditions that are not originally intended for. The users shall exercise due care and effective means to ensure the robot would not be working beyond its limits.

Yours sincerely,  
For and on behalf of  
Construction Industry Council

A handwritten signature in black ink, appearing to read 'Alex HO'.

Alex HO  
Director – Industry Development

AH/ck

## MIDI's concerns

1. MIDI 問：可否提供 methods statement / 操作流程說明？

SQD 答：可以，SQD 需先收集使用 Sky Inspector 的樓宇的圖紙，及實地考察 (Site Investigation)，分析 SQD 機械人可供試水範圍/服務並提供 Method Statement 說明。SQD 曾於金門和協興建築公司地盤進行試水機械人的服務，並提供相應的 method statement，詳情可看附件一作參考。

2. MIDI 問：保用期一年包期間任何維修，檢驗？

SQD 答：一年保用包工包料維修和檢驗。

3. MIDI 問：使用試水機械人安全性，有冇防護/防墮措施？

SQD 答：機械人本身已具備防墮設計，另 SQD 會就機械人於工地使用前做好風險評估 (Risk Assessment)，詳情可看附件二作參考。

4. MIDI 問：有冇 certification / testing 在使用前/期間需要提交？

SQD 答：在使用機械人前，SQD 會安排第三方專業人員 (RPE) 檢驗吊架，並提供適用勞工處 [工廠及工業經營條例(第 59 章)] 的檢驗證書，詳情如下：

Form 4	Certificate Of Test And Thorough Examination Of Lifting Appliances (Except Cranes, Crabs And Winches) <a href="https://www.labour.gov.hk/eng/form/acrobat/lalgf4.pdf">https://www.labour.gov.hk/eng/form/acrobat/lalgf4.pdf</a>
Form 5	Certificate Of Results Of Thorough Examinations In The Preceding Twelve Months <a href="https://www.labour.gov.hk/eng/form/acrobat/lalgf5.pdf">https://www.labour.gov.hk/eng/form/acrobat/lalgf5.pdf</a>
Form 6	Certificate Of Test And Thorough Examination Of Chains, Ropes And Lifting Gear <a href="https://www.labour.gov.hk/eng/form/acrobat/lalgf6.pdf">https://www.labour.gov.hk/eng/form/acrobat/lalgf6.pdf</a>
Form 7	Chains, Ropes And Lifting Gear Certificate Of Results Of Thorough Examination In The Preceding Six Months <a href="https://hksta.org/wp-content/uploads/2015/06/LALG-F7.pdf">https://hksta.org/wp-content/uploads/2015/06/LALG-F7.pdf</a>

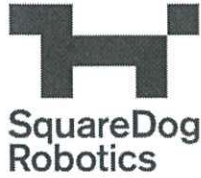
5. MIDI 問：Training 包 3 日係 on site？有人數上限嗎？

SQD 答：一般為期 3 天(約一星期)的 Training 可於 SQD 上水工場或工地上進行，沒有人數上限 (同一時段最適合 3 名人員接受 Training)。由於 MIDI 將會於 LP11 工地使用 SQD 機械人，按工程進度可能需要使用 2 部或以上的機械人，所以 SQD 可安排於 LP11 工地進行 Training，一部機械人為期約一星期 Training。

6. MIDI 問：1 日可教導整個裝拆使用既流程嗎？

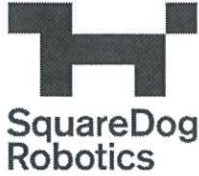
SQD 答：可以，如果工地已有適用機械人的吊架裝置。

如工地沒有適用機械人的吊架/吊船裝置，確實裝拆流程時間視乎工地實際環境，一般約 1-2 個工作天，因 SQD 需安排第三方裝(拆)吊架及專業人員檢驗，並進行測試。



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[Redacted]  
Road) – Window water leaking  
inspection project

Version: 03

### 1. Scope of work

1. The scope of work includes water leaking test on external walls of a building using the SQD Sky Inspector, ensuring the work done safely and efficiently while minimized risks to the operators and the public.
2. The work schedule includes start and completion dates:  
From            To be confirmed            (dd/mm/yyyy) to            confirmed            (dd/mm/yyyy)
3. Project site address: New headquarter of CLP (Shing Kai Road)
4. Project contact details (emergency details if provided):

Client Manager Name:            To be confirmed            phone:            To be confirmed           

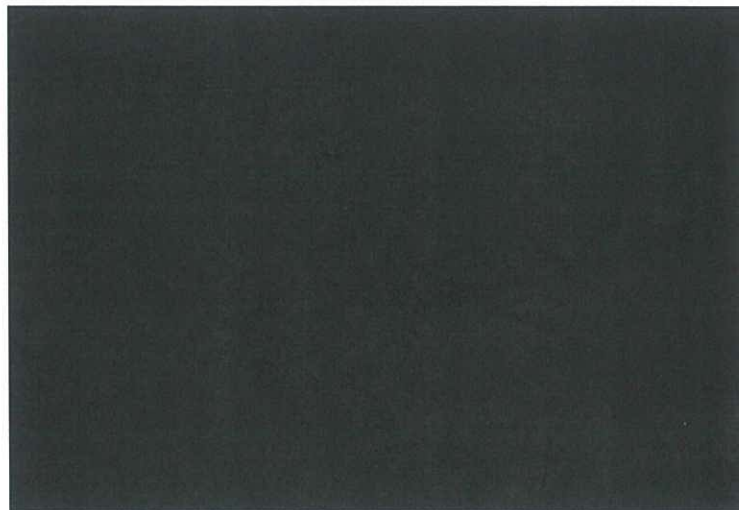
SQD Site Supervisor Name:            phone:           

#### 1.1 Designated working area

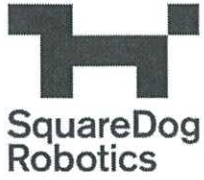
Working area details (e.g. no. of floors):

Site layout/ plan

East-South Direction

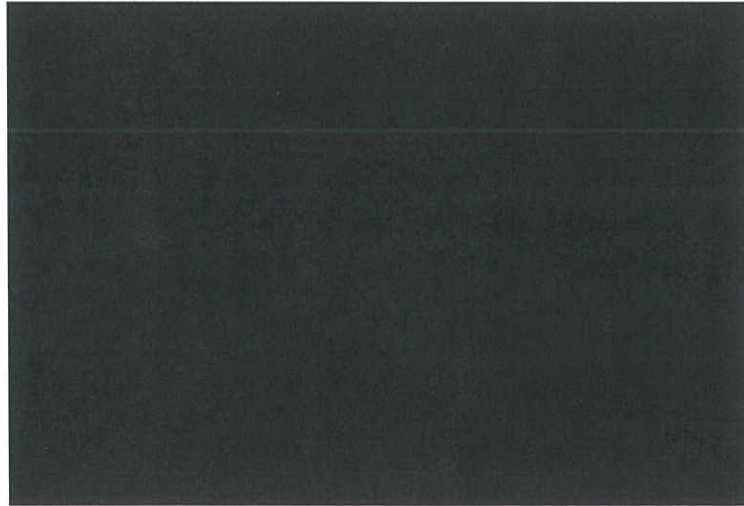


West-South Direction

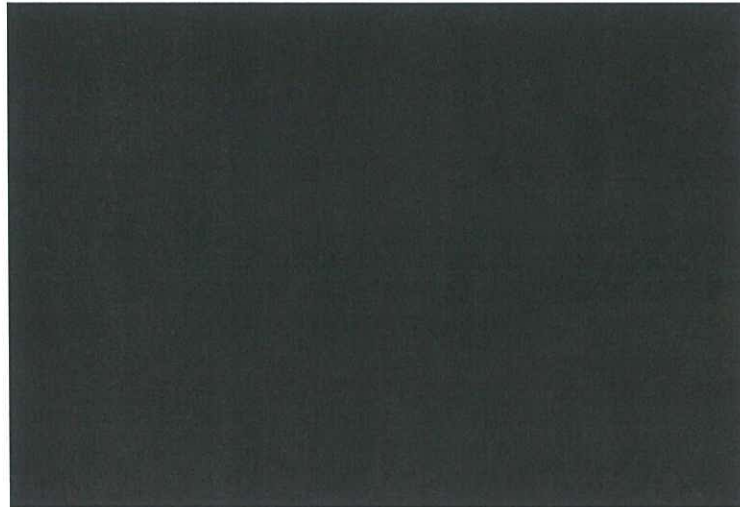


Version: 03

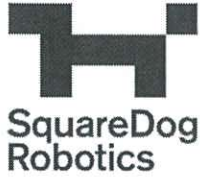
Road) – Window water leaking inspection project



East-Noth Direction



East-South Direction



[REDACTED]  
Road) – Window water leaking  
inspection project

Version: 03

Note:

1. The red square areas are working zones, the Sky Robot can work properly.
2. Some face of working zones should be slightly escaped the width of fin by Sky Robot operation.

## 2. Preparation works.

### 2.1 Material and equipment

#### 1. Material

- a. Steel wire (D4 x 2) for Sky robot; steel wire (D6 x 2) for fall arrest system
- b. Wall mounted davit's arm (for Hangers) 2 pcs or other hanger design
- c. Power supply socket 380 V, 2 pcs

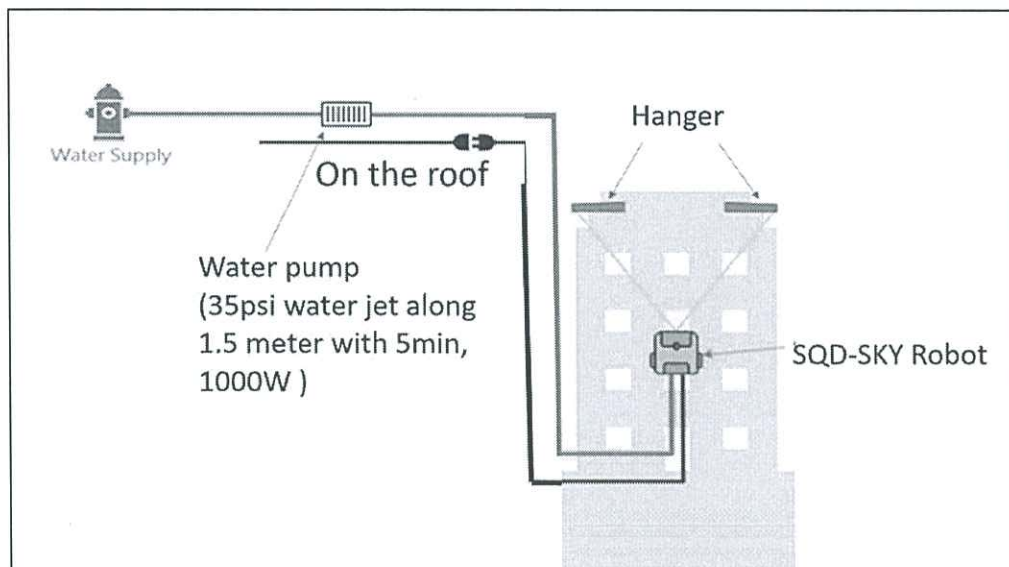
#### 2. Equipment

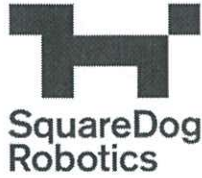
- a. Sky Robot - Sky Inspector)
- b. Water pump provide 300mm 35psi, 1000W, 1 pcs

## 2.2 Set up of Sky Robot with associated materials and equipment

- The main steel wire (D4 x 2) and safety steel wires (D6 x 2) (for the fall arrest system) should be connected from the roof hanger (davit's arm) to the Sky Robot placed at the ground level. Both types of wires should have NO defect/damage before connection.
- The water supply and electricity should be connected to the Sky Robot from the roof floor. Before the Sky Robot is operated, a comprehensive check should be conducted to ensure no water leakage or electrical hazards.
- The design loads: According to the COP for Safe Use and Operation of Suspended Working Platform, the Sky Robot in its operating position should be designed to withstand the sustained wind speed up to 14 meters up per second and gust up to 31 metres per second.

Diagram 1 – The Sky Robotic system





[REDACTED]  
Road) – Window water leaking  
inspection project

Version: 03

### 3. Standard operation procedure

This section provides a detailed step-by-step plan of how the task will be carried out, including any specific procedures that need to be followed.

#### 3.1 Standard operation procedure of the hangers for Sky Robot

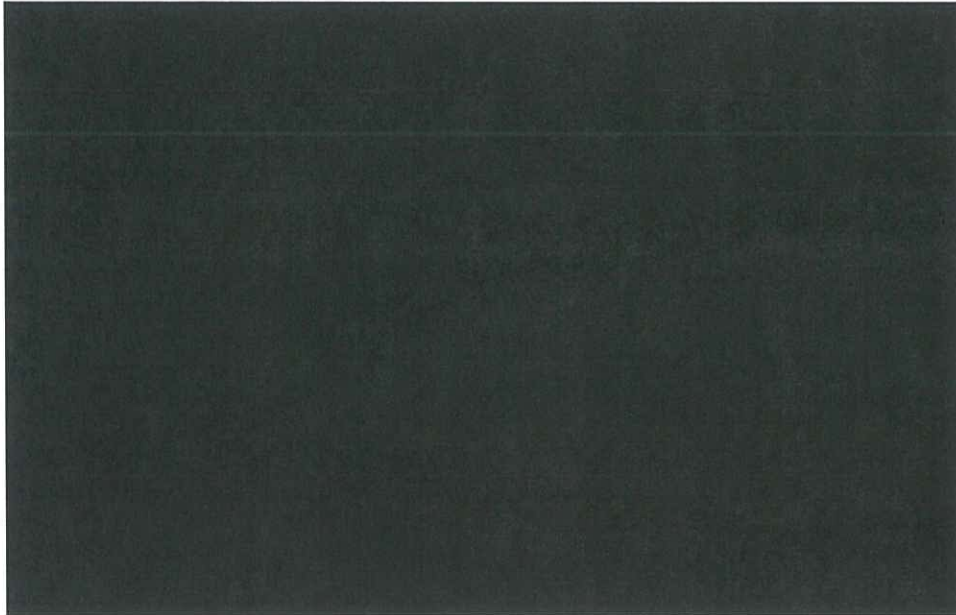
##### The hanger of roof beam system

It is required to check the strength of counterweight roof beam for hoisting of the material. One suspension wire with hook will be provided for material hoisting.

##### 3.1.1 Codes and standards

- (a) The Structural use of steel, Hong Kong (2011)
- (b) A Guide to the Factories and Industrial Undertakings (Lifting Appliance and Lifting Gear Regulations)
- (c) Code Practice for Safe Use and Operation of Suspended Working Platforms (1999)
- (d) Code of practice for wind effects in Hong Kong (2004)

### 3.1.2 Hanger drawing



### 3.1.3 Material properties

- (a) Grade S275 Steel to BS EN 10025

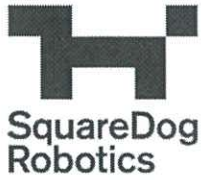
Design Strength	$p_y$	=	[Redacted]
Design Tensile Strength	$p_t$	=	[Redacted]
Design Shear Strength	$p_v$	=	[Redacted]
Modulus of elasticity	$E$	=	[Redacted]

- (b) Grade S275 weld

Design Weld Strength	$p_w$	=	[Redacted]
----------------------	-------	---	------------

- (c) Grade 8.8 bolt

Design Tensile Strength	$p_t$	=	[Redacted]
Design Shear Strength	$p_v$	=	[Redacted]
Design Bearing Strength	$p_{bb}$	=	[Redacted]



[REDACTED]  
Road) – Window water leaking  
inspection project

Version: 03

### 3.1.4 Loading estimation

The load characteristics of the material hoist is shown below:

Imposed load (weight of material)

Weight of Chain block with chain

Total suspended load

[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]





[Redacted]  
Road) – Window water leaking  
inspection project

Version: 03

Reaction force on front and rear support

Front / rear ratio ( $D_B / D_A$ )	Ra (In-operation) $= P \cdot (D_A + D_B) / D_B$	Rb (In-operation) $= P + (CW \times 9.81) - Ra$	Ra (In-parking)	Rb (In-parking) $= CW \times 9.81$
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]

Two support at front (near parapet), each support load

= [Redacted]  
= [Redacted]  
= [Redacted]

Four support at rear (away parapet), each support load

= [Redacted]  
= [Redacted]  
= [Redacted]

Check bearing of concrete for suspension beam hanger (at typical floor)

For installation of suspension beam hanger type, the outrigger should be seated on / nearby the existing r.c. wall. The loading of outrigger is significant small with the structural strength of r.c. wall. Therefore, it is not significant to check the existing structure.

$f_{cu} =$  [Redacted]

Area of outrigger base plate, A = [Redacted]

$f_{oc} =$  [Redacted]

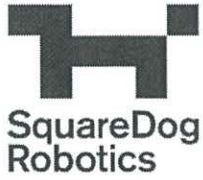
= [Redacted]

= [Redacted]

= [Redacted]

< [Redacted]

∴ Pass



### 3.1.6 Design load for member checking

Design Load = 7.4 kN x 1.6

=

[Redacted]

(The dynamic factor of 1.25 and safety factor of 1.6 were taken.)

### 3.3.7 Strength checking of $\phi$ 8mm tie wire

	Max. $D_A = 2000\text{mm}$
[Redacted]	[Redacted]

	Max. $D_B = 4500\text{mm}$
[Redacted]	[Redacted]

Try 8 mm steel wires as tie wires,  $T_1$

Max. tensile force,  $T_1$

=

[Redacted]

=

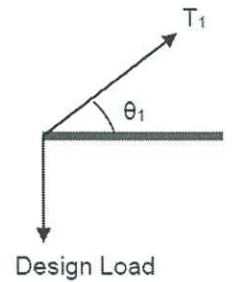
=

Min. breaking load,  $T_b$

=

>

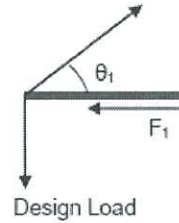
$\therefore$  Pass



**3.1.8 Strength check on horizontal members.**

100 x 50 x 5 mm thick RHS – (2000 mm length)

$$\begin{aligned}
 F_1 &= [Redacted] \\
 &= [Redacted] \\
 L &= [Redacted] \\
 L/r &= [Redacted] \\
 &= [Redacted]
 \end{aligned}$$



Compressive strength,  $p_c = [Redacted]$

Compressive force on the member,

$$\begin{aligned}
 F_c &= [Redacted] \\
 &= [Redacted] \\
 \text{Area, } A &= [Redacted]
 \end{aligned}$$

Compressive stress on the member,

$$\begin{aligned}
 f_c &= [Redacted] \\
 &= [Redacted] \\
 &= [Redacted]
 \end{aligned}$$

100 x 50 x 5 mm thick RHS – (4500 mm length at rear part)

$$\begin{aligned}
 L &= [Redacted] \\
 \lambda = L/r &= [Redacted] \\
 &= [Redacted]
 \end{aligned}$$

From Table 8.8a,

Compressive strength,  $p_c = [Redacted]$

Compressive stress on the member,

$$\begin{aligned}
 f_c &= [Redacted] \\
 &= [Redacted] \\
 &= [Redacted] \therefore \text{Pass}
 \end{aligned}$$

**3.1.9 Checking of bolt connection between horizontal member and vertical member.**

(100 x 50 x 5mm RHS)

Use (4 nos.) M16 grade 8.8 bolt as locking bolt,

Shear load = [Redacted]  
= [Redacted]

Shear area of M16 bolt = [Redacted]  
= [Redacted]

Shear capacity of bolt check

$P_s$  = [Redacted]  
= [Redacted]  
= [Redacted]  
> [Redacted]

∴ Pass

Strength check on vertical member of 100 x 50 x 5 mm thick RHS

As tie wire,  $T_1$  and  $T_2$  are connected through one wire,

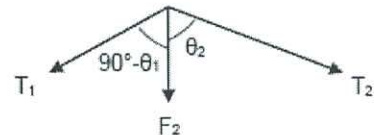
$T_2$  = [Redacted]  
= [Redacted]

$F_2$  = [Redacted]  
= [Redacted]  
= [Redacted]

Compression load,  $F_c$  = [Redacted]  
= [Redacted]

Area,  $A$  = [Redacted]  
 $L$  = [Redacted]  
 $L/r$  = [Redacted]  
= [Redacted]

The force diagram:



Compressive strength,  $p_c$  = 153

Compressive stress on the member,

$P_c$  = [Redacted]  
= [Redacted]  
= [Redacted]  
> [Redacted]

∴ Pass

Strength check on vertical member of 100 x 50 x 5 mm thick RHS vertical member at rear

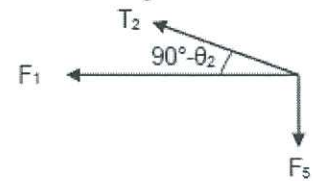
$\Sigma Y = 0;$   $F_s$  = [Redacted]  
 $F_s$  = [Redacted]

Tensile load,  $F_T$  = [Redacted]  
= [Redacted]

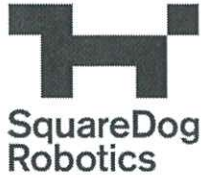
Area,  $A$  = [Redacted]

Tensile capacity,  $P_t$  = [Redacted]  
= [Redacted]  
= [Redacted]  
> [Redacted]

The force diagram:



∴ Pass



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### 3.2 Quality control

#### The Sky robotic system on-site job:

- a. The Sky Robot outlook of all parts is in good condition.
- b. The functionality of main body, winch, fall arrest system, end-tools, propeller, arm, and camera are in good condition.
- c. The functionality of control cabinet is in good condition.

#### The Sky Robot machine system after on-site job:

- a. The Sky Robot and associated equipment should be inspected to ensure that they are in good condition and free from defects.
- b. The Sky Robot should be stored in a safe and secure location.
- c. All equipment should be disassembled, cleaned, and stored in a secure storage area.
- d. The work area should be cleaned and cleared of any debris or waste materials.
- e. The barricades or warning signs should be removed from the work area.

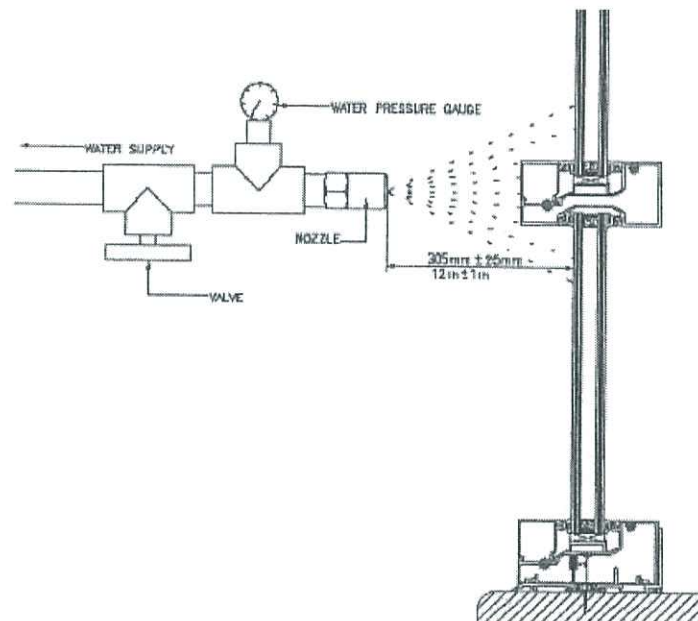
### 3.3 Water leaking test

SQD water leaking test is governed by American Architectural Manufacturers Association (AAMA) standard: AAMA 501.2-03 – Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems. According to the AAMA 501.2-03 procedure, SQD follows which each 1.5m section of test area shall be evaluated for a period of 5 minutes by slowly moving the nozzle back and forth over the test section please refer to Diagram 6. The water pressure to the nozzle shall be adjusted to produce 205 to 240 kPa (30 – 35 psi), but not lower than 205 kPa (30 psi) which is not practical to be applied at a multi-story building location.

SQD shall provide:

- (1) the proposed testing path of water leaking test; and
- (2) estimated total time for water leaking after site investigation.

Diagram 6 - The generic setting for water leaking test.



The time taking for each edge by Proportional is under 5 min per 1.5 meter standard under the standard AAMA 501.2-03

### 3.4 Standard operation procedure of landing unresponsive Sky Robot

- a. The wiring system has been jammed or has abnormal operation on one or both sides.
  - i. Diagram 7 shows the normal working condition of Sky Robot system.

- ii. The hand winches on either side of the machine would jack up/lift the robotics system. The winches provide manual cranking power to raise the system of the guide tracks or other support. Please refer to Diagram 8.
- iii. The wiring system has been jacked up on the affected side(s), the shackle(s) connecting those side(s) to the support structure will be removed. The shackle is presumably the mechanism / link allowing the side(s) to run along the support tracks.
- iv. The Sky Robot would be slowly and carefully released / lowered to the opposite unaffected side after moving the shackle(s) Since the shackle(s) has been detached, the system can shift to that the opposite side takes the full weight and supports normal movement.

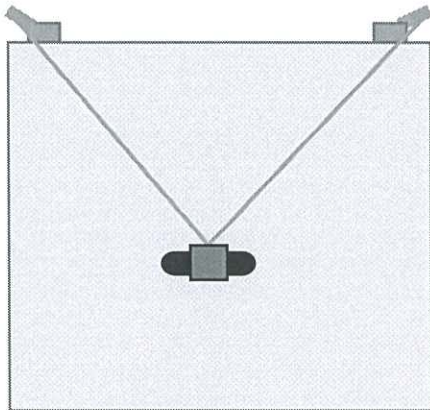


Diagram 7 - normal condition

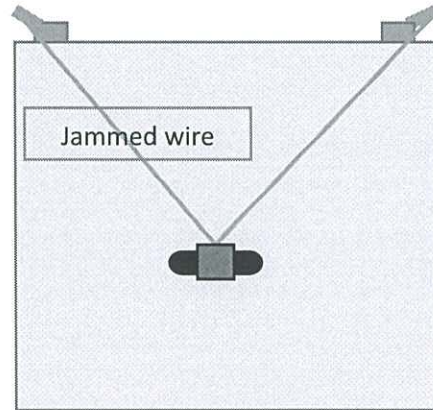


Diagram 8 - abnormal condition

b. Landing the Sky robotic system when the wire of one side is jammed.

- i. The Sky robotic system is shifted / moved to the opposite unaffected. The Sky robotic system is adjusted by the remain functional wire moving to the robot in perpendicular to the ground. Please refer to Diagram 9.

- ii. The system has transitioned fully to the opposite side and the other wires / sides are straight up and down, both set of wires / sides would be slowly released and lowered together.

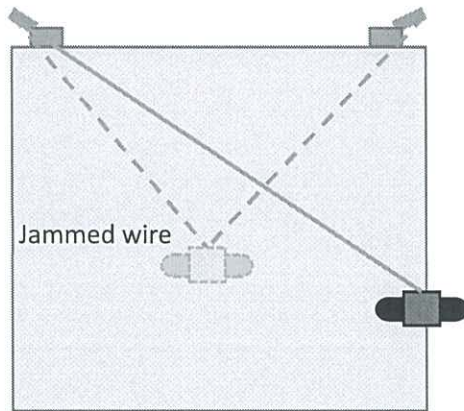


Diagram 9 - Adjusting the robot

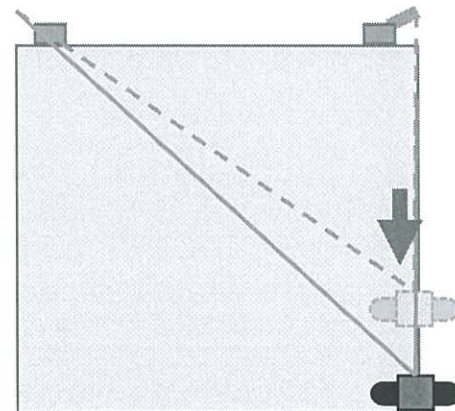


Diagram 10 – Sky robotic system

landing

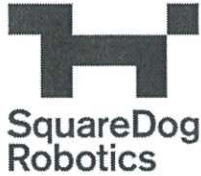
- iii. The wire / side is released and lowered gradually, then the Sky Robot will move down slowly and gently.
- iv. The Sky robotic system should go down gradually under control until it can rest securely on the ground as illustrated in Diagram 10.

#### 4. Risk assessment

This section outlines the potential hazards and risks associated with the task, and the measures that will be taken to mitigate them.

##### 4.1 Weather issue

The operator should be responsible for the following:



- a. Review the weather forecast before the commencement of the work and keep checking on time to time basis.
- b. In times of inclement weather, operator should stay in safe premises.
- c. Use the remote control to guide the Sky Robot down to the ground safely.
- d. Check if the Sky Robot is in good condition after landed, e.g. tightening wires, and strapping down equipment.
- e. Check the Sky Robot can function well when the weather becomes normal.

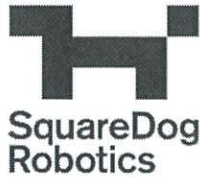
#### **4.2 Power issue**

- a. The power supply should be stable and reliable.
- b. The power source should be in appropriate voltage (380V) and have the capacity to support operations or restart the Sky robotic system.

#### **4.3 Workplace safety, health, and environment impacts**

(To be considered but not limited)

- a. Before operating Sky Robot on the external wall of a building: (i) Checking the Sky Robot functionality.
- b. During the operation of Sky Robot on the external wall of building: (i) Prohibition of unauthorized person entering the workplace; (ii) Avoiding suddenly fall of the material from the top of building; (iii) Using tools properly; (iv) Operator should wear the protection materials when operating Sky robot; (v) Protecting electric socket with waterproof material.
- c. After operation of Sky Robot on the external wall of building, all the electric supply and water supply from the Sky Robot system should be de-assembled.



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## 5. Safety precautions

The safety precautions procedure should be implemented during the installation and operation of the Sky robotic system but not limited.

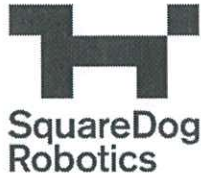
**5.1 Conduct risk assessments:** Before commencing any construction activity on site with Sky Robot, a thorough risk assessment should be conducted to identify potential safety risks and hazards. A competent person should perform this assessment and the assessment should be reviewed regularly.

**5.2 Provide safety training:** All robot operators and engineers should receive safety training before the start of work on any construction sites. The training should cover the specific risk associated with the job, safety procedures, and the proper use of personal protective equipment (PPE).

**5.3 Use personal protective equipment (PPE):** PPE such as safety helmet, safety glasses, gloves, and safety shoes should be provided where appropriate to protect robot operators and engineers from potential hazards and ensure workers wear them properly.

**5.4 Maintain equipment:** All on-site equipment should be regularly maintained, inspected, and repaired as necessary to ensure its use is safe.

**5.5 Implement safety protocols:** (a) Safety protocols and procedures should be implemented to ensure workers are safe on the job site. This may include protocols for working at height, excavation, electrical safety, and confined spaces. (b) A barricade



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with warning signs should be placed around the working area to prevent unauthorised access and ensure the public’s safety. (c) A safety fall arrest system with a pair of 6mm hanging wires should be applied in Sky Robot, with minimum breaking tension 20kN.

- 5.6 **Disseminate safety information:** Safety information should be regularly delivered to workers. This may include safety meetings, safety posters, and safety bulletins.
  
- 5.7 **Monitor safety performance:** Safety performance should be regularly monitored on the job site. This may include conducting safety audits and inspections, reviewing incident reports, and providing feedback to workers on their safety performance.
  
- 5.8 **User concerns:** The safety of operators and engineers should be assured, and accidents should be avoided in the operation of Sky Robot in an on-site environment by standard operating procedures.

**Publication date : 4 Dec 2023**

**Version number: 03**

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## SQD Standard Risk Assessment Report (RA Report)

F010-RAR-V01

Doc#	Analysis Conducted by:														
Customer/ Company:	SINO Group					Name:					Signature:				
Process / Location:	Residential Development at TKOTL 70RP, Phase 11, Lohas Park Tseung Kwun O. N.T.										Title:				
Issued by (Name):											Approved by (Name):				
Signature & Date:											Signature & Date:				
Original RA Date															
This RA Review Date:															
Next RA Review Date:															
<b>Before start the job</b>															
<b>1. Hazards and Risk Identifications</b>															
S/n.	Activity Description	Environmental Aspects / Workplace Hazards	Environmental Impacts / Workplace Risks	Existing control measures	2. Risk Evaluations and Controls			Additional control measures	3. Risk Evaluations and Controls			Person-In-Charge (PIC)	Due Date	Remarks	
					Initial Risk Ratings (Likelihood x Severity = Risk)				Residual Risk Ratings (Likelihood x Severity = Risk)						
					L	S	R		L	S	R				
1	Before Operating Sky Robot on the wall of building	No checking Sky Robot functionality	It shall check the critical function of Sky Robot	Checking the critical functions of Sky Robot before operation.	5	4	20								
		Unauthorized person entry the working area	Applying the warning sign or control gate to prohibit unauthorized person entry working area.	Posted the warning sign or control gate	4	3	12								
		Misunderstand the working condition and duration	Daily meeting before starting operation of Sky Robot machine	Daily meeting with all the stakeholders to pass the updated message about working condition	4	2	8								



S/n.	Activity Description	Environmental Aspects / Workplace Hazards	Environmental Impacts / Workplace Risks	Existing control measures	Initial Risk Ratings (Likelihood x Severity = Risk)			Additional control measures	Residual Risk Ratings (Likelihood x Severity = Risk)			Person-In-Charge (PIC)	Due Date	Remarks
					L	S	R		L	S	R			
3	After operating SKY Robot on the wall building	No connect the electric wire when finished the job	Engineer shall check all electric wire are disconnect after operation of Sky Robot	Checking the wires are disconnect after operation of Sky Robot	5	4	20							



Risk Assessment Level

Risk Ranking (R)

Risk Matrix		Severity (S)				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood (L)	Rare	1	2	3	4	5
	Unlikely	2	4	6	8	10
	Possible	3	6	9	12	15
	Likely	4	8	12	16	20
	Almost certain	5	10	15	20	25

Likelihood (L)	Level	Definition	Severity (S)	Level	Definition
Rare	1	Unlikely to happen and/or have negligible consequences	Insignificant	1	Trivial Injuries
Unlikely	2	Unlikely to happen and/or have minor consequences	Minor	2	Slight Injuries
Possible	3	possible to happen and/or to have moderate consequences.	Moderate	3	Minor Injuries
Likely	4	likely to happen and/or to have serious consequences.	Major	4	Major Injuries
Almost certain	5	Almost sure to happen and/or to have major consequences.	Severe	5	Serious Injuries

Risk Level Note:

1-4 : Acceptance risk and continue monitoring the safety procedure.

5-12 : Acceptance risk and keep control the operation procedure in good practice

15-25 : Unacceptance risk and stop the operation procedure in which to improve the operation procedure on low level risk