

工程指示 / 要求簡箋(E.I.)

工程指示編號：EI / 5413 / 22

修改版次：

工程編號：J - 858

工程名稱：將軍澳日出康城

工程項目：吊機吊船 地盤用鐵件 (3mm 鐵板)

收件人：Maggie

發件人：Ant Yeung

日期：02/12/2022

□要求提供 / □確認 事項：

- | | | |
|------------------------------------|-------------------------------------|-------------------------------|
| <input type="checkbox"/> 初步鋁料 B.M. | <input type="checkbox"/> 加工拆圖，然後生產 | <input type="checkbox"/> 尺寸表 |
| <input type="checkbox"/> 正式鋁料 B.M. | <input type="checkbox"/> 技術上資料 / 指示 | <input type="checkbox"/> 報價 |
| <input type="checkbox"/> 配件 B.M. | <input type="checkbox"/> 樣辦或貨品說明書 | <input type="checkbox"/> 分判合約 |

內容：

按 Aecom R.E 放寬 comment 減厚度，鐵板用 3mm。

請準備以下鐵料到送地盤 (不用熱浸鋅，黑鐵，油紅丹) 後面用 A: 350x350x3 厚：90 件
每輛計 前掌用 B: 650x650x3 厚：25 件

現來 11 winch 和 5 船 第一批 驗機、驗船用

請在 2022. 12. 06 前完成上列要求。

附：

以上項目為：

- | | | |
|---------------------------------|--------------------------------------|--------------------------------|
| <input type="checkbox"/> 原合約工程包 | <input type="checkbox"/> 原合約工程加 / 減賬 | <input type="checkbox"/> 新工程報價 |
|---------------------------------|--------------------------------------|--------------------------------|

分發東莞各部門：

- | | | | | | | | |
|---------------------------------|------------------------------|--------------------------------|------------------------------|-------------------------------|------------------------------|--------------------------------|------------------------------|
| <input type="checkbox"/> 生產技術總監 | <input type="checkbox"/> 連附件 | <input type="checkbox"/> 技術部 | <input 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 type="checkbox"/> 生產統籌部 | <input type="checkbox"/> 連附件 | <input type="checkbox"/> 小羅&清 | <input 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 水洪 | <input type="checkbox"/> 連附件 |

分發其他分判：

 連附件 檳

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 積哥 | <input checked="" type="checkbox"/> 連附件 |
| <input type="checkbox"/> 採購部 | <input 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 |

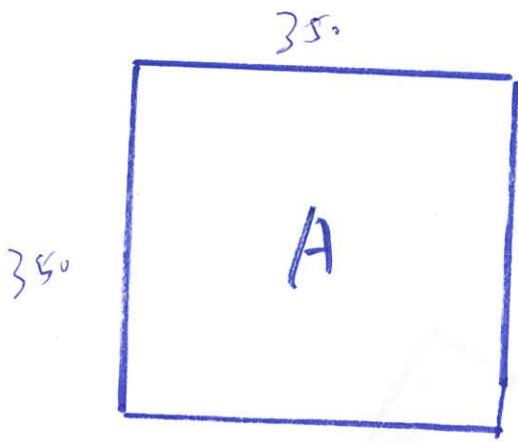
傳遞編號：

發件人簽署：

HK / 22

項目經理簽署：

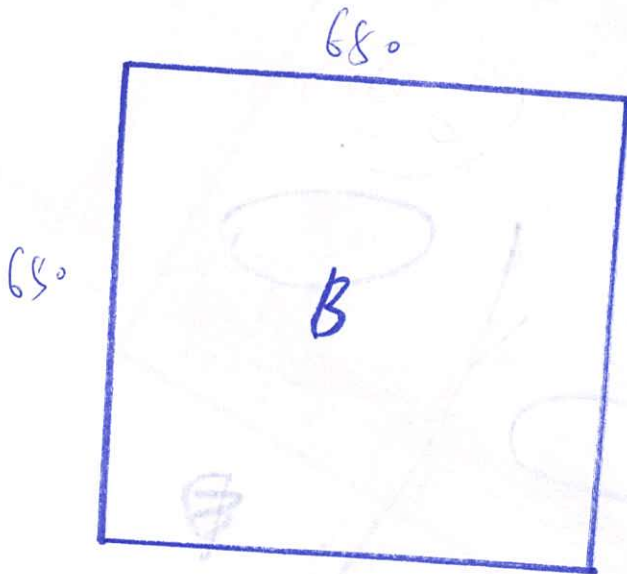
J858



3mm

尾石用

9.14



3mm

前堂用

25个

Project Proposed Residential Development at TKOTL 70RP, Phase 11, Lohas Park, Tseung Kwan O, New Territories

Works Main Contract

Contract No. J3931

Ref. No. P19084NT/TS/S/873 (Rev.5)

GECCL Ref. J3931/304/D08276

Date 30/11/2022

To / Attn RLP / Mr. Kenneth Wong / Ms. Florence Cheung

Subject **Design of Tower 1-3 Temporary Gondola for Curtain Wall Installation**

We write to request this submission replied by: RLP / AECOM / WSP / Others

Anticipated date of response 14/12/2022

We certify that the submission has been checked and is in full compliance with the Specification & Contract Documents, unless otherwise stated in the remarks.


 Matthew Wong
 For and on behalf of
Gammon Engineering & Construction Company Limited


 MW/BK/SWY/TD/vh

Material / Work Description *	Design of Tower 1-3 Temporary Gondola for Curtain Wall Installation	
Location	Tower	
Brand Name	N/A	
Model / Reference No. *	N/A	
Country of Origin	N/A	
Manufacturer / Supplier Name *	N/A	
Others (Color / Pattern, etc.) *	N/A	
Material / Work Reference *	N/A	
Specification Reference	N/A	
Related Dwg. / A.I. Ref. *	N/A	
Related BQ Reference	N/A	
Submission Attachment		
Sample	<input type="checkbox"/>	N/A
Catalogue / Technical Data *	<input checked="" type="checkbox"/>	Attached
Test Report / Certificate *	<input checked="" type="checkbox"/>	Attached
Equipment Schedule	<input type="checkbox"/>	N/A
Method Statement	<input type="checkbox"/>	N/A
Installation Details	<input checked="" type="checkbox"/>	Attached
Job Reference	<input type="checkbox"/>	N/A
Remarks (To list deviations, if any)	* Delete as appropriate	

RESPONSE TO TECHNICAL SUBMISSION

Date

Comments



For and on behalf of
Ronald Lu & Partners (Hong Kong) Ltd.

No review is made of detail dimensions/quantities.
 The submission is reviewed for general compliance with the design intent only.
 Any comments or amendments required shall not be deemed to be variation.
 The review does not release the Contractor from his responsibilities to comply with contract requirements.
 For resubmission, the Contractor has to highlight or cloud those revision areas in the shop drawing for review.

Legend: A (No objection) C (Amendment & resubmission required)
 B (No objection, subject to comments as noted) D (Rejected & resubmission required)

w/e

Form RLP/TSF

Received by / / /

Received by RLP

- cc w/o
- Mr. KS Lee / Mr. Teddy Wu / Mr. HF Au / Mr. SL Kwan / Mr. Jacky Cheung
 - Mr. Tony Fan
 - Mr. Ricky Ting
 - Mr. Anthony Tam
 - Mr. Herbert Tsung / Mr. Francis Lai / Mr. Davy Ko / Mr. Kenneth Leung / Mr. Andy Chan
 - Mr. Henry Lo / Mr. Colin Li
 - Ms. Monnie Lee / Ms. Phoebe Chung / Mr. Ryan Ko / Ms. Crystal Wong
 - Mr. Simon Kwan / Mr. Tommy Leung
 - Mr. Wilber So / Mr. Kenil Ng
 - Mr. Morty Law
 - Mr. Keith Yim / Mr. Randolph Chan
 - Mr. Simon Tso / Mr. Ken Siu
 - Mr. Marcus Kee
 - BSI
 - Mr. Chris Tong / Mr. Louis Siu
 - Mr. David Young
 - Mr. Eddie Kwan
 - Mr. Andy Lai
 - Mr. Marco Tam / Mr. Jason Leung

Review Status / Comment

B

Your technical submission is noted, but with the following reminders:

- We remind the contractor that according to CoP of Site Supervision 2009, "the RC has the sole responsibility of ensuring the integrity of temporary works and that the carrying out of temporary works should be safe and should not endanger the workers on site, the public and adjoining buildings."
- Please refer to other comments from relevant consultants.

Replied by Simon Tso (AECOM SRE) on 01/12/22


Replied by SE / Date

Replied by BS / Date

Replied by / Date

- cc w/o
- Mr. KS Lee / Mr. Teddy Wu / Mr. HF Au / Mr. SL Kwan / Mr. Jacky Cheung
 - Mr. Tony Fan
 - Mr. Ricky Ting
 - Mr. Anthony Tam
 - Mr. Herbert Tsung / Mr. Francis Lai / Mr. Davy Ko / Mr. Kenneth Leung / Mr. Andy Chan
 - Mr. Henry Lo / Mr. Colin Li
 - Ms. Monnie Lee / Ms. Phoebe Chung / Mr. Ryan Ko / Ms. Crystal Wong
 - Mr. Simon Kwan / Mr. Tommy Leung
 - Mr. Wilber So / Mr. Kenil Ng
 - Mr. Morty Law
 - Mr. Keith Yim / Mr. Randolph Chan
 - Mr. Simon Tso / Mr. Ken Siu
 - Mr. Marcus Kee
 - BSI
 - Mr. Chris Tong / Mr. Louis Siu
 - Mr. David Young
 - Mr. Eddie Kwan
 - Mr. Andy Lai

A

	PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T.	JOB REF
	TITLE REPORT FOR R.C. STRUCTURE SUPPORTING GONDOLA	VERSION C
	BD REF. NO.	CAL BY RL
	CHECKED BY SEAL	DATE 20221129
<u>REF NO.</u>	<u>CALCULATIONS</u>	<u>OUTPUT</u>
	<p>DESIGN REPORT</p> <p>TO</p> <p>R.C. STRUCTURE SUPPORTING GONDOLA (T1, T2 & T3)</p> <p>FOR PROJECT</p> <p>PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2</p> <div style="text-align: center;">  <hr style="width: 100px; margin: 0 auto;"/> <p>Lao Dongjie RPE(STL) RP0557480 MHKIE, MStructE, CEng</p> </div>	

	PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T.	JOB REF
	TITLE REPORT FOR R.C. STRUCTURE SUPPORTING GONDOLA	VERSION C
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	CHECKED BY SEAL	DATE 20221129
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	PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T.	JOB REF
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	BD REF. NO.	CAL BY RL
	CHECKED BY SEAL	DATE 20221129
<u>REF NO.</u>	<u>CALCULATIONS</u>	<u>OUTPUT</u>
PART 1 1	<p><u>INTRODUCTION</u></p> <p>This report is to present the design and analysis of R.C. structure supporting the gondola at T1 typical floor (19, 39, 61 & R/F) T2 typical floor (22, 45, 66 & R/F) T3 typical floor (22, 45, 66 & R/F) at Proposed Residential Development at Lohas Park Phase 11 TKOTL 70RP, Tsueng Kwan O, NT, Site C2. By checking, it is found that all the elements in this submission are structural adequate.</p>	
2	<p><u>DESIGN ASSUMPTIONS</u></p>	
2.1	<p><u>Design Reference</u></p> <ul style="list-style-type: none"> - Building (Construction) Regulation, Chapter 123 - 1990 - Code of Practice for Structural Use of Concrete, 2013 - Code of Practice for Structural Use of Steel, 2011 - Code of Practice for Dead and Imposed Loads, 2011 - Code of Practice for Wind Effects in Hong Kong, 2004 	

PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2			JOB REF
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3

DESIGN CHECKING

3.1

CHECKING FOR SLAB CAPACITY

Slab properties:


Thickness

= 150.00 mm

Concrete grade


= 45.00 MPa

10TH, 15TH~39TH & 42ND~45TH FLOOR LOADING ALLOWANCE TABLE:

ITEM	LEGEND	LOCATION & USAGE	FINISHES (kPa)	SERVICES (kPa)	PARITION (kPa)	LIVE LOAD (kPa)	F.R.R. (MINS)
①		RESIDENTIAL FLAT	1.2	0.1	1.0	2.0	60









Loading Allowable Table for 19/F & 39/F

46TH~61ST FLOOR LOADING ALLOWANCE TABLE:

ITEM	LEGEND	LOCATION & USAGE	FINISHES (kPa)	SERVICES (kPa)	PARITION (kPa)	LIVE LOAD (kPa)	F.R.R. (MINS)
①		RESIDENTIAL FLAT	1.2	0.1	1.0	2.0	60

Loading Allowable Table for 61/F

ROOF FLOOR LOADING ALLOWANCE TABLE:

ITEM	LEGEND	LOCATION & USAGE	FINISHES (kPa)	SERVICES (kPa)	PARITION (kPa)	LIVE LOAD (kPa)	F.R.R. (MINS)
④		METER ROOM	1.2	0.1	-	3.0	60
⑤		STAIRCASE	1.2	0.1	-	5.0	60
⑥		LIFT LOBBY/CORRIDOR	1.2	0.1	-	3.0	60
⑩		INACCESSIBLE ROOF	4.8	0.1	-	2.0	60
⑪		ACCESSIBLE ROOF	4.8	0.1	-	2.0	60
⑫		LIFT MACHINE ROOM	1.2	0.1	-	25.0	60
⑬		E&M ROOM	1.2	0.1	-	7.5	60
⑭		WATER TANK (MAX 2.0m)	1.2	0.1	-	20.0	60

Loading Allowable Table for R/F (NOT CONTROL)

Allowable unfactored reserved loading during construction stage

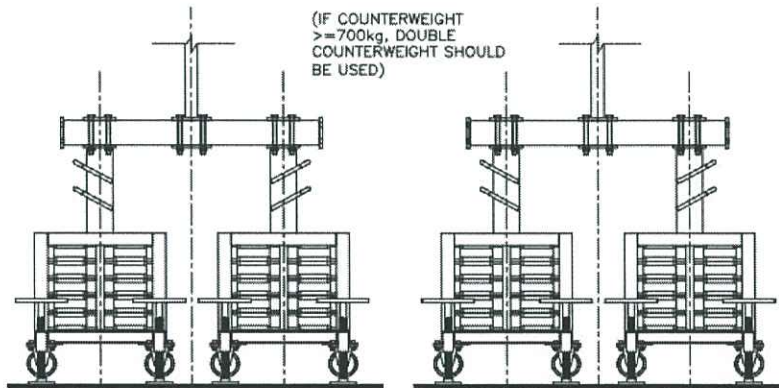
= Finishes + Services + Partition + Live Load

= 4.30 kPa

(Same as T2 & T3)

PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2		JOB REF
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For counterweight $\geq 700\text{kg}$, double counterweight containers should be used.

Critical case: T2-C01 & T3-C01

Front / Rear ratio = 1.5

Reaction force on front and rear support

Front / rear ratio (D_B / D_A)	R_a (In-operation) $= P \cdot (D_A + D_B) / D_B$	R_b (In-operation) $= P + (CW \times 9.81) - R_a$	R_a (In-parking)	R_b (In-parking) $= CW \times 9.81$
3.75	8.58 kN	3.88 kN	0	5.69 kN
3.5	8.7 kN	4.15 kN	0	6.08 kN
3.25	8.85 kN	4.59 kN	0	6.67 kN
3	9.03 kN	5 kN	0	7.26 kN
2.75	9.23 kN	5.39 kN	0	7.85 kN
2.5	9.48 kN	5.92 kN	0	8.63 kN
2.25	9.78 kN	6.6 kN	0	9.61 kN
2	10.16 kN	7.4 kN	0	10.79 kN
1.75	10.64 kN	8.29 kN	0	12.16 kN
1.5	11.28 kN	9.81 kN	0	14.32 kN
1.25	12.19 kN	11.65 kN	0	17.07 kN

Max R_b = 14.32 kN

Eight supports at rear (away parapet), each support load = $R_b / 8$ = 1.79 kN

Use a 350x350x3mm thk steel plate

Spread loading area = $(0.35 + 0.15/\tan 30^\circ \times 2)^2$ = 0.76 m²

Design load on slab = 1.79 / 0.76 = 2.36 kPa

OK! As: < 4.30 kPa

Max R_a = 11.28 kN

Two supports at rear (away parapet), each support load = $R_b / 2$ = 5.64 kN

Use a 650x650x3mm thk steel plate

Spread loading area = $(0.65 + 0.15/\tan 30^\circ \times 2)^2$ = 1.37 m²

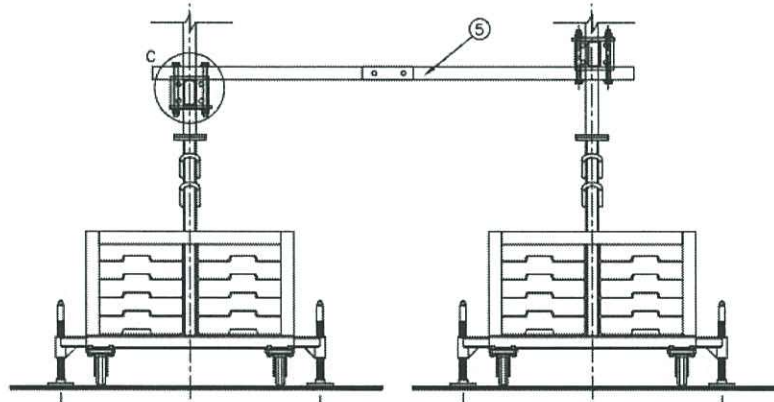
Design load on slab = 5.64 / 1.37 = 4.12 kPa

OK! As: < 4.30 kPa



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For counterweight < 700kg, single counterweight container should be used.

Critical case: T1-C09, T1-C10, T2-C08, T2-C09, T2-C10, T3-C09, T3-C10 & T3-C11

Front / Rear ratio = 2.75

Reaction force on front and rear support

Front / rear ratio (D _B / D _A)	R _a (In-operation) = P · (D _A + D _B) / D _B	R _b (In-operation) = P + (CW x 9.81) - R _a	R _a (In-parking)	R _b (In-parking) = CW x 9.81
3.75	8.58 kN	3.88 kN	0	5.69 kN
3.5	8.7 kN	4.15 kN	0	6.08 kN
3.25	8.85 kN	4.59 kN	0	6.67 kN
3	9.03 kN	5 kN	0	7.26 kN
2.75	9.23 kN	5.39 kN	0	7.85 kN
2.5	9.48 kN	5.92 kN	0	8.63 kN
2.25	9.78 kN	6.6 kN	0	9.61 kN
2	10.16 kN	7.4 kN	0	10.79 kN
1.75	10.64 kN	8.29 kN	0	12.16 kN
1.5	11.28 kN	9.81 kN	0	14.32 kN
1.25	12.19 kN	11.65 kN	0	17.07 kN

Max R_b = 7.85 kN

Four supports at rear (away parapet), each support load = R_b / 4 = 1.96 kN

Use a 350x350x3mm thk steel plate

Spread loading area = (0.35 + 0.15/tan30° x 2) ^ 2 = 0.76 m²

Design load on slab = 1.96 / 0.76 = 2.59 kPa

OK! As: < 4.30 kPa

Max R_a = 9.23 kN

Two supports at rear (away parapet), each support load = R_a / 2 = 4.62 kN

Use a 650x650x3mm thk steel plate

Spread loading area = (0.65 + 0.15/tan30° x 2) ^ 2 = 1.37 m²

Design load on slab = 4.62 / 1.37 = 3.37 kPa

OK! As: < 4.30 kPa



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<u>REF NO.</u>	<u>CALCULATIONS</u>		<u>OUTPUT</u>
4	Checking for 3mm thk steel plate Max allowable loading density = 4.30 kPa Max plate size = 650.00 mm Max base plate size = 100.00 mm >> Max span = (650 - 100) / 2 = 275.00 mm Equivalent UDL = 4.30 x 0.65 = 2.80 kN/m Design moment = 2.80 x 0.275 ^ 2 / 2 = 0.11 kNm $Z = bh^2 / 6 = 650 \times 3^2 / 6 = 975.00 \text{ mm}^3$ Design strenght $P_y = 275.00 \text{ MPa}$ Moment capacity $M_c = p_y * Z = 0.27 \text{ kNm}$ OK! As: > 0.11 kNm The 3mm steel plate is capable to transfer the loading to the RC structure.		
	<u>CONCLUSION</u> Based on the above checking, the parent RC structure is capable to resist the loading from gondola system.		

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	<p>APPENDIX</p>	

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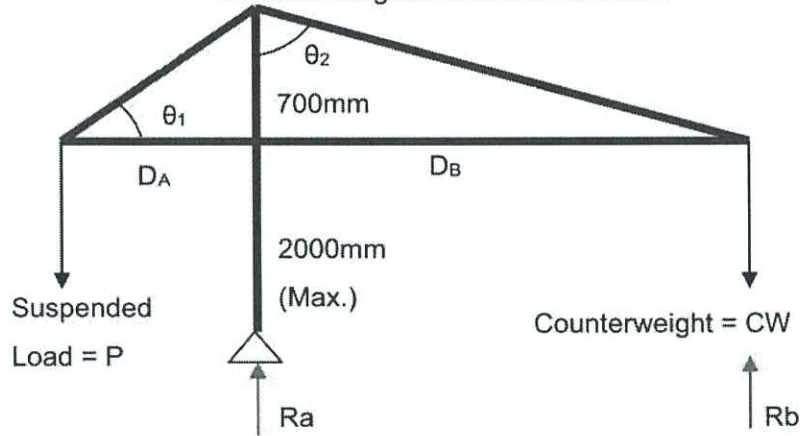
<u>REF NO.</u>	<u>CALCULATIONS</u>	<u>OUTPUT</u>
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Reaction Force on Front and Rear Support

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) = $CW \times 9.81$
3.75	7.38 kN	3.36 kN	0	4.91 kN
3.5	7.5 kN	3.63 kN	0	5.3 kN
3.25	7.62 kN	3.9 kN	0	5.69 kN
3	7.77 kN	4.14 kN	0	6.08 kN
2.75	7.95 kN	4.55 kN	0	6.67 kN
2.5	8.16 kN	4.93 kN	0	7.26 kN
2.25	8.42 kN	5.65 kN	0	8.24 kN
2	8.75 kN	6.3 kN	0	9.22 kN
1.75	9.16 kN	7.07 kN	0	10.4 kN
1.5	9.72 kN	8.27 kN	0	12.16 kN
1.25	10.49 kN	9.86 kN	0	14.52 kN

(Table extracted from Design Calculation of Counterweight Gondola System for Suspended Working Platform)

The force diagram is shown as below



(Figure extracted from Design Calculation of Counterweight Gondola System for Suspended Working Platform)

CAGE MARK	CAGE SIZE	FRONT ARM LENGTH (\leq mm)	REAR ARM LENGTH (\geq mm)	FRONT/REAR RATIO	COUNTER WEIGHTS (KG) (TOTAL)
T1-C01	5.5M L-SHAPE	1400	2450	1.75	20KG x 60 PCS = 1200KG
		1800	5400	3	20KG x 35 PCS = 700KG
T1-C02	4.5M	1000	3500	3.5	20KG x 29 PCS = 580KG
		1000	3000	3	20KG x 33 PCS = 660KG
T1-C03	4.5M L-SHAPE	1400	2800	2	20KG x 50 PCS = 1000KG
		1400	3500	2.5	20KG x 40 PCS = 800KG
T1-C04	2.0M	1200	3000	2.5	20KG x 36 PCS = 720KG
		1200	2400	2	20KG x 45 PCS = 900KG
T1-C05	5.0M L-SHAPE	1500	2625	1.75	20KG x 58 PCS = 1160KG
		1800	4500	2.5	20KG x 41 PCS = 820KG
T1-C06	5.5M L-SHAPE	1800	5400	3	20KG x 35 PCS = 700KG
		1500	3000	2	20KG x 52 PCS = 1040KG
T1-C07	3.0M	1200	3000	2.5	20KG x 38 PCS = 760KG
		1200	3000	2.5	20KG x 38 PCS = 760KG
T1-C08	3.0M	1200	3000	2.5	20KG x 38 PCS = 760KG
		1200	2000	1.67	20KG x 63 PCS = 1260KG
T1-C09	3.0M	1200	3000	2.5	20KG x 38 PCS = 760KG
		1800	4950	2.75	20KG x 34 PCS = 680KG
T1-C10	5.0M	1200	3600	3	20KG x 34 PCS = 680KG
		1200	3000	2.5	20KG x 41 PCS = 820KG
T1-C11	4.0M	1600	3200	2	20KG x 49 PCS = 980KG
		1200	2400	2	20KG x 49 PCS = 980KG
T1-C12	4.5M	1000	2000	2	20KG x 50 PCS = 1000KG
		1000	3000	3	20KG x 33 PCS = 660KG
T1-C13	3.0M	1400	2450	1.75	20KG x 54 PCS = 1080KG
		1200	3000	2.5	20KG x 38 PCS = 760KG
T1-C14	3.0M	1200	4800	4	20KG x 25 PCS = 500KG
		1200	4800	4	20KG x 25 PCS = 500KG

SINGLE CONTAINER

DOUBLE CONTAINER

CAGE MARK	CAGE SIZE	FRONT ARM LENGTH (\leq mm)	REAR ARM LENGTH (\geq mm)	FRONT/REAR RATIO	COUNTER WEIGHTS (KG) (TOTAL)
T2-C01	5.5M L-SHAPE	1400	2100	1.5	20KG x 69 PCS = 1380KG
		1800	5400	3	20KG x 35 PCS = 700KG
T2-C02	4.5M	1000	3200	3.2	20KG x 33 PCS = 660KG
		1000	2500	2.5	20KG x 40 PCS = 800KG
T2-C03	3.0M	1200	2400	2	20KG x 47 PCS = 940KG
		1000	2500	2.5	20KG x 38 PCS = 760KG
T2-C04	5.5M L-SHAPE	1800	5400	3	20KG x 35 PCS = 700KG
		1600	3000	1.88	20KG x 60 PCS = 1200KG
T2-C05	5.5M L-SHAPE	1800	3600	2	20KG x 52 PCS = 1040KG
		2000	4000	2	20KG x 52 PCS = 1040KG
T2-C06	3.0M	1200	3000	2.5	20KG x 38 PCS = 760KG
		1200	3600	3	20KG x 32 PCS = 640KG
T2-C07	3.0M	1200	3600	3	20KG x 32 PCS = 640KG
		1200	2400	2	20KG x 47 PCS = 940KG
T2-C08	3.0M	1000	2500	2.5	20KG x 38 PCS = 760KG
		1800	4950	2.75	20KG x 34 PCS = 680KG
T2-C09	5.0M	1200	3000	2.5	20KG x 41 PCS = 820KG
		1200	3600	3	20KG x 34 PCS = 680KG
T2-C10	4.0M	1200	3600	3	20KG x 33 PCS = 660KG
		2000	5000	2.5	20KG x 39 PCS = 780KG
T2-C11	2.5M	1000	2000	2	20KG x 46 PCS = 920KG
		1000	2300	2.3	20KG x 41 PCS = 820KG
T2-C12	1.5M	1800	4500	2.5	20KG x 36 PCS = 720KG
		1200	2300	1.92	20KG x 52 PCS = 1040KG
T2-C13	3.0M	1300	4000	3.1	20KG x 32 PCS = 640KG
		1300	4000	3.1	20KG x 32 PCS = 640KG


SINGLE CONTAINER

DOUBLE CONTAINER

CAGE MARK	CAGE SIZE	FRONT ARM LENGTH (<=mm)	REAR ARM LENGTH (>=mm)	FRONT/REAR RATIO	COUNTER WEIGHTS (KG) (TOTAL)
T3-C01	5.5M L-SHAPE	1400	2100	1.5	20KG x 69 PCS = 1380KG
		1800	5400	3	20KG x 35 PCS = 700KG
T3-C02	4.5M	1000	3000	3	20KG x 33 PCS = 660KG
		1000	3000	3	20KG x 33 PCS = 660KG
T3-C03	3.0M	1100	2700	2.45	20KG x 42 PCS = 840KG
		1000	3500	3.5	20KG x 27 PCS = 540KG
T3-C04	2.0M	1200	2400	2	20KG x 45 PCS = 900KG
		1200	2400	2	20KG x 45 PCS = 900KG
T3-C05	5.0M L-SHAPE	1800	4500	2.5	20KG x 41 PCS = 820KG
		1500	2625	1.75	20KG x 58 PCS = 1160KG
T3-C06	3.5M L-SHAPE	1800	4050	2.25	20KG x 43 PCS = 860KG
		1200	2400	2	20KG x 48 PCS = 960KG
T3-C07	3.0M	1200	3000	2.5	20KG x 38 PCS = 760KG
		1200	3000	2.5	20KG x 38 PCS = 760KG
T3-C08	3.0M	1200	2500	2.08	20KG x 47 PCS = 940KG
		1200	4000	3.3	20KG x 29 PCS = 580KG
T3-C09	3.0M	1800	4950	2.75	20KG x 34 PCS = 680KG
		1200	2500	2.08	20KG x 47 PCS = 940KG
T3-C10	5.0M	1200	3000	2.5	20KG x 41 PCS = 820KG
		1200	3600	3	20KG x 34 PCS = 680KG
T3-C11	4.0M	1200	3600	3	20KG x 33 PCS = 660KG
		2000	5000	2.5	20KG x 39 PCS = 780KG
T3-C12	2.5M	1000	2000	2	20KG x 46 PCS = 920KG
		1000	2300	2.3	20KG x 41 PCS = 820KG
T3-C13	3.0M	1200	2500	2.08	20KG x 47 PCS = 940KG
		1200	2500	2.08	20KG x 47 PCS = 940KG

 SINGLE CONTAINER

 DOUBLE CONTAINER

	PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T.	JOB REF
	TITLE REPORT FOR R.C. STRUCTURE SUPPORTING WINCH	VERSION C
	BD REF. NO.	CAL BY RL
	CHECKED BY SEAL	DATE 20221129
<u>REF NO.</u>	<u>CALCULATIONS</u>	<u>OUTPUT</u>
	<p>DESIGN REPORT</p> <p>TO</p> <p>R.C. STRUCTURE SUPPORTING WINCH (T1, T2 & T3)</p> <p>FOR PROJECT</p> <p>PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2</p> <div style="text-align: center;">  <p>_____ Lao Dongjie RPE(STL) RP0557480 MHKIE, MStructE, CEng</p> </div>	

	PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T.	JOB REF
	TITLE REPORT FOR R.C. STRUCTURE SUPPORTING WINCH	VERSION C
	BD REF. NO.	CAL BY RL
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	PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T.	JOB REF
	TITLE REPORT FOR R.C. STRUCTURE SUPPORTING WINCH	VERSION C
	BD REF. NO.	CAL BY RL
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<u>REF NO.</u>	<u>CALCULATIONS</u>	<u>OUTPUT</u>
PART 1		
1	<p><u>INTRODUCTION</u></p> <p>This report is to present the design and analysis of R.C. structure supporting the winch at T1 typical floor (18, 38, 60 & R/F) T2 typical floor (21, 43, 65 & R/F) T3 typical floor (21, 43, 65 & R/F) at Proposed Residential Development at Lohas Park Phase 11 TKOTL 70RP, Tsueng Kwan O, NT, Site C2. By checking, it is found that all the elements in this submission are structural adequate.</p>	
2	<p><u>DESIGN ASSUMPTIONS</u></p>	
2.1	<p><u>Design Reference</u></p> <ul style="list-style-type: none"> - Building (Construction) Regulation, Chapter 123 - 1990 - Code of Practice for Structural Use of Concrete, 2013 - Code of Practice for Structural Use of Steel, 2011 - Code of Practice for Dead and Imposed Loads, 2011 - Code of Practice for Wind Effects in Hong Kong, 2004 	

PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2			JOB REF
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BD REF. NO.		CHECKED BY SEAL	DATE 20221129

<u>REF NO.</u>	<u>CALCULATIONS</u>	<u>OUTPUT</u>
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3

DESIGN CHECKING

3.1

CHECKING FOR SLAB CAPACITY

Slab properties:

Thickness

= 150.00 mm

Concrete grade

= 45.00 MPa

10TH, 15TH~39TH & 42ND~45TH FLOOR LOADING ALLOWANCE TABLE:

ITEM	LEGEND	LOCATION & USAGE	FINISHES (kPa)	SERVICES (kPa)	PARITION (kPa)	LIVE LOAD (kPa)	F.R.R. (MINS)
①		RESIDENTIAL FLAT	1.2	0.1	1.0	2.0	60

Loading Allowable Table for 19/F & 39/F

46TH~61ST FLOOR LOADING ALLOWANCE TABLE:

ITEM	LEGEND	LOCATION & USAGE	FINISHES (kPa)	SERVICES (kPa)	PARITION (kPa)	LIVE LOAD (kPa)	F.R.R. (MINS)
①		RESIDENTIAL FLAT	1.2	0.1	1.0	2.0	60

Loading Allowable Table for 61/F

ROOF FLOOR LOADING ALLOWANCE TABLE:

ITEM	LEGEND	LOCATION & USAGE	FINISHES (kPa)	SERVICES (kPa)	PARITION (kPa)	LIVE LOAD (kPa)	F.R.R. (MINS)
④		METER ROOM	1.2	0.1	-	3.0	60
⑤		STAIRCASE	1.2	0.1	-	5.0	60
⑥		LIFT LOBBY/CORRIDOR	1.2	0.1	-	3.0	60
⑩		INACCESSIBLE ROOF	4.8	0.1	-	2.0	60
⑪		ACCESSIBLE ROOF	4.8	0.1	-	2.0	60
⑫		LIFT MACHINE ROOM	1.2	0.1	-	25.0	60
⑬		E&M ROOM	1.2	0.1	-	7.5	60
⑭		WATER TANK (MAX 2.0m)	1.2	0.1	-	20.0	60

Loading Allowable Table for R/F (NOT CONTROL)

Allowable unfactored reserved loading during construction stage

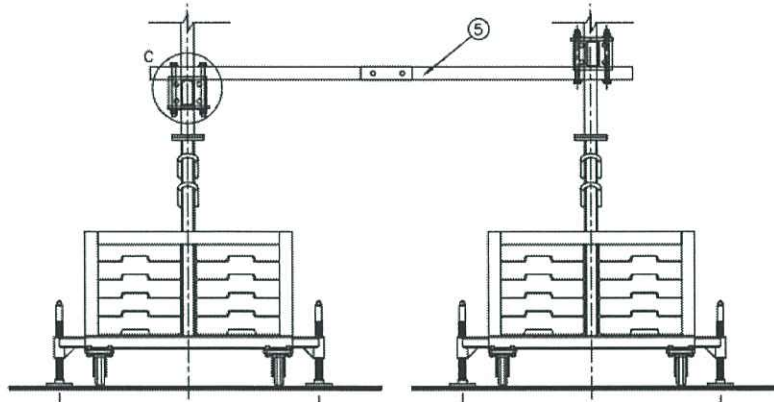
= Finishes + Services + Partition + Live Load

= 4.30 kPa

(Same as T2 & T3)

PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2		JOB REF
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For counterweight < 700kg, single counterweight container should be used.

Critical case:

Front / Rear ratio = 2.5

Reaction force on front and rear support

Front / rear ratio (D _B / D _A)	Ra (In-operation) = P · (D _A + D _B) / D _B	Rb (In-operation) = P + (CW x 9.81) - Ra	Ra (In-parking)	Rb (In-parking) = CW x 9.81
4	8.43 kN	1.84 kN	0	3.53 kN
3.75	8.54 kN	1.93 kN	0	3.73 kN
3.5	8.67 kN	1.99 kN	0	3.92 kN
3.25	8.81 kN	2.25 kN	0	4.32 kN
3	8.99 kN	2.26 kN	0	4.51 kN
2.75	9.19 kN	2.46 kN	0	4.91 kN
2.5	9.44 kN	2.79 kN	0	5.49 kN

Max Rb = 5.49 kN

Four supports at rear (away parapet), each support load = Rb / 4 = 1.37 kN

Use a 350x350x3mm thk steel plate

Spread loading area = (0.35 + 0.15/tan30° x 2) ^ 2 = 0.76 m²

Design load on slab = 1.37 / 0.76 = 1.81 kPa

OK! As: < 4.30 kPa

Max Ra = 9.44 kN

Two supports at rear (away parapet), each support load = Rb / 2 = 4.72 kN

Use a 650x650x3mm thk steel plate

Spread loading area = (0.65 + 0.15/tan30° x 2) ^ 2 = 1.37 m²

Design load on slab = 4.72 / 1.37 = 3.45 kPa

OK! As: < 4.30 kPa

PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2		JOB REF	
TITLE REPORT FOR R.C. STRUCTURE SUPPORTING WINCH		VERSION C	
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4	<p>Checking for 3mm thk steel plate</p> <p>Max allowable loading density = 4.30 kPa</p> <p>Max plate size = 650.00 mm</p> <p>Max base plate size = 100.00 mm</p> <p>>> Max span = (650 - 100) / 2 = 275.00 mm</p> <p>Equivalent UDL = 4.30 x 0.65 = 2.80 kN/m</p> <p>Design moment = 2.80 x 0.275 ^ 2 / 2 = 0.11 kNm</p> <p>$Z = bh^2 / 6 = 650 \times 3^2 / 6 = 975.00 \text{ mm}^3$</p> <p>Design strenght $P_y = 275.00 \text{ MPa}$</p> <p>Moment capacity $M_c = p_y * Z = 0.27 \text{ kNm}$</p> <p style="text-align: right;">OK! As: > 0.11 kNm</p> <p>The 3mm steel plate is capable to transfer the loading to the RC structure.</p>		
	<p><u>CONCLUSION</u></p> <p>Based on the above checking, the parent RC structure is capable to resist the loading from winch system.</p>		

	PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2	JOB REF 	
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	APPENDIX		

PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2		JOB REF
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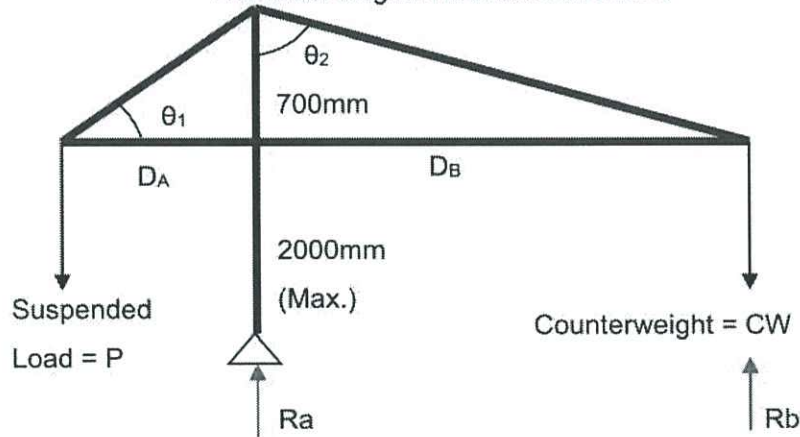
Reaction Force on Front and Rear Support

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) = $P + (CW \times 9.81) - R_a$	Ra (In-parking)	Rb (In-parking) = $CW \times 9.81$
4	8.43 kN	1.84 kN	0	3.53 kN
3.75	8.54 kN	1.93 kN	0	3.73 kN
3.5	8.67 kN	1.99 kN	0	3.92 kN
3.25	8.81 kN	2.25 kN	0	4.32 kN
3	8.99 kN	2.26 kN	0	4.51 kN
2.75	9.19 kN	2.46 kN	0	4.91 kN
2.5	9.44 kN	2.79 kN	0	5.49 kN
2.25	9.74 kN	3.08 kN	0	6.08 kN
2	10.11 kN	3.5 kN	0	6.87 kN
1.75	10.59 kN	4 kN	0	7.85 kN
1.5	11.23 kN	4.54 kN	0	9.03 kN
1.25	12.13 kN	5.4 kN	0	10.79 kN

(Table extracted from Design Calculation of Counterweight Gondola System for Winch)

The force diagram is shown as below



(Figure extracted from Design Calculation of Counterweight Gondola System for Winch)

PROJECT PROPOSED RESIDENTIAL DEVELOPMENT AT LOHAS PARK PHASE 11 TKOTL 70RP, TSUENG KWAN O, N.T. SITE C2		JOB REF
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WINCH MARK	S.W.L.	FRONT ARM LENGTH (<=mm)	REAR ARM LENGTH (>=mm)	FRONT/REAR RATIO	COUNTER WEIGHTS (KG) (TOTAL)
T1-W01	500KG	1200	3600	3	20KG x 23 PCS = 460KG
T1-W02	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T1-W03	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T1-W04	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T1-W05	500KG	1200	3600	3	20KG x 23 PCS = 460KG
T1-W06	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T1-W07	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T1-W08	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T1-W09	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG

WINCH MARK	S.W.L.	FRONT ARM LENGTH (<=mm)	REAR ARM LENGTH (>=mm)	FRONT/REAR RATIO	COUNTER WEIGHTS (KG) (TOTAL)
T2-W01	500KG	1200	3600	3	20KG x 23 PCS = 460KG
T2-W02	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T2-W03	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T2-W04	500KG	1200	3600	3	20KG x 23 PCS = 460KG
T2-W05	500KG	1200	3600	3	20KG x 23 PCS = 460KG
T2-W06	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T2-W07	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T2-W08	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T2-W09	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG

WINCH MARK	S.W.L.	FRONT ARM LENGTH (<=mm)	REAR ARM LENGTH (>=mm)	FRONT/REAR RATIO	COUNTER WEIGHTS (KG) (TOTAL)
T3-W01	500KG	1200	3600	3	20KG x 23 PCS = 460KG
T3-W02	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T3-W03	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T3-W04	500KG	1200	3600	3	20KG x 23 PCS = 460KG
T3-W05	500KG	1400	3500	2.5	20KG x 27 PCS = 540KG
T3-W06	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T3-W07	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG
T3-W08	500KG	1000	2500	2.5	20KG x 27 PCS = 540KG