美 特 鋁 質 有 限 公 司
MIDI ALUMINIUM FABRICATOR LTD.

工程指示 / 要求簡箋(E.I.)

工程指示編號：EI / 6738 / 23　　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　：趟門中企 鐵件拆圖 (拆圖指示)

收件人　：生統 / 拆圖　　發件人　：Ant Yeung　　日 期 ：15/09/2023

☐要求提供 / ☐確認 事項 ：

( ) 初步鋁料 B.M.　( ) 加工拆圖，然後生產　( ) 尺寸表

( ) 正式鋁料 B.M.　( ) 技術上資料 / 指示　( ) 報價

( ) 配件 B.M.　( ) 樣辦或貨品說明書　( ) 分判合約

內容 ：

按計數和 BD 批圖 3500 高的趟門要 加力鐵 60x50

請計 BM 用量和給 拆圖

謝謝

請在 2023.9.18 前完成上列要求。

附：

☐ 原合約工程包　☐ 原合約工程加 / 減賬　☐ 新工程報價

原因 ：-

分發東莞各部門 ：

( )生產技術總監☐連附件 (✓)技術部 ☑連附件 ( )生產部 ☐連附件 ( )機械設計部☐連附件

( )採購部 ☐連附件 (✓)生產統籌部☑連附件 ( )小羅&清 ☐連附件

(✓)質檢部 ☑連附件 ( )會計部 ☐連附件 ( )報關組 ☐連附件 ( )其他 _____☑連附件

分發香港各部門 ：

( )行政部☐連附件 ( )會計部☐連附件 ( )統籌部☐連附件 ( )工程部地盤科文 積哥 ☐ 連附件

( )採購部☐連附件 ( )QS 部 ☐連附件 ( )維修部☐連附件 ( )其他 _____☐連附件

傳遞編號：

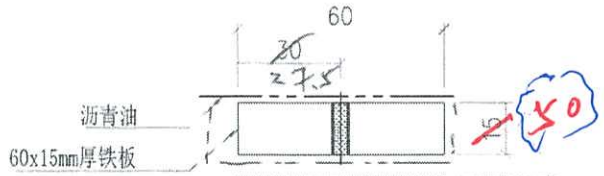
HK 2153 / 23

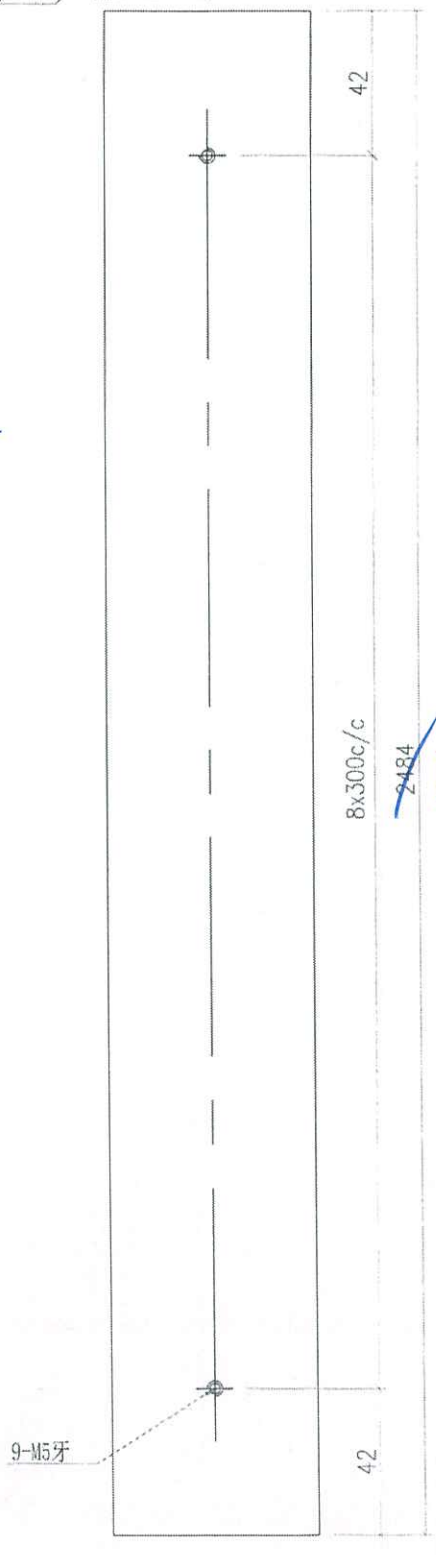
發件人簽署：

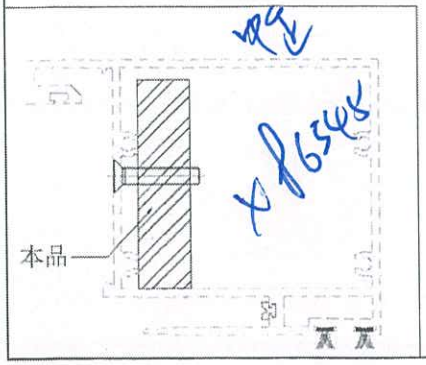
項目經理簽署：

美特鋁質有限公司 MIDI Aluminium Fabricator Ltd.				工程號	J858	類別		物料號	-		
				地盤	康城11期	制圖	W.E.X	2022-07-25	圖號	SD-GS05	
修改			採用工廠 ✓ 地盤	图纸名称	铁料加工图	復核	-	-	數量	-	
日期			材料顏色 热浸锌	材料	S-275	批准	-	-	單件重量	17.55	(KG)

位置	QTY
T1	572
T2	624
T3	624
合计:	1820







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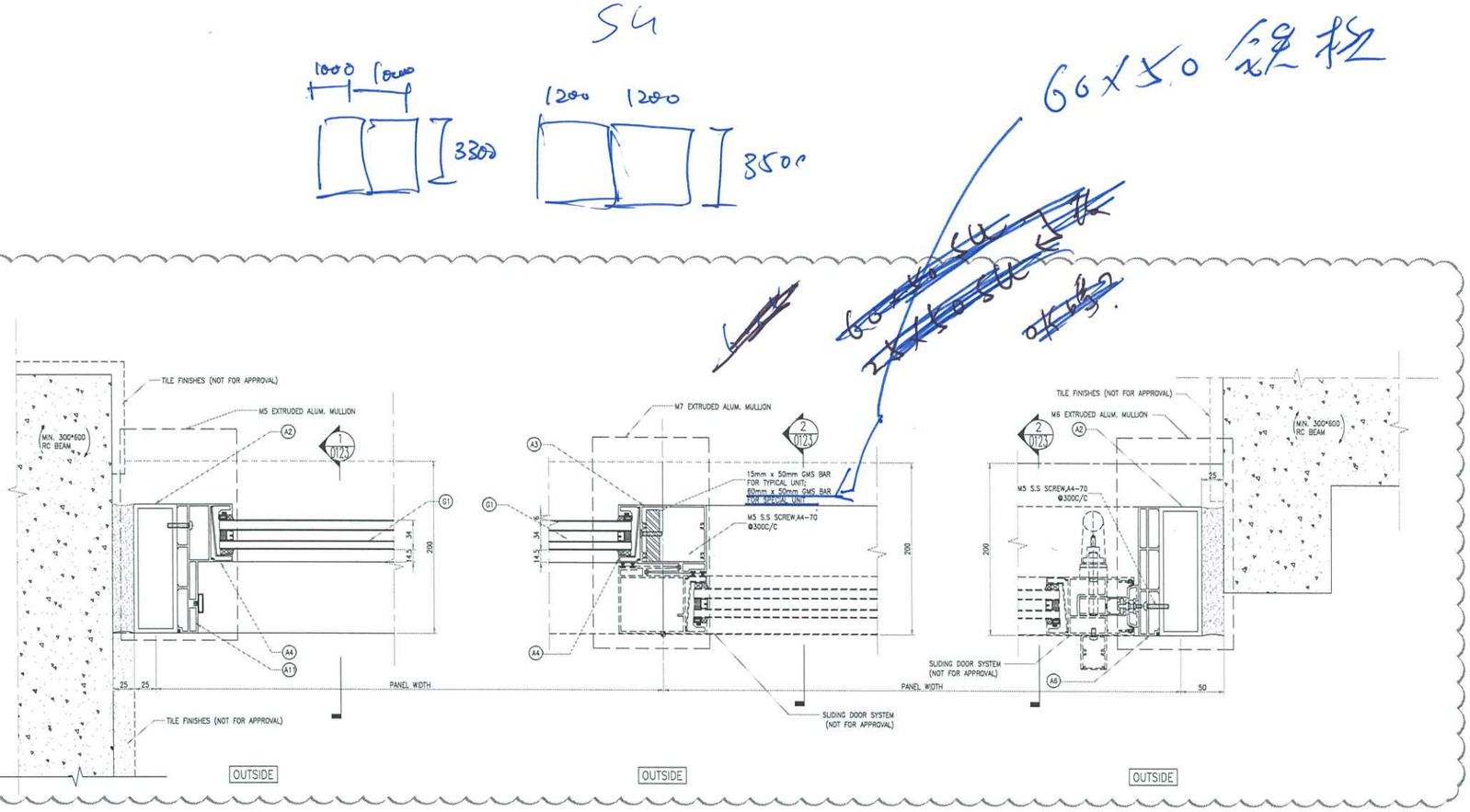
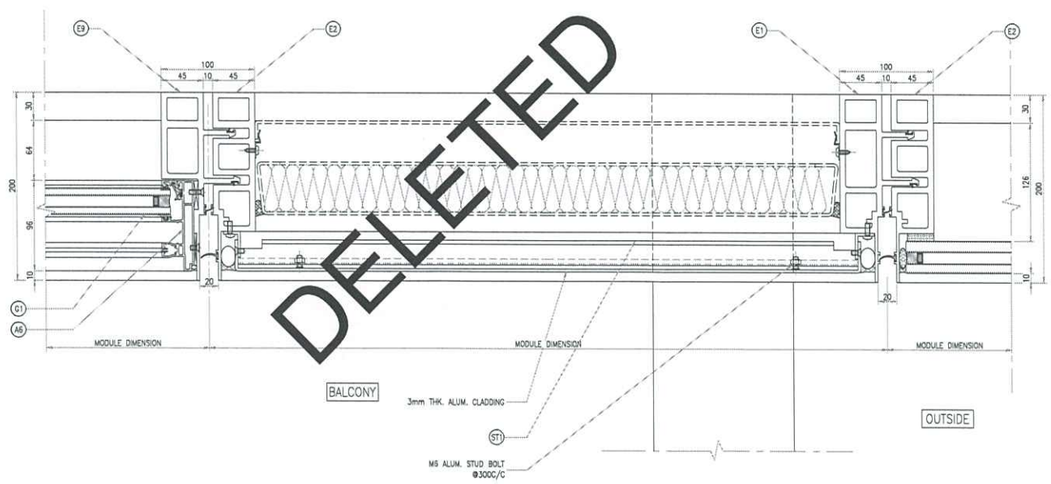




B.D. REF :

CLIENT :
信和置業有限公司
Sino Land Company Limited

ARCHITECT :
ronald lu & partners
Architects Planners Interior Designers
Ronald Lu & Partners (HK) Ltd.
呂元祥建築師事務所(香港)有限公司

MAIN CONTRACTOR :
Gammon

STRUCTURAL ENGINEER :
AECOM

FACADE CONSULTANT:
AECOM

NOTE :
1. ALL DIMENSIONS ARE IN mm.
2. ALL ELEVATIONS ARE VIEWED FROM OUTSIDE.
3. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE FABRICATION.

LEGEND :
X1 — DETAIL MARK NO.
X001 — REFER SHEET NO.
1. F.F.L. -- FINISHED FLOOR LEVEL
2. S.F.L. -- STRUCTURAL FLOOR LEVEL
3. /R -- REVERSED DETAIL

NO.	DATE	REVISED	BY
B	25.04.22	BD AMENDMENT	K
A	28.12.21	BD AMENDMENT	K
–	30.09.20	BD SUBMISSION	K

JOB NO. : J-858

PROJECT :
PROPOSED RESIDENTIAL DEVELOPMENT
AT TKOTL 70RP, PHASE 11, LOHAS PARK
TSEUNG KWAN O, N.T.

TITLE :
FACADE DETAIL

DATE : 22-OCT-21 | SCALE : 1:1(A1)

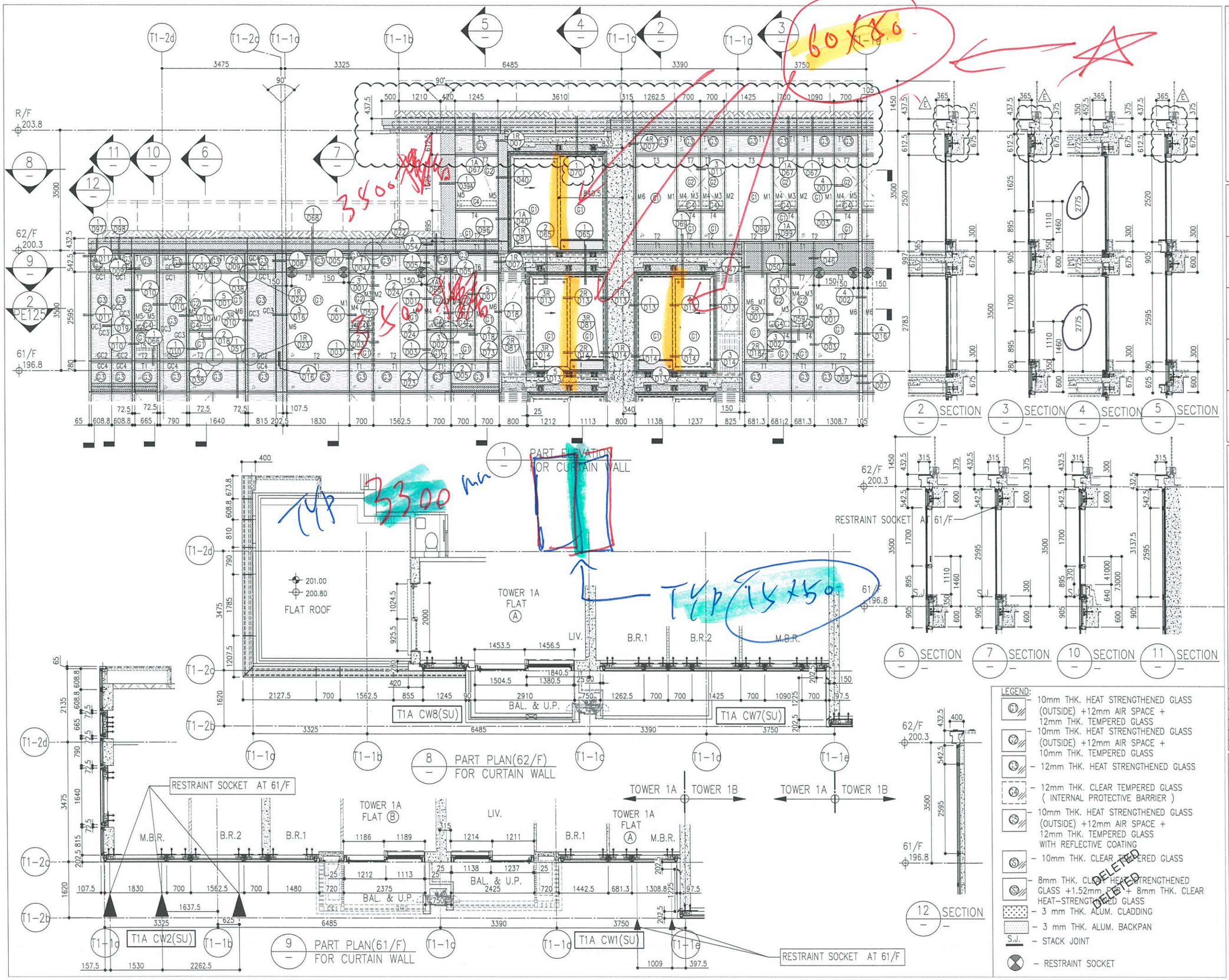
DRAWN BY : KY | CHECKED BY : YB

B.D. AMENDMENT

"THE WORKS SHOWN ON THESE PLANS ARE TYPE II WORKS (SUPERSTRUCTURE (CURTAIN WALL AT TOWER 1,2 & 5)) IN RESPECT OF WHICH CONSENT IS APPLIED FOR THE PURPOSE OF FAST TRACK CONSENT APPLICATION UNDER REGULATION 77 OF THE BUILDING (ADMINISTRATION) REGULATIONS."

美特鋁質有限公司
MIDI ALUMINIUM FABRICATOR LTD.
Units 6-8, Sunray Industrial Centre, 1/F
610 Cha Kwa Ling Road, Kowloon
Tel:23489211-4 Fax:(852)27727666

DWG NO. : LP11/0102 | REV. : B



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LEGEND:
- G1 — 10mm THK. HEAT STRENGTHENED GLASS (OUTSIDE) +12mm AIR SPACE + 12mm THK. TEMPERED GLASS
- G2 — 10mm THK. HEAT STRENGTHENED GLASS (OUTSIDE) +12mm AIR SPACE + 10mm THK. TEMPERED GLASS
- G3 — 12mm THK. HEAT STRENGTHENED GLASS
- G4 — 12mm THK. CLEAR TEMPERED GLASS (INTERNAL PROTECTIVE BARRIER)
- G5 — 10mm THK. HEAT STRENGTHENED GLASS (OUTSIDE) +12mm AIR SPACE + 12mm THK. TEMPERED GLASS WITH REFLECTIVE COATING
- S1 — 10mm THK. CLEAR TEMPERED GLASS
- S2 — 8mm THK. CLEAR HEAT STRENGTHENED GLASS +1.52mm PVB + 8mm THK. CLEAR HEAT-STRENGTHENED GLASS
- 3 mm THK. ALUM. CLADDING
- 3 mm THK. ALUM. BACKPAN
- S.J. — STACK JOINT
- RESTRAINT SOCKET

DELETED
DELETED

NO.	DATE	REVISED	BY
E	14/08/23	REVISED AS PER COMMENTS	LS
D	18/04/23	REVISED AS PER COMMENTS	LS
C	26/07/22	REVISED AS PER COMMENTS	LS
B	26/05/22	REVISED AS PER COMMENTS	LS
A	13/04/22	REVISED AS PER COMMENTS	LS

JOB NO. : J-858

PROJECT :
PROPOSED RESIDENTIAL DEVELOPMENT AT TKOTL 70RP, PHASE 11, LOHAS PARK TSEUNG KWAN O, N.T.

TITLE :
PENTHOUSE FLOOR PARTIAL ELEVATION & SECTION, PLAN FOR CURTAIN WALL (TOWER 1)

DATE : 12-JAN-22 | SCALE : 1:50(A1)

DRAWN BY : | CHECKED BY :

美特鋁質有限公司
MIDI ALUMINIUM FABRICATOR LTD.
Units 6-8, Sunray Industrial Centre, 1/F
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Tel:23489211-4 Fax:(852)27727666

DWG NO. : J858-CW-PE117 | REV. : E

Mark	DIE NUMBER	ALLOY TEMPER	FINISH CODE	AREA (mm²)	WEIGHT (kg/m)	EXT. PER. (mm)	DESCRIPTION	MOMENTS OF INERTIA-X (mm⁴)	MOMENTS OF INERTIA-Y (mm⁴)
#20	S22	GMS	–	800	6.28	216	8mm THK.GMS PLATE	4266.7	666666.7
#21	S23	GMS	–	1500	11.8	230	15mm THK.GMS PLATE	28125.0	1250000.0
#22	S24	GMS	–	867.9	7.02	294.8	100x50x6mm THK.GMS ANGLE	156112.9	902269.2
	S25	GMS	–	5000.0	39.3	300.0	50mm THK.GMS PLATE	1041666.7	4166666.7
#23	S26	GMS	–	4806.9	38.38	814.8	260x150x12.5mm THK.GMS ANGLE	8760059.9	34390532.3
#24	S27	GMS	–	866.7	7.02	295.7	75x75x6mm THK.GMS ANGLE	465684.1	465684.1
#25	S28	GMS	–	1421.8	11.2	366.1	85*100*8mm THK.GMS ANGLE	938135.1	1400323.7
	A15	6063-T5	–	417.4	1.31	328.8	ALUM. EXTRUSION	83645.5	218419.1
	A16	6063-T5	–	296.1	0.80	261.4	ALUM. EXTRUSION	153025.7	86599.3
	S29	GMS	–	500	3.92	210	5mm THK.GMS PLATE	1041.7	416666.7
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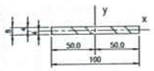
#20



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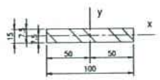

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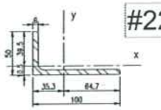
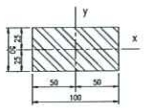
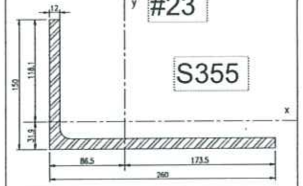




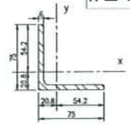
#23

S355

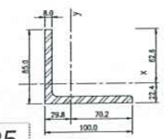


cut from 300*200*12.5mm thk GMS RHS

#24



CUT FROM 100X100X8MM ANGLE



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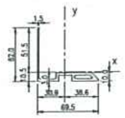

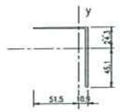

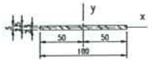

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3. (R) --REVERSED DETAIL

NEW DRAWING

NO.	DATE	REVISED	BY
–	07.02.23	BD SUBMISSION	K

JOB NO. : J-858

PROJECT :
PROPOSED RESIDENTIAL DEVELOPMENT AT TKOTL 70RP, PHASE 11, LOHAS PARK TSEUNG KWAN O, N.T.

TITLE :
SECTION PROPERTY

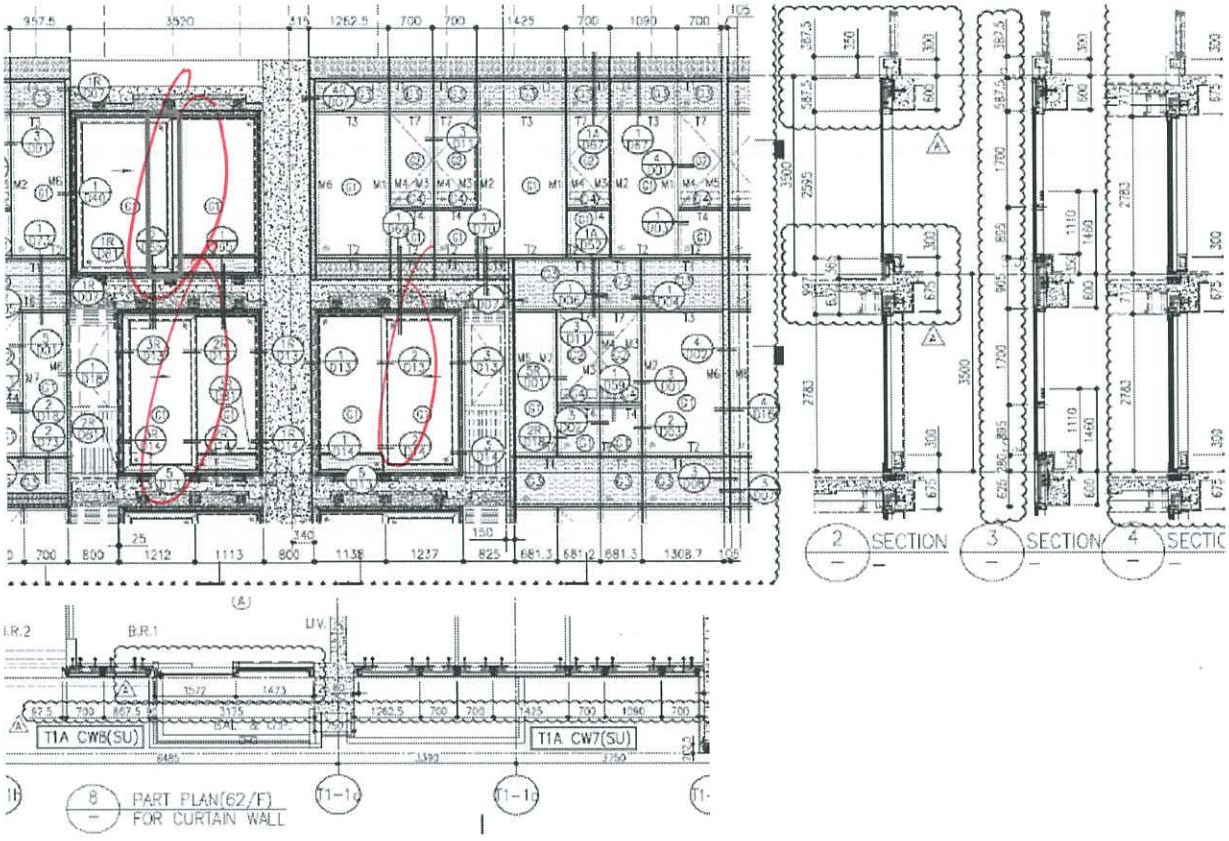
DATE : 22-OCT-21 | SCALE : 1:1(A1)
DRAWN BY : KY | CHECKED BY : YB

美特鋁質有限公司
MIDI ALUMINIUM FABRICATOR LTD.
Units 6-8, Sunray Industrial Centre, 1/F
610 Cha Kwo Ling Road, Kowloon
Tel:23489211-4 Fax:(852)27727666

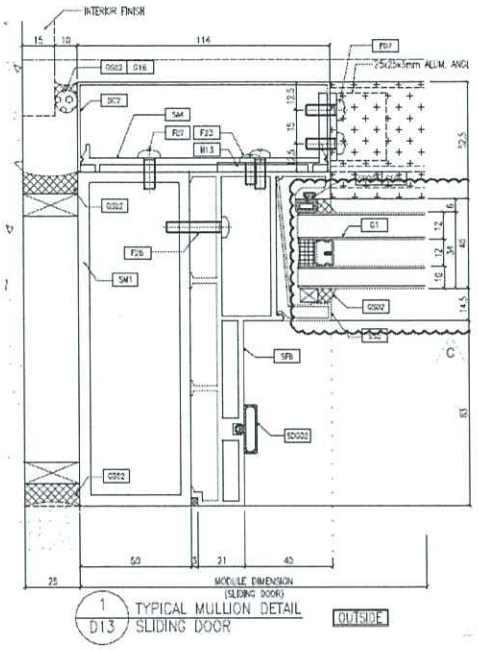
DWG NO. : LP11/002d | REV. : –

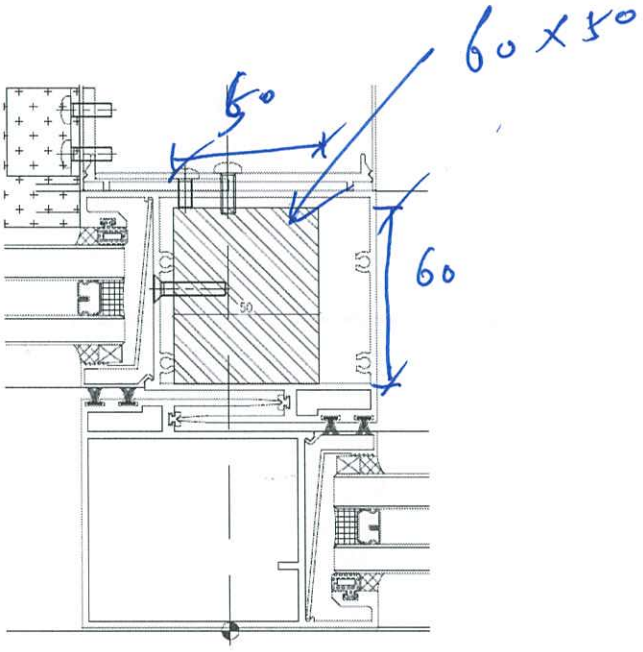
8.1A Check Sliding Door Middle Mullion at penthouse

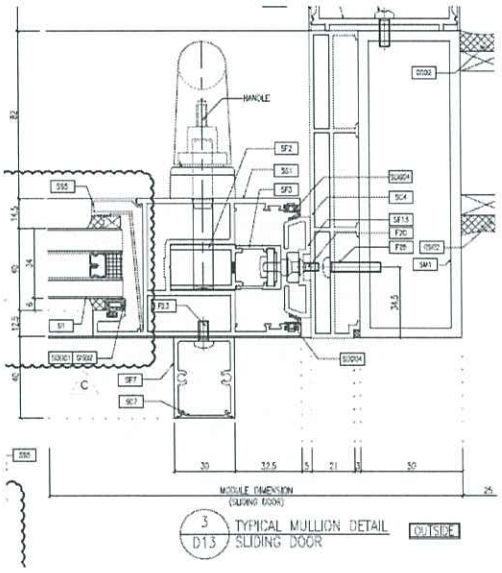
Refer to DWG: J858-CW-PE117



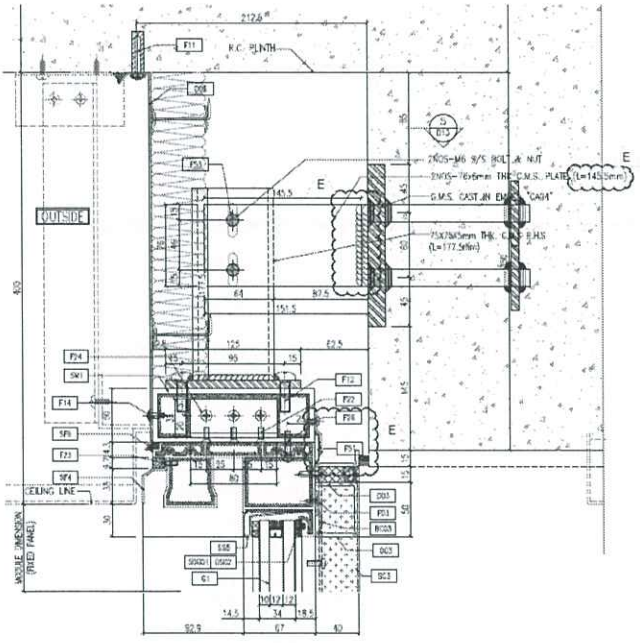
Refer to DWG: J858-CW-D13



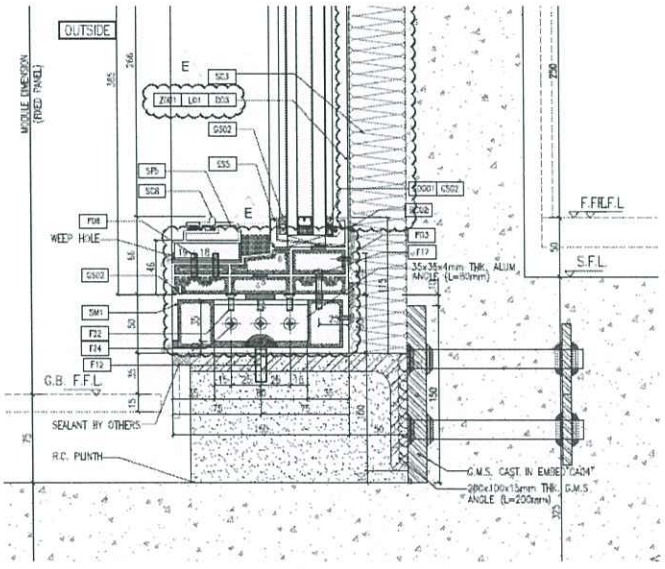




Refer to DWG: J858-CW-D65



1 / D65 TYPICAL TRANSOM DETAIL SLIDING DOOR



Loading Analysis

1.1 Wind Load

Wind load on curtain wall $WL := 4.57KPa$

1.2 Dead Load

Density of glass $D_{gl} = 2650 \cdot kg \cdot m^{-3}$

Gravity density of glass $G_{gl} := D_{gl} \cdot g$ $G_{gl} = 26 \cdot KN \cdot m^{-3}$

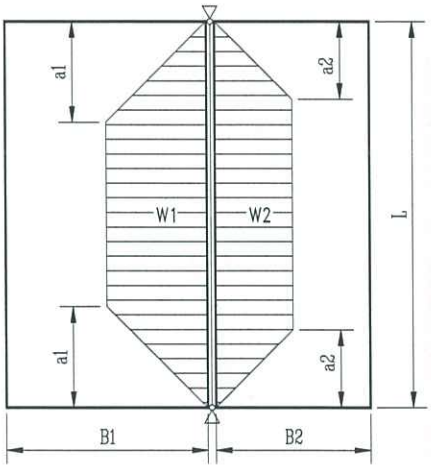
Glass thickness $t_{gl} := 22mm$

Dead load due to glass weight $DL := G_{gl} \cdot t_{gl} \cdot (1 + 10\%)$ $DL = 0.63 \cdot KPa$

(Increasing 10% allowing for weight of frames and other accessories)

1.3 Linear Load on Mullion

Span of mullion $L := 2761mm$



Modulus dimension $B_1 := 1572mm$ $B_2 := 1473mm$

$$a_1 := \frac{\min(L, B_1)}{2} \qquad a_1 = 786 \cdot mm$$

$$a_2 := \frac{\min(L, B_2)}{2} \qquad a_2 = 736.5 \cdot mm$$

Linear load due to wind $q_1 := WL \cdot a_1$ $q_1 = 3.59 \cdot N \cdot mm^{-1}$

$q_2 := WL \cdot a_2$ $q_2 = 3.37 \cdot N \cdot mm^{-1}$

$$M_1 := \frac{q_1 \cdot L^2}{24} \cdot \left(3 - 4 \cdot \frac{a_1^2}{L^2}\right) \qquad M_1 = 3.05 \cdot KN \cdot m$$

$$M_2 := \frac{q_2 \cdot L^2}{24} \cdot \left(3 - 4 \cdot \frac{a_2^2}{L^2}\right) \qquad M_2 = 2.9 \cdot KN \cdot m$$

Maximum bending moment due to wind $M_{max} := M_1 + M_2$ $M_{max} = 5.96 \cdot KN \cdot m$

$$V_1 := \frac{q_1 \cdot L}{2} \cdot \left(1 - \frac{a_1}{L}\right) \qquad V_1 = 3.55 \cdot KN$$

$$V_2 := \frac{q_2 \cdot L}{2} \cdot \left(1 - \frac{a_2}{L}\right) \qquad V_2 = 3.41 \cdot KN$$

Maximum shear force due to wind $V_{max} := V_1 + V_2$ $V_{max} = 6.95 \cdot KN$

Axis load due to weight $P := DL \cdot L \cdot (B_1 + B_2) \cdot 0.5$ $P = 2.64 \cdot KN$

2.0 > Analysis Model

2.1 Material Properties

Alum. alloy condition

$$\begin{pmatrix} p_o \\ p_a \\ p_v \end{pmatrix} := \text{Alum\_Strength}(\text{Alloy\_Condition}) \qquad \text{Alloy\_Condition} = \text{"6063-T6"}$$

Limiting stresses

$p_o = 160 \cdot MPa$ Limiting stress for bending and overall yielding

$p_a = 175 \cdot MPa$ Limiting stress for local capacity of the section in tension or compression

$p_v = 95 \cdot MPa$ Limiting stress in shear

Material properties

$E_{al} = 70000 \cdot MPa$ Young's modulus $\qquad \nu_{al} = 0.33$ Poison's ratio

$$G_{al} := \frac{E_{al}}{2 \cdot (1 + \nu_{al})} \qquad G_{al} = 26316 \cdot MPa$$ Shear modulus

Shape factor

$\gamma_s := 1.2$ The assumed shape factor for closed section = 1.2 is consistent with generally accepted structural and facade engineering principles.

Material factor

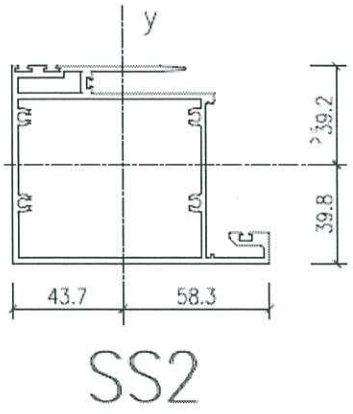
$\gamma_m := 1.2$ [BS8118 Table3.3]

Load factor

$\gamma_f := 1.2$ [BS8118 Table3.1]

2.2 Section Elastic Properties

- *Section Properties of SS2*



SS2

MASS PROPERTIES (UNIT)	VALUES
Area (mm2) :	1082.2
Perimeter (mm) :	937.3
Bounding Box – X (mm):	–43.7 to 58.3
Bounding Box – Y (mm):	–39.8 to 39.2
Centroid – X (mm) :	0.0
Centroid – Y (mm) :	0.0
Moments of inertia – X (mm4) :	986468.9
Moments of inertia – Y (mm4) :	1164232.0
Product of inertia – XY (mm4) :	321844.5
Radii of gyration – X (mm) :	30.2
Radii of gyration – Y (mm) :	32.8
Principal moments along X–Y (mm4) :	741458.5 along [0.8 –0.6]
Principal moments along Y–X (mm4) :	1409242.4 along [0.6 0.8]
Elastic Modulus – Zx (mm3):	I / y-max= 24774.6
Elastic Modulus – Zy (mm3):	J / x-max= 19963.8
Aluminium Weight (kg/m)	2.935
Steel Weight (kg/m)	8.495

MALE MULLION:

Section Area $A_m := 1082.2mm^2$

Moment Inertia(X-X) $I_{x\_m} := 986468.9mm^4$

Moment Inertia(Y-Y) $I_{y\_m} := 1164232mm^4$

Elastic Modulus(X-X) $Z_{x\_m} := 24774.6mm^3$

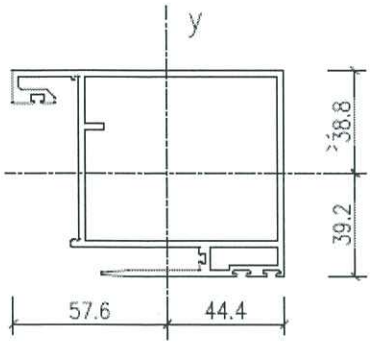
Elastic Modulus(Y-Y) $Z_{y\_m} := 19963.8mm^3$

Plastic Modulus(X-X) $S_{x\_m} := 1.2 \cdot Z_{x\_m}$ $S_{x\_m} = 29729.52 \cdot mm^3$

Plastic Modulus(Y-Y) $S_{y\_m} := 1.2 \cdot Z_{y\_m}$ $S_{y\_m} = 23956.56 \cdot mm^3$

Radii of Gyration(X-X) $r_{x\_m} := I_{x\_m}^{0.5} \cdot A_m^{-0.5}$ $r_{x\_m} = 30.19 \cdot mm$

Radii of Gyration(Y-Y) $r_{y\_m} := I_{y\_m}^{0.5} \cdot A_m^{-0.5}$ $r_{y\_m} = 32.8 \cdot mm$



SM2

MASS PROPERTIES (UNIT)	VALUES
Area (mm²) :	1024.2
Perimeter (mm) :	874.1
Bounding Box – X (mm):	−57.6 to 44.4
Bounding Box – Y (mm):	−39.2 to 38.8
Centroid – X (mm) :	0.0
Centroid – Y (mm) :	0.0
Moments of inertia – X (mm⁴) :	940697.5
Moments of inertia – Y (mm⁴) :	1087216.3
Product of inertia – XY (mm⁴) :	327480.9
Radii of gyration – X (mm) :	30.3
Radii of gyration – Y (mm) :	32.6
Principal moments along X–Y (mm⁴) :	678381.8 along [0.8 −0.6]
Principal moments along Y–X (mm⁴) :	1349532.0 along [0.6 0.8]
Elastic Modulus – Zx (mm³):	I / y-max= 24021.3
Elastic Modulus – Zy (mm³):	J / x-max= 18859.8
Aluminium Weight (kg/m)	2.778
Steel Weight (kg/m)	8.040

Section Size

Section Area $A_f := 1024.2mm^2$

Moment Inertia(X-X) $I_{x\_f} := 940697.5mm^4$

Moment Inertia(Y-Y) $I_{y\_f} := 1087216.3mm^4$

Elastic Modulus(X-X) $Z_{x\_f} := 24021mm^3$

Elastic Modulus(Y-Y) $Z_{y\_f} := 18859.8mm^3$

Plastic Modulus(X-X) $S_{x\_f} := \gamma_s \cdot Z_{x\_f}$

Plastic Modulus(Y-Y) $S_{y\_f} := \gamma_s \cdot Z_{y\_f}$

Radii of Gyration(X-X) $r_{x\_f} := I_{x\_f}^{0.5} \cdot A_f^{-0.5}$ $r_{x\_f} = 30.31 \cdot mm$

Radii of GyrationY-Y) $r_{y\_f} := I_{y\_f}^{0.5} \cdot A_f^{-0.5}$ $r_{y\_f} = 32.58 \cdot mm$

Young's modulus $E_{al} = 70000 \cdot MPa$

Depth of GMS Reinforcement $b := 60mm$

Thk of GMS Reinforcement $t := 50mm$

Section Area $A_s := b \cdot t = 3000\,mm^2$

Moment Inertia(X-X) $I_{x\_s} := \frac{b^3 \cdot t}{12} = 900000 \cdot mm^4$

$Z_{x\_s} := \frac{b^2 \cdot t}{6} = 30000 \cdot mm^3$

Young's modulus $E_{st} = 205000 \cdot MPa$

- ***Section Properties of Mullion***

Moment Inertia(X-X) $I_x := I_{x\_m} + I_{x\_f} + I_{x\_s} \cdot \frac{E_{st}}{E_{al}}$ $I_x = 4562880.69 \cdot mm^4$

Load share factor (male) $\eta_m := \frac{I_{x\_m}}{I_x}$ $\eta_m = 0.22$

Load share factor (female) $\eta_f := \frac{I_{x\_f}}{I_x}$ $\eta_f = 0.21$

Load share factor (GMS) $\eta_s := 1 - \eta_m - \eta_f$ $\eta_s = 0.58$

3.0 > Check Deflection

Deflection due to wind $\delta_1 := \frac{q_1 \cdot L^4}{240 \cdot E_{al} \cdot I_x} \cdot \left[\frac{25}{8} - 5 \cdot \left(\frac{a_1}{L} \right)^2 + 2 \cdot \left(\frac{a_1}{L} \right)^4 \right]$ $\delta_1 = 7.44 \cdot mm$

Deflection due to wind $\delta_2 := \frac{q_2 \cdot L^4}{240 \cdot E_{al} \cdot I_x} \cdot \left[\frac{25}{8} - 5 \cdot \left(\frac{a_2}{L} \right)^2 + 2 \cdot \left(\frac{a_2}{L} \right)^4 \right]$ $\delta_2 = 7.09 \cdot mm$

Max.deflection $\delta_{max} := \delta_1 + \delta_2$ $\delta_{max} = 14.53 \cdot mm$

The allowable deflection $\delta_{lim} := \min\left(\frac{L}{180}, 20mm \right)$ $\delta_{lim} = 15.34 \cdot mm$

Check deflection $\boxed{\text{HENCE}(\delta_{max} < \delta_{lim}) = \text{"OK,PASS!"}}$

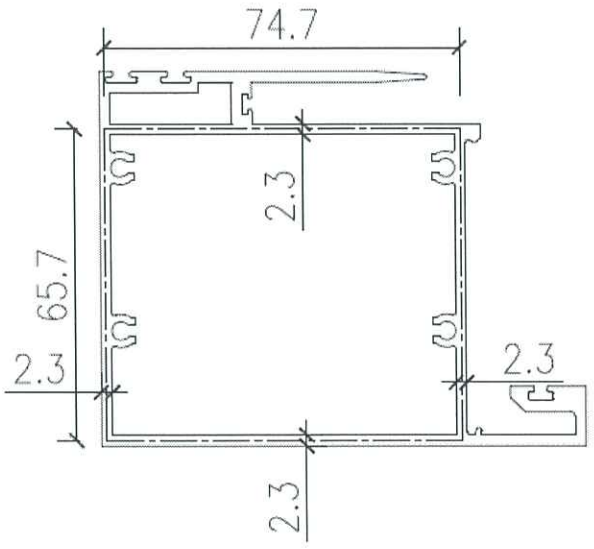
4.0 > Check Strength

Maximum bending moment $M_{max} = 5.96 \cdot KN \cdot m$

Maximum shear force $V_{max} = 6.95 \cdot KN$

Maximum axial force $P = 2.64 \cdot KN$

Load share factor $\eta_m = 0.22$ $\eta_f = 0.21$



$$t_{tub\_m} := \begin{pmatrix} 2.3 \\ 2.3 \\ 2.3 \\ 2.3 \end{pmatrix} \cdot mm \quad d_{tub\_m} := \begin{pmatrix} 74.7 \\ 65.7 \\ 74.7 \\ 65.7 \end{pmatrix} \cdot mm$$

Area enclosed by mean perimeter

$A_{male} := 74.7mm \cdot 65.7mm$

Calculation Torsional Constant

$$J_m := \frac{4 \cdot A_{male}^{\ 2}}{\sum \left(\frac{d_{tub\_m}}{t_{tub\_m}} \right)}$$

$J_m = 789155.6 \cdot mm^4$

4.1 Check Male Mullion

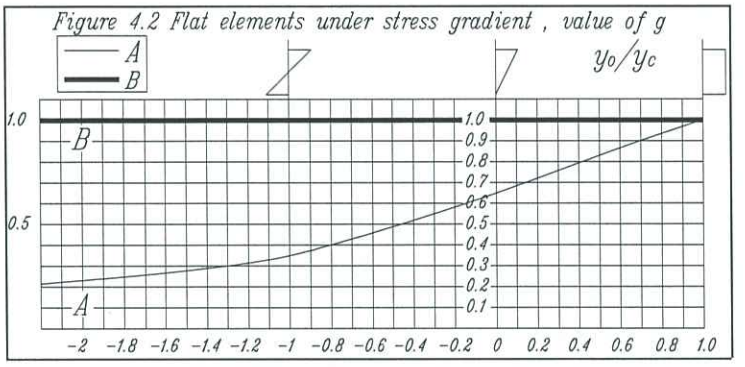
- ***Load Shared by Male Mullion***

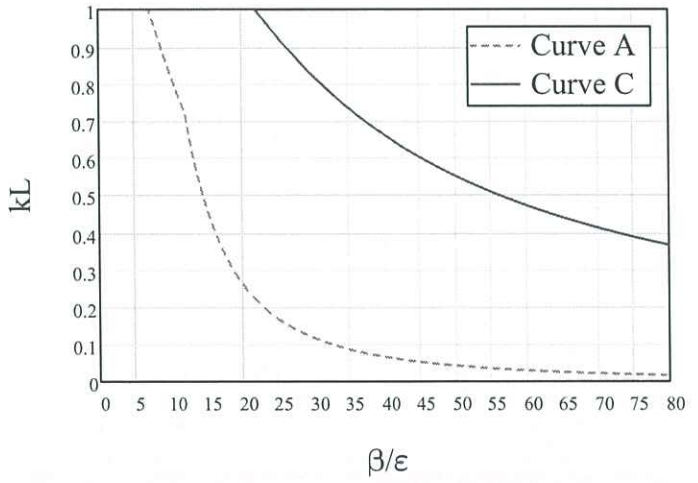
Load share factor	$\eta_m = 0.22$	
Maximum bending moment	$M_x := \eta_m \cdot M_{max}$	$M_x = 1.29 \cdot KN \cdot m$
Maximum shear force	$F_{sy} := V_{max}$	$F_{sy} = 6.95 \cdot KN$
Maximum axial force	$P_a := \eta_m \cdot P$	$P_a = 0.57 \cdot KN$

- ***Section Classification***

BS 8118. 1991 Table 4.3 Limiting Values of β					Where:
Elements	β_0		β_1		$\varepsilon=(250/p_o)^{0.5}$
	Unwelded	Welded	Unwelded	Welded	p_o =Limiting Stress(N/mm2)
Outstand Elements	7ε	6ε	6ε	5ε	
Internal Elements	22ε	18ε	18ε	15ε	

Alloy_Condition = "6063-T6" $p_o = 160 \cdot MPa$ $\varepsilon := (250MPa)^{0.5} \cdot p_o^{-0.5}$ $\varepsilon = 1.25$





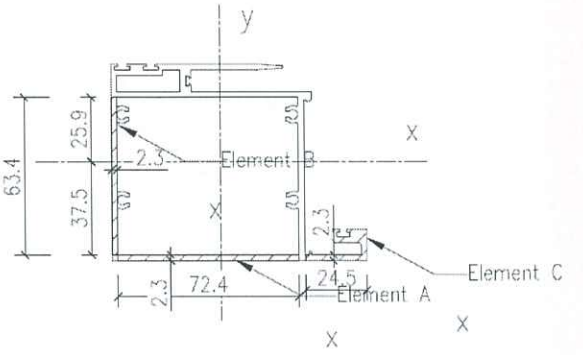


Figure 4.5 Local buckling factor kL