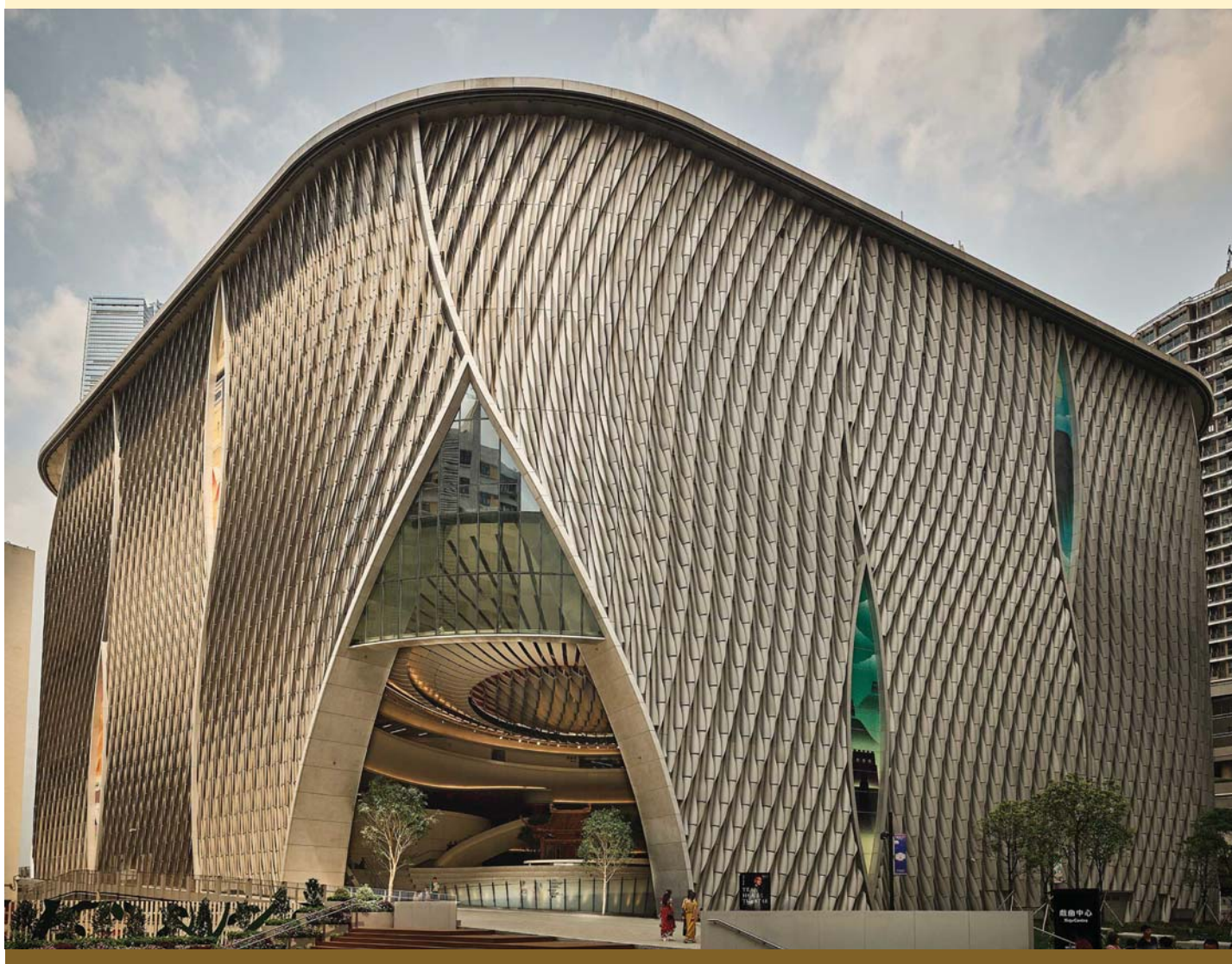


REBARDEK® 威鋼迪

Design to BS 5950-4/6/7/8

混凝土組合樓承板

Profile steel decking system



建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

REBARDEK® 威鋼迪

目錄 Contents

1 .	產品簡介 Products	1
2 .	設計說明 Design	3
3 .	設計材料 Materials	3
4 .	施工階段設計 Construction Stage Design	4
5 .	組合階段設計 Combination Stage Design	9
6 .	性能介紹 Performance	11
7 .	安裝配件 Accessories	18
8 .	典型節點 Typical Details	19
9 .	工程案例 Reference	21

產品簡介 1 . Products

產品簡介

1 . Products

縮口型樓承板：威鋼迪 50-600
Reentrant type Steel Decking : REBARDEK 50-600



REBARDEK 威鋼迪樓承板採用了縮口型的板肋設計，具有較大的結構剛度，主要應用於鋼結構建築的複合混凝土樓板，樓承板可以替代受拉鋼筋和當為鋼模板用途，在相同的設計要求下，可以節省鋼筋和混凝土的用量，無需拆卸及裝置臨時支撐，而且可以多層樓面同時施工，大大降低了工程綜合造價，縮短了施工進度；

樓承板底面易於加裝鋪設保溫隔熱、吸音材料及天花裝飾等；

樓承板產品可選配使用彩塗鋼板作為加工材料，直接減省額外的天花吊頂，既經濟又美觀。

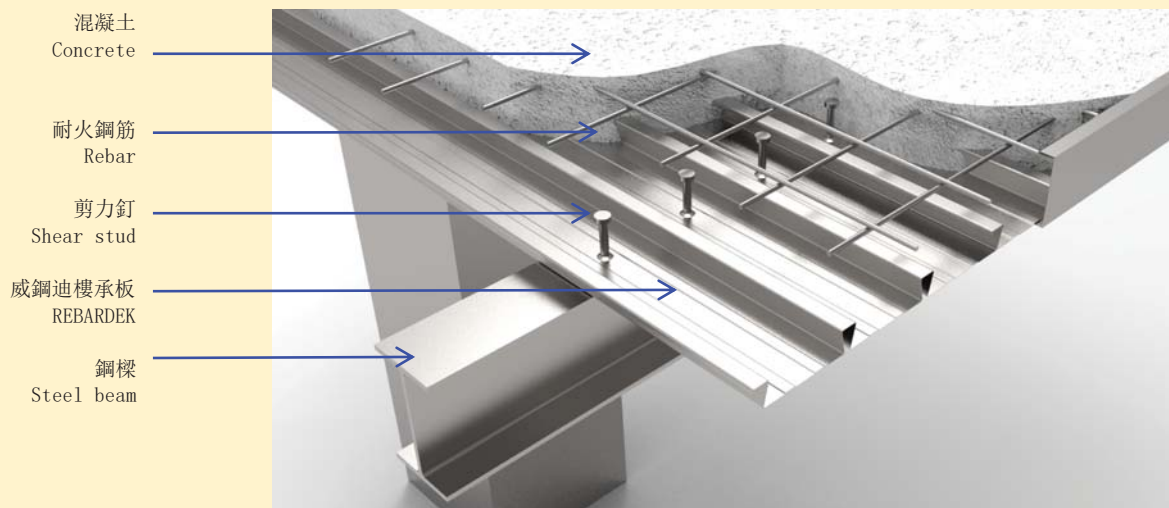
REBARDEK steel decking adopts a Reentrant type rib design, which has greater structural rigidity. It is mainly used in composite concrete floors of steel structure buildings. Steel decking can replace the role of tensile steel bars and as steel formwork. Under the same design requirements, the consumption of steel bars and concrete is saved, and there is no need to dismantle and install temporary supports, and multiple floors can be constructed at the same time, which greatly reduces the overall cost of the project and shortens the construction schedule;

The bottom surface of the REBARDEK steel decking is easy to install and lay thermal insulation, sound-absorbing materials and other ceiling decoration;

REBARDEK steel decking products can use color-coated steel plates as raw materials, which directly saves additional ceilings, which is both economical and beautiful.

威鋼迪樓板構造

REBARDEK Steel Decking Structure



建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

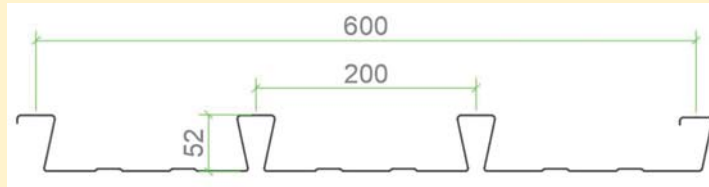
P&L 百安力

www.baianli.com.hk

產品簡介

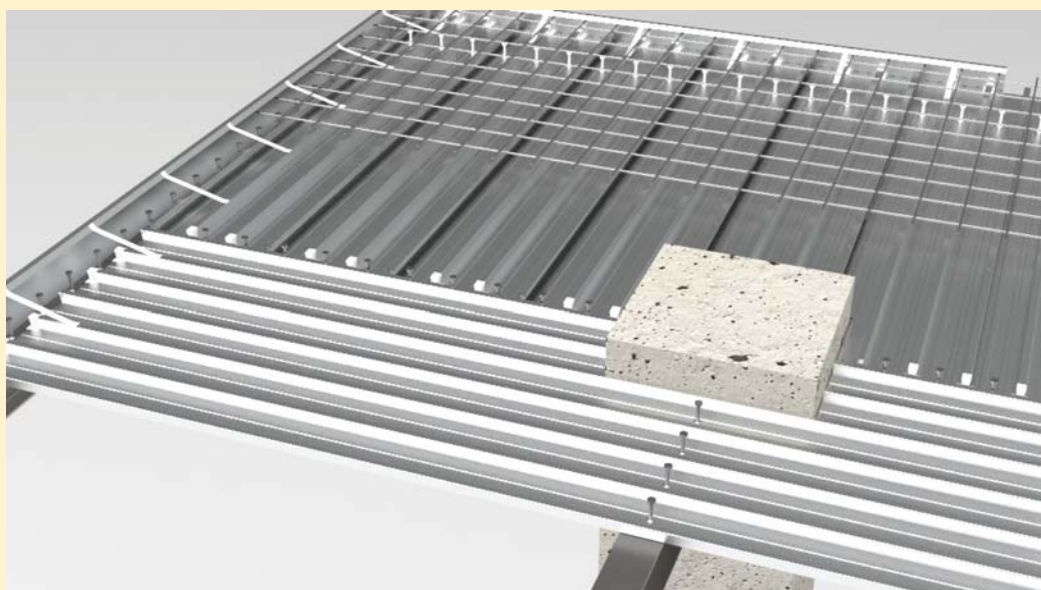
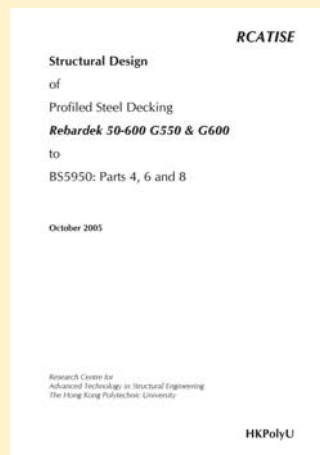
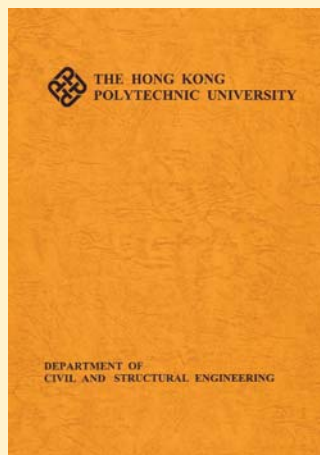
1. Products

REBARDEK 威鋼迪規格:
Product Specifications:



厚度 Thickness	鍍層 Coating	材質 Grade	塗層 Colour - Optional
0.75 / 1.0	Z275 / Z350 / ZM275	G 550 / G 600	靚塗 HDPE Coating
1.2	Z275 / Z350 / ZM275	G 550 / G 600	靚塗 HDPE Coating

REBARDEK 威鋼迪BS EN認證
REBARDEK BS EN certification



建築金屬 圍護系統服務

設計說明 2 . Design

設計說明

2 . Design

- 2.1 壓型鋼承板的設計是遵照英標BS5950: 第6章: 1995年“輕型壓型鋼承板設計實用規範”。
The design of the profiled steel decking is in accordance with BS5950:Part6:1995 ‘Code of practice for design of light gauge profiled steel sheeting’ .
- 2.2 複合樓板設計是遵照英標BS5950: 第四章: 1994年“壓型鋼承板複合樓板設計實用規範”。
The design of the composite slabs with profiled steel decking is in accordance with BS5950:Part4:1994 ‘Code of practice for design of composite slabs with profiled steel sheeting’ .
- 2.3 複合樓板的耐火極限狀態設計是遵照音標BS5950: 第8章: 2003“壓型鋼承板合樓板耐火設計實用規範”, 耐火期限分別為1小時, 1.5小時, 2小時和3小時。
Refractory composite floor limit state design is in accordance with phonetic BS5950: Chapter 8: 2003 “press fit bearing plate steel floor fire-resistant design of practice,” refractory period shall be 1 hour, 1.5 hours, 2 hours and 3 hours.
- 2.4 複合樓板的耐火設計是按照“英國鋼鐵建築協會”的出版刊物提供的公式嚴格推導出來的: 複合樓板的耐火能力, SCI-P056. 1991年第二版鋼鐵建築的耐火設計手冊根據英標BS5950第8章SCI-P080, 1990。
Composite decking system fire-resistant design is in accordance with the formula “British Steel Construction Association/ the publication provided strictly deduced: composite slab fire resistance, SCI-P056.1991 second edition. Steel Building Design Manual fire according to the British standard BS5950 Chapter 8 SCI-P080.1990.
- 2.5 在計算壓型鋼承板的截面特性時需考慮以下兩個方面:
In calculating the pressure bearing plate steel section properties, two aspects should be considered:
A. 壓力作用下翼緣的縱向彎曲以及彎曲作用下腹板的變形。
Under pressure flange buckling and bending deformation in webs.
B. 壓型鋼承板在上撓彎矩作用下的塑性變形。
Pressure steel plate bearing on the flexible plastic deformation at the moment.
- 2.6 壓型鋼承板截面性質和截面能力的測定均遵照英標BS5950: 第6章。
Section properties and determining the ability of pressure sectional steel carrier plate are in accordance with the British Standard BS5950: Chapter 6.
- 2.7 物理測試能獲得截面性能和能力的數據, 詳細數據請參照“壓型鋼承板測試威鋼迪50-600遵照英標BS5950 第6章995”。2005年9月。統計分析和標準化後壓型鋼承板截面性能的測試數據從技術報告中抽出作比較。
Processing test data to obtain cross-sectional performance and capacity, detailed data refer to “profiled steel plate for testing in accordance with British Standard BS5950 Rebardek 50-600 Chapter 6 995.” September 2005. Test data statistical analysis and standardized profiled steel plate for sectional properties extracted from a technical report for comparison.

材料設計

3 . Materials design

REBARDEK 50-600	基材厚度 Thickness (mm)	屈服強度 Yield strength Py N/mm ²	樓板厚度 Slab thickness	剪力粘結失效參數 Shear Bond Failure Parameter		最大施加荷載 Maximum Load kPa
				Mr	Kr	
	0.75	550	125 ~ 250	204	0.08	10
	1.0			222	0.08	
	1.2			222	0.08	

建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

P&L  百安力

www.baianli.com.hk

#VALUE!

施工階段設計 4 . Construction Design

施工階段設計

4 . Construction Design

◆、壓型鋼承板施工階段設計考慮：

The requirement and some matters need attention for profiled steel decking in construction:

- 1) 抗彎矩能力
Bending Capacity
- 2) 腹板抗屈曲能力
Web crushing resistance
- 3) 腹板抗剪能力
Web shear capacity
- 4) 同時考慮抗彎和抗屈曲
Combined bending and crushing
- 5) 同時考慮抗彎和抗剪
Combined bending and shear
- 6) 撓度
Deflection



◆、在英國標準 BS5950 第4章5.3條中指出的：壓型鋼承板的撓度極限是跨距的1/130，但不能超過30mm（考慮到圍水養護）。

As the British standard BS 5950: noted in Chapter 4, 5.3: The ultimate compressive deflection steel carrier plate is span / 130 but not more than 30mm (taking into account the surrounding water conservation).

◆、邊緣和中間的支撐長度最小分別是：50mm, 100mm。

Edges and in the middle of the length of the minimum support are: 50mm, 100mm.

設計荷載

4 . 1 Design Load

設計荷載 Design Load	荷載系數 Load Factor	設計值 Design value	
		最小 Minimum	
施工荷載 Construction load	1.6(max)	最小 Minimum	1.5 kN/m ²
		If Lp < 3m (Lp is the span of decking)	4.5/Lp kN/m ²
		最大 Maximum	3.0 kN/m ²
堆壓荷載 Storage load	1.6(max)		3.1 kN/m ²
恆荷載 Dead load	1.0(min) 1.4(max)	建築混凝土自重 Self weight of concrete	23.5 kN/m ³
		鋼承板自重 Self weight of profiled steel decking	78.5 kN/m ³
		t = 0 . 75 mm	0.980 kN/m ²
		t = 1 . 0 mm	0.131 kN/m ²
		t = 1 . 2 mm	0.157 kN/m ²

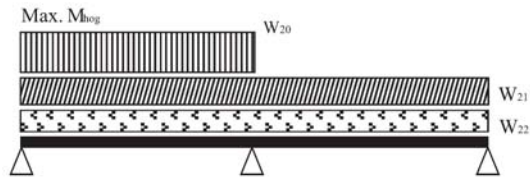
建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

施工階段設計 4 . Construction Design

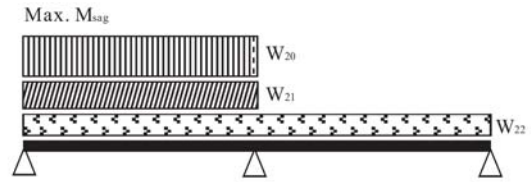
施工階段的設計系數

4 . 2 Design coefficient in construction stage



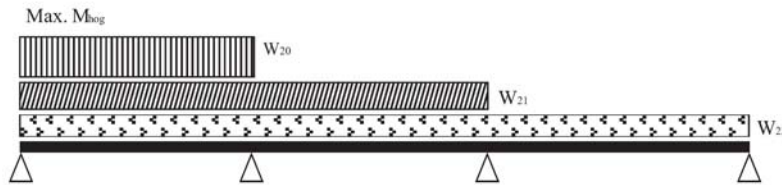
最大正彎矩組合
Maximum Positive Moment Combination

最大正彎矩 $Max. M_{sag} = 0.096W_{20} + 0.096W_{21} + 0.070W_{22}$
 最大負彎矩 $Max. M_{hog} = 0.063W_{20} + 0.125W_{21} + 0.125W_{22}$



最大負彎矩組合
Maximum Negative Moment Combination

最大剪力 $Max. V = 0.562W_{20} + 0.625W_{21} + 0.625W_{22}$
 最大支座反力 $Max. R = 0.625W_{20} + 1.250W_{21} + 1.250W_{22}$



最大正彎矩組合
Maximum Positive Moment Combination



最大負彎矩組合
Maximum Negative Moment Combination

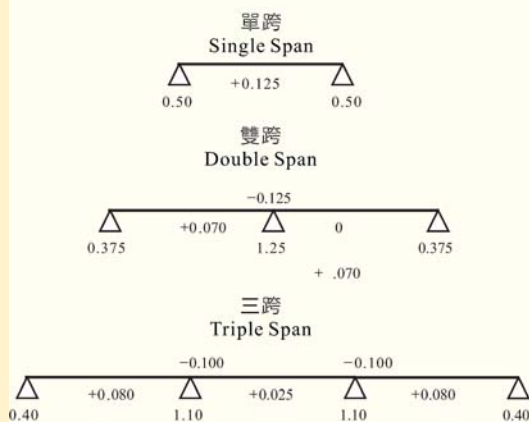
最大正彎矩 $Max. M_{sag} = 0.094W_{20} + 0.094W_{21} + 0.080W_{22}$
 最大負彎矩 $Max. M_{hog} = 0.067W_{20} + 0.117W_{21} + 0.100W_{22}$

最大剪力 $Max. V = 0.567W_{20} + 0.617W_{21} + 0.600W_{22}$
 最大支座反力 $Max. R = 0.650W_{20} + 1.200W_{21} + 1.100W_{22}$

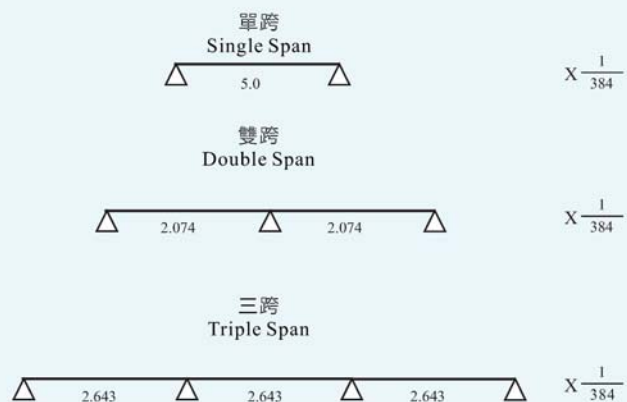
注釋 Notes:

- $W_{20} = 1.6 \times 2/3 LL_{Const}$
- $W_{21} = 1.4 DL_{Const} + 1.6 \times 1/3 LL_{Const}$
- $W_{22} = 1.4 DL_{deck}$

彎矩與支座反力系數 Bending Moment And Shear Force Coefficients



撓度係數 Deflection Coefficients

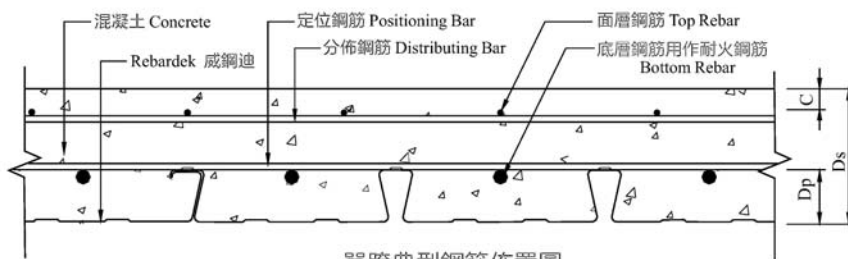


建築金屬 圍護系統服務

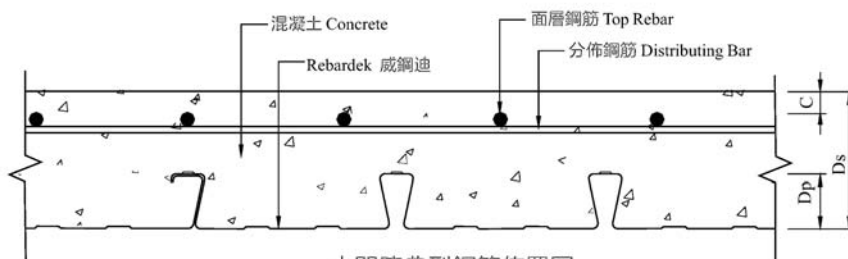
施工階段設計 4 . Construction Design

典型鋼筋佈置圖

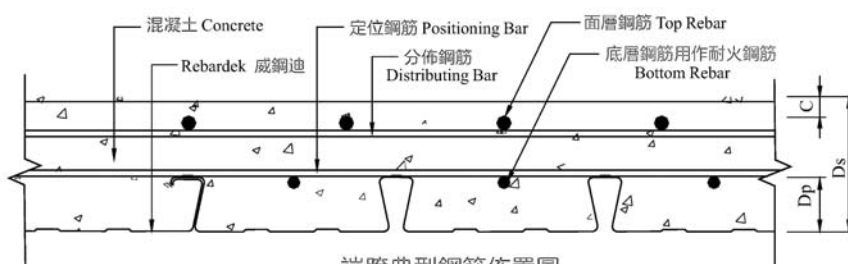
4 . 3 Typical Reinforcement Layout



單跨典型鋼筋佈置圖
Typical rebar layout for single span



中間跨典型鋼筋佈置圖
Typical rebar layout for internal span



端跨典型鋼筋佈置圖
Typical rebar layout for end span

REBARDEK 50-600 截面特性

4 . 4 Section Properties

設計強度 Design strength P_y	基材厚度 Metal thickness	抗翹曲彎矩能力 Hogging moment capacity	抗下垂彎矩能力 Sagging moment capacity	抗腹板屈曲能力 Web crushing resistance	次彎矩面積 Second moment of area					
					總面積 Gross area	總計 Gross I_g	下垂彎曲 Sagging moment I_s	翹曲彎曲 Hogging moment I_h	單跨 Single span $(I_g+I_s)/2$	多跨 Multiple span $(2I_g+I_s+I_h)/4$
(N/mm^2)	(mm)	(kNm/m)	(kNm/m)	(mm^3/m)	A_p (mm^2/m)	I_g (mm^4/m)	I_s (mm^4/m)	I_h (mm^4/m)	I_{sv} (mm^4/m)	I_{av} (mm^4/m)
550	0.75	5.12	4.4	52.24	1212	44.18	42.43	29.91	43.31	40.18
	1	7.7	7.62	95.9	1614	58.25	58.25	43.46	58.25	54.55
	1.2	10.15	9.67	136.6	1934	69.27	69.27	54.57	69.27	65.60
600	0.75	5.88	4.84	56.98	1212	44.18	44.18	29.45	44.18	40.50
	1	8.4	8.31	104.62	1614	58.25	58.25	42.88	58.25	54.41
	1.2	11.07	10.55	149.02	1934	69.27	69.27	53.9	69.27	65.43

建築金屬 圍護系統服務

P&L 百安力

SOLUTION Provider of Metal Building Envelope

www.baianli.com.hk

施工階段設計

4 . Construction Design

荷載与跨度使用表

4 . 5 Load Span Table

用作施工複合板的荷載跨度使用表

Load span tables for construction and composite stages

0.75mm REBARDEK G550

Single span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	2365	2365	2365	2365	2335
125	2185	2185	2185	2185	2185
150	2045	2045	2045	2045	2045
175	1930	1930	1930	1930	1930
200	1835	1835	1835	1835	1835
225	1750	1750	1750	1750	1750
250	1680	1680	1680	1680	1680

Double span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	2750	2750	2750	2545	2335
125	2470	2470	2470	2470	2470
150	2255	2255	2255	2255	2255
175	2085	2085	2085	2085	2085
200	1945	1945	1945	1945	1945
225	1825	1825	1825	1825	1825
250	1725	1725	1725	1725	1725

Triple span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	2835	2835	2830	2545	2335
125	2545	2545	2545	2545	2545
150	2325	2325	2325	2325	2325
175	2150	2150	2150	2150	2150
200	2005	2005	2005	2005	2005
225	1885	1885	1885	1885	1885
250	1780	1780	1780	1780	1780

Notes: 1) Internal bearing length, N_b = 100 mm (minimum).

2) A superimposed dead load, W_{SDL}, of 4.2 kPa is included in the calculation.

建築金屬 圍護系統服務

施工階段設計

4 . Construction Design

荷載与跨度使用表

4 . 5 Load Span Table

用作施工複合板的荷載跨度使用表

Load span tables for construction and composite stages

1. 0mm REBARDEK G550

Single span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	2975	2975	2975	2975	2935
125	2790	2790	2790	2790	2790
150	2640	2640	2640	2640	2640
175	2520	2520	2520	2520	2520
200	2415	2415	2415	2415	2415
225	2330	2330	2330	2330	2330
250	2255	2255	2255	2255	2255

Double span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	3545	3545	3545	3200	2935
125	3275	3275	3275	3275	3275
150	3055	3055	3055	3055	3055
175	2840	2840	2840	2840	2840
200	2655	2655	2655	2655	2655
225	2500	2500	2500	2500	2500
250	2365	2365	2365	2365	2365

Triple span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	3630	3630	3555	3200	2935
125	3360	3360	3360	3360	3275
150	3140	3140	3140	3140	3140
175	2930	2930	2930	2930	2930
200	2740	2740	2740	2740	2740
225	2580	2580	2580	2580	2580
250	2445	2445	2445	2445	2445

Notes: 1) Internal bearing length, N_b = 100 mm (minimum).

2) A superimposed dead load, W_{SDL}, of 4.2 kPa is included in the calculation.

建築金屬 圍護系統服務

施工階段設計

4 . Construction Design

荷載与跨度使用表

4 . 5 Load Span Table

用作施工複合板的荷載跨度使用表

Load span tables for construction and composite stages

1. 2mm REBARDEK G550

Single span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	3135	3135	3135	3135	3135
125	2940	2940	2940	2940	2940
150	2785	2785	2785	2785	2785
175	2660	2660	2660	2660	2660
200	2555	2555	2555	2555	2555
225	2465	2465	2465	2465	2465
250	2385	2385	2385	2385	2385

Double span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	4055	4010	3695	3410	3195
125	3755	3755	3755	3755	3585
150	3510	3510	3510	3510	3510
175	3310	3310	3310	3310	3310
200	3135	3135	3135	3135	3135
225	2990	2990	2990	2990	2990
250	2845	2845	2845	2845	2845

Triple span

D _{cs} (mm)	Formwork	Imposed load, W _{IL} (kPa)			
		3.0	5.0	7.5	10.0
100	3850	3850	3695	3410	3195
125	3615	3615	3615	3615	3585
150	3430	3430	3430	3430	3430
175	3275	3275	3275	3275	3275
200	3145	3145	3145	3145	3145
225	3035	3035	3035	3035	3035
250	2940	2940	2940	2940	2940

Notes: 1) Internal bearing length, N_b = 100 mm (minimum).

2) A superimposed dead load, W_{SDL}, of 4.2 kPa is included in the calculation.

建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

組合階段設計 5 . Combination Design

組合階段設計

5 . Combination Design

◆、壓型鋼承板組合階段設計考慮：

The requirement and some matters need attention for profiled steel decking in combination design:

- 1) 抗彎矩能力
Bending Capacity
- 2) 抗縱向滑移能力
Slippage resistance
- 3) 腹板抗剪能力
Web shear capacity
- 4) 支撐處抗剪能力
Shear capacity at the support
- 5) 撓度
Deflection



◆、混凝土的等級為C30，恆載中鋼筋混凝土的容重為23.5kN/m³，鋼筋設計強度為460N/mm²。

The concrete is Grade C30, the unit weight of reinforced concrete in dead load is 23.5kN/m³ and the reinforcement design strength is 460N/mm²,

◆、合板按簡支設計，不考慮壓型鋼承板在支撐處的連續性。支撐處的防開裂構造鋼筋和橫向鋼筋的排布分別與英標BS5950：第4章6.7, 6.8, 6.9條相一致。

Plywood in accordance with the simple design, regardless of the pressure-type steel bearing plate at the support of the continuity. The arrangement of the anti-cracking structural reinforcement and transverse reinforcement at the support is in accordance with BS5950: Chapter 4, 6.7, 6.8 and 6.9, respectively.

◆、對於上撓的混凝土，需要25mm的覆蓋層。

For upturned concrete, a 25 mm overlay is required.

◆、邊緣和中間的支撐長度最小分別是：50mm, 100mm。

The minimum length of the edge and the middle support are: 50mm, 100mm.

設計荷載

5 . 1 Design Load

設計荷載 Design Load	荷載系數 Load Factor	設計值 Design value	
恆荷載 Dead load	1.0(min) 1.4(max)	鋼筋混凝土自重 Self weight of	23.5 kN/m ³
		樓承板自重 Self weight of profiled	78.5 kN/m ³
		t = 0.75 mm	0.980 kN/m ²
		t = 1.0 mm	0.131 kN/m ²
分層恆荷載 Superimposed dead load W _{SP} L	1.0(min) 1.4(max)	隔牆 Partition	2.5 kN/m ²
		找平層與地面 Screedings	1.2 kN/m ²
		吊掛荷載 Services	0.5 kN/m ²
		合計 Total	4.2 kN/m ²
施加荷載 Imposed load W _I L	1.0(min) 1.6(max)	施加荷載允許值 Imposed load allowances	3.0 kN/m ²
			5.0 kN/m ²
			7.5 kN/m ²
			10 kN/m ²

建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

性能介紹 6 . Performance

性能介紹-耐腐蝕

6 . 1 Performance - Corrosion Resistance

6.1.1

◆、組合樓板的耐腐蝕性能

設計複合樓板時，要保證壓型鋼板在使用年限內不會被腐蝕，REBARDEK 威鋼迪採用優質的鍍鋅鋼板，具有優秀的抗腐蝕能力。

REBARDEK has good corrosion resistance capacity by using excellent galvanized steel to ensure that the profiled steel will not be corroded in the service life.

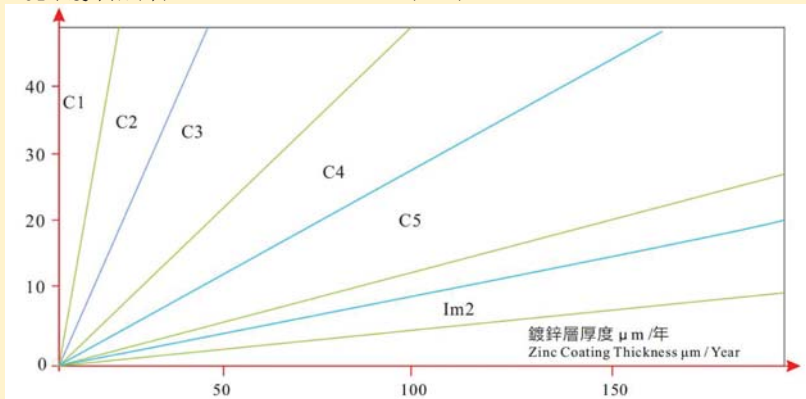
6.1.2

◆、環境種類、腐蝕風險和腐蝕速率 Environment, corrosion risk and corrosion rate

ISO 14713-1 General principles of design and corrosion resistance / GB/T 19355.1-2016

C 腐蝕等級 - 腐蝕水平 Zinc Corrosion Rate $r_{corr}/(\mu\text{m/a})$	典型環境 Typical environments (examples)	
	室內 Internal	室外 External
C1- 很低 Very Low $r_{corr} \leq 0.1$	有採暖的, 溫度相對較低, 如辦公室, 學校, 博物館 Heated spaces with low relative humidity and insignificant pollution, e.g. offices, schools, museums	乾燥或寒冷地區污染非常低, 少凝露的大氣環境, 如沙漠, 南北極中心區 Dry or cold areas with very low pollution and less condensation, such as deserts, South/Arctic
C2- 低 Low $0.1 < r_{corr} \leq 0.7$	無採暖的, 溫度有變化, 相對潮濕, 較少產生凝露, 如倉庫, 體育館 Unheated spaces with varying temperature and relative humidity. Low frequency of condensation and low pollution, e.g. storage, sport halls	溫帶氣候區, 污染較低 ($\text{SO}_2 < 5\mu\text{g}/\text{m}^2$) 的大氣環境, 如農村, 小城鎮 Temperate climate zone, atmospheric environment with low pollution ($\text{SO}_2 < 5\mu\text{g}/\text{m}^2$), such as rural areas, small towns
C3- 中等 Medium $0.7 < r_{corr} \leq 2$	有時產生凝露, 受中度污染, 如食品廠, 洗衣房 Spaces with moderate frequency of condensation and moderate pollution from production process, e.g. food-processing plants, laundries, breweries, dairies	溫帶氣候區, 中等污染, 有氯化物影響的, 如市區, 部分沿海地區 Temperate climate zone, moderate pollution, chloride influence, such as urban areas, some coastal areas
C4- 高 High $2 < r_{corr} \leq 4$	經常產生凝露, 有高度污染, 如工業生產廠房, 游泳池 Condensation often occurs, with high pollution, such as industrial production plants, swimming pools	溫帶氣候區, 高污染, 較多氯化物影響的, 如污染的工業區, 平靜海灘 Temperate climate zone, high pollution, high chloride influence, such as polluted industrial area, calm beach
C5- 很高 Very high $4 < r_{corr} \leq 8$	凝露非常頻繁, 受高度污染 Condensation is very frequent and highly polluted	溫帶亞熱帶地區, 嚴重污染, 且有嚴重氯化物影響的, 如重工業區, 沿海海灘 Temperate and subtropical regions, heavily polluted, and severely affected by chlorides, such as heavy industrial areas, coastal beaches
CX- 極高 Extreme $8 < r_{corr} \leq 25$	長時間冷凝或暴露於極端溫度影响和高污染的 prolonged condensation or exposure to extreme humidity effects and high contamination	亞熱帶和熱帶地區, 污染極嚴重, 工業污染及氯化物影響, 如極端工業污染區域, 有海水飛濺的海岸 Subtropical and tropical areas, extremely polluted, industrial pollution and chloride effects, such as extreme industrial pollution areas, coasts with sea water splashes

免維護年限(年) Maintenance-Free Life (Year)



6.1.3

◆、不同鍍鋅含量的免維護年限 Maintenance-free life of different content

Type	C1	C2	C3	C4	C5
Z120	>83	12~83	4~12	2~4	1~2
Z150	>104	15~104	5~15	3~5	1~3
Z180	>125	18~125	6~18	3~6	2~3
Z275	>196	27~196	10~27	5~10	2~5
Z350	>243	35~243	12~35	6~12	3~6
Z450	>312	45~312	16~45	8~12	4~8

注: 上表的鍍鋅含量為雙面的總量, 建議使用鍍鋅量Z275以上的鋼板作為複合樓板。

The galvanized content in the table is for double sides sheet and using composite steel decking of Z275 or above is preferred.

建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

P&L 百安力

www.baiianli.com.hk

性能介紹 6 . Performance

性能介紹-耐腐蝕

6 . 1 Performance - Corrosion Resistance

6.1.4 金屬鍍層 Metallic coatings

金屬塗層 是用額外的金屬元素合金層覆蓋在金屬部件表面以避免腐蝕的過程。除了防止基材劣化之外，金屬塗層還可以改善基材的機械、物理和美觀特性。鋅、鋁和鎂是常用的金屬元素。

Metallc coating is the process of covering the surface of a metal component with an additional layer of alloy of metallic elements to avoid corrosion. In addition to preventing substrate degradation, metal coatings can improve the mechanical, physical and aesthetic properties of the substrate. Zinc, aluminum and magnesium are commonly used metallic elements.



Z熱浸鍍鋅 -

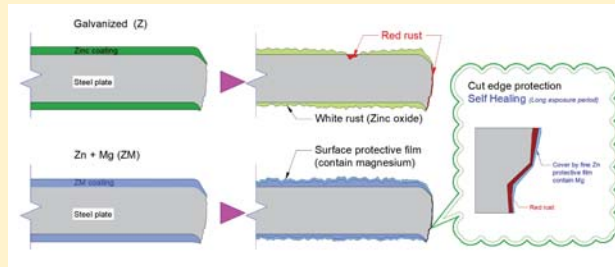
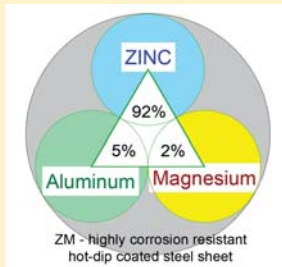
在鐵、鋼或黑色金屬材料上塗上一層鋅的過程。這是通過使金屬在860° F (460° C) 的溫度下通過熔融鋅形成碳酸鋅(ZnCO₃)。碳酸鋅是一種堅固的材料，可以保護鋼，並在許多情況下防止腐蝕。

Hot dip galvanizing - A process of coating iron, steel or ferrous materials with a layer of zinc. This done by passing the metal through molten zinc at a temperature of 860° F (460° C) to form zinc carbonate (ZnCO₃). Zinc carbonate is a strong material that protects steel and can prevent corrosion in many circumstances.

Zinc-Aluminum-Magnesium (ZM)

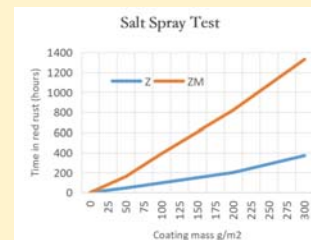
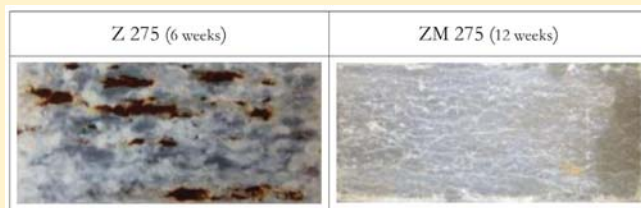
鍍鋅鋁鎂鋼板是新型高耐腐蝕性鍍層鋼板，鋅-鋁-鎂鍍層是以鋅為主要成分的三元合金塗層，鋁和鎂的含量在1.5-8%之間，在1.5%-3%的鎂及微量矽組成的熱浸鍍鍍層，比單純Z275鍍鋅板具備更優良的耐蝕性能，優異的剪切斷面自癒合和抗紅銹能力。

Zinc-aluminum-magnesium steel plate is a new type of highly corrosion resistant coated steel plate, zinc-aluminum-magnesium coating is a ternary alloy coating with zinc as the main component. The content of aluminum and magnesium is between 1.5-8 %, the hot-dip coating composed of 1.5%-3% magnesium and trace amounts of silicon has better corrosion resistance than galvanized sheets, with excellent shear section self-healing and red rust resistance.



REBARDEK 威鋼迪50-600 樓承板產品採用連續熱浸鍍鋅鋼帶製造，鍍鋅層總質量至少為 275g/m²(20μm)，符合 BS EN 10346。REBARDEK 威鋼迪樓承板產品還可以選擇 ZM 鍍層的鋼帶，並可提供比標準鍍鋅材料多五倍的保護。

REBARDEK 50-600 steel decking are manufactured in galvanised steel with continuously hot dipped structural steel strip in a minimum zinc coating total mass of 275g/m², comply to BS EN 10346. REBARDEK can also using the ZM coating steel strip and may provide five times more protection than Z275 steel sheet.



建築金屬 圍護系統服務

性能介紹

6 . Performance

性能介紹-耐火

6 . 2 Performance - Fire Resistance

◆、抵抗下彎矩的耐火鋼筋應設計在其上面覆蓋一層混凝土，這樣耐火鋼筋的頂部與壓型鋼承板的波峯處在同一水平高度。用R6的鋼筋橫跨鋼承板波峯，以500mm的間距排布，其下是耐火鋼筋。

The refractory steel bar that resists the bending moment should be designed to be covered with a layer of concrete, so that the top of the refractory steel bar is at the same level as the wave crest of the profiled steel bearing plate. R6 steel bars are used to cross the wave crest of the steel support plate, and are arranged at a distance of 500mm, and the refractory steel bars are below it.

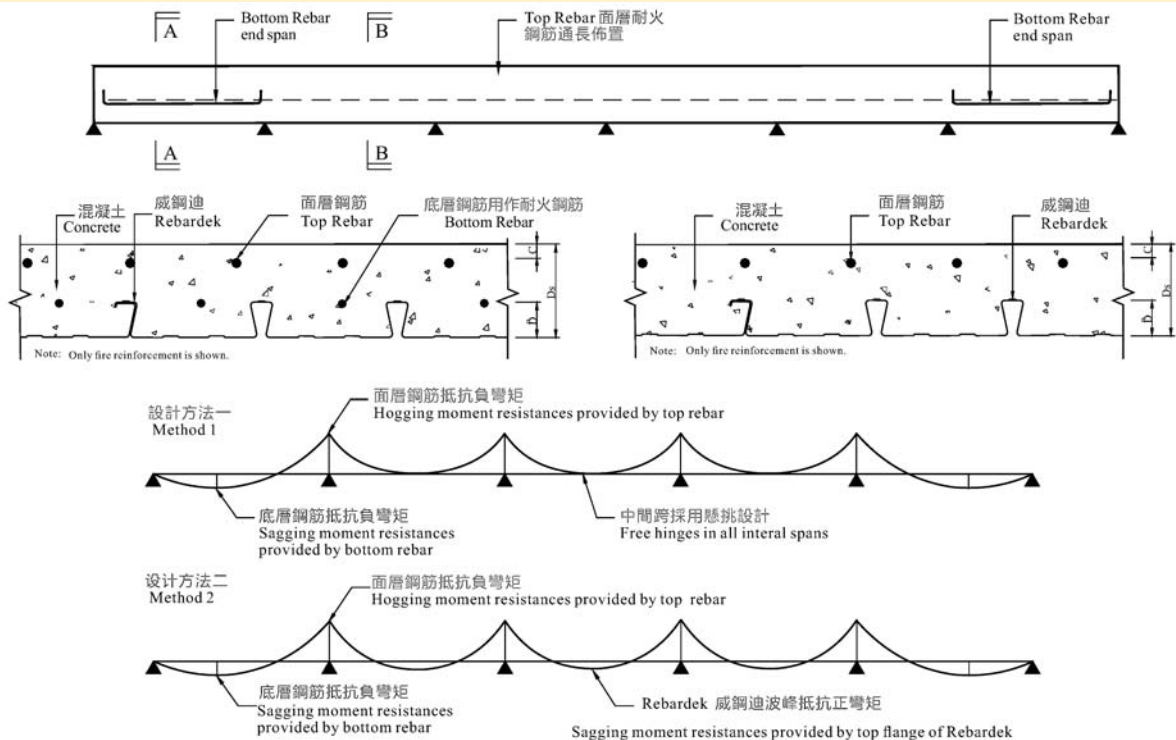
◆、複合樓承板的溫度分配參照英標BS5950:第8章表12, 2003年。但是壓型鋼承板的溫度分配係數要採用0.75mm厚的REBARDEK 威鋼迪50-600壓型鋼承板複合樓板的耐火實驗結果。

The temperature distribution of the composite floor deck shall refer to the British Standard BS5950: Chapter 8, Table 12, 2003. However, the temperature distribution coefficient of the profiled steel plate should be based on the fire resistance test results of the REBARDEK 50-600 profiled steel composite floor with a thickness of 0.75mm.

6.2.1 設計荷載 Design load

設計荷載 Design Load	荷載系數 Load Factor	設計值 Design value	
恆荷載 Dead load	1.0	鋼筋混凝土自重 Self weight of	23.5 kN/m ³
		樓承板自重 Self weight of profiled	78.5 kN/m ³
		t = 0.75 mm	0.980 kN/m ²
		t = 1.0 mm	0.131 kN/m ²
		t = 1.2 mm	0.157 kN/m ²
分層恆荷載 Superimposed dead load W _{SD} L	1.0	隔牆 Partition	2.5 kN/m ²
		找平層與地面 Screedings	1.2 kN/m ²
		吊掛荷載 Services	0.5 kN/m ²
		合計 Total	4.2 kN/m ²
施加荷載 Imposed load W _I L	1.0	施加荷載允許值	3.0 kN/m ²
		Imposed load allowances	5.0 kN/m ²
			7.5 kN/m ²
			10 kN/m ²

6.2.2 耐火設計方法 Refractory design

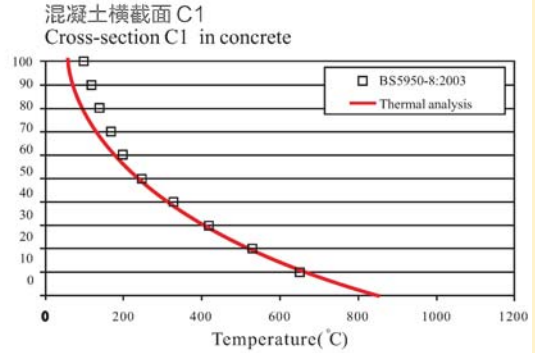
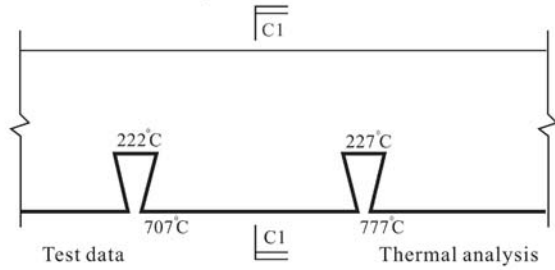


建築金屬 圍護系統服務

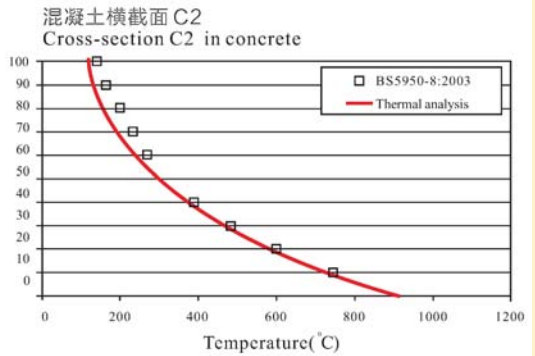
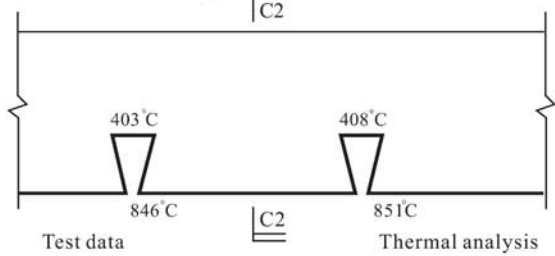
性能介紹 6 . Performance

6.2.3 極限狀態下耐火鋼筋抗彎能力設計方法 ----- 溫度分佈 Design of bending resistance of fire resistant reinforcement in Limit State-Temperature distribution

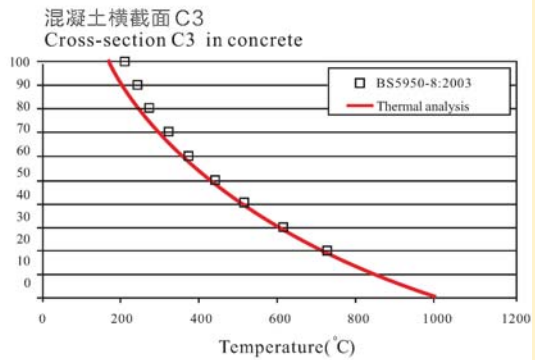
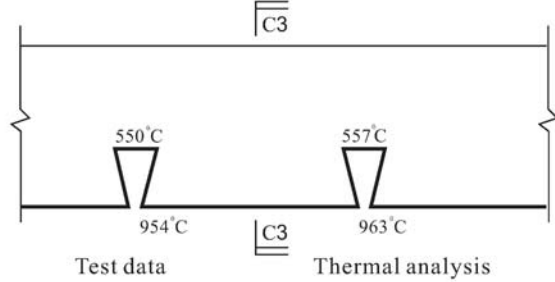
FRP = 1hr
Profiled steel decking



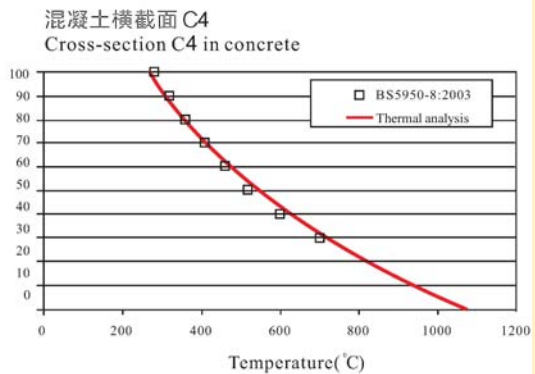
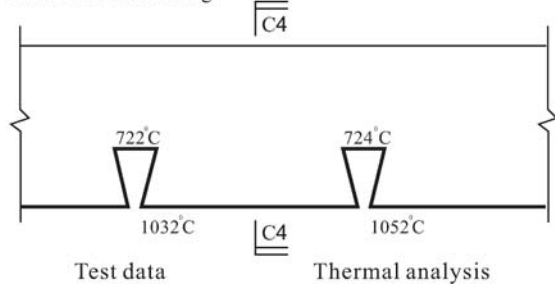
FRP = 1.5hr
Profiled steel decking



FRP = 2hr
Profiled steel decking



FRP = 3hr
Profiled steel decking



建築金屬 圍護系統服務

性能介紹 6 . Performance

6.2.4 耐火極限狀態荷載與跨度使用 Load Span Table For Fire Limit State

0.75mm 威鋼迪G550耐火鋼筋耐火極限狀態荷載表

0.75 mm REBARDEK G550 - Fire reinforcement Load span table for fire limit state

Dcs (mm)	W _{IL} (kPa)	L _s (mm)	1 hr FRP			2 hr FRP			3 hr FRP		
			End span		Internal span	End span		Internal span	End span		Internal span
			TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m	TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m	TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m
100	3.0	2835	142	369	448	--	--	--	--	--	--
	5.0	2830	142	465	598	--	--	--	--	--	--
	7.5	2545	142	455	583	--	--	--	--	--	--
	10.0	2335	142	451	575	--	--	--	--	--	--
125	3.0	2545	192	151	225	192	177	252	--	--	--
	5.0	2545	192	199	276	192	239	314	--	--	--
	7.5	2545	192	260	344	192	314	400	--	--	--
	10.0	2545	192	322	416	192	390	497	--	--	--
150	3.0	2325	252	142	252	252	142	252	252	142	252
	5.0	2325	252	142	252	252	142	252	252	150	252
	7.5	2325	252	142	252	252	142	252	252	205	286
	10.0	2325	252	153	253	252	181	275	252	269	346
175	3.0	2150	252	142	252	252	142	252	252	142	252
	5.0	2150	252	142	252	252	142	252	252	142	252
	7.5	2150	252	142	252	252	142	252	252	142	252
	10.0	2150	252	142	252	252	142	252	252	142	252
200	3.0	2005	393	142	393	393	142	393	393	142	393
	5.0	2005	393	142	393	393	142	393	393	142	393
	7.5	2005	393	142	393	393	142	393	393	142	393
	10.0	2005	393	142	393	393	142	393	393	142	393
225	3.0	1885	393	142	393	393	142	393	393	142	393
	5.0	1885	393	142	393	393	142	393	393	142	393
	7.5	1885	393	142	393	393	142	393	393	142	393
	10.0	1885	393	142	393	393	142	393	393	142	393
250	3.0	1780	565	142	565	565	142	565	565	142	565
	5.0	1780	565	142	565	565	142	565	565	142	565
	7.5	1780	565	142	565	565	142	565	565	142	565
	10.0	1780	565	142	565	565	142	565	565	142	565

註釋: Ls: 跨度 Length of span (mm)

Note: 上部鋼筋: 混凝土複合板上部附近的耐火鋼筋的最小面積 (mm²/m)

Top Rebar: Minimum area of fire reinforcement (mm²/m) to be provided near the top of the composite slab

底部鋼筋: 混凝土複合板底部附近的耐火鋼筋的最小面積 (mm²/m)

Bottom Rebar: Minimum area of fire reinforcement (mm²/m) to be provided near the bottom of the composite slab

計算已包含了4.2kPa的分層恆荷載

A superimposed dead load of 4.2 kPa is included in the calculation

建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope



www.baianli.com.hk

性能介紹 6 . Performance

6.2.4 耐火極限狀態荷載與跨度使用 Load Span Table For Fire Limit State

1. 0mm 威鋼迪G550耐火鋼筋耐火極限狀態荷載表

1.0 mm REBARDEK G550 - Fire reinforcement Load span table for fire limit state

D _{cs} (mm)	W _{IL} (kPa)	L _s (mm)	1 hr FRP			2 hr FRP			3 hr FRP		
			End span		Internal span	End span		Internal span	End span		Internal span
			TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m	TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m	TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m
100	3.0	3630	142	685	---	---	---	---	---	---	---
	5.0	3555	142	821	---	---	---	---	---	---	---
	7.5	3200	142	809	---	---	---	---	---	---	---
	10.0	2935	142	801	---	---	---	---	---	---	---
125	3.0	3360	192	336	433	192	407	521	---	---	---
	5.0	3360	192	423	544	192	517	688	---	---	---
	7.5	3360	192	535	701	192	662	1003	---	---	---
	10.0	3275	192	612	820	192	759	---	---	---	---
150	3.0	3140	252	179	282	252	213	309	252	315	393
	5.0	3140	252	232	342	252	277	378	252	410	495
	7.5	3140	252	300	420	252	361	472	252	535	644
	10.0	3140	252	369	501	252	447	573	252	668	832
175	3.0	2930	252	142	252	252	142	252	252	181	252
	5.0	2930	252	142	252	252	166	258	252	240	304
	7.5	2930	252	188	292	252	219	313	252	317	373
	10.0	2930	252	234	343	252	274	370	252	398	446
200	3.0	2740	393	142	393	393	142	393	393	142	393
	5.0	2740	393	142	393	393	142	393	393	142	393
	7.5	2740	393	142	393	393	142	393	393	142	393
	10.0	2740	393	142	393	393	142	393	393	185	393
225	3.0	2580	393	142	393	393	142	393	393	142	393
	5.0	2580	393	142	393	393	142	393	393	142	393
	7.5	2580	393	142	393	393	142	393	393	142	393
	10.0	2580	393	142	393	393	142	393	393	142	393
250	3.0	2445	565	142	565	565	142	565	565	142	565
	5.0	2445	565	142	565	565	142	565	565	142	565
	7.5	2445	565	142	565	565	142	565	565	142	565
	10.0	2445	565	142	565	565	142	565	565	142	565

註釋: L_s: 跨度 Length of span (mm)

Note: 上部鋼筋: 混凝土複合板上部附近的耐火鋼筋的最小面積 (mm²/m)

Top Rebar: Minimum area of fire reinforcement (mm²/m) to be provided near the top of the composite slab

底部鋼筋: 混凝土複合板底部附近的耐火鋼筋的最小面積 (mm²/m)

Bottom Rebar: Minimum area of fire reinforcement (mm²/m) to be provided near the bottom of the composite slab

計算已包含了4.2kPa的分層恆荷載

A superimposed dead load of 4.2 kPa is included in the calculation

建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope



www.baianli.com.hk

性能介紹 6 . Performance

6.2.4 耐火極限狀態荷載與跨度使用 Load Span Table For Fire Limit State

1. 2mm 威鋼迪G550耐火鋼筋耐火極限狀態荷載表
1.2 mm REBARDEK G550 - Fire reinforcement Load span table for fire limit state

Dcs (mm)	W _{IL} (kPa)	L _S (mm)	1 hr FRP			2 hr FRP			3 hr FRP		
			End span		Internal span	End span		Internal span	End span		Internal span
			TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m	TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m	TopRebar mm ² /m	BottomRebar mm ² /m	TopRebar mm ² /m
100	3.0	4010	142	880	--	--	--	--	--	--	--
	5.0	3695	142	909	--	--	--	--	--	--	--
	7.5	3410	142	952	--	--	--	--	--	--	--
	10.0	3195	142	989	--	--	--	--	--	--	--
125	3.0	3755	192	448	577	192	548	743	--	--	--
	5.0	3755	192	560	739	192	694	1122	--	--	--
	7.5	3755	192	707	995	192	883	--	--	--	--
	10.0	3585	192	764	1123	192	958	--	--	--	--
150	3.0	3510	252	251	363	252	300	404	252	444	534
	5.0	3510	252	319	442	252	385	499	252	571	692
	7.5	3510	252	406	547	252	493	631	252	742	961
	10.0	3510	252	495	659	252	606	779	252	923	--
175	3.0	3310	252	163	265	252	190	283	252	275	335
	5.0	3310	252	210	316	252	246	340	252	356	408
	7.5	3310	252	269	382	252	317	415	252	462	504
	10.0	3310	252	328	450	252	391	493	252	574	610
200	3.0	3145	393	142	393	393	142	393	393	142	393
	5.0	3145	393	142	393	393	142	393	393	174	393
	7.5	3145	393	142	393	393	164	393	393	241	393
	10.0	3145	393	181	393	393	213	393	393	312	417
225	3.0	3035	393	142	393	393	142	393	393	142	393
	5.0	3035	393	142	393	393	142	393	393	142	393
	7.5	3035	393	142	393	393	142	393	393	160	393
	10.0	3035	393	142	393	393	146	393	393	212	393
250	3.0	2940	565	142	565	565	142	565	565	142	565
	5.0	2940	565	142	565	565	142	565	565	142	565
	7.5	2940	565	142	565	565	142	565	565	142	565
	10.0	2940	565	142	565	565	142	565	565	142	565

註釋: Ls: 跨度 Length of span (mm)
 Note: 上部鋼筋: 混凝土複合板上部附近的耐火鋼筋的最小面積 (mm²/m)
 Top Rebar: Minimum area of fire reinforcement (mm²/m) to be provided near the top of the composite slab
 底部鋼筋: 混凝土複合板底部附近的耐火鋼筋的最小面積 (mm²/m)
 Bottom Rebar: Minimum area of fire reinforcement (mm²/m) to be provided near the bottom of the composite slab
 計算已包含了4.2kPa的分層恆荷載
 A superimposed dead load of 4.2 kPa is included in the calculation

建築金屬 圍護系統服務

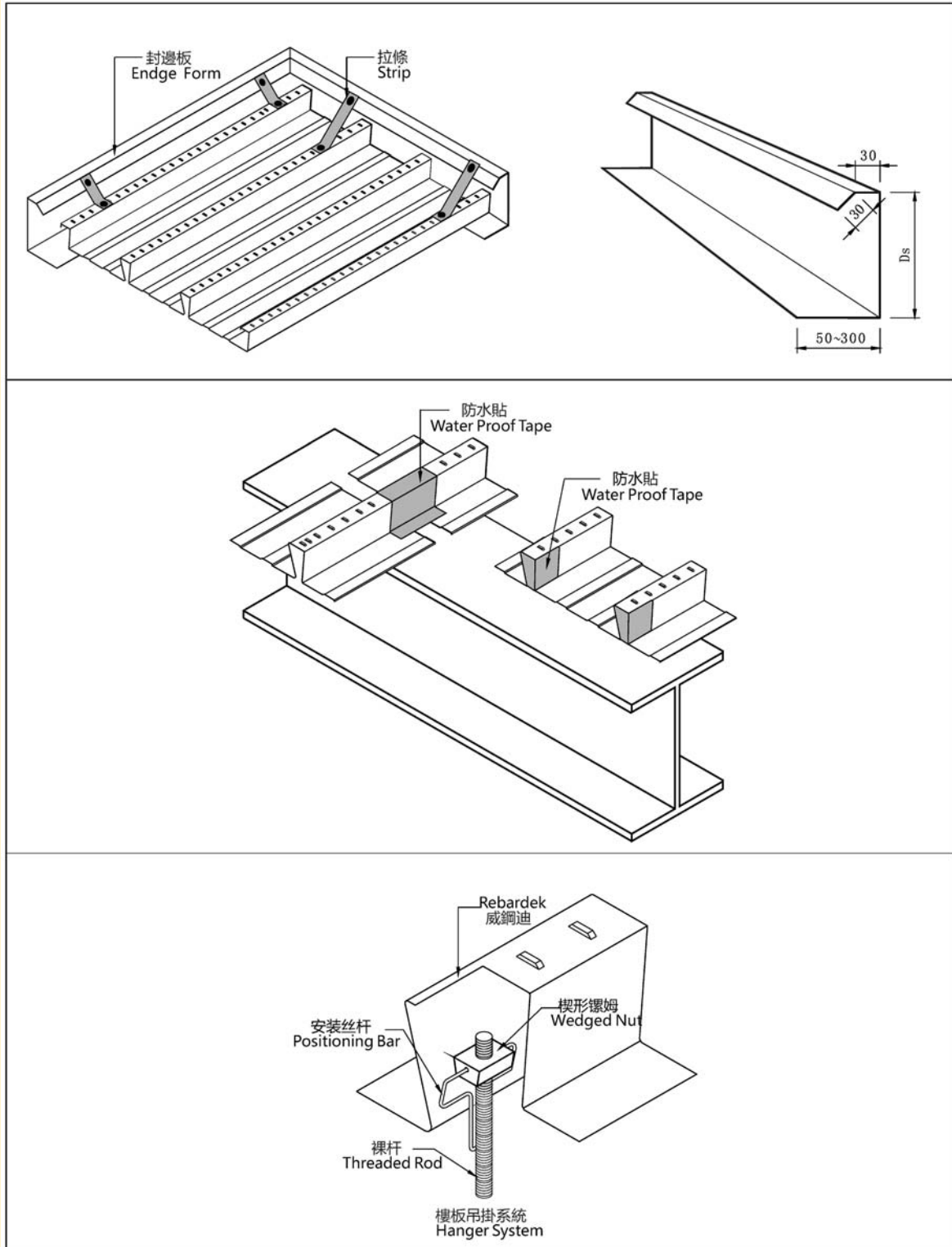
SOLUTION Provider of Metal Building Envelope

樓承板配件

7 . Decking Accessories

樓承板配件

7 . Decking Accessories

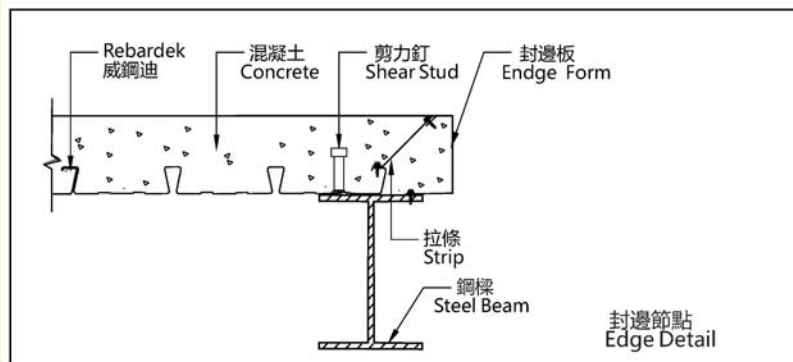
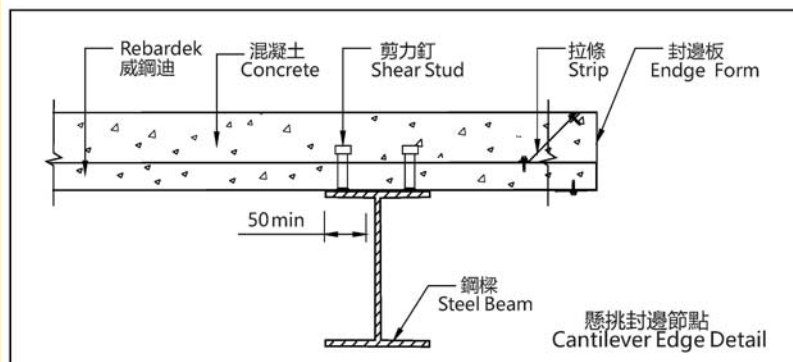
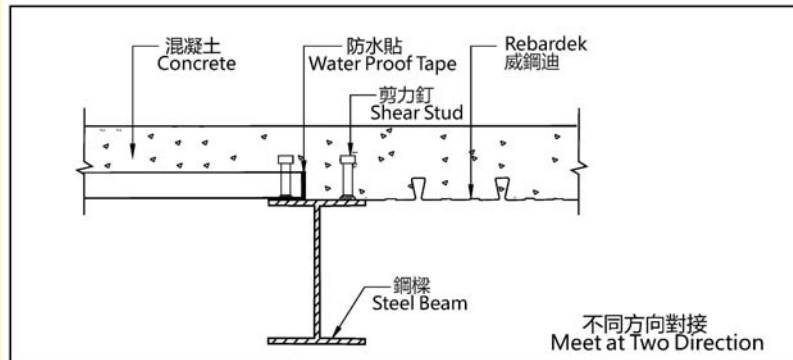
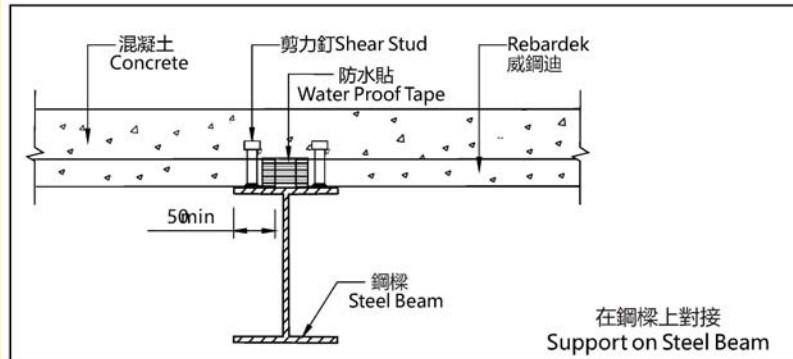


建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

典型節點 8 . Typical Details

8 . Typical Details



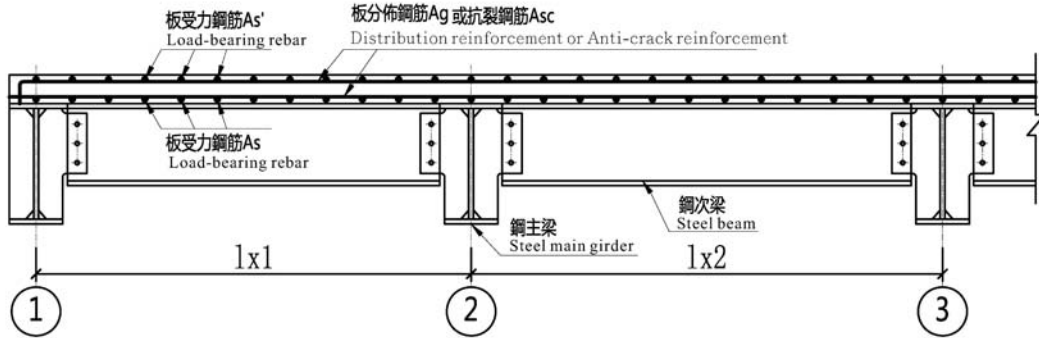
建築金屬 圍護系統服務

典型節點

8 . Typical Details

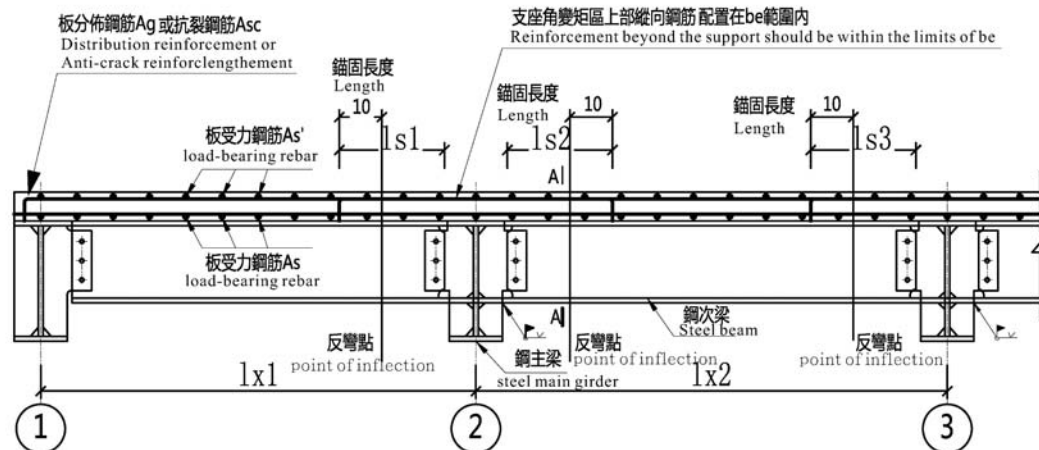
典型節點

8 . Typical Details



1-1簡支組合梁節點連接及配筋構造

Simple support combination of Beam node connection and reinforcement structure



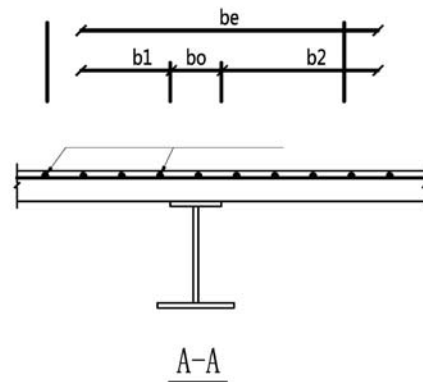
2-2連續組合梁節點連接及配筋構造

Continuous combination of Beam node connection and reinforcement structure

注: 1. 混凝土翼板的有效寬度 b 取值
見本圖集16頁。

2. 板中鋼筋應按實際腕力計算配置。

Notes: 1. The effective width value b of concrete slab should be in accordance with the P16 in this manual.
2. The steel bars in the plates shall be configured according to the actual steel force



建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

工程案例

9 . Project Reference

工程案例

9 . Project Reference



建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope

P&L 百安力

www.baianli.com.hk

REBARDEK® 威鋼迪

Design to BS 5950-4/6/7/8

混凝土組合樓承板

Profile steel decking system



百安力鋼結構應用科技有限公司
P&Ls Steel Structures Applied Technology Co., Limited

香港新界屯門杯渡路99號工作室5樓506室

Unit 506, 5/F, 99-COMMONS, 99 Pui To Road, Tuen Mun, N.T, HK

Tel : (852) 2451 8882 Email : info@baianli.com.hk / failau@baianli.com.hk

中國廣東省珠海市金灣區三灶鎮卓越路七號

No.7, Zhuoyue Road, Sanzao Town, Jinwan District, Zhuhai City, Guangdong, China

建築金屬 圍護系統服務

SOLUTION Provider of Metal Building Envelope