



**PERMADEC**

SAFE | LIGHTWEIGHT | DURABLE



# GRP PERMANENT FORMWORK

Presented by

Michael Train

Head of Sales & Technical Lead



**Establish  
ed in 1964**





# HISTORY & BACKGROUND

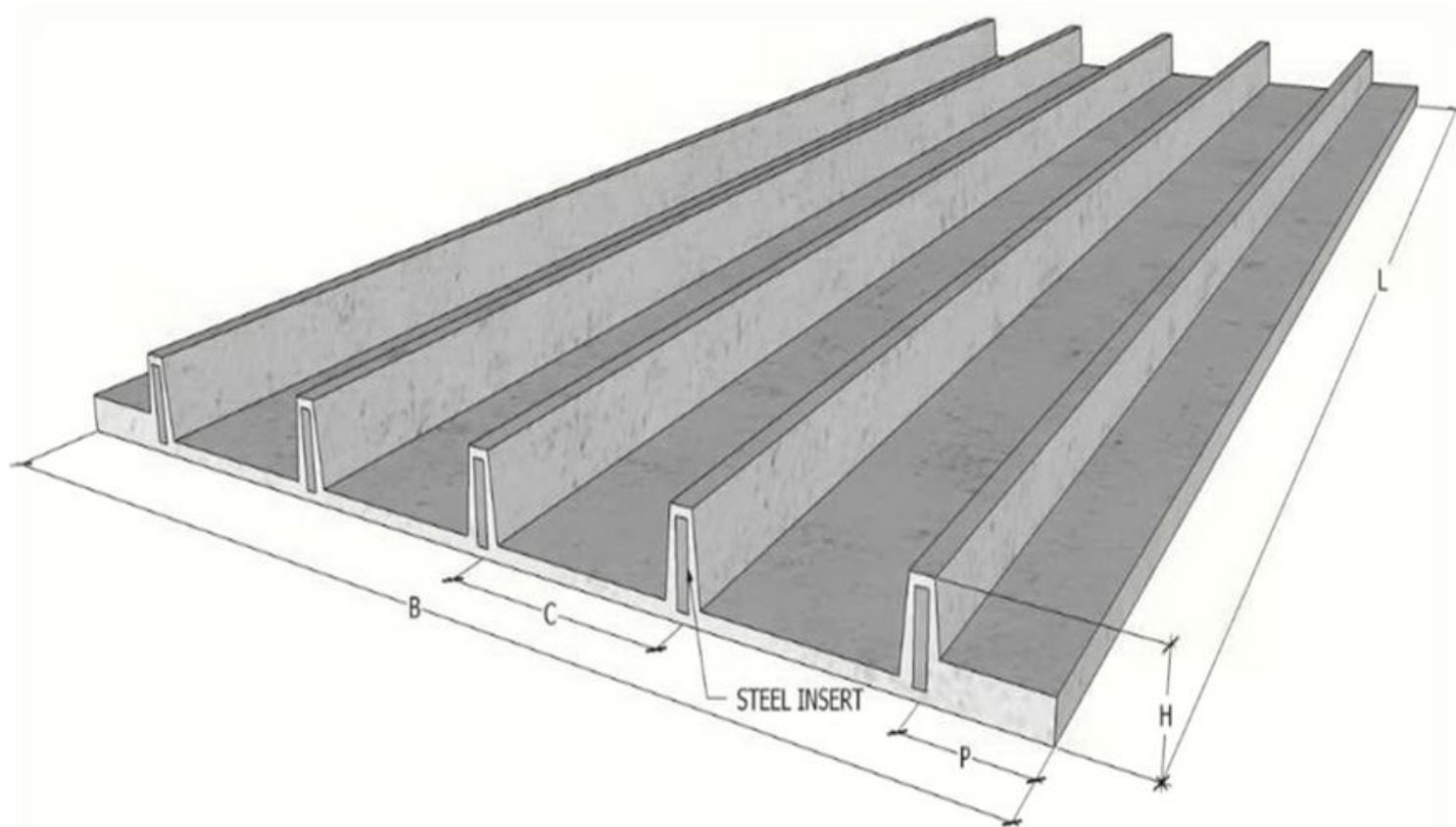
EMJ was established in 1964 and have been manufacturing GRP Products for the construction industry for 60 years  
We are the Global leader in manufacture of GRP Permanent Bridge Deck Formwork we have help construct over 5,500 bridges.



01

Design & Manufacturing is based in Scunthorpe , North Lincolnshire, UK

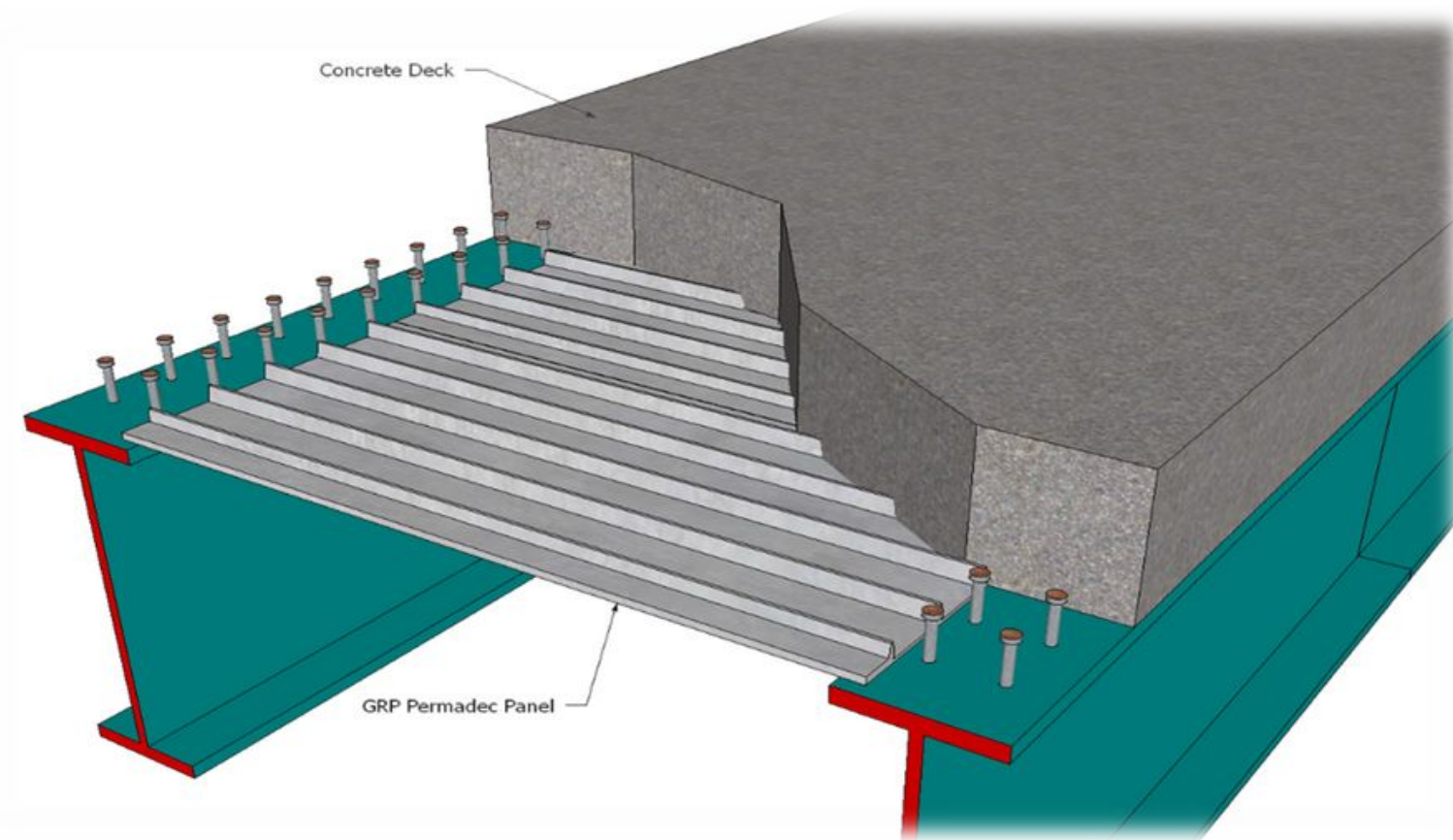




## WHAT ARE GRP PERMADEC PANELS

- They are used as a sacrificial permanent formwork
- Steel reinforced glass fiber panels
- Designed to span with no intermediate supports needed
- Range of Standard Panels and Bespoke Panels to suit customers needs





## DESIGNED LOADS

- Wet concrete of the insitu deck
- Self Weight of the Panel
- Live Load



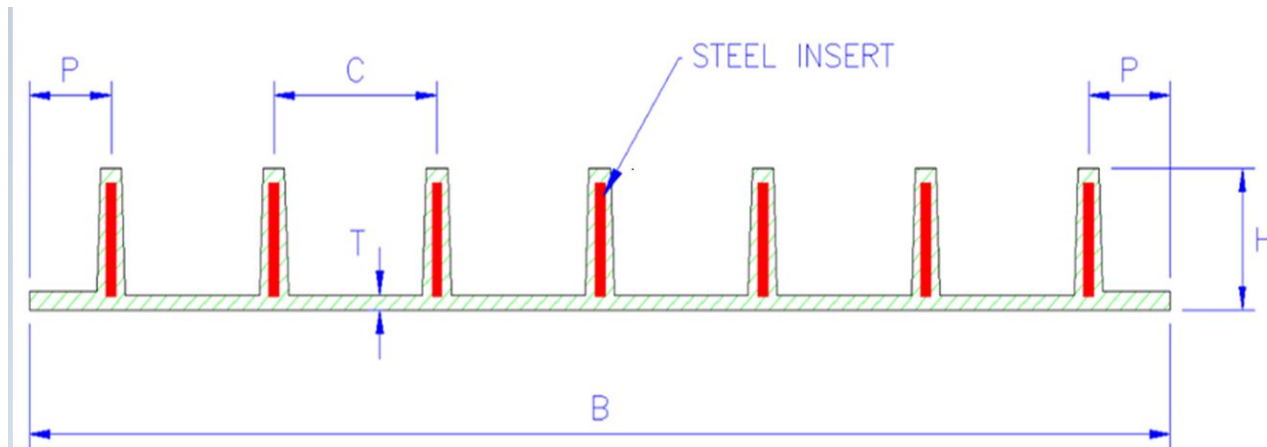




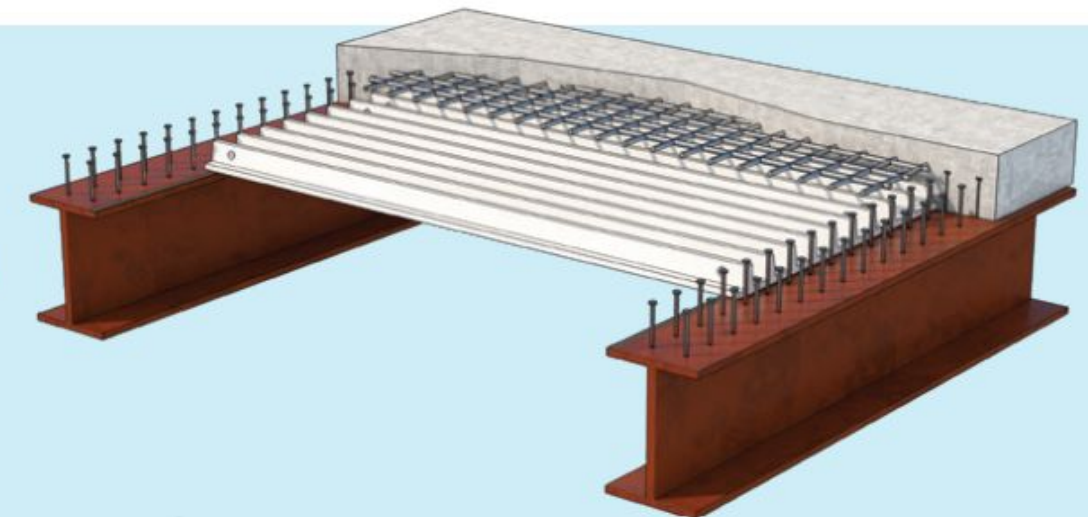
# STANDARD RANGE

Soffit Thickness	Weight/m <sup>2</sup>
Panel Height	Rib Centers
Panel Lengths	End Ribs
Panel Width	Number of Ribs
Clear Span	Deflection

EMJ Standard Panel Range		1	3	3A	3B	3C	4	4A	4B	4C	5A	5B	5C	6
T = Soffit Thickness	mm	6	8	8	8	8	8	8	8	8	6	8	8	8
H = Overall Height inc. rib	mm	38	38	50	63	75	38	50	63	75	63	75	105	90
L = Length (maximum)	mm	1200	1400	2100	2800	3700	1500	2300	3100	3800	3300	4200	5300	5100
Cs = Clear Span (maximum)	mm	1100	1300	2000	2700	3600	1400	2200	3000	3700	3200	4100	5200	5000
B = Breadth	mm	1220	750	750	750	750	875	875	875	700	700	700	700	700
W = Weight	kg/m <sup>2</sup>	16-20	24-29	29-40	37-57	43-64	26-33	32-46	42-65	49-74	53-82	58-89	94-116	97-108
C = Centre of Ribs	mm	229	150	150	150	150	125	125	125	125	100	100	100	100
P = Position of End Ribs	mm	38	75	75	75	75	62	62	62	62	50	50	50	50
N = Number of Ribs	mm	6	5	5	5	5	7	7	7	7	7	7	7	7



Typical EMJ Permadec Standard panel installed on steel beams







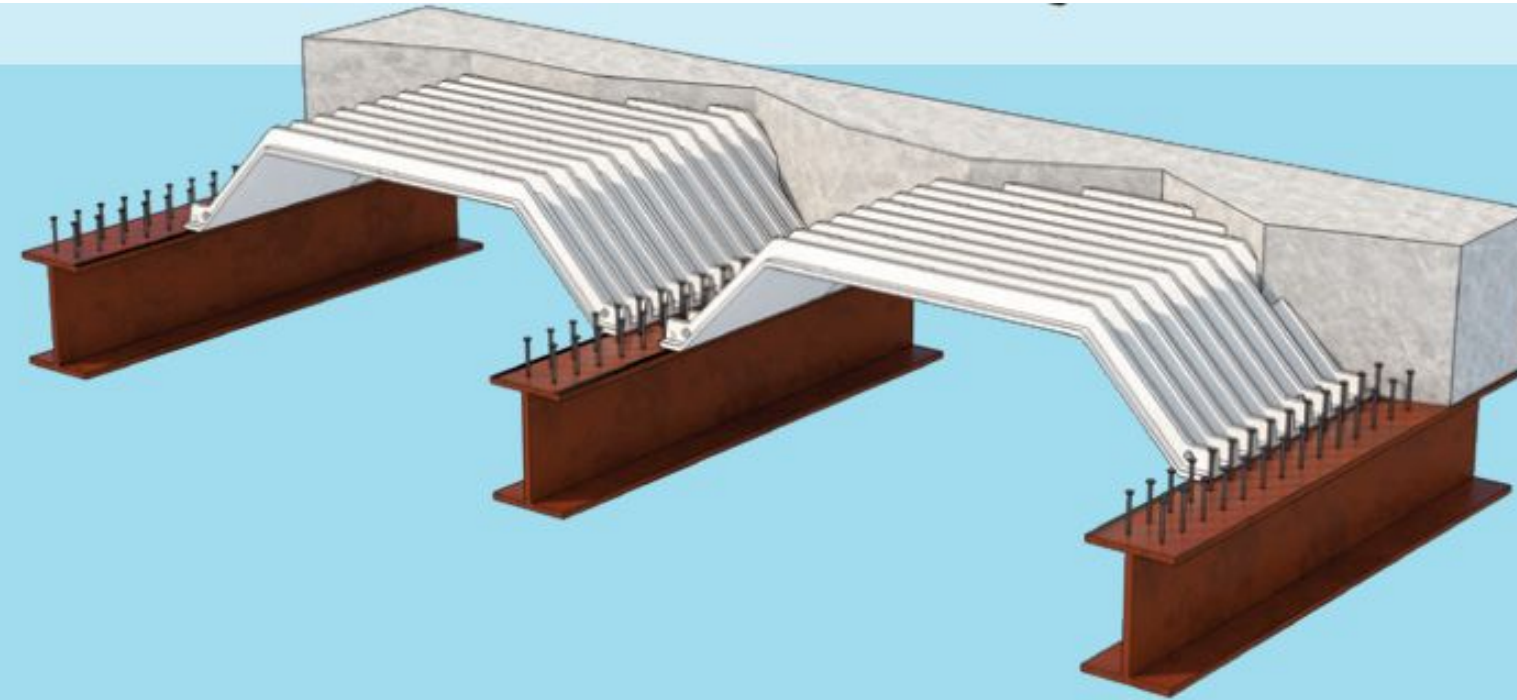
## STANDARD PANEL - STEEL BEAMS



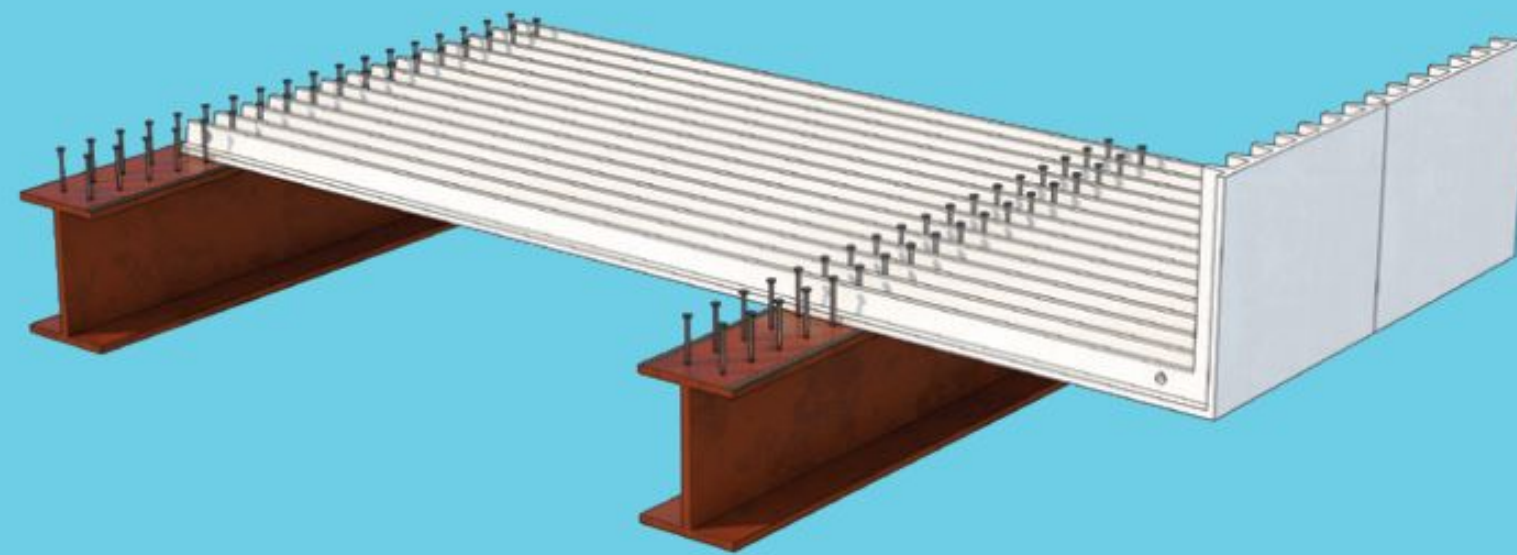
# BESPOKE PERMADEC PANELS



Typical EMJ Permadec Haunched panel installed on steel beams



Typical EMJ Permadec Cantilever panel installed on steel beams







# BESPOKE PERMADEC PANELS - STEEL BEAMS



▶▶▶▶ Tabor – Permadec Haunched Panel

Hostivar – Permadec Cantilever Panel





## CANTILEVER PANELS







# INSTALLTION TECHNIQUE



MANUA



LIFTING





# SEALANTS



- Ease in installation
- Prevents Grout Loss
- Highly Tested System





# CUTTING OF PANELS



- Standard Stihl saw (or similar)
- Respiratory Mask, Rigger & Gloves
- Skewed ends require support on both ends of each rib
- Minimum bearing of 30mm should be achieved







# ADVANTAGES

## PANEL



- ✓ **Lightweight & very strong**
- ✓ **Large Span Capability**
- ✓ **Durability 120 Year Lifespan**
- ✓ **Safe Working Platform**
- ✓ **Designed to Suit Application**
- ✓ **Quick Manufacturing Times**

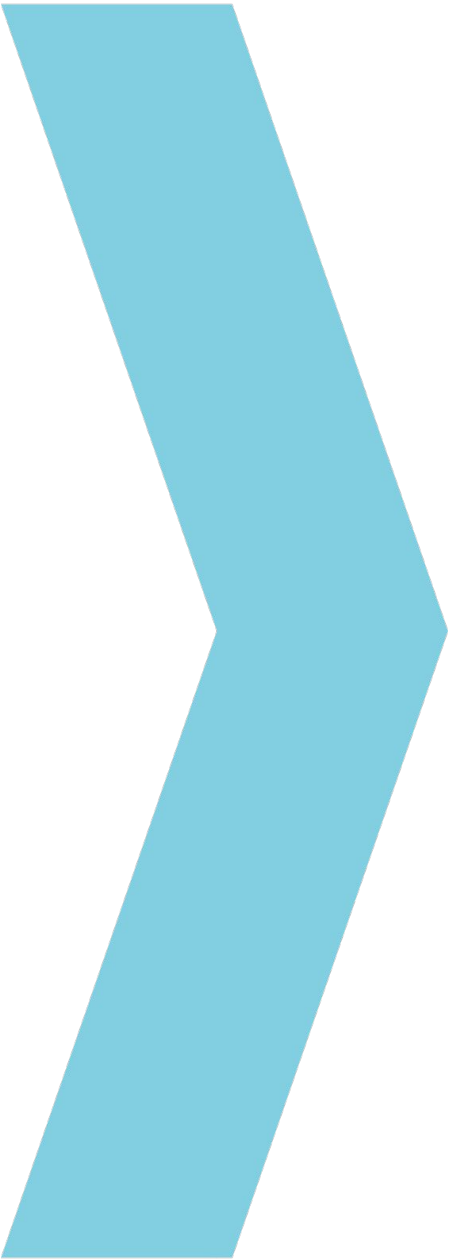




# CASE STUDY



## Friargate Bridge, Coventry UK





# CASE STUDY



## Friargate Bridge, Coventry UK





# CASE STUDY



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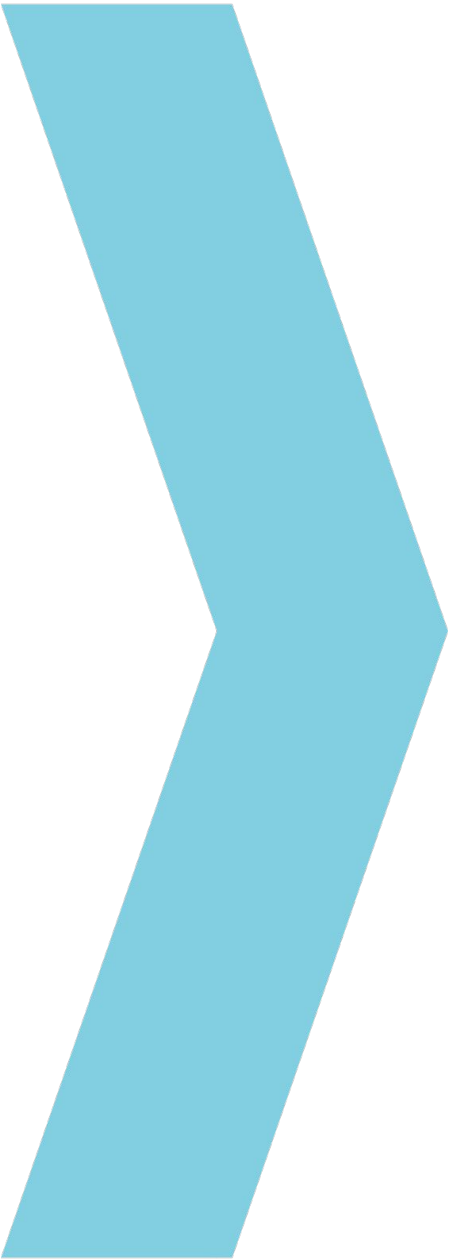




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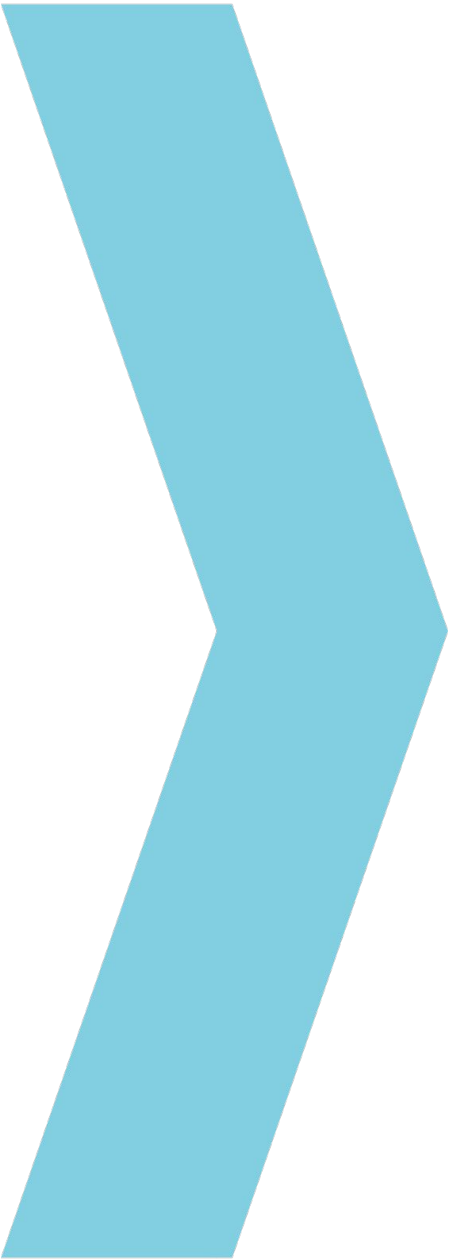




# CASE STUDY



## Hostivar , Prague

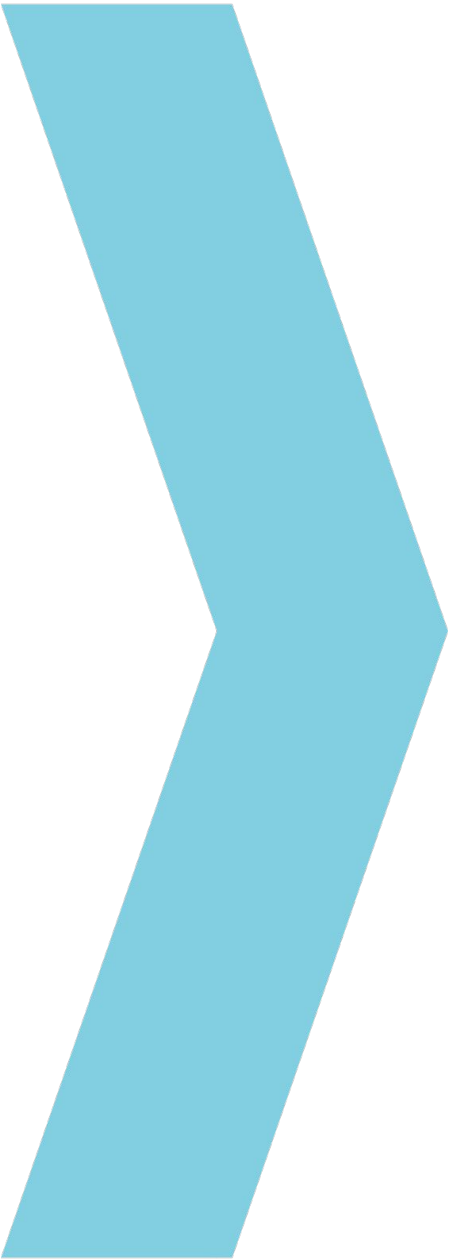




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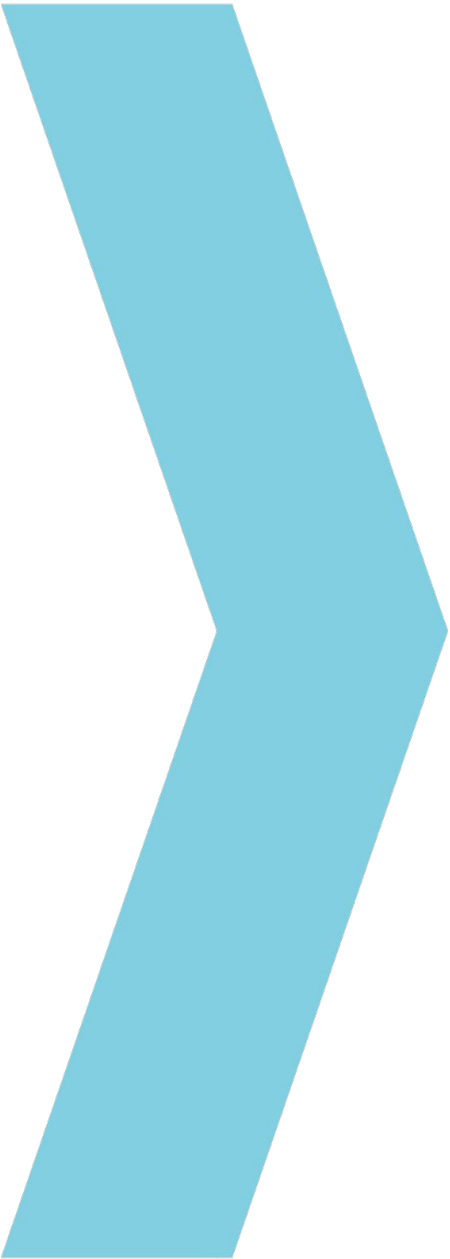


## Hostivar , Prague





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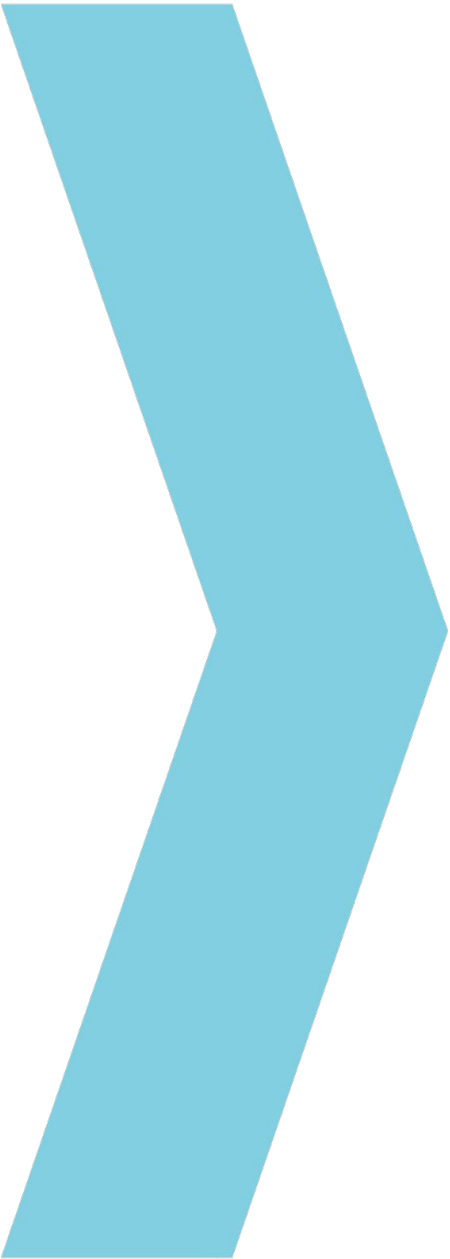


## Hostivar , Prague





# CASE STUDY



## Hostivar , Prague





# CASE STUDY



## Hostivar , Prague







**Design Loads to consider:**

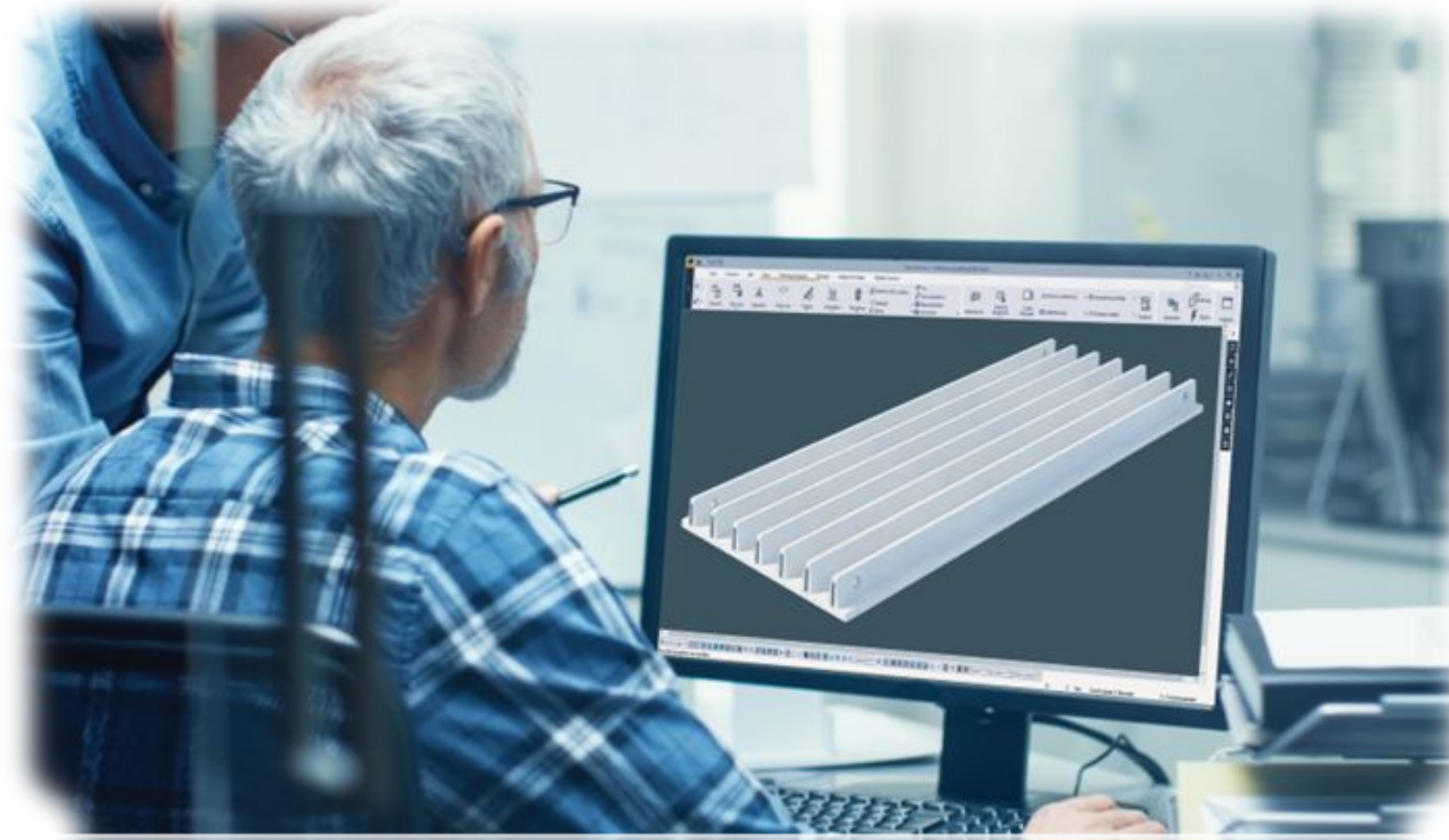
**Self weight of the panel**

**Wet concrete of the insitu deck**

**Live Load**

**Design Guidance:**

**BA 36/90 guidance for the use of  
permanent formwork  
interim Advice Note 131/11  
CD 359 (2020)**



**Section design:**

**Stress Analysis**

**Utilization of Composite section**

**Designed by qualified and experienced  
personnel**



**Panels are produced in a highly monitored and controlled environment  
EMJ employ and maintain a Quality Management System ISO 9001 Certified  
along with ISO 45001, ISO 14001 & EPD Pending final approval**





## PANEL DETAILS

File Ref. EMJ9049	TYPICAL DETAIL FOR INFORMATION / DISCUSSION PURPOSES ONLY AT THIS TIME	<b>HEALTH &amp; SAFETY INFORMATION</b> <ul style="list-style-type: none"> <li>• Limit height of concrete on Permadec Formwork to depth of permanent slab</li> <li>• Remove all debris from Permadec Formwork at all times</li> <li>• Permadec must not be used to support construction materials or for storage purposes</li> <li>• Allowable live loading limits of 1.5kN/m<sup>2</sup> should be maintained at all times</li> <li>• Do not assume Permadec Formwork is a safe working platforms until correctly installed in line with EMJ guidelines</li> <li>• Do not use Permadec Formwork for storage areas under any circumstances</li> <li>• Manufacturing Tolerances - +/- 3mm</li> <li>• 200kg Max Point Load (Dead+Live) for spacer blocks (80mm x 50mm typical contact area) sitting on Permadec soffit.</li> </ul>																								
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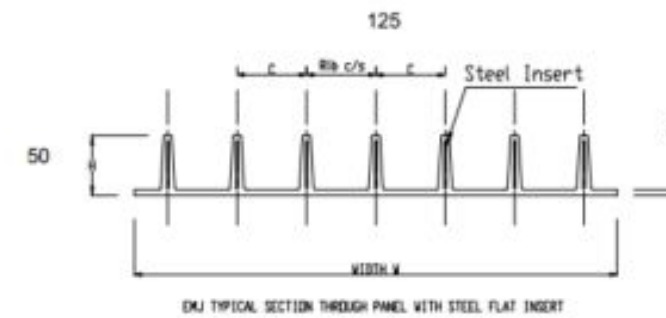






## CALCULATION

DESIGN CALCULATION SUMMARY SHEET		
	Type 4A.2	Standard
Panel Type		
Panel Width	625	W
Panel length	1547	L
Panel Height	50	H
Flange Thickness	8	T
Rib Centres	125	C
No of Ribs	5	
Width at top of Rib	19	RT
Width at bottom of Rib	25	RB
Steel Height	40	SH
Steel Thickness	5	ST
E value for Steel	210000	N/mm <sup>2</sup>
Grade of Steel	S275 JR	
Yield Value	275	N/mm <sup>2</sup>
Mild Steel Density	78	kN/M3
Weight of Steel per lin M	0.016	kN/m
Weight of Matrix per M3	1860	Kg
E value for GRP	10000	N/mm <sup>2</sup>
Deck thickness	250	mm
Live Load (ULS)	1.5	KN/M <sup>2</sup>
Equivalent Uniform Load (ULS)	6.25	kN/M <sup>2</sup>
Clear Span	1447	mm
Bearing	50	mm
Panel Weight	41	Kg/M <sup>2</sup>
<b>Deflection</b>		
Deflection at concrete deck load	4.1	mm
Deflection at concrete deck load + Live Load	5.0	mm
<b>Maximum Tensile Stress on Steel</b>		
Per Rib		
Min Section Modulus	2308 mm <sup>3</sup>	
Max Bending moment (Dead)	218 kN*mm	
Max Bending moment (Dead+ Live)	267 kN*mm	
Dead Load Stress	94.4	N/mm <sup>2</sup>
Deck+Live Load Stress	115.6	N/mm <sup>2</sup>
Ultimate Yield Stress	275.0	N/mm <sup>2</sup>



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**CALCULATION APPROVAL BY CLIENT**

APPROVED BY

PRINT NAME      SIGNATURE      COMPANY      DATE

**Notes**

The calculation of mechanical properties are based on elastic theory of the composite section.

Compliance with HE CD-359 Design requirements for permanent soffit formwork

Load factor of 1 (Dead and Live)

Live Load 1.5kN/m<sup>2</sup>

BS EN 1991-1-6, Table 4.1

Calculations are based upon one rib of the panel

i.e. the width of the rib centres.

Calculated weights are approx. and should not be taken as accurate measurements.

Concrete Density 25 kN/m<sup>3</sup>

**EMJ PLASTICS LTD**

UNIT 8 STERLING BUSINESS PARK

PARK FARM ROAD

SCUNTHORPE

DN15 8QP

TEL: 01723 512224

[sales@emjplastics.com](mailto:sales@emjplastics.com)



**CLIENT** GOLDEN VALLEY CONSTRUCTION

**CONTRACT** SARACENS HEAD WALKWAY

**STRUCTURE** SARACENS HEAD WALKWAY

**DESIGN Ref:** EMJ11614-DN001

**EMJ Ref:** EMJ11614

**DATE** 16/08/2024

**DESIGNED BY** N.H

**CHECKED BY** J.B



To be approved and returned to EMJ Plastics Ltd prior to commencement of manufacturing.

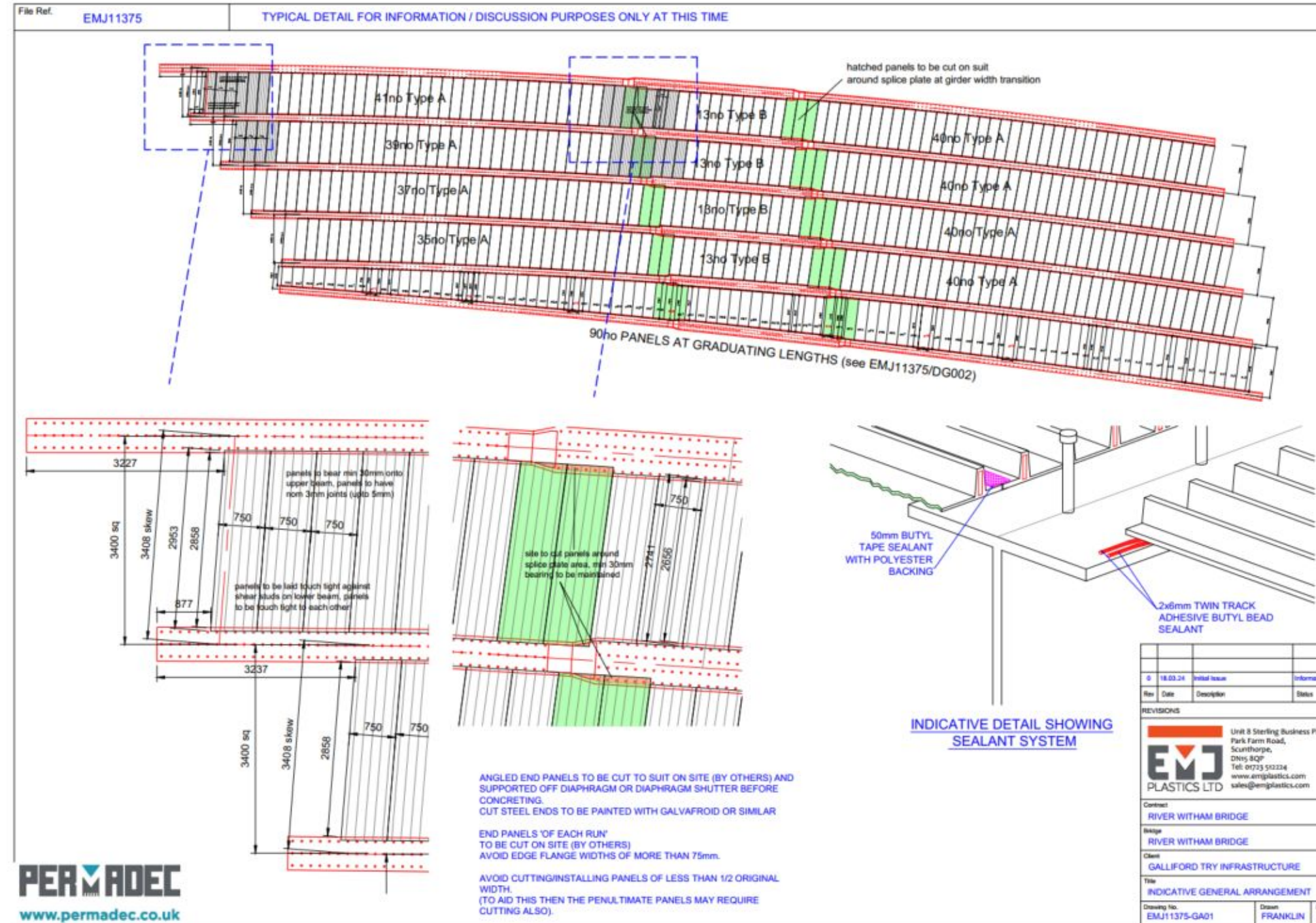








## LAYOUTS – River Witham







# GRP PERMANENT FORMWORK

If you have any further questions or require further information on our products and services, then please

contact us on

[sales@permadec.com](mailto:sales@permadec.com)

Thank You For Your Time

