



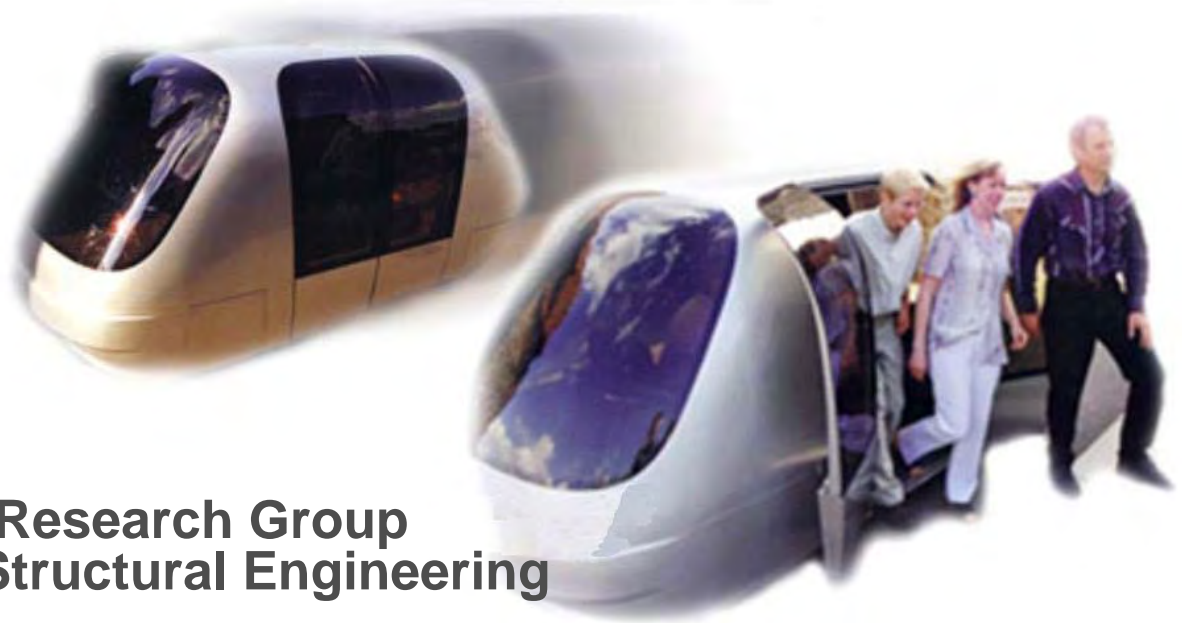
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# URBAN LIGHT TRANSPORT (ULTRA) GUIDEWAY PROJECT

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# Outline



- **What is ULTra?**
- **RC FRP Plank design**
- **Experimental program**
- **Experimental results**
- **Concluding remarks**



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# What is ULTra?

## The ULTra system



## Why ULTra?

- A personal auto



Effective, low cost and sustainable transport facilities, initial 3 km network route applications worldwide



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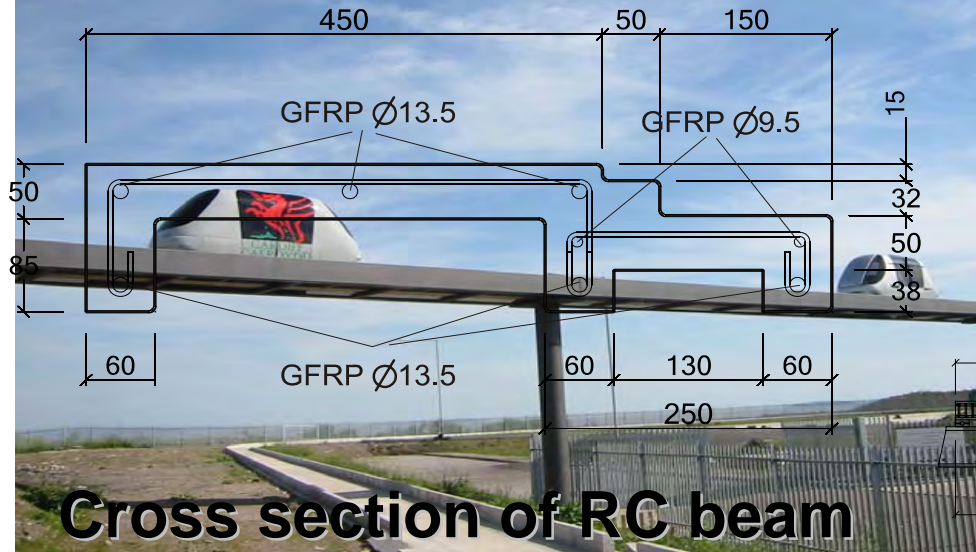
# RC FRP Plank design



## • Reinforcing materials?

**FRP or Steel geometry** →

The ULTra system





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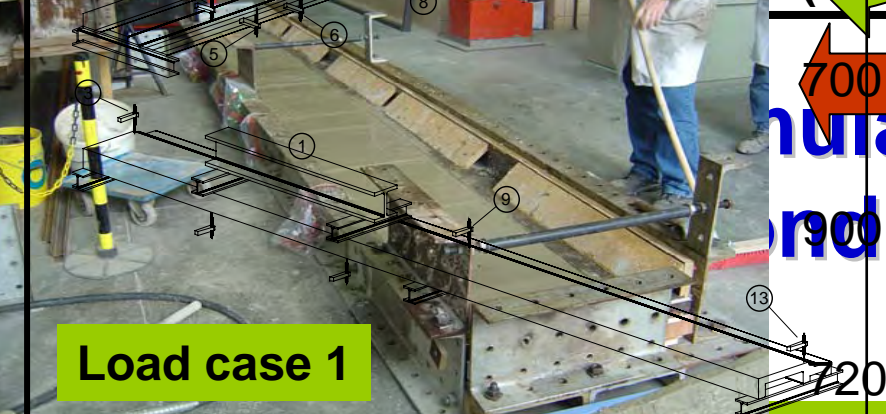
# Experimental program



- Material properties
- Beam preparation (6m)
- Casting process

Flexural bar: Eurocrete  
Shear reinforcement: Plytron

Fixed end



Load case 1



Load case 2

Manufacturing of FRP links using



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# Experimental results



- Crack pattern

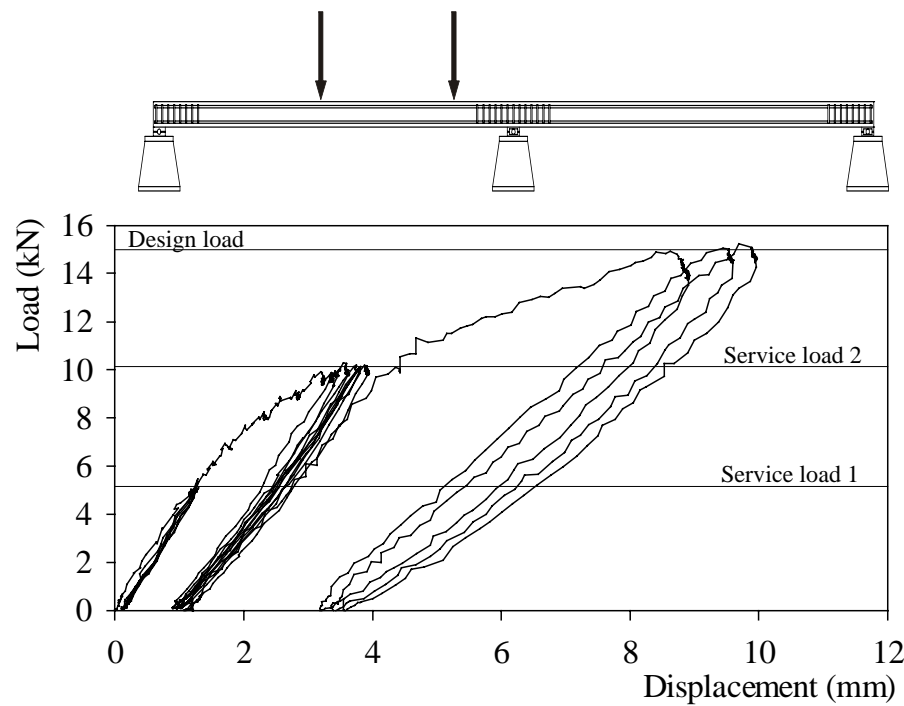


Test

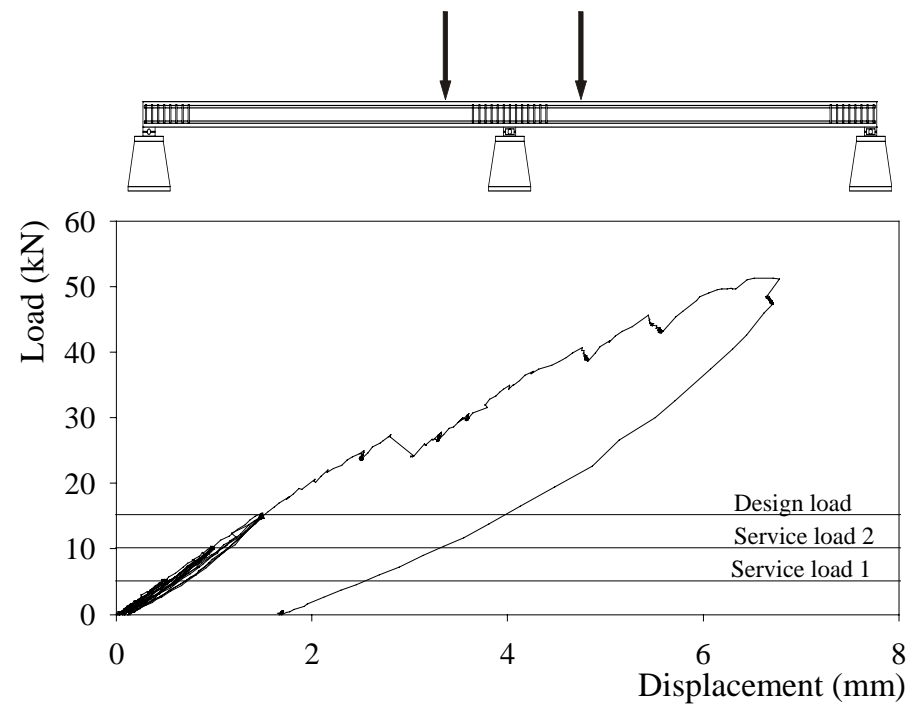


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# Experimental results



**Load case 1**



**Load case 2**



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# Experimental results

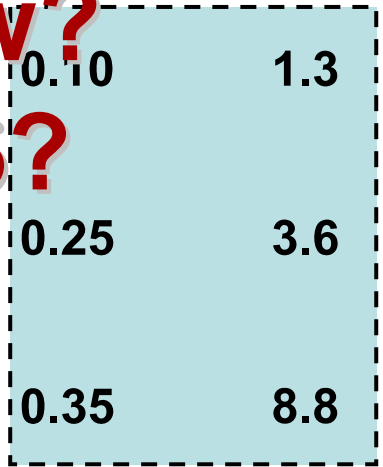


## Summary of the test results



Load (kN)	Experimental values	
	$W_{max}$ (mm)	$\delta_{max}$ (mm)
75	0.10	1.3
119	0.25	3.6
197	0.35	8.8

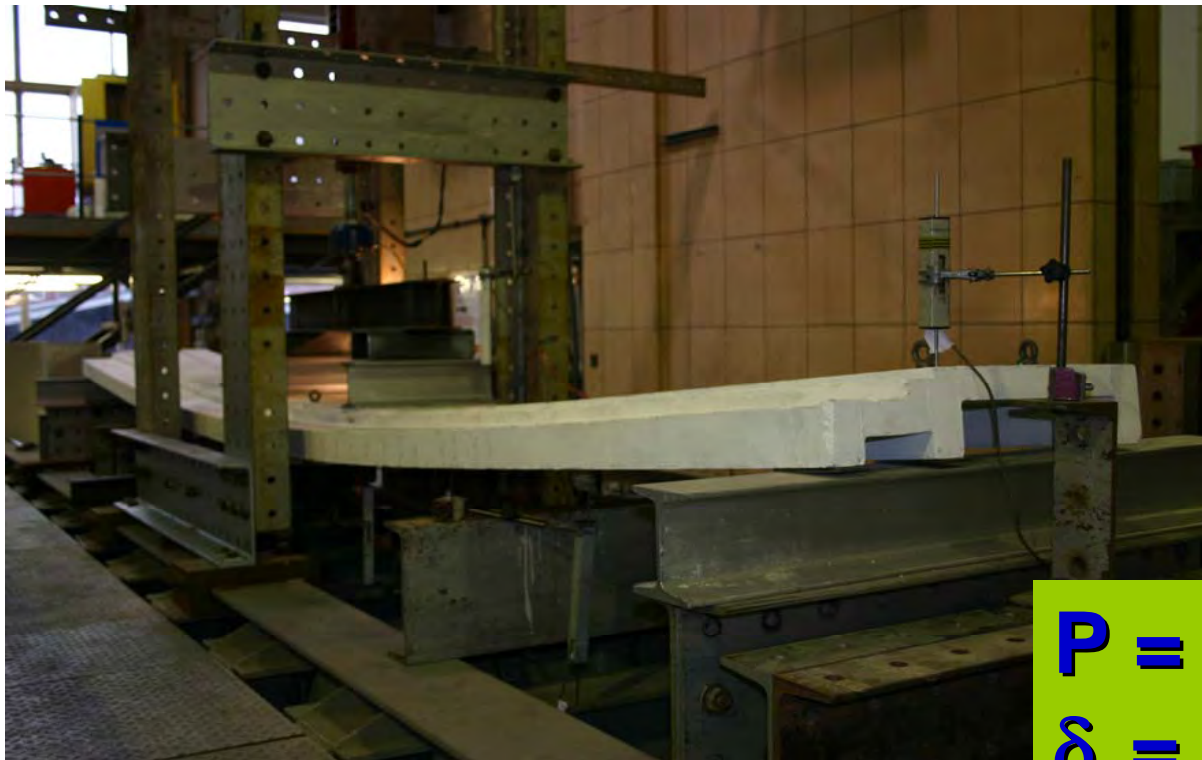
**W?**  
 **$\delta$ ?**





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# What is the $\delta_{max}$ ?



**$P = 30 \text{ kN}$**   
 **$\delta = 50 \text{ mm}$**

**$P = 55 \text{ kN}$**   
 **$\delta = 100 \text{ mm}$**



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# Concluding remarks



- **The use of FRPs can extend the lifespan of concrete structures and reduce the need for maintenance or repair**
- **The use of FRPs can reduce the concrete cover and hence reduce the self weight of RC structures**
- **Thermoplastics can offer a viable solution for on-site bending**
- **The use of FRPs for RC structures can meet serviceability requirements as given by current design recommendations**