

Introduction of Carbon Fiber Reinforced Plastic (CFRP) to PC Hollow Girders

=2018 Onahama Port East Port Area -18m Quay (Seismic Countermeasure) Superstructure Work=

Maintenance (seismic countermeasure) work of quay of the water depth -18m was carried out at the east port area of Onahama Port in Iwaki city, Fukushima prefecture. As part of this project, 3 bridges per overall length 370m was built to connect the pier-type quay and the east port reclaimed land by way of minimum passage.

In this project, introduction of Carbon Fiber Reinforcement Plastics (CFRP) to these bridges was decided as a port technology pilot programme; PC hollow girders for the Bridge A (conventional PC), the Bridge B (conventional PC + CFRP) and the Bridge C (CFRP) were built.

Different from conventional PC hollow girders that use reinforcing steels, it is expected that the maintenance work caused by salt damage is not needed for CFRP girders, because CFRP has no concern for corrosion such as rust.

Monitoring and comparative investigation of these three bridges are scheduled to confirm workability and durability; By means of the results, establishment of design and installation method of CFRP considering Life Cycle Cost (LCC) is expected.

*CFRP used in this project is CFCC manufactured by Tokyo Rope International.



Photo-1 Location of Bridges

	Bridge A	Bridge B	Bridge C
	渡橋 A	渡橋 B	渡橋 C
標準断面			
活荷重	T-25荷重(実際は管理用車面が利用)		
鋼材 (梁強材)	PC鋼より線(7本よりφ 15.2mm) × 31本 (上線:13本、下線:18本)	PC鋼より線(7本よりφ 15.2mm) × 20本 (上線:12本、下線:8本)	-
CFRP (梁強材)	-	CFRPより線(7本よりφ 15.2mm) × 8本 (下線:8本)	CFRPより線(7本よりφ 15.2mm) × 31本 (上線:13本、下線:18本)
センサー	ひずみ計 × 4個	ひずみ計 × 4個 EMセンサー × 4個	ひずみ計 × 4個

Figure-1 Comparison of Cross-section of Bridges



Photo-2 Manufacturing of PC Hollow Girder



Photo-3 Finished PC Hollow Girders

