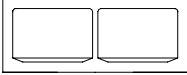


TUNNEL NAME/LOCATION/DATE COMPLETED:		T.74 - Guldborgsund	
Guldborgsund Tunnel; crossing the sound between the islands of Lolland and Falster, Denmark; 1988			
TUNNEL TYPE AND USE: Reinforced concrete box sections; Vehicular		LANES/TRACKS: Two tubes; each with two lanes	
NO OF ELEMENTS: 2	LENGTH: 230 m	HEIGHT: 7.6 m	WIDTH: 20.6 m
TOTAL IMMERSSED LENGTH: 460 m		DEPTH AT BOTTOM OF STRUCTURE: 13.8 m	
UNUSUAL FEATURES:	230 m long, vertically curved elements are some of the longest ever produced. Computer-controlled dynamic ballasting was used.		
FABRICATION METHOD: The two tunnel elements were cast one at a time in a drydock located in the future tunnel ramp at Lolland. The elements were cast in 15 m to 15.3 m segments to prevent cracks. When cracks occurred in the first segment, cooling was used in the second element, and no cracks were found.		JOINT TYPE: Between tunnel elements; Gina gasket supplemented with flat rubber interior gasket. At shore ends of tunnel: Temporary tightening by rubber lip gaskets, allowing ramps to be emptied of water, whereupon the permanent rubber Omega gaskets were installed between the tunnel and the portal structures. The tunnel was made monolithic by casting reinforced concrete in the temporary gap between the two tunnel elements.	
WATERPROOFING METHOD:	The elements were waterproofed with a 6 mm steel membrane on the bottom and sides. On the top, a bituminous membrane was installed and protected with 15 cm of reinforced concrete.		
PLACEMENT METHOD:	Each of the tunnel elements was provided with bulkheads at the ends and equipped with six ballast tanks with a total capacity of 4,000 m ³ of water. After flotation, the elements were moved to their final position and sunk onto temporary supports approximately 1 m above the bottom of the excavated trench.		
FOUNDATION METHOD: Sandjetting		DREDGING METHOD: A cutterhead suction dredge was used	
VENTILATION TYPE:	Longitudinal ventilation by means of jet fans		
COVER AND TYPE:	The eastern part, where the tunnel is located above the seabed, is protected with 1 m of gravel. No cover is provided for the remaining part of the tunnel.		
ADDITIONAL INFORMATION: The tunnel ramps are located in low water areas in the sound, and surrounded by dikes. Within the dikes, dewatering is performed by relief wells; the collected water is pumped out into the sound at the tunnel portals. The tunnel is designed to be unmanned, with automatic and remote controls OWNER: Road Directorate DESIGNER / ENGINEER: Christiani & Nielsen, Copenhagen CONTRACTOR: Guldborg Sound Consortium: Arnton A/S and Pihl & Son A/S			