

Chapter 0 Why Fluid Mechanics?

0.1 Speculation of Leonardo da Vinci

0.2 Physics of Golf

0.3 Water Resources

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0.7 Flooding of the Han River in 1995

0.8 River Navigation

0.1 Speculation of Leonardo da Vinci



Bridge
Pier

Horseshoe Vortex

Leonardo da Vinci
(1452-1519)

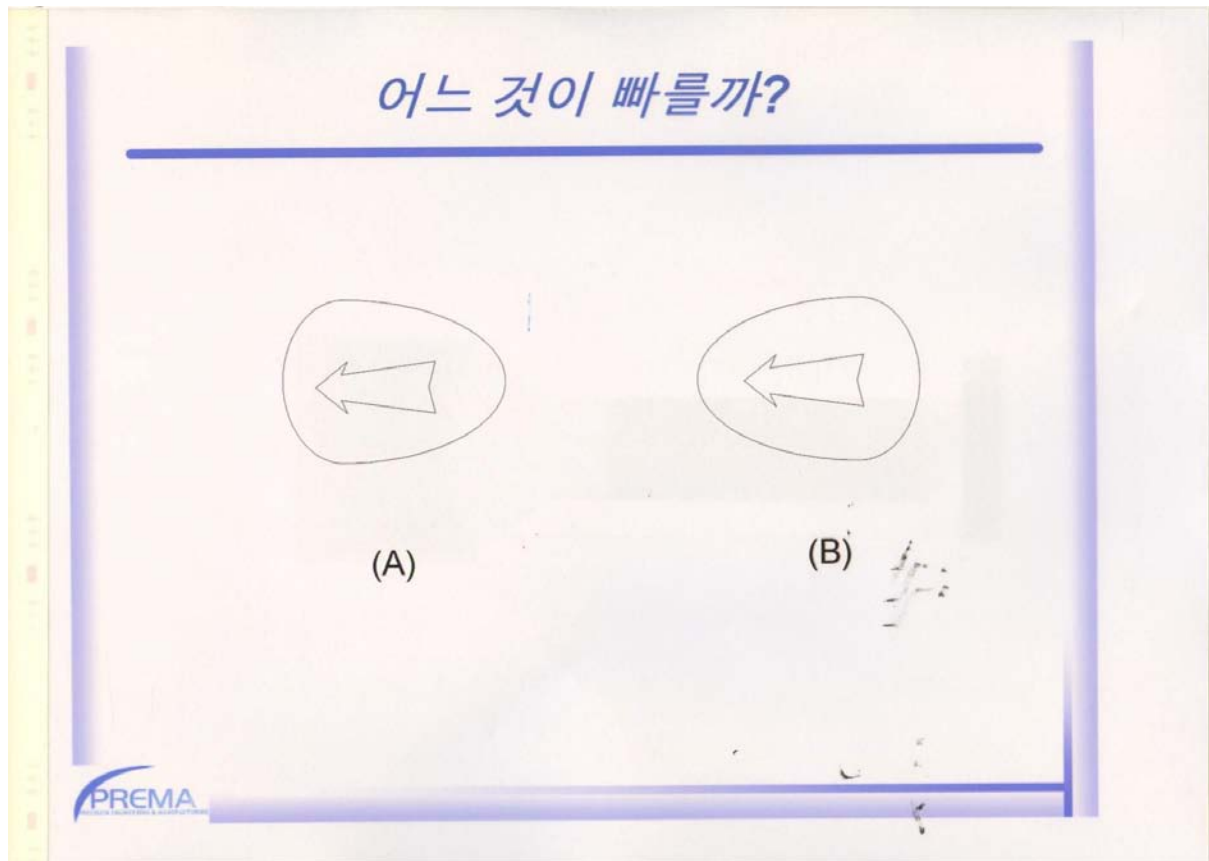


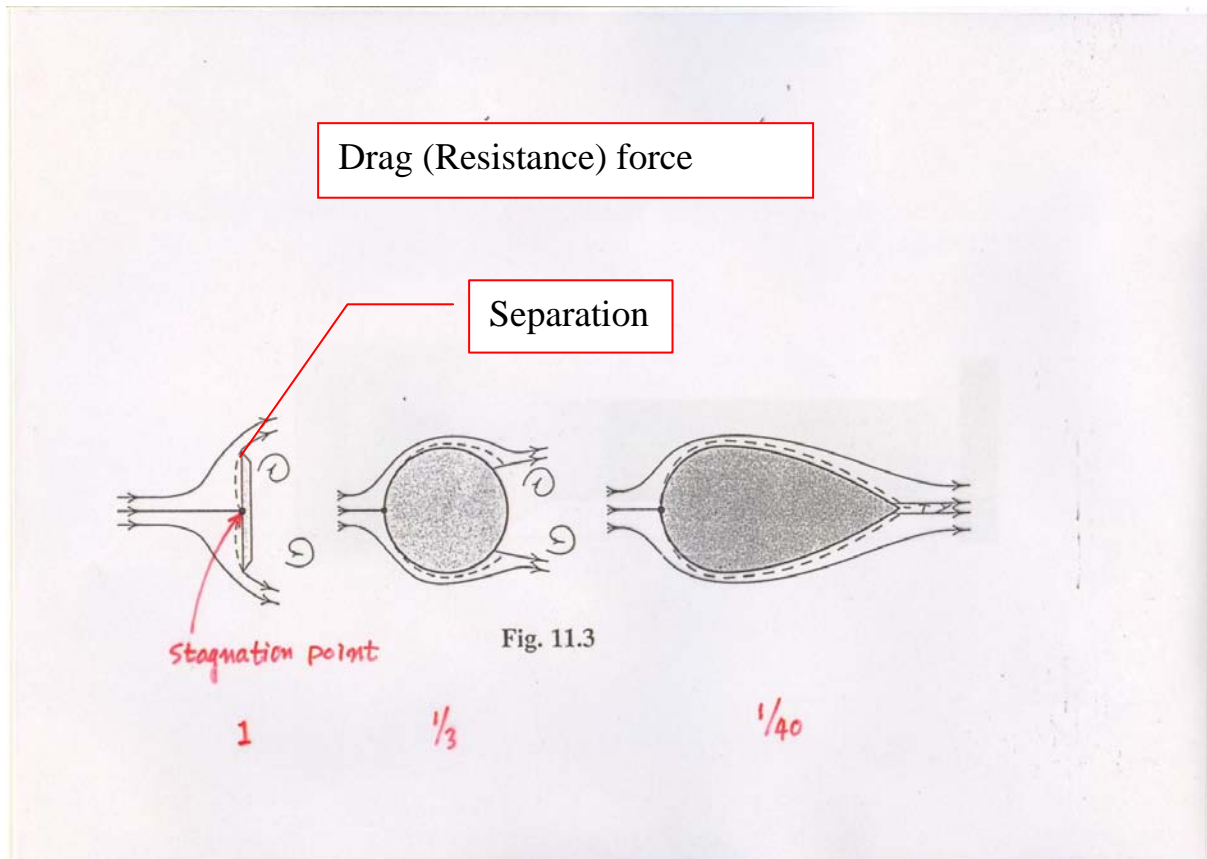
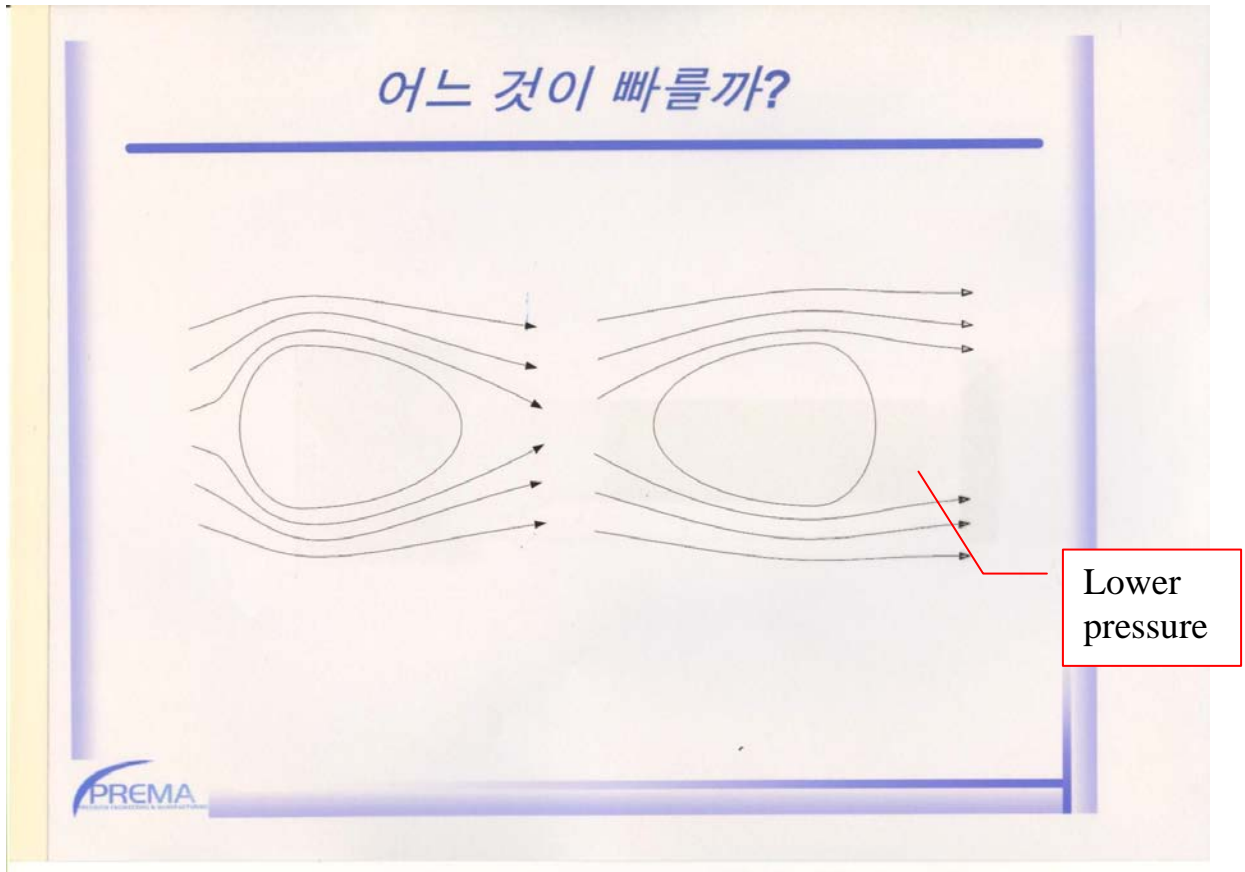
그림 1-1 Leonardo da Vinci와 그가 그린 위어에서의 물흐름



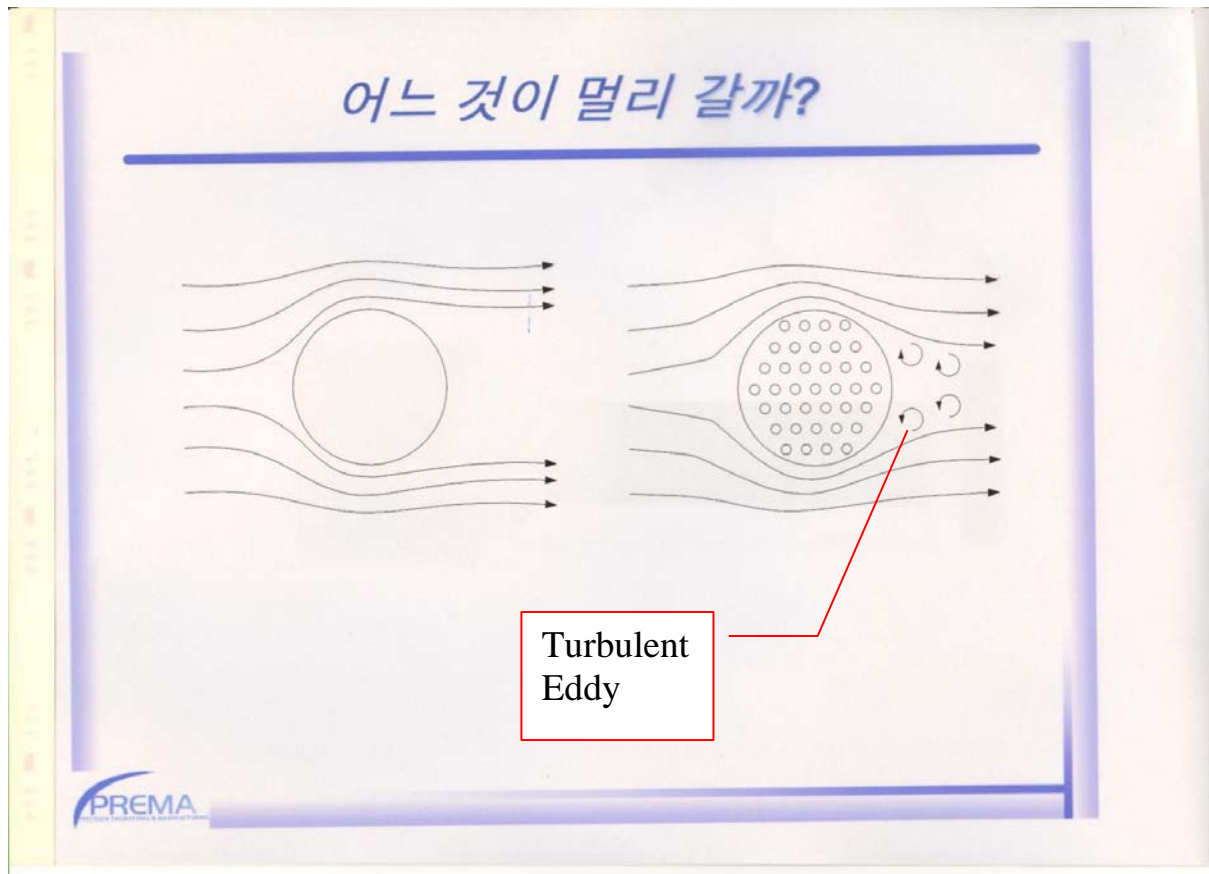
River Tummel, Pitlochry, Scotland, UK (2011)

0.2 Physics of Golf









Scarred ball

Guttie ball

Dimple ball

Feathery Ball



Last feathery made by Robertson, in 1852



Guttie Ball



Smooth ball made by Robertson in 1852



Red, hand-hammered guttie for use in snow



Hand-hammered Robertson guttie from the 1850s



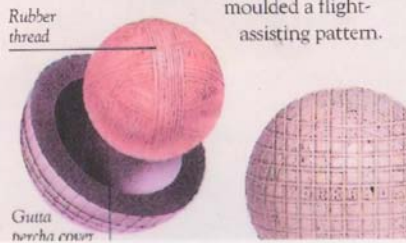
Guttie ball stamped with a distinctive circle marking



Rubber-core Ball

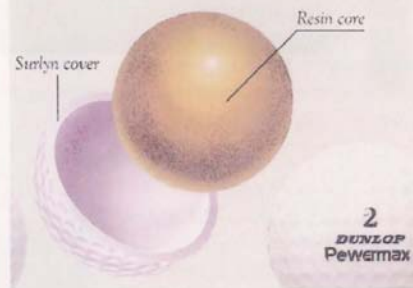
THE RUBBER-CORE BALL

The rubber-core ball, developed by Coburn Haskell in 1898 and first made commercially in 1901, could be hit farther and faster than previous designs. It was made by winding great lengths of rubber yarn, stretched under tension, around a rubber core. A livelier core enabled golfers to exercise more control over the ball's spin and flight. Early models had a gutta percha covering, on to which was moulded a flight-assisting pattern.



TWO-PIECE

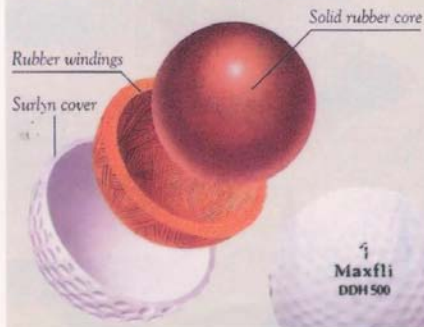
A high-energy acrylate or resin core with a tough cut-proof blended cover gives the two-piece more length than any other ball. It is also virtually indestructible which, with its top roll distance, makes it by far the most popular ball among ordinary golfers. However, because it has a lower spin rate, it is less easy to control.



Rubber-core Ball

THREE-PIECE (SURLYN COVER)

This version of the three-piece wound ball has a solid rubber core over which rubber yarn is wound for good control. The cover is made from Surlyn, a thermoplastic resin that is harder than balata and is thus considerably more durable; it is virtually uncuttable.

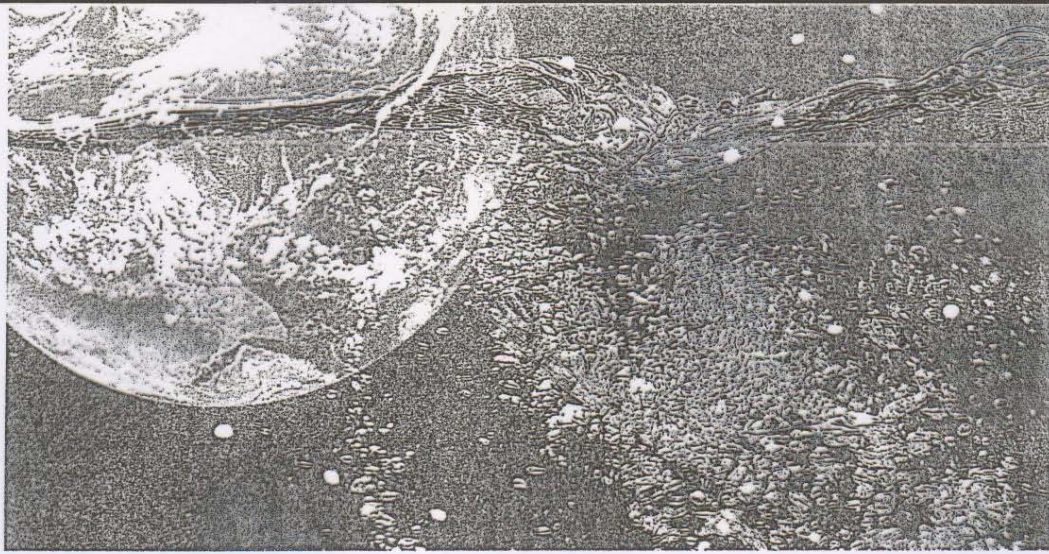


THREE-PIECE (BALATA COVER)

The balata-covered, liquid-centred three-piece ball might be described as the most advanced of golf balls. The wound construction over a liquid centre, combined with a soft, synthetic balata cover, produces the highest spin rate, making it the ball with maximum control and superb feel.



0.3 Water Resources



물 수요-공급 전망 (단위: 억톤)		
	2001	2011
물수요량	337.4	370.0
물공급량	338.0(100%)	351.6
-하천수	158.8(47%)	164.8
-댐	147.8(44%)	152.1
-지하수	31.5(9%)	34.8
공급량-수요량	0.6	-18.4

Water
Shortage

0.4 Dams



Chungju Multi-purpose Dam at Han River
(Concrete Gravity Dam)

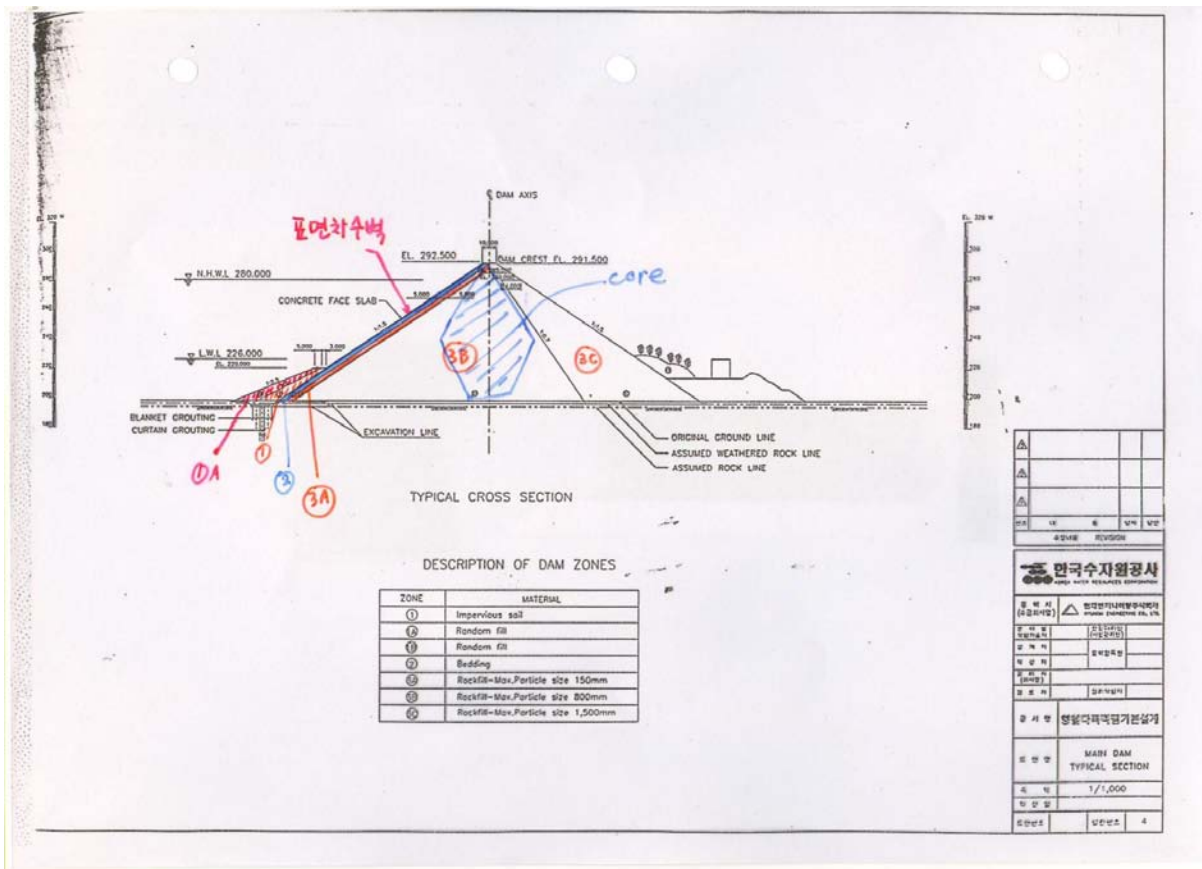


Yongdam Dam at Guem River
(Rock Fill Dam)

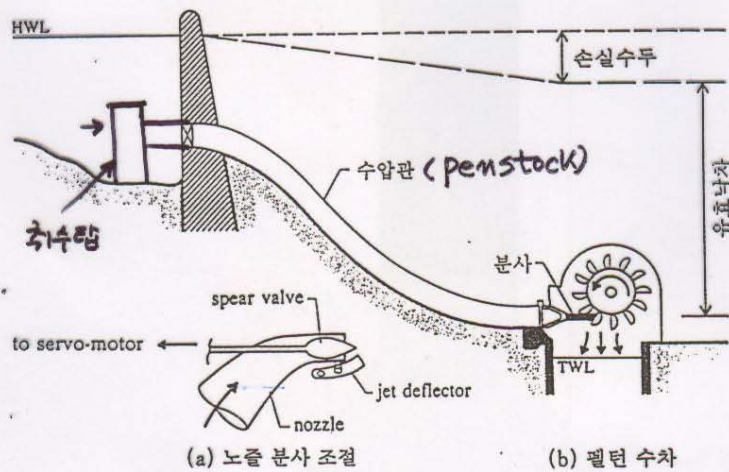


그림 2.4 장성 농업용 댐(영산강) Changseong Irrigation Dam(Yeongsan R.)

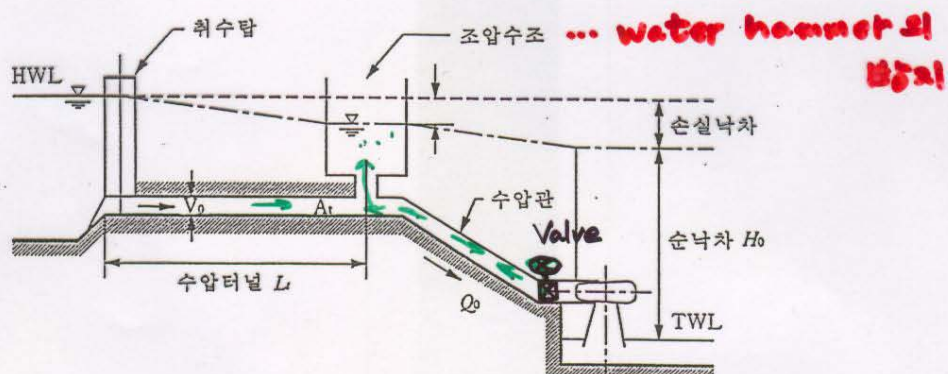
Changseong Dam at Yeongsan River (Earth Fill Dam)



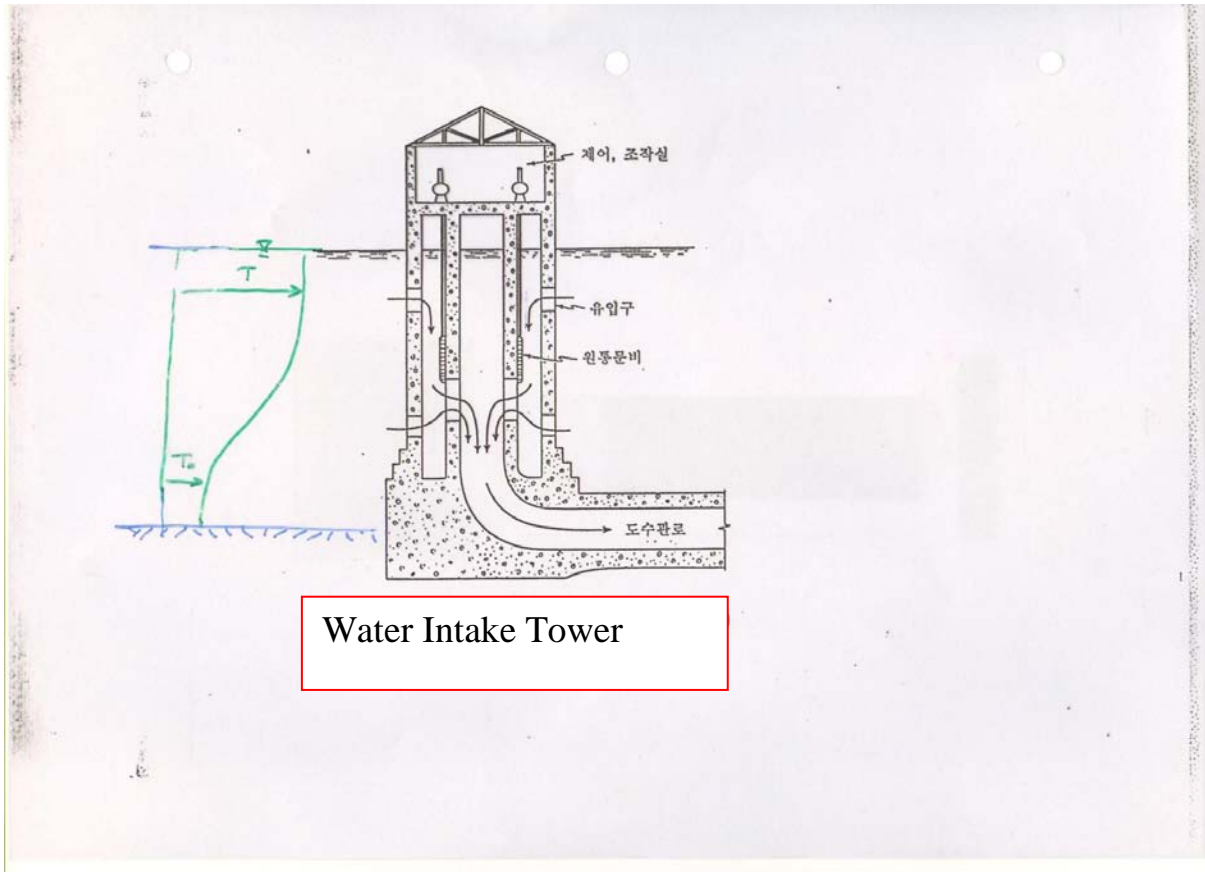
0.5 Hydropower Plants

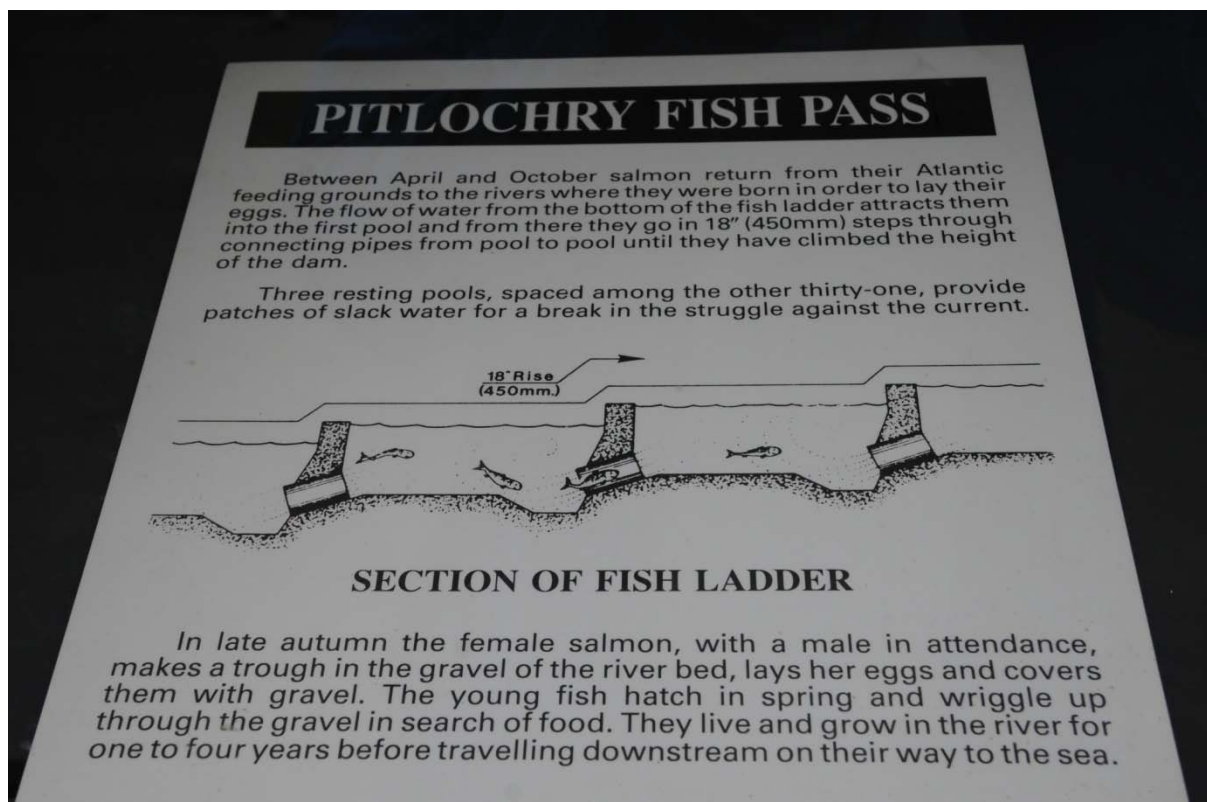
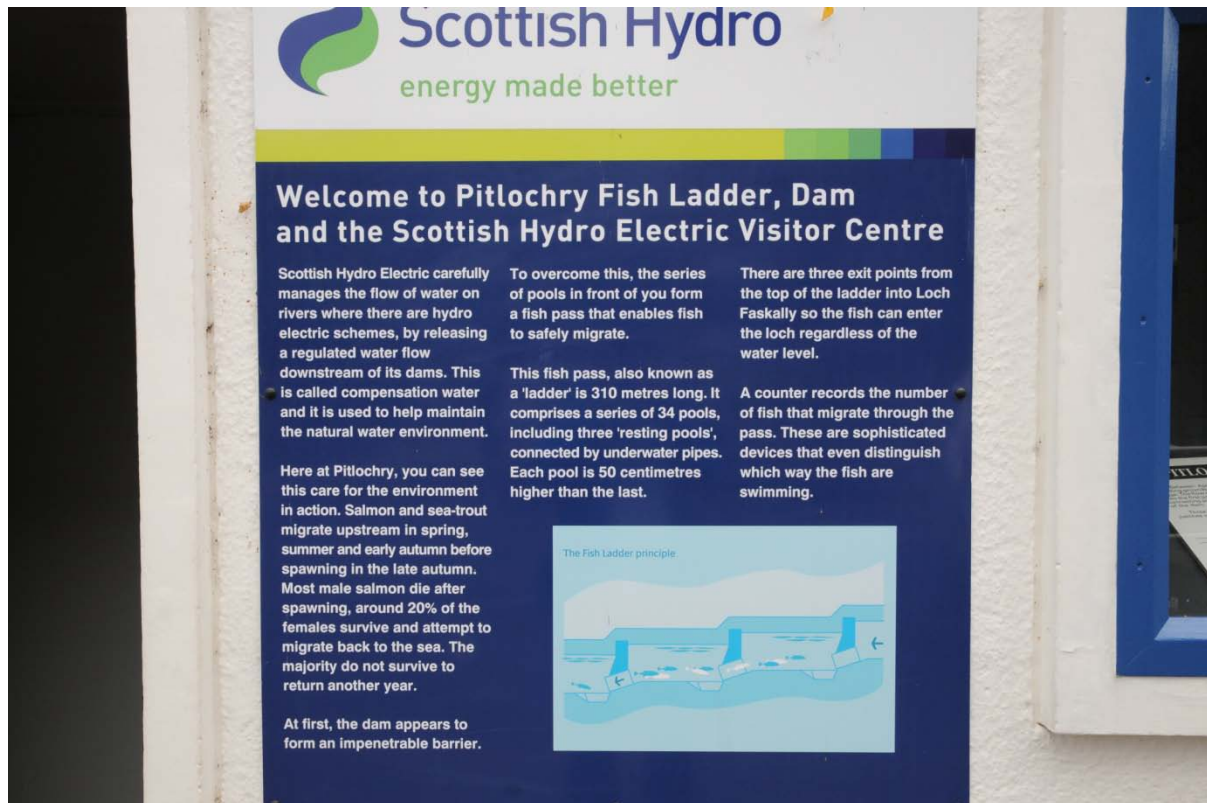


Penstock of Hydropower Plant

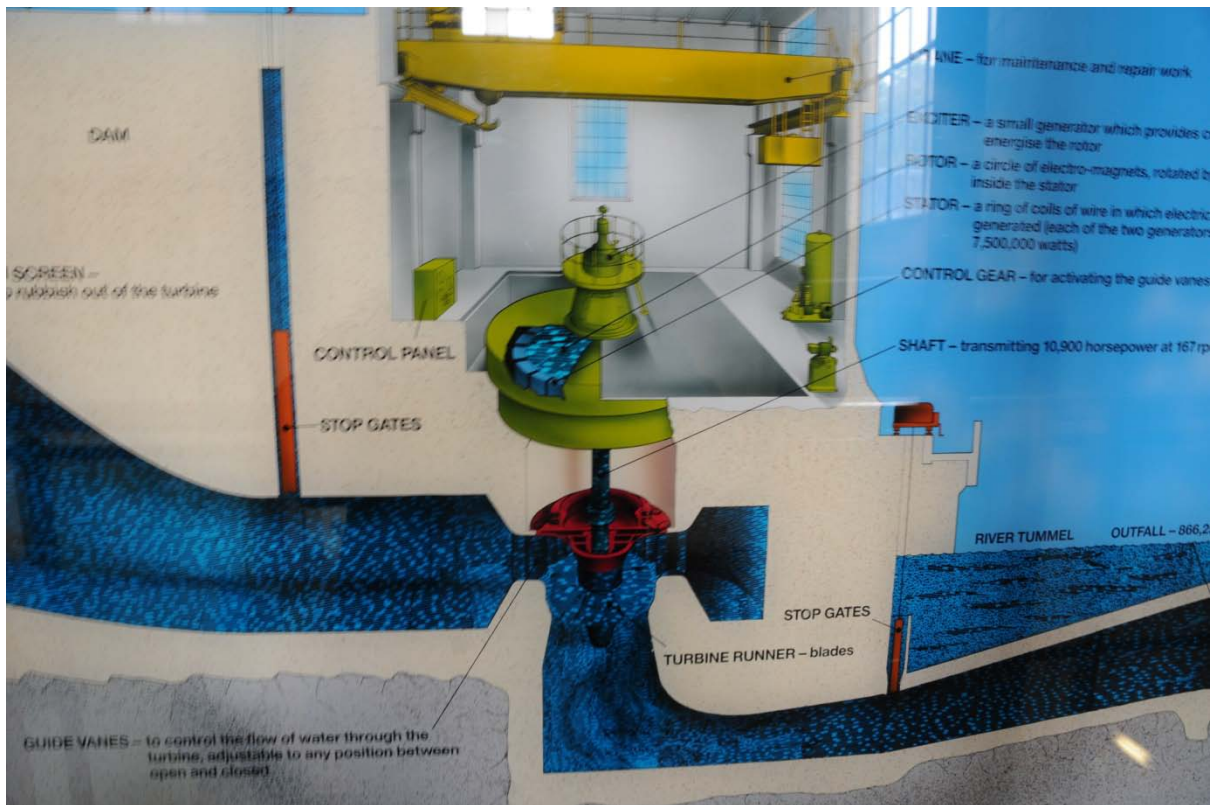


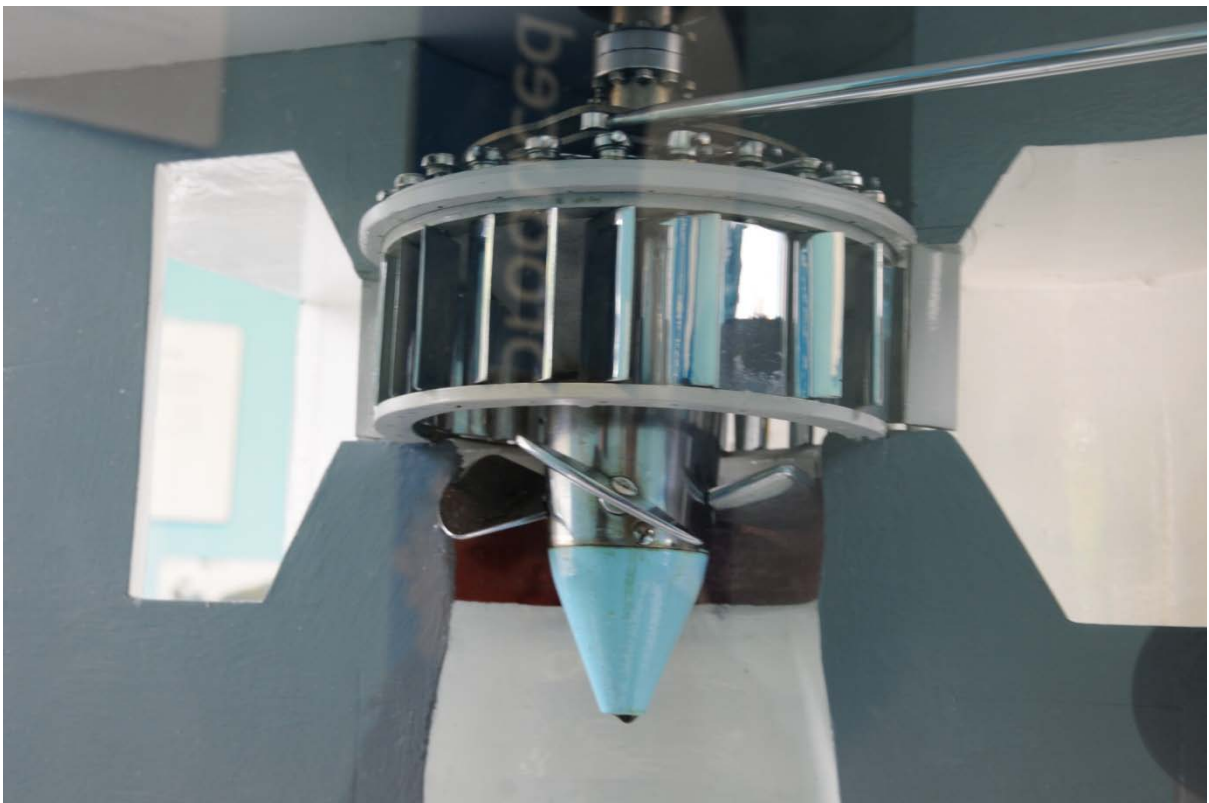
Surge Tank for prevention of Water Hammer





Scottish Hydro, Pitlochry, UK (2011)







0.6 Spillways

하천 및 댐공학

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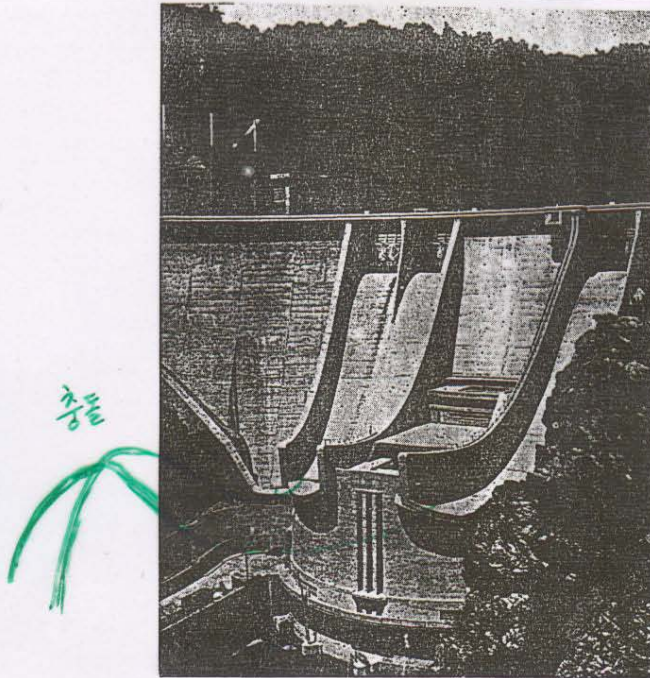


그림 8.17 스키점프 여수로(프랑스 l'Aigle 댐)

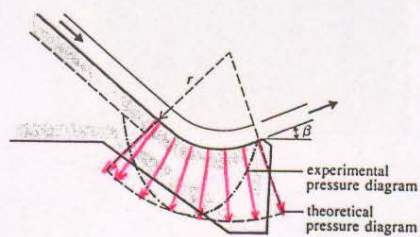
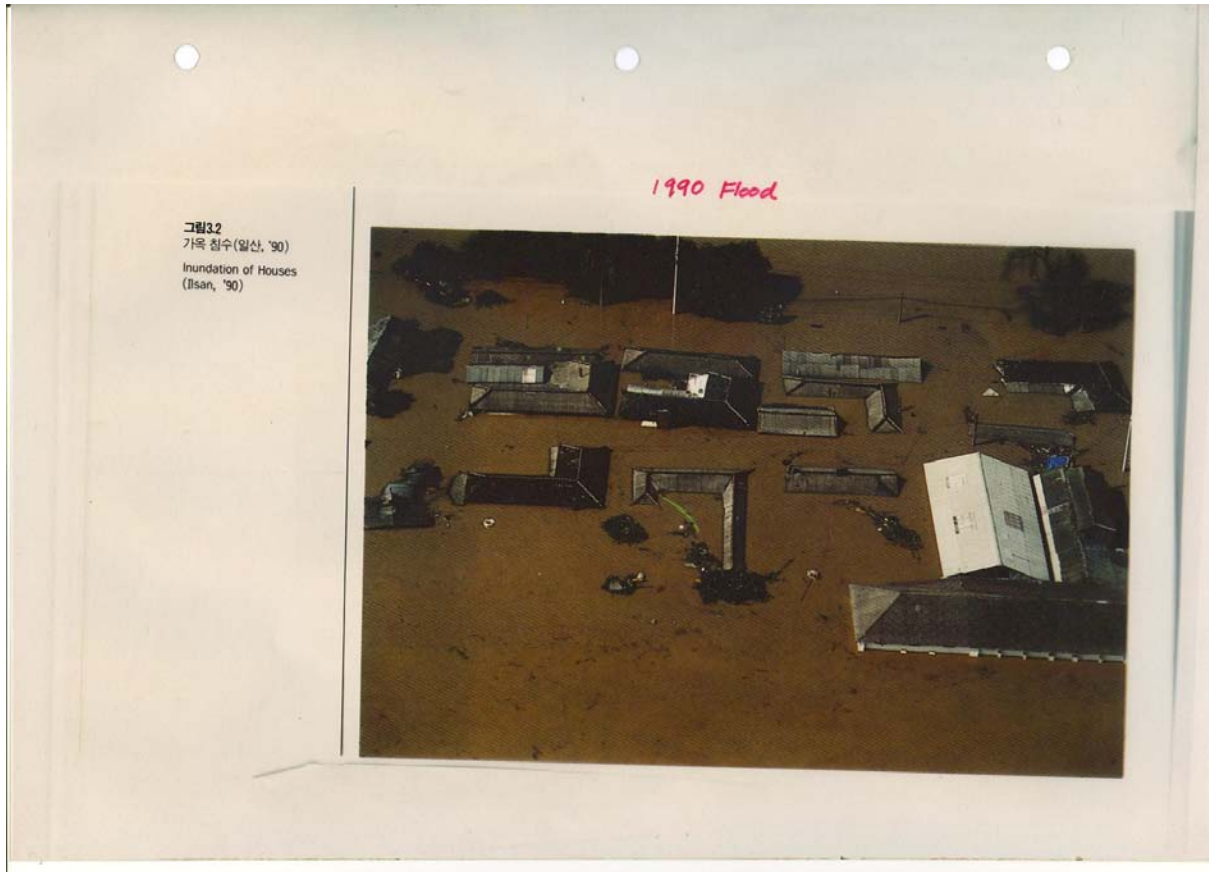
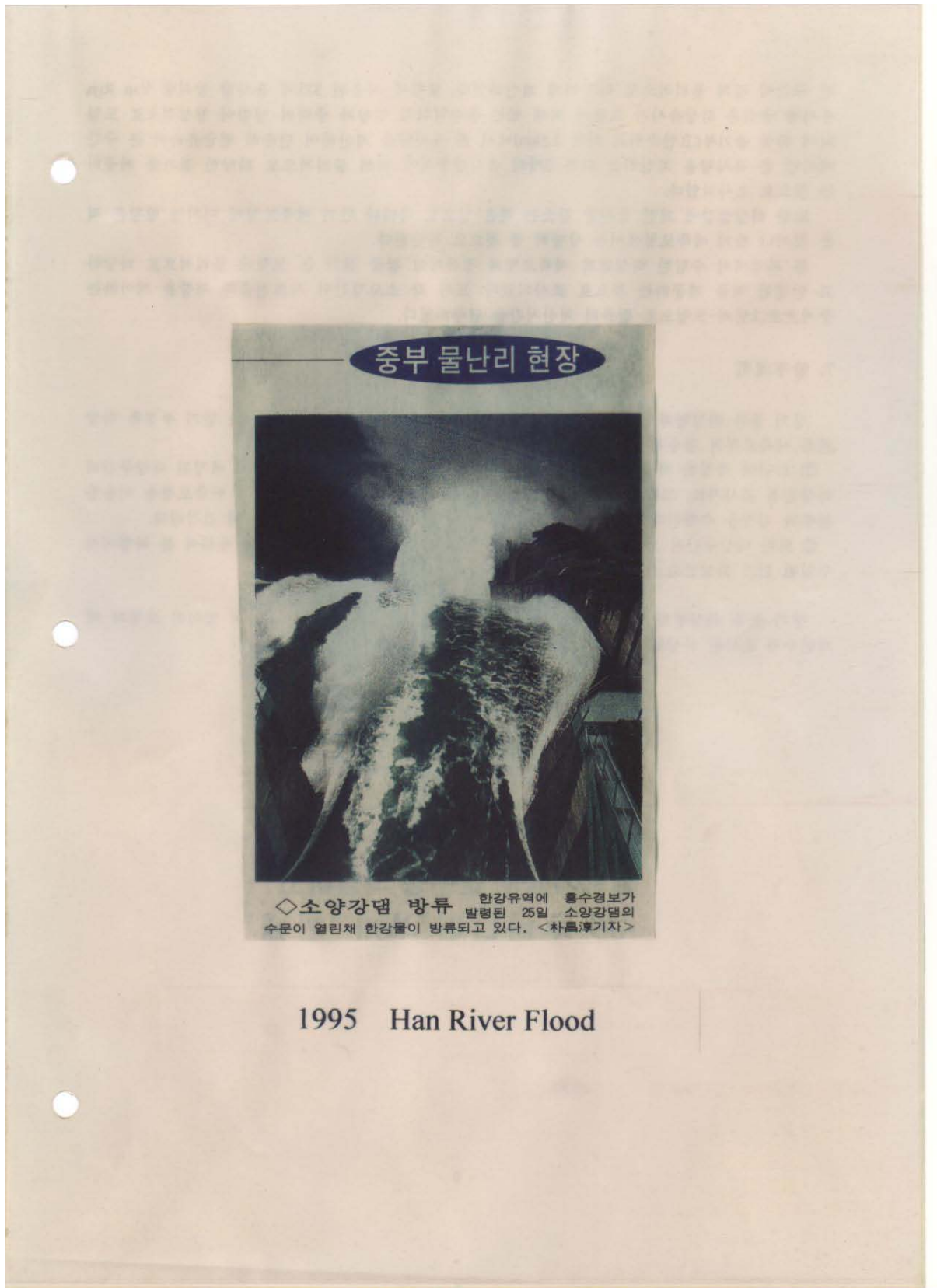


그림 8.18 버킷부의 설계

0.7 Flooding of the Han River in 1995









◇ 황토물 「大路」

63빌딩에서 바라본 올림픽대로. 25일
오후 한강 물이 크게 불어나면서 노랑
진 일대 올림픽대로가 황토물에 잠겨버
렸다.
<李起元기자>

1995 Han River Flood

0.8 River Navigation



