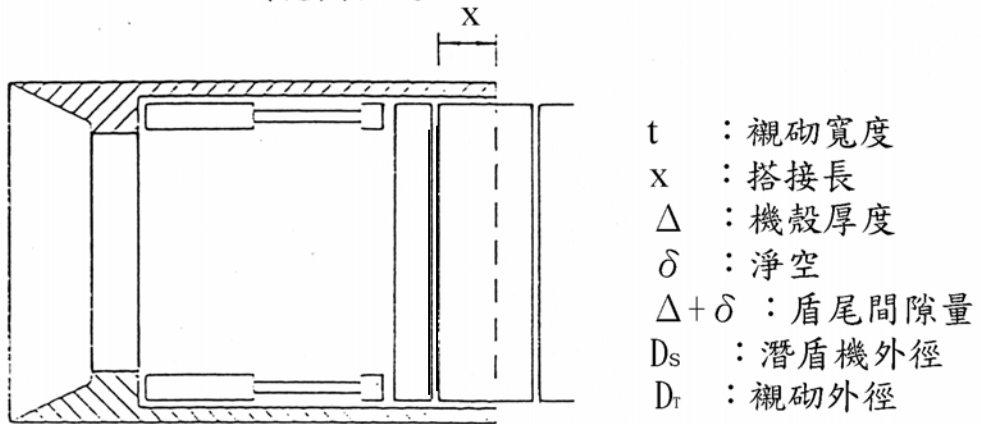
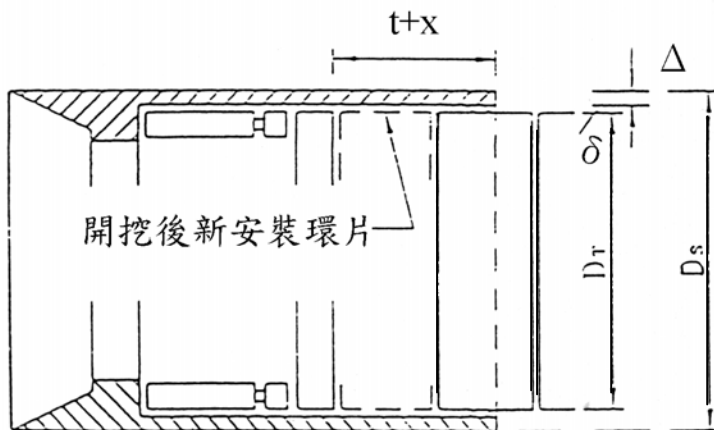


a. 開挖與掘進



b. 掘進終止



c. 安裝襯砌

圖 2-1 潛盾施工作業循環示意圖

(摘自 朱旭, 1984a)

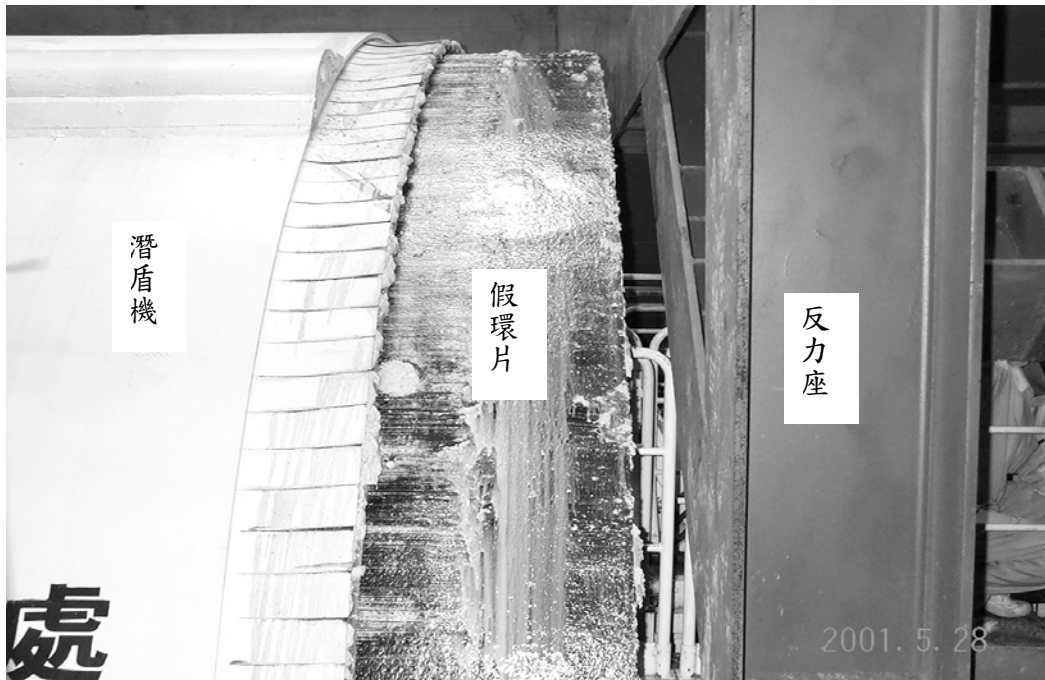


圖 2-2 初期掘進期間假環片推出機殼
(摘自 高宗正, 2003)

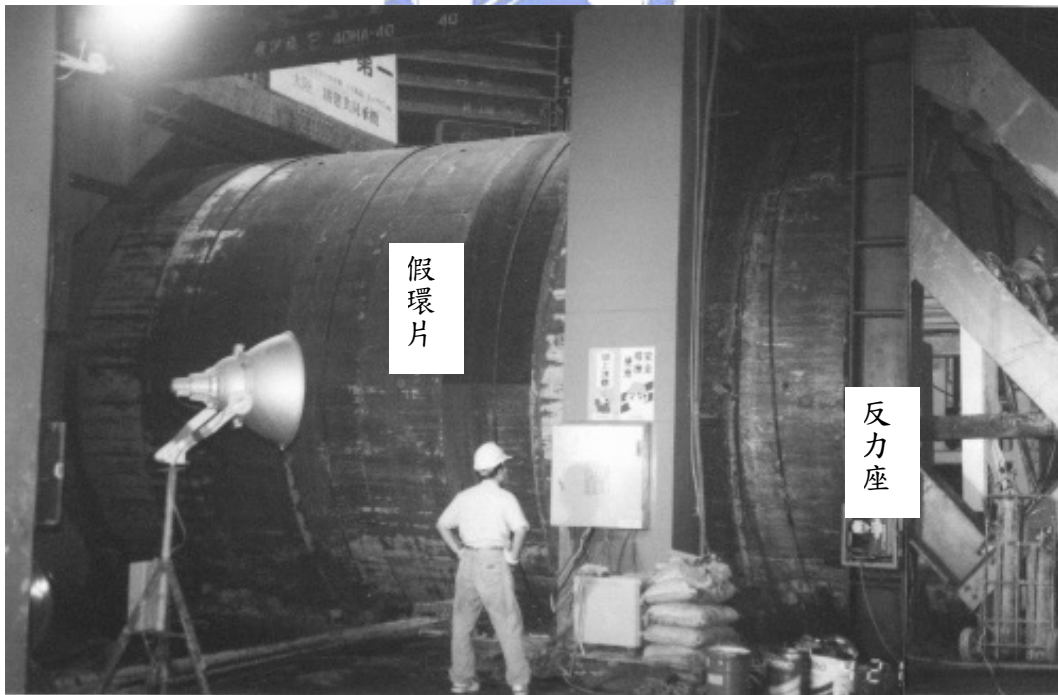
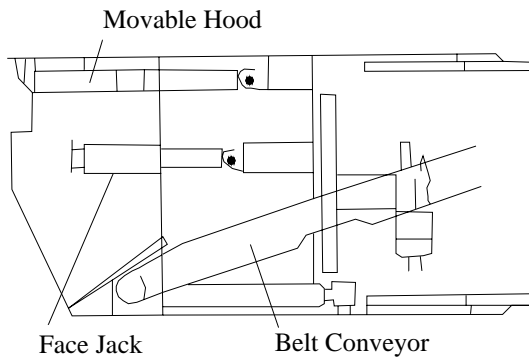
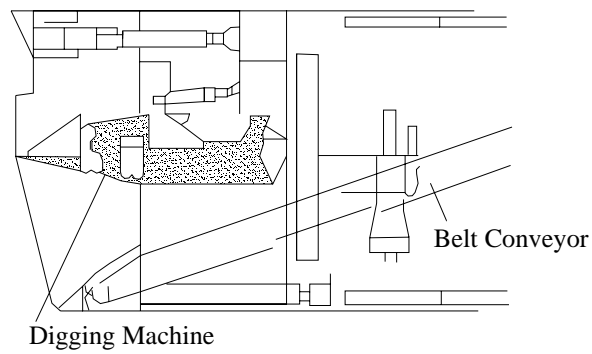


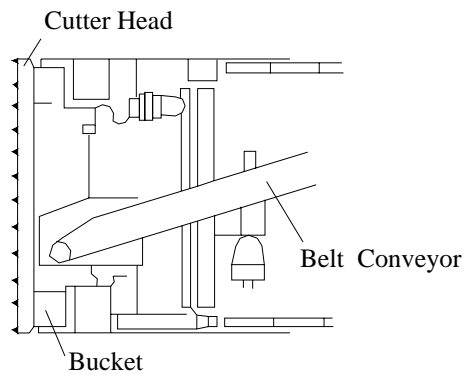
圖 2-3 初期掘進潛盾機發進挖掘進入地盤改良區
(摘自 高宗正, 2003)



(一) 手挖式潛盾機



(二) 半機械式潛盾機



(三) 機械式潛盾機

圖 2-4 開放式潛盾機

(摘自 IHI Tunneling Shield 型錄，1987)

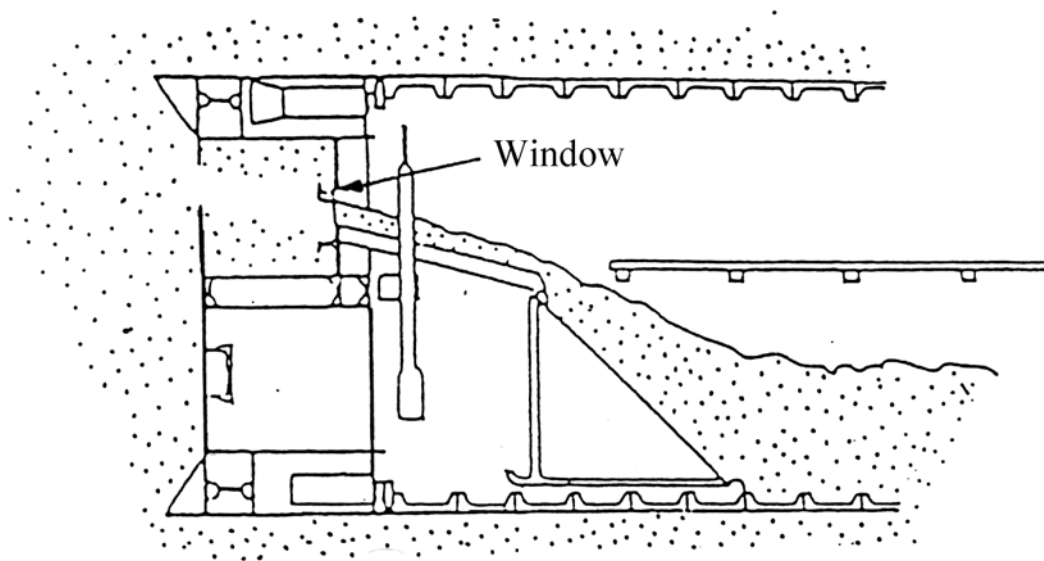


圖 2-5 擠壓式潛盾機
(after Konda, 1987)

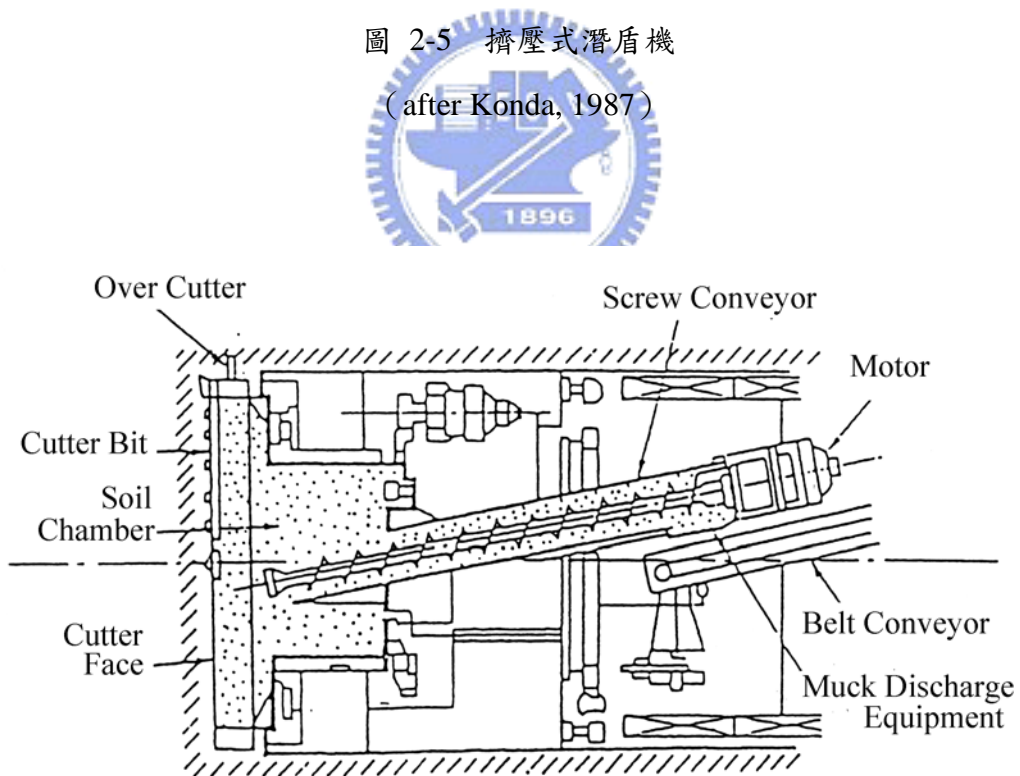


圖 2-6 土壓平衡式潛盾機
(after Konda, 1987)

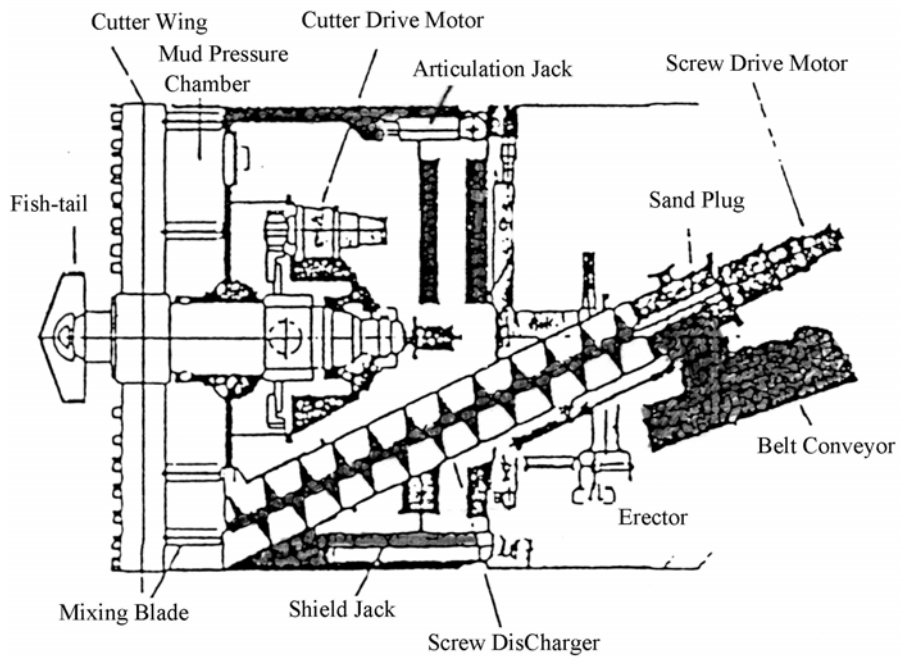


圖 2-7 加泥土壓平衡式潛盾機

(after Hitachi Zosen, 1990)

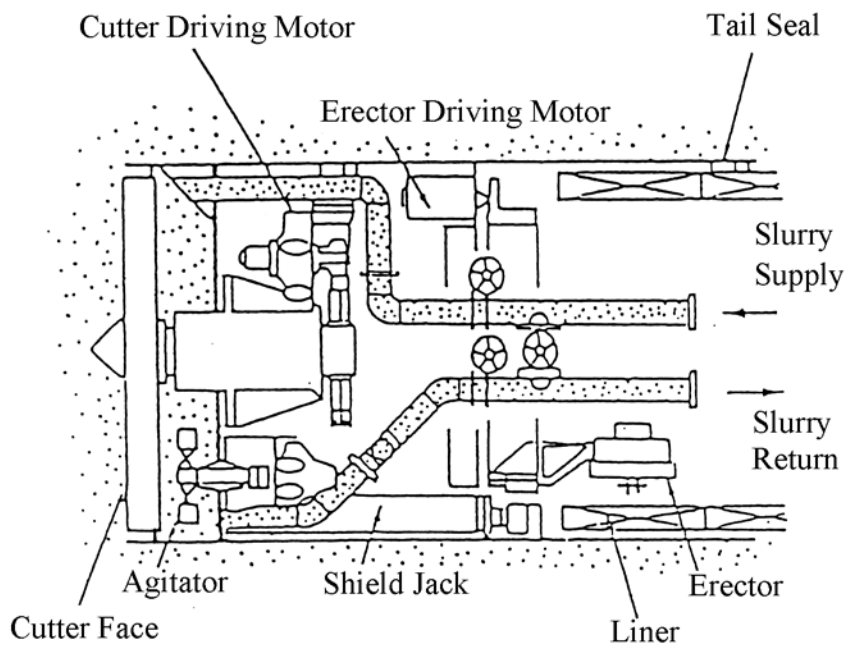


圖 2-8 泥水式潛盾機

(after Konda, 1987)

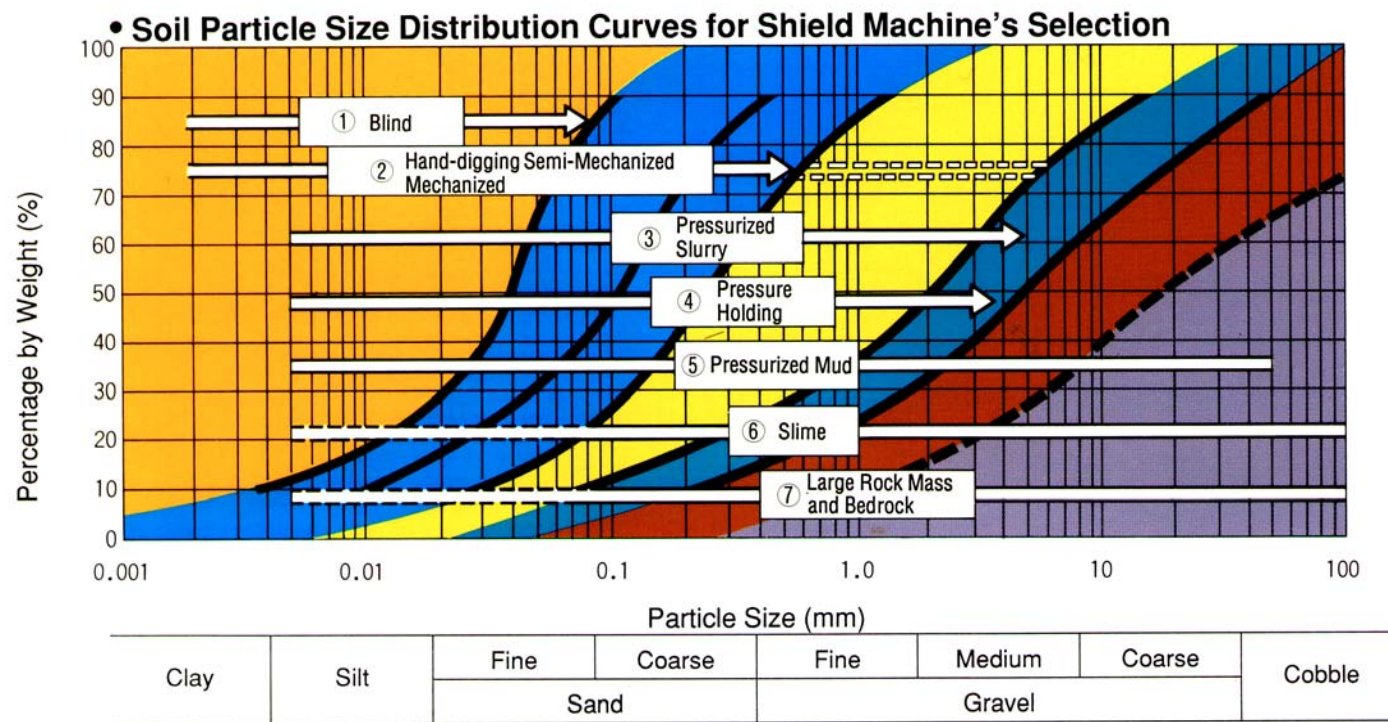


圖 2-9 土壤粒徑分佈與潛盾機適用範圍

(after Hitachi Zosen Corporation, 1990)

■ Conventional Shields

■ Special Shields

Type	1		2		3	
	Blind		Hand-digging	Semi-mechanized	Pressurized Slurry	
Description	Good for soft, silty soils containing less sand. Muck discharge rate controlled by adjusting the aperture ratio in accordance with the excavating speed.		Good for hard, non-collapsing soils or semi-hard soils. Equipped with half-moon and face jacks to hold the face. Special equipment, such as movable hood, movable deck, etc. is available if the soil condition requires it.	A mechanized version of manual open type, equipped with a backhoe, boom cutter or the like if the soil condition requires it.	Good for water-seeping sand and sand-gravel (less gravel) soils. May be equipped with stone box and stone discharger to remove cobbles in the slurry	
Form						
Appearance						
Page			4-5		6-7	



4	5	6		7
		Pressure Holding	Muddy Soil Pressure Ballanced	
		Double Screw	Ribbon Screw	
Good for clay and clay-sand soils. One of the main features is the screw discharger with a cone valve to form a sand plug. Also applicable to partial pneumatic operation.	Mechanical shield equipped with the full-face spoke type cutter, applicable to a variety of strata by injecting slime. Features are the converting-into-mud function and the open-cutter-face structure.	With slime injection into cutter chamber. Good for water-seeping sand- gravel-cobble soil and super-soft soil as well as complex strata. This type has the features of the pressurized slurry type and the pressure holding type in that it is adaptable to any type of strata.		Mechanical shield equipped with the roller bits to crush large rock masses and bedrock. Recommended for clay strata, collapsible water bearing strata, large rock masses and bedrock.
8-9	10-11	12~13	14~15	16-17

圖 2-10 各型式潛盾機與其適用地質
(after Hitachi Zosen Corporation, 1990)

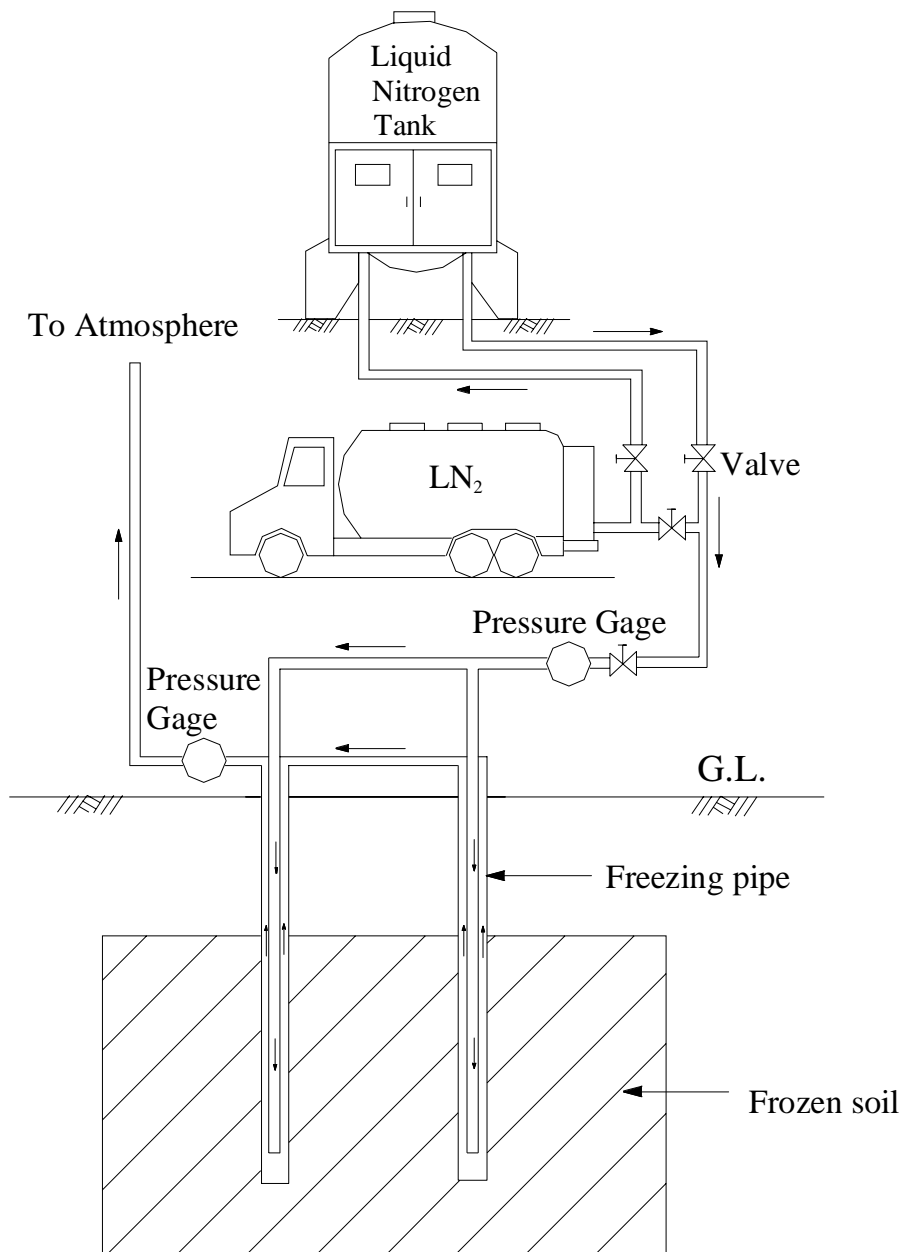


圖 2-11 液態氮 (LN₂) 凍結工法
(摘自 曾紀偉, 1998)

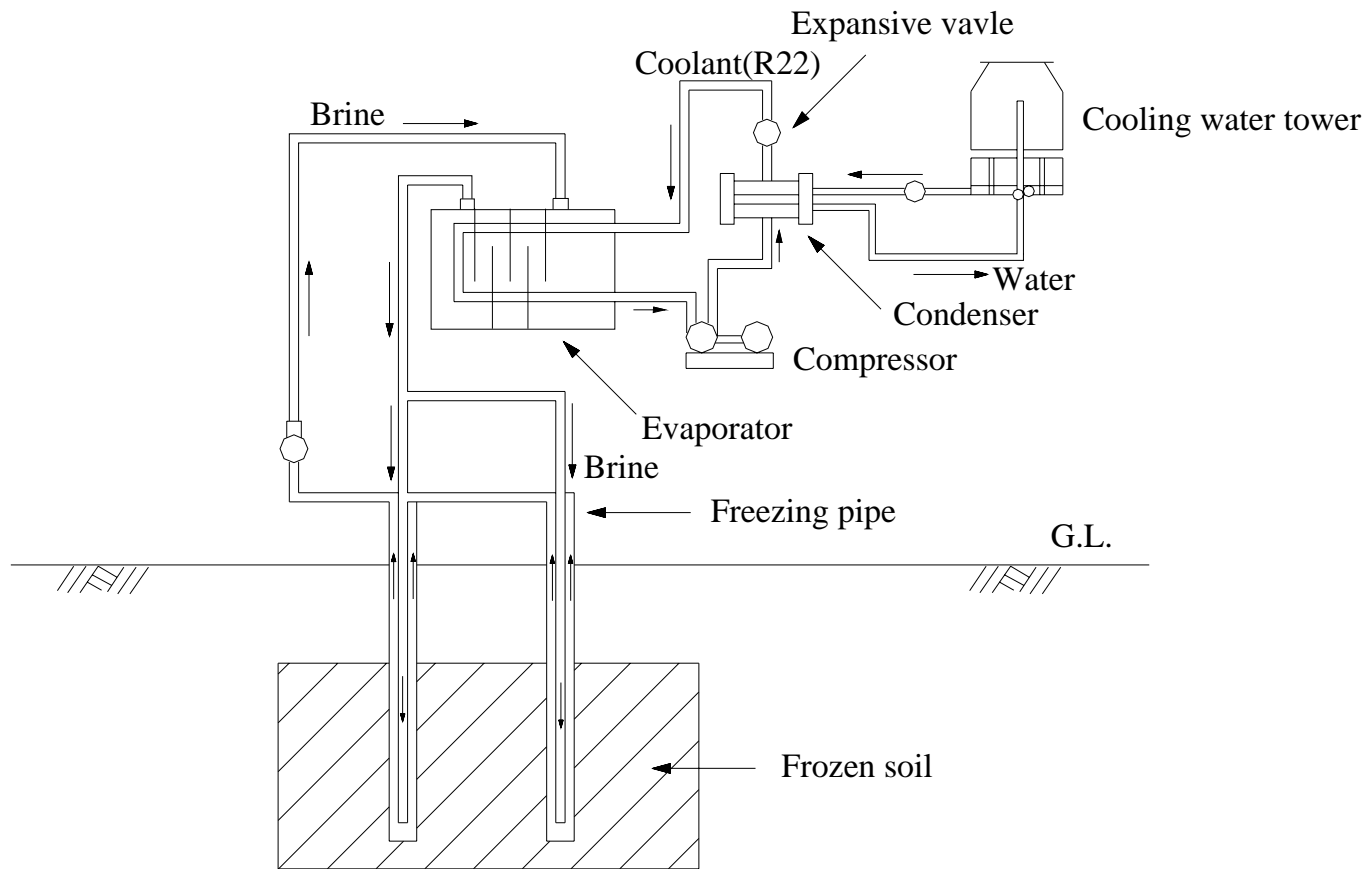


圖 2-12 鹽水 (Brine) 凍結工法 (摘自 曾紀偉, 1998)

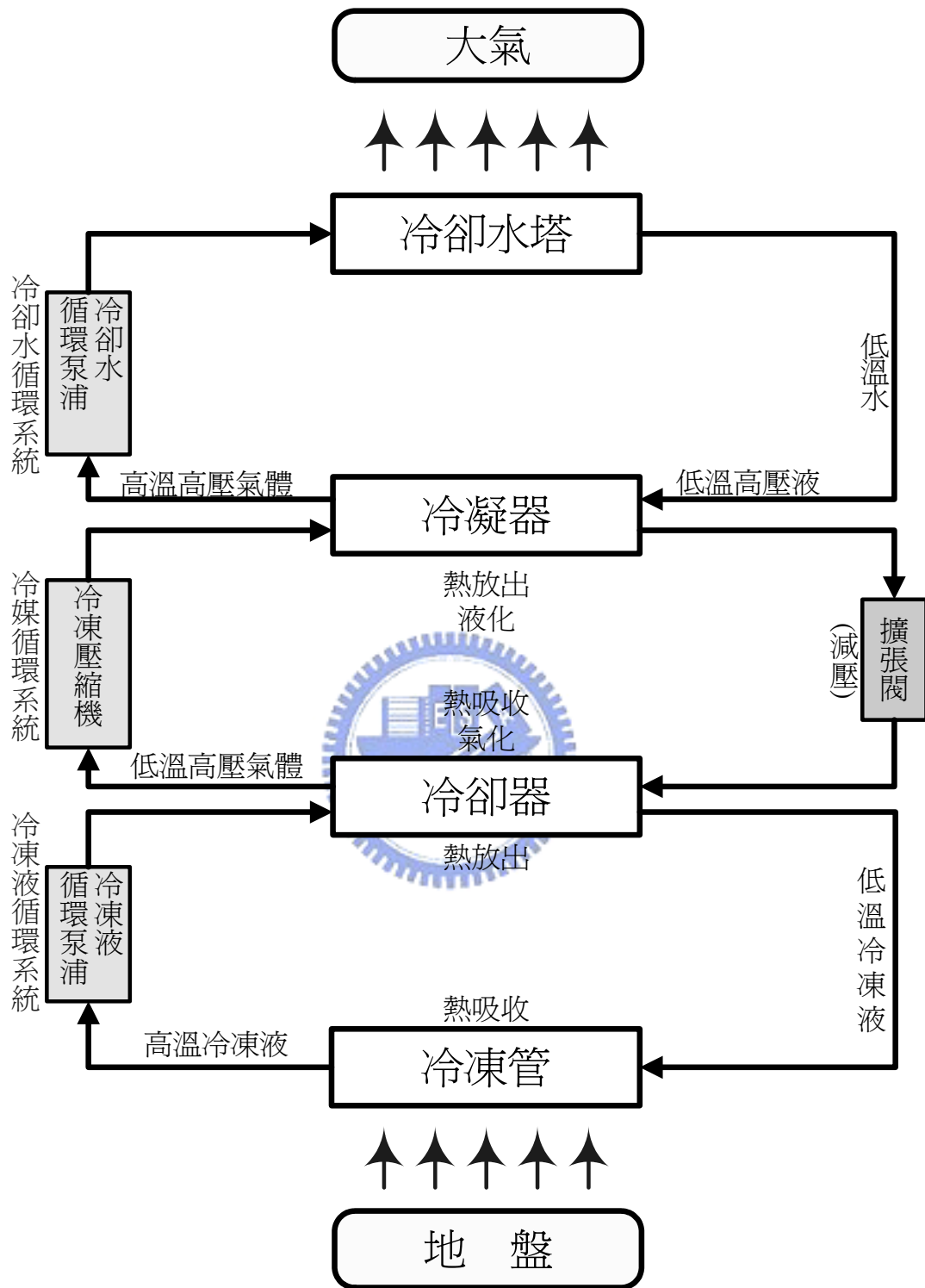


圖 2-13 冷凍液 (Brine 液) 方式凍結循環示意圖

(摘自 大陸工程, 2003)

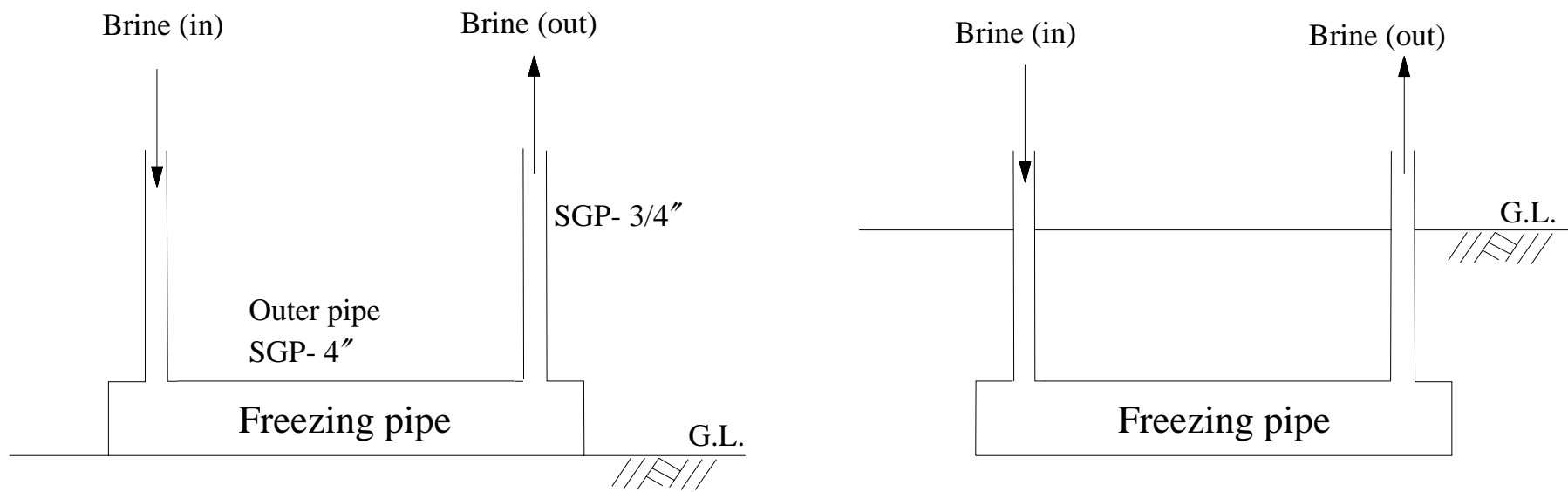


圖 2-14 單管式凍結管
 (摘自 曾紀偉, 1998)

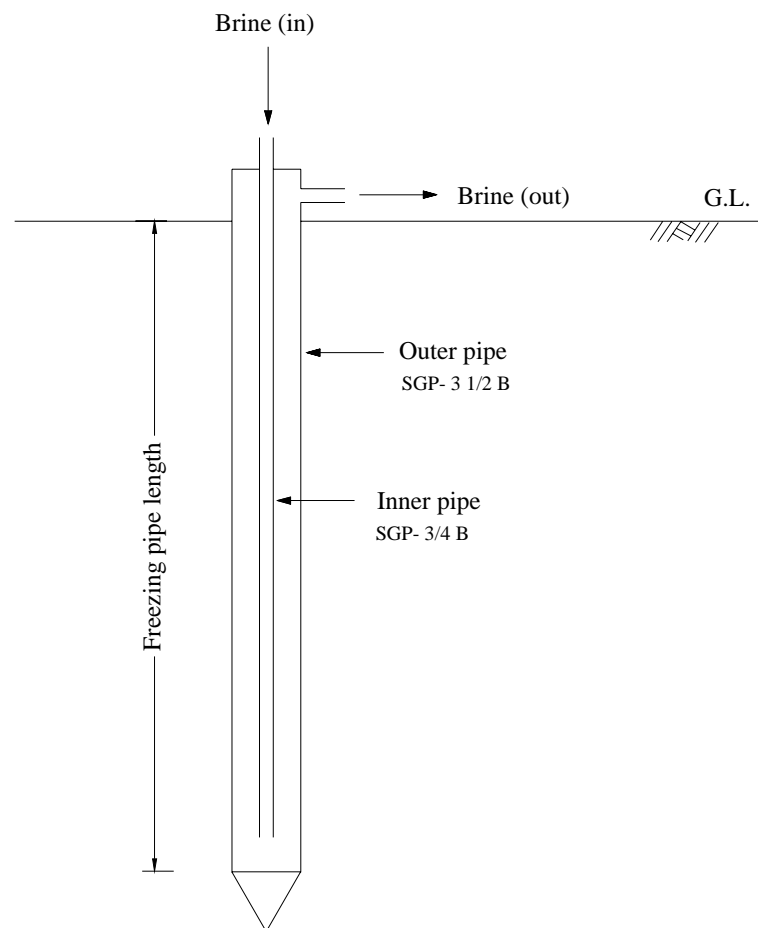


圖 2-15 二重管式凍結管
 (摘自 曾紀偉, 1998)

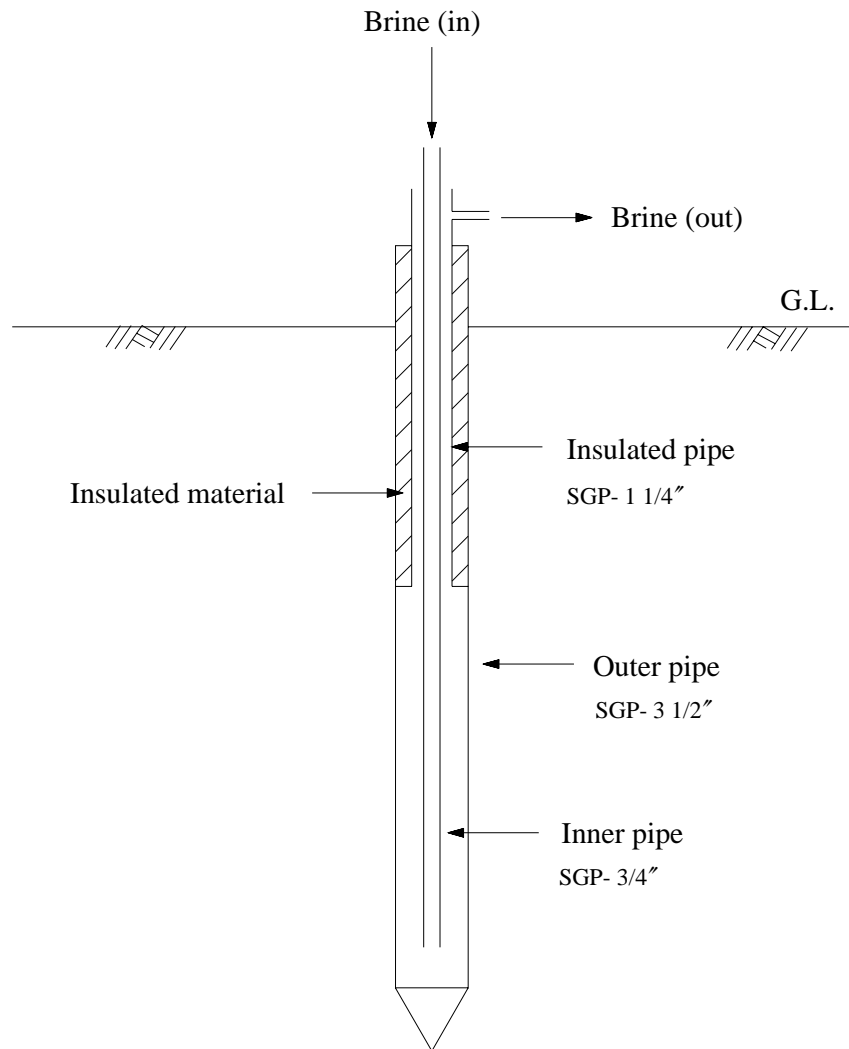


圖 2-16 限定管式凍結管
 (摘自 曾紀偉, 1998)

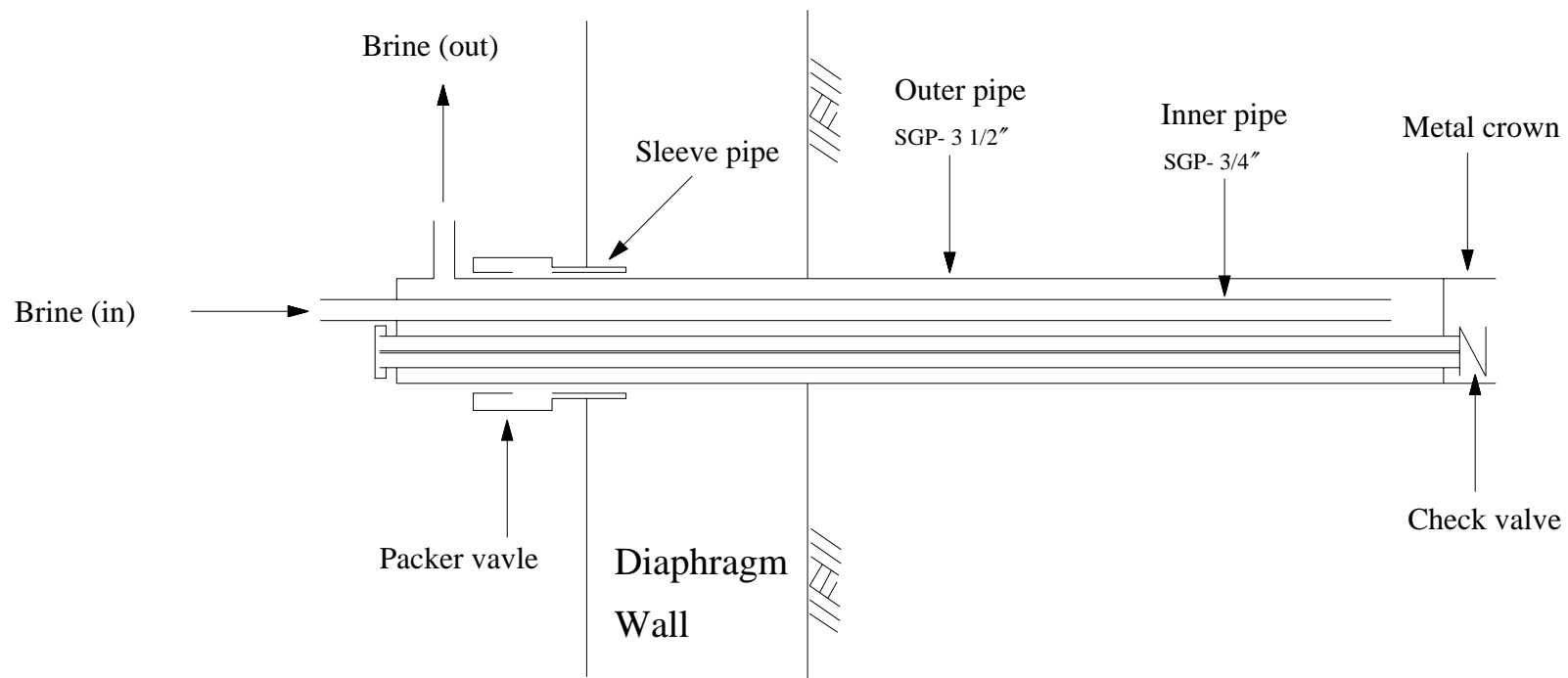


圖 2-17 鑽孔式凍結管
(摘自 曾紀偉, 1998)