

TPL208 INFRASTRUKTUR WILAYAH

ELEMEN INFRASTRUKTUR WILAYAH

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Program Studi Perencanaan Wilayah dan Kota
Fakultas Teknik - Universitas Esa Unggul

JENIS-JENIS INFRASTRUKTUR

- I. TRANSPORTATION
- II. WATER & WASTE WATER
- III. WASTE MANAGEMENT
- IV. ENERGY PRODUCTION & DISTRIBUTION
- V. BUILDINGS
- VI. RECREATION FACILITIES
- VII. COMMUNICATION

INFRASTRUCTURE FACILITIES

- I. TRANSPORTATION FACILITIES
- II. UTILITY & COMMUNICATION FACILITIES
- III. SHOPPING MALLS
- IV. CULTURAL & RECREATIONAL FACILITIES
- V. NATURAL HAZARD PREVENTION FACILITIES
- VI. STORAGE & MANUFACTURING FACILITIES
- VII. ENERGY FACILITIES
- VIII. RESEARCH FACILITIES

TRANSPORTATION FACILITIES

- Subways & Stations
- Underground roads
- Underground parking spaces
- Walkway networks

UTILITY & COMMUNICATION FACILITIES

- a. Electric Supply Lines & Transformer Stations
- b. Telephone Lines
- c. Gas Supply
- d. Water Supply & Sewage Lines
- e. Sewage Treatment Plants
- f. Garbage Collecting Tube Systems
- g. Utility Tunnels⁵

SHOPPING MALLS

- STORES
- RESTAURANTS
- WALKWAYS

CULTURAL & RECREATIONAL FACILITIES

- Libraries, Musseums & Art Museums
- Exhibition Halls
- Gymnasiums & Swimming Pools

NATURAL HAZARD PREVENTION

- Underground Floodways.
- Underfround Detention Reservoirs
- Evacuation Passage Ways
- Places of Refuge

STORAGE & MANUFACTURING FACILITIES

- Grain Storage
- Vegetable & Fruit Storage
- Commodity Storage
- Underground Reservoirs
- Nuclear Waste Material Storage
- Underground Graves
- Underground Factories

ENERGY FACILITIES

- Underground Hydropower Station
- Pumped Storage Hydropower
- Substation Hydropower
- Compressed Air Energy Storage (CAES) Power Plants
- Oil Storage Tanks
- Liquefied Natural Gas Storage tanks

RESEARCH FACILITIES

- Earthquake Observation Stations
- Cosmic Ray Observation Stations
- Underground Living Research facilities
- Microgravity Experiment Facilities

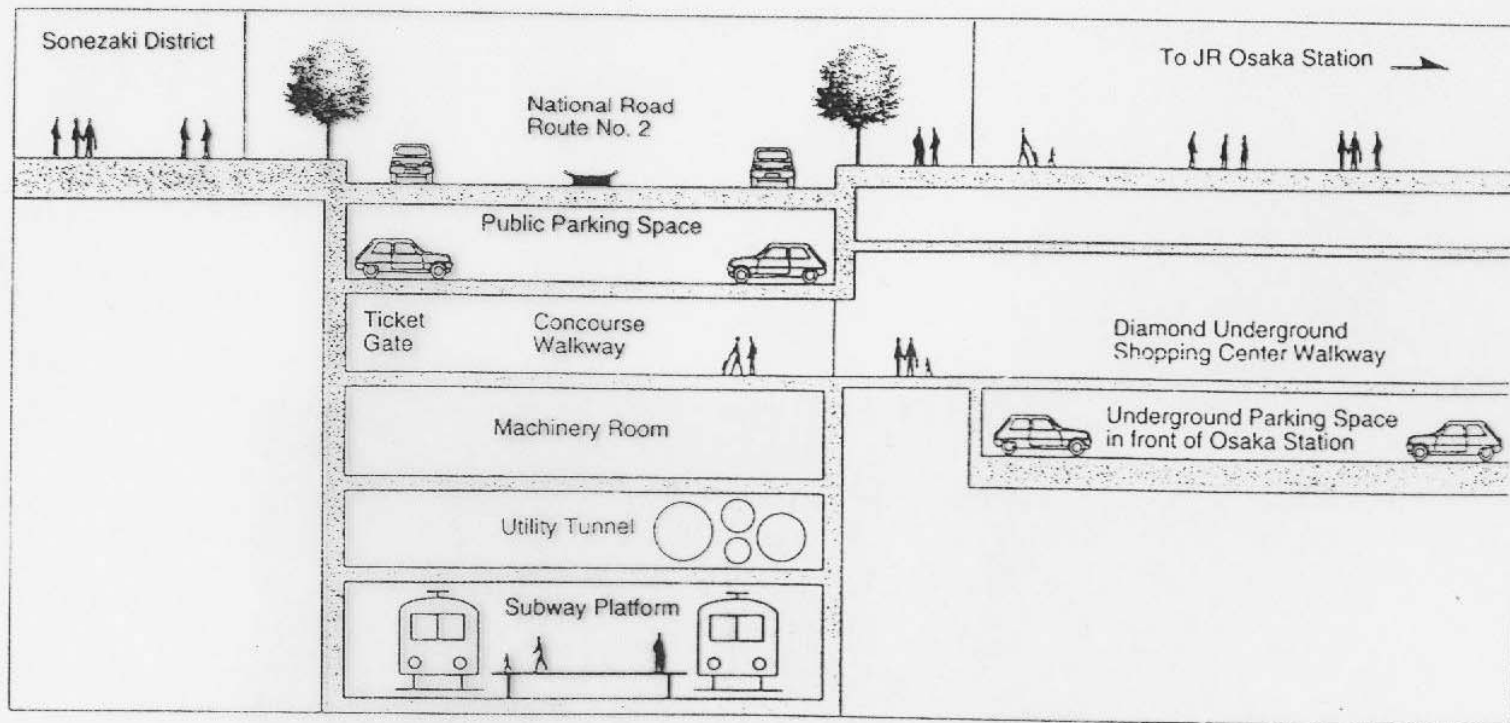


Fig. 3-9 Cross Section of Underground Facilities

(Source : Pamphlet of Urban Redevelopment & Housing Bureau and Construction Bureau, Osaka City Government)

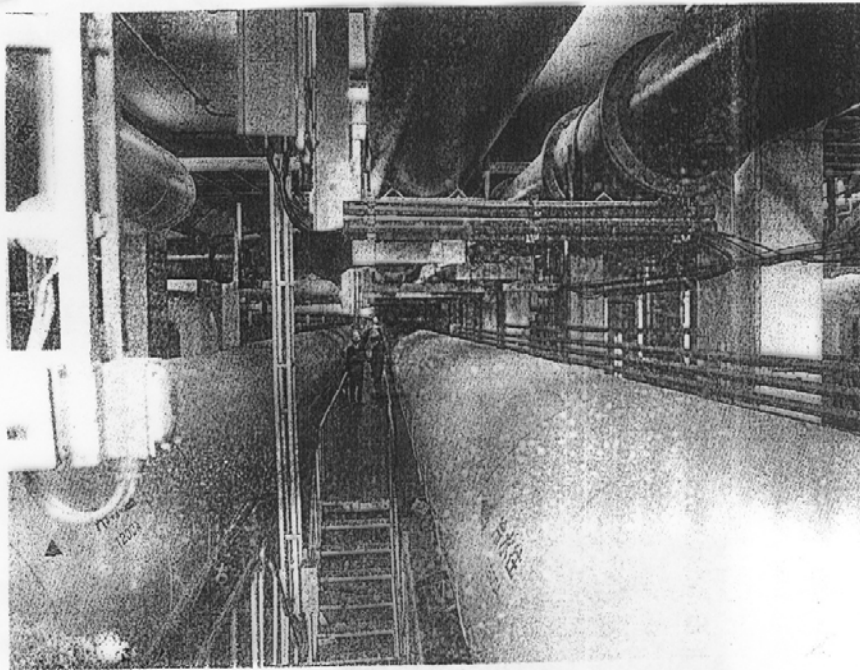
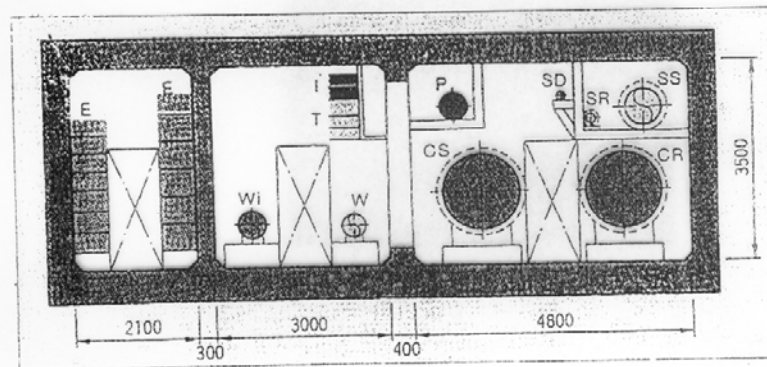


Photo. 3-3 Multi-Service Utility Tunnel at the Minato-Mirai 21

(Source : Pamphlet of Primary Road Div., Road and Highway Bureau, Yokohama City Government)



Legend:

E: Electricity	T: Telephone	W: Drinking water
Wi: Industrial use water	G: Gas	P: Garbage
CS: Chilled water supply	CR: Chilled water return	SD: Steam drain
SS: Steam supply	SR: Steam return	
I: CATV line		

Fig 3-8 Standard Cross Section of Utility Tunnel at the Minato-Mirai 21

(Source : Pamphlet of Primary Road Div., Road and Highway Bureau, Yokohama City Government)

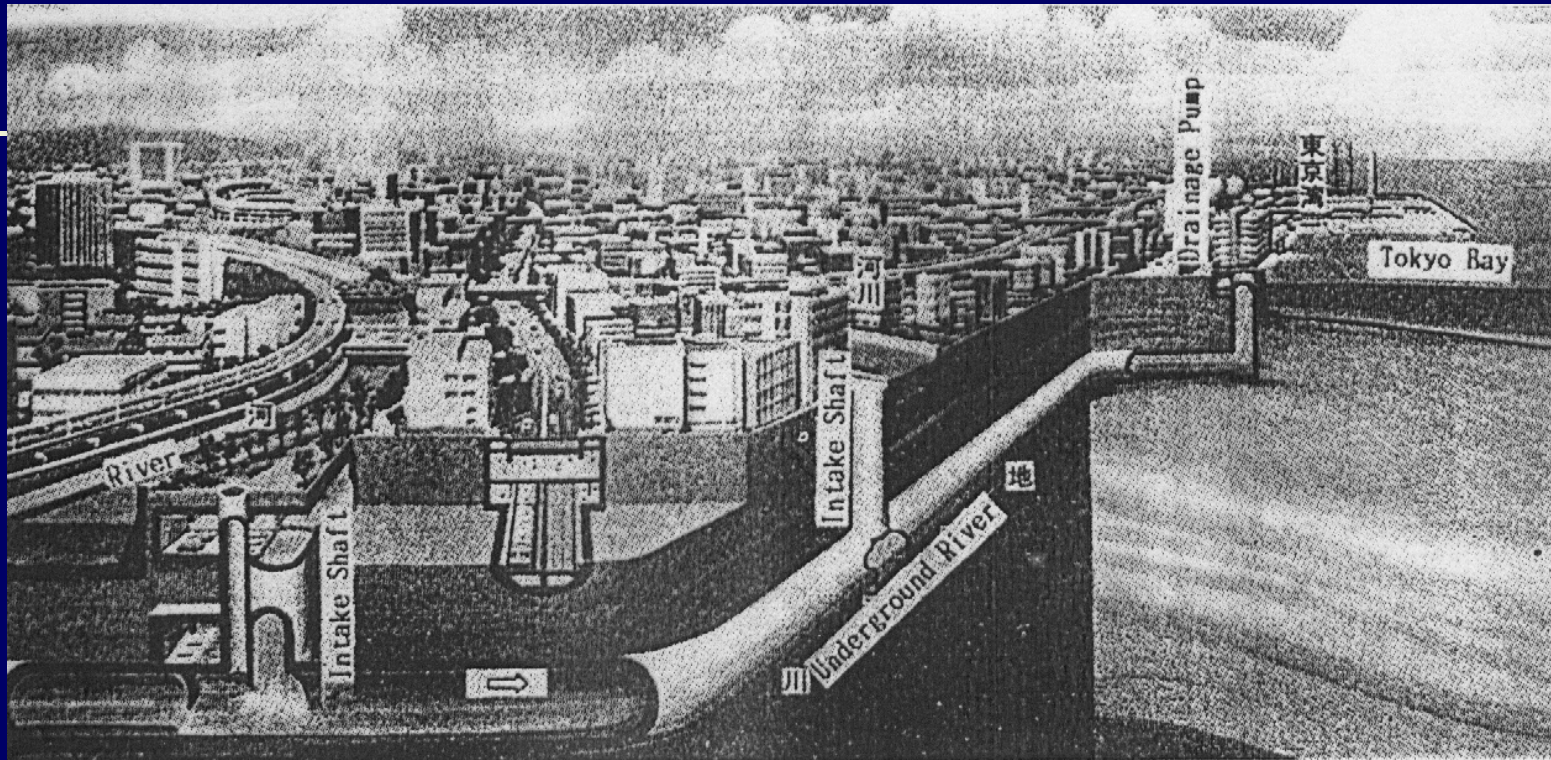
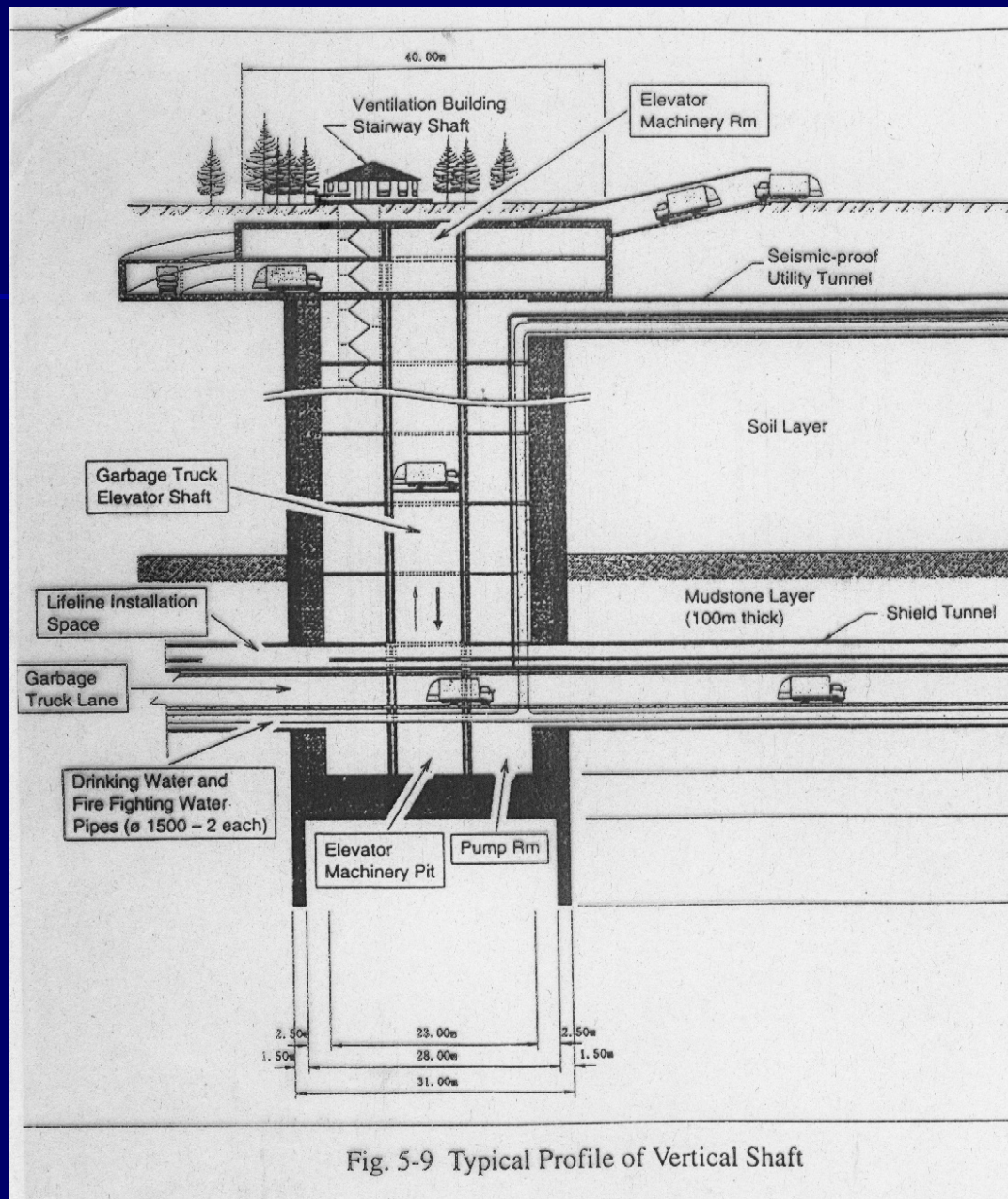


Photo. 3-5 Image Picture of underground river system in Tokyo

(Source : Pamphlet of planning Section, River Division, Bureau of Construction, Tokyo Metropolitan Government)



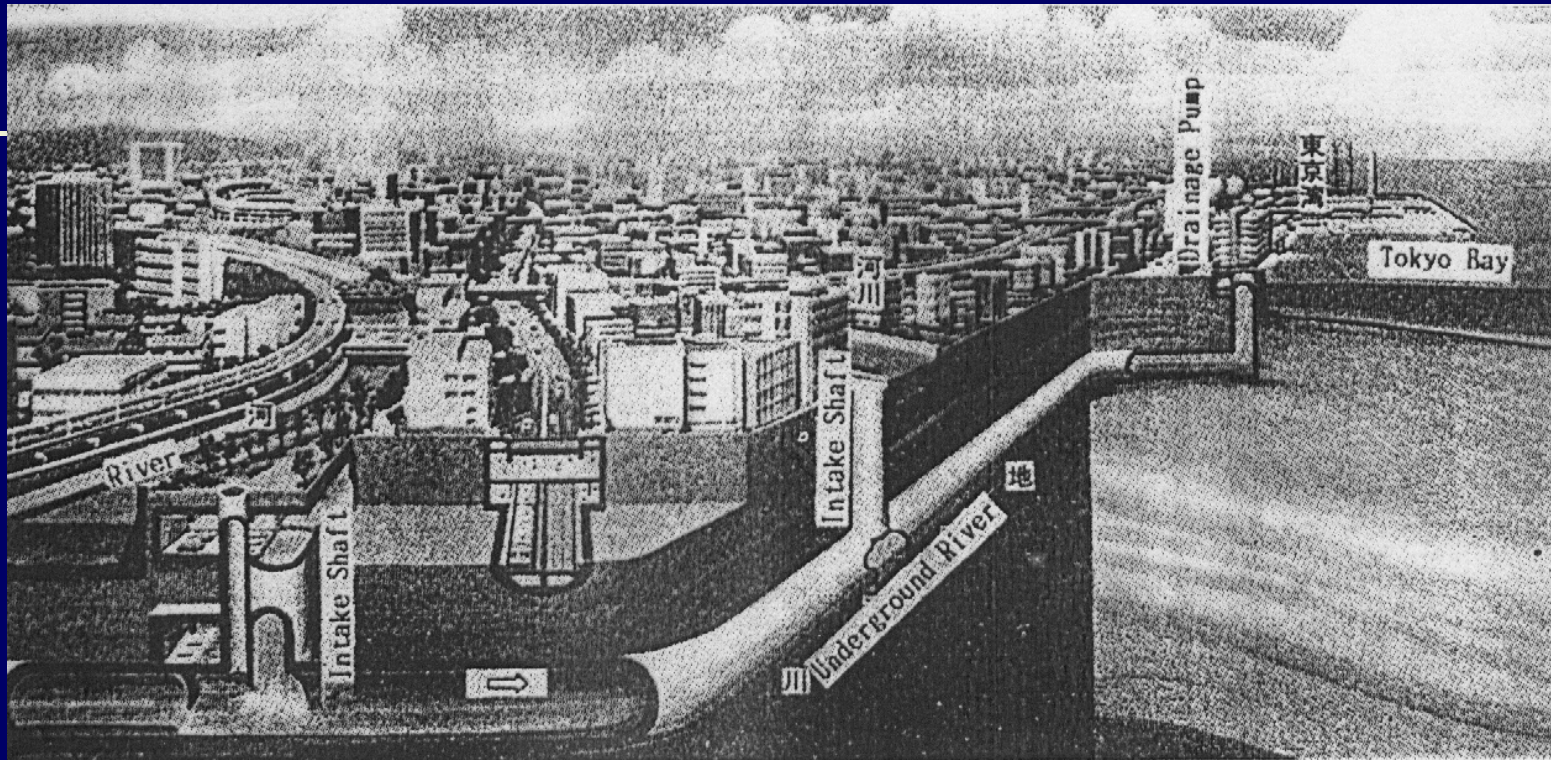


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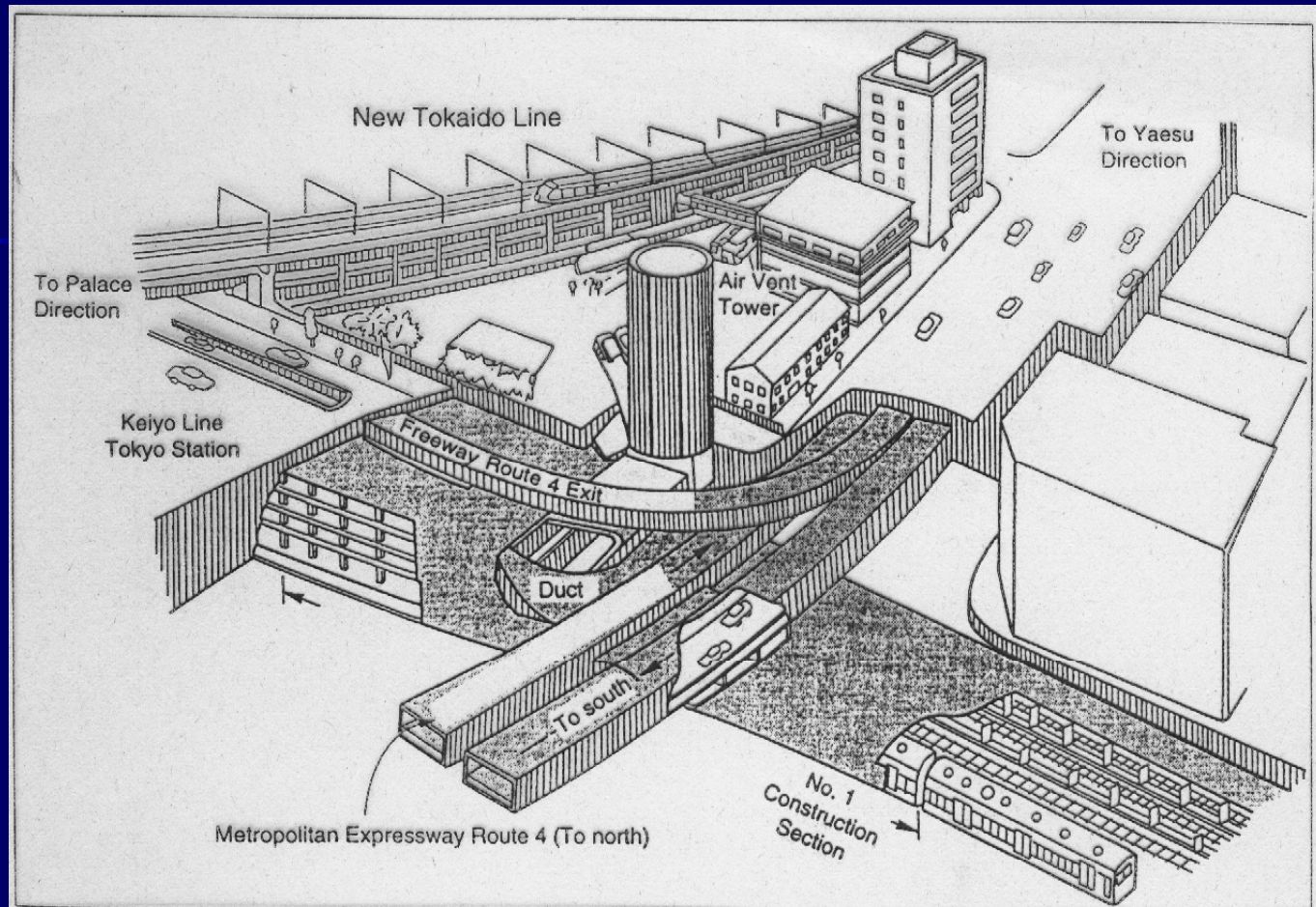


Fig 5-1 Intricate Underground Facilities Near the Keiyo Line Tokyo Station
(Source:Junji NISHI, "Urban Underground Space Use" 1992, pp79, Sankaido Pblishing Co..)

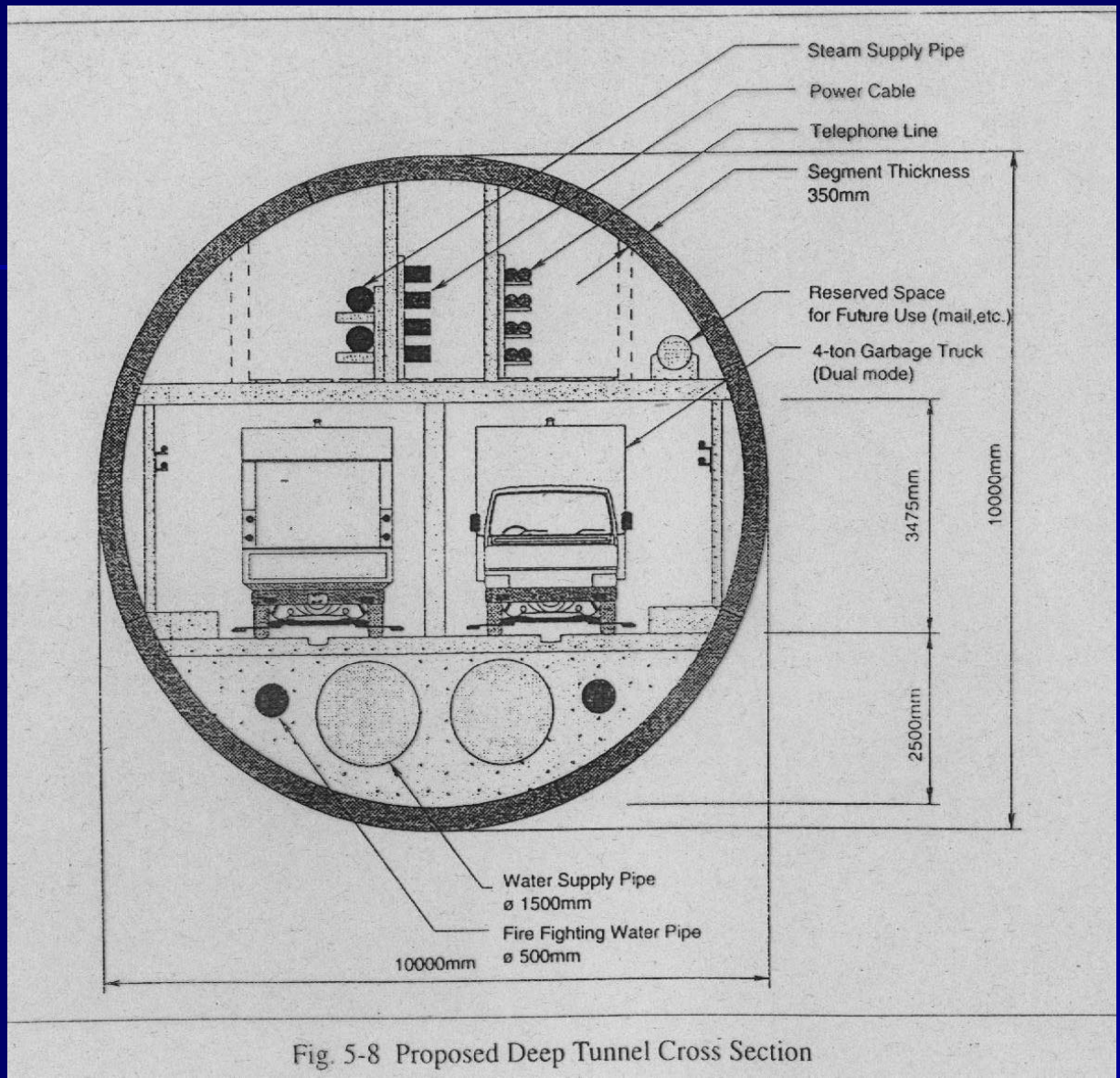


Fig. 5-8 Proposed Deep Tunnel Cross Section

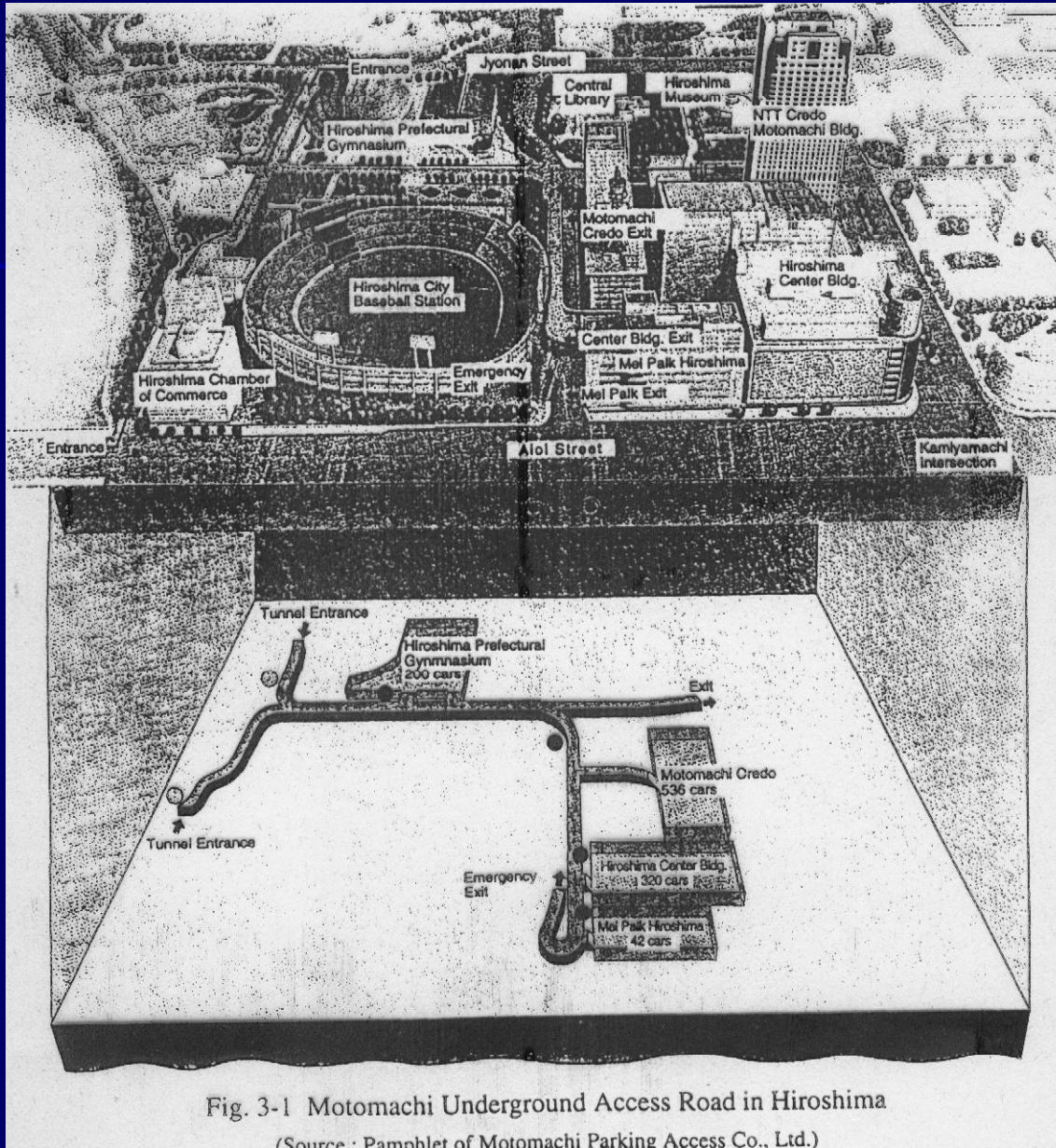


Fig. 3-1 Motomachi Underground Access Road in Hiroshima
 (Source : Pamphlet of Motomachi Parking Access Co., Ltd.)

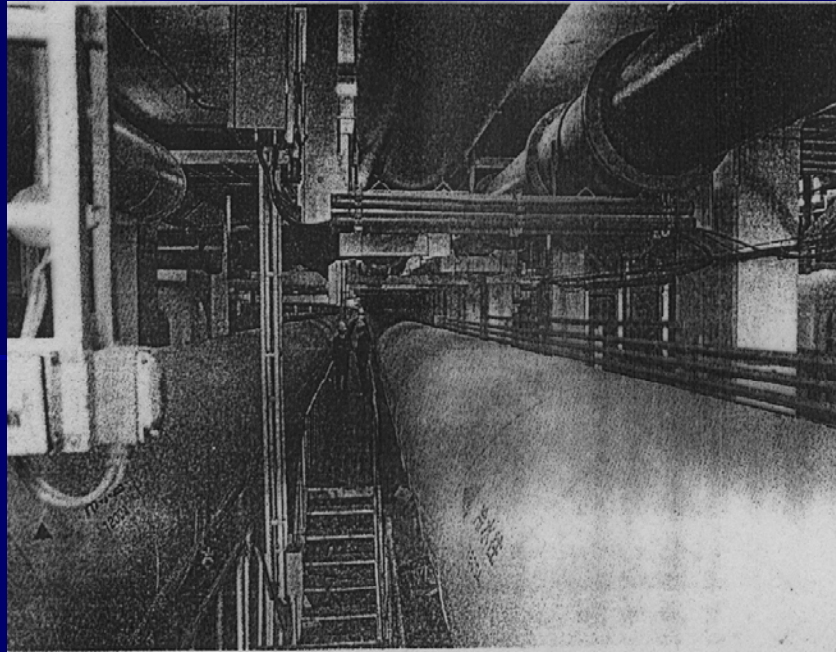
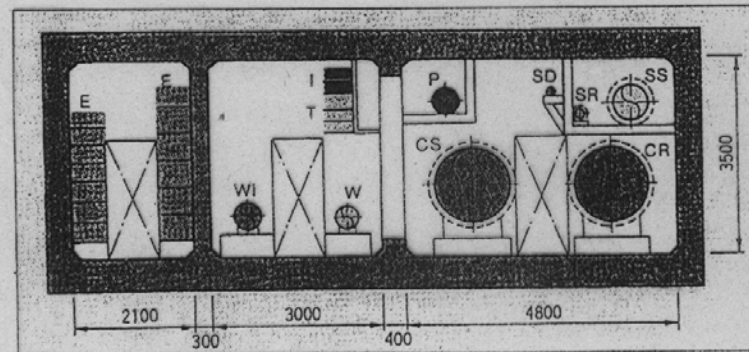


Photo. 3-3 Multi-Service Utility Tunnel at the Minato-Mirai 21

(Source : Pamphlet of Primary Road Div., Road and Highway Bureau, Yokohama City Government)



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