

CHAPTER 2

HISTORY OF SEWERAGE AND DRAINAGE IN BANGKOK-THONBURI

Since the time Bangkok-Thonburi was established, houses were scattered here and there. Sewage was disposed by primitive means. Rain water was drained to klongs and floods usually occurred in the wet season. The city has gradually been altered in many ways; population has been increased, modern buildings can be found everywhere. Consequently the ditches and sewers have been provided to serve the community but there is no adequate sewers to serve all of the areas and it still followed by other problems such as nuisances and damage to public health. The standard of living in the capital are considered as important factor to raise at the same time the development of the country is intensified. In fact, the laws controlling the cleanliness states that one who polluted ditches and klongs causing it to smell have violated the laws, but it is very difficult to control every place in the city. The problems gradually become more serious.

Environmental and Economic Effects of Sewerage and Drainage Deficiencies

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Environmental effects caused by sewerage and drainage deficiencies in the metropolitan area range from minor nuisances to condition involving a significant hazard to community health and well being. Economic effects, involving damage to property, include losses due to damage the areas devoted largely to recreational activity. The following

statements are the effects of sewerage and drainage deficiencies to the Bangkok-Thonburi area:-

1. Strong smell and unsightly appearance can be found everywhere along the klongs and stagnant pools adjacent to some buildings.

2. Serious nuisances due to mosquitoes breeding is a big problem that encountered in the metropolitan area. At the present time people are faced with the big menace to public health such as Thai Acute Haemorrhagic Fever.

3. Flooding of some roads in heavy rainfall.

4. The kind of privies provided in the houses in the metropolitan area is not up to standard. It is clear that the water from the privies must seep into the ground, but actually some of it eventually finds its way to the canal system. It is not quite safe to leave it as such.

¹5. Flooding due to high river levels is extremely serious. It occurs when the river rises due to high tide and high flood season. Some flooding of the lower lying areas occurs almost every year in the wet season and causes considerable interruption to transport and inconvenience to people. Occasionally severe flooding can cause catastrophic

¹Husband & Co, Report on Sewerage and Sewage Disposal for the Central Area of Bangkok (Department of Public and Municipal Works, 1962), p. 17.

²6. Flooding due to heavy rainfall on a shallow ditches and pools in gardens and other places where surface water from buildings and paved areas accumulates and where the natural drainage outlet is cut off by the constructions of new roads or other obstructions. This low land collects water which causes the back up.

7. We anticipate that this pollution will become worse as water consumption increases.

³8. During dry periods at neap tides when the tidal range is small. The canals are almost full of crude septic sewage which cannot be drained to the river.

⁴9. In addition to pollution from sewage, a large quantity of decaying vegetable matter and domestic refuse is thrown into the canals adding bad condition to these waterways.

10. There are a lot of people who always got a disease and they do not know its source. He knows only that he has got low resistant. We can find 80 - 90 % of patients in hospital who are very poor. If we consider their ways of living, it is clear that the drainage from their houses is also very poor. Waste water with strong smell can be found under their

²ibid p. 49.

³ibid p. 17.

⁴ibid p. 18.

houses and a large number of mosquitoes are existing. They do not know that the occurrence comes from the combination of wastewater and water from privy adjacent at hand. When they breathe in air it would damage their respiratory systems and it made them weaker and weaker, moreover it lets way to other diseases to enter the bodies.

11. Due to the presence of wastewater adjacent to some buildings in which water supply pipe are buried, when there is a leakage and the maintenance is poor, the water pipe will be contaminated with the waste water and this is very dangerous to anyone who drinks the water from hose bibb.

⁵PROGRAMME OF SEWAGE AND WASTE DISPOSAL

The government must seek a way to solve these problems. Experts have been hired and the general plan for disposal waste water and stormwater are proposed. These are:-

1. Sewage Disposal
2. Rain Water Disposal
3. Flood Control

Sewage Disposal

This is no sewerage in Bangkok-Thonburi, the disposal

⁵The Committee for Consideration of Road and Drainage System Project, in Bangkok-Thonburi, Sewage & Waste Disposal and Flood Control (Hydrographic Section, Royal Irrigation Department, 1965), pp. 3-6.

of sewage from houses is done by conduits, klongs, and the lower area adjacent to the house.

For large buildings such as hotels, shops and institutions, sewage disposed of by storing the waste in the tank, the water from the tank soaks into the ground and combines with the water from the other tank, and finds its way to the nearest point of exit, as watercourses or klongs.

When the water level in the klong is low and stagnant, it turns to dark color and gives very strong smell. In some klongs the excreta can be found and this is very unpleasant sight. Klongs are usually used for receiving refuse and wastewater more than receiving the stormwater in the dry season. Consequently the polluted water spoils the amenity and is a menace to health of the public.

Storm Water Disposal

The ditches and klongs are the drains for stormwater. Due to the filling in the klongs to construct new roads. Sewers have been replaced and its slope must be increased as its length increase. In Bangkok-Thonburi area the topography is extremely flat. The drainage by gravity flow requires deep excavation. The slope of the existing sewers is inadequate and it cannot remove the sludge, soil, grit entirely. It is advised to have manholes at every 6 metres. Ditches and klongs are most favourable breeding places for mosquitoes causing nuisance throughout the city. So that the plan for these purpose would be considerably needed.

Flood Control

In the Bangkok-Thonburi area the relief of topography between 35.5 to 37.0 metres if referring to the mean sea level which equal to 35.05 metres by assuming it zero, the level will be in the range + 0.50 to + 2.00 metres.

The level of existing roads and houses was about + 1.30 to 1.80 metres, but nowadays the level has been raised to the level + 2.00 metres.

Level of the bottom of some klongs is at Elevation - 1.00 metres.

The Hydrographic Department gives the average flood level for the year 2486-2504 equal to + 1.70 m.s.l., but in the year 2485 the water level come up to + 2.04 m.s.l.

Chao Phraya Dam was constructed and based on this flood in the year 2485 and was considered as 100 year flooding period. In the project for the Phomiphol Dam, it takes the 500 year flooding record, although some parts of the city are very low in elevation and will not be flooded because high roads have been constructed to protect the river water. That is the flood control in the Bangkok-Thonburi area can do it by a dike.

LITCHFIELD'S REPORT

With the cooperation of the United States Operations Mission to Thailand, Litchfield Whiting Bowne & Associates was employed to prepare the Bangkok-Thonburi City planning project, the important destination of the report requires to

plan the city, consequently the sewerage and drainage were planned broadly together with the programme city planning. The area under consideration for the sewerage includes Non-thaburi and Samutprakarn. The report has been prepared in the year 1960. The recommendations give separate drainage and system are summarized as follows:-

The Sewerage System.

The area was divided into various parts, each part having the sump with pump to lift the sewage conveying it to a sewage treatment plant which is to be sited away from the community, where the sea water cannot affect the dump sewage. The programme was supposed to start in 2503 and expected to be completed in 10 years time. The total cost was estimated about 1,460 million baht, for the total area of 173 Km², or 8.44 million baht per Km².

The Drainage System

The complete drainage system depends upon the complete sewerage system going before. The zone of higher elevation is directly discharged to klong, and the lower ones will require pumping to discharge the waste water into klongs. The estimated cost about 200 million and the initial cost approximately has been 73 million baht in staging for 10 years.

Flood Control

Flooding is a combination of high tides from river level and the overflow water from paddyfields in the wet season. The protection may be recommended by construction the

dike to drain the water directly to the estuary of Chao Phraya River. About 20 million baht would be required for this 10 year project and the cost would be about 60 million baht.

HUSBAND'S REPORT

With the help of the British Department of Technical Cooperation the report was prepared by the HUSBAN & CO, another Consulting Firm, to present another project of sewerage and drainage disposal scheme for central Bangkok. The report came out in September, 1962, requiring 6 years to complete. This report recommended that the sewage should be separated from the surface water, the sewerage system should in general gravitate to main pumping stations where the sewage would then be discharged into treatment work situated near the junction of the Klong Chong Nonsi with the river, and the sewage should be treated in sedimentation tanks to remove the heavier suspended solids before discharge to the river. The sewage sludge being dealt with in digestion tanks would then be dried on drying bed. The area are limited to 30 Km² and about 711 million baht would be required for this project and it is average at 23.7 million baht per Km².

The Drainage System

Storm water is to be discharged directly into pipe and culvert situated either beneath the footpath, or at the sides of road and joined to the canal system connected direct to the river. The levels of water in the klongs will be controlled

to a lower elevation than the surrounding area at all the time by pump at various places. The approximate expenditure is 49 million baht.

Flood Control

Raising the highway to protect the flood and construction the road as a dike.

MR. THOLIN'S REPORT

Mr. Tholin was formerly an engineer in Public Work for Chicago, at present, he acts as consultant to the Bangkok Municipality.

A single combined system is his recommendation stating that both wastewater and stormwater should be conveyed in the same conduit. In dry weather all flows in the sewers will be delivered to intercepting sewers and sewage treatment works. In periods of heavy rainfall the excess flow of diluted wastewater will be pumped directly Chao Phraya River and three other selected klongs. The Municipality has divided the area into eight drainage districts. Each district has a pumping station, which can either relay the dry weather flow to the treatment works or pump diluted wastewater to the open watercourse. The construction cost is estimated to be 450 million baht (in the community area) plus 523 million baht for an area of 155 Km² averaging about 6.13 million baht per Km².