Artificial Seawall By Blasting Squeezing Silt And amelioration treatments in Saline-alkali Soil With Toilet Revolution without sewers

CHENG XU1,7, HAN Rui-ze2, ZHANG Li-ying3, TIEN Jerry 4, CAI Wen-ping5, WANG Ganqin6, WU Xiaoling7, WANG Liqun8

1Ministry of Education, University of Science & Technology Beijing, Civil & Environment Engineering School, State Key Laboratory of High-Efficient Mining and Safety of Metal Mines, Beijing 100083, CHINA;
2Nanjing Audit University, school of information engineering, Nanjing, 211815, CHINA;
3Beijing district heating group, 100032
4Monash University Clayton, VIC,3800, Australia
5Urumqi City people’s hospital (children’s hospital, Department of Children Healthcare) north hospital, Urumqi Xinjiang 830011;
6Fangchenggang shangsi County, Bureau of Veterans Affairs, Guangxi, CHINA, 535500
7Nanjing Duble metal equipment Engineering Co., Ltd, Nanjing, China, 211153
8Beijing Forestry University, School of Soil and Water Conservation, 100083

Corresponding author’s e-mail: CHENG XU, Ph.D., engineer, research area/interests: rock & civil engineering, mining, blasting. E-mail: 1519283516@qq.com, bjkkjdtxth@163.com.;

Abstract. Artificial seawall by silt squeezing with blasting dike, a small price for a good seawall than with mechanical dredging, and is effective in preventing this kind of accident from tsunami and typhoon disaster. This paper briefly discusses the pollution situation of poultry and mankind waste in China. For the first time gives the techniques for harmless (China patent ZL 201220109642.1, no flush heathy toilet.) and utilization of waste in China are presented and analysed for benefit utilization. Sanitary toilet without sewers -2019 world break-through technologies (no flush heathy toilet) driven reinvent the toilet challenge, RTTC. Authors also show the technique for harass and utilization of wastes in China. The authors suggest that all the mankind and animal waste, after harmless processing, should be used in a way of useful things as feed, fertilizer, etc. to benefit human society, prevent disease (covid-19, sars) propagation and reduce greenhouse gases. It is also can be used on ship, aircraft, coach and out space etc. (China patent ZL 201220109642.1 is one of several ways of human and livestock faeces harmless treatment, ultraviolet disinfection, ozone fumigation), its weight less than 15kg, volume less than 0.12m³.
1. Introduction

After the earthquake, 11/3, 2011, in north-east of Japan, but then the earthquake triggered tsunami, flooded diesel engine factory. As nuclear plant lost all the act power, unable to provide cooling water for core, so that residual heat of core can't discharged, thus hydrogen explosion occurred Successively[1].

On December 26, 2004, a powerful 9.3-magnitude earthquake was triggered by the collision of the Indian Ocean plate with the Eurasian plate. The tsunami, which was more than 10 meters high, brought huge disaster to people in 16 surrounding countries, and the death toll reached 292,200.

Location height of first nuclear plant emergency diesel generators is 13meter. Location height of tsunami arrived nuclear plant is 14meter. Obviously, tsunami well beyond design standard is one of the prime reasons of Fukushima nuclear power station accident.

Seawall near Fukushima nuclear power station far below tsunami is uppermost reason of disaster. "Rock fill dike with blasting squeezing silt", a small price for a good seawall than with mechanical dredging, is effective in preventing this kind of accident and typhoon disaster.

2. The embankment method of stone filling with blasting squeezing silt

"Technical Code of Blasting for Port and Waterway Engineering" (204-2008) JTS in 2009, is given a circulating footage for 4.0 ~7.0 m, the scope of application for 4 to 25 m thick mud. The past research work shows that footage over 7.0 m, the ripped-rock layer at the bottom of the sludge could be packages can't be squeezed out.

The sediment fallen back has a high content of water and thus low strength, this is good for the later rock dumping to squeeze off the sediment from a complete rock pile body. Arranging explosive package and calculating explosive amount correctly and after several recycles of this kind, a sea dike which meets the requirement of design will be constructed.

The method of "blasting compaction directional sliding dike" to squeeze off muddy under the
embankment is to embed a rectangular explosive package (or a number of concentrated group packages) in the mud under the rock-fill or on the surface of the mud. After explosion, the muddy is squeezed off by the explosion pressure. Then the rock-fill is fallen into the cavity of the squeezed off muddy under the action of gravity. The covering and nearby water and mud break upwards and the front part of the rock falls down into the sediment. The main part of explosion energy is used in lateral squeezing muddy off. The advantage of this method is that the explosion energy can be made fuller use of [2].

Project practice proves that only a little amount of stone is splashed out, part of which falls back to the rock-fill, the rest falls down to the muddy surface. The rock-fill body form is basically kept. Using this method to build embankments, the explosive consumption is very low.

After the muddy is squeezed off by the explosion pressure, the rock-fill body will fall down to the explosion cavity forming the designed embankment.

Trailing suction hopper dredger is one of the most advanced of the family of dredger, its superiority compared to another dredger is unable to. Its cost is very high. As explosion method was used in new seawall engineering, it has avoided complete cleaning of mud in bed-trough by dredger specified in original design. The dredging costs for navigable pass and bed-trough were saved; meanwhile, by utilizing the inverse pressure from the mud on both side of the embankment base, which has a favorable effect on the stability of the embankment body, the embankment section size was reduced, time limit for a project shorten, stone riprap amount was saved, boat riprap works avoided and the engineering cost greatly reduced.

Sediment removed with explosion and rock dumping method was carried out in Xugou test area and east bank revetment, Lianyungang harbor etc.

By explosion method in Lianyungang harbor West embankment project, about 17.13 million yuan was saved(price of 1998) against the original design cost; in Xugou test area and east bank revetment project, about 11.96 million yuan was saved(price of 1998) against the original design cost, the economic benefits being very conspicuous[3].

Project engineering involves soft base treatments of various kinds of coastal engineering structures, including sea dyke, bank revetment, vertical sea wall and riprap body etc. The processing methods are also diverse. It is possible to choose a convenient method for the soft base treatment of different building.

Methods suit the mud foundation treatment for all kinds of marine engineering structures. They have advantages of low cost, simple construction, and good economic benefit. Therefore, it is valuable to popularize these methods.

3. Sea-level rise expected will cause severe flooding throughout Europe and other coast

The Arctic Circle had its hottest day 38°C on record 2020 June 23, the Antarctica 20.75°C on record 2020 February 25.

Figure. 5 is ice floe collapse model from researcher.
Within 20-50 years, the glacier of the arctic circle and antarctica would collapse and sea levels are rising 91—183cm as warm oceans are melting the ice sheets. There are 200 million people whose residential location is 50 kilometres inside from coastline and some cities may be drown in sea such as Shanghai, New York and so on. By raising coastline of Europe or dike (embankment wall) with blasting squeezing silt, most of flood disaster will be prevented.

Soil salinization seriously restricts the construction of ecological environment in coastal area. It is of great significance to explore the economic, efficient and ecological improvement techniques of saline alkali land. Artificial seawall cut off the incoming tide, the source of salt is greatly reduced and accelerate soil desalination, in enclose tideland for cultivation or marine reclamation land with dike (embankment wall) by blasting squeezing silt.

The landscaping (improvement) of saline-alkali lands was a worldwide problem. Applying a certain amount of farm manure is effective technical measures for saline-alkali land greening[4].

The technique of China patent (ZL 201220109642.1 no flush toilet without sewers) provide manure fertilizer of mankind and animal[5].

Manure mixture for fertilizing (Organic matter sludge) is important way to reduce the risk of heavy metal contamination in soil[6].

Soil salinization seriously restricts the construction of ecological environment in coastal area. It is of great significance to explore the economic, efficient and ecological improvement techniques of saline alkali land. Artificial seawall cut off the incoming tide, the source of salt is greatly reduced, accelerate soil desalination and is useful to enclose tideland for cultivation of coastal mud flat.

4. No flush healthy toilet without sewers
The production of crops could not be separated from the application of chemical fertilizers, the rational use of chemical fertilizers can improve the content of organic matter in soil, increase soil nutrients, and then reduce pests and diseases and increase crop yields. On the other hand, too little or too much chemical fertilizer will lead to great changes in the content of organic components in the soil, which will cause diseases and insect pests, affect the growth and yield of crops, endanger the ecological environment seriously and have a bad effect on the health of the residents. Fertilizer production releases large quantities of greenhouse gas [7].

Generally, the overall direction of night-soil sludge was to gradually cancel the sewers. At the same time, the harmless treatment and disposal as well as effective utilization of faeces sludge must be strengthened by government in the future.

The epidemiological research team launched an investigation into where the couple contracted the covid-19 virus, eventually arriving at the address of 70 Yongding Road of Beijing, which was visited...
four times by the couple, according to report. After the investigation was completed, medical staff eventually determined the couple was infected from the public toilet at 70 Yongding Road of Beijing. They were infected through microbe aerosols diffusion (air Legionella pneumophila) of covid-19 in shared toilet.

Faeces contain various intestinal pathogens, ascarsis eggs, bird flu, SARS and so on, can spread a variety of diseases. For solving the contradiction of development and environment pollution, the technique of China patent (ZL 201220109642.1) could be used as no flush heathy toilet. Shit of mankind (livestock) could be made into granulated organic fertilizer (or packaging) no bacteria and stink by this technique in a short time (one person’s shit about half hour), adding some catalyst and green deodorant. This patent technique not only eliminate bacteria, but also control disease transmission of shit replace chemical fertilizer, saving a lot of clean water and avoid environmental pollution and sewage treatment cost[5].

Figure.6 is sketch map of no flush heathy toilet without sewers.

![Fig. 6. sketch map of no flush heathy toilet.](image)

No flush health toilet(China patent ZL 201220109642.1) and artificial seawall will benefit tidal flats being reclaimed from the sea and improvement of saline alkali land. The patent system also reduces the amount and retention time of farm plant manure (pig, sheep, egg, etc.), ensuring the drying and cleaning of the farm plant, preventing the spread of disease.

5. Prospect
As density of water is much heavier than air, shockwave performance of explosives is much fierce underwater and may cause widespread blasting damages to hydraulic structures, aquatic life near the detonation centre and so on.

Blasting cushion pad can also be used to reduce the peak pressure of blasting shock wave of underwater, for example, the embankment method of stone filling with blasting squeezing silt, marine reclamation land [8][9].

According to Bruce Gordon, acting coordinator of the Water, Sanitation, Hygiene and Health unit at the World Health Organization (WHO) in Geneva, the lack of access to safe, clean sanitation currently puts an estimated 2.5 billion people at risk of many diseases including SARS, typhoid, dysentery, schistosomiasis, cholera, covid-19, trachoma and intestinal worms. An estimated 645 000 children under five die every year from diarrhoea – a preventable, toilet-related disease (poultry and livestock manure also termed excreta and faeces) [10].

No flush healthy toilets without sewers (China patent ZL 201220109642.1) are supposed to remove germs from waste, recover valuable resources such as energy, clean water and nutrients, without being connected to water, sewer. China patent ZL 201220109642.1 is one of several ways of human and livestock faeces harmless treatment and ultraviolet disinfection, ozone fumigation also being used including out space toilet[11][12].

Artificial seawall not only benefit tidal flats being reclaimed from the sea and improvement of saline alkali land, but also stop the tsunami from earthquake and typhoon. No flush sanitary toilet
without sewers can save lives and is a big business of $6 billion per year (Bill Gates). It is suitable for various kind of religions to use, religions compatibility (harmony), all things linked.

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References
[1] WANG Chuan, MA Zhigang, YUAN Tianhong, The Enlightenment of Fukushima Nuclear Power Plant Accident to China's Nuclear Power Development, Industrial Safety and Environmental Protection, 2014, 40(2), 83-85.
[2] Zheng Zhemin, Yang Zhengsheng, Jin Liu, Underwater Explosion Treatment of Marine Soft Foundation, China Ocean Engineering, 1990, 5(2), 213-234.
[3] Wu Kegui, Gao Xiaofu, Experiment and research of blasting drainage for solidifying mud foundation, Journal of Nanjing Hydraulic Research Institute, 1998, 2.
[4] Wang Hongyi, Gao Lina, Wang Zhihui, Research of Control Technology on Afforestation of Saline-alkali soil in Daqing, Journal of Heilongjiang Bayi Agricultural University, 2018.
[5] CHENG Xu, HAN Ruize, The Toilet Revolution Starting A New Era of Human Health Civilization, CHINA SCIENCE & TECHNOLOGY OVERVIEW, 2018, 12.
[6] BAI Li-ping, QI Hong-tao, FU Ya-ping, Nutrient Contents and Heavy Metal Pollutions in Composted Sewage Sludge from Different Municipal Wastewater Treatment Plants in Beijing Region, ENVIRONMENTAL SCIENCE, 2014, 12.
[7] WANG Sheng-xin, Qinghai, Harm of Excessive Application of Chemical Fertilizer and its Control Measures, Agriculture and Forestry Science and Technology, China, 2018, 2.
[8] Cheng Xu and Zheng binxu etc., Cushion blasting study which improves rock slope stability at large extent about rock excavation with explosion, ICTE 2013 © ASCE 2013, pp. 501-506.
[9] CHENG Xu, LI Haigang, HAN Ruize, Blasting Cushion Pad Of Reducing Vibration Start a New Era of Decreasing Disaster In Civil & Mining Engineering Explosion With Miro-damage, 2019, 5, IOP.
[10] HUANG Shengbiao, Promition of Toilet Revolution: Technological Problems and Measures, China Environment Management, 2018, 2.
[11] LIU Shu-lin, TANG Yu-lin, Solutions of Common Problems and Development Trends of Ultraviolet Disinfection in Wastewater Treatment Plant, CHINA WATER & WASTEWATER, 2017, 11.
[12] Zhu Qiang, Zhou Chunlan, Wang Shumei, Application of ozonator in sewage treatment system, Chemical Intermediate, 2015, 2.