

**METHOD OF PREPARING RECLAIMED LAND WITHIN SEAWALL AND
FACILITY STRUCTURE USING THE SAME**

BACKGROUND OF THE INVENTION

Field of the Invention

[001] The present invention relates to a method of preparing a reclaimed land within a seawall and a facility structure using the same, and more particularly, to a method of preparing a reclaimed land in which the reclaimed land is prepared by performing banking for dredged soil within a planned reclaimed land, thereby reducing costs, solving an environmental problem according to external dredging, utilizing a ground depression, formed within the planned reclaimed land by the dredging, as a variety of industrial facilities, a stream, or a park, and utilizing clean rainwater as water for industrial and agricultural use, and a facility structure using the method.

Background of the Related Art

[002] As a method of securing industrial sites or agricultural sites, a method of preparing a reclaimed land by placing a seawall in the seashore and converting a tideland and the sea into the earth has been widely known. A representative example is the Saemangeum land reclamation project in Korea.

[003] Inland reclamation within a seawall is commonly performed by banking using soil and stones picked from the soil and stone picking places of a nearby hillock. If soil and stone picking places do not exist nearby or if a banking area, such as Saemangeum land reclamation project, is very large, Inland reclamation is performed by banking using dredged soil dredged from a nearby sea area.

[004] However, if external dredged soil is used in order to reclaim the inland waters of a seawall, it is difficult to supply the dredged soil in due season according to the construction period.

[005] That is, if external dredged soil is used as banking material, there is a problem in that the construction period is inevitably delayed because it is difficult to supply the banking material owing to an environmental problem and mismatch in a construction plan for each construction institution.

[006] Furthermore, if soil dredged from a nearby sea area is used as banking material, there is a problem in that huge equipment, such as apparatuses for the dredging in the sea are and a lot of vehicles for transporting the dredged soil, huge manpower, and costs must be invested.

[007] Meanwhile, in a reclaimed land in which the inland waters of a seawall are reclaimed to a certain area, a freshwater lake formed by the seawall is used as inflow water. Water introduced

from the freshwater lake is circulated through the industrial complex of the reclaimed land and then drained. However, the freshwater lake formed by the seawall is not smoothly circulated, the quality of water is difficult to manage, and the quality of water is easily contaminated. Accordingly, lots of environmental problems are generated.

SUMMARY OF THE INVENTION

[008] Accordingly, the present invention has been made in view of the above problems occurring in the prior art, and it is an object of the present invention to provide a method of preparing a reclaimed land within a seawall by performing banking using earth and sand obtained by excavating a certain area within a planned reclaimed land, and facilities using the method. Accordingly, costs can be reduced, an environmental problem according to external dredging can be solved, a ground depression formed within the planned reclaimed land by the dredging can be used as a variety of industrial facilities or a stream and a park, and clean rainwater can be used as water for industrial and agricultural use.

[009] According to an aspect of the present invention, there is provided a method of preparing a reclaimed land within a seawall by filling the inland waters of the seawall, including a temporary soil portion construction step of constructing

temporary soil portions by piling up soil or stones along a circumference of a specific area within a planned reclaimed land; a dredger introduction step of introducing a dredger into an excavation portion within the planned reclaimed land; a banking step of banking earth and sand within the excavation portion higher than the inland altitude of the inland waters toward insides of the temporary soil portions using the dredger, but completing banking portions with the excavation portion within the planned reclaimed land remained intact; a dredger discharging step of externally draining the dredger outside of the planned reclaimed land before completing the banking portions; a drainage step of externally draining water within the excavation portion outside of the planned reclaimed land after completing the banking portions within the planned reclaimed land; and a drying step of drying the earth and sand within the planned reclaimed land.

[010] According to another aspect of the present invention, there is provided a method of preparing a reclaimed land within a seawall by filling inland waters of the seawall, including a road construction step of constructing a road along the circumference of a specific area of a planned reclaimed land; a cut-off wall installation step of forming a cut-off wall along the circumference of an excavation portion in order to prevent water from being externally introduced into the excavation portion

within the planned reclaimed land; a drainage and drying step of externally draining water within the planned reclaimed land outside of the planned reclaimed land and drying earth and sand; and a banking step of banking the earth and sand of the excavation portion higher than a height of an inland altitude other than the excavation portion by excavating the earth and sand.

[011] According to yet another aspect of the present invention, there is provided a reclaimed land facility structure of a seawall, including temporary soil portions installed by piling up soil or stone material along the circumference of a planned reclaimed land and configured to prevent inland waters from being introduced into the planned reclaimed land of the seawall; an excavation portion configured to have a ground depression formed therein by dredging a specific area within the planned reclaimed land; banking portions configured to form flatlands higher than an inland altitude by reclaiming the planned reclaimed land other than the excavation portion by using earth and sand obtained from the excavation portion; and a cut-off portion installed along the circumference of the excavation portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[012] Further objects and advantages of the invention can be more fully understood from the following detailed description taken in conjunction with the accompanying drawings in which:

[013] FIG. 1 is a flowchart of works for respective steps illustrating a method of preparing the reclaimed land of a seawall that is dredged by introducing a dredger into a planned reclaimed land according to the present invention;

[014] FIG. 2 shows an embodiment of works for respective steps illustrating a method of preparing a reclamation land within a seawall in which a dredger cannot be injected into a planned reclaimed land;

[015] FIG. 3 is a plan view after land reclamation according to the method of preparing the reclaimed land within the seawall according to the present invention;

[016] FIG. 4 is a cross-sectional view taken along line A-A of FIG. 3;

[017] FIG. 5 is a schematic perspective view of a reclaimed land according to the present invention;

[018] FIG. 6 is a plan view of a stream 80 according to the present invention;

[019] FIG. 7 is a cross-sectional view taken along line A-A of FIG. 6;

[020] FIGS. 8, 9, and 10 are cross-sectional views of FIG. 7; and

[021] FIGs. 11 and 12 show a removal portion 160 and a purification portion 170 according to the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[022] Some exemplary embodiments of the present invention will now be described in detail with reference to the accompanying drawings.

[023] FIG. 1 is a flowchart of works for respective steps illustrating a method of preparing the reclaimed land of a seawall that is dredged by introducing a dredger into a planned reclaimed land according to the present invention, and FIG. 2 shows an embodiment of works for respective steps illustrating a method of preparing a reclamation land within a seawall in which a dredger cannot be injected into a planned reclaimed land.

[024] Meanwhile, FIG. 3 is a plan view after land reclamation according to the method of preparing the reclaimed land within the seawall according to the present invention, and FIG. 4 is a cross-sectional view taken along line A-A of FIG. 3.

[025] The method of preparing a reclaimed land within a seawall according to the present invention may be distinguished according to whether a work through a dredger is possible within a planned reclaimed land.

[026] First, a method of performing a dredging work through a dredger is described.

[027] An area on which a dredging work through a dredger is possible in a planned reclaimed land within a seawall is advantageous in a work using the dredger in terms of costs. Accordingly, the method of performing a dredging work through a dredger includes a temporary soil portion construction step S1, a dredger introduction step S2, a banking portion construction step S3, a dredger discharging step S4, a drainage step S5, a drying step S6, and a cut-off wall installation step S7.

[028] Each of the steps is described in detail.

[029] A. Temporary soil portion construction step S1

[030] The temporary soil portion construction step S1 is the step of constructing temporary soil portions 20 by piling up soil or stones along the circumference of a certain area within a planned reclamation land 10.

[031] When the inland waters of a seawall 1 is reclaimed, the entire inland waters is not reclaimed at the same time, but the planned reclaimed land 10 is partitioned into specific areas according to uses for an industrial complex, a housing complex, and an agricultural development and the partitioned areas are independently reclaimed.

[032] Accordingly, the temporary soil portion construction step S1 includes setting the planned reclaimed land 10 of a specific area, partitioning the inside of the planned reclaimed land 10 into a

plurality of areas, and constructing the temporary soil portions 20 along the circumferences of the classified areas.

[033] That is, the temporary soil portions 20 are produced by piling up soil or stones along the circumferences of the plurality of partitioned areas within the planned reclaimed land 10.

[034] One temporary soil portion 20 is constructed on the circumference of one of the plurality of partitioned areas, and the other temporary soil portion 20 is constructed on the circumference of the other of the plurality of partitioned areas. During the time for which the other temporary soil portion 20 is constructed subsequently to the circumference of the other area, a banking work through a dredger (not shown) is performed toward the inside of the temporary soil portion 20 previously constructed.

[035] Furthermore, it is preferred that the height of the temporary soil portion 20 be higher than the height of the inland waters of the seawall 1 and the height of a banking portion 30.

[036] Meanwhile, when the temporary soil portions 20 are constructed within the planned reclaimed land 10, there must be a passage (not shown) through which the dredger is injected.

[037] B. Dredger introduction step S2

[038] The dredger introduction step S2 is the step of introducing a dredger into the dredging work space S (i.e., an excavation portion 50) of the planned reclaimed land 10.

[039] It is preferred that the excavation portion 50 have a specific area approximately at the center of the planned reclaimed land 10. However, the excavation portion 50 may exist at various places within the planned reclaimed land 10.

[040] Furthermore, the dredger may be injected before or after the temporary soil portion construction step S1 or during a construction.

[041] C. Banking step S3

[042] The banking step S3 is the step of banking earth and sand within the excavation portion 50 into the insides of the temporary soil portions 20 using a dredger, but only the excavation portion 50 of the planned reclaimed land 10 remains intact.

[043] That is, earth and sand, dipped up into the inside of the temporary soil portion 20 constructed on the circumference of a specific area in the temporary soil portion construction step S1 through the dredger, is piled up in the banking portion 30 other than the excavation portion 50. Here, it is preferred that the height of the banking portion 30 be higher than the altitude of the inland waters of the seawall 1 and the height of the temporary soil portion 20.

[044] As described above, the temporary soil portion construction step S1 and the banking step S3 are repeatedly performed. Accordingly, banking is performed on the insides of all the temporary soil portions 20 within the planned reclaimed land 10 by sequentially piling up the insides of the plurality of partitioned temporary soil portions 20.

[045] Accordingly, a ground depression is formed within the excavation portion 50 of the planned reclaimed land 10 that has been generated by dipping up earth and sand and, at the same time, the banking portions 30 higher than the inland waters of the seawall 1 is formed in the remaining portions of the planned reclaimed land 10. Here, the banking work is performed so that there remains a passage through which the dredger used for the dredging work within the excavation portion 50 can exit outside of the planned reclaimed land 10.

[046] Meanwhile, while the banking work is performed toward the inside of the temporary soil portion 20 using earth and sand, water is drained outside the temporary soil portion 20.

[047] D. Dredger discharging step S4

[048] The dredger discharging step S4 is a work of discharging the dredger outside the planned reclaimed land 10 before the entire banking work for the planned reclaimed land 10 is completed.

[049] After the dredger is externally drained from the planned reclaimed land 10, the passage remained in order to discharge the

dredger is subjected to banking, thereby completing the banking portions 30.

[050] When the dredger is externally drained from the planned reclaimed land 10, earth and sand are dipped up from the excavation portion 50 of the planned reclaimed land 10 using the dredger, thereby generating a ground depression. The remaining portions form the banking portions 30 on each of which earth and sand are piled up to a specific height. Water is filled in the bottom of the ground depression formed in the excavation portion 50.

[051] E. Drainage step S5

[052] The drainage step S5 is a work of externally draining the water of the planned reclaimed land 10 filled in the bottom of the ground depression within the excavation portion 50, after the banking within the planned reclaimed land 10 is completed.

[053] That is, the water filled in the excavation portion 50 is fully drained toward the inside of the planned reclaimed land 10 using a pump.

[054] F. Drying step S6

[055] The drying step S6 is a process of naturally drying the earth and sand within the planned reclaimed land 10 after the water within the excavation portion 50 is drained toward the inland waters of the planned reclaimed land 10 through the drainage step S5.

[056] Here, not only the earth and sand piled up on the banking portion 30, but also earth and sand within the ground depression 50 formed through the dredging within the excavation portion 50 is fully dried.

[057] G. Cut-off wall installation step S7

[058] The cut-off wall installation step S7 is a work of pile-hammering a sheet pile 40 in the circumference of the excavation portion 50 or grouting the circumference of the excavation portion 50 in order to prevent water from being introduced into the ground depression formed in the planned reclaimed land 10 after the drying step S6.

[059] Here, it is preferred that the sheet pile 40 be inserted into the underground to a depth of about 25 to 35 m, although it may be changed according to the nature of the soil.

[060] Meanwhile, if a work is difficult to perform because of a rock bed found while the sheet pile 40 is subjected to pile-hammering, a portion of the rock bed from which water leaks is grouted.

[061] If the sheet pile 40 is installed in the circumference of the excavation portion 50 or the circumference of the excavation portion 50 is grouted as described above, the subsidence of ground in the ground depression formed in the excavation portion 50 can be prevented.

[062] Meanwhile, the ground depression within the excavation portion 50 formed through the dredging work has a gentler incline plane 51 as shown in FIG. 4. The incline plane 51 may be formed in a step form, and industrial facilities or a variety of facilities, such as a building, a park, and a solar light power plant, may be built in horizontal planes 52.

[063] Furthermore, if the incline plane 51 of the excavation portion 50 is formed stepwise, problems due to heaving, boiling, piping, sliding, and the introduction of underground water can be prevented.

[064] Furthermore, the bottom surface of the excavation portion 50 is formed into a water tank 55 in which rainwater can be stored through a grading work. The water of the water tank 55 is purified through an ecology stream that circulates the water through the reclaimed land.

[065] Accordingly, various facilities, a park, and a solar light power plant can be built in the ground depression of the excavation portion 50 formed through the dredging within the planned reclaimed land 10. Furthermore, a water-friendly ecology space can be created because purified rainwater can be used as water for industrial and agricultural use even though the water of a freshwater lake is not introduced.

[066] An embodiment of a method of preparing a reclaimed land when it is difficult to inject a dredger because the depth of inland

waters within the planned reclaimed land 10 is small or there are a lot of obstacles, such as stones, in the planned reclaimed land 10 is described below.

[067] As shown in FIG. 2, a reclaimed land is prepared using a temporary soil portion and road construction step S100, a cut-off wall installation step S200, a drainage and drying step S300, and an excavation and banking step S400.

[068] A detailed work is described below if a dredger cannot be injected in the planned reclaimed land 10 as described above.

[069] A. Road construction step S100

[070] The road construction step S100 is a work of building a road in the planned reclaimed land 10 using earth and sand or concrete in the planned reclaimed land 10.

[071] A road adjoining inland waters within the seawall 1 is formed higher than an inland altitude, thus functioning to prevent the intrusion of inland waters. Meanwhile, a road placed within the planned reclaimed land 10 is constructed according to a pre-planned characteristic for development, such as an industrial complex or a housing complex.

[072] Here, the excavation portion 50 is previously set at the central portion of the planned reclaimed land 10 so that a road can be constructed on the circumference of the excavation portion 50.

[073] B. Cut-off wall installation step S200

[074] The cut-off wall installation step S7 is performed by pile-hammering the sheet pile 40 in the circumference of the preset excavation portion 50 or grouting the preset excavation portion 50 in order to prevent water from being introduced into the ground depression to be formed through a subsequent work within the planned reclaimed land 10 after the road construction step S100.

[075] Here, it is preferred that the sheet pile 40 be inserted into the underground to a depth of about 25 to 35 m, although it may be changed according to the nature of the soil.

[076] Meanwhile, if a work is difficult to perform because of a rock bed found while the sheet pile 40 is subjected to pile-hammering, a portion of the rock bed from which water leaks is grouted.

[077] If the sheet pile 40 is installed in the circumference of the excavation portion 50 or the circumference of the excavation portion 50 is grouted as described above, the subsidence of ground in the ground depression formed in the excavation portion 50 can be prevented.

[078] C. Drainage and drying step S300

[079] The drainage and drying step S300 is a process of draining water, existing within the entire planned reclaimed land 10, toward the inland waters of the seawall 1 and drying the entire planned reclaimed land 10 at the same time.

[080] That is, the water existing within the planned reclaimed land 10 is fully drained toward the inland waters of the seawall 1 using a pump, and the planned reclaimed land 10 is naturally dried at the same time.

[081] Since water does not exist in the entire area within the planned reclaimed land 10 through the drainage and drying step S300, the planned reclaimed land 10 is lower as low as the depth of water except the road 20.

[082] D. Excavation and banking step S400

[083] The excavation and banking step S400 is a work of producing the banking portions 30 by picking earth and sand from the excavation portion 50 in which the sheet pile is installed in the cut-off wall installation step S200.

[084] That is, earth and sand are dipped up from the excavation portion 50 within the planned reclaimed land 10 and then externally moved outside of the excavation portion 50 and then loaded thereon, thereby completing the banking portions 30.

[085] Here, it is preferred that the height of the banking be higher than the height of inland waters of the seawall 1.

[086] After the excavation and banking step S400 is completed, the ground depression is formed because of the earth and sand dipped up on the excavation portion 50. The banking portions 30 become flatlands higher than the inland waters of the seawall 1.

[087] Here, since the sheet pile is installed in the circumference of the excavation portion 50 in the cut-off wall installation step S200, there is no water in the ground depression of the excavation portion 50.

[088] Like in the method of preparing the reclaimed land by injecting the dredger, the ground depression within the excavation portion 50 has the incline plane 51. The incline plane 51 is formed stepwise, so that industrial facilities or various facilities, such as a building, a park, and a solar light power plant, can be built in the horizontal planes 52.

[089] Furthermore, problems due to heaving, boiling, piping, sliding, and the introduction of underground water can be prevented because the incline plane 51 of the excavation portion 50 is formed stepwise.

[090] Furthermore, the bottom surface of the excavation portion 50 becomes the water tank 55 capable of storing rainwater through a grading work, and the water of the water tank 55 is purified through an ecology stream that circulates the water through the reclaimed land.

[091] A facility capable of utilizing purified rainwater as water for industrial and agricultural use using the ground depression of the excavation portion 50 formed according to the method of preparing the reclaimed land within the seawall 1 is described below.

[092] As can be seen from FIG. 3, the reclaimed land formed by the preparing method according to the present invention includes the temporary soil portions or roads 20 installed by piling up soil or stone material along the circumference of the planned reclaimed lands 20 in order to prevent freshwater from being introduced into the planned reclaimed land 10 of the seawall 1, the excavation portion 50 in which the ground depression is formed by dredging a specific area within the planned reclaimed land 10, the banking portions 30 in which the flatlands higher than the inland altitude are formed by reclaiming the planned reclaimed land 10 other than the excavation portion 50 by using earth and sand obtained from the excavation portion 50, and a cut-off portion 40 installed along the circumference of the excavation portion 50.

[093] Meanwhile, the excavation portion 50 includes the incline portion 53 formed stepwise and the water tank 55 formed at the bottom. The incline portion 53 includes the horizontal plane 51 and the incline plane 52.

[094] According to the present invention, freshwater (i.e., inland waters) is not used as water provided to industrial facilities and apartments installed within the reclaimed land, but purified rainwater is used as water for industrial and agricultural uses.

[095] According to the present invention, in order to purify rainwater filled in the water tank 55 of the excavation portion

50, the rainwater is purified by forming a stream and a facility for purifying contaminated rainwater (initial rainwater) is additionally installed.

[096] FIG. 5 is a schematic perspective view of the reclaimed land according to the present invention.

[097] In FIG. 5, a construction for circulating water filled in the water tank 55 of the excavation portion 50 is shown.

[098] Water stored in the water tank 55 is supplied to a stream 80 through water supply channel 73 using a lifting machinery 70 installed in the banking portion 30 of the flatland. The stream 80 is formed in the banking portion 30 of the flatland and the incline portion 53 of the excavation portion and then connected to the water tank 55.

[099] Accordingly, when the water lifting machinery 70 is driven, the water of the water tank 55 is circulated in order of the water tank 55 → the water supply channel 73 → the stream 80 of the banking portion 30 → the stream 80 of the incline portion 53 → the water tank 55. Accordingly, the water stored in the water tank 55 is naturally purified.

[0100] The water lifting machinery 70 and the stream 80 may be installed or produced according to a characteristic for each development of the reclaimed land.

[0101] Meanwhile, a plurality of purification facility portions 71 may be installed in the middles of the stream 80 in order to further circulate purified water.

[0102] Furthermore, a water gate 72 is installed at a placed where the banking portion 30 adjoins the incline portion 53 of the excavation portion 50 in order to further improve the quality of water through the natural drop of water.

[0103] The clean rainwater stream may be varied according to how initial rainwater is purified.

[0104] According to the present invention, means for gathering the initial rainwater is installed in the stream 80.

[0105] FIG. 6 is a plan view of the stream 80 according to the present invention, FIG. 7 is a cross-sectional view taken along line A-A of FIG. 6, and FIGS. 8, 9, and 10 are cross-sectional views of FIG. 7.

[0106] As can be seen from FIGS. 6 and 7, the rainwater gathering means 100 of the present invention includes a rainwater pipe 110 into which rainwater on a road is introduced, a catchment pipe 130 for guiding the rainwater passing through the rainwater pipe 110 so that the rainwater can flow in the same direction as water flowing through the stream 80, and an undercurrent tank 140 for temporarily gathering the rainwater passing through the catchment pipe 130.

[0107] The catchment pipe 130 has a diameter much greater than that of the rainwater pipe 110.

[0108] Furthermore, according to the present invention, if the amount of rainfall is much after initial contaminated rainwater drops, catchment tanks 150 connected to the upper portion of the rainwater pipe 110 are installed so that rainwater flowing through the rainwater pipe 110 is introduced into the stream 80.

[0109] Accordingly, as can be seen from FIG. 7, the rainwater passing through the catchment tanks 150 flows into the catchment pipe 130 via the lower portion of a rainwater pipe 115 installed under a stream bottom portion 120.

[0110] As shown in FIGS. 7 and 9, a portion of the catchment tank 150, adjoining the incline plane 81 of the stream 80, is higher than the inflow hole 111 of an upper portion of the rainwater pipe 110 and has a great width. Accordingly, the rainwater passing through the inflow hole 111 of the upper portion of the rainwater pipe 110 is temporarily stored in the catchment tanks 150.

[0111] Next, if the amount of the rainwater introduced into the upper portion of the rainwater pipe 110 of the catchment tank 150 is increased to exceed the capacity of the catchment pipe 130, the rainwater flows over to the stream 80 through an overflow portion 151.

[0112] Meanwhile, as shown in FIG. 6, a branch pipe 145 connected to the catchment pipe 130 is installed on the ground near the downstream of the stream 80 adjacent to the water tank 55. Accordingly, the rainwater gathered in the catchment pipe 130 is gathered at the undercurrent tank 140 the branch pipe 145 installed outside the stream 80.

[0113] Although not shown, if the rainwater gathering means 100 is installed separately from the stream 80, the catchment pipe 130 may be directly connected to the undercurrent tank 140 without additionally installing the branch pipe 145.

[0114] The branch pipe 145 is installed at a place different from that of the stream 80.

[0115] A removal portion 160 for filtering contaminated water and floating matters and a purification portion 170 for purifying water are installed on the branch pipe 145 installed between the catchment pipe 130 and the undercurrent tank 140 of the present invention.

[0116] FIGs. 11 and 12 show a removal portion 160 and a purification portion 170 according to the present invention.

[0117] The removal portion 160 includes a curve portion 161 configured to make slow the speed of a flow by increasing a part of the branch pipe 145 greater than the cross section of the branch pipe 145, a guidance portion 162 configured to change the direction of the flow, and a precipitation portion 164 formed

deeper than the bottom of the branch pipe 145. Accordingly, while rainwater passes through the removal portion 160, floating matters and deposits remain in the removal portion 160.

[0118] Furthermore, the purification portion 170 includes an enlarged pipe portion 171 formed by enlarging a part of the branch pipe 145, a guidance portion 172 configured to change the flow of water within the enlarged pipe portion 171, and a purification filter 175 installed at right angles to the direction of water.

[0119] As described above, the rainwater filtered through the branch pipe 145 having the precipitation portion 160 and the purification portion 170 reaches the undercurrent tank 140.

[0120] The undercurrent tank 140 includes a first pipe line 141 connected to the water purification plant according to the state of the quality of water, a second pipe line 142 connected to a sewage disposal treatment plant, and a third pipe line 143 connected to a drainage line. The present invention shows only an example of a pipe line connected to the undercurrent tank 140 and can connect various facilities according to the state of the quality of water and purify rainwater.

[0121] Meanwhile, although not shown, rainwater passing through the facilities of a common sewage disposal treatment plant or water purification plant can flow into the water tank 55 in a clean state.

[0122] The means for circulating the water of the ground depression formed in the reclaimed land prepared according to the method of preparing the reclamation method according to the present invention and the means for gathering purified rainwater are only embodiments, and a lot of methods using rainwater may be used.

[0123] As described above, according to the present invention, dredged soil within the planned reclaimed land of a seawall is used. Accordingly, costs can be reduced. Furthermore, a variety of industrial facilities or streams are formed in ground depression formed by dredging within the planned reclaimed land and used as a rainwater storage tank. Accordingly, clean water for industrial and agricultural use can be supplied to prepared developments.

[0124] Furthermore, ecology spaces can be prepared within the reclaimed land through streams for circulating rainwater. Accordingly, eco-friendly developments can be formed.

[0125] As described above, according to the present invention, banking is performed using dredged soil picked from an excavation portion within a planned reclaimed land. Accordingly, the construction period and costs can be reduced, and an environmental problem according to external dredging can be solved.

[0126] Furthermore, the water tank capable of storing rainwater purified in the ground depression produced through dredging in the excavation portion is used, and the rainwater is used as water for industrial and agricultural uses. Furthermore, ecology spaces can be formed by circulating water, stored in the water tank, through the reclaimed land.

[0127] While the present invention has been described with reference to the particular illustrative embodiments, it is not to be restricted by the embodiments but only by the appended claims. It is to be appreciated that those skilled in the art can change or modify the embodiments without departing from the scope and spirit of the present invention.

What is claimed is:

1. A method of preparing a reclaimed land within a seawall 1 by filling inland waters of the seawall 1, the method comprising:

5 a temporary soil portion construction step S1 of constructing temporary soil portions 20 by piling up soil or stones along a circumference of a specific area within a planned reclaimed land 10;

10 a dredger introduction step S2 of introducing a dredger into an excavation portion 50 within the planned reclaimed land 10;

a banking step S3 of banking earth and sand within the excavation portion 50 higher than an inland altitude of the inland waters toward insides of the temporary soil portions 20 using the dredger, but completing banking portions 30 with the 15 excavation portion 50 within the planned reclaimed land 10 remained intact;

a dredger discharging step S4 of externally draining the dredger outside of the planned reclaimed land 10 before completing the banking portions 30;

20 a drainage step S5 of externally draining water within the excavation portion 50 outside of the planned reclaimed land 10 after completing the banking portions 30 within the planned reclaimed land 10; and

a drying step S6 of drying the earth and sand within the planned reclaimed land 10.

2. The method as claimed in claim 1, further comprising
5 the step S7 of installing a cut-off wall in a circumference of the excavation portion 50 so that the circumference of the excavation portion 50 formed through the dredging in the excavation portion 50 can be cut off after the drying step S6.

10 3. The method as claimed in claim 1, wherein the temporary soil portion construction step S1 comprises the step of partitioning an inside of the planned reclaimed land 10 into a plurality of areas and constructing the temporary soil portions 20 in the respective areas.

15 4. The method as claimed in claim 1, wherein:

an incline plane 51 of the excavation portion 50 is formed stepwise and configured to have various facilities installed in the incline plane 51, and

20 a bottom of a dredging work space S includes a water tank 55 for storing rainwater.

5. A method of preparing a reclaimed land within a seawall 1 by filling inland waters of the seawall 1, the method comprising:

a road construction step S100 of constructing a road 20 along a circumference of a specific area of a planned reclaimed land 10;

a cut-off wall installation step S200 of forming a cut-off wall 40 along a circumference of an excavation portion 5 in order to prevent water from being externally introduced into the excavation portion 50 within the planned reclaimed land 10;

a drainage and drying step S300 of externally draining water within the planned reclaimed land 10 outside of the planned reclaimed land 10 and drying earth and sand; and

a banking step S400 of banking the earth and sand of the excavation portion 50 higher than a height of an inland altitude other than the excavation portion 50 by excavating the earth and sand.

6. The method as claimed in claim 5, wherein the road construction step S100 comprises the step of partitioning an inside of the planned reclaimed land 10 into a plurality of areas and constructing roads 20 in the areas.

7. The method as claimed in claim 5, wherein:

an incline portion 53 of the excavation portion 50 is formed stepwise and configured to have various facilities installed in the incline plane 51, and

a bottom of the excavation portion 50 includes a water tank
5 55 for storing rainwater.

8. A reclaimed land facility structure of a seawall 1, comprising:

temporary soil portions 20 installed by piling up soil or
10 stone material along a circumference of a planned reclaimed land 10 and configured to prevent inland waters from being introduced into the planned reclaimed land 10 of the seawall 1;

an excavation portion 50 configured to have a ground depression formed therein by dredging a specific area within the
15 planned reclaimed land 10;

banking portions 30 configured to form flatlands higher than an inland altitude by reclaiming the planned reclaimed land 10 other than the excavation portion 50 by using earth and sand obtained from the excavation portion 50; and

20 a cut-off portion 40 installed along a circumference of the excavation portion 50.

9. The reclaimed land facility structure as claimed in claim 8, wherein the excavation portion 50 comprises:

an incline portion 53 formed stepwise, and
a water tank 55 formed in a bottom of the excavation portion
50.

5 10. The reclaimed land facility structure as claimed in
claim 8, wherein the cut-off portion 40 is a sheet pile.

11. The reclaimed land facility structure as claimed in
claim 8, wherein the cut-off portion 40 is formed by performing
10 grouting and then installing a sheet file.

12. The reclaimed land facility structure as claimed in
claim 9, further comprising a stream 80 formed along the banking
portion 30 having the flatland formed therein and incline planes
15 51 of the excavation portion 50, wherein water stored in the
water tank 55 is circulated using a water lifting machinery 70
installed in the banking portion 30.

13. The reclaimed land facility structure as claimed in
20 claim 12, further comprising a plurality of purification facility
portions 71 installed in the stream 80.

14. The reclaimed land facility structure as claimed in
claim 12, further comprising a water gate 72 installed at a

portion adjoining the incline planes 51 of the excavation portion
50 of the stream 80.

15. The reclaimed land facility structure as claimed in
5 claim 12, further comprising rainwater gathering means 100
installed in the stream 80.

16. The reclaimed land facility structure as claimed in
claim 15, wherein the rainwater gathering means 100 comprises:
10 rainwater pipes 110 and 115 configured to have rainwater on
a ground introduced therein;

a catchment pipe 130 installed in a stream bottom portion
120 and configured to guide rainwater, passing through the
rainwater pipes 110 and 115, so that the rainwater flows in a
15 direction identical with a direction along which water flows
through the stream 80; and

an undercurrent tank 140 configured to have the rainwater,
passing through the catchment pipe 130, temporally gathered
therein.

20
17. The reclaimed land facility structure as claimed in
claim 16, wherein the catchment pipe 130 has a greater diameter
than each of the rainwater pipes 110 and 115.

18. The reclaimed land facility structure as claimed in claim 16, further comprising catchment tanks 150 connected to the rainwater pipe 110 at a portion adjoining the stream bottom portion 120 and configured to have the rainwater introduced into
5 the stream 80 when the rainwater is increased.

19. The reclaimed land facility structure as claimed in claim 18, further comprising an overflow portion 151 installed at a point where the catchment tanks 150 come in contact with the
10 incline portion 81 of the stream 80, installed higher than a surface of the water of the stream 80, and configured to have the rainwater flow into the stream 80 through the overflow portion 151.

15 20. The reclaimed land facility structure as claimed in claim 16, further comprising a branch pipe 145 connected to the catchment pipe 130 neat a lower reach of the stream 80 adjacent to the water tank 55 and configured to have the rainwater, gathered at the catchment pipe 130, gathered at the undercurrent
20 tank 140 through the branch pipe 145.

21. The reclaimed land facility structure as claimed in claim 16 or 20, wherein the undercurrent tank 140 comprises:

a first pipe line 141 connected to a water purification plant according to a state of a quality of water;

a second pipe line 142 connected to a sewage disposal treatment plant; and

5 a third pipe line 143 connected to a drainage path.

22. The reclaimed land facility structure as claimed in claim 21, wherein water passing through the sewage disposal treatment plant and the water purification plant reaches the
10 water tank 55.

23. The reclaimed land facility structure as claimed in claim 20, wherein:

the branch pipe 145 is installed on a ground separately from
15 the stream 80, and

the branch pipe 145 comprises a removal portion 160 and a purification portion 170 for removing floating matters and deposits while the rainwater flows through the branch pipe 145.

20 24. The reclaimed land facility structure as claimed in claim 23, wherein the removal portion 160 comprises:

a curve portion 161 formed to have a larger cross section than the branch pipe 145 and configured to make slow a speed of a flow;

a guidance portion 162 configured to change the direction of the flow; and

a precipitation portion 164 formed deeper than a bottom of the branch pipe 145,

5 wherein while the rainwater passes through the removal portion 160, floating matters and deposits remain in the removal portion 160.

25. The reclaimed land facility structure as claimed in
10 claim 23, wherein the purification portion 170 comprises:

an enlarged pipe portion 171 formed by enlarging a part of the branch pipe 145,

a guidance portion 172 configured to change a direction of the flow, and

15 a purification filter 175 installed within the enlarged pipe portion 171.

26. The reclaimed land facility structure as claimed in claim 25, wherein the purification filter 175 is installed at
20 right angles to a direction along which the water flows.