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(54) **AUGMENTING A FLOODWALL WITH A COLLAR**

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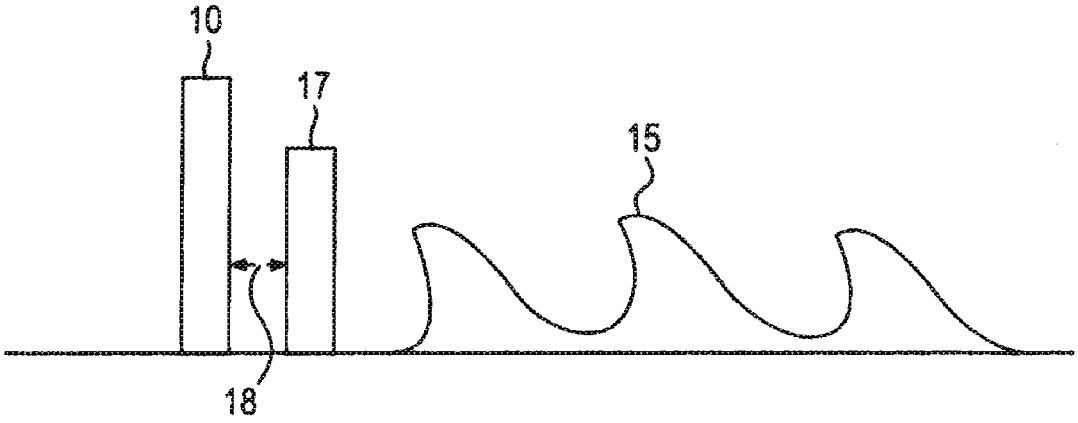
CPC . ***E02B 3/106*** (2013.01); ***E02B 3/12*** (2013.01); ***E02B 8/00*** (2013.01)

(57) **ABSTRACT**

A system, method and collar for augmenting a floodwall are disclosed herein. The collar includes metal shell conformed in the shape of bollard, and is slideable over the bollard. The collar is capable of being locked to the bollard by a bolt. The collar is welded or attached to a post of the floodwall. The floodwall may be a removable floodwall installation.



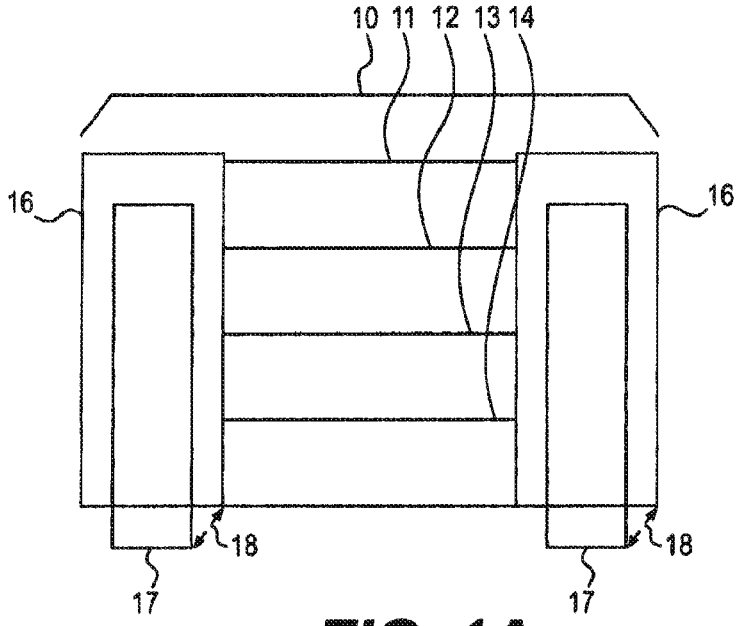


FIG. 1A

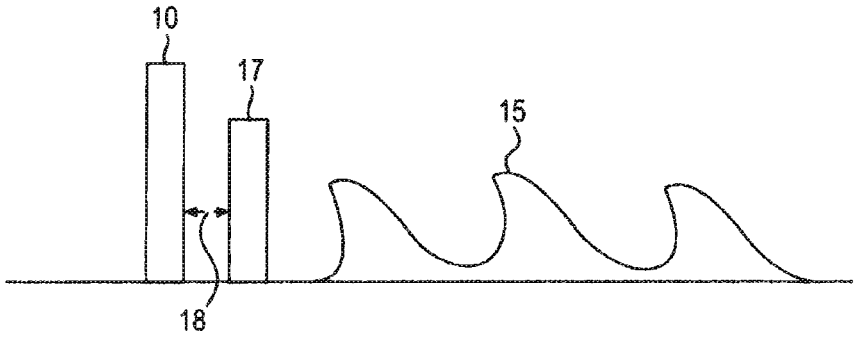


FIG. 1B

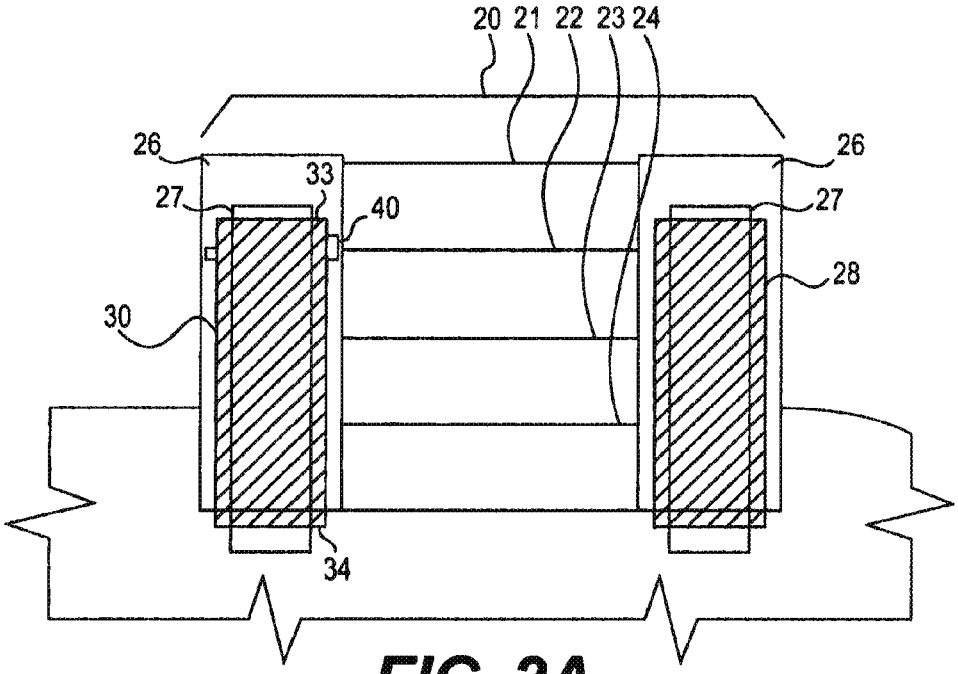


FIG. 2A

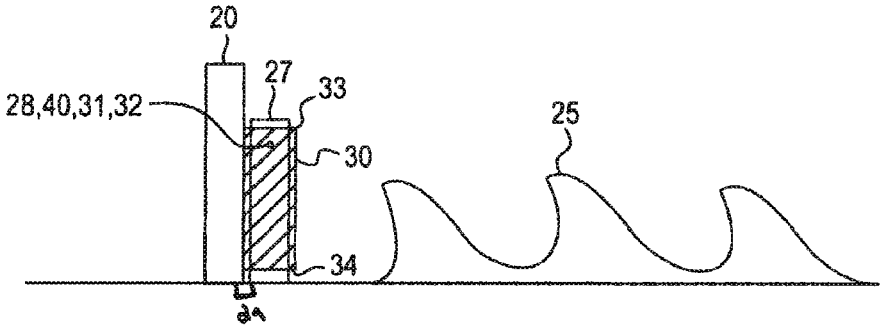


FIG. 2B

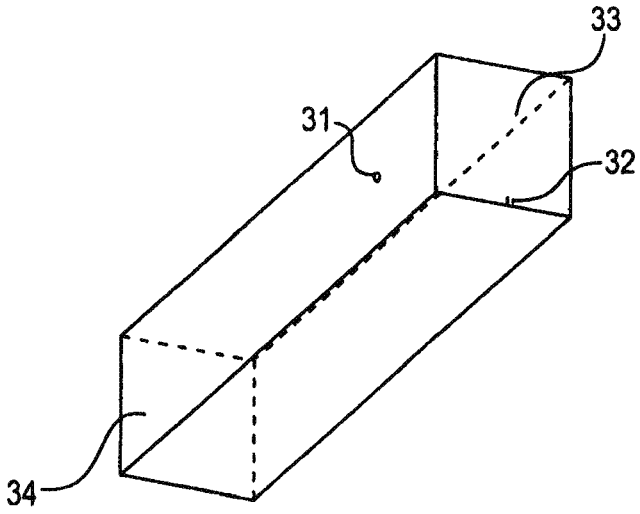


FIG. 3

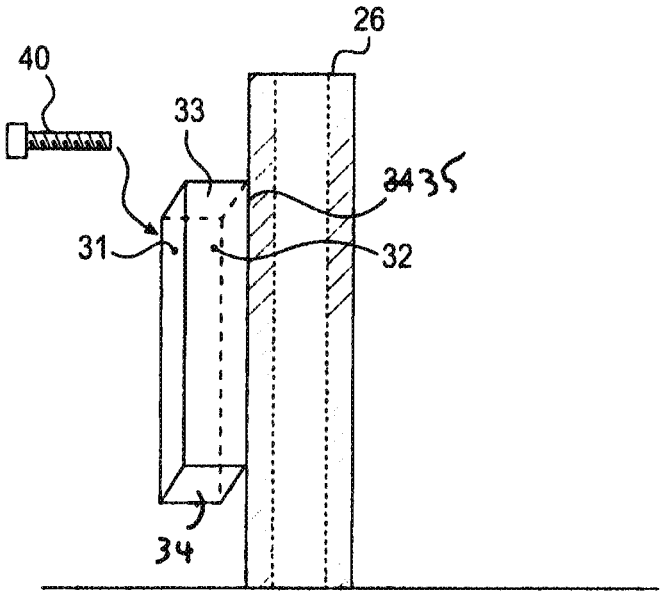


FIG. 4

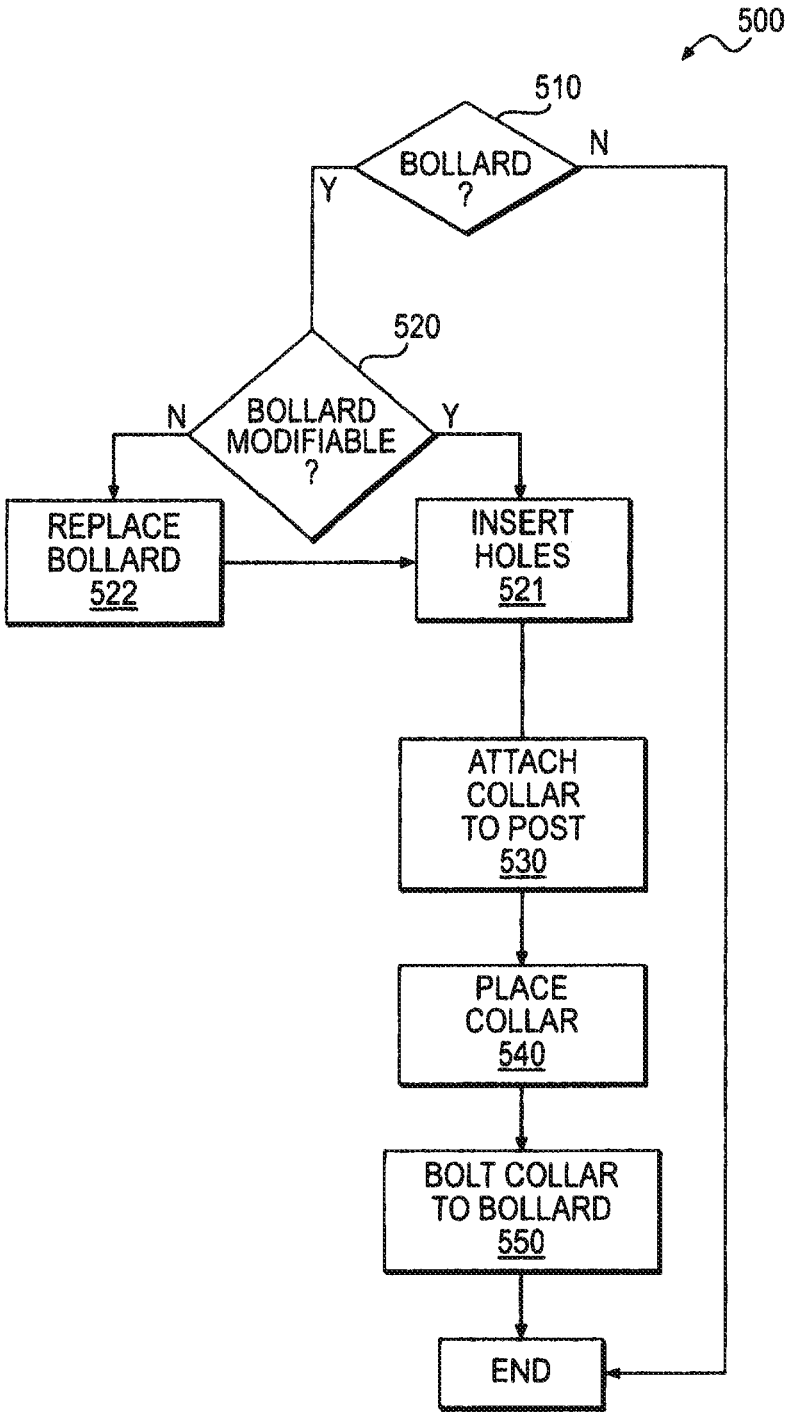

500
510
BOLLARD ?
N
Y
520
BOLLARD MODIFIABLE ?
N
Y
REPLACE BOLLARD 522
INSERT HOLES 521
ATTACH COLLAR TO POST 530
PLACE COLLAR 540
BOLT COLLAR TO BOLLARD 550
END

FIG. 5

AUGMENTING A FLOODWALL WITH A COLLAR

CLAIM TO PRIORITY

[0001] This patent application claims priority to U.S. Provisional Application No. 62/029,250, filed Jul. 25, 2014, entitled "Augmenting a Floodwall with a Collar," now pending. This patent application contains the entire Detailed Description of U.S. Patent Application No. 62/029,250.

BACKGROUND

[0002] Buildings and other locations often times are built near bodies of water. Various phenomena may cause the body of water to rise, and potentially cause deleterious effects associated with flooding. As storms become more frequent and larger, and other phenomena, such as climate change becomes an issue, flooding may become more common.

[0003] One such solution is to provide a floodwall. The floodwall may be erected in between the source of water and the building/location. Thus, even if the water rises over a certain level, the floodwall may effectively block the water out.

[0004] Several problems exist with floodwalls. One issue is that the floodwall may not be aesthetically pleasing. Thus, a general facade of a building/location may be drastically altered by the placement of a floodwall.

[0005] A workaround to this problem is to provide removable floodwalls. Removable floodwalls have been implemented in numerous locations around the world. The removable floodwall allows the floodwall to be erected when needed, or during a particularly flood sensitive time period.

[0006] FIGS. **1**(*a*) and (*b*) illustrate an example of a front view and a sideview of a floodwall **10** according to a conventional implementation.

[0007] The floodwall **10** includes a plurality of removable planks **11-14**, a post **16**. The removable planks **11-14** are stackable, and may be selectively provided based on need or an implementer of the floodwall **10**'s preference. As shown in FIGS. **1**(*a*) and (*b*), the removable planks **11-14** are disposed in between multiple posts **16**. The posts **16** may be configured to allow the removable planks **11-14** to maintain a stable position. For example, the post **16** may be configured so as to have a groove that is fitted to allow the removable planks **11-14** to be disposed therein.

[0008] Also shown in FIGS. **1**(*a*) and (*b*) is a bollard **17**. A bollard **17** is a post that is cemented or placed into the ground in front of the floodwall **10**. The bollard **17** may be introduced for a variety of reasons, including but not limited to, preventing of terrorism or other stray objects from making contact with the floodwall **10** or the area in which the floodwall **10** is situated at. The bollard **17** may be periodically placed at or around the floodwall **10** at predefined spacing, with a plurality of bollards **17** being situated at the floodwall **10**'s installation. The bollard **17** may be placed in a side of the floodwall **10** that opposes the water **15**, or in another example (not shown), the bollard **17** may be placed on the side of the floodwall **10** opposite of the water **15**.

[0009] The bollard **17** may be reinforced into the ground by various techniques, such as, but not limited to, a concrete attachment to the ground.

[0010] Also shown in FIG. **1** is a distance **18** between the bollard **17** and the floodwall **10**. The approximate position and space between the bollard **17** and the floodwall **10** may be selectively chosen based on an implementer's preference, and take into account other factors, such as the context in which the installation is being provided.

[0011] The bollard **17** is merely one type of existing structure that may be near or around the floodwall **10**. However, in order to simplify the explanation of the aspects disclosed herein, the bollard **17** will be employed to illustrate the concepts disclosed herein. However, one of ordinary skill in the art may substitute the bollard **17** with similar existing elements in or around a floodwall **10**.

[0012] As water **15** hits the floodwall **10**, as shown in the side-view, the floodwall **10** provides a certain amount of protection against the water **15**. However, as water patterns change, flooding becomes more of an issue, and climate change also become more pernicious—the singular solution to preventing floods may not be adequate. Thus, existing floodwalls may be incapable of being adequate for the size and force of flooding that was not anticipated.

[0013] However, due to the introduction of an existing structure, for example, the bollard **17**, modifying a floodwall **10** to be stronger and more capable of being flood and wind resistance may be difficult.

SUMMARY

[0014] A system, method and collar for augmenting a floodwall are disclosed herein. The collar includes metal shell conformed in the shape of bollard, and is slide-able over the bollard. The collar is capable of being locked to the bollard by a bolt.

DESCRIPTION OF THE DRAWINGS

[0015] The detailed description refers to the following drawings, in which like numerals refer to like items, and in which:

[0016] FIGS. **1**(*a*) and (*b*) illustrate an example of a front view and a sideview of a floodwall **10** according to a conventional implementation.

[0017] FIGS. **2**(*a*) and (*b*) illustrate an example of a front view and a side view floodwall **20** augmented by the aspects disclosed herein.

[0018] FIG. **3** illustrates an example of a collar employed in FIGS. **2**(*a*) and **2**(*b*).

[0019] FIG. **4** illustrates an example of a collar attached to a post of a removable floodwall system.

[0020] FIG. **5** illustrates an example implementation of method for augmenting a floodwall with a collar.

DETAILED DESCRIPTION

[0021] The invention is described more fully hereinafter with references to the accompanying drawings, in which exemplary embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these exemplary embodiments are provided so that this disclosure is thorough, and will fully convey the scope of the invention to those skilled in the art. It will be understood that for the purposes of this disclosure, "at least one of each" will be interpreted to mean any combination the enumerated elements following the respective language, including combination of multiples of the enumerated elements. For example, "at least one of X, Y, and Z" will be construed to mean X only, Y only, Z only, or any combination of two or more items X, Y, and Z (e.g. XYZ, XZ, YZ, X).

Throughout the drawings and the detailed description, unless otherwise described, the same drawing reference numerals are understood to refer to the same elements, features, and structures. The relative size and depiction of these elements may be exaggerated for clarity, illustration, and convenience.

[0022] As explained in the Background section, floodwalls, such as floodwall **10**, may be implemented to help aid and protect an environment, building, or area from environmental conditions, such as flooding. However, due to legacy conditions, the certain areas may not include any sort of flooding protection.

[0023] One such solution is a removable floodwall, such as floodwall **10**. Floodwall **10** provides an ability to prevent an area from being engulfed by waters, and the floodwall **10** may be built to be strong enough to avoid being knocked down by winds.

[0024] In order for floodwall **10** to be effective, the strength and durability of the floodwall **10** needs to match and anticipate flooding situations. However, various conditions may cause flooding to be stochastic and unpredictable. Thus, floodwalls that are implemented at a certain period of time and context, may not be adequate to deal with future flooding conditions.

[0025] Disclosed herein are methods and systems for augmenting a floodwall system. By employing the aspects disclosed herein, an existing floodwall **10** may be strengthened to handle future and more powerful floods. The aspects disclosed herein allow and provide for implementation with existing structures, such as a bollard **17** described in the Background section. The aspects disclosed herein have been tested and experimented with, and have been shown to improve existing floodwall implementations.

[0026] FIGS. **2**(*a*) and (*b*) illustrates front-view and a side-view floodwall **20** augmented by the aspects disclosed herein. The floodwall **20** includes removable planks **21-24**, a post **26**, and a bollard **27**. Between the bollard **27** and the floodwall **20**, a distance **29** is shown. The floodwall **20** shown is a removable floodwall; however, one of ordinary skill in the art may implement the aspects disclosed herein with other types of floodwalls.

[0027] Referring to FIGS. **2**(*a*) and (*b*), the floodwall **20** is substantially similar to floodwall **10** depicted in FIG. **1**. However, the following differences are noted.

[0028] The bollard **27** now includes a hole **28**, with two openings. The hole **28** is substantially parallel with the placement of the removable planks **21-24**. The hole **28** may be pre-manufactured with the bollard **27**, or alternatively, be added through any drilling process on an already existing bollard installed near a floodwall.

[0029] Also shown in FIGS. **2**(*a*) and **2**(*b*), are a collar **30** and a bolt **40**. The collar **30** is shown in greater detail in FIG. **3**, and the collar **30** as attached to the post **26** is shown in greater detail in FIG. **4**.

[0030] The collar **30** is attached to the post **26** via a connection technique at location **35**. As both the collar **30** and the post **26** may be metal, an approach to effectuate the attachment at location **35** may be through a welding process. Welding ensures that the post **26** and collar **30** are attached in a strong enough and stable way.

[0031] The collar **30** is placed over an existing bollard **27**, as shown in FIG. **4**, the collar **30** includes two holes **31** and **32**. The holes **31** and **32** correspond with hole **28**. Various materials may be used in the production of collar **30**.

[0032] The collar **30** is designed with minimum clearance—for example, in one example it may be provided with a clearance of less than a quarter inch—so as to make it easy to slide the post **26** and collar **30** integrated assembly over the bollard **27**. The collar height is designed to transfer the loads handling the bending/ turnover forces created by the water on the wall height. The post **26** and collar **30** may be connected via three pin connectors, and positioned using a welder's alignment pin tool. The various pins and bolt **40** may be attached via a wing nut fastened to provide a secure connection.

[0033] The collar **30** also includes two openings **33** and **34**. The collar **30** is ideally shaped to fit over an existing bollard **27**, so the collar **30** is shaped to be in a shell that fits over the bollard **27**. The collar **30** may then be slid over the bollard **27**, thereby providing a snug fit with the bollard **27**.

[0034] Thus, depending on the shape of bollard **27**, the shape of the collar **30** may be designed accordingly. In FIG. **3**, the collar **30** is shown as rectangular; however, the shape of the collar **30** is not limited to this shape, with one of ordinary skill in the art conforming the shape of collar **30** based on the shape of the provided bollard **27**, or an implementer's design choice.

[0035] The collar **30**, as shown in FIG. **3**, may be provided with a bolt **40**. In one embodiment, the bolt **40** may be a titanium metal. In another example, the collar **30** may be steel metal. However, the metal or substance employed for bolt **40** may be substituted by the implementer of floodwall **20** according to one of ordinary skill in the art.

[0036] As shown in FIG. **2**, the floodwall **20** incorporates the elements shown in FIGS. **3** and **4**. Thus, the bollard **28** incorporates a collar **30**, locked into place with the bolt **40**. The locking mechanism is implemented with the bolt **40**, which is slid through holes **28**, **31**, and **32**.

[0037] Thus, in the floodwall **20** shown in FIGS. **2**(*a*) and (*b*), in response to water **25** approaching the floodwall **20**, the augmented bollard **27** provides additional support to fend off the environmental conditions. The bollard **27**, due to the addition of a collar **30** and bolt **40**, and the locking elements as described, provide additional counter force towards water **25** and wind which may displace and force the floodwall **20** to collapse.

[0038] FIG. **5** illustrates a method **500** for augmenting a floodwall system for greater structural integrity.

[0039] In operation **510**, a determination of whether a bollard is situated in an area of a floodwall installation is made. If a bollard is placed, the method **500** proceeds to operation **520**. If not, the method **500** proceeds to end. As explained above, this analysis may be performed via numerous existing structures, such as other permanent or semi-permanent structures installed in a location.

[0040] In operation **520**, a determination is made as to whether the existing bollard is modifiable. If the existing bollard is modifiable, holes, such as hole **28**, are inserted into the bollard (operation **521**). If not, the bollard is replaced with a modifiable bollard (operation **522**), and holes are inserted into the modifiable bollard (operation **521**). The inclusion of operation **522** may be omitted in most cases. This is due to the fact that many bollards or existing structures are not modifiable or may not be manipulated by the floodwall's installers.

[0041] In operation **530**, a collar, as described above is affixed to a post implemented in a removable floodwall installation. As explained above, the post and the collar may be

pre-welded together to ensure a rigid and secure attachment. The method **500** then proceeds to operation **540**.

[0042] In operation **540**, the collar is placed over the bollard. The collar may incorporate holes as well. The holes of the elements, the collar and the bollard, may significantly line up with each other. As the collar is placed over the bollard, the post may be installed as well. In this way, the collar, the bollard and the post at various locations and installation spots along the floodwall may significantly line up.

[0043] In operation **550**, a bolt may be inserted through the two elements, the collar and bollard. The bolt allows the two elements to substantially lock together.

[0044] Thus, employing the aspects disclosed herein, an existing floodwall (e.g. removable floodwall systems), may be strengthened. Due to the necessity to have a system that is easy to implement, cheap, and portable, the aspects disclosed herein allow a floodwall implementer to accomplish a more efficient and cost-effective design.

[0045] Further, because floodwall systems are being improved upon, end users of the floodwall may realize safer communities, free of the deleterious effects associated with modern and common environmental phenomena.

[0046] It will be apparent to those skilled in the art that various modifications and variation can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

We claim:

1. A collar for augmenting a floodwall, the collar comprising:

a metal shell fitted to conform to a bollard, the metal shell including a first opening and a second opening;

a first hole and a second hole included on the metal shell, wherein the first hole and the second hole line-up significantly with a bollard hole, and

the collar is welded to a post of the floodwall.

2. The collar of claim **1**, further comprising a bolt to be placed in the first hole, the second hole, and the bollard hole.

3. The collar of claim **1**, wherein the metal shell is aluminum.

4. The collar of claim **1**, wherein the floodwall is removable.

5. A removable floodwall system, the system comprising:

a plurality of posts to receive a plurality of removable planks disposed in-between the plurality of posts; and

a plurality of collars, each of the collars being a metal shell conformed to fit each of a plurality of bollards, wherein each of the plurality of posts is welded to at least some of the plurality of collars.

6. The system according to claim **5**, wherein each of the plurality of collars includes:

a first hole and a second hole included on the metal shell, wherein the first hole and the second hole line-up significantly with a bollard hole.

7. The system of claim **6**, further comprising a bolt to be placed in the first hole, the second hole, and the bollard hole.

8. The system of claim **6**, wherein the floodwall is removable.

9. A method for augmenting a floodwall with a collar, the method comprising:

inserting a hole in a bollard situated with a floodwall;

conforming a metal shell in the shape of the bollard;

inserting a first hole and a second hole to line-up with the bollard hole;

welding the metal shell with a post of the floodwall;

sliding the metal shell over the bollard; and

locking the metal shell and the bollard with a bolt.

* * * * *