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(54) **SYSTEM, METHOD AND APPARATUS FOR INTEGRATED WATER MANAGEMENT OF A BASEMENT**

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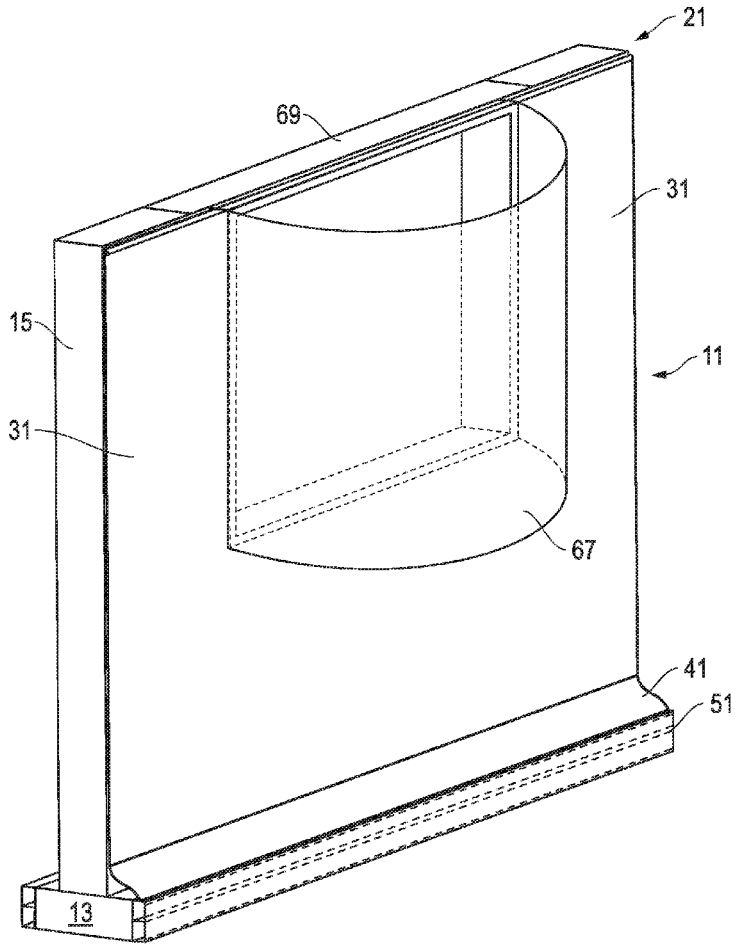
CPC ***E02D 31/06*** (2013.01); ***E04F 17/06*** (2013.01); ***E02D 29/14*** (2013.01); ***E04B 1/7038*** (2013.01)

(57) **ABSTRACT**

A system for integrated water management of a basement is disclosed. The basement has a footer, a wall extending upward from the footer, and a sill plate on top of the wall. The system may include a sill plate barrier with a base located between the sill plate and the wall. The system may include a vertical barrier coupled to the sill plate barrier and extending downward along an exterior of the wall toward the footer. In addition, the system may have a footer barrier coupled to the vertical barrier and extending over an exterior of the footer. The system may include a drain member adjacent the exterior of the footer and coupled to the footer barrier. In one version, the sill plate barrier, vertical barrier, footer barrier and drain member collectively form the integrated water management system for the exterior of the basement to prevent water intrusion.



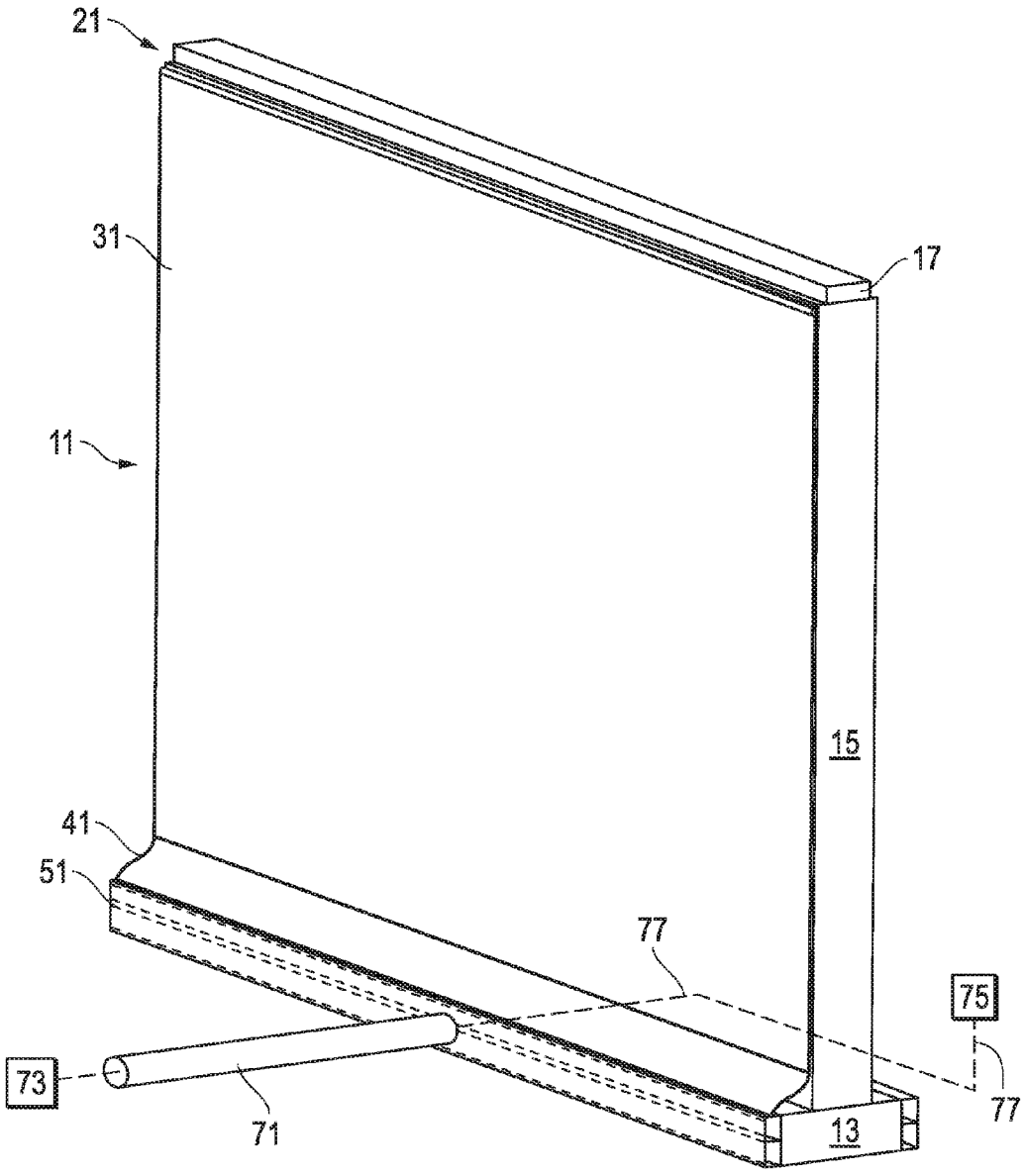


FIG. 1

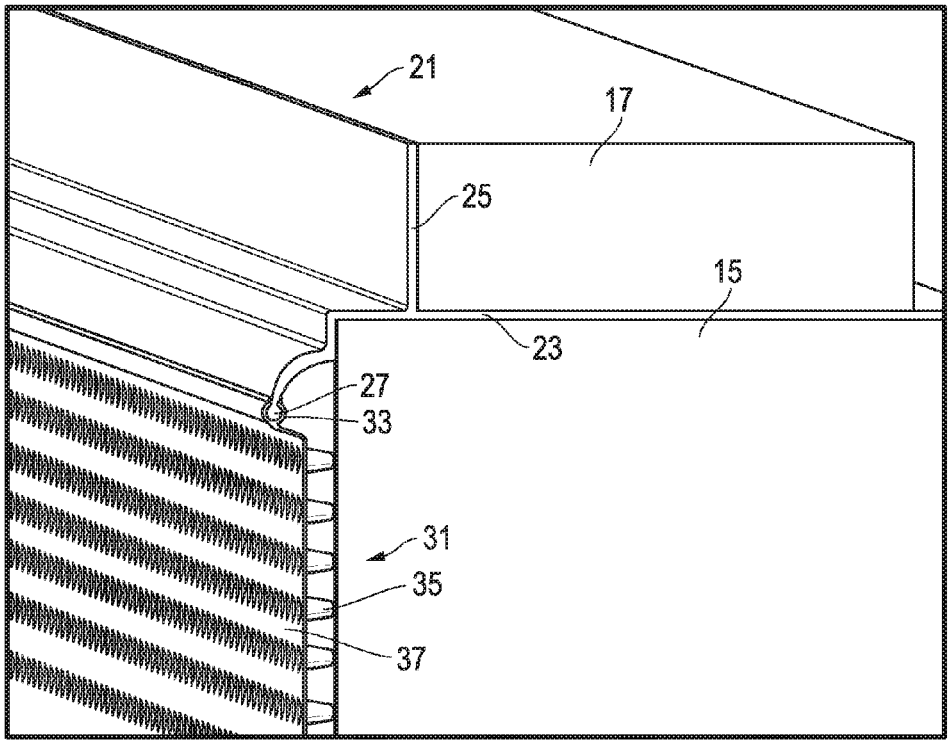


FIG. 2

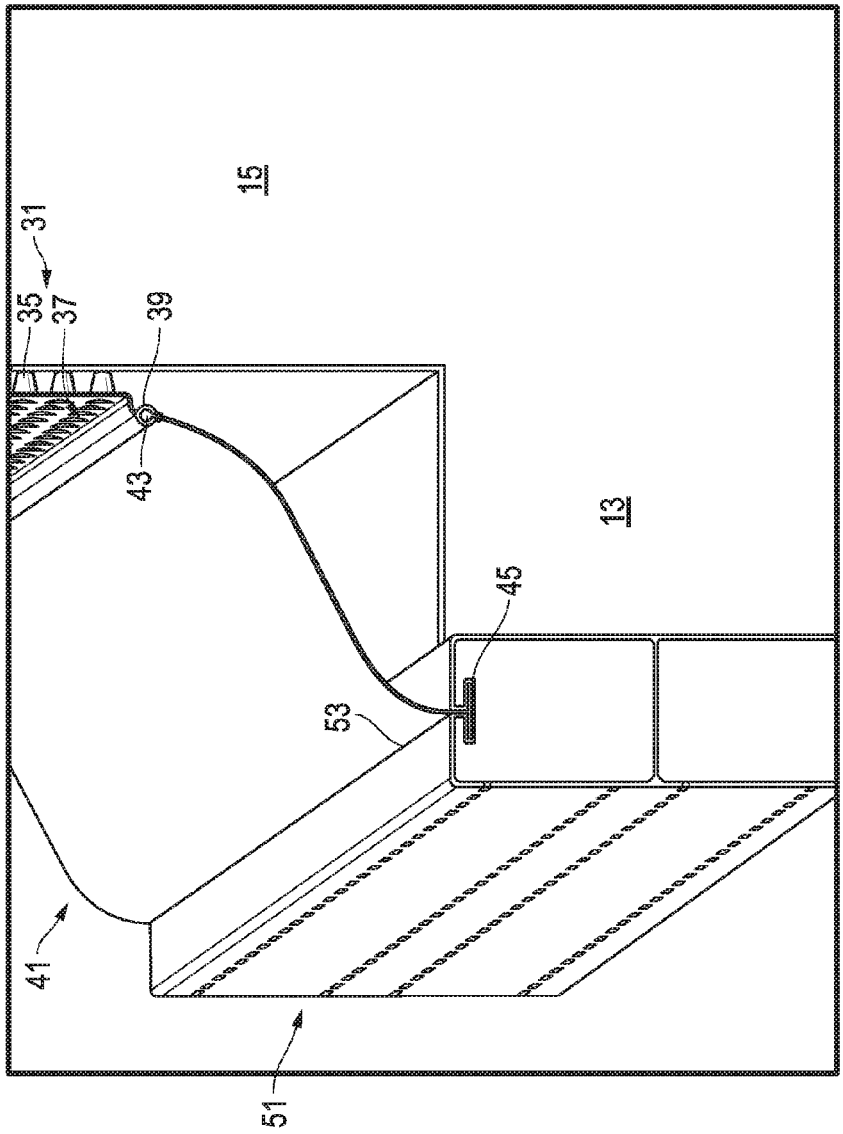


FIG. 3

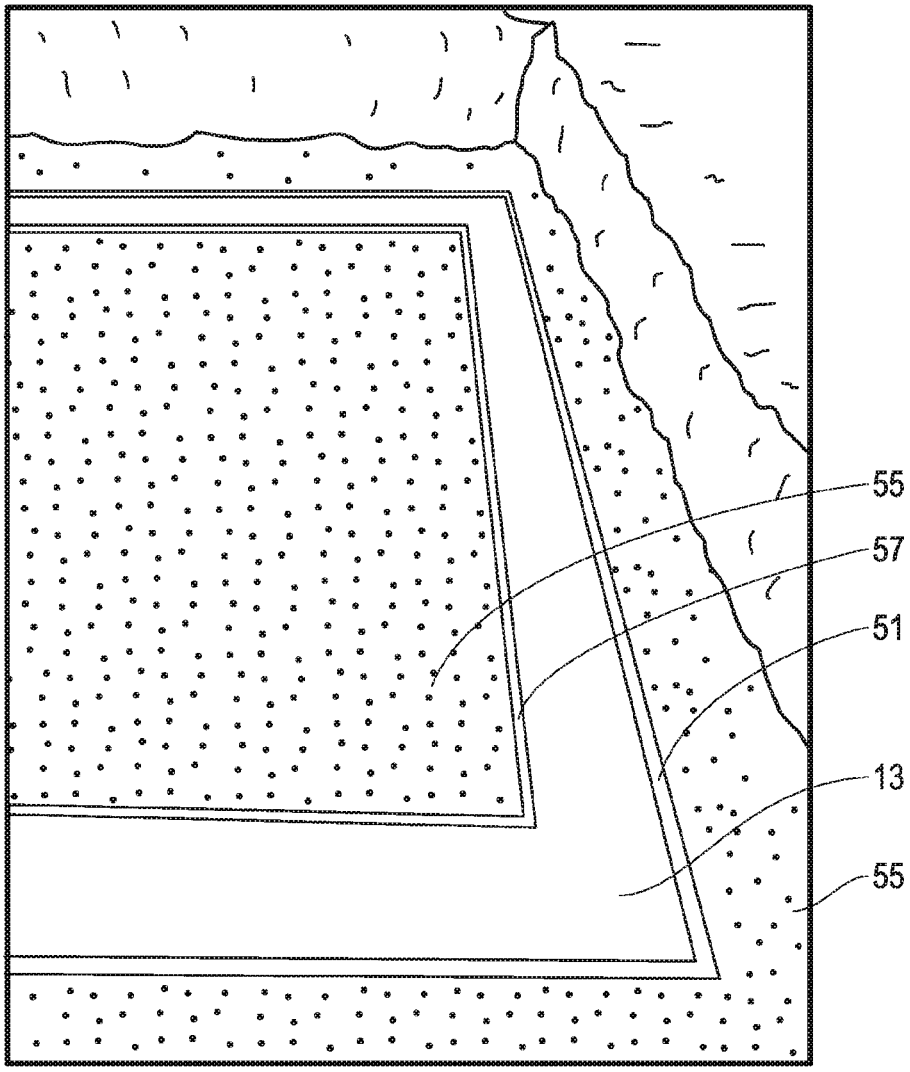


FIG. 4

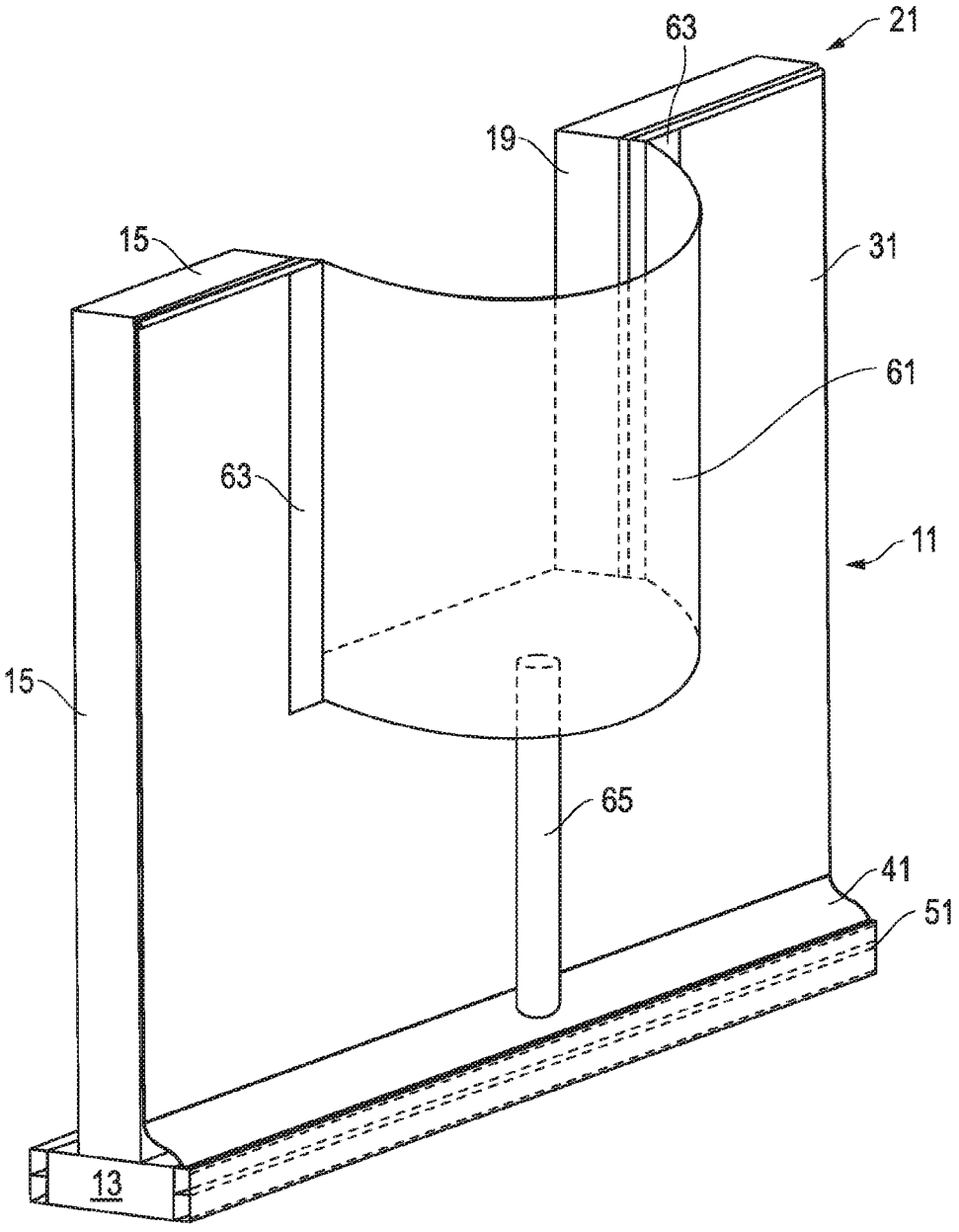


FIG. 5

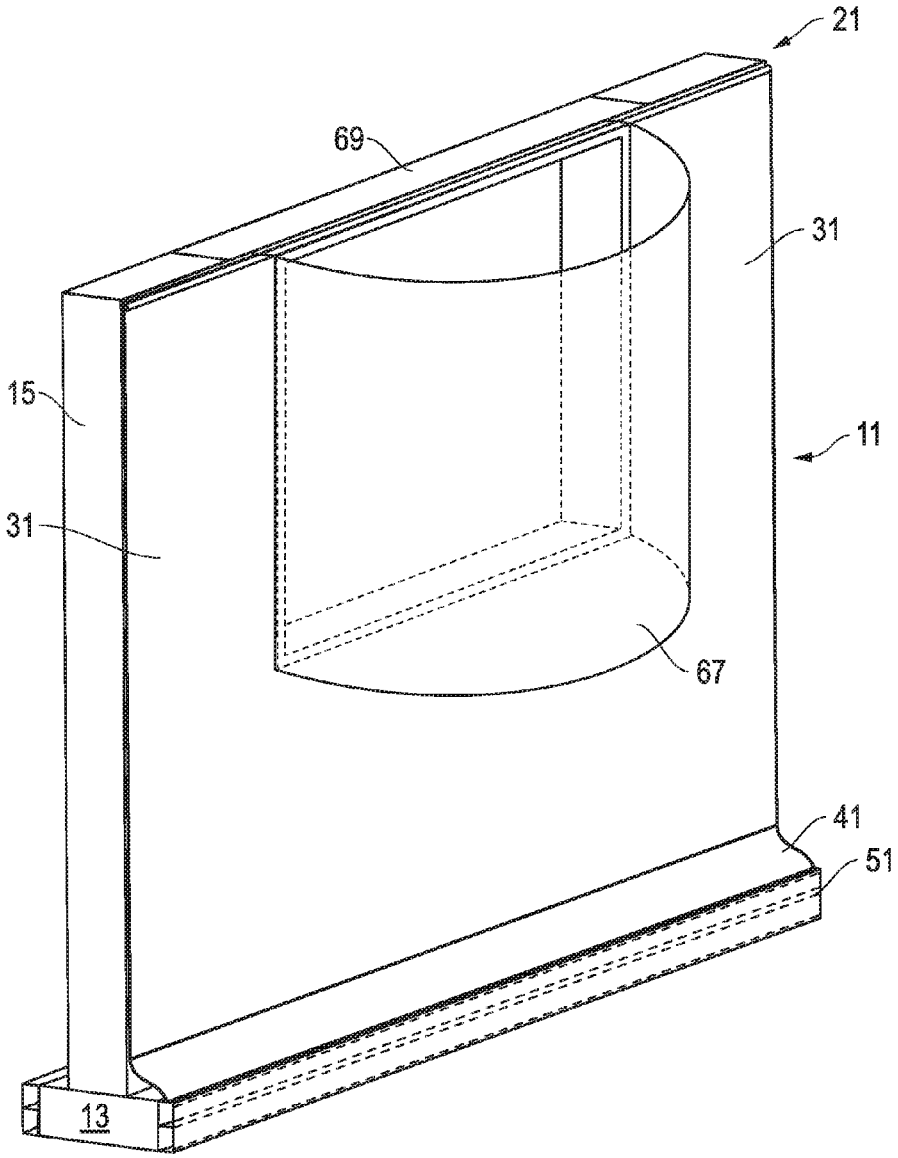


FIG. 6

SYSTEM, METHOD AND APPARATUS FOR INTEGRATED WATER MANAGEMENT OF A BASEMENT

[0001] This application claims priority to and the benefit of U.S. Provisional Application No. 62/326,199, filed on Apr. 22, 2016. The present invention relates in general to basements and, in particular, to a system, method and apparatus for integrated water management of a basement.

BACKGROUND OF THE INVENTION

Field of the Disclosure

[0002] The present invention relates in general to basements and, in particular, to a system, method and apparatus for integrated water management of a basement.

Description of the Prior Art

[0003] In conventional basement construction, a footer is initially formed from poured concrete between forms at the bottom perimeter of the basement. Walls of the basement are then formed from poured concrete, also between forms, on top of the at least partially-cured footer. A sill plate is then attached to the top of the wall, for attachment of the structure located above the basement. Since at least a portion of basements is located underground, water seepage into basements can be a problem. Numerous prior art devices and systems exist for mitigating water seepage into basements. However, improvements in water management of basements continue to be of interest.

SUMMARY

[0004] Embodiments of a system, method and apparatus for integrated water management of a basement are disclosed. The basement may include a footer, a wall extending upward from the footer, and a sill plate on top of the wall. In an example, the system may have a sill plate barrier with a base located between the sill plate and the wall. The system may include a vertical barrier coupled to the sill plate barrier and extending downward along an exterior of the wall toward the footer. In addition, the system may have a footer barrier coupled to the vertical barrier and extending over an exterior of the footer. The system may include a drain member adjacent the exterior of the footer and may be coupled to the footer barrier. In one version, the sill plate barrier, vertical barrier, footer barrier and drain member collectively form the integrated water management system for the basement to prevent water intrusion from the sill plate to the footer.

[0005] In another embodiment, a kit for integrated water management for a basement may include a sill plate barrier configured to extend between the sill plate and the wall. The kit may have a vertical barrier configured to be coupled to the sill plate barrier and configured to extend downward along the wall toward the footer. In addition, the kit may include a footer barrier configured to be coupled to the vertical barrier and configured to extend over the footer. Further, the kit may have a drain member configured to be placed adjacent the footer and configured to be coupled to the footer barrier. Collectively, the sill plate barrier, vertical barrier, footer barrier and drain member may be configured to form a kit for integrated water management for a basement to prevent water intrusion at the sill plate, wall and footer.

[0006] The foregoing and other objects and advantages of these embodiments will be apparent to those of ordinary skill in the art in view of the following detailed description, taken in conjunction with the appended claims and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] So that the manner in which the features and advantages of the embodiments are attained and can be understood in more detail, a more particular description may be had by reference to the embodiments thereof that are illustrated in the appended drawings. However, the drawings illustrate only some embodiments and therefore are not to be considered limiting in scope as there may be other equally effective embodiments.

[0008] FIG. **1** is a top, front, isometric view of an embodiment of a water management system for a basement.

[0009] FIG. **2** is an enlarged, top, front, isometric view of an upper portion of the embodiment of the water management system of FIG. **1**.

[0010] FIG. **3** is an enlarged, top, front, isometric view of a lower portion of the embodiment of the water management system of FIG. **1**.

[0011] FIG. **4** is a top, isometric view of a poured concrete footer formed with a portion of the water management system of FIG. **1**.

[0012] FIGS. **5** and **6** are top, front, isometric views of two different embodiments of a window well barrier for the water management system of FIG. **1**.

[0013] The use of the same reference symbols in different drawings indicates similar or identical items.

DETAILED DESCRIPTION

[0014] Embodiments of a system, method and apparatus for integrated water management of a basement are disclosed. For example, one version of a system **11** for integrated water management for an exterior of a basement is shown in FIG. **1**. The basement may include a footer **13**, a wall **15** extending upward from the footer, and a sill plate **17** on top of the wall **15**. In a structure, such as a dwelling, these components of the basement may extend to form one or more enclosed rooms beneath the ground floor of the structure.

[0015] Embodiments of the system **11** may include a sill plate barrier **21** having a base **23** (FIG. **2**) located between the sill plate **17** and the wall **15**. Examples of the sill plate barrier **21** may include a vertical member **25** extending upward from the base **23** on an exterior side of the sill plate **17**. In this way, the vertical member **25** may be configured to direct water away from the sill plate **17** (and away from the interior of the basement) to a vertical barrier **31** (FIG. **1**).

[0016] Versions of the vertical barrier **31** may be coupled to the sill plate barrier **21**. The vertical barrier **31** can extend downward along an exterior of the wall **15** toward the footer **13**. For example, the sill plate barrier **21** may include a rib **27** (FIG. **2**) extending horizontally across a lower width thereof. Versions of the vertical barrier **31** may comprise a complementary groove **33** extending horizontally across an upper width thereof. The rib **27** may be configured to seat in the groove **33** to couple the sill plate barrier **21** to the vertical barrier **31**.

[0017] Conversely, the sill plate barrier **21** may comprise a groove (not shown, but an inverted version of the embodi-

ment illustrated in FIG. **2**) extending horizontally across a lower width thereof. The vertical barrier **31** may include a rib (not shown, but similar to rib **27** in FIG. **2**) extending horizontally across an upper width thereof. Similarly, the rib may be configured to seat in the groove to couple the vertical barrier **31** to the sill plate barrier **21**.

[0018] In still another embodiment, the sill plate barrier **21** and the vertical barrier **31** each may include at least one of dimples and recesses (not shown). The dimples and recesses may be interlocked to secure the vertical barrier **31** to the sill plate barrier **21**. In addition, the vertical barrier **31** may include stand-offs **35** for maintaining a space between a sheet portion **37** of the vertical barrier **31** and the wall **15**. In yet another embodiment, the sill plate barrier **21** and the vertical barrier **31** may be integrally formed as a unitary structure.

[0019] Embodiments of the system **11** may further include a footer barrier **41** (FIG. **1**). The footer barrier **41** may be coupled to the vertical barrier **31** and extend over an exterior of the footer **13**. Like the complementary mating features of the sill plate barrier **21** and the vertical barrier **31** described above, the vertical barrier **31** and the footer barrier **41** may be compatibly secured to each other as well. For example, the vertical barrier **31** may include a groove **39** (FIG. **3**) extending horizontally across a lower width thereof. The footer barrier **41** may have a complementary rib **43** extending horizontally across an upper width thereof. The rib **43** may be configured to seat in the groove **39** to couple the vertical barrier **31** to the footer barrier **41**.

[0020] In an alternate version, the vertical barrier **31** may comprise a rib (not shown) extending horizontally across a lower width thereof. The footer barrier may have a groove (not shown) extending horizontally across an upper width thereof. The rib may be configured to seat in the groove to couple the vertical barrier **31** to the footer barrier **41**.

[0021] In still another embodiment, each of the vertical barrier **31** and the footer barrier **41** may include at least one of dimples and recesses (not shown). The dimples and recesses may interlock with each other to secure the vertical barrier **31** to the footer barrier **41**.

[0022] Again referring to FIGS. **1** and **3**, the system **11** may further comprise a drain member **51** adjacent the exterior of the footer **13**. The drain member **51** may be coupled to the footer barrier **41**. Alternatively, the vertical barrier **31** and the drain member **51** may be configured to be coupled directly to each other (not shown), such as by the devices described elsewhere herein.

[0023] Embodiments of the footer barrier **41** may include an anchor **45** (FIG. **3**) that extends horizontally across a lower width thereof. The drain member **51** may comprise a groove **53** extending horizontally across an upper portion thereof. The anchor **45** may be configured to seat in and be retained by the groove **53** to couple the footer barrier **41** to the drain member **51**.

[0024] Alternatively, the footer barrier **41** may comprise a groove (not shown) extending horizontally across a lower width thereof. The drain member **51** may include an anchor (not shown) extending horizontally across an upper portion thereof. The anchor may be configured to seat in and be retained by the groove to couple the footer barrier **41** to the drain member **51**. In yet another embodiment, the vertical barrier **31** and the drain member **51** may be integrally formed as a unitary structure.

[0025] Thus, collectively, the sill plate barrier **21**, vertical barrier **31**, footer barrier **41** and drain member **51** may form the integrated water management system **11** for the basement. In an example, the system can protect primarily the exterior of the basement to prevent water intrusion from above the sill plate **17**, along the wall **15** and at or below the footer **13**.

[0026] In some embodiments, the drain member **51** also may be configured to be a concrete form for poured concrete. For example, as shown in FIG. **4**, the drain member **51** may be provided with sufficient structural rigidity to maintain hydraulic loads of wet concrete (e.g., of footer **13**) without flexing when the drain member **51** is pinned to the ground at least about every 8 feet when backfilled with and supported by gravel **55**. Embodiments of the system **11** may further comprise an interior drain member **57** (e.g., substantially identical to drain member **51**) that is configured to be adjacent to an interior of the footer **13** on an opposite side of the footer **13** and the wall **15** (FIG. **1**). Together, the drain member **51** and the interior drain member **57** may comprise the concrete form for poured concrete for the footer **13**. The drain members **51**, **57** can remain permanently installed with the basement.

[0027] Referring now to FIG. **5**, the basement also may include a basement window **19** formed in the wall **15**. For such applications, the system **11** may further include a window well barrier **61**. In one version, the window well barrier **61** may be configured to be coupled to the wall **15** at the basement window **19**. In another version, the window well barrier **61** also may be configured to be coupled to other components of the system **11**, such as the vertical barrier **31**. The window well barrier **61** may include mounting members **63** configured to mount the window well barrier **61** to an exterior surface of the wall **15**, such as adjacent to but spaced apart from the basement window **19**. The window well barrier **61** may further comprise a window well conduit **65** configured to drain fluid from the window well barrier **61** to the drain member **51**. The window well conduit **65** may include a tube extending from a lower end of the window well barrier **61** down to the drain member **51**. Collectively, the sill plate barrier **21**, vertical barrier **31**, footer barrier **41**, drain member **51** and the window well barrier **61** may be configured to form the integrated water management system **11**.

[0028] Alternatively, an embodiment of the window well barrier **67** (FIG. **6**) may include a window frame **69**. For example, the window frame **69** may be configured to be a concrete form in the wall **15** when the wall **15** is formed from poured concrete.

[0029] Embodiments of a kit for integrated water management for a basement also are disclosed. As previously described, the basement may include the footer **13**, wall **15** extending upward from the footer **13**, and the sill plate **17** on top of the wall **15**. For example, the kit may include the sill plate barrier **21** configured to extend between the sill plate **17** and the wall **15**. The kit may include the vertical barrier **31** configured to be coupled to the sill plate barrier **21** and configured to extend downward along the wall **15** toward the footer **13**. In addition, the kit may include the footer barrier **41** configured to be coupled to the vertical barrier **31** and configured to extend over the footer **13**. Further, the kit may include the drain member **51** configured to be placed adjacent the footer **13** and configured to be coupled to the footer barrier **41**. Collectively, the sill plate barrier **21**, vertical

barrier **31**, footer barrier **41** and drain member **51** may be configured to form a kit for integrated water management for a basement to prevent water intrusion at the sill plate **17**, wall **15** and footer **13**. The kit may or may not include the window well barrier **61**, **67**.

[0030] Referring again to FIG. **1**, the system **11** may further include a drain pipe **71**. The drain pipe **71** may be located outside of the basement. In an example, the drain pipe **71** may be coupled to the system **11**, such as to the drain member **51**. The drain pipe **71** may extend away from the system **11** on grade (i.e., downslope from system **11**) to direct water in that direction. In addition, the drain pipe **71** may extend to a sewer **73** or open ground. In another embodiment, the basement may have a sump pump **75** in an interior thereof for removing water from the interior of the basement. The system **11** may further include a cross-over pipe **77**. The cross-over pipe **77** may be coupled to the sump pump **75**. The cross-over pipe **77** also may be coupled to the drain member **51**, and/or to the drain pipe **71** for directing water from the interior of the basement to an exterior of the basement.

[0031] This written description uses examples to disclose the embodiments, including the best mode, and also to enable those of ordinary skill in the art to make and use the invention. The patentable scope is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal languages of the claims.

[0032] Note that not all of the activities described above in the general description or the examples are required, that a portion of a specific activity may not be required, and that one or more further activities may be performed in addition to those described. Still further, the order in which activities are listed are not necessarily the order in which they are performed.

[0033] In the foregoing specification, the concepts have been described with reference to specific embodiments. However, one of ordinary skill in the art appreciates that various modifications and changes can be made without departing from the scope of the invention as set forth in the claims below. Accordingly, the specification and figures are to be regarded in an illustrative rather than a restrictive sense, and all such modifications are intended to be included within the scope of invention.

[0034] As used herein, the terms "comprises," "comprising," "includes," "including," "has," "having" or any other variation thereof, are intended to cover a non-exclusive inclusion. For example, a process, method, article, or apparatus that comprises a list of features is not necessarily limited only to those features but may include other features not expressly listed or inherent to such process, method, article, or apparatus. Further, unless expressly stated to the contrary, "or" refers to an inclusive-or and not to an exclusive-or. For example, a condition A or B is satisfied by any one of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

[0035] Also, the use of "a" or "an" are employed to describe elements and components described herein. This is done merely for convenience and to give a general sense of the scope of the invention. This description should be read to include one or at least one and the singular also includes the plural unless it is obvious that it is meant otherwise.

[0036] Benefits, other advantages, and solutions to problems have been described above with regard to specific embodiments. However, the benefits, advantages, solutions to problems, and any feature(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential feature of any or all the claims.

[0037] After reading the specification, skilled artisans will appreciate that certain features are, for clarity, described herein in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features that are, for brevity, described in the context of a single embodiment, may also be provided separately or in any subcombination. Further, references to values stated in ranges include each and every value within that range.

What is claimed is:

1. A system for integrated water management for an exterior of a basement, the basement having a footer, a wall extending upward from the footer, and a sill plate on top of the wall, the system comprising:

a sill plate barrier having a base located between the sill plate and the wall;

a vertical barrier coupled to the sill plate barrier and extending downward along an exterior of the wall toward the footer;

a footer barrier coupled to the vertical barrier and extending over an exterior of the footer;

a drain member adjacent the exterior of the footer and coupled to the footer barrier; and

collectively, the sill plate barrier, vertical barrier, footer barrier and drain member form an integrated water management system for the exterior of the basement to prevent water intrusion at the sill plate, wall and footer.

2. The system of claim **1**, wherein the sill plate barrier comprises a vertical member extending upward from the base on an exterior of the sill plate, such that the vertical member is configured to direct water away from the sill plate to the vertical barrier.

3. The system of claim **1**, wherein the sill plate barrier comprises a rib extending horizontally across a lower width thereof, the vertical barrier comprises a groove extending horizontally across an upper width thereof, and the rib seats in the groove to couple the sill plate barrier to the vertical barrier.

4. The system of claim **1**, wherein the sill plate barrier comprises a groove extending horizontally across a lower width thereof, the vertical barrier comprises a rib extending horizontally across an upper width thereof, and the rib seats in the groove to couple the vertical barrier to the sill plate barrier.

5. The system of claim **1**, wherein the sill plate barrier and the vertical barrier each comprise at least one of dimples and recesses, and the dimples and recesses are interlocking to secure the vertical barrier to the sill plate barrier.

6. The system of claim **1**, wherein the vertical barrier and the footer barrier each comprise at least one of dimples and recesses, and the dimples and recesses are interlocking to secure the vertical barrier to the footer barrier.

7. The system of claim **1**, wherein the vertical barrier and the drain member also are configured to be coupled directly to each other.

8. The system of claim **1**, wherein the vertical barrier comprises a rib extending horizontally across a lower width thereof, the footer barrier comprises a groove extending horizontally across an upper width thereof, and the rib seats in the groove to couple the vertical barrier to the footer barrier.

9. The system of claim **1**, wherein the vertical barrier comprises a groove extending horizontally across a lower width thereof, the footer barrier comprises a rib extending horizontally across an upper width thereof, and the rib seats in the groove to couple the vertical barrier to the footer barrier.

10. The system of claim **1**, wherein the footer barrier comprises an anchor extending horizontally across a lower width thereof, the drain member comprises a groove extending horizontally across an upper portion thereof, and the anchor seats in and is retained by the groove to couple the footer barrier to the drain member.

11. The system of claim **1**, wherein the footer barrier comprises a groove extending horizontally across a lower width thereof, the drain member comprises an anchor extending horizontally across an upper portion thereof, and the anchor seats in and is retained by the groove to couple the footer barrier to the drain member.

12. The system of claim **1**, wherein the drain member also is a concrete form for poured concrete, the drain member having sufficient structural rigidity to maintain hydraulic loads of wet concrete without flexing when the drain member is pinned to the ground at least about every 8 feet when backfilled with and supported by gravel.

13. The system of claim **12**, further comprising an interior drain member configured to be adjacent an interior of the footer on an opposite side of the footer and the wall, and together the drain member and the interior drain member comprise the concrete form for poured concrete for the footer.

14. The system of claim **1**, wherein the basement also has a basement window formed in the wall, and the system further comprises:

a window well barrier configured to be coupled to the wall at the basement window and configured to be coupled to the vertical barrier; and

collectively, the sill plate barrier, vertical barrier, footer barrier, drain member and the window well barrier are configured to form the integrated water management system.

15. The system of claim **14**, wherein the window well barrier comprises mounting members configured to mount the window well barrier to an exterior surface of the wall adjacent to but spaced apart from the basement window.

16. The system of claim **14**, wherein the window well barrier comprises a window frame configured to be a concrete form in the wall when the wall is formed from poured concrete.

17. The system of claim **14**, wherein the window well barrier further comprises a window well conduit configured to drain fluid to the drain member.

18. The system of claim **17**, wherein the window well conduit comprises a tube extending from a lower end of the window well barrier to the drain member.

19. The system of claim **1**, wherein the vertical barrier comprises stand-offs for maintaining a space between a sheet portion of the vertical barrier and the wall.

20. The system of claim **1**, further comprising a drain pipe outside the basement, wherein the drain pipe is coupled to the drain member and extends away from the system on grade.

21. The system of claim **20**, wherein the basement has a sump pump for removing water from an interior of the basement, and the system further comprises:

a cross-over pipe coupled to the sump pump and to the drain pipe for directing water from the interior of the basement to an exterior of the basement.

22. A kit for integrated water management for a basement, the basement having a footer, a wall extending upward from the footer, and a sill plate on top of the wall, the kit comprising:

a sill plate barrier configured to extend between the sill plate and the wall;

a vertical barrier configured to be coupled to the sill plate barrier and configured to extend downward along the wall toward the footer;

a footer barrier configured to be coupled to the vertical barrier and configured to extend over the footer;

a drain member configured to be placed adjacent the footer and configured to be coupled to the footer barrier; and

collectively, the sill plate barrier, vertical barrier, footer barrier and drain member are configured to form a kit for integrated water management for a basement to prevent water intrusion at the sill plate, wall and footer.

* * * * *