BASEMENT WALL RECOVERY SYSTEM METHOD AND APPARATUS

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Abstract

The basement wall recovery system method and apparatus of this invention includes push plate(s), pulling post(s), pulling rod(s), backing plate(s) and a method to apply a pulling force on the pulling rods. The earth is excavated from the wall to be repaired. Based upon the length of the wall, a number of pulling posts are vertically positioned at spaced intervals along the wall. The lower end of the pulling posts generally rest upon the footing of the building. The top of each of the pulling posts rest up against an outer surface of one or two push plates. The push plates are horizontally positioned against the buildings outside wall near the bottom of the wall where it contacts the top of the basement wall to be repaired and generally aligned with the buildings floor joists. The pulling rods are inserted through openings in the pulling posts and through holes bored in the basement wall. A backing plate is attached to the inside end of the pulling post and against the inside of the basement wall to be repaired. The pulling devices are installed on the outer end of the pulling rods extending through the pulling posts. The pulling devices are operated in a predetermined pattern thereby pulling the wall outward and returning the wall to its original plume position.
FIG 4
BASEMENT WALL RECOVERY SYSTEM

METHOD AND APPARATUS

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a basement wall recovery system and more particularly to an apparatus and method to repair basement walls that are damaged and bowed inward.

[0002] Basement walls are subjected to lateral forces. The lateral forces are generally due to the compression of the earth around the basement walls and water pressure. The lateral forces may cause the basement wall or walls to bow or cave inwards. As the wall bows, in most instances, the wall cracks and bows more until the lateral forces are equalized. In the worst case the, lateral forces completely cave in the wall. When cracked and bowed, the wall leaks which further aggravates the situation.

[0003] There has been no good or fast way to fix the bowed, concaved, and cracked walls. The most common method used has been to excavate the wall, jack up the house or building, and completely repaired the damaged wall. This is an expensive and time consuming method.

[0004] There are systems that jack up and re-supports sunken footings and basement walls. These types of systems do not correct bowed and/or damaged walls.

[0005] There has not been a simple and fast method to correct and repair damaged and bowed walls. This invention provides a simple and very effective process, apparatus, and method of returning a bowed wall back to a plume position, and for repairing damaged basement walls.

[0006] Accordingly, it is an object of the present invention to provide a basement wall recovery system that can be used to return a bowed or concaved basement wall back to a plume position. With the basement wall recovery system of this invention it has been found that damaged basement walls can be quickly and easily returned to a plume position and repaired to properly support the building resting upon the wall.

[0007] Another object of the present invention is to provide a basement wall recovery system that is constructed to provide an apparatus that can be used repeatedly and be easily moved from site to site.

[0008] A further object of the present invention is to provide a basement wall recovery system that provides an overall method to repair basement walls and return bowed basement walls to a true plume position.

[0009] To accomplish the foregoing and other objects of this invention there is provided a basement wall recovery system and more particularly to a basement wall recovery system used to straightening basement walls that are damaged, cracked, concaved, and/or bowed inward. The basement wall system uses a post-pull system that returns the damaged wall to its original plume position.

SUMMARY OF THE INVENTION

[0010] The basement wall recovery system of this invention includes push plate(s), pulling post(s), pulling rod(s), backing plate(s) and pulling means. The specific number of each is determined by the size or length of the wall being repaired. The earth is excavated away from the wall to be repaired. Based upon the length of the wall, a number of pulling posts are vertically positioned at spaced intervals along the wall. The lower end of the pulling posts generally rest upon the footing or near the footing. One or a multiple number of holes are bored through the wall where the posts are located. The top of each of the pulling posts rest up against an outer surface of one or two push plates. The push plates, one or two for each pulling post, are horizontally positioned against the building’s outside wall near the bottom of the wall where it contacts the top of the basement wall to be repaired and generally aligned with the buildings floor joists. The pulling rods are inserted through openings in the pulling posts and trough the holes bored through the basement wall. A backing plate is attached to the inside end of the pulling post and against the inside of the basement wall to be repaired. The pulling means are installed on the outer end of the pulling rods extending through the pulling posts. The pulling means are operated in a predetermined pattern thereby pulling the wall outward returning the wall to its original plume position.

[0011] The above mentioned and other objects, and features of the present invention will be better understood and appreciated from the following detailed description of the main embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 shows a side view of a typical push plate for the basement wall recovery system.

[0013] FIG. 2 shows a side view of a typical set up of the basement wall recovery system.

[0014] FIG. 3 shows a front view of a typical set up of the basement wall recovery system using multiple pulling posts and two push plates for each pulling post, and also showing multiple compression/tension plates installed along a crack in the basement wall.

[0015] FIG. 4 shows a typical compression/tension plate used to reinforce a cracked wall.

DETAILED DESCRIPTION

[0016] Referring now to the drawings there is shown one preferred embodiment for the basement wall recovery system. The embodiment shown and illustrated is a simple method and the preferred embodiment. It is not meant to be an all inclusive description. Equivalent structure could be substituted and is intended to be included within the scope of this invention.

[0017] The basement wall recovery system utilizes, as many as needed based upon the length of the wall to be repaired, push plate(s), pulling post(s), pulling rod(s), backing plate(s) and one or more pulling means. The various components will be described first and then the method of use will be described.

[0018] Referring to FIG. 1. Each push plate is made from a sturdy material, such as wood, steel, or a composite material. The exact material is not detrimental to the scope of the invention. It can be made from any material that is sturdy and can distribute forces over a surface area. The base
plate 14 is the principle portion of the push plate 12 and, in the preferred embodiment, is made from wood. Generally, in the preferred embodiment, the base plate 14 is a 2×6 35 inches in length. The size can be greater or lesser depending on the spacing and the area needed for distribution of the pushing force.

[0019] A positioner 16 is generally positioned at a center location on base plate 14. The positioner 16 provides a space that holds the top end of the pulling post 22 at the center location on the push plate 12. The positioner 16 can be complicated or as simple as blocks attached to the surface of the base plate 14 with a space between the blocks for positioning the pulling post 22. In the preferred embodiment as illustrated, the positioner 16 is defined by braces 18 and 20. The braces 20 are attached to the base plate 14 in a spaced relation at a center location to allow the pulling post 22 to fit between the braces 20. Braces 18 extend from the top of the brace 20 to respective outer ends of the base plate 14. This configuration helps spread forces evenly over the entire surface area of the base plate 14. Without bracing, as illustrated with the preferred embodiment or with some similar or equivalent bracing, the base plate 14 could bend or bow as a pulling force is applied resulting in an uneven distribution of forces.

[0020] The push plate 12 could also have a securing means for securing the pulling post 22 within the positioner 16. In the preferred embodiment as illustrated, the securing means 24 is a simple bracket plate with a center threaded bore extending across and attached to outer ends of braces 20. A threaded bolt having a 'T' handle is then screwed down onto and securing the top of the pulling post 22 within the positioner 16. The securing means 24 can be any configuration and means to hold and secure the pulling post 22 within in the positioner 16. The securing means 24 holds the push plate 12 in position to make it easier to set up and operate the basement wall recovery system 10. Without the securing means 24 the push plate 12 and the pulling post 22 have a tendency to move around and makes the job more difficult.

[0021] During use, the push plate 12 is positioned against the outside wall 3 on a building that the basement wall 1 is being repaired. Referring to FIGS. 2 and 3. The push plate 12 is positioned along a bottom edge of the outside wall 3 just above the basement wall 1 to be recovered, and generally aligned with the floor joists 4 of the building. The purpose of the push plate 12 is to distribute the pulling force over an area on the outside wall covered by the push plate. In this regard any device that functions to distribute the forces over an area on the building wall is within the scope of this invention.

[0022] Each pulling post(s) 22 is a sturdy post, generally rectangular in cross section with one or more bores laterally through the pulling post. In the preferred embodiment the pulling post 22 has a rectangular cross section, but it can have other shapes as long as the function herein described is fulfilled. The pulling post 22 has a height to allow the pulling post to extend upwards from a footing on the building to a position at least slightly above the push plate(s) positioned on the wall 3 of the building. In the preferred embodiment each pulling post 22 is made from a nine foot section of ¾ inch thick 3 inch by 6 inch rectangular steel tubing. The pulling post can be made with other materials and other dimensions that will also function as described. The preferred embodiment has been selected based upon a universal use. It can be used on most basement walls, is fairly portable, and very rugged so it can be reused.

[0023] In use the pulling post(s) 22 are positioned vertically with a bottom end against the footing 2 and an upper end resting against the push plate(s) 12. The pulling posts 22 are positioned at spaced intervals along the length of the basement wall being recovered. The space between the pulling posts 22 is generally the same distance, or greater, as the length of the push plate 12. The number of pulling posts 22 needed is determined by the length of the basement wall being recovered.

[0024] A spacer 26 is generally used as needed between the lower end of the pulling post 22 and the bottom of the wall 1 being repaired. The spacer 26 allows a tolerance when pulling the wall back to a plume position. Without the spacer 26 the wall could contact the pulling post and stop the wall from being pulled back to a true plume position. The spacer also permits the pulling posts 22 to be positioned vertically level. The top of the pulling post 22 is resting against the push plate resulting in the top being positioned away from the wall. The use of the spacer makes up for the thickness of the push plate 12. So without the spacer 26, the pulling post might have a tendency to lean outwards at the top.

[0025] A lifting eye 28 can also be attached to the top of each pulling post 22. In the preferred embodiment, the lifting eye 28 is simply a steel plate with a hole welded to the top of the pulling post 22. The lifting eye 28 provides a means of lifting, lowering, and positioning the pulling posts 22 along the basement wall 1.

[0026] Each pulling rod 30 is a rod having a length to permit the rod to extend through a bore in the pulling post and through a hole drilled through the basement wall with a short length extending outward from both the inside of the basement wall and the outer surface of the pulling post 22. The pulling rod 30 can have many different configurations and dimensions. In the preferred embodiment, the pulling rod(s) 30 is a ¾ inch diameter threaded rod having a length determined by the thickness of the basement wall 1, the thickness of the pulling post 22, the width of the spacer 28 and push plate 12, the type of pulling means used, and thickness of the backing plate 32.

[0027] A backing plate 32 is used to prevent a pulling rod 30 from being pulled outward from the basement wall as a pulling force is applied. Each pulling rod 30 will have a backing plate 32. Each backing plate 32 is positioned on an inside surface of the basement wall 1 to be recovered, and is attached to and secured to the end of the pulling rod 22. The backing plate(s) 32 spread the pulling force over a greater area for force distribution, and prevents the pulling rods 30 from damaging the basement wall if the pulling rod 30 is pulled through.

[0028] In the preferred embodiment the backing plate is made from a 34 inch section of ¾ inch thick 3 inch by 6 inch rectangular steel tubing. The backing plate could also be a square or rectangular plate steel, or any other size and dimension. The principle purpose is to spread the forces and prevent damage. It is used to prevent the pulling rod 30 from being pulled through the basement wall and causing further damage. In this regard any structure filling this function would be within the scope of this invention. The preferred
embodiment is preferred because the length of the backing plate 32 can be positioned along different directions to position and apply the pulling force as needed based upon the damage to the wall. The backing plate 32 is easily attached to the preferred embodiment of the pulling rods 30 by the use of nuts 34. The backing plate 32 with a center positioned bore is simply placed over the end of the threaded rod and secured in position using a nut 34.

[0029] A pulling means 36 is positioned and attached to the outer end of the pulling rod 30 and against the outer surface of the pulling post 22. The pulling means 36 applies the pulling force to the pulling rod(s) and distributes the pulling force along the pulling post 22 to the push plate 12 above and to the footing 2 below. As the pulling force is applied the bowed and damage wall is pulled outwards. The pulling force will be applied to the various pulling rods 30 in a predetermined pattern to return the basement wall to a plume position.

[0030] In the preferred embodiment, the pulling means 36 is a nut screwed unto the end of threaded rod use as the preferred pulling rod 30. The nuts or pulling means 36 are tightened, in a pattern, using an impact wrench, breaker bar, or wrench until the basement wall 1 is returned to a plume position.

[0031] In other embodiments, the pulling rods 30 can be an eye bolt with the eye on the outer surface of the pulling posts 22 and the threaded end extending through the basement wall 1 for attaching the backing plate 32 with a nut. A jack or other pulling apparatus can then be used as the pulling means 36. The point being that there could be a number of different configurations, to numerous to explain in detail or to illustrate. Any configuration of pulling rods 30 and pulling means 36 that provides the equivalent function described above is considered within the scope of the invention.

SET UP AND OPERATION

[0032] First, the earth is excavated along the wall to be repaired. The excavated trench needs to be a minimum of 24 inches at the bottom and slopped back to meet trenching standards. Based upon the length of the wall, a number of pulling posts 22 are vertically positioned at spaced intervals along the wall. The lower end of the pulling posts 22 generally rest upon the footing 2 or near the footing. One or a multiple number of holes are bored through the basement wall 1 where the pulling posts are located. The holes are bored from the inside to prevent the concrete from chipping out on the inside when the bit comes through. The top holes are generally bored approximately 6 inches down from the top of the basement wall 1. Push plates 12, one or two for each pulling post, are horizontally positioned against the buildings outside wall 3 near the bottom of the wall where it contacts the top of the basement wall 1 to be repaired. The push plates 12 are generally aligned with the buildings floor joists 4. The top of each of the pulling posts 12 rest up against the outer surface of the push plates 12 within the positioner 16. The pulling rods 30 are inserted through bores in the pulling posts 12 and through the holes bored in the basement wall 1. The backing plates 32 are positioned on the inside end of the pulling posts 30 on the inside of the basement wall 1 and nuts are installed to hold the backing plates 32 in position against the inside surface of the basement wall. Nuts, or pulling means 36, are installed on the outer end of the pulling rods 30 extending through the pulling posts 12. The nuts 36 are then tightened, or the pulling means 36 are operated, in a pattern pulling the wall outward returning the wall to its original plume position.

[0033] A walk board 38 can be attached to the pulling posts 22 to make it easier to operate the pulling means 36. The walk boards 38 are attached to the pulling posts using a bracket or other attaching means.

[0034] Once the basement wall 1 is returned to a plume position, compression/tension plates 40 can be installed over cracks to reinforce the basement wall 1. These are installed to reduce future wall movement or failure. In the preferred embodiment as illustrated, the compression/tension plates are a 12 inch by 6 inch by ½ inch steel. Other dimensions could be used as determined by the need. The compression/tension plates 40 are attached with bolts extending through the basement wall 1. Hydraulic cement or an epoxy is used to fill all cracks and allowed to dry. The basement wall recovery system 10 is then removed. A drain is installed in the bottom of the trench and the trenched is back filled with clean aggregate to facilitate drainage and to remove the lateral force from the earth and water pressure on the wall.

[0035] The preferred embodiment and the best mode contemplated of the basement wall recovery system of the present invention are herein described. However, it should be understood that the best mode for carrying out the invention hereinafter described is offered by way of illustration and not by the way of limitation. It is intended that the scope of the invention include all modifications which incorporate its principal design features.

[0036] Having described the invention in detail, those skilled in the art will appreciate that modifications may be made of the invention without departing from the spirit of the inventive concept herein described.

[0037] Therefore, it is not intended that the scope of the invention be limited to the specific and preferred embodiments illustrated and described. Rather, it is intended that the scope of the invention be determined by the appended claims and their equivalents.

What is claimed is:

1. A basement wall recovery system comprising:
   one or more push plate(s), each push plate being a sturdy plate, generally rectangular in shape, positionable along a bottom edge and against an outside wall on a building just above the basement wall to be recovered;
   one or more pulling post(s), each of the pulling post(s) being a sturdy post, with one or more bore(s) through the pulling post, and having a height to allow the pulling post to extend upward from a footing on the building to a position to at least the position of the push plate(s), the pulling post(s) being positioned vertically with a bottom end against the footing and an upper end resting against the push plate(s), the pulling posts, if more than one is being used, being positioned at spaced intervals along the length of the basement wall being recovered, the number being determined by the length of the basement wall being recovered;
one or more pulling rod(s), each of the pulling rods having a length to enable each pulling rod to extend through a hole bored through the basement wall to be recovered and extending through one of the bores in the pulling posts, one or more pulling rods being used as determined by the length and size of the wall to be repaired;

one or more backing plate(s), each of the backing plates being positioned on an inside surface of the basement wall to be recovered, and each backing plate(s) being secured to the inside end of a pulling rod(s), the backing plate(s) spread or distributing a pulling force over an area, and preventing the pulling rod from being pulled through the basement wall; and

one or more pulling means, the pulling means attachable to the outer end of the pulling rod(s) extending outward from the pulling post(s), the pulling means applying a pulling force to the pulling rod(s) and distributing the pulling force along the pulling post to the push plate above and to the footing below, thereby pulling the bowed and damaged wall outward as the pulling force is applied to return the basement wall to a plumb position.

2. The basement wall recovery system as set forth in claim 1 in which the push plate further comprises a positioner, said positioner being at a center location on an outer surface of the push plate for receiving and holding a top end of the pulling posts.

3. The basement wall recovery system as set forth in claim 2 in which the positioner comprises braces, the braces being attached to an outer surface of the push plate in a spaced relationship for positioning the pulling posts between the braces, and the braces extending to outer ends of the push plate, the braces preventing the push plates from bowing when a pulling force is applied.

4. The basement wall recovery system as set forth in claim 1 in which the pulling rods comprise a threaded rod.

5. The basement wall recovery system as set forth in claim 4 in which the pulling means comprise nuts screwed onto the outer end of the pulling rods and tightened against the pulling posts to apply a pulling force.

6. The basement wall recovery system as set forth in claim 4 in which the back ing plate has a center bore, the backing plate being positioned over the inner end of the pulling rod and secured in position using a nut.

7. A basement wall recovery system comprising:

one or more push plate(s) positioned against a building on which a basement wall is to be repaired,

one or more pulling post(s) positioned vertically outside the basement wall to be repaired with a top end resting against a push pate and a bottom end positioned against a lower base or footing of the basement wall,

one or more pulling rod(s) extending through openings in the pulling post and through the basement wall being repaired,

one or more backing plate(s) positioned on an inside end of each pulling rod, and

one or more pulling means attached to an outside end of the pulling rod(s), said pulling means exerting a force against the pulling post and onto the pulling rod, to apply pressure to the backing plate(s) to pull the backing plate against an inside surface of a bowed basement wall to pull the bowed basement wall outward towards the pulling post and into a plumb position.

8. A method of repairing a bowed or concaved basement wall the steps comprising:

excavating the earth, as needed, along the basement wall to be repaired,

positioning one or more push plate(s) along a bottom edge of a building positioned on and above the basement wall to be repaired,

positioning one or more pulling post(s) vertically along the basement wall bing repaired with an upper end of each pulling post resting against one or two push plate(s) and a lower end positioned against a lower base area of the basement wall or a footing under the wall,

extending pull rods through bores in the pulling post and through holes bored in the basement wall with an outer end extending outwards from the pulling post and an inner end extending through the inside surface of the basement wall,

installing and securing backing plate(s) on the inner end of each pulling rod with the outer surface of the backing plate resting against the inside surface of the basement wall,

attaching a pulling means to the outer ends of each pulling rod with the pulling means positioned against the pulling posts, and

operating each pulling means to apply a pulling force on each of the pulling rods in a predetermined pattern, the pulling force applied pulling the basement wall outwards towards the pulling post until the basement wall is in a plumb position, the pulling force being distributed along the pulling posts to the push plates and to the footing or base.

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