CONCRETE FORMING SYSTEM

Inventor: Russell A. Durocher, Linden, MI (US)

Correspondence Address:
GIFORD, KRASS, GROH, SPRINKLE
ANDERSON & CITKOWSKI, PC
280 N OLD WOODARD AVE
SUITE 400
BIRMINGHAM, MI 48009 (US)

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ABSTRACT

A concrete forming system for forming first and second concrete walls which intersect each other perpendicularly. Each concrete wall is formed by spaced apart inner and outer panels which are held together by ties. An elongated outer corner form joins the outer panels at the corner while, similarly, an elongated inner corner form joins the inner panels at their corner intersection. The inner corner form is substantially rectangular in shape. A plurality of vertically spaced elongated corner ties secure the inner and outer corner forms together. These corner ties, furthermore, are dimensioned so that a portion of each corner tie protrudes inwardly from the inner corner form. Each corner tie includes a notch spaced outwardly from its innermost end which forms a fracture line across the corner tie. Thus, after the concrete walls are formed, the corner ties are broken along their fracture line by striking their inwardly protruding end with a hammer.
CONCRETE FORMING SYSTEM

BACKGROUND OF THE INVENTION

I. Field of the Invention

The present invention relates to a concrete forming system for forming walls having a corner.

II. Description of Related Art

With reference to FIG. 1, a prior art concrete forming system 10 is illustrated for forming two concrete walls which intersect each other at an inside corner 12. The concrete forming system includes a first outer panel 14 and a first inner panel 16. These panels 14 and 16 are secured together in a spaced apart and parallel relationship by elongated panel ties 18 extending between the outer panel 14 and inner panel 16 (thus forming a concrete receiving cavity 28 therebetween. Furthermore, as best shown in FIG. 1, a portion 20 of each panel tie 18 protrudes inwardly from its associated inner panel 16.

Similarly, a second outer panel 22 and second inner panel 24 are secured together by panel ties 18 so that the panels 22 and 24 are substantially perpendicular to the panels 14 and 16 and intersect each other at the corner 12.

As best shown in FIGS. 1 and 3, an outer elongated corner form 32 is positioned at the corner 12 of two perpendicular walls 34 and 36. The walls 34 and 36 of the outer corner form 32 are generally coplanar with the outer panels 14 and 22, respectively.

Referring now to FIGS. 1-3, an elongated inner corner form 40 is positioned at the corner intersection of the inner panels 16 and 24. The inside corner form 40 is generally rectangular in shape thus having two perpendicularly intersecting walls 42 and 44 which are generally coplanar with the inner panels 16 and 24. The third wall 46 and fourth wall 48 of the corner form 40 flatly abut against the vertical edges of the inner panels 14 and 24, respectively.

As best shown in FIGS. 2 and 3, it has been the previous practice to secure the inner and outer corner forms 40 and 32 using corner ties 19 having a notch which defines a fracture line. Furthermore, these previously known corner ties 19 have been dimensioned such that their free end 21 (FIG. 2) terminates short of the free edge of the corner form 40. Consequently, the entire outwardly protruding portion 23 of the panel tie 19 flatly abuts against the inner corner form 40.

With the previously known concrete framing systems 10, after the panels 14 and 16, 22 and 24, as well as the corner forms 32 and 40 are secured together by the panel ties 18, concrete is poured into the cavities 28 and 30. Once the concrete has set, the walls are completed and the concrete forming system 10 can be removed for reuse.

In removing the panels 16 and 24, the outwardly protruding portions 20 of the panel ties are broken off from the remainder of the panel ties, now embedded within the concrete walls, by simply striking the outwardly protruding portions 20 with a hammer. The hammer thus breaks the outwardly protruding portion 20 away from the remainder of the panel tie 18 along the fracture line formed between the two notches.

While the previously known method for removing the outwardly protruding portion 20 of the panel tie 18 from the inner and outer panels has proven effective in operation, the use of the previously known corner ties 19 to secure the corner forms 40 and 32 together have not. Specifically, as best shown in FIG. 2, since the outwardly protruding portion 23 of the corner tie 19 lies flush against the corner form 40, it has been previously necessary to first pry the outwardly protruding portion 20 of the panel tie away from the form 40 with a screwdriver or pry bar. Thereafter, the outwardly protruding portion 23 can be struck by a hammer and broken away from the remainder of the corner tie 19. However, the necessity of manually prying the outwardly protruding portions 20 of the panel ties 18 away from the inner corner form 40 is time consuming thus increasing the labor costs.

SUMMARY OF THE PRESENT INVENTION

The present invention provides a concrete forming system which overcomes all of the above-mentioned disadvantages of the previously known systems.

In brief, like the previously known concrete forming systems, the concrete forming system of the present invention includes inner and outer panels which intersect at each other at a corner. These inner and outer panels are each secured together in a spaced apart and parallel relationship thus forming a concrete receiving cavity therebetween. Conventional panel ties are utilized to secure the inner and outer panels together.

Similarly, like the previously known concrete forming systems, the concrete forming system of the present invention also utilizes an outer corner form and an inner corner form at a corner of the wall.

Unlike the previously known concrete forming systems, however, in the system of the present invention unique corner ties are utilized to secure the inner and outer corner forms together. The corner ties each are formed from an elongated flat bar like the panel ties. However, unlike the panel ties, the corner ties are longer than the panel ties by a predetermined amount.

Consequently, upon securing the corner forms together utilizing the corner ties, the innermost end of each corner tie protrudes inwardly from the inner corner form. As such, the innermost end of the corner tie is readily accessible and can be easily struck and broken off without the necessity of prying the end of the corner tie away from the inner corner form as has been the previous practice.

BRIEF DESCRIPTION OF THE DRAWING

A better understanding of the present invention will be had upon reference to the following detailed description, when read in conjunction with the accompanying drawing, wherein like reference characters refer to like parts throughout the several views, and in which:

FIG. 1 is an elevational view illustrating a prior art concrete forming system;

FIG. 2 is a fragmentary elevational view of a portion of a prior art concrete forming system;

FIG. 3 is a fragmentary sectional view of a corner of a prior art concrete forming system;
FIG. 4 is an elevational view illustrating a preferred embodiment of the concrete forming system of the present invention;

FIG. 5 is an elevational view of a portion of the preferred embodiment of the present invention and enlarged for clarity;

FIG. 6 is a longitudinal sectional view illustrating the preferred embodiment of the present invention; and

FIG. 7 is a cross-sectional view illustrating the preferred embodiment of the invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE PRESENT INVENTION

With reference first to FIG. 4, a preferred embodiment of the concrete forming system 100 of the present invention is there shown having a corner 112. The concrete forming system includes a first outer panel 114 and a first inner panel 116 that are secured together in a spaced apart and parallel relationship by a plurality of conventional panel ties 118.

Similarly, a second outer panel 120 and a second inner panel 122 are secured together by conventional panel ties 118 so that the panels 120 and 122 are spaced apart and parallel to each other.

The panels 114 and 116 thus form a concrete receiving cavity 124 therebetween while, likewise, the panels 120 and 122 form a second concrete receiving cavity 126. Each cavity 124 and 126 corresponds to one wall of the finished construction and these walls intersect each other generally perpendicularly at the corner 112.

Still referring to FIG. 4, the present invention includes a conventional outer corner form 130 which is elongated and includes two perpendicular walls 132 and 134. The wall 132 is generally coplanar with the outer panel 114 while, similarly, the outer corner form wall 134 is generally coplanar with the outer panel 120.

The concrete forming system 120 further includes a conventional inner corner bracket 150 which is generally rectangular in shape. Thus, as best shown in FIG. 7, one wall 152 of the corner form 150 is generally coplanar with the inner panel 116 while, similarly, a second wall 154 of the corner form 150 is generally coplanar with the inner wall 122. The third wall 156 and fourth wall 158 of the corner form 150 lie in a plane that is generally parallel to the vertical edges of the panels 116 and 122, respectively.

With reference now to FIGS. 5 and 6, at least one, and preferably several longitudinally or vertically spaced corner ties 160 are utilized to secure the inside corner form 150 and outside corner form 130 together. Each corner tie 160 comprises an elongated flat bar having a fastening opening 162 adjacent each end. Conventional connecting pins on the forms and panels extend through the openings 162 to secure the panels and corner forms together.

Still referring to FIGS. 5 and 6, unlike the previously known corner ties, the corner tie 160 of the present invention includes an extended end 164 which protrudes outwardly from its associated wall 156 or 158 of the corner form 150 after attachment to the inner corner form 150. This outwardly protruding portion 164 is thus accessible for striking without the previously known necessity of prying outwardly protruding portion of the panel tie 18 away from the corner form as in the prior art.

With reference now particularly to FIG. 6, the corner tie 160 includes at least one, and preferably two V-shaped notches 170 at a position spaced inwardly from each end of the corner tie 160. The facing notches 170 thus form a fracture line 172 at a position spaced inwardly from each end of the corner tie 160. These notches 170 are preferably aligned with either the inner panels 116 or 122, or the outer panels 114 or 120 so that, when broken off, the corner tie 160 is wholly contained in the concrete wall.

In practice, the concrete forming system of the present invention is assembled in the conventional fashion except that the longer corner ties 160 replace the previous inner ties 19. The concrete is then poured into the cavity formed between the inner and outer panels as well as the inner and outer corner forms and the concrete is then allowed to set.

After the concrete has set, the panels 114, 116, 122, and 120, as well as the inner and outer corner forms 150 and 130, are ready for removal and subsequent reuse. The panels are removed by striking the outwardly protruding portions 20 (FIG. 1) of the conventional panel ties 18 thus breaking off the ends of the panel ties in the desired fashion so that the fracture line for each tie is either flush with or slightly embedded in the now formed concrete wall.

Similarly, the inwardly protruding portions 164 of the corner ties 160 are also broken off by striking the inwardly protruding portion 164 with a hammer or the like thus breaking off the inner end of the corner tie 160 at its fracture line 72. Thereafter, the inner corner form 150 may be easily removed.

From the foregoing, it can be seen that the present invention provides a simple and yet highly effective concrete forming system which allows easy removal of the aluminum forms after the concrete has been poured and set.

Having described my invention, however, many modifications thereto will become apparent to those skilled in the art to which it pertains without deviation from the spirit of the invention as defined by the scope of the appended claims.

I claim:

1. For use with a concrete forming system having spaced apart inner and outer panels held together by ties and forming a cavity therebetween for receiving concrete, said system including at least one generally rectangular corner form having four sides, said corner form being positioned at the intersection of two perpendicular inner panels so that two adjacent sides of the corner form are generally coplanar with said intersecting inner panels while the remaining two sides protrude perpendicularly outwardly from each of said perpendicular inner panels, a corner tie comprising:

   an elongated flat bar,

   one end of said flat bar being attached to an outer panel adjacent the corner form,

   the other end of said flat bar being attached to one of said perpendicularly protruding sides of said corner form,
wherein, with said flat bar attached to both the outer panel and the corner form, a portion of said other end of said flat bar protrudes inwardly from the perpendicularly protruding sides of the corner form.

2. The invention as defined in claim 1 wherein said elongated flat bar includes at least one notch at a predetermined distance from said other end of said bar, said predetermined distance being selected such that said notch is either flush with or slightly embedded in concrete filling the cavity.

3. The invention as defined in claim 2 wherein said at least one notch comprises a pair of notches, one notch being formed on each lateral side of said bar, said notches forming a fracture line in said bar.

4. The invention as defined in claim 3 wherein each notch is V-shaped.

5. A concrete forming system for forming a first and a second concrete wall which intersect each other substantially perpendicularly comprising:

- a first inner panel and a first outer panel,

- at least one panel tie for securing said first inner panel and said first outer panel together so that said first inner panel and said first outer panel are spaced apart from each other by a predefined distance thus forming a cavity adapted to receive concrete corresponding to the first wall,

- a second inner panel and a second outer panel,

- at least one panel tie for securing said second inner panel and said second outer panel together so that said second inner panel and said second outer panel are spaced apart from each other by a predefined distance thus forming a cavity adapted to receive concrete corresponding to the second wall,

- an elongated outer corner form having two generally perpendicular walls, said outer corner form being positioned so that one wall is substantially coplanar with said first outer panel and the other wall is substantially coplanar with said second outer panel,

- an elongated inner corner form, said inner corner form being substantially rectangular in shape, a first and second wall of said inner form being generally perpendicular to each other, said inner corner form being positioned so that its said first wall is substantially coplanar with said first inner panel and its said second wall is substantially coplanar with said second inner panel, a third wall of said inner corner form extending perpendicular to said first inner panel and a fourth wall of said inner corner form extending perpendicular to said second inner panel,

- a first elongated corner tie bar having one end attached to said outer corner form and its other end attached to said third wall of said inner corner form, said first corner tie being dimensioned so that said other end of said first corner tie protrudes inwardly for said third wall of said inner corner form, and

- a second elongated corner tie bar having one end attached to said outer corner form and its other end attached to said fourth wall of said inner corner form, said second corner tie being dimensioned so that said other end of said second corner tie protrudes inwardly for said fourth wall of said inner corner form.

6. The invention as defined in claim 5 and comprising a plurality of first and second corner ties, said first and second corner ties being longitudinally spaced from each other along said inner corner form.

7. The invention as defined in claim 5 where in each corner tie bar includes a notch at a preset distance inwardly from its said other end, said notch forming a fracture line across said tie bar.

8. The invention as defined in claim 7 wherein said tie bar comprises a flat bar.

9. The invention as defined in claim 8 and comprising a pair of notches formed in said tie bar on opposite lateral sides thereof.

10. The invention as defined in claim 7 wherein said notch is V-shaped.

11. The invention as defined in claim 7 wherein a portion of said notch is aligned with one of said inner panels.

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