

A BUILDING ELEMENT FOR A STRUCTURAL BUILDING PANEL

Technical Field

The present invention relates to elongated hollow building elements that are combined to form a wall or panel and more particularly to such building elements that are extruded for plastics material and are secured together by snap engagement. The building elements can be used in the construction of basement walls, liquid and granular storage tanks and other like structures.

Background of the Invention

The present invention relates to the building element described in USA Patent 7703248.

Where walls are exposed to moisture, such as walls of water storage tanks and building walls below ground level, typically waterproofing is applied to the walls that are exposed to the moisture. In the construction of conventional concrete and reinforced masonry walls, the walls need to be protected from moisture as exposure to moisture over time will cause degradation of the concrete and corrosion of the steel. A still further problem is mould, mildew and fungus and bacterial development on the walls. To address this issue typically a waterproof membrane is applied to inhibit water reaching the concrete or reinforced masonry wall. It is also not unusual to provide a gap between an earth surface and the wall to enable a water proofing membrane to be applied. Typically the gap can be a metre. This gap can be considered a safety issue for workers.

The above construction of walls that are to exist in a damp environment has a number of disadvantages in that if the waterproofing fails then the wall will degrade. A further disadvantage is the loss of floor area should a gap be required between the wall and an earth surface.

Object of the Invention

It is the object of the present invention to overcome or substantially ameliorate at least one of the above disadvantages.

Summary of the Invention

There is disclosed herein an extruded hollow longitudinally elongated building element into which concrete is to be poured, the element being extruded so as to be integrally formed and comprising:

a pair of longitudinally extending spaced walls which are generally longitudinally coextensive and longitudinally parallel;

a plurality of longitudinally extending spaced transverse webs joining the side walls, the webs including a first and a second web;

a pair of longitudinally extending grooves, each of the grooves being formed in a respective one of the side walls;

a pair of longitudinally extending end flanges, each of the end flanges extending from a respective one of the walls;

a pair of longitudinally surfaces that diverge from the first web toward the grooves;

a sealing projection extending from each flange and extending longitudinally thereof; and wherein

the end flanges and grooves are positioned and configured to engage a respective one of the grooves of a respective one of the flanges of a like element, and the end flanges are resiliently deformed by engagement longitudinal surface of the like element so as to be resiliently deformed such that, when the end flanges are moved in a transverse direction relative to the diverging surfaces of the like element, there is a resilient deformation of the end flanges to allow snap engagement of each end flange in a respective one of the grooves to thereby secure the elements together by snap engagement, and the sealing projections extend transversely from their associated flange toward the other element to aid in sealingly connecting the elements.

Preferably, each end flange includes a first portion extending transversely from the first wall, and a second portion extending generally transverse relative to the first portion so as to project into the associated groove of the like element.

In one preferred form, said sealing element projects from said portion.

In a further preferred form, said sealing projection extends from said second portion.

Preferably, each groove is provided by a groove providing portion extending longitudinally of the element, the groove providing portion having a sealing projection extending longitudinally of the element and extending into the groove so as to be operatively associated with the sealing element of the second portion to aid in sealingly connecting the elements.

Brief Description of the Drawings

Preferred forms of the present invention will now be described by way of example with reference to the accompanying drawings wherein:

Figure 1 is a schematic top plan view of the walls of a building basement;

Figure 2 is a schematic top plan view of portion of one of the walls of Figure 1;

Figure 3 is a schematic top plan view of a further portion of one of the walls of Figure 1;

Figure 4 is a schematic top plan view of a building element used to form the walls of the basement of Figure 1;

Figure 5 is a schematic top plan view of a further building element used in forming the walls of Figure 1;

Figure 6 is a schematic enlarged view of portion of the elements used to form the walls of Figure 1; and

Figure 7 is a schematic top plan view of an alternative portion of Figure 6.

Detailed Description of the Preferred Embodiments

In Figure 1 of the accompanying drawings there is schematically depicted the basement 10 of a building. The basement 10 may be below ground level.

The basement 10 includes walls 11 that may be straight or curved. Each of the walls 11 is formed by a plurality of elongated building elements 12. Each building element 12 is hollow and is extruded from plastics material. Each element 12 has a pair of longitudinally extending side walls 13 that are longitudinally parallel. In Figure 3 the element 12 illustrated has the walls 13 also transversely parallel and generally flat. The element 12 of Figure 5 has longitudinally extending side walls 14 and 15 that provide for the construction of curved walls and corners, with the walls 11 inclined by a desired angle 29. The inner wall 15 is of a shorter transverse width relative to the outer wall 14.

Each of the elements 12 has a plurality of transverse webs 16 and end webs 17 and 18. The webs 16 of the element 12 of Figure 4 is joined to the side walls 13 by connecting webs 19. The connecting webs 19 are inclined so as to converge from their connection with the side walls 13 to the associated web 16.

The end web 18 has extending from it longitudinally extending ramp surfaces 20 that diverge from the web 18 toward the side walls 13, 14 and 15. The surfaces 20 extend to longitudinally extending grooves 21.

Extending from the end web 17 are flanges 22 that in the embodiment of Figure 4 are generally parallel and coextensive.

Like elements 12 are connected by transverse relative movement between the elements 12. In particular the flanges 22 of one of the elements 12 moves transversely across the surfaces 20 so as to be resiliently deflected apart, with the flanges 22 then snap engaging within the recesses 21 to thereby connect adjacent elements 12.

As best seen in Figures 6 and 7 each flange 22 includes a first flange portion 23 that extends from the web 17, and a second flange portion 24 that extends from the first flange portion 23. The second portion 24 is to be located in the recess 21. The portions 23 of each element 12 are generally parallel and coextensive and extend generally transverse to the associated web 17. The second portion 26 projects from the first portion 23 in a direction generally parallel to the web 17.

Each groove 21 is provided by a groove providing portion 25, the portions 25 of each element 12 being generally parallel and coextensive. The portions 25 are of a "U" shaped transverse cross section so as to receive the portion 24.

In the embodiment of Figure 6, the first flange portion 23 is provided with a longitudinally extending seal projection 26 that is shaped like a barb. The projection 26 extends from the first portion 23 toward the other element 12. The projection 26 may actually engage the other element 12 or be slightly spaced therefrom. In such instances, wet concrete delivered to the cavities 30 would sealingly connect each sealing projection 26 to the adjacent element 12. The projection 26 aids in sealingly connecting engaged elements 12.

When elements 12, as shown in Figure 6, are connected, the second portion 24 would move along the surface 20 so as to cause resilient outward deflection of the first portions 22 until the second portions 24 were aligned with the groove 21 so as to snap engage therein.

In the embodiment of Figure 7, there is provided a pair of sealing projections 27 and 28. The projection 27 extends from the second portion 24 while the projection 28 extends from the recess providing portion 25. The projections 27 and 28 engage, or are located adjacent each other so that the gap therebetween is sealed by wet concrete.

The projections 26, 27 and 28 extend the entire longitudinal length of each of the elements 12.

CLAIMS:

1. An extruded hollow longitudinally elongated building element into which concrete is to be poured, the element being extruded so as to be integrally formed and comprising:

a pair of longitudinally extending spaced walls which are generally longitudinally coextensive and longitudinally parallel;

a plurality of longitudinally extending spaced transverse webs joining the side walls, the webs including a first and a second web;

a pair of longitudinally extending grooves, each of the grooves being formed in a respective one of the side walls;

a pair of longitudinally extending end flanges, each of the end flanges extending from a respective one of the walls;

a pair of longitudinally surfaces that diverge from the first web toward the grooves;

a sealing projection extending from each flange and extending longitudinally thereof; and wherein

the end flanges and grooves are positioned and configured to engage a respective one of the grooves of a respective one of the flanges of a like element, and the end flanges are resiliently deformed by engagement longitudinal surface of the like element so as to be resiliently deformed such that, when the end flanges are moved in a transverse direction relative to the diverging surfaces of the like element, there is a resilient deformation of the end flanges to allow snap engagement of each end flange in a respective one of the grooves to thereby secure the elements together by snap engagement, and the sealing projections extend transversely from their associated flange toward the other element to aid in sealingly connecting the elements.

2. The building element of claim 1, wherein each end flange includes a first portion extending transversely from the first wall, and a second portion extending generally transverse relative to the first portion so as to project into the associated groove of the like element.

3. The building element of claim 1 or 2, wherein said sealing element projects from said portion.

4. The building element of claim 1 or 2, wherein said sealing projection extends from said second portion.

5. The building element of any one of claims 1 to 4, wherein each groove is provided by a groove providing portion extending longitudinally of the element, the groove providing portion having a sealing projection extending longitudinally of the element and extending into the groove so as to be operatively associated with the sealing element of the second portion to aid in sealingly connecting the elements.