As an alternative to molded stair noses, load-carrying box elements that may be molded into the upper and lower part of the stair unit are currently used. Each box element is molded into the stair unit so that one end of it projects freely from the stair unit. During installation, these free ends are inserted into recesses in the stair landings. Any difference between the horizontal level of the stair unit and the stair landing is adapted with an adjustable screw which is arranged in the free end of the box element, before the recesses are filled with concrete mass and molded to the stair landing.

The process steps comprising molding the stair unit during prefabrication, lifting the stair unit out of the mold and installing the stair unit in position relative to the stair landing by means of lifting cables, are time consuming and costly. It should be mentioned here in particular, that the need for separate lifting brackets to lift the finished molded stair unit out of the mold and the subsequent need for using other lifting brackets to position the stair unit next to the stair landing, are time and cost driving factors that contribute to enhancing the cost of the process.

Against this background, embodiments of the invention seek to provide a solution which may simplify and streamline the handling and maneuvering both when lifting the stair unit from the mold and when installing the stair unit in a position adjacent to a stair landing at the upper and / or lower step. Furthermore, the solution facilitates that the upper and / or lower step may be adapted to the horizontal position of the stair landing.

According to a first aspect of the present invention, there is provided a load-transferring connecting element for establishing a connection between a first building element and a second building element and which is adapted for transfer of force between the first and second building elements, the load-transferring connecting element comprising an elongated box-shaped main body, wherein a first end portion of the load-transferring connecting element is arranged for attachment into the first building element with a remaining second end portion of the load-transferring connecting element positioned so as to project from the first building element, wherein the second end portion is adapted for being received in a cavity arranged in the second building element, wherein the second end portion of the load-transferring connecting element is provided with an attachment area for attaching lifting equipment for handling of the first building element, and wherein the first end portion is provided with a reinforcement arrangement to ensure transfer of forces between the load-transferring connecting element and the first building element, the reinforcement arrangement comprising a transverse element attached to the main body along the first end portion of the load-transferring connecting element and having an orientation where a longitudinal axis of the transverse element is positioned transversely to a longitudinal axis of the load-transferring connecting element.

There is disclosed a load-transferring connecting element for connecting a first building element and a second building element. The load transfer element is adapted for the transfer of load / forces between the two building elements. The first building element may comprise a stair unit and the second building element may comprise a stair landing, but also other kind of building elements where a connection is to be established are relevant, and especially prefabricated building elements. The load-transferring connecting element comprises an elongated box-shaped main body. A first end portion of the load-transferring connecting element is adapted for attachment, for example by being molded or embedded into the first building element, typically the stair unit. The remaining second end portion of the load-transferring connecting element then projects from this first building element, and is adapted for being received in a cavity arranged in the second building element, typically the stair landing. The second end portion of the load transferring connecting element is arranged with an attachment area for attaching lifting equipment. The lifting equipment must be used for handling the first building element, which may then typically be the stair unit.

-a plate structure comprising two main surfaces and a plurality of side surfaces where the plate structure is attached with one of its main surfaces to the main body so that the end opening of the first end portion is covered and the plate structure projects perpendicularly from the main body,

-a transverse element attached to the first end portion of the load transferring connecting element and having an orientation where the longitudinal axis of the transverse element is positioned transverse to the longitudinal axis of the load transferring connecting element.

According to a first aspect of the present invention, there is provided a building system comprising a first building element and a second building element and at least one load-transferring connecting element for establishing a connection between a first building element and a second building element,

wherein the at least one load-transferring connecting element is adapted for transfer of force between the first and second building elements, the load-transferring connecting element comprising an elongated box-shaped main body,

wherein a first end portion of the load-transferring connecting element is arranged for attachment into the first building element with a remaining second end portion of the load-transferring connecting element positioned so as to project from the first building element,

wherein the second end portion is adapted for being received in a cavity arranged in the second building element, wherein the second end portion of the load-transferring connecting element is provided with an attachment area for attaching lifting equipment for handling of the first building element,

wherein the first building element comprises a stair unit and the second building element comprises a stair landing where the at least one load-transferring connecting element projects from a side surface of the stair unit and into the cavity arranged in a side surface of the stair landing, and

wherein the first end portion is provided with a reinforcement arrangement to ensure transfer of forces between the load-transferring connecting element and the first building element, the reinforcement arrangement comprising a transverse element attached to the main body along the first end portion of the load-transferring connecting element and having an orientation where a longitudinal axis of the transverse element is positioned transversely to a longitudinal axis of the load-transferring connecting element.

The building system may further comprise a lifting equipment comprising a plurality of elongated lifting bodies such as lifting chains or lifting wires, each comprising attachment means for attachment to an attachment area arranged on the projecting second portion of the load transfer member. The stair unit may be lifted and maneuvered by means of the lifting equipment so that it is placed in the installation position next to the stair landing.

The number of load-transferring connecting elements that the stair unit is equipped with may vary. At least two connecting elements may be mounted projecting from a side surface at the lower step of the stair unit and at least two load-transferring connecting element may be mounted projecting from a side surface at the upper step of the stair unit.

In the following, an example of the invention will be described with reference to the accompanying figures, in which

Figure 1 shows a stair shaft seen from above where a stair unit is lifted into place with lifting chains which are connected to a load-transferring connecting element according to the invention.

Figure 2 shows the load transfer element attached to the stair unit.

Figure 3 shows the stair unit in the installed position with the load transfer element accommodated in a cavity in a stair landing.

Figure 4 shows a detailed view of the load transferring element in perspective.

Figure 5 is a front view of the load transferring element of Figure 4.

CLAIMS

1. A load-transferring connecting element for establishing a connection between a first building element and a second building element and which is adapted for transfer of force between the first and second building elements, the load-transferring connecting element comprising an elongated box-shaped main body,

wherein a first end portion of the load-transferring connecting element is arranged for attachment into the first building element with a remaining second end portion of the load-transferring connecting element positioned so as to project from the first building element,

wherein the second end portion is adapted for being received in a cavity arranged in the second building element, wherein the second end portion of the load-transferring connecting element is provided with an attachment area for attaching lifting equipment for handling of the first building element, and

wherein the first end portion is provided with a reinforcement arrangement to ensure transfer of forces between the load-transferring connecting element and the first building element, the reinforcement arrangement comprising a transverse element attached to the main body along the first end portion of the load-transferring connecting element and having an orientation where a longitudinal axis of the transverse element is positioned transversely to a longitudinal axis of the load-transferring connecting element.

2. The load-transferring connecting element according to claim 1, wherein the second end portion of the load-transferring connecting element is arranged with an adjusting device adapted for adjusting a relative height between the first building element and the second building element when receiving the load-transferring connecting element in the cavity of the second building element.

3. The load-transferring connecting element according to claim 1, wherein the attachment area comprises an attachment hole for attachment means which are connected to the lifting equipment.

4. The load-transferring connecting element according to claim 2, wherein the adjusting device comprises a screw device which is adjustably arranged in a screw hole arranged in the load-transferring connecting element.

5. The load-transferring connecting element according to claim 1, wherein the reinforcement arrangement further comprises:

a plate structure comprising two main surfaces and a plurality of side surfaces, the plate structure being fixed with one of the main surfaces to the main body so that an end opening of the first end portion is covered and the main surfaces protrude perpendicularly from the main body.

6. A building system comprising a first building element and a second building element and at least one load-transferring connecting element for establishing a connection between a first building element and a second building element,

wherein the at least one load-transferring connecting element is adapted for transfer of force between the first and second building elements, the load-transferring connecting element comprising an elongated box-shaped main body,

wherein a first end portion of the load-transferring connecting element is arranged for attachment into the first building element with a remaining second end portion of the load-transferring connecting element positioned so as to project from the first building element,

wherein the second end portion is adapted for being received in a cavity arranged in the second building element, wherein the second end portion of the load-transferring connecting element is provided with an attachment area for attaching lifting equipment for handling of the first building element,

wherein the first building element comprises a stair unit and the second building element comprises a stair landing where the at least one load-transferring connecting element projects from a side surface of the stair unit and into the cavity arranged in a side surface of the stair landing, and

wherein the first end portion is provided with a reinforcement arrangement to ensure transfer of forces between the load-transferring connecting element and the first building element, the reinforcement arrangement comprising a transverse element attached to the main body along the first end portion of the load-transferring connecting element and having an orientation where a longitudinal axis of the transverse element is positioned transversely to a longitudinal axis of the load-transferring connecting element.

7. The building system according to claim 6,

wherein the building system comprises lifting equipment comprising a plurality of elongated lifting bodies, wherein each elongated lifting body comprises attachment means for attachment to the attachment area provided on the projecting second end portion of the load-transferring connecting element.

8. The building system according to claim 6,

wherein at least two load-transferring connecting elements are mounted projecting from a side surface at a lower step of the stair unit and at least two load-transferring connecting element are mounted projecting from a side surface at an upper stair step of the stair unit.