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(54) **Spot footing**

Stützfuss

Pied de support

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Description

[0001] The present invention relates to a spot footing needed for attaching a wooden or a precast concrete pillar to a foundation or for extending such a pillar, as defined in the preamble of claim 1.

[0002] In current technology, precast concrete pillars are reinforced and extended in factory by providing the lower end of the precast pillar with a spot footing with dowels cast in the pillar. Loads received from the spot footing are transmitted via the footing dowels to the pillar concrete. The pillar is additionally provided with main bars generally placed at the corners and extending over the entire length of the pillar. In this case, the forces from the spot footing dowels are transmitted to the main bar at the corner of the pillar, so there are three or four steel bars at the corner, depending on the type of spot footing used, to transmit the force needed for only one bar. At its top end, the pillar has coupling bolts placed in the corner areas to transmit the forces at the top end of the pillar from the main bars to the coupling bolts at the top end of the pillar. Thus, at each corner of the top end of the pillar, there are two steel bars running side by side through a distance corresponding to the length of the coupling bolt. Via the threads of the coupling bolts, the forces are again transmitted from the coupling bolts to the spot footings of the next floor. The forces are transmitted via corrugated dowel bars, so there are at least two steel bars for one main bar at each corner of the pillar. Moreover, for the installation of the spot footing, main bars and coupling bolts, it is necessary to mount at least nine separate parts in the column form. Thus, this traditional structure consumes a large amount of corrugated bar, comprises a large number of parts to be mounted and is therefore an expensive solution.

[0003] FI utility models no. 320, 341 and 544 present a solution that allows the number of dowel bars needed in the spot footing to be substantially reduced and that permits the dowel bars of the spot footing to simultaneously act as reinforcements of the pillar.

[0004] In these utility models, the spot footing comprises a bottom plate having a square shape and a hole for a threaded main bar of the pillar of the floor below as well as a protective casing for the nuts, in which the inner corner has been rounded into the shape of a quarter circle. The main dowel bar of the spot footing is placed on top of the protective casing and it also functions as a main bar of the pillar.

[0005] In the aforementioned solutions, a drawback in the area of the actual footing joint is that the forces of the spot footing are transmitted via the vertical plate outside the protective casing and via the bottom plate, which is substantially larger than the protective casing, to the anchor bolt. This solution results in fairly large eccentricity forces in the footing structure and requires a large amount of steel plate in the footing, so the structure is expensive. If the forces in the spot footing could be transmitted from the pillar reinforcements to the anchor bolt along a route passing as close by the centre line between the dowel bars of the spot footing as possible, the footing structure could be made lighter, thus achieving a more economical solution.

[0006] DE-A-21 16 538 discloses a spot footing arrangement for attachment a concrete pillar to another building part below the pillar. The spot footing arrangement in DE-A-21 16 538 has several bottom plates and protective casings with a top plate arranged at a distance from each other. Each top plate has an opening for a screw part.

[0007] Additionally the arrangement has separate centering means with a upper plate and a conical hollow into which a cylindrical centering tap can be arranged. This centering tap is used in order to install the upper pillar part to the lower part, whereby during the installation the centering tap goes into the conical hollow and will thus be guided to a centering cylindrical hollow part.

[0008] The spot footing described in the present invention partly uses known technical solutions as used in the above-mentioned utility models, but only in respect of the disposal of the dowel bars and anchor bolt of the spot footing. The main spot footing structure has been developed completely anew, thus achieving a more economical solution.

[0009] The present invention is based on a solution in which the force of the dowel bars of the spot footing acts in the footing area along a line as close to the centre line formed by the dowel bar and the anchor bolt as possible. The result is that the spot footing has but a small internal eccentricity and the extra forces due to such eccentricity are also small, so the footing structure can be made substantially lighter. This requirement can be fulfilled by implementing the protective casing as a circular, cylindrical structure with one side open, designed to transmit the forces from the pillar to the anchor bolt. Inside the circular protective casing, a circular plate is welded to the upper edge of the casing, the dowel bar of the spot footing being attached to the centre of this circular plate. Welded to the interior lower edge of the protective casing is another circular plate with a hole for the attachment of the anchor bolt. In addition, the sides of the opening of the protective casing are provided with additional plates which meet the surface of the column form and guide the footing to the correct position during mounting. The features characteristic of the solution of the invention are presented in detail in the attached claims.

[0010] In the present solution there is no need for a vertical plate like that comprised in the prior-art solution in the spot footing area, and the bottom plate of the spot footing is also substantially smaller. This solution produces a spot footing with a reduced weight and a simpler structure. The solution is therefore more economical than prior-art spot footings.

[0011] In the following, the invention will be described in detail by the aid of an example by referring to the attached drawings, wherein

Fig. 1 presents a spot footing according to the invention in side view.

Fig. 2 presents a spot footing according to the invention in top view.

Fig. 3 presents a spot footing according to the invention in side view as seen from the direction of the opening in the casing.

Fig. 4 presents a spot footing according to the invention in top view and sectioned through the casing.

[0012] Part 1, shown in Figures 1 and 3, is the dowel bar of the spot footing. It is attached to the top plate 2 of the casing of the spot footing either by welding or with a screw thread. In addition to forming the dowel bar, part 1 also functions as a pillar reinforcement at the same time, and its end is provided with a screw thread for a nut joint. Part 3 is the bottom plate of the spot footing. It is of a circular shape and has a central hole 7 for the anchor bolt of the floor below. Part 4 forms the side wall of the protective casing for the nuts. It is a steel plate of a cylindrical shape and circular cross-section, with an opening 5 on one side for the mounting of the nut. Placed at the edges of the opening 5 of the protective casing 4 are two rectangular outer plates 6, which guide the spot footing during installation so that it will meet the edges of the column form. The top plate 2 and the bottom plate 3 have a diameter equal to the diameter of the interior surface of the cylindrical part of the side wall, allowing the plates to be welded inside the top and bottom edges of the cylindrical part as shown in Fig. 1 - 4.

[0013] Part 8 is a balancing bar placed at the back corner of the spot footing and typically made of corrugated bar and attached to part 3.

[0014] The spot footing can be used in conjunction with wooden and precast concrete pillars, but it can also be mounted in the foundation, in which case only the threaded bars mounted inside the spot footing will protrude from the pillar.

[0015] The invention is not restricted to the embodiments described above, but it can be varied within the scope of the following claims.

Claims

1. Spot footing especially designed for the attachment of a precast concrete or wooden pillar to a foundation and for the extension of such a pillar, said spot footing comprising a bottom plate (3) and a protective casing with a top plate (2) and a partially open side wall part (4), the bottom (3) plate being arranged to the lower edge of the protective casing and the top plate being arranged to the upper edge of the protective casing, and the main dowel bar (1) of the spot footing being attached to the top plate (2),
characterised in that
the side wall part (4) of the protective casing is of a cylindrical structure with one side open to transmit the forces from the pillar, and that
the bottom and top plates are of a circular shape and their diameters are substantially equal to the diameter of the cross-section of the cylindrical side wall part.

2. Spot footing as defined in claim 1, **characterised in that** it comprises two protruding plates (6) disposed on the open sides of the circular, cylindrical side wall part (4) of the protective casing, said plates being especially designed to guide the spot footing against the edges of the column form during installation.

3. Spot footing as defined in claim 1, **characterised in that** the dowel bar of the spot footing is fixed to the centre of the circular top plate.

Patentansprüche

1. Stützfuß speziell konstruiert für die Befestigung eines vorgefertigten Pfeilers aus Beton oder Holz an einem Fundament, sowie für die Verlängerung eines solchen Pfeilers, wobei der Stützfuß eine untere Scheibe (3) und ein Schutzgehäuse mit einer oberen Scheibe (2) und eine teilweise geöffnete Seitenwand (4) aufweist, wobei der Haupt-Passstift (1) des Stützfußes an der oberen Scheibe (2) befestigt ist,
dadurch gekennzeichnet, dass
die Seitenwand (4) des Schutzgehäuses einen zylindrischen Aufbau mit einer offenen Seite hat und dass
die untere Scheibe und die obere Scheibe kreisförmig sind und ihre Durchmesser im Wesentlichen gleich dem Durchmesser des Vertikalschnittes der zylindrischen Seitenwand sind.

2. Stützfuß nach Anspruch 1, **dadurch gekennzeichnet, dass** dieser zwei vorstehende Scheiben (6) aufweist, welche sich an den offenen Seiten der kreisförmigen, zylindrischen Seitenwand (4) des Schutzgehäuses befinden, wobei die Scheiben so konstruiert sind, dass sie während des Einbaus den Stützfuß gegen die Ränder der Säulen-Form führen.

3. Stützfuß nach Anspruch 1, **dadurch gekennzeichnet, dass** der Passstift des Stützfußes mit dem inneren Bereich der kreisförmigen oberen Scheibe verbunden ist.

Revendications

1. Pied de support spécialement conçu pour attacher un pilier en béton préfabriqué ou en bois à des fondations et pour l'extension d'un tel pilier, ledit pied de support comprenant une plaque inférieure (3) et une enveloppe de protection avec une plaque supérieure (2), et une partie de paroi latérale partiellement ouverte (4), la plaque inférieure (3) étant disposée au niveau du bord inférieur de l'enveloppe de protection et la plaque supérieure étant disposée au niveau de la partie supérieure de l'enveloppe de protection, et le goujon principal (1) du pied de support étant fixé à la plaque supérieure (2),
caractérisé en ce que
la partie de paroi latérale (4) de l'enveloppe de protection est de structure cylindrique avec un côté ouvert pour transmettre les forces en provenance du pilier, et **en ce que**
les plaques inférieure et supérieure sont de forme circulaire et leurs diamètres sont sensiblement égaux au diamètre de la coupe transversale de la partie de paroi latérale cylindrique.

2. Pied de support selon la revendication 1, **caractérisé en ce qu'**il comprend deux plaques faisant saillie (6) disposées sur les côtés ouverts de la partie de paroi latérale circulaire cylindrique (4) de l'enveloppe de protection, lesdites plaques étant spécialement conçues pour guider le pied de support contre les bords du coffrage de la colonne lors de l'installation.

3. Pied de support selon la revendication 1, **caractérisé en ce que** le goujon du pied de support est fixé au centre de la plaque circulaire supérieure.

Fig 1.

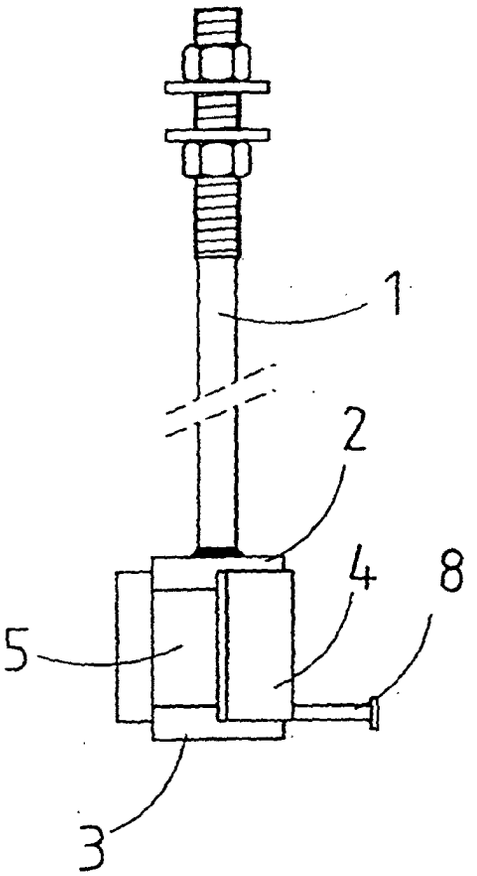


Fig 3.

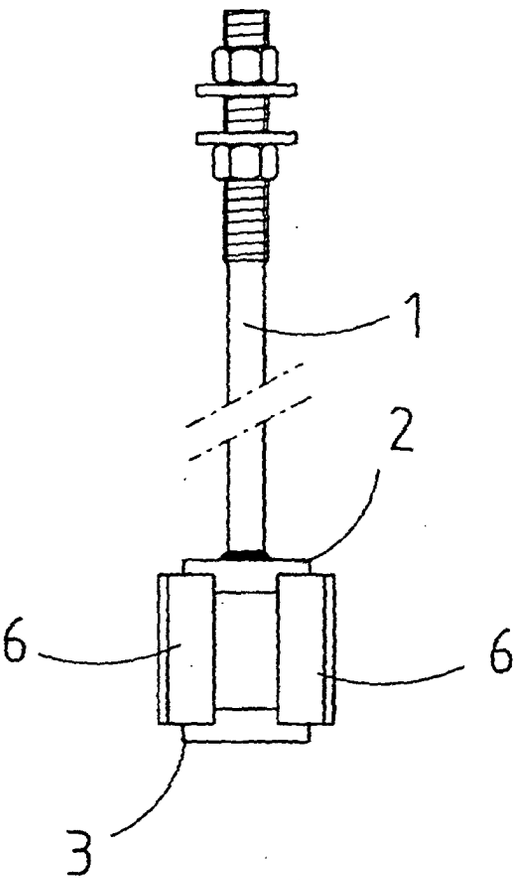


Fig 2.

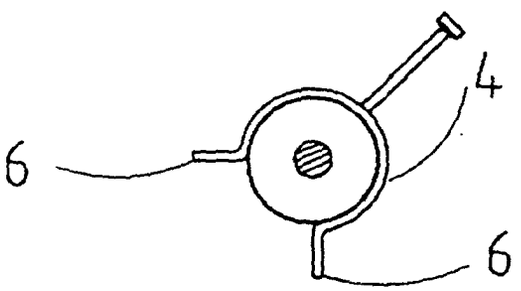


Fig 4

