

ROOFTOP PARAPET OF THERMALLY-INSULATED
CURTAIN WALLED BUILDING

The present invention relates to a rooftop parapet of a thermally-insulated curtain-walled building.

In modern buildings, curtain walls are widely used, partly because they cause a substantially reduced term
5 of works and partly because they make the building very neat in appearance.

FIGS. 1 and 2 of the accompanying drawings are schematic vertical cross-sectional views of a part of a curtain-walled building, illustrating a prior art
10 problem. Referring particularly to FIG. 1, most curtain walls 1, each including a panel usually made of metal such as stainless steel, are secured to a building framework 2 by a plurality of fasteners 3 so as to be spaced apart facewise (i.e. horizontally) from the
15 building framework 2. The uppermost curtain wall 1 has an upper part 1a which is spaced apart from a parapet base 4 with a gap g therebetween; a coping plate 5 is laid over an upper edge of the uppermost curtain wall 1, the gap g, and an upper edge of the parapet base 4.

Because of this structural characteristic, the individual curtain wall 1 tends to become inwardly curved in its middle between the fasteners 3 when loading of wind pressure is effected on the curtain wall 1 (from outside), as shown in FIG. 2. At that time the upper part 1a of the uppermost curtain wall 1 is thus appreciably deflected away from the parapet base 4, widening the gap g. Consequently, the mounting of the coping plate 5 must be such that the coping plate 5 follows or allows such deflection of the upper part 1a of the uppermost curtain wall 1.

To effect a thermal insulation in such a rooftop parapet, it is known to place a thermally insulating material between the coping plate 5 and an upper edge of the parapet base 4, the curtain walls being thermally insulated. However, this thermally insulating material serves as an absorber of moisture inside the building, thus causing a sharply reduced degree of thermal insulation.

According to the present invention there is provided a building comprising: a thermally-insulated curtain wall having an upper part horizontally spaced apart from a base of a rooftop parapet with a gap therebetween; a moisture-proof sheet covering said gap; a thermally insulating material laid over an upper end of said

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parapet base, said moisture-proof sheet, and an upper edge of said curtain wall; a waterproof sheet superposed over said insulating material and hence over said upper edge of said parapet base, said moisture-proof sheet and said upper edge of said curtain wall; and a coping plate superposed over said waterproof sheet and hence over said upper edge of said parapet base, said moisture-proof sheet and said upper edge of said curtain wall; the moisture-proof sheet serving to prevent the thermally insulating material from absorbing moisture inside the building; the waterproof sheet serving to prevent dew-drops on an inner face of the coping plate from coming down to the insulating material.

Preferably each of the moisture-proof sheet and the waterproof sheet has a sagged portion and the coping plate is fixed to the curtain wall but not to the parapet base, so that the coping plate can follow the deflection of the curtain wall's upper part due to loading of wind pressure effected on the curtain wall. The moisture-proof sheet serving to prevent the thermally insulating material from absorbing moisture inside the building; the waterproof sheet serving to prevent dewdrops on an inner face of the coping plate from coming down to the insulating material.

It is believed possible by means of the invention (at

least in its preferred form) to provide a rooftop parapet of a thermally-insulated-curtain-walled building, which parapet guarantees an adequate degree of thermal insulation.

- 5 It is also believed possible by means of the invention (at least in its preferred form) to provide a rooftop parapet of a thermally-insulated-curtain-walled building, which parapet allows an upper part of the uppermost curtain wall to be deflected due to
10 loading of wind pressure.

The invention will be described by way of example with reference to FIG. 3 of the accompanying drawings, FIG. 3 being a vertical cross-sectional view of a rooftop parapet of a curtain-walled building embodying the
15 present invention.

The present invention is particularly useful when embodied in a curtain-walled building with a rooftop parapet 10 such as shown in FIG. 3, generally indicated by the numeral 10.

- 20 The rooftop parapet 10 generally comprises a parapet base 11 disposed on an edge of the building's uppermost slab, and an uppermost curtain wall 12 which is thermally insulated and which is secured to a building

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framework (not shown) by a plurality of fasteners (not shown) so as to be spaced horizontally apart from the building framework. Thus an upper part 12a of the uppermost curtain wall 12 is spaced horizontally apart
5 from the parapet base 11 with a predetermined gap g therebetween, which gap opens to the air inside the building.

The parapet base 11 includes, from the exterior side (right side in FIG. 3), an iron plate 13, a layer of
10 thermally insulating material 14, a layer of waterproof material 15, and a layer of mortar 16.

The curtain wall 12 comprises a rectangular frame and a panel 17 mounted on the frame at its exterior side (right side in FIG. 3). The rectangular frame includes
15 a pair of upper and lower horizontal frame members 18, 18 (only the upper horizontal frame member is shown for clarity) of hollow cross section, and a pair of vertical frame members 19, 19 (only one vertical frame member is shown for clarity) of hollow cross section connected to
20 the upper and lower horizontal frame members 18, 18 at their ends. The panel 17 is preferably filled with a thermally insulating material (not shown).

The gap g between the parapet base 11 and the upper part 12a of the uppermost curtain wall 12 is covered at its

upper side by an elongate moisture-proof sheet 20 which is made of metal, plastic or rubber. The moisture-proof sheet 20 is secured at one or exterior longitudinal margin 20a to the upper horizontal frame member 18 by a plurality of screws 21 (only one screw is shown) each extending through a bracket 22, the moisture-proof sheet 20, and an upper plate 18a of the upper horizontal frame member 18. Likewise, the other or interior longitudinal margin 20b of the moisture-proof sheet 20 is secured to the parapet base 11 by a plurality of screws 23 (only one screw is shown) each extending through a bracket 24, the moisture-proof sheet 20, and the iron plate 13. The moisture-proof sheet 20 is downwardly sagged in its middle 20c along its entire length, for a purpose described below.

An elongated hollow support member 26 is mounted on the upper and exterior edge of the uppermost curtain wall 12, for a purpose described below. Disposed between the support member 26 and the panel 17 is a batten 27 which is secured to the upper horizontal frame member 18 by a plurality of screws 25 (only one screw is shown) each extending through the batten 27, a thermally insulating material 28, and an exterior plate 18b of the upper horizontal frame member 18. The support member 26 is connected to the upper horizontal frame member 18 via a plurality of brackets 29 (only one bracket is shown) of

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generally reversed C-shaped cross section; each bracket 29 thus has upper and lower horizontal plates 29a, 29b and a vertical plate 29c extending therebetween. The support member 26 is secured to the vertical plate 29c by a screw 30, and the lower horizontal plate 29b in turn is secure to the upper horizontal frame member 18 by a screw 31 extending through the lower horizontal plate 29b, a thermally insulating material 32, and the upper plate 18a of the upper horizontal frame member 18.

10 A thermally insulating material 33 is laid over an upper edge of the parapet base 11, the gap g, and the upper horizontal frame member 18. A waterproof sheet 34, which is made of metal, plastic or rubber, is superposed over the thermal insulating material 33. One or

15 exterior margin 34a of the waterproof sheet 34 extends on and across an upper plate of the support member 26 and terminates in a hanging edge 34a'. At the other or interior margin 34b, the waterproof sheet 34 penetrates deeply into the parapet base 11 between the waterproof material layer 15 and the mortar layer 16. The

20 waterproof sheet 34 has a downwardly sagged portion 34c extending longitudinally along the upper edge of the parapet base 11, for a purpose described below.

In addition, a capping or coping plate 35, which is

25 preferably made of metal, is superposed over the

waterproof sheet 34. One or exterior margin 35a of the coping plate 35 extends over and about the support member 26 and terminates in a vertical edge 35a' which is spaced outwardly from an exterior plate 26a of the support member 26 by a predetermined distance. At the other or interior margin 35b, the coping plate 35 extends over the upper edge of the parapet base 11 and terminates in a vertical edge 35b which is spaced inwardly from an interior face 16a of the mortar layer 16 by a predetermined distance. The coping plate 35 is secured not only to the brackets 22 by a plurality of screws 36 (only one screw is shown) but also to the brackets 29 by a plurality of screws 37 (only one screw is shown). Each of the screws 36 extends through the coping plate 35, the waterproof sheet 34, a thermally insulating material 38, and an upper plate 22a of the respective bracket 22. On the other hand, each of the screws 37 extends through the coping plate 35, the waterproof sheet 34, and the upper plate 29a of the respective bracket 29.

The coping plate 35 can freely follow the deflection of the uppermost curtain wall's upper part 12a due to loading of wind pressure effected on the curtain wall 12, partly because the coping plate 35 is fixed to the upper horizontal frame member 18 and is not fixed to the parapet base 11 and partly because each of the

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moisture-proof sheet 20 and the waterproof sheet 34 has the sagged portion 20c, 34c, respectively.

Another advantage is that the moisture-proof sheet 20 serves to prevent the thermally insulating material 33 from absorbing moisture inside the building, while the waterproof sheet 34 serves to prevent dewdrops on an inner face of the coping plate 35 from coming down to the insulating material 33, thus jointly maintaining an adequate degree of thermal insulation. The waterproof sheet 34 also serves to prevent water, penetrated through the joint of adjacent segments of the coping plate 35, from coming into the insulating material 33.



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Claims:-

1. A building comprising:
a thermally-insulated curtain wall having an upper part
horizontally spaced apart from a base of a rooftop
5 parapet with a gap therebetween; a moisture-proof sheet
covering said gap; a thermally insulating material laid
over an upper edge of said parapet base, said
moisture-proof sheet, and an upper edge of said curtain
wall; a waterproof sheet superposed over said insulating
10 material and hence over said upper edge of said parapet
base, said moisture-proof sheet and said upper edge of
said curtain wall; and a coping plate superposed over
said waterproof sheet the moisture-proof sheet serving
to prevent the thermally insulating material from
15 absorbing moisture inside the building; the waterproof
sheet serving to prevent dew-drops on an inner face of
the coping plate from coming down to the insulating
material.
2. A rooftop parapet according to claim 1, said
20 moisture-proof sheet having a sagged portion.
3. A rooftop parapet according to claim 1 or 2, said
waterproof sheet having a sagged portion.
4. A building as claimed in claim 1, 2 or 3, wherein

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the coping plate is fixed to the curtain wall but not to the parapet base.

5. A building as claimed in any preceding claim wherein the moisture-proof sheet is secured at an exterior longitudinal margin thereof to an upper horizontal frame member of the curtain wall.

6. A building as claimed in any preceding claim wherein the moisture-proof sheet is secured at an interior longitudinal margin thereof to the parapet base.

7. A building as claimed in any preceding claim wherein an exterior margin of the waterproof sheet terminates in a hanging edge.

8. A building as claimed in any preceding claim wherein the waterproof sheet penetrates at an interior margin thereof into the parapet base.

9. A curtain-walled building with a rooftop parapet substantially as described with reference to and as illustrated in Figure 3 of the accompanying drawings.
