

## MOBILE BUILDING PLATFORM

### FIELD OF THE INVENTION

5 The present invention relates to the building and construction industry. In a particular form the invention relates to providing an elevated building platform that may be employed as a base for cranes and other hoisting equipment for work to be carried out externally on a building.

10

### BACKGROUND OF THE INVENTION

Often during the construction or refit of a building there is a requirement to have construction personnel, cranes and other hoisting equipment located at an elevated level. This is especially so where work is being conducted  
15 externally on a large structure which may be of multiple storeys in height. One example of such a construction task is the extension or construction of a building such as an airport terminal which is generally of extended length to house the individual reception areas for each airline.

20 It is in these instances that a single crane is unsuitable due to the size of the structure and as a consequence as the work progresses along the building, cranes and other hoisting equipment will need to be dismantled and re-erected on fresh staging. Clearly, this is an expensive and time consuming process with associated time delays which may run into months. To address  
25 this time delay typically two or more cranes will be employed at a time. Another disadvantage of this approach is that where a refit is being performed on a building having multiple entrances and exit points the dismantling and erection of a crane such as a tower crane will affect public access to the building causing great inconvenience. Additionally, it will often

be the case that cranes and other hoisting equipment will be required to be located close to the building also preventing vehicular access.

It is an object of the present invention to provide an elevated building platform capable of being conveniently moved to a new work section without complete dismantling and suitable for use as a staging platform for a crane or other hoisting equipment.

It is a further object of the present invention to provide an elevated building platform that attempts to maximise public access to ground level areas.

## SUMMARY OF THE INVENTION

In a first aspect the present invention accordingly provides an elevated mobile building platform arrangement for the construction of an elevated structure, said arrangement including:

- a first support member;
- a second support member spaced apart from said first support member;
- a roof member bridging said first and second support members, said roof member forming an elevated building platform; and
- a temporary track located adjacent to the elevated structure, said temporary track removable after the construction of the elevated structure, wherein said first and second support members each include track mounted movement means for moving said elevated building platform along the temporary track.

As the platform can be moved to a new location as required it is only necessary to erect the building platform once thereby saving substantially on time, materials and costs. The platform may be used to both mount

equipment such as cranes and the like and also for the storage of materials before they form part of the construction work. Additionally, the roof member may provide a safety canopy to areas beneath the roof member.

- 5 Preferably, said movement means includes sliding means to facilitate movement of said platform arrangement along said track.

Preferably, said sliding means includes a horizontal plate element to slide along said track. Preferably, said plate element is self-lubricating.

10

Optionally, said movement means includes roller elements to facilitate movement of said platform arrangement along said track.

Preferably, said roller elements are Hilman™ rollers.

15

Preferably, said roof member includes a reinforced portion, wherein said reinforced portion of said roof member is reinforced for the mounting of a tower crane or similar hoisting equipment on said reinforced portion.

- 20 By being able to mount a tower crane onto the platform arrangement the requirement to use a number of these cranes for extended constructions sites is overcome. This substantially reduces the costs of a construction project of this nature.

- 25 Preferably, said reinforced portion is reinforced by including a third support member, said third support member located substantially near to said second support member and providing support to said reinforced portion, said third support member also including track mounted movement means for moving said elevated building platform along said track.

This provides a convenient way to implement the extra reinforcing required when the platform arrangement is being used to support heavy equipment.

5 Preferably, said platform arrangement includes jacking or winching means to winch cables attached to said platform arrangement to move said platform arrangement along said track.

10 Optionally, said moving means includes drive means located on said platform arrangement to drive said roller elements to move said platform arrangement along said track.

15 Preferably, said roof member spans an extended space between said support members, said extended space sufficient to allow vehicular access underneath said platform arrangement.

Thus in the example of an airport terminal undergoing extension, vehicles may still drive under the platform arrangement to access other parts of the terminal as required.

20 Preferably, said track includes corresponding channel or rail elements for each support member.

25 Preferably, said support members form substantially parallel wall members extending along said platform arrangement.

Preferably, said wall members each include an aperture to allow human access through said wall members.

This allows public access to regions either under or to the other side of the platform arrangement.

5 In a second aspect the present invention accordingly provides an extended mobile building platform arrangement, said extended mobile building platform arrangement including a plurality of mobile building platform arrangements according to a first aspect of the present invention, wherein each of said mobile building platform arrangements may be individually moved along said track and secured together to form an extended elevated  
10 building platform.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

A preferred embodiment of the present invention will be discussed with  
15 reference to the accompanying drawings wherein:

FIGURE 1 is a front view of an elevated mobile building platform arrangement according to a preferred embodiment of the present invention being erected;

FIGURE 2 is a front view of the elevated mobile building platform  
20 arrangement illustrated in Figure 1 after erection with a tower crane installed on the platform;

FIGURE 3a is a top view of a plurality of elevated mobile building platform arrangements as illustrated in Figure 1 prior to movement to a new location;

FIGURE 3b is a side view of the plurality of elevated mobile building  
25 platform arrangements as illustrated in Figure 3a;

FIGURE 4a is a top view of the plurality of elevated mobile building platform arrangements as illustrated in Figure 3a depicting the movement of the crane supporting platform to the new location;

FIGURE 4b is a side view of the plurality of elevated mobile building platform arrangements as illustrated in Figure 4a;

FIGURE 5a is a top view of the plurality of elevated mobile building platform arrangements as illustrated in Figure 3a depicting the movement of the

5 second platform to the new location;

FIGURE 5b is a side view of the plurality of elevated mobile building platform arrangements as illustrated in Figure 5a;

FIGURE 6a is a top view of the plurality of elevated mobile building platform arrangements as illustrated in Figure 3a depicting the movement of the third

10 platform to the new location;

FIGURE 6b is a side view of the plurality of elevated mobile building platform arrangements as illustrated in Figure 6a;

FIGURE 7a is a top view of the plurality of elevated mobile building platform arrangements as illustrated in Figure 3a depicting the movement of the fourth

15 and final platform to the new location; and

FIGURE 7b is a side view of the plurality of elevated mobile building platform arrangements as illustrated in Figure 7a.

20 In the following description, like reference characters designate like or corresponding parts throughout the several views of the drawings.

## DESCRIPTION OF PREFERRED EMBODIMENT

Referring now to Figure 1, there is shown an elevated mobile building platform arrangement 100 according to a preferred embodiment of the  
25 present invention in the process of being erected. For the purposes of description only, the present invention will be described in relation to one application, namely its use in relation to construction tasks required in the extension of an airport terminal. In this example, elevated mobile building  
30 platform arrangement 100 is being constructed atop an elevated driveway 315

which extends along the front of an airport terminal 300 building having a roof 350 which is to be extended in length in the direction of driveway 315.

5 Elevated mobile building platform arrangement 100 is formed by a first wall member 110 and second and third adjacent wall members 120, 130 each formed from a rectangular steel framework grid. Each wall member is 5.25 metres in height and 15 metres in length. As shown in Figure 1, a roof member 500 is being lowered by crane 200 to sit atop and bridge wall members 110, 120, 130 thereby forming an elevated building platform. As  
10 would be apparent to those skilled in the art, other support members which support the building platform at an elevated level are also contemplated to be within the scope of the invention.

During the lowering of roof member 500, wall members 110, 120, 130 are  
15 supported by bracing arrangements (not shown) to ensure they remain vertical. Each roof member 500 is 15 metres in length and approximately 22 metres in width extending over elevated driveway 315 and furthermore weighs approximately 52 metric tonnes. Roof member 500 is attached to wall members 110, 120, 130 by standard securing arrangements as known in the  
20 art. In this manner, elevated mobile building platform arrangement 100 may be constructed by use of a crane 200 lifting each of the rectangular steel framework sections that make up the walls and roof of the platform arrangement 100.

25 In this preferred embodiment, platform arrangement 100 is itself constructed on an elevated driveway 315 which is supported from the ground 360 by support means 340 but as would be apparent to those skilled in the art the present invention is applicable to all those instances where an elevated platform is required relative to the local base or ground level.

Referring now to Figure 2, there is shown elevated mobile building platform arrangement 100 after completion with tower crane 600 installed by second crane 210 on roof member 500 which now forms an elevated building platform. Tower crane 600 is formed from a series of sections forming a mast 620, a central operator cabin 625, a boom 610 having a length of 54 metres upon which a crane pulley 615 travels along. Counter jib section 630 includes counter weight 635 and pulley drive means 636. In total, crane 600 weighs approximately 40 metric tonnes and is capable of carrying loads up to 4 metric tonnes on a single pulley load. Roof member 500 also includes safety rail 510.

The crane mast 620 is located midway on the right hand side of elevated building platform 500 (as shown in Figure 2) which has an enhanced load bearing capability in this region provided by the increased support of twin wall members 120, 130 located directly under this region. Furthermore, extra support is provided to compensate for the extra weight of tower crane 600 by hoarding members 400 located underneath elevated driveway 315. Crane 600 may then be used to assist construction of new sections of the building by lifting materials and the like.

Each of the wall members 110, 120, 130 is mounted on a series of oil-less plates 115, 125, 135 which sit upon corresponding channels or rails 310, 320, 330 which are located on elevated driveway 315 and together form a track that guides the movement of platform arrangement 100. As would be clear to those skilled in the art, other plate of sliding arrangements whether self-lubricated or not may be equally suitable depending on the circumstances. Alternatively each of the wall members 110, 120, 130 may be mounted on a series of Hilman<sup>TM</sup> rollers or other roller elements that also sit within

corresponding channels or rails 310, 320, 330 that are located on elevated driveway 315.

5 Elevated mobile building platform arrangement 100 is secured in place by a section of steel universal beam (not shown) that is bolted across the channels or rails at both ends of the platform arrangement 100 to prevent any further movement.

10 Referring now to Figures 3 to 7, there is shown top and side views of four elevated mobile building platform arrangements 101, 102, 103, 104 of the type illustrated in Figures 1 and 2 each mounted adjacent to each other on corresponding rails 310, 320, 330 which are aligned with the location of the first, second and third wall members 110, 120, 130 of each platform arrangement. This then forms an extended building platform 800 that extends  
15 the elevated work area that may be attended to at any one time with assistance from crane 600. Platform arrangements 102, 103, 104 each have modified wall members (for example inner wall member 137) where the middle framework section (for example framework section 136) is raised to provide a 3 metre height clearance thereby allowing potential access by  
20 human traffic through each wall.

Crane 600 is located on first platform arrangement 101 and prior to moving, the boom 610 and counter jib section 630 of crane 600 are aligned with track 330 and hence with the direction of travel to ensure that platform  
25 arrangement 101 is correctly balanced during movement. A series of hydraulic jacks 710, 720, 730 each having a capacity of 3 metric tonnes are located at the end of rails 310, 320, 330 in the direction of travel and 3 by 16.3 mm diameter wire ropes or cables are attached at one end to jacks 710, 720, 730, and at the other end to corresponding wall members 110, 120, 130. A

separate cross steel member is bolted to the front of corresponding wall members 110, 120, 130, this member in itself being towed by a separate cable and hydraulic jack arrangement (not shown).

5 Moving the combined extended building platform 800 involves first preparing the channel or rails and rollers by cleaning the rails of any rust followed by greasing. In addition initial lubricating oil is provided to the plates 115, 125, 135. First platform arrangement 101 is then moved by powering each jack 710, 720, 730 ensuring that any movement difference  
10 between each jack is controlled to within 150 mm. This causes the first platform arrangement 101 to move towards hydraulic jacks 710, 720, 730. This movement continues until the first platform arrangement 101 reaches the desired location (as best seen in Figures 4a and 4b) at which stage platform arrangement 101 is locked in place by the securing arrangement described  
15 above.

Second platform arrangement 102 is then moved in a similar manner (as best seen in Figures 5a and 5b). Once all four platform arrangements have been moved to form an extended platform 800 (as best seen in Figures 7a and 7b) in  
20 the new location, then crane 600 may be re-deployed for use. Rail sections 310, 320 and 330 may then be removed and re-used to move the platform arrangements further along or simply left in place if the extended platform 800 is required to be moved back to its original location.

25 A brief consideration of the above described preferred embodiment will indicate that the invention provides an extremely effective means to provide an elevated building work platform that can be conveniently moved to a new location as required.

Whilst the present invention is described in relation to providing a mobile elevated building platform for use in the construction industry, it will be appreciated that the invention will have other numerous applications consistent with the principles described in the specification.

5

Although a preferred embodiment of the present invention has been described in the foregoing detailed description, it will be understood that the invention is not limited to the embodiment disclosed, but is capable of numerous rearrangements, modifications and substitutions without departing

10 from the scope of the invention as set forth and defined by the following claims.

**THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS**

1. An elevated mobile building platform arrangement for the construction of an elevated structure, said arrangement including:
  - a first support member;
  - 5 a second support member spaced apart from said first support member;
  - a roof member bridging said first and second support members, said roof member forming an elevated building platform; and
  - a temporary track located adjacent to the elevated structure, said temporary track removable after the construction of the elevated structure,
  - 10 wherein said first and second support members each include track mounted movement means for moving said elevated building platform along the temporary track.
2. An elevated mobile building platform arrangement as claimed in claim 1, wherein said movement means includes sliding means to facilitate movement of  
15 said platform arrangement along said track.
3. An elevated mobile building platform arrangement as claimed in claim 2, wherein said sliding means includes a horizontal plate element to slide along said track.
4. An elevated mobile building platform arrangement as claimed in claim 2,  
20 wherein said plate element is self-lubricating.
5. An elevated mobile building platform arrangement as claimed in claim 1, wherein said movement means includes roller elements to facilitate movement of said platform arrangement along said track.

6. An elevated mobile building platform arrangement as claimed in claim 5, wherein said roller elements are Hilman™ rollers.
7. An elevated mobile building platform arrangement as claimed in any one of the preceding claims, wherein said roof member includes a reinforced portion, wherein said reinforced portion of said roof member is reinforced for the mounting of a tower crane or similar hoisting equipment on said reinforced portion.
8. An elevated mobile building platform arrangement as claimed in claim 7, wherein said reinforced portion is reinforced by including a third support member, said third support member located substantially near to said second support member and providing support to said reinforced portion, said third support member also including track mounted movement means for moving said elevated building platform along said track.
9. An elevated mobile building platform arrangement as claimed in any one of the preceding claims, wherein said platform arrangement includes jacking or winching means to winch cables attached to said platform arrangement to move said platform arrangement along said track.
10. An elevated mobile building platform arrangement as claimed in any one of claims 5 to 9, wherein said moving means includes drive means located on said platform arrangement to drive said roller elements to move said platform arrangement along said track.
11. An elevated mobile building platform arrangement as claimed in any one of the preceding claims, wherein said roof member spans an extended space between said support members, said extended space sufficient to allow vehicular access underneath said platform arrangement.

12. An elevated mobile building platform arrangement as claimed in any one of the preceding claims, wherein said track includes corresponding channel or rail elements for each support member.

13. An elevated mobile building platform arrangement as claimed in any one  
5 of the preceding claims, wherein said support members form substantially parallel wall members extending along said platform arrangement.

14. An elevated mobile building platform arrangement as claimed in claim 13, wherein said wall members each include an aperture to allow human access through said wall members.

10 15. An extended mobile building platform arrangement, said extended mobile building platform arrangement including a plurality of mobile building platform arrangements as claimed in any of claims 1 to 14, wherein each of said mobile building platform arrangements may be individually moved along said track and secured together to form an extended elevated building platform.