MOBILE BUILDING PLATFORM

FIELD OF THE INVENTION

The present invention relates to the building and construction industry. In a particular form the invention relates to providing an elevated building platform suitable for use by construction personnel with their equipment and materials when working at elevated levels.

BACKGROUND OF THE INVENTION

Often during the construction or refit of a building there is a requirement for construction personnel to work at an elevated level. One such example includes the interior fit out of the ceiling of a large building such as an airport terminal. Such a fit out would typically include the installation of services such as air conditioning and electrical cabling for lighting and signage. The conventional approach to providing an elevated building platform in these circumstances is to erect a new work platform for each work section as the work progresses along the length of the building.

Clearly, this approach has a number of serious disadvantages. The primary disadvantage is that a fresh elevated building platform must be erected each time the work progresses to a new section. This involves dismantling the current work platform and re-erection of the various scaffolding components to assemble a new elevated building platform resulting in time delays and increased cost implications.

Another disadvantage with this approach is that the dismantling, moving and reinstallation impacts other workers in the construction site who may be attending to tasks at ground level. In the example of a retro-fit of a pre-

existing structure such as an airport terminal it may be necessary that the terminal remain functioning during the construction process, processing passengers and the like, whilst the retrofit occurs. This process of dismantling and reassembling the work or building platform will directly impact on the ability of the terminal to function normally as it will impact on the flow of human traffic.

A further disadvantage is that the equipment and materials being employed by construction personnel will have to be removed from the building platform when it is moved to the next site thus further adding to the expense and inconvenience of this process of dismantling and re-erecting a building platform as the elevated work area or section changes location.

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 followed by reassembly.

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 without compromising their safety.

SUMMARY OF THE INVENTION

In a first aspect the present invention accordingly provides an elevated mobile building platform arrangement, said arrangement including

a static base structure, said base structure including a plurality of vertical support members and horizontal beam members arranged to form a self supporting framework;

a platform member supported at an elevated position by said base structure;

securing means to secure said platform member to a fixed position with respect to said base structure; and

lifting means to lift said platform member with respect to said base structure, wherein on removal of said securing means said platform member may be raised to a raised position by said lifting means from said base structure so it may be moved along said base structure to a new location supported by said base structure.

As the platform member can be moved to different locations on the static base structure this overcomes one of the most significant disadvantages of the prior art in that the elevated platform does not have to be dismantled and re-erected each time the work section moves thereby saving on the considerable costs and time delays associated with this procedure. Additionally, as the base structure is made up of a plurality of vertical support members it can be constructed so that it overlays areas which may require public access. This has the dual advantage of improving the public access to these areas and also providing a safety canopy to these areas from the building work occurring in the elevated area.

Preferably, said platform is supported on said base structure in said raised position by movement means, said movement means including roller elements to facilitate the movement of said platform with respect to said base structure.

This allows the platform member to be moved directly along the base structure by making use of the rolling elements.

Preferably, at least one of said horizontal beam members forms a guide track upon which said roller elements move along to move said platform member.

In this manner, structural components of the base structure may also be employed to form a guide track thereby saving on costs.

Preferably, said roller elements are Hilman™ rollers. These are particularly suitable to moving heavy loads.

Preferably, said lifting means includes hydraulic jacks located on said vertical support members of said base structure. As the jacks are incorporated with the vertical support members which directly support the platform member prior to being raised to the raised position this simplifies the operation of the mobile building platform arrangement.

Preferably, said platform member includes at least one tow point, wherein a tow cable attached to said at least one tow point is employed to move said platform member along said base structure.

Optionally, said platform member includes drive means to drive said platform member along said base structure.

Preferably, a removable portion of said base structure may be removed at one end of said base structure when said removable portion is not supporting said platform member and appended at a second end to provide an extended portion of said base structure for movement of said platform member thereon.

In this manner, parts of the base structure may be re-used as the work progresses to a different location. This once again saves on costs, as the base structure does not have to be large enough to cover the whole work area as portions of the base structure that are not being utilised to support the platform member may be removed and added onto the base structure in the

region of the new work section. This provides a great degree of flexibility to the mobile building platform arrangement.

In a second aspect the present invention accordingly provides a method for moving a building platform supported by a base structure along said base structure, said base structure including a plurality of vertical support members and horizontal beam members arranged to form a self supporting framework, said method including the steps:

unsecuring said building platform from said base structure;

lifting said building platform from said base structure;

locating movement means between said building platform and said base structure; and

moving said building platform with respect to said base structure on said movement means.

BRIEF DESCRIPTION OF THE DRAWINGS

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

FIGURE 1 is a top perspective view of the elevated mobile building platform arrangement according to a preferred embodiment of the present invention;

FIGURE 2 is a detailed perspective view of a column of the elevated mobile building platform as illustrated in Figure 1 depicting the jacking arrangement in a lowered state;

FIGURE 3 is a detailed perspective view of the column illustrated in Figure 2 depicting the jacking arrangement in the raised state;

FIGURE 4 is a perspective view of elevated mobile building platform illustrated in Figure 1 before moving to a new location.

FIGURE 5 is a perspective view of the elevated mobile building platform illustrated in Figure 4 in the process of moving to a new location ; and

FIGURE 6 is a perspective view of the elevated mobile building platform illustrated in Figure 4 located and secured in the new location.

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 present invention. Elevated mobile building platform arrangement 100 includes a static base structure 300 consisting of an array of four rows of three vertical columns 110. The column rows are spaced 15 metres apart and the inter-column spacing within a row is 12.5 metres thereby forming a total covered area of approximately 1124 m^2.

Each column is approximately 5 metres in height and is formed from structural steel. Extending longitudinally along either side of the central row of columns and furthermore to both the left and right sides of the base structure 300 are four parallel horizontal trusses 130 which are attached towards the top of each column 110. Four sets of pairs of parallel cross bracing horizontal beams 120, 125 extending between columns 110 and located underneath trusses 130 are attached to columns 110 along each row. In this manner a self supporting framework constructed of vertical support and horizontal beam members is formed which covers an extended area.

Attached to the base structure is a platform 200 which consists of 7 equally spaced parallel horizontal longitudinal platform beams 210 oriented in the direction of trusses 130 and covering the top of the base structure. Arranged perpendicular and attached to longitudinal platform beams 210 are four equally spaced pairs of top and bottom parallel platform cross beams 230, 220

corresponding to the location of the rows of columns 110. Interspaced between these are further equally spaced parallel top cross beams 230 thereby forming a rectangular grid framework. Further cross ties or bracing members 240 may be incorporated into the rectangular grid framework to strengthen areas of platform 200 as required. A floor (not shown) overlays the framework to form the building platform 200.

Platform 200 is attached to base structure by a series of upwardly extending angled bracing members 140 which extend between platform attachment points 250 located on platform 200 and corresponding base structure attachment points 117 located on each column 110. Each column includes three attachment points 117 and angled bracing members 140 are attached by brackets 141 which allow each angled bracing member 140 to be easily removed. When the platform is attached to the base structure in this manner, horizontal trusses 130 may be removed due to the longitudinal bracing provided by longitudinal platform beams. As would be apparent to those skilled in the art the size and configuration of the base structure and corresponding platform can be varied according to the requirements of the construction task.

Referring now to Figure 2, there is shown located on an inner side and towards the top of each column 110 of the base structure a hydraulic jack 160 supported by a horizontal shelf 115 forming part of column 110. Lifting surface 161 of each jack 160 is located underneath a respective bottom platform cross beam 220 that overlays a column 110 of the base structure. In this preferred embodiment, each jack has a lifting capacity of 20 metric tonnes and a stroke length of 200 mm. A series of tow rings (not shown) are located on each end of building platform 200.

Referring now to Figure 3, there is shown a similar view as depicted in Figure 2 with platform 200 in the raised position ready for moving. Angled bracing members 140 have been removed and hydraulic jack 160 is shown in the activated configuration with lifting surface 161 raised thereby lifting bottom platform cross beam 220 from the column 110. As each column incorporates a hydraulic jack 160 simultaneous operation of each of the jacks 160 will result in the entire platform 200 being raised approximately 180 mm from base structure 300. In this raised position, Hilman™ rollers 400 are then inserted in the gap between the top rail portion 135 of truss and the corresponding bottom platform cross beam 220 at that location. After all the rollers 400 have been installed, platform 200 is then lowered down to transfer the load to rollers 400 by lowering lifting surface 161. In this raised configuration platform 200 may then be moved along the rail portion 135 of truss 130. In this preferred embodiment a pair of strand jacks (not shown) each having a 100 kN capacity powered by respective hydraulic pumps are employed.

Referring now to Figures 4 to 6, the platform 200 movement procedure is depicted in detail. Before movement of platform 200 can occur a new base structure 300' is constructed (note that numbering of the new base structure will be generally indicated by primed numerals) consisting of columns 110', pairs of parallel cross bracing horizontal beams 120', 125' and trusses 130' which replicates to configuration of original base structure 300. Platform member 200 is then moved to the new base structure 300' (as best seen in Figure 5) as described above.

Whilst in this preferred embodiment a combination of Hilman™ rollers 400 and a winching arrangement are employed to move platform 200, clearly other forms of moving the platform 200 whilst it is in the raised position are contemplated to be within the scope of present invention. One example is the

use of drive wheels located and powered on platform 200 which engage a guide track located on base structure to directly drive movement of the platform 200.

Once the platform 200 is aligned with new base structure 300', the hydraulic jacks 160 located on each column 110' may be activated to bear the weight of platform 200 and the rollers 400 removed. Hydraulic jacks 160 may then be simultaneously lowered resulting in the platform being supported by columns 110' at which stage angled bracing members 140 may be bolted between the platform attachment points 250 and the column attachment points 117' thereby securing platform 200 to new base structure 300'. At this stage the original base structure 300 can be dismantled and re-erected adjacent to new base structure 300' when platform 200 is required to be moved again. Alternatively the base structure 300 may be constructed initially to cover a much larger area than that of platform 200 and platform 200 then moved to the desired location as required.

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.

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 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, said arrangement including

a static base structure, said base structure including a plurality of vertical support members and horizontal beam members arranged to form a self supporting framework;

a platform member supported at an elevated position by said base structure;

securing means to secure said platform member to a fixed position with respect to said base structure; and

lifting means to lift said platform member with respect to said base structure, wherein on removal of said securing means said platform member may be raised to a raised position by said lifting means from said base structure so it may be moved along said base structure to a new location supported by said base structure.

2. An elevated mobile building platform arrangement as claimed in claim 1, wherein said platform member is supported on said base structure in said raised position by movement means, said movement means including roller elements to facilitate the movement of said platform with respect to said base structure.

3. An elevated mobile building platform arrangement as claimed in claim 2, wherein at least one of said horizontal beam members forms a guide track upon which said roller elements move along to move said platform member.

4. An elevated mobile building platform arrangement as claimed in claim 3, wherein said roller elements are Hilman™ rollers.

5. An elevated mobile building platform arrangement as claimed in any one of the preceding claims, wherein said lifting means includes hydraulic jacks located on said vertical support members of said base structure.

6. An elevated mobile building platform arrangement as claimed in any one of the preceding claims, wherein said platform member includes at least one tow point, wherein a tow cable attached to said at least one tow point is employed to move said platform member along said base structure.

7. An elevated mobile building platform arrangement as claimed in any one of claims 1 to 5, wherein said platform member includes drive means to drive said platform member along said base structure.

8. An elevated mobile building platform arrangement as claimed in any one of the preceding claims wherein a removable portion of said base structure may be removed at one end of said base structure when said removable portion is not supporting said platform member and appended at a second end to provide an extended portion of said base structure for movement of said platform member thereon.

9. A method for moving a building platform supported by a base structure along said base structure, said base structure including a plurality of vertical support members and horizontal beam members arranged to form a self supporting framework, said method including the steps:

unsecuring said building platform from said base structure;

lifting said building platform from said base structure;

locating movement means between said building platform and said base structure; and

moving said building platform with respect to said base structure on said movement means.

10. A method for moving a building platform as claimed in claim 9, wherein said at least one of said horizontal beam members forms a guide track upon which said movement means moves along to move said building platform.

11. A method for moving a building platform as claimed in claim 9 or 10, wherein said step of lifting includes hydraulically jacking said platform member to an elevated position by hydraulic jacks located on said vertical support members of said base structure.

12. A method for moving a building platform as claimed in any one of claims 9 to 11, wherein said step of moving includes towing said platform member along said base structure.

13. A method for moving a building platform as claimed in any one of claims 9 to 11, wherein said step of moving said building platform includes driving said building platform to move along said base structure by drive means located on said building platform.

14. A method for moving a building platform as claimed in any one of claims 9 to 13, including:

removing a removable portion of the base structure not supporting said platform; and

appending said removable portion to said base structure to provide an extended portion of said base structure for movement of said building platform thereon.