

CONSTRUCTION METHOD

FIELD OF INVENTION

- 5 The invention relates to construction methods and to a track assembly for use in construction.

BACKGROUND TO THE INVENTION

- 10 It is known to construct buildings by first assembling a steel and/or concrete framework and then providing walls to the framework. The framework is generally constructed by first laying foundations and locating columns to extend upwardly there from. A lattice of primary beams is then
15 arranged to extend between the columns and secondary beams are arranged to extend between the primary beams where necessary.

- Buildings constructed in this manner are generally several
20 storeys high and in order to connect the beams to the columns or to other beams it is necessary for construction workers to operate at height.

- A known method of construction requires a beam to be moved
25 towards its desired location by a crane and for a construction worker to guide the beam to its final position. The beam must then be secured in place. During this operation a construction worker may stand upon the existing structure secured by means of a fall-arrest
30 harness attached to the structure. This can be a potentially hazardous process and a worker may still be exposed to some fall risks. There is thus a need for

alternative safer and/or more efficient methods of construction.

Accordingly, the present invention aims to address at least one disadvantage associated with known construction methods whether discussed herein or otherwise.

SUMMARY OF INVENTION

10 According to a first aspect of the present invention there is provided a method of construction, the method comprising:

(i) locating a track for a mechanical erection working platform (MEWP) within a partial building structure wherein said track is located such that it is supported by building framework members of said structure and/or wherein said track is integral with building framework members of said structure;

(ii) locating a MEWP in engagement with the track such that it can move within the structure in a guided manner; and

(iii) using the MEWP to access parts of the structure above the height of the track during the installation of further framework members.

30 Suitably, the method of construction comprises:

(i) locating a track for a mechanical erection working platform (MEWP) within a partial building

structure such that said track is supported by building framework members of said structure;

(ii) locating a MEWP in engagement with the track such that it can move within the structure in a guided manner; and

(iii) using the MEWP to access parts of the structure above the height of the track during the installation of further framework members.

As used herein, the term mechanical erection working platform (MEWP) encompasses a motorised vehicle, suitably a wheeled vehicle, having a lifting platform for carrying a load such as a person.

Suitably, the partial building structure comprises steel framework members. The framework members may thus form a steelwork frame.

Suitably, the partial building structure comprises framework members comprising columns and beams. Suitably, at least some of the beams are arranged to form part of and/or support a floor of a building structure.

Suitably, the method comprises locating the track to be supported by beams of a partial building structure.

Suitably, the partial building structure comprises at least some beams arranged to form and/or support an nth floor of a building structure, wherein $n \geq 1$ and 0 corresponds to the floor comprising the building structure foundations.

Suitably, the method comprises locating the track at an elevated height. Suitably, the method comprises locating the track at the level of the nth floor of the structure.

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Suitably, the method comprises using the MEWP to access parts of the structure at the level of an nth + m floor wherein m is ≥ 1 . Suitably, m = 1.

10 Suitably, the method comprises using the MEWP to access parts of the structure at the level of an nth + p floor wherein p is ≥ 2 . Suitably p = 2.

The method may thus comprise accessing one or more,
15 suitably two or more, levels of a building structure lying above the level on which the track and MEWP are supported.

Suitably, the track is arranged to support a MEWP. Suitably, the method comprises locating the track such
20 that it can support the MEWP. Suitably, the track is located such that it overlies and is supported by two or more beams of a building framework.

Suitably, the method comprises locating the MEWP onto the
25 track and the MEWP may thus be supported by the track.

Suitably, the method comprises releasably securing the track to a building structure. Suitably, the method comprises releasably securing the track to a building
30 framework, suitably to two or more beams of the framework.

Alternatively, the track may be maintained in place relative to a building structure by gravity alone.

Suitably, the track comprises rails extending transverse, for example perpendicularly, to said supporting beams.

- 5 The method may comprise locating the track such that it abuts beams of a building framework and securing it in place. The track may thus form an open lattice with the beams.
- 10 Suitably, the method comprises locating decking, preferably steel decking, onto beams of a building framework and then locating the track such that it overlies, suitably abuts, the decking. The method may then comprise securing the track in place. The track may
- 15 be releasably secured to beams, for example by bolts passing through the decking. The beams and track may support the MEWP but the decking may provide a safe area on which workers may walk.
- 20 Suitably, the track comprises one or more guide rails. Suitably the track comprises first and second guide rails. Suitably, each rail comprises a beam. Suitably, the method comprises locating the MEWP such that the wheels of a first side engage a first guide rail and the wheels of a
- 25 second side engage a second guide rail.

Suitably, the track comprises a longitudinally extending guide arranged to restrict lateral movement of a MEWP in a first direction. Suitably, the track comprises a

30 longitudinally extending guide arranged to restrict lateral movement of the MEWP in a second direction opposed to said first direction. Suitably, the rails comprise said guides.

Suitably, the track comprises first and second rails, each having longitudinally extending guides arranged to lie on either; an inner side of wheels of first and second sides
5 of the MEWP respectively; an outer side of wheels of first and second sides of the MEWP respectively; or suitably both.

Suitably, the track comprises first and second guide rails
10 each comprising a channel section. The base of the channel may support the weight of the MEWP. The upturned sides of the channel may provide the longitudinally extending guides.

15 Suitably, the method comprises locating the MEWP such that wheels thereof lie within channels of the track. The wheels and thus MEWP may thus be guided to travel along the channel length. Suitably, the wheels and thus MEWP may be prevented from tipping out of the channel.

20 Suitably, the track comprises at least two track sections. Suitably, the track comprises first and second track sections. Suitably each track section comprises first and second guide rails.

25 Suitably, the track comprises first and second parallel guide rails connected by connecting members to hold them in spaced relationship. Suitably, each track section comprises first and second parallel guide rails connected
30 by connecting members to hold them in spaced relationship.

The connecting members may comprise support beams. Suitably, the support beams are arrangeable to support the

weight of the guide rails in use. The support beams may also be arrangeable to hold the guide rails in spaced parallel relationship. The support beams are suitably arrangeable to overlies beams of a building framework.

5 Suitably, the support beams are releaseably coupled to the rails by mounting means to allow their spacing to be adjusted to match a given building structure.

The connecting members may comprise tie beams. Suitably,
10 the tie beams are arranged to hold the guide rails in spaced parallel relationship. Tie beams may be located at the ends and middle of a track section.

Suitably, the method comprises forming a track from track
15 sections. Suitably, the method employs a track assembly comprising a plurality of, for example two, track sections.

Suitably, the method comprises locating first and second
20 track sections such that they are each supported by building framework members and positioning them end to end such that they form a track.

Suitably, the method comprises locating a first track
25 section such that it is supported by building framework members. Suitably, the method comprises securing the first track section in position relative to said framework members. Suitably, the method then comprises locating a second track section such that ends of first and second
30 guide rails thereof lie adjacent the ends of first and second guide rails of the first track section respectively, and such that said second framework member is supported by building framework members. Suitably, the

method comprises securing the second track section in position relative to said framework members. A track may thus be formed by conjoining the track sections.

- 5 The method may comprise locating first and second track sections to form a track and then locating a MEWP in position relative to the track.

Alternatively, the method may comprise locating the MEWP
10 onto the first track section once it is in place but before the second track section is in position. In this case stops may be located at the ends of the first track section to keep the MEWP in engagement with the first track section until the second track section is located in
15 position. The stop(s) lying between the track sections may then be removed allowing the MEWP to move along the length of the track.

Suitably, the method comprises locating stops at the ends
20 of the track to keep the MEWP in engagement with the track.

Suitably, the method comprises releasably securing stops
at the ends of the track.

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Suitably, the method comprises an operator moving the MEWP along the track. A basket of the MEWP may thus be moved forward and back along the track. Suitably, the method comprises moving a basket of the MEWP up and down. Thus,
30 access may be gained to parts of a structure lying above the height of the track over the tracks length.

Suitably, the method comprises repositioning a track section once the desired work has been carried out above it.

5 Suitably, the method comprises locating the MEWP on a track section, for example the second section, and positioning stops at both ends to maintain the MEWP in engagement with that track section. Suitably, a stop is already positioned at one end of said track section, for
10 example the second track section, and the method simply comprises locating a stop at the end adjoining the other, for example the first, track section.

Suitably, the other track section, for example the first
15 section, may then be moved to lie adjacent the other end of the unmoved, for example second, track section. The stop(s) lying between the track sections may then be removed allowing the MEWP to move along the length of the track. Thus, access to a further part of the structure
20 may be provided.

This process may be repeated but this time locating the MEWP on the last moved track section, for example the first section, and moving the other, for example second,
25 section to lie adjacent the other end of the last moved, for example first, section. In this manner the track and thus MEWP can be moved along the length of a building.

Suitably, the method comprises relocating the track and
30 MEWP to higher levels of a building structure. The MEWP may for example be moved along the track on an nth level to construct an nth + m level to a sufficient degree that

nth + m level is able to support a track and the track and MEWP may then be located onto the nth + m level.

Suitably, the method comprises lifting the track into position with a crane. Suitably, the track comprises sections lifted into place by crane.

Suitably, the method comprises repositioning track sections with a crane to move the track within a structure.

Suitably, the MEWP is lifted into position by crane.

The method may comprise using the MEWP to guide a frame element, for example a beam, into place. The method may comprise using a MEWP to allow a worker access to secure a frame element, for example a beam, to a building framework.

According to a second aspect of the present invention there is provided a track assembly, wherein the assembly comprises first and second track sections, each track section comprising a first guide rail, a second guide rail and connecting members holding the rails in spaced parallel relationship and wherein the track sections are arrangeable to be positioned end to end to form a track for guiding the travel of a MEWP within a building structure.

Suitably, the track assembly is arrangeable to form a track for supporting and guiding the travel of a MEWP at height within a building structure.

Suitably, the track assembly further comprises stops for the ends of the track and/or track sections.

Suitably, the track assembly is arranged to be employed in
5 a method according to the first aspect.

Suitably, the track assembly comprises any feature as described in relation to the first aspect except where such features are mutually exclusive.

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BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be illustrated by way of example with reference to the accompanying drawings in
15 which:

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Figure 1 is a side elevation of apparatus for use in a construction method located in a partial building structure.

Figure 2 is a perspective view of a track section;

Figure 3 is a plan view of a track section;

25 Figure 4 is a section along line B-B;

Figure 5 is a section along line C-C also showing a MEWP in position on a track; and

30 Figure 6 is a detailed view of part of a track with parts omitted for clarity.

DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1 illustrates apparatus for employment in a method of construction. The apparatus comprises a track 10
5 formed from a track assembly 20 comprising first and second track sections 30, 40 and a mechanical erection working platform (MEWP) 50.

In use, the track 10 is located such that it overlies
10 beams 60 of a framework 70 of a partial building structure 80 and is thus supported thereby. During construction the MEWP 50 can be moved forward and back along the track 10 and a basket 90 manoeuvred to allow access to parts of the structure 80 lying above the level of the track 10.

15 As best illustrated by Figure 2, each track section 30, 40, comprises a first guide rail 100 for engaging wheels of a first side of the MEWP 50 and a second guide rail 110 for engaging wheels of a second side of the MEWP.

20 Each guide rail 100, 110 comprises a longitudinal beam 120 arranged to support the weight of the MEWP 50. Attached to the beam 120 are guides for directing the direction of travel of the wheels of the MEWP. A first longitudinal
25 guide 130 extends along an outward side of the beam 120 and a second longitudinal guide 140 extends along an inner side of the beam 120. The guides each have an "L" shaped form and are secured to the beam 120 to define a channel for receiving wheels of the MEWP. In use, the upturned
30 edges of the channel can engage the wheels to keep them within the channel such that the MEWP 50 travels in the longitudinal direction of the beam 120. The upturned

edges of the channel may also prevent the MEWP 50 tipping over.

Each track section further comprises connecting members
5 150 joining the first and second rails 100, 110 and holding them in parallel spaced apart relationship. The connecting members comprise support beams 160 and tie beams 170.

10 The support beams 160 are arranged to be located over beams 60 of a structure 80 to both support the rails 100, 110 and hold them in the correct positions. The support beams are connected to the rails 100, 110 by mountings 180.

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The tie beams 170 are secured between the rails 100, 110 at ends and a mid point thereof to fix the rails in position relative to one another.

20 The track 10 further comprises stops 190 selectively located at the ends of the track 10 or a track section 30, 40 to prevent the MEWP 50 from leaving the rails unintentionally.

25 A partial building structure 80 is formed by laying foundations (not shown) and creating a framework 70 of columns and beams. Beams 60 for forming and/or supporting the floors of several levels may be installed by accessing the structure with an MEWP situated at the level of the
30 foundations. However beyond the reach of the MEWP this is not possible. Accordingly, once beams have been installed at an nth floor level, wherein $n \geq 1$, and 0 corresponds to the floor level of the building structure foundations, the

track 10 can be located at that nth level and the MEWP 50 operated on the track 10 to construct further parts of the structure 80.

- 5 In a preferred embodiment a track 10 for an MEWP is installed within a partial building structure 80 such that said track 10 is supported by building framework members comprising beams 60 of said structure. Following this an MEWP 50 is located in engagement with the track 10 such
10 that it can move within the structure 80 in a guided manner. The MEWP 50 is then used to access parts of the structure 80 above the height of the track during the installation of further framework members 60.
- 15 In a preferred embodiment once beams of a building framework 70 have been located at the nth level of a structure 80 decking 200 is laid down to form a floor upon which workers can walk.
- 20 Track sections 30, 40 are formed by securing support beams 160 to the rails 100, 110 via mountings 180. In this step support beams are located at positions corresponding to the locations of beams of the framework 70 onto which the track is to be located. The tie beams 170 fixedly secure
25 the rails 100, 110 to one another to ensure that they remain correctly positioned during this operation.

A first track section 30 is lifted into place by crane and positioned such that the support beams 160 rest upon the
30 decking 200 and overlies beams of the building framework. The support beams 160 are then secured in place.

A second track section 40 is similarly located and secured into place such that it lies end to end with the first track section 30 to form a track 10.

- 5 Stops 190 are located at either end of the track 10 to ensure that an MEWP 50 can not be driven off the track 10. An MEWP is then lifted into place by crane and located onto the track 10 such that its wheels lie within the channels of the rails 100, 110 of the track 10.

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A worker can then walk onto the decking 200 and access the MEWP 50. The MEWP may then be driven forward and back along the track 10 and the basket 90 manoeuvred to allow access to parts of the structure 80 lying above the height
15 of the track 10.

Once the necessary work above the track 10 within the reach of the MEWP 50 has been completed the MEWP 50 may be moved onto one of the track sections, and parked up. For
20 example, Figure 1 illustrates, in dotted outline, the MEWP parked up on the first track section 30. Stops 190 can be located at the end of the first track section 30 adjacent the second track section 40. In this way the MEWP 50 can be maintained on the first track section 30.

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The second track section 40 can then be detached from the framework 70 and lifted by crane into a new position, shown in dotted outline in Figure 1, such that it lies adjacent the other end of the first track section 30. A
30 stop (not shown) is located at the end (not shown) of the second track section 40 opposed to the first track section 30 such that the track 10 has stops 190 at each end. The stop 190 lying at the end of the first track section 30

which is now adjacent the second track section 40 is then removed allowing the MEWP to travel along the length of the repositioned track 10.

- 5 This process may be repeated by moving the first track section 30 and so on to allow the track 10 to be moved along the length of a structure 80.

10 Once the necessary work has been undertaken to install framework elements for one or more floor levels above the level of the track 10 the track sections 30, 40 and MEWP 50 can be located by crane to a higher level and the method repeated as necessary to install framework elements 60 at higher levels of the structure 80.

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It will be appreciated that preferred embodiments of the present invention may allow for safe and efficient construction of building structures. Preferred
20 embodiments may allow safe access to and from an MEWP basket and ease of rescue in an emergency. They may also be used with a range of decking profiles and may be modified to accommodate a range of MEWP's.

25 Attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

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All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or

process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

- 5 Each feature disclosed in this specification (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each
10 feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any
15 novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A method of construction, the method comprising:

- 5 (i) locating a track for a mechanical erection working platform (MEWP) within a partial building structure wherein said track is located such that it is supported by building framework members of said structure and/or wherein said track is
- 10 integral with building framework members of said structure;
- (ii) locating a MEWP in engagement with the track such that it can move within the structure in a guided
- 15 manner; and
- (iii) using the MEWP to access parts of the structure above the height of the track during the installation of further framework members.
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2. A method of construction according to claim 1, wherein the method comprises:

- (i) locating a track for a mechanical erection working
- 25 platform (MEWP) within a partial building structure such that said track is supported by building framework members of said structure;
- (ii) locating a MEWP in engagement with the track such
- 30 that it can move within the structure in a guided manner; and

- (iii) using the MEWP to access parts of the structure above the height of the track during the installation of further framework members.
- 5 3. A method according to any preceding claim, wherein the method comprises locating the track to be supported by beams of a partial building structure.
- 10 4. A method according to any preceding claim, wherein the method comprises locating the track at an elevated height.
- 15 5. A method according to any preceding claim, wherein the partial building structure comprises at least some beams arranged to form and/or support an nth floor of a building structure, wherein $n \geq 1$ and 0 corresponds to the floor comprising the building structure foundations and the method comprises locating the track at the level of the nth floor of the structure.
- 20 6. A method according to claim 5, wherein the method comprises using the MEWP to access parts of the structure at the level of an nth + m floor wherein m is ≥ 1 and/or using the MEWP to access parts of the structure at the level of an nth + p floor wherein p is ≥ 2 .
- 25 7. A method according to any preceding claim, wherein the method comprises releasably securing the track to a building structure.
- 30 8. A method according to any preceding claim, wherein the track comprises a longitudinally extending guide

arranged to restrict lateral movement of a MEWP in a first direction.

- 5 9. A method according to claim 8, wherein the track comprises a longitudinally extending guide arranged to restrict lateral movement of the MEWP in a second direction opposed to said first direction.
- 10 10. A method according to any preceding claim, wherein the track comprises one or more guide rails.
- 15 11. A method according to claim 10, wherein the track comprises first and second guide rails each comprising a channel section.
- 20 12. A method according to claim 10 or 11, wherein the track comprises first and second parallel guide rails connected by connecting members to hold them in spaced relationship.
- 25 13. A method according to any preceding claim, wherein the track comprises at least two track sections and the method comprises forming a track from track sections.
- 30 14. A method according to claim 13, wherein each track section comprises first and second parallel guide rails connected by connecting members to hold them in spaced relationship.
15. A method according to any preceding claim, wherein the method comprises locating stops at the ends of the track to keep the MEWP in engagement with the track.

16. A method according to any preceding claim, wherein the method comprises repositioning a track section once the desired work has been carried out above it.
- 5 17. A track assembly, comprising first and second track sections, each track section comprising a first guide rail, a second guide rail and connecting members holding the rails in spaced parallel relationship and wherein the track sections are arrangeable to be
10 positioned end to end to form a track for guiding the travel of a MEWP within a building structure.
18. A track assembly according to claim 15, wherein the track assembly is arrangeable to form a track for
15 supporting and guiding the travel of a MEWP at height within a building structure.
19. A track assembly according to claim 17 or 18, wherein the track assembly further comprises stops for the
20 ends of the track and/or track sections.
20. A track assembly according to any of claims 17 to 19, wherein the track assembly is arranged to be employed in a method according to any of claims 1 to 16.